



**LEBANON PLANNING BOARD
AUGUST 12, 2024 - 6:30 PM
COUNCIL CHAMBERS, CITY HALL OR
REMOTE VIA VIRTUAL PLATFORM
LEBANONNH.GOV/LIVE**

1. Call to Order

- A. To participate in this meeting, please [join live via Microsoft Teams](#) or call 929-229-5356 (access code: 993 751 431#). If you have trouble accessing this meeting, please [email tim.corwin@lebanonnh.gov](mailto:tim.corwin@lebanonnh.gov).

2. Notice of Regional Impact

3. Other Business

- A. **Marlee Dixon, 78 Bank Street (Tax Map 92, Lot 106), zoned R-O:** Request per Section 213.8.B of the Zoning Ordinance to waive the impact fees assessed for the conversion of a previous office use to a one-family dwelling. **PB2024-30-AAD**

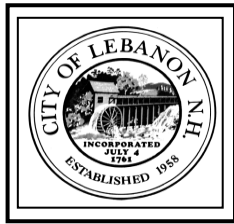
4. Public Hearing Items

- A. **Brickyard One Nominee Trust, 174 Hanover Street (Tax Map 48, Lot 4), 0 Hanover Street (Tax Map 48, Lot 2), 0 Hanover Street (Tax Map 48, Lot 1), and 238 Hanover Street (Tax Map 63, Lot 1), zoned R-1, R-O-1, R-3 & RL-3:** Request for Site Plan Review and a Conditional Use Permit pursuant to Sections 308.2, 310.2, 311A.2, and 501.2 of the Zoning Ordinance for a proposed 474-unit multi-family Planned Unit Residential Development (PURD) totaling +/- 731,600 sq. ft. in size, consisting of 11 buildings together with parking, utilities, landscaping, access, and other related site improvements. Applicant also requests a Conditional Use Permit pursuant to Section 308.4 of the Zoning Ordinance to allow an increase in the maximum permitted building height from 45 ft. to 55 ft. **PB2024-22-CUPSPR - Continued from July 8, 2024**
- B. **XYZ Dairy, LLC, 0 Beyerle Street & 51 Crafts Avenue (Tax Map 58, Lot 18 & Tax Map 58, Lot 19), zoned R-3:** Request for a Conditional Use Permit pursuant to Sections 310.2 and 509 of the Zoning Ordinance for a proposed cottage development with 16 dwelling units and a community building, together with related site improvements. **PB2024-31-CUP - Continued from July 8, 2024**
- C. **Edwards Properties, LLC, 135 Heater Road (Tax Map 78, Lot 41), zoned IND-L:** To allow the conversion of a dwelling unit to an office use, applicant requests (i) a Conditional Use Permit pursuant to Section 303.2 of the Zoning Ordinance to expand the office use approved by Conditional Use Permit on April 15, 2024 (PB2024-02-CUP), and (ii) pursuant to Section 9.1 of the Site Plan Review Regulations, a modification to the site plan approved on April 15, 2024 (PB2024-14-SPR). **PB2024-27-CUPSPA - Postponed from July 8, 2024**
- D. **XYZ Dairy, LLC, River Park Drive (Tax Map 44, Lots 21 - 30 & Tax Map 44, Lot 7), zoned CBD, IND-L and R-3:** Applicant requests a 2-year extension of the River Park Subdivision approval (PB2011-01-FMAJ) and Site Plan approval (PB2010-25-SPR), as most recently amended on September 9, 2019 (PB2018-34-SPA) and extended on October 12, 2021 (PB2021-29-EXT). **PB2024-34-EXT**

- E. **City of Lebanon, 0 Barrows Street (Tax Map 77, Lot 106), zoned R-3:** Applicant requests (i) a Conditional Use Permit per Sections 310.2 and 509 of the Zoning Ordinance for a proposed 5-unit cottage development and (ii) Site Plan Review for the first phase of the development. **PB2024-33-CUPSPR**
- 5. **Approval of Minutes**
 - A. July 8, 2024
 - B. July 22, 2024
 - C. June 24, 2024
- 6. **Adjournment**

The order of agenda items is subject to change.

Meetings are open for in-person and remote attendance. Members of the public that wish to attend remotely may do so by going to LebanonNH.gov/Live where you will find instructions on how to enter the meeting. Members of the public will be able to participate and ask questions through the City's virtual platform or by phone. Please note: Should technical difficulties occur during the meeting that disrupts virtual or phone connection(s), the meeting will continue without remote access capabilities.



CITY OF LEBANON ~ PLANNING & DEVELOPMENT

MEMORANDUM

TO: Planning Board

FROM: Planning and Development Department Staff

**RE: July 8, 2024 Planning Board Meeting - Agenda Item 4.A
Marlee Dixon/Greg Hagley Appeal of Impact Fee Assessment -
78 Bank Street (Tax Map 92, Lot 106), Zoned R-O**

DATE: July 4, 2024

INTRODUCTION

On June 10, 2024, the Planning & Development Department received a letter from Marlee Dixon and Greg Hagley requesting a waiver of impact fees assessed against their property at 78 Bank Street. Ms. Dixon and Mr. Hagley purchased the property in January 2024 and converted it from an office use to a one-family dwelling. Per Section 213.8.B of the Zoning Ordinance, the Planning Board is authorized to grant full or partial waivers if an applicant satisfies the criteria set forth in either Section 213.8.B.1 or 2 (see below for discussion).

BACKGROUND

The property at 78 Bank Street (Tax Map 92, Lot 106), located in the Residential Two (R-2) zoning district, was constructed in 1800 according to the City's assessing records. On February 6, 1989, the Zoning Board of Adjustment granted a Special Exception for the property to "permit a professional office in a residential building" (quoting the ZBA's Notice of Decision for ZB-32-109-89), followed by Site Plan approval from the Planning Board on March 27, 1989 for "a proposed 1,750 sq. ft. office at Bank Street," (quoting the Planning Board's Notice Action for PB32-10-89). To staff's knowledge, the building at 78 Bank Street was used as a professional office through the end of 2023.

On January 31, 2024, the property was sold to Marlee Dixon and Gregory Hagley who subsequently sought approval from the City to convert the use of the building to a one-family dwelling (which is a permitted use in the R-2 District). In connection with Ms. Dixon and Mr. Hagley's proposed conversion from an office to a one-family use, the Planning & Development Department has assessed impact fees pursuant to Section 213 of the Zoning Ordinance. A copy of the Impact Fee Acknowledgement Form/Invoice is attached for reference.

Pursuant to Section 213.4 of the Zoning Ordinance, the Planning Board has authorized the assessment of impact fees relative to the proportional demand of new development on the City's recreation, Fire Department, and Police Department capital facilities and the capital facilities of the School District. Pursuant to Section 213 of the Zoning Ordinance, new development includes the creation of a new dwelling unit and the conversion of a legally existing use which would result in a net increase in the number of dwelling units. See Section 213.3.E(1) and (3).

Lebanon's impact fee ordinance was first adopted in 1991 and repealed in 1999. A new ordinance was adopted in 2001 as Section 213 of the Zoning Ordinance which was then replaced with a re-

8/12/24 PLANNING BOARD MEETING
AGENDA ITEM 3.A
POSTPONED FROM 7/8/2024

STAFF MEMORANDUM

Agenda Item 4.A
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write of Section 213 in 2009. The adoption of Lebanon's initial impact fee ordinance and all amendments thereto occurred after conversion of the building at 78 Bank Street from an office to a residential use 35 years ago in 1989.

Pursuant to the authority granted under Sections 213.4 ("Authority to Assess Impact Fees"), 213.5 ("Standards and Basis of Assessment"), and 213.6 ("Review and Change in Assessment Schedules") of the Zoning Ordinance, the Planning Board has adopted an impact fee schedule which assesses fees based on the area of the building to be occupied by the proposed use. For residential uses, the impact fee is calculated by multiplying the total gross living area (GLA) by the per square foot fee for each category. For example, if the gross living area of a new home is 2,000 sq. ft., the school impact fee is calculated as follows: 2,000 sq. ft. GLA x \$2.00 per sq. ft. = \$4,000.

With respect to the proposed one-family conversion of 78 Bank Street, the total impact fee is **\$5,311.76**, which calculated pursuant to the current impact fee schedule that was adopted by the Planning Board on October 12, 2021¹. See attached Impact Fee Acknowledgement/Invoice. The assessed impact fee was also calculated in accordance with Section 213.5.D which addresses use conversions (as opposed to new construction):

- D. In the case of new development created by conversion or modification of an existing use, the impact fee shall be based upon the net positive increase in the impact fee assessed for the new use for each category of impact fee assessment as compared to the highest impact fee that was or would have been assessed for each category of impact fee assessment for the previous use in existence on or after the effective date of this Ordinance.

Pursuant to Section 213.5.D, the impact fee for the 78 Bank Street conversion is "discounted" \$0.10 per sq. ft. for the Recreation fee and \$0.26 per sq. ft. for the Police Department fee, and is reduced to \$0.00 for the Fire Department fee since the Fire Department rate for commercial uses is actually higher than the rate for single-family uses. The school fee is assessed at the full \$2.00 per square foot rate since school impact fees are not assessed for non-residential development. Consequently, the effective impact fee rates for the proposed conversion are shown in red below (image taken from the attached Impact Fee Acknowledgement/Invoice):

Structure Type or Use	Impact Fees Per Square Foot - 2021 Update				
	Schools *	Recreation	Police Dept	Fire Dept	Total
Residential Development					
<i>Per Sq. Ft. Gross Living Area</i>					
Single Family Detached	\$2.00	\$0.76	\$0.28	\$0.20	\$3.24
All Other Housing Units	\$1.45	\$0.69	\$0.25	\$0.40	\$2.79
Non-Residential Development					
<i>Per Sq. Ft. Gross Floor Area</i>					
Retail, Restaurants and Lodging	---	\$0.06	\$0.36	\$0.36	\$0.78
Offices and Commercial Services	---	\$0.10	\$0.26	\$0.31	\$0.67
Industrial, Transp, Whse, Commun.	---	\$0.04	\$0.10	\$0.10	\$0.24
Nursing & Licensed Care Facilities	---	\$0.03	\$0.05	\$0.45	\$0.53
Other Institutional Uses	---	\$0.03	\$0.29	\$0.26	\$0.58
	\$2.00**	\$0.66**	\$0.02**	\$0.00**	\$2.68

¹ Note that the total owed would be \$7,888.36 if the current impact fee schedule which was adopted by the Planning Board on May 20, 2024, was in effect at the time that the impact fee in question was assessed.

ZONING ORDINANCE

The Planning Board is authorized to grant *full or partial* waivers of impact fees pursuant to Section 213.8.B of the Zoning Ordinance, which provides as follows:

- B. The Planning Board may grant full or partial waivers of impact fees to an assessed property where the Board based on credible evidence presented by the applicant finds that one or more of the following criteria are met with respect to the particular public capital facilities for which impact fees are normally assessed:
1. An assessed property may apply to the Planning Board for a full or partial waiver of impact fee assessments imposed by this Ordinance on the basis of other contributions toward public capital facilities. The amount of such a waiver shall not exceed the value of land, facilities construction, or other contributions for public capital facilities. The value of on-site and off-site improvements which are required by the Planning Board as a result of subdivision or site plan review, and which would have to be completed by the developer, regardless of the impact fee provisions, shall not be considered eligible for waiver under this Ordinance. The value of contributions or improvements shall be credited only toward facilities of like kind, and may not be credited to other categories of impact fee assessment. All costs incurred by the City for the review of a proposed waiver, including consultant and counsel fees, shall be paid by the applicant.
 2. The Planning Board may waive an impact fee, in whole or in part where, in the opinion of the Board, such fee would, due to interference with constitutionally-vested rights, pose an unnecessary hardship to the applicant and waiver would not be contrary to the spirit and intent of this Ordinance.

In order to grant a waiver from all or any portion of impact fees assessed pursuant to Section 213 of the Zoning Ordinance, the Board must find that the applicant has satisfied the criteria in one or both of the Section 213.8.B criteria set forth above.

ATTACHMENTS

- Impact Fee Acknowledgement Form/Invoice prepared for 78 Bank Street conversion
- Application:
 - Application form (1 page)
 - Letter dated June 9, 2024 from Marlee Dixon and Greg Hadley (2 pages)
 - Attachments to June 9, 2024 letter from Marlee Dixon and Greg Hadley (3 pages)

Cc (via e-mail): Marlee Dixon
Greg Hagley

IMPACT FEE ACKNOWLEDGMENT/INVOICECity Tax Map 92 Lot 106 Plot _____Planning Board: App.# N/A Approval Date N/A Date Lot was Created prior to 2009

Building Permit # _____ Date Building Permit Filed _____

Property Owner: Gregory Hadley et alProperty Location 78 Bank StreetTotal Amount of Gross Living Area or Gross Floor Area (see below definitions) 1,982* Sq. Ft.Impact Fee assessed (School).....\$ 3,964.00*Living Area per City
assessing recordsImpact Fee assessed (Recreation).....\$ 1,308.12Impact Fee assessed (Police).....\$ 39.64Impact Fee assessed (Fire).....\$ 0.00TOTAL IMPACT FEE ASSESSED.....\$ 5,311.76

TOTAL IMPACT FEE PAID \$ _____

DATE PAID _____

The Impact Fee is assessed at the time of Building Permit application and must be paid prior to issuance of a Certificate of Occupancy / Certificate of Completion

City of Lebanon, New Hampshire - Impact Fee Schedule
as adopted by the Planning Board on 10/12/21

Structure Type or Use	Impact Fees Per Square Foot - 2021 Update				
	Schools *	Recreation	Police Dept	Fire Dept	Total
Residential Development					
<i>Per Sq. Ft. Gross Living Area</i>					
Single Family Detached	\$2.00	\$0.76	\$0.28	\$0.20	\$3.24
All Other Housing Units	\$1.45	\$0.69	\$0.25	\$0.40	\$2.79
Non-Residential Development					
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Retail, Restaurants and Lodging	---	\$0.06	\$0.36	\$0.36	\$0.78
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Other Institutional Uses	---	\$0.03	\$0.29	\$0.26	\$0.58
	\$2.00**	\$0.66**	\$0.02**	\$0.00**	\$2.68

Definitions from Appendix A of the Lebanon Zoning Ordinance:

Gross Living Area (Residential): The total area of above-grade residential space within a *dwelling unit* as measured using exterior building dimensions, with a ceiling height of 7 ft. or greater, excluding unheated areas such as garages, enclosed or open porches, covered or open decks, outside stairs, balconies, and other unenclosed areas. The floor area of a walk-out basement with a ceiling height of 7 feet or greater shall be included.

Gross Floor Area (Non-Residential Uses): The total square footage of all floors of a building as measured using exterior building dimensions. For purposes of calculating minimum parking requirements per Section 607.2.A, "gross floor area" shall mean the total square footage of all floors devoted to the use, or accessory to that use, as **measured** using exterior building dimensions.

I acknowledge that as a condition of the Building Permit, the total impact fee assessed above must be paid prior to occupancy and/or the issuance of any Certificate of Occupancy (RSA 674:21 V). I agree that I will not occupy and that I will not permit the occupancy of any buildings described above that are subject to this impact fee prior to payment of such fee. I further agree to notify the Building Inspector of any changes in gross living area for residential uses, and gross floor area for non-residential uses, prior to occupancy.

Property Owner Signature _____ Date _____

**Where the impact fee rate for a new use is higher than the impact fee rate for the prior use, an impact fee for the new use is assessed based on the difference between the two rates. See Section 213.5.D of the Zoning Ordinance.

Lebanon Zoning Ordinance – Selected Text from Section 213 - Impact Fees
(full text available in the Zoning Ordinance last revised February 7, 2024)

Authority. These regulations are authorized by New Hampshire RSA 674:21, V, and other pertinent state law, as an innovative land use control. Under this authority, new development in the City of Lebanon may be assessed impact fees in proportion to its demand on the public capital facilities of the City and the School District. *(Adopted July 15, 2009)*

213.3 Definitions.

- D. **Impact fee** means a fee or assessment imposed upon development, including subdivision, building construction or other land use change, in order to help meet the needs occasioned by the development for the construction or improvement of capital facilities owned or operated by the municipality, including and limited to water treatment and distribution facilities; wastewater treatment and disposal facilities; sanitary sewers; storm water, drainage and flood control facilities; public road systems and rights-of-way; municipal office facilities; public school facilities; the municipality's proportional share of capital facilities of a cooperative or regional school district of which the municipality is a member; public safety facilities; solid waste collection, transfer, recycling, processing and disposal facilities; public libraries; and public recreation facilities, not including public open space.
- E. **New development** means an activity that results in:
- (1) The creation of a new dwelling unit or units or new manufactured housing; or
 - (2) The conversion of a legally existing use, or additions thereto, which would result in a net increase in the number of dwelling units; or
 - (3) Construction resulting in a new non-residential building or a net increase in the gross floor area of any non-residential building; or
 - (4) The conversion of a lawful existing use to another use if such change would result in a net increase in the demand on public capital facilities that are the subject of impact fee assessment.
 - (5) A net increase in a residential building's gross floor area greater than 500 square feet.

Notwithstanding the above, new development shall not include:

- a. The creation of any new studio or one-bedroom accessory dwelling unit with a gross living area of 500 sq. ft. or less;
- b. The replacement of an existing manufactured housing unit or any existing dwelling unit; or
- c. The reconstruction of a structure that has been destroyed by fire or natural disaster where there is no change in size, density, or type of use that would increase the demand on capital facilities for which impact fees are assessed.

213.4 Authority to Assess Impact Fees.

The Planning Board is hereby authorized to assess impact fees upon new development, as herein defined, and in accordance with the standards herein set forth. The Planning Board shall have the authority to adopt regulations to implement the provisions of this Ordinance and to delegate the administrative functions of impact fee assessment, collection and disbursement.

213.7 Assessment and Collection of Impact Fees.

- A. Where subdivision or site plan approval is required for new development, impact fees shall be assessed at the time of Planning Board approval of a subdivision plat or site plan.
- B. When no Planning Board approval is required, or has been made prior to the adoption or amendment of the impact fee Ordinance, impact fees shall be assessed prior to, or as a condition for, the issuance of a building permit.
- C. Impact fees shall be collected at the time a certificate of occupancy is issued. If no certificate of occupancy is required, impact fees shall be collected at the time when the development is ready for its intended use.
- D. The Planning Board and the assessed property owner may establish an alternate, mutually acceptable schedule of payment of impact fees. If an alternate schedule of payment is established, the Planning Board may require the applicant to post security, in the form of a cash bond, letter of credit, or performance bond so as to guarantee future payment of assessed impact fees.

213.9 Appeals under This Section.

- A. A party aggrieved by a decision made by the Zoning Administrator relating to administrative decisions in the assessment or collection of impact fees authorized by this Section may appeal such decision to the Planning Board within 30 days of the administrative decision, and not afterward.
- B. As set forth in RSA 676:5, III, a party aggrieved by a decision of the Planning Board under this Section may not appeal to the Zoning Board of Adjustment, but may appeal to the Grafton County Superior Court as provided by RSA 677:15, as amended.

SPECIAL EXCEPTION ☒ ☐	SITE PLAN REVIEW ☐
VARIANCE ☐	SUBDIVISION ☐
MOTION FOR REHEARING ☐	LOT LINE ADJUSTMENT ☐
APPEAL OF AN ADMIN. DECISION ☒	CONDITIONAL USE PERMIT ☐

☒ OTHER Impact Fee Waiver Request

PROPERTY OWNER (APPLICANT):	
NAME: Marlee Dixon	TEL.#: 970-485-5048
MAILING ADDRESS: 78 Bank Street, Lebanon, NH 03766	
E-MAIL ADDRESS: Marleedixon@hotmail.com	
CO-APPLICANT, AGENT, OR LESSEE:	
NAME: Gregory Hagley	TEL.#: 978-985-3051
MAILING ADDRESS: 78 Bank Street, Lebanon, NH 03766	
E-MAIL ADDRESS: greg.hagley@gmail.com	
PROJECT LOCATION:	
TAX MAP #:	LOT #: PLOT #: ZONE: RO
STREET ADDRESS OF PROJECT: 78 Bank Street, Lebanon, NH 03766	
IS THIS PROPERTY LOCATED IN THE: WETLANDS ☐ YES ☒ NO HISTORIC DISTRICT ☐ YES ☒ NO	
FLOOD PLAIN ☐ YES ☒ NO	
SCOPE OF PROJECT:	
The owners are requesting an abatement to impact fees applied months after purchasing 78 Bank St. and describing our intention to convert the property back to its original use as a single-family home.	
TYPE OF OCCUPANCY: Residential	
EXISTING ☐ VACANT ☒ ONE FAMILY ☐ TWO FAMILY ☐ MULTI-FAMILY ☐ COMMERCIAL ☐ INDUSTRIAL PROPOSED ☐ VACANT ☒ ONE FAMILY ☐ TWO FAMILY ☐ MULTI-FAMILY ☐ COMMERCIAL ☐ INDUSTRIAL IF USE IS <u>COMMERCIAL</u> OR <u>INDUSTRIAL</u> , PLEASE NOTE <u>SPECIFIC</u> USE: _____	
SIGNATURE BLOCK:	
FOR PLANNING BOARD APPLICATIONS ONLY: I, the undersigned, hereby submit this application on the date noted below with the knowledge and understanding that the Planning Board shall determine if the submitted application is complete according to its regulations at its next regularly scheduled meeting on July 8, 2024, unless I personally request, in writing, that the Board delay its determination of completeness to a later date. PROPERTY OWNER: Marlee Dixon and Gregory Hagley <i>Gregory Hagley</i> DATE: 6/9/2024 NOTE: IF, AS OWNER, YOU WISH TO DESIGNATE AN AGENT TO ACT ON YOUR BEHALF, PLEASE READ THE FOLLOWING AND SIGN BELOW: I hereby designate the person listed above as my agent for the purpose of procuring the necessary local permits for the proposed work as described herein. Representations made by my agent may be accepted as though made by me personally, and I understand that I am bound by any official decision made on the basis of such representation. PROPERTY OWNER: _____ DATE: _____	

DATE RECEIVED	FILE # (MAP/LOT)	APPLICATION #	FEE - \$ AMOUNT	DATE PAID	VOUCHER #

8/12/24 PLANNING BOARD MEETING
AGENDA ITEM 3.A
POSTPONED FROM 7/8/2024

June 9, 2024

Dear Planning Board members,

We are writing to appeal for an abatement on the impact fees assessed after we purchased 78 Bank Street Lebanon, NH. We believe the fees should be waved because of the following reasons: 1) they were not transparent throughout our many interactions with the City of Lebanon before purchasing the house and would have greatly impacted our plans to purchase the house, 2) They are an unnecessary financial hardship for us 3) enforcing the fee would not be in the spirit of the ordinance and 4) the house was originally a single-family home and therefore we are returning it to its original zoning.

Before purchasing a commercial property and converting it to a home, we consulted with City Hall on multiple occasions. Starting on 12/17/23, Marlee clearly stated our intention to convert the property into a home and to obtain a permit to install a bathtub (in a spot one previously existed). This was the essential step to convert the house to residential zoning. Having only learned of a modest fee to re-file the property and a \$250 sewer fee, we decided to purchase and follow our plan. It was over 3 months after our first interactions that the city sent an email stating, "It has come to our attention that you will need to change your site (78 Bank Street/Lebanon) from a Commercial site to a Residential Site. Please select Change of Occupancy as the permit type. In the Project Description please list "changed from Law Office to Residential home." With this email came a \$5700 fee that was never mentioned before we purchased the home. Below we included an email chain of the conversations we had with the city. This \$5700 fee could therefore be considered a hidden fee since it was clear that we were buying the property with the intent of making it a home, yet it was more than 3 months later and we were locked into the purchase of the home, that the fee was disclosed.

It was acknowledged by city workers that there is not an established process to identify who will receive these fees. Therefore, there is no way we could have been aware we would have to pay these high fees before purchasing the home. We purchased the home on 2 modest middle-class salaries. Purchasing a home—especially one needing renovation in a city with a housing shortage—requires careful planning and budgeting. In addition to the costs to make this our home, we have found it to be a huge financial burden to pay an additional \$9000 in fees.

The spirit of the Impact fee is to equitably collect a fee from new residences that pay for city services. Yet, we present a unique situation where our property was a house for over 150 years. It was a law office for several decades. And now—during a local housing shortage—we converted it back to its original purpose as a residence. It not in the spirit of the ordinance to collect a fee from a home purchaser in Lebanon during a real estate transaction which is essentially what this Impact fee is doing. Other houses built prior to the ordinance were grandfathered in and their new homeowners are not charged an Impact Fee. Similarly, 78 Bank Street was a residential property and should not be charged an Impact Fee after a real estate transaction.

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AGENDA ITEM 3.A
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In addition to the impact fee of \$5700, we are being charged \$3577 in water and sewer fees. These fees were also never made known to us until after we had purchased the home. While we were under contract to buy the property, we were granted a permit for the bathtub. Over 2 weeks after being granted the permit and after we had closed on the home, we were given a water/sewer form to fill out where we were asked to include the “proposed bedrooms” for our home. We don’t have *proposed* bedrooms since the rooms already existed and did not need to be modified in any capacity. 78 Bank Street was a single-family home for over 150 years and we did not *propose* any bedrooms. We were then charged \$2777 in sewer fees and \$800 in water fees based on proposed increased usage. We are disputing these costs because no additional work or services were completed by the city, the water/sewer was never turned off or on, the water meter was not modified, the house was a single-family zoned residential home and paid the water/sewer expenses for 150 years while it was a residential home, and we were never informed of these fees during the permitting process. We pay for our ongoing water/sewer usage in our water bill and \$8100 yearly property taxes. We would not have purchased the house if we had been aware of these excessive fees of \$9000.

It’s clear that the City of Lebanon is a good place to live with an ambient spirit which is why we wanted to live here. However, we are appealing these fees for the following reasons:

- The city was not transparent during our multiple interactions before purchasing the house and it was only after we were locked into our home purchase that we were made aware of the \$9000 in fees.
- Our water and sewer require no additional action from the town—both the water and sewer lines already existed, and we pay for the services through monthly bills and annual taxes.
- These fees are a large financial burden to us because purchasing a home now is extremely expensive, we have invested considerable time, money and work to make this our home, and we make modest salaries.
- The house was originally a single-family home for over 150 years and therefore we are returning it to its original zoning. Our situation is unique and does not follow the standard impact fee assessment guidelines. Therefore, it is not in the spirit of the ordinance to enforce this fee.

We look forward to hearing from you.

Regards,

Marlee Dixon

Greg Hagley

**8/12/24 PLANNING BOARD MEETING
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POSTPONED FROM 7/8/2024**

I will provide copies of the chain of email interactions I had with the town if needed. Below are the cut/pasted emails.

1st email 12/18/23:

Hi Leann,

We are under contract to purchase a residential office that we will be converting into a primary home. The address is 78 Bank St. Lebanon. I was in there the other day and the woman mentioned we could ask the sellers to sign a document so we could complete the work as soon as we closed. I believe she said the permitting process takes 30 days. The work we need to complete to live there is to add a shower/bathtub to the home since there is only a half bath. Please let me know how I would get the application to send to the sellers to have them sign off.

Thank you,
Marlee
970-485-5048

We contacted the city multiple times via email, over the phone and in person to get the permit completed. We were clear with our intentions to convert the law office to our home.

2nd email:

Marlee:

Attached the permit for the new tub/shower install.
Once your closing has been completed, please email me a copy of the first page of the sales agreement
Or deed where both names (previous owner/new owner) are listed on the page.

I will switch the permit to the new owner's name.

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You can use the attached Permit to get your project complete. It does not have to be in the new owner's name to do the work.
Please post this on your front door.

Thank you,

Leann
City of Lebanon
Planning and Development
603 448 1457 x6126

We received the permit and still at this time we were not made aware that we would have to pay over \$3500 in water/sewer fees or be accessed an impact fee.

3. 1/29/24 (Two days before we closed on the property):

Marlee:

Thank you for your call this morning.
Our City Engineer/Brian Vincent will need the Water and Sewer Use forms completed.
Once completed, please return the forms to the Dept of Public Works.
There is a \$250.00 fee for the Sewer Allocation form.
Please identify how many bedrooms will be in your new home.

Sewer Allocation Application Form: [Application-for-Sewer-Use-Allocation-PDF \(lebanonnh.gov\)](#)
Water Use Application Form: [Water and Sprinkler Service Checklist and Application \(PDF\)](#)

Please send them to Brian.vincent@lebanonNH.gov. Please do include a cover note letting him know your timeline for the closing and the move in.

Thank you,

Leann
City of Lebanon
Planning and Development
603 448 1457 x626

Two days before closing it was still not made aware to us that we would need to pay over \$3500 in water/sewer fees to convert this house back to a single-family home. It was constructed as a single-family home so we had no way of knowing that we would need to pay any fees to turn it back into a single-family home. We never physically added any bedrooms and the bathtub we added had originally been there but removed while it was a law office.

3/25/24- Email from Leann:

**8/12/24 PLANNING BOARD MEETING
AGENDA ITEM 3.A
POSTPONED FROM 7/8/2024**

It has come to our attention that you will need to change your site (78 Bank Street/Lebanon) from a Commercial site to a Residential Site.

You may apply for this permit online at:

LebanonNH.gov/PermitPortal

Please select Change of Occupancy as the permit type. In the Project Description please list “changed from Law Office to Residential home.”

Please include a floor plan of your home with this application. This can be hand drawn. Please label the square footage of each living space.

No mention was ever made of an impact fee. I spoke to LeAnn starting in mid-December regarding converting the house back to a residential address. How was this missed? The town should have let us know of these fees in advance of obtaining a building permit. Especially knowing that we were closing on the house.



CITY OF LEBANON ~ PLANNING & DEVELOPMENT

PLANNING BOARD

August 12, 2024 Meeting

Staff Memorandum – PB2024-22-CUPSPR – *con't from 7/8/24*

APPLICATION INFORMATION

Agenda Item: 4.A

Application ID: 2024-22-CUPSPR

Application Type:

Site Plan Review and CUP for a proposed 11-building, 474-unit multi-family PURD totaling +/- 731,600 sq. ft. in size, and a CUP to allow an increase in the maximum permitted building height from 45 ft. to 55 ft.

Property Location & Tax Map:

- 174 Hanover St (Tax Map 48, Lot 4)
- 0 Hanover St (Tax Map 48, Lot 2)
- 0 Hanover St (Tax Map 48, Lot 1)
- 238 Hanover St (Tax Map 63, Lot 1)

Applicant & Property Owner:

Brickyard One Nominee Trust

Property Size: +/-136.87 acres total (per City Assessor's records)

Zoning District(s):

- Residential One (R-1)
- Residential Three (R-3)
- Residential-Office-One (R-O-1)
- Rural Lands Three (RL-3)

Overlay District(s):

- Wetlands Conservation District
- Floodplain District
- Steep Slopes District

Future Land Use Map:

- Mixed Use
- Rural (where zoned RL-3)

Existing Use & Improvements:

- 174 Hanover Street: remains of Densmore Brickyard
- 238 Hanover Street: +/-5,146 (gross) sq. ft. one-family dwelling, constructed in 1800 (a conforming use in the R-3 District per §310.2) and accessory structures

LEGAL NOTICE

Brickyard One Nominee Trust, 174 Hanover Street (Tax Map 48, Lot 4), 0 Hanover Street (Tax Map 48, Lot 2), 0 Hanover Street (Tax Map 48, Lot 1), and 238 Hanover Street (Tax Map 63, Lot 1), zoned R-1, R-O-1, R-3 & RL-3: Request for Site Plan Review and a Conditional Use Permit pursuant to Sections 308.2, 310.2, 311A.2, and 501.2 of the Zoning Ordinance for a proposed 474-unit multi-family Planned Unit Residential Development (PURD) totaling +/- 731,600 sq. ft. in size, consisting of 11 buildings together with parking, utilities, landscaping, access, and other related site improvements. Applicant also requests a Conditional Use Permit pursuant to Section 308.4 of the Zoning Ordinance to allow an increase in the maximum permitted building height from 45 ft. to 55 ft. PB2024-22-CUPSPR

APPLICATION MATERIALS AND OTHER SUBMISSIONS

Staff comments and other public comment:

- ▶ Letter dated June 26, 2024 from Steven Keach, PE, of Keach-Nordstrom Associates, Inc. (reviewing engineer comments; pgs 1-11 of 1113 of the attachment)
- ▶ Memo dated August 1, 2024 from Douglas Oster, PE, of Weston & Sampson (traffic study peer review; pgs of 12-13)
- ▶ Memo dated June 12, 2024 from Duane Egner, Lebanon Fire Department (review comments; pg 14)
- ▶ Memo dated June 5, 2024 from the Lebanon Pedestrian & Bicyclist Advisory Committee (PBAC) (review comments; pgs 15-16)
- ▶ Letter dated July 1, 2024 from Nicole Ford Burley, Lebanon Heritage Commission Chair (review comments; pgs 17-18)
- ▶ E-mail sent June 17, 2024 from Andrew Garthwaite, Lebanon Tree Advisory Board Chair (review comments; pg 19)
- ▶ E-mail sent July 1, 2024 from David Kroner, abutter at 194 Hanover Street (pg 20)
- ▶ E-mail sent July 7, 2024 from Brendan Nyhan (pgs 21-22)
- ▶ Letter dated June 11, 2024 from Brian Edwards, Town of Hanover Planning Board Chair (pgs 23-24)

Applicant submissions:

- ▶ Application form (pg 25)
- ▶ Letter dated May 13, 2024 from Dave Fenstermacher, PE, of VHB (transmittal letter; pg 26)

STAFF MEMORANDUM

PB2024-22-CUPSPR
174 Hanover St (48-4)
August 12, 2024 PB Mtg
Agenda Item 4.A
Page 2 of 3

- ▶ Letter dated May 13, 2024, revised August 6, 2024, from Dave Fenstermacher, PE, of VHB (project description and impact statement; pgs 27-33)
- ▶ Letter dated July 2, 2024, from Dave Fenstermacher, PE, Managing Director of VHB (PUD/PURD Conditional Use Permit narrative; pgs 34-44)
- ▶ Application for Conditional Use Permit Support Statement (PUD/PURD CUP per Sections 501.1 & 501.2 of the Zoning Ordinance; pgs 45-47)
- ▶ Application for Conditional Use Permit Support Statement (CUP for building height per Section 308.4 of the Zoning Ordinance; pgs 48-50)
- ▶ Application for Waivers (pgs 51-52)
- ▶ Site Plan Review Regulations Technical Checklist dated May 10, 2024 (pgs 53-62)
- ▶ Certified Notification List (pgs 63-64)
- ▶ Fee Schedule (pgs 65-66)
- ▶ Fiscal Impact Analysis for The Brickyard – Hanover Street, dated May 8, 2024, prepared by Fougere Planning & Development (pgs 67-81)
- ▶ PURD Density Figure, dated May 2024, prepared by VHB (pg 82)
- ▶ PURD Open Space Figure, dated May 2024, prepared by VHB (pg 83)
- ▶ PURD Development Calculations, dated May 10, 2024, prepared by VHB (pg 84)
- ▶ Letter dated July 2, 2024 from Dave Fenstermacher, PE, of VHB (response to staff completeness comments; pgs 85-88)
- ▶ Letter dated August 7, 2024 from Dave Fenstermacher, PE, of VHB (response to staff review comments; pgs 89-125)
- ▶ Memo from Jason Plourde, PE, of VHB (response to Weston & Sampson peer review of traffic study; pgs 126-129)
- ▶ Plan set titled “The Brickyard Residential Development,” dated May 10, 2024, latest issue August 6, 2024, prepared by VHB, EV Project: 52933.00 (50 sheets plus cover sheet; pgs 130-180)
- ▶ Traffic Impact Study for Lebanon Brickyard Development, dated May 2024, revised August 2024, prepared by Jason Plourde, PE, of VHB (traffic study without appendices; pgs 181-248)

Available on-line only:

- ▶ Traffic Impact Study for Lebanon Brickyard Development, dated May 2024, revised August 2024, prepared by Jason Plourde, PE, of VHB (traffic study appendices; pgs 249-690)
- ▶ Drainage Report for Lebanon Brickyard Development, dated May 10, 2024, revised August 6, 2024, prepared by David Fenstermacher, PE, of VHB (pgs 690-1041)
- ▶ Lighting specifications by Gardco (pgs 1042-1113)

COMPLETENESS REVIEW

The Planning Board accepted the application as complete on July 8, 2024.

STAFF COMMENTS

Following the applicant's initial submission on May 13, 2024, the project has been reviewed City staff including the Planning & Development Department, the City Engineer, the Police Department, and the Fire Department. Additionally, third party engineering review was conducted by Keach & Associates and a peer review of the applicant's traffic study was conducted by Weston & Sampson. Other comments have been provided by the Lebanon Pedestrian & Bicyclist Committee, the Lebanon Heritage Commission, and the Lebanon Tree Advisory Committee. Comments were provided to the applicant as they were completed, the last of which were those from Weston & Sampson which the City sent to the applicant on August 2, 2024.

In response to the various review comments, the applicant prepared revised plans and materials which were submitted to the Planning & Development Department on August 7, 2024. For the August 12th hearing, Planning Board members are encouraged to review as much of the applicant's revised plans and materials (see pages 25-248 of the attachment) recognizing that the application will need to be continued to the Board's September 9, 2024 regular meeting to allow staff an opportunity to review.

At the August 12th meeting, it is anticipated that the applicant will explain the changes made to the plan in response to staff comments, and that the Board will continue asking questions to better understand the project and to request any additional information that's needed to address the Board's questions/concerns/comments. Public comment will be permitted at the discretion of the Chair. Staff's comments on the applicant's revised plans materials and staff's recommendations with respect to the application will be provided to the Planning Board in advance of the September 9th meeting.

Attachments

cc: Brickyard One Nominee Trust (emailmarchese@gmail.com)
Dave Fenstermacher, PE, VHB (dfenstermacher@vhb.com)
Richard Whitehouse, PE, VHB (rwhitehouse@vhb.com)
File

June 26, 2024

Mr. Brian A. Vincent, P.E.; City Engineer
City of Lebanon – Department of Public Works
193 Dartmouth College Highway
Lebanon, New Hampshire 03766

Subject: **Site Plan Review Application – The Brickyard Residential Development**
174 Hanover Street (Map 48 – Lots 01, 02 & 04; and Map 63 – Lot 01)
Lebanon, New Hampshire
KNA Project No. 24-0516-3

Dear Mr. Vincent:

At your department's request we have performed a technical review of project plans and supporting documents submitted to the City Planning & Development Department under the subject application. Specifically, we acknowledge receipt of copies of the following documents, which were the subject of our current review:

- An application for Site Plan Review, with attachments, dated May 13, 2024.
- A cover letter/project narrative, with attachments, addressed to the Planning and Development Director, prepared by the applicant's consultant on May 13, 2024.
- An Application for Waivers dated November 08, 2021.
- A Traffic Impact Study dated May 2024.
- A Drainage Report dated May10, 2024.
- A Site Plan (39 drawings) dated May 10, 2024.

Based upon our careful consideration and review of the cited information we offer the following comments and recommendations at this time:

General Comments

1. This project necessitates receipt of the following State Agency Permits: (a) a NHDES Alteration of Terrain Permit; (b) a NHDES Wetlands Permit; and (c) a NHDES Sewer Connection Permit. We recommend receipt of each required permit prior to or as a condition of site plan approval.
2. We understand the planned residential development will rely on public water and sewer utilities available at Mount Support Road. Accordingly, we recommend the applicant

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receive local Water Use and Sewer Use Permits necessary to support the extent of buildout contemplated prior to or as a condition of site plan approval.

3. Given the extent of land area to be disturbed by planned construction activities, coupled with immediate proximity of this work to Densmore Pond and other on-site wetlands, we recommend the Planning Board rely on authority of Section 8.3 of the Site Plan Review Regulations (SPRR's) to require, as a condition of application approval, the applicant provide a performance guarantee, in an amount and form acceptable to your Department, to serve as a financial surety for: site restoration in the event of abandonment; installation and maintenance of appropriate erosion and sedimentation controls throughout construction; and full and final completion of public improvements and/or work within the public right-of-way at Hanover Street.
4. We understand the owner/applicant intends to voluntarily merge four existing parcels to yield the single 136± acre tract that is the subject of this application. If so, we recommend execution and recording of a Notice of Voluntary Lot Merger prior to or as a condition of application approval.

Planning/Design Matters

1. A Parking Summary Chart provided on the Cover Sheet indicates a total of 780 planned on-site parking spaces. We count 779. The same Summary Chart indicates a total of 502 planned garage spaces, notes on Sheets C1.0 through C2.3 suggest 512. We recommend reconciliation of these differences.
2. We recommend expansion of the drawings to provide a detailed layout of interior parking space stall and aisle dimensions. We note the project narrative indicates the dimensions of standard parking spaces situated within garages are planned to be 8' x 18' rather than 9' x 18' as required by Section 6.5.E (3) of the SPRR's. We also note Section 6.5.E (5) permits approval of "alternate parking designs" under certain circumstances. Prior to offering comment pursuant to that section, we believe examination of parking layout within the proposed garages is prudent.
3. Section 6.5.A of the SPRR's adopts both Standard Specifications for Road and Bridge Construction (NHDOT) and Guide for the Development of Bicycle Facilities (AASHTO) as local construction standards by reference. We recommend expansion of Sheet C1.0 to acknowledge the same.
4. Existing Conditions Plans of the subject site identifies various buildings, structures, site improvements, and utility infrastructure. We anticipate most existing improvements will be removed to facilitate the proposed construction. In addition, we understand it is the applicant's intent to preserve at least two existing brick kilns for purposes of legacy preservation. Collectively, we recommend expansion of the site plan drawings to include a site preparation/demolition plan which specifically defines the intended disposition of existing improvements.

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5. As conveniently shown on Sheet C2.0, site driveways at Hanover Street near both the southerly and northerly ends of the development parcel with interior drives connecting the two. While we fully support this approach, given the high residential density served, we recommend consideration of designating paired parallel drives between Buildings 3 & 4 and Buildings 8 & 9 for one-way travel (easterly drive northbound; westerly drive southbound). In our view, enhanced vehicular and pedestrian safety could be realized by elimination of need for parked vehicle backing movements into two directional traffic along the fronts of these four buildings.
6. As a further safety enhancement, we recommend considering selective placement of one-way vehicular stop conditions at the intersections of intersections of paved site drives, especially those in the vicinity of painted crosswalks. In our view this accommodation would serve as an effective traffic calming measure.
7. Close examination of Sheet C2.0 reveals garage access/egress at Building 4 will necessitate travel through garages at either Building 3 or Building 5. While we do not view this as problematic, this fact may influence the timing of construction of individual buildings and adjoining infrastructure.
8. Provisions of Section 6.5.D (5) of the SPRR's serve to require sidewalk installation along the frontage of the development parcel at Hanover Street. Although a public sidewalk is presently available along the easterly side of Hanover Street to the south of its intersection with Old Etna Road, no public sidewalk presently exists to the north of this intersection. To satisfy the cited requirement we recommend expansion of the site plan drawings to specify public sidewalk installation along the frontage of the development parcel, beginning at a point opposite the northerly the northerly Lebanon High School property site driveway and extending northerly to a point at or about the northerly parcel boundary. To best link this recommended sidewalk to existing walks along both the easterly sideline of Hanover Street and along the northerly sideline of the High School site driveway, we recommend painted crosswalk installations at both the northerly development site driveway and at the recommended southerly limit of sidewalk construction on the west side of Hanover Street. In our view, requirements of Section 6.5.D (5) will be satisfied through the applicant's proposal to construct a painted crosswalk providing development site pedestrian access to existing public sidewalk on the easterly side of Hanover Street to the south of Evans Drive.
9. A note provided on Sheet C2.0 cites the fact that access to public transit is presently available near the intersection of Heater Road and Old Etna Road; approximately 0.2 miles from the development site. That said in correspondence dated May 13th, the applicant's consultant acknowledges that "with the additional ridership resulting from this project, there is potential to coordinate future stops." We suspect this prediction may prove to be accurate. To that end we recommend the applicant consider expanding the final site plan to identify a location suitable for such future accommodation at or near one or both proposed site driveways. While we are not suggesting constructing any permanent improvement(s) at this time, we believe it may be wise to at least pre-plan for this potential eventuality at this time.

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10. We note Sheets C2.0 and C2.1 currently depict proposed installation of pavement markings permitting either left or right exiting turning movements at the northerly site driveway. Since the proposed site driveway is situated directly opposite Evans Drive, we recommend elimination of this pavement marking as the Traffic Impact Study suggests significant volumes of traffic operating through the northerly site driveway seek eastbound travel on Evans Drive.
11. To satisfy specific requirements of the SPRR's we recommend:
 - Expansion of the drawings to specify location and details of any proposed site signage [Section 5.1.E (14)].
 - Identification of resident recreational facility accommodations sufficient to satisfy Section 6.5.H.
 - Identification of suitable on-site seasonal snow storage areas [Section 5.1.E 19)].
12. Sheets C2.1 through C2.3 specify various elements of site construction not detailed on the drawings. We recommend expansion of the drawings to provide typical construction details/specifications for the following site improvements:
 - Vertical granite curb.
 - Bicycle parking apparatus.
 - Precast box culvert and associated end wall installation(s).
 - Exterior patio construction.
 - Decorative metal fence installation.
 - EV charging station equipment and apparatus.
 - Paved sluice construction.
 - Guardrail installation.
 - Elements of water, sewer, and storm drainage construction.
13. Sheets C2.1 through C2.3 graphically depict planned dumpster enclosure installations. Although Sheet C7.2 provides good details of this construction, those details refer the reader to the Layout and Materials Plan (Sheets C2.0 through C2.3) for dimensions. We recommend expansion of the referenced drawings to specify those dimensions.
14. Sheet C2.2 identifies a typical accessible parking sign by MUTCD designation R7-1. We believe the correct designation is R7-8.
15. Similarly, Sheet C2.2 identifies a typical EV charging station location by use of signage corresponding with MUTCD designations D-11B and D-11BP. We believe the correct references are D9-11B and D9-11BP.
16. Sheet C2.3 contains a note stating "subsurface infiltration basin" located to the immediate northeast of Building 5. We believe this note is misplaced on the drawing.

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17. We recommend the Fire Department review and comment on the adequacy of site circulation, building accessibility, hydrant placement, building identification and other matters within the Department's purview.
18. We recommend expansion of the site plan to identify acceptable accommodations for resident mail delivery.
19. Based upon consideration and review of design plans of proposed site grading and stormwater management accommodations we offer the following remarks:
 - Sheets C3.0 through C3.3 graphically illustrate several locations where modularized block retaining wall construction is planned. We recommend expansion of the drawings to specify top and bottom of wall elevations.
 - We recommend the design engineer recheck and adjust the placement of finish grade contours on the southerly end of a segment of retaining wall planned immediately east of Building 1 for both clarity and accuracy. We offer an identical comment relative to site grading shown in the vicinity of the northerly end of Building 8 and southwesterly corner of Building 3, both on Sheet C3.2.
 - The southwesterly corner of parking planned to the southwest of Building 1 is situated immediately atop either a 2:1 fill slope and/or retaining wall. We recommend guardrail and/or safety fence installation, as appropriate, at this location.
 - As shown on Sheet C3.1, stormwater exiting proposed drainage structure OCS 913 is to discharge onto a 2:1 fill slope at headwall HW 914. We recommend extending the length of storm drain discharging at HW 914 to avoid this condition.
 - We recommend expansion of Sheets C3.1 through C3.3 to label proposed stormwater management improvements in a manner consistent with Sheets C4.1 through C4.3.
 - We recommend expansion of the drawings to provide site-specific design details, specifications, and elevations for construction of each individual underground infiltration pond/system, bioretention pond, and subsurface detention basin.
 - We recommend expansion of the drawings to specify location, elevation, and details of proposed forebay construction at each of three proposed bioretention ponds. The applicant's Drainage Report indicates intent to satisfy stormwater pretreatment requirements of Section 6.6.E (10) of the SPRR's via forebay installation. If so, we recommend expansion of the drawings to include corresponding design information.

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- We recommend labeling proposed sluice construction on Sheets C3.2, C3.3, C4.2 and C4.3 respectively as applicable.
- As shown on Sheets C3.2 and C3.3 perimeter swale construction is planned to the west of Buildings 7 through 10. The intent of this swale construction appears two-fold. One is to capture surface water tributary to the development area from the west. The second is to capture groundwater exiting a proposed cut slope situated to the immediate west. Based on our review of this proposed construction, we offer the following remarks: (a) is the typical cross-section of Stormwater Swale #1 detailed on Sheet C7.3 intended to be applicable to this perimeter swale construction? If so, we recommend the addition of a call out on Sheets C3.2 and C3.3 referencing that intent; and (b) as shown on the drawings, the longitudinal slope of this proposed perimeter swale varies significantly along its total length. While very flat (1%) in most locations, channel slope increases to over 12% at other locations. We recommend the design engineer review potential need for channel armor installation at steeper locations situated to the northwest of Buildings 7 and 8, and at the southerly limits of swale construction (where flow volume is at a maximum).
- Text providing information pertaining to proposed cut slope construction was inadvertently “cropped” from the top of the drawing image shown on Sheet C3.3.
- As shown on Sheet C3.3 construction of an excavated 1.5:1 embankment is planned to the west of Buildings 7 through 10. To the west of Building 10 the vertical embankment height will exceed 40-feet. We recommend: (a) completion of geotechnical exploration sufficient to confirm feasibility of and design parameters for this construction; and (b) introduction of vertical “benching” at intervals sufficient to permit convenient embankment construction and provide added slope stability.
- As shown on Sheet C3.3 curvilinear walkway construction is planned to the immediate east of Building 10 to provide exterior building access from adjoining parking. We recommend the addition of site-specific details of this construction to the drawings. Given the proposed embankment slope at this location, it appears exterior stair construction will be necessary. If so, what is the applicant’s proposal for providing ADA compliant access to Building 10?
- As shown on Sheet C3.3 a short length of fill embankment with a 2.3:1 slope is planned between Buildings 4 and 5. We recommend placement of safety rail or fence atop this slope.
- We recommend labeling additional finish grade contours throughout Sheets C3.1 through C3.3 to improve drawing clarity.
- Given the design engineer’s reliance on stormwater infiltration practices, we recommend completion of a geotechnical evaluation of a scope sufficient to

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confirm presumed soil texture, permeability, and seasonal high water depth values upon which the design was based.

- We recommend the drawing identify the intended disposition of two existing 60-inch diameter and one existing 54-inch diameter culverts located in the vicinity of Building 1 (See Sheets Sv-2 & C4.1).
- The proposed layout of Underground Infiltration Ponds #1, #2 & #3 2 are shown on Sheets C4.1 through C4.3. We recommend: (a) expansion of the drawings to label each drain manhole and specify corresponding design elevations; (b) we recommend expansion of the drawings to provide site-specific construction details of planned outlet control structures OCS 913, OCS 203 and OCS 305; (c) callouts for this series of Underground Infiltration Ponds include design elevations for proposed underdrain which is not otherwise shown or referenced on the drawings. If underdrain is planned, we would recommend expansion of the drawings identify same.
- We recommend expansion of the drawings to provide a detailed storm drainage pipe schedule.
- We recommend expansion of the drawings to provide typical construction details, including design elevations, for a series of proposed trench drain installations planned at garage entrances.
- Design elevations for DMH 204 provided on Sheet C4.2 suggests drainage structure “101” connects with the same. Structure 101 is neither shown nor labeled on the drawing image.
- For improved storm sewer hydraulics, we recommend matching pipe crown elevations of inflowing pipes of varying diameter at drainage structures. Design invert elevation values specified on Sheets C4.1 through C4.3 vary from this rule at several locations (Example: CB 207 shown on Sheet C4.1).
- We recommend the design engineer recheck design invert elevations for the segment of storm drain planned between CB 218 and CB 217 (See Sheet C4.1). An identical comment is offered regarding CB 314 and CB 315 shown on Sheet C4.2.
- Sheet C4.3 graphically depicts a series of four segments of storm drain discharging to daylight. We recommend expansion of the drawing to specify: (a) end treatment; (b) invert elevation; and (c) accommodation for outlet protection at each location.

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20. Based upon review and consideration of the applicant's Drainage Report we offer the following series of remarks:

- Although the design engineer states: "the study area has been divided into two drainage areas that discharge into one of two discharge points", for the purposes of quantitative analysis of pre and post-development stormwater volumes, a single Design Point (DP-1), identified as "Densmore Pond/Wetlands", is utilized. DP-1 does not represent a single point on the ground but rather the perimeter of both Densmore Pond and a series of on-site wetlands tributary to Densmore Pond. While we agree with the consultant's choice to consider "two drainage areas that discharge into one of two discharge points" we recommend completion of separate analysis for each of the two discharge points referenced by the consultant.
- As discussed above, a swale is planned along the westerly limits of construction. This swale conveys intercepted surface and groundwater volumes to a wetland situated near the southerly site boundary. We recommend expansion of the analysis to quantify and consider the impact of the volume of stormwater runoff from land situated beyond the development area that will be intercepted and conveyed/redirected by proposed perimeter swale construction.
- We recommend the design engineer confirm availability of storm drain grate capacity sufficient to accommodate the 25-year return frequency design storm event.
- We recommend expansion of the Drainage Report narrative to describe how stormwater treatment requirements contained in Section 6.6.F of the SPRR's will be satisfied.
- To satisfy Section 6.6.H (2) of the SPRR's we recommend preparation and submittal of a comprehensive stormwater operation and maintenance plan.
- As acknowledged above, an NHDES Alteration of Terrain Permit must be issued for this project. We recommend expansion of the applicant's final Drainage Report to include all information, computations and exhibits required for submission of a full and complete Alteration of Terrain Permit application.

21. No water service connection to Building 1 is shown on Sheet C4.1.

22. As shown on Sheet C4.3, a 4-way junction of water main/service is planned at Buildings 5 and 10. For improved serviceability and ease of construction, we recommend off-setting these two services so connections to the main can be constructed as two successive 3-way junctions.

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23. Also, for improved serviceability and ease of construction we recommend modest realignment of the proposed sewer service at Building 9 (See Sheet C6.2) to avoid need for a “3-pipe stacked” crossing/intersection of water, sewer, and storm drain.
24. Based upon consideration and review of design accommodations for on-site wastewater collection and connection to existing public sanitary sewer at Hanover Street we offer the following remarks:
- Sheets C4.1 and C4.3 indicate proposed sewer manholes SMH 100 and SMH 200 will be installed over existing 12-inch diameter sewer at Hanover Street to provide tie-in points at the south and north ends of the proposed development respectively. We recommend expansion of the drawings to provide details of the construction.
 - Part Env-Wq 704.04 (b) of the New Hampshire Code of Administrative Rules (Rules) requires a minimum of 6-vertical feet of soil cover over sanitary sewer situated beneath paved surfaces. As shown on Sheets C4.1 through C4.3 there are numerous segments of the proposed sewer which do not presently comply with this requirement.
 - As currently presented, there are numerous on-site locations which contemplate vertical drop sewer manhole construction. We recommend avoidance of drop manhole construction to the fullest extent possible. This outcome can be achieved by lowering the invert-in elevation(s) of inflowing sewer. In the event drop manhole construction cannot be avoided, we would recommend expansion of the drawings to provide a detail of this construction. The foregoing remark regarding vertical drop sewer construction notwithstanding, we do recommend a vertical drop in invert elevation of not less than 0.1-foot over the width of any sewer manhole. While a vertical drop of 0.1-feet is specified at most locations, there are others (Example: SMH 104 – Sheet C4.1) where invert-in and invert-out elevations match. We recommend revision.
 - We recommend expansion of Sheet C4.3 to specify pipe diameter, slope, and length values for two segments of proposed sewer connecting the planned maintenance building with SMH 201. We offer an identical comment for Buildings 3, 4 and 7.
 - We recommend expansion of the drawings to specify sewer invert elevations at the foundation wall of each proposed building.
 - Parts Env-Wq 704.19 (c) and 704.19 (e) of the Rules require minimum horizontal and vertical separation distances of 10-feet and 18-inches between water and sanitary sewer lines. We recommend the design engineer recheck and edit the design for compliance.

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- We recommend the addition of typical sanitary sewer trench and manhole details to the drawings.
 - The drawings note proposed sewer will be constructed with PVC pipe. We recommend expansion of the drawings to indicate PVC pipe and fittings incorporated with sewer construction shall be SDR 35 PVC.
25. As shown on Sheet C-5.1 construction of a fill embankment slope is planned to extend downward to an adjoining parcel boundary for a length of 120-feet. To reduce potential for inadvertent encroachment on the abutting parcel, we recommend considering installation of rigid construction fence along the common boundary.
26. We recommend accommodation be made for site security during construction to dissuade unauthorized entry to work areas.
27. To avoid interference with temporary high traffic volumes operating on Hanover Street in immediate vicinity of this site during student arrival and dismissal periods at Lebanon High School, we recommend construction traffic on Hanover Street be limited to a minimum during those peak hour periods on days school is in session.
28. We recommend Sheet C2.8 (Landscape Plan) be expanded to include notes and specifications capturing applicable requirements of Section 6.2.H of the SPRR's regarding both workmanship and materials to be incorporated in the planned landscape installation as well as future maintenance of the same.
29. As shown on various site plan drawings, numerous lengths of retaining wall are planned throughout the site. A typical detail of segmental block retaining wall construction is provided on Sheet C7.1. As acknowledged at Note No. 1 on this detail, it is understood the contractor shall submit drawing(s) stamped by a NH Licensed Professional Engineer for approval by Project Engineer and City of Lebanon prior to construction.
30. A typical Bituminous Concrete Pavement Section is provided on Sheet C7.1. We recommend revision of this detail to conform with Section 6.5.E (2.c) of the SPRR's relative depth and variety of aggregate base material installation.
31. Sheet PP-1 of the drawings provides a generalize phasing plan of proposed/sequential building construction. To satisfy Sections 4.9.C (1) and 5.1.G (1) of the SPRR's, we recommend expansion of this drawing to identify proposed phasing of completion of common area and infrastructure improvements prior to construction and/or occupancy of each future residential building.
32. The project narrative submitted under the application references construction of "a walking path along Densmore Pond ... a dog park and overlook areas." We note these improvements are neither shown nor referenced on the current site plan drawings.

Mr. Brian A. Vincent, P.E.

June 26, 2024

33. We recommend expansion of Sheets L1.0 through L2.1 to demonstrate compliance with quantitative and qualitative landscaping standards specified under Section 6.2 of the SPRR's.
34. To satisfy Section 5.1.E (13) of the SPRR's we recommend expansion of Sheet SL-1A and/or submission of manufacturers catalogue cuts to provide details and specifications of proposed exterior site lighting fixtures and appurtenances.
35. Sheet SL-1A specifies uniformity ratio values of 7.55 and 9.80 for exterior site lighting of parking & drive lanes, and sidewalk respectively. These values exceed the maximum uniformity ratio value of 4.0 permitted under Section 6.7.C (1) of the SPRR's.
36. We recommend the project land surveyor recheck the reported distance of the northerly line of Map 63 – Lot 1 (562') reported on Sheet Sv-1. We also recommend the addition of bearing and distance dimensions of the tie-line shown on the easterly boundary of this same parcel.

We trust your department will find those remarks provided in the foregoing letter report useful in its continued consideration and review of the subject application. As always, please contact this writer in the event you should have specific questions or further instructions related to this matter.

Sincerely:

Steven B. Keach, P.E.
President
Keach-Nordstrom Associates, Inc.

Peer Review City of Lebanon Planning Board

Project Name: Lebanon Brickyard Development

Location: Hanover Street & Evans Drive
Lebanon, NH

Applicant: Richard Marchese
CPO Box 720
Middleton, MA 01949

Transportation Engineer: Vanasse Hangen Brustlin, Inc.
2 Bedford Farms Drive
Suite 200
Bedford, NH 03110

Documents Reviewed: Traffic Impact Study dated May 2024

Review Completed: August 1, 2024

Reviewed By: Douglas Ostler, PE, PTOE

Weston & Sampson has performed a peer review of the submitted Lebanon Brickyard Development Traffic Impact Study dated May 2024. The project is located on the west side of Hanover Street at Evans Drive in Lebanon, NH. This review has been provided at the request of the City of Lebanon for consideration by the City of Lebanon Planning Board of the submitted application.

TRAFFIC COMMENTS

1. Traffic Impact Study Comments

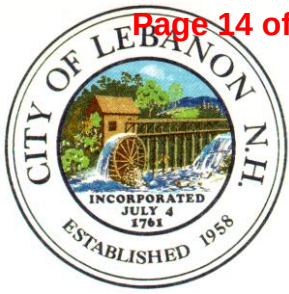
- a. The traffic study is expected to be sealed by the responsible professional engineer registered in the State of New Hampshire.
- b. Crash data was not collected for study intersections as would typically be required by NHDOT and industry standards. Please include an evaluation of crash data at the study area intersections.
- c. The study indicates the proposed 474 apartments is anticipated to generate approximately 197 vehicle trips during the weekday morning peak hour, 185 vehicle trips during the weekday evening peak hour, and 191 vehicle trips during the Saturday midday peak hour. The projections were formulated using the standard practice of ITE

methodologies, which has created formulas based on collected data from mid-rise multi-family housing complexes whose buildings comprise of four and ten stories.

- d. The trip distribution applied to the project trips appears to indicate that all traffic to/from the south will use the south driveway and Evans Drive. It is expected that some drivers going to/from the site would prefer to use the north driveway, either because their apartment is closer to the north driveway or if the driver prefers to make a left turn from Route 120 at Heater Road which provides a signalized, protected phase.
- e. The eastbound left turn movement at the intersection of Route 120 and Old Etna Road operates at LOS F during the Existing AM peak hour and is over capacity during the 2025 No-Build AM peak hour. The study indicates that NHDOT is formulating improvements to the intersection and the study analyzed an additional lane in all approaches in 2035. Was this lane configuration dictated by NHDOT? Is there a feasible alternative that could mitigate the intersection?
- f. At the intersection of Route 120 and Evans Drive, the northbound left turn is overcapacity in 2025 No Build AM and PM peak hours, and the eastbound right turn is over capacity in the 2025 No Build PM peak hour and becomes overcapacity in the 2025 Build AM peak hour. In 2035 the eastbound left turn is restricted and third through lanes are added to Route 120, but the turn movements are still over capacity. Is there a feasible mitigation for the intersection?
- g. The proposed north driveway intersects Hanover Street near but not at Old Etna Road. If possible with the adjacency of the pond, please align the driveway with the existing intersection and consider all-way stop control for improved pedestrian crossings. Can Old Etna Road be realigned within the existing right-of way to slope more perpendicular into Hanover Street? The town has expressed concern about the non-perpendicular intersection, the increase in southbound left turns, and school children on Hanover Street
- h. A sentence on pages 33 and 64 reads "... standard traffic engineering practice suggests that the proposed development would not be expected to result in noticeable impacts to the area roadway system beyond the southern driveway." A prior sentence reads "Common traffic engineering practice suggests that a development may have a significant impact if the addition of site trips increases traffic volumes at an intersection by 100 vehicles per hour or more." Given that the traffic study documented projected traffic impacts, recommend removing the inference to avoid reader confusion.

2. Site Plan

- a. Sheets C2.1 and C2.3 call out sight distance lines with measurements of 300'. Add text or new callouts to remove shrubbery/trees within the sight triangle. Also, correct callouts' text from 155' to 300'.
- b. Please provide truck turning templates for the city's Fire Truck, a trash truck and a WB-67 to enter/exit both driveways from all directions and circulate within the site.
- c. Please verify that pedestrian ramps for sidewalks at crosswalks or across driveways within the site have been provided per ADA requirements as it appears some were not detailed or labeled (i.e. driveway to maintenance building).
- d. Extend sidewalk along the west side of Hanover Street from the north driveway south to Old Etna Street and add a crosswalk(s) and ADA ramps as required across Hanover Street connecting to the existing sidewalk on Old Etna Street. This will provide a pedestrian connection from the site to the existing bus stop on Heater Road.



LEBANON FIRE DEPARTMENT
12 South Park Street
Lebanon, NH 03766

Phone: 603-448-8810
FAX: 603-448-8811
James Wheatley,
Fire Chief

June 12, 2024

To: Tim Corwin, Senior Planner and Zoning Administrator
Lebanon Planning Board Members

From: Duane Egner, Fire Inspector

Re: The Brickyard Residential Development Application Review

Tim,

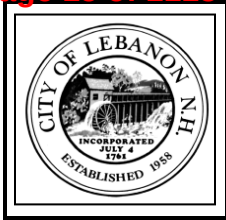
The Lebanon Fire Department has reviewed the above Lebanon Planning Board application to determine compliance with the various applicable fire codes adopted by the State of New Hampshire and City of Lebanon. Below are the results of the review.

- As the proposed buildings are in excess of 30 feet above the grade plane of the roadways, aerial fire apparatus access roads shall be provided in accordance with the 2021 IFC Appendix D105. This section requires that the roads have a minimum unobstructed width of 26 feet, exclusive of shoulders, in the immediate vicinity of the building.
- The proximity of the aerial fire apparatus access roads to the building shall be located not less than 15 feet and not greater than 30 feet from the building and positioned parallel to one entire side of the building.
- According to the US Forest Service Wildland Urban Interface 2020 Map Service, the property is in the Wildland-Urban Intermix and Interface area. Per the 2018 NFPA 1, Section 17.1.1: In cases in which the local jurisdiction declares that an area within the jurisdiction is a wildland urban interface as determined by an assessment tool based upon accepted fire services practices, or where new structures will be located in a wildland/urban interface or intermix area, the AHJ shall perform, or cause to be performed, a wildland fire hazard assessment of each structure ignition zone in the development to determine relative risk, the extent of wildland fire hazard, and applicable mitigation measures. Due to this proposed development being in both the intermix and interface, the applicant will be required to complete a wildland fire hazard assessment.
- An additional fire hydrant should be located in the area of Building 1, preferably between the entrance to the parking garage and parking lot.
- This proposed development will require a new street name.

Please let me know if there are any questions.

Sincerely,

Duane E. Egner



CITY OF LEBANON ~ PLANNING OFFICE

MEMORANDUM

TO: City of Lebanon, Planning Board

FROM: Pedestrian-Bicyclist Advisory Committee

RE: Hanover Street Residential Development Project

DATE: June 5, 2024

Planning Board Members,

I am writing on behalf of the Pedestrian & Bicyclist Advisory Committee with respect to the 174 Hanover Street project proposed in Lebanon.

The Pedestrian and Bicyclist Advisory Committee reviewed the site plan and traffic study for the proposed development at their June 4, 2024, meeting. The Pedestrian & Bicyclist Advisory Committee has several recommendations to maintain safe conditions in the neighborhood around the proposed development for pedestrians and cyclists. This particular area of Lebanon is extremely sensitive to bike-pedestrian issues because of the proximity of the high school and elementary school. There are a lot of new teen drivers, young children on bikes, and entire families walking to school. Hanover Street is also a main route for those traveling by bike or foot to DHMC. The Pedestrian & Bicyclist Advisory Committee strongly urges that the project take into consideration the following proposed changes:

1. Add a sidewalk to the development side of Hanover Street. Ideally from Dartmouth Ave to the pedestrian bridge, but at least on the development's property either side of the development's entrance close to the intersection of Hanover Street and Old Etna Road. This will ensure safe walking conditions for residents of the new development and residents of the Dartmouth Ave neighborhood to reach the existing sidewalk system on Hanover Street.
2. Create a 4-way intersection with stop signs and crosswalks at the Old Etna Road intersection. This would require moving the proposed northern driveway and maintenance building and changing the orientation of the end of Old Etna Road so that it curved to meet Hanover Street at a right angle. This will improve the safety of the intersection of Hanover Street, Old Etna Road, and the development's northern driveway, as well as slowing traffic on Hanover Street as it approaches the school campus from the north.

If the 4-way intersection cannot be achieved, add a crosswalk from the new sidewalk on the west side of Hanover Street that connects to the sidewalk at the school campus' north entrance (entrance closest to the intersection of Hanover Street and Old Etna Road).

3. Create a multiuse path for pedestrians and cyclists on the east side of Hanover Street by widening the existing sidewalk. This would run from the pedestrian bridge to at least the

school campus' south entrance (entrance closest to the intersection of Hanover Street and Evans Drive) and would provide a safe separated multiuse path for children, and parents escorting children, between the schools and the pedestrian bridge.

4. Reduce the number of parking spaces required in the development and encourage more bus, pedestrian, and bicycle trips.
5. Offer trail user parking and a trail protected with an easement to the Boston Lot trail system from the development (connecting to, for example, the "Hardwoods" trail just west of the developer's property line).
6. Provide covered and secure bike parking for residents of the development.

The Pedestrian & Bicyclist Advisory Committee's mission is "to help make the City of Lebanon more safely walkable and bikeable by facilitating, enhancing, and encouraging safe pedestrian and bicyclist travel and connectivity in the City of Lebanon." In keeping with that mission statement, the Pedestrian & Bicyclist Advisory Committee feels that it is necessary to make these changes, especially with a development of this size and impact. The above listed necessary improvements along Hanover Street will benefit all the residents in the neighborhood – both existing and new - by providing parts of an interconnected sidewalk network to allow them safe walking access, especially for some of our most vulnerable residents, children.

1 July 2024

Lebanon Planning Board
51 North Park Street
Lebanon, NH 03766

Re: Brickyard One Nominee Trust, 174 Hanover Street Ext (Tax Map 48, Lot 4), 0 Hanover Street Ext (Tax Map 48, Lot 2), 0 Hanover Street Ext (Tax Map 48, Lot 1), and 238 Hanover Street (Tax Map 63, Lot 1), zoned R-1, R-O-1 & R-3

Dear members of the Planning Board,

At the June 12th, 2024 meeting of the Heritage Commission, the commission reviewed the materials submitted to the Planning Board by Brickyard One Nominee Trust as part of their proposal for a multi-family Planned Unit Residential Development (PURD) at 174 Hanover Street Extension & 238 Hanover Street. The commission identified several areas of concern and developed a number of questions that we would like to see addressed by the applicant. The purpose of this letter is to summarize the Heritage Commission's concerns and to pose the commission's questions to the Planning Board so that it may assist the board in its review and consideration of this application.

The Heritage Commission's primary concerns are regarding the historical significance of the site and whether the applicant is giving sufficient attention to this element.

Historic Context

The brickyard at 174 Hanover Street Extension dates back to the early 19th century. In 1883, Jason Densmore purchased the brickyard and infrastructure from George Nelson Greeley, and it operated as the Densmore Brick Company until 1974. During its 90-year tenure, the Densmore Brick Company produced bricks for countless buildings throughout the Upper Valley and the broader region, including:

- Soldiers Memorial, Lebanon
- Lebanon City Hall
- Carter Community Building, Lebanon
- Lebanon High School
- Baker Library, Dartmouth College
- Hopkins Center, Dartmouth College
- Buildings at Colby-Sawyer College, New London
- Buildings at Kimball Union Academy, Plainfield

The five beehive kilns were constructed in 1946.

On the east side of the pond, the house at 238 Hanover Street was for many years the residence of Arthur Chandler, owner of the Hanover Street Garage (237 Hanover Street). During the 1930s and 1940s, Chandler rented cabins on his property as "Chandler's Cabins," which were featured in a well-known postcard from the time.

Existing Structures

Per the applicant's plans, seven existing structures at the brickyard site and five at the Chandler's Cabins site will be demolished. At the brickyard site, this includes one beehive kiln and four supplemental brickyard buildings, while the remaining four Chandler's cabins are slated for destruction, alongside the Chandler homestead. Additionally, the "remains" of two kilns and two additional structures at the brickyard site will be removed as part of the project, although the integrity or state of these structures is not currently known to the commission.

Heritage Commission Questions

Having reviewed the proposal, the Heritage Commission has identified several areas of concern and requests additional information on the following topics.

What research has been conducted into the history and cultural significance of the site?

The Commission is pleased to see that in the current plan, two kilns will be preserved, but we would like further information about how the kilns were evaluated, what historic assessment was conducted on the site, and what will be done to document the site before it is demolished. Has the Chandler Cabins site been evaluated for its historical and cultural significance? What assessment has been conducted on the cabins?

Is a preservation consultant on staff?

Projects of this scale on historic properties routinely employ a preservation consultant to assess the site and advise the team on how to preserve and respect the historic and cultural significance of the site. Has a preservation consultant been hired, or will one be?

Will the site be open to the public?

The kilns and other historic elements of this site are significant parts of Lebanon's history and should be accessible to the public. Will the preserved structures be open to the public and accessible? Will they be part of a park or planned green space? What interpretative elements (e.g., signage, labels) will be included in these spaces?

While the Heritage Commission recognizes that it holds no regulatory authority in this area, the commission nevertheless feels obliged to register its concerns and to urge the Planning Board to consider the very great historic and cultural significance of the Densmore brickyard and Chandler's Cabins sites. The destruction of Lebanon's historic resources should not be undertaken lightly or without due consideration, and the Heritage Commission would like to understand more about how the applicant will consider and preserve these resources.

Sincerely,



Nicole Ford Burley
Chair, Heritage Commission

From: [Patrick McCarthy](#)
To: [Tim Corwin](#)
Subject: FW: [EXTERNAL] TAB review of planning submissions.
Date: Monday, June 17, 2024 8:22:48 AM

Tim see below

From: Andrew Garthwaite <andrew@hgarchitects.com>
Sent: Monday, June 17, 2024 8:05 AM
To: Patrick McCarthy <patrick.mccarthy@lebanonnh.gov>
Subject: Re: [EXTERNAL] TAB review of planning submissions.

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

Hi Patrick,
Is the Planning Board meeting tonight?

People did have problems with the files.

The only comments so far, was that we would recommend that the tree species diversity be increased, and that there seemed to be one parking lot that didn't have many islands and trees. Was this for subsurface drainage?
I'll check with the TAB to see if anyone has anything to add.

Thanks,

Andrew

Andrew Garthwaite
Haynes & Garthwaite Architects PLC
Norwich VT 05055
802-649-3606
andrew@hgarchitects.com
www.hgarchitects.com

Tim Corwin

From: David Kroner <davidrkroner@gmail.com>
Sent: Monday, July 1, 2024 1:56 PM
To: Tim Corwin
Cc: crkroner@gmail.com
Subject: [EXTERNAL] Site Plan for One Hanover St Brickyard

Categories: Planning

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

Dear Tim, Thank you for your time today, Mon 7/1/24 to explain the plan to develop the Densmore brickyard and pond area. My wife, Connie, and I have lived at 194 Hanover St for the last 39 years, and have several concerns:

1- Drainage

The pond was created by digging out the clay to form the bricks for the Lebanon/ Hanover/ Dartmouth area. Springs were encountered which created the pond, and subsequently the beavers arrived. These animals have built dams along the outflow, as well as blocking the culverts, and raising the water level. This floods the properties on this side of the pond, resulting in erosion & loss of at least 0.2 acres of our land, as well as flooding our finished basement. We have regularly destroyed the dams and paid trappers to control this issue. Respectfully, I submit that this project should address this issue.

2 - Pond access

The two properties on the east side of the pond have deeded access for use. What are the plans for the new residents and their safety? Does the city assume liability? The current owner never has.

3- Wetlands

What setback is planned to protect the wetlands and wildlife? We have seen deer, bear, moose, opossum, and foxes as well as Canada geese , various ducks, herons, etc. Any plans to protect them?

4- Down Stream Flooding

With the additional developments on Mount Support Rd, how much added water will be added to the Mascoma? Will catch basins to slow water runoff be necessary to decrease the impact of these large ugly buildings, loss of trees, and building large parking lots?

Respectfully submitted,
 David R Kroner, M.D.

 This email has been scanned for spam and viruses by Proofpoint Essentials. Visit the following link to report this email as spam:

https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fus3.proofpointessentials.com%2Fapp%2Freport_spam.php%3Fmod_id%3D11%26mod_option%3Dlogitem%26report%3D1%26type%3Deasyspam%26k%3Dk1%26payload%3D53616c7465645f5f6441278ec82926e42119798d34544a05c022d926fa8835e602f0f55c13653ae3f0776212a9037d32d44d7a92827b932b495aa67c6b7799294fafa9938a1e4e5d79212f1b61d22bdebe138aa867e85ae75e3e54a5c20f1677b1874c8573eec5904155174849d3400df196ae86f0695507785fd3f096354e63db73b4344239561740197d3f65ab7b58248f862abdc242077514aa304a192e2b&data=05%7C02%7CTim.Corwin%40lebanonnh.gov%7Cdfc8f657ad3a46b4e15608dc99f7230b%7C92a5f37da56c44ce9e96290ef2f04776%7C0%7C0%7C638554533928112331%7CUnknown%7CTWfPbGZsb3d8eyJWljojMC4wLjAwMDAiLCJQIjojV2luMzliLCJBTil6Ik1haWwWlCjXVCI6Mn0%3D%7C4000%7C%7C%7C&sdata=fhhopmUX15oQ0DKZ6iOwkut8GaFiTeBJAHrgA%2FXopek%3D&reserved=0

From: noreply@civicplus.com
To: [webmaster](#); [Beth Beraldi](#); [City of Lebanon-Planning](#)
Subject: [EXTERNAL] Online Form Submission #10539 for Boards and Committees Contact Form
Date: Sunday, July 7, 2024 1:58:33 PM

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

Boards and Committees Contact Form

Please complete this form to contact a City of Lebanon board or committee. Your submission will be received by a city staff member who will forward your communication to members of the board or committee you choose below. Please be aware that your submission will become part of the public record.

Visit our [Boards and Committees page](#) to find rosters, agendas, meeting details, and more. Please [contact the City Manager's office](#) if you have questions about this form.

(Section Break)

Your First Name	Brendan
Your Last Name	Nyhan
Email Address	brendan.j.nyhan@gmail.com
Contact Phone Number	9194526451

(Section Break)

Which board or committee do you wish to contact?	Planning Board
--	----------------

Please enter your comments:	I am writing in very strong support of the proposed apartment development described in the Valley News. The lack of housing in the Upper Valley affects everyone. For instance, I live in Hanover and work at Dartmouth and the housing shortage is affecting the ability of my faculty and staff colleagues and our graduate students to find housing anywhere in the Upper Valley. (To be clear, I very strongly support building more housing in Hanover as well - every single community must do their part.) I especially urge you not to impose additional restrictions and delays on the project - as you know, one of the reasons for the severe housing shortages in many communities like ours across the country are regulatory burdens and delays that stall projects, increase their costs, and reduce their scope (forcing fewer units,
-----------------------------	--

etc.). We need these units and many, many more to meet the goal of 10,000 new units by 2030 (not really that far away). I'm sure you will hear from a few vocal opponents (as with any new development) but I urge you to remember how rare and unrepresentative they are. Thank you for your service and for considering this comment.

Best-
Brendan Nyhan

Do you need to attach
a file?

No

Email not displaying correctly? [View it in your browser.](#)

TOWN of HANOVER

Nathan Reichert
Lebanon Planning and Development Department
51 North Park Street
5th Floor City Hall
Lebanon, NH 03766

June 11, 2024

Dear Nathan,

The Hanover Planning Board discussed the proposed 474-unit multi-family project identified as PB2024-22-SPR at their meeting on June 4, 2024. The Planning Board supports efforts to augment the area's housing supply and address the housing shortage identified in the Keys to the Valley study and the regional housing needs analysis.

With regard to transportation/traffic issues, the Planning Board is very interested in ensuring that residents are connected with the existing public transit options and supports improving routes to Hanover's and Lebanon's downtown and the Dartmouth Hitchcock Medical Center. This measure is crucial to ensure that the new residents of this future development are not solely reliant on private vehicles for commuting or their daily needs, as well as with improved pedestrian and bicycle paths to provide a safe and connected network to Hanover and to Sachem Village. Bus shelters and covered bike parking at bus stations would also be necessary to create protection from the elements. Allowing space along Hanover Street for an improved transit stop will be critical, inviting increased use year-round.

Also, the Board encourages the City of Lebanon to consider this project in conjunction with recently proposed and completed housing projects on Mt. Support Road to more fully understand the impacts on traffic from Lebanon's downtown to Hanover's downtown.

In conclusion, the Planning Board supports this proposal and encourages continued efforts to improve regional public transport connections and decrease the flow of personal vehicles into Lebanon's and Hanover's downtowns. The Board also supports a multifaceted approach to reducing reliance on private vehicles as set out in the Town of Hanover Sustainability Master Plan, including improved pedestrian and bicycle routes, extended and weekend Advance Transit services, and the possibility of a dedicated transit route for future residents north of Interstate 89.

TOWN of HANOVER

The Town of Hanover is willing to partner with the City of Lebanon to seek funding options to achieve this goal.

Don't hesitate to contact Robert Houseman, Director, or Alex Taft, Senior Planner, to answer any questions about the Hanover Board's comments.

Sincerely yours,

A handwritten signature in black ink, appearing to read "B. Edwards", written over a light blue horizontal line.

Brian Edwards,

Town of Hanover Planning Board Chair

CITY OF LEDARON
APPLICATION FOR

SPECIAL EXCEPTION	☐	☒	SITE PLAN REVIEW
VARIANCE	☐	☐	SUBDIVISION
MOTION FOR REHEARING	☐	☐	LOT LINE ADJUSTMENT
APPEAL OF AN ADMIN. DECISION	☐	☐	CONDITIONAL USE PERMIT
☐ OTHER _____			

PROPERTY OWNER (APPLICANT):

NAME: Brickyard One Nominee Trust TEL.#: (617) 834-4441

MAILING ADDRESS: P.O. Box 720, Middleton, MA 01949

E-MAIL ADDRESS: emailmarchese@gmail.com

CO-APPLICANT, AGENT, OR LESSEE:

NAME: TEL.#:

MAILING ADDRESS:

E-MAIL ADDRESS:

PROJECT LOCATION:TAX MAP #: 48 LOT #: 1, 2, & 4 PLOT #: ZONE: R1, RO1, R3
63 1

STREET ADDRESS OF PROJECT: 174 Hanover Street Ext. & 238 Hanover Street

IS THIS PROPERTY LOCATED IN THE: **WETLANDS** ☒ YES ☐ NO **HISTORIC DISTRICT** ☐ YES ☒ NO
FLOOD PLAIN ☒ YES ☐ NO**SCOPE OF PROJECT:**

Ten apartment buildings and a combined maintenance shop/property manager's residence are proposed, totaling 474 multifamily residential units with access provided via two full access driveways along Hanover Street.

TYPE OF OCCUPANCY:EXISTING ☐ VACANT ☐ ONE FAMILY ☐ TWO FAMILY ☐ MULTI-FAMILY ☐ COMMERCIAL ☒ INDUSTRIAL
PROPOSED ☐ VACANT ☐ ONE FAMILY ☐ TWO FAMILY ☒ MULTI-FAMILY ☐ COMMERCIAL ☐ INDUSTRIAL
IF USE IS **COMMERCIAL** OR **INDUSTRIAL**, PLEASE NOTE **SPECIFIC**
USE: Former brick manufacturing facility**SIGNATURE BLOCK:****FOR PLANNING BOARD APPLICATIONS ONLY:** I, the undersigned, hereby submit this application on the date noted below with the knowledge and understanding that the Planning Board shall determine if the submitted application is complete according to its regulations at its next regularly scheduled meeting on June 10, 2024, unless I personally request, in writing, that the Board delay its determination of completeness to a later date.PROPERTY OWNER: *Richard M. Marchese* DATE: May 13, 2024**NOTE: IF, AS OWNER, YOU WISH TO DESIGNATE AN AGENT TO ACT ON YOUR BEHALF, PLEASE READ THE FOLLOWING AND SIGN BELOW:** I hereby designate the person listed above as my agent for the purpose of procuring the necessary local permits for the proposed work as described herein. Representations made by my agent may be accepted as though made by me personally, and I understand that I am bound by any official decision made on the basis of such representation.

PROPERTY OWNER: DATE:

DATE RECEIVED	FILE # (MAP/LOT)	APPLICATION #	FEE - \$ AMOUNT	DATE PAID	VOUCHER #



May 13, 2024
Ref: 52933.00

Mr. Nathan Reichert
Planning and Development Director
51 North Park Street
City Hall, 5th Floor
Lebanon, NH 03766

Re: The Brickyard Residential Development
Site Plan Review Application

Mr. Reichert,

On behalf of the applicant, Brickyard One Nominee Trust, VHB is submitting the following materials in support of the Site Plan Review for the proposed Brickyard Multi-Family PURD located at 174 Hanover Street Extension:

- Signed Application with Checklist
- Application Fee & Calculation
- Project Narrative and Impact Statement
- Abutters Notification Form
- Waiver Application
- Technical & Stormwater Checklists
- Site Plans (1 Hard Copy delivered to the Planning Office)
- Stormwater Report
- Traffic Study
- PURD Calculations and Figures

Thank you for your assistance through this process. Please reach out with any questions.

Sincerely,

Vanasse Hangen Brustlin, Inc.

A handwritten signature in blue ink, appearing to read "DF", is placed below the typed name.

Dave Fenstermacher, PE
Managing Director

Engineers | Scientists | Planners | Designers

2 Bedford Farms Drive
Suite 200
Bedford, New Hampshire 03110
P 603.391.3900
F 603.518.7495



May 13, 2024

Revised: August 6, 2024

Ref: 52933.00

Mr. Nathan Reichert
Planning and Development Director
51 North Park Street
City Hall, 5th Floor
Lebanon, NH 03766

Re: The Brickyard Multi-family Planned Unit Residential Development (PURD)
174 Hanover Street Ext. & 238 Hanover Street (Map 48 Lots 1, 2, & 4 and Map 63 Lot 1)
Project Description and Impact Statement for Site Plan Review

Mr. Reichert,

In support of the site plan review application, this letter provides a project description and impact statements for the proposed multi-family Planned Unit Residential Development (PURD) project (the Project) located at 174 Hanover Street Extension & 238 Hanover Street (the Site).

Project Description

Summary

The Applicant, Brickyard One Nominee Trust, is proposing a new multi-family Planned Unit Residential Development (PURD) with associated parking, stormwater management, utilities, landscaping, and pedestrian/vehicular access, on Tax Map 48 Lots 1, 2, and 4 and Tax Map 63 Lot 1 located at 174 Hanover Street Extension and 238 Hanover Street. As currently proposed, the Project is comprised of ten four story residential apartment buildings over vehicular parking, totaling 473 units. An additional building is proposed at the northeast corner of the Site, which is anticipated to contain the development's leasing office, maintenance shop, and one residential unit for the on-site property manager. The PURD density calculations provided indicate that the Project is allotted 424 units, with the Planning Board given the ability to grant up to 12% more. With the 12% bonus, the allowable density increases to 474 dwelling units. The Project currently proposes 474 dwelling units as illustrated on the site plans, and as such, the Applicant is requesting Planning Board approval of the 12% density bonus.

The Site encompasses approximately 133.5 acres on four parcels of land primarily consisting of woodland, with areas previously developed as the former Densmore Brick Company's mining and manufacturing facility and a series of electric transmission lines. The overall property that the Project is situated within includes four local zoning districts, however all work is proposed within the R-1, R-3, and RO-1 districts.

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Engineers | Scientists | Planners | Designers

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The RL3 district area that covers approximately 105 acres toward the rear of the property will not be developed as part of this application and has not been included in the PURD density or open space calculations (refer to attached PURD calculation figures). The RL3 property area may be developed as part of a separate future application, with access provided through the Project Site utilizing one of the proposed below-building parking area driveways.

The Site topography consists of significant grade change, generally sloping down from west to east. Densmore Pond and associated streams and wetland resource areas are situated at the low point of the Site near Hanover Street.

The site improvements include a looped driveway accessed via Hanover Street at either end, additional surface parking throughout the site, and parking below the ten apartment buildings. The Project was designed to minimize disturbances to the existing wetlands to the maximum extent possible. A trail system is present north and northwest of the Site. The Site is proximate to I-89 access, the Hanover Street School and Lebanon High School, and is within 2 miles of Dartmouth Hitchcock Medical Center. Additionally, Advance Transit's Heater Landing bus stop is currently only 0.2 miles from the Site, however with the additional ridership resulting from this project, there is potential to coordinate future stops.

These components of the development are discussed in greater detail in the following sections. Please also refer to the attached site plans for a graphical depiction of the Project as well as technical details.

Site Layout

The site layout was developed in a way that accommodates the existing site characteristics, including topography, wetlands, Densmore Pond, and surrounding roadways, and respects the nearby existing mountain biking trail system. Proposed buildings are oriented to balance earthwork, minimize the overall disturbed area. Additionally, the Project intends to activate the area along the banks of Densmore Pond and overlooking the brick kilns as resident amenities and a tribute to the Site's legacy.

Vehicular circulation is provided via a looped driveway accessed via two full-service curb cuts along Hanover Street. Two access points provides continuous fire access and disburses daily traffic, and is offset by the removal of two existing driveway curb cuts. Parking is available along both sides of the site driveway and each apartment building will be constructed using podium style construction, offering vehicular access to a covered parking area below the building. Addressing the natural topography and reducing the Project's overall disturbance, below-building parking areas will be built into the hillside, with the exceptions of Buildings 1, 6, and 7. As such the first floors of Buildings 2-5 are at-grade on the driveway side, and the first floors of Buildings 8-10 are at-grade on the side opposite the driveway. The parking levels are at least partially open-air on the remaining three sides. Buildings 1, 6, and 7 are true podium style buildings in that the parking area below the building is open-air on all four sides. It should also be noted that parking spaces below buildings are reduced to 8'x18' to allow more covered parking and reduce site impervious area. Site parking spaces regulated by the Zoning Ordinance meet the required 9'x18' dimensions.

Amenity spaces in the forms of a walking path along Densmore Pond, patios, a dog park, and overlook areas leverage site features and topography to offer tenants welcoming outdoor spaces and viewpoints.

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Transportation

Access to the Site will be provided via a looped driveway accessed via two full-service curb cuts along Hanover Street. As described previously, parking spaces exceeding the quantity required by the local zoning ordinance is proposed throughout the Site comprised of a combination of covered and typical surface parking. Due to the target bedroom mix, residents owning multiple vehicles are anticipated and as such the Applicant believes that additional parking above the minimum requirement is an operational improvement. The layout has been designed to accommodate circulation of emergency vehicles. The Applicant is providing bike storage on-site in excess of the quantity required by the local zoning ordinance. A sidewalk exists on the east side of Hanover Street, accessed from the Site via crosswalk at its southern driveway entrance. The Site is proximate to I-89 access and less than one quarter mile from Advance Transit's Heater Landing bus stop. A Traffic Impact Study has been provided as part of this application, and discusses existing and proposed traffic conditions in detail.

Wetlands

Existing wetlands exist on-site and were field delineated by Goddard Consulting. As such the Project falls within the Wetlands Conservation District. Based on the wetland inventory, as depicted on the Lebanon Wetland Overlay District Map, none of the wetlands on the site are listed as High or Very High Value wetland inventory, and therefore there are no associated buffers zones.

Wetlands have been respected in the design of the Project to the maximum extent practicable, with priority given to minimizing wetland impacts. Due to the location of the wetlands on-site, access to the development area requires that both proposed site driveways include one stream and associated bordering wetland crossing. To minimize wetland impacts by locating driveway crossings at the narrowest suitable areas, the Applicant acquired parcel 63-1 and realigned the original driveway layouts. The resultant cumulative proposed wetland impacts are less than 3,000 SF and as such the Project is expected to require a minimal impact permit from the NHDES Wetlands Bureau. Accordingly, the Project is exempt from a special exception requirement at the local level.

Stormwater Management

The Project will provide a stormwater management system pursuant to City of Lebanon and New Hampshire Department of Environmental Services (NHDES) regulations. To provide adequate water quality and water quantity control, improvements to the stormwater management system will include new catch basins and pipe network infrastructure that will direct the stormwater runoff to a series of surface and subsurface treatment/detention systems to achieve water quality and quantity control. A comprehensive Stormwater Management Report has been completed and is included with this site plan review application. Please refer to that document for detailed stormwater management information.

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Utilities

Connections to existing municipal and private utilities located in Hanover Street are proposed as follows.

Water

The Project will connect to the existing 10" water main within Hanover Street at both proposed driveway locations to create a looped water main providing domestic and fire protection services throughout the Site. Existing fire hydrants are located along Hanover Street and not intended to be modified by the Project. Additionally, the Project proposes hydrants along the site driveway intended to provide appropriate building coverage and easy access for apparatus. Hydrant locations and apparatus accommodations shall be reviewed by the Lebanon Fire Department. Hydrant flow testing will be conducted to confirm the existing pressures and flow rates near the Site and support the buildings' fire protection design by others.

Sewer

The Project will connect to the existing 12" PVC sewer main in Hanover Street at both proposed driveway locations. Connections are anticipated to consist of new precast concrete manhole structures installed along the existing sewer main with masonry troughs to properly introduce sanitary sewage flow generated by the development to the flow in the existing main.

Other Utilities

Electric, phone, cable/data, and fire alarm service to the Site is anticipated to be provided by new connections to the existing infrastructure in Hanover Street.

Landscape

Landscaping will include a mix of native and acclimated/hardy deciduous and evergreen trees, shrubs, perennial groundcover and spring bulbs. The proposed plant palette will provide year-round interest through seasonal changing of foliage, blooms, bark color and texture, winter berries and a variety of evergreen species. Plant material will be used to frame and enhance views as well as screen at grade different elements of the site like transformer pads, parking areas, and dumpster enclosures.

A detailed Landscape Plan is included in the Site Plans accompanying this letter.

Construction Schedule

Construction is anticipated to begin during the second half of 2024, beginning with tree cutting, building demolition, and debris cleanup. Once the necessary permits are obtained, site grubbing and earthwork operations will commence. Construction of roadways, utilities, and building pads may not begin until 2026. Buildings will then be constructed individually and sequentially from one end of the Site to the other. Occupancy of each building is anticipated upon its individual completion. Refer to the Phasing Plan included in the Site Plans accompanying this letter for more information related to the construction phasing intent.

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Project Impact Statement

Pursuant to Section 5.1.G.4. of the Lebanon Site Plan Review Regulations, the following statements of impact are offered as outlined in 6.9.B. of the Site Plan Regulations.

1. Natural resources and environmental quality including, but not limited to, water quality, air quality, wetlands, soil erosion and agricultural soils and a statement of pollution control and environmental impact mitigation measures.

In support of the site plan review application which this letter is part of, as well as the upcoming NHDES wetland permit and Alteration of Terrain Permit applications, a Stormwater Management Report and supporting Erosion Control Plans outline the impacts and mitigation measures for the Project. Refer to those materials for more information. Impacts to water and air quality, agricultural soils, and increases in soil erosion and pollution are not anticipated as a result of the Project. Care has been taken to build protective measures into the proposed site improvements, such as a perimeter swale to intercept and convey stormwater runoff from the upgradient hillside in a controlled manner, protecting the developed area from erosion and stormwater accumulation.

2. Capacity of the school system; effect on school bus transportation and distance of the proposed subdivision from the nearest elementary school.

These items are addressed in the report attached hereto prepared by Fougere Planning and Development dated May 8, 2024 entitled "Fiscal Impact Analysis – The Brickyard – Hanover Street". Please refer to that document for detailed analysis and findings.

3. Adequacy of streets and/or sidewalks in the general area of the subdivision including major intersections providing access, and such other areas as requested by the Board.

The Applicant and VHB attended a scoping meeting with the City Staff and NHDOT to identify intersections to be analyzed as part of the Site Plan Application. As such, a comprehensive Traffic Impact Study was prepared which analyzed the traffic generated by the Project at the proposed driveways and nearby intersections relative to existing conditions and various future conditions. The Traffic Impact Study is included with the site plan review application this letter is part of. Please refer to that document for detailed analysis and findings.

4. Sufficiency, availability, and capacity of utility services to provide water, fire protection, and sewer, and further, the impact of the subdivision on the municipal solid waste disposal facilities.

Public and private utilities are available in Hanover Street. The Applicant will be submitting for a Sewer Allocation from the City for sewer capacity. A hydrant flow test will be performed to understand the flow rate and pressure available to the Site for domestic and fire protection services. Lebanon DPW will review the municipal utilities sufficiency and capacity as part of the Site Plan review process and the design

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refined as required. The Applicant will contract with a solid waste disposal company to remove the residential solid waste collected in dumpsters on-site.

5. (If applicable) The impact of on-site subsurface sewage disposal systems as to adjacent wells, water supply systems, and any known aquifers so designated by the United States Geological Survey.

Not applicable. Sanitary sewage generated by the Project will be collected on-site and discharged to the existing public sewer infrastructure in Hanover Street.

6. Any special fire, police and public safety problems due to location and/or special conditions relative to the type of use.

Portions of these items are addressed in the report attached hereto prepared by Fougere Planning and Development dated May 8, 2024 entitled "Fiscal Impact Analysis – The Brickyard – Hanover Street". Past meetings with City Staff did not identify any specific conditions or problems with the Site, however the Applicant will continue to coordinate with City Staff and the appropriate departments to address concerns that may arise during permitting.

7. Impact of drainage from the subdivision on abutting properties and potential drainage problems both on the site of the subdivision and downstream from the subdivision.

The proposed stormwater management system has been designed to effectively and appropriately collect and manage stormwater runoff, reducing peak rates of runoff over the existing condition and discharging stormwater in a controlled manner that is consistent with existing drainage patterns. As such, impacts of stormwater runoff on abutting properties and downstream of the Site as a result of the Project are not anticipated. The Project does not intend to correct existing drainage issues that may be present. For more information, please refer to the stormwater management plan, prepared in accordance with the City of Lebanon and NHDES Alteration of Terrain regulations, included in the application package. The stormwater management design will be reviewed by the City Engineer or Peer Review Engineer as part of the site plan review process. The report will also be submitted to NHDES and reviewed as part of the upcoming Alteration of Terrain Permit. A copy of those documents will be shared with the City at the time of the NHDES submission.

8. Fiscal impact statement analyzing the impact of the subdivision on municipal, school and county revenues and expenditures, including estimated potential tax revenue and estimated number of school children.

These items are addressed in the report attached hereto prepared by Fougere Planning and Development dated May 8, 2024 entitled "Fiscal Impact Analysis – The Brickyard – Hanover Street". Please refer to that document for detailed analysis and findings.

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On behalf of the Applicant, we hope this information is satisfactory in describing the Project, its approach, and its impacts to the community. Please feel free to contact me with any questions you may have.

Thank you,

A handwritten signature in blue ink, appearing to read "D Fenstermacher".

Dave Fenstermacher, PE
Managing Director



July 2, 2024

Ref: 52933.00

Mr. Nathan Reichert
Planning and Development Director
51 North Park Street
City Hall, 5th Floor
Lebanon, NH 03766

Re: Proposed Multi-Family Development ("The Brickyard").
Site Plan Review Application
PUD/PURD Narrative Pieces

The following narrative has been provided as a supplement to the initial submission of the multi-family Planned Unit Residential Development (PURD) project, referred to as "The Brickyard". The pieces below intend to address both the design procedure documentation and the criteria for an Impact Statement for both a PUD and PURD outlined in Section 501.1 and 501.2 of the City of Lebanon Zoning Ordinance.

PUD Site Plan Preparation Requirements (Section 501.1.E.1.a. through d.)

- a. *Delineation of Site Resources and Required Open Space:*
 - i. *Show the location of all environmentally sensitive areas of high resource value which shall include:*
 - a. *floodplains as defined in Section 402.1;*
 - b. *wetlands and buffers as defined in Section 401.2;*
 - c. *perennial stream courses and adjacent buffers as defined in Section 410.3;*
 - d. *slopes in excess of 25%;*
 - e. *Significant Ecological Areas (SEAs) and Co-Occurrence areas as identified in Natural Lebanon the 2010 natural resources inventory prepared for the City of Lebanon, available on the City of Lebanon website;*
 - f. *vernal pools;*
 - g. *wildlife corridors; and*
 - h. *species or habitat of significance known or found to occur on or in close proximity to the subject property.*
 - ii. *Indicate areas of moderate resource value which shall include:*
 - a. *areas with agricultural soils of national and statewide significance as defined by the Grafton County Natural Resources and Conservation Service;*
 - b. *aquifers; intermittent streams; and*
 - c. *historic and cultural structures or features including stonewalls and cellar holes.*
 - iii. *Propose a prioritization of the Site Resources in terms of their highest to least suitability for inclusion in the Open Space for the proposed development. The proposed prioritization should reflect the value of each Site Resource relative to one another. This determination may be refined in consultation with the Planning Board during conceptual review and/or as part of the Board's review of the CUP application.*



- iv. *Identify and delineate between proposed Open Space area(s) as defined in Section 501.1.F below and the area(s) suitable for development taking into account:*
- the location of the Site Resources;*
 - the tract's context in relation to natural, historic, and cultural areas on adjoining and nearby properties;*
 - the minimum percentage and acreage of required Open Space areas; and*
 - the Open Space public benefit criteria set forth in Section 501.1.J.1.a.ii below.*

Response: Natural resources were verified and delineated on the Project Site prior to development of a concept. Refer to the existing conditions plans for locations of the floodplains, wetlands, and stream courses. Vernal pools were not found within the development area for the Project. Slopes in excess of 25% were mapped by the City of Lebanon GIS and used for the Project's open space calculations.

Based on the mapping as part of Natural Lebanon, found on the City of Lebanon website, the Site does not contain any Significant Ecological Areas (SEAs), but there appears to be a small area further up the mountain northwest of the Project Site. The Project will continue to coordinate with Town Staff to identify and minimize any impacts to the SEA.

The Project has submitted to the NH Natural Heritage Bureau and the site was found to have two wildlife species of concern in the area; an area of Rich red oak rocky woods, located west of the Project Site at the higher elevations of the mountain, and crested sedge found further west up the mountain in wetland areas. Based on the location of the development, the Project Team does not anticipate impacts to either species and will be coordinating with the state agency on mitigating any potential impacts.

Based on a cursory review of the Grafton County Natural Resources and Conservation Service website, the subject site does not contain areas with agricultural soils of national or statewide significance.

Though the Project Site has been a part of Lebanon history as the Densmore Brick Company, the Project Team has not found records that indicate there are historic or cultural structures or features on the site. There are old brick kilns that were used when the Densmore Brickyard operated, and the Project is currently intending to keep the kilns that are still standing in place (where safe to do so).

The Project prioritized the following Site Resources in the stated order:

- Wetlands, Vernal Pools and Streams;
- Floodplains;
- Wildlife corridors/species or habitats of significance;
- Significant Ecological Areas (SEAs)
- Slopes in excess of 25%

Given the nature of the existing site, avoiding impacts to slopes of 25% would be the most difficult due to the existing terrain. Prioritizing wetlands and streams was an achievable goal that the Project was able to take steps to address, such as the acquisition of additional land to preserve wetlands area adjacent to Densmore Pond, minimizing impacts associated with accessing the interior of the Site. The Project does



not anticipate impacting floodplain or species/habitats of significance, and therefore is prioritizing those Site Resources quite highly.

Based on the calculation required in Section 501.2 for PURD projects, the subject Project will require 12.02 acres of open space dedicated for public benefit. Please refer to the Open Space Plan (sheet C1.2 of the Site Plans) and exhibits submitted as part of this application. The Open Space is proposed on the north and south sides of the Site where streams and wetland areas can transect providing ecological value to the Open Space. Densmore Pond has not been included as part of the Open Space.

Public Benefit of Open Space (Section 501.1.J.1.a.ii.)

The Planning Board must determine that the layout of the designated Open Space area provides the greatest feasible public benefit which is compatible with the applicant's permissible development goals. The Board shall not approve such layout if it finds that there is a feasible alternative layout which would yield a significantly improved Open Space public benefit while still fulfilling the applicant's otherwise permissible development objectives. "Public benefit" means that the Open Space fulfills as many of the following criteria as are feasible:

- *the Open Space is larger and contiguous, rather than smaller and fragmented. In achieving characteristics of larger and contiguous, the location of the Open Space will factor in off-site, adjacent open space natural areas;*
- *the Open Space conserves Site Resources located on the property;*
- *the Open Space is realistically capable of management for economically viable agriculture or forestry activities;*
- *the Open Space conserves natural habitat for animals or plants, especially those which are locally rare or unusual;*
- *the Open Space contributes to the ecological viability of natural systems, or natural areas, or of nearby recreation areas;*
- *the Open Space conserves historical and archeological resources;*
- *the Open Space provides opportunities for passive and/or active public indoor or outdoor recreation;*
- *the Open Space provides scenic enjoyment by the public from the vantage point of public lands, highways, or waters; and/or*
- *the Open Space provides some other open space public benefit explicitly identified by the Planning Board in its decision.*

Response: The Open Space areas meet the public benefit criteria in several ways, including, but not limited to:

- The Open Space is large and contiguous, with limited breaks.
- The Open Space conserves several wetland and stream areas, as well as slopes in excess of 25%.
- The Open Space contains wooded areas that could realistically be used for forestry activities.



- The Open Space conserves wooded and wetland areas that various species of plants and animals may utilize.
- The Open Space provides opportunities for outdoor recreation, as portions of the mountain that is west/northwest of the development area connects to existing trail networks for hiking or biking.
- The Open Space provides scenic enjoyment for the public and those who live there, by providing scenic viewpoints at elevations higher than the adjacent valley. There are also scenic views of the wetlands and Densmore Pond in several portions of the Site.

b. *Location of Building Sites: Potential building sites (e.g. building footprints or building envelopes) shall be tentatively located, using the proposed Open Space/development areas as a base map. Accessory buildings and building setback lines shall also be indicated. Building sites shall be located with careful consideration given to:*

- a. *Relevant property data such as topography and soils;*
- b. *Potential impacts, both positive and negative on the Site Resources. Measures to mitigate adverse impacts on the Site Resources shall be provided;*
- c. *Providing attractive views and visual settings for residences to the maximum extent practicable; and*
- d. *Providing adequate solar orientation to the maximum extent practicable*

Response: Refer to the Project Plans for locations of the proposed apartment buildings and ancillary structures and amenities. The proposed apartment buildings were generally located on the west side of Densmore Pond in order to provide distance from Hanover Street and the abutters located along the road. Additionally, the locations of the buildings were placed to avoid impacting the Site Resources like wetlands, steep slopes and streams.

The buildings face desirable sight lines towards either Densmore Pond or up the mountain to the west. Higher floors along Densmore Pond will likely have views of the valley due to the elevation of the site. Trees and forested areas are being maintained to the maximum extent possible in order to preserve natural views and screen both tenants and abutters from undesirable views of other buildings.



- c. *Alignment of Roads, Driveways and Trails: The plans shall be designed to provide vehicular access to each building, complying with the applicable standards in the Site Plan Review Regulations and/or the Subdivision Regulations, as applicable, and bearing a logical relationship to topographic conditions. Impacts of the vehicular access design on proposed Open Space areas and the Site Resources shall be minimized, particularly with respect to crossing environmentally sensitive areas such as wetlands and traversing slopes exceeding 15%. Road connections shall be required to the maximum extent practicable in order to minimize the number of new cul-de-sacs and to facilitate access to and from homes in different parts of the tract and adjoining lots.*

Response: The Project driveway loops through the development and connects to Hanover Street at two locations. The driveway locations were selected in order to minimize impacts to the wetlands on the site. To do so, the Project Owner purchased an additional parcel along the north side of the Project to ensure that the wetland crossing would be at as minimal a width as possible. Additionally, the wetland crossing will not be causing a dam, as the driveway will span the wetland with a box culvert providing connectivity on both sides. This design is used at both ends of the driveway where the driveway crosses wetlands.

The driveway was carefully placed and graded so that it mimicked the majority of existing grades, and walls and reinforced slopes were used to tie proposed grades into existing, and minimize the overall limits of disturbance compared to using more gradual, un-reinforced slopes. The majority of parking for the Project has been located under the proposed apartment buildings at the ground floor, which reduces the amount of impervious space needed throughout the Site to support the development.

- d. *Drawing in the Lot Lines: When Steps a through c are completed, lines shall be drawn to delineate the lots for development and the Open Space lot(s), if individual lots are proposed.*

Response: New lot lines were not needed for this Project, but the four (4) parcels that are part of it will be merged as the Project progresses through permitting.

PUD Impact Statement / PUD Criteria (Section 501.1.E.2.a. through k.)

- e. *Statement of impact of the proposed development on natural resources and environmental quality including but not limited to water quality, air quality, wetlands, soil erosion and agricultural lands and a statement of pollution control and environmental impact mitigation measures.*

Response: Proposed site work minimizes wetland impacts to the maximum extent practicable and is not expected to impact floodplain. It should be noted that the majority of the wetland impacts will actually be spanned by the driveway and replaced with a box culvert to maintain connectivity. The proposed wetlands impacts are necessary to access the developable portion of the property and were minimized by acquiring an additional parcel to allow crossing at the narrowest points of the resource area. The Project has been designed to work with the natural topography to minimize ground



disturbance, and to utilize natural features, such as Densmore Pond, as a resident amenity, providing a walking path overlooking the pond along its length. Erosion and pollution control is discussed further in the Project's Drainage Report submitted as part of this application, and additionally the Project will be subject to a US EPA National Pollutant Discharge Elimination System (NPDES) Construction General Permit that establishes requirements for erosion and sedimentation control, inspection, and reporting throughout the construction phase. As a residential use proposed on a previously developed and wooded site, the Project is not expected to impact air quality or agricultural lands.

f. *Statement of impact of the proposed development on abutters.*

Response: The Project has been designed to minimize impacts on abutters and enhance the community by providing much needed housing. Mainly tucked away from the public road, the buildings' scale will be less noticeable and is also consistent with similar developments along the nearby Route 120 corridor. Landscaping will be provided in accordance with all applicable City requirements and is intended to screen the development from abutting properties and the public right of way, in addition to aesthetically enhancing the proposed site entrances and its interior. The Project will not be impacting the existing trail system that exists at the higher elevations of the property. Site access is provided via two proposed driveway connections to Hanover Street so traffic entering and exiting the Site is dispersed across the surrounding roadway network.

g. *Statement of sufficiency of proposed parking for the use intended.*

Response: The proposed development's parking supply is provided through a mix of covered parking under podium construction buildings and surface parking across the Site. Aligned with anticipated market demands, the proposed parking quantity exceeds the quantity required by the City's Zoning Ordinance, which is based on 1.5 parking spaces per apartment unit. To help offset the additional impervious area resulting from the increase in parking, parking spaces below buildings are 8'x18' to allow more parking under buildings. VHB understands the 8' wide parking spaces can be approved by the engineer reviewing the site plans on the City's behalf. Accessible stalls are provided in accordance to ADA requirements, and electric vehicle (EV) charging spaces are provided with additional EV-capable or EV-ready spaces available for future charging kiosk installation per the City of Lebanon Site Plan Regulations.

h. *Statement of adequacy of streets and/or sidewalks in the general area of development including major intersections providing access, and such other areas as requested by the Board.*

Response: As discussed in the Traffic Study submitted as part of this application, the proposed development is not expected to result in noticeable impacts to the area roadway system beyond the southern site driveway, where a traffic impact may be experienced at peak times. All-way stop control (AWSC) at the proposed four-way intersection of Hanover Street, Evans Drive, and the southern site driveway may be beneficial in mitigating that impact. That measure is discussed further in the Traffic Study and is intentionally not shown on the site plans because the recommended first step would be



to implement the AWSC using temporary means to confirm its effectiveness. A permanent implementation could be considered thereafter. An existing, continuous sidewalk spans the Project frontage along the east side of Hanover Street from south of I-89 to Old Etna Road, leaving a relatively short section of Hanover Street with no separated sidewalk. The geometry of the Old Etna Road/Hanover Street intersection, existing private land uses, and wetland areas make continuing the sidewalk prohibitive and a safety concern.

Additionally, parts of the Project Team are coordinating with the active NHDOT Corridor Improvement Project in the area, and that Project is aiming to address some of the deficiencies that have been identified in the area.

- i. *Statement of sufficiency, availability and capacity of utility services to provide water, fire protection and sewer and storm drainage, and further, the impact of the development on the municipal solid waste disposal facilities.*

Response: Municipal sewer and water are available in Hanover Street, and stormwater treatment is being provided via infiltration and detention systems in various areas across the Site. The Project does not intend to connect to municipal drainage infrastructure in Hanover Street. Electric and other telecommunication services are available in Hanover Street. A hydrant flow test will be performed to inform the fire protection system design for each building requiring sprinklers. The Applicant will work with solid waste disposal companies to determine the appropriate way to remove solid waste from the Site, including an emphasis on recycling to reduce impacts on municipal solid waste disposal facilities. The Project team will coordinate with the City of Lebanon DPW on the sewer modeling to confirm capacity of the existing system.

- j. *(If applicable) Statement of impact of on-site subsurface sewage disposal systems as to adjacent wells, water supply systems, and any known aquifers so designated by the United States Geological Survey.*

Response: Not applicable - The Project's proposed sanitary sewer collection system intends to discharge to the existing municipal sewer infrastructure in Hanover Street.

- k. *Statement of impact of storm drainage from the development on abutting properties and potential storm drainage problems both on the site of the development and downstream from the development.*

Response: The Project will provide a stormwater management system pursuant to City of Lebanon and New Hampshire Department of Environmental Services (NHDES) regulations and as such does not anticipate off-site stormwater impacts. To provide adequate water quality and water quantity control, improvements to the stormwater management system will include new catch basins and pipe network infrastructure that will direct the stormwater runoff to a series of surface and subsurface treatment/detention systems to achieve water quality and quantity control. A comprehensive Stormwater Management Report was submitted as part of this application. Please refer to that document for detailed stormwater management information.



l. *Statement of noise control methods and procedures.*

Response: Because the Project's proposed use is residential, a noticeable increase in noise levels over the existing condition is not anticipated following construction. During construction, the Contractor will be responsible for complying with applicable local and state requirements for noise, hours of operation, etc. that are specifically geared toward regulating temporary construction activities.

m. *Statement on the capacity of the school system; effect on school bus transportation and distance of the proposed development from, the nearest elementary school.*

Response: As discussed in the Fiscal Impact Analysis prepared by Fougere Planning & Development, Inc., the school system superintendent does not expect that the increase in student population will impact class sizes and did not express any capacity concerns. The Project Site is located across Hanover Street from both the Hanover Street School (elementary) and Lebanon High School and no bussing impacts are anticipated.

n. *Fiscal impact statement analyzing the impact of the development on municipal, school and county revenues and expenditures, including estimated potential tax revenue and estimated number of school children.*

Response: Please see the Fiscal Impact Analysis prepared by Fougere Planning & Development, Inc., submitted as part of this application (attached to the Project Narrative).

o. *Statement on any special fire, police and public safety problems due to location and/or special conditions related to the site's proposed type of use.*

Response: Special fire, police, and public safety conditions or concerns are not anticipated based on the proposed site improvements and use, both of which exist at very similar residential developments that are currently occupied along the Route 120 corridor.

PURD Objectives / PURD "Criteria" (Section 501.2.A.1. through 9.)

A. Objectives. The objectives of the PURD provisions of this ordinance are as follows:

1. To encourage conservation of Open Space to effect appropriate density and protect important natural resources such as agricultural soils, forested land, wildlife habitat, water resources, other natural resources, including geologic and scenic, and historical and archeological resources.

Response: The Project proposes to dedicate approximately 12.02 acres as protected open space on the Site, in addition to embracing Densmore Pond as an amenity for residents who will have access to a walking path overlooking the pond along its western side. Further, the Project proposes to maintain and feature two of the remaining brick kilns to highlight and pay homage to the Site's history as a pillar of the community and prominent business in the Upper Valley. Impact to the existing nearby mountain bike trail network is not anticipated.



2. To establish a connected network of conservation lands, trails, and working farm and forest land throughout the City by linking the Open Spaces and trails within the development, to conservation lands, important natural resources and trails on adjoining lands wherever possible, and as particularly found in the Lebanon *Master Plan* and *Natural Lebanon*.

Response: As discussed throughout this document the Project will dedicate Open Space comprised of two large, contiguous areas. The Open Space is adjacent to the existing trail network transecting the hill west of the Site, available for future connection if appropriate.

3. To preserve areas of the property that have the highest ecological value, including, for example, wildlife habitat, large un-fragmented blocks of undeveloped land, and areas of co-occurring resources as shown in *Natural Lebanon*, and water resources, such as drinking water supply areas, wetlands, streams and rivers.

Response: The Project's development area is as close to Hanover Street as site constraints and regulations allow, leaving a contiguous 100-acre forested portion of the Site undeveloped. Proposed site work minimizes wetland impacts to the maximum extent practicable and is not expected to impact floodplain. The proposed wetlands impacts are necessary to access the developable portion of the property and were minimized by acquiring an additional parcel to allow crossing at the narrowest points of the resource area. The Project has been designed to work with the natural topography to minimize ground disturbance, and to utilize natural features, such as Densmore Pond, as a resident amenity, providing a walking path overlooking the pond along its length.

4. To encourage the development of environmentally sensitive outdoor recreation land uses.

Response: The Project features amenities such as the Densmore Pond walking path, brick kiln overlook, and outdoor gathering spaces to enhance the on-site community and living experience for residents and their guests.

5. To allow flexibility in residential development to provide for a diversity of housing types, densities, and styles.

Response: The Project proposes housing densities commensurate with the zoning district in which the buildings are situated, ranging from a single family style house and leasing office to various sizes of mid-rise apartment buildings, the larger of which are pulled back from Hanover Street to soften their scale from the public realm and allow for far greater natural vegetative buffer.

6. To provide opportunities for the development of workforce or affordable housing.

Response: The Project will add up to 474 much needed residential units for the families of the Upper Valley. The development program is focused on offering units aligned with market demands, consisting mainly of higher earning professionals and students seeking higher-end accommodations. As such the program currently does not include affordable or workforce level housing.



7. To locate buildings and structures on those portions of the property which are most appropriate for development and avoiding developing in areas ill-suited for development, including, areas with poor soil conditions, a high water table, that are subject to frequent flooding or that have excessively steep slopes.

Response: The Project has been designed to work with the natural topography to minimize ground and steep slope disturbance, utilize natural features, and minimize impacts to natural resource areas such as the pond, streams, and wetlands that exist on-site. As the Site is positioned on a hillside and the proposed improvements include filling the lower portions of the Site, flooding and shallow groundwater issues are not anticipated. Buildings are expected to be elevated above the 100-year base flood elevation. When the Site is cleared and access roads can be established, a geotechnical exploration program will be executed to collect data on soil characteristics, seasonal high groundwater elevations, and bedrock elevations. That data will be compared to the site-specific soil mapping data to confirm expectations and stormwater management system design assumptions.

8. To encourage a more suitable form of development by facilitating the design, construction, and maintenance of housing, streets, utilities and public services in a more economic and efficient manner and by integrating the new development into the existing built and natural environment.

Response: The Project intends to compliment the neighborhood and provide much needed housing to support the local economy and growth in Lebanon and the Upper Valley. The scale of buildings will be aesthetically reduced as the majority of buildings are set well off of Hanover Street, better integrating the development with the surrounding environment. The Project is laid out to work with the hillside, offering views over Densmore Pond and the area east of the Site, as well as walking paths along Densmore Pond and a brick kiln viewing area. Two points of access at Hanover Street and a continuous route through the development offers improved vehicular and pedestrian circulation efficiency and disbursement.

9. To promote the reduction of impervious surface areas and sustainable stormwater management.

Response: Because the Site is mostly forested, the Project will add significant impervious area. However, the Project will provide a stormwater management system pursuant to City of Lebanon and New Hampshire Department of Environmental Services (NHDES) regulations and as such does not anticipate off-site stormwater impacts. To provide adequate water quality and water quantity control, improvements to the stormwater management system will include new catch basins and pipe network infrastructure that will direct the stormwater runoff to a series of surface and subsurface treatment/detention systems to achieve water quality and quantity control. A comprehensive Stormwater Management Report was submitted as part of this application. Please refer to that document for detailed stormwater management information.



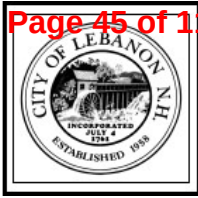
On behalf of the Applicant, we hope this information is satisfactory in describing the Project, its approach, and its impacts to the community. Please feel free to contact me with any questions you may have.

Thank you,

A handwritten signature in blue ink, appearing to read "D Fenstermacher".

Dave Fenstermacher, PE

Managing Director



City of Lebanon, New Hampshire

APPLICATION FOR CONDITIONAL USE PERMIT

SUPPORT STATEMENT

Office Use Only Date Received: _____ Application No.: _____

I. APPLICATION CHECKLIST

- [Application form](#)
- [Public Hearing Notification List](#)
- [Filing fee](#)
- This form, including written responses to the Section 302.4.D requirements, outlined below
- A site plan
- Optional: photos and any other materials in support of your application

II. PROJECT DESCRIPTION

I (we) hereby request a Conditional Use Permit as provided for in Article(s) V,
Section(s) 501.1.B, of the Lebanon Zoning Ordinance.

Please describe your proposed project with as much detail as possible. You can respond in the space provided below or on a separate sheet of paper.

The Project proposes the construction of a 474-unit multi-family development totaling approximately
731,600 SF, with 11 total buildings. Parking, landscaping, access, utilities, and other site
improvements are proposed as part of the Project.

III. CONDITIONAL USE PERMIT CRITERIA

In order to obtain a Conditional Use Permit, you must demonstrate to the Planning Board that the proposal satisfies the applicable criteria set forth in Sections A and B below. You must address each criteria in the space provided or on a separate sheet of paper.

A. Specific Criteria

The Conditional Use Permit is authorized by Article V, Section 501.1.B of the Zoning Ordinance which requires the applicant to demonstrate that (*please address any criteria set forth in the Zoning Ordinance that specifically apply to your proposed use or project*):

The Project is submitting a site plan application for the development as a Planned Unit Residential
Development (PURD). Pursuant to Zoning Ordinance Article V, Section 501.1.B, a CUP is required in
support of PURD applications.

B. General Criteria per Section 302.4.D

A conditional use permit shall be granted only if the Planning Board determines that the proposal conforms to all of the following standards:

1. The site is suitable for the proposal. This includes:

a. Adequate vehicular and pedestrian access for the intended use.

The Project proposes two driveway and sidewalk connections to Hanover St. providing full circulation through the development. Additional sidewalks and walking paths are also proposed as resident amenities.

b. The availability of adequate public services to serve the intended use including emergency services, pedestrian facilities, safe access, and other municipal services.

Emergency vehicle access and separated sidewalks are proposed through the Site with two connections to Hanover St. Fire hydrants are proposed along the main vehicular route through the site. A fiscal impact analysis discussing municipal service and school system impacts is included with the application package.

c. The absence of environmental constraints (floodplain, steep slope, etc.) proposed to be impacted by the intended use.

Proposed site work minimizes wetland impacts to the maximum extent practicable and is not expected to impact floodplain. The Project has been designed to work with the natural topography to minimize ground disturbance, and to utilize natural features, such as Densmore Pond, as a resident amenity, providing a walking path overlooking the pond along its length.

d. The availability of appropriate utilities to serve the intended use including water, sewage disposal, stormwater treatment, electricity, and similar utilities.

Municipal sewer and water are available in Hanover Street, and stormwater treatment is being provided via infiltration and detention systems in various areas across the Site. Electric and other telecommunication services are available in Hanover Street. Capacities of each utility will be confirmed through the design phase of the Project.

2. External impacts: The external impacts of the proposed use on abutting properties and the neighborhood shall be commensurate with the impacts of adjacent existing uses or other uses permitted in the zoning district. This shall include, but not be limited to, water runoff, drainage, traffic, noise, odors, vibrations, dust, fumes, hours of operation, and exterior lighting and glare. In addition, the location, nature, design, and height of the structure and its appurtenances, its scale with reference to its surroundings, and the nature and intensity of the use, shall not have an adverse effect on the surrounding environment nor discourage the appropriate and orderly development and use of land and buildings in the neighborhood. The proportion of the site proposed to be occupied by impervious surfaces shall be minimized to the extent necessary to preclude unreasonable risk of runoff, erosion, sedimentation, and other potentially adverse on-site or off-site effects.

The Project has taken measures to minimize impacts to abutting properties and the predominately residential neighborhood. PURDs are an allowed use in each zoning district the Site lies within, and multifamily developments are an allowed use in the districts where the apartment buildings are proposed. Stormwater runoff quality and quantity shall be maintained or improved. The redevelopment

of the Site will be an improvement over the existing vacant, deteriorating remnants of the Densmore Brickyard that presents a public safety hazard and visually detracts from the area. Landscaping and architectural design will result in a pleasing and complimentary aesthetic across the currently derelict parcel. Mainly tucked away from the public road, the buildings' scale will be less noticeable and is also consistent with similar developments along the nearby Route 120 corridor. Construction impacts (dust, fumes, traffic) will be limited to the max. extent practicable and subject to US EPA sedimentation/dust control requirements.

3. Character of the site development: The proposed layout and design of the site shall not be incompatible with the established character of the neighborhood and shall mitigate any external impacts on abutters, the neighborhood, and nearby public ways and infrastructure. This shall include, but not be limited to, the relationship of the building(s) to the street, the amount, location, and screening of off-street parking, the treatment of yards and setbacks, the buffering of adjacent properties, and provisions for vehicular and pedestrian access to and within the site.

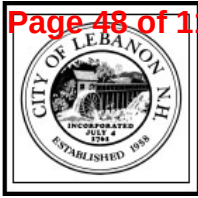
The largest proposed structures are located well beyond the required building setbacks, and landscape screening is proposed to address undesirable views. The vast majority of parking will not be visible to abutters, due to distance, vegetative screening, and positioning below the podium construction buildings in additionally screened parking areas. Vehicle and pedestrian access to/from the site will be provided at two driveway connections at Hanover Street that provide continual access across the Site.

4. Character of the buildings and structures: The design of any new buildings or structures and the modification of existing buildings or structures on the site shall not be incompatible with the established character of the neighborhood. This shall include, but not be limited to, the scale, height, and massing of the building or structure, the roof line, locations of access, and visual compatibility with the area.

The design of the new buildings is intended to be similar to other multi-family developments that have been recently built along the Mt. Support Road corridor. The Site also intends to utilize the existing features like Densmore Pond and the existing brick kilns to enhance the site. The heights of the buildings are a maximum of 45' and 55' above grade, as permitted by zoning district in the Zoning Ordinance.

5. Preservation of natural, cultural, historic, and scenic resources: The proposed use and layout of the site, including all related development activities, shall to the greatest extent practicable preserve identified natural, cultural, historic, and scenic resources on the site and shall not degrade such identified resources on abutting properties. This shall include, but not be limited to, identified wetlands, floodplains, significant wildlife habitat and documented wildlife corridors, stonewalls, mature tree lines, identified historic buildings or sites, scenic views, and viewsheds.

The Project has minimized wetland impacts by crossing at the narrowest locations practicable, and aims to maintain and utilize existing elements on-site to enhance the resident's experience. Some of the existing brick kilns will be maintained and multiple patios with overlooks of Densmore Pond are proposed. The elevation of the development provides desirable view corridors from the overlooks into the valley to the east. Cultural and historic resource assessment will be performed prior to ground disturbing activity on-site.



City of Lebanon, New Hampshire

APPLICATION FOR CONDITIONAL USE PERMIT

SUPPORT STATEMENT

Office Use Only Date Received: _____ Application No.: _____

I. APPLICATION CHECKLIST

- [Application form](#)
- [Public Hearing Notification List](#)
- [Filing fee](#)
- This form, including written responses to the Section 302.4.D requirements, outlined below
- A site plan
- Optional: photos and any other materials in support of your application

II. PROJECT DESCRIPTION

I (we) hereby request a Conditional Use Permit as provided for in Article(s) III,
Section(s) 308.4, of the Lebanon Zoning Ordinance.

Please describe your proposed project with as much detail as possible. You can respond in the space provided below or on a separate sheet of paper.

The Project proposes the construction of a 474-unit multi-family development totaling approximately 731,600 SF, with 11 total buildings. Parking, landscaping, access, utilities, and other site improvements are proposed as part of the Project. This CUP is requested only for the buildings in the R-1 zone, as buildings within R-0-1 will be 45' maximum in compliance with that zone.

III. CONDITIONAL USE PERMIT CRITERIA

In order to obtain a Conditional Use Permit, you must demonstrate to the Planning Board that the proposal satisfies the applicable criteria set forth in Sections A and B below. You must address each criteria in the space provided or on a separate sheet of paper.

A. Specific Criteria

The Conditional Use Permit is authorized by Article V, Section 501.1.B of the Zoning Ordinance which requires the applicant to demonstrate that (*please address any criteria set forth in the Zoning Ordinance that specifically apply to your proposed use or project*):

The Project is submitting a site plan application for the development as a Planned Unit Residential Development (PURD). To minimize paved area on-site and provide covered parking for residents, the proposed apartment building designs include parking below the buildings. Pursuant to Zoning Ordinance Article III, Section 308.4, a CUP is required in support of building heights up to 55' with parking below in the R-1 zone.

B. General Criteria per Section 302.4.D

A conditional use permit shall be granted only if the Planning Board determines that the proposal conforms to all of the following standards:

1. The site is suitable for the proposal. This includes:

a. Adequate vehicular and pedestrian access for the intended use.

The Project proposes two driveway and sidewalk connections to Hanover St. providing full circulation through the development. Additional sidewalks and walking paths are also proposed as resident amenities.

b. The availability of adequate public services to serve the intended use including emergency services, pedestrian facilities, safe access, and other municipal services.

Emergency vehicle access and separated sidewalks are proposed through the Site with two connections to Hanover St. Fire hydrants are proposed along the main vehicular route through the site. A fiscal impact analysis discussing municipal service and school system impacts is included with the application package.

c. The absence of environmental constraints (floodplain, steep slope, etc.) proposed to be impacted by the intended use.

Proposed site work minimizes wetland impacts to the maximum extent practicable and is not expected to impact floodplain. The Project has been designed to work with the natural topography to minimize ground disturbance, and to utilize natural features, such as Densmore Pond, as a resident amenity, providing a walking path overlooking the pond along its length.

d. The availability of appropriate utilities to serve the intended use including water, sewage disposal, stormwater treatment, electricity, and similar utilities.

Municipal sewer and water are available in Hanover Street, and stormwater treatment is being provided via infiltration and detention systems in various areas across the Site. Electric and other telecommunication services are available in Hanover Street. Capacities of each utility will be confirmed through the design phase of the Project.

2. External impacts: The external impacts of the proposed use on abutting properties and the neighborhood shall be commensurate with the impacts of adjacent existing uses or other uses permitted in the zoning district. This shall include, but not be limited to, water runoff, drainage, traffic, noise, odors, vibrations, dust, fumes, hours of operation, and exterior lighting and glare. In addition, the location, nature, design, and height of the structure and its appurtenances, its scale with reference to its surroundings, and the nature and intensity of the use, shall not have an adverse effect on the surrounding environment nor discourage the appropriate and orderly development and use of land and buildings in the neighborhood. The proportion of the site proposed to be occupied by impervious surfaces shall be minimized to the extent necessary to preclude unreasonable risk of runoff, erosion, sedimentation, and other potentially adverse on-site or off-site effects.

The Project has taken measures to minimize impacts to abutting properties and the predominately residential neighborhood. PURDs are an allowed use in each zoning district the Site lies within, and multifamily developments are an allowed use in the districts where the apartment buildings are proposed. Stormwater runoff quality and quantity shall be maintained or improved. The redevelopment

of the Site will be an improvement over the existing vacant, deteriorating remnants of the Densmore Brickyard that presents a public safety hazard and visually detracts from the area. Landscaping and architectural design will result in a pleasing and complimentary aesthetic across the currently derelict parcel. Mainly tucked away from the public road, the buildings' scale will be less noticeable and is also consistent with similar developments along the nearby Route 120 corridor. Construction impacts (dust, fumes, traffic) will be limited to the max. extent practicable and subject to US EPA sedimentation/dust control requirements.

3. Character of the site development: The proposed layout and design of the site shall not be incompatible with the established character of the neighborhood and shall mitigate any external impacts on abutters, the neighborhood, and nearby public ways and infrastructure. This shall include, but not be limited to, the relationship of the building(s) to the street, the amount, location, and screening of off-street parking, the treatment of yards and setbacks, the buffering of adjacent properties, and provisions for vehicular and pedestrian access to and within the site.

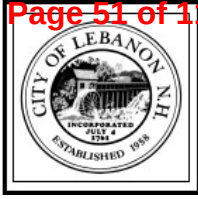
The largest proposed structures are located well beyond the required building setbacks, and landscape screening is proposed to address undesirable views. The vast majority of parking will not be visible to abutters, due to distance, vegetative screening, and positioning below the podium construction buildings in additionally screened parking areas. Vehicle and pedestrian access to/from the site will be provided at two driveway connections at Hanover Street that provide continual access across the Site.

4. Character of the buildings and structures: The design of any new buildings or structures and the modification of existing buildings or structures on the site shall not be incompatible with the established character of the neighborhood. This shall include, but not be limited to, the scale, height, and massing of the building or structure, the roof line, locations of access, and visual compatibility with the area.

The design of the new buildings is intended to be similar to other multi-family developments that have been recently built along the Mt. Support Road corridor. The Site also intends to utilize the existing features like Densmore Pond and the existing brick kilns to enhance the site. The heights of the buildings are a maximum of 45' and 55' above grade, as permitted by zoning district in the Zoning Ordinance.

5. Preservation of natural, cultural, historic, and scenic resources: The proposed use and layout of the site, including all related development activities, shall to the greatest extent practicable preserve identified natural, cultural, historic, and scenic resources on the site and shall not degrade such identified resources on abutting properties. This shall include, but not be limited to, identified wetlands, floodplains, significant wildlife habitat and documented wildlife corridors, stonewalls, mature tree lines, identified historic buildings or sites, scenic views, and viewsheds.

The Project has minimized wetland impacts by crossing at the narrowest locations practicable, and aims to maintain and utilize existing elements on-site to enhance the resident's experience. Some of the existing brick kilns will be maintained and multiple patios with overlooks of Densmore Pond are proposed. The elevation of the development provides desirable view corridors from the overlooks into the valley to the east. Cultural and historic resource assessment will be performed prior to ground disturbing activity on-site.



City of Lebanon, New Hampshire APPLICATION FOR WAIVERS

Office Use Only

Date Received: _____

File No.: _____

PROJECT INFORMATION

Name of Applicant: Brickyard One Nominee TrustProject Name: Brickyard Multi-family Planned Unit Residential DevelopmentProject Address: 174 Hanover Street Ext.

WAIVER REGULATIONS

In order to grant a Waiver from a requirement of the City of Lebanon Site Plan Review or Subdivision Regulations, the Planning Board must find that the Waiver is justified under one of the following criteria (See Article VII of the Site Plan Review Regulations and Section 7.15 of the Subdivision Regulations):

Criteria A. Strict conformity would pose an unnecessary hardship to the Applicant and waiver would not be contrary to the spirit and intent of the regulations;

OR

Criteria B. Specific circumstances relative to the site plan, or conditions of the land in such site plan, indicate that the waiver will properly carry out the spirit and intent of the regulations.

WAIVER REQUEST(S)

I (we) hereby request a Waiver from:

[You can respond in the space provided, or attach a separate statement. Please be prepared to address each request during your public hearing. You must show that you have justified granting the Waiver(s).]

- Section ^{5.1.E(7)} of the (circle one) Site Plan Review / Subdivision Regulations. A Waiver of this Section meets (circle one) Criteria A / Criteria B because the required information for all but 2 existing buildings within 200' of the Site is provided. One omitted building is a school maintenance building that is nearly 200' from the Site. Both omitted buildings are of similar height to those shown on the site plans and are omitted because they are located beyond the limits of the existing conditions survey.
- Section ^{5.1.E(16)(b)} of the (circle one) Site Plan Review / Subdivision Regulations. A Waiver of this Section meets (circle one) Criteria A / Criteria B because the Site consists of 23 acres, the vast majority of which is wooded. A quantity of trees prohibitive to identifying all sitewide are 12" in diameter or larger. The Project will be planting a significant amount of trees as part of the landscaping requirements and compliance calculations are provided on the Landscape Plans.

3. Section ^{5.1.E(21)(b)} ___ of the (circle one) Site Plan Review / Subdivision Regulations. A Waiver of this Section meets (circle one) Criteria A / Criteria B because profiles are provided at different scales than the required 1"=40' Horizontal (1"=30') or 1"=4' Vertical (1"=6'). The Applicant requests relief from the required 1"=40' as it would add unnecessary additional blank space to the plans while reducing readability. The Applicant also requests relief from the required 1"=4', as it is required to show more elevation on each profile given the steep topography on this site.
4. Section ^{6.6.C.1(2)k} ___ of the (circle one) Site Plan Review / Subdivision Regulations. A Waiver of this Section meets (circle one) Criteria A / Criteria B because the stormwater management design is based on preliminary information from a Certified Soil Scientist and confirmatory test pits will be completed as soon as proposed stormwater management locations are accessible. Results will be shared with the City and the design updated if necessary.
5. Section ^{5.1.E.(7)} ___ of the (circle one) Site Plan Review / Subdivision Regulations. A Waiver of this Section meets (circle one) Criteria A / Criteria B because the requested waiver is temporary and the spirit and intent of the regulations will be met. The waiver is requested to allow submission of the proposed single family residence building elevation views at a later date. The building will not exceed 35' in height as required by the Zoning Ordinance. Elevations will be provided prior to completion of the public hearing process.
6. Section ___ of the (circle one) Site Plan Review / Subdivision Regulations. A Waiver of this Section meets (circle one) Criteria A / Criteria B because _____
7. Section ___ of the (circle one) Site Plan Review / Subdivision Regulations. A Waiver of this Section meets (circle one) Criteria A / Criteria B because _____
8. Section ___ of the (circle one) Site Plan Review / Subdivision Regulations. A Waiver of this Section meets (circle one) Criteria A / Criteria B because _____

SIGNATURE

I (we) hereby submit this application to the Planning Board and attest that to the best of my (our) knowledge all of the information on this application form and in the accompanying application materials and documentation is true and accurate. As the applicant or as the agent of the applicant, I attest that I am duly authorized to act in this capacity.

Signature of Applicant:  Date: July 2, 2024

CITY OF LEBANON, NH SITE PLAN REVIEW REGULATIONS TECHNICAL CHECKLIST	
PROJECT NAME: The Brickyard Residential Development	
APPLICANT: Brickyard One Nominee Trust	DATE: 05/10/2024
GENERAL SUBMISSION REQUIREMENTS:	

All applications to the Planning Board for Site Plan Review must be submitted by 12:00 Noon on the day of the filing cutoff. [§4.7.B] Submissions must be accompanied by the following information or review of the application may be delayed:

A properly completed and signed Application Form *(available at www.lebanonnh.gov)*. [§5.1.A]

The appropriate filing fees. [§5.1.B]

A written project description. [§5.1.C]

A list of the names and mailing addresses of all persons to be notified, by certified mail, of the public hearing. [§5.1.D]

A completed and signed Application for Waivers *(available at www.lebanonnh.gov)* [§5.1.G.3]

A completed and signed Technical Checklist *(available at www.lebanonnh.gov)*. [§4.7.B]
[Applicants must complete the entire checklist to ensure that all necessary information and materials have been provided with the application or that written requests for waivers have been properly provided in accordance with Article VII of the Site Plan Review Regulations, as appropriate.]

Two (2) full-size sets of the Site Plan set. [§5.1.E]

A digital copy of the Site Plan set in .PDF format. [§5.1.F]

NOTE: Applications shall contain sufficient information to enable the City Staff and the Planning Board to evaluate the proposed development for compliance with the Zoning Ordinance, the Planning Board's Regulations, and other applicable City Codes, and for the Planning Board to make an informed decision.

All required application materials shall be submitted as a single inclusive package, including any appropriate waiver requests as permitted by the Regulations. Submission of a complete application package ensures that the review process by City Staff is as efficient and effective as possible.

The purpose of the filing deadline is to provide adequate time for City review of the proposal. Submission of any altered, additional, or substitute application materials required by Article V of these Regulations, subsequent to the filing deadline, other than as directed by City Staff, shall cause the application to be deemed untimely filed, and such application shall not be heard until a subsequent month.

PLAN SUBMITTAL TECHNICAL CHECKLIST:

NOTE: Site plan drawings shall include the information described below pursuant to Article V of the Lebanon Site Plan Review Regulations. Plans shall be submitted on sheets no larger than 24" x 36". Plan sets with multiple sheets shall include sheets of uniform size and be bound on the left edge. When more than three (3) sheets are required, an additional cover sheet shall be attached including a table of contents. A scale of not smaller than one (1) inch equals 40 feet is suggested. All lettering shall be of a size and type that is legible.

In order to facilitate the use of the City's Geographic Information System (GIS) for planning purposes, all surveys and engineered plans submitted for Site Plan Review shall utilize the NH State Plane Coordinate system and shall reference the North American Vertical Datum of 1988 (NAVD 88), unless prior approval to use an alternate coordinate system and/or vertical datum is granted by the Planning & Development Department.

A written request for waiver shall be required, pursuant to Article VII of the Site Plan Review Regulations, for any submission requirement for which the information or data is not provided by the applicant. [§5.1.G(4)] NOTE: The submission requirements described in paragraphs 5.1.E(1) through 5.1.E(4) shall not be waivable under the procedures of Article VII of the Site Plan Review Regulations. [§5.1.E]

[Checklist begins on following page]

TECHNICAL CHECKLIST & STORMWATER CHECKLIST

[illegible]

CITY OF LEBANON, NH
SITE PLAN REVIEW REGULATIONS
TECHNICAL CHECKLIST & STORMWATER CHECKLIST

Plan Requirements (cont.)	Info. Provided	Waiver Sought
5.1.E(6) - Existing and proposed grades, including topographic contours, with spot elevations. Where the grade is less than 20%, the contours shall be at 2-foot intervals; otherwise they shall be at 5-foot intervals. All contours shall be referenced to USGS or FEMA Flood Insurance Rate Map (FIRM) datums, as appropriate. Existing topographic information shall be prepared by a professional engineer registered in New Hampshire or land surveyor licensed in New Hampshire.	☒	☐
5.1.E(7) - Shape, size, height, and location of all existing structures located on site and within 200 feet of site.	☒	☒
5.1.E(7) - Elevation views indicating shape, size, height, and location of all proposed structures, including expansions of or additions to existing buildings. Such elevation views shall provide sufficient detail to allow for review by the Board and City staff of the adequacy of proposed access and egress points, walkways, lighting, and other site-related improvements.	☒	☐
5.1.E(8) - Location of existing natural features such as streams, marshes, lakes, ponds, wetlands, rock outcrops, or wooded areas, and existing man-made features such as roads and structures. Indicate those natural and man-made features that are to be removed, retained, or altered.	☒	☐
5.1.E(8) - Wetlands on the property shall be delineated by a NH Certified Wetlands Scientist, whose seal and signature shall appear on the plan. Documentation in the form of U.S. Army Corps of Engineers New England District Wetlands Delineation Data Sheets and/or other field notes and materials concerning the delineation shall be submitted.	☒	☐
5.1.E(9) - Zoning District, Tax Map and Lot number, and use of abutting properties within 200 feet of property.	☒	☐
5.1.E(9) - Location of streets, pedestrian paths/trails, and bicycle routes within 200 feet of the site boundary; and the location of curb cuts and vehicle accesses within 200 feet of the site boundary.	☒	☐
5.1.E(10) - Proposed streets, driveways, emergency vehicle accesses, parking spaces, and sidewalks, with indication of dimensions and direction of travel. Show required sight distances at curb cuts and dimensions for the inside radii of all curves.	☒	☐
5.1.E(10) - Vehicle and bicycle parking spaces shall be numbered.	☒	☐
5.1.E(10) - Loading spaces and facilities used in connection with any structures on the site shall be shown	☒	☐
5.1.E(10) - Total square footage and percentage of the lot covered by impervious cover shall be shown.	☒	☐
5.1.E(11) - Parking area safety measures including raised crosswalks/speed tables, signage, walkway lighting, striping and similar markings such as dedicated pedestrian/bicycle crossings and lanes through parking areas, fire lanes, compact and/or electric vehicle parking/charging, parking wayfinding, ADA signage and access aisles.	☒	☐
5.1.E(12) - Size and location of all existing and proposed public and private utilities. <i>(Note: the applicant is encouraged to submit a Sewer Use Permit Application and obtain a Notice of Permitted Allocation, and to obtain a Water Use Permit prior to submission of the Site Plan Review application.)</i>	☒	☐

CITY OF LEBANON, NH
SITE PLAN REVIEW REGULATIONS
TECHNICAL CHECKLIST & STORMWATER CHECKLIST

Plan Requirements (cont.)	Info. Provided	Waiver Sought
5.1.E(13) - Plan for outdoor lighting showing proposed location, mounting height, fixture type, lamp type, color correlated temperature (CCT), and wattage of all exterior free-standing lighting or building-mounted fixtures.	☒	☐
5.1.E(13) - Analyses and illuminance-level diagrams, to include average and minimum foot-candle measurements, showing that proposed installation conforms to the lighting-level standards in Site Plan Review Regulations.	☒	☐
5.1.E(13) - Manufacturer's specification information for each proposed light fixture and lamp (NOTE: This information may be provided on the plan or as a separate attachment).	☒	☐
5.1.E(13) - Drawings of all relevant building elevations showing location and height of all building-mounted fixtures, the portions of any walls or architectural features to be illuminated, illumination levels of walls or architectural features, and aiming points for any remote light fixtures.	☒	☐
5.1.E(14) - Plan for location of free-standing or building-mounted signs, including location, mounting, aiming, and shielding of any remote light fixtures for externally-lit signs.	☒	☐
5.1.E(14) - For internally-lit signs, relevant information concerning the method of illumination and the opacity of the sign background, showing that the proposed installation conforms to the requirements of the Regulations.	☒	☐
5.1.E(15) - The location and boundaries of any Overlay Districts established pursuant to Article IV of the Zoning Ordinance (including but not limited to the Wetlands Conservation District, Riverbank Protection District, Steep Slopes District, and Floodplain District) and, if applicable, protected shorelands pursuant to the Shoreland Water Quality Protection Act (NH RSA 483-B).	☒	☐
5.1.E(15) - For properties located within the Floodplain District, the 100-year flood elevation, floodway, shoreland protection zone, and flood plain limits shall be identified.	☒	☐
5.1.E(16) - Landscaping plan showing proposed new plantings to be installed and existing natural vegetation to be retained. Plan shall show in detail the number, size (height and/or caliper), and species (botanical and common names) of all proposed shrubs and trees.	☒	☐
5.1.E(16) - Existing trees over 12 inches in diameter (measured 4.5 feet above ground surface) within 25 feet of the disturbed area, must be counted and shown on the plan, if included towards fulfilling landscaping requirements.	☐	☒
5.1.E(16) - Calculations for square footage of perimeter landscaping.	☒	☐
5.1.E(16) - Parking lot shading calculations shall be provided by depicting new trees and shrubs at 10-year crown size.	☒	☐
5.1.E(17) - Existing and proposed surface and subsurface storm drainage facilities, including City storm drainage facilities located within 200' of site.	☒	☐
5.1.E(17) - Plans for retention, detention, slow release, and treatment of storm water shall be provided shall be provided in accordance with the requirements of Section 6.6.	☒	☐
5.1.E(18) - Section 6.6. Stormwater Management submission requirements.	See Stormwater Checklist	
5.1.E(19) - Plans for snow removal and storage.	☒	☐

TECHNICAL CHECKLIST & STORMWATER CHECKLIST

Plan Requirements (cont.)	Info. Provided	Waiver Sought
5.1.E(20) - A plan for the development showing provisions for automobile, transit, bicyclist, and pedestrian access and circulation. Such plan shall show both existing and proposed means of access to the site including connections with, public streets, sidewalks, transit stops, and formal paths/trails. Plans shall include any traffic calming and traffic control devices necessary in conjunction with the site development, as well as the location of all existing transit routes and transit stops located or passing within 1/4 mile (1,320 feet) of the property.	☒	☐
5.1.E(21) - Construction detail drawings including, but not limited to, pavements, walks, steps, curbing, drainage structures, water and/or sewer utilities, ground-mounted signage (e.g., fire lanes, ADA parking, commercial), surface treatments, transit shelters, energy generation units (e.g., solar), bike rack style, electric vehicle charging, outdoor lighting, outdoor furniture, retaining walls, tree boxes and other site systems or structures. Accompanying specifications and cutsheets may be required.	☒	☐
5.1.E(21) - Where applicable, roadway, drainage, water and sewer utility profile drawings shall be provided at a scale of 1"=40 feet (horizontal) and 1"=4 feet (vertical) and typical cross-section drawings shall be provided at a scale of 1"=5 feet (horizontal and vertical), unless prior approval to use an alternate scale is granted by the Reviewing Engineer. (NOTE: Ordinarily, only two (2) sets of such construction drawings shall be provided to the Planning and Development Department with the application submission.)	☐	☒
5.1.E(22) - Depict any current and proposed easements, rights-of-way, and deed restrictions including those related to sewer, electrical utility, shared access, etc.	☒	☐
5.1.E(23) - For multi-family structures, plans for on-site recreational facilities.	☒	☐
5.1.E(24) - Where a fire, emergency equipment, or similar vehicle turnaround area is provided, it must have an adequate turn radius. Provide CAD Autoturn data or a similar basis of design for the turn radius, if requested by Lebanon Fire or Engineering staff. City staff may also ask for this information at any time.	☒	☐
Supporting Documents and Information, Where Applicable	Info. Provided	Not Applicable
5.1.G(1) - An estimated timetable, to include phasing schedules, for construction and completion of buildings, parking, facilities, landscaping, and other required improvements.	☒	☐
5.1.G(2) - Any development estimated to generate a net increase of 100 peak hour trips or 1,000 average daily trips (based upon the most current edition of the ITE Trip Generation Manual) shall prepare and submit a Traffic Impact Study in accordance with standard traffic analysis conventions as set forth by the NHDOT. The Board may, at its discretion, require the submission of a Traffic Impact Study for developments estimated to generate less than 100 peak hour trips or 1,000 average daily trips if the Board has reason to believe such development could adversely affect levels of service or have other adverse impacts.	☒	☐
5.1.G(3) - Written requests for waivers from all applicable provisions of these Regulations shall be provided pursuant to Article VII - "Waiver Procedure". (note: use Application for Waivers form).	☒	☐
5.1.G(4) - For multi-family dwelling developments and mixed-use developments resulting in a net increase of 50 dwelling units or more, the application shall include the information and impact statements identified in Section 6.9.B.	☒	☐

NOTE: THE APPLICANT IS RESPONSIBLE FOR PROVIDING THE REQUIRED INFORMATION PURSUANT TO ARTICLE V OF THE SITE PLAN REVIEW REGULATIONS. PLEASE BE AWARE THAT THIS CHECKLIST IS FOR INFORMATION AND GUIDANCE ONLY AND DOES NOT REPRESENT THE LAW DICTATING SUBMITTAL REQUIREMENTS NOR IS IT COMPLETE AND INCLUSIVE THEREOF.

Completed By: Tom D'Aguiar, PE (VHB)

CITY OF LEBANON, NH
SITE PLAN REVIEW REGULATIONS
TECHNICAL CHECKLIST & STORMWATER CHECKLIST

CITY OF LEBANON, NH STORMWATER REVIEW REGULATIONS TECHNICAL CHECKLIST	
PROJECT NAME: The Brickyard Residential Development	
APPLICANT: Brickyard One Nominee Trust	DATE: 05/10/2024

NOTE: Stormwater plans shall include the information described below pursuant to Article VI of the Lebanon Site Plan Review Regulations. Plans shall be submitted on sheets no larger than 24" x 36". Plan sets with multiple sheets shall include sheets of uniform size and be bound on the left edge. When more than three (3) sheets are required, an additional cover sheet shall be attached including a table of contents. A scale of not smaller than one (1) inch equals 40 feet is suggested. All lettering shall be of a size and type that is legible.

In order to facilitate the use of the City's Geographic Information System (GIS) for planning purposes, all surveys and engineered plans submitted shall utilize the NH State Plane Coordinate system and shall reference the North American Vertical Datum of 1988 (NAVD 88), unless prior approval to use an alternate coordinate system and/or vertical datum is granted by the Planning Office.

A written request for waiver shall be required, pursuant to Article VII of the Site Plan Review Regulations, for any submission requirement for which the information or data is not provided by the applicant. [§6.6.I]

[Stormwater checklist begins on following page]

TECHNICAL CHECKLIST & STORMWATER CHECKLIST

[illegible]

CITY OF LEBANON, NH
SITE PLAN REVIEW REGULATIONS
TECHNICAL CHECKLIST & STORMWATER CHECKLIST

Plan Requirements (cont.)	Info. Provided	Waiver Sought
g. Plan references and notes (including sequence of soil disturbance)	☒	☐
h. Proposed and existing public and private utilities	☒	☐
i. Proposed project components to become property of or the responsibility of the City shall be labeled as such	☒	☐
j. Existing and proposed impervious cover, with areas used to calculate effective impervious cover (EIC, as defined herein) clearly identified and the square footage of each type identified and labeled.	☒	☐
k. Test Pit(s) locations and data where stormwater practices are proposed, as appropriate.	☐	☒
l. Details of individual design elements shown on separate plan sheets following the Proposed Conditions SMP.	☒	☐
The Existing Conditions SMP & the Proposed Conditions SMP shall be provided on sheets no larger than 24" x 36", at a scale of one (1) inch = 20 feet for urban areas, and one (1) inch = 40 feet for non-urban areas. The City Engineer will make the final determination as to the appropriate scale, ensuring that all important site and hydrologic features are easily recognized. If plan shall encompass more than two (2) sheets, at the required 1:40 or 1:20 scale, a separate large scale representation plan sheet (e.g. 1:100) is required to be provided, so as to show entirety of site, as well as off-site contributing areas.		
6.6.C.2 - In addition to the above described SMP plan sheets, the following SMP supplemental information is required: 1. A drainage analysis that includes calculations comparing pre- and post-development stormwater runoff rates (cubic feet per minute) and volumes (cubic feet) based on a 1-inch rainstorm, and the 2-year, 25-year, 50-year, and 100-year, 24-hour frequency storms. Calculations shall include, but not be limited to, the sizing of all structures and BMPs, including sizing of emergency overflow structures based on the 50-year 24-hour frequency storm discharge rate, with 1-foot of free-board. Storm rates shall be based on current design depths from the Northeast Regional Climate Center - http://precip.eas.cornell.edu. <i>Any site that was primarily wooded in the last five years shall be considered undisturbed woods Any site from which wooded vegetation has been removed within 5 years prior to the first submission to the planning board with respect to a proposed development, or upon which, at some earlier time, clearing has occurred in anticipation of development, shall be treated as undisturbed woodland for purposes of calculating pre-development runoff volumes. For purposes of this paragraph any tree cutting which occurred without leaving stands of healthy, growing trees within areas near waters and highways, as required by RSA 227-J:9, I, shall be presumed to have occurred in anticipation of development</i>	☒	☐

CITY OF LEBANON, NH
SITE PLAN REVIEW REGULATIONS
TECHNICAL CHECKLIST & STORMWATER CHECKLIST

Plan Requirements (cont.)	Info. Provided	Waiver Sought
2. A drainage analysis results summary tabulated (pre & post) for each proposed outfall or catchment outlet point including runoff rates and volumes for each storm event analyzed above.	☒	☐
3. An Erosion and Sediment Control Plan for all proposed construction activities in accordance with the NH Stormwater Management Manual Volume 3, (December 2008 or current revision; downloadable from the website)	☒	☐
4. A comprehensive Operation and Maintenance Plan for long-term maintenance of all proposed stormwater management elements and BMPs including the proposed schedule of inspections and anticipated maintenance (see section H.2 Operations & Maintenance Plan for detailed requirements).	☒	☐
<u>6.6.D</u> - Phased Development: For phased developments, the plans and calculation requirements under this section (6.6) shall apply as though the development of the entire parcel were being proposed in one single application. The review and approval process for phased development applications is provided in section 4.9 of the Lebanon Site Plan Regulations.	☒	☐

NOTE: THE APPLICANT IS RESPONSIBLE FOR PROVIDING THE REQUIRED INFORMATION PURSUANT TO ARTICLE VI OF THE SITE PLAN REVIEW REGULATIONS. PLEASE BE AWARE THAT THIS CHECKLIST IS FOR INFORMATION AND GUIDANCE ONLY AND DOES NOT REPRESENT THE LAW DICTATING SUBMITTAL REQUIREMENTS NOR IS IT COMPLETE AND INCLUSIVE THEREOF.

Completed By: Tom D'Aguiar, PE (VHB)

(Last Revised 9/20/2021)

Planning office Use Only:

Date Received ___/___/___ Checklist Complete YES or NO Checked by: _____

CERTIFIED NOTIFICATION LIST

THE CITY OF LEBANON IS REQUIRED UNDER NH RSA 672:3 TO NOTIFY THE FOLLOWING PERSONS OF PUBLIC HEARINGS BEFORE THE PLANNING BOARD: ALL ABUTTERS; THE APPLICANT; PROPERTY OWNER; HOLDER OF CONSERVATION, PRESERVATION, OR AGRICULTURAL PRESERVATION RESTRICTION(S); AND EVERY ENGINEER, ARCHITECT, LAND SURVEYOR, OR SOIL SCIENTIST WHOSE PROFESSIONAL SEAL APPEARS ON ANY PLAT SUBMITTED TO THE BOARD.

PLEASE PROVIDE NAMES & MAILING ADDRESSES FOR ALL PERSONS LISTED ABOVE.

MAP & LOT NUMBER: 48-1	MAP & LOT NUMBER: _____
ABUTTER/OTHER: Brickyard One Nominee Trust Marchese, Richard TTEE PO Box 720 Middleton, MA 01949	ABUTTER/OTHER: UVLSRPC 10 Water Street, Suite 225 Lebanon, NH 03766
MAP & LOT NUMBER: _____	MAP & LOT NUMBER: _____
ABUTTER/OTHER: Engineer David Fenstermacher, PE VHB 2 Bedford Farms Drive, Suite 200 Bedford, NH 03110	ABUTTER/OTHER: Town of Hanover Attn Planning P.O. Box 483 41 South Main Street Hanover, NH 03755
MAP & LOT NUMBER: _____	MAP & LOT NUMBER: _____
ABUTTER/OTHER: Land Surveyor Mike Hammer, LLS, PLS VHB 2 Bedford Farms Drive, Suite 200 Bedford, NH 03110	ABUTTER/OTHER: Wetland Scientist Goddard Consulting, LLC 291 Main Street - Suite 8 Northborough, MA 01532
MAP & LOT NUMBER: _____	MAP & LOT NUMBER: _____
ABUTTER/OTHER: Landscape Architect Erik Bednarek, RLA VHB 101 Walnut Street PO Box 9151 Watertown, MA 02471	ABUTTER/OTHER: Soil Scientist Sherrie Trefry VHB 2 Bedford Farms Drive - Suite 200 Bedford, NH 03110
MAP & LOT NUMBER: _____	MAP & LOT NUMBER: 48-3
ABUTTER/OTHER: NH DOT 7 Hazen Drive Concord, NH 03302	ABUTTER/OTHER: Comcast of CT/GA/MA/NH/NY/NC/V One Comcast Center Philadelphia, PA 19103
MAP & LOT NUMBER: 48-5	MAP & LOT NUMBER: 48-6
ABUTTER/OTHER: Loney, David & Georgia 296 Pleasant Street Portsmouth, NH 03801	ABUTTER/OTHER: Kroner, Constance I 194 Hanover Street EXT Lebanon, NH 03766

CERTIFIED NOTIFICATION LIST

THE CITY OF LEBANON IS REQUIRED UNDER NH RSA 672:3 TO NOTIFY THE FOLLOWING PERSONS OF PUBLIC HEARINGS BEFORE THE PLANNING BOARD: ALL ABUTTERS; THE APPLICANT; PROPERTY OWNER; HOLDER OF CONSERVATION, PRESERVATION, OR AGRICULTURAL PRESERVATION RESTRICTION(S); AND EVERY ENGINEER, ARCHITECT, LAND SURVEYOR, OR SOIL SCIENTIST WHOSE PROFESSIONAL SEAL APPEARS ON ANY PLAT SUBMITTED TO THE BOARD.

PLEASE PROVIDE NAMES & MAILING ADDRESSES FOR ALL PERSONS LISTED ABOVE.

MAP & LOT NUMBER: <u>77-113</u>	MAP & LOT NUMBER: <u>77-115</u>
ABUTTER/OTHER: Lee, Cuong V 194 Plain Street Rockland, MA 02370	ABUTTER/OTHER: Leuca Magdalena TTEE 9920 SE 40th Street Mercer Island, WA 98040
MAP & LOT NUMBER: <u>49-1</u>	MAP & LOT NUMBER: <u>63-2</u>
ABUTTER/OTHER: Creighton Daniel Silas 266 Slab City Road Grafton, NH 03240	ABUTTER/OTHER: Levin Mary Anne TTEE 248 Hanover Street EXT Lebanon, NH 03766
MAP & LOT NUMBER: <u>63-4</u>	MAP & LOT NUMBER: <u>64-2</u>
ABUTTER/OTHER: Cicotte Prop LLC PO Box 600 Lebanon, NH 03766	ABUTTER/OTHER: Boisvert Sr, E M & EE CO-TTES 2 Pasture Lane West Lebanon, NH 03784
MAP & LOT NUMBER: <u>64-33</u>	MAP & LOT NUMBER: <u>76-10</u>
ABUTTER/OTHER: Lebanon School District 20 Seminary Hill West Lebanon, NH 03784	ABUTTER/OTHER: Dartmouth College Trustees PO Box 5188 Hanover, NH 03755
MAP & LOT NUMBER: <u>77-83</u>	MAP & LOT NUMBER: <u>77-81</u>
ABUTTER/OTHER: Seidman, Max James + Zhang, Angela 53 Winter Street Lebanon, NH 03766	ABUTTER/OTHER: Rader III, Gerald Lenard 54 Winter Street Lebanon, NH 03766
MAP & LOT NUMBER: <u>77-111</u>	MAP & LOT NUMBER: _____
ABUTTER/OTHER: Valdiviezo Zenia Mae 48 Juniper Circle Lebanon, NH 03766	ABUTTER, <u>OTHER</u> : *Notified Via Email* Architect Vesal Tebyanian Studio Integrate 73 Commercial Street London E1, England

FEE SCHEDULE LEBANON PLANNING BOARD

Adopted January 24, 2022

LOT LINE ADJUSTMENT (Boundary Line Adjustment)		
		TOTALS
FILING FEE	\$25.00	\$25.00
ADVERTISING FEE	\$100	\$100
NOTIFICATION FEE (see note on page 2)	\$5.00 + Current USPS rate per certified notice (see below) X _____ notices	\$5.00 \$ _____ (abutter certified)
TOTAL DUE		\$ _____
MINOR SUBDIVISION		
		TOTALS
FILING FEE	\$150.00	\$150.00
ADVERTISING FEE	\$100.00	\$100.00
NOTIFICATION FEE (see note on page 2)	\$5.00 + Current USPS rate per certified notice (see below) X _____ notices	\$5.00 \$ _____ (abutter certified)
TOTAL DUE AT TIME OF FILING		\$ _____
**Engineering Review fees may also be required. See note on page 2.		
PRELIMINARY REVIEW OF A MAJOR SUBDIVISION		
		TOTALS
FILING FEE	\$200.00	\$200.00
NUMBER OF LOTS* _____	\$30.00 per lot*	
ADVERTISING FEE	\$100.00	\$100.00
NOTIFICATION FEE (see note on page 2)	\$5.00 + Current USPS rate per certified notice (see below) X _____ notices	\$5.00 \$ _____ (abutter certified)
TOTAL DUE AT TIME OF FILING		\$ _____
*Or units when the subdivision does not create individual lots. **Engineering Review fees will also be required. See note on page 2.		
FINAL REVIEW OF A MAJOR SUBDIVISION		
		TOTALS
FILING FEE	\$500.00	\$500.00
FIRST FIVE (5) LOTS*	\$75.00 per lot*	
NUMBER OF LOTS 6+*	\$150.00 per lot*	
ADVERTISING FEE	\$100.00	\$100.00
NOTIFICATION FEE (see note on page 2)	\$5.00 + Current USPS rate per certified notice (see below) X _____ notices	\$5.00 \$ _____ (abutter certified)
TOTAL DUE TIME OF FILING		\$ _____
*Or units when the subdivision does not create individual lots. **Engineering Review fees will also be required. See note on page 2.		
SITE PLAN REVIEW		
		TOTALS
FILING FEE	\$250.00	\$250.00
SQUARE FOOTAGE 731,600 sf	\$75.00 per 1,000 sq. ft. (gross floor area)	\$54,870.00
ADVERTISING FEE	\$100.00	\$100.00
NOTIFICATION FEE (see note on page 2)	\$5.00 + Current USPS rate per certified notice (see below) (\$5.04/notice) X 25 notices	\$5.00 \$ 126.00 (abutter certified)

SITE PLAN REVIEW

TOTAL DUE AT TIME OF FILING

\$ **\$55,351.00******Engineering Review fees will also be required. See note on page 2.****SITE PLAN REVIEW AMENDMENT (WITH STRUCTURAL CHANGES)****TOTALS**

FILING FEE

\$250.00

\$250.00

SQUARE FOOTAGE

\$75.00 per 1,000 sq. ft.
(gross floor area)

ADVERTISING FEE

\$100.00

\$100.00

NOTIFICATION FEE (see note below)

\$5.00 + Current USPS rate per certified notice
(see below)
X _____ notices

\$5.00

\$ _____ (abutter certified)

TOTAL DUE AT TIME OF FILING

\$

****Engineering Review fees may also be required. See note below.****OTHER****-SITE PLAN REVIEW AMENDMENT (WITH NO STRUCTURAL CHANGES)****-EXTENSION REQUESTS****-CONDITIONAL USE PERMITS****TOTALS**

FILING FEE

\$250.00

\$250.00

ADVERTISING FEE

\$100.00

\$100.00

NOTIFICATION FEE (see note below)

\$5.00 + Current USPS rate per certified notice
(see below)
X _____ notices

\$5.00

\$ _____ (abutter certified)

TOTAL DUE AT TIME OF FILING

\$

****Engineering Review fees may also be required. See note below.****MINOR SITE PLAN REVIEW****TOTALS**

FILING FEE

\$150.00

\$150.00

NOTIFICATION FEE (see note below)

Current USPS rate per certified notice (see
below)
X _____ notices

\$ _____ (abutter certified)

TOTAL DUE

\$

ENGINEERING REVIEW FEES:

After an application to the Planning Board is submitted and the filing fees identified above have been paid, the Planning & Development Department will determine the scope of required engineering review and will obtain an estimated cost from the reviewing engineer. A cost estimate of the review fees will usually be generated within two (2) – three (3) business days. Once conveyed to the applicant, the estimated review fees shall be paid by the applicant within five (5) business days, and an escrow account shall be established by the Planning & Development Department. No plans will be reviewed unless and until the review fee estimate is paid, if required.

Please note that escrow fees are only an estimate of what services will cost and actual costs of review may be less or more than the amount initially estimated. Any unused portion of the escrow will be returned to the applicant at the end of the approval process if such a surplus remains. Additionally, in the event the escrow amount does not cover the full cost of services the Applicant shall pay any remaining costs as a condition of approval. See also Section 4.7 of the Site Plan Review Regulations and Section 7.7 of the Subdivision Regulations.

NOTIFICATION FEE: CURRENT FEE as of January 2024 is \$5.04 per certified notice

THE CERTIFIED NOTIFICATION FEE IN ALL SECTIONS ABOVE INCLUDES THE FOLLOWING: ALL ABUTTERS, THE APPLICANT, PROPERTY OWNER, HOLDER OF CONSERVATION, PRESERVATION, OR AGRICULTURAL PRESERVATION RESTRICTION(S); AND EVERY ENGINEER, ARCHITECT, LAND SURVEYOR OR SOIL SCIENTIST WHOSE PROFESSIONAL SEAL APPEARS ON ANY PLAT SUBMITTED TO THE BOARD AND ANY OTHER PERSONS REQUIRED BY RSA 676:4, I(d).

Fiscal Impact Analysis

The Brickyard – Hanover Street
Lebanon, NH
May 8, 2024



FOUGERE PLANNING & DEVELOPMENT, Inc.**Mark J. Fougere, AICP**

253 Jennison Road Milford, New Hampshire 03055

phone: 603-315-1288 email: Fougereplanning@comcast.net

FISCAL IMPACT ANALYSIS**The Brickyard – Hanover Street
Lebanon, NH****May 8, 2024****1. Introduction**

Fougere Planning and Development has been engaged by VHB to undertake this Fiscal Impact Analysis to outline potential General Fund property tax and revenue increases, as well as demand for service impacts to the City of Lebanon from the proposal to develop 473 market rate apartments units¹ with a mixture of one, two and three bedroom units within 10 garden style buildings. In addition, one single home is proposed (which includes the manager's residence, leasing office and maintenance storage; total units 474). The 133 acre +/- project is located off of Hanover Street, across from the Hanover Street Elementary School and Lebanon High. Two old existing industrial buildings and other site features will be demolished to make way for the new community. The proposed project will assist addressing the ongoing critical housing need impacting the Upper Valley, with the recently published Housing Needs Assessment² targeting the necessity for an additional 1,102 housing units by the year 2035.

All on site drives and trash pickup will be privately maintained by the project owner; public water and sewer will service the property.

This Report will address a number of municipal impacts as required in Lebanon's Subdivision Regulations Section 12.3, B. Areas of Study and Information:

¹ One unit will be for site manager, a detached single family home with office space & maintenance space.

² UVLSRPC Housing Needs Assessment, 2023, Table 5-1 – Summary of Future Housing Needs Targets.

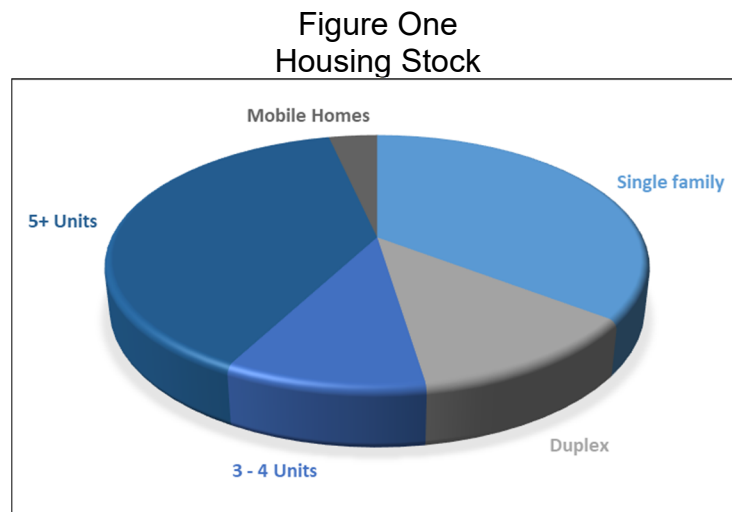
2. *Capacity of School System; effect on school bus transportation and distance of the proposed subdivision from the nearest elementary school.*

8. *Fiscal impact statement analyzing the impact of the subdivision on municipal, school and county revenues and expenditures, including estimated potential tax revenue and estimated number of school children.*

2. Regional and Local Trends

Census figures report that from 2000 to 2010 Lebanon's population increased from 12,568 to 13,151 over the 10-year period. The 2020 Census reports Lebanon's population to be 14,282, a 8.6% increase since 2010. The NH Office of Planning and Development reports the city's 2022 population to be 15,108.

Approximately 35.3% of Lebanon's housing stock consists of single-family homes, with the Census data reporting 2,790 homes out of a total housing stock of 7,886 units³ as outlined in Figure One.



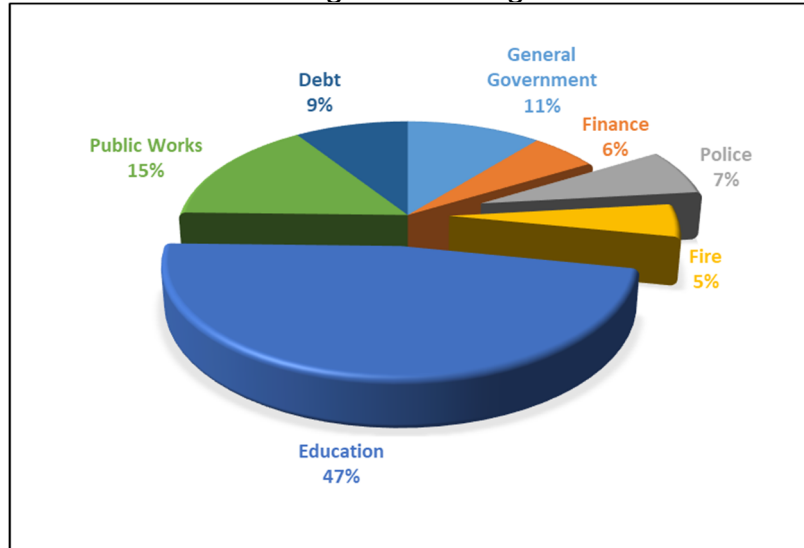
3. Budgets

The city's FY24 Budget, as detailed in Figure Two, outlines that education is the largest municipal budget line item, followed by the emergency service

³ NH Office of Planning and Development.

departments. Based on case studies of comparable properties, given the proposed use development program, potential increases in municipal service demands will be primarily focused on emergency service departments, along with the school department. Key budget drivers this Fiscal year include increases in workers compensation costs (17.96%), employee benefits (9.15%), and capital improvement investments (28.5%).

Figure Two
Budget Percentages



4. Fiscal Methodology Approach

Fiscal Impact Analyses can have many connotations, this analysis will follow the classic definition of fiscal impact as follows *“A projection of the direct, current public costs and revenues associated with residential or nonresidential growth to the local jurisdiction in which the growth is taking place⁴.”*

There are several methodologies that are used to estimate fiscal impacts of proposed development projects. The Per Capita/Unit Multiplier Method is the most often used analysis to determine municipal cost allocation. This method is the classic “average” costing method for projecting the impact of population

⁴ Burchell.

growth on local spending patterns and is used to establish the costs of existing services for new development. The basic premise of this method is that current revenue/cost ratios per person and/or per unit are a potential indicator of future revenue/cost impacts occasioned by growth. The advantage of this approach is its simplicity of implementation; however, the downside of this approach is that the methodology calculates the “average” cost as being the expected cost, which is often not the case, and costs can be exaggerated—in some cases significantly. For most new land uses, many department budgets are not measurably impacted in any long-term way.

The Marginal Cost Approach is an alternative methodology that can be used to estimate and measure developmental impacts based on actual costs that occur in the community. At this time, a “level of service” exists in Lebanon to serve the community. This existing service level addresses the needs of the community through existing tax collections. As new developments occur, pressures are placed on some departments to address increased demands, while other departments see little if any measurable impacts. In reviewing the potential impacted departments specifically, a truer picture of anticipated cost impacts can be determined. For this analysis, we will apply both the Average Cost and Marginal Cost Approach methodologies to review municipal service demand cost increases.

Given the nature of the proposed Project, as will be seen by the analysis below, few significant impacts will be felt by most City departments. Solid waste generated by the project will be removed by a private hauler. Any water and sewer expenses will be offset through user fees. All onsite driveways will be private, and all maintenance expenses will be paid for by the project owner. This is not to infer that no increased expenditure will occur because of this project. Measurable operational influences will be felt by a few departments, most noticeable the Police/Fire and Schools.

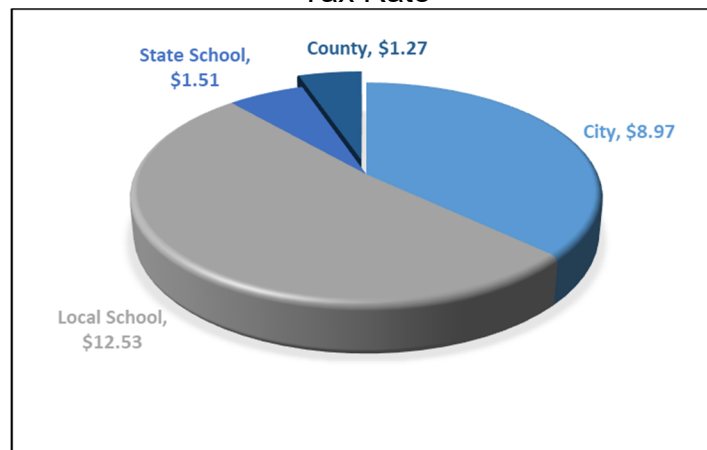
This fiscal report will outline General Fund revenues and municipal service costs. All data, tax rates and costs are assumed to be in FY2024. It should be noted that the costs outlined are “estimates” and no actual costs will be realized without review and approval by appropriate department heads, administrators, and elected City officials.

5. Local Revenues

A) Property Taxes

Local property taxes provide the bulk of municipal revenues for New Hampshire communities. The 2023 total Tax Rate for Lebanon is \$24.28. Figure Three outlines the breakdown of the various tax rate components.

Figure Three
Tax Rate



Reviewing local market conditions and the assessments of similar apartment complexes in the community, it is estimated the proposed project will have a value of \$88,550,025 once complete as outlined in Table One.

Table One
Estimated Project Assessment

Apartment Community	Assessment	Units	Assess/Unit
Timberwood	\$49,934,620	252	\$198,153
Emerson Gardens	\$27,442,100	160	\$171,513
Altaria	\$28,173,415	153	\$184,140
Average	\$105,550,135	565	\$186,814
Proposed	\$88,550,025	474	

Based upon this estimated assessment, as outlined in Table Two, we believe the development will generate \$2,149,995 in annual property tax payments, with \$794,294 being paid in local City property taxes and \$1,243,242 generated in school property taxes. The existing site properties are assessed for \$1,313,300 and generate \$31,887 in total tax payments. With this redevelopment project, site property tax payments will increase by 6,629%.

Table Two
Estimated Property Tax Revenue

Units	Total Value	City Revenue	School Revenue	County Revenue	Total Taxes
474	\$88,550,025	\$794,294	\$1,243,242	\$112,459	\$2,149,995
			Existing Site Assessment	\$1,313,300	\$31,887
			Net New Property Revenue		\$2,118,108

Another source of revenue to the community is from vehicle registrations; Lebanon reported \$2,703,139 in vehicle registrations in FY23. Table Three outlines the projected motor vehicle permit fee revenue stream for the proposed project.

Table Three
Motor Vehicle Permit Fees⁵

541 vehicles ⁶ x \$191	\$103,331
-----------------------------------	-----------

Total estimated project revenues total \$2,253,326 as outlined in Table Four.

Table Five Total Estimated Revenues	
Local Property Taxes	\$2,149,995
Motor Vehicle Fees	\$103,331
Total	\$2,253,326

⁵ Based upon data from the City Clerk, the average cost of vehicle registrations is \$191 on 14,802 vehicle registrations, including processing fees; FY23 revenue totaled \$2,838,194.

⁶ 1 vehicle per studio/one bed, 1.25 per 2/3 bedroom.

C) Impact Fees

The City of Lebanon charges impact fees on new development projects. These Fees are related to school, recreation, police and fire capital projects. As outlined in Table Six, these one-time fees are estimated to total \$1,273,384 and are collected once the units are constructed.

Table Six Estimated Impact Fees		
Building Area	456,410	Fee
School	\$1.45	\$661,795
Recreation	\$0.69	\$314,923
Police	\$0.25	\$114,103
Fire	\$0.40	\$182,564
Total		\$1,273,384

6. Municipal Service Costs

Police & Fire

The Police and Fire Departments are projected to experience some measurable impact from the proposed project. For fiscal year 2024, the Police Department budget was \$7,398,430 and the Fire Department budget \$5,278,980. To assess the degree of impact this Project would have on these departments, emergency calls to similar apartment developments in Lebanon were analyzed. As emergency calls are a reliable metric that provides a more realistic measure of demand for service, we will use this average costing method to allocate costs to the proposed apartment use. Emergency call data was obtained for both police and fire departments and averaged to determine the numbers of annual calls per unit. These ratios were then totaled to derive a total average call volume per unit, which was then used to generate projected emergency calls for each Department as outlined in Table Seven.

Extrapolating from the comparable call data, increases in call volume are projected to the City's Police and Fire Departments. Annual Police calls are projected to increase by 60 calls per year (1.15 week). The Department responds to approximately 27,700 Calls For Service⁷ annually (532 call per week).

Annual Fire Department calls are projected to increase by 59 calls (21 fire/ 38 EMS) per year (1.13 calls per week). In 2023, the Department responded to a total of 4,105 calls in the city, of which 3,088 were EMS related.

⁷ City Manger Updates; January 2024

Table Seven
Average Calls: Police-Fire-EMS

Project	Town	Units	Avg. Police Call Per Year	Avg. Call Per Unit	Projected Calls
Altaria	Lebanon	129	14	0.11	
Emerson Gardens	Lebanon	160	49	0.31	
Timberwood	Lebanon	252	6	0.02	
Totals		541	69	0.13	
Proposed	Brickyard	474			60

Project	Town	Units	Avg. Fire Call Per Year	Avg. Call Per Unit	Projected Calls
Altaria	Lebanon	129	11	0.085	
Emerson Gardens	Lebanon	160	7	0.044	
Timberwood	Lebanon	252	7.1	0.028	
Stone Farms	Lebanon	144	4.6	0.032	
Totals		685	30	0.043	
Proposed	Brickyard	474			21

Project	Town	Units	Avg. EMS Call Per Year	Avg. Call Per Unit	Projected Calls
Altaria	Lebanon	129	5	0.039	
Emerson Gardens	Lebanon	160	28	0.175	
Timberwood	Lebanon	252	7.3	0.029	
Stone Farms	Lebanon	144	3.1	0.022	
Totals		541	43	0.08	
Proposed	Brickyard	474			38

Police Department

The average cost of a police officer in Lebanon, with benefits, ranges from \$110,000 to \$120,000 a year. To assign some cost to the community from the proposed new land use, we have calculated an average cost per call of \$333 and when applied to the estimated 60 calls, as detailed in Table Eight, a cost of \$19,980 is derived.

Table Eight
Police Department Impact

Department	FY 2024 Budget	Yearly Calls ⁸	Cost/call	Est. Calls	Annual Cost
Police	\$7,398,430	22,210	\$333	60	\$19,980

This cost estimate is not inferring the Police Budget will increase as a result of the proposed development but assigns a “cost” to account for this expanded land use in the community.

⁸ Calls discounted by 20% to address minor calls.

Fire Department

As noted above, a projected increase of 59 new calls (21 fire/38 EMS) are anticipated for the Fire Department. The average cost of a fire fighter with benefits is \$110,000. As with the police department, as outlined in Table Eight, we have used cost averaging to estimate a **\$75,874** impact on the Fire Department.

Table Nine
Fire Department Impact

Department	FY 2024 Budget	Yearly Calls	Cost/call	Est. Calls	Annual Cost
Fire	\$5,278,980	4,105	\$1,286	59	\$75,874

It should be noted that the EMS service is a revenue generator for the city and in FY2023 Budget, an estimated \$1,292,000 in revenue is reported. This translates into an average of \$417 in revenue per EMS call ($\$1,292,000 / 3,088$ EMS calls). As such, costs associated with EMS calls to the subject site will be somewhat mitigated by the estimated EMS revenues of **\$15,846** ($\417×38 EMS calls).

For both the police and fire departments, this project, when combined with other proposed and approved developments in the community will increase demands on the departments over time. This impact from this increased demand for services on the Departments will need to be addressed as the city continues to grow.

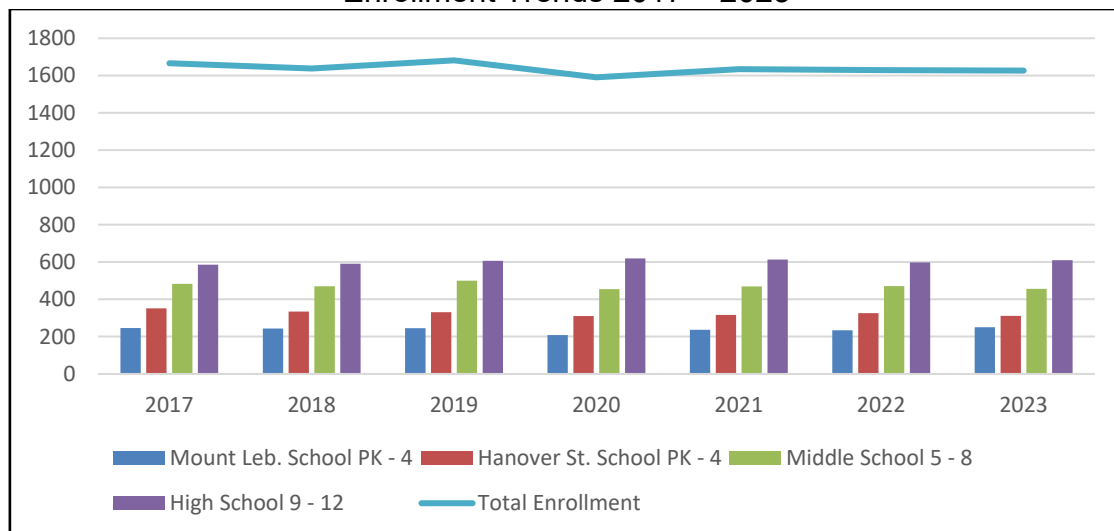
School Department

Table Ten and Figure One outline enrollment trends within the Lebanon School District since 2017. Overall, dramatic changes have not been seen and all schools are well within their building capacity⁹. The Hanover Street Elementary School has seen the largest decline in enrollment of 11.4%, overall school enrollment has declined by 2.3%. The subject site lies across the street from Hanover Street Elementary school and High School.

Table Ten
School Enrollment 2017 - 23

School	2017	2018	2019	2020	2021	2022	2023	% Change	Capacity
Mount Leb. School PK - 4	246	243	245	208	236	234	250	1.63%	310
Hanover St. School PK - 4	351	334	331	310	316	326	311	-11.40%	383
Middle School 5 - 8	483	470	500	454	469	471	456	-5.59%	600
High School 9 - 12	586	591	606	619	613	598	610	4.10%	720
Total Enrollment	1,666	1,638	1,682	1,591	1,634	1,629	1,627	-2.34%	2,013

Figure Four
Enrollment Trends 2017 – 2023



As noted above, the Project will involve the construction of 474 housing units. To estimate the number of School Age Children (SAC) that may reside within the residential community, we relied upon the Impact Fee Update Report prepared

⁹ City of Lebanon Impact Fee Update 2021, BCM Planning, LLC.

by BCM Planning¹⁰ for the City. Based upon SAC ratios calculated per 1,000 square feet of living area for non-single family housing units¹¹, an estimated 55 SAC may reside with the proposed complex as summarized in Table Eleven.

Table Eleven
Estimated School Age Children

	Units	Total Sq. Ft. ¹²	Enrollment Per 1,000 Sq. Ft.	SAC
Total	474	456,410	0.12	55

Using these same SAC ratios, the anticipated grade breakdown of these 55 students is outlined in Table Twelve, with 24 elementary students anticipated, 18 middle school and 13 high school.

Table Twelve
Estimated Enrollment Breakdown

Grade	Lvg. Area	Ratio	SAC
Elementary	456,410	0.05	24
Middle	456,410	0.04	18 (17.8)
High School	456,410	0.03	13 (12.7)
Total SAC			55

To understand the current state of Lebanon schools, we discussed the project with School Superintendent Allen and Business Administrator Tim Ball. The Superintendent noted that the average cost of a teacher, with benefits, is estimated to be approximately \$120,000 annually. The Superintendent did not believe the increased student population would impact class sizes or raise capacity concerns. The proximity of the site to both the elementary and high school was noted as very convenient and no bussing impacts are anticipated. Additionally staffing may be needed depending on the number of children added to a specific grade; the Superintendent suggested the Report account for the potential need for two teachers. Approximately 18% of the student population receives some form of special educational services at an average cost of \$38,000. Applying this percentage to the estimated 55 School Age Children,

¹⁰ City of Lebanon Impact Fee Update 2021, August 20, 2021, BCM Planning, LLC.

¹¹ One of the housing units will be single family, approximately 2,000 square feet, and based upon the Impact Fee SAC ratio, would generate .336 SAC. Given this minor finding, the homes square footage was added into the multi-family square footage.

¹² Housing unit living area total.

equates to 10 SAC potentially requiring SPED assistance with a potential cost of \$380,000. With these two noted costs, totaling \$620,000, the Superintendent believed potential new school costs will be reported within this Report.

The New Hampshire Department of Education distributes Adequacy Aid to communities, along with other qualified funding programs. For FY2025, it is estimated that Lebanon will receive \$7,212,696 in Aid¹³ through this program. Aid is distributed based upon a community's Average Daily Membership (ADM) and Base Aid totals \$4,182 per student. If the enrollment estimate of 55 students is assumed, **\$230,000 in Aid funds** would be received. Other qualified Aid includes Free/reduced Differentiated Aid; \$2,346 per student, Special Education Aid; \$2,142 per student, and English Language Aid; \$816 per student.

Other Departments

As noted previously, all areas within the development will be private (maintenance & refuse) and water/sewer expenses will be addressed through connection and user fees. Any costs to the Building Department will be offset by the payment of thousands of dollars in building permit fees. No other measurable impacts are anticipated to other City departments. To be conservative, we will account for \$120 per unit, or **\$56,760** potential miscellaneous City related costs¹⁴.

County Impacts

As noted in Table One, we are estimating \$112,211 in County property tax revenue from this project. Grafton County oversees a number of services for the region including nursing homes, sheriff's department, and the court system. Estimating new costs that may impact County services, with any confidence, would be extremely challenging and unreliable, therefore an estimated cost impact was not calculated in this analysis.

¹³ NHDOE, FY2025 Estimate, November 15, 2023.

¹⁴ Estimated \$120 per unit, covering potential costs to libraries, humane services, community services.

Summary

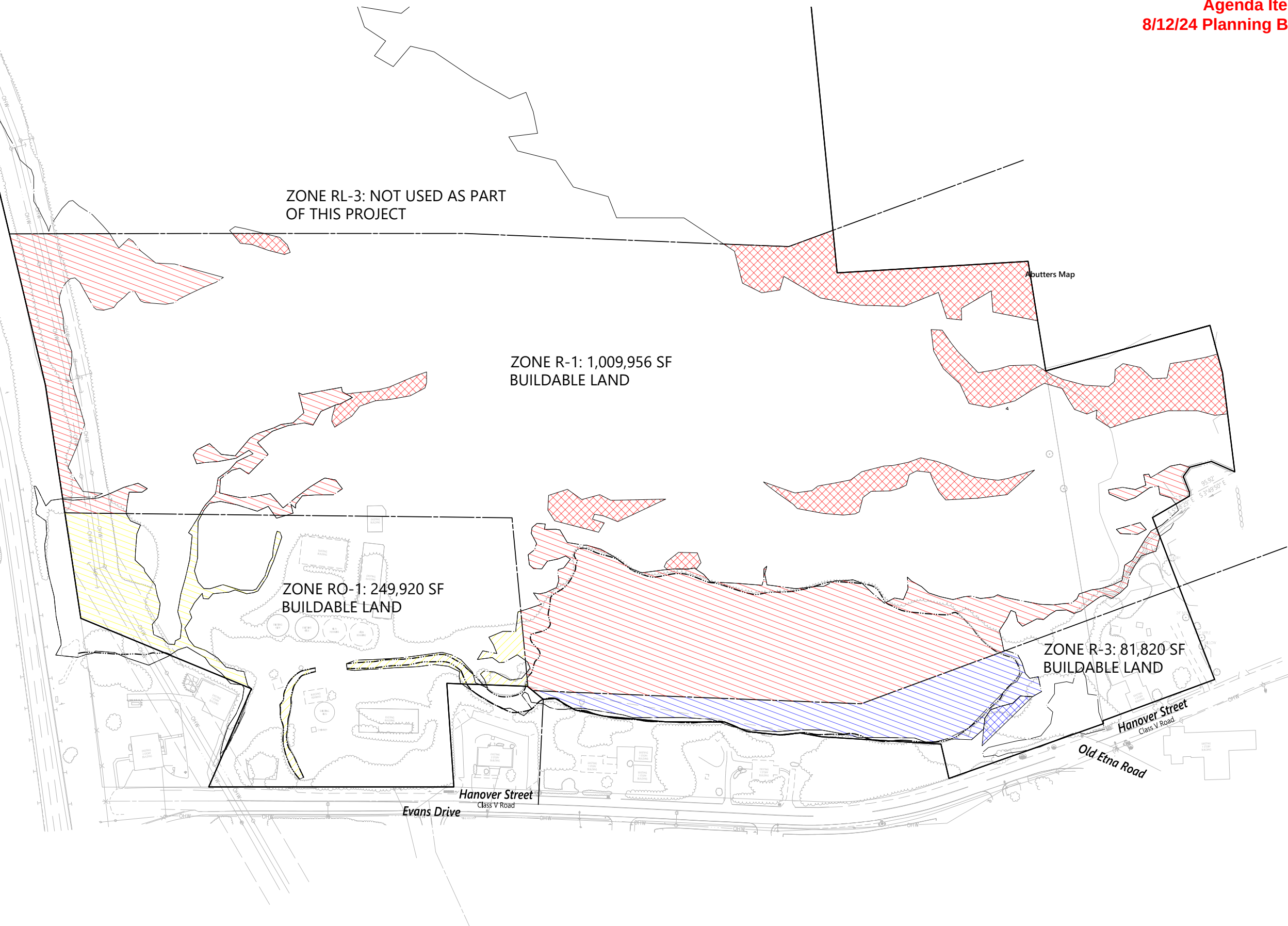
Table Thirteen
Fiscal Findings

Gross Local Property Taxes & Revenue	\$2,253,326
Municipal Costs	
Police	-\$19,980
Fire	-\$75,874
Schools	-\$620,000
Misl.	-\$56,760
Total Estimated Costs	-\$772,614
Net Negative Fiscal Impact	+\$1,480,712

Based upon the report's findings, gross yearly local property taxes and revenues generated by the proposed project are estimated to total \$2,253,326. The anticipated fiscal impact to the city is estimated to be \$772,614, resulting with a positive fiscal impact from the proposed development of approximately \$1,480,712. All anticipated costs are estimates and no definitive costs are reported.

Key findings supporting this conclusion include:

- Calls to the Police Department are projected to increase by less than 1%, with an estimated 60 calls generated from the site annually.
- Calls to the Fire Department will realize less than a 1% increase in call volume, with an estimated 21 fire calls and 38 EMS calls annually. EMS revenue is estimated to total \$15,824 annually.
- An estimated 55 school age children may reside within the residential community, per student State Aid totals \$4,182 for FY2025. Hanover Elementary school enrollment has declined by 40 students over the last six years.
- The proposed project will include private drives and trash collection.
- \$1,273,384 in impact fee payments will be made for fire, police, schools and recreation capital facilities.
- Full time jobs will be created managing the new apartment complex along with temporary construction jobs, infusing millions of dollars into the local economy.



PURD Density Figure

Lebanon Brickyard Development

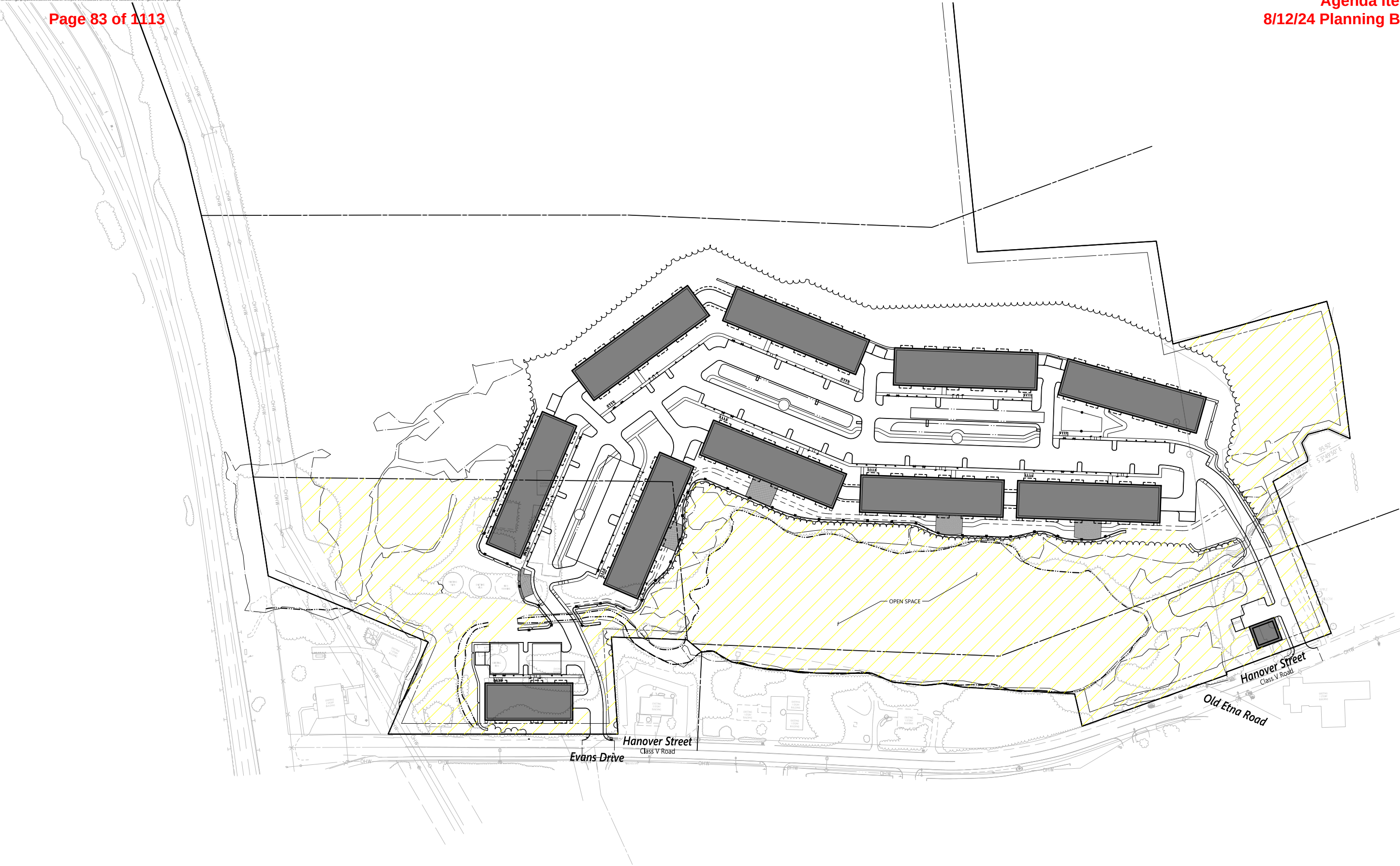
Lebanon, NH

Source: VHB
Prepared for: Planning Board Meeting
Date: May 2024

Legend

- WETLANDS AREA
- STEEP SLOPES AREA





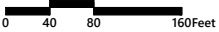
PURD Open Space Figure

Lebanon Brickyard Development

Lebanon, NH

Source: VHB
Prepared for: Planning Board Meeting
Date: May 2024

Open Space Calculations			
Zone	Total Area (SF)	% Required	Open Space Required
RESIDENTIAL 1 (R-1)	1,252,605	30	375,782 SF
RESIDENTIAL-OFFICE-1 (R-O-1)	286,532	30	85,960 SF
RESIDENTIAL 3 (R-3)	123,849	50	61,925 SF
TOTAL OPEN SPACE REQUIRED			523,666 SF
TOTAL OPEN SPACE PROVIDED			523,666 SF





Planned Unit Residential Development Calculations

Project Brickyard Planned Unit Residential Development
Hanover Street, Lebanon, NH
Calculated by TMD
Checked by

Project # 52933.00
Date 5/10/2024
Date 5/10/2024

Buildable Area Calculations

Zoning District	Total Area On-Site (SF)		Steep Slopes Area (SF)	Combined Wetlands and Steep Slopes Area (SF)		% Coverage	% to be Subtracted	Wetlands/Steep Slopes Deduction Area (SF)		10% Road/Street Reduction
	Site (SF)	Wetlands Area (SF)		Slopes Area (SF)				Gross Buildable Area (SF)		
R3	123,849	52,370	2,527	54,897	44.3%	60%	32,938	90,911		81,820
R1	1,252,605	221,288	104,790	326,078	26.0%	40%	130,431	1,122,174		1,009,956
RO1	286,532	50,290	0	44,218	15.4%	20%	8,844	277,688		249,920
	1,662,986									

Maximum Dwelling Unit Quantity Calculations

Buildable Area PURD Formula Method (SF)	Zone	Density (SF required for first two Units)		Permitted Dwelling Units
			Density (Units per SF)	
81,820	R3	N/A	10,000	8
1,009,956	R1	20,000	3,000	332
249,920	RO1	0	3,000	83
Subtotal Number of Units				423.5
12% bonus				50.8
Total Number of Units				474.3

Open Space Requirement Calculation

Zoning District	Total Area On-Site (SF)	Open Space Requirement	Required Open Space (SF)
R3	123,849	50%	61,925
R1	1,252,605	30%	375,782
RO1	286,532	30%	85,960
		Total	523,666

Assumptions:

Delineated wetlands were used wherever possible
Used LebGIS for steep slope delineation
Used LebGIS for wetlands outside of field delineation and survey scope
Wetlands and steep slopes could not overlap



July 2, 2024

Ref: 52933.00

Mr. Nathan Reichert
Planning and Development Director
51 North Park Street
City Hall, 5th Floor
Lebanon, NH 03766

Re: Proposed Multi-Family Development
Completeness Review Items Response

Dear Mr. Reichert:

On behalf of Brickyard One Nominee Trust (the "Applicant"), VHB is pleased to provide the following responses to the site plan application's completeness review for the proposed multi-family development (the "Brickyard"). This letter is in response to the email sent by Tim Corwin from the City of Lebanon on June 28, 2024.

For ease of reference, VHB has provided a copy of each comment in *italics* followed by responses in plain text.

These responses have been prepared by the project team, including:

- Brickyard One Nominee Trust – Applicant
- VHB – Land Surveyor, Site Civil Engineer, Traffic Engineer, and Landscape Architect

Completeness comments per Section 4.7 A.2

1. *Address Bldg 1, 2, and 6 building height issue (45 ft is the max in the R-O-1) (comment originally provided via e-mail sent 6/24).*

VHB Response: The building heights have been addressed and updated elevation views are submitted as part of this package.

2. *Include an open space plan with the plan clearly delineating the open space.*

VHB Response: An Open Space Plan has been provided. Please see Sheet C1.2 of the Site Plans.

3. *Need to submit a Conditional Use Permit support statement for the PURD.*

VHB Response: A Conditional Use Permit Support Statement for the PURD has been submitted as part of this package.

4. *Need narrative responding to the PUD criteria set forth in Section 501.1 of the Zoning Ordinance and the PURD criteria set forth in Section 501.2.*

VHB Response: A narrative responding to the PUD criteria has been submitted as part of this package. Please see the document titled "PUD & PURD Narrative".

Mr. Nathan Reichert
Ref: 52933.00
July 2, 2024
Page 2



5. *55 ft. building heights require a CUP per Section 308.4-provide a Conditional Use Support Statement*

VHB Response: A Conditional Use Permit Support Statement for the 55' building heights has been submitted as part of this package.

6. *EV parking:*

- a. *Required EV-READY SPACES is 156 (not 117)*
- b. *Minimum number of EV-CAPABLE SPACES is 507 (currently none are provided)*

VHB Response: The Parking Tables have been updated on the Cover Sheet of the Site Plans to provide the required EV parking calculations. The Site Plans C2.1 through C2.3 note the type of EV parking space as EV, EV-Ready or EV-Capable. The Legend on C1.1 has been updated to include the acronyms shown on the parking stalls. The acronyms are graphical only and will not be painted on the spaces.

7. *The following information required by Section 5.1.E of the Site Plan Review Regulations is missing or incomplete (see bolded text):*

4. *The following information shall be provided on the first page (or cover page, if applicable) of the Site Plan:*

- e. *The following basic site information in TABLE FORM:*
 - (4) *Gross floor area of existing and proposed buildings/additions;*
 - (8) *Height of existing and proposed buildings/additions;*
 - (9) *Number of stories and gross square footage of each;*
 - (10) *Proposed use;*

VHB Response: The requested information has been added to a table on the Cover Sheet of the Site Plans under the Site Information table.

8. *The location of existing natural features such as streams, marshes, lakes, ponds, wetlands, rock outcrops, or wooded areas, and existing man-made features such as roads and structures. The plan shall indicate those natural and man-made features that are to be removed, retained, or altered. Wetlands on the property shall be delineated by a NH Certified Wetlands Scientist, whose seal and signature shall appear on the plan.... STAFF NOTE: Indicate natural and man-made features to be removed, retained or altered on the existing conditions plan....*

VHB Response: Consistent with prior Planning Department discussion, the demolition notes on sheet C1.1 of the Site Plans cover this scope. However, VHB has added additional labels to clarify items to remain or be removed on the Site and will continue to coordinate with the Planning Department and other groups to clarify as needed through additional plan refinements as the Project advances through the permitting process.

Mr. Nathan Reichert
Ref: 52933.00
July 2, 2024
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9. *The Zoning District, Tax Map and Lot number, and use of abutting properties within 200 feet of the site boundary; the locations of streets, pedestrian paths/trails, and bicycle routes within 200 feet of the site boundary; and the location of curb cuts and vehicle accesses within 200 feet of the site boundary.*

VHB Response: Please see Sheet C1.2 for a larger abutter map and zoning plan. This plan also notes the locations of the pedestrian paths/trails, biking trails, and nearby bus stop in relation to the development site.

13. *Manufacturer's specification information shall be provided for each proposed light fixture and lamp.*

AND

The plan shall also include drawings of all relevant building elevations, showing the location and height of all building-mounted fixtures[.]

STAFF NOTE: Need an architectural elevation of the maintenance building

VHB Response: The lighting manufacturer's specification information has been provided for each currently proposed light fixture located on the Site and on the buildings. VHB has coordinated with the Planning Department on providing the Maintenance Building elevation views at a later date. The building will not exceed 35' in height as required by the Zoning Ordinance. A waiver request has been submitted as part of this package for relief from the requirement until it is provided.

14. *A plan for the location of free-standing or building-mounted signs, including the location, mounting, aiming, and shielding of any remote light fixtures for externally-lit signs. For internally-lit signs, relevant information concerning the method of illumination and the opacity of the sign background shall be provided, showing that the proposed installation conforms to the requirements of these Regulations.*

VHB Response: No signs are currently proposed at the entrances to the development, so this comment no longer applies. The Applicant will provide the requisite information if a sign is proposed later.

20. *A plan for the development showing provisions for automobile, transit, bicyclist, and pedestrian access and circulation. Such plan shall show both existing and proposed means of access to the site including connections with, public streets, sidewalks, transit stops, and formal paths/trails. Plans shall include any traffic calming and traffic control devices necessary in conjunction with the site development, as well as the location of all existing transit routes and transit stops located or passing within 1/4 mile (1,320 feet) of the property.*

VHB Response: A plan for the development showing provisions for different transportation and pedestrian access and circulation has been added as Sheet C1.3. Existing and proposed means of access to the Site have also been added. The plan includes the location of all existing transit routes and transit stops located or passing within ¼ mile of the property, the pedestrian path to the right-of-way, and the location of trails within 200' of the Site.

Mr. Nathan Reichert
Ref: 52933.00
July 2, 2024
Page 4



We hope that the responses provided herein are satisfactory. We are available to discuss further if helpful.

Sincerely,
VHB

A handwritten signature in blue ink, appearing to read "DF", followed by a long horizontal line.

David Fenstermacher, PE
Director of Land Development



August 7, 2024

Ref: 52933.00

Mr. Nathan Reichert
Planning and Development Director
51 North Park Street
City Hall, 5th Floor
Lebanon, NH 03766

Re: Proposed Multi-Family PURD Development
174 Hanover Street
Response to Comments Received 6/3/2024 – 7/1/2024

Dear Mr. Reichert:

On behalf of Brickyard One Nominee Trust (the "Applicant"), VHB is pleased to provide the following responses to the site plan application for the proposed multi-family Planned Unit Residential Development (PURD) (the "Project"). This letter addresses comments received between June 3, 2024 and July 1, 2024. Application completeness comments, traffic study comments, and abutter comments are addresses under separate cover.

For ease of reference, VHB has provided a copy of each comment in italics followed by responses in plain text. Responses have been prepared by the project team, including:

- › Brickyard One Nominee Trust – Applicant
- › VHB – Land Surveyor, Site Civil Engineer, Traffic Engineer, Landscape Architect, & Cultural Resource Consultant
- › Studio Integrate – Architect
- › Apex Lighting Solutions – Lighting Consultant

Email from Tim Corwin, Deputy Planning and Development Director (6/3/2024)

Comment 1. *"You'll need to submit a Conditional Use Permit support statement for the PURD."*

Response: CUP Statement of Support was submitted with Final Completeness Update Package.

Comment 2. *"I don't see a narrative responding to the PUD criteria set forth in Section 501.1 of the Zoning Ordinance and the PURD criteria set forth in Section 501.2. That will need to be provided as a matter of completeness."*

Response: PUD & PURD Narrative was submitted with Final Completeness Update Package.

Mr. Nathan Reichert
Ref: 52933.00
August 7, 2024
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Comment 3. *"Is it your intent to keep the lots as is? i.e. you're not proposing to merge the lots and/or any lot line adjustments?"*

Response: See sheet C2.0-C2.3 for information regarding the future merger of lots 48-01, 48-02, 48-04, and 63-01.

Comment 4. *"In order to verify the project's compliance with the Zoning Ordinance, we need an exhibit very clearly showing:"*

Comment 4a. *"the lot lines (or proposed lot lines if you're proposing any mergers and/or lot line adjustments);"*

Response: See sheet C1.1 for figure showing the four lots that will be merged. See sheet C2.0-C2.3 for information regarding the future merger of lots 48-01, 48-02, 48-04, and 63-01.

Comment 4b. *"the zoning district boundaries;"*

Response: See sheet C1.1.

Comment 4c. *"the proposed improvements and where those improvements will be located in relationship to the lot lines and zoning boundaries; and"*

Response: See sheet C1.1.

Comment 4d. *"the proposed open space in where the open space will be located in relationship to the lot lines and zoning boundaries."*

Response: See sheet C1.2.

Email from Tim Corwin, Draft PLN Comments - Part 1 (6/14/2024)

Comment 1. *"Plan sheets are very difficult to read. Please provide a site plan sheet or sheets that depict only proposed above-ground conditions. Please see attached example."*

Response: The existing conditions baseplan on sheets C2.0-C2.3 has been removed within the limit of work to improve readability.

Comment 2. *"Open space calculations ok"*

Response: Acknowledged. Calculations are provided on sheet C1.2 of the site plans.

Comment 2a. *"Pond cannot be included as part of minimum required open space (ponds not identified as a site resource in section 501.1.E of the ZO), although we encourage it be included within the overall protected open space."*

Response: The pond has been removed from the open space calculations provided on sheet C1.2 of the site plans.

Mr. Nathan Reichert
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Comment 2b. *"Open space as currently configured does not appear to meet design requirements of Section 501 of the ZO."*

Response: The proposed open space has been reconfigured based on direction provided by City of Lebanon Planning staff. The Project still proposes to provide the required amount of open space area. See sheet C1.2.

Comment 2c. *"Include an open space plan with the plan clearly delineating the open space (the OS plan will be recorded)."*

Response: See sheet C1.2.

Comment 2d. *"Identify how the open space will be owned, managed, and protected per the requirements of Section 501 of the ZO."*

Response: The Applicant is considering the alternatives listed in Zoning Ordinance section 501.1.F.5. through 501.1.F.7. and will identify the ownership, management, and protection approach on the final version of the Open Space Plan.

Comment 2d.1. *"Provide draft documentation as may be required by Section 501 of the ZO"*

Response: Upon City acceptance of the proposed open space calculations and boundaries, draft documentation will be prepared as may be required by section 501.1.F.5. through 501.1.F.7. and will be provided for City review.

Comment 2e. *"Note that the minimum required open space must be made available for public use."*

Response: The Applicant is considering means and locations in which to implement public access in a way that does not impact development security or resident experience.

Comment 3. *"Density calculations need correction (please review your calculations – I can provide more detail if needed), but staff agrees the permitted density is 424 with 474 if the Planning Board approves the 12% bonus request."*

Response: The project narrative has been updated to more clearly identify the request for the Planning Board to approve the 12% density bonus, which as the comment states, is included in the submitted density calculations. The Applicant and the City are in agreement that 474 units is the maximum number of units provided the Planning Board approves the 12% bonus request.

Comment 3a. *"Project narrative should more clearly identify that the applicant is requesting the 12% density bonus per Section 507.2.A for a 12% density bonus."*

Response: The project narrative has been updated to more clearly identify the request for the Planning Board to approve the 12% density bonus.

Comment 4. *"Need to submit a Conditional Use Permit support statement for the PURD."*

Response: CUP Statement of Support - PURD was submitted with the Final Completeness Update Package.

Mr. Nathan Reichert
Ref: 52933.00
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Comment 5. *"need narrative responding to the PUD criteria set forth in Section 501.1 of the Zoning Ordinance and the PURD criteria set forth in Section 501.2. That will need to be provided as a matter of completeness."*

Response: This is discussed in the PUD & PURD Narrative submitted as part of the Final Completeness Update Package.

Comment 6. *"Test pit waiver – staff still evaluating our position."*

Response: A test pit waiver has been requested.

Comment 7. *"The drive aisle will need to be given its own name which will require City Council approval as a condition of site plan approval. Please provide three suggested names in order of preference so that we can pre-approve the name."*

Response: (1) Brickyard Lane; (2) Red Brick Way; or (3) Densmore Lane

Comment 8. *"Building Elevations:"*

Comment 8a. *"Show height of towers/shafts."*

Response: See updated architectural elevations.

Comment 8b. *"Buildings 2-5: identify height on lake elevations."*

Response: See updated architectural elevations.

Comment 8c. *"Providing elevations of maintenance building."*

Response: See updated architectural elevations.

Comment 8d. *"Garage floor plans should identify use of floor drains and oil/grit separators."*

Response: See updated architectural elevations.

Comment 9. *"55 ft. building heights require a CUP per Section 308.4 – identify need for CUP on cover sheet, in the narrative, and provide a Conditional Use Support Statement."*

Response: A CUP Statement of Support for 55' building height was submitted as part of the Final Completeness Update Package.

Comment 10. *"BUILDING 1: front setback provided is 26; however, setback of 40 ft is required per Section 308.4 of the ZO (or the height of the building must be reduced to 45 ft)."*

Response: Building 1 height was reduced to 45'.

Comment 11. *"COVER SHEET (or other sheet):"*

Comment 11a. *"Cover sheet contains many errors, inconsistencies, typos etc. – as partially reviewed with Richard and Tom in person – please review and correct/update."*

Response: See updated Cover Sheet.

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Comment 11b. *"In connection with the PURD Calculations table, add a note specifically referencing the PURD Density Figure and PURD Calculations exhibit and indicating that density calculations are more fully set forth on those exhibits"*

Response: See updated Cover Sheet.

Comment 11c. *"For each of the 11 buildings: provide total gross floor area in total and per floor/story, number of floors/stories, # of units, unit mix (e.g. 3 bedrooms?), building height, number of garage parking spaces, number of long term bike storage spaces...."*

Response: All of these numbers are provided in plans between the Cover Sheet and the Layout and Materials plans. The unit mix is still being considered within each building but will contain a mixture of 1, 2 and 3 bedroom units with priority given to 3 bedroom units.

Comment 11d. *"Identify parking spaces needed for maintenance building and add to total number of required minimum parking spaces."*

Response: The site design currently exceeds the zoning required parking quantity by 68 spaces. As the interior layout and garage parking spaces within the maintenance building is developed by the Architect, the parking quantity at that specific building will be further evaluated and adjusted as necessary.

Comment 11e. *"Add note that the lots will be voluntarily merged."*

Response: A note has been added to the overall site plan.

Comment 12. *"Bike Storage:"*

Comment 12a. *"Identify long term bike storage on garage floor plans."*

Response: Acknowledged, see architectural sheets.

Comment 12a.1. *"What's the zig-zag line that appears in the bike storage areas?"*

Response: The short-term bike storage areas on-site consist of a concrete pad with metal pipe to secure bikes to. A detail was added to the site plans. Long-term bike storage is provided in the parking level of each apartment building. The referenced 'zig-zag line' no longer appears on the plan.

Comment 12b. *"Provide details of short and long-term bike storage sufficient to demonstrate compliance with design requirements of Appendix A of the SPR."*

Response: The short-term bike storage areas on-site consist of a concrete pad with metal pipe to secure bikes to. A detail was added to the site plans, see sheet C7.2. Long-term bike storage is provided in the parking level of each apartment building and will be detailed by the architect as the design of the buildings progresses.

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Comment 13. *"EV Parking:"*

Comment 13a. *"Required EV-READY SPACES is 156 (not 117)."*

Response: See updated Cover Sheet.

Comment 13b. *"Minimum number of EV-CAPABLE SPACES is 507 (currently none are provided)."*

Response: The site plans have been updated to provide the required number of EV-capable parking spaces. See updated Cover Sheet and Layout and Materials Plans.

Comment 14. *"Plan set comments:"*

Comment 14a. *"Remove all lot lines that will be eliminated with voluntary lot merger except on survey and existing conditions sheets."*

Response: The existing interior lot lines that will ultimately be removed during the future lot merger are specified on the site plans. To facilitate the lot merger, a lot consolidation plan will be prepared at a later date and recorded with the Grafton County Registry of Deeds.

Comment 14b. *"Clearly delineate the PURD portion of the lot somewhere in the plan set..."*

Response: Limit of PURD was added to the Abutter and Zoning Plan.

Comment 14c. *"Phasing plan needs more detail as required per 4.9.C of the Site Plan review regs"*

Response: Phasing plan has been updated to provide more detail.

Comment 15. *"For 8 x 18 garage parking spaces, address the criteria in Section 6.5.E.5 or provide a waiver request (note: staff still evaluating our position on this proposal)"*

Response: It is VHB's understanding that the reviewing engineer can approve alternate parking designs. As such, it is not expected that a waiver is necessary, unless the reviewing engineer takes exception to the proposed parking space dimensions. As requested by City of Lebanon staff, the reduction in parking stall width is addressed in the project narrative, depicted on the architectural plans, and noted as an alternative parking design in the Parking Summary Chart on the site plans Cover Sheet.

Comment 16. *"Staff will likely recommend that the Board obtain a peer review of the traffic study (the cost of which the applicant will be responsible for)"*

Response: Traffic peer review comments were provided to VHB on August 1, 2024 and responses are included in a separate memorandum as part of the overall initial response to comments package.

Comment 17. *"The application will need to be renoticed to identify the request for a Conditional Use Permit for a PURD and the building height."*

Response: Acknowledged.

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Comment 18. *"Water lines and hydrants to be owned by the City – provide plan notes re: same and include easement plan in plan set."*

Response: Plan notes have been to sheet C4.0. The easement boundaries will be provided for city review following coordination of building plumbing design and final design acceptance from the Lebanon Fire Department.

Comment 18a. *"Council approval and conveyance of water infrastructure will be required as a condition of site plan approval."*

Response: Acknowledged.

Email from Tim Corwin, Draft PLN Comments - Part 2 (6/18/2024)

Comment 1. *"Project narrative:"*

Comment 1a. *"A trail system is present north and northwest of the Site." Show on plan set*

Response: Trails proximate to the Site are shown on sheet C1.3.

Comment 1b. *"Additionally, Advance Transit's Heater Landing bus stop is currently only 0.2 miles from the Site, however with the additional ridership resulting from this project, there is potential to coordinate future stops. What is meant by this?"*

Response: The Applicant will coordinate with Advanced Transit and City staff to determine whether a new transit stop location is warranted based on the Project's presumed increase in ridership demand.

Comment 1c. *"The Project intends to activate the area along the banks of Densmore Pond and overlooking the brick kilns as resident amenities and a tribute to the Site's legacy. How?"*

Response: The amenity spaces are placed strategically throughout the site to view these areas. The walking path overlooking Densmore pond is elevated along the retaining wall, and amenity space is proposed atop the retaining wall overlooking the kilns. Signage noting the historical significance of the kilns viewable from the amenity space may be provided.

Comment 1d. *"Due to the target bedroom mix" – identify the bedroom mix"*

Response: The buildings will contain a mixture of studio, 1, 2, and 3 bedroom units with priority given to 3 bedroom units.

Comment 1e. *"The resultant cumulative proposed wetland impacts are less than 3,000 SF and as such the Project is expected to require a minimal impact permit from the NHDES Wetlands Bureau" – clearly identify the impacted."*

Response: Wetland impacts have been added to sheet C3.0.

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Comment 1f. *"Project impact statement 1: response provided is not fully responsive (e.g., no discussion of air quality is included, etc.)"*

Response: The Project Impact Statement has been updated.

Comment 1g. *"Project impact statement 7: response only refers to AOT and stormwater management plan; consequently response provided is not fully responsive."*

Response: The Project Impact Statement has been updated.

Comment 2. *"PURD density figure: wetlands area striping in legend is backwards."*

Response: The PURD Density Figure has been updated.

Comment 3. *"PURD calculations exhibit: under max DU quantity calcs, for density (SF required for first two units) change 20,000 for R1 to 10,000 and change 0 for RO1 to 10,000."*

Response: The PURD supporting calculations have been updated and are attached to the updated project description and impact statement.

The following information required by Section 5.1.E of the Site Plan Review Regulations is missing or incomplete (see bolded text):

Comment 4. *"The following information shall be provided on the first page (or cover page, if applicable) of the Site Plan:"*

Comment 4a. *"(4) Gross floor area of existing and proposed buildings/ additions;"*

Response: See Cover sheet.

Comment 4b. *"(8) Height of existing and proposed buildings/additions;"*

Response: See Cover sheet.

Comment 4c. *"(9) Number of stories and gross square footage of each;"*

Response: See Cover sheet.

Comment 4d. *"(10) Proposed use;"*

Response: See Cover sheet.

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- Comment 5.** *"A current survey certified by a land surveyor licensed in New Hampshire, depicting the perimeter boundaries of the lot(s) of the proposed site, including compass bearings, distances, and lot areas, and depicting the location of any existing improvements on the property and the width and location of any rights-of-way and/or easements on the property."*

Existing improvements (e.g., kilns) are either missing or obscured by text

Response: Existing kilns and other existing features are shown in greater detail and with more clarity on sheets SV-2 and SV-3 than SV-1. Plan readability has been improved to the extent practicable.

- Comment 6.** *"The location of existing natural features such as streams, marshes, lakes, ponds, wetlands, rock outcrops, or wooded areas, and existing man-made features such as roads and structures. The plan shall indicate those natural and man-made features that are to be removed, retained, or altered. Wetlands on the property shall be delineated by a NH Certified Wetlands Scientist, whose seal and signature shall appear on the plan. In addition, documentation in the form of the U.S. Army Corps of Engineers New England District Wetlands Delineation Data Sheets and/or other field notes and materials concerning the delineation shall be submitted to the Planning and Development Department."*

Indicated natural and man-made features to be removed, retained or altered on the existing conditions plan.

Response: Sheet C1.0 (Legend and General Notes) and the Layout and Materials Plans indicate site features to be removed, retained, or altered. The existing conditions plans are focused on existing conditions only, and as such information related to the proposed condition is not included on the existing conditions plans.

- Comment 7.** *"The Zoning District, Tax Map and Lot number, and use of abutting properties within 200 feet of the site boundary; the locations of streets, pedestrian paths/trails, and bicycle routes within 200 feet of the site boundary; and the location of curb cuts and vehicle accesses within 200 feet of the site boundary."*

Response: Refer to the Abutter and Zoning Plan and Layout and Materials Plans for this information.

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- Comment 8.** *"A plan for outdoor lighting showing the proposed location mounting height, fixture type, lamp type, color correlated temperature (CCT), and wattage of all exterior free-standing or building-mounted light fixtures, as well as analyses and illuminance-level diagrams, to include average and minimum foot-candle measurements, showing that the proposed installation conforms to the lighting level standards in these Regulations. Manufacturer's specification information shall be provided for each proposed light fixture and lamp. The plan shall also include drawings of all relevant building elevations, showing the location and height of all building-mounted fixtures, the portions of any walls or architectural features to be illuminated, the illumination levels of the walls or architectural features, and the aiming points for any remote light fixtures."*

Regarding the latter sentence, an elevation of the maintenance building hasn't been provided.

Response: See updated architectural sheets for the maintenance building elevation.

- Comment 9.** *"A plan for the location of free-standing or building-mounted signs, including the location, mounting, aiming, and shielding of any remote light fixtures for externally-lit signs. For internally-lit signs, relevant information concerning the method of illumination and the opacity of the sign background shall be provided, showing that the proposed installation conforms to the requirements of these Regulations."*

Response: The development does not currently include any illuminated signs.

- Comment 10.** *"The location and boundaries of any Overlay Districts established pursuant to Article IV of the Zoning Ordinance (including but not limited to the Wetlands Conservation District, Riverbank Protection District, Steep Slopes District, and Floodplain District) and, if applicable, protected shorelands pursuant to the Shoreland Water Quality Protection Act (NH RSA 483-B). For properties located within the Floodplain District, the 100-year flood elevation, floodway, shoreland protection zone, and flood plain limits shall be identified."*

It is very difficult to discern the wetland district and floodplain district boundaries.

Response: The FEMA floodplain has been added to the site plans.

- Comment 11.** *"A plan for the development showing provisions for automobile, transit, bicyclist, and pedestrian access and circulation. Such plan shall show both existing and proposed means of access to the site including connections with, public streets, sidewalks, transit stops, and formal paths/trails. Plans shall include any traffic calming and traffic control devices necessary in conjunction with the site development, as well as the location of all existing transit routes and transit stops located or passing within 1/4 mile (1,320 feet) of the property."*

Response: This information is depicted on sheet C1.3.

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Comment 12. *"Depict any current and proposed easements, rights-of-way, and deed restrictions including those related to sewer, electrical utility, shared access, etc."*

Easement will be needed to access water infrastructure.

Response: Proposed easement information is described on sheet C4.0. Easement boundaries will be depicted once water infrastructure design is finalized and accepted by the City of Lebanon.

Comment 13. *"The plan set does not satisfy the following design requirements of Section 6.2 of the Site Plan Review Regulations (see bolded text):"*

Perimeter Landscaping

Comment 13a. *"The perimeter landscaped area shall be planted with intermittent vegetation from the ground level to at least 30 feet in height at maturity, and shall be planted at a minimum with one (1) shade tree plus a mix of shrubs and understory trees totaling at least 5 plants for each 600 square feet, unless the Planning Board determines that a semi-opaque or an opaque buffer is required."*

Response: The Landscape Plans have been updated to provide the relevant plantings and refine the shade calculations.

Comment 13b. *"Within the landscaped areas, the Applicant shall propose a mix of shade trees, understory trees, shrubs, well-kept grassed areas, and ground cover that is appropriate for the site, its environment, and its surroundings."*

Response: Confirmed.

Comment 13c. *"semi-opaque buffer required along the northern boundary of the site and the abutting single-family dwelling use – see 6.2.B.7.b below"*

Response: Additional plantings were added along the northern boundary.

Comment 13d. *"Buffers and screens shall be either opaque or semi-opaque, as determined by the Planning Board, based on the width of the landscaped area and the extent of negative impact of the use or facility being screened or buffered."*

Response: Confirmed.

Comment 13e. *"The semi-opaque buffer is opaque from ground level to 3 feet in height, with intermittent vegetation from 3 feet to at least 30 feet in height. It shall be planted at a minimum of one (1) shade tree and one (1) understory tree per 300 square feet, with as many shrubs as necessary to partially block visual contact from ground level to 3 feet in height."*

Response: Confirmed.

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Comment 13f. *"Screens at least 5 feet in width shall be provided for service areas and facilities (such as garbage and waste disposal containers, recycling bins, and loading areas; outside storage areas; and electrical and mechanical equipment, such as transformers and compressors), or for any other similar facilities or areas required by the Planning Board. Screens may be incorporated within any of the minimum landscaped areas required herein."*

Response: Additional planting areas have been added to the landscape design for further screening.

Comment 13g. *"Trees spaced no greater than 40 feet on center shall be provided along all street frontages in order to create a definition of the street with regularly spaced shade trees appropriate to the neighborhood. These trees may be counted toward the amount of planting required in the perimeter landscaped area."*

Response: Additional trees and shrubs have been added to the landscape design along Hanover Street.

Landscaping around Buildings

Comment 13h. *"Landscaping around buildings shall be provided to a minimum width of 10 feet and planted with trees, shrubs, and ground cover appropriate to the architecture in order to buffer parking areas, define entrances, provide foundation planting, and soften large expanses of walls or long roof lines."*

Response: Additional planting areas have been added around buildings. 10 foot wide plant beds have been provided to the maximum extent practicable but is not possible in all areas. Planting beds varying in width will create a more appealing and natural looking design.

Landscaping of Parking Areas

Comment 13i. *"Those areas containing one or two rows of parking spaces shall be planted with deciduous trees along the perimeter, so placed to shade 30% of the total parking area, and supplemented with shrubs, perennials, or understory trees to visually screen the parking area."*

Response: Based on the shading calculations, the provided shading exceeds the 30% requirement.

Comment 13j. *"Any single or double row of parking longer than 100 feet shall be dispersed every 100 feet or less by a landscaped bed that is at least 8 feet by 8 feet, exclusive of curbing. The Planning Board may exclude from this requirement any row of parking that abuts a landscaped area along the full-length of the row. See building 2 (please check other buildings too)."*

Response: The longest continual row of parking is 99 feet as currently designed.

Comment 14. *"Existing Plant Material Credit. The Applicant shall save and protect, to the greatest extent practicable, all existing large trees on the site having a trunk diameter of at least 12 inches, measured 4 feet above the ground surface. Please address."*

Response: The limit of clearing was minimized throughout the site to the greatest extent practicable. Trees have been planted in areas throughout the developed site.

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Other Requirements

Comment 15. *"The landscape design on large (more than 25 units) multifamily and commercial properties should demonstrate at least one place-making element that enhances pedestrian-level engagement and offers visibility on the principal frontage. Where a multifamily or commercial use property provides front yard additional to the minimum required front yard setback, the development must provide such streetscape enhancements. Elements may include but are not exclusive to: usable public open space such as a plaza, or pocket park with seating; landscaping integrated with structural elements (e.g., awning, gazebo, vegetated wall, trellis, shade pergola, or screen); distinct or custom outdoor lighting, plant hangers, banners, or bicycle parking; interactive design; hardscape installations like terracing and water features; attractive wayfinding; permanent or rotating public art space and installations; and/or other amenities that contribute to and are compatible with the primary neighborhood character and function."*

Response: The landscape design has been updated to include a potential pergola at the patio near the brick kilns.

Comment 16. *"The plan set does not satisfy the following design requirements of Section 6.5 of the Site Plan Review Regulations (see bolded text):"*

Orientation and Form

Comment 16a. *"Highlight Entrances. At least one primary entrance to the building shall face the public way on which the lot has frontage."*

Building 1 does not appear to meet this requirement.

Response: Building 1 has been reoriented to face Hanover Street.

Comment 16b. *"Adaptable Entrance Design and Building Massing. Pedestrian entrances shall be provided at least every 60 linear feet along the ground floor of the primary façade unless such egress would create safety or security concerns for the building's use. In such instances, a significant architectural feature that creates varied massing, such as a bay window or other feature, must be provided every 60 linear feet."*

Response: All apartment buildings contain significant architectural features such as balconies, large windows, or exterior doors spaced less than 60 feet apart.

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Comment 16c. *"Structured Parking, Garage and Carport Design. When parking structure (e.g., parking garage) is located on a lot with frontage, the portion(s) with frontage, shall be designed to include attractive fenestrations, high-quality materials, and varied design elements. **At least 1/3 of frontage-facing elements in new construction shall be screened by occupied active interior space for other uses at the ground floor level (retail, lobby, etc.), or at least 1/3 of the frontage must have variation in massing, substantial transparency and additional architectural detail that is distinct from the rest of the building and which visually enhances the remainder of the ground floor level. Occupied uses shall have a depth of at least 20 feet."***

Response: The updated architectural plans include parking level screening consistent with the description in the comment.

Access and Traffic

Comment 16e. *"The public streets providing access to the site shall be sufficient and have adequate capacity and features for the safety of vehicles, pedestrians and bicycles. This will include the main traffic arteries that must be utilized for travel to and from the site. The Board shall not approve a proposed site plan without such sufficient and adequate access capacity and features. Please address."*

Response: The traffic study is based on the scope established with City, NHDOT, and UVLSRPC officials.

- › The motorized and non-motorized facilities were identified within the vicinity of the site, and bicycle and pedestrian travel was counted at the study area intersections.
- › NHDOT officials are developing improvements for the NH Route 120 corridor between Hanover St and Etna Rd/Old Etna Rd. An indirect result may be the redistribution of vehicles currently traveling along the Mount Support Rd/ Heater Rd corridor that avoid the NH Route 120 corridor may change their travel route onto the major highway system. To provide a worse-case scenario, no vehicles were redistributed from the local roadways to the state highway system with the corridor improvements in place. Therefore, future traffic operations along the local roadway system may be better than as analyzed within the traffic study.
- › At the local study area intersections, ample capacity will be available as the operations are projected to be at LOS B or better at the Hanover St/Old Etna Rd intersection, LOS C or better at the Hanover St Extension/Heater Rd/Mount Support Rd intersection, and LOS D or better at the Old Etna Rd/Heater Rd intersection. The proposed north site driveway is projected to operate at LOS A and the proposed south site driveway is projected to operate at LOS C or better (with the intersection placed under All-Way Stop-Control).

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Comment 16f. *"The traffic patterns on, at, and around the site shall be coordinated so as to compose a safe and efficient system for vehicles, pedestrians, and bicyclists, in support of complete streets, including alignment with the City of Lebanon's Complete Streets Policy (2017). There shall be proper arrangement of roadways, loading areas, and parking areas within and around the site, in relation to existing and planned streets, so the proposed development of the site shall not endanger the safety or welfare of vehicles, pedestrians, or bicyclists. There shall be adequate traffic access to and from City streets to ensure the safety of vehicles, pedestrians, and bicyclists. Please address."*

Response: In addition to the response provided to Comment 110-1:

- › A vehicle speed study was conducted along Hanover St north of Evans Dr.
- › A sight distance evaluation was conducted at the proposed site driveways that show available sightlines exceed AASHTO methodologies.
- › The Hanover St intersection with Evans Dr and the proposed south site driveway would be placed under temporary All-Way Stop-Control in compliance with MUTCD methodologies to help control left-turn conflicts, improve traffic operational characteristics of the intersection, and with consideration of pedestrian and bicycle movements. Since the traffic volumes evaluated within the Traffic Study may represent an overestimated scenario, the intersection operations presented may show worse conditions than will be realized. Therefore, the AWSC will be installed should City of Lebanon officials deem this type of traffic control appropriate.

Comment 16g. *"The development, except for those in rural lands and heavy industrial zoning districts, shall install sidewalks along the street frontage(s) in order to support a walkable community that has continuous connections between existing and planned sidewalks."*

Response: The Applicant is currently exploring the ability to provide additional sidewalk and two new crosswalks across Hanover Street and Old Etna Road at the intersection.

Comment 16h. *"When a location's posted vehicular traffic speeds are 25 mph or greater, there must be a 5-foot wide pedestrian facility on at least one side of the street. When the posted limit is 35mph or greater, the sidewalk must be separated from the road by at least an additional 2-foot wide landscaped median."*

Response: The driveway speed limit is to be 25 mph or less.

Comment 16i. *"Sidewalks must be at least 5 feet wide (not including curb) and free of barriers and obstructions including signage, utilities, lighting and landscaping. Wider sidewalks should be considered for primary routes in new construction."*

Response: All proposed sidewalks currently exceed the required 5 foot width and comply with ADA requirements in all areas with obstructions.

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Comment 16j. *"Connectivity. To address gaps in Lebanon's pedestrian and bicycle network, implement recommendations in current plans, policies, or programs adopted by the City of Lebanon, including but not limited to the Master Plan. The following strategies may apply. Connect neighboring commercial properties at the side and rear lot lines with pedestrian facilities (path or sidewalk) when public routes are not available within 100 feet. Locate facilities to connect to existing or planned parks and trails. Identify opportunities for public access easements for future non-motorized access, where such exist. Prioritize use of proposed or existing corridors through the development, such as sewer easements. For adjacency to conservation properties, work with the Conservation Commission, where deemed to be appropriate by the Commission, to accommodate trail access. Please address."*

Response: Along Hanover Street, the Applicant is currently exploring the ability to provide additional sidewalk and two new crosswalks across Hanover Street and Old Etna Road at the intersection. Interior to the development, the Applicant is considering ways to provide connectivity to existing trails, proposed dedicated open space, and other proposed site features as discussed previously in this letter.

Comment 16k. *"Shared Streets. In cases where traffic speed and volume are low, an internal roadway/drive may be designed as a shared street. This may be a thoroughfare without sidewalks or striped lanes. Vehicle, bicycle, and pedestrian movement are mixed and movement must be adequately controlled through traffic calming and safety features as well as landscape and amenity elements to the satisfaction of staff and Planning Board review. Please address."*

Response: Along Hanover St within the study area:

- › The speed limit along Hanover St within the study area is posted at 25 mph and reduced to 20 mph within the School Zone between 7:30 AM-4:30 PM.
- › The Upper Valley Loop Trail is provided along the Hanover St corridor between the non-motorized I-89 overpass to the south and Mount Support Rd to the north.
- › Cyclists use the existing Hanover St paved roadway for travel with no striped shoulders or bike lanes provided.
- › There is a sidewalk provided along the east side of Hanover St from the non-motorized I-89 overpass to Old Etna Rd, and no sidewalk provided along Hanover St north of Old Etna Rd, though a small extension is being considered by the Applicant to provide complete sidewalk coverage between site driveways.
- › The proposed on-site improvements include separated pedestrian walkways.

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Comment 16l. *"Transit. If a property borders an existing, recommended, or proposed transit stop or dedicated transit route, supporting on- and off-site street design elements (see below) must be detailed in the application. Implement recommendations for Lebanon in current plans, policies, or programs adopted by the City of Lebanon, including but not limited to the Master Plan and 2010 Bus Stop Design Study. The applicant must demonstrate coordination with the transit authority and City officials to verify service, identify key elements, and address such in the proposed design. Elements for appropriate design may include: pavement markings, crosswalks between stops, adjacent sidewalks and site access for pedestrians/bus riders, snow removal accessibility and responsibility for stops, curb height, spacing of transit stops, dimensions of transit stop space (e.g., for bus shelter pad), bulb-out or pull-out, sidewalk tip-down, distance from intersections and drive accesses, shelters, street furniture, signage, and lighting. Safe access must be provided to and from the main development entrance(s) to the transit stop. Pedestrian access to the transit stop must limit crossing points and distance over parking facilities, driveways, and vehicular rights of way. Specifications must adhere to City construction and lighting policies for elements in the public way. Please address."*

Response: The Applicant will coordinate with Advanced Transit and City staff to determine whether a new transit stop location is warranted based on the Project's presumed increase in ridership demand. The design and maintenance practices described in the comment will be considered as this item progresses.

Multi-family Open Space and Recreational Facilities

Comment 16m. *"Site plans for multi-family dwelling developments shall make adequate provision for the on-site recreational facility needs of the residents of the proposed development, with the exception of multi-family dwelling developments consisting of less than five (5) units. The plan shall be designed to minimize the likelihood that public safety will be endangered by the extensive use of internal roads and parking areas for recreation. The plan does not appear to provide sufficient recreational facilities to serve the residents."*

Response: The Applicant is considering additional recreation facilities, such as a playground. Additionally, as the site plans evolve, the amenity spaces and other recreational features discussed in this letter will be developed, with more information provided.

Comment 17. *The plan set does not satisfy the following design requirements of Section 6.5 of the Site Plan Review Regulations (see bolded text):*

General Requirements

Comment 17a. *"Light fixtures shall be located, mounted, aimed, and shielded so as to not cause light trespass upon adjacent properties or onto streets or rights-of-way in excess of the following levels: The light intensity at adjoining streets or commercial property boundaries shall not exceed 0.5 foot-candles at grade level, and the light intensity at adjoining residential property boundaries shall not exceed 0.1 foot-candles at grade level."*

Response: Sheet SL-1C has been updated to address the comment.

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Lighting of Parking Lots, Passive Vehicular Storage Areas, and Exterior Display/Sales Areas

Comment 17b. *"Areas designated as parking lots, passive vehicular storage areas, or exterior display/sales areas shall be illuminated so that the average horizontal illuminance at grade level is no more than 5.0 foot-candles. The uniformity ratio (ratio of average to minimum illuminance) shall be no greater than 4:1. The average and minimum shall be computed for only that area designated as parking lots, passive vehicular storage areas, and exterior display/sales areas."*

Response: Sheet SL-1C has been updated to reduce the uniformity ratio to 3.98.

Town of Hanover - Planning and Development Department (6/11/2024)

Comment 1. *"With regard to transportation/traffic issues, the Planning Board is very interested in ensuring that residents are connected with the existing public transit options and supports improving routes to Hanover's and Lebanon's downtown and the Dartmouth Hitchcock Medical Center. This measure is crucial to ensure that the new residents of this future development are not solely reliant on private vehicles for commuting or their daily needs, as well as with improved pedestrian and bicycle paths to provide a safe and connected network to Hanover and to Sachem Village. Bus shelters and covered bike parking at bus stations would also be necessary to create protection from the elements. Allowing space along Hanover Street for an improved transit stop will be critical, inviting increased use year-round."*

Response: The Applicant will coordinate with Advanced Transit and City staff to determine whether a new transit stop location is warranted based on the Project's presumed increase in ridership demand.

Comment 2. *"Also, the Board encourages the City of Lebanon to consider this project in conjunction with recently proposed and completed housing projects on Mt. Support Road to more fully understand the impacts on traffic from Lebanon's downtown to Hanover's downtown."*

Response: Directed to City of Lebanon; VHB response not required.

Comment 3. *"In conclusion, the Planning Board supports this proposal and encourages continued efforts to improve regional public transport connections and decrease the flow of personal vehicles into Lebanon's and Hanover's downtowns."*

Response: Directed to City of Lebanon; VHB response not required.

Comment 4. *"The Board also supports a multifaceted approach to reducing reliance on private vehicles as set out in the Town of Hanover Sustainability Master Plan, including improved pedestrian and bicycle routes, extended and weekend Advance Transit services, and the possibility of a dedicated transit route for future residents north of Interstate 89."*

Response: Directed to City of Lebanon; VHB response not required.

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Peer Review Comments – Keach-Nordstrom Associates, Inc. (6/26/2024)

General Comments

Comment 1. *"This project necessitates receipt of the following State Agency Permits: (a) a NHDES Alteration of Terrain Permit; (b) a NHDES Wetlands Permit; and (c) a NHDES Sewer Connection Permit. We recommend receipt of each required permit prior to or as a condition of site plan approval."*

Response: Sheet C1.0 states that all three of these permits are to be submitted.

Comment 2. *"We understand the planned residential development will rely on public water and sewer utilities available at Mount Support Road. Accordingly, we recommend the applicant receive local Water Use and Sewer Use Permits necessary to support the extent of buildout contemplated prior to or as a condition of site plan approval."*

Response: Sheet C1.0 states that these permits are to be submitted.

Comment 3. *"Given the extent of land area to be disturbed by planned construction activities, coupled with immediate proximity of this work to Densmore Pond and other on-site wetlands, we recommend the Planning Board rely on authority of Section 8.3 of the Site Plan Review Regulations (SPRR's) to require, as a condition of application approval, the applicant provide a performance guarantee, in an amount and form acceptable to your Department, to serve as a financial surety for: site restoration in the event of abandonment; installation and maintenance of appropriate erosion and sedimentation controls throughout construction; and full and final completion of public improvements and/or work within the public right-of-way at Hanover Street."*

Response: The Applicant will coordinate with city staff to determine appropriate performance guarantees.

Comment 4. *"We understand the owner/applicant intends to voluntarily merge four existing parcels to yield the single 136+ acre tract that is the subject of this application. If so, we recommend execution and recording of a Notice of Voluntary Lot Merger prior to or as a condition of application approval."*

Response: The Applicant intends to voluntarily merge the existing parcels and will submit a Notice of Voluntary Lot Merger.

Planning/Design Matters

Comment 1. *"A Parking Summary Chart provided on the Cover Sheet indicates a total of 780 planned on-site parking spaces. We count 779. The same Summary Chart indicates a total of 502 planned garage spaces, notes on Sheets C1.0 through C2.3 suggest 512. We recommend reconciliation of these differences."*

Response: The parking chart has been updated, see Cover sheet.

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Comment 2. *"We recommend expansion of the drawings to provide a detailed layout of interior parking space stall and aisle dimensions. We note the project narrative indicates the dimensions of standard parking spaces situated within garages are planned to be 8' x 18' rather than 9' x 18' as required by Section 6.5.E (3) of the SPRR's. We also note Section 6.5.E (5) permits approval of "alternate parking designs" under certain circumstances. Prior to offering comment pursuant to that section, we believe examination of parking layout within the proposed garages is prudent."*

Response: Parking garage layout has been provided in greater detail on the architectural sheets.

Comment 3. *"Section 6.5.A of the SPRR's adopts both Standard Specifications for Road and Bridge Construction (NHDOT) and Guide for the Development of Bicycle Facilities (AASHTO) as local construction standards by reference. We recommend expansion of Sheet C1.0 to acknowledge the same."*

Response: Sheet C1.0 has been updated to include these references.

Comment 4. *"Existing Conditions Plans of the subject site identifies various buildings, structures, site improvements, and utility infrastructure. We anticipate most existing improvements will be removed to facilitate the proposed construction. In addition, we understand it is the applicant's intent to preserve at least two existing brick kilns for purposes of legacy preservation. Collectively, we recommend expansion of the site plan drawings to include a site preparation/demolition plan which specifically defines the intended disposition of existing improvements."*

Response: Sheet C1.0 provides demolition notes that indicate all existing manmade features within the limit of work are to be removed unless otherwise indicated in the drawings. The plans specify existing features to be maintained. As such, and because there are limited existing features within the Site to discuss, a site preparation doesn't see warranted.

Comment 5. *"As conveniently shown on Sheet C2.0, site driveways at Hanover Street near both the southerly and northerly ends of the development parcel with interior drives connecting the two. While we fully support this approach, given the high residential density served, we recommend consideration of designating paired parallel drives between Buildings 3 & 4 and Buildings 8 & 9 for one-way travel (easterly drive northbound; westerly drive southbound). In our view, enhanced vehicular and pedestrian safety could be realized by elimination of need for parked vehicle backing movements into two directional traffic along the fronts of these four buildings."*

Response: The Lebanon Fire Department is requiring drive aisles serving parking to be 26 feet wide, which would not promote one-way circulation in practice. As such, allowing two directional traffic in these areas is expected to be more consistent with the way in which drivers will actually circulate the Site, improving safety.

Comment 6. *"As a further safety enhancement, we recommend considering selective placement of one-way vehicular stop conditions at the intersections of intersections of paved site drives, especially those in the vicinity of painted crosswalks. In our view this accommodation would serve as an effective traffic calming measure."*

Response: Stop signs were added to areas intersecting the main drive aisle.

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Comment 7. *"Close examination of Sheet C2.0 reveals garage access/egress at Building 4 will necessitate travel through garages at either Building 3 or Building 5. While we do not view this as problematic, this fact may influence the timing of construction of individual buildings and adjoining infrastructure."*

Response: The phasing of the Project is such that buildings 3, 4, and 5 are expected to be built in consecutive order, so drive aisles accessing buildings 4 and 5 will be a simple extension of the drive aisle from the previously completed building.

Comment 8. *"Provisions of Section 6.5.D (5) of the SPRR's serve to require sidewalk installation along the frontage of the development parcel at Hanover Street. Although a public sidewalk is presently available along the easterly side of Hanover Street to the south of its intersection with Old Etna Road, no public sidewalk presently exists to the north of this intersection. To satisfy the cited requirement we recommend expansion of the site plan drawings to specify public sidewalk installation along the frontage of the development parcel, beginning at a point opposite the northerly the northerly Lebanon High School property site driveway and extending northerly to a point at or about the northerly parcel boundary. To best link this recommended sidewalk to existing walks along both the easterly sideline of Hanover Street and along the northerly sideline of the High School site driveway, we recommend painted crosswalk installations at both the northerly development site driveway and at the recommended southerly limit of sidewalk construction on the west side of Hanover Street. In our view, requirements of Section 6.5.D (5) will be satisfied through the applicant's proposal to construct a painted crosswalk providing development site pedestrian access to existing public sidewalk on the easterly side of Hanover Street to the south of Evans Drive."*

Response: The Applicant is currently exploring the ability to provide additional sidewalk and two new crosswalks across Hanover Street and Old Etna Road at the intersection. This would provide continuous sidewalk coverage between both proposed site driveways.

Comment 9. *"A note provided on Sheet C2.0 cites the fact that access to public transit is presently available near the intersection of Heater Road and Old Etna Road; approximately 0.2 miles from the development site. That said in correspondence dated May 13th, the applicant's consultant acknowledges that "with the additional ridership resulting from this project, there is potential to coordinate future stops." We suspect this prediction may prove to be accurate. To that end we recommend the applicant consider expanding the final site plan to identify a location suitable for such future accommodation at or near one or both proposed site driveways. While we are not suggesting constructing any permanent improvement(s) at this time, we believe it may be wise to at least pre-plan for this potential eventuality at this time."*

Response: The Applicant will coordinate with Advanced Transit and City staff to determine whether a new transit stop location is warranted based on the Project's presumed increase in ridership demand.

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Comment 10. *"We note Sheets C2.0 and C2.1 currently depict proposed installation of pavement markings permitting either left or right exiting turning movements at the northerly site driveway. Since the proposed site driveway is situated directly opposite Evans Drive, we recommend elimination of this pavement marking as the Traffic Impact Study suggests significant volumes of traffic operating through the northerly site driveway seek eastbound travel on Evans Drive."*

Response: The arrows shown on the site plans are an indication of vehicular circulation direction only, in response to another comment received. VHB's believes the comment references the southerly driveway as it is opposite Evans Drive, and as such has removed the arrows at both proposed driveway and Hanover Street intersections. See sheet C2.0 and C2.1.

Comment 11. *"To satisfy specific requirements of the SPRR's we recommend:*

- › *Expansion of the drawings to specify location and details of any proposed site signage [Section 5.1.E (14)].*
- › *Identification of resident recreational facility accommodations sufficient to satisfy Section 6.5.H.*
- › *Identification of suitable on-site seasonal snow storage areas [Section 5.1.E.19)]."*

Response: This information is provided on the Layout and Materials Plans. The Applicant is considering additional recreational facilities.

Comment 12. *"Sheets C2.1 through C2.3 specify various elements of site construction not detailed on the drawings. We recommend expansion of the drawings to provide typical construction details/specifications for the following site improvements:*

- › *Vertical granite curb.*
- › *Bicycle parking apparatus.*
- › *Precast box culvert and associated end wall installation(s).*
- › *Exterior patio construction.*
- › *Decorative metal fence installation.*
- › *EV charging station equipment and apparatus.*
- › *Paved sluice construction.*
- › *Guardrail installation.*
- › *Elements of water, sewer, and storm drainage construction."*

Response: See sheets C7.1-7.5 for the listed details, with the exception of 'exterior patio construction' and 'EV charging station equipment and apparatus'. Exterior patios are expected to be an asphalt or masonry product, however the material and finish has not yet been selected. Upon selection, the relevant detail(s) will be added to the plan. Though the site plans provide the layout accommodations for EV charging station equipment and apparatus, those propriety items will be detailed by the Project's electrical engineer.

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Comment 13. *"Sheets C2.1 through C2.3 graphically depict planned dumpster enclosure installations. Although Sheet C7.2 provides good details of this construction, those details refer the reader to the Layout and Materials Plan (Sheets C2.0 through C2.3) for dimensions. We recommend expansion of the referenced drawings to specify those dimensions."*

Response: The detail provides the minimum dimensions for dumpster enclosures. Dimensions provided on the Site Plans will be updated once the Applicant determines actual enclosure sizes based on dumpster sizing and quantity.

Comment 14. *"Sheet C2.2 identifies a typical accessible parking sign by MUTCD designation R7-1. We believe the correct designation is R7-8."*

Response: The Sign Summary on sheet C2.1 has been updated.

Comment 15. *"Similarly, Sheet C2.2 identifies a typical EV charging station location by use of signage corresponding with MUTCD designations D-11B and D-11BP. We believe the correct references are D9-11B and D9-11BP."*

Response: The Sign Summary on sheet C2.1 has been updated.

Comment 16. *"Sheet C2.3 contains a note stating "subsurface infiltration basin" located to the immediate northeast of Building 5. We believe this note is misplaced on the drawing."*

Response: Sheet C2.3 has been updated.

Comment 17. *"We recommend the Fire Department review and comment on the adequacy of site circulation, building accessibility, hydrant placement, building identification and other matters within the Department's purview."*

Response: The Lebanon Fire Department has provided comments which are addressed in this letter.

Comment 18. *"We recommend expansion of the site plan to identify acceptable accommodations for resident mail delivery."*

Response: Resident mail delivery is expected to be occur in mail rooms inside each building residents.

Comment 19. *"Based upon consideration and review of design plans of proposed site grading and stormwater management accommodations we offer the following remarks:"*

Comment 19a. *"Sheets C3.0 through C3.3 graphically illustrate several locations where modularized block retaining wall construction is planned. We recommend expansion of the drawings to specify top and bottom of wall elevations."*

Response: Top and bottom of wall elevations have been added to the grading plans for reference.

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Comment 19b. *"We recommend the design engineer recheck and adjust the placement of finish grade contours on the southerly end of a segment of retaining wall planned immediately east of Building 1 for both clarity and accuracy. We offer an identical comment relative to site grading shown in the vicinity of the northerly end of Building 8 and southwesterly corner of Building 3, both on Sheet C3.2."*

Response: Elevation information has been updated in the noted locations.

Comment 19c. *"The southwesterly corner of parking planned to the southwest of Building 1 is situated immediately atop either a 2:1 fill slope and/or retaining wall. We recommend guardrail and/or safety fence installation, as appropriate, at this location."*

Response: The proposed retaining wall has been extended to remove the steep slope adjacent to the parking area.

Comment 19d. *"As shown on Sheet C3.1, stormwater exiting proposed drainage structure OCS 913 is to discharge onto a 2:1 fill slope at headwall HW 914. We recommend extending the length of storm drain discharging at HW 914 to avoid this condition."*

Response: The design has been updated to discharge stormwater through the retaining wall at the existing ground surface elevation.

Comment 19e. *"We recommend expansion of Sheets C3.1 through C3.3 to label proposed stormwater management improvements in a manner consistent with Sheets C4.1 through C4.3."*

Response: Pipe sizes and flow arrows have been added to these sheets consistent with C4.1-C4.3.

Comment 19f. *"We recommend expansion of the drawings to provide site-specific design details, specifications, and elevations for construction of each individual underground infiltration pond/system, bioretention pond, and subsurface detention basin."*

Response: Following the completion of the project permitting process, and typically as a construction submittal facilitated by the contractor, site specific designs of each stormwater best management practice will be provided by the manufacturer. As a basis of design for reference during permitting, generic details are provided. Subsurface Detention Basins to follow StormTech MC-7200 detail. Elevations and configurations called out in sheets C3.1-C3.3. Bioretention Basin detail provided, elevations and configurations called out in sheets C3.1-C3.3.

Comment 19g. *"We recommend expansion of the drawings to specify location, elevation, and details of proposed forebay construction at each of three proposed bioretention ponds. The applicant's Drainage Report indicates intent to satisfy stormwater pretreatment requirements of Section 6.6.E (10) of the SPRR's via forebay installation. If so, we recommend expansion of the drawings to include corresponding design information."*

Response: Additional sediment forebay design information has been added to the site plans.

Comment 19h. *"We recommend labeling proposed sluice construction on Sheets C3.2, C3.3, C4.2 and C4.3 respectively as applicable."*

Response: The noted labels have been added to the site plans.

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Comment 19i. *"As shown on Sheets C3.2 and C3.3 perimeter swale construction is planned to the west of Buildings 7 through 10. The intent of this swale construction appears two-fold. One is to capture surface water tributary to the development area from the west. The second is to capture groundwater exiting a proposed cut slope situated to the immediate west. Based on our review of this proposed construction, we offer the following remarks: (a) is the typical cross-section of Stormwater Swale #1 detailed on Sheet C7.3 intended to be applicable to this perimeter swale construction? If so, we recommend the addition of a call out on Sheets C3.2 and C3.3 referencing that intent; and (b) as shown on the drawings, the longitudinal slope of this proposed perimeter swale varies significantly along its total length. While very flat (1%) in most locations, channel slope increases to over 12% at other locations. We recommend the design engineer review potential need for channel armor installation at steeper locations situated to the northwest of Buildings 7 and 8, and at the southerly limits of swale construction (where flow volume is at a maximum)."*

Response: The swale cross section was revised to be considered a riprap channel. The length of the channel was increased slightly to permit slopes less than 10% at the steepest portion, which in conjunction with lining the channel with riprap, keeps the velocity within the channel under 10 ft/s in the 100-year storm. This riprap placement should minimize velocities and erosion potential within the channel. Please refer to the design sheets in Appendix C of the Drainage Report and the updated detail on C7.4.

Comment 19j. *"Text providing information pertaining to proposed cut slope construction was inadvertently "cropped" from the top of the drawing image shown on Sheet C3.3."*

Response: Corrected.

Comment 19k. *"As shown on Sheet C3.3 construction of an excavated 1.5:1 embankment is planned to the west of Buildings 7 through 10. To the west of Building 10 the vertical embankment height will exceed 40-feet. We recommend: (a) completion of geotechnical exploration sufficient to confirm feasibility of and design parameters for this construction; and (b) introduction of vertical "benching" at intervals sufficient to permit convenient embankment construction and provide added slope stability."*

Response: The Applicant is actively engaging geotechnical engineer. Subsurface exploration of this area and slope recommendations will be part of their scope, and their recommendations will be incorporated into the Site Plans prior to building permit. In discussions with NHDES AOT, benching is not required on a reinforced slope as the reinforcement provides the adequate stability.

Comment 19l. *"As shown on Sheet C3.3 curvilinear walkway construction is planned to the immediate east of Building 10 to provide exterior building access from adjoining parking. We recommend the addition of site-specific details of this construction to the drawings. Given the proposed embankment slope at this location, it appears exterior stair construction will be necessary. If so, what is the applicant's proposal for providing ADA compliant access to Building 10?"*

Response: The walkway configuration has been revised to accommodate ADA requirements, see sheet C3.3.

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Comment 19m. *"As shown on Sheet C3.3 a short length of fill embankment with a 2.3:1 slope is planned between Buildings 4 and 5. We recommend placement of safety rail or fence atop this slope."*

Response: There is a flat area approximately 15 feet in width between the top of slope and the pedestrian walkway which provides an opportunity to use plantings to further discourage pedestrians from walking along the top of slope.

Comment 19n. *"We recommend labeling additional finish grade contours throughout Sheets C3.1 through C3.3 to improve drawing clarity."*

Response: Additional labels have been added to the plans where appropriate.

Comment 19o. *"Given the design engineer's reliance on stormwater infiltration practices, we recommend completion of a geotechnical evaluation of a scope sufficient to confirm presumed soil texture, permeability, and seasonal high water depth values upon which the design was based."*

Response: Test pits and infiltration rate testing will be completed as part of the forthcoming geotechnical investigation for the Project. The results will be shared with the City of Lebanon and stormwater assumptions will be adjusted accordingly based on those results. For now, conservative values were assumed for estimated seasonal high groundwater and infiltration rates.

Comment 19p. *"We recommend the drawing identify the intended disposition of two existing 60-inch diameter and one existing 54-inch diameter culverts located in the vicinity of Building 1 (See Sheets Sv-2 & C4.1)."*

Response: The Project does not intend to disturb these culverts beyond the limit of work as they are an established part of the stream and removing them would be more disruptive to the stream than beneficial.

Comment 19q. *"The proposed layout of Underground Infiltration Ponds #1, #2 & #3 are shown on Sheets C4.1 through C4.3. We recommend: (a) expansion of the drawings to label each drain manhole and specify corresponding design elevations; (b) we recommend expansion of the drawings to provide site-specific construction details of planned outlet control structures OCS 913, OCS 203 and OCS 305; (c) callouts for this series of Underground Infiltration Ponds include design elevations for proposed underdrain which is not otherwise shown or referenced on the drawings. If underdrain is planned, we would recommend expansion of the drawings identify same."*

Response: Expanded labels were provided for each OCS in the plan sheets and system-specific details were added to the detail sheets. Please see updated plans.

Comment 19r. *"We recommend expansion of the drawings to provide a detailed storm drainage pipe schedule."*

Response: A pipe schedule table has been added to sheet C7.3.

Comment 19s. *"We recommend expansion of the drawings to provide typical construction details, including design elevations, for a series of proposed trench drain installations planned at garage entrances."*

Response: A trench drain detail was added to sheet C7.3 and elevations are provided on the plans.

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Comment 19t. *"Design elevations for DMH 204 provided on Sheet C4.2 suggests drainage structure "101" connects with the same. Structure 101 is neither shown nor labeled on the drawing image."*

Response: Corrected.

Comment 19u. *"For improved storm sewer hydraulics, we recommend matching pipe crown elevations of inflowing pipes of varying diameter at drainage structures. Design invert elevation values specified on Sheets C4.1 through C4.3 vary from this rule at several locations (Example: CB 207 shown on Sheet C4.1)."*

Response: Noted, this design recommendation will be considered.

Comment 19v. *"We recommend the design engineer recheck design invert elevations for the segment of storm drain planned between CB 218 and CB 217 (See Sheet C4.1). An identical comment is offered regarding CB 314 and CB 315 shown on Sheet C4.2."*

Response: Reviewed and updated accordingly.

Comment 19w. *"Sheet C4.3 graphically depicts a series of four segments of storm drain discharging to daylight. We recommend expansion of the drawing to specify: (a) end treatment; (b) invert elevation; and (c) accommodation for outlet protection at each location."*

Response: The noted information has been added.

Comment 20. *"Based upon review and consideration of the applicant's Drainage Report we offer the following series of remarks:"*

Comment 20a. *"Although the design engineer states: "the study area has been divided into two drainage areas that discharge into one of two discharge points", for the purposes of quantitative analysis of pre and post-development stormwater volumes, a single Design Point (DP-1), identified as "Densmore Pond/Wetlands", is utilized. DP-1 does not represent a single point on the ground but rather the perimeter of both Densmore Pond and a series of on-site wetlands tributary to Densmore Pond. While we agree with the consultant's choice to consider "two drainage areas that discharge into one of two discharge points" we recommend completion of separate analysis for each of the two discharge points referenced by the consultant."*

Response: As discussed with the review engineer from KNA, the complexity of the interconnected wetlands and pond on site create a difficult issue using multiple discharge points. A single discharge point has been retained, but it has been moved to be more pointedly located at the existing culvert that runs under Hanover Street to the adjacent wetland complex. The study area has been enlarged in order to capture the scope of the drainage area, and the report notates the full boundaries of stormwater runoff. The results of the stormwater management report have been updated. Please see revised stormwater report.

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Comment 20b. *"As discussed above, a swale is planned along the westerly limits of construction. This swale conveys intercepted surface and groundwater volumes to a wetland situated near the southerly site boundary. We recommend expansion of the analysis to quantify and consider the impact of the volume of stormwater runoff from land situated beyond the development area that will be intercepted and conveyed/redirected by proposed perimeter swale construction."*

Response: The upstream tributary area has been included in the resubmission and included in the HydroCAD model. Additionally, a swale design spreadsheet has been added to the report in order to clearly show peak elevations, flow rates and velocities encountered in the swale at various points. Please see the revised report.

Comment 20c. *"We recommend the design engineer confirm availability of storm drain grate capacity sufficient to accommodate the 25-year return frequency design storm event."*

Response: An inlet capacity design sheet has been included as part of Appendix C of the Drainage Report. Catch basin grates were modified as needed.

Comment 20d. *"We recommend expansion of the Drainage Report narrative to describe how stormwater treatment requirements contained in Section 6.6.F of the SPRR's will be satisfied."*

Response: The City of Lebanon requirements were added to the Drainage Report and notated as part of the "Conclusions" portion of the report (Section 5.4).

Comment 20e. *"To satisfy Section 6.6.H (2) of the SPRR's we recommend preparation and submittal of a comprehensive stormwater operation and maintenance plan."*

Response: An Inspection and Maintenance Plan is included as part of the Drainage Report within Appendix E. The I&M includes all stormwater BMP's that are necessary to maintain the treatment quality and recharge volume for the project.

Comment 20f. *"As acknowledged above, an NHDES Alteration of Terrain Permit must be issued for this project. We recommend expansion of the applicant's final Drainage Report to include all information, computations and exhibits required for submission of a full and complete Alteration of Terrain Permit application."*

Response: Additional information that would be required as part of the Alteration of Terrain Permit application have been included, with exception to specific items such as the application, etc.

Comment 21. *"No water service connection to Building 1 is shown on Sheet C4.1."*

Response: Proposed water service to Building 1 has been added.

Comment 22. *"As shown on Sheet C4.3, a 4-way junction of water main/service is planned at Buildings 5 and 10. For improved serviceability and ease of construction, we recommend off-setting these two services so connections to the main can be constructed as two successive 3-way junctions."*

Response: Updated.

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Comment 23. *"Also, for improved serviceability and ease of construction we recommend modest realignment of the proposed sewer service at Building 9 (See Sheet C6.2) to avoid need for a "3-pipe stacked" crossing/intersection of water, sewer, and storm drain."*

Response: Updated.

Comment 24. *"Based upon consideration and review of design accommodations for on-site wastewater collection and connection to existing public sanitary sewer at Hanover Street we offer the following remarks:"*

Comment 24a. *"Sheets C4.1 and C4.3 indicate proposed sewer manholes SMH 100 and SMH 200 will be installed over existing 12-inch diameter sewer at Hanover Street to provide tie-in points at the south and north ends of the proposed development respectively. We recommend expansion of the drawings to provide details of the construction."*

Response: The sewer manhole detail on sheet C7.3 shows representative pipe connections to a new structure additional information will be provided in the project specifications. The contractor will be responsible for coordinating a connections permit and installation requirements with the sewer authority.

Comment 24b. *"Part Env-Wq 704.04 (b) of the New Hampshire Code of Administrative Rules (Rules) requires a minimum of 6-vertical feet of soil cover over sanitary sewer situated beneath paved surfaces. As shown on Sheets C4.1 through C4.3 there are numerous segments of the proposed sewer which do not presently comply with this requirement."*

Response: Sanitary piping has been updated to comply with this regulation.

Comment 24c. *"As currently presented, there are numerous on-site locations which contemplate vertical drop sewer manhole construction. We recommend avoidance of drop manhole construction to the fullest extent possible. This outcome can be achieved by lowering the invert-in elevation(s) of inflowing sewer. In the event drop manhole construction cannot be avoided, we would recommend expansion of the drawings to provide a detail of this construction. The foregoing remark regarding vertical drop sewer construction notwithstanding, we do recommend a vertical drop in invert elevation of not less than 0.1-foot over the width of any sewer manhole. While a vertical drop of 0.1-feet is specified at most locations, there are others (Example: SMH 104 – Sheet C4.1) where invert-in and invert-out elevations match. We recommend revision."*

Response: Drop sewer manholes are no longer proposed and all structures have a minimum 0.1' drop across them.

Comment 24d. *"We recommend expansion of Sheet C4.3 to specify pipe diameter, slope, and length values for two segments of proposed sewer connecting the planned maintenance building with SMH 201. We offer an identical comment for Buildings 3, 4 and 7."*

Response: Updated.

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Comment 24e. *"We recommend expansion of the drawings to specify sewer invert elevations at the foundation wall of each proposed building."*

Response: Added, see sheets C4.1-C4.3.

Comment 24f. *"Parts Env-Wq 704.19 (c) and 704.19 (e) of the Rules require minimum horizontal and vertical separation distances of 10-feet and 18-inches between water and sanitary sewer lines. We recommend the design engineer recheck and edit the design for compliance."*

Response: This requirement is met to the maximum extent practicable. Construction specifications provide the requirement and direction for circumstances where the requirement cannot be met, such as concrete encasement. Field locating water line routing during installation may further reduce locations conflicting with these requirements, which is based on construction means and methods and project specifications.

Comment 24g. *"We recommend the addition of typical sanitary sewer trench and manhole details to the drawings."*

Response: Sanitary Sewer Manhole and Utility Trench details are provided on Sheet C7.4.

Comment 24h. *"The drawings note proposed sewer will be constructed with PVC pipe. We recommend expansion of the drawings to indicate PVC pipe and fittings incorporated with sewer construction shall be SDR 35 PVC."*

Response: See sheet C1.0. Utility note 8.B.

Comment 25. *"As shown on Sheet C-5.1 construction of a fill embankment slope is planned to extend downward to an adjoining parcel boundary for a length of 120-feet. To reduce potential for inadvertent encroachment on the abutting parcel, we recommend considering installation of rigid construction fence along the common boundary."*

Response: Construction fence has been added to the plan.

Comment 26. *"We recommend accommodation be made for site security during construction to dissuade unauthorized entry to work areas."*

Response: The Applicant is considering security measures for the construction phase of the Project.

Comment 27. *"To avoid interference with temporary high traffic volumes operating on Hanover Street in immediate vicinity of this site during student arrival and dismissal periods at Lebanon High School, we recommend construction traffic on Hanover Street be limited to a minimum during those peak hour periods on days school is in session."*

Response: The Project construction logistics plan by the contractor will consider peak traffic times related to school operations.

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Comment 28. *"We recommend Sheet C2.8 (Landscape Plan) be expanded to include notes and specifications capturing applicable requirements of Section 6.2.H of the SPRR's regarding both workmanship and materials to be incorporated in the planned landscape installation as well as future maintenance of the same."*

Response: Notes 1 and 2 from section 6.2H added to Plant Maintenance Notes.

Comment 29. *"As shown on various site plan drawings, numerous lengths of retaining wall are planned throughout the site. A typical detail of segmental block retaining wall construction is provided on Sheet C7.1. As acknowledged at Note No. 1 on this detail, it is understood the contractor shall submit drawing(s) stamped by a NH Licensed Professional Engineer for approval by Project Engineer and City of Lebanon prior to construction."*

Response: Structural design drawings will be provided for retaining walls that require them.

Comment 30. *"A typical Bituminous Concrete Pavement Section is provided on Sheet C7.1. We recommend revision of this detail to conform with Section 6.5.E (2.c) of the SPRR's relative depth and variety of aggregate base material installation."*

Response: The detail has been updated to conform with City requirements.

Comment 31. *"Sheet PP-1 of the drawings provides a generalize phasing plan of proposed/sequential building construction. To satisfy Sections 4.9.C (1) and 5.1.G (1) of the SPRR's, we recommend expansion of this drawing to identify proposed phasing of completion of common area and infrastructure improvements prior to construction and/or occupancy of each future residential building."*

Response: The project phasing plan has been expanded as noted.

Comment 32. *"The project narrative submitted under the application references construction of "a walking path along Densmore Pond ... a dog park and overlook areas." We note these improvements are neither shown nor referenced on the current site plan drawings."*

Response: The features are identified on sheets C2.1 to C2.3.

Comment 33. *"We recommend expansion of Sheets L1.0 through L2.1 to demonstrate compliance with quantitative and qualitative landscaping standards specified under Section 6.2 of the SPRR's."*

Response: Landscape calculations added to sheet L1.0. Sheet L1.1 expanded to show additional plantings added to frontage. Additional plantings added to perimeter on sheet L1.3.

Comment 34. *"To satisfy Section 5.1.E (13) of the SPRR's we recommend expansion of Sheet SL-1A and/or submission of manufacturers catalogue cuts to provide details and specifications of proposed exterior site lighting fixtures and appurtenances."*

Response: Sheet SL-2C has been added showing all lighting manufacturer catalogue cuts.

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Comment 35. *"Sheet SL-1A specifies uniformity ratio values of 7.55 and 9.80 for exterior site lighting of parking & drive lanes, and sidewalk respectively. These values exceed the maximum uniformity ratio value of 4.0 permitted under Section 6.7.C (1) of the SPRR's."*

Response: Sheet SL-1C has been updated to reduce the uniformity ratio to 3.98.

Comment 36. *"We recommend the project land surveyor recheck the reported distance of the northerly line of Map 63 – Lot 1 (562') reported on Sheet Sv-1. We also recommend the addition of bearing and distance dimensions of the tie-line shown on the easterly boundary of this same parcel."*

Response: Sheet Sv-1 has been updated.

Pedestrian-Bicyclist Advisory Committee - Draft Letter (6/5/2024)

Comment 1. *"Add a sidewalk to the development side of Hanover Street. Ideally from Dartmouth Ave to the pedestrian bridge, but at least on the development's property either side of the development's entrance close to the intersection of Hanover Street and Old Etna Road. This will ensure safe walking conditions for residents of the new development and residents of the Dartmouth Ave neighborhood to reach the existing sidewalk system on Hanover Street."*

Response: The Applicant is currently exploring the ability to provide additional sidewalk and two new crosswalks across Hanover Street and Old Etna Road at the intersection. This extension of the existing sidewalk would provide continuous sidewalk coverage between both proposed site driveways and to the greater existing sidewalk network beyond Hanover Street, including the pedestrian bridge over I-89.

Comment 2. *"Create a 4-way intersection with stop signs and crosswalks at the Old Etna Road intersection. This would require moving the proposed northern driveway and maintenance building and changing the orientation of the end of Old Etna Road so that it curved to meet Hanover Street at a right angle. This will improve the safety of the intersection of Hanover Street, Old Etna Road, and the development's northern driveway, as well as slowing traffic on Hanover Street as it approaches the school campus from the north."*

If the 4-way intersection cannot be achieved, add a crosswalk from the new sidewalk on the west side of Hanover Street that connects to the sidewalk at the school campus' north entrance (entrance closest to the intersection of Hanover Street and Old Etna Road)."

Response: Based on discussions with City of Lebanon and its peer review consultant, consideration was previously provided in constructing the northern site driveway across from Old Etna Road but was not pursued due to wetland concerns along the west side of Hanover Street. In addition, the consideration of placing the existing Hanover Street and Old Etna Road intersection under All-Way Stop-Control was discussed with City of Lebanon and its peer review consultant and determined not to be desirable due to a right-turn movement from Old Etna Road (onto Hanover Street northbound) that may conflict with a stopped vehicle on the Hanover Street southbound approach.

Further, preliminary review of geographic information system (GIS) data showed that the property lines for 237 Hanover Street (property located on the northeast corner of the intersection) would

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limit the ability of realigning the Old Etna Road leg without land acquisition. On the west side of Hanover Street, substantial wetland impacts would be required to shift the proposed northerly site driveway south to align with Old Etna Road in its current location.

To improve the offset intersection condition and reduce wetland impacts, the Applicant has purchased the 238 Hanover Street property to acquire the additional space required to further separate the proposed site driveway from the Old Etna Road Hanover Street intersection, improving safety.

For the pedestrian connectivity portion of the comment, see response to comment 1 above.

- Comment 3.** *"Create a multiuse path for pedestrians and cyclists on the east side of Hanover Street by widening the existing sidewalk. This would run from the pedestrian bridge to at least the school campus' south entrance (entrance closest to the intersection of Hanover Street and Evans Drive) and would provide a safe separated multiuse path for children, and parents escorting children, between the schools and the pedestrian bridge."*

Response: A multiuse path is not currently proposed as part of the Project, however the Applicant is exploring the ability to provide additional sidewalk and two new crosswalks across Hanover Street and Old Etna Road at the intersection. This extension of the existing sidewalk would provide continuous sidewalk coverage between both proposed site driveways and to the greater existing sidewalk network beyond Hanover Street, including the pedestrian bridge over I-89.

- Comment 4.** *"Reduce the number of parking spaces required in the development and encourage more bus, pedestrian, and bicycle trips."*

Response: The Project proposes what the Applicant believes to be an appropriate number of parking spaces based on zoning requirements and anticipated parking demand. To reduce paved area on-site a significant number of parking spaces are located below the buildings. The Project also proposes a significant number of bike storage locations, both short-term and long-term. The site is located within walking distance of an existing Advance Transit bus stop.

- Comment 5.** *"Offer trail user parking and a trail protected with an easement to the Boston Lot trail system from the development (connecting to, for example, the "Hardwoods" trail just west of the developer's property line)."*

Response: Connection to the existing trails and associated parking dedication is being considered by the Applicant.

- Comment 6.** *"Provide covered and secure bike parking for residents of the development."*

Response: Covered, long-term bike parking is provided in the parking level below each apartment buildings.

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Lebanon Fire Department - Duane Egner, Fire Inspector (6/12/2024)

Comment 1. *"As the proposed buildings are in excess of 30 feet above the grade plane of the roadways, aerial fire apparatus access roads shall be provided in accordance with the 2021 IFC Appendix D105. This section requires that the roads have a minimum unobstructed width of 26 feet, exclusive of shoulders, in the immediate vicinity of the building."*

Response: Drive aisles in the immediate vicinity of the buildings have been widened to 26 feet.

Comment 2. *The proximity of the aerial fire apparatus access roads to the building shall be located not less than 15 feet and not greater than 30 feet from the building and positioned parallel to one entire side of the building.*

Response: The requirements set forth in the Lebanon Zoning Ordinance relative to landscape and sidewalk width, in addition to parking to serve each building, requires the main drive aisles to be located greater than 30' from the apartment buildings. Other paved access drives are located less than 30' from the buildings and could be used for firefighting, equipment, and apparatus.

Comment 3. *"According to the US Forest Service Wildland Urban Interface 2020 Map Service, the property is in the Wildland-Urban Intermix and Interface area. Per the 2018 NFPA 1, Section 17.1.1: In cases in which the local jurisdiction declares that an area within the jurisdiction is a wildland urban interface as determined by an assessment tool based upon accepted fire services practices, or where new structures will be located in a wildland/urban interface or intermix area, the AHJ shall perform, or cause to be performed, a wildland fire hazard assessment of each structure ignition zone in the development to determine relative risk, the extent of wildland fire hazard, and applicable mitigation measures. Due to this proposed development being in both the intermix and interface, the applicant will be required to complete a wildland fire hazard assessment."*

Response: The team is engaging a consultant to complete this study which will be provided at a later date.

Comment 4. *"An additional fire hydrant should be located in the area of Building 1, preferably between the entrance to the parking garage and parking lot."*

Response: A fire hydrant has been added to the area between the entrance to the parking garage and parking lot.

Comment 5. *"This proposed development will require a new street name."*

Response: Street names presented for City consideration previously in this letter consist of (1) Brickyard Lane, (2) Red Brick Way, or (3) Densmore Lane.

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August 7, 2024
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Tree Advisory Board - Andrew Garthwaite - Haynes & Garthwaite Architects (6/19/2024)

Comment 1. *"The repeat the early comment about increasing the diversity of species and recommend little leaf lindens, sycamores and additional species. Too many maples have been planted in Lebanon (per A.J DuPere the state urban forester.)."*

Response: Species proposed on the planting plan have been diversified to the extent practicable while still providing native, common species that are appropriate for site conditions.

Comment 2. *"It is also recommended that exposure be considered so that the trees are placed as much as possible to shade the pavement. with south and west exposures particularly considered."*

Response: The planting plan has been developed to exceed the shading requirement set forth in the City's Zoning Ordinance.

Heritage Commission Comment - Nicole Ford Burley (7/1/2024)

Comment 1. *"What research has been conducted into the history and cultural significance of the site? The Commission is pleased to see that in the current plan, two kilns will be preserved, but we would like further information about how the kilns were evaluated, what historic assessment was conducted on the site, and what will be done to document the site before it is demolished. Has the Chandler Cabins site been evaluated for its historical and cultural significance? What assessment has been conducted on the cabins?"*

Response: The project is subject to regulatory review by the Division of Historic Resources for potential impacts to historic resources. VHB's in-house architectural historians and Monadnock Archaeology are working with the development team, which will include research into the property and the surrounding area's history.

Comment 2. *"Is a preservation consultant on staff? Projects of this scale on historic properties routinely employ a preservation consultant to assess the site and advise the team on how to preserve and respect the historic and cultural significance of the site. Has a preservation consultant been hired, or will one be?"*

Response: VHB's in-house architectural historians will be working with the development team and providing feedback. The team's archaeology consultant will also be involved when needed.

Comment 3. *"Will the site be open to the public? The kilns and other historic elements of this site are significant parts of Lebanon's history and should be accessible to the public. Will the preserved structures be open to the public and accessible? Will they be part of a park or planned green space? What interpretative elements (e.g., signage, labels) will be included in these spaces?"*

Response: The Applicant is considering public access accommodations to view the kilns, though the kilns themselves are not expected to be made accessible to the public or residents of the development for preservation and security purposes. The proposed site improvements include a patio/overlook sitting area to offer views of the kilns from an elevated position at the top of the proposed retaining wall.

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Planning and Development – Plan Set Comments (6/18/2024)

Comment 1. *"Can a crosswalk be provided across Hanover Street at the northern access drive?"*

Response: The Applicant is currently exploring the ability to provide additional sidewalk and two new crosswalks across Hanover Street and Old Etna Road at the intersection.

Comment 2. *"Detail labels on plan sheets and detail sheets are inconsistent; for example (but not limited to) there is no detail of a "rain garden" or "bituminous sidewalk" – please be address throughout the plan set."*

Response: See updated sheet C7.1 for bituminous sidewalk detail. Rain garden callouts have been changed to bioretention ponds.

Comment 3. *"Provide sheet numbers (1,2,3,4, etc) in the lower right hand corner of all plan sheets with a prominent font size (see cover sheet comment re: table of contents)"*

Response: Consecutive sheet numbering has been added to the plan set.

"Please provide details of the following"

Comment 4. *"Driveway Canopy"*

Response: This is intended to be a simple roof over select sections of driveway where snow removal may be more difficult, and will be designed by the architect as building design advances.

Comment 5. *"R7-8 bollard mounted"*

Response: See the detail for bollard mounted sign on sheet C7.1 and sign chart on sheet 2.1.

Comment 6. *"R7-8 R7-8P bollard mounted"*

Response: See the detail for bollard mounted sign on sheet C7.1 and sign chart on sheet 2.1.

Comment 7. *"Decorative black metal fence"*

Response: See detail sheets for decorative black metal fence.

Comment 8. *"Proposed patio/overlook"*

Response: Exterior patios are expected to be an asphalt or masonry product, however the material and finish has not yet been selected. Upon selection, the relevant detail(s) will be added to the plan.

Comment 9. *"Are indoor handicap parking spaces needed? (might want on ice and snow days)"*

Response: Each building parking level proposes 2 ADA parking spaces. See updated architectural plans.

Comment 10. *"Change the title of "Sheet Index" to "Table of Contents" (Section 5.1.E)."*

Response: Updated on cover sheet.

Comment 11. *"Add sheet numbers (1, 2, 3, 4, etc)."*

Response: Added.

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Comment 12. *"Incorporate "reference drawings" into the TOC and provide sheet numbers."*

Response: Updated on cover sheet.

Comment 13. *"Parking summary chart contains multiple errors and typos."*

Response: Updated on cover sheet.

Comment 14. *"Identify RL-3 district as "Rural Lands (RL-3)."*

Response: Updated on cover sheet.

Comment 15. *"Change "flood zone A" to "floodplain district."*

Response: Updated on cover sheet.

Comment 16. *"Add "steep slopes" as an overlay district."*

Response: Updated on cover sheet.

Comment 17. *"Identify the unit mix"*

Response: The buildings will contain a mixture of studio, 1, 2 and 3 bedroom units with priority given to 3 bedroom units.

Comment 18. *Identify the use as a "474-unit multi-family Planned Unit Residential Development (PURD)"*

Response: Updated on cover sheet.

Comment 19. *"Add an asterisk after "maximum building height" and note that the proposed height is permitted by CUP per Section 308.4 of the ZO..."*

Response: Updated on cover sheet.

Comment 20. *"Identify maximum permitted building coverage."*

Response: The maximum building coverage for each zone has been provided in square feet as well, rather than just in percentages. See cover sheet.

Comment 21. *"Rework to clarify which zoning district the chart relates to and/or provide different charts for each zone..."*

Response: The requirements of each zoning district has been listed individually in the Zoning Chart on the cover sheet.

We hope that the responses provided herein are satisfactory. We are available to discuss further if helpful.

Sincerely,

Dave Fenstermacher, PE
Managing Director



Memorandum

To: Brian A. Vincent, PE
Lebanon City Engineer
Department of Public Works
193 Dartmouth College Highway
Lebanon, NH 03766

Date: August 2, 2024

Project #: 52933.00

From: Jason R. Plourde, PE, PTP
Dave Fenstermacher, PE

Re: Response to Traffic Comments
The Brickyard Residential Development
Lebanon, New Hampshire

Introduction

VHB prepared a May 2024 Traffic Impact Study to summarize the anticipated transportation impacts associated with the Lebanon Brickyard residential development to be located at 238 Hanover Street in Lebanon, New Hampshire. The scope of the traffic study was developed based on initial coordination efforts with City of Lebanon and Keach-Nordstrom Associates, Inc. (KNA) officials and at a December 1, 2023 traffic scoping meeting with City of Lebanon, New Hampshire Department of Transportation (NHDOT), and Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC) officials as well as WSP USA consultants on behalf of the NHDOT Bureau of Traffic. VHB also prepared site plans dated May 10, 2024, revised July 2, 2024 depicting proposed site improvements, sight distances, and vehicular and pedestrian accommodations.

Both the Traffic Impact Study and the site plans were submitted to the City of Lebanon Planning Department as part of a site plan review and conditional use permit application. Subsequently, Weston & Sampson conducted a review of those documents on behalf of the City of Lebanon and issued an August 1, 2024 peer review memorandum focused on the project's traffic-related elements. VHB has reviewed that document and prepared this letter to address the peer review comments. VHB appreciates the opportunity to provide clarification on these items.

Traffic Impact Study Comments

Comment 1a: The traffic study is expected to be sealed by the responsible professional engineer registered in the State of New Hampshire.

VHB Response: The final version of the Traffic Impact Study will be stamped, signed, and dated by a Professional Engineer licensed in the State of New Hampshire for the City and NHDOT records (see response to Comment 1h).

Comment 1b: Crash data was not collected for study intersections as would typically be required by NHDOT and industry standards. Please include an evaluation of crash data at the study area intersections.

VHB Response: The Traffic Impact Study was based on the agreed upon parameters established by City, NHDOT, UVLSRPC, and WSP officials at the traffic scoping meeting. A crash evaluation was neither requested nor required to be provided by local, state, or regional planning officials.



Comment 1c: The study indicates the proposed 474 apartments is anticipated to generate approximately 197 vehicle trips during the weekday morning peak hour, 185 vehicle trips during the weekday evening peak hour, and 191 vehicle trips during the Saturday midday peak hour. The projections were formulated using the standard practice of ITE methodologies, which has created formulas based on collected data from mid-rise multi-family housing complexes whose buildings comprise of four and ten stories.

VHB Response: The trip-generation methodology was presented and accepted at the traffic scoping meeting. No further response is anticipated to be required.

Comment 1d: The trip distribution applied to the project trips appears to indicate that all traffic to/from the south will use the south driveway and Evans Drive. It is expected that some drivers going to/from the site would prefer to use the north driveway, either because their apartment is closer to the north driveway or if the driver prefers to make a left turn from Route 120 at Heater Road which provides a signalized, protected phase.

VHB Response: The trip-distribution methodology was presented and accepted at the traffic scoping meeting. No further response is anticipated to be required.

Comment 1e: The eastbound left turn movement at the intersection of Route 120 and Old Etna Road operates at LOS F during the Existing AM peak hour and is over capacity during the 2025 No-Build AM peak hour. The study indicates that NHDOT is formulating improvements to the intersection and the study analyzed an additional lane in all approaches in 2035. Was this lane configuration dictated by NHDOT? Is there a feasible alternative that could mitigate the intersection?

VHB Response: As stated by NHDOT officials at the traffic scoping meeting, operational constraints currently exist along the NH Route 120 corridor and NHDOT officials are in the process of evaluating design alternatives between Hanover Street and Old Etna Road/Etna Road (Lebanon 29612). Since a preferred alternative had not been determined, NHDOT officials recommended that the proposed geometry identified in Alternative 1 (presented at the November 16, 2022 Project Advisory Committee meeting) be considered to be in place under the 2035 traffic-volume conditions (opening year plus 10 years) of the Traffic Impact Study. Accordingly, the lane configurations from Alternative 1 were included within the 2035 traffic conditions.

Comment 1f: At the intersection of Route 120 and Evans Drive, the northbound left turn is overcapacity in 2025 No Build AM and PM peak hours, and the eastbound right turn is over capacity in the 2025 No Build PM peak hour and becomes overcapacity in the 2025 Build AM peak hour. In 2035 the eastbound left turn is restricted and third through lanes are added to Route 120, but the turn movements are still over capacity. Is there a feasible mitigation for the intersection?

VHB Response: NHDOT officials are evaluating different improvements along the NH Route 120 corridor that include the NH Route 120 and Evans Drive intersection.



Comment 1g: The proposed north driveway intersects Hanover Street near but not at Old Etna Road. If possible with the adjacency of the pond, please align the driveway with the existing intersection and consider all-way stop control for improved pedestrian crossings. Can Old Etna Road be realigned within the existing right-of way to slope more perpendicular into Hanover Street? The town [sic] has expressed concern about the non-perpendicular intersection, the increase in southbound left turns, and school children on Hanover Street.

VHB Response: Based on discussions with City of Lebanon and KNA officials, consideration was previously provided in constructing the northern site driveway across from Old Etna Road but was not pursued due to wetland concerns along the west side of Hanover Street. In addition, the consideration of placing the existing Hanover Street and Old Etna Road intersection under All-Way Stop-Control was discussed with City of Lebanon and KNA officials and determined not to be desirable due to a right-turn movement from Old Etna Road (onto Hanover Street northbound) that may conflict with a stopped vehicle on the Hanover Street southbound approach. Further, preliminary review of geographic information system (GIS) data showed that the property lines for 237 Hanover Street (property located on the northeast corner of the intersection) would limit the ability of realigning the Old Etna Road leg without land acquisition.

Comment 1h: A sentence on pages 33 and 64 reads "... standard traffic engineering practice suggests that the proposed development would not be expected to result in noticeable impacts to the area roadway system beyond the southern driveway." A prior sentence reads "Common traffic engineering practice suggests that a development may have a significant impact if the addition of site trips increases traffic volumes at an intersection by 100 vehicles per hour or more." Given that the traffic study documented projected traffic impacts, recommend removing the inference to avoid reader confusion.

VHB Response: VHB will make a modification to the Traffic Impact Study and submit a final copy for the City's records that will be stamped, signed, and dated by a Professional Engineer licensed in the State of New Hampshire.

Site Plan Comments

Comment 2a: Sheets C2.1 and C2.3 call out sight distance lines with measurements of 300'. Add text or new callouts to remove shrubbery/trees within the sight triangle. Also, correct callouts' text from 155' to 300'.

VHB Response: The noted sheets have been updated to address those items.

Comment 2b: Please provide truck turning templates for the city's Fire Truck, a trash truck and a WB-67 to enter/exit both driveways from all directions and circulate within the site.

VHB Response: Truck turning templates for the city's Fire Truck, Garbage Truck, and WB-50 truck have been added to the Site Plans, see sheets C9.1-C9.3. A WB-50 truck is the largest common AASHTO design vehicle that the site layout fully accommodates, and it is larger than the trucks expected to enter the development. WB-67s are not expected to enter the development, however, the site layout will accommodate a WB-67 with the exception of the intersections of site driveways and Hanover Street, where the trailer may track over the curb.



Comment 2c: Please verify that pedestrian ramps for sidewalks at crosswalks or across driveways within the site have been provided per ADA requirements as it appears some were not detailed or labeled (i.e. driveway to maintenance building).

VHB Response: The Site plans have been updated to label accessible curb ramp locations and type. In some locations where sidewalks are not following along a curbline, a blended transition may be used in place of an accessible curb ramp.

Comment 2d: Extend sidewalk along the west side of Hanover Street from the north driveway south to Old Etna Street and add a crosswalk(s) and ADA ramps as required across Hanover Street connecting to the existing sidewalk on Old Etna Street. This will provide a pedestrian connection from the site to the existing bus stop on Heater Road.

VHB Response: The Applicant and VHB are currently exploring the ability to provide an additional sidewalk and two new crosswalks across Hanover Street and Old Etna Road at their intersection.

vhb.com



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Wetland Scientist (Goddard)
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Suite 8
Northborough, MA 01532

Site Plans

Issued for	Permitting
Date Issued	May 10, 2024
Latest Issue	August 6, 2024

The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766
Grafton County

Owner/Applicant

Brickyard One Nominee Trust
Richard M. Marchese, Trustee
P.O. Box 720, Middleton, MA 01949

Assessor's Map/Lot:

Map 48 Lots 01, 02, & 04
Map 63 Lot 01

Parking Requirements:					
DWELLING, APARTMENT, ONE BEDROOM AND UP	474 UNITS	x	1.5 SPACES	/	1 UNIT = 711 SPACES
TOTAL PARKING REQUIRED					= 711 SPACES
MAXIMUM PARKING ALLOWED (120% OF REQUIRED)					= 863 SPACES

Bicycle Parking Requirements:					
SHORT TERM PARKING	474 UNITS	x	0.15 SPACES	/	1 UNIT = 71 SPACES
TOTAL PARKING REQUIRED					= 213 SPACES

Parking Summary Chart

Description	Size		Spaces	
	Required	Provided	Required	Provided
STANDARD SPACES	9 x 18	9 x 18*	9	76
EVSE-INSTALLED PARKING SPACES**	9 x 18	9 x 18	40	40**
EV-READY PARKING SPACES***	9 x 18	9 x 18	158	158***
EV-CAPABLE PARKING SPACES****	9 x 18	9 x 18	512	513****
TOTAL SPACES			719	787
TOTAL ACCESSIBLE SPACES*****	9 x 18	9 x 18	14	31
VAN ACCESSIBLE SPACES*****	8 x 18	9 x 18	2	11
LOADING BAYS			0	0

* 8 x 18 SPACES BELOW BUILDINGS REQUESTED AS ALTERNATE PARKING DESIGN PER SECTION 6.5.6(C) OF THE SITE PLAN REVIEW REGULATIONS.
** 40 SPACES LOCATED EXTERNALLY, 0 INTERNALLY
*** 125 SPACES LOCATED EXTERNALLY, 33 INTERNALLY
**** 64 SPACES LOCATED EXTERNALLY, 449 INTERNALLY
***** ADA/STATE/LOCAL REQUIREMENTS
***** INCLUDES 2 ACCESSIBLE STALLS BELOW EACH APARTMENT BUILDING

Bicycle Parking Summary Chart

Description	Spaces	
	Required	Provided
SHORT TERM SPACES	71	80
LONG TERM SPACES	142	142
TOTAL SPACES	213	222



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3	C1.2	Open Space Plan	August 6, 2024	
4	C1.3	Access and Circulation Plan	August 6, 2024	
5	C1.4	Overall Site Plan	August 6, 2024	
6	C2.0	Overall Layout and Materials Plan	August 6, 2024	
7	C2.1	Layout and Materials Plan 1	August 6, 2024	
8	C2.2	Layout and Materials Plan 2	August 6, 2024	
9	C2.3	Layout and Materials Plan 3	August 6, 2024	
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26	C7.2	Site Details 2	August 6, 2024	
27	C7.3	Site Details 3	August 6, 2024	
28	C7.4	Site Details 4	August 6, 2024	
29	C7.5	Site Details 5	August 6, 2024	
30	C8.1	Phasing Plan 1	August 6, 2024	
31	C8.2	Phasing Plan 2	August 6, 2024	
32	C8.3	Phasing Plan 3	August 6, 2024	
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42	Sv-2	Existing Conditions Plan of Land	August 6, 2024	
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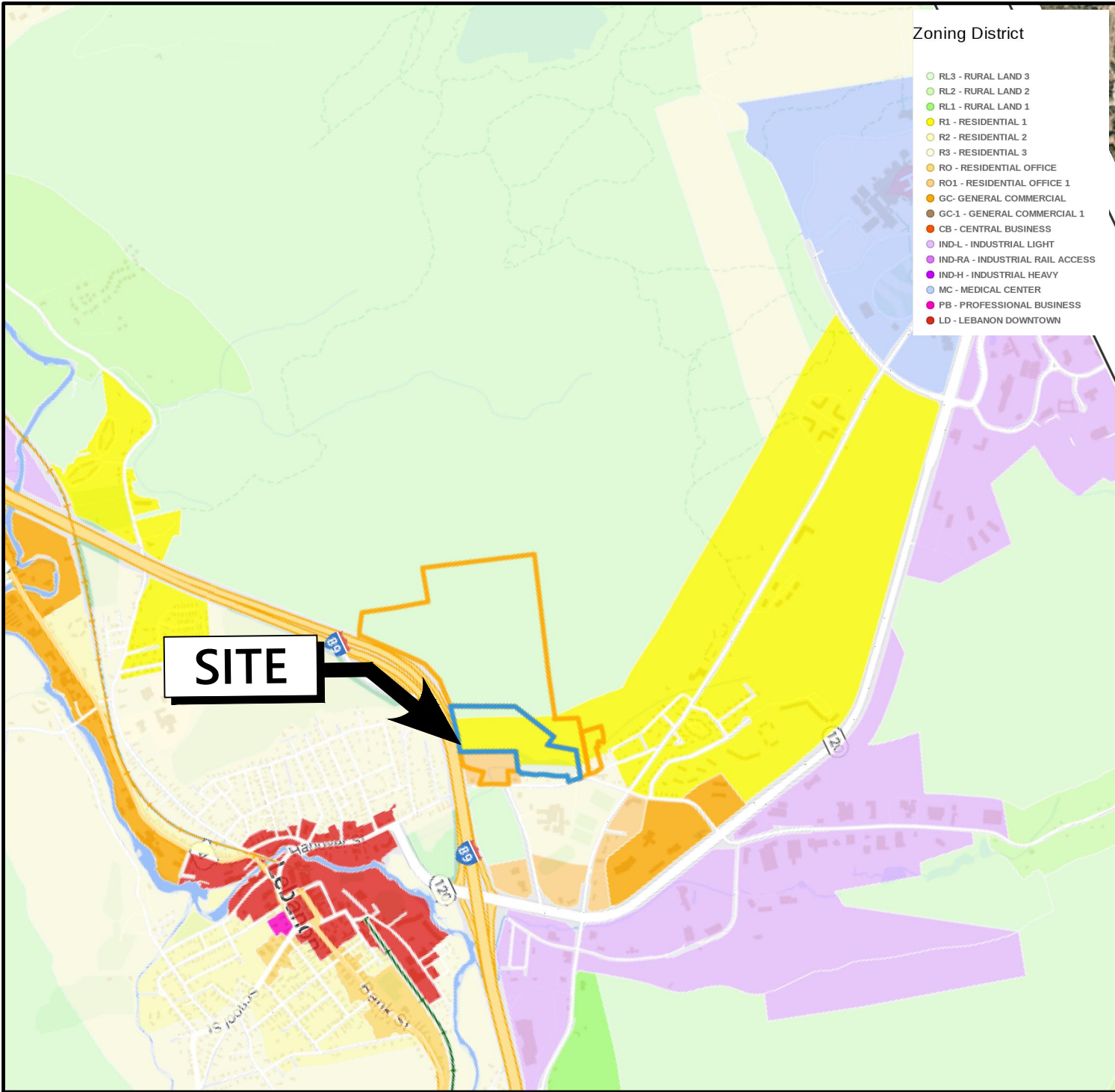


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49	0089-1204	Building 6 Proposed Plan & Elevations	August 2, 2024	
50	0089-1205	Building 7-10 Proposed Plan & Elevations	August 2, 2024	

Zoning Summary Chart

Zoning Districts: Residential 1 (R-1), Residential 3 (R-3), Residential-Office-1 (R-O-1), Rural Lands 3 (RL-3)

Overlay District: Floodplain District, Wetlands Conservation District, Steep Slopes

Use: 474-unit multi-family Planned Unit Residential Development (PURD)

Tax Map & Lot #: 48-01, 48-02, 48-04, & 63-01

Zoning Regulation Requirements	Required (PURD)	Required (R-1)	Required (R-3)	Required (R-O-1)	Required (RL-3)	Provided
MINIMUM LOT AREA	28.5 Acres	0.2 Acres	0.2 Acres	0.2 Acres	10.0 Acres	126.3 Acres
FRONTAGE	20.0 Feet	NA	NA	NA	20.0 Feet	932.0 Feet
FRONT YARD SETBACK	20 Feet	20 Feet	20 Feet	20 Feet	50 Feet	21 Feet
SIDE YARD SETBACK	15 Feet	15 Feet	15 Feet	15 Feet	50 Feet	58 Feet
REAR YARD SETBACK	20 Feet	20 Feet	20 Feet	20 Feet	50 Feet	56 Feet
MINIMUM LOT WIDTH	75 Feet	75 Feet	75 Feet	75 Feet	NA	932 Feet
MAXIMUM BUILDING HEIGHT*	55 Feet	55 Feet	35	45 Feet	35 Feet	55 Feet
MAXIMUM BUILDING COVERAGE	25.0 %	25.0 %	25.0 %	25.0 %	1.0 %	13.3 %
MAXIMUM BUILDING COVERAGE	1,375,407 SF	1,375,407 SF	1,375,407 SF	1,375,407 SF	55,016 SF	164,950 SF
GROSS FLOOR AREA	N/A	N/A	N/A	N/A	N/A	655,000 SF
IMPERVIOUS COVERAGE	N/A	N/A	N/A	N/A	N/A	403,365 SF (32.5%)
USE	N/A	N/A	N/A	N/A	N/A	Planned Unit Residential Development (PURD)

* Proposed height is permitted by CUP per section 308.4 of the City of Lebanon, New Hampshire Zoning Ordinance last amended April 3, 2024

PURD Calculations

SEE PURD DENSITY AND PURD CALCULATION EXHIBITS UNDER SEPARATE COVER

Zone	Buildable Area (SF)*	/	Permitted Dwelling Units
RESIDENTIAL 1 (R-1)	989,956	3,000	330.0
RESIDENTIAL-OFFICE-1 (R-O-1)	249,920	3,000	83.3
RESIDENTIAL 3 (R-3)	81,820	10,000	8.2
1 PER 10,000*	20,000	10,000	2.0
SUBTOTAL	1,239,876		423
12% BONUS***			51
*TOTAL (INCLUDES 12% BONUS)			474

* FOR THE PURD CALCULATIONS THE RL-3 ZONE (97.8 ACRES) HAS BEEN EXCLUDED, AREA RESERVED FOR POTENTIAL FUTURE BUILDOUT.
** FIRST 10,000 SQUARE FEET OF ZONE R-1 SUBTRACTED FROM TOTAL SQUARE FOOTAGE.
*** 12% BONUS PERMITTED THROUGH APPROVAL BY PLANNING BOARD.

Open Space Calculations

Zone*	Total Area (SF)	% Required	Open Space Required
RESIDENTIAL 1 (R-1)	1,252,605	30	375,782 SF
RESIDENTIAL-OFFICE-1 (R-O-1)	286,532	30	85,960 SF
RESIDENTIAL 3 (R-3)	123,849	50	61,925 SF
TOTAL OPEN SPACE REQUIRED			523,666 SF

* THE RL-3 ZONE HAS BEEN EXCLUDED FROM THE PURD CALCULATIONS, AREA RESERVED FOR POTENTIAL FUTURE BUILDOUT

Legend

Exist.	Prop.		Exist.	Prop.	
		PROPERTY LINE			CONCRETE
		PROJECT LIMIT LINE			HEAVY DUTY PAVEMENT
		RIGHT-OF-WAY/PROPERTY LINE			BUILDINGS
		EASEMENT			RIPRAP
		BUILDING SETBACK			CONSTRUCTION EXIT
		PARKING SETBACK			
		BASELINE	27.35 TC x	27.35 TC x	TOP OF CURB ELEVATION
		CONSTRUCTION LAYOUT	26.85 BC x	26.85 BC x	BOTTOM OF CURB ELEVATION
		ZONING LINE	132.75 x	132.75 x	SPOT ELEVATION
		TOWN LINE	45.0 TW x	45.0 TW x	TOP & BOTTOM OF WALL ELEVATION
			38.5 BW	38.5 BW	BORING LOCATION
		LIMIT OF DISTURBANCE			TEST PIT LOCATION
		WETLAND LINE WITH FLAG			MONITORING WELL
		FLOODPLAIN			
		BORDERING LAND SUBJECT TO FLOODING			UNDERDRAIN
		WETLAND BUFFER ZONE			DRAIN
		NO DISTURB ZONE			ROOF DRAIN
		200' RIVERFRONT AREA			SEWER
					FORCE MAIN
		GRAVEL ROAD			OVERHEAD WIRE
		EDGE OF PAVEMENT			WATER
		BITUMINOUS BERM			FIRE PROTECTION
		BITUMINOUS CURB			DOMESTIC WATER
		CONCRETE CURB			GAS
		CURB AND GUTTER			ELECTRIC
		EXTRUDED CONCRETE CURB			STEAM
		MONOLITHIC CONCRETE CURB			TELEPHONE
		PRECAST CONC. CURB			FIRE ALARM
		SLOPED GRAN. EDGING			CABLE TV
		VERT. GRAN. CURB			
		LIMIT OF CURB TYPE			CATCH BASIN CONCENTRIC
		SAWCUT			CATCH BASIN ECCENTRIC
		BUILDING			DOUBLE CATCH BASIN CONCENTRIC
		BUILDING ENTRANCE			DOUBLE CATCH BASIN ECCENTRIC
		LOADING DOCK			GUTTER INLET
		BOLLARD			DRAIN MANHOLE CONCENTRIC
		DUMPSTER PAD			DRAIN MANHOLE ECCENTRIC
		SIGN			TRENCH DRAIN
		DOUBLE SIGN			PLUG OR CAP
		STEEL GUARDRAIL			CLEANOUT
		WOOD GUARDRAIL			FLARED END SECTION
					HEADWALL
		PATH			SEWER MANHOLE CONCENTRIC
		APPROXIMATE LIMIT OF CLEARING			SEWER MANHOLE ECCENTRIC
		WIRE FENCE			CURB STOP & BOX
		FENCE			WATER VALVE & BOX
		STOCKADE FENCE			TAPPING SLEEVE, VALVE & BOX
		STONE WALL			FIRE DEPARTMENT CONNECTION
		RETAINING WALL			FIRE HYDRANT
		STREAM / POND / WATER COURSE			WATER METER
		DETENTION BASIN			POST INDICATOR VALVE
		HAY BALES			WATER WELL
		SILT FENCE			GAS GATE
		SILT SOCK / STRAW WATTLE			GAS METER
		MINOR CONTOUR			ELECTRIC MANHOLE
		MAJOR CONTOUR			ELECTRIC METER
		PARKING COUNT			LIGHT POLE
		COMPACT PARKING STALLS			TELEPHONE MANHOLE
		DOUBLE YELLOW LINE			TRANSFORMER PAD
		STOP LINE			UTILITY POLE
		CROSSWALK			GUY POLE
		ACCESSIBLE CURB RAMP			GUY WIRE & ANCHOR
		ACCESSIBLE PARKING			HAND HOLE
		VAN-ACCESSIBLE PARKING			PULL BOX

Abbreviations

General	
ABAN	ABANDON
ACR	ACCESSIBLE CURB RAMP
ADJ	ADJUST
APPROX	APPROXIMATE
BIT	BITUMINOUS
BS	BOTTOM OF SLOPE
BWLL	BROKEN WHITE LANE LINE
CONC	CONCRETE
DYCL	DOUBLE YELLOW CENTER LINE
EL	ELEVATION
ELEV	ELEVATION
EVC	ELECTRIC VEHICLE CAPABLE PARKING SPACE
EVR	ELECTRIC VEHICLE READY PARKING SPACE
EX	EXISTING
FDN	FOUNDATION
FFE	FIRST FLOOR ELEVATION
GRAN	GRANITE
GFE	GARAGE FLOOR ELEVATION
GTD	GRADE TO DRAIN
LA	LANDSCAPE AREA
LOD	LIMIT OF DISTURBANCE
MAX	MAXIMUM
MIN	MINIMUM
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
PERF	PERFORATED
PROP	PROPOSED
REM	REMOVE
RET	RETAIN
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
SWEL	SOLID WHITE EDGE LINE
SWLL	SOLID WHITE LANE LINE
TS	TOP OF SLOPE
TYP	TYPICAL
Utility	
AD	AREA DRAIN
CB	CATCH BASIN
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
DCB	DOUBLE CATCH BASIN
DMH	DRAIN MANHOLE
CIP	CAST IRON PIPE
COND	CONDUIT
DIP	DUCTILE IRON PIPE
DW	DRYWELL
FA	FIRE ALARM
FES	FLARED END SECTION
FM	FORCE MAIN
F&G	FRAME AND GRATE
F&C	FRAME AND COVER
GI	GUTTER INLET
GT	GREASE TRAP
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HH	HANDHOLE
HW	HEADWALL
HYD	HYDRANT
INV	INVERT ELEVATION
I=	INVERT ELEVATION
LP	LIGHT POLE
MES	METAL END SECTION
PIV	POST INDICATOR VALVE
PWW	PAVED WATER WAY
PVC	POLYVINYLCHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
R=	RIM ELEVATION
RIM=	RIM ELEVATION
SMH	SEWER MANHOLE
TSV	TAPPING SLEEVE, VALVE AND BOX
UG	UNDERGROUND
UGE/T	UNDERGROUND ELECTRIC/TELECOM
UP	UTILITY POLE

Notes

General

1. THE PURPOSE OF THESE SITE PLANS ARE TO SHOW A PROPOSED SITE DESIGN FOR THE PERMITTING OF A MULTI-FAMILY RESIDENTIAL PROJECT.
2. CONTRACTOR SHALL NOTIFY "DIG-SAFE" (1-888-344-7233) AT LEAST 72 HOURS BEFORE EXCAVATING.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
4. ACCESSIBLE ROUTES, PARKING SPACES, RAMPS, SIDEWALKS AND WALKWAYS SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE FEDERAL AMERICANS WITH DISABILITIES ACT AND WITH STATE AND LOCAL LAWS AND REGULATIONS (WHICHEVER ARE MORE STRINGENT).
5. AREAS DISTURBED DURING CONSTRUCTION AND NOT RESTORED WITH IMPERVIOUS SURFACES (BUILDINGS, PAVEMENTS, WALKS, ETC.) SHALL RECEIVE 6-INCHES LOAM AND SEED.
6. WITHIN THE LIMITS OF THE BUILDING FOOTPRINT, THE SITE CONTRACTOR SHALL PERFORM EARTHWORK OPERATIONS REQUIRED UP TO SUBGRADE ELEVATIONS.
7. WORK WITHIN THE LOCAL RIGHTS-OF-WAY SHALL CONFORM TO LOCAL MUNICIPAL STANDARDS, WORK WITHIN STATE RIGHTS-OF-WAY SHALL CONFORM TO THE LATEST EDITION OF THE STATE HIGHWAY DEPARTMENTS STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
8. UPON AWARD OF CONTRACT, CONTRACTOR SHALL MAKE NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK INDICATED ON THE DRAWINGS, IN THE SPECIFICATIONS, AND IN THE CONTRACT DOCUMENTS. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, AND FIRE HYDRANTS, WITHOUT APPROPRIATE PERMITS.
9. TRAFFIC SIGNAGE AND PAVEMENT MARKINGS SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
10. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
11. IN THE EVENT THAT SUSPECTED CONTAMINATED SOIL, GROUNDWATER, AND OTHER MEDIA ARE ENCOUNTERED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES BASED ON VISUAL, OLFACTORY, OR OTHER EVIDENCE, THE CONTRACTOR SHALL STOP WORK IN THE VICINITY OF THE SUSPECT MATERIAL TO AVOID FURTHER SPREADING OF THE MATERIAL, AND SHALL NOTIFY THE OWNER IMMEDIATELY SO THAT THE APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN.
12. CONTRACTOR SHALL PREVENT DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE AND SHALL BE RESPONSIBLE FOR CLEANUP, REPAIRS AND CORRECTIVE ACTION IF SUCH OCCURS.
13. DAMAGE RESULTING FROM CONSTRUCTION LOADS AND ACTIVITIES SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO OWNER.
14. CONTRACTOR SHALL CONTROL STORMWATER RUNOFF DURING CONSTRUCTION TO PREVENT ADVERSE IMPACTS TO OFF SITE AREAS, AND SHALL BE RESPONSIBLE TO REPAIR RESULTING DAMAGES, IF ANY, AT NO COST TO OWNER.
15. THIS PROJECT DISTURBS MORE THAN ONE ACRE OF LAND AND FALLS WITHIN THE NPDES CONSTRUCTION GENERAL PERMIT (CGP PROGRAM AND EPA JURISDICTION). PRIOR TO THE START OF CONSTRUCTION CONTRACTOR IS TO FILE A CGP NOTICE OF INTENT WITH THE EPA AND PREPARE A STORMWATER POLLUTION PREVENTION PLAN IN ACCORDANCE WITH THE NPDES REGULATIONS. CONTRACTOR SHALL CONFIRM THE PLAN HAS ALSO FILED A NOTICE OF INTENT WITH THE EPA.
16. SNOW STORAGE LOCATIONS SHOWN ON LAYOUT AND MATERIALS PLAN. FUTURE SNOW REMOVAL AT THE FACILITY WILL FOLLOW THE CURRENT SNOW MANAGEMENT PLAN TO REMOVE SNOW TO REMOTE LOCATIONS AS NECESSARY.
17. TREE CLEARING SHALL NOT BE CONDUCTED DURING JUNE 1 TO JULY 31 IN ORDER TO MINIMIZE ADVERSE IMPACTS TO THE NORTHERN LONG EARED BAT.
18. CONTRACTOR TO FOLLOW STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (NHDOT) AND GUIDE FOR THE DEVELOPMENT OF BICYCLE FACILITIES (AASHTO) FOR CONSTRUCTIONS STANDARDS,

Utilities

1. THE UTILITY COMPANIES SERVICING THE PROJECT AREA ARE:

A. WATER: CITY OF LEBANON
B. SEWER: CITY OF LEBANON
C. ELECTRIC: LIBERTY UTILITIES
D. TELEPHONE: CONSOLIDATED COMMUNICATIONS
E. CABLE TV: COMCAST
F. GAS: NONE

2. THE LOCATIONS, SIZES, AND TYPES OF EXISTING UTILITIES ARE SHOWN AS AN APPROXIMATE REPRESENTATION ONLY. THE OWNER OR ITS REPRESENTATIVE(S) HAVE NOT INDEPENDENTLY VERIFIED THIS INFORMATION AS SHOWN ON THE PLANS. THE UTILITY INFORMATION SHOWN DOES NOT GUARANTEE THE ACTUAL EXISTENCE, SERVICEABILITY, OR OTHER DATA CONCERNING THE UTILITIES, NOR DOES IT GUARANTEE AGAINST THE POSSIBILITY THAT ADDITIONAL UTILITIES MAY BE PRESENT THAT ARE NOT SHOWN ON THE PLANS. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY AND DETERMINE THE EXACT LOCATIONS, SIZES, AND ELEVATIONS OF THE POINTS OF CONNECTIONS TO EXISTING UTILITIES AND, SHALL CONFIRM THAT THERE ARE NO INTERFERENCES WITH EXISTING UTILITIES AND THE PROPOSED UTILITY ROUTES, INCLUDING ROUTES WITHIN THE PUBLIC RIGHTS OF WAY.
3. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, OR EXISTING CONDITIONS DIFFER FROM THOSE SHOWN SUCH THAT THE WORK CANNOT BE COMPLETED AS INTENDED, THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED IN WRITING TO THE OWNER'S REPRESENTATIVE FOR THE RESOLUTION OF THE CONFLICT AND CONTRACTOR'S FAILURE TO NOTIFY PRIOR TO PERFORMING ADDITIONAL WORK RELEASES OWNER FROM OBLIGATIONS FOR ADDITIONAL PAYMENTS WHICH OTHERWISE MAY BE WARRANTED TO RESOLVE THE CONFLICT. COORDINATE WITH CITY OF LEBANON FOR PUBLIC UTILITY INSTALLATION AND CONNECTION.
4. SET CATCH BASIN RIMS, AND INVERTS OF SEWERS, DRAINS, AND DITCHES IN ACCORDANCE WITH ELEVATIONS ON THE GRADING AND UTILITY PLANS.
5. RIM ELEVATIONS FOR DRAIN AND SEWER MANHOLES, WATER VALVE COVERS, GAS GATES, ELECTRIC AND TELEPHONE PULL BOXES, AND MANHOLES, AND OTHER SUCH ITEMS, ARE APPROXIMATE AND SHALL BE SET/RESET AS FOLLOWS:
 - A. PAVEMENTS AND CONCRETE SURFACES: FLUSH
 - B. ALL SURFACES ABOVE ACCESSIBLE ROUTES: FLUSH
 - C. LANDSCAPE, LOAM AND SEED, AND OTHER EARTH SURFACE AREAS: ONE INCH ABOVE SURROUNDING AREA AND TAPER EITHER TO THE RIM ELEVATION.
6. THE LOCATION, SIZE, DEPTH, AND SPECIFICATIONS FOR CONSTRUCTION OF PROPOSED PRIVATE UTILITY SERVICES SHALL BE INSTALLED ACCORDING TO THE REQUIREMENTS PROVIDED BY, AND APPROVED BY, THE RESPECTIVE UTILITY COMPANY (GAS, TELEPHONE, ELECTRIC, FIRE ALARM, ETC.). FINAL DESIGN LOADS AND LOCATIONS TO BE COORDINATED WITH OWNER AND ARCHITECT. COORDINATE WITH CITY OF LEBANON FOR PUBLIC UTILITY INSTALLATION AND CONNECTION.
7. CONTRACTOR SHALL MAKE ARRANGEMENTS FOR AND SHALL BE RESPONSIBLE FOR PAYING FEES FOR POLE RELOCATION AND FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE, FIRE ALARM, AND ANY OTHER PRIVATE UTILITIES, WHETHER WORK IS PERFORMED BY CONTRACTOR OR BY THE UTILITIES COMPANY.
8. UTILITY PIPE MATERIALS SHALL AS FOLLOWS, UNLESS OTHERWISE NOTED ON THE PLAN:

UTILITY PIPE MATERIALS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED ON THE PLAN:

- A. WATER PIPES SHALL BE CEMENT LINED DUCTILE IRON CLASS 52.
- B. SANITARY SEWER PIPES SHALL BE POLYVINYL CHLORIDE (PVC) SEWER PIPE SDR 35.
- C. STORM DRAINAGE PIPES SHALL BE SMOOTH INTERIOR DUAL WALL HIGH DENSITY POLYETHYLENE (HDPE).

8. CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR AND SHALL FURNISH EXCAVATION, INSTALLATION, AND BACKFILL OF ELECTRICAL FURNISHED SITEWORK RELATED ITEMS SUCH AS PULL BOXES, CONDUITS, CEMENT CASKS, LIGHT POLE BASES, AND CONCRETE PADS. SITE CONTRACTOR SHALL INDICATE CONCRETE CEMENTATION OF DUCT BANKS IF REQUIRED BY THE UTILITY COMPANY AND AS INDICATED ON THE DRAWINGS.
9. CONTRACTOR SHALL EXCAVATE AND BACKFILL TRENCHES FOR GAS IN ACCORDANCE WITH GAS COMPANY'S REQUIREMENTS.
10. ALL DRAINAGE AND SANITARY STRUCTURE INTERIOR DIAMETERS (4" MIN) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS AND LOCAL MUNICIPAL STANDARDS. FOR MANHOLES THAT ARE 20 FEET IN DEPTH AND GREATER, THE MINIMUM DIAMETER SHALL BE 5 FEET.
11. CONTRACTOR TO NOTIFY ENGINEER IN ADVANCE OF ANY INSTALLATION OF UNDERGROUND DETENTION, INFILTRATION OR FILTERING SYSTEMS. A LETTER SIGNING BY A QUALIFIED ENGINEER MUST BE PROVIDED TO DES STATING THAT THE INDIVIDUAL OBSERVED ANY UNDERGROUND DETENTION, INFILTRATION, OR FILTERING SYSTEMS PRIOR TO CONSTRUCTION AND FURTHER, IN CONFORMER PROFESSIONAL OPINION, THE SYSTEM(S) CONFORM TO THE APPROVED PLANS AND SPECIFICATIONS.

Layout and Materials

1. DIMENSIONS ARE FROM THE FACE OF CURB, FACE OF BUILDING, FACE OF WALL, AND CENTER LINE OF PAVEMENT MARKINGS, UNLESS OTHERWISE NOTED.
2. CURB RADII ARE 3 FEET UNLESS OTHERWISE NOTED.
3. CURBING SHALL BE PRECAST CONCRETE (PCC) WITHIN THE SITE UNLESS OTHERWISE INDICATED ON THE PLANS.
4. SEE ARCHITECTURAL DRAWINGS FOR EXACT BUILDING DIMENSIONS AND DETAILS CONTIGUOUS TO THE BUILDING, INCLUDING BUILDING ENTRANCES, UTILITY PENETRATIONS, CONCRETE DOOR PADS, COMPACTOR PAD, LOADING DOCKS, BOLLARDS, ETC.
5. PROPOSED BOUNDS AND ANY EXISTING PROPERTY LINE MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A LICENSED LAND SURVEYOR (LLS).
6. PRIOR TO START OF CONSTRUCTION, CONTRACTOR SHALL VERIFY EXISTING PAVEMENT ELEVATIONS AT INTERFACE WITH PROPOSED PAVEMENTS, AND EXISTING GROUND ELEVATIONS ADJACENT TO DRAINAGE OUTLETS TO ASSURE PROPER TRANSITIONS BETWEEN EXISTING AND PROPOSED FACILITIES.

Demolition

1. CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING MANMADE SURFACE FEATURES WITHIN THE LIMIT OF WORK INCLUDING BUILDINGS, STRUCTURES, PAVEMENTS, SLABS, CURBING, FENCES, UTILITY POLES, SIGNS, ETC. UNLESS INDICATED OTHERWISE ON THE DRAWINGS, REMOVE AND DISPOSE OF EXISTING UTILITIES, STRUCTURES, OR MATERIALS TO A MINIMUM DISTANCE OF 10 FEET BEYOND THE PROPOSED BUILDING FOOTPRINT INCLUDING REMOVAL COLUMNS.
2. EXISTING UTILITIES SHALL BE TERMINATED, UNLESS OTHERWISE NOTED, IN CONFORMANCE WITH LOCAL, STATE AND INDIVIDUAL UTILITY COMPANY STANDARD SPECIFICATIONS AND DETAILS. THE CONTRACTOR SHALL COORDINATE UTILITY SERVICE DISCONNECTS WITH THE UTILITY REPRESENTATIVES.
3. CONTRACTOR SHALL DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUTES.
4. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING THE DETAILED SCOPE OF DEMOLITION BEFORE SUBMITTING ITS BID/PROPOSAL. TO PERFORM THE WORK AND SHALL MAKE NO CLAIMS AND SEEK NO ADDITIONAL COMPENSATION FOR CHANGED CONDITIONS OR UNFORESEEN OR LATENT SITE CONDITIONS RELATIVE TO ANY CONDITIONS DISCOVERED DURING EXECUTION OF THE WORK.
5. UNLESS OTHERWISE SPECIFICALLY PROVIDED ON THE PLANS OR IN THE SPECIFICATIONS, THE ENGINEER HAS NOT PREPARED DESIGNS FOR AND SHALL HAVE NO RESPONSIBILITY FOR THE PRESENCE, DISCOVERY, REMOVAL, ABATEMENT OR DISPOSAL OF HAZARDOUS MATERIALS, TOXIC WASTES OR POLLUTANTS AT THE PROJECT SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE IDENTIFICATION, REMOVAL, ABATEMENT, AND DISPOSAL OF DEATH ARISING FROM THE PRESENCE OF HAZARDOUS MATERIAL AND CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS THE ENGINEER FROM ANY CLAIMS MADE IN CONNECTION THEREWITH; MOREOVER, THE ENGINEER SHALL HAVE NO ADMINISTRATIVE OBLIGATIONS OF ANY TYPE WITH REGARD TO ANY CONTRACTOR AVOIDING OR MINIMIZING THE ISSUES OF DISCOVERY, REMOVAL, ABATEMENT OR DISPOSAL OF ASBESTOS OR OTHER HAZARDOUS MATERIALS.

Existing Conditions Information

1. BASE PLAN: PROVIDED BY VHB, INC., DATED NOVEMBER, 2022. FIELD SURVEY OF PROJECT LOCUS PROVIDED BY VHB, IN SEPTEMBER THRU NOVEMBER, 2022.
2. TOPOGRAPHY: ELEVATIONS ARE BASED ON NAVD 1988.

Local Permits

1. NOTICE OF ACTION ISSUED BY THE PLANNING BOARD: PENDING
2. BUILDING PERMIT TO BE SUBMITTED.
3. WATER USE PERMIT TO BE SUBMITTED
4. SEWER USE PERMIT TO BE SUBMITTED

State Permits

1. NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES (NHDES) ALTERATION OF TERRAIN PERMIT AOT-TO BE SUBMITTED.
2. NHDES SEWER CONNECTION PERMIT TO BE SUBMITTED.
3. NHDES WETLANDS AND NON-SITE SPECIFIC PERMIT TO BE SUBMITTED.

Federal Permits

1. US EPA NPDES CONSTRUCTION GENERAL PERMIT (CGP) TO BE SUBMITTED

Document Use

1. THESE PLANS AND CORRESPONDING CAD DOCUMENTS ARE INSTRUMENTS OF PROFESSIONAL SERVICE, AND SHALL NOT BE USED, IN WHOLE OR IN PART, FOR ANY PURPOSE OTHER THAN FOR WHICH IT WAS CREATED WITHOUT THE EXPRESSED, WRITTEN CONSENT OF VHB. ANY UNAUTHORIZED USE, REUSE, MODIFICATION OR ALTERATION, INCLUDING AUTOMATIC CONVERSION OF THIS DOCUMENT SHALL BE AT THE USER'S SOLE RISK WITHOUT LIABILITY OR LEGAL EXPOSURE TO VHB.
2. CONTRACTOR SHALL NOT RELY SOLELY ON ELECTRONIC VERSIONS OF PLANS, SPECIFICATIONS, AND DATA FILES THAT ARE OBTAINED FROM THE DESIGNERS, BUT SHALL VERIFY LOCATION OF PROJECT FEATURES IN ACCORDANCE WITH THE PAPER COPIES OF THE PLANS AND SPECIFICATIONS THAT ARE SUPPLIED AS PART OF THE CONTRACT DOCUMENTS.
3. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SCALED TO THEIR ACTUAL DIMENSIONS OR LOCATIONS ON THE DRAWINGS. THE CONTRACTOR SHALL REFER TO THE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.

New Hampshire Fish and Game

1. ALL OBSERVATIONS OF THREATENED OR ENDANGERED SPECIES SHALL BE REPORTED IMMEDIATELY TO THE NEW HAMPSHIRE FISH AND GAME DEPARTMENT NONGAME AND ENDANGERED WILDLIFE ENVIRONMENTAL REVIEW PROGRAM BY PHONE AT 603-271-2461 AND BY EMAIL AT NHFGreiwew@wildlife.nh.gov. EMAIL SUBJECT LINE: **ENDANGERED SPECIES**
2. PHOTOGRAPHS OF THE OBSERVED SPECIES AND NEARBY ELEMENTS OF HABITAT OR AREAS OF LAND DISTURBANCE SHALL BE PROVIDED TO NHF&G IN DIGITAL FORMAT AT THE ABOVE EMAIL ADDRESS FOR VERIFICATION AS FEASIBLE.
3. IN THE EVENT A THREATENED OR ENDANGERED SPECIES IS OBSERVED ON THE PROJECT SITE DURING THE TERM OF THE PERMIT, THE SPECIES SHALL NOT BE DISTURBED, HANDLED, OR HARMED IN ANY WAY PRIOR TO CONSULTATION WITH NHF&G AND IMPLEMENTATION OF CORRECTIVE ACTIONS RECOMMENDED BY NHF&G, IF ANY. TO ENSURE THE PROJECT DOES NOT APPRECIABLY JEOPARDIZE THE CONTINUED EXISTENCE OF THREATENED AND ENDANGERED SPECIES AS DEFINED IN FS 1002.04.
4. THE NHF&G INCLUDING ITS EMPLOYEES AND AUTHORIZED AGENTS, SHALL HAVE ACCESS TO THE PROPERTY DURING THE TERM OF THE PERMIT.
5. ENV-WQ 1506.15 REQUIRES THAT:
 - 5.1. ALL MANUFACTURED EROSION AND SEDIMENT CONTROLS PRODUCTS, EXCEPT FOR SILT FENCE INSTALLED IN ACCORDANCE WITH ENV-WQ 1506.04, UTILIZED FOR, BUT NOT LIMITED TO, SLOPE PROTECTION, RUNOFF DIVERSION, SLOPE INTERRUPTION, PERIMETER CONTROL, INLET PROTECTION, CHECK DAMS, AND SEDIMENT TRAPS SHALL NOT CONTAIN WELDED PLASTIC, PLASTIC, OR MULTI-FILAMENT OR MONOFILAMENT POLYPROPYLENE NETTING OR MESH WITH AN OPENING SIZE OF GREATER THAN 1/8 INCH.
 - 5.2. TURF REINFORCEMENT MATS SHALL BE COVERED WITH SOIL TO PREVENT EXPOSURE OF THE MATS TO THE SURFACE.



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

The Brickyard Residential Development

**174 Hanover Street Extension
Lebanon, New Hampshire 03766**

No.	Revision	Date	Apprd.
1	Response to Comments Update	08/06/24	DF

Designed by	Checked by
TMD	MJV
Issued for	Date

Permitting May 10, 2024

Not Approved for Construction

Legend and General Notes

Drawing Number

C1.0

Sheet 1 of 50

Project Number
52933.00

52933.00



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

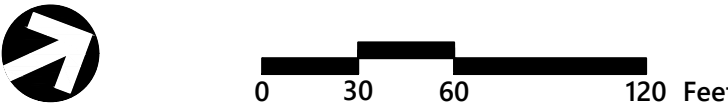
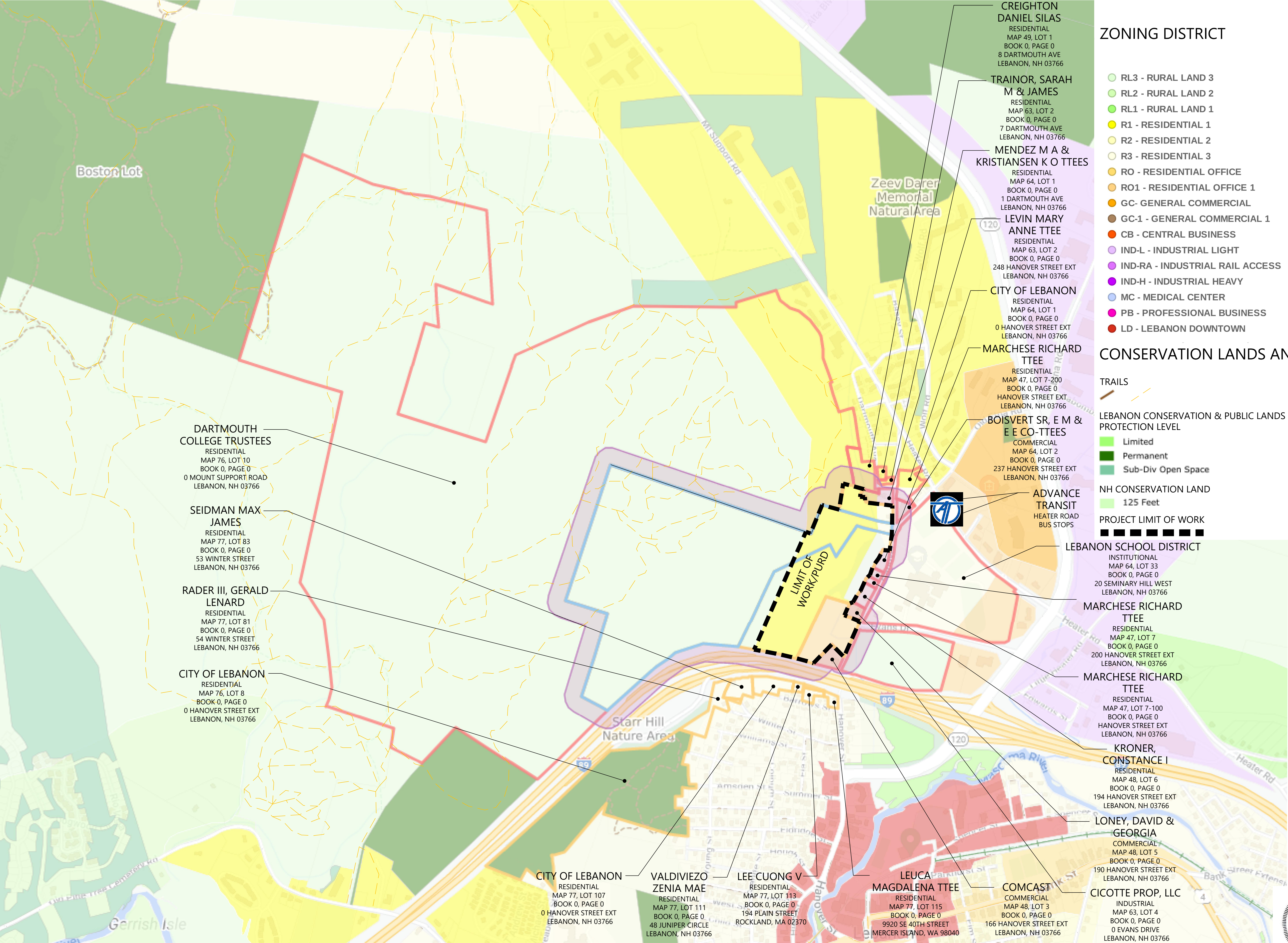
MAP THEME LEGENDS

ZONING DISTRICT

- RL3 - RURAL LAND 3
- RL2 - RURAL LAND 2
- RL1 - RURAL LAND 1
- R1 - RESIDENTIAL 1
- R2 - RESIDENTIAL 2
- R3 - RESIDENTIAL 3
- RO - RESIDENTIAL OFFICE
- RO1 - RESIDENTIAL OFFICE 1
- GC - GENERAL COMMERCIAL
- GC-1 - GENERAL COMMERCIAL 1
- CB - CENTRAL BUSINESS
- IND-L - INDUSTRIAL LIGHT
- IND-RA - INDUSTRIAL RAIL ACCESS
- IND-H - INDUSTRIAL HEAVY
- MC - MEDICAL CENTER
- PB - PROFESSIONAL BUSINESS
- LD - LEBANON DOWNTOWN

CONSERVATION LANDS AND TRAILS

- TRAILS
- LEBANON CONSERVATION & PUBLIC LANDS PROTECTION LEVEL
- Limited
 - Permanent
 - Sub-Div Open Space
- NH CONSERVATION LAND
- 125 Feet
- PROJECT LIMIT OF WORK
- ■ ■ ■ ■ ■ ■ ■



The Brickyard
Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

No.	Revision	Date	Appr'd
1	Completeness Review Comments	07/02/24	DF
2	Response to Comments Update	08/06/24	DF

Designed by TMD
Checked by MJV
Issued for Permitting
Date May 10, 2024

Not Approved for Construction
Drawing Title
Abutter and Zoning Plan



C1.1

Sheet 2 of 50



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

Open Space Calculations

Zone	Total Area (SF)	% Required	Open Space Required
RESIDENTIAL 1 (R-1)	1,252,605	30	375,782 SF (8.62 AC)
RESIDENTIAL-OFFICE-1 (R-O-1)	286,532	30	85,960 SF (1.97 AC)
RESIDENTIAL 3 (R-3)	123,849	50	61,925 SF (1.42 AC)
TOTAL OPEN SPACE REQUIRED			523,666 SF (12.02 AC)
TOTAL OPEN SPACE PROVIDED			523,666 SF (12.02 AC)

PROVIDED OPEN SPACE SHOULD MATCH OR SLIGHTLY EXCEED REQUIRED SO THAT IT IS NOT A FUTURE DEVELOPMENT LIMITATION.



0 40 80 160Feet

The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

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Open Space Plan



C1.2

Sheet 3 of 50

Project Number
52933.00

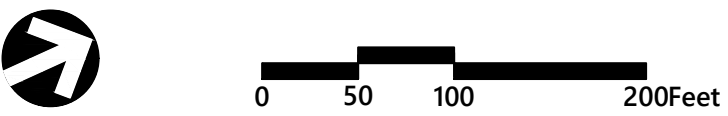


2 Bedford Farms Drive
Suite 200
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Legend

- PEDESTRIAN PATH TO PUBLIC R.O.W.
- VEHICLE PATH TO PUBLIC R.O.W.
- EXISTING PEDESTRIAN PATHS
- UPPER VALLEY MOUNTAIN BIKE ASSOCIATION TRAILS
- POTENTIAL FUTURE PEDESTRIAN PATH



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Issued for		Date	May 10, 2024

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Access and Circulation Plan

Drawing Number

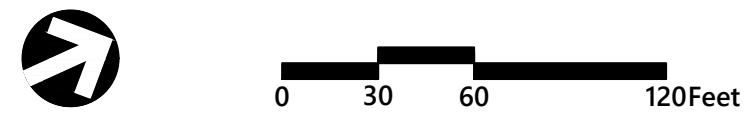
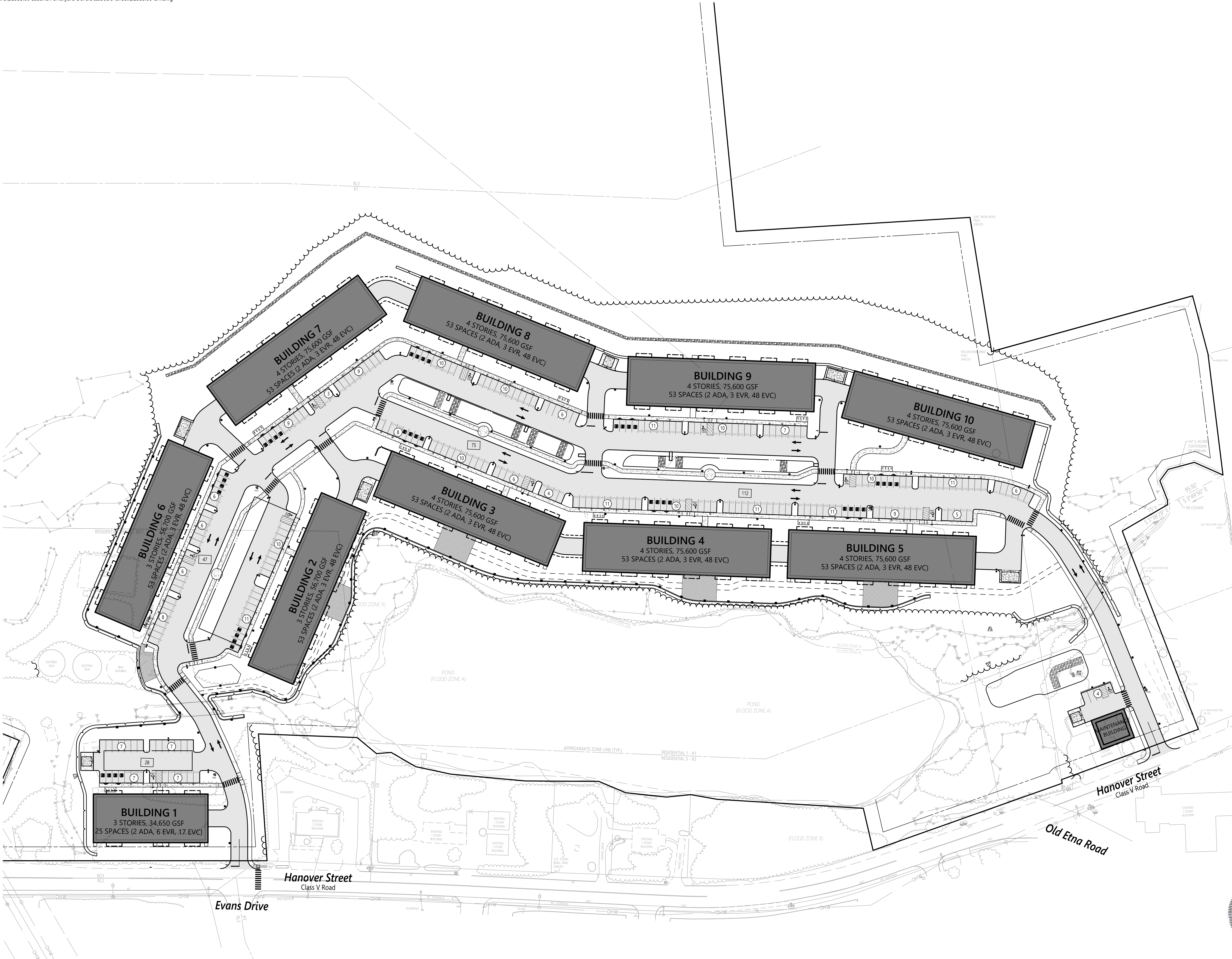
C1.3

Sheet 4 of 50

Project Number
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2 Bedford Farms Drive
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The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

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Issued for	Permitting	Date	May 10, 2024
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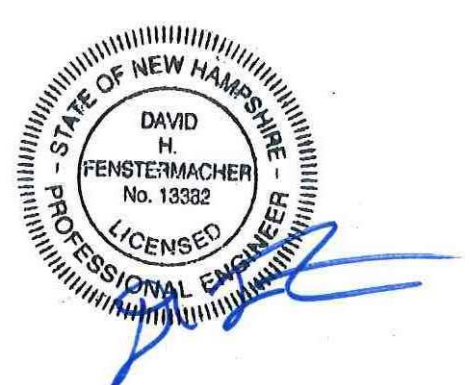
Overall Site Plan

Drawing Number

C1.4

Sheet 5 of 50

Project Number
52933.00





2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

ABUTTING PROPERTIES ACROSS INTERSTATE 89 INCLUDE THE FOLLOWING:

1. CITY OF LEBANON
MAP 76, LOT 8
BOOK 0, PAGE 0
51 NORTH PARK STREET
LEBANON, NH 03766
2. RADER III, GERALD LENARD
MAP 77, LOT 81
BOOK 0, PAGE 0
54 WINTER STREET
LEBANON, NH 03766
3. SEIDMAN, MAX JAMES
MAP 77, LOT 83
BOOK 0, PAGE 0
53 WINTER STREET
LEBANON, NH 03766
4. CITY OF LEBANON
MAP 77, LOT 107
BOOK 0, PAGE 0
51 NORTH PARK STREET
LEBANON, NH 03766
5. VALDIVIEZO ZENIA MAE
MAP 77, LOT 111
BOOK 0, PAGE 0
48 JUNIPER CIRCLE
LEBANON, NH 03766
6. LEE, CUONG V
MAP 77, LOT 113
BOOK 0, PAGE 0
194 PLAIN STREET
ROCKLAND, MA 02370
7. LEUCA MAGDALENA TTEE
MAP 77, LOT 115
BOOK 0, PAGE 0
9920 SE 40TH STREET
MERCER ISLAND, WA 98040

Notes

1. EXISTING BUS STOP AT CORNER OF HEATER RD AND OLD ETNA ROAD IS APPROXIMATELY 0.20 MILES AWAY FROM PROJECT SITE.
2. LOTS 48-01, 48-02, 48-04, AND 63-01 ARE TO BE CONSOLIDATED INTO ONE PARCEL



0 30 60 120Feet

The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

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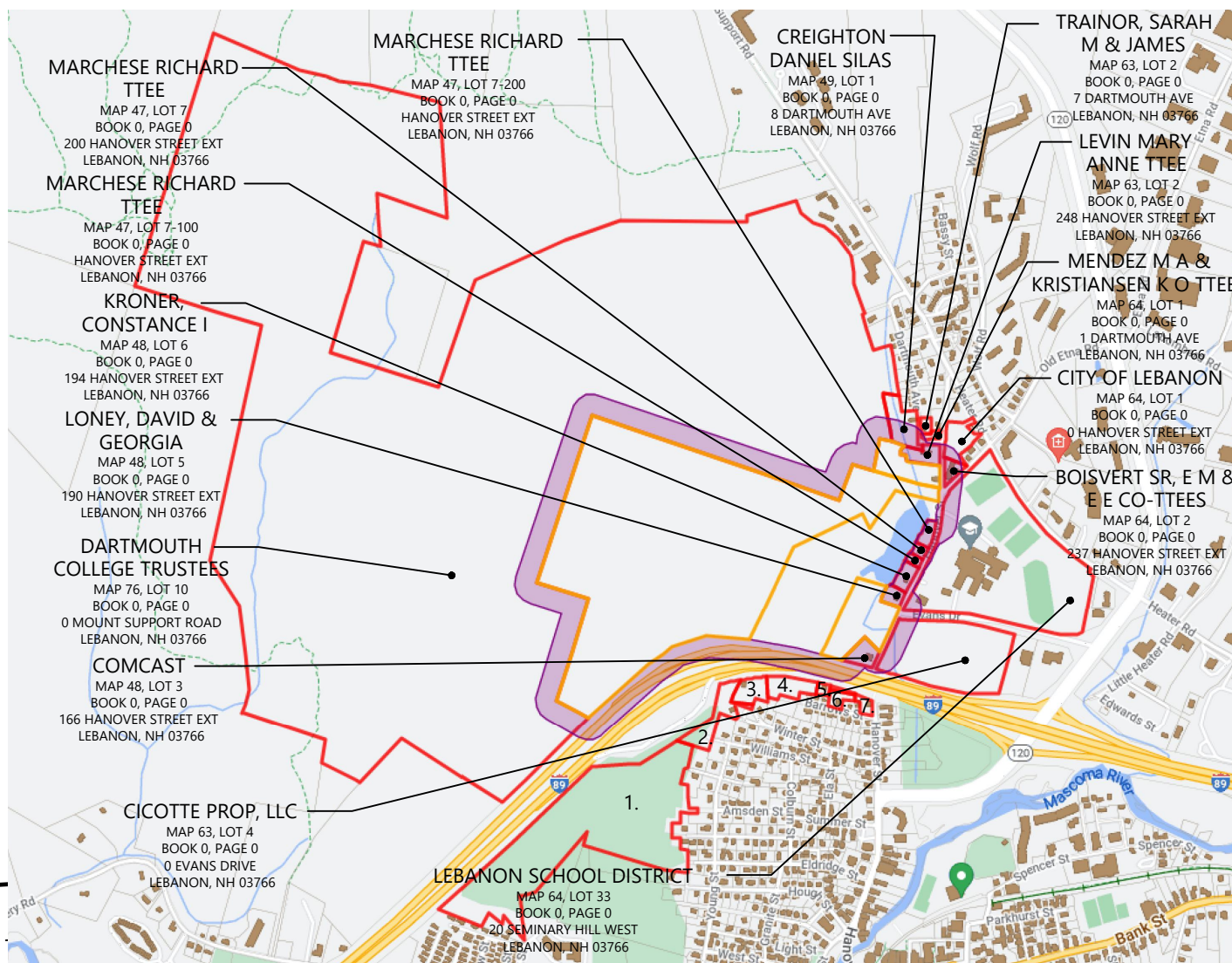
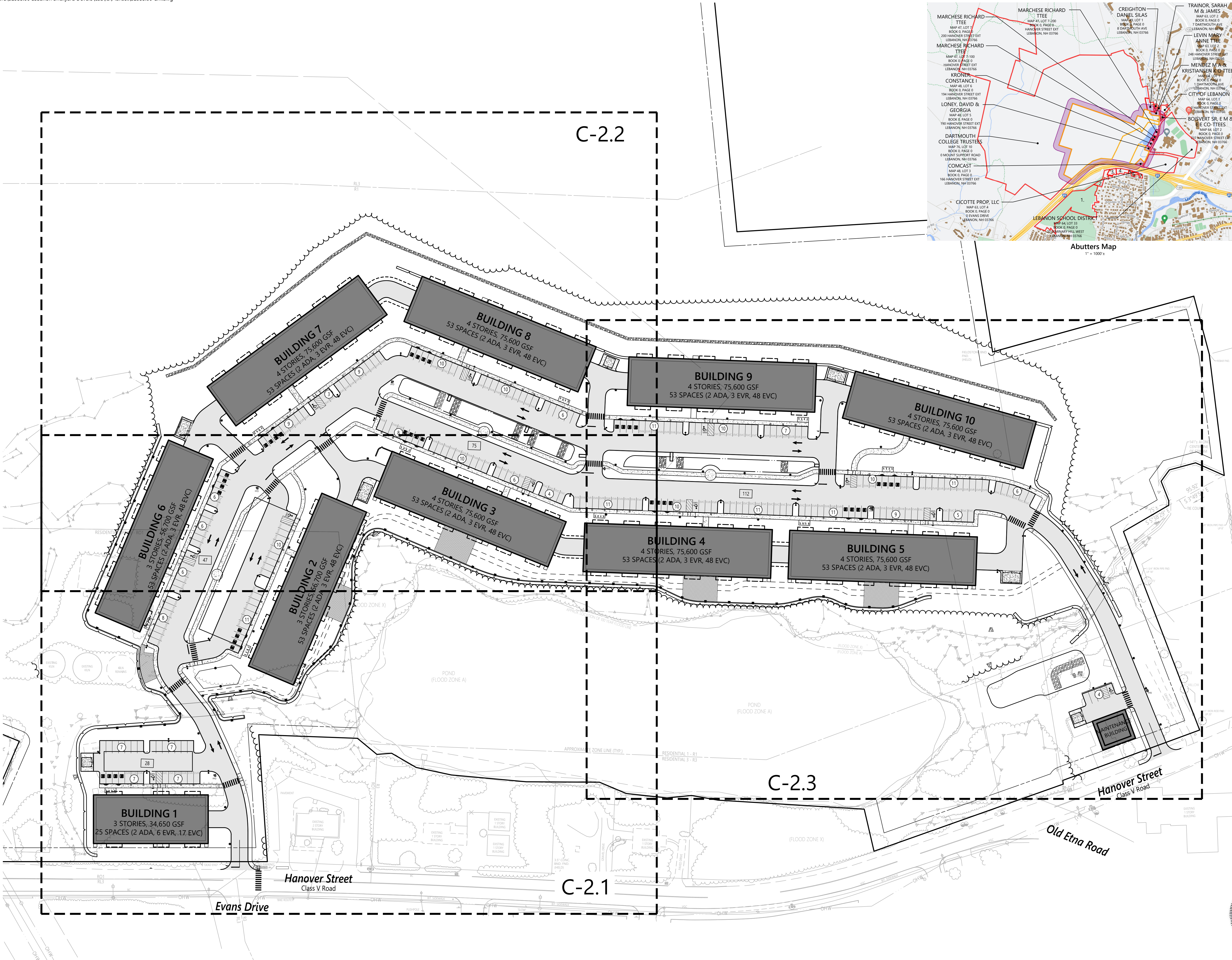
Not Approved for Construction
Drawing Title
**Overall Layout and
Materials Plan**



C2.0

Sheet 6 of 50

Project Number
52933.00



Abutters Map

1" = 1000'

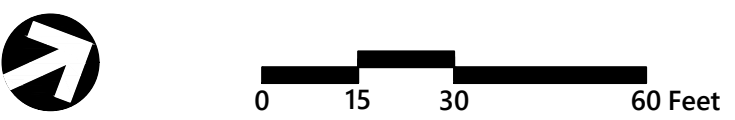


2 Bedford Farms Drive
Suite 200
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Sign Summary

M.U.T.C.D. Number	Specification Width	Height	Desc.
R1-1	30"	30"	
R7-8	12"	18"	
R7-8P	12"	6"	
D9-11B	12"	18"	
D9-11BP	12"	12"	

SNOW STORAGE AREA



The Brickyard Residential Development

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Issued for Permitting Date May 10, 2024

Not Approved for Construction

Layout and Materials Plan 1

Drawing Title

Professional Engineer Seal: DAVID H. FENSTERMACHER, No. 13382, LICENSED PROFESSIONAL ENGINEER, STATE OF NEW HAMPSHIRE

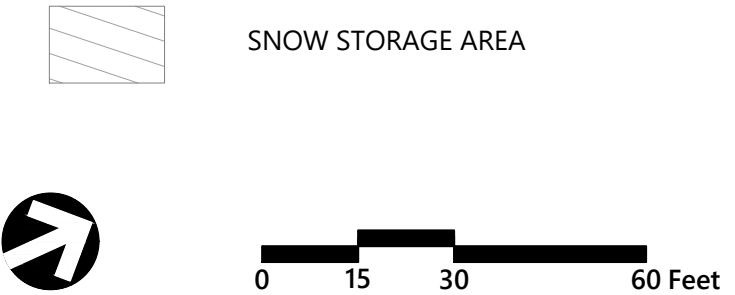
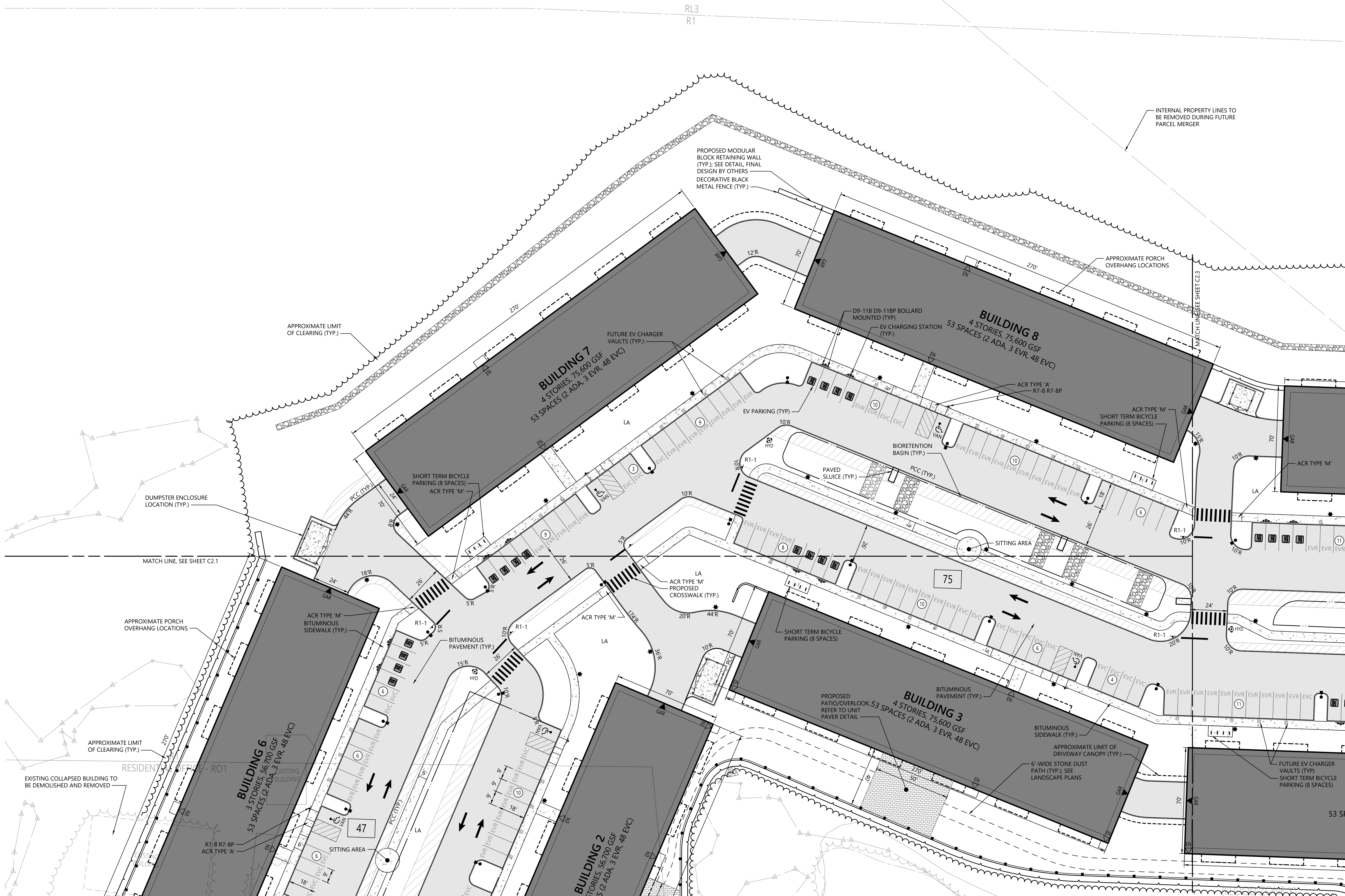
Sheet 7 of 50

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The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

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TMD	MJV
Issued for	Date
Permitting	May 10, 2024

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Layout and Materials Plan 2

Drawing Number

C2.2

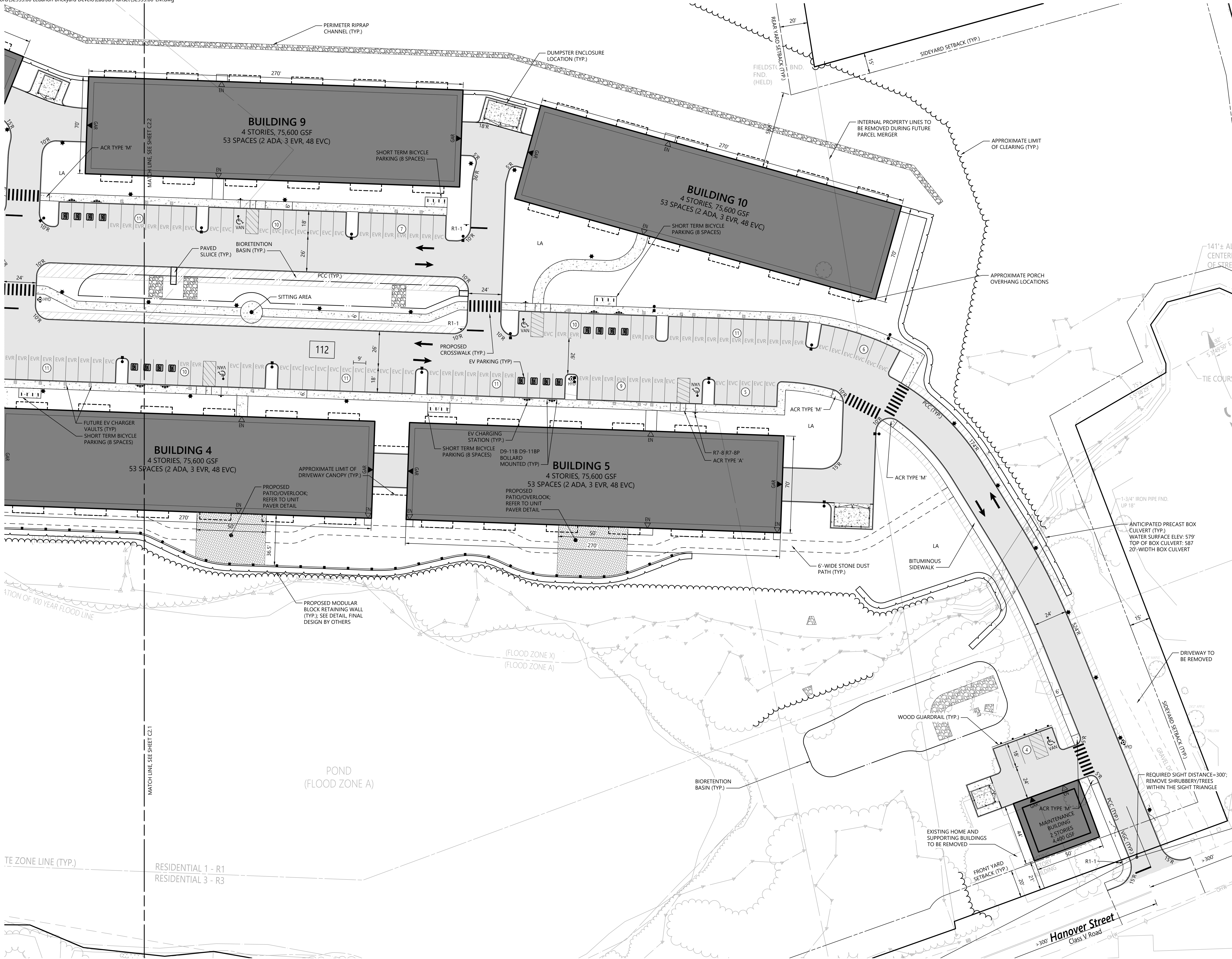
Sheet 8 of 50

Project Number
52933.00

STATE OF NEW HAMPSHIRE
DAVID H. FENSTERMACHER
No. 13382
LICENSED PROFESSIONAL ENGINEER



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900



The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

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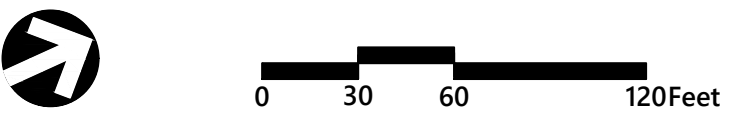
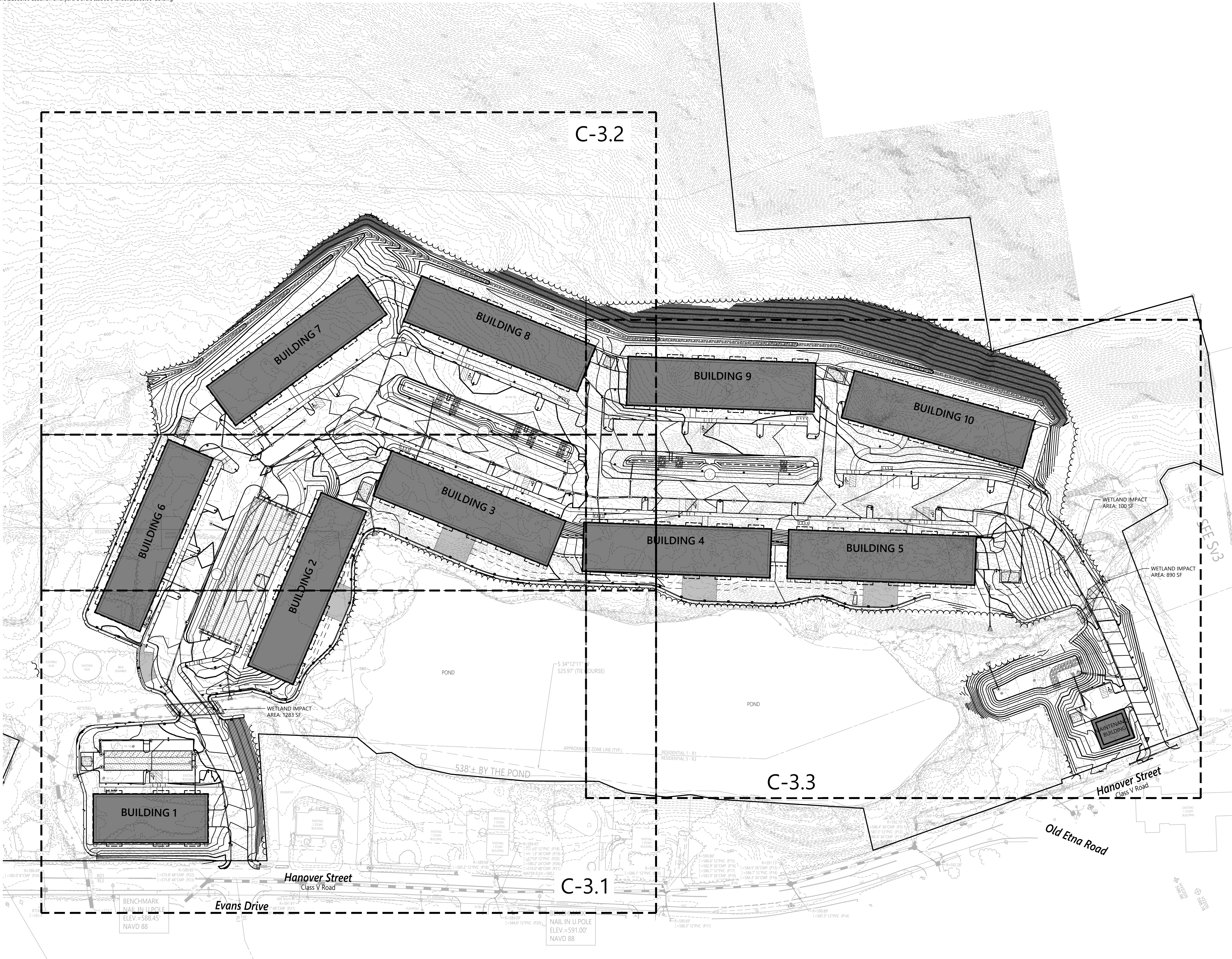
Designed by: TMD
Checked by: MJV
Issued for: Permitting
Date: May 10, 2024

Not Approved for Construction
Drawing Title: Layout and Materials
Plan 3

Sheet 9 of 50
Project Number: 52933.00
Professional Engineer Seal: David H. Fenstermacher, No. 13382, Licensed Professional Engineer, State of New Hampshire



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The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

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Overall Grading and Drainage Plan

C3.0

Sheet 10 of 50

Project Number
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The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

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Designed by	Checked by
TMD	MJV
Issued for	Date
Permitting	May 10, 2024

Not Approved for Construction
Drawing Title
**Grading and Drainage
Plan 1**

Drawing Number
C3.1

Sheet
11
of
50

Project Number
52933.00

Professional Engineer Seal for David Fenstermacher, No. 13382, State of New Hampshire.



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The Brickyard Residential Development

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Issued for	Permitting	Date	May 10, 2024

Not Approved for Construction
Drawing Title
**Grading and Drainage
Plan 2**
Drawing Number

C3.2

Sheet 12 of 50

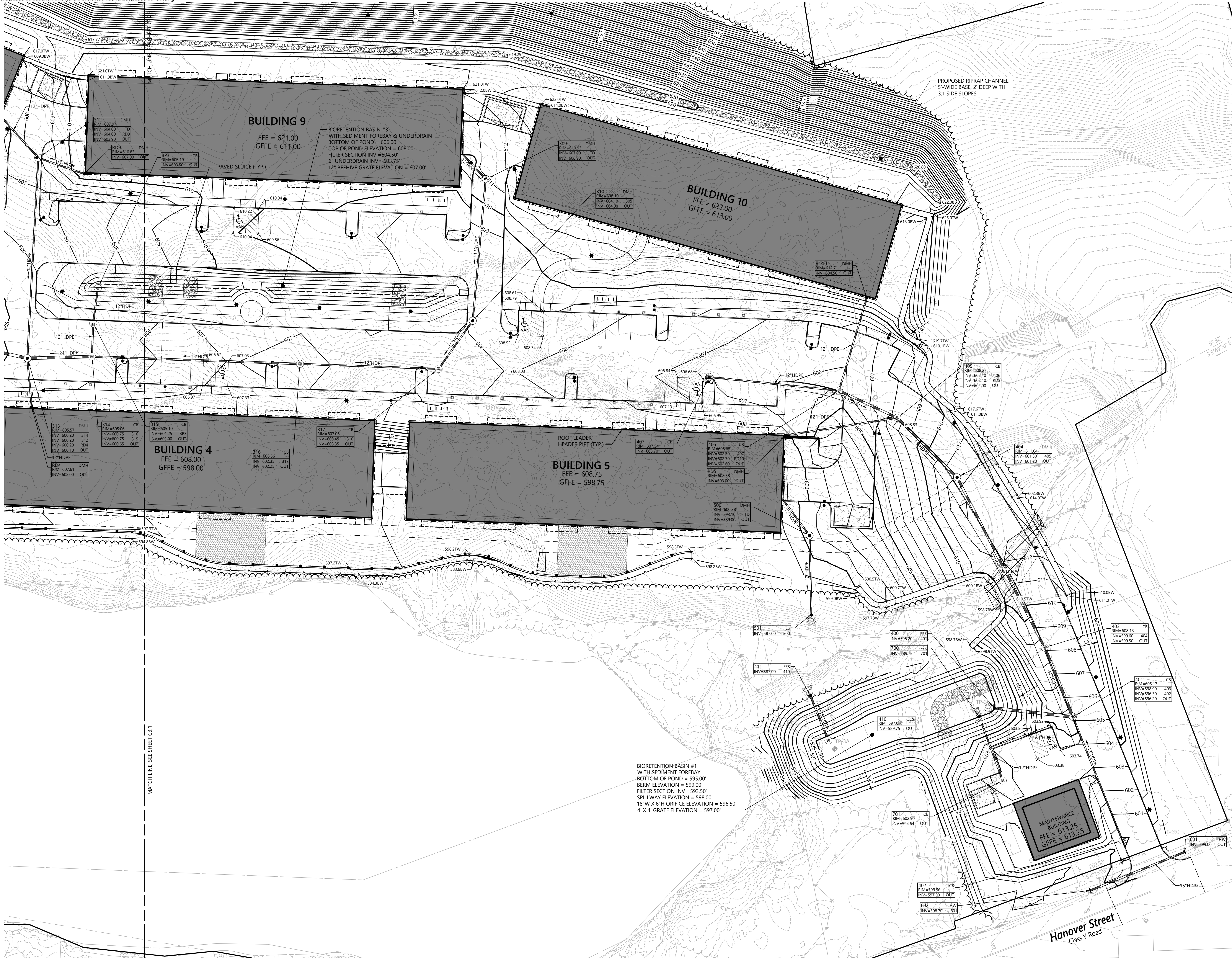
Project Number
52933.00

9/12/24

DAVID H. FENSTERMACHER
No. 13382
LICENSED PROFESSIONAL ENGINEER



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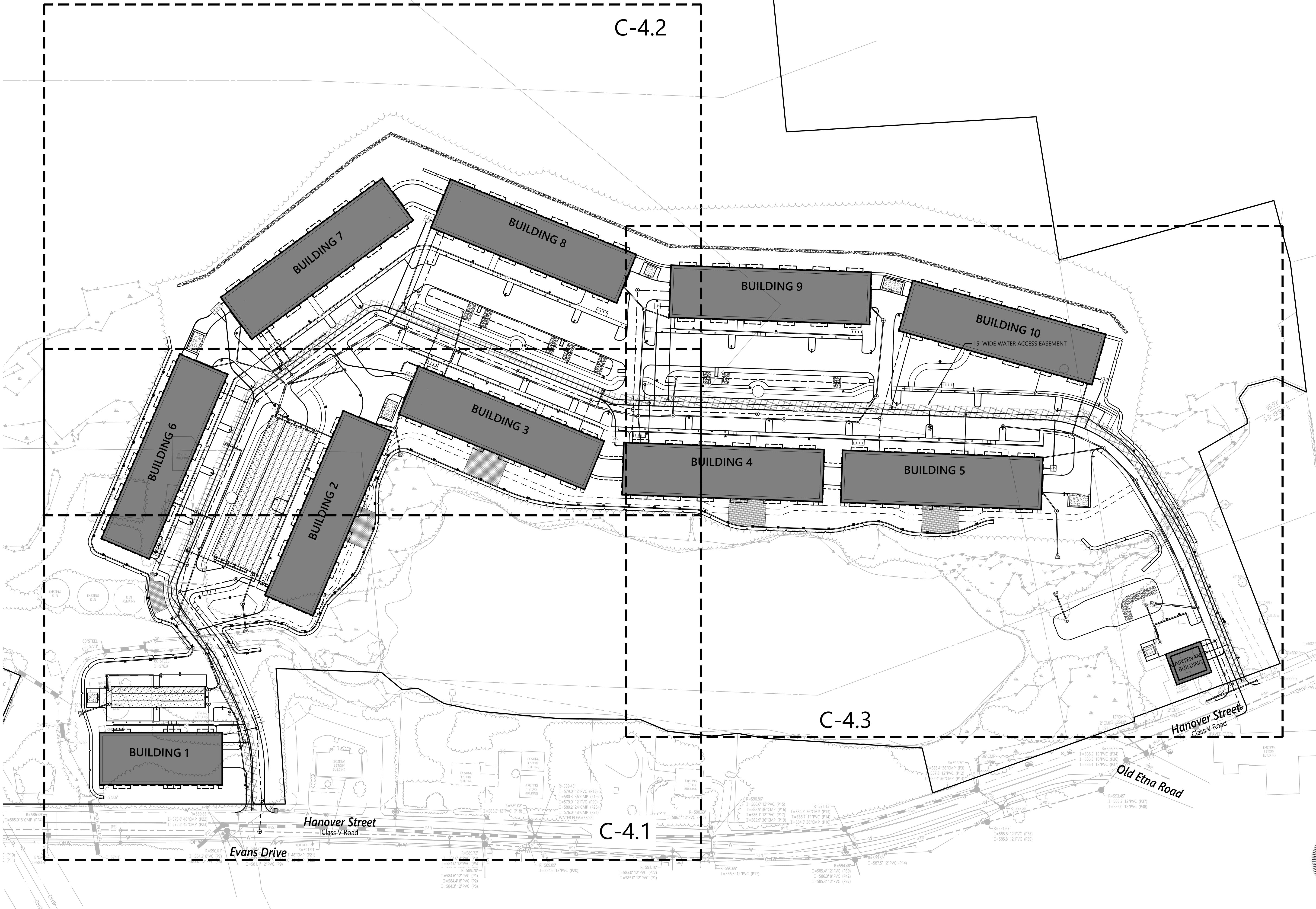
Not Approved for Construction
Drawing Title
Grading and Drainage
Plan 3

Drawing Number
C3.3
Sheet 13 of 50
Project Number
52933.00

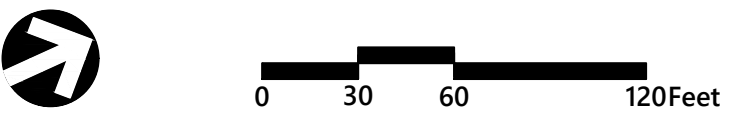
DAVID H. FENSTERMACHER
No. 13382
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW HAMPSHIRE



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900



NOTE:
1) AN ACCESS AND MAINTENANCE EASEMENT BENEFITING THE CITY OF LEBANON WILL BE PROVIDED FOLLOWING WATER INFRASTRUCTURE ACROSS THE SITE, WHICH WILL BE OWNED BY THE CITY OF LEBANON. THE EASEMENT BOUNDARIES WILL BE PROVIDED FOR CITY REVIEW FOLLOWING COORDINATION OF BUILDING PLUMBING DESIGN FINAL DESIGN ACCEPTANCE FROM THE LEBANON FIRE DEPARTMENT.



The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

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TMD	MJV
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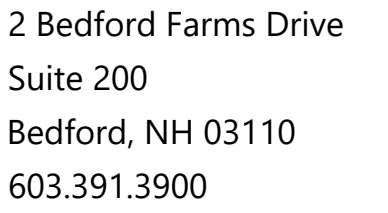
Not Approved for Construction
Drawing Title
Overall Utility Plan



C4.0

Sheet 14 of 50

Project Number
52933.00



**174 Hanover Street Extension
Lebanon, New Hampshire 03766**

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Permitting May 10, 2024

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Utility Plan 1

Drawing Number

C4.1

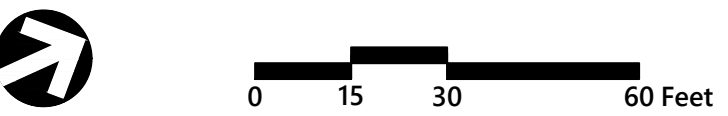
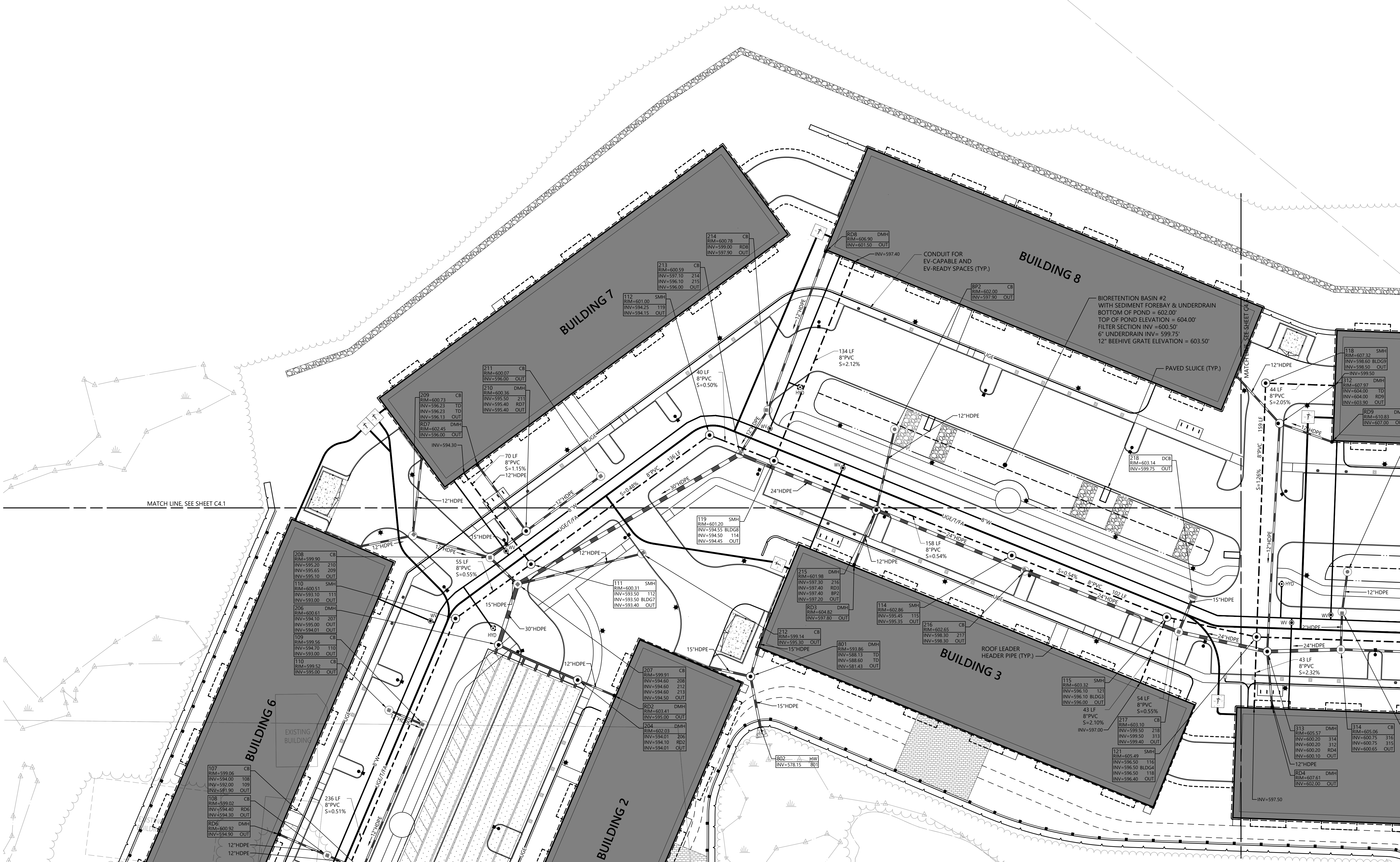
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Project Number
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The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

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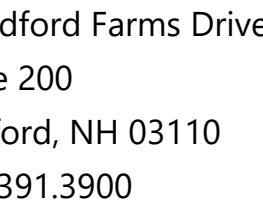
Utility Plan 2

C4.2

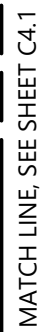
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The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

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Permitting May 10, 2024

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Utility Plan 3

Drawing Number

C4.3

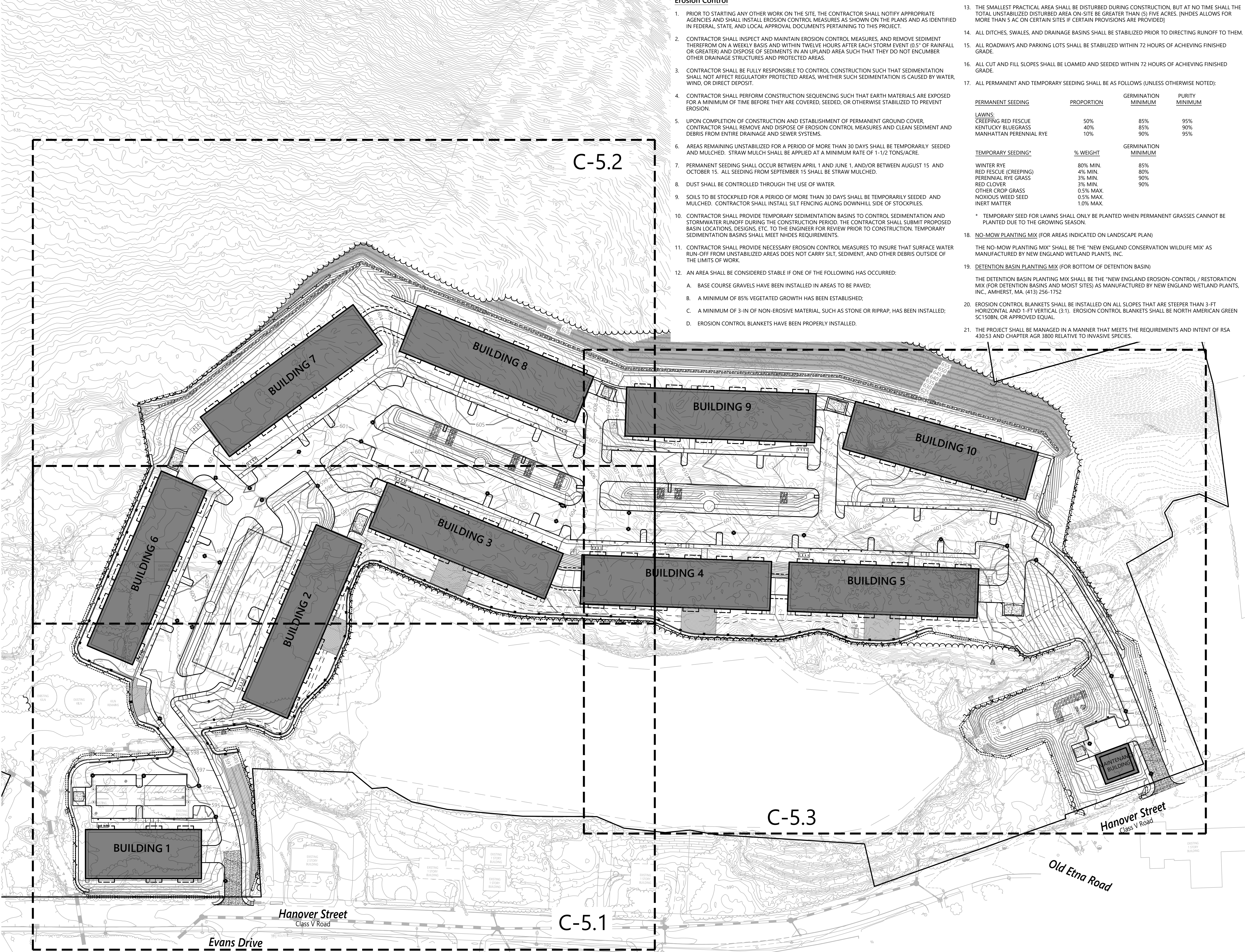
Sheet 17 of 50

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2 Bedford Farms Drive
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Erosion Control

1. PRIOR TO STARTING ANY OTHER WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN FEDERAL, STATE, AND LOCAL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. CONTRACTOR SHALL INSPECT AND MAINTAIN EROSION CONTROL MEASURES, AND REMOVE SEDIMENT THEREFROM ON A WEEKLY BASIS AND WITHIN TWELVE HOURS AFTER EACH STORM EVENT (0.5" OF RAINFALL OR GREATER) AND DISPOSE OF SEDIMENTS IN AN UPLAND AREA SUCH THAT THEY DO NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
3. CONTRACTOR SHALL BE FULLY RESPONSIBLE TO CONTROL CONSTRUCTION SUCH THAT SEDIMENTATION SHALL NOT AFFECT REGULATORY PROTECTED AREAS, WHETHER SUCH SEDIMENTATION IS CAUSED BY WATER, WIND, OR DIRECT DEPOSIT.
4. CONTRACTOR SHALL PERFORM CONSTRUCTION SEQUENCING SUCH THAT EARTH MATERIALS ARE EXPOSED FOR A MINIMUM OF TIME BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED TO PREVENT EROSION.
5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, CONTRACTOR SHALL REMOVE AND DISPOSE OF EROSION CONTROL MEASURES AND CLEAN SEDIMENT AND DEBRIS FROM ENTIRE DRAINAGE AND SEWER SYSTEMS.
6. AREAS REMAINING UNSTABILIZED FOR A PERIOD OF MORE THAN 30 DAYS SHALL BE TEMPORARILY SEEDED AND MULCHED. STRAW MULCH SHALL BE APPLIED AT A MINIMUM RATE OF 1-1/2 TONS/ACRE.
7. PERMANENT SEEDING SHALL OCCUR BETWEEN APRIL 1 AND JUNE 1, AND/OR BETWEEN AUGUST 15 AND OCTOBER 15. ALL SEEDING FROM SEPTEMBER 15 SHALL BE STRAW MULCHED.
8. DUST SHALL BE CONTROLLED THROUGH THE USE OF WATER.
9. SOILS TO BE STOCKPILED FOR A PERIOD OF MORE THAN 30 DAYS SHALL BE TEMPORARILY SEEDED AND MULCHED. CONTRACTOR SHALL INSTALL SILT FENCING ALONG DOWNHILL SIDE OF STOCKPILES.
10. CONTRACTOR SHALL PROVIDE TEMPORARY SEDIMENTATION BASINS TO CONTROL SEDIMENTATION AND STORMWATER RUNOFF DURING THE CONSTRUCTION PERIOD. THE CONTRACTOR SHALL SUBMIT PROPOSED BASIN LOCATIONS, DESIGNS, ETC. TO THE ENGINEER FOR REVIEW PRIOR TO CONSTRUCTION. TEMPORARY SEDIMENTATION BASINS SHALL MEET NHDES REQUIREMENTS.
11. CONTRACTOR SHALL PROVIDE NECESSARY EROSION CONTROL MEASURES TO INSURE THAT SURFACE WATER RUN-OFF FROM UNSTABILIZED AREAS DOES NOT CARRY SILT, SEDIMENT, AND OTHER DEBRIS OUTSIDE OF THE LIMITS OF WORK.
12. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
 - A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
 - B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
 - C. A MINIMUM OF 3-IN OF NON-EROSIVE MATERIAL, SUCH AS STONE OR RIPRAP, HAS BEEN INSTALLED;
 - D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

13. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT AT NO TIME SHALL THE TOTAL UNSTABILIZED DISTURBED AREA ON-SITE BE GREATER THAN (5) FIVE ACRES. [NHDES ALLOWS FOR MORE THAN 5 AC ON CERTAIN SITES IF CERTAIN PROVISIONS ARE PROVIDED]
14. ALL DITCHES, SWALES, AND DRAINAGE BASINS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
15. ALL ROADWAYS AND PARKING LOTS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
16. ALL CUT AND FILL SLOPES SHALL BE LOAMED AND SEEDED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
17. ALL PERMANENT AND TEMPORARY SEEDING SHALL BE AS FOLLOWS (UNLESS OTHERWISE NOTED):

PERMANENT SEEDING	PROPORTION	GERMINATION MINIMUM	PURITY MINIMUM
LAWNS:			
CREeping RED FESCUE	50%	85%	95%
KENTUCKY BLUEGRASS	40%	85%	90%
MANHATTAN PERENNIAL RYE	10%	90%	95%

TEMPORARY SEEDING*	% WEIGHT	GERMINATION MINIMUM
WINTER RYE	80% MIN.	85%
RED FESCUE (CREeping)	4% MIN.	80%
PERENNIAL RYE GRASS	3% MIN.	90%
RED CLOVER	3% MIN.	90%
OTHER CROP GRASS	0.5% MAX.	
NOXIOUS WEEED SEED	0.5% MAX.	
INERT MATTER	1.0% MAX.	

* TEMPORARY SEED FOR LAWNS SHALL ONLY BE PLANTED WHEN PERMANENT GRASSES CANNOT BE PLANTED DUE TO THE GROWING SEASON.

18. NO-MOW PLANTING MIX (FOR AREAS INDICATED ON LANDSCAPE PLAN)

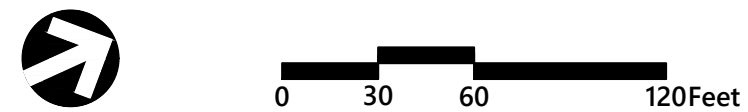
THE NO-MOW PLANTING MIX* SHALL BE THE "NEW ENGLAND CONSERVATION WILDLIFE MIX" AS MANUFACTURED BY NEW ENGLAND WETLAND PLANTS, INC.

19. DETENTION BASIN PLANTING MIX (FOR BOTTOM OF DETENTION BASIN)

THE DETENTION BASIN PLANTING MIX SHALL BE THE "NEW ENGLAND EROSION-CONTROL / RESTORATION MIX (FOR DETENTION BASINS AND MOIST SITES) AS MANUFACTURED BY NEW ENGLAND WETLAND PLANTS, INC., AMHERST, MA. (413) 256-1752

20. EROSION CONTROL BLANKETS SHALL BE INSTALLED ON ALL SLOPES THAT ARE STEEPER THAN 3:1 HORIZONTAL AND 1-FT VERTICAL (3:1). EROSION CONTROL BLANKETS SHALL BE NORTH AMERICAN GREEN SC150BN, OR APPROVED EQUAL.

21. THE PROJECT SHALL BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.



The Brickyard
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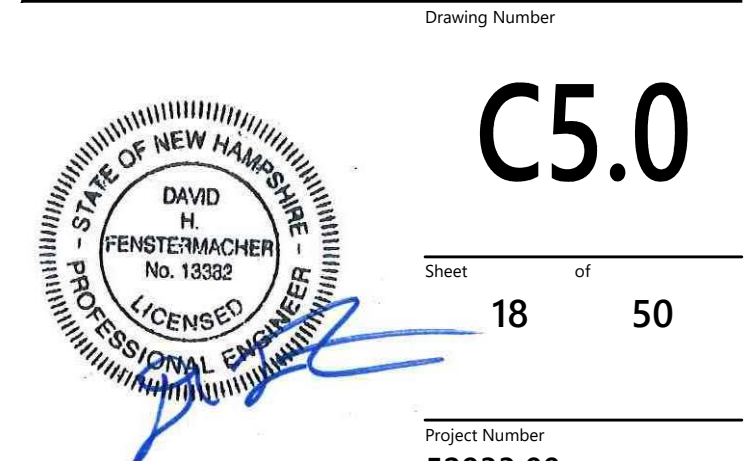
No.	Revision	Date	Apprvd.
1	Response to Comments Update	08/06/24	DF

Designed by	Checked by
TMD	MJV

Issued for	Date
Permitting	May 10, 2024

Not Approved for Construction

Overall Erosion
Control Plan



C5.0

Sheet 18 of 50

Project Number
52933.00



2 Bedford Farms Drive
Suite 200
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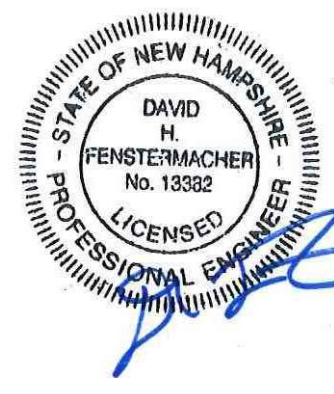
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Issued for	Permitting	Date	May 10, 2024
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Not Approved for Construction

Erosion Control Plan 1

Drawing Number



C5.1

Sheet 19 of 50

Project Number
52933.00



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900



The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

No.	Revision	Date	Appr'd.
1	Response to Comments Update	08/06/24	DF

Designed by	Checked by
TMD	MJV
Issued for	Date
Permitting	May 10, 2024

Not Approved for Construction
Drawing Title
Erosion Control Plan 2

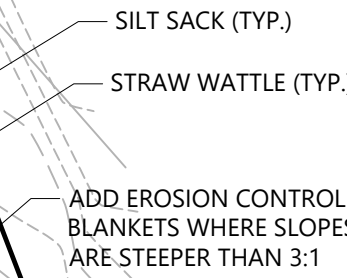
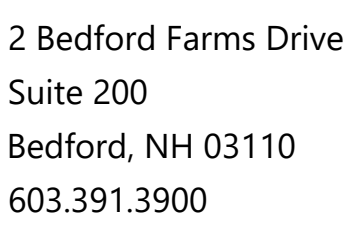
Drawing Number

C5.2

Sheet 20 of 50

Project Number
52933.00

Professional Engineer
DAVID H. FENSTERMACHER
No. 13382
LICENSED



174 Hanover Street Extension
Lebanon, New Hampshire 03766

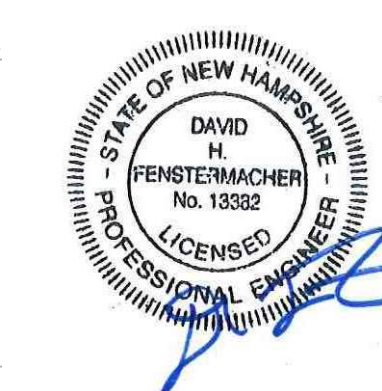
Designed by	Checked by
TMD	MJV

Not Approved for Construction

1000

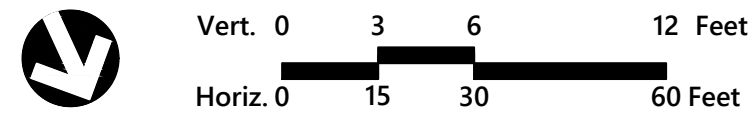
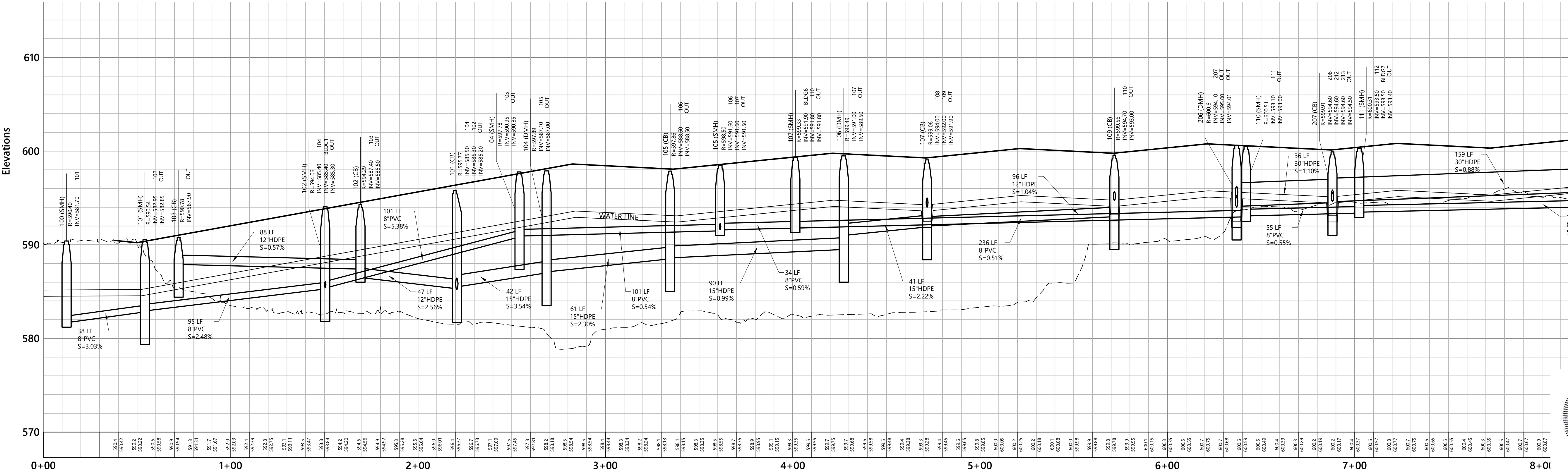
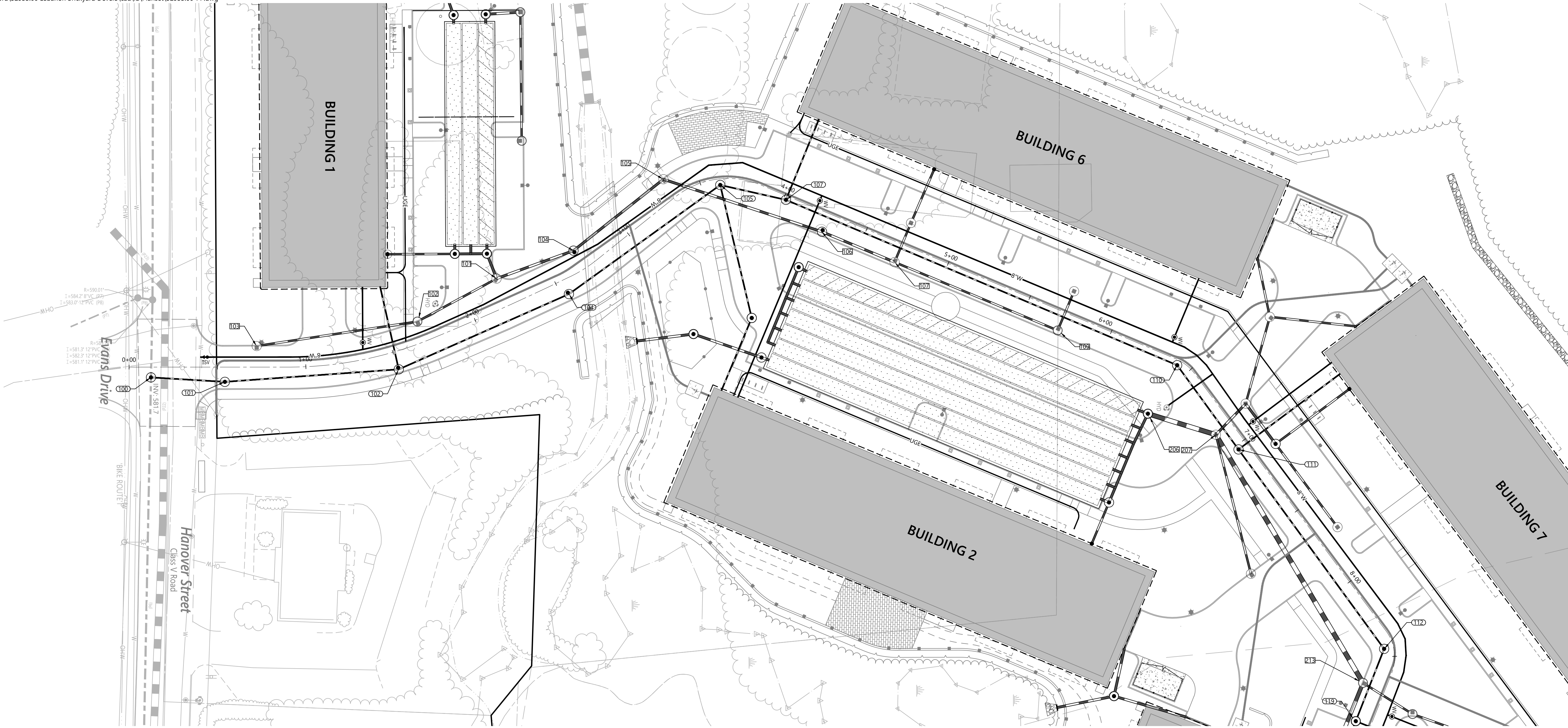
C5.3

Project Number
52933.00





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The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

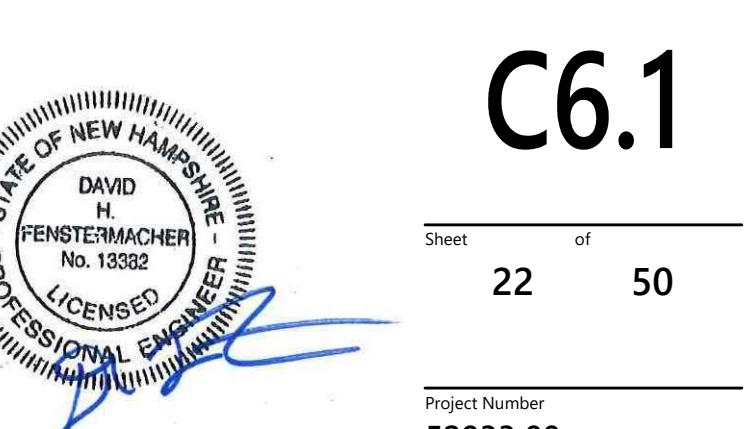
No.	Revision	Date	Appr'd.

Designed by TMD	Checked by MJV
Issued for Permitting	Date May 10, 2024

Not Approved for Construction

Plan and Profile 1
Sewer, Drainage and Water

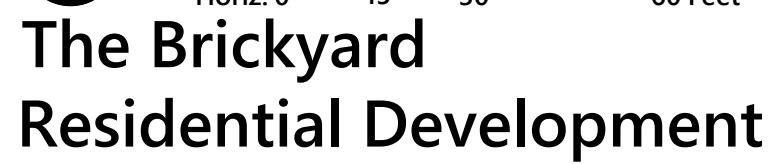
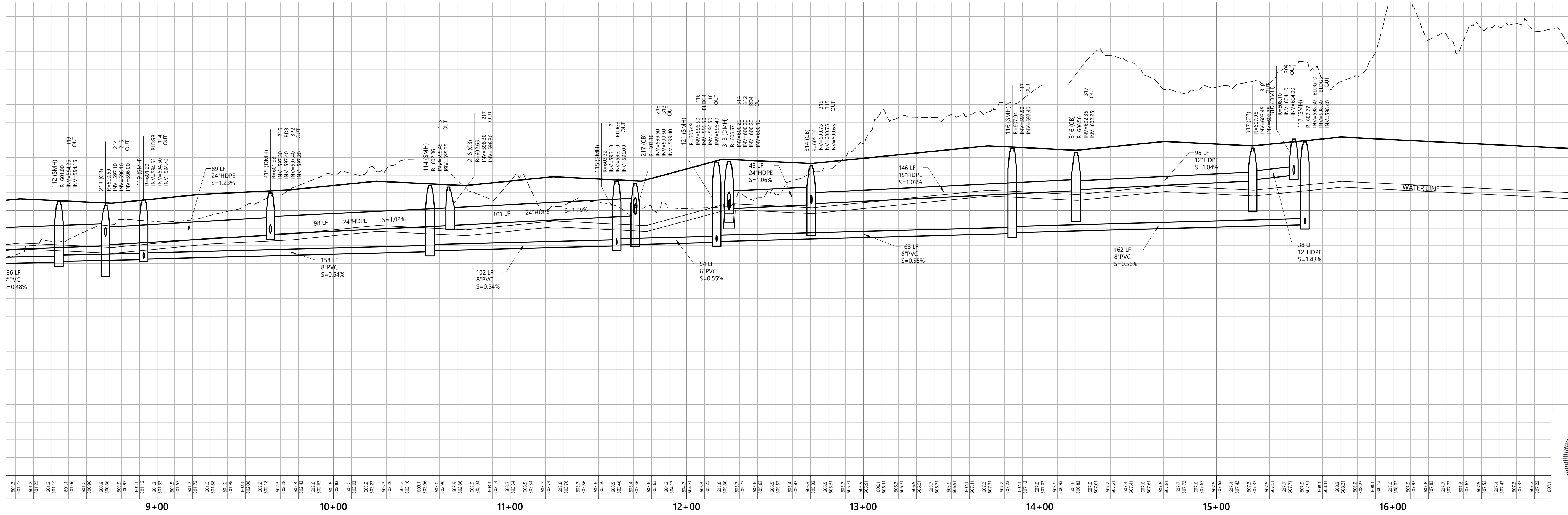
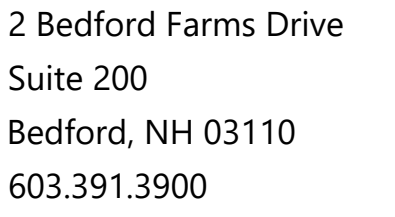
Drawing Title



C6.1

Sheet 22 of 50

Project Number
52933.00

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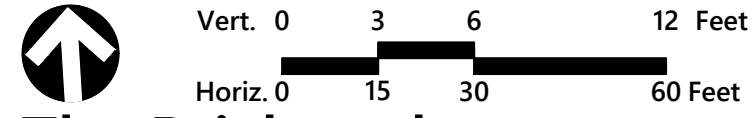
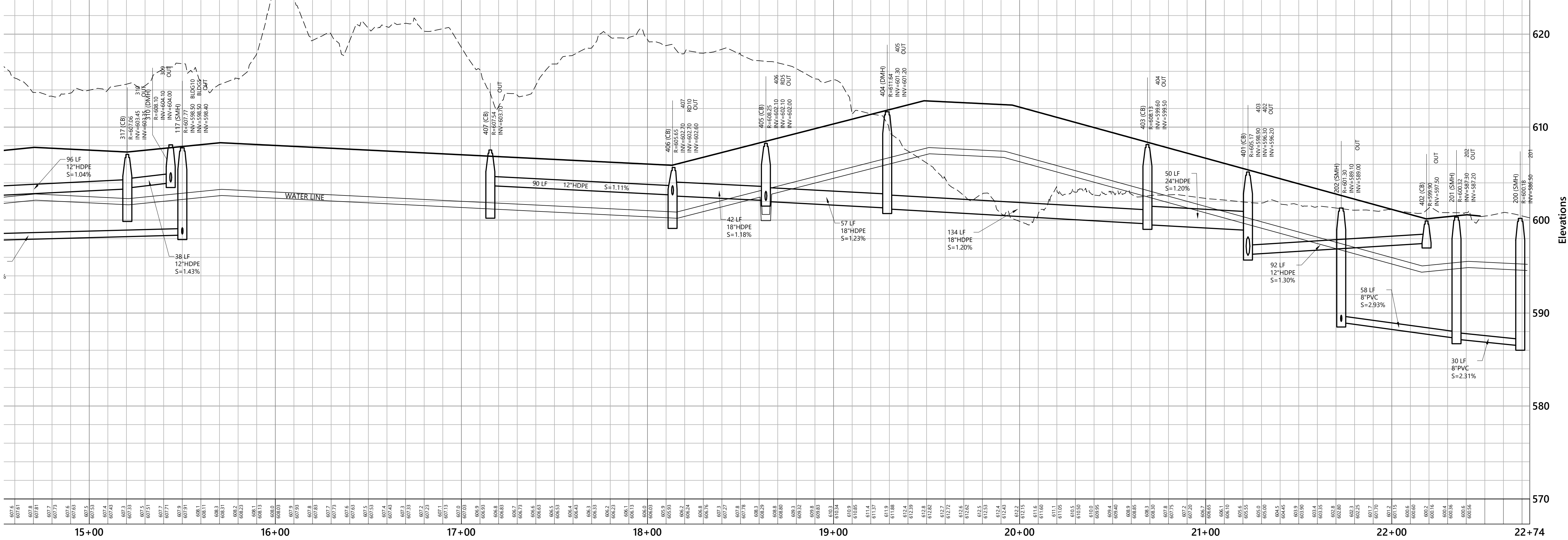
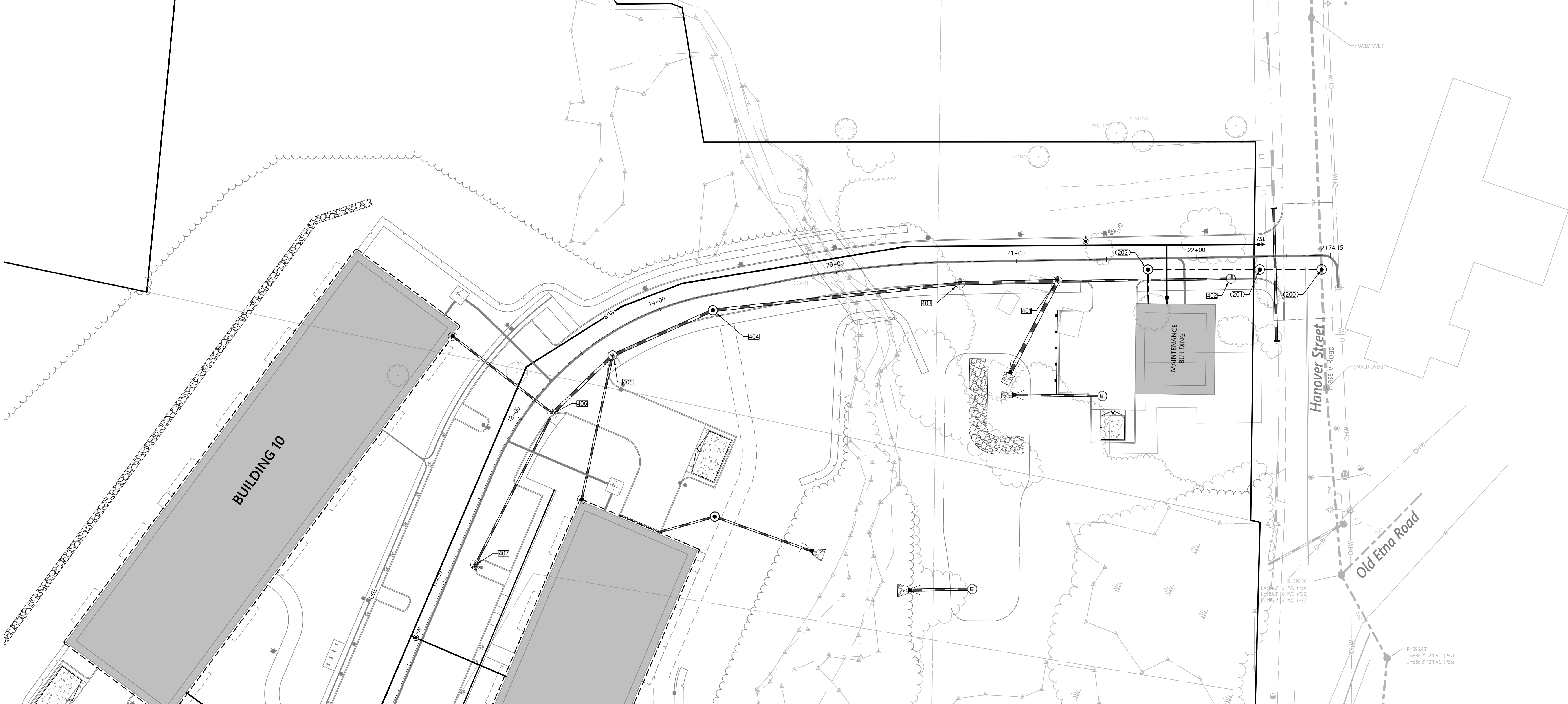
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Sheet 23 of 50

Project Number
52933.00



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The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

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Issued for Permitting	Date May 10, 2024

Not Approved for Construction
Drawing Title
**Plan and Profile 3
Sewer, Drainage and Water**

Drawing Number

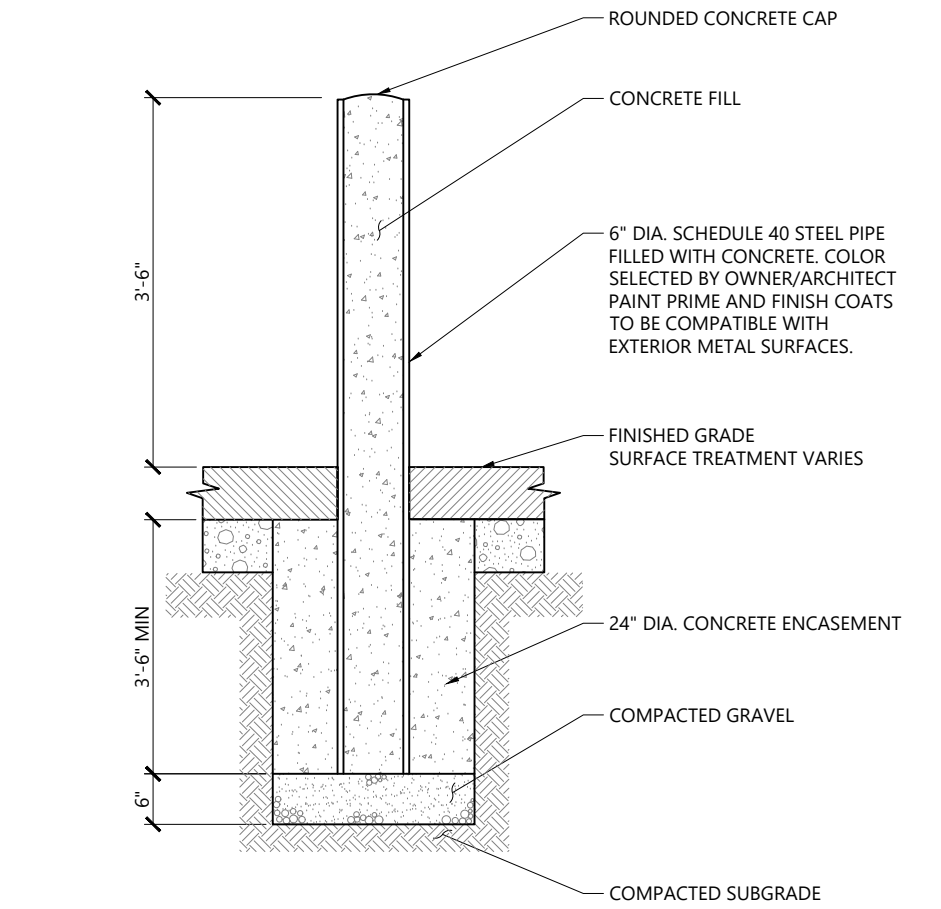
C6.3

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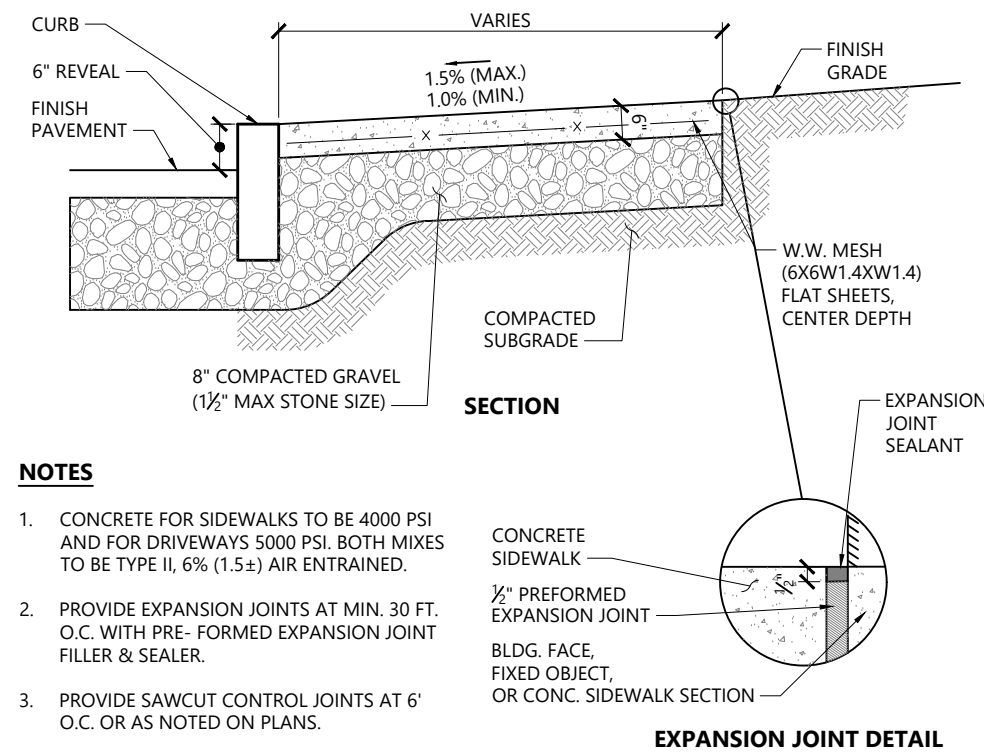
Project Number
52933.00



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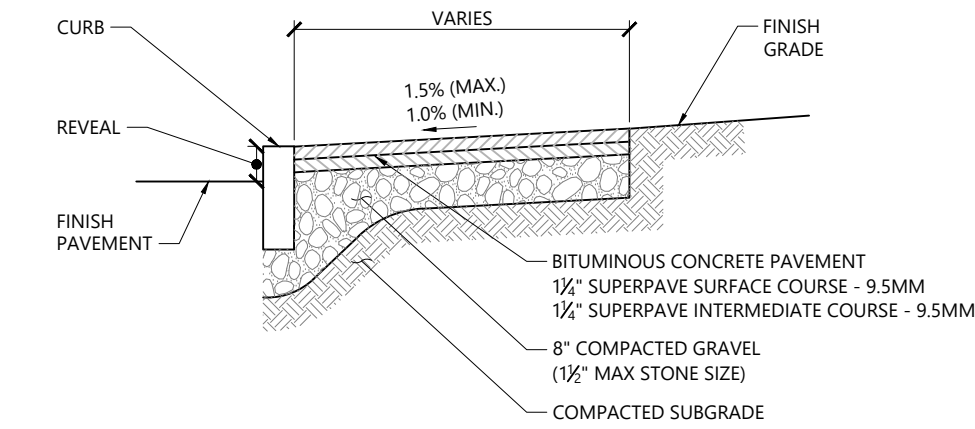


Bollard 12/19
N.T.S. Source: VHB REV LD_700

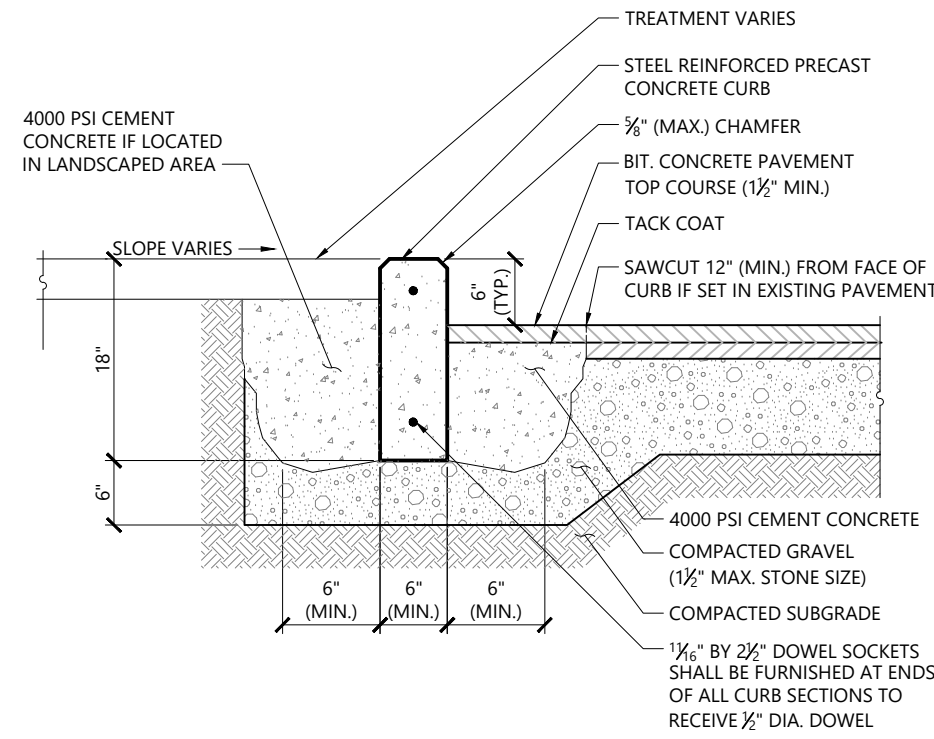


- NOTES**
1. CONCRETE FOR SIDEWALKS TO BE 4000 PSI AND FOR DRIVEWAYS 5000 PSI. BOTH MIXES TO BE TYPE II, 6% (1.5s) AIR ENTRAINED.
 2. PROVIDE EXPANSION JOINTS AT MIN. 30 FT. O.C. WITH PRE-FORMED EXPANSION JOINT FILLER & SEALER.
 3. PROVIDE SAWCUT CONTROL JOINTS AT 6' O.C. OR AS NOTED ON PLANS.
 4. PROVIDE MEDIUM BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.
 5. ALL EXPOSED CONCRETE SURFACES SHALL BE SEALED WITH A SILANE-SILOXANE PRODUCT.

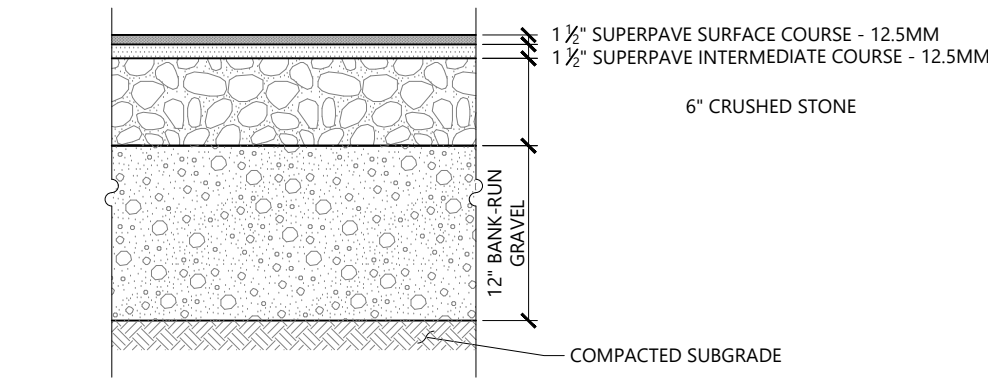
Concrete Sidewalk 3/20
N.T.S. Source: VHB REV LD_420



Bituminous Concrete Sidewalk 3/20
N.T.S. Source: VHB REV LD_422

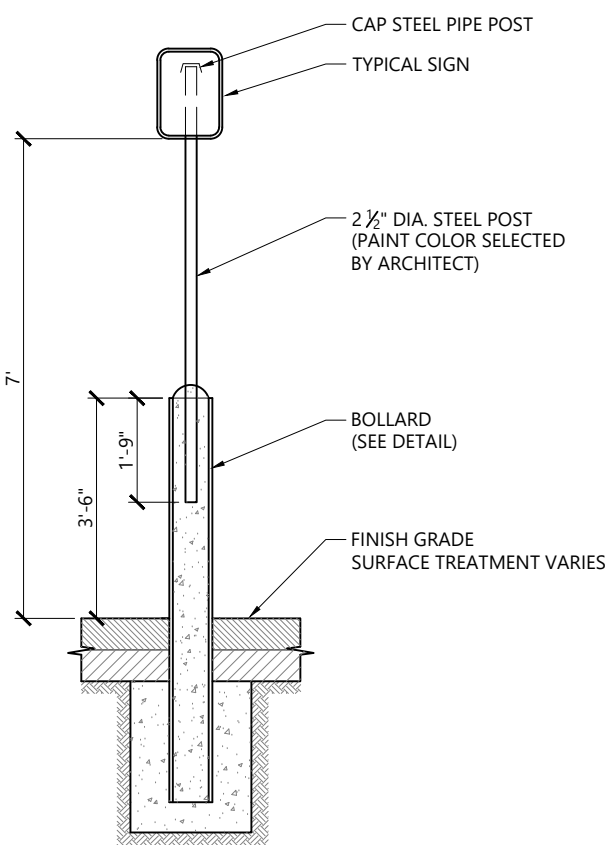


Precast Concrete Curb (PCC) 3/20
N.T.S. Source: VHB REV LD_404

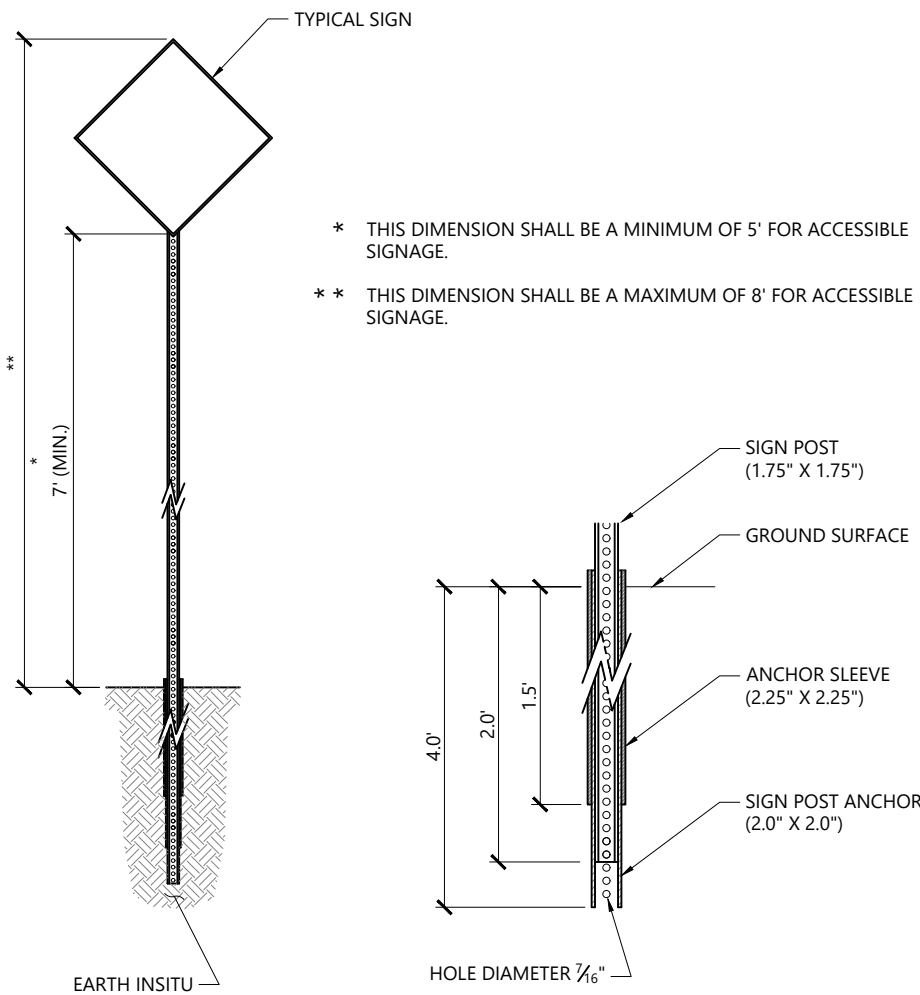


- NOTES**
- PAVEMENT SECTIONS ARE SUBJECT TO CHANGE AND WILL BE BASED ON THE RESULTS OF FURTHER GEOTECHNICAL INVESTIGATIONS.

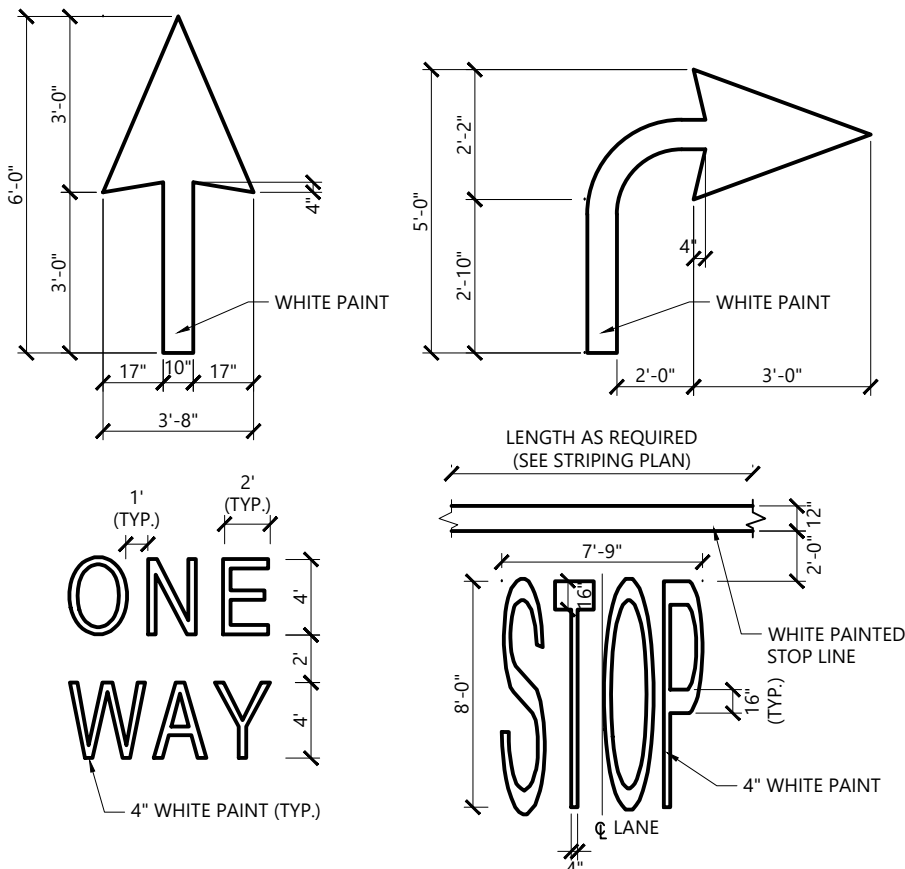
Bituminous Concrete Pavement Sections 7/22
N.T.S. Source: VHB REV LD_430



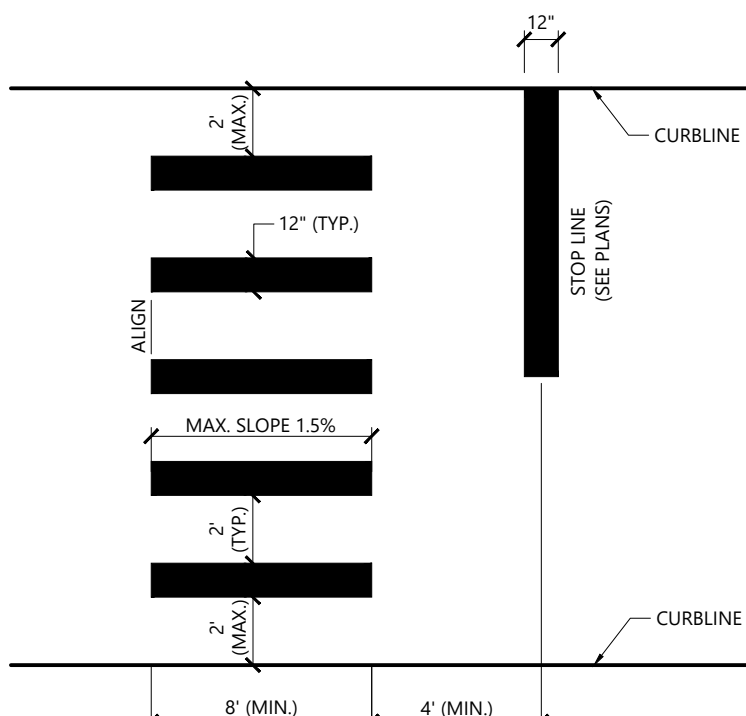
Bollard Mounted Sign 1/16
N.T.S. Source: VHB REV LD_703-NH



Sign Post - Type 'B' 1/16
N.T.S. Source: VHB REV LD_702

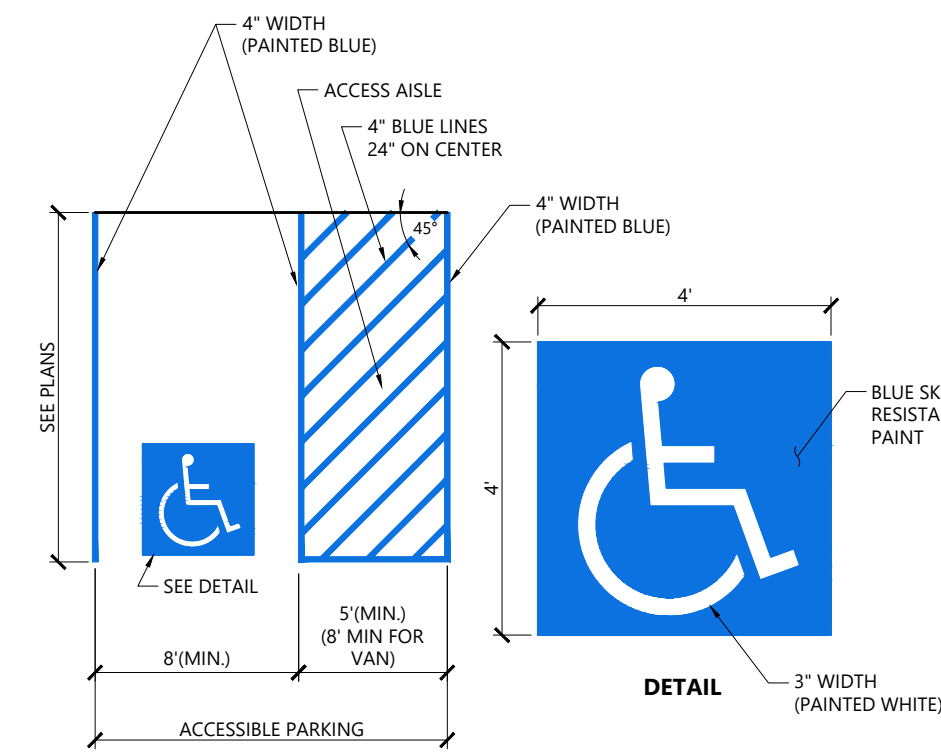


Painted Pavement Markings - On Site 1/16
N.T.S. Source: VHB REV LD_554



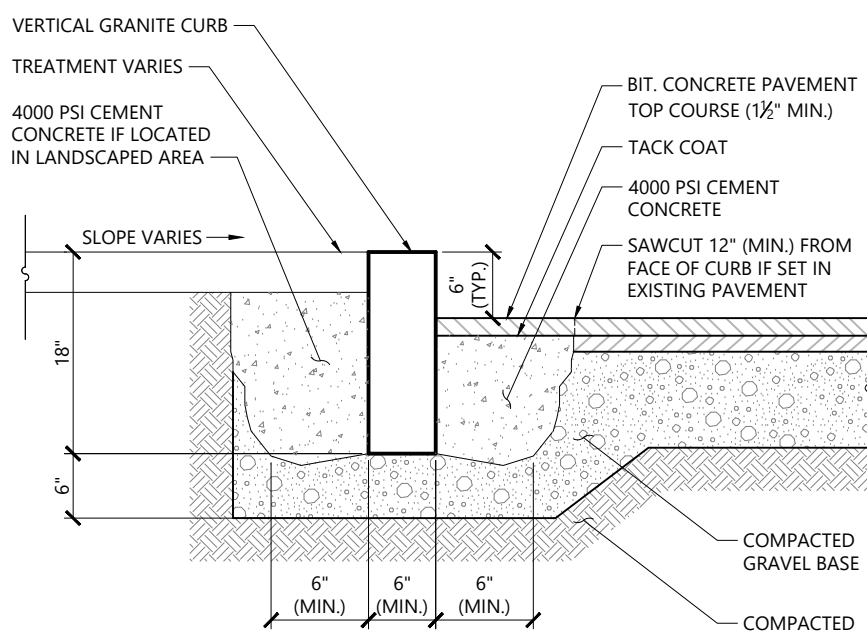
- NOTES**
1. TWELVE INCH (12") LINES SHALL BE APPLIED IN ONE APPLICATION, NO COMBINATION OF LINES (TWO - 6 INCH LINES) WILL BE ACCEPTED.
 2. LONGITUDINAL CROSSWALK LINES TO BE PARALLEL TO CURBLINE.
 3. ALL LONGITUDINAL CROSSWALK LINES SHALL BE THE SAME LENGTH AND PROPERLY ALIGNED.
 4. CROSS WALK SIDESLOPE SHALL NOT EXCEED 1.5%.

Crosswalk 12/19
N.T.S. Source: VHB REV LD_553A

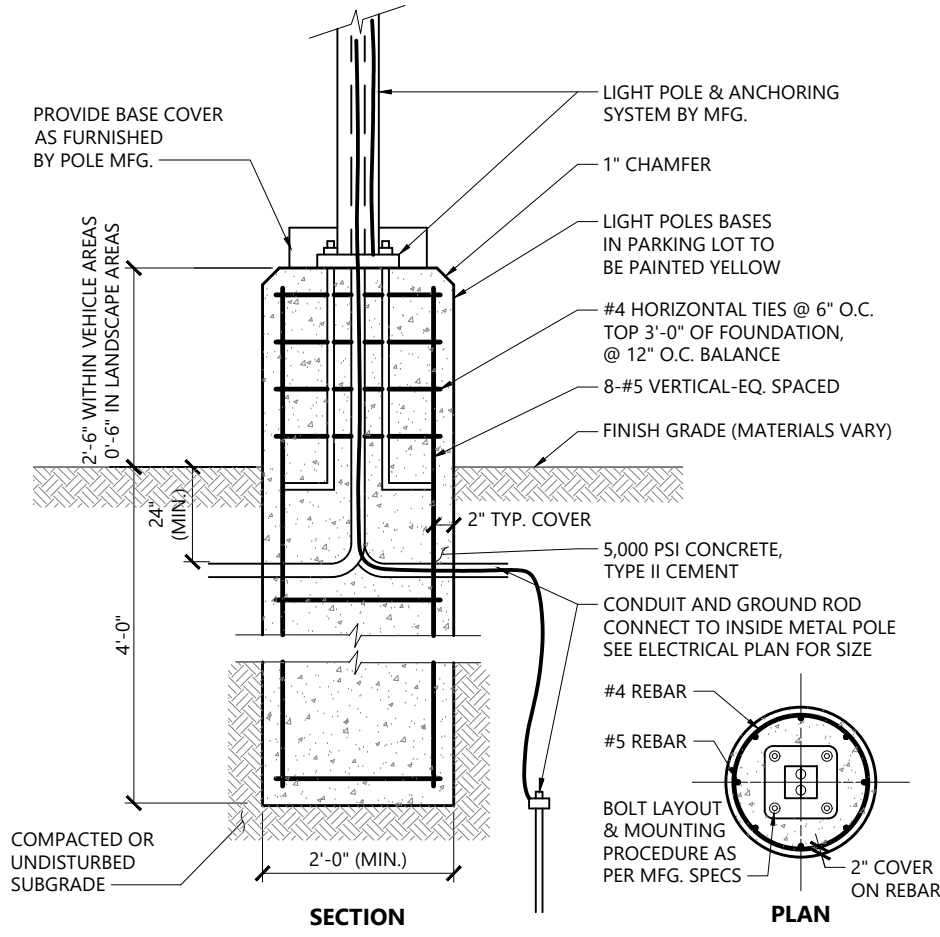


- NOTES**
1. ALL DIMENSIONS TO EDGES OF 4" PAVEMENT STRIPING.
 2. 8' STALL WIDTH REFERS TO 8' CLEAR BETWEEN INSIDE EDGES OF PAVEMENT MARKINGS.
 3. ALL SLOPES THROUGHOUT THE ACCESSIBLE PARKING AND AISLE AREAS SHALL NOT EXCEED 1.5%.
 4. ACCESS AISLE MEASURED BETWEEN OUTSIDE EDGES OF PAVEMENT MARKINGS.

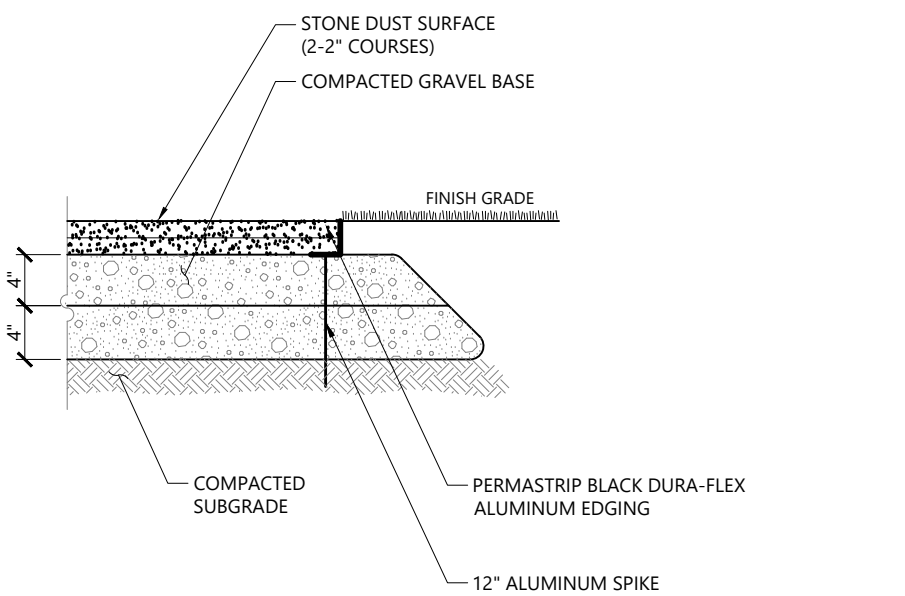
Accessible Parking Space 1/16
N.T.S. Source: VHB REV LD_552-NH



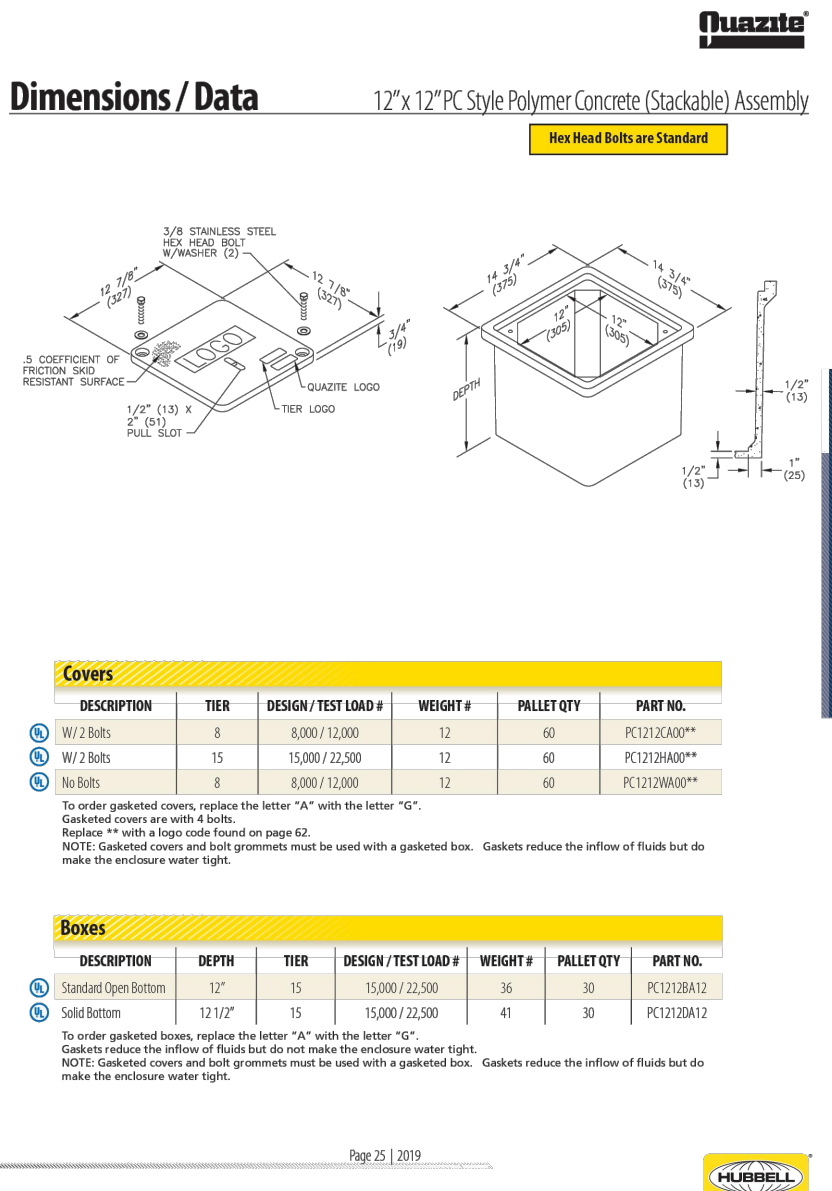
Vertical Granite Curb (VGC) 3/20
N.T.S. Source: VHB REV LD_402



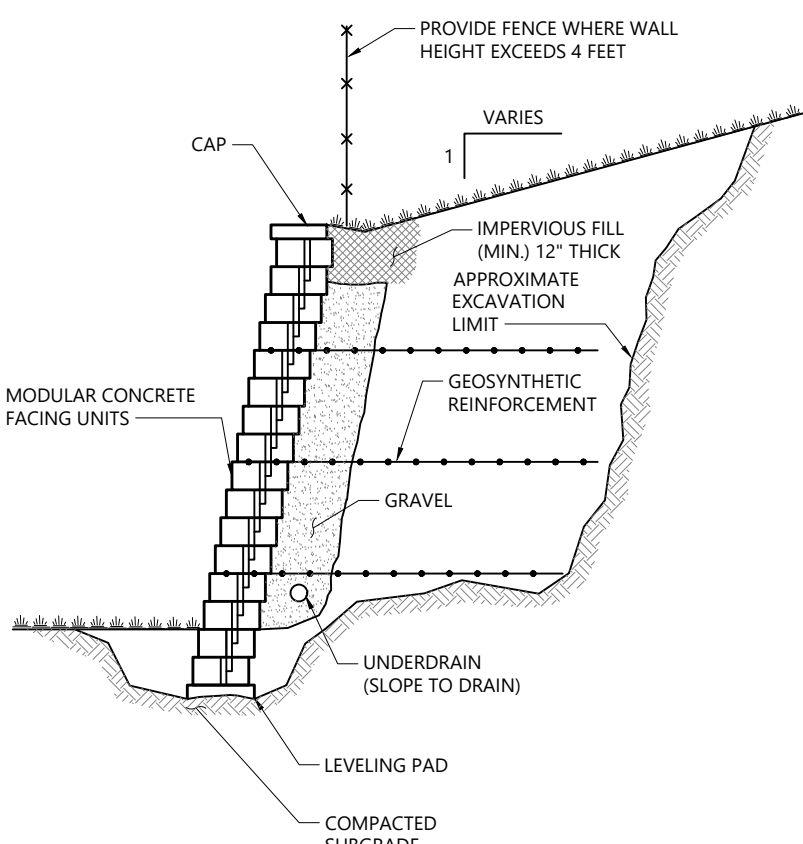
Light Pole Foundation Detail (Up to 15' Pole) 5/23
N.T.S. Source: VHB REV LD_310A



Stonedust Path 1/16
N.T.S. Source: VHB REV LD_447



Future EV Charging Vault 1/16
N.T.S. Source: VHB REV LD_447



Modular Retaining Wall 10/7
N.T.S. Source: VHB REV LD_71

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Lebanon, New Hampshire 03766

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Not Approved for Construction
Drawing Title
Detail Sheet 1
Drawing Number



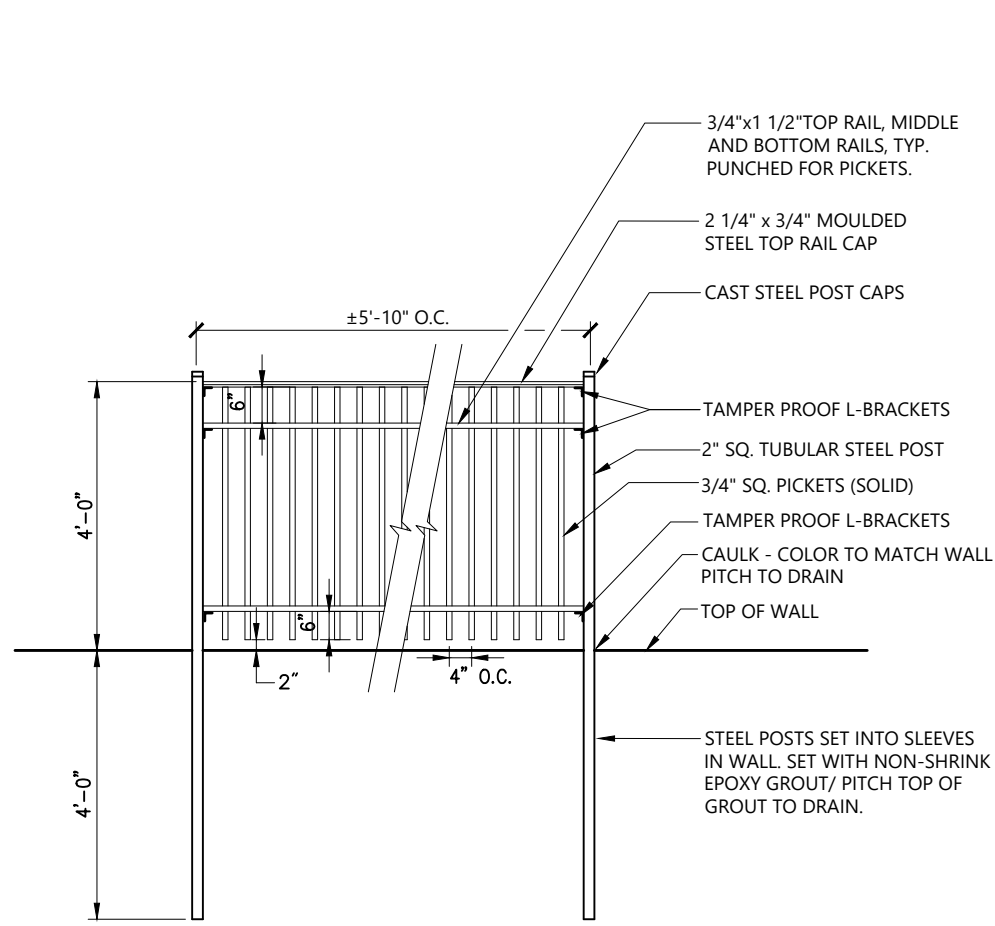
C7.1

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Project Number
52933.00

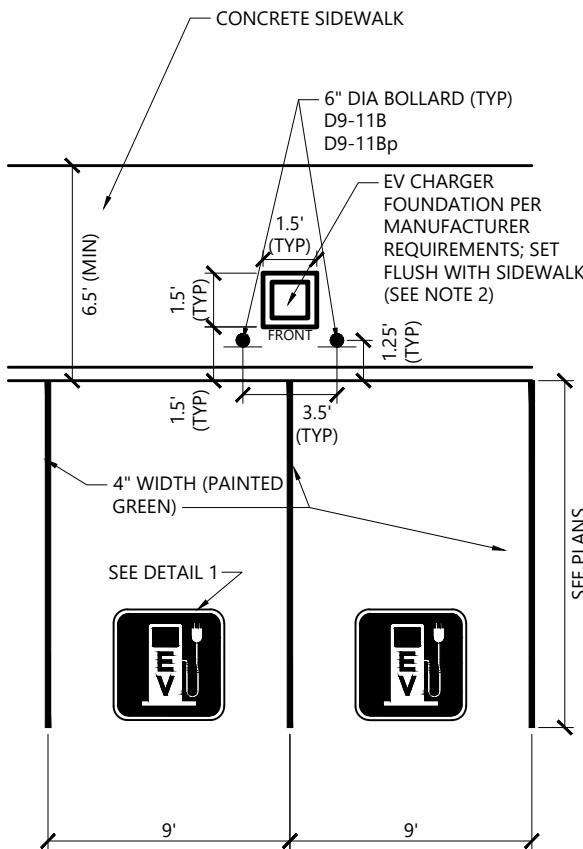


2 Bedford Farms Drive
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- NOTES:
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, BASED ON FIELD MEASUREMENTS, FOR APPROVAL PRIOR TO FABRICATION.
 - ALL STEEL SHALL BE HOT DIPPED GALVANIZED WITH FACTORY APPLIED EPOXY ENAMEL FINISH TO MATCH EXISTING FENCE.

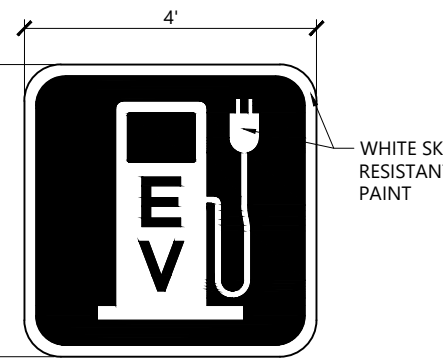
4' Ht. Metal Fence on Wall 5/23
N.T.S. Source: VHB LD_



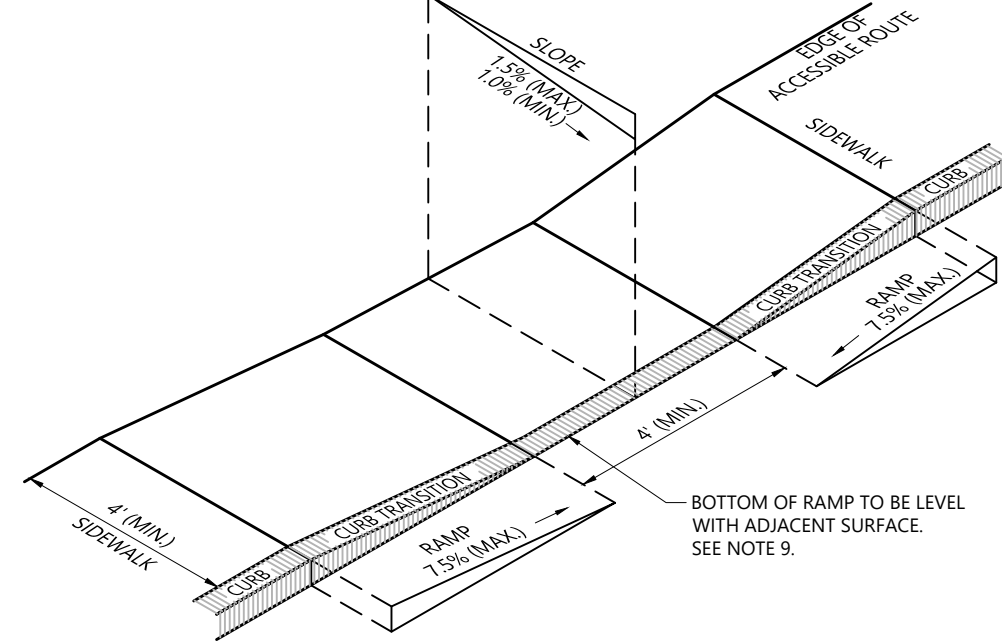
- NOTES
- ALL DIMENSION TO CENTER OF STRIPING.
 - FOR FUTURE EV CHARGING LOCATIONS, CONTRACTOR SHALL INSTALL A 18"W x 18"H x 24"D CONCRETE SECTION WITH EV CHARGING VAULT INSET WITHIN (SEE DETAIL).

Electric Vehicle Charging Spaces
N.T.S. Source: VHB

Sign Summary			
M.U.T.C.D. Number	Width	Height	Desc.
D9-11B	12"	18"	
D9-11BP	12"	12"	

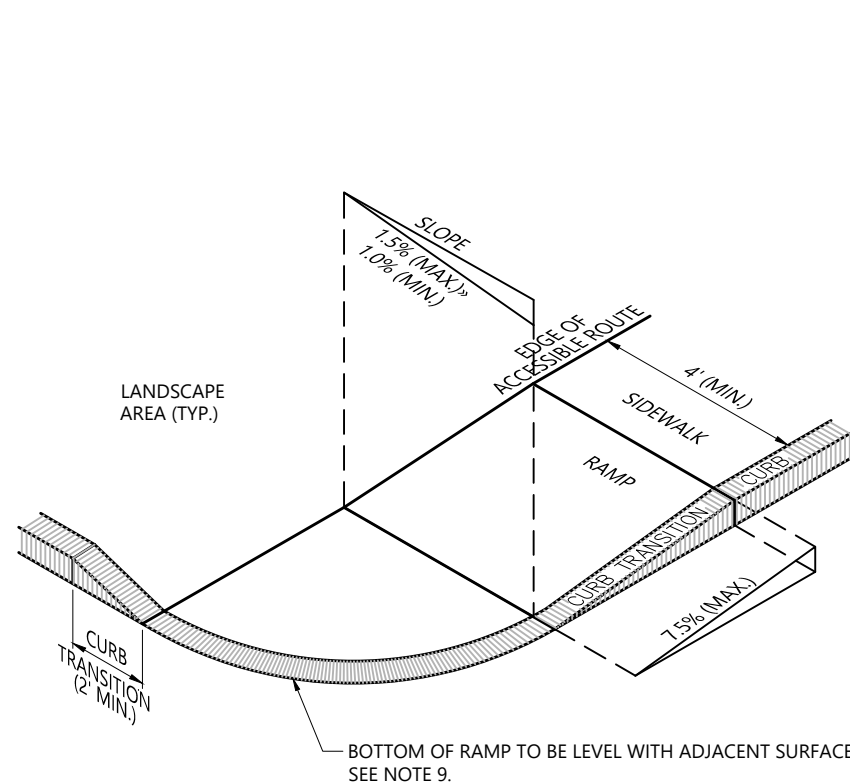


DETAIL 1



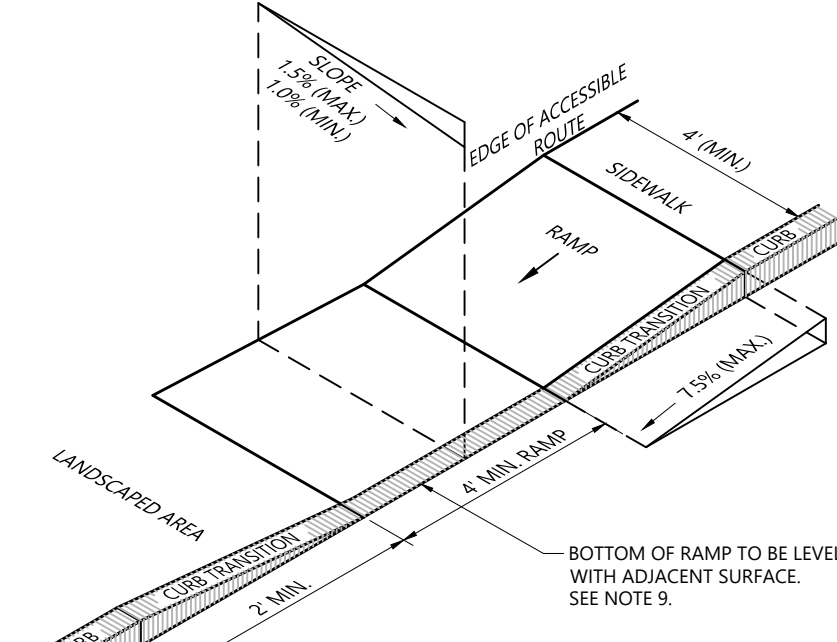
- NOTES
- THE MAXIMUM ALLOWABLE SIDEWALK AND CURB RAMP CROSS SLOPES SHALL BE 1.5 (1% MIN.).
 - THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
 - THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE AT CURB RAMPS SHALL BE 7.5%.
 - A MINIMUM OF 3 FEET CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (I.E., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.).
 - CURB TREATMENT VARIES. SEE PLANS FOR CURB TYPE.
 - RAMP, CURB, AND ADJACENT PAVEMENTS SHALL BE GRADED TO PREVENT PONDING.
 - SEE TYPICAL SIDEWALK SECTION FOR RAMP CONSTRUCTION.
 - WHERE ACCESSIBLE ROUTES ARE LESS THAN 5' IN WIDTH (EXCLUDING CURBING) A 5' x 5' PASSING AREA SHALL BE PROVIDED AT INTERVALS NOT TO EXCEED 200 FEET.
 - ELIMINATE CURBING AT RAMP (OTHER THAN VERTICAL CURBING, WHICH SHALL BE SET FLUSH) WHERE IT ABUTS ROADWAY.

Accessible Curb Ramp (ACR) Type 'A' 12/20
N.T.S. Source: VHB REV LD_500



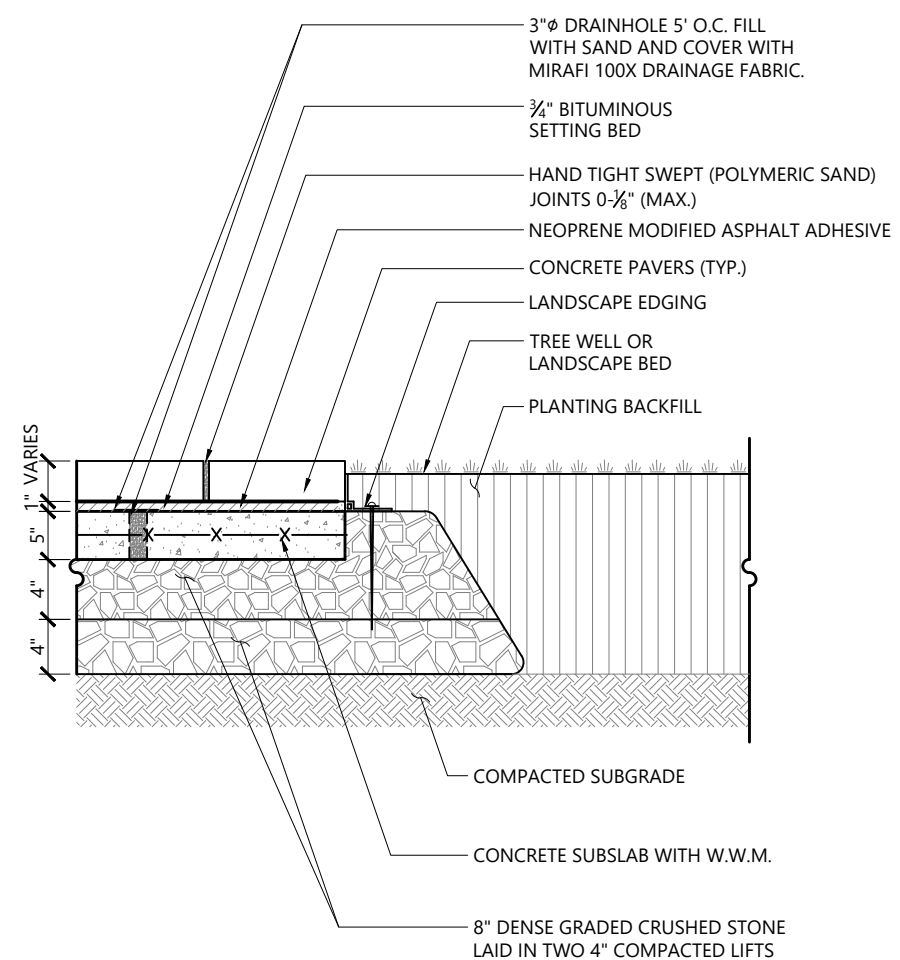
- NOTES
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 - CURB TREATMENT VARIES. SEE PLANS FOR CURB TYPE.
 - RAMP, CURB AND ADJACENT PAVEMENTS SHALL BE GRADED TO PREVENT PONDING.
 - SEE TYPICAL SIDEWALK SECTION FOR RAMP CONSTRUCTION.
 - WHERE ACCESSIBLE ROUTES ARE LESS THAN 5' IN WIDTH (EXCLUDING CURBING) A 5' x 5' PASSING AREA SHALL BE PROVIDED AT INTERVALS NOT TO EXCEED 200 FEET.
 - ELIMINATE CURBING AT RAMP WHERE IT ABUTS ROADWAY, EXCEPT WHERE VERTICAL CURBING IS INDICATED ON THE DRAWINGS TO BE INSTALLED AND SET FLUSH.

Accessible Curb Ramp (ACR) - Type 'B' 12/20
N.T.S. Source: VHB REV LD_501

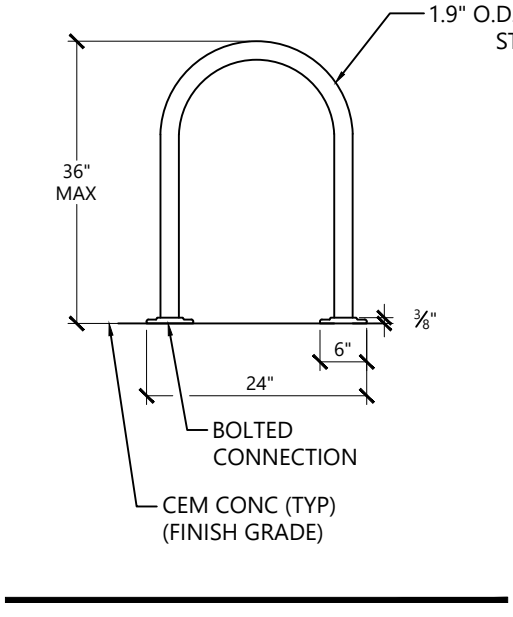
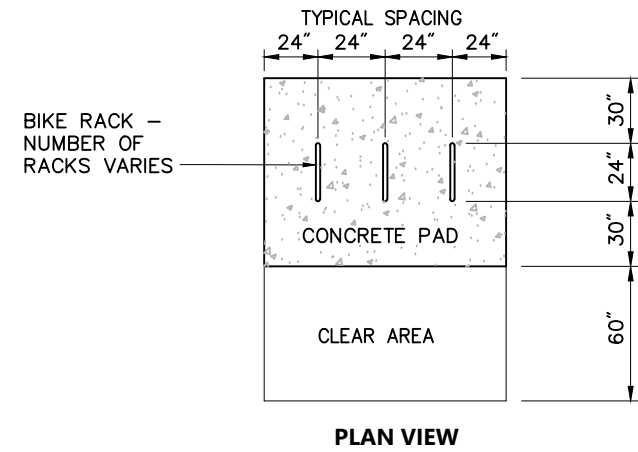


- NOTES
- THE MAXIMUM ALLOWABLE SIDEWALK AND CURB RAMP CROSS SLOPES SHALL BE 1.5 (1% MIN.).
 - THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
 - THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE AT CURB RAMPS SHALL BE 7.5%.
 - A MINIMUM OF 3 FEET CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (I.E., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.).
 - CURB TREATMENT VARIES. SEE PLANS FOR CURB TYPE.
 - RAMP, CURB AND ADJACENT PAVEMENTS SHALL BE GRADED TO PREVENT PONDING.
 - SEE TYPICAL SIDEWALK SECTION FOR RAMP CONSTRUCTION.
 - WHERE ACCESSIBLE ROUTES ARE LESS THAN 5' IN WIDTH (EXCLUDING CURBING) A 5' x 5' PASSING AREA SHALL BE PROVIDED AT INTERVALS NOT TO EXCEED 200 FEET.
 - ELIMINATE CURBING AT RAMP WHERE IT ABUTS ROADWAY, EXCEPT WHERE VERTICAL CURBING IS INDICATED ON THE DRAWINGS TO BE INSTALLED AND SET FLUSH.

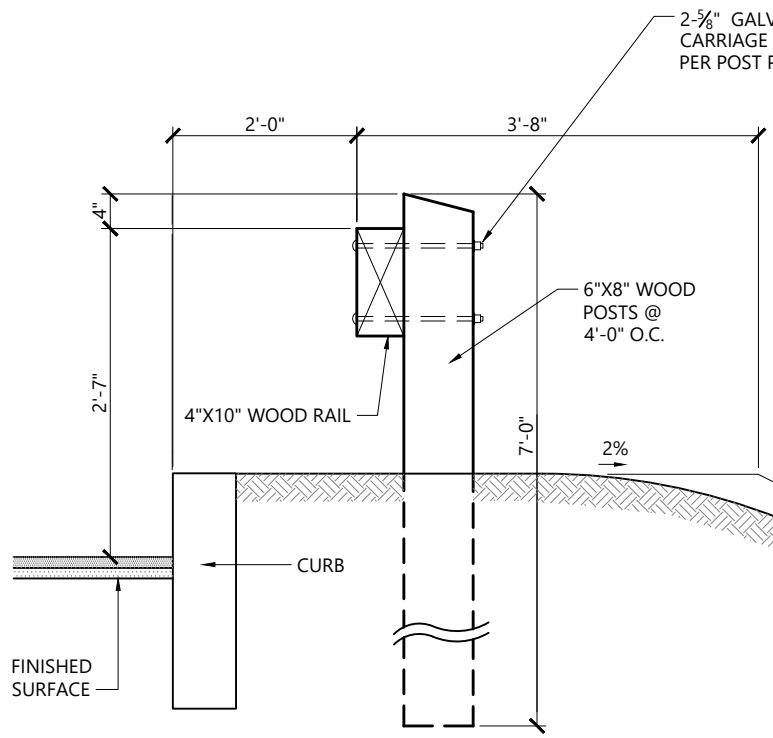
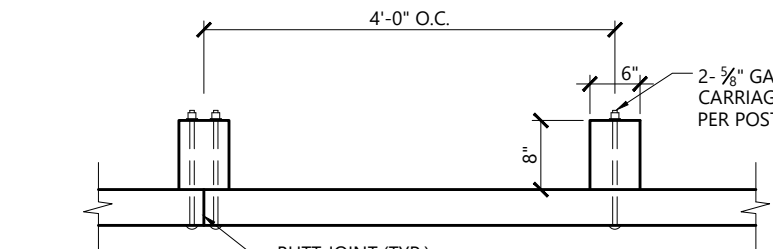
Accessible Curb Ramp (ACR) Type 'G' 12/20
N.T.S. Source: VHB REV LD_506



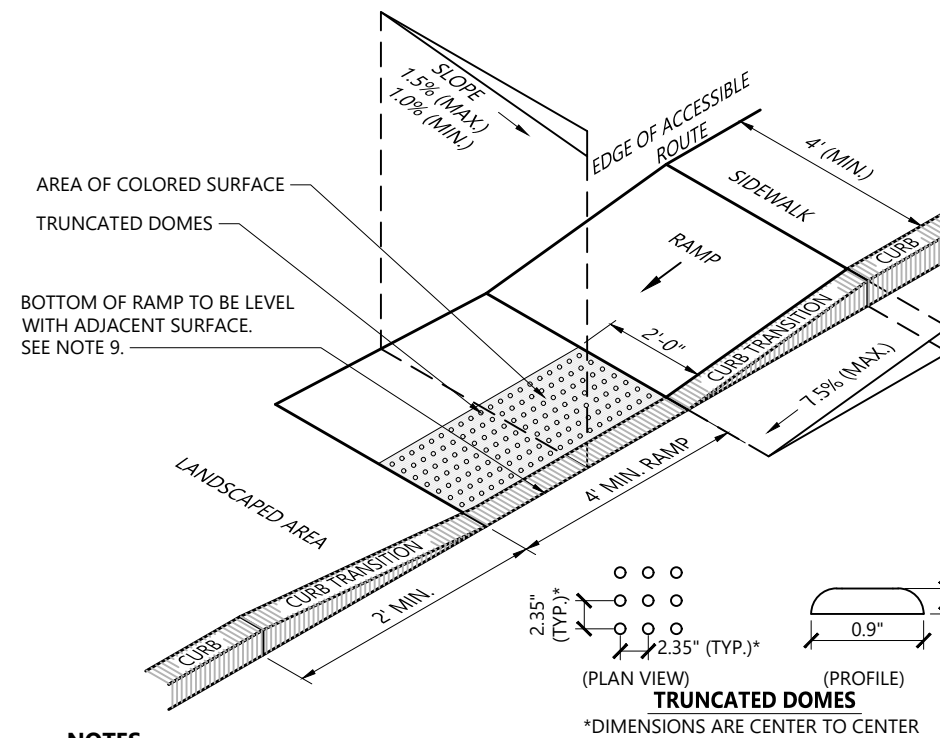
Unit Paver on Concrete Base at Landscape Edge 1/16
N.T.S. Source: VHB REV LD_830-B



Bicycle Parking
N.T.S.

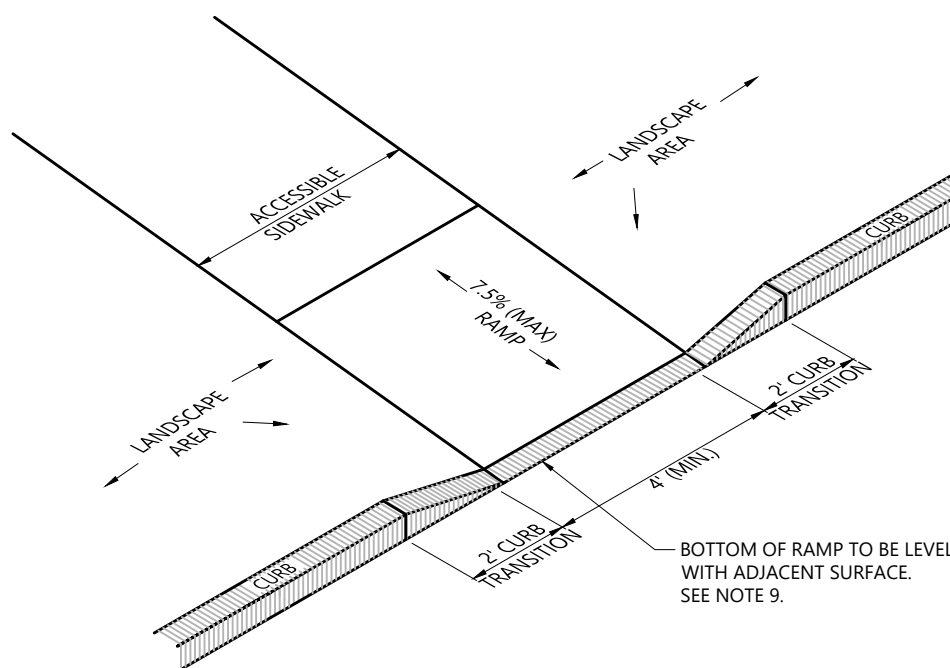


Wood Guardrail 10/20
N.T.S. Source: VHB REV LD_450



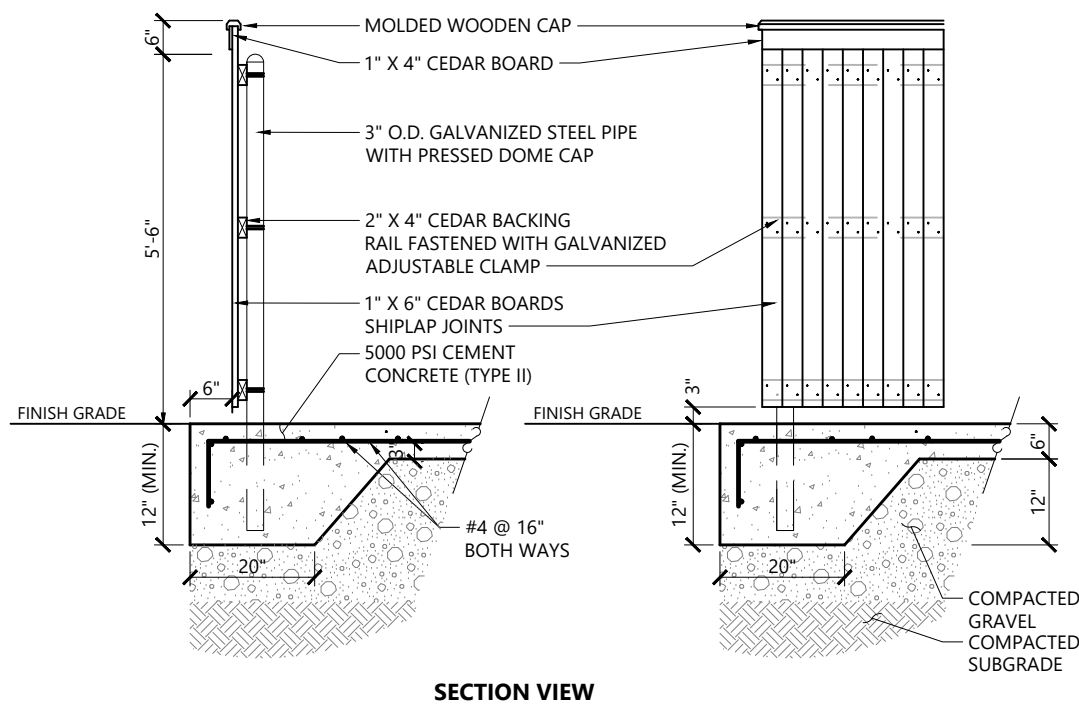
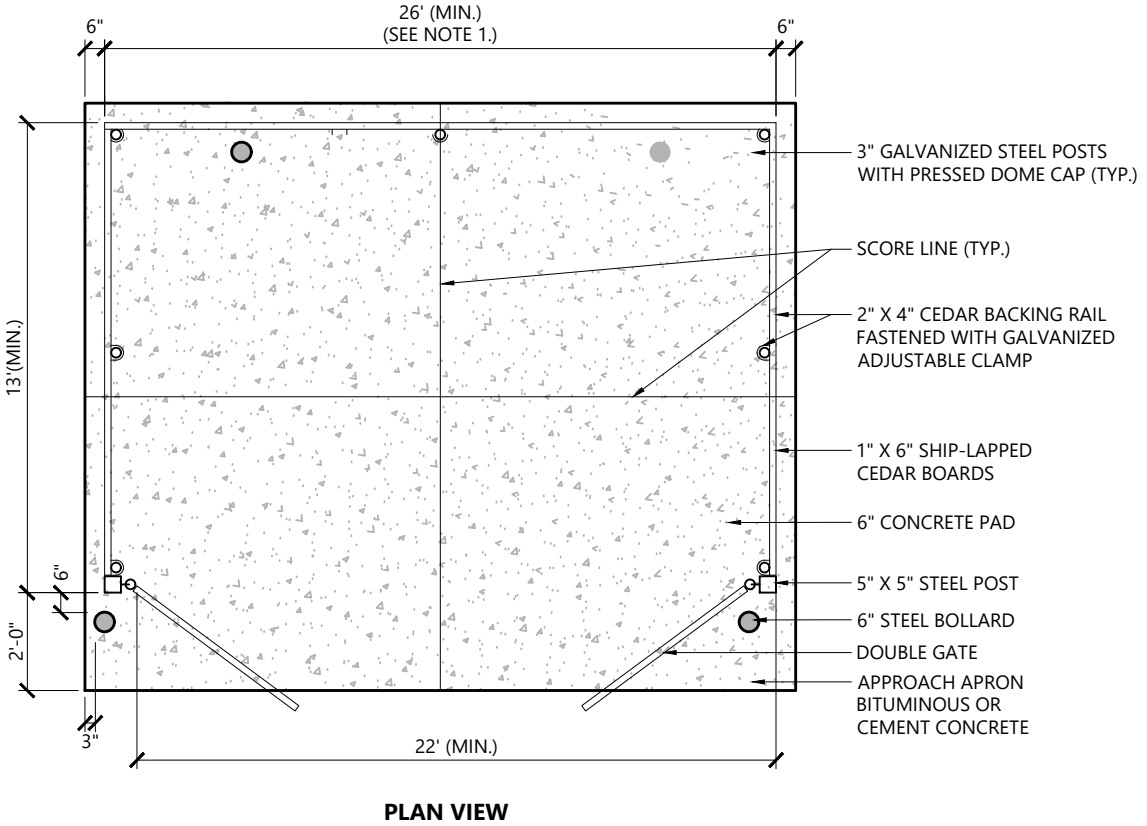
- NOTES
- THE MAXIMUM ALLOWABLE SIDEWALK AND CURB RAMP CROSS SLOPES SHALL BE 1.5 (1% MIN.).
 - THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
 - THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE AT CURB RAMPS SHALL BE 7.5%.
 - A MINIMUM OF 3 FEET CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (I.E., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.).
 - CURB TREATMENT VARIES. SEE PLANS FOR CURB TYPE.
 - RAMP, CURB AND ADJACENT PAVEMENTS SHALL BE GRADED TO PREVENT PONDING.
 - SEE TYPICAL SIDEWALK SECTION FOR RAMP CONSTRUCTION.
 - WHERE ACCESSIBLE ROUTES ARE LESS THAN 5' IN WIDTH (EXCLUDING CURBING) A 5' x 5' PASSING AREA SHALL BE PROVIDED AT INTERVALS NOT TO EXCEED 200 FEET.
 - ELIMINATE CURBING AT RAMP WHERE IT ABUTS ROADWAY, EXCEPT WHERE VERTICAL CURBING IS INDICATED ON THE DRAWINGS TO BE INSTALLED AND SET FLUSH.
 - DETECTABLE WARNINGS SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES.
 - DETECTABLE WARNINGS SHALL BE INSTALLED PERPENDICULAR TO THE ACCESSIBLE ROUTE.
 - CONTRACTOR TO SUBMIT R.F.I. FOR THIS TYPE OF ACCESSIBLE CURB RAMP FOR APEX ROADWAY CROSSINGS.

Accessible Curb Ramp (ACR) Type 'G-D' 12/20
N.T.S. Source: VHB REV LD_506



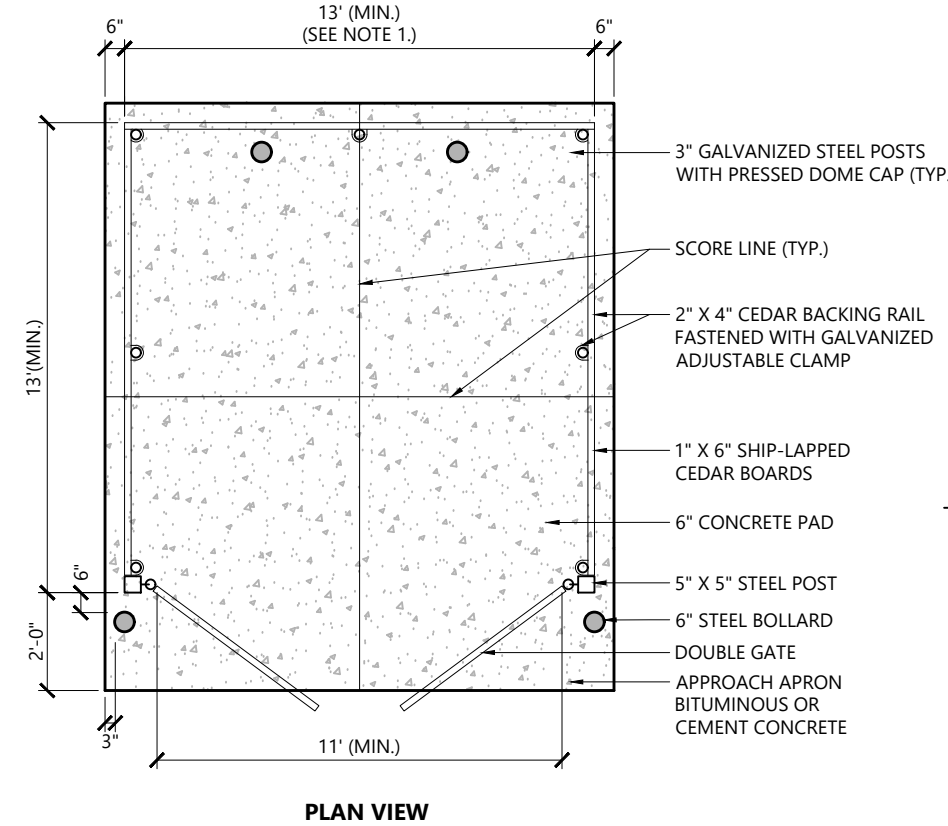
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 - THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE AT CURB RAMPS SHALL BE 7.5%.
 - A MINIMUM OF 3 FEET CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (I.E., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.).
 - CURB TREATMENT VARIES. SEE PLANS FOR CURB TYPE.
 - RAMP, CURB AND ADJACENT PAVEMENTS SHALL BE GRADED TO PREVENT PONDING.
 - SEE TYPICAL SIDEWALK SECTION FOR RAMP CONSTRUCTION.
 - WHERE ACCESSIBLE ROUTES ARE LESS THAN 5' IN WIDTH (EXCLUDING CURBING) A 5' x 5' PASSING AREA SHALL BE PROVIDED AT INTERVALS NOT TO EXCEED 200 FEET.
 - ELIMINATE CURBING AT RAMP WHERE IT ABUTS ROADWAYS.

Accessible Curb Ramp (ACR) Type 'M' 12/20
N.T.S. Source: VHB REV LD_512



- NOTES
- DUMPSTER PAD DIMENSIONS SHOWN AS MINIMUM. REFER TO PLAN FOR ACTUAL DIMENSION.
 - PAD DESIGNED FOR TWO 6 YARD DUMPSTERS.

Double Dumpster Pad w/ Enclosure 1/20
N.T.S. Source: VHB REV LD_713



- NOTES
- DUMPSTER PAD DIMENSIONS SHOWN AS MINIMUM. REFER TO PLAN FOR ACTUAL DIMENSION.
 - PAD DESIGNED FOR 6 YARD DUMPSTER.

Dumpster Pad w/ Enclosure 1/20
N.T.S. Source: VHB REV LD_71

The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

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1	Response to Comments Update	08/06/24	DF

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Issued for Permitting
Checked by
Date May 10, 2024

Not Approved for Construction

Drawing Title
Detail Sheet 2

Drawing Number



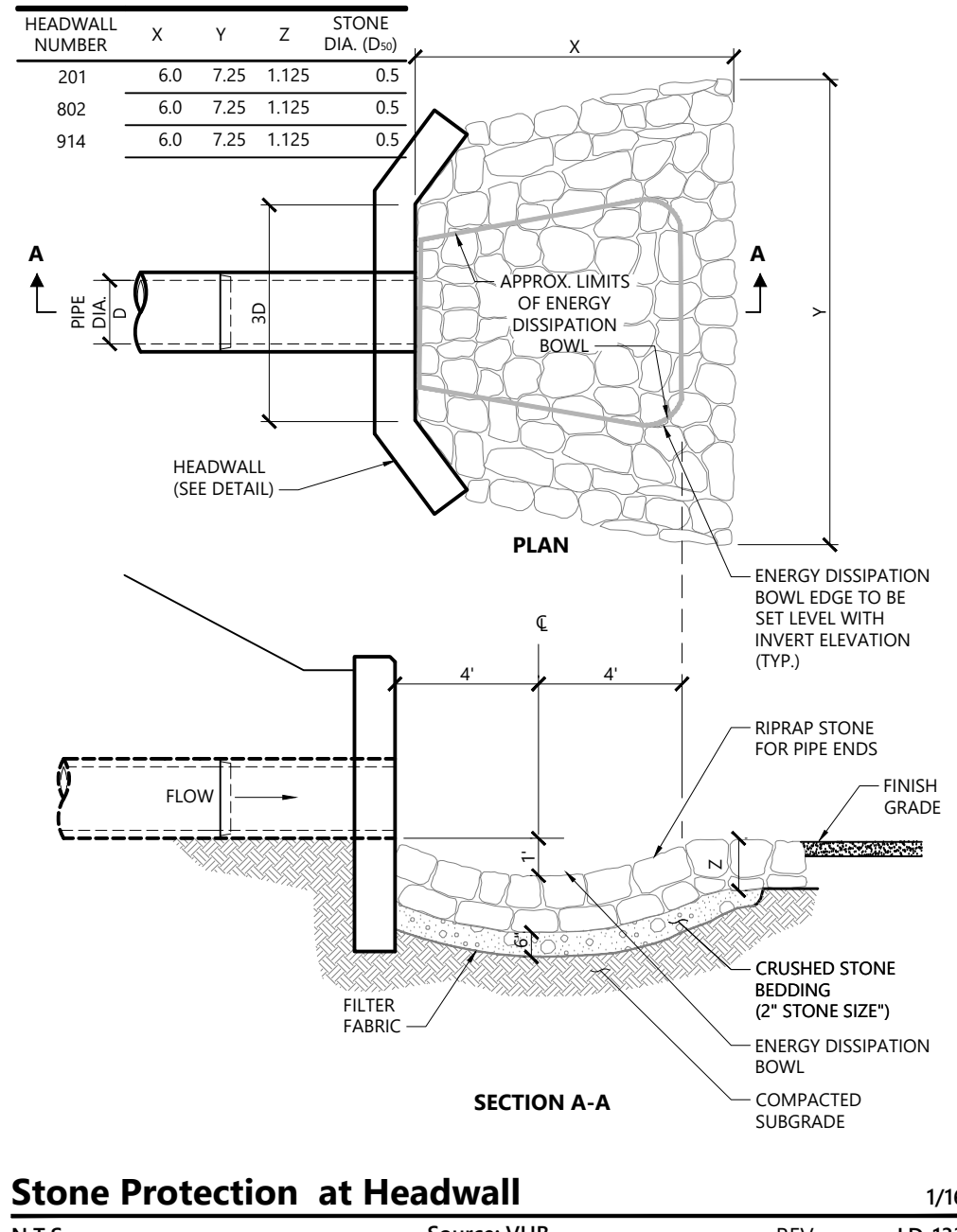
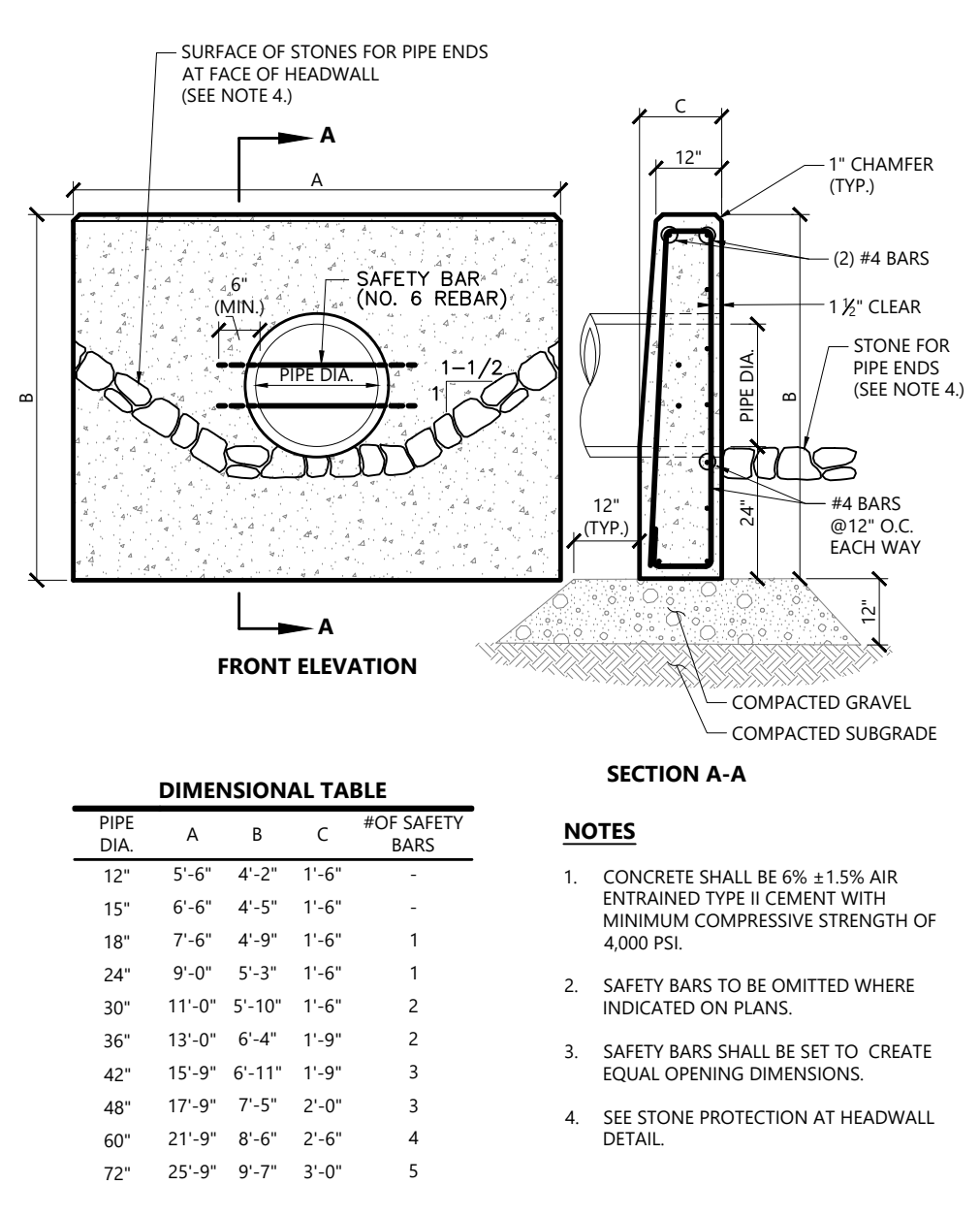
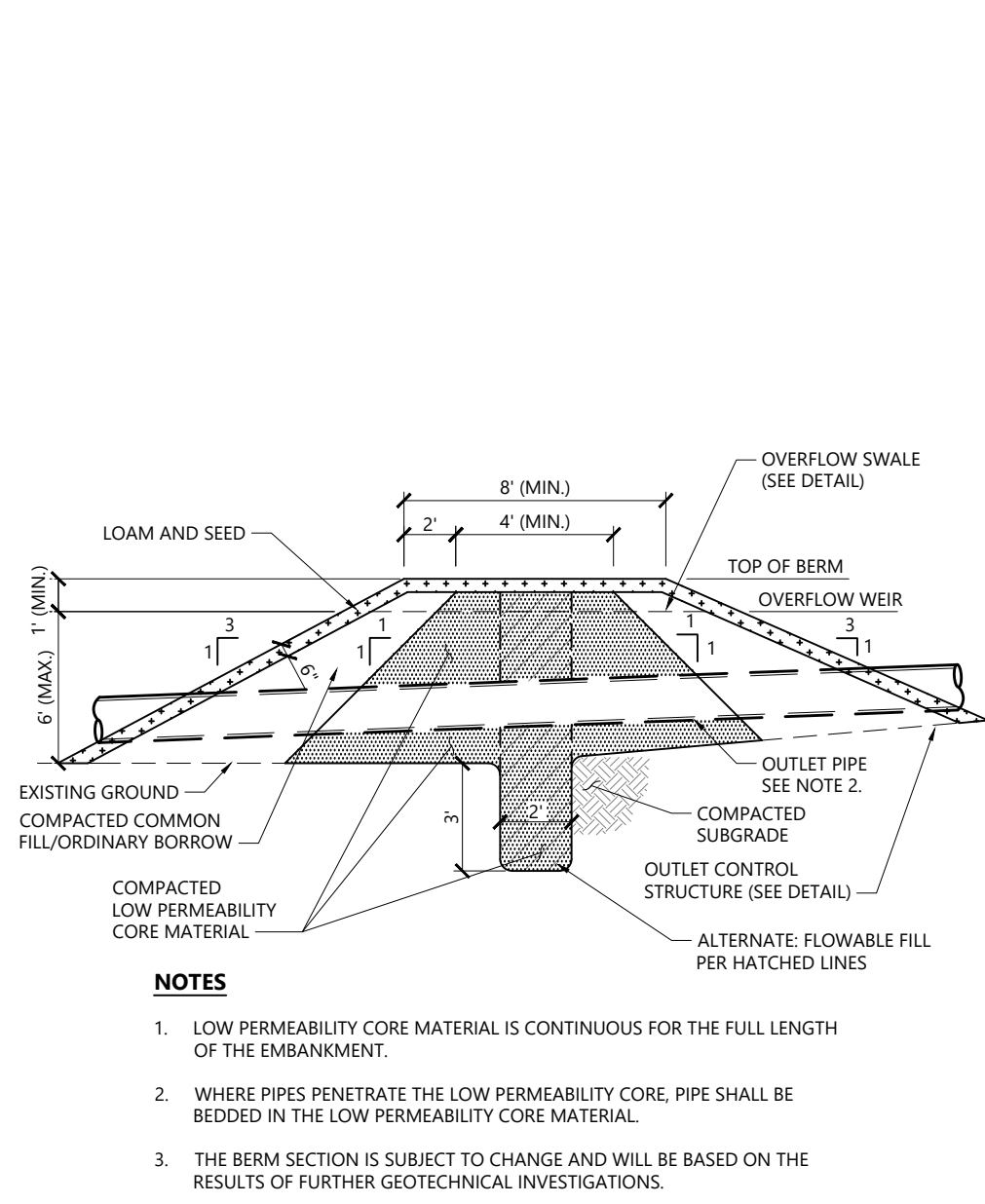
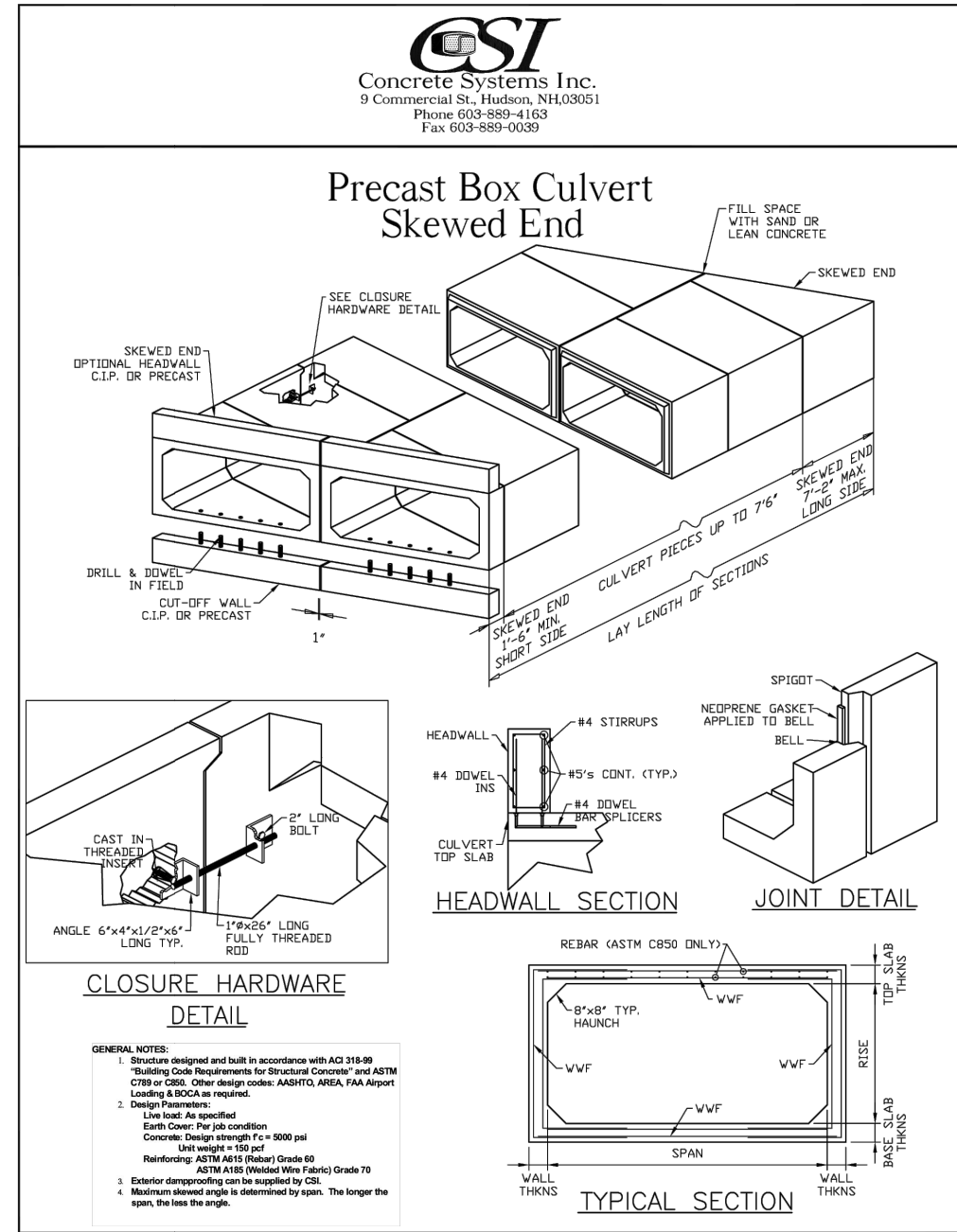
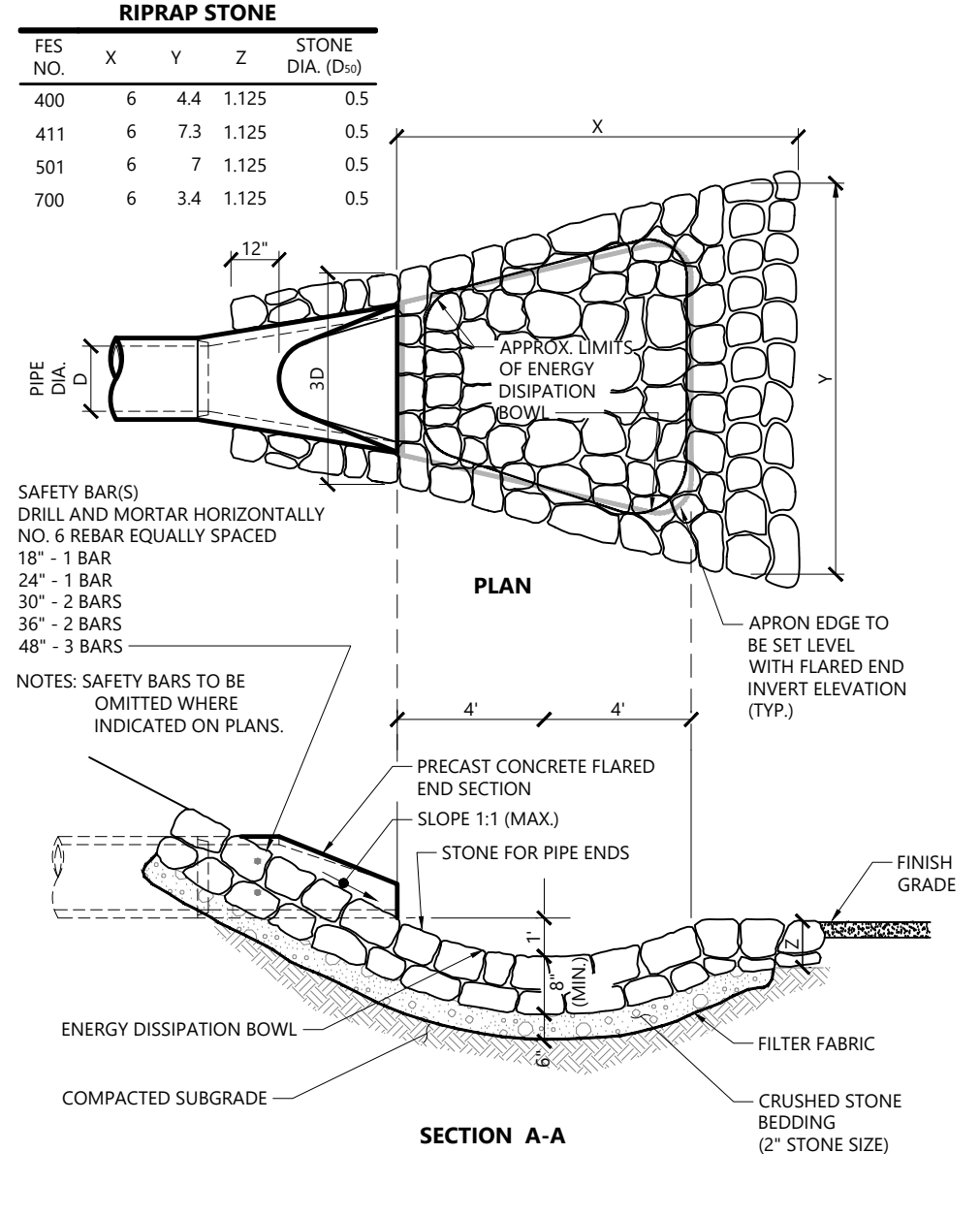
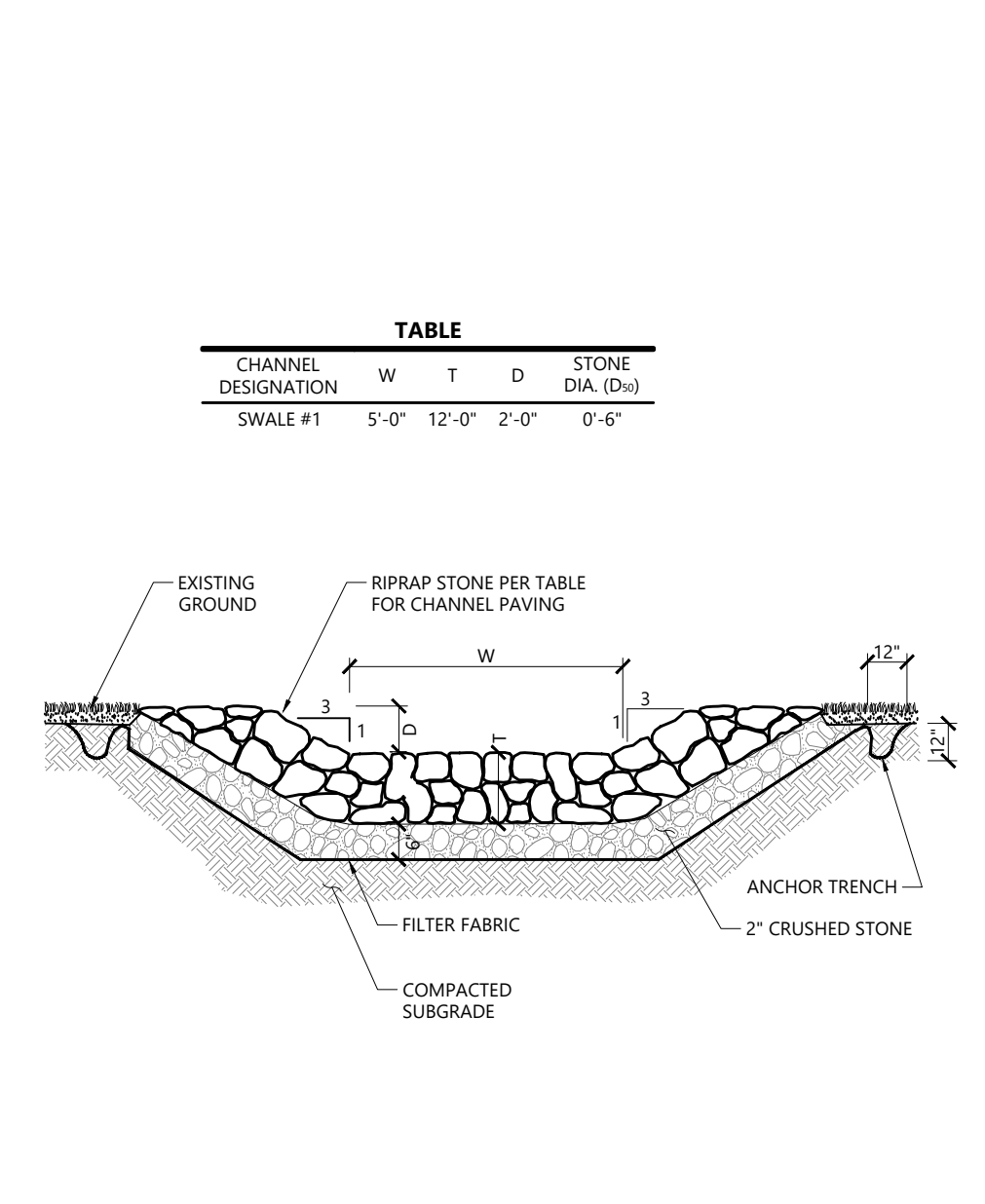
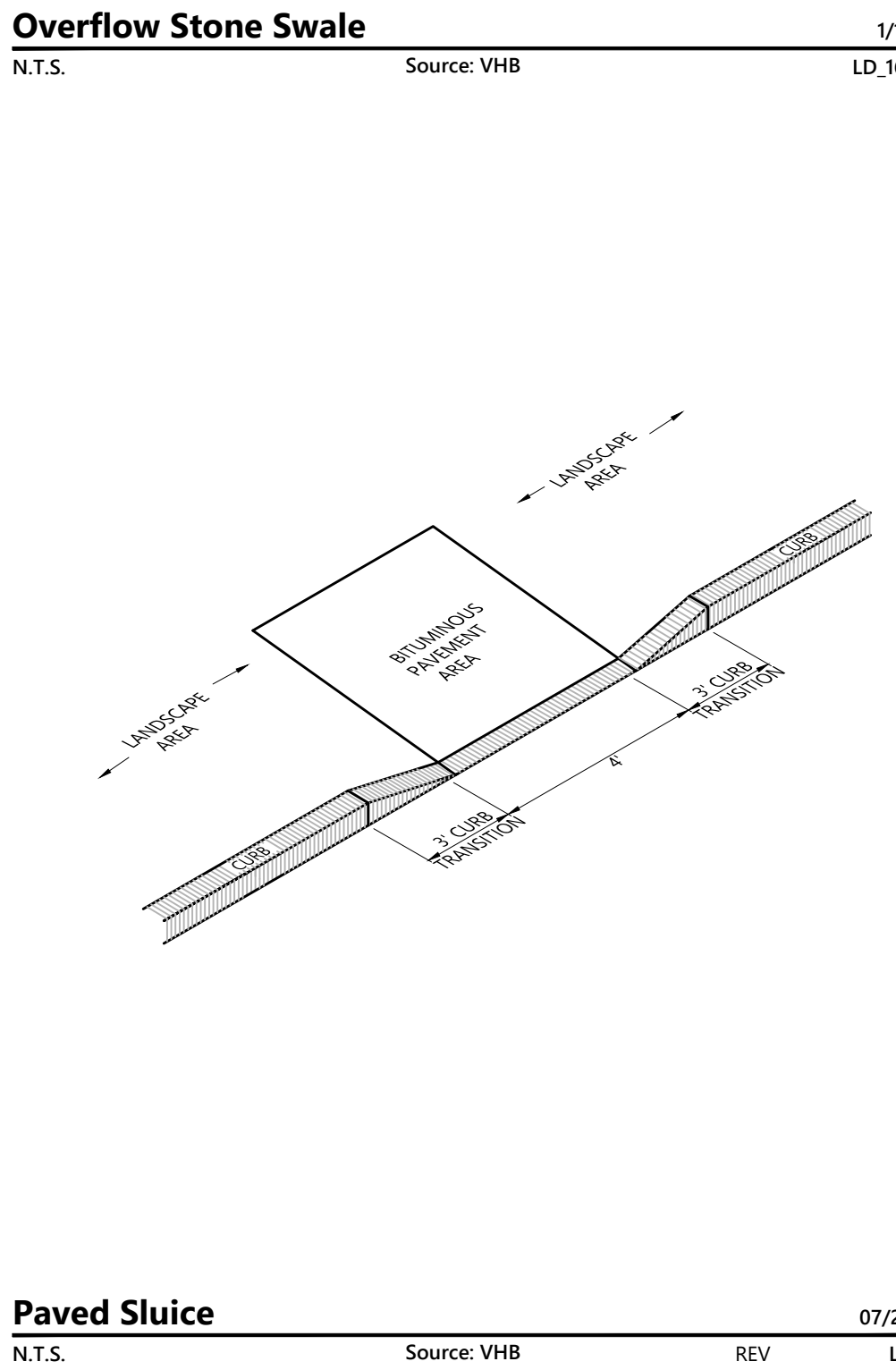
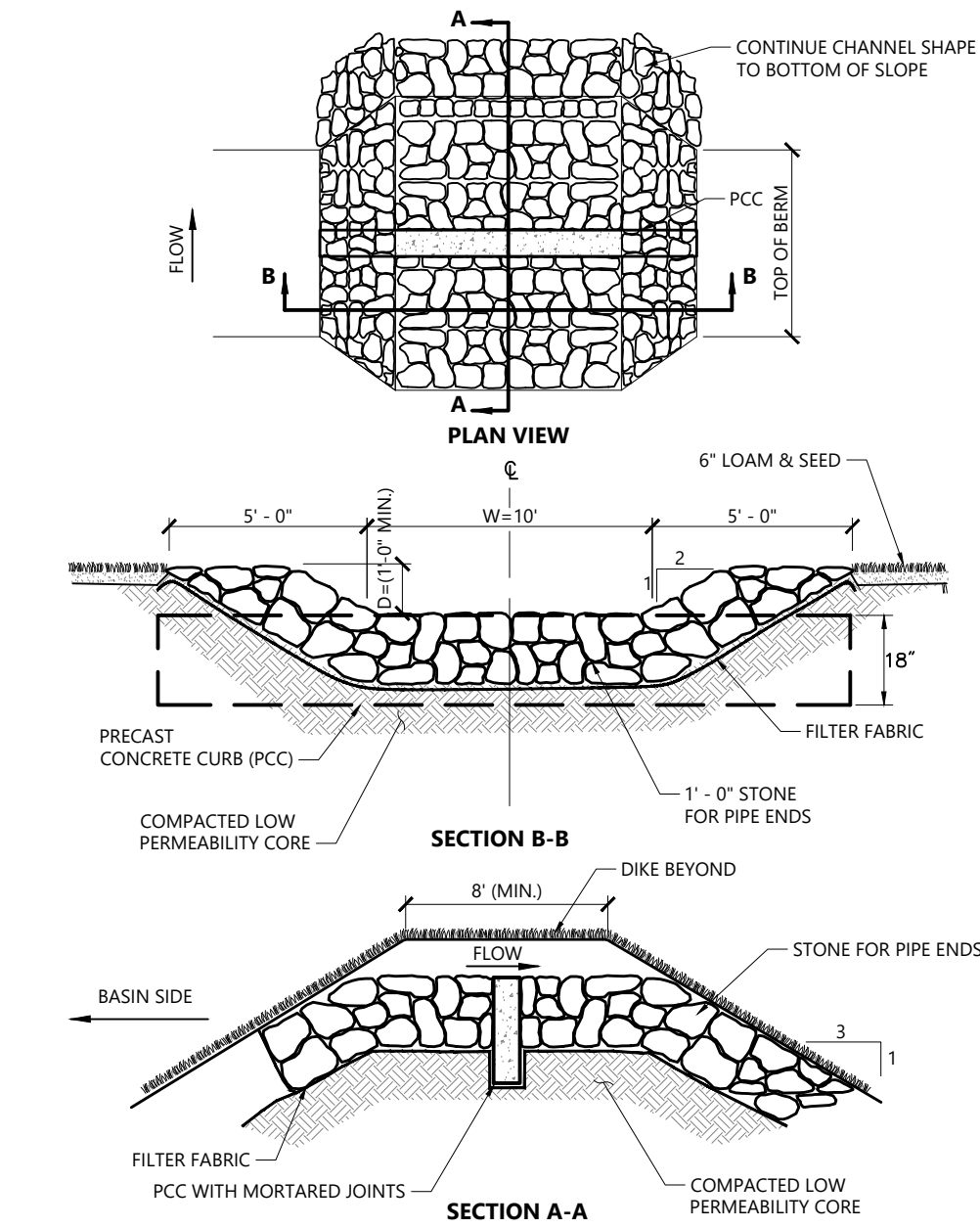
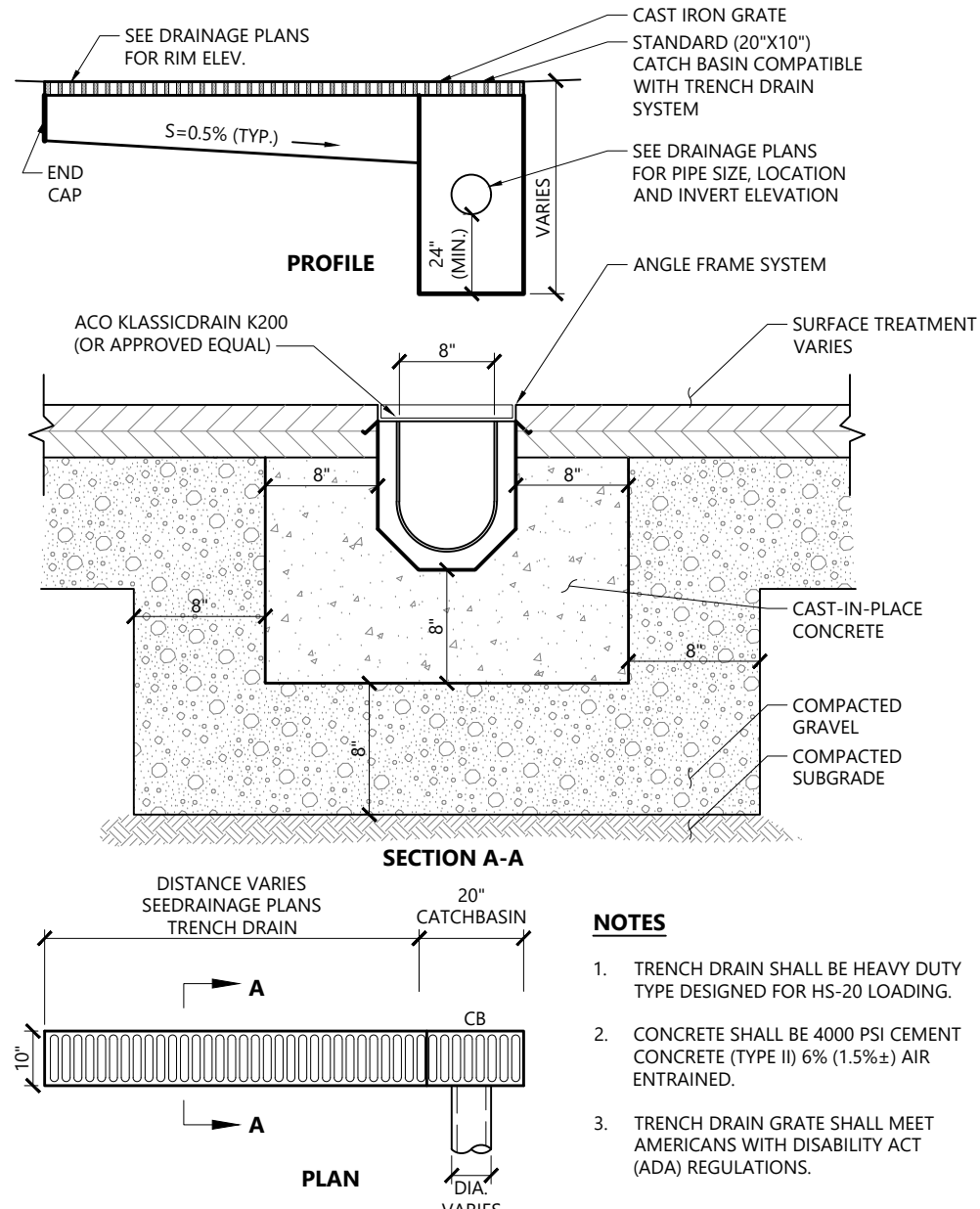
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Sheet 26 of 50

Project Number
52933.00

Storm Sewer Pipe Schedule

Start Str.	End Str.	Size	Material	Length	Slope	Start Inv.	End Inv.
101 (3)	902 (3)	15	HDPE	1.256	1.33%	48.19	48.18
102 (3)	101 (3)	12	HDPE	4.244	2.36%	48.42	48.32
103 (3)	102 (3)	12	HDPE	7.662	0.54%	48.53	48.49
104 (3)	101 (3)	15	HDPE	3.856	3.24%	48.34	48.22
105 (3)	104 (3)	15	HDPE	5.412	2.16%	48.47	48.35
106 (3)	105 (3)	15	HDPE	7.874	0.95%	48.55	48.48
107 (3)	106 (3)	15	HDPE	3.708	2.02%	48.75	48.68
108 (3)	107 (3)	12	HDPE	2.000	1.25%	49.07	49.04
109 (3)	107 (3)	12	HDPE	8.333	1.00%	48.96	48.88
110 (3)	109 (3)	12	HDPE	2.000	1.25%	49.12	49.10
202 (3)	201 (3)	15	HDPE	2.686	3.10%	48.18	48.09
207 (3)	206 (3)	30	HDPE	3.353	0.99%	48.40	48.36
208 (3)	207 (3)	15	HDPE	2.028	2.05%	49.02	48.98
209 (3)	208 (3)	12	HDPE	4.243	0.95%	49.22	49.18
210 (3)	208 (3)	15	HDPE	2.364	0.70%	49.04	49.03
211 (3)	210 (3)	12	HDPE	4.888	0.85%	49.21	49.17
212 (3)	207 (3)	12	HDPE	6.755	0.86%	49.15	49.09
213 (3)	207 (3)	30	HDPE	13.594	0.86%	48.52	48.40
214 (3)	213 (3)	12	HDPE	2.756	2.42%	49.37	49.30
215 (3)	213 (3)	24	HDPE	7.787	1.18%	48.85	48.76
216 (3)	215 (3)	24	HDPE	8.479	0.98%	48.94	48.86
217 (3)	216 (3)	24	HDPE	8.735	1.05%	49.03	48.94
218 (3)	217 (3)	15	HDPE	2.000	1.04%	49.41	49.39
309 (3)	310 (3)	12	HDPE	8.542	2.73%	50.12	49.88
310 (3)	317 (3)	12	HDPE	3.540	1.29%	49.88	49.83
312 (3)	313 (3)	12	HDPE	12.062	2.56%	49.87	49.56
313 (3)	217 (3)	24	HDPE	4.786	1.04%	49.09	49.04
314 (3)	313 (3)	24	HDPE	3.884	0.97%	49.14	49.10
315 (3)	314 (3)	12	HDPE	2.000	1.04%	49.62	49.60
316 (3)	314 (3)	15	HDPE	12.500	1.00%	49.61	49.49
317 (3)	316 (3)	12	HDPE	8.333	1.00%	49.82	49.74
401 (3)	400 (3)	24	HDPE	4.741	1.76%	48.77	48.68
402 (3)	401 (3)	12	HDPE	7.998	1.25%	49.33	49.23
403 (3)	401 (3)	24	HDPE	4.500	1.11%	49.04	48.99
404 (3)	403 (3)	18	HDPE	11.486	1.16%	49.41	49.28
405 (3)	404 (3)	18	HDPE	5.073	1.15%	49.48	49.42
406 (3)	405 (3)	18	HDPE	3.856	1.08%	49.53	49.49
407 (3)	406 (3)	12	HDPE	7.840	1.06%	49.85	49.77
500 (3)	501 (3)	12	HDPE	4.754	3.51%	48.62	48.46
601 (3)	602 (3)	15	HDPE	6.129	0.41%	49.34	49.32
701 (3)	700 (3)	12	HDPE	4.078	10.00%	49.10	48.69
908 (3)	915 (3)	15	HDPE	1.637	0.68%	48.49	48.48
909 (2)	908 (3)	12	HDPE	6.058	1.27%	48.69	48.62
913 (3)	914 (3)	15	HDPE	3.004	4.16%	48.14	48.01
BP2 (3)	215 (3)	12	HDPE	4.281	0.97%	49.37	49.32
BP3 (3)	315 (3)	12	HDPE	2.124	8.83%	49.83	49.65
OCS 203 (3)	202 (3)	15	HDPE	3.389	3.44%	48.30	48.19
OCS 410 (3)	411 (3)	15	HDPE	2.885	7.93%	48.57	48.34
RD1 (3)	901 (3)	12	HDPE	3.172	1.05%	48.66	48.62
RD2 (3)	204 (3)	12	HDPE	2.099	3.57%	49.12	49.05
RD3 (3)	215 (3)	12	HDPE	3.108	1.07%	49.36	49.32
RD4 (3)	313 (3)	12	HDPE	2.945	5.09%	49.71	49.56
RD5 (3)	405 (3)	12	HDPE	6.801	1.10%	49.79	49.72
RD6 (3)	108 (3)	12	HDPE	2.750	1.52%	49.12	49.08
RD7 (3)	210 (3)	12	HDPE	4.329	1.15%	49.21	49.16
RD8 (3)	214 (3)	12	HDPE	8.913	2.34%	49.67	49.46
RD9 (3)	312 (3)	12	HDPE	2.927	8.54%	50.12	49.88
RD10 (3)	406 (3)	12	HDPE	5.826	2.57%	49.92	49.77
TD (3)	309 (3)	12	HDPE	2.058	1.01%	50.15	50.12
TD (3)	209 (3)	12	HDPE	4.074	1.57%	49.29	49.23
TD (3)	500 (3)	12	HDPE	2.646	1.26%	49.00	48.97
TD (3)	209 (3)	12	HDPE	2.809	2.28%	49.29	49.23
TD (3)	312 (3)	12	HDPE	3.302	1.01%	49.91	49.88



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

No.	Revision	Date	Appr.
1	Response to Comments Update	08/06/24	DF

Designed by TMD
Checked by MJV
Issued for Permitting
Date May 10, 2024

Not Approved for Construction

Drawing Title
Detail Sheet 3

Drawing Number

C7.3

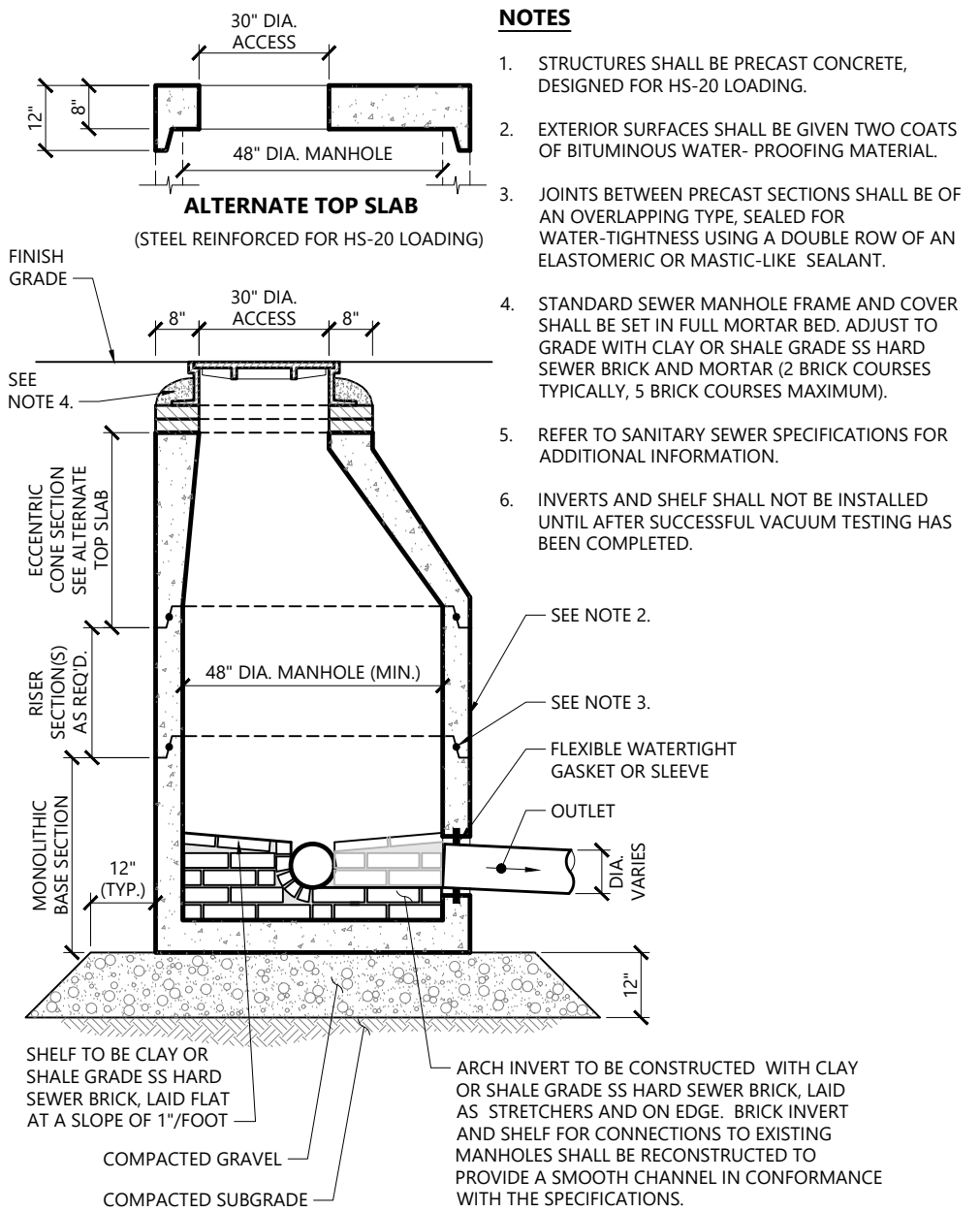
Sheet 27 of 50

Project Number
52933.00

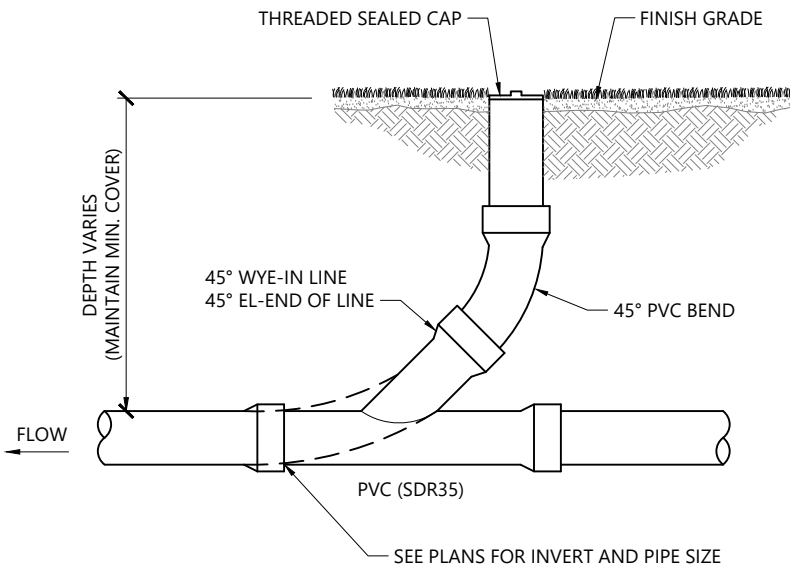
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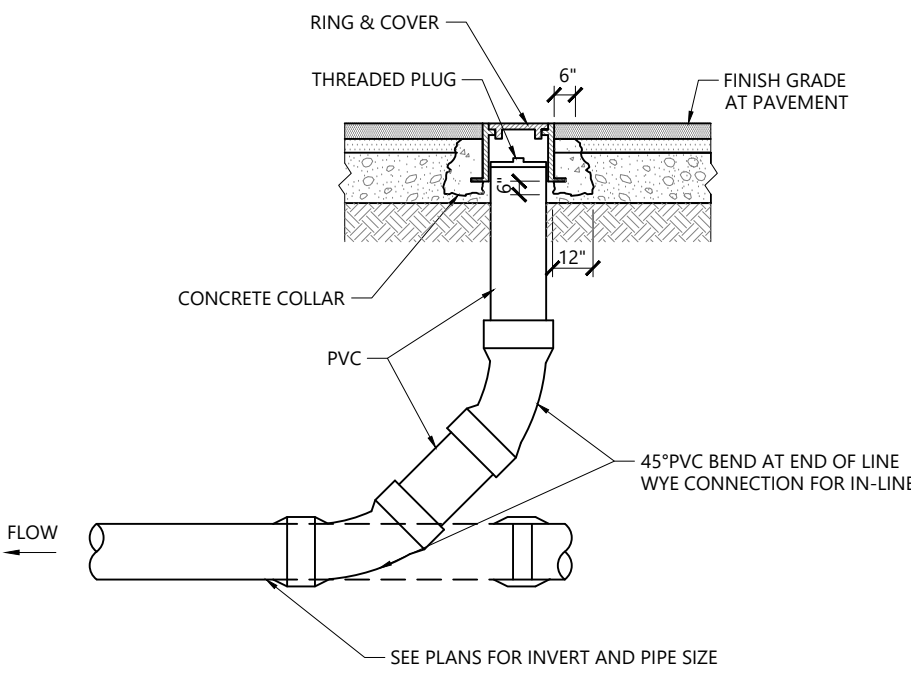
2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900



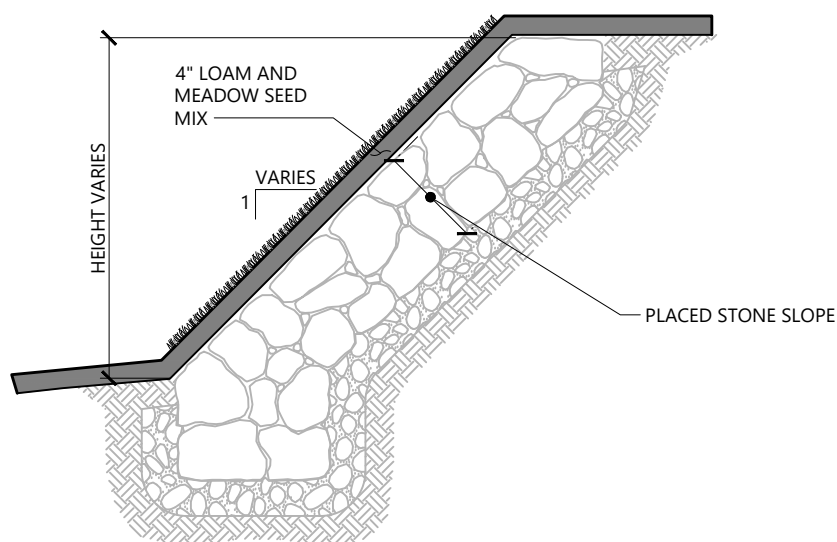
Sanitary Sewer Manhole (SMH) 1/16
N.T.S. Source: VHB REV LD_200 NH



Cleanout - Landscape Area 1/16
N.T.S. Source: VHB LD_302

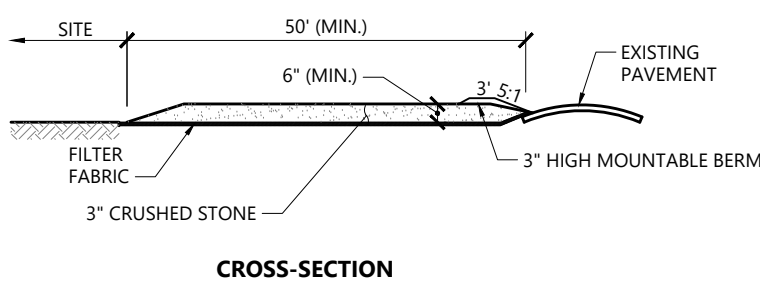
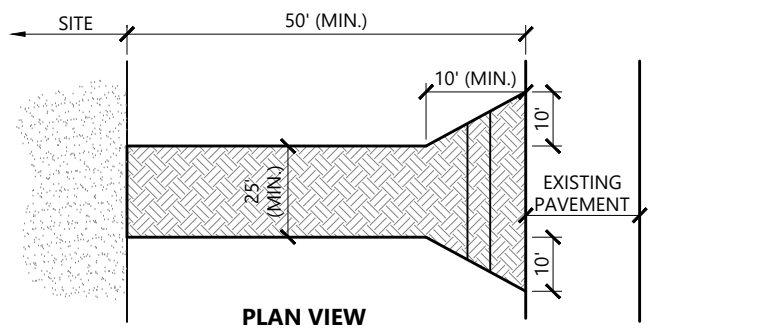


Cleanout - Paved Area 1/16
N.T.S. Source: VHB LD_303



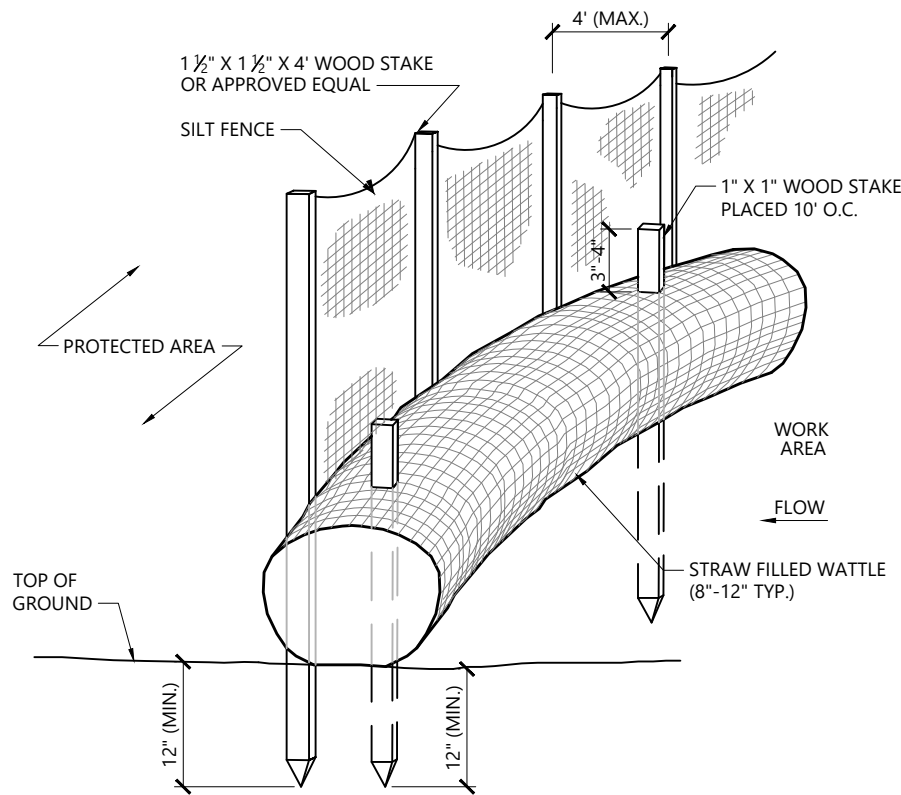
- NOTES**
- EROSION CONTROL BLANKETS SHALL BE USED DURING GROWTH.
 - CONTRACTOR TO REPAIR SLOPE IF EVIDENCE OF EROSION IS PRESENT PRIOR TO CERTIFICATE OF OCCUPANCY.
 - CONTRACTOR TO ENSURE 4" OF LOAM ABOVE FACE OF ROCK.

Loam and Meadow Mix Stone Slope 1/16
N.T.S. Source: VHB REV LD_760



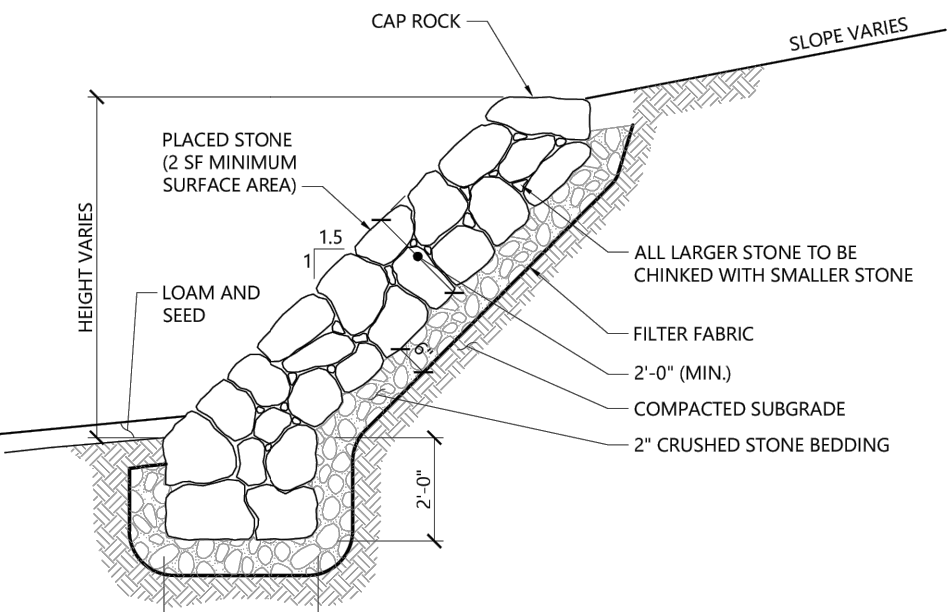
- NOTES**
- EXIT WIDTH SHALL BE A TWENTY-FIVE (25) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
 - THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY. BERM SHALL BE PERMITTED. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.
 - STABILIZED CONSTRUCTION EXIT SHALL BE REMOVED PRIOR TO FINAL FINISH MATERIALS BEING INSTALLED.

Stabilized Construction Exit 5/17
N.T.S. Source: VHB REV LD_682-NH



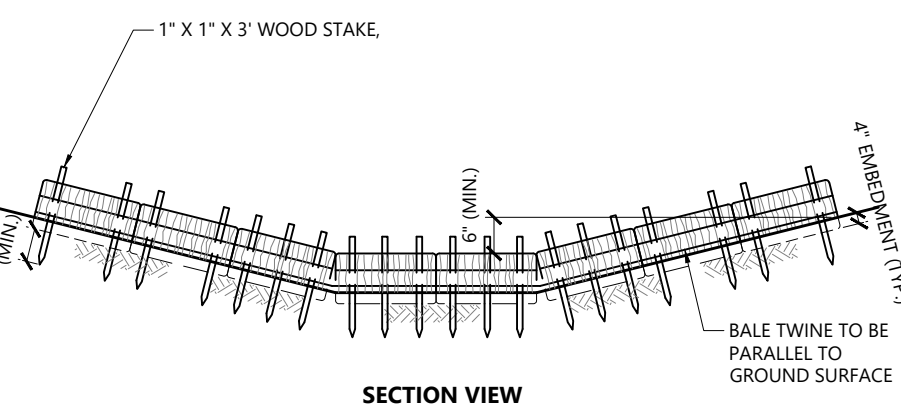
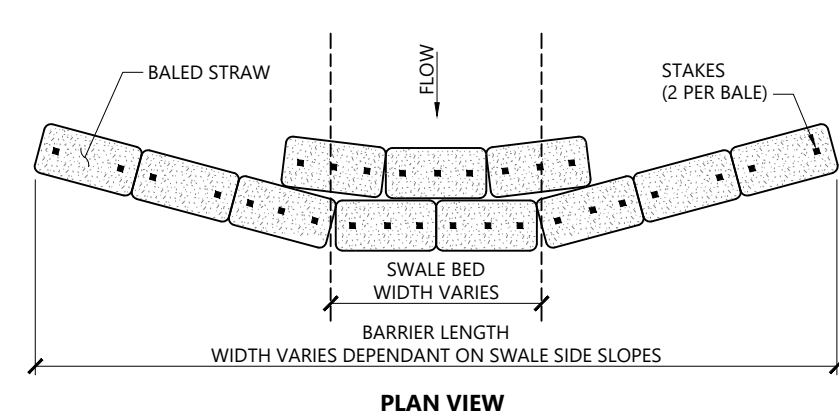
- NOTES**
- STRAW WATTLE SHALL BE AS MANUFACTURED BY EARTHSAVER OR APPROVED EQUAL.
 - STRAW WATTLES SHALL OVERLAP A MINIMUM OF 12 INCHES.
 - STRAW WATTLE SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS, AND REPAIR OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.
 - TEMPORARY STRAW WATTLES TO BE REMOVED BY CONTRACTOR. ALL OTHERS TO REMAIN IN PLACE UNLESS DIRECTED OTHERWISE BY ENGINEER.
 - IF NON BIODEGRADABLE NETTING IS USED THE NETTING SHALL BE COLLECTED AND DISPOSED OF OFFSITE.

Straw Wattle - Erosion Control Barrier 10/21
N.T.S. Source: VHB REV LD_659-A



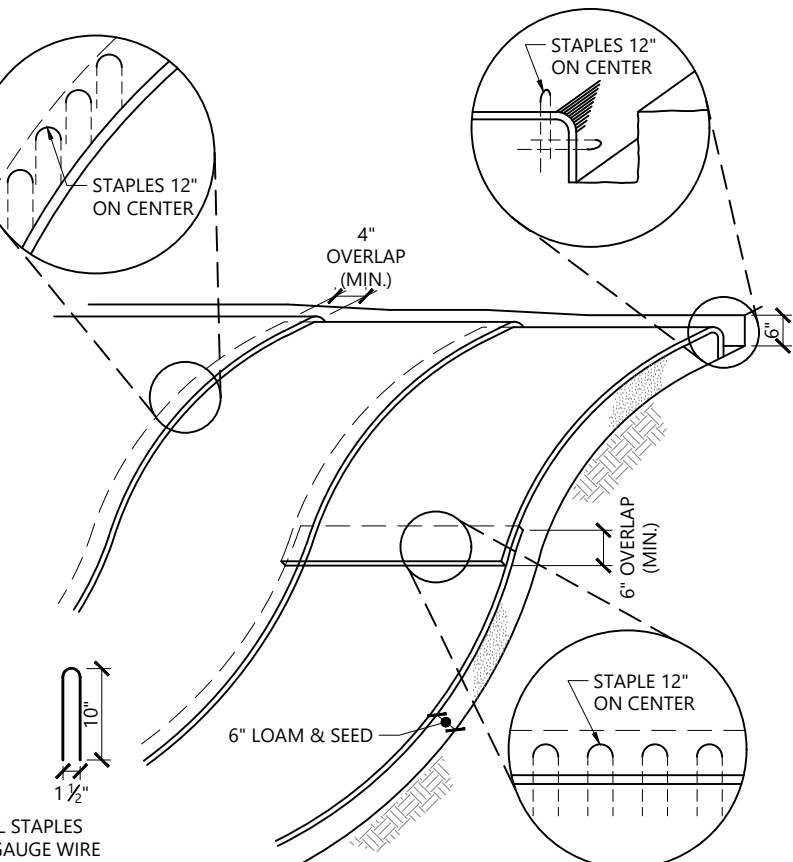
- NOTES**
- SLOPE TO BE FOUNDED ON UNDISTURBED MATERIAL OR GRAVEL AND COMPACTED CONSISTENT WITH GEOTECHNICAL ENGINEERS RECOMMENDATIONS.
 - GAP IN STONE TO BE FILLED WITH SOIL AND MEADOW MIX ONCE SLOPE HAS BEEN COMPLETED.
 - WHERE EXISTING ROCK IS PRESENT, USE AN EXPOSED ROCK CUT AT 1:1 TO ESTABLISH SLOPE.

Placed Stone Slope 1/16
N.T.S. Source: VHB LD_760



- NOTES**
- THIS CHECKDAM SHALL BE INSTALLED IN A DRAINAGE SWALE WITH BED WIDTHS OF 2 FT. OR MORE.
 - THE DISTANCE BETWEEN BALE CHECKDAMS SHALL BE DETERMINED BY THE SLOPE OF THE SWALE. CHECKDAMS SHALL BE SET AT EVERY 2 FT. DROP IN SWALE ELEVATION.
 - BALES SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS AND REPAIR OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.
 - INSTALL 3 STAPLES PER BALE WITHIN SWALE BED AREA.

Straw Bale Checkdam (Wide Swale) 1/16
N.T.S. Source: VHB REV LD_670



- NOTES**
- BEGIN AT THE TOP OF BLANKET INSTALLATION AREA BY ANCHORING BLANKET IN A 6" DEEP TRENCH BACKFILL AND COMPACT TRENCH AFTER STAPLING.
 - ROLL THE BLANKET DOWN THE SWALE IN THE DIRECTION OF THE WATER FLOW.
 - THE EDGES OF BLANKETS MUST BE STAPLED WITH APPROX. 4 INCH OVERLAP WHERE 2 OR MORE STRIP WIDTHS ARE EQUIVALENT.
 - WHEN BLANKETS MUST BE SPLICED DOWN THE SWALE, PLACE UPPER BLANKET END OVER LOWER END WITH 6 INCH (MIN.) OVERLAP AND STAPLE BOTH TOGETHER.
 - METHOD OF INSTALLATION SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS.
 - EROSION CONTROL BLANKETS SHALL BE USED IN ALL AREAS WHERE SLOPES EXCEED 3:1.

Erosion Control Blanket Slope Installation 10/20
N.T.S. Source: VHB REV LD_680

Erosion Control

- PRIOR TO STARTING ANY OTHER WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN FEDERAL, STATE, AND LOCAL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
- CONTRACTOR TO MANAGE PROJECT IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGS 3800 RELATIVE TO INVASIVE SPECIES.
- CONTRACTOR SHALL INSPECT AND MAINTAIN EROSION CONTROL MEASURES, AND REMOVE SEDIMENT THEREFROM ON A WEEKLY BASIS AND WITHIN TWELVE HOURS AFTER EACH STORM EVENT (0.5" OF RAINFALL OR GREATER) AND DISPOSE OF SEDIMENTS IN AN UPLAND AREA SUCH THAT THEY DO NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
- CONTRACTOR SHALL BE FULLY RESPONSIBLE TO CONTROL CONSTRUCTION SUCH THAT SEDIMENTATION SHALL NOT AFFECT REGULATORY PROTECTED AREAS, WHETHER SUCH SEDIMENTATION IS CAUSED BY WATER, WIND, OR DIRECT DEPOSIT.
- CONTRACTOR SHALL PERFORM CONSTRUCTION SEQUENCING SUCH THAT EARTH MATERIALS ARE EXPOSED FOR A MINIMUM OF TIME BEFORE THEY ARE COVERED, SEED, OR OTHERWISE STABILIZED TO PREVENT EROSION.
- UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, CONTRACTOR SHALL REMOVE AND DISPOSE OF EROSION CONTROL MEASURES AND CLEAN SEDIMENT AND DEBRIS FROM ENTIRE DRAINAGE AND SEWER SYSTEMS.
- AREAS REMAINING UNSTABILIZED FOR A PERIOD OF MORE THAN 30 DAYS SHALL BE TEMPORARILY SEED, AND MULCHED. HAY MULCH SHALL BE APPLIED AT A MINIMUM RATE OF 1-1/2 TONS/ACRE.
- PERMANENT SEEDING SHALL OCCUR BETWEEN APRIL 1 AND JUNE 1, AND/OR BETWEEN AUGUST 15 AND OCTOBER 15. ALL SEEDING FROM SEPTEMBER 15 SHALL BE HAY MULCHED.
- DUST SHALL BE CONTROLLED THROUGH THE USE OF WATER.
- SOILS TO BE STOCKPILED FOR A PERIOD OF MORE THAN 30 DAYS SHALL BE TEMPORARILY SEED, AND MULCHED. CONTRACTOR SHALL INSTALL SILT FENCING ALONG DOWNHILL SIDE OF STOCKPILES.
- CONTRACTOR SHALL PROVIDE TEMPORARY SEDIMENTATION BASINS TO CONTROL SEDIMENTATION AND STORMWATER RUNOFF DURING THE CONSTRUCTION PERIOD. THE CONTRACTOR SHALL SUBMIT PROPOSED BASIN LOCATIONS, DESIGN, ETC. TO THE ENGINEER FOR REVIEW PRIOR TO CONSTRUCTION. TEMPORARY SEDIMENTATION BASINS SHALL MEET NHDES REQUIREMENTS.
- CONTRACTOR SHALL PROVIDE NECESSARY EROSION CONTROL MEASURES TO INSURE THAT SURFACE WATER RUN-OFF FROM UNSTABILIZED AREAS DOES NOT CARRY SILT, SEDIMENT, AND OTHER DEBRIS OUTSIDE OF THE LIMITS OF WORK.
- AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
 - BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
 - A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
 - A MINIMUM OF 3-IN OF NON-EROSIVE MATERIAL, SUCH AS STONE OR RIPRAP, HAS BEEN INSTALLED;
 - EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
- AT NO TIME SHALL THE TOTAL UNSTABILIZED DISTURBED AREA ON-SITE BE GREATER THAN (5) FIVE ACRES.
- ALL DITCHES, SWALES, AND DRAINAGE BASINS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
- ALL ROADWAYS AND PARKING LOTS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
- ALL CUT AND FILL SLOPES SHALL BE LOAMED AND SEED, WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
- ALL PERMANENT AND TEMPORARY SEEDING SHALL BE AS FOLLOWS (UNLESS OTHERWISE NOTED):

PERMANENT SEEDING	PROPORTION	GERMINATION MINIMUM	PURITY MINIMUM
LAWNS:			
CREeping RED FESCUE	50%	85%	95%
KENTUCKY BLUEGRASS	40%	85%	90%
MANHATTAN PERENNIAL RYE	10%	90%	95%
TEMPORARY SEEDING*	% WEIGHT	GERMINATION MINIMUM	
WINTER RYE	80% MIN.	85%	
RED FESCUE (CREeping)	4% MIN.	80%	
PERENNIAL RYE GRASS	3% MIN.	90%	
RED CLOVER	3% MIN.	90%	
OTHER CROP GRASS	0.5% MAX.		
NOxious WEED SEED	0.5% MAX.		
INERT MATTER	1.0% MAX.		

* TEMPORARY SEED FOR LAWNS SHALL ONLY BE PLANTED WHEN PERMANENT GRASSES CANNOT BE PLANTED DUE TO THE GROWING SEASON.

- NO-MOW PLANTING MIX (FOR AREAS INDICATED ON LANDSCAPE PLAN)

THE NO-MOW PLANTING MIX SHALL BE THE "NEW ENGLAND CONSERVATION WILDLIFE MIX" AS MANUFACTURED BY NEW ENGLAND WETLAND PLANTS, INC.

- STORMWATER BASIN PLANTING MIX (FOR BOTTOM OF DETENTION BASIN)

THE STORMWATER BASIN PLANTING MIX SHALL BE THE "NEW ENGLAND EROSION-CONTROL / RESTORATION MIX (FOR DETENTION BASINS AND MOIST SITES) AS MANUFACTURED BY NEW ENGLAND WETLAND PLANTS, INC., AMHERST, MA. (413) 256-1752

- EROSION CONTROL BLANKETS SHALL BE INSTALLED ON ALL SLOPES THAT ARE STEEPER THAN 3-FT HORIZONTAL AND 1-FT VERTICAL (3:1). EROSION CONTROL BLANKETS SHALL BE NORTH AMERICAN GREEN SC150BN, OR APPROVED EQUAL.

NHDES WINTER NOTES

- ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
- ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
- AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.

NHREG PERMIT CONDITIONS

- EROSION CONTROL MATERIALS SUCH AS WELDED PLASTIC OR "BIODEGRADABLE PLASTIC" NETTING OF THREAD (E.G. POLYPROPYLENE) SHALL NOT BE USED. THE USE OF EROSION CONTROL BERM, WHITE FILTREXX, DEGRADABLE WOVEN SILT SOCK OR WOVEN ORGANIC MATERIALS (E.G. COCO OR JUTE MATTING SUCH AS NORTH AMERICAN GREEN SC150BN) SHALL BE USED.

The Brickyard Residential Development

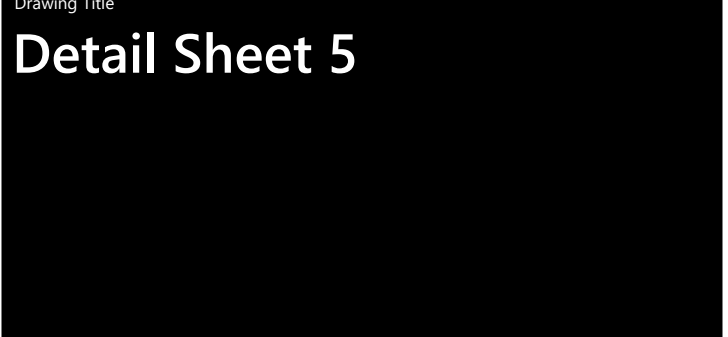
174 Hanover Street Extension
Lebanon, New Hampshire 03766

No.	Revision	Date	Appr'd.
1	Response to Comments Update	08/06/24	DF

Designed by TMD Checked by MJV

Issued for Permitting Date May 10, 2024

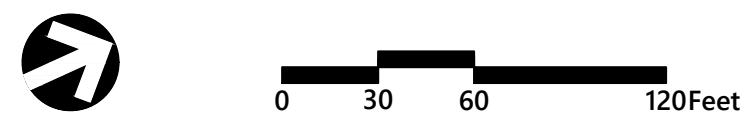
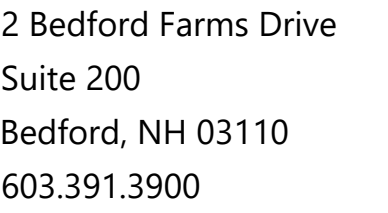
Not Approved for Construction



C7.5

Sheet 29 of 50

Project Number
52933.00



174 Hanover Street Extension
Lebanon, New Hampshire 03766

Designed by	Checked by
TMD	MJV

Permitting May 10, 2024

Not Approved for Construction

Phasing Plans

Drawing Number

C8.1

Sheet 30 of 50

Project Number
52933.00

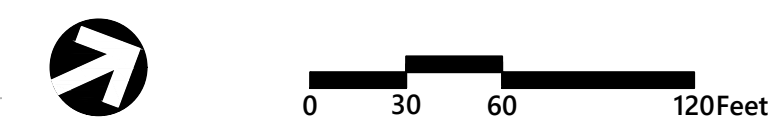
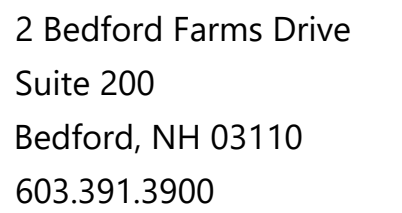
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Phase	Summary Of Improvements	Estimated Start
Phase 1	Roadway, Utilities, Parking Lots, Building Foundations	Late 2024 - Early 2025
Phase 2	Maintenance Building, Building 1	Late 2025 - Early 2026 Anticipated
Phase 3 (A through I)	Buildings A-I as Occupied	Phase A Upon Completion of Phase 2 Phase B-I based on Occupancy and Market

THE INTENT OF THE PHASING OF THE PROJECT IS TO INITIALLY CONSTRUCT THE NECESSARY ROADWAYS, UTILITY INFRASTRUCTURE AND BUILDING FOUNDATIONS. THE BUILDINGS WILL THEN BE CONSTRUCTED AND OCCUPIED SEQUENTIALLY. THE PRELIMINARY SCHEDULE PROVIDED REPRESENTS THE CURRENT UNDERSTANDING OF THE INTENDED PHASING, HOWEVER IT IS SUBJECT TO CHANGE BASED ON ECONOMY, WEATHER, AND OTHER UNFORESEEN CONDITIONS.

 FOUNDATION TO BE
CONSTRUCTED IN THIS PHASE

 ROADWAY AND PARKING LOT
INSTALLATION



174 Hanover Street Extension
Lebanon, New Hampshire 03766

Designed by	Checked by
TMD	MJV

Permitting May 10, 2024

Not Approved for Construction

Drawing Title

Drawing Number

Sheet 31 of 50

Project Number
52933.00

Page 177 of 1225

Phase	Summary Of Improvements	Estimated Start
Phase 1	Roadway, Utilities, Parking Lots, Building Foundations	Late 2024 - Early 2025
Phase 2	Maintenance Building, Building 1	Late 2025 - Early 2026 Anticipated
Phase 3 (A through I)	Buildings A-I as Occupied	Phase A Upon Completion of Phase 2 Phase B-I based on Occupancy and Market

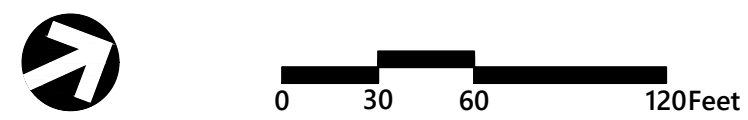
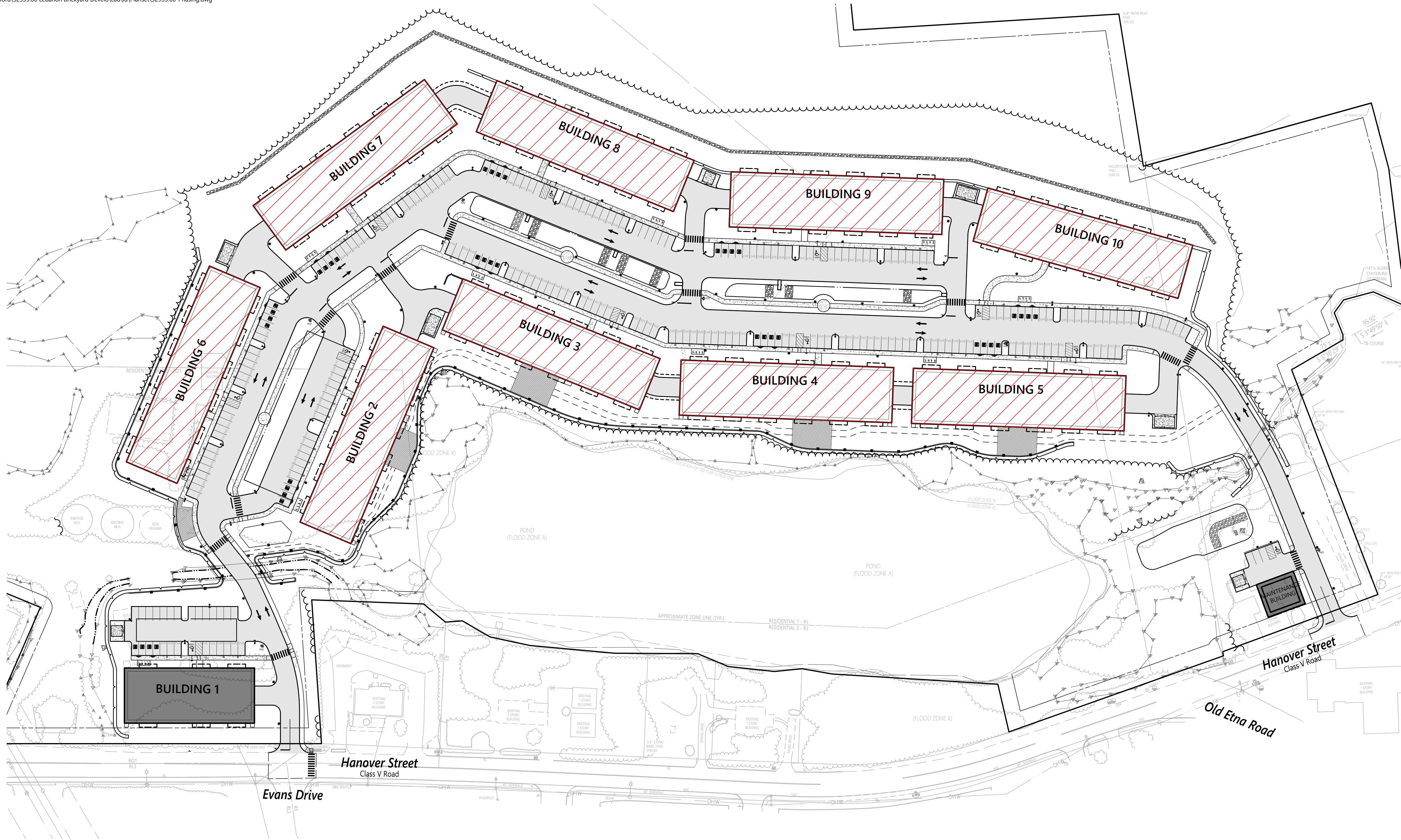
THE INTENT OF THE PHASING OF THE PROJECT IS TO INITIALLY CONSTRUCT THE NECESSARY ROADWAYS, UTILITY INFRASTRUCTURE AND BUILDING FOUNDATIONS. THE BUILDINGS WILL THEN BE CONSTRUCTED AND OCCUPIED SEQUENTIALLY. THE PRELIMINARY SCHEDULE PROVIDED REPRESENTS THE CURRENT UNDERSTANDING OF THE INTENDED PHASING, HOWEVER IT IS SUBJECT TO CHANGE BASED ON ECONOMY, WEATHER, AND OTHER UNFORESEEN CONDITIONS.

 FOUNDATION TO BE
CONSTRUCTED IN THIS PHASE

 BUILDING TO BE CONSTRUCTED
IN THIS PHASE



anni



The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

No.	Revision	Date	Appvd.
1	Response to Comments Update	08/06/24	DF

Designed by	Checked by
TMD	MJV

Permitting May 10, 2024

Not Approved for Construction

Phasing Plans

Drawing Number

C8.3

Sheet **32** of **50**

Project Number
52933.00

Page 178 of 122

Phasing Schedule

Phase	Summary Of Improvements	Estimated Start
Phase 1	Roadway, Utilities, Parking Lots, Building Foundations	Late 2024 - Early 2025
Phase 2	Maintenance Building, Building 1	Late 2025 - Early 2026 Anticipated
Phase 3 (A through I)	Buildings A-I as Occupied	Phase A Upon Completion of Phase 2 Phase B-I based on Occupancy and Market

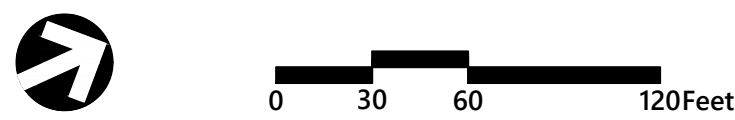
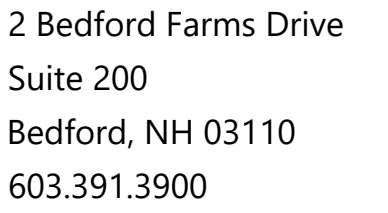
Note

THE INTENT OF THE PHASING OF THE PROJECT IS TO INITIALLY CONSTRUCT THE NECESSARY ROADWAYS, UTILITY INFRASTRUCTURE AND BUILDING FOUNDATIONS. THE BUILDINGS WILL THEN BE CONSTRUCTED AND OCCUPIED SEQUENTIALLY. THE PRELIMINARY SCHEDULE PROVIDED REPRESENTS THE CURRENT UNDERSTANDING OF THE INTENDED PHASING, HOWEVER IT IS SUBJECT TO CHANGE BASED ON ECONOMY, WEATHER, AND OTHER UNFORESEEN CONDITIONS.

LEGEND

-  FOUNDATION TO BE CONSTRUCTED IN THIS PHASE
-  BUILDING TO BE CONSTRUCTED IN THIS PHASE
-  BUILDING ALREADY CONSTRUCTED IN THIS PHASE





174 Hanover Street Extension
Lebanon, New Hampshire 03766

Designed by	Checked by
TMD	MJV

Permitting May 10, 2024

Not Approved for Construction

Drawing Title

Vehicle Tracking

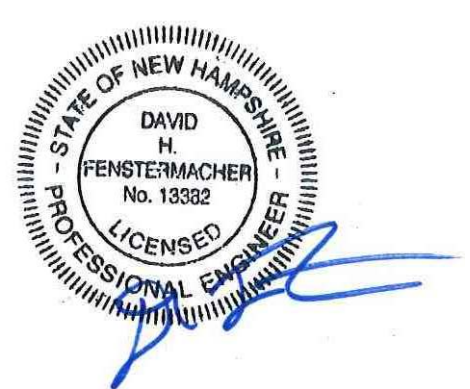
City of Lebanon Firetruck

Drawing Number

C9.1

Sheet 33 of 50

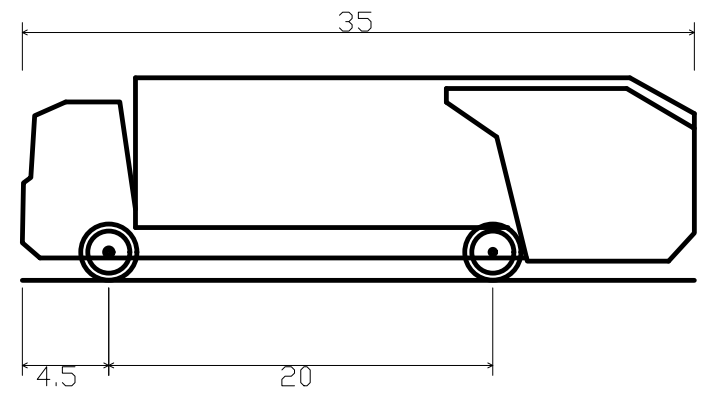
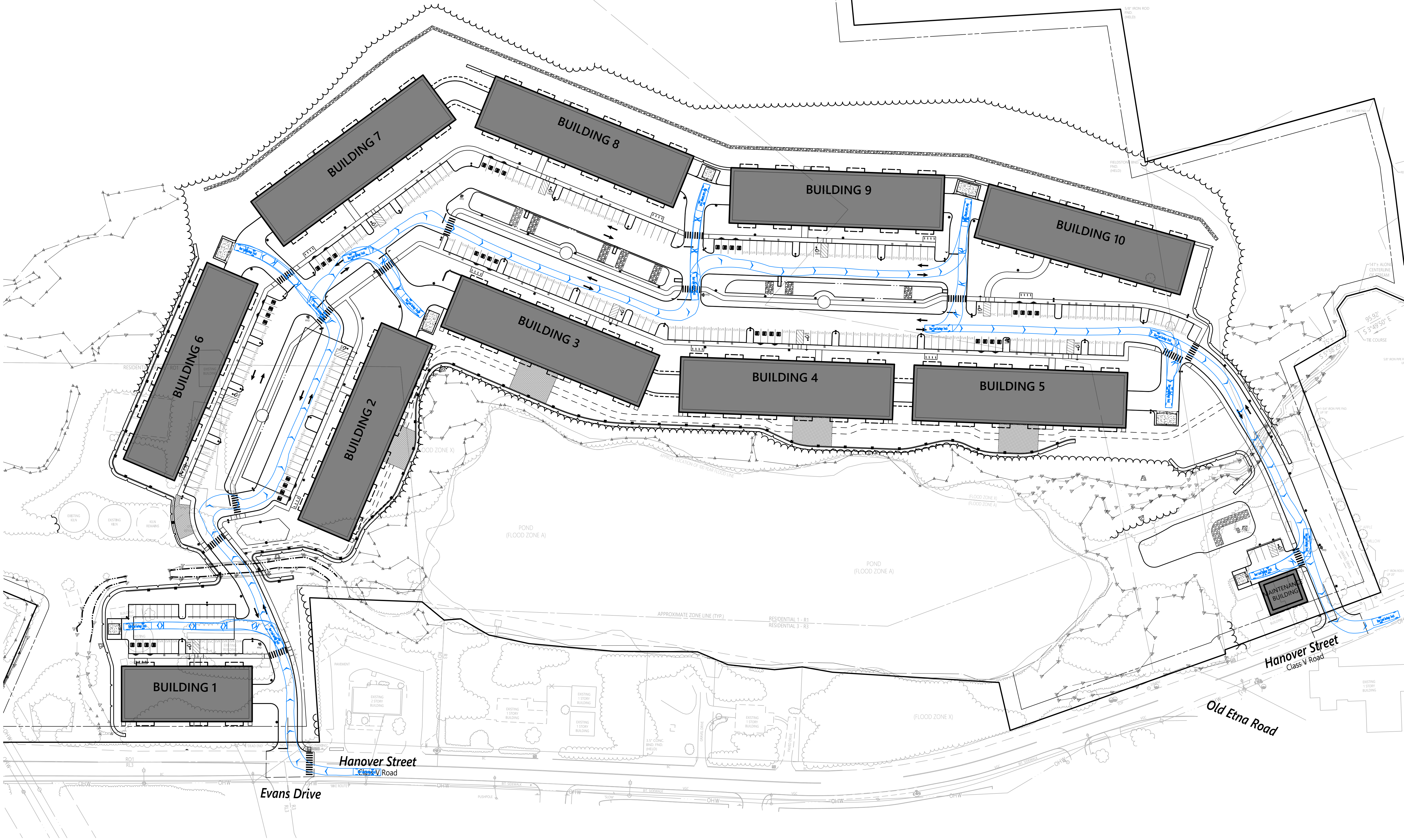
Project Number
52933.00



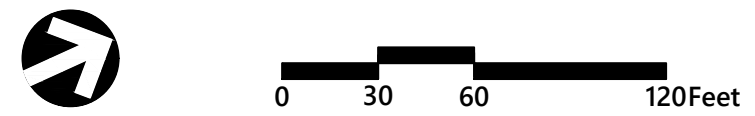
Lebanon Ladder 1	
Overall Length	38.500ft
Overall Width	9.167ft
Overall Body Height	7.675ft
Min Body Ground Clearance	0.925ft
Track Width	9.167ft
Lock-to-lock time	5.00s
Curb to Curb Turning Radius	33.000ft



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900



Rear-Load Garbage Truck
Overall Length 35.000ft
Overall Width 8.375ft
Overall Body Height 10.546ft
Min Body Ground Clearance 1.000ft
Track Width 8.375ft
Lock-to-lock time 6.00s
Curb to Curb Turning Radius 29.300ft



The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

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1	Response to Comments Update	08/06/24	DF

Designed by	TMD	Checked by	MJV
Issued for		Date	May 10, 2024

Permitting

Not Approved for Construction

Vehicle Tracking
Garbage Truck



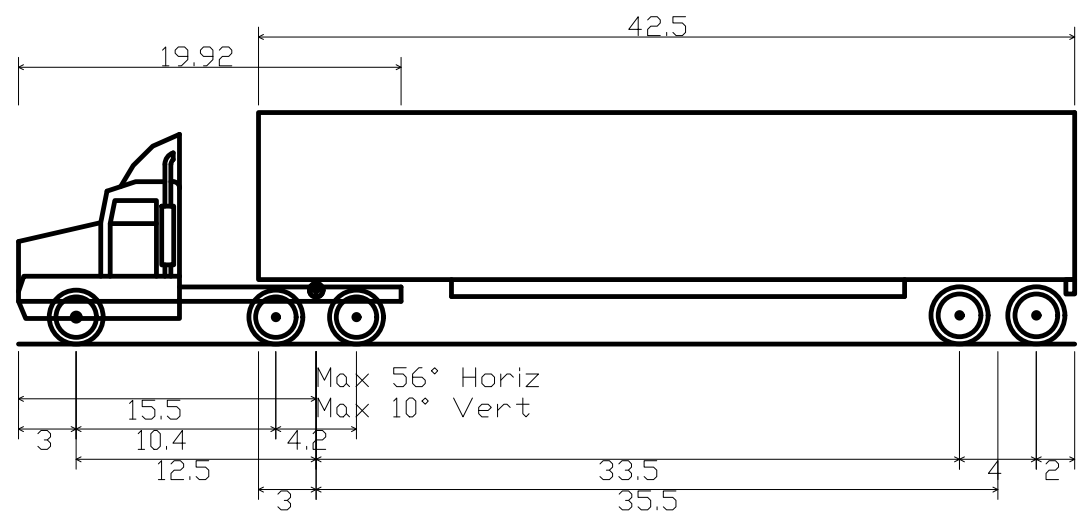
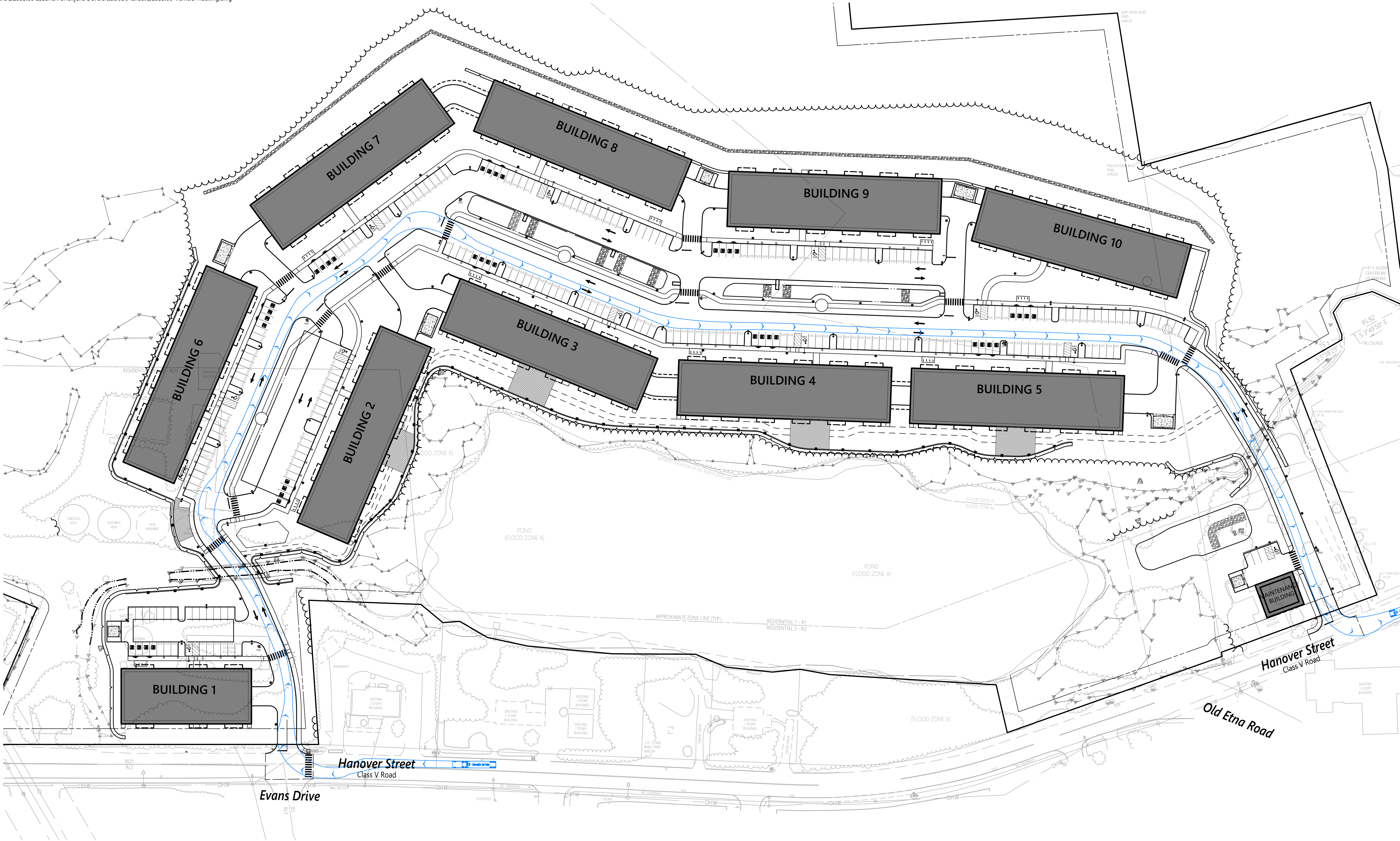
C9.2

Sheet 34 of 50

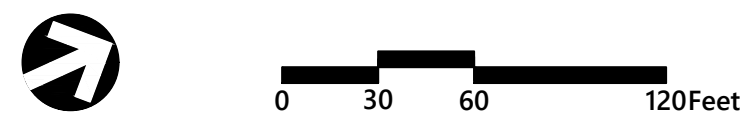
Project Number
52933.00



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900



WB-50 - Intermediate Semi-Trailer
Overall Length 55.00ft
Overall Width 8.50ft
Overall Body Height 12.05ft
Min Body Ground Clearance 1.33ft
Max Track Width 8.50ft
Lock-to-lock time 6.00s
Max Steering Angle (Virtual) 17.90°



The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

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Designed by	Checked by
TMD	MJV

Issued for	Date
Permitting	May 10, 2024

Not Approved for Construction

Drawing Title
**Vehicle Tracking
WB-50**



C9.3

Sheet 35 of 50

Project Number
52933.00



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

Planting Notes

- ALL PROPOSED PLANTING LOCATIONS SHALL BE STAKED AS SHOWN ON THE PLANS FOR FIELD REVIEW AND APPROVAL BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
- CONTRACTOR SHALL VERIFY LOCATIONS OF ALL BELOW GRADE AND ABOVE GROUND UTILITIES AND NOTIFY OWNERS REPRESENTATIVE OF CONFLICTS.
- NO PLANT MATERIALS SHALL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA. CONTRACTOR SHALL NOTIFY OWNER'S REPRESENTATIVE OF ANY CONFLICT.
- A 3-INCH DEEP MULCH PER SPECIFICATION SHALL BE INSTALLED UNDER ALL TREES AND SHRUBS, AND IN ALL PLANTING BEDS, UNLESS OTHERWISE INDICATED ON THE PLANS, OR AS DIRECTED BY OWNER'S REPRESENTATIVE.
- ALL TREES SHALL BE BALLED AND BURLAPPED, UNLESS OTHERWISE NOTED IN THE DRAWINGS OR SPECIFICATION, OR APPROVED BY THE OWNER'S REPRESENTATIVE.
- FINAL QUANTITY FOR EACH PLANT TYPE SHALL BE AS GRAPHICALLY SHOWN ON THE PLAN. THIS NUMBER SHALL TAKE PRECEDENCE IN CASE OF ANY DISCREPANCY BETWEEN QUANTITIES SHOWN ON THE PLANT LIST AND ON THE PLAN. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES BETWEEN THE NUMBER OF PLANTS SHOWN ON THE PLANT LIST AND PLANT LABELS PRIOR TO BIDDING.
- ANY PROPOSED PLANT SUBSTITUTIONS MUST BE REVIEWED BY LANDSCAPE ARCHITECT AND APPROVED IN WRITING BY THE OWNER'S REPRESENTATIVE.
- ALL PLANT MATERIALS INSTALLED SHALL MEET THE SPECIFICATIONS OF THE "AMERICAN STANDARDS FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN AND CONTRACT DOCUMENTS.
- ALL PLANT MATERIALS SHALL BE GUARANTEED FOR ONE YEAR FOLLOWING DATE OF FINAL ACCEPTANCE.
- AREAS DESIGNATED AS "LAWN" OR "LOAM & SEED" SHALL RECEIVE MINIMUM 6" OF LOAM AND SPECIFIED SEED MIX. LAWNS OVER 2:1 SLOPE SHALL BE PROTECTED WITH EROSION CONTROL FABRIC.
- ALL DISTURBED AREAS NOT OTHERWISE NOTED ON CONTRACT DOCUMENTS SHALL BE LOAM AND SEEDED OR MULCHED AS DIRECTED BY OWNER'S REPRESENTATIVE.
- THESE PLANS ARE INTENDED FOR PLANTING PURPOSES. REFER TO SITE / CIVIL DRAWINGS FOR ALL OTHER SITE CONSTRUCTION INFORMATION.

Plant Maintenance Notes

- CONTRACTOR SHALL PROVIDE COMPLETE MAINTENANCE OF THE LAWNS AND PLANTINGS. NO IRRIGATION IS PROPOSED FOR THIS SITE. THE CONTRACTOR SHALL SUPPLY SUPPLEMENTAL WATERING FOR NEW LAWNS AND PLANTINGS DURING THE ONE YEAR PLANT GUARANTEE PERIOD.
- CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, AND EQUIPMENT FOR THE COMPLETE LANDSCAPE MAINTENANCE WORK. WATER SHALL BE PROVIDED BY THE CONTRACTOR.
- WATERING SHALL BE REQUIRED DURING THE GROWING SEASON, WHEN NATURAL RAINFALL IS BELOW ONE INCH PER WEEK.
- WATER SHALL BE APPLIED IN SUFFICIENT QUANTITY TO THOROUGHLY SATURATE THE SOIL IN THE ROOT ZONE OF EACH PLANT.
- CONTRACTOR SHALL REPLACE DEAD OR DYING PLANTS AT THE END OF THE ONE YEAR GUARANTEE PERIOD. CONTRACTOR SHALL TURN OVER MAINTENANCE TO THE FACILITY MAINTENANCE STAFF AT THAT TIME.
- THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR MAINTAINING ALL LANDSCAPING, TO INCLUDE GRASS AND MULCH, IN GOOD HEALTHY CONDITION SO AS TO PRESENT A NEAT AND ORDERLY APPEARANCE. THE PROPERTY OWNER SHALL REPLACE ANY UNHEALTHY OR DEAD PLANT MATERIALS IN CONFORMANCE WITH THE LANDSCAPE PLAN APPROVED BY THE BOARD AS PART OF THE SITE PLAN.
- THE PROPERTY OWNER SHALL PLANT MATERIALS APPROPRIATE TO THE SITES SOIL AND MOISTURE CONDITIONS, AS WELL AS ITS PROXIMITY TO SUBSTANTIAL OPEN SPACE AND WILDLANDS.

SHRUBS, GRASSES AND PERENNIALS SHALL BE A SELECTION OF:

CODE	BOTANICAL NAME	COMMON NAME
SHRUBS		
CAH	Clethra alnifolia 'Hummingbird'	'Hummingbird' Summersweet
CAE	Cornus alba 'Elegantissima'	Variegated RedTwig Dogwood
CR	Cornus racemosa	Gray Dogwood
CS	Cornus sericea	Red Twig Dogwood
CS1	Cornus stolonifera	Red Osier Dogwood
FG	Fothergilla gardenii	Dwarf Fothergilla
IG	Ilex glabra	Inkberry
IGS	Ilex glabra 'Shamrock'	Shamrock Inkberry
IVR	Ilex verticillata 'Red Sprite'	Red Sprite Winterberry
JBH	Juniperus horizontalis 'Bar Harbor'	Bar Harbor Creeping Juniper
RC	Rhododendron x 'Cunningham's Blush'	Cunningham's Blush Rhododendron
RA	Rhus aromatica 'Gro-Low'	Gro-Low Fragrant Sumac
VN	Viburnum nudum 'Winterthur'	Smooth Witherod
GRASSES		
PVS	Panicum virgatum 'Shenandoah'	Shenendoah Switch Grass
PERENNIALS		
H-SO	Hemerocallis x 'Stella de Oro'	Stella de Oro Daylily

- SEEDING**
- AREAS INDICATED AS "RAIN GARDEN" ARE TO BE SEEDED WITH NEW ENGLAND EROSION CONTROL / RESTORATION MIX FOR DETENTION PONDS AND MOIST AREAS, AS MANUFACTURED BY NEW ENGLAND WETLAND PLANTS, INC. AMHERST, MA (413) 548-8000, www.NEWP.com, OR AN APPROVED EQUAL. APPLY IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
 - AREAS INDICATED AS "EROSION CONTROL SEED MIX" ARE TO BE SEEDED WITH NEW ENGLAND CONSERVATION EROSION CONTROL/RESTORATION MIX FOR DRY SITES, AS MANUFACTURED BY NEW ENGLAND WETLAND PLANTS, INC. AMHERST, MA (413) 548-8000, www.NEWP.com, OR AN APPROVED EQUAL. APPLY IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

PLANT SCHEDULE

CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE
DECIDUOUS TREES				
AR	23	Acer rubrum	Red Maple	2 1/2 - 3" CAL.
BN	35	Betula nigra 'Heritage'	Heritage River Birch	10 - 12" HT./Multi-Stem
NS	27	Nyssa sylvatica	Black Tupelo	2 1/2 - 3" CAL.
PO	14	Platanus occidentalis	American Sycamore	2 1/2 - 3" CAL.
TA	15	Tilia americana	American Linden	2 1/2 - 3" CAL.
TC	17	Tilia cordata 'Greenspire'	Greenspire Littleleaf Linden	2 1/2 - 3" CAL.
EVERGREEN TREES				
JVB	9	Juniperus virginiana 'Blue Arrow'	Blue Arrow Juniper	6 - 7' HT.
JVC	27	Juniperus virginiana 'Corcorcor' TM	Emerald Sentinel Juniper	6 - 7' HT.
PG	27	Picea glauca	White Spruce	6 - 7' HT.
TO	38	Thuja occidentalis 'Nigra'	Dark American Arborvitae	6 - 7' HT.
FLOWERING TREES				
ACS	29	Amelanchier canadensis	Shadblow Serviceberry	8 - 10' HT./Multi-Stem
MS	11	Malus hybrid 'Spring Snow'	Spring Snow Crab Apple	2 1/2 - 3" CAL.

SHRUBS				
IG	58	Ilex glabra	Inkberry	2 - 3' HT.
RC	55	Rhododendron x 'Cunningham's Blush'	Cunningham's Blush Rhododendron	24 - 30" HT.

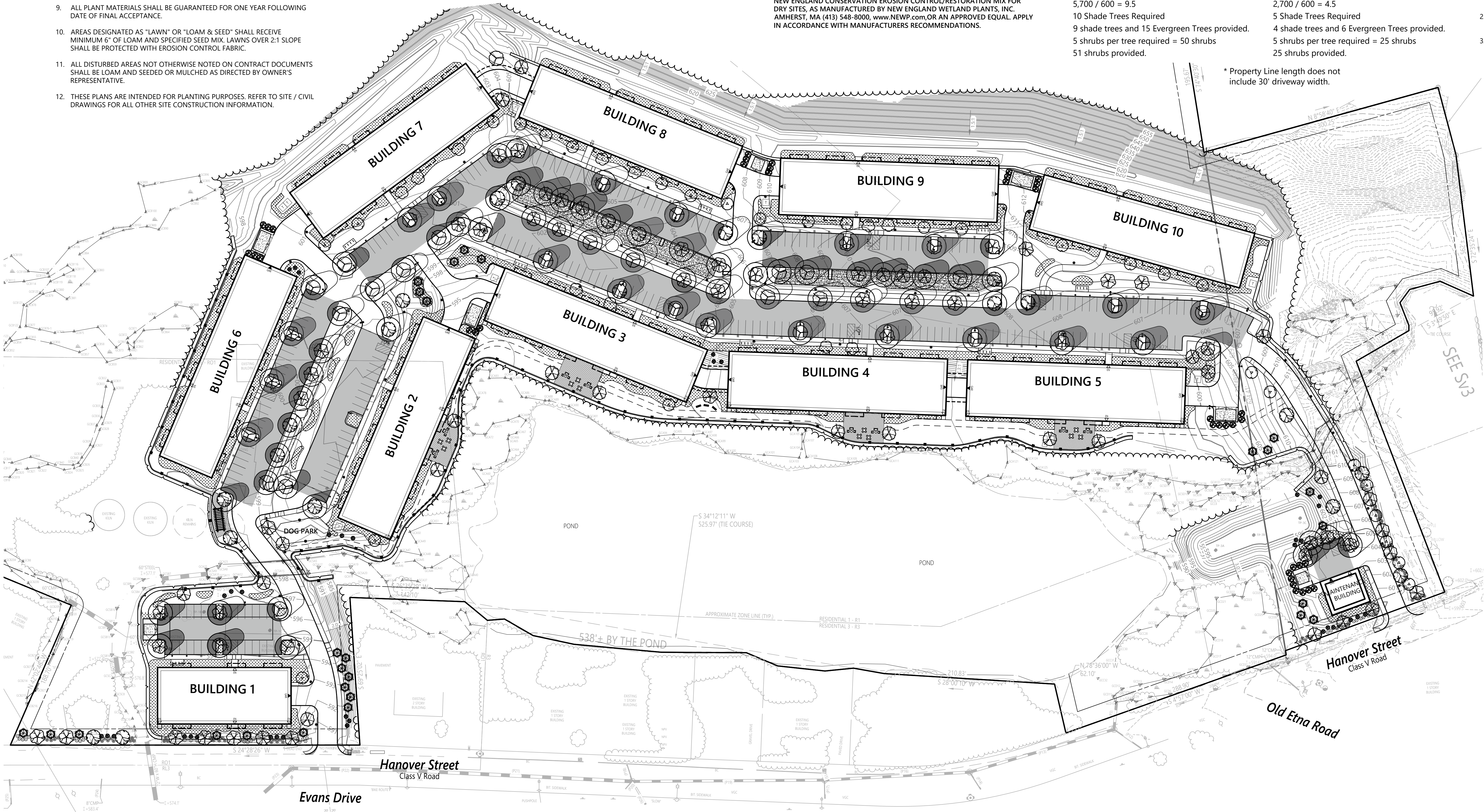
PERIMETER LANDSCAPING

Length of southern Property Line along Hanover Street = 380' *
380 x 15 = 5,700
5,700 / 600 = 9.5
10 Shade Trees Required
9 shade trees and 15 Evergreen Trees provided.
5 shrubs per tree required = 50 shrubs
51 shrubs provided.

PERIMETER LANDSCAPING

Length of northern Property Line along Hanover Street = 180' *
180 x 15 = 2,700
2,700 / 600 = 4.5
5 Shade Trees Required
4 shade trees and 6 Evergreen Trees provided.
5 shrubs per tree required = 25 shrubs
25 shrubs provided.

* Property Line length does not include 30' driveway width.



Planting Requirements

- AREAS CONTAINING ONE OR TWO ROWS OF PARKING SHALL BE PLANTED WITH DECIDUOUS TREES ALONG THE PERIMETER, SO PLACED TO SHADE 30% OF THE PARKING AREA.
- DECIDUOUS TREES TO BE A MINIMUM 2.5 TO 3 INCHES IN CALIPER.
- EVERGREEN TREES TO BE A MINIMUM OF 6 TO 7 FEET HEIGHT.

SHADE TREE CALCULATION BUILDING 1

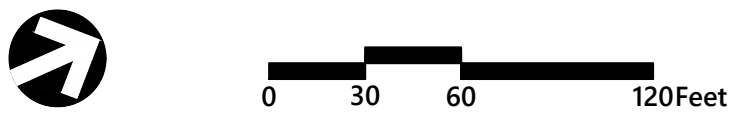
8,690 sf parking area
x 30% = 2,607 sf
Shade area = 2,905 sf (33.8%)

SHADE TREE CALCULATION MAINT. BLDG.

1,890 sf parking area
x 30% = 567 sf
Shade area = 645 sf (34.1%)

SHADE TREE CALCULATION PARKING LOTS

97,071 sf parking area
x 30% = 329,121 sf
Shade area = 31,284 sf (32.2%)



The Brickyard
Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

No.	Revision	Date	Appr'd
1	Completeness Review Comments	07/02/24	DF

Designed by: EJB
Issued for: Permitting
Checked by:
Date: May 10, 2024

Not Approved for Construction
Drawing Title: Overall Landscape and Tree Shading Plan
Drawing Number:

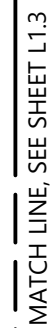
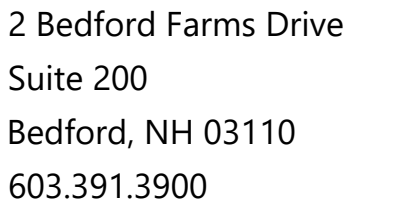


L1.0

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08/06/2024

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2. AREAS INDICATED AS "EROSION CONTROL SEED MIX" ARE TO BE SEEDED WITH NEW ENGLAND CONSERVATION EROSION CONTROL/RESTORATION MIX FOR DRY SITES, AS MANUFACTURED BY NEW ENGLAND WETLAND PLANTS, INC. AMHERST, MA (413) 548-8000, www.NEWP.com, OR AN APPROVED EQUAL. APPLY IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

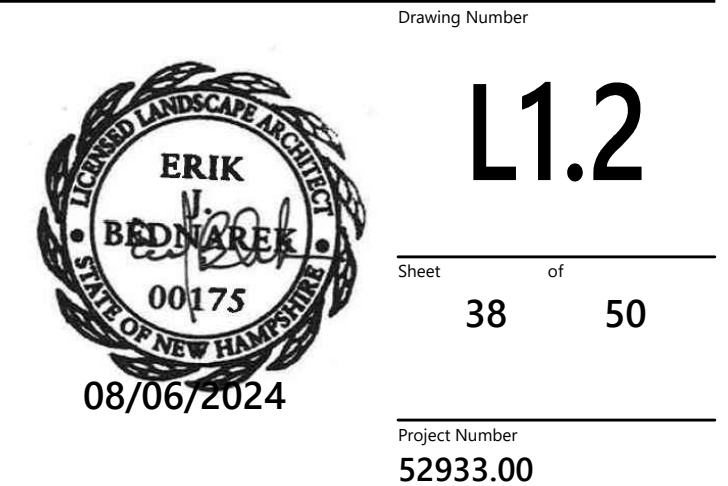
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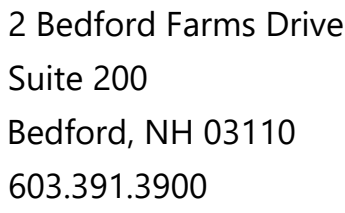
Sheet _____ of _____

37 50

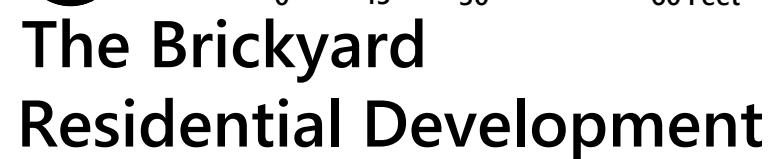
08/06/2024

2 Bedford Farms Drive
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No.	Revision	Date	Appvd.
1	Completeness Review Comments	07/02/24	DF

No.	Revision	Date	Appvd.
1	Completeness Review Comments	07/02/24	DF

Designed by	Checked by
EJB	

Not Approved for Construction

Landscape Plan 3



08/06/2024

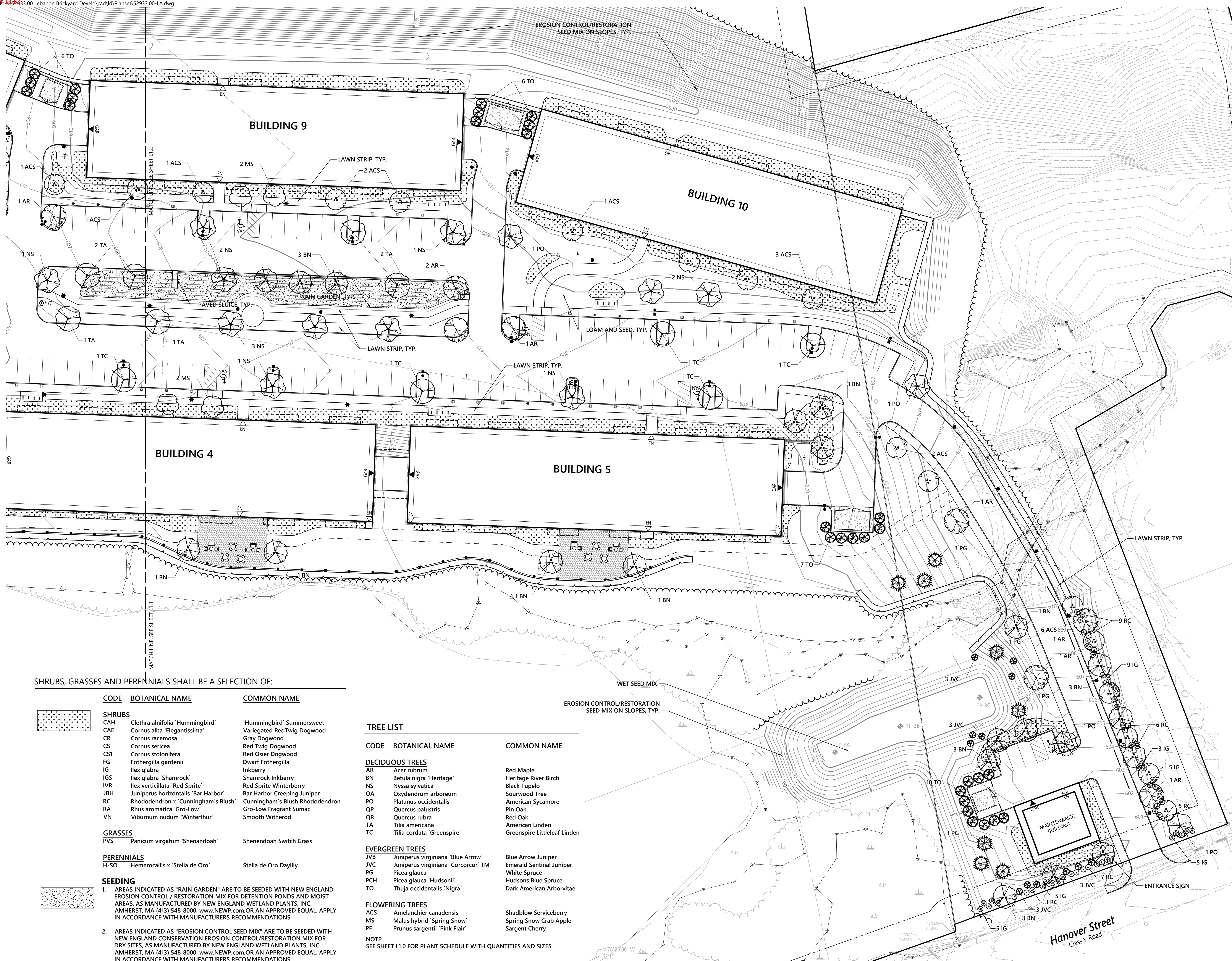
L1.3

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Project Number
52933.00

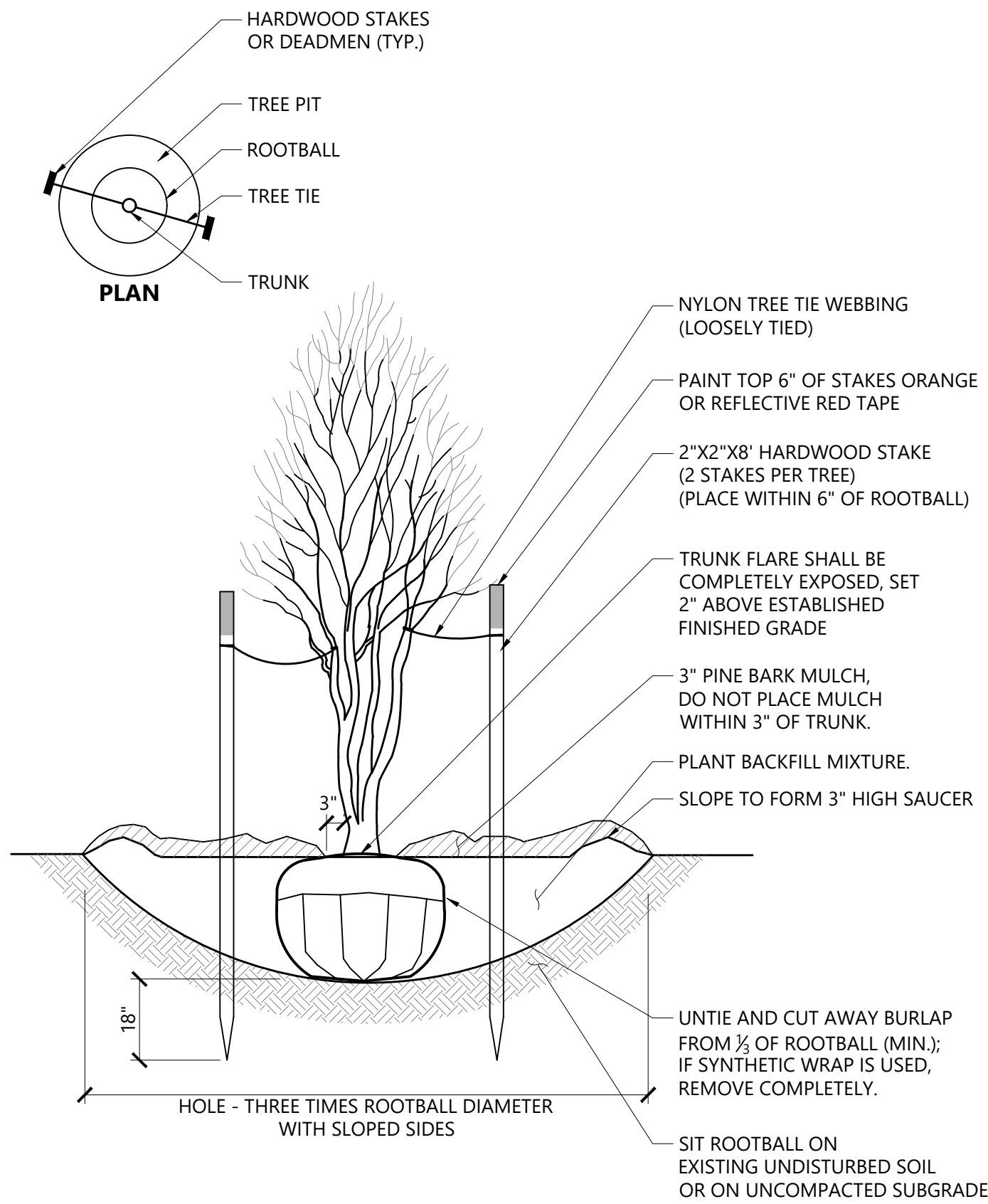
52933.00

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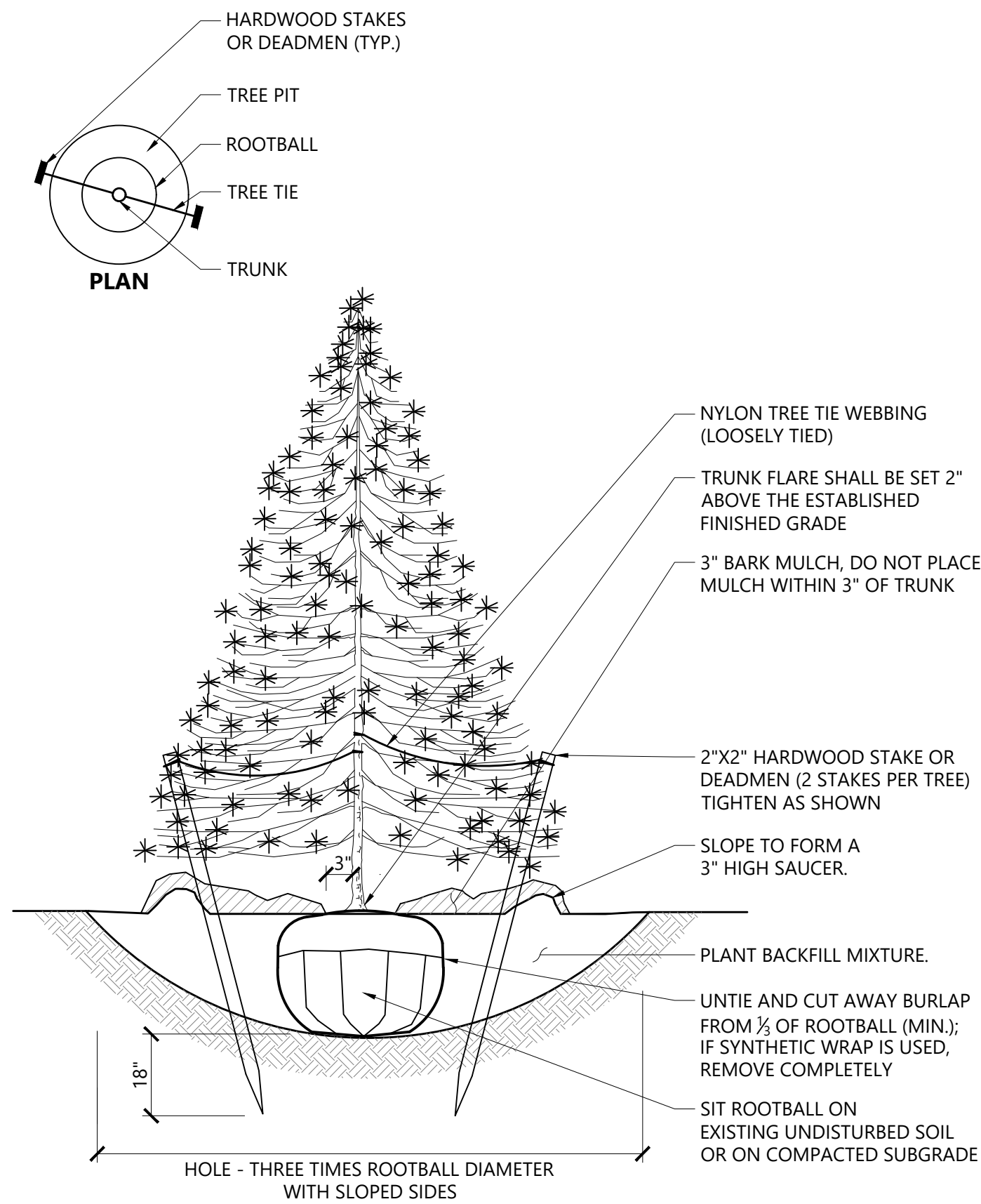


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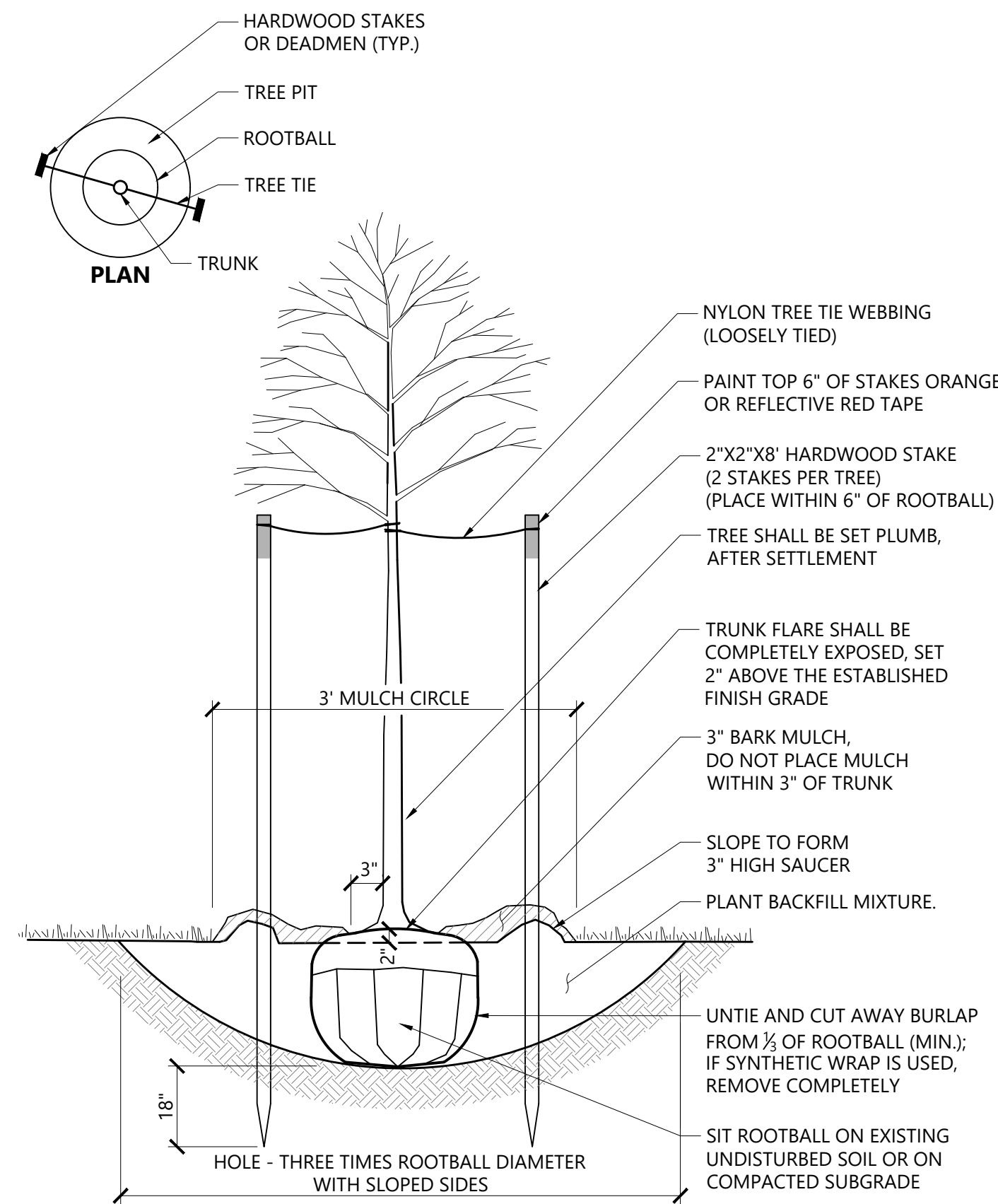
Multistem Tree Planting

N.T.S.	Source: VHB	LD_606
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Evergreen Tree Planting

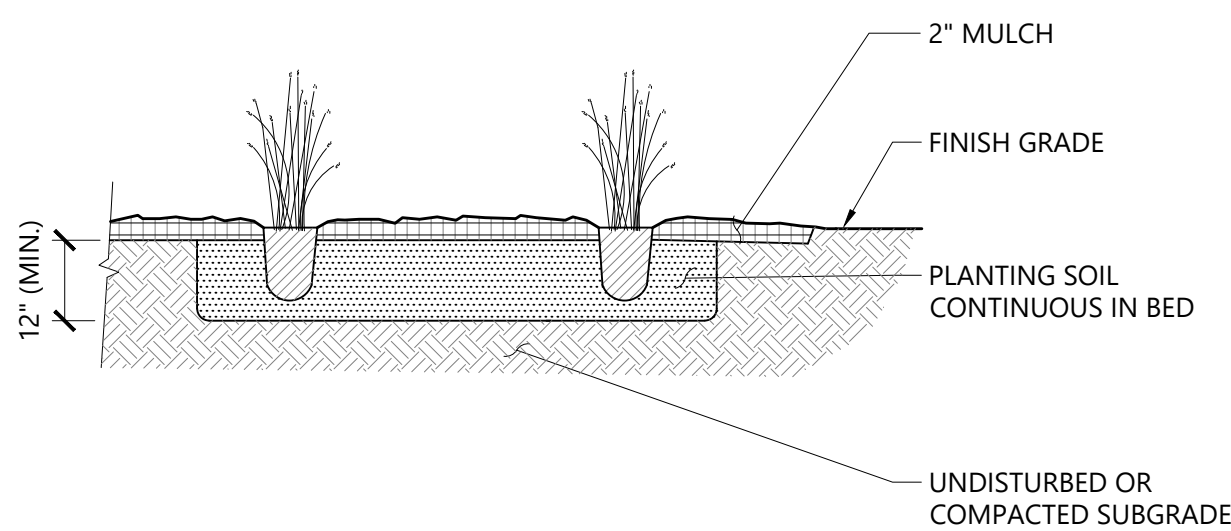
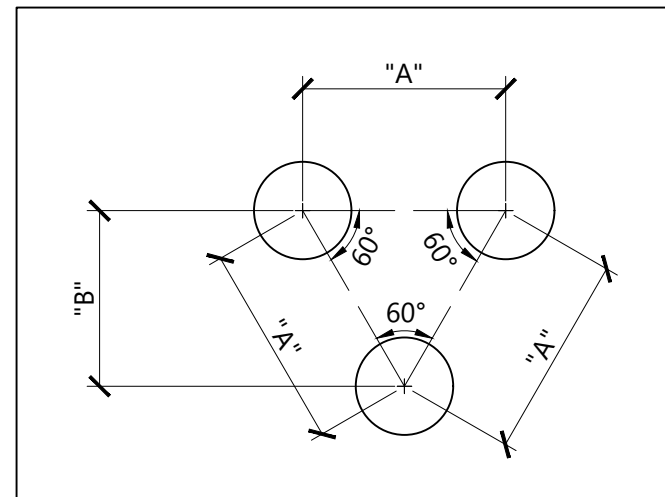
N.T.S.	Source: VHB	LD_604
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Tree Planting (For Trees Under 4" Caliper)

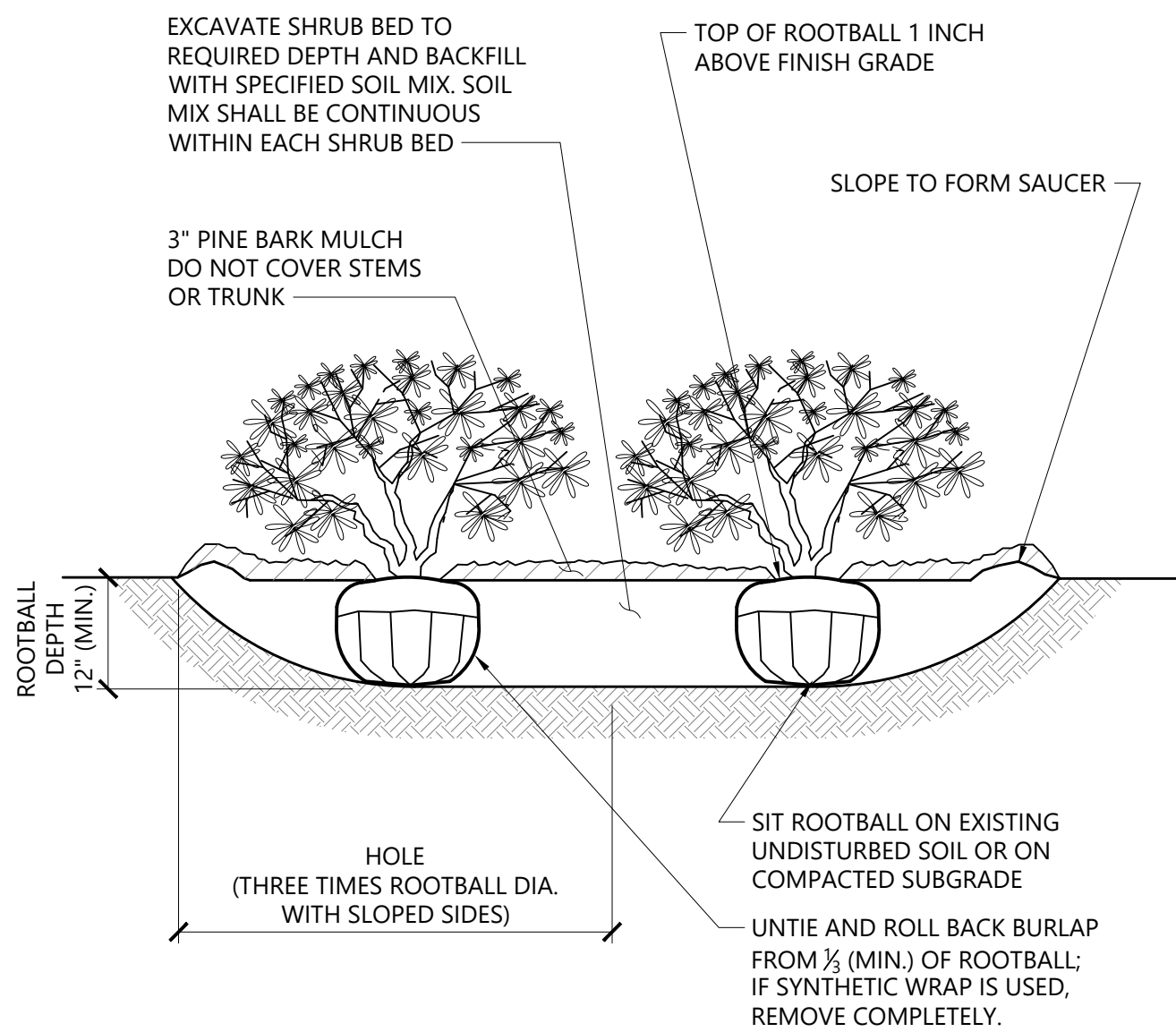
N.T.S.	Source: VHB	LD_602
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PLANT SPACING	
PLANT SPACING ("A")	ROW SPACING ("B")
6 IN. O.C.	5 IN. O.C.
8 IN. O.C.	7 IN. O.C.
10 IN. O.C.	8 ½ IN. O.C.
12 IN. O.C.	10 ½ IN. O.C.
15 IN. O.C.	13 IN. O.C.
18 IN. O.C.	16 IN. O.C.
24 IN. O.C.	21 IN. O.C.
30 IN. O.C.	26 IN. O.C.
36 IN. O.C.	30 IN. O.C.
48 IN. O.C.	42 IN. O.C.
54 IN. O.C.	48 IN. O.C.
60 IN. O.C.	54 IN. O.C.



Perennial and Ornamental Grass Planting

N.T.S. Source: VHB LD_618

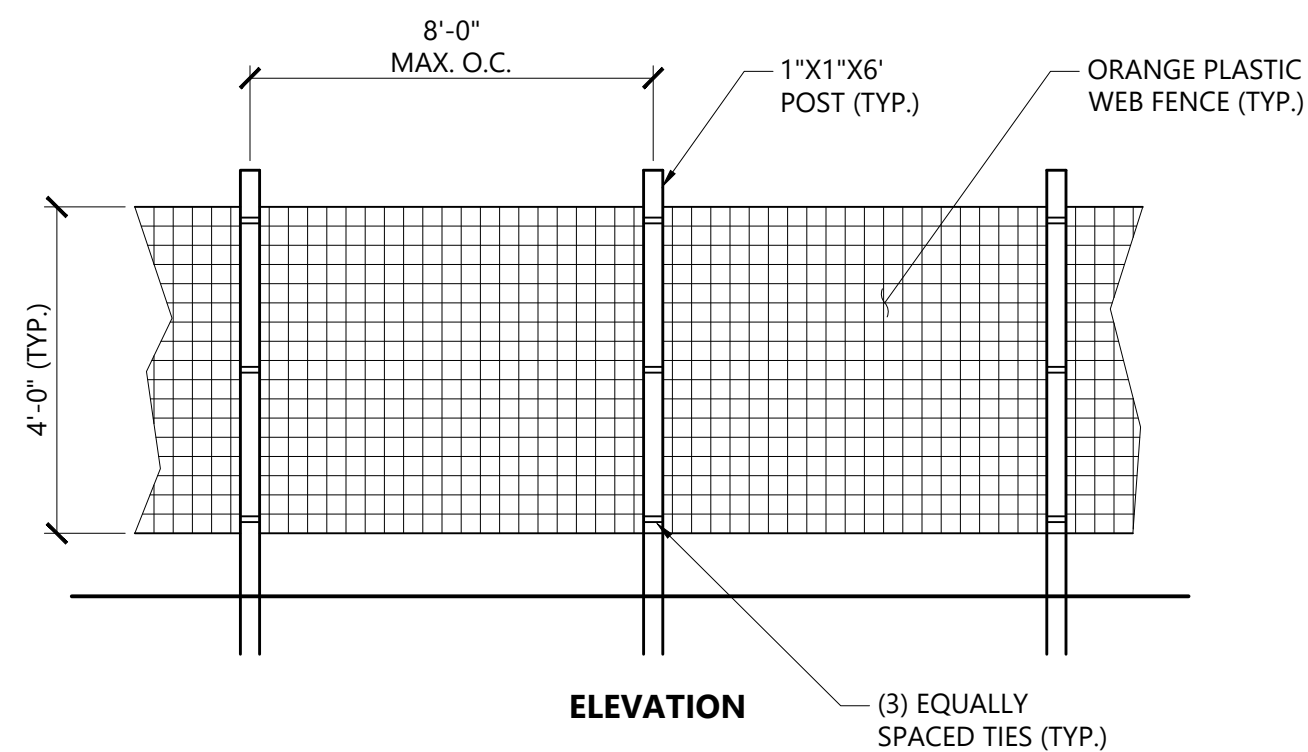
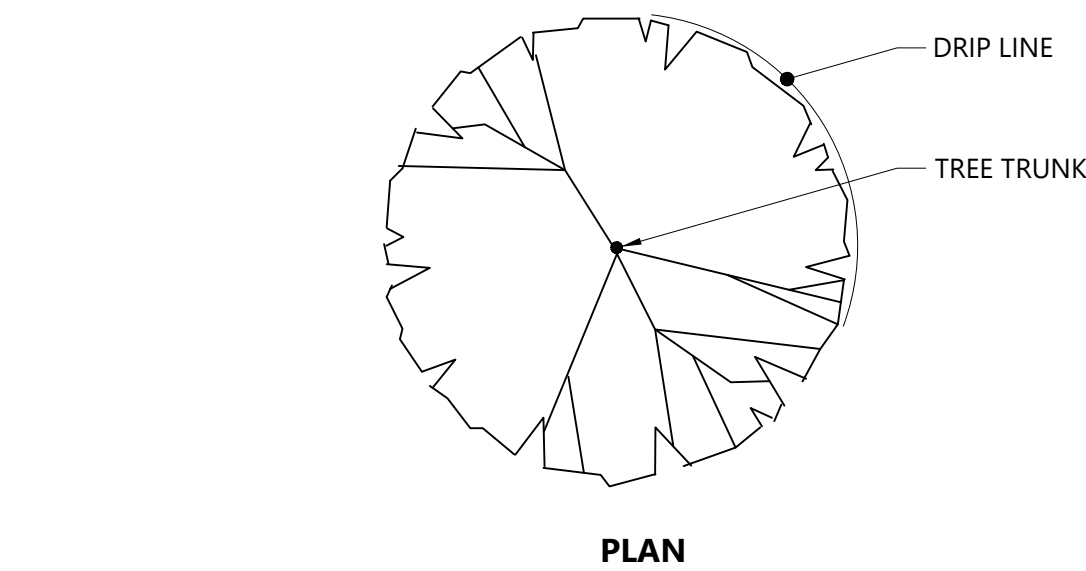


NOTES

1. LOOSEN ROOTS AT THE OUTER EDGE OF ROOTBALL OF CONTAINER GROWN SHRUBS.

Shrub Bed Planting

N.T.S. Source: VHB LD_601



NOTES

1. INSTALL TREE PROTECTION FENCE AT THE DRIP LINE OF EXISTING TREES TO REMAIN.

Tree Protection Fence

N.T.S. Source: VHB LD_610

The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

[illegible]

Designed by	Checked by
EJB	

Permitting May 10, 2024

Not Approved for Construction

Landscape Details



08/06/2024

L2.1

Sheet 40 of 50

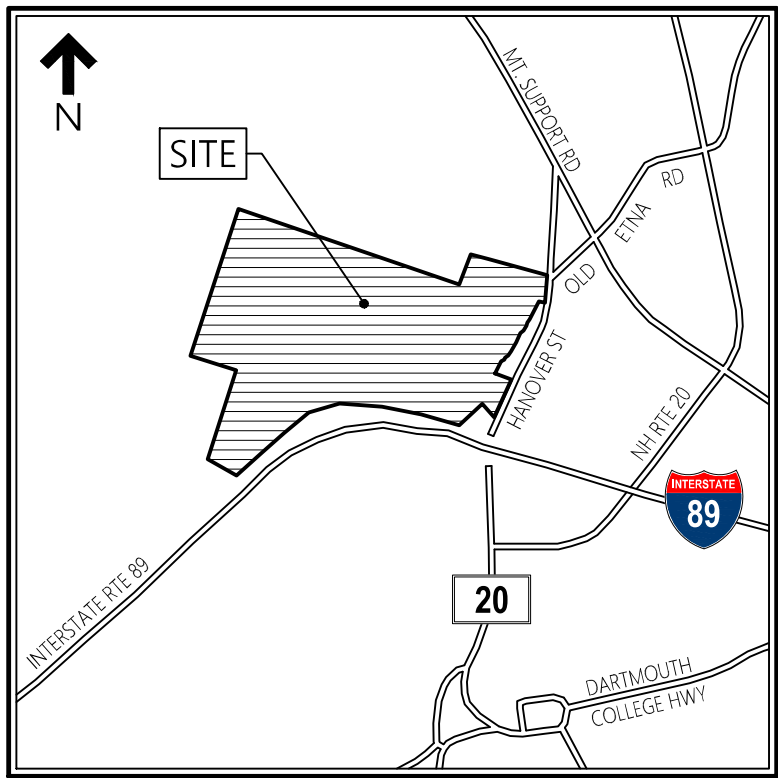
Project Number
52933.00



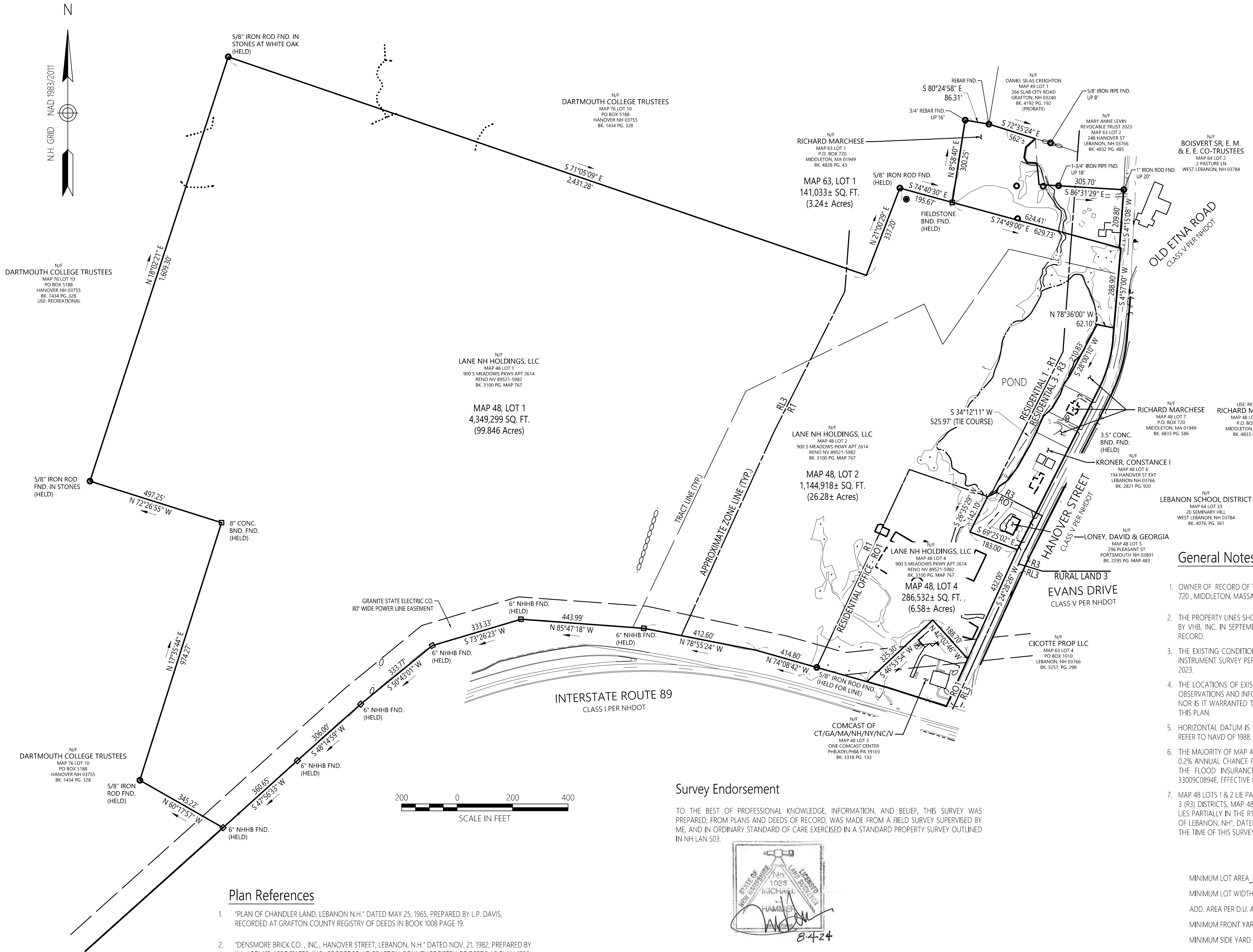
2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

Legend

- ① DRAIN MANHOLE
- ☐ CATCH BASIN
- ⊙ SEWER MANHOLE
- ⊙ ELECTRIC MANHOLE
- ① TELEPHONE MANHOLE
- ⊙ MANHOLE
- ⊙ HAND HOLE
- ⊙ WATER GATE
- ⊙ FIRE HYDRANT
- ⊙ GAS GATE
- BOLLARD
- STREET SIGN
- ☆ LIGHT POLE
- ⊙ UTILITY POLE
- ⊙ GUY POLE
- GUY WIRE
- ⊙ MONITORING WELL
- ⊙ FLOOD LIGHT
- ⊙ PEDESTRIAN SIGNAL
- MAST ARM
- ⊙ FLASHING SIGNAL
- ⊙ WELL
- ⊙ MARSH
- ⊙ F.F.E. = 45.27'
- FINISHED FLOOR ELEVATION
- DASHED WHITE LINE
- EDGE OF PAVEMENT
- VERTICAL GRANITE CURB
- SLOPED GRANITE EDGE
- GUARD RAIL
- CHAIN LINK FENCE
- DRAINAGE LINE
- SEWER LINE
- OVERHEAD WIRE
- UNDERGROUND ELECTRIC
- TELEPHONE LINE
- GAS LINE
- WATER LINE
- STONE WALL
- TREE LINE
- LIMIT OF BANK
- VEGETATED WETLAND BOUNDARY



Locus Map
(NOT TO SCALE)



General Notes

- OWNER OF RECORD OF TAX MAP 48 LOTS 1, 2, AND 4 IS BRICKYARD ONE NOMINEE TRUST, P.O. BOX 720, MIDDLETON, MASSACHUSETTS 01949, GCRD BOOK 4865 PAGE 128.
- THE PROPERTY LINES SHOWN ON THIS PLAN ARE BASED UPON AN ACTUAL FIELD SURVEY CONDUCTED BY VHB, INC. IN SEPTEMBER AND OCTOBER OF 2022, APRIL 2023, AND FROM DEEDS AND PLANS OF RECORD.
- THE EXISTING CONDITIONS SHOWN ON THIS PLAN ARE BASED UPON AN ACTUAL ON-THE-GROUND INSTRUMENT SURVEY PERFORMED BY VHB, INC. FROM SEPTEMBER THRU NOVEMBER, 2022, AND APRIL 2023.
- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN ON THIS PLAN ARE BASED ON FIELD OBSERVATIONS AND INFORMATION OF RECORD. THEY ARE NOT WARRANTED TO BE EXACTLY LOCATED NOR IS IT WARRANTED THAT ALL UNDERGROUND UTILITIES OR OTHER STRUCTURES ARE SHOWN ON THIS PLAN.
- HORIZONTAL DATUM IS BASED ON NH GRID SYSTEM, NAD 1983. ELEVATIONS SHOWN ON THIS PLAN REFER TO NAVD OF 1988.
- THE MAJORITY OF MAP 48, LOTS 1, 2 & 4 LIES WITHIN ZONE X (UNSHADED) (AREAS TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) WITH THE EXCEPTION OF THE POND (ZONE A) AS SHOWN ON THE FLOOD INSURANCE RATE MAP FOR GRAFTON COUNTY, NEW HAMPSHIRE, MAP NUMBER 33009C0894E, EFFECTIVE DATE FEBRUARY 20, 2008.
- MAP 48 LOTS 1 & 2 LIE PARTIALLY WITHIN THE RURAL LAND 3 (RL3), RESIDENTIAL 1 (R1) AND RESIDENTIAL 3 (R3) DISTRICTS, MAP 48 LOT 4 LIES ENTIRELY WITHIN THE RESIDENTIAL OFFICE 1 (RO1), MAP 63 LOT 1 LIES PARTIALLY IN THE R1 AND R3 DISTRICTS AS SHOWN ON THE "OFFICIAL ZONING MAP OF THE CITY OF LEBANON, N.H.", DATED JUNE 1, 2020. DIMENSIONAL REQUIREMENTS FOR THE ZONING DISTRICTS AT THE TIME OF THIS SURVEY ARE:

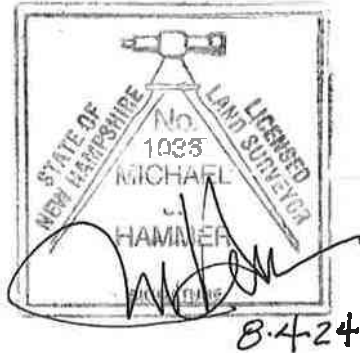
	RL3	R1 & RO1	R1 & RO1	R1 & RO1
		(CLASS 1)	(CLASS 2)	(CLASS 3)
MINIMUM LOT AREA	10 AC.	10K SF	15K SF	40K SF
MINIMUM LOT WIDTH	N/A	75 FT	75 FT	100 FT
ADD. AREA PER D.U. AFTER TWO	N/A	3K SF	5K SF	15K SF
MINIMUM FRONT YARD SETBACK	50 FT	20 FT	20 FT	25 FT
MINIMUM SIDE YARD SETBACK	50 FT	15 FT	15 FT	25 FT
MINIMUM REAR YARD SETBACK	50 FT	20 FT	20 FT	30 FT
MAXIMUM BUILDING HEIGHT	35 FT	45 FT*	45 FT*	45 FT*
MAXIMUM BUILDING COVERAGE	1%	25%	20%	15%

* WITHIN THE R1 DISTRICT, THE BUILDING HEIGHT MAY BE INCREASED TO 55 FT TO ACCOMMODATE A PARKING STRUCTURE UNDERNEATH OR WITHIN THE PROPOSED BUILDING (SEE SECTION 308.4).

- THE WETLANDS SHOWN ON THIS PLAN WERE FLAGGED BY GODDARD CONSULTING, LLC AND LOCATED IN NOVEMBER 2022.
- THE TREE SYMBOL OUTLINE SHOWN ON THIS PLAN DOES NOT REPRESENT THE ACTUAL TREE CANOPY.
- FOOT TRAILS WERE OBSERVED CROSSING THE NORTH AND WEST LOT LINES AS SHOWN. NO DOCUMENTS WERE FOUND AT THE GCRD PROVIDING RIGHTS OF ACCESS OR USE.
- THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A CURRENT TITLE REPORT AND MAY BE SUBJECT TO ADDITIONAL INFORMATION DISCLOSED IN SUCH.

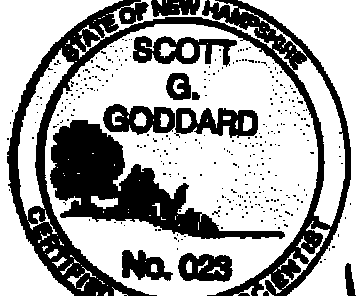
Survey Endorsement

TO THE BEST OF PROFESSIONAL KNOWLEDGE, INFORMATION, AND BELIEF, THIS SURVEY WAS PREPARED; FROM PLANS AND DEEDS OF RECORD, WAS MADE FROM A FIELD SURVEY SUPERVISED BY ME, AND IN ORDINARY STANDARD OF CARE EXERCISED IN A STANDARD PROPERTY SURVEY OUTLINED IN NH LAN 503.



Wetland Endorsement

THIS IS TO CERTIFY THAT THE WETLANDS HAVE BEEN DELINEATED IN ACCORDANCE WITH THE PROCEDURES OUTLINED IN THE 1987 CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL (TECHNICAL REPORT Y-87-1)



Plan References

- "PLAN OF CHANDLER LAND, LEBANON N.H." DATED MAY 25, 1965, PREPARED BY L.P. DAVIS, RECORDED AT GRAFTON COUNTY REGISTRY OF DEEDS IN BOOK 1008 PAGE 19.
- "DENSMORE BRICK CO., INC., HANOVER STREET, LEBANON, N.H." DATED NOV. 21, 1982, PREPARED BY K.A. LECLAIR ASSOCIATES, INC., RECORDED AT GRAFTON COUNTY REGISTRY OF DEEDS AS PLAN 1700.
- "DENSMORE BRICK CO., INC., HANOVER STREET, LEBANON, N.H." DATED NOV. 21, 1982, REVISED OCT. 4, 1983, PREPARED BY K.A. LECLAIR ASSOCIATES, INC., RECORDED AT GRAFTON COUNTY REGISTRY OF DEEDS AS PLAN 2089.
- "DENSMORE BRICK CO., INC., HANOVER STREET, LEBANON, N.H." DATED NOV. 21, 1982, REVISED APRIL 24, 1984, PREPARED BY K.A. LECLAIR ASSOCIATES, INC., RECORDED AT GRAFTON COUNTY REGISTRY OF DEEDS AS PLAN 2934.
- "HODGES DEVELOPMENT CORP., HANOVER STREET, GRAFTON COUNTY, LEBANON, N.H." DATED APRIL 4, 1986, REVISED THROUGH 5/4/89, PREPARED BY K.A. LECLAIR ASSOCIATES, INC., RECORDED AT GRAFTON COUNTY REGISTRY OF DEEDS AS PLAN 5625.
- "ELBTHAL REALTY TRUST, LEBANON, N.H." DATED JULY 3, 1980, PREPARED BY K.A. LECLAIR ASSOCIATES, INC., RECORDED AT GRAFTON COUNTY REGISTRY OF DEEDS AS PLAN 6453.
- "STATE OF NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS, PLANS OF PROPOSED FEDERAL AID PROJECT, I 89-1(45)53, N.H. PROJECT NO. P-3821-B" UNDATED, ON FILE WITH NHDOT AS PLAN P5821.B.

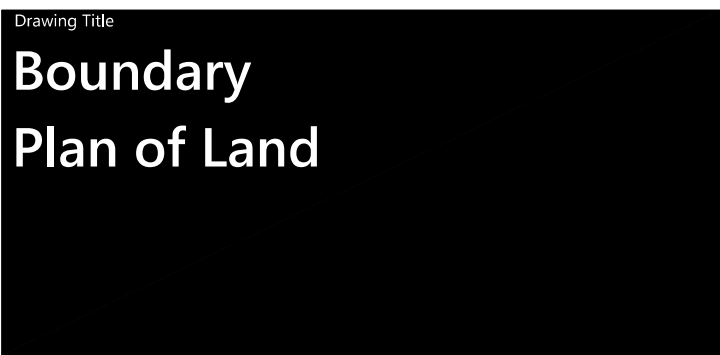
The Brickyard

Hanover Street
Lebanon, Grafton County, N.H.

No.	Revision	Date	Apprvd.
1	RESPONSE TO COMMENTS UPDATE	8/06/2024	MJH

Designed by	Checked by
Issued for	Date

April 1, 2024

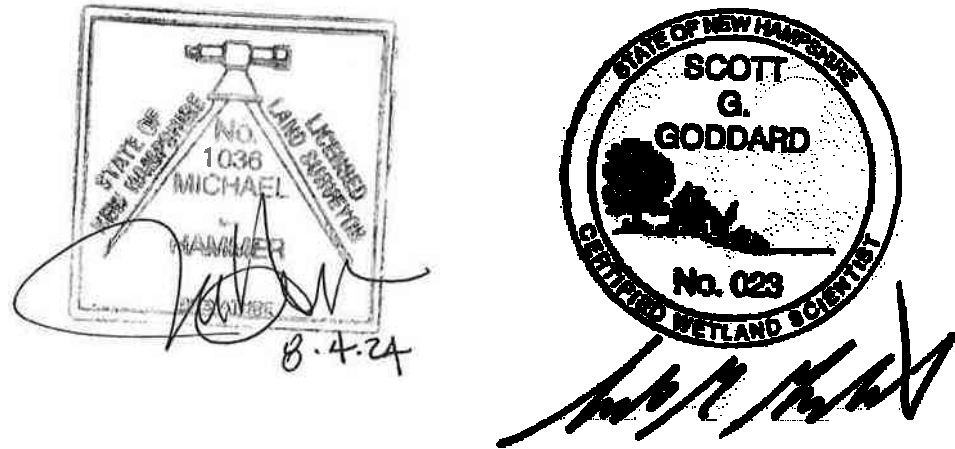


Drawing Number

Sv-1

Sheet 41 of 50

Project Number
52933.00



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

Legend

- | | |
|---|----------------------------|
|  | DRAIN MANHOLE |
|  | CATCH BASIN |
|  | SEWER MANHOLE |
|  | ELECTRIC MANHOLE |
|  | TELEPHONE MANHOLE |
|  | MANHOLE |
|  | HAND HOLE |
|  | WATER GATE |
|  | FIRE HYDRANT |
|  | GAS GATE |
|  | BOLLARD |
|  | STREET SIGN |
|  | LIGHT POLE |
|  | UTILITY POLE |
|  | GUY POLE |
|  | GUY WIRE |
|  | MONITORING WELL |
|  | FLOOD LIGHT |
|  | PEDESTRIAN SIGNAL |
|  | MAST ARM |
|  | FLASHING SIGNAL |
|  | WELL |
|  | MARSH |
| | F.F.E. = 45.27' |
| | FINISHED FLOOR ELEVATION |
|  | DOUBLE YELLOW LINE |
|  | DASHED WHITE LINE |
|  | EDGE OF PAVEMENT |
|  | VERTICAL GRANITE CURB |
|  | SLOPED GRANITE EDGE |
|  | CURB RAIL |
|  | CHAIN LINK FENCE |
|  | DRAINAGE LINE |
|  | SEWER LINE |
|  | OVERHEAD WIRE |
|  | UNDERGROUND ELECTRIC |
|  | TELEPHONE LINE |
|  | GAS LINE |
|  | WATER LINE |
|  | STONE WALL |
|  | TREE LINE |
|  | LIMIT OF BANK |
|  | VEGETATED WETLAND BOUNDARY |

See Sheet Sv-3

The Brickyard

Hanover Street
Lebanon, Grafton County, N.H.

No.	Revision	Date	Appvd.
1	RESPONSE TO COMMENTS UPDATE	8/06/2024	MJH

Designed by	Checked by
Issued for	Date
	April 1, 2024

Drawing Title

Existing Conditions
Plan of Land

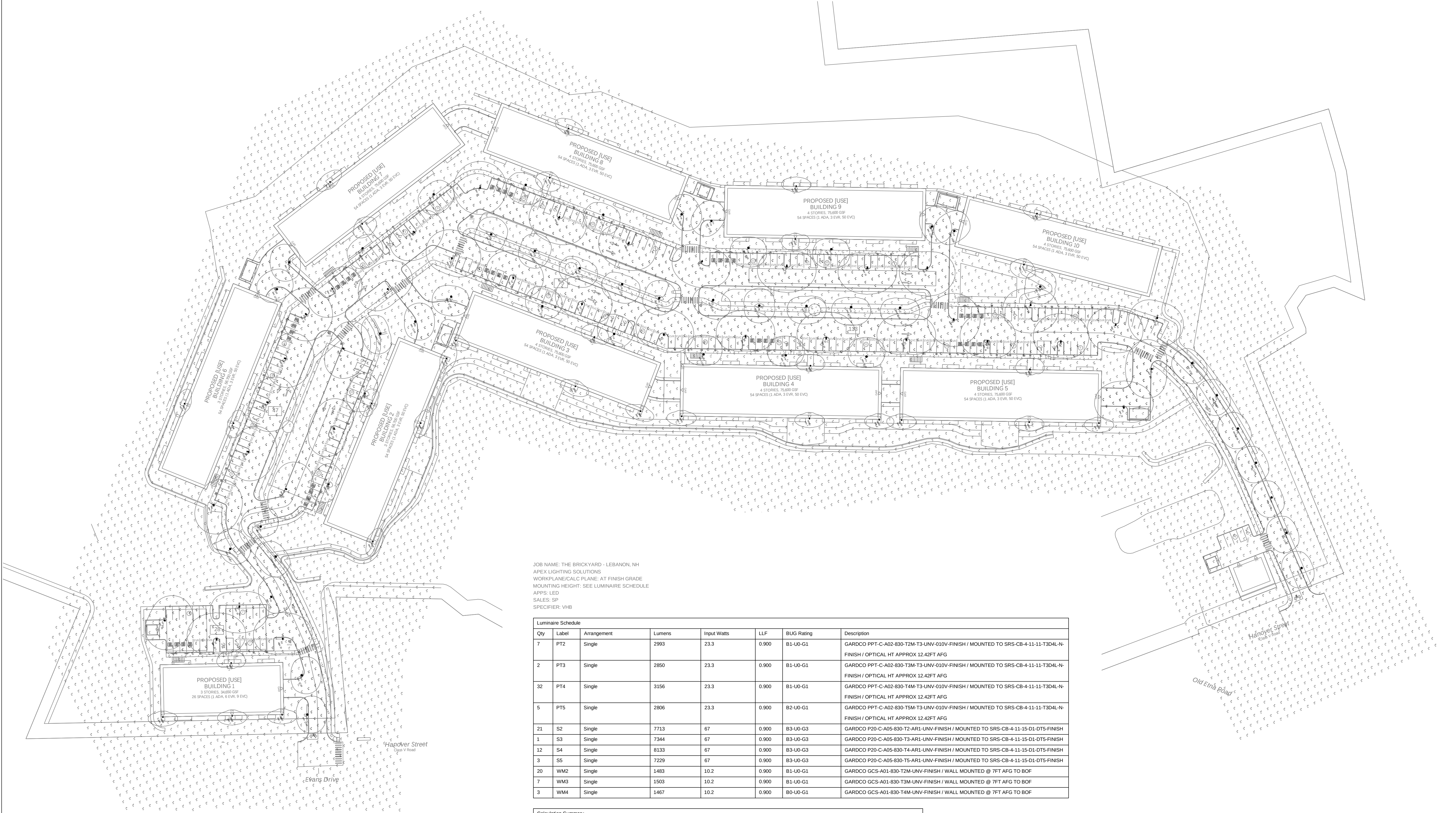
Drawing Number

Sv-2

Sheet 42 of 50

Project Number
52933.00

Page 188 of 1225



JOB NAME: THE BRICKYARD - LEBANON, NH
APEX LIGHTING SOLUTIONS
WORKPLANE/CALC PLANE: AT FINISH GRADE
MOUNTING HEIGHT: SEE LUMINAIRE SCHEDULE
APPS: LED
SALES: SP
SPECIFIER: VHB

Luminaire Schedule							
Qty	Label	Arrangement	Lumens	Input Watts	LLF	BUG Rating	Description
7	PT2	Single	2993	23.3	0.900	B1-U0-G1	GARDCO PPT-C-A02-830-T2M-T3-UNV-010V-FINISH / MOUNTED TO SRS-CB-4-11-11-T3D4L-N-FINISH / OPTICAL HT APPROX 12.42FT AFG
2	PT3	Single	2850	23.3	0.900	B1-U0-G1	GARDCO PPT-C-A02-830-T3M-T3-UNV-010V-FINISH / MOUNTED TO SRS-CB-4-11-11-T3D4L-N-FINISH / OPTICAL HT APPROX 12.42FT AFG
32	PT4	Single	3156	23.3	0.900	B1-U0-G1	GARDCO PPT-C-A02-830-T4M-T3-UNV-010V-FINISH / MOUNTED TO SRS-CB-4-11-11-T3D4L-N-FINISH / OPTICAL HT APPROX 12.42FT AFG
5	PT5	Single	2806	23.3	0.900	B2-U0-G1	GARDCO PPT-C-A02-830-T5M-T3-UNV-010V-FINISH / MOUNTED TO SRS-CB-4-11-11-T3D4L-N-FINISH / OPTICAL HT APPROX 12.42FT AFG
21	S2	Single	7713	67	0.900	B3-U0-G3	GARDCO P20-C-A05-830-T2-AR1-UNV-FINISH / MOUNTED TO SRS-CB-4-11-15-D1-DT5-FINISH
1	S3	Single	7344	67	0.900	B3-U0-G3	GARDCO P20-C-A05-830-T3-AR1-UNV-FINISH / MOUNTED TO SRS-CB-4-11-15-D1-DT5-FINISH
12	S4	Single	8133	67	0.900	B3-U0-G3	GARDCO P20-C-A05-830-T4-AR1-UNV-FINISH / MOUNTED TO SRS-CB-4-11-15-D1-DT5-FINISH
3	S5	Single	7229	67	0.900	B3-U0-G3	GARDCO P20-C-A05-830-T5-AR1-UNV-FINISH / MOUNTED TO SRS-CB-4-11-15-D1-DT5-FINISH
20	WM2	Single	1483	10.2	0.900	B1-U0-G1	GARDCO GCS-A01-830-T2M-UNV-FINISH / WALL MOUNTED @ 7FT AFG TO BOF
7	WM3	Single	1503	10.2	0.900	B1-U0-G1	GARDCO GCS-A01-830-T3M-UNV-FINISH / WALL MOUNTED @ 7FT AFG TO BOF
3	WM4	Single	1467	10.2	0.900	B0-U0-G1	GARDCO GCS-A01-830-T4M-UNV-FINISH / WALL MOUNTED @ 7FT AFG TO BOF

Calculation Summary						
Label	Grid Height	Avg	Max	Min	Avg/Min	Max/Min
BLDG ENTRY DRIVES	0	1.50	3.1	0.3	5.00	10.33
PARKING LOTS	0	1.59	3.5	0.4	3.98	8.75
SIDEWALKS	0	1.00	3.6	0.1	10.00	36.00
SITE	0	0.48	4.6	0.0	N.A.	N.A.
SITE ENTRY DRIVES	0	1.27	3.1	0.1	12.70	31.00

GENERAL DISCLAIMER:

Calculations have been performed according to IES standards and good practice. Some differences between measured values and calculated results may occur due to tolerances in calculation methods, testing procedures, component performance, measurement techniques and field conditions such as voltage and temperature variations. Input data used to generate the attached calculations such as room dimensions, reflectances, furniture and architectural elements significantly affect the lighting calculations. If the real environment conditions do not match the input data, differences will occur between measured values and calculated values.

* LLF Determined Using Current Published Lamp Data

NOTE TO REVIEWER:

Total Light Loss Factor (LLF) applied at time of design is determined by applying the Lamp Lumen Depreciation (LLD) from current lamp manufacturer's catalog, a Luminaire Dirt Depreciation Factor (LDD) based on IES recommended values and a Ballast Factor (BF) from current ballast specification sheets. Application of an incorrect Light Loss Factor (LLF) will result in forecasts of performance that will not accurately depict actual results. For proper comparison of photometric layouts, it is essential that you insist all designers use correct Light Loss Factors.



20-30 BEAVER ROAD, WETHERSFIELD, CT 06109
TELEPHONE 860.632.8766 / WWW.APEXLTG.COM

PROJECT TITLE:

THE BRICKYARD
LEBANON, NH

DRAWING TITLE:

SITE LIGHTING
PHOTOMETRIC CALCULATION

Sheet 44 of 50

SCALE : 1"=60'-0"

DATE: 7/18/24

DRAWN BY: LED

SHEET:

SL-1C

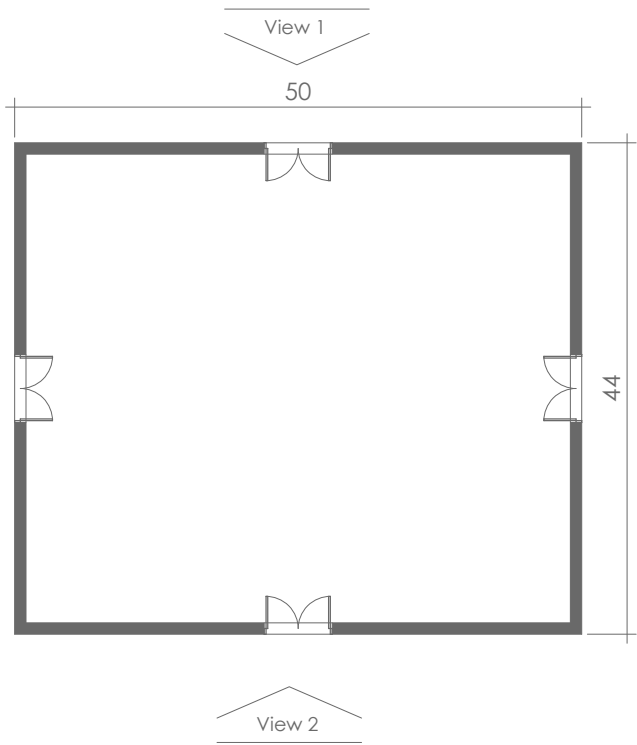
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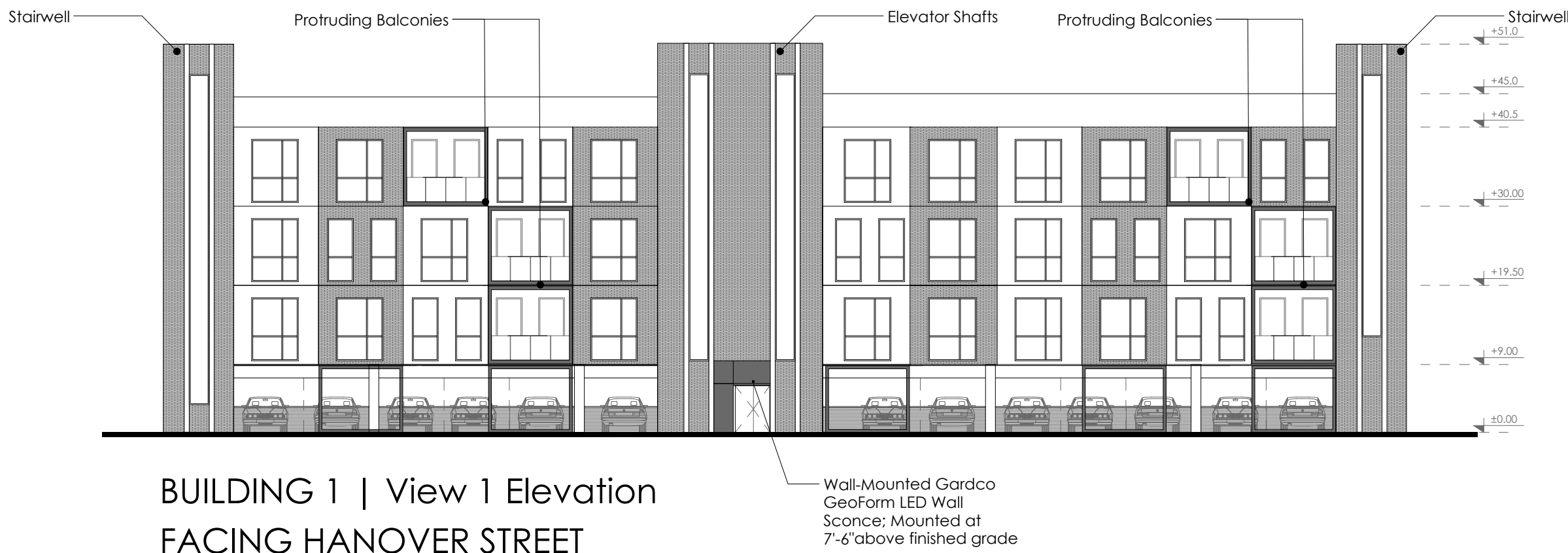
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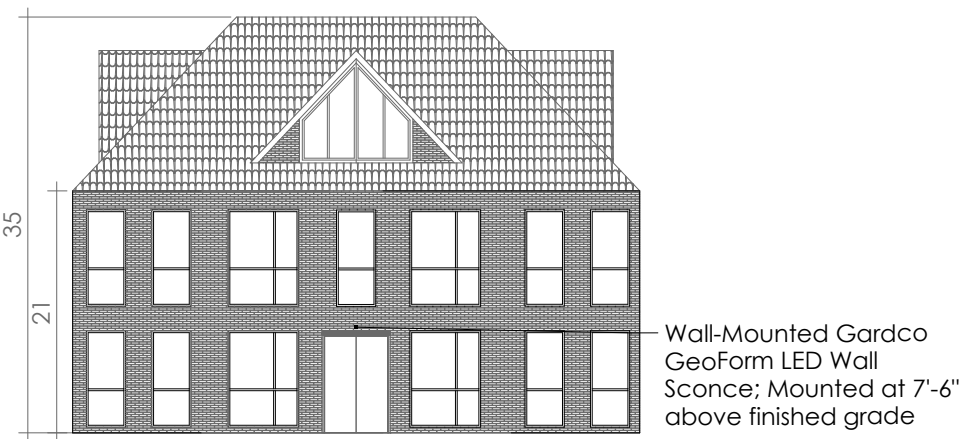
BUILDING 1 | Parking Level Plan



MAINTENANCE BUILDING | GROUND FLOOR PLAN



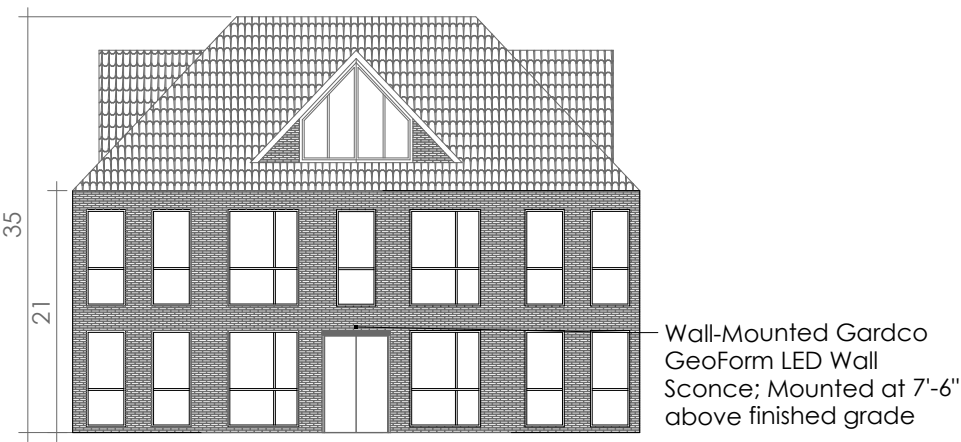
BUILDING 1 | View 1 Elevation
FACING HANOVER STREET



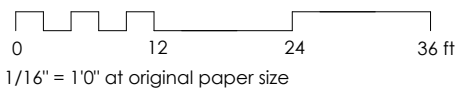
MAINTENANCE BUILDING | View 1 Elevation



BUILDING 1 | View 2 Elevation
SURFACE PARKING AREA



MAINTENANCE BUILDING | View 2 Elevation



Sheet 46 of 50			
P3	Submission	VT	24/08/02
P2	Submission	SS	24/08/02
P1	Submission	SS	24/05/07
REV	DESCRIPTION	DRN	DATE



CLIENT

PROJECT
Lebanon NH

DRAWING STATUS
PLANNING

DRAWING NAME
BUILDING 1 & MAINTENANCE BUILDING
PROPOSED PLAN & ELEVATIONS
DRAWING NO.
0089-1201-P3

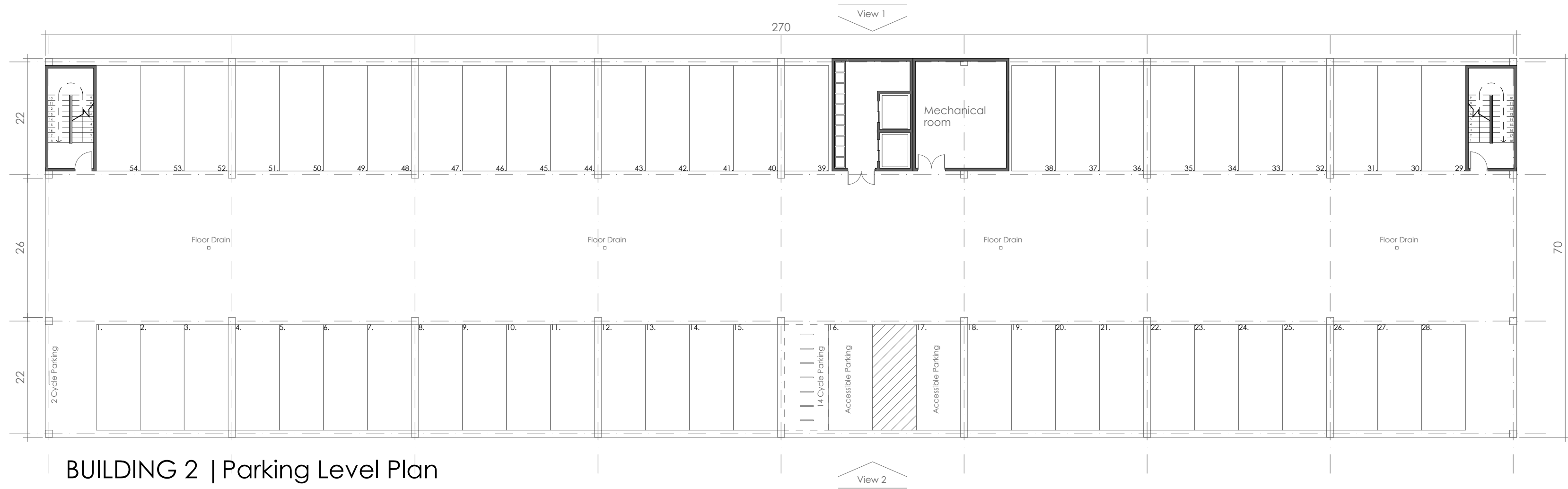
REV
P3

DATE
24/08/02
DRAWN
SS
SCALE
1/16" = 1'0" @A1
CHECKED
VT

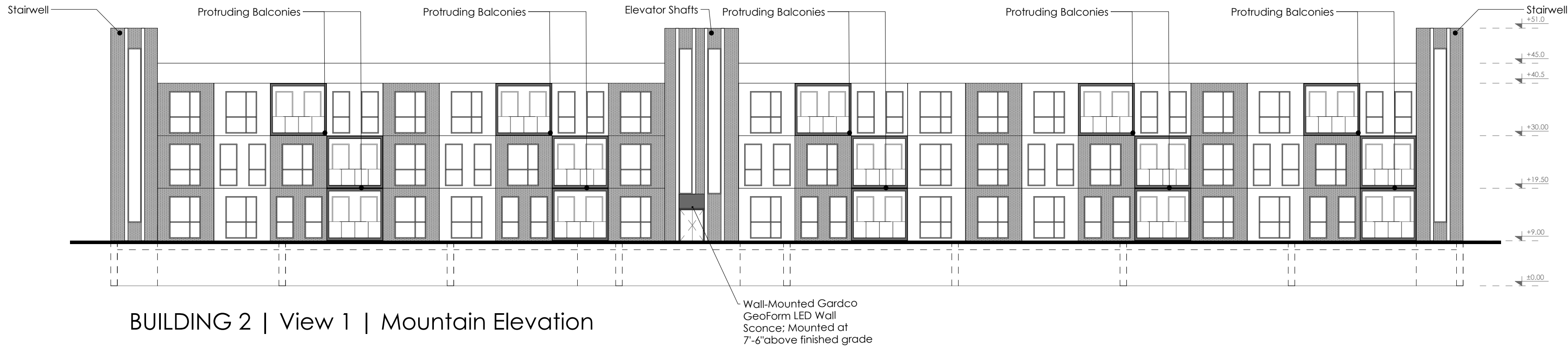
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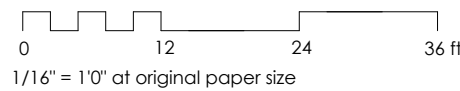
BUILDING 2 | Parking Level Plan



BUILDING 2 | View 1 | Mountain Elevation



BUILDING 2 | View 2 | Lake Elevation



Sheet of
47 50

P3	Submission	VT	24/08/02
P2	Submission	SS	24/08/02
P1	Submission	SS	24/05/07



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PROJECT
Lebanon NH

DRAWING STATUS
PLANNING

DRAWING NAME
BUILDING 2 | PROPOSED PLAN & ELEVATIONS

DRAWING NO. REV
0089-1202-F3 F3

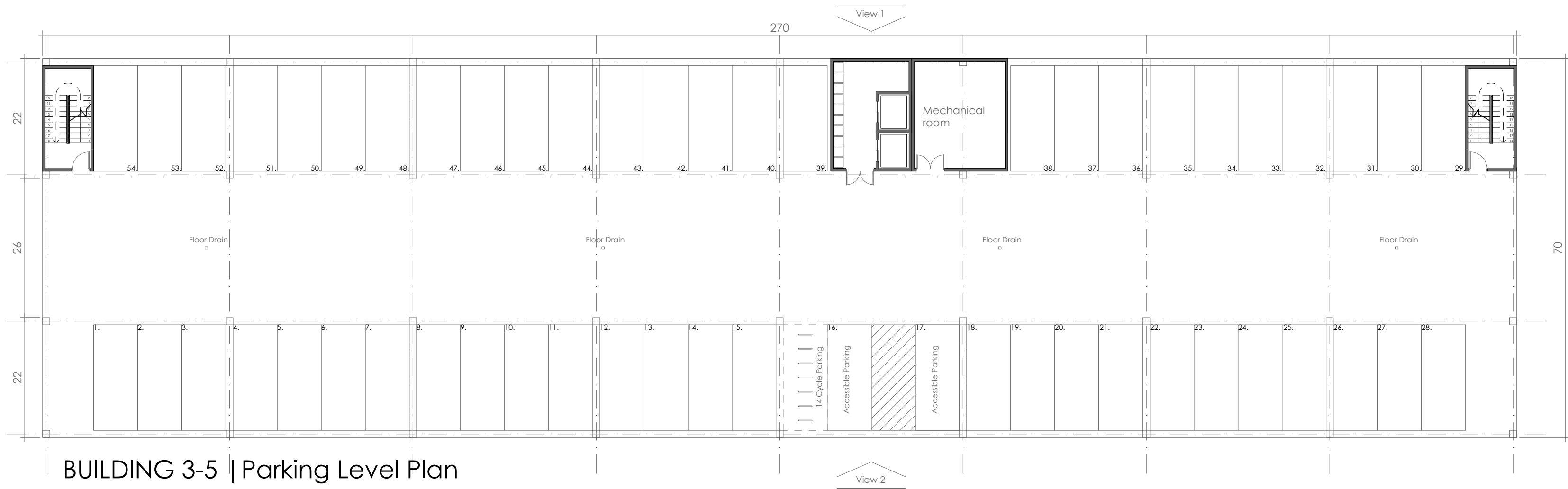
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24/08/02 SS

SCALE CHECKED
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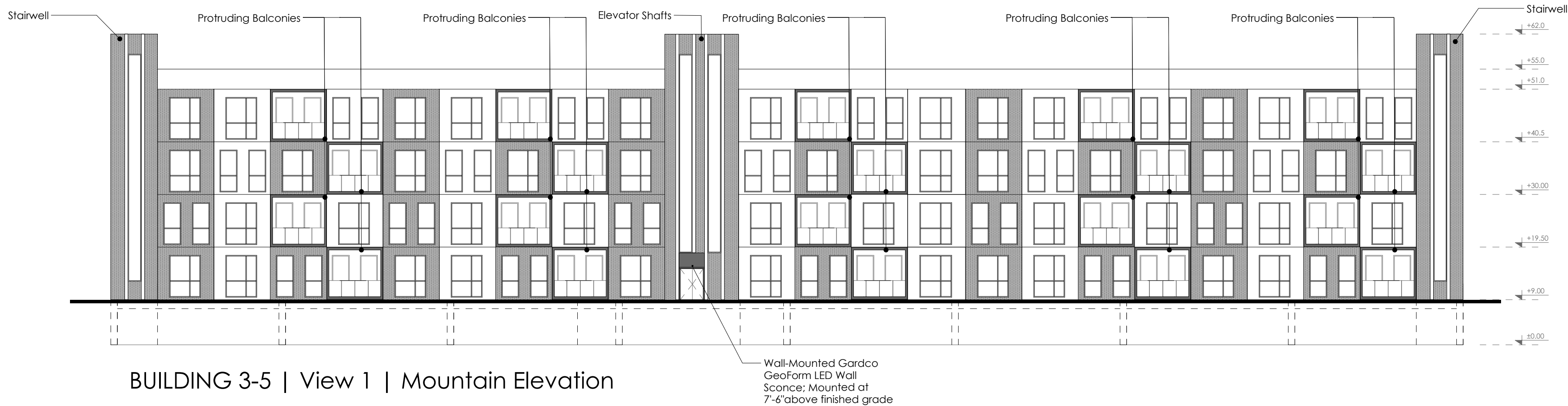
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BUILDING 3-5 | Parking Level Plan



BUILDING 3-5 | View 1 | Mountain Elevation



BUILDING 3-5 | View 2 | Lake Elevation

Sheet of
48 50

P3	Submission	VT	24/08/02
P2	Submission	SS	24/08/02
P1	Submission	SS	24/05/07



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PROJECT
Lebanon NH

DRAWING STATUS
PLANNING

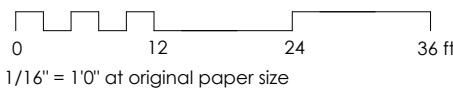
DRAWING NAME
BUILDING 3-5 | PROPOSED PLAN & ELEVATIONS

DRAWING NO. REV
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DATE DRAWN
24/08/02 SS

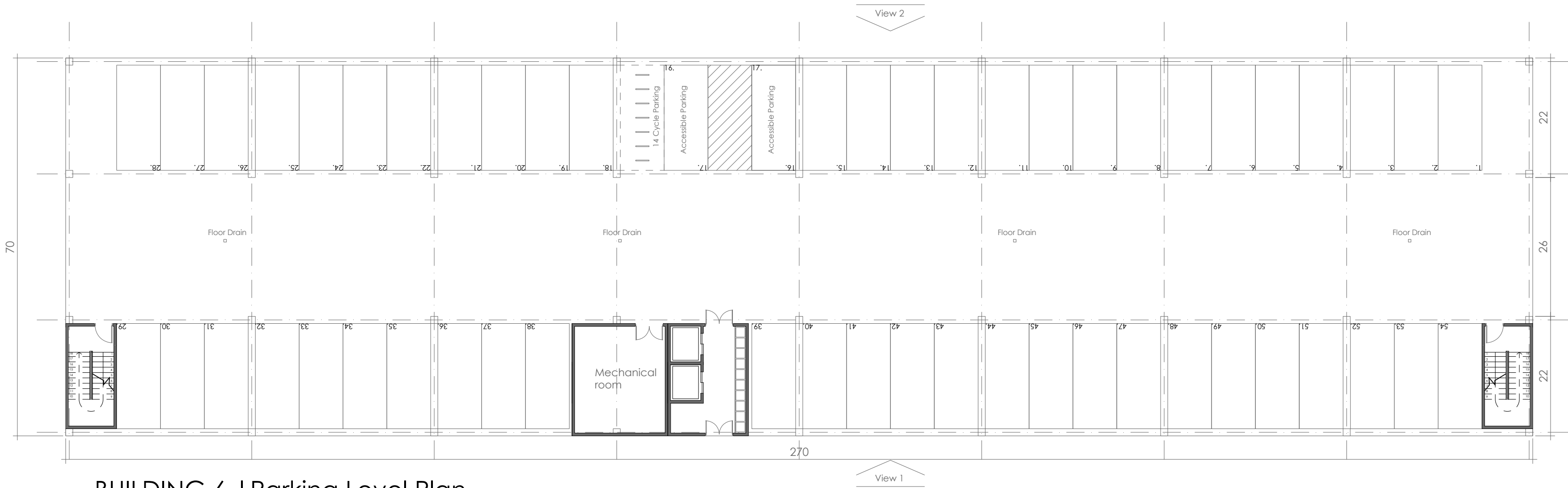
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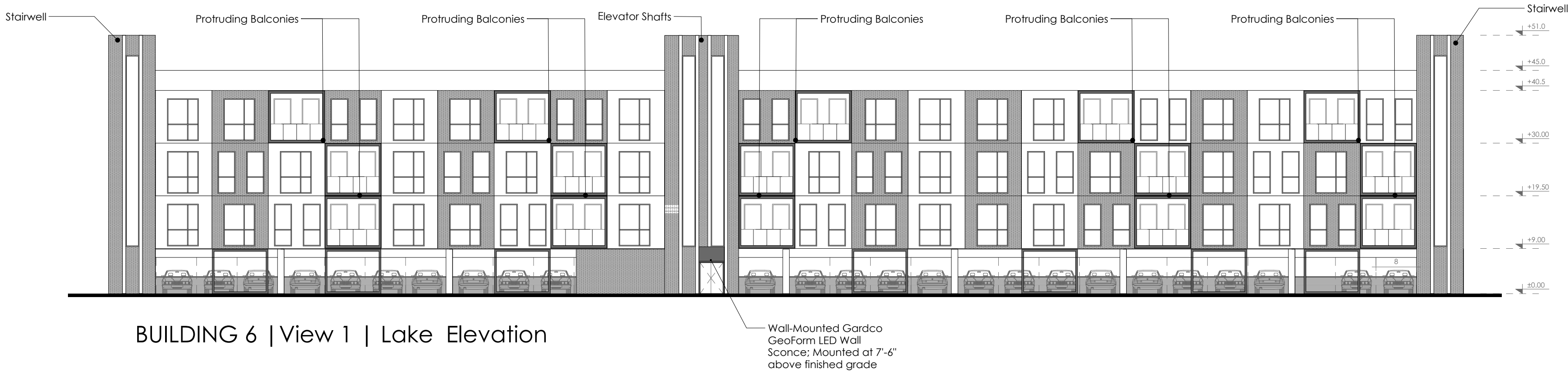


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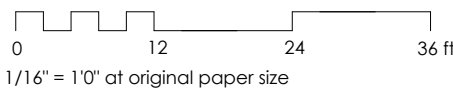
BUILDING 6 | Parking Level Plan



BUILDING 6 | View 1 | Lake Elevation



BUILDING 6 | View 2 | Mountain Elevation



Sheet			of		
49			50		
P3	Submission	VT	24/08/02		
P2	Submission	SS	24/08/02		
P1	Submission	SS	24/05/07		
REV	DESCRIPTION	DRN	DATE		



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PROJECT
Lebanon NH

DRAWING STATUS
PLANNING

DRAWING NAME
BUILDING 6 | PROPOSED PLAN & ELEVATIONS

DRAWING NO.	REV
0089-1204-P3	P3

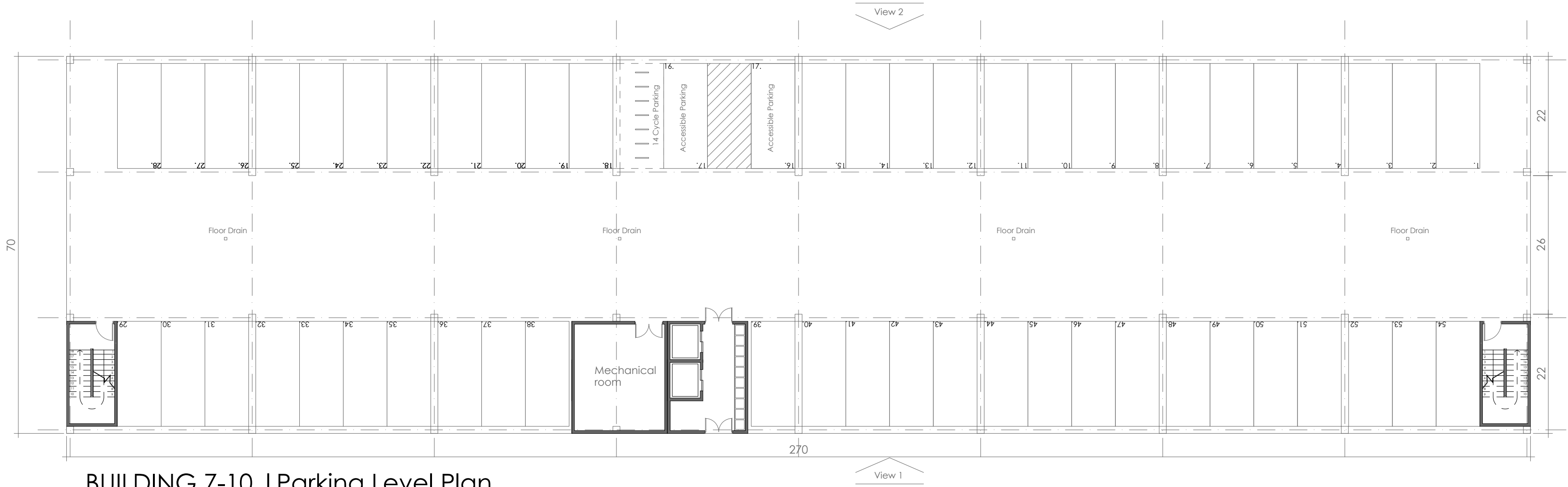
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24/08/02	SS

SCALE	CHECKED
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Please note that the plans and elevations are design intent only. The architectural details shown for illustrative purposes and refinements may be necessary as the design phase progresses.



BUILDING 7-10 | Parking Level Plan



BUILDING 7-10 | View 1 | Lake Elevation



BUILDING 7-10 | View 2 | Mountain Elevation

Sheet			of		
50			50		
P3	Submission	VT	24/08/22		
P2	Submission	SS	24/08/22		
P1	Submission	SS	24/05/21		
REV	DESCRIPTION	DRN	DATE		



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PROJECT
Lebanon NH

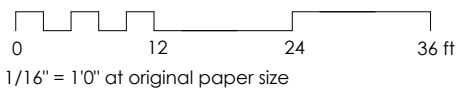
DRAWING STATUS
PLANNING

DRAWING NAME
BUILDING 7-10 | PROPOSED PLAN & ELEVATIONS

DRAWING NO.	REV
0089-1205-P3	P3

DATE	DRAWN
24/08/22	SS
SCALE	CHECKED
1/16" = 1'0" @A1	VT

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TRAFFIC IMPACT STUDY

Lebanon Brickyard Development

Lebanon, New Hampshire

PREPARED FOR

Richard Marchese
CPO Box 720
Middleton, MA 01949

PREPARED BY



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

May 2024 (rev August 2024)

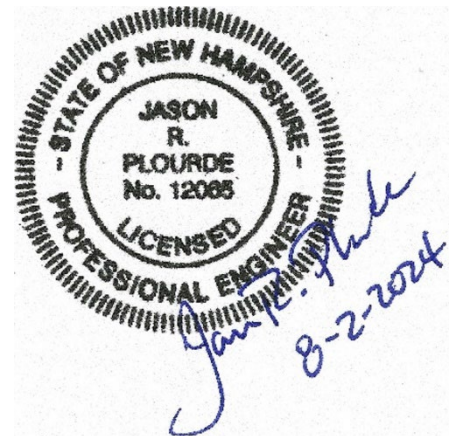


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1

Introduction

Vanasse Hangen Brustlin, Inc. (VHB) has prepared this Traffic Impact Study to summarize the anticipated transportation impacts associated with the proposed Lebanon Brickyard residential development to be located along the west side of Hanover Street in Lebanon, New Hampshire. As proposed, the development program consists of constructing 474 apartment units in 10 four-story buildings. In addition, the project is envisioned to replace the residence at 238 Hanover Street with a structure to contain a single-family residence for the property manager of the Lebanon Brickyard development. Access is proposed via two full access driveways along Hanover Street. The northern driveway will be located to the north of Old Etna Road and the southern driveway will be located across from Evans Drive. The site location in relation to the surrounding roadway network is shown in Figure 1.

New Hampshire Department of Transportation (NHDOT) officials are developing improvements for the NH Route 120 corridor between Hanover Street and Etna Road/Old Etna Road.¹ On December 1, 2023, the project team attended a meeting with City of Lebanon, NHDOT, and Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC) officials to discuss the scope of this traffic study for the proposed Lebanon Brickyard residential development and the NH Route 120 roadway project. During the

¹ www.dot.nh.gov/projects-plans-and-programs/project-center/lebanon-29612

meeting, NHDOT officials stated that an NHDOT permit is not expected to be required for the proposed land development project due to the low traffic increases on the state highway system. Therefore, approval of the proposed residential development with respect to traffic impacts is expected to be required through the local permitting process. This traffic study has been prepared in accordance with the City of Lebanon's Site Plan Regulations (Article V Section 5.1.G.2)² and the scope agreed upon at the December 1, 2023 meeting.

VHB had prepared and submitted a May 2024 Traffic Impact Study that was peer reviewed by Weston & Sampson on behalf of the City of Lebanon. This current version of the Traffic Impact Study has been stamped by a Professional Engineer licensed in the State of New Hampshire and incorporates requested typographical revisions. This version does not change the traffic volumes, methodologies, or findings of the May 2024 Traffic Impact Study.

² City of Lebanon, New Hampshire. Site Plan Review Regulations. 23 Jan. 2023.



Site Location Map

Figure 1



0 350 700 Feet



2

Existing Conditions

Existing conditions were developed by conducting field reconnaissance and collecting traffic counts within the vicinity of the site. In preparing this study, the following 'study area' intersections have been analyzed and evaluated:

- › Hanover Street and Evans Drive
- › Hanover Street and Old Etna Road
- › Hanover Street Extension, Heater Road, and Mount Support Road
- › Old Etna Road and Heater Road
- › NH Route 120, Old Etna Road, and Etna Road
- › NH Route 120 and Evans Drive

Within the vicinity of the site, Hanover Street is functionally classified as a Local Roadway, under City of Lebanon jurisdiction, and has a posted speed limit of 25 miles per hour (mph) and a speed limit of 20 mph between 7:00 AM-4:00 PM within the school zone for Hanover Street Elementary School (193 Hanover Street) and Lebanon High School (195 Hanover Street). Directional flows are separated along Hanover Street by double solid line yellow (DSL) centerlines. Land uses consist of residences, Comcast, Hanover Street Elementary School, and Lebanon High School.

There is a sidewalk provided along the east side of Hanover Street starting at Old Etna Road (to the north) that continues over Interstate 89 (I-89) to the south.

Traffic Volumes

Traffic Counts

Base traffic conditions at the study area intersections were developed by conducting turning movement counts (TMCs) and vehicle classification counts on Thursday, November 10, 2022, during the weekday AM peak period (7:00-9:00 AM) and the weekday PM peak period (2:00-6:00 PM). In addition, intersection traffic counts were collected on Saturday, November 12, 2022, during the midday peak period (11:00 AM-1:00 PM). These weekday time periods were selected in order to capture the weekday commuting peak periods³ as well as the student arrival and dismissal periods for Hanover Street Elementary School and Lebanon High School.⁴ In addition, automatic traffic recorder (ATR) counts were conducted along Hanover Street and Evans Drive in the vicinity of the site to collect weekday and Saturday daily traffic volumes and vehicle speed measurements. The traffic count data are provided in the Appendix.

An evaluation of the traffic counts revealed that the study area generally experienced a weekday peak between 7:00-8:00 AM and between 4:30-5:30 PM, and a Saturday peak between 11:00 AM-12:00 PM. Along Hanover Street at the unsignalized intersections with Old Etna Road and with Evans Drive, the influence of the elementary and high school dismissal traffic showed that the weekday afternoon peak occurred between 2:15-3:15 PM and between 2:00-3:00 PM, respectively. Therefore, a supplemental evaluation was conducted at these intersections and the proposed site driveways during the school dismissal time period as provided in the Appendix.

Seasonal Adjustment

Traffic on a given roadway typically fluctuates throughout the year depending on the area and the type of roadway. Based on NHDOT guidelines for the preparation of a traffic study, existing traffic volumes must represent peak-month conditions. Upon review of seasonal adjustment and historical count data provided by NHDOT at the permanent count station located along NH Route 120 south of Lahaye Drive, traffic volumes in the month of November are approximately 13 percent lower than peak-month volumes (October).⁵ Therefore, the November 2022 traffic counts at the study area intersections were increased by 13 percent to represent 2022 peak-hour traffic volumes during peak-month conditions. The NHDOT seasonal adjustment data are provided in the Appendix.

³ Weekday commuting peak periods typically occur between 7:00-9:00 AM and 4:00-6:00 PM.

⁴ Hanover Street Elementary School: the bell to enter school rang at 8:00 AM and the end of the day bell rang at 3:00 PM. Lebanon High School: Monday-Thursday first bell was at 7:30 AM and the last bell was at 2:35 PM.

⁵ New Hampshire Department of Transportation Bureau of Traffic. Year 2019 Monthly Data, Count Station 02253025: Lebanon – NH Route 120 1 mile south of Hanover Town Line (south of Lahaye Drive).

Pandemic Adjustment

Due to the coronavirus disease 2019 (COVID-19) pandemic, traffic volumes may not represent normal travel conditions along New Hampshire roadways. To determine whether a pandemic adjustment should be made to the 2022 peak-month traffic volumes, NHDOT guidance is to review historical traffic counts from a nearby permanent count station during the month of full data that is nearest to the month of the counts and during that same month prior to the pandemic.⁶ Based on this NHDOT methodology, a comparison of the November 2022 and the November 2019 data from the permanent count station located along NH Route 120 south of Lahaye Drive shows that traffic volumes have decreased by 29.7 percent during the weekday AM peak hour, 19.1 percent during the weekday PM peak hour, and 6.2 percent during the Saturday midday peak hour.

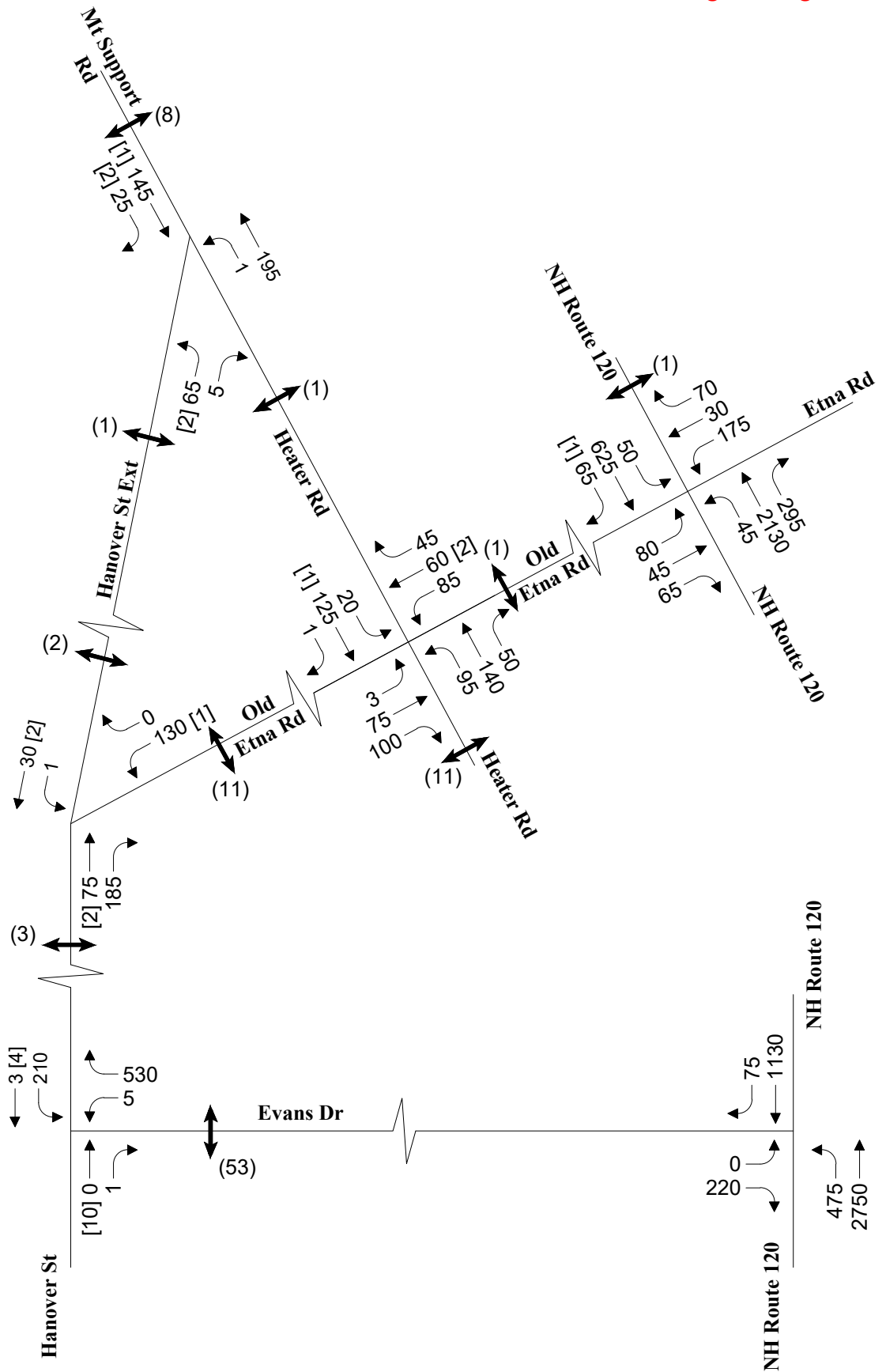
While traffic volumes along NH Route 120 were shown to experience large decreases between November 1999 and November 2022, these same reductions may not have been realized on the nearby local roadway system or on the turns to and from local roadways along NH Route 120 (e.g., Evans Drive) which are mostly influenced by school and Dartmouth Health related traffic. To be consistent with NHDOT methodologies, however, the 2022 peak-month traffic volumes were increased by the same pandemic adjustment factors at all study area intersections which then may accordingly reflect an overestimated baseline scenario at the local intersections.⁷ The November 2022 and November 2019 traffic volume comparison is provided in the Appendix.

Existing Traffic Volume Summary

The 2022 Existing weekday AM, weekday PM, and Saturday midday peak hour transportation volumes (vehicles, pedestrians, and bicycles) are reflected on Figures 2, 3, and 4, respectively. Table 1 provides a summary of the vehicular volumes along Hanover Street and Evans Drive in the vicinity of the proposed development.

⁶ Ibid. 5.

⁷ The 2022 peak-month traffic volumes were increased by 1.147 during the weekday daily period, 1.109 during the Saturday daily basis, 1.297 during the weekday AM peak hour, 1.191 during the weekday PM peak hour, and 1.062 during the Saturday midday peak hour.



LEGEND

XX = Vehicles
(XX) = Pedestrians
[XX] = Bicycles

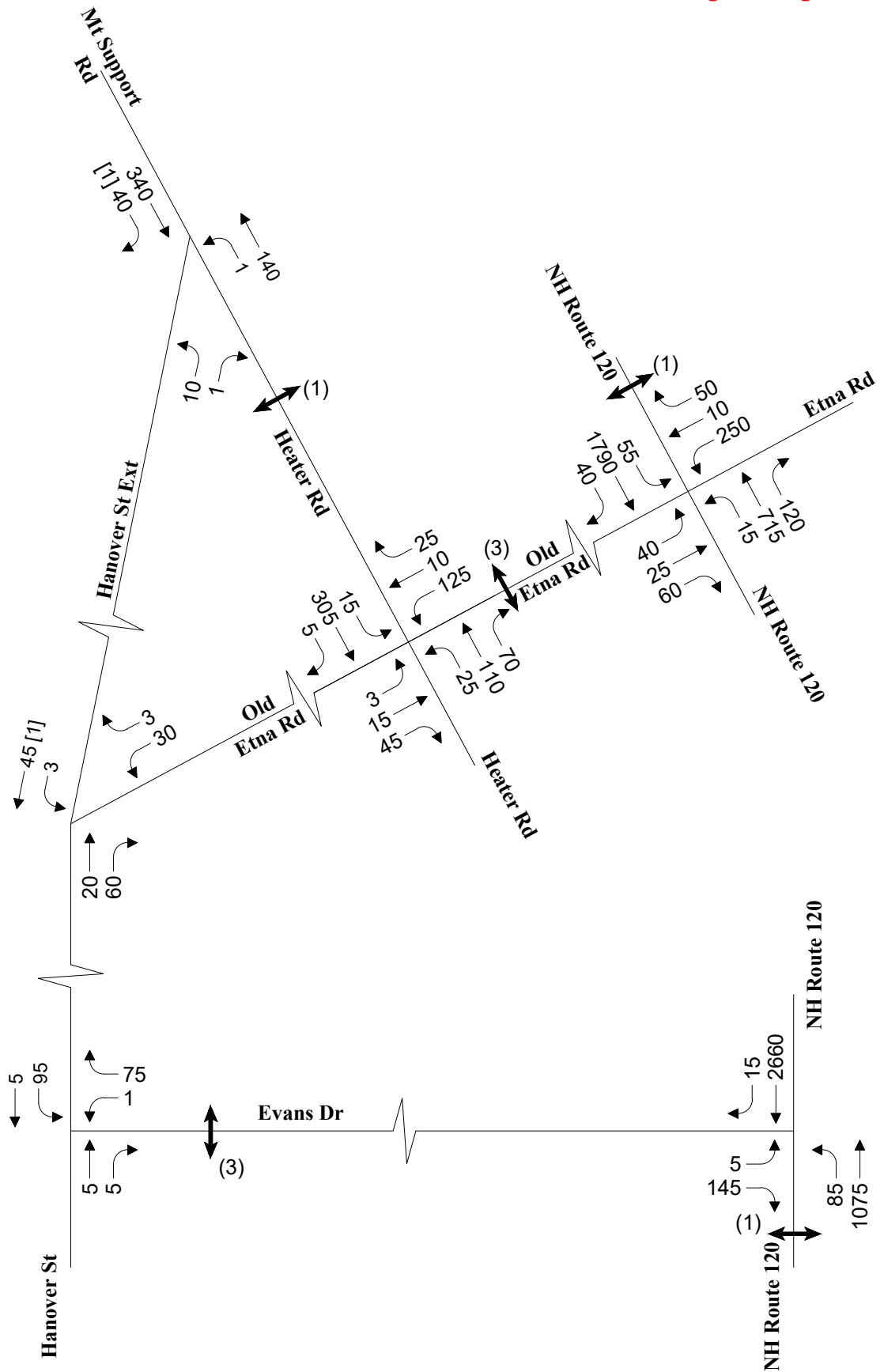


Not to Scale



2022 Existing Weekday Morning
Peak Hour Traffic Volumes

Figure 2



LEGEND

XX = Vehicles
(XX) = Pedestrians
[XX] = Bicycles



Not to Scale



2022 Existing Weekday Evening
Peak Hour Traffic Volumes

Figure 3

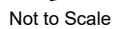
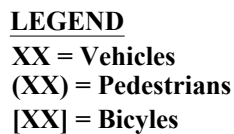


Figure 4

Table 1 Existing Traffic Volume Summary

Location/Time Period	Daily Traffic Volume (vpd) ^a	Peak Hour Traffic Volume (vph) ^b	K-Factor ^c	Directional Distribution ^d
Hanover St north of Evans Dr				
Weekday Daily	2,550			
Weekday AM Peak Hour		740	29.0	71% NB
Weekday PM Peak Hour		180	7.1	56% SB
Saturday Daily	670			
Saturday Midday Peak Hour		50	7.2	60% NB
Evans Dr east of Hanover St				
Weekday Daily	2,655			
Weekday AM Peak Hour		745	28.1	72% WB
Weekday PM Peak Hour		176	6.6	57% EB
Saturday Daily	610			
Saturday Midday Peak Hour		50	8.2	58% WB

- a In vehicles per day. Weekday daily traffic counts seasonally increased by 1.13 and pandemically adjusted by 1.147, and Saturday daily traffic counts seasonally increased by 1.13 and pandemically adjusted by 1.109.
- b In vehicles per hour. Weekday AM peak hour traffic counts increased by 1.13 and pandemically adjusted by 1.297, weekday PM peak hour traffic counts seasonally increased 1.13 and pandemically adjusted by 1.191, and Saturday midday peak hour traffic counts increased by 1.13 and pandemically adjusted by 1.062.
- c Percent of average daily traffic occurring during the peak hour.
- d Predominant traffic flow, with NB = northbound, SB = southbound, EB = eastbound, and WB = westbound.

Many rural and urban roadways experience a K-factor that falls between 9.0 and 10.0 for the weekday commuting time periods. The K-factor may exceed 10.0 for roadways with heavy peak traffic demand.⁸ As shown in Table 1, the K-factor for the weekday AM peak hour is greater than the typical range along rural and urban roadways during the weekday commuting peak hours (28.1 and 29.0 vs. 9.0-10.0), which suggests that these sections of Hanover Street and Evans Drive carried traffic volumes with strong peak demands (i.e., a heavy traffic flow) during the weekday AM time period. These heavier weekday AM traffic volumes coincide with both the commuter peak and the student arrival periods for the nearby elementary and high schools, whereas the weekday PM commuter peak and the student dismissal periods occur at separate times.

Vehicle Speeds

Driving is a self-paced activity where each individual driver controls the speed of their vehicle according to perceived and actual roadway conditions. Posted speed limits provide the legal or allowed maximum travel speed which can be enforced by law enforcement agencies. Table 2 provides statistical data summarized from the speed study conducted along Hanover Street north of Evans Drive and along Evans Drive east of Hanover Street. The average vehicular speed is calculated as the arithmetic mean of the observed vehicle speeds (i.e., the sum of the speeds divided by the number of observations). The 85th percentile speed generally indicates the speed

⁸ Dowling, Richard, et al. Planning and Preliminary Engineering Applications Guide to the Highway Capacity Manual. National Cooperative Highway Research Program Report 825, Washington, DC: National Academy of Sciences, 2016.

that most drivers consider safe and reasonable under ideal conditions. The pace speed is the 10-mph range with the greatest number of observations. Additional speed statistics such as the 15th and 95th percentile speeds are provided in the Traffic Count section of the Appendix.

Table 2 Vehicle Speed Summary

Location/Direction	Speed Limit (mph) ^a	Average Speed (mph)	85 th Percentile Speed (mph)	10 mph Pace (mph)
Hanover St north of Evans Dr				
Northbound	20/25	15	18	9-18
Southbound	20/25	16	19	11-20
Combined	20/25	15	18	9-18
Evans Dr east of Hanover St				
Eastbound	20/30	29	32	23-32
Westbound	20/30	27	31	20-29
Combined	20/30	30	32	21-30

a The speed limit is 20 mph within the School Zones between 7:00 AM-4:30 AM along Hanover Street and during student arrival/dismissal time periods along Evans Drive (when lights are flashing). During other time periods, the posted speed limit along Hanover Street is 25 mph and the enforced speed limit Along Evans Drive is 30 mph.

As shown in Table 2, the vehicle speeds along Evans Drive were found to be higher than those along Hanover Street. The average and 85th percentile speeds along Hanover Street were found to be lower than the 20 mph speed limit within the school zone and the posted speed limit of 25 mph. The speeds along Evans Drive were noted to be slightly higher than the speed limit, with faster vehicle travel speeds in the eastbound direction.

Transit

Within the study area, Heater Road between NH Route 120 and Hanover Street Extension is currently served by public transit in the form of Advance Transit. Advance Transit is a bus service provided for commuters in the Upper Valley region of Vermont and New Hampshire. The Advance Transit Blue Bus Route offers frequent weekday service between Dartmouth College, the Town of Hanover, Dartmouth Health, and the City of Lebanon. In addition, this fixed route service provides several daily trips to the Towns of Enfield and Canaan. The Blue Bus Route is in operation between 5:15 AM and 7:10 PM on weekdays with stops provided within the study area along Heater Road adjacent to Lebanon High School.

Capacity and Queue Analyses

Capacity Analysis Methodology

Intersection operational analyses were performed for the study area intersections with the 2022 Existing weekday AM, weekday PM, and Saturday midday peak hour traffic volumes based on the concepts and procedures in the Highway Capacity Manual (HCM) using the Trafficware Synchro Software computer program. This software program is an NHDOT approved traffic

analysis tool for determining intersection capacity operations. Based on NHDOT guidelines,⁹ HCM 2000 methodologies¹⁰ are preferred for signalized intersections. In addition, HCM 6th edition¹¹ is the NHDOT accepted methodology for unsignalized intersections. Therefore, the HCM 2000 methodologies and procedures have been used to evaluate operations at the NH Route 120, Old Etna Road, and Etna Road signalized intersection and the HCM 6th edition was used for the unsignalized study area intersections.

The analysis results are categorized in terms of Level of Service (LOS), which describes the qualitative intersection operational conditions based on the calculated average delay per vehicle. The criteria for unsignalized intersections are different than for signalized intersections because drivers expect different performance levels from each type of intersection. The relationship between LOS and delay is summarized in Table 3.

Table 3 Level of Service Criteria

LOS	Unsignalized Intersection/ Control Delay (seconds per vehicle) ^a	Signalized Intersection Criteria Average Total Delay (seconds per vehicle)
A	< 10.0	< 10.0
B	10.1 to 15.0	10.1 to 20.0
C	15.1 to 25.0	20.1 to 35.0
D	25.1 to 35.0	35.1 to 55.0
E	35.1 to 50.0	55.1 to 80.0
F	> 50.0	> 80.0

Source: Highway Capacity Manual.

^a LOS F is assigned to a movement if its volume-to-capacity ratio exceeds 1.00 regardless of the control delay.

Queue Length Methodology

The study area intersections were also evaluated with respect to vehicle queuing. For signalized intersections, the quantitative measures of vehicle queue length are defined as the 50th and the 95th percentile queues. The 50th percentile queue represents the average queue length during the peak hour and the 95th percentile queue represents the calculated maximum back of queue that has a probability of 5 percent or less of being exceeded during the peak hour.

For unsignalized intersections, the quantitative measure of vehicle queue length is defined as the 95th percentile queue. The 95th percentile queue represents the percent of time during the peak period being analyzed that the calculated maximum back of queue would be equal to or less than the percentile estimate (i.e., the maximum queue length that would be exceeded only 5 percent of the time). HCM 6th edition methodologies produce queue results in number of

⁹ New Hampshire Department of Transportation Bureau of Traffic. Synchro Inputs Checklist. 16 Aug. 2021.

¹⁰ Transportation Research Board. Highway Capacity Manual 2000. Washington, DC. 16 Jan. 1998.

¹¹ Transportation Research Board. Highway Capacity Manual 6th Edition: A Guide for Multimodal Mobility Analysis. Washington, DC. 2016

vehicles. Therefore, data presented for unsignalized analyses reflect queues in feet based on standard vehicle spacing of 25 feet per vehicle (front bumper to front bumper).¹²

Intersection Operational Results

The capacity and queue length analysis results are summarized in Table 4 for the 2022 Existing traffic volume conditions. To better understand the effects of the peak-month and pandemic adjustments applied to the November traffic counts, separate intersection analyses were conducted for the study area intersections using the traffic counts without any adjustments. These supplemental analyses were evaluated to replicate typical traffic volume conditions as the study area intersections are influenced by the school and Dartmouth Health traffic and may not be impacted by these factors. The computer-generated analysis reports are provided in the Appendix.

Based on the traffic operational comparison between the 2022 Existing traffic volumes and the November 2022 traffic counts without seasonal and pandemic adjustments, the vehicle queues and delays for the latter analysis are more consistent with what were observed in the field and consistent with initial discussions with local officials. Therefore, the traffic volumes used within this traffic study and the associated intersection analyses are considered to be overestimated (i.e., results in longer delays and vehicle queues than may be realized).

The NH Route 120 signalized intersections with the I-89 southbound ramps, I-89 northbound ramps, Heater Road, and Etna Road/Old Etna Road are contained within an adaptive traffic control system (ATCS) in which traffic signal timings change or adapt based on actual traffic demand. To reflect these ATCS operations, the Synchro computer model was programmed with one coordinated phase per National Transportation Communications for Intelligent Transportation System Protocol (NTCIP) and a maximum recall placed on the coordinated phase on the other side of the ring barrier to signify that these phases would be called every cycle (cannot be skipped). For example, the NH Route 120 southbound through phase (Phase 2) at Etna Road and Old Etna Road represents the coordinated phase (Coordinated Maximum) with the NH Route 120 northbound approach set to maximum recall (Phase 6). In addition, the computer model was calibrated to reflect ATCS operations by adjusting the green time for different signal phases based on observed conditions (i.e., balancing the delays and volume-to-capacity [v/c] ratios for the critical movements by adjusting the green time for separate phases).

As shown, the 2022 Existing weekday AM peak hour conditions reflect long delays experienced on the Evans Drive westbound approach to Hanover Street which are common near schools during the student arrival time period. The NH Route 120 signalized intersection with Etna Road and Old Etna Road operates at with long delays (LOS E) during the weekday AM peak hour. During the weekday AM, weekday PM, and Saturday midday peak hours, long delays are experienced on different lane groups (LOS E and F). In addition, long delays (LOS F) are experienced on the NH Route 120 northbound left-turn lane at the unsignalized intersection with Evans Drive during the weekday AM and PM peak hours. Similarly, the Evans Drive minor street movements experience long delays during the weekday AM and PM peak hours due to the heavy demand of conflicting NH Route 120 traffic. Due to operational constraints along the NH Route 120 corridor, NHDOT officials are in the process of evaluating design alternatives as described within the Planned Roadway Improvements section of this Traffic Impact Study.

¹² Institute of Transportation Engineers. Traffic Engineering Handbook, 7th ed. John Wiley & Sons, Inc. Hoboken, NJ. Jan. 2016.

Table 4 Capacity Analysis Summary 2022 Existing Conditions

Intersection/Peak Hour/ Critical Movement or Lane Group	2022 Existing					2022 Existing without Adjustments				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
Hanover Street and Evans Drive										
<i>Weekday AM</i>										
Evans Dr WB Approach	0.98	44.8	E	--	425	0.66	16.1	C	--	130
Hanover St SB Left	0.20	7.8	A	--	18	0.13	7.6	A	--	12
<i>Weekday PM</i>										
Evans Dr WB Approach	0.09	8.8	A	--	8	0.06	8.6	A	--	5
Hanover St SB Left	0.08	7.4	A	--	8	0.06	7.4	A	--	5
<i>Saturday Midday</i>										
Evans Dr WB Approach	0.04	8.5	A	--	2	0.04	8.5	A	--	2
Hanover St SB Left	0.02	7.2	A	--	2	0.01	7.2	A	--	0
Hanover Street and Old Etna Road										
<i>Weekday AM</i>										
Old Etna Rd WB Approach	0.31	11.9	B	--	32	0.19	10.4	B	--	18
Hanover St SB Left	0.00	7.9	A	--	0	0.00	7.7	A	--	0
<i>Weekday PM</i>										
Old Etna Rd WB Approach	0.05	9.4	A	--	2	0.04	9.2	A	--	2
Hanover St SB Left	0.00	7.5	A	--	0	0.00	7.4	A	--	0
<i>Saturday Midday</i>										
Old Etna Rd WB Approach	0.01	8.8	A	--	0	0.01	8.8	A	--	0
Hanover St SB Left ^a	--	--	--	--	--	--	--	--	--	--

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

^a No vehicles were counted on this movement.

Table 4 Capacity Analysis Summary 2022 Existing Conditions (Continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2022 Existing					2022 Existing without Adjustments				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
Hanover Street Extension, Heater Road, and Mount Support Road										
<i>Weekday AM</i>										
Hanover St Extension EB Approach	0.13	12.1	B	--	12	0.08	10.7	A	--	5
Heater Rd NB Left	0.00	7.7	A	--	0	0.00	7.6	A	--	0
<i>Weekday PM</i>										
Hanover St Extension EB Approach	0.04	13.2	B	--	2	0.04	11.6	B	--	2
Heater Rd NB Left	0.00	8.5	A	--	0	0.00	8.1	A	--	0
<i>Saturday Midday</i>										
Hanover St Extension EB Approach	0.02	9.6	A	--	2	0.02	9.4	A	--	0
Heater Rd NB Left	0.00	0.0	A	--	0	0.00	0.0	A	--	0

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

Table 4 Capacity Analysis Summary 2022 Existing Conditions (Continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2022 Existing					2022 Existing without Adjustments				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
Old Etna Road and Heater Road										
<i>Weekday AM</i>										
Old Etna Rd EB Approach	0.41	12.9	B	--	50	0.24	9.3	A	--	22
Old Etna Rd WB Approach	0.36	12.5	B	--	40	0.21	9.5	A	--	20
Heater Rd NB Approach	0.55	15.6	C	--	82	0.32	10.3	B	--	35
Heater Rd SB Approach	0.38	12.9	B	--	45	0.22	9.6	A	--	20
<i>Weekday PM</i>										
Old Etna Rd EB Approach	0.22	10.4	B	--	20	0.14	8.8	A	--	12
Old Etna Rd WB Approach	0.29	11.6	B	--	30	0.18	9.6	A	--	15
Heater Rd NB Approach	0.40	12.0	B	--	48	0.26	9.4	A	--	25
Heater Rd SB Approach	0.63	17.0	C	--	112	0.42	11.2	B	--	50
<i>Saturday Midday</i>										
Old Etna Rd EB Approach	0.03	7.3	A	--	2	0.03	7.3	A	--	2
Old Etna Rd WB Approach	0.11	8.0	A	--	10	0.09	7.8	A	--	8
Heater Rd NB Approach	0.12	7.6	A	--	10	0.11	7.5	A	--	10
Heater Rd SB Approach	0.10	7.7	A	--	8	0.08	7.6	A	--	8

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

Table 4 Capacity Analysis Summary 2022 Existing Conditions (Continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2022 Existing					2022 Existing without Adjustments				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
NH Route 120, Old Etna Road, and Etna Road										
<i>Weekday AM</i>										
Old Etna Rd EB Left	0.90	>100.0	F	95	169	0.67	76.3	E	64	102
Old Etna Rd EB Through/Right	0.95	>100.0	F	95	180	0.56	67.8	E	48	90
Etna Rd WB Left	0.86	>100.0	F	106	224	0.67	75.7	E	69	133
Etna Rd WB Left/Through/Right	0.90	>100.0	F	112	247	0.66	75.1	E	70	137
Etna Rd WB Right	0.05	47.7	D	0	43	0.03	50.1	D	0	12
NH Route 120 NB Left	0.62	74.6	E	47	88	0.45	66.9	E	31	65
NH Route 120 NB Through	1.11	83.5	F	1,370	1,380	0.73	18.0	B	538	595
NH Route 120 NB Right	0.22	7.1	A	3	12	0.15	6.0	A	0	8
NB Route 120 SB Left	0.59	70.0	E	52	97	0.51	67.6	E	37	74
NH Route 120 SB Through/Right	0.36	12.4	B	173	202	0.24	9.9	A	103	130
Overall Intersection	1.04	66.9	E	--	--	0.71	23.2	C	--	--

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

Table 4 Capacity Analysis Summary 2022 Existing Conditions (Continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2022 Existing					2022 Existing without Adjustments				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
NH Route 120, Old Etna Road, and Etna Road										
<i>Weekday PM</i>										
Old Etna Rd EB Left	0.44	64.5	E	43	78	0.37	64.8	E	32	63
Old Etna Rd EB Through/Right	0.36	64.0	E	29	76	0.30	64.3	E	21	64
Etna Rd WB Left	0.74	71.0	E	144	207	0.68	68.7	E	109	164
Etna Rd WB Left/Through/Right	0.77	75.0	E	151	218	0.70	71.3	E	113	171
Etna Rd WB Right	0.03	42.8	D	0	17	0.03	45.8	D	0	9
NH Route 120 NB Left	0.46	71.3	E	14	40	0.33	70.0	E	10	32
NH Route 120 NB Through	0.36	15.5	B	186	282	0.25	12.1	B	115	188
NH Route 120 NB Right	0.08	6.1	A	0	10	0.06	5.5	A	0	8
NB Route 120 SB Left	0.60	71.4	E	51	98	0.48	66.5	E	37	76
NH Route 120 SB Through/Right	0.85	25.5	C	554	1,098	0.60	15.1	B	283	564
Overall Intersection	0.82	29.9	C	--	--	0.61	23.0	C	--	--

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

Table 4 Capacity Analysis Summary 2022 Existing Conditions (Continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2022 Existing					2022 Existing without Adjustments				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
NH Route 120, Old Etna Road, and Etna Road										
<i>Saturday Midday</i>										
Old Etna Rd EB Left	0.30	66.5	E	18	38	0.27	67.9	E	12	29
Old Etna Rd EB Through/Right	0.13	65.4	E	6	29	0.16	67.2	E	6	27
Etna Rd WB Left	0.51	64.9	E	51	96	0.46	64.8	E	42	84
Etna Rd WB Left/Through/Right	0.53	65.9	E	52	100	0.47	64.9	E	43	86
Etna Rd WB Right	0.02	50.5	D	0	0	0.01	51.4	D	0	0
NH Route 120 NB Left	0.33	70.0	E	10	32	0.40	75.3	E	5	21
NH Route 120 NB Through	0.23	8.6	A	98	154	0.19	7.4	A	76	120
NH Route 120 NB Right	0.06	4.6	A	0	7	0.04	4.2	A	0	6
NB Route 120 SB Left	0.41	66.6	E	28	62	0.36	66.5	E	23	56
NH Route 120 SB Through/Right	0.20	7.3	A	58	130	0.16	5.8	A	45	101
Overall Intersection	0.27	16.9	B	--	--	0.22	15.4	B	--	--

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

Table 4 Capacity Analysis Summary 2022 Existing Conditions (Continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2022 Existing					2022 Existing without Adjustments				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
NH Route 120 and Evans Drive										
<i>Weekday AM</i>										
NH Route 120 NB Left	1.01	68.3	F	--	358	0.24	8.0	A	--	22
Evans Dr EB Left ^a	--	--	--	--	--	--	--	--	--	--
Evans Dr EB Right	0.74	34.3	D	--	148	0.20	9.3	A	--	18
<i>Weekday PM</i>										
NH Route 120 NB Left	0.68	79.5	F	--	92	0.26	24.5	C	--	25
Evans Dr EB Left	> 1.20	> 100.0	F	--	45	0.42	> 100.0	F	--	28
Evans Dr EB Right	> 1.20	> 100.0	F	--	278	0.58	41.5	E	--	80
<i>Saturday Midday</i>										
NH Route 120 NB Left	0.04	9.5	A	--	2	0.03	9.0	A	--	2
Evans Dr EB Left	0.04	28.4	D	--	2	0.02	21.5	C	--	2
Evans Dr EB Right	0.06	11.3	B	--	5	0.04	10.6	B	--	2

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

^a No vehicles were counted on this movement.



3

Future Conditions

The impact of site-generated traffic within the study area has been evaluated under two design horizons: 2025 and 2035 traffic volume conditions. Traffic volumes on the roadway network would include existing traffic, new traffic due to normal traffic growth, and traffic related to significant development by others that are expected to be completed within the design horizons. The 2025 design horizon represents opening conditions for the proposed development that can determine the project's traffic impacts, whereas the opening year conditions plus 10 years (2035) is typically used for planning purposes. Consideration of these factors resulted in the development of 2025 and 2035 No-Build traffic volumes, which assume the proposed project is not built. The incremental impacts of the proposed development may then be determined by adding site-generated traffic volumes (Build conditions) and making comparisons to the baseline (No-Build) conditions.

No-Build Conditions

Traffic growth is a function of the expected land development in a region. To predict a rate at which traffic can be expected to grow during the forecast periods, both historical growth and planned areas developments were examined.

Historical Growth

An annual average traffic-growth percentage was determined based on NHDOT historical traffic volume data. A review of NHDOT permanent count station along NH Route 120 in Lebanon

revealed that traffic volumes experienced an annual increase of 0.07 percent between 2009 and 2019.¹³ Consistent with NHDOT preference, a minimum of a 1.00 percent compounded annual growth rate was used to account for general population growth and traffic generated by smaller area developments. The 1.0 compounded annual growth rate was applied to the traffic volumes along the NH Route 120 corridor and not along the local roadway system as these movements are projected to be impacted by specific land development projects and not by general population growth. The NHDOT permanent count station data are provided in the Appendix.

Background Developments

Traffic to be generated by planned developments anticipated to add substantial traffic volumes through the study area were considered in projecting future traffic volumes. Based on discussions with City of Lebanon Planning & Development staff, the following projects were identified:

- › The Dartmouth Health patient tower expansion project.
 - A new patient tower will be constructed to support 233,500 square feet of gross floor area and 128 beds on four levels. These site trips were obtained from the traffic study prepared for that project.¹⁴
- › Mount Support Road residential developments.
 - The Marek at Lebanon, NH is a 250-unit multifamily development to be constructed at 343 Mount Support Road in Lebanon. These site trips were obtained from the traffic study prepared for that project.¹⁵
 - A 309-unit multifamily residential development to be constructed at 401 Mount Support Road in Lebanon. At the time of the November 2022 traffic counts collected as part of the Lebanon Brickyard residential development, approximately 96 percent of the units were occupied.¹⁶ Based on the trip-generation methodologies provided within that traffic study,¹⁷ the remaining 4 percent of the residential units represent between 4 and 6 vehicles per hour during the weekday AM, weekday PM, and Saturday midday peak hours. Therefore, these minimal trips were considered to be accounted for within the 1.0 percent annual growth rate.
 - A 202-apartment unit development to be constructed at 402 Mount Support Road in Lebanon. These site trips were obtained from the traffic study prepared for that project.¹⁸
- › Redevelopment of Village Marketplace.
 - The redevelopment of the Village Marketplace site at 2 Mascoma Street in Lebanon is to include 152 residential dwelling units. Based on a review of the traffic study¹⁹ prepared for that project, the site trips were determined to be accounted for within the 1.0 percent annual growth rate.

¹³ Ibid. 5.

¹⁴ VHB. Traffic Impact and Access Study. Dartmouth Hitchcock Medical Center Expansion, Lebanon, NH. Dec. 2019.

¹⁵ VHB. Traffic Impact Assessment. The Marek at Lebanon, NH: 343 Mount Support Road, Lebanon, New Hampshire. 28 Feb. 2020.

¹⁶ 611 of the 638 bedrooms (~96%) were occupied in November 2022.

¹⁷ VHB. Traffic Impact Assessment. Proposed Multi-Family Housing Development: 401 Mount Support Road, Lebanon, NH. 7 Feb. 2020.

¹⁸ VHB. Traffic Impact Assessment. Proposed Apartment Development: 402 Mount Support Road, Lebanon, NH. 27 Apr. 2020.

¹⁹ Wall Consultant Group. Village Marketplace Redevelopment – Transportation Review, Lebanon, NH. 22 Apr. 2022.

- › Lebanon Woolen Mill residential development.
 - The development consists of replacing a commercial laundry facility, a dry-cleaning plant and retail facility, and an apartment building with 196 apartment units at 1 Foundry Street in Lebanon. Based on a review of the traffic study²⁰ prepared for that project, the site trips were determined to be accounted for within the 1.0 percent annual growth rate.
- › Starbucks restaurant.
 - A Starbucks restaurant with a drive-through window is to be located within Centerra Market Place located off Centerra Parkway in Lebanon. Based on a review of the traffic study²¹ prepared for that project, the site trips were determined to be accounted for within the 1.0 percent annual growth rate.

Planned Roadway Improvements

NHDOT officials are developing improvements along the NH Route 120 corridor between Hanover Street (to the south) and Old Etna Road/Etna Road (to the north). This project (Lebanon 29612) is intended to improve operations, progression, and safety along the corridor that includes the I-89 interchange at Exit 18. During the December 1, 2023 meeting with City of Lebanon, NHDOT, and UVLSRPC officials, NHDOT engineers stated that a preferred alternative has not been determined. Therefore, the proposed geometry identified in Alternative 1 presented at the November 16, 2022 Project Advisory Committee meeting was recommended to be considered to be in place under the 2035 No-Build conditions for the purposes of this Traffic Impact Study. These improvements are subject to change as part of further evaluation and design for the NHDOT roadway project. Within the study area, these improvements consist of the following:

- › NH Route 120 and Evans Drive:
 - Widen the NH Route 120 northbound approach to provide an exclusive left-turn lane and three through lanes (i.e., an additional through lane).
 - Widen the NH Route 120 southbound approach to provide two through lanes and a shared through/right-turn lane (i.e., an additional through lane).
 - Restrict left turns from the Evans Drive westbound approach (i.e., right turns only onto NH Route 120 southbound).
- › NH Route 120, Old Etna Road, and Etna Road:
 - Widen the Old Etna Road eastbound approach to provide an exclusive left-turn lane, two through lanes, and an exclusive right-turn lane (i.e., added an additional through lane and an exclusive right-turn lane).
 - Widen the Etna Road westbound approach to provide two left-turn lanes, a through lane, and an exclusive right-turn lane (i.e., added an additional left-turn lane)

While these improvements are anticipated to improve transportation operations, mobility, and safety along the corridor, an indirect result may be the redistribution of vehicles currently traveling along the Mount Support Road/ Heater Road corridor that avoid the NH Route 120 corridor may change their travel route onto the major highway system. For the purposes of this

²⁰ Wall Consultant Group. Lebanon Woolen Mill Transportation Study, Lebanon, NH. 10 Aug. 2022.

²¹ Vanasse & Associates, Inc. Transportation Impact Assessment. Proposed Starbucks Restaurant, Lebanon, NH. Oct. 2022.

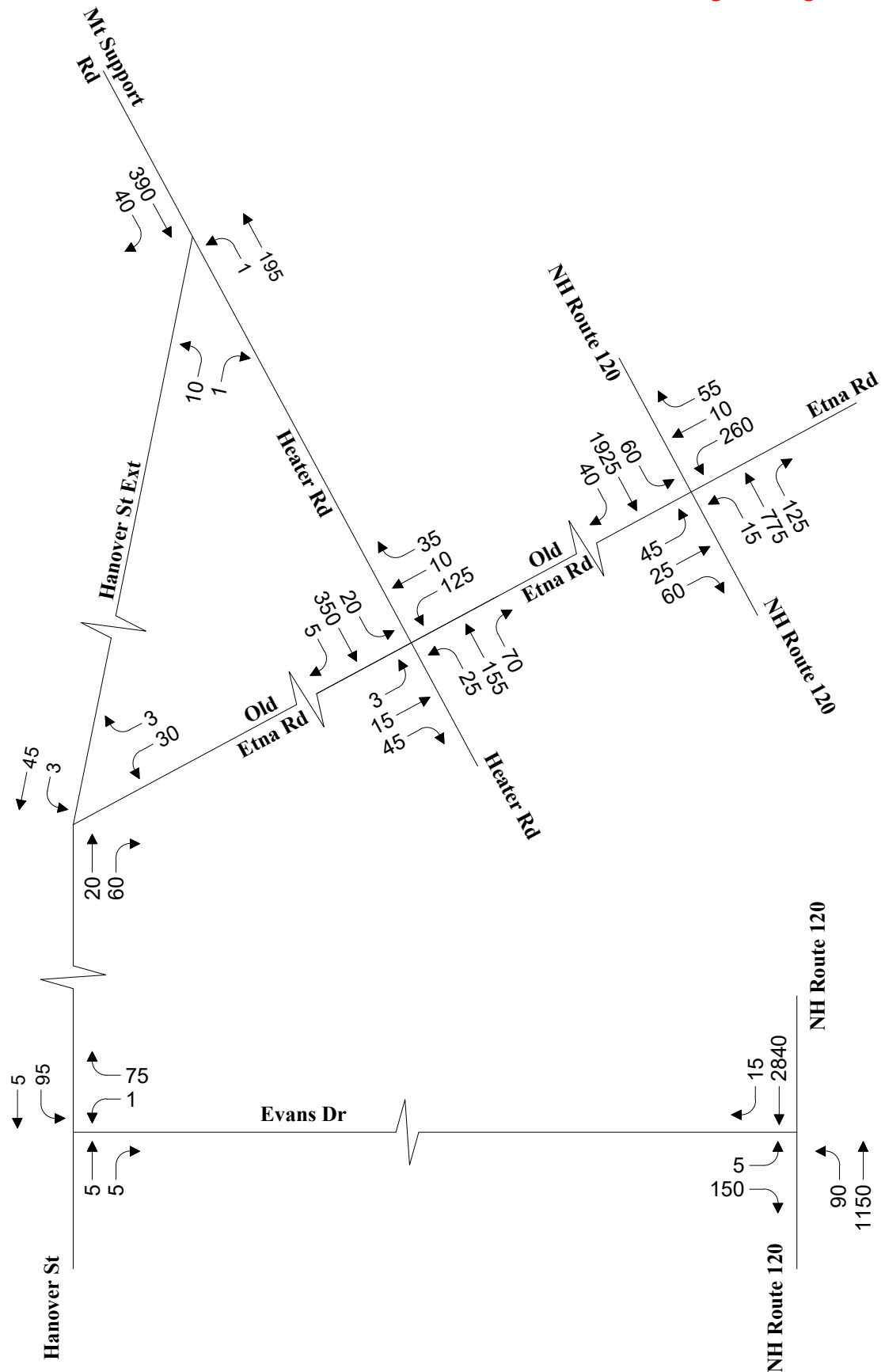
Traffic Impact Study, no vehicles were redistributed from the local corridor onto the state highway system with the NH Route 120 improvements in place.

No-Build Traffic Volumes

The 2025 No-Build peak hour traffic volumes were accordingly developed by applying a 1.0 percent compounded annual traffic growth rate (or 3.0 percent over 3 years) to the 2022 Existing volumes and adding the vehicle trips associated with the Dartmouth Health patient tower expansion project and two residential developments along Mount Support Road. The 2025 No-Build traffic volumes are shown graphically for the study area intersections on Figures 5, 6, and 7 for the weekday AM, weekday PM, and Saturday midday peak hours, respectively.

The 2035 No-Build peak-hour traffic volumes were accordingly developed by applying a 1.0 percent compounded annual traffic growth rate (or 13.8 percent over 13 years) to the 2022 Existing volumes and adding the vehicle trips associated with the Dartmouth Health patient tower expansion project and two residential developments along Mount Support Road. In addition, the NHDOT Alternative 1 improvements being considered as part of the NH Route 120 corridor project were evaluated to be in place. The 2035 No-Build traffic volumes are shown graphically for the study area intersections on Figures 8, 9, and 10 for the weekday AM, weekday PM, and Saturday midday peak hours, respectively.



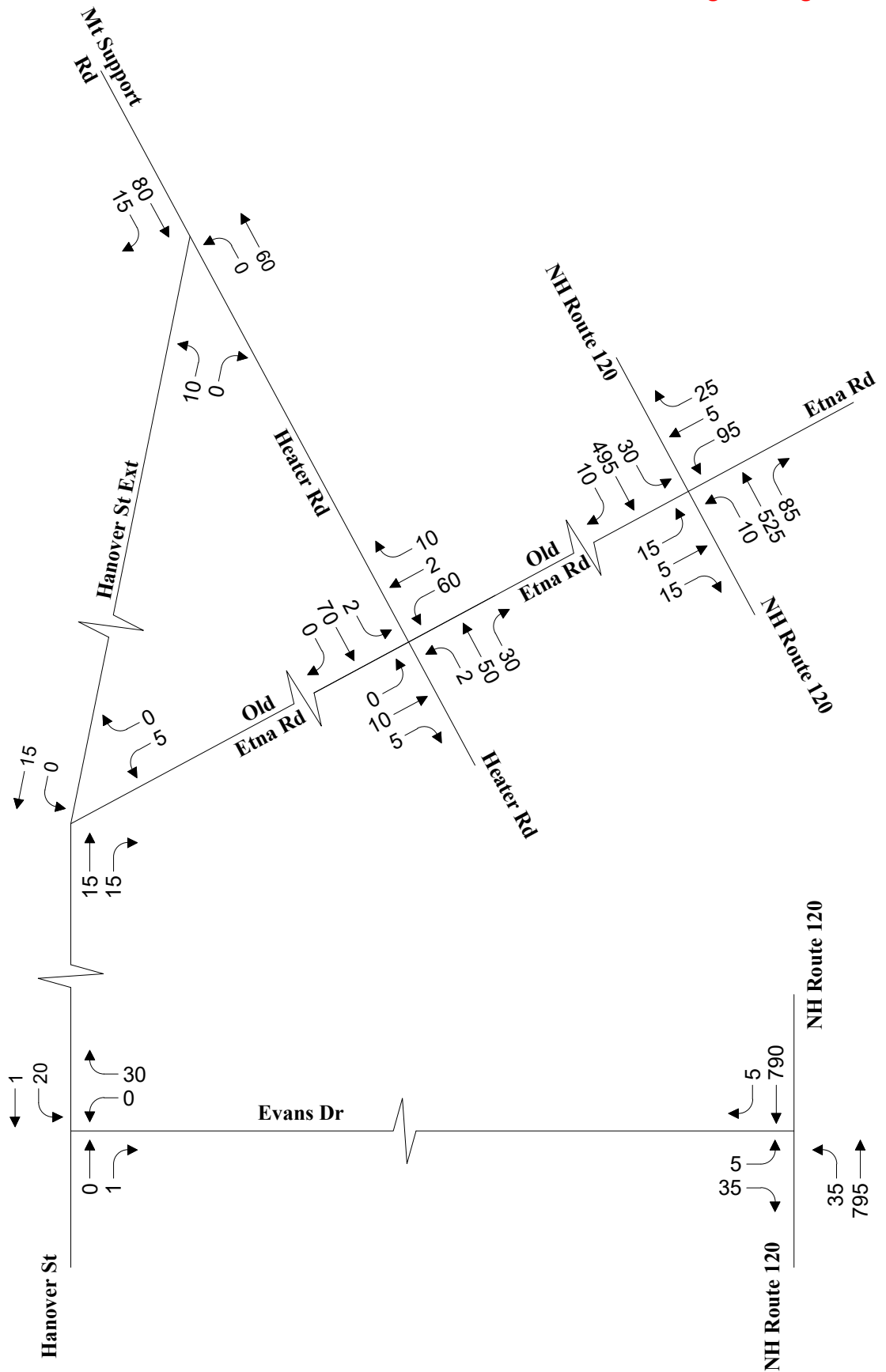


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2025 No-Build Weekday Evening Peak Hour Traffic Volumes

Figure 6

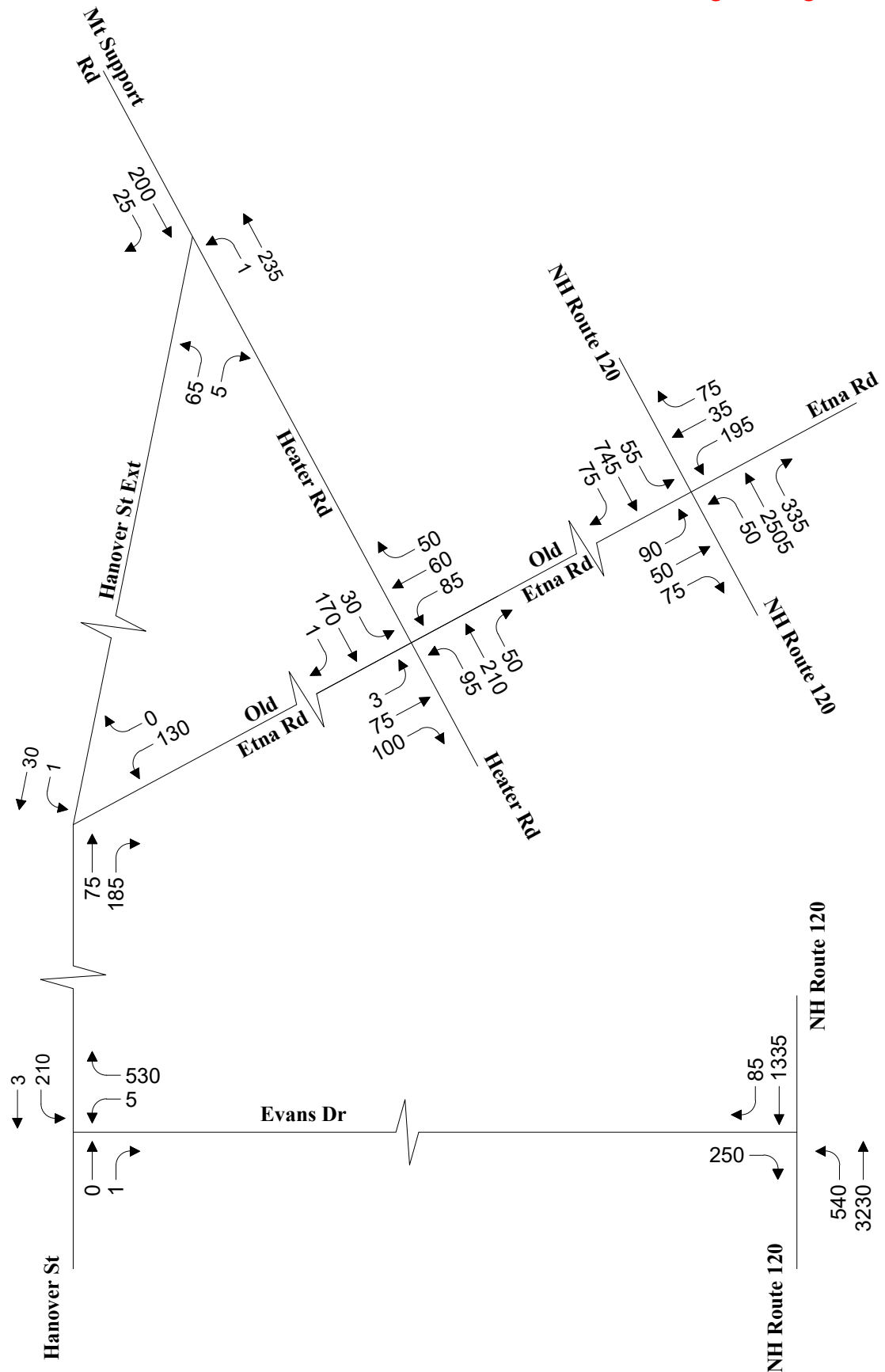


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2025 No-Build Saturday Midday
Peak Hour Traffic Volumes

Figure 7

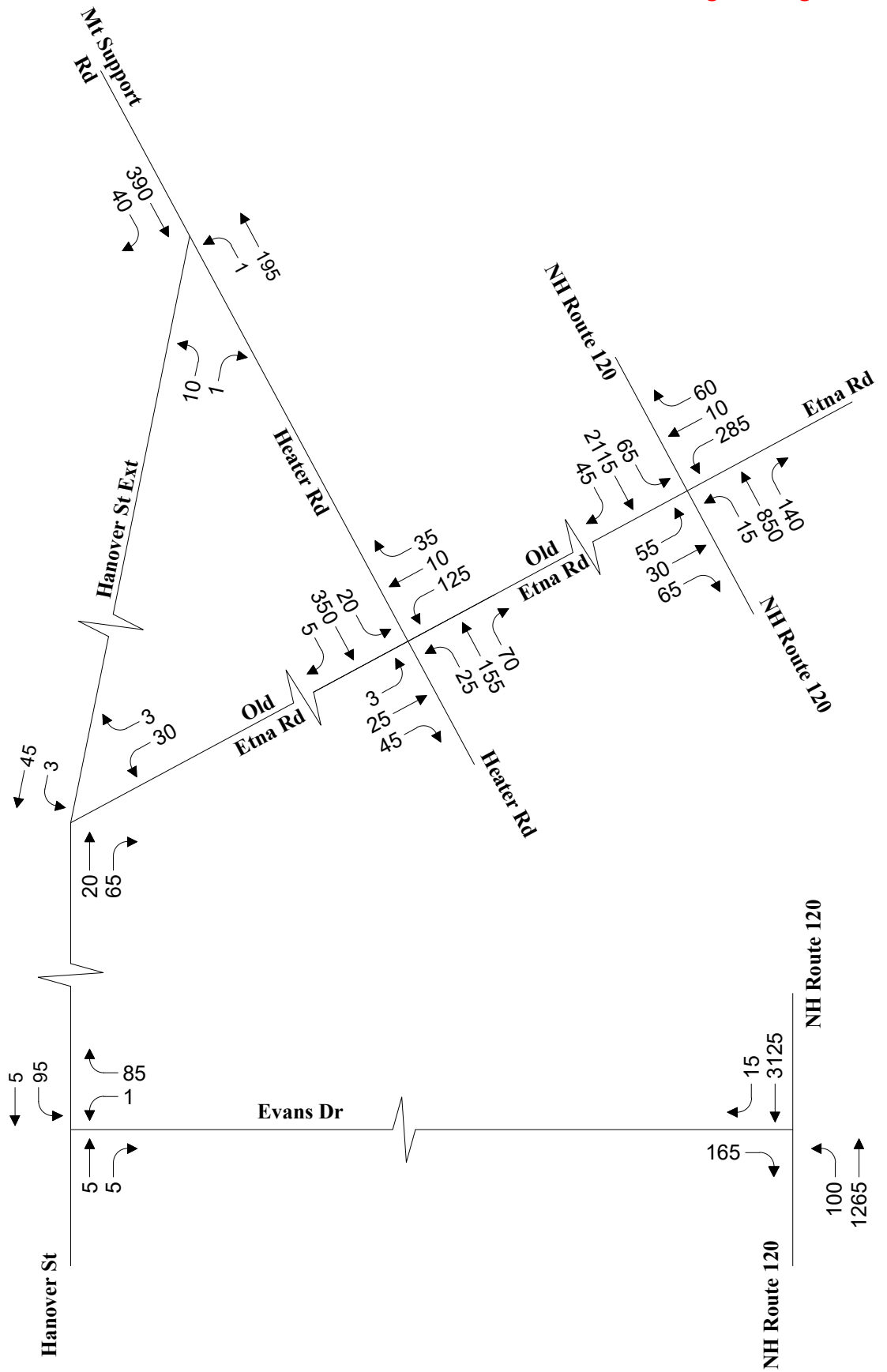


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2035 No-Build Weekday Morning
Peak Hour Traffic Volumes

Figure 8



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Not to Scale



2035 No-Build Weekday Evening
Peak Hour Traffic Volumes

Figure 9



Build Conditions

The proposed development program consists of constructing 474 apartment units in 10 four-story buildings and replacing the residence at 238 Hanover Street with a structure to contain a single-family residence for the property manager of the Lebanon Brickyard development. The property manager is anticipated to remain on-site during the weekday AM, weekday PM, and Saturday midday peak hours and would thus not be expected to generate site trips during these time periods. Access is proposed via two full access driveways along Hanover Street. The northern driveway will be located to the north of Old Etna Road and create a three-legged unsignalized intersection with single travel lanes on the Hanover Street northbound, Hanover Street southbound, and site driveway eastbound approaches. The southern driveway will be located across from Evans Drive to form a standard four-way intersection with single travel lanes on the Hanover Street northbound, Hanover Street southbound, Evans Drive westbound, and site driveway eastbound approaches.

Sight Distance

As proposed, full access driveways will be constructed along the west side of Hanover Street north of Old Etna Road (north site driveway) and across from Evans Drive (south site driveway). Sight distances have been evaluated at the proposed site driveway locations to determine if the available sightlines for vehicles exiting the site meet or exceed the minimum distances required for approaching vehicles to safely stop. The available sight distances were compared with minimum requirements, as established by the American Association of State Highway and Transportation Officials (AASHTO).²² AASHTO is the national standard by which vehicle sight distance is calculated, measured, and reported.

Sight distance is the length of roadway ahead visible to the driver. The Stopping Sight Distance (SSD) is the minimum distance required for a vehicle traveling at a certain speed to safely stop before reaching a stationary object in its path. The Intersection Sight Distance (ISD) is provided on minor street approaches to allow the drivers of stopped vehicles a sufficient view of the major roadway to decide when to enter the major roadway. In accordance with the AASHTO manual, the ISD must be equal to or greater than the minimum required SSD in order to provide safe operations at an intersection to anticipate and avoid collisions.²³ The available SSD and ISD at the proposed site driveway locations were measured and compared to minimum requirements as established by AASHTO. The required minimum sight distances for each speed are shown in Table 5.

As indicated in Table 5, available sight distances to the north and south of the proposed site driveways exceed the AASHTO SSD and ISD minimum requirements. To encourage safe and efficient flow of traffic to and from the site, proposed plantings, vegetation, landscaping, and signing along the site frontage and at the site driveway are recommended to be kept low to the ground or set back sufficiently from the edge of the roadways so as not to inhibit the available sightlines.

²² American Association of State Highway and Transportation Officials. A Policy on Geometric Design of Highways and Streets, 7th ed. Washington, D.C. 2018.

²³ AASHTO, page 9-35.

Table 5 Sight Distance Summary

Location/Condition	Stopping Sight Distance (feet)		Intersection Sight Distance (feet)	
	To/From North	To/From South	To/From North	To/From South
Hanover St North Site Driveway				
Measured	>300	>300	>300	>300
Minimum Required ^a	155	155	155	155
Hanover St South Site Driveway				
Measured	>300	>300	>300	>300
Minimum Required ^a	155	155	155	155

^a Minimum required SSD values based on the posted speed limit (25 mph) and minimum required ISD values are consistent with SSD values. Based on AASHTO Table 9-7.

Trip Generation

To estimate the volume of traffic to be generated by the proposed project, trip rates published in the Institute of Transportation Engineers (ITE) Trip Generation Manual²⁴ were researched for Land Use Code 221 (Multifamily Housing [Mid-Rise]). The property manager is anticipated to remain on-site during the weekday AM, weekday PM, and Saturday midday peak hours and would thus not be expected to generate site trips during these time periods. A summary of the ITE trip-generation data is provided in Table 6 with the trip-generation calculations provided in the Appendix.

Table 6 Trip-Generation Summary

Peak Hour/Direction	Site Trips ^a
Weekday AM Peak Hour	
Enter	45
Exit	152
Total	197
Weekday PM Peak Hour	
Enter	113
Exit	72
Total	185
Saturday Midday Peak Hour	
Enter	98
Exit	93
Total	191

^a ITE Land Use Code 221 (Multifamily Housing [Mid-Rise]) for 474 dwelling units.

As shown, the proposed development is projected to generate 197 trips (45 entering and 152 exiting) during the weekday AM peak hour, 185 trips (113 entering and 72 exiting) during

²⁴ Institute of Transportation Engineers. Trip Generation Manual, 11th ed. Washington, DC, Sept. 2021.

the weekday PM peak hour, and 191 trips (97 entering and 93 exiting) during the Saturday midday peak hour. Since the development is estimated to generate more than 100 vehicle trips per hour, Article V Section 5.1.G.2 of the City of Lebanon's Site Plan Review Regulations requires the preparation of a Traffic Impact Study.

Build Traffic Volumes

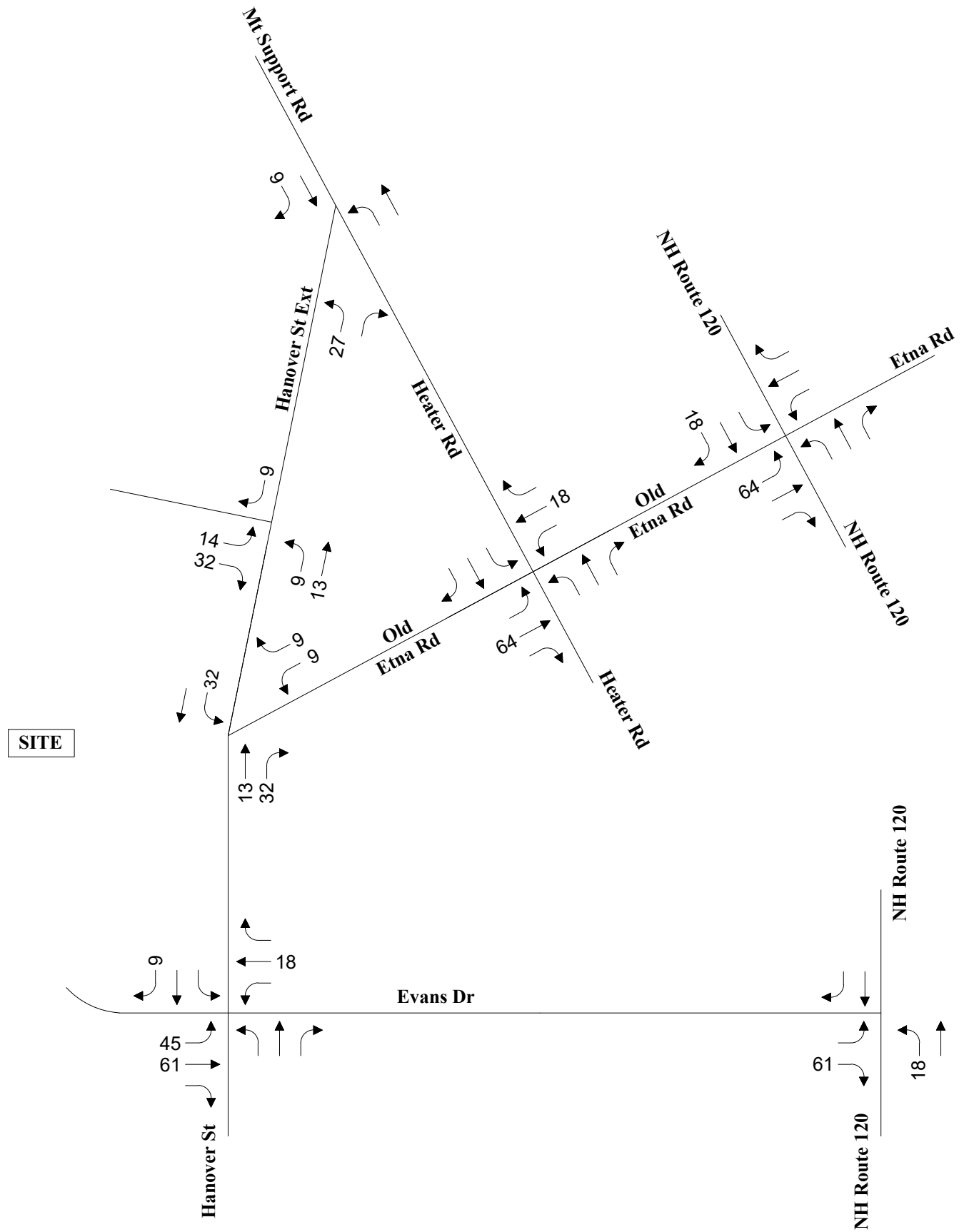
The directional distribution of the site generated traffic was approximated based on United States Census Bureau data for the City of Lebanon and existing traffic flow patterns within the study area. A summary of the distribution data is provided in the Appendix. Based on the traffic-generation and distribution estimates for the proposed residential development, the site trips were assigned to the adjacent roadway network. The project-generated traffic volumes are shown in Figures 11 through 13.

The project-generated traffic volumes were combined with the No-Build traffic volumes to develop the Build peak-hour traffic-volume networks. The 2025 Build weekday AM, weekday PM, and Saturday midday peak hour traffic volumes are illustrated in Figures 14, 15, and 16, respectively. The 2035 Build weekday AM, weekday PM, and Saturday midday peak hour traffic volumes are illustrated on Figures 17, 18, and 19, respectively.

In accordance with ITE methodologies²⁵ and NHDOT guidance,²⁶ a development estimated to generate 100 vehicles per hour or more through an intersection (total of entering and exiting trips) may result in a change in vehicular operations (i.e., noticeably drop level of service or increase v/c ratios). In general, traffic increases less than this threshold could be attributed to the fluctuation of vehicles due to driver patterns that occur during the day, on different days of the week, or different months of the year. Based on standard traffic engineering practice and methodologies, Figures 11 through 13 show that the proposed development is projected to meet this threshold only at the proposed Hanover Street southern site driveway during the peak hours (119-133 vehicles per hour). Accordingly, improvements have been evaluated and are proposed at the Hanover Street, Evans Drive, and southern site driveway intersection within the Improvements section of this Traffic Impact Study.

²⁵ ITE Recommended Practice: Multimodal Transportation Impact Analysis for Site Development. Washington, DC: Institute of Transportation Engineers. 2023.

²⁶ Bollinger, Robert E. Inter-Department Communication. New Hampshire Department of Transportation, Bureau of Traffic. 17 Feb. 2010.

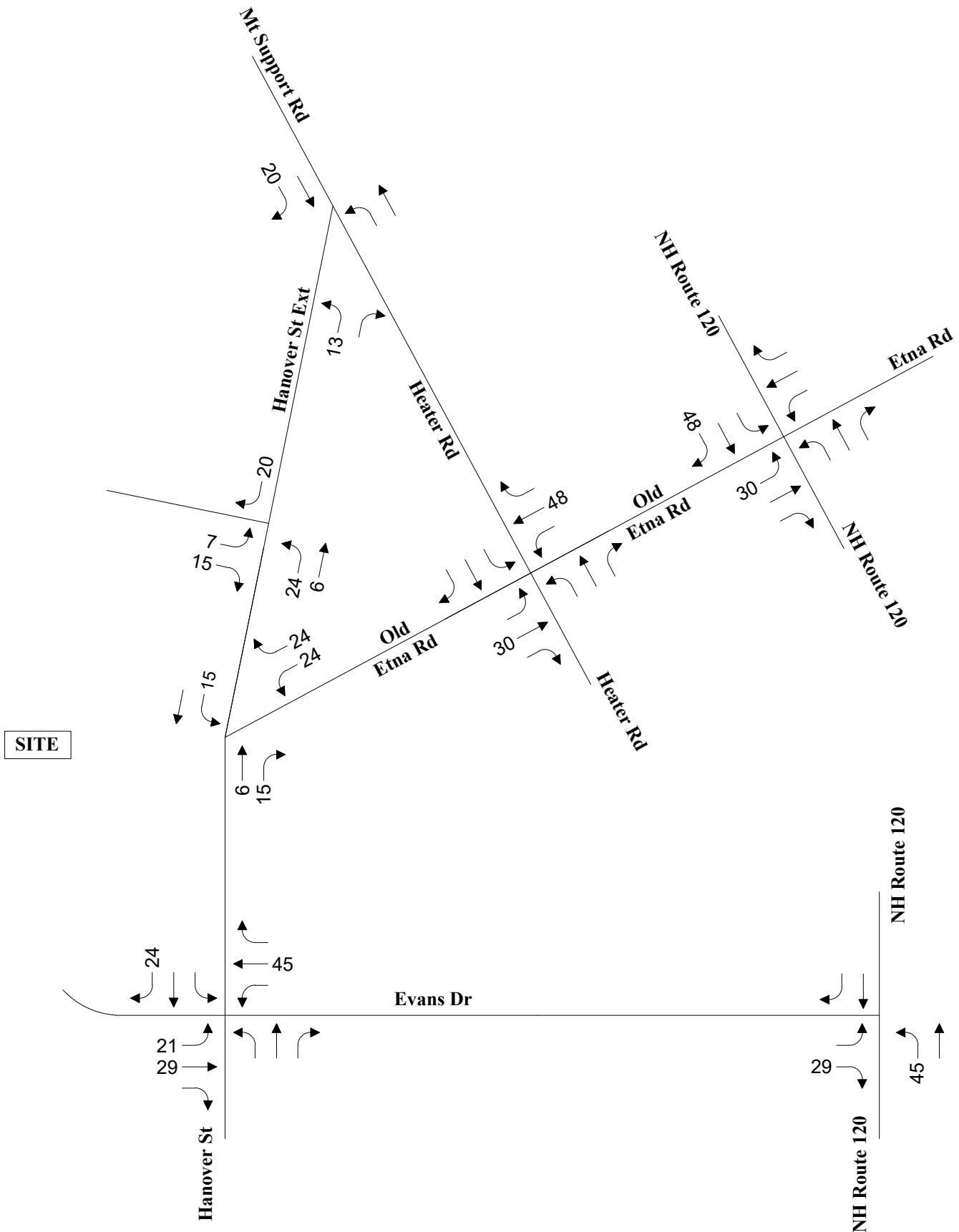


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Site Trips Weekday Morning
Peak Hour Traffic Volumes

Figure 11

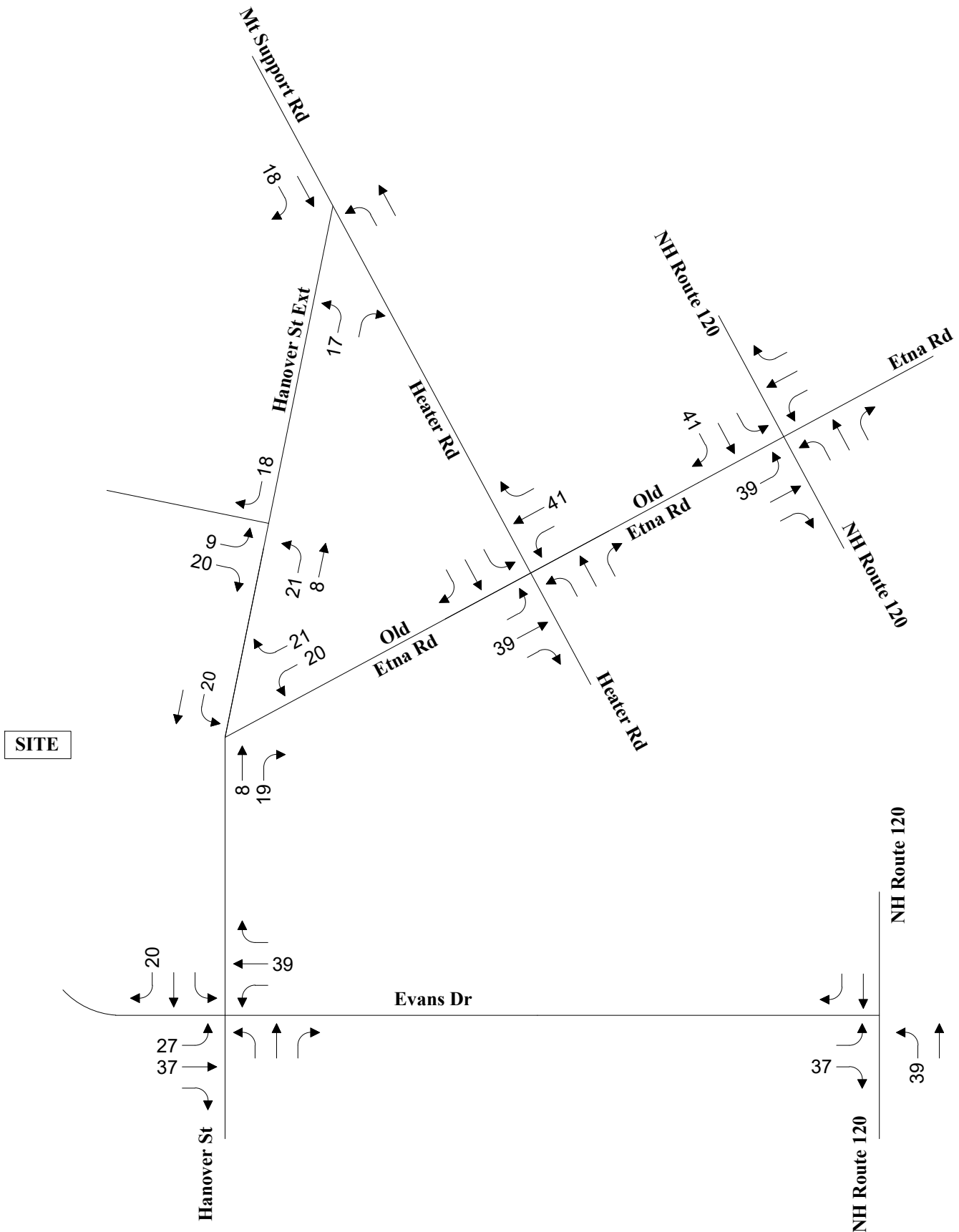


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Site Trips Weekday Evening
Peak Hour Traffic Volumes

Figure 12

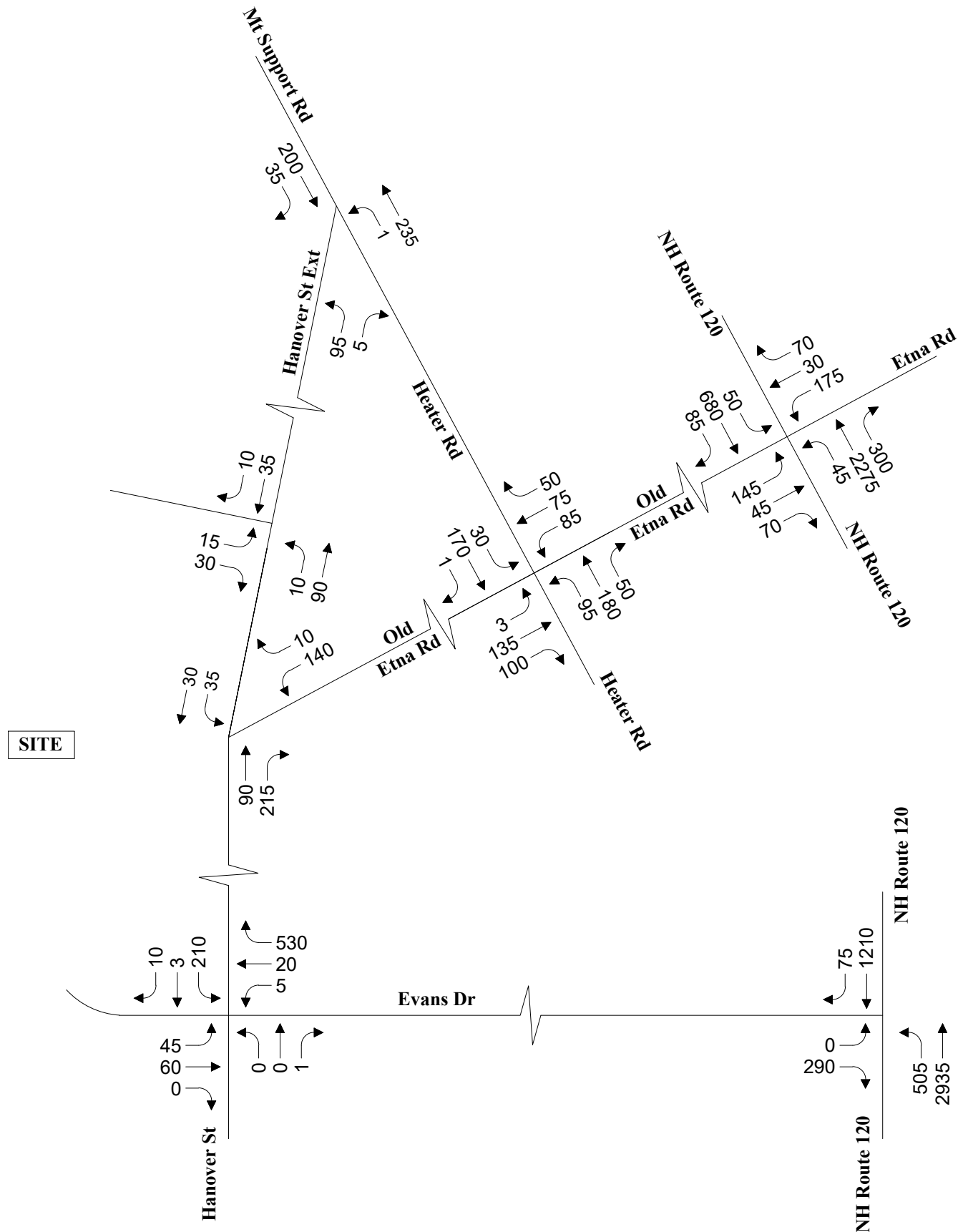


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Site Trips Saturday Midday
Peak Hour Traffic Volumes

Figure 13

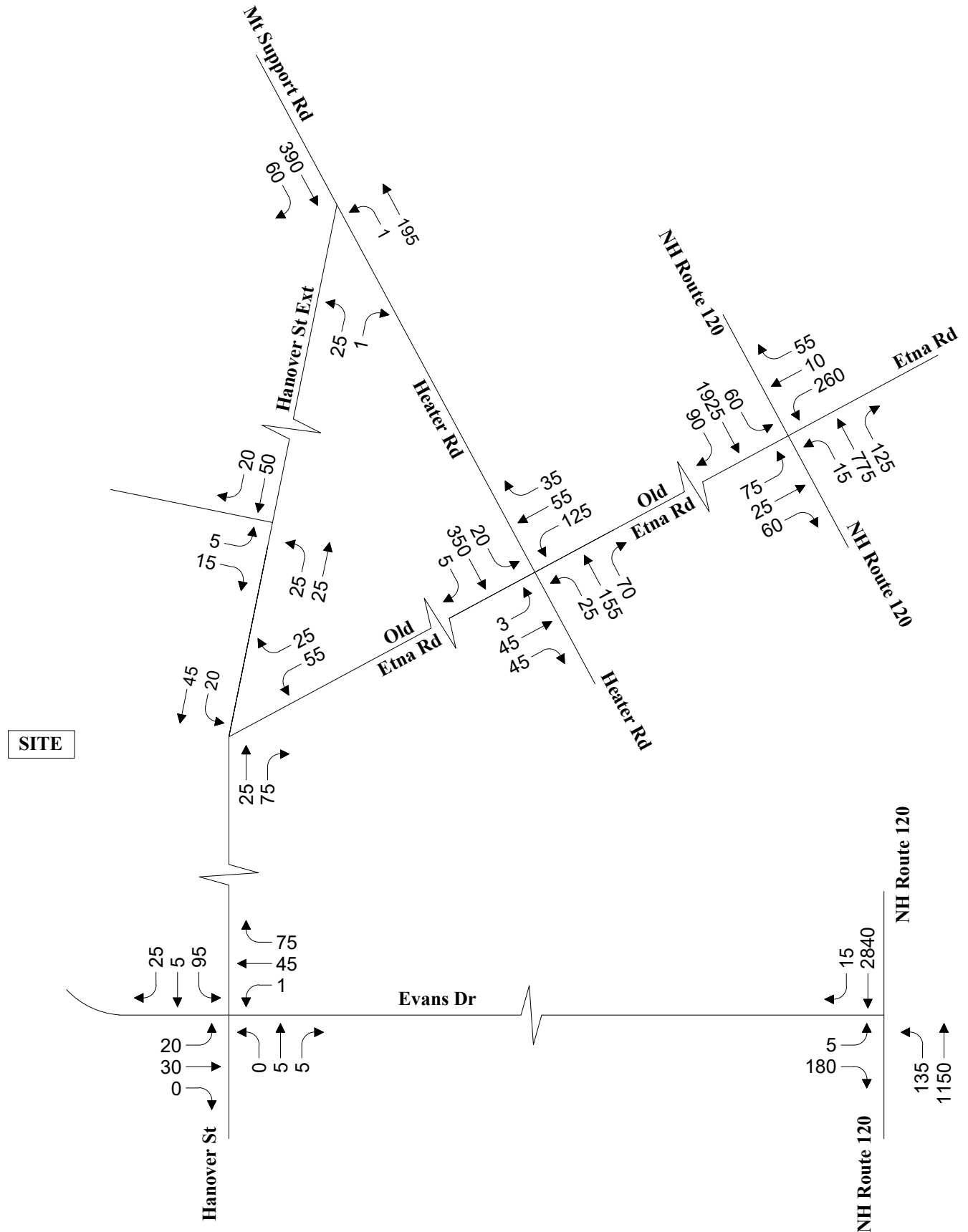


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2025 Build Weekday Morning Peak Hour Traffic Volumes

Figure 14

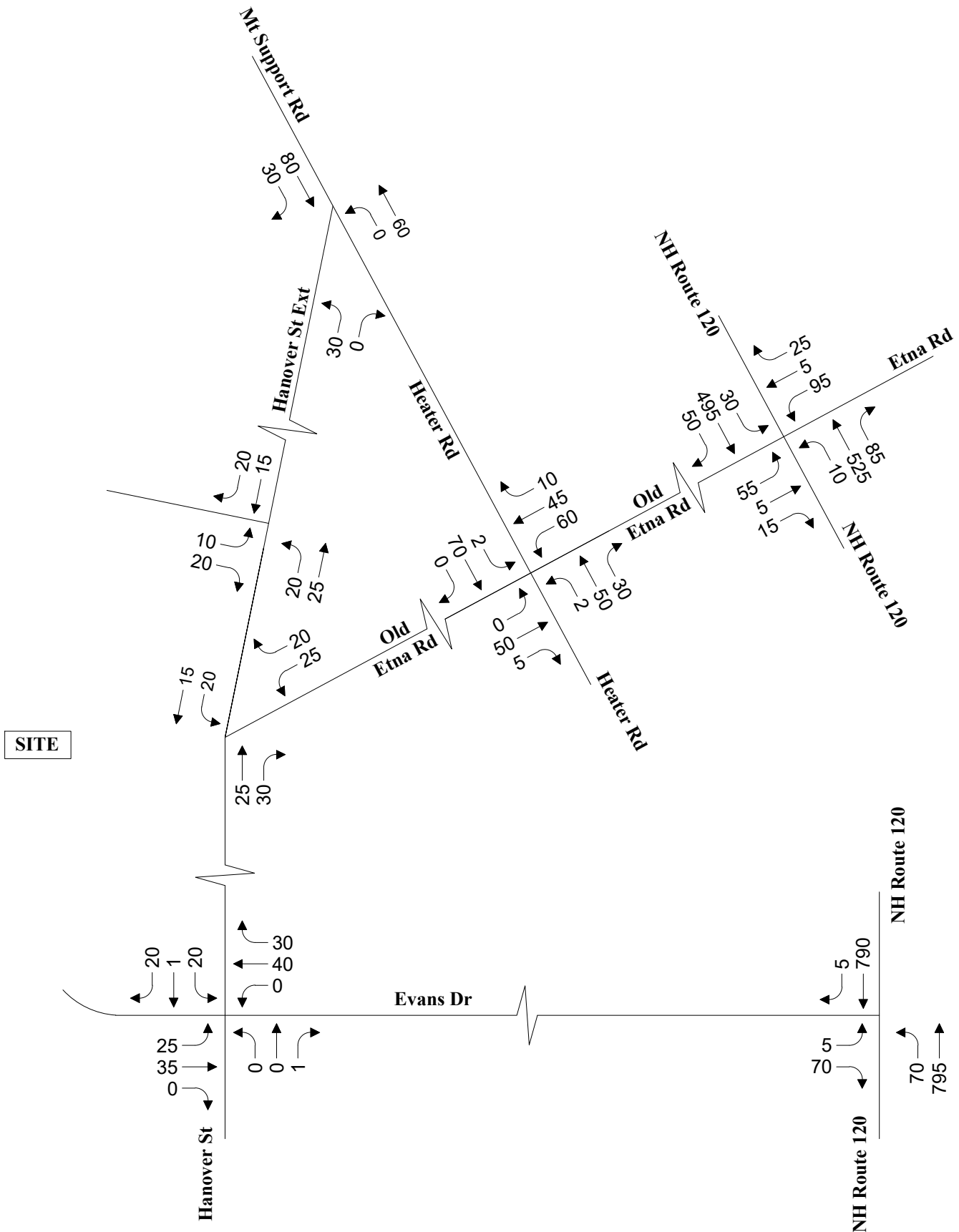


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2025 Build Weekday Evening
Peak Hour Traffic Volumes

Figure 15

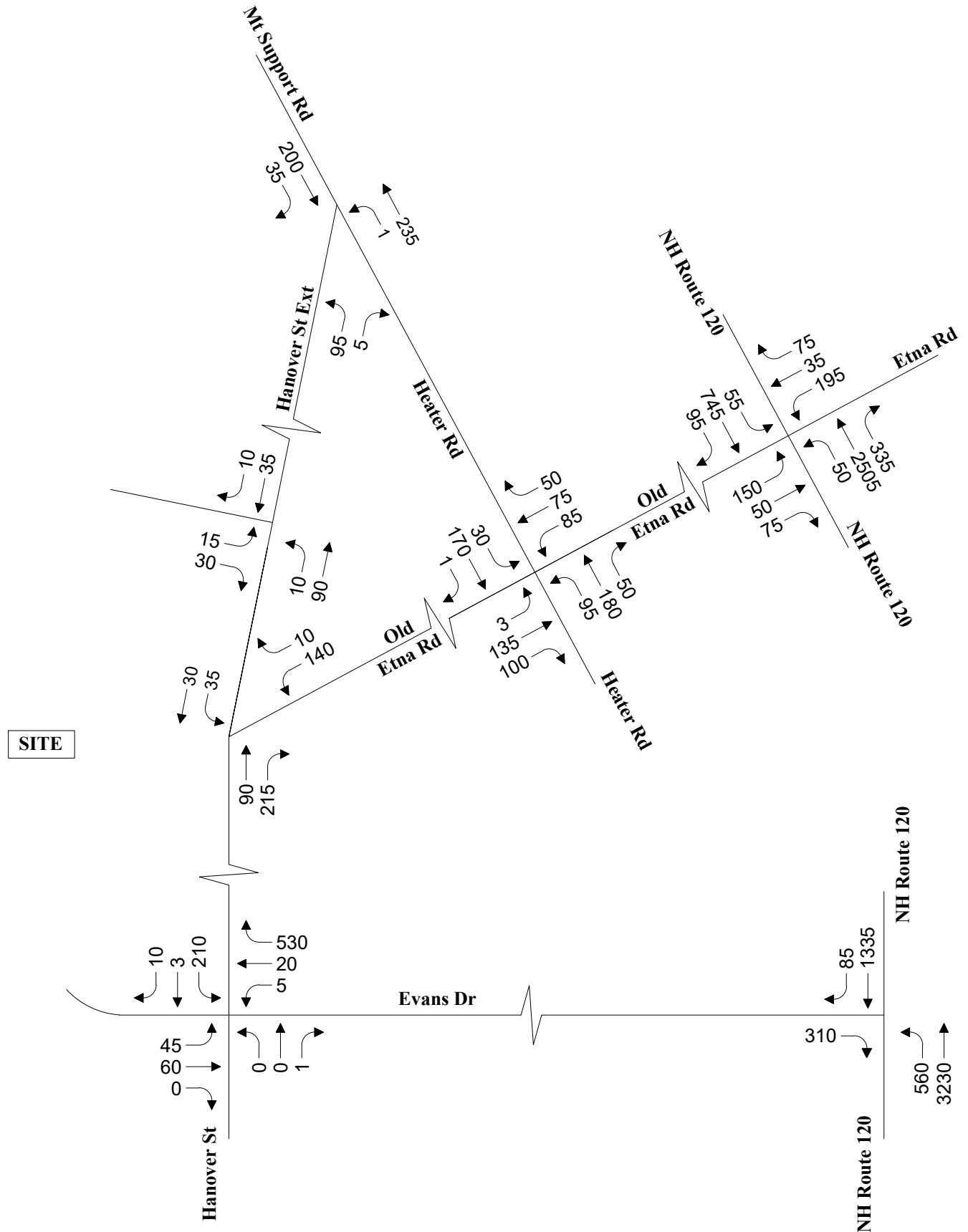


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2025 Build Saturday Midday Peak Hour Traffic Volumes

Figure 16

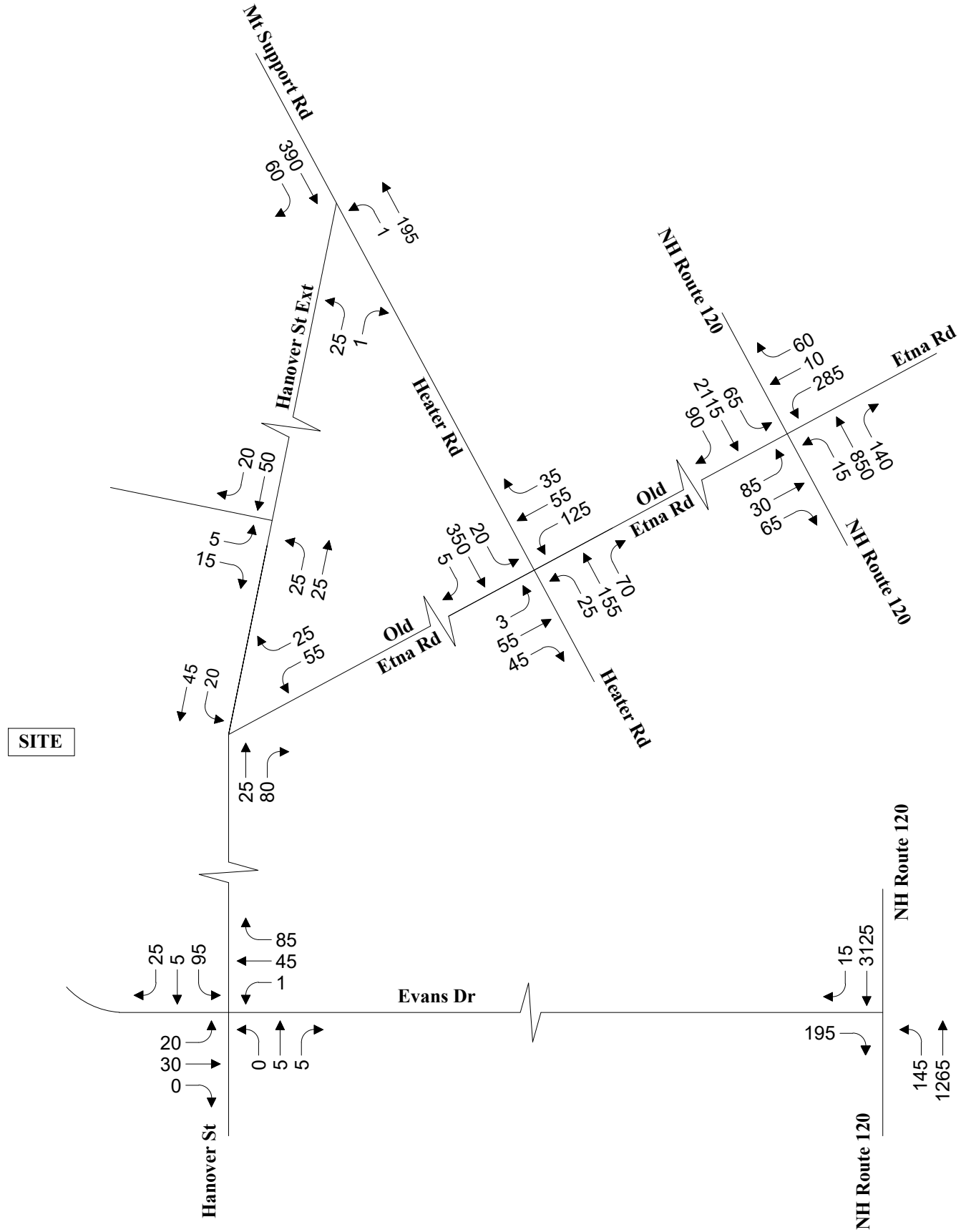


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2035 Build Weekday Morning
Peak Hour Traffic Volumes

Figure 17

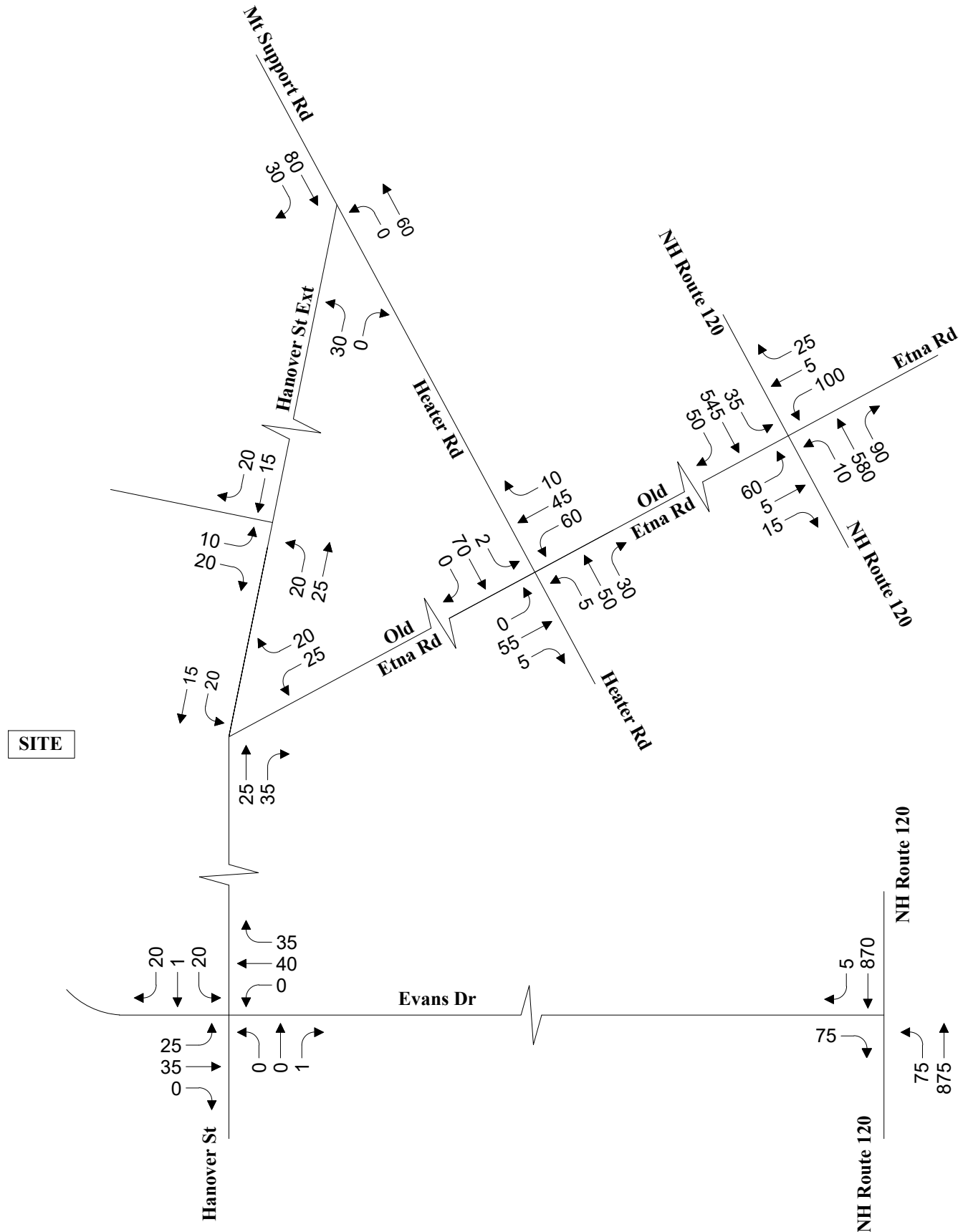


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2035 Build Weekday Evening
Peak Hour Traffic Volumes

Figure 18



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Not to Scale



2035 Build Saturday Midday
Peak Hour Traffic Volumes

Figure 19

Capacity and Queue Analyses

Capacity and queue analyses were performed for the study area intersections to examine operations under future traffic volume conditions without the development (2025 and 2035 No-Build) and with the development (2025 and 2035 Build) during the weekday AM, weekday PM, and Saturday midday peak hours. A summary of the 2025 traffic volume operations is reflected in Table 7 and the 2035 analyses are summarized in Table 8. The capacity analysis worksheets are provided in the Appendix.

The peak hour factor (PHF) is a measure of traffic demand fluctuations within the peak hour. As traffic volumes and patterns change within the design horizons, the concentration of traffic volumes is not anticipated to remain stagnant. In conformance with NHDOT Bureau of Traffic's guidelines for intersection analyses, existing PHFs were increased to 0.90 for the 2035 No-Build and Build traffic volume conditions.²⁷ For those approaches where existing PHFs were observed to be above 0.90, the PHFs were used as observed without a reduction.

The 2035 future traffic volume operations include the NHDOT corridor project (Lebanon 29612) along NH Route 120 corridor between Hanover Street and Old Etna Road/Etna Road. Of importance to note, the intersection operations may reflect longer delays and queues within this Traffic Impact Study as compared to other evaluations conducted as part of that roadway project or other planning studies in the area due to different parameters required in developing traffic volumes. For example, transportation studies supporting public roadway improvement projects typically use average-month factors, may not apply pre-pandemic adjustment factors, and use calculated historical growth percentages. In comparison, land development traffic impact studies for private development in New Hampshire are required to analyze peak-month conditions, apply factors to account for the pandemic, and use no less than a 1 percent compounded annual growth rate in developing future traffic volumes which can result in higher traffic volumes and produce worse intersection operating results.

²⁷ Ibid. 8.

Table 7 Capacity Analysis Summary 2025 Opening Year Conditions

Intersection/Peak Hour/ Critical Movement or Lane Group	2025 No-Build					2025 Build				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
Hanover Street and Evans Drive										
<i>Weekday AM</i>										
South Site Driveway EB Approach	--	--	--	--	--	>1.20	>100	F	--	390
Evans Dr WB Approach	0.98	44.8	E	--	425	1.09	80.4	F	--	612
Hanover St NB Left ^a	--	--	--	--	--	--	--	--	--	--
Hanover St SB Left	0.20	7.8	A	--	18	0.20	7.8	A	--	18
<i>Weekday PM</i>										
South Site Driveway EB Approach	--	--	--	--	--	0.11	12.9	B	--	10
Evans Dr WB Approach	0.09	8.8	A	--	8	0.19	10.7	B	--	18
Hanover St NB Left ^a	--	--	--	--	--	--	--	--	--	--
Hanover St SB Left	0.08	7.4	A	--	8	0.08	7.4	A	--	8
<i>Saturday Midday</i>										
South Site Driveway EB Approach	--	--	--	--	--	0.09	10.2	B	--	8
Evans Dr WB Approach	0.04	8.5	A	--	2	0.12	9.6	A	--	10
Hanover St NB Left ^a	--	--	--	--	--	--	--	--	--	--
Hanover St SB Left	0.02	7.2	A	--	2	0.02	7.2	A	--	2

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

^a No vehicles were counted or projected on this movement.

Table 7 Capacity Analysis Summary 2025 Opening Year Conditions (continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2025 No-Build					2025 Build				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
Hanover Street and Old Etna Road										
<i>Weekday AM</i>										
Old Etna Rd WB Approach	0.31	11.9	B	--	32	0.42	14.9	B	--	52
Hanover St SB Left	0.00	7.9	A	--	0	0.04	8.1	A	--	2
<i>Weekday PM</i>										
Old Etna Rd WB Approach	0.05	9.4	A	--	2	0.12	10.0	B	--	5
Hanover St SB Left	0.00	7.5	A	--	0	0.02	7.6	A	--	2
<i>Saturday Midday</i>										
Old Etna Rd WB Approach	0.01	8.8	A	--	0	0.08	9.3	A	--	8
Hanover St SB Left	0.00	0.0	A	--	0	0.02	7.4	A	--	2
Hanover Street and North Site Driveway										
<i>Weekday AM</i>										
North Site Driveway EB Approach	--	--	--	--	--	0.05	9.0	A	--	5
Hanover St NB Left	--	--	--	--	--	0.01	7.3	A	--	0
<i>Weekday PM</i>										
North Site Driveway EB Approach	--	--	--	--	--	0.02	8.9	A	--	2
Hanover St NB Left	--	--	--	--	--	0.02	7.4	A	--	2
<i>Saturday Midday</i>										
North Site Driveway EB Approach	--	--	--	--	--	0.03	8.8	A	--	2
Hanover St NB Left	--	--	--	--	--	0.01	7.3	A	--	0

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

Table 7 Capacity Analysis Summary 2025 Opening Year Conditions (continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2025 No-Build					2025 Build				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
Hanover Street Extension, Heater Road, and Mount Support Road										
<i>Weekday AM</i>										
Hanover St Extension EB Approach	0.15	13.5	B	--	12	0.22	14.4	A	--	20
Heater Rd NB Left	0.00	7.9	A	--	0	0.00	8.0	A	--	0
<i>Weekday PM</i>										
Hanover St Extension EB Approach	0.05	14.7	B	--	5	0.12	15.9	C	--	10
Heater Rd NB Left	0.00	8.7	A	--	0	0.00	8.8	A	--	0
<i>Saturday Midday</i>										
Hanover St Extension EB Approach	0.02	9.6	A	--	2	0.05	9.8	A	--	5
Heater Rd NB Left ^a	--	--	--	--	--	--	--	--	--	--

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

^a No vehicles were counted or projected on this movement.

Table 7 Capacity Analysis Summary 2025 Opening Year Conditions (continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2025 No-Build					2025 Build				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
Old Etna Road and Heater Road										
<i>Weekday AM</i>										
Old Etna Rd EB Approach	0.46	14.8	B	--	60	0.66	22.4	C	--	120
Old Etna Rd WB Approach	0.41	14.3	B	--	48	0.48	17.1	C	--	62
Heater Rd NB Approach	0.67	21.2	C	--	128	0.75	27.7	D	--	160
Heater Rd SB Approach	0.55	17.1	C	--	82	0.61	20.9	C	--	100
<i>Weekday PM</i>										
Old Etna Rd EB Approach	0.24	11.3	B	--	22	0.40	14.3	B	--	45
Old Etna Rd WB Approach	0.33	12.8	B	--	35	0.45	15.8	C	--	58
Heater Rd NB Approach	0.52	14.8	B	--	75	0.58	18.0	C	--	92
Heater Rd SB Approach	0.76	23.8	C	--	172	0.85	34.7	D	--	228
<i>Saturday Midday</i>										
Old Etna Rd EB Approach	0.03	7.3	A	--	2	0.11	8.0	A	--	10
Old Etna Rd WB Approach	0.11	8.0	A	--	10	0.18	8.5	A	--	15
Heater Rd NB Approach	0.12	7.6	A	--	10	0.13	8.0	A	--	12
Heater Rd SB Approach	0.10	7.7	A	--	8	0.10	8.1	A	--	8

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

Table 7 Capacity Analysis Summary 2025 Opening Year Conditions (continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2025 No-Build					2025 Build				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
NH Route 120, Old Etna Road, and Etna Road										
<i>Weekday AM</i>										
Old Etna Rd EB Left	0.90	>100	F	95	169	>1.20	>100	F	218	309
Old Etna Rd EB Through/Right	0.98	>100	F	98	186	0.81	91.0	F	96	164
Etna Rd WB Left	0.86	>100	F	106	224	0.95	>100	F	107	235
Etna Rd WB Left/Through/Right	0.90	>100	F	112	247	0.99	>100	F	113	259
Etna Rd WB Right	0.05	47.7	D	0	43	0.05	48.5	D	0	43
NH Route 120 NB Left	0.62	74.6	E	47	88	0.62	74.6	E	47	88
NH Route 120 NB Through	1.19	>100	F	1,536	1,536	1.20	>100	F	1,549	1,549
NH Route 120 NB Right	0.23	7.2	A	5	15	0.24	7.9	A	8	19
NB Route 120 SB Left	0.59	70.0	E	52	97	0.59	70.0	E	52	97
NH Route 120 SB Through/Right	0.39	12.7	B	193	224	0.40	13.4	B	203	234
Overall Intersection	1.10	85.7	F	--	--	1.15	95.1	F	--	--

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

Table 7 Capacity Analysis Summary 2025 Opening Year Conditions (continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2025 No-Build					2025 Build				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
NH Route 120, Old Etna Road, and Etna Road										
<i>Weekday PM</i>										
Old Etna Rd EB Left	0.49	64.7	E	48	84	0.64	69.4	E	81	127
Old Etna Rd EB Through/Right	0.36	63.7	E	29	76	0.29	61.3	E	29	75
Etna Rd WB Left	0.76	71.9	E	149	215	0.77	73.1	E	149	217
Etna Rd WB Left/Through/Right	0.78	75.7	E	156	225	0.80	77.6	E	156	227
Etna Rd WB Right	0.04	41.6	D	0	24	0.04	41.7	D	0	25
NH Route 120 NB Left	0.46	71.3	E	14	40	0.46	71.3	E	14	40
NH Route 120 NB Through	0.40	16.9	B	211	310	0.41	18.1	B	222	310
NH Route 120 NB Right	0.08	6.5	A	0	10	0.08	7.3	A	0	11
NB Route 120 SB Left	0.55	67.0	E	56	105	0.55	67.0	E	56	105
NH Route 120 SB Through/Right	0.92	31.1	C	665	1,237	0.97	39.8	D	761	1,292
Overall Intersection	0.87	33.2	C	--	--	0.92	38.8	D	--	--

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

Table 7 Capacity Analysis Summary 2025 Opening Year Conditions (continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2025 No-Build					2025 Build				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
NH Route 120, Old Etna Road, and Etna Road										
<i>Saturday Midday</i>										
Old Etna Rd EB Left	0.30	66.5	E	18	38	0.64	72.8	E	66	95
Old Etna Rd EB Through/Right	0.13	65.4	E	6	29	0.08	61.7	E	6	28
Etna Rd WB Left	0.53	65.1	E	54	101	0.53	65.1	E	54	101
Etna Rd WB Left/Through/Right	0.54	65.7	E	56	104	0.54	65.7	E	56	104
Etna Rd WB Right	0.02	50.2	D	0	0	0.02	50.2	D	0	0
NH Route 120 NB Left	0.33	70.0	E	10	32	0.33	70.0	E	10	32
NH Route 120 NB Through	0.24	8.8	A	102	160	0.25	10.3	B	113	180
NH Route 120 NB Right	0.06	4.7	A	0	7	0.06	5.7	A	0	10
NB Route 120 SB Left	0.41	66.6	E	28	62	0.41	66.6	E	28	62
NH Route 120 SB Through/Right	0.21	7.4	A	62	135	0.24	8.9	A	76	165
Overall Intersection	0.28	17.0	B	--	--	0.31	19.8	B	--	--

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

Table 7 Capacity Analysis Summary 2025 Opening Year Conditions (continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2025 No-Build					2025 Build				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
NH Route 120 and Evans Drive										
<i>Weekday AM</i>										
NH Route 120 NB Left	1.12	>100	F	--	462	1.15	>100	F	--	500
Evans Dr EB Left ^a	--	--	--	--	--	--	--	--	--	--
Evans Dr EB Right	0.80	42.8	E	--	178	1.04	88.4	F	--	330
<i>Weekday PM</i>										
NH Route 120 NB Left	0.87	>100	F	--	125	>1.20	>100	F	--	235
Evans Dr EB Left	>1.20	>100	F	--	332	>1.20	>100	F	--	435
Evans Dr EB Right	>1.20	>100	F	--	332	>1.20	>100	F	--	435
<i>Saturday Midday</i>										
NH Route 120 NB Left	0.04	9.6	A	--	2	0.09	9.9	A	--	8
Evans Dr EB Left	0.04	30.4	D	--	2	0.05	35.0	E	--	2
Evans Dr EB Right	0.07	11.5	B	--	5	0.14	12.0	B	--	12

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

^a No vehicles were counted or projected on this movement.

Table 8 Capacity Analysis Summary 2035 Design Year Conditions

Intersection/Peak Hour/ Critical Movement or Lane Group	2035 No-Build					2035 Build				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
Hanover Street and Evans Drive ^a										
<i>Weekday AM</i>										
South Site Driveway EB Approach	--	--	--	--	--	0.73	72.9	F	--	112
Evans Dr WB Approach	0.63	15.3	C	--	118	0.69	17.6	C	--	145
Hanover St NB Left ^a	--	--	--	--	--	--	--	--	--	--
Hanover St SB Left	0.15	7.7	A	--	12	0.15	7.7	A	--	12
<i>Weekday PM</i>										
South Site Driveway EB Approach	--	--	--	--	--	0.10	12.0	B	--	8
Evans Dr WB Approach	0.09	8.7	A	--	8	0.17	10.2	B	--	15
Hanover St NB Left ^a	--	--	--	--	--	--	--	--	--	--
Hanover St SB Left	0.06	7.4	A	--	5	0.06	7.4	A	--	5
<i>Saturday Midday</i>										
South Site Driveway EB Approach	--	--	--	--	--	0.08	9.9	A	--	8
Evans Dr WB Approach	0.04	8.5	A	--	2	0.09	9.3	A	--	8
Hanover St NB Left ^a	--	--	--	--	--	--	--	--	--	--
Hanover St SB Left	0.01	7.2	A	--	0	0.01	7.2	A	--	0

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

^a No vehicles were counted or projected on this movement.

Table 8 Capacity Analysis Summary 2035 Design Year Conditions (continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2035 No-Build					2035 Build				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
Hanover Street and Old Etna Road										
<i>Weekday AM</i>										
Old Etna Rd WB Approach	0.19	10.8	B	--	18	0.26	12.5	B	--	25
Hanover St SB Left	0.00	7.8	A	--	0	0.03	8.1	A	--	2
<i>Weekday PM</i>										
Old Etna Rd WB Approach	0.04	9.2	A	--	2	0.10	9.6	A	--	8
Hanover St SB Left	0.00	7.4	A	--	0	0.02	7.5	A	--	0
<i>Saturday Midday</i>										
Old Etna Rd WB Approach	0.01	8.7	A	--	0	0.05	9.1	A	--	5
Hanover St SB Left	0.00	0.0	A	--	0	0.01	7.4	A	--	0
Hanover Street and North Site Driveway										
<i>Weekday AM</i>										
North Site Driveway EB Approach	--	--	--	--	--	0.05	9.0	A	--	5
Hanover St NB Left	--	--	--	--	--	0.01	7.3	A	--	0
<i>Weekday PM</i>										
North Site Driveway EB Approach	--	--	--	--	--	0.02	8.9	A	--	2
Hanover St NB Left	--	--	--	--	--	0.02	7.4	A	--	2
<i>Saturday Midday</i>										
North Site Driveway EB Approach	--	--	--	--	--	0.03	8.8	A	--	2
Hanover St NB Left	--	--	--	--	--	0.01	7.3	A	--	0

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

Table 8 Capacity Analysis Summary 2035 Design Year Conditions (continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2035 No-Build					2035 Build				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
Hanover Street Extension, Heater Road, and Mount Support Road										
<i>Weekday AM</i>										
Hanover St Extension EB Approach	0.14	12.9	B	--	12	0.21	13.6	B	--	20
Heater Rd NB Left	0.00	7.8	A	--	0	0.00	7.8	A	--	0
<i>Weekday PM</i>										
Hanover St Extension EB Approach	0.03	13.4	B	--	2	0.07	14.0	B	--	5
Heater Rd NB Left	0.00	8.4	A	--	0	0.00	8.5	A	--	0
<i>Saturday Midday</i>										
Hanover St Extension EB Approach	0.01	9.4	A	--	0	0.04	9.6	A	--	2
Heater Rd NB Left	0.00	0.0	A	--	0	0.00	0.0	A	--	0

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

Table 8 Capacity Analysis Summary 2035 Design Year Conditions (continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2035 No-Build					2035 Build				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
Old Etna Road and Heater Road										
<i>Weekday AM</i>										
Old Etna Rd EB Approach	0.32	11.7	B	--	35	0.45	13.9	B	--	58
Old Etna Rd WB Approach	0.36	12.5	B	--	40	0.41	13.6	B	--	50
Heater Rd NB Approach	0.61	17.1	C	--	105	0.60	17.6	C	--	100
Heater Rd SB Approach	0.37	11.7	B	--	42	0.40	13.5	B	--	48
<i>Weekday PM</i>										
Old Etna Rd EB Approach	0.13	9.6	A	--	10	0.19	10.6	B	--	18
Old Etna Rd WB Approach	0.29	11.4	B	--	30	0.38	12.9	B	--	45
Heater Rd NB Approach	0.40	11.7	B	--	48	0.43	12.8	B	--	52
Heater Rd SB Approach	0.60	15.5	C	--	100	0.63	17.5	C	--	112
<i>Saturday Midday</i>										
Old Etna Rd EB Approach	0.03	7.3	A	--	2	0.08	7.8	A	--	8
Old Etna Rd WB Approach	0.10	7.8	A	--	8	0.16	8.3	A	--	15
Heater Rd NB Approach	0.10	7.4	A	--	8	0.11	7.8	A	--	10
Heater Rd SB Approach	0.09	7.7	A	--	8	0.10	8.0	A	--	8

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

Table 8 Capacity Analysis Summary 2035 Design Year Conditions (continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2035 No-Build					2035 Build				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
NH Route 120, Old Etna Road, and Etna Road										
<i>Weekday AM</i>										
Old Etna Rd EB Left	0.87	>100	F	92	203	>1.20	>100	F	194	347
Old Etna Rd EB Through	0.24	62.5	E	25	50	0.22	61.5	E	25	49
Old Etna Rd EB Right	0.05	54.2	D	0	40	0.05	53.4	D	0	40
Etna Rd WB Left	0.86	89.9	F	96	168	0.86	89.9	F	96	168
Etna Rd WB Through	0.29	62.1	E	33	71	0.29	62.1	E	33	71
Etna Rd WB Right	0.08	48.8	D	7	54	0.08	48.8	D	7	54
NH Route 120 NB Left	0.54	67.2	E	50	97	0.54	67.2	E	50	97
NH Route 120 NB Through	>1.20	>100	F	1,661	1,778	>1.20	>100	F	1,674	1,791
NH Route 120 NB Right	0.25	7.4	A	7	21	0.26	7.7	A	9	23
NB Route 120 SB Left	0.60	71.3	E	55	105	0.60	71.3	E	55	105
NH Route 120 SB Through/Right	0.41	13.2	B	203	253	0.43	13.9	B	213	266
Overall Intersection	1.13	94.0	F	--	--	1.18	>100	F	--	--

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

Table 8 Capacity Analysis Summary 2035 Design Year Conditions (continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2035 No-Build					2035 Build				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
NH Route 120, Old Etna Road, and Etna Road										
<i>Weekday PM</i>										
Old Etna Rd EB Left	0.57	68.5	E	55	104	0.78	88.4	F	85	177
Old Etna Rd EB Through	0.15	62.5	E	15	33	0.14	61.5	E	15	33
Old Etna Rd EB Right	0.06	57.6	E	1	39	0.06	56.6	E	1	39
Etna Rd WB Left	0.90	85.3	F	150	254	0.97	>100	F	152	254
Etna Rd WB Through	0.06	56.5	E	9	30	0.06	57.5	E	9	30
Etna Rd WB Right	0.04	43.9	D	0	39	0.04	44.8	D	0	39
NH Route 120 NB Left	0.25	66.5	E	14	40	0.25	66.5	E	14	40
NH Route 120 NB Through	0.42	15.6	B	223	278	0.42	15.6	B	223	278
NH Route 120 NB Right	0.09	6.6	A	0	10	0.09	6.9	A	0	10
NB Route 120 SB Left	0.59	68.6	E	60	112	0.59	68.6	E	60	112
NH Route 120 SB Through/Right	0.99	43.4	D	1,017	1,267	1.02	49.8	D	1,158	1,316
Overall Intersection	0.95	40.4	D	--	--	0.99	46.2	D	--	--

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

Table 8 Capacity Analysis Summary 2035 Design Year Conditions (continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2035 No-Build					2035 Build				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
NH Route 120, Old Etna Road, and Etna Road										
<i>Saturday Midday</i>										
Old Etna Rd EB Left	0.40	68.2	E	20	49	0.61	71.1	E	60	109
Old Etna Rd EB Through	0.05	65.9	E	2	10	0.03	61.8	E	2	10
Old Etna Rd EB Right	0.01	62.2	E	0	0	0.01	58.3	E	0	0
Etna Rd WB Left	0.52	64.2	E	51	82	0.52	64.2	E	51	82
Etna Rd WB Through	0.05	61.5	E	5	20	0.05	61.5	E	5	20
Etna Rd WB Right	0.02	50.3	D	0	0	0.02	50.3	D	0	0
NH Route 120 NB Left	0.23	67.7	E	10	32	0.23	67.7	E	10	32
NH Route 120 NB Through	0.26	8.6	A	115	174	0.27	10.3	B	126	193
NH Route 120 NB Right	0.06	4.5	A	0	8	0.06	5.7	A	0	9
NB Route 120 SB Left	0.44	66.5	E	32	69	0.44	66.5	E	32	69
NH Route 120 SB Through/Right	0.23	7.4	A	96	144	0.26	9.2	A	113	173
Overall Intersection	0.30	16.2	B	--	--	0.32	18.9	B	--	--

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

Table 8 Capacity Analysis Summary 2035 Design Year Conditions (continued)

Intersection/Peak Hour/ Critical Movement or Lane Group	2035 No-Build					2035 Build				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
NH Route 120 and Evans Drive										
<i>Weekday AM</i>										
NH Route 120 NB Left	> 1.20	> 100	F	--	1,308	> 1.20	> 100	F	--	1,375
Evans Dr EB Right	0.93	73.8	F	--	225	1.15	> 100	F	--	365
<i>Weekday PM</i>										
NH Route 120 NB Left	> 1.20	> 100	F	--	320	> 1.20	> 100	F	--	462
Evans Dr EB Right	> 1.20	> 100	F	--	445	> 1.20	> 100	F	--	545
<i>Saturday Midday</i>										
NH Route 120 NB Left	0.08	13.9	B	--	8	0.10	10.3	B	--	8
Evans Dr EB Right	0.08	13.2	B	--	8	0.15	12.5	B	--	12

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

Hanover Street, Evans Drive, and South Site Driveway

As previously described, long delays are currently experienced along the Evans Drive westbound approach at the unsignalized intersection with Hanover Street during the weekday AM peak hour. These delays are common near schools during the student arrival time period. Delays may be shown to improve with the 2035 traffic volumes as compared with the 2025 traffic volumes due to the PHF modifications in compliance with NHDOT guidelines. Under Build traffic-volume conditions, the south site driveway will be constructed as the fourth (west) leg to the unsignalized intersection. As part of the proposed development, measures have been evaluated to improve intersection operations (discussed below).

Hanover Street and Old Etna Road

Based on the 2025 and 2035 No-Build and Build traffic volume conditions, the minor street approaches at the Hanover Street and Old Etna Road unsignalized intersection are projected to operate at LOS B or better during the weekday AM, weekday PM, and Saturday midday peak hours. With the addition of the estimated site trips, capacity is shown to be available as the v/c ratios are well below 1.00.

Hanover Street Extension and North Site Driveway

The critical movements at the proposed north site driveway unsignalized intersection with Hanover Street Extension are projected to operate at LOS A during the weekday AM, weekday PM, and Saturday midday peak hours.

Hanover Street Extension, Heater Road, and Mount Support Road

Under 2025 and 2035 No-Build and Build traffic volume conditions, the Hanover Street Extension approach and the Heater Road northbound left turns at the unsignalized intersection with Mount Support Road are estimated to operate at LOS C or better during the weekday AM, weekday PM, and Saturday midday peak hours. With the addition of site trips added to the roadway network, delay increases are projected to be negligible (<1 second) during the peak hours.

Old Etna Road and Heater Road

Delays at the Heater Road and Old Etna Road All-Way Stop-Control (AWSC) intersection may be shown to improve with the 2035 traffic volumes as compared with the 2025 traffic volumes due to the PHF modifications in compliance with NHDOT guidelines. Based on the 2035 No-Build and Build traffic volume conditions, the minor street approaches to the unsignalized intersection are projected to operate at LOS D or better during the weekday AM, weekday PM, and Saturday midday peak hours. With the addition of the site trips through this intersection during the 2035 traffic volume conditions, increases in delays are anticipated to minimal (≤ 2.2 seconds) and capacity is shown to be available as the v/c ratios are below 1.00.

NH Route 120, Old Etna Road, and Etna Road

As previously described, the NH Route 120 signalized intersection with Old Etna Road and Etna Road is contained within a traffic signal system with the I-89 southbound ramps, I-89

northbound ramps, and Heater Road. Based on existing intersection operations, there are long delays experienced at the NH Route 120, Old Etna Road, Etna Road signalized intersection independent of future traffic growth associated with historical growth, background developments, and the proposed residential development. Since capacity constraints are shown with the 2022 Existing traffic volumes during the weekday AM peak hour, improvements deemed necessary at this location are separate from the proposed residential development. NHDOT officials are developing improvements along the NH Route 120 corridor (Lebanon 29612) between Hanover Street and Old Etna Road/Etna Road.

NH Route 120 and Evans Drive

Under 2022 Existing traffic-volume conditions, long delays (LOS F) are experienced on the NH Route 120 northbound left-turn lane at the unsignalized intersection with Evans Drive during the weekday AM and PM peak hours. Long delays are also experienced on the Evans Drive minor street movements during the weekday PM peak hour due to the heavy demand of conflicting NH Route 120 traffic. Similar to the NH Route 120, Old Etna Road, and Etna Road intersection, improvements required at this location are being considered as part of the NHDOT corridor improvement project along NH Route 120 independent of the proposed residential development.

Improvements

The final component of a traffic study is the identification of improvement measures that are expected to be effective in eliminating or improving anticipated deficiencies resulting from the combination of existing, background, and project-generated traffic. As discussed at the December 1, 2023 meeting with local, state, and regional representatives, City officials have considered installing AWSC at the Hanover Street and Evans Drive intersection. To determine if the Hanover Street, Evans Drive, and south site driveway should be placed under AWSC, a review was conducted of the Manual on Uniform Traffic Control Devices (MUTCD)²⁸ criteria. The AWSC criteria discussion included within this section is based on the 2009 edition of the MUTCD because the newest edition (11th Edition) was recently published in December 2023 and has not yet been accepted by NHDOT officials. The following summarizes the findings of the criteria being satisfied for MUTCD Section 2B.17 (AWSC Warrant E):

› The need to control left-turn conflicts.²⁹

- As shown on Figures 17 through 19 for the 2035 Build weekday AM, weekday PM, and Saturday midday peak hour traffic volumes:
 - There are projected to be between 20 and 45 vehicles turning left from the proposed site driveway onto Hanover Street northbound that would be in conflict with between 41 and 223 vehicles on the Hanover Street southbound approach and between 75 and 555 vehicles on the Evans Drive westbound approach.
 - There are projected to be between 20 and 210 vehicles turning left from Hanover Street southbound onto Evans Drive that would be in conflict with between 75 and

²⁸ Federal Highway Administration. Manual on Uniform Traffic Control Devices for Streets and Highways, 11th ed. Dec. 2023.

²⁹ MUTCD, Section 2B.17, Paragraph 1, Item A.

555 vehicles on the Evans Drive westbound approach and between 50 and 105 vehicles on the south site driveway eastbound approach.

- As reflected in Table 8, the site driveway approach to Hanover Street and Evans Drive is shown to operate with long delays (LOS F) with the 2035 No-Build weekday AM peak hour traffic volumes.
 - Therefore, the criterion of needing to control the left-turn conflicts would be met.
- › **An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where AWSC would improve traffic operational characteristics of the intersection.**³⁰
- Hanover Street and Evans Drive are local roadways providing single lanes of vehicle travel in each direction and a sidewalk provided along one side of each roadway (i.e., along the east side of Hanover Street and along the north side of Evans Drive).
 - Based on 2035 Build conditions during the weekday AM, weekday PM, and Saturday midday peak hours (Figures 17 through 19), the Hanover Street southbound approach is projected to carry between 41 and 223 vehicles and the Evans Drive westbound approach estimated to carry between 75 and 555 vehicles.
 - The Hanover Street and Evans Drive intersection is in close proximity to Hanover Street Elementary School and Lebanon High School that generate motorized and non-motorized travel.
 - With the placement of the intersection under AWSC (as shown in Table 9), the intersection would be projected to operate with all approaches at LOS C or better.
 - Therefore, the criterion of two residential neighborhood collector (through) streets of similar design and operating characteristics where AWSC would improve traffic operations would be met.
- › **Where pedestrian and/or bicyclist movement support the installation of AWSC.**³¹
- The Hanover Street and Evans Drive intersection is in close proximity to Hanover Street Elementary School and Lebanon High School that generate motorized and non-motorized travel.
 - As reflected in the November 2022 traffic counts, the intersection captured:
 - 14 cyclists and 53 pedestrians crossing the intersection on a weekday between 7:00 and 8:00 AM.
 - 11 cyclists and 77 pedestrians crossing the intersection on a weekday between 2:00 and 3:00 PM.
 - 7 cyclists and 52 pedestrians crossing the intersection on a weekday between 3:00 and 4:00 PM.
 - 2 cyclists and 12 pedestrians crossing the intersection on a weekday between 4:00 and 5:00 PM.
 - Therefore, the non-motorized transportation movements may support the AWSC criterion.

³⁰ MUTCD, Section 2B.07, Paragraph 1, Item B.

³¹ MUTCD, Section 2B.17, Paragraph 1, Item C.

Intersection analyses have been conducted with the Hanover Street, Evans Drive, and south site driveway intersection placed under AWSC. A summary of the 2035 traffic-volume operations with these improvements in place are reflected in Table 9. The capacity analysis worksheets are provided in the Appendix.

Table 9 Capacity Analysis Summary: 2035 Build with Improvements

Intersection/ Peak Hour/Critical Movement	v/c	Delay	LOS	50 th % Queue	95 th % Queue
Hanover Street and Evans Drive					
<i>Weekday AM</i>					
Site Driveway EB Approach	0.18	9.7	A	--	15
Evans Dr WB Approach	0.72	17.5	C	--	160
Hanover St NB Approach	0.00	8.5	A		0
Hanover St SB Approach	0.40	12.6	B	--	48
<i>Weekday PM</i>					
Site Driveway EB Approach	0.07	7.9	A	--	5
Evans Dr WB Approach	0.16	7.7	A	--	15
Hanover St NB Approach	0.01	7.3	A		0
Hanover St SB Approach	0.17	8.3	A	--	15
<i>Saturday Midday</i>					
Site Driveway EB Approach	0.08	7.5	A	--	5
Evans Dr WB Approach	0.09	7.1	A	--	8
Hanover St NB Approach	0.00	6.7	A		0
Hanover St SB Approach	0.05	7.2	A	--	5

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

As shown, these improvements would result in operations on the four approaches at LOS C or better with the 2035 Build traffic volumes for the weekday AM, weekday PM, and Saturday midday peak hours. Accordingly, the installation of AWSC at this location may be desirable.

As detailed within this traffic study, the traffic volumes evaluated may represent an overestimated scenario that may not be realized along the local roadway system (application of peak-month and pandemic adjustments from NH Route 120). Therefore, the intersection operations presented within this traffic study may show worse conditions than will be realized. As such, the applicant of the proposed Lebanon Brickyard development is committed to installing the AWSC at this location should City of Lebanon officials deem this type of traffic control appropriate.

Summary of Findings

Existing and future conditions in the study area have been described, analyzed, and evaluated with respect to traffic operations and the impact of the proposed Lebanon Brickyard residential development. Due to existing operational deficiencies along the NH Route 120 corridor, NHDOT

officials are developing improvements between Hanover Street (to the south) and Old Etna Road/Etna Road (to the north). The improvements are intended to improve operations, progression, and safety along the corridor that includes the I-89 interchange at Exit 18 (Lebanon 29612). Within the study area for the proposed Lebanon Brickyard residential development, improvements are being evaluated at the NH Route 120 intersections with Evans Drive and with Old Etna Road and Etna Road. These improvements may result in vehicles currently traveling along the Mount Support Road/Heater Road corridor changing their travel route onto the major highway system (NH Route 120 corridor).

Based on ITE methodologies and NHDOT guidance, a development may have an impact at an intersection if the addition of site trips increases traffic volumes at that location by 100 vehicles per hour or more. As detailed within this traffic study, the addition of site traffic through the study area intersections meets this threshold only at the Hanover Street, Evans Drive, and southern site driveway intersection. Therefore, improvements were evaluated to offset the impacts of the proposed residential development at this location. As described within this traffic study, the seasonal and pandemic adjustments used in developing the traffic volumes may result in worse intersection operations than will be realized along the local roadway system. Therefore, the applicant is committed to installing the AWSC at the Hanover Street, Evans Drive, and southern site driveway intersection should City of Lebanon officials deem this type of traffic control appropriate. As an interim condition, City officials may consider having the applicant install the AWSC as a temporary condition to understand the intersection operations prior to implementing a formal change to the traffic control.

Appendix

Traffic Count and Vehicle Speed Data

Traffic-Volume Adjustment Data

Advance Transit Bus Service Data

Existing Intersection Analysis Worksheets

Background Developments

Trip-Generation and Distribution Calculations

No-Build and Build Intersection Analysis Worksheets

2034 Build Analysis Worksheets with Improvements

School Dismissal Condition Data

Traffic Count and Vehicle Speed Data

Location : Evans Drive
 Location : East of Hanover Street
 City/State: Lebanon, NH
 Direction: WB,

52933001

11/10/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
3:00	0	0	0	0	0	0	0	1	2	0	0	0	0	0	3
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	2	4	1	2	1	2	1	0	13
6:00	0	0	0	0	1	2	7	20	23	12	6	3	0	1	75
7:00	0	0	0	1	2	24	77	127	77	34	15	2	2	0	361
8:00	0	0	0	1	0	3	12	17	24	15	8	2	0	1	83
9:00	0	0	0	0	1	1	4	8	14	2	3	1	0	0	34
10:00	0	0	0	0	1	1	2	11	11	7	3	0	0	0	36
11:00	0	0	0	0	1	3	3	16	15	6	1	2	0	0	47
12:00 PM	0	0	0	0	1	4	9	12	8	9	3	2	0	0	48
1:00	0	0	0	0	0	3	13	14	20	6	3	2	1	0	62
2:00	0	0	0	0	0	2	8	24	38	7	5	2	0	1	87
3:00	0	0	0	0	0	2	8	12	8	14	2	0	0	0	46
4:00	0	0	0	0	3	1	5	16	15	5	4	0	1	1	51
5:00	0	0	1	0	0	0	2	14	9	8	3	1	3	0	41
6:00	0	0	0	0	0	1	4	4	6	4	7	0	0	0	26
7:00	0	0	0	0	0	2	3	5	4	2	1	0	1	0	18
8:00	0	0	0	1	0	2	0	4	4	0	1	0	0	0	12
9:00	0	0	0	0	0	0	0	0	2	3	0	1	0	0	6
10:00	0	0	0	0	0	0	1	3	1	2	0	0	0	0	7
11:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	0	1	3	10	51	160	314	283	139	66	20	9	4	1060

Percentile 15th 50th 85th 95th
 Speed 20 24 29 32
 Mean Speed (Average) 24.6
 10 MPH Pace Speed 18-27
 Number in Pace 800
 Percent in Pace 75.5%
 Number > 27 MPH 238
 Percent > 27 MPH 22.5%

Location : Evans Drive
 Location : East of Hanover Street
 City/State: Lebanon, NH
 Direction: WB,

52933001

11/11/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	1	1	1	0	0	0	0	0	3
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
3:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
4:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
5:00	0	0	0	0	0	0	1	1	3	2	0	0	0	0	7
6:00	0	0	0	0	0	0	4	7	6	6	4	3	1	1	32
7:00	0	0	0	0	0	1	6	5	12	8	5	1	1	0	39
8:00	0	0	0	0	0	0	4	5	8	2	2	1	0	0	22
9:00	0	0	0	0	0	1	4	6	8	9	3	0	0	0	31
10:00	0	0	1	0	0	2	2	3	7	8	1	1	2	0	27
11:00	0	0	0	0	1	0	7	7	4	1	2	1	0	0	23
12:00 PM	0	0	0	0	0	0	7	4	8	5	6	1	1	0	32
1:00	0	0	0	0	1	2	4	7	10	2	0	1	2	0	29
2:00	0	0	0	0	0	0	5	5	3	4	1	0	1	0	19
3:00	0	0	0	0	0	1	1	4	4	4	1	1	1	0	17
4:00	0	0	0	0	0	0	1	3	7	4	1	1	0	1	18
5:00	0	0	0	1	0	1	1	3	3	5	3	0	0	0	17
6:00	0	0	0	0	0	0	2	5	2	7	0	2	0	0	18
7:00	0	0	0	0	1	1	2	1	4	1	1	1	0	0	12
8:00	0	0	0	0	0	0	0	4	3	2	2	0	0	0	11
9:00	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2
10:00	0	0	0	0	0	0	0	1	3	0	2	0	0	0	6
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	1	3	9	52	72	98	73	34	14	9	2	368

Percentile 15th 50th 85th 95th
 Speed 20 25 31 34
 Mean Speed (Average) 26.2
 10 MPH Pace Speed 20-29
 Number in Pace 260
 Percent in Pace 70.7%
 Number > 27 MPH 132
 Percent > 27 MPH 35.9%

Location : Evans Drive
 Location : East of Hanover Street
 City/State: Lebanon, NH
 Direction: WB,

52933001

11/12/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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5:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
6:00	0	0	0	0	0	0	0	2	2	4	2	0	1	0	11
7:00	0	0	0	0	0	0	0	0	3	0	0	0	1	0	4
8:00	0	0	0	0	0	0	2	3	5	3	2	2	1	0	18
9:00	0	0	0	0	0	2	4	7	11	5	1	1	0	1	32
10:00	0	0	0	0	0	0	1	7	7	2	3	1	1	0	22
11:00	0	0	0	0	0	1	5	5	5	4	2	2	0	0	24
12:00 PM	0	0	0	0	0	1	1	1	4	3	4	1	0	0	15
1:00	0	0	0	0	0	0	3	4	7	5	2	1	1	0	23
2:00	0	0	0	0	0	0	0	2	5	7	1	0	1	0	16
3:00	0	0	0	0	0	1	1	3	5	0	1	1	0	3	15
4:00	0	0	1	0	0	0	2	3	8	3	1	2	0	1	21
5:00	0	0	0	0	0	0	2	6	7	4	2	2	0	1	24
6:00	0	0	0	0	0	0	1	8	2	3	1	1	0	0	16
7:00	0	0	0	0	0	1	0	0	3	3	0	1	0	0	8
8:00	0	0	0	0	0	0	0	1	0	3	0	0	0	0	4
9:00	0	0	0	0	0	0	2	3	2	1	2	0	0	0	10
10:00	0	0	0	0	0	0	1	2	3	2	0	0	0	0	8
11:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Total	0	0	1	0	0	8	26	57	80	52	24	15	6	6	275
Percentile															
Speed				15th	50th	85th	95th								
				21	25	32	35								
Mean Speed (Average)				28.5											
10 MPH Pace Speed				20-29											
Number in Pace				197											
Percent in Pace				71.6%											
Number > 27 MPH				103											
Percent > 27 MPH				37.5%											
Grand Total	0	0	3	4	13	68	238	443	461	264	124	49	24	12	1703
Stats															
Percentile				15th	50th	85th	95th								
Speed				21	25	31	34								
Mean Speed (Average)				27.2											
10 MPH Pace Speed				20-29											
Number in Pace				1246											
Percent in Pace				73.2%											
Number > 27 MPH				1244											
Percent > 27 MPH				38.5%											

Location : Evans Drive
 Location : East of Hanover Street
 City/State: Lebanon, NH
 Direction: EB,

52933001

11/10/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	0	0	1	1	0	0	1	0	3
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	1	1	0	1	0	0	0	3
3:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
4:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
5:00	0	0	0	0	0	0	0	0	1	2	0	0	0	0	3
6:00	0	0	0	1	0	3	0	2	3	6	4	0	1	0	20
7:00	0	0	0	0	0	5	9	16	51	41	13	5	1	1	142
8:00	0	0	0	0	0	2	0	4	13	26	13	2	1	1	62
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10:00	0	0	0	0	3	1	3	6	9	6	4	4	1	1	38
11:00	0	0	0	0	0	1	2	5	17	18	13	5	0	2	63
12:00 PM	0	0	0	0	0	0	1	5	23	11	5	3	1	1	50
1:00	0	0	0	0	0	0	1	10	11	19	11	3	2	0	57
2:00	0	0	0	0	0	1	5	24	43	35	21	9	2	2	142
3:00	0	0	0	0	0	1	8	28	34	23	17	3	3	2	119
4:00	0	0	0	0	2	0	7	16	22	16	7	4	2	1	77
5:00	0	0	0	0	0	1	2	11	27	21	6	3	1	1	73
6:00	0	0	0	0	0	2	1	4	5	3	5	1	1	1	23
7:00	0	0	0	0	0	0	0	1	3	3	2	2	0	0	11
8:00	0	0	0	0	1	0	1	7	10	4	4	1	0	0	28
9:00	0	0	0	0	0	0	1	1	2	0	0	1	0	0	5
10:00	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2
11:00	0	0	0	0	0	0	0	1	1	0	1	0	0	0	3
Total	0	0	0	1	6	18	45	143	288	242	132	48	18	13	954

Percentile 15th 50th 85th 95th
 Speed 22 27 31 34
 Mean Speed (Average) 28.5
 10 MPH Pace Speed 21-30
 Number in Pace 714
 Percent in Pace 74.8%
 Number > 27 MPH 453
 Percent > 27 MPH 47.5%

Location : Evans Drive
 Location : East of Hanover Street
 City/State: Lebanon, NH
 Direction: EB,

52933001

11/11/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3
3:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
4:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
5:00	0	0	0	0	0	0	1	0	1	1	1	0	0	0	4
6:00	0	0	0	0	0	1	0	0	0	2	1	0	0	0	4
7:00	0	0	0	0	0	0	0	3	5	2	2	1	1	0	14
8:00	0	0	0	0	0	0	0	1	2	5	1	1	1	0	11
9:00	0	0	0	0	0	0	1	1	7	8	6	1	1	0	25
10:00	0	0	0	0	0	0	3	5	9	8	5	1	0	2	33
11:00	0	0	0	0	0	1	2	4	5	8	4	3	1	2	30
12:00 PM	0	0	0	0	0	0	1	4	12	6	10	0	0	1	34
1:00	0	0	0	0	0	1	1	5	5	6	5	3	1	0	27
2:00	0	0	0	0	1	1	1	3	6	14	4	2	1	0	33
3:00	0	0	0	0	1	0	0	3	9	11	4	2	3	0	33
4:00	0	0	0	0	0	0	0	9	8	9	7	3	3	1	40
5:00	0	0	0	0	0	0	0	4	9	10	4	0	0	0	27
6:00	0	0	0	0	0	0	1	2	5	2	6	1	0	0	17
7:00	0	0	0	0	0	0	0	2	3	0	1	1	1	0	8
8:00	0	0	0	0	0	0	1	0	3	1	0	1	0	0	6
9:00	0	0	0	0	0	1	0	0	0	0	0	1	0	0	2
10:00	0	0	0	0	0	0	0	1	2	1	0	0	0	0	4
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	3	6	12	49	93	94	62	21	13	6	359

Percentile 15th 50th 85th 95th
 Speed 24 27 32 36
 Mean Speed (Average) 29.5
 10 MPH Pace Speed 23-32
 Number in Pace 265
 Percent in Pace 73.8%
 Number > 27 MPH 196
 Percent > 27 MPH 54.6%

Location : Evans Drive
 Location : East of Hanover Street
 City/State: Lebanon, NH
 Direction: EB,

52933001

11/12/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
1:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2
2:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
3:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
4:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2
7:00	0	0	0	0	0	0	0	1	2	3	1	0	0	0	7
8:00	0	0	0	0	0	0	1	2	3	1	0	2	1	0	10
9:00	0	0	0	0	0	0	0	3	6	4	7	3	1	0	24
10:00	0	0	0	0	0	0	0	1	7	3	7	0	4	1	23
11:00	0	0	0	0	0	1	2	3	6	3	3	0	0	0	18
12:00 PM	0	0	0	0	0	0	0	1	3	5	1	0	0	1	11
1:00	0	0	0	0	0	0	1	3	5	9	2	3	0	0	23
2:00	0	0	0	0	0	0	0	0	1	3	2	0	2	1	9
3:00	0	0	0	0	0	0	1	1	3	2	0	1	1	1	10
4:00	0	0	0	0	0	0	0	1	2	2	1	0	0	0	6
5:00	0	0	0	0	0	1	1	1	1	2	4	2	0	1	13
6:00	0	0	0	0	0	0	2	8	4	7	5	0	1	0	27
7:00	0	0	0	0	0	0	0	1	2	2	3	2	1	0	11
8:00	0	0	0	0	0	0	1	0	1	1	0	2	0	0	5
9:00	0	0	0	0	0	0	0	1	1	1	1	0	1	0	5
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	11	27	49	52	37	16	12	5	211
Percentile				15th	50th	85th	95th								
Speed				23	28	34	37								
Mean Speed (Average)				30.8											
10 MPH Pace Speed				23-32											
Number in Pace				147											
Percent in Pace				69.7%											
Number > 27 MPH				122											
Percent > 27 MPH				57.8%											
Grand Total	0	0	0	1	9	26	68	219	430	388	231	85	43	24	1524
Stats				Percentile	15th	50th	85th	95th							
				Speed	23	27	32	35							
Mean Speed (Average)				29.0											
10 MPH Pace Speed				23-32											
Number in Pace				1122											
Percent in Pace				73.6%											
Number > 27 MPH				771											
Percent > 27 MPH				50.6%											

Location : Evans Drive
 Location : East of Hanover Street
 City/State: Lebanon, NH
 Direction: Combined

52933001

11/10/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	0	1	1	1	0	0	1	0	4
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	2	2	0	1	0	0	0	5
3:00	0	0	0	0	0	0	0	1	2	0	1	0	0	0	4
4:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
5:00	0	0	0	0	0	0	2	4	2	4	1	2	1	0	16
6:00	0	0	0	1	1	5	7	22	26	18	10	3	1	1	95
7:00	0	0	0	1	2	29	86	143	128	75	28	7	3	1	503
8:00	0	0	0	1	0	5	12	21	37	41	21	4	1	2	145
9:00	0	0	0	0	1	2	7	8	25	8	7	3	1	0	62
10:00	0	0	0	0	4	2	5	17	20	13	7	4	1	1	74
11:00	0	0	0	0	1	4	5	21	32	24	14	7	0	2	110
12:00 PM	0	0	0	0	1	4	10	17	31	20	8	5	1	1	98
1:00	0	0	0	0	0	3	14	24	31	25	14	5	3	0	119
2:00	0	0	0	0	0	3	13	48	81	42	26	11	2	3	229
3:00	0	0	0	0	0	3	16	40	42	37	19	3	3	2	165
4:00	0	0	0	0	5	1	12	32	37	21	11	4	3	2	128
5:00	0	0	1	0	0	1	4	25	36	29	9	4	4	1	114
6:00	0	0	0	0	0	3	5	8	11	7	12	1	1	1	49
7:00	0	0	0	0	0	2	3	6	7	5	3	2	1	0	29
8:00	0	0	0	1	1	2	1	11	14	4	5	1	0	0	40
9:00	0	0	0	0	0	0	1	1	4	3	0	2	0	0	11
10:00	0	0	0	0	0	0	1	4	1	3	0	0	0	0	9
11:00	0	0	0	0	0	0	0	1	1	1	1	0	0	0	4
Total	0	0	1	4	16	69	205	457	571	381	198	68	27	17	2014

Percentile 15th 50th 85th 95th
 Speed 21 25 30 34
 Mean Speed (Average) 26.5
 10 MPH Pace Speed 21-30
 Number in Pace 1475
 Percent in Pace 73.2%
 Number > 27 MPH 691
 Percent > 27 MPH 34.3%

Location : Evans Drive
 Location : East of Hanover Street
 City/State: Lebanon, NH
 Direction: Combined

52933001

11/11/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	1	1	1	1	1	0	0	0	0	0	5
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	3	0	1	0	0	0	4
3:00	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2
4:00	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2
5:00	0	0	0	0	0	0	2	1	4	3	1	0	0	0	11
6:00	0	0	0	0	0	1	4	7	6	8	5	3	1	1	36
7:00	0	0	0	0	0	1	6	8	17	10	7	2	2	0	53
8:00	0	0	0	0	0	0	4	6	10	7	3	2	1	0	33
9:00	0	0	0	0	0	1	5	7	15	17	9	1	1	0	56
10:00	0	0	1	0	0	2	5	8	16	16	6	2	2	2	60
11:00	0	0	0	0	1	1	9	11	9	9	6	4	1	2	53
12:00 PM	0	0	0	0	0	0	8	8	20	11	16	1	1	1	66
1:00	0	0	0	0	1	3	5	12	15	8	5	4	3	0	56
2:00	0	0	0	0	1	1	6	8	9	18	5	2	2	0	52
3:00	0	0	0	0	1	1	1	7	13	15	5	3	4	0	50
4:00	0	0	0	0	0	0	1	12	15	13	8	4	3	2	58
5:00	0	0	0	1	0	1	1	7	12	15	7	0	0	0	44
6:00	0	0	0	0	0	0	3	7	7	9	6	3	0	0	35
7:00	0	0	0	0	1	1	2	3	7	1	2	2	1	0	20
8:00	0	0	0	0	0	0	1	4	6	3	2	1	0	0	17
9:00	0	0	0	0	0	1	0	0	1	1	0	1	0	0	4
10:00	0	0	0	0	0	0	0	2	5	1	2	0	0	0	10
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	1	6	15	64	121	191	167	96	35	22	8	727

Percentile 15th 50th 85th 95th
 Speed 22 26 32 35
 Mean Speed (Average) 27.8
 10 MPH Pace Speed 21-30
 Number in Pace 510
 Percent in Pace 70.2%
 Number > 27 MPH 328
 Percent > 27 MPH 45.1%

Location : Evans Drive
 Location : East of Hanover Street
 City/State: Lebanon, NH
 Direction: Combined

52933001

11/12/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
1:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2
2:00	0	0	0	0	0	2	1	0	0	0	0	0	0	0	3
3:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
4:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
5:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
6:00	0	0	0	0	0	0	0	2	3	4	2	1	1	0	13
7:00	0	0	0	0	0	0	0	1	5	3	1	0	1	0	11
8:00	0	0	0	0	0	0	3	5	8	4	2	4	2	0	28
9:00	0	0	0	0	0	2	4	10	17	9	8	4	1	1	56
10:00	0	0	0	0	0	0	1	8	14	5	10	1	5	1	45
11:00	0	0	0	0	0	2	7	8	11	7	5	2	0	0	42
12:00 PM	0	0	0	0	0	1	1	2	7	8	5	1	0	1	26
1:00	0	0	0	0	0	0	4	7	12	14	4	4	1	0	46
2:00	0	0	0	0	0	0	0	2	6	10	3	0	3	1	25
3:00	0	0	0	0	0	1	2	4	8	2	1	2	1	4	25
4:00	0	0	1	0	0	0	2	4	10	5	2	2	0	1	27
5:00	0	0	0	0	0	1	3	7	8	6	6	4	0	2	37
6:00	0	0	0	0	0	0	3	16	6	10	6	1	1	0	43
7:00	0	0	0	0	0	1	0	1	5	5	3	3	1	0	19
8:00	0	0	0	0	0	0	1	1	1	4	0	2	0	0	9
9:00	0	0	0	0	0	0	2	4	3	2	3	0	1	0	15
10:00	0	0	0	0	0	0	1	2	3	2	0	0	0	0	8
11:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Total	0	0	1	0	0	10	37	84	129	104	61	31	18	11	486
Percentile															
Speed				15th	50th	85th	95th								
				22	27	32	37								
Mean Speed (Average)				29.5											
10 MPH Pace Speed				21-30											
Number in Pace				337											
Percent in Pace				69.3%											
Number > 27 MPH				225											
Percent > 27 MPH				46.3%											
Grand Total	0	0	3	5	22	94	306	662	891	652	355	134	67	36	3227
Stats															
Percentile				15th	50th	85th	95th								
Speed				21	25	31	34								
Mean Speed (Average)				27.2											
10 MPH Pace Speed				21-30											
Number in Pace				2322											
Percent in Pace				72.0%											
Number > 27 MPH				1244											
Percent > 27 MPH				38.5%											

Location : Evans Drive
 Location : East of Hanover Street
 City/State: Lebanon, NH

52933001

11/10/2022	WB,		Hour Totals		EB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	0	12			1	11				
12:15	0	17			2	21				
12:30	1	9			0	11				
12:45	0	10	1	48	0	7	3	50	4	98
1:00	0	12			0	12				
1:15	0	12			0	21				
1:30	0	12			0	14				
1:45	0	26	0	62	0	10	0	57	0	119
2:00	2	21			1	49				
2:15	0	22			0	29				
2:30	0	22			2	30				
2:45	0	22	2	87	0	34	3	142	5	229
3:00	1	15			1	45				
3:15	0	10			0	34				
3:30	1	10			0	19				
3:45	1	11	3	46	0	21	1	119	4	165
4:00	0	13			1	20				
4:15	0	7			0	25				
4:30	0	13			0	20				
4:45	0	18	0	51	0	12	1	77	1	128
5:00	5	14			0	27				
5:15	2	11			1	25				
5:30	1	7			0	12				
5:45	5	9	13	41	2	9	3	73	16	114
6:00	10	5			2	4				
6:15	20	7			4	11				
6:30	14	7			7	4				
6:45	31	7	75	26	7	4	20	23	95	49
7:00	81	4			20	4				
7:15	149	1			54	2				
7:30	68	5			34	3				
7:45	63	8	361	18	34	2	142	11	503	29
8:00	41	5			25	15				
8:15	21	4			19	3				
8:30	9	2			7	7				
8:45	12	1	83	12	11	3	62	28	145	40
9:00	12	2			7	0				
9:15	7	2			9	0				
9:30	11	2			8	3				
9:45	4	0	34	6	4	2	28	5	62	11
10:00	8	2			6	1				
10:15	2	3			15	0				
10:30	8	1			6	0				
10:45	18	1	36	7	11	1	38	2	74	9
11:00	10	1			25	0				
11:15	15	0			18	1				
11:30	13	0			9	1				
11:45	9	0	47	1	11	1	63	3	110	4
Total	655	405			364	590			1019	995
Percent	61.8%	38.2%			38.2%	61.8%			50.6%	49.4%

Location : Evans Drive
 Location : East of Hanover Street
 City/State: Lebanon, NH

52933001

11/11/2022	WB,		Hour Totals		EB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	2	4			0	10				
12:15	1	11			0	8				
12:30	0	8			1	10				
12:45	0	9	3	32	1	6	2	34	5	66
1:00	0	11			0	3				
1:15	0	4			0	6				
1:30	0	5			0	10				
1:45	0	9	0	29	0	8	0	27	0	56
2:00	0	3			1	9				
2:15	0	11			0	4				
2:30	0	2			2	12				
2:45	1	3	1	19	0	8	3	33	4	52
3:00	0	5			1	12				
3:15	0	1			0	3				
3:30	0	5			0	10				
3:45	1	6	1	17	0	8	1	33	2	50
4:00	0	4			0	19				
4:15	0	2			0	6				
4:30	0	6			0	10				
4:45	1	6	1	18	1	5	1	40	2	58
5:00	0	4			0	12				
5:15	2	5			2	7				
5:30	2	4			1	4				
5:45	3	4	7	17	1	4	4	27	11	44
6:00	5	4			1	3				
6:15	13	6			1	6				
6:30	9	4			0	5				
6:45	5	4	32	18	2	3	4	17	36	35
7:00	8	2			2	1				
7:15	7	4			3	1				
7:30	10	2			6	5				
7:45	14	4	39	12	3	1	14	8	53	20
8:00	6	2			2	1				
8:15	7	3			3	1				
8:30	4	2			4	3				
8:45	5	4	22	11	2	1	11	6	33	17
9:00	3	2			8	0				
9:15	10	0			5	1				
9:30	9	0			8	0				
9:45	9	0	31	2	4	1	25	2	56	4
10:00	7	1			6	1				
10:15	4	1			8	3				
10:30	10	2			7	0				
10:45	6	2	27	6	12	0	33	4	60	10
11:00	7	0			7	0				
11:15	3	0			8	0				
11:30	4	0			9	0				
11:45	9	0	23	0	6	0	30	0	53	0
Total	187	181			128	231			315	412
Percent	50.8%	49.2%			35.7%	64.3%			43.3%	56.7%

Location : Evans Drive
 Location : East of Hanover Street
 City/State: Lebanon, NH

52933001

11/12/2022	WB,		Hour Totals		EB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	0	5			1	4				
12:15	0	4			0	4				
12:30	0	6			0	2				
12:45	0	0	0	15	1	1	2	11	2	26
1:00	0	4			0	2				
1:15	0	6			1	15				
1:30	0	9			1	3				
1:45	0	4	0	23	0	3	2	23	2	46
2:00	1	7			0	5				
2:15	0	3			1	2				
2:30	1	3			0	0				
2:45	0	3	2	16	0	2	1	9	3	25
3:00	0	3			0	2				
3:15	0	5			0	0				
3:30	0	5			0	3				
3:45	0	2	0	15	1	5	1	10	1	25
4:00	0	5			0	3				
4:15	0	7			0	1				
4:30	0	4			1	2				
4:45	0	5	0	21	0	0	1	6	1	27
5:00	0	4			0	2				
5:15	0	3			0	5				
5:30	1	4			0	2				
5:45	0	13	1	24	0	4	0	13	1	37
6:00	3	5			1	18				
6:15	3	3			0	5				
6:30	3	4			1	3				
6:45	2	4	11	16	0	1	2	27	13	43
7:00	1	2			1	4				
7:15	1	1			0	4				
7:30	2	0			4	0				
7:45	0	5	4	8	2	3	7	11	11	19
8:00	4	1			1	2				
8:15	2	1			1	1				
8:30	3	2			6	1				
8:45	9	0	18	4	2	1	10	5	28	9
9:00	1	5			5	2				
9:15	2	2			1	2				
9:30	11	1			7	1				
9:45	18	2	32	10	11	0	24	5	56	15
10:00	5	3			6	0				
10:15	7	2			7	0				
10:30	3	1			3	0				
10:45	7	2	22	8	7	0	23	0	45	8
11:00	5	1			2	0				
11:15	9	0			4	1				
11:30	5	1			3	0				
11:45	5	0	24	2	9	0	18	1	42	3
Total	114	162			91	121			205	283
Percent	41.3%	58.7%			42.9%	57.1%			42.0%	58.0%
Grand Total	956	748			583	942			1539	1690
Percent	56.1%	43.9%			38.2%	61.8%			47.7%	52.3%

ADT

ADT: 1,076

AADT: 1,076

Location : Evans Drive
 Location : East of Hanover Street
 City/State: Lebanon, NH

52933001

11/7/2022	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday		Week Average	
Time	WB,	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,	EB,
12:00 AM	*	*	*	*	*	*	1	3	3	2	0	2	*	*	1	2
1:00	*	*	*	*	*	*	0	0	0	0	0	2	*	*	0	1
2:00	*	*	*	*	*	*	2	3	1	3	2	1	*	*	2	2
3:00	*	*	*	*	*	*	3	1	1	1	0	1	*	*	1	1
4:00	*	*	*	*	*	*	0	1	1	1	0	1	*	*	0	1
5:00	*	*	*	*	*	*	13	3	7	4	1	0	*	*	7	2
6:00	*	*	*	*	*	*	75	20	32	4	11	2	*	*	39	9
7:00	*	*	*	*	*	*	361	142	39	14	4	7	*	*	135	54
8:00	*	*	*	*	*	*	83	62	22	11	18	10	*	*	41	28
9:00	*	*	*	*	*	*	34	28	31	25	32	24	*	*	32	26
10:00	*	*	*	*	*	*	36	38	27	33	22	23	*	*	28	31
11:00	*	*	*	*	*	*	47	63	23	30	24	18	*	*	31	37
12:00 PM	*	*	*	*	*	*	48	50	32	34	15	11	*	*	32	32
1:00	*	*	*	*	*	*	62	57	29	27	23	23	*	*	38	36
2:00	*	*	*	*	*	*	87	142	19	33	16	9	*	*	41	61
3:00	*	*	*	*	*	*	46	119	17	33	15	10	*	*	26	54
4:00	*	*	*	*	*	*	51	77	18	40	21	6	*	*	30	41
5:00	*	*	*	*	*	*	41	73	17	27	24	13	*	*	27	38
6:00	*	*	*	*	*	*	26	23	18	17	16	27	*	*	20	22
7:00	*	*	*	*	*	*	18	11	12	8	8	11	*	*	13	10
8:00	*	*	*	*	*	*	12	28	11	6	4	5	*	*	9	13
9:00	*	*	*	*	*	*	6	5	2	2	10	5	*	*	6	4
10:00	*	*	*	*	*	*	7	2	6	4	8	0	*	*	7	2
11:00	*	*	*	*	*	*	1	3	0	0	1	0	*	*	1	1
Total	0	0	0	0	0	0	1060	954	368	359	275	211	0	0	567	508
Day	0		0		0		2014		727		486		0		1075	
AM Peak							7:00	7:00	7:00	10:00	9:00	9:00			7:00	7:00
Volume							361	142	39	33	32	24			135	54
PM Peak							2:00	2:00	12:00 PM	4:00	5:00	6:00			2:00	2:00
Volume							87	142	32	40	24	27			41	61
Comb Total	0		0		0		2014		727		486		0		1075	
ADT	ADT: 1,076		AADT: 1,076													

Location : Hanover Street
 Location : North of Evans Drive
 City/State: Lebanon, NH
 Direction: NB,

52933002

11/10/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
3:00	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	1	3	7	1	0	0	0	0	0	0	0	0	12
6:00	0	0	0	16	37	15	8	0	0	0	0	0	0	0	76
7:00	0	0	7	63	217	66	10	0	0	0	0	1	0	0	364
8:00	0	0	1	16	53	10	0	1	1	0	0	0	0	0	82
9:00	0	0	2	6	15	12	3	1	0	0	0	0	0	0	39
10:00	0	0	1	11	16	6	0	0	0	0	0	0	0	0	34
11:00	0	0	2	4	28	12	1	1	0	0	0	0	0	0	48
12:00 PM	0	0	2	11	26	12	4	0	1	0	0	0	0	0	56
1:00	0	0	2	13	30	5	1	1	0	0	0	0	0	0	52
2:00	0	0	7	15	54	11	4	0	0	0	0	0	0	0	91
3:00	0	0	2	17	34	3	2	0	0	0	0	0	0	0	58
4:00	0	0	0	6	30	13	0	0	0	0	0	0	0	0	49
5:00	0	0	3	7	25	9	4	0	0	0	0	0	0	0	48
6:00	0	0	1	5	11	7	1	0	0	0	0	0	0	0	25
7:00	0	0	0	7	9	3	2	0	0	0	0	0	0	0	21
8:00	0	0	0	5	8	0	0	0	0	0	0	0	0	0	13
9:00	0	0	0	1	4	2	0	0	0	0	0	0	0	0	7
10:00	0	0	0	2	3	2	0	0	0	0	0	0	0	0	7
11:00	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
Total	0	0	31	210	611	190	40	4	2	0	0	1	0	0	1089

Percentile 15th 50th 85th 95th
 Speed 12 14 15 17
 Mean Speed (Average) 13.6
 10 MPH Pace Speed 9-18
 Number in Pace 1024
 Percent in Pace 94.0%
 Number > 15 MPH 237
 Percent > 15 MPH 21.8%

Location : Hanover Street
 Location : North of Evans Drive
 City/State: Lebanon, NH
 Direction: NB,

52933002

11/11/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	1	0	1	1	0	0	0	0	0	0	0	3
1:00	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
2:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
3:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	8	0	0	0	0	0	0	0	0	0	8
6:00	0	0	0	9	17	8	2	0	0	0	0	0	0	0	36
7:00	0	0	0	9	23	8	2	0	0	0	0	0	0	0	42
8:00	0	0	0	7	10	7	2	0	0	0	0	0	0	0	26
9:00	0	0	2	6	16	6	4	0	0	0	0	0	0	0	34
10:00	0	0	1	6	19	2	1	0	0	0	0	0	0	0	29
11:00	0	0	2	3	11	2	3	0	0	0	0	0	0	0	21
12:00 PM	0	0	2	5	20	8	1	0	0	0	0	0	0	0	36
1:00	0	0	0	7	14	7	4	0	0	0	0	0	0	0	32
2:00	0	0	2	5	12	2	2	0	0	0	0	0	0	0	23
3:00	0	0	0	3	9	3	2	0	0	0	0	0	0	0	17
4:00	0	0	0	3	11	6	1	0	0	0	0	0	0	0	21
5:00	0	0	1	2	10	6	1	0	0	0	0	0	0	0	20
6:00	0	0	0	1	11	3	3	0	0	0	0	0	0	0	18
7:00	0	0	0	3	6	3	1	1	0	0	0	0	0	0	14
8:00	0	0	0	3	6	1	0	0	0	0	0	0	0	0	10
9:00	0	0	0	1	1	0	1	0	0	0	0	0	0	0	3
10:00	0	0	0	3	4	1	0	0	0	0	0	0	0	0	8
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	10	77	210	75	31	1	0	0	0	0	0	0	404

Percentile 15th 50th 85th 95th
 Speed 12 14 17 18
 Mean Speed (Average) 13.9
 10 MPH Pace Speed 9-18
 Number in Pace 372
 Percent in Pace 92.1%
 Number > 15 MPH 107
 Percent > 15 MPH 26.5%

Location : Hanover Street
 Location : North of Evans Drive
 City/State: Lebanon, NH
 Direction: NB,

52933002

11/12/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
6:00	0	0	0	2	7	4	1	0	0	0	0	0	0	0	14
7:00	0	0	0	0	3	4	0	0	0	0	0	0	0	0	7
8:00	0	0	0	2	11	4	1	0	0	0	0	0	0	0	18
9:00	0	0	1	6	17	5	4	0	0	0	0	0	0	0	33
10:00	0	0	1	11	9	2	1	0	0	0	0	0	0	0	24
11:00	0	0	0	6	9	6	2	0	0	0	0	0	0	0	23
12:00 PM	0	0	0	4	12	3	2	0	0	0	0	0	0	0	21
1:00	0	0	0	6	15	4	2	1	0	0	0	0	0	0	28
2:00	0	0	0	1	7	9	1	0	0	0	0	0	0	0	18
3:00	0	0	0	2	6	8	0	2	0	0	0	0	0	0	18
4:00	0	0	0	3	8	9	1	1	0	0	0	0	0	0	22
5:00	0	0	0	4	17	6	1	0	0	0	0	0	0	0	28
6:00	0	0	0	5	10	3	0	0	1	0	0	0	0	0	19
7:00	0	0	0	1	6	1	0	0	0	0	0	0	0	0	8
8:00	0	0	0	0	2	2	1	0	0	0	0	0	0	0	5
9:00	0	0	0	2	6	2	1	0	0	0	0	0	0	0	11
10:00	0	0	0	2	7	0	0	0	0	0	0	0	0	0	9
11:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Total	0	0	2	59	156	72	18	4	1	0	0	0	0	0	312
Percentile				15th	50th	85th	95th								
Speed				12	14	17	19								
Mean Speed (Average)				14.1											
10 MPH Pace Speed				9-18											
Number in Pace				292											
Percent in Pace				93.6%											
Number > 15 MPH				95											
Percent > 15 MPH				30.4%											
Grand Total	0	0	43	346	977	337	89	9	3	0	0	1	0	0	1805
Stats				Percentile	15th	50th	85th	95th							
				Speed	12	15	18	19							
Mean Speed (Average)				14.8											
10 MPH Pace Speed				9-18											
Number in Pace				1688											
Percent in Pace				93.5%											
Number > 15 MPH				1336											
Percent > 15 MPH				41.5%											

Location : Hanover Street
 Location : North of Evans Drive
 City/State: Lebanon, NH
 Direction: SB,

52933002

11/10/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	2	1	0	0	0	0	0	0	0	0	3
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
3:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
4:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5:00	0	0	0	0	1	2	0	0	0	0	0	0	0	0	3
6:00	0	0	0	0	1	2	7	0	0	0	0	0	0	0	10
7:00	0	0	19	24	57	39	6	1	0	0	0	0	0	0	146
8:00	0	0	1	5	13	21	11	0	2	0	0	0	0	0	53
9:00	0	0	0	0	3	9	10	1	0	0	0	0	0	0	23
10:00	0	0	0	0	9	11	8	1	0	0	0	0	0	0	29
11:00	0	0	0	3	15	14	23	5	0	1	0	0	0	0	61
12:00 PM	0	0	0	2	8	22	14	0	0	0	0	0	0	0	46
1:00	0	0	0	3	7	20	13	3	0	1	0	0	0	1	48
2:00	0	0	27	18	39	42	10	0	0	0	0	0	0	0	136
3:00	0	0	2	6	26	31	12	1	1	0	0	0	0	0	79
4:00	0	0	0	0	13	30	14	5	0	0	0	0	0	0	62
5:00	0	0	0	2	20	24	15	3	1	1	1	0	0	0	67
6:00	0	0	0	1	6	11	5	0	0	0	0	0	0	0	23
7:00	0	0	1	0	3	5	4	0	1	0	1	0	0	0	15
8:00	0	0	0	1	8	10	7	0	0	0	0	0	0	0	26
9:00	0	0	0	1	0	4	0	0	0	0	0	0	0	0	5
10:00	0	0	0	0	2	1	0	0	0	0	0	0	0	0	3
11:00	0	0	0	0	1	2	0	0	1	0	0	0	0	0	4
Total	0	0	50	66	238	301	160	20	6	3	2	0	0	1	847

Percentile 15th 50th 85th 95th
 Speed 12 15 19 20
 Mean Speed (Average) 15.7
 10 MPH Pace Speed 11-20
 Number in Pace 718
 Percent in Pace 84.8%
 Number > 15 MPH 493
 Percent > 15 MPH 58.2%

Location : Hanover Street
 Location : North of Evans Drive
 City/State: Lebanon, NH
 Direction: SB,

52933002

11/11/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	1	0	1	1	0	0	0	0	0	0	0	3
3:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
4:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5:00	0	0	0	0	2	2	0	0	1	0	0	0	0	0	5
6:00	0	0	0	0	0	2	1	0	0	0	0	0	0	0	3
7:00	0	0	0	0	2	7	4	0	0	0	0	0	0	0	13
8:00	0	0	0	0	1	3	6	1	1	0	0	0	0	0	12
9:00	0	0	1	0	2	9	8	0	0	1	1	0	0	0	22
10:00	0	0	1	1	9	12	4	3	1	1	2	1	0	0	35
11:00	0	0	0	1	5	12	6	1	2	0	0	0	0	0	27
12:00 PM	0	0	0	1	8	16	7	0	0	1	0	0	0	0	33
1:00	0	0	0	0	6	9	10	0	0	0	0	0	0	0	25
2:00	0	0	2	5	8	3	10	3	0	1	0	0	0	0	32
3:00	0	0	0	1	8	11	5	2	0	0	0	0	0	0	27
4:00	0	0	0	1	8	15	14	0	0	0	0	0	0	0	38
5:00	0	0	0	1	9	11	4	0	0	1	0	0	0	0	26
6:00	0	0	0	1	10	2	4	0	1	0	0	0	0	0	18
7:00	0	0	0	1	3	4	3	0	1	0	0	0	0	0	12
8:00	0	0	0	0	2	2	0	0	0	0	0	0	0	0	4
9:00	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
10:00	0	0	0	0	2	2	0	0	0	0	0	0	0	0	4
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	4	15	87	123	88	10	9	5	3	1	0	0	345

Percentile 15th 50th 85th 95th
 Speed 14 17 19 24
 Mean Speed (Average) 17.0
 10 MPH Pace Speed 11-20
 Number in Pace 301
 Percent in Pace 87.2%
 Number > 15 MPH 239
 Percent > 15 MPH 69.3%

Location : Hanover Street
 Location : North of Evans Drive
 City/State: Lebanon, NH
 Direction: SB,

52933002

11/12/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
1:00	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
2:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
3:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
4:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
7:00	0	0	0	0	1	3	4	0	0	0	0	0	0	0	8
8:00	0	0	0	1	1	7	2	0	0	0	0	0	0	0	11
9:00	0	0	1	1	1	10	9	0	1	0	0	0	0	0	23
10:00	0	0	0	0	2	12	7	2	0	0	0	0	0	0	23
11:00	0	0	0	1	5	5	6	0	1	0	0	0	0	0	18
12:00 PM	0	0	0	0	8	2	1	2	0	0	0	0	0	0	13
1:00	0	0	0	0	3	10	9	0	0	0	0	0	0	0	22
2:00	0	0	0	0	2	5	5	0	0	0	0	0	0	0	12
3:00	0	0	0	0	1	7	2	0	1	0	0	0	0	0	11
4:00	0	0	0	1	2	4	0	0	0	0	0	0	0	0	7
5:00	0	0	1	0	5	2	5	0	1	0	0	0	0	0	14
6:00	0	0	0	2	8	12	4	0	1	1	0	0	0	0	28
7:00	0	0	0	0	3	8	2	0	0	0	0	0	0	0	13
8:00	0	0	0	0	1	0	2	0	0	0	1	0	0	0	4
9:00	0	0	0	0	1	2	2	0	0	0	0	0	0	0	5
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	2	7	47	93	61	4	5	1	1	0	0	0	221
Percentile															
Speed				15th	50th	85th	95th								
				14	17	19	20								
Mean Speed (Average)				16.9											
10 MPH Pace Speed				11-20											
Number in Pace				202											
Percent in Pace				91.4%											
Number > 15 MPH				165											
Percent > 15 MPH				74.7%											
Grand Total	0	0	56	88	372	517	309	34	20	9	6	1	0	1	1413
Stats															
Percentile				15th	50th	85th	95th								
Speed				13	16	19	21								
Mean Speed (Average)				16.2											
10 MPH Pace Speed				11-20											
Number in Pace				1220											
Percent in Pace				86.3%											
Number > 15 MPH				897											
Percent > 15 MPH				63.5%											

Location : Hanover Street
 Location : North of Evans Drive
 City/State: Lebanon, NH
 Direction: Combined

52933002

11/10/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	3	1	0	0	0	0	0	0	0	0	4
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	4	1	0	0	0	0	0	0	0	0	5
3:00	0	0	0	1	1	0	1	0	0	0	0	0	0	0	3
4:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5:00	0	0	1	3	8	3	0	0	0	0	0	0	0	0	15
6:00	0	0	0	16	38	17	15	0	0	0	0	0	0	0	86
7:00	0	0	26	87	274	105	16	1	0	0	0	1	0	0	510
8:00	0	0	2	21	66	31	11	1	3	0	0	0	0	0	135
9:00	0	0	2	6	18	21	13	2	0	0	0	0	0	0	62
10:00	0	0	1	11	25	17	8	1	0	0	0	0	0	0	63
11:00	0	0	2	7	43	26	24	6	0	1	0	0	0	0	109
12:00 PM	0	0	2	13	34	34	18	0	1	0	0	0	0	0	102
1:00	0	0	2	16	37	25	14	4	0	1	0	0	0	1	100
2:00	0	0	34	33	93	53	14	0	0	0	0	0	0	0	227
3:00	0	0	4	23	60	34	14	1	1	0	0	0	0	0	137
4:00	0	0	0	6	43	43	14	5	0	0	0	0	0	0	111
5:00	0	0	3	9	45	33	19	3	1	1	1	0	0	0	115
6:00	0	0	1	6	17	18	6	0	0	0	0	0	0	0	48
7:00	0	0	1	7	12	8	6	0	1	0	1	0	0	0	36
8:00	0	0	0	6	16	10	7	0	0	0	0	0	0	0	39
9:00	0	0	0	2	4	6	0	0	0	0	0	0	0	0	12
10:00	0	0	0	2	5	3	0	0	0	0	0	0	0	0	10
11:00	0	0	0	1	2	2	0	0	1	0	0	0	0	0	6
Total	0	0	81	276	849	491	200	24	8	3	2	1	0	1	1936

Percentile 15th 50th 85th 95th
 Speed 12 14 17 19
 Mean Speed (Average) 14.5
 10 MPH Pace Speed 9-18
 Number in Pace 1679
 Percent in Pace 86.7%
 Number > 15 MPH 730
 Percent > 15 MPH 37.7%

Location : Hanover Street
 Location : North of Evans Drive
 City/State: Lebanon, NH
 Direction: Combined

52933002

11/11/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	2	0	1	1	0	1	0	0	0	0	0	5
1:00	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
2:00	0	0	0	1	1	1	1	0	0	0	0	0	0	0	4
3:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
4:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5:00	0	0	0	0	10	2	0	0	1	0	0	0	0	0	13
6:00	0	0	0	9	17	10	3	0	0	0	0	0	0	0	39
7:00	0	0	0	9	25	15	6	0	0	0	0	0	0	0	55
8:00	0	0	0	7	11	10	8	1	1	0	0	0	0	0	38
9:00	0	0	3	6	18	15	12	0	0	1	1	0	0	0	56
10:00	0	0	2	7	28	14	5	3	1	1	2	1	0	0	64
11:00	0	0	2	4	16	14	9	1	2	0	0	0	0	0	48
12:00 PM	0	0	2	6	28	24	8	0	0	1	0	0	0	0	69
1:00	0	0	0	7	20	16	14	0	0	0	0	0	0	0	57
2:00	0	0	4	10	20	5	12	3	0	1	0	0	0	0	55
3:00	0	0	0	4	17	14	7	2	0	0	0	0	0	0	44
4:00	0	0	0	4	19	21	15	0	0	0	0	0	0	0	59
5:00	0	0	1	3	19	17	5	0	0	1	0	0	0	0	46
6:00	0	0	0	2	21	5	7	0	1	0	0	0	0	0	36
7:00	0	0	0	4	9	7	4	1	1	0	0	0	0	0	26
8:00	0	0	0	3	8	3	0	0	0	0	0	0	0	0	14
9:00	0	0	0	1	1	0	2	0	1	0	0	0	0	0	5
10:00	0	0	0	3	6	3	0	0	0	0	0	0	0	0	12
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	14	92	297	198	119	11	9	5	3	1	0	0	749

Percentile 15th
 Speed 12
 50th 15
 85th 18
 95th 20
 Mean Speed (Average) 15.3
 10 MPH Pace Speed 11-20
 Number in Pace 644
 Percent in Pace 86.0%
 Number > 15 MPH 346
 Percent > 15 MPH 46.2%

Location : Hanover Street
 Location : North of Evans Drive
 City/State: Lebanon, NH
 Direction: Combined

52933002

11/12/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	1	2	1	0	0	0	0	0	0	0	0	4
1:00	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
2:00	0	0	0	2	1	0	0	0	0	0	0	0	0	0	3
3:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
4:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
6:00	0	0	0	2	7	5	2	0	0	0	0	0	0	0	16
7:00	0	0	0	0	4	7	4	0	0	0	0	0	0	0	15
8:00	0	0	0	3	12	11	3	0	0	0	0	0	0	0	29
9:00	0	0	2	7	18	15	13	0	1	0	0	0	0	0	56
10:00	0	0	1	11	11	14	8	2	0	0	0	0	0	0	47
11:00	0	0	0	7	14	11	8	0	1	0	0	0	0	0	41
12:00 PM	0	0	0	4	20	5	3	2	0	0	0	0	0	0	34
1:00	0	0	0	6	18	14	11	1	0	0	0	0	0	0	50
2:00	0	0	0	1	9	14	6	0	0	0	0	0	0	0	30
3:00	0	0	0	2	7	15	2	2	1	0	0	0	0	0	29
4:00	0	0	0	4	10	13	1	1	0	0	0	0	0	0	29
5:00	0	0	1	4	22	8	6	0	1	0	0	0	0	0	42
6:00	0	0	0	7	18	15	4	0	2	1	0	0	0	0	47
7:00	0	0	0	1	9	9	2	0	0	0	0	0	0	0	21
8:00	0	0	0	0	3	2	3	0	0	0	1	0	0	0	9
9:00	0	0	0	2	7	4	3	0	0	0	0	0	0	0	16
10:00	0	0	0	2	7	0	0	0	0	0	0	0	0	0	9
11:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Total	0	0	4	66	203	165	79	8	6	1	1	0	0	0	533
Percentile															
Speed				15th	50th	85th	95th								
				12	15	18	20								
Mean Speed (Average)				15.3											
10 MPH Pace Speed				11-20											
Number in Pace				469											
Percent in Pace				88.0%											
Number > 15 MPH				260											
Percent > 15 MPH				48.8%											
Grand Total	0	0	99	434	1349	854	398	43	23	9	6	2	0	1	3218
Stats															
Percentile				15th	50th	85th	95th								
Speed				12	15	18	19								
Mean Speed (Average)				14.8											
10 MPH Pace Speed				9-18											
Number in Pace				2760											
Percent in Pace				85.8%											
Number > 15 MPH				1336											
Percent > 15 MPH				41.5%											

Location : Hanover Street
 Location : North of Evans Drive
 City/State: Lebanon, NH

52933002

11/10/2022	NB,		Hour Totals		SB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	0	13			1	9				
12:15	0	20			2	22				
12:30	1	12			0	10				
12:45	0	11	1	56	0	5	3	46	4	102
1:00	0	12			0	11				
1:15	0	8			0	20				
1:30	0	10			0	10				
1:45	0	22	0	52	0	7	0	48	0	100
2:00	2	27			1	45				
2:15	0	21			0	29				
2:30	0	21			2	30				
2:45	0	22	2	91	0	32	3	136	5	227
3:00	1	28			1	25				
3:15	0	11			0	24				
3:30	0	9			0	13				
3:45	1	10	2	58	0	17	1	79	3	137
4:00	0	12			1	20				
4:15	0	6			0	18				
4:30	0	13			0	13				
4:45	0	18	0	49	0	11	1	62	1	111
5:00	4	16			0	23				
5:15	2	14			1	24				
5:30	1	9			0	11				
5:45	5	9	12	48	2	9	3	67	15	115
6:00	11	4			0	4				
6:15	19	6			3	12				
6:30	17	7			2	2				
6:45	29	8	76	25	5	5	10	23	86	48
7:00	72	3			23	4				
7:15	162	4			53	3				
7:30	67	5			32	5				
7:45	63	9	364	21	38	3	146	15	510	36
8:00	39	5			22	16				
8:15	26	4			17	2				
8:30	8	4			6	7				
8:45	9	0	82	13	8	1	53	26	135	39
9:00	14	2			6	0				
9:15	6	2			8	0				
9:30	13	3			4	3				
9:45	6	0	39	7	5	2	23	5	62	12
10:00	10	2			5	1				
10:15	2	3			12	0				
10:30	5	1			5	0				
10:45	17	1	34	7	7	2	29	3	63	10
11:00	9	1			25	0				
11:15	13	0			18	1				
11:30	16	0			9	2				
11:45	10	1	48	2	9	1	61	4	109	6
Total	660	429			333	514			993	943
Percent	60.6%	39.4%			39.3%	60.7%			51.3%	48.7%

Location : Hanover Street
 Location : North of Evans Drive
 City/State: Lebanon, NH

52933002

11/11/2022	NB,		Hour Totals		SB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	2	6			0	8				
12:15	1	12			0	8				
12:30	0	9			1	11				
12:45	0	9	3	36	1	6	2	33	5	69
1:00	0	12			0	2				
1:15	1	4			0	6				
1:30	0	5			0	9				
1:45	0	11	1	32	0	8	0	25	1	57
2:00	0	7			1	9				
2:15	0	10			0	3				
2:30	0	3			2	12				
2:45	1	3	1	23	0	8	3	32	4	55
3:00	0	6			1	10				
3:15	0	1			0	2				
3:30	0	4			0	9				
3:45	1	6	1	17	0	6	1	27	2	44
4:00	0	4			0	16				
4:15	0	2			0	7				
4:30	0	7			0	10				
4:45	0	8	0	21	1	5	1	38	1	59
5:00	1	5			0	11				
5:15	1	6			2	8				
5:30	2	4			1	3				
5:45	4	5	8	20	2	4	5	26	13	46
6:00	4	4			0	3				
6:15	15	6			1	6				
6:30	11	4			0	6				
6:45	6	4	36	18	2	3	3	18	39	36
7:00	7	2			1	2				
7:15	7	5			3	4				
7:30	12	3			6	5				
7:45	16	4	42	14	3	1	13	12	55	26
8:00	8	1			2	0				
8:15	10	3			4	1				
8:30	3	2			4	2				
8:45	5	4	26	10	2	1	12	4	38	14
9:00	5	2			8	0				
9:15	12	0			7	0				
9:30	9	1			3	1				
9:45	8	0	34	3	4	1	22	2	56	5
10:00	8	2			6	1				
10:15	4	1			8	2				
10:30	12	2			8	1				
10:45	5	3	29	8	13	0	35	4	64	12
11:00	6	0			5	0				
11:15	3	0			8	0				
11:30	3	0			8	0				
11:45	9	0	21	0	6	0	27	0	48	0
Total	202	202			124	221			326	423
Percent	50.0%	50.0%			35.9%	64.1%			43.5%	56.5%

Location : Hanover Street
 Location : North of Evans Drive
 City/State: Lebanon, NH

52933002

11/12/2022	NB,		Hour Totals		SB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	0	6			1	4				
12:15	0	4			0	5				
12:30	0	7			0	2				
12:45	2	4	2	21	1	2	2	13	4	34
1:00	0	5			0	4				
1:15	0	6			1	13				
1:30	0	9			1	2				
1:45	0	8	0	28	0	3	2	22	2	50
2:00	1	7			1	6				
2:15	0	5			0	4				
2:30	1	3			0	0				
2:45	0	3	2	18	0	2	1	12	3	30
3:00	0	3			0	3				
3:15	0	6			0	0				
3:30	0	7			0	3				
3:45	0	2	0	18	1	5	1	11	1	29
4:00	0	5			0	3				
4:15	0	7			0	3				
4:30	0	4			1	1				
4:45	0	6	0	22	0	0	1	7	1	29
5:00	0	5			0	2				
5:15	0	5			0	5				
5:30	1	5			0	3				
5:45	0	13	1	28	0	4	0	14	1	42
6:00	4	6			1	18				
6:15	5	3			0	6				
6:30	3	5			1	3				
6:45	2	5	14	19	0	1	2	28	16	47
7:00	2	2			1	4				
7:15	1	1			1	5				
7:30	3	0			5	0				
7:45	1	5	7	8	1	4	8	13	15	21
8:00	4	1			1	1				
8:15	2	1			1	2				
8:30	3	2			6	0				
8:45	9	1	18	5	3	1	11	4	29	9
9:00	1	5			5	2				
9:15	3	1			2	2				
9:30	12	1			6	1				
9:45	17	4	33	11	10	0	23	5	56	16
10:00	5	2			6	0				
10:15	7	3			7	0				
10:30	5	2			3	0				
10:45	7	2	24	9	7	0	23	0	47	9
11:00	4	1			3	0				
11:15	9	0			5	1				
11:30	5	1			3	0				
11:45	5	0	23	2	7	0	18	1	41	3
Total	124	189			92	130			216	319
Percent	39.6%	60.4%			41.4%	58.6%			40.4%	59.6%
Grand Total	986	820			549	865			1535	1685
Percent	54.6%	45.4%			38.8%	61.2%			47.7%	52.3%

ADT

ADT: 1,073

AADT: 1,073

Location : Hanover Street
 Location : North of Evans Drive
 City/State: Lebanon, NH

52933002

11/7/2022	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday		Week Average	
Time	NB,	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,	SB,
12:00 AM	*	*	*	*	*	*	1	3	3	2	2	2	*	*	2	2
1:00	*	*	*	*	*	*	0	0	1	0	0	2	*	*	0	1
2:00	*	*	*	*	*	*	2	3	1	3	2	1	*	*	2	2
3:00	*	*	*	*	*	*	2	1	1	1	0	1	*	*	1	1
4:00	*	*	*	*	*	*	0	1	0	1	0	1	*	*	0	1
5:00	*	*	*	*	*	*	12	3	8	5	1	0	*	*	7	3
6:00	*	*	*	*	*	*	76	10	36	3	14	2	*	*	42	5
7:00	*	*	*	*	*	*	364	146	42	13	7	8	*	*	138	56
8:00	*	*	*	*	*	*	82	53	26	12	18	11	*	*	42	25
9:00	*	*	*	*	*	*	39	23	34	22	33	23	*	*	35	23
10:00	*	*	*	*	*	*	34	29	29	35	24	23	*	*	29	29
11:00	*	*	*	*	*	*	48	61	21	27	23	18	*	*	31	35
12:00 PM	*	*	*	*	*	*	56	46	36	33	21	13	*	*	38	31
1:00	*	*	*	*	*	*	52	48	32	25	28	22	*	*	37	32
2:00	*	*	*	*	*	*	91	136	23	32	18	12	*	*	44	60
3:00	*	*	*	*	*	*	58	79	17	27	18	11	*	*	31	39
4:00	*	*	*	*	*	*	49	62	21	38	22	7	*	*	31	36
5:00	*	*	*	*	*	*	48	67	20	26	28	14	*	*	32	36
6:00	*	*	*	*	*	*	25	23	18	18	19	28	*	*	21	23
7:00	*	*	*	*	*	*	21	15	14	12	8	13	*	*	14	13
8:00	*	*	*	*	*	*	13	26	10	4	5	4	*	*	9	11
9:00	*	*	*	*	*	*	7	5	3	2	11	5	*	*	7	4
10:00	*	*	*	*	*	*	7	3	8	4	9	0	*	*	8	2
11:00	*	*	*	*	*	*	2	4	0	0	1	0	*	*	1	1
Total	0	0	0	0	0	0	1089	847	404	345	312	221	0	0	602	471
Day	0		0		0		1936		749		533		0		1073	
AM Peak							7:00	7:00	7:00	10:00	9:00	9:00			7:00	7:00
Volume							364	146	42	35	33	23			138	56
PM Peak							2:00	2:00	12:00 PM	4:00	1:00	6:00			2:00	2:00
Volume							91	136	36	38	28	28			44	60
Comb Total	0		0		0		1936		749		533		0		1073	
ADT	ADT: 1,073		AADT: 1,073													

N/S Street : Hanover Street
 E/W Street : Evans Drive
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933001
 Site Code : 52933001
 Start Date : 11/10/2022
 Page No : 1

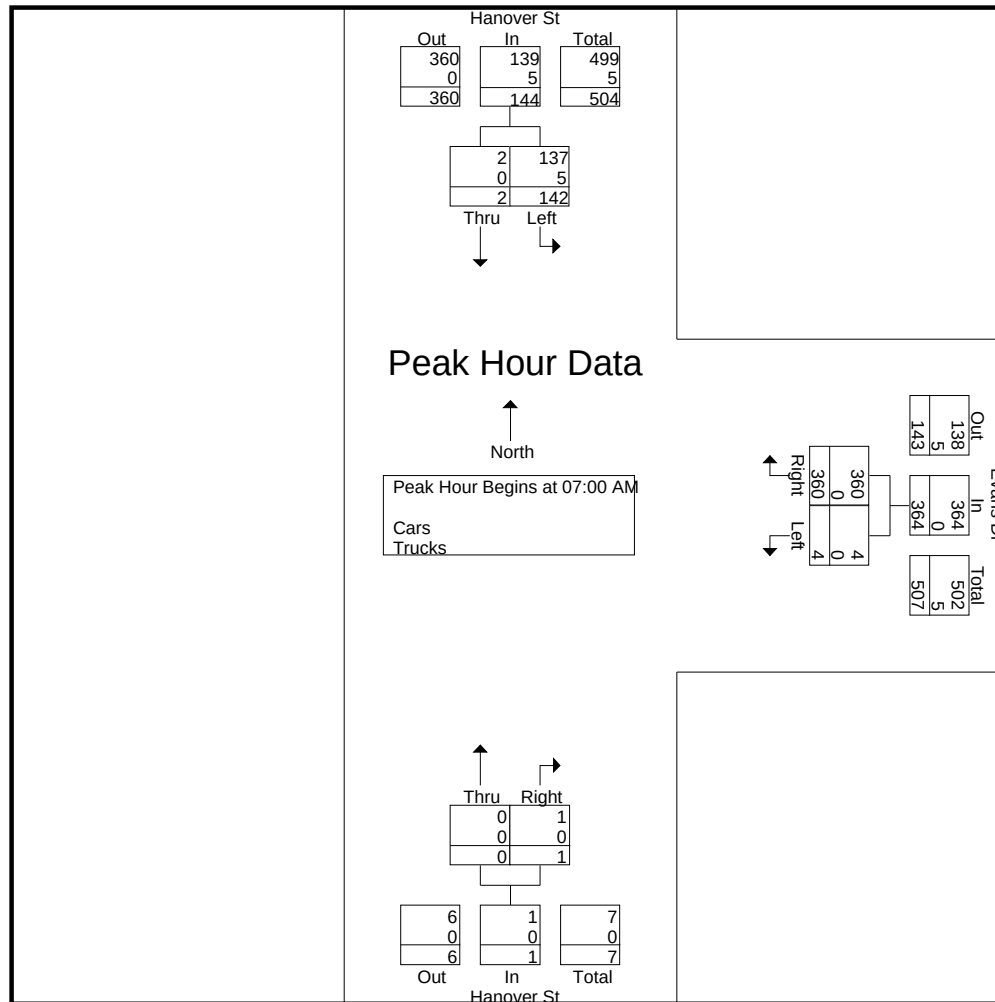
Groups Printed- Cars - Trucks

	Hanover St From North		Evans Dr From East		Hanover St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	21	1	4	74	0	0	100
07:15 AM	54	0	0	155	0	0	209
07:30 AM	33	0	0	67	0	0	100
07:45 AM	34	1	0	64	0	1	100
Total	142	2	4	360	0	1	509
08:00 AM	22	1	0	41	1	0	65
08:15 AM	17	1	0	22	0	0	40
08:30 AM	6	0	0	8	0	1	15
08:45 AM	8	0	1	11	0	0	20
Total	53	2	1	82	1	1	140
Grand Total	195	4	5	442	1	2	649
Apprch %	98	2	1.1	98.9	33.3	66.7	
Total %	30	0.6	0.8	68.1	0.2	0.3	
Cars	190	4	5	441	1	2	643
% Cars	97.4	100	100	99.8	100	100	99.1
Trucks	5	0	0	1	0	0	6
% Trucks	2.6	0	0	0.2	0	0	0.9

	Hanover St From North			Evans Dr From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	21	1	22	4	74	78	0	0	0	100
07:15 AM	54	0	54	0	155	155	0	0	0	209
07:30 AM	33	0	33	0	67	67	0	0	0	100
07:45 AM	34	1	35	0	64	64	0	1	1	100
Total Volume	142	2	144	4	360	364	0	1	1	509
% App. Total	98.6	1.4		1.1	98.9		0	100		
PHF	.657	.500	.667	.250	.581	.587	.000	.250	.250	.609
Cars	137	2	139	4	360	364	0	1	1	504
% Cars	96.5	100	96.5	100	100	100	0	100	100	99.0
Trucks	5	0	5	0	0	0	0	0	0	5
% Trucks	3.5	0	3.5	0	0	0	0	0	0	1.0

N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 52933001
Site Code : 52933001
Start Date : 11/10/2022
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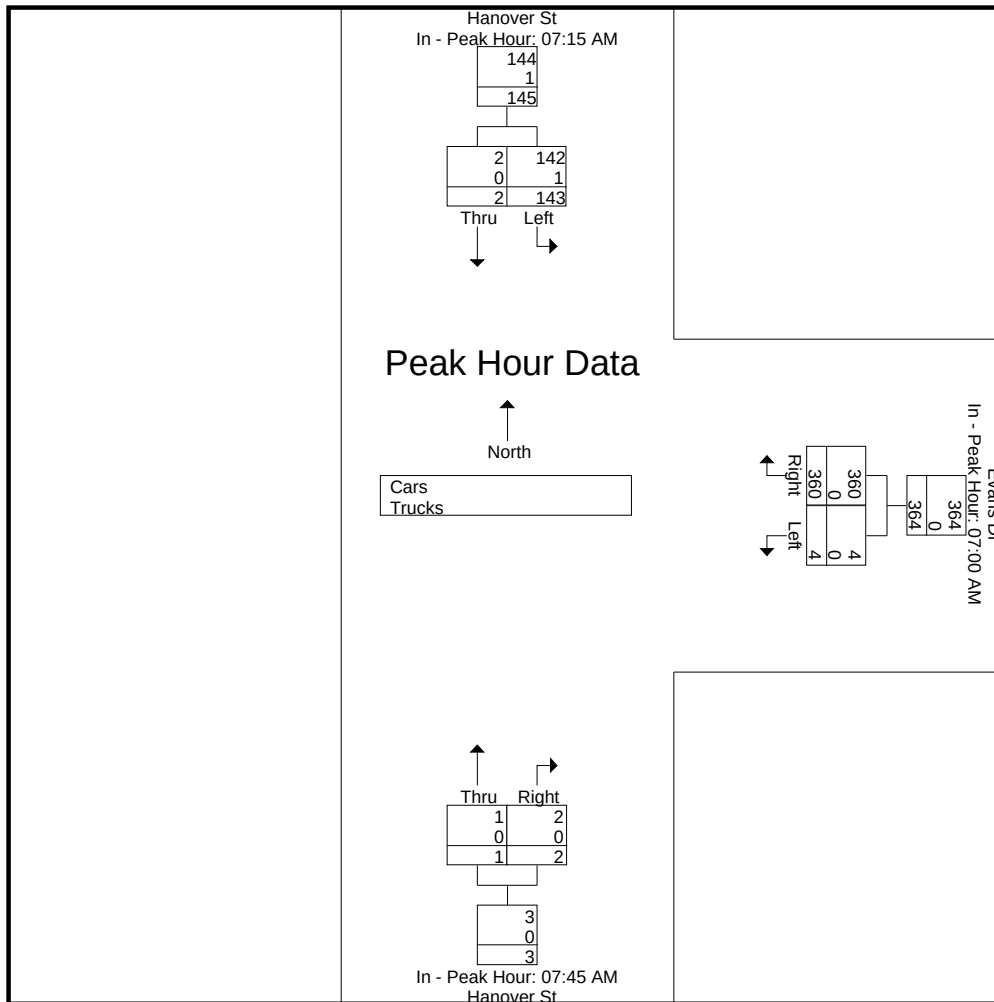


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:00 AM			07:45 AM		
+0 mins.	54	0	54	4	74	78	0	1	1
+15 mins.	33	0	33	0	155	155	1	0	1
+30 mins.	34	1	35	0	67	67	0	0	0
+45 mins.	22	1	23	0	64	64	0	1	1
Total Volume	143	2	145	4	360	364	1	2	3
% App. Total	98.6	1.4		1.1	98.9		33.3	66.7	
PHF	.662	.500	.671	.250	.581	.587	.250	.500	.750
Cars	142	2	144	4	360	364	1	2	3
% Cars	99.3	100	99.3	100	100	100	100	100	100
Trucks	1	0	1	0	0	0	0	0	0
% Trucks	0.7	0	0.7	0	0	0	0	0	0

N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 52933001
Site Code : 52933001
Start Date : 11/10/2022
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N/S Street : Hanover Street
 E/W Street : Evans Drive
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933001
 Site Code : 52933001
 Start Date : 11/10/2022
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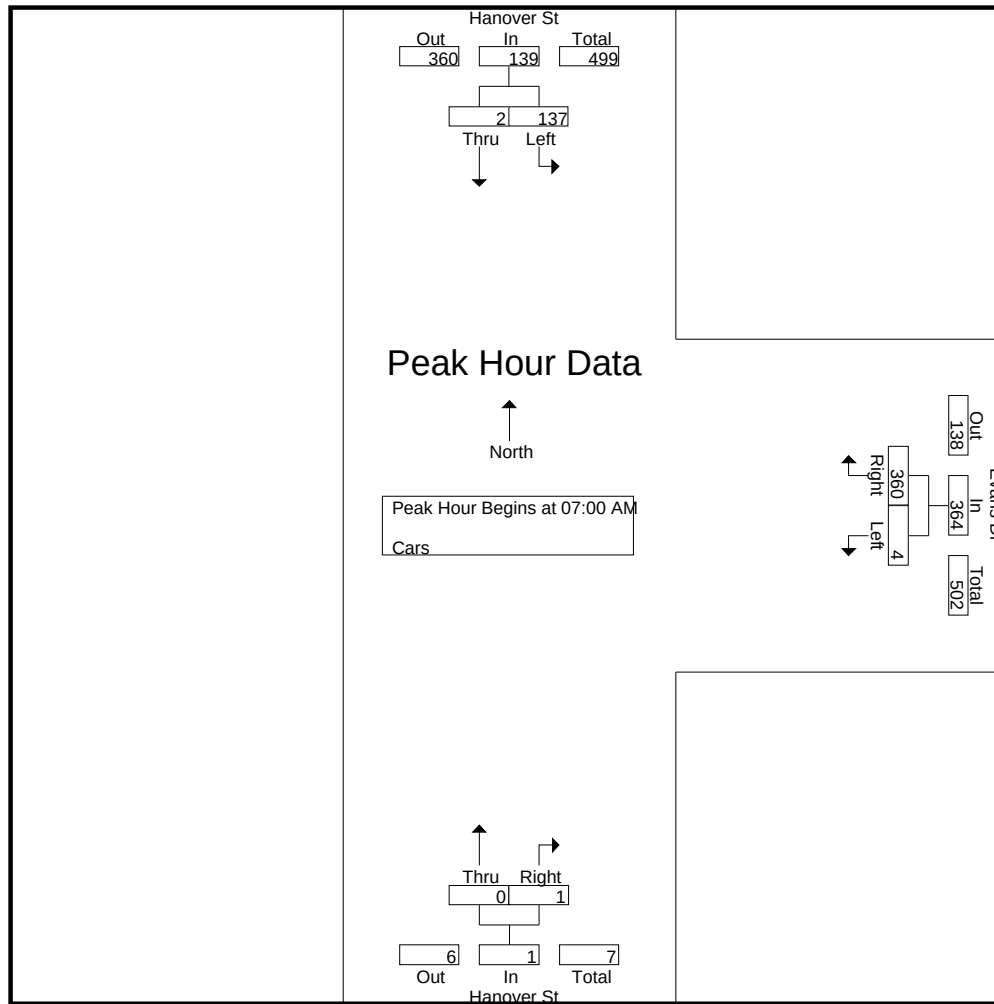
Groups Printed- Cars

	Hanover St From North		Evans Dr From East		Hanover St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	17	1	4	74	0	0	96
07:15 AM	54	0	0	155	0	0	209
07:30 AM	33	0	0	67	0	0	100
07:45 AM	33	1	0	64	0	1	99
Total	137	2	4	360	0	1	504
08:00 AM	22	1	0	41	1	0	65
08:15 AM	17	1	0	22	0	0	40
08:30 AM	6	0	0	7	0	1	14
08:45 AM	8	0	1	11	0	0	20
Total	53	2	1	81	1	1	139
Grand Total	190	4	5	441	1	2	643
Apprch %	97.9	2.1	1.1	98.9	33.3	66.7	
Total %	29.5	0.6	0.8	68.6	0.2	0.3	

	Hanover St From North			Evans Dr From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	17	1	18	4	74	78	0	0	0	96
07:15 AM	54	0	54	0	155	155	0	0	0	209
07:30 AM	33	0	33	0	67	67	0	0	0	100
07:45 AM	33	1	34	0	64	64	0	1	1	99
Total Volume	137	2	139	4	360	364	0	1	1	504
% App. Total	98.6	1.4		1.1	98.9		0	100		
PHF	.634	.500	.644	.250	.581	.587	.000	.250	.250	.603

N/S Street : Hanover Street
 E/W Street : Evans Drive
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933001
 Site Code : 52933001
 Start Date : 11/10/2022
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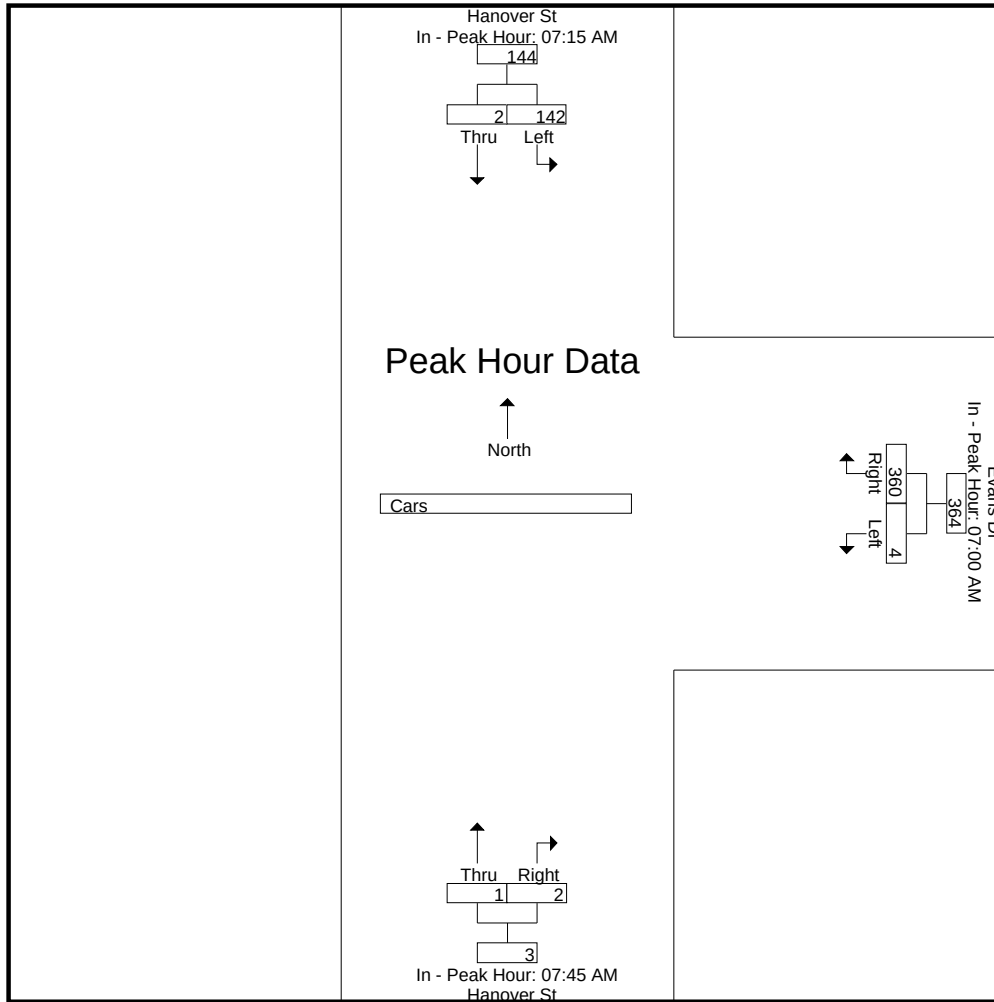


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:15 AM			07:00 AM			07:45 AM		
+0 mins.	54	0	54	4	74	78	0	1	1
+15 mins.	33	0	33	0	155	155	1	0	1
+30 mins.	33	1	34	0	67	67	0	0	0
+45 mins.	22	1	23	0	64	64	0	1	1
Total Volume	142	2	144	4	360	364	1	2	3
% App. Total	98.6	1.4		1.1	98.9		33.3	66.7	
PHF	.657	.500	.667	.250	.581	.587	.250	.500	.750

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N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear



N/S Street : Hanover Street
 E/W Street : Evans Drive
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933001
 Site Code : 52933001
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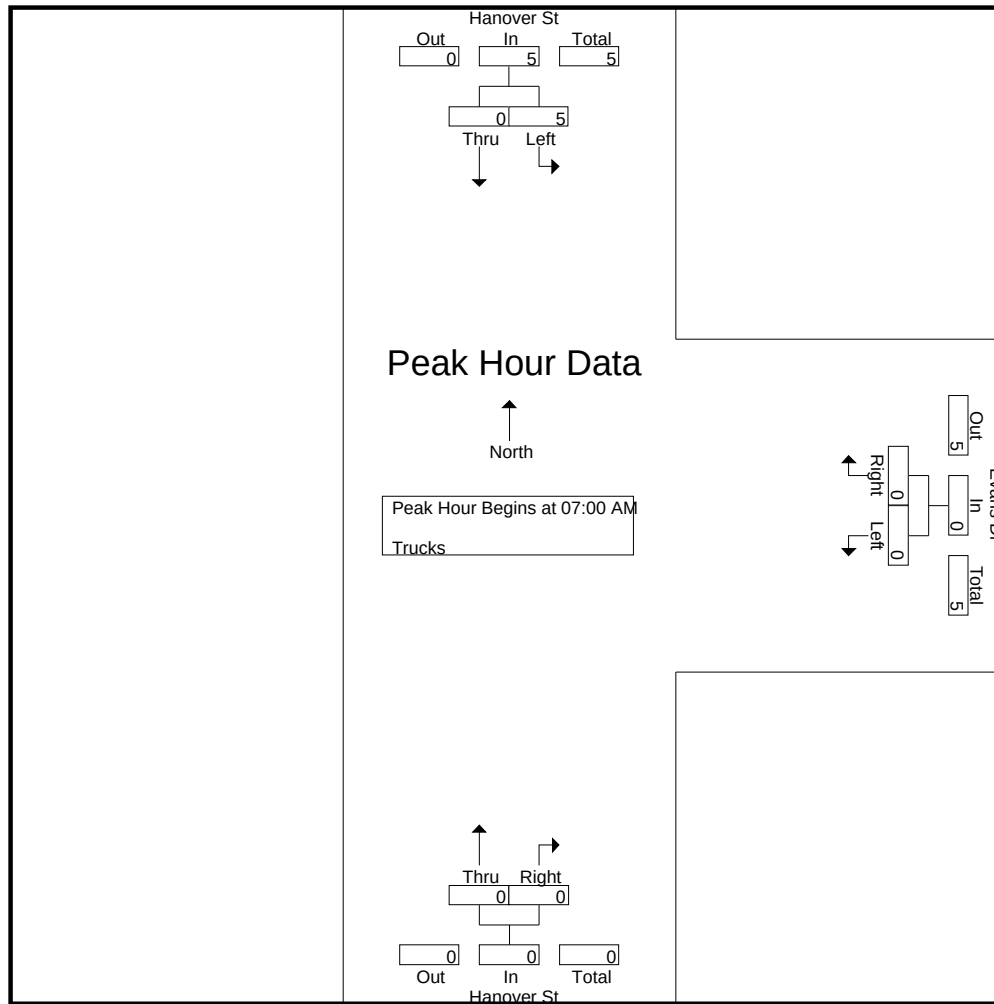
Groups Printed- Trucks

	Hanover St From North		Evans Dr From East		Hanover St From South		Int. Total
Start Time	Left	Thru	Left	Right	Thru	Right	
07:00 AM	4	0	0	0	0	0	4
07:15 AM	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0
07:45 AM	1	0	0	0	0	0	1
Total	5	0	0	0	0	0	5
08:00 AM	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0
08:30 AM	0	0	0	1	0	0	1
08:45 AM	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	1
Grand Total	5	0	0	1	0	0	6
Apprch %	100	0	0	100	0	0	
Total %	83.3	0	0	16.7	0	0	

	Hanover St From North			Evans Dr From East			Hanover St From South			Int. Total
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	4	0	4	0	0	0	0	0	0	4
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	1	0	1	0	0	0	0	0	0	1
Total Volume	5	0	5	0	0	0	0	0	0	5
% App. Total	100	0		0	0		0	0		
PHF	.313	.000	.313	.000	.000	.000	.000	.000	.000	.313

N/S Street : Hanover Street
 E/W Street : Evans Drive
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933001
 Site Code : 52933001
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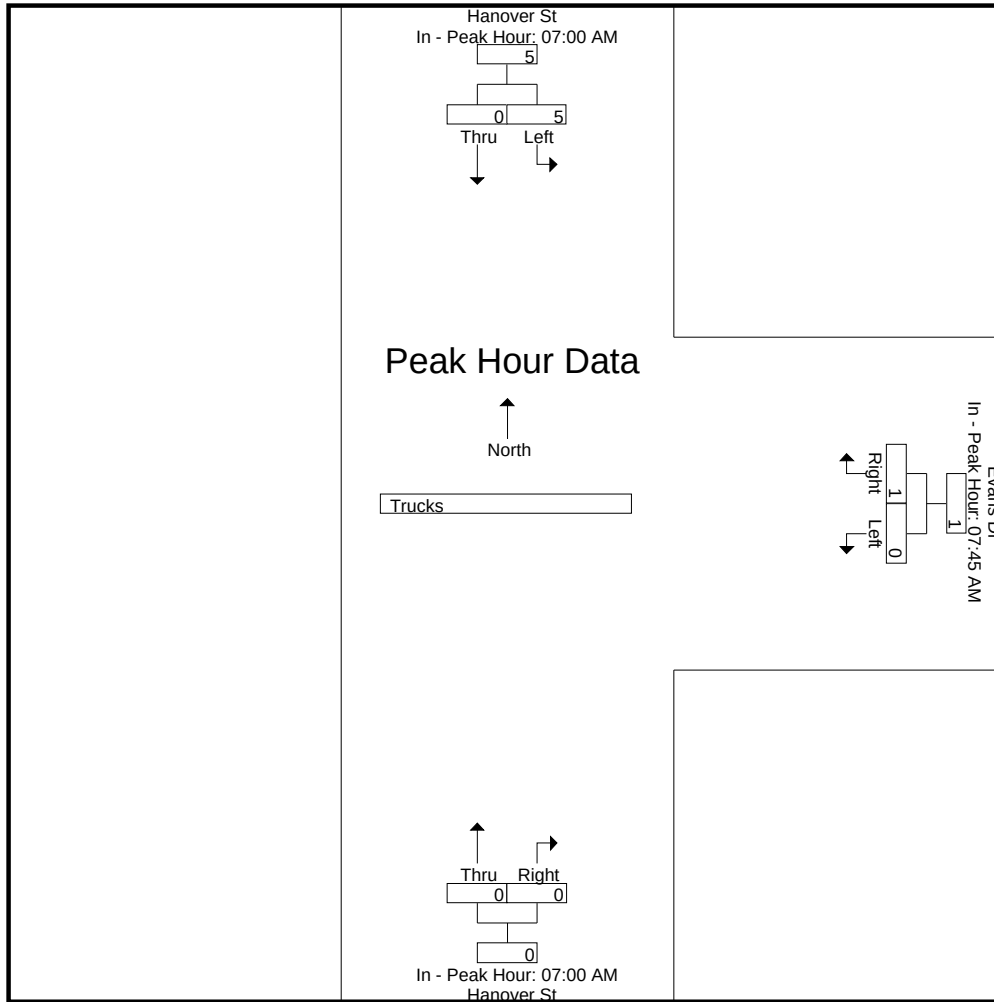


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM			07:45 AM			07:00 AM		
+0 mins.	4	0	4	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	1	0	1	0	1	1	0	0	0
Total Volume	5	0	5	0	1	1	0	0	0
% App. Total	100	0		0	100		0	0	
PHF	.313	.000	.313	.000	.250	.250	.000	.000	.000

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N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear



N/S Street : Hanover Street
 E/W Street : Evans Drive
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933001
 Site Code : 52933001
 Start Date : 11/10/2022
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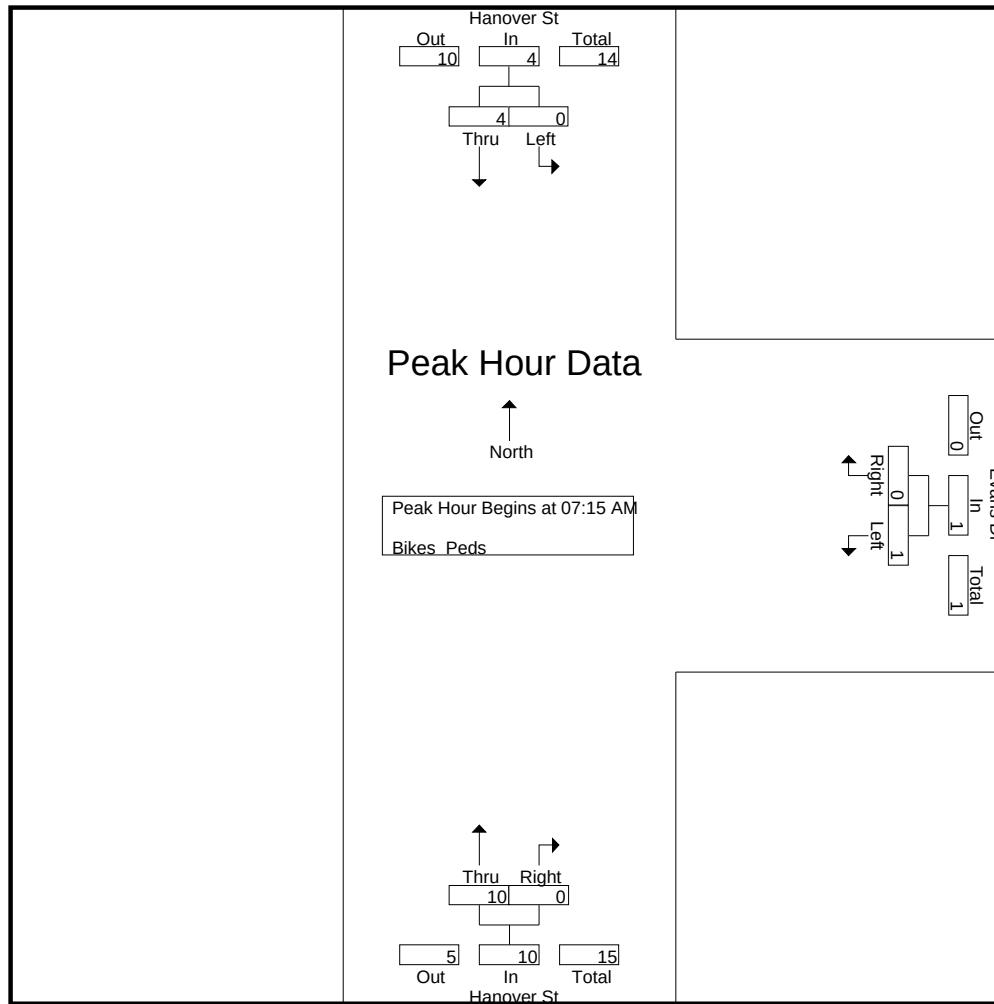
Groups Printed- Bikes Peds

	Hanover St From North			Evans Dr From East			Hanover St From South			Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
07:00 AM	0	0	0	0	0	13	1	0	0	13	1	14
07:15 AM	0	1	0	0	0	9	4	0	0	9	5	14
07:30 AM	0	1	0	0	0	11	1	0	0	11	2	13
07:45 AM	0	2	0	0	0	20	4	0	0	20	6	26
Total	0	4	0	0	0	53	10	0	0	53	14	67
08:00 AM	0	0	0	1	0	7	1	0	0	7	2	9
08:15 AM	0	0	0	0	0	2	0	0	0	2	0	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	3	1	0	0	3	1	4
Total	0	0	0	1	0	12	2	0	0	12	3	15
Grand Total	0	4	0	1	0	65	12	0	0	65	17	82
Apprch %	0	100		100	0		100	0				
Total %	0	23.5		5.9	0		70.6	0		79.3	20.7	

	Hanover St From North			Evans Dr From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	1	1	0	0	0	4	0	4	5
07:30 AM	0	1	1	0	0	0	1	0	1	2
07:45 AM	0	2	2	0	0	0	4	0	4	6
08:00 AM	0	0	0	1	0	1	1	0	1	2
Total Volume	0	4	4	1	0	1	10	0	10	15
% App. Total	0	100		100	0		100	0		
PHF	.000	.500	.500	.250	.000	.250	.625	.000	.625	.625

N/S Street : Hanover Street
 E/W Street : Evans Drive
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933001
 Site Code : 52933001
 Start Date : 11/10/2022
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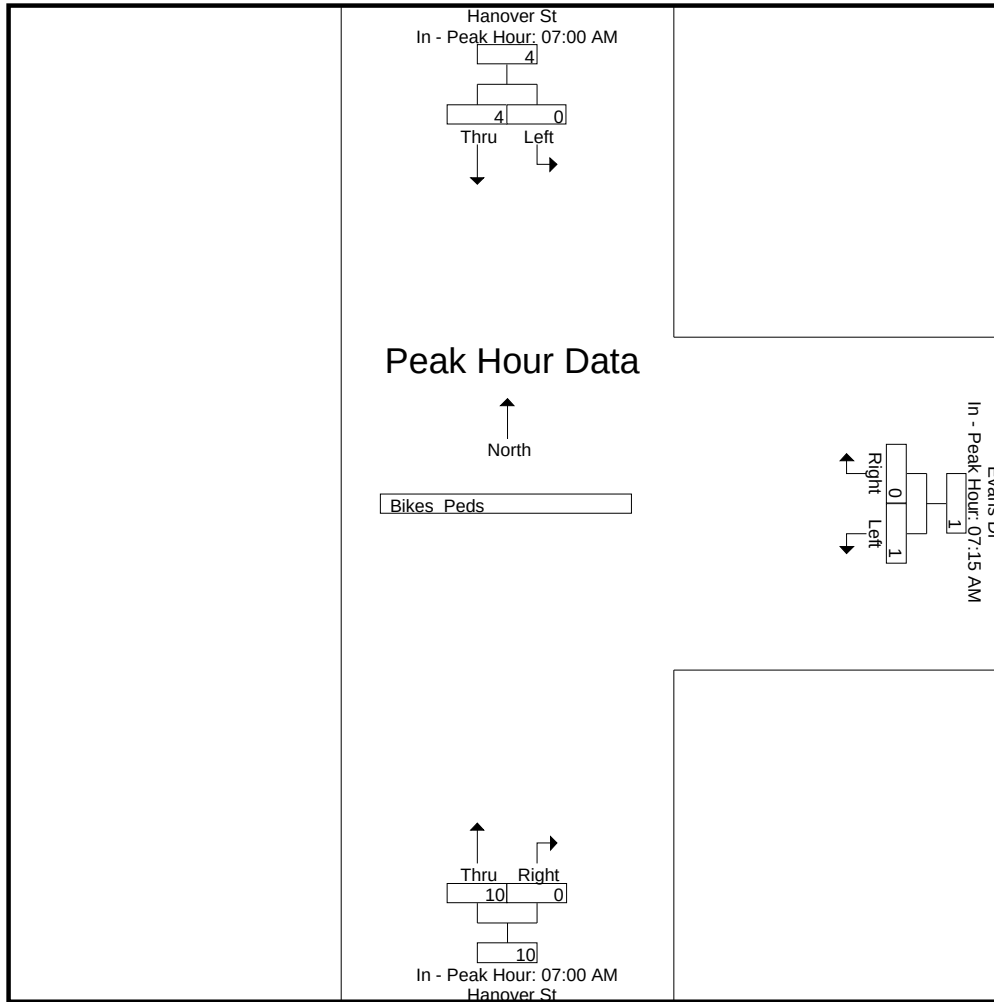


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM			07:15 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	1	0	1
+15 mins.	0	1	1	0	0	0	4	0	4
+30 mins.	0	1	1	0	0	0	1	0	1
+45 mins.	0	2	2	1	0	1	4	0	4
Total Volume	0	4	4	1	0	1	10	0	10
% App. Total	0	100		100	0		100	0	
PHF	.000	.500	.500	.250	.000	.250	.625	.000	.625

N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 52933001
Site Code : 52933001
Start Date : 11/10/2022
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N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 52933001
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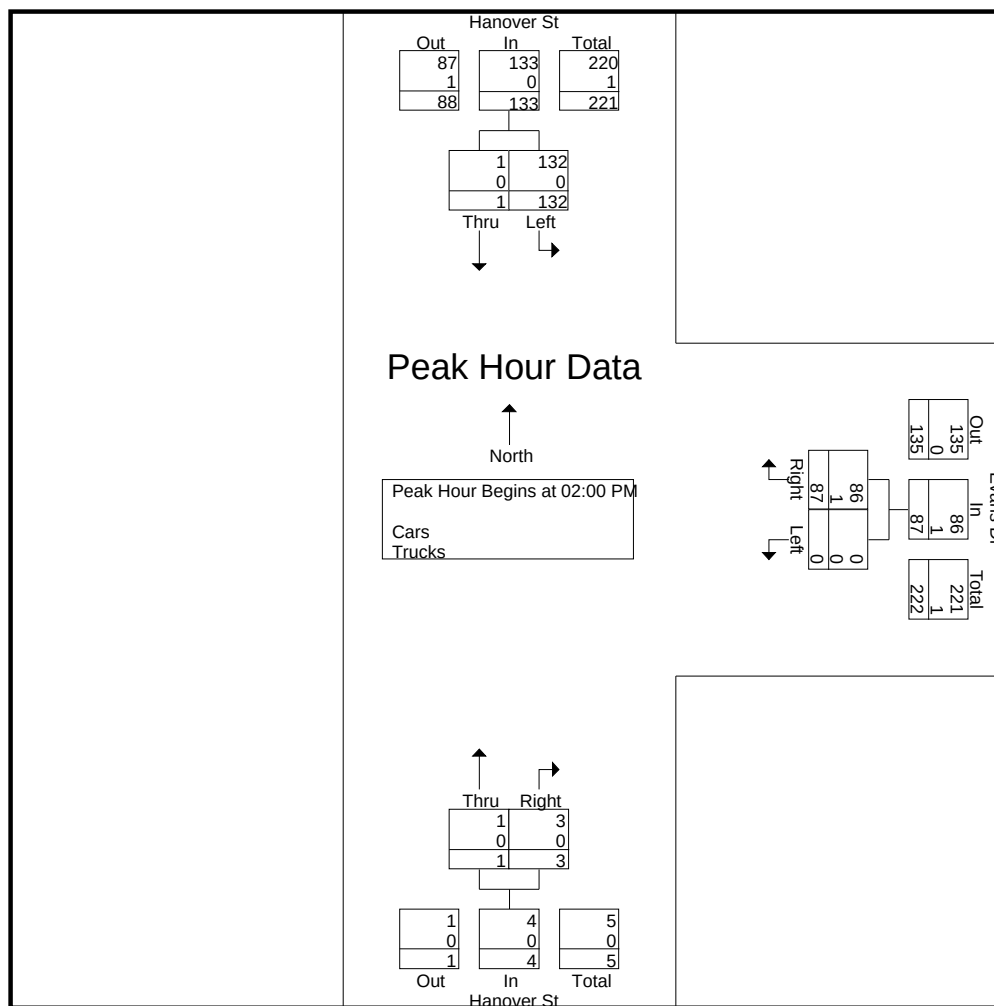
Groups Printed- Cars - Trucks

	Hanover St From North		Evans Dr From East		Hanover St From South		Int. Total
Start Time	Left	Thru	Left	Right	Thru	Right	
02:00 PM	46	1	0	22	1	1	71
02:15 PM	26	0	0	20	0	2	48
02:30 PM	30	0	0	22	0	0	52
02:45 PM	30	0	0	23	0	0	53
Total	132	1	0	87	1	3	224
03:00 PM	25	0	0	26	0	0	51
03:15 PM	25	0	0	10	0	0	35
03:30 PM	13	0	0	9	0	1	23
03:45 PM	18	0	0	11	0	0	29
Total	81	0	0	56	0	1	138
04:00 PM	18	1	1	10	0	1	31
04:15 PM	18	0	1	5	0	0	24
04:30 PM	13	1	1	12	1	2	30
04:45 PM	11	0	0	18	0	0	29
Total	60	2	3	45	1	3	114
05:00 PM	25	1	0	15	0	1	42
05:15 PM	23	2	0	12	2	0	39
05:30 PM	11	0	0	7	0	0	18
05:45 PM	9	0	0	9	0	0	18
Total	68	3	0	43	2	1	117
Grand Total	341	6	3	231	4	8	593
Apprch %	98.3	1.7	1.3	98.7	33.3	66.7	
Total %	57.5	1	0.5	39	0.7	1.3	
Cars	341	6	3	227	4	8	589
% Cars	100	100	100	98.3	100	100	99.3
Trucks	0	0	0	4	0	0	4
% Trucks	0	0	0	1.7	0	0	0.7

	Hanover St From North			Evans Dr From East			Hanover St From South			Int. Total
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	46	1	47	0	22	22	1	1	2	71
02:15 PM	26	0	26	0	20	20	0	2	2	48
02:30 PM	30	0	30	0	22	22	0	0	0	52
02:45 PM	30	0	30	0	23	23	0	0	0	53
Total Volume	132	1	133	0	87	87	1	3	4	224
% App. Total	99.2	0.8		0	100		25	75		
PHF	.717	.250	.707	.000	.946	.946	.250	.375	.500	.789
Cars	132	1	133	0	86	86	1	3	4	223
% Cars	100	100	100	0	98.9	98.9	100	100	100	99.6
Trucks	0	0	0	0	1	1	0	0	0	1
% Trucks	0	0	0	0	1.1	1.1	0	0	0	0.4

N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 52933001
Site Code : 52933001
Start Date : 11/10/2022
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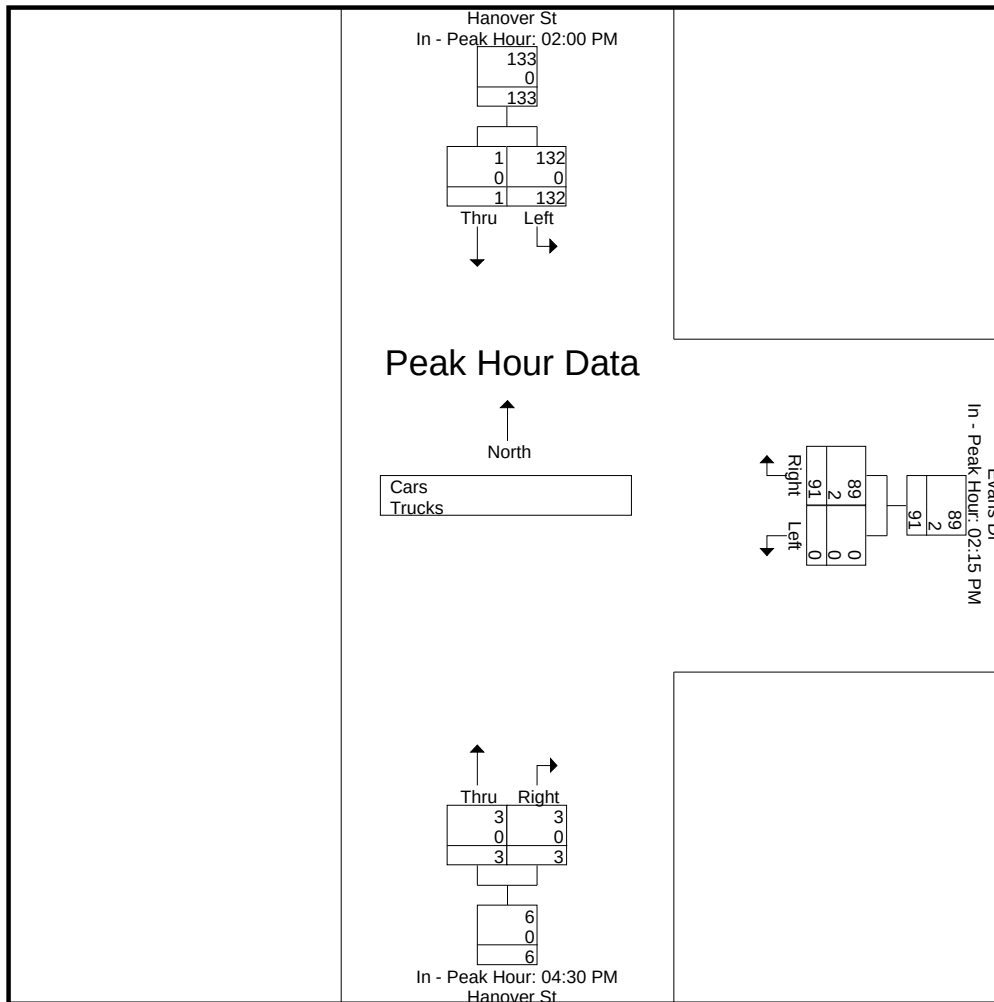


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	02:00 PM			02:15 PM			04:30 PM		
+0 mins.	46	1	47	0	20	20	1	2	3
+15 mins.	26	0	26	0	22	22	0	0	0
+30 mins.	30	0	30	0	23	23	0	1	1
+45 mins.	30	0	30	0	26	26	2	0	2
Total Volume	132	1	133	0	91	91	3	3	6
% App. Total	99.2	0.8		0	100		50	50	
PHF	.717	.250	.707	.000	.875	.875	.375	.375	.500
Cars	132	1	133	0	89	89	3	3	6
% Cars	100	100	100	0	97.8	97.8	100	100	100
Trucks	0	0	0	0	2	2	0	0	0
% Trucks	0	0	0	0	2.2	2.2	0	0	0

N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 52933001
Site Code : 52933001
Start Date : 11/10/2022
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N/S Street : Hanover Street
 E/W Street : Evans Drive
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933001
 Site Code : 52933001
 Start Date : 11/10/2022
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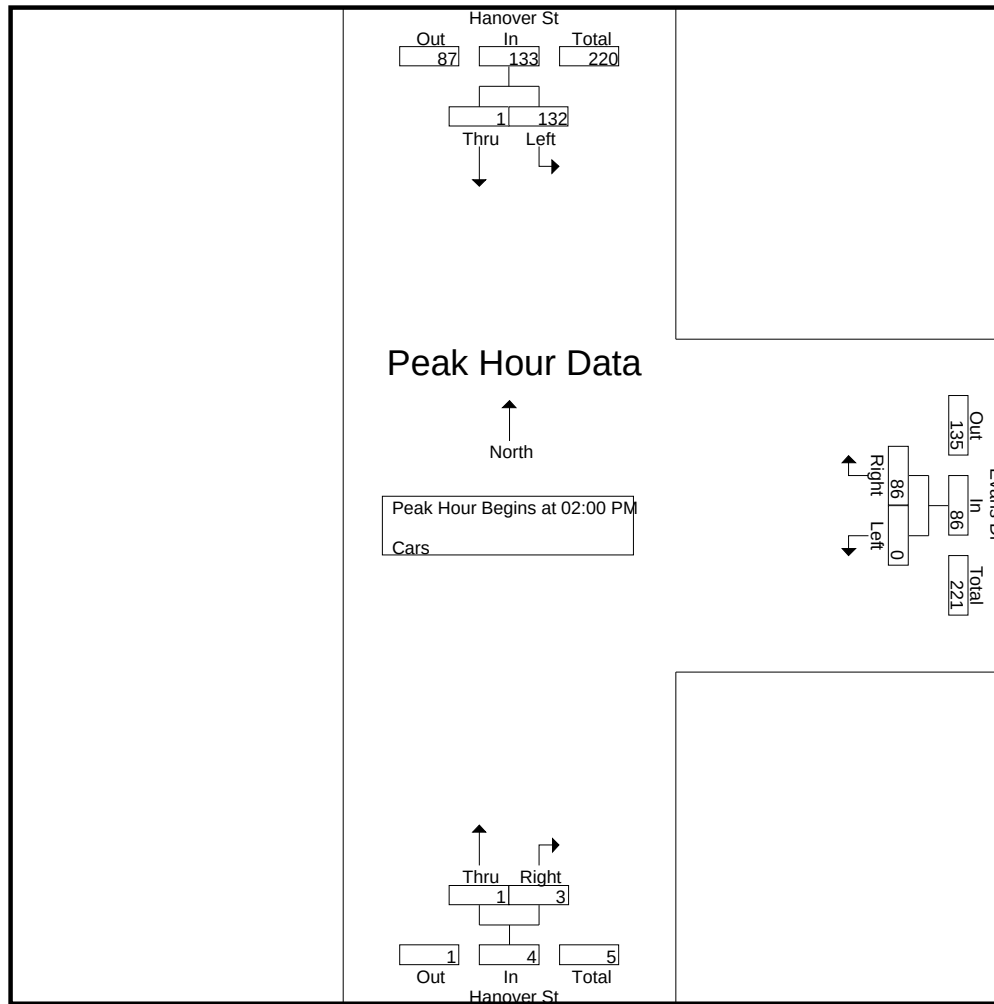
Groups Printed- Cars

	Hanover St From North		Evans Dr From East		Hanover St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
02:00 PM	46	1	0	22	1	1	71
02:15 PM	26	0	0	19	0	2	47
02:30 PM	30	0	0	22	0	0	52
02:45 PM	30	0	0	23	0	0	53
Total	132	1	0	86	1	3	223
03:00 PM	25	0	0	25	0	0	50
03:15 PM	25	0	0	10	0	0	35
03:30 PM	13	0	0	9	0	1	23
03:45 PM	18	0	0	10	0	0	28
Total	81	0	0	54	0	1	136
04:00 PM	18	1	1	10	0	1	31
04:15 PM	18	0	1	5	0	0	24
04:30 PM	13	1	1	11	1	2	29
04:45 PM	11	0	0	18	0	0	29
Total	60	2	3	44	1	3	113
05:00 PM	25	1	0	15	0	1	42
05:15 PM	23	2	0	12	2	0	39
05:30 PM	11	0	0	7	0	0	18
05:45 PM	9	0	0	9	0	0	18
Total	68	3	0	43	2	1	117
Grand Total	341	6	3	227	4	8	589
Apprch %	98.3	1.7	1.3	98.7	33.3	66.7	
Total %	57.9	1	0.5	38.5	0.7	1.4	

	Hanover St From North			Evans Dr From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	46	1	47	0	22	22	1	1	2	71
02:15 PM	26	0	26	0	19	19	0	2	2	47
02:30 PM	30	0	30	0	22	22	0	0	0	52
02:45 PM	30	0	30	0	23	23	0	0	0	53
Total Volume	132	1	133	0	86	86	1	3	4	223
% App. Total	99.2	0.8		0	100		25	75		
PHF	.717	.250	.707	.000	.935	.935	.250	.375	.500	.785

N/S Street : Hanover Street
 E/W Street : Evans Drive
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933001
 Site Code : 52933001
 Start Date : 11/10/2022
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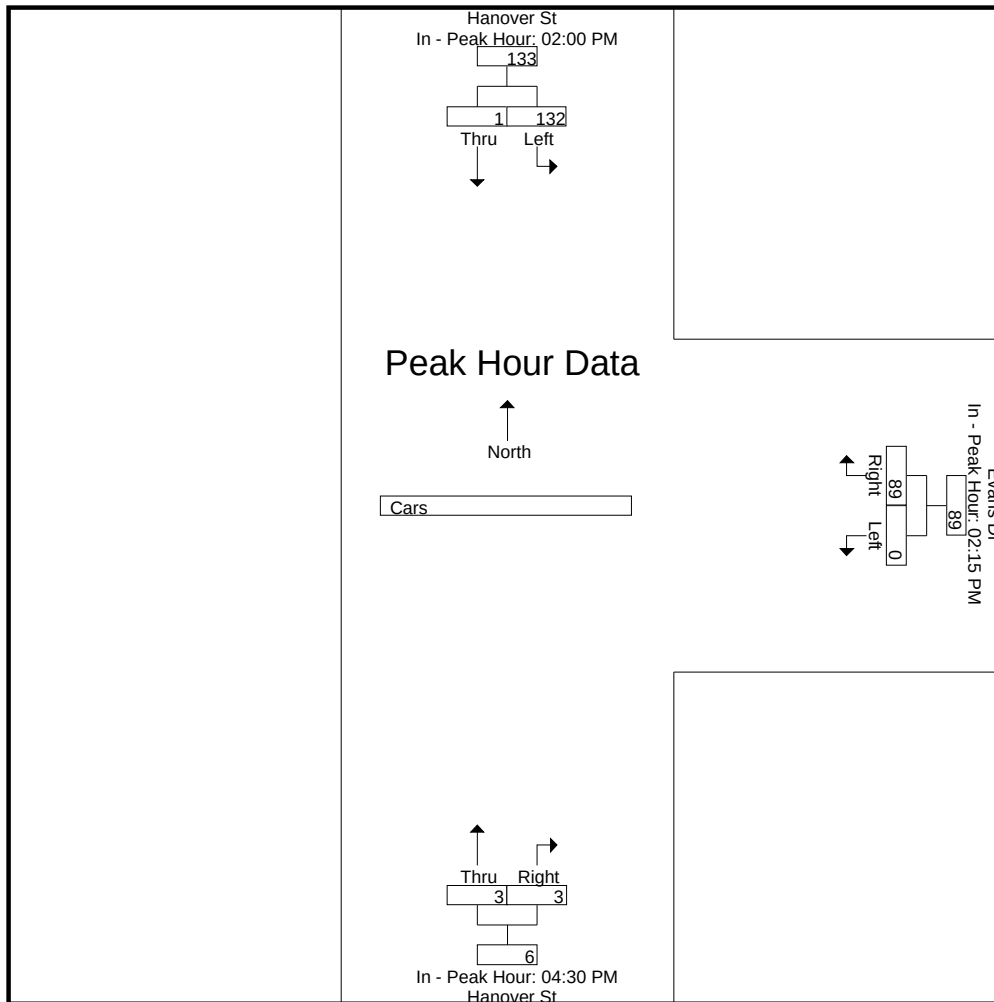


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	02:00 PM			02:15 PM			04:30 PM		
+0 mins.	46	1	47	0	19	19	1	2	3
+15 mins.	26	0	26	0	22	22	0	0	0
+30 mins.	30	0	30	0	23	23	0	1	1
+45 mins.	30	0	30	0	25	25	2	0	2
Total Volume	132	1	133	0	89	89	3	3	6
% App. Total	99.2	0.8		0	100		50	50	
PHF	.717	.250	.707	.000	.890	.890	.375	.375	.500

N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 52933001
Site Code : 52933001
Start Date : 11/10/2022
Page No : 6



N/S Street : Hanover Street
 E/W Street : Evans Drive
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933001
 Site Code : 52933001
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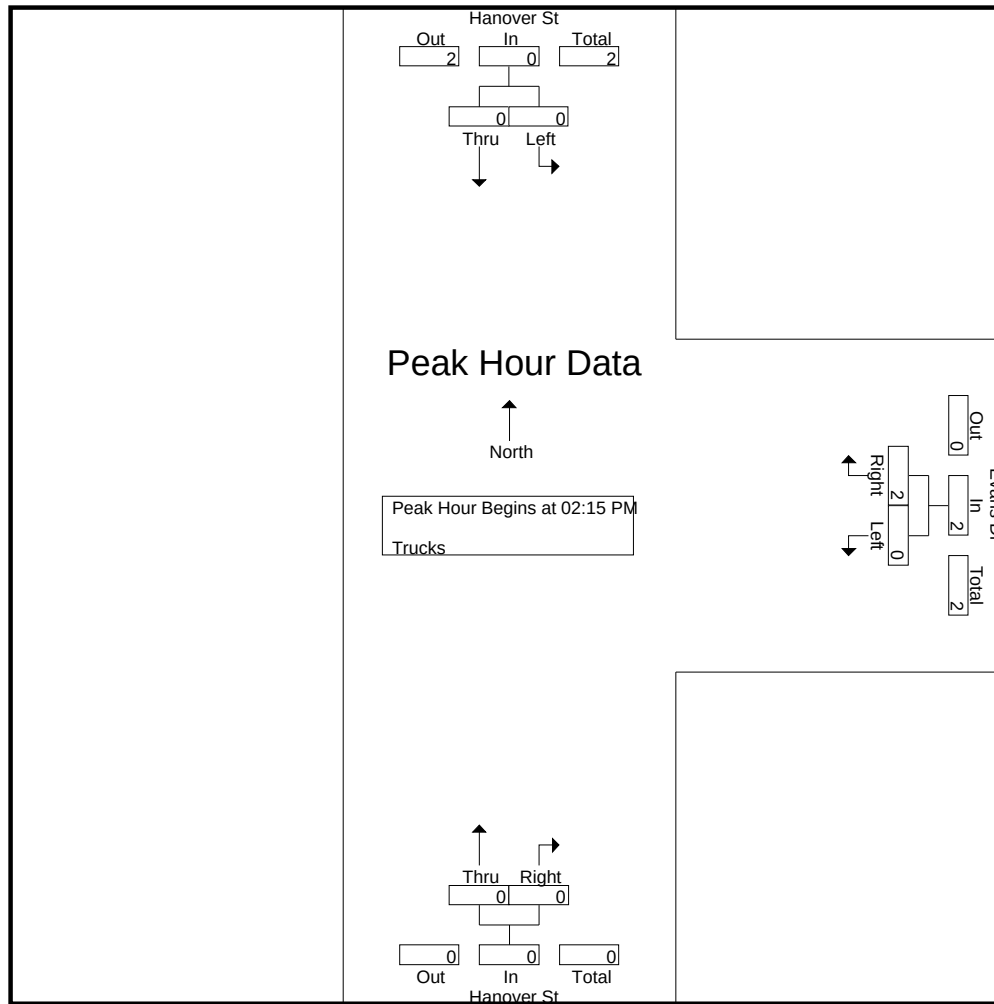
Groups Printed- Trucks

	Hanover St From North		Evans Dr From East		Hanover St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
02:00 PM	0	0	0	0	0	0	0
02:15 PM	0	0	0	1	0	0	1
02:30 PM	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	1
03:00 PM	0	0	0	1	0	0	1
03:15 PM	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0
03:45 PM	0	0	0	1	0	0	1
Total	0	0	0	2	0	0	2
04:00 PM	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0
04:30 PM	0	0	0	1	0	0	1
04:45 PM	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	1
05:00 PM	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Grand Total	0	0	0	4	0	0	4
Apprch %	0		0	100	0	0	
Total %	0		0	100	0	0	

	Hanover St From North			Evans Dr From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:15 PM										
02:15 PM	0	0	0	0	1	1	0	0	0	1
02:30 PM	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	1	1	0	0	0	1
Total Volume	0	0	0	0	2	2	0	0	0	2
% App. Total	0	0		0	100		0	0		
PHF	.000	.000	.000	.000	.500	.500	.000	.000	.000	.500

N/S Street : Hanover Street
 E/W Street : Evans Drive
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933001
 Site Code : 52933001
 Start Date : 11/10/2022
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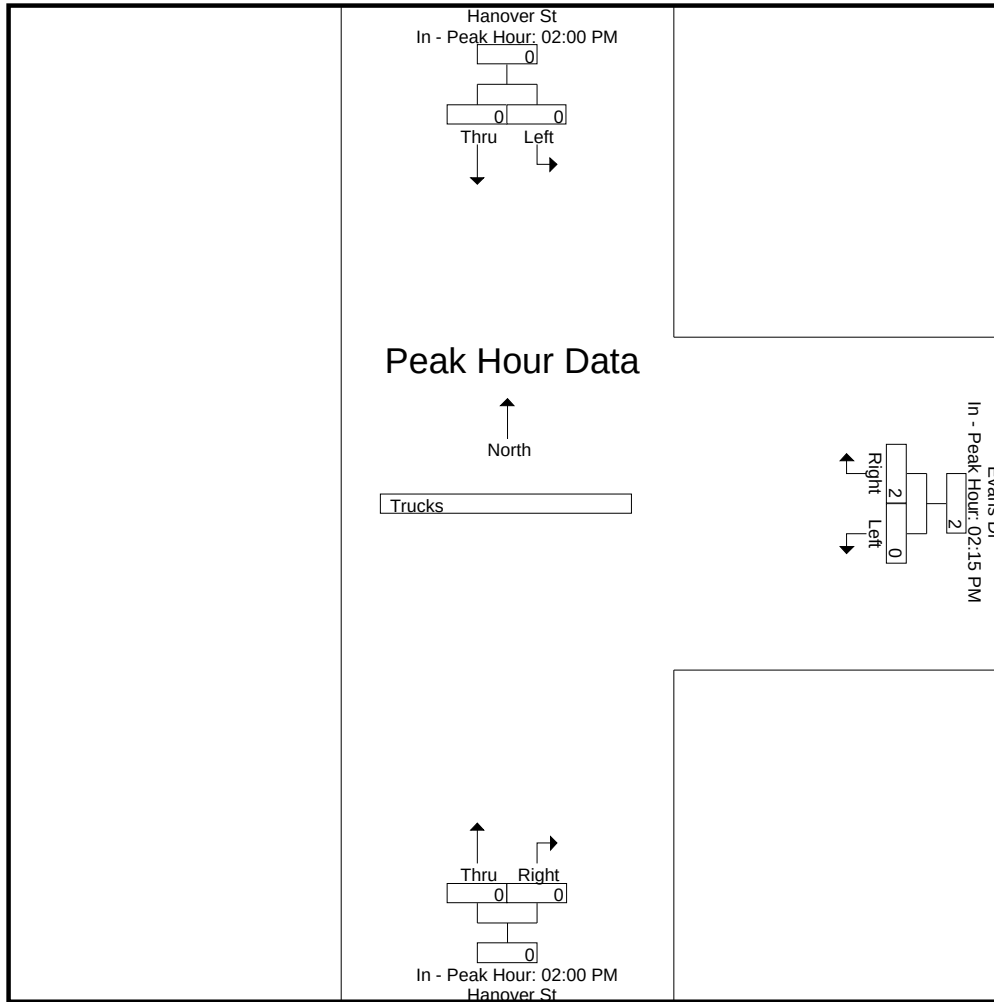


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	02:00 PM			02:15 PM			02:00 PM		
+0 mins.	0	0	0	0	1	1	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	1	1	0	0	0
Total Volume	0	0	0	0	2	2	0	0	0
% App. Total	0	0		0	100		0	0	
PHF	.000	.000	.000	.000	.500	.500	.000	.000	.000

File Name : 52933001
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N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear



N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 52933001
Site Code : 52933001
Start Date : 11/10/2022
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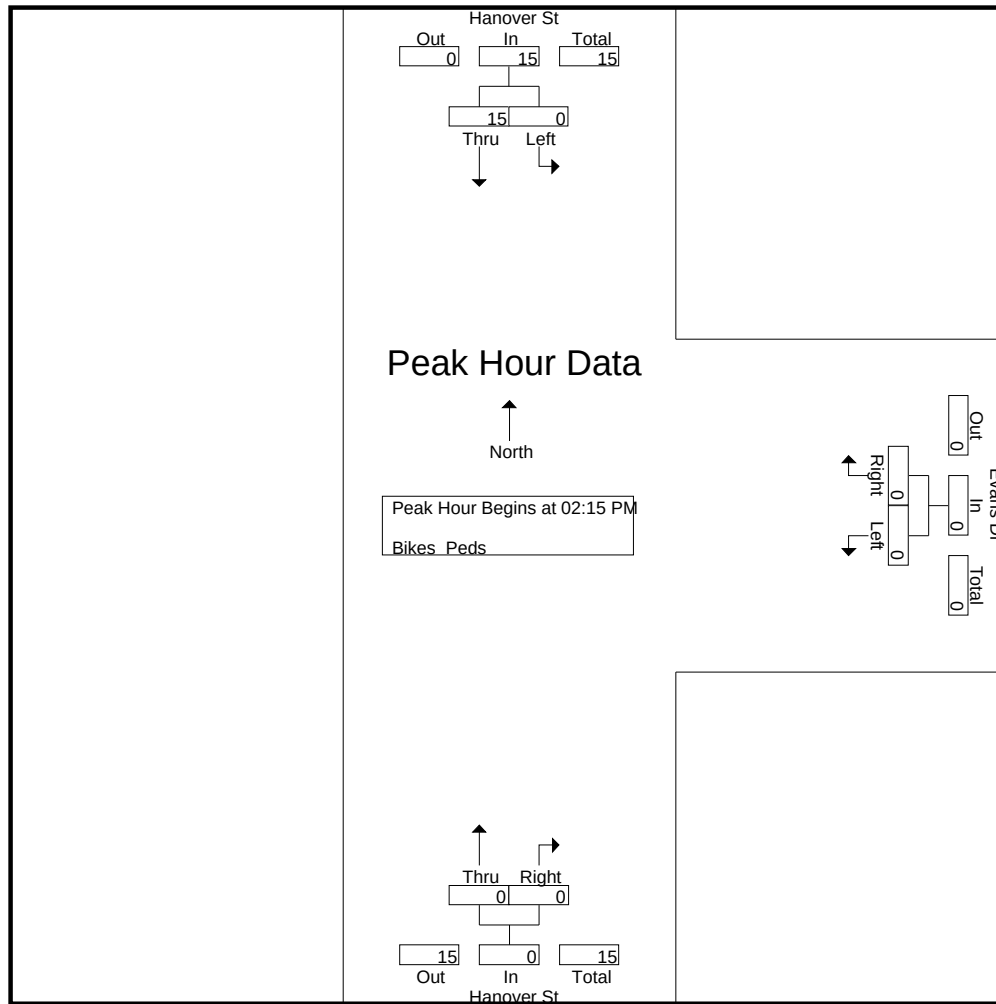
Groups Printed- Bikes Peds

	Hanover St From North			Evans Dr From East			Hanover St From South			Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
02:00 PM	0	1	0	0	0	17	0	0	0	17	1	18
02:15 PM	0	5	0	0	0	13	0	0	0	13	5	18
02:30 PM	0	3	0	0	0	16	0	0	0	16	3	19
02:45 PM	0	2	0	0	0	31	0	0	0	31	2	33
Total	0	11	0	0	0	77	0	0	0	77	11	88
03:00 PM	0	5	0	0	0	39	0	0	0	39	5	44
03:15 PM	0	0	0	0	0	6	0	0	0	6	0	6
03:30 PM	0	0	0	0	0	4	1	0	0	4	1	5
03:45 PM	0	1	0	0	0	3	0	0	0	3	1	4
Total	0	6	0	0	0	52	1	0	0	52	7	59
04:00 PM	0	1	0	0	0	8	1	0	0	8	2	10
04:15 PM	0	0	0	0	0	2	0	0	1	3	0	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	1	0	0	0	1	0	1
Total	0	1	0	0	0	11	1	0	1	12	2	14
05:00 PM	0	0	0	0	0	1	0	0	0	1	0	1
05:15 PM	0	0	0	0	0	1	0	0	0	1	0	1
05:30 PM	0	2	0	0	0	1	0	0	0	1	2	3
05:45 PM	0	1	0	0	0	0	0	0	0	0	1	1
Total	0	3	0	0	0	3	0	0	0	3	3	6
Grand Total	0	21	0	0	0	143	2	0	1	144	23	167
Apprch %	0	100		0	0		100	0				
Total %	0	91.3		0	0		8.7	0		86.2	13.8	

	Hanover St From North			Evans Dr From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:15 PM										
02:15 PM	0	5	5	0	0	0	0	0	0	5
02:30 PM	0	3	3	0	0	0	0	0	0	3
02:45 PM	0	2	2	0	0	0	0	0	0	2
03:00 PM	0	5	5	0	0	0	0	0	0	5
Total Volume	0	15	15	0	0	0	0	0	0	15
% App. Total	0	100		0	0		0	0		
PHF	.000	.750	.750	.000	.000	.000	.000	.000	.000	.750

N/S Street : Hanover Street
 E/W Street : Evans Drive
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933001
 Site Code : 52933001
 Start Date : 11/10/2022
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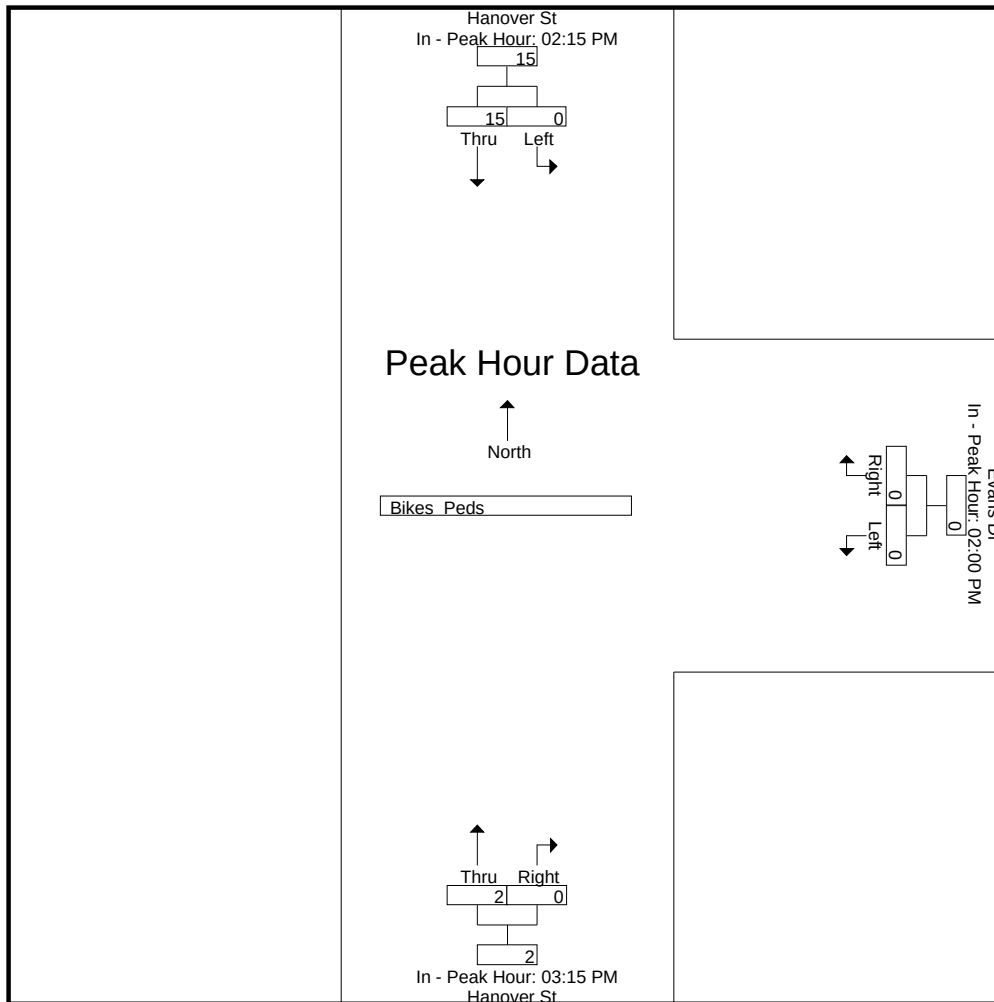


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	02:15 PM			02:00 PM			03:15 PM		
+0 mins.	0	5	5	0	0	0	0	0	0
+15 mins.	0	3	3	0	0	0	1	0	1
+30 mins.	0	2	2	0	0	0	0	0	0
+45 mins.	0	5	5	0	0	0	1	0	1
Total Volume	0	15	15	0	0	0	2	0	2
% App. Total	0	100		0	0		100	0	
PHF	.000	.750	.750	.000	.000	.000	.500	.000	.500

N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 52933001
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N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S1
Site Code : 52933001
Start Date : 11/12/2022
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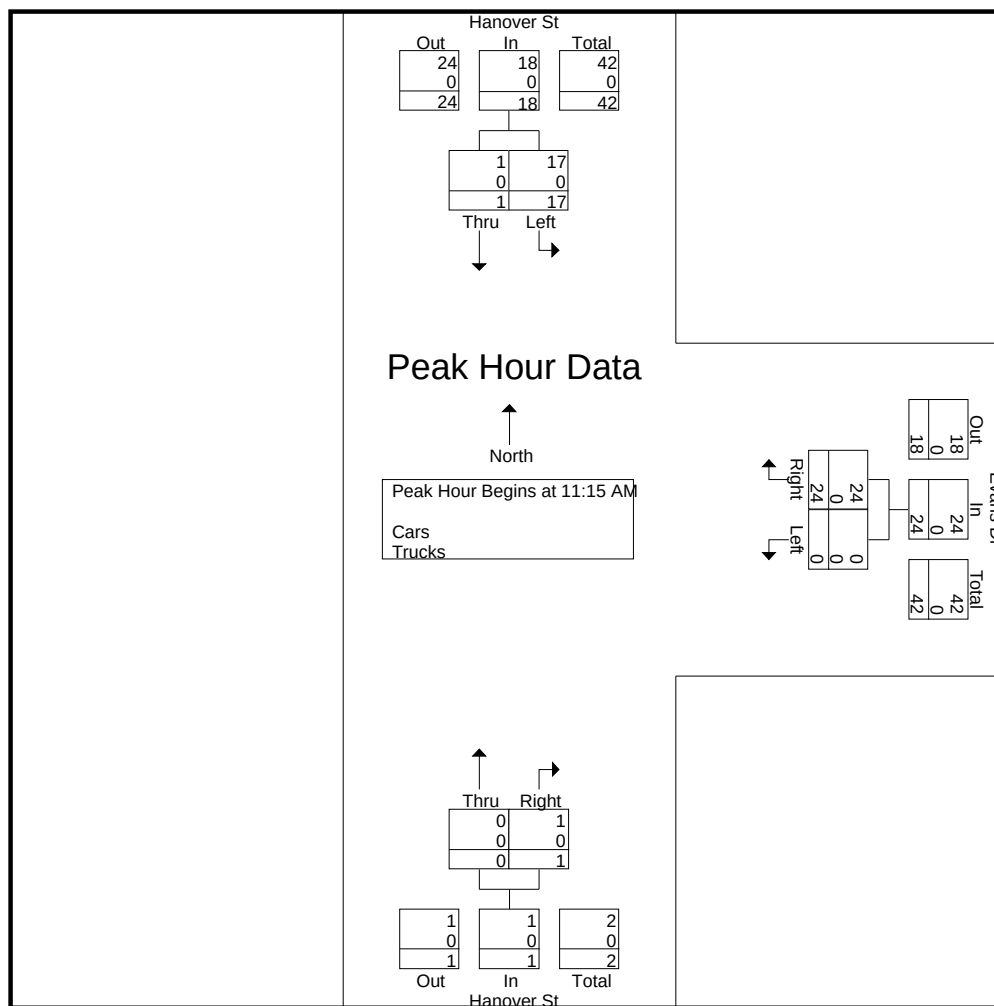
Groups Printed- Cars - Trucks

	Hanover St From North		Evans Dr From East		Hanover St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
11:00 AM	2	0	1	4	0	0	7
11:15 AM	3	1	0	9	0	1	14
11:30 AM	3	0	0	4	0	0	7
11:45 AM	7	0	0	6	0	0	13
Total	15	1	1	23	0	1	41
12:00 PM	4	0	0	5	0	0	9
12:15 PM	4	0	0	4	0	0	8
12:30 PM	2	0	0	7	0	0	9
12:45 PM	2	1	0	2	1	0	6
Total	12	1	0	18	1	0	32
Grand Total	27	2	1	41	1	1	73
Apprch %	93.1	6.9	2.4	97.6	50	50	
Total %	37	2.7	1.4	56.2	1.4	1.4	
Cars	27	2	1	41	1	1	73
% Cars	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0

	Hanover St From North			Evans Dr From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:15 AM										
11:15 AM	3	1	4	0	9	9	0	1	1	14
11:30 AM	3	0	3	0	4	4	0	0	0	7
11:45 AM	7	0	7	0	6	6	0	0	0	13
12:00 PM	4	0	4	0	5	5	0	0	0	9
Total Volume	17	1	18	0	24	24	0	1	1	43
% App. Total	94.4	5.6		0	100		0	100		
PHF	.607	.250	.643	.000	.667	.667	.000	.250	.250	.768
Cars	17	1	18	0	24	24	0	1	1	43
% Cars	100	100	100	0	100	100	0	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0

N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

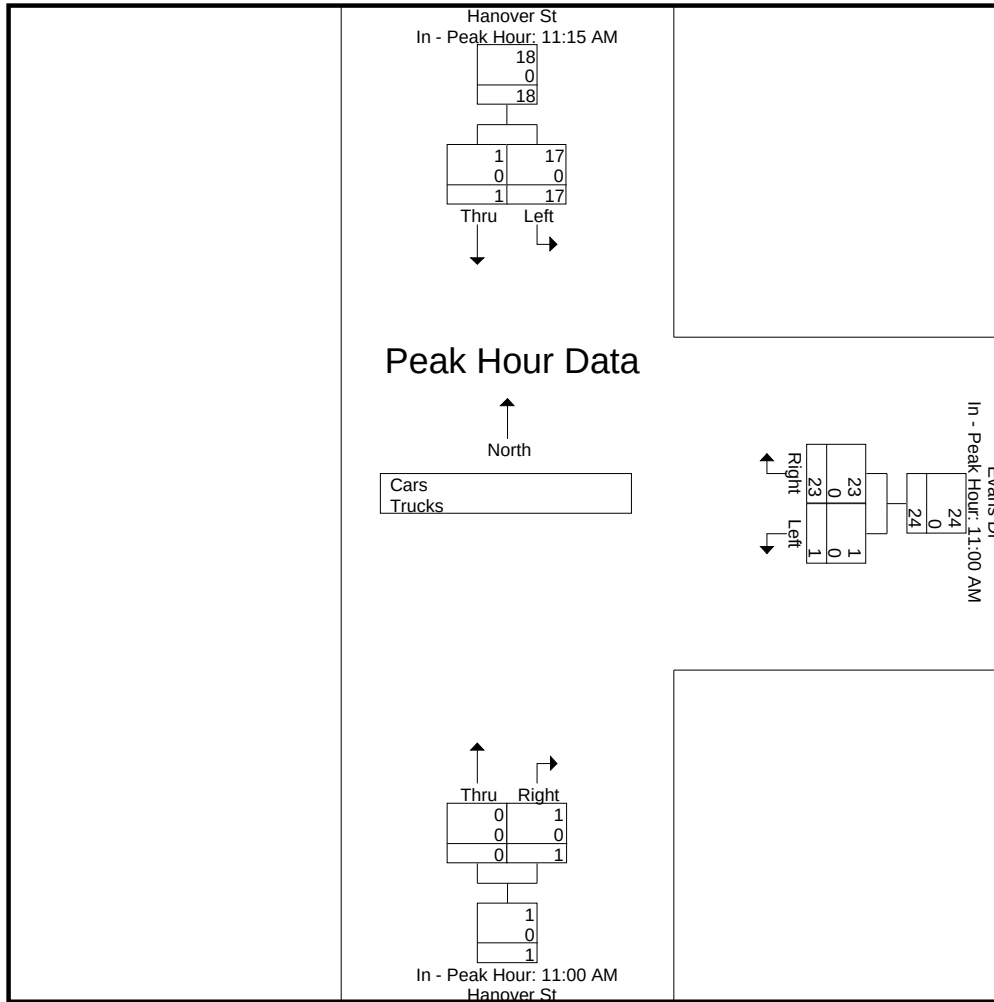
File Name : 529330S1
Site Code : 52933001
Start Date : 11/12/2022
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Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:15 AM			11:00 AM			11:00 AM		
+0 mins.	3	1	4	1	4	5	0	0	0
+15 mins.	3	0	3	0	9	9	0	1	1
+30 mins.	7	0	7	0	4	4	0	0	0
+45 mins.	4	0	4	0	6	6	0	0	0
Total Volume	17	1	18	1	23	24	0	1	1
% App. Total	94.4	5.6		4.2	95.8		0	100	
PHF	.607	.250	.643	.250	.639	.667	.000	.250	.250
Cars	17	1	18	1	23	24	0	1	1
% Cars	100	100	100	100	100	100	0	100	100
Trucks	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0

N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear



N/S Street : Hanover Street
 E/W Street : Evans Drive
 City/State : Lebanon, NH
 Weather : Clear

File Name : 529330S1
 Site Code : 52933001
 Start Date : 11/12/2022
 Page No : 4

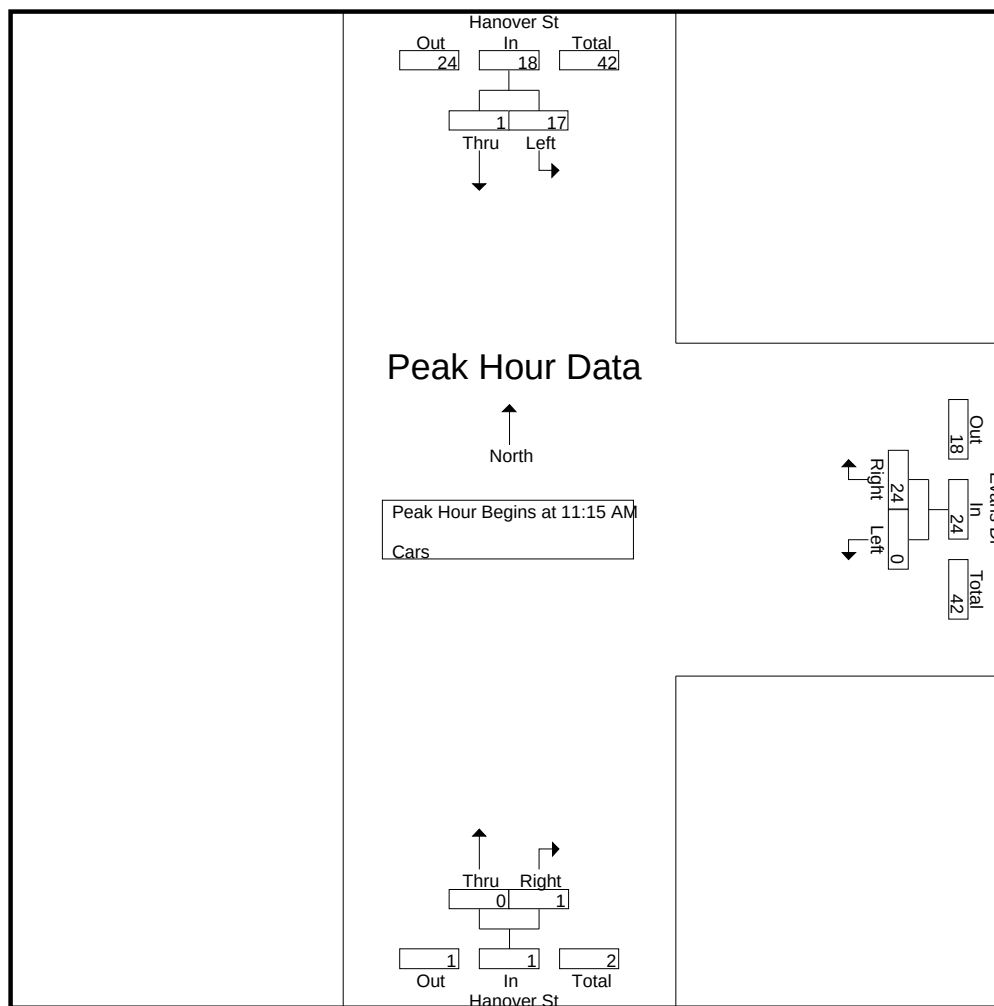
Groups Printed- Cars

	Hanover St From North		Evans Dr From East		Hanover St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
11:00 AM	2	0	1	4	0	0	7
11:15 AM	3	1	0	9	0	1	14
11:30 AM	3	0	0	4	0	0	7
11:45 AM	7	0	0	6	0	0	13
Total	15	1	1	23	0	1	41
12:00 PM	4	0	0	5	0	0	9
12:15 PM	4	0	0	4	0	0	8
12:30 PM	2	0	0	7	0	0	9
12:45 PM	2	1	0	2	1	0	6
Total	12	1	0	18	1	0	32
Grand Total	27	2	1	41	1	1	73
Apprch %	93.1	6.9	2.4	97.6	50	50	
Total %	37	2.7	1.4	56.2	1.4	1.4	

	Hanover St From North			Evans Dr From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:15 AM										
11:15 AM	3	1	4	0	9	9	0	1	1	14
11:30 AM	3	0	3	0	4	4	0	0	0	7
11:45 AM	7	0	7	0	6	6	0	0	0	13
12:00 PM	4	0	4	0	5	5	0	0	0	9
Total Volume	17	1	18	0	24	24	0	1	1	43
% App. Total	94.4	5.6		0	100		0	100		
PHF	.607	.250	.643	.000	.667	.667	.000	.250	.250	.768

N/S Street : Hanover Street
 E/W Street : Evans Drive
 City/State : Lebanon, NH
 Weather : Clear

File Name : 529330S1
 Site Code : 52933001
 Start Date : 11/12/2022
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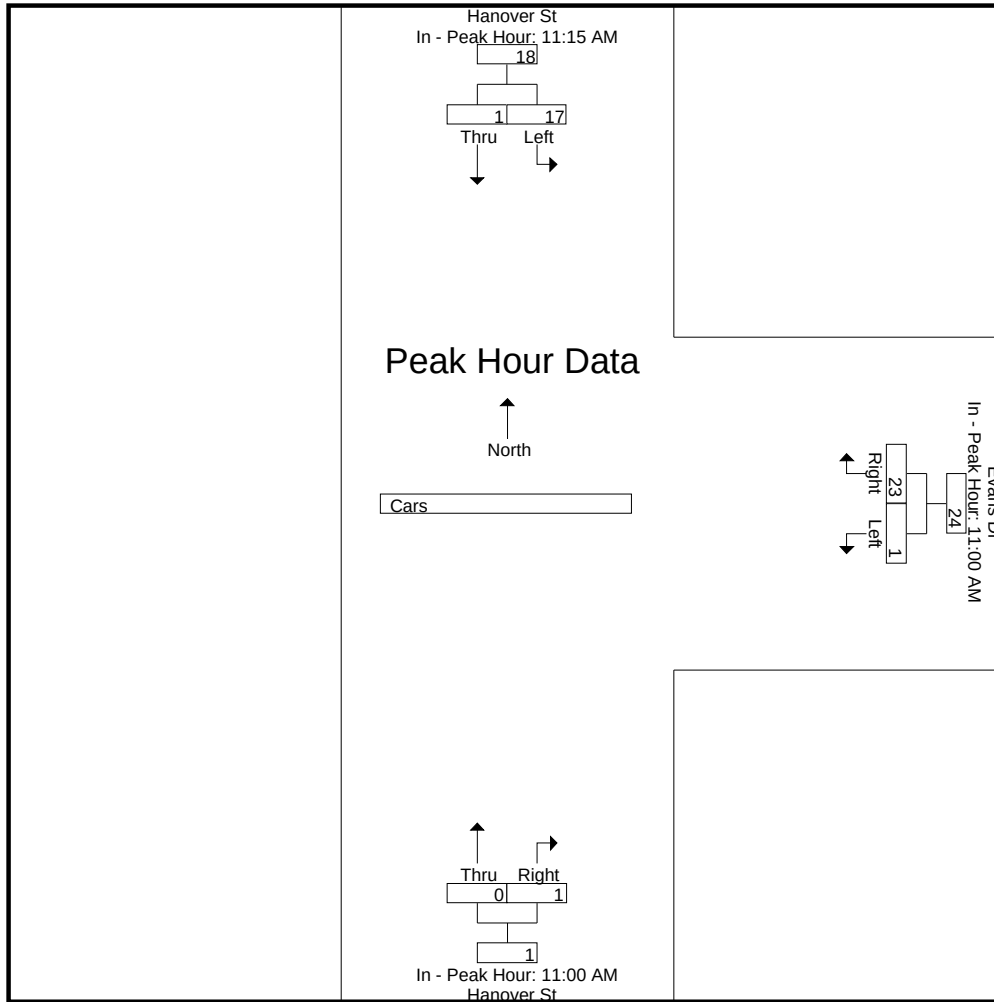
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	11:15 AM			11:00 AM			11:00 AM		
+0 mins.	3	1	4	1	4	5	0	0	0
+15 mins.	3	0	3	0	9	9	0	1	1
+30 mins.	7	0	7	0	4	4	0	0	0
+45 mins.	4	0	4	0	6	6	0	0	0
Total Volume	17	1	18	1	23	24	0	1	1
% App. Total	94.4	5.6		4.2	95.8		0	100	
PHF	.607	.250	.643	.250	.639	.667	.000	.250	.250

File Name : 529330S1
Site Code : 52933001
Start Date : 11/12/2022
Page No : 6

N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear



N/S Street : Hanover Street
 E/W Street : Evans Drive
 City/State : Lebanon, NH
 Weather : Clear

File Name : 529330S1
 Site Code : 52933001
 Start Date : 11/12/2022
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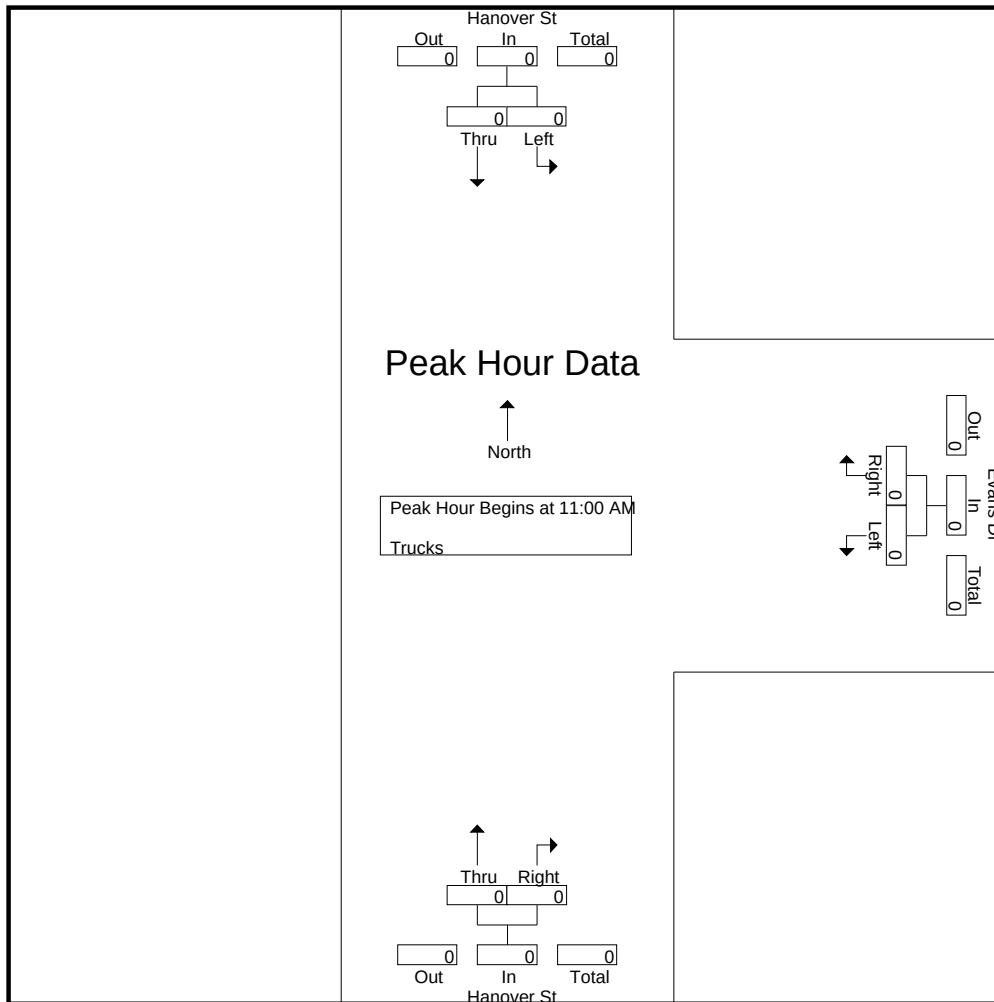
Groups Printed- Trucks

	Hanover St From North		Evans Dr From East		Hanover St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
11:00 AM	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	
Total %							

	Hanover St From North			Evans Dr From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:00 AM										
11:00 AM	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S1
Site Code : 52933001
Start Date : 11/12/2022
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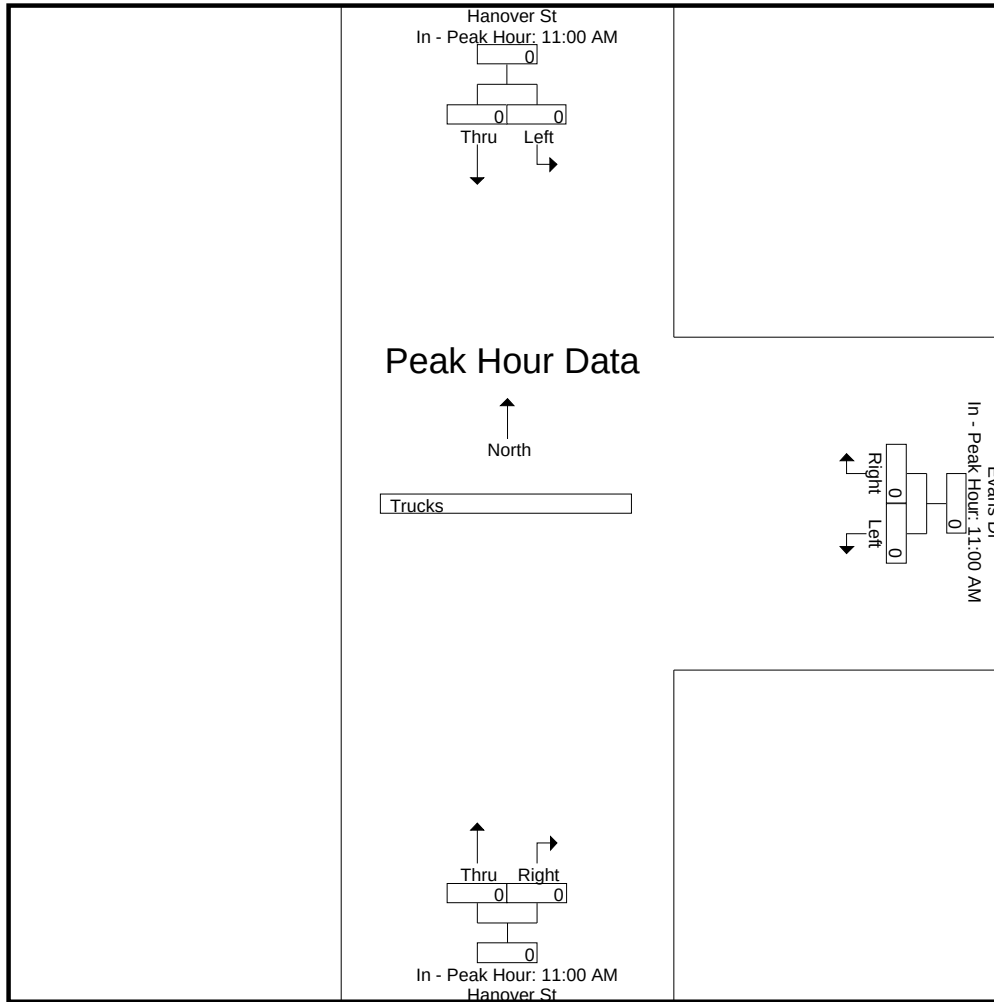


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:00 AM			11:00 AM			11:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S1
Site Code : 52933001
Start Date : 11/12/2022
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N/S Street : Hanover Street
 E/W Street : Evans Drive
 City/State : Lebanon, NH
 Weather : Clear

File Name : 529330S1
 Site Code : 52933001
 Start Date : 11/12/2022
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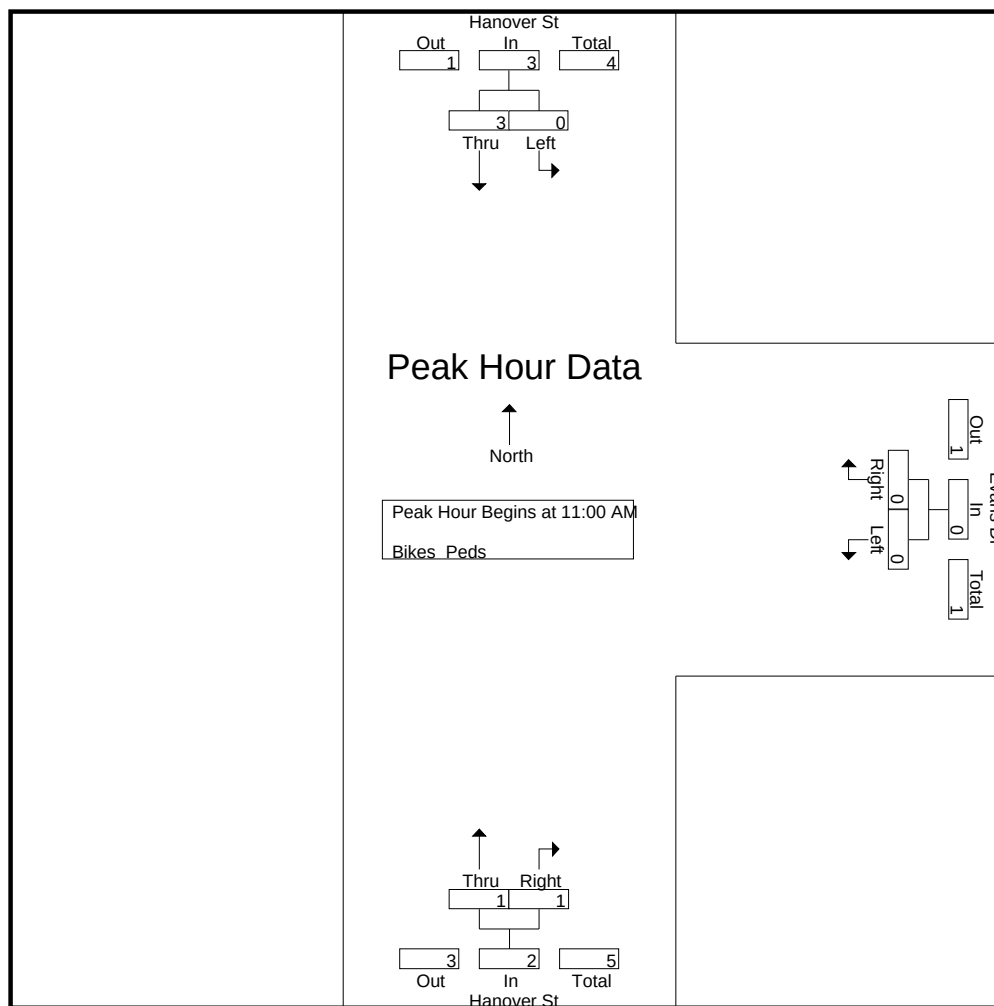
Groups Printed- Bikes Peds

	Hanover St From North			Evans Dr From East			Hanover St From South			Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
11:00 AM	0	2	0	0	0	2	0	0	0	2	2	4
11:15 AM	0	1	0	0	0	4	1	0	0	4	2	6
11:30 AM	0	0	0	0	0	2	0	0	0	2	0	2
11:45 AM	0	0	0	0	0	3	0	1	0	3	1	4
Total	0	3	0	0	0	11	1	1	0	11	5	16
12:00 PM	0	0	0	0	0	0	1	0	0	0	1	1
12:15 PM	0	1	0	0	0	0	2	0	0	0	3	3
12:30 PM	0	0	0	0	0	1	0	0	0	1	0	1
12:45 PM	0	0	0	0	0	1	1	0	0	1	1	2
Total	0	1	0	0	0	2	4	0	0	2	5	7
Grand Total	0	4	0	0	0	13	5	1	0	13	10	23
Apprch %	0	100		0	0		83.3	16.7				
Total %	0	40		0	0		50	10		56.5	43.5	

	Hanover St From North			Evans Dr From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:00 AM										
11:00 AM	0	2	2	0	0	0	0	0	0	2
11:15 AM	0	1	1	0	0	0	1	0	1	2
11:30 AM	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	1	1	1
Total Volume	0	3	3	0	0	0	1	1	2	5
% App. Total	0	100		0	0		50	50		
PHF	.000	.375	.375	.000	.000	.000	.250	.250	.500	.625

N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S1
Site Code : 52933001
Start Date : 11/12/2022
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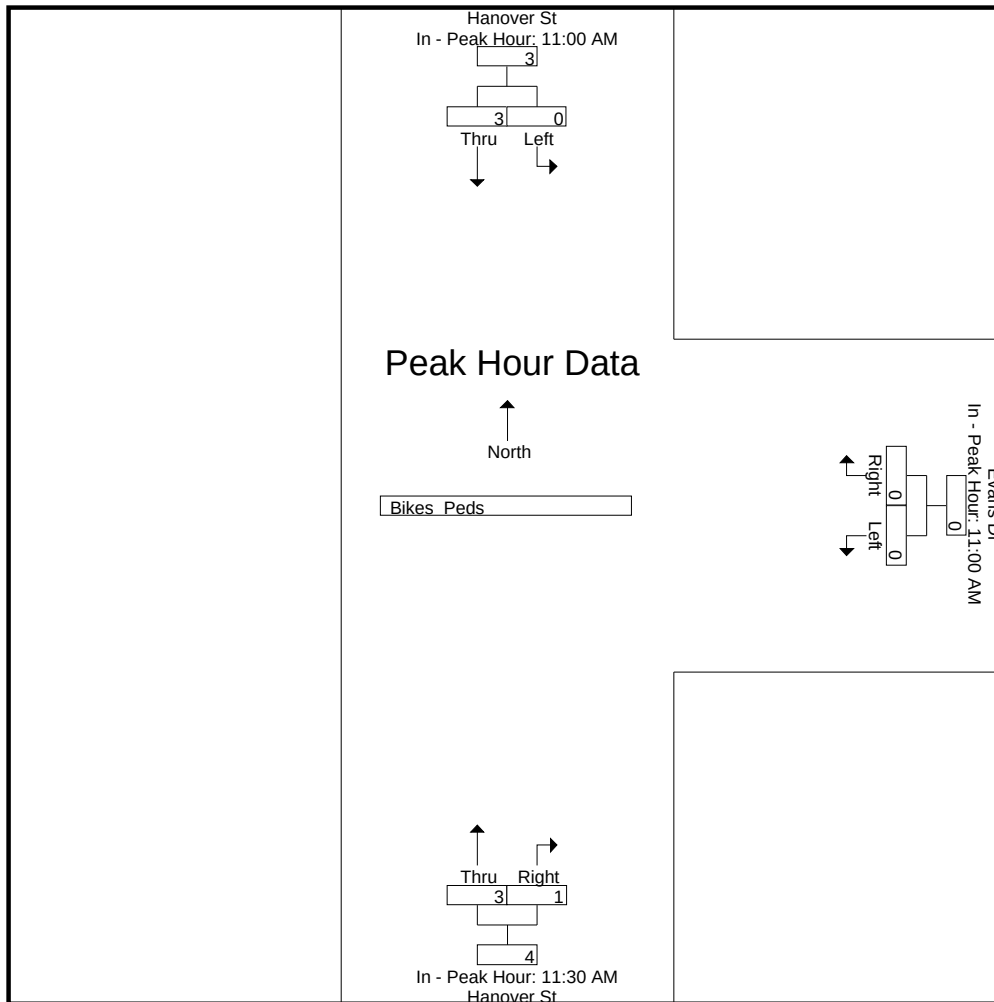


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:00 AM			11:00 AM			11:30 AM		
+0 mins.	0	2	2	0	0	0	0	0	0
+15 mins.	0	1	1	0	0	0	0	1	1
+30 mins.	0	0	0	0	0	0	1	0	1
+45 mins.	0	0	0	0	0	0	2	0	2
Total Volume	0	3	3	0	0	0	3	1	4
% App. Total	0	100		0	0		75	25	
PHF	.000	.375	.375	.000	.000	.000	.375	.250	.500

N/S Street : Hanover Street
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S1
Site Code : 52933001
Start Date : 11/12/2022
Page No : 12



N/S Street : Hanover Street
 E/W Street : Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933002
 Site Code : 52933002
 Start Date : 11/10/2022
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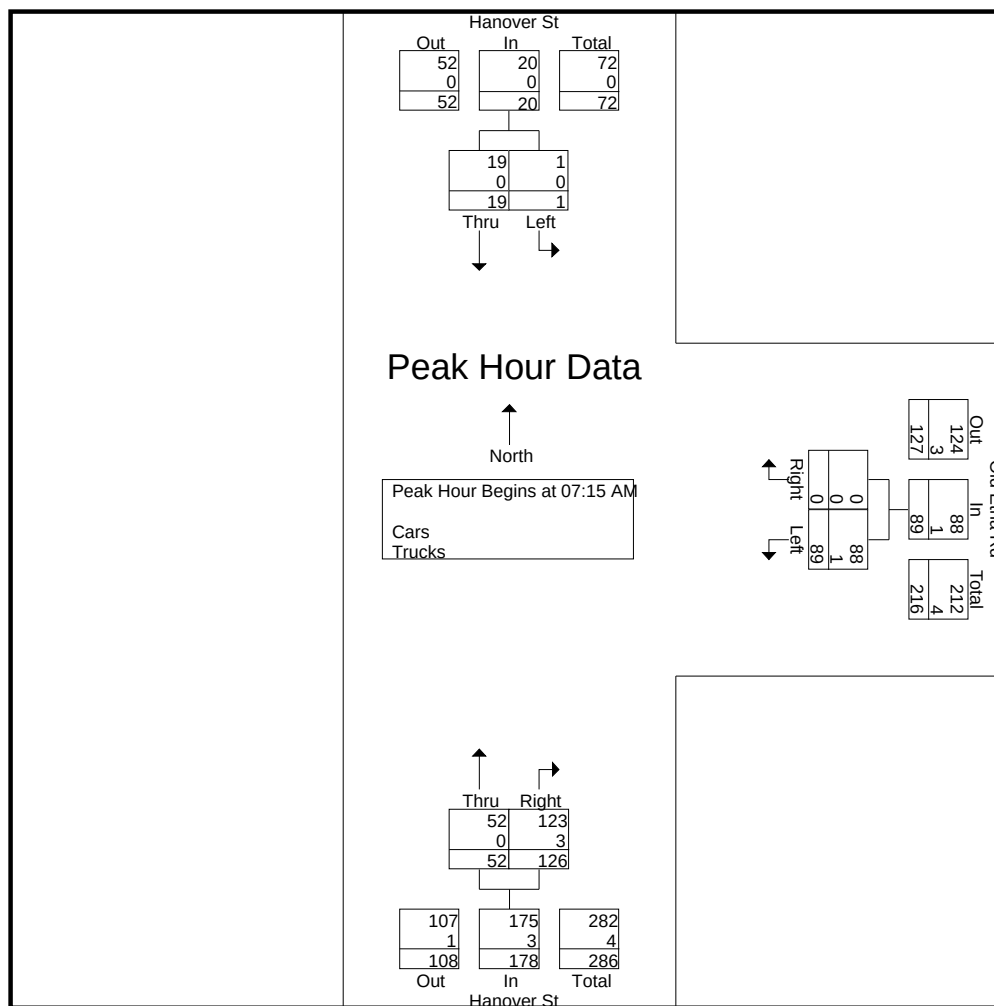
Groups Printed- Cars - Trucks

	Hanover St From North		Old Etna Rd From East		Hanover St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	2	21	0	9	15	47
07:15 AM	0	5	39	0	13	40	97
07:30 AM	0	5	15	0	14	31	65
07:45 AM	1	3	28	0	12	33	77
Total	1	15	103	0	48	119	286
08:00 AM	0	6	7	0	13	22	48
08:15 AM	0	3	4	0	11	10	28
08:30 AM	0	4	1	0	4	4	13
08:45 AM	0	2	4	0	3	2	11
Total	0	15	16	0	31	38	100
Grand Total	1	30	119	0	79	157	386
Apprch %	3.2	96.8	100	0	33.5	66.5	
Total %	0.3	7.8	30.8	0	20.5	40.7	
Cars	1	29	118	0	76	152	376
% Cars	100	96.7	99.2	0	96.2	96.8	97.4
Trucks	0	1	1	0	3	5	10
% Trucks	0	3.3	0.8	0	3.8	3.2	2.6

	Hanover St From North			Old Etna Rd From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	5	5	39	0	39	13	40	53	97
07:30 AM	0	5	5	15	0	15	14	31	45	65
07:45 AM	1	3	4	28	0	28	12	33	45	77
08:00 AM	0	6	6	7	0	7	13	22	35	48
Total Volume	1	19	20	89	0	89	52	126	178	287
% App. Total	5	95		100	0		29.2	70.8		
PHF	.250	.792	.833	.571	.000	.571	.929	.788	.840	.740
Cars	1	19	20	88	0	88	52	123	175	283
% Cars	100	100	100	98.9	0	98.9	100	97.6	98.3	98.6
Trucks	0	0	0	1	0	1	0	3	3	4
% Trucks	0	0	0	1.1	0	1.1	0	2.4	1.7	1.4

N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933002
Site Code : 52933002
Start Date : 11/10/2022
Page No : 2

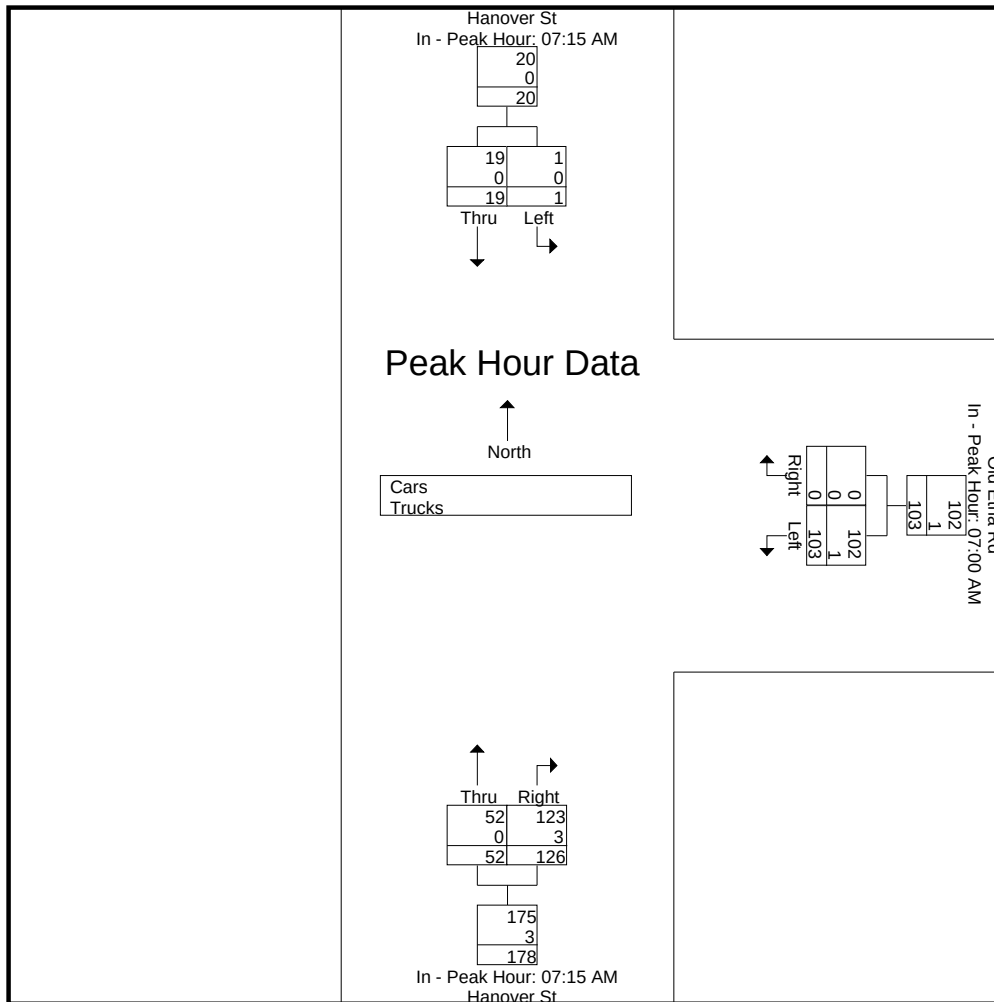


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:00 AM			07:15 AM		
+0 mins.	0	5	5	21	0	21	13	40	53
+15 mins.	0	5	5	39	0	39	14	31	45
+30 mins.	1	3	4	15	0	15	12	33	45
+45 mins.	0	6	6	28	0	28	13	22	35
Total Volume	1	19	20	103	0	103	52	126	178
% App. Total	5	95		100	0		29.2	70.8	
PHF	.250	.792	.833	.660	.000	.660	.929	.788	.840
Cars	1	19	20	102	0	102	52	123	175
% Cars	100	100	100	99	0	99	100	97.6	98.3
Trucks	0	0	0	1	0	1	0	3	3
% Trucks	0	0	0	1	0	1	0	2.4	1.7

File Name : 52933002
Site Code : 52933002
Start Date : 11/10/2022
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N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear



N/S Street : Hanover Street
 E/W Street : Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933002
 Site Code : 52933002
 Start Date : 11/10/2022
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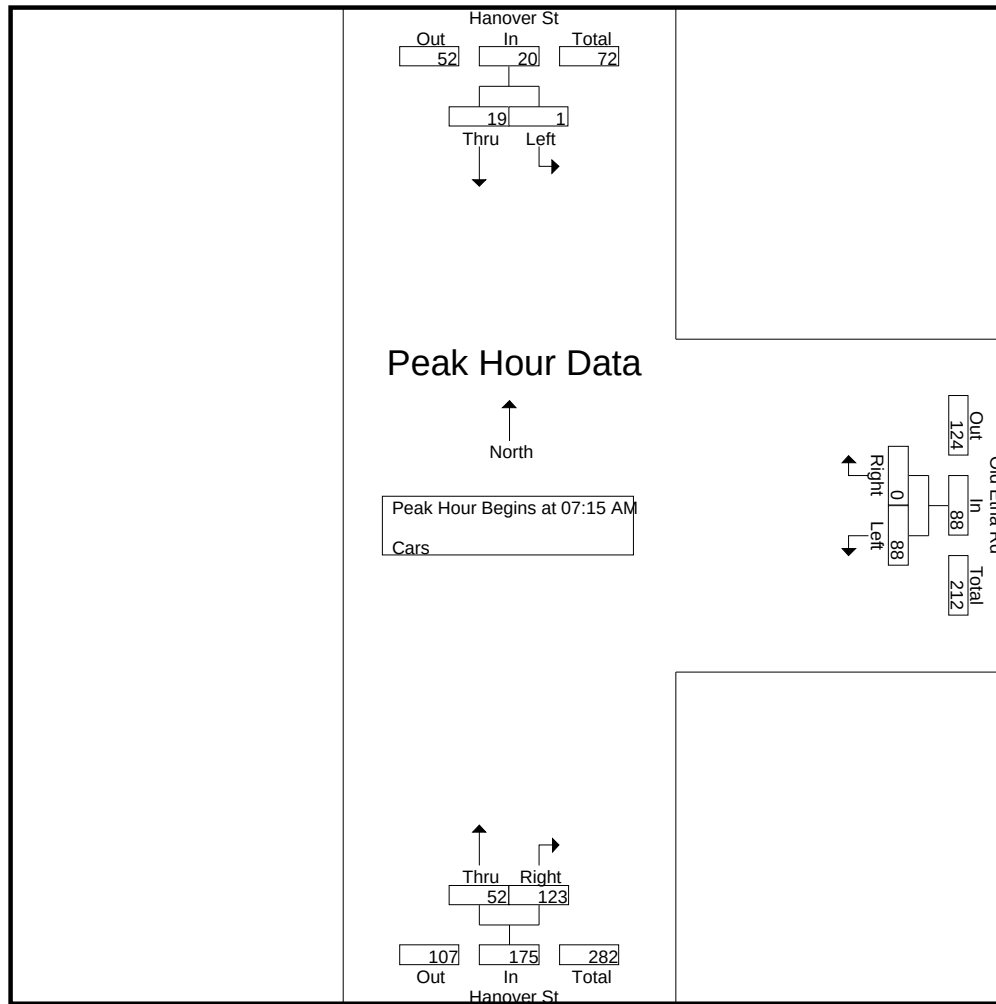
Groups Printed- Cars

	Hanover St From North		Old Etna Rd From East		Hanover St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	1	21	0	8	13	43
07:15 AM	0	5	39	0	13	39	96
07:30 AM	0	5	15	0	14	31	65
07:45 AM	1	3	27	0	12	32	75
Total	1	14	102	0	47	115	279
08:00 AM	0	6	7	0	13	21	47
08:15 AM	0	3	4	0	10	10	27
08:30 AM	0	4	1	0	3	4	12
08:45 AM	0	2	4	0	3	2	11
Total	0	15	16	0	29	37	97
Grand Total	1	29	118	0	76	152	376
Apprch %	3.3	96.7	100	0	33.3	66.7	
Total %	0.3	7.7	31.4	0	20.2	40.4	

	Hanover St From North			Old Etna Rd From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	5	5	39	0	39	13	39	52	96
07:30 AM	0	5	5	15	0	15	14	31	45	65
07:45 AM	1	3	4	27	0	27	12	32	44	75
08:00 AM	0	6	6	7	0	7	13	21	34	47
Total Volume	1	19	20	88	0	88	52	123	175	283
% App. Total	5	95		100	0		29.7	70.3		
PHF	.250	.792	.833	.564	.000	.564	.929	.788	.841	.737

N/S Street : Hanover Street
 E/W Street : Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933002
 Site Code : 52933002
 Start Date : 11/10/2022
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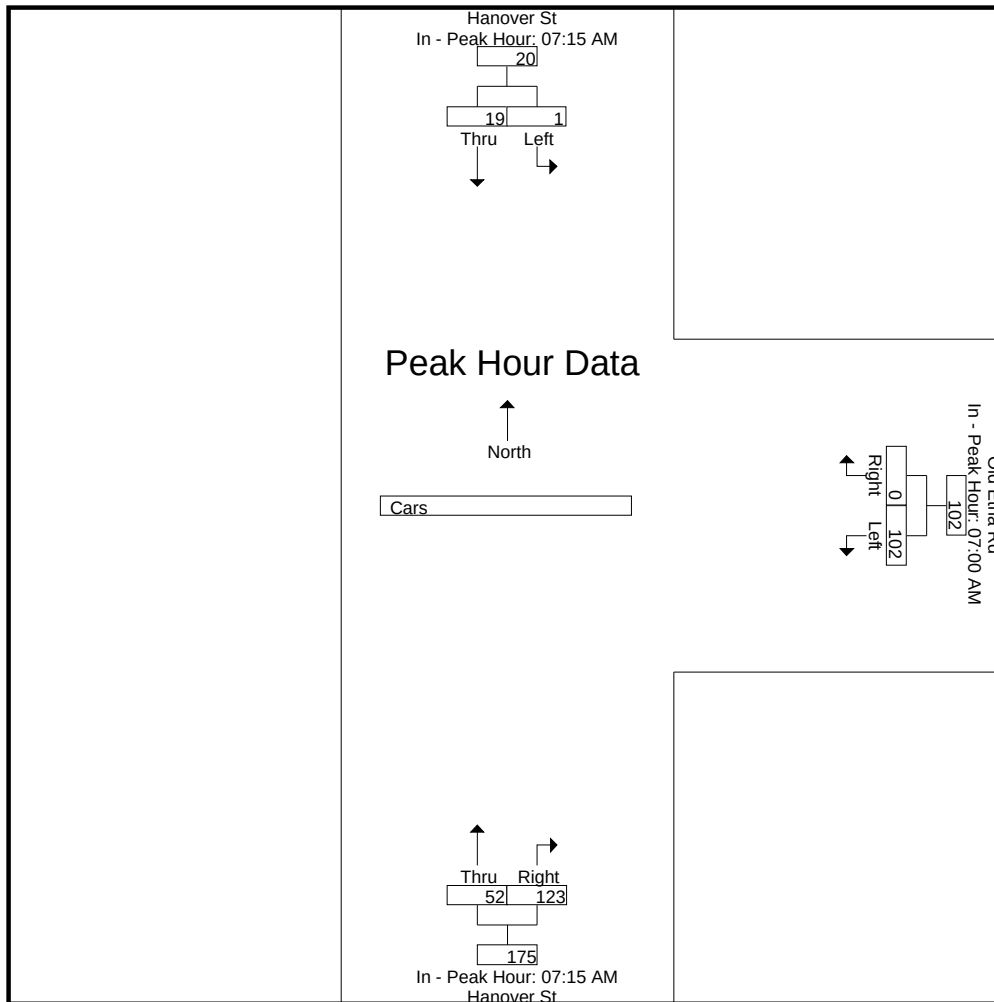


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:15 AM			07:00 AM			07:15 AM		
+0 mins.	0	5	5	21	0	21	13	39	52
+15 mins.	0	5	5	39	0	39	14	31	45
+30 mins.	1	3	4	15	0	15	12	32	44
+45 mins.	0	6	6	27	0	27	13	21	34
Total Volume	1	19	20	102	0	102	52	123	175
% App. Total	5	95		100	0		29.7	70.3	
PHF	.250	.792	.833	.654	.000	.654	.929	.788	.841

N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933002
Site Code : 52933002
Start Date : 11/10/2022
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N/S Street : Hanover Street
 E/W Street : Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933002
 Site Code : 52933002
 Start Date : 11/10/2022
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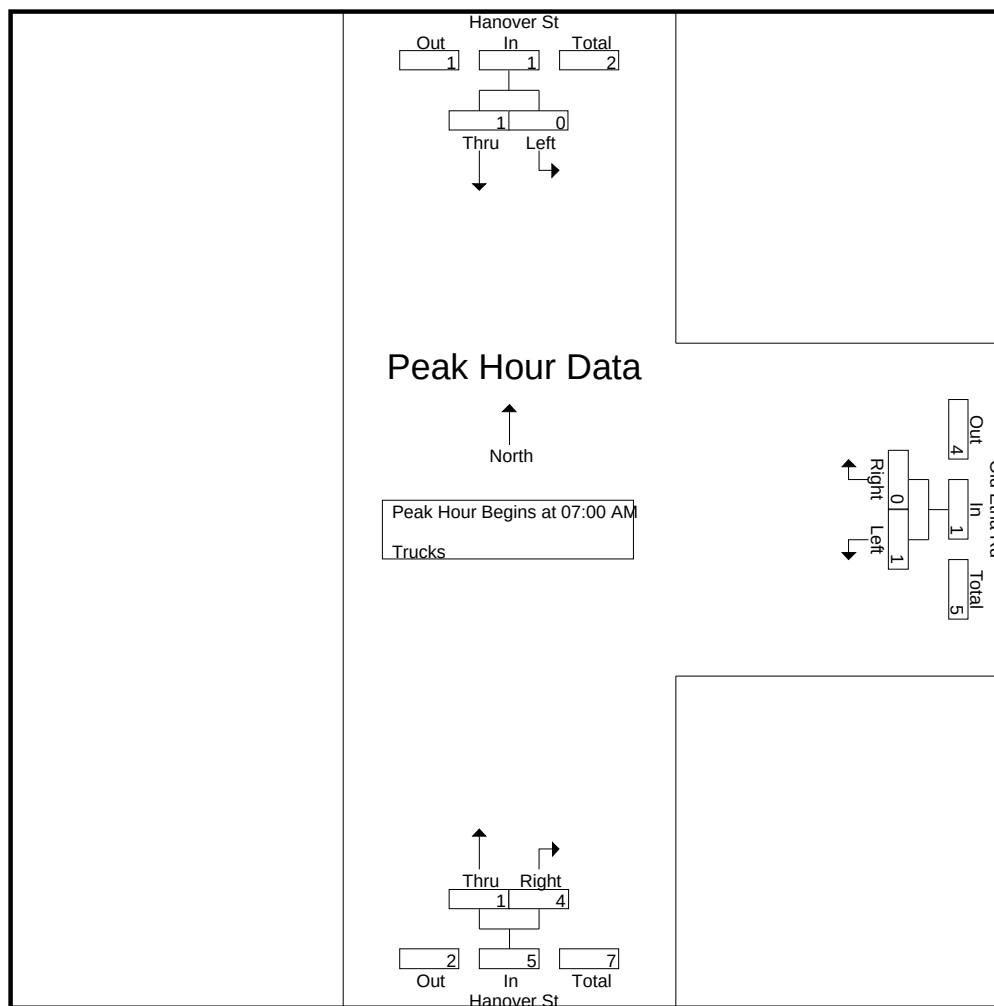
Groups Printed- Trucks

	Hanover St From North		Old Etna Rd From East		Hanover St From South		Int. Total
Start Time	Left	Thru	Left	Right	Thru	Right	
07:00 AM	0	1	0	0	1	2	4
07:15 AM	0	0	0	0	0	1	1
07:30 AM	0	0	0	0	0	0	0
07:45 AM	0	0	1	0	0	1	2
Total	0	1	1	0	1	4	7
08:00 AM	0	0	0	0	0	1	1
08:15 AM	0	0	0	0	1	0	1
08:30 AM	0	0	0	0	1	0	1
08:45 AM	0	0	0	0	0	0	0
Total	0	0	0	0	2	1	3
Grand Total	0	1	1	0	3	5	10
Apprch %	0	100	100	0	37.5	62.5	
Total %	0	10	10	0	30	50	

	Hanover St From North			Old Etna Rd From East			Hanover St From South			Int. Total
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	1	1	0	0	0	1	2	3	4
07:15 AM	0	0	0	0	0	0	0	1	1	1
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	1	0	1	0	1	1	2
Total Volume	0	1	1	1	0	1	1	4	5	7
% App. Total	0	100		100	0		20	80		
PHF	.000	.250	.250	.250	.000	.250	.250	.500	.417	.438

N/S Street : Hanover Street
 E/W Street : Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933002
 Site Code : 52933002
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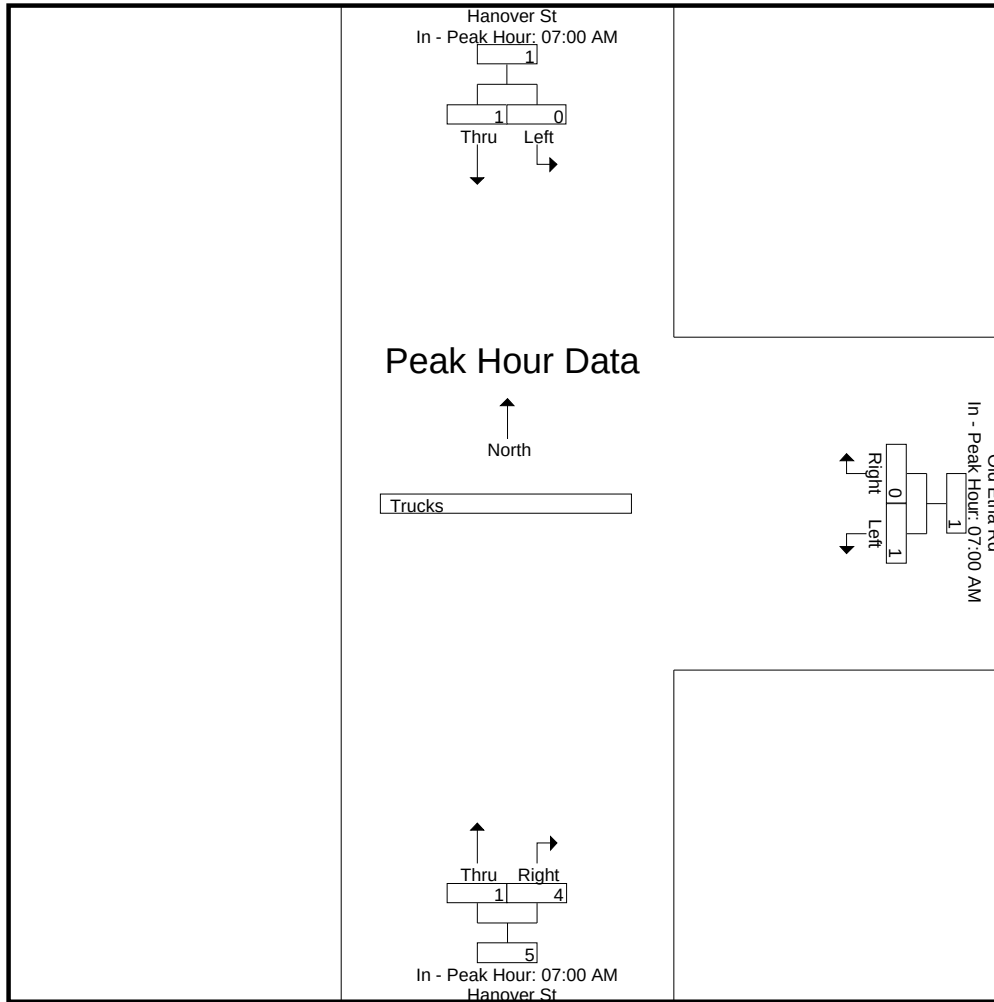


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	1	1	0	0	0	1	2	3
+15 mins.	0	0	0	0	0	0	0	1	1
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	1	0	1	0	1	1
Total Volume	0	1	1	1	0	1	1	4	5
% App. Total	0	100		100	0		20	80	
PHF	.000	.250	.250	.250	.000	.250	.250	.500	.417

N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933002
Site Code : 52933002
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N/S Street : Hanover Street
 E/W Street : Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933002
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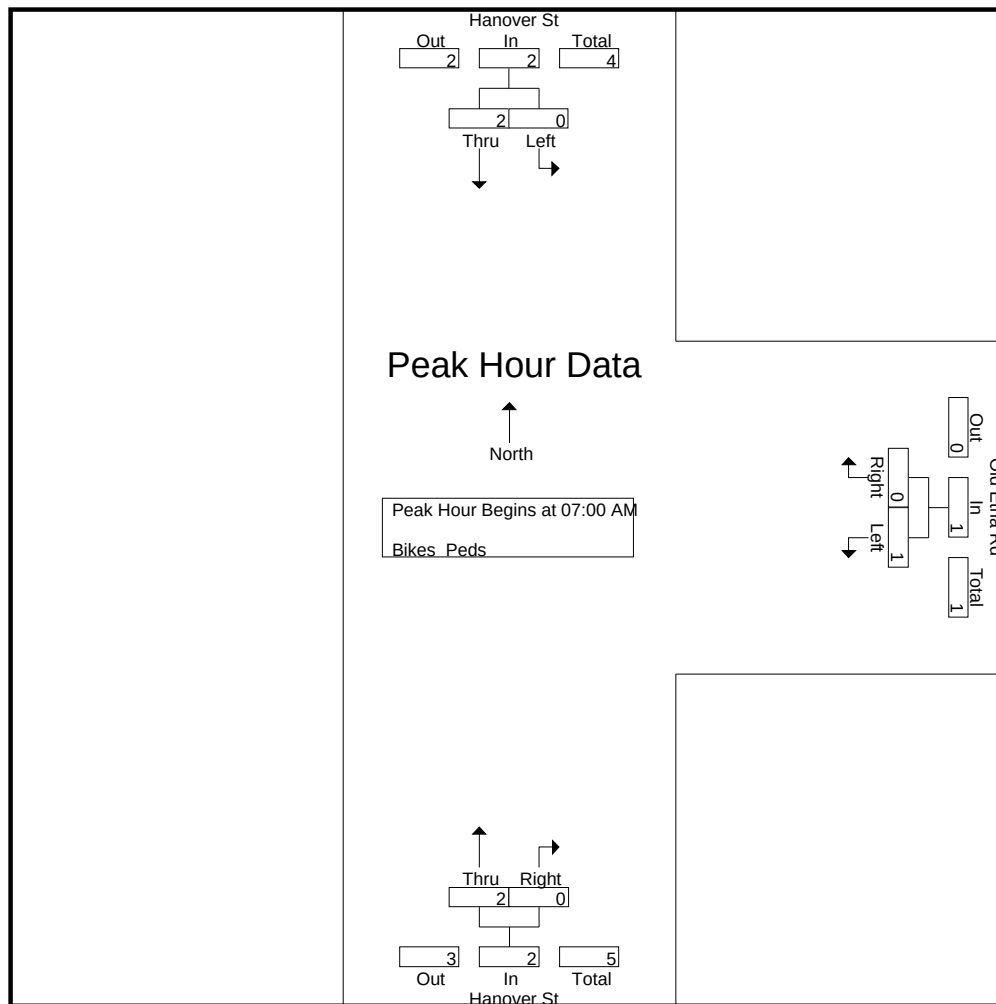
Groups Printed- Bikes Peds

	Hanover St From North			Old Etna Rd From East			Hanover St From South			Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	1	2	0	0	0	1	0	2	4	2	6
07:30 AM	0	0	0	1	0	0	0	0	0	0	1	1
07:45 AM	0	1	0	0	0	6	1	0	0	6	2	8
Total	0	2	2	1	0	6	2	0	2	10	5	15
08:00 AM	0	0	0	0	0	5	0	0	1	6	0	6
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	1	0	0	0	1	0	1
Total	0	0	0	0	0	6	0	0	1	7	0	7
Grand Total	0	2	2	1	0	12	2	0	3	17	5	22
Apprch %	0	100		100	0		100	0				
Total %	0	40		20	0		40	0		77.3	22.7	

	Hanover St From North			Old Etna Rd From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	1	1	0	0	0	1	0	1	2
07:30 AM	0	0	0	1	0	1	0	0	0	1
07:45 AM	0	1	1	0	0	0	1	0	1	2
Total Volume	0	2	2	1	0	1	2	0	2	5
% App. Total	0	100		100	0		100	0		
PHF	.000	.500	.500	.250	.000	.250	.500	.000	.500	.625

N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933002
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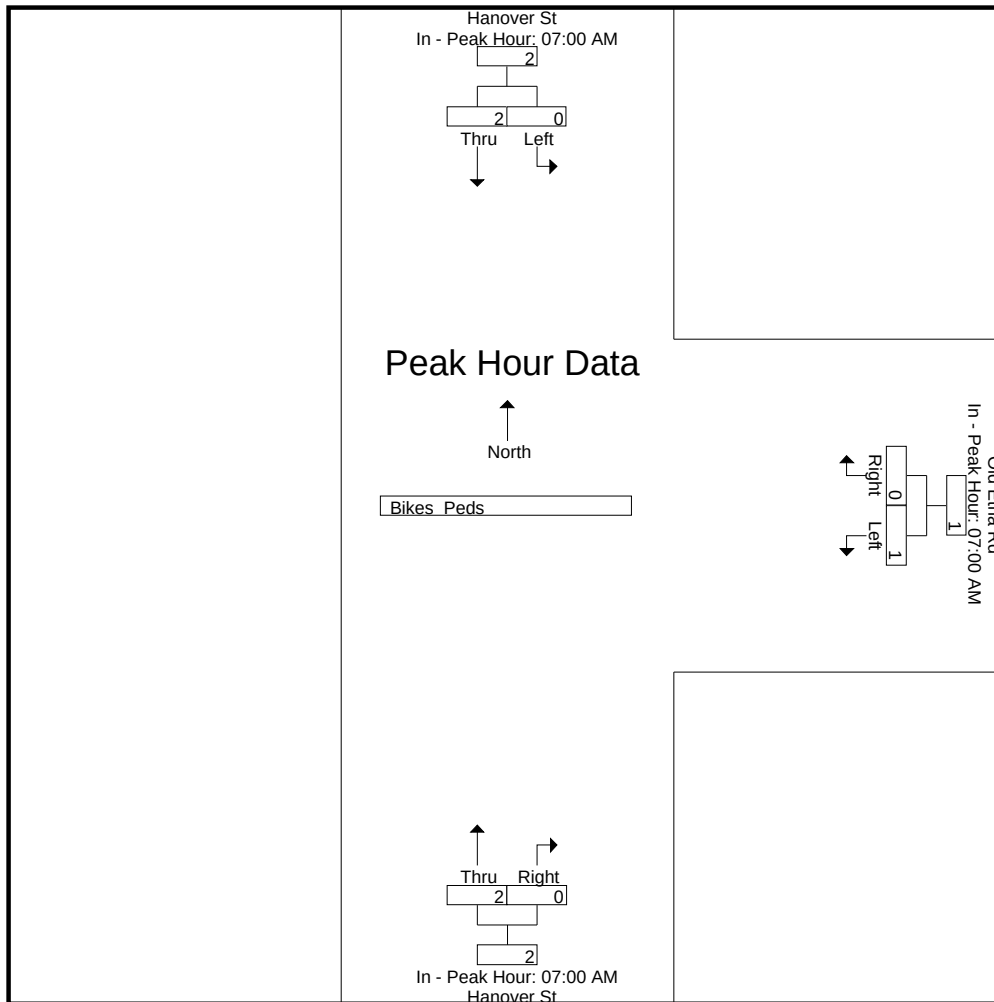


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	1	1	0	0	0	1	0	1
+30 mins.	0	0	0	1	0	1	0	0	0
+45 mins.	0	1	1	0	0	0	1	0	1
Total Volume	0	2	2	1	0	1	2	0	2
% App. Total	0	100		100	0		100	0	
PHF	.000	.500	.500	.250	.000	.250	.500	.000	.500

N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933002
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N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933002
Site Code : 52933002
Start Date : 11/10/2022
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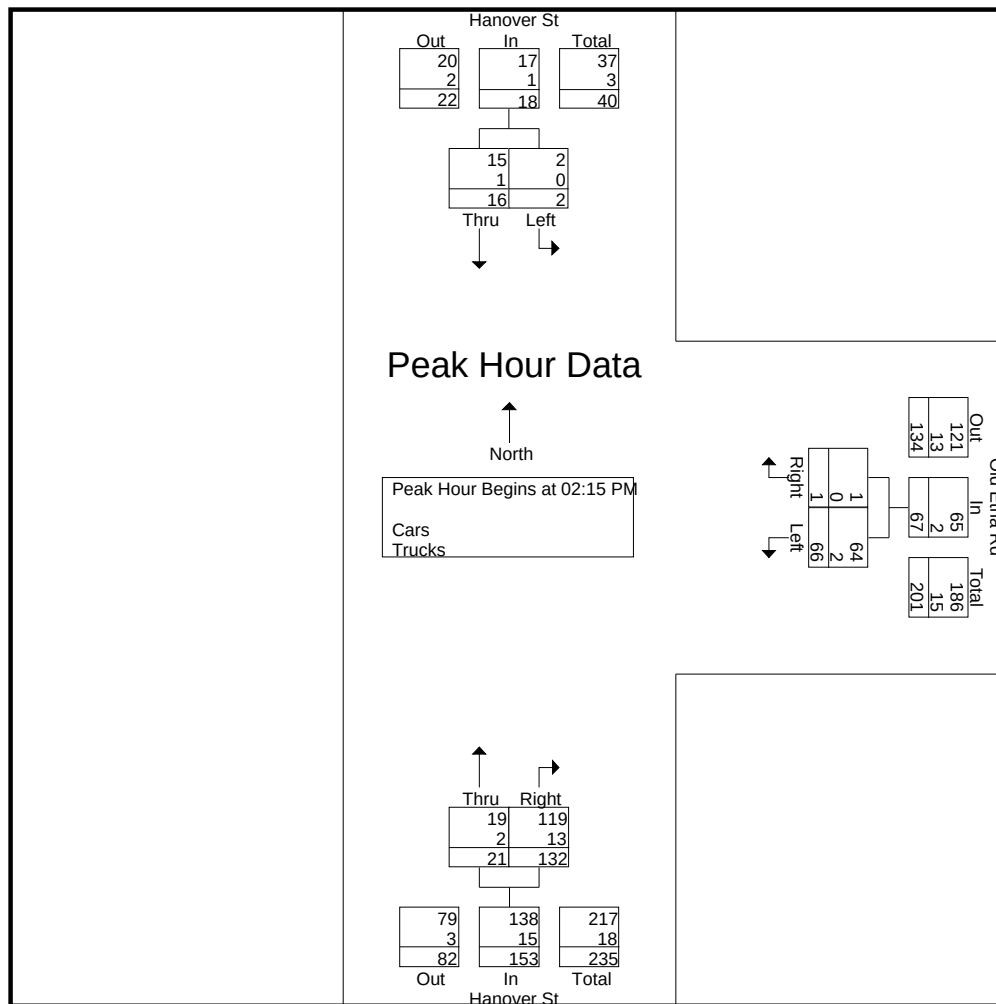
Groups Printed- Cars - Trucks

	Hanover St From North		Old Etna Rd From East		Hanover St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
02:00 PM	0	9	8	0	7	22	46
02:15 PM	0	2	13	1	2	19	37
02:30 PM	1	3	16	0	3	24	47
02:45 PM	1	6	18	0	5	20	50
Total	2	20	55	1	17	85	180
03:00 PM	0	5	19	0	11	69	104
03:15 PM	0	1	5	1	8	18	33
03:30 PM	0	6	5	0	3	15	29
03:45 PM	0	8	11	1	1	5	26
Total	0	20	40	2	23	107	192
04:00 PM	0	7	5	1	5	9	27
04:15 PM	2	9	5	1	2	7	26
04:30 PM	0	7	5	0	2	8	22
04:45 PM	0	8	6	1	6	9	30
Total	2	31	21	3	15	33	105
05:00 PM	0	9	8	0	4	21	42
05:15 PM	0	6	9	0	1	7	23
05:30 PM	0	9	1	0	3	5	18
05:45 PM	0	5	2	0	5	5	17
Total	0	29	20	0	13	38	100
Grand Total	4	100	136	6	68	263	577
Apprch %	3.8	96.2	95.8	4.2	20.5	79.5	
Total %	0.7	17.3	23.6	1	11.8	45.6	
Cars	4	99	133	6	64	249	555
% Cars	100	99	97.8	100	94.1	94.7	96.2
Trucks	0	1	3	0	4	14	22
% Trucks	0	1	2.2	0	5.9	5.3	3.8

	Hanover St From North			Old Etna Rd From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:15 PM										
02:15 PM	0	2	2	13	1	14	2	19	21	37
02:30 PM	1	3	4	16	0	16	3	24	27	47
02:45 PM	1	6	7	18	0	18	5	20	25	50
03:00 PM	0	5	5	19	0	19	11	69	80	104
Total Volume	2	16	18	66	1	67	21	132	153	238
% App. Total	11.1	88.9		98.5	1.5		13.7	86.3		
PHF	.500	.667	.643	.868	.250	.882	.477	.478	.478	.572
Cars	2	15	17	64	1	65	19	119	138	220
% Cars	100	93.8	94.4	97.0	100	97.0	90.5	90.2	90.2	92.4
Trucks	0	1	1	2	0	2	2	13	15	18
% Trucks	0	6.3	5.6	3.0	0	3.0	9.5	9.8	9.8	7.6

N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933002
Site Code : 52933002
Start Date : 11/10/2022
Page No : 2

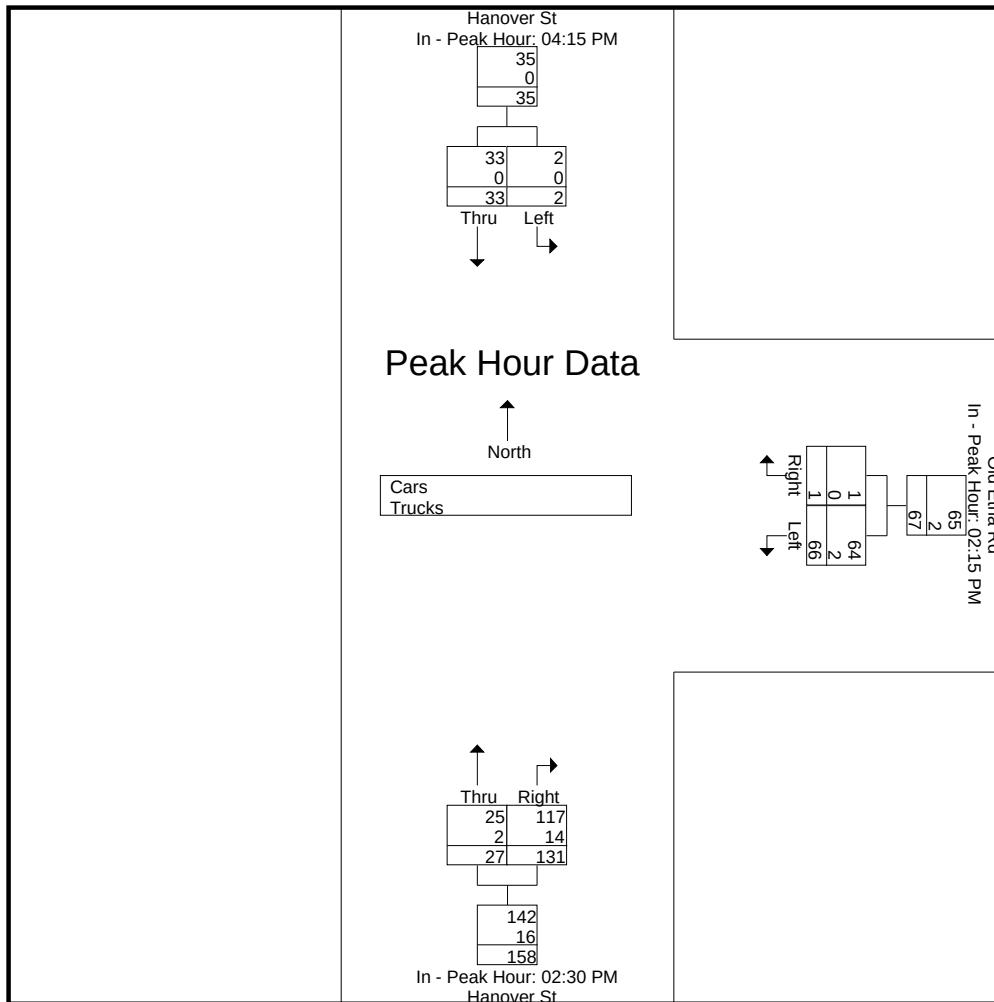


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM			02:15 PM			02:30 PM		
+0 mins.	2	9	11	13	1	14	3	24	27
+15 mins.	0	7	7	16	0	16	5	20	25
+30 mins.	0	8	8	18	0	18	11	69	80
+45 mins.	0	9	9	19	0	19	8	18	26
Total Volume	2	33	35	66	1	67	27	131	158
% App. Total	5.7	94.3		98.5	1.5		17.1	82.9	
PHF	.250	.917	.795	.868	.250	.882	.614	.475	.494
Cars	2	33	35	64	1	65	25	117	142
% Cars	100	100	100	97	100	97	92.6	89.3	89.9
Trucks	0	0	0	2	0	2	2	14	16
% Trucks	0	0	0	3	0	3	7.4	10.7	10.1

N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933002
Site Code : 52933002
Start Date : 11/10/2022
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N/S Street : Hanover Street
 E/W Street : Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933002
 Site Code : 52933002
 Start Date : 11/10/2022
 Page No : 4

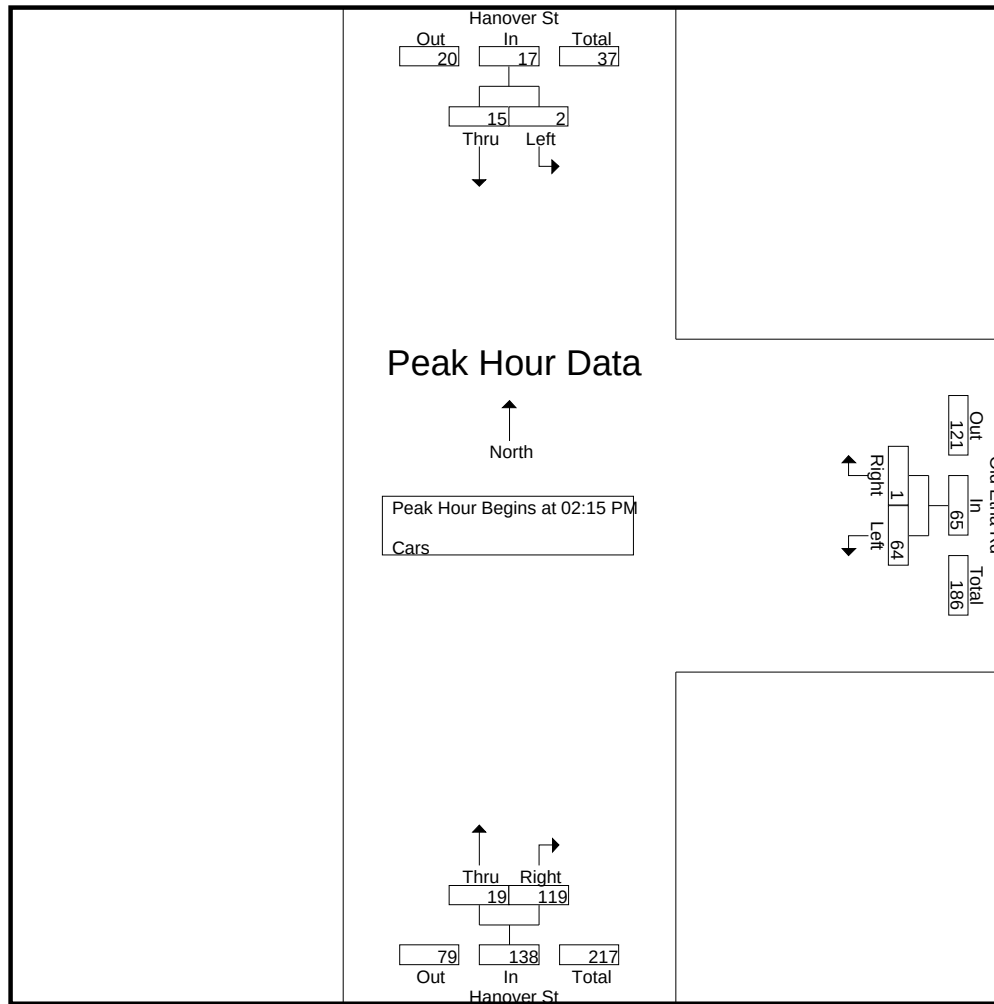
Groups Printed- Cars

	Hanover St From North		Old Etna Rd From East		Hanover St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
02:00 PM	0	9	8	0	6	22	45
02:15 PM	0	1	13	1	1	19	35
02:30 PM	1	3	16	0	2	17	39
02:45 PM	1	6	17	0	5	17	46
Total	2	19	54	1	14	75	165
03:00 PM	0	5	18	0	11	66	100
03:15 PM	0	1	5	1	7	17	31
03:30 PM	0	6	5	0	3	15	29
03:45 PM	0	8	10	1	1	5	25
Total	0	20	38	2	22	103	185
04:00 PM	0	7	5	1	5	9	27
04:15 PM	2	9	5	1	2	7	26
04:30 PM	0	7	5	0	2	8	22
04:45 PM	0	8	6	1	6	9	30
Total	2	31	21	3	15	33	105
05:00 PM	0	9	8	0	4	21	42
05:15 PM	0	6	9	0	1	7	23
05:30 PM	0	9	1	0	3	5	18
05:45 PM	0	5	2	0	5	5	17
Total	0	29	20	0	13	38	100
Grand Total	4	99	133	6	64	249	555
Apprch %	3.9	96.1	95.7	4.3	20.4	79.6	
Total %	0.7	17.8	24	1.1	11.5	44.9	

	Hanover St From North			Old Etna Rd From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:15 PM										
02:15 PM	0	1	1	13	1	14	1	19	20	35
02:30 PM	1	3	4	16	0	16	2	17	19	39
02:45 PM	1	6	7	17	0	17	5	17	22	46
03:00 PM	0	5	5	18	0	18	11	66	77	100
Total Volume	2	15	17	64	1	65	19	119	138	220
% App. Total	11.8	88.2		98.5	1.5		13.8	86.2		
PHF	.500	.625	.607	.889	.250	.903	.432	.451	.448	.550

N/S Street : Hanover Street
 E/W Street : Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933002
 Site Code : 52933002
 Start Date : 11/10/2022
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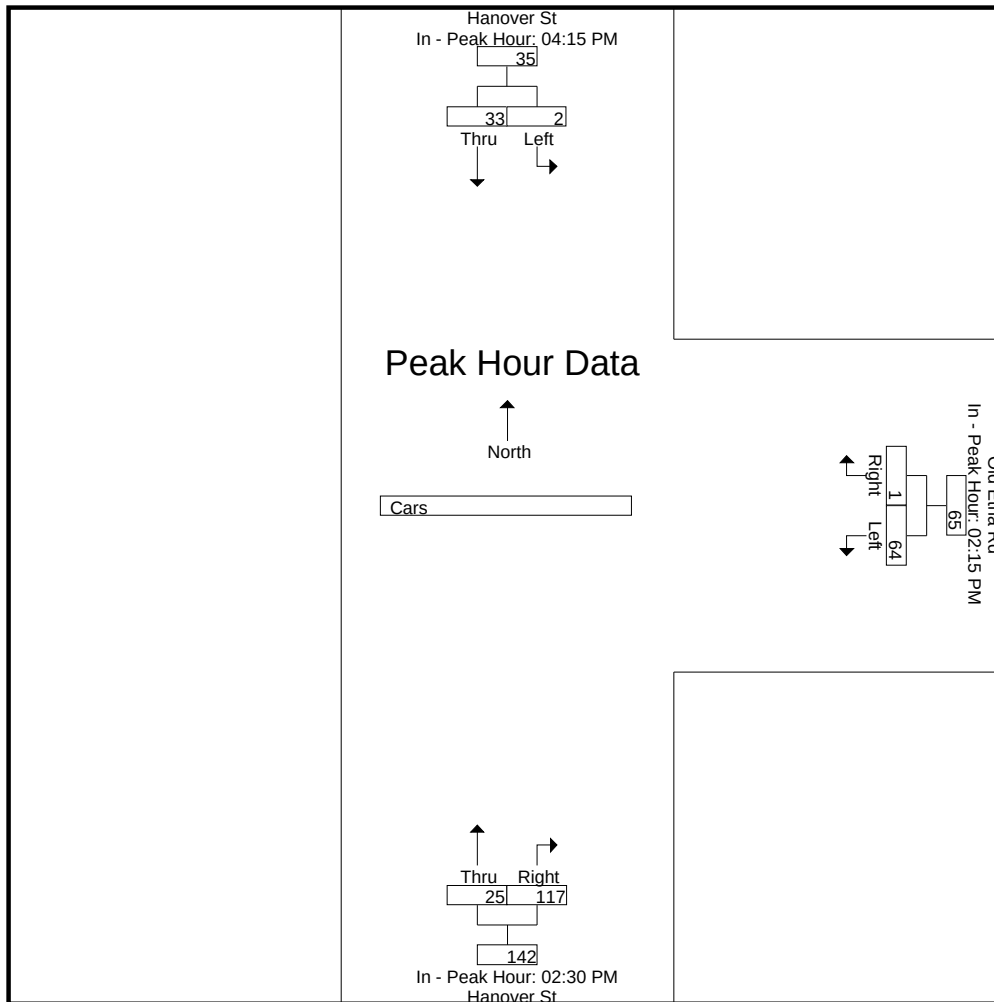


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:15 PM			02:15 PM			02:30 PM		
+0 mins.	2	9	11	13	1	14	2	17	19
+15 mins.	0	7	7	16	0	16	5	17	22
+30 mins.	0	8	8	17	0	17	11	66	77
+45 mins.	0	9	9	18	0	18	7	17	24
Total Volume	2	33	35	64	1	65	25	117	142
% App. Total	5.7	94.3		98.5	1.5		17.6	82.4	
PHF	.250	.917	.795	.889	.250	.903	.568	.443	.461

N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933002
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N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933002
Site Code : 52933002
Start Date : 11/10/2022
Page No : 7

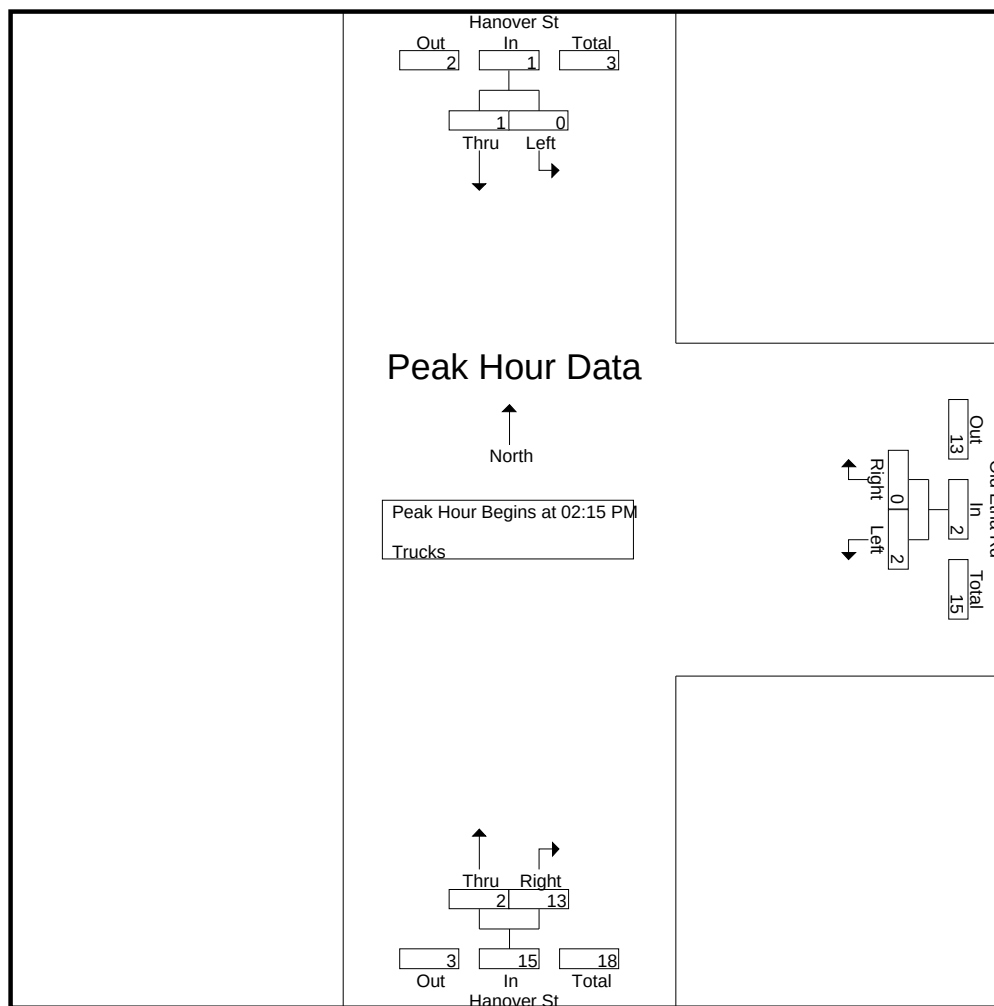
Groups Printed- Trucks

	Hanover St From North		Old Etna Rd From East		Hanover St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
02:00 PM	0	0	0	0	1	0	1
02:15 PM	0	1	0	0	1	0	2
02:30 PM	0	0	0	0	1	7	8
02:45 PM	0	0	1	0	0	3	4
Total	0	1	1	0	3	10	15
03:00 PM	0	0	1	0	0	3	4
03:15 PM	0	0	0	0	1	1	2
03:30 PM	0	0	0	0	0	0	0
03:45 PM	0	0	1	0	0	0	1
Total	0	0	2	0	1	4	7
04:00 PM	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Grand Total	0	1	3	0	4	14	22
Apprch %	0	100	100	0	22.2	77.8	
Total %	0	4.5	13.6	0	18.2	63.6	

	Hanover St From North			Old Etna Rd From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:15 PM										
02:15 PM	0	1	1	0	0	0	1	0	1	2
02:30 PM	0	0	0	0	0	0	1	7	8	8
02:45 PM	0	0	0	1	0	1	0	3	3	4
03:00 PM	0	0	0	1	0	1	0	3	3	4
Total Volume	0	1	1	2	0	2	2	13	15	18
% App. Total	0	100		100	0		13.3	86.7		
PHF	.000	.250	.250	.500	.000	.500	.500	.464	.469	.563

N/S Street : Hanover Street
 E/W Street : Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933002
 Site Code : 52933002
 Start Date : 11/10/2022
 Page No : 8

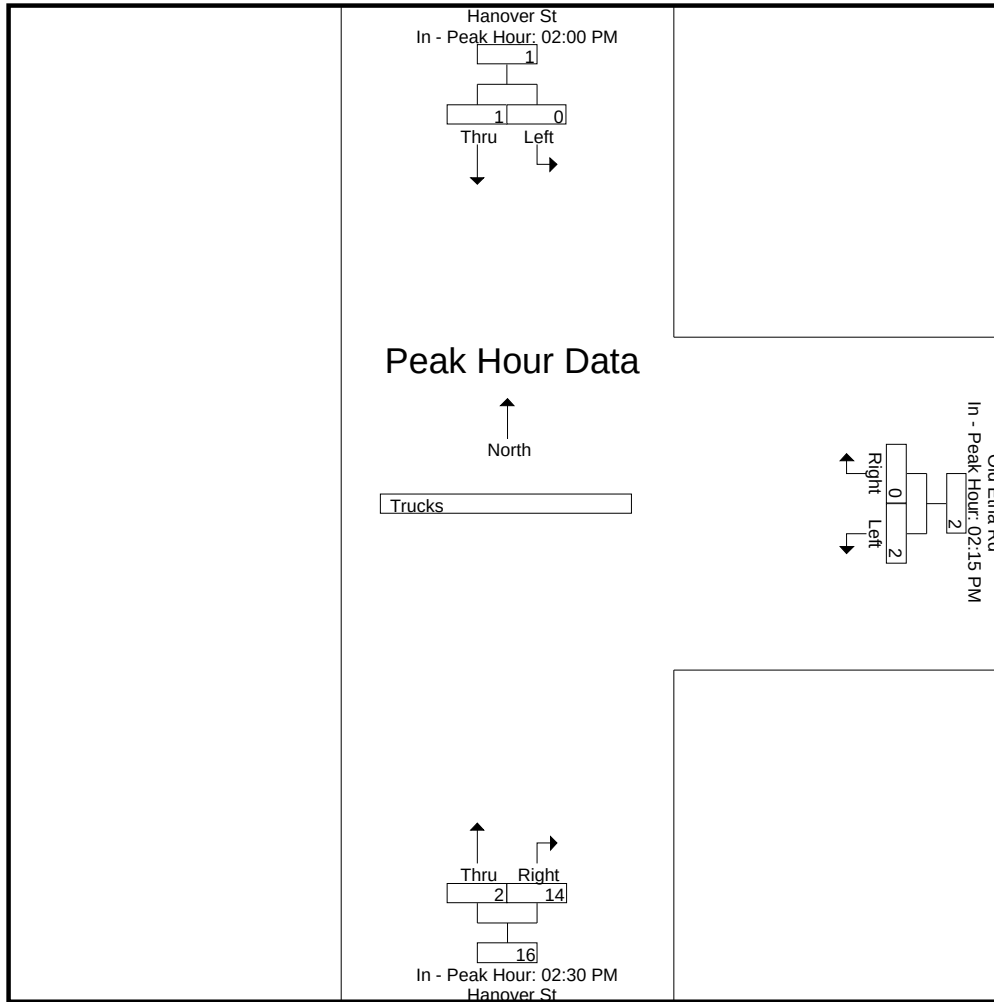


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	02:00 PM			02:15 PM			02:30 PM		
+0 mins.	0	0	0	0	0	0	1	7	8
+15 mins.	0	1	1	0	0	0	0	3	3
+30 mins.	0	0	0	1	0	1	0	3	3
+45 mins.	0	0	0	1	0	1	1	1	2
Total Volume	0	1	1	2	0	2	2	14	16
% App. Total	0	100		100	0		12.5	87.5	
PHF	.000	.250	.250	.500	.000	.500	.500	.500	.500

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Site Code : 52933002
Start Date : 11/10/2022
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N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear



N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933002
Site Code : 52933002
Start Date : 11/10/2022
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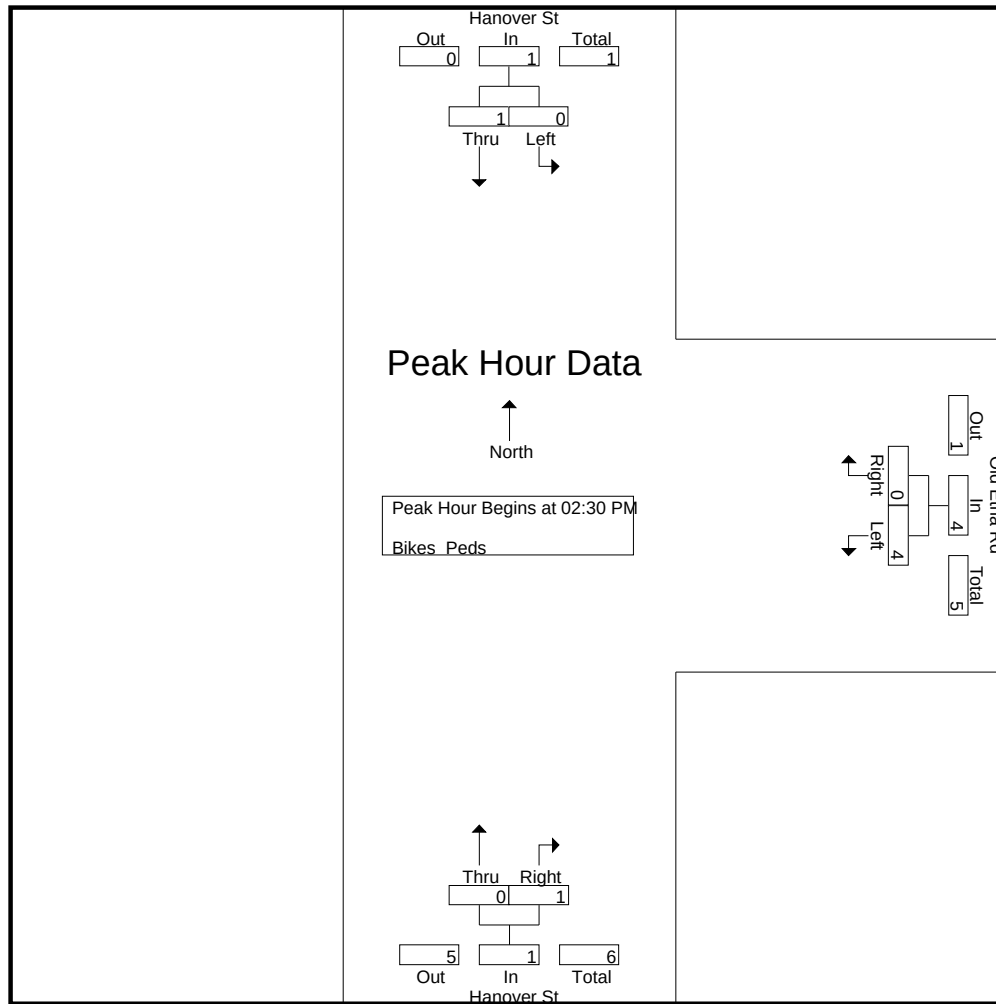
Groups Printed- Bikes Peds

	Hanover St From North			Old Etna Rd From East			Hanover St From South			Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
02:00 PM	0	0	0	0	0	0	0	0	1	1	0	1
02:15 PM	0	0	0	0	0	0	0	0	1	1	0	1
02:30 PM	0	0	0	3	0	0	0	0	0	0	3	3
02:45 PM	0	0	0	1	0	0	0	0	0	0	1	1
Total	0	0	0	4	0	0	0	0	2	2	4	6
03:00 PM	0	1	0	0	0	1	0	0	0	1	1	2
03:15 PM	0	0	0	0	0	1	0	1	3	4	1	5
03:30 PM	0	0	0	0	0	2	0	0	1	3	0	3
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	4	0	1	4	8	2	10
04:00 PM	0	1	0	0	0	0	1	0	1	1	2	3
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	1	0	0	0	0	0	0	0	0	0	1	1
Total	1	1	0	0	0	0	1	0	1	1	3	4
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	1	2	0	4	0	4	1	1	7	11	9	20
Apprch %	33.3	66.7		100	0		50	50				
Total %	11.1	22.2		44.4	0		11.1	11.1		55	45	

	Hanover St From North			Old Etna Rd From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:30 PM										
02:30 PM	0	0	0	3	0	3	0	0	0	3
02:45 PM	0	0	0	1	0	1	0	0	0	1
03:00 PM	0	1	1	0	0	0	0	0	0	1
03:15 PM	0	0	0	0	0	0	0	1	1	1
Total Volume	0	1	1	4	0	4	0	1	1	6
% App. Total	0	100		100	0		0	100		
PHF	.000	.250	.250	.333	.000	.333	.000	.250	.250	.500

N/S Street : Hanover Street
 E/W Street : Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933002
 Site Code : 52933002
 Start Date : 11/10/2022
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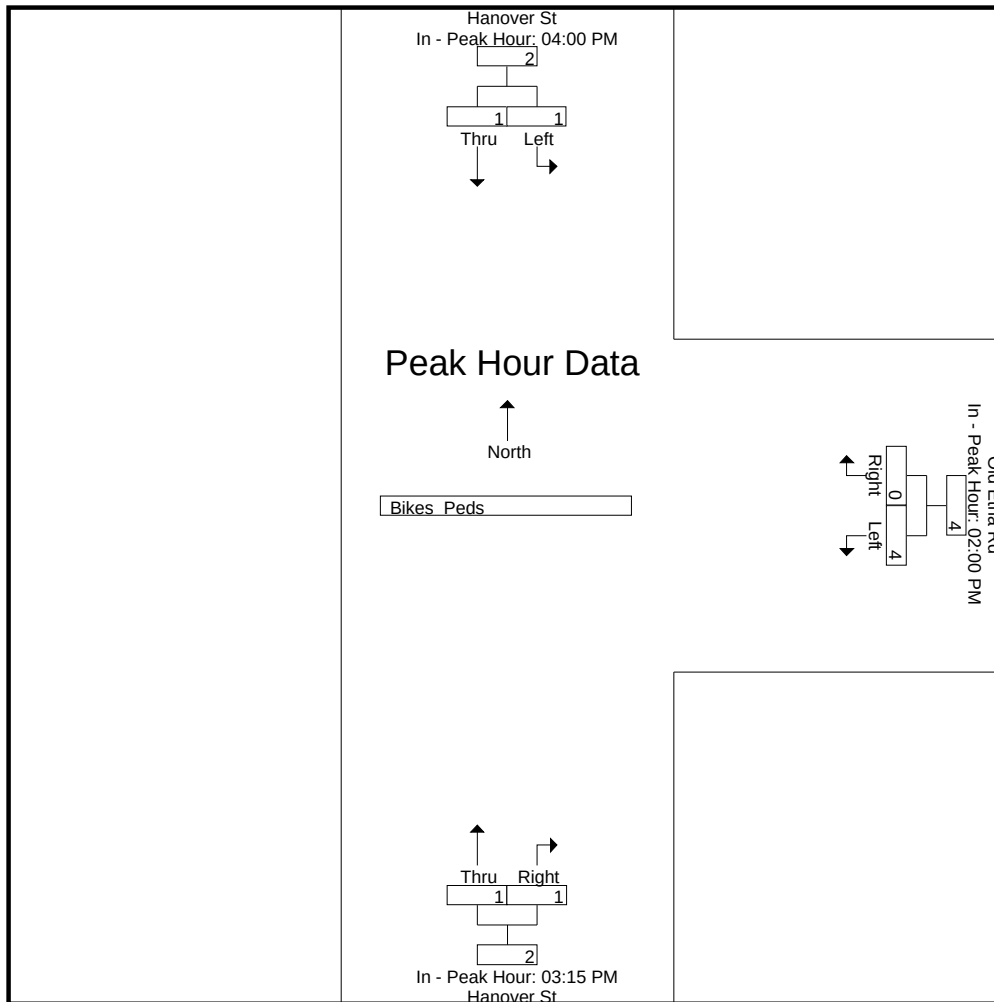


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:00 PM			02:00 PM			03:15 PM		
+0 mins.	0	1	1	0	0	0	0	1	1
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	3	0	3	0	0	0
+45 mins.	1	0	1	1	0	1	1	0	1
Total Volume	1	1	2	4	0	4	1	1	2
% App. Total	50	50		100	0		50	50	
PHF	.250	.250	.500	.333	.000	.333	.250	.250	.500

N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933002
Site Code : 52933002
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N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S2
Site Code : 52933002
Start Date : 11/12/2022
Page No : 1

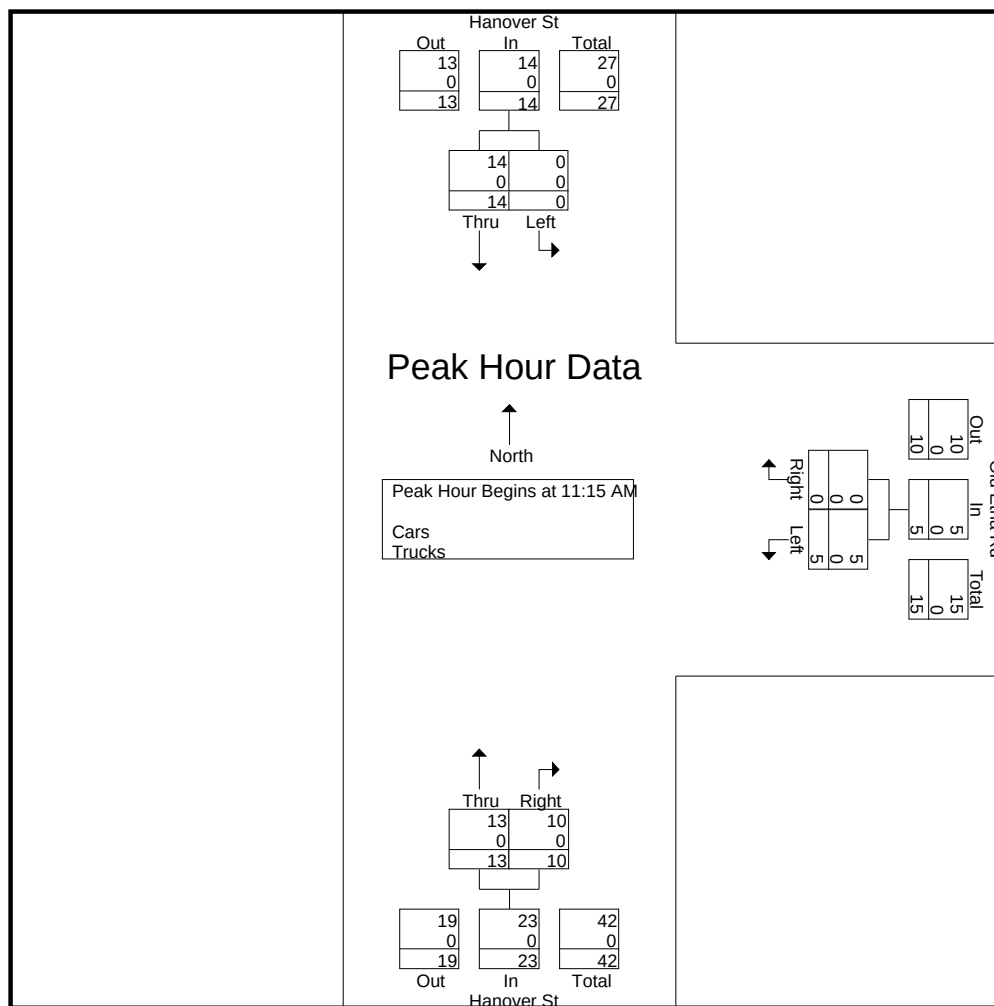
Groups Printed- Cars - Trucks

	Hanover St From North		Old Etna Rd From East		Hanover St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
11:00 AM	0	1	0	0	1	5	7
11:15 AM	0	2	2	0	3	5	12
11:30 AM	0	2	1	0	4	1	8
11:45 AM	0	6	2	0	3	2	13
Total	0	11	5	0	11	13	40
12:00 PM	0	4	0	0	3	2	9
12:15 PM	0	4	0	1	3	1	9
12:30 PM	0	1	1	0	6	2	10
12:45 PM	0	3	0	0	2	1	6
Total	0	12	1	1	14	6	34
Grand Total	0	23	6	1	25	19	74
Apprch %	0	100	85.7	14.3	56.8	43.2	
Total %	0	31.1	8.1	1.4	33.8	25.7	
Cars	0	23	6	1	25	19	74
% Cars	0	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0

	Hanover St From North			Old Etna Rd From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:15 AM										
11:15 AM	0	2	2	2	0	2	3	5	8	12
11:30 AM	0	2	2	1	0	1	4	1	5	8
11:45 AM	0	6	6	2	0	2	3	2	5	13
12:00 PM	0	4	4	0	0	0	3	2	5	9
Total Volume	0	14	14	5	0	5	13	10	23	42
% App. Total	0	100		100	0		56.5	43.5		
PHF	.000	.583	.583	.625	.000	.625	.813	.500	.719	.808
Cars	0	14	14	5	0	5	13	10	23	42
% Cars	0	100	100	100	0	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0

N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S2
Site Code : 52933002
Start Date : 11/12/2022
Page No : 2

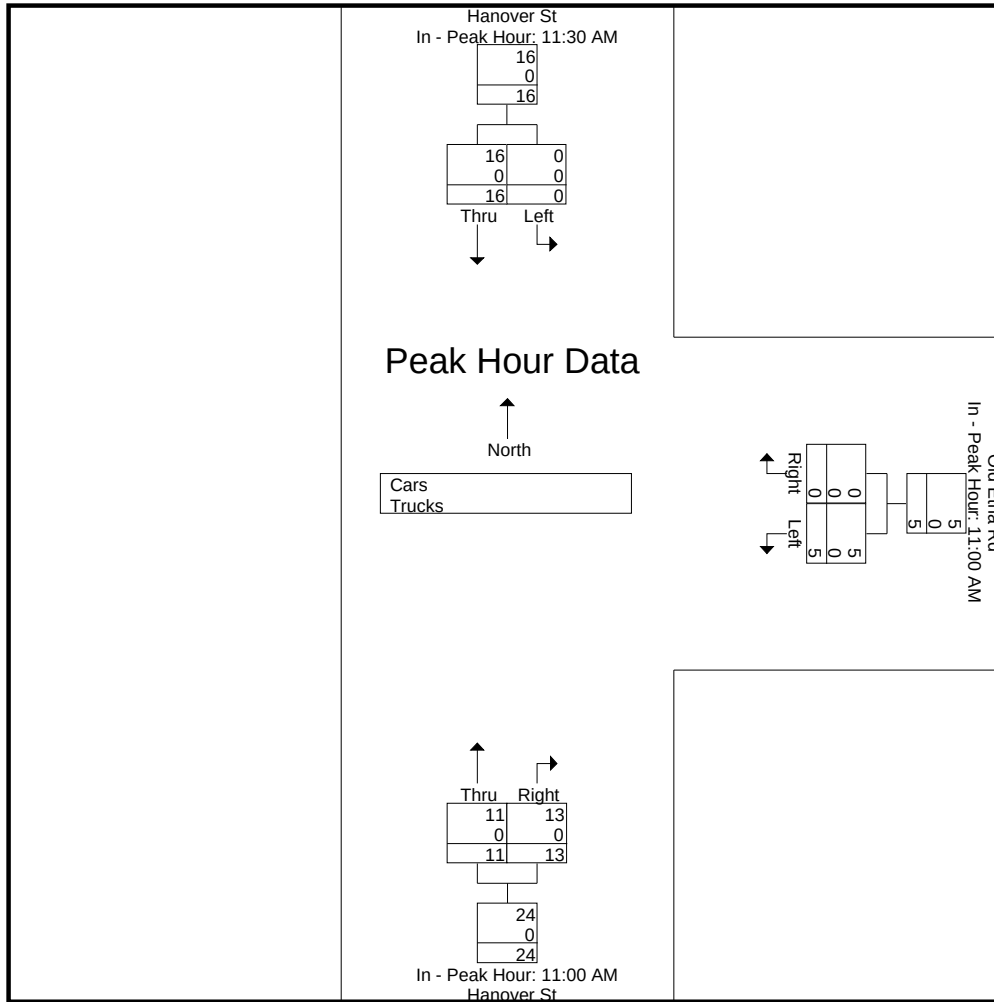


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:30 AM			11:00 AM			11:00 AM		
+0 mins.	0	2	2	0	0	0	1	5	6
+15 mins.	0	6	6	2	0	2	3	5	8
+30 mins.	0	4	4	1	0	1	4	1	5
+45 mins.	0	4	4	2	0	2	3	2	5
Total Volume	0	16	16	5	0	5	11	13	24
% App. Total	0	100		100	0		45.8	54.2	
PHF	.000	.667	.667	.625	.000	.625	.688	.650	.750
Cars	0	16	16	5	0	5	11	13	24
% Cars	0	100	100	100	0	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0

File Name : 529330S2
Site Code : 52933002
Start Date : 11/12/2022
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N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear



N/S Street : Hanover Street
 E/W Street : Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 529330S2
 Site Code : 52933002
 Start Date : 11/12/2022
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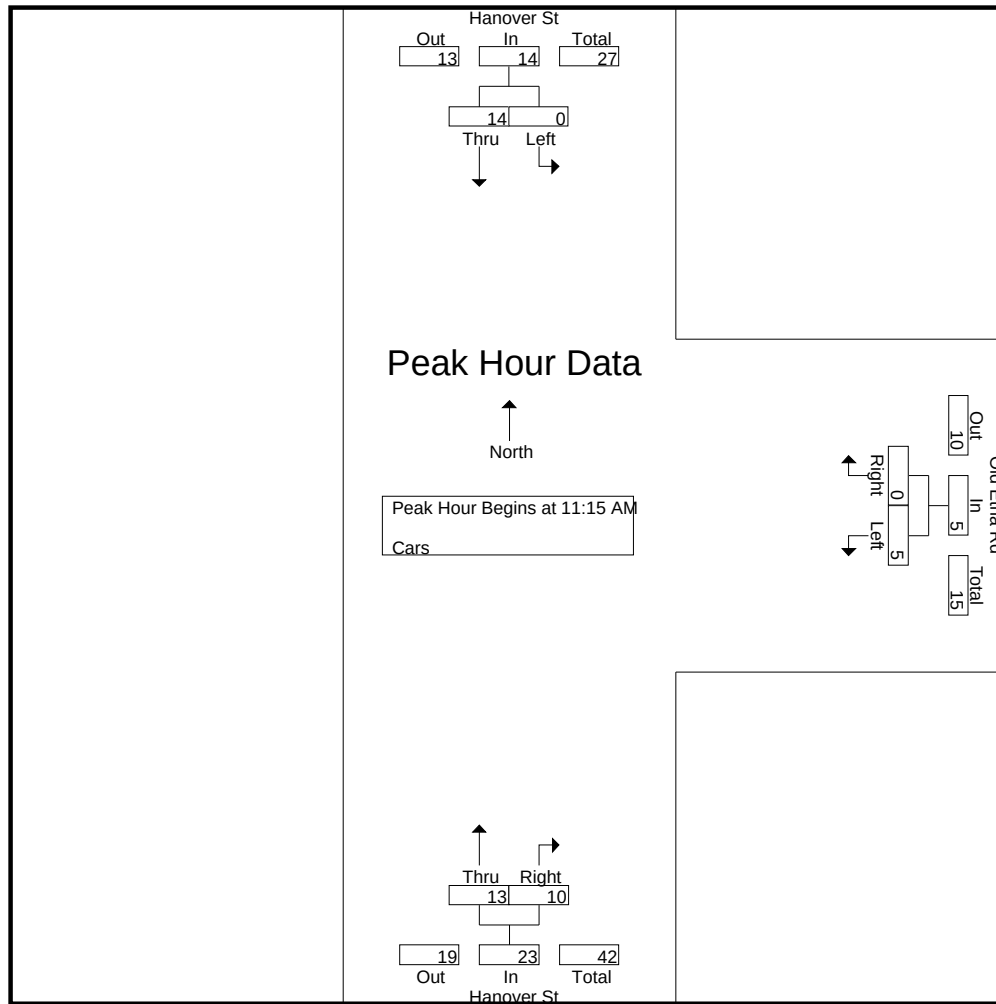
Groups Printed- Cars

	Hanover St From North		Old Etna Rd From East		Hanover St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
11:00 AM	0	1	0	0	1	5	7
11:15 AM	0	2	2	0	3	5	12
11:30 AM	0	2	1	0	4	1	8
11:45 AM	0	6	2	0	3	2	13
Total	0	11	5	0	11	13	40
12:00 PM	0	4	0	0	3	2	9
12:15 PM	0	4	0	1	3	1	9
12:30 PM	0	1	1	0	6	2	10
12:45 PM	0	3	0	0	2	1	6
Total	0	12	1	1	14	6	34
Grand Total	0	23	6	1	25	19	74
Apprch %	0	100	85.7	14.3	56.8	43.2	
Total %	0	31.1	8.1	1.4	33.8	25.7	

	Hanover St From North			Old Etna Rd From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:15 AM										
11:15 AM	0	2	2	2	0	2	3	5	8	12
11:30 AM	0	2	2	1	0	1	4	1	5	8
11:45 AM	0	6	6	2	0	2	3	2	5	13
12:00 PM	0	4	4	0	0	0	3	2	5	9
Total Volume	0	14	14	5	0	5	13	10	23	42
% App. Total	0	100		100	0		56.5	43.5		
PHF	.000	.583	.583	.625	.000	.625	.813	.500	.719	.808

N/S Street : Hanover Street
 E/W Street : Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 529330S2
 Site Code : 52933002
 Start Date : 11/12/2022
 Page No : 5

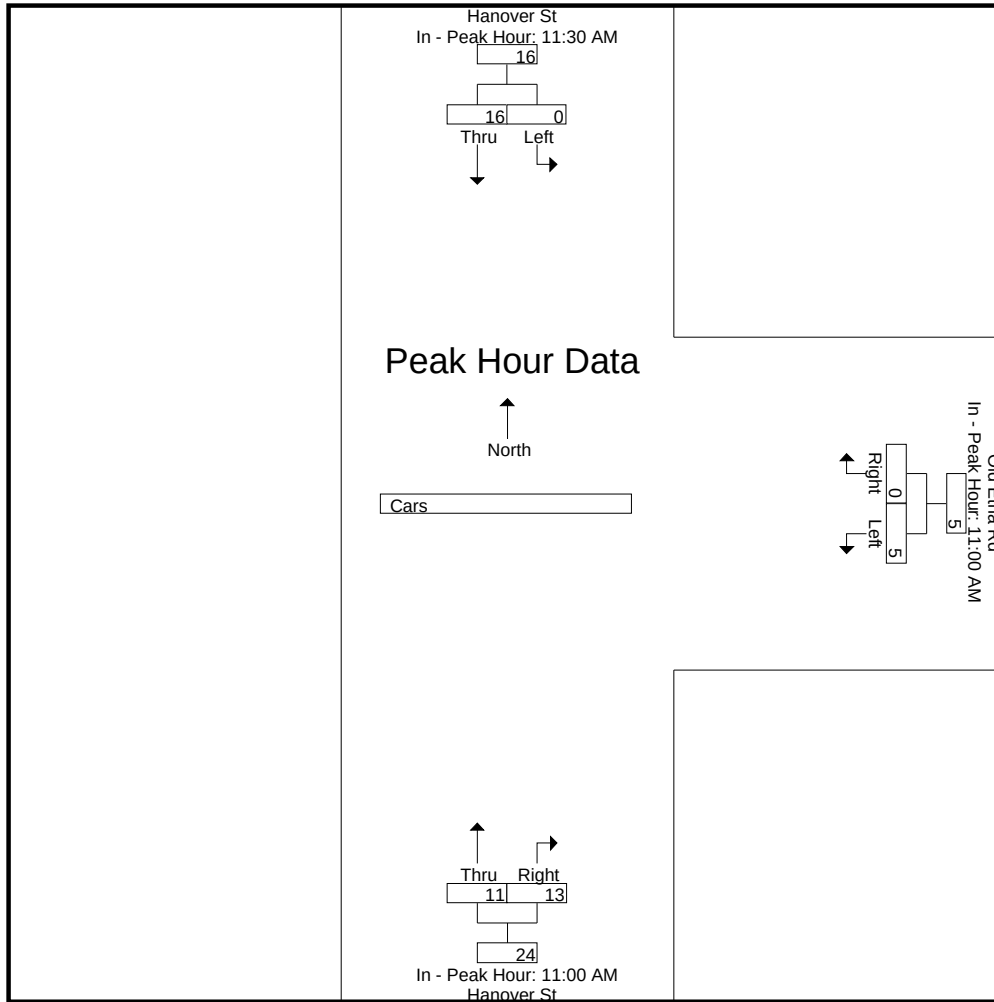


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	11:30 AM			11:00 AM			11:00 AM		
+0 mins.	0	2	2	0	0	0	1	5	6
+15 mins.	0	6	6	2	0	2	3	5	8
+30 mins.	0	4	4	1	0	1	4	1	5
+45 mins.	0	4	4	2	0	2	3	2	5
Total Volume	0	16	16	5	0	5	11	13	24
% App. Total	0	100		100	0		45.8	54.2	
PHF	.000	.667	.667	.625	.000	.625	.688	.650	.750

File Name : 529330S2
Site Code : 52933002
Start Date : 11/12/2022
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N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear



N/S Street : Hanover Street
 E/W Street : Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 529330S2
 Site Code : 52933002
 Start Date : 11/12/2022
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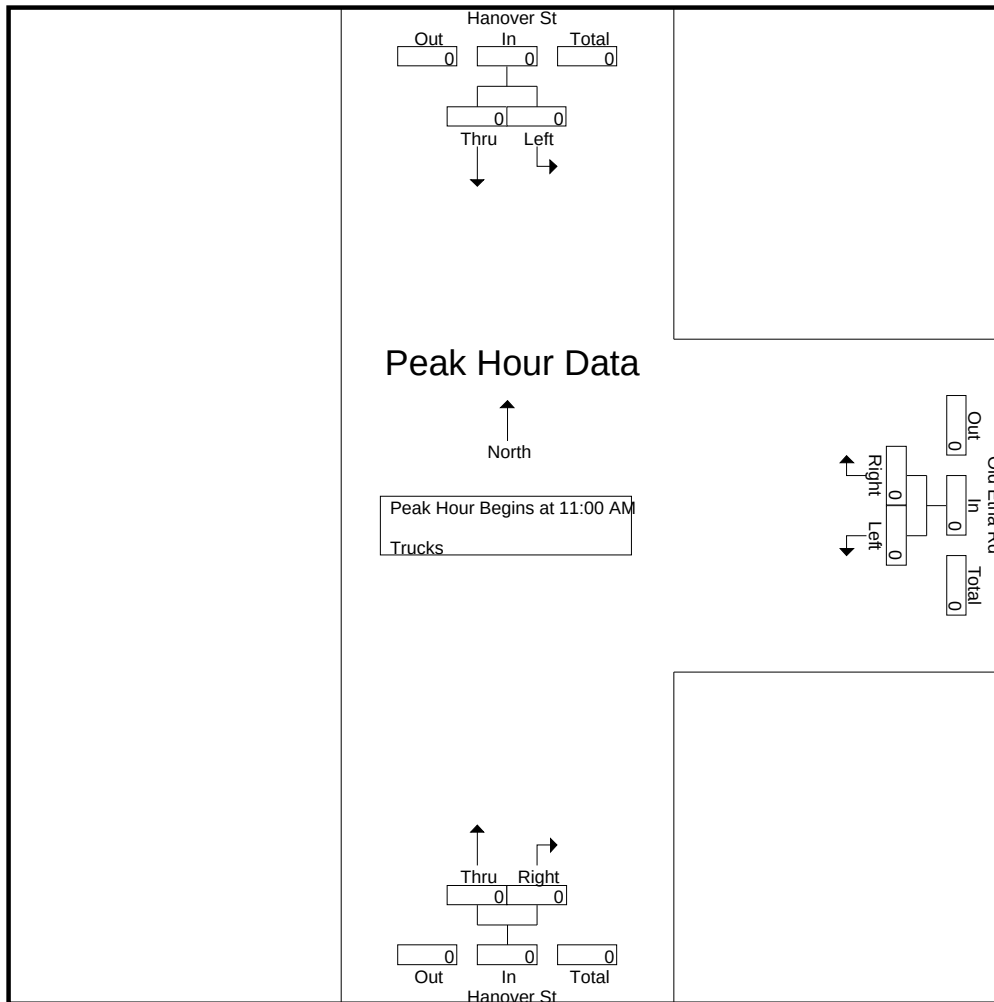
Groups Printed- Trucks

	Hanover St From North		Old Etna Rd From East		Hanover St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
11:00 AM	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	
Total %							

	Hanover St From North			Old Etna Rd From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:00 AM										
11:00 AM	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S2
Site Code : 52933002
Start Date : 11/12/2022
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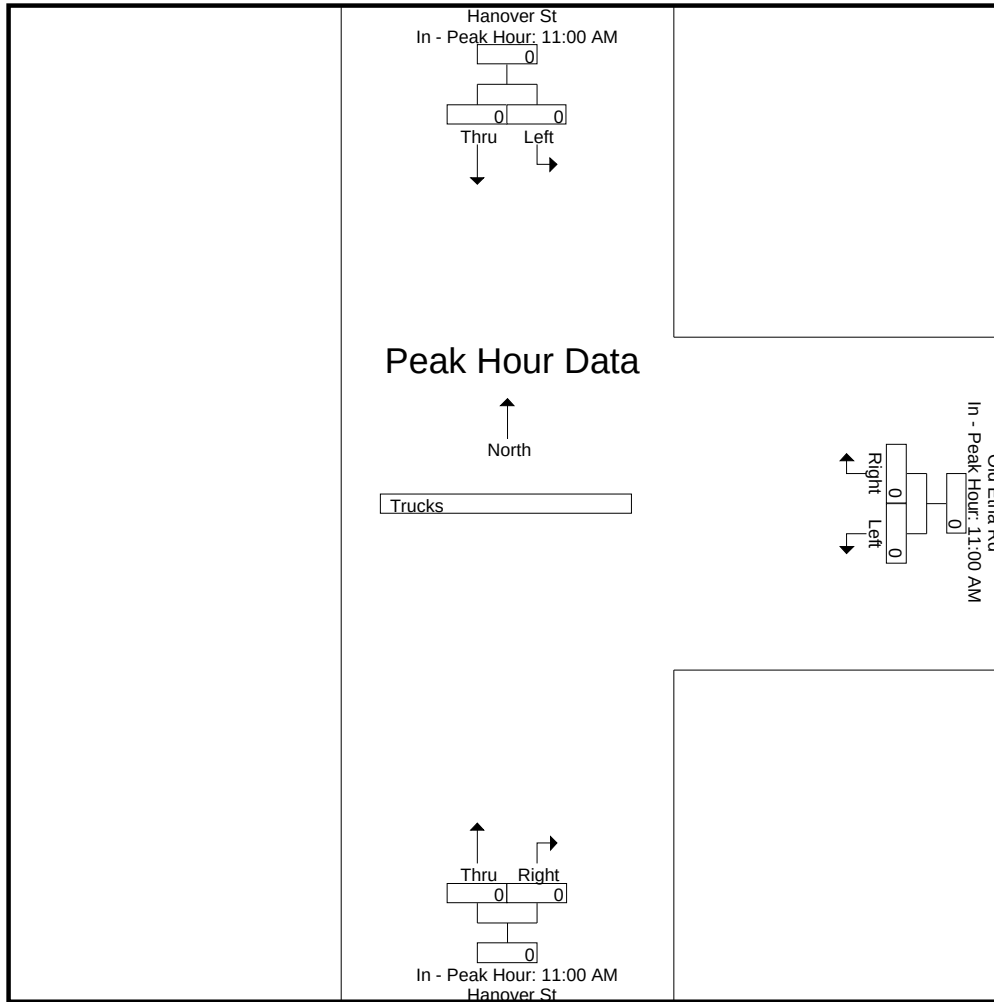


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:00 AM			11:00 AM			11:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

File Name : 529330S2
Site Code : 52933002
Start Date : 11/12/2022
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N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear



N/S Street : Hanover Street
 E/W Street : Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 529330S2
 Site Code : 52933002
 Start Date : 11/12/2022
 Page No : 10

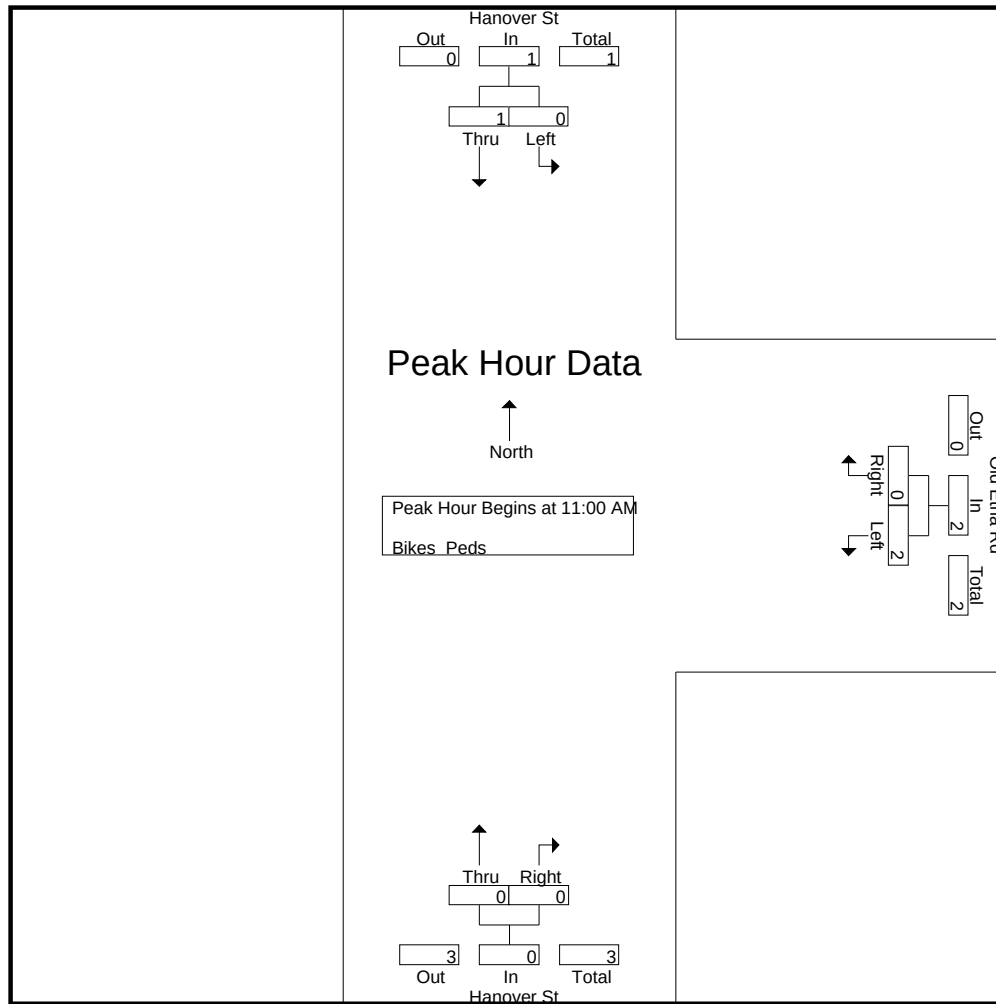
Groups Printed- Bikes Peds

	Hanover St From North			Old Etna Rd From East			Hanover St From South			Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
11:00 AM	0	0	0	2	0	0	0	0	0	0	2	2
11:15 AM	0	1	0	0	0	2	0	0	0	2	1	3
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	2	0	2	0	0	0	2	3	5
12:00 PM	0	0	0	0	0	0	1	0	0	0	1	1
12:15 PM	0	0	0	1	0	0	0	1	0	0	2	2
12:30 PM	0	0	0	0	0	0	0	0	1	1	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	1	1	1	1	3	4
Grand Total	0	1	0	3	0	2	1	1	1	3	6	9
Apprch %	0	100		100	0		50	50				
Total %	0	16.7		50	0		16.7	16.7		33.3	66.7	

	Hanover St From North			Old Etna Rd From East			Hanover St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:00 AM										
11:00 AM	0	0	0	2	0	2	0	0	0	2
11:15 AM	0	1	1	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	1	2	0	2	0	0	0	3
% App. Total	0	100		100	0		0	0		
PHF	.000	.250	.250	.250	.000	.250	.000	.000	.000	.375

N/S Street : Hanover Street
 E/W Street : Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 529330S2
 Site Code : 52933002
 Start Date : 11/12/2022
 Page No : 11

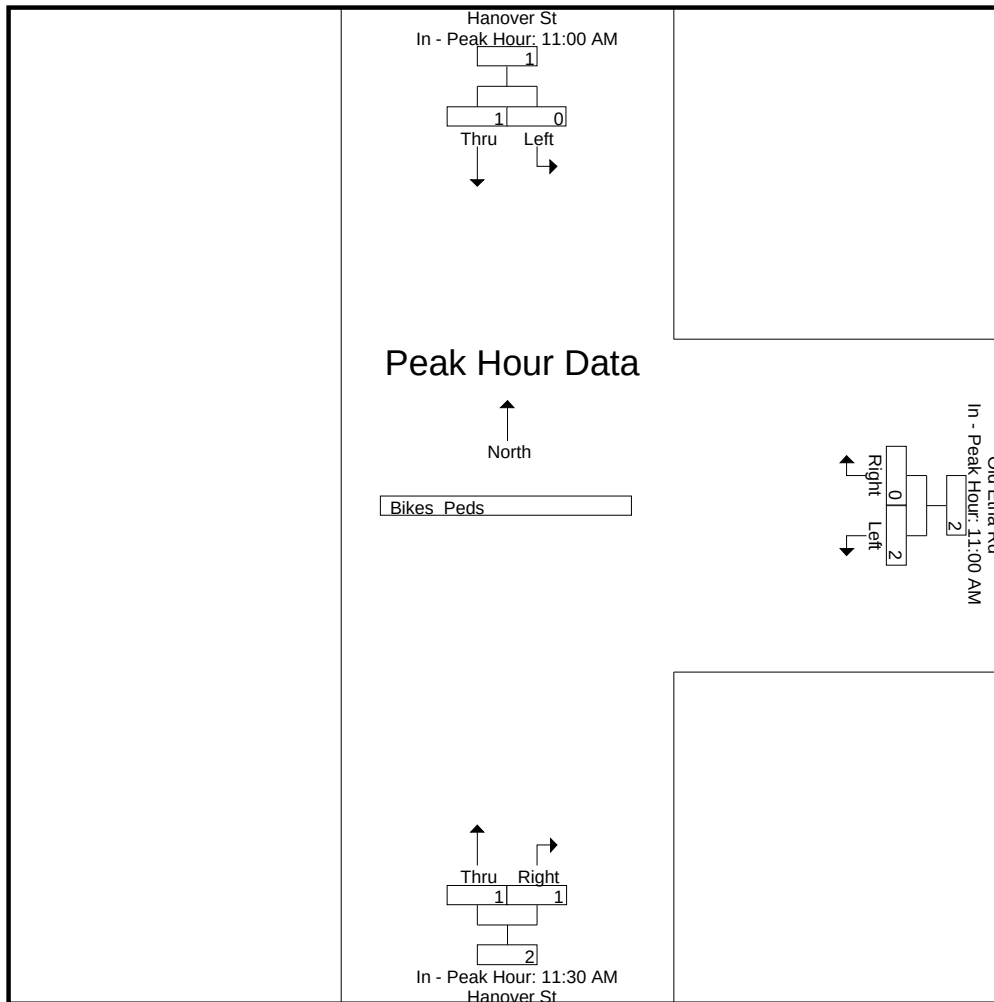


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	11:00 AM			11:00 AM			11:30 AM		
+0 mins.	0	0	0	2	0	2	0	0	0
+15 mins.	0	1	1	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	1	0	1
+45 mins.	0	0	0	0	0	0	0	1	1
Total Volume	0	1	1	2	0	2	1	1	2
% App. Total	0	100		100	0		50	50	
PHF	.000	.250	.250	.250	.000	.250	.250	.250	.500

N/S Street : Hanover Street
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S2
Site Code : 52933002
Start Date : 11/12/2022
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N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933003
 Site Code : 52933003
 Start Date : 11/10/2022
 Page No : 1

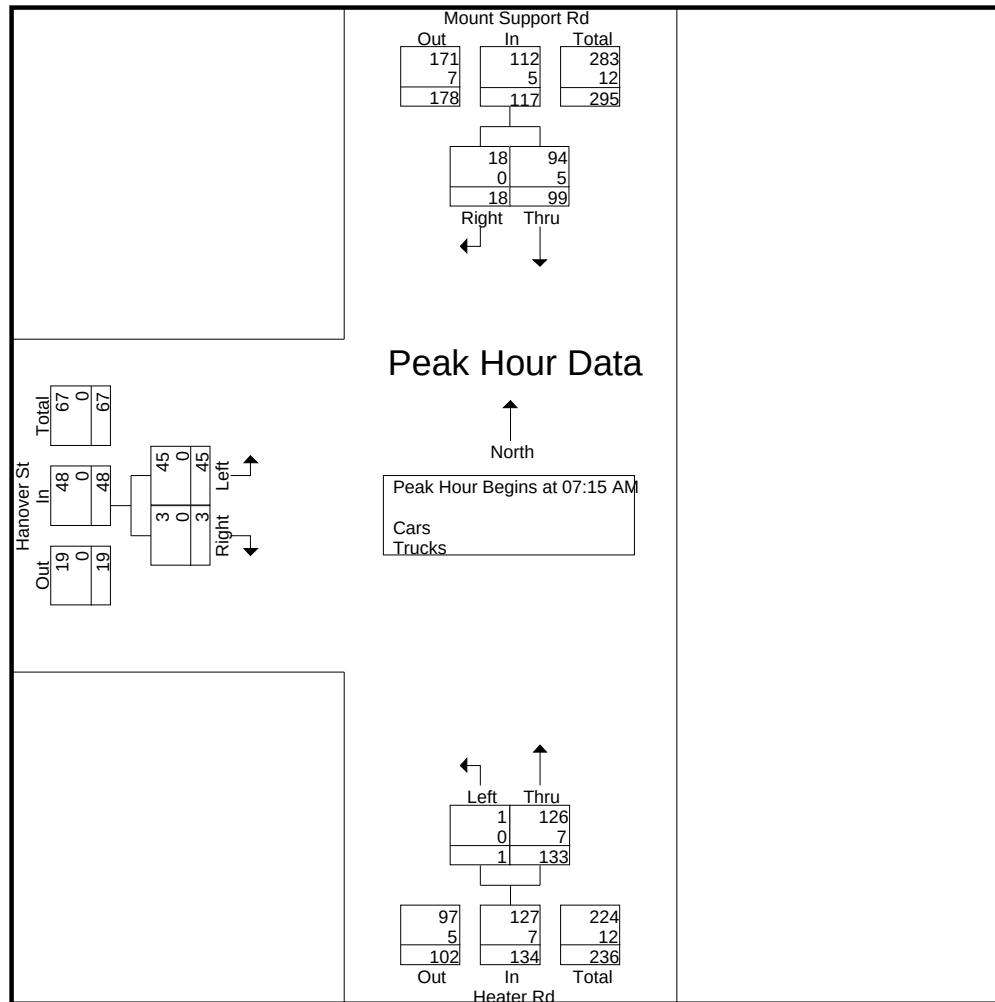
Groups Printed- Cars - Trucks

	Mount Support Rd From North		Heater Rd From South		Hanover St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	14	1	1	25	7	0	48
07:15 AM	23	5	1	29	12	0	70
07:30 AM	25	5	0	34	11	1	76
07:45 AM	36	2	0	39	11	2	90
Total	98	13	2	127	41	3	284
08:00 AM	15	6	0	31	11	0	63
08:15 AM	21	1	0	21	8	0	51
08:30 AM	18	3	0	20	1	0	42
08:45 AM	18	2	0	21	2	0	43
Total	72	12	0	93	22	0	199
Grand Total	170	25	2	220	63	3	483
Apprch %	87.2	12.8	0.9	99.1	95.5	4.5	
Total %	35.2	5.2	0.4	45.5	13	0.6	
Cars	159	24	2	209	61	3	458
% Cars	93.5	96	100	95	96.8	100	94.8
Trucks	11	1	0	11	2	0	25
% Trucks	6.5	4	0	5	3.2	0	5.2

	Mount Support Rd From North			Heater Rd From South			Hanover St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	23	5	28	1	29	30	12	0	12	70
07:30 AM	25	5	30	0	34	34	11	1	12	76
07:45 AM	36	2	38	0	39	39	11	2	13	90
08:00 AM	15	6	21	0	31	31	11	0	11	63
Total Volume	99	18	117	1	133	134	45	3	48	299
% App. Total	84.6	15.4		0.7	99.3		93.8	6.2		
PHF	.688	.750	.770	.250	.853	.859	.938	.375	.923	.831
Cars	94	18	112	1	126	127	45	3	48	287
% Cars	94.9	100	95.7	100	94.7	94.8	100	100	100	96.0
Trucks	5	0	5	0	7	7	0	0	0	12
% Trucks	5.1	0	4.3	0	5.3	5.2	0	0	0	4.0

N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933003
 Site Code : 52933003
 Start Date : 11/10/2022
 Page No : 2

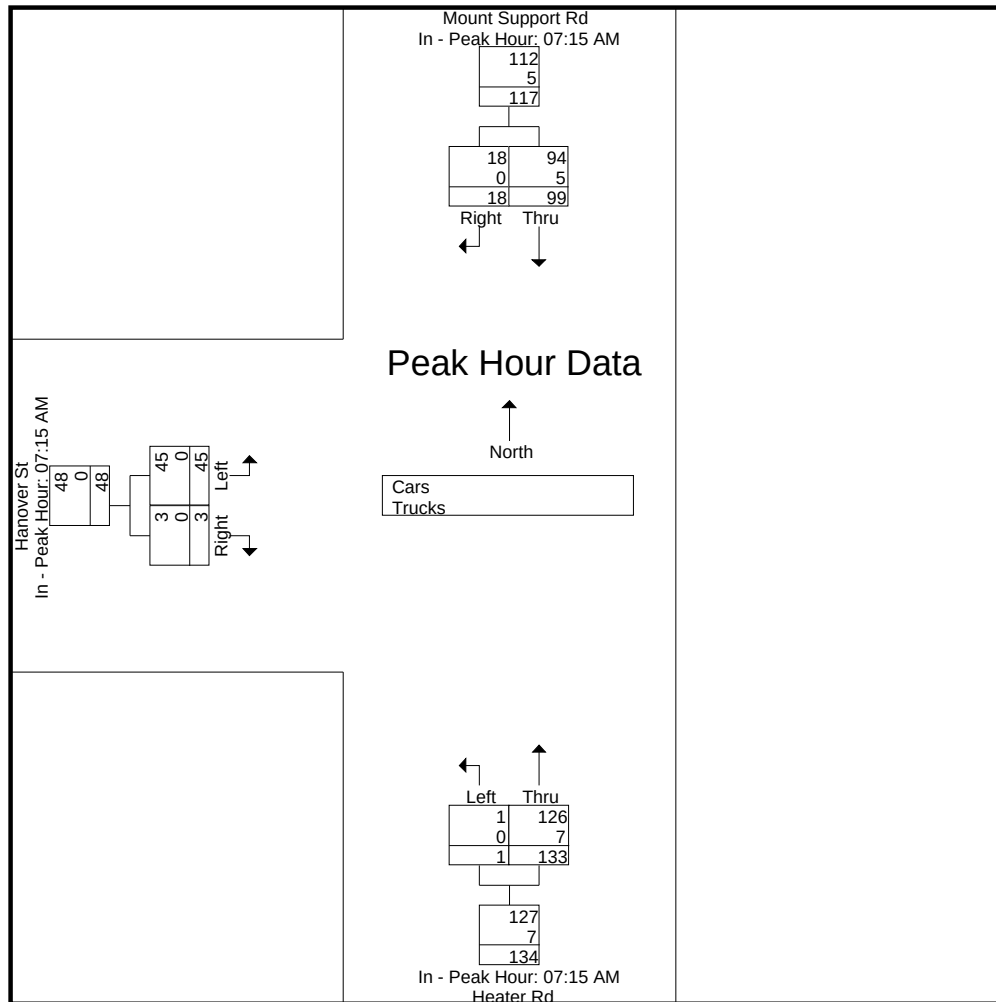


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	23	5	28	1	29	30	12	0	12
+15 mins.	25	5	30	0	34	34	11	1	12
+30 mins.	36	2	38	0	39	39	11	2	13
+45 mins.	15	6	21	0	31	31	11	0	11
Total Volume	99	18	117	1	133	134	45	3	48
% App. Total	84.6	15.4		0.7	99.3		93.8	6.2	
PHF	.688	.750	.770	.250	.853	.859	.938	.375	.923
Cars	94	18	112	1	126	127	45	3	48
% Cars	94.9	100	95.7	100	94.7	94.8	100	100	100
Trucks	5	0	5	0	7	7	0	0	0
% Trucks	5.1	0	4.3	0	5.3	5.2	0	0	0

N/S Street : Mount Support Rd/Heater Rd
E/W Street : Hanover Street
City/State : Lebanon, NH
Weather : Clear

File Name : 52933003
Site Code : 52933003
Start Date : 11/10/2022
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N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933003
 Site Code : 52933003
 Start Date : 11/10/2022
 Page No : 4

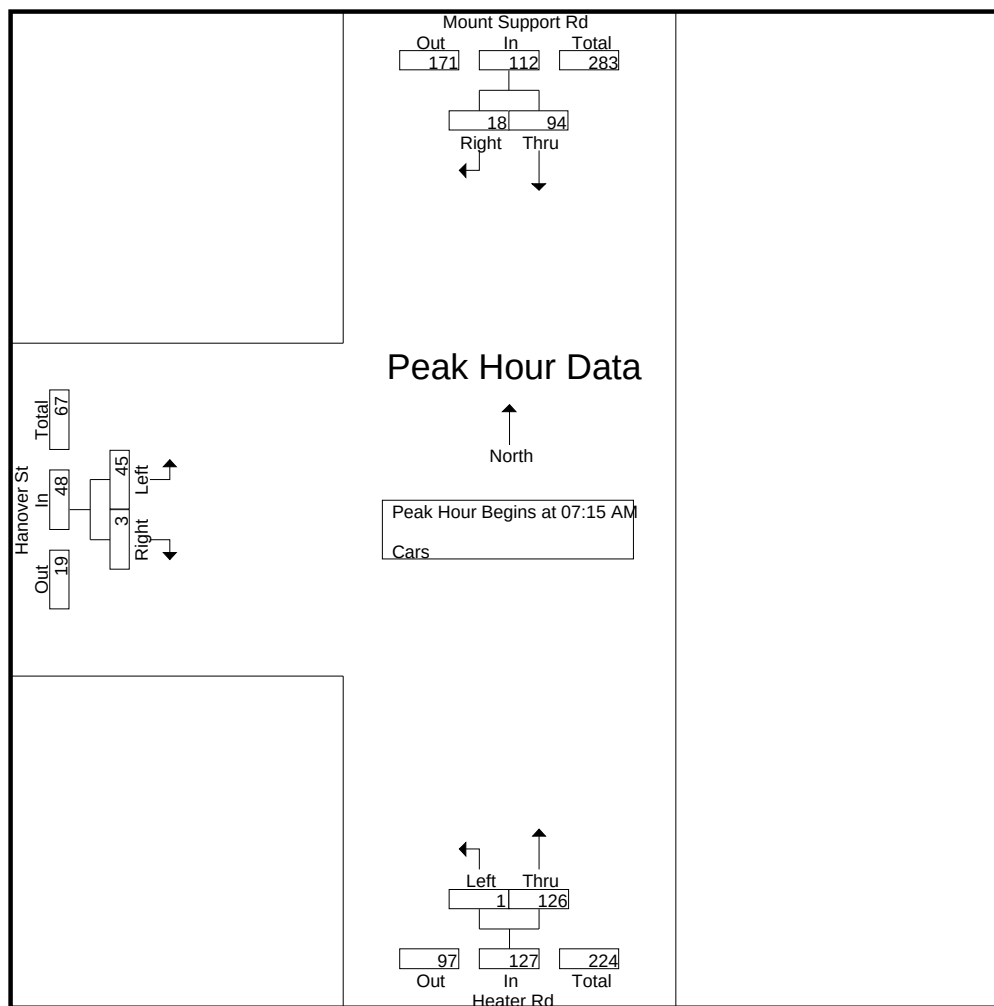
Groups Printed- Cars

	Mount Support Rd From North		Heater Rd From South		Hanover St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	13	0	1	24	6	0	44
07:15 AM	22	5	1	27	12	0	67
07:30 AM	24	5	0	33	11	1	74
07:45 AM	33	2	0	36	11	2	84
Total	92	12	2	120	40	3	269
08:00 AM	15	6	0	30	11	0	62
08:15 AM	18	1	0	20	7	0	46
08:30 AM	16	3	0	19	1	0	39
08:45 AM	18	2	0	20	2	0	42
Total	67	12	0	89	21	0	189
Grand Total	159	24	2	209	61	3	458
Apprch %	86.9	13.1	0.9	99.1	95.3	4.7	
Total %	34.7	5.2	0.4	45.6	13.3	0.7	

	Mount Support Rd From North			Heater Rd From South			Hanover St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	22	5	27	1	27	28	12	0	12	67
07:30 AM	24	5	29	0	33	33	11	1	12	74
07:45 AM	33	2	35	0	36	36	11	2	13	84
08:00 AM	15	6	21	0	30	30	11	0	11	62
Total Volume	94	18	112	1	126	127	45	3	48	287
% App. Total	83.9	16.1		0.8	99.2		93.8	6.2		
PHF	.712	.750	.800	.250	.875	.882	.938	.375	.923	.854

N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933003
 Site Code : 52933003
 Start Date : 11/10/2022
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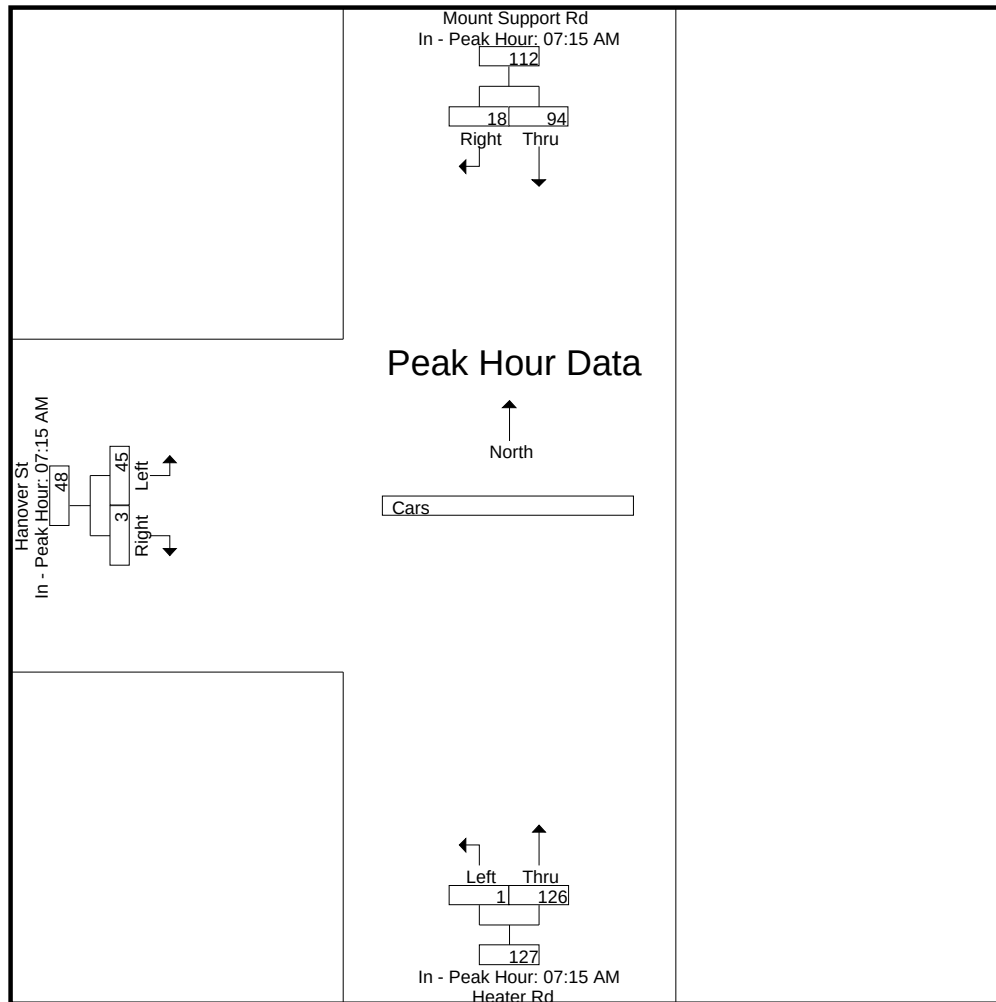
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	22	5	27	1	27	28	12	0	12
+15 mins.	24	5	29	0	33	33	11	1	12
+30 mins.	33	2	35	0	36	36	11	2	13
+45 mins.	15	6	21	0	30	30	11	0	11
Total Volume	94	18	112	1	126	127	45	3	48
% App. Total	83.9	16.1		0.8	99.2		93.8	6.2	
PHF	.712	.750	.800	.250	.875	.882	.938	.375	.923

N/S Street : Mount Support Rd/Heater Rd
E/W Street : Hanover Street
City/State : Lebanon, NH
Weather : Clear

File Name : 52933003
Site Code : 52933003
Start Date : 11/10/2022
Page No : 6



N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933003
 Site Code : 52933003
 Start Date : 11/10/2022
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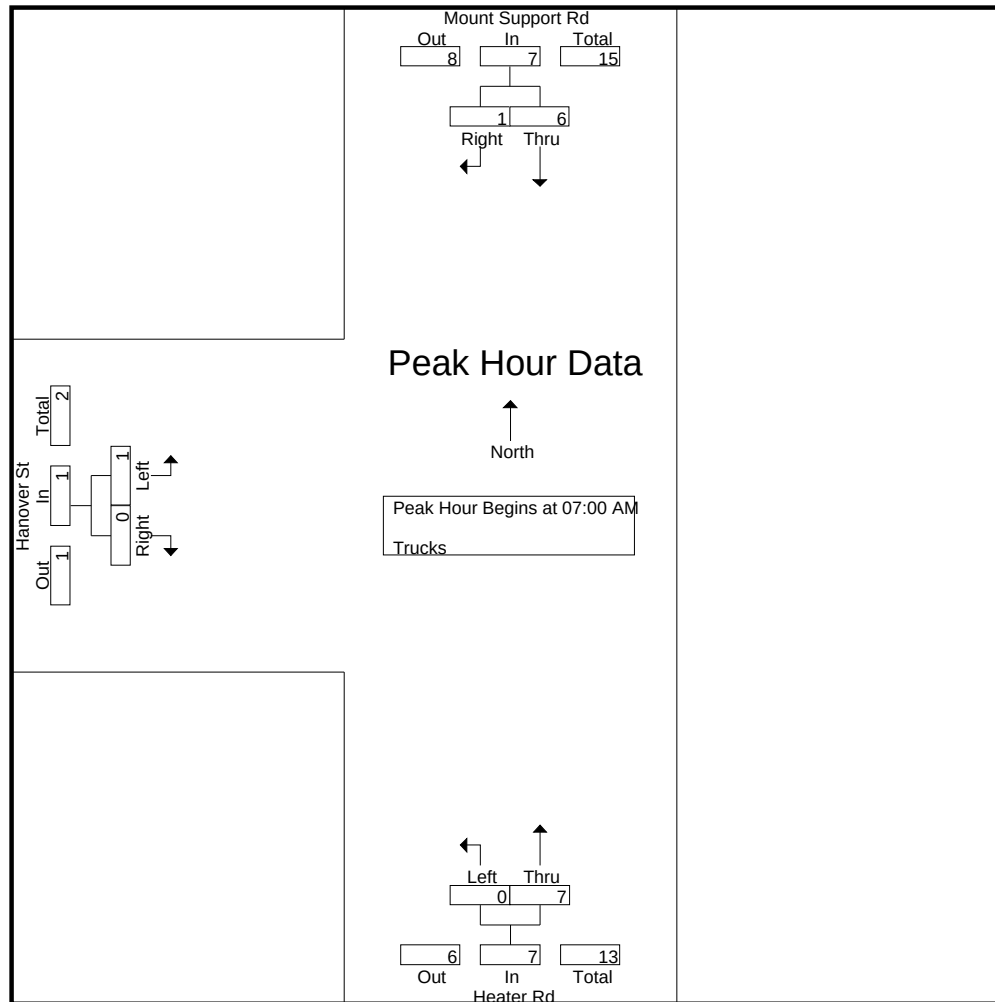
Groups Printed- Trucks

	Mount Support Rd From North		Heater Rd From South		Hanover St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	1	1	0	1	1	0	4
07:15 AM	1	0	0	2	0	0	3
07:30 AM	1	0	0	1	0	0	2
07:45 AM	3	0	0	3	0	0	6
Total	6	1	0	7	1	0	15
08:00 AM	0	0	0	1	0	0	1
08:15 AM	3	0	0	1	1	0	5
08:30 AM	2	0	0	1	0	0	3
08:45 AM	0	0	0	1	0	0	1
Total	5	0	0	4	1	0	10
Grand Total	11	1	0	11	2	0	25
Apprch %	91.7	8.3	0	100	100	0	
Total %	44	4	0	44	8	0	

	Mount Support Rd From North			Heater Rd From South			Hanover St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	1	1	2	0	1	1	1	0	1	4
07:15 AM	1	0	1	0	2	2	0	0	0	3
07:30 AM	1	0	1	0	1	1	0	0	0	2
07:45 AM	3	0	3	0	3	3	0	0	0	6
Total Volume	6	1	7	0	7	7	1	0	1	15
% App. Total	85.7	14.3		0	100		100	0		
PHF	.500	.250	.583	.000	.583	.583	.250	.000	.250	.625

N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933003
 Site Code : 52933003
 Start Date : 11/10/2022
 Page No : 8

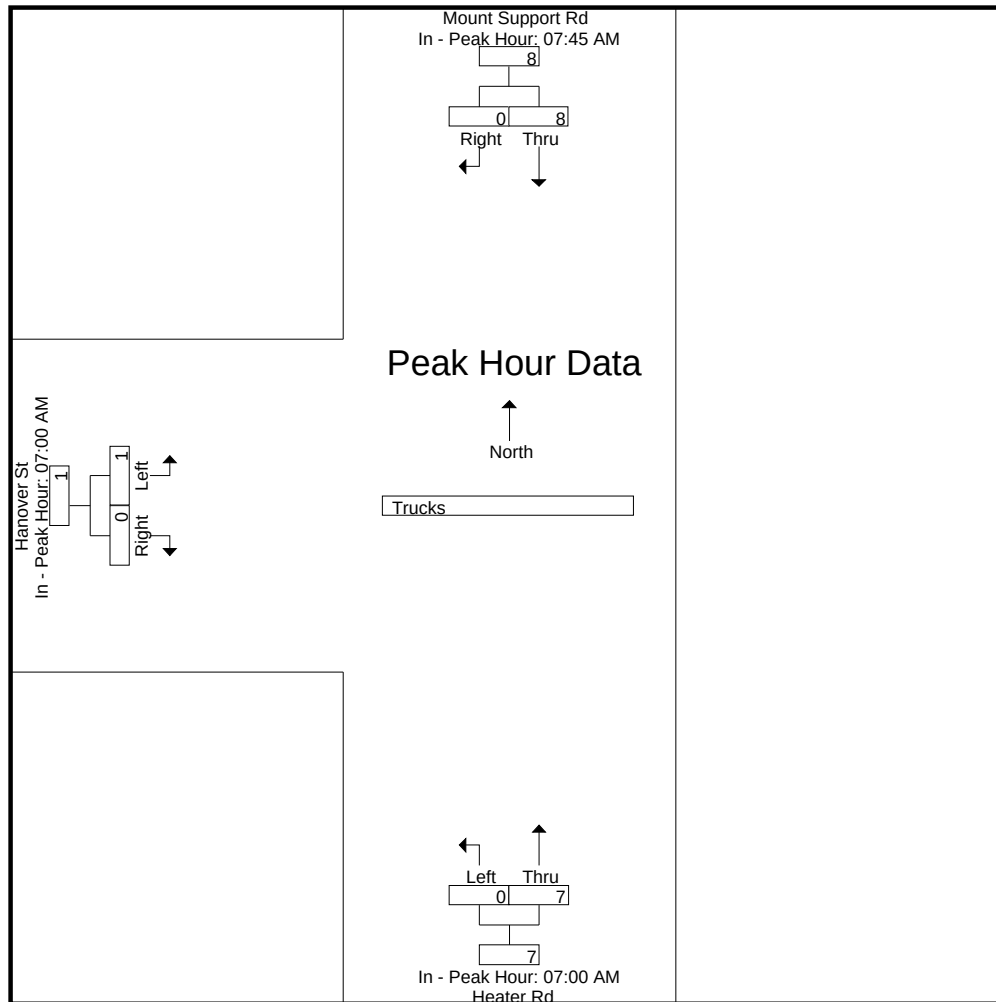


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:45 AM			07:00 AM			07:00 AM		
+0 mins.	3	0	3	0	1	1	1	0	1
+15 mins.	0	0	0	0	2	2	0	0	0
+30 mins.	3	0	3	0	1	1	0	0	0
+45 mins.	2	0	2	0	3	3	0	0	0
Total Volume	8	0	8	0	7	7	1	0	1
% App. Total	100	0		0	100		100	0	
PHF	.667	.000	.667	.000	.583	.583	.250	.000	.250

N/S Street : Mount Support Rd/Heater Rd
E/W Street : Hanover Street
City/State : Lebanon, NH
Weather : Clear

File Name : 52933003
Site Code : 52933003
Start Date : 11/10/2022
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N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933003
 Site Code : 52933003
 Start Date : 11/10/2022
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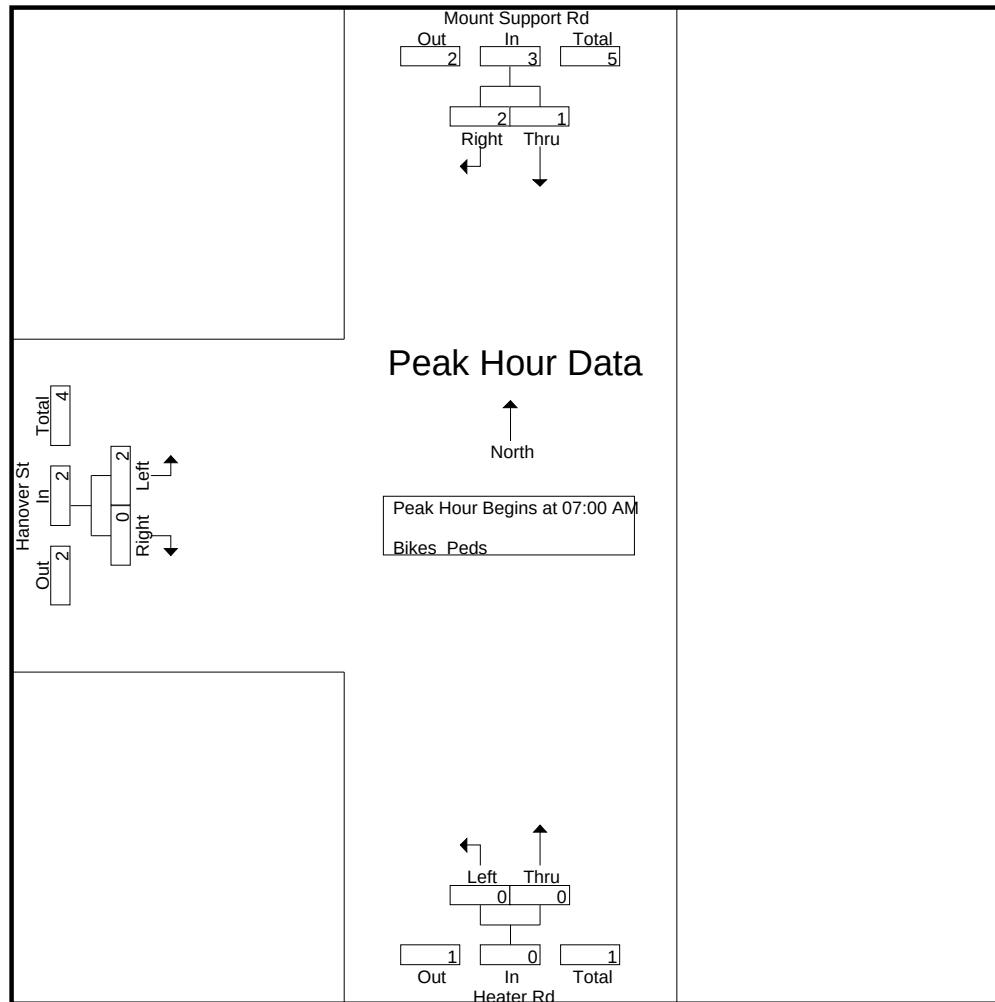
Groups Printed- Bikes Peds

	Mount Support Rd From North			Heater Rd From South			Hanover St From West			Exclu. Total	Inclu. Total	Int. Total
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds			
07:00 AM	0	0	1	0	0	0	0	0	1	2	0	2
07:15 AM	0	1	3	0	0	0	1	0	0	3	2	5
07:30 AM	0	0	0	0	0	1	0	0	0	1	0	1
07:45 AM	1	1	5	0	0	0	1	0	0	5	3	8
Total	1	2	9	0	0	1	2	0	1	11	5	16
08:00 AM	0	0	0	0	0	0	0	0	1	1	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	2	0	0	0	0	0	1	3	0	3
Total	0	0	2	0	0	0	0	0	2	4	0	4
Grand Total	1	2	11	0	0	1	2	0	3	15	5	20
Apprch %	33.3	66.7		0	0		100	0				
Total %	20	40		0	0		40	0		75	25	

	Mount Support Rd From North			Heater Rd From South			Hanover St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	1	1	0	0	0	1	0	1	2
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	1	1	2	0	0	0	1	0	1	3
Total Volume	1	2	3	0	0	0	2	0	2	5
% App. Total	33.3	66.7		0	0		100	0		
PHF	.250	.500	.375	.000	.000	.000	.500	.000	.500	.417

N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933003
 Site Code : 52933003
 Start Date : 11/10/2022
 Page No : 11

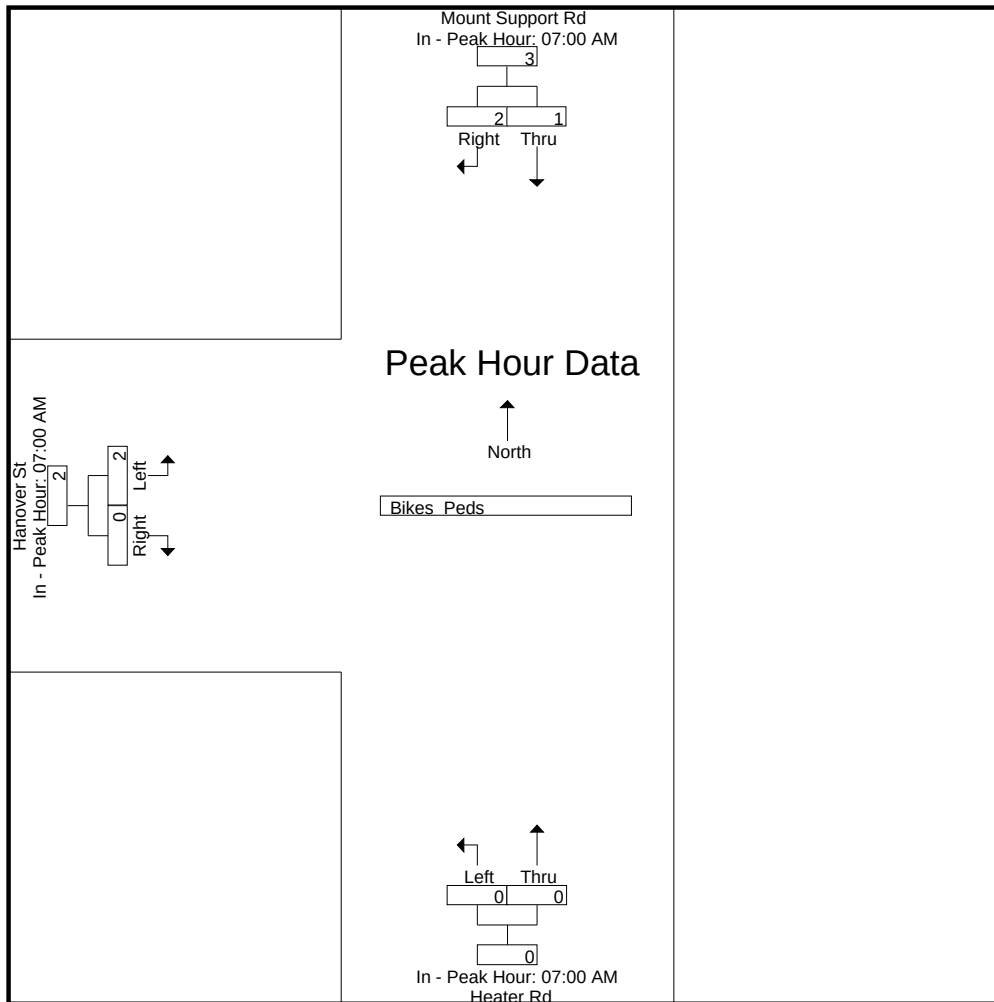


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	1	1	0	0	0	1	0	1
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	1	1	2	0	0	0	1	0	1
Total Volume	1	2	3	0	0	0	2	0	2
% App. Total	33.3	66.7		0	0		100	0	
PHF	.250	.500	.375	.000	.000	.000	.500	.000	.500

N/S Street : Mount Support Rd/Heater Rd
E/W Street : Hanover Street
City/State : Lebanon, NH
Weather : Clear

File Name : 52933003
Site Code : 52933003
Start Date : 11/10/2022
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N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933003
 Site Code : 52933003
 Start Date : 11/10/2022
 Page No : 1

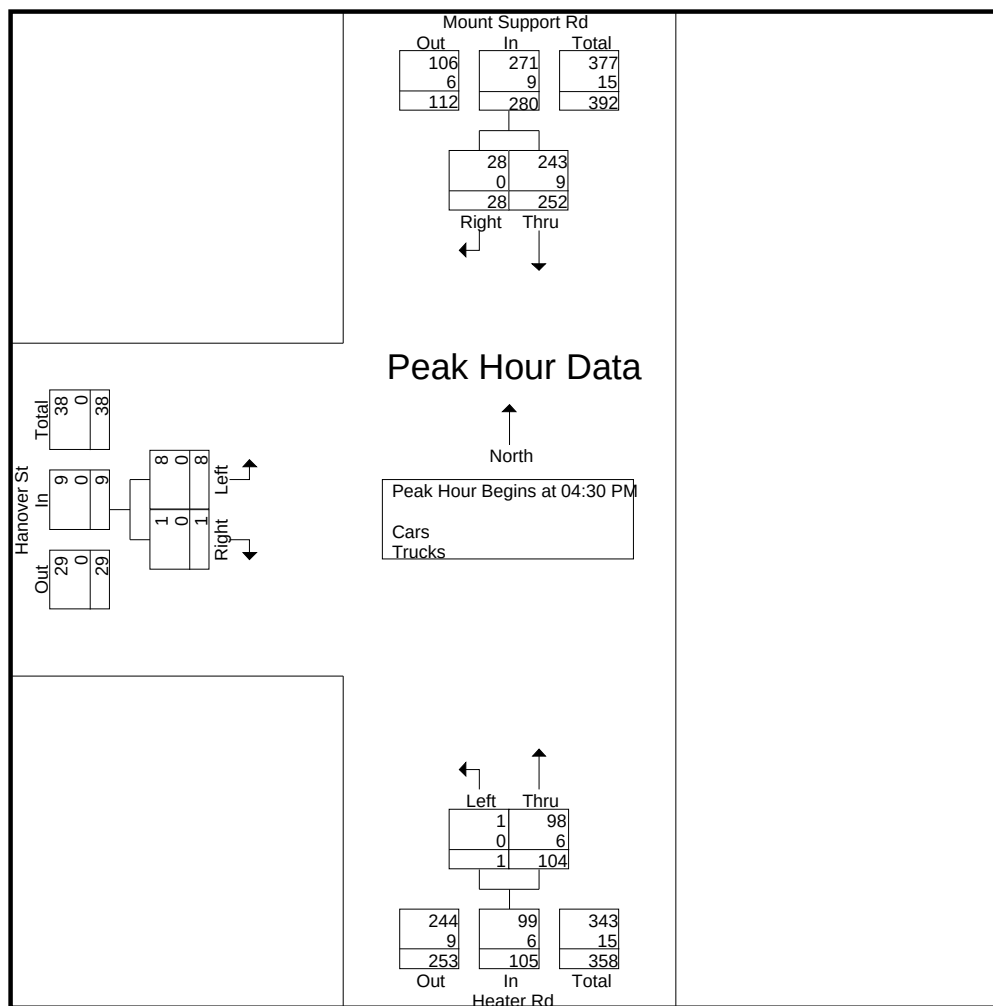
Groups Printed- Cars - Trucks

	Mount Support Rd From North		Heater Rd From South		Hanover St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
02:00 PM	28	4	0	12	6	0	50
02:15 PM	24	1	0	25	3	0	53
02:30 PM	43	3	0	17	1	0	64
02:45 PM	31	6	0	14	4	0	55
Total	126	14	0	68	14	0	222
03:00 PM	40	4	0	21	8	0	73
03:15 PM	36	1	0	19	8	1	65
03:30 PM	65	5	1	22	3	0	96
03:45 PM	42	7	0	22	1	0	72
Total	183	17	1	84	20	1	306
04:00 PM	63	8	0	14	5	0	90
04:15 PM	64	9	1	17	3	0	94
04:30 PM	51	4	1	24	1	0	81
04:45 PM	43	9	0	26	3	1	82
Total	221	30	2	81	12	1	347
05:00 PM	83	10	0	27	3	0	123
05:15 PM	75	5	0	27	1	0	108
05:30 PM	49	6	0	18	2	1	76
05:45 PM	26	3	0	20	3	0	52
Total	233	24	0	92	9	1	359
Grand Total	763	85	3	325	55	3	1234
Apprch %	90	10	0.9	99.1	94.8	5.2	
Total %	61.8	6.9	0.2	26.3	4.5	0.2	
Cars	737	85	3	309	52	3	1189
% Cars	96.6	100	100	95.1	94.5	100	96.4
Trucks	26	0	0	16	3	0	45
% Trucks	3.4	0	0	4.9	5.5	0	3.6

	Mount Support Rd From North			Heater Rd From South			Hanover St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	51	4	55	1	24	25	1	0	1	81
04:45 PM	43	9	52	0	26	26	3	1	4	82
05:00 PM	83	10	93	0	27	27	3	0	3	123
05:15 PM	75	5	80	0	27	27	1	0	1	108
Total Volume	252	28	280	1	104	105	8	1	9	394
% App. Total	90	10		1	99		88.9	11.1		
PHF	.759	.700	.753	.250	.963	.972	.667	.250	.563	.801
Cars	243	28	271	1	98	99	8	1	9	379
% Cars	96.4	100	96.8	100	94.2	94.3	100	100	100	96.2
Trucks	9	0	9	0	6	6	0	0	0	15
% Trucks	3.6	0	3.2	0	5.8	5.7	0	0	0	3.8

N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933003
 Site Code : 52933003
 Start Date : 11/10/2022
 Page No : 2

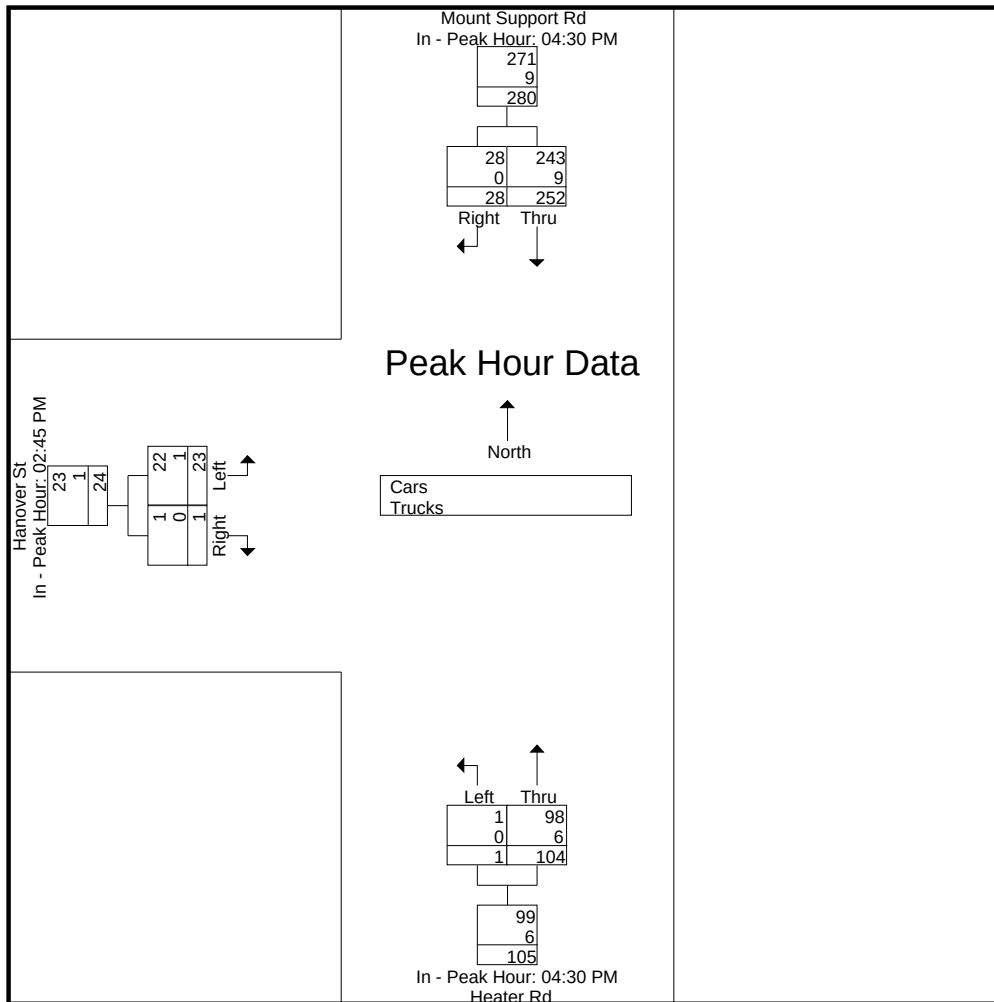


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:30 PM			04:30 PM			02:45 PM		
+0 mins.	51	4	55	1	24	25	4	0	4
+15 mins.	43	9	52	0	26	26	8	0	8
+30 mins.	83	10	93	0	27	27	8	1	9
+45 mins.	75	5	80	0	27	27	3	0	3
Total Volume	252	28	280	1	104	105	23	1	24
% App. Total	90	10		1	99		95.8	4.2	
PHF	.759	.700	.753	.250	.963	.972	.719	.250	.667
Cars	243	28	271	1	98	99	22	1	23
% Cars	96.4	100	96.8	100	94.2	94.3	95.7	100	95.8
Trucks	9	0	9	0	6	6	1	0	1
% Trucks	3.6	0	3.2	0	5.8	5.7	4.3	0	4.2

N/S Street : Mount Support Rd/Heater Rd
E/W Street : Hanover Street
City/State : Lebanon, NH
Weather : Clear

File Name : 52933003
Site Code : 52933003
Start Date : 11/10/2022
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N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933003
 Site Code : 52933003
 Start Date : 11/10/2022
 Page No : 4

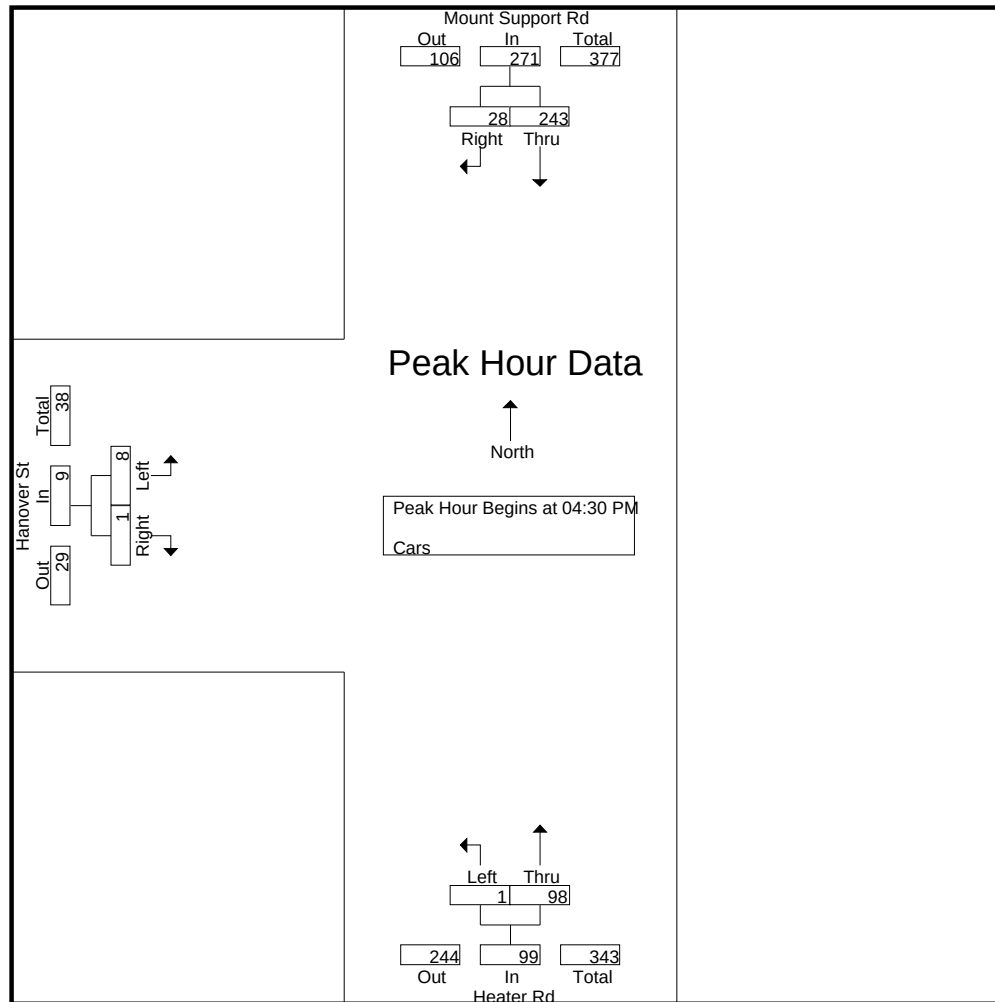
Groups Printed- Cars

	Mount Support Rd From North		Heater Rd From South		Hanover St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
02:00 PM	27	4	0	12	6	0	49
02:15 PM	23	1	0	23	2	0	49
02:30 PM	41	3	0	16	0	0	60
02:45 PM	29	6	0	13	4	0	52
Total	120	14	0	64	12	0	210
03:00 PM	38	4	0	21	8	0	71
03:15 PM	35	1	0	18	7	1	62
03:30 PM	63	5	1	21	3	0	93
03:45 PM	42	7	0	21	1	0	71
Total	178	17	1	81	19	1	297
04:00 PM	60	8	0	13	5	0	86
04:15 PM	63	9	1	16	3	0	92
04:30 PM	50	4	1	23	1	0	79
04:45 PM	41	9	0	23	3	1	77
Total	214	30	2	75	12	1	334
05:00 PM	83	10	0	25	3	0	121
05:15 PM	69	5	0	27	1	0	102
05:30 PM	48	6	0	18	2	1	75
05:45 PM	25	3	0	19	3	0	50
Total	225	24	0	89	9	1	348
Grand Total	737	85	3	309	52	3	1189
Apprch %	89.7	10.3	1	99	94.5	5.5	
Total %	62	7.1	0.3	26	4.4	0.3	

	Mount Support Rd From North			Heater Rd From South			Hanover St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	50	4	54	1	23	24	1	0	1	79
04:45 PM	41	9	50	0	23	23	3	1	4	77
05:00 PM	83	10	93	0	25	25	3	0	3	121
05:15 PM	69	5	74	0	27	27	1	0	1	102
Total Volume	243	28	271	1	98	99	8	1	9	379
% App. Total	89.7	10.3		1	99		88.9	11.1		
PHF	.732	.700	.728	.250	.907	.917	.667	.250	.563	.783

N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933003
 Site Code : 52933003
 Start Date : 11/10/2022
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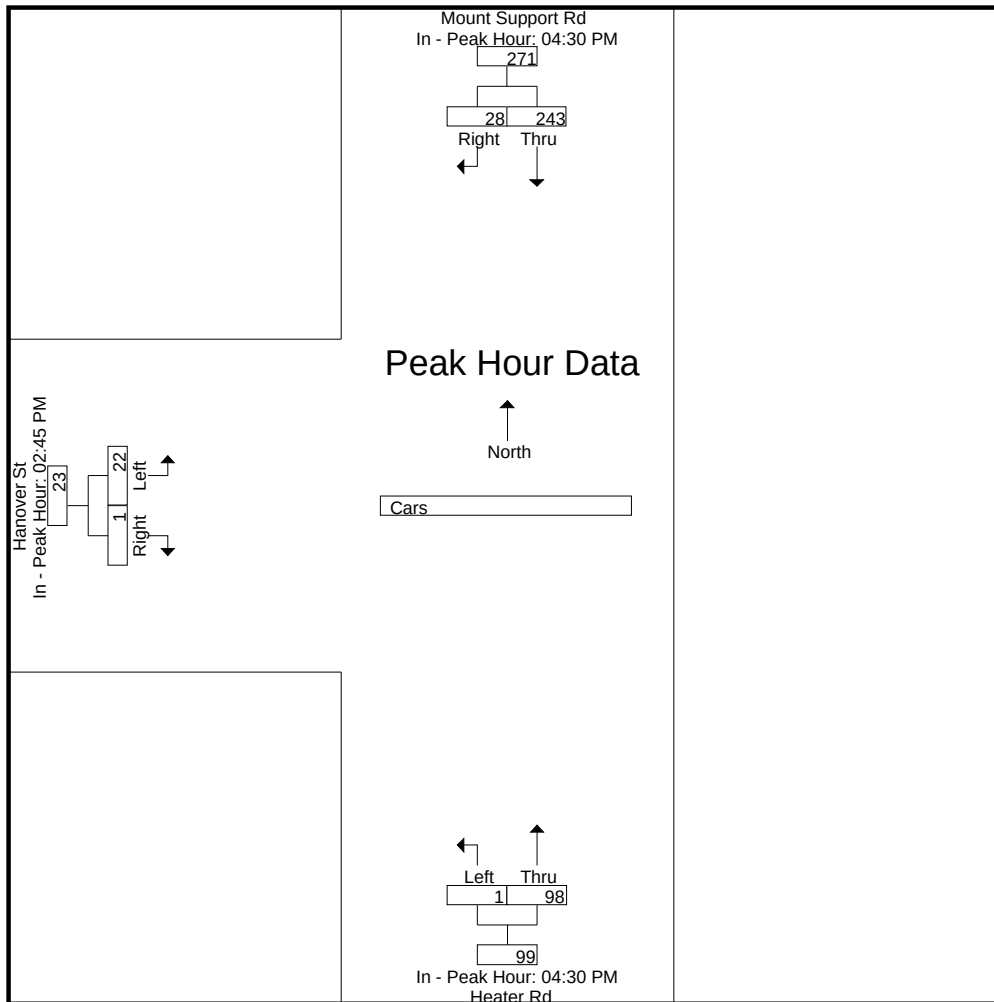


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:30 PM			04:30 PM			02:45 PM		
+0 mins.	50	4	54	1	23	24	4	0	4
+15 mins.	41	9	50	0	23	23	8	0	8
+30 mins.	83	10	93	0	25	25	7	1	8
+45 mins.	69	5	74	0	27	27	3	0	3
Total Volume	243	28	271	1	98	99	22	1	23
% App. Total	89.7	10.3		1	99		95.7	4.3	
PHF	.732	.700	.728	.250	.907	.917	.688	.250	.719

N/S Street : Mount Support Rd/Heater Rd
E/W Street : Hanover Street
City/State : Lebanon, NH
Weather : Clear

File Name : 52933003
Site Code : 52933003
Start Date : 11/10/2022
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N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933003
 Site Code : 52933003
 Start Date : 11/10/2022
 Page No : 7

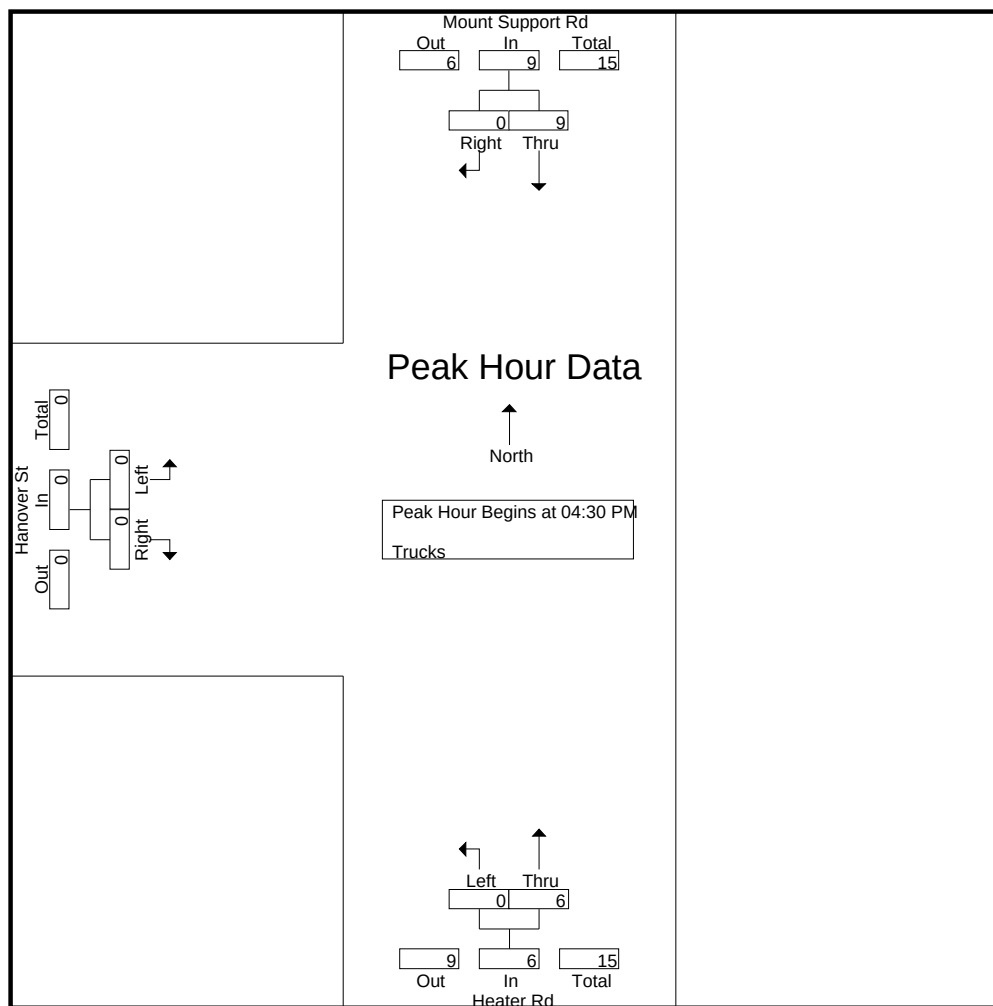
Groups Printed- Trucks

	Mount Support Rd From North		Heater Rd From South		Hanover St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
02:00 PM	1	0	0	0	0	0	1
02:15 PM	1	0	0	2	1	0	4
02:30 PM	2	0	0	1	1	0	4
02:45 PM	2	0	0	1	0	0	3
Total	6	0	0	4	2	0	12
03:00 PM	2	0	0	0	0	0	2
03:15 PM	1	0	0	1	1	0	3
03:30 PM	2	0	0	1	0	0	3
03:45 PM	0	0	0	1	0	0	1
Total	5	0	0	3	1	0	9
04:00 PM	3	0	0	1	0	0	4
04:15 PM	1	0	0	1	0	0	2
04:30 PM	1	0	0	1	0	0	2
04:45 PM	2	0	0	3	0	0	5
Total	7	0	0	6	0	0	13
05:00 PM	0	0	0	2	0	0	2
05:15 PM	6	0	0	0	0	0	6
05:30 PM	1	0	0	0	0	0	1
05:45 PM	1	0	0	1	0	0	2
Total	8	0	0	3	0	0	11
Grand Total	26	0	0	16	3	0	45
Apprch %	100	0	0	100	100	0	
Total %	57.8	0	0	35.6	6.7	0	

	Mount Support Rd From North			Heater Rd From South			Hanover St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	1	0	1	0	1	1	0	0	0	2
04:45 PM	2	0	2	0	3	3	0	0	0	5
05:00 PM	0	0	0	0	2	2	0	0	0	2
05:15 PM	6	0	6	0	0	0	0	0	0	6
Total Volume	9	0	9	0	6	6	0	0	0	15
% App. Total	100	0		0	100		0	0		
PHF	.375	.000	.375	.000	.500	.500	.000	.000	.000	.625

N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933003
 Site Code : 52933003
 Start Date : 11/10/2022
 Page No : 8



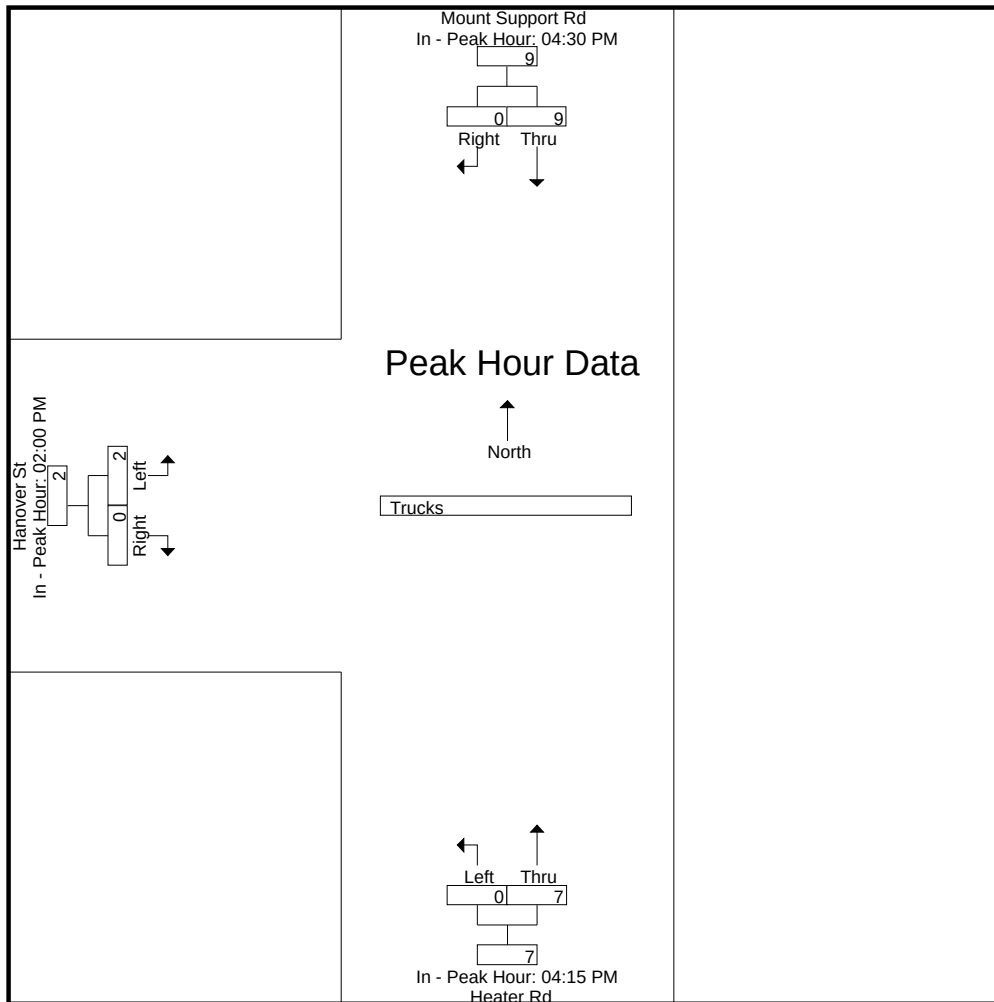
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:30 PM			04:15 PM			02:00 PM		
+0 mins.	1	0	1	0	1	1	0	0	0
+15 mins.	2	0	2	0	1	1	1	0	1
+30 mins.	0	0	0	0	3	3	1	0	1
+45 mins.	6	0	6	0	2	2	0	0	0
Total Volume	9	0	9	0	7	7	2	0	2
% App. Total	100	0		0	100		100	0	
PHF	.375	.000	.375	.000	.583	.583	.500	.000	.500

N/S Street : Mount Support Rd/Heater Rd
E/W Street : Hanover Street
City/State : Lebanon, NH
Weather : Clear

File Name : 52933003
Site Code : 52933003
Start Date : 11/10/2022
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N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933003
 Site Code : 52933003
 Start Date : 11/10/2022
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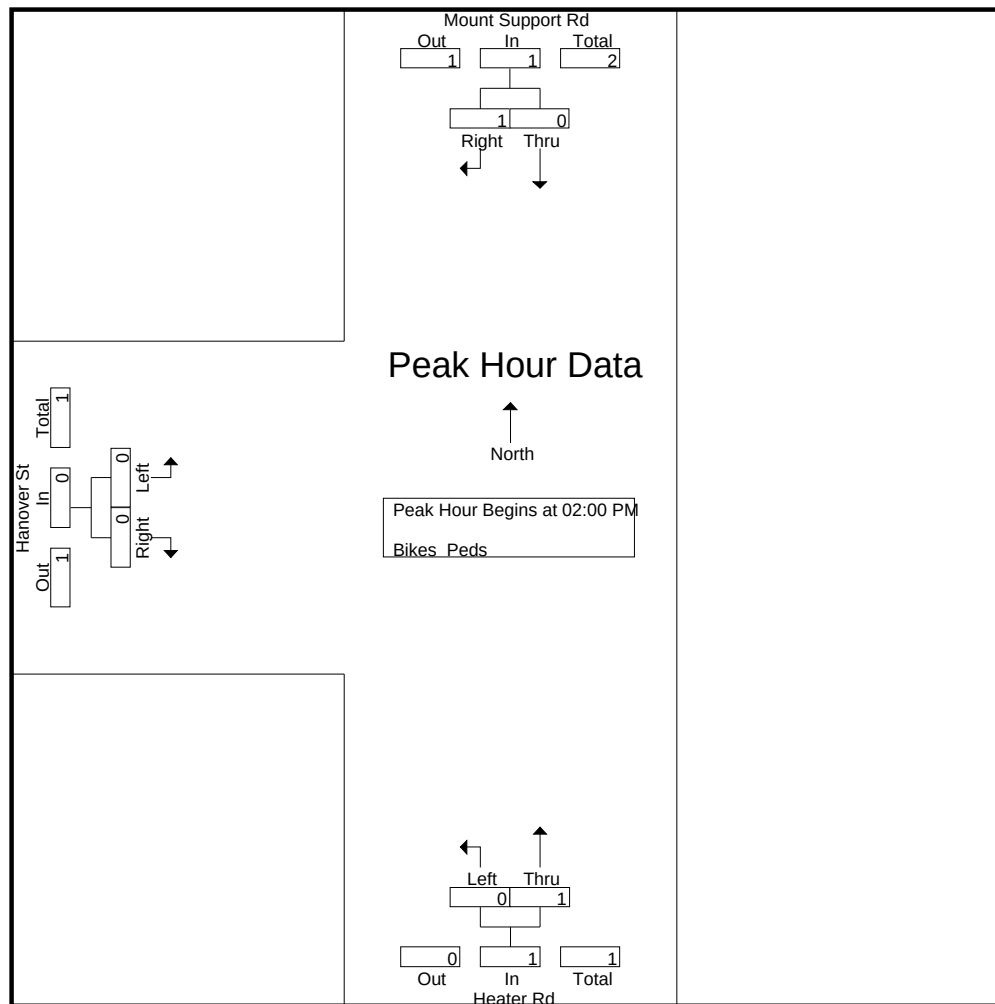
Groups Printed- Bikes Peds

	Mount Support Rd From North			Heater Rd From South			Hanover St From West			Exclu. Total	Inclu. Total	Int. Total
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds			
02:00 PM	0	1	0	0	0	0	0	0	0	0	1	1
02:15 PM	0	0	0	0	1	0	0	0	0	0	1	1
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	2	0	0	0	0	0	0	2	0	2
Total	0	1	2	0	1	0	0	0	0	2	2	4
03:00 PM	0	1	0	0	0	0	0	0	0	0	1	1
03:15 PM	0	0	0	0	0	1	0	0	0	1	0	1
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	1	0	0	0	1	0	1
Total	0	1	0	0	0	2	0	0	0	2	1	3
04:00 PM	1	0	1	0	1	0	0	0	0	1	2	3
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	1	0	0	0	1	0	1
Total	1	0	1	0	1	1	0	0	0	2	2	4
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	1	0	0	0	0	0	0	0	0	1	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	0	0	0	1	1
Grand Total	1	3	3	0	2	3	0	0	0	6	6	12
Apprch %	25	75		0	100		0	0				
Total %	16.7	50		0	33.3		0	0		50	50	

	Mount Support Rd From North			Heater Rd From South			Hanover St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	0	1	1	0	0	0	0	0	0	1
02:15 PM	0	0	0	0	1	1	0	0	0	1
02:30 PM	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	1	0	1	1	0	0	0	2
% App. Total	0	100		0	100		0	0		
PHF	.000	.250	.250	.000	.250	.250	.000	.000	.000	.500

N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933003
 Site Code : 52933003
 Start Date : 11/10/2022
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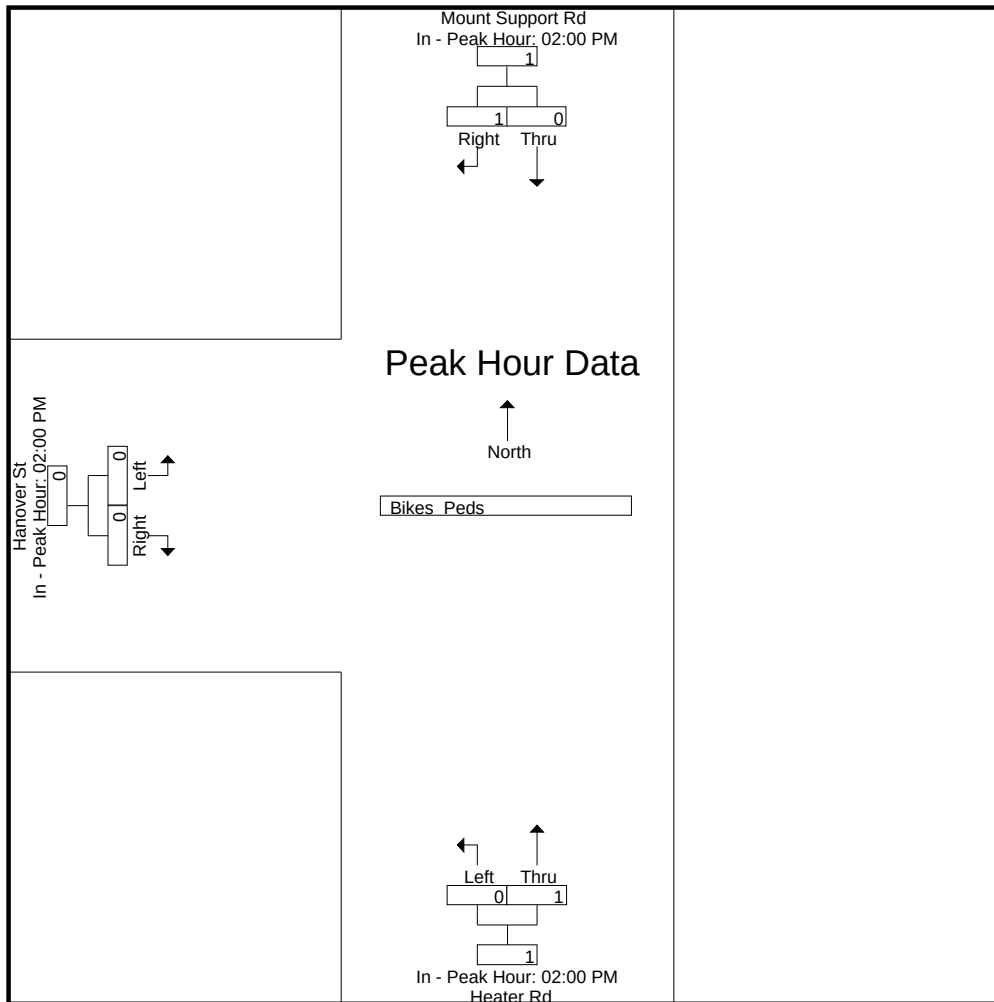


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	02:00 PM			02:00 PM			02:00 PM		
+0 mins.	0	1	1	0	0	0	0	0	0
+15 mins.	0	0	0	0	1	1	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	1	1	0	1	1	0	0	0
% App. Total	0	100		0	100		0	0	
PHF	.000	.250	.250	.000	.250	.250	.000	.000	.000

N/S Street : Mount Support Rd/Heater Rd
E/W Street : Hanover Street
City/State : Lebanon, NH
Weather : Clear

File Name : 52933003
Site Code : 52933003
Start Date : 11/10/2022
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N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 529330S3
 Site Code : 52933003
 Start Date : 11/12/2022
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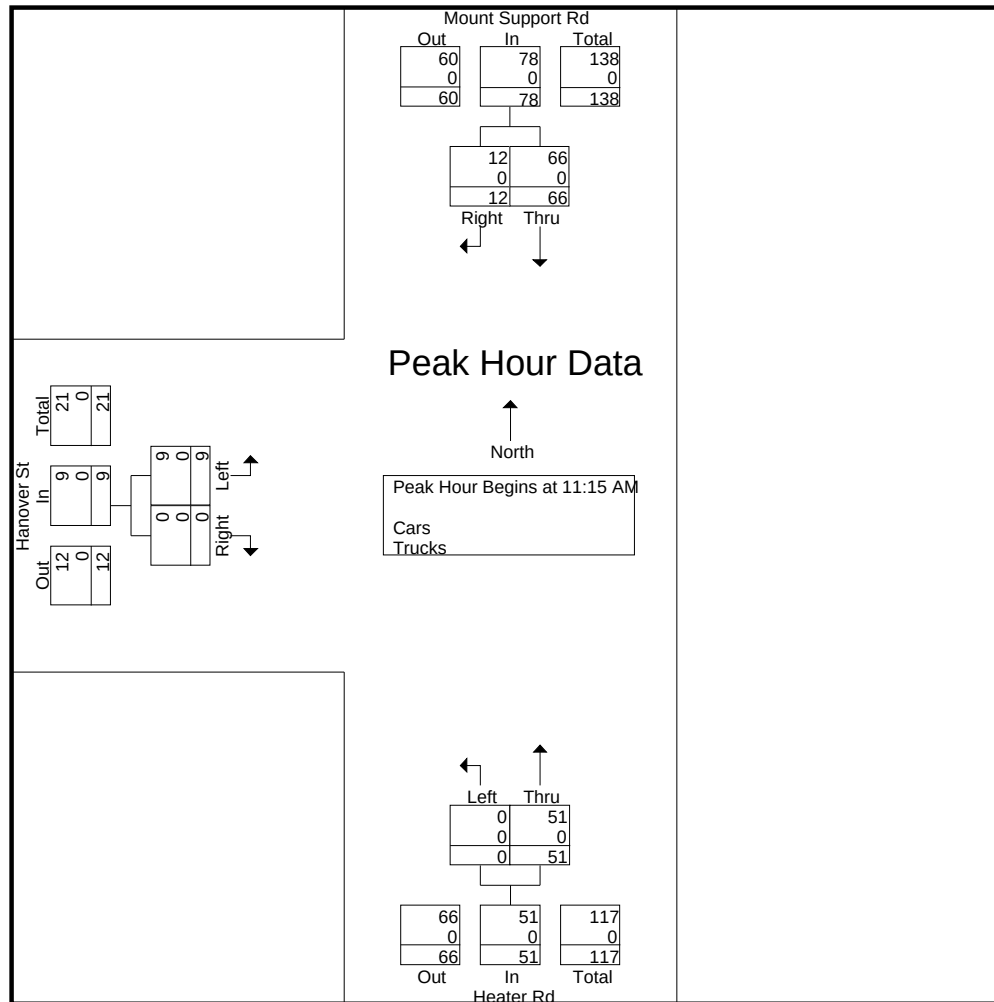
Groups Printed- Cars - Trucks

	Mount Support Rd From North		Heater Rd From South		Hanover St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
11:00 AM	11	1	0	16	1	0	29
11:15 AM	16	1	0	20	3	0	40
11:30 AM	15	3	0	13	3	0	34
11:45 AM	17	5	0	5	0	0	27
Total	59	10	0	54	7	0	130
12:00 PM	18	3	0	13	3	0	37
12:15 PM	12	3	1	9	2	0	27
12:30 PM	18	0	0	10	3	0	31
12:45 PM	11	0	0	14	2	0	27
Total	59	6	1	46	10	0	122
Grand Total	118	16	1	100	17	0	252
Apprch %	88.1	11.9	1	99	100	0	
Total %	46.8	6.3	0.4	39.7	6.7	0	
Cars	118	16	1	100	17	0	252
% Cars	100	100	100	100	100	0	100
Trucks	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0

	Mount Support Rd From North			Heater Rd From South			Hanover St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:15 AM										
11:15 AM	16	1	17	0	20	20	3	0	3	40
11:30 AM	15	3	18	0	13	13	3	0	3	34
11:45 AM	17	5	22	0	5	5	0	0	0	27
12:00 PM	18	3	21	0	13	13	3	0	3	37
Total Volume	66	12	78	0	51	51	9	0	9	138
% App. Total	84.6	15.4		0	100		100	0		
PHF	.917	.600	.886	.000	.638	.638	.750	.000	.750	.863
Cars	66	12	78	0	51	51	9	0	9	138
% Cars	100	100	100	0	100	100	100	0	100	100
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0

N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 529330S3
 Site Code : 52933003
 Start Date : 11/12/2022
 Page No : 2

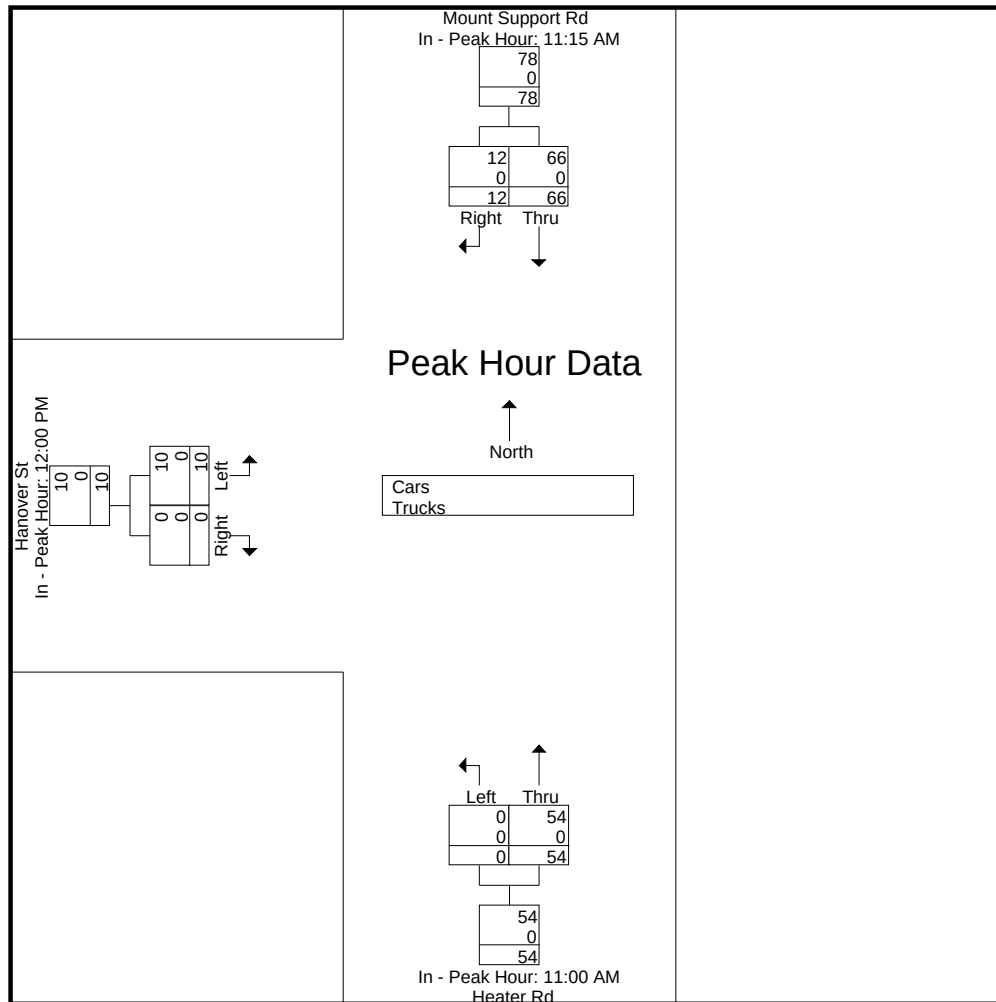


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	11:15 AM			11:00 AM			12:00 PM		
+0 mins.	16	1	17	0	16	16	3	0	3
+15 mins.	15	3	18	0	20	20	2	0	2
+30 mins.	17	5	22	0	13	13	3	0	3
+45 mins.	18	3	21	0	5	5	2	0	2
Total Volume	66	12	78	0	54	54	10	0	10
% App. Total	84.6	15.4		0	100		100	0	
PHF	.917	.600	.886	.000	.675	.675	.833	.000	.833
Cars	66	12	78	0	54	54	10	0	10
% Cars	100	100	100	0	100	100	100	0	100
Trucks	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0

N/S Street : Mount Support Rd/Heater Rd
E/W Street : Hanover Street
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S3
Site Code : 52933003
Start Date : 11/12/2022
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N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 529330S3
 Site Code : 52933003
 Start Date : 11/12/2022
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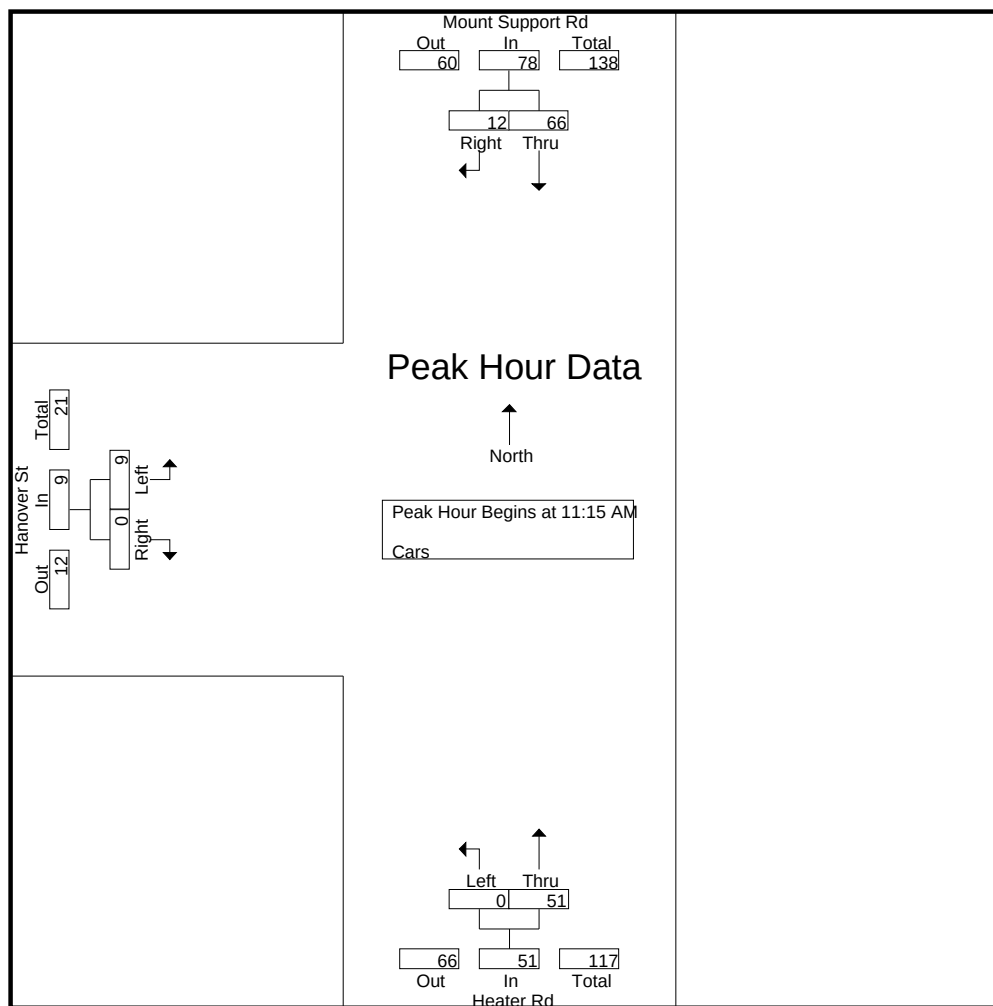
Groups Printed- Cars

	Mount Support Rd From North		Heater Rd From South		Hanover St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
11:00 AM	11	1	0	16	1	0	29
11:15 AM	16	1	0	20	3	0	40
11:30 AM	15	3	0	13	3	0	34
11:45 AM	17	5	0	5	0	0	27
Total	59	10	0	54	7	0	130
12:00 PM	18	3	0	13	3	0	37
12:15 PM	12	3	1	9	2	0	27
12:30 PM	18	0	0	10	3	0	31
12:45 PM	11	0	0	14	2	0	27
Total	59	6	1	46	10	0	122
Grand Total	118	16	1	100	17	0	252
Apprch %	88.1	11.9	1	99	100	0	
Total %	46.8	6.3	0.4	39.7	6.7	0	

	Mount Support Rd From North			Heater Rd From South			Hanover St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:15 AM										
11:15 AM	16	1	17	0	20	20	3	0	3	40
11:30 AM	15	3	18	0	13	13	3	0	3	34
11:45 AM	17	5	22	0	5	5	0	0	0	27
12:00 PM	18	3	21	0	13	13	3	0	3	37
Total Volume	66	12	78	0	51	51	9	0	9	138
% App. Total	84.6	15.4		0	100		100	0		
PHF	.917	.600	.886	.000	.638	.638	.750	.000	.750	.863

N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 529330S3
 Site Code : 52933003
 Start Date : 11/12/2022
 Page No : 5

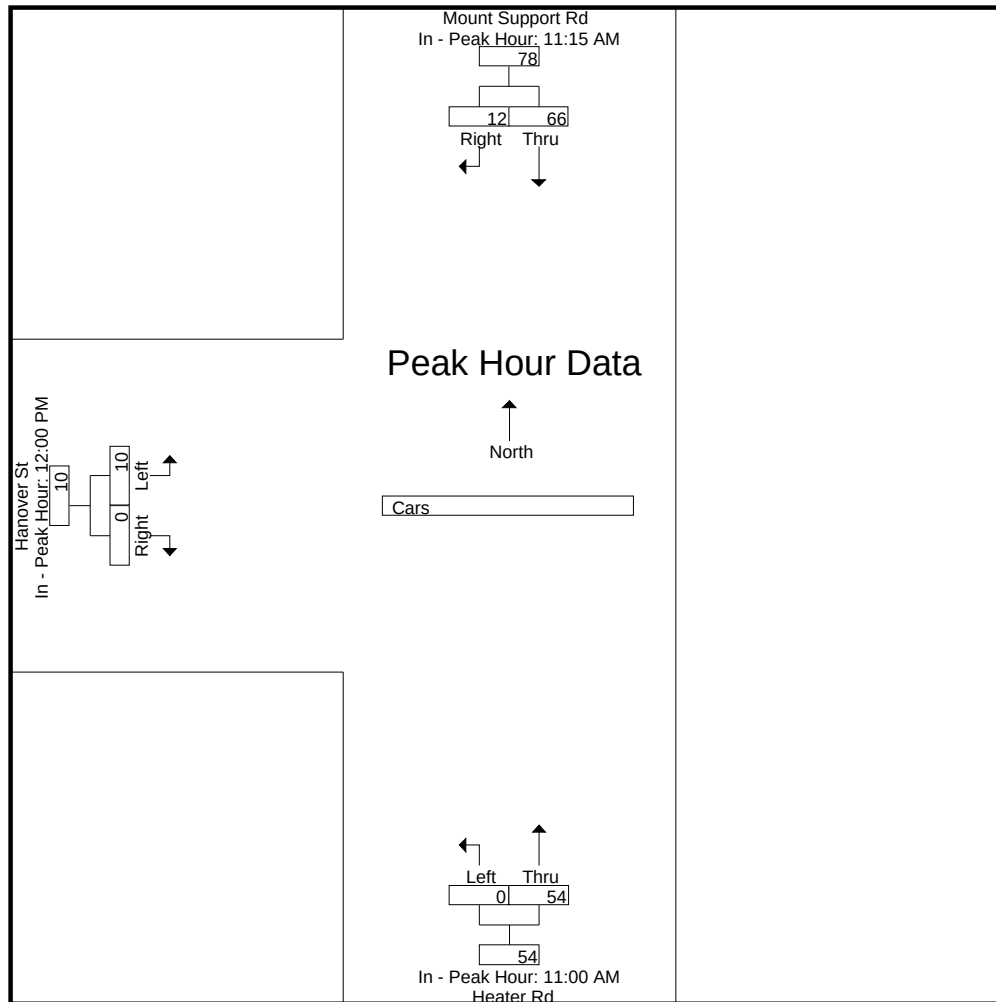


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	11:15 AM			11:00 AM			12:00 PM		
+0 mins.	16	1	17	0	16	16	3	0	3
+15 mins.	15	3	18	0	20	20	2	0	2
+30 mins.	17	5	22	0	13	13	3	0	3
+45 mins.	18	3	21	0	5	5	2	0	2
Total Volume	66	12	78	0	54	54	10	0	10
% App. Total	84.6	15.4		0	100		100	0	
PHF	.917	.600	.886	.000	.675	.675	.833	.000	.833

N/S Street : Mount Support Rd/Heater Rd
E/W Street : Hanover Street
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S3
Site Code : 52933003
Start Date : 11/12/2022
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N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 529330S3
 Site Code : 52933003
 Start Date : 11/12/2022
 Page No : 7

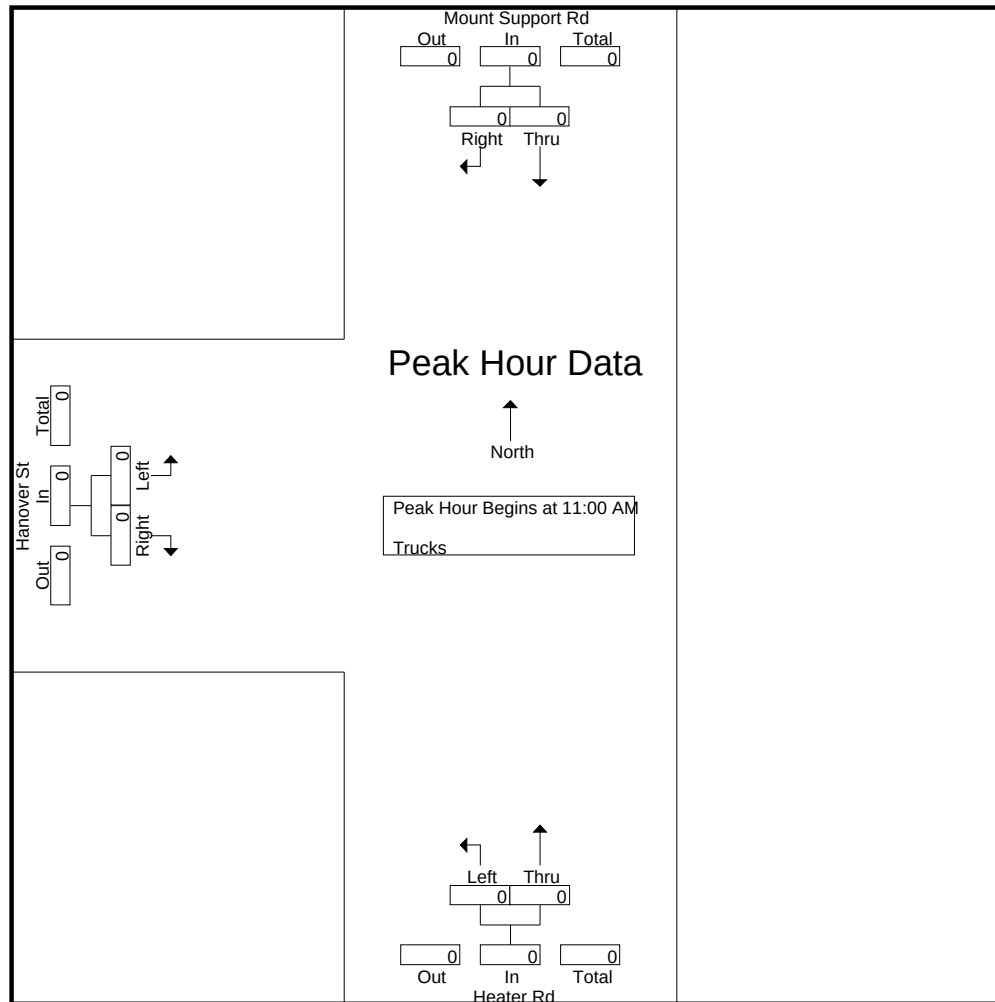
Groups Printed- Trucks

	Mount Support Rd From North		Heater Rd From South		Hanover St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
11:00 AM	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	
Total %							

	Mount Support Rd From North			Heater Rd From South			Hanover St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:00 AM										
11:00 AM	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

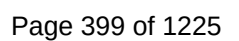
File Name : 529330S3
 Site Code : 52933003
 Start Date : 11/12/2022
 Page No : 8



Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	11:00 AM			11:00 AM			11:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

File Name : 529330S3
Site Code : 52933003
Start Date : 11/12/2022
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N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 529330S3
 Site Code : 52933003
 Start Date : 11/12/2022
 Page No : 10

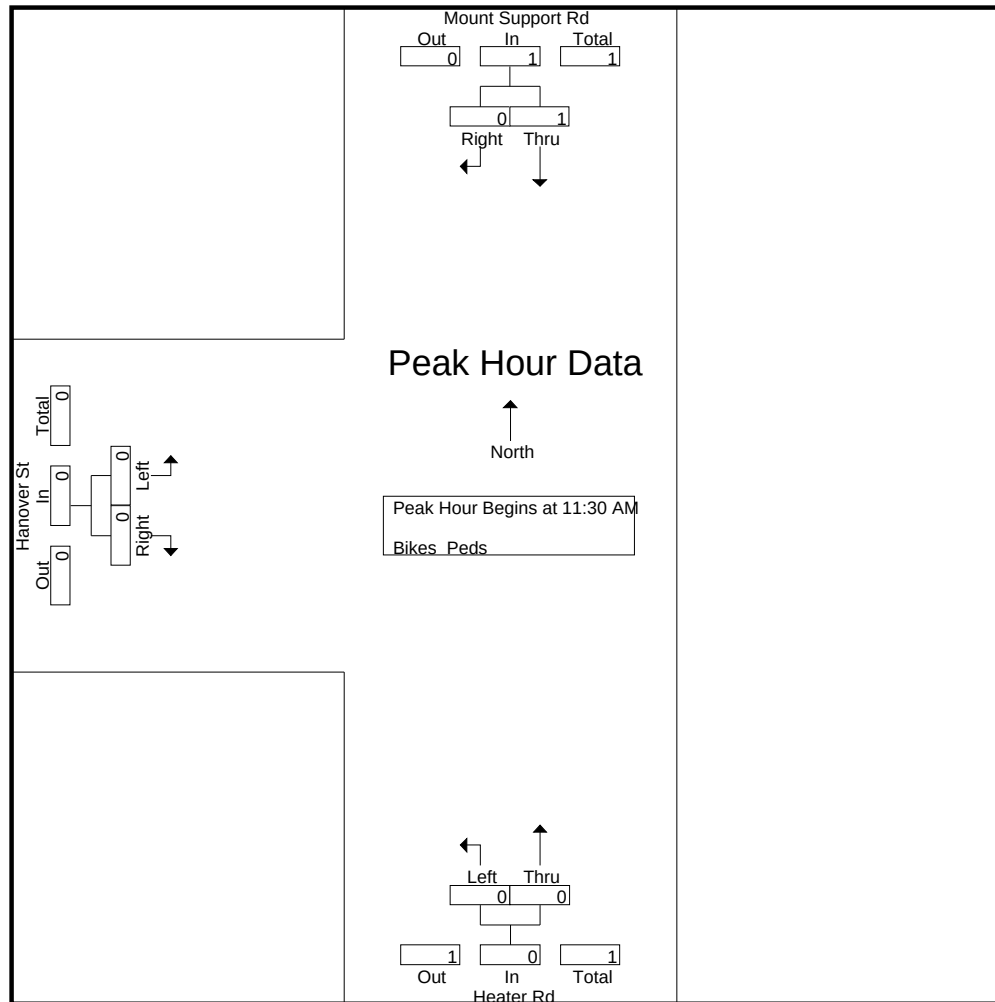
Groups Printed- Bikes Peds

	Mount Support Rd From North			Heater Rd From South			Hanover St From West			Exclu. Total	Inclu. Total	Int. Total
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds			
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	3	3	0	3
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	3	3	0	3
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	1	0	0	0	0	0	0	0	0	0	1	1
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	1	0	0	0	0	0	0	1	0	1
Total	1	0	1	0	0	0	0	0	0	1	1	2
Grand Total	1	0	1	0	0	0	0	0	3	4	1	5
Apprch %	100	0		0	0		0	0				
Total %	100	0		0	0		0	0		80	20	

	Mount Support Rd From North			Heater Rd From South			Hanover St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:30 AM										
11:30 AM	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0
12:15 PM	1	0	1	0	0	0	0	0	0	1
Total Volume	1	0	1	0	0	0	0	0	0	1
% App. Total	100	0		0	0		0	0		
PHF	.250	.000	.250	.000	.000	.000	.000	.000	.000	.250

N/S Street : Mount Support Rd/Heater Rd
 E/W Street : Hanover Street
 City/State : Lebanon, NH
 Weather : Clear

File Name : 529330S3
 Site Code : 52933003
 Start Date : 11/12/2022
 Page No : 11

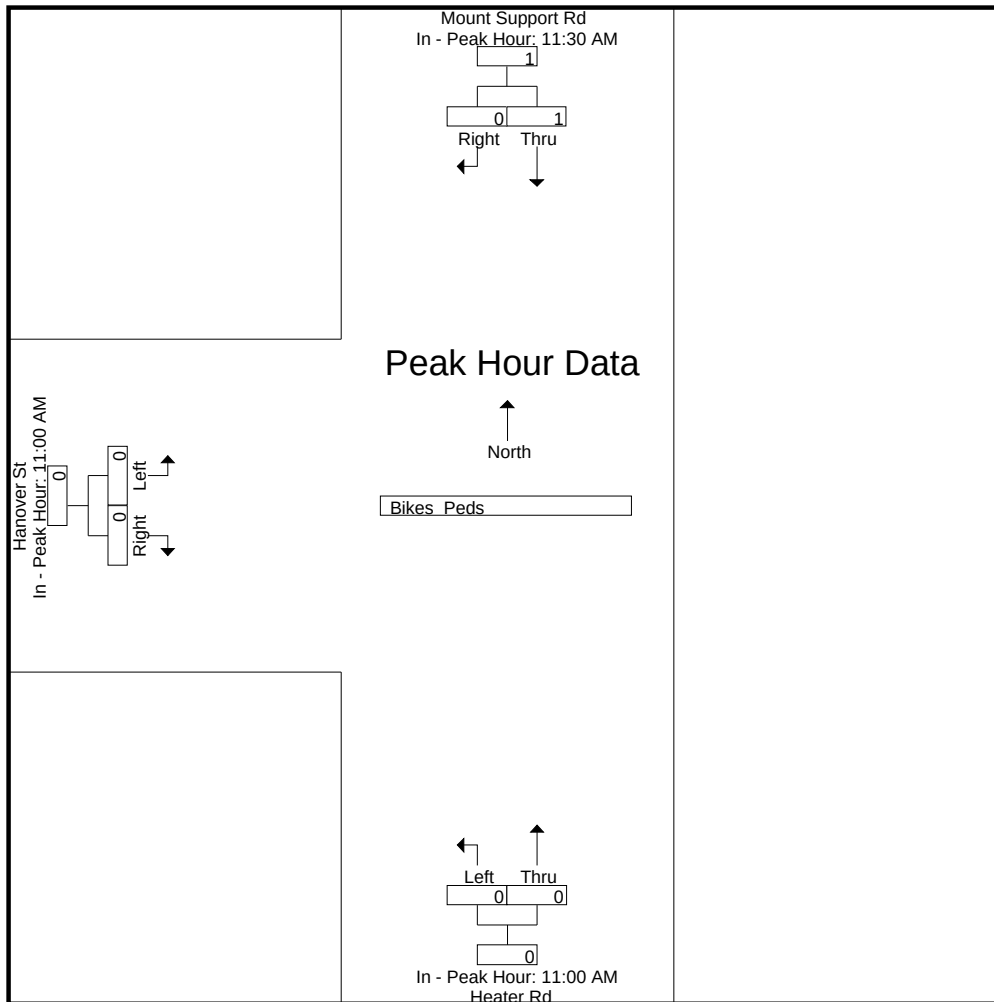


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	11:30 AM			11:00 AM			11:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	1	0	1	0	0	0	0	0	0
Total Volume	1	0	1	0	0	0	0	0	0
% App. Total	100	0		0	0		0	0	
PHF	.250	.000	.250	.000	.000	.000	.000	.000	.000

N/S Street : Mount Support Rd/Heater Rd
E/W Street : Hanover Street
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S3
Site Code : 52933003
Start Date : 11/12/2022
Page No : 12



N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
Page No : 1

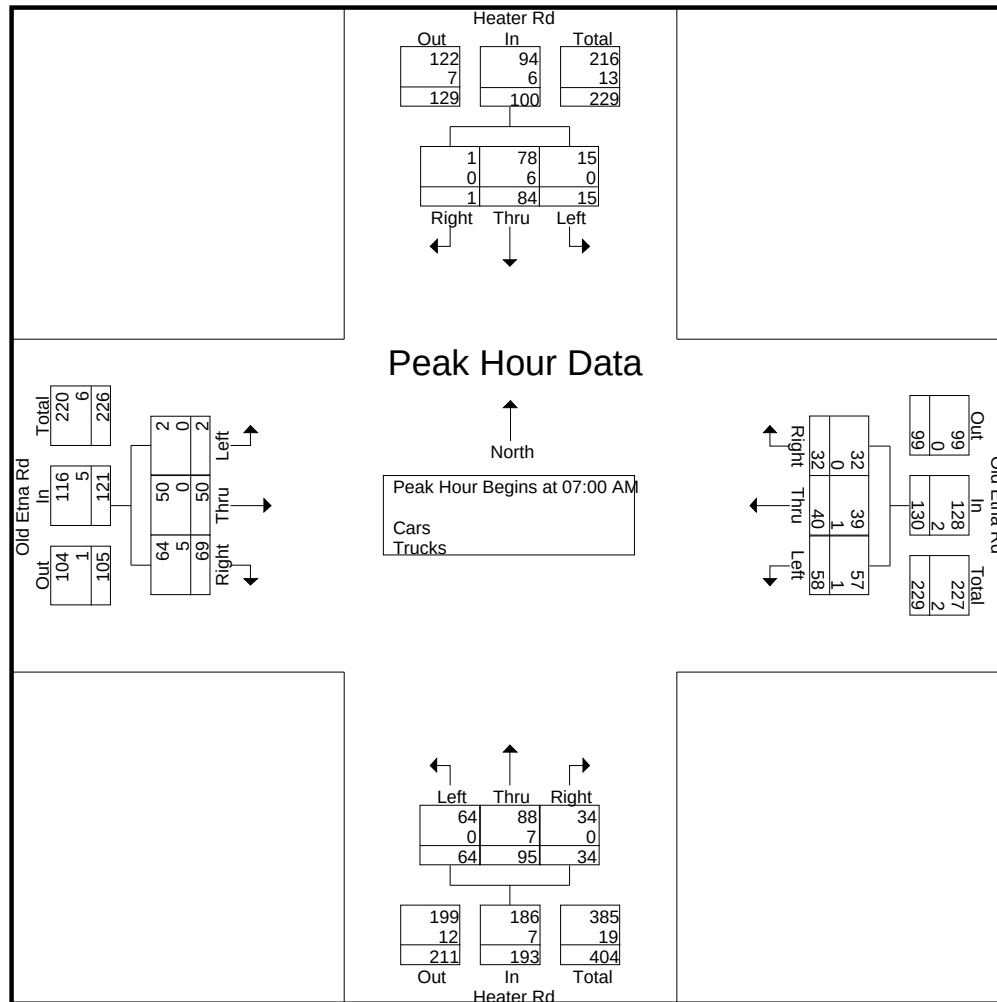
Groups Printed- Cars - Trucks

	Heater Rd From North			Old Etna Rd From East			Heater Rd From South			Old Etna Rd From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	2	13	0	14	6	8	16	19	13	0	5	10	106
07:15 AM	3	23	1	17	14	5	25	25	8	1	15	28	165
07:30 AM	1	19	0	12	9	9	6	25	8	1	15	13	118
07:45 AM	9	29	0	15	11	10	17	26	5	0	15	18	155
Total	15	84	1	58	40	32	64	95	34	2	50	69	544
08:00 AM	6	9	0	11	5	8	1	23	11	0	9	11	94
08:15 AM	2	20	0	10	3	4	1	18	9	0	4	6	77
08:30 AM	4	14	0	14	0	6	1	14	13	0	4	4	74
08:45 AM	2	16	1	12	2	6	3	16	5	0	2	1	66
Total	14	59	1	47	10	24	6	71	38	0	19	22	311
Grand Total	29	143	2	105	50	56	70	166	72	2	69	91	855
Apprch %	16.7	82.2	1.1	49.8	23.7	26.5	22.7	53.9	23.4	1.2	42.6	56.2	
Total %	3.4	16.7	0.2	12.3	5.8	6.5	8.2	19.4	8.4	0.2	8.1	10.6	
Cars	29	131	2	104	49	56	70	155	72	2	69	84	823
% Cars	100	91.6	100	99	98	100	100	93.4	100	100	100	92.3	96.3
Trucks	0	12	0	1	1	0	0	11	0	0	0	7	32
% Trucks	0	8.4	0	1	2	0	0	6.6	0	0	0	7.7	3.7

	Heater Rd From North				Old Etna Rd From East				Heater Rd From South				Old Etna Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	2	13	0	15	14	6	8	28	16	19	13	48	0	5	10	15	106
07:15 AM	3	23	1	27	17	14	5	36	25	25	8	58	1	15	28	44	165
07:30 AM	1	19	0	20	12	9	9	30	6	25	8	39	1	15	13	29	118
07:45 AM	9	29	0	38	15	11	10	36	17	26	5	48	0	15	18	33	155
Total Volume	15	84	1	100	58	40	32	130	64	95	34	193	2	50	69	121	544
% App. Total	15	84	1		44.6	30.8	24.6		33.2	49.2	17.6		1.7	41.3	57		
PHF	.417	.724	.250	.658	.853	.714	.800	.903	.640	.913	.654	.832	.500	.833	.616	.688	.824
Cars	15	78	1	94	57	39	32	128	64	88	34	186	2	50	64	116	524
% Cars	100	92.9	100	94.0	98.3	97.5	100	98.5	100	92.6	100	96.4	100	100	92.8	95.9	96.3
Trucks	0	6	0	6	1	1	0	2	0	7	0	7	0	0	5	5	20
% Trucks	0	7.1	0	6.0	1.7	2.5	0	1.5	0	7.4	0	3.6	0	0	7.2	4.1	3.7

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
Page No : 2

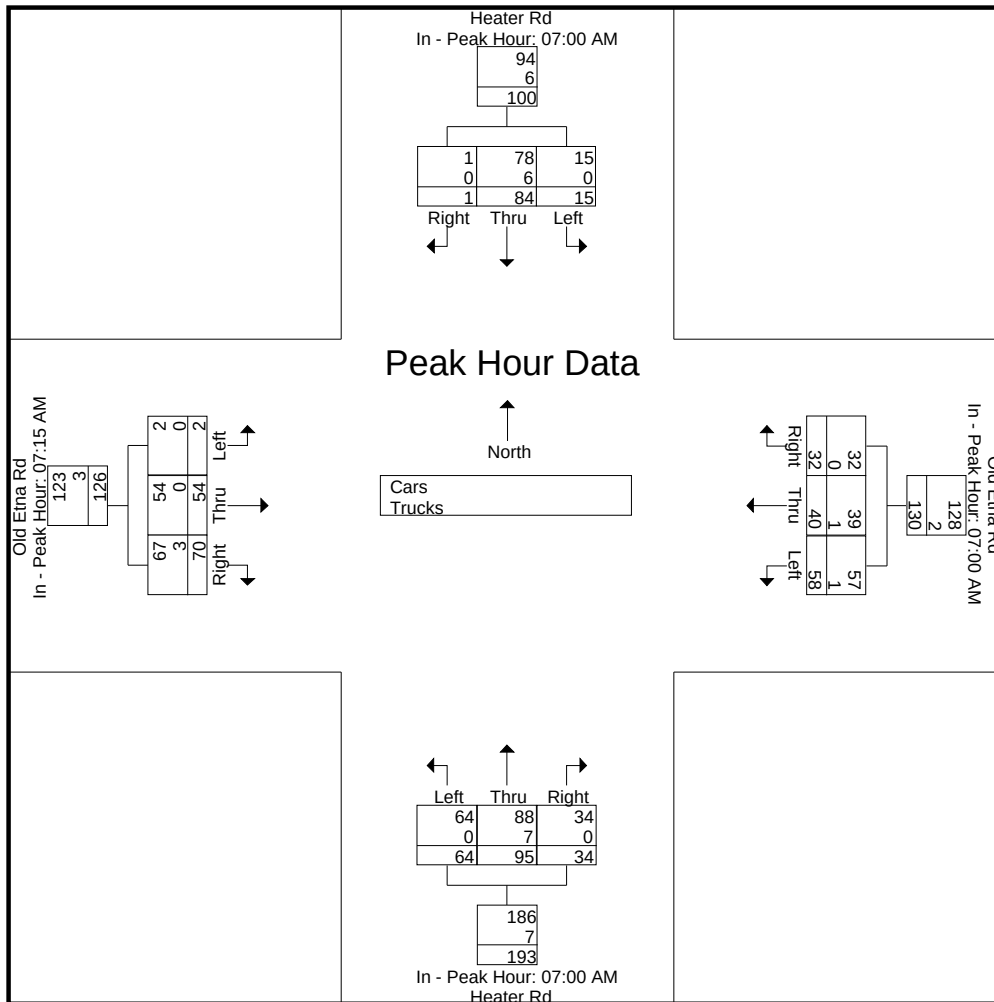


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:15 AM			
+0 mins.	2	13	0	15	14	6	8	28	16	19	13	48	1	15	28	44
+15 mins.	3	23	1	27	17	14	5	36	25	25	8	58	1	15	13	29
+30 mins.	1	19	0	20	12	9	9	30	6	25	8	39	0	15	18	33
+45 mins.	9	29	0	38	15	11	10	36	17	26	5	48	0	9	11	20
Total Volume	15	84	1	100	58	40	32	130	64	95	34	193	2	54	70	126
% App. Total	15	84	1		44.6	30.8	24.6		33.2	49.2	17.6		1.6	42.9	55.6	
PHF	.417	.724	.250	.658	.853	.714	.800	.903	.640	.913	.654	.832	.500	.900	.625	.716
Cars	15	78	1	94	57	39	32	128	64	88	34	186	2	54	67	123
% Cars	100	92.9	100	94	98.3	97.5	100	98.5	100	92.6	100	96.4	100	100	95.7	97.6
Trucks	0	6	0	6	1	1	0	2	0	7	0	7	0	0	3	3
% Trucks	0	7.1	0	6	1.7	2.5	0	1.5	0	7.4	0	3.6	0	0	4.3	2.4

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
Page No : 3



N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
Page No : 4

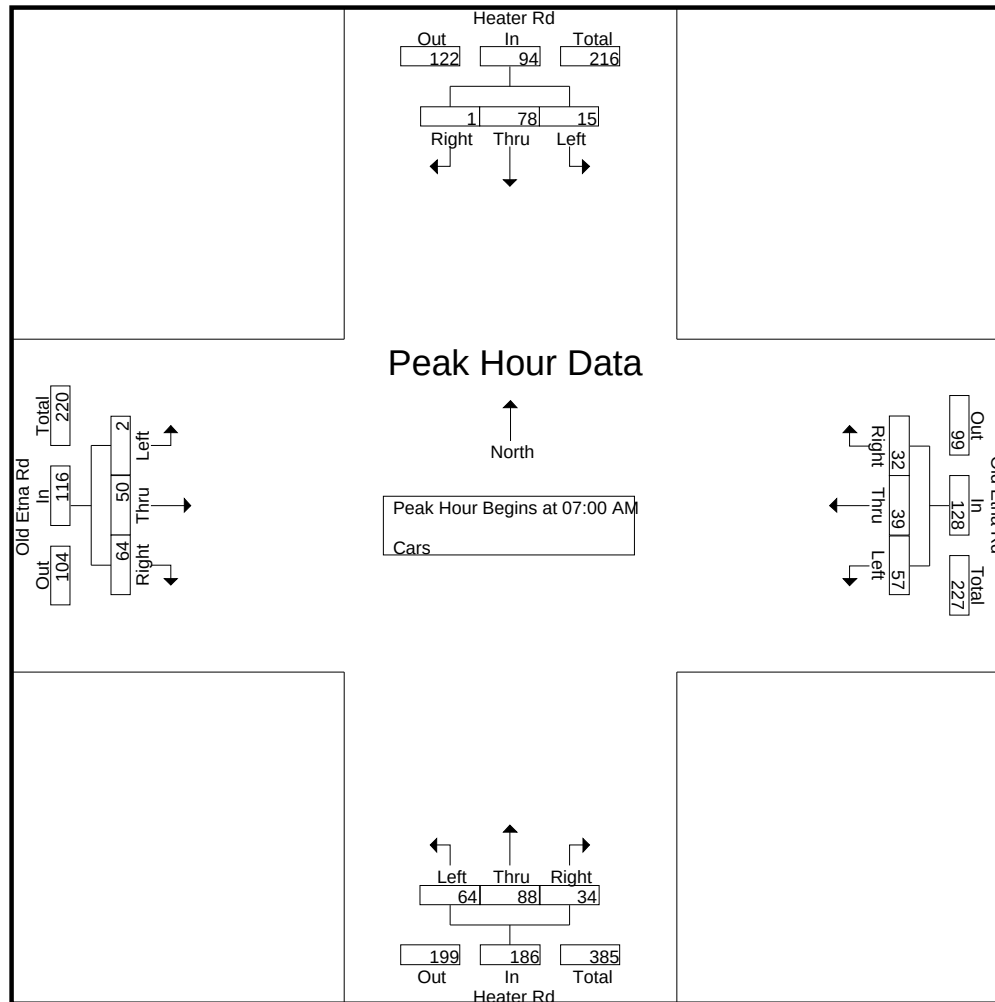
Groups Printed- Cars

	Heater Rd From North			Old Etna Rd From East			Heater Rd From South			Old Etna Rd From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	2	12	0	13	6	8	16	18	13	0	5	7	100
07:15 AM	3	22	1	17	14	5	25	23	8	1	15	27	161
07:30 AM	1	19	0	12	9	9	6	24	8	1	15	13	117
07:45 AM	9	25	0	15	10	10	17	23	5	0	15	17	146
Total	15	78	1	57	39	32	64	88	34	2	50	64	524
08:00 AM	6	9	0	11	5	8	1	22	11	0	9	10	92
08:15 AM	2	17	0	10	3	4	1	17	9	0	4	6	73
08:30 AM	4	12	0	14	0	6	1	13	13	0	4	3	70
08:45 AM	2	15	1	12	2	6	3	15	5	0	2	1	64
Total	14	53	1	47	10	24	6	67	38	0	19	20	299
Grand Total	29	131	2	104	49	56	70	155	72	2	69	84	823
Apprch %	17.9	80.9	1.2	49.8	23.4	26.8	23.6	52.2	24.2	1.3	44.5	54.2	
Total %	3.5	15.9	0.2	12.6	6	6.8	8.5	18.8	8.7	0.2	8.4	10.2	

	Heater Rd From North				Old Etna Rd From East				Heater Rd From South				Old Etna Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	2	12	0	14	13	6	8	27	16	18	13	47	0	5	7	12	100
07:15 AM	3	22	1	26	17	14	5	36	25	23	8	56	1	15	27	43	161
07:30 AM	1	19	0	20	12	9	9	30	6	24	8	38	1	15	13	29	117
07:45 AM	9	25	0	34	15	10	10	35	17	23	5	45	0	15	17	32	146
Total Volume	15	78	1	94	57	39	32	128	64	88	34	186	2	50	64	116	524
% App. Total	16	83	1.1		44.5	30.5	25		34.4	47.3	18.3		1.7	43.1	55.2		
PHF	.417	.780	.250	.691	.838	.696	.800	.889	.640	.917	.654	.830	.500	.833	.593	.674	.814

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
Page No : 5

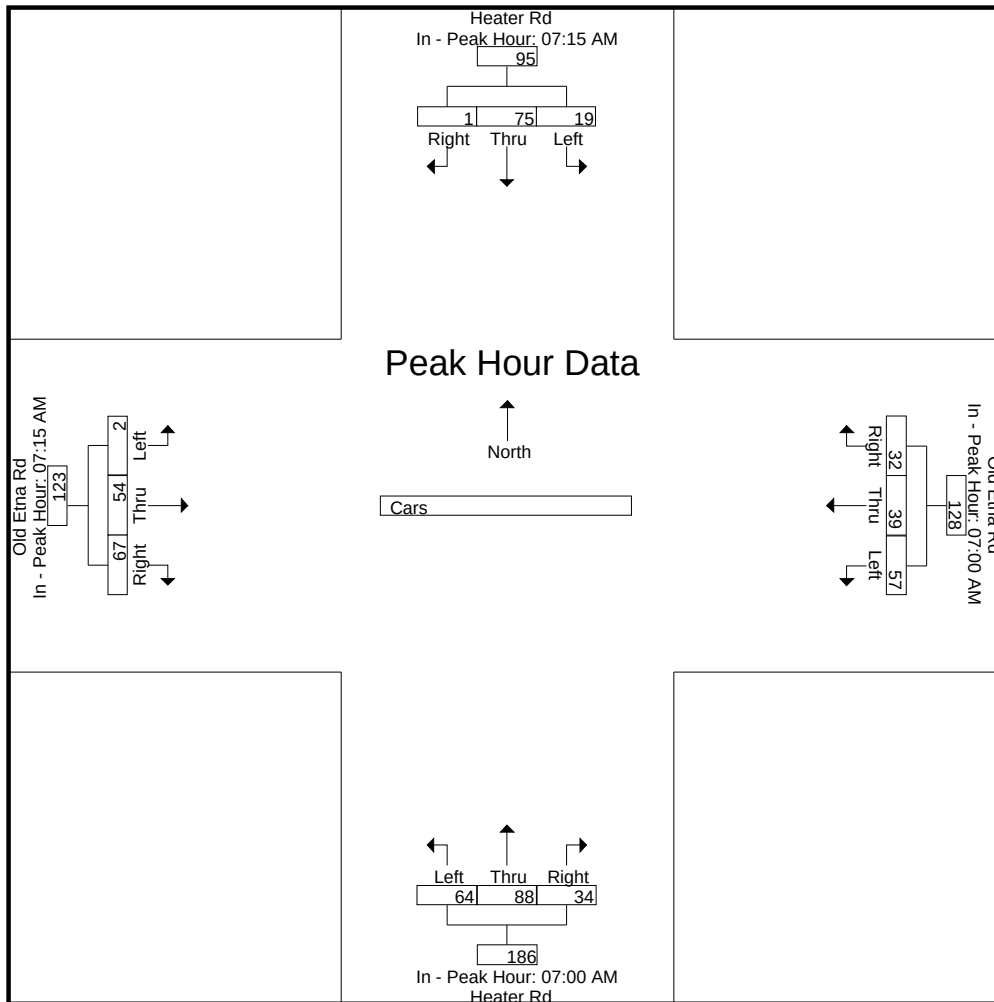


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:00 AM				07:15 AM			
+0 mins.	3	22	1	26	13	6	8	27	16	18	13	47	1	15	27	43
+15 mins.	1	19	0	20	17	14	5	36	25	23	8	56	1	15	13	29
+30 mins.	9	25	0	34	12	9	9	30	6	24	8	38	0	15	17	32
+45 mins.	6	9	0	15	15	10	10	35	17	23	5	45	0	9	10	19
Total Volume	19	75	1	95	57	39	32	128	64	88	34	186	2	54	67	123
% App. Total	20	78.9	1.1		44.5	30.5	25		34.4	47.3	18.3		1.6	43.9	54.5	
PHF	.528	.750	.250	.699	.838	.696	.800	.889	.640	.917	.654	.830	.500	.900	.620	.715

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
Page No : 6



N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
Page No : 7

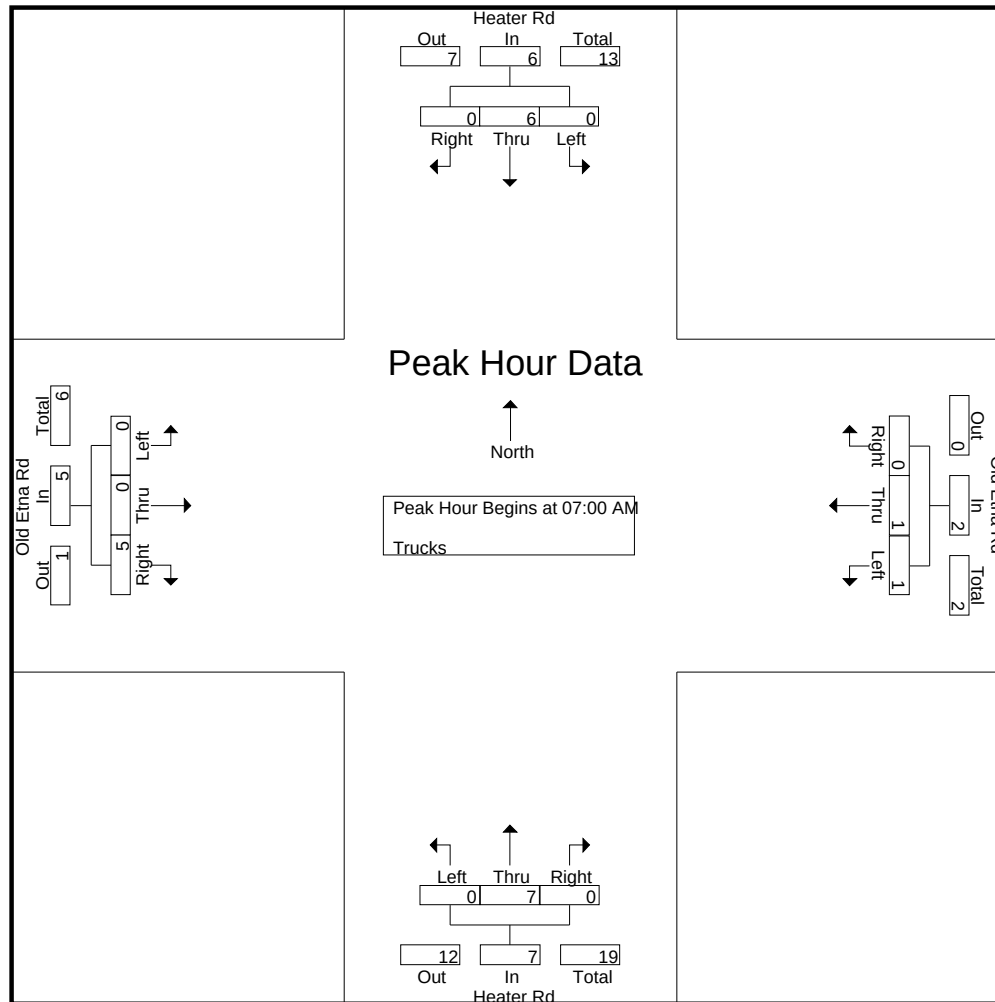
Groups Printed- Trucks

	Heater Rd From North			Old Etna Rd From East			Heater Rd From South			Old Etna Rd From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	1	0	1	0	0	0	1	0	0	0	3	6
07:15 AM	0	1	0	0	0	0	0	2	0	0	0	1	4
07:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
07:45 AM	0	4	0	0	1	0	0	3	0	0	0	1	9
Total	0	6	0	1	1	0	0	7	0	0	0	5	20
08:00 AM	0	0	0	0	0	0	0	1	0	0	0	1	2
08:15 AM	0	3	0	0	0	0	0	1	0	0	0	0	4
08:30 AM	0	2	0	0	0	0	0	1	0	0	0	1	4
08:45 AM	0	1	0	0	0	0	0	1	0	0	0	0	2
Total	0	6	0	0	0	0	0	4	0	0	0	2	12
Grand Total	0	12	0	1	1	0	0	11	0	0	0	7	32
Apprch %	0	100	0	50	50	0	0	100	0	0	0	100	
Total %	0	37.5	0	3.1	3.1	0	0	34.4	0	0	0	21.9	

	Heater Rd From North				Old Etna Rd From East				Heater Rd From South				Old Etna Rd From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	1	0	1	1	0	0	1	0	1	0	1	0	0	3	3	6
07:15 AM	0	1	0	1	0	0	0	0	0	2	0	2	0	0	1	1	4
07:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
07:45 AM	0	4	0	4	0	1	0	1	0	3	0	3	0	0	1	1	9
Total Volume	0	6	0	6	1	1	0	2	0	7	0	7	0	0	5	5	20
% App. Total	0	100	0		50	50	0		0	100	0		0	0	100		
PHF	.000	.375	.000	.375	.250	.250	.000	.500	.000	.583	.000	.583	.000	.000	.417	.417	.556

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
Page No : 8

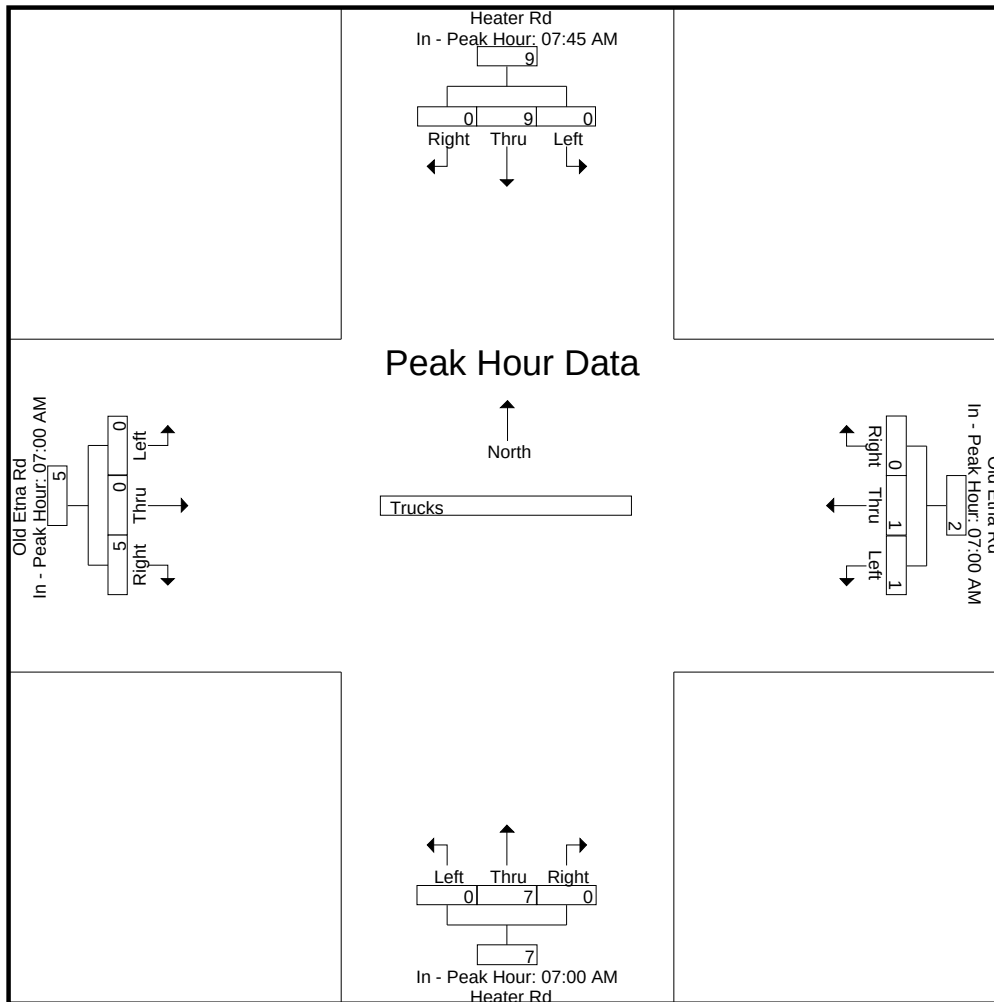


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	4	0	4	1	0	0	1	0	1	0	1	0	0	3	3
+15 mins.	0	0	0	0	0	0	0	0	0	2	0	2	0	0	1	1
+30 mins.	0	3	0	3	0	0	0	0	0	1	0	1	0	0	0	0
+45 mins.	0	2	0	2	0	1	0	1	0	3	0	3	0	0	1	1
Total Volume	0	9	0	9	1	1	0	2	0	7	0	7	0	0	5	5
% App. Total	0	100	0		50	50	0		0	100	0		0	0	100	
PHF	.000	.563	.000	.563	.250	.250	.000	.500	.000	.583	.000	.583	.000	.000	.417	.417

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
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N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
Page No : 10

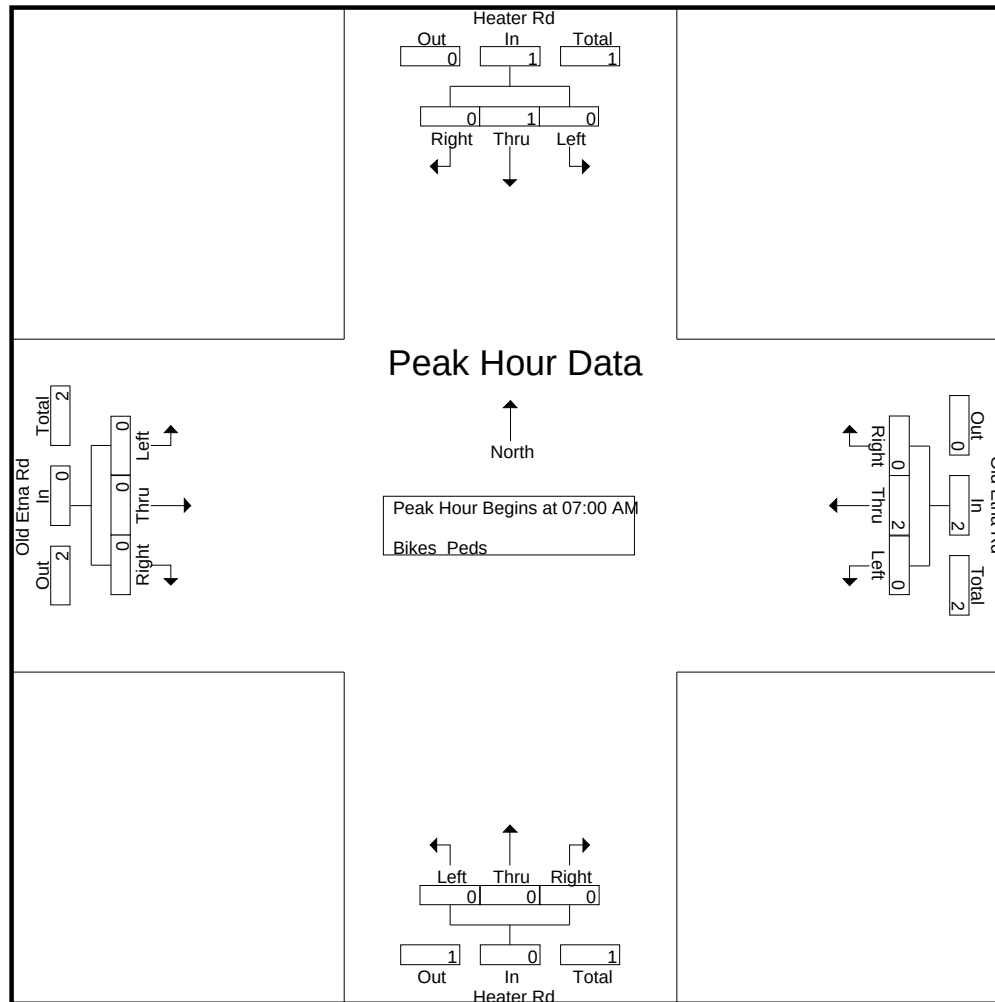
Groups Printed- Bikes Peds

	Heater Rd From North				Old Etna Rd From East				Heater Rd From South				Old Etna Rd From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	0	3
07:15 AM	0	0	0	0	0	1	0	1	0	0	0	3	0	0	0	0	4	1	5
07:30 AM	0	0	0	0	0	1	0	0	0	0	0	4	0	0	0	0	4	1	5
07:45 AM	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	2
Total	0	1	0	0	0	2	0	1	0	0	0	11	0	0	0	0	12	3	15
08:00 AM	0	0	0	0	0	0	0	4	0	0	0	3	0	0	0	0	7	0	7
08:15 AM	0	0	0	0	0	0	0	3	0	0	0	2	0	0	0	0	5	0	5
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
Total	0	0	0	0	0	0	0	7	0	0	0	7	0	0	0	0	14	0	14
Grand Total	0	1	0	0	0	2	0	8	0	0	0	18	0	0	0	0	26	3	29
Apprch %	0	100	0		0	100	0		0	0	0		0	0	0				
Total %	0	33.3	0		0	66.7	0		0	0	0		0	0	0		89.7	10.3	

	Heater Rd From North				Old Etna Rd From East				Heater Rd From South				Old Etna Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
07:45 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
% App. Total	0	100	0		0	100	0		0	0	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.500	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.750

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
Page No : 11

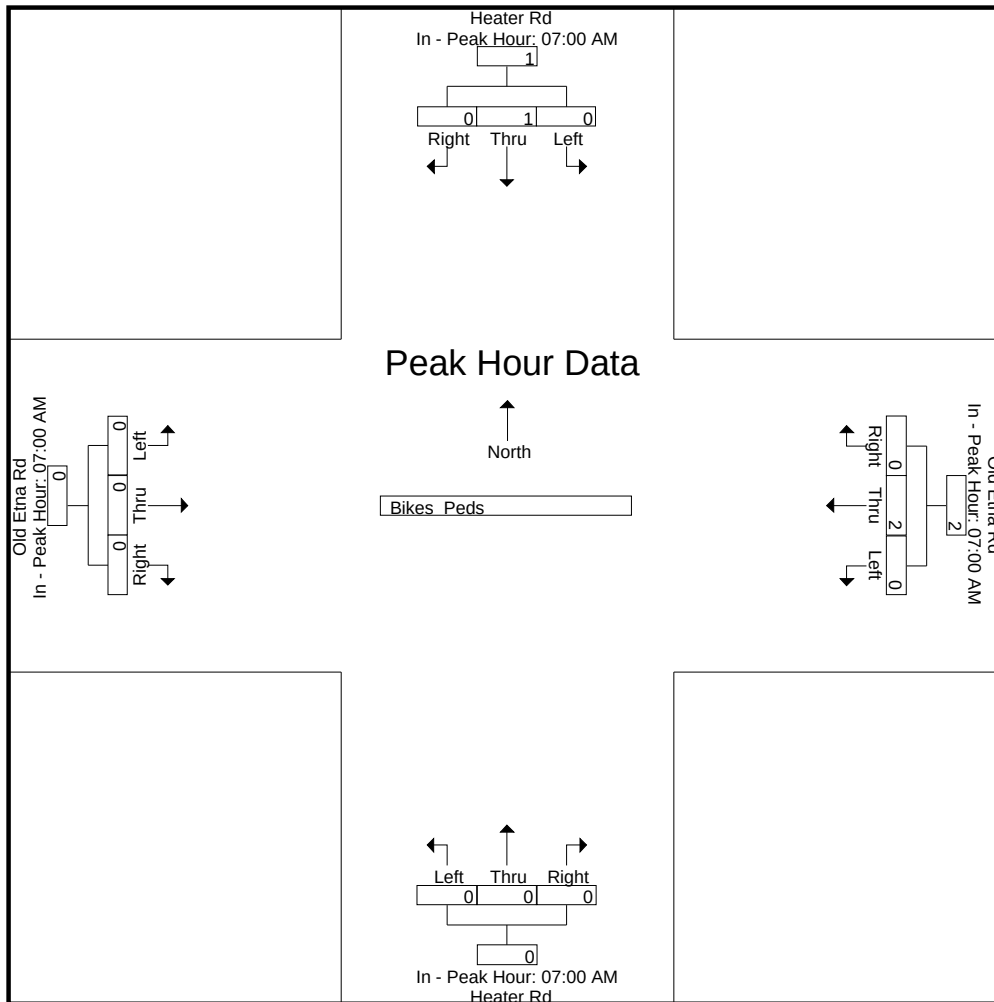


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
+45 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0
% App. Total	0	100	0		0	100	0		0	0	0		0	0	0	
PHF	.000	.250	.000	.250	.000	.500	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
Page No : 12



N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
Page No : 1

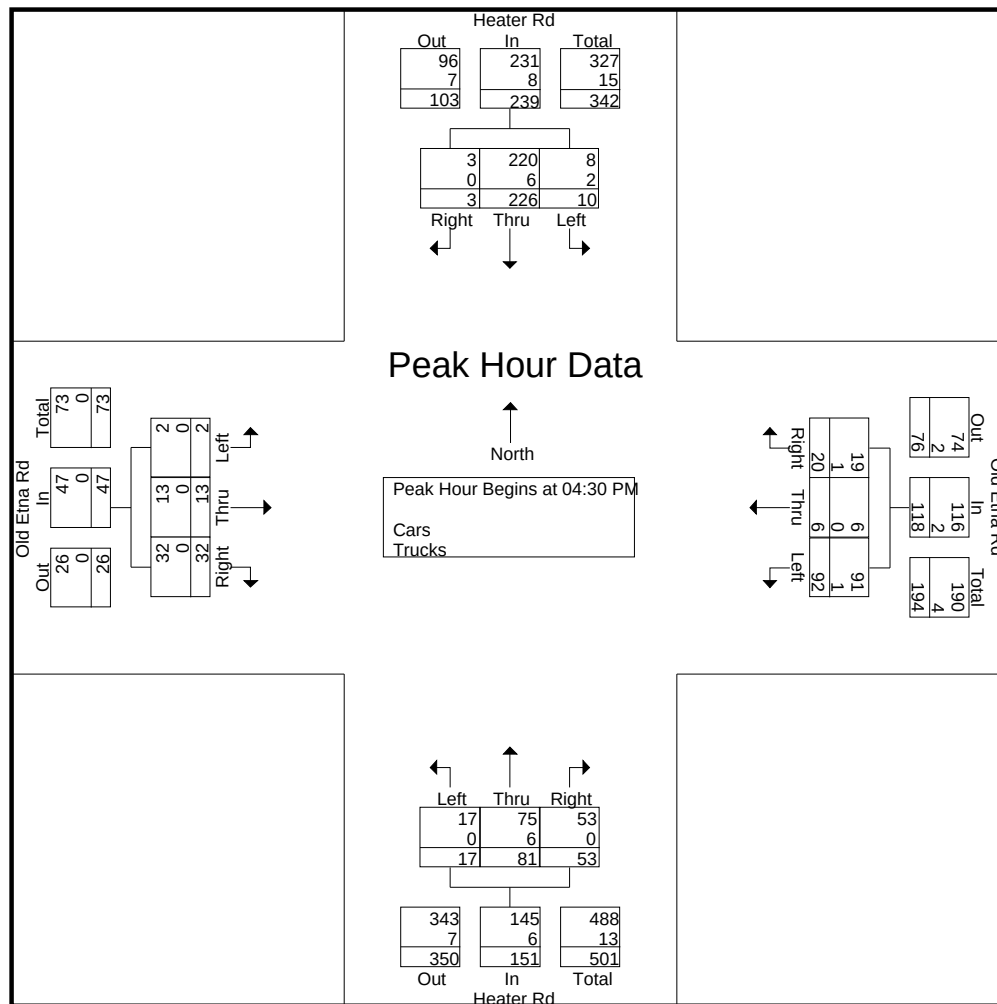
Groups Printed- Cars - Trucks

	Heater Rd From North			Old Etna Rd From East			Heater Rd From South			Old Etna Rd From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
02:00 PM	2	25	1	9	3	1	5	10	9	1	2	20	88
02:15 PM	2	23	0	15	4	7	10	19	6	0	3	14	103
02:30 PM	3	37	1	19	6	4	11	12	13	0	4	23	133
02:45 PM	2	28	0	15	5	5	12	11	14	0	4	19	115
Total	9	113	2	58	18	17	38	52	42	1	13	76	439
03:00 PM	3	39	0	22	9	6	10	12	11	0	13	56	181
03:15 PM	6	31	0	14	3	8	3	10	17	1	3	14	110
03:30 PM	4	58	0	16	3	12	2	11	7	0	5	10	128
03:45 PM	3	43	3	24	4	9	5	13	11	0	1	3	119
Total	16	171	3	76	19	35	20	46	46	1	22	83	538
04:00 PM	2	58	2	8	2	4	1	12	10	0	2	8	109
04:15 PM	3	62	0	29	4	5	2	12	13	0	2	8	140
04:30 PM	1	47	1	25	1	5	3	17	18	0	1	7	126
04:45 PM	4	37	1	25	3	3	4	22	4	0	2	5	110
Total	10	204	4	87	10	17	10	63	45	0	7	28	485
05:00 PM	3	75	1	18	0	9	4	16	14	2	9	15	166
05:15 PM	2	67	0	24	2	3	6	26	17	0	1	5	153
05:30 PM	4	50	2	12	0	2	1	14	8	0	4	2	99
05:45 PM	0	25	0	11	1	3	2	18	12	0	3	2	77
Total	9	217	3	65	3	17	13	74	51	2	17	24	495
Grand Total	44	705	12	286	50	86	81	235	184	4	59	211	1957
Apprch %	5.8	92.6	1.6	67.8	11.8	20.4	16.2	47	36.8	1.5	21.5	77	
Total %	2.2	36	0.6	14.6	2.6	4.4	4.1	12	9.4	0.2	3	10.8	
Cars	42	682	12	281	49	85	79	217	184	4	57	198	1890
% Cars	95.5	96.7	100	98.3	98	98.8	97.5	92.3	100	100	96.6	93.8	96.6
Trucks	2	23	0	5	1	1	2	18	0	0	2	13	67
% Trucks	4.5	3.3	0	1.7	2	1.2	2.5	7.7	0	0	3.4	6.2	3.4

	Heater Rd From North				Old Etna Rd From East				Heater Rd From South				Old Etna Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	1	47	1	49	25	1	5	31	3	17	18	38	0	1	7	8	126
04:45 PM	4	37	1	42	25	3	3	31	4	22	4	30	0	2	5	7	110
05:00 PM	3	75	1	79	18	0	9	27	4	16	14	34	2	9	15	26	166
05:15 PM	2	67	0	69	24	2	3	29	6	26	17	49	0	1	5	6	153
Total Volume	10	226	3	239	92	6	20	118	17	81	53	151	2	13	32	47	555
% App. Total	4.2	94.6	1.3		78	5.1	16.9		11.3	53.6	35.1		4.3	27.7	68.1		
PHF	.625	.753	.750	.756	.920	.500	.556	.952	.708	.779	.736	.770	.250	.361	.533	.452	.836
Cars	8	220	3	231	91	6	19	116	17	75	53	145	2	13	32	47	539
% Cars	80.0	97.3	100	96.7	98.9	100	95.0	98.3	100	92.6	100	96.0	100	100	100	100	97.1
Trucks	2	6	0	8	1	0	1	2	0	6	0	6	0	0	0	0	16
% Trucks	20.0	2.7	0	3.3	1.1	0	5.0	1.7	0	7.4	0	4.0	0	0	0	0	2.9

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
Page No : 2

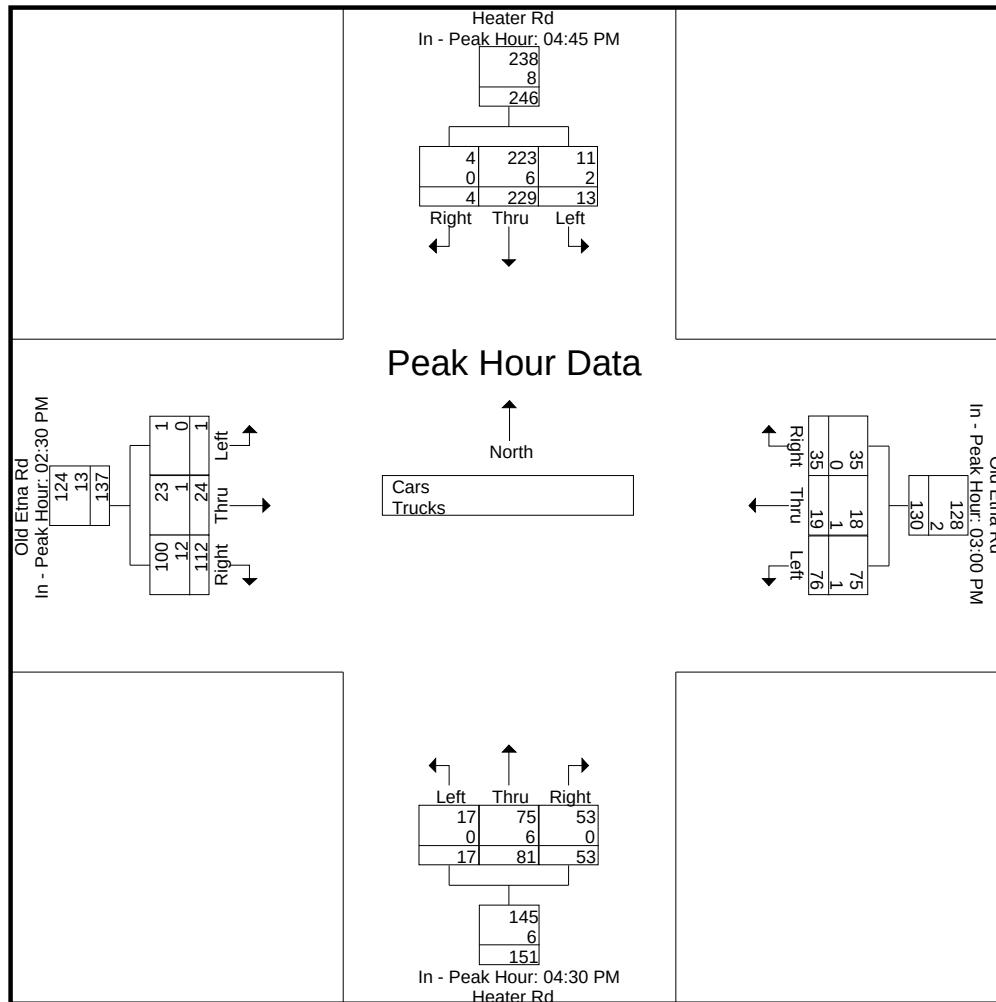


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				03:00 PM				04:30 PM				02:30 PM			
+0 mins.	4	37	1	42	22	9	6	37	3	17	18	38	0	4	23	27
+15 mins.	3	75	1	79	14	3	8	25	4	22	4	30	0	4	19	23
+30 mins.	2	67	0	69	16	3	12	31	4	16	14	34	0	13	56	69
+45 mins.	4	50	2	56	24	4	9	37	6	26	17	49	1	3	14	18
Total Volume	13	229	4	246	76	19	35	130	17	81	53	151	1	24	112	137
% App. Total	5.3	93.1	1.6		58.5	14.6	26.9		11.3	53.6	35.1		0.7	17.5	81.8	
PHF	.813	.763	.500	.778	.792	.528	.729	.878	.708	.779	.736	.770	.250	.462	.500	.496
Cars	11	223	4	238	75	18	35	128	17	75	53	145	1	23	100	124
% Cars	84.6	97.4	100	96.7	98.7	94.7	100	98.5	100	92.6	100	96	100	95.8	89.3	90.5
Trucks	2	6	0	8	1	1	0	2	0	6	0	6	0	1	12	13
% Trucks	15.4	2.6	0	3.3	1.3	5.3	0	1.5	0	7.4	0	4	0	4.2	10.7	9.5

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
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N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
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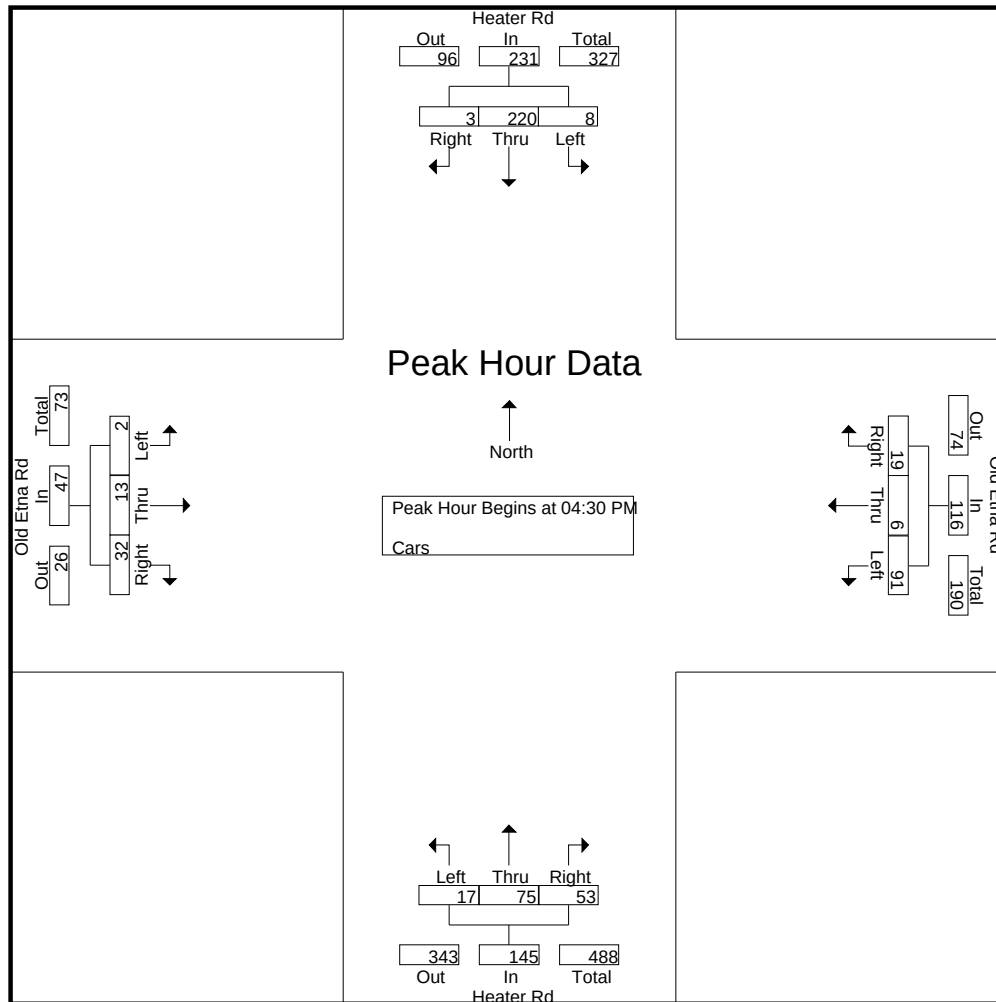
Groups Printed- Cars

	Heater Rd From North			Old Etna Rd From East			Heater Rd From South			Old Etna Rd From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
02:00 PM	2	24	1	9	3	1	5	9	9	1	2	19	85
02:15 PM	2	22	0	15	4	7	10	17	6	0	3	14	100
02:30 PM	3	34	1	19	6	4	11	11	13	0	4	17	123
02:45 PM	2	27	0	14	5	5	11	10	14	0	3	16	107
Total	9	107	2	57	18	17	37	47	42	1	12	66	415
03:00 PM	3	37	0	22	9	6	9	11	11	0	13	53	174
03:15 PM	6	30	0	13	3	8	3	9	17	1	3	14	107
03:30 PM	4	57	0	16	3	12	2	10	7	0	5	10	126
03:45 PM	3	42	3	24	3	9	5	12	11	0	1	3	116
Total	16	166	3	75	18	35	19	42	46	1	22	80	523
04:00 PM	2	56	2	8	2	4	1	11	10	0	2	8	106
04:15 PM	3	60	0	28	4	5	2	11	13	0	2	8	136
04:30 PM	1	46	1	25	1	5	3	16	18	0	1	7	124
04:45 PM	3	36	1	24	3	3	4	19	4	0	2	5	104
Total	9	198	4	85	10	17	10	57	45	0	7	28	470
05:00 PM	3	75	1	18	0	8	4	15	14	2	9	15	164
05:15 PM	1	63	0	24	2	3	6	25	17	0	1	5	147
05:30 PM	4	49	2	11	0	2	1	14	8	0	3	2	96
05:45 PM	0	24	0	11	1	3	2	17	12	0	3	2	75
Total	8	211	3	64	3	16	13	71	51	2	16	24	482
Grand Total	42	682	12	281	49	85	79	217	184	4	57	198	1890
Apprch %	5.7	92.7	1.6	67.7	11.8	20.5	16.5	45.2	38.3	1.5	22	76.4	
Total %	2.2	36.1	0.6	14.9	2.6	4.5	4.2	11.5	9.7	0.2	3	10.5	

	Heater Rd From North				Old Etna Rd From East				Heater Rd From South				Old Etna Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	1	46	1	48	25	1	5	31	3	16	18	37	0	1	7	8	124
04:45 PM	3	36	1	40	24	3	3	30	4	19	4	27	0	2	5	7	104
05:00 PM	3	75	1	79	18	0	8	26	4	15	14	33	2	9	15	26	164
05:15 PM	1	63	0	64	24	2	3	29	6	25	17	48	0	1	5	6	147
Total Volume	8	220	3	231	91	6	19	116	17	75	53	145	2	13	32	47	539
% App. Total	3.5	95.2	1.3		78.4	5.2	16.4		11.7	51.7	36.6		4.3	27.7	68.1		
PHF	.667	.733	.750	.731	.910	.500	.594	.935	.708	.750	.736	.755	.250	.361	.533	.452	.822

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
Page No : 5

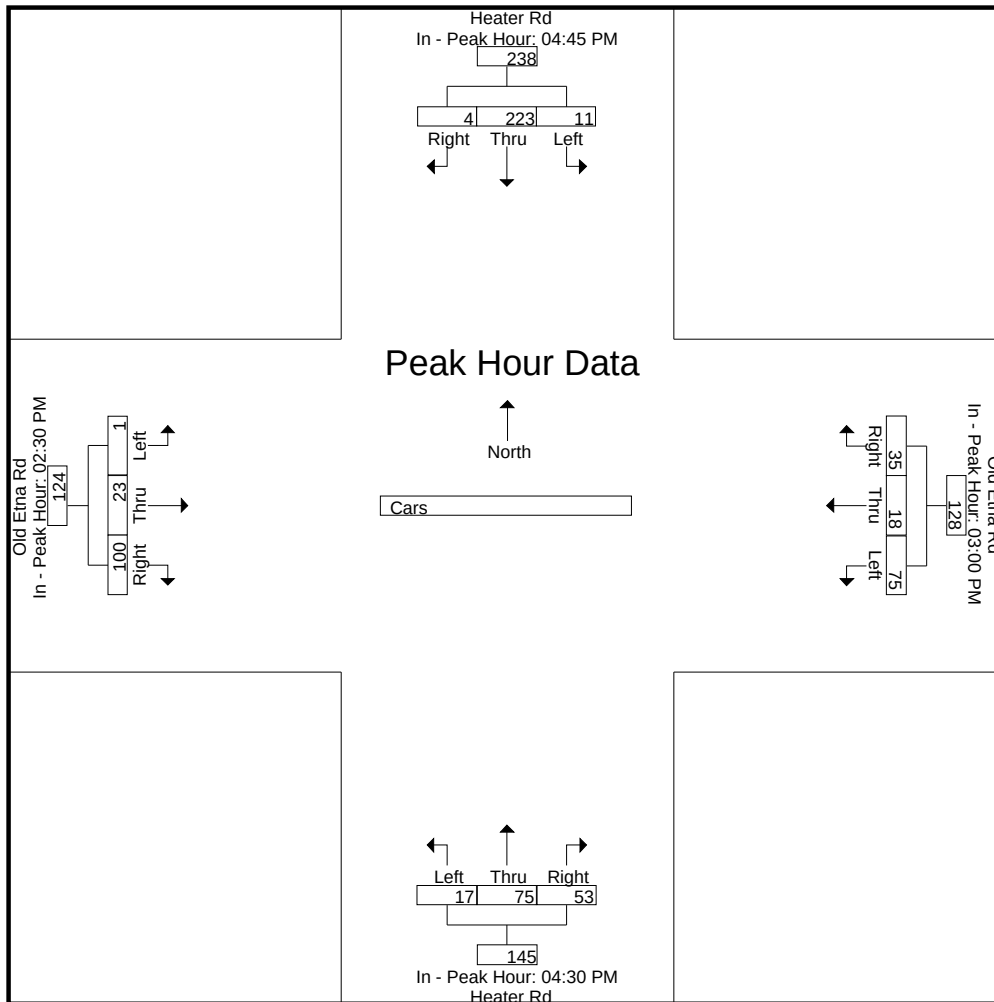


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				03:00 PM				04:30 PM				02:30 PM			
+0 mins.	3	36	1	40	22	9	6	37	3	16	18	37	0	4	17	21
+15 mins.	3	75	1	79	13	3	8	24	4	19	4	27	0	3	16	19
+30 mins.	1	63	0	64	16	3	12	31	4	15	14	33	0	13	53	66
+45 mins.	4	49	2	55	24	3	9	36	6	25	17	48	1	3	14	18
Total Volume	11	223	4	238	75	18	35	128	17	75	53	145	1	23	100	124
% App. Total	4.6	93.7	1.7		58.6	14.1	27.3		11.7	51.7	36.6		0.8	18.5	80.6	
PHF	.688	.743	.500	.753	.781	.500	.729	.865	.708	.750	.736	.755	.250	.442	.472	.470

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
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N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
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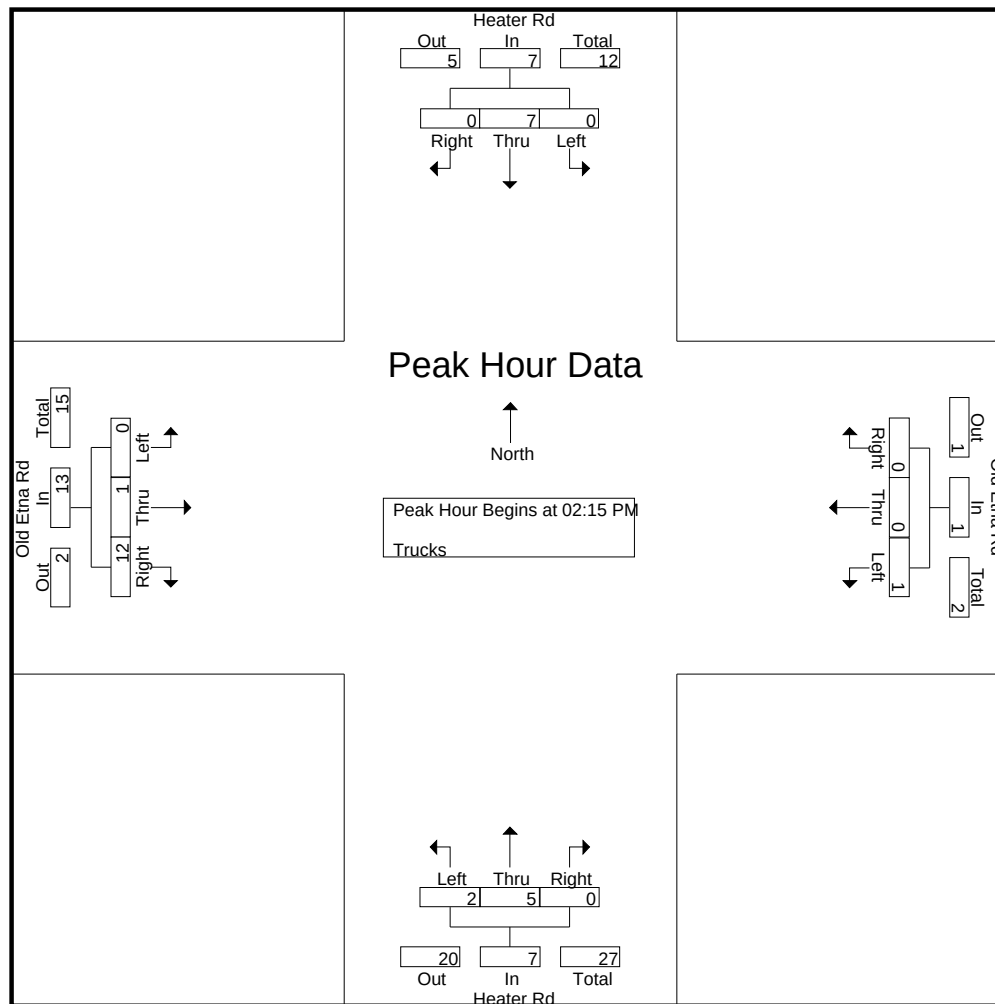
Groups Printed- Trucks

	Heater Rd From North			Old Etna Rd From East			Heater Rd From South			Old Etna Rd From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	0	1	0	0	0	0	0	1	0	0	0	1	3
02:15 PM	0	1	0	0	0	0	0	2	0	0	0	0	3
02:30 PM	0	3	0	0	0	0	0	1	0	0	0	6	10
02:45 PM	0	1	0	1	0	0	1	1	0	0	1	3	8
Total	0	6	0	1	0	0	1	5	0	0	1	10	24
03:00 PM	0	2	0	0	0	0	1	1	0	0	0	3	7
03:15 PM	0	1	0	1	0	0	0	1	0	0	0	0	3
03:30 PM	0	1	0	0	0	0	0	1	0	0	0	0	2
03:45 PM	0	1	0	0	1	0	0	1	0	0	0	0	3
Total	0	5	0	1	1	0	1	4	0	0	0	3	15
04:00 PM	0	2	0	0	0	0	0	1	0	0	0	0	3
04:15 PM	0	2	0	1	0	0	0	1	0	0	0	0	4
04:30 PM	0	1	0	0	0	0	0	1	0	0	0	0	2
04:45 PM	1	1	0	1	0	0	0	3	0	0	0	0	6
Total	1	6	0	2	0	0	0	6	0	0	0	0	15
05:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	2
05:15 PM	1	4	0	0	0	0	0	1	0	0	0	0	6
05:30 PM	0	1	0	1	0	0	0	0	0	0	1	0	3
05:45 PM	0	1	0	0	0	0	0	1	0	0	0	0	2
Total	1	6	0	1	0	1	0	3	0	0	1	0	13
Grand Total	2	23	0	5	1	1	2	18	0	0	2	13	67
Apprch %	8	92	0	71.4	14.3	14.3	10	90	0	0	13.3	86.7	
Total %	3	34.3	0	7.5	1.5	1.5	3	26.9	0	0	3	19.4	

	Heater Rd From North				Old Etna Rd From East				Heater Rd From South				Old Etna Rd From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:15 PM																	
02:15 PM	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
02:30 PM	0	3	0	3	0	0	0	0	0	1	0	1	0	0	6	6	10
02:45 PM	0	1	0	1	1	0	0	1	1	1	0	2	0	1	3	4	8
03:00 PM	0	2	0	2	0	0	0	0	1	1	0	2	0	0	3	3	7
Total Volume	0	7	0	7	1	0	0	1	2	5	0	7	0	1	12	13	28
% App. Total	0	100	0		100	0	0		28.6	71.4	0		0	7.7	92.3		
PHF	.000	.583	.000	.583	.250	.000	.000	.250	.500	.625	.000	.875	.000	.250	.500	.542	.700

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
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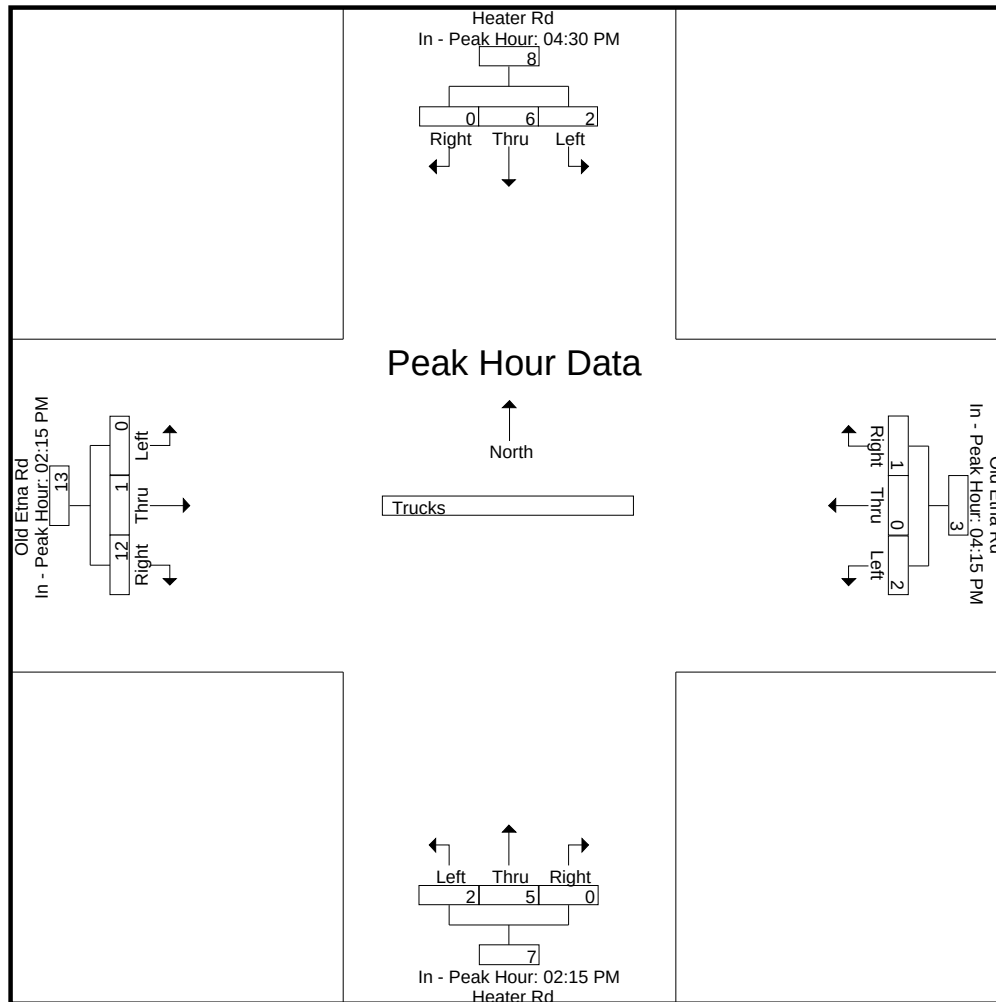


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:15 PM				02:15 PM				02:15 PM			
+0 mins.	0	1	0	1	1	0	0	1	0	2	0	2	0	0	0	0
+15 mins.	1	1	0	2	0	0	0	0	0	1	0	1	0	0	6	6
+30 mins.	0	0	0	0	1	0	0	1	1	1	0	2	0	1	3	4
+45 mins.	1	4	0	5	0	0	1	1	1	1	0	2	0	0	3	3
Total Volume	2	6	0	8	2	0	1	3	2	5	0	7	0	1	12	13
% App. Total	25	75	0		66.7	0	33.3		28.6	71.4	0		0	7.7	92.3	
PHF	.500	.375	.000	.400	.500	.000	.250	.750	.500	.625	.000	.875	.000	.250	.500	.542

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
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N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
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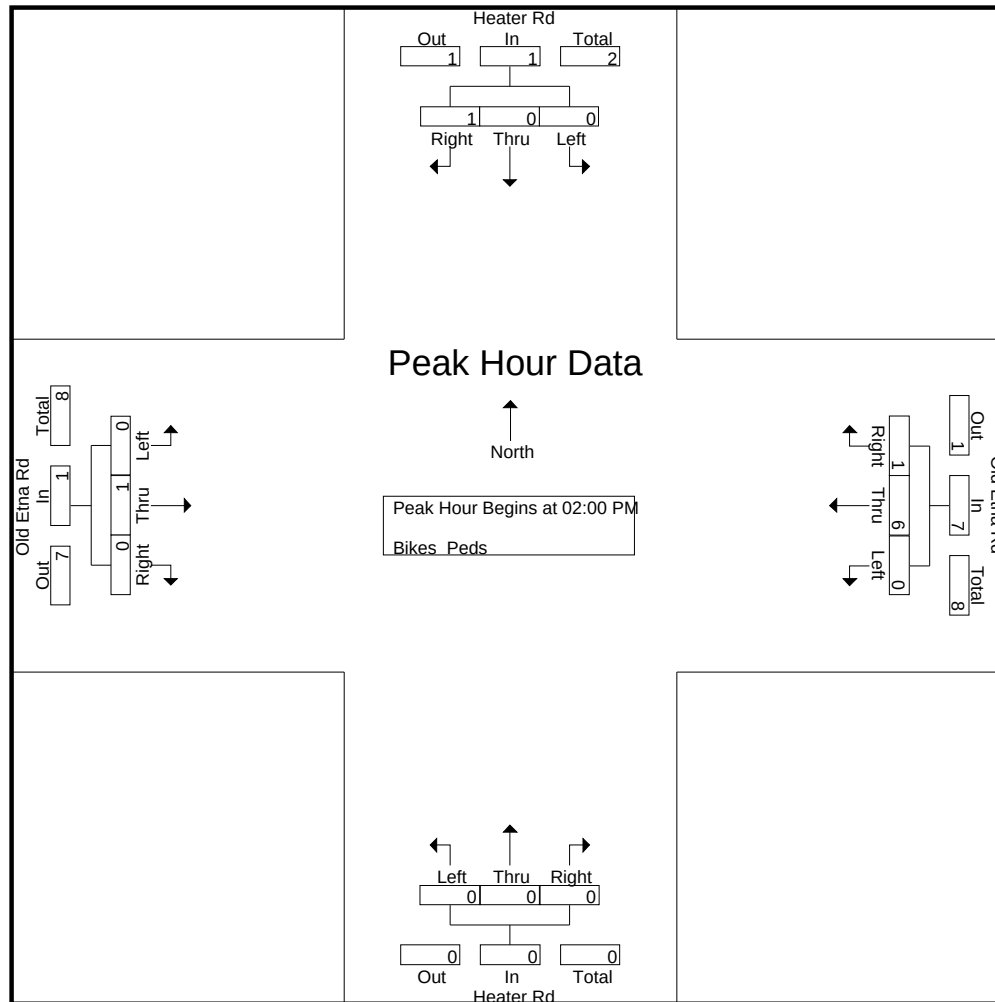
Groups Printed- Bikes Peds

	Heater Rd From North				Old Etna Rd From East				Heater Rd From South				Old Etna Rd From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
02:00 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	2	1	3
02:15 PM	0	0	0	0	0	3	1	0	0	0	0	1	0	0	0	0	1	4	5
02:30 PM	0	0	1	0	0	2	0	1	0	0	0	8	0	0	0	0	9	3	12
02:45 PM	0	0	0	0	0	1	0	2	0	0	0	7	0	0	0	0	9	1	10
Total	0	0	1	0	0	6	1	4	0	0	0	17	0	1	0	0	21	9	30
03:00 PM	0	0	0	0	0	1	0	2	0	0	0	4	0	0	0	0	6	1	7
03:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	2	1	3
03:30 PM	0	0	0	0	0	1	0	2	0	0	0	6	0	0	0	0	8	1	9
03:45 PM	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	3	0	3
Total	0	0	0	0	0	2	0	6	0	0	0	13	0	0	1	0	19	3	22
04:00 PM	0	0	0	0	0	1	0	3	0	0	0	2	0	0	0	0	5	1	6
04:15 PM	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	6	0	6
04:30 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	8	0	0	0	5	0	0	0	0	13	1	14
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	2
Grand Total	0	0	1	0	0	9	1	20	0	0	0	35	0	1	1	0	55	13	68
Apprch %	0	0	100		0	90	10		0	0	0		0	50	50				
Total %	0	0	7.7		0	69.2	7.7		0	0	0		0	7.7	7.7		80.9	19.1	

	Heater Rd From North				Old Etna Rd From East				Heater Rd From South				Old Etna Rd From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
02:15 PM	0	0	0	0	0	3	1	4	0	0	0	0	0	0	0	0	4
02:30 PM	0	0	1	1	0	2	0	2	0	0	0	0	0	0	0	0	3
02:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total Volume	0	0	1	1	0	6	1	7	0	0	0	0	0	1	0	1	9
% App. Total	0	0	100		0	85.7	14.3		0	0	0		0	100	0		
PHF	.000	.000	.250	.250	.000	.500	.250	.438	.000	.000	.000	.000	.000	.250	.000	.250	.563

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
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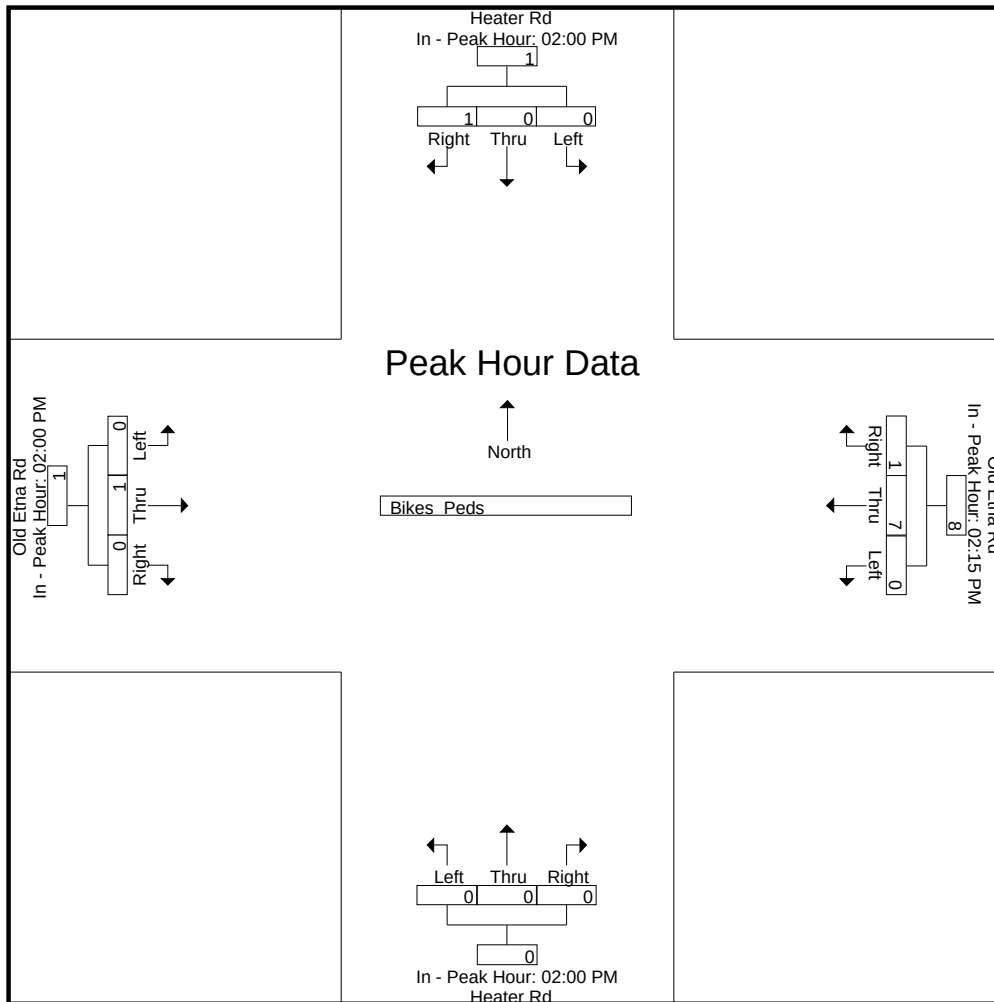


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	02:00 PM				02:15 PM				02:00 PM				02:00 PM			
+0 mins.	0	0	0	0	0	3	1	4	0	0	0	0	0	1	0	1
+15 mins.	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0
+30 mins.	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
Total Volume	0	0	1	1	0	7	1	8	0	0	0	0	0	1	0	1
% App. Total	0	0	100		0	87.5	12.5		0	0	0		0	100	0	
PHF	.000	.000	.250	.250	.000	.583	.250	.500	.000	.000	.000	.000	.000	.250	.000	.250

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933004
Site Code : 52933004
Start Date : 11/10/2022
Page No : 12



N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S4
Site Code : 52933004
Start Date : 11/12/2022
Page No : 1

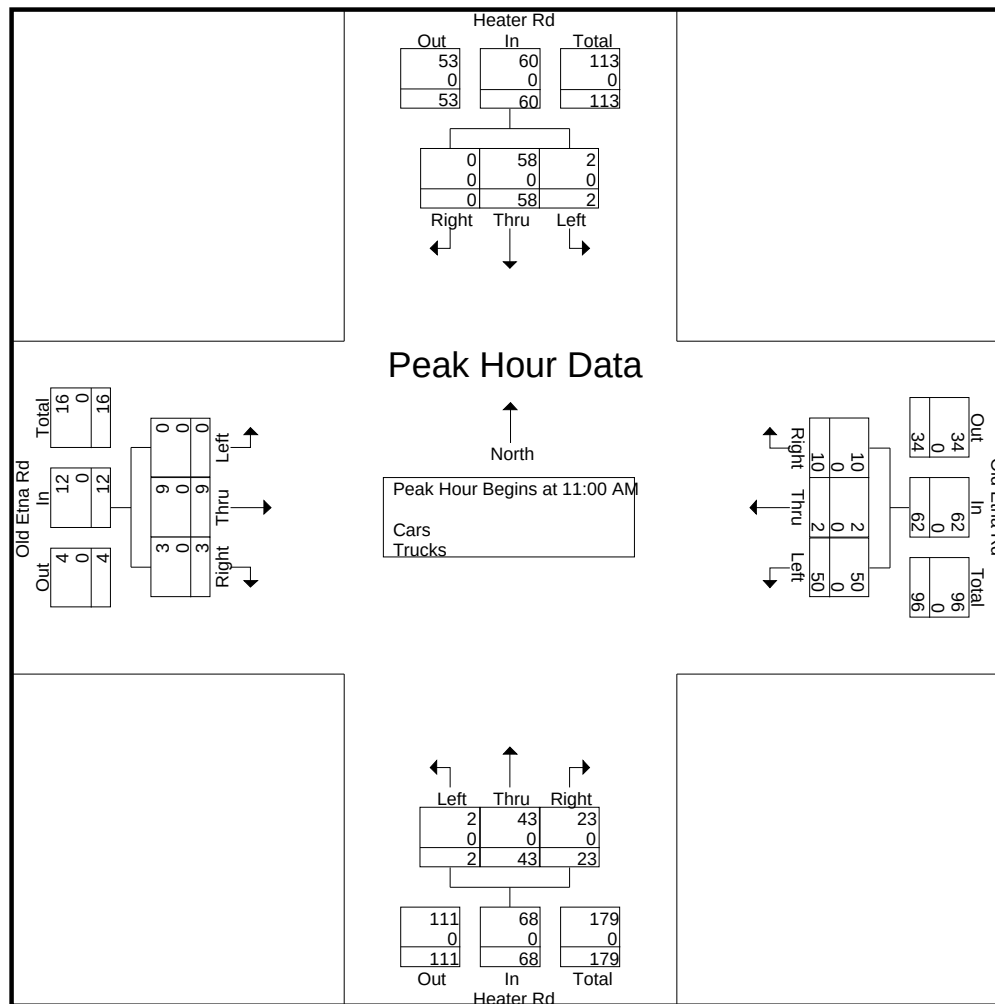
Groups Printed- Cars - Trucks

	Heater Rd From North			Old Etna Rd From East			Heater Rd From South			Old Etna Rd From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
11:00 AM	2	10	0	13	0	3	0	14	2	0	3	2	49
11:15 AM	0	16	0	14	0	5	1	14	8	0	3	0	61
11:30 AM	0	15	0	13	0	1	1	11	8	0	2	0	51
11:45 AM	0	17	0	10	2	1	0	4	5	0	1	1	41
Total	2	58	0	50	2	10	2	43	23	0	9	3	202
12:00 PM	0	18	0	6	0	2	0	11	3	0	1	1	42
12:15 PM	0	12	0	22	1	0	0	9	11	0	1	0	56
12:30 PM	2	14	1	12	0	1	0	10	6	0	2	0	48
12:45 PM	0	12	0	9	0	1	0	12	7	0	0	1	42
Total	2	56	1	49	1	4	0	42	27	0	4	2	188
Grand Total	4	114	1	99	3	14	2	85	50	0	13	5	390
Apprch %	3.4	95.8	0.8	85.3	2.6	12.1	1.5	62	36.5	0	72.2	27.8	
Total %	1	29.2	0.3	25.4	0.8	3.6	0.5	21.8	12.8	0	3.3	1.3	
Cars	4	114	1	99	3	14	2	85	50	0	13	5	390
% Cars	100	100	100	100	100	100	100	100	100	0	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0

	Heater Rd From North				Old Etna Rd From East				Heater Rd From South				Old Etna Rd From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:00 AM																	
11:00 AM	2	10	0	12	13	0	3	16	0	14	2	16	0	3	2	5	49
11:15 AM	0	16	0	16	14	0	5	19	1	14	8	23	0	3	0	3	61
11:30 AM	0	15	0	15	13	0	1	14	1	11	8	20	0	2	0	2	51
11:45 AM	0	17	0	17	10	2	1	13	0	4	5	9	0	1	1	2	41
Total Volume	2	58	0	60	50	2	10	62	2	43	23	68	0	9	3	12	202
% App. Total	3.3	96.7	0		80.6	3.2	16.1		2.9	63.2	33.8		0	75	25		
PHF	.250	.853	.000	.882	.893	.250	.500	.816	.500	.768	.719	.739	.000	.750	.375	.600	.828
Cars	2	58	0	60	50	2	10	62	2	43	23	68	0	9	3	12	202
% Cars	100	100	0	100	100	100	100	100	100	100	100	100	0	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S4
Site Code : 52933004
Start Date : 11/12/2022
Page No : 2

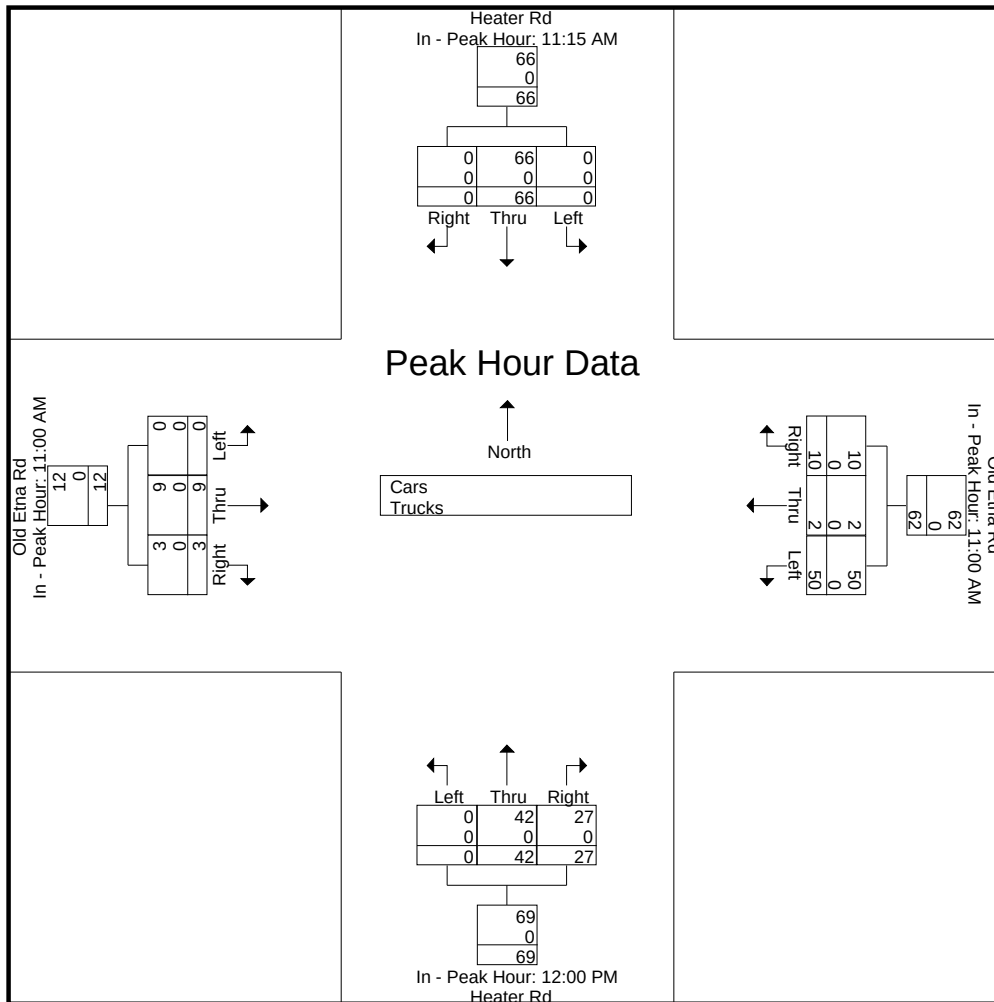


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:15 AM				11:00 AM				12:00 PM				11:00 AM			
+0 mins.	0	16	0	16	13	0	3	16	0	11	3	14	0	3	2	5
+15 mins.	0	15	0	15	14	0	5	19	0	9	11	20	0	3	0	3
+30 mins.	0	17	0	17	13	0	1	14	0	10	6	16	0	2	0	2
+45 mins.	0	18	0	18	10	2	1	13	0	12	7	19	0	1	1	2
Total Volume	0	66	0	66	50	2	10	62	0	42	27	69	0	9	3	12
% App. Total	0	100	0		80.6	3.2	16.1		0	60.9	39.1		0	75	25	
PHF	.000	.917	.000	.917	.893	.250	.500	.816	.000	.875	.614	.863	.000	.750	.375	.600
Cars	0	66	0	66	50	2	10	62	0	42	27	69	0	9	3	12
% Cars	0	100	0	100	100	100	100	100	0	100	100	100	0	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S4
Site Code : 52933004
Start Date : 11/12/2022
Page No : 3



N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S4
Site Code : 52933004
Start Date : 11/12/2022
Page No : 4

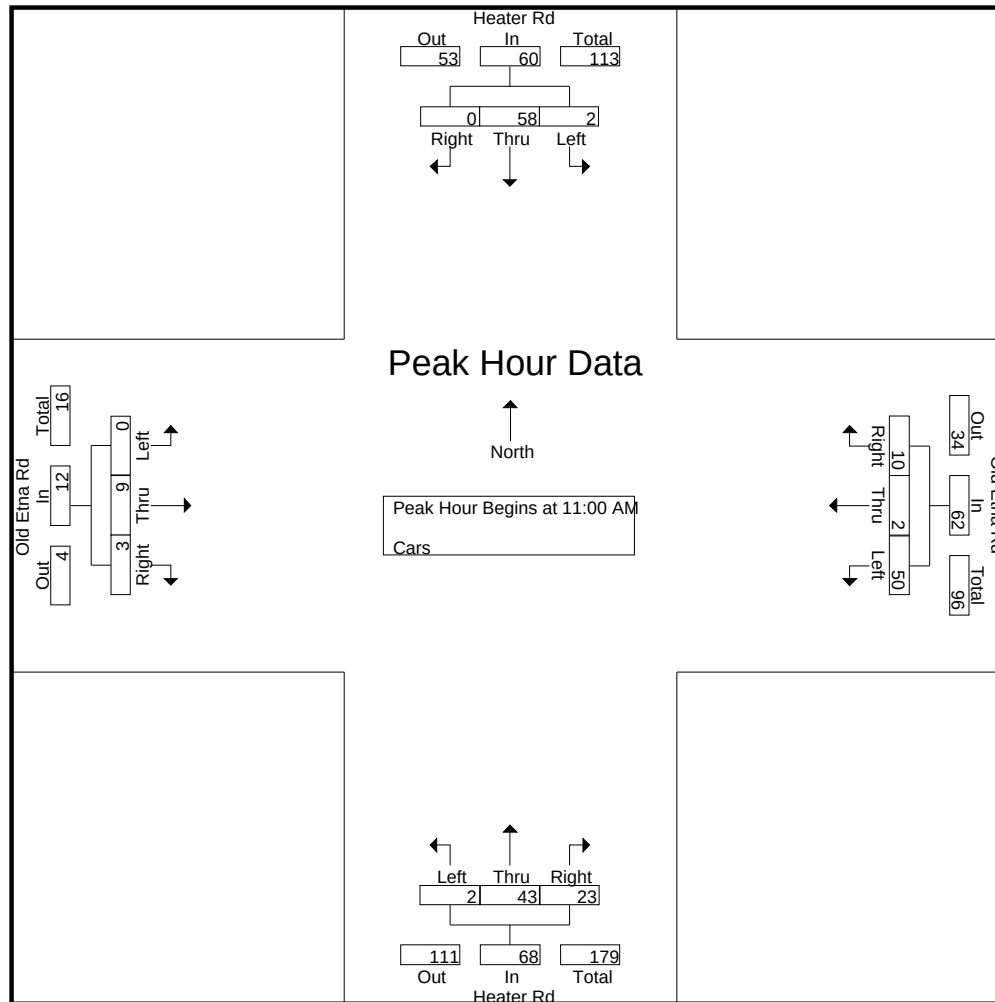
Groups Printed- Cars

	Heater Rd From North			Old Etna Rd From East			Heater Rd From South			Old Etna Rd From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
11:00 AM	2	10	0	13	0	3	0	14	2	0	3	2	49
11:15 AM	0	16	0	14	0	5	1	14	8	0	3	0	61
11:30 AM	0	15	0	13	0	1	1	11	8	0	2	0	51
11:45 AM	0	17	0	10	2	1	0	4	5	0	1	1	41
Total	2	58	0	50	2	10	2	43	23	0	9	3	202
12:00 PM	0	18	0	6	0	2	0	11	3	0	1	1	42
12:15 PM	0	12	0	22	1	0	0	9	11	0	1	0	56
12:30 PM	2	14	1	12	0	1	0	10	6	0	2	0	48
12:45 PM	0	12	0	9	0	1	0	12	7	0	0	1	42
Total	2	56	1	49	1	4	0	42	27	0	4	2	188
Grand Total	4	114	1	99	3	14	2	85	50	0	13	5	390
Apprch %	3.4	95.8	0.8	85.3	2.6	12.1	1.5	62	36.5	0	72.2	27.8	
Total %	1	29.2	0.3	25.4	0.8	3.6	0.5	21.8	12.8	0	3.3	1.3	

	Heater Rd From North				Old Etna Rd From East				Heater Rd From South				Old Etna Rd From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:00 AM																	
11:00 AM	2	10	0	12	13	0	3	16	0	14	2	16	0	3	2	5	49
11:15 AM	0	16	0	16	14	0	5	19	1	14	8	23	0	3	0	3	61
11:30 AM	0	15	0	15	13	0	1	14	1	11	8	20	0	2	0	2	51
11:45 AM	0	17	0	17	10	2	1	13	0	4	5	9	0	1	1	2	41
Total Volume	2	58	0	60	50	2	10	62	2	43	23	68	0	9	3	12	202
% App. Total	3.3	96.7	0		80.6	3.2	16.1		2.9	63.2	33.8		0	75	25		
PHF	.250	.853	.000	.882	.893	.250	.500	.816	.500	.768	.719	.739	.000	.750	.375	.600	.828

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S4
Site Code : 52933004
Start Date : 11/12/2022
Page No : 5

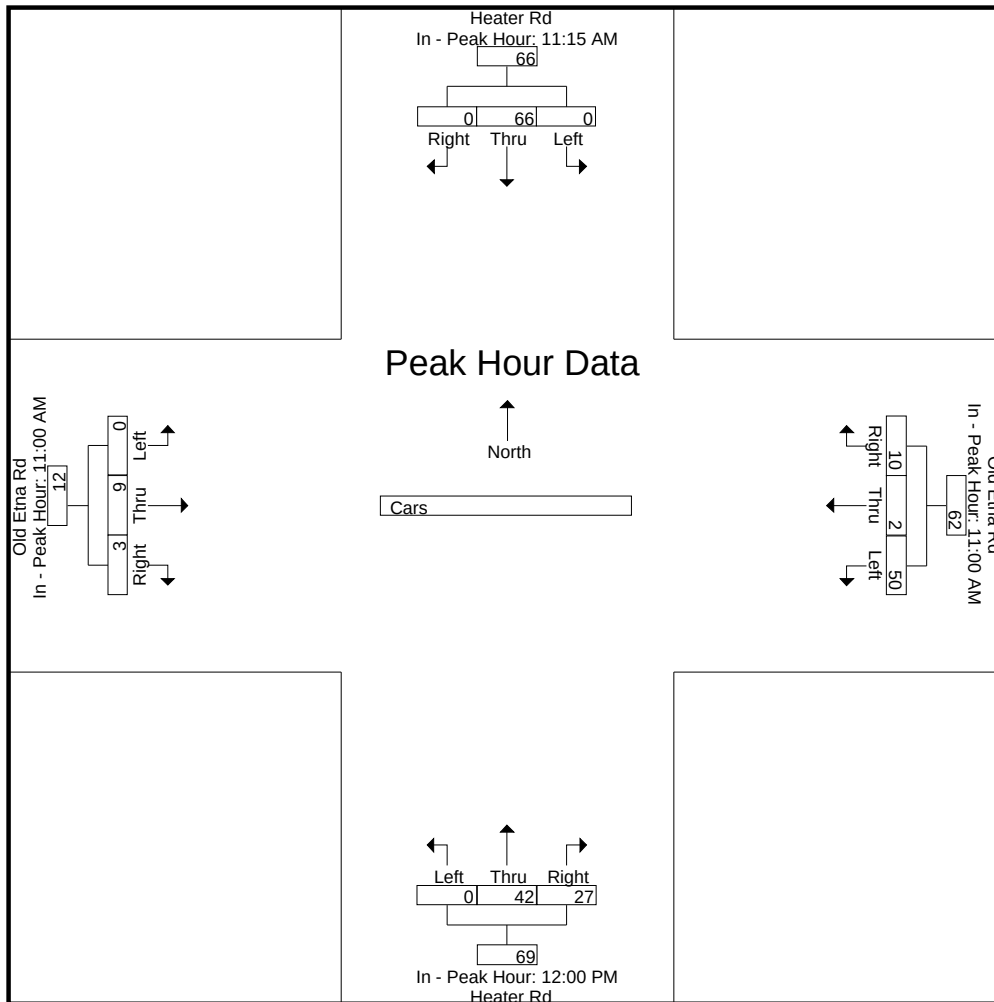


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:15 AM				11:00 AM				12:00 PM				11:00 AM			
+0 mins.	0	16	0	16	13	0	3	16	0	11	3	14	0	3	2	5
+15 mins.	0	15	0	15	14	0	5	19	0	9	11	20	0	3	0	3
+30 mins.	0	17	0	17	13	0	1	14	0	10	6	16	0	2	0	2
+45 mins.	0	18	0	18	10	2	1	13	0	12	7	19	0	1	1	2
Total Volume	0	66	0	66	50	2	10	62	0	42	27	69	0	9	3	12
% App. Total	0	100	0		80.6	3.2	16.1		0	60.9	39.1		0	75	25	
PHF	.000	.917	.000	.917	.893	.250	.500	.816	.000	.875	.614	.863	.000	.750	.375	.600

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S4
Site Code : 52933004
Start Date : 11/12/2022
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N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S4
Site Code : 52933004
Start Date : 11/12/2022
Page No : 7

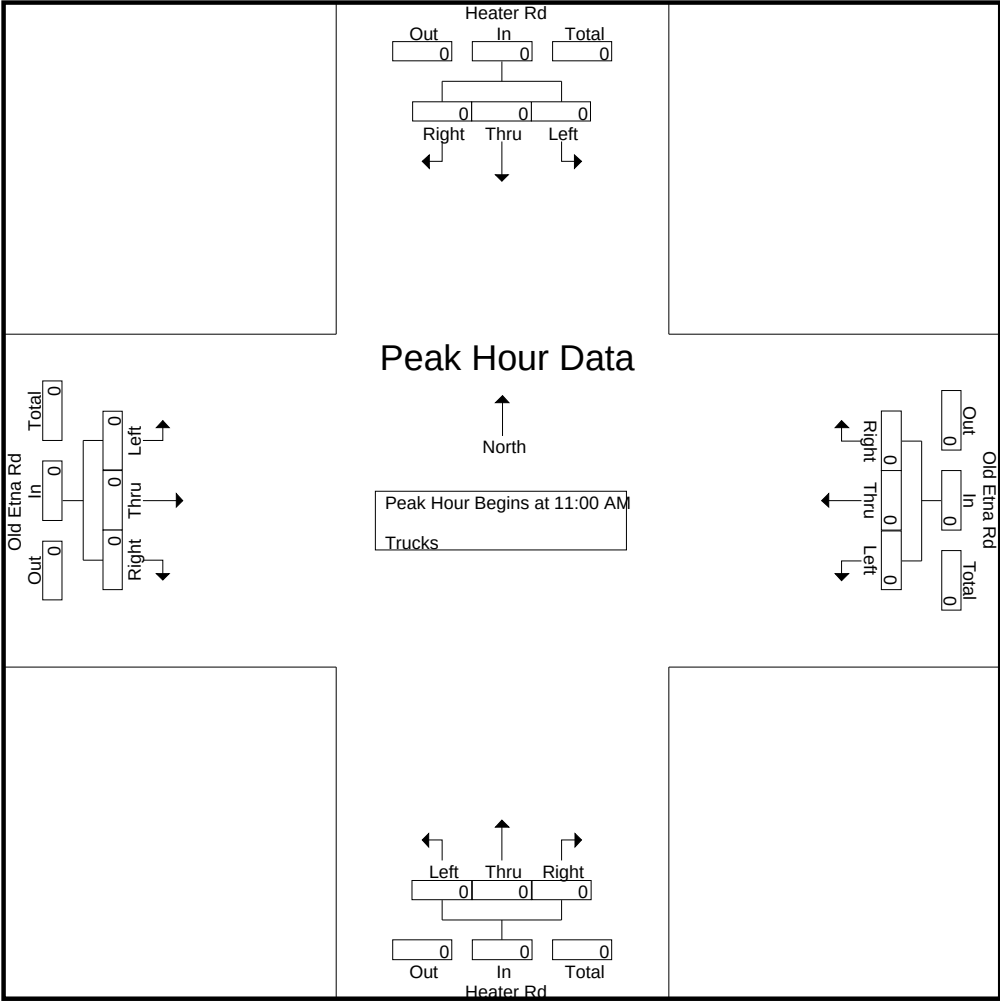
Groups Printed- Trucks

	Heater Rd From North			Old Etna Rd From East			Heater Rd From South			Old Etna Rd From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	
Total %													

	Heater Rd From North				Old Etna Rd From East				Heater Rd From South				Old Etna Rd From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:00 AM																	
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S4
Site Code : 52933004
Start Date : 11/12/2022
Page No : 8

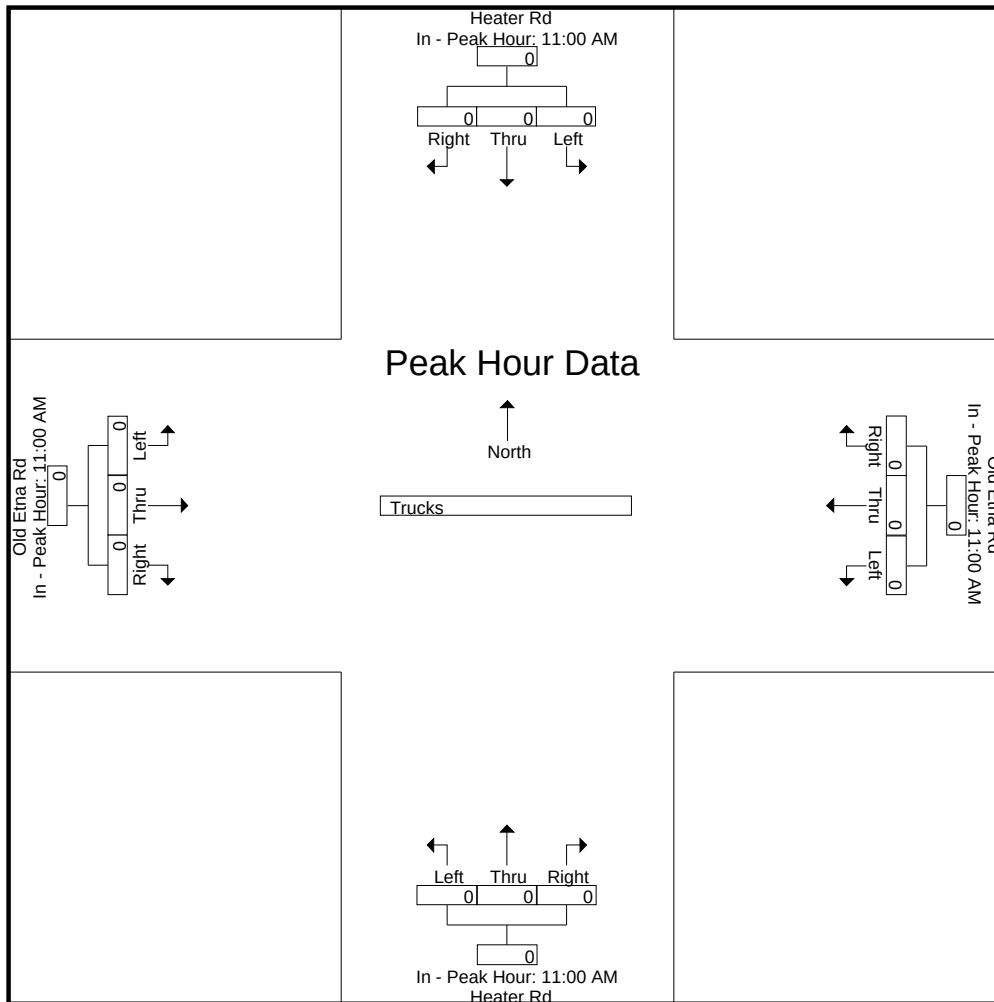


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:00 AM				11:00 AM				11:00 AM				11:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S4
Site Code : 52933004
Start Date : 11/12/2022
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N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S4
Site Code : 52933004
Start Date : 11/12/2022
Page No : 10

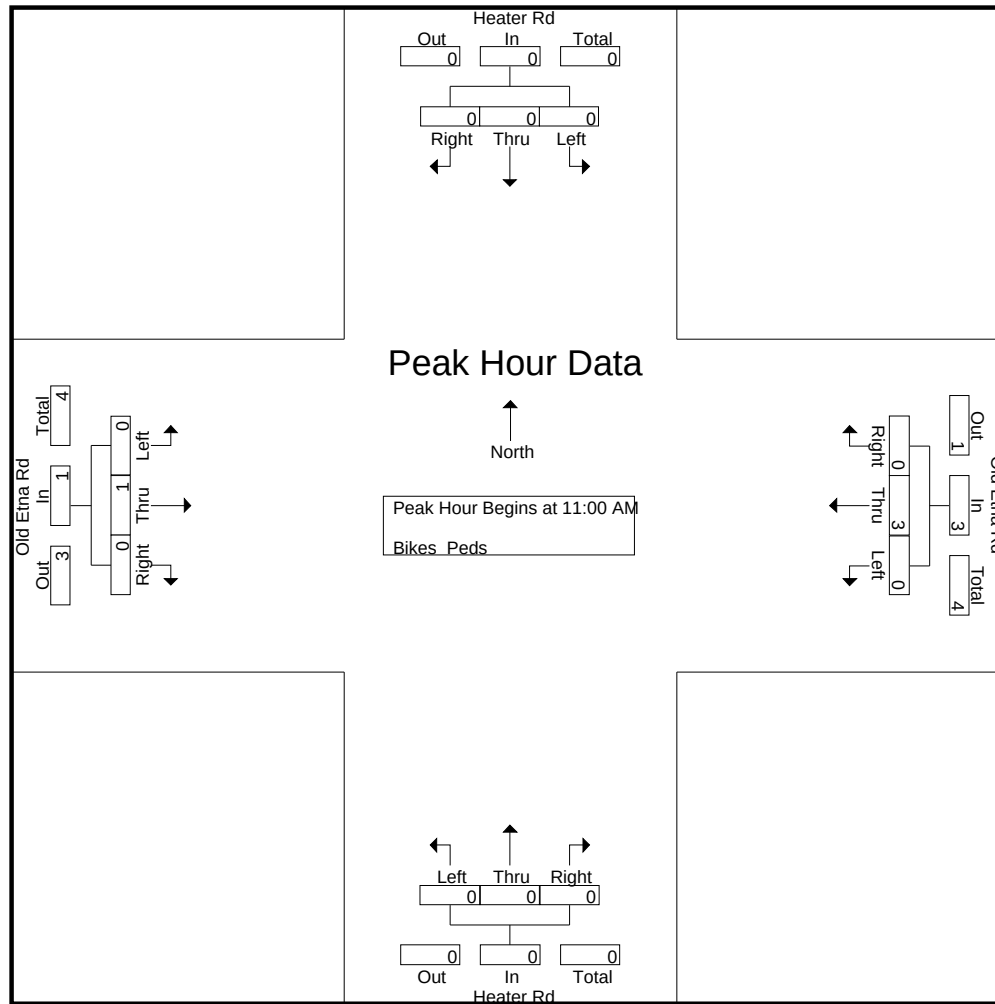
Groups Printed- Bikes Peds

	Heater Rd From North				Old Etna Rd From East				Heater Rd From South				Old Etna Rd From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
11:00 AM	0	0	0	0	0	2	0	2	0	0	0	1	0	0	0	0	3	2	5
11:15 AM	0	0	0	0	0	1	0	2	0	0	0	7	0	1	0	0	9	2	11
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	0	3
11:45 AM	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	4	0	4
Total	0	0	0	0	0	3	0	6	0	0	0	13	0	1	0	0	19	4	23
12:00 PM	0	0	0	1	0	0	0	0	0	0	0	3	0	0	0	1	5	0	5
12:15 PM	0	1	0	0	0	1	0	1	0	0	0	1	0	2	0	0	2	4	6
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
Total	0	1	0	1	0	1	0	1	0	0	0	6	0	2	0	1	9	4	13
Grand Total	0	1	0	1	0	4	0	7	0	0	0	19	0	3	0	1	28	8	36
Apprch %	0	100	0		0	100	0		0	0	0		0	100	0				
Total %	0	12.5	0		0	50	0		0	0	0		0	37.5	0		77.8	22.2	

	Heater Rd From North				Old Etna Rd From East				Heater Rd From South				Old Etna Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:00 AM																	
11:00 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
11:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	3	0	3	0	0	0	0	0	1	0	1	4
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.375	.000	.375	.000	.000	.000	.000	.000	.250	.000	.250	.500

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S4
Site Code : 52933004
Start Date : 11/12/2022
Page No : 11

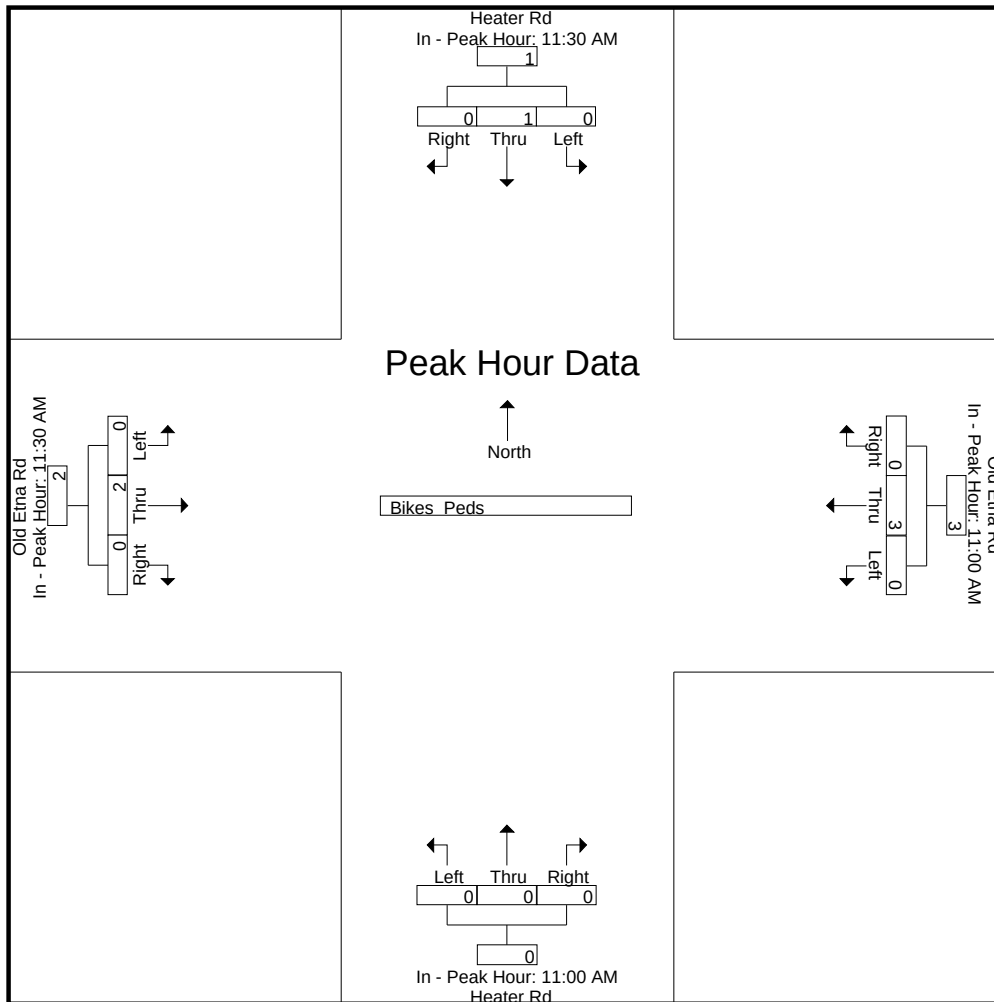


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:30 AM				11:00 AM				11:00 AM				11:30 AM			
+0 mins.	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	2	0	2
Total Volume	0	1	0	1	0	3	0	3	0	0	0	0	0	2	0	2
% App. Total	0	100	0		0	100	0		0	0	0		0	100	0	
PHF	.000	.250	.000	.250	.000	.375	.000	.375	.000	.000	.000	.000	.000	.250	.000	.250

N/S Street : Heater Road
E/W Street : Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S4
Site Code : 52933004
Start Date : 11/12/2022
Page No : 12



N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
Page No : 1

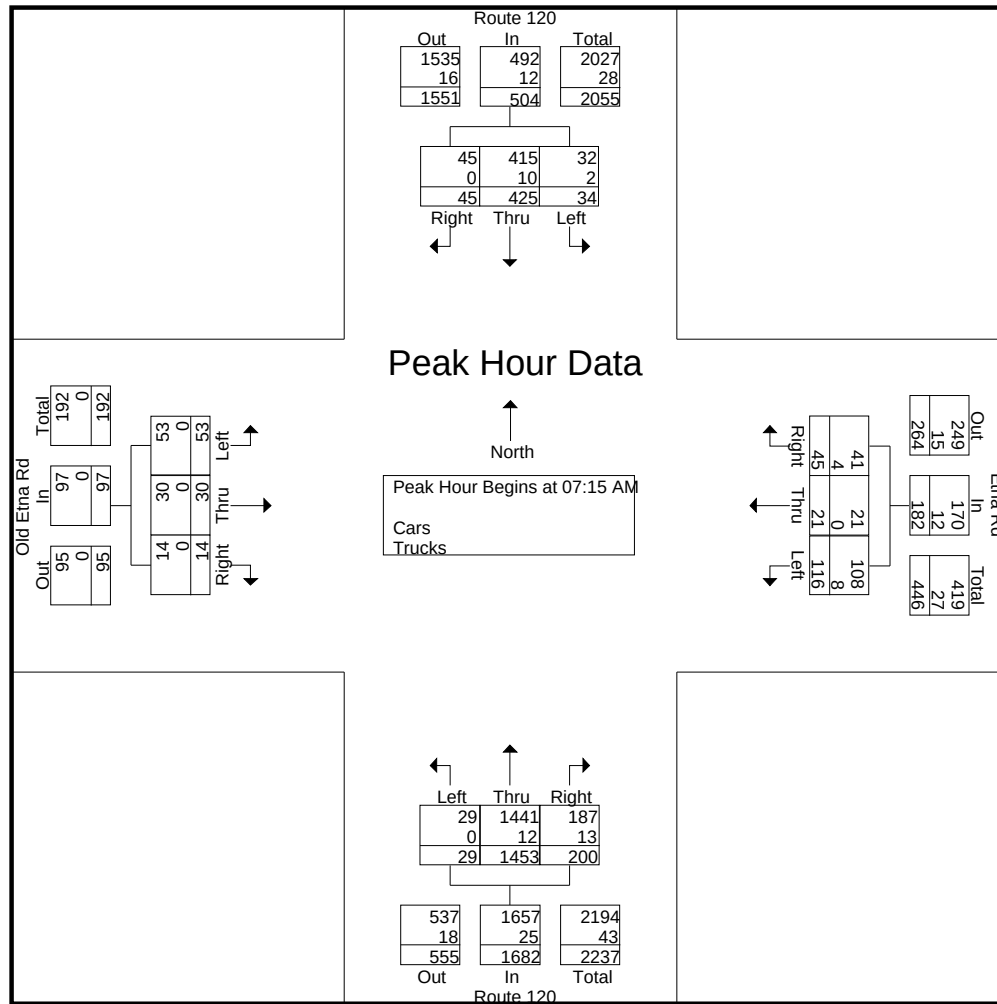
Groups Printed- Cars - Trucks

	Route 120 From North			Etna Rd From East			Route 120 From South			Old Etna Rd From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	5	68	5	72	8	6	4	251	41	7	5	3	475
07:15 AM	4	88	12	33	4	10	12	317	40	10	8	2	540
07:30 AM	6	111	8	32	4	12	4	389	43	15	3	5	632
07:45 AM	11	108	10	27	6	11	7	412	69	17	11	3	692
Total	26	375	35	164	22	39	27	1369	193	49	27	13	2339
08:00 AM	13	118	15	24	7	12	6	335	48	11	8	4	601
08:15 AM	12	77	10	21	3	7	5	314	58	8	4	2	521
08:30 AM	14	90	6	34	0	13	11	261	37	9	2	8	485
08:45 AM	11	89	10	18	2	16	8	236	38	8	3	8	447
Total	50	374	41	97	12	48	30	1146	181	36	17	22	2054
Grand Total	76	749	76	261	34	87	57	2515	374	85	44	35	4393
Apprch %	8.4	83.1	8.4	68.3	8.9	22.8	1.9	85.4	12.7	51.8	26.8	21.3	
Total %	1.7	17	1.7	5.9	0.8	2	1.3	57.3	8.5	1.9	1	0.8	
Cars	67	733	76	245	34	77	57	2490	354	85	43	35	4296
% Cars	88.2	97.9	100	93.9	100	88.5	100	99	94.7	100	97.7	100	97.8
Trucks	9	16	0	16	0	10	0	25	20	0	1	0	97
% Trucks	11.8	2.1	0	6.1	0	11.5	0	1	5.3	0	2.3	0	2.2

	Route 120 From North				Etna Rd From East				Route 120 From South				Old Etna Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	4	88	12	104	33	4	10	47	12	317	40	369	10	8	2	20	540
07:30 AM	6	111	8	125	32	4	12	48	4	389	43	436	15	3	5	23	632
07:45 AM	11	108	10	129	27	6	11	44	7	412	69	488	17	11	3	31	692
08:00 AM	13	118	15	146	24	7	12	43	6	335	48	389	11	8	4	23	601
Total Volume	34	425	45	504	116	21	45	182	29	1453	200	1682	53	30	14	97	2465
% App. Total	6.7	84.3	8.9		63.7	11.5	24.7		1.7	86.4	11.9		54.6	30.9	14.4		
PHF	.654	.900	.750	.863	.879	.750	.938	.948	.604	.882	.725	.862	.779	.682	.700	.782	.891
Cars	32	415	45	492	108	21	41	170	29	1441	187	1657	53	30	14	97	2416
% Cars	94.1	97.6	100	97.6	93.1	100	91.1	93.4	100	99.2	93.5	98.5	100	100	100	100	98.0
Trucks	2	10	0	12	8	0	4	12	0	12	13	25	0	0	0	0	49
% Trucks	5.9	2.4	0	2.4	6.9	0	8.9	6.6	0	0.8	6.5	1.5	0	0	0	0	2.0

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
Page No : 2

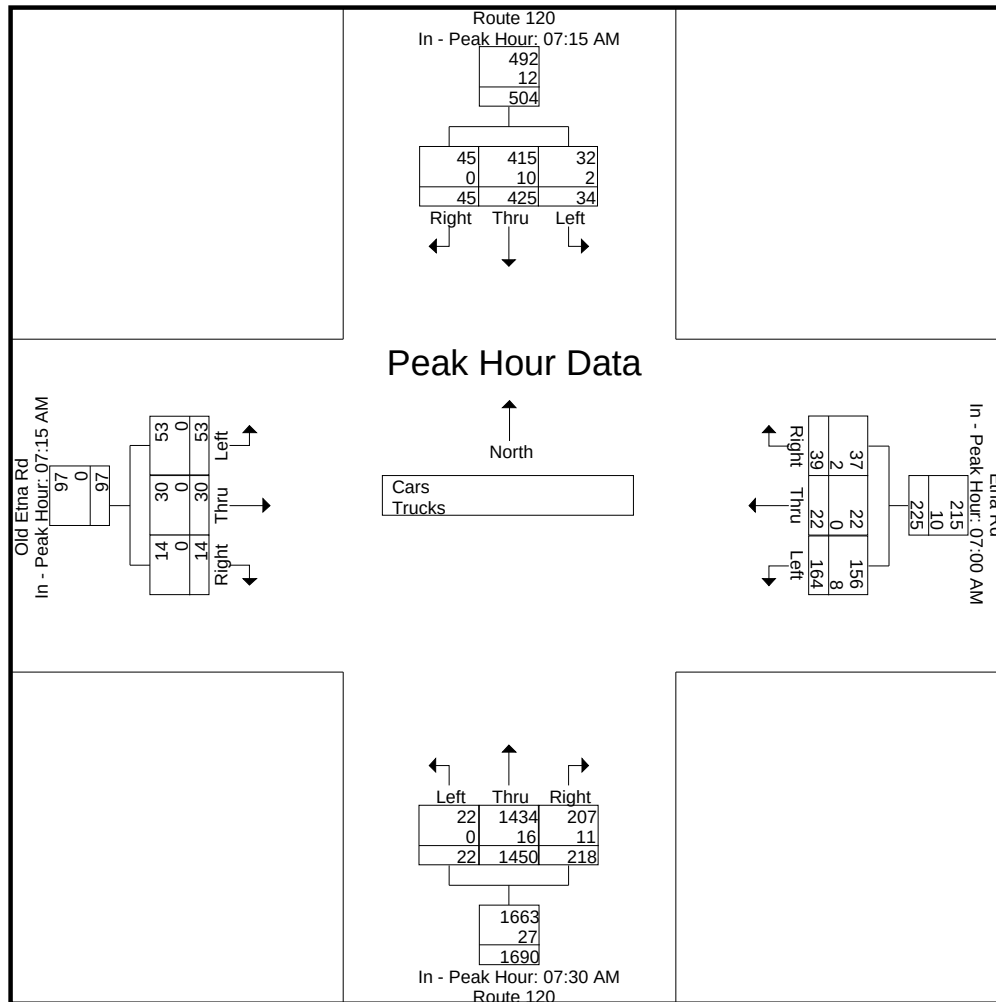


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:30 AM				07:15 AM			
+0 mins.	4	88	12	104	72	8	6	86	4	389	43	436	10	8	2	20
+15 mins.	6	111	8	125	33	4	10	47	7	412	69	488	15	3	5	23
+30 mins.	11	108	10	129	32	4	12	48	6	335	48	389	17	11	3	31
+45 mins.	13	118	15	146	27	6	11	44	5	314	58	377	11	8	4	23
Total Volume	34	425	45	504	164	22	39	225	22	1450	218	1690	53	30	14	97
% App. Total	6.7	84.3	8.9		72.9	9.8	17.3		1.3	85.8	12.9		54.6	30.9	14.4	
PHF	.654	.900	.750	.863	.569	.688	.813	.654	.786	.880	.790	.866	.779	.682	.700	.782
Cars	32	415	45	492	156	22	37	215	22	1434	207	1663	53	30	14	97
% Cars	94.1	97.6	100	97.6	95.1	100	94.9	95.6	100	98.9	95	98.4	100	100	100	100
Trucks	2	10	0	12	8	0	2	10	0	16	11	27	0	0	0	0
% Trucks	5.9	2.4	0	2.4	4.9	0	5.1	4.4	0	1.1	5	1.6	0	0	0	0

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
Page No : 3

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear



N/S Street : Route 120
 E/W Street : Etna Road/Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933005
 Site Code : 52933005
 Start Date : 11/10/2022
 Page No : 4

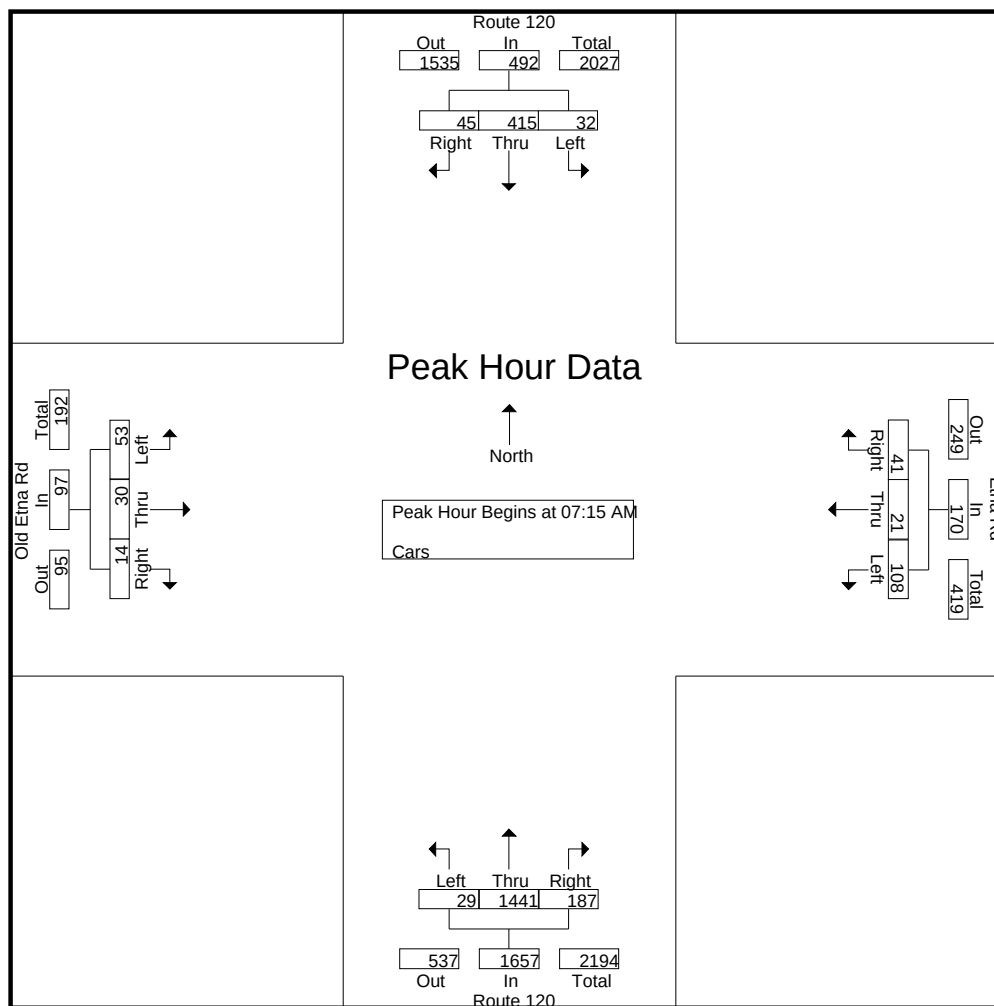
Groups Printed- Cars

	Route 120 From North			Etna Rd From East			Route 120 From South			Old Etna Rd From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	5	68	5	71	8	5	4	251	40	7	4	3	471
07:15 AM	4	87	12	32	4	10	12	315	37	10	8	2	533
07:30 AM	5	109	8	28	4	11	4	386	41	15	3	5	619
07:45 AM	10	105	10	25	6	11	7	407	64	17	11	3	676
Total	24	369	35	156	22	37	27	1359	182	49	26	13	2299
08:00 AM	13	114	15	23	7	9	6	333	45	11	8	4	588
08:15 AM	10	76	10	21	3	6	5	308	57	8	4	2	510
08:30 AM	12	89	6	29	0	12	11	255	35	9	2	8	468
08:45 AM	8	85	10	16	2	13	8	235	35	8	3	8	431
Total	43	364	41	89	12	40	30	1131	172	36	17	22	1997
Grand Total	67	733	76	245	34	77	57	2490	354	85	43	35	4296
Apprch %	7.6	83.7	8.7	68.8	9.6	21.6	2	85.8	12.2	52.1	26.4	21.5	
Total %	1.6	17.1	1.8	5.7	0.8	1.8	1.3	58	8.2	2	1	0.8	

	Route 120 From North				Etna Rd From East				Route 120 From South				Old Etna Rd From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	4	87	12	103	32	4	10	46	12	315	37	364	10	8	2	20	533
07:30 AM	5	109	8	122	28	4	11	43	4	386	41	431	15	3	5	23	619
07:45 AM	10	105	10	125	25	6	11	42	7	407	64	478	17	11	3	31	676
08:00 AM	13	114	15	142	23	7	9	39	6	333	45	384	11	8	4	23	588
Total Volume	32	415	45	492	108	21	41	170	29	1441	187	1657	53	30	14	97	2416
% App. Total	6.5	84.3	9.1		63.5	12.4	24.1		1.8	87	11.3		54.6	30.9	14.4		
PHF	.615	.910	.750	.866	.844	.750	.932	.924	.604	.885	.730	.867	.779	.682	.700	.782	.893

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
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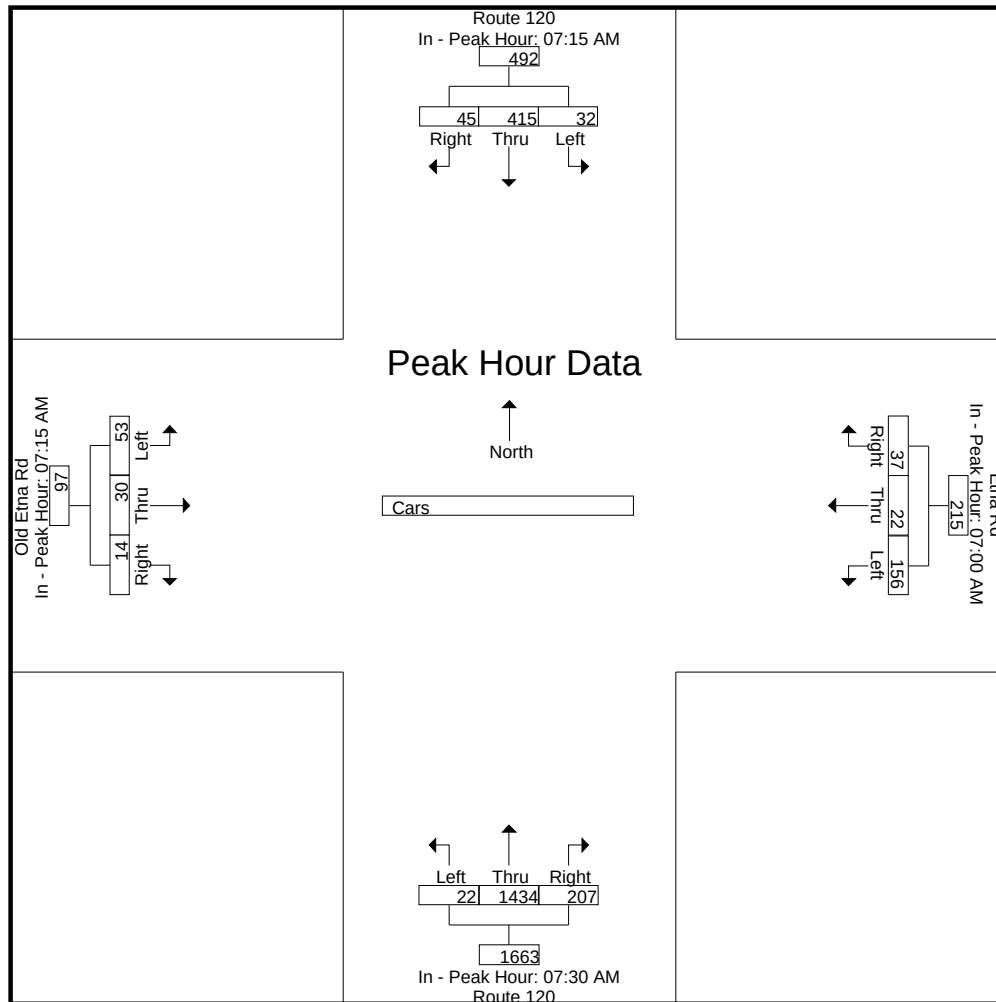


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:30 AM				07:15 AM			
+0 mins.	4	87	12	103	71	8	5	84	4	386	41	431	10	8	2	20
+15 mins.	5	109	8	122	32	4	10	46	7	407	64	478	15	3	5	23
+30 mins.	10	105	10	125	28	4	11	43	6	333	45	384	17	11	3	31
+45 mins.	13	114	15	142	25	6	11	42	5	308	57	370	11	8	4	23
Total Volume	32	415	45	492	156	22	37	215	22	1434	207	1663	53	30	14	97
% App. Total	6.5	84.3	9.1		72.6	10.2	17.2		1.3	86.2	12.4		54.6	30.9	14.4	
PHF	.615	.910	.750	.866	.549	.688	.841	.640	.786	.881	.809	.870	.779	.682	.700	.782

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
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N/S Street : Route 120
 E/W Street : Etna Road/Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933005
 Site Code : 52933005
 Start Date : 11/10/2022
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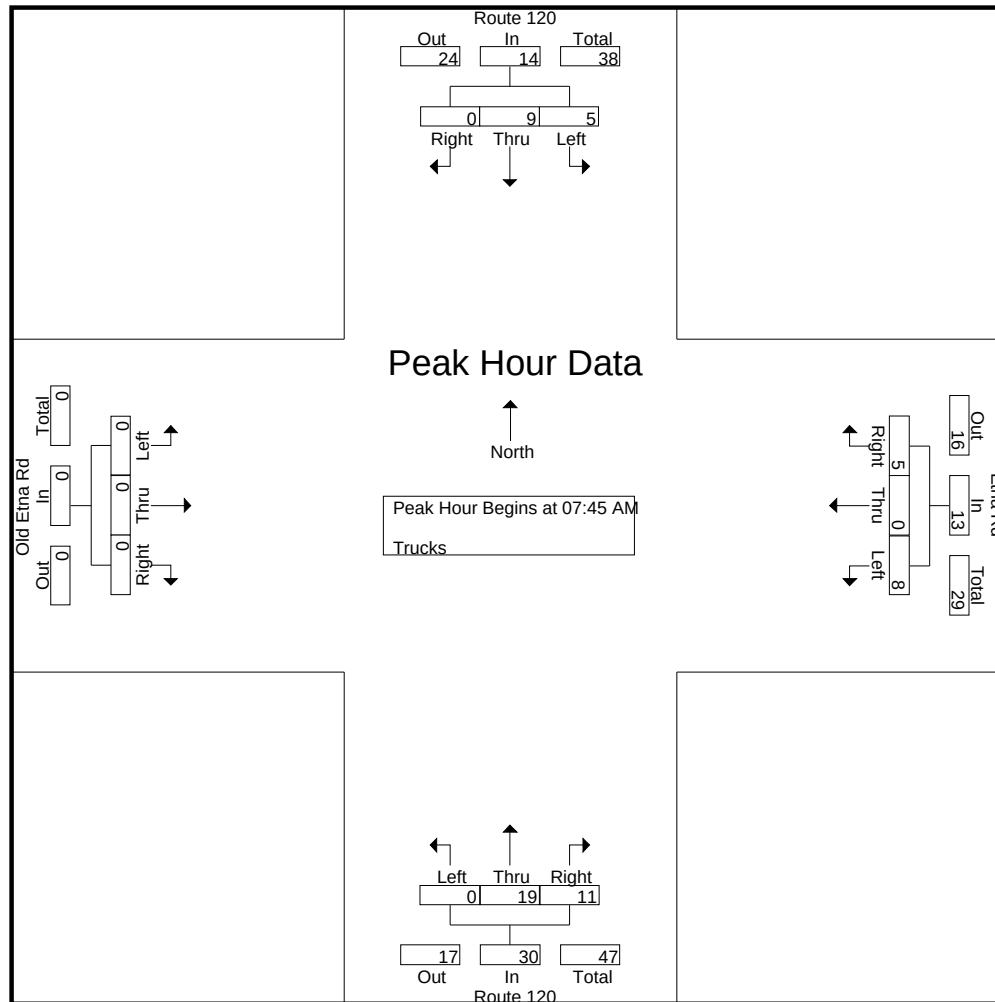
Groups Printed- Trucks

	Route 120 From North			Etna Rd From East			Route 120 From South			Old Etna Rd From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	0	0	1	0	1	0	0	1	0	1	0	4
07:15 AM	0	1	0	1	0	0	0	2	3	0	0	0	7
07:30 AM	1	2	0	4	0	1	0	3	2	0	0	0	13
07:45 AM	1	3	0	2	0	0	0	5	5	0	0	0	16
Total	2	6	0	8	0	2	0	10	11	0	1	0	40
08:00 AM	0	4	0	1	0	3	0	2	3	0	0	0	13
08:15 AM	2	1	0	0	0	1	0	6	1	0	0	0	11
08:30 AM	2	1	0	5	0	1	0	6	2	0	0	0	17
08:45 AM	3	4	0	2	0	3	0	1	3	0	0	0	16
Total	7	10	0	8	0	8	0	15	9	0	0	0	57
Grand Total	9	16	0	16	0	10	0	25	20	0	1	0	97
Apprch %	36	64	0	61.5	0	38.5	0	55.6	44.4	0	100	0	
Total %	9.3	16.5	0	16.5	0	10.3	0	25.8	20.6	0	1	0	

	Route 120 From North				Etna Rd From East				Route 120 From South				Old Etna Rd From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	1	3	0	4	2	0	0	2	0	5	5	10	0	0	0	0	16
08:00 AM	0	4	0	4	1	0	3	4	0	2	3	5	0	0	0	0	13
08:15 AM	2	1	0	3	0	0	1	1	0	6	1	7	0	0	0	0	11
08:30 AM	2	1	0	3	5	0	1	6	0	6	2	8	0	0	0	0	17
Total Volume	5	9	0	14	8	0	5	13	0	19	11	30	0	0	0	0	57
% App. Total	35.7	64.3	0		61.5	0	38.5		0	63.3	36.7		0	0	0		
PHF	.625	.563	.000	.875	.400	.000	.417	.542	.000	.792	.550	.750	.000	.000	.000	.000	.838

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
Page No : 8

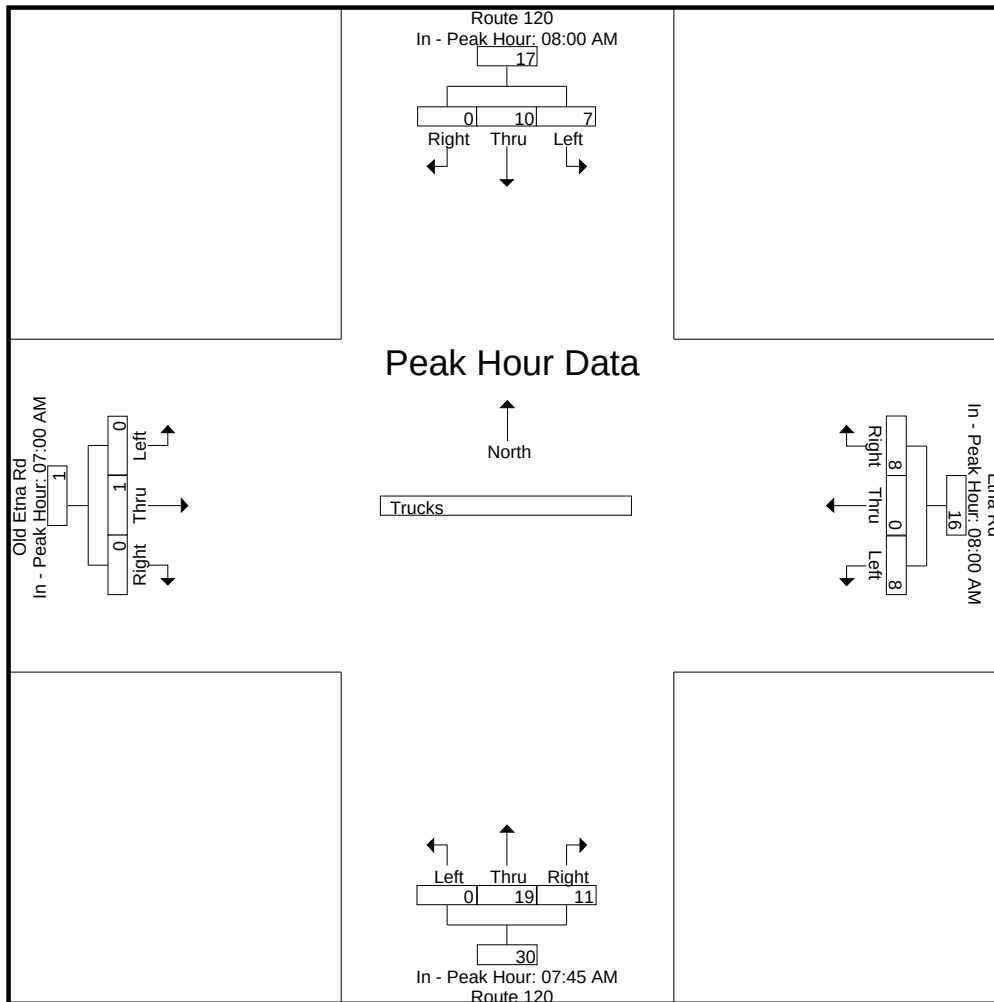


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				07:45 AM				07:00 AM			
+0 mins.	0	4	0	4	1	0	3	4	0	5	5	10	0	1	0	1
+15 mins.	2	1	0	3	0	0	1	1	0	2	3	5	0	0	0	0
+30 mins.	2	1	0	3	5	0	1	6	0	6	1	7	0	0	0	0
+45 mins.	3	4	0	7	2	0	3	5	0	6	2	8	0	0	0	0
Total Volume	7	10	0	17	8	0	8	16	0	19	11	30	0	1	0	1
% App. Total	41.2	58.8	0		50	0	50		0	63.3	36.7		0	100	0	
PHF	.583	.625	.000	.607	.400	.000	.667	.667	.000	.792	.550	.750	.000	.250	.000	.250

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
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N/S Street : Route 120
 E/W Street : Etna Road/Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 52933005
 Site Code : 52933005
 Start Date : 11/10/2022
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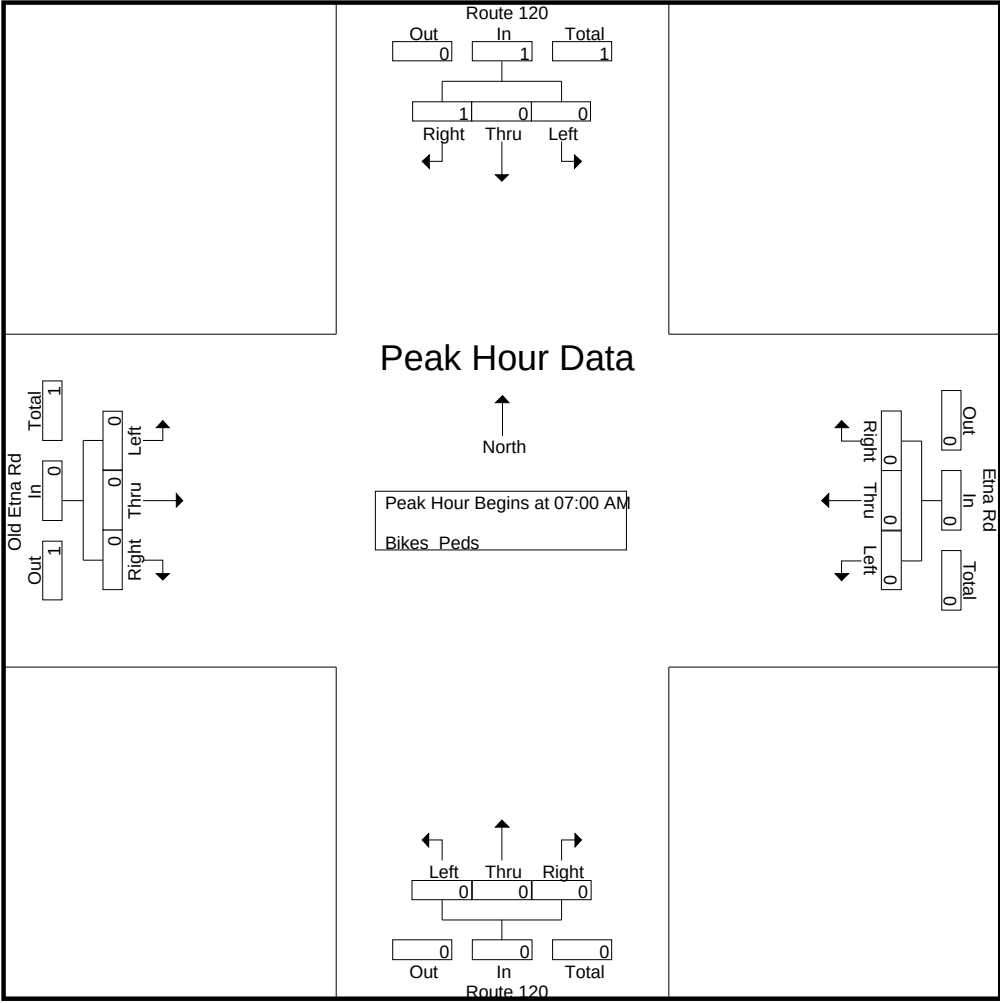
Groups Printed- Bikes Peds

	Route 120 From North				Etna Rd From East				Route 120 From South				Old Etna Rd From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
07:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
08:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
08:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Grand Total	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	4
Apprch %	0	50	50		0	0	0		0	0	0		0	0	0				
Total %	0	50	50		0	0	0		0	0	0		0	0	0		50	50	

	Route 120 From North				Etna Rd From East				Route 120 From South				Old Etna Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
% App. Total	0	0	100		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
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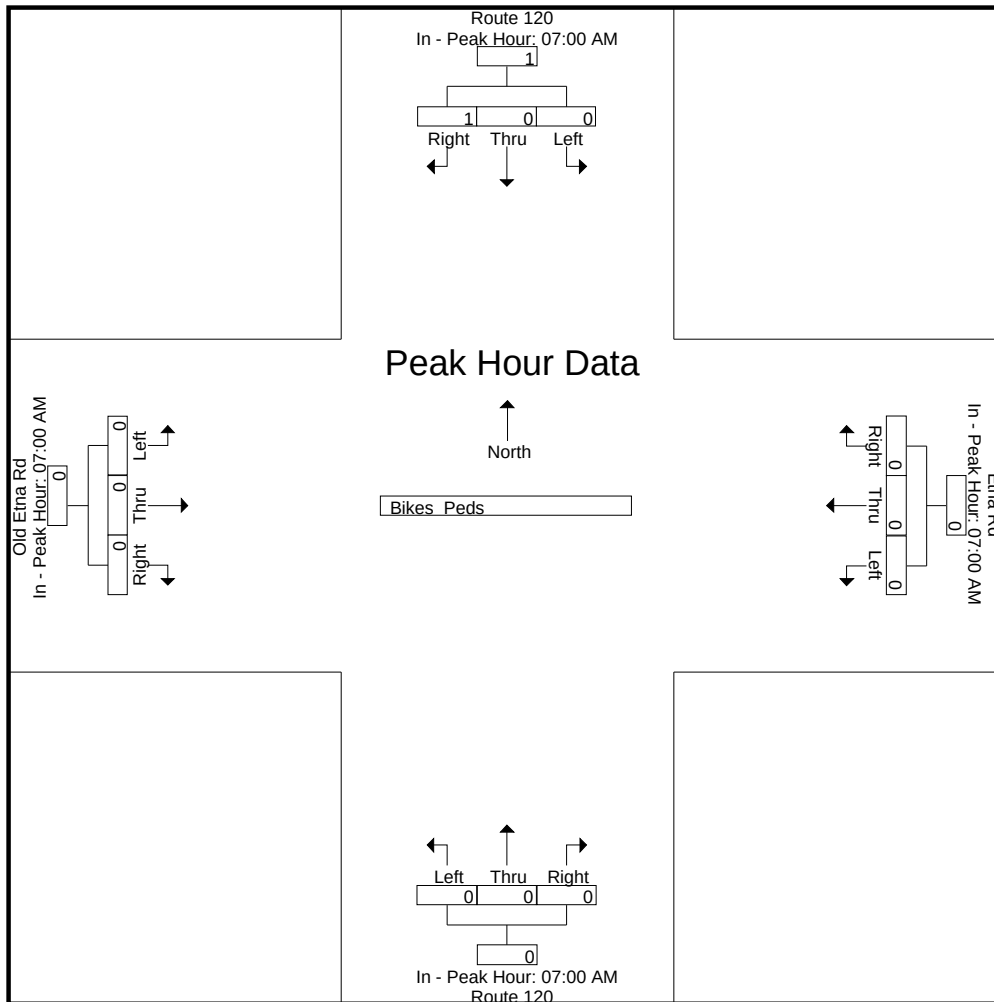


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	100		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
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N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
Page No : 1

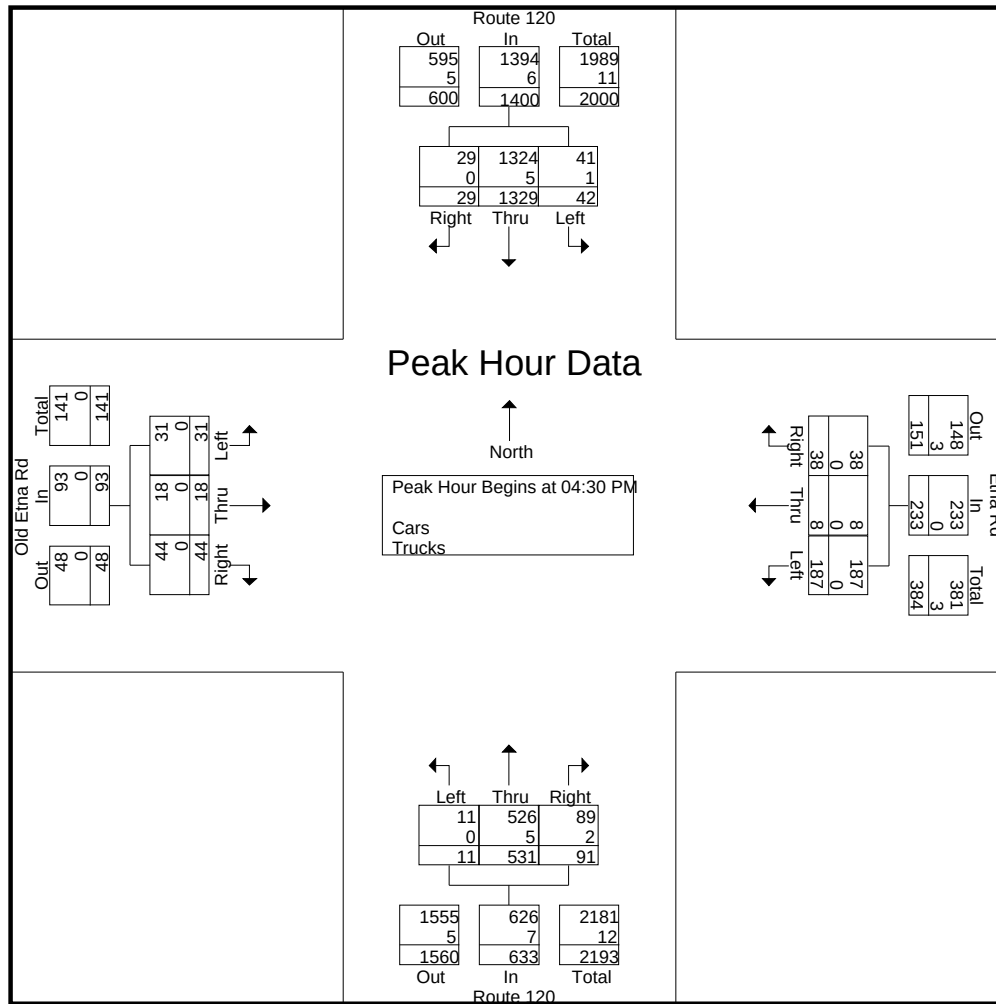
Groups Printed- Cars - Trucks

	Route 120 From North			Etna Rd From East			Route 120 From South			Old Etna Rd From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	10	192	10	39	2	10	3	152	35	4	2	13	472
02:15 PM	6	191	13	39	5	13	10	146	28	11	3	8	473
02:30 PM	7	203	9	74	5	14	12	143	44	13	8	11	543
02:45 PM	9	232	16	46	3	6	16	158	64	6	8	15	579
Total	32	818	48	198	15	43	41	599	171	34	21	47	2067
03:00 PM	7	228	10	74	4	13	4	116	32	12	8	19	527
03:15 PM	12	276	11	59	8	13	5	121	29	8	6	10	558
03:30 PM	7	316	12	69	4	11	4	121	17	10	5	7	583
03:45 PM	7	273	8	46	7	11	8	111	28	5	6	10	520
Total	33	1093	41	248	23	48	21	469	106	35	25	46	2188
04:00 PM	18	324	6	59	5	9	5	119	29	8	3	14	599
04:15 PM	9	311	7	53	5	10	6	106	19	6	2	14	548
04:30 PM	14	324	4	58	0	10	3	120	21	9	2	14	579
04:45 PM	6	331	8	44	3	8	2	135	27	6	6	12	588
Total	47	1290	25	214	13	37	16	480	96	29	13	54	2314
05:00 PM	14	329	10	51	4	7	4	129	24	11	5	12	600
05:15 PM	8	345	7	34	1	13	2	147	19	5	5	6	592
05:30 PM	7	260	3	34	1	5	3	90	23	4	0	2	432
05:45 PM	12	201	1	23	1	7	0	102	18	5	0	2	372
Total	41	1135	21	142	7	32	9	468	84	25	10	22	1996
Grand Total	153	4336	135	802	58	160	87	2016	457	123	69	169	8565
Apprch %	3.3	93.8	2.9	78.6	5.7	15.7	3.4	78.8	17.9	34.1	19.1	46.8	
Total %	1.8	50.6	1.6	9.4	0.7	1.9	1	23.5	5.3	1.4	0.8	2	
Cars	145	4316	134	789	58	148	87	2001	437	122	69	169	8475
% Cars	94.8	99.5	99.3	98.4	100	92.5	100	99.3	95.6	99.2	100	100	98.9
Trucks	8	20	1	13	0	12	0	15	20	1	0	0	90
% Trucks	5.2	0.5	0.7	1.6	0	7.5	0	0.7	4.4	0.8	0	0	1.1

	Route 120 From North				Etna Rd From East				Route 120 From South				Old Etna Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	14	324	4	342	58	0	10	68	3	120	21	144	9	2	14	25	579
04:45 PM	6	331	8	345	44	3	8	55	2	135	27	164	6	6	12	24	588
05:00 PM	14	329	10	353	51	4	7	62	4	129	24	157	11	5	12	28	600
05:15 PM	8	345	7	360	34	1	13	48	2	147	19	168	5	5	6	16	592
Total Volume	42	1329	29	1400	187	8	38	233	11	531	91	633	31	18	44	93	2359
% App. Total	3	94.9	2.1		80.3	3.4	16.3		1.7	83.9	14.4		33.3	19.4	47.3		
PHF	.750	.963	.725	.972	.806	.500	.731	.857	.688	.903	.843	.942	.705	.750	.786	.830	.983
Cars	41	1324	29	1394	187	8	38	233	11	526	89	626	31	18	44	93	2346
% Cars	97.6	99.6	100	99.6	100	100	100	100	100	99.1	97.8	98.9	100	100	100	100	99.4
Trucks	1	5	0	6	0	0	0	0	0	5	2	7	0	0	0	0	13
% Trucks	2.4	0.4	0	0.4	0	0	0	0	0	0.9	2.2	1.1	0	0	0	0	0.6

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
Page No : 2

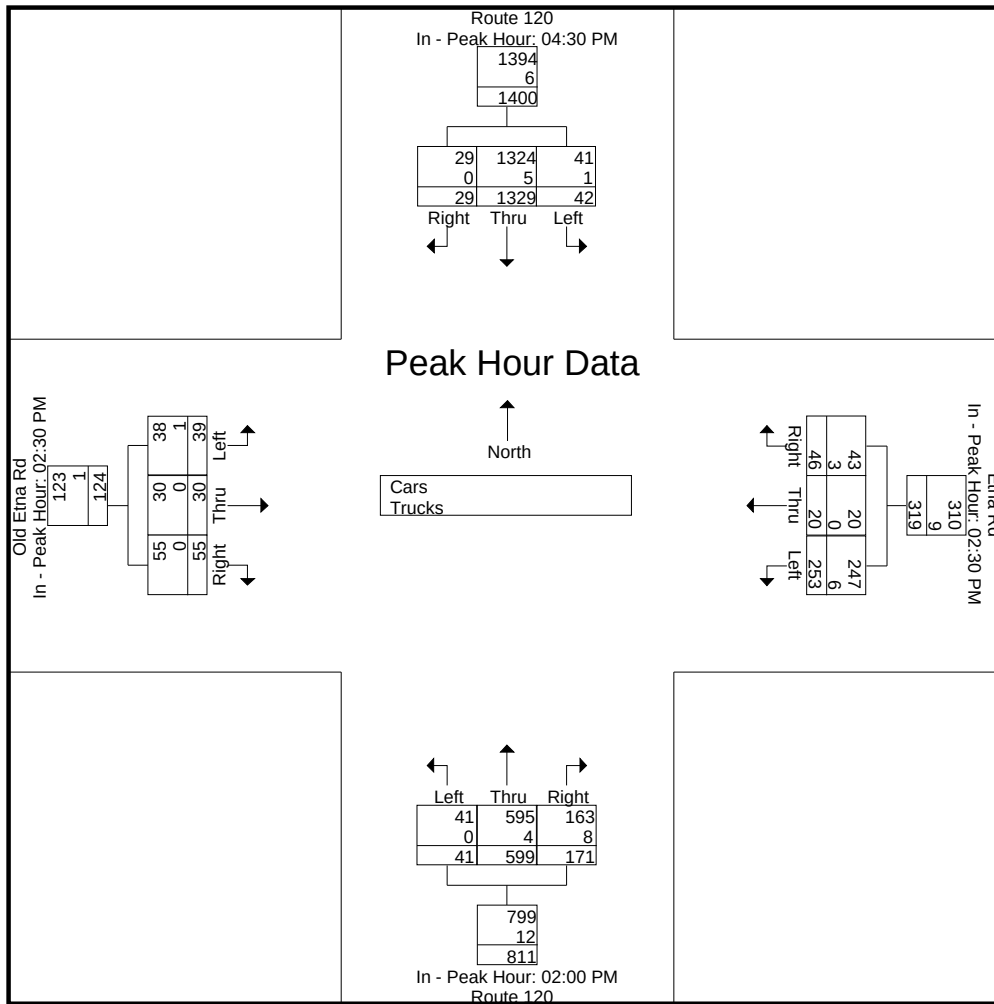


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				02:30 PM				02:00 PM				02:30 PM			
+0 mins.	14	324	4	342	74	5	14	93	3	152	35	190	13	8	11	32
+15 mins.	6	331	8	345	46	3	6	55	10	146	28	184	6	8	15	29
+30 mins.	14	329	10	353	74	4	13	91	12	143	44	199	12	8	19	39
+45 mins.	8	345	7	360	59	8	13	80	16	158	64	238	8	6	10	24
Total Volume	42	1329	29	1400	253	20	46	319	41	599	171	811	39	30	55	124
% App. Total	3	94.9	2.1		79.3	6.3	14.4		5.1	73.9	21.1		31.5	24.2	44.4	
PHF	.750	.963	.725	.972	.855	.625	.821	.858	.641	.948	.668	.852	.750	.938	.724	.795
Cars	41	1324	29	1394	247	20	43	310	41	595	163	799	38	30	55	123
% Cars	97.6	99.6	100	99.6	97.6	100	93.5	97.2	100	99.3	95.3	98.5	97.4	100	100	99.2
Trucks	1	5	0	6	6	0	3	9	0	4	8	12	1	0	0	1
% Trucks	2.4	0.4	0	0.4	2.4	0	6.5	2.8	0	0.7	4.7	1.5	2.6	0	0	0.8

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
Page No : 3

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear



N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
Page No : 4

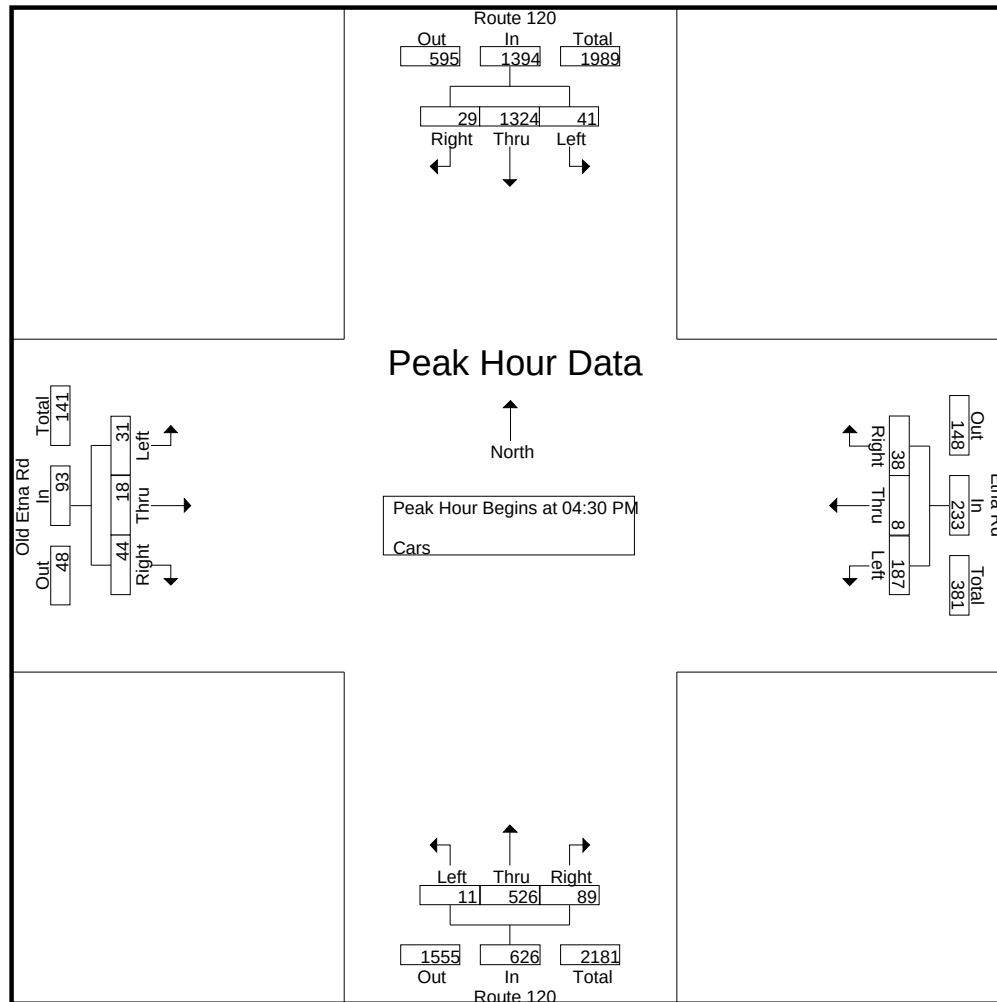
Groups Printed- Cars

	Route 120 From North			Etna Rd From East			Route 120 From South			Old Etna Rd From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	6	187	10	39	2	8	3	152	32	4	2	13	458
02:15 PM	6	189	13	39	5	10	10	143	26	11	3	8	463
02:30 PM	7	202	9	72	5	12	12	142	42	13	8	11	535
02:45 PM	9	228	16	43	3	6	16	158	63	5	8	15	570
Total	28	806	48	193	15	36	41	595	163	33	21	47	2026
03:00 PM	6	228	10	73	4	13	4	115	31	12	8	19	523
03:15 PM	11	276	11	59	8	12	5	121	26	8	6	10	553
03:30 PM	7	315	12	67	4	10	4	119	15	10	5	7	575
03:45 PM	7	272	7	45	7	11	8	110	27	5	6	10	515
Total	31	1091	40	244	23	46	21	465	99	35	25	46	2166
04:00 PM	17	324	6	56	5	6	5	118	28	8	3	14	590
04:15 PM	9	310	7	53	5	10	6	106	19	6	2	14	547
04:30 PM	14	323	4	58	0	10	3	118	21	9	2	14	576
04:45 PM	5	330	8	44	3	8	2	134	26	6	6	12	584
Total	45	1287	25	211	13	34	16	476	94	29	13	54	2297
05:00 PM	14	329	10	51	4	7	4	128	24	11	5	12	599
05:15 PM	8	342	7	34	1	13	2	146	18	5	5	6	587
05:30 PM	7	260	3	33	1	5	3	90	22	4	0	2	430
05:45 PM	12	201	1	23	1	7	0	101	17	5	0	2	370
Total	41	1132	21	141	7	32	9	465	81	25	10	22	1986
Grand Total	145	4316	134	789	58	148	87	2001	437	122	69	169	8475
Apprch %	3.2	93.9	2.9	79.3	5.8	14.9	3.4	79.2	17.3	33.9	19.2	46.9	
Total %	1.7	50.9	1.6	9.3	0.7	1.7	1	23.6	5.2	1.4	0.8	2	

	Route 120 From North				Etna Rd From East				Route 120 From South				Old Etna Rd From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	14	323	4	341	58	0	10	68	3	118	21	142	9	2	14	25	576
04:45 PM	5	330	8	343	44	3	8	55	2	134	26	162	6	6	12	24	584
05:00 PM	14	329	10	353	51	4	7	62	4	128	24	156	11	5	12	28	599
05:15 PM	8	342	7	357	34	1	13	48	2	146	18	166	5	5	6	16	587
Total Volume	41	1324	29	1394	187	8	38	233	11	526	89	626	31	18	44	93	2346
% App. Total	2.9	95	2.1		80.3	3.4	16.3		1.8	84	14.2		33.3	19.4	47.3		
PHF	.732	.968	.725	.976	.806	.500	.731	.857	.688	.901	.856	.943	.705	.750	.786	.830	.979

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
Page No : 5

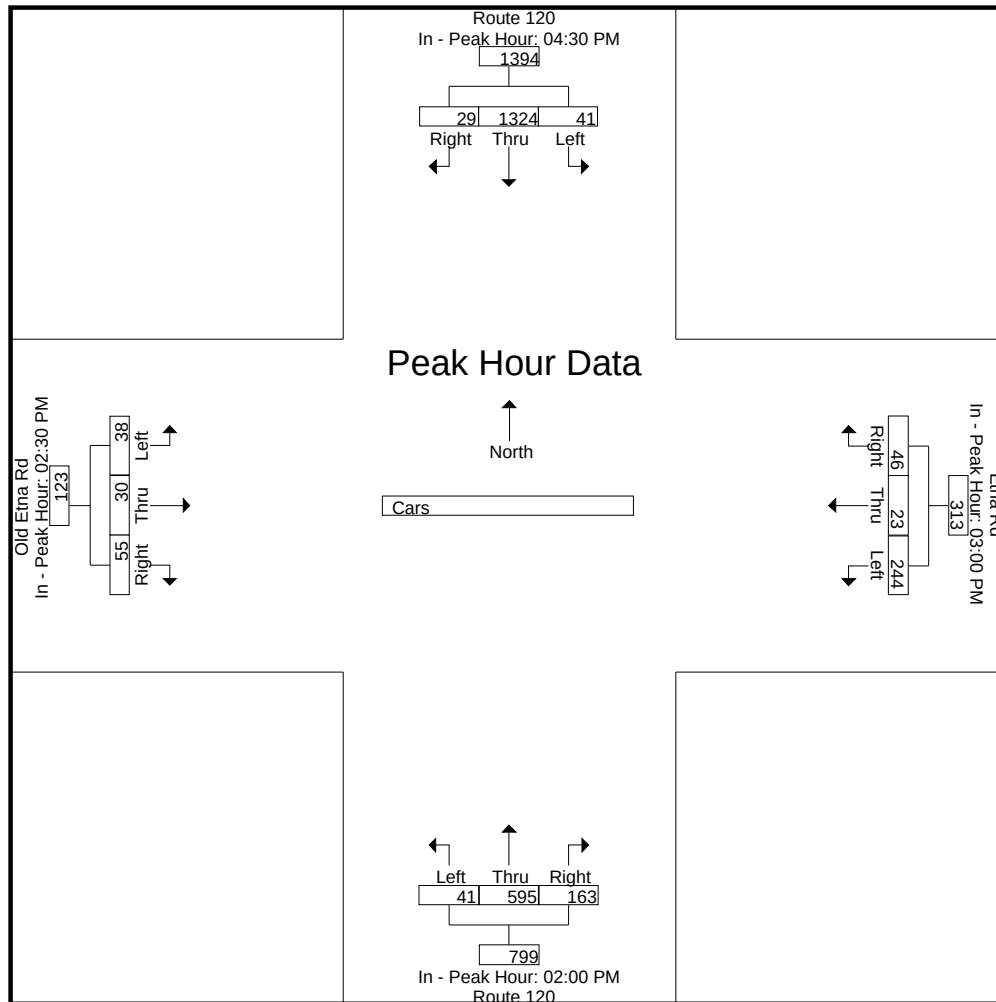


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				03:00 PM				02:00 PM				02:30 PM			
+0 mins.	14	323	4	341	73	4	13	90	3	152	32	187	13	8	11	32
+15 mins.	5	330	8	343	59	8	12	79	10	143	26	179	5	8	15	28
+30 mins.	14	329	10	353	67	4	10	81	12	142	42	196	12	8	19	39
+45 mins.	8	342	7	357	45	7	11	63	16	158	63	237	8	6	10	24
Total Volume	41	1324	29	1394	244	23	46	313	41	595	163	799	38	30	55	123
% App. Total	2.9	95	2.1		78	7.3	14.7		5.1	74.5	20.4		30.9	24.4	44.7	
PHF	.732	.968	.725	.976	.836	.719	.885	.869	.641	.941	.647	.843	.731	.938	.724	.788

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
Page No : 6



N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
Page No : 7

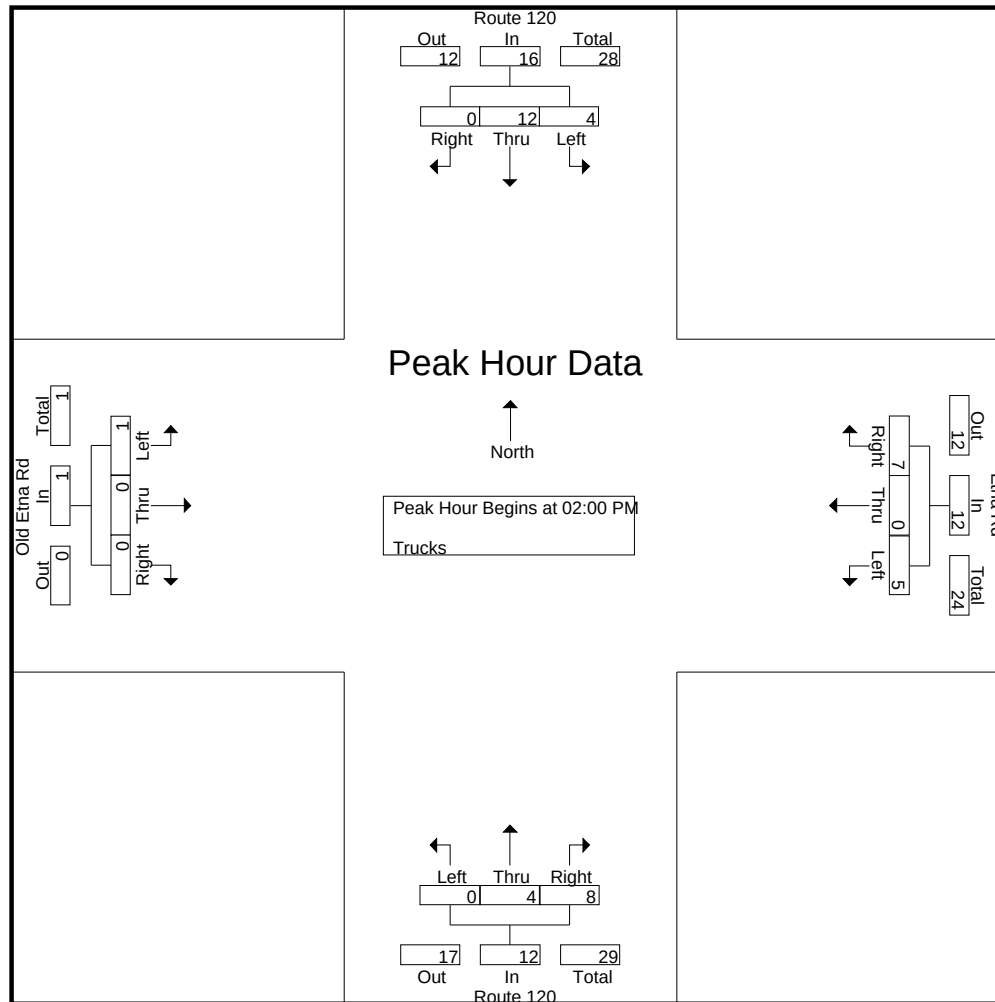
Groups Printed- Trucks

	Route 120 From North			Etna Rd From East			Route 120 From South			Old Etna Rd From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	4	5	0	0	0	2	0	0	3	0	0	0	14
02:15 PM	0	2	0	0	0	3	0	3	2	0	0	0	10
02:30 PM	0	1	0	2	0	2	0	1	2	0	0	0	8
02:45 PM	0	4	0	3	0	0	0	0	1	1	0	0	9
Total	4	12	0	5	0	7	0	4	8	1	0	0	41
03:00 PM	1	0	0	1	0	0	0	1	1	0	0	0	4
03:15 PM	1	0	0	0	0	1	0	0	3	0	0	0	5
03:30 PM	0	1	0	2	0	1	0	2	2	0	0	0	8
03:45 PM	0	1	1	1	0	0	0	1	1	0	0	0	5
Total	2	2	1	4	0	2	0	4	7	0	0	0	22
04:00 PM	1	0	0	3	0	3	0	1	1	0	0	0	9
04:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	1	0	0	0	0	0	2	0	0	0	0	3
04:45 PM	1	1	0	0	0	0	0	1	1	0	0	0	4
Total	2	3	0	3	0	3	0	4	2	0	0	0	17
05:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
05:15 PM	0	3	0	0	0	0	0	1	1	0	0	0	5
05:30 PM	0	0	0	1	0	0	0	0	1	0	0	0	2
05:45 PM	0	0	0	0	0	0	0	1	1	0	0	0	2
Total	0	3	0	1	0	0	0	3	3	0	0	0	10
Grand Total	8	20	1	13	0	12	0	15	20	1	0	0	90
Apprch %	27.6	69	3.4	52	0	48	0	42.9	57.1	100	0	0	
Total %	8.9	22.2	1.1	14.4	0	13.3	0	16.7	22.2	1.1	0	0	

	Route 120 From North				Etna Rd From East				Route 120 From South				Old Etna Rd From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
02:00 PM	4	5	0	9	0	0	2	2	0	0	3	3	0	0	0	0	14
02:15 PM	0	2	0	2	0	0	3	3	0	3	2	5	0	0	0	0	10
02:30 PM	0	1	0	1	2	0	2	4	0	1	2	3	0	0	0	0	8
02:45 PM	0	4	0	4	3	0	0	3	0	0	1	1	1	0	0	1	9
Total Volume	4	12	0	16	5	0	7	12	0	4	8	12	1	0	0	1	41
% App. Total	25	75	0		41.7	0	58.3		0	33.3	66.7		100	0	0		
PHF	.250	.600	.000	.444	.417	.000	.583	.750	.000	.333	.667	.600	.250	.000	.000	.250	.732

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
Page No : 8

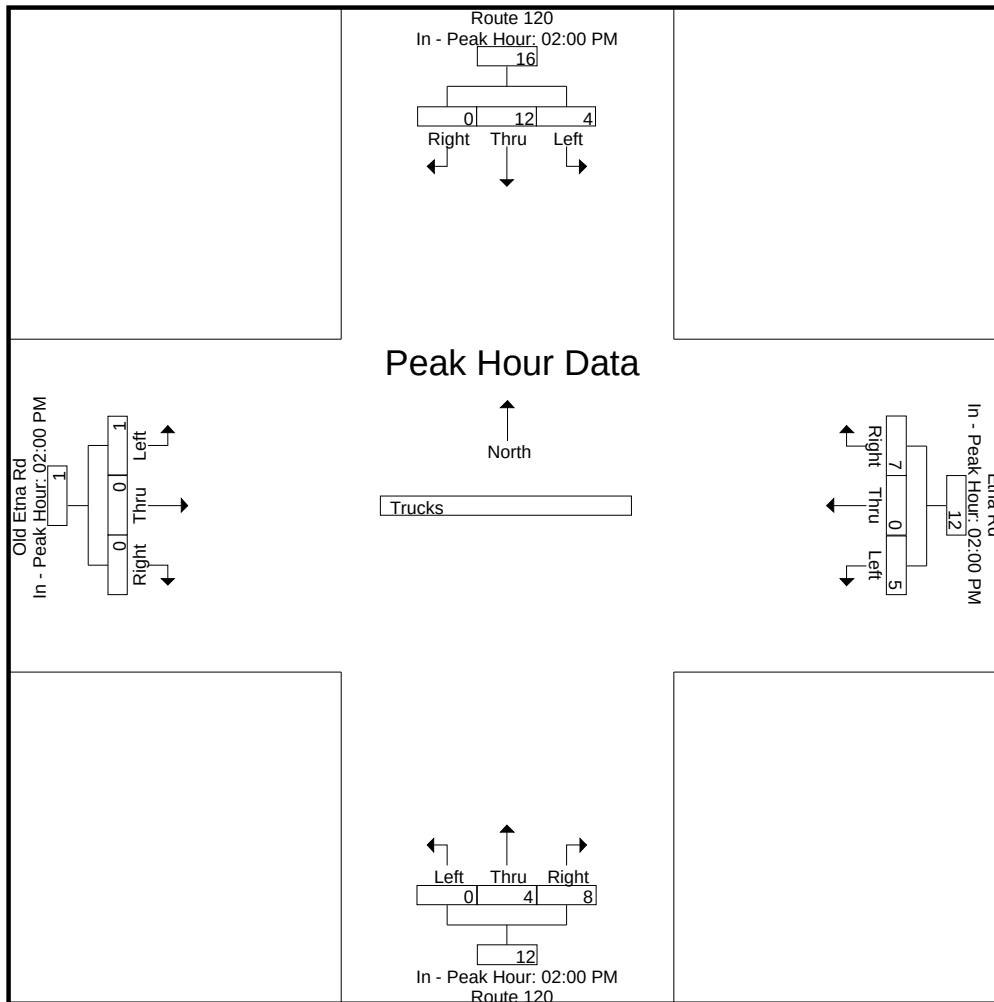


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	02:00 PM				02:00 PM				02:00 PM				02:00 PM			
+0 mins.	4	5	0	9	0	0	2	2	0	0	3	3	0	0	0	0
+15 mins.	0	2	0	2	0	0	3	3	0	3	2	5	0	0	0	0
+30 mins.	0	1	0	1	2	0	2	4	0	1	2	3	0	0	0	0
+45 mins.	0	4	0	4	3	0	0	3	0	0	1	1	1	0	0	1
Total Volume	4	12	0	16	5	0	7	12	0	4	8	12	1	0	0	1
% App. Total	25	75	0		41.7	0	58.3		0	33.3	66.7		100	0	0	
PHF	.250	.600	.000	.444	.417	.000	.583	.750	.000	.333	.667	.600	.250	.000	.000	.250

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
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N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
Page No : 10

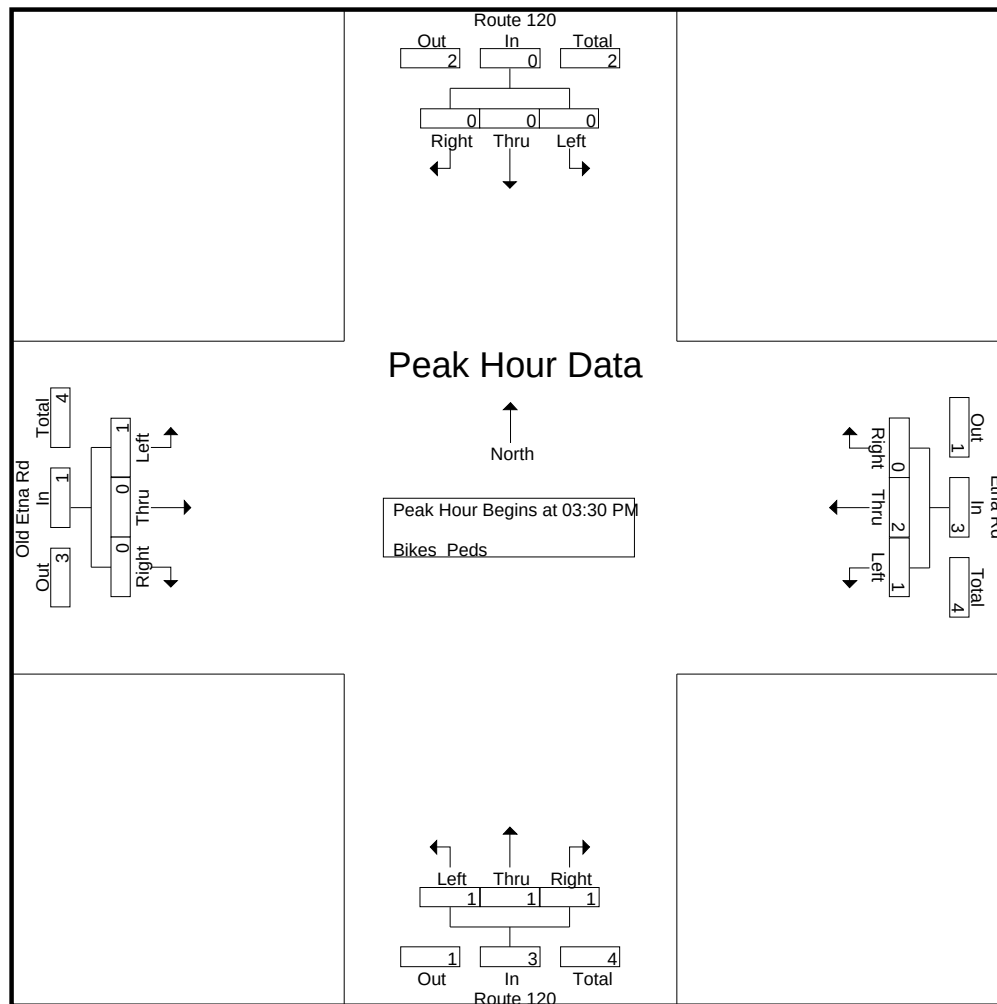
Groups Printed- Bikes Peds

	Route 120 From North				Etna Rd From East				Route 120 From South				Old Etna Rd From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	2
02:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	2
02:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	5	5
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	1	2
Total	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	1	2
04:00 PM	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	3	3
04:15 PM	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	3	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	1	1	2	0	0	1	1	0	0	1	0	0	0	1	6	7
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	2	1	7	0	0	1	1	1	0	1	0	0	0	2	12	14
Apprch %	0	0	0		12.5	87.5	0		33.3	33.3	33.3		100	0	0				
Total %	0	0	0		8.3	58.3	0		8.3	8.3	8.3		8.3	0	0		14.3	85.7	

	Route 120 From North				Etna Rd From East				Route 120 From South				Old Etna Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:30 PM																	
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
04:00 PM	0	0	0	0	1	2	0	3	0	0	0	0	0	0	0	0	3
04:15 PM	0	0	0	0	0	0	0	0	1	1	0	2	1	0	0	1	3
Total Volume	0	0	0	0	1	2	0	3	1	1	1	3	1	0	0	1	7
% App. Total	0	0	0	0	33.3	66.7	0		33.3	33.3	33.3		100	0	0		
PHF	.000	.000	.000	.000	.250	.250	.000	.250	.250	.250	.250	.375	.250	.000	.000	.250	.583

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
Page No : 11

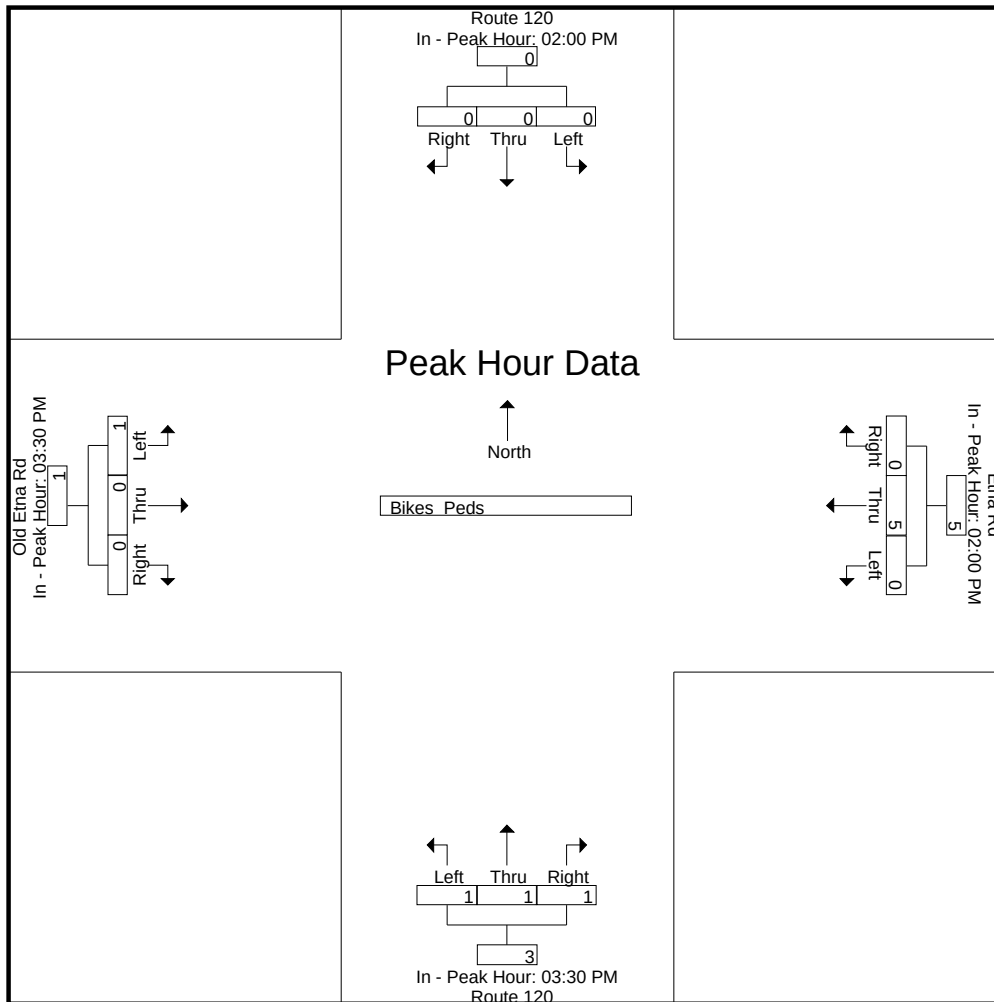


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	02:00 PM				02:00 PM				03:30 PM				03:30 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	2	0	2	0	0	1	1	0	0	0	0
+30 mins.	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	1	0	1	1	1	0	2	1	0	0	1
Total Volume	0	0	0	0	0	5	0	5	1	1	1	3	1	0	0	1
% App. Total	0	0	0	0	0	100	0		33.3	33.3	33.3		100	0	0	
PHF	.000	.000	.000	.000	.000	.625	.000	.625	.250	.250	.250	.375	.250	.000	.000	.250

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 52933005
Site Code : 52933005
Start Date : 11/10/2022
Page No : 12



N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S5
Site Code : 52933005
Start Date : 11/12/2022
Page No : 1

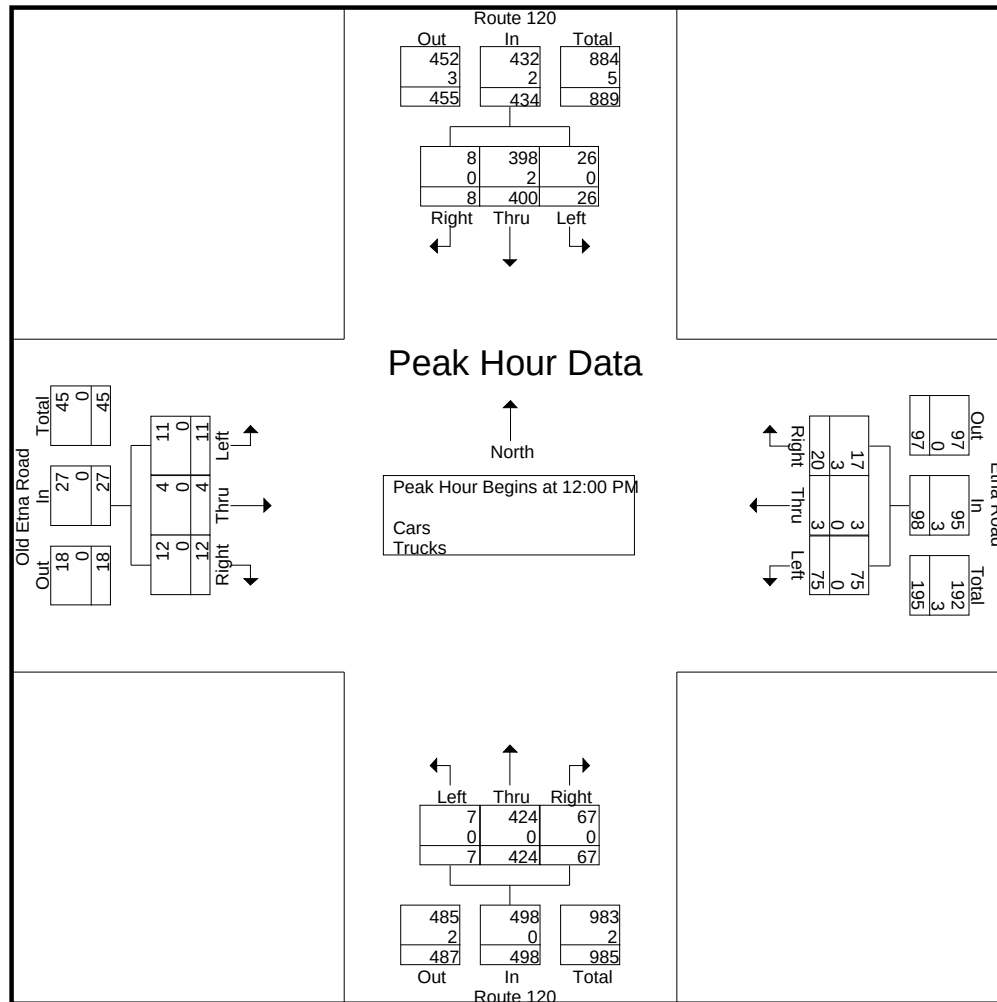
Groups Printed- Cars - Trucks

	Route 120 From North			Etna Road From East			Route 120 From South			Old Etna Road From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
11:00 AM	5	91	0	24	2	4	4	86	15	3	0	14	248
11:15 AM	1	73	1	23	0	4	2	112	21	1	0	4	242
11:30 AM	4	98	3	15	4	4	8	106	22	3	1	8	276
11:45 AM	3	102	2	16	0	4	4	92	27	3	0	1	254
Total	13	364	6	78	6	16	18	396	85	10	1	27	1020
12:00 PM	5	103	0	21	0	2	3	110	14	3	1	5	267
12:15 PM	8	96	1	16	2	4	0	101	19	2	2	4	255
12:30 PM	5	99	4	18	1	9	2	118	19	1	1	2	279
12:45 PM	8	102	3	20	0	5	2	95	15	5	0	1	256
Total	26	400	8	75	3	20	7	424	67	11	4	12	1057
Grand Total	39	764	14	153	9	36	25	820	152	21	5	39	2077
Apprch %	4.8	93.5	1.7	77.3	4.5	18.2	2.5	82.2	15.2	32.3	7.7	60	
Total %	1.9	36.8	0.7	7.4	0.4	1.7	1.2	39.5	7.3	1	0.2	1.9	
Cars	37	761	14	153	9	30	25	818	152	21	5	39	2064
% Cars	94.9	99.6	100	100	100	83.3	100	99.8	100	100	100	100	99.4
Trucks	2	3	0	0	0	6	0	2	0	0	0	0	13
% Trucks	5.1	0.4	0	0	0	16.7	0	0.2	0	0	0	0	0.6

	Route 120 From North				Etna Road From East				Route 120 From South				Old Etna Road From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	5	103	0	108	21	0	2	23	3	110	14	127	3	1	5	9	267
12:15 PM	8	96	1	105	16	2	4	22	0	101	19	120	2	2	4	8	255
12:30 PM	5	99	4	108	18	1	9	28	2	118	19	139	1	1	2	4	279
12:45 PM	8	102	3	113	20	0	5	25	2	95	15	112	5	0	1	6	256
Total Volume	26	400	8	434	75	3	20	98	7	424	67	498	11	4	12	27	1057
% App. Total	6	92.2	1.8		76.5	3.1	20.4		1.4	85.1	13.5		40.7	14.8	44.4		
PHF	.813	.971	.500	.960	.893	.375	.556	.875	.583	.898	.882	.896	.550	.500	.600	.750	.947
Cars	26	398	8	432	75	3	17	95	7	424	67	498	11	4	12	27	1052
% Cars	100	99.5	100	99.5	100	100	85.0	96.9	100	100	100	100	100	100	100	100	99.5
Trucks	0	2	0	2	0	0	3	3	0	0	0	0	0	0	0	0	5
% Trucks	0	0.5	0	0.5	0	0	15.0	3.1	0	0	0	0	0	0	0	0	0.5

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S5
Site Code : 52933005
Start Date : 11/12/2022
Page No : 2

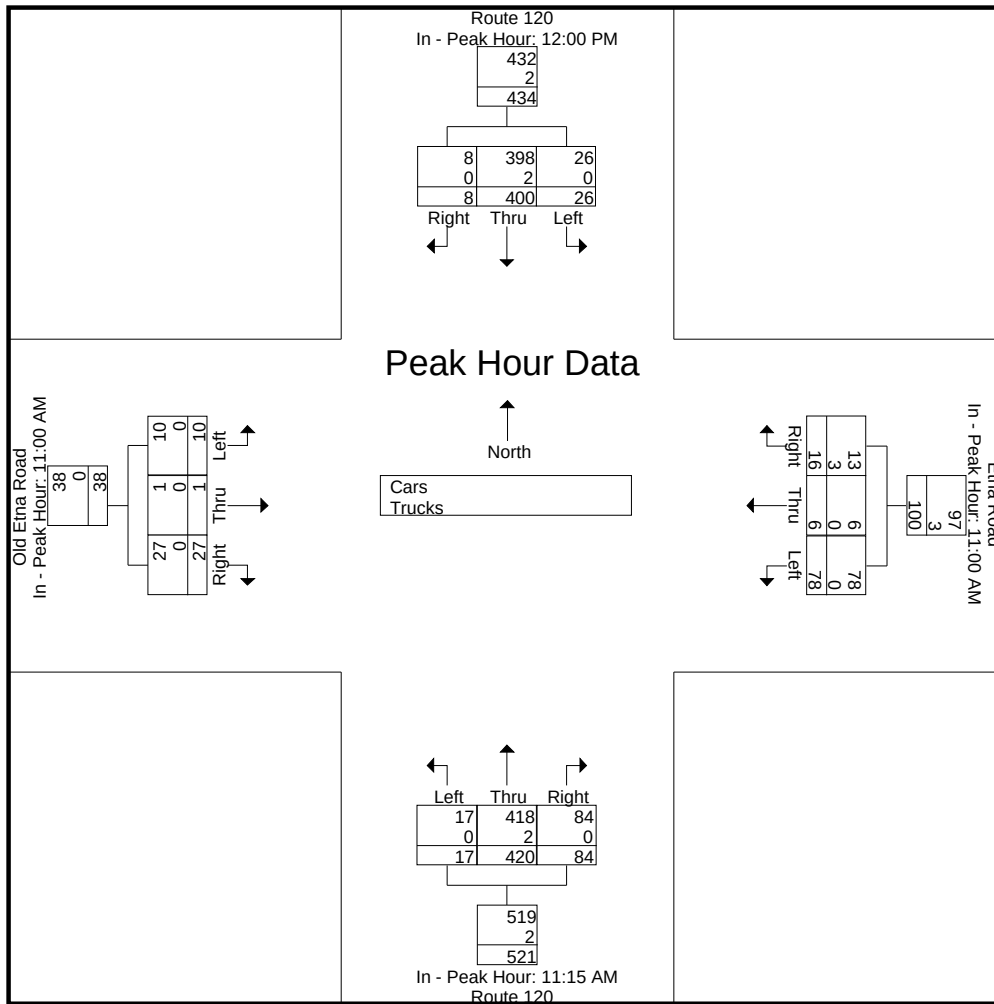


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:00 PM				11:00 AM				11:15 AM				11:00 AM			
+0 mins.	5	103	0	108	24	2	4	30	2	112	21	135	3	0	14	17
+15 mins.	8	96	1	105	23	0	4	27	8	106	22	136	1	0	4	5
+30 mins.	5	99	4	108	15	4	4	23	4	92	27	123	3	1	8	12
+45 mins.	8	102	3	113	16	0	4	20	3	110	14	127	3	0	1	4
Total Volume	26	400	8	434	78	6	16	100	17	420	84	521	10	1	27	38
% App. Total	6	92.2	1.8		78	6	16		3.3	80.6	16.1		26.3	2.6	71.1	
PHF	.813	.971	.500	.960	.813	.375	1.000	.833	.531	.938	.778	.958	.833	.250	.482	.559
Cars	26	398	8	432	78	6	13	97	17	418	84	519	10	1	27	38
% Cars	100	99.5	100	99.5	100	100	81.2	97	100	99.5	100	99.6	100	100	100	100
Trucks	0	2	0	2	0	0	3	3	0	2	0	2	0	0	0	0
% Trucks	0	0.5	0	0.5	0	0	18.8	3	0	0.5	0	0.4	0	0	0	0

File Name : 529330S5
Site Code : 52933005
Start Date : 11/12/2022
Page No : 3

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear



N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S5
Site Code : 52933005
Start Date : 11/12/2022
Page No : 4

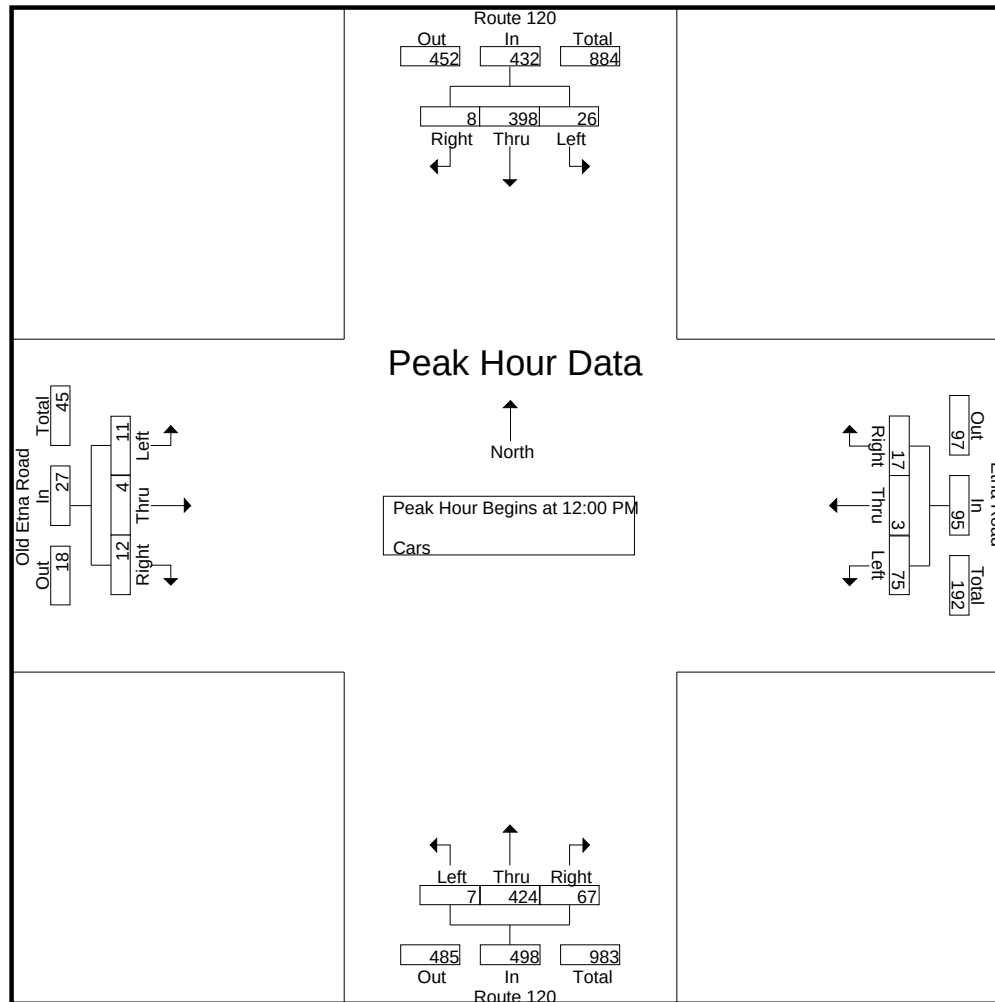
Groups Printed- Cars

	Route 120 From North			Etna Road From East			Route 120 From South			Old Etna Road From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
11:00 AM	5	91	0	24	2	3	4	86	15	3	0	14	247
11:15 AM	1	73	1	23	0	3	2	112	21	1	0	4	241
11:30 AM	3	98	3	15	4	3	8	104	22	3	1	8	272
11:45 AM	2	101	2	16	0	4	4	92	27	3	0	1	252
Total	11	363	6	78	6	13	18	394	85	10	1	27	1012
12:00 PM	5	103	0	21	0	2	3	110	14	3	1	5	267
12:15 PM	8	96	1	16	2	3	0	101	19	2	2	4	254
12:30 PM	5	98	4	18	1	8	2	118	19	1	1	2	277
12:45 PM	8	101	3	20	0	4	2	95	15	5	0	1	254
Total	26	398	8	75	3	17	7	424	67	11	4	12	1052
Grand Total	37	761	14	153	9	30	25	818	152	21	5	39	2064
Apprch %	4.6	93.7	1.7	79.7	4.7	15.6	2.5	82.2	15.3	32.3	7.7	60	
Total %	1.8	36.9	0.7	7.4	0.4	1.5	1.2	39.6	7.4	1	0.2	1.9	

	Route 120 From North				Etna Road From East				Route 120 From South				Old Etna Road From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	5	103	0	108	21	0	2	23	3	110	14	127	3	1	5	9	267
12:15 PM	8	96	1	105	16	2	3	21	0	101	19	120	2	2	4	8	254
12:30 PM	5	98	4	107	18	1	8	27	2	118	19	139	1	1	2	4	277
12:45 PM	8	101	3	112	20	0	4	24	2	95	15	112	5	0	1	6	254
Total Volume	26	398	8	432	75	3	17	95	7	424	67	498	11	4	12	27	1052
% App. Total	6	92.1	1.9		78.9	3.2	17.9		1.4	85.1	13.5		40.7	14.8	44.4		
PHF	.813	.966	.500	.964	.893	.375	.531	.880	.583	.898	.882	.896	.550	.500	.600	.750	.949

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S5
Site Code : 52933005
Start Date : 11/12/2022
Page No : 5

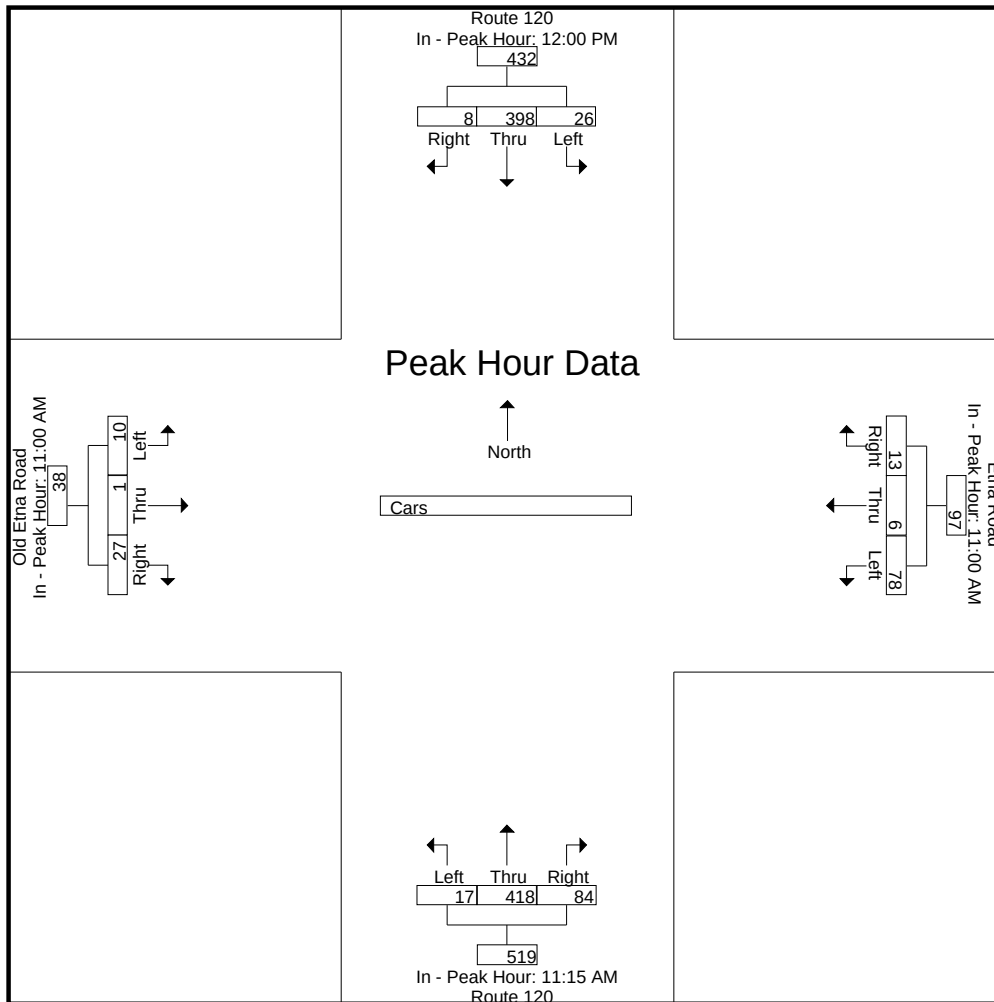


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:00 PM				11:00 AM				11:15 AM				11:00 AM			
+0 mins.	5	103	0	108	24	2	3	29	2	112	21	135	3	0	14	17
+15 mins.	8	96	1	105	23	0	3	26	8	104	22	134	1	0	4	5
+30 mins.	5	98	4	107	15	4	3	22	4	92	27	123	3	1	8	12
+45 mins.	8	101	3	112	16	0	4	20	3	110	14	127	3	0	1	4
Total Volume	26	398	8	432	78	6	13	97	17	418	84	519	10	1	27	38
% App. Total	6	92.1	1.9		80.4	6.2	13.4		3.3	80.5	16.2		26.3	2.6	71.1	
PHF	.813	.966	.500	.964	.813	.375	.813	.836	.531	.933	.778	.961	.833	.250	.482	.559

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S5
Site Code : 52933005
Start Date : 11/12/2022
Page No : 6



N/S Street : Route 120
 E/W Street : Etna Road/Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 529330S5
 Site Code : 52933005
 Start Date : 11/12/2022
 Page No : 7

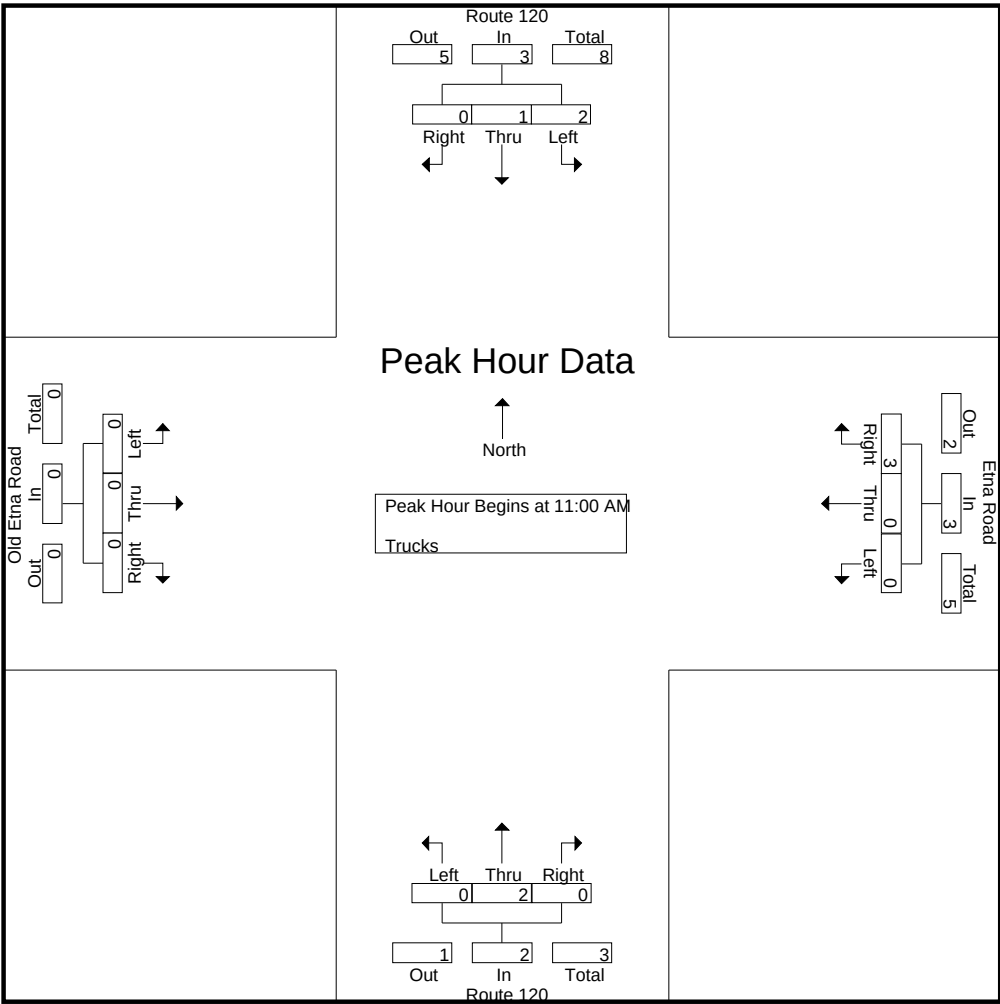
Groups Printed- Trucks

	Route 120 From North			Etna Road From East			Route 120 From South			Old Etna Road From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
11:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	1
11:30 AM	1	0	0	0	0	1	0	2	0	0	0	0	4
11:45 AM	1	1	0	0	0	0	0	0	0	0	0	0	2
Total	2	1	0	0	0	3	0	2	0	0	0	0	8
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	1
12:30 PM	0	1	0	0	0	1	0	0	0	0	0	0	2
12:45 PM	0	1	0	0	0	1	0	0	0	0	0	0	2
Total	0	2	0	0	0	3	0	0	0	0	0	0	5
Grand Total	2	3	0	0	0	6	0	2	0	0	0	0	13
Apprch %	40	60	0	0	0	100	0	100	0	0	0	0	
Total %	15.4	23.1	0	0	0	46.2	0	15.4	0	0	0	0	

	Route 120 From North				Etna Road From East				Route 120 From South				Old Etna Road From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:00 AM																	
11:00 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
11:30 AM	1	0	0	1	0	0	1	1	0	2	0	2	0	0	0	0	4
11:45 AM	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	2	1	0	3	0	0	3	3	0	2	0	2	0	0	0	0	8
% App. Total	66.7	33.3	0		0	0	100		0	100	0		0	0	0		
PHF	.500	.250	.000	.375	.000	.000	.750	.750	.000	.250	.000	.250	.000	.000	.000	.000	.500

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S5
Site Code : 52933005
Start Date : 11/12/2022
Page No : 8

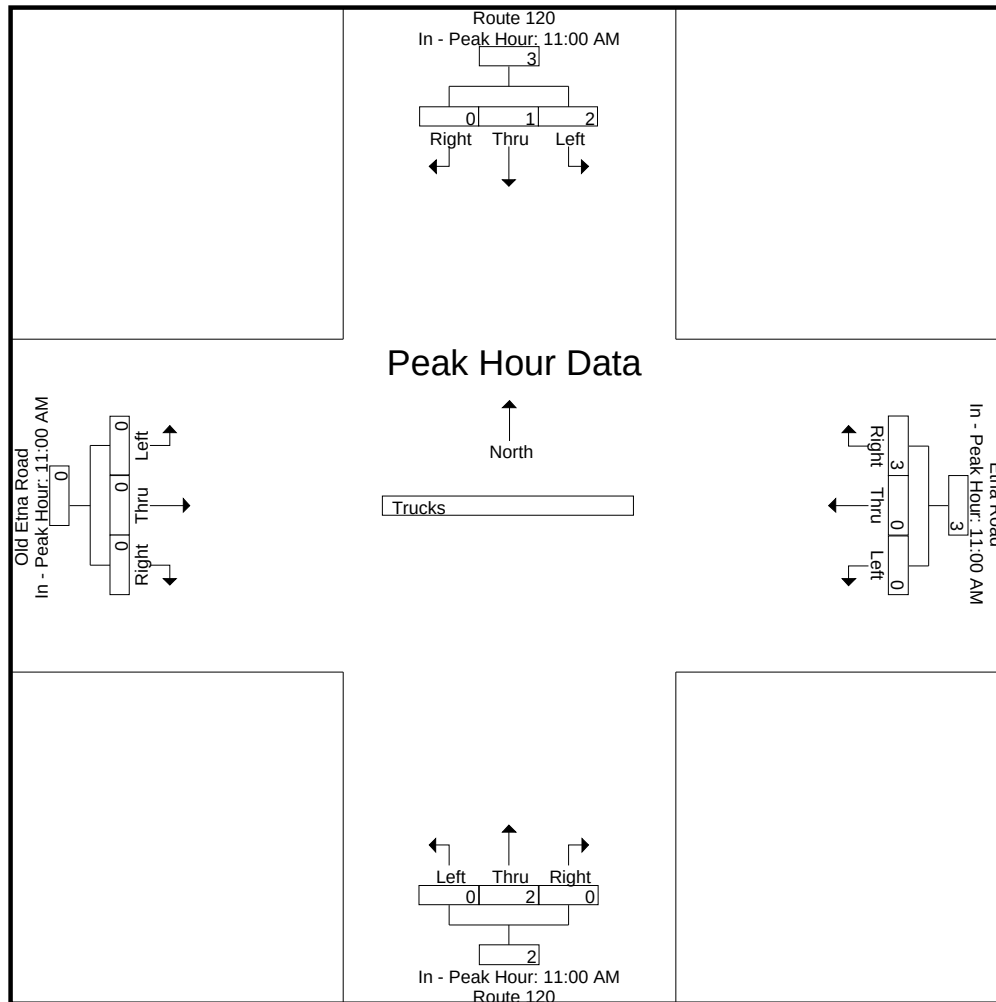


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:00 AM				11:00 AM				11:00 AM				11:00 AM			
+0 mins.	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
+30 mins.	1	0	0	1	0	0	1	1	0	2	0	2	0	0	0	0
+45 mins.	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	2	1	0	3	0	0	3	3	0	2	0	2	0	0	0	0
% App. Total	66.7	33.3	0		0	0	100		0	100	0		0	0	0	
PHF	.500	.250	.000	.375	.000	.000	.750	.750	.000	.250	.000	.250	.000	.000	.000	.000

File Name : 529330S5
Site Code : 52933005
Start Date : 11/12/2022
Page No : 9

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear



N/S Street : Route 120
 E/W Street : Etna Road/Old Etna Road
 City/State : Lebanon, NH
 Weather : Clear

File Name : 529330S5
 Site Code : 52933005
 Start Date : 11/12/2022
 Page No : 10

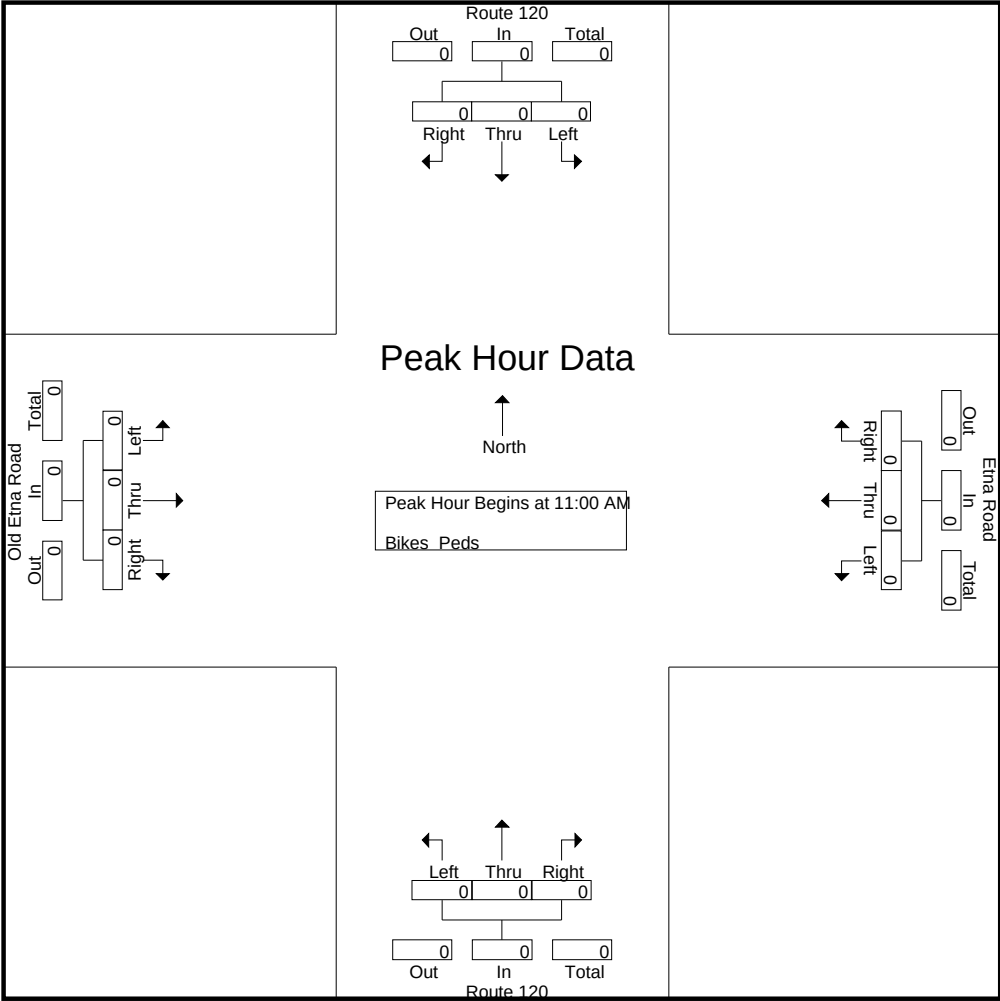
Groups Printed- Bikes Peds

	Route 120 From North				Etna Road From East				Route 120 From South				Old Etna Road From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
11:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2	0	2
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2	0	2
Grand Total	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	3	0	3
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

	Route 120 From North				Etna Road From East				Route 120 From South				Old Etna Road From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:00 AM																	
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S5
Site Code : 52933005
Start Date : 11/12/2022
Page No : 11

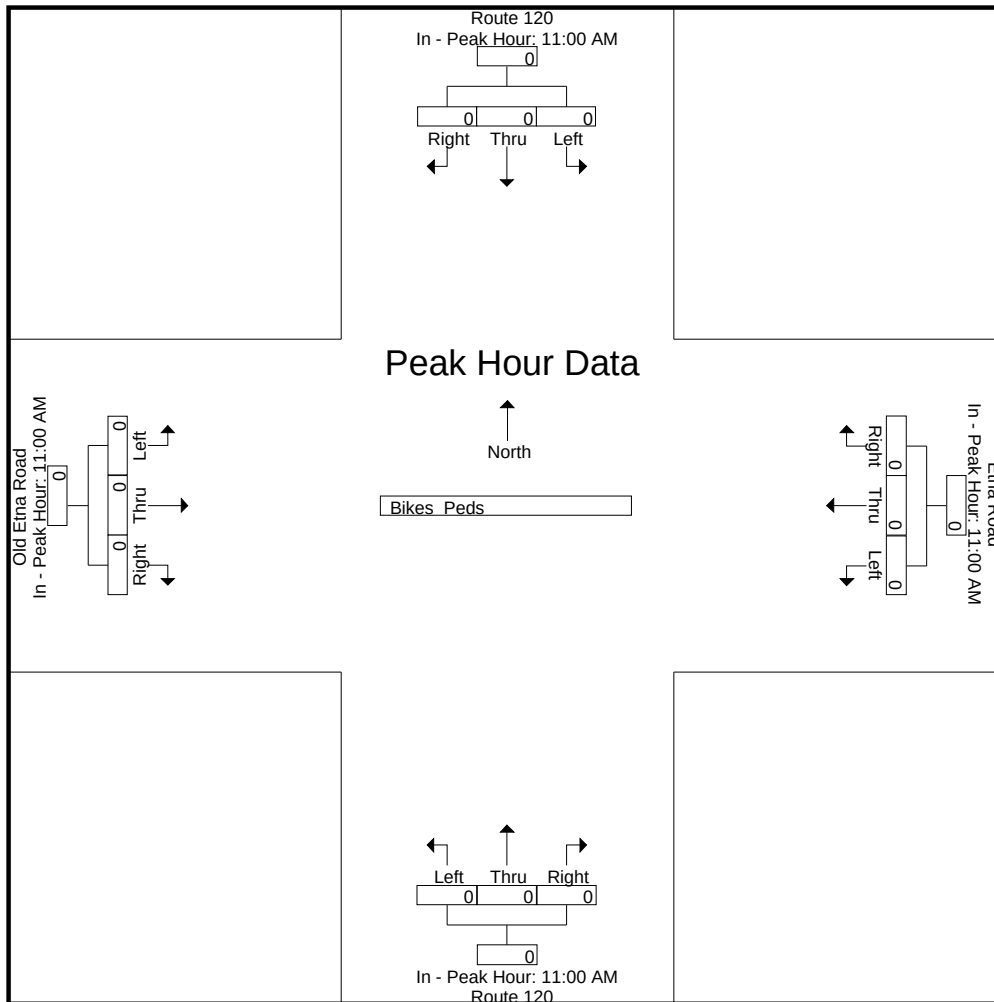


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:00 AM				11:00 AM				11:00 AM				11:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Route 120
E/W Street : Etna Road/Old Etna Road
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S5
Site Code : 52933005
Start Date : 11/12/2022
Page No : 12



N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 52933006
Site Code : 52933006
Start Date : 11/10/2022
Page No : 1

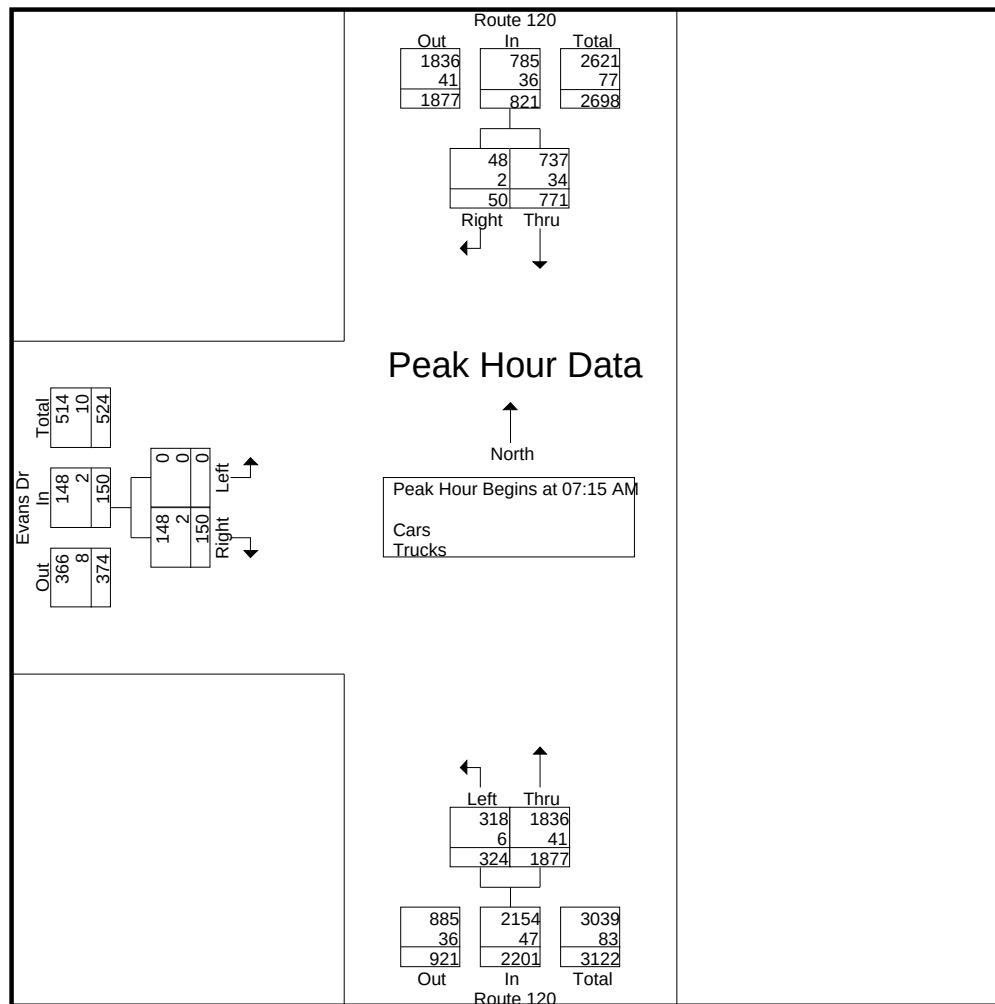
Groups Printed- Cars - Trucks

	Route 120 From North			Route 120 From South			Evans Dr From West			
Start Time	Thru	Right		Left	Thru		Left	Right		Int. Total
07:00 AM	175	9		102	361		1	20		668
07:15 AM	176	19		161	399		0	52		807
07:30 AM	202	18		65	493		0	36		814
07:45 AM	207	11		64	553		0	35		870
Total	760	57		392	1806		1	143		3159
08:00 AM	186	2		34	432		0	27		681
08:15 AM	134	3		22	388		0	21		568
08:30 AM	161	2		9	374		0	9		555
08:45 AM	164	0		17	277		1	11		470
Total	645	7		82	1471		1	68		2274
Grand Total	1405	64		474	3277		2	211		5433
Apprch %	95.6	4.4		12.6	87.4		0.9	99.1		
Total %	25.9	1.2		8.7	60.3		0	3.9		
Cars	1334	62		463	3196		2	205		5262
% Cars	94.9	96.9		97.7	97.5		100	97.2		96.9
Trucks	71	2		11	81		0	6		171
% Trucks	5.1	3.1		2.3	2.5		0	2.8		3.1

	Route 120 From North			Route 120 From South			Evans Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	176	19	195	161	399	560	0	52	52	807
07:30 AM	202	18	220	65	493	558	0	36	36	814
07:45 AM	207	11	218	64	553	617	0	35	35	870
08:00 AM	186	2	188	34	432	466	0	27	27	681
Total Volume	771	50	821	324	1877	2201	0	150	150	3172
% App. Total	93.9	6.1		14.7	85.3		0	100		
PHF	.931	.658	.933	.503	.849	.892	.000	.721	.721	.911
Cars	737	48	785	318	1836	2154	0	148	148	3087
% Cars	95.6	96.0	95.6	98.1	97.8	97.9	0	98.7	98.7	97.3
Trucks	34	2	36	6	41	47	0	2	2	85
% Trucks	4.4	4.0	4.4	1.9	2.2	2.1	0	1.3	1.3	2.7

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 52933006
Site Code : 52933006
Start Date : 11/10/2022
Page No : 2

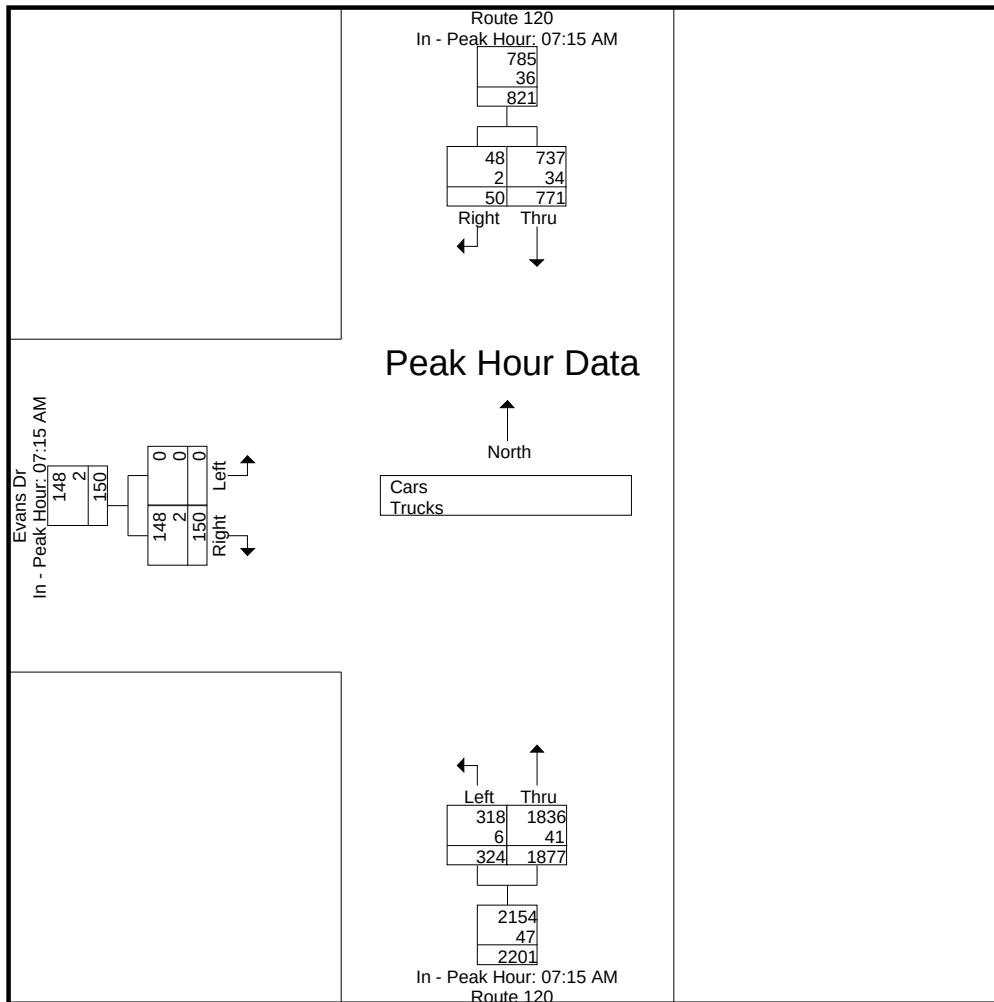


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	176	19	195	161	399	560	0	52	52
+15 mins.	202	18	220	65	493	558	0	36	36
+30 mins.	207	11	218	64	553	617	0	35	35
+45 mins.	186	2	188	34	432	466	0	27	27
Total Volume	771	50	821	324	1877	2201	0	150	150
% App. Total	93.9	6.1		14.7	85.3		0	100	
PHF	.931	.658	.933	.503	.849	.892	.000	.721	.721
Cars	737	48	785	318	1836	2154	0	148	148
% Cars	95.6	96	95.6	98.1	97.8	97.9	0	98.7	98.7
Trucks	34	2	36	6	41	47	0	2	2
% Trucks	4.4	4	4.4	1.9	2.2	2.1	0	1.3	1.3

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

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N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 52933006
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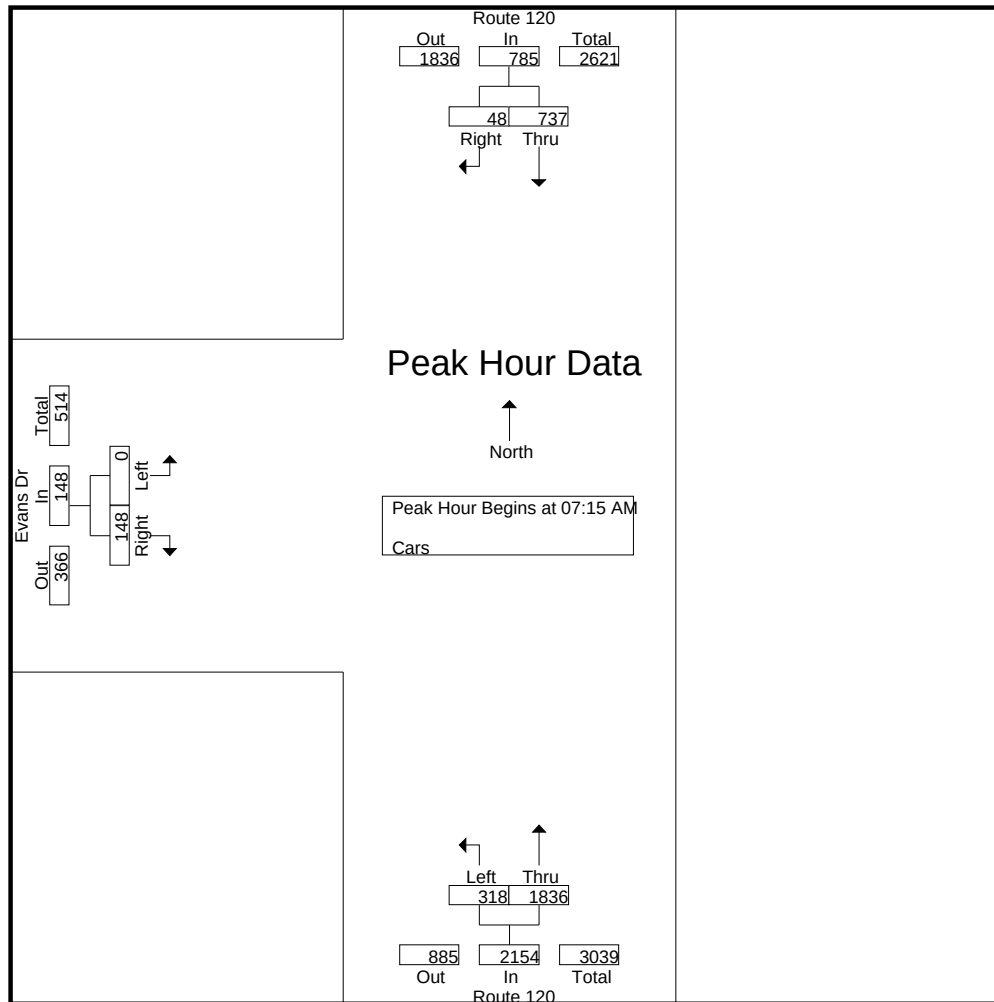
Groups Printed- Cars

	Route 120 From North		Route 120 From South		Evans Dr From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	164	9	98	355	1	17	644
07:15 AM	172	19	159	388	0	51	789
07:30 AM	191	17	65	482	0	35	790
07:45 AM	196	10	62	539	0	35	842
Total	723	55	384	1764	1	138	3065
08:00 AM	178	2	32	427	0	27	666
08:15 AM	127	3	22	374	0	21	547
08:30 AM	152	2	8	365	0	8	535
08:45 AM	154	0	17	266	1	11	449
Total	611	7	79	1432	1	67	2197
Grand Total	1334	62	463	3196	2	205	5262
Apprch %	95.6	4.4	12.7	87.3	1	99	
Total %	25.4	1.2	8.8	60.7	0	3.9	

	Route 120 From North			Route 120 From South			Evans Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	172	19	191	159	388	547	0	51	51	789
07:30 AM	191	17	208	65	482	547	0	35	35	790
07:45 AM	196	10	206	62	539	601	0	35	35	842
08:00 AM	178	2	180	32	427	459	0	27	27	666
Total Volume	737	48	785	318	1836	2154	0	148	148	3087
% App. Total	93.9	6.1		14.8	85.2		0	100		
PHF	.940	.632	.944	.500	.852	.896	.000	.725	.725	.917

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 52933006
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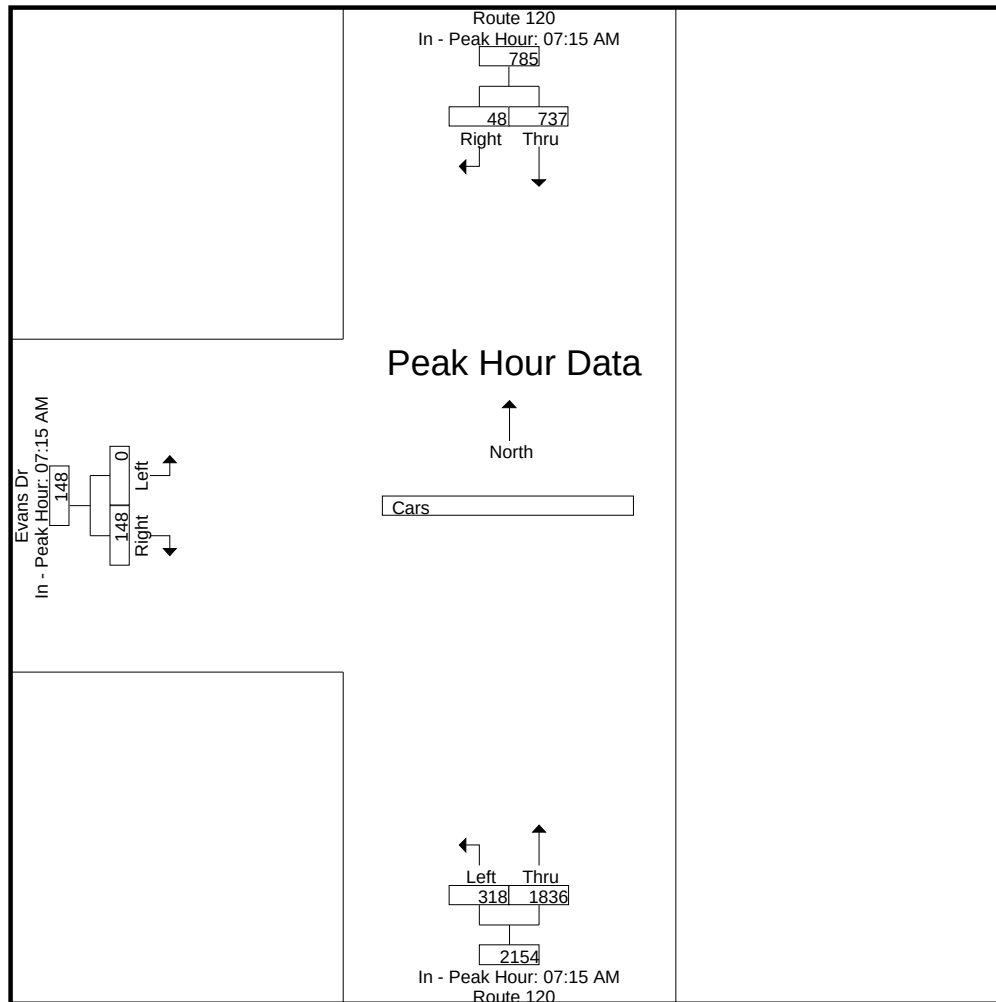


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	172	19	191	159	388	547	0	51	51
+15 mins.	191	17	208	65	482	547	0	35	35
+30 mins.	196	10	206	62	539	601	0	35	35
+45 mins.	178	2	180	32	427	459	0	27	27
Total Volume	737	48	785	318	1836	2154	0	148	148
% App. Total	93.9	6.1		14.8	85.2		0	100	
PHF	.940	.632	.944	.500	.852	.896	.000	.725	.725

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

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N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

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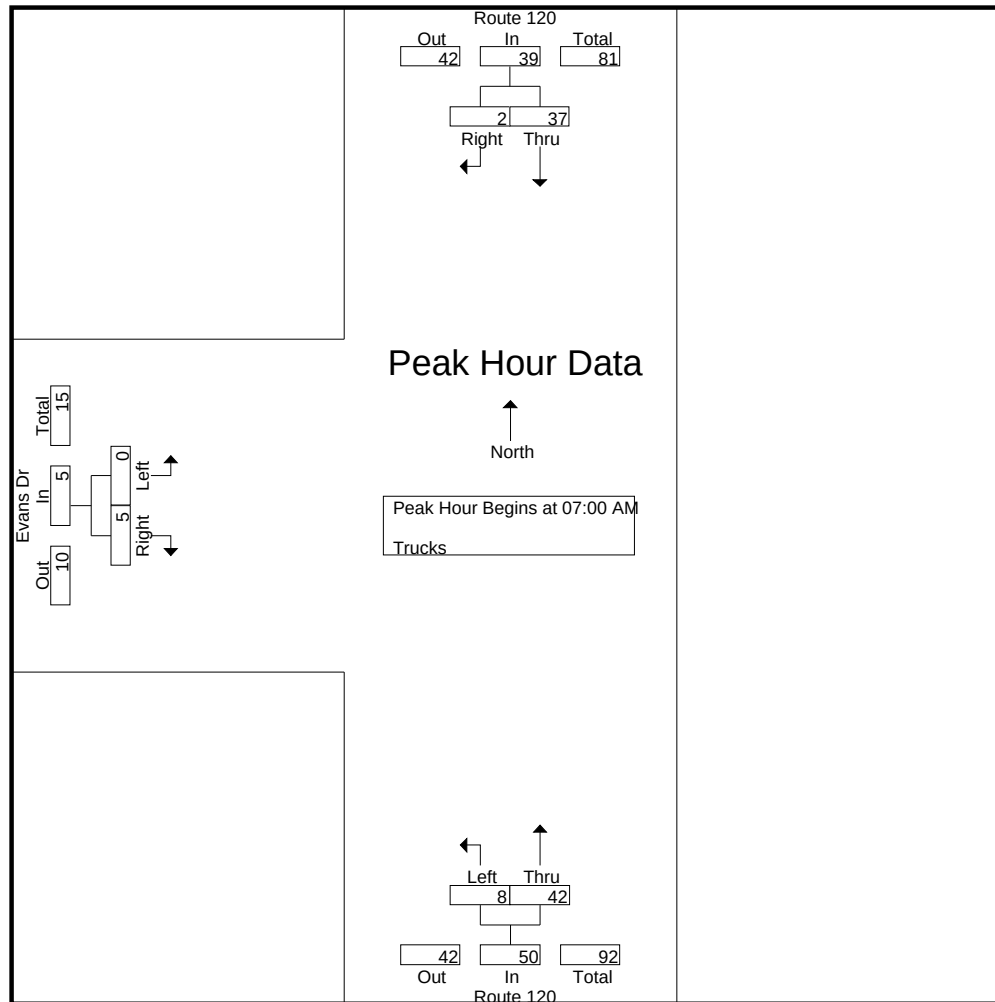
Groups Printed- Trucks

	Route 120 From North		Route 120 From South		Evans Dr From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	11	0	4	6	0	3	24
07:15 AM	4	0	2	11	0	1	18
07:30 AM	11	1	0	11	0	1	24
07:45 AM	11	1	2	14	0	0	28
Total	37	2	8	42	0	5	94
08:00 AM	8	0	2	5	0	0	15
08:15 AM	7	0	0	14	0	0	21
08:30 AM	9	0	1	9	0	1	20
08:45 AM	10	0	0	11	0	0	21
Total	34	0	3	39	0	1	77
Grand Total	71	2	11	81	0	6	171
Apprch %	97.3	2.7	12	88	0	100	
Total %	41.5	1.2	6.4	47.4	0	3.5	

	Route 120 From North			Route 120 From South			Evans Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	11	0	11	4	6	10	0	3	3	24
07:15 AM	4	0	4	2	11	13	0	1	1	18
07:30 AM	11	1	12	0	11	11	0	1	1	24
07:45 AM	11	1	12	2	14	16	0	0	0	28
Total Volume	37	2	39	8	42	50	0	5	5	94
% App. Total	94.9	5.1		16	84		0	100		
PHF	.841	.500	.813	.500	.750	.781	.000	.417	.417	.839

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

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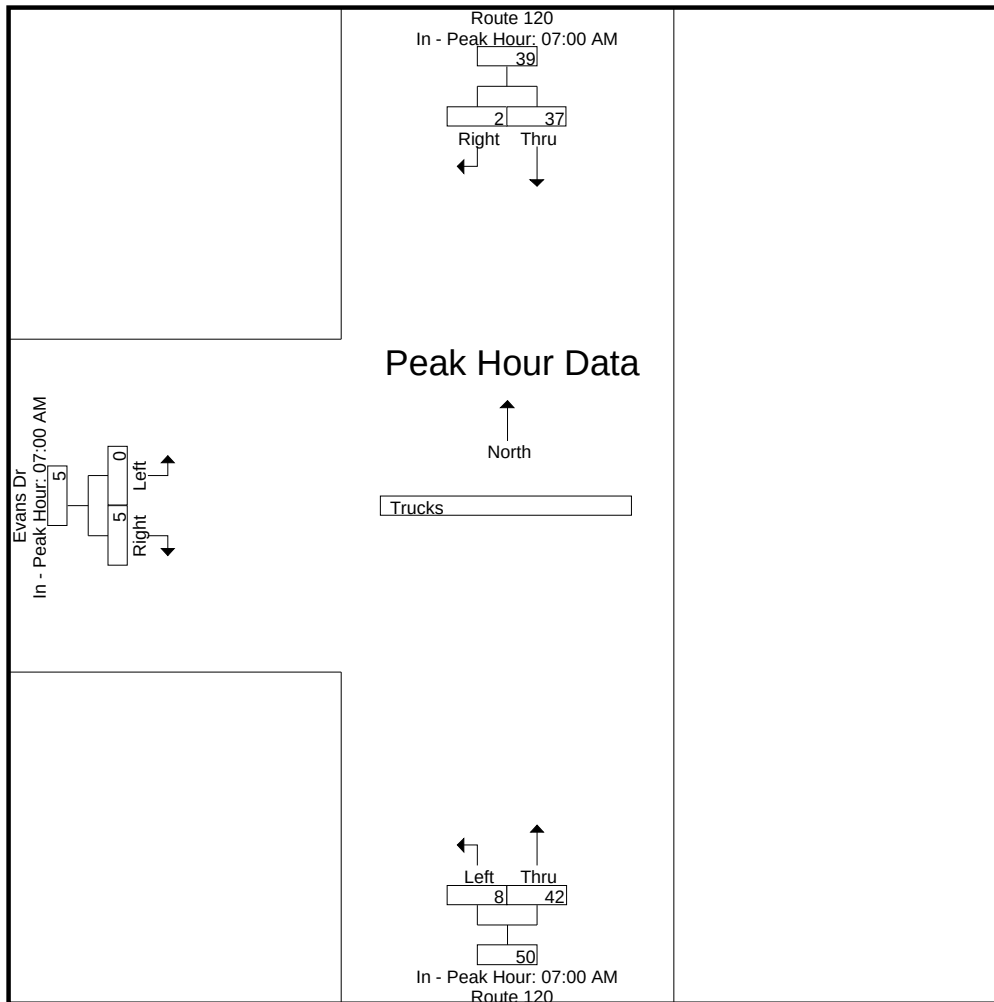


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	11	0	11	4	6	10	0	3	3
+15 mins.	4	0	4	2	11	13	0	1	1
+30 mins.	11	1	12	0	11	11	0	1	1
+45 mins.	11	1	12	2	14	16	0	0	0
Total Volume	37	2	39	8	42	50	0	5	5
% App. Total	94.9	5.1		16	84		0	100	
PHF	.841	.500	.813	.500	.750	.781	.000	.417	.417

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

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N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

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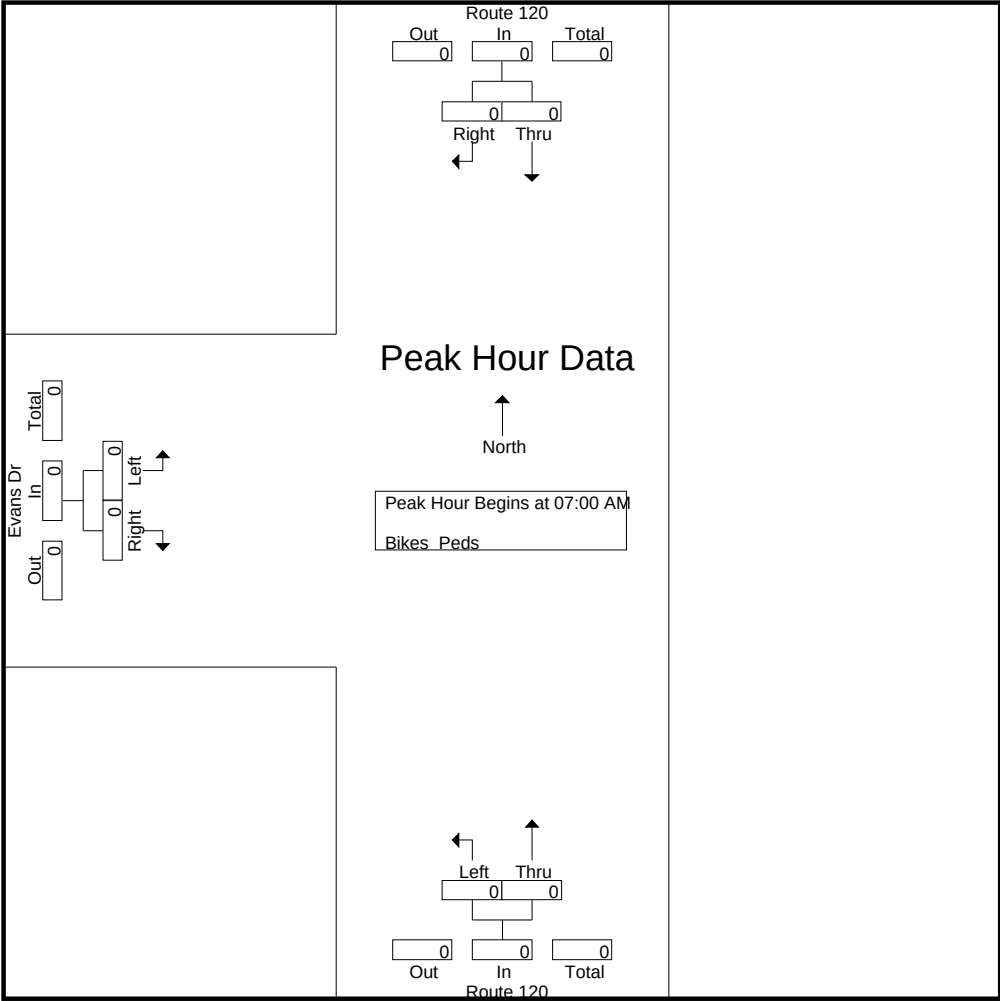
Groups Printed- Bikes Peds

	Route 120 From North			Route 120 From South			Evans Dr From West					
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0				
Total %										0	0	

	Route 120 From North			Route 120 From South			Evans Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

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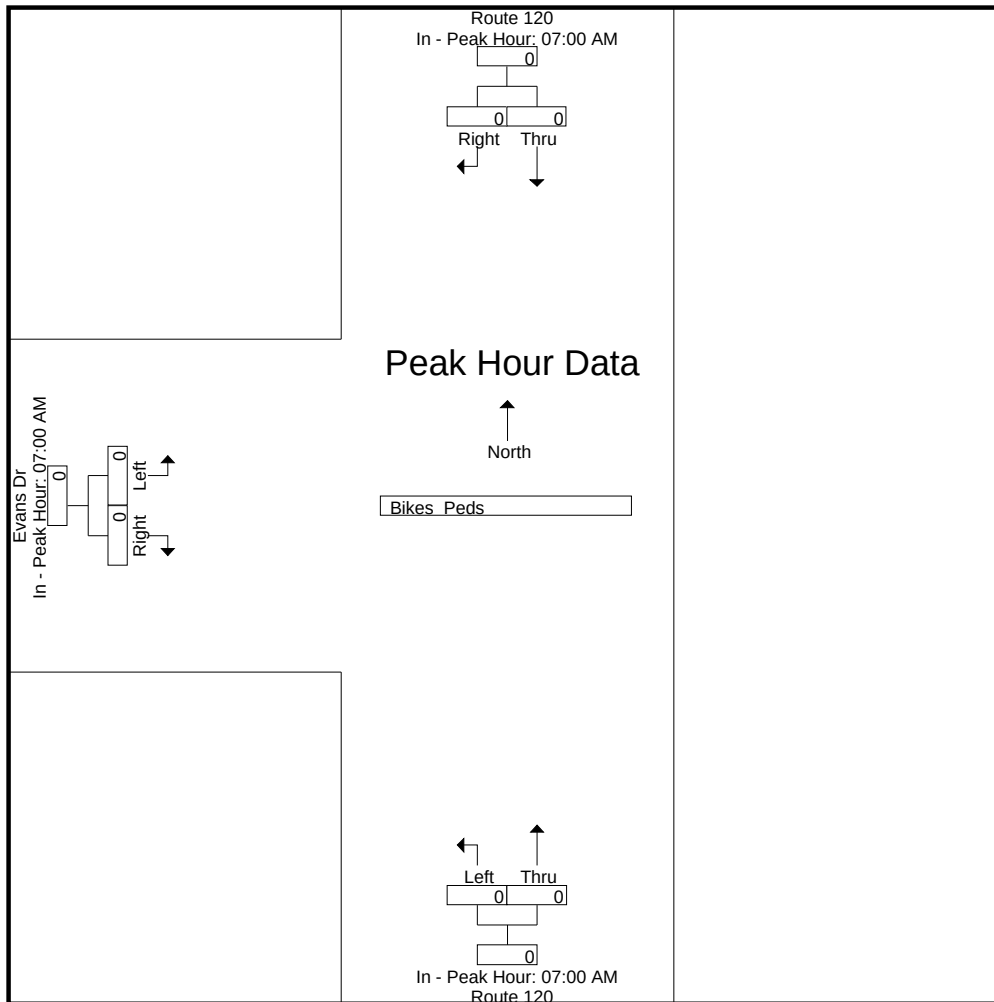


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

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N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

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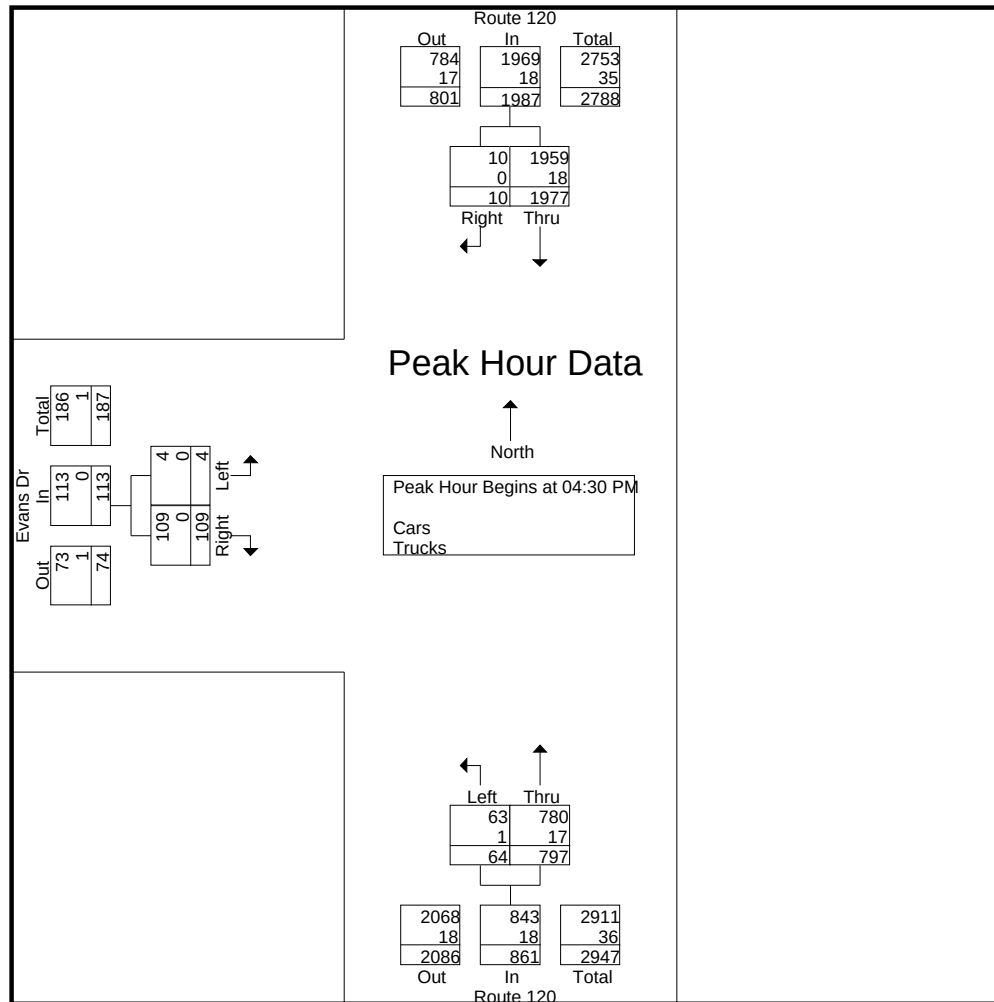
Groups Printed- Cars - Trucks

	Route 120 From North		Route 120 From South		Evans Dr From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
02:00 PM	268	2	31	223	0	56	580
02:15 PM	342	5	28	239	0	32	646
02:30 PM	355	5	33	263	0	30	686
02:45 PM	351	11	30	273	1	36	702
Total	1316	23	122	998	1	154	2614
03:00 PM	404	2	21	210	2	50	689
03:15 PM	385	1	12	181	2	38	619
03:30 PM	473	2	14	190	1	25	705
03:45 PM	452	2	13	212	1	21	701
Total	1714	7	60	793	6	134	2714
04:00 PM	427	2	13	181	0	29	652
04:15 PM	497	2	10	183	0	28	720
04:30 PM	471	0	20	192	2	29	714
04:45 PM	478	8	13	207	1	19	726
Total	1873	12	56	763	3	105	2812
05:00 PM	496	1	18	193	1	32	741
05:15 PM	532	1	13	205	0	29	780
05:30 PM	363	0	6	165	2	15	551
05:45 PM	284	1	10	141	0	11	447
Total	1675	3	47	704	3	87	2519
Grand Total	6578	45	285	3258	13	480	10659
Apprch %	99.3	0.7	8	92	2.6	97.4	
Total %	61.7	0.4	2.7	30.6	0.1	4.5	
Cars	6479	43	268	3181	13	475	10459
% Cars	98.5	95.6	94	97.6	100	99	98.1
Trucks	99	2	17	77	0	5	200
% Trucks	1.5	4.4	6	2.4	0	1	1.9

	Route 120 From North			Route 120 From South			Evans Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	471	0	471	20	192	212	2	29	31	714
04:45 PM	478	8	486	13	207	220	1	19	20	726
05:00 PM	496	1	497	18	193	211	1	32	33	741
05:15 PM	532	1	533	13	205	218	0	29	29	780
Total Volume	1977	10	1987	64	797	861	4	109	113	2961
% App. Total	99.5	0.5		7.4	92.6		3.5	96.5		
PHF	.929	.313	.932	.800	.963	.978	.500	.852	.856	.949
Cars	1959	10	1969	63	780	843	4	109	113	2925
% Cars	99.1	100	99.1	98.4	97.9	97.9	100	100	100	98.8
Trucks	18	0	18	1	17	18	0	0	0	36
% Trucks	0.9	0	0.9	1.6	2.1	2.1	0	0	0	1.2

N/S Street : Route 120
E/W Street : Evans Drive
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Weather : Clear

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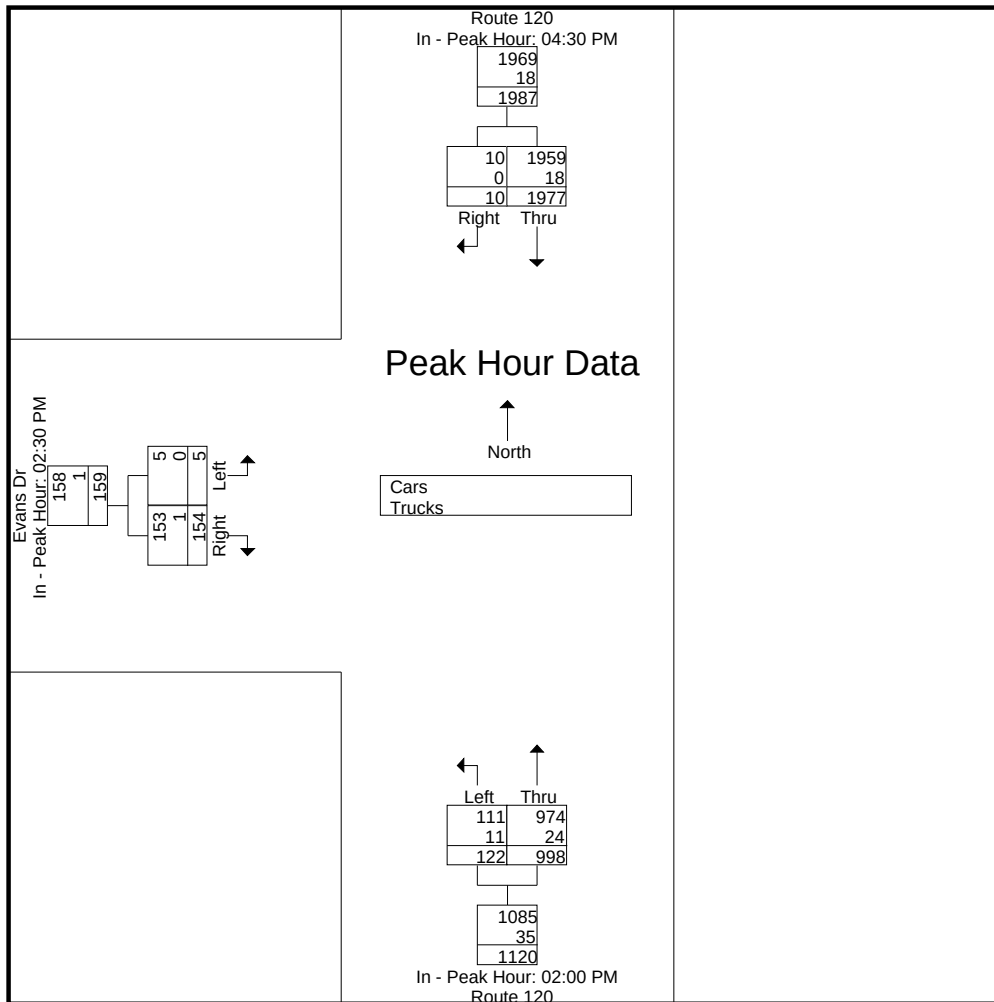


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM			02:00 PM			02:30 PM		
+0 mins.	471	0	471	31	223	254	0	30	30
+15 mins.	478	8	486	28	239	267	1	36	37
+30 mins.	496	1	497	33	263	296	2	50	52
+45 mins.	532	1	533	30	273	303	2	38	40
Total Volume	1977	10	1987	122	998	1120	5	154	159
% App. Total	99.5	0.5		10.9	89.1		3.1	96.9	
PHF	.929	.313	.932	.924	.914	.924	.625	.770	.764
Cars	1959	10	1969	111	974	1085	5	153	158
% Cars	99.1	100	99.1	91	97.6	96.9	100	99.4	99.4
Trucks	18	0	18	11	24	35	0	1	1
% Trucks	0.9	0	0.9	9	2.4	3.1	0	0.6	0.6

N/S Street : Route 120
E/W Street : Evans Drive
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N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

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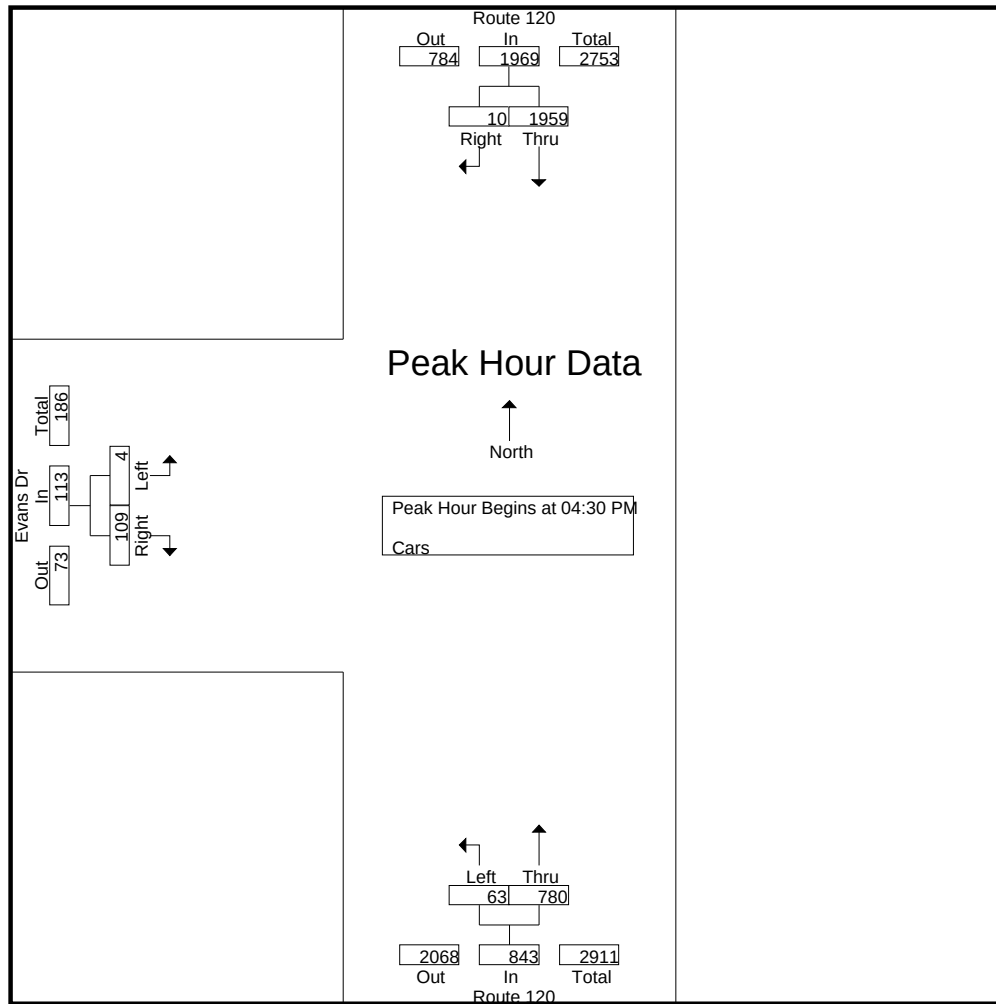
Groups Printed- Cars

	Route 120 From North		Route 120 From South		Evans Dr From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
02:00 PM	256	2	29	216	0	53	556
02:15 PM	341	4	24	232	0	31	632
02:30 PM	339	5	29	258	0	29	660
02:45 PM	338	11	29	268	1	36	683
Total	1274	22	111	974	1	149	2531
03:00 PM	399	2	20	205	2	50	678
03:15 PM	380	1	10	177	2	38	608
03:30 PM	468	1	14	180	1	25	689
03:45 PM	445	2	12	205	1	21	686
Total	1692	6	56	767	6	134	2661
04:00 PM	422	2	12	181	0	29	646
04:15 PM	492	2	10	180	0	28	712
04:30 PM	466	0	19	188	2	29	704
04:45 PM	474	8	13	199	1	19	714
Total	1854	12	54	748	3	105	2776
05:00 PM	492	1	18	191	1	32	735
05:15 PM	527	1	13	202	0	29	772
05:30 PM	358	0	6	160	2	15	541
05:45 PM	282	1	10	139	0	11	443
Total	1659	3	47	692	3	87	2491
Grand Total	6479	43	268	3181	13	475	10459
Apprch %	99.3	0.7	7.8	92.2	2.7	97.3	
Total %	61.9	0.4	2.6	30.4	0.1	4.5	

	Route 120 From North			Route 120 From South			Evans Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	466	0	466	19	188	207	2	29	31	704
04:45 PM	474	8	482	13	199	212	1	19	20	714
05:00 PM	492	1	493	18	191	209	1	32	33	735
05:15 PM	527	1	528	13	202	215	0	29	29	772
Total Volume	1959	10	1969	63	780	843	4	109	113	2925
% App. Total	99.5	0.5		7.5	92.5		3.5	96.5		
PHF	.929	.313	.932	.829	.965	.980	.500	.852	.856	.947

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

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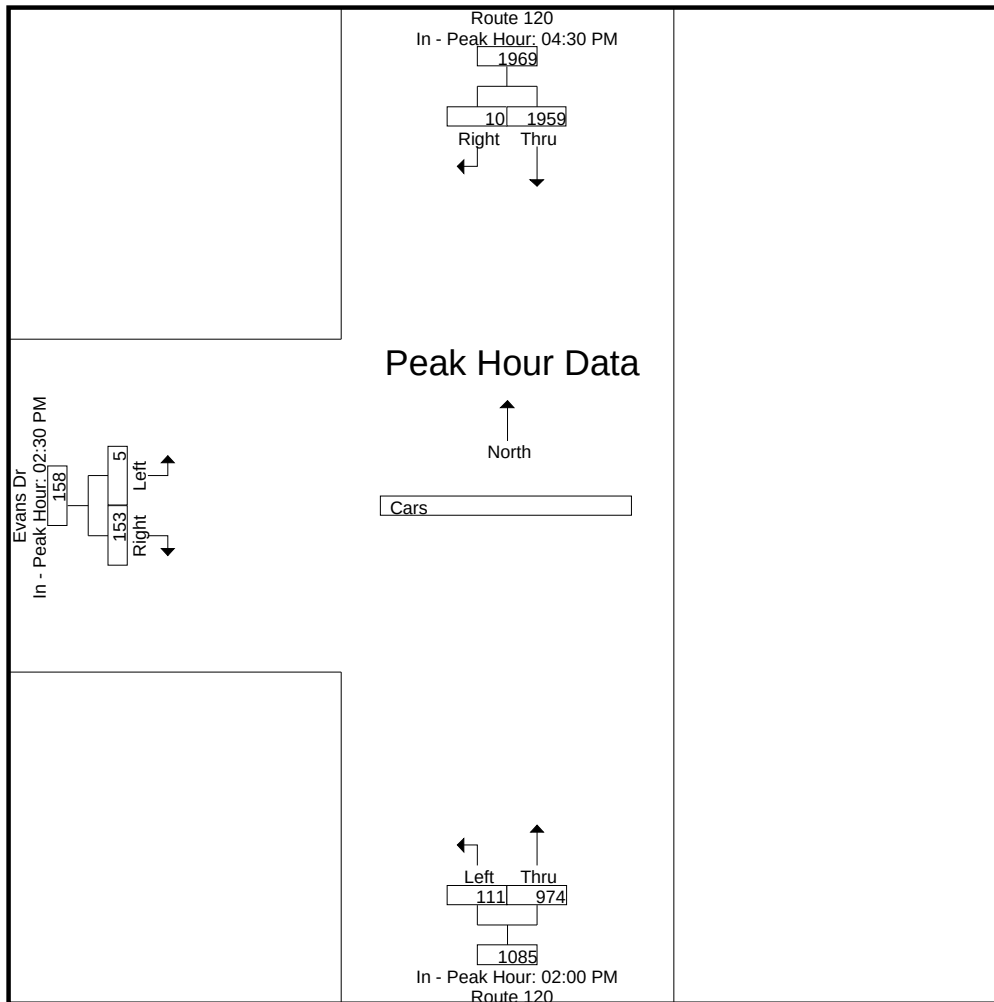


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM			02:00 PM			02:30 PM		
+0 mins.	466	0	466	29	216	245	0	29	29
+15 mins.	474	8	482	24	232	256	1	36	37
+30 mins.	492	1	493	29	258	287	2	50	52
+45 mins.	527	1	528	29	268	297	2	38	40
Total Volume	1959	10	1969	111	974	1085	5	153	158
% App. Total	99.5	0.5		10.2	89.8		3.2	96.8	
PHF	.929	.313	.932	.957	.909	.913	.625	.765	.760

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

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N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

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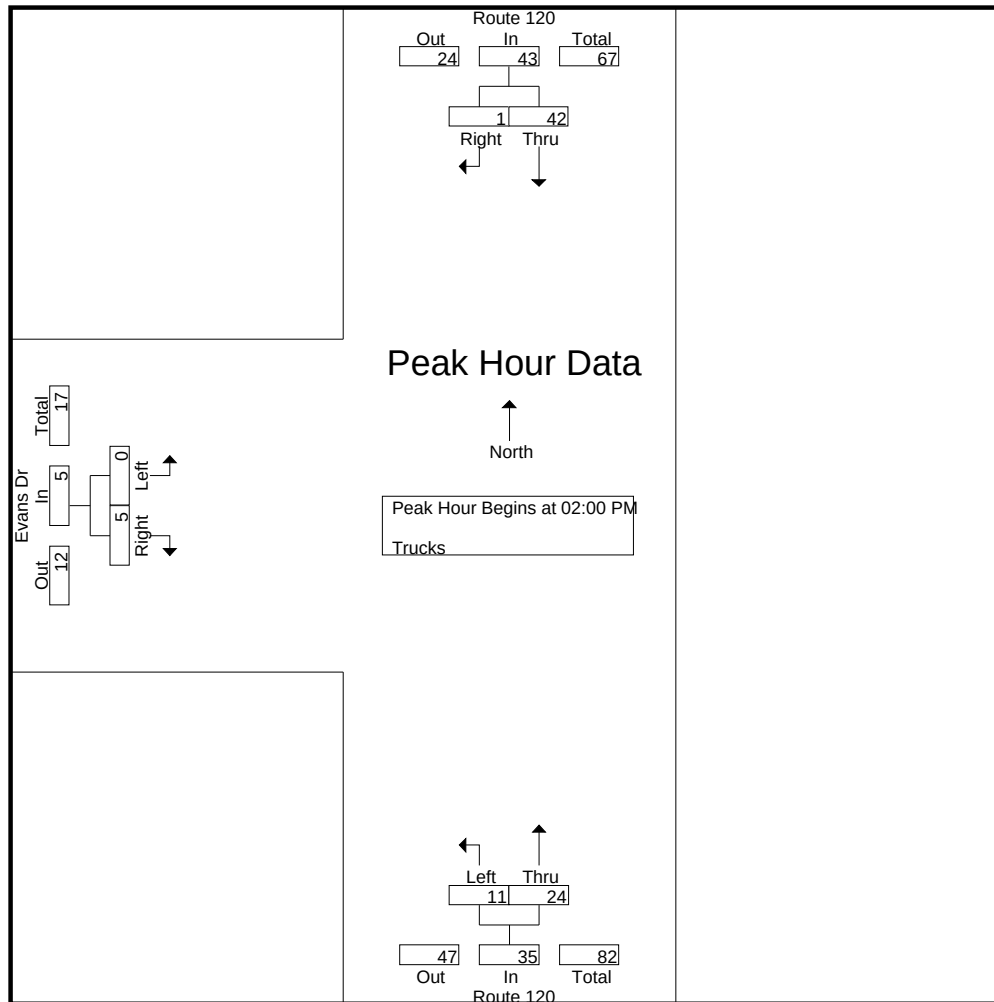
Groups Printed- Trucks

	Route 120 From North		Route 120 From South		Evans Dr From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
02:00 PM	12	0	2	7	0	3	24
02:15 PM	1	1	4	7	0	1	14
02:30 PM	16	0	4	5	0	1	26
02:45 PM	13	0	1	5	0	0	19
Total	42	1	11	24	0	5	83
03:00 PM	5	0	1	5	0	0	11
03:15 PM	5	0	2	4	0	0	11
03:30 PM	5	1	0	10	0	0	16
03:45 PM	7	0	1	7	0	0	15
Total	22	1	4	26	0	0	53
04:00 PM	5	0	1	0	0	0	6
04:15 PM	5	0	0	3	0	0	8
04:30 PM	5	0	1	4	0	0	10
04:45 PM	4	0	0	8	0	0	12
Total	19	0	2	15	0	0	36
05:00 PM	4	0	0	2	0	0	6
05:15 PM	5	0	0	3	0	0	8
05:30 PM	5	0	0	5	0	0	10
05:45 PM	2	0	0	2	0	0	4
Total	16	0	0	12	0	0	28
Grand Total	99	2	17	77	0	5	200
Apprch %	98	2	18.1	81.9	0	100	
Total %	49.5	1	8.5	38.5	0	2.5	

	Route 120 From North			Route 120 From South			Evans Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	12	0	12	2	7	9	0	3	3	24
02:15 PM	1	1	2	4	7	11	0	1	1	14
02:30 PM	16	0	16	4	5	9	0	1	1	26
02:45 PM	13	0	13	1	5	6	0	0	0	19
Total Volume	42	1	43	11	24	35	0	5	5	83
% App. Total	97.7	2.3		31.4	68.6		0	100		
PHF	.656	.250	.672	.688	.857	.795	.000	.417	.417	.798

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

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Start Date : 11/10/2022
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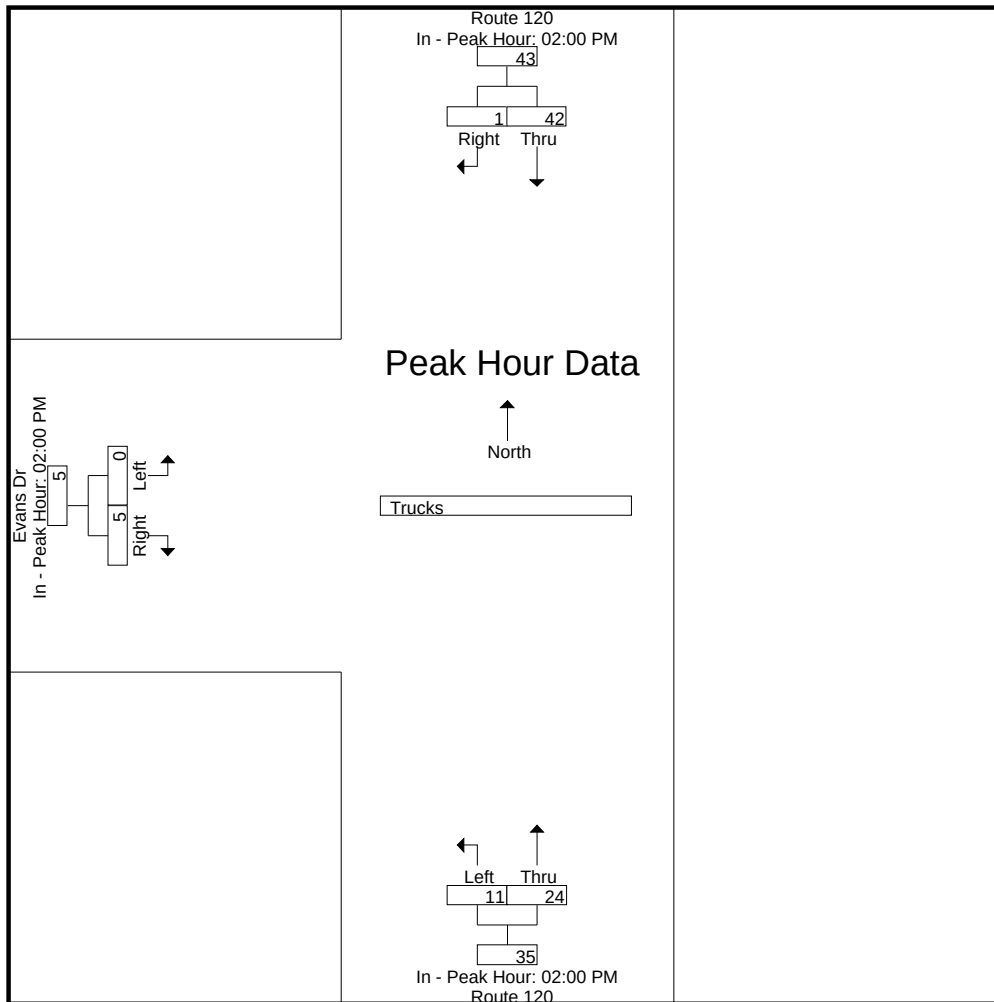


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	02:00 PM			02:00 PM			02:00 PM		
+0 mins.	12	0	12	2	7	9	0	3	3
+15 mins.	1	1	2	4	7	11	0	1	1
+30 mins.	16	0	16	4	5	9	0	1	1
+45 mins.	13	0	13	1	5	6	0	0	0
Total Volume	42	1	43	11	24	35	0	5	5
% App. Total	97.7	2.3		31.4	68.6		0	100	
PHF	.656	.250	.672	.688	.857	.795	.000	.417	.417

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 52933006
Site Code : 52933006
Start Date : 11/10/2022
Page No : 9



N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 52933006
Site Code : 52933006
Start Date : 11/10/2022
Page No : 10

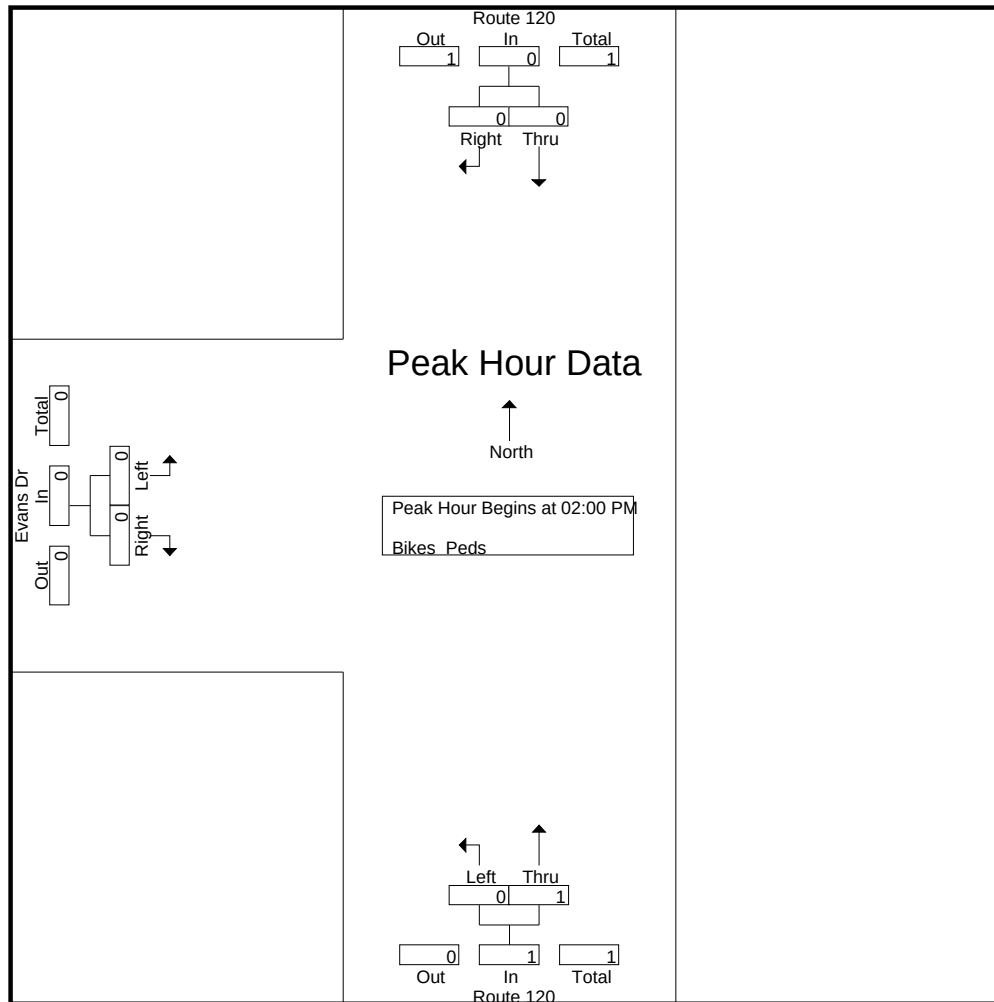
Groups Printed- Bikes Peds

Start Time	Route 120 From North			Route 120 From South			Evans Dr From West			Exclu. Total	Inclu. Total	Int. Total
	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds			
02:00 PM	0	0	0	0	1	0	0	0	0	0	1	1
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	0	0	0	1	1
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	1	0	0	0	0	0	1	1
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	0	0	0	1	1
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	1	0	0	0	1	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	0	1	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	2	1	0	0	0	1	2	3
Apprch %	0	0		0	100		0	0				
Total %	0	0		0	100		0	0		33.3	66.7	

	Route 120 From North			Route 120 From South			Evans Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	0	0	0	0	1	1	0	0	0	1
02:15 PM	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	1	0	0	0	1
% App. Total	0	0		0	100		0	0		
PHF	.000	.000	.000	.000	.250	.250	.000	.000	.000	.250

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 52933006
Site Code : 52933006
Start Date : 11/10/2022
Page No : 11

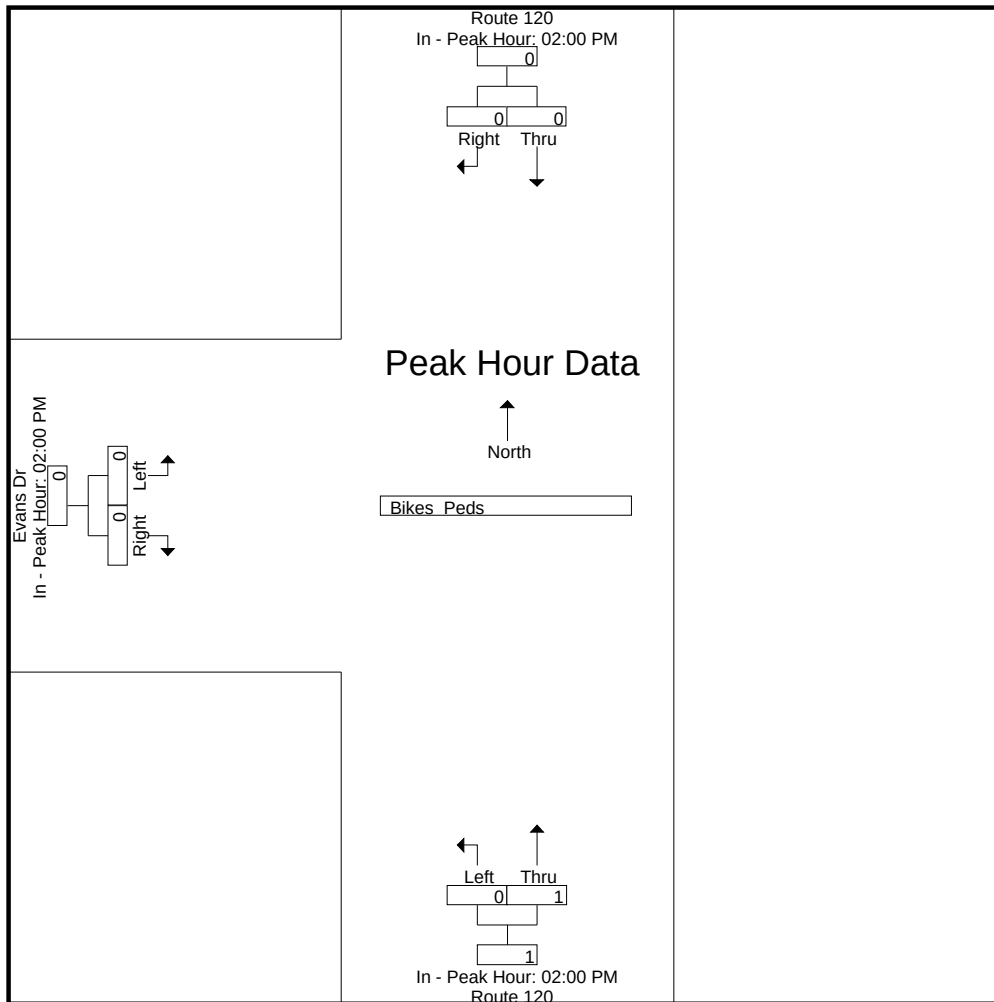


Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	02:00 PM			02:00 PM			02:00 PM		
+0 mins.	0	0	0	0	1	1	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	1	0	0	0
% App. Total	0	0		0	100		0	0	
PHF	.000	.000	.000	.000	.250	.250	.000	.000	.000

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 52933006
Site Code : 52933006
Start Date : 11/10/2022
Page No : 12



N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S6
Site Code : 52933006
Start Date : 11/12/2022
Page No : 1

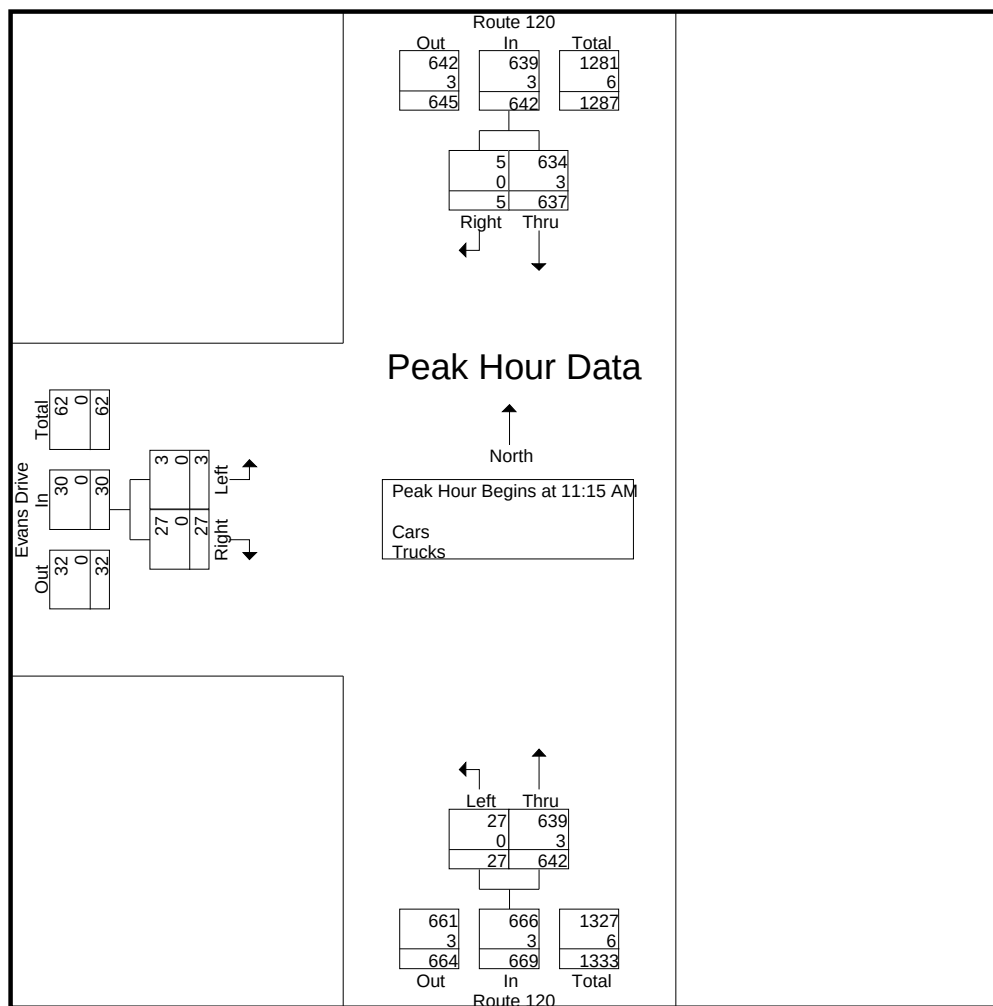
Groups Printed- Cars - Trucks

	Route 120 From North		Route 120 From South		Evans Drive From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
11:00 AM	183	3	11	133	7	6	343
11:15 AM	155	1	8	161	2	6	333
11:30 AM	160	2	7	164	0	4	337
11:45 AM	157	2	6	149	0	9	323
Total	655	8	32	607	9	25	1336
12:00 PM	165	0	6	168	1	8	348
12:15 PM	155	3	9	150	3	9	329
12:30 PM	157	2	9	160	3	8	339
12:45 PM	144	1	2	125	1	3	276
Total	621	6	26	603	8	28	1292
Grand Total	1276	14	58	1210	17	53	2628
Apprch %	98.9	1.1	4.6	95.4	24.3	75.7	
Total %	48.6	0.5	2.2	46	0.6	2	
Cars	1268	14	58	1205	17	53	2615
% Cars	99.4	100	100	99.6	100	100	99.5
Trucks	8	0	0	5	0	0	13
% Trucks	0.6	0	0	0.4	0	0	0.5

	Route 120 From North			Route 120 From South			Evans Drive From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:15 AM										
11:15 AM	155	1	156	8	161	169	2	6	8	333
11:30 AM	160	2	162	7	164	171	0	4	4	337
11:45 AM	157	2	159	6	149	155	0	9	9	323
12:00 PM	165	0	165	6	168	174	1	8	9	348
Total Volume	637	5	642	27	642	669	3	27	30	1341
% App. Total	99.2	0.8		4	96		10	90		
PHF	.965	.625	.973	.844	.955	.961	.375	.750	.833	.963
Cars	634	5	639	27	639	666	3	27	30	1335
% Cars	99.5	100	99.5	100	99.5	99.6	100	100	100	99.6
Trucks	3	0	3	0	3	3	0	0	0	6
% Trucks	0.5	0	0.5	0	0.5	0.4	0	0	0	0.4

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S6
Site Code : 52933006
Start Date : 11/12/2022
Page No : 2

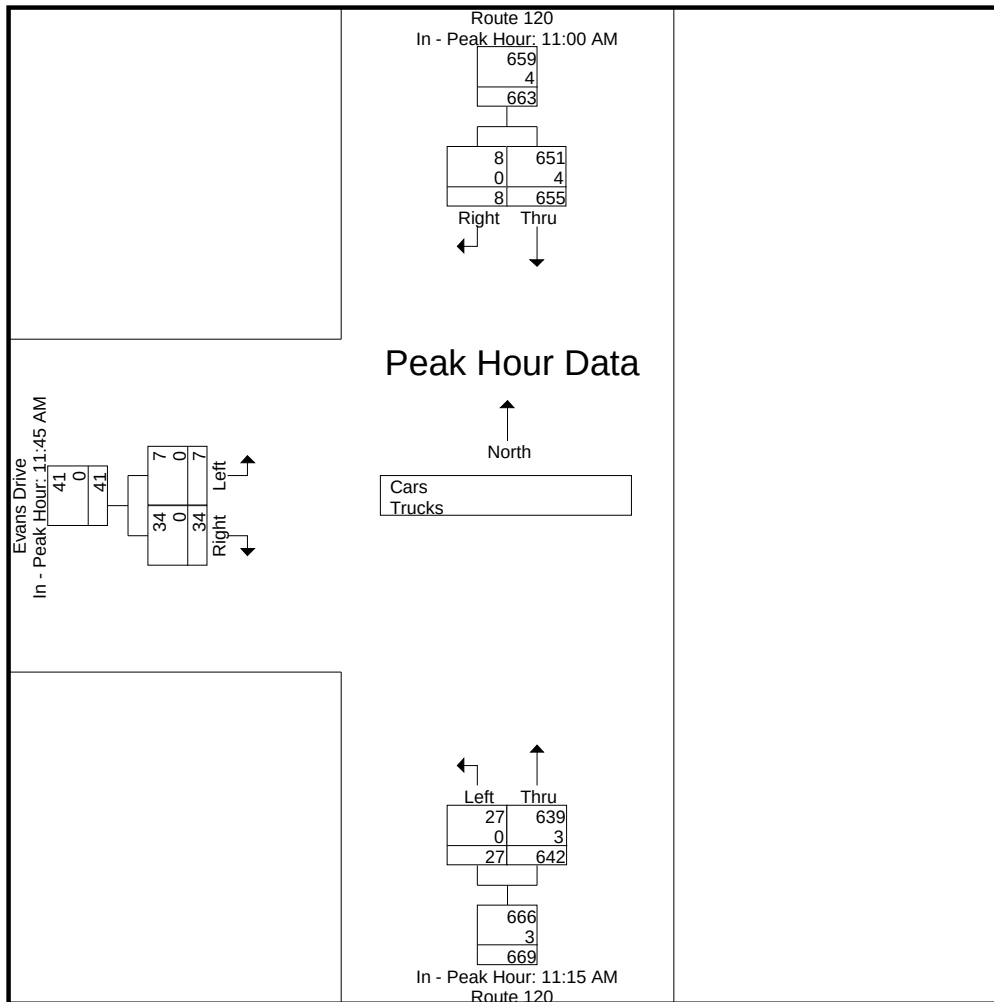


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:00 AM			11:15 AM			11:45 AM		
+0 mins.	183	3	186	8	161	169	0	9	9
+15 mins.	155	1	156	7	164	171	1	8	9
+30 mins.	160	2	162	6	149	155	3	9	12
+45 mins.	157	2	159	6	168	174	3	8	11
Total Volume	655	8	663	27	642	669	7	34	41
% App. Total	98.8	1.2		4	96		17.1	82.9	
PHF	.895	.667	.891	.844	.955	.961	.583	.944	.854
Cars	651	8	659	27	639	666	7	34	41
% Cars	99.4	100	99.4	100	99.5	99.6	100	100	100
Trucks	4	0	4	0	3	3	0	0	0
% Trucks	0.6	0	0.6	0	0.5	0.4	0	0	0

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S6
Site Code : 52933006
Start Date : 11/12/2022
Page No : 3



N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S6
Site Code : 52933006
Start Date : 11/12/2022
Page No : 4

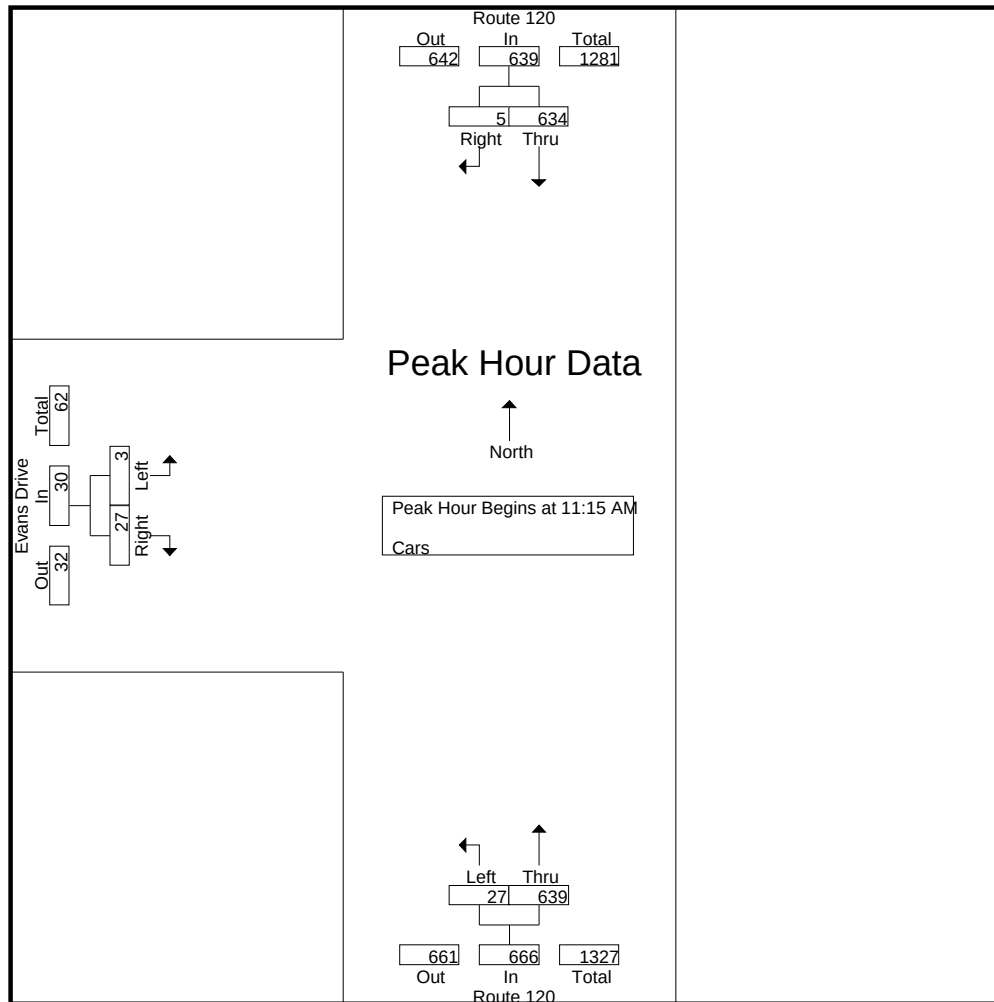
Groups Printed- Cars

	Route 120 From North		Route 120 From South		Evans Drive From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
11:00 AM	181	3	11	133	7	6	341
11:15 AM	153	1	8	160	2	6	330
11:30 AM	160	2	7	163	0	4	336
11:45 AM	157	2	6	148	0	9	322
Total	651	8	32	604	9	25	1329
12:00 PM	164	0	6	168	1	8	347
12:15 PM	154	3	9	148	3	9	326
12:30 PM	156	2	9	160	3	8	338
12:45 PM	143	1	2	125	1	3	275
Total	617	6	26	601	8	28	1286
Grand Total	1268	14	58	1205	17	53	2615
Apprch %	98.9	1.1	4.6	95.4	24.3	75.7	
Total %	48.5	0.5	2.2	46.1	0.7	2	

	Route 120 From North			Route 120 From South			Evans Drive From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:15 AM										
11:15 AM	153	1	154	8	160	168	2	6	8	330
11:30 AM	160	2	162	7	163	170	0	4	4	336
11:45 AM	157	2	159	6	148	154	0	9	9	322
12:00 PM	164	0	164	6	168	174	1	8	9	347
Total Volume	634	5	639	27	639	666	3	27	30	1335
% App. Total	99.2	0.8		4.1	95.9		10	90		
PHF	.966	.625	.974	.844	.951	.957	.375	.750	.833	.962

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S6
Site Code : 52933006
Start Date : 11/12/2022
Page No : 5

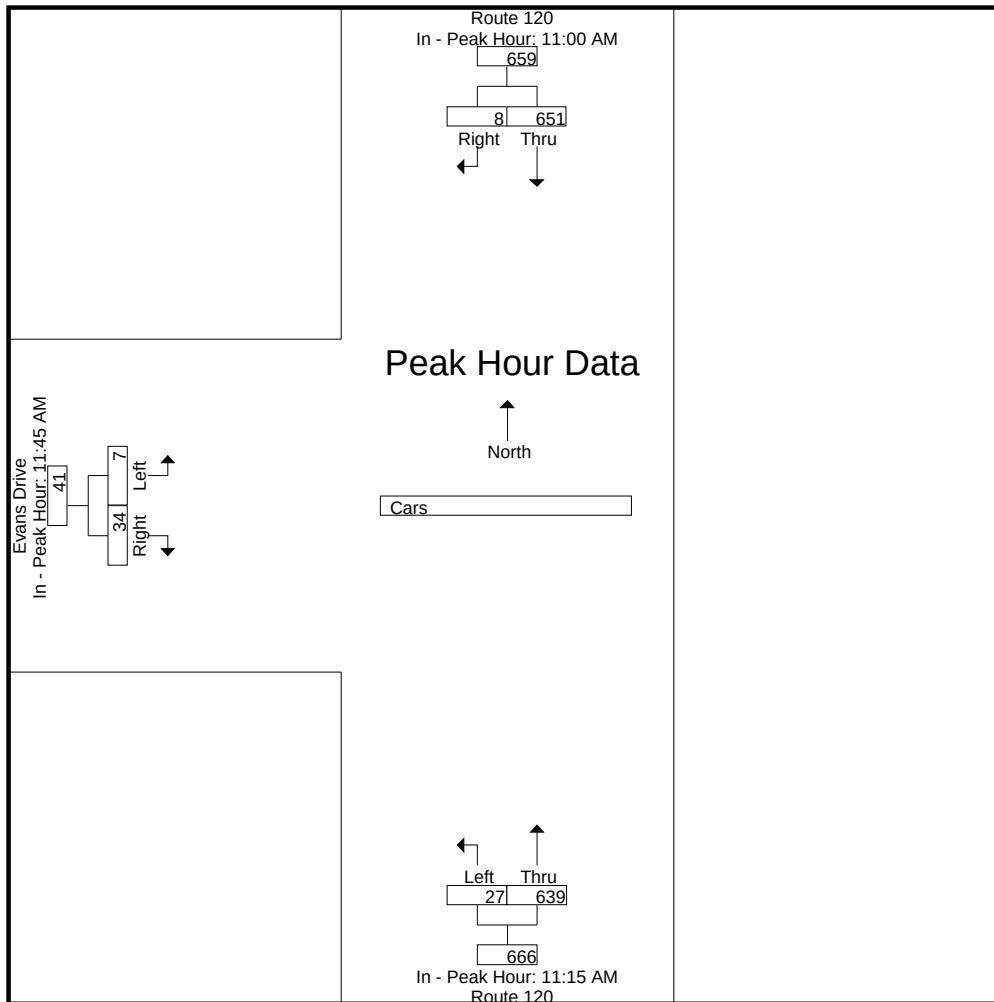


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:00 AM			11:15 AM			11:45 AM		
+0 mins.	181	3	184	8	160	168	0	9	9
+15 mins.	153	1	154	7	163	170	1	8	9
+30 mins.	160	2	162	6	148	154	3	9	12
+45 mins.	157	2	159	6	168	174	3	8	11
Total Volume	651	8	659	27	639	666	7	34	41
% App. Total	98.8	1.2		4.1	95.9		17.1	82.9	
PHF	.899	.667	.895	.844	.951	.957	.583	.944	.854

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S6
Site Code : 52933006
Start Date : 11/12/2022
Page No : 6



N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S6
Site Code : 52933006
Start Date : 11/12/2022
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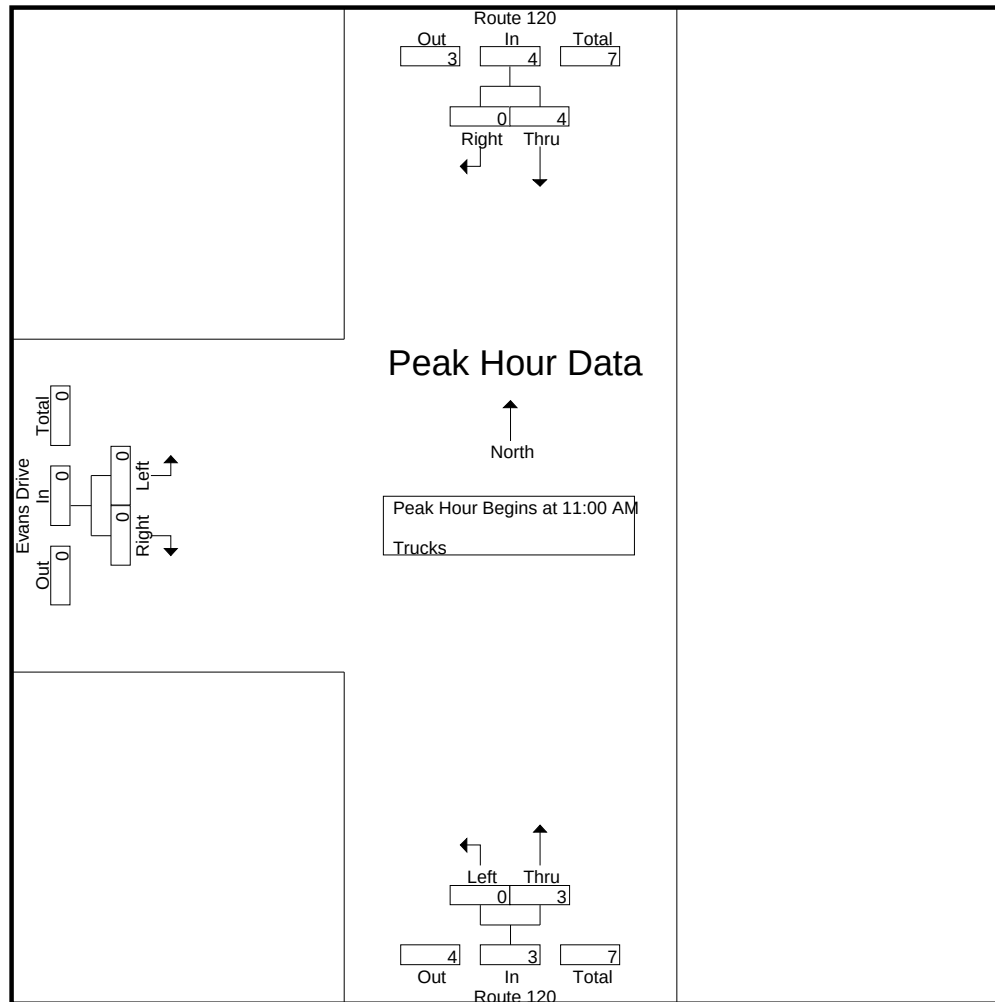
Groups Printed- Trucks

	Route 120 From North		Route 120 From South		Evans Drive From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
11:00 AM	2	0	0	0	0	0	2
11:15 AM	2	0	0	1	0	0	3
11:30 AM	0	0	0	1	0	0	1
11:45 AM	0	0	0	1	0	0	1
Total	4	0	0	3	0	0	7
12:00 PM	1	0	0	0	0	0	1
12:15 PM	1	0	0	2	0	0	3
12:30 PM	1	0	0	0	0	0	1
12:45 PM	1	0	0	0	0	0	1
Total	4	0	0	2	0	0	6
Grand Total	8	0	0	5	0	0	13
Apprch %	100	0	0	100	0	0	
Total %	61.5	0	0	38.5	0	0	

	Route 120 From North			Route 120 From South			Evans Drive From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:00 AM										
11:00 AM	2	0	2	0	0	0	0	0	0	2
11:15 AM	2	0	2	0	1	1	0	0	0	3
11:30 AM	0	0	0	0	1	1	0	0	0	1
11:45 AM	0	0	0	0	1	1	0	0	0	1
Total Volume	4	0	4	0	3	3	0	0	0	7
% App. Total	100	0		0	100		0	0		
PHF	.500	.000	.500	.000	.750	.750	.000	.000	.000	.583

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S6
Site Code : 52933006
Start Date : 11/12/2022
Page No : 8

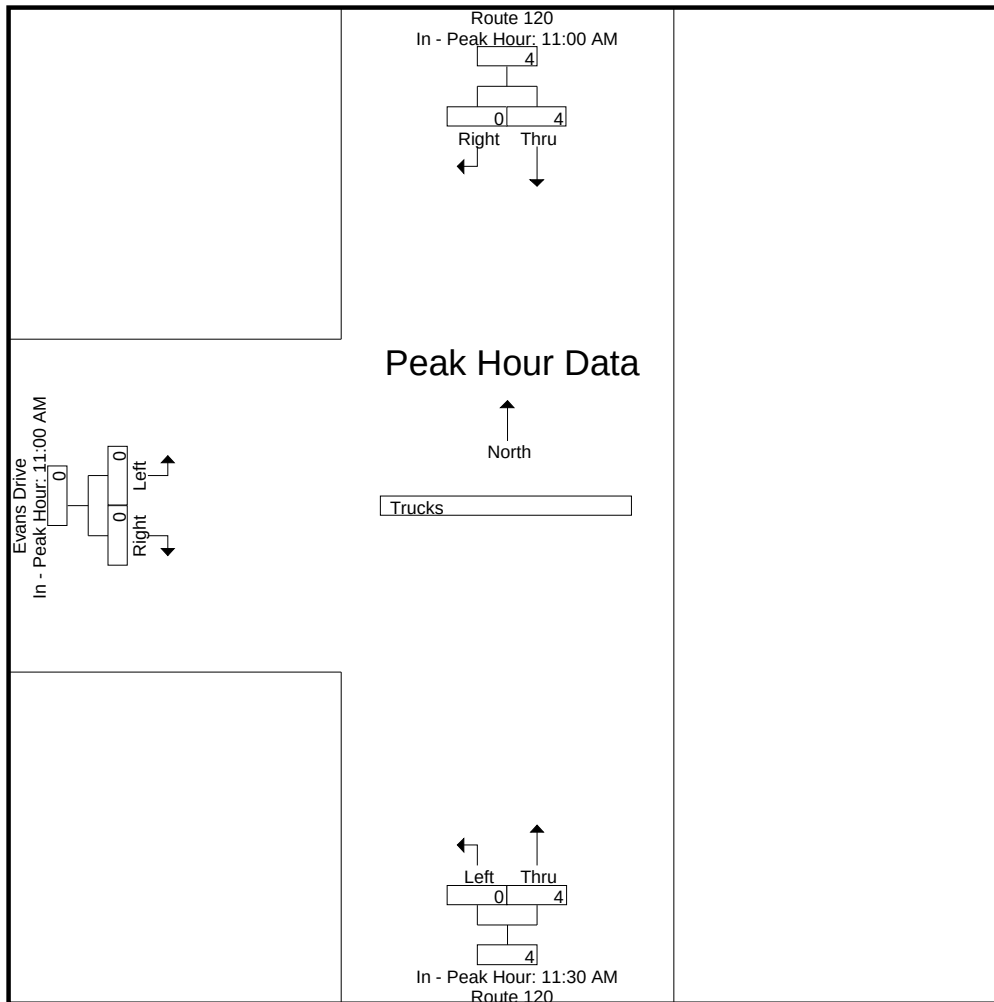


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:00 AM			11:30 AM			11:00 AM		
+0 mins.	2	0	2	0	1	1	0	0	0
+15 mins.	2	0	2	0	1	1	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	2	2	0	0	0
Total Volume	4	0	4	0	4	4	0	0	0
% App. Total	100	0		0	100		0	0	
PHF	.500	.000	.500	.000	.500	.500	.000	.000	.000

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S6
Site Code : 52933006
Start Date : 11/12/2022
Page No : 9



N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S6
Site Code : 52933006
Start Date : 11/12/2022
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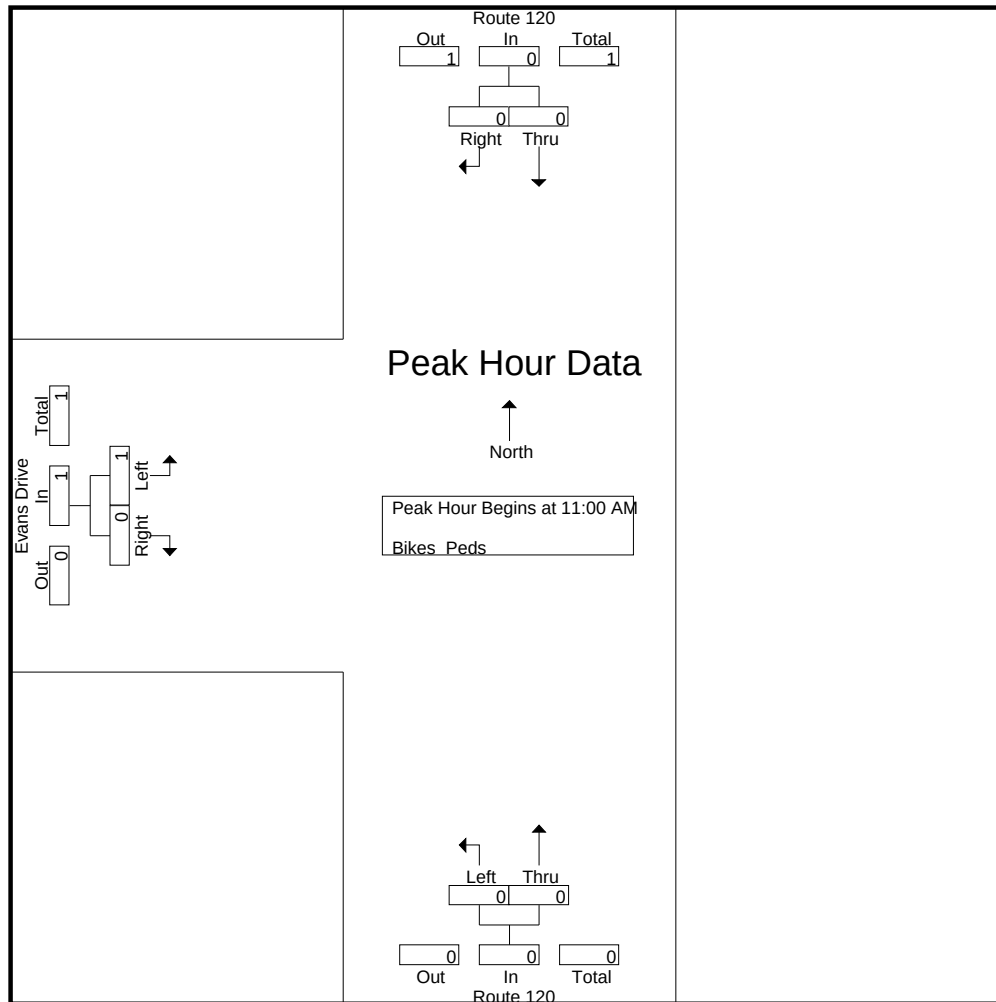
Groups Printed- Bikes Peds

	Route 120 From North			Route 120 From South			Evans Drive From West					
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	1	0	0	0	1	1
Total	0	0	0	0	0	0	1	0	0	0	1	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	1	0	0	0	1	1
Apprch %	0	0		0	0		100	0				
Total %	0	0		0	0		100	0		0	100	

	Route 120 From North			Route 120 From South			Evans Drive From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:00 AM										
11:00 AM	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	0	0	1	0	1	1
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S6
Site Code : 52933006
Start Date : 11/12/2022
Page No : 11

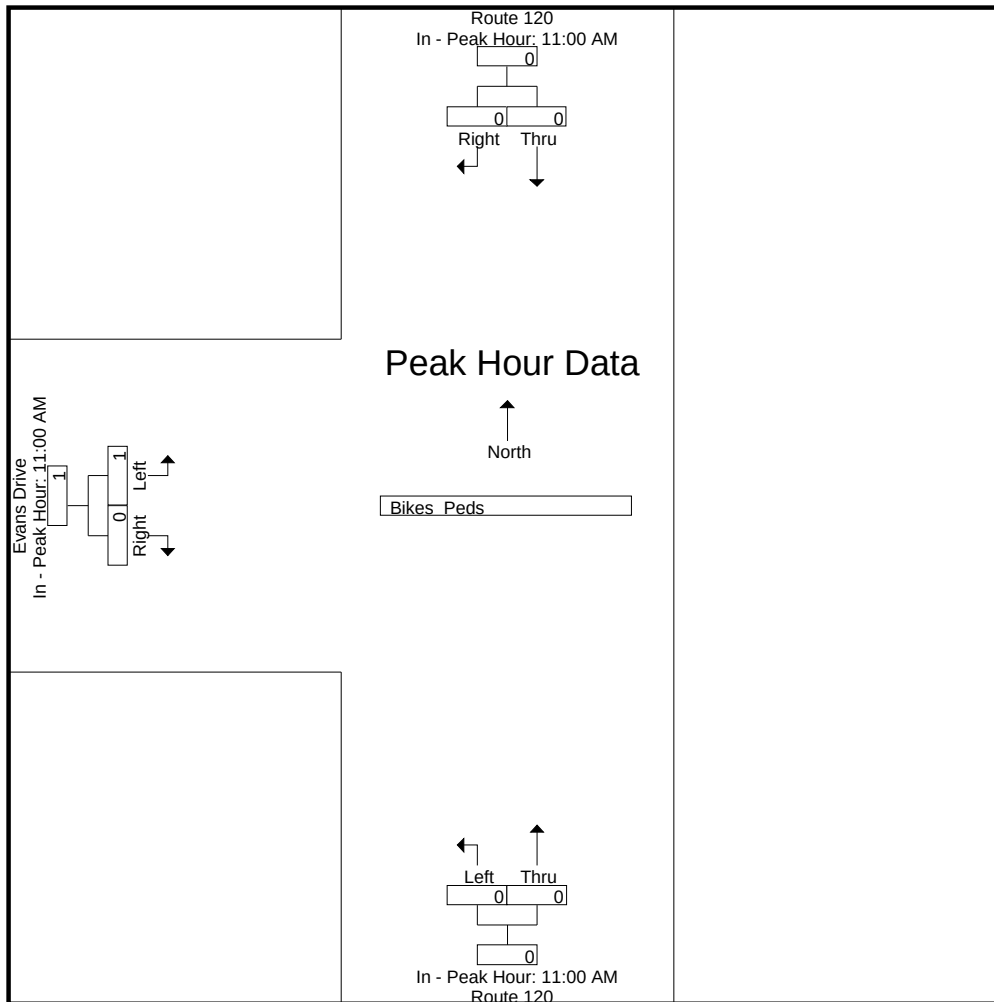


Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:00 AM			11:00 AM			11:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	1	0	1
Total Volume	0	0	0	0	0	0	1	0	1
% App. Total	0	0		0	0		100	0	
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250

N/S Street : Route 120
E/W Street : Evans Drive
City/State : Lebanon, NH
Weather : Clear

File Name : 529330S6
Site Code : 52933006
Start Date : 11/12/2022
Page No : 12



Traffic-Volume Adjustment Data

Year 2019 Monthly Data

Town: Lebanon
Station: 02253025
Location: NH 120 1 mile south of Hanover TL (south of Lahaye Dr)
Group: 4

<u>Month</u>	<u>ADT</u>	<u>Adjustment to Average</u>	<u>Adjustment to Peak</u>
January	19,419	1.04	1.14
February	19,789	1.02	1.12
March	19,597	1.03	1.13
April	20,616	0.98	1.07
May	20,764	0.97	1.07
June	20,272	0.99	1.09
July	20,301	0.99	1.09
August	20,252	0.99	1.09
September	20,293	0.99	1.09
October	22,157	0.91	1.00
November	19,544	1.03	1.13
December	18,300	1.10	1.21
AADT:	20,106		
Peak Month:	22,157		

Weekday AM Peak:

$$2,322/1,790 = x 1.297$$

School PM Peak:

$$1,556/1,476 = x 1.054$$

Weekday PM Peak:

$$2,065/1,734 = x 1.191$$

Weekday Daily:

$$23,322/20,340 = x 1.147$$

LOCATION INFO	
Location ID	02253025
Type	SPOT
Funct'l Class	4
Located On	NH Route 120
Loc On Alias	NH 120 1 MILE SOUTH OF HANOVER TL (SB-NB) (01253114-01253115)
Direction	2-WAY

County	GRAFTON
Community	LEBANON
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

INTERVAL:15-MIN						
Time	15-min Interval				Hourly Count	% Diff
	1st	2nd	3rd	4th		
0:00-1:00	16	20	15	9	60	0.0
1:00-2:00	8	12	8	8	36	-22.2
2:00-3:00	9	8	9	10	36	-24.4
3:00-4:00	8	11	12	12	43	-2.3
4:00-5:00	14	26	42	40	122	-21.9
5:00-6:00	53	83	135	161	432	-18.1
6:00-7:00	238	319	419	327	1303	-15.3
7:00-8:00	352	450	534	454	1790	-12.4
8:00-9:00	396	372	359	322	1449	-5.2
9:00-10:00	297	294	325	302	1218	-9.8
10:00-11:00	300	294	304	295	1193	-9.3
11:00-12:00	299	290	324	322	1235	-6.0
12:00-13:00	342	336	335	315	1328	-3.3
13:00-14:00	318	306	337	325	1286	-13.1
14:00-15:00	345	360	400	371	1476	-8.2
15:00-16:00	393	405	433	407	1638	-12.2
16:00-17:00	436	407	459	432	1734	-18.4
17:00-18:00	487	389	330	263	1469	-11.3
18:00-19:00	247	250	241	173	911	-6.5
19:00-20:00	172	182	170	130	654	-13.3
20:00-21:00	114	95	86	73	368	-10.3
21:00-22:00	83	73	59	46	261	-4.9
22:00-23:00	42	46	42	34	164	-17.8
23:00-24:00	39	38	35	22	134	29.1
Total	Counts = 22				20340	-10.6

Count Criteria

Local Id	02253025
Start Date	11/01/2022
End Date	11/30/2022
Aggregation	AVG
Include Abnormal	False
Selected Days	Monday Tuesday Wednesday Thursday Friday

INTERVAL:60-MIN						
Time	60-min Interval				Hourly Count	% Diff
	1st	2nd	3rd	4th		
0:00-1:00	-	-	-	-	68	12.5
1:00-2:00	-	-	-	-	45	0.0
2:00-3:00	-	-	-	-	40	-14.0
3:00-4:00	-	-	-	-	47	6.6
4:00-5:00	-	-	-	-	123	-21.1
5:00-6:00	-	-	-	-	413	-22.6
6:00-7:00	-	-	-	-	1397	-8.4
7:00-8:00	-	-	-	-	2322	13.6
8:00-9:00	-	-	-	-	1784	15.6
9:00-10:00	-	-	-	-	1339	-0.3
10:00-11:00	-	-	-	-	1281	-2.2
11:00-12:00	-	-	-	-	1359	3.5
12:00-13:00	-	-	-	-	1493	8.4
13:00-14:00	-	-	-	-	1405	-4.3
14:00-15:00	-	-	-	-	1556	-3.0
15:00-16:00	-	-	-	-	1759	-5.0
16:00-17:00	-	-	-	-	2065	-1.0
17:00-18:00	-	-	-	-	1772	7.4
18:00-19:00	-	-	-	-	1096	12.0
19:00-20:00	-	-	-	-	744	-0.4
20:00-21:00	-	-	-	-	475	15.2
21:00-22:00	-	-	-	-	328	17.9
22:00-23:00	-	-	-	-	225	13.8
23:00-24:00	-	-	-	-	186	60.1
Total	Counts = 21				23322	3.1

Count Criteria

Local Id	02253025
Start Date	11/01/2019
End Date	11/30/2019
Aggregation	AVG
Include Abnormal	False
Selected Days	Monday Tuesday Wednesday Thursday Friday

LOCATION INFO			
Location ID	02253025	County	GRAFTON
Type	SPOT	Community	LEBANON
Funct'l Class	4	MPO ID	
Located On	NH Route 120	HPMS ID	
Loc On Alias	NH 120 1 MILE SOUTH OF HANOVER TL (SB-NB) (01253114-01253115)	Agency	New Hampshire DOT
Direction	2-WAY		

Saturday Peak:

908/855 = x 1.062

Saturday Daily:

11,815/10,657 = x 1.109

INTERVAL:15-MIN						
Time	15-min Interval				Hourly Count	% Diff
	1st	2nd	3rd	4th		
0:00-1:00	23	25	17	12	77	24.8
1:00-2:00	12	15	9	8	44	-2.2
2:00-3:00	9	5	9	9	32	-35.9
3:00-4:00	5	8	8	10	31	-34.7
4:00-5:00	11	13	24	16	64	-81.5
5:00-6:00	20	37	53	49	159	-106.1
6:00-7:00	79	114	150	93	436	-110.8
7:00-8:00	99	116	139	118	472	-124.4
8:00-9:00	110	108	142	123	483	-103.8
9:00-10:00	111	134	154	165	564	-81.7
10:00-11:00	178	193	187	188	746	-54.9
11:00-12:00	206	208	204	217	835	-44.4
12:00-13:00	221	208	228	198	855	-46.5
13:00-14:00	196	195	209	188	788	-60.2
14:00-15:00	201	184	216	206	807	-66.1
15:00-16:00	186	185	197	187	755	-84.1
16:00-17:00	199	184	195	189	767	-92.4
17:00-18:00	190	164	158	161	673	-83.9
18:00-19:00	163	179	187	133	662	-37.9
19:00-20:00	147	167	157	107	578	-25.5
20:00-21:00	87	73	74	74	308	-27.9
21:00-22:00	71	61	60	54	246	-10.8
22:00-23:00	42	47	36	33	158	-21.5
23:00-24:00	38	30	28	21	117	15.7
Total	Counts = 4				10657	-71.9

Count Criteria

Local Id	02253025
Start Date	11/01/2022
End Date	11/30/2022
Aggregation	AVG
Include Abnormal	False
Selected Days	Saturday

INTERVAL:60-MIN						
Time	60-min Interval				Hourly Count	% Diff
	1st	2nd	3rd	4th		
0:00-1:00	-	-	-	-	80	28.6
1:00-2:00	-	-	-	-	68	40.7
2:00-3:00	-	-	-	-	43	-6.7
3:00-4:00	-	-	-	-	33	-28.6
4:00-5:00	-	-	-	-	59	-88.2
5:00-6:00	-	-	-	-	128	-120.7
6:00-7:00	-	-	-	-	441	-110.0
7:00-8:00	-	-	-	-	541	-115.7
8:00-9:00	-	-	-	-	564	-92.1
9:00-10:00	-	-	-	-	670	-66.9
10:00-11:00	-	-	-	-	821	-45.9
11:00-12:00	-	-	-	-	908	-36.4
12:00-13:00	-	-	-	-	901	-41.5
13:00-14:00	-	-	-	-	861	-52.1
14:00-15:00	-	-	-	-	850	-61.4
15:00-16:00	-	-	-	-	857	-73.4
16:00-17:00	-	-	-	-	824	-86.7
17:00-18:00	-	-	-	-	752	-74.5
18:00-19:00	-	-	-	-	738	-27.4
19:00-20:00	-	-	-	-	603	-21.3
20:00-21:00	-	-	-	-	358	-13.1
21:00-22:00	-	-	-	-	358	26.6
22:00-23:00	-	-	-	-	211	7.4
23:00-24:00	-	-	-	-	146	37.4
Total	Counts = 5				11815	-62.8

Count Criteria

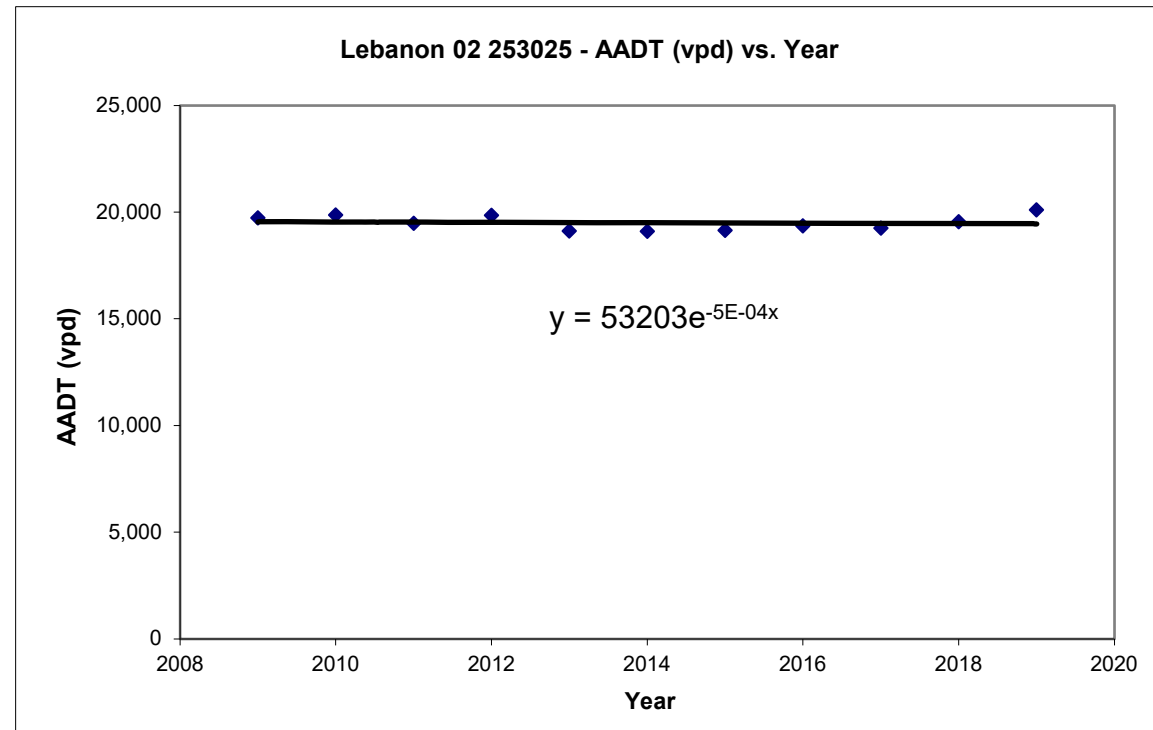
Local Id	02253025
Start Date	11/01/2019
End Date	11/30/2019
Aggregation	AVG
Include Abnormal	False
Selected Days	Saturday

Station 02253025
 Lebanon - NH 120 South of Hanover TL
 Group 4
 Region C
 FC 16

AADT Annual Change

2009	19735	
2010	19873	0.70%
2011	19474	-2.01%
2012	19856	1.96%
2013	19112	-3.75%
2014	19096	-0.08%
2015	19146	0.26%
2016	19358	1.11%
2017	19256	-0.53%
2018	19552	1.54%
2019	20106	2.83%

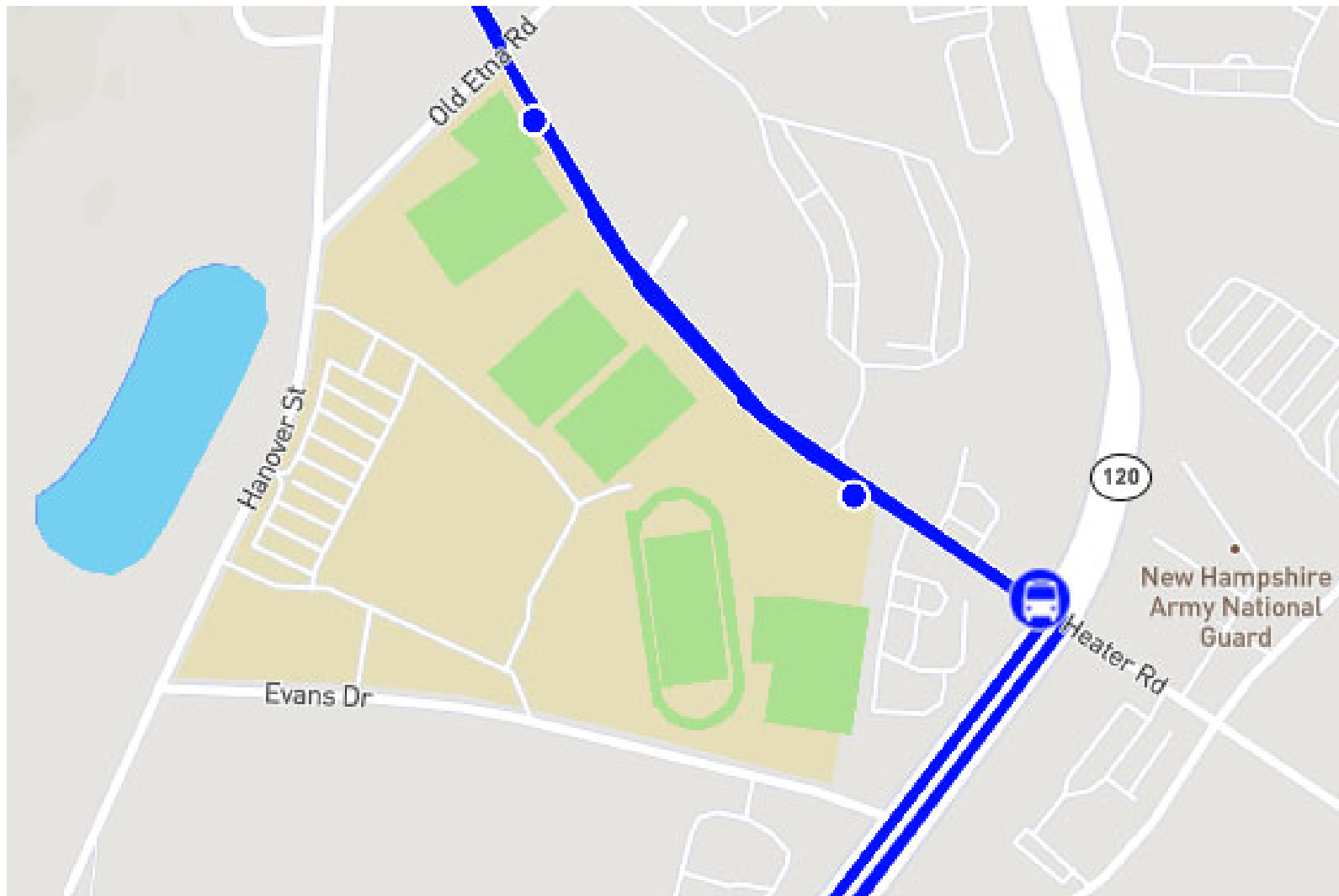
CAGR	0.19%
Exp	-0.05%
Avg	0.07%



Advance Transit Bus Service Data



Free Transit for the
Upper Valley



BLUE

BLUE						Main @ Allen									
Canaan	Enfield	Lebanon	Heater Rd	DHMC	Vail DMS		DHMC	Heater Rd	Lebanon	Enfield	Canaan				
READ ACROSS									5:15	5:25	5:40				
									6:15	6:25	6:40				
5:40	5:51	5:45	5:49	6:00	6:10	6:14	6:24	6:29	6:37						
		6:10	6:14	6:25	6:35	6:39	6:49	6:54	7:02						
		6:25	6:29	6:40	6:50	6:54	7:04	7:09	7:17						
6:45	6:56	6:45	6:49	7:00	7:10	7:14	7:24	7:29	7:37						
		-	D	7:15	7:25	7:29	7:39	7:44	7:52						
		7:10	7:14	7:27	7:37	7:41	7:51	7:56	8:04						
									8:10			8:20	8:35		
		7:25	7:29	7:40	7:50	7:54	8:05	8:10	8:18						
		7:40	7:44	7:56	8:07	8:11	8:24	8:29	8:37						
		8:00	8:04	8:15	8:25	8:29	8:39	8:44	8:52						
		8:15	8:19	8:30	8:40	8:44	8:54	8:59	9:07						
		8:30	8:34	8:45	8:55	8:59	9:09	9:14	9:22						
		8:45	8:49	9:00	9:10	9:14	9:24	9:29	9:37						
		8:35	8:46	9:00											
		9:00	9:04	9:15	9:25	9:29	9:39	9:44	9:52						
		9:15	9:19	9:30	9:40	9:44	9:54	9:59	10:07						
		9:30	9:34	9:45	9:55	9:59	10:09	10:14	10:22						
		9:45	9:49	10:00	10:10	10:14	10:24	10:29	10:37						
		10:00	10:04	10:15	10:25	10:29	10:39	10:44	10:52						
		10:15	10:19	10:30	10:40	10:44	10:54	10:59	11:07						
		10:30	10:34	10:45	10:55	10:59	11:09	11:14	11:22						
		10:45	10:49	11:00	11:10	11:14	11:24	11:29	11:37						
		11:00	11:04	11:15	11:25	11:29	11:39	11:44	11:52						
		11:15	11:19	11:30	11:40	11:44	11:54	11:59	12:07						
		11:30	11:34	11:45	11:55	11:59	12:09	12:14	12:22						
		11:45	11:49	12:00	12:10	12:14	12:24	12:29	12:37						
		12:00	12:04	12:15	12:25	12:29	12:39	12:44	12:52						
		12:15	12:19	12:30	12:40	12:44	12:54	12:59	1:07						
		12:30	12:34	12:45	12:55	12:59	1:09	1:14	1:22						
		12:45	12:49	1:00	1:10	1:14	1:24	1:29	1:37						
		1:00	1:04	1:15	1:25	1:29	1:39	1:44	1:52						
		1:15	1:19	1:30	1:40	1:44	1:54	1:59	2:07						
		1:30	1:34	1:45	1:55	1:59	2:09	2:14	2:22						
		1:45	1:49	2:00	2:10	2:14	2:24	2:29	2:37						
2:00	2:04	2:15	2:25	2:29	2:39	2:44	2:52								
									School year only	2:55	3:05	@ H.S. 3:10			
		2:15	2:19	2:30	2:40	2:44	2:54	2:59	3:07						
		2:30	2:34	2:45	2:55	2:59	3:09	3:14	3:22						
		2:45	2:49	3:00	3:10	3:14	3:24	3:29	3:37						
		3:00	3:04	3:15	3:25	3:29	3:39	3:44	3:52						
		3:15	3:19	3:30	3:40	3:44	3:54	3:59	4:07						
							4:05	4:10	4:18			4:28	4:43		
		@ H.S. 3:15	3:20	3:30	3:34	3:45	3:55	3:59	4:09			4:14	4:22		
		3:40	School year only												
		3:45	3:49	4:00	4:10	4:15	4:27	4:32	4:40						
		4:05	4:09	4:20	4:30	4:35	4:47	4:52	5:02						
4:20	4:24	4:35	4:50	4:54	5:10	5:15	5:23	5:33	5:48						
4:35	4:39	4:50	5:00	5:05	5:20	5:25	5:35								
4:50	4:54	5:05	5:15	5:19	5:32	5:37	5:45								
5:05	5:09	5:20	5:30	5:34	5:45	5:50	6:00	6:10	6:25						
4:43	4:54	5:13													
		5:20	5:24	5:35	5:45	5:49	5:59	6:04	6:12						
		5:50	5:54	6:05	6:15	6:19	6:29	6:34	6:42						
		5:48	5:59	6:13											
		6:15	6:19	6:30	6:38	to Norwich and Wilder on request									
		6:45	6:49	7:00	7:10	to US 5 and Dothan Brook School on request									

"D" = DROP ON REQUEST ONLY

AM= light face

PM= bold

Existing Intersection Analysis Worksheets

1: Hanover St & Evans Dr
HCM 6th TWSC2022 Existing
Weekday AM

Intersection

Int Delay, s/veh	35.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	530	0	1	210	3
Future Vol, veh/h	5	530	0	1	210	3
Conflicting Peds, #/hr	0	53	0	10	10	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	59	59	25	25	67	67
Heavy Vehicles, %	0	0	0	0	4	4
Mvmt Flow	8	898	0	4	313	4

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	642	65	0
Stage 1	12	-	-
Stage 2	630	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	442	1005	-
Stage 1	1016	-	-
Stage 2	535	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	351	945	-
Mov Cap-2 Maneuver	351	-	-
Stage 1	1006	-	-
Stage 2	429	-	-

Approach	WB	NB	SB
HCM Control Delay, s	44.8	0	7.7
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	930	1576
HCM Lane V/C Ratio	-	-	0.975	0.199
HCM Control Delay (s)	-	-	44.8	7.8
HCM Lane LOS	-	-	E	A
HCM 95th %tile Q(veh)	-	-	17	0.7

2: Hanover St/Hanover St Ext & Old Etna Rd
HCM 6th TWSC2022 Existing
Weekday AM

Intersection

Int Delay, s/veh	4.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	130	0	75	185	1	30
Future Vol, veh/h	130	0	75	185	1	30
Conflicting Peds, #/hr	0	11	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	57	57	84	84	83	83
Heavy Vehicles, %	1	1	0	0	2	2
Mvmt Flow	228	0	89	220	1	36

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	240	213	0
Stage 1	202	-	-
Stage 2	38	-	-
Critical Hdwy	6.41	6.21	-
Critical Hdwy Stg 1	5.41	-	-
Critical Hdwy Stg 2	5.41	-	-
Follow-up Hdwy	3.509	3.309	-
Pot Cap-1 Maneuver	750	830	-
Stage 1	834	-	-
Stage 2	987	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	747	819	-
Mov Cap-2 Maneuver	747	-	-
Stage 1	831	-	-
Stage 2	986	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.9	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	747	1244
HCM Lane V/C Ratio	-	-	0.305	0.001
HCM Control Delay (s)	-	-	11.9	7.9
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	1.3	0

3: Heater Rd/Mt Support Rd & Hanover St Ext
HCM 6th TWSC2022 Existing
Weekday AM

Intersection

Int Delay, s/veh 1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
----------	-----	-----	-----	-----	-----	-----

Lane Configurations						
Traffic Vol, veh/h	65	5	1	195	145	25
Future Vol, veh/h	65	5	1	195	145	25
Conflicting Peds, #/hr	0	1	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	86	86	77	77
Heavy Vehicles, %	0	0	5	5	4	4
Mvmt Flow	71	5	1	227	188	32

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	441	213	228
Stage 1	212	-	-
Stage 2	229	-	-
Critical Hdwy	6.4	6.2	4.15
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.245
Pot Cap-1 Maneuver	577	832	1323
Stage 1	828	-	-
Stage 2	814	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	567	825	1313
Mov Cap-2 Maneuver	567	-	-
Stage 1	821	-	-
Stage 2	807	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1313	-	580	-	-
HCM Lane V/C Ratio	0.001	-	0.131	-	-
HCM Control Delay (s)	7.7	0	12.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

4: Heater Rd & Old Etna Rd
HCM 6th AWSC2022 Existing
Weekday AM

Intersection

Intersection Delay, s/veh 13.7
Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	75	100	85	60	45	95	140	50	20	125	1
Future Vol, veh/h	3	75	100	85	60	45	95	140	50	20	125	1
Peak Hour Factor	0.69	0.69	0.69	0.90	0.90	0.90	0.83	0.83	0.83	0.66	0.66	0.66
Heavy Vehicles, %	4	4	4	2	2	2	4	4	4	6	6	6
Mvmt Flow	4	109	145	94	67	50	114	169	60	30	189	2
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	12.9			12.5			15.6			12.9		
HCM LOS	B			B			C			B		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	33%	2%	45%	14%
Vol Thru, %	49%	42%	32%	86%
Vol Right, %	18%	56%	24%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	285	178	190	146
LT Vol	95	3	85	20
Through Vol	140	75	60	125
RT Vol	50	100	45	1
Lane Flow Rate	343	258	211	221
Geometry Grp	1	1	1	1
Degree of Util (X)	0.546	0.416	0.359	0.378
Departure Headway (Hd)	5.843	5.799	6.121	6.144
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	622	624	589	588
Service Time	3.843	3.812	4.146	4.161
HCM Lane V/C Ratio	0.551	0.413	0.358	0.376
HCM Control Delay	15.6	12.9	12.5	12.9
HCM Lane LOS	C	B	B	B
HCM 95th-tile Q	3.3	2	1.6	1.8

5: Route 120 & Old Etna Rd/Etna Rd
Queues2022 Existing
Weekday AM

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	103	141	110	113	67	52	2477	343	58	803
v/c Ratio	0.90	0.96	0.87	0.90	0.21	0.54	1.11	0.28	0.59	0.36
Control Delay	123.5	110.4	112.8	120.8	11.4	84.0	83.8	1.1	87.2	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	123.5	110.4	112.8	120.8	11.4	84.0	83.8	1.1	87.2	12.2
Queue Length 50th (ft)	95	95	106	112	0	47	~1370	3	52	173
Queue Length 95th (ft)	#169	#180	#224	#247	43	88	#1380	12	97	202
Internal Link Dist (ft)		539		473			1647			1282
Turn Bay Length (ft)	65		300		75	350		325	300	
Base Capacity (vph)	115	147	128	125	315	113	2228	1213	113	2257
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.96	0.86	0.90	0.21	0.46	1.11	0.28	0.51	0.36

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: Route 120 & Old Etna Rd/Etna Rd
HCM Signalized Intersection Capacity Analysis2022 Existing
Weekday AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	45	65	175	30	70	45	2130	295	50	625	65
Future Volume (vph)	80	45	65	175	30	70	45	2130	295	50	625	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			6%			0%			0%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.91		1.00	0.99	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1796	1724		1631	1577	1459	1770	3539	1583	1770	3482	
Flt Permitted	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1796	1724		1631	1577	1459	1770	3539	1583	1770	3482	
Peak-hour factor, PHF	0.78	0.78	0.78	0.95	0.95	0.95	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	103	58	83	184	32	74	52	2477	343	58	727	76
RTOR Reduction (vph)	0	36	0	0	2	55	0	0	92	0	5	0
Lane Group Flow (vph)	103	105	0	110	111	12	52	2477	251	58	798	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA		Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	3	3		4	4	4 5	1	6	6 4	5	2	
Permitted Phases												
Actuated Green, G (s)	9.0	9.0		11.0	11.0	24.9	6.7	88.1	99.1	7.9	89.3	
Effective Green, g (s)	9.0	9.0		11.0	11.0	24.9	6.7	88.1	99.1	7.9	89.3	
Actuated g/C Ratio	0.06	0.06		0.08	0.08	0.18	0.05	0.63	0.71	0.06	0.64	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	115	110		128	123	259	84	2227	1120	99	2221	
v/s Ratio Prot	0.06	c0.06		0.07	c0.07	0.01	0.03	c0.70	0.16	c0.03	0.23	
v/s Ratio Perm												
v/c Ratio	0.90	0.95		0.86	0.90	0.05	0.62	1.11	0.22	0.59	0.36	
Uniform Delay, d1	65.0	65.3		63.7	64.0	47.7	65.4	26.0	7.1	64.5	11.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	51.4	69.3		38.9	51.5	0.0	9.2	57.5	0.0	5.6	0.5	
Delay (s)	116.5	134.6		102.6	115.5	47.7	74.6	83.5	7.1	70.0	12.4	
Level of Service	F	F		F	F	D	E	F	A	E	B	
Approach Delay (s)		127.0			94.9			74.2			16.2	
Approach LOS		F			F			E			B	
Intersection Summary												
HCM 2000 Control Delay			66.9									
HCM 2000 Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			84.4%									
Analysis Period (min)			15									
c Critical Lane Group												

5: Route 120 & Old Etna Rd/Etna Rd
Timing Report, Sorted By Phase2022 Existing
Weekday AM

						
Phase Number	1	2	3	4	5	6
Movement	NBL	SBT	EBTL	WBTL	SBL	NBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	None	Max
Maximum Split (s)	15	93	15	17	15	93
Maximum Split (%)	10.7%	66.4%	10.7%	12.1%	10.7%	66.4%
Minimum Split (s)	15	16	15	16	15	16
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	9	5	5	5	10
Vehicle Extension (s)	2	3	2	2	2	3
Minimum Gap (s)	2	3	2	2	2	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	No	No	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	20	35	128	3	20	35
End Time (s)	35	128	3	20	35	128
Yield/Force Off (s)	29	122	137	14	29	122
Yield/Force Off 170(s)	29	122	137	14	29	122
Local Start Time (s)	38	53	6	21	38	53
Local Yield (s)	47	0	15	32	47	0
Local Yield 170(s)	47	0	15	32	47	0

Intersection Summary

Cycle Length 140
Control Type Actuated-Coordinated
Natural Cycle 150
Offset: 122 (87%), Referenced to phase 2:SBT, Start of Yellow

Splits and Phases: 5: Route 120 & Old Etna Rd/Etna Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
15 s	93 s	15 s	17 s
 Ø5	 Ø6		
15 s	93 s		

6: Route 120 & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh 9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
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Lane Configurations						
Traffic Vol, veh/h	0	220	475	2750	1130	75
Future Vol, veh/h	0	220	475	2750	1130	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	40	450	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	72	72	89	89	93	93
Heavy Vehicles, %	1	1	2	2	4	4
Mvmt Flow	0	306	534	3090	1215	81

Major/Minor	Minor2	Major1	Major2
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Conflicting Flow All	3869	648	1296	0	-	0
Stage 1	1256	-	-	-	-	-
Stage 2	2613	-	-	-	-	-
Critical Hdwy	6.82	6.92	4.14	-	-	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	2.22	-	-	-
Pot Cap-1 Maneuver	3	415	~ 531	-	-	-
Stage 1	233	-	-	-	-	-
Stage 2	41	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	0	415	~ 531	-	-	-
Mov Cap-2 Maneuver	0	-	-	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	41	-	-	-	-	-

Approach	EB	NB	SB
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HCM Control Delay, s	34.3	10.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
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Capacity (veh/h)	~ 531	-	-	415	-	-
HCM Lane V/C Ratio	1.005	-	-	0.736	-	-
HCM Control Delay (s)	68.3	-	0	34.3	-	-
HCM Lane LOS	F	-	A	D	-	-
HCM 95th %tile Q(veh)	14.3	-	-	5.9	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

1: Hanover St & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh	7.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	75	5	5	95	5
Future Vol, veh/h	1	75	5	5	95	5
Conflicting Peds, #/hr	0	3	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	50	50	73	73
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	1	93	10	10	130	7

Major/Minor	Minor1	Major1		Major2	
Conflicting Flow All	282	18	0	0	20
Stage 1	15	-	-	-	-
Stage 2	267	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.1
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.2
Pot Cap-1 Maneuver	708	1061	-	-	1609
Stage 1	1008	-	-	-	-
Stage 2	778	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	651	1058	-	-	1609
Mov Cap-2 Maneuver	651	-	-	-	-
Stage 1	1008	-	-	-	-
Stage 2	715	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	7.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1049	1609
HCM Lane V/C Ratio	-	-	0.089	0.081
HCM Control Delay (s)	-	-	8.8	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.3

2: Hanover St/Hanover St Ext & Old Etna Rd
HCM 6th TWSC2022 Existing
Weekday PM

Intersection

Int Delay, s/veh	1.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	3	20	60	3	45
Future Vol, veh/h	30	3	20	60	3	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	59	59	80	80
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	37	4	34	102	4	56

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	149	85	0
Stage 1	85	-	-
Stage 2	64	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	848	980	-
Stage 1	943	-	-
Stage 2	964	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	845	980	-
Mov Cap-2 Maneuver	845	-	-
Stage 1	943	-	-
Stage 2	961	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	856	1461
HCM Lane V/C Ratio	-	-	0.047	0.003
HCM Control Delay (s)	-	-	9.4	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

3: Heater Rd/Mt Support Rd & Hanover St Ext
HCM 6th TWSC2022 Existing
Weekday PM

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
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Lane Configurations						
Traffic Vol, veh/h	10	1	1	140	340	40
Future Vol, veh/h	10	1	1	140	340	40
Conflicting Peds, #/hr	0	0	1	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	56	56	97	97	75	75
Heavy Vehicles, %	0	0	6	6	3	3
Mvmt Flow	18	2	1	144	453	53

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	627	481	507
Stage 1	481	-	-
Stage 2	146	-	-
Critical Hdwy	6.4	6.2	4.16
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.254
Pot Cap-1 Maneuver	451	589	1038
Stage 1	626	-	-
Stage 2	886	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	450	588	1037
Mov Cap-2 Maneuver	450	-	-
Stage 1	625	-	-
Stage 2	885	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.2	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1037	-	460	-	-
HCM Lane V/C Ratio	0.001	-	0.043	-	-
HCM Control Delay (s)	8.5	0	13.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

4: Heater Rd & Old Etna Rd
HCM 6th AWSC2022 Existing
Weekday PM

Intersection

Intersection Delay, s/veh 13.8
Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	15	45	125	10	25	25	110	70	15	305	5
Future Vol, veh/h	3	15	45	125	10	25	25	110	70	15	305	5
Peak Hour Factor	0.45	0.45	0.45	0.95	0.95	0.95	0.77	0.77	0.77	0.76	0.76	0.76
Heavy Vehicles, %	0	0	0	2	2	2	4	4	4	3	3	3
Mvmt Flow	7	33	100	132	11	26	32	143	91	20	401	7
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	10.4			11.6			12			17		
HCM LOS	B			B			B			C		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	12%	5%	78%	5%
Vol Thru, %	54%	24%	6%	94%
Vol Right, %	34%	71%	16%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	205	63	160	325
LT Vol	25	3	125	15
Through Vol	110	15	10	305
RT Vol	70	45	25	5
Lane Flow Rate	266	140	168	428
Geometry Grp	1	1	1	1
Degree of Util (X)	0.398	0.221	0.286	0.629
Departure Headway (Hd)	5.375	5.674	6.105	5.292
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	666	629	586	680
Service Time	3.437	3.747	4.175	3.345
HCM Lane V/C Ratio	0.399	0.223	0.287	0.629
HCM Control Delay	12	10.4	11.6	17
HCM Lane LOS	B	B	B	C
HCM 95th-tile Q	1.9	0.8	1.2	4.5

5: Route 120 & Old Etna Rd/Etna Rd
Queues2022 Existing
Weekday PM

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	102	154	155	52	16	761	128	57	1886
v/c Ratio	0.44	0.61	0.74	0.78	0.13	0.21	0.36	0.11	0.52	0.82
Control Delay	75.1	39.8	79.6	83.2	4.9	70.7	16.9	0.8	80.2	24.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.1	39.8	79.6	83.2	4.9	70.7	16.9	0.8	80.2	24.7
Queue Length 50th (ft)	43	29	144	151	0	14	186	0	51	554
Queue Length 95th (ft)	78	76	207	218	17	40	282	10	98	#1098
Internal Link Dist (ft)		539		473			1647			1282
Turn Bay Length (ft)	65		300		75	350		325	300	
Base Capacity (vph)	179	231	264	254	406	114	2137	1230	140	2310
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.44	0.58	0.61	0.13	0.14	0.36	0.10	0.41	0.82

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: Route 120 & Old Etna Rd/Etna Rd
HCM Signalized Intersection Capacity Analysis2022 Existing
Weekday PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	25	60	250	10	50	15	715	120	55	1790	40
Future Volume (vph)	40	25	60	250	10	50	15	715	120	55	1790	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			6%			0%			0%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.89		1.00	0.99	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1796	1690		1663	1597	1488	1787	3574	1599	1787	3561	
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1796	1690		1663	1597	1488	1787	3574	1599	1787	3561	
Peak-hour factor, PHF	0.83	0.83	0.83	0.86	0.86	0.86	0.94	0.94	0.94	0.97	0.97	0.97
Adj. Flow (vph)	48	30	72	291	12	58	16	761	128	57	1845	41
RTOR Reduction (vph)	0	65	0	0	1	40	0	0	37	0	1	0
Lane Group Flow (vph)	48	37	0	154	154	12	16	761	91	57	1885	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	3	3		4	4	4 5	1	6	6 4	5	2	
Permitted Phases												
Actuated Green, G (s)	8.5	8.5		17.5	17.5	31.0	2.8	82.5	100.0	7.5	87.2	
Effective Green, g (s)	8.5	8.5		17.5	17.5	31.0	2.8	82.5	100.0	7.5	87.2	
Actuated g/C Ratio	0.06	0.06		0.12	0.12	0.22	0.02	0.59	0.71	0.05	0.62	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	109	102		207	199	329	35	2106	1142	95	2217	
v/s Ratio Prot	c0.03	0.02		0.09	c0.10	0.01	0.01	0.21	0.06	c0.03	c0.53	
v/s Ratio Perm												
v/c Ratio	0.44	0.36		0.74	0.77	0.03	0.46	0.36	0.08	0.60	0.85	
Uniform Delay, d1	63.5	63.2		59.1	59.3	42.8	67.8	15.0	6.1	64.8	21.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.0	0.8		11.9	15.6	0.0	3.4	0.5	0.0	6.6	4.3	
Delay (s)	64.5	64.0		71.0	75.0	42.8	71.3	15.5	6.1	71.4	25.5	
Level of Service	E	E		E	E	D	E	B	A	E	C	
Approach Delay (s)		64.1			68.6			15.1			26.9	
Approach LOS		E			E			B			C	
Intersection Summary												
HCM 2000 Control Delay			29.9									
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			75.1%									
Analysis Period (min)			15									
c Critical Lane Group												

5: Route 120 & Old Etna Rd/Etna Rd
Timing Report, Sorted By Phase2022 Existing
Weekday PM

						
Phase Number	1	2	3	4	5	6
Movement	NBL	SBT	EBTL	WBTL	SBL	NBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	None	Max
Maximum Split (s)	15	77	20	28	17	75
Maximum Split (%)	10.7%	55.0%	14.3%	20.0%	12.1%	53.6%
Minimum Split (s)	15	16	16	16	15	16
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	9	5	5	5	10
Vehicle Extension (s)	2	3	2	2	2	3
Minimum Gap (s)	2	3	2	2	2	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	No	No	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	36	51	128	8	36	53
End Time (s)	51	128	8	36	53	128
Yield/Force Off (s)	45	122	2	30	47	122
Yield/Force Off 170(s)	45	122	2	30	47	122
Local Start Time (s)	54	69	6	26	54	71
Local Yield (s)	63	0	20	48	65	0
Local Yield 170(s)	63	0	20	48	65	0

Intersection Summary

Cycle Length 140
Control Type Actuated-Coordinated
Natural Cycle 110
Offset: 122 (87%), Referenced to phase 2:SBT, Start of Yellow

Splits and Phases: 5: Route 120 & Old Etna Rd/Etna Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
15 s	77 s	20 s	28 s
 Ø5	 Ø6		
17 s	75 s		

6: Route 120 & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh 23.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
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Lane Configurations	↖	↗	↖	↗	↗	↗
Traffic Vol, veh/h	5	145	85	1075	2660	15
Future Vol, veh/h	5	145	85	1075	2660	15
Conflicting Peds, #/hr	0	0	1	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	40	450	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	98	98	93	93
Heavy Vehicles, %	0	0	2	2	1	1
Mvmt Flow	6	169	87	1097	2860	16

Major/Minor	Minor2	Major1	Major2
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Conflicting Flow All	3592	1439	2877	0	-	0
Stage 1	2869	-	-	-	-	-
Stage 2	723	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.14	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.22	-	-	-
Pot Cap-1 Maneuver	~ 4	~ 125	127	-	-	-
Stage 1	30	-	-	-	-	-
Stage 2	447	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 1	~ 125	127	-	-	-
Mov Cap-2 Maneuver	~ 1	-	-	-	-	-
Stage 1	9	-	-	-	-	-
Stage 2	447	-	-	-	-	-

Approach	EB	NB	SB
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HCM Control Delay, s	521.9	5.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
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Capacity (veh/h)	127	-	1	125	-	-
HCM Lane V/C Ratio	0.683	-	5.814	1.349	-	-
HCM Control Delay (s)	79.5	\$	7942.6	266	-	-
HCM Lane LOS	F	-	F	F	-	-
HCM 95th %tile Q(veh)	3.7	-	1.8	11.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

1: Hanover St & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh	7.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	30	0	1	20	1
Future Vol, veh/h	0	30	0	1	20	1
Conflicting Peds, #/hr	0	9	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	67	67	25	25	64	64
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	45	0	4	31	2

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	66	11	0	0	4
Stage 1	2	-	-	-	-
Stage 2	64	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	944	1076	-	-	1631
Stage 1	1026	-	-	-	-
Stage 2	964	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	926	1067	-	-	1631
Mov Cap-2 Maneuver	926	-	-	-	-
Stage 1	1026	-	-	-	-
Stage 2	946	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	6.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1067	1631
HCM Lane V/C Ratio	-	-	0.042	0.019
HCM Control Delay (s)	-	-	8.5	7.2
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1

2: Hanover St/Hanover St Ext & Old Etna Rd
HCM 6th TWSC2022 Existing
Sat MIDDAY

Intersection

Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	0	15	10	0	15
Future Vol, veh/h	5	0	15	10	0	15
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	72	72	58	58
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	8	0	21	14	0	26

Major/Minor	Minor1	Major1		Major2	
Conflicting Flow All	54	30	0	0	35
Stage 1	28	-	-	-	-
Stage 2	26	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	959	1050	-	-	1589
Stage 1	1000	-	-	-	-
Stage 2	1002	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	959	1048	-	-	1589
Mov Cap-2 Maneuver	959	-	-	-	-
Stage 1	1000	-	-	-	-
Stage 2	1002	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	959	1589
HCM Lane V/C Ratio	-	-	0.008	-
HCM Control Delay (s)	-	-	8.8	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

3: Heater Rd/Mt Support Rd & Hanover St Ext
HCM 6th TWSC2022 Existing
Sat MIDDAY

Intersection

Int Delay, s/veh 0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
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Lane Configurations						
Traffic Vol, veh/h	10	0	0	60	80	15
Future Vol, veh/h	10	0	0	60	80	15
Conflicting Peds, #/hr	3	3	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	64	64	89	89
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	13	0	0	94	90	17

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	196	102	107
Stage 1	99	-	-
Stage 2	97	-	-
Critical Hdwy	6.4	6.2	4.1
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	797	959	1497
Stage 1	930	-	-
Stage 2	932	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	797	956	1497
Mov Cap-2 Maneuver	797	-	-
Stage 1	930	-	-
Stage 2	932	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1497	-	797	-	-
HCM Lane V/C Ratio	-	-	0.017	-	-
HCM Control Delay (s)	0	-	9.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

4: Heater Rd & Old Etna Rd
HCM 6th AWSC2022 Existing
Sat MIDDAY

Intersection

Intersection Delay, s/veh 7.7
Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	10	5	60	2	10	2	50	30	2	70	0
Future Vol, veh/h	0	10	5	60	2	10	2	50	30	2	70	0
Peak Hour Factor	0.60	0.60	0.60	0.82	0.82	0.82	0.74	0.74	0.74	0.88	0.88	0.88
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	17	8	73	2	12	3	68	41	2	80	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	7.3			8			7.6			7.7		
HCM LOS	A			A			A			A		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	0%	83%	3%
Vol Thru, %	61%	67%	3%	97%
Vol Right, %	37%	33%	14%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	82	15	72	72
LT Vol	2	0	60	2
Through Vol	50	10	2	70
RT Vol	30	5	10	0
Lane Flow Rate	111	25	88	82
Geometry Grp	1	1	1	1
Degree of Util (X)	0.121	0.029	0.106	0.095
Departure Headway (Hd)	3.944	4.214	4.334	4.186
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	894	855	815	843
Service Time	2.032	2.214	2.426	2.276
HCM Lane V/C Ratio	0.124	0.029	0.108	0.097
HCM Control Delay	7.6	7.3	8	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.1	0.4	0.3

5: Route 120 & Old Etna Rd/Etna Rd
Queues2022 Existing
Sat MIDDAY

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	20	27	55	56	25	11	567	89	31	510
v/c Ratio	0.25	0.29	0.51	0.54	0.09	0.15	0.22	0.07	0.35	0.19
Control Delay	71.8	38.7	78.7	78.4	0.6	69.0	9.4	0.7	74.2	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.8	38.7	78.7	78.4	0.6	69.0	9.4	0.7	74.2	7.3
Queue Length 50th (ft)	18	6	51	52	0	10	98	0	28	58
Queue Length 95th (ft)	38	29	96	100	0	32	154	7	62	130
Internal Link Dist (ft)		539		473			1647			1282
Turn Bay Length (ft)	65		300		75	350		325	300	
Base Capacity (vph)	215	219	265	256	387	167	2521	1392	216	2636
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.12	0.21	0.22	0.06	0.07	0.22	0.06	0.14	0.19
Intersection Summary										

5: Route 120 & Old Etna Rd/Etna Rd
HCM Signalized Intersection Capacity Analysis2022 Existing
Sat MIDDAY

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	5	15	90	5	25	10	510	80	30	480	10
Future Volume (vph)	15	5	15	90	5	25	10	510	80	30	480	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			6%			0%			0%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.89		1.00	0.99	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1778	1664		1615	1550	1445	1805	3610	1615	1787	3562	
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1778	1664		1615	1550	1445	1805	3610	1615	1787	3562	
Peak-hour factor, PHF	0.75	0.75	0.75	0.88	0.88	0.88	0.90	0.90	0.90	0.96	0.96	0.96
Adj. Flow (vph)	20	7	20	102	6	28	11	567	89	31	500	10
RTOR Reduction (vph)	0	19	0	0	2	21	0	0	22	0	1	0
Lane Group Flow (vph)	20	8	0	55	54	4	11	567	67	31	509	0
Confl. Peds. (#/hr)							1		1	1		1
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Turn Type	Split	NA		Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	3	3		4	4	4 5	1	6	6 4	5	2	
Permitted Phases												
Actuated Green, G (s)	5.3	5.3		9.3	9.3	21.3	2.6	95.4	104.7	6.0	98.8	
Effective Green, g (s)	5.3	5.3		9.3	9.3	21.3	2.6	95.4	104.7	6.0	98.8	
Actuated g/C Ratio	0.04	0.04		0.07	0.07	0.15	0.02	0.68	0.75	0.04	0.71	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	67	62		107	102	219	33	2459	1207	76	2513	
v/s Ratio Prot	c0.01	0.00		0.03	c0.03	0.00	0.01	c0.16	0.04	c0.02	c0.14	
v/s Ratio Perm												
v/c Ratio	0.30	0.13		0.51	0.53	0.02	0.33	0.23	0.06	0.41	0.20	
Uniform Delay, d1	65.5	65.1		63.2	63.2	50.5	67.8	8.4	4.6	65.3	7.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	0.3		1.7	2.6	0.0	2.2	0.2	0.0	1.3	0.2	
Delay (s)	66.5	65.4		64.9	65.9	50.5	70.0	8.6	4.6	66.6	7.3	
Level of Service	E	E		E	E	D	E	A	A	E	A	
Approach Delay (s)		65.9			62.6			9.1			10.7	
Approach LOS		E			E			A			B	
Intersection Summary												
HCM 2000 Control Delay			16.9									
HCM 2000 Volume to Capacity ratio			0.27									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			42.8%									
Analysis Period (min)			15									
c Critical Lane Group												

5: Route 120 & Old Etna Rd/Etna Rd
Timing Report, Sorted By Phase2022 Existing
Sat Midday

						
Phase Number	1	2	3	4	5	6
Movement	NBL	SBT	EBTL	WBTL	SBL	NBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	None	Max
Maximum Split (s)	19	69	23	29	23	65
Maximum Split (%)	13.6%	49.3%	16.4%	20.7%	16.4%	46.4%
Minimum Split (s)	15	16	16	16	15	16
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	9	5	5	5	10
Vehicle Extension (s)	2	3	2	2	2	3
Minimum Gap (s)	2	3	2	2	2	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	No	No	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	40	59	128	11	40	63
End Time (s)	59	128	11	40	63	128
Yield/Force Off (s)	53	122	5	34	57	122
Yield/Force Off 170(s)	53	122	5	34	57	122
Local Start Time (s)	58	77	6	29	58	81
Local Yield (s)	71	0	23	52	75	0
Local Yield 170(s)	71	0	23	52	75	0

Intersection Summary

Cycle Length 140
Control Type Actuated-Coordinated
Natural Cycle 65
Offset: 122 (87%), Referenced to phase 2:SBT, Start of Yellow

Splits and Phases: 5: Route 120 & Old Etna Rd/Etna Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
19 s	69 s	23 s	29 s
 Ø5	 Ø6		
23 s	65 s		

6: Route 120 & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh 0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
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Lane Configurations						
Traffic Vol, veh/h	5	30	30	770	765	5
Future Vol, veh/h	5	30	30	770	765	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	40	450	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	96	96	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	6	36	31	802	789	5

Major/Minor	Minor2	Major1	Major2
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Conflicting Flow All	1255	397	794	0	-	0
Stage 1	792	-	-	-	-	-
Stage 2	463	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.12	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.21	-	-	-
Pot Cap-1 Maneuver	166	608	830	-	-	-
Stage 1	412	-	-	-	-	-
Stage 2	606	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	160	608	830	-	-	-
Mov Cap-2 Maneuver	160	-	-	-	-	-
Stage 1	397	-	-	-	-	-
Stage 2	606	-	-	-	-	-

Approach	EB	NB	SB
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HCM Control Delay, s	13.7	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
-----------------------	-----	-----	-------	-------	-----	-----

Capacity (veh/h)	830	-	160	608	-	-
HCM Lane V/C Ratio	0.038	-	0.038	0.059	-	-
HCM Control Delay (s)	9.5	-	28.4	11.3	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0.2	-	-

Intersection

Int Delay, s/veh	13.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	360	0	1	140	2
Future Vol, veh/h	5	360	0	1	140	2
Conflicting Peds, #/hr	0	53	0	10	10	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	59	59	25	25	67	67
Heavy Vehicles, %	0	0	0	0	4	4
Mvmt Flow	8	610	0	4	209	3

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	433	65	0
Stage 1	12	-	-
Stage 2	421	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	584	1005	-
Stage 1	1016	-	-
Stage 2	667	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	501	945	-
Mov Cap-2 Maneuver	501	-	-
Stage 1	1006	-	-
Stage 2	578	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.1	0	7.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	934	1576
HCM Lane V/C Ratio	-	-	0.662	0.133
HCM Control Delay (s)	-	-	16.1	7.6
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	5.2	0.5

Intersection

Int Delay, s/veh	4.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	90	0	50	125	1	20
Future Vol, veh/h	90	0	50	125	1	20
Conflicting Peds, #/hr	0	11	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	57	57	84	84	83	83
Heavy Vehicles, %	1	1	0	0	2	2
Mvmt Flow	158	0	60	149	1	24

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	164	149	0	0	212
Stage 1	138	-	-	-	-
Stage 2	26	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.12
Critical Hdwy Stg 1	5.41	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.218
Pot Cap-1 Maneuver	829	900	-	-	1358
Stage 1	891	-	-	-	-
Stage 2	999	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	826	888	-	-	1354
Mov Cap-2 Maneuver	826	-	-	-	-
Stage 1	888	-	-	-	-
Stage 2	998	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	826	1354
HCM Lane V/C Ratio	-	-	0.191	0.001
HCM Control Delay (s)	-	-	10.4	7.7
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.7	0

Intersection

Int Delay, s/veh	1.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	45	3	1	135	100	20
Future Vol, veh/h	45	3	1	135	100	20
Conflicting Peds, #/hr	0	1	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	86	86	77	77
Heavy Vehicles, %	0	0	5	5	4	4
Mvmt Flow	49	3	1	157	130	26

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	310	152	164	0	0
Stage 1	151	-	-	-	-
Stage 2	159	-	-	-	-
Critical Hdwy	6.4	6.2	4.15	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.245	-	-
Pot Cap-1 Maneuver	687	900	1396	-	-
Stage 1	882	-	-	-	-
Stage 2	875	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	675	892	1385	-	-
Mov Cap-2 Maneuver	675	-	-	-	-
Stage 1	874	-	-	-	-
Stage 2	868	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1385	-	685	-	-
HCM Lane V/C Ratio	0.001	-	0.076	-	-
HCM Control Delay (s)	7.6	0	10.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection

Intersection Delay, s/veh 9.7
Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	50	70	60	40	30	65	95	35	15	85	1
Future Vol, veh/h	2	50	70	60	40	30	65	95	35	15	85	1
Peak Hour Factor	0.69	0.69	0.69	0.90	0.90	0.90	0.83	0.83	0.83	0.66	0.66	0.66
Heavy Vehicles, %	4	4	4	2	2	2	4	4	4	6	6	6
Mvmt Flow	3	72	101	67	44	33	78	114	42	23	129	2
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	9.3			9.5			10.3			9.6		
HCM LOS	A			A			B			A		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	33%	2%	46%	15%
Vol Thru, %	49%	41%	31%	84%
Vol Right, %	18%	57%	23%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	195	122	130	101
LT Vol	65	2	60	15
Through Vol	95	50	40	85
RT Vol	35	70	30	1
Lane Flow Rate	235	177	144	153
Geometry Grp	1	1	1	1
Degree of Util (X)	0.32	0.235	0.204	0.217
Departure Headway (Hd)	4.908	4.78	5.074	5.11
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	726	743	701	695
Service Time	2.987	2.86	3.159	3.197
HCM Lane V/C Ratio	0.324	0.238	0.205	0.22
HCM Control Delay	10.3	9.3	9.5	9.6
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1.4	0.9	0.8	0.8

5: Route 120 & Old Etna Rd/Etna Rd

2022 Existing - no adjustments

Queues

Weekday AM

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	71	96	74	73	42	35	1692	233	41	546
v/c Ratio	0.68	0.69	0.67	0.67	0.14	0.39	0.72	0.19	0.44	0.23
Control Delay	93.8	61.3	91.5	90.3	4.1	76.4	18.7	0.7	78.5	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.8	61.3	91.5	90.3	4.1	76.4	18.7	0.7	78.5	10.1
Queue Length 50th (ft)	64	48	69	70	0	31	538	0	37	103
Queue Length 95th (ft)	102	90	#133	#137	12	65	595	8	74	130
Internal Link Dist (ft)		539		473			1647			1282
Turn Bay Length (ft)	65		300		75	350		325	300	
Base Capacity (vph)	115	149	128	125	292	113	2352	1236	113	2326
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.64	0.58	0.58	0.14	0.31	0.72	0.19	0.36	0.23

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: Route 120 & Old Etna Rd/Etna Rd

2022 Existing - no adjustments

HCM Signalized Intersection Capacity Analysis

Weekday AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	30	45	115	20	45	30	1455	200	35	425	45
Future Volume (vph)	55	30	45	115	20	45	30	1455	200	35	425	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			6%			0%			0%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.91		1.00	0.99	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1796	1719		1631	1577	1459	1770	3539	1583	1770	3482	
Flt Permitted	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1796	1719		1631	1577	1459	1770	3539	1583	1770	3482	
Peak-hour factor, PHF	0.78	0.78	0.78	0.95	0.95	0.95	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	71	38	58	121	21	47	35	1692	233	41	494	52
RTOR Reduction (vph)	0	40	0	0	2	35	0	0	64	0	5	0
Lane Group Flow (vph)	71	56	0	74	71	7	35	1692	169	41	541	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA		Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	3	3		4	4	4 5	1	6	6 4	5	2	
Permitted Phases												
Actuated Green, G (s)	8.3	8.3		9.5	9.5	21.9	6.1	91.8	101.3	6.4	92.1	
Effective Green, g (s)	8.3	8.3		9.5	9.5	21.9	6.1	91.8	101.3	6.4	92.1	
Actuated g/C Ratio	0.06	0.06		0.07	0.07	0.16	0.04	0.66	0.72	0.05	0.66	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	106	101		110	107	228	77	2320	1145	80	2290	
v/s Ratio Prot	c0.04	0.03		c0.05	0.05	0.00	0.02	c0.48	0.11	c0.02	0.16	
v/s Ratio Perm												
v/c Ratio	0.67	0.56		0.67	0.66	0.03	0.45	0.73	0.15	0.51	0.24	
Uniform Delay, d1	64.5	64.1		63.7	63.7	50.0	65.3	15.9	6.0	65.3	9.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	11.7	3.8		12.0	11.4	0.0	1.5	2.1	0.0	2.3	0.2	
Delay (s)	76.3	67.8		75.7	75.1	50.1	66.9	18.0	6.0	67.6	9.9	
Level of Service	E	E		E	E	D	E	B	A	E	A	
Approach Delay (s)		71.4			69.8			17.4			14.0	
Approach LOS		E			E			B			B	
Intersection Summary												
HCM 2000 Control Delay			23.2									
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			63.7%									
Analysis Period (min)			15									
c Critical Lane Group												

5: Route 120 & Old Etna Rd/Etna Rd

Timing Report, Sorted By Phase

						
Phase Number	1	2	3	4	5	6
Movement	NBL	SBT	EBTL	WBTL	SBL	NBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	None	Max
Maximum Split (s)	15	93	15	17	15	93
Maximum Split (%)	10.7%	66.4%	10.7%	12.1%	10.7%	66.4%
Minimum Split (s)	15	16	15	16	15	16
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	9	5	5	5	10
Vehicle Extension (s)	2	3	2	2	2	3
Minimum Gap (s)	2	3	2	2	2	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	No	No	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	20	35	128	3	20	35
End Time (s)	35	128	3	20	35	128
Yield/Force Off (s)	29	122	137	14	29	122
Yield/Force Off 170(s)	29	122	137	14	29	122
Local Start Time (s)	38	53	6	21	38	53
Local Yield (s)	47	0	15	32	47	0
Local Yield 170(s)	47	0	15	32	47	0

Intersection Summary

Cycle Length 140
 Control Type Actuated-Coordinated
 Natural Cycle 90
 Offset: 122 (87%), Referenced to phase 2:SBT, Start of Yellow

Splits and Phases: 5: Route 120 & Old Etna Rd/Etna Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
15 s	93 s	15 s	17 s
 Ø5	 Ø6		
15 s	93 s		

Intersection

Int Delay, s/veh 1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	150	325	1875	0	50
Future Vol, veh/h	0	150	325	1875	0	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	40	450	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	72	72	89	89	93	93
Heavy Vehicles, %	1	1	2	2	4	4
Mvmt Flow	0	208	365	2107	0	54

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	1811	27	54	0	0
Stage 1	27	-	-	-	-
Stage 2	1784	-	-	-	-
Critical Hdwy	6.82	6.92	4.14	-	-
Critical Hdwy Stg 1	5.82	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-
Follow-up Hdwy	3.51	3.31	2.22	-	-
Pot Cap-1 Maneuver	71	1045	1549	-	-
Stage 1	995	-	-	-	-
Stage 2	121	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	54	1045	1549	-	-
Mov Cap-2 Maneuver	54	-	-	-	-
Stage 1	760	-	-	-	-
Stage 2	121	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1549	-	-	1045	-	-
HCM Lane V/C Ratio	0.236	-	-	0.199	-	-
HCM Control Delay (s)	8	-	0	9.3	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0.9	-	-	0.7	-	-

Intersection

Int Delay, s/veh	7.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	55	3	3	70	5
Future Vol, veh/h	1	55	3	3	70	5
Conflicting Peds, #/hr	0	3	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	50	50	73	73
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	1	68	6	6	96	7

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	208	12	0	0	12
Stage 1	9	-	-	-	-
Stage 2	199	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.1
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.2
Pot Cap-1 Maneuver	780	1069	-	-	1620
Stage 1	1014	-	-	-	-
Stage 2	835	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	734	1066	-	-	1620
Mov Cap-2 Maneuver	734	-	-	-	-
Stage 1	1014	-	-	-	-
Stage 2	786	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.6	0	6.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1057	1620
HCM Lane V/C Ratio	-	-	0.065	0.059
HCM Control Delay (s)	-	-	8.6	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.2

Intersection

Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	2	15	45	2	35
Future Vol, veh/h	25	2	15	45	2	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	59	59	80	80
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	30	2	25	76	3	44

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	113	63	0	0	101
Stage 1	63	-	-	-	-
Stage 2	50	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	888	1007	-	-	1504
Stage 1	965	-	-	-	-
Stage 2	978	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	886	1007	-	-	1504
Mov Cap-2 Maneuver	886	-	-	-	-
Stage 1	965	-	-	-	-
Stage 2	976	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	894	1504
HCM Lane V/C Ratio	-	-	0.037	0.002
HCM Control Delay (s)	-	-	9.2	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection

Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	1	1	105	250	30
Future Vol, veh/h	10	1	1	105	250	30
Conflicting Peds, #/hr	0	0	1	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	56	56	97	97	75	75
Heavy Vehicles, %	0	0	6	6	3	3
Mvmt Flow	18	2	1	108	333	40

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	464	354	374	0	-	0
Stage 1	354	-	-	-	-	-
Stage 2	110	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.16	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.254	-	-	-
Pot Cap-1 Maneuver	560	694	1163	-	-	-
Stage 1	715	-	-	-	-	-
Stage 2	920	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	558	693	1162	-	-	-
Mov Cap-2 Maneuver	558	-	-	-	-	-
Stage 1	714	-	-	-	-	-
Stage 2	919	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1162	-	568	-	-
HCM Lane V/C Ratio	0.001	-	0.035	-	-
HCM Control Delay (s)	8.1	0	11.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection

Intersection Delay, s/veh 10.1
Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	15	30	90	5	20	15	80	55	10	225	3
Future Vol, veh/h	2	15	30	90	5	20	15	80	55	10	225	3
Peak Hour Factor	0.45	0.45	0.45	0.95	0.95	0.95	0.77	0.77	0.77	0.76	0.76	0.76
Heavy Vehicles, %	0	0	0	2	2	2	4	4	4	3	3	3
Mvmt Flow	4	33	67	95	5	21	19	104	71	13	296	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	8.8			9.6			9.4			11.2		
HCM LOS	A			A			A			B		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	4%	78%	4%
Vol Thru, %	53%	32%	4%	95%
Vol Right, %	37%	64%	17%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	150	47	115	238
LT Vol	15	2	90	10
Through Vol	80	15	5	225
RT Vol	55	30	20	3
Lane Flow Rate	195	104	121	313
Geometry Grp	1	1	1	1
Degree of Util (X)	0.255	0.142	0.179	0.413
Departure Headway (Hd)	4.716	4.89	5.313	4.752
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	754	725	668	752
Service Time	2.79	2.976	3.398	2.818
HCM Lane V/C Ratio	0.259	0.143	0.181	0.416
HCM Control Delay	9.4	8.8	9.6	11.2
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	1	0.5	0.6	2

5: Route 120 & Old Etna Rd/Etna Rd

2022 Existing - no adjustments

Queues

Weekday PM

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	36	78	116	116	42	11	564	96	41	1402
v/c Ratio	0.37	0.55	0.68	0.70	0.12	0.15	0.25	0.08	0.42	0.58
Control Delay	73.7	38.9	79.3	81.5	3.2	69.2	13.3	0.8	75.8	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.7	38.9	79.3	81.5	3.2	69.2	13.3	0.8	75.8	15.2
Queue Length 50th (ft)	32	21	109	113	0	10	115	0	37	283
Queue Length 95th (ft)	63	64	164	171	9	32	188	8	76	564
Internal Link Dist (ft)		539		473			1647			1282
Turn Bay Length (ft)	65		300		75	350		325	300	
Base Capacity (vph)	179	218	261	252	377	114	2257	1265	140	2417
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.36	0.44	0.46	0.11	0.10	0.25	0.08	0.29	0.58
Intersection Summary										

5: Route 120 & Old Etna Rd/Etna Rd

2022 Existing - no adjustments

HCM Signalized Intersection Capacity Analysis

Weekday PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	20	45	185	10	40	10	530	90	40	1330	30
Future Volume (vph)	30	20	45	185	10	40	10	530	90	40	1330	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			6%			0%			0%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.90		1.00	0.99	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1796	1694		1663	1598	1488	1787	3574	1599	1787	3561	
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1796	1694		1663	1598	1488	1787	3574	1599	1787	3561	
Peak-hour factor, PHF	0.83	0.83	0.83	0.86	0.86	0.86	0.94	0.94	0.94	0.97	0.97	0.97
Adj. Flow (vph)	36	24	54	215	12	47	11	564	96	41	1371	31
RTOR Reduction (vph)	0	51	0	0	1	34	0	0	26	0	1	0
Lane Group Flow (vph)	36	27	0	116	115	8	11	564	70	41	1401	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	3	3		4	4	4 5	1	6	6 4	5	2	
Permitted Phases												
Actuated Green, G (s)	7.6	7.6		14.4	14.4	27.1	2.6	87.3	101.7	6.7	91.4	
Effective Green, g (s)	7.6	7.6		14.4	14.4	27.1	2.6	87.3	101.7	6.7	91.4	
Actuated g/C Ratio	0.05	0.05		0.10	0.10	0.19	0.02	0.62	0.73	0.05	0.65	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	97	91		171	164	288	33	2228	1161	85	2324	
v/s Ratio Prot	c0.02	0.02		0.07	c0.07	0.01	0.01	0.16	0.04	c0.02	c0.39	
v/s Ratio Perm												
v/c Ratio	0.37	0.30		0.68	0.70	0.03	0.33	0.25	0.06	0.48	0.60	
Uniform Delay, d1	63.9	63.6		60.6	60.7	45.8	67.8	11.8	5.5	65.0	13.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	0.7		8.1	10.5	0.0	2.2	0.3	0.0	1.6	1.2	
Delay (s)	64.8	64.3		68.7	71.3	45.8	70.0	12.1	5.5	66.5	15.1	
Level of Service	E	E		E	E	D	E	B	A	E	B	
Approach Delay (s)		64.4			66.3			12.1			16.5	
Approach LOS		E			E			B			B	
Intersection Summary												
HCM 2000 Control Delay			23.0									
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			60.2%									
Analysis Period (min)			15									
c Critical Lane Group												

5: Route 120 & Old Etna Rd/Etna Rd

2022 Existing - no adjustments

Timing Report, Sorted By Phase

Weekday PM

						
Phase Number	1	2	3	4	5	6
Movement	NBL	SBT	EBTL	WBTL	SBL	NBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	None	Max
Maximum Split (s)	15	77	20	28	17	75
Maximum Split (%)	10.7%	55.0%	14.3%	20.0%	12.1%	53.6%
Minimum Split (s)	15	16	16	16	15	16
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	9	5	5	5	10
Vehicle Extension (s)	2	3	2	2	2	3
Minimum Gap (s)	2	3	2	2	2	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	No	No	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	36	51	128	8	36	53
End Time (s)	51	128	8	36	53	128
Yield/Force Off (s)	45	122	2	30	47	122
Yield/Force Off 170(s)	45	122	2	30	47	122
Local Start Time (s)	54	69	6	26	54	71
Local Yield (s)	63	0	20	48	65	0
Local Yield 170(s)	63	0	20	48	65	0

Intersection Summary

Cycle Length 140
Control Type Actuated-Coordinated
Natural Cycle 90
Offset: 122 (87%), Referenced to phase 2:SBT, Start of Yellow

Splits and Phases: 5: Route 120 & Old Etna Rd/Etna Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
15 s	77 s	20 s	28 s
 Ø5	 Ø6		
17 s	75 s		

Intersection

Int Delay, s/veh 2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	110	65	795	1975	10
Future Vol, veh/h	5	110	65	795	1975	10
Conflicting Peds, #/hr	0	0	1	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	40	450	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	98	98	93	93
Heavy Vehicles, %	0	0	2	2	1	1
Mvmt Flow	6	128	66	811	2124	11

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2669	1069	2136
Stage 1	2131	-	-
Stage 2	538	-	-
Critical Hdwy	6.8	6.9	4.14
Critical Hdwy Stg 1	5.8	-	-
Critical Hdwy Stg 2	5.8	-	-
Follow-up Hdwy	3.5	3.3	2.22
Pot Cap-1 Maneuver	19	221	250
Stage 1	79	-	-
Stage 2	555	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	14	221	250
Mov Cap-2 Maneuver	14	-	-
Stage 1	58	-	-
Stage 2	554	-	-

Approach	EB	NB	SB
HCM Control Delay, s	56.5	1.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	250	-	14	221	-	-
HCM Lane V/C Ratio	0.265	-	0.415	0.579	-	-
HCM Control Delay (s)	24.5	-	386.2	41.5	-	-
HCM Lane LOS	C	-	F	E	-	-
HCM 95th %tile Q(veh)	1	-	1.1	3.2	-	-

Intersection

Int Delay, s/veh	7.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	25	0	1	15	1
Future Vol, veh/h	0	25	0	1	15	1
Conflicting Peds, #/hr	0	9	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	67	67	25	25	64	64
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	37	0	4	23	2

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	50	11	0
Stage 1	2	-	-
Stage 2	48	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	964	1076	-
Stage 1	1026	-	-
Stage 2	980	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	951	1067	-
Mov Cap-2 Maneuver	951	-	-
Stage 1	1026	-	-
Stage 2	966	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	6.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1067	1631
HCM Lane V/C Ratio	-	-	0.035	0.014
HCM Control Delay (s)	-	-	8.5	7.2
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection

Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	0	15	10	0	15
Future Vol, veh/h	5	0	15	10	0	15
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	72	72	58	58
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	8	0	21	14	0	26

Major/Minor	Minor1	Major1		Major2	
Conflicting Flow All	54	30	0	0	35
Stage 1	28	-	-	-	-
Stage 2	26	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	959	1050	-	-	1589
Stage 1	1000	-	-	-	-
Stage 2	1002	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	959	1048	-	-	1589
Mov Cap-2 Maneuver	959	-	-	-	-
Stage 1	1000	-	-	-	-
Stage 2	1002	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	959	1589
HCM Lane V/C Ratio	-	-	0.008	-
HCM Control Delay (s)	-	-	8.8	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

3: Heater Rd/Mt Support Rd & Hanover St Ext HCM 6th TWSC

Intersection

Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	0	0	50	65	10
Future Vol, veh/h	10	0	0	50	65	10
Conflicting Peds, #/hr	3	3	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	64	64	89	89
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	13	0	0	78	73	11

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	160	82	84	0	0
Stage 1	79	-	-	-	-
Stage 2	81	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	836	983	1526	-	-
Stage 1	949	-	-	-	-
Stage 2	947	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	836	980	1526	-	-
Mov Cap-2 Maneuver	836	-	-	-	-
Stage 1	949	-	-	-	-
Stage 2	947	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1526	-	836	-	-
HCM Lane V/C Ratio	-	-	0.016	-	-
HCM Control Delay (s)	0	-	9.4	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection

Intersection Delay, s/veh 7.6
Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	10	3	50	2	10	2	45	25	2	60	0
Future Vol, veh/h	0	10	3	50	2	10	2	45	25	2	60	0
Peak Hour Factor	0.60	0.60	0.60	0.82	0.82	0.82	0.74	0.74	0.74	0.88	0.88	0.88
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	17	5	61	2	12	3	61	34	2	68	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	7.3			7.8			7.5			7.6		
HCM LOS	A			A			A			A		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	0%	81%	3%
Vol Thru, %	62%	77%	3%	97%
Vol Right, %	35%	23%	16%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	72	13	62	62
LT Vol	2	0	50	2
Through Vol	45	10	2	60
RT Vol	25	3	10	0
Lane Flow Rate	97	22	76	70
Geometry Grp	1	1	1	1
Degree of Util (X)	0.106	0.025	0.09	0.081
Departure Headway (Hd)	3.919	4.11	4.27	4.149
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	903	856	829	853
Service Time	1.992	2.205	2.348	2.224
HCM Lane V/C Ratio	0.107	0.026	0.092	0.082
HCM Control Delay	7.5	7.3	7.8	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.1	0.3	0.3

5: Route 120 & Old Etna Rd/Etna Rd

2022 Existing - no adjustments

Queues

Sat MIDDAY

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	13	20	45	45	21	6	472	72	26	427
v/c Ratio	0.18	0.24	0.46	0.48	0.08	0.09	0.18	0.05	0.31	0.15
Control Delay	69.7	43.5	77.6	77.6	0.6	67.6	7.8	0.7	73.2	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.7	43.5	77.6	77.6	0.6	67.6	7.8	0.7	73.2	5.2
Queue Length 50th (ft)	12	6	42	43	0	5	76	0	23	45
Queue Length 95th (ft)	29	27	84	86	0	21	120	6	56	101
Internal Link Dist (ft)		539		473			1647			1282
Turn Bay Length (ft)	65		300		75	350		325	300	
Base Capacity (vph)	215	216	265	254	379	167	2620	1445	216	2787
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.09	0.17	0.18	0.06	0.04	0.18	0.05	0.12	0.15
Intersection Summary										

5: Route 120 & Old Etna Rd/Etna Rd

2022 Existing - no adjustments

HCM Signalized Intersection Capacity Analysis

Sat MIDDAY

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	5	10	75	3	20	5	425	65	25	400	10
Future Volume (vph)	10	5	10	75	3	20	5	425	65	25	400	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			6%			0%			0%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.90		1.00	0.99	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1778	1689		1615	1549	1445	1805	3610	1615	1787	3560	
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1778	1689		1615	1549	1445	1805	3610	1615	1787	3560	
Peak-hour factor, PHF	0.75	0.75	0.75	0.88	0.88	0.88	0.90	0.90	0.90	0.96	0.96	0.96
Adj. Flow (vph)	13	7	13	85	3	23	6	472	72	26	417	10
RTOR Reduction (vph)	0	13	0	0	1	18	0	0	17	0	1	0
Lane Group Flow (vph)	13	7	0	45	44	3	6	472	55	26	426	0
Confl. Peds. (#/hr)							1		1	1		1
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Turn Type	Split	NA		Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	3	3		4	4	4 5	1	6	6 4	5	2	
Permitted Phases												
Actuated Green, G (s)	3.8	3.8		8.5	8.5	20.2	1.2	98.0	106.5	5.7	102.5	
Effective Green, g (s)	3.8	3.8		8.5	8.5	20.2	1.2	98.0	106.5	5.7	102.5	
Actuated g/C Ratio	0.03	0.03		0.06	0.06	0.14	0.01	0.70	0.76	0.04	0.73	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	48	45		98	94	208	15	2527	1228	72	2606	
v/s Ratio Prot	c0.01	0.00		0.03	c0.03	0.00	0.00	c0.13	0.03	c0.01	c0.12	
v/s Ratio Perm												
v/c Ratio	0.27	0.16		0.46	0.47	0.01	0.40	0.19	0.04	0.36	0.16	
Uniform Delay, d1	66.7	66.5		63.5	63.6	51.4	69.0	7.2	4.1	65.4	5.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	0.6		1.2	1.3	0.0	6.3	0.2	0.0	1.1	0.1	
Delay (s)	67.9	67.2		64.8	64.9	51.4	75.3	7.4	4.2	66.5	5.8	
Level of Service	E	E		E	E	D	E	A	A	E	A	
Approach Delay (s)		67.4			62.3			7.7			9.3	
Approach LOS		E			E			A			A	
Intersection Summary												
HCM 2000 Control Delay			15.4									
HCM 2000 Volume to Capacity ratio			0.22									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			39.8%									
Analysis Period (min)			15									
c Critical Lane Group												

5: Route 120 & Old Etna Rd/Etna Rd

2022 Existing - no adjustments

Timing Report, Sorted By Phase

Sat Midday

						
Phase Number	1	2	3	4	5	6
Movement	NBL	SBT	EBTL	WBTL	SBL	NBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	None	Max
Maximum Split (s)	19	69	23	29	23	65
Maximum Split (%)	13.6%	49.3%	16.4%	20.7%	16.4%	46.4%
Minimum Split (s)	15	16	16	16	15	16
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	9	5	5	5	10
Vehicle Extension (s)	2	3	2	2	2	3
Minimum Gap (s)	2	3	2	2	2	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	No	No	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	40	59	128	11	40	63
End Time (s)	59	128	11	40	63	128
Yield/Force Off (s)	53	122	5	34	57	122
Yield/Force Off 170(s)	53	122	5	34	57	122
Local Start Time (s)	58	77	6	29	58	81
Local Yield (s)	71	0	23	52	75	0
Local Yield 170(s)	71	0	23	52	75	0

Intersection Summary

Cycle Length 140
Control Type Actuated-Coordinated
Natural Cycle 65
Offset: 122 (87%), Referenced to phase 2:SBT, Start of Yellow

Splits and Phases: 5: Route 120 & Old Etna Rd/Etna Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
19 s	69 s	23 s	29 s
 Ø5	 Ø6		
23 s	65 s		

Intersection

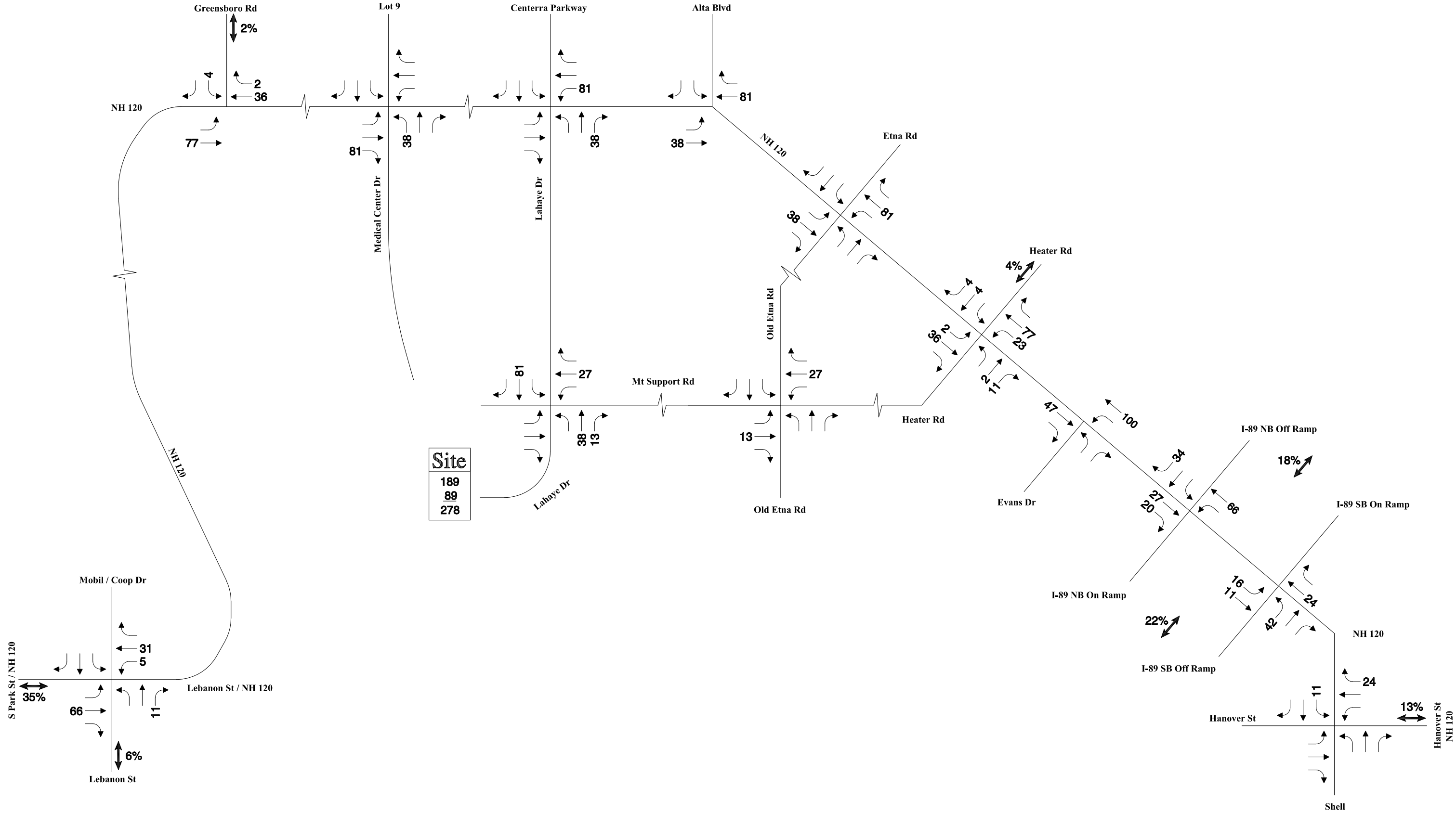
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	25	25	640	635	5
Future Vol, veh/h	3	25	25	640	635	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	40	450	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	96	96	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	4	30	26	667	655	5

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	1044	330	660	0	0
Stage 1	658	-	-	-	-
Stage 2	386	-	-	-	-
Critical Hdwy	6.8	6.9	4.12	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.21	-	-
Pot Cap-1 Maneuver	228	672	931	-	-
Stage 1	482	-	-	-	-
Stage 2	662	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	222	672	931	-	-
Mov Cap-2 Maneuver	222	-	-	-	-
Stage 1	469	-	-	-	-
Stage 2	662	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.8	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	931	-	222	672	-	-
HCM Lane V/C Ratio	0.028	-	0.016	0.045	-	-
HCM Control Delay (s)	9	-	21.5	10.6	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0.1	-	-

Background Developments

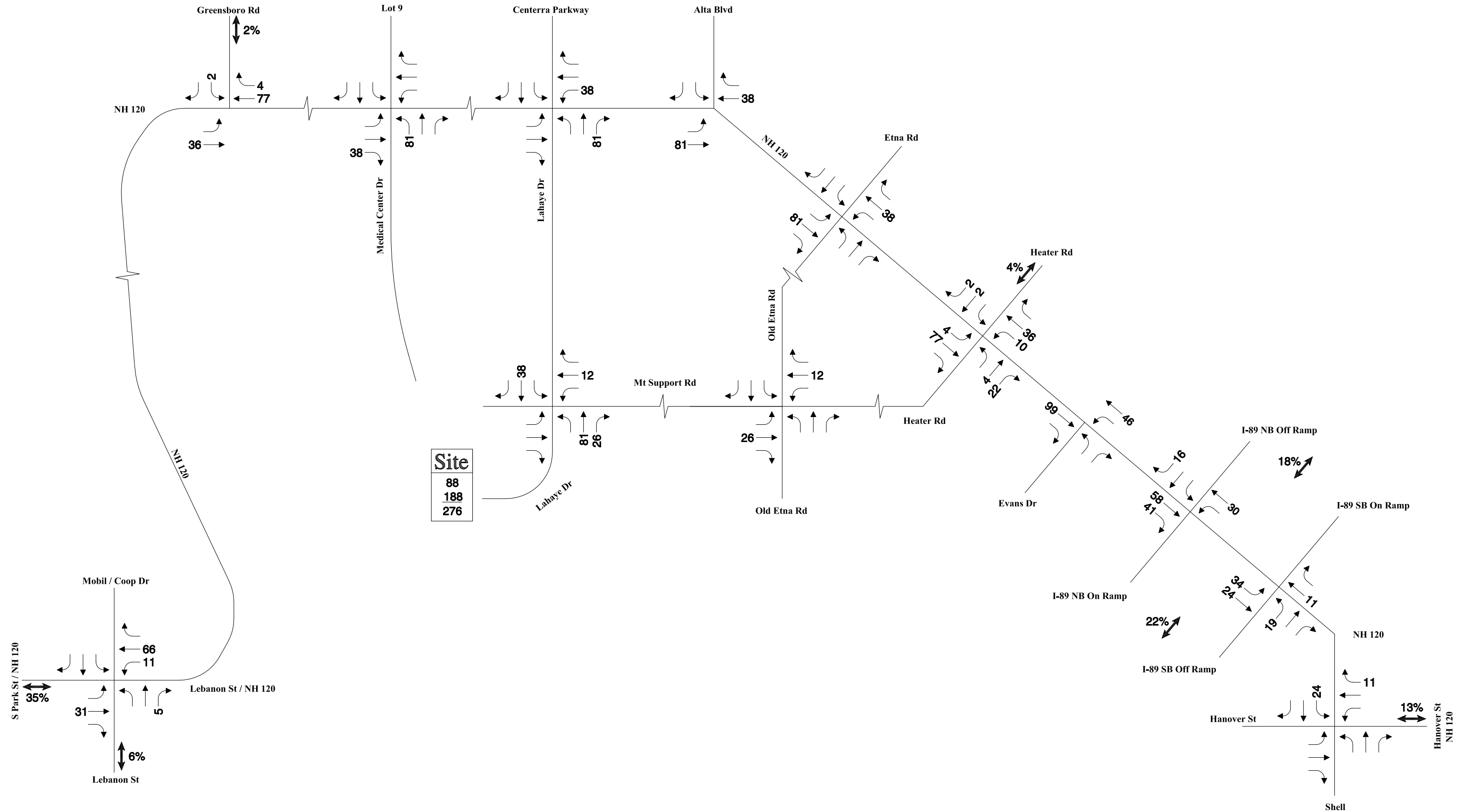


Not to Scale



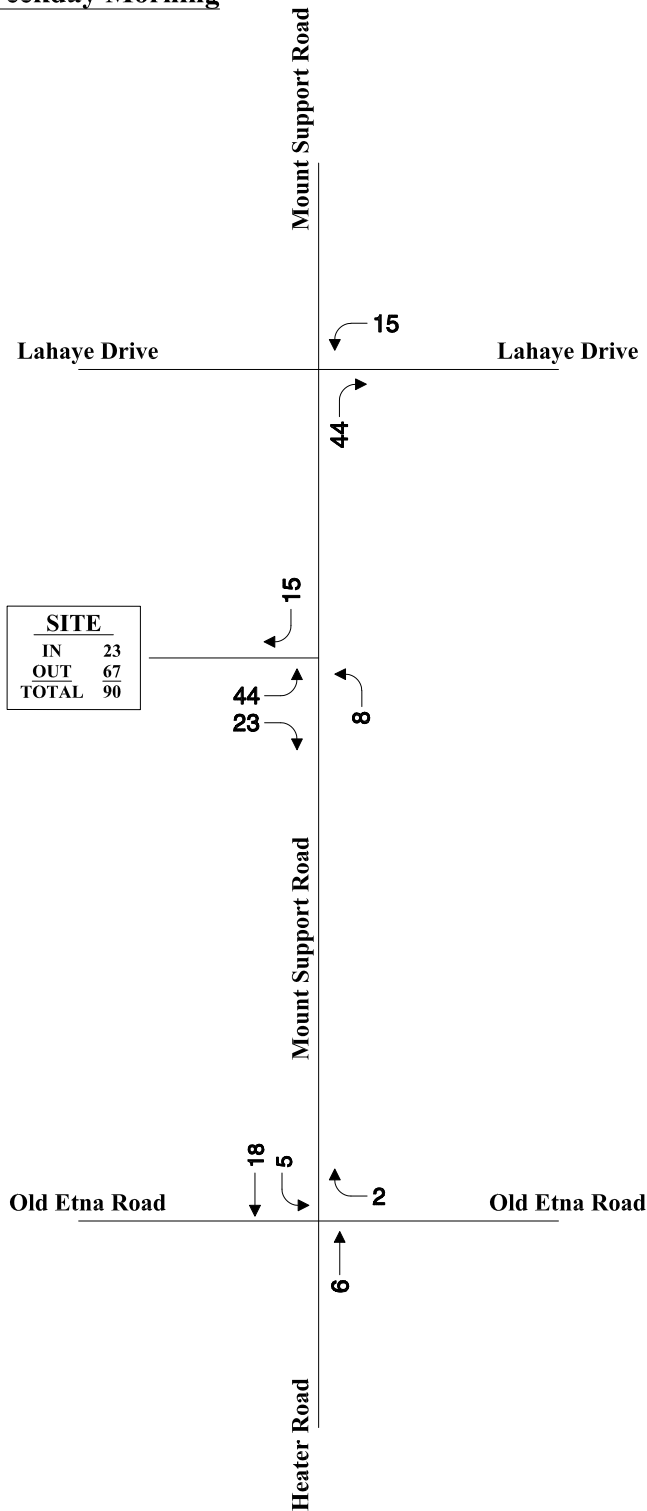
Site Generated
Weekday Morning
Peak Hour Traffic Volumes
DHMC Patient Care Tower Expansion

Figure 8

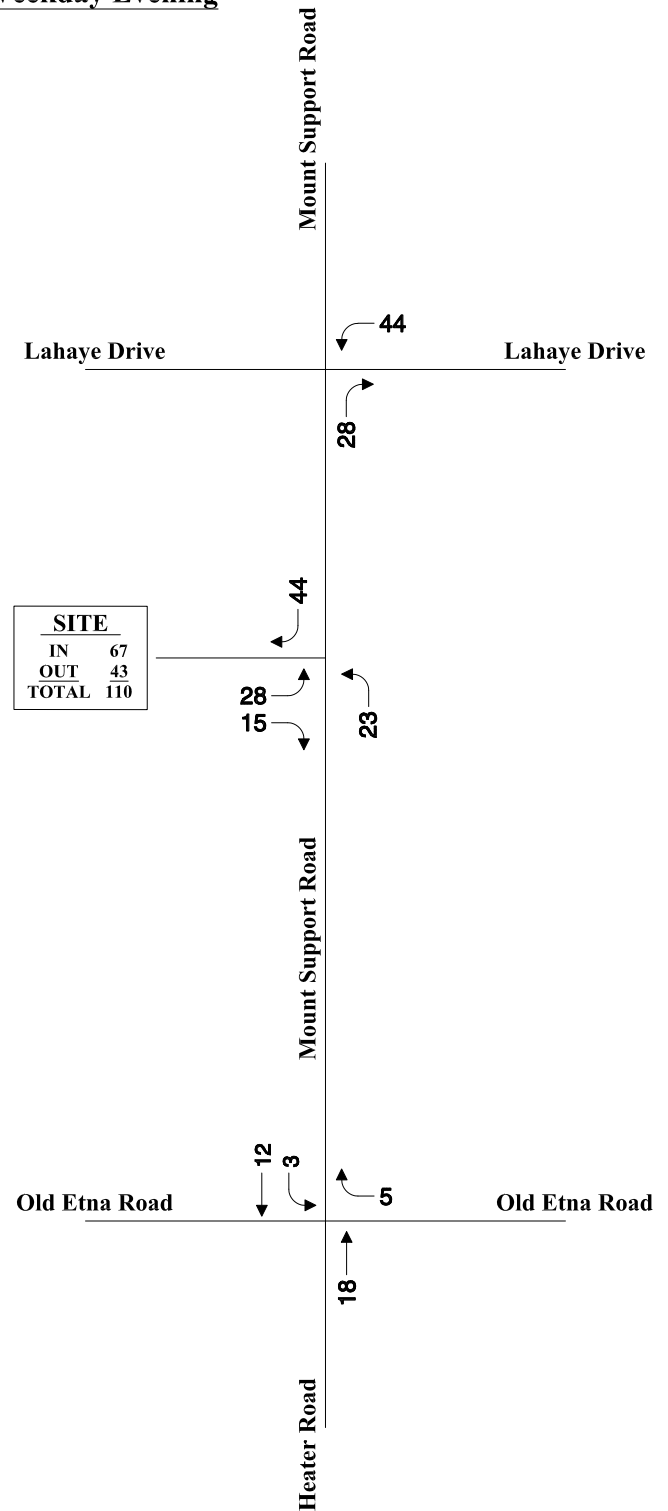


Not to Scale

Weekday Morning



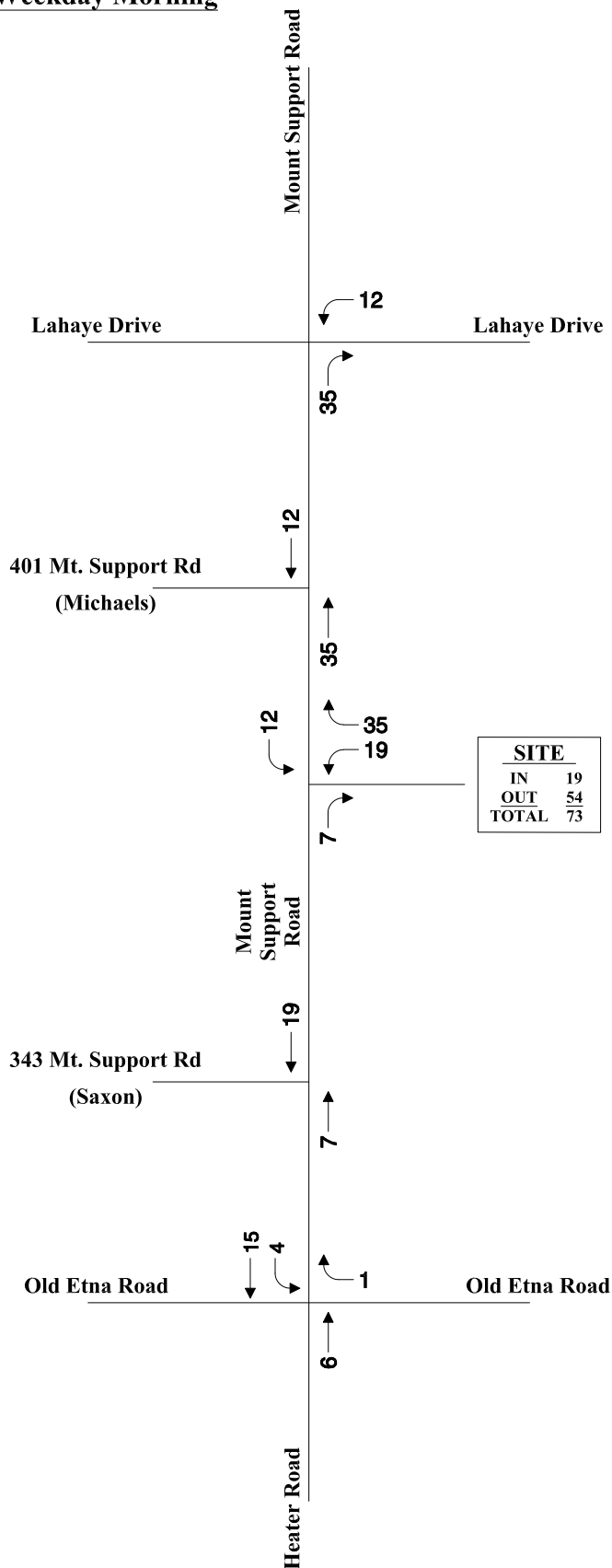
Weekday Evening



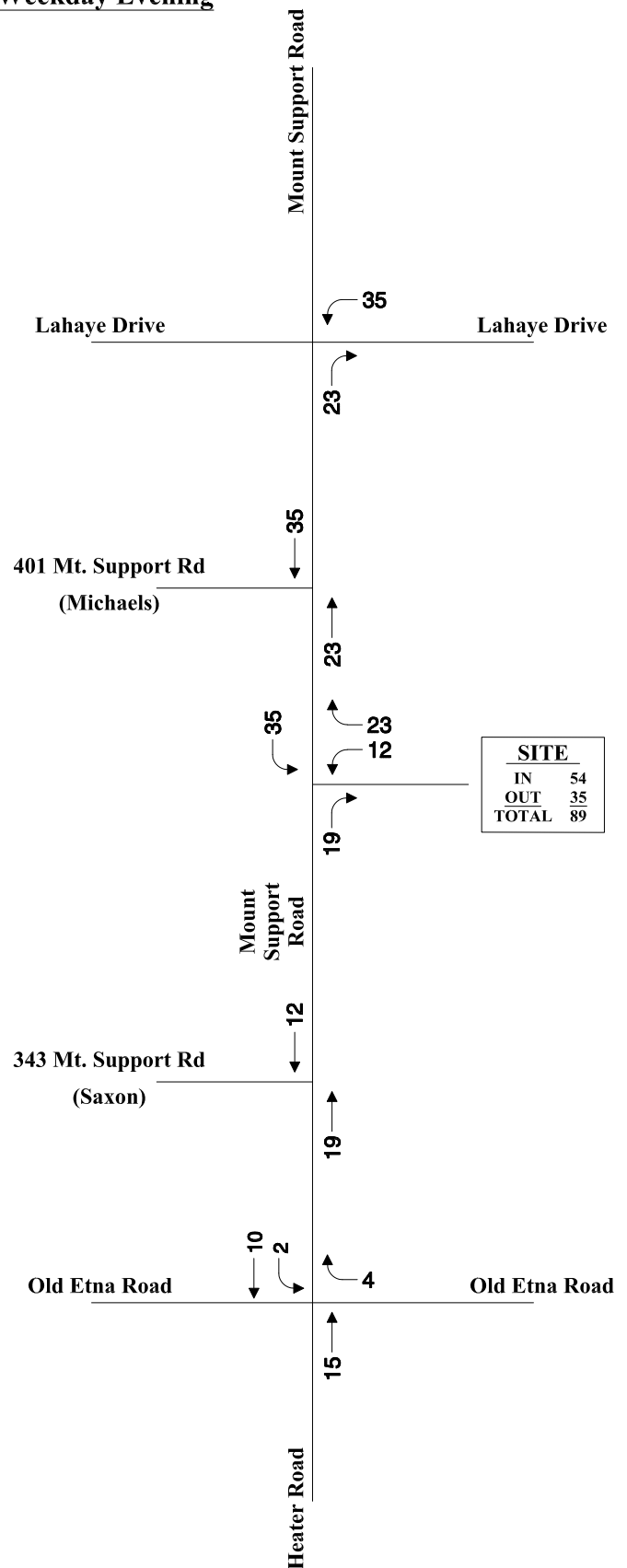
Site Generated
Peak Hour Traffic Volumes

Figure A-1

Weekday Morning



Weekday Evening



Site Generated
Peak Hour Traffic Volumes

Figure A-1

Trip-Generation and Distribution Calculations

ITE TRIP GENERATION WORKSHEET
(11th Edition, Updated 2021)

LANDUSE: Multifamily Housing (Mid-Rise) - Not Close to Rail Transit: 4-10 stories
LANDUSE CODE: 221 Independent Variable --- Number of Dwelling Units
SETTING/LOCATION: General Urban/Suburban
JOB NAME: 474 dwelling units
JOB NUMBER:

WEEKDAY

RATES:		# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
				Average	Low	High	Average	Low	High	Enter	Exit
	DAILY	11	0.93	4.54	3.76	5.40	201	60	330	50%	50%
	AM PEAK OF GENERATOR	23	0.89	0.35	0.13	0.53	226	21	1,168	26%	74%
	PM PEAK OF GENERATOR	22	0.93	0.39	0.19	0.60	221	21	1,168	60%	40%
	AM PEAK (ADJACENT ST)	30	0.91	0.37	0.15	0.53	173	26	490	23%	77%
	PM PEAK (ADJACENT ST)	31	0.91	0.39	0.19	0.57	169	26	490	61%	39%

TRIPS:

		BY AVERAGE			BY REGRESSION		
		Total	Enter	Exit	Total	Enter	Exit
	DAILY	2,152	1,076	1,076	2,216	1,108	1,108
	AM PEAK OF GENERATOR	166	43	123	158	41	117
	PM PEAK OF GENERATOR	185	111	74	167	100	67
	AM PEAK (ADJACENT ST)	175	40	135	197	45	152
	PM PEAK (ADJACENT ST)	185	113	72	185	113	72

SATURDAY

RATES:		# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
				Average	Low	High	Average	Low	High	Enter	Exit
	DAILY	5	0.91	4.57	4.03	5.31	250	140	330	50%	50%
	PEAK OF GENERATOR	5	0.92	0.39	0.34	0.43	250	140	330	51%	49%

TRIPS:

		BY AVERAGE			BY REGRESSION		
		Total	Enter	Exit	Total	Enter	Exit
	DAILY	2,168	1,084	1,084	2,064	1,032	1,032
	PEAK OF GENERATOR	185	94	91	191	97	93

SUNDAY

RATES:		# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
				Average	Low	High	Average	Low	High	Enter	Exit
	DAILY	5	0.85	3.77	3.06	4.24	250	140	330	50%	50%
	PEAK OF GENERATOR	5	0.79	0.32	0.26	0.42	250	140	330	55%	45%

TRIPS:

		BY AVERAGE			BY REGRESSION		
		Total	Enter	Exit	Total	Enter	Exit
	DAILY	1,788	894	894	1,672	836	836
	PEAK OF GENERATOR	152	83	68	135	74	61

Table 3. Residence MCD/County to Workplace MCD/County Commuting Flows for the United States and Puerto Rico**Sorted by Residence Geography: 5-Year ACS, 2011-2015**

Universe: Workers 16 years and over.

Commuting flows are sorted by residence state, residence county, and residence minor civil division.

Place of Residency: Lebanon, NH - Grafton County

Place of Work		Commuting Flow	Travel Route Factors				Travel Route by # of Commuters				Travel Route by % of Commuters			
State Name	Minor Civil Division Name	Workers in Commuting Flow	I-89 North	I-89 South	NH 120 North	NH 120 South	I-89 North	I-89 South	NH 120 North	NH 120 South	I-89 North	I-89 South	NH 120 North	NH 120 South
MA	Cambridge city	14		1			0	14	0	0	0%	0%	0%	0%
MA	Boston city	21		1			0	21	0	0	0%	0%	0%	0%
NH	Walpole town	17	1				17	0	0	0	0%	0%	0%	0%
NH	Bath town	16			1		0	0	16	0	0%	0%	0%	0%
NH	Bethlehem town	14			1		0	0	14	0	0%	0%	0%	0%
NH	Canaan town	75		1			0	75	0	0	0%	1%	0%	0%
NH	Enfield town	80		1			0	80	0	0	0%	1%	0%	0%
NH	Franconia town	18			1		0	0	18	0	0%	0%	0%	0%
NH	Hanover town	1,220			1		0	0	1,220	0	0%	0%	17%	0%
NH	Lebanon city	4,212	0.1	0.25	0.6	0.05	421	1,053	2,527	211	6%	15%	35%	3%
NH	Littleton town	87			1		0	0	87	0	0%	0%	1%	0%
NH	Lyme town	69			1		0	0	69	0	0%	0%	1%	0%
NH	Piermont town	26			1		0	0	26	0	0%	0%	0%	0%
NH	Plymouth town	89		1			0	89	0	0	0%	1%	0%	0%
NH	Nashua city	14		1			0	14	0	0	0%	0%	0%	0%
NH	Concord city	31		1			0	31	0	0	0%	0%	0%	0%
NH	New London town	53		1			0	53	0	0	0%	1%	0%	0%
NH	Claremont city	78	1				78	0	0	0	1%	0%	0%	0%
NH	Cornish town	18			1		0	0	18	0	0%	0%	0%	0%
NH	Newport town	56		1			0	56	0	0	0%	1%	0%	0%
NH	Plainfield town	79				1	0	0	0	79	0%	0%	0%	1%
VT	Williston town	13	1				13	0	0	0	0%	0%	0%	0%
VT	Fairlee town	14			1		0	0	14	0	0%	0%	0%	0%
VT	Newbury town	16			1		0	0	16	0	0%	0%	0%	0%
VT	Thetford town	18			1		0	0	18	0	0%	0%	0%	0%
VT	Killington town	13	1				13	0	0	0	0%	0%	0%	0%
VT	Rutland city	15	1				15	0	0	0	0%	0%	0%	0%
VT	Montpelier city	45	1				45	0	0	0	1%	0%	0%	0%
VT	Grafton town	13	1				13	0	0	0	0%	0%	0%	0%
VT	Bethel town	13	1				13	0	0	0	0%	0%	0%	0%
VT	Hartford town	380	1				380	0	0	0	5%	0%	0%	0%
VT	Ludlow town	28	1				28	0	0	0	0%	0%	0%	0%
VT	Norwich town	62			1		0	0	62	0	0%	0%	1%	0%
VT	Plymouth town	31	1				31	0	0	0	0%	0%	0%	0%
VT	Royalton town	57	1				57	0	0	0	1%	0%	0%	0%
VT	Sharon town	14	1				14	0	0	0	0%	0%	0%	0%
VT	Springfield town	20	1				20	0	0	0	0%	0%	0%	0%
VT	Windsor town	70	1				70	0	0	0	1%	0%	0%	0%
VT	Woodstock town	18	1				18	0	0	0	0%	0%	0%	0%
		7,127					1,246	1,486	4,105	290	17%	21%	58%	4%
							Rounded:				15%	20%	60%	5%

Data are based on a sample and are subject to sampling variability. A margin of error is a measure of an estimate's variability. The larger the margin of error in relation to the size of the estimates, the less reliable the estimate. When added to and subtracted from the estimate, the margin of error forms the 90 percent confidence interval.

Flows are presented for MCDs for the 12 "strong MCD states" (CT, ME, MA, NH, RI, VT, MI, WI, NJ, NY, MN, and PA), and at the county level for all other states.

Source: U.S. Census Bureau, 2011-2015 American Community Survey.

No-Build and Build Intersection Analysis Worksheets

1: Hanover St & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh	35.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	530	0	1	210	3
Future Vol, veh/h	5	530	0	1	210	3
Conflicting Peds, #/hr	0	53	0	10	10	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	59	59	25	25	67	67
Heavy Vehicles, %	0	0	0	0	4	4
Mvmt Flow	8	898	0	4	313	4

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	642	65	0
Stage 1	12	-	-
Stage 2	630	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	442	1005	-
Stage 1	1016	-	-
Stage 2	535	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	351	945	-
Mov Cap-2 Maneuver	351	-	-
Stage 1	1006	-	-
Stage 2	429	-	-

Approach	WB	NB	SB
HCM Control Delay, s	44.8	0	7.7
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	930	1576
HCM Lane V/C Ratio	-	-	0.975	0.199
HCM Control Delay (s)	-	-	44.8	7.8
HCM Lane LOS	-	-	E	A
HCM 95th %tile Q(veh)	-	-	17	0.7

2: Hanover St/Hanover St Ext & Old Etna Rd
HCM 6th TWSC

Intersection

Int Delay, s/veh	4.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	130	0	75	185	1	30
Future Vol, veh/h	130	0	75	185	1	30
Conflicting Peds, #/hr	0	11	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	57	57	84	84	83	83
Heavy Vehicles, %	1	1	0	0	2	2
Mvmt Flow	228	0	89	220	1	36

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	240	213	0
Stage 1	202	-	-
Stage 2	38	-	-
Critical Hdwy	6.41	6.21	-
Critical Hdwy Stg 1	5.41	-	-
Critical Hdwy Stg 2	5.41	-	-
Follow-up Hdwy	3.509	3.309	-
Pot Cap-1 Maneuver	750	830	-
Stage 1	834	-	-
Stage 2	987	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	747	819	-
Mov Cap-2 Maneuver	747	-	-
Stage 1	831	-	-
Stage 2	986	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.9	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	747	1244
HCM Lane V/C Ratio	-	-	0.305	0.001
HCM Control Delay (s)	-	-	11.9	7.9
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	1.3	0

3: Heater Rd/Mt Support Rd & Hanover St Ext
HCM 6th TWSC2025 No-Build
Weekday AM

Intersection

Int Delay, s/veh 1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
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Lane Configurations						
Traffic Vol, veh/h	65	5	1	235	200	25
Future Vol, veh/h	65	5	1	235	200	25
Conflicting Peds, #/hr	0	1	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	86	86	77	77
Heavy Vehicles, %	0	0	5	5	4	4
Mvmt Flow	71	5	1	273	260	32

Major/Minor	Minor2	Major1	Major2
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Conflicting Flow All	559	285	300	0	-	0
Stage 1	284	-	-	-	-	-
Stage 2	275	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.15	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.245	-	-	-
Pot Cap-1 Maneuver	494	759	1244	-	-	-
Stage 1	769	-	-	-	-	-
Stage 2	776	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	486	752	1235	-	-	-
Mov Cap-2 Maneuver	486	-	-	-	-	-
Stage 1	762	-	-	-	-	-
Stage 2	770	-	-	-	-	-

Approach	EB	NB	SB
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HCM Control Delay, s	13.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
-----------------------	-----	-----	-------	-----	-----

Capacity (veh/h)	1235	-	499	-	-
HCM Lane V/C Ratio	0.001	-	0.152	-	-
HCM Control Delay (s)	7.9	0	13.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

4: Heater Rd & Old Etna Rd
HCM 6th AWSC

2025 No-Build

Weekday AM

Intersection

Intersection Delay, s/veh 17.4
Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	75	100	85	60	50	95	180	50	30	170	1
Future Vol, veh/h	3	75	100	85	60	50	95	180	50	30	170	1
Peak Hour Factor	0.69	0.69	0.69	0.90	0.90	0.90	0.83	0.83	0.83	0.66	0.66	0.66
Heavy Vehicles, %	4	4	4	2	2	2	4	4	4	6	6	6
Mvmt Flow	4	109	145	94	67	56	114	217	60	45	258	2
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	14.8			14.3			21.2			17.1		
HCM LOS	B			B			C			C		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	29%	2%	44%	15%
Vol Thru, %	55%	42%	31%	85%
Vol Right, %	15%	56%	26%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	325	178	195	201
LT Vol	95	3	85	30
Through Vol	180	75	60	170
RT Vol	50	100	50	1
Lane Flow Rate	392	258	217	305
Geometry Grp	1	1	1	1
Degree of Util (X)	0.673	0.458	0.404	0.546
Departure Headway (Hd)	6.189	6.385	6.712	6.457
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	583	562	533	557
Service Time	4.254	4.456	4.788	4.527
HCM Lane V/C Ratio	0.672	0.459	0.407	0.548
HCM Control Delay	21.2	14.8	14.3	17.1
HCM Lane LOS	C	B	B	C
HCM 95th-tile Q	5.1	2.4	1.9	3.3

5: Route 120 & Old Etna Rd/Etna Rd

2025 No-Build

Queues

Weekday AM

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	103	148	110	113	67	52	2645	349	58	872
v/c Ratio	0.90	0.99	0.87	0.90	0.21	0.54	1.19	0.29	0.59	0.39
Control Delay	123.5	115.4	112.8	120.8	11.4	84.0	115.5	1.2	87.2	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	123.5	115.4	112.8	120.8	11.4	84.0	115.5	1.2	87.2	12.6
Queue Length 50th (ft)	95	98	106	112	0	47	~1536	5	52	193
Queue Length 95th (ft)	#169	#186	#224	#247	43	88	#1535	15	97	224
Internal Link Dist (ft)		539		473			1647			1282
Turn Bay Length (ft)	65		300		75	350		325	300	
Base Capacity (vph)	115	150	128	125	315	113	2228	1208	113	2257
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.99	0.86	0.90	0.21	0.46	1.19	0.29	0.51	0.39

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: Route 120 & Old Etna Rd/Etna Rd
HCM Signalized Intersection Capacity Analysis

2025 No-Build

Weekday AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	45	70	175	30	70	45	2275	300	50	680	70
Future Volume (vph)	80	45	70	175	30	70	45	2275	300	50	680	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			6%			0%			0%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.91		1.00	0.99	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1796	1718		1631	1577	1459	1770	3539	1583	1770	3483	
Flt Permitted	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1796	1718		1631	1577	1459	1770	3539	1583	1770	3483	
Peak-hour factor, PHF	0.78	0.78	0.78	0.95	0.95	0.95	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	103	58	90	184	32	74	52	2645	349	58	791	81
RTOR Reduction (vph)	0	40	0	0	2	55	0	0	88	0	5	0
Lane Group Flow (vph)	103	108	0	110	111	12	52	2645	261	58	867	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA		Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	3	3		4	4	4 5	1	6	6 4	5	2	
Permitted Phases												
Actuated Green, G (s)	9.0	9.0		11.0	11.0	24.9	6.7	88.1	99.1	7.9	89.3	
Effective Green, g (s)	9.0	9.0		11.0	11.0	24.9	6.7	88.1	99.1	7.9	89.3	
Actuated g/C Ratio	0.06	0.06		0.08	0.08	0.18	0.05	0.63	0.71	0.06	0.64	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	115	110		128	123	259	84	2227	1120	99	2221	
v/s Ratio Prot	0.06	c0.06		0.07	c0.07	0.01	0.03	c0.75	0.16	c0.03	0.25	
v/s Ratio Perm												
v/c Ratio	0.90	0.98		0.86	0.90	0.05	0.62	1.19	0.23	0.59	0.39	
Uniform Delay, d1	65.0	65.4		63.7	64.0	47.7	65.4	26.0	7.2	64.5	12.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	51.4	78.2		38.9	51.5	0.0	9.2	89.3	0.0	5.6	0.5	
Delay (s)	116.5	143.6		102.6	115.5	47.7	74.6	115.3	7.2	70.0	12.7	
Level of Service	F	F		F	F	D	E	F	A	E	B	
Approach Delay (s)		132.4			94.9			102.2			16.3	
Approach LOS		F			F			F			B	
Intersection Summary												
HCM 2000 Control Delay			85.7									
HCM 2000 Volume to Capacity ratio			1.10									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			88.7%									
Analysis Period (min)			15									
c Critical Lane Group												

5: Route 120 & Old Etna Rd/Etna Rd
Timing Report, Sorted By Phase

2025 No-Build

Weekday AM

						
Phase Number	1	2	3	4	5	6
Movement	NBL	SBT	EBTL	WBTL	SBL	NBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	None	Max
Maximum Split (s)	15	93	15	17	15	93
Maximum Split (%)	10.7%	66.4%	10.7%	12.1%	10.7%	66.4%
Minimum Split (s)	15	16	15	16	15	16
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	9	5	5	5	10
Vehicle Extension (s)	2	3	2	2	2	3
Minimum Gap (s)	2	3	2	2	2	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	No	No	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	20	35	128	3	20	35
End Time (s)	35	128	3	20	35	128
Yield/Force Off (s)	29	122	137	14	29	122
Yield/Force Off 170(s)	29	122	137	14	29	122
Local Start Time (s)	38	53	6	21	38	53
Local Yield (s)	47	0	15	32	47	0
Local Yield 170(s)	47	0	15	32	47	0

Intersection Summary

Cycle Length 140
Control Type Actuated-Coordinated
Natural Cycle 150
Offset: 122 (87%), Referenced to phase 2:SBT, Start of Yellow

Splits and Phases: 5: Route 120 & Old Etna Rd/Etna Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
15 s	93 s	15 s	17 s
 Ø5	 Ø6		
15 s	93 s		

6: Route 120 & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh 12.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	225	490	2935	1210	75
Future Vol, veh/h	0	225	490	2935	1210	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	40	450	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	72	72	89	89	93	93
Heavy Vehicles, %	1	1	2	2	4	4
Mvmt Flow	0	313	551	3298	1301	81

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	4093	691	1382
Stage 1	1342	-	-
Stage 2	2751	-	-
Critical Hdwy	6.82	6.92	4.14
Critical Hdwy Stg 1	5.82	-	-
Critical Hdwy Stg 2	5.82	-	-
Follow-up Hdwy	3.51	3.31	2.22
Pot Cap-1 Maneuver	2	389	~ 492
Stage 1	210	-	-
Stage 2	35	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	0	389	~ 492
Mov Cap-2 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	35	-	-

Approach	EB	NB	SB
HCM Control Delay, s	42.8	15.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	~ 492	-	-	389	-	-
HCM Lane V/C Ratio	1.119	-	-	0.803	-	-
HCM Control Delay (s)	105.4	-	0	42.8	-	-
HCM Lane LOS	F	-	A	E	-	-
HCM 95th %tile Q(veh)	18.5	-	-	7.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

1: Hanover St & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh 7.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	75	5	5	95	5
Future Vol, veh/h	1	75	5	5	95	5
Conflicting Peds, #/hr	0	3	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	50	50	73	73
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	1	93	10	10	130	7

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	282	18	0
Stage 1	15	-	-
Stage 2	267	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	708	1061	-
Stage 1	1008	-	-
Stage 2	778	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	651	1058	-
Mov Cap-2 Maneuver	651	-	-
Stage 1	1008	-	-
Stage 2	715	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	7.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1049	1609
HCM Lane V/C Ratio	-	-	0.089	0.081
HCM Control Delay (s)	-	-	8.8	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.3

2: Hanover St/Hanover St Ext & Old Etna Rd
HCM 6th TWSC

2025 No-Build

Weekday PM

Intersection

Int Delay, s/veh 1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	3	20	60	3	45
Future Vol, veh/h	30	3	20	60	3	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	59	59	80	80
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	37	4	34	102	4	56

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	149	85	0
Stage 1	85	-	-
Stage 2	64	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	848	980	-
Stage 1	943	-	-
Stage 2	964	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	845	980	-
Mov Cap-2 Maneuver	845	-	-
Stage 1	943	-	-
Stage 2	961	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	856	1461
HCM Lane V/C Ratio	-	-	0.047	0.003
HCM Control Delay (s)	-	-	9.4	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

3: Heater Rd/Mt Support Rd & Hanover St Ext
HCM 6th TWSC

2025 No-Build

Weekday PM

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
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Lane Configurations 

Traffic Vol, veh/h 10 1 1 195 390 40

Future Vol, veh/h 10 1 1 195 390 40

Conflicting Peds, #/hr 0 0 1 0 0 0

Sign Control Stop Stop Free Free Free Free

RT Channelized - None - None - None

Storage Length 0 - - - - -

Veh in Median Storage, # 0 - - 0 0 -

Grade, % 0 - - 0 0 -

Peak Hour Factor 56 56 97 97 75 75

Heavy Vehicles, % 0 0 6 6 3 3

Mvmt Flow 18 2 1 201 520 53

Major/Minor	Minor2	Major1	Major2
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Conflicting Flow All 751 548 574 0 - 0

Stage 1 548 - - - - -

Stage 2 203 - - - - -

Critical Hdwy 6.4 6.2 4.16 - - -

Critical Hdwy Stg 1 5.4 - - - - -

Critical Hdwy Stg 2 5.4 - - - - -

Follow-up Hdwy 3.5 3.3 2.254 - - -

Pot Cap-1 Maneuver 381 540 979 - - -

Stage 1 583 - - - - -

Stage 2 836 - - - - -

Platoon blocked, % - - -

Mov Cap-1 Maneuver 380 539 978 - - -

Mov Cap-2 Maneuver 380 - - - - -

Stage 1 582 - - - - -

Stage 2 835 - - - - -

Approach	EB	NB	SB
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HCM Control Delay, s 14.7 0 0

HCM LOS B

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
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Capacity (veh/h) 978 - 390 - -

HCM Lane V/C Ratio 0.001 - 0.05 - -

HCM Control Delay (s) 8.7 0 14.7 - -

HCM Lane LOS A A B - -

HCM 95th %tile Q(veh) 0 - 0.2 - -

4: Heater Rd & Old Etna Rd
HCM 6th AWSC2025 No-Build
Weekday PM

Intersection

Intersection Delay, s/veh 18
Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	15	45	125	10	35	25	155	70	20	350	5
Future Vol, veh/h	3	15	45	125	10	35	25	155	70	20	350	5
Peak Hour Factor	0.45	0.45	0.45	0.95	0.95	0.95	0.77	0.77	0.77	0.76	0.76	0.76
Heavy Vehicles, %	0	0	0	2	2	2	4	4	4	3	3	3
Mvmt Flow	7	33	100	132	11	37	32	201	91	26	461	7
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	11.3			12.8			14.8			23.8		
HCM LOS	B			B			B			C		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	5%	74%	5%
Vol Thru, %	62%	24%	6%	93%
Vol Right, %	28%	71%	21%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	250	63	170	375
LT Vol	25	3	125	20
Through Vol	155	15	10	350
RT Vol	70	45	35	5
Lane Flow Rate	325	140	179	493
Geometry Grp	1	1	1	1
Degree of Util (X)	0.519	0.243	0.327	0.755
Departure Headway (Hd)	5.755	6.247	6.588	5.618
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	630	575	548	646
Service Time	3.755	4.273	4.614	3.618
HCM Lane V/C Ratio	0.516	0.243	0.327	0.763
HCM Control Delay	14.8	11.3	12.8	23.8
HCM Lane LOS	B	B	B	C
HCM 95th-tile Q	3	0.9	1.4	6.9

5: Route 120 & Old Etna Rd/Etna Rd
Queues

2025 No-Build

Weekday PM

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	54	102	160	160	58	16	824	133	62	2026
v/c Ratio	0.48	0.60	0.76	0.79	0.15	0.21	0.40	0.11	0.55	0.88
Control Delay	76.7	38.9	80.7	84.1	6.6	70.7	18.4	0.9	81.5	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.7	38.9	80.7	84.1	6.6	70.7	18.4	0.9	81.5	28.4
Queue Length 50th (ft)	48	29	149	156	0	14	211	0	56	665
Queue Length 95th (ft)	84	76	215	225	24	40	310	10	105	#1237
Internal Link Dist (ft)		539		473			1647			1282
Turn Bay Length (ft)	65		300		75	350		325	300	
Base Capacity (vph)	179	231	264	254	407	114	2059	1210	140	2296
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.44	0.61	0.63	0.14	0.14	0.40	0.11	0.44	0.88

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: Route 120 & Old Etna Rd/Etna Rd
HCM Signalized Intersection Capacity Analysis

2025 No-Build

Weekday PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	25	60	260	10	55	15	775	125	60	1925	40
Future Volume (vph)	45	25	60	260	10	55	15	775	125	60	1925	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			6%			0%			0%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.89		1.00	0.99	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1796	1690		1663	1597	1488	1787	3574	1599	1787	3562	
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1796	1690		1663	1597	1488	1787	3574	1599	1787	3562	
Peak-hour factor, PHF	0.83	0.83	0.83	0.86	0.86	0.86	0.94	0.94	0.94	0.97	0.97	0.97
Adj. Flow (vph)	54	30	72	302	12	64	16	824	133	62	1985	41
RTOR Reduction (vph)	0	65	0	0	1	44	0	0	39	0	1	0
Lane Group Flow (vph)	54	37	0	160	159	14	16	824	94	62	2025	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	3	3		4	4	4 5	1	6	6 4	5	2	
Permitted Phases												
Actuated Green, G (s)	8.7	8.7		17.8	17.8	32.6	2.8	80.7	98.5	8.8	86.7	
Effective Green, g (s)	8.7	8.7		17.8	17.8	32.6	2.8	80.7	98.5	8.8	86.7	
Actuated g/C Ratio	0.06	0.06		0.13	0.13	0.23	0.02	0.58	0.70	0.06	0.62	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	111	105		211	203	346	35	2060	1125	112	2205	
v/s Ratio Prot	c0.03	0.02		0.10	c0.10	0.01	0.01	0.23	0.06	c0.03	c0.57	
v/s Ratio Perm												
v/c Ratio	0.49	0.36		0.76	0.78	0.04	0.46	0.40	0.08	0.55	0.92	
Uniform Delay, d1	63.5	63.0		59.0	59.2	41.6	67.8	16.3	6.5	63.7	23.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	0.8		12.9	16.5	0.0	3.4	0.6	0.0	3.3	7.6	
Delay (s)	64.7	63.7		71.9	75.7	41.6	71.3	16.9	6.5	67.0	31.1	
Level of Service	E	E		E	E	D	E	B	A	E	C	
Approach Delay (s)		64.1			68.9			16.4			32.2	
Approach LOS		E			E			B			C	
Intersection Summary												
HCM 2000 Control Delay			33.2									
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			79.2%									
Analysis Period (min)			15									
c Critical Lane Group												

5: Route 120 & Old Etna Rd/Etna Rd
Timing Report, Sorted By Phase

2025 No-Build

Weekday PM

						
Phase Number	1	2	3	4	5	6
Movement	NBL	SBT	EBTL	WBTL	SBL	NBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	None	Max
Maximum Split (s)	15	77	20	28	17	75
Maximum Split (%)	10.7%	55.0%	14.3%	20.0%	12.1%	53.6%
Minimum Split (s)	15	16	16	16	15	16
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	9	5	5	5	10
Vehicle Extension (s)	2	3	2	2	2	3
Minimum Gap (s)	2	3	2	2	2	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	No	No	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	36	51	128	8	36	53
End Time (s)	51	128	8	36	53	128
Yield/Force Off (s)	45	122	2	30	47	122
Yield/Force Off 170(s)	45	122	2	30	47	122
Local Start Time (s)	54	69	6	26	54	71
Local Yield (s)	63	0	20	48	65	0
Local Yield 170(s)	63	0	20	48	65	0

Intersection Summary

Cycle Length 140
Control Type Actuated-Coordinated
Natural Cycle 130
Offset: 122 (87%), Referenced to phase 2:SBT, Start of Yellow

Splits and Phases: 5: Route 120 & Old Etna Rd/Etna Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
15 s	77 s	20 s	28 s
 Ø5	 Ø6		
17 s	75 s		

6: Route 120 & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh 2.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	150	90	1150	2840	15
Future Vol, veh/h	5	150	90	1150	2840	15
Conflicting Peds, #/hr	0	0	1	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	40	450	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	98	98	93	93
Heavy Vehicles, %	0	0	2	2	1	1
Mvmt Flow	6	174	92	1173	3054	16

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	3834	1536	3071
Stage 1	3063	-	-
Stage 2	771	-	-
Critical Hdwy	6.8	6.9	4.14
Critical Hdwy Stg 1	5.8	-	-
Critical Hdwy Stg 2	5.8	-	-
Follow-up Hdwy	3.5	3.3	2.22
Pot Cap-1 Maneuver	~ 3	~ 107	106
Stage 1	23	-	-
Stage 2	422	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	0	~ 107	106
Mov Cap-2 Maneuver	0	-	-
Stage 1	~ 3	-	-
Stage 2	422	-	-

Approach	EB	NB	SB
HCM Control Delay, s		9.3	0
HCM LOS	-		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	106	-	-	107	-	-
HCM Lane V/C Ratio	0.866	-	-	1.63	-	-
HCM Control Delay (s)	127.8	-	-	\$ 392	-	-
HCM Lane LOS	F	-	-	F	-	-
HCM 95th %tile Q(veh)	5	-	-	13.3	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

1: Hanover St & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh 7.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	30	0	1	20	1
Future Vol, veh/h	0	30	0	1	20	1
Conflicting Peds, #/hr	0	9	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	67	67	25	25	64	64
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	45	0	4	31	2

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	66	11	0
Stage 1	2	-	-
Stage 2	64	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	944	1076	-
Stage 1	1026	-	-
Stage 2	964	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	926	1067	-
Mov Cap-2 Maneuver	926	-	-
Stage 1	1026	-	-
Stage 2	946	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	6.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1067	1631
HCM Lane V/C Ratio	-	-	0.042	0.019
HCM Control Delay (s)	-	-	8.5	7.2
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1

2: Hanover St/Hanover St Ext & Old Etna Rd
HCM 6th TWSC

Intersection

Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	0	15	15	0	15
Future Vol, veh/h	5	0	15	15	0	15
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	72	72	58	58
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	8	0	21	21	0	26

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	58	34	0
Stage 1	32	-	-
Stage 2	26	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	954	1045	-
Stage 1	996	-	-
Stage 2	1002	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	954	1043	-
Mov Cap-2 Maneuver	954	-	-
Stage 1	996	-	-
Stage 2	1002	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	954	1580
HCM Lane V/C Ratio	-	-	0.008	-
HCM Control Delay (s)	-	-	8.8	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

3: Heater Rd/Mt Support Rd & Hanover St Ext
HCM 6th TWSC

Intersection

Int Delay, s/veh 0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
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Lane Configurations						
Traffic Vol, veh/h	10	0	0	60	80	15
Future Vol, veh/h	10	0	0	60	80	15
Conflicting Peds, #/hr	3	3	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	64	64	89	89
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	13	0	0	94	90	17

Major/Minor	Minor2	Major1		Major2	
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Conflicting Flow All	196	102	107	0	-	0
Stage 1	99	-	-	-	-	-
Stage 2	97	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	797	959	1497	-	-	-
Stage 1	930	-	-	-	-	-
Stage 2	932	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	797	956	1497	-	-	-
Mov Cap-2 Maneuver	797	-	-	-	-	-
Stage 1	930	-	-	-	-	-
Stage 2	932	-	-	-	-	-

Approach	EB	NB	SB
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HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
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Capacity (veh/h)	1497	-	797	-	-
HCM Lane V/C Ratio	-	-	0.017	-	-
HCM Control Delay (s)	0	-	9.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

4: Heater Rd & Old Etna Rd
HCM 6th AWSC

Intersection

Intersection Delay, s/veh 7.7
Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	10	5	60	2	10	2	50	30	2	70	0
Future Vol, veh/h	0	10	5	60	2	10	2	50	30	2	70	0
Peak Hour Factor	0.60	0.60	0.60	0.82	0.82	0.82	0.74	0.74	0.74	0.88	0.88	0.88
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	17	8	73	2	12	3	68	41	2	80	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	7.3			8			7.6			7.7		
HCM LOS	A			A			A			A		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	0%	83%	3%
Vol Thru, %	61%	67%	3%	97%
Vol Right, %	37%	33%	14%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	82	15	72	72
LT Vol	2	0	60	2
Through Vol	50	10	2	70
RT Vol	30	5	10	0
Lane Flow Rate	111	25	88	82
Geometry Grp	1	1	1	1
Degree of Util (X)	0.121	0.029	0.106	0.095
Departure Headway (Hd)	3.944	4.214	4.334	4.186
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	894	855	815	843
Service Time	2.032	2.214	2.426	2.276
HCM Lane V/C Ratio	0.124	0.029	0.108	0.097
HCM Control Delay	7.6	7.3	8	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.1	0.4	0.3

5: Route 120 & Old Etna Rd/Etna Rd

2025 No-Build

Queues

Sat MIDDAY

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	20	27	58	59	25	11	583	94	31	526
v/c Ratio	0.25	0.29	0.53	0.55	0.09	0.15	0.23	0.07	0.35	0.20
Control Delay	71.8	38.7	78.9	78.6	0.6	69.0	9.6	0.7	74.2	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.8	38.7	78.9	78.6	0.6	69.0	9.6	0.7	74.2	7.4
Queue Length 50th (ft)	18	6	54	56	0	10	102	0	28	62
Queue Length 95th (ft)	38	29	101	104	0	32	160	7	62	135
Internal Link Dist (ft)		539		473			1647			1282
Turn Bay Length (ft)	65		300		75	350		325	300	
Base Capacity (vph)	215	219	265	256	390	167	2514	1390	216	2629
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.12	0.22	0.23	0.06	0.07	0.23	0.07	0.14	0.20
Intersection Summary										

5: Route 120 & Old Etna Rd/Etna Rd
HCM Signalized Intersection Capacity Analysis

2025 No-Build

Sat MIDDAY

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	5	15	95	5	25	10	525	85	30	495	10
Future Volume (vph)	15	5	15	95	5	25	10	525	85	30	495	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			6%			0%			0%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.89		1.00	0.99	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1778	1664		1615	1550	1445	1805	3610	1615	1787	3563	
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1778	1664		1615	1550	1445	1805	3610	1615	1787	3563	
Peak-hour factor, PHF	0.75	0.75	0.75	0.88	0.88	0.88	0.90	0.90	0.90	0.96	0.96	0.96
Adj. Flow (vph)	20	7	20	108	6	28	11	583	94	31	516	10
RTOR Reduction (vph)	0	19	0	0	2	21	0	0	24	0	1	0
Lane Group Flow (vph)	20	8	0	58	57	4	11	583	70	31	525	0
Confl. Peds. (#/hr)							1		1	1		1
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Turn Type	Split	NA		Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	3	3		4	4	4 5	1	6	6 4	5	2	
Permitted Phases												
Actuated Green, G (s)	5.3	5.3		9.6	9.6	21.6	2.6	95.1	104.7	6.0	98.5	
Effective Green, g (s)	5.3	5.3		9.6	9.6	21.6	2.6	95.1	104.7	6.0	98.5	
Actuated g/C Ratio	0.04	0.04		0.07	0.07	0.15	0.02	0.68	0.75	0.04	0.70	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	67	62		110	106	222	33	2452	1207	76	2506	
v/s Ratio Prot	c0.01	0.00		0.04	c0.04	0.00	0.01	c0.16	0.04	c0.02	c0.15	
v/s Ratio Perm												
v/c Ratio	0.30	0.13		0.53	0.54	0.02	0.33	0.24	0.06	0.41	0.21	
Uniform Delay, d1	65.5	65.1		63.0	63.1	50.2	67.8	8.6	4.7	65.3	7.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	0.3		2.1	2.6	0.0	2.2	0.2	0.0	1.3	0.2	
Delay (s)	66.5	65.4		65.1	65.7	50.2	70.0	8.8	4.7	66.6	7.4	
Level of Service	E	E		E	E	D	E	A	A	E	A	
Approach Delay (s)		65.9			62.7			9.2			10.7	
Approach LOS		E			E			A			B	
Intersection Summary												
HCM 2000 Control Delay			17.0									
HCM 2000 Volume to Capacity ratio			0.28									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			43.4%									
Analysis Period (min)			15									
c Critical Lane Group												

5: Route 120 & Old Etna Rd/Etna Rd
Timing Report, Sorted By Phase

2025 No-Build

Sat MIDDAY

						
Phase Number	1	2	3	4	5	6
Movement	NBL	SBT	EBTL	WBTL	SBL	NBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	None	Max
Maximum Split (s)	19	69	23	29	23	65
Maximum Split (%)	13.6%	49.3%	16.4%	20.7%	16.4%	46.4%
Minimum Split (s)	15	16	16	16	15	16
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	9	5	5	5	10
Vehicle Extension (s)	2	3	2	2	2	3
Minimum Gap (s)	2	3	2	2	2	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	No	No	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	40	59	128	11	40	63
End Time (s)	59	128	11	40	63	128
Yield/Force Off (s)	53	122	5	34	57	122
Yield/Force Off 170(s)	53	122	5	34	57	122
Local Start Time (s)	58	77	6	29	58	81
Local Yield (s)	71	0	23	52	75	0
Local Yield 170(s)	71	0	23	52	75	0

Intersection Summary

Cycle Length 140
Control Type Actuated-Coordinated
Natural Cycle 65
Offset: 122 (87%), Referenced to phase 2:SBT, Start of Yellow

Splits and Phases: 5: Route 120 & Old Etna Rd/Etna Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
19 s	69 s	23 s	29 s
 Ø5	 Ø6		
23 s	65 s		

6: Route 120 & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh 0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	35	35	795	790	5
Future Vol, veh/h	5	35	35	795	790	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	40	450	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	96	96	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	6	42	36	828	814	5

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1303	410	819
Stage 1	817	-	-
Stage 2	486	-	-
Critical Hdwy	6.8	6.9	4.12
Critical Hdwy Stg 1	5.8	-	-
Critical Hdwy Stg 2	5.8	-	-
Follow-up Hdwy	3.5	3.3	2.21
Pot Cap-1 Maneuver	155	596	812
Stage 1	400	-	-
Stage 2	590	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	148	596	812
Mov Cap-2 Maneuver	148	-	-
Stage 1	382	-	-
Stage 2	590	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.9	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	812	-	148	596	-	-
HCM Lane V/C Ratio	0.045	-	0.041	0.071	-	-
HCM Control Delay (s)	9.6	-	30.4	11.5	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0.2	-	-

1: Hanover St & Site Driveway/Evans Dr
HCM 6th TWSC2025 Build
Weekday AM

Intersection

Int Delay, s/veh 376.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	45	60	0	5	20	530	0	0	1	210	3	10
Future Vol, veh/h	45	60	0	5	20	530	0	0	1	210	3	10
Conflicting Peds, #/hr	0	0	0	0	0	53	0	0	10	10	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	59	59	59	25	25	25	67	67	67
Heavy Vehicles, %	2	2	2	0	0	0	0	0	0	4	4	4
Mvmt Flow	50	67	0	8	34	898	0	0	4	313	4	15

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1159	652	12	683	657	65	19	0	0	14	0	0
Stage 1	638	638	-	12	12	-	-	-	-	-	-	-
Stage 2	521	14	-	671	645	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.2	-	-	2.236	-	-
Pot Cap-1 Maneuver	173	387	1069	366	387	1005	1611	-	-	1591	-	-
Stage 1	465	471	-	1014	890	-	-	-	-	-	-	-
Stage 2	539	884	-	449	471	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 6	306	1069	257	306	945	1611	-	-	1576	-	-
Mov Cap-2 Maneuver	~ 6	306	-	257	306	-	-	-	-	-	-	-
Stage 1	465	376	-	1004	881	-	-	-	-	-	-	-
Stage 2	~ 24	875	-	295	376	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, \$	3832.2	80.4	0	7.4
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1611	-	-	14	860	1576	-	-
HCM Lane V/C Ratio	-	-	-	8.333	1.094	0.199	-	-
HCM Control Delay (s)	0	-	-	\$ 3832.2	80.4	7.8	0	-
HCM Lane LOS	A	-	-	F	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	15.6	24.5	0.7	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

2: Hanover St/Hanover St Ext & Old Etna Rd
HCM 6th TWSC2025 Build
Weekday AM

Intersection

Int Delay, s/veh	6.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	140	10	90	215	35	30
Future Vol, veh/h	140	10	90	215	35	30
Conflicting Peds, #/hr	0	11	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	57	57	84	84	83	83
Heavy Vehicles, %	1	1	0	0	2	2
Mvmt Flow	246	18	107	256	42	36

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	358	249	0
Stage 1	238	-	-
Stage 2	120	-	-
Critical Hdwy	6.41	6.21	-
Critical Hdwy Stg 1	5.41	-	-
Critical Hdwy Stg 2	5.41	-	-
Follow-up Hdwy	3.509	3.309	-
Pot Cap-1 Maneuver	642	792	-
Stage 1	804	-	-
Stage 2	908	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	617	781	-
Mov Cap-2 Maneuver	617	-	-
Stage 1	802	-	-
Stage 2	875	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.9	0	4.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	626	1190
HCM Lane V/C Ratio	-	-	0.42	0.035
HCM Control Delay (s)	-	-	14.9	8.1
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	2.1	0.1

3: Hanover St Ext & North Site Driveway
HCM 6th TWSC2025 Build
Weekday AM

Intersection

Int Delay, s/veh	2.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	30	10	90	35	10
Future Vol, veh/h	15	30	10	90	35	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	33	11	100	39	11

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	167	45	50	0	-	0
Stage 1	45	-	-	-	-	-
Stage 2	122	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	823	1025	1557	-	-	-
Stage 1	977	-	-	-	-	-
Stage 2	903	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	817	1025	1557	-	-	-
Mov Cap-2 Maneuver	817	-	-	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	903	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1557	-	945	-	-
HCM Lane V/C Ratio	0.007	-	0.053	-	-
HCM Control Delay (s)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

4: Heater Rd/Mt Support Rd & Hanover St Ext
HCM 6th TWSC

Intersection

Int Delay, s/veh 2.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
----------	-----	-----	-----	-----	-----	-----

Lane Configurations						
Traffic Vol, veh/h	95	5	1	235	200	35
Future Vol, veh/h	95	5	1	235	200	35
Conflicting Peds, #/hr	0	1	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	86	86	77	77
Heavy Vehicles, %	0	0	5	5	4	4
Mvmt Flow	103	5	1	273	260	45

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	566	292	313
Stage 1	291	-	-
Stage 2	275	-	-
Critical Hdwy	6.4	6.2	4.15
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.245
Pot Cap-1 Maneuver	489	752	1230
Stage 1	763	-	-
Stage 2	776	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	481	746	1221
Mov Cap-2 Maneuver	481	-	-
Stage 1	756	-	-
Stage 2	770	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1221	-	490	-	-
HCM Lane V/C Ratio	0.001	-	0.222	-	-
HCM Control Delay (s)	8	0	14.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

5: Heater Rd & Old Etna Rd
HCM 6th AWSC

Intersection

Intersection Delay, s/veh 22.7
Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	135	100	85	75	50	95	180	50	30	170	1
Future Vol, veh/h	3	135	100	85	75	50	95	180	50	30	170	1
Peak Hour Factor	0.69	0.69	0.69	0.90	0.90	0.90	0.83	0.83	0.83	0.66	0.66	0.66
Heavy Vehicles, %	4	4	4	2	2	2	4	4	4	6	6	6
Mvmt Flow	4	196	145	94	83	56	114	217	60	45	258	2
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	22.4			17.1			27.7			20.9		
HCM LOS	C			C			D			C		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	29%	1%	40%	15%
Vol Thru, %	55%	57%	36%	85%
Vol Right, %	15%	42%	24%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	325	238	210	201
LT Vol	95	3	85	30
Through Vol	180	135	75	170
RT Vol	50	100	50	1
Lane Flow Rate	392	345	233	305
Geometry Grp	1	1	1	1
Degree of Util (X)	0.748	0.659	0.478	0.609
Departure Headway (Hd)	6.876	6.881	7.37	7.194
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	525	524	488	499
Service Time	4.939	4.948	5.443	5.263
HCM Lane V/C Ratio	0.747	0.658	0.477	0.611
HCM Control Delay	27.7	22.4	17.1	20.9
HCM Lane LOS	D	C	C	C
HCM 95th-tile Q	6.4	4.8	2.5	4

6: Route 120 & Old Etna Rd/Etna Rd
Queues2025 Build
Weekday AM

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	186	148	110	113	67	52	2645	349	58	890
v/c Ratio	1.32	0.85	0.95	0.99	0.22	0.54	1.20	0.29	0.59	0.40
Control Delay	232.4	82.6	134.3	144.5	11.7	84.0	122.1	1.4	87.2	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	232.4	82.6	134.3	144.5	11.7	84.0	122.1	1.4	87.2	13.2
Queue Length 50th (ft)	~218	96	107	113	0	47	~1549	8	52	203
Queue Length 95th (ft)	#309	#164	#235	#259	43	88	#1548	19	97	234
Internal Link Dist (ft)		539		473			1647			1282
Turn Bay Length (ft)	65		300		75	350		325	300	
Base Capacity (vph)	141	174	116	114	318	113	2201	1185	113	2225
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.32	0.85	0.95	0.99	0.21	0.46	1.20	0.29	0.51	0.40

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

6: Route 120 & Old Etna Rd/Etna Rd
HCM Signalized Intersection Capacity Analysis2025 Build
Weekday AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	45	70	175	30	70	45	2275	300	50	680	85
Future Volume (vph)	145	45	70	175	30	70	45	2275	300	50	680	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			6%			0%			0%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.91		1.00	0.99	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1796	1718		1631	1577	1459	1770	3539	1583	1770	3472	
Flt Permitted	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1796	1718		1631	1577	1459	1770	3539	1583	1770	3472	
Peak-hour factor, PHF	0.78	0.78	0.78	0.95	0.95	0.95	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	186	58	90	184	32	74	52	2645	349	58	791	99
RTOR Reduction (vph)	0	40	0	0	2	56	0	0	88	0	7	0
Lane Group Flow (vph)	186	108	0	110	111	11	52	2645	261	58	883	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA		Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	3	3		4	4	4 5	1	6	6 4	5	2	
Permitted Phases												
Actuated Green, G (s)	11.0	11.0		10.0	10.0	23.9	6.7	87.1	97.1	7.9	88.3	
Effective Green, g (s)	11.0	11.0		10.0	10.0	23.9	6.7	87.1	97.1	7.9	88.3	
Actuated g/C Ratio	0.08	0.08		0.07	0.07	0.17	0.05	0.62	0.69	0.06	0.63	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	141	134		116	112	249	84	2201	1097	99	2189	
v/s Ratio Prot	c0.10	0.06		0.07	c0.07	0.01	0.03	c0.75	0.16	c0.03	0.25	
v/s Ratio Perm												
v/c Ratio	1.32	0.81		0.95	0.99	0.05	0.62	1.20	0.24	0.59	0.40	
Uniform Delay, d1	64.5	63.5		64.7	65.0	48.5	65.4	26.5	7.9	64.5	12.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	184.7	27.5		66.1	82.2	0.0	9.2	95.4	0.0	5.6	0.6	
Delay (s)	249.2	91.0		130.8	147.2	48.5	74.6	121.9	7.9	70.0	13.4	
Level of Service	F	F		F	F	D	E	F	A	E	B	
Approach Delay (s)		179.1			118.2			108.0			16.8	
Approach LOS		F			F			F			B	
Intersection Summary												
HCM 2000 Control Delay			95.1			HCM 2000 Level of Service				F		
HCM 2000 Volume to Capacity ratio			1.15									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				24.0		
Intersection Capacity Utilization			90.1%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

6: Route 120 & Old Etna Rd/Etna Rd
Timing Report, Sorted By Phase

						
Phase Number	1	2	3	4	5	6
Movement	NBL	SBT	EBTL	WBTL	SBL	NBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	None	Max
Maximum Split (s)	15	92	17	16	15	92
Maximum Split (%)	10.7%	65.7%	12.1%	11.4%	10.7%	65.7%
Minimum Split (s)	15	16	15	16	15	16
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	9	5	5	5	10
Vehicle Extension (s)	2	3	2	2	2	3
Minimum Gap (s)	2	3	2	2	2	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	No	No	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	21	36	128	5	21	36
End Time (s)	36	128	5	21	36	128
Yield/Force Off (s)	30	122	139	15	30	122
Yield/Force Off 170(s)	30	122	139	15	30	122
Local Start Time (s)	39	54	6	23	39	54
Local Yield (s)	48	0	17	33	48	0
Local Yield 170(s)	48	0	17	33	48	0

Intersection Summary

Cycle Length 140
Control Type Actuated-Coordinated
Natural Cycle 150
Offset: 122 (87%), Referenced to phase 2:SBT, Start of Yellow

Splits and Phases: 6: Route 120 & Old Etna Rd/Etna Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
15 s	92 s	17 s	16 s
 Ø5	 Ø6		
15 s	92 s		

7: Route 120 & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh 18.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	290	505	2935	1210	75
Future Vol, veh/h	0	290	505	2935	1210	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	40	450	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	72	72	89	89	93	93
Heavy Vehicles, %	1	1	2	2	4	4
Mvmt Flow	0	403	567	3298	1301	81

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	4125	691	1382
Stage 1	1342	-	-
Stage 2	2783	-	-
Critical Hdwy	6.82	6.92	4.14
Critical Hdwy Stg 1	5.82	-	-
Critical Hdwy Stg 2	5.82	-	-
Follow-up Hdwy	3.51	3.31	2.22
Pot Cap-1 Maneuver	2 ~ 389	~ 492	-
Stage 1	210	-	-
Stage 2	33	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	0 ~ 389	~ 492	-
Mov Cap-2 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	33	-	-

Approach	EB	NB	SB
HCM Control Delay, s	88.4	17.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	~ 492	-	-	389	-	-
HCM Lane V/C Ratio	1.153	-	-	1.035	-	-
HCM Control Delay (s)	117.4	-	0	88.4	-	-
HCM Lane LOS	F	-	A	F	-	-
HCM 95th %tile Q(veh)	20	-	-	13.2	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

1: Hanover St & South Site Driveway/Evans Dr
HCM 6th TWSC2025 Build
Weekday PM

Intersection

Int Delay, s/veh 8.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	30	0	1	45	75	0	5	5	95	5	25
Future Vol, veh/h	20	30	0	1	45	75	0	5	5	95	5	25
Conflicting Peds, #/hr	0	0	0	0	0	3	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	81	81	81	50	50	50	73	73	73
Heavy Vehicles, %	2	2	2	2	2	2	0	0	0	0	0	0
Mvmt Flow	22	33	0	1	56	93	0	10	10	130	7	34

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	377	304	24	316	316	18	41	0	0	20	0	0
Stage 1	284	284	-	15	15	-	-	-	-	-	-	-
Stage 2	93	20	-	301	301	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	580	609	1052	637	600	1061	1581	-	-	1609	-	-
Stage 1	723	676	-	1005	883	-	-	-	-	-	-	-
Stage 2	914	879	-	708	665	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	456	558	1052	569	550	1058	1581	-	-	1609	-	-
Mov Cap-2 Maneuver	456	558	-	569	550	-	-	-	-	-	-	-
Stage 1	723	620	-	1005	883	-	-	-	-	-	-	-
Stage 2	779	879	-	614	610	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.9	10.7	0	5.6
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1581	-	-	512	783	1609	-	-
HCM Lane V/C Ratio	-	-	-	0.109	0.191	0.081	-	-
HCM Control Delay (s)	0	-	-	12.9	10.7	7.4	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.7	0.3	-	-

2: Hanover St/Hanover St Ext & Old Etna Rd
HCM 6th TWSC2025 Build
Weekday PM

Intersection

Int Delay, s/veh	3.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	55	25	25	75	20	45
Future Vol, veh/h	55	25	25	75	20	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	59	59	80	80
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	67	30	42	127	25	56

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	212	106	0	0	169
Stage 1	106	-	-	-	-
Stage 2	106	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	781	954	-	-	1421
Stage 1	923	-	-	-	-
Stage 2	923	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	767	954	-	-	1421
Mov Cap-2 Maneuver	767	-	-	-	-
Stage 1	923	-	-	-	-
Stage 2	906	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	2.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	817	1421
HCM Lane V/C Ratio	-	-	0.119	0.018
HCM Control Delay (s)	-	-	10	7.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1

3: Hanover St Ext & North Site Driveway
HCM 6th TWSC2025 Build
Weekday PM

Intersection

Int Delay, s/veh	2.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	15	25	25	50	20
Future Vol, veh/h	5	15	25	25	50	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	17	28	28	56	22

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	151	67	78	0	-	0
Stage 1	67	-	-	-	-	-
Stage 2	84	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	841	997	1520	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	939	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	825	997	1520	-	-	-
Mov Cap-2 Maneuver	825	-	-	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	939	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	3.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1520	-	948	-	-
HCM Lane V/C Ratio	0.018	-	0.023	-	-
HCM Control Delay (s)	7.4	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

4: Heater Rd/Mt Support Rd & Hanover St Ext
HCM 6th TWSC

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	1	1	195	390	60
Future Vol, veh/h	25	1	1	195	390	60
Conflicting Peds, #/hr	0	0	1	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	56	56	97	97	75	75
Heavy Vehicles, %	0	0	6	6	3	3
Mvmt Flow	45	2	1	201	520	80
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	764	561	601	0	-	0
Stage 1	561	-	-	-	-	-
Stage 2	203	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.16	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.254	-	-	-
Pot Cap-1 Maneuver	375	531	957	-	-	-
Stage 1	575	-	-	-	-	-
Stage 2	836	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	374	530	956	-	-	-
Mov Cap-2 Maneuver	374	-	-	-	-	-
Stage 1	574	-	-	-	-	-
Stage 2	835	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	15.9	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	956	-	378	-	-	
HCM Lane V/C Ratio	0.001	-	0.123	-	-	
HCM Control Delay (s)	8.8	0	15.9	-	-	
HCM Lane LOS	A	A	C	-	-	
HCM 95th %tile Q(veh)	0	-	0.4	-	-	

5: Heater Rd & Old Etna Rd
HCM 6th AWSC2025 Build
Weekday PM

Intersection

Intersection Delay, s/veh 23.6
Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	45	45	125	55	35	25	155	70	20	350	5
Future Vol, veh/h	3	45	45	125	55	35	25	155	70	20	350	5
Peak Hour Factor	0.45	0.45	0.45	0.95	0.95	0.95	0.77	0.77	0.77	0.76	0.76	0.76
Heavy Vehicles, %	0	0	0	2	2	2	4	4	4	3	3	3
Mvmt Flow	7	100	100	132	58	37	32	201	91	26	461	7
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	14.3			15.8			18			34.7		
HCM LOS	B			C			C			D		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	3%	58%	5%
Vol Thru, %	62%	48%	26%	93%
Vol Right, %	28%	48%	16%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	250	93	215	375
LT Vol	25	3	125	20
Through Vol	155	45	55	350
RT Vol	70	45	35	5
Lane Flow Rate	325	207	226	493
Geometry Grp	1	1	1	1
Degree of Util (X)	0.578	0.392	0.445	0.848
Departure Headway (Hd)	6.408	6.823	7.072	6.189
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	558	523	507	582
Service Time	4.496	4.92	5.165	4.264
HCM Lane V/C Ratio	0.582	0.396	0.446	0.847
HCM Control Delay	18	14.3	15.8	34.7
HCM Lane LOS	C	B	C	D
HCM 95th-tile Q	3.7	1.8	2.3	9.1

6: Route 120 & Old Etna Rd/Etna Rd
Queues2025 Build
Weekday PM

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	90	102	160	160	58	16	824	133	62	2078
v/c Ratio	0.64	0.52	0.77	0.80	0.15	0.21	0.41	0.12	0.55	0.93
Control Delay	82.7	33.0	82.2	85.8	6.7	70.7	19.6	0.9	81.5	33.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.7	33.0	82.2	85.8	6.7	70.7	19.6	0.9	81.5	33.3
Queue Length 50th (ft)	81	29	149	156	0	14	222	0	56	761
Queue Length 95th (ft)	127	75	217	227	25	40	310	11	105	#1292
Internal Link Dist (ft)		539		473			1647			1282
Turn Bay Length (ft)	65		300		75	350		325	300	
Base Capacity (vph)	179	231	261	251	405	114	2008	1187	140	2236
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.44	0.61	0.64	0.14	0.14	0.41	0.11	0.44	0.93

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

6: Route 120 & Old Etna Rd/Etna Rd
HCM Signalized Intersection Capacity Analysis2025 Build
Weekday PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	25	60	260	10	55	15	775	125	60	1925	90
Future Volume (vph)	75	25	60	260	10	55	15	775	125	60	1925	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			6%			0%			0%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.89		1.00	0.99	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1796	1690		1663	1597	1488	1787	3574	1599	1787	3547	
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1796	1690		1663	1597	1488	1787	3574	1599	1787	3547	
Peak-hour factor, PHF	0.83	0.83	0.83	0.86	0.86	0.86	0.94	0.94	0.94	0.97	0.97	0.97
Adj. Flow (vph)	90	30	72	302	12	64	16	824	133	62	1985	93
RTOR Reduction (vph)	0	64	0	0	1	45	0	0	42	0	2	0
Lane Group Flow (vph)	90	38	0	160	159	13	16	824	91	62	2076	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	3	3		4	4	4 5	1	6	6 4	5	2	
Permitted Phases												
Actuated Green, G (s)	11.0	11.0		17.6	17.6	32.4	2.8	78.6	96.2	8.8	84.6	
Effective Green, g (s)	11.0	11.0		17.6	17.6	32.4	2.8	78.6	96.2	8.8	84.6	
Actuated g/C Ratio	0.08	0.08		0.13	0.13	0.23	0.02	0.56	0.69	0.06	0.60	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	141	132		209	200	344	35	2006	1098	112	2143	
v/s Ratio Prot	c0.05	0.02		0.10	c0.10	0.01	0.01	0.23	0.06	c0.03	c0.59	
v/s Ratio Perm												
v/c Ratio	0.64	0.29		0.77	0.80	0.04	0.46	0.41	0.08	0.55	0.97	
Uniform Delay, d1	62.6	60.8		59.2	59.5	41.7	67.8	17.5	7.3	63.7	26.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.8	0.4		13.9	18.1	0.0	3.4	0.6	0.0	3.3	13.4	
Delay (s)	69.4	61.3		73.1	77.6	41.7	71.3	18.1	7.3	67.0	39.8	
Level of Service	E	E		E	E	D	E	B	A	E	D	
Approach Delay (s)		65.1			70.2			17.5			40.6	
Approach LOS		E			E			B			D	
Intersection Summary												
HCM 2000 Control Delay			38.8									
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			80.8%									
Analysis Period (min)			15									
c Critical Lane Group												

6: Route 120 & Old Etna Rd/Etna Rd
Timing Report, Sorted By Phase2025 Build
Weekday PM

						
Phase Number	1	2	3	4	5	6
Movement	NBL	SBT	EBTL	WBTL	SBL	NBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	None	Max
Maximum Split (s)	15	77	20	28	17	75
Maximum Split (%)	10.7%	55.0%	14.3%	20.0%	12.1%	53.6%
Minimum Split (s)	15	16	16	16	15	16
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	9	5	5	5	10
Vehicle Extension (s)	2	3	2	2	2	3
Minimum Gap (s)	2	3	2	2	2	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	No	No	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	36	51	128	8	36	53
End Time (s)	51	128	8	36	53	128
Yield/Force Off (s)	45	122	2	30	47	122
Yield/Force Off 170(s)	45	122	2	30	47	122
Local Start Time (s)	54	69	6	26	54	71
Local Yield (s)	63	0	20	48	65	0
Local Yield 170(s)	63	0	20	48	65	0

Intersection Summary

Cycle Length 140
Control Type Actuated-Coordinated
Natural Cycle 130
Offset: 122 (87%), Referenced to phase 2:SBT, Start of Yellow

Splits and Phases: 6: Route 120 & Old Etna Rd/Etna Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
15 s	77 s	20 s	28 s
 Ø5	 Ø6		
17 s	75 s		

7: Route 120 & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh 7.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	180	135	1150	2840	15
Future Vol, veh/h	5	180	135	1150	2840	15
Conflicting Peds, #/hr	0	0	1	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	40	450	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	98	98	93	93
Heavy Vehicles, %	0	1	2	2	1	1
Mvmt Flow	6	209	138	1173	3054	16

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	3926	1536	3071
Stage 1	3063	-	-
Stage 2	863	-	-
Critical Hdwy	6.8	6.92	4.14
Critical Hdwy Stg 1	5.8	-	-
Critical Hdwy Stg 2	5.8	-	-
Follow-up Hdwy	3.5	3.31	2.22
Pot Cap-1 Maneuver	~ 2	~ 106	~ 106
Stage 1	23	-	-
Stage 2	378	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	0	~ 106	~ 106
Mov Cap-2 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	378	-	-

Approach	EB	NB	SB
HCM Control Delay, s		27.6	0
HCM LOS	-		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	~ 106	-	-	106	-	-
HCM Lane V/C Ratio	1.3	-	-	1.975	-	-
HCM Control Delay (s)	262.6	-	-	\$ 538	-	-
HCM Lane LOS	F	-	-	F	-	-
HCM 95th %tile Q(veh)	9.4	-	-	17.4	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

1: Hanover St & South Site Driveway/Evans Dr
HCM 6th TWSC

2025 Build

Sat MIDDAY

Intersection

Int Delay, s/veh 8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	35	0	0	40	30	0	0	1	20	1	20
Future Vol, veh/h	25	35	0	0	40	30	0	0	1	20	1	20
Conflicting Peds, #/hr	0	0	0	0	0	9	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	67	67	67	25	25	25	64	64	64
Heavy Vehicles, %	2	2	2	0	0	0	0	0	0	0	0	0
Mvmt Flow	28	39	0	0	60	45	0	0	4	31	2	31

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	144	84	18	101	97	11	33	0	0	4	0	0
Stage 1	80	80	-	2	2	-	-	-	-	-	-	-
Stage 2	64	4	-	99	95	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	825	806	1061	885	797	1076	1592	-	-	1631	-	-
Stage 1	929	828	-	1026	898	-	-	-	-	-	-	-
Stage 2	947	892	-	912	820	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	728	791	1061	840	782	1067	1592	-	-	1631	-	-
Mov Cap-2 Maneuver	728	791	-	840	782	-	-	-	-	-	-	-
Stage 1	929	812	-	1026	898	-	-	-	-	-	-	-
Stage 2	840	892	-	852	804	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.2	9.6	0	3.5
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1592	-	-	763 883	1631	-	-
HCM Lane V/C Ratio	-	-	-	0.087 0.118	0.019	-	-
HCM Control Delay (s)	0	-	-	10.2 9.6	7.2	0	-
HCM Lane LOS	A	-	-	B A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3 0.4	0.1	-	-

2: Hanover St/Hanover St Ext & Old Etna Rd
HCM 6th TWSC2025 Build
Sat MIDDAY

Intersection

Int Delay, s/veh	4.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	20	25	30	20	15
Future Vol, veh/h	25	20	25	30	20	15
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	72	72	58	58
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	40	32	35	42	34	26

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	150	58	0	0	77
Stage 1	56	-	-	-	-
Stage 2	94	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	847	1014	-	-	1535
Stage 1	972	-	-	-	-
Stage 2	935	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	828	1012	-	-	1535
Mov Cap-2 Maneuver	828	-	-	-	-
Stage 1	972	-	-	-	-
Stage 2	914	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	4.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	901	1535
HCM Lane V/C Ratio	-	-	0.079	0.022
HCM Control Delay (s)	-	-	9.3	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1

3: Hanover St Ext & North Site Driveway
HCM 6th TWSC

Intersection

Int Delay, s/veh	3.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	20	20	25	15	20
Future Vol, veh/h	10	20	20	25	15	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	22	22	28	17	22

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	100	28	39	0	0
Stage 1	28	-	-	-	-
Stage 2	72	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	899	1047	1571	-	-
Stage 1	995	-	-	-	-
Stage 2	951	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	886	1047	1571	-	-
Mov Cap-2 Maneuver	886	-	-	-	-
Stage 1	981	-	-	-	-
Stage 2	951	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	3.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1571	-	987	-	-
HCM Lane V/C Ratio	0.014	-	0.034	-	-
HCM Control Delay (s)	7.3	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

4: Heater Rd/Mt Support Rd & Hanover St Ext
HCM 6th TWSC

Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
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Lane Configurations						
Traffic Vol, veh/h	30	0	0	60	80	30
Future Vol, veh/h	30	0	0	60	80	30
Conflicting Peds, #/hr	3	3	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	64	64	89	89
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	40	0	0	94	90	34

Major/Minor	Minor2	Major1	Major2
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Conflicting Flow All	204	110	124	0	-	0
Stage 1	107	-	-	-	-	-
Stage 2	97	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	789	949	1475	-	-	-
Stage 1	922	-	-	-	-	-
Stage 2	932	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	789	946	1475	-	-	-
Mov Cap-2 Maneuver	789	-	-	-	-	-
Stage 1	922	-	-	-	-	-
Stage 2	932	-	-	-	-	-

Approach	EB	NB	SB
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HCM Control Delay, s	9.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
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Capacity (veh/h)	1475	-	789	-	-
HCM Lane V/C Ratio	-	-	0.051	-	-
HCM Control Delay (s)	0	-	9.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

5: Heater Rd & Old Etna Rd
HCM 6th AWSC

Intersection

Intersection Delay, s/veh 8.2
Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	50	5	60	45	10	2	50	30	2	70	0
Future Vol, veh/h	0	50	5	60	45	10	2	50	30	2	70	0
Peak Hour Factor	0.60	0.60	0.60	0.82	0.82	0.82	0.74	0.74	0.74	0.88	0.88	0.88
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	83	8	73	55	12	3	68	41	2	80	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB		WB		NB		SB					
Opposing Approach	WB		EB		SB		NB					
Opposing Lanes	1		1		1		1					
Conflicting Approach Left	SB		NB		EB		WB					
Conflicting Lanes Left	1		1		1		1					
Conflicting Approach Right	NB		SB		WB		EB					
Conflicting Lanes Right	1		1		1		1					
HCM Control Delay	8		8.5		8		8.1					
HCM LOS	A		A		A		A					

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	0%	52%	3%
Vol Thru, %	61%	91%	39%	97%
Vol Right, %	37%	9%	9%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	82	55	115	72
LT Vol	2	0	60	2
Through Vol	50	50	45	70
RT Vol	30	5	10	0
Lane Flow Rate	111	92	140	82
Geometry Grp	1	1	1	1
Degree of Util (X)	0.133	0.113	0.175	0.104
Departure Headway (Hd)	4.315	4.444	4.493	4.564
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	832	808	799	786
Service Time	2.337	2.466	2.515	2.586
HCM Lane V/C Ratio	0.133	0.114	0.175	0.104
HCM Control Delay	8	8	8.5	8.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0.4	0.6	0.3

6: Route 120 & Old Etna Rd/Etna Rd
Queues

2025 Build

Sat MIDDAY

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	73	27	58	59	25	11	583	94	31	568
v/c Ratio	0.57	0.20	0.53	0.55	0.09	0.15	0.24	0.08	0.35	0.23
Control Delay	79.1	31.6	78.9	78.6	0.6	69.0	11.5	0.9	74.2	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.1	31.6	78.9	78.6	0.6	69.0	11.5	0.9	74.2	9.1
Queue Length 50th (ft)	66	6	54	56	0	10	113	0	28	76
Queue Length 95th (ft)	95	28	101	104	0	32	180	10	62	165
Internal Link Dist (ft)		539		473			1647			1282
Turn Bay Length (ft)	65		300		75	350		325	300	
Base Capacity (vph)	215	219	265	256	390	167	2419	1350	216	2505
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.12	0.22	0.23	0.06	0.07	0.24	0.07	0.14	0.23
Intersection Summary										

6: Route 120 & Old Etna Rd/Etna Rd
HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	5	15	95	5	25	10	525	85	30	495	50
Future Volume (vph)	55	5	15	95	5	25	10	525	85	30	495	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			6%			0%			0%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.89		1.00	0.99	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1778	1664		1615	1550	1445	1805	3610	1615	1787	3518	
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1778	1664		1615	1550	1445	1805	3610	1615	1787	3518	
Peak-hour factor, PHF	0.75	0.75	0.75	0.88	0.88	0.88	0.90	0.90	0.90	0.96	0.96	0.96
Adj. Flow (vph)	73	7	20	108	6	28	11	583	94	31	516	52
RTOR Reduction (vph)	0	19	0	0	2	21	0	0	26	0	3	0
Lane Group Flow (vph)	73	8	0	58	57	4	11	583	68	31	565	0
Confl. Peds. (#/hr)							1		1	1		1
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Turn Type	Split	NA		Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	3	3		4	4	4 5	1	6	6 4	5	2	
Permitted Phases												
Actuated Green, G (s)	9.0	9.0		9.6	9.6	21.6	2.6	91.4	101.0	6.0	94.8	
Effective Green, g (s)	9.0	9.0		9.6	9.6	21.6	2.6	91.4	101.0	6.0	94.8	
Actuated g/C Ratio	0.06	0.06		0.07	0.07	0.15	0.02	0.65	0.72	0.04	0.68	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	114	106		110	106	222	33	2356	1165	76	2382	
v/s Ratio Prot	c0.04	0.00		0.04	c0.04	0.00	0.01	c0.16	0.04	c0.02	c0.16	
v/s Ratio Perm												
v/c Ratio	0.64	0.08		0.53	0.54	0.02	0.33	0.25	0.06	0.41	0.24	
Uniform Delay, d1	63.9	61.6		63.0	63.1	50.2	67.8	10.1	5.7	65.3	8.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.8	0.1		2.1	2.6	0.0	2.2	0.3	0.0	1.3	0.2	
Delay (s)	72.8	61.7		65.1	65.7	50.2	70.0	10.3	5.7	66.6	8.9	
Level of Service	E	E		E	E	D	E	B	A	E	A	
Approach Delay (s)		69.8			62.7			10.6			11.9	
Approach LOS		E			E			B			B	
Intersection Summary												
HCM 2000 Control Delay			19.8									
HCM 2000 Volume to Capacity ratio			0.31									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			44.2%									
Analysis Period (min)			15									
c Critical Lane Group												

6: Route 120 & Old Etna Rd/Etna Rd
Timing Report, Sorted By Phase

						
Phase Number	1	2	3	4	5	6
Movement	NBL	SBT	EBTL	WBTL	SBL	NBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	None	Max
Maximum Split (s)	19	69	23	29	23	65
Maximum Split (%)	13.6%	49.3%	16.4%	20.7%	16.4%	46.4%
Minimum Split (s)	15	16	16	16	15	16
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	9	5	5	5	10
Vehicle Extension (s)	2	3	2	2	2	3
Minimum Gap (s)	2	3	2	2	2	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	No	No	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	40	59	128	11	40	63
End Time (s)	59	128	11	40	63	128
Yield/Force Off (s)	53	122	5	34	57	122
Yield/Force Off 170(s)	53	122	5	34	57	122
Local Start Time (s)	58	77	6	29	58	81
Local Yield (s)	71	0	23	52	75	0
Local Yield 170(s)	71	0	23	52	75	0

Intersection Summary

Cycle Length 140
Control Type Actuated-Coordinated
Natural Cycle 65
Offset: 122 (87%), Referenced to phase 2:SBT, Start of Yellow

Splits and Phases: 6: Route 120 & Old Etna Rd/Etna Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
19 s	69 s	23 s	29 s
 Ø5	 Ø6		
23 s	65 s		

7: Route 120 & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	70	70	795	790	5
Future Vol, veh/h	5	70	70	795	790	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	40	450	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	96	96	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	6	84	73	828	814	5

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	1377	410	819	0	0
Stage 1	817	-	-	-	-
Stage 2	560	-	-	-	-
Critical Hdwy	6.8	6.9	4.12	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.21	-	-
Pot Cap-1 Maneuver	138	596	812	-	-
Stage 1	400	-	-	-	-
Stage 2	541	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	126	596	812	-	-
Mov Cap-2 Maneuver	126	-	-	-	-
Stage 1	364	-	-	-	-
Stage 2	541	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.5	0.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	812	-	126	596	-	-
HCM Lane V/C Ratio	0.09	-	0.048	0.142	-	-
HCM Control Delay (s)	9.9	-	35	12	-	-
HCM Lane LOS	A	-	E	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.1	0.5	-	-

1: Hanover St & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh	13.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	530	0	1	210	3
Future Vol, veh/h	5	530	0	1	210	3
Conflicting Peds, #/hr	0	53	0	10	10	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	4	4
Mvmt Flow	6	589	0	1	233	3

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	480	64	0	0	11
Stage 1	11	-	-	-	-
Stage 2	469	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.14
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.236
Pot Cap-1 Maneuver	548	1006	-	-	1595
Stage 1	1017	-	-	-	-
Stage 2	634	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	462	946	-	-	1580
Mov Cap-2 Maneuver	462	-	-	-	-
Stage 1	1007	-	-	-	-
Stage 2	540	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.3	0	7.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	937	1580
HCM Lane V/C Ratio	-	-	0.634	0.148
HCM Control Delay (s)	-	-	15.3	7.7
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	4.7	0.5

2: Hanover St/Hanover St Ext & Old Etna Rd
HCM 6th TWSC2035 No-Build
Weekday AM

Intersection

Int Delay, s/veh	3.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	130	0	75	185	1	30
Future Vol, veh/h	130	0	75	185	1	30
Conflicting Peds, #/hr	0	11	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	0	0	2	2
Mvmt Flow	144	0	83	206	1	33

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	224	200	0
Stage 1	189	-	-
Stage 2	35	-	-
Critical Hdwy	6.41	6.21	-
Critical Hdwy Stg 1	5.41	-	-
Critical Hdwy Stg 2	5.41	-	-
Follow-up Hdwy	3.509	3.309	-
Pot Cap-1 Maneuver	766	843	-
Stage 1	846	-	-
Stage 2	990	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	763	832	-
Mov Cap-2 Maneuver	763	-	-
Stage 1	843	-	-
Stage 2	989	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	763	1266
HCM Lane V/C Ratio	-	-	0.189	0.001
HCM Control Delay (s)	-	-	10.8	7.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.7	0

3: Heater Rd/Mt Support Rd & Hanover St Ext
HCM 6th TWSC2035 No-Build
Weekday AM

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
----------	-----	-----	-----	-----	-----	-----

Lane Configurations						
Traffic Vol, veh/h	65	5	1	235	200	25
Future Vol, veh/h	65	5	1	235	200	25
Conflicting Peds, #/hr	0	1	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	90	90	90	90
Heavy Vehicles, %	0	0	5	5	4	4
Mvmt Flow	71	5	1	261	222	28

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	507	245	258
Stage 1	244	-	-
Stage 2	263	-	-
Critical Hdwy	6.4	6.2	4.15
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.245
Pot Cap-1 Maneuver	529	799	1289
Stage 1	801	-	-
Stage 2	786	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	520	792	1279
Mov Cap-2 Maneuver	520	-	-
Stage 1	794	-	-
Stage 2	780	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1279	-	533	-	-
HCM Lane V/C Ratio	0.001	-	0.143	-	-
HCM Control Delay (s)	7.8	0	12.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

4: Heater Rd & Old Etna Rd
HCM 6th AWSC

Intersection

Intersection Delay, s/veh 14.1
Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	75	100	85	60	50	95	210	50	30	170	1
Future Vol, veh/h	3	75	100	85	60	50	95	210	50	30	170	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	4	4	4	2	2	2	4	4	4	6	6	6
Mvmt Flow	3	83	111	94	67	56	106	233	56	33	189	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	11.7			12.5			17.1			12.6		
HCM LOS	B			B			C			B		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	27%	2%	44%	15%
Vol Thru, %	59%	42%	31%	85%
Vol Right, %	14%	56%	26%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	355	178	195	201
LT Vol	95	3	85	30
Through Vol	210	75	60	170
RT Vol	50	100	50	1
Lane Flow Rate	394	198	217	223
Geometry Grp	1	1	1	1
Degree of Util (X)	0.611	0.321	0.362	0.37
Departure Headway (Hd)	5.581	5.838	6.016	5.96
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	643	609	594	599
Service Time	3.656	3.93	4.108	4.049
HCM Lane V/C Ratio	0.613	0.325	0.365	0.372
HCM Control Delay	17.1	11.7	12.5	12.6
HCM Lane LOS	C	B	B	B
HCM 95th-tile Q	4.2	1.4	1.6	1.7

5: Route 120 & Old Etna Rd/Etna Rd
Queues

2035 No-Build

Weekday AM

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	100	56	83	205	37	79	56	2783	372	61	911
v/c Ratio	0.87	0.24	0.31	0.86	0.29	0.25	0.54	1.24	0.31	0.61	0.41
Control Delay	118.5	65.1	10.5	95.9	67.8	15.3	82.5	136.5	1.4	89.2	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	118.5	65.1	10.5	95.9	67.8	15.3	82.5	136.5	1.4	89.2	13.3
Queue Length 50th (ft)	92	25	0	96	33	7	50	~1661	7	55	203
Queue Length 95th (ft)	#203	50	40	#168	71	54	97	#1778	21	105	253
Internal Link Dist (ft)		539			473			1647			1282
Turn Bay Length (ft)	65			300		75	350		325	300	
Base Capacity (vph)	115	230	289	237	129	331	126	2250	1209	113	2213
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.24	0.29	0.86	0.29	0.24	0.44	1.24	0.31	0.54	0.41

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: Route 120 & Old Etna Rd/Etna Rd
HCM Signalized Intersection Capacity Analysis

2035 No-Build

Weekday AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 		 				 			 	
Traffic Volume (vph)	90	50	75	195	35	75	50	2505	335	55	745	75
Future Volume (vph)	90	50	75	195	35	75	50	2505	335	55	745	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			6%			0%			0%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1796	3592	1607	3330	1807	1536	1770	3539	1583	1770	3484	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1796	3592	1607	3330	1807	1536	1770	3539	1583	1770	3484	
Peak-hour factor, PHF	0.90	0.90	0.90	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	100	56	83	205	37	79	56	2783	372	61	828	83
RTOR Reduction (vph)	0	0	73	0	0	58	0	0	89	0	5	0
Lane Group Flow (vph)	100	56	10	205	37	21	56	2783	283	61	906	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	3	3	3 1	4	4	4 5	1	6	6 4	5	2	
Permitted Phases												
Actuated Green, G (s)	9.0	9.0	17.2	10.0	10.0	24.0	8.2	89.0	99.0	8.0	88.8	
Effective Green, g (s)	9.0	9.0	17.2	10.0	10.0	24.0	8.2	89.0	99.0	8.0	88.8	
Actuated g/C Ratio	0.06	0.06	0.12	0.07	0.07	0.17	0.06	0.64	0.71	0.06	0.63	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	115	230	197	237	129	263	103	2249	1119	101	2209	
v/s Ratio Prot	c0.06	0.02	0.01	c0.06	0.02	0.01	0.03	c0.79	0.18	c0.03	0.26	
v/s Ratio Perm												
v/c Ratio	0.87	0.24	0.05	0.86	0.29	0.08	0.54	1.24	0.25	0.60	0.41	
Uniform Delay, d1	64.9	62.3	54.2	64.3	61.6	48.7	64.1	25.5	7.3	64.5	12.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	44.4	0.2	0.0	25.6	0.4	0.0	3.1	110.9	0.0	6.8	0.6	
Delay (s)	109.3	62.5	54.2	89.9	62.1	48.8	67.2	136.4	7.4	71.3	13.2	
Level of Service	F	E	D	F	E	D	E	F	A	E	B	
Approach Delay (s)		79.2			76.6			120.2			16.9	
Approach LOS		E			E			F			B	
Intersection Summary												
HCM 2000 Control Delay			94.0									
HCM 2000 Volume to Capacity ratio			1.13									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			93.9%									
Analysis Period (min)			15									
c Critical Lane Group												

5: Route 120 & Old Etna Rd/Etna Rd
Timing Report, Sorted By Phase

2035 No-Build

Weekday AM

						
Phase Number	1	2	3	4	5	6
Movement	NBL	SBT	EBTL	WBTL	SBL	NBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	None	Max
Maximum Split (s)	16	93	15	16	15	94
Maximum Split (%)	11.4%	66.4%	10.7%	11.4%	10.7%	67.1%
Minimum Split (s)	15	16	15	16	15	16
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	9	5	5	5	10
Vehicle Extension (s)	2	3	2	2	2	3
Minimum Gap (s)	2	3	2	2	2	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	No	No	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	19	35	128	3	19	34
End Time (s)	35	128	3	19	34	128
Yield/Force Off (s)	29	122	137	13	28	122
Yield/Force Off 170(s)	29	122	137	13	28	122
Local Start Time (s)	37	53	6	21	37	52
Local Yield (s)	47	0	15	31	46	0
Local Yield 170(s)	47	0	15	31	46	0

Intersection Summary

Cycle Length 140
Control Type Actuated-Coordinated
Natural Cycle 150
Offset: 122 (87%), Referenced to phase 2:SBT, Start of Yellow

Splits and Phases: 5: Route 120 & Old Etna Rd/Etna Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
16 s	93 s	15 s	16 s
 Ø5	 Ø6		
15 s	94 s		

Intersection

Int Delay, s/veh 88.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘	↑↑↑	↑↑↑	
Traffic Vol, veh/h	0	250	540	3230	1335	85
Future Vol, veh/h	0	250	540	3230	1335	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	450	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	93	93
Heavy Vehicles, %	1	1	2	2	4	4
Mvmt Flow	0	278	600	3589	1435	91

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	763 1526	0 - 0
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	7.12 5.34	- - -
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	3.91 3.12	- - -
Pot Cap-1 Maneuver	0	299 ~ 216	- - -
Stage 1	0	-	- - -
Stage 2	0	-	- - -
Platoon blocked, %			- - -
Mov Cap-1 Maneuver	-	299 ~ 216	- - -
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	NB	SB
HCM Control Delay, s	73.8	121.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	~ 216	-	299	-	-
HCM Lane V/C Ratio	2.778	-	0.929	-	-
HCM Control Delay (s)	\$ 846.9	-	73.8	-	-
HCM Lane LOS	F	-	F	-	-
HCM 95th %tile Q(veh)	52.3	-	9	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

1: Hanover St & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh 7.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	85	5	5	95	5
Future Vol, veh/h	1	85	5	5	95	5
Conflicting Peds, #/hr	0	3	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	1	94	6	6	106	6

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	227	12	0
Stage 1	9	-	-
Stage 2	218	-	-
Critical Hdwy	6.42	6.22	4.1
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.2
Pot Cap-1 Maneuver	761	1069	1620
Stage 1	1014	-	-
Stage 2	818	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	711	1066	1620
Mov Cap-2 Maneuver	711	-	-
Stage 1	1014	-	-
Stage 2	764	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1060	1620
HCM Lane V/C Ratio	-	-	0.09	0.065
HCM Control Delay (s)	-	-	8.7	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.2

2: Hanover St/Hanover St Ext & Old Etna Rd
HCM 6th TWSC

2035 No-Build

Weekday PM

Intersection

Int Delay, s/veh 2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	3	20	65	3	45
Future Vol, veh/h	30	3	20	65	3	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	33	3	22	72	3	50

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	114	58	0
Stage 1	58	-	-
Stage 2	56	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	887	1014	-
Stage 1	970	-	-
Stage 2	972	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	885	1014	-
Mov Cap-2 Maneuver	885	-	-
Stage 1	970	-	-
Stage 2	970	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	895	1513
HCM Lane V/C Ratio	-	-	0.041	0.002
HCM Control Delay (s)	-	-	9.2	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

3: Heater Rd/Mt Support Rd & Hanover St Ext
HCM 6th TWSC2035 No-Build
Weekday PM

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
----------	-----	-----	-----	-----	-----	-----

Lane Configurations						
Traffic Vol, veh/h	10	1	1	195	390	40
Future Vol, veh/h	10	1	1	195	390	40
Conflicting Peds, #/hr	0	0	1	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	97	97	90	90
Heavy Vehicles, %	0	0	6	6	3	3
Mvmt Flow	11	1	1	201	433	44

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	659	456	478
Stage 1	456	-	-
Stage 2	203	-	-
Critical Hdwy	6.4	6.2	4.16
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.254
Pot Cap-1 Maneuver	432	609	1064
Stage 1	643	-	-
Stage 2	836	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	431	608	1063
Mov Cap-2 Maneuver	431	-	-
Stage 1	642	-	-
Stage 2	835	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1063	-	443	-	-
HCM Lane V/C Ratio	0.001	-	0.028	-	-
HCM Control Delay (s)	8.4	0	13.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

4: Heater Rd & Old Etna Rd
HCM 6th AWSC

Intersection

Intersection Delay, s/veh 13.1
Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	25	45	125	10	35	25	155	70	20	350	5
Future Vol, veh/h	3	25	45	125	10	35	25	155	70	20	350	5
Peak Hour Factor	0.90	0.90	0.90	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	0	0	0	2	2	2	4	4	4	3	3	3
Mvmt Flow	3	28	50	132	11	37	28	172	78	22	389	6
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	9.6			11.4			11.7			15.5		
HCM LOS	A			B			B			C		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	4%	74%	5%
Vol Thru, %	62%	34%	6%	93%
Vol Right, %	28%	62%	21%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	250	73	170	375
LT Vol	25	3	125	20
Through Vol	155	25	10	350
RT Vol	70	45	35	5
Lane Flow Rate	278	81	179	417
Geometry Grp	1	1	1	1
Degree of Util (X)	0.401	0.128	0.293	0.595
Departure Headway (Hd)	5.203	5.7	5.89	5.14
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	692	626	608	700
Service Time	3.244	3.757	3.938	3.176
HCM Lane V/C Ratio	0.402	0.129	0.294	0.596
HCM Control Delay	11.7	9.6	11.4	15.5
HCM Lane LOS	B	A	B	C
HCM 95th-tile Q	1.9	0.4	1.2	4

5: Route 120 & Old Etna Rd/Etna Rd
Queues

2035 No-Build

Weekday PM

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	61	33	72	317	11	67	16	904	149	67	2226
v/c Ratio	0.57	0.15	0.32	0.90	0.06	0.17	0.21	0.42	0.13	0.59	0.98
Control Delay	84.2	63.1	12.4	88.8	58.7	10.1	70.7	16.0	0.8	83.4	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.2	63.1	12.4	88.8	58.7	10.1	70.7	16.0	0.8	83.4	40.0
Queue Length 50th (ft)	55	15	1	150	9	0	14	223	0	60	~1017
Queue Length 95th (ft)	104	33	39	#254	30	39	40	278	10	112	#1267
Internal Link Dist (ft)		539			473			1647			1282
Turn Bay Length (ft)	65			300		75	350		325	300	
Base Capacity (vph)	128	256	278	354	192	408	114	2145	1170	140	2271
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.13	0.26	0.90	0.06	0.16	0.14	0.42	0.13	0.48	0.98

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: Route 120 & Old Etna Rd/Etna Rd
HCM Signalized Intersection Capacity Analysis

2035 No-Build

Weekday PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 		 				 			 	
Traffic Volume (vph)	55	30	65	285	10	60	15	850	140	65	2115	45
Future Volume (vph)	55	30	65	285	10	60	15	850	140	65	2115	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			6%			0%			0%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1796	3592	1607	3397	1843	1567	1787	3574	1599	1787	3562	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1796	3592	1607	3397	1843	1567	1787	3574	1599	1787	3562	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.94	0.94	0.94	0.97	0.97	0.97
Adj. Flow (vph)	61	33	72	317	11	67	16	904	149	67	2180	46
RTOR Reduction (vph)	0	0	63	0	0	53	0	0	44	0	1	0
Lane Group Flow (vph)	61	33	9	317	11	14	16	904	105	67	2225	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	3	3	3 1	4	4	4 5	1	6	6 4	5	2	
Permitted Phases												
Actuated Green, G (s)	8.4	8.4	13.4	14.6	14.6	29.6	5.0	84.0	98.6	9.0	88.0	
Effective Green, g (s)	8.4	8.4	13.4	14.6	14.6	29.6	5.0	84.0	98.6	9.0	88.0	
Actuated g/C Ratio	0.06	0.06	0.10	0.10	0.10	0.21	0.04	0.60	0.70	0.06	0.63	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	107	215	153	354	192	331	63	2144	1126	114	2238	
v/s Ratio Prot	c0.03	0.01	0.01	c0.09	0.01	0.01	0.01	0.25	0.07	c0.04	c0.62	
v/s Ratio Perm												
v/c Ratio	0.57	0.15	0.06	0.90	0.06	0.04	0.25	0.42	0.09	0.59	0.99	
Uniform Delay, d1	64.0	62.4	57.6	61.9	56.5	43.9	65.7	15.0	6.6	63.7	25.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.5	0.1	0.1	23.3	0.0	0.0	0.8	0.6	0.0	4.9	17.7	
Delay (s)	68.5	62.5	57.6	85.3	56.5	43.9	66.5	15.6	6.6	68.6	43.4	
Level of Service	E	E	E	F	E	D	E	B	A	E	D	
Approach Delay (s)		62.6			77.5			15.1			44.2	
Approach LOS		E			E			B			D	
Intersection Summary												
HCM 2000 Control Delay			40.4									
HCM 2000 Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			87.2%									
Analysis Period (min)			15									
c Critical Lane Group												

5: Route 120 & Old Etna Rd/Etna Rd
Timing Report, Sorted By Phase

2035 No-Build

Weekday PM

						
Phase Number	1	2	3	4	5	6
Movement	NBL	SBT	EBTL	WBTL	SBL	NBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	None	Max
Maximum Split (s)	15	90	16	19	17	88
Maximum Split (%)	10.7%	64.3%	11.4%	13.6%	12.1%	62.9%
Minimum Split (s)	15	16	16	16	15	16
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	9	5	5	5	10
Vehicle Extension (s)	2	3	2	2	2	3
Minimum Gap (s)	2	3	2	2	2	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	No	No	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	23	38	128	4	23	40
End Time (s)	38	128	4	23	40	128
Yield/Force Off (s)	32	122	138	17	34	122
Yield/Force Off 170(s)	32	122	138	17	34	122
Local Start Time (s)	41	56	6	22	41	58
Local Yield (s)	50	0	16	35	52	0
Local Yield 170(s)	50	0	16	35	52	0

Intersection Summary

Cycle Length 140
Control Type Actuated-Coordinated
Natural Cycle 140
Offset: 122 (87%), Referenced to phase 2:SBT, Start of Yellow

Splits and Phases: 5: Route 120 & Old Etna Rd/Etna Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
15 s	90 s	16 s	19 s
 Ø5	 Ø6		
17 s	88 s		

6: Route 120 & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh 67.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	165	100	1265	3125	15
Future Vol, veh/h	0	165	100	1265	3125	15
Conflicting Peds, #/hr	0	0	1	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	450	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	98	98	93	93
Heavy Vehicles, %	0	0	2	2	1	1
Mvmt Flow	0	183	102	1291	3360	16

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 1689	3377	0 - 0
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	- 7.1	5.34	- - -
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	- 3.9	3.12	- - -
Pot Cap-1 Maneuver	0 ~ 72	~ 24	- - -
Stage 1	0	-	- - -
Stage 2	0	-	- - -
Platoon blocked, %			- - -
Mov Cap-1 Maneuver	- ~ 72	~ 24	- - -
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	NB	SB
HCM Control Delay, s	825.2	131.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	~ 24	-	72	-	-
HCM Lane V/C Ratio	4.252	-	2.546	-	-
HCM Control Delay (s)	\$ 1793.4	-	\$ 825.2	-	-
HCM Lane LOS	F	-	F	-	-
HCM 95th %tile Q(veh)	12.8	-	17.8	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

1: Hanover St & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh	7.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	35	0	1	20	1
Future Vol, veh/h	0	35	0	1	20	1
Conflicting Peds, #/hr	0	9	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	39	0	1	22	1

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	46	10	0	0	1
Stage 1	1	-	-	-	-
Stage 2	45	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	969	1077	-	-	1635
Stage 1	1028	-	-	-	-
Stage 2	983	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	956	1068	-	-	1635
Mov Cap-2 Maneuver	956	-	-	-	-
Stage 1	1028	-	-	-	-
Stage 2	970	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	6.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1068	1635
HCM Lane V/C Ratio	-	-	0.036	0.014
HCM Control Delay (s)	-	-	8.5	7.2
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

2: Hanover St/Hanover St Ext & Old Etna Rd
HCM 6th TWSC

Intersection

Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	0	15	15	0	15
Future Vol, veh/h	5	0	15	15	0	15
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	6	0	17	17	0	17

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	43	28	0
Stage 1	26	-	-
Stage 2	17	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	973	1053	-
Stage 1	1002	-	-
Stage 2	1011	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	973	1051	-
Mov Cap-2 Maneuver	973	-	-
Stage 1	1002	-	-
Stage 2	1011	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	973	1591
HCM Lane V/C Ratio	-	-	0.006	-
HCM Control Delay (s)	-	-	8.7	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

3: Heater Rd/Mt Support Rd & Hanover St Ext
HCM 6th TWSC2035 No-Build
Sat MIDDAY

Intersection

Int Delay, s/veh 0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
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Lane Configurations						
Traffic Vol, veh/h	10	0	0	60	80	15
Future Vol, veh/h	10	0	0	60	80	15
Conflicting Peds, #/hr	3	3	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	0	0	67	89	17

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	168	101	106
Stage 1	98	-	-
Stage 2	70	-	-
Critical Hdwy	6.4	6.2	4.1
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	827	960	1498
Stage 1	931	-	-
Stage 2	958	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	827	957	1498
Mov Cap-2 Maneuver	827	-	-
Stage 1	931	-	-
Stage 2	958	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1498	-	827	-	-
HCM Lane V/C Ratio	-	-	0.013	-	-
HCM Control Delay (s)	0	-	9.4	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

4: Heater Rd & Old Etna Rd
HCM 6th AWSC

Intersection

Intersection Delay, s/veh 7.6
Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	15	5	60	2	10	2	50	30	2	70	0
Future Vol, veh/h	0	15	5	60	2	10	2	50	30	2	70	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	17	6	67	2	11	2	56	33	2	78	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB		WB		NB		SB					
Opposing Approach	WB		EB		SB		NB					
Opposing Lanes	1		1		1		1					
Conflicting Approach Left	SB		NB		EB		WB					
Conflicting Lanes Left	1		1		1		1					
Conflicting Approach Right	NB		SB		WB		EB					
Conflicting Lanes Right	1		1		1		1					
HCM Control Delay	7.3		7.8		7.4		7.7					
HCM LOS	A		A		A		A					

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	0%	83%	3%
Vol Thru, %	61%	75%	3%	97%
Vol Right, %	37%	25%	14%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	82	20	72	72
LT Vol	2	0	60	2
Through Vol	50	15	2	70
RT Vol	30	5	10	0
Lane Flow Rate	91	22	80	80
Geometry Grp	1	1	1	1
Degree of Util (X)	0.099	0.025	0.095	0.092
Departure Headway (Hd)	3.924	4.108	4.296	4.154
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	901	856	824	853
Service Time	2	2.205	2.375	2.227
HCM Lane V/C Ratio	0.101	0.026	0.097	0.094
HCM Control Delay	7.4	7.3	7.8	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.1	0.3	0.3

5: Route 120 & Old Etna Rd/Etna Rd
Queues

2035 No-Build

Sat MIDDAY

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	22	6	17	111	6	28	11	644	100	36	578
v/c Ratio	0.27	0.04	0.09	0.52	0.05	0.09	0.15	0.25	0.08	0.38	0.22
Control Delay	72.2	63.2	0.8	71.5	60.8	0.6	69.0	9.0	0.7	75.0	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.2	63.2	0.8	71.5	60.8	0.6	69.0	9.0	0.7	75.0	7.6
Queue Length 50th (ft)	20	2	0	51	5	0	10	115	0	32	96
Queue Length 95th (ft)	49	10	0	82	20	0	32	174	8	69	144
Internal Link Dist (ft)		539			473			1647			1282
Turn Bay Length (ft)	65			300		75	350		325	300	
Base Capacity (vph)	203	406	372	471	255	402	167	2571	1405	216	2637
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.01	0.05	0.24	0.02	0.07	0.07	0.25	0.07	0.17	0.22
Intersection Summary											

5: Route 120 & Old Etna Rd/Etna Rd
HCM Signalized Intersection Capacity Analysis

2035 No-Build

Sat MIDDAY

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	5	15	100	5	25	10	580	90	35	545	10
Future Volume (vph)	20	5	15	100	5	25	10	580	90	35	545	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			6%			0%			0%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1778	3556	1591	3298	1789	1521	1805	3610	1615	1787	3564	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1778	3556	1591	3298	1789	1521	1805	3610	1615	1787	3564	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.96	0.96	0.96
Adj. Flow (vph)	22	6	17	111	6	28	11	644	100	36	568	10
RTOR Reduction (vph)	0	0	16	0	0	24	0	0	25	0	1	0
Lane Group Flow (vph)	22	6	1	111	6	4	11	644	75	36	577	0
Confl. Peds. (#/hr)							1		1	1		1
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	3	3	3 1	4	4	4 5	1	6	6 4	5	2	
Permitted Phases												
Actuated Green, G (s)	4.4	4.4	8.1	9.1	9.1	21.5	3.7	96.1	105.2	6.4	98.8	
Effective Green, g (s)	4.4	4.4	8.1	9.1	9.1	21.5	3.7	96.1	105.2	6.4	98.8	
Actuated g/C Ratio	0.03	0.03	0.06	0.06	0.06	0.15	0.03	0.69	0.75	0.05	0.71	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	55	111	92	214	116	233	47	2478	1213	81	2515	
v/s Ratio Prot	c0.01	0.00	0.00	c0.03	0.00	0.00	0.01	c0.18	0.05	c0.02	c0.16	
v/s Ratio Perm												
v/c Ratio	0.40	0.05	0.01	0.52	0.05	0.02	0.23	0.26	0.06	0.44	0.23	
Uniform Delay, d1	66.5	65.8	62.2	63.3	61.4	50.3	66.8	8.4	4.5	65.1	7.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.7	0.1	0.0	0.9	0.1	0.0	0.9	0.3	0.0	1.4	0.2	
Delay (s)	68.2	65.9	62.2	64.2	61.5	50.3	67.7	8.6	4.5	66.5	7.4	
Level of Service	E	E	E	E	E	D	E	A	A	E	A	
Approach Delay (s)		65.6			61.4			9.0			10.9	
Approach LOS		E			E			A			B	
Intersection Summary												
HCM 2000 Control Delay			16.2									
HCM 2000 Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			44.7%									
Analysis Period (min)			15									
c Critical Lane Group												

5: Route 120 & Old Etna Rd/Etna Rd
Timing Report, Sorted By Phase

2035 No-Build

Sat MIDDAY

						
Phase Number	1	2	3	4	5	6
Movement	NBL	SBT	EBTL	WBTL	SBL	NBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	None	Max
Maximum Split (s)	19	73	22	26	23	69
Maximum Split (%)	13.6%	52.1%	15.7%	18.6%	16.4%	49.3%
Minimum Split (s)	15	16	16	16	15	16
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	9	5	5	5	10
Vehicle Extension (s)	2	3	2	2	2	3
Minimum Gap (s)	2	3	2	2	2	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	No	No	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	36	55	128	10	36	59
End Time (s)	55	128	10	36	59	128
Yield/Force Off (s)	49	122	4	30	53	122
Yield/Force Off 170(s)	49	122	4	30	53	122
Local Start Time (s)	54	73	6	28	54	77
Local Yield (s)	67	0	22	48	71	0
Local Yield 170(s)	67	0	22	48	71	0

Intersection Summary

Cycle Length 140
Control Type Actuated-Coordinated
Natural Cycle 65
Offset: 122 (87%), Referenced to phase 2:SBT, Start of Yellow

Splits and Phases: 5: Route 120 & Old Etna Rd/Etna Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
19 s	73 s	22 s	26 s
 Ø5	 Ø6		
23 s	69 s		

6: Route 120 & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh 0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
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Lane Configurations		↗	↘	↑↑↑	↑↑↑	
Traffic Vol, veh/h	0	35	35	875	870	5
Future Vol, veh/h	0	35	35	875	870	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	450	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	96	96	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	0	39	36	911	897	5

Major/Minor	Minor2	Major1	Major2
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Conflicting Flow All	-	451	902	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.32	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.11	-	-	-
Pot Cap-1 Maneuver	0	479	439	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	479	439	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
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HCM Control Delay, s	13.2	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
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Capacity (veh/h)	439	-	479	-	-
HCM Lane V/C Ratio	0.083	-	0.081	-	-
HCM Control Delay (s)	13.9	-	13.2	-	-
HCM Lane LOS	B	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.3	-	-

1: Hanover St & South Site Driveway/Evans Dr
HCM 6th TWSC2035 Build
Weekday AM

Intersection

Int Delay, s/veh 21.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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Lane Configurations

Traffic Vol, veh/h	45	60	0	5	20	530	0	0	1	210	3	10
Future Vol, veh/h	45	60	0	5	20	530	0	0	1	210	3	10
Conflicting Peds, #/hr	0	0	0	0	0	53	0	0	10	10	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	0	0	0	0	0	0	4	4	4
Mvmt Flow	50	67	0	6	22	589	0	0	1	233	3	11

Major/Minor	Minor2		Minor1		Major1		Major2	
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Conflicting Flow All	834	486	9	519	491	64	14	0	0	11	0	0
Stage 1	475	475	-	11	11	-	-	-	-	-	-	-
Stage 2	359	11	-	508	480	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.2	-	-	2.236	-	-
Pot Cap-1 Maneuver	288	481	1073	471	481	1006	1617	-	-	1595	-	-
Stage 1	570	557	-	1015	890	-	-	-	-	-	-	-
Stage 2	659	886	-	551	558	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	88	405	1073	362	405	946	1617	-	-	1580	-	-
Mov Cap-2 Maneuver	88	405	-	362	405	-	-	-	-	-	-	-
Stage 1	570	474	-	1005	881	-	-	-	-	-	-	-
Stage 2	230	877	-	403	475	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
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HCM Control Delay, s	72.9	17.6	0	7.2
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
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Capacity (veh/h)	1617	-	-	159	890	1580	-
HCM Lane V/C Ratio	-	-	-	0.734	0.693	0.148	-
HCM Control Delay (s)	0	-	-	72.9	17.6	7.7	0
HCM Lane LOS	A	-	-	F	C	A	A
HCM 95th %tile Q(veh)	0	-	-	4.5	5.8	0.5	-

2: Hanover St & Old Etna Rd
HCM 6th TWSC2035 Build
Weekday AM

Intersection

Int Delay, s/veh	4.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	140	10	90	215	35	30
Future Vol, veh/h	140	10	90	215	35	30
Conflicting Peds, #/hr	0	11	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	0	0	2	2
Mvmt Flow	156	11	100	239	39	33

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	334	234	0
Stage 1	223	-	-
Stage 2	111	-	-
Critical Hdwy	6.41	6.21	-
Critical Hdwy Stg 1	5.41	-	-
Critical Hdwy Stg 2	5.41	-	-
Follow-up Hdwy	3.509	3.309	-
Pot Cap-1 Maneuver	663	808	-
Stage 1	816	-	-
Stage 2	916	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	639	797	-
Mov Cap-2 Maneuver	639	-	-
Stage 1	814	-	-
Stage 2	886	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.5	0	4.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	648	1214
HCM Lane V/C Ratio	-	-	0.257	0.032
HCM Control Delay (s)	-	-	12.5	8.1
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	1	0.1

3: Hanover St/Hanover St Ext & North Site Driveway
HCM 6th TWSC2035 Build
Weekday AM

Intersection

Int Delay, s/veh	2.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	30	10	90	35	10
Future Vol, veh/h	15	30	10	90	35	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	33	11	100	39	11

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	167	45	50	0	-	0
Stage 1	45	-	-	-	-	-
Stage 2	122	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	823	1025	1557	-	-	-
Stage 1	977	-	-	-	-	-
Stage 2	903	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	817	1025	1557	-	-	-
Mov Cap-2 Maneuver	817	-	-	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	903	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1557	-	945	-	-
HCM Lane V/C Ratio	0.007	-	0.053	-	-
HCM Control Delay (s)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

4: Heater Rd/Mt Support Rd & Hanover St Ext
HCM 6th TWSC

Intersection

Int Delay, s/veh 2.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
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Lane Configurations						
Traffic Vol, veh/h	95	5	1	235	200	35
Future Vol, veh/h	95	5	1	235	200	35
Conflicting Peds, #/hr	0	1	8	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	90	90	90	90
Heavy Vehicles, %	0	0	5	5	4	4
Mvmt Flow	103	5	1	261	222	39

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	513	251	269
Stage 1	250	-	-
Stage 2	263	-	-
Critical Hdwy	6.4	6.2	4.15
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.245
Pot Cap-1 Maneuver	525	793	1277
Stage 1	796	-	-
Stage 2	786	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	516	786	1267
Mov Cap-2 Maneuver	516	-	-
Stage 1	789	-	-
Stage 2	780	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1267	-	525	-	-
HCM Lane V/C Ratio	0.001	-	0.207	-	-
HCM Control Delay (s)	7.8	0	13.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

5: Heater Rd & Old Etna Rd
HCM 6th AWSC2035 Build
Weekday AM

Intersection

Intersection Delay, s/veh 15
Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	135	100	85	75	50	95	180	50	30	170	1
Future Vol, veh/h	3	135	100	85	75	50	95	180	50	30	170	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	4	4	4	2	2	2	4	4	4	6	6	6
Mvmt Flow	3	150	111	94	83	56	106	200	56	33	189	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	13.9			13.6			17.6			13.5		
HCM LOS	B			B			C			B		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	29%	1%	40%	15%
Vol Thru, %	55%	57%	36%	85%
Vol Right, %	15%	42%	24%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	325	238	210	201
LT Vol	95	3	85	30
Through Vol	180	135	75	170
RT Vol	50	100	50	1
Lane Flow Rate	361	264	233	223
Geometry Grp	1	1	1	1
Degree of Util (X)	0.6	0.445	0.407	0.394
Departure Headway (Hd)	5.981	6.059	6.273	6.354
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	603	592	574	565
Service Time	4.023	4.107	4.321	4.403
HCM Lane V/C Ratio	0.599	0.446	0.406	0.395
HCM Control Delay	17.6	13.9	13.6	13.5
HCM Lane LOS	C	B	B	B
HCM 95th-tile Q	4	2.3	2	1.9

6: Route 120 & Old Etna Rd/Etna Rd
Queues2035 Build
Weekday AM

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	167	56	83	205	37	79	56	2783	372	61	934
v/c Ratio	1.30	0.22	0.30	0.86	0.29	0.25	0.54	1.25	0.31	0.61	0.43
Control Delay	230.9	63.6	10.1	95.9	67.8	15.3	82.5	142.9	1.5	89.2	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	230.9	63.6	10.1	95.9	67.8	15.3	82.5	142.9	1.5	89.2	13.9
Queue Length 50th (ft)	~194	25	0	96	33	7	50	~1674	9	55	213
Queue Length 95th (ft)	#347	49	40	#168	71	54	97	#1791	23	105	266
Internal Link Dist (ft)		539			473			1647			1282
Turn Bay Length (ft)	65			300		75	350		325	300	
Base Capacity (vph)	128	256	300	237	129	331	126	2225	1198	113	2183
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.30	0.22	0.28	0.86	0.29	0.24	0.44	1.25	0.31	0.54	0.43

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

6: Route 120 & Old Etna Rd/Etna Rd
HCM Signalized Intersection Capacity Analysis2035 Build
Weekday AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 		 				 			 	
Traffic Volume (vph)	150	50	75	195	35	75	50	2505	335	55	745	95
Future Volume (vph)	150	50	75	195	35	75	50	2505	335	55	745	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			6%			0%			0%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1796	3592	1607	3330	1807	1536	1770	3539	1583	1770	3471	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1796	3592	1607	3330	1807	1536	1770	3539	1583	1770	3471	
Peak-hour factor, PHF	0.90	0.90	0.90	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	167	56	83	205	37	79	56	2783	372	61	828	106
RTOR Reduction (vph)	0	0	72	0	0	58	0	0	89	0	7	0
Lane Group Flow (vph)	167	56	11	205	37	21	56	2783	283	61	927	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	3	3	3 1	4	4	4 5	1	6	6 4	5	2	
Permitted Phases												
Actuated Green, G (s)	10.0	10.0	18.2	10.0	10.0	24.0	8.2	88.0	98.0	8.0	87.8	
Effective Green, g (s)	10.0	10.0	18.2	10.0	10.0	24.0	8.2	88.0	98.0	8.0	87.8	
Actuated g/C Ratio	0.07	0.07	0.13	0.07	0.07	0.17	0.06	0.63	0.70	0.06	0.63	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	128	256	208	237	129	263	103	2224	1108	101	2176	
v/s Ratio Prot	c0.09	0.02	0.01	c0.06	0.02	0.01	0.03	c0.79	0.18	c0.03	0.27	
v/s Ratio Perm												
v/c Ratio	1.30	0.22	0.05	0.86	0.29	0.08	0.54	1.25	0.26	0.60	0.43	
Uniform Delay, d1	65.0	61.3	53.3	64.3	61.6	48.7	64.1	26.0	7.7	64.5	13.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	182.4	0.2	0.0	25.6	0.4	0.0	3.1	117.0	0.0	6.8	0.6	
Delay (s)	247.4	61.5	53.4	89.9	62.1	48.8	67.2	143.0	7.7	71.3	13.9	
Level of Service	F	E	D	F	E	D	E	F	A	E	B	
Approach Delay (s)		160.7			76.6			126.0			17.4	
Approach LOS		F			E			F			B	
Intersection Summary												
HCM 2000 Control Delay			102.6									
HCM 2000 Volume to Capacity ratio			1.18									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			97.2%									
Analysis Period (min)			15									
c Critical Lane Group												

6: Route 120 & Old Etna Rd/Etna Rd
Timing Report, Sorted By Phase2035 Build
Weekday AM

						
Phase Number	1	2	3	4	5	6
Movement	NBL	SBT	EBTL	WBTL	SBL	NBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	None	Max
Maximum Split (s)	16	92	16	16	15	93
Maximum Split (%)	11.4%	65.7%	11.4%	11.4%	10.7%	66.4%
Minimum Split (s)	15	16	15	16	15	16
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	9	5	5	5	10
Vehicle Extension (s)	2	3	2	2	2	3
Minimum Gap (s)	2	3	2	2	2	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	No	No	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	20	36	128	4	20	35
End Time (s)	36	128	4	20	35	128
Yield/Force Off (s)	30	122	138	14	29	122
Yield/Force Off 170(s)	30	122	138	14	29	122
Local Start Time (s)	38	54	6	22	38	53
Local Yield (s)	48	0	16	32	47	0
Local Yield 170(s)	48	0	16	32	47	0

Intersection Summary

Cycle Length 140
Control Type Actuated-Coordinated
Natural Cycle 150
Offset: 122 (87%), Referenced to phase 2:SBT, Start of Yellow

Splits and Phases: 6: Route 120 & Old Etna Rd/Etna Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
16 s	92 s	16 s	16 s
 Ø5	 Ø6		
15 s	93 s		

7: Route 120 & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh 99.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	310	560	3230	1335	85
Future Vol, veh/h	0	310	560	3230	1335	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	450	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	93	93
Heavy Vehicles, %	1	1	2	2	4	4
Mvmt Flow	0	344	622	3589	1435	91

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	763 1526	0 - 0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	7.12 5.34	- - -
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.91 3.12	- - -
Pot Cap-1 Maneuver	0 ~ 299	~ 216	- - -
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %			- - -
Mov Cap-1 Maneuver	- ~ 299	~ 216	- - -
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	137.3	131.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	~ 216	-	299	-	-
HCM Lane V/C Ratio	2.881	-	1.152	-	-
HCM Control Delay (s)	\$ 892.8	-	137.3	-	-
HCM Lane LOS	F	-	F	-	-
HCM 95th %tile Q(veh)	55	-	14.6	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

1: Hanover St & South Site Driveway/Evans Dr
HCM 6th TWSC2035 Build
Weekday PM

Intersection

Int Delay, s/veh 8.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	30	0	1	45	85	0	5	5	95	5	25
Future Vol, veh/h	20	30	0	1	45	85	0	5	5	95	5	25
Conflicting Peds, #/hr	0	0	0	0	0	3	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	0	0	0	0	0	0
Mvmt Flow	22	33	0	1	50	94	0	6	6	106	6	28

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	316	244	20	258	255	12	34	0	0	12	0	0
Stage 1	232	232	-	9	9	-	-	-	-	-	-	-
Stage 2	84	12	-	249	246	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	637	658	1058	695	649	1069	1591	-	-	1620	-	-
Stage 1	771	713	-	1012	888	-	-	-	-	-	-	-
Stage 2	924	886	-	755	703	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	515	614	1058	632	606	1066	1591	-	-	1620	-	-
Mov Cap-2 Maneuver	515	614	-	632	606	-	-	-	-	-	-	-
Stage 1	771	665	-	1012	888	-	-	-	-	-	-	-
Stage 2	792	886	-	669	656	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12	10.2	0	5.6
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1591	-	-	570	842	1620	-	-
HCM Lane V/C Ratio	-	-	-	0.097	0.173	0.065	-	-
HCM Control Delay (s)	0	-	-	12	10.2	7.4	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.6	0.2	-	-

2: Hanover St & Old Etna Rd
HCM 6th TWSC2035 Build
Weekday PM

Intersection

Int Delay, s/veh 3.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	55	25	25	80	20	45
Future Vol, veh/h	55	25	25	80	20	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	61	28	28	89	22	50

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	167	73	0
Stage 1	73	-	-
Stage 2	94	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	828	995	-
Stage 1	955	-	-
Stage 2	935	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	816	995	-
Mov Cap-2 Maneuver	816	-	-
Stage 1	955	-	-
Stage 2	921	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	2.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	865	1484
HCM Lane V/C Ratio	-	-	0.103	0.015
HCM Control Delay (s)	-	-	9.6	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0

3: Hanover St/Hanover St Ext & North Site Driveway
HCM 6th TWSC2035 Build
Weekday PM

Intersection

Int Delay, s/veh	2.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	15	25	25	50	20
Future Vol, veh/h	5	15	25	25	50	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	17	28	28	56	22

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	151	67	78	0	-	0
Stage 1	67	-	-	-	-	-
Stage 2	84	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	841	997	1520	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	939	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	825	997	1520	-	-	-
Mov Cap-2 Maneuver	825	-	-	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	939	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	3.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1520	-	948	-	-
HCM Lane V/C Ratio	0.018	-	0.023	-	-
HCM Control Delay (s)	7.4	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

4: Heater Rd/Mt Support Rd & Hanover St Ext
HCM 6th TWSC2035 Build
Weekday PM

Intersection

Int Delay, s/veh 0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
----------	-----	-----	-----	-----	-----	-----

Lane Configurations						
Traffic Vol, veh/h	25	1	1	195	390	60
Future Vol, veh/h	25	1	1	195	390	60
Conflicting Peds, #/hr	0	0	1	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	97	97	90	90
Heavy Vehicles, %	0	0	6	6	3	3
Mvmt Flow	28	1	1	201	433	67

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	671	468	501
Stage 1	468	-	-
Stage 2	203	-	-
Critical Hdwy	6.4	6.2	4.16
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.254
Pot Cap-1 Maneuver	425	599	1043
Stage 1	634	-	-
Stage 2	836	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	424	598	1042
Mov Cap-2 Maneuver	424	-	-
Stage 1	633	-	-
Stage 2	835	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1042	-	429	-	-
HCM Lane V/C Ratio	0.001	-	0.067	-	-
HCM Control Delay (s)	8.5	0	14	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

5: Heater Rd & Old Etna Rd
HCM 6th AWSC2035 Build
Weekday PM

Intersection

Intersection Delay, s/veh 14.5
Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	55	45	125	55	35	25	155	70	20	350	5
Future Vol, veh/h	3	55	45	125	55	35	25	155	70	20	350	5
Peak Hour Factor	0.90	0.90	0.90	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	0	0	0	2	2	2	4	4	4	3	3	3
Mvmt Flow	3	61	50	132	58	37	28	172	78	22	389	6
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	10.6			12.9			12.8			17.5		
HCM LOS	B			B			B			C		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	3%	58%	5%
Vol Thru, %	62%	53%	26%	93%
Vol Right, %	28%	44%	16%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	250	103	215	375
LT Vol	25	3	125	20
Through Vol	155	55	55	350
RT Vol	70	45	35	5
Lane Flow Rate	278	114	226	417
Geometry Grp	1	1	1	1
Degree of Util (X)	0.428	0.192	0.381	0.632
Departure Headway (Hd)	5.547	6.029	6.063	5.457
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	644	589	588	658
Service Time	3.62	4.121	4.143	3.52
HCM Lane V/C Ratio	0.432	0.194	0.384	0.634
HCM Control Delay	12.8	10.6	12.9	17.5
HCM Lane LOS	B	B	B	C
HCM 95th-tile Q	2.1	0.7	1.8	4.5

6: Route 120 & Old Etna Rd/Etna Rd
Queues2035 Build
Weekday PM

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	94	33	72	317	11	67	16	904	149	67	2273
v/c Ratio	0.78	0.14	0.30	0.97	0.06	0.18	0.21	0.42	0.13	0.59	1.00
Control Delay	101.4	62.4	11.9	104.5	59.0	10.2	70.7	16.0	0.8	83.4	45.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	101.4	62.4	11.9	104.5	59.0	10.2	70.7	16.0	0.8	83.4	45.8
Queue Length 50th (ft)	85	15	1	~152	9	0	14	223	0	60	~1158
Queue Length 95th (ft)	#177	33	39	#254	30	39	40	278	10	112	#1316
Internal Link Dist (ft)		539			473			1647			1282
Turn Bay Length (ft)	65			300		75	350		325	300	
Base Capacity (vph)	128	256	278	328	178	396	114	2144	1158	140	2264
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.13	0.26	0.97	0.06	0.17	0.14	0.42	0.13	0.48	1.00

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

6: Route 120 & Old Etna Rd/Etna Rd
HCM Signalized Intersection Capacity Analysis2035 Build
Weekday PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 		 				 			 	
Traffic Volume (vph)	85	30	65	285	10	60	15	850	140	65	2115	90
Future Volume (vph)	85	30	65	285	10	60	15	850	140	65	2115	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			6%			0%			0%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1796	3592	1607	3397	1843	1567	1787	3574	1599	1787	3549	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1796	3592	1607	3397	1843	1567	1787	3574	1599	1787	3549	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.94	0.94	0.94	0.97	0.97	0.97
Adj. Flow (vph)	94	33	72	317	11	67	16	904	149	67	2180	93
RTOR Reduction (vph)	0	0	63	0	0	53	0	0	45	0	2	0
Lane Group Flow (vph)	94	33	9	317	11	14	16	904	104	67	2271	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	3	3	3 1	4	4	4 5	1	6	6 4	5	2	
Permitted Phases												
Actuated Green, G (s)	9.5	9.5	14.5	13.5	13.5	28.5	5.0	84.0	97.5	9.0	88.0	
Effective Green, g (s)	9.5	9.5	14.5	13.5	13.5	28.5	5.0	84.0	97.5	9.0	88.0	
Actuated g/C Ratio	0.07	0.07	0.10	0.10	0.10	0.20	0.04	0.60	0.70	0.06	0.63	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	121	243	166	327	177	318	63	2144	1113	114	2230	
v/s Ratio Prot	c0.05	0.01	0.01	c0.09	0.01	0.01	0.01	0.25	0.06	c0.04	c0.64	
v/s Ratio Perm												
v/c Ratio	0.78	0.14	0.06	0.97	0.06	0.04	0.25	0.42	0.09	0.59	1.02	
Uniform Delay, d1	64.2	61.4	56.6	63.0	57.5	44.8	65.7	15.0	6.9	63.7	26.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	24.2	0.1	0.1	40.8	0.1	0.0	0.8	0.6	0.0	4.9	23.8	
Delay (s)	88.4	61.5	56.6	103.9	57.5	44.8	66.5	15.6	6.9	68.6	49.8	
Level of Service	F	E	E	F	E	D	E	B	A	E	D	
Approach Delay (s)		72.4			92.6			15.2			50.4	
Approach LOS		E			F			B			D	
Intersection Summary												
HCM 2000 Control Delay			46.2									
HCM 2000 Volume to Capacity ratio			0.99									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			88.6%									
Analysis Period (min)			15									
c Critical Lane Group												

6: Route 120 & Old Etna Rd/Etna Rd
Timing Report, Sorted By Phase2035 Build
Weekday PM

						
Phase Number	1	2	3	4	5	6
Movement	NBL	SBT	EBTL	WBTL	SBL	NBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	None	Max
Maximum Split (s)	15	90	16	19	17	88
Maximum Split (%)	10.7%	64.3%	11.4%	13.6%	12.1%	62.9%
Minimum Split (s)	15	16	16	16	15	16
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	9	5	5	5	10
Vehicle Extension (s)	2	3	2	2	2	3
Minimum Gap (s)	2	3	2	2	2	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	No	No	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	23	38	128	4	23	40
End Time (s)	38	128	4	23	40	128
Yield/Force Off (s)	32	122	138	17	34	122
Yield/Force Off 170(s)	32	122	138	17	34	122
Local Start Time (s)	41	56	6	22	41	58
Local Yield (s)	50	0	16	35	52	0
Local Yield 170(s)	50	0	16	35	52	0

Intersection Summary

Cycle Length 140
Control Type Actuated-Coordinated
Natural Cycle 150
Offset: 122 (87%), Referenced to phase 2:SBT, Start of Yellow

Splits and Phases: 6: Route 120 & Old Etna Rd/Etna Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
15 s	90 s	16 s	19 s
 Ø5	 Ø6		
17 s	88 s		

Intersection

Int Delay, s/veh 122.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	195	145	1265	3125	15
Future Vol, veh/h	0	195	145	1265	3125	15
Conflicting Peds, #/hr	0	0	1	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	450	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	98	98	93	93
Heavy Vehicles, %	0	0	2	2	1	1
Mvmt Flow	0	217	148	1291	3360	16

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	1689	3377
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	7.1	5.34
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.9	3.12
Pot Cap-1 Maneuver	0	~ 72	~ 24
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	~ 72	~ 24
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, \$	1028.7	272.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	~ 24	-	72	-	-
HCM Lane V/C Ratio	6.165	-	3.009	-	-
HCM Control Delay (s)	\$ 2646.3	\$	1028.7	-	-
HCM Lane LOS	F	-	F	-	-
HCM 95th %tile Q(veh)	18.5	-	21.8	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

1: Hanover St & South Site Driveway/Evans Dr
HCM 6th TWSC

2035 Build

Sat MIDDAY

Intersection

Int Delay, s/veh 8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	35	0	0	40	35	0	0	1	20	1	20
Future Vol, veh/h	25	35	0	0	40	35	0	0	1	20	1	20
Conflicting Peds, #/hr	0	0	0	0	0	9	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	0	0	0	0	0	0	0	0	0
Mvmt Flow	28	39	0	0	44	39	0	0	1	22	1	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	107	57	12	77	68	10	23	0	0	1	0	0
Stage 1	56	56	-	1	1	-	-	-	-	-	-	-
Stage 2	51	1	-	76	67	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	872	834	1069	917	826	1077	1605	-	-	1635	-	-
Stage 1	956	848	-	1027	899	-	-	-	-	-	-	-
Stage 2	962	895	-	938	843	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	790	822	1069	875	814	1068	1605	-	-	1635	-	-
Mov Cap-2 Maneuver	790	822	-	875	814	-	-	-	-	-	-	-
Stage 1	956	836	-	1027	899	-	-	-	-	-	-	-
Stage 2	874	895	-	882	831	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.9	9.3	0	3.5
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1605	-	-	808 916	1635	-	-
HCM Lane V/C Ratio	-	-	-	0.083 0.091	0.014	-	-
HCM Control Delay (s)	0	-	-	9.9 9.3	7.2	0	-
HCM Lane LOS	A	-	-	A A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3 0.3	0	-	-

2: Hanover St & Old Etna Rd
HCM 6th TWSC2035 Build
Sat MIDDAY

Intersection

Int Delay, s/veh 4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	20	25	35	20	15
Future Vol, veh/h	25	20	25	35	20	15
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	28	22	28	39	22	17

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	109	50	0
Stage 1	48	-	-
Stage 2	61	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	893	1024	-
Stage 1	980	-	-
Stage 2	967	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	880	1022	-
Mov Cap-2 Maneuver	880	-	-
Stage 1	980	-	-
Stage 2	953	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	4.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	938	1547
HCM Lane V/C Ratio	-	-	0.053	0.014
HCM Control Delay (s)	-	-	9.1	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0

3: Hanover St/Hanover St Ext & North Site Driveway
HCM 6th TWSC2035 Build
Sat MIDDAY

Intersection

Int Delay, s/veh	3.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	20	20	25	15	20
Future Vol, veh/h	10	20	20	25	15	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	22	22	28	17	22

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	100	28	39	0	-	0
Stage 1	28	-	-	-	-	-
Stage 2	72	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	899	1047	1571	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	951	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	886	1047	1571	-	-	-
Mov Cap-2 Maneuver	886	-	-	-	-	-
Stage 1	981	-	-	-	-	-
Stage 2	951	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	3.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1571	-	987	-	-
HCM Lane V/C Ratio	0.014	-	0.034	-	-
HCM Control Delay (s)	7.3	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

4: Heater Rd/Mt Support Rd & Hanover St Ext
HCM 6th TWSC

Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
----------	-----	-----	-----	-----	-----	-----

Lane Configurations						
Traffic Vol, veh/h	30	0	0	60	80	30
Future Vol, veh/h	30	0	0	60	80	30
Conflicting Peds, #/hr	3	3	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	33	0	0	67	89	33

Major/Minor	Minor2	Major1	Major2
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Conflicting Flow All	176	109	122	0	-	0
Stage 1	106	-	-	-	-	-
Stage 2	70	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	818	950	1478	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	958	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	818	947	1478	-	-	-
Mov Cap-2 Maneuver	818	-	-	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	958	-	-	-	-	-

Approach	EB	NB	SB
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HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
-----------------------	-----	-----	-------	-----	-----

Capacity (veh/h)	1478	-	818	-	-
HCM Lane V/C Ratio	-	-	0.041	-	-
HCM Control Delay (s)	0	-	9.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

5: Heater Rd & Old Etna Rd
HCM 6th AWSC2035 Build
Sat MIDDAY

Intersection

Intersection Delay, s/veh
Intersection LOS8
A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	55	5	60	45	10	5	50	30	2	70	0
Future Vol, veh/h	0	55	5	60	45	10	5	50	30	2	70	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	61	6	67	50	11	6	56	33	2	78	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB		WB		NB		SB					
Opposing Approach	WB		EB		SB		NB					
Opposing Lanes	1		1		1		1					
Conflicting Approach Left	SB		NB		EB		WB					
Conflicting Lanes Left	1		1		1		1					
Conflicting Approach Right	NB		SB		WB		EB					
Conflicting Lanes Right	1		1		1		1					
HCM Control Delay	7.8		8.3		7.8		8					
HCM LOS	A		A		A		A					

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	0%	52%	3%
Vol Thru, %	59%	92%	39%	97%
Vol Right, %	35%	8%	9%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	85	60	115	72
LT Vol	5	0	60	2
Through Vol	50	55	45	70
RT Vol	30	5	10	0
Lane Flow Rate	94	67	128	80
Geometry Grp	1	1	1	1
Degree of Util (X)	0.111	0.081	0.157	0.099
Departure Headway (Hd)	4.236	4.385	4.419	4.454
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	848	819	814	806
Service Time	2.251	2.4	2.432	2.469
HCM Lane V/C Ratio	0.111	0.082	0.157	0.099
HCM Control Delay	7.8	7.8	8.3	8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.3	0.6	0.3

6: Route 120 & Old Etna Rd/Etna Rd
Queues

2035 Build

Sat MIDDAY

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	67	6	17	111	6	28	11	644	100	36	620
v/c Ratio	0.55	0.02	0.07	0.52	0.05	0.09	0.15	0.26	0.08	0.38	0.25
Control Delay	78.7	58.6	0.6	71.5	60.8	0.6	69.0	11.3	0.9	75.0	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.7	58.6	0.6	71.5	60.8	0.6	69.0	11.3	0.9	75.0	9.5
Queue Length 50th (ft)	60	2	0	51	5	0	10	126	0	32	113
Queue Length 95th (ft)	109	10	0	82	20	0	32	193	9	69	173
Internal Link Dist (ft)		539			473			1647			1282
Turn Bay Length (ft)	65			300		75	350		325	300	
Base Capacity (vph)	266	533	420	424	230	392	167	2431	1316	204	2474
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.01	0.04	0.26	0.03	0.07	0.07	0.26	0.08	0.18	0.25
Intersection Summary											

6: Route 120 & Old Etna Rd/Etna Rd
HCM Signalized Intersection Capacity Analysis

2035 Build

Sat MIDDAY

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 		 				 			 	
Traffic Volume (vph)	60	5	15	100	5	25	10	580	90	35	545	50
Future Volume (vph)	60	5	15	100	5	25	10	580	90	35	545	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			6%			0%			0%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1778	3556	1591	3298	1789	1521	1805	3610	1615	1787	3523	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1778	3556	1591	3298	1789	1521	1805	3610	1615	1787	3523	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.96	0.96	0.96
Adj. Flow (vph)	67	6	17	111	6	28	11	644	100	36	568	52
RTOR Reduction (vph)	0	0	16	0	0	24	0	0	28	0	3	0
Lane Group Flow (vph)	67	6	1	111	6	4	11	644	72	36	617	0
Confl. Peds. (#/hr)							1		1	1		1
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	3	3	3 1	4	4	4 5	1	6	6 4	5	2	
Permitted Phases												
Actuated Green, G (s)	8.6	8.6	12.3	9.1	9.1	21.5	3.7	91.9	101.0	6.4	94.6	
Effective Green, g (s)	8.6	8.6	12.3	9.1	9.1	21.5	3.7	91.9	101.0	6.4	94.6	
Actuated g/C Ratio	0.06	0.06	0.09	0.06	0.06	0.15	0.03	0.66	0.72	0.05	0.68	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	109	218	139	214	116	233	47	2369	1165	81	2380	
v/s Ratio Prot	c0.04	0.00	0.00	c0.03	0.00	0.00	0.01	c0.18	0.04	c0.02	c0.18	
v/s Ratio Perm												
v/c Ratio	0.61	0.03	0.01	0.52	0.05	0.02	0.23	0.27	0.06	0.44	0.26	
Uniform Delay, d1	64.1	61.8	58.3	63.3	61.4	50.3	66.8	10.1	5.7	65.1	8.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.0	0.0	0.0	0.9	0.1	0.0	0.9	0.3	0.0	1.4	0.3	
Delay (s)	71.1	61.8	58.3	64.2	61.5	50.3	67.7	10.3	5.7	66.5	9.2	
Level of Service	E	E	E	E	E	D	E	B	A	E	A	
Approach Delay (s)		68.1			61.4			10.6			12.3	
Approach LOS		E			E			B			B	
Intersection Summary												
HCM 2000 Control Delay			18.9									
HCM 2000 Volume to Capacity ratio			0.33									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			45.8%									
Analysis Period (min)			15									
c Critical Lane Group												

6: Route 120 & Old Etna Rd/Etna Rd
Timing Report, Sorted By Phase2035 Build
Sat MIDDAY

						
Phase Number	1	2	3	4	5	6
Movement	NBL	SBT	EBTL	WBTL	SBL	NBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize						
Recall Mode	None	C-Max	None	None	None	Max
Maximum Split (s)	19	70	27	24	22	67
Maximum Split (%)	13.6%	50.0%	19.3%	17.1%	15.7%	47.9%
Minimum Split (s)	15	16	16	16	15	16
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	9	5	5	5	10
Vehicle Extension (s)	2	3	2	2	2	3
Minimum Gap (s)	2	3	2	2	2	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	No	No	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	39	58	128	15	39	61
End Time (s)	58	128	15	39	61	128
Yield/Force Off (s)	52	122	9	33	55	122
Yield/Force Off 170(s)	52	122	9	33	55	122
Local Start Time (s)	57	76	6	33	57	79
Local Yield (s)	70	0	27	51	73	0
Local Yield 170(s)	70	0	27	51	73	0

Intersection Summary

Cycle Length 140
Control Type Actuated-Coordinated
Natural Cycle 65
Offset: 122 (87%), Referenced to phase 2:SBT, Start of Yellow

Splits and Phases: 6: Route 120 & Old Etna Rd/Etna Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
19 s	70 s	27 s	24 s
 Ø5	 Ø6		
22 s	67 s		

7: Route 120 & Evans Dr
HCM 6th TWSC

Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	75	75	875	870	5
Future Vol, veh/h	0	75	75	875	870	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	450	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	96	96	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	0	83	78	911	897	5

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	451	902
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	2.21
Pot Cap-1 Maneuver	0	561	756
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	-	561	756
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	0.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	756	-	561	-	-
HCM Lane V/C Ratio	0.103	-	0.149	-	-
HCM Control Delay (s)	10.3	-	12.5	-	-
HCM Lane LOS	B	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.5	-	-

2034 Build Analysis Worksheets with Improvements

Intersection

Intersection Delay, s/veh 15.3
Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	60	0	5	20	530	0	0	1	210	3	10
Future Vol, veh/h	45	60	0	5	20	530	0	0	1	210	3	10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	0	0	0	0	0	0	4	4	4
Mvmt Flow	50	67	0	6	22	589	0	0	1	233	3	11
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	9.7			17.5			8.5			12.6		
HCM LOS	A			C			A			B		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	43%	1%	94%
Vol Thru, %	0%	57%	4%	1%
Vol Right, %	100%	0%	95%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	105	555	223
LT Vol	0	45	5	210
Through Vol	0	60	20	3
RT Vol	1	0	530	10
Lane Flow Rate	1	117	617	248
Geometry Grp	1	1	1	1
Degree of Util (X)	0.002	0.179	0.721	0.4
Departure Headway (Hd)	5.481	5.514	4.211	5.805
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	654	652	851	624
Service Time	3.502	3.536	2.292	3.811
HCM Lane V/C Ratio	0.002	0.179	0.725	0.397
HCM Control Delay	8.5	9.7	17.5	12.6
HCM Lane LOS	A	A	C	B
HCM 95th-tile Q	0	0.6	6.4	1.9

Intersection

Intersection Delay, s/veh
Intersection LOS8
A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	30	0	1	45	85	0	5	5	95	5	25
Future Vol, veh/h	20	30	0	1	45	85	0	5	5	95	5	25
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	0	0	0	0	0	0
Mvmt Flow	22	33	0	1	50	94	0	6	6	106	6	28
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	7.9			7.7			7.3			8.3		
HCM LOS	A			A			A			A		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	40%	1%	76%
Vol Thru, %	50%	60%	34%	4%
Vol Right, %	50%	0%	65%	20%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	50	131	125
LT Vol	0	20	1	95
Through Vol	5	30	45	5
RT Vol	5	0	85	25
Lane Flow Rate	11	56	146	139
Geometry Grp	1	1	1	1
Degree of Util (X)	0.013	0.07	0.16	0.169
Departure Headway (Hd)	4.185	4.504	3.954	4.387
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	857	798	910	822
Service Time	2.201	2.516	1.964	2.387
HCM Lane V/C Ratio	0.013	0.07	0.16	0.169
HCM Control Delay	7.3	7.9	7.7	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.2	0.6	0.6

Intersection

Intersection Delay, s/veh 7.3
Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	35	0	0	40	35	0	0	1	20	1	20
Future Vol, veh/h	25	35	0	0	40	35	0	0	1	20	1	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	0	0	0	0	0	0	0	0	0
Mvmt Flow	28	39	0	0	44	39	0	0	1	22	1	22
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	7.5			7.1			6.7			7.2		
HCM LOS	A			A			A			A		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	42%	0%	49%
Vol Thru, %	0%	58%	53%	2%
Vol Right, %	100%	0%	47%	49%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	60	75	41
LT Vol	0	25	0	20
Through Vol	0	35	40	1
RT Vol	1	0	35	20
Lane Flow Rate	1	67	83	46
Geometry Grp	1	1	1	1
Degree of Util (X)	0.001	0.077	0.087	0.05
Departure Headway (Hd)	3.592	4.161	3.75	3.963
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	984	860	953	896
Service Time	1.66	2.192	1.785	2.022
HCM Lane V/C Ratio	0.001	0.078	0.087	0.051
HCM Control Delay	6.7	7.5	7.1	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.2	0.3	0.2

School Dismissal Condition Data

Weekday Afternoon Student Dismissal Peak Analysis Summary

- The Hanover Street intersections with Evans Drive and with Old Etna Road have localized afternoon peaks that correspond with school dismissal times (2:00-3:00 PM and 2:15-3:15 PM).
- A limited review of the school dismissal time at the above listed two intersections was completed.
- **2022 Existing Traffic Volumes:**
 - Adjustment factors based on the methodology presented within the body of the traffic study:
 - Seasonal Adjustment = November 2022 traffic counts increased by 13%.
 - Pandemic Adjustment = 2022 peak month traffic volumes increased by 5.4%.
- **2025 No-Build Traffic Volumes:**
 - Historical Growth = increased 2022 Existing traffic volumes along NH Route 120 by a 1% compounded annual growth rate.
 - Background Developments: the Dartmouth Health patient tower expansion project, the Marek at Lebanon, NH multifamily development (343 Mount Support Road), and the apartment development to be constructed at 402 Mount Support Road.
- **2025 Build Traffic Volumes:**
 - ITE has vehicle time of day distributions for Land Use Code 221 – Multifamily Housing (Mid-Rise) that identify the percentage of daily traffic that is distributed to each hour of the day. During the weekday afternoon student dismissal peak, the following site trips were estimated for the proposed development:

Table A-1 Trip-Generation Summary

Peak Hour/Direction	Apartment Trips ^a
Weekday PM School Dismissal Peak Hour	
Enter	45
Exit	41
Total	86

^a ITE Land Use Code 221 (Multifamily Housing [Mid-Rise]) for 474 dwelling units.

- Trips were distributed using the same methodology as the within the body of the traffic study.
- The project-generated traffic volumes were combined with the No-Build traffic volumes to develop the Build peak-hour traffic-volume networks
- Intersections were analyzed for their operations under 2025 traffic volume conditions during the student dismissal peak as shown in Table A-2.
 - Operations are a LOS B or better for all movements at the two existing Hanover Street intersections as well as at the proposed north site driveway.

Table A-2 Capacity Analysis Summary 2025 Opening Year Conditions – Student Dismissal Peak

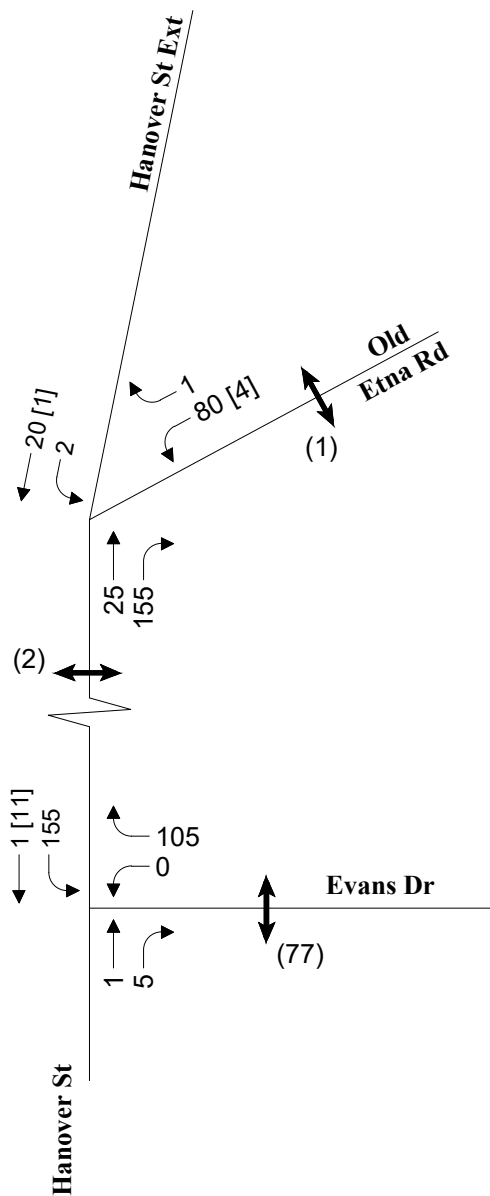
Intersection/Critical Movement	2025 No-Build					2025 Build				
	v/c	Delay	LOS	50th % Queue	95th % Queue	v/c	Delay	LOS	50th % Queue	95th % Queue
Hanover Street and Evans Drive ^a										
South Site Driveway EB Approach	--	--	--	--	--	0.08	15.0	B	--	8
Evans Dr WB Approach	0.12	8.8	A	--	10	0.18	10.0	B	--	15
Hanover St NB Left	--	--	--	--	--	--	--	--	--	--
Hanover St SB Left	0.13	7.6	A	--	12	0.13	7.6	A	--	12
Hanover Street and Old Etna Road										
Old Etna Rd WB Approach	0.13	10.2	B	--	10	0.16	10.7	B	--	15
Hanover St SB Left	0.00	7.8	A	--	0	0.01	7.9	A	--	0
Hanover Street and North Site Driveway										
North Site Driveway EB Approach	--	--	--	--	--	0.02	8.7	A	--	2
Hanover St NB Left	--	--	--	--	--	0.01	7.3	A	--	0

v/c = volume-to-capacity ratio.

Delay in seconds.

Queue lengths in feet (unsignalized intersections produce number of vehicles multiplied by standard traffic engineering practice vehicle spacing of 25 feet/vehicle).

a No vehicles were counted or projected on the Hanover Street northbound left-turn movement and no site trips were assigned to this movement.



LEGEND

XX = Vehicles
(XX) = Pedestrians
[XX] = Bicycles

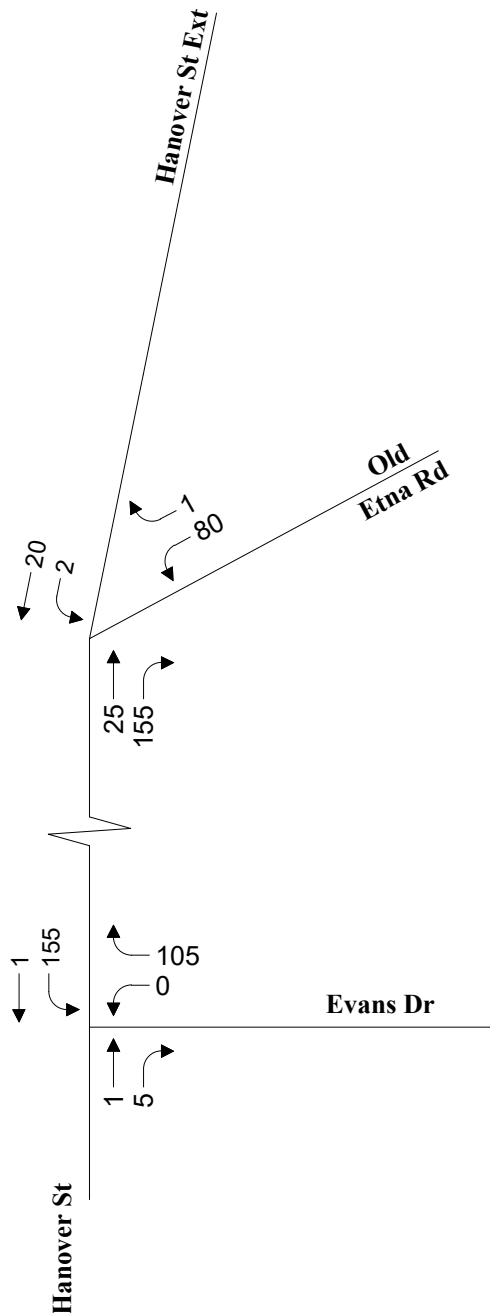


Not to Scale



2022 Existing Weekday Afternoon
Peak Hour Traffic Volumes

Figure A-1



↑
Not to Scale



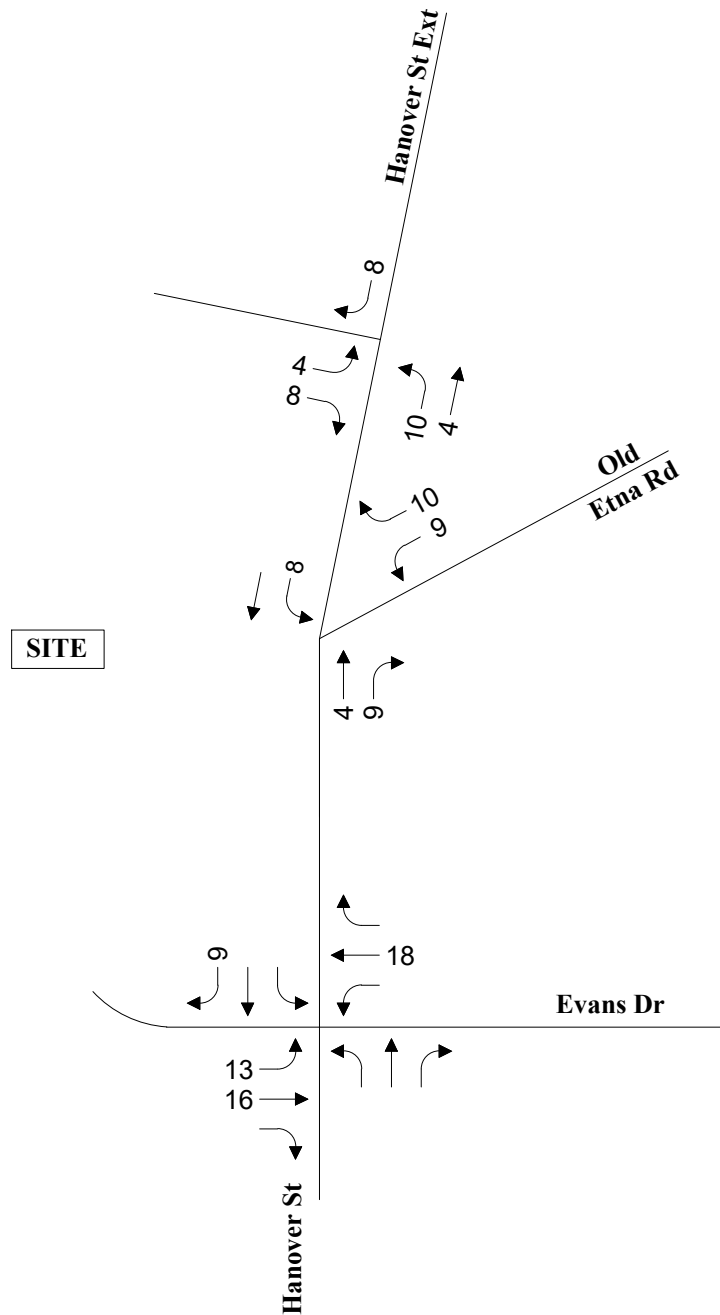
2025 No-Build Weekday Afternoon
School Dismissal
Peak Hour Traffic Volumes

Figure A-2

Hourly Distribution of Entering and Exiting Vehicle Trips by Land Use						
Source: ITE Trip Generation Manual, 11th Edition						
Land Use Code	221			221		
Land Use	Multifamily Housing (Mid-Rise)			Multifamily Housing (Mid-Rise)		
Subcategory	Not Close to Rail transit			Not Close to Rail transit		
Setting	General Urban/Suburban			General Urban/Suburban		
Time Period	Weekday			Saturday		
# Data Sites	6			1		
	% of 24-Hour Vehicle Trips			% of 24-Hour Vehicle Trips		
Time	Total	Entering	Exiting	Total	Entering	Exiting
12:00 - 1:00 AM	0.8%	1.2%	0.4%	1.8%	2.8%	0.8%
1:00 - 2:00 AM	0.4%	0.6%	0.3%	0.3%	0.4%	0.2%
2:00 - 3:00 AM	0.2%	0.3%	0.1%	0.5%	0.9%	0.2%
3:00 - 4:00 AM	0.2%	0.2%	0.2%	1.7%	2.4%	1.0%
4:00 - 5:00 AM	0.3%	0.1%	0.5%	0.3%	0.4%	0.2%
5:00 - 6:00 AM	1.2%	0.4%	2.0%	0.2%	0.2%	0.2%
6:00 - 7:00 AM	4.4%	1.0%	7.8%	1.2%	0.4%	1.9%
7:00 - 8:00 AM	8.6%	2.5%	14.7%	3.5%	3.0%	4.0%
8:00 - 9:00 AM	7.8%	3.0%	12.5%	3.8%	2.8%	4.8%
9:00 - 10:00 AM	4.5%	2.2%	6.9%	5.8%	3.5%	8.1%
10:00 - 11:00 AM	3.7%	2.7%	4.6%	6.4%	5.0%	7.7%
11:00 - 12:00 PM	3.7%	3.4%	4.0%	6.4%	6.1%	6.7%
12:00 - 1:00 PM	4.6%	4.3%	4.8%	6.6%	4.5%	8.5%
1:00 - 2:00 PM	4.4%	4.4%	4.4%	6.2%	6.9%	5.4%
2:00 - 3:00 PM	3.9%	4.1%	3.7%	7.3%	7.1%	7.5%
3:00 - 4:00 PM	4.9%	5.9%	3.8%	6.7%	8.2%	5.2%
4:00 - 5:00 PM	7.2%	9.2%	5.1%	6.2%	6.3%	6.0%
5:00 - 6:00 PM	9.4%	13.1%	5.8%	7.7%	7.8%	7.7%
6:00 - 7:00 PM	9.0%	12.1%	6.0%	6.8%	6.3%	7.3%
7:00 - 8:00 PM	7.4%	9.4%	5.4%	5.4%	6.9%	4.0%
8:00 - 9:00 PM	5.4%	7.7%	3.1%	4.3%	4.5%	4.2%
9:00 - 10:00 PM	4.0%	6.5%	1.5%	4.0%	4.3%	3.7%
10:00 - 11:00 PM	2.6%	3.7%	1.6%	3.9%	4.8%	3.1%
11:00 - 12:00 AM	1.4%	2.1%	0.8%	3.0%	4.3%	1.7%
	100.0%	100.0%	100.0%			

ITE Land Use Code 221: Multifamily Housing (Mid-Rise)
474 dwelling units

Weekday Daily		Saturday Daily	
1,108 vpd enter	1,108 vpd exit	1,032 vpd enter	1,032 vpd exit
13	4	29	9
6	4	4	2
3	1	9	2
3	3	25	11
1	6	4	2
5	23	2	2
11	86	4	19
28	162	31	41
33	139	29	49
24	76	36	84
30	51	51	79
37	44	63	69
48	53	47	88
48	49	71	56
45	41	74	77
66	42	85	54
102	57	65	62
145	64	80	79
134	66	65	75
105	60	71	41
85	35	47	43
72	17	45	39
41	18	49	32
23	9	45	17
1,108	1,108	1,032	1,032



↑
Not to Scale



Site Trips Weekday Afternoon
School Dismissal
Peak Hour Traffic Volumes

Figure A-3

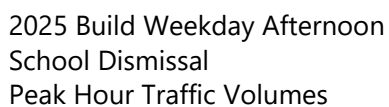
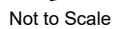


Figure A-4

Intersection

Int Delay, s/veh	7.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	105	1	5	155	1
Future Vol, veh/h	0	105	1	5	155	1
Conflicting Peds, #/hr	0	3	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	50	50	73	73
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	0	130	2	10	212	1

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	432	10	0
Stage 1	7	-	-
Stage 2	425	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	581	1071	-
Stage 1	1016	-	-
Stage 2	659	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	505	1068	-
Mov Cap-2 Maneuver	505	-	-
Stage 1	1016	-	-
Stage 2	573	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	7.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1068	1620
HCM Lane V/C Ratio	-	-	0.121	0.131
HCM Control Delay (s)	-	-	8.8	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.5

Intersection

Int Delay, s/veh	2.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	80	1	25	155	2	20
Future Vol, veh/h	80	1	25	155	2	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	59	59	80	80
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	98	1	42	263	3	25

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	205	174	0
Stage 1	174	-	-
Stage 2	31	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	788	875	-
Stage 1	861	-	-
Stage 2	997	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	786	875	-
Mov Cap-2 Maneuver	786	-	-
Stage 1	861	-	-
Stage 2	995	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.2	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	787	1267
HCM Lane V/C Ratio	-	-	0.126	0.002
HCM Control Delay (s)	-	-	10.2	7.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0

Intersection

Int Delay, s/veh	7.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	105	1	5	155	1
Future Vol, veh/h	0	105	1	5	155	1
Conflicting Peds, #/hr	0	3	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	50	50	73	73
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	0	130	2	10	212	1

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	432	10	0
Stage 1	7	-	-
Stage 2	425	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	581	1071	-
Stage 1	1016	-	-
Stage 2	659	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	505	1068	-
Mov Cap-2 Maneuver	505	-	-
Stage 1	1016	-	-
Stage 2	573	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	7.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1068	1620
HCM Lane V/C Ratio	-	-	0.121	0.131
HCM Control Delay (s)	-	-	8.8	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.5

Intersection

Int Delay, s/veh	2.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	80	1	25	155	2	20
Future Vol, veh/h	80	1	25	155	2	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	59	59	80	80
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	98	1	42	263	3	25

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	205	174	0
Stage 1	174	-	-
Stage 2	31	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	788	875	-
Stage 1	861	-	-
Stage 2	997	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	786	875	-
Mov Cap-2 Maneuver	786	-	-
Stage 1	861	-	-
Stage 2	995	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.2	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	787	1267
HCM Lane V/C Ratio	-	-	0.126	0.002
HCM Control Delay (s)	-	-	10.2	7.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0

Intersection

Int Delay, s/veh 8.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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Lane Configurations

Traffic Vol, veh/h	15	15	0	0	20	105	0	1	5	155	1	10
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Future Vol, veh/h	15	15	0	0	20	105	0	1	5	155	1	10
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Conflicting Peds, #/hr	0	0	0	0	0	3	0	0	0	0	0	0
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Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
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Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
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Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
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Peak Hour Factor	90	90	90	81	81	81	50	50	50	73	73	73
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Heavy Vehicles, %	2	2	2	2	2	2	2	0	0	0	0	2
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Mvmt Flow	17	17	0	0	25	130	0	2	10	212	1	14
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Major/Minor	Minor2		Minor1		Major1		Major2	
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Conflicting Flow All	520	444	8	448	446	10	15	0	0	12	0	0
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Stage 1	432	432	-	7	7	-	-	-	-	-	-	-
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Stage 2	88	12	-	441	439	-	-	-	-	-	-	-
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Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.1	-	-
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Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
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Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
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Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.2	-	-
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Pot Cap-1 Maneuver	467	508	1074	521	507	1071	1603	-	-	1620	-	-
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Stage 1	602	582	-	1015	890	-	-	-	-	-	-	-
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Stage 2	920	886	-	595	578	-	-	-	-	-	-	-
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Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
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Mov Cap-1 Maneuver	352	441	1074	455	440	1068	1603	-	-	1620	-	-
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Mov Cap-2 Maneuver	352	441	-	455	440	-	-	-	-	-	-	-
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Stage 1	602	505	-	1015	890	-	-	-	-	-	-	-
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Stage 2	784	886	-	499	502	-	-	-	-	-	-	-
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Approach	EB	WB	NB	SB
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HCM Control Delay, s	15	10	0	7.1
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HCM LOS	C	B		
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Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
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Capacity (veh/h)	1603	-	-	392	869	1620	-	-
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HCM Lane V/C Ratio	-	-	-	0.085	0.178	0.131	-	-
--------------------	---	---	---	-------	-------	-------	---	---

HCM Control Delay (s)	0	-	-	15	10	7.6	0	-
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HCM Lane LOS	A	-	-	C	B	A	A	-
--------------	---	---	---	---	---	---	---	---

HCM 95th %tile Q(veh)	0	-	-	0.3	0.6	0.5	-	-
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Intersection

Int Delay, s/veh	2.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	90	10	30	165	10	20
Future Vol, veh/h	90	10	30	165	10	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	59	59	80	80
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	110	12	51	280	13	25

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	242	191	0
Stage 1	191	-	-
Stage 2	51	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	751	856	-
Stage 1	846	-	-
Stage 2	977	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	743	856	-
Mov Cap-2 Maneuver	743	-	-
Stage 1	846	-	-
Stage 2	966	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	2.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	753	1240
HCM Lane V/C Ratio	-	-	0.162	0.01
HCM Control Delay (s)	-	-	10.7	7.9
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.6	0

Intersection

Int Delay, s/veh	2.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	10	10	30	20	10
Future Vol, veh/h	5	10	10	30	20	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	11	11	33	22	11

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	83	28	33	0	0
Stage 1	28	-	-	-	-
Stage 2	55	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	919	1047	1579	-	-
Stage 1	995	-	-	-	-
Stage 2	968	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	913	1047	1579	-	-
Mov Cap-2 Maneuver	913	-	-	-	-
Stage 1	988	-	-	-	-
Stage 2	968	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	1.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1579	-	998	-	-
HCM Lane V/C Ratio	0.007	-	0.017	-	-
HCM Control Delay (s)	7.3	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

DRAINAGE REPORT

The Brickyard Residential Development

Lebanon, New Hampshire

PREPARED FOR

Brickyard One Nominee Trust
P.O. Box 720
Middleton, MA 01949

PREPARED BY



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

05/10/2024

Revised: 08/06/2024

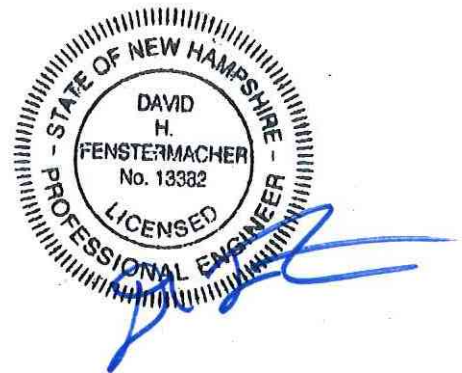


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1

Introduction

This report has been prepared by VHB to provide a brief description of existing and proposed drainage areas, design methodology, soil characteristics, and a summary of peak discharge rates for the project area.

Four parcels, a total of 133.5-acres are located on Hanover Street in Lebanon, NH (see Figure 1: Site Location Map). The Project Site consists of approximately 22.3-acres that will be disturbed during the construction of the development. The site is bounded by Hanover Street to the east, woodlands to the west, Dartmouth Ave to the north, and Route 89 to the south.

The Site is predominantly undeveloped, which is presently comprised of primarily woodland areas. There are portions of the existing site that were previously developed as part of the Densmore Brickyard on the southeastern portion of the parcel. Multiple existing buildings on site that will be razed and demolished as part of the project. Under existing conditions, untreated stormwater runoff currently flows overland towards the east to Hanover Street. There is a large pond toward the east of the site and wetlands on the south of the site which both eventually direct runoff east toward Hanover Street.

The proposed development of the site includes the construction of 10 apartment buildings that total 473 residential units and a single-family property caretaker home. The site also includes the required parking and two access drives connecting to Hanover Street. The associated utilities and drainage, and landscape improvements to support the development are included in the development. The development is proposing the construction of three surface basins and two subsurface chamber systems to provide stormwater treatment and peak rate mitigation. Infiltration will be utilized where possible, pending subsurface soil investigations. As part of the design, a diversionary channel has been proposed to direct upstream runoff to the adjacent wetlands.

A hydrologic model was developed to evaluate the existing and proposed drainage conditions on the Site. The results of the analyses indicate that there is no increase in peak discharge rates between the pre- and post-development conditions for the 2-, 10-, 25-, 50- and 100-year storm events. The pre- and post-development peak discharge rates are presented in the Stormwater Management Impacts Section of this report.

The Site will also be subject to an NHDES Alteration of Terrain permit due to land disturbance in excess of 100,000 SF. As part of that permit process, NHDES will review the stormwater design to confirm compliance with their regulations and review the proposed grading designs. A copy of

the AOT application, including the Inspection & Maintenance Manual, will be provided to the City upon submission of the application.



2

Existing Conditions

2.1 Description of Contributing Areas

The study area for the development is primarily comprised of undeveloped land, but is the site of the former Densmore Brickyard, so is previously developed in some areas towards the southeastern portion of the Site (see Figure 4, Existing Conditions: Drainage Area Plan). There are multiple streams and wetland areas on site, and the existing Densmore Pond has disturbance around the perimeter. The drainage area that was studied was approximately 108.2 acres and overland flows generally move to the east towards Hanover Street from the ridge on the western side of the site. The project site is southeast of the Landmark Tract/Boston Lot, and sees flows coming off of the elevated areas of the lot. The majority of the tributary area is wooded but does have areas of forested wetlands. Slopes are generally in excess of 3:1 once west of Densmore Pond on the site.

The study area is being considered one large subcatchment in the existing condition as all flow discharges from the site via the existing culvert beneath Hanover Street, near the southeastern edge of the study area. The flow paths are complex and involve flows going to and from the pond at different times, depending on the water elevation of the pond at the time of a storm. For this reason, after discussion with the City of Lebanon and its peer reviewing engineer, the single discharge point was used for the Project. The limits of the subcatchment include all upstream flows that reach the proposed swale (discussed in later sections) and the remainder of the subject property south of that drainage area.

Table 1 summarizes the study area and its characteristics.

Table 1 Drainage Area Characteristics Summary (Existing Conditions)

Discharge Point		Sub-Area(s)		Area (Acres)	Tc (Min.)	CN
DP-1	Densmore Pond/Wetlands	EX-1	Central/Northern Majority of Site	108.2	32.8	71
Total				22.3	n/a	71*

* Weighted CN Value

2.2 Soil Conditions

The study area is comprised of several different soil types as defined by the Natural Resources Conservation Service (NRCS), Web Soil Survey, <http://websoilsurvey.sc.egov.usda.gov>. Table 2, Soil Types, lists the designations, names, and groups of the soils located within the study area per the NRCS. A site-specific soil survey report has been completed and is appended to this stormwater management report.

Table 2 NRCS Soil Types

Soil Designation	Soil Name	Hydrologic Soil Group
26A	Windsor loamy sand, 0-3% slopes	A
26E	Windsor loamy sand, 15-60% slopes	A
63C	Charlton fine sandy loam, 8-15% slopes, very stony	B
341B	Stissing silt loam, 3-8% slopes, very stony	C/D
361D	Cardigan-Kearsarge-Rock outcrop complex, 15-25% slopes	C
361E	Cardigan-Kearsarge-Rock outcrop complex, 25-60% slopes	C
534	Binghamville silt loam	C/D

2.3 Existing Hydrologic Flow Patterns

Stormwater Runoff from the existing study area flows generally from west to east toward Hanover Street and Densmore Pond.

The following describes the existing stormwater flow patterns of each of the sub areas.

- › Sub Area EX-1 consists primarily of woodland area around the site, with some patches of grasses near the previously developed areas of the Site. Runoff flows overland directly to the east towards Densmore Pond and outlets at the existing culvert under Hanover Street (DP-1).



3

Proposed Conditions

3.1 Description of Contributing Areas

The proposed development of the site includes the construction of 10 apartment buildings that total 473 residential units and a single-family property caretaker home. The site also includes the required parking and two access drives connecting to Hanover Street. Landscaping, utilities and pedestrian circulation are also proposed as part of the Project (See Figure 5, Proposed Conditions Drainage Plan).

The proposed conditions sub-areas are comprised of the same 108.2-acre study area represented in the existing conditions drainage analysis. Table 3 summarizes the proposed sub areas and their characteristics.

Table 3 Drainage Area Characteristics Summary (Proposed Conditions)

Discharge Point		Sub-Area(s)		Area (Acres)	Tc (Min.)	CN
DP-1	Densmore Pond/Wetlands	PR-1	Flows from uphill through the swale	29.63	23.2	70
		PR-2	Building 10, parking and driveway area	0.81	5.0	92
		PR-3	Portion of driveway and parking	0.91	5.0	93
		PR-4	Southern edge of site	56.16	32.8	70
		PR-5	Sidewalk & slope at south driveway	0.13	5.0	66
		PR-6	Central portion of development	5.37	5.0	93
		PR-7	Building #8 parking area	0.73	5.0	87
		PR-8	Building #9 parking area	0.57	5.0	87

PR-9	Buildings #5 and #10	1.88	5.0	92
PR-10	Areas between buildings and pond	9.13	5.0	86
PR-11	North Driveway & Caretaker Home	0.70	5.0	81
PR-12	North Driveway Shoulder	1.60	11.6	72
PR-13	North of Building #10	0.56	5.0	97
Total		±108.2	n/a	73*

* Weighted CN Value

3.2 Proposed Hydrologic Flow Patterns

The proposed development has been designed to direct the stormwater runoff from most of the site's impervious areas to provide stormwater treatment and peak rate attenuation. Runoff around the site is directed to catch basins or curb breaks and enters underground infiltration systems or bioretention areas for the proper treatment. Runoff from the remaining areas within the study area will generally maintain their existing flow patterns to Densmore Pond and the outlet at the culvert under Hanover Street (DP-1).

Stormwater flow paths are represented on the Time of Concentration (TC) lines on Figure 3, Proposed Conditions Drainage Plan.



4

Methodology and Design Criteria

VHB evaluated the hydrologic and hydraulic impacts for proposed development's stormwater runoff. VHB analyzed the proposed development's hydrologic impacts using the Soil Conservation Service (SCS) Technical Release 20 (TR-20) methodology. The following section summarizes the design parameters/constraints that were used during the drainage design for this development under the SCS and Rational Methodologies. Additionally, this section summarizes the methodology used for the development's proposed erosion control and stormwater treatment methods.

4.1 Hydrologic Model Description

VHB analyzed the proposed developments stormwater runoff impacts using the SCS TR-20 methodology. The hydrologic program HydroCAD, as developed by HydroCAD Software Solutions, LLC., was utilized to compute and develop the stormwater runoff model. HydroCAD's SCS TR-20 program is designed to model complex watersheds, such as the watershed analyzed in this report. The complexity of the watershed has been based on multiple land uses (surface conditions) with varying soil conditions and inter-connected sub-watersheds reflecting complex hydrologic flow patterns.

4.1.1 Design Storms

VHB analyzed the proposed stormwater impacts for 1-inch, 2-, 10-, 25-, 50- and 100-year design storms. These rainfall events are based on a 24-hour storm duration using a Type II distribution curve, storm volumes derived from the Cornell Northeast Regional Climate Center. The appendices contain copies of the rainfall data charts used in the calculations.

4.1.2 Curve Number

VHB developed weighted curve numbers for each sub-area based on the different ground covers and hydrologic soil group types found within each area. The curve numbers were based on the SCS TR-55 methodology and are included in hydrologic calculations.

4.1.3 Travel Times and Time of Concentration

VHB calculated the Travel Times (Tt) and the Time of Concentrations (Tc) for each of the individual sub-areas using the hydraulically most distant point within each area. A minimum time of 5 minutes was used in the calculations. The Tt's and Tc's were based on SCS TR-55 methodology and are included in hydrologic calculations.

4.2 Hydraulic Calculations (Storm Drain Piping)

VHB used the rational method to develop the flows used in the design the development's subsurface storm drain piping system. The drainage system was sized based on a 25 year design storm under pressurized flow conditions. VHB used the following design parameters and criteria to design the system:

- Minimum Pipe Size: 12 inches
- RCP Pipe Coefficient of Friction: 0.013
- Minimum Time of Concentration (Tc): 5 minutes
- Runoff Coefficient: 0.2 open space
- Runoff Coefficient: 0.9 pavement and roofs
- Design Software: StormCAD (Bentley)

The storm drain piping calculations are included in the appendices.

4.3 Stormwater Detention and Treatment

The proposed development increases the amount of impervious area from that of the existing conditions; as a result, the runoff curve numbers will increase for the proposed conditions. The higher curve numbers will increase the calculated stormwater runoff rate from that of the existing site, therefore, stormwater detention chambers and basins have been proposed for this project. This detention volume will mitigate the increased stormwater runoff rates by using outlet control structures to reduce the proposed stormwater discharge rates from the site. Additionally, the detention chambers have been designed with a subsurface sand filter section, filter media section, or permit infiltration, that will provide stormwater treatment for the majority of the proposed development's stormwater runoff by percolating runoff through tightly packed sand, media or soils, removing pollutants and sediment.

VHB used the following design parameter and criteria to design the detention areas:

- › Side Slopes (surface): 3:1 (max)
- › Design Storms: 2, 10, 25, 50, 100-year

Refer to the appendices for further information and design calculations.

4.4 Riprap Outlet Protection

VHB sized the riprap outlet protection using Chapter 4, Section 4-6.6, Outlet Protection of the New Hampshire Stormwater Manual, Volume 2, Post-Construction Best Management Practices Selection & Design, December 2008, NHDES. The following design parameters represent the minimum acceptable riprap apron dimensions used for design (refer to the appendices for design computations):

- › Apron Width: ≥ 10 feet
- › Apron Length: ≥ 10 feet
- › Median Stone Diameter: 0.5 feet
- › Depth of Stone: 12 inches (minimum)

4.5 Base Calculations (GRV & WQV)

The stormwater best management practices are designed to treat the Water Quality Volume (WQV) and Groundwater Recharge Volume (GRV) based on the criteria outlined in NHDES Env-Wq 1500 Alteration of Terrain and City of Lebanon Stormwater Regulations. Refer to attached calculations in Appendix A.

4.6 Municipal Requirements

Per Section 6.6.F of the City of Lebanon Site Plan Regulations, additional stormwater calculations required are as follows:

- › Maximum effective impervious cover of 10%.
- › Pre-development peak rate of runoff shall not exceed post in the: 2-, 25-, 50- and 100-year storms
- › WQV per HSG Group at the same ratio for infiltration
- › Removal of 80% TSS and 40% TP based on the NH Stormwater Manual.



5

Stormwater Management Impacts/ Conclusion

5.1 Stormwater Quantity Mitigation

Under the proposed conditions, the peak flow rates were calculated for the 2-, 10-, 25-, 50- and 100-year storm events. The peak runoff rates for the proposed conditions, in the absence of mitigation, are anticipated to increase over the existing condition rates. These peak flow increases are to be reduced to near or less than current peak runoff rates at the Design Point by routing the runoff through the proposed infiltration basin systems, bioretention basins, or filtration system. The proposed development will incorporate a stormwater collection system that will capture runoff from the proposed areas by means of surface flow directing runoff to the proposed detention systems.

The various treatment basins are designed to attenuate site runoff by temporarily detaining runoff in order for the outflow from the site to be approximately equal to or less than the existing flow rate. Infiltration practices also contribute to reducing peak rates by directing stormwater runoff directly to groundwater instead of redirecting as runoff.

Table 4 Peak Stormwater Runoff Rate Summary

Discharge Point		Condition	Peak Flow for Given Storm (cfs)				
			2-yr	10-yr	25-yr	50-yr	100-yr
DP-1 Densmore Pond/Wetlands		Existing	33.6	90.5	141.9	192.8	256.0
		Proposed	27.9	78.4	127.6	177.3	238.9

Table 5 Stormwater Runoff Volume Summary

Discharge Point		Condition	Runoff Volume for Given Storm (acre-feet)	
			2-yr	
DP-1 Densmore Pond/Wetlands		Existing	4.4	
		Proposed	4.4	

5.2 Stormwater Quality Mitigation – Best Management Practices (BMPs)

The proposed Stormwater Management System contains several Best Management Practices (BMPs) that will provide treatment of site generated stormwater runoff. The proposed BMP's are described below:

- › Sediment Forebay
- › Infiltration Basin
- › Subsurface Detention Chambers
- › Sand Filters
- › Bioretention Basins

5.2.1 Sediment Forebay

A sediment forebay is an impoundment, basin, or other storage structure designed to dissipate the energy of incoming runoff and allow for initial settling of coarse sediments. Forebays are used for pretreatment of runoff prior to discharge into the primary water quality treatment BMP.

5.2.2 Infiltration Basin

Infiltration basins are impoundments designed to temporarily store runoff, allowing all or a portion of the water to infiltrate into the ground. An infiltration basin is designed to completely drain between storm events. In a properly sited and designed infiltration basin, water quality treatment is provided by runoff pollutants binding to soil particles beneath the basin as water percolates into the subsurface. Biological and chemical processes occurring in the soil also contribute to the breakdown of pollutants. Infiltrated water is used by plants to support growth or it is recharged to the underlying groundwater.

This project utilizes Subsurface Detention Chambers with crushed stone bottoms open to native material to permit infiltration. Approximate infiltration rates were obtained from the SSSNNE Special Publication No. 5 document with the corresponding soils found in the Site Specific Soil Survey. 0.5 in/hr was the rate used conservatively at the time of the submission, and rates will be obtained through on-site testing in the upcoming months. Test pits will be conducted to determine actual groundwater elevations and infiltration rate tests will be done within the test pits, close to the estimated elevation for infiltration.

5.2.3 Subsurface Detention Chambers

The proposed detention chamber system has been designed to handle the 50-yr storm event and will function as part of a water quality sedimentation basin. The system will include an internal outlet control structure at the terminus of the chambers to control the flow out of the system in different storms. The chambers include a sedimentation pool that provides pretreatment and eliminates the likelihood that fine sediments enter the treatment portion of the system. Some chambers include a sand filter section (described in the next section) that provides

treatment. The system also includes an underdrain that will ensure that stormwater is not remaining within the system for more than 72 hours. The basin is intended to remain dry except during and following significant storm events. Additionally, an overflow pipe has been added to control the flow from large infrequent storm events and prevent extreme surcharges.

5.2.4 Sand Filters

Sand filters are used to filter out pollutants by straining them out or adsorbing to the sand media. Pretreated stormwater enters through the exposed surface and percolates through the media, and from there can either flow to the native soil and infiltrate or can be directed to a proposed underdrain. The underdrain system is in place to ensure that stored stormwater does not remain in the storage chambers for more than 72 hours. Profile views of the proposed sand filter can be found on the Site Plans.

5.2.5 Bioretention Basins

Similar to sand filters, bioretention basins utilize a filter media section to treat runoff. Pretreated stormwater enters through the exposed surface and percolates through the media, and from there can either flow to the native soil and infiltrate or can be directed to a proposed underdrain. The underdrain system is in place for basins that do not infiltrate to ensure that stored stormwater does not remain in the basin for more than 72 hours. Profile views of the proposed filter section can be found on the Site Plans.

5.3 Erosion Control Measures

5.3.1 Temporary Erosion Control

During construction of the proposed development, the contractor shall be responsible for installation and maintenance of temporary sedimentation and erosion control measures to prevent off-site tracking and waterborne loss of earth sediment and debris. The specific measures proposed as a part of the project plan are shown in the Site Plan Package on the Sedimentation and Erosion Control Plan and the Erosion Control Details.

Removal of temporary erosion control measures will be prohibited until paving has been installed and vegetation (grass) is well established.

5.3.2 Permanent Erosion Control

At the completion of construction, all soils will be permanently stabilized by one or more of the following measures:

- › Access: Driveways and access roads will be stabilized with bituminous concrete pavement or the applicable surface cover.
- › Landscaped Areas: All disturbed areas, not permanently stabilized by pavement or buildings, will be covered with bark mulch, stone, sod or a minimum of six (6) inches of topsoil and seeded.
- › Pipe Outlets: Scour protection (riprap) shall be constructed at the headwall outlet to prevent scouring.

5.4 Conclusion

By implementing standard stormwater management techniques, the proposed development can successfully mitigate its impacts on peak stormwater runoff rates. Furthermore, stormwater quality issues can be addressed through the proposed implementation of standard practices (infiltration basins, etc.) that are accepted by both the City of Lebanon and the NH Department of Environmental Services Alteration of Terrain Bureau. The Project complies with the minimum groundwater recharge requirement, water quality volume requirements, and treatment rates via the utilization of bioretention basins and the subsurface infiltration basins.

- › Minimum groundwater recharge required (NHDES AOT): 4,383 CF
 - Minimum groundwater recharge provided: **53,966 CF**
- › Minimum water quality volume required (City of Lebanon): 4,383 CF
 - Water quality volume provided: **69,091 CF**
- › TSS and TP Treatment Percentages required: 80% and 40% respectively (City of Lebanon)
 - TSS Treatment Percentages:
 - Infiltration Practices: **90% and 65%**
 - Bioretention Systems: **90% and 65%**
- › Pre-development vs post-development peak runoff rates: **refer to Table 4.**
- › 2-Year Pre-development vs post-development runoff volume: **refer to Table 5.**
- › Maximum 10% Effective Impervious Cover (EIC): **1.1% provided.** 95.8% of total impervious area is treated, leaving 1.1% as EIC.

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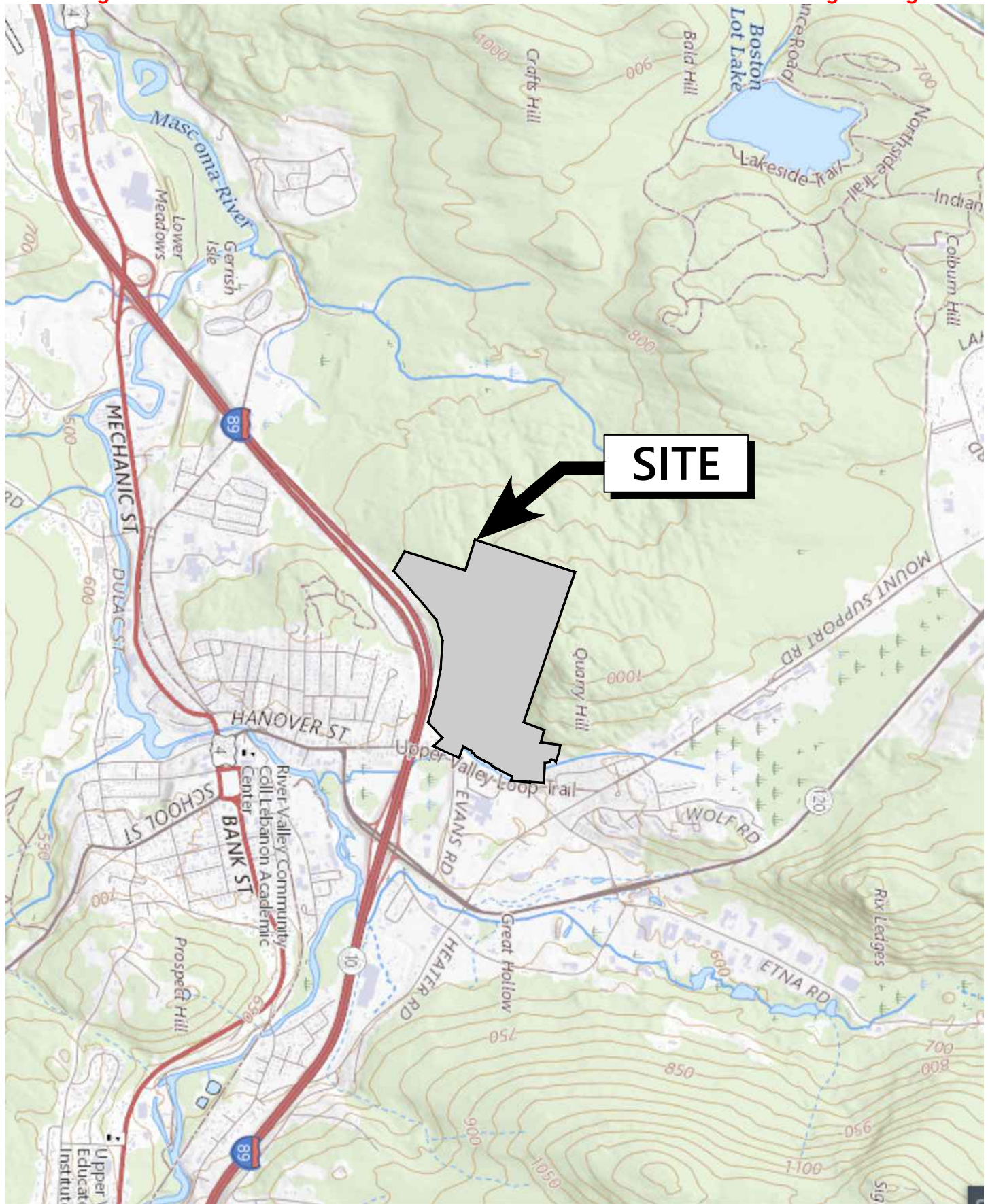


6

Figures

- › Figure 1: Site Location Map
- › Figure 2: Existing Conditions Drainage Area Plan
- › Figure 3: Proposed Conditions Drainage Area Plan
- › Figure 4: Existing Conditions Color Coded Soils Plan
- › Figure 5: Proposed Conditions Color Coded Soils Plan

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Site USGS Map
Lebanon Brickyard Development
Lebanon, NH 03766

Figure 1

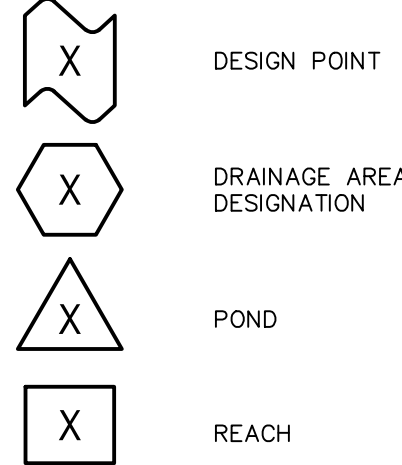
November 2023



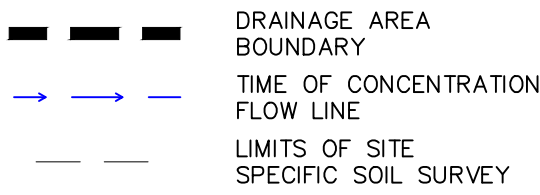
2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

Legend

SYMBOLS



LINETYPES



NRCS SOIL CLASSIFICATIONS

- 26A WINDSOR LOAMY SAND, 0-3% SLOPES, HSG A
- 26B WINDSOR LOAMY SAND, 3-8% SLOPES, HSG A
- 26E WINDSOR LOAMY SAND, 15-60% SLOPES, HSG A
- 63C CHARLTON FINE SANDY LOAM, 8-15% SLOPES, VERY STONY, HSG B
- 331C BERNARDSTON SILT LOAM, 8-15% SLOPES, VERY STONY, HSG D
- 331D BERNARDSTON SILT LOAM, 15-25% SLOPES, VERY STONY, HSG D
- 341B STISSING SILT LOAM, 3-8% SLOPES, VERT STONY, HSG C/D
- 361D CARDIGAN-KEARSARGE-ROCK OUTCROP, 15-25% SLOPES, HSG C
- 361E CARDIGAN-KEARSARGE-ROCK OUTCROP, 25-60% SLOPES, HSG C
- 53A BINGHAMVILLE SILT LOAM, HSG C/D
- W WATER



0 60 120 240Feet

The Brickyard
Residential Development

174 Hanover Street
Lebanon, New Hampshire 03677

No.	Revision	Date	Appr'd.

Designed by	TMD	Checked by	MJV
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Issued for
Permitting
Date
July 6, 2024

Not Approved for Construction

Existing Conditions
Stormwater Management
Plan

Drawing Number

EX-1

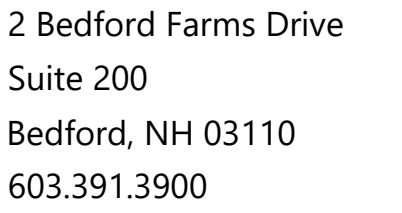
Sheet 1 of 4

Project Number
52933.00

Soil symbol	Soil series: Slope class	600C/ fccb/P	Endoaquents, 8-15% slope	HSG B
540B/P	Raypol, 3-8% slope	HSG D	600A/fccb/P	Endoaquents, 0-3% slope
540D/P	Raypol, 25-25% slope	HSG D	600A/fcdc/P	Endoaquents, 0-3% slope
513A	Ninigret, 0-3% slope	HSG B	336B	Pittstown, very stony, 3-8% slope
513B	Ninigret, 3-8% slope	HSG B	331A	Bernardston, very stony, 0-3% slope
917A	Ninigret Variant, 0-3% slope	HSG C	331B	Bernardston, very stony, 3-8% slope
917C	Ninigret Variant, 8-15% slope	HSG C	331C	Bernardston, very stony, 8-15% slope
917D	Ninigret Variant, 15-25% slope	HSG C	45B	Montauk, very stony, 3-8% slope
299A/ cbaaa	Smoothed Udorthents, 0-3% slope	HSG A	45C	Montauk, very stony, 8-15% slope
410A	Haven, 0-3% slope	HSG B	45D	Montauk, very stony, 15-25% slope
200B/ dccb	Smoothed Udorthents, 3-8% slope	HSG B	141B	Hollis-rock outcrop - Chatfield complex, 3-8% slope
200C/ dccb	Smoothed Udorthents, 8-15% slope	HSG B	141C	Hollis-rock outcrop - Chatfield complex, 8-15% slope
200D/ dccb	Smoothed Udorthents; refuse substratum, 15-25% slope	HSG B	141D	Hollis-rock outcrop - Chatfield complex, 15-25% slope
299A/ caabb	Smoothed Udorthents, 0-3% slope	HSG B	141E	Hollis-rock outcrop - Chatfield complex, 25-50% slope
299B/ caabb	Smoothed Udorthents, 3-8% slope	HSG B	250B	Chatfield - Hollis - Montauk complex, very stony, 3-8% slope
299C/ caabb	Smoothed Udorthents, 8-15% slope	HSG B	250C	Chatfield - Hollis - Montauk complex, very stony, 8-15% slope
299D/ caabb	Smoothed Udorthents, 15-15% slope	HSG B	250D	Chatfield - Hollis - Montauk complex, very stony, 15-25% slope
299D/ cccb	Smoothed Udorthents, 8-15% slope	HSG B	500B/cfcb	Udorthents, loamy, 3-8% slope
299D/ cccb	Smoothed Udorthents, 15-25% slope	HSG B	500C/cfcb	Udorthents, loamy, 8-15% slope
299E/ cccb	Smoothed Udorthents, 25-50% slope	HSG B	500E/cfcb	Udorthents, loamy, 25-50% slope
		RO		Rack outcrop

Notes

- 1) PREPARED FOR BRICKYARD ONE NOMINEE TRUST FOR THE BRICKYARD RESIDENTIAL DEVELOPMENT, LOCATED ON HANVOER STREET, TAX MAPS 48-1, 2, 4 AND 63-1.



SYMBOLS

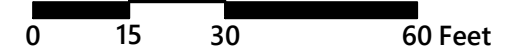


LINETYPES



NRCS SOIL TYPE
BOUNDARY

NRCS SOIL CLASSIFICATIONS

534
C/D

174 Hanover Street
Lebanon, New Hampshire 03677

Checked by _____

Date _____

July 6, 2024

Drawing Title

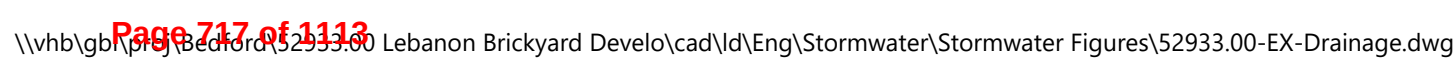
Existing Conditions Stormwater Management Plan

Drawing Number

EX-2

Sheet 2 of 4

Project Number
52933.00



LINETYPES

	DRAINAGE AREA BOUNDARY
	TIME OF CONCENTRATION FLOW LINE
	NRCS SOIL TYPE BOUNDARY
	LIMITS OF SITE SPECIFIC SOIL SURVEY

174 Hanover Street
Lebanon, New Hampshire 03677

Designed by	Checked by
TMD	

Permitting July 6, 2024

Not Approved for Construction

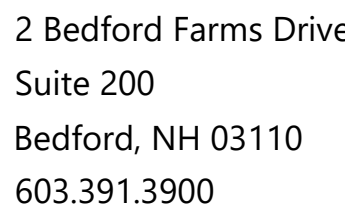
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Drawing Number

EX-3

Sheet 3 of 4

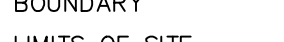
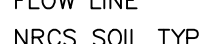
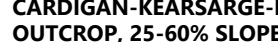
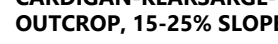
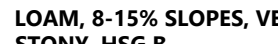
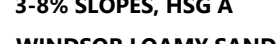
Project Number
52933.00



SYMBOL



LINETYPES

**NRCS SOIL CLASSIFICATION**

174 Hanover Street
Lebanon, New Hampshire 03677

Issued for **Permitting** Date **July 6, 2024**

Permitting

July 6, 2024

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Existing Conditions Stormwater Management Plan

Drawing Number

EX-4

Sheet 4 of 4

Project Number
52933.0



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

Legend

SYMBOLS

-
- DESIGN POINT
-
- DRAINAGE AREA DESIGNATION
-
- POND
-
- REACH

LINETYPES

-
- DRAINAGE AREA BOUNDARY
-
- TIME OF CONCENTRATION FLOW LINE
-
- LIMITS OF SITE SPECIFIC SOIL SURVEY

NRCS SOIL CLASSIFICATIONS

-
- WINDSOR LOAMY SAND, 0-3% SLOPES, HSG A
-
- WINDSOR LOAMY SAND, 3-8% SLOPES, HSG A
-
- WINDSOR LOAMY SAND, 15-60% SLOPES, HSG A
-
- CHARLTON FINE SANDY LOAM, 8-15% SLOPES, VERY STONY, HSG B
-
- BERNARDSTON SILT LOAM, 8-15% SLOPES, VERY STONY, HSG D
-
- BERNARDSTON SILT LOAM, 15-25% SLOPES, VERY STONY, HSG D
-
- STISSING SILT LOAM, 3-8% SLOPES, VERT STONY, HSG C/D
-
- CARDIGAN-KEARSARGE-ROCK OUTCROP, 15-25% SLOPES, HSG C
-
- CARDIGAN-KEARSARGE-ROCK OUTCROP, 25-60% SLOPES, HSG C
-
- BINGHAMVILLE SILT LOAM, HSG C/D
-
- WATER



The Brickyard
Residential Development

174 Hanover Street
Lebanon, New Hampshire 03677

No.	Revision	Date	Appr.

Designed by	TMD	Checked by	MJV
Issued for		Date	

Permitting July 6, 2024

Not Approved for Construction
Drawing Title
Proposed Conditions
Stormwater Management
Plan

Drawing Number

PR-1

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Project Number
52933.00

Soil symbol	Soil series: Slope class		600C/ fccb/P	Endoaquents, 8-15% slope	HSG B
540B/P	Raycol, 3-8% slope	HSG D	600A/fccb/P	Endoaquents, 0-3% slope <td>HSG B</td>	HSG B
540D/P	Raycol, 25-25% slope	HSG D	600A/fccd/P	Endoaquents, 0-3% slope <td>HSG B</td>	HSG B
513A	Ninigret, 0-3% slope	HSG B	336B	Pittstown, very stony, 3-8% slope <td>HSG C</td>	HSG C
513B	Ninigret, 3-8% slope	HSG B	331A	Bernardston, very stony, 0-3% slope <td>HSG C</td>	HSG C
917A	Ninigret Variant, 0-3% slope	HSG C	331B	Bernardston, very stony, 3-8% slope <td>HSG C</td>	HSG C
917C	Ninigret Variant, 8-15% slope	HSG C	331C	Bernardston, very stony, 8-15% slope <td>HSG C</td>	HSG C
917D	Ninigret Variant, 15-25% slope	HSG C	45B	Montauk, very stony, 3-8% slope <td>HSG C</td>	HSG C
299A/ caaa	Smoothed Udorthents, 0-3% slope	HSG A	45C	Montauk, very stony, 8-15% slope <td>HSG C</td>	HSG C
410A	Haven, 0-3% slope	HSG B	45D	Montauk, very stony, 15-25% slope <td>HSG C</td>	HSG C
200B/ dcbbb	Smoothed Udorthents, 3-8% slope	HSG B	141B	Hollis-rock outcrop - Chatfield complex, 3-8% slope <td>HSG C</td>	HSG C
200C/ dcbbb	Smoothed Udorthents, 8-15% slope	HSG B	141C	Hollis-rock outcrop - Chatfield complex, 8-15% slope <td>HSG C</td>	HSG C
200D/ dcbbb	Smoothed Udorthents; refuse substratum, 15-25% slope	HSG B	141D	Hollis-rock outcrop - Chatfield complex, 15-25% slope <td>HSG C</td>	HSG C
299A/ caabb	Smoothed Udorthents, 0-3% slope	HSG B	141E	Hollis-rock outcrop - Chatfield complex, 25-50% slope <td>HSG C</td>	HSG C
299A/ daabb	Smoothed Udorthents, 0-3% slope	HSG B	250B	Chatfield - Hollis - Montauk complex, very stony, 3-8% slope <td>HSG C</td>	HSG C
299B/ caabb	Smoothed Udorthents, 3-8% slope	HSG B	250C	Chatfield - Hollis - Montauk complex, very stony, 8-15% slope <td>HSG C</td>	HSG C
299C/ caabb	Smoothed Udorthents, 8-15% slope	HSG B	250D	Chatfield - Hollis - Montauk complex, very stony, 15-25% slope <td>HSG C</td>	HSG C
299D/ ccbbb	Smoothed Udorthents, 8-15% slope	HSG B	500B/cfbbb	Udorthents, loamy, 3-8% slope <td>HSG B</td>	HSG B
299D/ ccbbb	Smoothed Udorthents, 15-25% slope	HSG B	500C/cfbbb	Udorthents, loamy, 8-15% slope <td>HSG B</td>	HSG B
299E/ ccbbb	Smoothed Udorthents, 25-50% slope	HSG B	500E/cfbbb	Udorthents, loamy, 25-50% slope <td>HSG B</td>	HSG B
			RO	Rock outcrop	

Notes

- 1) PREPARED FOR BRICKYARD ONE NOMINEE TRUST FOR THE BRICKYARD RESIDENTIAL DEVELOPMENT, LOCATED ON HANOVER STREET, TAX MAPS 48-1, 2, 4 AND 63-1.
- 2) IMPERVIOUS COVER CALCULATIONS
 - EXISTING IMPERVIOUS: 0.75 AC
 - NEW IMPERVIOUS: 9.28 AC
 - NET NEW IMPERVIOUS: 8.53 AC
 - GROUNDWATER RECHARGE REQUIRED PER ENV-WQ 1500: 6,906 CF (SEE WORKSHEET)
 - GROUNDWATER RECHARGE PROVIDED: 51,674 CF
- 3) APPROXIMATE DISTURBED AREA IS ±15.9 AC
- 4) CONSTRUCTION SEQUENCE: REFER TO PHASING PLAN FOR DETAILS. ROADWAY, PARKING, UTILITIES AND BUILDINGS 1 AND MAINTENANCE BUILDING CONSTRUCTED FIRST.



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

Legend

SYMBOLS

- DESIGN POINT
- DRAINAGE AREA DESIGNATION
- POND
- REACH

LINE TYPES

- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- NRCS SOIL TYPE BOUNDARY
- LIMITS OF SITE SPECIFIC SOIL SURVEY

NRCS SOIL CLASSIFICATIONS

- 26A WINDSOR LOAMY SAND, 0-3% SLOPES, HSG A
- 26B WINDSOR LOAMY SAND, 3-8% SLOPES, HSG A
- 26E WINDSOR LOAMY SAND, 15-60% SLOPES, HSG A
- 63C CHARLTON FINE SANDY LOAM, 8-15% SLOPES, VERY STONY, HSG B
- 331C BERNARDSTON SILT LOAM, 8-15% SLOPES, VERY STONY, HSG D
- 331D BERNARDSTON SILT LOAM, 15-25% SLOPES, VERY STONY, HSG D
- 341B STISSING SILT LOAM, 3-8% SLOPES, VERT STONY, HSG C/D
- 361D CARDIGAN-KEARSARGE-ROCK OUTCROP, 15-25% SLOPES, HSG C
- 361E CARDIGAN-KEARSARGE-ROCK OUTCROP, 25-60% SLOPES, HSG C
- 53A BINGHAMVILLE SILT LOAM, HSG C/D
- W WATER



0 15 30 60 Feet

The Brickyard Residential Development

174 Hanover Street
Lebanon, New Hampshire 03677

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Issued for Permitting Date July 6, 2024

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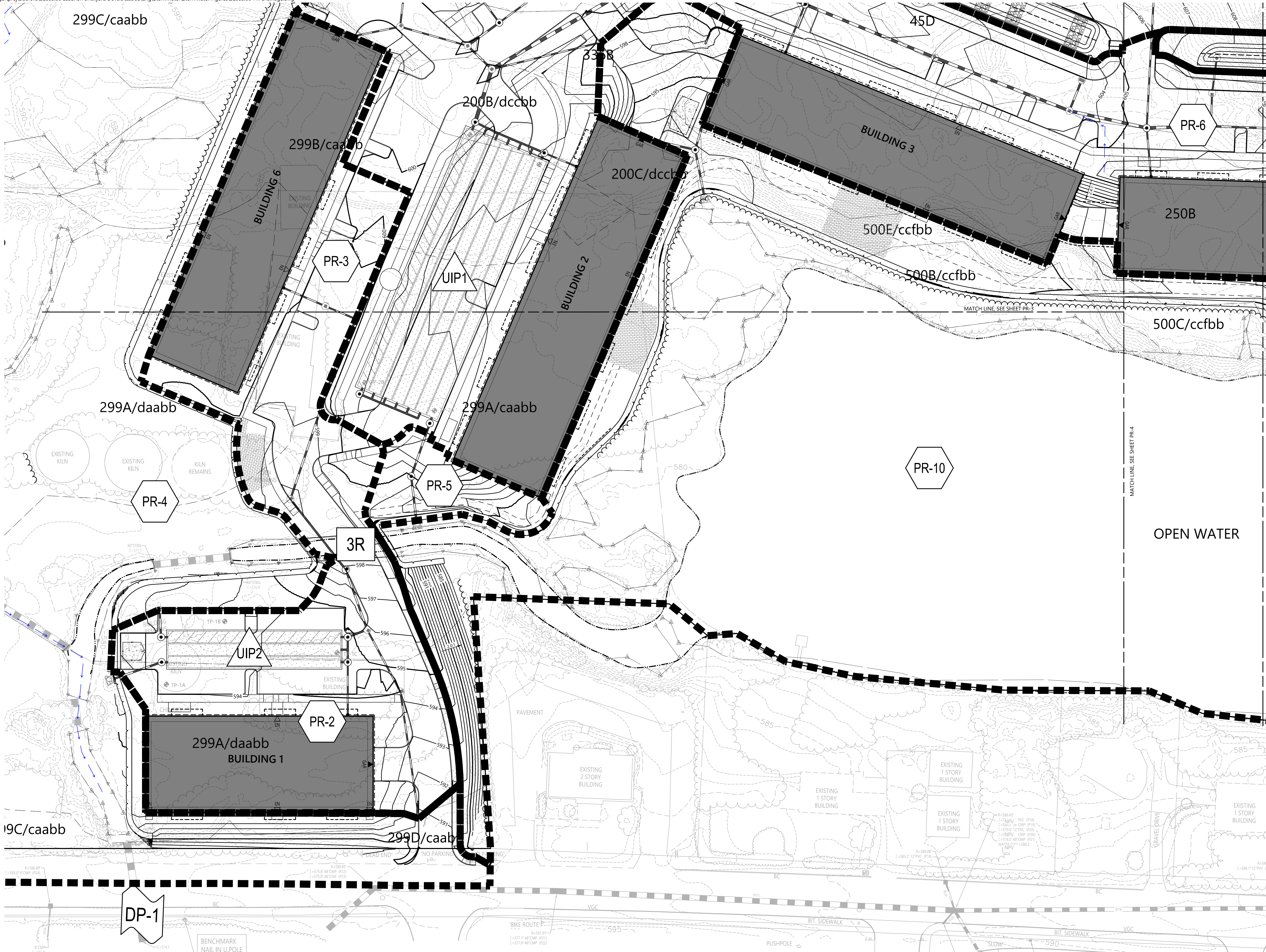
Drawing Title
**Proposed Conditions
Stormwater Management
Plan**

Drawing Number

PR-2

Sheet 2 of 4

Project Number
52933.00





2 Bedford Farms Drive
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Bedford, NH 03110
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Legend

SYMBOLS

- 

DESIGN POINT
- 

DRAINAGE AREA DESIGNATION
- 

POND
- 

REACH

LINE TYPES

- 

DRAINAGE AREA BOUNDARY
- 

TIME OF CONCENTRATION FLOW LINE
- 

NRCS SOIL TYPE BOUNDARY
- 

LIMITS OF SITE SPECIFIC SOIL SURVEY

NRCS SOIL CLASSIFICATIONS

- 

WINDSOR LOAMY SAND, 0-3% SLOPES, HSG A
- 

WINDSOR LOAMY SAND, 3-8% SLOPES, HSG A
- 

WINDSOR LOAMY SAND, 15-60% SLOPES, HSG A
- 

CHARLTON FINE SANDY LOAM, 8-15% SLOPES, VERY STONY, HSG B
- 

BERNARDSTON SILT LOAM, 8-15% SLOPES, VERY STONY, HSG D
- 

BERNARDSTON SILT LOAM, 15-25% SLOPES, VERY STONY, HSG D
- 

STISSING SILT LOAM, 3-8% SLOPES, VERT STONY, HSG C/D
- 

CARDIGAN-KEARSARGE-ROCK OUTCROP, 15-25% SLOPES, HSG C
- 

CARDIGAN-KEARSARGE-ROCK OUTCROP, 25-60% SLOPES, HSG C
- 

BINGHAMVILLE SILT LOAM, HSG C/D
- 

WATER



The Brickyard
Residential Development

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Lebanon, New Hampshire 03677

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Drawing Title
Proposed Conditions
Stormwater Management
Plan

PR-3

Sheet 3 of 4

Project Number
52933.00



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
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Legend

SYMBOLS

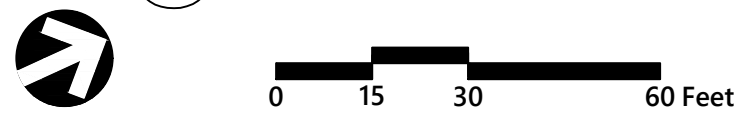
- DESIGN POINT
- DRAINAGE AREA DESIGNATION
- POND
- REACH

LINE TYPES

- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- NRCS SOIL TYPE BOUNDARY
- LIMITS OF SITE SPECIFIC SOIL SURVEY

NRCS SOIL CLASSIFICATIONS

- WINDSOR LOAMY SAND, 0-3% SLOPES, HSG A
- WINDSOR LOAMY SAND, 3-8% SLOPES, HSG A
- WINDSOR LOAMY SAND, 15-60% SLOPES, HSG A
- CHARLTON FINE SANDY LOAM, 8-15% SLOPES, VERY STONY, HSG B
- BERNARDSTON SILT LOAM, 8-15% SLOPES, VERY STONY, HSG D
- BERNARDSTON SILT LOAM, 15-25% SLOPES, VERY STONY, HSG D
- STISSING SILT LOAM, 3-8% SLOPES, VERT STONY, HSG C/D
- CARDIGAN-KEARSARGE-ROCK OUTCROP, 15-25% SLOPES, HSG C
- CARDIGAN-KEARSARGE-ROCK OUTCROP, 25-60% SLOPES, HSG C
- BINGHAMVILLE SILT LOAM, HSG C/D
- WATER



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Residential Development

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Lebanon, New Hampshire 03677

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July 6, 2024

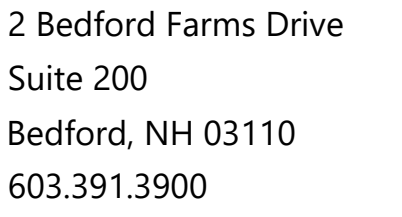
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Drawing Title
Proposed Conditions
Stormwater Management
Plan

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PR-4

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4 of 4

Project Number
52933.00

HSG C

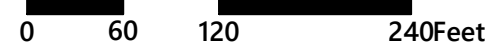
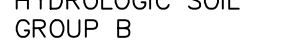
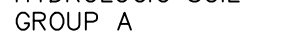
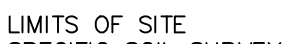
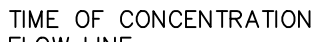
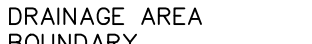
HSG C

HSG C

SYMBOLS



LINE TYPES



174 Hanover Street
Lebanon, New Hampshire 03677

No.	Revision	Date	Appvd.
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[illegible]

	TMD	MJV
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Permitting July 6, 2024

Not Approved for Construction

Existing Conditions

Color Coded Soils

Plan

Drawing Number

EX-1

Sheet 1 of 4

Project Number
52933.00



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

Legend

SYMBOLS

- DESIGN POINT
- DRAINAGE AREA DESIGNATION
- POND
- REACH

LINETYPES

- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- LIMITS OF SITE
- SPECIFIC SOIL SURVEY
- NRCS SOIL BOUNDARY
- HYDROLOGIC SOIL GROUP A
- HYDROLOGIC SOIL GROUP B
- HYDROLOGIC SOIL GROUP C
- HYDROLOGIC SOIL GROUP D
- WATER SURFACE
- IMPERVIOUS AREA



0 15 30 60 Feet

The Brickyard
Residential Development

174 Hanover Street
Lebanon, New Hampshire 03677

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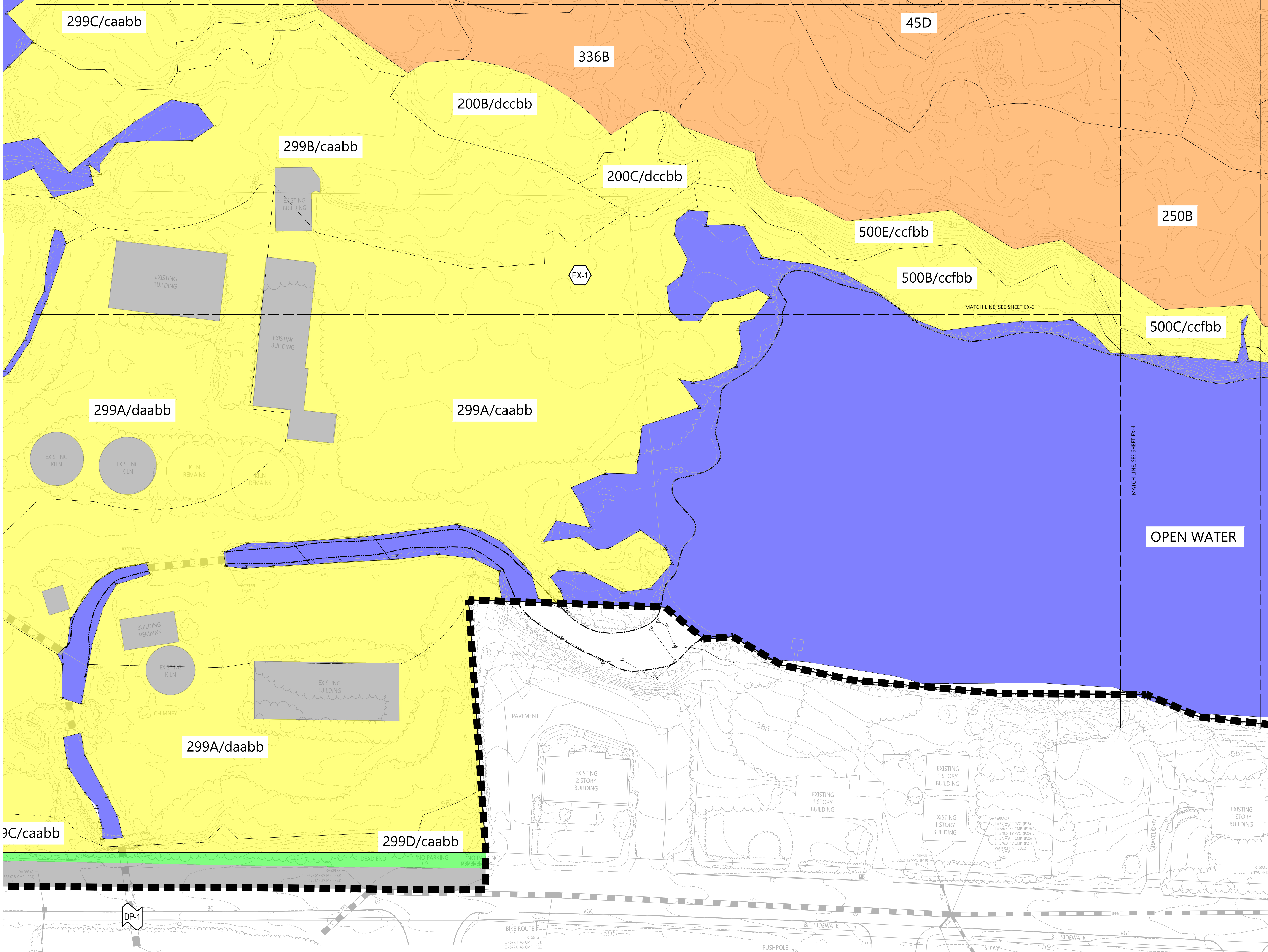
Existing Conditions
Color Coded Soils
Plan

Drawing Number

EX-2

Sheet 2 of 4

Project Number
52933.00





2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

Legend

SYMBOLS



DESIGN POINT



DRAINAGE AREA
DESIGNATION



POND



REACH

LINETYPES



DRAINAGE AREA
BOUNDARY

TIME OF CONCENTRATION
FLOW LINE



LIMITS OF SITE
SPECIFIC SOIL SURVEY



NRCS
SOIL BOUNDARY



HYDROLOGIC SOIL
GROUP A



HYDROLOGIC SOIL
GROUP B



HYDROLOGIC SOIL
GROUP C



HYDROLOGIC SOIL
GROUP D



WATER SURFACE



IMPERVIOUS AREA



0 15 30 60 Feet

The Brickyard
Residential Development

174 Hanover Street
Lebanon, New Hampshire 03677

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Existing Conditions
Color Coded Soils
Plan

Drawing Number

EX-3

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of

3

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Project Number

52933.00



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

Legend

SYMBOLS



DESIGN POINT



DRAINAGE AREA
DESIGNATION



POND



REACH

LINETYPES



DRAINAGE AREA
BOUNDARY



TIME OF CONCENTRATION
FLOW LINE



LIMITS OF SITE
SPECIFIC SOIL SURVEY



NRCS
SOIL BOUNDARY



HYDROLOGIC SOIL
GROUP A



HYDROLOGIC SOIL
GROUP B



HYDROLOGIC SOIL
GROUP C



HYDROLOGIC SOIL
GROUP D



WATER SURFACE



IMPERVIOUS AREA



0 15 30 60 Feet

The Brickyard
Residential Development

174 Hanover Street
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Plan

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EX-4

Sheet

of

4

4

Project Number

52933.00



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

Soil symbol	Soil series: Slope class	600C/ fcbb/P	Endoaquents, 8-15% slope	HSG B
540B/P	Raypol, 3-8% slope	HSG D	600A/fcbb/P	Endoaquents, 0-3% slope
540D/P	Raypol, 25-25% slope	HSG D	600A/fcdc/P	Endoaquents, 0-3% slope
513A	Ninigret, 0-3% slope	HSG B	336B	Pittstown, very stony, 3-8% slope
513B	Ninigret, 3-8% slope	HSG B	331A	Bernardston, very stony, 0-3% slope
917A	Ninigret Variant, 0-3% slope	HSG C	331B	Bernardston, very stony, 3-8% slope
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299A/ cbaaa	Smoothed Udorthents, 0-3% slope	HSG A	45C	Montauk, very stony, 8-15% slope
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200B/ dcbbb	Smoothed Udorthents, 3-8% slope	HSG B	141B	Hollis-rock outcrop - Chatfield complex, 3-8% slope
200C/ dcbbb	Smoothed Udorthents, 8-15% slope	HSG B	141C	Hollis-rock outcrop - Chatfield complex, 8-15% slope
200D/ dcbbb	Smoothed Udorthents; refuse substratum, 15-25% slope	HSG B	141D	Hollis-rock outcrop - Chatfield complex, 15-25% slope
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299B/ caabb	Smoothed Udorthents, 3-8% slope	HSG B	250B	Chatfield - Hollis - Montauk complex, very stony, 3-8% slope
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299D/ caabb	Smoothed Udorthents, 15-15% slope	HSG B	250D	Chatfield - Hollis - Montauk complex, very stony, 15-25% slope
299D/ ccbbb	Smoothed Udorthents, 8-15% slope	HSG B	500B/cfbb	Udorthents, loamy, 3-8% slope
299D/ ccbbb	Smoothed Udorthents, 15-25% slope	HSG B	500C/cfbb	Udorthents, loamy, 8-15% slope
299E/ ccbbb	Smoothed Udorthents, 25-50% slope	HSG B	500E/cfbb	Udorthents, loamy, 25-50% slope
		RO		Rock outcrop

NRCS SOIL CLASSIFICATIONS	
26A	WINDSOR LOAMY SAND, 0-3% SLOPES, HSG A
26B	WINDSOR LOAMY SAND, 3-8% SLOPES, HSG A
26E	WINDSOR LOAMY SAND, 15-60% SLOPES, HSG A
63C	CHARLTON FINE SANDY LOAM, 8-15% SLOPES, VERY STONY, HSG B
331C	BERNARDSTON SILT LOAM, 8-15% SLOPES, VERY STONY, HSG D
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361D	CARDIGAN-KEARSARGE-ROCK OUTCROP, 15-25% SLOPES, HSG C
361E	CARDIGAN-KEARSARGE-ROCK OUTCROP, 25-60% SLOPES, HSG C
534	BINGHAMVILLE SILT LOAM, HSG C/D
W	WATER

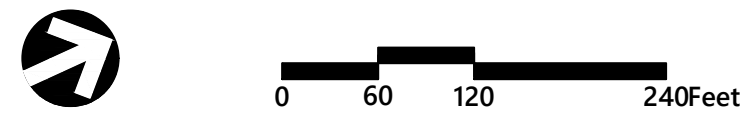
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SYMBOLS

- DESIGN POINT
- DRAINAGE AREA DESIGNATION
- POND
- REACH

LINETYPES

- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- LIMITS OF SITE SPECIFIC SOIL SURVEY
- NRCS SOIL BOUNDARY
- HYDROLOGIC SOIL GROUP A
- HYDROLOGIC SOIL GROUP B
- HYDROLOGIC SOIL GROUP C
- HYDROLOGIC SOIL GROUP D
- WATER SURFACE
- IMPERVIOUS AREA



The Brickyard
Residential Development

174 Hanover Street
Lebanon, New Hampshire 03677

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Permitting

Not Approved for Construction

Proposed Conditions
Color Coded Soils
Plan

Drawing Number

PR-1

Sheet 1 of 4

Project Number
52933.00



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

Legend

SYMBOLS

- DESIGN POINT
- DRAINAGE AREA DESIGNATION
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LINE TYPES

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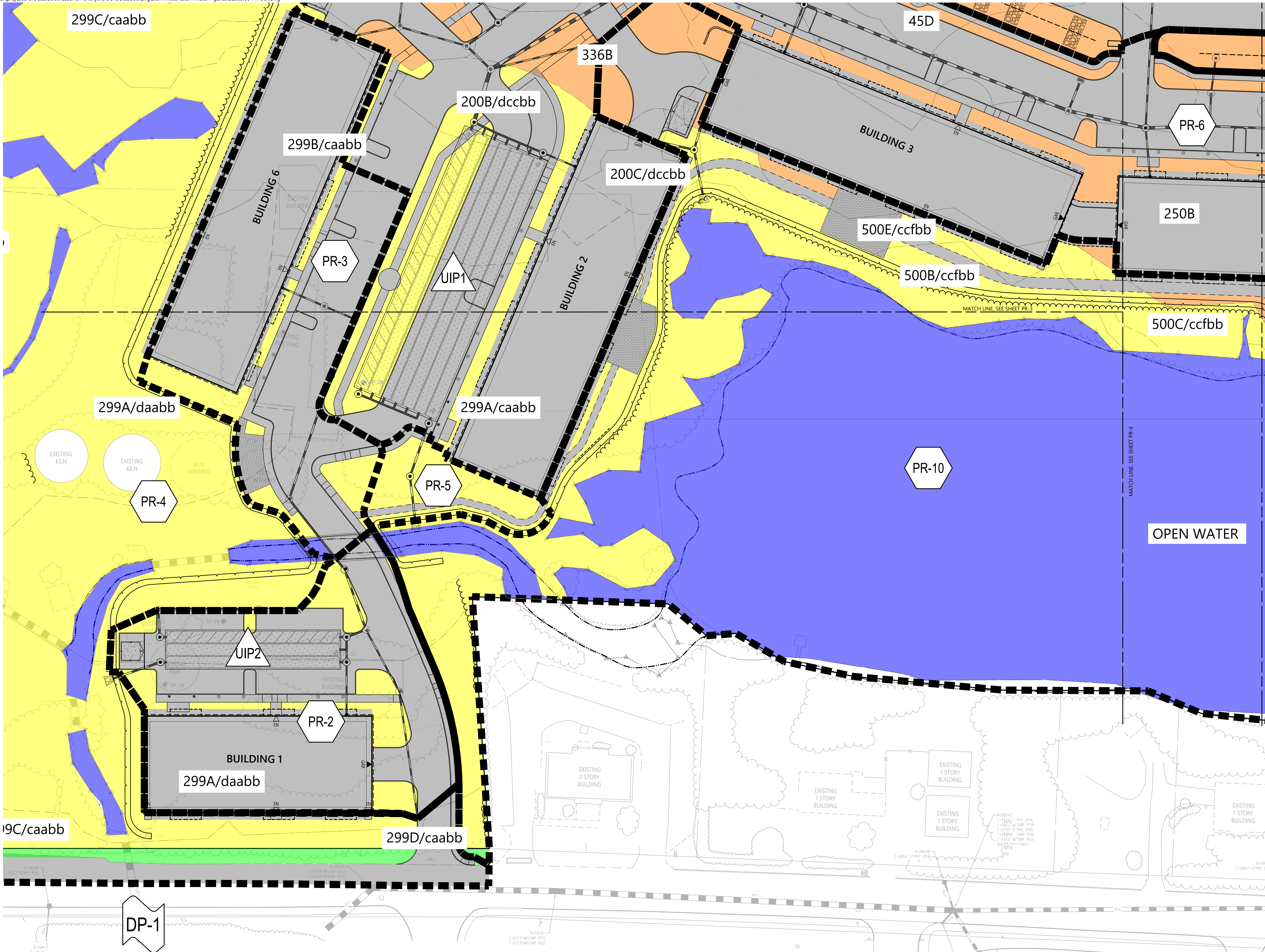
Proposed Conditions
Stormwater Management
Plan

Drawing Number

PR-2

Sheet 2 of 4

Project Number
52933.00





2 Bedford Farms Drive
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Legend

SYMBOLS



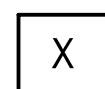
DESIGN POINT



DRAINAGE AREA
DESIGNATION



POND



REACH

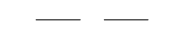
LINETYPES



DRAINAGE AREA
BOUNDARY



TIME OF CONCENTRATION
FLOW LINE



LIMITS OF SITE
SPECIFIC SOIL SURVEY



NRCS
SOIL BOUNDARY



HYDROLOGIC SOIL
GROUP A



HYDROLOGIC SOIL
GROUP B



HYDROLOGIC SOIL
GROUP C



HYDROLOGIC SOIL
GROUP D



WATER SURFACE



IMPERVIOUS AREA



0 15 30 60 Feet

The Brickyard
Residential Development

174 Hanover Street
Lebanon, New Hampshire 03677

No. Revision Date Apprd.

Designed by TMD Checked by

Issued for Date

Permitting July 6, 2024

Not Approved for Construction

Drawing Title

Proposed Conditions
Stormwater Management
Plan

Drawing Number

PR-3

Sheet

of

3

4

Project Number

52933.00



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

Legend

SYMBOLS

- DESIGN POINT
- DRAINAGE AREA DESIGNATION
- POND
- REACH

LINETYPES

- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- LIMITS OF SITE
- SPECIFIC SOIL SURVEY
- NRCS SOIL BOUNDARY
- HYDROLOGIC SOIL GROUP A
- HYDROLOGIC SOIL GROUP B
- HYDROLOGIC SOIL GROUP C
- HYDROLOGIC SOIL GROUP D
- WATER SURFACE
- IMPERVIOUS AREA



0 15 30 60 Feet

The Brickyard
Residential Development

174 Hanover Street
Lebanon, New Hampshire 03677

No. Revision Date Appr.

Designed by TMD Checked by

Issued for Date

Permitting July 6, 2024

Not Approved for Construction

Proposed Conditions
Stormwater Management
Plan

Drawing Number

PR-4

Sheet 4 of 4

Project Number
52933.00

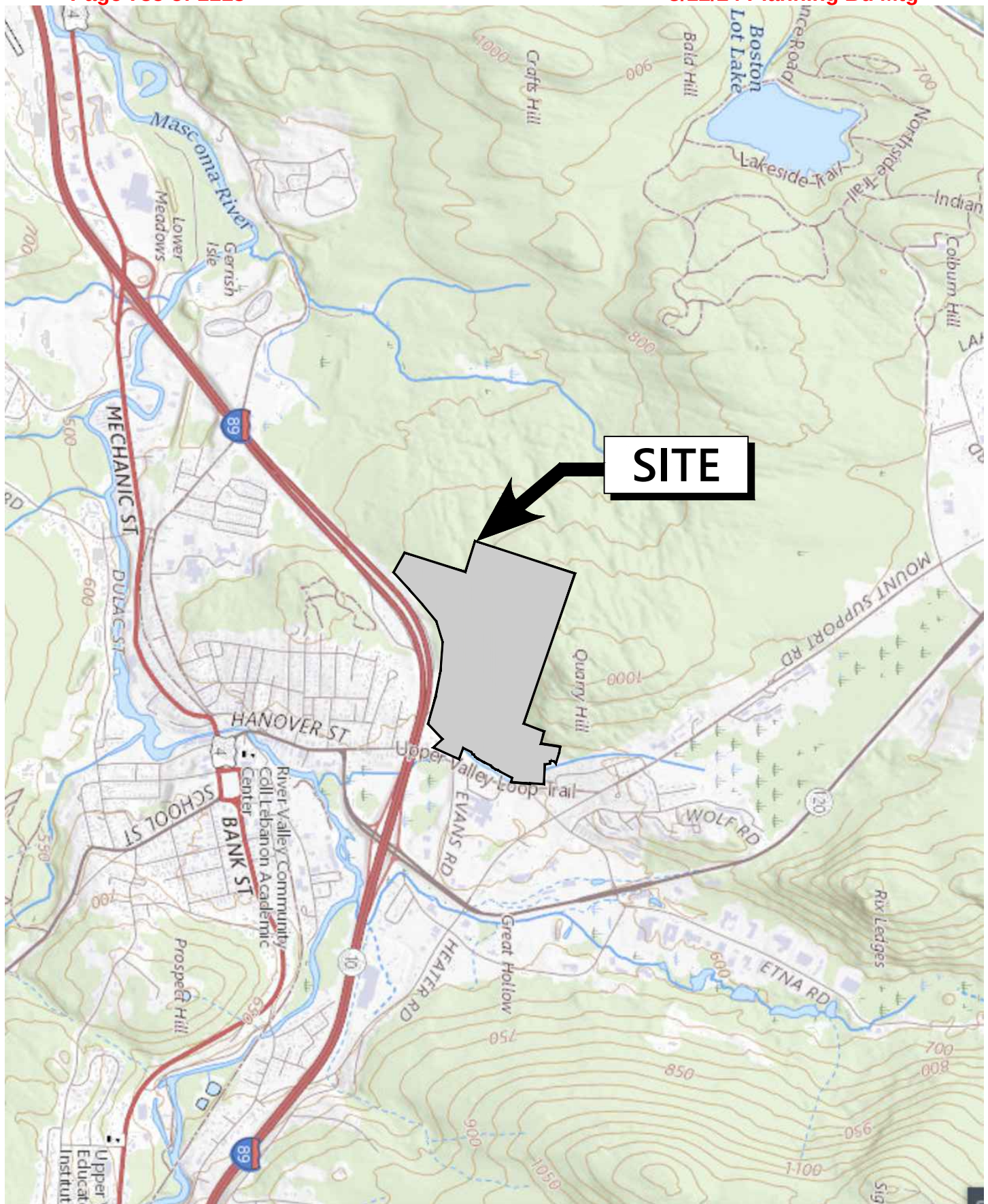
Appendix A: Supporting Data

- › Web GIS Printouts (USGS, Screening Layers, Surface Water Impairments)
- › NHB Letter/Wildlife Coordination
- › NRCS Soils Data
- › Aerial Photograph of the Site
- › BMP Worksheets
- › NRCC Rainfall Data

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Web GIS Printouts

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Site USGS Map
Lebanon Brickyard Development
Lebanon, NH 03766

Figure 1

November 2023

AoT Screening Layers



Legend

- * Remediation Sites
- Coastal and Great Bay Regional Communities
- Designated Rivers Quarter Buffer
- Public Water Supply Wells
- Groundwater Classification / GA1
- Groundwater Classification / GA2
- Water Supply Intake Protect Areas
- Wellhead Protection Areas
- Class A Lakes with a Quarter Buffer
- Class A - All Features
- All Lakes, with a Quarter Mile Buffer
- Outstanding Resource Water Watersheds
- Surface Waters with Impairment with Quarter Mile Buffer
- Watersheds with Chloride Impairments

Map Scale

1: 5,000

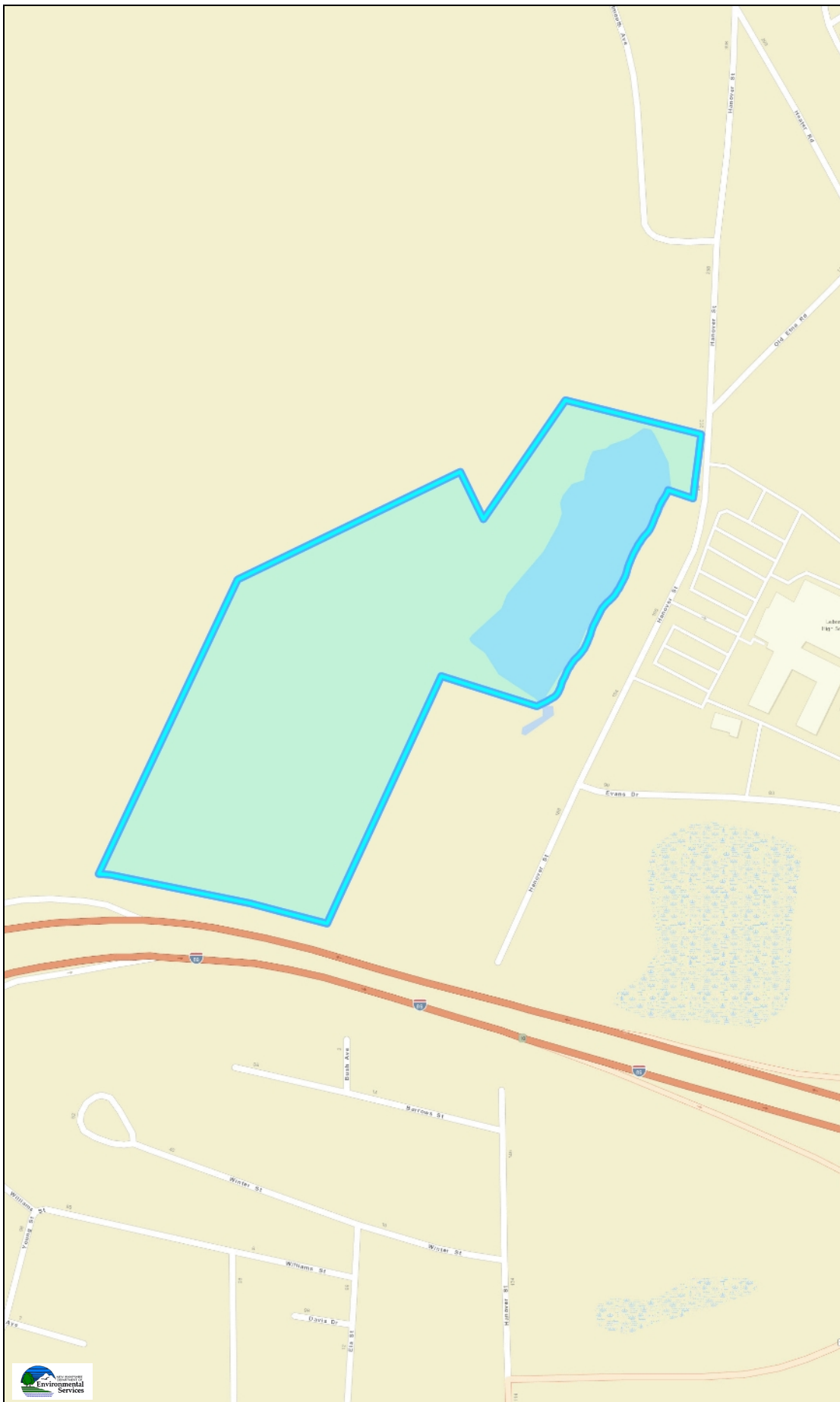
© NH DES, <http://des.nh.gov>

Map Generated: 10/6/2023



Notes

Surface Water Impairments Screening Layers



Legend

-  Surface Waters with Impairment with Quarter Mile Buffer

Map Scale

1: 5,000

© NH DES, <http://des.nh.gov>

Map Generated: 10/6/2023



Notes

NHB Letter

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NHB DataCheck Results Letter

NH Natural Heritage Bureau

Please note: maps and NHB record pages are **confidential** and shall be redacted from public documents.

To: Derek Bosworth
2 Bedford Farms Drive
Salem, NH 03079
dbosworth@vnhb.com

From: NHB Review
NH Natural Heritage Bureau
Main Contact: Ashley Litwinenko - nhbreview@dnrcr.nh.gov

cc:

Date: 10/13/2023 (valid until 10/13/2024)
Re: DataCheck Review by NH Natural Heritage Bureau and NH Fish & Game
Permits: NHDES - Alteration of Terrain Permit

NHB ID: NHB23-2953

Town: Lebanon
Location: 174 Hanover Street EXT

Project Description: Six residential apartment buildings and the required parking +/-700 parking spots are being proposed in the lot.

Next Steps for Applicant:

NHB's database has been searched for records of rare species and exemplary natural communities. Please carefully read the comments and consultation requirements below.

NHB Comments: I was unable to find a record of prior coordination for NHB22-3529. If coordination has occurred please send NHB record of this so we can ensure we stay consistent with past recommendations. If coordination has not occurred, please send NHB proposed plans and representative photos during the growing season of all proposed impact areas.

NHFG Comments: No comments at this time.

NHB Consultation

If this NHB DataCheck letter includes records of rare plants and/or natural communities/systems, please contact NHB and provide any requested supplementary materials by emailing nhbreview@dnrcr.nh.gov.

If this NHB DataCheck letter DOES NOT include any records of rare plants and/or natural communities/systems, no further consultation with NHB is required.



NHB DataCheck Results Letter

NH Natural Heritage Bureau

Please note: maps and NHB record pages are **confidential** and shall be redacted from public documents.

NH Fish and Game Department Consultation

If this NHB DataCheck letter DOES NOT include ANY wildlife species records, then, based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

If this NHB DataCheck letter includes a record for a threatened (T) or endangered (E) wildlife species, consultation with the New Hampshire Fish and Game Department under Fis 1004 may be required. To review the Fis 1000 rules (effective February 3, 2022), please go to <https://www.wildlife.nh.gov/wildlife-and-habitat/nongame-and-endangered-species/environmental-review>. All requests for consultation and submittals should be sent via email to NHFGreview@wildlife.nh.gov or can be sent by mail, and **must include the NHB DataCheck results letter number and "Fis 1004 consultation request" in the subject line.**

If the NHB DataCheck response letter does not include a threatened or endangered wildlife species but includes other wildlife species (e.g., Species of Special Concern), consultation under Fis 1004 is not required; however, some species are protected under other state laws or rules, so coordination with NH Fish & Game is highly recommended or may be required for certain permits. While some permitting processes are exempt from required consultation under Fis 1004 (e.g., *statutory permit by notification*, *permit by rule*, *permit by notification*, *routine roadway registration*, *docking structure registration*, or *conditional authorization by rule*), coordination with NH Fish & Game may still be required under the rules governing those specific permitting processes, and it is recommended you contact the applicable permitting agency. For projects not requiring consultation under Fis 1004, but where additional coordination with NH Fish and Game is requested, please email NHFGreview@wildlife.nh.gov, and include the NHB DataCheck results letter number and "review request" in the email subject line.

Contact NH Fish & Game at (603) 271-0467 with questions.



NHB DataCheck Results Letter

NH Natural Heritage Bureau

Please note: maps and NHB record pages are **confidential** and shall be redacted from public documents.

NHB Database Records:

The following record(s) have been documented in the vicinity of the proposed project.

Please see the map and detailed information about the record(s) on the following pages.

Natural Community	State ¹	Federal	Notes
Rich red oak rocky woods*	--	--	The primary threat to this natural community is logging and development.
Plant species	State ¹	Federal	Notes
crested sedge (<i>Carex cristatella</i>)*	E	--	This wetland species, which occurs in bogs, fens, seeps, and wet meadows, would be threatened by changes to local hydrology, including increased nutrient input from stormwater runoff, and sedimentation from nearby disturbance.

¹Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list.

An asterisk (*) indicates that the most recent report for that occurrence was 20 or more years ago.

Disclaimer: NHB's database can only tell you of known occurrences that have been reported to NHFG/NHB. Known occurrences are based on information gathered by qualified biologists or members of the public, reported to our offices, and verified by NHB/NHFG.

However, many areas have never been surveyed, or have only been surveyed for certain species.

NHB recommends surveys to determine what species/natural communities are present onsite.

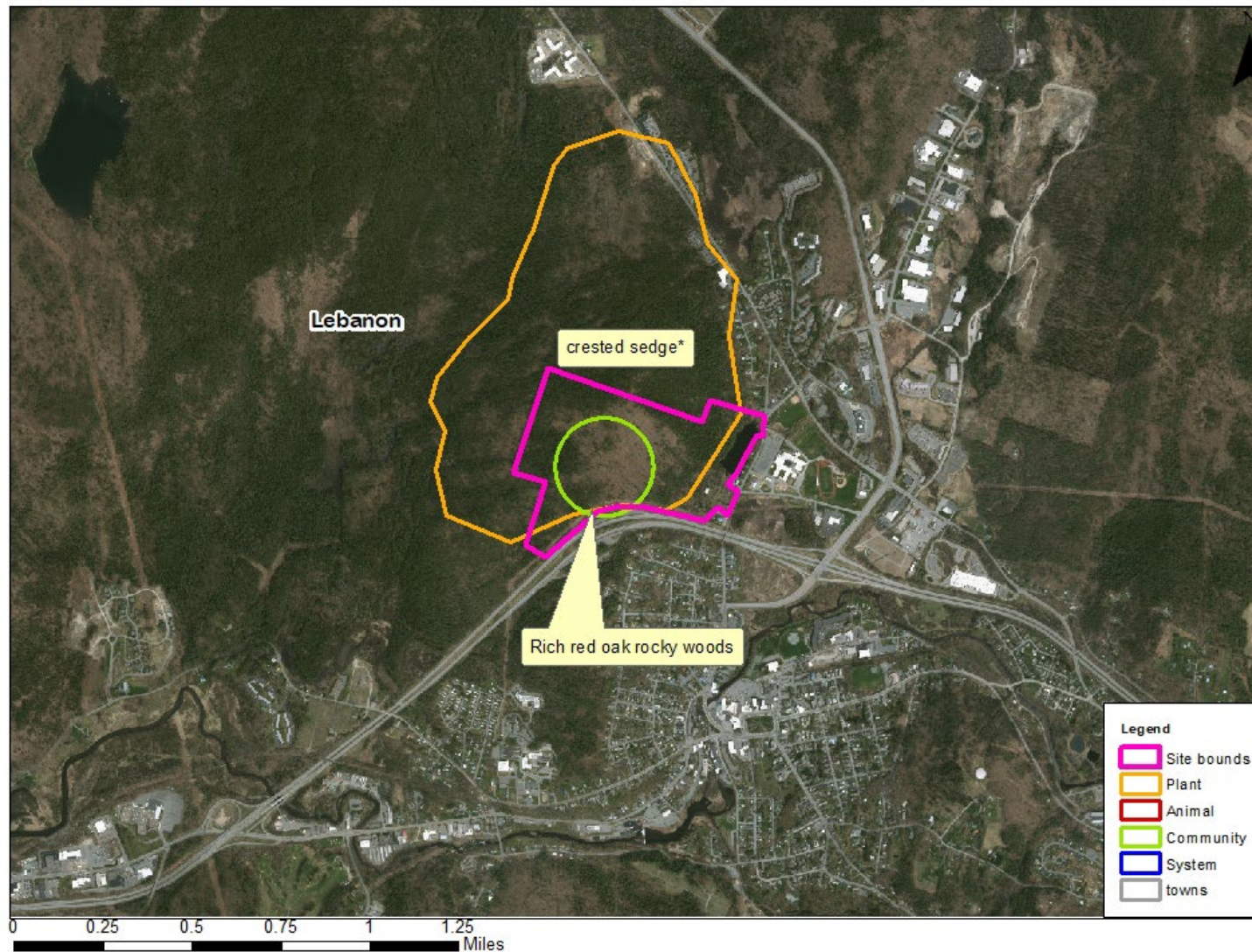


NHB DataCheck Results Letter

NH Natural Heritage Bureau

Please note: maps and NHB record pages are **confidential** and shall be redacted from public documents.

NHB23-2953



NHB DataCheck Results Letter

NH Natural Heritage Bureau

Please note: maps and NHB record pages are **confidential** and shall be redacted from public documents.

NHB23-2953

EOCODE:

CT00000203*005*NH

New Hampshire Natural Heritage Bureau - Community Record

Rich red oak rocky woods**Legal Status**

Federal: Not listed

State: Not listed

Conservation Status

Global: Not ranked (need more information)

State: Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Fair quality, condition and/or landscape context ('C' on a scale of A-D).

Comments on Rank: Not old-growth.

Detailed Description: 1984: A relatively young forest dominated by *Quercus rubra* (red oak), *Ostrya virginiana* (ironwood), and *Acer saccharum* (sugar maple). Characteristic species include: *Platanthera hookeri* (Hooker's orchid), *Adiantum pedatum* (northern maidenhair fern), *Botrychium virginianum* (rattlesnake fern), and *Viola pubescens* (downy yellow violet).

General Area: 1984: To the east a contact with granite is encountered and the soils are extremely acidic by comparison. A mixed hardwood/conifer forest occurs on the eastern granite slope, while a pure hardwood forest occurs on the more western slope, presumably reflecting more fertile soils.

General Comments: 1984: Only known New Hampshire station for *Collinsonia canadensis* (Canada horsebalm). Return visit in summer is needed.

Management --

Comments:

Location

Survey Site Name: Quarry Hill

Managed By:

County: Grafton

Town(s): Lebanon

Size: 38.0 acres

Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: Quarry Hill, southwest slope, north of rest area.

Dates documented

First reported: 1984-05-22

Last reported: 1984-05-22

NHB DataCheck Results Letter

NH Natural Heritage Bureau

Please note: maps and NHB record pages are **confidential** and shall be redacted from public documents.

NHB23-2953

EOCODE:

PMCP033A0*007*NH

New Hampshire Natural Heritage Bureau - Plant Record

crested sedge (*Carex cristatella*)**Legal Status**Federal: Not listed
State: Listed Endangered**Conservation Status**Global: Demonstrably widespread, abundant, and secure
State: Critically imperiled due to rarity or vulnerability**Description at this Location**Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 1962: Specimen collected.

General Area: 1962: Run of rich woods.

General Comments: --

Management: --

Comments:

LocationSurvey Site Name: Chapmans Farm
Managed By: Timberwood OS

County: Grafton

Town(s): Lebanon

Size: 436.1 acres

Elevation:

Precision: Within 1.5 miles of the area indicated on the map (location information is vague or uncertain).

Directions: Chapman's Farm.

Dates documented

First reported: 1962-06-29

Last reported: 1962-06-29

Web Soil Survey Data

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Hydrologic Soil Group—Grafton County, New Hampshire

Map Scale: 1:15,400 if printed on A landscape (11" x 8.5") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND**Area of Interest (AOI)**
 Area of Interest (AOI)
Soils**Soil Rating Polygons**

-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available

Soil Rating Lines

-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available

Soil Rating Points

-  A
-  A/D
-  B
-  B/D

-  C
-  C/D
-  D
-  Not rated or not available

Water Features
 Streams and Canals
Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background
 Aerial Photography
MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Grafton County, New Hampshire
Survey Area Data: Version 27, Aug 22, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 27, 2020—Sep 16, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Occum fine sandy loam, frequently flooded	B	6.8	0.6%
2	Suncook loamy fine sand	A	6.8	0.6%
4	Pootatuck very fine sandy loam	B	17.2	1.6%
5	Rippowam fine sandy loam	A/D	114.0	10.7%
9	Winooski silt loam	B	5.3	0.5%
26A	Windsor loamy sand, 0 to 3 percent slopes	A	15.3	1.4%
26B	Windsor loamy sand, 3 to 8 percent slopes	A	9.2	0.9%
26E	Windsor loamy sand, 15 to 60 percent slopes	A	12.7	1.2%
63B	Charlton fine sandy loam, 3 to 8 percent slopes, very stony	B	44.4	4.2%
63C	Charlton fine sandy loam, 8 to 15 percent slopes, very stony	B	25.5	2.4%
63D	Charlton fine sandy loam, 15 to 25 percent slopes, very stony	A	31.8	3.0%
63E	Charlton fine sandy loam, 25 to 35 percent slopes, very stony	A	0.1	0.0%
114	Walpole-Binghamville complex	A/D	13.2	1.2%
132A	Dartmouth silt loam, 0 to 3 percent slopes	C	14.4	1.4%
132B	Dartmouth silt loam, 3 to 8 percent slopes	C	29.5	2.8%
299	Udorthents, smoothed		15.0	1.4%
310A	Quonset loamy sand, 0 to 3 percent slopes	A	6.7	0.6%
310B	Quonset loamy sand, 3 to 8 percent slopes	A	10.7	1.0%
313	Deerfield loamy fine sand, 0 to 3 percent slopes	A	34.6	3.2%
330B	Bernardston silt loam, 3 to 8 percent slopes	D	0.0	0.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
330C	Bernardston silt loam, 8 to 15 percent slopes	D	47.2	4.4%
330D	Bernardston silt loam, 15 to 25 percent slopes	D	7.3	0.7%
331C	Bernardston silt loam, 8 to 15 percent slopes, very stony	D	16.4	1.5%
331D	Bernardston silt loam, 15 to 25 percent slopes, very stony	D	16.4	1.5%
334B	Pittstown loam, 3 to 8 percent slopes	C	7.8	0.7%
336B	Pittstown loam, 3 to 8 percent slopes, very stony	C	16.1	1.5%
341B	Stissing silt loam, 3 to 8 percent slopes, very stony	C/D	3.3	0.3%
361B	Cardigan-Kearsarge-Rock outcrop complex, 3 to 8 percent slopes	C	5.0	0.5%
361C	Cardigan-Kearsarge-Rock outcrop complex, 8 to 15 percent slopes	C	44.4	4.2%
361D	Cardigan-Kearsarge-Rock outcrop complex, 15 to 25 percent slopes	C	242.7	22.8%
361E	Cardigan-Kearsarge-Rock outcrop complex, 25 to 60 percent slopes	C	190.4	17.9%
401	Occum fine sandy loam, occasionally flooded	B	3.0	0.3%
534	Binghamville silt loam	C/D	42.4	4.0%
W	Water		9.2	0.9%
Totals for Area of Interest			1,065.2	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

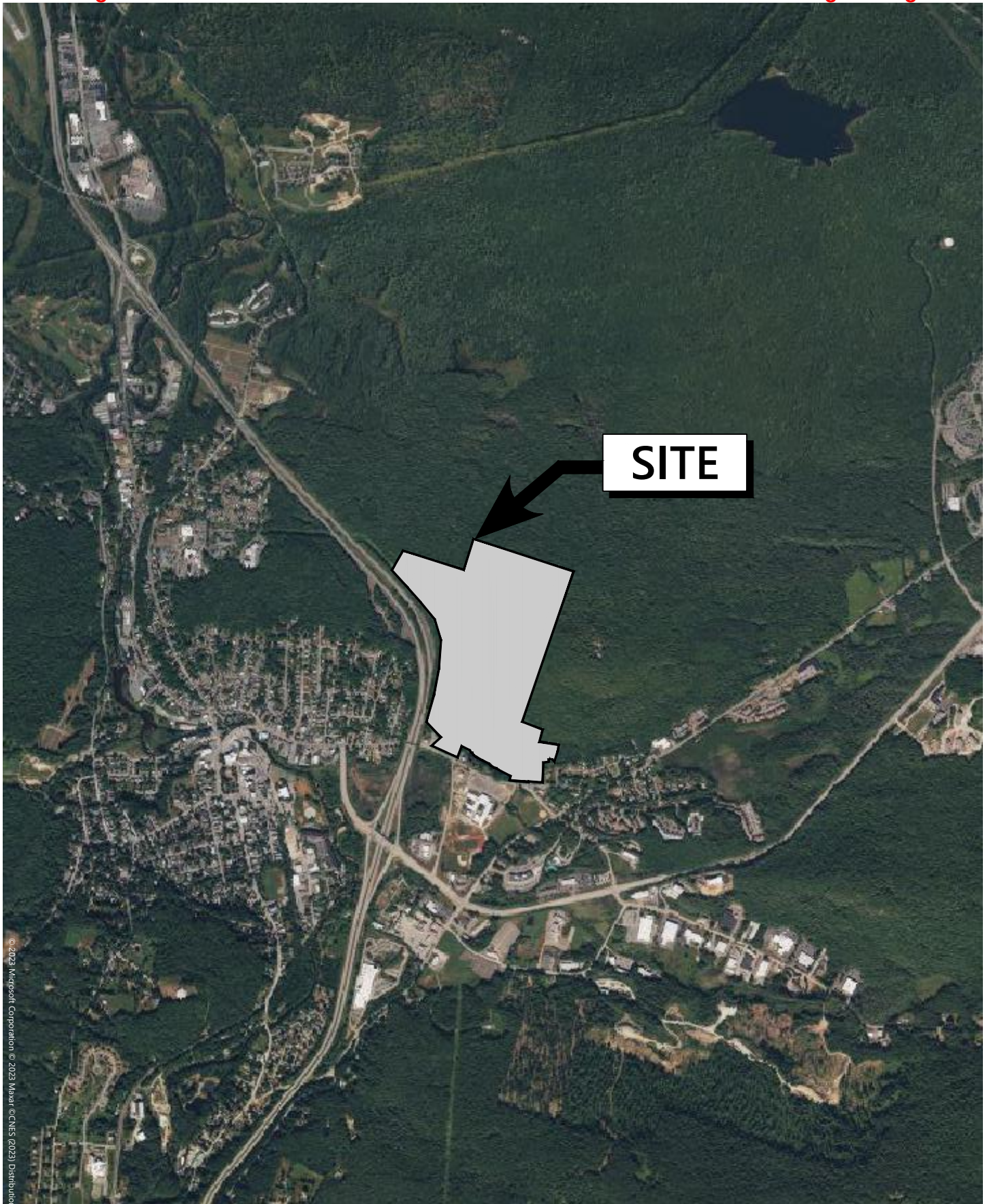
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Aerial Photograph of the Site

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0 1000 2000 Feet



Site Aerial Map
Lebanon Brickyard Development
Lebanon, NH 03766

Figure 1

November 2023

Groundwater Recharge Volume (GRV) Calculation

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[illegible]

BMP Worksheets

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FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/node name:

Bioretention Basin #1

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
2.58	ac	A = Area draining to the practice	
1.74	ac	A _i = Impervious area draining to the practice	
0.68	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.66	unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)	
1.70	ac-in	WQV = 1" x R _v x A	
6,165	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
1,541	cf	25% x WQV (check calc for sediment forebay volume)	
4,624	cf	75% x WQV (check calc for surface sand filter volume)	
Sediment Forebay		Method of Pretreatment? (not required for clean or roof runoff)	
1,600	cf	V _{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
6,187	sf	A _{SA} = Surface area of the practice	
0.50	iph	K _{sat} _{DESIGN} = Design infiltration rate ¹	
		If K _{sat} (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
23.9	hours	T _{DRAIN} = Drain time = V / (A _{SA} * I _{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
	ft	E _{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q _{WQV} = Discharge at the E _{WQV} (attach stage-discharge table)	
-	hours	T _{DRAIN} = Drain time = 2WQV/Q _{WQV}	≤ 72-hrs
593.50	feet	E _{FC} = Elevation of the bottom of the filter course material ²	
-	feet	E _{UD} = Invert elevation of the underdrain (UD), if applicable	
592.50	feet	E _{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
592.50	feet	E _{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
#VALUE!	feet	D _{FC to UD} = Depth to UD from the bottom of the filter course	≥ 1'
1.00	feet	D _{FC to ROCK} = Depth to bedrock from the bottom of the filter course	≥ 1'
1.00	feet	D _{FC to SHWT} = Depth to SHWT from the bottom of the filter course	≥ 1'
597.58	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
598.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	< 10 ac
	cf	V = Volume of storage ³ (attach a stage-storage table)	≥ 75%WQV
	inches	D _{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification.	
Yes/No		Access grate provided?	← yes



FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/node name:

Bioretention Basin #2

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.73	ac	A = Area draining to the practice	
0.39	ac	A _I = Impervious area draining to the practice	
0.53	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.53	unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)	
0.39	ac-in	WQV = 1" x R _v x A	
1,406	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
351	cf	25% x WQV (check calc for sediment forebay volume)	
1,054	cf	75% x WQV (check calc for surface sand filter volume)	
Sediment Forebay		Method of Pretreatment? (not required for clean or roof runoff)	
360	cf	V _{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
	sf	A _{SA} = Surface area of the practice	
	iph	K _{sat} _{DESIGN} = Design infiltration rate ¹	
		If K _{sat} (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
-	hours	T _{DRAIN} = Drain time = V / (A _{SA} * I _{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
602.31	ft	E _{WQV} = Elevation of WQV (attach stage-storage table)	
0.20	cfs	Q _{WQV} = Discharge at the E _{WQV} (attach stage-discharge table)	
3.90	hours	T _{DRAIN} = Drain time = 2WQV/Q _{WQV}	≤ 72-hrs
600.50	feet	E _{FC} = Elevation of the bottom of the filter course material ²	
599.75	feet	E _{UD} = Invert elevation of the underdrain (UD), if applicable	
598.75	feet	E _{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
598.75	feet	E _{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
0.75	feet	D _{FC to UD} = Depth to UD from the bottom of the filter course	≥ 1'
1.75	feet	D _{FC to ROCK} = Depth to bedrock from the bottom of the filter course	≥ 1'
1.75	feet	D _{FC to SHWT} = Depth to SHWT from the bottom of the filter course	≥ 1'
603.06	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
604.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	< 10 ac
	cf	V = Volume of storage ³ (attach a stage-storage table)	≥ 75%WQV
	inches	D _{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification.	
Yes/No		Access grate provided?	← yes



FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/node name:

Bioretention Basin #3

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.57	ac	A = Area draining to the practice	
0.30	ac	A _i = Impervious area draining to the practice	
0.53	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.52	unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)	
0.30	ac-in	WQV = 1" x R _v x A	
1,084	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
271	cf	25% x WQV (check calc for sediment forebay volume)	
813	cf	75% x WQV (check calc for surface sand filter volume)	
Sediment Forebay		Method of Pretreatment? (not required for clean or roof runoff)	
275	cf	V _{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
	sf	A _{SA} = Surface area of the practice	
	iph	K _{sat} _{DESIGN} = Design infiltration rate ¹	
		If K _{sat} (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
-	hours	T _{DRAIN} = Drain time = V / (A _{SA} * I _{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
606.10	ft	E _{WQV} = Elevation of WQV (attach stage-storage table)	
0.10	cfs	Q _{WQV} = Discharge at the E _{WQV} (attach stage-discharge table)	
6.02	hours	T _{DRAIN} = Drain time = 2WQV/Q _{WQV}	≤ 72-hrs
604.50	feet	E _{FC} = Elevation of the bottom of the filter course material ²	
603.75	feet	E _{UD} = Invert elevation of the underdrain (UD), if applicable	
602.75	feet	E _{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
602.72	feet	E _{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
0.75	feet	D _{FC to UD} = Depth to UD from the bottom of the filter course	≥ 1'
1.78	feet	D _{FC to ROCK} = Depth to bedrock from the bottom of the filter course	≥ 1'
1.75	feet	D _{FC to SHWT} = Depth to SHWT from the bottom of the filter course	≥ 1'
607.03	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
608.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	< 10 ac
	cf	V = Volume of storage ³ (attach a stage-storage table)	≥ 75%WQV
	inches	D _{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification.	
Yes/No		Access grate provided?	← yes



INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.06)

UIP#1

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	← yes
7.23	ac	A = Area draining to the practice	
5.54	ac	A _I = Impervious area draining to the practice	
0.77	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.74	unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)	
5.35	ac-in	WQV = 1" x R _v x A	
19,410	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
4,853	cf	25% x WQV (check calc for sediment forebay volume)	
Isolator Row		Method of pretreatment? (not required for clean or roof runoff)	
5,301	cf	V _{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
48,333	cf	V = Volume ¹ (attach a stage-storage table)	≥ WQV
13,305	sf	A _{SA} = Surface area of the bottom of the pond	
0.50	iph	K _{sat} _{DESIGN} = Design infiltration rate ²	
35.0	hours	I _{DRAIN} = Drain time = V / (A _{SA} * I _{DESIGN})	≤ 72-hrs
592.30	feet	E _{BTM} = Elevation of the bottom of the basin	
589.30	feet	E _{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
589.30	feet	E _{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
3.00	feet	D _{SHWT} = Separation from SHWT	≥ * ³
3.0	feet	D _{ROCK} = Separation from bedrock	≥ * ³
	ft	D _{amend} = Depth of amended soil, if applicable due high infiltration rate	≥ 24"
	ft	D _T = Depth of trench, if trench proposed	4 - 10 ft
No	Yes/No	If a trench or underground system is proposed, has observation well been provided?	← yes
N/A		If a trench is proposed, does material meet Env-Wq 1508.06(k)(2) requirements. ⁴	← yes
Yes	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	← yes
-	:1	If a basin is proposed, pond side slopes.	≥ 3:1
596.46	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
597.79	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
599.05	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench? ⁵	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. K_{sat}_{DESIGN} includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes: StormTech MC-7200 System with infiltration below



INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.06)

UIP#2

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

Yes	Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	← yes
1.72 ac	A = Area draining to the practice	
1.48 ac	A _I = Impervious area draining to the practice	
0.86 decimal	I = Percent impervious area draining to the practice, in decimal form	
0.82 unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)	
1.42 ac-in	WQV = 1" x R _v x A	
5,147 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
1,287 cf	25% x WQV (check calc for sediment forebay volume)	
Isolator Row	Method of pretreatment? (not required for clean or roof runoff)	
817 cf	V _{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
5,633 cf	V = Volume ¹ (attach a stage-storage table)	≥ WQV
3,594 sf	A _{SA} = Surface area of the bottom of the pond	
0.50 iph	K _{sat} _{DESIGN} = Design infiltration rate ²	
34.4 hours	I _{DRAIN} = Drain time = V / (A _{SA} * I _{DESIGN})	≤ 72-hrs
583.00 feet	E _{BTM} = Elevation of the bottom of the basin	
580.00 feet	E _{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
580.00 feet	E _{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
3.00 feet	D _{SHWT} = Separation from SHWT	≥ * ³
3.0 feet	D _{ROCK} = Separation from bedrock	≥ * ³
ft	D _{amend} = Depth of amended soil, if applicable due high infiltration rate	≥ 24"
ft	D _T = Depth of trench, if trench proposed	4 - 10 ft
No	If a trench or underground system is proposed, has observation well been provided?	←yes
N/A	If a trench is proposed, does material meet Env-Wq 1508.06(k)(2) requirements. ⁴	← yes
Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	← yes
:1	If a basin is proposed, pond side slopes.	≥ 3:1
586.35 ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
587.77 ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
589.75 ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES	10 peak elevation ≤ Elevation of the top of the trench? ⁵	← yes
YES	If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. K_{sat}_{DESIGN} includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes: StormTech MC-7200 System with infiltration below

Rainfall Data

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Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New Hampshire
Location	
Longitude	72.254 degrees West
Latitude	43.654 degrees North
Elevation	0 feet
Date/Time	Mon, 07 Nov 2022 13:43:45 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.66	0.82	1.02	1yr	0.71	0.93	1.17	1.44	1.76	2.15	2.42	1yr	1.90	2.32	2.69	3.30	3.79	1yr
2yr	0.31	0.47	0.59	0.78	0.98	1.22	2yr	0.85	1.11	1.40	1.70	2.07	2.50	2.81	2yr	2.21	2.70	3.15	3.76	4.31	2yr
5yr	0.37	0.57	0.72	0.96	1.23	1.54	5yr	1.06	1.40	1.76	2.14	2.57	3.07	3.47	5yr	2.71	3.34	3.87	4.55	5.18	5yr
10yr	0.41	0.65	0.82	1.12	1.45	1.83	10yr	1.26	1.67	2.10	2.54	3.03	3.58	4.08	10yr	3.17	3.92	4.52	5.25	5.95	10yr
25yr	0.49	0.78	1.00	1.37	1.82	2.30	25yr	1.57	2.11	2.64	3.18	3.77	4.40	5.05	25yr	3.90	4.85	5.55	6.36	7.16	25yr
50yr	0.56	0.90	1.15	1.61	2.17	2.75	50yr	1.87	2.52	3.15	3.79	4.45	5.15	5.93	50yr	4.56	5.71	6.49	7.35	8.24	50yr
100yr	0.64	1.03	1.33	1.89	2.58	3.28	100yr	2.22	3.01	3.76	4.50	5.25	6.03	6.98	100yr	5.33	6.71	7.59	8.49	9.48	100yr
200yr	0.74	1.20	1.56	2.23	3.07	3.91	200yr	2.65	3.60	4.48	5.33	6.19	7.05	8.21	200yr	6.24	7.89	8.88	9.82	10.91	200yr
500yr	0.89	1.46	1.90	2.76	3.86	4.94	500yr	3.33	4.55	5.65	6.68	7.70	8.69	10.18	500yr	7.69	9.79	10.94	11.92	13.15	500yr

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.24	0.37	0.45	0.60	0.74	0.83	1yr	0.64	0.81	0.99	1.19	1.58	1.94	2.20	1yr	1.72	2.11	2.46	2.95	3.50	1yr
2yr	0.30	0.46	0.56	0.76	0.94	1.11	2yr	0.81	1.08	1.24	1.62	2.06	2.45	2.75	2yr	2.17	2.65	3.09	3.70	4.23	2yr
5yr	0.34	0.52	0.65	0.89	1.13	1.32	5yr	0.98	1.29	1.49	1.91	2.41	2.91	3.28	5yr	2.58	3.15	3.66	4.30	4.92	5yr
10yr	0.38	0.58	0.71	1.00	1.29	1.50	10yr	1.11	1.47	1.69	2.16	2.70	3.31	3.75	10yr	2.93	3.60	4.15	4.81	5.51	10yr
25yr	0.43	0.66	0.82	1.16	1.53	1.77	25yr	1.32	1.73	1.97	2.52	3.13	3.93	4.48	25yr	3.47	4.30	4.91	5.57	6.39	25yr
50yr	0.47	0.72	0.89	1.28	1.73	2.00	50yr	1.49	1.96	2.21	2.85	3.51	4.46	5.12	50yr	3.95	4.92	5.58	6.21	7.15	50yr
100yr	0.52	0.79	0.99	1.43	1.96	2.26	100yr	1.69	2.21	2.48	3.19	3.94	5.08	5.84	100yr	4.50	5.62	6.35	6.93	7.99	100yr
200yr	0.58	0.87	1.10	1.59	2.21	2.55	200yr	1.91	2.50	2.78	3.60	4.47	5.78	6.68	200yr	5.11	6.42	7.23	7.72	8.93	200yr
500yr	0.66	0.98	1.26	1.83	2.61	2.98	500yr	2.25	2.91	3.20	4.19	5.23	6.87	7.99	500yr	6.08	7.68	8.60	8.89	10.34	500yr

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.44	0.54	0.73	0.90	1.03	1yr	0.78	1.01	1.19	1.51	1.89	2.31	2.62	1yr	2.05	2.52	2.87	3.51	4.01	1yr
2yr	0.32	0.49	0.61	0.82	1.01	1.19	2yr	0.88	1.17	1.36	1.73	2.17	2.57	2.87	2yr	2.27	2.76	3.22	3.86	4.40	2yr
5yr	0.40	0.61	0.76	1.05	1.33	1.56	5yr	1.15	1.53	1.73	2.16	2.71	3.23	3.66	5yr	2.86	3.52	4.07	4.78	5.44	5yr
10yr	0.48	0.74	0.91	1.28	1.65	1.95	10yr	1.42	1.90	2.14	2.61	3.22	3.87	4.40	10yr	3.43	4.24	4.88	5.64	6.40	10yr
25yr	0.61	0.93	1.16	1.66	2.18	2.61	25yr	1.88	2.56	2.85	3.34	4.03	4.91	5.65	25yr	4.35	5.43	6.18	7.04	7.94	25yr
50yr	0.74	1.12	1.40	2.01	2.70	3.27	50yr	2.33	3.19	3.55	4.02	4.80	5.87	6.81	50yr	5.20	6.55	7.40	8.34	9.37	50yr
100yr	0.89	1.35	1.69	2.44	3.35	4.10	100yr	2.89	4.01	4.44	4.85	5.72	7.04	8.23	100yr	6.23	7.92	8.86	9.88	11.06	100yr
200yr	1.08	1.63	2.06	2.98	4.16	5.14	200yr	3.59	5.02	5.55	5.86	6.84	8.43	9.94	200yr	7.46	9.55	10.63	11.73	13.06	200yr
500yr	1.40	2.09	2.68	3.90	5.54	6.96	500yr	4.78	6.80	7.47	7.50	8.58	10.72	12.76	500yr	9.48	12.27	13.50	14.75	16.30	500yr

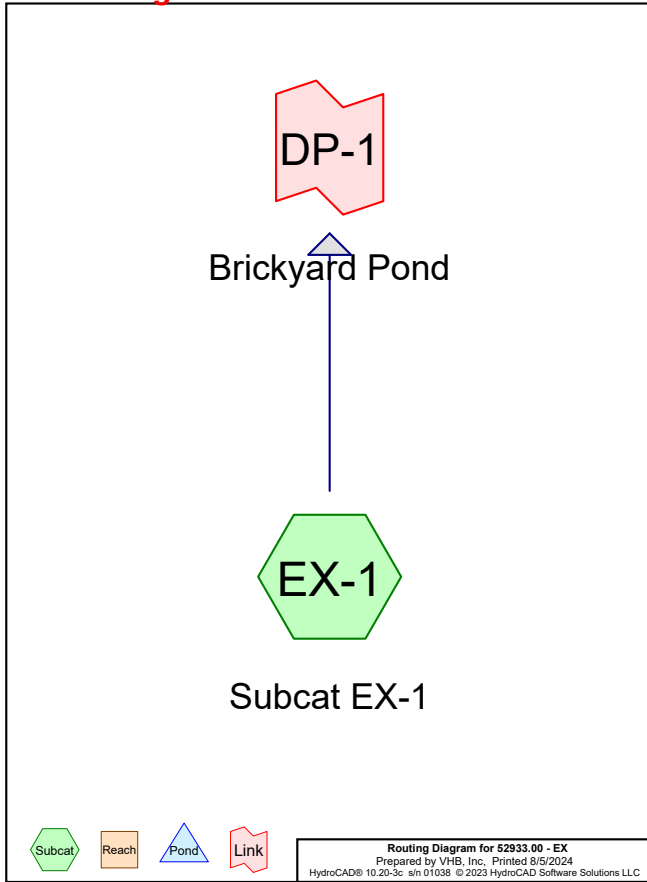
Appendix B: Hydrologic Calculations

- › Existing Conditions
- › Proposed Conditions

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Existing Conditions

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Type II 24-hr		Default	24.00	1	2.50	2
2	10-year	Type II 24-hr		Default	24.00	1	3.58	2
3	25-year	Type II 24-hr		Default	24.00	1	4.40	2
4	50-year	Type II 24-hr		Default	24.00	1	5.15	2
5	100-year	Type II 24-hr		Default	24.00	1	6.03	2

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.11	39	>75% Grass cover, Good, HSG A (EX-1)
0.48	61	>75% Grass cover, Good, HSG B (EX-1)
0.11	74	>75% Grass cover, Good, HSG C (EX-1)
0.00	80	>75% Grass cover, Good, HSG D (EX-1)
0.01	30	Brush, Good, HSG A (EX-1)
2.22	48	Brush, Good, HSG B (EX-1)
0.25	65	Brush, Good, HSG C (EX-1)
0.17	98	Paved parking, HSG A (EX-1)
0.06	98	Paved parking, HSG B (EX-1)
0.06	98	Roofs, HSG A (EX-1)
0.46	98	Roofs, HSG B (EX-1)
2.20	98	Water Surface, 0% imp, HSG B (EX-1)
4.51	98	Water Surface, 0% imp, HSG C (EX-1)
0.25	98	Water Surface, 0% imp, HSG D (EX-1)
0.03	30	Woods, Good, HSG A (EX-1)
6.07	55	Woods, Good, HSG B (EX-1)
90.33	70	Woods, Good, HSG C (EX-1)
0.53	77	Woods, Good, HSG D (EX-1)
0.00	32	Woods/grass comb., Good, HSG A (EX-1)
0.32	58	Woods/grass comb., Good, HSG B (EX-1)
108.18	71	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.39	HSG A	EX-1
11.82	HSG B	EX-1
95.19	HSG C	EX-1
0.78	HSG D	EX-1
0.00	Other	
108.18		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.11	0.48	0.11	0.00	0.00	0.70	>75% Grass cover, Good	EX-1
0.01	2.22	0.25	0.00	0.00	2.49	Brush, Good	EX-1
0.17	0.06	0.00	0.00	0.00	0.23	Paved parking	EX-1
0.06	0.46	0.00	0.00	0.00	0.52	Roofs	EX-1
0.00	2.20	4.51	0.25	0.00	6.97	Water Surface, 0% imp	EX-1
0.03	6.07	90.33	0.53	0.00	96.96	Woods, Good	EX-1
0.00	0.32	0.00	0.00	0.00	0.32	Woods/grass comb., Good	EX-1
0.39	11.82	95.19	0.78	0.00	108.18	TOTAL AREA	

Agenda Item 4.A
8/12/24 Planning Bd Mtg

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Type II 24-hr 2-year Rainfall=2.50"

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Time span=0.00-72.00 hrs, dt=0.03 hrs, 2401 points x 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-1: Subcat EX-1

Runoff Area=108.18 ac 0.69% Impervious Runoff Depth=0.49"
Flow Length=3,025' Tc=32.8 min CN=71 Runoff=33.6 cfs 4.4 af

Link DP-1: Brickyard Pond

Inflow=33.6 cfs 4.4 af
Primary=33.6 cfs 4.4 afTotal Runoff Area = 108.18 ac Runoff Volume = 4.4 af Average Runoff Depth = 0.49"
99.31% Pervious = 107.44 ac 0.69% Impervious = 0.74 ac

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Type II 24-hr 2-year Rainfall=2.50"

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Summary for Subcatchment EX-1: Subcat EX-1

Runoff = 33.6 cfs @ 12.34 hrs, Volume= 4.4 af, Depth= 0.49"
Routed to Link DP-1 : Brickyard PondRunoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 2-year Rainfall=2.50"

Area (ac)	CN	Description
0.11	39	>75% Grass cover, Good, HSG A
0.48	61	>75% Grass cover, Good, HSG B
0.11	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.01	30	Brush, Good, HSG A
2.22	48	Brush, Good, HSG B
0.25	65	Brush, Good, HSG C
0.17	98	Paved parking, HSG A
0.06	98	Paved parking, HSG B
0.06	98	Roofs, HSG A
0.46	98	Roofs, HSG B
2.20	98	Water Surface, 0% imp, HSG B
4.51	98	Water Surface, 0% imp, HSG C
0.25	98	Water Surface, 0% imp, HSG D
0.03	30	Woods, Good, HSG A
6.07	55	Woods, Good, HSG B
90.33	70	Woods, Good, HSG C
0.53	77	Woods, Good, HSG D
0.00	32	Woods/grass comb., Good, HSG A
0.32	58	Woods/grass comb., Good, HSG B
108.18	71	Weighted Average
107.44		99.31% Pervious Area
0.74		0.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.1600	0.08		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
15.3	2,100	0.2100	2.29		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.9	875	0.0200	2.12		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
32.8	3,025	Total			

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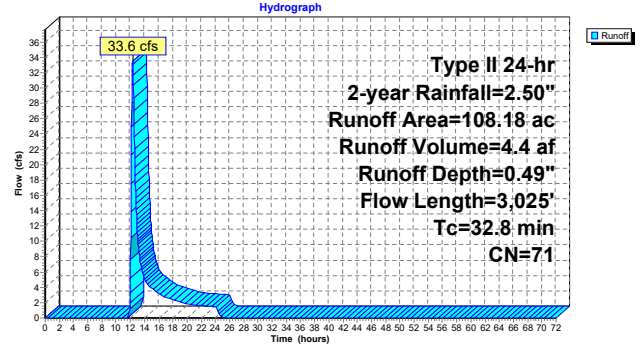
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Type II 24-hr 2-year Rainfall=2.50"

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Subcatchment EX-1: Subcat EX-1



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Type II 24-hr 2-year Rainfall=2.50"

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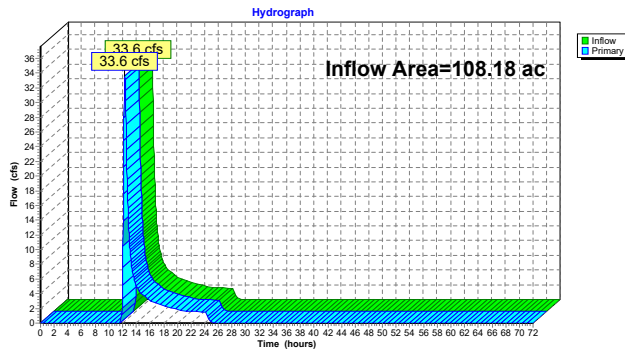
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Summary for Link DP-1: Brickyard Pond

Inflow Area = 108.18 ac, 0.69% Impervious, Inflow Depth = 0.49" for 2-year event
 Inflow = 33.6 cfs @ 12.34 hrs, Volume= 4.4 af
 Primary = 33.6 cfs @ 12.34 hrs, Volume= 4.4 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs

Link DP-1: Brickyard Pond



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Type II 24-hr 10-year Rainfall=3.58"

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Time span=0.00-72.00 hrs, dt=0.03 hrs, 2401 points x 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-1: Subcat EX-1

Runoff Area=108.18 ac 0.69% Impervious Runoff Depth=1.11"
 Flow Length=3,025' Tc=32.8 min CN=71 Runoff=90.5 cfs 10.1 af

Link DP-1: Brickyard Pond

Inflow=90.5 cfs 10.1 af
 Primary=90.5 cfs 10.1 af

Total Runoff Area = 108.18 ac Runoff Volume = 10.1 af Average Runoff Depth = 1.11"
 99.31% Pervious = 107.44 ac 0.69% Impervious = 0.74 ac

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Type II 24-hr 10-year Rainfall=3.58"

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Summary for Subcatchment EX-1: Subcat EX-1

Runoff = 90.5 cfs @ 12.30 hrs, Volume= 10.1 af, Depth= 1.11"
 Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 10-year Rainfall=3.58"

Area (ac)	CN	Description
0.11	39	>75% Grass cover, Good, HSG A
0.48	61	>75% Grass cover, Good, HSG B
0.11	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.01	30	Brush, Good, HSG A
2.22	48	Brush, Good, HSG B
0.25	65	Brush, Good, HSG C
0.17	98	Paved parking, HSG A
0.06	98	Paved parking, HSG B
0.06	98	Roofs, HSG A
0.46	98	Roofs, HSG B
2.20	98	Water Surface, 0% imp, HSG B
4.51	98	Water Surface, 0% imp, HSG C
0.25	98	Water Surface, 0% imp, HSG D
0.03	30	Woods, Good, HSG A
6.07	55	Woods, Good, HSG B
90.33	70	Woods, Good, HSG C
0.53	77	Woods, Good, HSG D
0.00	32	Woods/grass comb., Good, HSG A
0.32	58	Woods/grass comb., Good, HSG B
108.18	71	Weighted Average
107.44		99.31% Pervious Area
0.74		0.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.1600	0.08		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
15.3	2,100	0.2100	2.29		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.9	875	0.0200	2.12		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
32.8	3,025	Total			

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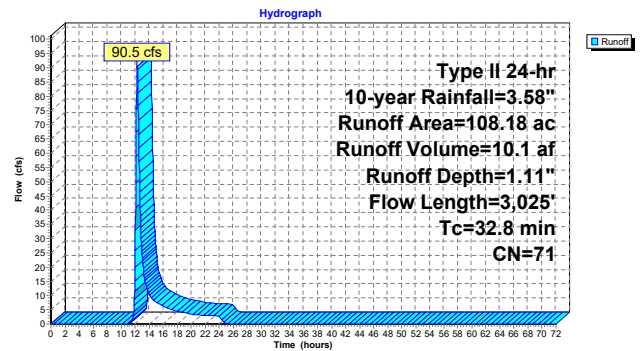
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Type II 24-hr 10-year Rainfall=3.58"

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Subcatchment EX-1: Subcat EX-1



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Type II 24-hr 10-year Rainfall=3.58"

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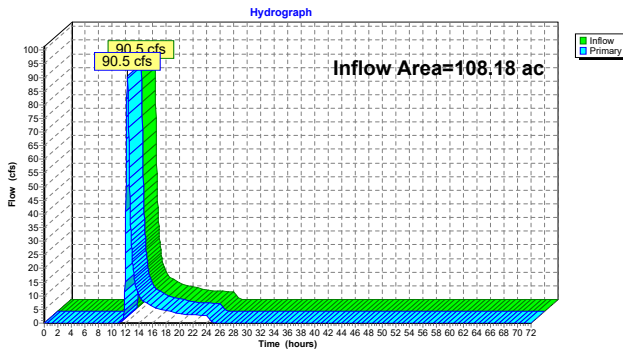
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Summary for Link DP-1: Brickyard Pond

Inflow Area = 108.18 ac, 0.69% Impervious, Inflow Depth = 1.11" for 10-year event
Inflow = 90.5 cfs @ 12.30 hrs, Volume= 10.1 af
Primary = 90.5 cfs @ 12.30 hrs, Volume= 10.1 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs

Link DP-1: Brickyard Pond



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Type II 24-hr 25-year Rainfall=4.40"

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Time span=0.00-72.00 hrs, dt=0.03 hrs, 2401 points x 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-1: Subcat EX-1

Runoff Area=108.18 ac 0.69% Impervious Runoff Depth=1.67"
Flow Length=3,025' Tc=32.8 min CN=71 Runoff=141.9 cfs 15.1 af

Link DP-1: Brickyard Pond

Inflow=141.9 cfs 15.1 af
Primary=141.9 cfs 15.1 af

Total Runoff Area = 108.18 ac Runoff Volume = 15.1 af Average Runoff Depth = 1.67"
99.31% Pervious = 107.44 ac 0.69% Impervious = 0.74 ac

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Type II 24-hr 25-year Rainfall=4.40"

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Summary for Subcatchment EX-1: Subcat EX-1

Runoff = 141.9 cfs @ 12.29 hrs, Volume= 15.1 af, Depth= 1.67"
Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 25-year Rainfall=4.40"

Area (ac)	CN	Description
0.11	39	>75% Grass cover, Good, HSG A
0.48	61	>75% Grass cover, Good, HSG B
0.11	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.01	30	Brush, Good, HSG A
2.22	48	Brush, Good, HSG B
0.25	65	Brush, Good, HSG C
0.17	98	Paved parking, HSG A
0.06	98	Paved parking, HSG B
0.06	98	Roofs, HSG A
0.46	98	Roofs, HSG B
2.20	98	Water Surface, 0% imp, HSG B
4.51	98	Water Surface, 0% imp, HSG C
0.25	98	Water Surface, 0% imp, HSG D
0.03	30	Woods, Good, HSG A
6.07	55	Woods, Good, HSG B
90.33	70	Woods, Good, HSG C
0.53	77	Woods, Good, HSG D
0.00	32	Woods/grass comb., Good, HSG A
0.32	58	Woods/grass comb., Good, HSG B
108.18	71	Weighted Average
107.44		99.31% Pervious Area
0.74		0.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.1600	0.08		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
15.3	2,100	0.2100	2.29		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.9	875	0.0200	2.12		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
32.8	3,025	Total			

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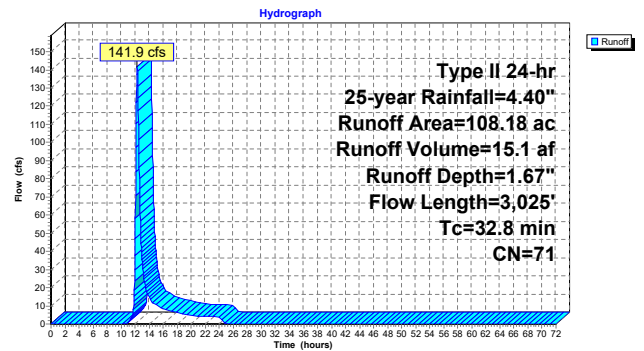
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Type II 24-hr 25-year Rainfall=4.40"

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Subcatchment EX-1: Subcat EX-1



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Type II 24-hr 25-year Rainfall=4.40"

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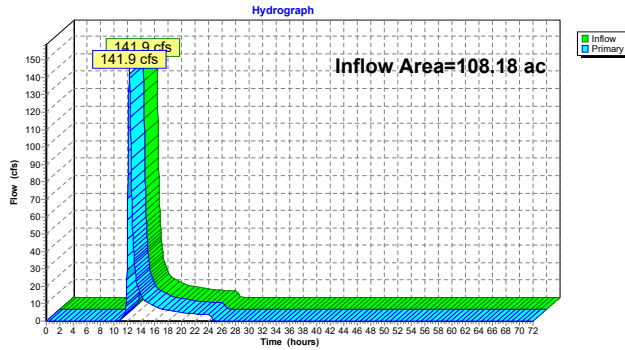
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Summary for Link DP-1: Brickyard Pond

Inflow Area = 108.18 ac, 0.69% Impervious, Inflow Depth = 1.67" for 25-year event
 Inflow = 141.9 cfs @ 12.29 hrs, Volume= 15.1 af
 Primary = 141.9 cfs @ 12.29 hrs, Volume= 15.1 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs

Link DP-1: Brickyard Pond



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Type II 24-hr 50-year Rainfall=5.15"

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Time span=0.00-72.00 hrs, dt=0.03 hrs, 2401 points x 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-1: Subcat EX-1

Runoff Area=108.18 ac 0.69% Impervious Runoff Depth=2.23"

Flow Length=3,025' Tc=32.8 min CN=71 Runoff=192.8 cfs 20.1 af

Link DP-1: Brickyard Pond

Inflow=192.8 cfs 20.1 af

Primary=192.8 cfs 20.1 af

Total Runoff Area = 108.18 ac Runoff Volume = 20.1 af Average Runoff Depth = 2.23"
 99.31% Pervious = 107.44 ac 0.69% Impervious = 0.74 ac

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Type II 24-hr 50-year Rainfall=5.15"

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Summary for Subcatchment EX-1: Subcat EX-1

Runoff = 192.8 cfs @ 12.29 hrs, Volume= 20.1 af, Depth= 2.23"
 Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 50-year Rainfall=5.15"

Area (ac)	CN	Description
0.11	39	>75% Grass cover, Good, HSG A
0.48	61	>75% Grass cover, Good, HSG B
0.11	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.01	30	Brush, Good, HSG A
2.22	48	Brush, Good, HSG B
0.25	65	Brush, Good, HSG C
0.17	98	Paved parking, HSG A
0.06	98	Paved parking, HSG B
0.06	98	Roofs, HSG A
0.46	98	Roofs, HSG B
2.20	98	Water Surface, 0% imp, HSG B
4.51	98	Water Surface, 0% imp, HSG C
0.25	98	Water Surface, 0% imp, HSG D
0.03	30	Woods, Good, HSG A
6.07	55	Woods, Good, HSG B
90.33	70	Woods, Good, HSG C
0.53	77	Woods, Good, HSG D
0.00	32	Woods/grass comb., Good, HSG A
0.32	58	Woods/grass comb., Good, HSG B
108.18	71	Weighted Average
107.44		99.31% Pervious Area
0.74		0.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.1600	0.08		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
15.3	2,100	0.2100	2.29		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.9	875	0.0200	2.12		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
32.8	3,025	Total			

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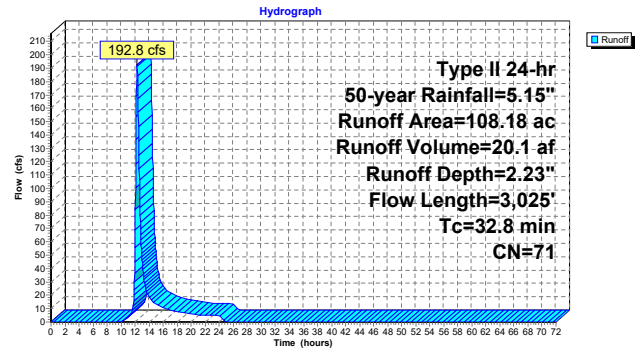
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Type II 24-hr 50-year Rainfall=5.15"

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Subcatchment EX-1: Subcat EX-1



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Type II 24-hr 50-year Rainfall=5.15"

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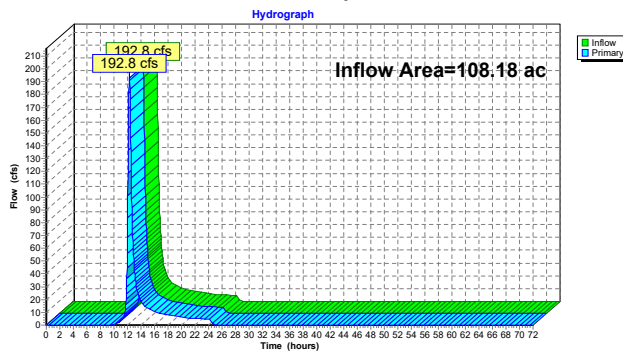
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Summary for Link DP-1: Brickyard Pond

Inflow Area = 108.18 ac, 0.69% Impervious, Inflow Depth = 2.23" for 50-year event
 Inflow = 192.8 cfs @ 12.29 hrs, Volume= 20.1 af
 Primary = 192.8 cfs @ 12.29 hrs, Volume= 20.1 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs

Link DP-1: Brickyard Pond



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Type II 24-hr 100-year Rainfall=6.03"

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Time span=0.00-72.00 hrs, dt=0.03 hrs, 2401 points x 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-1: Subcat EX-1

Runoff Area=108.18 ac 0.69% Impervious Runoff Depth=2.92"
 Flow Length=3,025' Tc=32.8 min CN=71 Runoff=256.0 cfs 26.4 af

Link DP-1: Brickyard Pond

Inflow=256.0 cfs 26.4 af
 Primary=256.0 cfs 26.4 af

Total Runoff Area = 108.18 ac Runoff Volume = 26.4 af Average Runoff Depth = 2.92"
 99.31% Pervious = 107.44 ac 0.69% Impervious = 0.74 ac

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Type II 24-hr 100-year Rainfall=6.03"

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Summary for Subcatchment EX-1: Subcat EX-1

Runoff = 256.0 cfs @ 12.28 hrs, Volume= 26.4 af, Depth= 2.92"
 Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 100-year Rainfall=6.03"

Area (ac)	CN	Description
0.11	39	>75% Grass cover, Good, HSG A
0.48	61	>75% Grass cover, Good, HSG B
0.11	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.01	30	Brush, Good, HSG A
2.22	48	Brush, Good, HSG B
0.25	65	Brush, Good, HSG C
0.17	98	Paved parking, HSG A
0.06	98	Paved parking, HSG B
0.06	98	Roofs, HSG A
0.46	98	Roofs, HSG B
2.20	98	Water Surface, 0% imp, HSG B
4.51	98	Water Surface, 0% imp, HSG C
0.25	98	Water Surface, 0% imp, HSG D
0.03	30	Woods, Good, HSG A
6.07	55	Woods, Good, HSG B
90.33	70	Woods, Good, HSG C
0.53	77	Woods, Good, HSG D
0.00	32	Woods/grass comb., Good, HSG A
0.32	58	Woods/grass comb., Good, HSG B
108.18	71	Weighted Average
107.44		99.31% Pervious Area
0.74		0.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.1600	0.08		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
15.3	2,100	0.2100	2.29		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.9	875	0.0200	2.12		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
32.8	3,025	Total			

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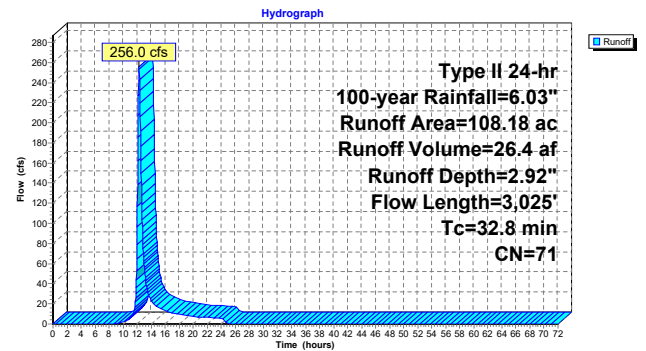
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Type II 24-hr 100-year Rainfall=6.03"

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Subcatchment EX-1: Subcat EX-1



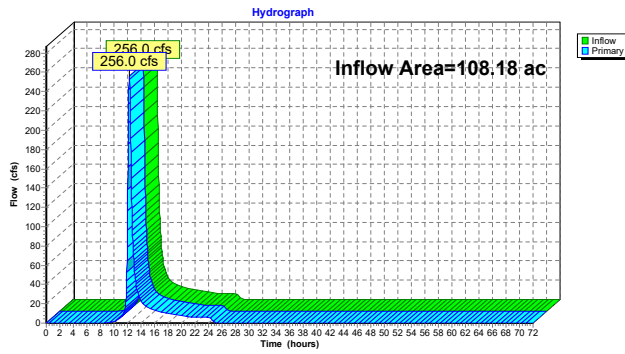
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Summary for Link DP-1: Brickyard Pond

Inflow Area = 108.18 ac, 0.69% Impervious, Inflow Depth = 2.92" for 100-year event
Inflow = 256.0 cfs @ 12.28 hrs, Volume= 26.4 af
Primary = 256.0 cfs @ 12.28 hrs, Volume= 26.4 af, Atten= 0%, Lag= 0.0 min

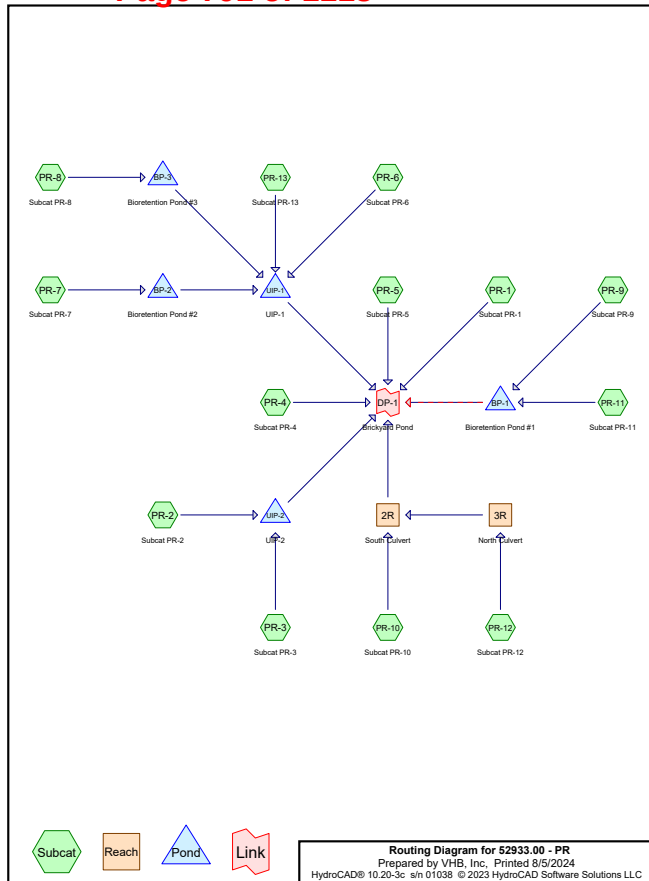
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs

Link DP-1: Brickyard Pond



Proposed Conditions

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Agenda Item 4.A

8/12/24 Planning Bd Mtg

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Type II 24-hr		Default	24.00	1	2.50	2
2	10-year	Type II 24-hr		Default	24.00	1	3.58	2
3	25-year	Type II 24-hr		Default	24.00	1	4.40	2
4	50-year	Type II 24-hr		Default	24.00	1	5.15	2
5	100-year	Type II 24-hr		Default	24.00	1	6.03	2

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.17	39	>75% Grass cover, Good, HSG A (PR-10, PR-11, PR-4)
2.16	61	>75% Grass cover, Good, HSG B (PR-1, PR-10, PR-11, PR-12, PR-2, PR-3, PR-4, PR-5, PR-6)
4.85	74	>75% Grass cover, Good, HSG C (PR-1, PR-10, PR-11, PR-12, PR-13, PR-3, PR-4, PR-6, PR-7, PR-8, PR-9)
0.00	80	>75% Grass cover, Good, HSG D (PR-10, PR-11, PR-12)
0.00	30	Brush, Good, HSG A (PR-10, PR-4)
1.04	48	Brush, Good, HSG B (PR-10, PR-12, PR-2, PR-4)
0.07	65	Brush, Good, HSG C (PR-10, PR-11)
0.10	85	Gravel roads, HSG B (PR-10, PR-3, PR-5)
0.09	89	Gravel roads, HSG C (PR-10)
0.18	98	Paved parking, HSG A (PR-10, PR-11, PR-4)
1.62	98	Paved parking, HSG B (PR-10, PR-11, PR-12, PR-2, PR-3, PR-4, PR-5, PR-6)
2.93	98	Paved parking, HSG C (PR-10, PR-11, PR-12, PR-13, PR-6, PR-7, PR-8, PR-9)
0.01	98	Paved parking, HSG D (PR-11, PR-12)
0.02	98	Roofs, HSG A (PR-11)
1.37	98	Roofs, HSG B (PR-10, PR-11, PR-2, PR-3, PR-4, PR-6, PR-9)
3.52	98	Roofs, HSG C (PR-1, PR-10, PR-13, PR-3, PR-6, PR-7, PR-8, PR-9)
2.18	98	Water Surface, 0% imp, HSG B (PR-10, PR-12, PR-4)
4.51	98	Water Surface, 0% imp, HSG C (PR-10, PR-12)
0.24	98	Water Surface, 0% imp, HSG D (PR-10, PR-11, PR-12)
0.01	30	Woods, Good, HSG A (PR-10, PR-4)
3.36	55	Woods, Good, HSG B (PR-1, PR-10, PR-12, PR-4)
79.22	70	Woods, Good, HSG C (PR-1, PR-10, PR-12, PR-4)
0.53	77	Woods, Good, HSG D (PR-10, PR-4)
108.18	74	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.39	HSG A	PR-10, PR-11, PR-4
11.81	HSG B	PR-1, PR-10, PR-11, PR-12, PR-2, PR-3, PR-4, PR-5, PR-6, PR-9
95.19	HSG C	PR-1, PR-10, PR-11, PR-12, PR-13, PR-3, PR-4, PR-6, PR-7, PR-8, PR-9
0.78	HSG D	PR-10, PR-11, PR-12, PR-4
0.00	Other	
108.18		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.17	2.16	4.85	0.00	0.00	7.18	>75% Grass cover, Good	PR-1, PR-10, PR-11, PR-12, PR-13, PR-2, PR-3, PR-4, PR-5, PR-6, PR-7, PR-8, PR-9
0.00	1.04	0.07	0.00	0.00	1.11	Brush, Good	PR-10, PR-11, PR-12, PR-2, PR-4
0.00	0.10	0.09	0.00	0.00	0.19	Gravel roads	PR-10, PR-3, PR-5
0.18	1.62	2.93	0.01	0.00	4.74	Paved parking	PR-10, PR-11, PR-12, PR-13, PR-2, PR-3, PR-4, PR-5, PR-6, PR-7, PR-8, PR-9
0.02	1.37	3.52	0.00	0.00	4.91	Roofs	PR-1, PR-10, PR-11, PR-13, PR-2, PR-3, PR-4, PR-6, PR-7, PR-8, PR-9
0.00	2.18	4.51	0.24	0.00	6.93	Water Surface, 0% imp	PR-10, PR-11, PR-12, PR-4
0.01	3.36	79.22	0.53	0.00	83.12	Woods, Good	PR-1, PR-10, PR-12, PR-4
0.39	11.81	95.19	0.78	0.00	108.18	TOTAL AREA	

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	2R	597.50	597.00	50.0	0.0100	0.011	96.0	108.0	0.0	
2	3R	602.00	600.00	60.0	0.0333	0.011	96.0	120.0	0.0	
3	BP-1	595.00	594.80	20.0	0.0100	0.013	0.0	18.0	0.0	
4	BP-2	597.90	597.40	50.0	0.0100	0.013	0.0	12.0	0.0	
5	BP-2	599.75	599.65	10.0	0.0100	0.013	0.0	6.0	0.0	
6	BP-3	603.50	593.80	60.0	0.1617	0.013	0.0	18.0	0.0	
7	BP-3	603.75	603.65	10.0	0.0100	0.013	0.0	6.0	0.0	
8	UIP-1	592.50	591.06	25.0	0.0576	0.013	0.0	24.0	0.0	
9	UIP-2	583.00	582.80	20.0	0.0100	0.013	0.0	12.0	0.0	

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Time span=0.00-72.00 hrs, dt=0.03 hrs, 2401 points x 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR-1: Subcat PR-1	Runoff Area=29.63 ac 0.42% Impervious Runoff Depth=0.46" Flow Length=1,970' Tc=23.5 min CN=70 Runoff=10.4 cfs 1.1 af
Subcatchment PR-10: Subcat PR-10	Runoff Area=9.13 ac 5.51% Impervious Runoff Depth=1.24" Tc=5.0 min CN=86 Runoff=20.9 cfs 0.9 af
Subcatchment PR-11: Subcat PR-11	Runoff Area=0.70 ac 45.60% Impervious Runoff Depth=0.94" Tc=5.0 min CN=81 Runoff=1.2 cfs 0.1 af
Subcatchment PR-12: Subcat PR-12	Runoff Area=1.60 ac 0.00% Impervious Runoff Depth=0.53" Flow Length=410' Tc=11.6 min CN=72 Runoff=1.1 cfs 0.1 af
Subcatchment PR-13: Subcat PR-13	Runoff Area=0.56 ac 94.01% Impervious Runoff Depth=2.16" Tc=5.0 min CN=97 Runoff=2.0 cfs 0.1 af
Subcatchment PR-2: Subcat PR-2	Runoff Area=0.81 ac 84.54% Impervious Runoff Depth=1.69" Tc=5.0 min CN=92 Runoff=2.4 cfs 0.1 af
Subcatchment PR-3: Subcat PR-3	Runoff Area=0.91 ac 87.38% Impervious Runoff Depth=1.78" Tc=5.0 min CN=93 Runoff=2.8 cfs 0.1 af
Subcatchment PR-4: Subcat PR-4	Runoff Area=56.16 ac 0.45% Impervious Runoff Depth=0.46" Flow Length=3,025' Tc=32.8 min CN=70 Runoff=15.6 cfs 2.1 af
Subcatchment PR-5: Subcat PR-5	Runoff Area=0.13 ac 4.40% Impervious Runoff Depth=0.33" Tc=5.0 min CN=66 Runoff=0.1 cfs 0.0 af
Subcatchment PR-6: Subcat PR-6	Runoff Area=5.37 ac 80.24% Impervious Runoff Depth=1.78" Tc=5.0 min CN=93 Runoff=16.7 cfs 0.8 af
Subcatchment PR-7: Subcat PR-7	Runoff Area=0.73 ac 55.39% Impervious Runoff Depth=1.31" Tc=5.0 min CN=87 Runoff=1.8 cfs 0.1 af
Subcatchment PR-8: Subcat PR-8	Runoff Area=0.57 ac 52.67% Impervious Runoff Depth=1.31" Tc=5.0 min CN=87 Runoff=1.4 cfs 0.1 af
Subcatchment PR-9: Subcat PR-9	Runoff Area=1.88 ac 75.74% Impervious Runoff Depth=1.69" Tc=5.0 min CN=92 Runoff=5.6 cfs 0.3 af
Reach 2R: South Culvert	Avg. Flow Depth=0.39' Max Vel=6.84 fps Inflow=21.5 cfs 1.0 af 96.0" x 108.0" Box Pipe n=0.011 L=50.0' S=0.0100' Capacity=1,604.0 cfs Outflow=21.5 cfs 1.0 af
Reach 3R: North Culvert	Avg. Flow Depth=0.03' Max Vel=5.23 fps Inflow=1.1 cfs 0.1 af 96.0" x 120.0" Box Pipe n=0.011 L=60.0' S=0.0333' Capacity=3,360.1 cfs Outflow=1.1 cfs 0.1 af
Pond BP-1: Bioretention Pond #1	Peak Elev=596.67' Storage=7,370 cf Inflow=6.9 cfs 0.3 af Discarded=0.1 cfs 0.2 af Primary=0.5 cfs 0.1 af Outflow=0.5 cfs 0.3 af

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Pond BP-2: Bioretention Pond #2	Peak Elev=602.25' Storage=1,221 cf Inflow=1.8 cfs 0.1 af Outflow=0.2 cfs 0.1 af
Pond BP-3: Bioretention Pond #3	Peak Elev=606.62' Storage=1,098 cf Inflow=1.4 cfs 0.1 af Outflow=0.1 cfs 0.1 af
Pond UIP-1: UIP-1	Peak Elev=595.92' Storage=35,782 cf Inflow=19.0 cfs 1.0 af Discarded=0.2 cfs 0.8 af Primary=0.0 cfs 0.0 af Outflow=0.2 cfs 0.8 af
Pond UIP-2: UIP-2	Peak Elev=585.53' Storage=6,463 cf Inflow=5.3 cfs 0.2 af Discarded=0.0 cfs 0.2 af Primary=0.2 cfs 0.1 af Outflow=0.2 cfs 0.2 af
Link DP-1: Brickyard Pond	Inflow=27.9 cfs 4.4 af Primary=27.9 cfs 4.4 af
Total Runoff Area = 108.18 ac Runoff Volume = 5.9 af Average Runoff Depth = 0.65" 91.08% Pervious = 98.53 ac 8.92% Impervious = 9.65 ac	

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Type II 24-hr 2-year Rainfall=2.50"

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Summary for Subcatchment PR-1: Subcat PR-1

Runoff = 10.4 cfs @ 12.21 hrs, Volume= 1.1 af, Depth= 0.46"
 Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 2-year Rainfall=2.50"

Area (ac)	CN	Description
0.00	61	>75% Grass cover, Good, HSG B
2.12	74	>75% Grass cover, Good, HSG C
0.12	98	Roofs, HSG C
0.00	55	Woods, Good, HSG B
27.38	70	Woods, Good, HSG C
29.63	70	Weighted Average
29.50		99.58% Pervious Area
0.12		0.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	50	0.0800	0.06		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
8.6	1,430	0.3100	2.78		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	490	0.0410	8.73	192.03	Channel Flow, Area= 22.0 sf Perim= 17.6' r= 1.25' n= 0.040 Earth, cobble bottom, clean sides
23.5	1,970	Total			

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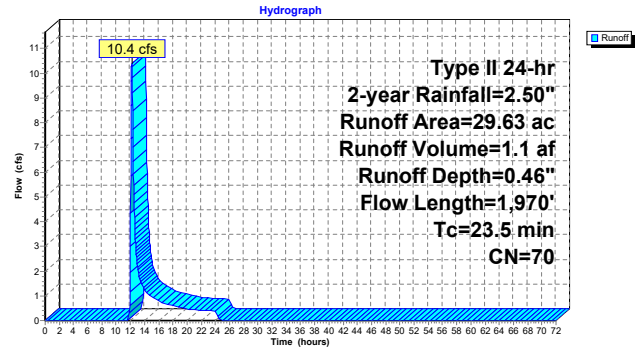
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Subcatchment PR-1: Subcat PR-1



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Summary for Subcatchment PR-10: Subcat PR-10

Runoff = 20.9 cfs @ 11.96 hrs, Volume= 0.9 af, Depth= 1.24"
 Routed to Reach 2R : South Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 2-year Rainfall=2.50"

Area (ac)	CN	Description
0.10	39	>75% Grass cover, Good, HSG A
0.71	61	>75% Grass cover, Good, HSG B
0.59	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.00	30	Brush, Good, HSG A
0.14	48	Brush, Good, HSG B
0.07	65	Brush, Good, HSG C
0.09	85	Gravel roads, HSG B
0.09	89	Gravel roads, HSG C
0.00	98	Paved parking, HSG A
0.16	98	Paved parking, HSG B
0.22	98	Paved parking, HSG C
0.05	98	Roofs, HSG B
0.07	98	Roofs, HSG C
0.81	98	Water Surface, 0% imp, HSG B
4.51	98	Water Surface, 0% imp, HSG C
0.21	98	Water Surface, 0% imp, HSG D
0.01	30	Woods, Good, HSG A
0.90	55	Woods, Good, HSG B
0.40	70	Woods, Good, HSG C
0.00	77	Woods, Good, HSG D
9.13	86	Weighted Average
8.63		94.49% Pervious Area
0.50		5.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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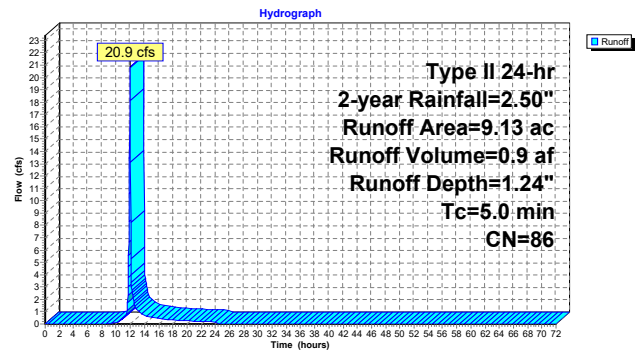
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Subcatchment PR-10: Subcat PR-10



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Summary for Subcatchment PR-11: Subcat PR-11

Runoff = 1.2 cfs @ 11.97 hrs, Volume= 0.1 af, Depth= 0.94"
 Routed to Pond BP-1 : Bioretention Pond #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 2-year Rainfall=2.50"

Area (ac)	CN	Description
0.00	39	>75% Grass cover, Good, HSG A
0.22	61	>75% Grass cover, Good, HSG B
0.16	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.00	65	Brush, Good, HSG C
0.01	98	Paved parking, HSG A
0.21	98	Paved parking, HSG B
0.03	98	Paved parking, HSG C
0.01	98	Paved parking, HSG D
0.02	98	Roofs, HSG A
0.03	98	Roofs, HSG B
0.00	98	Water Surface, 0% imp, HSG D
0.70	81	Weighted Average
0.36		54.40% Pervious Area
0.32		45.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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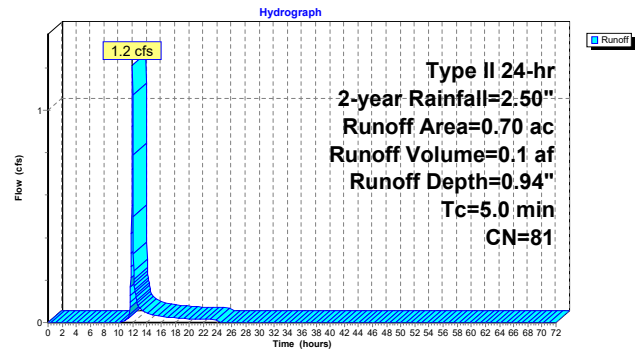
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Subcatchment PR-11: Subcat PR-11



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Summary for Subcatchment PR-12: Subcat PR-12

Runoff = 1.1 cfs @ 12.05 hrs, Volume= 0.1 af, Depth= 0.53"
 Routed to Reach 3R : North Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 2-year Rainfall=2.50"

Area (ac)	CN	Description
0.01	61	>75% Grass cover, Good, HSG B
0.09	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.02	48	Brush, Good, HSG B
0.00	98	Paved parking, HSG B
0.00	98	Paved parking, HSG C
0.00	98	Paved parking, HSG D
0.10	98	Water Surface, 0% imp, HSG B
0.01	98	Water Surface, 0% imp, HSG C
0.03	98	Water Surface, 0% imp, HSG D
0.06	55	Woods, Good, HSG B
1.28	70	Woods, Good, HSG C
1.60	72	Weighted Average
1.60		100.00% Pervious Area
0.00		0.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.3000	0.10		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
2.6	180	0.2200	1.17		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
0.8	180	0.0670	3.88		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
11.6	410				Total

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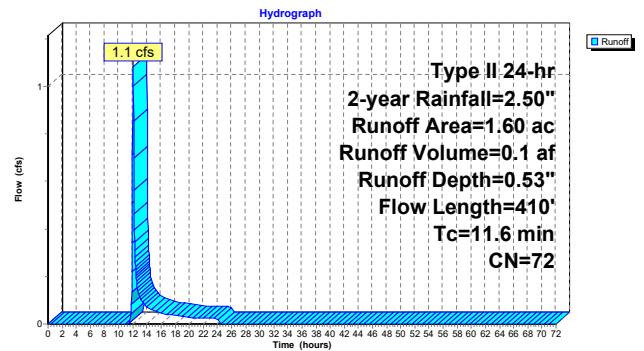
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Type II 24-hr 2-year Rainfall=2.50"

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Subcatchment PR-12: Subcat PR-12



Summary for Subcatchment PR-13: Subcat PR-13

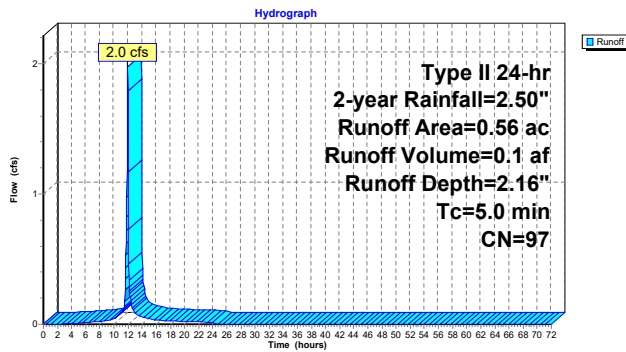
Runoff = 2.0 cfs @ 11.96 hrs, Volume= 0.1 af, Depth= 2.16"
 Routed to Pond UIP-1 : UIP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 2-year Rainfall=2.50"

Area (ac)	CN	Description
0.03	74	>75% Grass cover, Good, HSG C
0.09	98	Paved parking, HSG C
0.43	98	Roofs, HSG C
0.56	97	Weighted Average
0.03		5.99% Pervious Area
0.53		94.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-13: Subcat PR-13



Summary for Subcatchment PR-2: Subcat PR-2

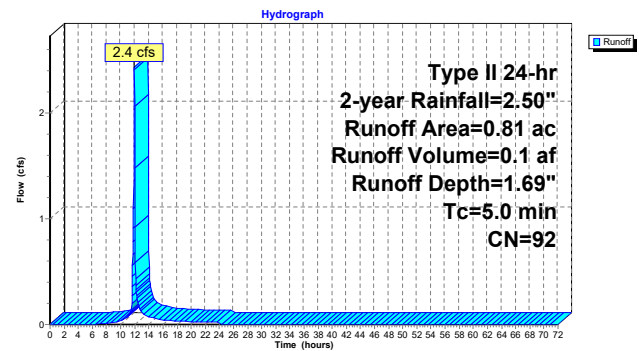
Runoff = 2.4 cfs @ 11.96 hrs, Volume= 0.1 af, Depth= 1.69"
 Routed to Pond UIP-2 : UIP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 2-year Rainfall=2.50"

Area (ac)	CN	Description
0.12	61	>75% Grass cover, Good, HSG B
0.00	48	Brush, Good, HSG B
0.40	98	Paved parking, HSG B
0.28	98	Roofs, HSG B
0.81	92	Weighted Average
0.13		15.46% Pervious Area
0.69		84.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-2: Subcat PR-2



Summary for Subcatchment PR-3: Subcat PR-3

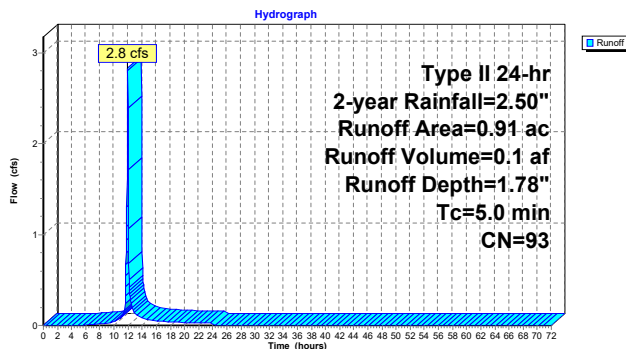
Runoff = 2.8 cfs @ 11.96 hrs, Volume= 0.1 af, Depth= 1.78"
 Routed to Pond UIP-2 : UIP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 2-year Rainfall=2.50"

Area (ac)	CN	Description
0.11	61	>75% Grass cover, Good, HSG B
0.00	74	>75% Grass cover, Good, HSG C
0.00	85	Gravel roads, HSG B
0.34	98	Paved parking, HSG B
0.46	98	Roofs, HSG B
0.00	98	Roofs, HSG C
0.91	93	Weighted Average
0.11		12.62% Pervious Area
0.79		87.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-3: Subcat PR-3



Summary for Subcatchment PR-4: Subcat PR-4

Runoff = 15.6 cfs @ 12.35 hrs, Volume= 2.1 af, Depth= 0.46"
 Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 2-year Rainfall=2.50"

Area (ac)	CN	Description
0.07	39	>75% Grass cover, Good, HSG A
0.57	61	>75% Grass cover, Good, HSG B
0.04	74	>75% Grass cover, Good, HSG C
0.00	30	Brush, Good, HSG A
0.88	48	Brush, Good, HSG B
0.18	98	Paved parking, HSG A
0.03	98	Paved parking, HSG B
0.05	98	Roofs, HSG B
1.26	98	Water Surface, 0% imp, HSG B
0.00	30	Woods, Good, HSG A
2.40	55	Woods, Good, HSG B
50.16	70	Woods, Good, HSG C
0.53	77	Woods, Good, HSG D
56.16	70	Weighted Average
55.91		99.55% Pervious Area
0.26		0.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.1600	0.08		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
15.3	2,100	0.2100	2.29		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.9	875	0.0200	2.12		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
32.8	3,025	Total			

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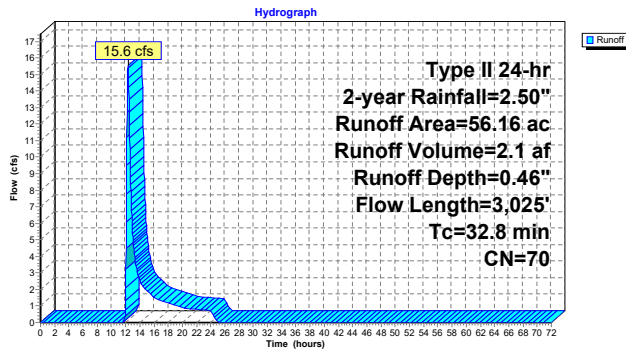
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Subcatchment PR-4: Subcat PR-4



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Summary for Subcatchment PR-5: Subcat PR-5

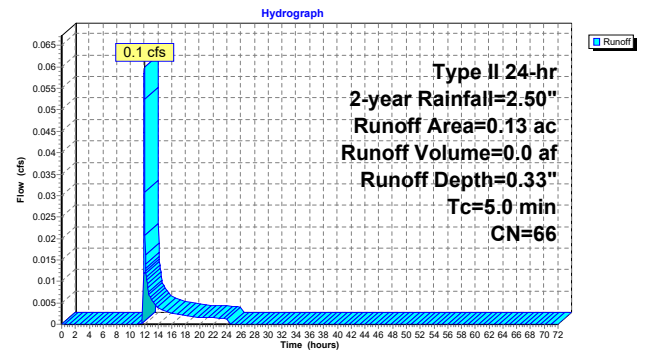
Runoff = 0.1 cfs @ 11.99 hrs, Volume= 0.0 af, Depth= 0.33"
Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 2-year Rainfall=2.50"

Area (ac)	CN	Description
0.11	61	>75% Grass cover, Good, HSG B
0.02	85	Gravel roads, HSG B
0.01	98	Paved parking, HSG B
0.13	66	Weighted Average
0.12		95.60% Pervious Area
0.01		4.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-5: Subcat PR-5



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Summary for Subcatchment PR-6: Subcat PR-6

Runoff = 16.7 cfs @ 11.96 hrs, Volume= 0.8 af, Depth= 1.78"
Routed to Pond UIP-1 : UIP-1

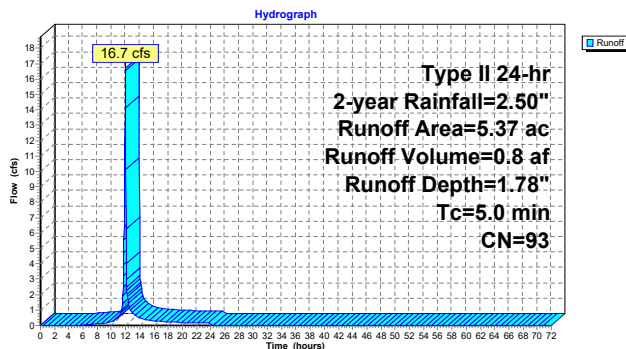
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 2-year Rainfall=2.50"

Area (ac)	CN	Description
0.29	61	>75% Grass cover, Good, HSG B
0.77	74	>75% Grass cover, Good, HSG C
0.47	98	Paved parking, HSG B
1.43	98	Paved parking, HSG C
0.49	98	Roofs, HSG B
1.92	98	Roofs, HSG C

5.37	93	Weighted Average
1.06		19.76% Pervious Area
4.31		80.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-6: Subcat PR-6



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Summary for Subcatchment PR-7: Subcat PR-7

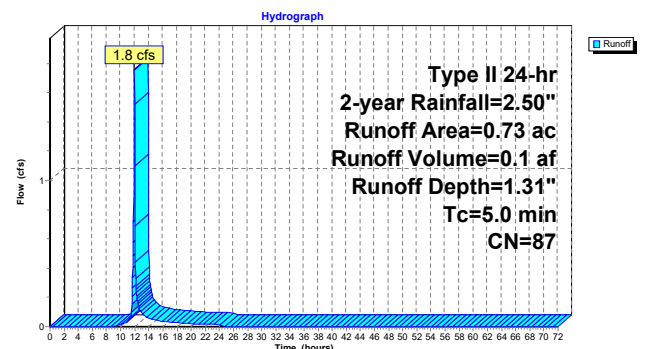
Runoff = 1.8 cfs @ 11.96 hrs, Volume= 0.1 af, Depth= 1.31"
Routed to Pond BP-2 : Bioretention Pond #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 2-year Rainfall=2.50"

Area (ac)	CN	Description
0.33	74	>75% Grass cover, Good, HSG C
0.38	98	Paved parking, HSG C
0.03	98	Roofs, HSG C
0.73	87	Weighted Average
0.33		44.61% Pervious Area
0.41		55.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-7: Subcat PR-7



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52933.00 - PR Type II 24-hr 2-year Rainfall=2.50"
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Summary for Subcatchment PR-8: Subcat PR-8

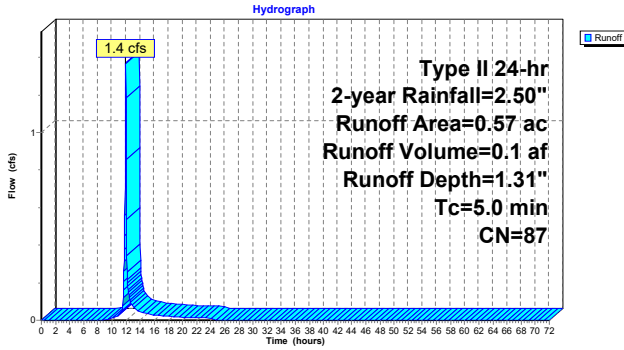
Runoff = 1.4 cfs @ 11.96 hrs, Volume= 0.1 af, Depth= 1.31"
Routed to Pond BP-3 : Bioretention Pond #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 2-year Rainfall=2.50"

Area (ac)	CN	Description
0.27	74	>75% Grass cover, Good, HSG C
0.28	98	Paved parking, HSG C
0.02	98	Roofs, HSG C
0.57	87	Weighted Average
0.27		47.33% Pervious Area
0.30		52.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-8: Subcat PR-8



Agenda Item 4.A 8/12/24 Planning Bd Mtg

52933.00 - PR Type II 24-hr 2-year Rainfall=2.50"
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Summary for Subcatchment PR-9: Subcat PR-9

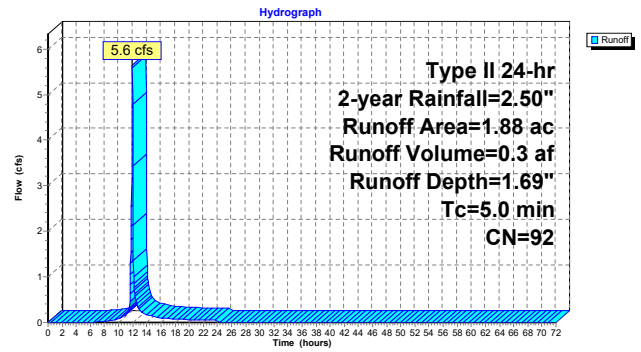
Runoff = 5.6 cfs @ 11.96 hrs, Volume= 0.3 af, Depth= 1.69"
Routed to Pond BP-1 : Bioretention Pond #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 2-year Rainfall=2.50"

Area (ac)	CN	Description
0.46	74	>75% Grass cover, Good, HSG C
0.50	98	Paved parking, HSG C
0.00	98	Roofs, HSG B
0.93	98	Roofs, HSG C
1.88	92	Weighted Average
0.46		24.26% Pervious Area
1.43		75.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-9: Subcat PR-9



52933.00 - PR Type II 24-hr 2-year Rainfall=2.50"
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Summary for Reach 2R: South Culvert

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 10.73 ac, 4.68% Impervious, Inflow Depth = 1.14" for 2-year event
Inflow = 21.5 cfs @ 11.96 hrs, Volume= 1.0 af
Outflow = 21.5 cfs @ 11.97 hrs, Volume= 1.0 af, Atten= 0%, Lag= 0.1 min
Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 6.84 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.76 fps, Avg. Travel Time= 0.3 min

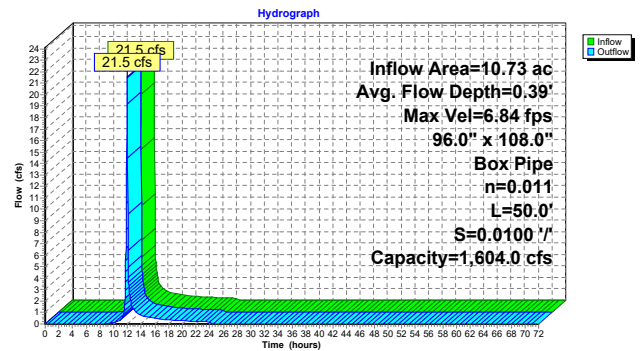
Peak Storage= 157 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.39', Surface Width= 8.00'
Bank-Full Depth= 9.00' Flow Area= 72.0 sf, Capacity= 1,604.0 cfs

96.0" W x 108.0" H Box Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 50.0' Slope= 0.0100 '/'
Inlet Invert= 597.50', Outlet Invert= 597.00'



52933.00 - PR Type II 24-hr 2-year Rainfall=2.50"
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Reach 2R: South Culvert



Stage-Area-Storage for Reach 2R: South Culvert

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
597.50	0.0	0	602.80	42.4	2,120
597.60	0.8	40	602.90	43.2	2,160
597.70	1.6	80	603.00	44.0	2,200
597.80	2.4	120	603.10	44.8	2,240
597.90	3.2	160	603.20	45.6	2,280
598.00	4.0	200	603.30	46.4	2,320
598.10	4.8	240	603.40	47.2	2,360
598.20	5.6	280	603.50	48.0	2,400
598.30	6.4	320	603.60	48.8	2,440
598.40	7.2	360	603.70	49.6	2,480
598.50	8.0	400	603.80	50.4	2,520
598.60	8.8	440	603.90	51.2	2,560
598.70	9.6	480	604.00	52.0	2,600
598.80	10.4	520	604.10	52.8	2,640
598.90	11.2	560	604.20	53.6	2,680
599.00	12.0	600	604.30	54.4	2,720
599.10	12.8	640	604.40	55.2	2,760
599.20	13.6	680	604.50	56.0	2,800
599.30	14.4	720	604.60	56.8	2,840
599.40	15.2	760	604.70	57.6	2,880
599.50	16.0	800	604.80	58.4	2,920
599.60	16.8	840	604.90	59.2	2,960
599.70	17.6	880	605.00	60.0	3,000
599.80	18.4	920	605.10	60.8	3,040
599.90	19.2	960	605.20	61.6	3,080
600.00	20.0	1,000	605.30	62.4	3,120
600.10	20.8	1,040	605.40	63.2	3,160
600.20	21.6	1,080	605.50	64.0	3,200
600.30	22.4	1,120	605.60	64.8	3,240
600.40	23.2	1,160	605.70	65.6	3,280
600.50	24.0	1,200	605.80	66.4	3,320
600.60	24.8	1,240	605.90	67.2	3,360
600.70	25.6	1,280	606.00	68.0	3,400
600.80	26.4	1,320	606.10	68.8	3,440
600.90	27.2	1,360	606.20	69.6	3,480
601.00	28.0	1,400	606.30	70.4	3,520
601.10	28.8	1,440	606.40	71.2	3,560
601.20	29.6	1,480	606.50	72.0	3,600
601.30	30.4	1,520			
601.40	31.2	1,560			
601.50	32.0	1,600			
601.60	32.8	1,640			
601.70	33.6	1,680			
601.80	34.4	1,720			
601.90	35.2	1,760			
602.00	36.0	1,800			
602.10	36.8	1,840			
602.20	37.6	1,880			
602.30	38.4	1,920			
602.40	39.2	1,960			
602.50	40.0	2,000			
602.60	40.8	2,040			
602.70	41.6	2,080			

Summary for Reach 3R: North Culvert

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.60 ac, 0.00% Impervious, Inflow Depth = 0.53" for 2-year event
 Inflow = 1.1 cfs @ 12.05 hrs, Volume= 0.1 af
 Outflow = 1.1 cfs @ 12.06 hrs, Volume= 0.1 af, Atten= 0%, Lag= 0.2 min
 Routed to Reach 2R : South Culvert

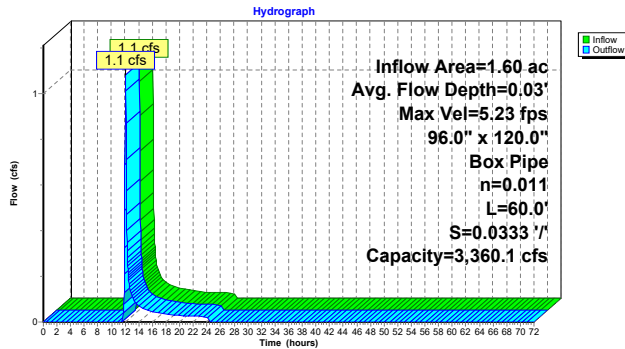
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Max. Velocity= 5.23 fps, Min. Travel Time= 0.2 min
 Avg. Velocity = 5.23 fps, Avg. Travel Time= 0.2 min

Peak Storage= 12 cf @ 12.06 hrs
 Average Depth at Peak Storage= 0.03' , Surface Width= 8.00'
 Bank-Full Depth= 10.00' Flow Area= 80.0 sf, Capacity= 3,360.1 cfs

96.0" W x 120.0" H Box Pipe
 n= 0.011 Concrete pipe, straight & clean
 Length= 60.0' Slope= 0.0333 '/'
 Inlet Invert= 602.00', Outlet Invert= 600.00'



Reach 3R: North Culvert



Stage-Area-Storage for Reach 3R: North Culvert

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
602.00	0.0	0	607.30	42.4	2,544
602.10	0.8	48	607.40	43.2	2,592
602.20	1.6	96	607.50	44.0	2,640
602.30	2.4	144	607.60	44.8	2,688
602.40	3.2	192	607.70	45.6	2,736
602.50	4.0	240	607.80	46.4	2,784
602.60	4.8	288	607.90	47.2	2,832
602.70	5.6	336	608.00	48.0	2,880
602.80	6.4	384	608.10	48.8	2,928
602.90	7.2	432	608.20	49.6	2,976
603.00	8.0	480	608.30	50.4	3,024
603.10	8.8	528	608.40	51.2	3,072
603.20	9.6	576	608.50	52.0	3,120
603.30	10.4	624	608.60	52.8	3,168
603.40	11.2	672	608.70	53.6	3,216
603.50	12.0	720	608.80	54.4	3,264
603.60	12.8	768	608.90	55.2	3,312
603.70	13.6	816	609.00	56.0	3,360
603.80	14.4	864	609.10	56.8	3,408
603.90	15.2	912	609.20	57.6	3,456
604.00	16.0	960	609.30	58.4	3,504
604.10	16.8	1,008	609.40	59.2	3,552
604.20	17.6	1,056	609.50	60.0	3,600
604.30	18.4	1,104	609.60	60.8	3,648
604.40	19.2	1,152	609.70	61.6	3,696
604.50	20.0	1,200	609.80	62.4	3,744
604.60	20.8	1,248	609.90	63.2	3,792
604.70	21.6	1,296	610.00	64.0	3,840
604.80	22.4	1,344	610.10	64.8	3,888
604.90	23.2	1,392	610.20	65.6	3,936
605.00	24.0	1,440	610.30	66.4	3,984
605.10	24.8	1,488	610.40	67.2	4,032
605.20	25.6	1,536	610.50	68.0	4,080
605.30	26.4	1,584	610.60	68.8	4,128
605.40	27.2	1,632	610.70	69.6	4,176
605.50	28.0	1,680	610.80	70.4	4,224
605.60	28.8	1,728	610.90	71.2	4,272
605.70	29.6	1,776	611.00	72.0	4,320
605.80	30.4	1,824	611.10	72.8	4,368
605.90	31.2	1,872	611.20	73.6	4,416
606.00	32.0	1,920	611.30	74.4	4,464
606.10	32.8	1,968	611.40	75.2	4,512
606.20	33.6	2,016	611.50	76.0	4,560
606.30	34.4	2,064	611.60	76.8	4,608
606.40	35.2	2,112	611.70	77.6	4,656
606.50	36.0	2,160	611.80	78.4	4,704
606.60	36.8	2,208	611.90	79.2	4,752
606.70	37.6	2,256	612.00	80.0	4,800
606.80	38.4	2,304			
606.90	39.2	2,352			
607.00	40.0	2,400			
607.10	40.8	2,448			
607.20	41.6	2,496			

Summary for Pond BP-1: Bioretention Pond #1

Inflow Area = 2.58 ac, 67.59% Impervious, Inflow Depth = 1.49" for 2-year event
 Inflow = 6.9 cfs @ 11.96 hrs, Volume= 0.3 af
 Outflow = 0.5 cfs @ 12.52 hrs, Volume= 0.3 af, Atten= 92%, Lag= 33.6 min
 Discarded = 0.1 cfs @ 12.52 hrs, Volume= 0.2 af
 Primary = 0.5 cfs @ 12.52 hrs, Volume= 0.1 af
 Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 596.67' @ 12.52 hrs Surf.Area= 4,901 sf Storage= 7,370 cf

Plug-Flow detention time= 888.4 min calculated for 0.3 af (100% of inflow)
 Center-of-Mass det. time= 889.1 min (1,699.8 - 810.7)

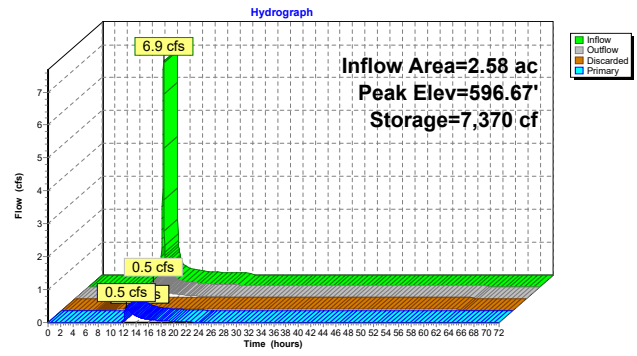
Volume	Invert	Avail.Storage	Storage Description			
#1	593.50'	21,619 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
593.50	3,350	303.7	0.0	0	0	3,350
595.00	3,350	303.7	10.0	503	503	3,806
598.00	6,338	360.3	100.0	14,296	14,798	6,958
599.00	7,314	382.0	100.0	6,820	21,619	8,292

Device	Routing	Invert	Outlet Devices
#1	Primary	595.00'	18.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 595.00' / 594.80' S= 0.0100' /' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	596.50'	24.0" W x 6.0" H Vert. Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	597.00'	48.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads
#4	Discarded	593.50'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.1 cfs @ 12.52 hrs HW=596.67' (Free Discharge)
4=Exfiltration (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.5 cfs @ 12.52 hrs HW=596.67' TW=0.00' (Dynamic Tailwater)
1=Culvert (Passes 0.5 cfs of 7.5 cfs potential flow)
2=Orifice (Orifice Controls 0.5 cfs @ 1.34 fps)
3=Grate (Controls 0.0 cfs)

Pond BP-1: Bioretention Pond #1



Stage-Area-Storage for Pond BP-1: Bioretention Pond #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
593.50	3,350	0	598.80	7,113	20,176
593.60	3,350	34	598.90	7,213	20,892
593.70	3,350	67	599.00	7,314	21,619
593.80	3,350	100			
593.90	3,350	134			
594.00	3,350	168			
594.10	3,350	201			
594.20	3,350	235			
594.30	3,350	268			
594.40	3,350	301			
594.50	3,350	335			
594.60	3,350	369			
594.70	3,350	402			
594.80	3,350	435			
594.90	3,350	469			
595.00	3,350	503			
595.10	3,434	842			
595.20	3,520	1,189			
595.30	3,606	1,546			
595.40	3,694	1,911			
595.50	3,782	2,285			
595.60	3,872	2,667			
595.70	3,963	3,059			
595.80	4,054	3,460			
595.90	4,147	3,870			
596.00	4,241	4,289			
596.10	4,336	4,718			
596.20	4,432	5,156			
596.30	4,529	5,605			
596.40	4,627	6,062			
596.50	4,726	6,530			
596.60	4,826	7,008			
596.70	4,927	7,495			
596.80	5,029	7,993			
596.90	5,133	8,501			
597.00	5,237	9,020			
597.10	5,342	9,549			
597.20	5,449	10,088			
597.30	5,556	10,638			
597.40	5,665	11,199			
597.50	5,774	11,771			
597.60	5,885	12,354			
597.70	5,997	12,948			
597.80	6,109	13,554			
597.90	6,223	14,170			
598.00	6,338	14,798			
598.10	6,452	15,437			
598.20	6,528	16,085			
598.30	6,623	16,742			
598.40	6,720	17,410			
598.50	6,817	18,086			
598.60	6,915	18,773			
598.70	7,014	19,470			

Summary for Pond BP-2: Bioretention Pond #2

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 0.73 ac, 55.39% Impervious, Inflow Depth = 1.31" for 2-year event
 Inflow = 1.8 cfs @ 11.96 hrs, Volume= 0.1 af
 Outflow = 0.2 cfs @ 12.35 hrs, Volume= 0.1 af, Atten= 89%, Lag= 23.4 min
 Primary = 0.2 cfs @ 12.35 hrs, Volume= 0.1 af
 Routed to Pond UIP-1 : UIP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 602.25' @ 12.35 hrs Surf.Area= 3,301 sf Storage= 1,221 cf

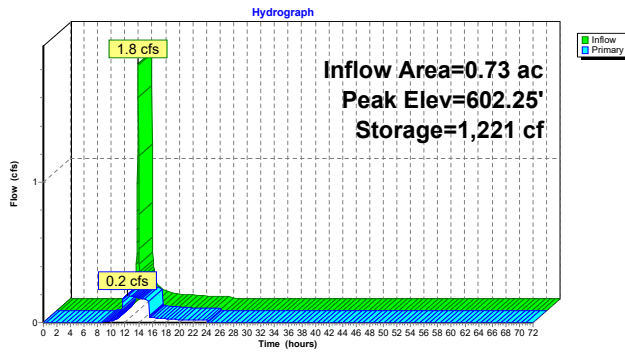
Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 45.9 min (871.6 - 825.7)

Volume	Invert	Avail.Storage	Storage Description			
#1	600.50'	9,543 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
600.50	2,922	537.6	0.0	0	0	2,922
602.00	2,922	537.6	10.0	438	438	3,728
603.00	4,564	556.9	100.0	3,713	4,151	5,496
604.00	6,264	576.4	100.0	5,392	9,543	7,344

Device	Routing	Invert	Outlet Devices
#1	Primary	597.90'	12.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 597.90' / 597.40' S= 0.0100' /' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	599.75'	6.0" Round Underdrain L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 599.75' / 599.65' S= 0.0100' /' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#3	Device 2	600.50'	2,500 in/hr Exfiltration over Surface area Phase-In= 0.01'
#4	Device 1	603.50'	12.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.2 cfs @ 12.35 hrs HW=602.25' TW=594.69' (Dynamic Tailwater)
1=Culvert (Passes 0.2 cfs of 7.1 cfs potential flow)
2=Underdrain (Passes 0.2 cfs of 1.4 cfs potential flow)
3=Exfiltration (Exfiltration Controls 0.2 cfs)
4=Grate (Controls 0.0 cfs)

Pond BP-2: Bioretention Pond #2



Stage-Area-Storage for Pond BP-2: Bioretention Pond #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
600.50	2,922	0	603.15	4,802	4,853
600.55	2,922	15	603.20	4,883	5,095
600.60	2,922	29	603.25	4,964	5,342
600.65	2,922	44	603.30	5,046	5,592
600.70	2,922	58	603.35	5,128	5,846
600.75	2,922	73	603.40	5,212	6,105
600.80	2,922	88	603.45	5,296	6,367
600.85	2,922	102	603.50	5,380	6,634
600.90	2,922	117	603.55	5,466	6,905
600.95	2,922	131	603.60	5,552	7,181
601.00	2,922	146	603.65	5,638	7,461
601.05	2,922	161	603.70	5,726	7,745
601.10	2,922	175	603.75	5,814	8,033
601.15	2,922	190	603.80	5,903	8,326
601.20	2,922	205	603.85	5,992	8,623
601.25	2,922	219	603.90	6,082	8,925
601.30	2,922	234	603.95	6,173	9,232
601.35	2,922	248	604.00	6,264	9,543
601.40	2,922	263			
601.45	2,922	278			
601.50	2,922	292			
601.55	2,922	307			
601.60	2,922	321			
601.65	2,922	336			
601.70	2,922	351			
601.75	2,922	365			
601.80	2,922	380			
601.85	2,922	394			
601.90	2,922	409			
601.95	2,922	424			
602.00	2,922	438			
602.05	2,995	586			
602.10	3,070	738			
602.15	3,145	893			
602.20	3,221	1,052			
602.25	3,298	1,215			
602.30	3,376	1,382			
602.35	3,455	1,553			
602.40	3,535	1,728			
602.45	3,616	1,907			
602.50	3,697	2,089			
602.55	3,780	2,276			
602.60	3,863	2,467			
602.65	3,948	2,663			
602.70	4,033	2,862			
602.75	4,119	3,066			
602.80	4,206	3,274			
602.85	4,294	3,487			
602.90	4,383	3,704			
602.95	4,473	3,925			
603.00	4,564	4,151			
603.05	4,643	4,381			
603.10	4,722	4,615			

Summary for Pond BP-3: Bioretention Pond #3

Inflow Area = 0.57 ac, 52.67% Impervious, Inflow Depth = 1.31" for 2-year event
 Inflow = 1.4 cfs @ 11.96 hrs, Volume = 0.1 af
 Outflow = 0.1 cfs @ 12.50 hrs, Volume = 0.1 af, Atten = 92%, Lag = 32.2 min
 Primary = 0.1 cfs @ 12.50 hrs, Volume = 0.1 af
 Routed to Pond UIP-1 : UIP-1

Routing by Dyn-Stor-Ind method, Time Span = 0.00-72.00 hrs, dt = 0.03 hrs / 2
 Peak Elev = 606.62' @ 12.50 hrs Surf.Area = 1,965 sf Storage = 1,098 cf

Plug-Flow detention time = 90.0 min calculated for 0.1 af (100% of inflow)
 Center-of-Mass det. time = 90.0 min (915.6 - 825.7)

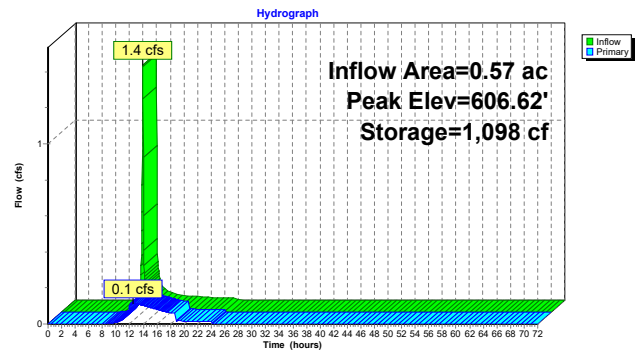
Volume	Invert	Avail.Storage	Storage Description			
#1	604.50'	5,393 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
604.50	1,082	510.4	0.0	0	0	1,082
606.00	1,082	510.4	10.0	162	162	1,848
607.00	2,627	548.9	100.0	1,798	1,961	5,136
608.00	4,307	570.7	100.0	3,433	5,393	7,157

Device	Routing	Invert	Outlet Devices
#1	Primary	603.50'	18.0" Round Culvert L = 60.0' CPP, square edge headwall, Ke = 0.500 Inlet / Outlet Invert = 603.50' / 593.80' S = 0.1617 ' Cc = 0.900 n = 0.013, Flow Area = 1.77 sf
#2	Device 1	603.75'	6.0" Round Underdrain L = 10.0' CPP, square edge headwall, Ke = 0.500 Inlet / Outlet Invert = 603.75' / 603.65' S = 0.0100 ' Cc = 0.900 n = 0.013, Flow Area = 0.20 sf
#3	Device 2	604.50'	2,500 in/hr Exfiltration over Surface area Phase-In = 0.01'
#4	Device 1	607.00'	18.0" Horiz. Grate C = 0.600 Limited to weir flow at low heads

Primary OutFlow Max = 0.1 cfs @ 12.50 hrs HW = 606.62' TW = 594.77' (Dynamic Tailwater)

- 1=Culvert (Passes 0.1 cfs of 13.1 cfs potential flow)
- 2=Underdrain (Passes 0.1 cfs of 1.5 cfs potential flow)
- 3=Exfiltration (Exfiltration Controls 0.1 cfs)
- 4=Grate (Controls 0.0 cfs)

Pond BP-3: Bioretention Pond #3



Stage-Area-Storage for Pond BP-3: Bioretention Pond #3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
604.50	1,082	0	607.15	2,853	2,371
604.55	1,082	5	607.20	2,930	2,516
604.60	1,082	11	607.25	3,008	2,664
604.65	1,082	16	607.30	3,088	2,817
604.70	1,082	22	607.35	3,168	2,973
604.75	1,082	27	607.40	3,249	3,134
604.80	1,082	32	607.45	3,332	3,298
604.85	1,082	38	607.50	3,415	3,467
604.90	1,082	43	607.55	3,500	3,640
604.95	1,082	49	607.60	3,585	3,817
605.00	1,082	54	607.65	3,672	3,998
605.05	1,082	60	607.70	3,760	4,184
605.10	1,082	65	607.75	3,848	4,374
605.15	1,082	70	607.80	3,938	4,569
605.20	1,082	76	607.85	4,029	4,768
605.25	1,082	81	607.90	4,120	4,972
605.30	1,082	87	607.95	4,213	5,180
605.35	1,082	92	608.00	4,307	5,393
605.40	1,082	97			
605.45	1,082	103			
605.50	1,082	108			
605.55	1,082	114			
605.60	1,082	119			
605.65	1,082	124			
605.70	1,082	130			
605.75	1,082	135			
605.80	1,082	141			
605.85	1,082	146			
605.90	1,082	151			
605.95	1,082	157			
606.00	1,082	162			
606.05	1,143	218			
606.10	1,206	277			
606.15	1,271	339			
606.20	1,337	404			
606.25	1,405	472			
606.30	1,475	544			
606.35	1,546	620			
606.40	1,619	699			
606.45	1,694	782			
606.50	1,770	868			
606.55	1,848	959			
606.60	1,928	1,053			
606.65	2,010	1,152			
606.70	2,093	1,254			
606.75	2,178	1,361			
606.80	2,264	1,472			
606.85	2,352	1,587			
606.90	2,442	1,707			
606.95	2,534	1,832			
607.00	2,627	1,961			
607.05	2,701	2,094			
607.10	2,776	2,231			

Summary for Pond UIP-1: UIP-1

Inflow Area = 7.23 ac, 76.62% Impervious, Inflow Depth = 1.72" for 2-year event
 Inflow = 19.0 cfs @ 11.96 hrs, Volume= 1.0 af
 Outflow = 0.2 cfs @ 9.87 hrs, Volume= 0.8 af, Atten= 99%, Lag= 0.0 min
 Discarded = 0.2 cfs @ 9.87 hrs, Volume= 0.8 af
 Primary = 0.0 cfs @ 0.00 hrs, Volume= 0.0 af
 Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 595.92' @ 24.04 hrs Surf.Area= 13,305 sf Storage= 35,782 cf

Plug-Flow detention time= 1,642.9 min calculated for 0.8 af (80% of inflow)
 Center-of-Mass det. time= 1,561.7 min (2,369.1 - 807.4)

Volume	Invert	Avail. Storage	Storage Description
#1A	592.30'	20,928 cf	64.83'W x 205.22'L x 6.75'H Field A 89,808 cf Overall - 37,487 cf Embedded = 52,321 cf x 40.0% Voids
#2A	593.05'	37,487 cf	ADS StormTech MC-7200 +Cap x 210 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 210 Chambers in 7 Rows Cap Storage= 39.5 cf x 2 x 7 rows = 553.0 cf
58,415 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	592.50'	24.0" Round Culvert L= 25.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 592.50' / 591.06' S= 0.0576' /' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	597.30'	5.0' long Sharp-Crested Rectangular Weir 2 End Contractions(s)
#3	Discarded	592.30'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.01'
#4	Device 1	596.05'	18.0" W x 15.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.2 cfs @ 9.87 hrs HW=592.37' (Free Discharge)
 3=Exfiltration (Exfiltration Controls 0.2 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=592.30' TW=0.00' (Dynamic Tailwater)
 1=Culvert (Controls 0.0 cfs)
 2=Sharp-Crested Rectangular Weir (Controls 0.0 cfs)
 4=Orifice/Grate (Controls 0.0 cfs)

Pond UIP-1: UIP-1 - Chamber Wizard Field A

Chamber Model = ADS StormTech MC-7200 +Cap (ADS StormTech® MC-7200 with cap volume)
 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf
 Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap
 Cap Storage= 39.5 cf x 2 x 7 rows = 553.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

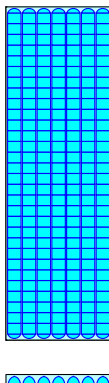
30 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 203.22' Row Length +12.0" End Stone x 2 =
 205.22' Base Length
 7 Rows x 100.0" Wide + 9.0" Spacing x 6 + 12.0" Side Stone x 2 = 64.83' Base Width
 9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

210 Chambers x 175.9 cf + 39.5 cf of Cap Volume x 2 x 7 Rows = 37,486.9 cf Chamber Storage

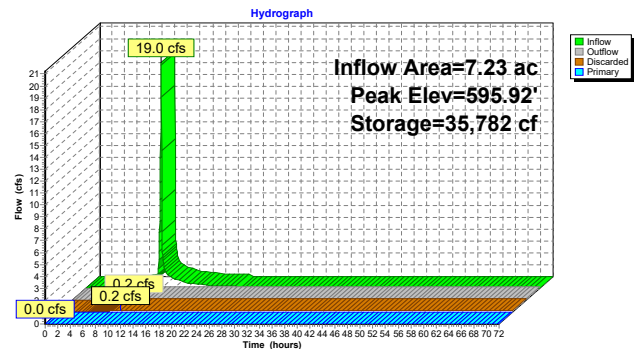
89,807.9 cf Field - 37,486.9 cf Chambers = 52,321.1 cf Stone x 40.0% Voids = 20,928.4 cf Stone Storage

Chamber Storage + Stone Storage = 58,415.3 cf = 1.3 af
 Overall Storage Efficiency = 65.0%
 Overall System Size = 205.22' x 64.83' x 6.75'

210 Chambers
 3,326.2 cy Field
 1,937.8 cy Stone



Pond UIP-1: UIP-1



Stage-Area-Storage for Pond UIP-1: UIP-1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
592.30	13,305	0	597.60	13,305	50,487
592.40	13,305	532	597.70	13,305	51,107
592.50	13,305	1,064	597.80	13,305	51,697
592.60	13,305	1,597	597.90	13,305	52,270
592.70	13,305	2,129	598.00	13,305	52,824
592.80	13,305	2,661	598.10	13,305	53,359
592.90	13,305	3,193	598.20	13,305	53,892
593.00	13,305	3,725	598.30	13,305	54,424
593.10	13,305	4,257	598.40	13,305	54,956
593.20	13,305	4,788	598.50	13,305	55,488
593.30	13,305	5,319	598.60	13,305	56,020
593.40	13,305	5,850	598.70	13,305	56,553
593.50	13,305	6,381	598.80	13,305	57,085
593.60	13,305	6,912	598.90	13,305	57,617
593.70	13,305	7,443	599.00	13,305	58,149
593.80	13,305	7,974			
593.90	13,305	8,505			
594.00	13,305	9,036			
594.10	13,305	9,567			
594.20	13,305	10,098			
594.30	13,305	10,629			
594.40	13,305	11,160			
594.50	13,305	11,691			
594.60	13,305	12,222			
594.70	13,305	12,753			
594.80	13,305	13,284			
594.90	13,305	13,815			
595.00	13,305	14,346			
595.10	13,305	14,877			
595.20	13,305	15,408			
595.30	13,305	15,939			
595.40	13,305	16,470			
595.50	13,305	17,001			
595.60	13,305	17,532			
595.70	13,305	18,063			
595.80	13,305	18,594			
595.90	13,305	19,125			
596.00	13,305	19,656			
596.10	13,305	20,187			
596.20	13,305	20,718			
596.30	13,305	21,249			
596.40	13,305	21,780			
596.50	13,305	22,311			
596.60	13,305	22,842			
596.70	13,305	23,373			
596.80	13,305	23,904			
596.90	13,305	24,435			
597.00	13,305	24,966			
597.10	13,305	25,497			
597.20	13,305	26,028			
597.30	13,305	26,559			
597.40	13,305	27,090			
597.50	13,305	27,621			

Summary for Pond UIP-2: UIP-2

Inflow Area = 1.72 ac, 86.04% Impervious, Inflow Depth = 1.74" for 2-year event
 Inflow = 5.3 cfs @ 11.96 hrs, Volume= 0.2 af
 Outflow = 0.2 cfs @ 13.41 hrs, Volume= 0.2 af, Atten= 96%, Lag= 87.1 min
 Discarded = 0.0 cfs @ 10.14 hrs, Volume= 0.2 af
 Primary = 0.2 cfs @ 13.41 hrs, Volume= 0.1 af
 Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 585.53' @ 13.41 hrs Surf.Area= 3,594 sf Storage= 6,463 cf

Plug-Flow detention time= 1,018.2 min calculated for 0.2 af (100% of inflow)
 Center-of-Mass det. time= 1,018.2 min (1,818.1 - 800.0)

Volume	Invert	Avail. Storage	Storage Description
#1A	583.00'	5,811 cf	28.50'W x 126.12'L x 6.75'H Field A 24,262 cf Overall - 9,734 cf Embedded = 14,527 cf x 40.0% Voids
#2A	583.75'	9,734 cf	ADS StormTech MC-7200 +Cap x 54 Inside #1 Effective Size= 91.2'W x 60.0'H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0'W x 60.0'H x 6.95'L with 0.36' Overlap 54 Chambers in 3 Rows Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf
15,545 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	583.00'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 583.00' / 582.80' S= 0.0100' /' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	585.25'	4.0" W x 27.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	587.50'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Discarded	583.00'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.0 cfs @ 10.14 hrs HW=583.07' (Free Discharge)
 4=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.2 cfs @ 13.41 hrs HW=585.53' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 0.2 cfs of 5.4 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.2 cfs @ 1.71 fps)
- 3=Sharp-Crested Rectangular Weir (Controls 0.0 cfs)

Pond UIP-2: UIP-2 - Chamber Wizard Field A

Chamber Model = ADS StormTech MC-7200 +Cap (ADS StormTech MC-7200 with cap volume)
 Effective Size= 91.2'W x 60.0'H => 26.68 sf x 6.59'L = 175.9 cf
 Overall Size= 100.0'W x 60.0'H x 6.95'L with 0.36' Overlap
 Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf

100.0" Wide x 9.0" Spacing = 109.0" C-C Row Spacing

18 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 124.12' Row Length +12.0" End Stone x 2 = 126.12' Base Length
 3 Rows x 100.0" Wide x 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width
 9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

54 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 3 Rows = 9,734.3 cf Chamber Storage

24,261.7 cf Field - 9,734.3 cf Chambers = 14,527.4 cf Stone x 40.0% Voids = 5,811.0 cf Stone Storage

Chamber Storage + Stone Storage = 15,545.2 cf = 0.4 af

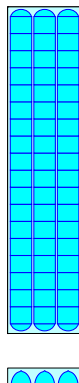
Overall Storage Efficiency = 64.1%

Overall System Size = 126.12' x 28.50' x 6.75'

54 Chambers

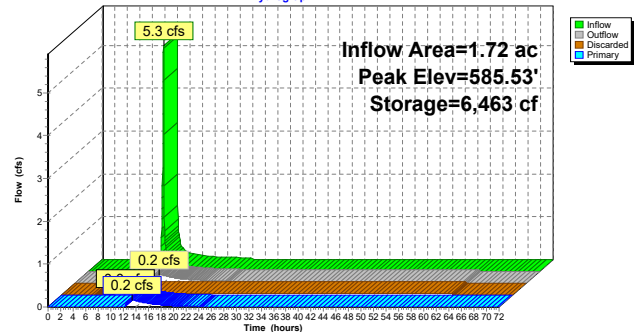
898.6 cy Field

538.1 cy Stone



Pond UIP-2: UIP-2

Hydrograph



Stage-Area-Storage for Pond UIP-2: UIP-2

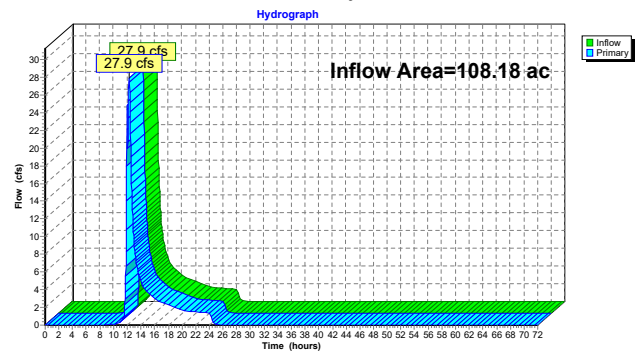
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
583.00	3,594	0	588.30	3,594	13,406
583.10	3,594	144	588.40	3,594	13,572
583.20	3,594	288	588.50	3,594	13,731
583.30	3,594	431	588.60	3,594	13,885
583.40	3,594	575	588.70	3,594	14,035
583.50	3,594	719	588.80	3,594	14,179
583.60	3,594	863	588.90	3,594	14,323
583.70	3,594	1,006	589.00	3,594	14,467
583.80	3,594	1,233	589.10	3,594	14,611
583.90	3,594	1,543	589.20	3,594	14,754
584.00	3,594	1,852	589.30	3,594	14,898
584.10	3,594	2,159	589.40	3,594	15,042
584.20	3,594	2,467	589.50	3,594	15,186
584.30	3,594	2,773	589.60	3,594	15,330
584.40	3,594	3,079	589.70	3,594	15,473
584.50	3,594	3,383			
584.60	3,594	3,687			
584.70	3,594	3,990			
584.80	3,594	4,291			
584.90	3,594	4,592			
585.00	3,594	4,891			
585.10	3,594	5,189			
585.20	3,594	5,485			
585.30	3,594	5,780			
585.40	3,594	6,074			
585.50	3,594	6,366			
585.60	3,594	6,656			
585.70	3,594	6,945			
585.80	3,594	7,231			
585.90	3,594	7,516			
586.00	3,594	7,799			
586.10	3,594	8,079			
586.20	3,594	8,358			
586.30	3,594	8,634			
586.40	3,594	8,908			
586.50	3,594	9,179			
586.60	3,594	9,447			
586.70	3,594	9,713			
586.80	3,594	9,976			
586.90	3,594	10,236			
587.00	3,594	10,492			
587.10	3,594	10,745			
587.20	3,594	10,995			
587.30	3,594	11,241			
587.40	3,594	11,482			
587.50	3,594	11,720			
587.60	3,594	11,953			
587.70	3,594	12,180			
587.80	3,594	12,403			
587.90	3,594	12,620			
588.00	3,594	12,830			
588.10	3,594	13,032			
588.20	3,594	13,225			

Summary for Link DP-1: Brickyard Pond

Inflow Area = 108.18 ac, 8.92% Impervious, Inflow Depth = 0.49" for 2-year event
 Inflow = 27.9 cfs @ 12.27 hrs, Volume = 4.4 af
 Primary = 27.9 cfs @ 12.27 hrs, Volume = 4.4 af, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-72.00 hrs, dt = 0.03 hrs

Link DP-1: Brickyard Pond



Time span=0.00-72.00 hrs, dt=0.03 hrs, 2401 points x 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR-1: Subcat PR-1	Runoff Area=29.63 ac 0.42% Impervious Runoff Depth=1.06" Flow Length=1,970' Tc=23.5 min CN=70 Runoff=29.2 cfs 2.6 af
Subcatchment PR-10: Subcat PR-10	Runoff Area=9.13 ac 5.51% Impervious Runoff Depth=2.17" Tc=5.0 min CN=86 Runoff=2.3 cfs 0.1 af
Subcatchment PR-11: Subcat PR-11	Runoff Area=0.70 ac 45.60% Impervious Runoff Depth=1.77" Tc=5.0 min CN=81 Runoff=2.3 cfs 0.1 af
Subcatchment PR-12: Subcat PR-12	Runoff Area=1.60 ac 0.00% Impervious Runoff Depth=1.17" Flow Length=410' Tc=11.6 min CN=72 Runoff=2.7 cfs 0.2 af
Subcatchment PR-13: Subcat PR-13	Runoff Area=0.56 ac 94.01% Impervious Runoff Depth=3.23" Tc=5.0 min CN=97 Runoff=2.9 cfs 0.2 af
Subcatchment PR-2: Subcat PR-2	Runoff Area=0.81 ac 84.54% Impervious Runoff Depth=2.71" Tc=5.0 min CN=92 Runoff=3.8 cfs 0.2 af
Subcatchment PR-3: Subcat PR-3	Runoff Area=0.91 ac 87.38% Impervious Runoff Depth=2.81" Tc=5.0 min CN=93 Runoff=4.3 cfs 0.2 af
Subcatchment PR-4: Subcat PR-4	Runoff Area=56.16 ac 0.45% Impervious Runoff Depth=1.06" Flow Length=3,025' Tc=32.8 min CN=70 Runoff=43.9 cfs 5.0 af
Subcatchment PR-5: Subcat PR-5	Runoff Area=0.13 ac 4.40% Impervious Runoff Depth=0.84" Tc=5.0 min CN=66 Runoff=0.2 cfs 0.0 af
Subcatchment PR-6: Subcat PR-6	Runoff Area=5.37 ac 80.24% Impervious Runoff Depth=2.81" Tc=5.0 min CN=93 Runoff=25.7 cfs 1.3 af
Subcatchment PR-7: Subcat PR-7	Runoff Area=0.73 ac 55.39% Impervious Runoff Depth=2.25" Tc=5.0 min CN=87 Runoff=3.0 cfs 0.1 af
Subcatchment PR-8: Subcat PR-8	Runoff Area=0.57 ac 52.67% Impervious Runoff Depth=2.25" Tc=5.0 min CN=87 Runoff=2.3 cfs 0.1 af
Subcatchment PR-9: Subcat PR-9	Runoff Area=1.88 ac 75.74% Impervious Runoff Depth=2.71" Tc=5.0 min CN=92 Runoff=8.8 cfs 0.4 af
Reach 2R: South Culvert	Avg. Flow Depth=0.56' Max Vel=8.40 fps Inflow=37.6 cfs 1.8 af 96.0" x 108.0" Box Pipe n=0.011 L=50.0' S=0.0100' Capacity=1,604.0 cfs Outflow=37.6 cfs 1.8 af
Reach 3R: North Culvert	Avg. Flow Depth=0.06' Max Vel=5.23 fps Inflow=2.7 cfs 0.2 af 96.0" x 120.0" Box Pipe n=0.011 L=60.0' S=0.0333' Capacity=3,360.1 cfs Outflow=2.6 cfs 0.2 af
Pond BP-1: Bioretention Pond #1	Peak Elev=597.17' Storage=9,926 cf Inflow=11.1 cfs 0.5 af Discarded=0.1 cfs 0.2 af Primary=5.9 cfs 0.3 af Outflow=6.0 cfs 0.5 af

Pond BP-2: Bioretention Pond #2	Peak Elev=602.59' Storage=2,444 cf Inflow=3.0 cfs 0.1 af Outflow=0.2 cfs 0.1 af
Pond BP-3: Bioretention Pond #3	Peak Elev=607.03' Storage=2,030 cf Inflow=2.3 cfs 0.1 af Outflow=0.2 cfs 0.1 af
Pond UIP-1: UIP-1	Peak Elev=596.46' Storage=41,092 cf Inflow=28.9 cfs 1.7 af Discarded=0.2 cfs 0.9 af Primary=1.3 cfs 0.5 af Outflow=1.4 cfs 1.4 af
Pond UIP-2: UIP-2	Peak Elev=586.35' Storage=8,760 cf Inflow=8.1 cfs 0.4 af Discarded=0.0 cfs 0.2 af Primary=1.2 cfs 0.2 af Outflow=1.3 cfs 0.4 af
Link DP-1: Brickyard Pond	Inflow=78.4 cfs 10.4 af Primary=78.4 cfs 10.4 af
Total Runoff Area = 108.18 ac Runoff Volume = 12.0 af Average Runoff Depth = 1.33"	
91.08% Pervious = 98.53 ac 8.92% Impervious = 9.65 ac	

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Type II 24-hr 10-year Rainfall=3.58"

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Summary for Subcatchment PR-1: Subcat PR-1

Runoff = 29.2 cfs @ 12.19 hrs, Volume= 2.6 af, Depth= 1.06"
 Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 10-year Rainfall=3.58"

Area (ac)	CN	Description
0.00	61	>75% Grass cover, Good, HSG B
2.12	74	>75% Grass cover, Good, HSG C
0.12	98	Roofs, HSG C
0.00	55	Woods, Good, HSG B
27.38	70	Woods, Good, HSG C
29.63	70	Weighted Average
29.50		99.58% Pervious Area
0.12		0.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	50	0.0800	0.06		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
8.6	1,430	0.3100	2.78		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	490	0.0410	8.73	192.03	Channel Flow, Area= 22.0 sf Perim= 17.6' r= 1.25' n= 0.040 Earth, cobble bottom, clean sides
23.5	1,970	Total			

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Type II 24-hr 10-year Rainfall=3.58"

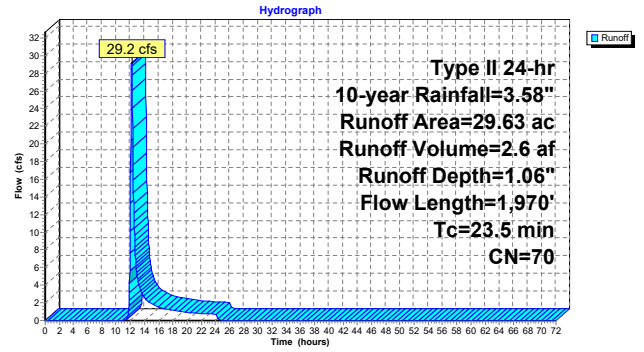
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Subcatchment PR-1: Subcat PR-1



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Type II 24-hr 10-year Rainfall=3.58"

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Summary for Subcatchment PR-10: Subcat PR-10

Runoff = 35.8 cfs @ 11.96 hrs, Volume= 1.7 af, Depth= 2.17"
 Routed to Reach 2R : South Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 10-year Rainfall=3.58"

Area (ac)	CN	Description
0.10	39	>75% Grass cover, Good, HSG A
0.71	61	>75% Grass cover, Good, HSG B
0.59	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.00	30	Brush, Good, HSG A
0.14	48	Brush, Good, HSG B
0.07	65	Brush, Good, HSG C
0.09	85	Gravel roads, HSG B
0.09	89	Gravel roads, HSG C
0.00	98	Paved parking, HSG A
0.16	98	Paved parking, HSG B
0.22	98	Paved parking, HSG C
0.05	98	Roofs, HSG B
0.07	98	Roofs, HSG C
0.81	98	Water Surface, 0% imp, HSG B
4.51	98	Water Surface, 0% imp, HSG C
0.21	98	Water Surface, 0% imp, HSG D
0.01	30	Woods, Good, HSG A
0.90	55	Woods, Good, HSG B
0.40	70	Woods, Good, HSG C
0.00	77	Woods, Good, HSG D
9.13	86	Weighted Average
8.63		94.49% Pervious Area
0.50		5.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type II 24-hr 10-year Rainfall=3.58"

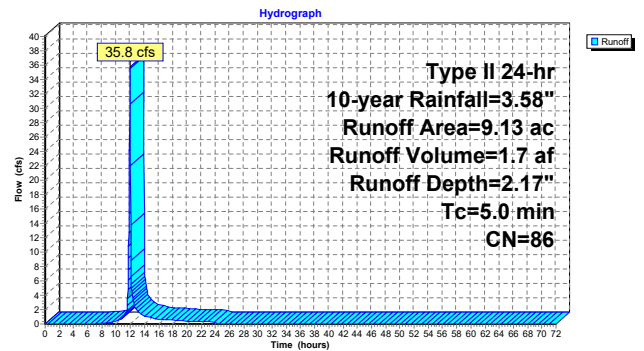
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Subcatchment PR-10: Subcat PR-10



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Type II 24-hr 10-year Rainfall=3.58"

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Summary for Subcatchment PR-11: Subcat PR-11

Runoff = 2.3 cfs @ 11.96 hrs, Volume= 0.1 af, Depth= 1.77"
 Routed to Pond BP-1 : Bioretention Pond #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 10-year Rainfall=3.58"

Area (ac)	CN	Description
0.00	39	>75% Grass cover, Good, HSG A
0.22	61	>75% Grass cover, Good, HSG B
0.16	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.00	65	Brush, Good, HSG C
0.01	98	Paved parking, HSG A
0.21	98	Paved parking, HSG B
0.03	98	Paved parking, HSG C
0.01	98	Paved parking, HSG D
0.02	98	Roofs, HSG A
0.03	98	Roofs, HSG B
0.00	98	Water Surface, 0% imp, HSG D
0.70	81	Weighted Average
0.36		54.40% Pervious Area
0.32		45.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type II 24-hr 10-year Rainfall=3.58"

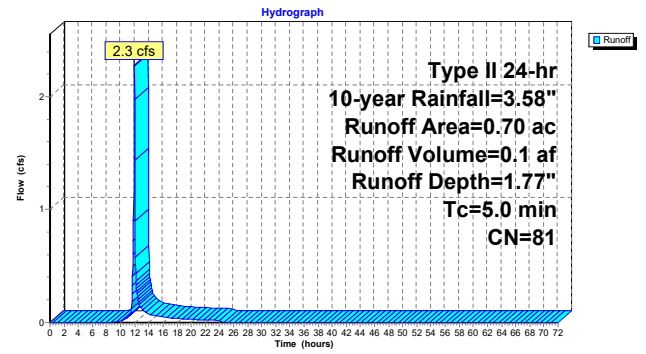
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Subcatchment PR-11: Subcat PR-11



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Type II 24-hr 10-year Rainfall=3.58"

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Summary for Subcatchment PR-12: Subcat PR-12

Runoff = 2.7 cfs @ 12.04 hrs, Volume= 0.2 af, Depth= 1.17"
 Routed to Reach 3R : North Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 10-year Rainfall=3.58"

Area (ac)	CN	Description
0.01	61	>75% Grass cover, Good, HSG B
0.09	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.02	48	Brush, Good, HSG B
0.00	98	Paved parking, HSG B
0.00	98	Paved parking, HSG C
0.00	98	Paved parking, HSG D
0.10	98	Water Surface, 0% imp, HSG B
0.01	98	Water Surface, 0% imp, HSG C
0.03	98	Water Surface, 0% imp, HSG D
0.06	55	Woods, Good, HSG B
1.28	70	Woods, Good, HSG C
1.60	72	Weighted Average
1.60		100.00% Pervious Area
0.00		0.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.3000	0.10		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
2.6	180	0.2200	1.17		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
0.8	180	0.0670	3.88		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
11.6	410				Total

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Type II 24-hr 10-year Rainfall=3.58"

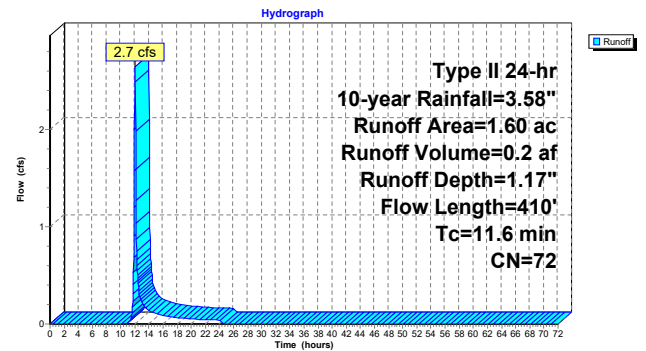
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Subcatchment PR-12: Subcat PR-12



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Summary for Subcatchment PR-13: Subcat PR-13

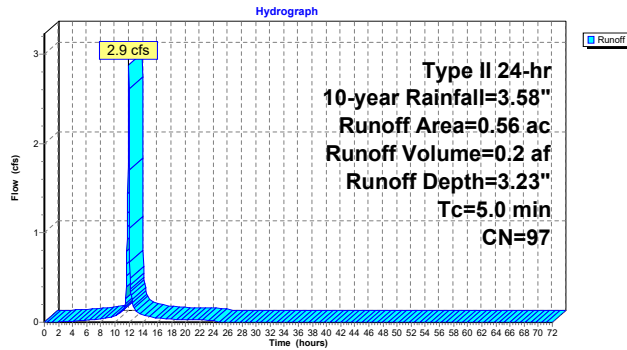
Runoff = 2.9 cfs @ 11.96 hrs, Volume= 0.2 af, Depth= 3.23"
 Routed to Pond UIP-1 : UIP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 10-year Rainfall=3.58"

Area (ac)	CN	Description
0.03	74	>75% Grass cover, Good, HSG C
0.09	98	Paved parking, HSG C
0.43	98	Roofs, HSG C
0.56	97	Weighted Average
0.03		5.99% Pervious Area
0.53		94.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-13: Subcat PR-13



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Summary for Subcatchment PR-2: Subcat PR-2

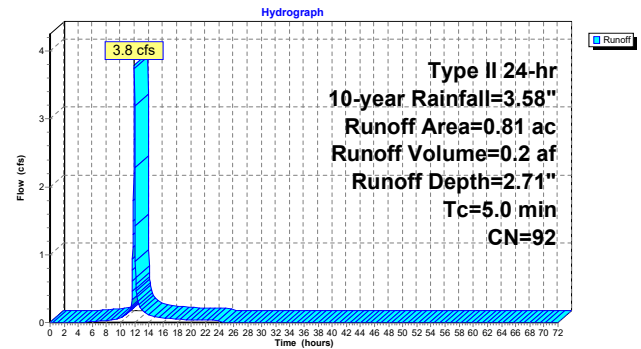
Runoff = 3.8 cfs @ 11.96 hrs, Volume= 0.2 af, Depth= 2.71"
 Routed to Pond UIP-2 : UIP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 10-year Rainfall=3.58"

Area (ac)	CN	Description
0.12	61	>75% Grass cover, Good, HSG B
0.00	48	Brush, Good, HSG B
0.40	98	Paved parking, HSG B
0.28	98	Roofs, HSG B
0.81	92	Weighted Average
0.13		15.46% Pervious Area
0.69		84.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-2: Subcat PR-2



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Summary for Subcatchment PR-3: Subcat PR-3

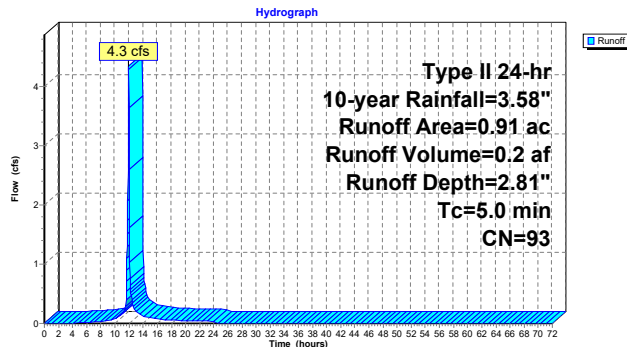
Runoff = 4.3 cfs @ 11.96 hrs, Volume= 0.2 af, Depth= 2.81"
 Routed to Pond UIP-2 : UIP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 10-year Rainfall=3.58"

Area (ac)	CN	Description
0.11	61	>75% Grass cover, Good, HSG B
0.00	74	>75% Grass cover, Good, HSG C
0.00	85	Gravel roads, HSG B
0.34	98	Paved parking, HSG B
0.46	98	Roofs, HSG B
0.00	98	Roofs, HSG C
0.91	93	Weighted Average
0.11		12.62% Pervious Area
0.79		87.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-3: Subcat PR-3



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Summary for Subcatchment PR-4: Subcat PR-4

Runoff = 43.9 cfs @ 12.31 hrs, Volume= 5.0 af, Depth= 1.06"
 Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 10-year Rainfall=3.58"

Area (ac)	CN	Description
0.07	39	>75% Grass cover, Good, HSG A
0.57	61	>75% Grass cover, Good, HSG B
0.04	74	>75% Grass cover, Good, HSG C
0.00	30	Brush, Good, HSG A
0.88	48	Brush, Good, HSG B
0.18	98	Paved parking, HSG A
0.03	98	Paved parking, HSG B
0.05	98	Roofs, HSG B
1.26	98	Water Surface, 0% imp, HSG B
0.00	30	Woods, Good, HSG A
2.40	55	Woods, Good, HSG B
50.16	70	Woods, Good, HSG C
0.53	77	Woods, Good, HSG D
56.16	70	Weighted Average
55.91		99.55% Pervious Area
0.26		0.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.1600	0.08		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
15.3	2,100	0.2100	2.29		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.9	875	0.0200	2.12		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
32.8	3,025	Total			

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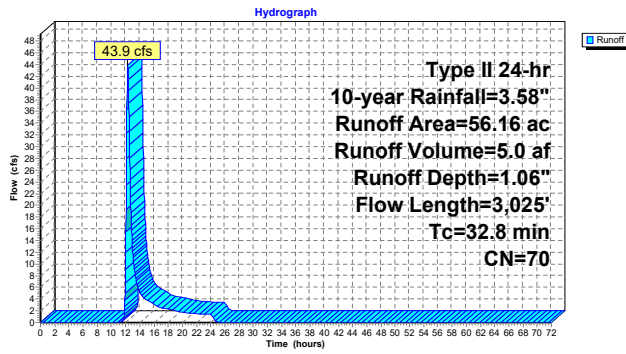
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Subcatchment PR-4: Subcat PR-4



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Summary for Subcatchment PR-5: Subcat PR-5

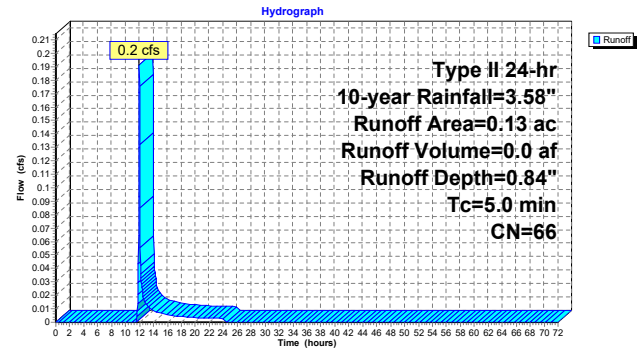
Runoff = 0.2 cfs @ 11.97 hrs, Volume= 0.0 af, Depth= 0.84"
Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 10-year Rainfall=3.58"

Area (ac)	CN	Description
0.11	61	>75% Grass cover, Good, HSG B
0.02	85	Gravel roads, HSG B
0.01	98	Paved parking, HSG B
0.13	66	Weighted Average
0.12		95.60% Pervious Area
0.01		4.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-5: Subcat PR-5



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Summary for Subcatchment PR-6: Subcat PR-6

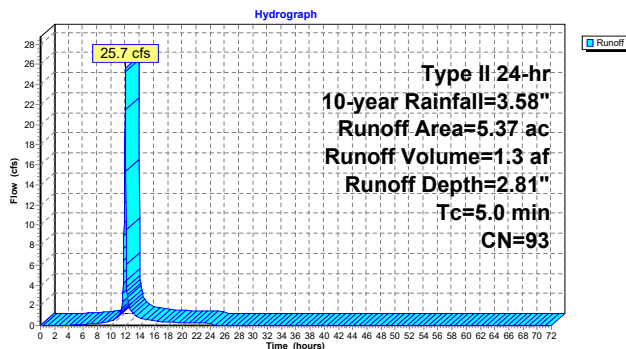
Runoff = 25.7 cfs @ 11.96 hrs, Volume= 1.3 af, Depth= 2.81"
Routed to Pond UIP-1 : UIP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 10-year Rainfall=3.58"

Area (ac)	CN	Description
0.29	61	>75% Grass cover, Good, HSG B
0.77	74	>75% Grass cover, Good, HSG C
0.47	98	Paved parking, HSG B
1.43	98	Paved parking, HSG C
0.49	98	Roofs, HSG B
1.92	98	Roofs, HSG C
5.37	93	Weighted Average
1.06		19.76% Pervious Area
4.31		80.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-6: Subcat PR-6



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Summary for Subcatchment PR-7: Subcat PR-7

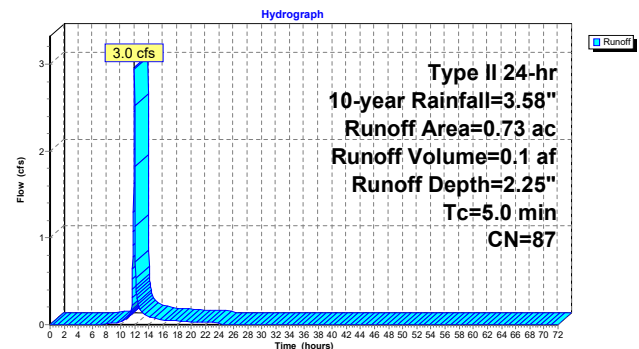
Runoff = 3.0 cfs @ 11.96 hrs, Volume= 0.1 af, Depth= 2.25"
Routed to Pond BP-2 : Bioretention Pond #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 10-year Rainfall=3.58"

Area (ac)	CN	Description
0.33	74	>75% Grass cover, Good, HSG C
0.38	98	Paved parking, HSG C
0.03	98	Roofs, HSG C
0.73	87	Weighted Average
0.33		44.61% Pervious Area
0.41		55.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-7: Subcat PR-7



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Summary for Subcatchment PR-8: Subcat PR-8

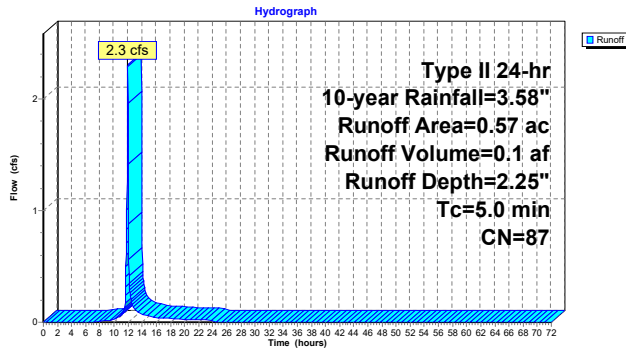
Runoff = 2.3 cfs @ 11.96 hrs, Volume= 0.1 af, Depth= 2.25"
 Routed to Pond BP-3 : Bioretention Pond #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 10-year Rainfall=3.58"

Area (ac)	CN	Description
0.27	74	>75% Grass cover, Good, HSG C
0.28	98	Paved parking, HSG C
0.02	98	Roofs, HSG C
0.57	87	Weighted Average
0.27		47.33% Pervious Area
0.30		52.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-8: Subcat PR-8



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Summary for Subcatchment PR-9: Subcat PR-9

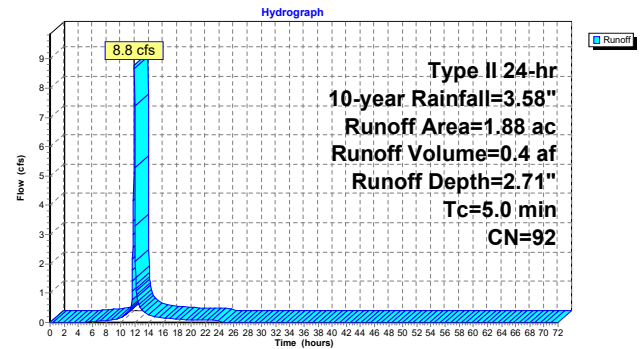
Runoff = 8.8 cfs @ 11.96 hrs, Volume= 0.4 af, Depth= 2.71"
 Routed to Pond BP-1 : Bioretention Pond #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 10-year Rainfall=3.58"

Area (ac)	CN	Description
0.46	74	>75% Grass cover, Good, HSG C
0.50	98	Paved parking, HSG C
0.00	98	Roofs, HSG B
0.93	98	Roofs, HSG C
1.88	92	Weighted Average
0.46		24.26% Pervious Area
1.43		75.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-9: Subcat PR-9



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Summary for Reach 2R: South Culvert

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 10.73 ac, 4.68% Impervious, Inflow Depth = 2.02" for 10-year event
 Inflow = 37.6 cfs @ 11.96 hrs, Volume= 1.8 af
 Outflow = 37.6 cfs @ 11.96 hrs, Volume= 1.8 af, Atten= 0%, Lag= 0.1 min
 Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Max. Velocity= 8.40 fps, Min. Travel Time= 0.1 min
 Avg. Velocity = 2.81 fps, Avg. Travel Time= 0.3 min

Peak Storage= 224 cf @ 11.96 hrs
 Average Depth at Peak Storage= 0.56', Surface Width= 8.00'
 Bank-Full Depth= 9.00' Flow Area= 72.0 sf, Capacity= 1,604.0 cfs

96.0" W x 108.0" H Box Pipe
 n= 0.011 Concrete pipe, straight & clean
 Length= 50.0' Slope= 0.0100 '/'
 Inlet Invert= 597.50', Outlet Invert= 597.00'



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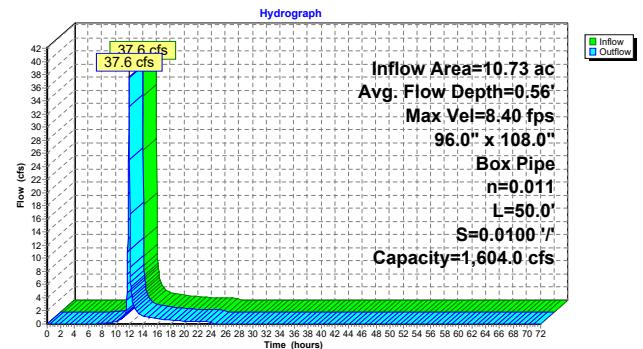
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Reach 2R: South Culvert



Stage-Area-Storage for Reach 2R: South Culvert

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
597.50	0.0	0	602.80	42.4	2,120
597.60	0.8	40	602.90	43.2	2,160
597.70	1.6	80	603.00	44.0	2,200
597.80	2.4	120	603.10	44.8	2,240
597.90	3.2	160	603.20	45.6	2,280
598.00	4.0	200	603.30	46.4	2,320
598.10	4.8	240	603.40	47.2	2,360
598.20	5.6	280	603.50	48.0	2,400
598.30	6.4	320	603.60	48.8	2,440
598.40	7.2	360	603.70	49.6	2,480
598.50	8.0	400	603.80	50.4	2,520
598.60	8.8	440	603.90	51.2	2,560
598.70	9.6	480	604.00	52.0	2,600
598.80	10.4	520	604.10	52.8	2,640
598.90	11.2	560	604.20	53.6	2,680
599.00	12.0	600	604.30	54.4	2,720
599.10	12.8	640	604.40	55.2	2,760
599.20	13.6	680	604.50	56.0	2,800
599.30	14.4	720	604.60	56.8	2,840
599.40	15.2	760	604.70	57.6	2,880
599.50	16.0	800	604.80	58.4	2,920
599.60	16.8	840	604.90	59.2	2,960
599.70	17.6	880	605.00	60.0	3,000
599.80	18.4	920	605.10	60.8	3,040
599.90	19.2	960	605.20	61.6	3,080
600.00	20.0	1,000	605.30	62.4	3,120
600.10	20.8	1,040	605.40	63.2	3,160
600.20	21.6	1,080	605.50	64.0	3,200
600.30	22.4	1,120	605.60	64.8	3,240
600.40	23.2	1,160	605.70	65.6	3,280
600.50	24.0	1,200	605.80	66.4	3,320
600.60	24.8	1,240	605.90	67.2	3,360
600.70	25.6	1,280	606.00	68.0	3,400
600.80	26.4	1,320	606.10	68.8	3,440
600.90	27.2	1,360	606.20	69.6	3,480
601.00	28.0	1,400	606.30	70.4	3,520
601.10	28.8	1,440	606.40	71.2	3,560
601.20	29.6	1,480	606.50	72.0	3,600
601.30	30.4	1,520			
601.40	31.2	1,560			
601.50	32.0	1,600			
601.60	32.8	1,640			
601.70	33.6	1,680			
601.80	34.4	1,720			
601.90	35.2	1,760			
602.00	36.0	1,800			
602.10	36.8	1,840			
602.20	37.6	1,880			
602.30	38.4	1,920			
602.40	39.2	1,960			
602.50	40.0	2,000			
602.60	40.8	2,040			
602.70	41.6	2,080			

Summary for Reach 3R: North Culvert

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.60 ac, 0.00% Impervious, Inflow Depth = 1.17" for 10-year event
 Inflow = 2.7 cfs @ 12.04 hrs, Volume= 0.2 af
 Outflow = 2.6 cfs @ 12.05 hrs, Volume= 0.2 af, Atten= 0%, Lag= 0.2 min
 Routed to Reach 2R : South Culvert

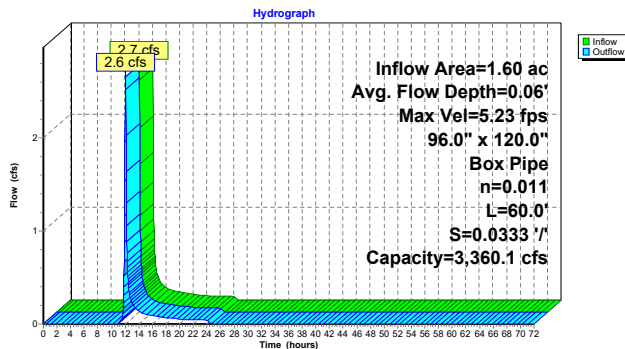
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Max. Velocity= 5.23 fps, Min. Travel Time= 0.2 min
 Avg. Velocity = 5.23 fps, Avg. Travel Time= 0.2 min

Peak Storage= 30 cf @ 12.05 hrs
 Average Depth at Peak Storage= 0.06' , Surface Width= 8.00'
 Bank-Full Depth= 10.00' Flow Area= 80.0 sf, Capacity= 3,360.1 cfs

96.0" W x 120.0" H Box Pipe
 n= 0.011 Concrete pipe, straight & clean
 Length= 60.0' Slope= 0.0333 '/'
 Inlet Invert= 602.00', Outlet Invert= 600.00'



Reach 3R: North Culvert



Stage-Area-Storage for Reach 3R: North Culvert

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
602.00	0.0	0	607.30	42.4	2,544
602.10	0.8	48	607.40	43.2	2,592
602.20	1.6	96	607.50	44.0	2,640
602.30	2.4	144	607.60	44.8	2,688
602.40	3.2	192	607.70	45.6	2,736
602.50	4.0	240	607.80	46.4	2,784
602.60	4.8	288	607.90	47.2	2,832
602.70	5.6	336	608.00	48.0	2,880
602.80	6.4	384	608.10	48.8	2,928
602.90	7.2	432	608.20	49.6	2,976
603.00	8.0	480	608.30	50.4	3,024
603.10	8.8	528	608.40	51.2	3,072
603.20	9.6	576	608.50	52.0	3,120
603.30	10.4	624	608.60	52.8	3,168
603.40	11.2	672	608.70	53.6	3,216
603.50	12.0	720	608.80	54.4	3,264
603.60	12.8	768	608.90	55.2	3,312
603.70	13.6	816	609.00	56.0	3,360
603.80	14.4	864	609.10	56.8	3,408
603.90	15.2	912	609.20	57.6	3,456
604.00	16.0	960	609.30	58.4	3,504
604.10	16.8	1,008	609.40	59.2	3,552
604.20	17.6	1,056	609.50	60.0	3,600
604.30	18.4	1,104	609.60	60.8	3,648
604.40	19.2	1,152	609.70	61.6	3,696
604.50	20.0	1,200	609.80	62.4	3,744
604.60	20.8	1,248	609.90	63.2	3,792
604.70	21.6	1,296	610.00	64.0	3,840
604.80	22.4	1,344	610.10	64.8	3,888
604.90	23.2	1,392	610.20	65.6	3,936
605.00	24.0	1,440	610.30	66.4	3,984
605.10	24.8	1,488	610.40	67.2	4,032
605.20	25.6	1,536	610.50	68.0	4,080
605.30	26.4	1,584	610.60	68.8	4,128
605.40	27.2	1,632	610.70	69.6	4,176
605.50	28.0	1,680	610.80	70.4	4,224
605.60	28.8	1,728	610.90	71.2	4,272
605.70	29.6	1,776	611.00	72.0	4,320
605.80	30.4	1,824	611.10	72.8	4,368
605.90	31.2	1,872	611.20	73.6	4,416
606.00	32.0	1,920	611.30	74.4	4,464
606.10	32.8	1,968	611.40	75.2	4,512
606.20	33.6	2,016	611.50	76.0	4,560
606.30	34.4	2,064	611.60	76.8	4,608
606.40	35.2	2,112	611.70	77.6	4,656
606.50	36.0	2,160	611.80	78.4	4,704
606.60	36.8	2,208	611.90	79.2	4,752
606.70	37.6	2,256	612.00	80.0	4,800
606.80	38.4	2,304			
606.90	39.2	2,352			
607.00	40.0	2,400			
607.10	40.8	2,448			
607.20	41.6	2,496			

Summary for Pond BP-1: Bioretention Pond #1

Inflow Area = 2.58 ac, 67.59% Impervious, Inflow Depth = 2.46" for 10-year event
 Inflow = 11.1 cfs @ 11.96 hrs, Volume= 0.5 af
 Outflow = 6.0 cfs @ 12.04 hrs, Volume= 0.5 af, Atten= 46%, Lag= 5.0 min
 Discarded = 0.1 cfs @ 12.04 hrs, Volume= 0.2 af
 Primary = 5.9 cfs @ 12.04 hrs, Volume= 0.3 af
 Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 597.17' @ 12.04 hrs Surf.Area= 5,417 sf Storage= 9,926 cf

Plug-Flow detention time= 558.3 min calculated for 0.5 af (100% of inflow)
 Center-of-Mass det. time= 559.0 min (1,356.6 - 797.5)

Volume	Invert	Avail.Storage	Storage Description			
#1	593.50'	21,619 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
593.50	3,350	303.7	0.0	0	0	3,350
595.00	3,350	303.7	10.0	503	503	3,806
598.00	6,338	360.3	100.0	14,296	14,798	6,958
599.00	7,314	382.0	100.0	6,820	21,619	8,292

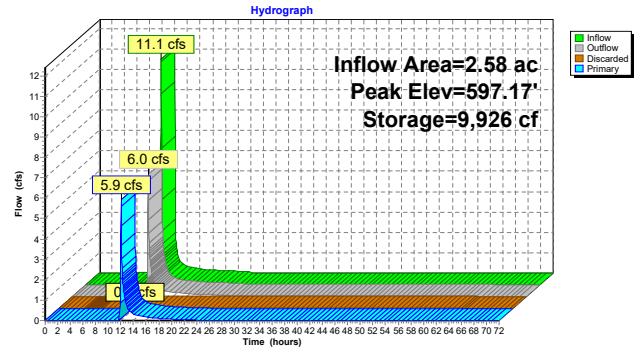
Device	Routing	Invert	Outlet Devices
#1	Primary	595.00'	18.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 595.00' / 594.80' S= 0.0100' /' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	596.50'	24.0" W x 6.0" H Vert. Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	597.00'	48.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads
#4	Discarded	593.50'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.1 cfs @ 12.04 hrs HW=597.16' (Free Discharge)
4=Exfiltration (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=5.7 cfs @ 12.04 hrs HW=597.16' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 5.7 cfs of 9.6 cfs potential flow)
- 2=Orifice (Orifice Controls 3.0 cfs @ 3.04 fps)
- 3=Grate (Weir Controls 2.7 cfs @ 1.32 fps)

Pond BP-1: Bioretention Pond #1



Stage-Area-Storage for Pond BP-1: Bioretention Pond #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
593.50	3,350	0	598.80	7,113	20,176
593.60	3,350	34	598.90	7,213	20,892
593.70	3,350	67	599.00	7,314	21,619
593.80	3,350	100			
593.90	3,350	134			
594.00	3,350	168			
594.10	3,350	201			
594.20	3,350	235			
594.30	3,350	268			
594.40	3,350	301			
594.50	3,350	335			
594.60	3,350	369			
594.70	3,350	402			
594.80	3,350	435			
594.90	3,350	469			
595.00	3,350	503			
595.10	3,434	842			
595.20	3,520	1,189			
595.30	3,606	1,546			
595.40	3,694	1,911			
595.50	3,782	2,285			
595.60	3,872	2,667			
595.70	3,963	3,059			
595.80	4,054	3,460			
595.90	4,147	3,870			
596.00	4,241	4,289			
596.10	4,336	4,718			
596.20	4,432	5,156			
596.30	4,529	5,605			
596.40	4,627	6,062			
596.50	4,726	6,530			
596.60	4,826	7,008			
596.70	4,927	7,495			
596.80	5,029	7,993			
596.90	5,133	8,501			
597.00	5,237	9,020			
597.10	5,342	9,549			
597.20	5,449	10,088			
597.30	5,556	10,638			
597.40	5,665	11,199			
597.50	5,774	11,771			
597.60	5,885	12,354			
597.70	5,997	12,948			
597.80	6,109	13,554			
597.90	6,223	14,170			
598.00	6,338	14,798			
598.10	6,452	15,437			
598.20	6,528	16,085			
598.30	6,623	16,742			
598.40	6,720	17,410			
598.50	6,817	18,086			
598.60	6,915	18,773			
598.70	7,014	19,470			

Summary for Pond BP-2: Bioretention Pond #2

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 0.73 ac, 55.39% Impervious, Inflow Depth = 2.25" for 10-year event
 Inflow = 3.0 cfs @ 11.96 hrs, Volume= 0.1 af
 Outflow = 0.2 cfs @ 12.52 hrs, Volume= 0.1 af, Atten= 92%, Lag= 33.8 min
 Primary = 0.2 cfs @ 12.52 hrs, Volume= 0.1 af
 Routed to Pond UIP-1 : UIP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 602.59' @ 12.52 hrs Surf.Area= 3,853 sf Storage= 2,444 cf

Plug-Flow detention time= 91.2 min calculated for 0.1 af (100% of inflow)
 Center-of-Mass det. time= 91.2 min (901.4 - 810.2)

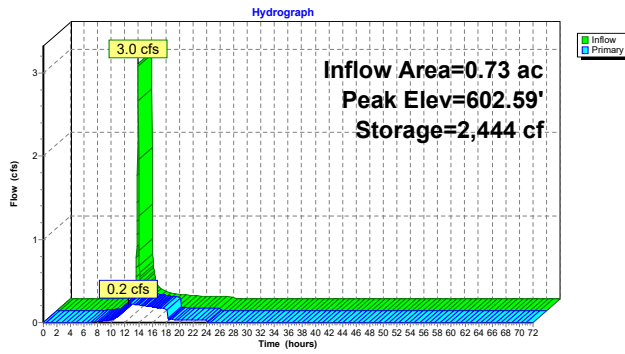
Volume	Invert	Avail.Storage	Storage Description			
#1	600.50'	9,543 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
600.50	2,922	537.6	0.0	0	0	2,922
602.00	2,922	537.6	10.0	438	438	3,728
603.00	4,564	556.9	100.0	3,713	4,151	5,496
604.00	6,264	576.4	100.0	5,392	9,543	7,344

Device	Routing	Invert	Outlet Devices
#1	Primary	597.90'	12.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 597.90' / 597.40' S= 0.0100' /' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	599.75'	6.0" Round Underdrain L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 599.75' / 599.65' S= 0.0100' /' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#3	Device 2	600.50'	2,500 in/hr Exfiltration over Surface area Phase-In= 0.01'
#4	Device 1	603.50'	12.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.2 cfs @ 12.52 hrs HW=602.59' TW=596.27' (Dynamic Tailwater)

- 1=Culvert (Passes 0.2 cfs of 7.4 cfs potential flow)
- 2=Underdrain (Passes 0.2 cfs of 1.5 cfs potential flow)
- 3=Exfiltration (Exfiltration Controls 0.2 cfs)
- 4=Grate (Controls 0.0 cfs)

Pond BP-2: Bioretention Pond #2



Stage-Area-Storage for Pond BP-2: Bioretention Pond #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
600.50	2,922	0	603.15	4,802	4,853
600.55	2,922	15	603.20	4,883	5,095
600.60	2,922	29	603.25	4,964	5,342
600.65	2,922	44	603.30	5,046	5,592
600.70	2,922	58	603.35	5,128	5,846
600.75	2,922	73	603.40	5,212	6,105
600.80	2,922	88	603.45	5,296	6,367
600.85	2,922	102	603.50	5,380	6,634
600.90	2,922	117	603.55	5,466	6,905
600.95	2,922	131	603.60	5,552	7,181
601.00	2,922	146	603.65	5,638	7,461
601.05	2,922	161	603.70	5,726	7,745
601.10	2,922	175	603.75	5,814	8,033
601.15	2,922	190	603.80	5,903	8,326
601.20	2,922	205	603.85	5,992	8,623
601.25	2,922	219	603.90	6,082	8,925
601.30	2,922	234	603.95	6,173	9,232
601.35	2,922	248	604.00	6,264	9,543
601.40	2,922	263			
601.45	2,922	278			
601.50	2,922	292			
601.55	2,922	307			
601.60	2,922	321			
601.65	2,922	336			
601.70	2,922	351			
601.75	2,922	365			
601.80	2,922	380			
601.85	2,922	394			
601.90	2,922	409			
601.95	2,922	424			
602.00	2,922	438			
602.05	2,995	586			
602.10	3,070	738			
602.15	3,145	893			
602.20	3,221	1,052			
602.25	3,298	1,215			
602.30	3,376	1,382			
602.35	3,455	1,553			
602.40	3,535	1,728			
602.45	3,616	1,907			
602.50	3,697	2,089			
602.55	3,780	2,276			
602.60	3,863	2,467			
602.65	3,948	2,663			
602.70	4,033	2,862			
602.75	4,119	3,066			
602.80	4,206	3,274			
602.85	4,294	3,487			
602.90	4,383	3,704			
602.95	4,473	3,925			
603.00	4,564	4,151			
603.05	4,643	4,381			
603.10	4,722	4,615			

Summary for Pond BP-3: Bioretention Pond #3

Inflow Area = 0.57 ac, 52.67% Impervious, Inflow Depth = 2.25" for 10-year event
 Inflow = 2.3 cfs @ 11.96 hrs, Volume = 0.1 af
 Outflow = 0.2 cfs @ 12.40 hrs, Volume = 0.1 af, Atten = 90%, Lag = 26.7 min
 Primary = 0.2 cfs @ 12.40 hrs, Volume = 0.1 af
 Routed to Pond UIP-1 : UIP-1

Routing by Dyn-Stor-Ind method, Time Span = 0.00-72.00 hrs, dt = 0.03 hrs / 2
 Peak Elev = 607.03' @ 12.40 hrs Surf.Area = 2,666 sf Storage = 2,030 cf

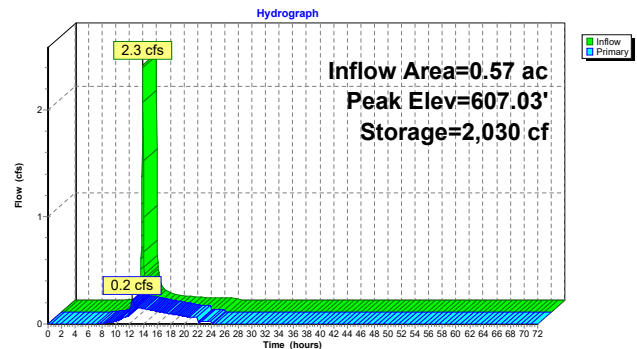
Plug-Flow detention time = (not calculated: outflow precedes inflow)
 Center-of-Mass det. time = 131.8 min (942.0 - 810.2)

Volume	Invert	Avail.Storage	Storage Description			
#1	604.50'	5,393 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
604.50	1,082	510.4	0.0	0	0	1,082
606.00	1,082	510.4	10.0	162	162	1,848
607.00	2,627	548.9	100.0	1,798	1,961	5,136
608.00	4,307	570.7	100.0	3,433	5,393	7,157

Device	Routing	Invert	Outlet Devices
#1	Primary	603.50'	18.0" Round Culvert L = 60.0' CPP, square edge headwall, Ke = 0.500 Inlet / Outlet Invert = 603.50' / 593.80' S = 0.1617 ' Cc = 0.900 n = 0.013, Flow Area = 1.77 sf
#2	Device 1	603.75'	6.0" Round Underdrain L = 10.0' CPP, square edge headwall, Ke = 0.500 Inlet / Outlet Invert = 603.75' / 603.65' S = 0.0100 ' Cc = 0.900 n = 0.013, Flow Area = 0.20 sf
#3	Device 2	604.50'	2,500 in/hr Exfiltration over Surface area Phase-In = 0.01'
#4	Device 1	607.00'	18.0" Horiz. Grate C = 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.2 cfs @ 12.40 hrs HW=607.03' TW=596.17' (Dynamic Tailwater)
 1=Culvert (Passes 0.2 cfs of 14.2 cfs potential flow)
 2=Underdrain (Passes 0.2 cfs of 1.6 cfs potential flow)
 3=Exfiltration (Exfiltration Controls 0.2 cfs)
 4=Grate (Weir Controls 0.1 cfs @ 0.53 fps)

Pond BP-3: Bioretention Pond #3



Stage-Area-Storage for Pond BP-3: Bioretention Pond #3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
604.50	1,082	0	607.15	2,853	2,371
604.55	1,082	5	607.20	2,930	2,516
604.60	1,082	11	607.25	3,008	2,664
604.65	1,082	16	607.30	3,088	2,817
604.70	1,082	22	607.35	3,168	2,973
604.75	1,082	27	607.40	3,249	3,134
604.80	1,082	32	607.45	3,332	3,298
604.85	1,082	38	607.50	3,415	3,467
604.90	1,082	43	607.55	3,500	3,640
604.95	1,082	49	607.60	3,585	3,817
605.00	1,082	54	607.65	3,672	3,998
605.05	1,082	60	607.70	3,760	4,184
605.10	1,082	65	607.75	3,848	4,374
605.15	1,082	70	607.80	3,938	4,569
605.20	1,082	76	607.85	4,029	4,768
605.25	1,082	81	607.90	4,120	4,972
605.30	1,082	87	607.95	4,213	5,180
605.35	1,082	92	608.00	4,307	5,393
605.40	1,082	97			
605.45	1,082	103			
605.50	1,082	108			
605.55	1,082	114			
605.60	1,082	119			
605.65	1,082	124			
605.70	1,082	130			
605.75	1,082	135			
605.80	1,082	141			
605.85	1,082	146			
605.90	1,082	151			
605.95	1,082	157			
606.00	1,082	162			
606.05	1,143	218			
606.10	1,206	277			
606.15	1,271	339			
606.20	1,337	404			
606.25	1,405	472			
606.30	1,475	544			
606.35	1,546	620			
606.40	1,619	699			
606.45	1,694	782			
606.50	1,770	868			
606.55	1,848	959			
606.60	1,928	1,053			
606.65	2,010	1,152			
606.70	2,093	1,254			
606.75	2,178	1,361			
606.80	2,264	1,472			
606.85	2,352	1,587			
606.90	2,442	1,707			
606.95	2,534	1,832			
607.00	2,627	1,961			
607.05	2,701	2,094			
607.10	2,776	2,231			

Summary for Pond UIP-1: UIP-1

Inflow Area = 7.23 ac, 76.62% Impervious, Inflow Depth = 2.74" for 10-year event
 Inflow = 28.9 cfs @ 11.96 hrs, Volume= 1.7 af
 Outflow = 1.4 cfs @ 13.40 hrs, Volume= 1.4 af, Atten= 95%, Lag= 86.4 min
 Discarded = 0.2 cfs @ 8.22 hrs, Volume= 0.9 af
 Primary = 1.3 cfs @ 13.40 hrs, Volume= 0.5 af
 Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 596.46' @ 13.40 hrs Surf.Area= 13,305 sf Storage= 41,092 cf

Plug-Flow detention time= 1,063.1 min calculated for 1.4 af (84% of inflow)
 Center-of-Mass det. time= 992.4 min (1,794.6 - 802.2)

Volume	Invert	Avail. Storage	Storage Description
#1A	592.30'	20,928 cf	64.83'W x 205.22'L x 6.75'H Field A 89,808 cf Overall - 37,487 cf of Embedded = 52,321 cf x 40.0% Voids
#2A	593.05'	37,487 cf	ADS StormTech MC-7200 +Cap x 210 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 210 Chambers in 7 Rows Cap Storage= 39.5 cf x 2 x 7 rows = 553.0 cf
58,415 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	592.50'	24.0" Round Culvert L= 25.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 592.50' / 591.06' S= 0.0576' /' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	597.30'	5.0' long Sharp-Crested Rectangular Weir 2 End Contractions(s)
#3	Discarded	592.30'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.01'
#4	Device 1	596.05'	18.0" W x 15.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.2 cfs @ 8.22 hrs HW=592.37' (Free Discharge)
 3=Exfiltration (Exfiltration Controls 0.2 cfs)

Primary OutFlow Max=1.3 cfs @ 13.40 hrs HW=596.46' TW=0.00' (Dynamic Tailwater)
 1=Culvert (Passes 1.3 cfs of 23.0 cfs potential flow)
 2=Sharp-Crested Rectangular Weir (Controls 0.0 cfs)
 4=Orifice/Grate (Orifice Controls 1.3 cfs @ 2.06 fps)

Pond UIP-1: UIP-1 - Chamber Wizard Field A

Chamber Model = ADS StormTech MC-7200 +Cap (ADS StormTech® MC-7200 with cap volume)
 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf
 Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap
 Cap Storage= 39.5 cf x 2 x 7 rows = 553.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

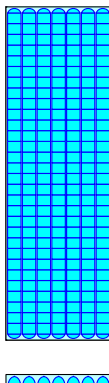
30 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 203.22' Row Length +12.0" End Stone x 2 =
 205.22' Base Length
 7 Rows x 100.0" Wide + 9.0" Spacing x 6 + 12.0" Side Stone x 2 = 64.83' Base Width
 9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

210 Chambers x 175.9 cf + 39.5 cf of Cap Volume x 2 x 7 Rows = 37,486.9 cf of Chamber Storage

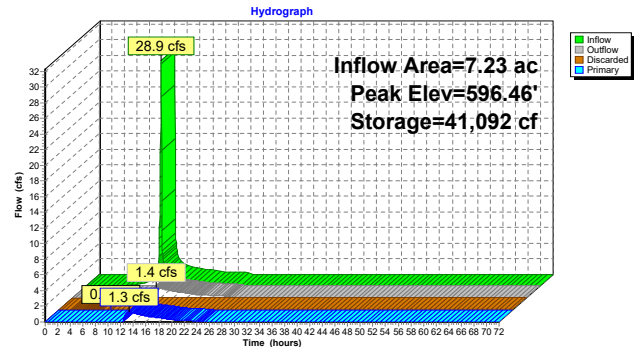
89,807.9 cf of Field - 37,486.9 cf of Chambers = 52,321.1 cf of Stone x 40.0% Voids = 20,928.4 cf of Stone Storage

Chamber Storage + Stone Storage = 58,415.3 cf = 1.3 af
 Overall Storage Efficiency = 65.0%
 Overall System Size = 205.22' x 64.83' x 6.75'

210 Chambers
 3,326.2 cy Field
 1,937.8 cy Stone



Pond UIP-1: UIP-1



Stage-Area-Storage for Pond UIP-1: UIP-1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
592.30	13,305	0	597.60	13,305	50,487
592.40	13,305	532	597.70	13,305	51,107
592.50	13,305	1,064	597.80	13,305	51,697
592.60	13,305	1,597	597.90	13,305	52,270
592.70	13,305	2,129	598.00	13,305	52,824
592.80	13,305	2,661	598.10	13,305	53,359
592.90	13,305	3,193	598.20	13,305	53,892
593.00	13,305	3,725	598.30	13,305	54,424
593.10	13,305	4,258	598.40	13,305	54,956
593.20	13,305	4,790	598.50	13,305	55,488
593.30	13,305	5,322	598.60	13,305	56,020
593.40	13,305	5,854	598.70	13,305	56,553
593.50	13,305	6,386	598.80	13,305	57,085
593.60	13,305	6,918	598.90	13,305	57,617
593.70	13,305	7,450	599.00	13,305	58,149
593.80	13,305	7,982			
593.90	13,305	8,514			
594.00	13,305	9,046			
594.10	13,305	9,578			
594.20	13,305	10,110			
594.30	13,305	10,642			
594.40	13,305	11,174			
594.50	13,305	11,706			
594.60	13,305	12,238			
594.70	13,305	12,770			
594.80	13,305	13,302			
594.90	13,305	13,834			
595.00	13,305	14,366			
595.10	13,305	14,898			
595.20	13,305	15,430			
595.30	13,305	15,962			
595.40	13,305	16,494			
595.50	13,305	17,026			
595.60	13,305	17,558			
595.70	13,305	18,090			
595.80	13,305	18,622			
595.90	13,305	19,154			
596.00	13,305	19,686			
596.10	13,305	20,218			
596.20	13,305	20,750			
596.30	13,305	21,282			
596.40	13,305	21,814			
596.50	13,305	22,346			
596.60	13,305	22,878			
596.70	13,305	23,410			
596.80	13,305	23,942			
596.90	13,305	24,474			
597.00	13,305	25,006			
597.10	13,305	25,538			
597.20	13,305	26,070			
597.30	13,305	26,602			
597.40	13,305	27,134			
597.50	13,305	27,666			

Summary for Pond UIP-2: UIP-2

Inflow Area = 1.72 ac, 86.04% Impervious, Inflow Depth = 2.77" for 10-year event
Inflow = 8.1 cfs @ 11.96 hrs, Volume = 0.4 af
Outflow = 1.3 cfs @ 12.14 hrs, Volume = 0.4 af, Atten= 84%, Lag= 11.1 min
Discarded = 0.0 cfs @ 8.55 hrs, Volume = 0.2 af
Primary = 1.2 cfs @ 12.14 hrs, Volume = 0.2 af
Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 586.35' @ 12.14 hrs Surf.Area= 3,594 sf Storage= 8,760 cf

Plug-Flow detention time= 679.5 min calculated for 0.4 af (100% of inflow)
Center-of-Mass det. time= 679.5 min (1,466.5 - 787.0)

Volume	Invert	Avail. Storage	Storage Description
#1A	583.00'	5,811 cf	28.50'W x 126.12'L x 6.75'H Field A 24,262 cf Overall - 9,734 cf Embedded = 14,527 cf x 40.0% Voids
#2A	583.75'	9,734 cf	ADS StormTech MC-7200 +Cap x 54 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 54 Chambers in 3 Rows Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf
15,545 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	583.00'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 583.00' / 582.80' S= 0.0100 ' /' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	585.25'	4.0" W x 27.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	587.50'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Discarded	583.00'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.0 cfs @ 8.55 hrs HW=583.07' (Free Discharge)
4=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=1.2 cfs @ 12.14 hrs HW=586.35' TW=0.00' (Dynamic Tailwater)
1=Culvert (Passes 1.2 cfs of 6.4 cfs potential flow)
2=Orifice/Grate (Orifice Controls 1.2 cfs @ 3.36 fps)
3=Sharp-Crested Rectangular Weir (Controls 0.0 cfs)

Pond UIP-2: UIP-2 - Chamber Wizard Field A

Chamber Model = ADS StormTech MC-7200 +Cap (ADS StormTech MC-7200 with cap volume)
Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf
Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap
Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf

100.0" Wide x 9.0" Spacing = 109.0" C-C Row Spacing

18 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 124.12' Row Length +12.0" End Stone x 2 = 126.12' Base Length
3 Rows x 100.0" Wide x 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width
9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

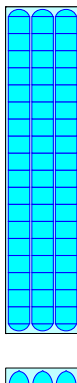
54 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 3 Rows = 9,734.3 cf Chamber Storage

24,261.7 cf Field - 9,734.3 cf Chambers = 14,527.4 cf Stone x 40.0% Voids = 5,811.0 cf Stone Storage

Chamber Storage + Stone Storage = 15,545.2 cf = 0.4 af
Overall Storage Efficiency = 64.1%

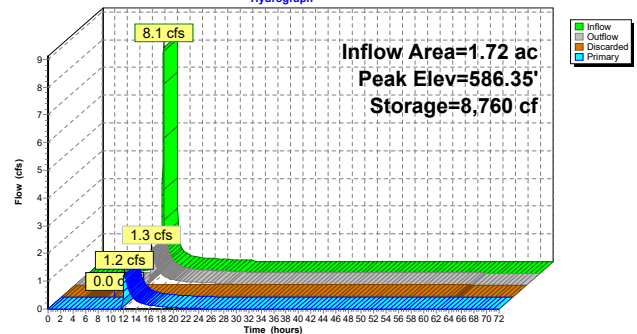
Overall System Size = 126.12' x 28.50' x 6.75'

54 Chambers
898.6 cy Field
538.1 cy Stone



Pond UIP-2: UIP-2

Hydrograph



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Type II 24-hr 10-year Rainfall=3.58"

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Stage-Area-Storage for Pond UIP-2: UIP-2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
583.00	3,594	0	588.30	3,594	13,406
583.10	3,594	144	588.40	3,594	13,572
583.20	3,594	288	588.50	3,594	13,731
583.30	3,594	431	588.60	3,594	13,885
583.40	3,594	575	588.70	3,594	14,035
583.50	3,594	719	588.80	3,594	14,179
583.60	3,594	863	588.90	3,594	14,323
583.70	3,594	1,006	589.00	3,594	14,467
583.80	3,594	1,233	589.10	3,594	14,611
583.90	3,594	1,543	589.20	3,594	14,754
584.00	3,594	1,852	589.30	3,594	14,898
584.10	3,594	2,159	589.40	3,594	15,042
584.20	3,594	2,467	589.50	3,594	15,186
584.30	3,594	2,773	589.60	3,594	15,330
584.40	3,594	3,079	589.70	3,594	15,473
584.50	3,594	3,383			
584.60	3,594	3,687			
584.70	3,594	3,990			
584.80	3,594	4,291			
584.90	3,594	4,592			
585.00	3,594	4,891			
585.10	3,594	5,189			
585.20	3,594	5,485			
585.30	3,594	5,780			
585.40	3,594	6,074			
585.50	3,594	6,366			
585.60	3,594	6,656			
585.70	3,594	6,945			
585.80	3,594	7,231			
585.90	3,594	7,516			
586.00	3,594	7,799			
586.10	3,594	8,079			
586.20	3,594	8,358			
586.30	3,594	8,634			
586.40	3,594	8,908			
586.50	3,594	9,179			
586.60	3,594	9,447			
586.70	3,594	9,713			
586.80	3,594	9,976			
586.90	3,594	10,236			
587.00	3,594	10,492			
587.10	3,594	10,745			
587.20	3,594	10,995			
587.30	3,594	11,241			
587.40	3,594	11,482			
587.50	3,594	11,720			
587.60	3,594	11,953			
587.70	3,594	12,180			
587.80	3,594	12,403			
587.90	3,594	12,620			
588.00	3,594	12,830			
588.10	3,594	13,032			
588.20	3,594	13,225			

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Type II 24-hr 10-year Rainfall=3.58"

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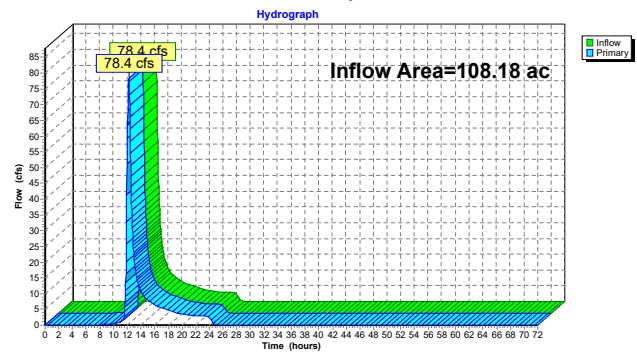
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Summary for Link DP-1: Brickyard Pond

Inflow Area = 108.18 ac, 8.92% Impervious, Inflow Depth = 1.16" for 10-year event
 Inflow = 78.4 cfs @ 12.24 hrs, Volume = 10.4 af
 Primary = 78.4 cfs @ 12.24 hrs, Volume = 10.4 af, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-72.00 hrs, dt = 0.03 hrs

Link DP-1: Brickyard Pond



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Type II 24-hr 25-year Rainfall=4.40"

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Time span=0.00-72.00 hrs, dt=0.03 hrs, 2401 points x 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR-1: Subcat PR-1	Runoff Area=29.63 ac 0.42% Impervious Runoff Depth=1.60" Flow Length=1,970' Tc=23.5 min CN=70 Runoff=46.2 cfs 4.0 af
Subcatchment PR-10: Subcat PR-10	Runoff Area=9.13 ac 5.51% Impervious Runoff Depth=2.91" Tc=5.0 min CN=86 Runoff=47.3 cfs 2.2 af
Subcatchment PR-11: Subcat PR-11	Runoff Area=0.70 ac 45.60% Impervious Runoff Depth=2.46" Tc=5.0 min CN=81 Runoff=3.1 cfs 0.1 af
Subcatchment PR-12: Subcat PR-12	Runoff Area=1.60 ac 0.00% Impervious Runoff Depth=1.75" Flow Length=410' Tc=11.6 min CN=72 Runoff=4.7 cfs 0.2 af
Subcatchment PR-13: Subcat PR-13	Runoff Area=0.56 ac 94.01% Impervious Runoff Depth=4.05" Tc=5.0 min CN=97 Runoff=3.6 cfs 0.2 af
Subcatchment PR-2: Subcat PR-2	Runoff Area=0.81 ac 84.54% Impervious Runoff Depth=3.50" Tc=5.0 min CN=92 Runoff=4.8 cfs 0.2 af
Subcatchment PR-3: Subcat PR-3	Runoff Area=0.91 ac 87.38% Impervious Runoff Depth=3.61" Tc=5.0 min CN=93 Runoff=5.5 cfs 0.3 af
Subcatchment PR-4: Subcat PR-4	Runoff Area=56.16 ac 0.45% Impervious Runoff Depth=1.60" Flow Length=3,025' Tc=32.8 min CN=70 Runoff=70.0 cfs 7.5 af
Subcatchment PR-5: Subcat PR-5	Runoff Area=0.13 ac 4.40% Impervious Runoff Depth=1.33" Tc=5.0 min CN=66 Runoff=0.3 cfs 0.0 af
Subcatchment PR-6: Subcat PR-6	Runoff Area=5.37 ac 80.24% Impervious Runoff Depth=3.61" Tc=5.0 min CN=93 Runoff=32.4 cfs 1.6 af
Subcatchment PR-7: Subcat PR-7	Runoff Area=0.73 ac 55.39% Impervious Runoff Depth=3.01" Tc=5.0 min CN=87 Runoff=3.9 cfs 0.2 af
Subcatchment PR-8: Subcat PR-8	Runoff Area=0.57 ac 52.67% Impervious Runoff Depth=3.01" Tc=5.0 min CN=87 Runoff=3.0 cfs 0.1 af
Subcatchment PR-9: Subcat PR-9	Runoff Area=1.88 ac 75.74% Impervious Runoff Depth=3.50" Tc=5.0 min CN=92 Runoff=11.2 cfs 0.6 af
Reach 2R: South Culvert	Avg. Flow Depth=0.67' Max Vel=9.34 fps Inflow=50.2 cfs 2.4 af 96.0" x 108.0" Box Pipe n=0.011 L=50.0' S=0.0100' Capacity=1,604.0 cfs Outflow=50.2 cfs 2.4 af
Reach 3R: North Culvert	Avg. Flow Depth=0.10' Max Vel=5.23 fps Inflow=4.0 cfs 0.2 af 96.0" x 120.0" Box Pipe n=0.011 L=60.0' S=0.0333' Capacity=3,360.1 cfs Outflow=4.0 cfs 0.2 af
Pond BP-1: Bioretention Pond #1	Peak Elev=597.36' Storage=10,958 cf Inflow=14.3 cfs 0.7 af Discarded=0.1 cfs 0.2 af Primary=10.7 cfs 0.5 af Outflow=10.7 cfs 0.7 af

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Type II 24-hr 25-year Rainfall=4.40"

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Pond BP-2: Bioretention Pond #2	Peak Elev=602.84' Storage=3,456 cf Inflow=3.9 cfs 0.2 af Outflow=0.2 cfs 0.2 af
Pond BP-3: Bioretention Pond #3	Peak Elev=607.16' Storage=2,391 cf Inflow=3.0 cfs 0.1 af Outflow=1.1 cfs 0.1 af
Pond UIP-1: UIP-1	Peak Elev=596.99' Storage=45,849 cf Inflow=36.3 cfs 2.1 af Discarded=0.2 cfs 0.9 af Primary=4.4 cfs 1.0 af Outflow=4.6 cfs 1.9 af
Pond UIP-2: UIP-2	Peak Elev=587.15' Storage=10,858 cf Inflow=10.3 cfs 0.5 af Discarded=0.0 cfs 0.2 af Primary=2.8 cfs 0.3 af Outflow=2.8 cfs 0.5 af
Link DP-1: Brickyard Pond	Inflow=127.5 cfs 15.7 af Primary=127.5 cfs 15.7 af
Total Runoff Area = 108.18 ac Runoff Volume = 17.3 af Average Runoff Depth = 1.91"	
91.08% Pervious = 98.53 ac 8.92% Impervious = 9.65 ac	

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Type II 24-hr 25-year Rainfall=4.40"

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Summary for Subcatchment PR-1: Subcat PR-1

Runoff = 46.2 cfs @ 12.18 hrs, Volume= 4.0 af, Depth= 1.60"
 Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 25-year Rainfall=4.40"

Area (ac)	CN	Description
0.00	61	>75% Grass cover, Good, HSG B
2.12	74	>75% Grass cover, Good, HSG C
0.12	98	Roofs, HSG C
0.00	55	Woods, Good, HSG B
27.38	70	Woods, Good, HSG C
29.63	70	Weighted Average
29.50		99.58% Pervious Area
0.12		0.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	50	0.0800	0.06		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
8.6	1,430	0.3100	2.78		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	490	0.0410	8.73	192.03	Channel Flow, Area= 22.0 sf Perim= 17.6' r= 1.25' n= 0.040 Earth, cobble bottom, clean sides
23.5	1,970	Total			

52933.00 - PR

Type II 24-hr 25-year Rainfall=4.40"

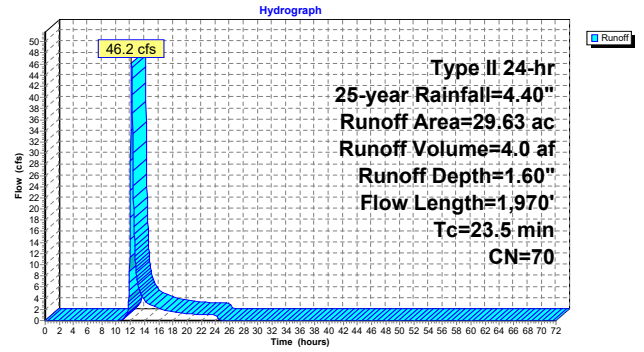
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Subcatchment PR-1: Subcat PR-1



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Type II 24-hr 25-year Rainfall=4.40"

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Summary for Subcatchment PR-10: Subcat PR-10

Runoff = 47.3 cfs @ 11.96 hrs, Volume= 2.2 af, Depth= 2.91"
 Routed to Reach 2R : South Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 25-year Rainfall=4.40"

Area (ac)	CN	Description
0.10	39	>75% Grass cover, Good, HSG A
0.71	61	>75% Grass cover, Good, HSG B
0.59	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.00	30	Brush, Good, HSG A
0.14	48	Brush, Good, HSG B
0.07	65	Brush, Good, HSG C
0.09	85	Gravel roads, HSG B
0.09	89	Gravel roads, HSG C
0.00	98	Paved parking, HSG A
0.16	98	Paved parking, HSG B
0.22	98	Paved parking, HSG C
0.05	98	Roofs, HSG B
0.07	98	Roofs, HSG C
0.81	98	Water Surface, 0% imp, HSG B
4.51	98	Water Surface, 0% imp, HSG C
0.21	98	Water Surface, 0% imp, HSG D
0.01	30	Woods, Good, HSG A
0.90	55	Woods, Good, HSG B
0.40	70	Woods, Good, HSG C
0.00	77	Woods, Good, HSG D
9.13	86	Weighted Average
8.63		94.49% Pervious Area
0.50		5.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

52933.00 - PR

Type II 24-hr 25-year Rainfall=4.40"

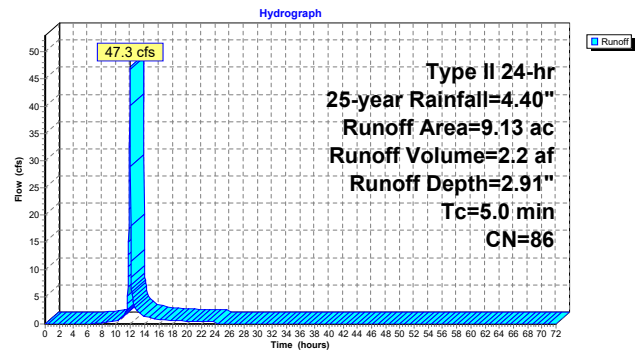
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Subcatchment PR-10: Subcat PR-10



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Type II 24-hr 25-year Rainfall=4.40"

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Summary for Subcatchment PR-11: Subcat PR-11

Runoff = 3.1 cfs @ 11.96 hrs, Volume= 0.1 af, Depth= 2.46"
 Routed to Pond BP-1 : Bioretention Pond #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 25-year Rainfall=4.40"

Area (ac)	CN	Description
0.00	39	>75% Grass cover, Good, HSG A
0.22	61	>75% Grass cover, Good, HSG B
0.16	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.00	65	Brush, Good, HSG C
0.01	98	Paved parking, HSG A
0.21	98	Paved parking, HSG B
0.03	98	Paved parking, HSG C
0.01	98	Paved parking, HSG D
0.02	98	Roofs, HSG A
0.03	98	Roofs, HSG B
0.00	98	Water Surface, 0% imp, HSG D
0.70	81	Weighted Average
0.36		54.40% Pervious Area
0.32		45.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

52933.00 - PR

Type II 24-hr 25-year Rainfall=4.40"

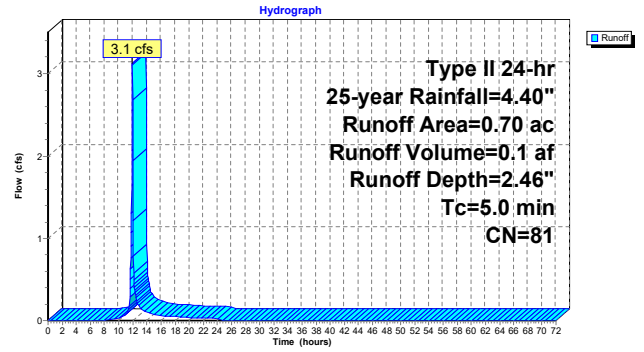
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Subcatchment PR-11: Subcat PR-11



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Type II 24-hr 25-year Rainfall=4.40"

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Summary for Subcatchment PR-12: Subcat PR-12

Runoff = 4.0 cfs @ 12.04 hrs, Volume= 0.2 af, Depth= 1.75"
 Routed to Reach 3R : North Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 25-year Rainfall=4.40"

Area (ac)	CN	Description
0.01	61	>75% Grass cover, Good, HSG B
0.09	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.02	48	Brush, Good, HSG B
0.00	98	Paved parking, HSG B
0.00	98	Paved parking, HSG C
0.00	98	Paved parking, HSG D
0.10	98	Water Surface, 0% imp, HSG B
0.01	98	Water Surface, 0% imp, HSG C
0.03	98	Water Surface, 0% imp, HSG D
0.06	55	Woods, Good, HSG B
1.28	70	Woods, Good, HSG C
1.60	72	Weighted Average
1.60		100.00% Pervious Area
0.00		0.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.3000	0.10		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
2.6	180	0.2200	1.17		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
0.8	180	0.0670	3.88		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
11.6	410				Total

52933.00 - PR

Type II 24-hr 25-year Rainfall=4.40"

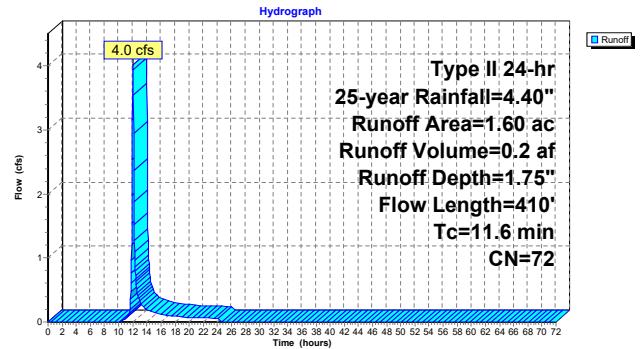
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Subcatchment PR-12: Subcat PR-12



Summary for Subcatchment PR-13: Subcat PR-13

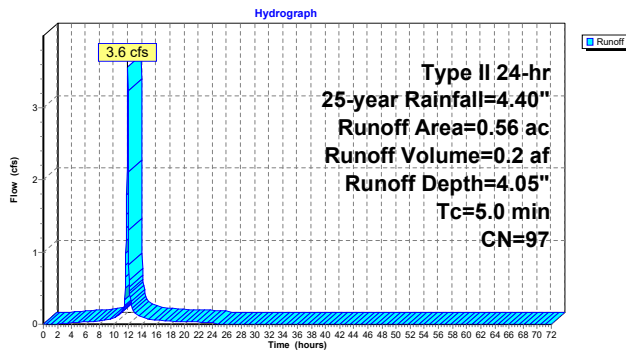
Runoff = 3.6 cfs @ 11.96 hrs, Volume= 0.2 af, Depth= 4.05"
 Routed to Pond UIP-1 : UIP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 25-year Rainfall=4.40"

Area (ac)	CN	Description
0.03	74	>75% Grass cover, Good, HSG C
0.09	98	Paved parking, HSG C
0.43	98	Roofs, HSG C
0.56	97	Weighted Average
0.03		5.99% Pervious Area
0.53		94.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-13: Subcat PR-13



Summary for Subcatchment PR-2: Subcat PR-2

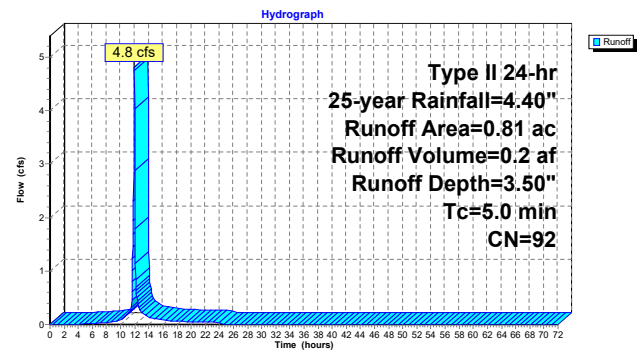
Runoff = 4.8 cfs @ 11.96 hrs, Volume= 0.2 af, Depth= 3.50"
 Routed to Pond UIP-2 : UIP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 25-year Rainfall=4.40"

Area (ac)	CN	Description
0.12	61	>75% Grass cover, Good, HSG B
0.00	48	Brush, Good, HSG B
0.40	98	Paved parking, HSG B
0.28	98	Roofs, HSG B
0.81	92	Weighted Average
0.13		15.46% Pervious Area
0.69		84.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-2: Subcat PR-2



Summary for Subcatchment PR-3: Subcat PR-3

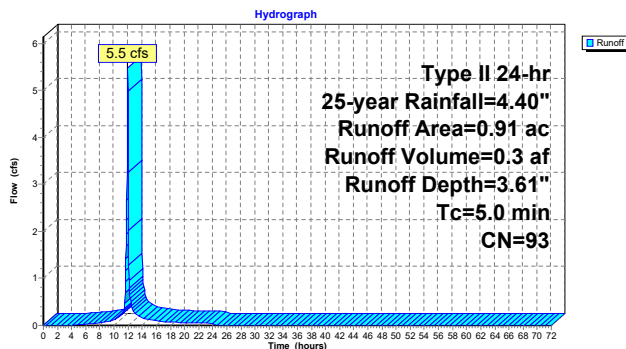
Runoff = 5.5 cfs @ 11.96 hrs, Volume= 0.3 af, Depth= 3.61"
 Routed to Pond UIP-2 : UIP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 25-year Rainfall=4.40"

Area (ac)	CN	Description
0.11	61	>75% Grass cover, Good, HSG B
0.00	74	>75% Grass cover, Good, HSG C
0.00	85	Gravel roads, HSG B
0.34	98	Paved parking, HSG B
0.46	98	Roofs, HSG B
0.00	98	Roofs, HSG C
0.91	93	Weighted Average
0.11		12.62% Pervious Area
0.79		87.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-3: Subcat PR-3



Summary for Subcatchment PR-4: Subcat PR-4

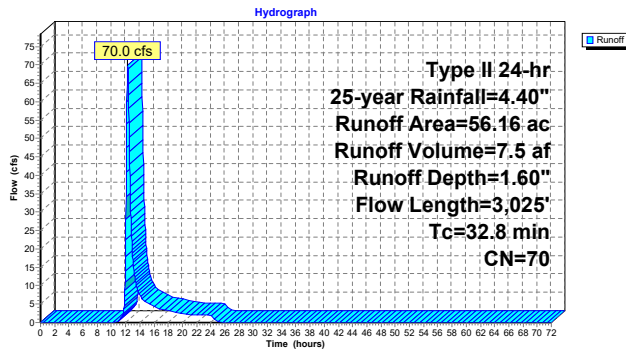
Runoff = 70.0 cfs @ 12.29 hrs, Volume= 7.5 af, Depth= 1.60"
 Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 25-year Rainfall=4.40"

Area (ac)	CN	Description
0.07	39	>75% Grass cover, Good, HSG A
0.57	61	>75% Grass cover, Good, HSG B
0.04	74	>75% Grass cover, Good, HSG C
0.00	30	Brush, Good, HSG A
0.88	48	Brush, Good, HSG B
0.18	98	Paved parking, HSG A
0.03	98	Paved parking, HSG B
0.05	98	Roofs, HSG B
1.26	98	Water Surface, 0% imp, HSG B
0.00	30	Woods, Good, HSG A
2.40	55	Woods, Good, HSG B
50.16	70	Woods, Good, HSG C
0.53	77	Woods, Good, HSG D
56.16	70	Weighted Average
55.91		99.55% Pervious Area
0.26		0.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.1600	0.08		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
15.3	2,100	0.2100	2.29		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.9	875	0.0200	2.12		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
32.8	3,025	Total			

Subcatchment PR-4: Subcat PR-4



Summary for Subcatchment PR-5: Subcat PR-5

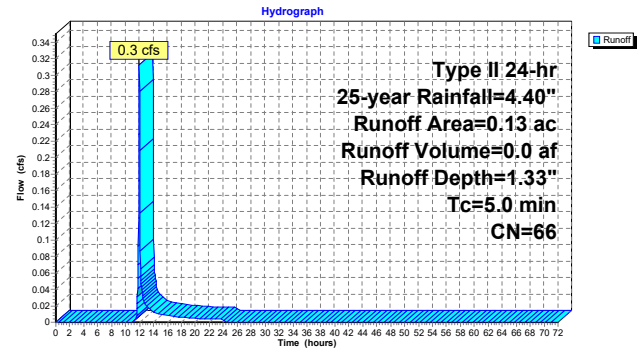
Runoff = 0.3 cfs @ 11.97 hrs, Volume= 0.0 af, Depth= 1.33"
Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 25-year Rainfall=4.40"

Area (ac)	CN	Description
0.11	61	>75% Grass cover, Good, HSG B
0.02	85	Gravel roads, HSG B
0.01	98	Paved parking, HSG B
0.13	66	Weighted Average
0.12		95.60% Pervious Area
0.01		4.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-5: Subcat PR-5



Summary for Subcatchment PR-6: Subcat PR-6

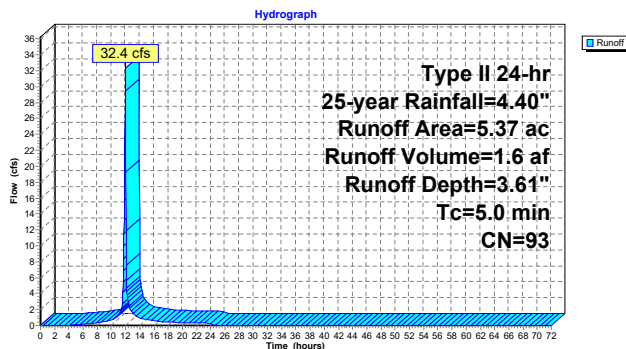
Runoff = 32.4 cfs @ 11.96 hrs, Volume= 1.6 af, Depth= 3.61"
Routed to Pond UIP-1 : UIP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 25-year Rainfall=4.40"

Area (ac)	CN	Description
0.29	61	>75% Grass cover, Good, HSG B
0.77	74	>75% Grass cover, Good, HSG C
0.47	98	Paved parking, HSG B
1.43	98	Paved parking, HSG C
0.49	98	Roofs, HSG B
1.92	98	Roofs, HSG C
5.37	93	Weighted Average
1.06		19.76% Pervious Area
4.31		80.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-6: Subcat PR-6



Summary for Subcatchment PR-7: Subcat PR-7

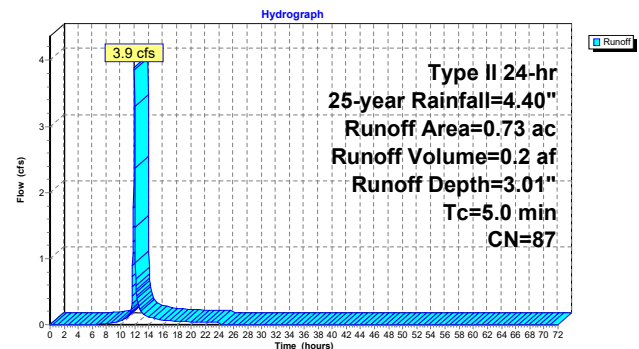
Runoff = 3.9 cfs @ 11.96 hrs, Volume= 0.2 af, Depth= 3.01"
Routed to Pond BP-2 : Bioretention Pond #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 25-year Rainfall=4.40"

Area (ac)	CN	Description
0.33	74	>75% Grass cover, Good, HSG C
0.38	98	Paved parking, HSG C
0.03	98	Roofs, HSG C
0.73	87	Weighted Average
0.33		44.61% Pervious Area
0.41		55.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-7: Subcat PR-7



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Type II 24-hr 25-year Rainfall=4.40"

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Summary for Subcatchment PR-8: Subcat PR-8

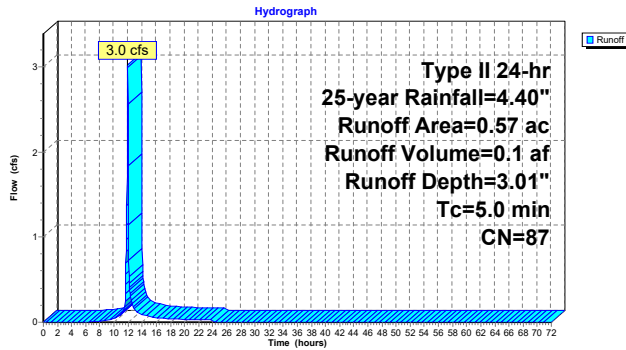
Runoff = 3.0 cfs @ 11.96 hrs, Volume= 0.1 af, Depth= 3.01"
 Routed to Pond BP-3 : Bioretention Pond #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 25-year Rainfall=4.40"

Area (ac)	CN	Description
0.27	74	>75% Grass cover, Good, HSG C
0.28	98	Paved parking, HSG C
0.02	98	Roofs, HSG C
0.57	87	Weighted Average
0.27		47.33% Pervious Area
0.30		52.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-8: Subcat PR-8



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Type II 24-hr 25-year Rainfall=4.40"

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Summary for Subcatchment PR-9: Subcat PR-9

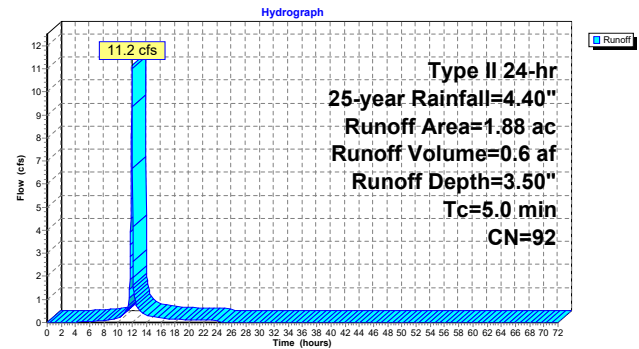
Runoff = 11.2 cfs @ 11.96 hrs, Volume= 0.6 af, Depth= 3.50"
 Routed to Pond BP-1 : Bioretention Pond #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 25-year Rainfall=4.40"

Area (ac)	CN	Description
0.46	74	>75% Grass cover, Good, HSG C
0.50	98	Paved parking, HSG C
0.00	98	Roofs, HSG B
0.93	98	Roofs, HSG C
1.88	92	Weighted Average
0.46		24.26% Pervious Area
1.43		75.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-9: Subcat PR-9



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Type II 24-hr 25-year Rainfall=4.40"

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Summary for Reach 2R: South Culvert

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 10.73 ac, 4.68% Impervious, Inflow Depth = 2.74" for 25-year event
 Inflow = 50.2 cfs @ 11.96 hrs, Volume= 2.4 af
 Outflow = 50.2 cfs @ 11.96 hrs, Volume= 2.4 af, Atten= 0%, Lag= 0.1 min
 Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Max. Velocity= 9.34 fps, Min. Travel Time= 0.1 min
 Avg. Velocity = 2.86 fps, Avg. Travel Time= 0.3 min

Peak Storage= 268 cf @ 11.96 hrs
 Average Depth at Peak Storage= 0.67' , Surface Width= 8.00'
 Bank-Full Depth= 9.00' Flow Area= 72.0 sf, Capacity= 1,604.0 cfs

96.0" W x 108.0" H Box Pipe
 n= 0.011 Concrete pipe, straight & clean
 Length= 50.0' Slope= 0.0100 '/'
 Inlet Invert= 597.50', Outlet Invert= 597.00'



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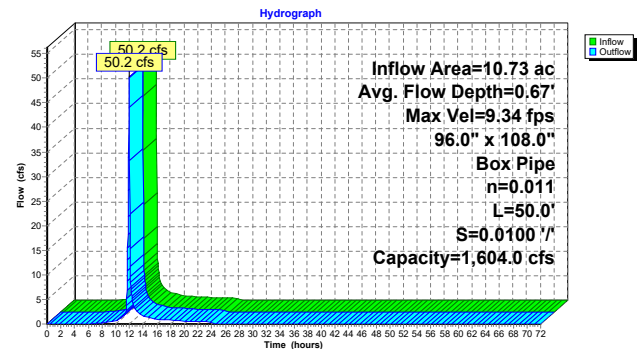
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Type II 24-hr 25-year Rainfall=4.40"

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Reach 2R: South Culvert



Stage-Area-Storage for Reach 2R: South Culvert

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
597.50	0.0	0	602.80	42.4	2,120
597.60	0.8	40	602.90	43.2	2,160
597.70	1.6	80	603.00	44.0	2,200
597.80	2.4	120	603.10	44.8	2,240
597.90	3.2	160	603.20	45.6	2,280
598.00	4.0	200	603.30	46.4	2,320
598.10	4.8	240	603.40	47.2	2,360
598.20	5.6	280	603.50	48.0	2,400
598.30	6.4	320	603.60	48.8	2,440
598.40	7.2	360	603.70	49.6	2,480
598.50	8.0	400	603.80	50.4	2,520
598.60	8.8	440	603.90	51.2	2,560
598.70	9.6	480	604.00	52.0	2,600
598.80	10.4	520	604.10	52.8	2,640
598.90	11.2	560	604.20	53.6	2,680
599.00	12.0	600	604.30	54.4	2,720
599.10	12.8	640	604.40	55.2	2,760
599.20	13.6	680	604.50	56.0	2,800
599.30	14.4	720	604.60	56.8	2,840
599.40	15.2	760	604.70	57.6	2,880
599.50	16.0	800	604.80	58.4	2,920
599.60	16.8	840	604.90	59.2	2,960
599.70	17.6	880	605.00	60.0	3,000
599.80	18.4	920	605.10	60.8	3,040
599.90	19.2	960	605.20	61.6	3,080
600.00	20.0	1,000	605.30	62.4	3,120
600.10	20.8	1,040	605.40	63.2	3,160
600.20	21.6	1,080	605.50	64.0	3,200
600.30	22.4	1,120	605.60	64.8	3,240
600.40	23.2	1,160	605.70	65.6	3,280
600.50	24.0	1,200	605.80	66.4	3,320
600.60	24.8	1,240	605.90	67.2	3,360
600.70	25.6	1,280	606.00	68.0	3,400
600.80	26.4	1,320	606.10	68.8	3,440
600.90	27.2	1,360	606.20	69.6	3,480
601.00	28.0	1,400	606.30	70.4	3,520
601.10	28.8	1,440	606.40	71.2	3,560
601.20	29.6	1,480	606.50	72.0	3,600
601.30	30.4	1,520			
601.40	31.2	1,560			
601.50	32.0	1,600			
601.60	32.8	1,640			
601.70	33.6	1,680			
601.80	34.4	1,720			
601.90	35.2	1,760			
602.00	36.0	1,800			
602.10	36.8	1,840			
602.20	37.6	1,880			
602.30	38.4	1,920			
602.40	39.2	1,960			
602.50	40.0	2,000			
602.60	40.8	2,040			
602.70	41.6	2,080			

Summary for Reach 3R: North Culvert

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.60 ac, 0.00% Impervious, Inflow Depth = 1.75" for 25-year event
Inflow = 4.0 cfs @ 12.04 hrs, Volume= 0.2 af
Outflow = 4.0 cfs @ 12.04 hrs, Volume= 0.2 af, Atten= 0%, Lag= 0.2 min
Routed to Reach 2R : South Culvert

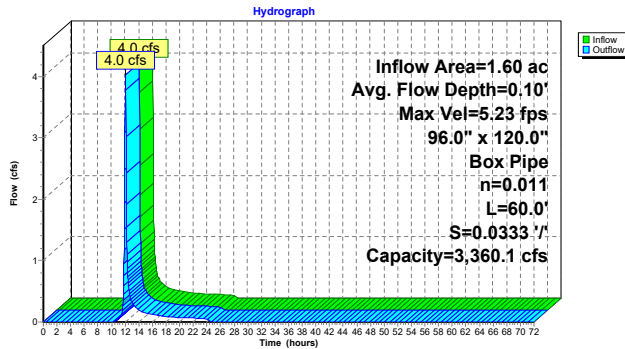
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 5.23 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 5.23 fps, Avg. Travel Time= 0.2 min

Peak Storage= 46 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.10' , Surface Width= 8.00'
Bank-Full Depth= 10.00' Flow Area= 80.0 sf, Capacity= 3,360.1 cfs

96.0" W x 120.0" H Box Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 60.0' Slope= 0.0333 '/'
Inlet Invert= 602.00', Outlet Invert= 600.00'



Reach 3R: North Culvert



Stage-Area-Storage for Reach 3R: North Culvert

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
602.00	0.0	0	607.30	42.4	2,544
602.10	0.8	48	607.40	43.2	2,592
602.20	1.6	96	607.50	44.0	2,640
602.30	2.4	144	607.60	44.8	2,688
602.40	3.2	192	607.70	45.6	2,736
602.50	4.0	240	607.80	46.4	2,784
602.60	4.8	288	607.90	47.2	2,832
602.70	5.6	336	608.00	48.0	2,880
602.80	6.4	384	608.10	48.8	2,928
602.90	7.2	432	608.20	49.6	2,976
603.00	8.0	480	608.30	50.4	3,024
603.10	8.8	528	608.40	51.2	3,072
603.20	9.6	576	608.50	52.0	3,120
603.30	10.4	624	608.60	52.8	3,168
603.40	11.2	672	608.70	53.6	3,216
603.50	12.0	720	608.80	54.4	3,264
603.60	12.8	768	608.90	55.2	3,312
603.70	13.6	816	609.00	56.0	3,360
603.80	14.4	864	609.10	56.8	3,408
603.90	15.2	912	609.20	57.6	3,456
604.00	16.0	960	609.30	58.4	3,504
604.10	16.8	1,008	609.40	59.2	3,552
604.20	17.6	1,056	609.50	60.0	3,600
604.30	18.4	1,104	609.60	60.8	3,648
604.40	19.2	1,152	609.70	61.6	3,696
604.50	20.0	1,200	609.80	62.4	3,744
604.60	20.8	1,248	609.90	63.2	3,792
604.70	21.6	1,296	610.00	64.0	3,840
604.80	22.4	1,344	610.10	64.8	3,888
604.90	23.2	1,392	610.20	65.6	3,936
605.00	24.0	1,440	610.30	66.4	3,984
605.10	24.8	1,488	610.40	67.2	4,032
605.20	25.6	1,536	610.50	68.0	4,080
605.30	26.4	1,584	610.60	68.8	4,128
605.40	27.2	1,632	610.70	69.6	4,176
605.50	28.0	1,680	610.80	70.4	4,224
605.60	28.8	1,728	610.90	71.2	4,272
605.70	29.6	1,776	611.00	72.0	4,320
605.80	30.4	1,824	611.10	72.8	4,368
605.90	31.2	1,872	611.20	73.6	4,416
606.00	32.0	1,920	611.30	74.4	4,464
606.10	32.8	1,968	611.40	75.2	4,512
606.20	33.6	2,016	611.50	76.0	4,560
606.30	34.4	2,064	611.60	76.8	4,608
606.40	35.2	2,112	611.70	77.6	4,656
606.50	36.0	2,160	611.80	78.4	4,704
606.60	36.8	2,208	611.90	79.2	4,752
606.70	37.6	2,256	612.00	80.0	4,800
606.80	38.4	2,304			
606.90	39.2	2,352			
607.00	40.0	2,400			
607.10	40.8	2,448			
607.20	41.6	2,496			

Summary for Pond BP-1: Bioretention Pond #1

Inflow Area = 2.58 ac, 67.59% Impervious, Inflow Depth = 3.22" for 25-year event
 Inflow = 14.3 cfs @ 11.96 hrs, Volume= 0.7 af
 Outflow = 10.7 cfs @ 12.01 hrs, Volume= 0.7 af, Atten= 25%, Lag= 3.2 min
 Discarded = 0.1 cfs @ 12.01 hrs, Volume= 0.2 af
 Primary = 10.7 cfs @ 12.01 hrs, Volume= 0.5 af
 Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 597.36' @ 12.01 hrs Surf.Area= 5,618 sf Storage= 10,958 cf

Plug-Flow detention time= 436.8 min calculated for 0.7 af (100% of inflow)
 Center-of-Mass det. time= 436.8 min (1,227.2 - 790.4)

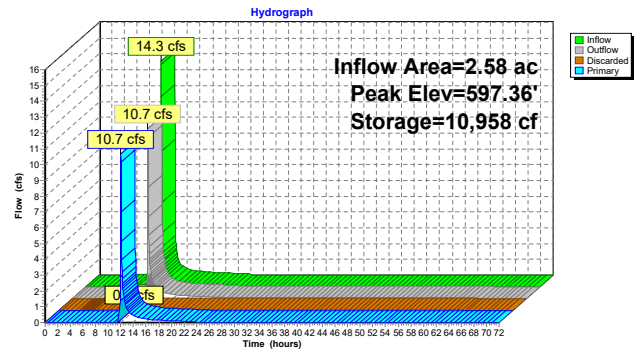
Volume	Invert	Avail.Storage	Storage Description			
#1	593.50'	21,619 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
593.50	3,350	303.7	0.0	0	0	3,350
595.00	3,350	303.7	10.0	503	503	3,806
598.00	6,338	360.3	100.0	14,296	14,798	6,958
599.00	7,314	382.0	100.0	6,820	21,619	8,292

Device	Routing	Invert	Outlet Devices
#1	Primary	595.00'	18.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 595.00' / 594.80' S= 0.0100' /' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	596.50'	24.0" W x 6.0" H Vert. Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	597.00'	48.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads
#4	Discarded	593.50'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.1 cfs @ 12.01 hrs HW=597.35' (Free Discharge)
4=Exfiltration (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=10.6 cfs @ 12.01 hrs HW=597.35' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 10.6 cfs @ 6.02 fps)
2=Orifice (Passes < 3.7 cfs potential flow)
3=Grate (Passes < 8.5 cfs potential flow)

Pond BP-1: Bioretention Pond #1



Stage-Area-Storage for Pond BP-1: Bioretention Pond #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
593.50	3,350	0	598.80	7,113	20,176
593.60	3,350	34	598.90	7,213	20,892
593.70	3,350	67	599.00	7,314	21,619
593.80	3,350	100			
593.90	3,350	134			
594.00	3,350	168			
594.10	3,350	201			
594.20	3,350	235			
594.30	3,350	268			
594.40	3,350	301			
594.50	3,350	335			
594.60	3,350	369			
594.70	3,350	402			
594.80	3,350	435			
594.90	3,350	469			
595.00	3,350	503			
595.10	3,434	842			
595.20	3,520	1,189			
595.30	3,606	1,546			
595.40	3,694	1,911			
595.50	3,782	2,285			
595.60	3,872	2,667			
595.70	3,963	3,059			
595.80	4,054	3,460			
595.90	4,147	3,870			
596.00	4,241	4,289			
596.10	4,336	4,718			
596.20	4,432	5,156			
596.30	4,529	5,605			
596.40	4,627	6,062			
596.50	4,726	6,530			
596.60	4,826	7,008			
596.70	4,927	7,495			
596.80	5,029	7,993			
596.90	5,133	8,501			
597.00	5,237	9,020			
597.10	5,342	9,549			
597.20	5,449	10,088			
597.30	5,556	10,638			
597.40	5,665	11,199			
597.50	5,774	11,771			
597.60	5,885	12,354			
597.70	5,997	12,948			
597.80	6,109	13,554			
597.90	6,223	14,170			
598.00	6,338	14,798			
598.10	6,452	15,437			
598.20	6,528	16,085			
598.30	6,623	16,742			
598.40	6,720	17,410			
598.50	6,817	18,086			
598.60	6,915	18,773			
598.70	7,014	19,470			

Summary for Pond BP-2: Bioretention Pond #2

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 0.73 ac, 55.39% Impervious, Inflow Depth = 3.01" for 25-year event
 Inflow = 3.9 cfs @ 11.96 hrs, Volume= 0.2 af
 Outflow = 0.2 cfs @ 12.61 hrs, Volume= 0.2 af, Atten= 94%, Lag= 39.4 min
 Primary = 0.2 cfs @ 12.61 hrs, Volume= 0.2 af
 Routed to Pond UIP-1 : UIP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 602.84' @ 12.61 hrs Surf.Area= 4,282 sf Storage= 3,456 cf

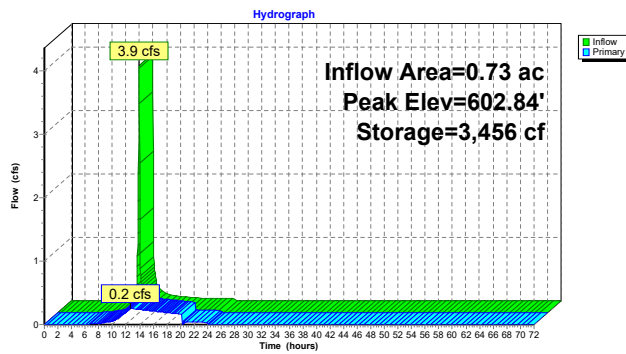
Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 124.2 min (926.2 - 802.0)

Volume	Invert	Avail.Storage	Storage Description			
#1	600.50'	9,543 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
600.50	2,922	537.6	0.0	0	0	2,922
602.00	2,922	537.6	10.0	438	438	3,728
603.00	4,564	556.9	100.0	3,713	4,151	5,496
604.00	6,264	576.4	100.0	5,392	9,543	7,344

Device	Routing	Invert	Outlet Devices
#1	Primary	597.90'	12.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 597.90' / 597.40' S= 0.0100' /' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	599.75'	6.0" Round Underdrain L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 599.75' / 599.65' S= 0.0100' /' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#3	Device 2	600.50'	2,500 in/hr Exfiltration over Surface area Phase-In= 0.01'
#4	Device 1	603.50'	12.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.2 cfs @ 12.61 hrs HW=602.84' TW=596.89' (Dynamic Tailwater)
1=Culvert (Passes 0.2 cfs of 7.6 cfs potential flow)
2=Underdrain (Passes 0.2 cfs of 1.6 cfs potential flow)
3=Exfiltration (Exfiltration Controls 0.2 cfs)
4=Grate (Controls 0.0 cfs)

Pond BP-2: Bioretention Pond #2



Stage-Area-Storage for Pond BP-2: Bioretention Pond #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
600.50	2,922	0	603.15	4,802	4,853
600.55	2,922	15	603.20	4,883	5,095
600.60	2,922	29	603.25	4,964	5,342
600.65	2,922	44	603.30	5,046	5,592
600.70	2,922	58	603.35	5,128	5,846
600.75	2,922	73	603.40	5,212	6,105
600.80	2,922	88	603.45	5,296	6,367
600.85	2,922	102	603.50	5,380	6,634
600.90	2,922	117	603.55	5,466	6,905
600.95	2,922	131	603.60	5,552	7,181
601.00	2,922	146	603.65	5,638	7,461
601.05	2,922	161	603.70	5,726	7,745
601.10	2,922	175	603.75	5,814	8,033
601.15	2,922	190	603.80	5,903	8,326
601.20	2,922	205	603.85	5,992	8,623
601.25	2,922	219	603.90	6,082	8,925
601.30	2,922	234	603.95	6,173	9,232
601.35	2,922	248	604.00	6,264	9,543
601.40	2,922	263			
601.45	2,922	278			
601.50	2,922	292			
601.55	2,922	307			
601.60	2,922	321			
601.65	2,922	336			
601.70	2,922	351			
601.75	2,922	365			
601.80	2,922	380			
601.85	2,922	394			
601.90	2,922	409			
601.95	2,922	424			
602.00	2,922	438			
602.05	2,995	586			
602.10	3,070	738			
602.15	3,145	893			
602.20	3,221	1,052			
602.25	3,298	1,215			
602.30	3,376	1,382			
602.35	3,455	1,553			
602.40	3,535	1,728			
602.45	3,616	1,907			
602.50	3,697	2,089			
602.55	3,780	2,276			
602.60	3,863	2,467			
602.65	3,948	2,663			
602.70	4,033	2,862			
602.75	4,119	3,066			
602.80	4,206	3,274			
602.85	4,294	3,487			
602.90	4,383	3,704			
602.95	4,473	3,925			
603.00	4,564	4,151			
603.05	4,643	4,381			
603.10	4,722	4,615			

Summary for Pond BP-3: Bioretention Pond #3

Inflow Area = 0.57 ac, 52.67% Impervious, Inflow Depth = 3.01" for 25-year event
 Inflow = 3.0 cfs @ 11.96 hrs, Volume= 0.1 af
 Outflow = 1.1 cfs @ 12.07 hrs, Volume= 0.1 af, Atten= 63%, Lag= 6.5 min
 Primary = 1.1 cfs @ 12.07 hrs, Volume= 0.1 af
 Routed to Pond UIP-1 : UIP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 607.16' @ 12.07 hrs Surf.Area= 2,863 sf Storage= 2,391 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 116.2 min (918.3 - 802.0)

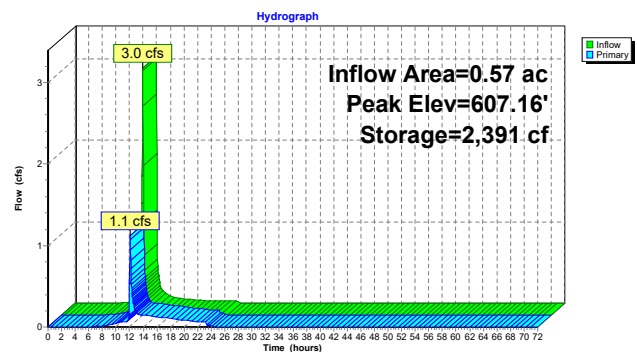
Volume	Invert	Avail.Storage	Storage Description			
#1	604.50'	5,393 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
604.50	1,082	510.4	0.0	0	0	1,082
606.00	1,082	510.4	10.0	162	162	1,848
607.00	2,627	548.9	100.0	1,798	1,961	5,136
608.00	4,307	570.7	100.0	3,433	5,393	7,157

Device	Routing	Invert	Outlet Devices
#1	Primary	603.50'	18.0" Round Culvert L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 603.50' / 593.80' S= 0.1617 ' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	603.75'	6.0" Round Underdrain L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 603.75' / 603.65' S= 0.0100 ' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#3	Device 2	604.50'	2,500 in/hr Exfiltration over Surface area Phase-In= 0.01'
#4	Device 1	607.00'	18.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.1 cfs @ 12.07 hrs HW=607.15' TW=596.77' (Dynamic Tailwater)

- 1=Culvert (Passes 1.1 cfs of 14.5 cfs potential flow)
- 2=Underdrain (Passes 0.2 cfs of 1.7 cfs potential flow)
- 3=Exfiltration (Exfiltration Controls 0.2 cfs)
- 4=Grate (Weir Controls 0.9 cfs @ 1.29 fps)

Pond BP-3: Bioretention Pond #3



Stage-Area-Storage for Pond BP-3: Bioretention Pond #3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
604.50	1,082	0	607.15	2,853	2,371
604.55	1,082	5	607.20	2,930	2,516
604.60	1,082	11	607.25	3,008	2,664
604.65	1,082	16	607.30	3,088	2,817
604.70	1,082	22	607.35	3,168	2,973
604.75	1,082	27	607.40	3,249	3,134
604.80	1,082	32	607.45	3,332	3,298
604.85	1,082	38	607.50	3,415	3,467
604.90	1,082	43	607.55	3,500	3,640
604.95	1,082	49	607.60	3,585	3,817
605.00	1,082	54	607.65	3,672	3,998
605.05	1,082	60	607.70	3,760	4,184
605.10	1,082	65	607.75	3,848	4,374
605.15	1,082	70	607.80	3,938	4,569
605.20	1,082	76	607.85	4,029	4,768
605.25	1,082	81	607.90	4,120	4,972
605.30	1,082	87	607.95	4,213	5,180
605.35	1,082	92	608.00	4,307	5,393
605.40	1,082	97			
605.45	1,082	103			
605.50	1,082	108			
605.55	1,082	114			
605.60	1,082	119			
605.65	1,082	124			
605.70	1,082	130			
605.75	1,082	135			
605.80	1,082	141			
605.85	1,082	146			
605.90	1,082	151			
605.95	1,082	157			
606.00	1,082	162			
606.05	1,143	218			
606.10	1,206	277			
606.15	1,271	339			
606.20	1,337	404			
606.25	1,405	472			
606.30	1,475	544			
606.35	1,546	620			
606.40	1,619	699			
606.45	1,694	782			
606.50	1,770	868			
606.55	1,848	959			
606.60	1,928	1,053			
606.65	2,010	1,152			
606.70	2,093	1,254			
606.75	2,178	1,361			
606.80	2,264	1,472			
606.85	2,352	1,587			
606.90	2,442	1,707			
606.95	2,534	1,832			
607.00	2,627	1,961			
607.05	2,701	2,094			
607.10	2,776	2,231			

Summary for Pond UIP-1: UIP-1

Inflow Area = 7.23 ac, 76.62% Impervious, Inflow Depth = 3.54" for 25-year event
 Inflow = 36.3 cfs @ 11.96 hrs, Volume= 2.1 af
 Outflow = 4.6 cfs @ 12.29 hrs, Volume= 1.9 af, Atten= 87%, Lag= 20.2 min
 Discarded = 0.2 cfs @ 6.96 hrs, Volume= 0.9 af
 Primary = 4.4 cfs @ 12.29 hrs, Volume= 1.0 af
 Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 596.99' @ 12.29 hrs Surf.Area= 13,305 sf Storage= 45,849 cf

Plug-Flow detention time= 816.8 min calculated for 1.9 af (88% of inflow)
 Center-of-Mass det. time= 756.2 min (1,554.2 - 797.9)

Volume	Invert	Avail. Storage	Storage Description
#1A	592.30'	20,928 cf	64.83'W x 205.22'L x 6.75'H Field A 89,808 cf Overall - 37,487 cf Embedded = 52,321 cf x 40.0% Voids
#2A	593.05'	37,487 cf	ADS StormTech MC-7200 +Cap x 210 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 210 Chambers in 7 Rows Cap Storage= 39.5 cf x 2 x 7 rows = 553.0 cf
58,415 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	592.50'	24.0" Round Culvert L= 25.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 592.50' / 591.06' S= 0.0576' /' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	597.30'	5.0' long Sharp-Crested Rectangular Weir 2 End Contractions(s)
#3	Discarded	592.30'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.01'
#4	Device 1	596.05'	18.0" W x 15.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.2 cfs @ 6.96 hrs HW=592.37' (Free Discharge)
 3=Exfiltration (Exfiltration Controls 0.2 cfs)

Primary OutFlow Max=4.4 cfs @ 12.29 hrs HW=596.99' TW=0.00' (Dynamic Tailwater)
 1=Culvert (Passes 4.4 cfs of 24.9 cfs potential flow)
 2=Sharp-Crested Rectangular Weir (Controls 0.0 cfs)
 4=Orifice/Grate (Orifice Controls 4.4 cfs @ 3.12 fps)

Pond UIP-1: UIP-1 - Chamber Wizard Field A

Chamber Model = ADS StormTech MC-7200 +Cap (ADS StormTech® MC-7200 with cap volume)
 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf
 Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap
 Cap Storage= 39.5 cf x 2 x 7 rows = 553.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

30 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 203.22' Row Length +12.0" End Stone x 2 =
 205.22' Base Length
 7 Rows x 100.0" Wide + 9.0" Spacing x 6 + 12.0" Side Stone x 2 = 64.83' Base Width
 9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

210 Chambers x 175.9 cf + 39.5 cf of Cap Volume x 2 x 7 Rows = 37,486.9 cf Chamber Storage

89,807.9 cf of Field - 37,486.9 cf Chambers = 52,321.1 cf Stone x 40.0% Voids = 20,928.4 cf Stone Storage

Chamber Storage + Stone Storage = 58,415.3 cf = 1.3 af

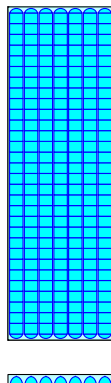
Overall Storage Efficiency = 65.0%

Overall System Size = 205.22' x 64.83' x 6.75'

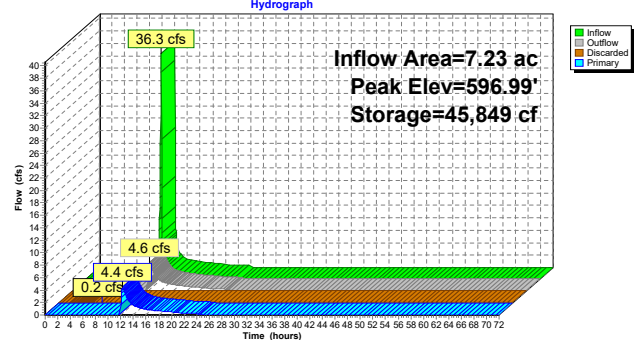
210 Chambers

3,326.2 cy Field

1,937.8 cy Stone



Pond UIP-1: UIP-1



Stage-Area-Storage for Pond UIP-1: UIP-1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
592.30	13,305	0	597.60	13,305	50,487
592.40	13,305	532	597.70	13,305	51,107
592.50	13,305	1,064	597.80	13,305	51,697
592.60	13,305	1,597	597.90	13,305	52,270
592.70	13,305	2,129	598.00	13,305	52,824
592.80	13,305	2,661	598.10	13,305	53,359
592.90	13,305	3,193	598.20	13,305	53,892
593.00	13,305	3,725	598.30	13,305	54,424
593.10	13,305	4,257	598.40	13,305	54,956
593.20	13,305	4,788	598.50	13,305	55,488
593.30	13,305	5,319	598.60	13,305	56,020
593.40	13,305	5,850	598.70	13,305	56,553
593.50	13,305	6,381	598.80	13,305	57,085
593.60	13,305	6,912	598.90	13,305	57,617
593.70	13,305	7,443	599.00	13,305	58,149
593.80	13,305	7,974			
593.90	13,305	8,505			
594.00	13,305	9,036			
594.10	13,305	9,567			
594.20	13,305	10,098			
594.30	13,305	10,629			
594.40	13,305	11,160			
594.50	13,305	11,691			
594.60	13,305	12,222			
594.70	13,305	12,753			
594.80	13,305	13,284			
594.90	13,305	13,815			
595.00	13,305	14,346			
595.10	13,305	14,877			
595.20	13,305	15,408			
595.30	13,305	15,939			
595.40	13,305	16,470			
595.50	13,305	17,001			
595.60	13,305	17,532			
595.70	13,305	18,063			
595.80	13,305	18,594			
595.90	13,305	19,125			
596.00	13,305	19,656			
596.10	13,305	20,187			
596.20	13,305	20,718			
596.30	13,305	21,249			
596.40	13,305	21,780			
596.50	13,305	22,311			
596.60	13,305	22,842			
596.70	13,305	23,373			
596.80	13,305	23,904			
596.90	13,305	24,435			
597.00	13,305	24,966			
597.10	13,305	25,497			
597.20	13,305	26,028			
597.30	13,305	26,559			
597.40	13,305	27,090			
597.50	13,305	27,621			

Summary for Pond UIP-2: UIP-2

Inflow Area = 1.72 ac, 86.04% Impervious, Inflow Depth = 3.56" for 25-year event
 Inflow = 10.3 cfs @ 11.96 hrs, Volume = 0.5 af
 Outflow = 2.8 cfs @ 12.08 hrs, Volume = 0.5 af, Atten= 72%, Lag= 7.6 min
 Discarded = 0.0 cfs @ 7.32 hrs, Volume = 0.2 af
 Primary = 2.8 cfs @ 12.08 hrs, Volume = 0.3 af
 Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 587.15' @ 12.08 hrs Surf.Area= 3,594 sf Storage= 10,858 cf

Plug-Flow detention time= 546.6 min calculated for 0.5 af (100% of inflow)
 Center-of-Mass det. time= 546.5 min (1,326.6 - 780.1)

Volume	Invert	Avail. Storage	Storage Description
#1A	583.00'	5,811 cf	28.50'W x 126.12'L x 6.75'H Field A 24,262 cf Overall - 9,734 cf Embedded = 14,527 cf x 40.0% Voids
#2A	583.75'	9,734 cf	ADS_StormTech MC-7200 +Cap x 54 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 54 Chambers in 3 Rows Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf
15,545 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	583.00'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 583.00' / 582.80' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	585.25'	4.0" W x 27.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	587.50'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Discarded	583.00'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.0 cfs @ 7.32 hrs HW=583.07' (Free Discharge)
4=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=2.8 cfs @ 12.08 hrs HW=587.14' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 2.8 cfs of 7.2 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 2.8 cfs @ 4.41 fps)
- 3=Sharp-Crested Rectangular Weir (Controls 0.0 cfs)

Pond UIP-2: UIP-2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-7200 +Cap (ADS StormTech® MC-7200 with cap volume)
 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf
 Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap
 Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf

100.0" Wide x 9.0" Spacing = 109.0" C-C Row Spacing

18 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 124.12' Row Length +12.0" End Stone x 2 = 126.12' Base Length
 3 Rows x 100.0" Wide x 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width
 9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

54 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 3 Rows = 9,734.3 cf Chamber Storage

24,261.7 cf Field - 9,734.3 cf Chambers = 14,527.4 cf Stone x 40.0% Voids = 5,811.0 cf Stone Storage

Chamber Storage + Stone Storage = 15,545.2 cf = 0.4 af

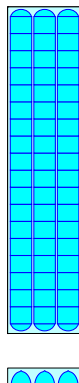
Overall Storage Efficiency = 64.1%

Overall System Size = 126.12' x 28.50' x 6.75'

54 Chambers

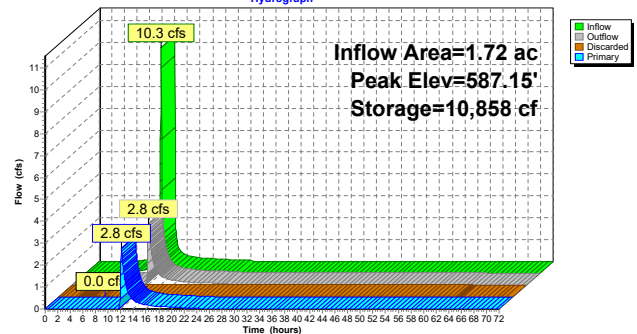
898.6 cy Field

538.1 cy Stone



Pond UIP-2: UIP-2

Hydrograph



Stage-Area-Storage for Pond UIP-2: UIP-2

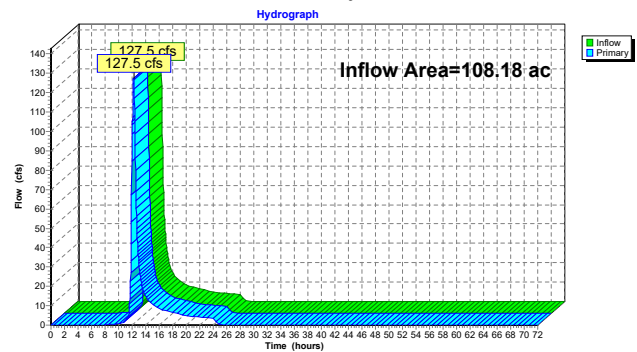
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
583.00	3,594	0	588.30	3,594	13,406
583.10	3,594	144	588.40	3,594	13,572
583.20	3,594	288	588.50	3,594	13,731
583.30	3,594	431	588.60	3,594	13,885
583.40	3,594	575	588.70	3,594	14,035
583.50	3,594	719	588.80	3,594	14,179
583.60	3,594	863	588.90	3,594	14,323
583.70	3,594	1,006	589.00	3,594	14,467
583.80	3,594	1,233	589.10	3,594	14,611
583.90	3,594	1,543	589.20	3,594	14,754
584.00	3,594	1,852	589.30	3,594	14,898
584.10	3,594	2,159	589.40	3,594	15,042
584.20	3,594	2,467	589.50	3,594	15,186
584.30	3,594	2,773	589.60	3,594	15,330
584.40	3,594	3,079	589.70	3,594	15,473
584.50	3,594	3,383			
584.60	3,594	3,687			
584.70	3,594	3,990			
584.80	3,594	4,291			
584.90	3,594	4,592			
585.00	3,594	4,891			
585.10	3,594	5,189			
585.20	3,594	5,485			
585.30	3,594	5,780			
585.40	3,594	6,074			
585.50	3,594	6,366			
585.60	3,594	6,656			
585.70	3,594	6,945			
585.80	3,594	7,231			
585.90	3,594	7,516			
586.00	3,594	7,799			
586.10	3,594	8,079			
586.20	3,594	8,358			
586.30	3,594	8,634			
586.40	3,594	8,908			
586.50	3,594	9,179			
586.60	3,594	9,447			
586.70	3,594	9,713			
586.80	3,594	9,976			
586.90	3,594	10,236			
587.00	3,594	10,492			
587.10	3,594	10,745			
587.20	3,594	10,995			
587.30	3,594	11,241			
587.40	3,594	11,482			
587.50	3,594	11,720			
587.60	3,594	11,953			
587.70	3,594	12,180			
587.80	3,594	12,403			
587.90	3,594	12,620			
588.00	3,594	12,830			
588.10	3,594	13,032			
588.20	3,594	13,225			

Summary for Link DP-1: Brickyard Pond

Inflow Area = 108.18 ac, 8.92% Impervious, Inflow Depth = 1.74" for 25-year event
 Inflow = 127.5 cfs @ 12.23 hrs, Volume = 15.7 af
 Primary = 127.5 cfs @ 12.23 hrs, Volume = 15.7 af, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-72.00 hrs, dt = 0.03 hrs

Link DP-1: Brickyard Pond



Time span=0.00-72.00 hrs, dt=0.03 hrs, 2401 points x 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR-1: Subcat PR-1	Runoff Area=29.63 ac 0.42% Impervious Runoff Depth=2.15" Flow Length=1,970' Tc=23.5 min CN=70 Runoff=63.1 cfs 5.3 af
Subcatchment PR-10: Subcat PR-10	Runoff Area=9.13 ac 5.51% Impervious Runoff Depth=3.61" Tc=5.0 min CN=86 Runoff=57.9 cfs 2.7 af
Subcatchment PR-11: Subcat PR-11	Runoff Area=0.70 ac 45.60% Impervious Runoff Depth=3.12" Tc=5.0 min CN=81 Runoff=3.9 cfs 0.2 af
Subcatchment PR-12: Subcat PR-12	Runoff Area=1.60 ac 0.00% Impervious Runoff Depth=2.31" Flow Length=410' Tc=11.6 min CN=72 Runoff=5.4 cfs 0.3 af
Subcatchment PR-13: Subcat PR-13	Runoff Area=0.56 ac 94.01% Impervious Runoff Depth=4.80" Tc=5.0 min CN=97 Runoff=4.2 cfs 0.2 af
Subcatchment PR-2: Subcat PR-2	Runoff Area=0.81 ac 84.54% Impervious Runoff Depth=4.24" Tc=5.0 min CN=92 Runoff=5.7 cfs 0.3 af
Subcatchment PR-3: Subcat PR-3	Runoff Area=0.91 ac 87.38% Impervious Runoff Depth=4.35" Tc=5.0 min CN=93 Runoff=6.5 cfs 0.3 af
Subcatchment PR-4: Subcat PR-4	Runoff Area=56.16 ac 0.45% Impervious Runoff Depth=2.15" Flow Length=3,025' Tc=32.8 min CN=70 Runoff=95.9 cfs 10.1 af
Subcatchment PR-5: Subcat PR-5	Runoff Area=0.13 ac 4.40% Impervious Runoff Depth=1.83" Tc=5.0 min CN=66 Runoff=0.4 cfs 0.0 af
Subcatchment PR-6: Subcat PR-6	Runoff Area=5.37 ac 80.24% Impervious Runoff Depth=4.35" Tc=5.0 min CN=93 Runoff=38.5 cfs 1.9 af
Subcatchment PR-7: Subcat PR-7	Runoff Area=0.73 ac 55.39% Impervious Runoff Depth=3.71" Tc=5.0 min CN=87 Runoff=4.7 cfs 0.2 af
Subcatchment PR-8: Subcat PR-8	Runoff Area=0.57 ac 52.67% Impervious Runoff Depth=3.71" Tc=5.0 min CN=87 Runoff=3.7 cfs 0.2 af
Subcatchment PR-9: Subcat PR-9	Runoff Area=1.88 ac 75.74% Impervious Runoff Depth=4.24" Tc=5.0 min CN=92 Runoff=13.3 cfs 0.7 af
Reach 2R: South Culvert	Avg. Flow Depth=0.77' Max Vel=10.06 fps Inflow=61.9 cfs 3.1 af 96.0" x 108.0" Box Pipe n=0.011 L=50.0' S=0.0100' Capacity=1,604.0 cfs Outflow=61.9 cfs 3.1 af
Reach 3R: North Culvert	Avg. Flow Depth=0.11' Max Vel=5.89 fps Inflow=5.4 cfs 0.3 af 96.0" x 120.0" Box Pipe n=0.011 L=60.0' S=0.0333' Capacity=3,360.1 cfs Outflow=5.3 cfs 0.3 af
Pond BP-1: Bioretention Pond #1	Peak Elev=597.59' Storage=12,318 cf Inflow=17.2 cfs 0.8 af Discarded=0.1 cfs 0.2 af Primary=11.6 cfs 0.6 af Outflow=11.6 cfs 0.8 af

Pond BP-2: Bioretention Pond #2	Peak Elev=603.06' Storage=4,442 cf Inflow=4.7 cfs 0.2 af Outflow=0.3 cfs 0.2 af
Pond BP-3: Bioretention Pond #3	Peak Elev=607.25' Storage=2,679 cf Inflow=3.7 cfs 0.2 af Outflow=2.2 cfs 0.2 af
Pond UIP-1: UIP-1	Peak Elev=597.79' Storage=51,651 cf Inflow=43.8 cfs 2.6 af Discarded=0.2 cfs 0.9 af Primary=14.9 cfs 1.4 af Outflow=15.1 cfs 2.3 af
Pond UIP-2: UIP-2	Peak Elev=587.77' Storage=12,346 cf Inflow=12.3 cfs 0.6 af Discarded=0.0 cfs 0.2 af Primary=6.0 cfs 0.4 af Outflow=6.0 cfs 0.6 af
Link DP-1: Brickyard Pond	Inflow=177.1 cfs 20.9 af Primary=177.1 cfs 20.9 af
Total Runoff Area = 108.18 ac Runoff Volume = 22.5 af Average Runoff Depth = 2.49"	
91.08% Pervious = 98.53 ac 8.92% Impervious = 9.65 ac	

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Type II 24-hr 50-year Rainfall=5.15"

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Summary for Subcatchment PR-1: Subcat PR-1

Runoff = 63.1 cfs @ 12.17 hrs, Volume= 5.3 af, Depth= 2.15"
 Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 50-year Rainfall=5.15"

Area (ac)	CN	Description
0.00	61	>75% Grass cover, Good, HSG B
2.12	74	>75% Grass cover, Good, HSG C
0.12	98	Roofs, HSG C
0.00	55	Woods, Good, HSG B
27.38	70	Woods, Good, HSG C
29.63	70	Weighted Average
29.50		99.58% Pervious Area
0.12		0.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	50	0.0800	0.06		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
8.6	1,430	0.3100	2.78		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	490	0.0410	8.73	192.03	Channel Flow, Area= 22.0 sf Perim= 17.6' r= 1.25' n= 0.040 Earth, cobble bottom, clean sides
23.5	1,970	Total			

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Type II 24-hr 50-year Rainfall=5.15"

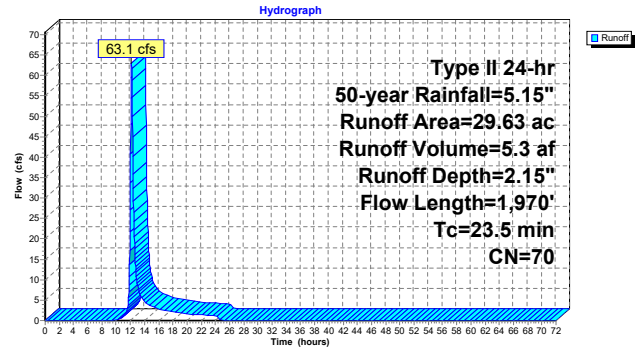
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Subcatchment PR-1: Subcat PR-1



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Type II 24-hr 50-year Rainfall=5.15"

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Summary for Subcatchment PR-10: Subcat PR-10

Runoff = 57.9 cfs @ 11.96 hrs, Volume= 2.7 af, Depth= 3.61"
 Routed to Reach 2R : South Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 50-year Rainfall=5.15"

Area (ac)	CN	Description
0.10	39	>75% Grass cover, Good, HSG A
0.71	61	>75% Grass cover, Good, HSG B
0.59	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.00	30	Brush, Good, HSG A
0.14	48	Brush, Good, HSG B
0.07	65	Brush, Good, HSG C
0.09	85	Gravel roads, HSG B
0.09	89	Gravel roads, HSG C
0.00	98	Paved parking, HSG A
0.16	98	Paved parking, HSG B
0.22	98	Paved parking, HSG C
0.05	98	Roofs, HSG B
0.07	98	Roofs, HSG C
0.81	98	Water Surface, 0% imp, HSG B
4.51	98	Water Surface, 0% imp, HSG C
0.21	98	Water Surface, 0% imp, HSG D
0.01	30	Woods, Good, HSG A
0.90	55	Woods, Good, HSG B
0.40	70	Woods, Good, HSG C
0.00	77	Woods, Good, HSG D
9.13	86	Weighted Average
8.63		94.49% Pervious Area
0.50		5.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type II 24-hr 50-year Rainfall=5.15"

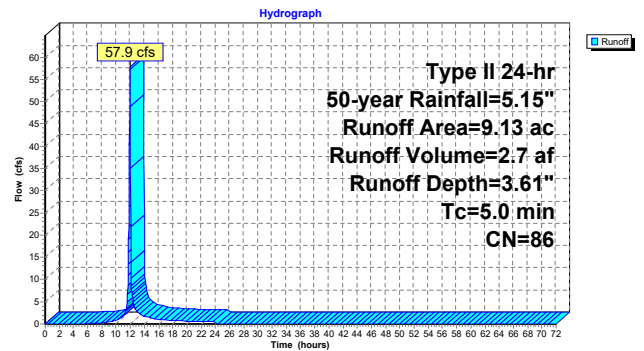
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Subcatchment PR-10: Subcat PR-10



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Type II 24-hr 50-year Rainfall=5.15"

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Summary for Subcatchment PR-11: Subcat PR-11

Runoff = 3.9 cfs @ 11.96 hrs, Volume= 0.2 af, Depth= 3.12"
 Routed to Pond BP-1 : Bioretention Pond #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 50-year Rainfall=5.15"

Area (ac)	CN	Description
0.00	39	>75% Grass cover, Good, HSG A
0.22	61	>75% Grass cover, Good, HSG B
0.16	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.00	65	Brush, Good, HSG C
0.01	98	Paved parking, HSG A
0.21	98	Paved parking, HSG B
0.03	98	Paved parking, HSG C
0.01	98	Paved parking, HSG D
0.02	98	Roofs, HSG A
0.03	98	Roofs, HSG B
0.00	98	Water Surface, 0% imp, HSG D
0.70	81	Weighted Average
0.36		54.40% Pervious Area
0.32		45.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

52933.00 - PR

Type II 24-hr 50-year Rainfall=5.15"

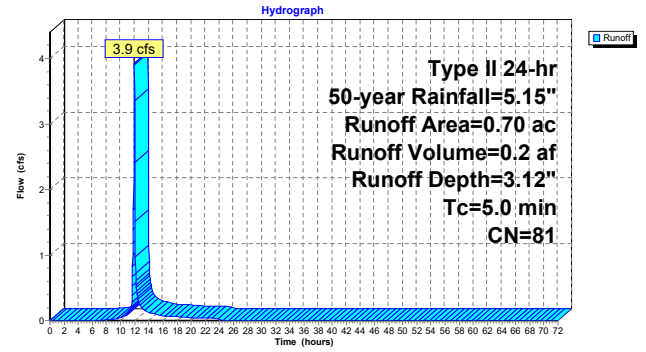
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Subcatchment PR-11: Subcat PR-11



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Type II 24-hr 50-year Rainfall=5.15"

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Summary for Subcatchment PR-12: Subcat PR-12

Runoff = 5.4 cfs @ 12.04 hrs, Volume= 0.3 af, Depth= 2.31"
 Routed to Reach 3R : North Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 50-year Rainfall=5.15"

Area (ac)	CN	Description
0.01	61	>75% Grass cover, Good, HSG B
0.09	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.02	48	Brush, Good, HSG B
0.00	98	Paved parking, HSG B
0.00	98	Paved parking, HSG C
0.00	98	Paved parking, HSG D
0.10	98	Water Surface, 0% imp, HSG B
0.01	98	Water Surface, 0% imp, HSG C
0.03	98	Water Surface, 0% imp, HSG D
0.06	55	Woods, Good, HSG B
1.28	70	Woods, Good, HSG C
1.60	72	Weighted Average
1.60		100.00% Pervious Area
0.00		0.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.3000	0.10		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
2.6	180	0.2200	1.17		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
0.8	180	0.0670	3.88		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
11.6	410				Total

52933.00 - PR

Type II 24-hr 50-year Rainfall=5.15"

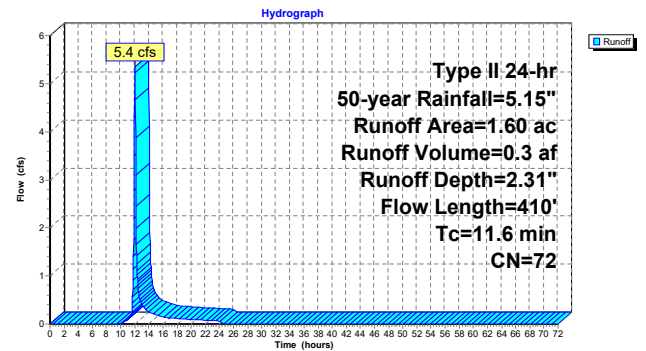
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Subcatchment PR-12: Subcat PR-12



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Type II 24-hr 50-year Rainfall=5.15"

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Summary for Subcatchment PR-13: Subcat PR-13

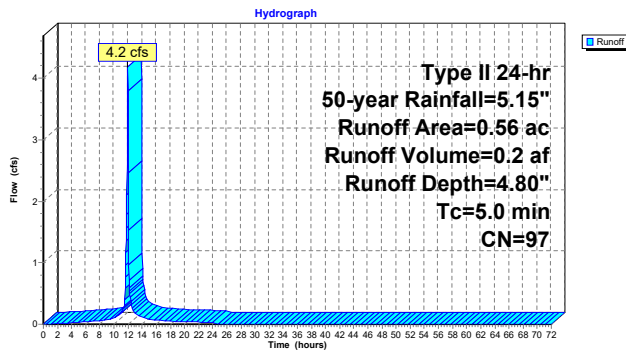
Runoff = 4.2 cfs @ 11.96 hrs, Volume= 0.2 af, Depth= 4.80"
 Routed to Pond UIP-1 : UIP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 50-year Rainfall=5.15"

Area (ac)	CN	Description
0.03	74	>75% Grass cover, Good, HSG C
0.09	98	Paved parking, HSG C
0.43	98	Roofs, HSG C
0.56	97	Weighted Average
0.03		5.99% Pervious Area
0.53		94.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-13: Subcat PR-13



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Type II 24-hr 50-year Rainfall=5.15"

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Summary for Subcatchment PR-2: Subcat PR-2

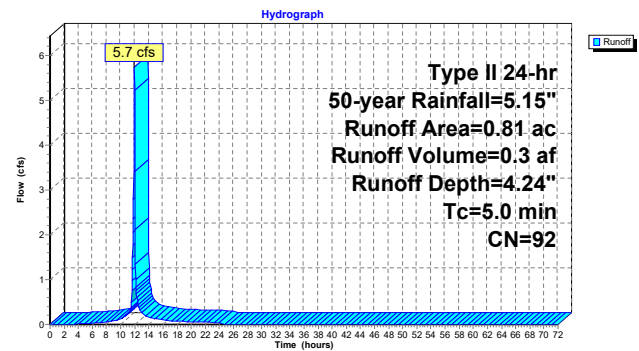
Runoff = 5.7 cfs @ 11.96 hrs, Volume= 0.3 af, Depth= 4.24"
 Routed to Pond UIP-2 : UIP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 50-year Rainfall=5.15"

Area (ac)	CN	Description
0.12	61	>75% Grass cover, Good, HSG B
0.00	48	Brush, Good, HSG B
0.40	98	Paved parking, HSG B
0.28	98	Roofs, HSG B
0.81	92	Weighted Average
0.13		15.46% Pervious Area
0.69		84.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-2: Subcat PR-2



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Type II 24-hr 50-year Rainfall=5.15"

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Summary for Subcatchment PR-3: Subcat PR-3

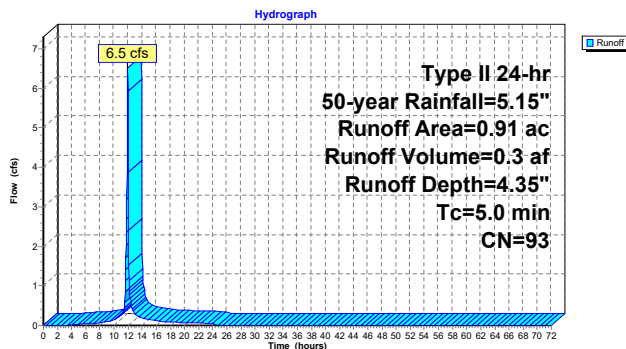
Runoff = 6.5 cfs @ 11.96 hrs, Volume= 0.3 af, Depth= 4.35"
 Routed to Pond UIP-2 : UIP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 50-year Rainfall=5.15"

Area (ac)	CN	Description
0.11	61	>75% Grass cover, Good, HSG B
0.00	74	>75% Grass cover, Good, HSG C
0.00	85	Gravel roads, HSG B
0.34	98	Paved parking, HSG B
0.46	98	Roofs, HSG B
0.00	98	Roofs, HSG C
0.91	93	Weighted Average
0.11		12.62% Pervious Area
0.79		87.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-3: Subcat PR-3



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Type II 24-hr 50-year Rainfall=5.15"

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Summary for Subcatchment PR-4: Subcat PR-4

Runoff = 95.9 cfs @ 12.29 hrs, Volume= 10.1 af, Depth= 2.15"
 Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 50-year Rainfall=5.15"

Area (ac)	CN	Description
0.07	39	>75% Grass cover, Good, HSG A
0.57	61	>75% Grass cover, Good, HSG B
0.04	74	>75% Grass cover, Good, HSG C
0.00	30	Brush, Good, HSG A
0.88	48	Brush, Good, HSG B
0.18	98	Paved parking, HSG A
0.03	98	Paved parking, HSG B
0.05	98	Roofs, HSG B
1.26	98	Water Surface, 0% imp, HSG B
0.00	30	Woods, Good, HSG A
2.40	55	Woods, Good, HSG B
50.16	70	Woods, Good, HSG C
0.53	77	Woods, Good, HSG D
56.16	70	Weighted Average
55.91		99.55% Pervious Area
0.26		0.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.1600	0.08		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
15.3	2,100	0.2100	2.29		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.9	875	0.0200	2.12		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
32.8	3,025	Total			

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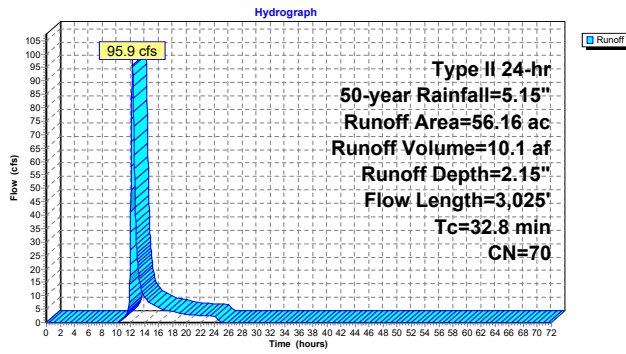
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Type II 24-hr 50-year Rainfall=5.15"

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Subcatchment PR-4: Subcat PR-4



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Type II 24-hr 50-year Rainfall=5.15"

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Summary for Subcatchment PR-5: Subcat PR-5

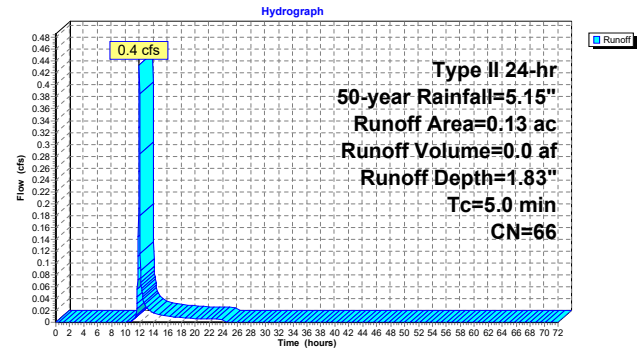
Runoff = 0.4 cfs @ 11.97 hrs, Volume= 0.0 af, Depth= 1.83"
Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 50-year Rainfall=5.15"

Area (ac)	CN	Description
0.11	61	>75% Grass cover, Good, HSG B
0.02	85	Gravel roads, HSG B
0.01	98	Paved parking, HSG B
0.13	66	Weighted Average
0.12		95.60% Pervious Area
0.01		4.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-5: Subcat PR-5



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Type II 24-hr 50-year Rainfall=5.15"

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Summary for Subcatchment PR-6: Subcat PR-6

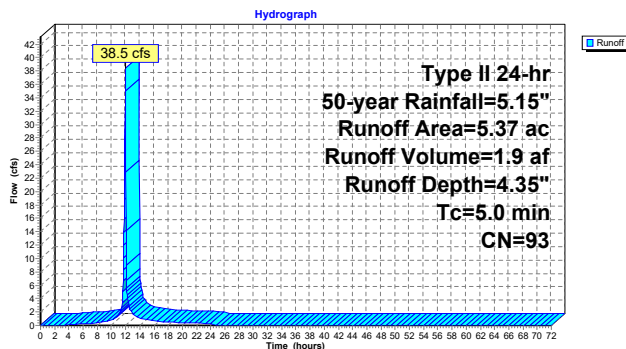
Runoff = 38.5 cfs @ 11.96 hrs, Volume= 1.9 af, Depth= 4.35"
Routed to Pond UIP-1 : UIP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 50-year Rainfall=5.15"

Area (ac)	CN	Description
0.29	61	>75% Grass cover, Good, HSG B
0.77	74	>75% Grass cover, Good, HSG C
0.47	98	Paved parking, HSG B
1.43	98	Paved parking, HSG C
0.49	98	Roofs, HSG B
1.92	98	Roofs, HSG C
5.37	93	Weighted Average
1.06		19.76% Pervious Area
4.31		80.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-6: Subcat PR-6



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Type II 24-hr 50-year Rainfall=5.15"

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Summary for Subcatchment PR-7: Subcat PR-7

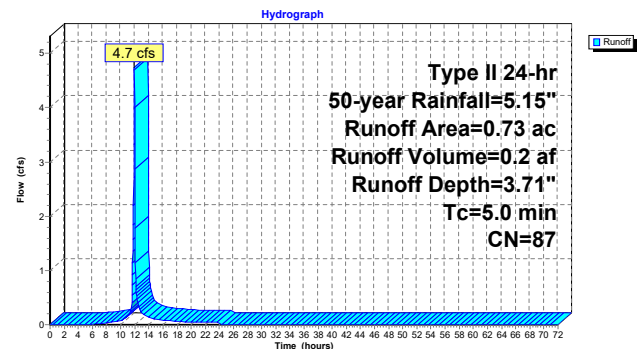
Runoff = 4.7 cfs @ 11.96 hrs, Volume= 0.2 af, Depth= 3.71"
Routed to Pond BP-2 : Bioretention Pond #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 50-year Rainfall=5.15"

Area (ac)	CN	Description
0.33	74	>75% Grass cover, Good, HSG C
0.38	98	Paved parking, HSG C
0.03	98	Roofs, HSG C
0.73	87	Weighted Average
0.33		44.61% Pervious Area
0.41		55.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-7: Subcat PR-7



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Type II 24-hr 50-year Rainfall=5.15"

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Summary for Subcatchment PR-8: Subcat PR-8

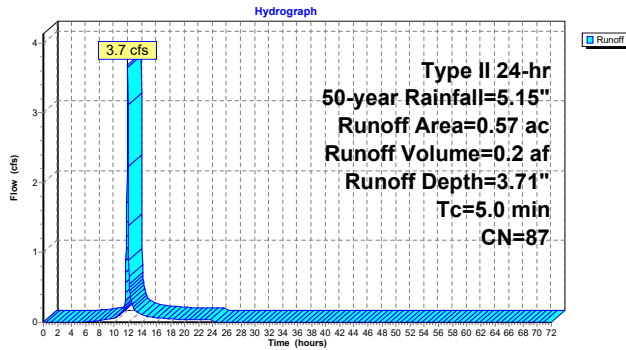
Runoff = 3.7 cfs @ 11.96 hrs, Volume= 0.2 af, Depth= 3.71"
 Routed to Pond BP-3 : Bioretention Pond #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 50-year Rainfall=5.15"

Area (ac)	CN	Description
0.27	74	>75% Grass cover, Good, HSG C
0.28	98	Paved parking, HSG C
0.02	98	Roofs, HSG C
0.57	87	Weighted Average
0.27		47.33% Pervious Area
0.30		52.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-8: Subcat PR-8



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Type II 24-hr 50-year Rainfall=5.15"

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Summary for Subcatchment PR-9: Subcat PR-9

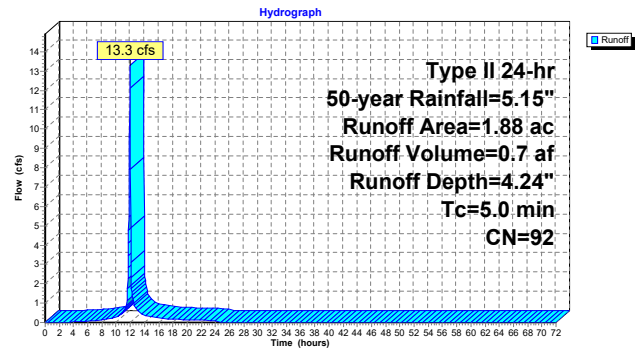
Runoff = 13.3 cfs @ 11.96 hrs, Volume= 0.7 af, Depth= 4.24"
 Routed to Pond BP-1 : Bioretention Pond #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 50-year Rainfall=5.15"

Area (ac)	CN	Description
0.46	74	>75% Grass cover, Good, HSG C
0.50	98	Paved parking, HSG C
0.00	98	Roofs, HSG B
0.93	98	Roofs, HSG C
1.88	92	Weighted Average
0.46		24.26% Pervious Area
1.43		75.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-9: Subcat PR-9



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Type II 24-hr 50-year Rainfall=5.15"

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Summary for Reach 2R: South Culvert

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 10.73 ac, 4.68% Impervious, Inflow Depth = 3.41" for 50-year event
 Inflow = 61.9 cfs @ 11.96 hrs, Volume= 3.1 af
 Outflow = 61.9 cfs @ 11.96 hrs, Volume= 3.1 af, Atten= 0%, Lag= 0.1 min
 Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Max. Velocity= 10.06 fps, Min. Travel Time= 0.1 min
 Avg. Velocity = 2.90 fps, Avg. Travel Time= 0.3 min

Peak Storage= 307 cf @ 11.96 hrs
 Average Depth at Peak Storage= 0.77' , Surface Width= 8.00'
 Bank-Full Depth= 9.00' Flow Area= 72.0 sf, Capacity= 1,604.0 cfs

96.0" W x 108.0" H Box Pipe
 n= 0.011 Concrete pipe, straight & clean
 Length= 50.0' Slope= 0.0100 '/
 Inlet Invert= 597.50', Outlet Invert= 597.00'



52933.00 - PR

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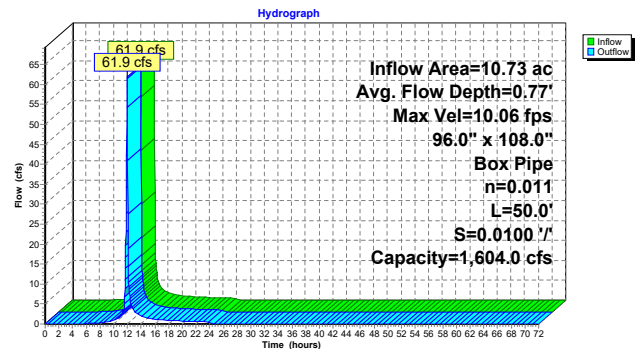
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Type II 24-hr 50-year Rainfall=5.15"

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Reach 2R: South Culvert



Stage-Area-Storage for Reach 2R: South Culvert

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
597.50	0.0	0	602.80	42.4	2,120
597.60	0.8	40	602.90	43.2	2,160
597.70	1.6	80	603.00	44.0	2,200
597.80	2.4	120	603.10	44.8	2,240
597.90	3.2	160	603.20	45.6	2,280
598.00	4.0	200	603.30	46.4	2,320
598.10	4.8	240	603.40	47.2	2,360
598.20	5.6	280	603.50	48.0	2,400
598.30	6.4	320	603.60	48.8	2,440
598.40	7.2	360	603.70	49.6	2,480
598.50	8.0	400	603.80	50.4	2,520
598.60	8.8	440	603.90	51.2	2,560
598.70	9.6	480	604.00	52.0	2,600
598.80	10.4	520	604.10	52.8	2,640
598.90	11.2	560	604.20	53.6	2,680
599.00	12.0	600	604.30	54.4	2,720
599.10	12.8	640	604.40	55.2	2,760
599.20	13.6	680	604.50	56.0	2,800
599.30	14.4	720	604.60	56.8	2,840
599.40	15.2	760	604.70	57.6	2,880
599.50	16.0	800	604.80	58.4	2,920
599.60	16.8	840	604.90	59.2	2,960
599.70	17.6	880	605.00	60.0	3,000
599.80	18.4	920	605.10	60.8	3,040
599.90	19.2	960	605.20	61.6	3,080
600.00	20.0	1,000	605.30	62.4	3,120
600.10	20.8	1,040	605.40	63.2	3,160
600.20	21.6	1,080	605.50	64.0	3,200
600.30	22.4	1,120	605.60	64.8	3,240
600.40	23.2	1,160	605.70	65.6	3,280
600.50	24.0	1,200	605.80	66.4	3,320
600.60	24.8	1,240	605.90	67.2	3,360
600.70	25.6	1,280	606.00	68.0	3,400
600.80	26.4	1,320	606.10	68.8	3,440
600.90	27.2	1,360	606.20	69.6	3,480
601.00	28.0	1,400	606.30	70.4	3,520
601.10	28.8	1,440	606.40	71.2	3,560
601.20	29.6	1,480	606.50	72.0	3,600
601.30	30.4	1,520			
601.40	31.2	1,560			
601.50	32.0	1,600			
601.60	32.8	1,640			
601.70	33.6	1,680			
601.80	34.4	1,720			
601.90	35.2	1,760			
602.00	36.0	1,800			
602.10	36.8	1,840			
602.20	37.6	1,880			
602.30	38.4	1,920			
602.40	39.2	1,960			
602.50	40.0	2,000			
602.60	40.8	2,040			
602.70	41.6	2,080			

Summary for Reach 3R: North Culvert

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.60 ac, 0.00% Impervious, Inflow Depth = 2.31" for 50-year event
 Inflow = 5.4 cfs @ 12.04 hrs, Volume= 0.3 af
 Outflow = 5.3 cfs @ 12.04 hrs, Volume= 0.3 af, Atten= 0%, Lag= 0.2 min
 Routed to Reach 2R : South Culvert

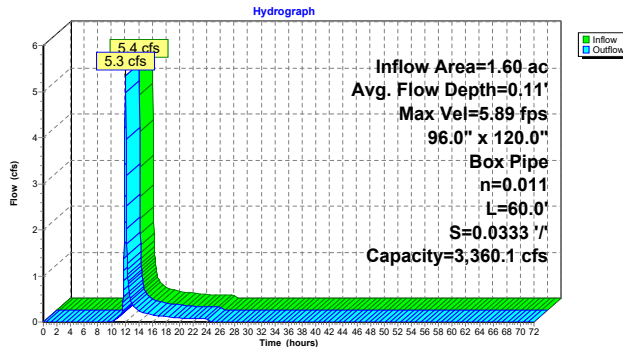
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Max. Velocity= 5.89 fps, Min. Travel Time= 0.2 min
 Avg. Velocity = 5.23 fps, Avg. Travel Time= 0.2 min

Peak Storage= 54 cf @ 12.04 hrs
 Average Depth at Peak Storage= 0.11', Surface Width= 8.00'
 Bank-Full Depth= 10.00' Flow Area= 80.0 sf, Capacity= 3,360.1 cfs

96.0" W x 120.0" H Box Pipe
 n= 0.011 Concrete pipe, straight & clean
 Length= 60.0' Slope= 0.0333 '/'
 Inlet Invert= 602.00', Outlet Invert= 600.00'



Reach 3R: North Culvert



Stage-Area-Storage for Reach 3R: North Culvert

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
602.00	0.0	0	607.30	42.4	2,544
602.10	0.8	48	607.40	43.2	2,592
602.20	1.6	96	607.50	44.0	2,640
602.30	2.4	144	607.60	44.8	2,688
602.40	3.2	192	607.70	45.6	2,736
602.50	4.0	240	607.80	46.4	2,784
602.60	4.8	288	607.90	47.2	2,832
602.70	5.6	336	608.00	48.0	2,880
602.80	6.4	384	608.10	48.8	2,928
602.90	7.2	432	608.20	49.6	2,976
603.00	8.0	480	608.30	50.4	3,024
603.10	8.8	528	608.40	51.2	3,072
603.20	9.6	576	608.50	52.0	3,120
603.30	10.4	624	608.60	52.8	3,168
603.40	11.2	672	608.70	53.6	3,216
603.50	12.0	720	608.80	54.4	3,264
603.60	12.8	768	608.90	55.2	3,312
603.70	13.6	816	609.00	56.0	3,360
603.80	14.4	864	609.10	56.8	3,408
603.90	15.2	912	609.20	57.6	3,456
604.00	16.0	960	609.30	58.4	3,504
604.10	16.8	1,008	609.40	59.2	3,552
604.20	17.6	1,056	609.50	60.0	3,600
604.30	18.4	1,104	609.60	60.8	3,648
604.40	19.2	1,152	609.70	61.6	3,696
604.50	20.0	1,200	609.80	62.4	3,744
604.60	20.8	1,248	609.90	63.2	3,792
604.70	21.6	1,296	610.00	64.0	3,840
604.80	22.4	1,344	610.10	64.8	3,888
604.90	23.2	1,392	610.20	65.6	3,936
605.00	24.0	1,440	610.30	66.4	3,984
605.10	24.8	1,488	610.40	67.2	4,032
605.20	25.6	1,536	610.50	68.0	4,080
605.30	26.4	1,584	610.60	68.8	4,128
605.40	27.2	1,632	610.70	69.6	4,176
605.50	28.0	1,680	610.80	70.4	4,224
605.60	28.8	1,728	610.90	71.2	4,272
605.70	29.6	1,776	611.00	72.0	4,320
605.80	30.4	1,824	611.10	72.8	4,368
605.90	31.2	1,872	611.20	73.6	4,416
606.00	32.0	1,920	611.30	74.4	4,464
606.10	32.8	1,968	611.40	75.2	4,512
606.20	33.6	2,016	611.50	76.0	4,560
606.30	34.4	2,064	611.60	76.8	4,608
606.40	35.2	2,112	611.70	77.6	4,656
606.50	36.0	2,160	611.80	78.4	4,704
606.60	36.8	2,208	611.90	79.2	4,752
606.70	37.6	2,256	612.00	80.0	4,800
606.80	38.4	2,304			
606.90	39.2	2,352			
607.00	40.0	2,400			
607.10	40.8	2,448			
607.20	41.6	2,496			

Summary for Pond BP-1: Bioretention Pond #1

Inflow Area = 2.58 ac, 67.59% Impervious, Inflow Depth = 3.93" for 50-year event
 Inflow = 17.2 cfs @ 11.96 hrs, Volume= 0.8 af, Atten= 33%, Lag= 3.8 min
 Outflow = 11.6 cfs @ 12.02 hrs, Volume= 0.8 af, Atten= 33%, Lag= 3.8 min
 Discarded = 0.1 cfs @ 12.02 hrs, Volume= 0.2 af
 Primary = 11.6 cfs @ 12.02 hrs, Volume= 0.6 af
 Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 597.59' @ 12.02 hrs Surf.Area= 5,878 sf Storage= 12,318 cf

Plug-Flow detention time= 365.0 min calculated for 0.8 af (100% of inflow)
 Center-of-Mass det. time= 365.9 min (1,151.2 - 785.3)

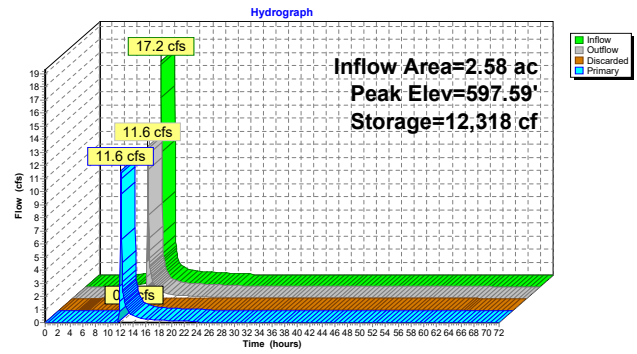
Volume	Invert	Avail.Storage	Storage Description			
#1	593.50'	21,619 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
593.50	3,350	303.7	0.0	0	0	3,350
595.00	3,350	303.7	10.0	503	503	3,806
598.00	6,338	360.3	100.0	14,296	14,798	6,958
599.00	7,314	382.0	100.0	6,820	21,619	8,292

Device	Routing	Invert	Outlet Devices
#1	Primary	595.00'	18.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 595.00' / 594.80' S= 0.0100' /' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	596.50'	24.0" W x 6.0" H Vert. Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	597.00'	48.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads
#4	Discarded	593.50'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.1 cfs @ 12.02 hrs HW=597.59' (Free Discharge)
4=Exfiltration (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=11.5 cfs @ 12.02 hrs HW=597.59' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 11.5 cfs @ 6.52 fps)
2=Orifice (Passes < 4.4 cfs potential flow)
3=Grate (Passes < 18.4 cfs potential flow)

Pond BP-1: Bioretention Pond #1



Stage-Area-Storage for Pond BP-1: Bioretention Pond #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
593.50	3,350	0	598.80	7,113	20,176
593.60	3,350	34	598.90	7,213	20,892
593.70	3,350	67	599.00	7,314	21,619
593.80	3,350	100			
593.90	3,350	134			
594.00	3,350	168			
594.10	3,350	201			
594.20	3,350	235			
594.30	3,350	268			
594.40	3,350	301			
594.50	3,350	335			
594.60	3,350	369			
594.70	3,350	402			
594.80	3,350	435			
594.90	3,350	469			
595.00	3,350	503			
595.10	3,434	842			
595.20	3,520	1,189			
595.30	3,606	1,546			
595.40	3,694	1,911			
595.50	3,782	2,285			
595.60	3,872	2,667			
595.70	3,963	3,059			
595.80	4,054	3,460			
595.90	4,147	3,870			
596.00	4,241	4,289			
596.10	4,336	4,718			
596.20	4,432	5,156			
596.30	4,529	5,605			
596.40	4,627	6,062			
596.50	4,726	6,530			
596.60	4,826	7,008			
596.70	4,927	7,495			
596.80	5,029	7,993			
596.90	5,133	8,501			
597.00	5,237	9,020			
597.10	5,342	9,549			
597.20	5,449	10,088			
597.30	5,556	10,638			
597.40	5,665	11,199			
597.50	5,774	11,771			
597.60	5,885	12,354			
597.70	5,997	12,948			
597.80	6,109	13,554			
597.90	6,223	14,170			
598.00	6,338	14,798			
598.10	6,452	15,437			
598.20	6,528	16,085			
598.30	6,623	16,742			
598.40	6,720	17,410			
598.50	6,817	18,086			
598.60	6,915	18,773			
598.70	7,014	19,470			

Summary for Pond BP-2: Bioretention Pond #2

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 0.73 ac, 55.39% Impervious, Inflow Depth = 3.71" for 50-year event
 Inflow = 4.7 cfs @ 11.96 hrs, Volume= 0.2 af
 Outflow = 0.3 cfs @ 12.76 hrs, Volume= 0.2 af, Atten= 94%, Lag= 47.9 min
 Primary = 0.3 cfs @ 12.76 hrs, Volume= 0.2 af
 Routed to Pond UIP-1 : UIP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 603.06' @ 12.76 hrs Surf.Area= 4,663 sf Storage= 4,442 cf

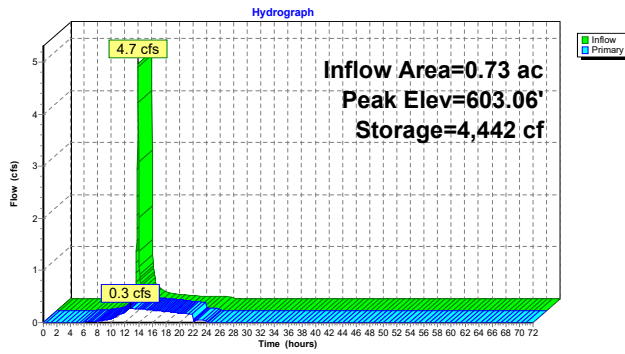
Plug-Flow detention time= 153.3 min calculated for 0.2 af (100% of inflow)
 Center-of-Mass det. time= 153.2 min (949.3 - 796.1)

Volume	Invert	Avail.Storage	Storage Description			
#1	600.50'	9,543 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
600.50	2,922	537.6	0.0	0	0	2,922
602.00	2,922	537.6	10.0	438	438	3,728
603.00	4,564	556.9	100.0	3,713	4,151	5,496
604.00	6,264	576.4	100.0	5,392	9,543	7,344

Device	Routing	Invert	Outlet Devices
#1	Primary	597.90'	12.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 597.90' / 597.40' S= 0.0100' /' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	599.75'	6.0" Round Underdrain L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 599.75' / 599.65' S= 0.0100' /' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#3	Device 2	600.50'	2,500 in/hr Exfiltration over Surface area Phase-In= 0.01'
#4	Device 1	603.50'	12.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.3 cfs @ 12.76 hrs HW=603.06' TW=596.97' (Dynamic Tailwater)
1=Culvert (Passes 0.3 cfs of 7.8 cfs potential flow)
2=Underdrain (Passes 0.3 cfs of 1.7 cfs potential flow)
3=Exfiltration (Exfiltration Controls 0.3 cfs)
4=Grate (Controls 0.0 cfs)

Pond BP-2: Bioretention Pond #2



Stage-Area-Storage for Pond BP-2: Bioretention Pond #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
600.50	2,922	0	603.15	4,802	4,853
600.55	2,922	15	603.20	4,883	5,095
600.60	2,922	29	603.25	4,964	5,342
600.65	2,922	44	603.30	5,046	5,592
600.70	2,922	58	603.35	5,128	5,846
600.75	2,922	73	603.40	5,212	6,105
600.80	2,922	88	603.45	5,296	6,367
600.85	2,922	102	603.50	5,380	6,634
600.90	2,922	117	603.55	5,466	6,905
600.95	2,922	131	603.60	5,552	7,181
601.00	2,922	146	603.65	5,638	7,461
601.05	2,922	161	603.70	5,726	7,745
601.10	2,922	175	603.75	5,814	8,033
601.15	2,922	190	603.80	5,903	8,326
601.20	2,922	205	603.85	5,992	8,623
601.25	2,922	219	603.90	6,082	8,925
601.30	2,922	234	603.95	6,173	9,232
601.35	2,922	248	604.00	6,264	9,543
601.40	2,922	263			
601.45	2,922	278			
601.50	2,922	292			
601.55	2,922	307			
601.60	2,922	321			
601.65	2,922	336			
601.70	2,922	351			
601.75	2,922	365			
601.80	2,922	380			
601.85	2,922	394			
601.90	2,922	409			
601.95	2,922	424			
602.00	2,922	438			
602.05	2,995	586			
602.10	3,070	738			
602.15	3,145	893			
602.20	3,221	1,052			
602.25	3,298	1,215			
602.30	3,376	1,382			
602.35	3,455	1,553			
602.40	3,535	1,728			
602.45	3,616	1,907			
602.50	3,697	2,089			
602.55	3,780	2,276			
602.60	3,863	2,467			
602.65	3,948	2,663			
602.70	4,033	2,862			
602.75	4,119	3,066			
602.80	4,206	3,274			
602.85	4,294	3,487			
602.90	4,383	3,704			
602.95	4,473	3,925			
603.00	4,564	4,151			
603.05	4,643	4,381			
603.10	4,722	4,615			

Summary for Pond BP-3: Bioretention Pond #3

Inflow Area = 0.57 ac, 52.67% Impervious, Inflow Depth = 3.71" for 50-year event
 Inflow = 3.7 cfs @ 11.96 hrs, Volume= 0.2 af
 Outflow = 2.2 cfs @ 12.04 hrs, Volume= 0.2 af, Atten= 42%, Lag= 4.7 min
 Primary = 2.2 cfs @ 12.04 hrs, Volume= 0.2 af
 Routed to Pond UIP-1 : UIP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 607.25' @ 12.04 hrs Surf.Area= 3,016 sf Storage= 2,679 cf

Plug-Flow detention time= 106.8 min calculated for 0.2 af (100% of inflow)
 Center-of-Mass det. time= 106.9 min (903.0 - 796.1)

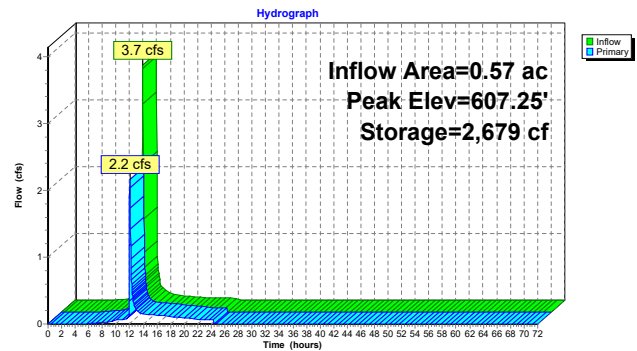
Volume	Invert	Avail.Storage	Storage Description			
#1	604.50'	5,393 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
604.50	1,082	510.4	0.0	0	0	1,082
606.00	1,082	510.4	10.0	162	162	1,848
607.00	2,627	548.9	100.0	1,798	1,961	5,136
608.00	4,307	570.7	100.0	3,433	5,393	7,157

Device	Routing	Invert	Outlet Devices
#1	Primary	603.50'	18.0" Round Culvert L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 603.50' / 593.80' S= 0.1617 ' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	603.75'	6.0" Round Underdrain L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 603.75' / 603.65' S= 0.0100 ' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#3	Device 2	604.50'	2,500 in/hr Exfiltration over Surface area Phase-In= 0.01'
#4	Device 1	607.00'	18.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.1 cfs @ 12.04 hrs HW=607.25' TW=597.64' (Dynamic Tailwater)

- 1=Culvert (Passes 2.1 cfs of 14.7 cfs potential flow)
- 2=Underdrain (Passes 0.2 cfs of 1.7 cfs potential flow)
- 3=Exfiltration (Exfiltration Controls 0.2 cfs)
- 4=Grate (Weir Controls 2.0 cfs @ 1.64 fps)

Pond BP-3: Bioretention Pond #3



Stage-Area-Storage for Pond BP-3: Bioretention Pond #3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
604.50	1,082	0	607.15	2,853	2,371
604.55	1,082	5	607.20	2,930	2,516
604.60	1,082	11	607.25	3,008	2,664
604.65	1,082	16	607.30	3,088	2,817
604.70	1,082	22	607.35	3,168	2,973
604.75	1,082	27	607.40	3,249	3,134
604.80	1,082	32	607.45	3,332	3,298
604.85	1,082	38	607.50	3,415	3,467
604.90	1,082	43	607.55	3,500	3,640
604.95	1,082	49	607.60	3,585	3,817
605.00	1,082	54	607.65	3,672	3,998
605.05	1,082	60	607.70	3,760	4,184
605.10	1,082	65	607.75	3,848	4,374
605.15	1,082	70	607.80	3,938	4,569
605.20	1,082	76	607.85	4,029	4,768
605.25	1,082	81	607.90	4,120	4,972
605.30	1,082	87	607.95	4,213	5,180
605.35	1,082	92	608.00	4,307	5,393
605.40	1,082	97			
605.45	1,082	103			
605.50	1,082	108			
605.55	1,082	114			
605.60	1,082	119			
605.65	1,082	124			
605.70	1,082	130			
605.75	1,082	135			
605.80	1,082	141			
605.85	1,082	146			
605.90	1,082	151			
605.95	1,082	157			
606.00	1,082	162			
606.05	1,143	218			
606.10	1,206	277			
606.15	1,271	339			
606.20	1,337	404			
606.25	1,405	472			
606.30	1,475	544			
606.35	1,546	620			
606.40	1,619	699			
606.45	1,694	782			
606.50	1,770	868			
606.55	1,848	959			
606.60	1,928	1,053			
606.65	2,010	1,152			
606.70	2,093	1,254			
606.75	2,178	1,361			
606.80	2,264	1,472			
606.85	2,352	1,587			
606.90	2,442	1,707			
606.95	2,534	1,832			
607.00	2,627	1,961			
607.05	2,701	2,094			
607.10	2,776	2,231			

Summary for Pond UIP-1: UIP-1

Inflow Area = 7.23 ac, 76.62% Impervious, Inflow Depth = 4.27" for 50-year event
 Inflow = 43.8 cfs @ 11.96 hrs, Volume= 2.6 af
 Outflow = 15.1 cfs @ 12.08 hrs, Volume= 2.3 af, Atten= 66%, Lag= 6.9 min
 Discarded = 0.2 cfs @ 6.09 hrs, Volume= 0.9 af
 Primary = 14.9 cfs @ 12.08 hrs, Volume= 1.4 af
 Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 597.79' @ 12.08 hrs Surf.Area= 13,305 sf Storage= 51,651 cf

Plug-Flow detention time= 676.8 min calculated for 2.3 af (90% of inflow)
 Center-of-Mass det. time= 622.7 min (1,418.2 - 795.5)

Volume	Invert	Avail. Storage	Storage Description
#1A	592.30'	20,928 cf	64.83'W x 205.22'L x 6.75'H Field A 89,808 cf Overall - 37,487 cf Embedded = 52,321 cf x 40.0% Voids
#2A	593.05'	37,487 cf	ADS StormTech MC-7200 +Cap x 210 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 210 Chambers in 7 Rows Cap Storage= 39.5 cf x 2 x 7 rows = 553.0 cf
		58,415 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	592.50'	24.0" Round Culvert L= 25.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 592.50' / 591.06' S= 0.0576' /' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	597.30'	5.0' long Sharp-Crested Rectangular Weir 2 End Contractions(s)
#3	Discarded	592.30'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.01'
#4	Device 1	596.05'	18.0" W x 15.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.2 cfs @ 6.09 hrs HW=592.37' (Free Discharge)
 3=Exfiltration (Exfiltration Controls 0.2 cfs)

Primary OutFlow Max=14.8 cfs @ 12.08 hrs HW=597.78' TW=0.00' (Dynamic Tailwater)
 1=Culvert (Passes 14.8 cfs of 27.6 cfs potential flow)
 2=Sharp-Crested Rectangular Weir (Weir Controls 5.4 cfs @ 2.27 fps)
 4=Orifice/Grate (Orifice Controls 9.4 cfs @ 5.00 fps)

Pond UIP-1: UIP-1 - Chamber Wizard Field A

Chamber Model = ADS StormTech MC-7200 +Cap (ADS StormTech® MC-7200 with cap volume)
 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf
 Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap
 Cap Storage= 39.5 cf x 2 x 7 rows = 553.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

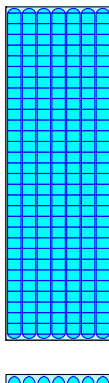
30 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 203.22' Row Length +12.0" End Stone x 2 =
 205.22' Base Length
 7 Rows x 100.0" Wide + 9.0" Spacing x 6 + 12.0" Side Stone x 2 = 64.83' Base Width
 9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

210 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 7 Rows = 37,486.9 cf Chamber Storage

89,807.9 cf Field - 37,486.9 cf Chambers = 52,321.1 cf Stone x 40.0% Voids = 20,928.4 cf Stone Storage

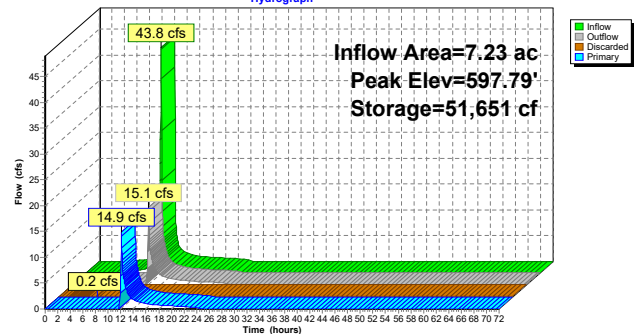
Chamber Storage + Stone Storage = 58,415.3 cf = 1.3 af
 Overall Storage Efficiency = 65.0%
 Overall System Size = 205.22' x 64.83' x 6.75'

210 Chambers
 3,326.2 cy Field
 1,937.8 cy Stone



Pond UIP-1: UIP-1

Hydrograph



Stage-Area-Storage for Pond UIP-1: UIP-1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
592.30	13,305	0	597.60	13,305	50,487
592.40	13,305	532	597.70	13,305	51,107
592.50	13,305	1,064	597.80	13,305	51,697
592.60	13,305	1,597	597.90	13,305	52,270
592.70	13,305	2,129	598.00	13,305	52,824
592.80	13,305	2,661	598.10	13,305	53,359
592.90	13,305	3,193	598.20	13,305	53,892
593.00	13,305	3,725	598.30	13,305	54,424
593.10	13,305	4,258	598.40	13,305	54,956
593.20	13,305	4,790	598.50	13,305	55,488
593.30	13,305	5,322	598.60	13,305	56,020
593.40	13,305	5,854	598.70	13,305	56,553
593.50	13,305	6,386	598.80	13,305	57,085
593.60	13,305	6,918	598.90	13,305	57,617
593.70	13,305	7,450	599.00	13,305	58,149
593.80	13,305	7,982			
593.90	13,305	8,514			
594.00	13,305	9,046			
594.10	13,305	9,578			
594.20	13,305	10,110			
594.30	13,305	10,642			
594.40	13,305	11,174			
594.50	13,305	11,706			
594.60	13,305	12,238			
594.70	13,305	12,770			
594.80	13,305	13,302			
594.90	13,305	13,834			
595.00	13,305	14,366			
595.10	13,305	14,898			
595.20	13,305	15,430			
595.30	13,305	15,962			
595.40	13,305	16,494			
595.50	13,305	17,026			
595.60	13,305	17,558			
595.70	13,305	18,090			
595.80	13,305	18,622			
595.90	13,305	19,154			
596.00	13,305	19,686			
596.10	13,305	20,218			
596.20	13,305	20,750			
596.30	13,305	21,282			
596.40	13,305	21,814			
596.50	13,305	22,346			
596.60	13,305	22,878			
596.70	13,305	23,410			
596.80	13,305	23,942			
596.90	13,305	24,474			
597.00	13,305	25,006			
597.10	13,305	25,538			
597.20	13,305	26,070			
597.30	13,305	26,602			
597.40	13,305	27,134			
597.50	13,305	27,666			

Summary for Pond UIP-2: UIP-2

Inflow Area = 1.72 ac, 86.04% Impervious, Inflow Depth = 4.29" for 50-year event
 Inflow = 12.3 cfs @ 11.96 hrs, Volume= 0.6 af
 Outflow = 6.0 cfs @ 12.05 hrs, Volume= 0.6 af, Atten= 51%, Lag= 5.3 min
 Discarded = 0.0 cfs @ 6.39 hrs, Volume= 0.2 af
 Primary = 6.0 cfs @ 12.05 hrs, Volume= 0.4 af
 Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 587.77' @ 12.05 hrs Surf.Area= 3,594 sf Storage= 12,346 cf

Plug-Flow detention time= 465.3 min calculated for 0.6 af (100% of inflow)
 Center-of-Mass det. time= 466.1 min (1,241.2 - 775.1)

Volume	Invert	Avail. Storage	Storage Description
#1A	583.00'	5,811 cf	28.50'W x 126.12'L x 6.75'H Field A 24,262 cf Overall - 9,734 cf Embedded = 14,527 cf x 40.0% Voids
#2A	583.75'	9,734 cf	ADS StormTech MC-7200 +Cap x 54 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 54 Chambers in 3 Rows Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf
15,545 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	583.00'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 583.00' / 582.80' S= 0.0100' /' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	585.25'	4.0" W x 27.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	587.50'	4.0" long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Discarded	583.00'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.0 cfs @ 6.39 hrs HW=583.07' (Free Discharge)
4=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=5.9 cfs @ 12.05 hrs HW=587.76' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 5.9 cfs of 7.8 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 4.1 cfs @ 5.49 fps)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 1.7 cfs @ 1.68 fps)

Pond UIP-2: UIP-2 - Chamber Wizard Field A

Chamber Model = ADS StormTech MC-7200 +Cap (ADS StormTech® MC-7200 with cap volume)
 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf
 Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap
 Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf

100.0" Wide x 9.0" Spacing = 109.0" C-C Row Spacing

18 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 124.12' Row Length +12.0" End Stone x 2 = 126.12' Base Length
 3 Rows x 100.0" Wide x 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width
 9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

54 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 3 Rows = 9,734.3 cf Chamber Storage

24,261.7 cf Field - 9,734.3 cf Chambers = 14,527.4 cf Stone x 40.0% Voids = 5,811.0 cf Stone Storage

Chamber Storage + Stone Storage = 15,545.2 cf = 0.4 af

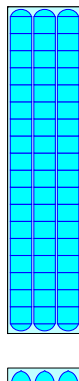
Overall Storage Efficiency = 64.1%

Overall System Size = 126.12' x 28.50' x 6.75'

54 Chambers

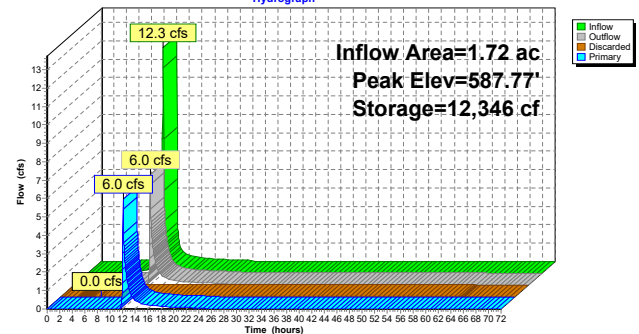
898.6 cy Field

538.1 cy Stone



Pond UIP-2: UIP-2

Hydrograph



Stage-Area-Storage for Pond UIP-2: UIP-2

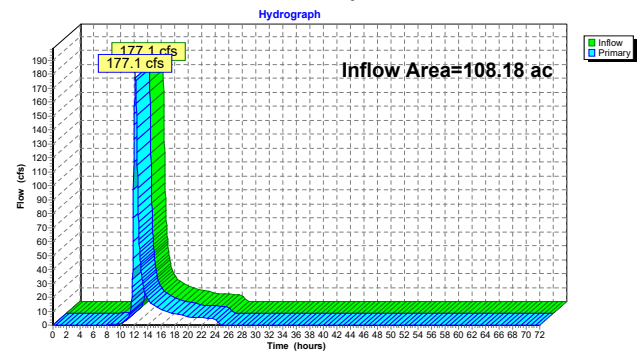
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
583.00	3,594	0	588.30	3,594	13,406
583.10	3,594	144	588.40	3,594	13,572
583.20	3,594	288	588.50	3,594	13,731
583.30	3,594	431	588.60	3,594	13,885
583.40	3,594	575	588.70	3,594	14,035
583.50	3,594	719	588.80	3,594	14,179
583.60	3,594	863	588.90	3,594	14,323
583.70	3,594	1,006	589.00	3,594	14,467
583.80	3,594	1,233	589.10	3,594	14,611
583.90	3,594	1,543	589.20	3,594	14,754
584.00	3,594	1,852	589.30	3,594	14,898
584.10	3,594	2,159	589.40	3,594	15,042
584.20	3,594	2,467	589.50	3,594	15,186
584.30	3,594	2,773	589.60	3,594	15,330
584.40	3,594	3,079	589.70	3,594	15,473
584.50	3,594	3,383			
584.60	3,594	3,687			
584.70	3,594	3,990			
584.80	3,594	4,291			
584.90	3,594	4,592			
585.00	3,594	4,891			
585.10	3,594	5,189			
585.20	3,594	5,485			
585.30	3,594	5,780			
585.40	3,594	6,074			
585.50	3,594	6,366			
585.60	3,594	6,656			
585.70	3,594	6,945			
585.80	3,594	7,231			
585.90	3,594	7,516			
586.00	3,594	7,799			
586.10	3,594	8,079			
586.20	3,594	8,358			
586.30	3,594	8,634			
586.40	3,594	8,908			
586.50	3,594	9,179			
586.60	3,594	9,447			
586.70	3,594	9,713			
586.80	3,594	9,976			
586.90	3,594	10,236			
587.00	3,594	10,492			
587.10	3,594	10,745			
587.20	3,594	10,995			
587.30	3,594	11,241			
587.40	3,594	11,482			
587.50	3,594	11,720			
587.60	3,594	11,953			
587.70	3,594	12,180			
587.80	3,594	12,403			
587.90	3,594	12,620			
588.00	3,594	12,830			
588.10	3,594	13,032			
588.20	3,594	13,225			

Summary for Link DP-1: Brickyard Pond

Inflow Area = 108.18 ac, 8.92% Impervious, Inflow Depth = 2.32" for 50-year event
 Inflow = 177.1 cfs @ 12.21 hrs, Volume = 20.9 af
 Primary = 177.1 cfs @ 12.21 hrs, Volume = 20.9 af, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-72.00 hrs, dt = 0.03 hrs

Link DP-1: Brickyard Pond



Time span=0.00-72.00 hrs, dt=0.03 hrs, 2401 points x 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR-1: Subcat PR-1	Runoff Area=29.63 ac 0.42% Impervious Runoff Depth=2.83" Flow Length=1,970' Tc=23.5 min CN=70 Runoff=84.0 cfs 7.0 af
Subcatchment PR-10: Subcat PR-10	Runoff Area=9.13 ac 5.51% Impervious Runoff Depth=4.44" Tc=5.0 min CN=86 Runoff=70.4 cfs 3.4 af
Subcatchment PR-11: Subcat PR-11	Runoff Area=0.70 ac 45.60% Impervious Runoff Depth=3.91" Tc=5.0 min CN=81 Runoff=4.9 cfs 0.2 af
Subcatchment PR-12: Subcat PR-12	Runoff Area=1.60 ac 0.00% Impervious Runoff Depth=3.02" Flow Length=410' Tc=11.6 min CN=72 Runoff=7.0 cfs 0.4 af
Subcatchment PR-13: Subcat PR-13	Runoff Area=0.56 ac 94.01% Impervious Runoff Depth=5.67" Tc=5.0 min CN=97 Runoff=4.9 cfs 0.3 af
Subcatchment PR-2: Subcat PR-2	Runoff Area=0.81 ac 84.54% Impervious Runoff Depth=5.10" Tc=5.0 min CN=92 Runoff=6.8 cfs 0.3 af
Subcatchment PR-3: Subcat PR-3	Runoff Area=0.91 ac 87.38% Impervious Runoff Depth=5.21" Tc=5.0 min CN=93 Runoff=7.7 cfs 0.4 af
Subcatchment PR-4: Subcat PR-4	Runoff Area=56.16 ac 0.45% Impervious Runoff Depth=2.83" Flow Length=3,025' Tc=32.8 min CN=70 Runoff=128.2 cfs 13.2 af
Subcatchment PR-5: Subcat PR-5	Runoff Area=0.13 ac 4.40% Impervious Runoff Depth=2.46" Tc=5.0 min CN=66 Runoff=0.6 cfs 0.0 af
Subcatchment PR-6: Subcat PR-6	Runoff Area=5.37 ac 80.24% Impervious Runoff Depth=5.21" Tc=5.0 min CN=93 Runoff=45.6 cfs 2.3 af
Subcatchment PR-7: Subcat PR-7	Runoff Area=0.73 ac 55.39% Impervious Runoff Depth=4.55" Tc=5.0 min CN=87 Runoff=5.7 cfs 0.3 af
Subcatchment PR-8: Subcat PR-8	Runoff Area=0.57 ac 52.67% Impervious Runoff Depth=4.55" Tc=5.0 min CN=87 Runoff=4.5 cfs 0.2 af
Subcatchment PR-9: Subcat PR-9	Runoff Area=1.88 ac 75.74% Impervious Runoff Depth=5.10" Tc=5.0 min CN=92 Runoff=15.8 cfs 0.8 af
Reach 2R: South Culvert	Avg. Flow Depth=0.87' Max Vel=10.81 fps Inflow=75.7 cfs 3.8 af 96.0" x 108.0" Box Pipe n=0.011 L=50.0' S=0.0100' Capacity=1,604.0 cfs Outflow=75.7 cfs 3.8 af
Reach 3R: North Culvert	Avg. Flow Depth=0.13' Max Vel=6.64 fps Inflow=7.0 cfs 0.4 af 96.0" x 120.0" Box Pipe n=0.011 L=60.0' S=0.0333' Capacity=3,360.1 cfs Outflow=7.0 cfs 0.4 af
Pond BP-1: Bioretention Pond #1	Peak Elev=597.88' Storage=14,065 cf Inflow=20.7 cfs 1.0 af Discarded=0.1 cfs 0.2 af Primary=12.4 cfs 0.8 af Outflow=12.5 cfs 1.0 af

Pond BP-2: Bioretention Pond #2	Peak Elev=603.31' Storage=5,666 cf Inflow=5.7 cfs 0.3 af Outflow=0.3 cfs 0.3 af
Pond BP-3: Bioretention Pond #3	Peak Elev=607.34' Storage=2,942 cf Inflow=4.5 cfs 0.2 af Outflow=3.2 cfs 0.2 af
Pond UIP-1: UIP-1	Peak Elev=598.68' Storage=56,461 cf Inflow=53.1 cfs 3.1 af Discarded=0.2 cfs 0.9 af Primary=30.4 cfs 1.9 af Outflow=30.5 cfs 2.8 af
Pond UIP-2: UIP-2	Peak Elev=588.41' Storage=13,594 cf Inflow=14.6 cfs 0.7 af Discarded=0.0 cfs 0.2 af Primary=8.4 cfs 0.5 af Outflow=8.4 cfs 0.7 af
Link DP-1: Brickyard Pond	Inflow=238.4 cfs 27.3 af Primary=238.4 cfs 27.3 af
Total Runoff Area = 108.18 ac Runoff Volume = 28.9 af Average Runoff Depth = 3.20"	
91.08% Pervious = 98.53 ac 8.92% Impervious = 9.65 ac	

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Type II 24-hr 100-year Rainfall=6.03"

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Summary for Subcatchment PR-1: Subcat PR-1

Runoff = 84.0 cfs @ 12.17 hrs, Volume= 7.0 af, Depth= 2.83"
 Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 100-year Rainfall=6.03"

Area (ac)	CN	Description
0.00	61	>75% Grass cover, Good, HSG B
2.12	74	>75% Grass cover, Good, HSG C
0.12	98	Roofs, HSG C
0.00	55	Woods, Good, HSG B
27.38	70	Woods, Good, HSG C
29.63	70	Weighted Average
29.50		99.58% Pervious Area
0.12		0.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	50	0.0800	0.06		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
8.6	1,430	0.3100	2.78		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	490	0.0410	8.73	192.03	Channel Flow, Area= 22.0 sf Perim= 17.6' r= 1.25' n= 0.040 Earth, cobble bottom, clean sides
23.5	1,970	Total			

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Type II 24-hr 100-year Rainfall=6.03"

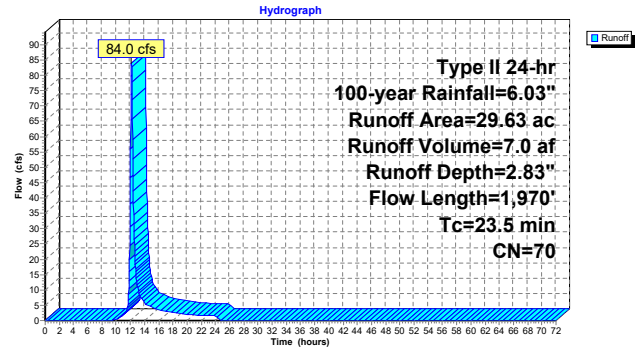
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Subcatchment PR-1: Subcat PR-1



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Summary for Subcatchment PR-10: Subcat PR-10

Runoff = 70.4 cfs @ 11.96 hrs, Volume= 3.4 af, Depth= 4.44"
 Routed to Reach 2R : South Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 100-year Rainfall=6.03"

Area (ac)	CN	Description
0.10	39	>75% Grass cover, Good, HSG A
0.71	61	>75% Grass cover, Good, HSG B
0.59	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.00	30	Brush, Good, HSG A
0.14	48	Brush, Good, HSG B
0.07	65	Brush, Good, HSG C
0.09	85	Gravel roads, HSG B
0.09	89	Gravel roads, HSG C
0.00	98	Paved parking, HSG A
0.16	98	Paved parking, HSG B
0.22	98	Paved parking, HSG C
0.05	98	Roofs, HSG B
0.07	98	Roofs, HSG C
0.81	98	Water Surface, 0% imp, HSG B
4.51	98	Water Surface, 0% imp, HSG C
0.21	98	Water Surface, 0% imp, HSG D
0.01	30	Woods, Good, HSG A
0.90	55	Woods, Good, HSG B
0.40	70	Woods, Good, HSG C
0.00	77	Woods, Good, HSG D
9.13	86	Weighted Average
8.63		94.49% Pervious Area
0.50		5.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type II 24-hr 100-year Rainfall=6.03"

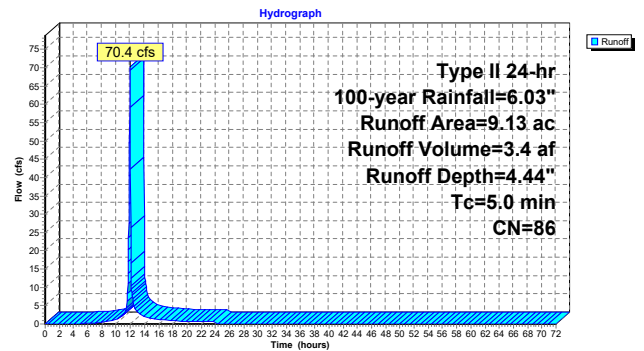
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Subcatchment PR-10: Subcat PR-10



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Summary for Subcatchment PR-11: Subcat PR-11

Runoff = 4.9 cfs @ 11.96 hrs, Volume= 0.2 af, Depth= 3.91"
 Routed to Pond BP-1 : Bioretention Pond #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 100-year Rainfall=6.03"

Area (ac)	CN	Description
0.00	39	>75% Grass cover, Good, HSG A
0.22	61	>75% Grass cover, Good, HSG B
0.16	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.00	65	Brush, Good, HSG C
0.01	98	Paved parking, HSG A
0.21	98	Paved parking, HSG B
0.03	98	Paved parking, HSG C
0.01	98	Paved parking, HSG D
0.02	98	Roofs, HSG A
0.03	98	Roofs, HSG B
0.00	98	Water Surface, 0% imp, HSG D
0.70	81	Weighted Average
0.36		54.40% Pervious Area
0.32		45.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type II 24-hr 100-year Rainfall=6.03"

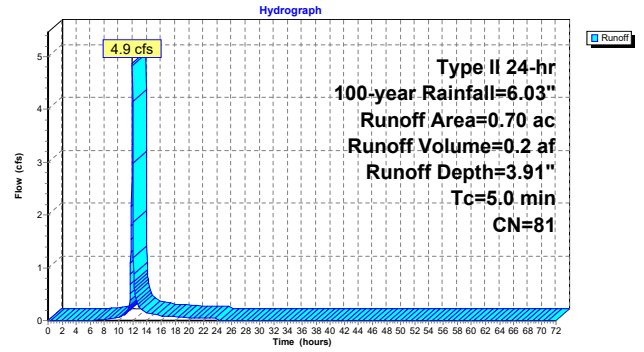
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Subcatchment PR-11: Subcat PR-11



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Summary for Subcatchment PR-12: Subcat PR-12

Runoff = 7.0 cfs @ 12.04 hrs, Volume= 0.4 af, Depth= 3.02"
 Routed to Reach 3R : North Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 100-year Rainfall=6.03"

Area (ac)	CN	Description
0.01	61	>75% Grass cover, Good, HSG B
0.09	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.02	48	Brush, Good, HSG B
0.00	98	Paved parking, HSG B
0.00	98	Paved parking, HSG C
0.00	98	Paved parking, HSG D
0.10	98	Water Surface, 0% imp, HSG B
0.01	98	Water Surface, 0% imp, HSG C
0.03	98	Water Surface, 0% imp, HSG D
0.06	55	Woods, Good, HSG B
1.28	70	Woods, Good, HSG C
1.60	72	Weighted Average
1.60		100.00% Pervious Area
0.00		0.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.3000	0.10		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
2.6	180	0.2200	1.17		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
0.8	180	0.0670	3.88		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
11.6	410				Total

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Type II 24-hr 100-year Rainfall=6.03"

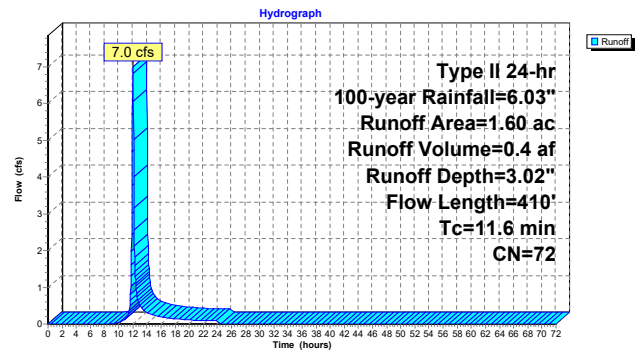
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Subcatchment PR-12: Subcat PR-12



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Type II 24-hr 100-year Rainfall=6.03"

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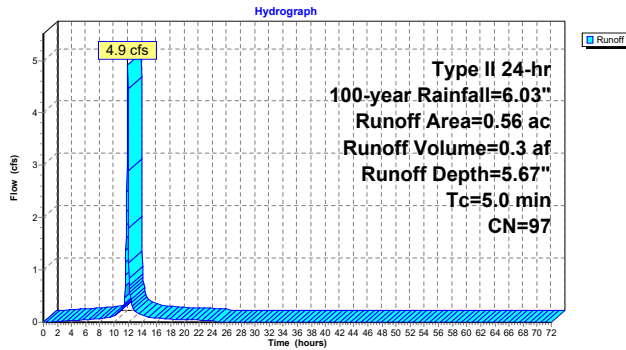
Summary for Subcatchment PR-13: Subcat PR-13

Runoff = 4.9 cfs @ 11.96 hrs, Volume= 0.3 af, Depth= 5.67"
 Routed to Pond UIP-1 : UIP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 100-year Rainfall=6.03"

Area (ac)	CN	Description			
0.03	74	>75% Grass cover, Good, HSG C			
0.09	98	Paved parking, HSG C			
0.43	98	Roofs, HSG C			
0.56	97	Weighted Average			
0.03		5.99% Pervious Area			
0.53		94.01% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-13: Subcat PR-13



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Type II 24-hr 100-year Rainfall=6.03"

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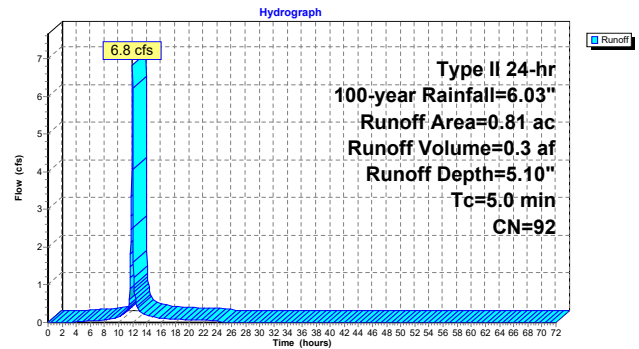
Summary for Subcatchment PR-2: Subcat PR-2

Runoff = 6.8 cfs @ 11.96 hrs, Volume= 0.3 af, Depth= 5.10"
 Routed to Pond UIP-2 : UIP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 100-year Rainfall=6.03"

Area (ac)	CN	Description			
0.12	61	>75% Grass cover, Good, HSG B			
0.00	48	Brush, Good, HSG B			
0.40	98	Paved parking, HSG B			
0.28	98	Roofs, HSG B			
0.81	92	Weighted Average			
0.13		15.46% Pervious Area			
0.69		84.54% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-2: Subcat PR-2



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Type II 24-hr 100-year Rainfall=6.03"

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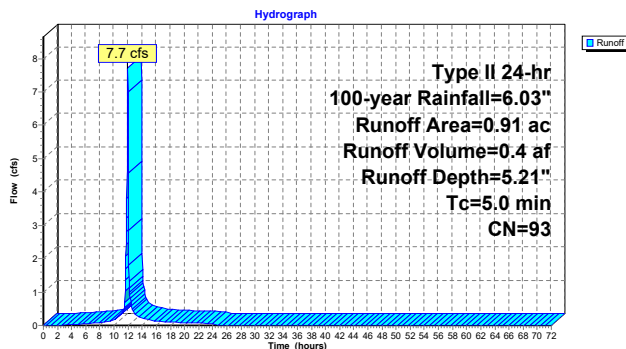
Summary for Subcatchment PR-3: Subcat PR-3

Runoff = 7.7 cfs @ 11.96 hrs, Volume= 0.4 af, Depth= 5.21"
 Routed to Pond UIP-2 : UIP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 100-year Rainfall=6.03"

Area (ac)	CN	Description			
0.11	61	>75% Grass cover, Good, HSG B			
0.00	74	>75% Grass cover, Good, HSG C			
0.00	85	Gravel roads, HSG B			
0.34	98	Paved parking, HSG B			
0.46	98	Roofs, HSG B			
0.00	98	Roofs, HSG C			
0.91	93	Weighted Average			
0.11		12.62% Pervious Area			
0.79		87.38% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-3: Subcat PR-3



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Type II 24-hr 100-year Rainfall=6.03"

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Summary for Subcatchment PR-4: Subcat PR-4

Runoff = 128.2 cfs @ 12.28 hrs, Volume= 13.2 af, Depth= 2.83"
 Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 100-year Rainfall=6.03"

Area (ac)	CN	Description
0.07	39	>75% Grass cover, Good, HSG A
0.57	61	>75% Grass cover, Good, HSG B
0.04	74	>75% Grass cover, Good, HSG C
0.00	30	Brush, Good, HSG A
0.88	48	Brush, Good, HSG B
0.18	98	Paved parking, HSG A
0.03	98	Paved parking, HSG B
0.05	98	Roofs, HSG B
1.26	98	Water Surface, 0% imp, HSG B
0.00	30	Woods, Good, HSG A
2.40	55	Woods, Good, HSG B
50.16	70	Woods, Good, HSG C
0.53	77	Woods, Good, HSG D
56.16	70	Weighted Average
55.91		99.55% Pervious Area
0.26		0.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.1600	0.08		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.50"
15.3	2,100	0.2100	2.29		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.9	875	0.0200	2.12		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
32.8	3,025	Total			

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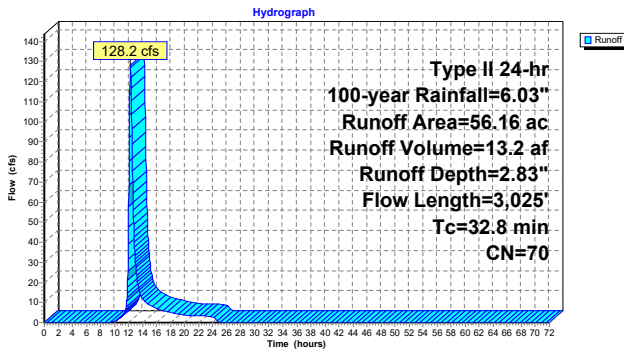
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Type II 24-hr 100-year Rainfall=6.03"

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Subcatchment PR-4: Subcat PR-4



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Summary for Subcatchment PR-5: Subcat PR-5

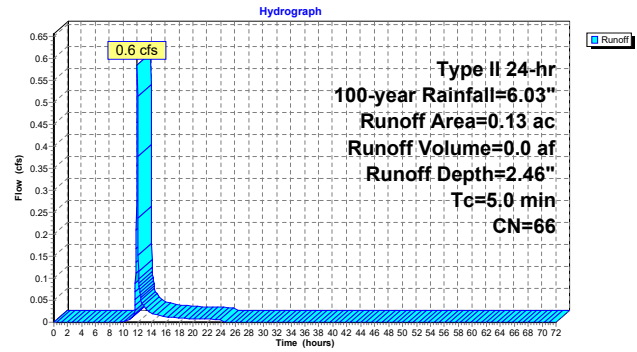
Runoff = 0.6 cfs @ 11.96 hrs, Volume= 0.0 af, Depth= 2.46"
Routed to Link DP-1 : Brickyard Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 100-year Rainfall=6.03"

Area (ac)	CN	Description
0.11	61	>75% Grass cover, Good, HSG B
0.02	85	Gravel roads, HSG B
0.01	98	Paved parking, HSG B
0.13	66	Weighted Average
0.12		95.60% Pervious Area
0.01		4.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-5: Subcat PR-5



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Summary for Subcatchment PR-6: Subcat PR-6

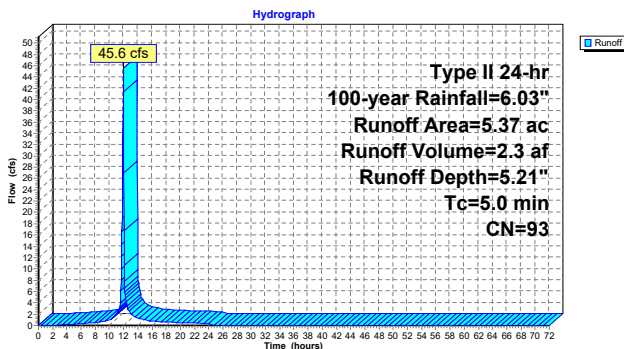
Runoff = 45.6 cfs @ 11.96 hrs, Volume= 2.3 af, Depth= 5.21"
Routed to Pond UIP-1 : UIP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 100-year Rainfall=6.03"

Area (ac)	CN	Description
0.29	61	>75% Grass cover, Good, HSG B
0.77	74	>75% Grass cover, Good, HSG C
0.47	98	Paved parking, HSG B
1.43	98	Paved parking, HSG C
0.49	98	Roofs, HSG B
1.92	98	Roofs, HSG C
5.37	93	Weighted Average
1.06		19.76% Pervious Area
4.31		80.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-6: Subcat PR-6



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Type II 24-hr 100-year Rainfall=6.03"

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Summary for Subcatchment PR-7: Subcat PR-7

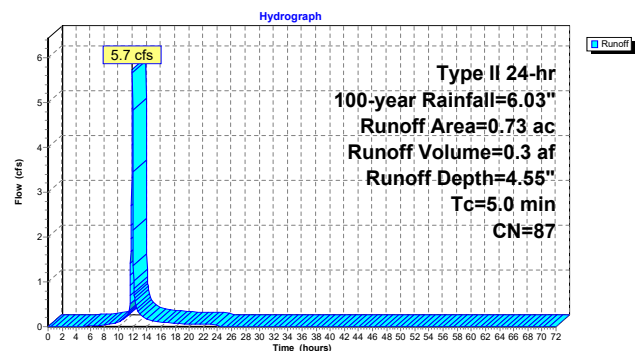
Runoff = 5.7 cfs @ 11.96 hrs, Volume= 0.3 af, Depth= 4.55"
Routed to Pond BP-2 : Bioretention Pond #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 100-year Rainfall=6.03"

Area (ac)	CN	Description
0.33	74	>75% Grass cover, Good, HSG C
0.38	98	Paved parking, HSG C
0.03	98	Roofs, HSG C
0.73	87	Weighted Average
0.33		44.61% Pervious Area
0.41		55.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-7: Subcat PR-7



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Type II 24-hr 100-year Rainfall=6.03"

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Summary for Subcatchment PR-8: Subcat PR-8

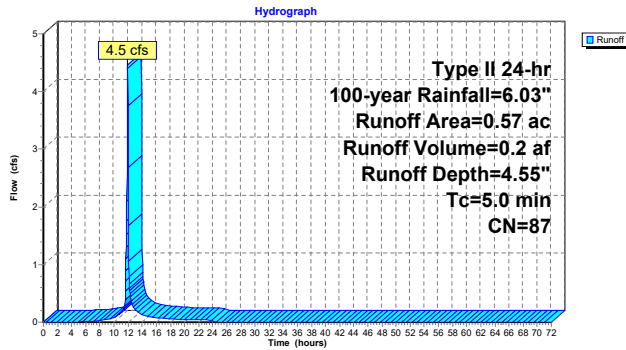
Runoff = 4.5 cfs @ 11.96 hrs, Volume= 0.2 af, Depth= 4.55"
 Routed to Pond BP-3 : Bioretention Pond #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 100-year Rainfall=6.03"

Area (ac)	CN	Description
0.27	74	>75% Grass cover, Good, HSG C
0.28	98	Paved parking, HSG C
0.02	98	Roofs, HSG C
0.57	87	Weighted Average
0.27		47.33% Pervious Area
0.30		52.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-8: Subcat PR-8



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Type II 24-hr 100-year Rainfall=6.03"

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Summary for Subcatchment PR-9: Subcat PR-9

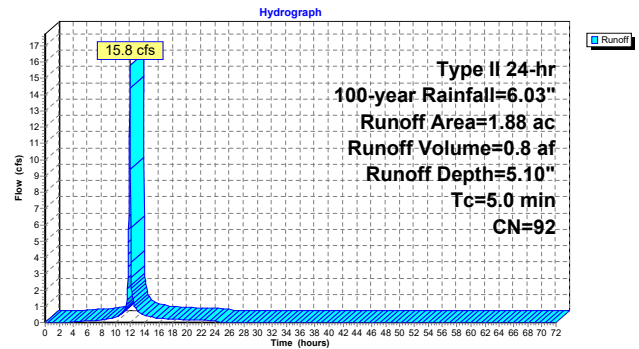
Runoff = 15.8 cfs @ 11.96 hrs, Volume= 0.8 af, Depth= 5.10"
 Routed to Pond BP-1 : Bioretention Pond #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type II 24-hr 100-year Rainfall=6.03"

Area (ac)	CN	Description
0.46	74	>75% Grass cover, Good, HSG C
0.50	98	Paved parking, HSG C
0.00	98	Roofs, HSG B
0.93	98	Roofs, HSG C
1.88	92	Weighted Average
0.46		24.26% Pervious Area
1.43		75.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-9: Subcat PR-9



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Type II 24-hr 100-year Rainfall=6.03"

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Summary for Reach 2R: South Culvert

[52] Hint: Inlet/Outlet conditions not evaluated
 [90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 10.73 ac, 4.68% Impervious, Inflow Depth = 4.23" for 100-year event
 Inflow = 75.7 cfs @ 11.96 hrs, Volume= 3.8 af
 Outflow = 75.7 cfs @ 11.96 hrs, Volume= 3.8 af, Atten= 0%, Lag= 0.1 min
 Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Max. Velocity= 10.81 fps, Min. Travel Time= 0.1 min
 Avg. Velocity = 2.95 fps, Avg. Travel Time= 0.3 min

Peak Storage= 349 cf @ 11.96 hrs
 Average Depth at Peak Storage= 0.87' , Surface Width= 8.00'
 Bank-Full Depth= 9.00' Flow Area= 72.0 sf, Capacity= 1,604.0 cfs

96.0" W x 108.0" H Box Pipe
 n= 0.011 Concrete pipe, straight & clean
 Length= 50.0' Slope= 0.0100 '/'
 Inlet Invert= 597.50', Outlet Invert= 597.00'



52933.00 - PR

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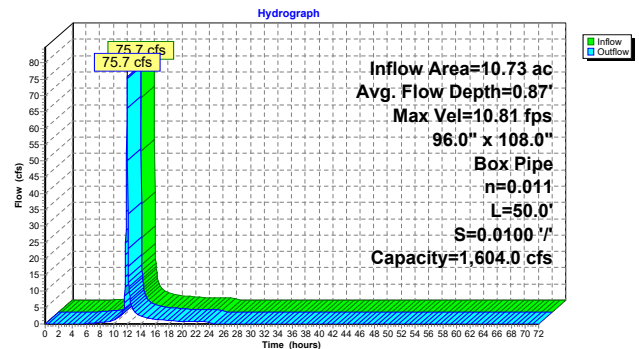
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Type II 24-hr 100-year Rainfall=6.03"

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Reach 2R: South Culvert



Stage-Area-Storage for Reach 2R: South Culvert

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
597.50	0.0	0	602.80	42.4	2,120
597.60	0.8	40	602.90	43.2	2,160
597.70	1.6	80	603.00	44.0	2,200
597.80	2.4	120	603.10	44.8	2,240
597.90	3.2	160	603.20	45.6	2,280
598.00	4.0	200	603.30	46.4	2,320
598.10	4.8	240	603.40	47.2	2,360
598.20	5.6	280	603.50	48.0	2,400
598.30	6.4	320	603.60	48.8	2,440
598.40	7.2	360	603.70	49.6	2,480
598.50	8.0	400	603.80	50.4	2,520
598.60	8.8	440	603.90	51.2	2,560
598.70	9.6	480	604.00	52.0	2,600
598.80	10.4	520	604.10	52.8	2,640
598.90	11.2	560	604.20	53.6	2,680
599.00	12.0	600	604.30	54.4	2,720
599.10	12.8	640	604.40	55.2	2,760
599.20	13.6	680	604.50	56.0	2,800
599.30	14.4	720	604.60	56.8	2,840
599.40	15.2	760	604.70	57.6	2,880
599.50	16.0	800	604.80	58.4	2,920
599.60	16.8	840	604.90	59.2	2,960
599.70	17.6	880	605.00	60.0	3,000
599.80	18.4	920	605.10	60.8	3,040
599.90	19.2	960	605.20	61.6	3,080
600.00	20.0	1,000	605.30	62.4	3,120
600.10	20.8	1,040	605.40	63.2	3,160
600.20	21.6	1,080	605.50	64.0	3,200
600.30	22.4	1,120	605.60	64.8	3,240
600.40	23.2	1,160	605.70	65.6	3,280
600.50	24.0	1,200	605.80	66.4	3,320
600.60	24.8	1,240	605.90	67.2	3,360
600.70	25.6	1,280	606.00	68.0	3,400
600.80	26.4	1,320	606.10	68.8	3,440
600.90	27.2	1,360	606.20	69.6	3,480
601.00	28.0	1,400	606.30	70.4	3,520
601.10	28.8	1,440	606.40	71.2	3,560
601.20	29.6	1,480	606.50	72.0	3,600
601.30	30.4	1,520			
601.40	31.2	1,560			
601.50	32.0	1,600			
601.60	32.8	1,640			
601.70	33.6	1,680			
601.80	34.4	1,720			
601.90	35.2	1,760			
602.00	36.0	1,800			
602.10	36.8	1,840			
602.20	37.6	1,880			
602.30	38.4	1,920			
602.40	39.2	1,960			
602.50	40.0	2,000			
602.60	40.8	2,040			
602.70	41.6	2,080			

Summary for Reach 3R: North Culvert

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.60 ac, 0.00% Impervious, Inflow Depth = 3.02" for 100-year event
 Inflow = 7.0 cfs @ 12.04 hrs, Volume= 0.4 af
 Outflow = 7.0 cfs @ 12.04 hrs, Volume= 0.4 af, Atten= 0%, Lag= 0.1 min
 Routed to Reach 2R : South Culvert

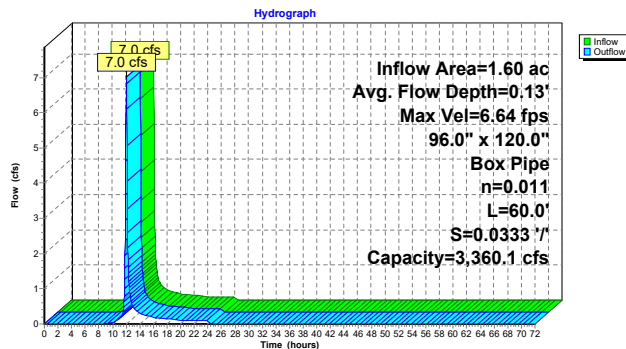
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Max. Velocity= 6.64 fps, Min. Travel Time= 0.2 min
 Avg. Velocity = 5.24 fps, Avg. Travel Time= 0.2 min

Peak Storage= 63 cf @ 12.04 hrs
 Average Depth at Peak Storage= 0.13' , Surface Width= 8.00'
 Bank-Full Depth= 10.00' Flow Area= 80.0 sf, Capacity= 3,360.1 cfs

96.0" W x 120.0" H Box Pipe
 n= 0.011 Concrete pipe, straight & clean
 Length= 60.0' Slope= 0.0333 '/'
 Inlet Invert= 602.00', Outlet Invert= 600.00'



Reach 3R: North Culvert



Stage-Area-Storage for Reach 3R: North Culvert

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
602.00	0.0	0	607.30	42.4	2,544
602.10	0.8	48	607.40	43.2	2,592
602.20	1.6	96	607.50	44.0	2,640
602.30	2.4	144	607.60	44.8	2,688
602.40	3.2	192	607.70	45.6	2,736
602.50	4.0	240	607.80	46.4	2,784
602.60	4.8	288	607.90	47.2	2,832
602.70	5.6	336	608.00	48.0	2,880
602.80	6.4	384	608.10	48.8	2,928
602.90	7.2	432	608.20	49.6	2,976
603.00	8.0	480	608.30	50.4	3,024
603.10	8.8	528	608.40	51.2	3,072
603.20	9.6	576	608.50	52.0	3,120
603.30	10.4	624	608.60	52.8	3,168
603.40	11.2	672	608.70	53.6	3,216
603.50	12.0	720	608.80	54.4	3,264
603.60	12.8	768	608.90	55.2	3,312
603.70	13.6	816	609.00	56.0	3,360
603.80	14.4	864	609.10	56.8	3,408
603.90	15.2	912	609.20	57.6	3,456
604.00	16.0	960	609.30	58.4	3,504
604.10	16.8	1,008	609.40	59.2	3,552
604.20	17.6	1,056	609.50	60.0	3,600
604.30	18.4	1,104	609.60	60.8	3,648
604.40	19.2	1,152	609.70	61.6	3,696
604.50	20.0	1,200	609.80	62.4	3,744
604.60	20.8	1,248	609.90	63.2	3,792
604.70	21.6	1,296	610.00	64.0	3,840
604.80	22.4	1,344	610.10	64.8	3,888
604.90	23.2	1,392	610.20	65.6	3,936
605.00	24.0	1,440	610.30	66.4	3,984
605.10	24.8	1,488	610.40	67.2	4,032
605.20	25.6	1,536	610.50	68.0	4,080
605.30	26.4	1,584	610.60	68.8	4,128
605.40	27.2	1,632	610.70	69.6	4,176
605.50	28.0	1,680	610.80	70.4	4,224
605.60	28.8	1,728	610.90	71.2	4,272
605.70	29.6	1,776	611.00	72.0	4,320
605.80	30.4	1,824	611.10	72.8	4,368
605.90	31.2	1,872	611.20	73.6	4,416
606.00	32.0	1,920	611.30	74.4	4,464
606.10	32.8	1,968	611.40	75.2	4,512
606.20	33.6	2,016	611.50	76.0	4,560
606.30	34.4	2,064	611.60	76.8	4,608
606.40	35.2	2,112	611.70	77.6	4,656
606.50	36.0	2,160	611.80	78.4	4,704
606.60	36.8	2,208	611.90	79.2	4,752
606.70	37.6	2,256	612.00	80.0	4,800
606.80	38.4	2,304			
606.90	39.2	2,352			
607.00	40.0	2,400			
607.10	40.8	2,448			
607.20	41.6	2,496			

Summary for Pond BP-1: Bioretention Pond #1

Inflow Area = 2.58 ac, 67.59% Impervious, Inflow Depth = 4.78" for 100-year event
 Inflow = 20.7 cfs @ 11.96 hrs, Volume= 1.0 af
 Outflow = 12.5 cfs @ 12.03 hrs, Volume= 1.0 af, Atten= 40%, Lag= 4.4 min
 Discarded = 0.1 cfs @ 12.03 hrs, Volume= 0.2 af
 Primary = 12.4 cfs @ 12.03 hrs, Volume= 0.8 af
 Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 597.88' @ 12.03 hrs Surf.Area= 6,204 sf Storage= 14,065 cf

Plug-Flow detention time= 308.6 min calculated for 1.0 af (100% of inflow)
 Center-of-Mass det. time= 309.4 min (1,089.8 - 780.3)

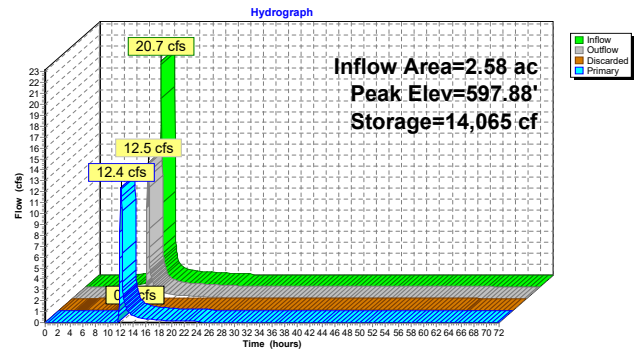
Volume	Invert	Avail.Storage	Storage Description			
#1	593.50'	21,619 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
593.50	3,350	303.7	0.0	0	0	3,350
595.00	3,350	303.7	10.0	503	503	3,806
598.00	6,338	360.3	100.0	14,296	14,798	6,958
599.00	7,314	382.0	100.0	6,820	21,619	8,292

Device	Routing	Invert	Outlet Devices
#1	Primary	595.00'	18.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 595.00' / 594.80' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	596.50'	24.0" W x 6.0" H Vert. Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	597.00'	48.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads
#4	Discarded	593.50'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.1 cfs @ 12.03 hrs HW=597.88' (Free Discharge)
 4=Exfiltration (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=12.4 cfs @ 12.03 hrs HW=597.88' TW=0.00' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 12.4 cfs @ 7.03 fps)
 2=Orifice (Passes < 5.1 cfs potential flow)
 3=Grate (Passes < 34.1 cfs potential flow)

Pond BP-1: Bioretention Pond #1



Stage-Area-Storage for Pond BP-1: Bioretention Pond #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
593.50	3,350	0	598.80	7,113	20,176
593.60	3,350	34	598.90	7,213	20,892
593.70	3,350	67	599.00	7,314	21,619
593.80	3,350	100			
593.90	3,350	134			
594.00	3,350	168			
594.10	3,350	201			
594.20	3,350	235			
594.30	3,350	268			
594.40	3,350	301			
594.50	3,350	335			
594.60	3,350	369			
594.70	3,350	402			
594.80	3,350	435			
594.90	3,350	469			
595.00	3,350	503			
595.10	3,434	842			
595.20	3,520	1,189			
595.30	3,606	1,546			
595.40	3,694	1,911			
595.50	3,782	2,285			
595.60	3,872	2,667			
595.70	3,963	3,059			
595.80	4,054	3,460			
595.90	4,147	3,870			
596.00	4,241	4,289			
596.10	4,336	4,718			
596.20	4,432	5,156			
596.30	4,529	5,605			
596.40	4,627	6,062			
596.50	4,726	6,530			
596.60	4,826	7,008			
596.70	4,927	7,495			
596.80	5,029	7,993			
596.90	5,133	8,501			
597.00	5,237	9,020			
597.10	5,342	9,549			
597.20	5,449	10,088			
597.30	5,556	10,638			
597.40	5,665	11,199			
597.50	5,774	11,771			
597.60	5,885	12,354			
597.70	5,997	12,948			
597.80	6,109	13,554			
597.90	6,223	14,170			
598.00	6,338	14,798			
598.10	6,452	15,437			
598.20	6,528	16,085			
598.30	6,623	16,742			
598.40	6,720	17,410			
598.50	6,817	18,086			
598.60	6,915	18,773			
598.70	7,014	19,470			

Summary for Pond BP-2: Bioretention Pond #2

Inflow Area = 0.73 ac, 55.39% Impervious, Inflow Depth = 4.55" for 100-year event
 Inflow = 5.7 cfs @ 11.96 hrs, Volume= 0.3 af
 Outflow = 0.3 cfs @ 12.89 hrs, Volume= 0.3 af, Atten= 95%, Lag= 56.1 min
 Primary = 0.3 cfs @ 12.89 hrs, Volume= 0.3 af
 Routed to Pond UIP-1 : UIP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 603.31' @ 12.89 hrs Surf.Area= 5,070 sf Storage= 5,666 cf

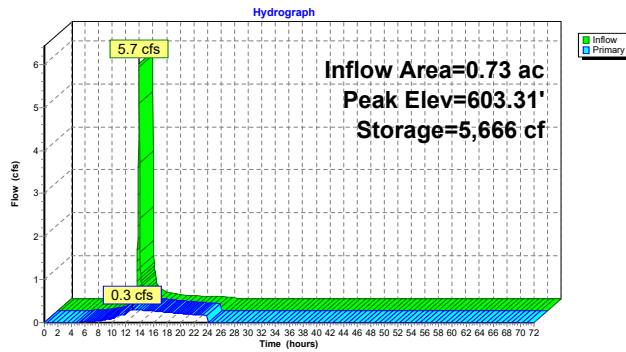
Plug-Flow detention time= 186.9 min calculated for 0.3 af (100% of inflow)
 Center-of-Mass det. time= 186.8 min (977.2 - 790.4)

Volume	Invert	Avail.Storage	Storage Description			
#1	600.50'	9,543 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
600.50	2,922	537.6	0.0	0	0	2,922
602.00	2,922	537.6	10.0	438	438	3,728
603.00	4,564	556.9	100.0	3,713	4,151	5,496
604.00	6,264	576.4	100.0	5,392	9,543	7,344

Device	Routing	Invert	Outlet Devices
#1	Primary	597.90'	12.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 597.90' / 597.40' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	599.75'	6.0" Round Underdrain L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 599.75' / 599.65' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#3	Device 2	600.50'	2.500 in/hr Exfiltration over Surface area Phase-In= 0.01'
#4	Device 1	603.50'	12.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.3 cfs @ 12.89 hrs HW=603.31' TW=596.96' (Dynamic Tailwater)
 1=Culvert (Passes 0.3 cfs of 8.0 cfs potential flow)
 2=Underdrain (Passes 0.3 cfs of 1.7 cfs potential flow)
 3=Exfiltration (Exfiltration Controls 0.3 cfs)
 4=Grate (Controls 0.0 cfs)

Pond BP-2: Bioretention Pond #2



Stage-Area-Storage for Pond BP-2: Bioretention Pond #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
600.50	2,922	0	603.15	4,802	4,853
600.55	2,922	15	603.20	4,883	5,095
600.60	2,922	29	603.25	4,964	5,342
600.65	2,922	44	603.30	5,046	5,592
600.70	2,922	58	603.35	5,128	5,846
600.75	2,922	73	603.40	5,212	6,105
600.80	2,922	88	603.45	5,296	6,367
600.85	2,922	102	603.50	5,380	6,634
600.90	2,922	117	603.55	5,466	6,905
600.95	2,922	131	603.60	5,552	7,181
601.00	2,922	146	603.65	5,638	7,461
601.05	2,922	161	603.70	5,726	7,745
601.10	2,922	175	603.75	5,814	8,033
601.15	2,922	190	603.80	5,903	8,326
601.20	2,922	205	603.85	5,992	8,623
601.25	2,922	219	603.90	6,082	8,925
601.30	2,922	234	603.95	6,173	9,232
601.35	2,922	248	604.00	6,264	9,543
601.40	2,922	263			
601.45	2,922	278			
601.50	2,922	292			
601.55	2,922	307			
601.60	2,922	321			
601.65	2,922	336			
601.70	2,922	351			
601.75	2,922	365			
601.80	2,922	380			
601.85	2,922	394			
601.90	2,922	409			
601.95	2,922	424			
602.00	2,922	438			
602.05	2,995	586			
602.10	3,070	738			
602.15	3,145	893			
602.20	3,221	1,052			
602.25	3,298	1,215			
602.30	3,376	1,382			
602.35	3,455	1,553			
602.40	3,535	1,728			
602.45	3,616	1,907			
602.50	3,697	2,089			
602.55	3,780	2,276			
602.60	3,863	2,467			
602.65	3,948	2,663			
602.70	4,033	2,862			
602.75	4,119	3,066			
602.80	4,206	3,274			
602.85	4,294	3,487			
602.90	4,383	3,704			
602.95	4,473	3,925			
603.00	4,564	4,151			
603.05	4,643	4,381			
603.10	4,722	4,615			

Summary for Pond BP-3: Bioretention Pond #3

Inflow Area = 0.57 ac, 52.67% Impervious, Inflow Depth = 4.55" for 100-year event
 Inflow = 4.5 cfs @ 11.96 hrs, Volume= 0.2 af
 Outflow = 3.2 cfs @ 12.02 hrs, Volume= 0.2 af, Atten= 28%, Lag= 3.5 min
 Primary = 3.2 cfs @ 12.02 hrs, Volume= 0.2 af
 Routed to Pond UIP-1 : UIP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 607.34' @ 12.02 hrs Surf.Area= 3,152 sf Storage= 2,942 cf

Plug-Flow detention time= 98.9 min calculated for 0.2 af (100% of inflow)
 Center-of-Mass det. time= 99.0 min (889.3 - 790.4)

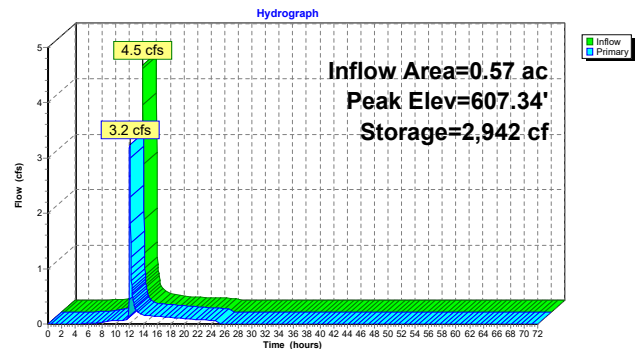
Volume	Invert	Avail.Storage	Storage Description			
#1	604.50'	5,393 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
604.50	1,082	510.4	0.0	0	0	1,082
606.00	1,082	510.4	10.0	162	162	1,848
607.00	2,627	548.9	100.0	1,798	1,961	5,136
608.00	4,307	570.7	100.0	3,433	5,393	7,157

Device	Routing	Invert	Outlet Devices
#1	Primary	603.50'	18.0" Round Culvert L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 603.50' / 593.80' S= 0.1617 ' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	603.75'	6.0" Round Underdrain L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 603.75' / 603.65' S= 0.0100 ' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#3	Device 2	604.50'	2,500 in/hr Exfiltration over Surface area Phase-In= 0.01'
#4	Device 1	607.00'	18.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.2 cfs @ 12.02 hrs HW=607.34' TW=598.59' (Dynamic Tailwater)

- 1=Culvert (Passes 3.2 cfs of 14.9 cfs potential flow)
- 2=Underdrain (Passes 0.2 cfs of 1.7 cfs potential flow)
- 3=Exfiltration (Exfiltration Controls 0.2 cfs)
- 4=Grate (Weir Controls 3.0 cfs @ 1.90 fps)

Pond BP-3: Bioretention Pond #3



Stage-Area-Storage for Pond BP-3: Bioretention Pond #3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
604.50	1,082	0	607.15	2,853	2,371
604.55	1,082	5	607.20	2,930	2,516
604.60	1,082	11	607.25	3,008	2,664
604.65	1,082	16	607.30	3,088	2,817
604.70	1,082	22	607.35	3,168	2,973
604.75	1,082	27	607.40	3,249	3,134
604.80	1,082	32	607.45	3,332	3,298
604.85	1,082	38	607.50	3,415	3,467
604.90	1,082	43	607.55	3,500	3,640
604.95	1,082	49	607.60	3,585	3,817
605.00	1,082	54	607.65	3,672	3,998
605.05	1,082	60	607.70	3,760	4,184
605.10	1,082	65	607.75	3,848	4,374
605.15	1,082	70	607.80	3,938	4,569
605.20	1,082	76	607.85	4,029	4,768
605.25	1,082	81	607.90	4,120	4,972
605.30	1,082	87	607.95	4,213	5,180
605.35	1,082	92	608.00	4,307	5,393
605.40	1,082	97			
605.45	1,082	103			
605.50	1,082	108			
605.55	1,082	114			
605.60	1,082	119			
605.65	1,082	124			
605.70	1,082	130			
605.75	1,082	135			
605.80	1,082	141			
605.85	1,082	146			
605.90	1,082	151			
605.95	1,082	157			
606.00	1,082	162			
606.05	1,143	218			
606.10	1,206	277			
606.15	1,271	339			
606.20	1,337	404			
606.25	1,405	472			
606.30	1,475	544			
606.35	1,546	620			
606.40	1,619	699			
606.45	1,694	782			
606.50	1,770	868			
606.55	1,848	959			
606.60	1,928	1,053			
606.65	2,010	1,152			
606.70	2,093	1,254			
606.75	2,178	1,361			
606.80	2,264	1,472			
606.85	2,352	1,587			
606.90	2,442	1,707			
606.95	2,534	1,832			
607.00	2,627	1,961			
607.05	2,701	2,094			
607.10	2,776	2,231			

Summary for Pond UIP-1: UIP-1

Inflow Area = 7.23 ac, 76.62% Impervious, Inflow Depth = 5.13" for 100-year event
 Inflow = 53.1 cfs @ 11.96 hrs, Volume= 3.1 af
 Outflow = 30.5 cfs @ 12.04 hrs, Volume= 2.8 af, Atten= 42%, Lag= 4.7 min
 Discarded = 0.2 cfs @ 5.28 hrs, Volume= 0.9 af
 Primary = 30.4 cfs @ 12.04 hrs, Volume= 1.9 af
 Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 598.68' @ 12.04 hrs Surf.Area= 13,305 sf Storage= 56,461 cf

Plug-Flow detention time= 566.6 min calculated for 2.8 af (91% of inflow)
 Center-of-Mass det. time= 517.7 min (1,311.5 - 793.8)

Volume	Invert	Avail. Storage	Storage Description
#1A	592.30'	20,928 cf	64.83'W x 205.22'L x 6.75'H Field A 89,808 cf Overall - 37,487 cf Embedded = 52,321 cf x 40.0% Voids
#2A	593.05'	37,487 cf	ADS StormTech MC-7200 +Cap x 210 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 210 Chambers in 7 Rows Cap Storage= 39.5 cf x 2 x 7 rows = 553.0 cf
58,415 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	592.50'	24.0" Round Culvert L= 25.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 592.50' / 591.06' S= 0.0576' /' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	597.30'	5.0' long Sharp-Crested Rectangular Weir 2 End Contractions(s)
#3	Discarded	592.30'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.01'
#4	Device 1	596.05'	18.0" W x 15.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.2 cfs @ 5.28 hrs HW=592.37' (Free Discharge)
 3=Exfiltration (Exfiltration Controls 0.2 cfs)

Primary OutFlow Max=30.3 cfs @ 12.04 hrs HW=598.68' TW=0.00' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 30.3 cfs @ 9.65 fps)
 2=Sharp-Crested Rectangular Weir (Passes < 24.5 cfs potential flow)
 4=Orifice/Grate (Passes < 12.7 cfs potential flow)

Pond UIP-1: UIP-1 - Chamber Wizard Field A

Chamber Model = ADS StormTech MC-7200 +Cap (ADS StormTech® MC-7200 with cap volume)
 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf
 Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap
 Cap Storage= 39.5 cf x 2 x 7 rows = 553.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

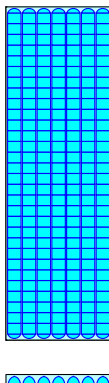
30 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 203.22' Row Length +12.0" End Stone x 2 = 205.22' Base Length
 7 Rows x 100.0" Wide + 9.0" Spacing x 6 + 12.0" Side Stone x 2 = 64.83' Base Width
 9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

210 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 7 Rows = 37,486.9 cf Chamber Storage

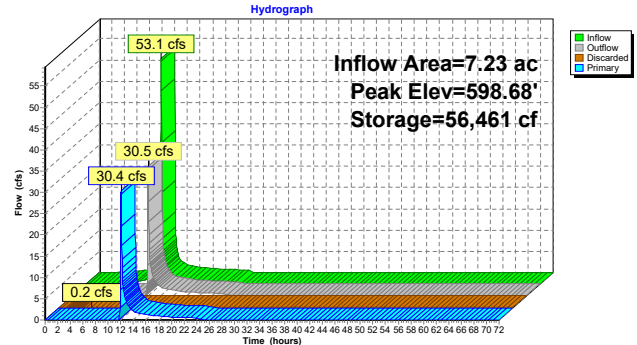
89,807.9 cf Field - 37,486.9 cf Chambers = 52,321.1 cf Stone x 40.0% Voids = 20,928.4 cf Stone Storage

Chamber Storage + Stone Storage = 58,415.3 cf = 1.3 af
 Overall Storage Efficiency = 65.0%
 Overall System Size = 205.22' x 64.83' x 6.75'

210 Chambers
 3,326.2 cy Field
 1,937.8 cy Stone



Pond UIP-1: UIP-1



Stage-Area-Storage for Pond UIP-1: UIP-1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
592.30	13,305	0	597.60	13,305	50,487
592.40	13,305	532	597.70	13,305	51,107
592.50	13,305	1,064	597.80	13,305	51,697
592.60	13,305	1,597	597.90	13,305	52,270
592.70	13,305	2,129	598.00	13,305	52,824
592.80	13,305	2,661	598.10	13,305	53,359
592.90	13,305	3,193	598.20	13,305	53,892
593.00	13,305	3,725	598.30	13,305	54,424
593.10	13,305	4,258	598.40	13,305	54,956
593.20	13,305	4,790	598.50	13,305	55,488
593.30	13,305	5,322	598.60	13,305	56,020
593.40	13,305	5,854	598.70	13,305	56,553
593.50	13,305	6,386	598.80	13,305	57,085
593.60	13,305	6,918	598.90	13,305	57,617
593.70	13,305	7,450	599.00	13,305	58,149
593.80	13,305	7,982			
593.90	13,305	8,514			
594.00	13,305	9,046			
594.10	13,305	9,578			
594.20	13,305	10,110			
594.30	13,305	10,642			
594.40	13,305	11,174			
594.50	13,305	11,706			
594.60	13,305	12,238			
594.70	13,305	12,770			
594.80	13,305	13,302			
594.90	13,305	13,834			
595.00	13,305	14,366			
595.10	13,305	14,898			
595.20	13,305	15,430			
595.30	13,305	15,962			
595.40	13,305	16,494			
595.50	13,305	17,026			
595.60	13,305	17,558			
595.70	13,305	18,090			
595.80	13,305	18,622			
595.90	13,305	19,154			
596.00	13,305	19,686			
596.10	13,305	20,218			
596.20	13,305	20,750			
596.30	13,305	21,282			
596.40	13,305	21,814			
596.50	13,305	22,346			
596.60	13,305	22,878			
596.70	13,305	23,410			
596.80	13,305	23,942			
596.90	13,305	24,474			
597.00	13,305	25,006			
597.10	13,305	25,538			
597.20	13,305	26,070			
597.30	13,305	26,602			
597.40	13,305	27,134			
597.50	13,305	27,666			

Summary for Pond UIP-2: UIP-2

Inflow Area = 1.72 ac, 86.04% Impervious, Inflow Depth = 5.16" for 100-year event
 Inflow = 14.6 cfs @ 11.96 hrs, Volume= 0.7 af
 Outflow = 8.4 cfs @ 12.03 hrs, Volume= 0.7 af, Atten= 42%, Lag= 4.6 min
 Discarded = 0.0 cfs @ 5.58 hrs, Volume= 0.2 af
 Primary = 8.4 cfs @ 12.03 hrs, Volume= 0.5 af
 Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 588.41' @ 12.03 hrs Surf.Area= 3,594 sf Storage= 13,594 cf

Plug-Flow detention time= 398.9 min calculated for 0.7 af (100% of inflow)
 Center-of-Mass det. time= 399.7 min (1,170.1 - 770.4)

Volume	Invert	Avail. Storage	Storage Description
#1A	583.00'	5,811 cf	28.50'W x 126.12'L x 6.75'H Field A 24,262 cf Overall - 9,734 cf Embedded = 14,527 cf x 40.0% Voids
#2A	583.75'	9,734 cf	ADS StormTech MC-7200 +Cap x 54 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 54 Chambers in 3 Rows Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf
15,545 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	583.00'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 583.00' / 582.80' S= 0.0100' /' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	585.25'	4.0" W x 27.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	587.50'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Discarded	583.00'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.0 cfs @ 5.58 hrs HW=583.07' (Free Discharge)
4=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=8.4 cfs @ 12.03 hrs HW=588.40' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 8.4 cfs @ 10.66 fps)
2=Orifice/Grate (Passes < 5.1 cfs potential flow)
3=Sharp-Crested Rectangular Weir (Passes < 10.7 cfs potential flow)

Pond UIP-2: UIP-2 - Chamber Wizard Field A

Chamber Model = ADS StormTech MC-7200 +Cap (ADS StormTech® MC-7200 with cap volume)
 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf
 Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap
 Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf

100.0" Wide x 9.0" Spacing = 109.0" C-C Row Spacing

18 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 124.12' Row Length +12.0" End Stone x 2 = 126.12' Base Length
 3 Rows x 100.0" Wide x 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width
 9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

54 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 3 Rows = 9,734.3 cf Chamber Storage

24,261.7 cf Field - 9,734.3 cf Chambers = 14,527.4 cf Stone x 40.0% Voids = 5,811.0 cf Stone Storage

Chamber Storage + Stone Storage = 15,545.2 cf = 0.4 af

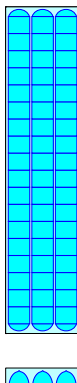
Overall Storage Efficiency = 64.1%

Overall System Size = 126.12' x 28.50' x 6.75'

54 Chambers

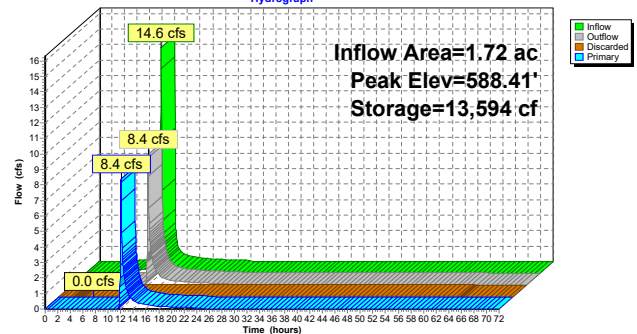
898.6 cy Field

538.1 cy Stone



Pond UIP-2: UIP-2

Hydrograph



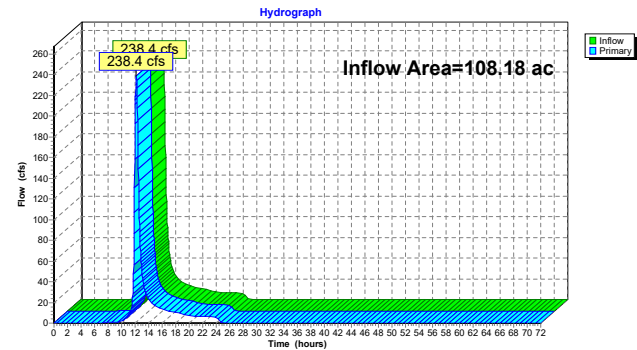
Stage-Area-Storage for Pond UIP-2: UIP-2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
583.00	3,594	0	588.30	3,594	13,406
583.10	3,594	144	588.40	3,594	13,572
583.20	3,594	288	588.50	3,594	13,731
583.30	3,594	431	588.60	3,594	13,885
583.40	3,594	575	588.70	3,594	14,035
583.50	3,594	719	588.80	3,594	14,179
583.60	3,594	863	588.90	3,594	14,323
583.70	3,594	1,006	589.00	3,594	14,467
583.80	3,594	1,233	589.10	3,594	14,611
583.90	3,594	1,543	589.20	3,594	14,754
584.00	3,594	1,852	589.30	3,594	14,898
584.10	3,594	2,159	589.40	3,594	15,042
584.20	3,594	2,467	589.50	3,594	15,186
584.30	3,594	2,773	589.60	3,594	15,330
584.40	3,594	3,079	589.70	3,594	15,473
584.50	3,594	3,383			
584.60	3,594	3,687			
584.70	3,594	3,990			
584.80	3,594	4,291			
584.90	3,594	4,592			
585.00	3,594	4,891			
585.10	3,594	5,189			
585.20	3,594	5,485			
585.30	3,594	5,780			
585.40	3,594	6,074			
585.50	3,594	6,366			
585.60	3,594	6,656			
585.70	3,594	6,945			
585.80	3,594	7,231			
585.90	3,594	7,516			
586.00	3,594	7,799			
586.10	3,594	8,079			
586.20	3,594	8,358			
586.30	3,594	8,634			
586.40	3,594	8,908			
586.50	3,594	9,179			
586.60	3,594	9,447			
586.70	3,594	9,713			
586.80	3,594	9,976			
586.90	3,594	10,236			
587.00	3,594	10,492			
587.10	3,594	10,745			
587.20	3,594	10,995			
587.30	3,594	11,241			
587.40	3,594	11,482			
587.50	3,594	11,720			
587.60	3,594	11,953			
587.70	3,594	12,180			
587.80	3,594	12,403			
587.90	3,594	12,620			
588.00	3,594	12,830			
588.10	3,594	13,032			
588.20	3,594	13,225			

Summary for Link DP-1: Brickyard Pond

Inflow Area = 108.18 ac, 8.92% Impervious, Inflow Depth = 3.03" for 100-year event
Inflow = 238.4 cfs @ 12.18 hrs, Volume= 27.3 af
Primary = 238.4 cfs @ 12.18 hrs, Volume= 27.3 af, Atten= 0%, Lag= 0.0 min
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs

Link DP-1: Brickyard Pond



Appendix C: Hydraulic Calculations

- › Storm Drain Piping Calculations
- › Riprap Channel Design Calculations
- › Riprap Outlet Sizing Calculations
- › Inlet Capacity Calculations

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Storm Drain Piping Calculations

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Stormcad Conduit Output Table - Hydraulic Pipe Analysis

25-YR

Project

The Brickyard Residential I

Project # 52933

Calculated by

DJB

Date 8/6/2024

Checked by

TMD

Date 8/6/2024

Start Node	Stop Node	Upstream Inlet Area	Upstream Inlet C	System CA	Intensity	Pipe Size	Material	Manning's "n"	Slope	Length	Capacity (Full Flow)	Capacity (Design)	Velocity (Average)	Rim (Upper)	Hydraulic Grade Line In	Rim (Lower)	Hydraulic Grade Line Out	Invert (Upper)	Invert (Lower)	Flow /Capacity (Design)	Depth (Normal) /Rise
-	-	(acres)	-	(acres)	(in/hr)	(in)	-	-	(ft/ft)	(ft)	(cfs)	(cfs)	(ft/s)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(%)	(%)
405	404	0.13	0.68	1.343	7.07	18	HDPE Pres	0.013	0.011	60.9	11.26	9.57	7.16	608.22	603.2	611.59	602.36	602	601.3	85	70.8
101	902	(N/A)	(N/A)	1.127	7.07	15	HDPE Pres	0.013	0.022	18.3	9.49	8.03	8.67	595.82	586.32	594.43	585.75	585.2	584.8	84.6	70.6
404	403	(N/A)	(N/A)	1.343	7.07	18	HDPE Pres	0.013	0.012	137.8	11.32	9.57	7.18	611.59	602.4	608.13	600.66	601.2	599.6	84.6	70.6
108	107	0.1	0.83	0.47	7.07	12	HDPE Pres	0.013	0.012	24	3.98	3.35	5.68	599.03	595.08	599.03	594.71	594.3	594	84.1	70.2
207	206	0.36	0.61	4.609	7.07	30	HDPE Pres	0.013	0.01	40.2	40.89	34.15	9.32	599.92	596.49	601.18	595.89	594.5	594.1	83.5	69.9
215	213	(N/A)	(N/A)	2.687	7.07	24	HDPE Pres	0.013	0.012	93.4	24.54	20.45	8.74	602.02	598.82	600.58	597.74	597.2	596.1	83.3	69.7
208	207	0.13	0.68	0.665	7.07	15	HDPE Pres	0.013	0.008	24.3	5.86	4.74	3.86	599.9	596.62	599.92	596.49	594.8	594.6	80.9	68.2
216	215	0.13	0.79	2.3	7.07	24	HDPE Pres	0.013	0.01	101.7	22.43	17.49	7.89	602.64	599.81	602.02	598.82	598.3	597.3	78	66.4
401	400	0.05	0.76	1.502	7.07	18	HDPE Pres	0.013	0.018	56.9	13.92	10.7	8.69	605.17	597.46	591.08	596.21	596.2	595.2	76.9	65.7
214	213	0.46	0.57	0.649	7.07	12	HDPE Pres	0.013	0.029	28	6.02	4.63	8.45	601.02	598.8	600.58	597.79	597.9	597.1	76.9	65.7
106	105	(N/A)	(N/A)	0.663	7.07	15	HDPE Pres	0.013	0.01	94.5	6.3	4.72	5.63	599.55	590.38	597.86	589.56	589.5	588.6	74.9	64.6
RD3	215	0.43	0.9	0.387	7.07	12	HDPE Pres	0.013	0.011	37.3	3.69	2.76	3.51	604.82	599.05	602.02	598.82	597.8	597.4	74.7	64.5
105	104	0.51	0.63	0.984	7.07	15	HDPE Pres	0.013	0.022	64.9	9.48	7.01	8.45	597.86	589.56	597.89	587.91	588.5	587.1	74	64
217	216	0.26	0.6	2.197	7.07	24	HDPE Pres	0.013	0.01	104.8	23.16	16.76	8.03	603.08	600.88	602.64	599.81	599.4	598.3	72.4	63
RD7	210	0.43	0.9	0.387	7.07	12	HDPE Pres	0.013	0.012	52	3.83	2.76	3.51	602.45	597.01	600.41	596.69	596	595.4	72	62.9
314	313 (PR Drain (3))	0.15	0.76	0.627	7.07	24	HDPE Pres	0.013	0.001	42.1	7.8	5.56	2.7	605.08	601.68	605.5	601.43	600.65	600.6	71.4	62.5
317	316	0.41	0.73	0.353	7.07	12	HDPE Pres	0.013	0.01	100	3.56	2.52	4.92	607.08	604.03	606.58	602.97	603.35	602.35	70.7	62.1
213	207	0.21	0.6	3.462	7.07	30		0.013	0.009	163.1	38	25.97	8.33	600.58	597.74	599.92	596.49	596	594.6	68.4	60.7
RD6	108	0.43	0.9	0.387	7.07	12	HDPE Pres	0.013	0.015	33	4.38	2.76	5.9	600.92	595.61	599.03	594.98	594.9	594.4	62.9	57.5
217	218	0.76	0.76	0.578	7.07	15	HDPE Pres	0.013	0.01	24	6.59	4.12	3.35	603.08	600.99	603.08	600.88	599.75	599.5	62.4	(N/A)
OCS 410	411	(N/A)	(N/A)	0	7.07	15		0.013	0.069	39.6	17.02	10.6	14.62	597	590.95	587	587.77	589.75	587	62.3	57.1
210	208	(N/A)	(N/A)	0.469	7.07	15	HDPE Pres	0.013	0.007	28.4	5.42	3.34	2.72	600.41	596.69	599.9	596.62	595.4	595.2	61.6	56.8
104	101	0.06	0	0.984	7.07	15	HDPE Pres	0.013	0.032	46.3	11.63	7.01	9.91	597.89	588.06	595.82	586.23	587	585.5	60.3	56
312	313 (PR Drain (3))	(N/A)	(N/A)	0.45	7.07	12		0.013	0.023	157.8	5.46	3.21	7.23	608.51	604.67	605.5	601.32	603.9	600.2	58.8	55.1
406	405	0.21	0.37	0.868	7.07	18	HDPE Pres	0.013	0.011	46.3	10.92	6.19	6.37	606.98	603.56	608.22	603.2	602.6	602.1	56.6	53.9
212	207	0.43	0.61	0.262	7.07	12	HDPE Pres	0.013	0.009	81.1	3.31	1.87	2.38	598.98	596.71	599.92	596.49	595.3	594.6	56.5	53.8
RD8	214	0.43	0.9	0.387	7.07	12	HDPE Pres	0.013	0.022	111.5	5.33	2.76	6.85	606.99	602.21	601.02	599.51	601.5	599	51.7	51
313 (PR Drain (3))	217	(N/A)	(N/A)	1.464	7.07	24		0.013	0.01	61.3	22.37	11.53	7.18	605.5	601.32	603.08	600.88	600.1	599.5	51.5	50.9
107	106	0.09	0.43	0.663	7.07	15	HDPE Pres	0.013	0.02	44.5	9.19	4.72	7.54	599.03	592.78	599.55	591.65	591.9	591	51.4	50.8
316	314	0.16	0.77	0.477	7.07	15	HDPE Pres	0.013	0.013	150	7.27	3.4	5.82	606.58	602.99	605.08	601.68	602.25	600.35	46.7	48
407	406	0.64	0.63	0.403	7.07	15	HDPE Pres	0.013	0.011	94.1	6.66	2.87	5.23	607.79	604.38	606.98	603.56	603.7	602.7	43.1	45.9
403	401	0.08	0.81	1.408	7.07	24	HDPE Pres	0.013	0.011	54	23.84	10.03	7.26	608.13	600.63	605.17	599.82	599.5	598.9	42.1	45.3
RD2	204	0.43	0.9	0.387	7.07	12	HDPE Pres	0.013	0.036	25.2	6.73	2.76	8.14	603.41	595.71	602.03	594.57	595	594.1	41	44.6
RD5	405	0.43	0.9	0.387	7.07	15	HDPE Pres	0.013	0.011	81.6	6.78	2.76	5.24	608.62	603.67	608.22	603.2	603	602.1	40.7	44.4
314	315	0.04	0.9	0.036	7.07	12	HDPE Pres	0.013	0.01	24	3.64	1.36	1.73	605.08	601.76	605.08	601.68	601	600.75	37.3	(N/A)
RD9	312	0.43	0.9	0.387	7.07	12		0.013	0.043	69	7.43	2.76	8.75	610.78	607.71	608.51	604.42	607	604	37.1	42.2
RD4	313 (PR Drain (3))	0.43	0.9	0.387	7.07	12	HDPE Pres	0.013	0.046	38	7.64	2.76	8.95	607.61	602.71	605.5	601.32	602	600.25	36.1	41.5
109	107	0.08	0.46	0.154	7.07	12	HDPE Pres	0.013	0.01	100.4	3.56	1.1	3.99	599.53	593.44	599.03	592.78	593	592	30.8	38.1
RD10	406	0.43	0.9	0.387	7.07	15	HDPE Pres	0.013	0.026	69.9	10.36	2.76	7.14	612.74	605.17	606.98	603.56	604.5	602.7	26.6	35.2
209	208	0.22	0.49	0.108	7.07	12	HDPE Pres	0.013	0.009	50.9	3.47	0.77	3.54	600.74	596.61	599.9	596.62	596.13	595.65	22.2	32
103	102	0.11	0.71	0.078	7.07	12	HDPE Pres	0.013	0.005	91.8	2.63	0.56	2.65	590.79	588.21	594.29	587.71	587.9	587.4	21.2	31.2
110	109	0.13	0.9	0.117	7.07	12	HDPE Pres	0.013	0.012	23.6	3.98	0.83	4.01	599.53	595.38	599.53	595.01	595	594.7	20.9	31.1
102	101	0.08	0.81	0.143	7.07	12	HDPE Pres	0.013	0.024	49.6	5.47	1.02	5.33	594.29	586.92	595.82	586.32	586.5	585.3	18.6	29.2

Project	The Brickyard Residential I	Project #	52933
Calculated by	DJB	Date	8/6/2024
Checked by	TMD	Date	8/6/2024

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Riprap Channel Design Calculations

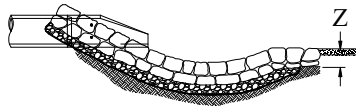
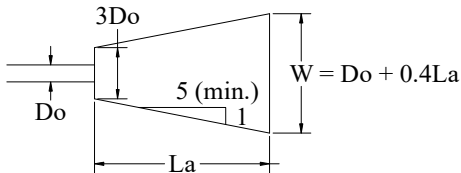
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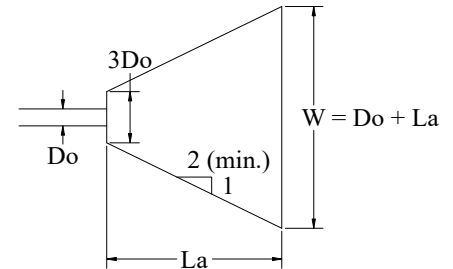
Outfall Riprap Sizing and Velocity Calculations

Project	Brickyard Residential Development	Project #	52933.00
Calculated by	DJB	Date	7/30/2024
Checked by	TMD	Date	8/5/2024

$$Tw \geq 0.5Do$$



$$Tw < 0.5Do$$



OUTLET DESCRIPTION:

		FES-400	FES-411	FES-501	FES-700	
Design Storm	(yr)	25	25	25	25	
Flow / Discharge (Q)	(cfs)	10.7	10.6	0.5	0.5	
Defined Channel ?	-	NO	NO	NO	NO	
Defined Channel Width	(ft)	0	0	0	0	
Outlet Pipe Diameter (D _O)	(in)	24	15	12	12	
Tailwater Condition (T _w)	(ft)	TW ≥ 0.5D	TW < 0.5D	TW < 0.5D	TW ≥ 0.5D	
Apron Length (L _A)	(ft)	6	6	6	6	
Apron Width at Outlet (3D _O)	(ft)	6	3.75	3	3	
Apron Width at End (W)	(ft)	4.4	7.25	7	3.4	
Median Stone Diameter (d ₅₀)	(in)	6	6	6	6	
Largest Stone Diameter	(in)	9	9	9	9	
Apron Depth (Z)	(in)	13.5	13.5	13.5	13.5	

Apron Length (L_A):

Length = From Virginia DCR Handbook - Plate 3.18-3

if T_w < 0.5D

Length = From Virginia DCR Handbook - Plate 3.18-4

if T_w ≥ 0.5D

Apron Width at Outlet (3D_O):

Width = 3 x pipe dia. (or width of channel)

Apron Width at End (W):

Width = dia. + apron length

if T_w < 0.5D

Width = dia. + 0.4 x apron length

if T_w ≥ 0.5D

or apron width = channel width if a well defined channel exists

Rock Riprap:

Median Diameter (d₅₀) = From Virginia DCR Handbook - Plate 3.18-3 or 4

Largest stone dia = 1.5 x d₅₀

Apron Depth (Z):

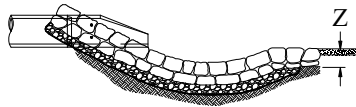
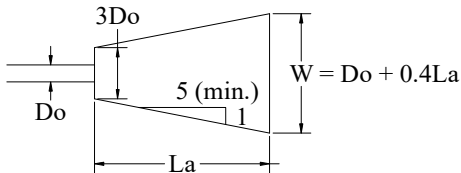
6" or 1.5 x largest stone dia



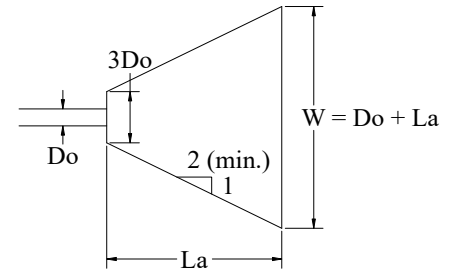
Outfall Riprap Sizing and Velocity Calculations

Project	Brickyard Residential Development	Project #	52933.00
Calculated by	DJB	Date	7/30/2024
Checked by	TMD	Date	8/5/2024

$$T_w \geq 0.5D_o$$



$$T_w < 0.5D_o$$



OUTLET DESCRIPTION:

		HW-201	HW-802	HW-914		
Design Storm	(yr)	25	25	25		
Flow / Discharge (Q)	(cfs)	2.8	3.0	4.6		
Defined Channel ?	-	NO	NO	NO		
Defined Channel Width	(ft)	0	0	0		
Outlet Pipe Diameter (D _o)	(in)	15	15	15		
Tailwater Condition (T _w)	(ft)	TW < 0.5D	TW < 0.5D	TW < 0.5D		
Apron Length (L _A)	(ft)	6	6	6		
Apron Width at Outlet (3D _o)	(ft)	3.75	3.75	3.75		
Apron Width at End (W)	(ft)	7.25	7.25	7.25		
Median Stone Diameter (d ₅₀)	(in)	6	6	6		
Largest Stone Diameter	(in)	9	9	9		
Apron Depth (Z)	(in)	13.5	13.5	13.5		

Apron Length (L_A):

Length = From Virginia DCR Handbook - Plate 3.18-3

if T_w < 0.5D

Length = From Virginia DCR Handbook - Plate 3.18-4

if T_w ≥ 0.5D

Apron Width at Outlet (3D_o):

Width = 3 x pipe dia. (or width of channel)

Apron Width at End (W):

Width = dia. + apron length

if T_w < 0.5D

Width = dia. + 0.4 x apron length

if T_w ≥ 0.5D

or apron width = channel width if a well defined channel exists

Rock Riprap:

Median Diameter (d₅₀) = From Virginia DCR Handbook - Plate 3.18-3 or 4

Largest stone dia = 1.5 x d₅₀

Apron Depth (Z):

6" or 1.5 x largest stone dia

Riprap Channel Design Calculations

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Computations

Project:	52933.00	Project	Brickyard Residential Development
Location:	Lebanon, NH	Sheet	1 of 4
Calculated by:	TMD	Date:	8/6/2024
Checked by:	DHF	Date:	8/6/2024
Title	Perimeter Swale Design Calculations		

Site Data

Storm Event = 100 year Q = CIA
 Tributary Area = 273,121 ft²

C = 0.25
 i = 5.72 in/hr
 A = 6,269,995 acres

Q_{Design} = 8.97 ft³/sec

Channel Data

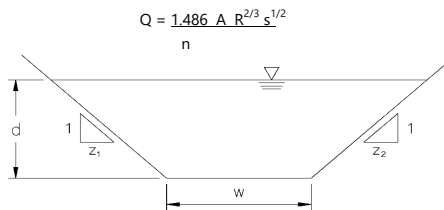
$Q = 1.486 A R^{2/3} s^{1/2}$

n = 0.035
 s = 0.005 ft/ft
 z₁ = 3 ft/ft
 z₂ = 3 ft/ft
 w = 5 ft
 d_{Full} = 2 ft

A = 22 ft²
 P_w = 17.65 ft
 R_h = 1.25 ft

Q_{Full} = 76.56 ft³/sec
V_{Full} = 3.48 ft/sec

d_{Design} = 0.66 ft
A_{Design} = 4.61
V_{Design} = 1.95 ft/sec





Computations

Project:	52933.00	Project	Brickyard Residential Development
Location:	Lebanon, NH	Sheet	2 of 4
Calculated by:	TMD	Date:	8/6/2024
Checked by:	DHF	Date:	8/6/2024
Title	Perimeter Swale Design Calculations		

Site Data

Storm Event = 100 year Q = CIA
 Tributary Area = 618,988 ft²

C = 0.25
 i = 3.61 in/hr
 A = 14.21 acres

Q_{Design} = 21.79 ft³/sec

Channel Data

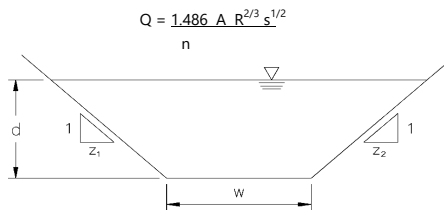
$Q = 1.486 A R^{2/3} s^{1/2}$

n = 0.035
 s = 0.01 ft/ft
 z₁ = 3 ft/ft
 z₂ = 3 ft/ft
 w = 5 ft
 d_{Full} = 2 ft

A = 22 ft²
 P_w = 17.65 ft
 R_h = 1.25 ft

Q_{Full} = 108.27 ft³/sec
V_{Full} = 4.92 ft/sec

d_{Design} = 0.89 ft
A_{Design} = 6.83
V_{Design} = 3.19 ft/sec





Computations

Project:	52933.00	Project	Brickyard Residential Development
Location:	Lebanon, NH	Sheet	3 of 4
Calculated by:	TMD	Date:	8/6/2024
Checked by:	DHF	Date:	8/6/2024
Title	Perimeter Swale Design Calculations		

Site Data

Storm Event = 100 year Q = CIA
 Tributary Area = 74,052 ft²

C = 0.25
 i = 5.95 in/hr
 A = 1.7 acres

Q_{Design} = 24.32 ft³/sec

Channel Data

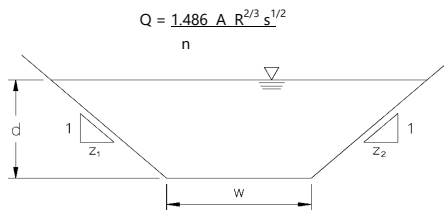
$Q = 1.486 A R^{2/3} s^{1/2}$

n = 0.035
 s = 0.09 ft/ft
 z₁ = 3 ft/ft
 z₂ = 3 ft/ft
 w = 5 ft
 d_{Full} = 2 ft

A = 22 ft²
 P_w = 17.65 ft
 R_h = 1.25 ft

Q_{Full} = 324.80 ft³/sec
V_{Full} = 14.76 ft/sec

d_{Design} = 0.52 ft
A_{Design} = 3.41
V_{Design} = 7.13 ft/sec





Computations

Project:	52933.00	Project	Brickyard Residential Development
Location:	Lebanon, NH	Sheet	4 of 4
Calculated by:	TMD	Date:	8/6/2024
Checked by:	DHF	Date:	8/6/2024
Title	Perimeter Swale Design Calculations		

Site Data

Storm Event = 100 year Q = CIA
 Tributary Area = 341,946 ft²

C = 0.25
 i = 5.02 in/hr
 A = 7.85 acres

Q_{Design} = 34.17 ft³/sec

Channel Data

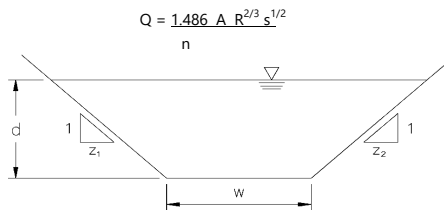
$Q = 1.486 A R^{2/3} s^{1/2}$

n = 0.035
 s = 0.0125 ft/ft
 z₁ = 3 ft/ft
 z₂ = 3 ft/ft
 w = 5 ft
 d_{Full} = 2 ft

A = 22 ft²
 P_w = 17.65 ft
 R_h = 1.25 ft

Q_{Full} = 121.05 ft³/sec
V_{Full} = 5.50 ft/sec

d_{Design} = 1.06 ft
A_{Design} = 8.67
V_{Design} = 3.94 ft/sec



Inlet Capacity Calculations

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2 Bedford Farms Drive, Suite 200
Bedford, NH 03101
603.391.3900

Inlet Capacity

Project Brickyard Residential
Calculated by DJB
Checked by TMD

Project # 52933.00
Date 8/5/2024
Date 8/5/2024

CB #	Flow to CB (cfs)	Grate Type	Grate Area (sf)	Head (ft)	Head (in)	Grate Capacity (cfs)	Adequate Capacity (Y/N)
402	0.4	A	1.51	0.50	6.00	3.60	YES
401	0.3	A	1.51	0.17	2.00	2.08	YES
403	0.5	A	1.51	0.17	2.00	2.08	YES
701	0.5	A	1.51	0.50	6.00	3.60	YES
405	0.6	A	1.51	0.50	6.00	3.60	YES
406	0.6	A	1.51	0.17	2.00	2.08	YES
407	2.9	B	3.01	0.17	2.00	4.15	YES
317	2.1	A	1.51	0.50	6.00	3.60	YES
316	0.9	A	1.51	0.50	6.00	3.60	YES
315	0.3	A	1.51	0.50	6.00	3.60	YES
314	0.8	A	1.51	0.50	6.00	3.60	YES
218	4.1	B	3.01	0.50	6.00	7.17	YES
217	1.1	A	1.51	0.50	6.00	3.60	YES
216	0.7	A	1.51	0.50	6.00	3.60	YES
214	1.9	A	1.51	0.50	6.00	3.60	YES
213	0.9	A	1.51	0.50	6.00	3.60	YES
212	1.9	A	1.51	0.17	2.00	2.08	YES
211	0.6	A	1.51	0.17	2.00	2.08	YES
209	0.8	A	1.51	0.17	2.00	2.08	YES
208	0.6	A	1.51	0.50	6.00	3.60	YES
207	1.6	A	1.51	0.50	6.00	3.60	YES
110	0.8	A	1.51	0.50	6.00	3.60	YES
109	0.3	A	1.51	0.50	6.00	3.60	YES
108	0.6	A	1.51	0.50	6.00	3.60	YES
107	0.3	A	1.51	0.50	6.00	3.60	YES
105	2.3	A	1.51	0.50	6.00	3.60	YES
101	0.3	A	1.51	0.17	2.00	2.08	YES
102	0.5	A	1.51	0.17	2.00	2.08	YES
103	0.5	A	1.51	0.50	6.00	3.60	YES
908	0.3	A	1.51	0.50	6.00	3.60	YES
909	0.3	A	1.51	0.50	6.00	3.60	YES

Notes:

1. CxA values from StormCAD analysis
2. Grate Types:

Name	Type	Area (sf)
East Jordan 5520M5 (Single)	A	1.51
East Jordan 5520M5 (Double)	B	3.01

3. Head = 6" for sag, 2" for in-line
4. The Orifice Equation was used to evaluate grate capacity:

$$Q = C \times A \times (2gh)^{1/2} \times f$$

where:

Q = Grate Capacity
 C = Orifice Coefficient, 0.6
 A = Free Open Area of grate in square feet
 h = Head over grate in feet
 g = Gravity, ft/s², 32.2
 *f = Clogging Factor, 0.7
 *Assumes the catch basin is 30% clogged

Appendix D: Site Specific Soil Survey Report

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To: Dave Fenstermacher, PE

Date: January 9, 2024
Project #: 52933.00

Memorandum

From: Sherrie Trefry, CSS

Re: Site-Specific Soil Mapping Report

Vanasse Hangen Brustlin, Inc. (VHB) has prepared this Site-Specific Soil Mapping Report to accompany the soils map that was prepared for TRB Group in Lebanon, New Hampshire. Certified Soil Scientist, Sherrie Trefry, CSS #93, developed a soils map on October 5th and 6th to classify the soils within ~35 acres of Lot 1, 2, and 4 on Map #48 and Lot 1 on Map #63. The property is being evaluated for a proposed residential development off Hanover Street. This Site-Site Specific Soil Map (SSSM) and Report were developed in accordance with Site-Specific Soil Mapping Standards For New Hampshire and Vermont, Special Publication No. 3, Version 7.0 (July 2021). The soils map was prepared on an existing condition plan at a scale of 1" = 80' Attachment 1.

Portions of the site have been previously developed for industrial and residential uses. Lot 4 was previously developed for brick production. There were several storage buildings, two brick kilns, and a smokestack still present on the lot at the time of the evaluation. The brickyard used a large deposit of clay from the site to make the bricks. The excavation of clay resulted in the creation of the existing pond on Lot 2 of the site. The operation of the brickyard resulted in most of Lot 4 and a portion of Lot 2 west of Lot 4 being disturbed. Excavations revealed buried urban fill consisting mostly of brick, brick dust, and other materials from the production process across most of the lot. The edge of disturbance was mapped west of Lot 4 in Lot 2 between a dump, mapped off the north corner of Lot 4, and the edge of the wetland that extends from Lot 2 south into Lot 4.

Lot 1 of Map #63 was previously developed for residential use. There was a house with an attached garage at the front of the lot, a cottage at the back of the lot near the stream that bisects the parcel and several small outbuildings on the lot at the time of the evaluation. The portion of the lot north of the existing house and east of the stream is a maintained lawn over undisturbed soil deposits. West of the stream portions of the ledge have been quarried leaving open water wetlands in some of the quarried areas.

Lot 1 on Map #48 is undeveloped with a portion of the lot having frontage on Hanover Street. The lot contains wetlands and a portion of the stream that flows across Lot 1 on Map #63 through this lot and into the pond on Lot 4. A large stand of the non-native Japanese knotweed extends between the wetland and the stream. The portion of the site west of the stream is forested and is contiguous with the forested portion of Lot 2.

The area evaluated, as depicted on the SSSM, the site contains soils formed in glacial lacustrine, eolian, or alluvial materials. The site is nearly level near Hanover Street at elevation ~580 ft ABMSL. The site rises to the west with moderate slopes giving way to steeper slopes that correspond with underlying ledge within 40 inches of the surface. The delineation of Hollis, Chatfield and Montauk series was not possible without an excavator given the extensive amount of ledge and surface stones in the area. Therefore, complexes were used as part of this SSSM. The ledge outcrops were delineated with sub-meter accuracy GPS.

The brick manufacturing lot was classified using disturbed soil classifications and modifiers to describe the observation of urban fill in much of that area. The table below summarizes the observed soil series and characteristics identified on the soil map. Official soil descriptions are provided in Attachment 2.

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Memorandum

Test Pit Observations:

Test Pit 1	Located just beyond the dump and disturbance associated with the brick production operation within a forested portion of Lot 2. Pit was located on a 3-8% slope. Moderately well drained soils formed in lodgement till derived mainly from slate, phyllite, shale, and schist. These soils are very deep to bedrock and moderately deep to a densic contact. Soil classification: Pittstown Seasonal high-water table at ~25 inches No observed, bedrock, gravel/rocks, or surface stones Many stones and						
Depth	Horizon	Color	Texture	Structure	Consistence	Redox	Other observations
0-2.5"	Oe	7.5YR 3/2	loam	granular	very friable	none	Many fine to medium roots
2.5-6.5"	A	2.5Y 4/3	loam	granular	very friable	none	Many fine to medium roots
6.5-13.5"	AB	2.5Y 5/3	silt loam	subangular blocky	friable	few, faint concentrations	Many fine to medium roots
13.5-19"	B ₁	2.5Y 6/2	silt loam	subangular blocky	firm	few, faint concentrations	Few fine-medium roots
19-23"	Cd	5Y 5/2	silt loam	platy	very firm	distinct, many concentrations 10YR 4/4 depletions 5Y 6/1	Few fine-medium roots
23-40"	C	5Y 5/2	silt loam	platy	firm	Distinct, many concentrations 2.5Y 5/4 depletions 2.5Y 6/1	Color of depletions represented more than 50% of color in profile

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Test Pit 3	Located upslope of Test Pit 1 within a forested area that appears undisturbed. The pit was located on a 3-8% slope. Pit was representative of the lower elevation well drained soils on the western portion of the site that have a densic contact. These are very deep, well drained soils formed in till derived mainly from dark gray phyllite, slate, or schist. Soil classification: Bernardston, very stony No observed seasonal high-water table or bedrock Stones and boulders within the profile						
Depth	Horizon	Color	Texture	Structure	Consistence	Redox	Other observations
0-5"	Oa	2.5Y 2.5/2	loam	granular	very friable	no redox	some fine, medium, large roots
5-9"	A	10YR 4/6	fine sandy loam	granular	very friable	no redox	some fine, medium, large roots
9-15"	Bw ₁	2.5Y 4/3	fine sandy loam	subangular blocky	friable	no redox	some fine, medium, large roots
15-22"	Bw ₂	2.5Y 5/3	silt loam	Subangular blocky	firm	no redox	some fine, medium, large roots
22-40"	Cd	5Y 4/2 and 2.5Y 6/1	silt loam	platy	very firm	no redox	some fine roots

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Test Pit 4	Located upslope of Test Pit 3 within a forested area that appears undisturbed. The pit was located on a 8-15% slope. Pit was representative of the higher elevation well drained soils on a large portion of the site that have a densic contact. These soils formed in lodgment or flow till derived primarily from granitic materials with lesser amounts of gneiss and schist. Soil classification: Montauk, very stony No observed seasonal high-water table or bedrock Stones and gravel within the profile Many surface boulders and stones						
Depth	Horizon	Color	Texture	Structure	Consistence	Redox	Other observations
0-12"	O	10 YR 2/2	loam	granular	very friable	no redox	many fine and medium roots
12-16"	E	7.5Y 5/1	loamy sand	granular	very friable	no redox	many fine and medium roots
16-35"	Bs	7.5YR 4/4	fine sandy loam	subangular blocky	friable	no redox	many fine and medium roots to about 24"
35-40"	Cd	5Y 5/2	fine sandy loam	Subangular blocky	firm	no redox	

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Test Pit 16	Located just behind the existing house within a maintained lawn. Pit was located on a 3-8% slope. Moderately well drained soils formed in in loamy over sandy and gravelly glacial outwash. These soils are very deep formed on glaciofluvial landforms. Soil classification: Ninigret Seasonal high-water table at ~36 inches No observed bedrock or surface stones						
Depth	Horizon	Color	Texture	Structure	Consistence	Redox	Other observations
0-8"	A	10 YR 3/3	fine sandy loam	subangular blocky	friable	no redox	many fine roots, 10% gravel
8-12"	Bh	10 YR 3/6	fine sandy loam	subangular blocky	very friable	no redox	many fine roots to 10", 30-50% gravel and cobbles
12-24"	Bw	2.5Y 4/4	loamy fine sand	granular	very friable	no redox	35-50% gravel and cobbles
24-36"	C ₁	2.5Y 4/4	loamy sand	granular	very friable	no redox	35-50% gravel and cobbles
36-40"	C ₂	2.5Y 3/3	loamy sand	granular	friable	Faint, many concentrations 7.5Y 4/4 depletions 2.5Y 5/2	50% gravel and cobbles
40+"	C ₃	2.5Y 5/2	very fine sand	platy	firm	Faint, many concentrations 7.5Y 4/3 depletions 2.5Y 6/2	lenses of silt present

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Test Pit 19	Located within the maintained lawn adjacent to the house near the apple tree. The pit was located on a 0-3% slope. Pit was representative of the well drained soils on the eastern portion of the site near the residence. These are very deep, well drained soils formed in loamy over sandy and gravelly outwash. Soil classification: Haven No observed seasonal high-water table or bedrock No observed bedrock or surface stones						
Depth	Horizon	Color	Texture	Structure	Consistence	Redox	Other observations
0-12"	Ap	10YR 3/2	fine sandy loam	subangular blocky	friable	no redox	many fine roots, 5% gravel
12-20"	Bhs	7.5YR 3/3	fine sandy loam	subangular blocky	friable	no redox	many fine roots to 10", 10% gravel
20-28"	Bh	2.5Y 4/3	loamy fine sand	granular	very friable	no redox	35-50% gravel and cobbles
28-36"	C ₁	2.5Y 4/3	medium – coarse sand	granular	very friable	no redox	35-50% gravel and cobbles
36-40"	C ₂	2.5Y 4/3	medium – coarse sand	granular	very friable	few faint concentrations 10YR 4/4	35-50% gravel and cobbles

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Memorandum

Hollis – Rock Outcrop – Chatfield Complex	Site and Soil Photos
Ledge outcrops observed in the northeast region of the site.	
Soil observation of Hollis Series. These are well drained soils formed in a thin mantle of till that are shallow to bedrock.	
Soil observation of Chatfield Series. These are well drained soils formed in loamy melt-out till. They are moderately deep to bedrock. Observed colors of sandy loam soils with no gravel Bw₁ 10YR 3/6 Bw₂ 10YR 5/6 C 2.5Y 4/6 R – bedrock observed at 16"	

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Urban Fill and Disturbed Soils	Site and Soil Photos
Test pit 6 located adjacent to the open water channel on the brick making property. Urban fill observed within 40" with no natural soil horizons observed. Free water was observed at 54" which is similar to the surface water depth in the adjacent channel. There was an odor detectable during excavation of the pit.	
Test pit 7 located adjacent to the open water channel west of the test pit 6 in front of a warehouse on the brick making property. Urban fill including brick pieces and brick dust observed down to 60" with no natural soil horizons observed. Free water was observed at 24" which is shallower than the surface water depth in the adjacent channel.	 

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Test pit 10 is located close to one of the brick ovens seen here behind the spoils pile. Urban fill was observed down to 60" with no native soil horizons observed. The first 24" contained sandy texture soils with brick debris. At depth 24" or greater, gray colors and silty loam textures were observed that may indicate native soils. Observed free water at 40".



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Test pit 13 was located east of the warehouse located to the right of the smokestack visible in the adjacent photo. No brick fill or dark soil observed as compared to the other pits excavated on the brickmaking property. Sandy loam soils observed over clay soils with a color of 2.5Y 5/1. Clay depth at 36" that is saturated with a seasonal high water table of 36".



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Memorandum

Soil symbol	Soil series; Taxonomic class	Soil Unit Map Description
540B/P	Raypol; Coarse-loamy over sandy or sandy-skeletal, mixed, active, acid, mesic Aeric Endoaquepts	Very deep, poorly drained soils formed in loamy over sandy and gravelly outwash. This soil is on gently sloping soils on a shallow drainageway. The soil has a water table near the surface. Permeability of the Raypol soils is moderate in the surface layer and subsoil and rapid or very rapid in the substratum. This soil is on a 3-8% slope. Hydrologic Soil Group D.
540D/P	Raypol; Coarse-loamy over sandy or sandy-skeletal, mixed, active, acid, mesic Aeric Endoaquepts	Very deep, poorly drained soils formed in loamy over sandy and gravelly outwash. This soil is uncharacteristically on a steep slope because the area was historically excavated. The soil has a water table near the surface. Permeability of the Raypol soils is moderate in the surface layer and subsoil and rapid or very rapid in the substratum. This soil is on a 15-25% slope. Hydrologic Soil Group D.
513A	Ninigret; Coarse-loamy over sandy or sandy-skeletal, mixed, active, mesic Aquic Dystrudepts	Very deep, moderately well drained soils formed in loamy over sandy and gravelly glacial outwash. This soil formed on a glaciofluvial landform with characteristics of an outwash plain. Saturated hydraulic conductivity is moderately high or high in the solum and high or very high in the substratum. This soil is on a 0-3% slope. Hydrologic Soil Group B.
513B	Ninigret; Coarse-loamy over sandy or sandy-skeletal,	Very deep, moderately well drained soils formed in loamy over sandy and gravelly glacial outwash. This soil formed on a glaciofluvial landform. Saturated hydraulic conductivity is moderately high or

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	mixed, active, mesic Aquic Dystrudepts	high in the solum and high or very high in the substratum. This soil is gently sloping a 3-8% slope. Hydrologic Soil Group B.
917A	Ninigret Variant; Coarse-loamy over sandy or sandy-skeletal, mixed, active, mesic Aquic Dystrudepts	Very deep, somewhat poorly drained soils formed in loamy over sandy and gravelly glacial outwash. This soil formed on a glaciofluvial landform with characteristics of an outwash plain. Saturated hydraulic conductivity is moderately high or high in the solum and high or very high in the substratum. This soil is on a 0-3% slope. Hydrologic Soil Group C.
917C	Ninigret Variant; Coarse-loamy over sandy or sandy-skeletal, mixed, active, mesic Aquic Dystrudepts	Very deep, somewhat poorly drained soils formed in loamy over sandy and gravelly glacial outwash. This soil formed on a glaciofluvial landform with characteristics of an outwash plain. Saturated hydraulic conductivity is moderately high or high in the solum and high or very high in the substratum. This soil is on a 8-15% slope. Hydrologic Soil Group C.
917D	Ninigret Variant; Coarse-loamy over sandy or sandy-skeletal, mixed, active, mesic Aquic Dystrudepts	Very deep, somewhat poorly drained soils formed in loamy over sandy and gravelly glacial outwash. This soil formed on a glaciofluvial landform with characteristics of an outwash plain. This soil is uncharacteristically on a steep slope because the area was historically excavated. Saturated hydraulic conductivity is moderately high or high in the solum and high or very high in the substratum. This soil is on a 15-25% slope. Hydrologic Soil Group C.
299A/ cbaaa	Smoothed Udorthents	Very deep, well drained filled area with parent material formed from glacial outwash. Area was filled with on-site materials and regraded likely for the construction of the existing house. Observed water at 36". This soil is on a 0-3% slopes. Hydrologic Soil Group A.
410A	Haven; Coarse-loamy over sandy or sandy-skeletal, mixed, active, mesic Typic Dystrudepts	Very deep, well drained soils formed in loamy over sandy and gravelly outwash. The soil is nearly level on an outwash plain. Saturated hydraulic conductivity is moderately high or high in the mineral solum and very high in the substratum. This soil is on a 0-3% slopes. Hydrologic Soil Group B.

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200B/ dccbb	Smoothed Udorthents	This is a disturbed soil that has been used as a refuse dump. Underlying soils are moderately well drained soils formed in lodgement till derived mainly from slate, phyllite, shale, and schist. These soils are very deep to bedrock and moderately deep to a densic contact. The soil is on a 3-8% slope. Hydrologic Soil Group B.
200C/ dccbb	Smoothed Udorthents	This is a disturbed soil that has been used as a refuse dump. Underlying soils are moderately well drained soils formed in lodgement till derived mainly from slate, phyllite, shale, and schist. These soils are very deep to bedrock and moderately deep to a densic contact. The soil is on a 8-15% slope. Hydrologic Soil Group B.
200D/ dccbb	Smoothed Udorthents; refuse substratum	This is a disturbed soil that has been used as a refuse dump. Underlying soils are moderately well drained soils formed in lodgement till derived mainly from slate, phyllite, shale, and schist. These soils are very deep to bedrock and moderately deep to a densic contact. The soil is on a 15-25% slope. Hydrologic Soil Group B.
299A/ caabb	Smoothed Udorthents	Very deep, well drained filled area with no parent material within 60 inches. Area was filled with on-site materials consisting largely of brick pieces, brick dust, ash and regraded materials from the surrounding site. This soil has no restrictive layer and moderate saturated hydraulic conductivity and is Hydrologic Soil Group B. This soil is on a 0-3% slopes.
299A/ daabb	Smoothed Udorthents	Very deep, moderately well drained filled area with no parent material within 60 inches. Area was filled with on-site materials consisting largely of brick pieces, brick dust, ash and regraded materials from the surrounding site. This soil has no restrictive layer and moderate saturated hydraulic conductivity and is Hydrologic Soil Group B. This soil is on a 0-3% slopes.
299B/ caabb	Smoothed Udorthents	Very deep, well drained filled area with no parent material within 60 inches. Area was filled with on-site materials consisting largely of

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		brick pieces, brick dust, ash and regraded materials from the surrounding site. This soil has no restrictive layer and moderate saturated hydraulic conductivity and is Hydrologic Soil Group B. This soil is on a 3-8% slopes.
299C/ caabb	Smoothed Udorthents	Very deep, well drained filled area with no parent material within 60 inches. Area was filled with on-site materials consisting largely of brick pieces, brick dust, ash and regraded materials from the surrounding site. This soil has no restrictive layer and moderate saturated hydraulic conductivity and is Hydrologic Soil Group B. This soil is on a 8-15% slopes.
299D/ caabb	Smoothed Udorthents	Very deep, well drained filled area with no parent material within 60 inches. Area was filled with on-site materials consisting largely of brick pieces, brick dust, ash and regraded materials from the surrounding site. This soil has no restrictive layer and moderate saturated hydraulic conductivity and is Hydrologic Soil Group B. This soil is on a 15-25% slopes.
299C/ cccbb	Smoothed Udorthents	Very deep, moderately well drained filled area with glacial till parent material within 60 inches. Area was filled with on-site materials consisting largely of brick pieces, brick dust, ash and regraded materials from the surrounding site. This soil has a mineral densic layer and moderate saturated hydraulic conductivity and is Hydrologic Soil Group B. This soil is on a 8-15% slopes.
299D/ cccbb	Smoothed Udorthents	Very deep, moderately well drained filled area with glacial till parent material within 60 inches. Area was filled with on-site materials consisting largely of brick pieces, brick dust, ash and regraded materials from the surrounding site. This soil has a mineral densic layer and moderate saturated hydraulic conductivity and is Hydrologic Soil Group B. This soil is on a 15-25% slopes.
299E/ cccbb	Smoothed Udorthents	Very deep, moderately well drained filled area with glacial till parent material within 60 inches. Area was filled with on-site materials

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		consisting largely of brick pieces, brick dust, ash and regraded materials from the surrounding site. This soil has a mineral densic layer and moderate saturated hydraulic conductivity and is Hydrologic Soil Group B. This soil is on a 25-50% slopes.
600C/ fccbb/P	Endoaquents	Very deep, moderately poorly drained filled area with glacial till parent material within 60 inches. Area was filled with on-site materials consisting largely of brick pieces, brick dust, ash and regraded materials from the surrounding site. This soil has a mineral densic layer and moderate saturated hydraulic conductivity and is Hydrologic Soil Group B. This soil is on a 8-15% slopes.
600A/fccbb/P	Endoaquents	Very deep, moderately poorly drained filled area with glacial till parent material within 60 inches. Area was filled with on-site materials consisting largely of brick pieces, brick dust, ash and regraded materials from the surrounding site. This soil has a mineral densic layer and moderate saturated hydraulic conductivity and is Hydrologic Soil Group B. This soil is on a 8-15% slopes.
600A/fcdcd/P	Endoaquents	Shallow poorly drained soils created from the excavation of bedrock. These soils were formed in glacial till. Area had standing water at the time of evaluation. Bedrock was within 20 inches. Soil was on a 0-3% slope at the base of rock outcrops. Hydrologic Soil Group D.
336B	Pittstown, Coarse-loamy, mixed, active, mesic Aquic Dystrudepts	Moderately well drained soils formed in lodgement till derived mainly from slate, phyllite, shale, and schist. These soils are very deep to bedrock and moderately deep to a densic contact. The soil is on a 3-8% slope. Hydrologic Soil Group C.
331A	Bernardston, Coarse-loamy, mixed, active, mesic Oxyaquic Dystrudepts, very stony	Very deep, well drained soils formed in till derived mainly from dark gray phyllite, slate, or schist. The soils are moderately deep to dense till. Saturated hydraulic conductivity is moderately high or high in the solum and low to moderately high in the substratum. The soil is on a 0-3% slope. Hydrologic Soil Group C.

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331B	Bernardston, Coarse-loamy, mixed, active, mesic Oxyaquic Dystrudepts, very stony	Very deep, well drained soils formed in till derived mainly from dark gray phyllite, slate, or schist. The soils are moderately deep to dense till. Saturated hydraulic conductivity is moderately high or high in the solum and low to moderately high in the substratum. The soil is on a 3-8% slope. Hydrologic Soil Group C.
331C	Bernardston, Coarse-loamy, mixed, active, mesic Oxyaquic Dystrudepts, very stony	Very deep, well drained soils formed in till derived mainly from dark gray phyllite, slate, or schist. The soils are moderately deep to dense till. Saturated hydraulic conductivity is moderately high or high in the solum and low to moderately high in the substratum. The soil is on a 8-15% slope. Hydrologic Soil Group C.
45B	Montauk, Coarse-loamy, mixed, active, mesic Oxyaquic Dystrudepts, very stony	Well drained soils formed in lodgment or flow till derived primarily from granitic materials with lesser amounts of gneiss and schist. The soils are very deep to bedrock and moderately deep to a densic contact. These soils are located along the less steep upland hill slope on the site. Saturated hydraulic conductivity is moderately high or high in the mineral solum and low to moderately high in the substratum. The soil is on a 3-8% slope.
45C	Montauk, Coarse-loamy, mixed, active, mesic Oxyaquic Dystrudepts, very stony	Well drained soils formed in lodgment or flow till derived primarily from granitic materials with lesser amounts of gneiss and schist. The soils are very deep to bedrock and moderately deep to a densic contact. These soils are located along the less steep upland hill slope on the site. Saturated hydraulic conductivity is moderately high or high in the mineral solum and low to moderately high in the substratum. The soil is on a 8-15% slope. Hydrologic Soil Group C.
45D	Montauk, Coarse-loamy, mixed, active, mesic Oxyaquic Dystrudepts, very stony	Well drained soils formed in lodgment or flow till derived primarily from granitic materials with lesser amounts of gneiss and schist. The soils are very deep to bedrock and moderately deep to a densic contact. These soils are on upland hills and moraines. Slope ranges from 0 to 35 percent. Saturated hydraulic conductivity is moderately

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		high or high in the mineral solum and low to moderately high in the substratum. Hydrologic Soil Group C.
141B	Hollis-rock outcrop – Chatfield complex	Hollis series consists of well drained soils formed in a thin mantle of till that are shallow to bedrock. Chatfield series consists of well drained soils formed in loamy melt-out till that are moderately deep to bedrock. These soils are located along the steep slope of the upland hill that extends to the northeast. Rock out crops were abundant along the hill side. There is too much variability to delineate between the series. Saturated hydraulic conductivity is moderately high or high in the mineral soil. The soil is on a 3-8% slope. Hydrologic Soil Group C.
141C	Hollis-rock outcrop – Chatfield complex	Hollis series consists of well drained soils formed in a thin mantle of till that are shallow to bedrock. Chatfield series consists of well drained soils formed in loamy melt-out till that are moderately deep to bedrock. These soils are located along the steep slope of the upland hill that extends to the northeast. Rock out crops were abundant along the hill side. There is too much variability to delineate between the series. Saturated hydraulic conductivity is moderately high or high in the mineral soil. The soil is on a 8-15% slope. Hydrologic Soil Group C.
141D	Hollis-rock outcrop – Chatfield complex	Hollis series consists of well drained soils formed in a thin mantle of till that are shallow to bedrock. Chatfield series consists of well drained soils formed in loamy melt-out till that are moderately deep to bedrock. These soils are located along the steep slope of the upland hill that extends to the northeast. Rock out crops were abundant along the hill side. There is too much variability to delineate between the series. Saturated hydraulic conductivity is moderately high or high in the mineral soil. The soil is on a 15-25% slope. Hydrologic Soil Group C.

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141E	Hollis-rock outcrop – Chatfield complex	Hollis series consists of well drained soils formed in a thin mantle of till that are shallow to bedrock. Chatfield series consists of well drained soils formed in loamy melt-out till that are moderately deep to bedrock. These soils are located along the steep slope of the upland hill that extends to the northeast. Rock out crops were abundant along the hill side. There is too much variability to delineate between the series. Saturated hydraulic conductivity is moderately high or high in the mineral soil. The soil is on a 25-35% slope. Hydrologic Soil Group C.
250B	Chatfield – Hollis – Montauk complex, very stony	Hollis series consists of well drained soils formed in a thin mantle of till that are shallow to bedrock. Chatfield series consists of well drained soils formed in loamy melt-out till that are moderately deep to bedrock. Montauk series consists of well drained soils formed in lodgment till derived primarily from granitic materials with lesser amounts of gneiss and schist. These soils are very deep to bedrock and moderately deep to a densic contact. There is too much variability to delineate between the series with the amount of stone present. The soils occurs on gently sloping foothill on 3-8% slope. Hydrologic Soil Group C.
250C	Chatfield – Hollis – Montauk complex, very stony	Hollis series consists of well drained soils formed in a thin mantle of till that are shallow to bedrock. Chatfield series consists of well drained soils formed in loamy melt-out till that are moderately deep to bedrock. Montauk series consists of well drained soils formed in lodgment till derived primarily from granitic materials with lesser amounts of gneiss and schist. These soils are very deep to bedrock and moderately deep to a densic contact. There is too much variability to delineate between the series with the amount of stone present. The soils occurs on gently sloping foothill on 8-15% slope. Hydrologic Soil Group C.
250D	Chatfield – Hollis – Montauk complex, very stony	Hollis series consists of well drained soils formed in a thin mantle of till that are shallow to bedrock. Chatfield series consists of well

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		drained soils formed in loamy melt-out till that are moderately deep to bedrock. Montauk series consists of well drained soils formed in lodgment till derived primarily from granitic materials with lesser amounts of gneiss and schist. These soils are very deep to bedrock and moderately deep to a densic contact. There is too much variability to delineate between the series with the amount of stone present. The soils occurs on gently sloping foothill on 15-25% slope. Hydrologic Soil Group C.
500B/ccfbb	Udorthents, loamy	These are well drained soils that have been excavated on the edge of the pond likely during the removal of clay for the brick manufacturing process. These soils were formed in glacial till with bedrock that is too variable to distinguish. Moderate saturated hydraulic conductivity and is Hydrologic Soil Group B. This soil is on a 3-8% slopes. Hydrologic Soil Group B.
500C/ccfbb	Udorthents, loamy	These are well drained soils that have been excavated on the edge of the pond likely during the removal of clay for the brick manufacturing process. These soils were formed in glacial till with bedrock that is too variable to distinguish. Moderate saturated hydraulic conductivity and is Hydrologic Soil Group B. This soil is on a 8-15% slopes. Hydrologic Soil Group B.
500E/ccfbb	Udorthents, loamy	These are well drained soils that have been excavated on the edge of the pond likely during the removal of clay for the brick manufacturing process. These soils were formed in glacial till with bedrock that is too variable to distinguish. Moderate saturated hydraulic conductivity and is Hydrologic Soil Group B. This soil is on a 25-35% slopes. Hydrologic Soil Group B.

Disturbed Map Units

This edition of the New Hampshire State-Wide Numerical Soil Legend contains eleven distinct map units used for identifying areas of soils altered or disturbed by human influence and the addition of one naturally formed map unit. These map units were designed for the Order 2 and Order 3 levels of mapping intensity, but can be used in Order 1 mapping if appropriate.

The definition of disturbed map units is intentionally brief and vague. Classification at the Great Group level allows for a wide range in soil properties and behavioral characteristics. The variability in soil properties typically requires on-site investigations before any interpretation can be developed. The map unit descriptions are intended to provide guidance in differentiating map units. The author of the soil map is expected to provide additional information to reflect the nature of the disturbed areas within the survey area.

I. Excavated land

300 Udipsamments

This map unit is characterized by soil textures of loamy fine sand to sand and gravel throughout the entire particle-size class control section (25 - 100 cm or 10 - 40 inches). Saturated hydraulic conductivity (K_{sat}) is high or very high. Drainage class ranges from excessively drained to well drained. The Hydrologic Soil Group (HSG) is A. Typical sand pit.

350 Udipsamments, wet substratum

This map unit is characterized by soil textures of loamy fine sand to sand and gravel throughout the entire particle-size class control section (25 - 100 cm or 10 - 40 inches). Saturated hydraulic conductivity (K_{sat}) is high or very high. Drainage class ranges from moderately well drained to somewhat poorly drained.

400 Udorthents, sandy or gravelly

This map unit typically includes the following concepts: 1) very gravelly (> 35%) sand or very gravelly loamy sand; Or 2) sand or loamy sand textures that may have lenses of loamy very fine sand or finer somewhere in the particle-size class control section (25 - 100 cm or 10 - 40"). Saturated hydraulic conductivity (K_{sat}) is high or very high. Drainage class ranges from excessively drained to somewhat poorly drained. Typical gravel pit.

Disturbed Map Units (continued)

500 Udorthents, loamy

This map unit is characterized typically by soil textures that are sandy loam, loam, or silt loam within the particle size control section (25 – 100cm or 10 – 40”). Saturated hydraulic conductivity (K_{sat}) is low through high. Drainage class ranges from well drained to somewhat poorly drained. These areas typically represent excavated glacial till or perhaps areas where sand and gravel was excavated down to the loamy underlying material.

550 Udorthents, Bedrock substratum

This map unit is characterized by soil textures of sandy loam, loam, or silt loam within the particle-size class control section (25 - 100 cm or 10 - 40 inches). These areas typically represent excavated soil materials where the range in depth to bedrock is 10 - 60 inches (25 - 152 cm). Saturated hydraulic conductivity (K_{sat}) is low through high. Drainage class ranges from somewhat excessively drained to somewhat poorly drained.

600 Endoaquents, loamy

This map unit represents areas where soil material was excavated down to, or near the water table. Soil material is typically sandy loam, loam or silt loam within the particle-size class control section (25 - 100 cm or 10 - 40 inches). Saturated hydraulic conductivity (K_{sat}) is low through high. Drainage class is poorly or very poorly drained. The Hydrologic Soil Group (HSG) is D.

900 Endoaquents, sandy or gravelly

This map unit represents areas where soil material was excavated down to / near the water table. This map unit is characterized typically by soil textures of: 1) very gravelly (> 35% gravel) sand or very gravelly loamy sand or; 2) sand or loamy sand textures that may have lenses of loamy very fine sand or finer somewhere in the particle-size class control section (25 - 100 cm or 10 - 40"). Saturated hydraulic conductivity (K_{sat}) is high or very high. Drainage class is poorly or very poorly drained. The Hydrologic Soil Group (HSG) is D. Typical gravel pit dug down to or close to the water table.

Disturbed Map Units (continued)

II. Filled land

100 Udorthents, wet substratum

This map unit represents areas that have been filled and leveled over what were originally hydric soils.

199 Dumps, bark chips, and organic material

This map unit consists of man-made deposits of bark, wood chips, sawdust, paper mill sludge, cinders, waste paper, ashes, and other similar refuse from the operation of paper mills and sawmills.

200 Udorthents, refuse substratum

This map unit represents alternating layers of soil and refuse such as in sanitary landfills. Closed landfills typically have 2 feet of loamy material capping the area.

299 Udorthents, smoothed

This map unit represents areas that have been cut and filled to create a large level or nearly level area. Soil material making up the map units typically came from the immediate area. School athletic fields are an example (unless they were created on hydric soils – see Map Unit 100).

III. Bottom Land

7 Fluvaquents

This map unit represents areas of various kinds of soil materials on the bottom lands of streams and rivers. The soil material ranges in texture from silt loam to sand and gravel within the particle-size class control section (25 - 100 cm or 10 - 40 inches). Drainage class is poorly or very poorly drained. The Hydrologic Soil Group (HSG) is D.

Disturbed Map Units (continued)**Catena Key for Excavated & Bottom Land**

Disturbed Map Units	Map Unit						
	Drainage Class						
	Excessively Drained	Somewhat Excessively Drained	Well Drained	Moderately Well Drained	Somewhat Poorly Drained	Poorly Drained	Very Poorly Drained
<i>Parent Material</i>							
I. Excavated Land							
<i>Typically sands</i>	300 Udipsamments nearly level	300 Udipsamments nearly level	300 Udipsamment nearly level	350 Udipsamments wet substratum	350 Udipsamments wet substratum	900 Endoaquents sandy or gravelly	900 Endoaquents, sandy or gravelly
<i>Typically gravels</i>	400 Udorthents, sandy or gravelly	400 Udorthents, sandy or gravelly	400 Udorthents, sandy or gravelly	400 Udorthents, sandy or gravelly	400 Udorthents, sandy or gravelly	900 Endoaquents sandy or gravelly	900 Endoaquent, sandy or gravelly
<i>Typically loams</i>			500 Udorthents, loamy	500 Udorthents, loamy	500 Udorthents, loamy	600 Endoaquents loamy	600 Endoaquent, loamy
<i>Bedrock controlled loams</i>		550 Udorthents, Bedrock substratum	550 Udorthents, Bedrock substratum	550 Udorthents, Bedrock substratum	550 Udorthents, Bedrock substratum	600 Endoaquents loamy	600 Endoaquent, loamy
III. Bottom Land							
<i>Typically silt loam to sands and gravels</i>						7 Fluvaquents	7 Fluvaquents

NOTE: Filled soils in Section II page 21 are too variable to place into the above key.

4. *Use of the map symbol denominators for disturbed or altered soils, is at the discretion of the Certified Soil Scientist.*

Map Symbol Denominators for Disturbed or Altered Soil Map Units

The map symbols for Site-Specific Soil Mapping of disturbed or altered soils in New Hampshire is a two-part symbol with parts separated by a forward slash (/).

The first part consists of the USDA-NRCS Disturbed Map Unit symbol from the NH State-Wide Numerical Soil Legend. The map symbol is composed of 1 to 3 digits followed by a capital letter designating slope.

The second part consists of symbols of the SSSNNE NH Disturbed or Altered Soil Supplement to the Site-Specific Soil Survey Standards, as detailed below. The disturbed map symbol is composed of 5 lower case letters.

A Site-Specific Map symbol for a map prepared for an AoT application would be formatted as follows: **400A/aaaaa**

These New Hampshire Disturbed Soil Supplemental symbols can only be used in conjunction with the USDA-NRCS Disturbed Map Unit symbols for the NH Statewide Numerical Soil Legend.

Supplemental Symbols

Supplemental symbols may be used at the discretion of the Certified Soil Scientist who creates the Site-Specific Soil Survey. The five components of the Disturbed Soil Mapping Unit Supplement are as follows:

Symbol 1: Drainage Class

- a -Excessively Drained
- b-Somewhat Excessively Drained
- c-Well Drained
- d-Moderately Well Drained
- e-Somewhat Poorly Drained
- f-Poorly Drained
- g-Very Poorly Drained
- h-Not Determined

Symbol 2: Parent Material (of naturally formed soil only, if present)

- a-No natural soil within 60"
- b-Glaciofluvial Deposits (outwash/terraces of sand or sand and gravel)
- c-Glacial till Material (active ice)
- d-Glaciolacustrine very fine sand and silt deposits (glacial lakes)
- e-Loamy/sandy over Silt/Clay deposits
- f-Marine Silt and Clay deposits (ocean waters)
- g-Alluvial Deposits (floodplains)
- h-Organic Materials-Fresh water wetlands
- i- Organic Materials-Tidal wetlands

Symbol 3: Restrictive/Impervious Layers

a-None

b-Bouldery surface with more than 15% of the surface covered with boulders

c-Mineral restrictive layer(s) are present in the soil profile less than 40 inches below the soil surface such as hard pan, platy structure or clayey texture with consistence of at least firm (i.e., more than 20 newtons). For other examples of soil characteristics that qualify for restrictive layers, see "Soil Manual for Site evaluations in NH" 2 Ed., (page 3-17, figure 3-14)

d-Bedrock in the soil profile; 0-20 inches

e-Bedrock in the soil profile; 20-60 inches

f-Areas where depth to bedrock is so variable that a single soil type cannot be applied, will be mapped as a complex of soil types

g-Subject to Flooding

h-Man-made impervious surface including pavement, concrete, or built-up surfaces (i.e., buildings) with no morphological restrictive layer within control section

Symbol 4: Estimated Ksat* (most limiting layer excluding symbol 3h above).

a- High.

b- Moderate

c- Low

d- Not determined *See "Guidelines for Ksat Class Placement" in Chapter 3 of the Soil Survey Manual, USDA

Symbol 5: Hydrologic Soil Group*

a-Group A

b-Group B

c-Group C

d-Group D

e-Not determined

*Excluding man-made surface impervious/restrictive layers

Established Series
Rev. SMF-DAF-MFF
07/2004

BERNARDSTON SERIES

The Bernardston series consists of very deep, well drained soils formed in till derived mainly from dark gray phyllite, slate, or schist. The soils are moderately deep to dense till. They are nearly level to very steep soils on uplands. Saturated hydraulic conductivity is moderately high or high in the solum and low to moderately high in the substratum. Slope ranges from 0 to 50 percent. The mean annual temperature is about 49 degrees F. and the mean annual precipitation is about 45 inches.

TAXONOMIC CLASS: Coarse-loamy, mixed, active, mesic Oxyaquic Dystrudepts

TYPICAL PEDON: Bernardston silt loam, on a 10 percent slope in a cultivated field. (Colors are for moist soil unless otherwise noted.)

Ap--0 to 6 inches; very dark grayish brown (10YR 3/2) silt loam, light brownish gray (10YR 6/2) dry; moderate medium granular structure; very friable; 5 percent phyllite channers; many fine roots; strongly acid; abrupt smooth boundary. (5 to 10 inches thick)

Bw1--6 to 10 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; very friable; 10 percent phyllite channers; many fine roots; strongly acid; gradual smooth boundary.

Bw2--10 to 20 inches; olive brown (2.5Y 4/4) channery silt loam; weak fine granular structure; very friable; common fine roots; 15 percent phyllite channers; strongly acid; abrupt wavy boundary. (Combined thickness of the Bw horizons is 7 to 25 inches.)

Cd1--20 to 36 inches; olive gray (5Y 4/2) channery silt loam; weak medium platy structure; very firm; few roots in upper part; few to common fine discontinuous vesicular pores; thin discontinuous films in pores; 25 percent phyllite and slate channers; strongly acid; gradual smooth boundary. (10 to 25 inches thick)

Cd2--36 to 65 inches; olive gray (5Y 4/2) channery silt loam; weak medium platy structure; firm; 30 percent phyllite and slate channers; strongly acid.

TYPE LOCATION: Franklin County, Massachusetts; town of Bernardston, 100 feet west of U.S. Route 5 at a point 0.4 miles north of the intersection of U.S. Route 5 and Massachusetts Route 10. Bernardston 7 1/2 minute quadrangle; latitude 42 degrees 40 minutes 38 seconds North and longitude 72 degrees 33 minutes 10 seconds West, NAD 27.

RANGE IN CHARACTERISTICS: Solum thickness commonly ranges from 20 to 30 inches and generally is the same as the depth to the dense substratum. The solum is silt loam, loam, or very fine sandy loam in the fine-earth fraction with more than 65 percent silt plus very fine sand. The volume of rock fragments larger than 3 inches ranges from 0 to 25 percent in the A horizon and 0 to 10 percent in the B and C horizons. Rock fragments smaller than 3 inches range from 5 to 25 percent in the A and B horizons, and 5 to 35 percent in the C horizon. The soil ranges from very strongly acid to moderately acid except where limed.

Some pedons have an O horizon 1 to 4 inches thick.

The Ap or A horizon has hue of 7.5YR to 2.5Y, value of 3 or 4, and chroma of 2 or 3. The A horizon has weak or moderate, fine or medium granular structure and friable or very friable consistence.

Some pedons have an E horizon 1 to 3 inches thick that has hue of 10YR or 2.5Y, value of 2 to 6, and chroma of 0 to 2.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 6. Hue of 7.5YR is restricted to the upper part of the Bw horizon. The Bw horizon has weak or moderate, fine or medium granular structure or weak, fine or medium subangular blocky structure and very friable or friable consistence.

Some pedons have a BC horizon with characteristics similar to the lower part of the Bw.

The Cd horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 2 to 4. It has weak or moderate, medium platy structure or it is massive. Fine-earth texture is silt loam, loam, or very fine sandy loam. It is firm or very firm.

COMPETING SERIES: [Amostown](#), [Broadbrook](#), [Horseneck](#) (tentative), [Nantucket](#), [Paxton](#), [Scituate](#), and [Wethersfield](#) soils are in the same family. Amostown soils are underlain by stratified very fine sand or silt within a depth of 40 inches. Broadbrook soils have a lithologic discontinuity at the top of the substratum. Horseneck soils do not have dense materials in the substratum. Scituate soils have sandy substrata. Nantucket soils have a lithologic discontinuity and formed in till mixed with Pleistocene Age silts and clays. Paxton soils have less than 65 percent silt plus very fine sand in the solum. Wethersfield soils have hues of 2.5YR or 5YR in the B horizon.

GEOGRAPHIC SETTING: Bernardston soils are nearly level to very steep and are on glaciated uplands and drumlins. Slope is commonly 8 to 25 percent, but ranges from 0 to 50 percent. The soils formed in acid, dense till derived mainly from dark gray phyllite, shale, slate, and schist. Mean annual temperature ranges from 45 to 52 degrees F. Mean annual precipitation ranges from 40 to 50 inches. The frost-free period ranges from 120 to 180 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the [Cardigan](#), [Dutchess](#), [Kearsarge](#), [Mansfield](#), [Nassau](#), [Pittstown](#), [Quonset](#), [Stissing](#), and [Warwick](#) soils on nearby landscapes. Kearsarge and Nassau soils have a lithic contact within a depth of 20 inches. The moderately well drained Pittstown, the poorly drained Stissing, and the very poorly drained Mansfield soils are associated in a drainage sequence. Quonset and Warwick soils are on outwash plains, terraces, eskers, and kames.

DRAINAGE AND PERMEABILITY: Well drained. Saturated hydraulic conductivity is moderately high or high in the solum and low to moderately high in the substratum. Runoff is low to high.

USE AND VEGETATION: Mostly woodland. Cleared areas are used mainly for growing hay, pasture, silage, corn, and apples. Common trees in woodlots include sugar maple, beech, white birch, white pine, red maple, northern red oak, white oak, and hemlock.

DISTRIBUTION AND EXTENT: Glacial uplands in Connecticut, Massachusetts, New Hampshire, Vermont, and eastern New York (MLRAs 142, 144A, 144B, and 145). The series is of moderate extent, about 20,000 acres.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Connecticut Valley Area, Connecticut-Massachusetts, 1903.

REMARKS: Cation exchange activity class was determined from a review of available data and similar soils.

The Second Edition of the Keys to Soil Taxonomy, Agricultural Handbook 436 (1999) distinguishes a shallow soil depth class family based upon the presence of a densic contact at a depth less than 50 cm. from the mineral soil surface. Soils correlated and/or published as the Bernardston series prior to 1996 may have included what would now be classified as a shallow family of Oxyaquic Dystrudepts. These soils are of minor extent throughout the range of the Bernardston series.

Diagnostic horizons and features recognized in this pedon include:

1. Ochric epipedon - from 0 to 6 inches (Ap horizon).
2. Cambic horizon - from 6 to 20 inches (Bw horizons).
3. Densic material - unaltered very firm and firm basal till at a depth of 20 to 65 inches (Cd horizon).
4. Oxyaquic feature - based upon saturation in one or more layers within 100 cm of the mineral soil surface, for one month or more per year, in 6 out of 10 years. A perched water table is at 18 to 24 inches February to April.

ADDITIONAL DATA: Full characterization data for samples S93MA011005, S78NH005024, S77NH019001, and S68VT021005. Analyzed by the National Soil Survey Laboratory, Lincoln, NE.

National Cooperative Soil Survey
U.S.A.

LOCATION CHATFIELD

NH+CT MA NJ NY

Established Series
Rev. LWK-ERS-JTI
04/2017

CHATFIELD SERIES

The Chatfield series consists of well drained soils formed in loamy melt-out till. They are moderately deep to bedrock. They are nearly level to very steep soils on bedrock-controlled hills and ridges. Slope ranges from 0 to 70 percent. Crystalline bedrock is at depths of 50 to 100 cm. Saturated hydraulic conductivity is moderately high or high in the mineral soil. Mean annual temperature is about 9 degrees C, and mean annual precipitation is about 1205 mm.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, mesic Typic Dystrudepts

TYPICAL PEDON: Chatfield fine sandy loam, on a 13 percent slope in a wooded area. (Colors are for moist soil unless otherwise noted).

Oi -- 0 to 3 cm, slightly decomposed leaf, needle, and twig litter; extremely acid, pH 4.2. (0 to 15 cm thick.)

A -- 3 to 5 cm, very dark gray (10YR 3/1) fine sandy loam, gray (10YR 5/1), dry; weak fine subangular blocky structure; friable; many fine and medium roots throughout; 5 percent mixed gravel and cobbles; very strongly acid, pH 4.5; abrupt smooth boundary. (1 to 25 cm thick.)

Bw1 -- 5 to 33 cm, strong brown (7.5YR 5/6) gravelly fine sandy loam; weak fine subangular blocky structure; friable; common fine roots throughout and common medium roots throughout; 15 percent mixed gravel and cobbles; very strongly acid, pH 4.5; abrupt wavy boundary.

Bw2 -- 33 to 76 cm, strong brown (7.5YR 5/6) gravelly fine sandy loam; moderate medium subangular blocky structure; friable; few fine roots throughout; 20 percent mixed rock fragments; very strongly acid, pH 4.5; abrupt irregular boundary. (Combined thickness of the Bw horizons is 10 to 80 cm.)

2R -- 76 cm; fractured slightly-weathered schist bedrock.

TYPE LOCATION: Merrimack County, New Hampshire; Town of Epsom, 450 feet north-northwest from point 3,550 feet southwest along Old Mountain Road from intersection of Mountain Road and Tarlton Road. USGS Gossville, NH topographic quadrangle; Latitude 43 degrees, 11 minutes, 55.79 seconds N. and Longitude 71 degrees, 19 minutes, 22.31 seconds W., WGS 1984.

RANGE IN CHARACTERISTICS: Solum thickness ranges from 40 to 97 cm. Depth to bedrock ranges from 50 to 100 cm from the mineral soil surface. Rock fragments range from 5 to 50 percent by volume in the A horizon and from 5 to 35 percent in the B and C horizons. Rock fragments are typically gravel or channers, but include cobbles, stones, boulders and flagstones, particularly just above the bedrock.

The O horizon has hue of 5YR to 2.5Y, value of 2 or 3, and chroma of 0 to 2. It is slightly, intermediately, and/or highly decomposed plant material. Reaction ranges from extremely acid to moderately acid.

The A, or Ap horizon where present, has hue of 7.5YR to 2.5Y, value of 2 to 4, and chroma of 1 to 4. Dry value is 6 or higher. Texture is sandy loam, fine sandy loam, very fine sandy loam, loam, or silt loam in the fine-earth

fraction. Structure is granular. Consistence is friable or very friable. Reaction ranges from extremely acid to moderately acid, unless limed.

The AB or BA horizon, where present, has hue of 7.5YR to 2.5Y, value of 3 or 4, and chroma of 2 to 4. Texture is similar to the A horizon.

The Bw horizon commonly has hue of 10YR or 2.5Y, and includes 7.5YR when a high ratio of ammonium oxalate extractable iron to dithionite-citrate extractable iron (greater than 0.15) exists, value of 3 to 6, and chroma of 4 to 6. Texture is similar to the A horizon. The Bw horizon has subangular blocky or granular structure and is friable or very friable. Reaction ranges from very strongly acid to moderately acid.

Some pedons have a BC horizon with color and texture similar to the C horizon.

The C horizon, where present, has hue of 7.5YR to 5Y, value of 4 or 5, and chroma of 2 to 4, and the 7.5YR hue is limited to horizons having a high ratio of ammonium oxalate extractable iron to dithionite-citrate extractable iron (> 0.15). Texture is sandy loam, fine sandy loam, very fine sandy loam, loam, or silt loam in the fine-earth fraction and may have lenses or pockets of loamy sand. It is massive and may have plate-like divisions. It is friable or firm. Reaction ranges from very strongly through moderately acid.

The 2R horizon is dominantly schist, granite, or gneiss bedrock. In places it is massive, but it dominantly has vertical and horizontal fractures in the upper 30 to 76 cm.

COMPETING SERIES: These are the [Chadakoin](#), [Charlton](#), [Maplecrest](#), [Riverhead](#), [Stinger](#), and [Valois](#) series. Chadakoin, Maplecrest, and Valois soils formed in till derived primary from sedimentary rock parent materials and are greater than 100 cm to bedrock. Charlton soils formed in similar parent material to that of Chatfield but are greater than 150 cm to bedrock. Riverhead soils formed in glacial outwash deposits and are greater than 100 cm to bedrock. Stinger soils are not from Region R and have a paralithic contact.

GEOGRAPHIC SETTING: Chatfield soils are nearly level through very steep, and are on bedrock-controlled glaciated upland landscapes. The soils formed in a moderately thick mantle of melt-out till overlying granite, gneiss, or schist bedrock. Slope ranges from 0 to 70 percent. Mean annual precipitation ranges from 660 to 1270 mm, mean annual temperature ranges from 7 to 13 degrees C, and the frost free season ranges from 130 to 180 days. Elevation ranges from 0 to 305 meters above sea level.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the [Brimfield](#), [Brookfield](#), [Cardigan](#), [Charlton](#), [Hollis](#), [Narragansett](#), [Nipmuck](#), and [Paxton](#) soils and their wetter associates on nearby landscapes where the soil mantle is deeper than 100 cm. Brimfield, Brookfield and Nipmuck soils formed in sulfur bearing parent materials and have a ratio of ammonium oxalate extractable iron to dithionite-citrate extractable iron less than 0.15 and have pedogenic iron contents greater than 1 percent throughout the pedon. Brookfield, Charlton, Narragansett, and Paxton soils are very deep soils. Cardigan soils are moderately deep soils that formed in till derived from phyllite, slate, shale, and schist. Hollis soils are shallow to bedrock and are on nearby ridge crests and areas adjacent to rock outcrops.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Well drained. Potential for surface runoff ranges from low to high. Saturated hydraulic conductivity is moderately high or high in the mineral soil.

USE AND VEGETATION: Most areas of Chatfield soils are in woodland. Major tree species include white and northern red oaks, sugar maple, beech, eastern hemlock, eastern white pine, eastern red cedar, and shagbark hickory. Some small cleared areas are used for pasture, are idle, or are sites for residential and recreational development.

DISTRIBUTION AND EXTENT: Connecticut, eastern New York, Massachusetts, New Jersey, and New Hampshire. MLRAs 142, 143, 144A and 145. The soils are of large extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Orange County, New York, 1940.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Ochric epipedon - the zone from 0 to 5 cm (Oi and A horizons).

Cambic horizon - the zone from 5 to 76 cm (Bw1 and Bw2 horizons).

Lithic contact - bedrock at 76 cm (2R horizon).

Particle-size control section - the zone from 28 to 76 cm (part of the Bw1 horizon and all of the Bw2 horizon).

Lithologic discontinuity - at a depth of 76 cm.

ADDITIONAL DATA: M.S. Thesis work by Shawn McVey, University of Connecticut, 2006. Full characterization data for pedons with User Pedon IDs of S1955NH015003, S1982CT007005, S1982CT007005, S1982NY061001, S1995NH013003, S1995NJ037003, S1998NY005001, S1999NY005004, S2000NY005002, S2000NY005004, S2000NY005008, S2000NY119002, S2000NY119003, S2002CT005007, and S2002CT005008. Pedons analyzed by the NSSL, Lincoln, NE. The laboratory characterization data for these pedons and similar soils is available through the National Cooperative Soil Survey Soil Characterization Database: <http://ncsslabdatamart.sc.egov.usda.gov/>

National Cooperative Soil Survey
U.S.A.

LOCATION HAVEN

NY CT MA NH PA

Established Series
Rev. RLM-JWW-MFF
03/2010

HAVEN SERIES

The Haven series consists of very deep, well drained soils formed in loamy over sandy and gravelly outwash. They are nearly level through moderately sloping soils on outwash plains, valley trains, terraces, and water-sorted moraine deposits. Saturated hydraulic conductivity is moderately high or high in the mineral solum and very high in the substratum. Slope ranges from 0 through 15 percent. Mean annual temperature is 50 degrees F. (10 degrees C.), and mean annual precipitation is 47 inches (1194 millimeters).

TAXONOMIC CLASS: Coarse-loamy over sandy or sandy-skeletal, mixed, active, mesic Typic Dystrudepts

TYPICAL PEDON: Haven loam - forested. (Colors are for moist soil.)

Oi-- 0 to 2 inches (0 to 5 centimeters); slightly decomposed plant material derived from loose pine needles, leaves and twigs.

Oa-- 2 to 3 inches (5 to 8 centimeters); black (5YR 2/1) highly decomposed plant material. (0 to 3 inches (0 to 8 centimeters) thick.)

A-- 3 to 6 inches (8 to 15 centimeters); dark grayish brown (10YR 4/2) loam; weak fine and medium granular structure; friable; many fine and coarse roots; very strongly acid; abrupt smooth boundary. (1 to 4 inches (3 to 10 centimeters) thick.)

Bw1-- 6 to 13 inches (15 to 33 centimeters); brown (7.5YR 4/4) loam; weak fine and medium subangular blocky structure; friable; common fine roots; many fine pores; very strongly acid; clear wavy boundary.

Bw2-- 13 to 22 inches (33 to 56 centimeters); strong brown (7.5YR 5/6) loam; weak fine and medium subangular blocky structure; friable; common fine roots; many fine pores; 5 percent fine gravel; very strongly acid; gradual wavy boundary. (Combined thickness of Bw horizon is 3 to 22 inches (8 to 56 centimeters) thick.)

BC-- 22 to 31 inches (56 to 79 centimeters); yellowish brown (10YR 5/6) gravelly loam; weak medium and fine subangular blocky structure; friable; few fine roots; common fine pores; 20 percent fine gravel; very strongly acid; clear wavy boundary. (0 to 11 inches (0 to 28 centimeters) thick.)

2C-- 31 to 65 inches (79 to 165 centimeters); yellowish brown (10YR 5/4) to brownish yellow (10YR 6/6) stratified gravelly sand; single grained; loose; 30 percent fine gravel; very strongly acid.

TYPE LOCATION: Suffolk County, New York; town of Brookhaven, one and one-half miles north of Sunrise Highway by Gerrard Road. USGS Bellport, NY topographic quadrangle; Latitude 40 degrees, 49 minutes, 4 seconds N. and Longitude 72 degrees, 54 minutes, 51 seconds W. NAD 1983.

RANGE IN CHARACTERISTICS: Thickness of solum and depth to the lithologic discontinuity range from 18 through 36 inches (46 through 91 centimeters). Gravel content ranges from 0 through 15 percent by volume in the A and Bw horizons, from 0 through 40 percent in the BC horizon, and from 0 through 65 percent in the 2C horizon. Cobble content ranges from 0 through 2 percent in the solum and 0 to 5 percent in the substratum. The soil ranges from very strongly acid through moderately acid.

The O horizon, where present, has hue 7.5YR or 10YR, value 2 or 2.5, and chroma of 0 through 2. The O horizons typically have increased decomposition with depth and range from fibric through sapric material.

A or Ap horizon, where present, has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 3. The A horizon is allowed to have value of 2 and chroma of 1. It is loam, silt loam, or very fine sandy loam. Structure is weak or moderate granular or massive. Consistence is friable or very friable.

Some pedons have thin albic and spodic horizons less than 2 inches (5 centimeters) thick. They have hue 7.5YR or 10YR, value 3 through 6, and chroma 1 through 3. Texture is very fine sandy loam. Structure is weak subangular blocky. Consistence is very friable or friable.

The B horizons have hues of 5YR through 2.5Y, values of 4 through 6, and chroma of 3 through 8. They are loam, silt loam, or very fine sandy loam, except the BC horizon is fine sandy loam, sandy loam, or loamy coarse sand in the fine earth fraction of some pedons. Structure is weak fine through coarse subangular blocky, or they are massive. Consistence is very friable or friable.

The 2C horizons have hues of 7.5YR through 2.5Y, values of 4 through 6, and chroma of 2 through 6. They are loamy fine sandy or coarser in the fine earth fraction. They are usually stratified.

COMPETING SERIES: The [Agawam](#), [Barnstable](#), [Branford](#), and [Narragansett](#) series are members of the same family. Agawam soils typically have less than 40 percent silt in lower part of the Bw horizon. Barnstable soils formed in till overlying outwash and have subangular or angular rock fragments larger than pebble-sized throughout. Branford soils have hues redder than 7.5YR. Narragansett do not have stratified sand and gravel in the substratum.

The [Allard](#), [Alton](#), [Bridgehampton](#), [Chenango](#), [Enfield](#), [Hartland](#), [Hoosic](#), [Riverhead](#) and [Tunkhannock](#) series are similar soils in related families. Allard soils have less than 15 percent fine sand and coarse in the upper part of the solum. Alton, Chenango, and Tunkhannock soil lack contrasting textures and have more than 35 percent coarse fragments in the particle-size control section. Bridgehampton, Enfield, and Hartland soils have more silt in the solum. Hoosic soils have sandy textures with more than 35 percent coarse fragments throughout. Riverhead soils have sandy loam or fine sandy loam B horizons with more than 50 percent fine sands and coarser.

GEOGRAPHIC SETTING: Haven soils are nearly level to moderately sloping soils of glacial outwash plains, valley trains, terraces, and water-sorted moraine deposits. Slope ranges from 0 through 15 percent in gradient. The regolith consists of 18 through 36 inches (46 through 91 centimeters) of water-sorted loamy material low in gravel over stratified gravel and sand. Mean annual air temperature ranges from 45 through 55 degrees F. (7 through 13 degrees C.), mean annual precipitation from 40 through 50 inches (1016 through 1270 millimeters), and mean growing season from 125 through 220 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the [Bridgehampton](#), [Carver](#), [Enfield](#), [Ninigret](#), [Plymouth](#), [Riverhead](#), and [Tisbury](#) soils. Bridgehampton soils have a coarse-silty particle size control section. Carver and Plymouth soils are sandy. Enfield soils are coarse-silty over sandy or sandy skeletal. Ninigret and Tisbury soils are moderately well drained. Riverhead soils have less silt in the upper part.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Well drained. The potential for surface runoff is very low to medium. Saturated hydraulic conductivity is moderately high or high in the mineral solum and very high in the substratum.

USE AND VEGETATION: Most of the soil has been cleared and is used for crops or is in community development. Principal crops are potatoes and other vegetables, corn, tobacco, or nursery stock. Common forest trees in woodlots include black, white, and northern red oak, beech, and maple.

DISTRIBUTION AND EXTENT: Southeastern New York and Connecticut. MLRA's 139, 140, 144A, 145, and 149B. The soil is of large extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts**SERIES ESTABLISHED:** Dukes and Nantucket Counties, Massachusetts, 1925.

REMARKS: It should be noted that as a competing series, Agawam soils typically have soil temperatures that may be slightly cooler, but a precise difference could not be quantified based on available data and historic use. The present separation of the Haven and Agawam series may not match historic use of the two series.

Diagnostic horizons and features recognized in the typical pedon:

1. Ochric epipedon - the zone from 0 to 6 inches (0 to 15 centimeters) (O and A horizons).
2. Cambic horizon - the zone from 6 to 31 inches (15 to 79 centimeters) (Bw1, Bw2, and BC horizons).
3. Strongly contrasting particle-size class - both the coarse-loamy part and the sandy part of the particle-size control section are greater than 5 inches (12.5 cm) thick and the transition zone between the two parts is less than 5 inches (12.5 cm) thick.
- 4) Particle-size control section - the zone from 10 to 40 inches (25 to 100 centimeters) (Bw1, Bw2, BC and 2C horizons).
- 5) Lithologic discontinuity - at a depth of 31 inches (79 centimeters).

National Cooperative Soil Survey
U.S.A.

LOCATION HOLLIS

CT+MA NH NJ NY

Established Series

Rev. MFF-SMF-SJM-DCP

05/2016

HOLLIS SERIES

The Hollis series consists of well drained and somewhat excessively drained soils formed in a thin mantle of till. They are shallow to bedrock. They are nearly level to very steep upland soils on bedrock-controlled hills and ridges. Slope ranges from 0 through 60 percent. Saturated hydraulic conductivity is moderately high or high. Depth to hard bedrock ranges from 25 to 50 cm. Mean annual temperature is about 9 degrees C, and mean annual precipitation is about 1205 mm.

TAXONOMIC CLASS: Loamy, mixed, superactive, mesic Lithic Dystrudepts

TYPICAL PEDON: Hollis gravelly fine sandy loam, 3 to 15 percent slopes, forested. (Colors are for moist soil.)

Oi--0 to 3 cm; slightly decomposed plant material.

Oa--3 to 5 cm; black (10YR 2/1) highly decomposed plant material; moderate fine granular structure; very friable; many fine and very fine roots; abrupt smooth boundary. (Combined thickness of the O horizons is 0 to 10 cm.)

A--5 to 18 cm; very dark grayish brown (10YR 3/2) gravelly fine sandy loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; very friable; common fine, very fine, medium, and coarse roots; 10 percent gravel, 5 percent channers; very strongly acid; clear smooth boundary. (3 to 15 cm thick)

Bw1--18 to 25 cm; dark yellowish brown (10YR 4/4) gravelly fine sandy loam; moderate medium subangular blocky structure; friable; few very fine and fine roots, common medium roots; 10 percent gravel, 10 percent channers; strongly acid; clear wavy boundary.

Bw2--25 to 41 cm; yellowish brown (10YR 5/6) gravelly fine sandy loam; moderate medium and coarse subangular blocky structure; friable; few fine and very fine roots, common medium roots; 10 percent gravel, 5 percent channers; strongly acid; abrupt smooth boundary. (Combined thickness of the Bw horizons is 18 to 48 cm.)

2R--41 cm; schist bedrock.

TYPE LOCATION: Middlesex County, Connecticut, town of East Hampton, 1000 feet due west of Connecticut Route 196 and 3200 feet due north of Connecticut Route 151; USGS Moodus, CT topographic quadrangle, Latitude 41 degrees 31, minutes 28, seconds N., Longitude 72 degrees, 29 minutes, 48 seconds W., NAD 27.

RANGE IN CHARACTERISTICS: Thickness of the solum and depth to bedrock range from 25 to 50 cm. Rock fragments commonly range from 5 through 35 percent by volume, but some pedons have less than 5 percent rock fragments. The fragments are mostly subrounded gravel, except where the surface is stony. The soil has 20 percent or more silt in the particle-size control section. Unless limed, reaction ranges from extremely acid through moderately acid in the organic horizons and very strongly acid through moderately acid

The O horizon, where present, ranges from slightly decomposed to highly decomposed plant material.

The A horizon has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 1 to 3. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction. Consistence is friable or very friable.

Some pedons have a BA horizon with colors similar to the A horizon and other properties similar to the Bw horizon.

The Bw horizon commonly has hue of 10YR or 2.5Y, and includes 7.5YR when a high ratio of ammonium oxalate extractable iron to dithionite-citrate extractable iron (greater than 0.15) exists, value of 4 or 5, and chroma of 4 through 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction. The Bw horizon has granular or subangular blocky structure. Consistence is friable or very friable.

Some pedons have a thin BC or C horizon with color like the Bw horizon, except it includes hue of 5Y. Texture, structure, and consistence are similar to the Bw horizon.

Some pedons have a thin 2Cr horizon that is typically weathered schist and moderately cemented.

COMPETING SERIES: This is the [Holyoke](#) series. Holyoke soils formed in a thin mantle of till derived mainly from basalt and red sandstone, conglomerate, and shale, and typically overly basalt, red sandstone, conglomerate, or shale bedrock.

The [Cleveland](#), [Kearsarge](#), and [Brimfield](#) series are in closely related families. Cleveland soils have less than 20 percent silt in the particle-size control section and lack a 2R horizon. Kearsarge soils lack a 2R horizon and have rock fragments of phyllite, slate, or schist. Brimfield soils formed in parent materials derived from sulfur bearing schist and have a ratio of ammonium oxalate extractable iron to dithionite-citrate extractable iron of less than 0.15. They have pedogenic iron contents of greater than 1 percent throughout the pedon.

GEOGRAPHIC SETTING: Hollis soils are nearly level to very steep soils on bedrock controlled hills, modified by glacial processes. Slope ranges from 0 to 60 percent. The soils formed in a thin mantle of till derived from local bedrock of schist, granite, and gneiss. Mean annual temperature ranges from 7 to 13 degrees C and mean annual precipitation ranges from 910 to 1295 mm, but the range includes as low as 660 mm in some places east of Adirondack Mountains in the Champlain Valley of New York. The growing season ranges from 115 through 185 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the [Brimfield](#), [Acton](#), [Broadbrook](#), [Brookfield](#), [Canton](#), [Charlton](#), [Chatfield](#), [Essex](#), [Gloucester](#), [Hibernia](#), [Leicester](#), [Montauk](#), [Narragansett](#), [Paxton](#), [Rainbow](#), [Ridgebury](#), [Rockaway](#), [Scituate](#), [Sutton](#), [Wapping](#), [Whitman](#), and [Woodbridge](#) soils on nearby landscapes. All are very deep upland soils formed in till except for the Brimfield and Chatfield soils. Acton, Rainbow, Rockaway, Scituate, Sutton, Wapping, and Woodbridge soils are moderately well drained. The Broadbrook, Brookfield, Canton, Charlton, Essex, Montauk, Narragansett, and Paxton soils are well drained. Chatfield soils have bedrock within a depth of 50 to 100 cm. Gloucester soils are somewhat excessively drained. Hibernia, Leicester, and Ridgebury soils are somewhat poorly drained or poorly drained soils in drainageways or low lying areas.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Well drained and somewhat excessively drained. Surface runoff is negligible to very high. Saturated hydraulic conductivity is moderately high or high.

USE AND VEGETATION: Mostly forested. Small areas with few rock outcrops are cleared of stones and used for cultivated crops, but most cleared areas are in hay or pasture. Scattered areas are used for community

development. Common trees are northern red, white, black, and chestnut oak, hickory, eastern white pine, eastern hemlock, and gray and black birch.

DISTRIBUTION AND EXTENT: Glaciated uplands in Connecticut, Massachusetts, New Jersey, New Hampshire, and eastern New York. MLRAs 101, 142, 144A, and 145. The series is of large extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Nashua Area, New Hampshire, 1909.

REMARKS: Diagnostic horizons and features recognized in this pedon include:

1. Ochric epipedon - the zone from 0 to 18 cm (O and A horizons).
2. Cambic horizon - the zone from 18 to 41 cm (Bw1 and Bw2 horizons).
3. Lithic contact - hard bedrock at 41 cm (2R horizon).
4. Particle-size control section - the zone from 30 to 41 cm.
5. Loamy (coarse-loamy) particle-size class - the control section from 30 to 41 cm averages less than 35 percent clay in fine-earth fraction and the soil is in a Lithic subgroup.
6. Lithologic discontinuity - till with rock fragments from mixed sources overlying single kind of hard bedrock at 41 cm.

ADDITIONAL DATA: M.S. Thesis work by Shawn McVey, University of Connecticut, 2006. Full characterization data for sample no. 1999CT005001, 2000CT007004, S2002CT005001, S2002CT005004, S2002CT005005, S2002CT005006, S1998NY061001, S2000NY119001. Partial characterization data for sample no. S99NY061003 and S99NY061003A-3D. Analyzed by the NSSL, Lincoln, NE.

National Cooperative Soil Survey
U.S.A.

LOCATION MONTAUK

NY+CT MA NH

Established Series

Rev. RLM-JWW-MCT

05/2015

MONTAUK SERIES

The Montauk series consists of well drained soils formed in lodgment or flow till derived primarily from granitic materials with lesser amounts of gneiss and schist. The soils are very deep to bedrock and moderately deep to a densic contact. These soils are on upland hills and moraines. Slope ranges from 0 to 35 percent. Saturated hydraulic conductivity is moderately high or high in the mineral solum and low to moderately high in the substratum. Mean annual temperature is about 9 degrees C., and mean annual precipitation is about 1143 mm.

TAXONOMIC CLASS: Coarse-loamy, mixed, active, mesic Oxyaquic Dystrudepts

TYPICAL PEDON: Montauk loam on a 14 percent slope in a wooded area with a discontinuous layer of undecomposed and slightly decomposed plant material less than 1 cm thick on the surface. (Colors are for moist soil unless otherwise noted.)

Ap-- 0 to 10 cm; very dark gray (10YR 3/1) loam; moderate fine granular structure; very friable; many very fine, fine, medium, and coarse roots; 2 percent gravel, 1 percent cobbles, and 1 percent stones; extremely acid (pH 4.1); clear smooth boundary. (5 to 25 cm thick)

BA-- 10 to 34 cm; brown (10YR 4/3) loam; moderate medium and coarse subangular blocky structure; friable; many fine, medium, and coarse roots; many fine and medium pores; 4 percent gravel, 1 percent cobbles, and 1 percent stones; extremely acid (pH 4.3); clear wavy boundary. (0 to 25 cm thick)

Bw1-- 34 to 65 cm; dark yellowish brown (10YR 4/6) loam; moderate coarse subangular blocky structure; friable; many fine, medium, and coarse roots; many fine and medium pores; 6 percent gravel, 1 percent cobbles, and 1 percent stones; extremely acid (pH 4.3); clear wavy boundary.

Bw2-- 65 to 87 cm; yellowish brown (10YR 5/6) sandy loam; moderate medium and coarse subangular blocky structure; friable; many very fine, fine, and coarse roots; many fine and medium pores; 5 percent gravel and 1 percent cobbles; extremely acid (pH 4.3); clear smooth boundary. (Combined thickness of the Bw horizons is 31 to 86 cm.)

2Cd1-- 87 to 101 cm; strong brown (7.5YR 5/6) gravelly loamy sand; moderate medium plates; firm; few fine roots; many fine pores; 10 percent gravel, 5 percent cobbles, and 1 percent stones; very strongly acid (pH 4.7); clear wavy boundary. (18 to 76 cm thick.)

2Cd2-- 101 to 184 cm; dark yellowish brown (10YR 4/6) gravelly loamy sand; moderate medium plates; firm; many fine pores; 10 percent gravel, 5 percent cobbles, and 1 percent stones; strongly acid (pH 5.1).

TYPE LOCATION: Queens County, New York; in Alley Pond Park near the Cross Island Parkway. USGS Flushing, NY topographic quadrangle; latitude 40 degrees, 45 minutes, 35 seconds N. and Longitude 73 degrees, 45 minutes, 20 seconds W. WGS 84.

RANGE IN CHARACTERISTICS: The thickness of the mineral solum and depth to the dense substratum

from the mineral soil surface ranges from 50 to 100 cm. Rock fragments range from 5 to 35 percent in the solum and 5 to 50 percent in the substratum. Reaction ranges from extremely acid to moderately acid.

Some pedons have Oi, Oe, and/or Oa horizons overlying the A horizon. Combined thickness of the O horizons is 0 to 10 cm thick.

The Ap horizon has hue of 7.5YR or 10YR, value of 2 to 5, and chroma of 1 to 4. Texture of the fine-earth fraction is silt loam, loam, fine sandy loam, or sandy loam. Structure is granular. Consistence is friable or very friable. Undisturbed pedons have an A horizon that has properties similar to the Ap horizon.

The BA horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 4. Texture of the fine-earth fraction is silt loam, loam, fine sandy loam, or sandy loam. Structure is subangular blocky or granular. Consistence is friable or very friable.

Some pedons have an E horizon up to 8 cm thick.

The upper part of the Bw horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 8. The lower part has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 6. Texture of the fine-earth fraction is silt loam, loam, fine sandy loam, or sandy loam. Structure is subangular blocky and may part to granular. Consistence is friable or very friable. Some pedons have an E, C, or BC horizon immediately above the Cd.

The Cd layer has hue of 5YR to 5Y, value of 4 to 6, and chroma of 1 to 6. Texture of the fine-earth fraction ranges from coarse sand to fine sandy loam, and at least one sublayer of the Cd is loamy fine sand or coarser. The horizon has plates of geogenic origin or is massive. Consistence is firm or very firm and is brittle. Some pedons have firm dark reddish brown bands up to 1 cm thick that are spaced 12 to 20 cm apart. Silt coatings on the upper side of stones and gravel are common.

COMPETING SERIES: These are the [Amostown](#), [Bernardston](#), [Broadbrook](#), [Horseneck](#), [Nantucket](#), [Paxton](#), [Scituate](#), and [Wethersfield](#) series. Amostown and Scituate soils are moderately well drained and have redoximorphic features in the B horizon. The Bearnardston, Nantucket, Paxton, and Wethersfield soils do not have sandy substratums. Broadbrook soils have a silty mantle with more than 65 percent silt plus very fine sand. Horseneck soils formed in friable glacialfluvial deposits and do not have a dense substratum.

GEOGRAPHIC SETTING: Montauk soils are on undulating to hilly slopes of terminal and recessional moraines in MLRA 149B and on glaciated uplands, hills, and ground moraines in MLRAs 144A and 145. Slope ranges from 0 to 35 percent. The soils formed in loamy friable till underlain by firm sandy lodgment or flow till derived from granite with lesser amounts of gneiss and schist. The climate is humid and cool temperate. The mean annual precipitation is 889 to 1422 mm, and the mean annual temperature is 8 to 11 degrees C. The frost-free period ranges from 120 to 200 days. Elevation ranges from 3 to 122 m above sea level.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the well drained [Charlton](#), [Chatfield](#), [Riverhead](#), [Canton](#), and [Haven](#) soils that do not have dense substratums, the excessively drained and sandy [Carver](#) and [Plymouth](#) soils, the moderately well drained [Scituate](#), [Sutton](#), and [Woodbridge](#) soils, the somewhat poorly and poorly drained [Ridgebury](#) soils, the poorly drained [Leicester](#) soils, the very poorly drained [Whitman](#) soils, and the shallow [Hollis](#) soils.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Well drained. Runoff is low to high. Saturated hydraulic conductivity is moderately high or high in the solum and low to moderately high in the substratum.

USE AND VEGETATION: Many of the nearly level and gently sloping areas are cleared and used for production of potatoes and vegetable crops, hay, silage corn, and pasture. Steeper and uneven areas are largely forested and contain northern red oak, white oak, and occasionally yellow poplar, eastern white pine, red pine,

sugar maple, beech, and birch.

DISTRIBUTION AND EXTENT: New York, Connecticut, Massachusetts, New Hampshire and possibly New Jersey and Rhode Island, MLRAs 149B, 144A, and 145. The series is of large extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Suffolk County, New York, 1970.

REMARKS: The typical pedon was updated from 1975NY103005 to the lab-sampled pedon S1998NY081002 that better represents the typical textures, horizonation, and location.

Diagnostic horizons and features recognized in this pedon include:

1. Ochric epipedon - the zone from 0 to 10 cm (Ap horizon).
2. Cambic horizon - the zone from 34 to 87 cm (Bw1 & Bw2 horizons).
3. Densic material - the zone from 87 to 184 cm (2Cd1 and 2Cd2 layers).
4. Oxyaquic subgroup - based on saturation in one or more layers within 100 cm of the mineral soil surface, for either or both 20 or more consecutive days or 30 or more cumulative days.
5. Lithologic discontinuity - at a depth of 87 cm.

ADDITIONAL DATA: Full characterization data for pedons with User Pedon IDs of S1973MA009003, S1987NY103002, S1993MA011001, S1998NY081002, and S02MA-011-002. Pedons analyzed by the KSSL, Lincoln, NE. Laboratory characterization data for these pedons and similar soils is available through the National Cooperative Soil Survey Soil Characterization Database: <http://ncsslslabdatamart.sc.egov.usda.gov/>

National Cooperative Soil Survey
U.S.A.

LOCATION NINIGRET

CT+MA NH NY RI VT

Established Series

Rev. RAS-EHS-TDT

01/2013

NINIGRET SERIES

The Ninigret series consists of very deep, moderately well drained soils formed in loamy over sandy and gravelly glacial outwash. They are nearly level to strongly sloping soils on glaciofluvial landforms, typically in slight depressions and broad drainage ways. Slope ranges from 0 through 15 percent. Saturated hydraulic conductivity is moderately high or high in the solum and high or very high in the substratum. Mean annual temperature is about 49 degrees F. and mean annual precipitation is about 48 inches.

TAXONOMIC CLASS: Coarse-loamy over sandy or sandy-skeletal, mixed, active, mesic Aquic Dystrudepts

TYPICAL PEDON: Ninigret fine sandy loam - idle field, 2 percent slope. (Colors are for moist soil unless otherwise noted.)

Ap --0 to 8 inches; very dark grayish brown (10YR 3/2) fine sandy loam; pale brown (10YR 6/3) dry; weak medium granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary. (6 to 12 inches thick.)

Bw1 --8 to 16 inches; yellowish brown (10YR 5/6) fine sandy loam; weak coarse granular structure; very friable; few fine roots; strongly acid; clear wavy boundary.

Bw2 --16 to 26 inches; yellowish brown (10YR 5/4) fine sandy loam; very weak coarse granular structure; very friable; very few fine roots; common medium distinct light brownish gray (10YR 6/2) and brownish yellow (10YR 6/6) redoximorphic features; strongly acid; clear wavy boundary. (Combined thickness of the Bw horizon is 11 to 32 inches.)

2C --26 to 65 inches; pale brown (10YR 6/3) loamy sand and few lenses of loamy fine sand; single grain; loose; many medium distinct light olive gray (5Y 6/2) and many prominent yellowish brown (10YR 5/8) redoximorphic features; strongly acid.

TYPE LOCATION: New London County, Connecticut; town of Stonington, 1,000 feet southwest along Riverside Drive from the intersection with Green Haven Road, 300 feet east of Riverside Drive, and 350 feet west of the Pawcatuck River. USGS Watch Hill, RI topographic quadrangle; Latitude 41 degrees, 20 minutes, 03 seconds N.; Longitude 71 degrees 50 minutes, 36 seconds W.; NAD 27.

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 18 through 38 inches and typically corresponds to the depth of sand or sand and gravel. Rock fragments, mainly rounded pebbles, range from 0 to 15 percent by volume in the solum, from 0 to 30 percent in the substratum above a depth of 40 inches, and from 0 to 60 percent below. Unless limed, the soil is very strongly acid through moderately acid to a depth of 30 inches and very strongly acid through slightly acid below 30 inches.

Some pedons have an O horizon up to 2 inches thick. It has hue of 7.5YR or 10YR, value of 2 through 3, and chroma of 1 or 2. It has weak or moderate granular structure, or it is massive

The Ap horizon has hue of 7.5YR through 2.5Y, value and chroma of 2 through 4. Dry value is 6 or more.

Undisturbed pedons have a thin A horizon with value of 2 through 3 and chroma of 1 through 9. The Ap or A horizon is fine sandy loam, very fine sandy loam, loam, or silt loam. It has weak or moderate granular structure and is friable or very friable.

The upper part of the Bw horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 4 through 8. The lower part of the Bw horizon has hue of 7.5YR through 5Y, value of 3 through 6, and chroma of 2 through 6. Texture is typically fine sandy loam with less than 50 percent fine or coarser sand or very fine sandy loam, but includes silt loam and loam. Structure is weak or moderate, granular or subangular blocky, or it is massive. Consistence is very friable or friable. Some pedons have a sandy loam Bw subhorizon or BC horizon less than 5 inches thick just above the 2C horizon.

The 2C horizon has hue of 10YR through 5Y, value of 4 through 7, and chroma of 1 through 6. It typically has redoximorphic features. The horizon is commonly stratified sand and gravel. Texture of individual layers ranges from coarse sand to fine sand through loamy fine sand in the fine-earth fraction.

COMPETING SERIES: There are no other series in this family.

In a related family, [Ellington](#) soils have dominant hue of 5YR or 2.5YR in the B and C horizons.

GEOGRAPHIC SETTING: Ninigret soils are nearly level to strongly sloping soils on glaciofluvial landforms. Slopes range from 0 through 15 percent, but commonly are 0 through 8 percent. The soils formed in loamy over stratified sandy and gravelly glacial outwash derived from a variety of acid rocks. Mean annual temperature ranges from 45 through 52 degrees F., mean annual precipitation ranges from 35 through 50 inches, and the growing season ranges from 120 through 195 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the [Agawam](#), [Dartmouth](#), [Deerfield](#), [Enfield](#), [Haven](#), [Narragansett](#), [Raynham](#), [Raypol](#), [Scio](#), [Sudbury](#), [Tisbury](#), [Walpole](#), and [Wapping](#) soils. The well drained Agawam and Haven soils and the poorly drained Walpole and Raypol soils are associated in a drainage sequence. Dartmouth and Scio soils have coarse-silty particle-size control sections. Deerfield and Sudbury soils are sandy terrace associates. Enfield, Haven, and Narragansett soils do not have low chroma depletions within a 24 inch depth. Raynham soils are poorly drained silty soils in low areas. Tisbury soils are coarse-silty over sandy or sandy-skeletal. Wapping soils are coarse-loamy.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Moderately well drained. Surface runoff is negligible to medium. Saturated hydraulic conductivity is moderately high or high in the solum and high or very high in the substratum. The soil has a seasonal high water table.

USE AND VEGETATION: Much of the acreage is used for cultivated crops, hay, or pasture. Common crops are silage corn, vegetables, tobacco, and nursery stock. Some areas are idle, wooded, or used for community development. Common trees are red, white and black oak, red maple, sugar maple, white pine, gray birch, white ash, and hemlock.

DISTRIBUTION AND EXTENT: Connecticut, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont: MLRA 144A. The series is of moderate extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Washington-Kent Counties, Rhode Island, 1934.

REMARKS: Cation exchange activity class placement determined from a review of available data.

Diagnostic horizons and other features recognized in this pedon include:

1. Ochric epipedon - the zone from 0 through 8 inches (Ap horizon).

2. Cambic horizon - the zone from 8 through 26 inches (Bw horizon).
3. Aquic feature - low chroma depletions within a 24 inch depth (Bw2 horizon).
4. Particle-size control section from 10 to 40 inches that is coarse-loamy to 26 inches and contrasting sandy or sandy-skeletal below.

National Cooperative Soil Survey
U.S.A.

LOCATION PITTSTOWN

MA+NH NY RI VT

Established Series
Rev. DGG-WHT-DAS
12/2012

PITTSTOWN SERIES

The Pittstown series consists of moderately well drained soils formed in lodgement till derived mainly from slate, phyllite, shale, and schist. These soils are very deep to bedrock and moderately deep to a densic contact. They are nearly level through moderately steep soils on uplands. Slope ranges from 0 through 25 percent. Saturated hydraulic conductivity is moderately high or high in the mineral solum and moderately low or moderately high in the substratum. Mean annual temperature is about 49 degrees F. (9 degrees C.), and mean annual precipitation is about 45 inches (1143 millimeters).

TAXONOMIC CLASS: Coarse-loamy, mixed, active, mesic Aquic Dystrudepts

TYPICAL PEDON: Pittstown loam, cultivated field. (Colors are for moist soil unless noted.)

Ap --0 to 10 inches (0 to 25 centimeters); very dark grayish brown (10YR 3/2) loam, light brownish gray (10YR 6/2) dry; moderate medium granular structure; friable; 10 percent phyllite fragments; very strongly acid; abrupt smooth boundary.

Bw1 --10 to 18 inches (25 to 46 centimeters); olive brown (2.5Y 4/4) loam; weak medium granular structure; friable; 10 percent phyllite fragments; very strongly acid; abrupt smooth boundary.

Bw2 --18 to 29 inches (46 to 74 centimeters); olive (5Y 4/3) channery loam; massive; friable; 15 percent phyllite fragments; common medium prominent dark yellowish brown (10YR 4/4) masses of iron accumulations and common medium distinct gray (5Y 5/1) iron depletions; very strongly acid; abrupt smooth boundary.

Cd --29 to 65 inches (74 to 165 centimeters); olive (5Y 5/3) channery loam; massive; very firm, brittle; 20 percent phyllite fragments; many coarse prominent dark yellowish brown (10YR 4/4) masses of iron accumulation and many coarse distinct olive gray (5Y 5/2) iron depletions; very strongly acid.

TYPE LOCATION: Bristol County, Massachusetts; Town of Somerset, 400 feet north of Wilbur Avenue, and 900 feet east of Brayton Point Road. Fall River, MA quadrangle: Latitude 41 degrees, 43 minutes, 25 seconds N. and Longitude 71 degrees, 10 minutes, 35 seconds W., NAD 1927.

RANGE IN CHARACTERISTICS: Thickness of the mineral solum and depth to dense substratum ranges from 20 through 30 inches (50 through 76 centimeters), but the range currently includes 15 through 30 inches (38 through 76 centimeters). The solum in the fine earth fraction is silt loam, loam, or very fine sandy loam with more than 65 percent silt plus very fine sand. Rock fragments consist of dark phyllite, slate, and schist. Rock fragments, by volume, larger than 10 inches range from 0 through 20 percent in the surface and 0 through 5 percent in the subsoil and substratum. 3 through 10 inch size fragments range from 0 through 15 percent in surface, 0 through 10 percent in the subsoil, and 0 through 15 percent in the substratum. Fragments less than 3 inches range from 5 through 25 percent in the surface, 5 through 25 percent in the subsoil, and 15 through 30 percent in the substratum. The soil, below the A or Ap horizon and above a depth of 30 inches (76 centimeters), is very strongly acid through moderately acid where not limed, and ranges from very strongly acid through slightly acid below a depth of 30 inches (76 centimeters).

Some pedons have an O horizon underlain by a thin A horizon. The A horizon commonly has hue of 10YR but the range includes 2.5Y, value of 2 or 3, and chroma of 1 through 3.

The Ap horizon has hue of 10YR, value of 2 through 4, and chroma of 2 or 3. Structure is granular. Consistence is friable or very friable.

Some pedons have a thin E horizon.

The upper part of the Bw horizon has hue of 7.5YR through 2.5Y, value of 4 or 5, and chroma of 3 through 6. The lower part of the Bw horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 3 through 6. Redoximorphic depletions and concentrations are commonly few to many in the lower part but the range includes few or common in the upper part in some pedons. Structure commonly is subangular blocky but the range includes granular or massive in some pedons. Consistence is friable or very friable.

Some pedons have a friable BC or C horizon above the Cd horizon. They have hue of 10YR through 5Y, value of 4 or 5, and chroma of 2 through 4. Texture is similar to the Cd horizon.

The Cd horizon has hue of 10YR through 5Y, value of 4 or 6, and chroma of 2 through 4. It is silt loam, very fine sandy loam, or loam in the fine-earth fraction. It is firm through extremely firm. The horizon is normally massive, but may have weak plate-like divisions.

COMPETING SERIES: These are the [Chautauqua](#), [Pompton](#), [Rainbow](#), [Sutton](#), [Wapping](#), [Wilbraham](#), and [Woodbridge](#) series. Chautauqua, Pompton, Sutton, and Wapping soils do not have densic materials in the substratum. [Ludlow](#) soils have hue of 5YR or redder in the Bw horizon. Rainbow soils have a lithologic discontinuity. Woodbridge soils have less than 65 percent silt and very fine sand in the B horizon. Wilbraham soils are poorly drained, but formed in reddish parent material so that they do not exhibit the low chroma matrix colors required for Aquepts.

GEOGRAPHIC SETTING: Pittstown soils are nearly level through moderately steep soils on glaciated uplands. Slope ranges from 0 through 25 percent. The soils developed in loamy till derived principally from dark phyllite, slate, or schist. Mean annual air temperature ranges from 45 through 52 degrees F. (7 through 11 degrees C.), and mean annual precipitation ranges from 40 through 50 inches (1016 through 1270 millimeters). The frost-free period ranges from 120 to 180 days.

GEOGRAPHICALLY ASSOCIATED SOILS: The well drained [Bernardston](#), poorly drained [Stissing](#), and very poorly drained [Mansfield](#) soils are associated in a drainage sequence. The excessively drained [Quonset](#) and the somewhat excessively drained [Warwick](#) soils are on nearby outwash plains, terraces, eskers, and kames. The well drained [Dutchess](#) soils, which do not have a dense substratum, the shallow to bedrock [Nassau](#) and [Kearsarge](#) soils and the moderately deep to bedrock [Cardigan](#) soils are closely associated on the uplands.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Moderately well drained. Surface runoff is medium. Saturated hydraulic conductivity is moderately high or high in the mineral solum and moderately low or moderately high in the substratum.

USE AND VEGETATION: Mostly forested. Cleared areas are used for growing hay and pasture in support of dairy farming. Principal trees are northern red, white and scarlet oak, red and sugar maple, gray and yellow birch, white ash, eastern white pine, and eastern hemlock.

DISTRIBUTION AND EXTENT: Glaciated uplands in Massachusetts, New Hampshire, Rhode Island, Vermont, and eastern New York. MLRA 144A. The series is of moderate extent, estimated to be about 96,000 acres.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Sullivan County, New York, 1938.

REMARKS: This revision reflects changes to the range in characteristics as well as general updating to metric units. In the past, the Pittstown series was mapped in areas that are now considered frigid. These areas require investigation are not included in the modern range of the series.

Diagnostic horizons and features recognized in this pedon are:

1. Ochric epipedon - the zone from 0 to 10 inches (0 to 25 centimeters) (Ap horizon).
2. Cambic horizon - the zone from 10 to 29 inches (25 to 74 centimeters) (Bw horizons).
3. Densic material- the zone from 29 through 65 inches (74 through 165 centimeters) (Cd horizon).
4. Aquic subgroup - presence of low chroma iron depletions at 18 inches (46 centimeters) (Bw1 horizon).
- 5) Particle-size control section - the zone from 10 through 29 inches (25 through 74 centimeters) (Bw horizons).

ADDITIONAL DATA: Full characterization data for sample no. 78NH005025 and 78NH019010. Pedons analyzed by the NSSL, Lincoln, NE.

National Cooperative Soil Survey
U.S.A.

LOCATION RAYPOL

CT+MA NY RI

Established Series
Rev. MFF-SMF
05/1999

RAYPOL SERIES

The Raypol series consists of very deep, poorly drained soils formed in loamy over sandy and gravelly outwash. They are nearly level to gently sloping soils in shallow drainageways and low-lying positions on terraces and plains. Slope ranges from 0 to 5 percent. The soils have a water table at or near the surface much of the year. Permeability of the Raypol soils is moderate in the surface layer and subsoil and rapid or very rapid in the substratum. Mean annual temperature is about 50 degrees F., and mean annual precipitation is about 47 inches.

TAXONOMIC CLASS: Coarse-loamy over sandy or sandy-skeletal, mixed, active, acid, mesic Aeric Endoaquepts

TYPICAL PEDON: Raypol silt loam - grass field, 2 percent slope. (Colors are for moist soil unless otherwise noted.)

Ap--0 to 8 inches; very dark brown (10YR 2/2) silt loam, pale brown (10YR 6/3) dry; weak medium granular structure; friable; common very fine, fine and medium roots; strongly acid; clear smooth boundary (6 to 10 inches thick)

Bg1--8 to 12 inches; grayish brown (10YR 5/2) very fine sandy loam; weak medium subangular blocky structure; friable; common very fine, fine and medium roots; common medium prominent yellowish brown (10YR 5/8) masses of iron accumulation; strongly acid; clear wavy boundary.

Bg2--12 to 20 inches; grayish brown (10YR 5/2) silt loam; weak medium subangular blocky structure; friable; common fine and medium roots; common medium prominent yellowish brown (10YR 5/8) masses of iron accumulation; strongly acid; clear wavy boundary.

Bw1--20 to 26 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; common medium prominent yellowish brown (10YR 5/8) and common medium distinct light brownish gray (10YR 6/2) masses of iron accumulation; strongly acid; gradual wavy boundary.

Bw2--26 to 29 inches; olive brown (2.5Y 4/4) very fine sandy loam; massive; friable; 5 percent gravel; common medium prominent yellowish brown (10YR 5/8) masses of iron accumulation and common medium distinct light brownish gray (10YR 6/2) iron depletions; strongly acid; clear wavy boundary. (Combined thickness of the B horizons is 12 to 32 inches)

2C1--29 to 52 inches; light olive brown (2.5Y 5/4) gravelly sand; single grain; loose; 25 percent gravel; few medium prominent yellowish brown (10YR 5/8) masses of iron accumulation; strongly acid.

2C2--52 to 65 inches; dark grayish brown (2.5Y 4/2) very gravelly sand; single grain; loose; 35 percent gravel and 5 percent cobbles; few medium prominent yellowish brown (10YR 5/6) masses of iron accumulation; strongly acid.

TYPE LOCATION: New Haven County, Connecticut; town of Orange, 0.4 mile north of the Derby-Milford Road and the Wilbur Cross Parkway overpass, 800 feet east of Derby-Milford Road near the edge of a field.

USGS Ansema topographic quadrangle; latitude 41 degrees 16 minutes 56 seconds N., longitude 73 degrees 02 minutes 56 seconds W., NAD 27

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 18 to 36 inches. Depth to the contrasting substratum ranges from 18 to 40 inches. Rock fragments range from 0 to 10 percent in the solum and from 0 to 60 percent in individual layers of the substratum. Typically, 70 percent or more of the rock fragments are rounded pebbles. Unless limed, the soil is very strongly acid or strongly acid above a depth of 40 inches and very strongly acid to slightly acid below 40 inches.

The Ap horizon has hue of 7.5YR or 10YR, value of 2 to 4 and chroma of 2 or 3. Undisturbed pedons have a 3 to 8 inch thick A horizon with value of 2 or 3 and chroma of 1 or 2. The Ap or A horizon is silt loam, very fine sandy loam or loam. It has weak or moderate granular structure and is friable or very friable.

The B horizon has hue of 5YR to 2.5Y, value of 4 to 6 and chroma of 1 to 4. Chroma of 3 and 4 is limited to subhorizons and chroma of 1 or 2 is in some subhorizon within a 20 inch depth. Texture is silt loam, very fine sandy loam or loam. Structure is weak subangular blocky or the horizon is massive. Consistency is friable or very friable and nonsticky or slightly sticky.

The 2C horizon has hue of 5YR to 5Y, value of 4 to 6 and chroma of 1 to 4. Texture of individual layers ranges from loamy fine sand to coarse sand in the fine earth.

Some pedons have a thin C or BC horizon that is silt loam, very fine sandy loam, loam or fine sandy loam.

COMPETING SERIES: There are no other series currently in the same family.

The [Fredon](#), [Halsey](#), [Lamson](#), [Leicester](#), [Massena](#), [Newstead](#), [Ninigret](#), [Norwell](#), [Raynham](#), [Red Hook](#), [Ridgebury](#), [Stissing](#), [Sun](#), [Tisbury](#) and [Walpole](#) series are similar soils in related families. Fredon soils are nonacid. Halsey soils are nonacid and lack a subhorizon with chroma of 3 or more within a 30 inch depth. Lamson, Massena, Newstead, Red Hook, Ridgebury and Sun soils are nonacid and coarse-loamy. Leicester and Stissing soils are coarse-loamy and Stissing soils have a dense substratum. Ninigret and Tisbury soils have matrix chroma of 3 or more in the B horizon to a depth of 20 inches. Norwell and Walpole soils have a sandy particle-size control section. In addition, Norwell soils have a dense substratum. Raynham soils are nonacid and coarse-silty.

GEOGRAPHIC SETTING: Raypol soils are nearly level to gently sloping soils in drainageways and low-lying areas on terraces and plains. Slope ranges from 0 to 5 percent. The soils formed in loamy over sandy and gravelly glaciofluvial materials derived mainly from acid crystalline and sedimentary rocks. Mean annual temperature is 45 to 54 degrees F., mean annual precipitation is 37 to 50 inches and the growing season is 130 to 195 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the [Agawam](#), [Branford](#), [Deerfield](#), [Ellington](#), [Enfield](#), [Hartford](#), [Haven](#), [Hinckley](#), [Leicester](#), [Manchester](#), [Merrimac](#), [Ninigret](#), [Occum](#), [Pootatuck](#), [Raynham](#), [Ridgebury](#), [Rippowam](#), [Stissing](#), [Sudbury](#), [Tisbury](#), [Walpole](#), and [Windsor](#) soils on nearby landscapes. The well drained Enfield and Haven soils and the moderately well drained Tisbury soils are common drainage associates. Agawam, Branford and Ellington soils are better drained loamy over sandy and gravelly soils. Deerfield, Hartford, Hinckley, Manchester, Merrimac, Sudbury and Windsor soils are moderately well drained to excessively drained coarse-textured soils on nearby glaciofluvial landforms. Occum, Pootatuck and Rippowam soils are on flood plains.

DRAINAGE AND PERMEABILITY: Poorly drained. Surface runoff is slow. Permeability is moderate in the solum and rapid or very rapid in the coarse-textured substratum. Raypol soils have a watertable at or near the surface much of the year.

USE AND VEGETATION: Most areas are wooded. Cleared areas are used for hay and pasture. Drained areas are used for silage corn, hay or vegetables. Common trees are red maple, white oak, white ash, aspen, elm,

DISTRIBUTION AND EXTENT: Glaciofluvial landforms in Connecticut, Rhode Island and New York; MLRAs 140, 144A and 145. The series is of moderate extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: New Haven County, Connecticut, 1976.

REMARKS: This revision reflects change in taxonomy from Aerice Haplaquepts and general updating. Cation exchange activity class placement determined from a review of limited lab data and similar or associated soils.

The horizons and features diagnostic for the typical pedon are:

1. Ochric epipedon from 0 to 8 inches (Ap horizon).
2. Cambic horizon from 8 to 29 inches (Bg and Bw horizons).
3. Aquic moisture regime as indicated by dominant chroma of 2 in the Bg horizon but with chroma too high within 30 inches (chroma 4 in the Bw horizon) to qualify for Typic Endoaquepts.
4. Endoaquepts subgroup based on saturation in all layers from the upper boundary of saturation to a depth of 200 cm. from the mineral soil surface.
5. Aerice great group based on matrix color and chroma of 3 or more in one subhorizon between the Ap and 75 cm. (Bw2).
6. Particle-size class: control section from 10 to 40 inches that is coarse-loamy from 10 to 29 inches and contrasting sandy or sandy-skeletal from 29 to 60 inches.
7. Acid reaction class and mesic temperature regime.

National Cooperative Soil Survey
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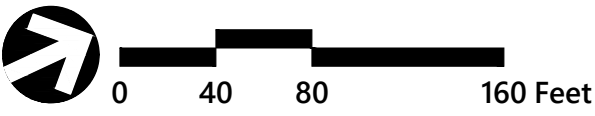


2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

SITE-SPECIFIC SOIL CLASSIFICATIONS

Soil symbol	Soil series: Slope class
540B/P	Regsol, 2-8% slope
540A/P	Regsol, 25-25% slope
513A	Wingpet, 0-3% slope
513B	Wingpet, 3-8% slope
517A	Wingpet Variant, 0-3% slope
517C	Wingpet Variant, 0-3% slope
517D	Wingpet Variant, 15-25% slope
299A/cbaaa	Smoothed Udonorths, 0-3% slope
410A	Spenn, 0-3% slope
500E/ccbb	Smoothed Udonorths, 3-8% slope
500C/ccbb	Smoothed Udonorths, 8-15% slope
500D/ccbb	Smoothed Udonorths, 15-25% slope
299A/caabb	Smoothed Udonorths, 0-3% slope
299A/daabb	Smoothed Udonorths, 0-3% slope
500B/caabb	Smoothed Udonorths, 3-8% slope
299C/caabb	Smoothed Udonorths, 8-15% slope
299D/caabb	Smoothed Udonorths, 15-25% slope
299E/ccbb	Smoothed Udonorths, 15-25% slope
500E/ccbb	Smoothed Udonorths, 25-50% slope
500C/ccbb	Subsagments, 8-15% slope
500D/ccbb	Subsagments, 0-3% slope
500A/ccbb	Subsagments, 0-3% slope
513B	Horstern, very stony, 3-8% slope
513A	Barnardston, very stony, 0-3% slope
513C	Barnardston, very stony, 3-8% slope
513D	Barnardston, very stony, 8-15% slope
45B	Montauk, very stony, 3-8% slope
45C	Montauk, very stony, 8-15% slope
45D	Montauk, very stony, 15-25% slope
141B	Hills-rock outcrop - Chaffield complex, 3-8% slope
141C	Hills-rock outcrop - Chaffield complex, 8-15% slope
141D	Hills-rock outcrop - Chaffield complex, 15-25% slope
141E	Hills-rock outcrop - Chaffield complex, 25-50% slope
500B	Chaffield - Hills - Montauk complex, very stony, 3-8% slope
500C	Chaffield - Hills - Montauk complex, very stony, 8-15% slope
500D	Chaffield - Hills - Montauk complex, very stony, 15-25% slope
500E/ccbb	Udonorths, loamy, 3-8% slope
500C/ccbb	Udonorths, loamy, 8-15% slope
500D/ccbb	Udonorths, loamy, 25-50% slope
500	Rock outcrop

This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for providing soils information for development of the property. It was produced by a professional Soil Scientist, and is not a product of the USDA Natural Resources Conservation Service. There is a report that accompanies this map.



Lebanon Brickyard Development

Hanover Street
Lebanon, New Hampshire

No.	Revision	Date	Appvd.

Designed by	DJB	Checked by	TMD
Issued for		Date	
Permitting		January 2024	

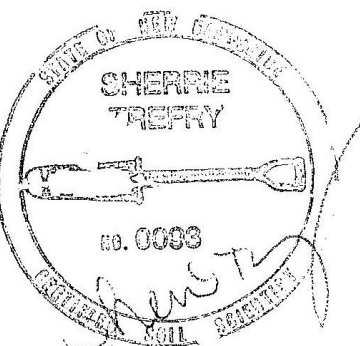
Site Specific
Soil Map

Drawing Number

SSSM

Sheet 1 of 1

Project Number
52933.00



Appendix E: Inspection & Maintenance Manual

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INSPECTION & MAINTENANCE MANUAL
(Stormwater Management System)

The Brickyard Residential Development

Lebanon, New Hampshire

PREPARED FOR

Brickyard One Nominee Trust
P.O. Box 720
Middleton, MA 01949

PREPARED BY



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

05/10/2024

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Introduction

VHB has prepared the following Stormwater Management System Inspection & Maintenance Manual for the Brickyard Residential Development located on Hanover Street in Lebanon, New Hampshire. The intent of this plan is to provide the applicant/owner with a list of procedures that document the inspection and maintenance requirements of the Stormwater Management System for this development.

The following inspection and maintenance program is necessary in order to keep the Stormwater Management System functioning properly. By following the enclosed procedures, the applicant will be able to maintain the functional design of the Stormwater Management System and maximize its ability to remove sediment and other contaminants from site generated stormwater runoff.

Responsible Party

The oversight of the inspection and maintenance program will be provided by:

Brickyard One Nominee Trust

P.O. Box 720

Middleton, MA 01949

Contact: Gil Aleixo

Email: gilaleixo@gmail.com

Phone: (617) 834-4441

Stormwater Management System Components

The Stormwater Management System is designed to mitigate both the quantity and quality of site-generated stormwater runoff. As a result, its design includes the following elements:

Non-Structural BMP's

Non-structural best management practices (BMP's) are designed to minimize and/or remove contaminants before they enter the stormwater collection system. Several of these BMP's have been incorporated into the Stormwater Management System including reduced use of road deicing agents, and litter/trash removal. These types of BMP's are a highly effective initial treatment measure for reducing stormwater pollutant loading.

Structural BMP's

Structural BMP's have been incorporated into the overall stormwater management plan. Structural BMP's include deep sump catch basins, subsurface sand filter and subsurface detention basins.

Inspection & Maintenance Plan

By implementing the following procedures, the applicant will be able to maintain the functional design of the Stormwater Management System and maximize the system's ability to remove sediment and other contaminants from site generated stormwater runoff.

Source Control

- Routinely empty all outside waste receptacles provided for public use.
- Clearing litter from substation and perimeter landscape areas.

Vegetated Areas Maintenance

Although not a specific component of the drainage system, the maintenance of vegetated areas may affect the functioning of stormwater management practices. This includes the health/density of vegetative cover and activities such as the application and disposal of lawn and garden care products, disposal of leaves and yard trimmings.

- Inspect planted areas on a semi-annual basis and remove any litter.
- Maintain planted areas adjacent to pavement to prevent soil washout.
- Immediately clean any soil deposited on pavement.
- Re-seed bare areas; install appropriate erosion control measures when native soil is exposed or erosion channels are forming.
- Plant alternative mixture of grass species in the event of unsuccessful establishment.
- The grass vegetation should be cut to a height between three and four inches.
- Pesticide/Herbicide Usage – No pesticides are to be used unless a single spot treatment is required for a specific control application.
- Fertilizer usage should be avoided. If deemed necessary, slow release fertilizer should be used. Fertilizer may be used to begin the establishment of vegetation in bare or damaged areas, but should not be applied on a regular basis unless necessary.

Deicing Agents

Deicing agents should be used in accordance with the following:

- Use sand as the primary agent for parking lot safety during ice and snow conditions.
- Use de-icing or anti-caking agents, added to enhance performance and application characteristics of sand mixtures, only as necessary and at minimum application rates.

- Maintain a Deicing Log to track the amount and type of deicing materials applied to the site.

Snow Management

Snow storage areas shall be maintained as follows:

- Snow storage areas will be managed to prevent blockage of storm drain catch basins or runoff flow paths. Snow combined with sand and debris may block a storm drainage system, diminishing the infiltration capacity of the system and causing localized flooding.
- Sand and debris deposited on vegetated or paved areas shall be cleared from the site and properly disposed of at the end of the snow season, no later than May 15.
- Snow shall not be dumped into any water body, pond, wetland resource area or stormwater detention basin.

Stormwater Outfalls

- Inspect outfall locations monthly for the first three months after construction to ensure proper functioning and correct any areas that have settled or experienced washouts.
- Inspect outfalls annually after initial three-month period.
- Annual inspections should be supplemented after large storms, when washouts may occur.
- Maintain/ cut vegetation around outfalls to prevent blockages at the outfall.
- Maintain rip rap pad below each outfall and repair any washouts or other damage immediately.
- Remove and dispose of any trash or debris at the outfall.

Infiltration Basin

- Remove debris from inlet and outlet structures
- Remove accumulated sediments
- Inspect and repair outlet structures and appurtenances
- Inspect infiltration components at least twice annually, and following any rainfall event exceeding 2.5 inches in a 24 hour period, with maintenance or rehabilitation conducted as warranted by such inspection.
- Inspect pretreatment measures at least twice annually, and remove accumulated sediment as warranted by inspection, but no less than once annually.
- Mow embankments periodically.
- Remove woody vegetation from embankments.
- Inspect and repair embankments and spillways.
- If the infiltration basin does not drain down within 72-hours following a rainfall event, then a qualified professional should assess the condition of the facility to determine

measures required to restore infiltration function, including but not limited to, removing accumulated sediments or reconstructing the infiltration section.

Subsurface Detention System

- The subsurface detention systems will be inspected at least twice each year by removing the manhole/access port covers and determining the thickness, if any, of sediment that has accumulated.
- If sediment is more than six inches deep, it must be suspended via flushing with clean water and removed using a vacuor truck.
- Refer to manufacturer's specifications and instructions for cleaning the system.
- Outlet control manholes will be examined at each inspection to verify that no blockage has occurred.
- System will be observed after rainfalls to see if it is properly draining.

Bioretention Ponds

- Systems should be inspected at least twice annually, and following any rainfall event exceeding 2.5 inches in a 24 hour period, with maintenance or rehabilitation conducted as warranted by such inspection.
- Pretreatment measures should be inspected at least twice annually, and cleaned of accumulated sediment as warranted by inspection, but no less than once annually.
- Trash and debris should be removed at each inspection.
- At least once annually, system should be inspected for drawdown time. If a filtration system does not drain within 72-hours following a rainfall event, then a qualified professional should assess the condition of the facility to determine measures required to restore filtration function, including but not limited to removal of accumulated sediments or reconstruction of the filter.
- Remove debris from any inlet and outlet structures.
- Remove accumulated sediment.
- Inspected and repair (if needed) outlet structures and appurtenances.
- Remove woody vegetation from embankments. Inspect and repair embankments as needed.

Invasive Plant Species Control

- Invasive plant species are alien or non-native plants which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control or food crops; or arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some of these exotic plants become invasive and cause harm by:
 - becoming weedy and overgrown;
 - killing established shade trees;

Inspection & Maintenance Manual

- obstructing pipes and drainage systems;
 - forming dense beds in water;
 - lowering water levels in lakes, streams and wetlands;
 - destroying natural communities;
 - promoting erosion on stream banks and hillsides; and
 - resisting control except by hazardous chemical.
- As part of the routine inspections of the drainage system and stormwater outfalls, the site should be checked for the presence of invasive plant species as defined by the New Hampshire Department of Agriculture, Markets & Food (a list is provide at the end of this manual).
 - If invasive plant species are found to be present they should be controlled as described in the "Control of Invasive Plants" document prepared by the NH Department of Agriculture, Markets & Food. A copy is provided at the end of this manual.

Record Keeping

- Inspections of the stormwater management system shall be conducted in accordance with the Inspection & Maintenance Checklist provided in this Manual.
- An Inspection & Maintenance Log shall be completed for each inspection and maintenance activity.
- All record keeping required by the I&M manual shall be maintained by the Responsible Party.
- A deicing log shall be maintained that tracks the amount and type of deicing materials applied to the site.
- Any transfer of responsibility for the I&M activities or transfer of ownership shall be documented to the NHDES Water Division in writing.

Inspection & Maintenance Checklist/Log

The following pages contain an Inspectison & Maintenance Checklist, a blank copy of the Stormwater Management System's Inspection & Maintenance Log, and a reduced copy of the Grading and Utility Plans. These forms/plans are provided to assist the applicant with the inspection and maintenance of the Stormwater Management System.

Invasive Species Information

A copy of the New Hampshire Department of Agriculture, Markets & Food's document "Control of Invasive Plants" is provide at the end of this manual.

Stormwater Management System
Inspection & Maintenance Checklist

BMP/System Component	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance/Cleanout Threshold
Source Control	Routinely	Inspect any outdoor waste receptacles areas for spillage. Inspect and clear litter from crushed stone pad and perimeter landscape areas.	Clean as required.
Deicing Agents	N/A	N/A	Use sand as primary agent for site roadway and parking safety during winter.

Stormwater Management System
Inspection & Maintenance Checklist

Closed Drainage System			
Drainage Pipes	1 time per 2 years	Check for sediment accumulation/clogging.	≥ 2 in. sediment depth.
Infiltration Basin	2 times per year	Check for sediment accumulation/clogging	Clean/repair as needed.
Subsurface Detention Basin	2 times per year	Check for sediment accumulation.	Refer to Manufacturers Requirements
Subsurface Sand Filter/Bioretention Ponds	2 times per year	Check for sediment accumulation/clogging	Refer to Manufacturers Requirements
Outlet Control Structure	2 times per year	Check for sediment accumulation/clogging	Clean/repair as needed.
Outfalls	Monthly for first 3 months and 1 time per year thereafter	-Check for sediment, trash and debris accumulation. -Check for vegetation blocking outfall. Inspect rip rap for washout.	Clean/repair as needed.

Stormwater Management System
Inspection & Maintenance Log

BMP/System Component	Date Inspected	Inspector	Cleaning/Repair Needed (List Items/Comments)	Date of Cleaning/Repair	Performed By

Stormwater Management System
Inspection & Maintenance Log

BMP/System Component	Date Inspected	Inspector	Cleaning/Repair Needed (List Items/Comments)	Date of Cleaning/Repair	Performed By

Notes:

Stormwater Management System
Deicing Log

Date	Type	Location/Amount	Name(s) of Maintenance Personnel

Control of Invasive Plants

New Hampshire Department of Agriculture, Markets & Food

Douglas Cygan

603-271-3488

doug.cygan@agr.nh.gov

This guide lists garden plants and weeds which are already causing significant changes to natural areas in the Mid-Atlantic. Measures for controlling each species are indicated by number, e.g., (3), in the text with a full explanation at the end of this article. Click on the word Control: to jump to that section. Then click your "back" button to return to the text. Following each section suggested alternative plants are given. These alternatives are native plants, well adapted and needing little care, attractive to birds and butterflies, and an important part of the food web for our indigenous species.

INVASIVE TREES

NORWAY MAPLE (*Acer platanoides*) has large leaves similar to sugar maple. To easily confirm that the plant is Norway maple, break off a leaf and if it's truly Norway maple it will exude milky white sap. Fall foliage is yellow. (Exception: cultivars such as 'Crimson King,' which have red leaves in spring or summer, may have red autumn leaves.) The leaves turn color late, usually in late October after native trees have dropped their foliage. This tree suppresses growth of grass, garden plants, and forest understory beneath it, at least as far as the drip-line. Its wind-borne seeds can germinate and grow in deep shade. The presence of young Norway maples in our woodlands is increasing.

Control: (1); (7), (8), (9), or (10); (11) in mid-October to early November, before the leaves turn color.

TREE OF HEAVEN (*Ailanthus altissima*), is incredibly tough and can grow in the poorest conditions. It produces huge quantities of wind-borne seeds, grows rapidly, and secretes a toxin that kills other plants. Its long compound leaves, with 11-25 lance-shaped leaflets, smell like peanut butter or burnt coffee when crushed. Once established, this tree cannot be removed by mechanical means alone.

Control: (1) - seedlings only. Herbicide - use Garlon 3a (9) with no more than a 1" gap between cuts, or (10); plus (11) on re-growth. Or paint bottom 12" of bark with Garlon 4 Ultra (in February or March to protect surrounding plants). USE MAXIMUM STRENGTH SPECIFIED ON LABEL for all herbicide applications on Ailanthus. Glyphosate is not effective against Ailanthus.

INVASIVE SHRUBS

AUTUMN OLIVE (*Eleagnus umbellata*): Formerly recommended for erosion control and wildlife value, these have proved highly invasive and diminish the overall quality of wildlife habitat.

Control: (1) - up to 4" diameter trunks; (7) or (10) or bury stump. Do not mow.

MULTIFLORA ROSE (*Rosa multiflora*), formerly recommended for erosion control, hedges, and wildlife habitat, becomes a huge shrub that chokes out all other vegetation and is too dense for many species of birds to nest in, though a few favor it. In shade, it grows up trees like a vine. It is covered with white flowers in June. (Our native roses have fewer flowers, mostly pink.) Distinguish multiflora by its size, and by the presence of very hard, curved thorns, and a fringed edge to the leaf stalk.

Control: (1) - pull seedlings, dig out larger plants at least 6" from the crown and 6" down; (4) on extensive infestations; (10) or (11). It may remain green in winter, so herbicide may be applied when other plants are dormant. For foliar application, mix Rodeo with extra sticker-spreader, or use Roundup Sure Shot Foam on small plants.

BUSH HONEYSUCKLES (*Lonicera spp.*), including Belle, Amur, Morrow's, and Tatarian honeysuckle. (In our region, assume that any honeysuckle is exotic unless it is a scarlet-flowered vine). Bush honeysuckles create denser shade than native shrubs, reducing plant diversity and eliminating nest sites for many forest interior species.

Control: (2) on ornamentals; (1); on shady sites only, brush cut in early spring and again in early fall (3); (4) during the growing season; (7); or (10) late in the growing season.

BLUNT-LEAVED PRIVET (*Ligustrum obtusifolium*). Control: (1); (7) or (10); or trim off all flowers. Do not cut back or mow.

BURNING BUSH, WINGED EUONYMUS (*Euonymus alatus*), identified by wide, corky wings on the branches.

Control: (1); (7) or (10); or trim off all flowers.

JAPANESE BARBERRY (*Berberis thunbergii*), and all cultivars and varieties.

Control: (1); (7) or (10); or trim off all flowers.

INVASIVE WOODY VINES

All of these vines shade out the shrubs and young trees of the forest understory, eventually killing them, and changing the open structure of the forest into a dense tangle. DO NOT PLANT NEXT TO OPEN SPACE.

JAPANESE HONEYSUCKLE (*Lonicera japonica*), including Hall's honeysuckle, has gold-and-white flowers with a heavenly scent and sweet nectar in June. This is probably the familiar honeysuckle of your childhood. It is a rampant grower that spirals around trees, often strangling them.

Control: (1); (3); (10); (11) in fall or early spring when native vegetation is dormant. Plan to re-treat repeatedly.

ORIENTAL BITTERSWEET (*Celastrus orbiculatus*) has almost completely displaced American bittersweet (*C. scandens*). The Asian plant has its flowers and bright orange seed capsules in clusters all along the stem, while the native species bears them only at the branch tips.

Control: (1); keep ornamental plants cut back, remove all fruits as soon as they open, and bag or burn fruits; to eradicate use Garlon 3a (10).

JAPANESE KNOTWEED, MEXICAN BAMBOO (*Polygonum cuspidatum*) can grow in shade. The stems have knotty joints, reminiscent of bamboo. It grows 6-10' tall and has large pointed oval or triangular leaves.

Control: Cut at least 3 times each growing season and/or treat with Rodeo (10) or (11). In gardens, heavy mulch or dense shade may kill it.

INVASIVE HERBACEOUS PLANTS

GARLIC MUSTARD (*Alliaria petiolata*, *A. officinalis*), a white-flowered biennial with rough, scalloped leaves (kidney-, heart- or arrow-shaped), recognizable by the smell of garlic and taste of mustard when its leaves are crushed. (The odor fades by fall.)

Control: Pull before it flowers in spring (1), removing crown and roots. Tamp down soil afterwards. Once it has flowered, cut (2), being careful not to scatter seed, then bag and burn or send to the landfill. (11) may be appropriate in some settings.

JAPANESE STILT GRASS (*Microstegium vimineum*) can be identified by its lime-green color and a line of silvery hairs down the middle of the 2-3" long blade. It tolerates sun or dense shade and quickly invades areas left bare or disturbed by tilling or flooding. An annual grass, it builds up a large seed bank in the soil.

Control: Easily pulled in early to mid-summer (1) - be sure to pull before it goes to seed. If seeds have formed, bag and burn or send to landfill. Mowing weekly or when it has just begun to flower may prevent it from setting seed (3). Use glyphosate (11) or herbicidal soap (less effective) on large infestations. Follow up with (5) in spring.

MILE-A-MINUTE VINE, DEVIL'S TAIL TEARTHUMB (*Polygonum perfoliatum*), a rapidly growing annual vine with triangular leaves, barbed stems, and turquoise berries in August which are spread by birds. It quickly covers and shades out herbaceous plants.

Control: same as for stilt grass.

SPOTTED KNAPWEED (*Centaurea maculosa*), a biennial with thistle-like flowers.

Control: Do NOT pull (1) unless the plant is young and the ground is very soft - the tap root will break off and produce several new plants. Wear sturdy gloves. (2); (6); (10) or (11).

CONTROL MEASURES

- (1) PULL seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs.
- (2) DEADHEAD to prevent spread of seeds of invasive plants. Cut off seeds or fruits before they ripen. Bag, and burn or send to a landfill.
- (3) MOW or CUTTING at least 4 times a season to deplete plants' store of nutrients and carbohydrates, reduce seed formation, and kill or minimize spread of plants. If necessary, repeat each year.
- (4) CONTROLLED BURNING during the spring, repeated over several years, allows native vegetation to compete more effectively with the invasive species. This requires a permit. Spot treatment with glyphosate in late fall can be used to make this method more effective.
- (5) Use a CORN-BASED PRE-EMERGENCE HERBICIDE on annual weeds. This product is also an organic fertilizer, i.e., it can stimulate growth of existing plants, including weeds, so it is appropriate for lawns and gardens but may not be appropriate in woodlands.
- (6) In lawns, SPOT TREAT with BROAD-LEAF WEEDKILLER. Good lawn-care practices (test soil; use lime and fertilizer only when soil test shows a need; mow high and frequently; leave clippings on lawn) reduce weed infestations.
- (7) CUT DOWN the tree. Grind out the stump, or clip off re-growth.
- (8) GIRDLE tree: cut through the bark and growing layer (cambium) all around the trunk, about 6" above the ground. Girdling is most effective in spring when the sap is rising, and from middle to late summer when the tree is sending down food to the roots. Clip off sucker sprouts.
- (9) FRILL: Using a machete, hatchet or similar device, hack scars (several holes in larger trees) downward into the cambium layer, and squirt in glyphosate (or triclopyr if recommended in text above). Follow label directions for Injection and Frill Applications. This is most effective from middle to late summer. Clip off any sucker sprouts or treat with glyphosate.
- (10) CUT STEM / CUT STUMP WITH GLYPHOSATE (or triclopyr if specified above). Follow label directions for Cut Stump Application. Clip off sucker sprouts or paint with glyphosate. See Note on Herbicides.
- (11) OLIAIR SPRAY WITH GLYPHOSATE herbicide (see Note on Herbicides). Use a backpack or garden sprayer or mist blower, following label directions. Avoid overspray and/or dripping onto non-target plants, because glyphosate kills most plants except moss. If it rolls off waxy or grass-like foliage, use additional sticker-spreader. Deciduous trees, shrubs, and perennials move nutrients down to the roots in late summer. Glyphosate is particularly effective at this time and when plants have just gone out of flowering. Several invasive species retain their foliage after native plants have lost theirs, and resume growth earlier in spring than most natives. This allows you to treat them without harming the natives. However, the plant must be actively growing for the herbicide to work. Retreatments may be necessary the following year if suckering occurs or the plant hasn't been entirely killed.

NOTE ON HERBICIDES: It is highly recommended that small populations try to be controlled using non-chemical methods wherever feasible. However, for large infestations, and for a few plants specified above, herbicide use is essential. Apply herbicides carefully to avoid non-target plants, glyphosate is the least environmentally damaging herbicide in most cases. Add food coloring for visibility, and a soap-based sticker such as Cide-Kick. Glyphosate is ineffective on some plants; for these, triclopyr (Garlon) may be indicated. When using herbicides, read the entire label and observe all precautions listed, including proper disposal. If in doubt, call your local Cooperative Extension Service.

Appendix F: Infiltration Feasibility Report

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INFILTRATION FEASIBILITY REPORT WILL BE FINALIZED ONCE TEST PITS AND INFILTRATION RATE TESTING HAS BEEN COMPLETED FOR THE SUBJECT SITE.

Appendix G: Remediation Site Report

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Remediation Site Report

PROJECT:

The Brickyard Residential Development
Lebanon, New Hampshire
August 2024



I. Project Overview

The subject property is listed on Lebanon's Tax Assessor's Map 48 Lots 1,2 and 4, and Map 63 Lot 1, located on Hanover Street, Lebanon, NH. The parcels are approximately 133.5 acres in area. The existing parcels are mostly undeveloped and consists primarily of woodlands. Limited areas of development exist where the former brick company operated.

The owner and applicant for this project is Brickyard One Nominee Trust.. The proposal entails the construction of up to 474 residential multifamily units throughout 11 buildings on site. A new paved driveway access is proposed, along with utilities and stormwater management systems. Some of the stormwater management practices on site utilize infiltration, including two underground chamber systems and one aboveground biofiltration basin. These stormwater best management practices will work to ensure that the post-development runoff is less than or equal to the pre-development runoff. Erosion control will be implemented to prevent sediment deposition and soil loss, both during and following construction activities. Methods of erosion control proposed for this site include silt fencing, erosion control blankets, and stone check dams.

Some of the aforementioned stormwater controls rely on infiltration and generate groundwater recharge for the property. Per Env-Wq 1507.02(c), infiltration is prohibited for stormwater in areas that have contaminants in groundwater at levels above the ambient groundwater quality standards (AGQS) established in Env-Or 603.03; or in soil with contaminants at levels above site-specific soil standards developed pursuant to Env-Or 606.119.

II. Remediation Sites

There are five remediation site locations within 500 ft of the subject property. These are the Former Muffler House, the Brousseau Residence, the Knights/Willey Property, Lane NH Holdings LLC., and a Motor Vehicle Accident site. Documentation for each remediation site has been attached, but it doesn't appear that any of the sites contain active contamination sites, as they are noted to be closed or inactive. The Motor Vehicle Accident site was not found on the NHDES OneStop system.



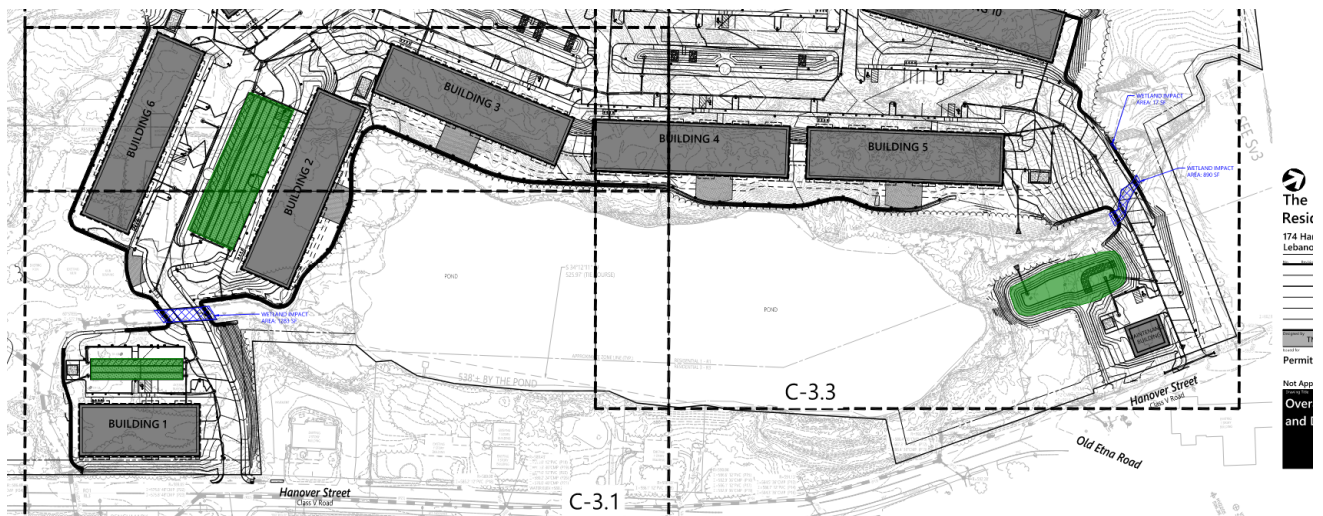
III. PFAS Sampling Data

There are no PFAS sampling sites located within 1,000 feet of the subject property. Additionally, the property is not located within the Consent Decree Boundary for the Saint-Gobain Performance Plastics site. Therefore, it can be assumed that PFAS contamination is not present on the site.



IV. Location of Infiltration Practice

Three infiltration practices are proposed, one near the south entrance at Building 1, one between Buildings 2 and 6, and one near the north driveway adjacent to the Maintenance Building. All 3 locations have pretreatment provided.





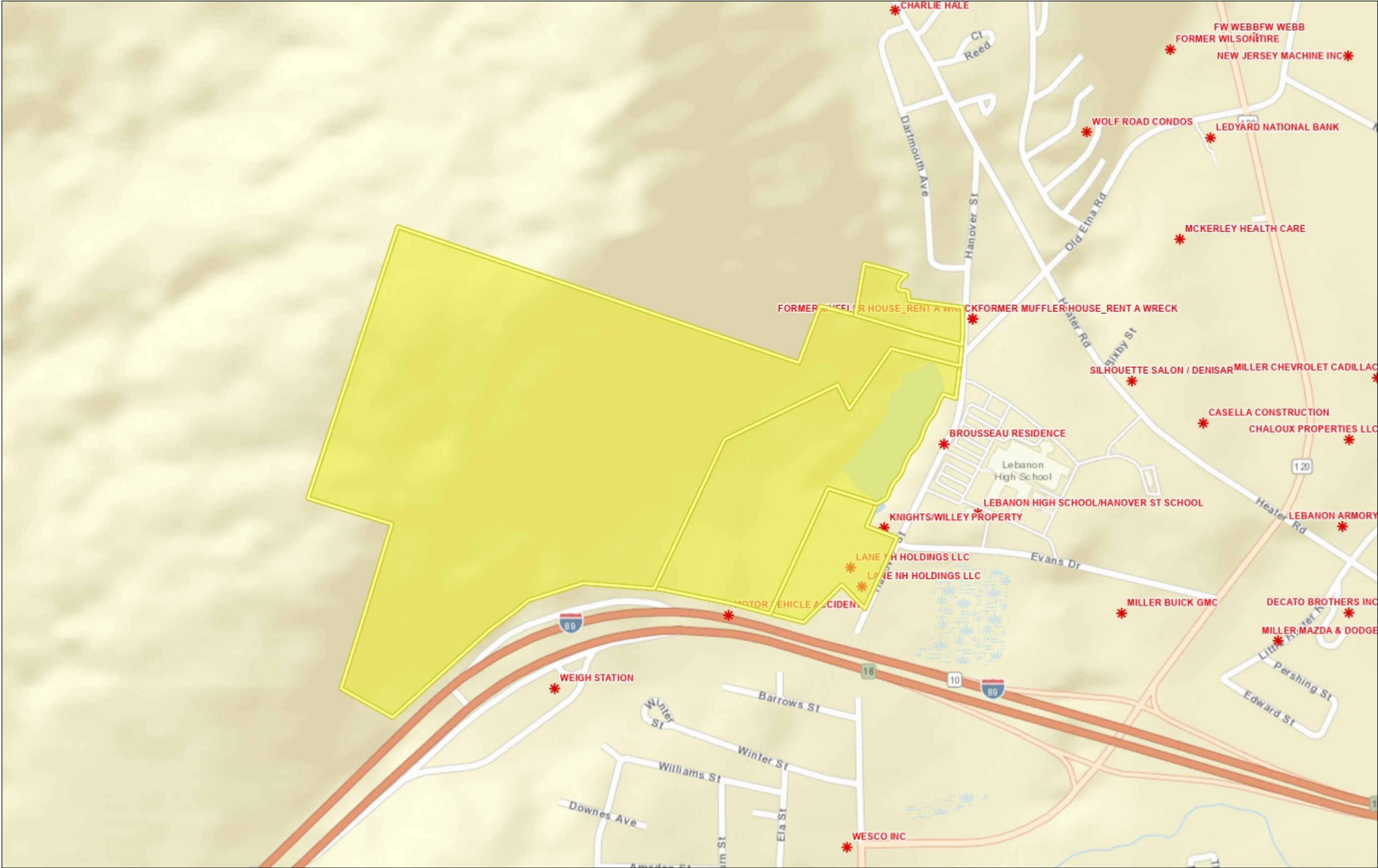
V. Potential Impacts

The evaluations from the Remediation Sites and the PFAS Sampling Data indicate that there are no potential impacts due to the existing remediation sites being closed or inactive in NHDES OneStop and no PFAS sampling sites located nearby.



VI. Summary

The purpose of the PFAS/Remediation site investigation is to ensure stormwater practices are not located on contaminated soils or contaminated groundwater. From the information collected, it is unlikely that the soils or groundwater from the site would be contaminated from either of the sources. In addition, there will be no anticipated soil or groundwater contamination from any of proposed stormwater management practices.



Legend

- * Remediation Sites
- Public Water Supply Wells

1: 9,028



Notes

This map was automatically generated using Geocortex Essentials.

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

0.3 0 0.14 0.3 Miles
WGS_1984_Web_Mercator_Auxiliary_Sphere
© Latitude Geographics Group Ltd.

8/5/2024

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On-premise Use Facility Containing Fuel Oil Project Report

Agenda Item 4.A
8/12/24 Planning Bd Mtg

1 of 5

Site Number: 199708025

Project Number: 0007212

Name and Address: BROUSSEAU RESIDENCE
200 HANOVER STREET
LEBANON

Responsible Party: TIM BROUSSEAU
LEBANON NH 03766

[Mapit](#)

PHONE: 603-448-6503

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 08/23/1997

Eligibile: PERMANENTLY ELIGIBLE

Eligibilty Determined on: 01/22/1998

MTBE: N

Brownfield: N

Project Related Documents (5)				
	Document Type	Name/Title	Date Submitted	File Size
4126917	NOTIFICATION	MILTON TAX MAP 42	07/02/2008	.21 MB
3799648	CORRESPONDENCE	CORRESPONDENCE DATED 3/23/04	03/23/2004	1.28 MB
4425190	CORRESPONDENCE	CORRESPONDENCE 12/11/97 TO 1/22/98	12/11/1997	.10 MB
4425188	PERMIT INFORMATION	TGP-970825-L-001 GROUNDWATER DISCHARGE PERMIT SAMPLING RESULTS 20-OCT-97	10/24/1997	.87 MB
4425189	REPORT TO DES	UST CLOSURE REPORT	10/09/1997	.31 MB

Site Number: 199708025

Project Number: 0007212

Name and Address: BROUSSEAU RESIDENCE
200 HANOVER STREET
LEBANONResponsible Party: TIM BROUSSEAU
LEBANON NH 03766[Mapit](#)

PHONE: 603-448-6503

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 08/23/1997

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/22/1998

MTBE: N

Brownfield: N

Activities (9)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
04/14/2000	Fund Reimbursement Request Received	KIRN	06/22/2000	Fund Reimbursement Request Approved	
03/13/2000	Initial Response Report	KIRN	06/20/2000	Regulatory Action Compl.-DES File Closed	

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4425179	CORRESPONDENCE-FROM	06/20/2000	.04 MB
4425180	REPORT TO DES	03/13/2000	.62 MB

12/21/1998	Initial Response Budget Received	CHWASCIK	12/22/1998	Initial Response Budget Approved	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4425181	WORKSCOPE/BUDGET	12/21/1998	.15 MB

01/22/1998	Fund Reimbursement Request Received	LEVERGOOD	04/22/1998	Fund Reimbursement Request Approved	
11/04/1997	Initial Response Budget Received	CHWASCIK	11/05/1997	Initial Response Budget Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4425182	WORKSCOPE/BUDGET	11/05/1997	.09 MB

Site Number: 199708025

Project Number: 0007212

Name and Address: BROUSSEAU RESIDENCE
200 HANOVER STREET
LEBANONResponsible Party: TIM BROUSSEAU
LEBANON NH 03766[Mapit](#)

PHONE: 603-448-6503

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 08/23/1997

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/22/1998

MTBE: N

Brownfield: N

Activities (9)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
09/08/1997	Additional Information Received	LOCKER	09/12/1997	Groundwater Permit Issued	

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4425184	PERMIT INFORMATION	TGP-970825-L-001 TEMPORARY GROUNDWATER DISCHARGE PERMIT	09/12/1997 .06 MB
4425183	PERMIT INFORMATION	TGP-970825-L-001 APPLICATION FOR TEMPORARY GROUNDWATER DISCHARGE PERMIT 8-SEP-97	09/10/1997 .36 MB

09/08/1997		CHWASCIK	09/08/1997		
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4425185	WORKSCOPE/BUDGET	WORKSCOPE FOR PUMP & TREAT	09/08/1999 .34 MB

08/26/1997		CHWASCIK	08/26/1997		
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4425186	WORKSCOPE/BUDGET	WORKSCOPE AUTHORIZATION FOR INITIAL RESPONSE ACTION	08/26/1997 .12 MB

8/5/2024

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On-premise Use Facility Containing Fuel Oil Project Report

Agenda Item 4.A
8/12/24 Planning Bd Mtg

4 of 5

Site Number: 199708025

Project Number: 0007212

Name and Address: Brousseau Residence
200 Hanover Street
Lebanon
[Mapit](#)

Responsible Party: Tim Brousseau
Lebanon NH 03766

Phone: 603-448-6503

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 08/23/1997

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/22/1998

MTBE: N

Brownfield: N

Activities (9)					
Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
08/23/1997	Discharge of a Regulated Substance	CHWASCIAK	09/08/1997	Emergency Response to Inland Water Spill	

Activity Documents (1)				
Document Type	Document Title	Document Date	File Size	
4425187	REPORT FROM DES PETROLEUM DISCHARGE INCIDENT REPORT & SITE INVESTIGATION SUMMARY REPORT	08/25/1997	.06 MB	

Site Number: 199708025

Project Number: 0007212

Name and Address: BROUSSEAU RESIDENCE
200 HANOVER STREET
LEBANONResponsible Party: TIM BROUSSEAU
LEBANON NH 03766[Mapit](#)

PHONE: 603-448-6503

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 08/23/1997

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/22/1998

MTBE: N

Brownfield: N

No Vapor Recovery Information

8/5/2024

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Hazardous Waste Generator Report

Agenda Item 4.A
8/12/24 Planning Bd Mtg

1 of 2

EPA Id: NHD510081797

Current Name and Address: KNIGHTS WILLEY
190 HANOVER ST
LEBANON

[Mapit](#)

Effective Date: 03/06/1999

Generator Size: SQG(CESQG)

Handler Id: 0005997

Contact Information: ROY KNIGHT
190 HANOVER ST
LEBANON NH 03766
603-795-2400

Current Status: INACTIVE

Owner:

Manifests (1)													
Ext.	Manifest No.	Manifest Date	Generator Signature Date	First Transporter Id	Transporter Signature Date	Other Transporter Ids		Facility Id		Facility Signature			
00696	CTF149331	03/05/1999	09/29/1992	NHD986471597	09/29/1992			CTD021816889		11/09/1999			
Waste Streams (1)													
DOT Id	Waste Description			Waste Codes		# of Cont.	Cont. Type	Total Qty	Reported Units	Fee Status	Weight In lbs.	Assessed Weight	Dates
NA1993	Refrigerating machine			1: CR02-CT - Waste Oil		1	TT	300	GALLONS	NON NH OR NON-HAZ	2501	0	03/05/1999 - 09/29/1992

8/5/2024

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Hazardous Waste Generator Report

Agenda Item 4.A
8/12/24 Planning Bd Mtg

2 of 2

EPA Id:	NHD510081797	Handler Id:	0005997
Current Name and Address:	KNIGHTS WILLEY 190 HANOVER ST LEBANON	Contact Information:	ROY KNIGHT 190 HANOVER ST LEBANON NH 03766
	Mapit		603-795-2400
Effective Date:	03/06/1999	Current Status:	INACTIVE
Generator Size:	SQG(CESQG)	Owner:	

Facilty
Signature
Date

.1/09/1992

iscrepancy

8/5/2024

Page 964 of 1113

On-premise Use Facility Containing Fuel Oil Project Report

Agenda Item 4.A
8/12/24 Planning Bd Mtg

1 of 4

Site Number: 199803053

Project Number: 0007794

Name and Address: KNIGHTS/WILLEY PROPERTY
190 HANOVER STREET
LEBANON

Responsible Party: C. ROY KNIGHTS JOSEPH B.WILLEY
LYME NH 03768

[Mapit](#)

PHONE: 603-448-1295

Wellhead Protection Area: No

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 01/22/1998

Eligibile: PERMANENTLY ELIGIBLE

Eligibilty Determined on: 12/21/1998

MTBE: N

Brownfield: N

Project Related Documents (3)				
	Document Type	Name/Title	Date Submitted	File Size
3799649	CORRESPONDENCE	CORRESPONDENCE DATED 3/23/04	03/23/2004	1.28 MB
4425202	CORRESPONDENCE	CORRESPONDENCE 1/6/98 TO 11/25/98	01/06/1998	.15 MB
4425107	REGISTRATION	RECORD OF TELEPHONE CONVERSATION	09/29/1992	.03 MB

Site Number: 199803053

Project Number: 0007794

Name and Address: KNIGHTS/WILLEY PROPERTY
190 HANOVER STREET
LEBANONResponsible Party: C. ROY KNIGHTS JOSEPH B.WILLEY
LYME NH 03768[Mapit](#)

PHONE: 603-448-1295

Wellhead Protection Area: No

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 01/22/1998

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 12/21/1998

MTBE: N

Brownfield: N

Activities (6)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
12/21/1998	Fund Reimbursement Request Received	ESTABROOK	02/25/1999	Fund Reimbursement Request Approved	
10/27/1998	Initial Response Report	CHWASCIK	10/27/1998	Regulatory Action Compl.-DES File Closed	

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4425197	CORRESPONDENCE-FROM	10/29/1998	.04 MB
4425198	REPORT TO DES	10/27/1998	.18 MB

05/11/1998	Initial Response Budget Received	CHWASCIK	05/12/1998	Initial Response Budget Approved	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4425106	WORKSCOPE/BUDGET	05/11/1998	.08 MB

04/10/1998	Initial Response Budget Received	CHWASCIK	04/10/1998	Initial Response Budget Approved	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4425199	WORKSCOPE/BUDGET	04/10/1998	.09 MB

Site Number: 199803053

Project Number: 0007794

Name and Address: KNIGHTS/WILLEY PROPERTY
190 HANOVER STREET
LEBANONResponsible Party: C. ROY KNIGHTS JOSEPH B.WILLEY
LYME NH 03768[Mapit](#)

PHONE: 603-448-1295

Wellhead Protection Area: No

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 01/22/1998

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 12/21/1998

MTBE: N

Brownfield: N

Activities (6)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
03/25/1998	Initial Response Budget Received	CHWASCIK	03/30/1998	Initial Response Budget Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4425200	WORKSCOPE/BUDGET	03/25/1998	.11 MB

01/22/1998	Discharge of a Regulated Substance	CHWASCIK	01/22/1998	Additional Information Requested	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4425201	REPORT TO DES	01/22/1998	.08 MB

Site Number: 199803053

Project Number: 0007794

Name and Address: KNIGHTS/WILLEY PROPERTY
190 HANOVER STREET
LEBANONResponsible Party: C. ROY KNIGHTS JOSEPH B.WILLEY
LYME NH 03768[Mapit](#)

PHONE: 603-448-1295

Wellhead Protection Area: No

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 01/22/1998

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 12/21/1998

MTBE: N

Brownfield: N

No Vapor Recovery Information

Site Number: 198805017

Project Number: 0000551

Name and Address: LANE NH HOLDINGS LLC
HANOVER ST EXT
LEBANONResponsible Party: LANE NH HOLDINGS LLC ATTN: M. GEHRET ESQ
276 KINGSBURY GRADE, STE 2000
LAKE TAHOE NV 89449-3390[Mapit](#)

PHONE: 603-228-1387

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 05/06/1988

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 07/17/2002

MTBE: N

Brownfield: Y

Project Related Documents (16)

	Document Type	Name/Title	Date Submitted	File Size
4029494	PERMIT INFORMATION	GWP-198805017-L-002 APRIL 2007 GROUNDWATER SAMPLING REPORT 30-MAY-2007	05/31/2007	1.07 MB
3976204	PERMIT INFORMATION	GWP-198805017-L-001 MAY 2006 GROUNDWATER SAMPLING REPORT 06-JUN-2006	06/06/2006	.74 MB
3976884	PERMIT INFORMATION	NOTIFICATION OF DEED RECORDATION 26-MAY-06	05/31/2006	.16 MB
3973248	PERMIT INFORMATION	GWP-198805017-L-001 DEED RECORDATION	05/31/2006	.13 MB
4768723	WORKSCOPE/BUDGET	COPIES OF WORK SCOPES FOR SOIL EXCAVATION 16-JUL-2003	07/16/2003	.26 MB
4768597	CORRESPONDENCE-FROM	LETTER OF NON COMPLIANCE RETURNED TO SENDER DES 21-MAY-1992	05/21/1992	.06 MB
4768596	PERMIT INFORMATION	NOTIFICATION OF NON COMPLIANCE WITH RSA 485-A 19-AUG-1991	08/19/1991	.05 MB
4768595	CORRESPONDENCE-FROM	TRANSFER OF OWNERSHIP OF GROUNDWATER PERMIT GWP # 8905- 1 3L 11-FEB-1991	02/11/1991	.04 MB
4768592	PERMIT INFORMATION	GWP 8905-13L PERMIT TRANSFER TO C.R.WILSON PROPERTIES, NH INC. 30-JUL-1989	08/01/1989	.03 MB
4768591	CORRESPONDENCE-TO	REQUEST FOR GWP TO BE TRANSFERED TO NEW OWNER 15-MAY-1989	05/18/1989	.02 MB
4768590	MONITORING NONPERMIT	RESULTS OF ANALYTICAL TESTS PERFORMED ON GROUNDWATER SAMPLES 7-NOV-1988	11/07/1988	.36 MB
4769055	REPORT TO DES	ENVIRONMENTAL SITE ASSESSMENT REPORT 09-DEC-1987	05/06/1988	2.27 MB
4768589	REPORT TO DES	REMEDIAL CLEANUP ACTIVITIES 22-APR-1988	04/22/1988	2.08 MB
4769890	MONITORING NONPERMIT	COPIES OF BORING LOGS, WELL LOGS #1 & #5 29-FEB-1988	03/10/1988	1.34 MB
4770956	CORRESPONDENCE	MISC CORRESPONDENCE 1/28/1988 TO 4/19/2004	01/28/1988	.58 MB
4768984	SITE PLAN	SITE PLAN 03-MAY-1988	05/11/0988	.88 MB

Site Number: 198805017

Project Number: 0000551

Name and Address: LANE NH HOLDINGS LLC
HANOVER ST EXT
LEBANONResponsible Party: LANE NH HOLDINGS LLC ATTN: M. GEHRET ESQ
276 KINGSBURY GRADE, STE 2000
LAKE TAHOE NV 89449-3390[Mapit](#)

PHONE: 603-228-1387

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 05/06/1988

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 07/17/2002

MTBE: N

Brownfield: Y

Activities (42)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
10/24/2008	Cost Recovery Payment Received	BLEDSE	10/24/2008	No Action Necessary (Report filed)	
12/21/2007	Fund Reimbursement Request Received	ESTABROOK	03/26/2008	Fund Reimbursement Request Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4067427	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 14	03/26/2008 .02 MB

12/06/2007	Fund Reimbursement Request Received	BLEDSE	10/24/2008	Fund Reimbursement Request Approved	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4143834	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 13	10/24/2008 .02 MB

11/16/2007	Annual Report Received	ESTABROOK	12/17/2007	Regulatory Action Compl.-DES File Closed	
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4056238	CORRESPONDENCE-FROM	CERTIFICATE OF NO FURTHER ACTION & FILE CLOSE OUT MEMO IN RESPONSE TO ANNUAL 2007 GROUNDWATER SAMPLING REPORT PREPARED BY CORPORATE ENVIRONMENTAL ADVISORS DATED NOVEMBER 16 2007	12/10/2007 .06 MB
4053239	PERMIT INFORMATION	GWP-198805017-L-002 2007 ANNUAL GROUNDWATER SAMPLING REPORT 16-NOV-2007	11/16/2007 6.91 MB

Site Number: 198805017

Project Number: 0000551

Name and Address: LANE NH HOLDINGS LLC
HANOVER ST EXT
LEBANONResponsible Party: LANE NH HOLDINGS LLC ATTN: M. GEHRET ESQ
276 KINGSBURY GRADE, STE 2000
LAKE TAHOE NV 89449-3390[Mapit](#)

PHONE: 603-228-1387

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 05/06/1988

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 07/17/2002

MTBE: N

Brownfield: Y

Activities (42)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
06/28/2007	Fund Reimbursement Request Received	ESTABROOK	09/20/2007	Fund Reimbursement Request Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4046064	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 12	09/20/2007 .02 MB

05/31/2007	Permit Related GW Data Submittal	ESTABROOK	06/14/2007	Technical Report Approved	
11/22/2006	Fund Reimbursement Request Received	ESTABROOK	02/22/2007	Fund Reimbursement Request Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4015336	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 11	02/22/2007 .02 MB

11/15/2006	Annual Report Received	ESTABROOK	11/28/2006	Technical Report Approved	
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4003940	CORRESPONDENCE-FROM	RESPONSE TO ANNUAL GROUNDWATER SAMPLING REPORT PREPARED BY CORPORATE ENVIRONMENTAL ADVISORS DATED NOVEMBER 15 2006	11/28/2006 .09 MB
4002660	PERMIT INFORMATION	GWP-198805017-L-002 ANNUAL GROUNDWATER REPORT 15-NOV-2006	11/15/2006 1.13 MB

Site Number: 198805017

Project Number: 0000551

Name and Address: LANE NH HOLDINGS LLC
HANOVER ST EXT
LEBANONResponsible Party: LANE NH HOLDINGS LLC ATTN: M. GEHRET ESQ
276 KINGSBURY GRADE, STE 2000
LAKE TAHOE NV 89449-3390[Mapit](#)

PHONE: 603-228-1387

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 05/06/1988

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 07/17/2002

MTBE: N

Brownfield: Y

Activities (42)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
07/10/2006	Fund Reimbursement Request Received	ESTABROOK	09/07/2006	Fund Reimbursement Request Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
3992068	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 10	09/06/2006 .02 MB

	BLEDSON	07/10/2006	Additional Information Requested	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4567528	CORRESPONDENCE-FROM	STATE FUND DEDUCTIBLE INVOICE	07/10/2006 .03 MB

06/19/2006	Fund Reimbursement Request Received	ESTABROOK	08/29/2006	Fund Reimbursement Request Approved	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
3989874	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 9	08/29/2006 .02 MB

06/06/2006	Permit Related GW Data Submittal	ESTABROOK	06/09/2006	Technical Report Approved	
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Site Number: 198805017

Project Number: 0000551

Name and Address: LANE NH HOLDINGS LLC
HANOVER ST EXT
LEBANONResponsible Party: LANE NH HOLDINGS LLC ATTN: M. GEHRET ESQ
276 KINGSBURY GRADE, STE 2000
LAKE TAHOE NV 89449-3390[Mapit](#)

PHONE: 603-228-1387

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 05/06/1988

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 07/17/2002

MTBE: N

Brownfield: Y

Activities (42)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
05/02/2006	Fund Reimbursement Request Received	BLED SOE	07/08/2006	Fund Reimbursement Request Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
3980795	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 8	07/08/2006 .02 MB

02/17/2006	Groundwater Permit Application Received	ESTABROOK	03/10/2006	Groundwater Permit Issued	
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
3958675	PERMIT INFORMATION	GWP-198805017-L-001 GROUNDWATER MANAGEMENT PERMIT	03/10/2006 .13 MB
3956155	PERMIT INFORMATION	GWP-198805017-L-001 GROUNDWATER MANAGEMENT PERMIT APPLICATION 15-FEB-06	02/17/2006 3.28 MB

11/04/2005	Non-Permit GW Monitoring Result Received	ESTABROOK	12/05/2005	Groundwater Permit Requested	
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
3947077	CORRESPONDENCE	RESPONSE TO SEPTEMBER 2005 GROUNDWATER SAMPLING REPORT PREPARED BY APPLIED GEOSYSTEMS DATED NOVEMBER 7 2005	12/05/2005 .22 MB
3943142	MONITORING NONPERMIT	APRIL (SEPTEMBER) 2005 GROUNDWATER SAMPLING REPORT 07-NOV-2005	11/04/2005 .73 MB

Site Number: 198805017

Project Number: 0000551

Name and Address: LANE NH HOLDINGS LLC
HANOVER ST EXT
LEBANONResponsible Party: LANE NH HOLDINGS LLC ATTN: M. GEHRET ESQ
276 KINGSBURY GRADE, STE 2000
LAKE TAHOE NV 89449-3390[Mapit](#)

PHONE: 603-228-1387

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 05/06/1988

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 07/17/2002

MTBE: N

Brownfield: Y

Activities (42)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
		ESTABROOK	10/04/2005	Additional Information Requested	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
3939872	CORRESPONDENCE	RESPONSE TO: OVERDUE GROUNDWATER QUALITY DATA	10/04/2005 .22 MB

11/29/2004	Fund Reimbursement Request Received	ESTABROOK	12/22/2004	Fund Reimbursement Request Approved	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
3876300	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 7	12/22/2004 .02 MB

11/29/2004	Non-Permit GW Monitoring Result Received	ESTABROOK	12/07/2004	Technical Report Approved	
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
3871834	SITE PLAN	Site Plan From Groundwater Monitoring Results Dated 11/22/04	11/29/2004 1.31 MB
3871833	MONITORING NONPERMIT	Groundwater Monitoring Results Dated 11/22/04	11/29/2004 2.45 MB

Site Number: 198805017

Project Number: 0000551

Name and Address: LANE NH HOLDINGS LLC
HANOVER ST EXT
LEBANONResponsible Party: LANE NH HOLDINGS LLC ATTN: M. GEHRET ESQ
276 KINGSBURY GRADE, STE 2000
LAKE TAHOE NV 89449-3390[Mapit](#)

PHONE: 603-228-1387

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 05/06/1988

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 07/17/2002

MTBE: N

Brownfield: Y

Activities (42)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
08/27/2004	Fund Reimbursement Request Received	ESTABROOK	10/14/2004	Fund Reimbursement Request Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
3856868	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 6	10/14/2004 .03 MB

08/20/2004	Additional Information Received	ESTABROOK	09/10/2004	Technical Report Approved	
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Activity Documents (3)

Document Type	Document Title	Document Date	File Size
3854865	CORRESPONDENCE	RESPONSE TO: REMEDIAL PLAN IMPLEMENTATION AND GROUNDWATER MONITORING RESULTS PREPARED BY BRUNO ASSOC. INC. P.C. AND HARPER ENVIRONMENTAL ASSOC. DATED AUGUST 17 2004 AND GROUNDWATER MONITORING RESULTS	09/13/2004 .41 MB
3863874	CORRESPONDENCE	RESPONSE TO: REMEDIAL PLAN IMPLEMENTATION AND GROUNDWATER MONITORING RESULTS PREPARED BY BRUNO ASSOC. INC. P.C. AND HARPER ENVIRONMENTAL ASSOC. DATED AUGUST 17 2004 AND GROUNDWATER MONITORING RESULTS	09/13/2004 2.05 MB
3845958	REPORT	Remedial Plan Implementation and Groundwater Monitoring Results Dated 8/17/04	08/20/2004 46.65 MB

08/17/2004	Non-Permit GW Monitoring Result Received	ESTABROOK	09/10/2004	Technical Report Approved	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
3846005	MONITORING NONPERMIT	July 2004 Groundwater Monitoring Results Dated 8/10/04	08/17/2004 13.86 MB

Site Number: 198805017

Project Number: 0000551

Name and Address: LANE NH HOLDINGS LLC
HANOVER ST EXT
LEBANONResponsible Party: LANE NH HOLDINGS LLC ATTN: M. GEHRET ESQ
276 KINGSBURY GRADE, STE 2000
LAKE TAHOE NV 89449-3390[Mapit](#)

PHONE: 603-228-1387

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 05/06/1988

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 07/17/2002

MTBE: N

Brownfield: Y

Activities (42)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
08/13/2004	Fund Reimbursement Request Received	ESTABROOK	09/29/2004	Fund Reimbursement Request Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
3852193	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 5	09/29/2004 .02 MB

01/08/2004	Fund Reimbursement Request Received	KIRBY	02/17/2004	Fund Reimbursement Request Approved	
01/05/2004	Non-Permit GW Monitoring Result Received	KIRBY	01/15/2004	Additional Information Requested	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4768727	MONITORING NONPERMIT	GROUNDWATER AND SOIL SAMPLING RESULTS 30-DEC-2003	01/05/2004 1.16 MB

12/30/2003	Additional Information Received	KIRBY	04/07/2004	Technical Report Approved	
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
3863875	CORRESPONDENCE	RESPONSE TO GROUNDWATER AND SOIL SAMPLING RESULTS BY T & M CONSULTANTS DATED 12/30/03 BY G KIRBY	04/07/2004 2.05 MB
3811694	CORRESPONDENCE	RESPONSE TO GROUNDWATER AND SOIL SAMPLING RESULTS BY T & M CONSULTANTS DATED 12/30/03	04/07/2004 .15 MB

09/26/2003	Fund Reimbursement Request Received	KIRBY	10/20/2003	Fund Reimbursement Request Approved	
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Site Number: 198805017

Project Number: 0000551

Name and Address: LANE NH HOLDINGS LLC
HANOVER ST EXT
LEBANONResponsible Party: LANE NH HOLDINGS LLC ATTN: M. GEHRET ESQ
276 KINGSBURY GRADE, STE 2000
LAKE TAHOE NV 89449-3390[Mapit](#)

PHONE: 603-228-1387

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 05/06/1988

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 07/17/2002

MTBE: N

Brownfield: Y

Activities (42)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
09/22/2003	Non-Permit GW Monitoring Result Received	KIRBY	09/25/2003	Additional Information Requested	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4768562	MONITORING NONPERMIT	SEPTEMBER 2003 DATA SUBMITTAL 17-SEP-2003	09/22/2003 .80 MB

07/07/2003	Fund Reimbursement Request Received	KIRBY	09/05/2003	Fund Reimbursement Request Approved	
06/30/2003	Non-Permit GW Monitoring Result Received	KIRBY	07/03/2003	Technical Report Approved	
06/30/2003	Non-Permit GW Monitoring Result Received	KIRBY	07/03/2003	Technical Report Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4768560	MONITORING NONPERMIT	JUNE 2003 DATA SUBMITTAL 25-JUN-2003	06/25/2003 1.31 MB

06/27/2003	Fund Reimbursement Request Received	KIRBY	09/05/2003	Fund Reimbursement Request Approved	
02/27/2003	Work Scope Submitted	MONGEON	07/21/2003	Work Scope Approved	
02/04/2003	Site Investigation Report Received	KIRBY	02/21/2003	Groundwater Permit Requested	

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4757544	CORRESPONDENCE-FROM	RESPONSE TO SUPPLEMENTAL SITE INVESTIGATION REPORT	02/21/2003 .06 MB
4768722	REPORT TO DES	SUPPLEMENTAL SITE INVESTIGATION 30-JAN-2003	02/04/2003 3.17 MB

12/20/2002	Change Order	KIRBY	12/23/2002	Work Scope Approved	
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Site Number: 198805017

Project Number: 0000551

Name and Address: LANE NH HOLDINGS LLC
HANOVER ST EXT
LEBANONResponsible Party: LANE NH HOLDINGS LLC ATTN: M. GEHRET ESQ
276 KINGSBURY GRADE, STE 2000
LAKE TAHOE NV 89449-3390[Mapit](#)

PHONE: 603-228-1387

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 05/06/1988

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 07/17/2002

MTBE: N

Brownfield: Y

Activities (42)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
08/05/2002	Change Order	CROCE	08/06/2002	Change Order Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4768620	WORKSCOPE/BUDGET	CHANGE ORDER FOR THREE-MAN CREW TO LOCATE MONITORING WELLS 05-AUG-2002	08/05/2002 .10 MB

02/01/2002	Additional Information Received	KIRBY	02/08/2002	Notice of Intent of State Action (state-	
04/05/1999	Additional Information Received	KIRBY	05/08/2000	Additional Information Requested	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4757551	CORRESPONDENCE-FROM	REQUEST FOR GROUNDWATER SAMPLING	05/08/2000 .09 MB

03/01/1995	OBS - No direct conversion to new code	ESTABROOK	12/20/1995	Additional Information Requested	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4768608	CORRESPONDENCE-TO	ISSUES CONCERNING GROUNDWATER CONTAMINATION AT THE SITE 20-DEC-1995	12/20/1995 .07 MB

Site Number: 198805017

Project Number: 0000551

Name and Address: LANE NH HOLDINGS LLC
HANOVER ST EXT
LEBANONResponsible Party: LANE NH HOLDINGS LLC ATTN: M. GEHRET ESQ
276 KINGSBURY GRADE, STE 2000
LAKE TAHOE NV 89449-3390[Mapit](#)

PHONE: 603-228-1387

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 05/06/1988

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 07/17/2002

MTBE: N

Brownfield: Y

Activities (42)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
		REICHARD	08/11/1992	Monitor. Results Viol.(GMZ, GMD Breach)	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4768598	CORRESPONDENCE-FROM	NOTICE OF MONITORING RESULTS VIOLATION 11-AUG-1992	08/11/1992 .04 MB

		CARLSON	02/11/1991	Groundwater Permit Requested	
08/01/1990	Groundwater Permit Application Received	CARLSON	01/28/1991	Groundwater Permit Requested	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4768594	CORRESPONDENCE-FROM	GROUNDWATER PERMIT APPLICATION SENT 28-JAN-1991	01/28/1991 .04 MB

03/23/1989		CARLSON	05/16/1989	Groundwater Permit Issued	
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Activity Documents (3)

Document Type	Document Title	Document Date	File Size
4214072	PERMIT INFORMATION	GWP-8905-13L GROUNDWATER MANAGEMENT PERMIT	05/16/1989 .11 MB
4769892	PERMIT INFORMATION	APPLICATION FOR GROUNDWATER MANAGEMENT PERMIT 20-MAR-1989	03/21/1989 .22 MB
4769891	REPORT TO DES	COPIES OF RETURN RECEIPTS FROM ABUTTERS 3-APR-1989	03/07/1989 .62 MB

Site Number: 198805017

Project Number: 0000551

Name and Address: LANE NH HOLDINGS LLC
HANOVER ST EXT
LEBANONResponsible Party: LANE NH HOLDINGS LLC ATTN: M. GEHRET ESQ
276 KINGSBURY GRADE, STE 2000
LAKE TAHOE NV 89449-3390[Mapit](#)

PHONE: 603-228-1387

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 05/06/1988

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 07/17/2002

MTBE: N

Brownfield: Y

Permits (20)

Permit Number	Permit Type	Application Date	Issue Date	Expiration Date	Revision Date(s)	Permittee
GWP-198805017-L-002	MANAGEMENT	01/31/2006	03/10/2006	03/09/2011		LANE HOLDINGS LLC 1660 BRADY CIRCLE CARLSBAD CA 92008

Permit Submittals

Due Date	Received Date	Sampling Date	Sample Description	Comments
12/30/2006	11/15/2006		ANNUAL GROUNDWATER REPORT	
12/30/2010			LAST ROUND THIS PERMIT	
06/15/2010				
12/09/2010			PERMIT RENEWAL DUE	
06/15/2009				
12/30/2008				
06/15/2008				
06/10/2006	05/31/2006		RECORDATION BK3283 PG0586	
06/15/2006	06/06/2006		MAY 2006 GW SAMPLING REPORT	
12/30/2009				
06/15/2007	05/31/2007		APRIL 2007 GW SAMPLING REPORT	
12/30/2007	11/16/2007		2007 ANNUAL GW SAMPLING REPORT	

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Leaking Underground Storage Tank Project Report

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Site Number: 198805017

Project Number: 0000551

Name and Address: LANE NH HOLDINGS LLC
HANOVER ST EXT
LEBANON

Responsible Party: LANE NH HOLDINGS LLC ATTN: M. GEHRET ESQ
276 KINGSBURY GRADE, STE 2000
LAKE TAHOE NV 89449-3390

[Mapit](#)

PHONE: 603-228-1387

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 05/06/1988

Eligibile: PERMANENTLY ELIGIBLE

Eligibilty Determined on: 07/17/2002

MTBE: N

Brownfield: Y

Permits (20)						
Permit Number	Permit Type	Application Date	Issue Date	Expiration Date	Revision Date(s)	Permitee
8905-13L		05/08/1989	05/08/1989	05/07/1994		

Permit Submittals				
Due Date	Received Date	Sampling Date	Sample Description	Comments
11/30/1993	11/11/2011		request current H2O data 12/20/95	
05/30/1993	01/01/2001			
11/30/1992	01/01/2001			
05/30/1992	01/01/2001			
11/30/1991	01/01/2001			
05/30/1991	01/01/2001		Black Hole Site - To Lombardo 8/94	
			B-1,B-5 Semi-ann. BTEX & Tot Petro Hydro	

No Vapor Recovery Information

Site Number: 198805017

Project Number: 0039223

Name and Address: FORMER DENSMORE BRICKYARD SITE
HANOVER ST EXT
LEBANON

Responsible Party: LANE NH HOLDINGS, LLC

[Mapit](#)

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 06/26/2019

Eligible:

Eligibility Determined on:

MTBE: N

Brownfield: Y

Activities (2)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
04/02/2021	Additional Information Received	MCCLUSKEY	04/19/2023	Regulatory Action Compl.-DES File Closed	RECOMMENDATIONS LIMITED TO KEEPING AN EYE ON AN OFFSITE, UPGRADIENT PLUME, REVISTING AN AREA THAT WAS OVERGROWN AT THE TIME OF THE SITE ASSESSMENT, AND ADDRESSING HAZARDOUS BUILDING MATERIALS.

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4912875 REPORT TO DES	PHASE I ENVIRONMENTAL SITE ASSESSMENT	04/02/2021	5.00 MB

06/26/2019	Additional Information Received	MCCLUSKEY	07/01/2019	TECHNICAL INFORMATION PROVIDED	ISSUED PETROLEUM BROWNFIELDS ELIGIBILITY DETERMINATION.
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4785329 CORRESPONDENCE-FROM	PETROLEUM BROWNFIELDS ELIGIBILITY DETERMINATION	07/01/2019	.50 MB

Site Number: 198805017

Project Number: 0039223

Name and Address: FORMER DENSMORE BRICKYARD SITE
HANOVER ST EXT
LEBANON

Responsible Party: LANE NH HOLDINGS, LLC

[Mapit](#)

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 06/26/2019

Eligible:

Eligibility Determined on:

MTBE: N

Brownfield: Y

No Vapor Recovery Information

Site Number: 198805017

Facility Id: 0114000

System Name and Address: LANE NH HOLDINGS LLC
HANOVER ST EXT
LEBANONFacility Owner: LANE NH HOLDINGS LLC
1660 BRADY CIRCLE
CARLSBAD CA 92008[Mapit](#)

Registration Date: 04/16/2006

Facility Type: COMMERCIAL

Tanks (3)

Active: 0 Closed: 3

Tank #	Substance Stored	Capacity	Installed Date	Temporarily Closed Date	Permanently Closed Date	Assessment Received Date	Construction Material	Piping Material	System Type	Overfill Install Date	Spill Install Date
1	GASOLINE	1000	11/11/1911		03/11/1988		STEEL - BARE/GALV	STEEL - BARE/GALV			
2	GASOLINE	1000	11/11/1911		03/11/1988		STEEL - BARE/GALV	STEEL - BARE/GALV			
3	DIESEL FUEL	1000	11/11/1911		03/11/1988		STEEL - BARE/GALV	STEEL - BARE/GALV			

Activity (1)

Activity	Enforcement Number	Activity Date	Substantial Compliance	Deadline	Response	Response Date
COMPLIANCE FILE REVIEW - COMPLIANT		07/17/2002	P			

Permits (1)

Type	Renewal Date	Issue Date
UST Permit		

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Site Number: 198805017

Facility Id: 0114000

System Name and Address: LANE NH HOLDINGS LLC
HANOVER ST EXT
LEBANON

Facility Owner: LANE NH HOLDINGS LLC
1660 BRADY CIRCLE
CARLSBAD CA 92008

[Mapit](#)

Registration Date: 04/16/2006

Facility Type: COMMERCIAL

Documents (5)				
	Document Type	Name/Title	Date Submitted	File Size
3968706	REGISTRATION	REGISTRATION FOR UNDERGROUND STORAGE TANKS	03/14/2006	.16 MB
3743512	REGISTRATION	Notification For USTs	02/15/2000	.96 MB
3743511	CORRESPONDENCE	Correspondence	07/18/1988	.12 MB
3743513	REPORT	UST Closure Report Dated 3/24/88	03/25/1988	.04 MB
4769087	REGISTRATION	REGISTRATION FORM	02/15/1988	.23 MB

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Underground Injection Control Project Report

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Site Number: 199308002

Project Number: 0005702

Name and Address: FORMER MUFFLER HOUSE/RENT A WRECK
237 HANOVER ST
LEBANON

Responsible Party: BOISVERT PLUMBING & HEATING
WEST LEBANON NH 03784

[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: NO SOURCES/NO AGQS VIO'S FROM ONSITE

Assigned To: CLOSED

Discovery Date: 03/15/1995

Eligibile:

Eligibilty Determined on:

MTBE: N

Brownfield: N

Activities (7)					
Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
		LOCKER	11/19/2001	Regulatory Action Compl.-DES File Closed	
		LOCKER	10/23/2001	Additional Information Requested	
		LOCKER	05/11/2000	Additional Information Requested	
		LOCKER	01/06/1999	Additional Information Requested	
		LOCKER	12/10/1998	Additional Information Requested	
08/17/1998	Additional Information Received	CARD	08/17/1998	Additional Information Requested	

Activity Documents (1)				
Document Type		Document Title	Document Date	File Size
4632347	CORRESPONDENCE-FROM	REQUEST FOR STATUS OF FLOOR DRAINS	08/17/1998	.05 MB

03/15/1995	Additional Information Received	CARD	01/05/1998	Additional Information Requested	
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Activity Documents (1)				
Document Type		Document Title	Document Date	File Size
4632346	CORRESPONDENCE-FROM	REQUEST FOR STATUS OF FLOOR DRAINS	01/06/1998	.05 MB

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Underground Injection Control Project Report

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Site Number:	199308002	Project Number:	0005702
Name and Address:	FORMER MUFFLER HOUSE/RENT A WRECK 237 HANOVER ST LEBANON	Responsible Party:	BOISVERT PLUMBING & HEATING WEST LEBANON NH 03784
Mapit		PHONE:	603-298-8482
Wellhead Protection Area:	Unknown	Risk Level:	NO SOURCES/NO AGQS VIO'S FROM ONSITE
Assigned To:	CLOSED	Discovery Date:	03/15/1995
Eligibile:		Eligibilty Determined on:	
MTBE:	N	Brownfield:	N

No Vapor Recovery Information

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Hazardous Waste Generator Report

Agenda Item 4.A
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EPA Id: NHD510107642

Current Name and Address: BOISVERT EUGENE
237 HANOVER ST
LEBANON

[Mapit](#)

Effective Date: 06/20/2006

Generator Size: NONE

Handler Id: 0006268

Contact Information: EUGENE BOISVERT
2 PASTURE LN
WEST LEBANON NH 03784
603-298-6888

Current Status: INACTIVE

Owner:

Notifications / Updates (2)					
Notification Date	Effective Date	Name	Generator Status	Generator Size	Generator Type
06/29/2006	06/20/2006	BOISVERT EUGENE	INACTIVE	NONE	STATE REGULATED
03/06/1999	03/06/1999	BOISVERT EUGENE	ACTIVE	SQG(CESQG)	STATE REGULATED

EPA Id: NHD510107642

Handler Id: 0006268

Current Name and Address: BOISVERT EUGENE
237 HANOVER ST
LEBANONContact Information: EUGENE BOISVERT
2 PASTURE LN
WEST LEBANON NH 03784[Mapit](#)

603-298-6888

Effective Date: 06/20/2006

Current Status: INACTIVE

Generator Size: NONE

Owner:

Documents (7)

	Document Type	Manifest Number	Year	Quarter	Name/Title	File Size
4297812	Other		2005	1	SQG SELF-CERTIFICATION	3.69 MB
3981056	Notification Declass		2006			.21 MB
3911582	GIS Field Location Form		1995			.04 MB
3842236	Quarterly Reports		2003	4		.17 MB
3832339	Correspondence Out		2003	4	1ST DELINQUENT LETTER	.08 MB
3767249	Manifest Copy 7	MEE001399	2003	4		1.49 MB
3757780	Manifest Copy 2	MEE001399	2003	4		.68 MB

EPA Id: NHD510107642

Handler Id: 0006268

Current Name and Address: BOISVERT EUGENE
237 HANOVER ST
LEBANONContact Information: EUGENE BOISVERT
2 PASTURE LN
WEST LEBANON NH 03784[Mapit](#)

603-298-6888

Effective Date: 06/20/2006

Current Status: INACTIVE

Generator Size: NONE

Owner:

Manifests (3)

Ext.	Manifest No.	Manifest Date	Generator Signature Date	First Transporter Id	Transporter Signature Date	Other Transporter Ids	Facility Id	Facility Signature Date
04399	MEE001399	11/24/2003	10/01/2003	MAD980670004	10/01/2003		MED019051069	10/02/2003

Waste Streams (1)

DOT Id	Waste Description	Waste Codes	# of Cont.	Cont. Type	Total Qty	Reported Units	Fee Status	Weight In lbs.	Assessed Weight	Discrepancy
NONE	PET CONT SOLIDS	1: NH01-NH Used Oil (T)	1	DM	100	POUNDS	ASSESSED FEE	100	100	
44495	MEA144495	03/05/1999 10/24/1996	NHD980521843	10/24/1996	2nd: NHD980521843		MED019051069	10/30/1996		

Waste Streams (1)

DOT Id	Waste Description	Waste Codes	# of Cont.	Cont. Type	Total Qty	Reported Units	Fee Status	Weight In lbs.	Assessed Weight	Discrepancy
UN1203	Gasoline	1: D001-Ignitability	1	TT	2500	GALLONS	ASSESSED FEE	20842.5	843	
01287	CTC119190	03/05/1999 03/07/1988	VAD980831580	03/07/1988			CTD072138969	03/09/1988		

Waste Streams (1)

DOT Id	Waste Description	Waste Codes	# of Cont.	Cont. Type	Total Qty	Reported Units	Fee Status	Weight In lbs.	Assessed Weight	Discrepancy
NA1263	WST PAINT FLAM LIQ	1: F003-Spent non-halogenated solvents (I)	1	TT	80	GALLONS	RECYCLING-EXEMPT	574	0	

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Project Related Documents (11)

	Document Type	Name/Title	Date Submitted	File Size
4150998	PERMIT INFORMATION	GWP-199308002-L-002 OCTOBER 2008 GROUNDWATER MONITORING RESULTS 10-DEC-2008	12/10/2008	1.07 MB
4129772	PERMIT INFORMATION	GWP-199308002-L-002 MAY 2008 GROUNDWATER MONITORING RESULTS 26-AUG-2008	08/26/2008	.62 MB
4033140	PERMIT INFORMATION	GWP-199308002-L-001 MAY 2007 GROUNDWATER MONITORING RESULTS 29-JUN-2007	06/29/2007	.62 MB
3990268	PERMIT INFORMATION	GWP-199308002-L-001 JUNE 2006 GROUNDWATER MONITORING RESULTS 24-AUG-2006	08/25/2006	3.63 MB
3911205	PERMIT INFORMATION	GWP-199308002-L-001 MAY 2005 GROUNDWATER MONITORING RESULTS BY PATHWAYS 15-JUN-2005	06/22/2005	3.58 MB
4632384	REPORT TO DES	18-AUG-2004 SOIL SAMPLING RESULTS	09/09/2004	.75 MB
3822118	PERMIT INFORMATION	GWP-199308002-L-001 Groundwater Monitoring Results Dated 6/2/04	06/07/2004	5.43 MB
3799650	CORRESPONDENCE	CORRESPONDENCE DATED 3/23/04	03/23/2004	1.28 MB
4632381	PERMIT INFORMATION	GWP-199308002-L-001 MAY 2003 DATA SUBMITTAL 28-MAY-2003	05/30/2003	1.07 MB
4632082	CORRESPONDENCE	CORRESPONDENCE 07/23/1993 - 03/18/2004	07/23/1993	.89 MB
4632074	SITE PLAN	SOIL VAPOR SURVEY & GROUNDWATER TABLE CONTOURS MAPS	06/17/1993	.11 MB

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Leaking Underground Storage Tank Project Report

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Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANON

Responsible Party: EUGENE BOISVERT
LEBANON NH 03784

Mapit

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibilty Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
07/17/2024	Additional Information Received	MARTS-JENNIFER	07/17/2024	Cost Recovery Bill Sent	SITE # 199308002004405 237 HANOVER ST, LEBANON COST RECOVERY FOR PERIOD 01/01/2024 - 03/31/2024

Activity Documents (1)				
Document Type		Document Title	Document Date	File Size
5211828	REIMBURSEMENT	INTERIM COST RECOVERY 01/01/2024 - 03/31/2024 INVOICE #: ORCB-CR-007957	07/17/2024	.07 MB

06/26/2024	Fund Reimbursement Request Received	OAKES			
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Activity Documents (1)				
Document Type		Document Title	Document Date	File Size
5205178	REIMBURSEMENT	REQ. NO. 52	06/26/2024	1.51 MB

06/26/2024	Fund Reimbursement Request Received	OAKES			
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Activity Documents (1)				
Document Type		Document Title	Document Date	File Size
5203933	REIMBURSEMENT	REQ. NO. 51	06/26/2024	1.51 MB

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Leaking Underground Storage Tank Project Report

Agenda Item 4.A
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Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANON

Responsible Party: EUGENE BOISVERT
LEBANON NH 03784

Mapit

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligibile: PERMANENTLY ELIGIBLE

Eligibilty Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
04/30/2024	Permit Related GW Data Submittal	OAKES			

Activity Documents (1)				
Document Type		Document Title	Document Date	File Size
5186573	PERMIT INFORMATION	GWP-199308002-L-004 APRIL 2024 DATA SUBMITTAL	30-APR-2021	04/30/2024 .97 MB

04/26/2024	Permit Related GW Data Submittal	OAKES			
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Activity Documents (1)				
Document Type		Document Title	Document Date	File Size
5186067	PERMIT INFORMATION	GWP-199308002-L-004 APRIL 2024 DATA SUBMITTAL	26-APR-2024	04/26/2024 1.38 MB

04/16/2024	Fund Reimbursement Request Received	MARTS-JENNIFER	05/08/2024	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)				
Document Type		Document Title	Document Date	File Size
5188495	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 50	05/08/2024	.01 MB
5181285	REIMBURSEMENT	INTERIM COST RECOVERY 10/01/2023 - 12/31/2023 INVOICE #: ORCB-CR-006373	04/16/2024	.14 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
03/20/2024	Permit Related GW Data Submittal	OAKES	04/03/2024		CONTINUE MONITORING PER GMP. NEXT EVENT APRIL 2024. GPA OVERUDE.

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
5170169	PERMIT INFORMATION	GWP-199308002-L-004 OCT 2023 DATA SUBMITTAL 20-MAR-2024	03/20/2024 1.18 MB

01/29/2024	Fund Reimbursement Request Received	MARTS-JENNIFER	02/13/2024	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
5155096	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 49	02/13/2024 .01 MB
5152089	REIMBURSEMENT	INTERIM COST RECOVERY 07/01/2023 - 09/30/2023 INVOICE #: ORCB-CR-004821	01/29/2024 .14 MB

12/27/2023	Fund Reimbursement Request Received	OAKES	01/24/2024	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
5148436	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 48	01/24/2024 .01 MB
5144334	REIMBURSEMENT	REQ. NO. 48	12/27/2023 1.47 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
12/27/2023	Fund Reimbursement Request Received	OAKES	01/24/2024	Fund Reimbursement Request Approved	APPROVED BY DES

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
5148428	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 47	01/24/2024 .01 MB
5144261	REIMBURSEMENT	REQ. NO. 47	12/27/2023 2.19 MB

11/09/2023	Additional Information Received	MARTS-JENNIFER	11/09/2023	Cost Recovery Bill Sent	SITE # 199308002004405 237 HANOVER ST, LEBANON COST RECOVERY FOR PERIOD 04/01/2023 - 06/30/2023
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
5130913	REIMBURSEMENT	INTERIM COST RECOVERY 04/01/2023 - 06/30/2023 INVOICE #: ORCB-CR-003317	11/09/2023 .07 MB

10/23/2023	Permit Related GW Data Submittal	OAKES	11/13/2023	Technical Report Approved	CONTINUE MONITORING. GPA DUE. OCT 2023 DT DUE.
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
5127103	PERMIT INFORMATION	GWP-199308002-L-004 APRIL 2023 DATA SUBMITTAL 23-OCT-2023	10/23/2023 1.02 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
09/06/2023	Fund Reimbursement Request Received	MARTS-JENNIFER	09/05/2023	Fund Reimbursement Request Approved	APPROVED BY DES

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
5113585	REIMBURSEMENT	INTERIM COST RECOVERY 01/01/2023 - 03/31/2023 INVOICE #: ORCB-CR-001828	09/06/2023 .14 MB
5114081	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 46	09/05/2023 .01 MB

06/05/2023	Permit Related GW Data Submittal	OAKES	11/13/2023	Additional Information Requested	REQUESTED INSTALLATION OF NEW MW AND WORK PLAN FOR SOIL REMOVAL. GPA OVERDUE.
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
5133085	CORRESPONDENCE-FROM	RESPONSE TO 2021 DATA GAP INVESTIGATION AND NOVEMBER 2021 DATA SUBMITTAL 14-NOV-2023	11/14/2023 .34 MB
5090049	PERMIT INFORMATION	GWP-199308002-L-004 2021 DATA GAP INVESTIGATION REPORT & NOV 2021 DATA SUBMITTAL 05-JUN-2023	06/05/2023 5.00 MB

05/05/2023	Fund Reimbursement Request Received	MARTS-JENNIFER	06/16/2023	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
5092769	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 45	06/16/2023 .01 MB
5080762	REIMBURSEMENT	INTERIM COST RECOVERY 10/01/2022 - 12/31/2022 INVOICE #: ORCB-CR-000388	05/05/2023 .07 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
04/04/2023	Fund Reimbursement Request Received	OAKES	05/17/2023	Fund Reimbursement Request Approved	APPROVED BY DES

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
5083777	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 44	05/17/2023 .01 MB
5072923	REIMBURSEMENT	REQ. NO. 44	04/06/2023 3.44 MB

02/22/2023	Change Order	OAKES	02/22/2023	Change Order Approved	APPROVED. REPORT OVERDUE.
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
5063016	WORKSCOPE/BUDGET	CO FOR ADDITIONAL REPORTING AND WELL SURVEY 22-FEB-2023	02/22/2023 .22 MB

01/04/2023	Permit Related GW Data Submittal	OAKES	03/20/2023	Technical Report Approved	CONTINUE MONITORING PER GMP.
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
5052163	PERMIT INFORMATION	GWP-199308002-L-004 NOV 2022 DATA SUBMITTAL 3-JAN-2023	01/04/2023 1.38 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
12/29/2022	Fund Reimbursement Request Received	OAKES	02/08/2023	Fund Reimbursement Request Approved	APPROVED BY DES

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
5060836	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 43	02/08/2023 .01 MB
5054922	REIMBURSEMENT	REQ. NO. 43	01/13/2023 1.26 MB

12/29/2022	Fund Reimbursement Request Received	OAKES	02/08/2023	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
5060832	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 42	02/08/2023 .01 MB
5054921	REIMBURSEMENT	REQ. NO. 42	01/13/2023 1.26 MB

06/22/2022	Permit Related GW Data Submittal	OAKES	07/12/2022	Technical Report Approved	COCS HIGHEST IN RECENT HISTORY AT MW-13. STILL AWAITING DATA GAP ANALYSIS AND 2022 PSR. CONTINUE MONITORING PER GMP.
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
5006910	PERMIT INFORMATION	GWP-199308002-L-004 APRIL 2022 DATA SUBMITTAL 22-JUN-2022	06/22/2022 1.55 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
02/28/2022	Permit Related GW Data Submittal	OAKES	03/18/2022	Technical Report Approved	BENZENE/ETHYLBENZENE INCREASING AT MW-9 AND MW-13. REVIEW RECOMMENDATIONS IN DATA GAP ASSESSMENT - PENDING SUBMITTAL.

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4975663	PERMIT INFORMATION	GWP-199308002-L-004 NOV 2021 DATA SUBMITTAL 28-FEB-2022	02/28/2022 2.43 MB

11/22/2021	Fund Reimbursement Request Received	OAKES	12/15/2021	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4964799	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 41	12/15/2021 .01 MB
4963351	REIMBURSEMENT	REQ. NO. 41	12/02/2021 1.78 MB

09/29/2021	Work Scope Submitted	OAKES	09/29/2021	Work Scope Approved	APPROVED
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4949506	WORKSCOPE/BUDGET	WORK SCOPE AUTHORIZATION FOR DATA GAP INVESTIGATION 27-SEP-2021	09/29/2021 .29 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
07/21/2021	Annual Report Received	OAKES	08/12/2021	Technical Report Approved	REQUESTED WORK SCOPE FOR SSI FOR DATA GAP ANALYSIS. NEXT SAMPLING OCT 2021.

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4939372	CORRESPONDENCE-FROM RESPONSE TO 2021 PERIODIC SUMMARY REPORT AND PROPOSED DATA GAP INVESTIGATION 12-AUG-2021	08/12/2021	.18 MB
4935645	PERMIT INFORMATION GWP-199308002-L-004 2021 PERIODIC SUMMARY REPORT & PROPOSED DATA GAP INVESTIGATION 21-JUN-2021	07/21/2021	5.00 MB

06/10/2021	Change Order	OAKES	06/10/2021	Change Order Approved	APPROVED
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4926735	WORKSCOPE/BUDGET CHANGE ORDER AUTHORIZATION - RESURVEYING SITE WELLS. FEATURES AND UPDATING FIGURES 10-JUN-2021	06/10/2021	.13 MB

05/10/2021	Fund Reimbursement Request Received	OAKES	06/11/2021	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4927236	REIMBURSEMENT NOTICE OF REIMBURSEMENT NO. 40	06/11/2021	.01 MB
4923008	REIMBURSEMENT REQ. NO. 40	05/20/2021	3.71 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
03/18/2021	Change Order	OAKES	03/18/2021	Change Order Approved	APPROVED.

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4909610	WORKSCOPE/BUDGET	CHANGE ORDER AUTHORIZATION FOR DATA GAP ANALYSIS 18-MAR-2021	03/18/2021 .20 MB

12/01/2020	Permit Related GW Data Submittal	PISKOVITZ	12/10/2020	Technical Report Approved	MNA HAS NOT BEEN EFFECTIVE. NEED TO EVALUATE OTHER ALTERNATIVES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4891791	CORRESPONDENCE-FROM	RESPONSE TO OCTOBER 2020 DATA SUBMITTAL AND MONITORING WELL REPAIRS 15-DEC-2020	12/15/2020 .18 MB
4888830	PERMIT INFORMATION	GWP-199308002-L-004 OCT 2020 GW MONITORING DATA SUBMITTAL & MW REPAIRS 01-DEC-2020	12/01/2020 2.80 MB

07/01/2020	Work Scope Submitted	FOPIANO	07/01/2020	Work Scope Approved	NHDES APPROVED
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4856114	WORKSCOPE/BUDGET	WORK SCOPE AUTHORIZATION FOR WELL REPAIRS 01-JUL-2020	07/01/2020 .10 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
06/30/2020	Fund Reimbursement Request Received	FOPIANO	08/11/2020	Fund Reimbursement Request Approved	APPROVED BY DES

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4865582	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 39	08/11/2020 .01 MB
4856336	REIMBURSEMENT	REQ. NO. 39	07/06/2020 1.24 MB

05/27/2020	Permit Related GW Data Submittal	FOPIANO	06/16/2020	Technical Report Approved	CONTINUE TO MONITOR IN ACCORDANCE WITH GMP
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4847943	PERMIT INFORMATION	GWP-199308002-L-004 APRIL 2020 GROUNDWATER MONITORING DATA SUBMITTAL 27-MAY-2020	05/27/2020 2.75 MB

02/13/2020	Fund Reimbursement Request Received	FOPIANO	03/05/2020	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4830626	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 38	03/05/2020 .01 MB
4828485	REIMBURSEMENT	REQ. NO. 38	02/19/2020 1.19 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
12/13/2019	Permit Related GW Data Submittal	FOPIANO	12/23/2019	Technical Report Approved	LETTER SENT; CONTINUE TO MONITOR IN ACCORDANCE WITH GMP

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4824298	CORRESPONDENCE-FROM RESPONSE TO OCTOBER 2019 DATA SUBMITTAL 26-DEC-2019	12/26/2019	.17 MB
4821167	PERMIT INFORMATION GWP-199308002-L-004 OCTOBER 2019 GROUNDWATER MONITORING DATA SUBMITTAL 13-DEC-2019	12/13/2019	3.86 MB

11/21/2019	Fund Reimbursement Request Received	FOPIANO	12/11/2019	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4820853	REIMBURSEMENT NOTICE OF REIMBURSEMENT NO. 37	12/11/2019	.01 MB
4818582	REIMBURSEMENT REQ. NO. 37	11/22/2019	1.18 MB

06/24/2019	Annual Report Received	FOPIANO	07/08/2019	Technical Report Approved	STABLE BTEX PLUME; PSR SUBMITTED ONE YEAR EARLY; CONTINUE TO MONITOR IN ACCORDANCE WITH GMP
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4781827	PERMIT INFORMATION GWP-199308002-L-004 2019 PERIODIC SUMMARY W/APRIL 2019 GW MONITORING DATA 14-JUN-2019	06/24/2019	4.54 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
03/06/2019	Fund Reimbursement Request Received	FOPIANO	04/23/2019	Fund Reimbursement Request Approved	APPROVED BY DES

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4770267	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 36	04/23/2019 .01 MB
4762779	REIMBURSEMENT	REIMBURSEMENT REQ. NO. 36	03/08/2019 1.56 MB

03/06/2019	Fund Reimbursement Request Received	FOPIANO	03/21/2019	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4764766	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 35	03/21/2019 .01 MB
4762778	REIMBURSEMENT	REIMBURSEMENT REQ. NO. 35	03/08/2019 1.21 MB

03/06/2019	Fund Reimbursement Request Received	FOPIANO	03/21/2019	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4764767	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 34	03/21/2019 .01 MB
4762777	REIMBURSEMENT	REIMBURSEMENT REQ. NO. 34	03/08/2019 1.26 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
11/15/2018	Additional Information Received	FOPIANO	12/24/2018	Technical Report Approved	LETTER SENT; CONTINUE TO MONITOR IN ACCORDANCE WITH GMP

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4757134	CORRESPONDENCE-FROM	RESPONSE TO SEPTEMBE 2018 SPECIAL SAMPLING ROUND DATA SUBMITTAL	01/03/2019 .11 MB
4747033	REPORT TO DES	SEPTEMBER 2018 SPECIAL SAMPLING DATA SUBMITTAL + WELL MW-17 INSTALLATION REPORT 15-NOV-2018	11/15/2018 4.41 MB

08/06/2018	Work Scope Submitted	FOPIANO	08/15/2018	Work Scope Approved	NHDES APPROVED
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4732548	WORKSCOPE/BUDGET	APPROVED WORK SCOPE AUTHORIZATION FOR MW-17 INSTALLATION + SAMPLING & ANALYSIS + REPORTING	08/15/2018 .10 MB

07/31/2018	Work Scope Submitted	FOPIANO	08/15/2018	Work Scope Approved	NHDES APPROVED
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
5040742	CORRESPONDENCE	EMAIL INCLUDING CONSULTANT LABOR RATE ADJUSTMENTS	10/28/2022 .16 MB
4732552	WORKSCOPE/BUDGET	APPROVED WORK SCOPE AUTHORIZATION FOR 2018 - 2023 PERMIT SAMPLING & ANALYSIS + REPORTING + PERMIT RENEWAL APPLICATION	08/15/2018 .04 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
05/31/2018	Permit Related GW Data Submittal	CONNELLY	06/04/2018	Technical Report Approved	REPORT REVIEWED, CONCENTRATIONS CONSISTENT WITH HISTORICAL TRENDS, RESPONSE WILL BE SENT FOLLOWING REPORT REVIEW FROM REQUESTS LISTED IN PERMIT RENEWAL DATED 6/1/18

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4714224	PERMIT INFORMATION	GWP-199308002-L-003 APRIL 2018 DATA SUBMITTAL 31-MAY-2018	05/31/2018 1.86 MB

04/18/2018	Groundwater Permit Application Received	CONNELLY	06/01/2018	Groundwater Permit Issued	PERMIT RENEWAL TO INCLUDE INSTALLATION OF MW AT DENSMORE POND (MW-17. SAMPLING SCHEDULE OF MW-4, 6, 9, 13, 14, 15, 16, NEWLY INSTALLED MW-17 AND SURFACE WATER SW-2 FOR VOCs. STANDARD REPORTS TO FOLLOW
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4718854	PERMIT INFORMATION	GWP-199308002-L-004 GROUNDWATER MANAGEMENT PERMIT RENEWAL	06/18/2018 .20 MB
4708532	PERMIT INFORMATION	GWP-199308002-L-004 GMP RENEWAL APP	04/18/2018 3.66 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
04/18/2018	Fund Reimbursement Request Received	MUZZEY-WORTHEN	05/18/2018	Fund Reimbursement Request Approved	APPROVED BY DES

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4712716	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 33	05/18/2018 .02 MB
4709366	REIMBURSEMENT	REIMBURSEMENT REQ. NO. 33 02-APR-2018	04/18/2018 .02 MB

02/06/2018	Permit Related GW Data Submittal	CONNELLY	06/01/2018	Technical Report Approved	REPORT REVIEWED IN CONJUNCTION WITH THE PERMIT RENEWAL ISSUED 6/1/18.
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4696863	PERMIT INFORMATION	GWP-199308002-L-003 OCTOBER 2017 DATA SUBMITTAL 30-NOV-2017	02/06/2018 1.91 MB

01/30/2018	Fund Reimbursement Request Received	CONNELLY	03/01/2018	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4700046	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 32	03/01/2018 .02 MB
4696144	REIMBURSEMENT	REIMBURSEMENT REQ. NO. 32	02/01/2018 1.22 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
01/30/2018	Fund Reimbursement Request Received	CONNELLY	03/01/2018	Fund Reimbursement Request Approved	APPROVED BY DES

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4700045	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 31	03/01/2018 .02 MB
4696143	REIMBURSEMENT	REIMBURSEMENT REQ. NO. 31	02/01/2018 1.28 MB

01/30/2018	Fund Reimbursement Request Received	CONNELLY	03/01/2018	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4700047	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 30	03/01/2018 .02 MB
4696141	REIMBURSEMENT	REIMBURSEMENT REQ. NO. 30	02/01/2018 1.36 MB

11/30/2017	Permit Related GW Data Submittal	CONNELLY	03/01/2018	Report Does Not Meet Or-600 Requirement	REPORT DOES NOT INCLUDE LAB DATA SHEETS. REQUEST SENT TO CONSULTANT TO SUBMIT DOCUMENTATION. DATA REPORT RESUBMITTED WITH LAB SHEETS ON 2/6/18.
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4700096	CORRESPONDENCE-FROM	EMAIL REQUEST FOR OCTOBER 2017 SAMPLING ANALYTICAL RESULTS	02/02/2018 .05 MB
4685829	PERMIT INFORMATION	GWP-199308002-L-003 OCTOBER 2017 DATA SUBMITTAL 30-NOV-2017	11/30/2017 .99 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
07/31/2017	Annual Report Received	CONNELLY	02/20/2018	Technical Report Approved	REPORT WILL BE REVIEWED IN CONJUNCTION WITH THE REVIEW OF THE NOVEMBER 2017 DATA REPORT.

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4667181	PERMIT INFORMATION	GWP-199308002-L-003 2017 PERIODIC SUMMARY REPORT 31-JUL-2017	07/31/2017 4.17 MB
4700088	CORRESPONDENCE	EMAIL EXCHANGE REGARDING APPROVAL OF APRIL 2017 SAMPLING EVENT	07/20/2017 .09 MB

07/18/2017	Work Scope Submitted	CONNELLY	07/20/2017	Work Scope Approved	INCLUDES SAMPLING OF 9 MWS AND 1 SURFACE WATER FOR VOCs ON OCT 2018 & APRIL 2018. ASSOCIATED DATA REPORTS TO FOLLOW AND THE GMP RENEWAL APPLICATION.
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4665030	CORRESPONDENCE-FROM	APPROVED WORK SCOPE AUTHORIZATION FOR OCT 2017 & APR 2018 SAMPLING & ANALYSIS + REPORTING + PERMIT RENEWAL APPLICATION	07/20/2017 .12 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
02/01/2017	Annual Report Received	CONNELLY	07/19/2017	Additional Information Requested	LOCATE MW-14 AND INCL IT IN OCT 2017 SAMPLING EVENT, COLLECT SURFACE WATER FROM DENSMORE POND, PROVIDE FEASIBILITY STUDY FOR DOWNGRADIENT MONITORING WELL, AND SUBMIT ASSOC. REPORT TO FOLLOW THE EVENT

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4665107	CORRESPONDENCE-FROM RESPONSE TO 2016 PERIODIC SUMMARY REPORT	07/21/2017	.19 MB
4641837	PERMIT INFORMATION GWP-199308002-L-003 2016 PERIODOC SUMMARY REPORT 31-JAN-2017	02/01/2017	2.42 MB

06/30/2016	Fund Reimbursement Request Received	CONNELLY	07/21/2016	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4614172	REIMBURSEMENT NOTICE OF REIMBURSEMENT NO. 29	07/21/2016	.02 MB
4612058	REIMBURSEMENT REIMBURSEMENT REQ. NO. 29	07/01/2016	1.35 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
06/29/2016	Fund Reimbursement Request Received	CONNELLY	07/21/2016	Fund Reimbursement Request Approved	APPROVED BY DES

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4614170	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 28	07/21/2016 .02 MB
4611842	REIMBURSEMENT	REIMBURSEMENT REQ. NO. 28	06/30/2016 1.43 MB

01/29/2016	Permit Related GW Data Submittal	CONNELLY	07/20/2016	Additional Information Requested	CONTINUE MONITORING PER GM PERMIT, INCLUDE MW-14 IN OCT 2016 AND APRIL 2017 SAMPLING ROUNDS, REPORT GW ELEVATION SURVEY, AND RESULTING SAMPLE REPORT.
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Activity Documents (3)

Document Type	Document Title	Document Date	File Size
4700086	CORRESPONDENCE	EMAIL EXCHANGE REGARDING APPROVAL OF 2016 PERMIT SAMPLING & ANALYSIS	01/13/2017 .08 MB
4617208	CORRESPONDENCE-FROM	RESPONSE TO NOVEMBER 2015 DATA SUBMITTAL	07/20/2016 .21 MB
4590447	PERMIT INFORMATION	GWP-199308002-L-003 NOVEMBER 2015 DATA SUBMITTAL 29-JAN-2016	01/29/2016 .99 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
11/18/2015	Fund Reimbursement Request Received	WARR	12/24/2015	Fund Reimbursement Request Approved	APPROVED BY DES

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4583168	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 27	12/24/2015 .02 MB
4579389	REIMBURSEMENT	REIMBURSEMENT REQ. NO. 27	11/20/2015 1.47 MB

11/18/2015	Fund Reimbursement Request Received	WARR	12/24/2015	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4583167	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 26	12/24/2015 .02 MB
4579300	REIMBURSEMENT	REIMBURSEMENT REQ. NO. 26	11/19/2015 1.47 MB

06/30/2015	Annual Report Received	WARR	07/17/2015	Technical Report Approved	DATA TRENDING APPEARS TO SHOW THE SLUG OF THE BENZENE PLUME CONTINUING TO MOVE DOWNGRADIENT OF THE SITE. MW-9 CONC 9,100 UG/L BENZENE. MW-16 NEAR THE POND IS BELOW AGQS. CONTINUE GMP. MONITORING.
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4559550	PERMIT INFORMATION	GWP-199308002-L-003 2015 PERIODIC SUMMARY REPORT 26-DEC-2015	06/30/2015 1.49 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
06/25/2015	Fund Reimbursement Request Received	WARR	08/13/2015	Fund Reimbursement Request Approved	APPROVED BY DES

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4564869	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 25	08/13/2015 .02 MB
4560049	REIMBURSEMENT	REIMBURSEMENT REQ. NO. 25	07/09/2015 1.39 MB

03/27/2015	Work Scope Submitted	WARR	04/08/2015	Work Scope Approved	APPROVED
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4542569	WORKSCOPE/BUDGET	APPROVED WORK SCOPE AUTHORIZATION FOR 2015 SAMPLING & ANALYSIS + REPORTING	04/08/2015 .06 MB

03/18/2015	Fund Reimbursement Request Received	WARR	04/23/2015	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4544545	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 24	04/23/2015 .02 MB
4540523	REIMBURSEMENT	REIMBURSEMENT REQ. NO. 24	03/18/2015 1.43 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
12/15/2014	Permit Related GW Data Submittal	WARR	12/31/2014	Technical Report Approved	NO LETTER SENT - CONTINUE MONITORING ACTIVITIES.

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4525813	PERMIT INFORMATION	GWP-199308002-L-003 OCTOBER 2014 DATA SUBMITTAL 15-DEC-2014	12/15/2014 3.51 MB

11/21/2014	Permit Related GW Data Submittal	WARR	12/31/2014	Technical Report Approved	NO LETTER SENT - CONTINUE MONITORING ACTIVITIES.
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4522208	PERMIT INFORMATION	GWP-199308002-L-003 OCTOBER 2013 DATA SUBMITTAL 24-FEB-2014	11/21/2014 3.29 MB

06/30/2014	Permit Related GW Data Submittal	WHIPPLE	10/24/2014	Technical Report Approved	NO LTR SENT - CONTINUE SAMPLING IN ACCORDANCE W/ PERMIT
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4505443	PERMIT INFORMATION	GWP-199308002-L-003 APRIL 2014 DATA SUBMITTAL 27-JUN-2014	06/30/2014 4.15 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
04/26/2014	Work Scope Submitted	WARR	05/14/2015	Work Scope Approved	APPROVED

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4665066	CORRESPONDENCE	EMAIL EXCHANGE REGARDING APRIL 2017 SAMPLING EVENT	07/20/2017 .11 MB
4549416	WORKSCOPE/BUDGET	APPROVED WORK SCOPE AUTHORIZATION FOR JAN - DEC 2014 SAMPLING & ANALYSIS + REPORTING	05/14/2015 .09 MB

11/19/2013	Permit Related GW Data Submittal	WHIPPLE	02/07/2014	Technical Report Approved	NO LTR SENT - CONTINUE SAMPLING IN ACCORDANCE W/ PERMIT
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4477173	PERMIT INFORMATION	GWP-199308002-L-003 APRIL 2013 DATA SUBMITTAL 18-NOV-2013	11/19/2013 4.76 MB

06/28/2013	Fund Reimbursement Request Received	KIRN	07/15/2013	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4454598	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 23	07/15/2013 .02 MB
4452672	REIMBURSEMENT	REIMBURSEMENT REQ. NO. 23	06/27/2013 .01 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
05/03/2013	Groundwater Permit Application Received	KIRN	07/03/2013	Groundwater Permit Issued	GW MONITORING IN APR & OCT

Activity Documents (4)

Document Type	Document Title	Document Date	File Size
4458052	CORRESPONDENCE-FROM GWP-199308002-L-003 GROUNDWATER MANAGEMENT PERMIT RENEWAL	07/03/2013	.08 MB
4452605	CORRESPONDENCE-FROM SECOND EMAIL REQUESTING PERMIT FEE	06/27/2013	.04 MB
4450843	CORRESPONDENCE-FROM EMAIL REQUEST FOR GROUNDWATER MANAGEMENT PERMIT RENEWAL APPLICATION FEE	06/18/2013	.02 MB
4441222	PERMIT INFORMATION GWP-199308002-L-003 GROUNDWATER MANAGEMENT PERMIT RENEW. APP. 19-MAR-2013	05/03/2013	3.66 MB

04/15/2013	Work Scope Submitted	WHIPPLE	04/15/2013	Work Scope Approved	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4438661	WORKSCOPE/BUDGET APPROVED WORK SCOPE AUTHORIZATION FOR 2013 SAMPLING & ANALYSIS + REPORTING	04/15/2013	.44 MB

12/24/2012	Permit Related GW Data Submittal	WHIPPLE	03/13/2013	Technical Report Approved	NO LTR SENT - CONTINUE SAMPLING IN ACCORDANCE W/ PERMIT
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4425836	PERMIT INFORMATION GWP-199308002-L-002 NOVEMBER 2012 DATA SUBMITTAL 24-DEC-2012	12/24/2012	3.10 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
06/29/2012	Permit Related GW Data Submittal	WHIPPLE	09/27/2012	Technical Report Approved	NO LTR SENT - CONTINUE SAMPLING IN ACCORDANCE W/ PERMIT

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4389892	PERMIT INFORMATION	GWP-199308002-L-002 MAY 2012 DATA SUBMITTAL 29-JUN-2012	06/29/2012 3.16 MB

03/20/2012	Additional Information Received	WHIPPLE	06/18/2012	No Action Necessary (Report filed)	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4356241	PERMIT INFORMATION	RECORDED GROUNDWATER MANAGEMENT PERMIT 19-MAR-2012	03/20/2012 .67 MB

02/21/2012	Permit Related GW Data Submittal	WHIPPLE	06/18/2012	Technical Report Approved	NO LTR SENT - CONTINUE SAMPLING IN ACCORDANCE W/ PERMIT
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4349342	PERMIT INFORMATION	GWP-199308002-L-002 NOVEMBER 2011 DATA SUBMITTAL 30-NOV-2011	02/21/2012 3.23 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
10/03/2011	Annual Report Received	WHIPPLE	01/23/2012	Groundwater Permit Modified	REVISED PERMIT TO REMOVE WELL MW-12 AND SW-1 AND INCLUDE WELLS MW-13, MW-15, AND MW-16. CORRECT RECORDATION REQUIRED. SUBMIT RECORDED NOTICE BY 4/23/12

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4346925	CORRESPONDENCE-FROM GWP-199308002-L-002 REVISED GROUNDWATER MANAGEMENT PERMIT	01/23/2012	.14 MB
4324753	PERMIT INFORMATION GWP-199308002-L-002 2011 PERIODIC SUMMARY REPORT 29-SEP-2011	10/03/2011	3.59 MB

08/31/2011	Fund Reimbursement Request Received	WHIPPLE	10/11/2011	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4326417	REIMBURSEMENT NOTICE OF REIMBURSEMENT NO. 22	10/11/2011	.03 MB
4319029	REIMBURSEMENT REIMBURSEMENT REQ. NO. 22	08/31/2011	1.59 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
12/02/2010	Permit Related GW Data Submittal	WHIPPLE	01/28/2011	Technical Report Approved	EMAIL TO PATHWAYS - INCLUDE NEW WELLS IN MAY 2011 PERMIT MONITORING EVENT.

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4274815	CORRESPONDENCE-FROM	EMAIL RESPONSE TO OCT 2010 SAMPLING	01/28/2011 .02 MB
4265860	PERMIT INFORMATION	GWP-199308002-L-002 OCTOBER 2010 GROUNDWATER MONITORING RESULTS 02-DEC-2010	12/02/2010 3.13 MB

11/03/2010	Fund Reimbursement Request Received	WHIPPLE	03/21/2011	Fund Reimbursement Request Approved	APPROVED BY DES
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4282753	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 21	03/21/2011 .02 MB
4261552	REIMBURSEMENT	REIMBURSEMENT REQ. NO. 21	11/03/2010 1.28 MB

09/16/2010	Permit Related GW Data Submittal	WHIPPLE	01/28/2011	Technical Report Approved	NO LTR SENT - CONTINUE MONITORING IN ACCORDANCE W/ PERMIT.
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4253331	PERMIT INFORMATION	GWP-199308002-L-002 JULY 2010 GROUNDWATER MONITORING AND MONITORING WELL INSTALL 16-SEP-2010	09/16/2010 2.93 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
03/19/2010	Work Scope Submitted	WHIPPLE	03/22/2010	Work Scope Approved	INCLUDE WELL INSTALLATION SUMMARY WITH MAY 2010 SAMPLING RESULTS

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4222603	WORKSCOPE/BUDGET	03/22/2010	.17 MB

03/01/2010	Additional Information Received	WHIPPLE	03/04/2010	Additional Information Requested	EMAIL RESPONSE APPROVING WELL LOCATIONS AND REQUESTING SCOPE & BUDGET FOR INSTALLATION
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4220884	CORRESPONDENCE	03/04/2010	.04 MB
4220885	FIGURES	03/01/2010	.60 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
11/25/2009	Permit Related GW Data Submittal	WHIPPLE	01/13/2010	Additional Information Requested	REQUESTED WS&B FOR ADDITIONAL WELLS TO DETERMINE DOWNGRADIENT EXTENT & CURRENT GW QUALITY IN FORMER UST AREA. WS&B DUE 2/28/10.

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4213014	CORRESPONDENCE-FROM RESPONSE TO OCTOBER 2009 GROUNDWATER MONITORING RESULTS PREPARED BY PATHWAYS CONSULTING LLC DATED NOVEMBER 25 2009	01/13/2010	.05 MB
4201108	PERMIT INFORMATION GWP-199308002-L-002 OCTOBER 2009 GROUNDWATER MONITORING RESULTS 25-NOV-2009	11/25/2009	2.97 MB

09/29/2009	Fund Reimbursement Request Received	WHIPPLE	12/09/2009	Fund Reimbursement Request Approved	
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4202434	REIMBURSEMENT NOTICE OF REIMBURSEMENT NO. 20	12/09/2009	.02 MB
4193701	REIMBURSEMENT REQ. NO. 20 25-SEP-09	09/29/2009	.12 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
07/29/2009	Annual Report Received	WHIPPLE	11/17/2009	Technical Report Approved	

Activity Documents (3)

Document Type	Document Title	Document Date	File Size
4206639	CORRESPONDENCE EMAIL REGARDING ANNUAL REPORT APPROVAL AND PLUME DELINEATION REQUIREMENTS	11/20/2010	.05 MB
4198685	CORRESPONDENCE EMAIL AUTHORIZING WELL REPAIR	11/02/2009	.04 MB
4185017	PERMIT INFORMATION GWP-199308002-L-002 2009 ANNUAL SUMMARY REPORT 23-JUN-2009	07/29/2009	.68 MB

03/02/2009	Fund Reimbursement Request Received	WHIPPLE	05/08/2009	Fund Reimbursement Request Approved	
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4175573	REIMBURSEMENT NOTICE OF REIMBURSEMENT NO. 19	05/08/2009	.02 MB
4204327	REIMBURSEMENT REQ. NO. 19 24-FEB-09	03/02/2009	.17 MB

12/10/2008	Permit Related GW Data Submittal	WHIPPLE	04/09/2009	Technical Report Approved	
08/26/2008	Permit Related GW Data Submittal	WHIPPLE	12/15/2008	Technical Report Approved	

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
07/28/2008	Fund Reimbursement Request Received	KIRBY	10/17/2008	Fund Reimbursement Request Approved	

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4142781	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 18	10/17/2008 .03 MB
4222028	REIMBURSEMENT	REQ. NO. 18 24-JUL-08	07/28/2008 .20 MB

		LEDGARD	04/08/2008	Additional Information Requested	
04/07/2008	Fund Reimbursement Request Received	BLEDSON	08/07/2008	Fund Reimbursement Request Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4120399	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 17	08/07/2008 .02 MB

04/07/2008	Groundwater Permit Application Received	LEDGARD	04/21/2008	Groundwater Permit Issued	
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4075488	PERMIT INFORMATION	GWP-199308002-L-002 GROUNDWATER MANAGEMENT PERMIT	04/21/2008 .06 MB
4068595	PERMIT INFORMATION	GWP-199308002-L-002 GROUNDWATER MANAGEMENT PERMIT RENEWAL APPLICATION 07-APR-2008	04/07/2008 1.42 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
01/16/2008	Annual Report Received	LEDGARD	03/13/2008	Technical Report Approved	

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4065593	CORRESPONDENCE-FROM E-MAIL RESPONSE TO 2007 ANNUAL SUMMARY REPORT; REQUEST FOR EDB ANALYSIS	03/13/2008	.02 MB
4058559	PERMIT INFORMATION GWP-199308002-L-001 2007 ANNUAL SUMMARY REPORT 16-JAN-2008	01/16/2008	1.02 MB

12/11/2007	Fund Reimbursement Request Received	ESTABROOK	03/25/2008	Fund Reimbursement Request Approved	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4067182	REIMBURSEMENT NOTICE OF REIMBURSEMENT NO. 16	03/25/2008	.03 MB

09/24/2007	Additional Information Received	LEDGARD	10/01/2007	Technical Report Approved	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4046416	REPORT TO DES MONITORING WELL MW-8 REPLACEMENT REPORT 24-SEP-2007	09/24/2007	.41 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
		LEDGARD	08/31/2007	Work Scope Approved	

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4043709	WORKSCOPE/BUDGET	WORK SCOPE FOR MONITORING WELL INSTALLATION; APPROVAL	08/31/2007 .06 MB
4043635	CORRESPONDENCE-FROM	E-MAIL COVERSHEET FOR SUBMITTAL AND RESPONSE TO WORK SCOPE; APPROVAL	08/31/2007 .01 MB

06/29/2007	Permit Related GW Data Submittal	LEDGARD	08/20/2007	Technical Report Approved	
03/28/2007	Annual Report Received	LEDGARD	04/04/2007	Additional Information Requested	

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4019022	CORRESPONDENCE-FROM	E-MAIL RESPONSE TO 2006 ANNUAL SUMMARY REPORT; APPROVAL FOR MONITORING WELL MW-8 REPLACEMENT	04/04/2007 .00 MB
4018554	PERMIT INFORMATION	GWP-199308002-L-001 2006 ANNUAL SUMMARY REPORT 23-MAR-2007	03/28/2007 3.68 MB

03/07/2007	Fund Reimbursement Request Received	LEDGARD	07/03/2007	Fund Reimbursement Request Approved	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4033201	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 15	07/03/2007 .02 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
02/27/2007	Additional Information Received	LEDGARD	04/04/2007	Technical Report Approved	

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4020870	CORRESPONDENCE-FROM RESPONSE TO PETROLEUM IMPACTED SOIL REMOVAL REPORT PREPARED BY GOLDER ASSOCIATES INC. DATED FEBRUARY 22 2007	04/04/2007	.04 MB
4016084	REPORT TO DES PETROLEUM-IMPACTED SOIL REMOVAL REPORT 22-FEB-2007	02/27/2007	128.28 MB

11/07/2006	Fund Reimbursement Request Received	BERUBE	02/01/2007	Fund Reimbursement Request Approved	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4013561	REIMBURSEMENT NOTICE OF REIMBURSEMENT NO. 14	02/01/2007	.03 MB

08/25/2006	Permit Related GW Data Submittal	BERUBE	09/20/2006	Technical Report Approved	
03/02/2006	Work Scope Submitted	BERUBE	05/02/2006	Work Scope Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
3968558	WORKSCOPE/BUDGET WORKSCOPE TO REPLACE MW-4	03/02/2006	.09 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
03/02/2006	Annual Report Received	BERUBE	04/11/2006	Technical Report Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
3957280	PERMIT INFORMATION	GWP-199308002-L-001 2005 ANNUAL SUMMARY REPORT 28-FEB-2006	02/28/2006 4.23 MB

06/20/2005	Permit Related GW Data Submittal	BERUBE	07/20/2005	Technical Report Approved	
04/04/2005	Fund Reimbursement Request Received	BERUBE	05/18/2005	Fund Reimbursement Request Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
3905634	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 13	05/18/2005 .02 MB

01/27/2005	Annual Report Received	BERUBE	04/11/2005	Technical Report Approved	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
3891706	PERMIT INFORMATION	GWP-199308002-L-001 Annual Groundwater Monitoring Results Report Dated 1/17/05	01/27/2005 4.79 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
09/01/2004	Work Scope Submitted	LEDGARD	09/09/2004	Work Scope Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4632383	WORKSCOPE/BUDGET	APPROVED WORK SCOPE AUTHORIZATION FOR SOIL REMOVAL & DISPOSAL + REPORT	09/09/2004 .41 MB

06/07/2004	Fund Reimbursement Request Received	BERUBE	07/19/2004	Fund Reimbursement Request Approved	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
3830588	REIMBURSEMENT	NOTICE OF REIMBURSEMENT NO. 12	07/19/2004 .02 MB

01/26/2004	Fund Reimbursement Request Received	BERUBE	03/08/2004	Fund Reimbursement Request Approved	
01/26/2004	Additional Information Received	BERUBE	01/29/2004	Technical Report Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4632382	PERMIT INFORMATION	GWP-199308002-L-001 2003 ANNUAL SUMMARY REPORT & DRUM REMOVAL 05-JAN-2004	01/26/2004 3.97 MB

09/19/2003	Work Scope Submitted	KIRBY	09/19/2003	Work Scope Approved	
05/30/2003	Fund Reimbursement Request Received	HOPKINS	07/18/2003	Fund Reimbursement Request Approved	
04/14/2003	Fund Reimbursement Request Received	PESHKA	06/25/2003	Fund Reimbursement Request Approved	
02/13/2003	Fund Reimbursement Request Received	KIRBY	03/20/2003	Fund Reimbursement Request Approved	

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
01/29/2003	Groundwater Permit Application Received	KIRBY	02/21/2003	Groundwater Permit Issued	

Activity Documents (3)

Document Type	Document Title	Document Date	File Size
4632096	PERMIT INFORMATION	RECORDATION OF GROUNDWATER MANAGEMENT PERMIT	04/07/2003 .19 MB
4194188	PERMIT INFORMATION	GWP-199308002-L-001 GROUNDWATER MANAGEMENT PERMIT	02/21/2003 .24 MB
4632380	PERMIT INFORMATION	GROUNDWATER MANAGEMENT PERMIT APPLICATION 24-JAN-2003	01/29/2003 .83 MB

01/29/2003	Fund Reimbursement Request Received	KIRBY	02/19/2003	Fund Reimbursement Request Approved	
11/26/2002	Fund Reimbursement Request Received	KIRBY	01/14/2003	Fund Reimbursement Request Approved	
11/26/2002	Non-Permit GW Monitoring Result Received	KIRBY	12/11/2002	Groundwater Permit Requested	

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4632378	CORRESPONDENCE-FROM	RESPONSE TO 2002 ANNUAL SUMMARY REPORT	12/11/2002 .10 MB
4632377	MONITORING NONPERMIT	2002 ANNUAL SUMMARY REPORT 22-NOV-2002	11/26/2002 2.91 MB

10/04/2002	Fund Reimbursement Request Received	KIRBY	11/08/2002	Fund Reimbursement Request Approved	
10/04/2002	Non-Permit GW Monitoring Result Received	CARLSON	10/10/2002	Additional Information Requested	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4632376	MONITORING NONPERMIT	SEPTEMBER 2002 GROUNDWATER MONITORING RESULTS 30-SEP-2002	10/04/2002 1.19 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
09/20/2002	Fund Reimbursement Request Received	KIRBY	10/23/2002	Fund Reimbursement Request Approved	
07/19/2002	Initial Response Report	KIRBY	08/14/2002	Additional Information Requested	

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4632094	CORRESPONDENCE-FROM	RESPONSE TO INITIAL RESPONSE ACTION REPORT	08/14/2002 .04 MB
4632374	REPORT TO DES	INITIAL RESPONSE ACTION REPORT 16-JUL-2002	07/19/2002 1.44 MB

06/13/2002	Non-Permit GW Monitoring Result Received	KIRBY	06/20/2002	Additional Information Requested	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4632373	MONITORING NONPERMIT	MAY 2002 GROUNDWATER MONITORING RESULTS 10-JUN-2002	06/13/2002 1.26 MB

06/03/2002	Change Order	CROCE	06/06/2002	Change Order Approved	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4632371	WORKSCOPE/BUDGET	APPROVED CHANGE ORDER FOR TWO ROUNDS OF SAMPLING IN BROOK + ANALYSIS	06/06/2002 .10 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
05/28/2002	Change Order	CROCE	06/06/2002	Change Order Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4632092	WORKSCOPE/BUDGET	APPROVED AUTHORIZATION FOR ROADBOX REPLACEMENT	06/06/2002 .10 MB

05/20/2002	Site Investigation Report Received	KIRBY	06/11/2002	Technical Report Approved	
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4632372	CORRESPONDENCE-FROM	RESPONSE TO SUPPLEMENTAL SITE INVESTIGATION REPORT	06/11/2002 .04 MB
4632370	REPORT TO DES	SUPPLEMENTAL SITE INVESTIGATION REPORT 15-MAY-2002	05/20/2002 2.17 MB

01/28/2002	Initial Response Budget Received	CROCE	01/29/2002	Initial Response Budget Approved	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4632091	WORKSCOPE/BUDGET	APPROVED AUTHORIZATION FOR SORBENT MATERIAL CHANGEOUTS + DISPOSAL OF USED SORBENT + SAMPLING & ANALYSIS + REPORT	01/29/2002 .75 MB

01/07/2002	Non-Permit GW Monitoring Result Received	CARLSON	01/08/2002	Additional Information Requested	
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Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
12/13/2001	Additional Information Received	KIRBY	12/16/2001	Report Does Not Meet Or-600 Requirement	

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4632090	SITE PLAN	12/17/2001	.08 MB
4632089	REPORT TO DES	12/07/2001	.17 MB

07/24/2001	Non-Permit GW Monitoring Result Received	KIRBY	10/03/2001	Additional Information Requested	
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4632367	CORRESPONDENCE-FROM	10/03/2001	.04 MB
4632364	MONITORING NONPERMIT	07/24/2001	.96 MB

10/20/2000	Additional Information Received	KARNAUKH-L	12/20/2000	Groundwater Permit Requested	
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4632356	CORRESPONDENCE-FROM	12/20/2000	.09 MB
4632355	REPORT TO DES	10/20/2000	1.32 MB

03/09/2000	Fund Reimbursement Request Received	HOPKINS	05/25/2000	Fund Reimbursement Request Approved	
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Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
01/26/2000	Remedial Action Plan Submitted	CARLSON	05/15/2000	Additional Information Requested	

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4632353	CORRESPONDENCE-FROM RESPONSE TO REMEDIAL IMPLEMENTATION + SEP & DEC 1999 GROUNDWATER SAMPLING RESULTS REPORT	05/15/2000	.05 MB
4632351	REPORT TO DES REMEDIAL IMPLEMENTATION + SEP & DEC 1999 GROUNDWATER SAMPLING RESULTS REPORT 24-JAN-2000	01/26/2000	3.24 MB

03/16/1999	Work Scope Submitted	MONGEON	04/13/1999	Work Scope Approved	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4632077	WORKSCOPE/BUDGET WORK SCOPE APPROVAL FOR SOIL EXCAVATION & DISPOSAL + BACKFILL & PAVING + ORC PLACEMENT + SAMPLING & ANALYSIS + REPORTING	04/13/1999	.35 MB

12/02/1998	Fund Reimbursement Request Received	LEVERGOOD	02/25/1999	Fund Reimbursement Request Approved	
10/22/1998	Additional Information Received	MONGEON	02/16/1999	Technical Report Approved	

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4632076	CORRESPONDENCE-FROM RESPONSE TO SUPPLEMENTAL SITE INVESTIGATION REPORT	02/16/1999	.04 MB
4632348	REPORT TO DES SUPPLEMENTAL SITE INVESTIGATION REPORT 20-OCT-1998	10/22/1998	3.40 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
05/18/1998	Additional Information Received	KARNAUKH-L	05/26/1998	Technical Report Approved	

Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4632083	SITE PLAN	REVISED SITE PLAN 22-MAY-1998	05/22/1998 .23 MB
4632084	CORRESPONDENCE-FROM	RESPONSE SITE INVESTIGATION REPORT	03/26/1998 .08 MB

04/21/1998	Additional Information Received	ESTABROOK	05/18/1998	Additional Information Requested	
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Activity Documents (2)

Document Type	Document Title	Document Date	File Size
4632088	CORRESPONDENCE-FROM	RESPONSE TO REVISED SITE PLAN	05/18/1998 .03 MB
4632079	SITE PLAN	REVISED SITE PLAN 21-APR-1998	04/21/1998 .06 MB

04/20/1998	Work Scope Submitted	ESTABROOK	05/04/1998	Work Scope Approved	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4632075	WORKSCOPE/BUDGET	WORK SCOPE APPROVAL FOR INSTALLATION OF 2 WELLS + SAMPLING & ANALYSIS + SUPPLEMENTAL SITE INVESTIGATION REPORT	05/04/1998 .25 MB

01/09/1998	Fund Reimbursement Request Received	LEVERGOOD	05/26/1998	Fund Reimbursement Request Approved	
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Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Activities (144)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
11/24/1997	Site Investigation Report Received	KARNAUKH-L	03/26/1998	Report Does Not Meet Or-600 Requirement	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4632345	REPORT TO DES	11/24/1997	5.00 MB

10/25/1996	Discharge of a Regulated Substance	CHWASCIK	02/19/1997	Site Investigation Report Requested	
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Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4632093	CORRESPONDENCE-FROM	02/21/1997	.05 MB

03/15/1995	Site Investigation Report Received	KIRBY	04/20/1995	Additional Information Requested	
07/29/1993	Discharge of a Regulated Substance	HEROUX	08/04/1993	Site Investigation Report Requested	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4632335	CORRESPONDENCE-FROM	08/04/1993	.05 MB

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Permits (47)

Permit Number	Permit Type	Application Date	Issue Date	Expiration Date	Revision Date(s)	Permitee
GWP-199308002-L-004	MANAGEMENT	04/02/2018	06/01/2018	05/31/2023		EUGENE BOISVERT 105 NORTH MAIN ST WEST LEBANON NH 03784

Permit Submittals

Due Date	Received Date	Sampling Date	Sample Description	Comments
06/15/2023	10/23/2023		APRIL 2023 DATA REPORT	
03/01/2023			GMP RENEWAL APPLICATION DUE	
12/15/2022			OCTOBER 2022 DATA REPORT	
06/15/2022			APRIL 2022 & PERIODIC SUMMARY REPORT	
12/15/2021			OCTOBER 2021 DATA REPORT	
12/15/2020	12/01/2020		OCTOBER 2020 DATA REPORT	
06/15/2020	05/27/2020		APRIL 2020 & PERIODIC SUMMARY REPORT	
10/15/2019	12/13/2019		OCTOBER 2019 DATA REPORT	
06/17/2019	06/24/2019		APRIL 2019 DATA REPORT	
12/17/2018			OCTOBER 2018 DATA REPORT	
06/15/2021			APRIL 2021 DATA REPORT	

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Permits (47)

Permit Number	Permit Type	Application Date	Issue Date	Expiration Date	Revision Date(s)	Permitee
GWP-199308002-L-003	EXPIRED	05/03/2013	07/03/2013	07/02/2018		EUGENE E. BOISVERT 105 NORTH MAIN STREET WEST LEBANON NH 03784

Permit Submittals

Due Date	Received Date	Sampling Date	Sample Description	Comments
04/03/2018			GMP RENEWAL APPLICATION DUE	
06/15/2018	05/31/2018	04/01/2013	DATA TRANSMITTAL	
12/15/2017		10/01/2013	DATA TRANSMITTAL	
06/15/2017	07/31/2017	04/01/2013	PERIODIC SUMMARY REPORT	
12/15/2016	01/29/2016	10/01/2013	NOVEMBER 2015 DATA SUBMITTAL	
06/15/2016		04/01/2013	DATA TRANSMITTAL	
12/15/2015	11/30/2017	10/01/2013	DATA TRANSMITTAL	
06/15/2015	06/30/2015	04/01/2013	2015 PERIODIC SUMMARY REPORT	
12/15/2014	12/15/2014	10/01/2013	OCTOBER 2014 DATA SUBMITTAL	
06/15/2014	06/30/2014	04/01/2013	APRIL 2014 DATA SUBMITTAL	
12/15/2013	11/19/2013	10/01/2013	APRIL 2013 DATA SUBMITTAL	
07/15/2013		05/01/2013	MAY DATA TRANSMITTAL UNDER GMP 002 DUE	

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Permits (47)

Permit Number	Permit Type	Application Date	Issue Date	Expiration Date	Revision Date(s)	Permitee
GWP-199308002-L-002	EXPIRED	04/02/2008	04/21/2008	04/20/2013		MR. EUGENE E. BOISVERT 105 NORTH MAIN STREET LEBANON NH 03784

Permit Submittals

Due Date	Received Date	Sampling Date	Sample Description	Comments
12/15/2008	12/10/2008	10/01/2008	OCTOBER 2008 GW MONITORING RESULTS	
07/15/2009	07/29/2009	05/01/2008	2009 ANNUAL SUMMARY REPORT	
12/15/2009	11/25/2009	10/01/2008	OCTOBER 2009 GW MONITORING RESULTS	
07/15/2010	09/16/2010	05/01/2008	JULY 2010 SAMPLING RESULTS	
07/15/2011	10/03/2011	05/01/2008	2011 PERIODIC SUMMARY REPORT	
07/15/2008	08/26/2008	05/01/2008	MAY 2008 GW MONITORING RESULTS	
01/20/2013	05/03/2013		PERMIT RENEWAL DUE	
12/15/2010	12/02/2010	10/01/2008	OCTOBER 2010 GROUNDWATER MONITORING RESULTS	
12/15/2011	02/21/2012	10/01/2008	NOVEMBER 2011 DATA SUBMITTAL	
07/15/2012	06/29/2012	05/01/2008	MAY 2012 - DATA SUBMITTAL	
12/15/2012	12/24/2012	10/01/2008	NOVEMBER 2012 - DATA SUBMITTAL	

Site Number: 199308002

Project Number: 0004405

Name and Address: FORMER MUFFLER HOUSE_RENT A WRECK
237 HANOVER ST
LEBANONResponsible Party: EUGENE BOISVERT
LEBANON NH 03784[Mapit](#)

PHONE: 603-298-8482

Wellhead Protection Area: Unknown

Risk Level: HIGH GW CONC./ALTER. WATER AVAILABLE

Assigned To: OAKES

Discovery Date: 07/29/1993

Eligible: PERMANENTLY ELIGIBLE

Eligibility Determined on: 01/09/1998

MTBE: Y

Brownfield: N

Permits (47)

Permit Number	Permit Type	Application Date	Issue Date	Expiration Date	Revision Date(s)	Permittee
GWP-199308002-L-001	EXPIRED	01/27/2003	02/21/2003	02/20/2008	1) 01/23/2012	EUGENE BOISVERT 2 PASTURE LANE WEST LEBANON NH 03784

Permit Submittals

Due Date	Received Date	Sampling Date	Sample Description	Comments
07/15/2007	06/29/2007		MAY 2007 GW MONITORING RESULTS	
07/15/2003	05/30/2003		APR-03 RESULTS PER GWP, VOCS MW-4 & 8	
12/15/2003	01/26/2004		ANN. GW RESULTS & DRUM REMOVAL; ALKYL SOURCE OFF SITE.	
12/15/2004	01/27/2005		2004 ANNUAL REPORT	
07/15/2005	06/20/2005		MAY 2005 GW MONITORING RESULTS [FILENET]	
12/15/2005	03/02/2006		2005 ANNUAL SUMMARY REPORT	
07/15/2006	08/25/2006		JUNE 2006 GW RESULTS	
	04/15/2003		DEED RECORDATION BK2790 PGS0778-0781	
12/15/2007	04/07/2008		PERMIT RENEWAL APPLICATION	
07/15/2004	06/07/2004		GW MONITORING RESULTS FOR MAY 2004 (FILE NET)	
12/15/2007	01/16/2008		2007 ANNUAL SUMMARY REPORT	
12/15/2006	03/28/2007		2006 ANNUAL SUMMARY REPORT	

8/5/2024

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Leaking Underground Storage Tank Project Report

Agenda Item 4.A
8/12/24 Planning Bd Mtg

50 of 50

Site Number:	199308002	Project Number:	0004405
Name and Address:	FORMER MUFFLER HOUSE_RENT A WRECK 237 HANOVER ST LEBANON	Responsible Party:	EUGENE BOISVERT LEBANON NH 03784
Mapit		PHONE:	603-298-8482
Wellhead Protection Area:	Unknown	Risk Level:	HIGH GW CONC./ALTER. WATER AVAILABLE
Assigned To:	OAKES	Discovery Date:	07/29/1993
Eligibile:	PERMANENTLY ELIGIBLE	Eligibilty Determined on:	01/09/1998
MTBE:	Y	Brownfield:	N

No Vapor Recovery Information

8/5/2024

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Underground Storage Tank Facility Report

Agenda Item 4.A
8/12/24 Planning Bd Mtg

1 of 2

Site Number: 199308002

Facility Id: 0114946

System Name and Address: FORMER MUFFLER HOUSE/RENT A WRECK
237 HANOVER ST
LEBANON

Facility Owner: EUGENE E BOISVERT
2 PASTURE LN
W LEBANON NH 03784

[Mapit](#)

Registration Date: 09/05/1996

Facility Type: COMMERCIAL

Tanks (3)											
Active: 0 Closed: 3											
Tank #	Substance Stored	Capacity	Installed Date	Temporarily Closed Date	Permanently Closed Date	Assessment Received Date	Construction Material	Piping Material	System Type	Overfill Install Date	Spill Install Date
1	UNKNOWN SUBSTANCE	1111	11/11/1911		10/25/1996	12/02/1996	UNKNOWN	UNKNOWN			
2	UNKNOWN SUBSTANCE	1111	11/11/1911		10/25/1996	12/02/1996	UNKNOWN	UNKNOWN			
3	UNKNOWN SUBSTANCE	1111	11/11/1911		10/25/1996	12/02/1996	UNKNOWN	UNKNOWN			

Activity (1)						
Activity	Enforcement Number	Activity Date	Substantial Compliance	Deadline	Response	Response Date
FILE REVIEW		01/09/1998			COMPLIANCE MET	12/18/1997

8/5/2024

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Underground Storage Tank Facility Report

Agenda Item 4.A
8/12/24 Planning Bd Mtg

2 of 2

Site Number: 199308002

Facility Id: 0114946

System Name and Address: FORMER MUFFLER HOUSE/RENT A WRECK
237 HANOVER ST
LEBANON

Facility Owner: EUGENE E BOISVERT
2 PASTURE LN
W LEBANON NH 03784

[Mapit](#)

Registration Date: 09/05/1996

Facility Type: COMMERCIAL

Documents (4)				
	Document Type	Name/Title	Date Submitted	File Size
3743569	CORRESPONDENCE	Correspondence 10/14/96 to 1/9/98	10/15/2003	.65 MB
3743571	REPORT	UST Closure Report Review	12/02/1996	.07 MB
4632078	REPORT TO DES	CLOSURE REPORT FOR TANKS 1 - 3 22-NOV-1996	11/22/1996	3.75 MB
3743570	REGISTRATION	Registration For USTs	09/09/1996	.42 MB



Gardco GeoForm block medium LED wall sconce features a rectangular geometric shape that will complement a range of architectural styles. GeoForm block medium is available with two light engines: precision optics which feature type 2, 3, and 4 distributions, as well as light effects optics which offer wall wash, spot, and pencil beam distributions. GeoForm with light effects can be used in up, down, or up and down configurations. Emergency battery backup option provides path-of-egress illumination. Multiple control options, including wireless Interact Pro outdoor, further enhance energy savings.

Project: _____
Location: _____
Cat.No: _____
Type: _____
Lamps: _____ Qty: _____
Notes: _____

Ordering guide

example: GBM-A06-840-T3M-UNV-FAWS-MG

Luminaire	Configuration Down (nom. lumens)	Color Temperature	Distribution Down	Configuration Up	Distribution Up	Voltage		
GBM								
GBM GeoForm Block Medium	Precision Plus optics						120 120V	
	A06 2,500 lumens	A10 ¹ 7,500 lumens	830 80CRI 3000K	T2M Type 2 down only	None Leave blank for down only	None Leave blank for down only	208 208V	
	A07 4,000 lumens	A11 ¹ 8,500 lumens	840 80CRI 4000K	T3M Type 3 down only			240 240V	
	A08 5,000 lumens	A12 ¹ 9,500 lumens	740 70CRI 4000K	T4M Type 4 down only			277 277V	
	A09 6,000 lumens	A13 ¹ 11,000 lumens	750 70CRI 5000K				347 347V	
		A14 ¹ 12,500 lumens					480 480V	
	Light Effects optics (up OR down)						UNV 120-277V (50/60Hz)	
	B01 ¹ 700 lumens		830 80CRI 3000K	WAW Wall Wash	None Leave blank for down only	None Leave blank for down only	HVU 347-480V (50/60Hz)	
	B02 ¹ 1,000 lumens		840 80CRI 4000K	SPT Spot				
	B03 ¹ 2,200 lumens			PEN Pencil Beam				
	Light Effects optics (up AND down)							
	B04 ¹ 1,400 lumens		830 80CRI 3000K	WAW Wall Wash	U Uplight configuration to match downlight configuration	WAW Wall Wash		
	B05 ¹ 2,000 lumens		840 80CRI 4000K	SPT Spot			SPT Spot	
	B06 ¹ 4,400 lumens			PEN Pencil Beam			PEN Pencil Beam	
Dimming Controls ²			Electrical	Options		Finish		
none	Leave blank (10kV kA dimming driver standard)	none	Leave blank (10kV kA surge protection standard)	none	Leave blank	Textured		
DLEA ²	Dimming Leads Externally Accessible (controls by others)			EC ⁶	Emergency Battery Pack, Cold rated (~20°C to 40°C). 120 or 277V only.	BK Black		
DUCC ^{1,2}	Dual Circuit Control (Only available with A06-A09)	SP2	Surge Protector 20kV/10kA (option)			WH White		
FAWS ²	Field Adjustable Wattage Selector	FS1	Single Fuse (120, 277, or 347VAC)	BAC ⁷	Meets the requirements of the Buy American Act of 1933 (BAA)	BZ Bronze		
MW30 ^{1,2,3,6}	Microwave motion sensor factory set at 30% dimming	FS2	Double Fuse (208V, 240V, or 480V)			DG Dark Gray		
		FS3	Double fuse Canadian double pull (208V, 240V, or 480V)			MG Medium Gray		
		PCB ⁵	Photocontrol Button (120-277V only)					
DynaDimmer: Automatic Profile Dimming Only offered with A08-A13						Customer specified		
CS50 ^{1,2,4,6}	Safety 50% dimming, 7 hours					RAL Specify optional color or RAL, (ex: OC-LGP or OC-RAL7024)		
CM50 ^{1,2,4,6}	Median 50% dimming, 8 hours							
CS30 ^{1,2,4,6}	Safety 30% dimming, 7 hours					CC Custom Color (must supply color chip, requires factory quote)		
CM30 ^{1,2,4,6}	Median 30% dimming, 8 hours							

- Emergency Battery Pack not available.
- Only one option can be selected from Dimming Controls column.
- Not available in 480V.
- Only available from 120-277V, or in UNV.
- Only available from 120-277V, must specify voltage.
- Not available with "Light Effects" B01 - B06.

- Failure to properly select the "BAC" suffix could result in you receiving product that is not BAA compliant product with no recourse for an RMA or refund. This BAC designation hereunder does not address (i) the applicability of, or availability of a waiver under, the Trade Agreements Act, or (ii) the "Buy America" domestic content requirements imposed on states, localities, and other non-federal entities as a condition of receiving funds administered by the Department of Transportation or other federal agencies.
- Consult Signify to confirm whether specific accessories are BAA-compliant.

Luminaire Accessories (order separately)⁸

GF-WS-BK Wall Mounted Box for surface conduit, painted black
GF-INV Inversion Mounting kit (required with inverted mounting)



**DARKSKY
APPROVED**
Reduces light pollution
Certified by DarkSky.org



GBM GeoForm block medium

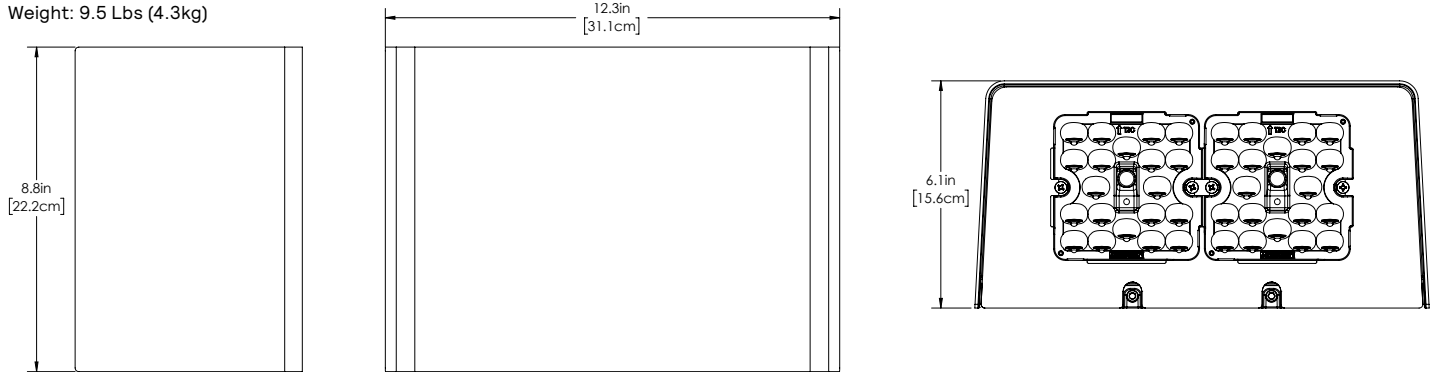
Wall sconce

Dimensions

GBM Medium Block

Standard

Weight: 9.5 Lbs (4.3kg)

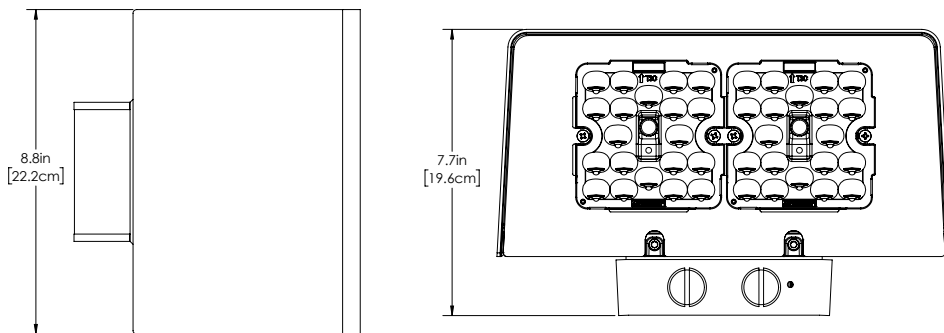


Accessory details

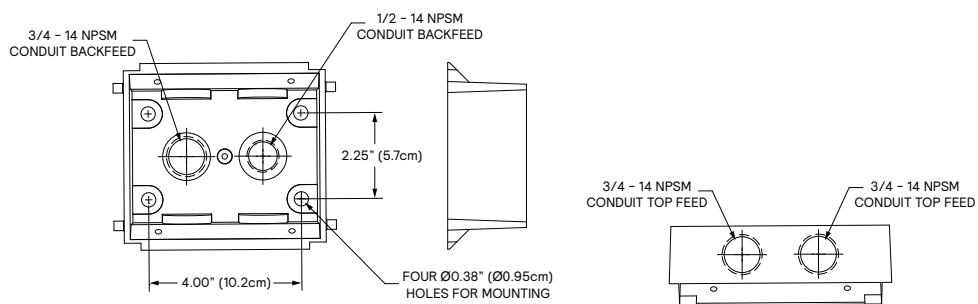
Surface mount conduit box (GF-WS-BK)

GBM Block with surface conduit wall mount box

Weight: 11 Lbs (5.9kg)



GF-WS-BK Details



GBM GeoForm block medium

Wall sconce

GBM Lumen values

3000K, 80CRI

Ordering Code	CCT	CRI	Average System Wattage	Type 2M			Type 3M			Type 4M		
				Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
GBM-A06-830	3000	80	16	2506	B1-U0-G1	154	2540	B1-U0-G1	156	2480	B1-U0-G1	152
GBM-A07-830	3000	80	23	3522	B1-U0-G1	153	3570	B1-U0-G1	155	3485	B1-U0-G1	152
GBM-A08-830	3000	80	30	4487	B1-U0-G1	150	4548	B1-U0-G1	152	4440	B1-U0-G1	148
GBM-A09-830	3000	80	39	5700	B2-U0-G2	147	5777	B2-U0-G2	149	5640	B1-U0-G2	146
GBM-A10-830	3000	80	45	6521	B2-U0-G2	145	6609	B2-U0-G2	147	6452	B1-U0-G2	143
GBM-A11-830	3000	80	52	7473	B2-U0-G2	145	7575	B2-U0-G2	147	7395	B2-U0-G2	143
GBM-A12-830	3000	80	59	8506	B2-U0-G2	143	8621	B2-U0-G2	145	8417	B2-U0-G2	142
GBM-A13-830	3000	80	66	9423	B2-U0-G2	142	9551	B2-U0-G2	144	9324	B2-U0-G2	140
GBM-A14-830	3000	80	77	10783	B3-U0-G3	139	10929	B3-U0-G3	141	10670	B2-U0-G2	138

4000K, 80CRI

Ordering Code	CCT	CRI	Average System Wattage	Type 2M			Type 3M			Type 4M		
				Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
GBM-A06-840	4000	80	16	2599	B1-U0-G1	159	2634	B1-U0-G1	162	2571	B1-U0-G1	158
GBM-A07-840	4000	80	23	3652	B1-U0-G1	159	3701	B1-U0-G1	161	3614	B1-U0-G1	157
GBM-A08-840	4000	80	30	4653	B1-U0-G1	156	4716	B1-U0-G1	158	4604	B1-U0-G1	154
GBM-A09-840	4000	80	39	5910	B2-U0-G2	153	5990	B2-U0-G2	155	5848	B1-U0-G2	151
GBM-A10-840	4000	80	45	6761	B2-U0-G2	150	6852	B2-U0-G2	152	6690	B1-U0-G2	149
GBM-A11-840	4000	80	52	7749	B2-U0-G2	150	7853	B2-U0-G2	152	7667	B2-U0-G2	149
GBM-A12-840	4000	80	59	8819	B2-U0-G2	149	8939	B2-U0-G2	151	8727	B2-U0-G2	147
GBM-A13-840	4000	80	66	9770	B3-U0-G3	147	9902	B3-U0-G3	149	9668	B2-U0-G2	146
GBM-A14-840	4000	80	77	11180	B3-U0-G3	144	11331	B3-U0-G3	146	11063	B2-U0-G2	143

4000K, 70CRI

Ordering Code	CCT	CRI	Average System Wattage	Type 2M			Type 3M			Type 4M		
				Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
GBM-A06-740	4000	70	16	2928	B1-U0-G1	180	2968	B1-U0-G1	182	2898	B1-U0-G1	178
GBM-A07-740	4000	70	23	4115	B1-U0-G1	179	4171	B1-U0-G1	181	4072	B1-U0-G1	177
GBM-A08-740	4000	70	30	5243	B2-U0-G2	175	5314	B2-U0-G2	178	5188	B1-U0-G1	174
GBM-A09-740	4000	70	39	6660	B2-U0-G2	172	6750	B2-U0-G2	174	6590	B1-U0-G2	170
GBM-A10-740	4000	70	45	7619	B2-U0-G2	169	7722	B2-U0-G2	172	7539	B2-U0-G2	168
GBM-A11-740	4000	70	52	8732	B2-U0-G2	169	8850	B2-U0-G2	172	8640	B2-U0-G2	167
GBM-A12-740	4000	70	59	9938	B3-U0-G3	168	10073	B3-U0-G3	170	9834	B2-U0-G2	166
GBM-A13-740	4000	70	66	11010	B3-U0-G3	166	11159	B3-U0-G3	168	10894	B2-U0-G2	164
GBM-A14-740	4000	70	77	12598	B3-U0-G3	163	12769	B3-U0-G3	165	12466	B2-U0-G2	161

5000K, 70CRI

Ordering Code	CCT	CRI	Average System Wattage	Type 2M			Type 3M			Type 4M		
				Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
GBM-A06-750	5000	70	16	2812	B1-U0-G1	173	2850	B1-U0-G1	175	2783	B1-U0-G1	171
GBM-A07-750	5000	70	23	3952	B1-U0-G1	172	4006	B1-U0-G1	174	3911	B1-U0-G1	170
GBM-A08-750	5000	70	30	5035	B2-U0-G2	168	5103	B2-U0-G2	171	4982	B1-U0-G1	167
GBM-A09-750	5000	70	39	6396	B2-U0-G2	165	6482	B2-U0-G2	167	6329	B1-U0-G2	164
GBM-A10-750	5000	70	45	7317	B2-U0-G2	163	7416	B2-U0-G2	165	7240	B2-U0-G2	161
GBM-A11-750	5000	70	52	8385	B2-U0-G2	163	8499	B2-U0-G2	165	8297	B2-U0-G2	161
GBM-A12-750	5000	70	59	9544	B2-U0-G2	161	9673	B3-U0-G3	163	9444	B2-U0-G2	159
GBM-A13-750	5000	70	66	10573	B3-U0-G3	159	10716	B3-U0-G3	161	10462	B2-U0-G2	158
GBM-A14-750	5000	70	77	12099	B3-U0-G3	156	12262	B3-U0-G3	158	11972	B2-U0-G2	155

GBM GeoForm block medium

Wall sconce

LED Wattage and Lumen Values (Emergency Mode)

Ordering Code	CCT	CRI	Avg. System Wattage (W)	Type 2M		Type 3M		Type 4M	
				Lumen Output	BUG Rating	Lumen Output	BUG Rating	Lumen Output	BUG Rating
GBM-A06/7/8/9-740-X-EM	4000	70	6	1000	B0-U0-G0	1014	B0-U0-G0	838	B0-U0-G0
GBM-A06/7/8/9-750-X-EM	5000	70	6	960	B0-U0-G0	973	B0-U0-G0	804	B0-U0-G0
GBM-A06/7/8/9-830-X-EM	3000	80	6	856	B0-U0-G0	868	B0-U0-G0	717	B0-U0-G0
GBM-A06/7/8/9-840-X-EM	4000	80	6	887	B0-U0-G0	899	B0-U0-G0	743	B0-U0-G0

Light Effects Optics 3000K, 80 CRI (Up or Down)

Ordering Code	CCT	CRI	Average System Wattage	Wall Wash (WAW)		Spot (SPT)		Pencil Beam (PEN)	
				Lumen Output	Efficacy (LPW)	Lumen Output	Efficacy (LPW)	Lumen Output	Efficacy (LPW)
GBM-B01-830	3000	80	8	699	88	767	97	66	8
GBM-B02-830	3000	80	18	1397	78	1534	86	133	7
GBM-B03-830	3000	80	30	2446	82	2685	90	232	8

Light Effects Optics 3000K, 80 CRI (Up and Down)

Ordering Code	CCT	CRI	Average System Wattage	Wall Wash (WAW)		Spot (SPT)		Pencil Beam (PEN)	
				Lumen Output	Efficacy (LPW)	Lumen Output	Efficacy (LPW)	Lumen Output	Efficacy (LPW)
GBM-B04-830	3000	80	16	1397	88	1534	97	133	8
GBM-B05-830	3000	80	36	2795	78	3068	86	266	7
GBM-B06-830	3000	80	60	4891	82	5369	90	465	8

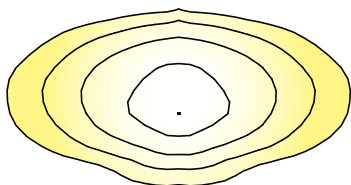
Light Effects Optics 4000K, 80 CRI (Up or Down)

Ordering Code	CCT	CRI	Average System Wattage	Wall Wash (WAW)		Spot (SPT)		Pencil Beam (PEN)	
				Lumen Output	Efficacy (LPW)	Lumen Output	Efficacy (LPW)	Lumen Output	Efficacy (LPW)
GBM-B01-840	4000	80	8	734	92	805	101	70	9
GBM-B02-840	4000	80	18	1467	82	1611	90	139	8
GBM-B03-840	4000	80	30	2568	86	2819	94	244	8

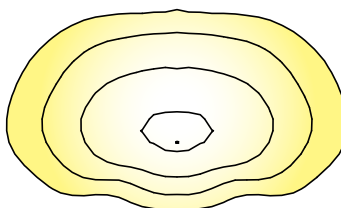
Light Effects Optics 4000K, 80 CRI (Up and Down)

Ordering Code	CCT	CRI	Average System Wattage	Wall Wash (WAW)		Spot (SPT)		Pencil Beam (PEN)	
				Lumen Output	Efficacy (LPW)	Lumen Output	Efficacy (LPW)	Lumen Output	Efficacy (LPW)
GBM-B04-840	4000	80	16	1467	92	1611	101	139	9
GBM-B05-840	4000	80	36	2935	82	3222	90	279	8
GBM-B06-840	4000	80	60	5136	86	5638	94	488	8

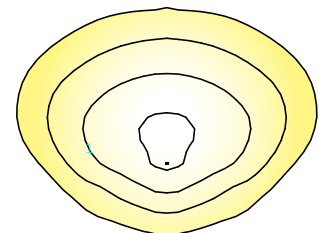
Optical Distributions



Type 2



Type 3



Type 4

GBM GeoForm block medium

Wall sconce

Specifications

Construction

Main body housing and door frame made of low copper die cast aluminum alloy for a high resistance to corrosion. Removable die cast backplate to allow access to driver or other electronic components for servicing. The housing acts as the main heat sinking component, optimized for maximum thermal dissipation. Giving the freedom to have a clean minimalist aesthetic design while allowing it to house emergency battery backup equipment and various other options. Luminaire housing rated to IP65, tested in accordance to Section 9 of IEC 60598-1.

IK Rating IK08 high impact resistance rating for both the housing and optics

IP Rating IP65 rated luminaire with IP66 rated light engine

Light engine

Electrical components are RoHS compliant, IP66 sealed light engine equipped LEDs tested by ISO 17025-2005 accredited lab in accordance with IESNA LM-80 guidelines in compliance with EPA ENERGY STAR, extrapolations in accordance with IESNA TM-21. Metal core board ensures greater heat transfer and longer lifespan.

LED Module

Precision Plus LED printed circuit board assembly made of 20 LEDs populated on aluminum metal clad board for optimal thermal dissipation ensuring long LED life. Light Effects feature single COB LED array.

Optical System

Precision Plus optics composed of high performance UV stabilized optical grade polymer refractor lenses to achieve desired distribution for optimized spacing, target lumens and a superior lighting uniformity. Performance tested per LM-63, LM-79 and TM-15 (IESNA) certifying its photometric performance. 0% uplight and U0 per IESNA TM-15. Light effects optics composed of low iron tempered clear glass with molded gasket attached to lens without tools or RTV. Lenses provide narrow spot, pencil beam, and wall wash optical distributions..

Mounting

Mounting is achieved through integral back plate that features a hook and lock quick mount plate that secures with two set screws from bottom of luminaire. Mounting plate is located in the center of the luminaire body. Luminaire ships fully assembled, ready to install.

Installation

GeoForm features an integral hook on its mounting plate which allows a single installer to perform wiring without assistance. See installation instructions for complete details.

Control options

0-10V dimming (DLEA): Access to 0-10V dimming leads supplied through back of luminaire (for secondary dimming controls by others). Cannot be used with other control options.

Dual Circuit Control (DUCC): Luminaire equipped with the ability to have two separate circuits controlling drivers and light engines independently. Permits separate switching of separate modules controlled by use of two sets of leads, one for each circuit. Not recommended to be used with other control options, motion response, or photocells.

Field Adjustable Wattage Selector (FAWS): Luminaire equipped with the ability to manually adjust the wattage in the field to reduce total luminaire lumen output and light levels. Comes pre-set to the highest position lumen output selected. Use chart below to estimate reduction in lumen output desired. Cannot be used with other control options or motion response.

FAWS Position	Percent of Typical Lumen Output	FAWS Position	Percent of Typical Lumen Output
1	25%	6	80%
2	50%	7	85%
3	55%	8	90%
4	65%	9	95%
5	75%	10	100%

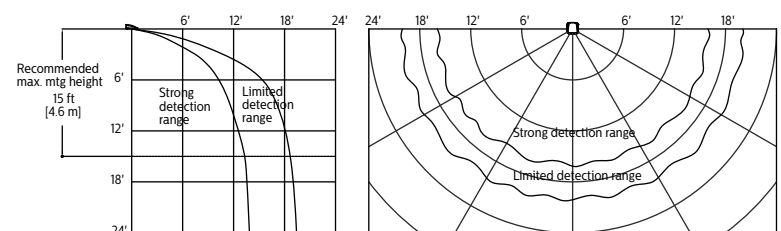
Note: Typical value accuracy +/- 5%

Automatic Profile Dimming (CS/CM): Standard dimming profiles provide flexibility towards energy savings goals while optimizing light levels during specific dark hours. Dimming profiles include two dimming settings including dim to 30% or 50% of the total lumen output. When used in combination with not programmed motion response it overrides the controller's schedule when motion is detected. After 5 minutes with no motion, it will return to the automatic dimming profile schedule. Automatic dimming profile scheduled with the following settings:

- **CS50/CS30:** Security for 7 hours night duration (Ex., 11 PM – 6 AM)
- **CM50/CM30:** Median for 8 hours night duration (Ex., 10 PM – 6 AM)

All above profiles are calculated from mid-point of the night. Dimming is set for 6 hours after the mid-point and 2, or 3 hours before depending on the duration of dimming. Cannot be used with other dimming control options. Luminaires with Dynadimmer option include D4i compatible drivers.

Motion Response (MW30): Motion Response (MW30): Motion response luminaires include a high frequency microwave sensor, 5.8GHz +/- 75MHz microwave ISM continuous wave band with 360° coverage area, <0.5 mW transmitting power and <1 W standby power. Factory programmed settings dim fixture to 30% with time delay of 5 minutes with no stand-by period. When motion is detected, the luminaire returns to 100% full light output and will remain on full power for 5 minutes.



Emergency Battery Backup (EC): Emergency battery pack included integral to the luminaire, allowing for a consistent look between emergency and non-emergency luminaires. EC is cold weather rated for use in ambient temperature conditions from -20°C (-4°F) to 40°C (104°F) designed to have a secondary driver with relay to immediately detect AC power loss to power luminaire for a minimum of 90 minutes from the time power is lost. Available with 120 or 277V only.

Electrical

Driver: Driver efficiency (>90% standard). 120-480V available (restrictions apply). Open/short circuit protection. 0-10V dimming driver down to 10% standard. RoHS compliant.

Button Photocontrol (PCB): Button style design for internal luminaires mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4Fc of ambient light.

GBM GeoForm block medium

Wall sconce

Specifications (cont'd)

Surge protection (SP2): Each luminaire is provided as standard with surge protector tested in accordance with ANSI/IEEE C62.45 per ANSI/ IEEE C62.41.2 Scenario I Category C High Exposure 10kV/5kA waveforms for Line Ground, Line Neutral and Neutral Ground, and in accordance with U.S. DOE (Department of Energy) MSSLC (Municipal Solid-State Street Lighting Consortium) Model Specification for LED Roadway Luminaires Appendix D Electrical Immunity High Test Level 10kV / 5kA. Optional 20kV is available for additional protection.

Listings

UL/cUL listed to the UL 1598 standard, suitable for wet locations when mounted downward facing. GeoForm with Precision Plus optics listed for damp locations when inverted. GeoForm with light effects optics listed for wet location in up or down orientation. Suitable for use in ambient temperatures from -40° to 40°C (-40° to 104°F). GeoForm configurations with Precision Plus optics are qualified under Design Lights Consortium® Premium category. Consult DLC Qualified Products List on Specific Classifications and for more details. CCTs 3000K and warmer are IDA Dark Sky Approved. FCC Compliant.

Finish

Each standard color luminaire receives a fade and abrasion resistant, electrostatically applied, thermally cured, triglycidic isocyanurate (TGIC) textured polyester powder coat finish. The surface treatment achieves a minimum of 1000 hours for salt spray resistant finish in accordance with testing performed and per ASTM B117 standard. Standard colors include bronze (BZ), black (BK), white (WH), dark gray (DGY), and medium gray (MGY). Consult factory for specs on optional or custom colors.

Service Tag

Each individual luminaire is uniquely identifiable, thanks to the Service tag application. With a simple scan of a QR code, placed on the inside of the mast door, you gain instant access to the luminaire configuration, making installation and maintenance operations faster and easier, no matter what stage of the luminaire's lifetime. Just download the APP and register your product right away. For more details visit: signify.com

Warranty

GeoForm luminaires feature a 5-year limited warranty. See signify.com/warranties for complete details and exclusions.

Predicted Lumen Depreciation Data

Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions. L₇₀ is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published L₇₀ hours limited to 6 times actual LED test hours

Ambient Temp°C	Drive current	L ₇₀ per TM-21	Lumen Maintenance % at 60,000 hrs
25°C	up to 1200 mA	>102,000 hours	>91%



THE BRICKYARD - HANOVER STREET
LEBANON, NH
PT2

Gardco PureForm LED post top features a sleek, low profile design and is available with two light engines. ComfortEdge optics provide a unique and lower glare lighting solution designed to enhance visual comfort for pedestrian applications, while precision optics maximize efficiency and spacing. PureForm post top is available with multiple optical distributions with output up to 17,000 lumens. A full range of control options provides additional energy savings. Optional integral emergency battery backup is available for path-of-egress illumination.

Project: _____
Location: _____
Cat.No: _____
Type: _____
Lamps: _____ Qty: _____
Notes: _____

Ordering guide

Example: PPT-P-A09-840-T5M-T3-120-DALI-CS30-PCB-BZ

Prefix	Catalog Code	Lumens Selection	CCT/CRI	Distribution	Shielding	Mounting	Voltage
PPT	C	A02	830	T2M		T3	UNV
PPT PureForm post top, comfort optics	P Precision optics	A01 ⁴ 2500 A06 11000 A02 ⁴ 3500 A07 13500 A03 ⁴ 5000 A08 16000 A04 7000 A09 17000 A05 9000	730 70CRI, 3000K 740 70CRI, 4000K 750 70CRI, 5000K 830 80CRI, 3000K 840 80CRI, 4000K 827 ¹ 80CRI, 2700K (ETor)	T2M Area optic type 2 T3M Area optic type 3 T4M Area optic type 4 T5M Area optic type 5 BLC Back light control	None - HIS ² Internal house side shield (clip-on)	T3 Mounts to a 3"x4" tenon (standard) T2 Post top tenon adapter for 2-3/8" x 4" (ships separately)	120 120V 208 208V 240 240V 277 10-277V UNV 120-277V 347 347V 480 480V HVV 374-480V
	C Comfort optics	A01 ⁴ 2000 A06 11000 A02 3500 A07 ¹⁴ 13500 A03 5000 A08 ¹⁴ 16000 A04 7000 A09 ¹⁴ 17000 A05 9000	830 80CRI, 3000K 840 80CRI, 4000K 827 ¹ 80CRI, 2700K (ETor) 835 ¹ 80CRI, 3500K (ETor) 750 ¹ 70CRI, 5000K (ETor)	T2M Comfort optic type 2M T3M Comfort optic type 3M T4M Comfort optic type 4M T5M Comfort optic type 5M	None - (comfort shielding must be ordered as separately as accessory PPT-EHS-BK)		
Driver type	Dimming Controls (only one may be selected)		Lighting controls ¹⁰ (only one may be selected)		Emergency	Finish	
010V						FINISH	
0-10V					None - EM ^{4,9,15} Emergency battery backup (0°C to +40°C/32°F to +104°F)	Standard textured finish	
010V 0-10V	None	-	None	-	EMC ⁴ Emergency battery pack, cold rated (20°C to +40°C/-4°F to +104°F) ^{7, 9, 11, 16}	BK Black WH White BZ Bronze DG Dark gray MG Medium gray	
	DLEA	Dimming leads externally accessible (controls by others)	PCB ^{4,12,13}	Photocontrol button			
	FAWS	Field adjustable wattage selector	TLR5	5-pin twist lock w/ 0-10v driver			
	BL50L2 ²	PIR motion response dim to 50% L2 lens	TLR7	7-pin twist lock w/ 0-10v driver (non-D4i)			
	BL50L3 ²	PIR motion response dim to 50% L3 lens	TLRPC ^{4,13}	7-pin twist lock w/ 0-10v driver (non-D4i) & on/off photocell			
	BL30MW ¹³	Microwave motion sensor factory set at 50% dimming					
DALI					Fusing	Customer specified	
DALI SR/ DALI	None	-	None	-	None - F1 ¹² Single Fuse (120V, 277V, or 347V) F2 ¹² Double Fuse (208V, 240V, or 480V) F3 ¹² Double Fuse Canadian double pole (208V, 240V, or 480V)	OC Optional color (specify optional color or RAL, contact factory) SC Special color (must supply color chip, requires factory quote)	
	CS50 ^{5,6}	Security 50 % dimming, 7 hours	PCB ^{4,12}	Photocontrol button			
	CM50 ^{5,6}	Median 50 % dimming, 8 hours	TR5 ^{5,6,13}	5-pin twist lock SR/DALI driver			
	CS30 ^{5,6}	Security 30 % dimming, 7 hours	TR7 ^{5,6,13}	7-pin twist lock SR/DALI driver (D4i)			
	CM30 ^{5,6}	Median 30 % dimming, 8 hours	TLP ^{5,6,12}	7-pin twist lock SR/DALI driver (D4i) & on/off photocell			
	SRDR ^{5,6}	SR driver connected to Zhaga socket (D4i)					
	WIAPLW ^{5,6}	Wireless Interact outdoor low mounting (7-15'), white housing					
	WIAPLB ^{5,6}	Wireless Interact outdoor low mounting (7-15'), black housing					
	WIAPHW ^{5,6}	Wireless Interact outdoor low mounting (15-40'), white housing					
	WIAPHB ^{5,6}	Wireless Interact outdoor low mounting (15-40'), black housing					
					Surge Protection		
					None SP1 Surge Protector 10kV / 10kA (standard)		
					SP2 Surge Protector 20kV/ 10kA (option)		

- Extended lead times apply. Contact factory for details.
- Available with Area optics only. Not allowed with Comfort optics.
- Available with Comfort optics only at 120-347V. Not allowed with Area optics.
- Not available at 347-480V(HVV).
- Not available at 347-480V(HVV) for Pixelated (P-Axx) optic lumen packages. A01-A02 and Comfort (C-Axx) optic lumen packages A01-A09.
- Not available at 120-277V(UNV) for Pixelated (P-Axx) optic lumen packages A01-A02 and Comfort (C-Axx) optic lumen packages A01-A02.
- EMC only compatible with DLEA and Dynadimmer (CSXX, CMXX) Dimming control options.
- Not available with Microwave Motion Sensor BL50MW.
- Not available with Comfort (C-Axx) optic lumen packages A07-A09.
- If selected with Dimming control, DIM leads from receptacle will not be connected to driver.
- Available only with Comfort optics.
- Must specify input voltage.
- BL50MW options and Twistlock photocell options (TLR5, TLR7, TLRPC, PCB) are not compatible due to mechanical conflict.
- Not available with emergency options.
- EMC limited to 25°C max ambient with shielding and A09. All other configurations listed to 40°C ambient.
- For comfort PPT, emergency cold-pack conflicts with BL50xx & PCB/TLRx & Zhaga & FAWS.



PPT PureForm LED post top

PureForm Accessories (order separately)

Mounting Accessories

- PPT-T2** Post top tenon adapter for 2 3/8" x 4"
- FSIR-100** BL Optional Remote Programming Tool
- PPT-EHS-BK** External house side shield, black

PPT Precision optics lumen values

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A01	15	T2M	2,525	B1-U0-G1	171	2,666	B1-U0-G1	180	2,666	B1-U0-G1	180	2,234	B1-U0-G1	151	2,380	B1-U0-G1	161
		T3M	2,578	B1-U0-G1	174	2,722	B1-U0-G1	184	2,722	B1-U0-G1	184	2,282	B1-U0-G1	154	2,430	B1-U0-G1	164
		T4M	2,518	B1-U0-G1	170	2,658	B1-U0-G1	180	2,658	B1-U0-G1	180	2,228	B1-U0-G1	151	2,373	B1-U0-G1	160
		T5M	2,575	B2-U0-G1	174	2,719	B2-U0-G1	184	2,719	B2-U0-G1	184	2,279	B2-U0-G1	154	2,427	B2-U0-G1	164
		BLC	1,775	B0-U0-G1	120	1,874	B0-U0-G1	127	1,874	B0-U0-G1	127	1,571	B0-U0-G1	106	1,673	B0-U0-G1	113
A02	21	T2M	3,596	B1-U0-G1	173	3,796	B1-U0-G1	183	3,796	B1-U0-G1	183	3,182	B1-U0-G1	153	3,389	B1-U0-G1	163
		T3M	3,672	B1-U0-G1	177	3,876	B1-U0-G1	186	3,876	B1-U0-G1	186	3,249	B1-U0-G1	156	3,460	B1-U0-G1	166
		T4M	3,586	B1-U0-G2	172	3,785	B1-U0-G2	182	3,785	B1-U0-G2	182	3,173	B1-U0-G2	153	3,395	B1-U0-G2	163
		T5M	3,667	B3-U0-G2	176	3,872	B3-U0-G2	186	3,872	B3-U0-G2	186	3,245	B2-U0-G1	156	3,456	B2-U0-G2	166
		BLC	2,528	B0-U0-G1	122	2,669	B0-U0-G1	128	2,669	B0-U0-G1	128	2,237	B0-U0-G1	108	2,383	B0-U0-G1	115
A03	30	T2M	5,002	B1-U0-G2	164	5,281	B1-U0-G2	173	5,281	B1-U0-G2	173	4,427	B1-U0-G1	145	4,714	B1-U0-G1	154
		T3M	5,108	B1-U0-G2	167	5,393	B1-U0-G2	177	5,393	B1-U0-G2	177	4,520	B1-U0-G1	148	4,814	B1-U0-G1	158
		T4M	4,988	B1-U0-G2	163	5,266	B1-U0-G2	173	5,266	B1-U0-G2	173	4,414	B1-U0-G2	145	4,723	B1-U0-G2	155
		T5M	5,102	B3-U0-G2	167	5,386	B3-U0-G2	176	5,386	B3-U0-G2	176	4,515	B3-U0-G2	148	4,808	B3-U0-G2	158
		BLC	3,517	B0-U0-G1	115	3,713	B0-U0-G1	122	3,713	B0-U0-G1	122	3,112	B0-U0-G1	102	3,315	B0-U0-G1	109
A04	42	T2M	7,095	B2-U0-G2	165	7,490	B2-U0-G2	174	7,490	B2-U0-G2	174	6,279	B2-U0-G2	146	6,687	B2-U0-G2	156
		T3M	7,245	B2-U0-G2	169	7,648	B2-U0-G2	178	7,648	B2-U0-G2	178	6,411	B1-U0-G2	149	6,828	B2-U0-G2	159
		T4M	7,075	B1-U0-G3	165	7,469	B1-U0-G3	174	7,469	B1-U0-G3	174	6,261	B1-U0-G2	146	6,699	B1-U0-G2	156
		T5M	7,236	B3-U0-G2	168	7,640	B3-U0-G2	178	7,640	B3-U0-G2	178	6,404	B3-U0-G2	149	6,820	B3-U0-G2	159
		BLC	4,988	B0-U0-G2	116	5,267	B0-U0-G2	123	5,267	B0-U0-G2	123	4,415	B0-U0-G2	103	4,701	B0-U0-G2	109
A05	53	T2M	8,407	B2-U0-G2	156	8,876	B2-U0-G2	165	8,876	B2-U0-G2	165	7,440	B2-U0-G2	138	7,924	B2-U0-G2	147
		T3M	8,585	B2-U0-G2	159	9,063	B2-U0-G2	168	9,063	B2-U0-G2	168	7,597	B2-U0-G2	141	8,091	B2-U0-G2	150
		T4M	8,384	B2-U0-G3	156	8,851	B2-U0-G3	164	8,851	B2-U0-G3	164	7,419	B1-U0-G3	138	7,938	B2-U0-G3	147
		T5M	8,574	B4-U0-G3	159	9,053	B4-U0-G3	168	9,053	B4-U0-G3	168	7,588	B3-U0-G2	141	8,081	B3-U0-G2	150
		BLC	5,911	B0-U0-G2	110	6,241	B0-U0-G2	116	6,241	B0-U0-G2	116	5,231	B0-U0-G2	97	5,571	B0-U0-G2	103
A06	70	T2M	10,388	B2-U0-G2	150	10,967	B2-U0-G2	158	10,967	B2-U0-G2	158	9,193	B2-U0-G2	132	9,790	B2-U0-G2	141
		T3M	10,607	B2-U0-G2	153	11,198	B2-U0-G2	161	11,198	B2-U0-G2	161	9,387	B2-U0-G2	135	9,997	B2-U0-G2	144
		T4M	10,358	B2-U0-G3	149	10,936	B2-U0-G3	157	10,936	B2-U0-G3	157	9,167	B2-U0-G3	132	9,808	B2-U0-G3	141
		T5M	10,594	B4-U0-G3	153	11,185	B4-U0-G3	161	11,185	B4-U0-G3	161	9,376	B4-U0-G3	135	9,985	B4-U0-G3	144
		BLC	7,304	B0-U0-G2	105	7,711	B0-U0-G2	111	7,711	B0-U0-G2	111	6,463	B0-U0-G2	93	6,883	B0-U0-G2	99
A07	90	T2M	13,080	B3-U0-G3	147	13,809	B3-U0-G3	155	13,809	B3-U0-G3	155	11,575	B3-U0-G3	130	12,328	B3-U0-G3	139
		T3M	13,356	B3-U0-G3	150	14,101	B3-U0-G3	159	14,101	B3-U0-G3	159	11,820	B2-U0-G3	133	12,588	B3-U0-G3	142
		T4M	13,043	B2-U0-G3	147	13,771	B2-U0-G3	155	13,771	B2-U0-G3	155	11,543	B2-U0-G3	130	12,351	B2-U0-G3	139
		T5M	13,341	B4-U0-G3	150	14,084	B4-U0-G3	158	14,084	B4-U0-G3	158	11,806	B4-U0-G3	133	12,573	B4-U0-G3	141
		BLC	9,197	B1-U0-G2	103	9,710	B1-U0-G2	109	9,710	B1-U0-G2	109	8,139	B0-U0-G2	92	8,668	B0-U0-G2	98

PPT PureForm LED post top

PPT Precision optics lumen values (continued)

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A08	107	T2M	15,324	B3-U0-G3	146	16,179	B3-U0-G3	154	16,179	B3-U0-G3	154	13,561	B3-U0-G3	129	14,443	B3-U0-G3	137
		T3M	15,648	B3-U0-G3	149	16,520	B3-U0-G3	157	16,520	B3-U0-G3	157	13,847	B3-U0-G3	132	14,748	B3-U0-G3	140
		T4M	15,281	B3-U0-G4	145	16,133	B3-U0-G4	153	16,133	B3-U0-G4	153	13,523	B2-U0-G3	129	14,470	B2-U0-G3	138
		T5M	15,629	B4-U0-G3	149	16,501	B4-U0-G3	157	16,501	B4-U0-G3	157	13,831	B4-U0-G3	132	14,730	B4-U0-G3	140
		BLC	10,775	B1-U0-G3	103	11,375	B1-U0-G3	108	11,375	B1-U0-G3	108	9,535	B1-U0-G2	91	10,155	B1-U0-G2	97
A09	114	T2M	16,062	B3-U0-G3	144	16,957	B3-U0-G3	152	16,957	B3-U0-G3	152	14,214	B3-U0-G3	127	15,138	B3-U0-G3	135
		T3M	16,401	B3-U0-G3	147	17,315	B3-U0-G3	155	17,315	B3-U0-G3	155	14,514	B3-U0-G3	130	15,457	B3-U0-G3	138
		T4M	16,017	B3-U0-G4	143	16,910	B3-U0-G4	151	16,910	B3-U0-G4	151	14,174	B2-U0-G3	127	15,166	B3-U0-G4	136
		T5M	16,382	B5-U0-G4	147	17,295	B5-U0-G4	155	17,295	B5-U0-G4	155	14,497	B4-U0-G3	130	15,439	B4-U0-G3	138
		BLC	11,293	B1-U0-G3	101	11,923	B1-U0-G3	107	11,923	B1-U0-G3	107	9,994	B1-U0-G2	89	10,644	B1-U0-G2	95

PPT Comfort optics lumen values

Perf. Package	System Watts	Dist. Type	80 CRI			80 CRI		
			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A01	13	T2M	1,565	B1-U0-G1	120	1,674	B1-U0-G1	129
		T3M	1,490	B1-U0-G1	115	1,594	B1-U0-G1	123
		T4M	1,650	B1-U0-G1	127	1,765	B1-U0-G1	136
		T5M	1,467	B1-U0-G1	113	1,569	B1-U0-G1	121
A02	23	T2M	2,993	B1-U0-G1	130	3,203	B1-U0-G1	139
		T3M	2,850	B1-U0-G1	124	3,050	B2-U0-G2	133
		T4M	3,156	B1-U0-G1	137	3,377	B1-U0-G1	147
		T5M	2,806	B2-U0-G1	122	3,002	B2-U0-G2	131
A03	35	T2M	4,172	B2-U0-G2	119	4,464	B2-U0-G2	128
		T3M	3,973	B2-U0-G2	114	4,251	B2-U0-G2	121
		T4M	4,399	B2-U0-G2	126	4,707	B2-U0-G2	135
		T5M	3,911	B3-U0-G2	112	4,184	B3-U0-G2	120
A04	50	T2M	5,881	B2-U0-G2	118	6,293	B2-U0-G2	126
		T3M	5,600	B2-U0-G2	112	5,992	B3-U0-G3	120
		T4M	6,201	B2-U0-G2	124	6,635	B2-U0-G2	133
		T5M	5,513	B3-U0-G2	110	5,898	B3-U0-G2	118
A05	67	T2M	7,562	B3-U0-G3	113	8,091	B3-U0-G3	121
		T3M	7,200	B3-U0-G3	107	7,704	B3-U0-G3	115
		T4M	7,973	B3-U0-G3	119	8,531	B3-U0-G3	127
		T5M	7,088	B3-U0-G3	106	7,584	B3-U0-G3	113

Perf. Package	System Watts	Dist. Type	80 CRI			80 CRI		
			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A06	83	T2M	8,979	B3-U0-G3	109	9,608	B3-U0-G3	116
		T3M	8,550	B3-U0-G3	103	9,149	B3-U0-G3	111
		T4M	9,468	B3-U0-G3	114	10,130	B3-U0-G3	123
		T5M	8,416	B3-U0-G3	102	9,006	B3-U0-G3	109
A07	106	T2M	11,237	B3-U0-G3	107	12,024	B3-U0-G3	114
		T3M	10,700	B3-U0-G3	101	11,449	B3-U0-G3	109
		T4M	11,849	B3-U0-G3	112	12,678	B3-U0-G3	120
		T5M	10,533	B4-U0-G3	100	11,270	B4-U0-G3	107
A08	132	T2M	13,238	B3-U0-G3	100	14,165	B3-U0-G3	108
		T3M	12,575	B3-U0-G3	95	13,455	B3-U0-G3	102
		T4M	13,958	B3-U0-G3	106	14,935	B3-U0-G3	113
		T5M	12,408	B4-U0-G3	94	13,277	B4-U0-G3	101
A09	140	T2M	14,283	B3-U0-G3	102	14,283	B3-U0-G3	102
		T3M	13,600	B3-U0-G3	97	14,552	B3-U0-G3	104
		T4M	15,060	B3-U0-G3	107	16,114	B3-U0-G3	115
		T5M	13,388	B4-U0-G3	95	14,325	B4-U0-G3	102

Predicted Lumen Depreciation Data

Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions. L70 is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published L70 hours limited to 6 times actual LED test hours

Optic type	Ambient Temperature °C	Calculated L70 Hours	L70 reported per TM-21	Lumen Maintenance % at 60,000 hrs
Precision (A01-A09)	25°C	>100,000 hours	>72,000 hours	95.60%
Comfort (P01-P09)	25°C	>100,000 hours	>100,000 hours	89.10%

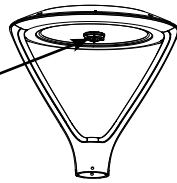
PPT PureForm LED post top

Dimensions – Post Top Luminaire

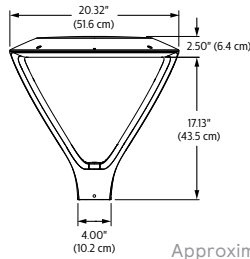
Effective Projected Area ft² / m²

Type	Single
PPT	0.35 ft ² /0.032m ²

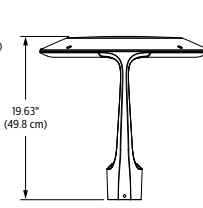
Approximate Motion
Sensor Placement



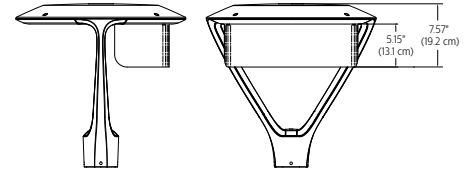
Front View



Side View



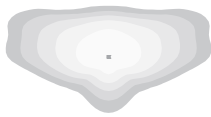
Luminaire with EHS Shield



Approximate Luminaire Weight:
Standard: 20 lbs (9.1 kg)
With battery pack: 26 lbs (11.8 kg)

Precision Optical Distributions

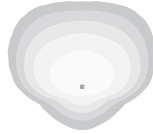
Type 2 Medium



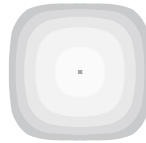
Type 3 Medium



Type 4 Medium



Type 5 Medium



Back Light Control



Comfort Optical Distributions

Type 2



Type 3



Type 4



Type 5

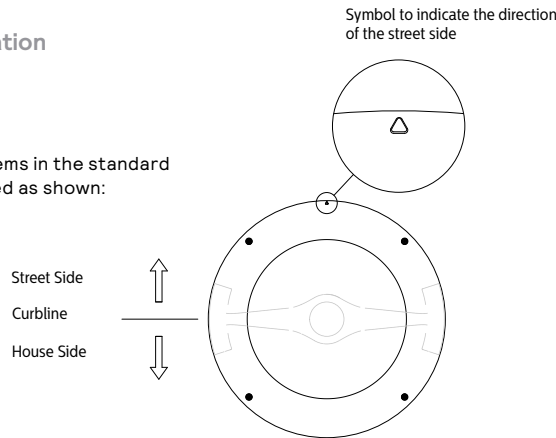


Asymmetric Optical Orientation Information

Standard Optic Position

Aimed Between The Yoke Supports

Luminaires ordered with asymmetric optical systems in the standard optic position will have the optical system oriented as shown:



PPT PureForm LED post top

Specifications

Housing

Two-piece sealed enclosure with main part of the housing designed as the structural and heat sink frame, enclosed by cover to give its unique form. It also includes yoke arm with arm covers. All die-cast parts are made of low-copper, die-cast aluminum alloy for a high resistance to corrosion. The sleek profile without optimized surface area allows housing to provide excellent convection heat transfer with minimum use of heat fins, giving the freedom to have a clean minimalist aesthetic design. Luminaire housing rated to IP66, tested in accordance to Section 9 of IEC 60598-1.

Vibration resistance

Luminaire is tested and rated Level 2 for Bridge and Overpass application (formerly 3G) cycles conforming to standards set forth by ANSI C136.31-2023. Testing includes vibration to 3G acceleration in three axes, all performed on the same luminaire.

Light engine

Comfort Edge technology provides low-glare, uniform illumination. Composed of LEDs strategically positioned on the edge of the optical plate. Light engine luminous opening size optimized to best achieve a balance between lumen output and optical performance with the need to provide visual comfort. LEDs are mounted directly to the housing to provide heat conduction and ensure maximized LED lifetime and performance. Light engine is RoHS compliant and available in 4 IES distribution options. Standard color temperatures: 3000K +/- 130K, 4000K +/- 130K, 5000K +/- 225K. Minimum CRI of 70. Also available in 2700K and 3500K color temperatures with extended leadtimes. Contact factory for details.

Precision LED Modules are comprised of 40 count LEDs mounted to metal clad printed circuit board and sealed to a polymer optic plate to meet IP66 rating.

Energy saving benefits

System efficacy up to 193 lms/W with significant energy savings over Pulse Start Metal Halide luminaires. Optional control options provide added energy savings during unoccupied periods.

Optical systems

ComfortEdge technology provides a unique and lower perceived glare lighting solution designed to enhance visual comfort for pedestrian applications. Available in IES distribution types 2, 3, 4, and 5 available up to 17,000 lumens.

Precision optics are available in type 2, 3, 4, 5 and Backlight Control (BLC) distributions available. Internal shield option mounts to LED optics to provide additional cutoff, and dedicated BLC optics provide the most stringent cutoff to meet requirements around property lines. Performance tested per LM-79 and TM-15 (IESNA) certifying its photometric performance. Luminaire designed with 0% uplight (UO per IESNA TM-15).

Mounting

PureForm Post Top mounts standard to a 3" x 4" Tenon, but can also be mounted to a 2-3/8" x 4" Tenon if a separate sleeve is specified and shipped as separately as an accessory.

Listings

PPT is UL/cUL wet location listed to the UL 1598 standard, suitable for use in ambient temperatures from -40° to 40°C (-40° to 104°F). Most PureForm PPT comfort configurations are qualified under Standard DesignLights Consortium® category. Consult DLC Qualified Products list to confirm your specific luminaire selection is approved. CCTs 3000K and warmer are Dark Sky Approved.

Controls

0-10V Dimming Control Options

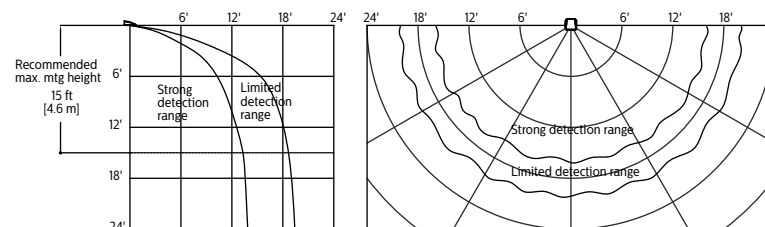
DLEA: Access to 0-10V dimming leads supplied through the yoke of the luminaire (for secondary dimming controls by others). Cannot be used with other control options.

Field Adjustable Wattage Selector (FAWS): Luminaire equipped with the ability to manually adjust the wattage in the field to reduce total luminaire lumen output and light levels. Comes pre-set to the highest of 10 output positions. Consult factory for specific dimming settings for each position.

BL50L2/BL50L3: Motion Response module is mounted integral to luminaire factory pre-programmed to 50% dimming when not ordered with other control options. BL50Lx options are set/operate in the following fashion: The motion sensor is set to a constant 50%. When motion is detected by the PIR sensor, the luminaire returns to full power/light output. Dimming on low is factory set to 50% with 5 minutes default in "full power" prior to dimming back to low. When no motion is detected for 5 minutes, the motion response system reduces the wattage by 50%, to 50% of the normal constant wattage reducing the light level. Other dimming settings can be provided if different dimming levels are required. Contact technical support for details.

Infrared Motion Response Lenses (BL50L2/BL50L3): Lens #2 is designed for mounting heights 8' to 15'. Lens #3 is designed for higher mounting heights up to 20' with a 40' diameter coverage area.

Microwave Motion Response (BL30MW): Motion response luminaires include a high frequency microwave sensor, 5.8GHz +/- 75MHz microwave ISM continuous wave band with 360° coverage area, <0.5 mW transmitting power and <1 W standby power. Factory programmed settings dim fixture to 30% with time delay of 5 minutes with no stand-by period. When motion is detected, the luminaire returns to 100% full light output and will remain on full power for 5 minutes.



Note: The beam patterns shown are intended solely as a general guide and are not to scale. Sensing capabilities and coverage area depend on many factors including the size, speed and direction of travel of persons and vehicles; sensor mounting height; environmental and site conditions; etc.

0-10V Lighting Control Options

Button Photocontrol (PCB): Button style design for internal luminaires mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4fc of ambient light.

Twist-Lock Receptacle (TLR5/TLR7/TLRPC): TLR options come with 5 pin or with 7 pins connected to 0-10V driver and not all pins will be connected. Dimming Receptacle Type B (5-pin) and Type D-24 (7-pin) in accordance to ANSI C136.41. Can be used with third-party control system. Receptacle located on top of luminaire housing. When specified with receptacle and photoelectric cell (TLRPC), 7-pin receptacle is supplier and voltage must be specified. When ordering Twist-lock receptacle (TLR5 or TLR7), photocell or shorting cap is not included. If Twistlock receptacle option is ordered with Dimming Control option, then dimming leads from driver will not be connected to TLR but consumed by selected device. Devices installed to NEMA twist-lock Receptacle must be IPX6 rated.

Sensor Ready(SR)/DALI Control Options

Automatic Profile Dimming (CS/CM/CE/CA): Standard dimming profiles provide flexibility towards energy savings goals while optimizing light levels during specific dark hours. Dimming profiles include two dimming settings including dim to 30% or 50% of the total lumen output. When used in combination with not programmed motion response it overrides the controller's schedule when motion is detected. After 5 minutes with no motion, it will return to the automatic dimming profile schedule. Automatic dimming profile scheduled with the following settings:

- **CS50/CS30:** Security for 7 hours night duration (Ex., 11 PM – 6 AM)
- **CM50/CM30:** Median for 8 hours night duration (Ex., 10 PM – 6 AM)

All above profiles are calculated from mid point of the night. Dimming is set for 6 hours after the mid point and 1 or 2 hours before depending of the duration of dimming. Time clock or photocell is required for on/off functionality to allow for midpoint calculation. Cannot be used with other dimming control options.

PPT PureForm LED post top

Specifications

Sensor Ready Zhaga Socket Connector (SRDR): Product is D4i Certified and equipped with Sensor Ready drivers connected to 4-pin Zhaga Book 18 compliant receptacle designed for sensor and other control system applications. Receptacle is rated IP66 assembly in a compact design that provides a sealed electrical interface and rated UV resistance, mounted on underside of the luminaire, protective dust cap included. When a controller not provided by Signify is used with Sensor Ready Zhaga socket connector, the controller must be certified to work with the Xitanium SR LED drivers as part of the SR certified program. SRDR can be used with NEMA 7-pin twist lock receptacle, which is mounted on top of the luminaire. D4i certification validates compliance with specifications for data exchange in connected lighting systems, ensuring interoperability, compatibility, and efficient operation. It also assures customers that the device meets industry standards.

Outdoor Interact:

Scalable connected sensor with integral occupancy and daylight sensing, supports wireless mesh connectivity. Sensor works in the Foundation mode when configured without a gateway or in an Interact Advanced mode if a compatible gateway (can be added later) is used. Interact offers an app, a portal and a broad portfolio of Interact ready Indoor and Outdoor luminaires, lamps and retrofit kits all working on the same system. Startup is implemented via Interact Pro App (available in iOS® or Android®) and Bluetooth® connectivity. The app provides flexibility to choose between a gateway or non gateway mode for setup. Setup with the gateway requires wired Internet access to the gateway. Prepare project configuration steps remotely and use IRT9015 remote accessory (ordered separately) or the App on-site to identify and group devices together. WIAP includes SR driver and SR receptacle. Daylight harvesting supported through dimming - activated via the Interact app. Sensors are available in black or white finish and high or low mounting height lenses. IP66 rated.

For more information on Interact visit:

www.interact-lighting.com/interactproscalablesystem

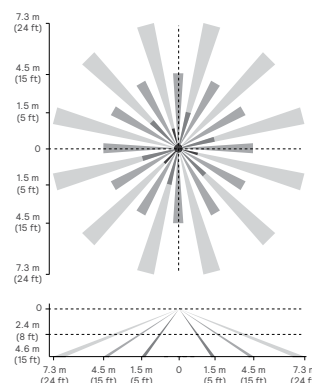
SR/DALI Lighting Control Options

Button Photocontrol (PCB): Button style design for internal luminaires mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4Fc of ambient light.

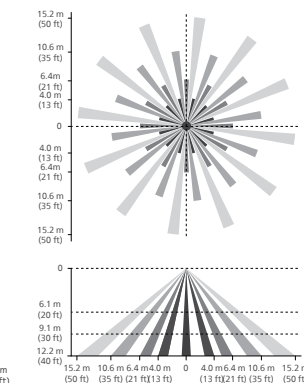
Twist-Lock Receptacle (TR5/TR7/ TLP): TLR5 includes with 5 pin (Type B) receptacle connected to SR/DALI driver all applicable connections made to driver and is not D4i compliant. TR7 includes (Type D-24) connected to SR/DALI driver with all leads connected for use of 3rd party control systems. Receptacles are in accordance to ANSI C136.41. Receptacle located on top of luminaire housing. When specified with receptacle and photoelectric cell (TRPC), 7-pin receptacle is supplied and voltage must be specified. When ordering Twist-lock receptacle (TR5 or TR7), photocell or shorting cap is not included. Devices installed to NEMA twist-lock Receptacle must be IPX6 rated.

Note: The beam patterns shown are intended solely as a general guide and are not to scale. Sensing capabilities and coverage area depend on many factors including the size, speed and direction of travel of persons and vehicles; sensor mounting height; environmental and site conditions; etc.

LW low sensor



HW high sensor



Finish

Each standard color luminaire receives a fade and abrasion resistant, electrostatically applied, thermally cured, triglycidic isocyanurate (TGIC) textured polyester powdercoat finish. The surface treatment achieves a minimum of 1000 hours for salt spray resistant finish in accordance with testing performed and per ASTM B117 standard. Standard colors include bronze (BZ), black (BK), white (WH), dark gray (DGY), and medium gray (MGY). Consult factory for specs on optional or custom colors.

Warranty

PureForm luminaires feature a 5-year limited warranty.

See signify.com/warranties for complete details and exclusions.



THE BRICKYARD - HANOVER STREET
LEBANON, NH
PT3

Gardco PureForm LED post top features a sleek, low profile design and is available with two light engines. ComfortEdge optics provide a unique and lower glare lighting solution designed to enhance visual comfort for pedestrian applications, while precision optics maximize efficiency and spacing. PureForm post top is available with multiple optical distributions with output up to 17,000 lumens. A full range of control options provides additional energy savings. Optional integral emergency battery backup is available for path-of-egress illumination.

Project: _____
Location: _____
Cat.No: _____
Type: _____
Lamps: _____ Qty: _____
Notes: _____

Ordering guide

Example: PPT-P-A09-840-T5M-T3-120-DALI-CS30-PCB-BZ

Prefix	Catalog Code	Lumens Selection	CCT/CRI	Distribution	Shielding	Mounting	Voltage
PPT	C	A02	830	T3M		T3	UNV
PPT PureForm post top, comfort optics	P Precision optics	A01 ⁴ 2500 A06 11000 A02 ⁴ 3500 A07 13500 A03 ⁴ 5000 A08 16000 A04 7000 A09 17000 A05 9000	730 70CRI, 3000K 740 70CRI, 4000K 750 70CRI, 5000K 830 80CRI, 3000K 840 80CRI, 4000K 827 ¹ 80CRI, 2700K (ETor)	T2M Area optic type 2 T3M Area optic type 3 T4M Area optic type 4 T5M Area optic type 5 BLC Back light control	None - HIS ² Internal house side shield (clip-on)	T3 Mounts to a 3"x4" tenon (standard) T2 Post top tenon adapter for 2-3/8" x 4" (ships separately)	120 120V 208 208V 240 240V 277 10-277V UNV 120-277V 347 347V 480 480V HVV 374-480V
	C Comfort optics	A01 ⁴ 2000 A06 11000 A02 3500 A07 ¹⁴ 13500 A03 5000 A08 ¹⁴ 16000 A04 7000 A09 ¹⁴ 17000 A05 9000	830 80CRI, 3000K 840 80CRI, 4000K 827 ¹ 80CRI, 2700K (ETor) 835 ¹ 80CRI, 3500K (ETor) 750 ¹ 70CRI, 5000K (ETor)	T2M Comfort optic type 2M T3M Comfort optic type 3M T4M Comfort optic type 4M T5M Comfort optic type 5M	None - (comfort shielding must be ordered as separately as accessory PPT-EHS-BK)		
Driver type	Dimming Controls (only one may be selected)		Lighting controls ¹⁰ (only one may be selected)		Emergency	Finish	
010V						FINISH	
0-10V					None - EM ^{4,9,15} Emergency battery backup (0°C to +40°C/32°F to +104°F)	Standard textured finish	
010V 0-10V	None	-	None	-	EMC ⁴ Emergency battery pack, cold rated (20°C to +40°C/-4°F to +104°F) ^{7, 9, 11, 16}	BK Black WH White BZ Bronze DG Dark gray MG Medium gray	
	DLEA	Dimming leads externally accessible (controls by others)	PCB ^{4,12,13}	Photocontrol button			
	FAWS	Field adjustable wattage selector	TLR5	5-pin twist lock w/ 0-10v driver			
	BL50L2 ²	PIR motion response dim to 50% L2 lens	TLR7	7-pin twist lock w/ 0-10v driver (non-D4i)			
	BL50L3 ²	PIR motion response dim to 50% L3 lens	TLRPC ^{4,13}	7-pin twist lock w/ 0-10v driver (non-D4i) & on/off photocell			
	BL30MW ¹³	Microwave motion sensor factory set at 50% dimming					
DALI					Fusing	Customer specified	
DALI SR/ DALI	None	-	None	-	None - F1 ¹² Single Fuse (120V, 277V, or 347V) F2 ¹² Double Fuse (208V, 240V, or 480V) F3 ¹² Double Fuse Canadian double pole (208V, 240V, or 480V)	OC Optional color (specify optional color or RAL, contact factory) SC Special color (must supply color chip, requires factory quote)	
	CS50 ^{5,6}	Security 50 % dimming, 7 hours	PCB ^{4,12}	Photocontrol button			
	CM50 ^{5,6}	Median 50 % dimming, 8 hours	TR5 ^{5,6,13}	5-pin twist lock SR/DALI driver			
	CS30 ^{5,6}	Security 30 % dimming, 7 hours	TR7 ^{5,6,13}	7-pin twist lock SR/DALI driver (D4i)			
	CM30 ^{5,6}	Median 30 % dimming, 8 hours	TLP ^{5,6,12}	7-pin twist lock SR/DALI driver (D4i) & on/off photocell			
	SRDR ^{5,6}	SR driver connected to Zhaga socket (D4i)					
	WIAPLW ^{5,6}	Wireless Interact outdoor low mounting (7-15'), white housing					
	WIAPLB ^{5,6}	Wireless Interact outdoor low mounting (7-15'), black housing					
	WIAPHW ^{5,6}	Wireless Interact outdoor low mounting (15-40'), white housing					
	WIAPHB ^{5,6}	Wireless Interact outdoor low mounting (15-40'), black housing					
					Surge Protection		
					None SP1 Surge Protector 10kV / 10kA (standard)		
					SP2 Surge Protector 20kV/ 10kA (option)		

- Extended lead times apply. Contact factory for details.
- Available with Area optics only. Not allowed with Comfort optics.
- Available with Comfort optics only at 120-347V. Not allowed with Area optics.
- Not available at 347-480V(HVV).
- Not available at 347-480V(HVV) for Pixelated (P-Axx) optic lumen packages. A01-A02 and Comfort (C-Axx) optic lumen packages A01-A09.
- Not available at 120-277V(UNV) for Pixelated (P-Axx) optic lumen packages A01-A02 and Comfort (C-Axx) optic lumen packages A01-A02.
- EMC only compatible with DLEA and Dynadimmer (CSXX, CMXX) Dimming control options.
- Not available with Microwave Motion Sensor BL50MW.
- Not available with Comfort (C-Axx) optic lumen packages A07-A09.
- If selected with Dimming control, DIM leads from receptacle will not be connected to driver.
- Available only with Comfort optics.
- Must specify input voltage.
- BL50MW options and Twistlock photocell options (TLR5, TLR7, TLRPC, PCB) are not compatible due to mechanical conflict.
- Not available with emergency options.
- EMC limited to 25°C max ambient with shielding and A09. All other configurations listed to 40°C ambient.
- For comfort PPT, emergency cold-pack conflicts with BL50xx & PCB/TLRx & Zhaga & FAWS.



PPT PureForm LED post top

PureForm Accessories (order separately)

Mounting Accessories

- PPT-T2** Post top tenon adapter for 2 3/8" x 4"
- FSIR-100** BL Optional Remote Programming Tool
- PPT-EHS-BK** External house side shield, black

PPT Precision optics lumen values

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A01	15	T2M	2,525	B1-U0-G1	171	2,666	B1-U0-G1	180	2,666	B1-U0-G1	180	2,234	B1-U0-G1	151	2,380	B1-U0-G1	161
		T3M	2,578	B1-U0-G1	174	2,722	B1-U0-G1	184	2,722	B1-U0-G1	184	2,282	B1-U0-G1	154	2,430	B1-U0-G1	164
		T4M	2,518	B1-U0-G1	170	2,658	B1-U0-G1	180	2,658	B1-U0-G1	180	2,228	B1-U0-G1	151	2,373	B1-U0-G1	160
		T5M	2,575	B2-U0-G1	174	2,719	B2-U0-G1	184	2,719	B2-U0-G1	184	2,279	B2-U0-G1	154	2,427	B2-U0-G1	164
		BLC	1,775	B0-U0-G1	120	1,874	B0-U0-G1	127	1,874	B0-U0-G1	127	1,571	B0-U0-G1	106	1,673	B0-U0-G1	113
A02	21	T2M	3,596	B1-U0-G1	173	3,796	B1-U0-G1	183	3,796	B1-U0-G1	183	3,182	B1-U0-G1	153	3,389	B1-U0-G1	163
		T3M	3,672	B1-U0-G1	177	3,876	B1-U0-G1	186	3,876	B1-U0-G1	186	3,249	B1-U0-G1	156	3,460	B1-U0-G1	166
		T4M	3,586	B1-U0-G2	172	3,785	B1-U0-G2	182	3,785	B1-U0-G2	182	3,173	B1-U0-G2	153	3,395	B1-U0-G2	163
		T5M	3,667	B3-U0-G2	176	3,872	B3-U0-G2	186	3,872	B3-U0-G2	186	3,245	B2-U0-G1	156	3,456	B2-U0-G2	166
		BLC	2,528	B0-U0-G1	122	2,669	B0-U0-G1	128	2,669	B0-U0-G1	128	2,237	B0-U0-G1	108	2,383	B0-U0-G1	115
A03	30	T2M	5,002	B1-U0-G2	164	5,281	B1-U0-G2	173	5,281	B1-U0-G2	173	4,427	B1-U0-G1	145	4,714	B1-U0-G1	154
		T3M	5,108	B1-U0-G2	167	5,393	B1-U0-G2	177	5,393	B1-U0-G2	177	4,520	B1-U0-G1	148	4,814	B1-U0-G1	158
		T4M	4,988	B1-U0-G2	163	5,266	B1-U0-G2	173	5,266	B1-U0-G2	173	4,414	B1-U0-G2	145	4,723	B1-U0-G2	155
		T5M	5,102	B3-U0-G2	167	5,386	B3-U0-G2	176	5,386	B3-U0-G2	176	4,515	B3-U0-G2	148	4,808	B3-U0-G2	158
		BLC	3,517	B0-U0-G1	115	3,713	B0-U0-G1	122	3,713	B0-U0-G1	122	3,112	B0-U0-G1	102	3,315	B0-U0-G1	109
A04	42	T2M	7,095	B2-U0-G2	165	7,490	B2-U0-G2	174	7,490	B2-U0-G2	174	6,279	B2-U0-G2	146	6,687	B2-U0-G2	156
		T3M	7,245	B2-U0-G2	169	7,648	B2-U0-G2	178	7,648	B2-U0-G2	178	6,411	B1-U0-G2	149	6,828	B2-U0-G2	159
		T4M	7,075	B1-U0-G3	165	7,469	B1-U0-G3	174	7,469	B1-U0-G3	174	6,261	B1-U0-G2	146	6,699	B1-U0-G2	156
		T5M	7,236	B3-U0-G2	168	7,640	B3-U0-G2	178	7,640	B3-U0-G2	178	6,404	B3-U0-G2	149	6,820	B3-U0-G2	159
		BLC	4,988	B0-U0-G2	116	5,267	B0-U0-G2	123	5,267	B0-U0-G2	123	4,415	B0-U0-G2	103	4,701	B0-U0-G2	109
A05	53	T2M	8,407	B2-U0-G2	156	8,876	B2-U0-G2	165	8,876	B2-U0-G2	165	7,440	B2-U0-G2	138	7,924	B2-U0-G2	147
		T3M	8,585	B2-U0-G2	159	9,063	B2-U0-G2	168	9,063	B2-U0-G2	168	7,597	B2-U0-G2	141	8,091	B2-U0-G2	150
		T4M	8,384	B2-U0-G3	156	8,851	B2-U0-G3	164	8,851	B2-U0-G3	164	7,419	B1-U0-G3	138	7,938	B2-U0-G3	147
		T5M	8,574	B4-U0-G3	159	9,053	B4-U0-G3	168	9,053	B4-U0-G3	168	7,588	B3-U0-G2	141	8,081	B3-U0-G2	150
		BLC	5,911	B0-U0-G2	110	6,241	B0-U0-G2	116	6,241	B0-U0-G2	116	5,231	B0-U0-G2	97	5,571	B0-U0-G2	103
A06	70	T2M	10,388	B2-U0-G2	150	10,967	B2-U0-G2	158	10,967	B2-U0-G2	158	9,193	B2-U0-G2	132	9,790	B2-U0-G2	141
		T3M	10,607	B2-U0-G2	153	11,198	B2-U0-G2	161	11,198	B2-U0-G2	161	9,387	B2-U0-G2	135	9,997	B2-U0-G2	144
		T4M	10,358	B2-U0-G3	149	10,936	B2-U0-G3	157	10,936	B2-U0-G3	157	9,167	B2-U0-G3	132	9,808	B2-U0-G3	141
		T5M	10,594	B4-U0-G3	153	11,185	B4-U0-G3	161	11,185	B4-U0-G3	161	9,376	B4-U0-G3	135	9,985	B4-U0-G3	144
		BLC	7,304	B0-U0-G2	105	7,711	B0-U0-G2	111	7,711	B0-U0-G2	111	6,463	B0-U0-G2	93	6,883	B0-U0-G2	99
A07	90	T2M	13,080	B3-U0-G3	147	13,809	B3-U0-G3	155	13,809	B3-U0-G3	155	11,575	B3-U0-G3	130	12,328	B3-U0-G3	139
		T3M	13,356	B3-U0-G3	150	14,101	B3-U0-G3	159	14,101	B3-U0-G3	159	11,820	B2-U0-G3	133	12,588	B3-U0-G3	142
		T4M	13,043	B2-U0-G3	147	13,771	B2-U0-G3	155	13,771	B2-U0-G3	155	11,543	B2-U0-G3	130	12,351	B2-U0-G3	139
		T5M	13,341	B4-U0-G3	150	14,084	B4-U0-G3	158	14,084	B4-U0-G3	158	11,806	B4-U0-G3	133	12,573	B4-U0-G3	141
		BLC	9,197	B1-U0-G2	103	9,710	B1-U0-G2	109	9,710	B1-U0-G2	109	8,139	B0-U0-G2	92	8,668	B0-U0-G2	98

PPT PureForm LED post top

PPT Precision optics lumen values (continued)

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A08	107	T2M	15,324	B3-U0-G3	146	16,179	B3-U0-G3	154	16,179	B3-U0-G3	154	13,561	B3-U0-G3	129	14,443	B3-U0-G3	137
		T3M	15,648	B3-U0-G3	149	16,520	B3-U0-G3	157	16,520	B3-U0-G3	157	13,847	B3-U0-G3	132	14,748	B3-U0-G3	140
		T4M	15,281	B3-U0-G4	145	16,133	B3-U0-G4	153	16,133	B3-U0-G4	153	13,523	B2-U0-G3	129	14,470	B2-U0-G3	138
		T5M	15,629	B4-U0-G3	149	16,501	B4-U0-G3	157	16,501	B4-U0-G3	157	13,831	B4-U0-G3	132	14,730	B4-U0-G3	140
		BLC	10,775	B1-U0-G3	103	11,375	B1-U0-G3	108	11,375	B1-U0-G3	108	9,535	B1-U0-G2	91	10,155	B1-U0-G2	97
A09	114	T2M	16,062	B3-U0-G3	144	16,957	B3-U0-G3	152	16,957	B3-U0-G3	152	14,214	B3-U0-G3	127	15,138	B3-U0-G3	135
		T3M	16,401	B3-U0-G3	147	17,315	B3-U0-G3	155	17,315	B3-U0-G3	155	14,514	B3-U0-G3	130	15,457	B3-U0-G3	138
		T4M	16,017	B3-U0-G4	143	16,910	B3-U0-G4	151	16,910	B3-U0-G4	151	14,174	B2-U0-G3	127	15,166	B3-U0-G4	136
		T5M	16,382	B5-U0-G4	147	17,295	B5-U0-G4	155	17,295	B5-U0-G4	155	14,497	B4-U0-G3	130	15,439	B4-U0-G3	138
		BLC	11,293	B1-U0-G3	101	11,923	B1-U0-G3	107	11,923	B1-U0-G3	107	9,994	B1-U0-G2	89	10,644	B1-U0-G2	95

PPT Comfort optics lumen values

Perf. Package	System Watts	Dist. Type	80 CRI			80 CRI		
			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A01	13	T2M	1,565	B1-U0-G1	120	1,674	B1-U0-G1	129
		T3M	1,490	B1-U0-G1	115	1,594	B1-U0-G1	123
		T4M	1,650	B1-U0-G1	127	1,765	B1-U0-G1	136
		T5M	1,467	B1-U0-G1	113	1,569	B1-U0-G1	121
A02	23	T2M	2,993	B1-U0-G1	130	3,203	B1-U0-G1	139
		T3M	2,850	B1-U0-G1	124	3,050	B2-U0-G2	133
		T4M	3,156	B1-U0-G1	137	3,377	B1-U0-G1	147
		T5M	2,806	B2-U0-G1	122	3,002	B2-U0-G2	131
A03	35	T2M	4,172	B2-U0-G2	119	4,464	B2-U0-G2	128
		T3M	3,973	B2-U0-G2	114	4,251	B2-U0-G2	121
		T4M	4,399	B2-U0-G2	126	4,707	B2-U0-G2	135
		T5M	3,911	B3-U0-G2	112	4,184	B3-U0-G2	120
A04	50	T2M	5,881	B2-U0-G2	118	6,293	B2-U0-G2	126
		T3M	5,600	B2-U0-G2	112	5,992	B3-U0-G3	120
		T4M	6,201	B2-U0-G2	124	6,635	B2-U0-G2	133
		T5M	5,513	B3-U0-G2	110	5,898	B3-U0-G2	118
A05	67	T2M	7,562	B3-U0-G3	113	8,091	B3-U0-G3	121
		T3M	7,200	B3-U0-G3	107	7,704	B3-U0-G3	115
		T4M	7,973	B3-U0-G3	119	8,531	B3-U0-G3	127
		T5M	7,088	B3-U0-G3	106	7,584	B3-U0-G3	113

Perf. Package	System Watts	Dist. Type	80 CRI			80 CRI		
			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A06	83	T2M	8,979	B3-U0-G3	109	9,608	B3-U0-G3	116
		T3M	8,550	B3-U0-G3	103	9,149	B3-U0-G3	111
		T4M	9,468	B3-U0-G3	114	10,130	B3-U0-G3	123
		T5M	8,416	B3-U0-G3	102	9,006	B3-U0-G3	109
A07	106	T2M	11,237	B3-U0-G3	107	12,024	B3-U0-G3	114
		T3M	10,700	B3-U0-G3	101	11,449	B3-U0-G3	109
		T4M	11,849	B3-U0-G3	112	12,678	B3-U0-G3	120
		T5M	10,533	B4-U0-G3	100	11,270	B4-U0-G3	107
A08	132	T2M	13,238	B3-U0-G3	100	14,165	B3-U0-G3	108
		T3M	12,575	B3-U0-G3	95	13,455	B3-U0-G3	102
		T4M	13,958	B3-U0-G3	106	14,935	B3-U0-G3	113
		T5M	12,408	B4-U0-G3	94	13,277	B4-U0-G3	101
A09	140	T2M	14,283	B3-U0-G3	102	14,283	B3-U0-G3	102
		T3M	13,600	B3-U0-G3	97	14,552	B3-U0-G3	104
		T4M	15,060	B3-U0-G3	107	16,114	B3-U0-G3	115
		T5M	13,388	B4-U0-G3	95	14,325	B4-U0-G3	102

Predicted Lumen Depreciation Data

Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions. L70 is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published L70 hours limited to 6 times actual LED test hours

Optic type	Ambient Temperature °C	Calculated L70 Hours	L70 reported per TM-21	Lumen Maintenance % at 60,000 hrs
Precision (A01-A09)	25°C	>100,000 hours	>72,000 hours	95.60%
Comfort (P01-P09)	25°C	>100,000 hours	>100,000 hours	89.10%

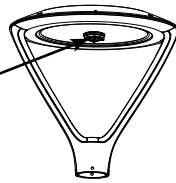
PPT PureForm LED post top

Dimensions – Post Top Luminaire

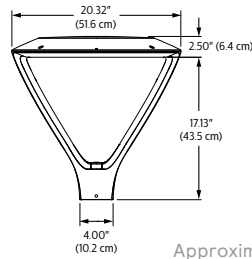
Effective Projected Area ft² / m²

Type	Single
PPT	0.35 ft ² /0.032m ²

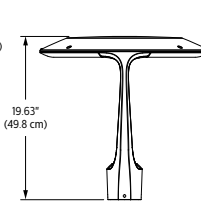
Approximate Motion
Sensor Placement



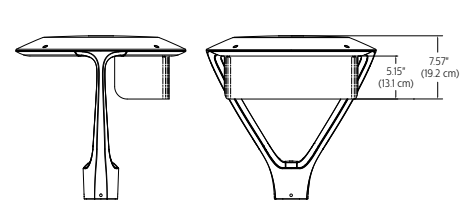
Front View



Side View



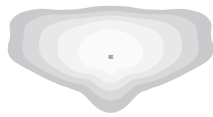
Luminaire with EHS Shield



Approximate Luminaire Weight:
Standard: 20 lbs (9.1 kg)
With battery pack: 26 lbs (11.8 kg)

Precision Optical Distributions

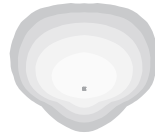
Type 2 Medium



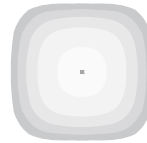
Type 3 Medium



Type 4 Medium



Type 5 Medium



Back Light Control



Comfort Optical Distributions

Type 2



Type 3



Type 4



Type 5

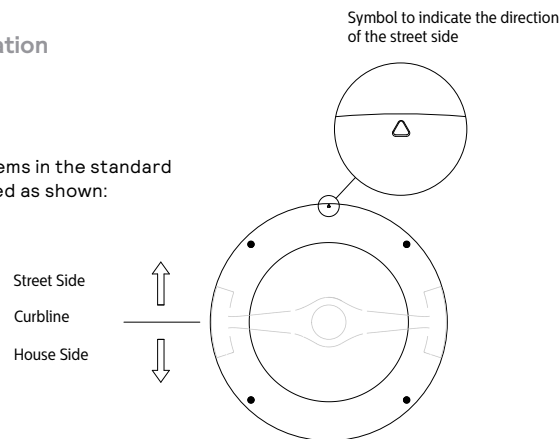


Asymmetric Optical Orientation Information

Standard Optic Position

Aimed Between The Yoke Supports

Luminaires ordered with asymmetric optical systems in the standard optic position will have the optical system oriented as shown:



PPT PureForm LED post top

Specifications

Housing

Two-piece sealed enclosure with main part of the housing designed as the structural and heat sink frame, enclosed by cover to give its unique form. It also includes yoke arm with arm covers. All die-cast parts are made of low-copper, die-cast aluminum alloy for a high resistance to corrosion. The sleek profile without optimized surface area allows housing to provide excellent convection heat transfer with minimum use of heat fins, giving the freedom to have a clean minimalist aesthetic design. Luminaire housing rated to IP66, tested in accordance to Section 9 of IEC 60598-1.

Vibration resistance

Luminaire is tested and rated Level 2 for Bridge and Overpass application (formerly 3G) cycles conforming to standards set forth by ANSI C136.31-2023. Testing includes vibration to 3G acceleration in three axes, all performed on the same luminaire.

Light engine

Comfort Edge technology provides low-glare, uniform illumination. Composed of LEDs strategically positioned on the edge of the optical plate. Light engine luminous opening size optimized to best achieve a balance between lumen output and optical performance with the need to provide visual comfort. LEDs are mounted directly to the housing to provide heat conduction and ensure maximized LED lifetime and performance. Light engine is RoHS compliant and available in 4 IES distribution options. Standard color temperatures: 3000K +/- 130K, 4000K +/- 130K, 5000K +/- 225K. Minimum CRI of 70. Also available in 2700K and 3500K color temperatures with extended leadtimes. Contact factory for details.

Precision LED Modules are comprised of 40 count LEDs mounted to metal clad printed circuit board and sealed to a polymer optic plate to meet IP66 rating.

Energy saving benefits

System efficacy up to 193 lms/W with significant energy savings over Pulse Start Metal Halide luminaires. Optional control options provide added energy savings during unoccupied periods.

Optical systems

ComfortEdge technology provides a unique and lower perceived glare lighting solution designed to enhance visual comfort for pedestrian applications. Available in IES distribution types 2, 3, 4, and 5 available up to 17,000 lumens.

Precision optics are available in type 2, 3, 4, 5 and Backlight Control (BLC) distributions available. Internal shield option mounts to LED optics to provide additional cutoff, and dedicated BLC optics provide the most stringent cutoff to meet requirements around property lines. Performance tested per LM-79 and TM-15 (IESNA) certifying its photometric performance. Luminaire designed with 0% uplight (UO per IESNA TM-15).

Mounting

PureForm Post Top mounts standard to a 3" x 4" Tenon, but can also be mounted to a 2-3/8" x 4" Tenon if a separate sleeve is specified and shipped as separately as an accessory.

Listings

PPT is UL/cUL wet location listed to the UL 1598 standard, suitable for use in ambient temperatures from -40° to 40°C (-40° to 104°F). Most PureForm PPT comfort configurations are qualified under Standard DesignLights Consortium® category. Consult DLC Qualified Products list to confirm your specific luminaire selection is approved. CCTs 3000K and warmer are Dark Sky Approved.

Controls

0-10V Dimming Control Options

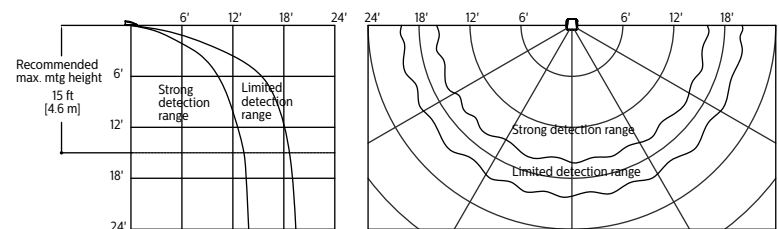
DLEA: Access to 0-10V dimming leads supplied through the yoke of the luminaire (for secondary dimming controls by others). Cannot be used with other control options.

Field Adjustable Wattage Selector (FAWS): Luminaire equipped with the ability to manually adjust the wattage in the field to reduce total luminaire lumen output and light levels. Comes pre-set to the highest of 10 output positions. Consult factory for specific dimming settings for each position.

BL50L2/BL50L3: Motion Response module is mounted integral to luminaire factory pre-programmed to 50% dimming when not ordered with other control options. BL50Lx options are set/operate in the following fashion: The motion sensor is set to a constant 50%. When motion is detected by the PIR sensor, the luminaire returns to full power/light output. Dimming on low is factory set to 50% with 5 minutes default in "full power" prior to dimming back to low. When no motion is detected for 5 minutes, the motion response system reduces the wattage by 50%, to 50% of the normal constant wattage reducing the light level. Other dimming settings can be provided if different dimming levels are required. Contact technical support for details.

Infrared Motion Response Lenses (BL50L2/BL50L3): Lens #2 is designed for mounting heights 8' to 15'. Lens #3 is designed for higher mounting heights up to 20' with a 40' diameter coverage area.

Microwave Motion Response (BL30MW): Motion response luminaires include a high frequency microwave sensor, 5.8GHz +/- 75MHz microwave ISM continuous wave band with 360° coverage area, <0.5 mW transmitting power and <1 W standby power. Factory programmed settings dim fixture to 30% with time delay of 5 minutes with no stand-by period. When motion is detected, the luminaire returns to 100% full light output and will remain on full power for 5 minutes.



Note: The beam patterns shown are intended solely as a general guide and are not to scale. Sensing capabilities and coverage area depend on many factors including the size, speed and direction of travel of persons and vehicles; sensor mounting height; environmental and site conditions; etc.

0-10V Lighting Control Options

Button Photocontrol (PCB): Button style design for internal luminaires mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4fc of ambient light.

Twist-Lock Receptacle (TLR5/TLR7/TLRPC): TLR options come with 5 pin or with 7 pins connected to 0-10V driver and not all pins will be connected. Dimming Receptacle Type B (5-pin) and Type D-24 (7-pin) in accordance to ANSI C136.41. Can be used with third-party control system. Receptacle located on top of luminaire housing. When specified with receptacle and photoelectric cell (TLRPC), 7-pin receptacle is supplier and voltage must be specified. When ordering Twist-lock receptacle (TLR5 or TLR7), photocell or shorting cap is not included. If Twistlock receptacle option is ordered with Dimming Control option, then dimming leads from driver will not be connected to TLR but consumed by selected device. Devices installed to NEMA twist-lock Receptacle must be IPX6 rated.

Sensor Ready(SR)/DALI Control Options

Automatic Profile Dimming (CS/CM/CE/CA): Standard dimming profiles provide flexibility towards energy savings goals while optimizing light levels during specific dark hours. Dimming profiles include two dimming settings including dim to 30% or 50% of the total lumen output. When used in combination with not programmed motion response it overrides the controller's schedule when motion is detected. After 5 minutes with no motion, it will return to the automatic dimming profile schedule. Automatic dimming profile scheduled with the following settings:

- **CS50/CS30:** Security for 7 hours night duration (Ex., 11 PM - 6 AM)
- **CM50/CM30:** Median for 8 hours night duration (Ex., 10 PM - 6 AM)

All above profiles are calculated from mid point of the night. Dimming is set for 6 hours after the mid point and 1 or 2 hours before depending of the duration of dimming. Time clock or photocell is required for on/off functionality to allow for midpoint calculation. Cannot be used with other dimming control options.

PPT PureForm LED post top

Specifications

Sensor Ready Zhaga Socket Connector (SRDR): Product is D4i Certified and equipped with Sensor Ready drivers connected to 4-pin Zhaga Book 18 compliant receptacle designed for sensor and other control system applications. Receptacle is rated IP66 assembly in a compact design that provides a sealed electrical interface and rated UV resistance, mounted on underside of the luminaire, protective dust cap included. When a controller not provided by Signify is used with Sensor Ready Zhaga socket connector, the controller must be certified to work with the Xitanium SR LED drivers as part of the SR certified program. SRDR can be used with NEMA 7-pin twist lock receptacle, which is mounted on top of the luminaire. D4i certification validates compliance with specifications for data exchange in connected lighting systems, ensuring interoperability, compatibility, and efficient operation. It also assures customers that the device meets industry standards.

Outdoor Interact:

Scalable connected sensor with integral occupancy and daylight sensing, supports wireless mesh connectivity. Sensor works in the Foundation mode when configured without a gateway or in an Interact Advanced mode if a compatible gateway (can be added later) is used. Interact offers an app, a portal and a broad portfolio of Interact ready Indoor and Outdoor luminaires, lamps and retrofit kits all working on the same system. Startup is implemented via Interact Pro App (available in iOS® or Android®) and Bluetooth® connectivity. The app provides flexibility to choose between a gateway or non gateway mode for setup. Setup with the gateway requires wired Internet access to the gateway. Prepare project configuration steps remotely and use IRT9015 remote accessory (ordered separately) or the App on-site to identify and group devices together. WIAP includes SR driver and SR receptacle. Daylight harvesting supported through dimming - activated via the Interact app. Sensors are available in black or white finish and high or low mounting height lenses. IP66 rated.

For more information on Interact visit:

www.interact-lighting.com/interactproscalablesystem

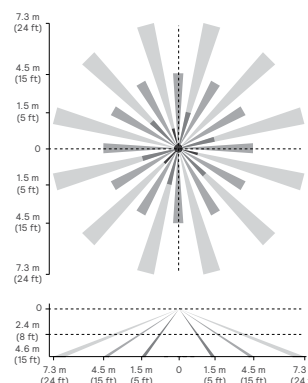
SR/DALI Lighting Control Options

Button Photocontrol (PCB): Button style design for internal luminaires mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4Fc of ambient light.

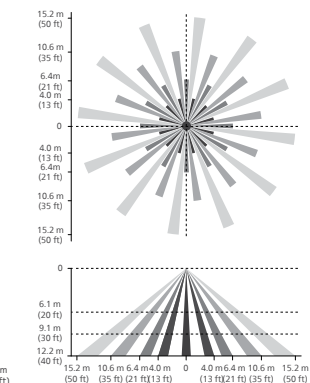
Twist-Lock Receptacle (TR5/TR7/ TLP): TLR5 includes with 5 pin (Type B) receptacle connected to SR/DALI driver all applicable connections made to driver and is not D4i compliant. TR7 includes (Type D-24) connected to SR/DALI driver with all leads connected for use of 3rd party control systems. Receptacles are in accordance to ANSI C136.41. Receptacle located on top of luminaire housing. When specified with receptacle and photoelectric cell (TRPC), 7-pin receptacle is supplied and voltage must be specified. When ordering Twist-lock receptacle (TR5 or TR7), photocell or shorting cap is not included. Devices installed to NEMA twist-lock Receptacle must be IPX6 rated.

Note: The beam patterns shown are intended solely as a general guide and are not to scale. Sensing capabilities and coverage area depend on many factors including the size, speed and direction of travel of persons and vehicles; sensor mounting height; environmental and site conditions; etc.

LW low sensor



HW high sensor



Finish

Each standard color luminaire receives a fade and abrasion resistant, electrostatically applied, thermally cured, triglycidic isocyanurate (TGIC) textured polyester powdercoat finish. The surface treatment achieves a minimum of 1000 hours for salt spray resistant finish in accordance with testing performed and per ASTM B117 standard. Standard colors include bronze (BZ), black (BK), white (WH), dark gray (DGY), and medium gray (MGY). Consult factory for specs on optional or custom colors.

Warranty

PureForm luminaires feature a 5-year limited warranty.

See signify.com/warranties for complete details and exclusions.



THE BRICKYARD - HANOVER STREET
LEBANON, NH
PT4

Gardco PureForm LED post top features a sleek, low profile design and is available with two light engines. ComfortEdge optics provide a unique and lower glare lighting solution designed to enhance visual comfort for pedestrian applications, while precision optics maximize efficiency and spacing. PureForm post top is available with multiple optical distributions with output up to 17,000 lumens. A full range of control options provides additional energy savings. Optional integral emergency battery backup is available for path-of-egress illumination.

Project: _____
Location: _____
Cat.No: _____
Type: _____
Lamps: _____ Qty: _____
Notes: _____

Ordering guide

Example: PPT-P-A09-840-T5M-T3-120-DALI-CS30-PCB-BZ

Prefix	Catalog Code	Lumens Selection	CCT/CRI	Distribution	Shielding	Mounting	Voltage
PPT	C	A02	830	T4M		T3	UNV
PPT PureForm post top, comfort optics	P Precision optics	A01 ⁴ 2500 A06 11000 A02 ⁴ 3500 A07 13500 A03 ⁴ 5000 A08 16000 A04 7000 A09 17000 A05 9000	730 70CRI, 3000K 740 70CRI, 4000K 750 70CRI, 5000K 830 80CRI, 3000K 840 80CRI, 4000K 827 ¹ 80CRI, 2700K (ETor)	T2M Area optic type 2 T3M Area optic type 3 T4M Area optic type 4 T5M Area optic type 5 BLC Back light control	None - HIS ² Internal house side shield (clip-on)	T3 Mounts to a 3"x4" tenon (standard) T2 Post top tenon adapter for 2-3/8" x 4" (ships separately)	120 120V 208 208V 240 240V 277 10-277V UNV 120-277V 347 347V 480 480V HVV 374-480V
	C Comfort optics	A01 ⁴ 2000 A06 11000 A02 3500 A07 ¹⁴ 13500 A03 5000 A08 ¹⁴ 16000 A04 7000 A09 ¹⁴ 17000 A05 9000	830 80CRI, 3000K 840 80CRI, 4000K 827 ¹ 80CRI, 2700K (ETor) 835 ¹ 80CRI, 3500K (ETor) 750 ¹ 70CRI, 5000K (ETor)	T2M Comfort optic type 2M T3M Comfort optic type 3M T4M Comfort optic type 4M T5M Comfort optic type 5M	None - (comfort shielding must be ordered as separately as accessory PPT-EHS-BK)		
Driver type	Dimming Controls (only one may be selected)		Lighting controls ¹⁰ (only one may be selected)		Emergency	Finish	
010V						FINISH	
0-10V					None - EM ^{4,9,15} Emergency battery backup (0°C to +40°C/32°F to +104°F) EMC ⁴ Emergency battery pack, cold rated (20°C to +40°C/-4°F to +104°F) ^{7, 9, 11, 16}	Standard textured finish	
010V 0-10V	None	-	None	-		BK Black WH White BZ Bronze DG Dark gray MG Medium gray	
	DLEA	Dimming leads externally accessible (controls by others)	PCB ^{4,12,13}	Photocontrol button			
	FAWS	Field adjustable wattage selector	TLR5	5-pin twist lock w/ 0-10v driver			
	BL50L2 ²	PIR motion response dim to 50% L2 lens	TLR7	7-pin twist lock w/ 0-10v driver (non-D4i)			
	BL50L3 ²	PIR motion response dim to 50% L3 lens	TLRPC ^{4,13}	7-pin twist lock w/ 0-10v driver (non-D4i) & on/off photocell			
	BL30MW ¹³	Microwave motion sensor factory set at 50% dimming					
DALI					Fusing	Customer specified	
DALI SR/ DALI	None	-	None	-	None - F1 ¹² Single Fuse (120V, 277V, or 347V) F2 ¹² Double Fuse (208V, 240V, or 480V) F3 ¹² Double Fuse Canadian double pole (208V, 240V, or 480V)	OC Optional color (specify optional color or RAL, contact factory) SC Special color (must supply color chip, requires factory quote)	
	CS50 ^{5,6}	Security 50 % dimming, 7 hours	PCB ^{4,12}	Photocontrol button			
	CM50 ^{5,6}	Median 50 % dimming, 8 hours	TR5 ^{5,6,13}	5-pin twist lock SR/DALI driver			
	CS30 ^{5,6}	Security 30 % dimming, 7 hours	TR7 ^{5,6,13}	7-pin twist lock SR/DALI driver (D4i)			
	CM30 ^{5,6}	Median 30 % dimming, 8 hours	TLP ^{5,6,12}	7-pin twist lock SR/DALI driver (D4i) & on/off photocell			
	SRDR ^{5,6}	SR driver connected to Zhaga socket (D4i)					
	WIAPLW ^{5,6}	Wireless Interact outdoor low mounting (7-15'), white housing					
	WIAPLB ^{5,6}	Wireless Interact outdoor low mounting (7-15'), black housing					
	WIAPHW ^{5,6}	Wireless Interact outdoor low mounting (15-40'), white housing					
	WIAPHB ^{5,6}	Wireless Interact outdoor low mounting (15-40'), black housing					
					Surge Protection		
					None SP1 Surge Protector 10kV / 10kA (standard)		
					SP2 Surge Protector 20kV/ 10kA (option)		

- Extended lead times apply. Contact factory for details.
- Available with Area optics only. Not allowed with Comfort optics.
- Available with Comfort optics only at 120-347V. Not allowed with Area optics.
- Not available at 347-480V(HVV).
- Not available at 347-480V(HVV) for Pixelated (P-Axx) optic lumen packages. A01-A02 and Comfort (C-Axx) optic lumen packages A01-A09.
- Not available at 120-277V(UNV) for Pixelated (P-Axx) optic lumen packages A01-A02 and Comfort (C-Axx) optic lumen packages A01-A02.
- EMC only compatible with DLEA and Dynadimmer (CSXX, CMXX) Dimming control options.
- Not available with Microwave Motion Sensor BL50MW.
- Not available with Comfort (C-Axx) optic lumen packages A07-A09.
- If selected with Dimming control, DIM leads from receptacle will not be connected to driver.
- Available only with Comfort optics.
- Must specify input voltage.
- BL50MW options and Twistlock photocell options (TLR5, TLR7, TLRPC, PCB) are not compatible due to mechanical conflict.
- Not available with emergency options.
- EMC limited to 25°C max ambient with shielding and A09. All other configurations listed to 40°C ambient.
- For comfort PPT, emergency cold-pack conflicts with BL50xx & PCB/TLRx & Zhaga & FAWS.



PPT PureForm LED post top

PureForm Accessories (order separately)

Mounting Accessories

- PPT-T2** Post top tenon adapter for 2 3/8" x 4"
- FSIR-100** BL Optional Remote Programming Tool
- PPT-EHS-BK** External house side shield, black

PPT Precision optics lumen values

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A01	15	T2M	2,525	B1-U0-G1	171	2,666	B1-U0-G1	180	2,666	B1-U0-G1	180	2,234	B1-U0-G1	151	2,380	B1-U0-G1	161
		T3M	2,578	B1-U0-G1	174	2,722	B1-U0-G1	184	2,722	B1-U0-G1	184	2,282	B1-U0-G1	154	2,430	B1-U0-G1	164
		T4M	2,518	B1-U0-G1	170	2,658	B1-U0-G1	180	2,658	B1-U0-G1	180	2,228	B1-U0-G1	151	2,373	B1-U0-G1	160
		T5M	2,575	B2-U0-G1	174	2,719	B2-U0-G1	184	2,719	B2-U0-G1	184	2,279	B2-U0-G1	154	2,427	B2-U0-G1	164
		BLC	1,775	B0-U0-G1	120	1,874	B0-U0-G1	127	1,874	B0-U0-G1	127	1,571	B0-U0-G1	106	1,673	B0-U0-G1	113
A02	21	T2M	3,596	B1-U0-G1	173	3,796	B1-U0-G1	183	3,796	B1-U0-G1	183	3,182	B1-U0-G1	153	3,389	B1-U0-G1	163
		T3M	3,672	B1-U0-G1	177	3,876	B1-U0-G1	186	3,876	B1-U0-G1	186	3,249	B1-U0-G1	156	3,460	B1-U0-G1	166
		T4M	3,586	B1-U0-G2	172	3,785	B1-U0-G2	182	3,785	B1-U0-G2	182	3,173	B1-U0-G2	153	3,395	B1-U0-G2	163
		T5M	3,667	B3-U0-G2	176	3,872	B3-U0-G2	186	3,872	B3-U0-G2	186	3,245	B2-U0-G1	156	3,456	B2-U0-G2	166
		BLC	2,528	B0-U0-G1	122	2,669	B0-U0-G1	128	2,669	B0-U0-G1	128	2,237	B0-U0-G1	108	2,383	B0-U0-G1	115
A03	30	T2M	5,002	B1-U0-G2	164	5,281	B1-U0-G2	173	5,281	B1-U0-G2	173	4,427	B1-U0-G1	145	4,714	B1-U0-G1	154
		T3M	5,108	B1-U0-G2	167	5,393	B1-U0-G2	177	5,393	B1-U0-G2	177	4,520	B1-U0-G1	148	4,814	B1-U0-G1	158
		T4M	4,988	B1-U0-G2	163	5,266	B1-U0-G2	173	5,266	B1-U0-G2	173	4,414	B1-U0-G2	145	4,723	B1-U0-G2	155
		T5M	5,102	B3-U0-G2	167	5,386	B3-U0-G2	176	5,386	B3-U0-G2	176	4,515	B3-U0-G2	148	4,808	B3-U0-G2	158
		BLC	3,517	B0-U0-G1	115	3,713	B0-U0-G1	122	3,713	B0-U0-G1	122	3,112	B0-U0-G1	102	3,315	B0-U0-G1	109
A04	42	T2M	7,095	B2-U0-G2	165	7,490	B2-U0-G2	174	7,490	B2-U0-G2	174	6,279	B2-U0-G2	146	6,687	B2-U0-G2	156
		T3M	7,245	B2-U0-G2	169	7,648	B2-U0-G2	178	7,648	B2-U0-G2	178	6,411	B1-U0-G2	149	6,828	B2-U0-G2	159
		T4M	7,075	B1-U0-G3	165	7,469	B1-U0-G3	174	7,469	B1-U0-G3	174	6,261	B1-U0-G2	146	6,699	B1-U0-G2	156
		T5M	7,236	B3-U0-G2	168	7,640	B3-U0-G2	178	7,640	B3-U0-G2	178	6,404	B3-U0-G2	149	6,820	B3-U0-G2	159
		BLC	4,988	B0-U0-G2	116	5,267	B0-U0-G2	123	5,267	B0-U0-G2	123	4,415	B0-U0-G2	103	4,701	B0-U0-G2	109
A05	53	T2M	8,407	B2-U0-G2	156	8,876	B2-U0-G2	165	8,876	B2-U0-G2	165	7,440	B2-U0-G2	138	7,924	B2-U0-G2	147
		T3M	8,585	B2-U0-G2	159	9,063	B2-U0-G2	168	9,063	B2-U0-G2	168	7,597	B2-U0-G2	141	8,091	B2-U0-G2	150
		T4M	8,384	B2-U0-G3	156	8,851	B2-U0-G3	164	8,851	B2-U0-G3	164	7,419	B1-U0-G3	138	7,938	B2-U0-G3	147
		T5M	8,574	B4-U0-G3	159	9,053	B4-U0-G3	168	9,053	B4-U0-G3	168	7,588	B3-U0-G2	141	8,081	B3-U0-G2	150
		BLC	5,911	B0-U0-G2	110	6,241	B0-U0-G2	116	6,241	B0-U0-G2	116	5,231	B0-U0-G2	97	5,571	B0-U0-G2	103
A06	70	T2M	10,388	B2-U0-G2	150	10,967	B2-U0-G2	158	10,967	B2-U0-G2	158	9,193	B2-U0-G2	132	9,790	B2-U0-G2	141
		T3M	10,607	B2-U0-G2	153	11,198	B2-U0-G2	161	11,198	B2-U0-G2	161	9,387	B2-U0-G2	135	9,997	B2-U0-G2	144
		T4M	10,358	B2-U0-G3	149	10,936	B2-U0-G3	157	10,936	B2-U0-G3	157	9,167	B2-U0-G3	132	9,808	B2-U0-G3	141
		T5M	10,594	B4-U0-G3	153	11,185	B4-U0-G3	161	11,185	B4-U0-G3	161	9,376	B4-U0-G3	135	9,985	B4-U0-G3	144
		BLC	7,304	B0-U0-G2	105	7,711	B0-U0-G2	111	7,711	B0-U0-G2	111	6,463	B0-U0-G2	93	6,883	B0-U0-G2	99
A07	90	T2M	13,080	B3-U0-G3	147	13,809	B3-U0-G3	155	13,809	B3-U0-G3	155	11,575	B3-U0-G3	130	12,328	B3-U0-G3	139
		T3M	13,356	B3-U0-G3	150	14,101	B3-U0-G3	159	14,101	B3-U0-G3	159	11,820	B2-U0-G3	133	12,588	B3-U0-G3	142
		T4M	13,043	B2-U0-G3	147	13,771	B2-U0-G3	155	13,771	B2-U0-G3	155	11,543	B2-U0-G3	130	12,351	B2-U0-G3	139
		T5M	13,341	B4-U0-G3	150	14,084	B4-U0-G3	158	14,084	B4-U0-G3	158	11,806	B4-U0-G3	133	12,573	B4-U0-G3	141
		BLC	9,197	B1-U0-G2	103	9,710	B1-U0-G2	109	9,710	B1-U0-G2	109	8,139	B0-U0-G2	92	8,668	B0-U0-G2	98

PPT PureForm LED post top

PPT Precision optics lumen values (continued)

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A08	107	T2M	15,324	B3-U0-G3	146	16,179	B3-U0-G3	154	16,179	B3-U0-G3	154	13,561	B3-U0-G3	129	14,443	B3-U0-G3	137
		T3M	15,648	B3-U0-G3	149	16,520	B3-U0-G3	157	16,520	B3-U0-G3	157	13,847	B3-U0-G3	132	14,748	B3-U0-G3	140
		T4M	15,281	B3-U0-G4	145	16,133	B3-U0-G4	153	16,133	B3-U0-G4	153	13,523	B2-U0-G3	129	14,470	B2-U0-G3	138
		T5M	15,629	B4-U0-G3	149	16,501	B4-U0-G3	157	16,501	B4-U0-G3	157	13,831	B4-U0-G3	132	14,730	B4-U0-G3	140
		BLC	10,775	B1-U0-G3	103	11,375	B1-U0-G3	108	11,375	B1-U0-G3	108	9,535	B1-U0-G2	91	10,155	B1-U0-G2	97
A09	114	T2M	16,062	B3-U0-G3	144	16,957	B3-U0-G3	152	16,957	B3-U0-G3	152	14,214	B3-U0-G3	127	15,138	B3-U0-G3	135
		T3M	16,401	B3-U0-G3	147	17,315	B3-U0-G3	155	17,315	B3-U0-G3	155	14,514	B3-U0-G3	130	15,457	B3-U0-G3	138
		T4M	16,017	B3-U0-G4	143	16,910	B3-U0-G4	151	16,910	B3-U0-G4	151	14,174	B2-U0-G3	127	15,166	B3-U0-G4	136
		T5M	16,382	B5-U0-G4	147	17,295	B5-U0-G4	155	17,295	B5-U0-G4	155	14,497	B4-U0-G3	130	15,439	B4-U0-G3	138
		BLC	11,293	B1-U0-G3	101	11,923	B1-U0-G3	107	11,923	B1-U0-G3	107	9,994	B1-U0-G2	89	10,644	B1-U0-G2	95

PPT Comfort optics lumen values

Perf. Package	System Watts	Dist. Type	80 CRI			80 CRI		
			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A01	13	T2M	1,565	B1-U0-G1	120	1,674	B1-U0-G1	129
		T3M	1,490	B1-U0-G1	115	1,594	B1-U0-G1	123
		T4M	1,650	B1-U0-G1	127	1,765	B1-U0-G1	136
		T5M	1,467	B1-U0-G1	113	1,569	B1-U0-G1	121
A02	23	T2M	2,993	B1-U0-G1	130	3,203	B1-U0-G1	139
		T3M	2,850	B1-U0-G1	124	3,050	B2-U0-G2	133
		T4M	3,156	B1-U0-G1	137	3,377	B1-U0-G1	147
		T5M	2,806	B2-U0-G1	122	3,002	B2-U0-G2	131
A03	35	T2M	4,172	B2-U0-G2	119	4,464	B2-U0-G2	128
		T3M	3,973	B2-U0-G2	114	4,251	B2-U0-G2	121
		T4M	4,399	B2-U0-G2	126	4,707	B2-U0-G2	135
		T5M	3,911	B3-U0-G2	112	4,184	B3-U0-G2	120
A04	50	T2M	5,881	B2-U0-G2	118	6,293	B2-U0-G2	126
		T3M	5,600	B2-U0-G2	112	5,992	B3-U0-G3	120
		T4M	6,201	B2-U0-G2	124	6,635	B2-U0-G2	133
		T5M	5,513	B3-U0-G2	110	5,898	B3-U0-G2	118
A05	67	T2M	7,562	B3-U0-G3	113	8,091	B3-U0-G3	121
		T3M	7,200	B3-U0-G3	107	7,704	B3-U0-G3	115
		T4M	7,973	B3-U0-G3	119	8,531	B3-U0-G3	127
		T5M	7,088	B3-U0-G3	106	7,584	B3-U0-G3	113

Perf. Package	System Watts	Dist. Type	80 CRI			80 CRI		
			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A06	83	T2M	8,979	B3-U0-G3	109	9,608	B3-U0-G3	116
		T3M	8,550	B3-U0-G3	103	9,149	B3-U0-G3	111
		T4M	9,468	B3-U0-G3	114	10,130	B3-U0-G3	123
		T5M	8,416	B3-U0-G3	102	9,006	B3-U0-G3	109
A07	106	T2M	11,237	B3-U0-G3	107	12,024	B3-U0-G3	114
		T3M	10,700	B3-U0-G3	101	11,449	B3-U0-G3	109
		T4M	11,849	B3-U0-G3	112	12,678	B3-U0-G3	120
		T5M	10,533	B4-U0-G3	100	11,270	B4-U0-G3	107
A08	132	T2M	13,238	B3-U0-G3	100	14,165	B3-U0-G3	108
		T3M	12,575	B3-U0-G3	95	13,455	B3-U0-G3	102
		T4M	13,958	B3-U0-G3	106	14,935	B3-U0-G3	113
		T5M	12,408	B4-U0-G3	94	13,277	B4-U0-G3	101
A09	140	T2M	14,283	B3-U0-G3	102	14,283	B3-U0-G3	102
		T3M	13,600	B3-U0-G3	97	14,552	B3-U0-G3	104
		T4M	15,060	B3-U0-G3	107	16,114	B3-U0-G3	115
		T5M	13,388	B4-U0-G3	95	14,325	B4-U0-G3	102

Predicted Lumen Depreciation Data

Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions. L70 is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published L70 hours limited to 6 times actual LED test hours

Optic type	Ambient Temperature °C	Calculated L70 Hours	L70 reported per TM-21	Lumen Maintenance % at 60,000 hrs
Precision (A01-A09)	25°C	>100,000 hours	>72,000 hours	95.60%
Comfort (P01-P09)	25°C	>100,000 hours	>100,000 hours	89.10%

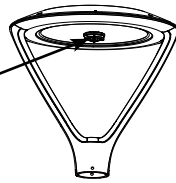
PPT PureForm LED post top

Dimensions – Post Top Luminaire

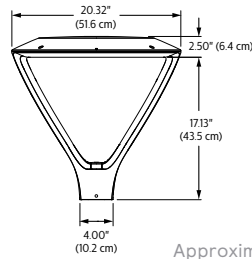
Effective Projected Area ft² / m²

Type	Single
PPT	0.35 ft ² /0.032m ²

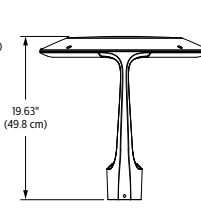
Approximate Motion
Sensor Placement



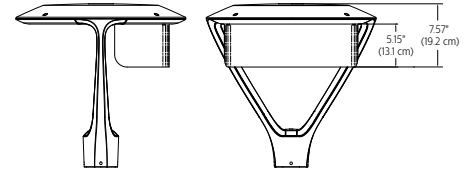
Front View



Side View



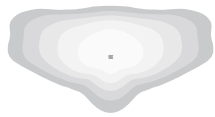
Luminaire with EHS Shield



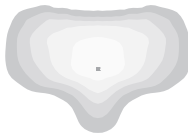
Approximate Luminaire Weight:
Standard: 20 lbs (9.1 kg)
With battery pack: 26 lbs (11.8 kg)

Precision Optical Distributions

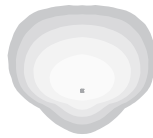
Type 2 Medium



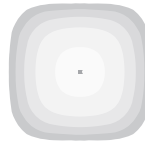
Type 3 Medium



Type 4 Medium



Type 5 Medium



Back Light Control



Comfort Optical Distributions

Type 2



Type 3



Type 4



Type 5

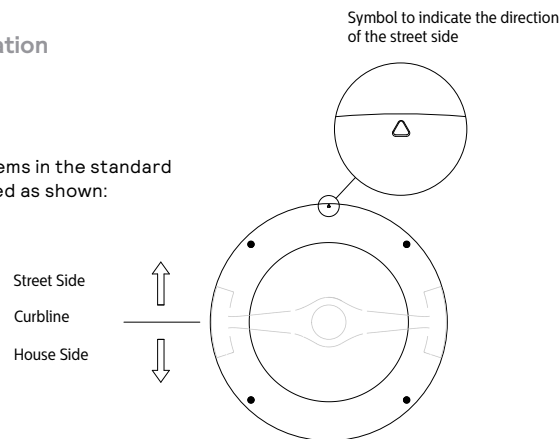


Asymmetric Optical Orientation Information

Standard Optic Position

Aimed Between The Yoke Supports

Luminaires ordered with asymmetric optical systems in the standard optic position will have the optical system oriented as shown:



PPT PureForm LED post top

Specifications

Housing

Two-piece sealed enclosure with main part of the housing designed as the structural and heat sink frame, enclosed by cover to give its unique form. It also includes yoke arm with arm covers. All die-cast parts are made of low-copper, die-cast aluminum alloy for a high resistance to corrosion. The sleek profile without optimized surface area allows housing to provide excellent convection heat transfer with minimum use of heat fins, giving the freedom to have a clean minimalist aesthetic design. Luminaire housing rated to IP66, tested in accordance to Section 9 of IEC 60598-1.

Vibration resistance

Luminaire is tested and rated Level 2 for Bridge and Overpass application (formerly 3G) cycles conforming to standards set forth by ANSI C136.31-2023. Testing includes vibration to 3G acceleration in three axes, all performed on the same luminaire.

Light engine

Comfort Edge technology provides low-glare, uniform illumination. Composed of LEDs strategically positioned on the edge of the optical plate. Light engine luminous opening size optimized to best achieve a balance between lumen output and optical performance with the need to provide visual comfort. LEDs are mounted directly to the housing to provide heat conduction and ensure maximized LED lifetime and performance. Light engine is RoHS compliant and available in 4 IES distribution options. Standard color temperatures: 3000K +/- 130K, 4000K +/- 130K, 5000K +/- 225K. Minimum CRI of 70. Also available in 2700K and 3500K color temperatures with extended leadtimes. Contact factory for details.

Precision LED Modules are comprised of 40 count LEDs mounted to metal clad printed circuit board and sealed to a polymer optic plate to meet IP66 rating.

Energy saving benefits

System efficacy up to 193 lms/W with significant energy savings over Pulse Start Metal Halide luminaires. Optional control options provide added energy savings during unoccupied periods.

Optical systems

ComfortEdge technology provides a unique and lower perceived glare lighting solution designed to enhance visual comfort for pedestrian applications. Available in IES distribution types 2, 3, 4, and 5 available up to 17,000 lumens.

Precision optics are available in type 2, 3, 4, 5 and Backlight Control (BLC) distributions available. Internal shield option mounts to LED optics to provide additional cutoff, and dedicated BLC optics provide the most stringent cutoff to meet requirements around property lines. Performance tested per LM-79 and TM-15 (IESNA) certifying its photometric performance. Luminaire designed with 0% uplight (UO per IESNA TM-15).

Mounting

PureForm Post Top mounts standard to a 3" x 4" Tenon, but can also be mounted to a 2-3/8" x 4" Tenon if a separate sleeve is specified and shipped as separately as an accessory.

Listings

PPT is UL/cUL wet location listed to the UL 1598 standard, suitable for use in ambient temperatures from -40° to 40°C (-40° to 104°F). Most PureForm PPT comfort configurations are qualified under Standard DesignLights Consortium® category. Consult DLC Qualified Products list to confirm your specific luminaire selection is approved. CCTs 3000K and warmer are Dark Sky Approved.

Controls

0-10V Dimming Control Options

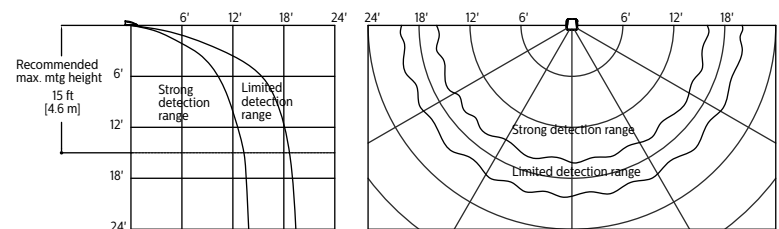
DLEA: Access to 0-10V dimming leads supplied through the yoke of the luminaire (for secondary dimming controls by others). Cannot be used with other control options.

Field Adjustable Wattage Selector (FAWS): Luminaire equipped with the ability to manually adjust the wattage in the field to reduce total luminaire lumen output and light levels. Comes pre-set to the highest of 10 output positions. Consult factory for specific dimming settings for each position.

BL50L2/BL50L3: Motion Response module is mounted integral to luminaire factory pre-programmed to 50% dimming when not ordered with other control options. BL50Lx options are set/operate in the following fashion: The motion sensor is set to a constant 50%. When motion is detected by the PIR sensor, the luminaire returns to full power/light output. Dimming on low is factory set to 50% with 5 minutes default in "full power" prior to dimming back to low. When no motion is detected for 5 minutes, the motion response system reduces the wattage by 50%, to 50% of the normal constant wattage reducing the light level. Other dimming settings can be provided if different dimming levels are required. Contact technical support for details.

Infrared Motion Response Lenses (BL50L2/BL50L3): Lens #2 is designed for mounting heights 8' to 15'. Lens #3 is designed for higher mounting heights up to 20' with a 40' diameter coverage area.

Microwave Motion Response (BL30MW): Motion response luminaires include a high frequency microwave sensor, 5.8GHz +/- 75MHz microwave ISM continuous wave band with 360° coverage area, <0.5 mW transmitting power and <1 W standby power. Factory programmed settings dim fixture to 30% with time delay of 5 minutes with no stand-by period. When motion is detected, the luminaire returns to 100% full light output and will remain on full power for 5 minutes.



Note: The beam patterns shown are intended solely as a general guide and are not to scale. Sensing capabilities and coverage area depend on many factors including the size, speed and direction of travel of persons and vehicles; sensor mounting height; environmental and site conditions; etc.

0-10V Lighting Control Options

Button Photocontrol (PCB): Button style design for internal luminaires mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4fc of ambient light.

Twist-Lock Receptacle (TLR5/TLR7/TLRPC): TLR options come with 5 pin or with 7 pins connected to 0-10V driver and not all pins will be connected. Dimming Receptacle Type B (5-pin) and Type D-24 (7-pin) in accordance to ANSI C136.41. Can be used with third-party control system. Receptacle located on top of luminaire housing. When specified with receptacle and photoelectric cell (TLRPC), 7-pin receptacle is supplier and voltage must be specified. When ordering Twist-lock receptacle (TLR5 or TLR7), photocell or shorting cap is not included. If Twistlock receptacle option is ordered with Dimming Control option, then dimming leads from driver will not be connected to TLR but consumed by selected device. Devices installed to NEMA twist-lock Receptacle must be IPX6 rated.

Sensor Ready(SR)/DALI Control Options

Automatic Profile Dimming (CS/CM/CE/CA): Standard dimming profiles provide flexibility towards energy savings goals while optimizing light levels during specific dark hours. Dimming profiles include two dimming settings including dim to 30% or 50% of the total lumen output. When used in combination with not programmed motion response it overrides the controller's schedule when motion is detected. After 5 minutes with no motion, it will return to the automatic dimming profile schedule. Automatic dimming profile scheduled with the following settings:

- **CS50/CS30:** Security for 7 hours night duration (Ex., 11 PM - 6 AM)
- **CM50/CM30:** Median for 8 hours night duration (Ex., 10 PM - 6 AM)

All above profiles are calculated from mid point of the night. Dimming is set for 6 hours after the mid point and 1 or 2 hours before depending of the duration of dimming. Time clock or photocell is required for on/off functionality to allow for midpoint calculation. Cannot be used with other dimming control options.

PPT PureForm LED post top

Specifications

Sensor Ready Zhaga Socket Connector (SRDR): Product is D4i Certified and equipped with Sensor Ready drivers connected to 4-pin Zhaga Book 18 compliant receptacle designed for sensor and other control system applications. Receptacle is rated IP66 assembly in a compact design that provides a sealed electrical interface and rated UV resistance, mounted on underside of the luminaire, protective dust cap included. When a controller not provided by Signify is used with Sensor Ready Zhaga socket connector, the controller must be certified to work with the Xitanium SR LED drivers as part of the SR certified program. SRDR can be used with NEMA 7-pin twist lock receptacle, which is mounted on top of the luminaire. D4i certification validates compliance with specifications for data exchange in connected lighting systems, ensuring interoperability, compatibility, and efficient operation. It also assures customers that the device meets industry standards.

Outdoor Interact:

Scalable connected sensor with integral occupancy and daylight sensing, supports wireless mesh connectivity. Sensor works in the Foundation mode when configured without a gateway or in an Interact Advanced mode if a compatible gateway (can be added later) is used. Interact offers an app, a portal and a broad portfolio of Interact ready Indoor and Outdoor luminaires, lamps and retrofit kits all working on the same system. Startup is implemented via Interact Pro App (available in iOS® or Android®) and Bluetooth® connectivity. The app provides flexibility to choose between a gateway or non gateway mode for setup. Setup with the gateway requires wired Internet access to the gateway. Prepare project configuration steps remotely and use IRT9015 remote accessory (ordered separately) or the App on-site to identify and group devices together. WIAP includes SR driver and SR receptacle. Daylight harvesting supported through dimming - activated via the Interact app. Sensors are available in black or white finish and high or low mounting height lenses. IP66 rated.

For more information on Interact visit:

www.interact-lighting.com/interactproscalablesystem

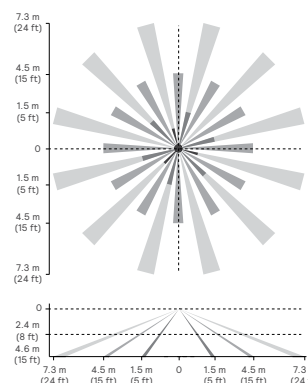
SR/DALI Lighting Control Options

Button Photocontrol (PCB): Button style design for internal luminaires mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4Fc of ambient light.

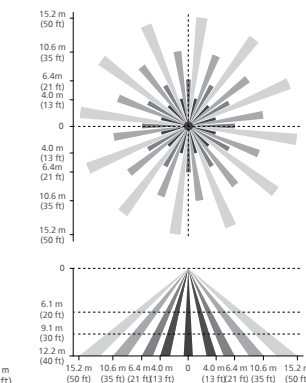
Twist-Lock Receptacle (TR5/TR7/ TLP): TLR5 includes with 5 pin (Type B) receptacle connected to SR/DALI driver all applicable connections made to driver and is not D4i compliant. TR7 includes (Type D-24) connected to SR/DALI driver with all leads connected for use of 3rd party control systems. Receptacles are in accordance to ANSI C136.41. Receptacle located on top of luminaire housing. When specified with receptacle and photoelectric cell (TRPC), 7-pin receptacle is supplied and voltage must be specified. When ordering Twist-lock receptacle (TR5 or TR7), photocell or shorting cap is not included. Devices installed to NEMA twist-lock Receptacle must be IPX6 rated.

Note: The beam patterns shown are intended solely as a general guide and are not to scale. Sensing capabilities and coverage area depend on many factors including the size, speed and direction of travel of persons and vehicles; sensor mounting height; environmental and site conditions; etc.

LW low sensor



HW high sensor



Finish

Each standard color luminaire receives a fade and abrasion resistant, electrostatically applied, thermally cured, triglycidic isocyanurate (TGIC) textured polyester powdercoat finish. The surface treatment achieves a minimum of 1000 hours for salt spray resistant finish in accordance with testing performed and per ASTM B117 standard. Standard colors include bronze (BZ), black (BK), white (WH), dark gray (DGY), and medium gray (MGY). Consult factory for specs on optional or custom colors.

Warranty

PureForm luminaires feature a 5-year limited warranty.

See signify.com/warranties for complete details and exclusions.



THE BRICKYARD - HANOVER STREET
LEBANON, NH
PT5

Gardco PureForm LED post top features a sleek, low profile design and is available with two light engines. ComfortEdge optics provide a unique and lower glare lighting solution designed to enhance visual comfort for pedestrian applications, while precision optics maximize efficiency and spacing. PureForm post top is available with multiple optical distributions with output up to 17,000 lumens. A full range of control options provides additional energy savings. Optional integral emergency battery backup is available for path-of-egress illumination.

Project: _____
Location: _____
Cat.No: _____
Type: _____
Lamps: _____ Qty: _____
Notes: _____

Ordering guide

Example: PPT-P-A09-840-T5M-T3-120-DALI-CS30-PCB-BZ

Prefix	Catalog Code	Lumens Selection	CCT/CRI	Distribution	Shielding	Mounting	Voltage
PPT	C	A02	830	T5M		T3	UNV
PPT PureForm post top, comfort optics	P Precision optics	A01 ⁴ 2500 A06 11000 A02 ⁴ 3500 A07 13500 A03 ⁴ 5000 A08 16000 A04 7000 A09 17000 A05 9000	730 70CRI, 3000K 740 70CRI, 4000K 750 70CRI, 5000K 830 80CRI, 3000K 840 80CRI, 4000K 827 ¹ 80CRI, 2700K (ETor)	T2M Area optic type 2 T3M Area optic type 3 T4M Area optic type 4 T5M Area optic type 5 BLC Back light control	None - HIS ² Internal house side shield (clip-on)	T3 Mounts to a 3"x4" tenon (standard) T2 Post top tenon adapter for 2-3/8" x 4" (ships separately)	120 120V 208 208V 240 240V 277 10-277V UNV 120-277V 347 347V 480 480V HVV 374-480V
	C Comfort optics	A01 ⁴ 2000 A06 11000 A02 3500 A07 ¹⁴ 13500 A03 5000 A08 ¹⁴ 16000 A04 7000 A09 ¹⁴ 17000 A05 9000	830 80CRI, 3000K 840 80CRI, 4000K 827 ¹ 80CRI, 2700K (ETor) 835 ¹ 80CRI, 3500K (ETor) 750 ¹ 70CRI, 5000K (ETor)	T2M Comfort optic type 2M T3M Comfort optic type 3M T4M Comfort optic type 4M T5M Comfort optic type 5M	None - (comfort shielding must be ordered as separately as accessory PPT-EHS-BK)		

Driver type	Dimming Controls (only one may be selected)	Lighting controls ¹⁰ (only one may be selected)	Emergency	Finish
010V				FINISH
0-10V				
010V 0-10V	None - DLEA Dimming leads externally accessible (controls by others) FAWS Field adjustable wattage selector BL50L2 ² PIR motion response dim to 50% L2 lens BL50L3 ² PIR motion response dim to 50% L3 lens BL30MW ¹³ Microwave motion sensor factory set at 50% dimming	None - PCB ^{4,12,13} Photocontrol button TLR5 5-pin twist lock w/ 0-10v driver TLR7 7-pin twist lock w/ 0-10v driver (non-D4i) TLRPC ^{4,13} 7-pin twist lock w/ 0-10v driver (non-D4i) & on/off photocell	None - EM ^{4,9,15} Emergency battery backup (0°C to +40°C/32°F to +104°F) EMC ⁴ Emergency battery pack, cold rated (20°C to +40°C/-4°F to +104°F) 7, 9, 11, 16	Standard textured finish BK Black WH White BZ Bronze DG Dark gray MG Medium gray
DALI				
DALI SR/ DALI	None - CS50 ^{5,6} Security 50 % dimming, 7 hours CM50 ^{5,6} Median 50 % dimming, 8 hours CS30 ^{5,6} Security 30 % dimming, 7 hours CM30 ^{5,6} Median 30 % dimming, 8 hours SRDR ^{5,6} SR driver connected to Zhaga socket (D4i) WIAPLW ^{5,6} Wireless Interact outdoor low mounting (7-15'), white housing WIAPLB ^{5,6} Wireless Interact outdoor low mounting (7-15'), black housing WIAPHW ^{5,6} Wireless Interact outdoor low mounting (15-40'), white housing WIAPHB ^{5,6} Wireless Interact outdoor low mounting (15-40'), black housing	None - PCB ^{4,12} Photocontrol button TR5 ^{5,6,13} 5-pin twist lock SR/DALI driver TR7 ^{5,6,13} 7-pin twist lock SR/DALI driver (D4i) TLP ^{5,6,12} 7-pin twist lock SR/DALI driver (D4i) & on/off photocell	None - F1 ¹² Single Fuse (120V, 277V, or 347V) F2 ¹² Double Fuse (208V, 240V, or 480V) F3 ¹² Double Fuse Canadian double pole (208V, 240V, or 480V) Surge Protection None SP1 Surge Protector 10kV / 10kA (standard) SP2 Surge Protector 20kV/ 10kA (option)	OC Optional color (specify optional color or RAL, contact factory) SC Special color (must supply color chip, requires factory quote)

- Extended lead times apply. Contact factory for details.
- Available with Area optics only. Not allowed with Comfort optics.
- Available with Comfort optics only at 120-347V. Not allowed with Area optics.
- Not available at 347-480V(HVV).
- Not available at 347-480V(HVV) for Pixelated (P-Axx) optic lumen packages. A01-A02 and Comfort (C-Axx) optic lumen packages A01-A09.
- Not available at 120-277V(UNV) for Pixelated (P-Axx) optic lumen packages A01-A02 and Comfort (C-Axx) optic lumen packages A01-A02.
- EMC only compatible with DLEA and Dynadimmer (CSXX, CMXX) Dimming control options.
- Not available with Microwave Motion Sensor BL50MW.
- Not available with Comfort (C-Axx) optic lumen packages A07-A09.
- If selected with Dimming control, DIM leads from receptacle will not be connected to driver.
- Available only with Comfort optics.
- Must specify input voltage.
- BL50MW options and Twistlock photocell options (TLR5, TLR7, TLRPC, PCB) are not compatible due to mechanical conflict.
- Not available with emergency options.
- EMC limited to 25°C max ambient with shielding and A09. All other configurations listed to 40°C ambient.
- For comfort PPT, emergency cold-pack conflicts with BL50xx & PCB/TLRx & Zhaga & FAWS.



PPT PureForm LED post top

PureForm Accessories (order separately)

Mounting Accessories

- PPT-T2** Post top tenon adapter for 2 3/8" x 4"
- FSIR-100** BL Optional Remote Programming Tool
- PPT-EHS-BK** External house side shield, black

PPT Precision optics lumen values

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A01	15	T2M	2,525	B1-U0-G1	171	2,666	B1-U0-G1	180	2,666	B1-U0-G1	180	2,234	B1-U0-G1	151	2,380	B1-U0-G1	161
		T3M	2,578	B1-U0-G1	174	2,722	B1-U0-G1	184	2,722	B1-U0-G1	184	2,282	B1-U0-G1	154	2,430	B1-U0-G1	164
		T4M	2,518	B1-U0-G1	170	2,658	B1-U0-G1	180	2,658	B1-U0-G1	180	2,228	B1-U0-G1	151	2,373	B1-U0-G1	160
		T5M	2,575	B2-U0-G1	174	2,719	B2-U0-G1	184	2,719	B2-U0-G1	184	2,279	B2-U0-G1	154	2,427	B2-U0-G1	164
		BLC	1,775	B0-U0-G1	120	1,874	B0-U0-G1	127	1,874	B0-U0-G1	127	1,571	B0-U0-G1	106	1,673	B0-U0-G1	113
A02	21	T2M	3,596	B1-U0-G1	173	3,796	B1-U0-G1	183	3,796	B1-U0-G1	183	3,182	B1-U0-G1	153	3,389	B1-U0-G1	163
		T3M	3,672	B1-U0-G1	177	3,876	B1-U0-G1	186	3,876	B1-U0-G1	186	3,249	B1-U0-G1	156	3,460	B1-U0-G1	166
		T4M	3,586	B1-U0-G2	172	3,785	B1-U0-G2	182	3,785	B1-U0-G2	182	3,173	B1-U0-G2	153	3,395	B1-U0-G2	163
		T5M	3,667	B3-U0-G2	176	3,872	B3-U0-G2	186	3,872	B3-U0-G2	186	3,245	B2-U0-G1	156	3,456	B2-U0-G2	166
		BLC	2,528	B0-U0-G1	122	2,669	B0-U0-G1	128	2,669	B0-U0-G1	128	2,237	B0-U0-G1	108	2,383	B0-U0-G1	115
A03	30	T2M	5,002	B1-U0-G2	164	5,281	B1-U0-G2	173	5,281	B1-U0-G2	173	4,427	B1-U0-G1	145	4,714	B1-U0-G1	154
		T3M	5,108	B1-U0-G2	167	5,393	B1-U0-G2	177	5,393	B1-U0-G2	177	4,520	B1-U0-G1	148	4,814	B1-U0-G1	158
		T4M	4,988	B1-U0-G2	163	5,266	B1-U0-G2	173	5,266	B1-U0-G2	173	4,414	B1-U0-G2	145	4,723	B1-U0-G2	155
		T5M	5,102	B3-U0-G2	167	5,386	B3-U0-G2	176	5,386	B3-U0-G2	176	4,515	B3-U0-G2	148	4,808	B3-U0-G2	158
		BLC	3,517	B0-U0-G1	115	3,713	B0-U0-G1	122	3,713	B0-U0-G1	122	3,112	B0-U0-G1	102	3,315	B0-U0-G1	109
A04	42	T2M	7,095	B2-U0-G2	165	7,490	B2-U0-G2	174	7,490	B2-U0-G2	174	6,279	B2-U0-G2	146	6,687	B2-U0-G2	156
		T3M	7,245	B2-U0-G2	169	7,648	B2-U0-G2	178	7,648	B2-U0-G2	178	6,411	B1-U0-G2	149	6,828	B2-U0-G2	159
		T4M	7,075	B1-U0-G3	165	7,469	B1-U0-G3	174	7,469	B1-U0-G3	174	6,261	B1-U0-G2	146	6,699	B1-U0-G2	156
		T5M	7,236	B3-U0-G2	168	7,640	B3-U0-G2	178	7,640	B3-U0-G2	178	6,404	B3-U0-G2	149	6,820	B3-U0-G2	159
		BLC	4,988	B0-U0-G2	116	5,267	B0-U0-G2	123	5,267	B0-U0-G2	123	4,415	B0-U0-G2	103	4,701	B0-U0-G2	109
A05	53	T2M	8,407	B2-U0-G2	156	8,876	B2-U0-G2	165	8,876	B2-U0-G2	165	7,440	B2-U0-G2	138	7,924	B2-U0-G2	147
		T3M	8,585	B2-U0-G2	159	9,063	B2-U0-G2	168	9,063	B2-U0-G2	168	7,597	B2-U0-G2	141	8,091	B2-U0-G2	150
		T4M	8,384	B2-U0-G3	156	8,851	B2-U0-G3	164	8,851	B2-U0-G3	164	7,419	B1-U0-G3	138	7,938	B2-U0-G3	147
		T5M	8,574	B4-U0-G3	159	9,053	B4-U0-G3	168	9,053	B4-U0-G3	168	7,588	B3-U0-G2	141	8,081	B3-U0-G2	150
		BLC	5,911	B0-U0-G2	110	6,241	B0-U0-G2	116	6,241	B0-U0-G2	116	5,231	B0-U0-G2	97	5,571	B0-U0-G2	103
A06	70	T2M	10,388	B2-U0-G2	150	10,967	B2-U0-G2	158	10,967	B2-U0-G2	158	9,193	B2-U0-G2	132	9,790	B2-U0-G2	141
		T3M	10,607	B2-U0-G2	153	11,198	B2-U0-G2	161	11,198	B2-U0-G2	161	9,387	B2-U0-G2	135	9,997	B2-U0-G2	144
		T4M	10,358	B2-U0-G3	149	10,936	B2-U0-G3	157	10,936	B2-U0-G3	157	9,167	B2-U0-G3	132	9,808	B2-U0-G3	141
		T5M	10,594	B4-U0-G3	153	11,185	B4-U0-G3	161	11,185	B4-U0-G3	161	9,376	B4-U0-G3	135	9,985	B4-U0-G3	144
		BLC	7,304	B0-U0-G2	105	7,711	B0-U0-G2	111	7,711	B0-U0-G2	111	6,463	B0-U0-G2	93	6,883	B0-U0-G2	99
A07	90	T2M	13,080	B3-U0-G3	147	13,809	B3-U0-G3	155	13,809	B3-U0-G3	155	11,575	B3-U0-G3	130	12,328	B3-U0-G3	139
		T3M	13,356	B3-U0-G3	150	14,101	B3-U0-G3	159	14,101	B3-U0-G3	159	11,820	B2-U0-G3	133	12,588	B3-U0-G3	142
		T4M	13,043	B2-U0-G3	147	13,771	B2-U0-G3	155	13,771	B2-U0-G3	155	11,543	B2-U0-G3	130	12,351	B2-U0-G3	139
		T5M	13,341	B4-U0-G3	150	14,084	B4-U0-G3	158	14,084	B4-U0-G3	158	11,806	B4-U0-G3	133	12,573	B4-U0-G3	141
		BLC	9,197	B1-U0-G2	103	9,710	B1-U0-G2	109	9,710	B1-U0-G2	109	8,139	B0-U0-G2	92	8,668	B0-U0-G2	98

PPT PureForm LED post top

PPT Precision optics lumen values (continued)

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A08	107	T2M	15,324	B3-U0-G3	146	16,179	B3-U0-G3	154	16,179	B3-U0-G3	154	13,561	B3-U0-G3	129	14,443	B3-U0-G3	137
		T3M	15,648	B3-U0-G3	149	16,520	B3-U0-G3	157	16,520	B3-U0-G3	157	13,847	B3-U0-G3	132	14,748	B3-U0-G3	140
		T4M	15,281	B3-U0-G4	145	16,133	B3-U0-G4	153	16,133	B3-U0-G4	153	13,523	B2-U0-G3	129	14,470	B2-U0-G3	138
		T5M	15,629	B4-U0-G3	149	16,501	B4-U0-G3	157	16,501	B4-U0-G3	157	13,831	B4-U0-G3	132	14,730	B4-U0-G3	140
		BLC	10,775	B1-U0-G3	103	11,375	B1-U0-G3	108	11,375	B1-U0-G3	108	9,535	B1-U0-G2	91	10,155	B1-U0-G2	97
A09	114	T2M	16,062	B3-U0-G3	144	16,957	B3-U0-G3	152	16,957	B3-U0-G3	152	14,214	B3-U0-G3	127	15,138	B3-U0-G3	135
		T3M	16,401	B3-U0-G3	147	17,315	B3-U0-G3	155	17,315	B3-U0-G3	155	14,514	B3-U0-G3	130	15,457	B3-U0-G3	138
		T4M	16,017	B3-U0-G4	143	16,910	B3-U0-G4	151	16,910	B3-U0-G4	151	14,174	B2-U0-G3	127	15,166	B3-U0-G4	136
		T5M	16,382	B5-U0-G4	147	17,295	B5-U0-G4	155	17,295	B5-U0-G4	155	14,497	B4-U0-G3	130	15,439	B4-U0-G3	138
		BLC	11,293	B1-U0-G3	101	11,923	B1-U0-G3	107	11,923	B1-U0-G3	107	9,994	B1-U0-G2	89	10,644	B1-U0-G2	95

PPT Comfort optics lumen values

Perf. Package	System Watts	Dist. Type	80 CRI			80 CRI		
			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A01	13	T2M	1,565	B1-U0-G1	120	1,674	B1-U0-G1	129
		T3M	1,490	B1-U0-G1	115	1,594	B1-U0-G1	123
		T4M	1,650	B1-U0-G1	127	1,765	B1-U0-G1	136
		T5M	1,467	B1-U0-G1	113	1,569	B1-U0-G1	121
A02	23	T2M	2,993	B1-U0-G1	130	3,203	B1-U0-G1	139
		T3M	2,850	B1-U0-G1	124	3,050	B2-U0-G2	133
		T4M	3,156	B1-U0-G1	137	3,377	B1-U0-G1	147
		T5M	2,806	B2-U0-G1	122	3,002	B2-U0-G2	131
A03	35	T2M	4,172	B2-U0-G2	119	4,464	B2-U0-G2	128
		T3M	3,973	B2-U0-G2	114	4,251	B2-U0-G2	121
		T4M	4,399	B2-U0-G2	126	4,707	B2-U0-G2	135
		T5M	3,911	B3-U0-G2	112	4,184	B3-U0-G2	120
A04	50	T2M	5,881	B2-U0-G2	118	6,293	B2-U0-G2	126
		T3M	5,600	B2-U0-G2	112	5,992	B3-U0-G3	120
		T4M	6,201	B2-U0-G2	124	6,635	B2-U0-G2	133
		T5M	5,513	B3-U0-G2	110	5,898	B3-U0-G2	118
A05	67	T2M	7,562	B3-U0-G3	113	8,091	B3-U0-G3	121
		T3M	7,200	B3-U0-G3	107	7,704	B3-U0-G3	115
		T4M	7,973	B3-U0-G3	119	8,531	B3-U0-G3	127
		T5M	7,088	B3-U0-G3	106	7,584	B3-U0-G3	113

Perf. Package	System Watts	Dist. Type	80 CRI			80 CRI		
			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A06	83	T2M	8,979	B3-U0-G3	109	9,608	B3-U0-G3	116
		T3M	8,550	B3-U0-G3	103	9,149	B3-U0-G3	111
		T4M	9,468	B3-U0-G3	114	10,130	B3-U0-G3	123
		T5M	8,416	B3-U0-G3	102	9,006	B3-U0-G3	109
A07	106	T2M	11,237	B3-U0-G3	107	12,024	B3-U0-G3	114
		T3M	10,700	B3-U0-G3	101	11,449	B3-U0-G3	109
		T4M	11,849	B3-U0-G3	112	12,678	B3-U0-G3	120
		T5M	10,533	B4-U0-G3	100	11,270	B4-U0-G3	107
A08	132	T2M	13,238	B3-U0-G3	100	14,165	B3-U0-G3	108
		T3M	12,575	B3-U0-G3	95	13,455	B3-U0-G3	102
		T4M	13,958	B3-U0-G3	106	14,935	B3-U0-G3	113
		T5M	12,408	B4-U0-G3	94	13,277	B4-U0-G3	101
A09	140	T2M	14,283	B3-U0-G3	102	14,283	B3-U0-G3	102
		T3M	13,600	B3-U0-G3	97	14,552	B3-U0-G3	104
		T4M	15,060	B3-U0-G3	107	16,114	B3-U0-G3	115
		T5M	13,388	B4-U0-G3	95	14,325	B4-U0-G3	102

Predicted Lumen Depreciation Data

Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions. L70 is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published L70 hours limited to 6 times actual LED test hours

Optic type	Ambient Temperature °C	Calculated L70 Hours	L70 reported per TM-21	Lumen Maintenance % at 60,000 hrs
Precision (A01-A09)	25°C	>100,000 hours	>72,000 hours	95.60%
Comfort (P01-P09)	25°C	>100,000 hours	>100,000 hours	89.10%

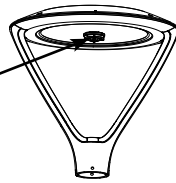
PPT PureForm LED post top

Dimensions – Post Top Luminaire

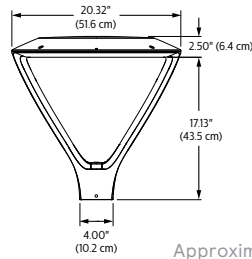
Effective Projected Area ft² / m²

Type	Single
PPT	0.35 ft ² /0.032m ²

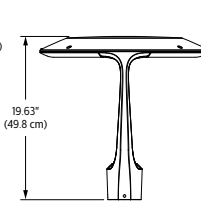
Approximate Motion
Sensor Placement



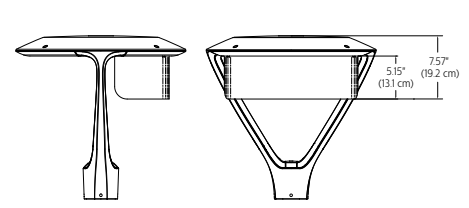
Front View



Side View



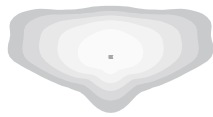
Luminaire with EHS Shield



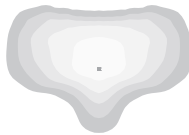
Approximate Luminaire Weight:
Standard: 20 lbs (9.1 kg)
With battery pack: 26 lbs (11.8 kg)

Precision Optical Distributions

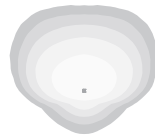
Type 2 Medium



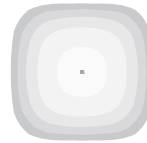
Type 3 Medium



Type 4 Medium



Type 5 Medium



Back Light Control



Comfort Optical Distributions

Type 2



Type 3



Type 4



Type 5

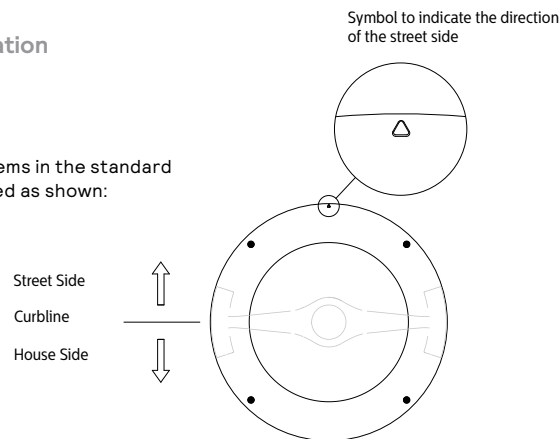


Asymmetric Optical Orientation Information

Standard Optic Position

Aimed Between The Yoke Supports

Luminaires ordered with asymmetric optical systems in the standard optic position will have the optical system oriented as shown:



PPT PureForm LED post top

Specifications

Housing

Two-piece sealed enclosure with main part of the housing designed as the structural and heat sink frame, enclosed by cover to give its unique form. It also includes yoke arm with arm covers. All die-cast parts are made of low-copper, die-cast aluminum alloy for a high resistance to corrosion. The sleek profile without optimized surface area allows housing to provide excellent convection heat transfer with minimum use of heat fins, giving the freedom to have a clean minimalist aesthetic design. Luminaire housing rated to IP66, tested in accordance to Section 9 of IEC 60598-1.

Vibration resistance

Luminaire is tested and rated Level 2 for Bridge and Overpass application (formerly 3G) cycles conforming to standards set forth by ANSI C136.31-2023. Testing includes vibration to 3G acceleration in three axes, all performed on the same luminaire.

Light engine

Comfort Edge technology provides low-glare, uniform illumination. Composed of LEDs strategically positioned on the edge of the optical plate. Light engine luminous opening size optimized to best achieve a balance between lumen output and optical performance with the need to provide visual comfort. LEDs are mounted directly to the housing to provide heat conduction and ensure maximized LED lifetime and performance. Light engine is RoHS compliant and available in 4 IES distribution options. Standard color temperatures: 3000K +/- 130K, 4000K +/- 130K, 5000K +/- 225K. Minimum CRI of 70. Also available in 2700K and 3500K color temperatures with extended leadtimes. Contact factory for details.

Precision LED Modules are comprised of 40 count LEDs mounted to metal clad printed circuit board and sealed to a polymer optic plate to meet IP66 rating.

Energy saving benefits

System efficacy up to 193 lms/W with significant energy savings over Pulse Start Metal Halide luminaires. Optional control options provide added energy savings during unoccupied periods.

Optical systems

ComfortEdge technology provides a unique and lower perceived glare lighting solution designed to enhance visual comfort for pedestrian applications. Available in IES distribution types 2, 3, 4, and 5 available up to 17,000 lumens.

Precision optics are available in type 2, 3, 4, 5 and Backlight Control (BLC) distributions available. Internal shield option mounts to LED optics to provide additional cutoff, and dedicated BLC optics provide the most stringent cutoff to meet requirements around property lines. Performance tested per LM-79 and TM-15 (IESNA) certifying its photometric performance. Luminaire designed with 0% uplight (UO per IESNA TM-15).

Mounting

PureForm Post Top mounts standard to a 3" x 4" Tenon, but can also be mounted to a 2-3/8" x 4" Tenon if a separate sleeve is specified and shipped as separately as an accessory.

Listings

PPT is UL/cUL wet location listed to the UL 1598 standard, suitable for use in ambient temperatures from -40° to 40°C (-40° to 104°F). Most PureForm PPT comfort configurations are qualified under Standard DesignLights Consortium® category. Consult DLC Qualified Products list to confirm your specific luminaire selection is approved. CCTs 3000K and warmer are Dark Sky Approved.

Controls

0-10V Dimming Control Options

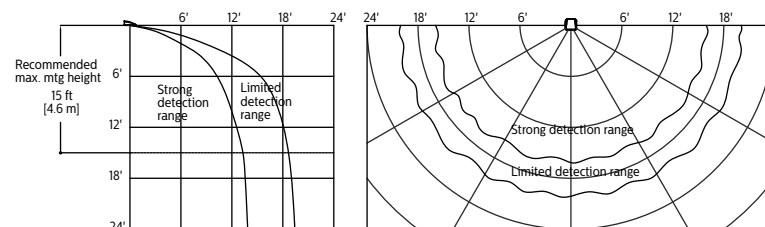
DLEA: Access to 0-10V dimming leads supplied through the yoke of the luminaire (for secondary dimming controls by others). Cannot be used with other control options.

Field Adjustable Wattage Selector (FAWS): Luminaire equipped with the ability to manually adjust the wattage in the field to reduce total luminaire lumen output and light levels. Comes pre-set to the highest of 10 output positions. Consult factory for specific dimming settings for each position.

BL50L2/BL50L3: Motion Response module is mounted integral to luminaire factory pre-programmed to 50% dimming when not ordered with other control options. BL50Lx options are set/operate in the following fashion: The motion sensor is set to a constant 50%. When motion is detected by the PIR sensor, the luminaire returns to full power/light output. Dimming on low is factory set to 50% with 5 minutes default in "full power" prior to dimming back to low. When no motion is detected for 5 minutes, the motion response system reduces the wattage by 50%, to 50% of the normal constant wattage reducing the light level. Other dimming settings can be provided if different dimming levels are required. Contact technical support for details.

Infrared Motion Response Lenses (BL50L2/BL50L3): Lens #2 is designed for mounting heights 8' to 15'. Lens #3 is designed for higher mounting heights up to 20' with a 40' diameter coverage area.

Microwave Motion Response (BL30MW): Motion response luminaires include a high frequency microwave sensor, 5.8GHz +/- 75MHz microwave ISM continuous wave band with 360° coverage area, <0.5 mW transmitting power and <1 W standby power. Factory programmed settings dim fixture to 30% with time delay of 5 minutes with no stand-by period. When motion is detected, the luminaire returns to 100% full light output and will remain on full power for 5 minutes.



Note: The beam patterns shown are intended solely as a general guide and are not to scale. Sensing capabilities and coverage area depend on many factors including the size, speed and direction of travel of persons and vehicles; sensor mounting height; environmental and site conditions; etc.

0-10V Lighting Control Options

Button Photocontrol (PCB): Button style design for internal luminaires mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4fc of ambient light.

Twist-Lock Receptacle (TLR5/TLR7/TLRPC): TLR options come with 5 pin or with 7 pins connected to 0-10V driver and not all pins will be connected. Dimming Receptacle Type B (5-pin) and Type D-24 (7-pin) in accordance to ANSI C136.41. Can be used with third-party control system. Receptacle located on top of luminaire housing. When specified with receptacle and photoelectric cell (TLRPC), 7-pin receptacle is supplier and voltage must be specified. When ordering Twist-lock receptacle (TLR5 or TLR7), photocell or shorting cap is not included. If Twistlock receptacle option is ordered with Dimming Control option, then dimming leads from driver will not be connected to TLR but consumed by selected device. Devices installed to NEMA twist-lock Receptacle must be IPX6 rated.

Sensor Ready(SR)/DALI Control Options

Automatic Profile Dimming (CS/CM/CE/CA): Standard dimming profiles provide flexibility towards energy savings goals while optimizing light levels during specific dark hours. Dimming profiles include two dimming settings including dim to 30% or 50% of the total lumen output. When used in combination with not programmed motion response it overrides the controller's schedule when motion is detected. After 5 minutes with no motion, it will return to the automatic dimming profile schedule. Automatic dimming profile scheduled with the following settings:

- **CS50/CS30:** Security for 7 hours night duration (Ex., 11 PM - 6 AM)
- **CM50/CM30:** Median for 8 hours night duration (Ex., 10 PM - 6 AM)

All above profiles are calculated from mid point of the night. Dimming is set for 6 hours after the mid point and 1 or 2 hours before depending of the duration of dimming. Time clock or photocell is required for on/off functionality to allow for midpoint calculation. Cannot be used with other dimming control options.

PPT PureForm LED post top

Specifications

Sensor Ready Zhaga Socket Connector (SRDR): Product is D4i Certified and equipped with Sensor Ready drivers connected to 4-pin Zhaga Book 18 compliant receptacle designed for sensor and other control system applications. Receptacle is rated IP66 assembly in a compact design that provides a sealed electrical interface and rated UV resistance, mounted on underside of the luminaire, protective dust cap included. When a controller not provided by Signify is used with Sensor Ready Zhaga socket connector, the controller must be certified to work with the Xitanium SR LED drivers as part of the SR certified program. SRDR can be used with NEMA 7-pin twist lock receptacle, which is mounted on top of the luminaire. D4i certification validates compliance with specifications for data exchange in connected lighting systems, ensuring interoperability, compatibility, and efficient operation. It also assures customers that the device meets industry standards.

Outdoor Interact:

Scalable connected sensor with integral occupancy and daylight sensing, supports wireless mesh connectivity. Sensor works in the Foundation mode when configured without a gateway or in an Interact Advanced mode if a compatible gateway (can be added later) is used. Interact offers an app, a portal and a broad portfolio of Interact ready Indoor and Outdoor luminaires, lamps and retrofit kits all working on the same system. Startup is implemented via Interact Pro App (available in iOS® or Android®) and Bluetooth® connectivity. The app provides flexibility to choose between a gateway or non gateway mode for setup. Setup with the gateway requires wired Internet access to the gateway. Prepare project configuration steps remotely and use IRT9015 remote accessory (ordered separately) or the App on-site to identify and group devices together. WIAP includes SR driver and SR receptacle. Daylight harvesting supported through dimming - activated via the Interact app. Sensors are available in black or white finish and high or low mounting height lenses. IP66 rated.

For more information on Interact visit:

www.interact-lighting.com/interactproscalablesystem

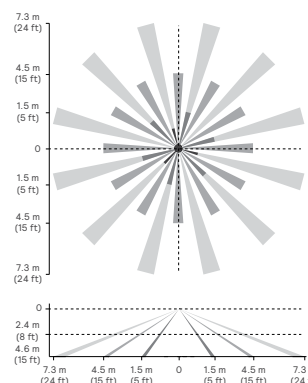
SR/DALI Lighting Control Options

Button Photocontrol (PCB): Button style design for internal luminaires mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4Fc of ambient light.

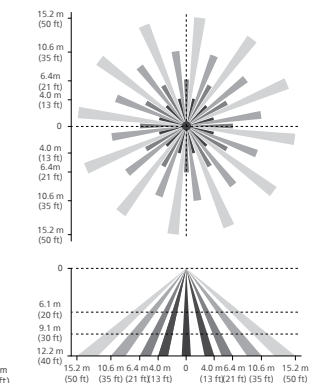
Twist-Lock Receptacle (TR5/TR7/ TLP): TLR5 includes with 5 pin (Type B) receptacle connected to SR/DALI driver all applicable connections made to driver and is not D4i compliant. TR7 includes (Type D-24) connected to SR/DALI driver with all leads connected for use of 3rd party control systems. Receptacles are in accordance to ANSI C136.41. Receptacle located on top of luminaire housing. When specified with receptacle and photoelectric cell (TRPC), 7-pin receptacle is supplied and voltage must be specified. When ordering Twist-lock receptacle (TR5 or TR7), photocell or shorting cap is not included. Devices installed to NEMA twist-lock Receptacle must be IPX6 rated.

Note: The beam patterns shown are intended solely as a general guide and are not to scale. Sensing capabilities and coverage area depend on many factors including the size, speed and direction of travel of persons and vehicles; sensor mounting height; environmental and site conditions; etc.

LW low sensor



HW high sensor



Finish

Each standard color luminaire receives a fade and abrasion resistant, electrostatically applied, thermally cured, triglycidic isocyanurate (TGIC) textured polyester powdercoat finish. The surface treatment achieves a minimum of 1000 hours for salt spray resistant finish in accordance with testing performed and per ASTM B117 standard. Standard colors include bronze (BZ), black (BK), white (WH), dark gray (DGY), and medium gray (MGY). Consult factory for specs on optional or custom colors.

Warranty

PureForm luminaires feature a 5-year limited warranty.

See signify.com/warranties for complete details and exclusions.



THE BRICKYARD - HANOVER STREET
LEBANON, NH
PT3, PT4 & PT5 POLE

The **Gardco SRS Straight Round Steel** pole consists of a one-piece high tensile carbon steel tube welded and secured to the carbon steel base plate providing excellent strength and integrity. The poles are finished with an electrostatically applied, thermally cured polyester powdercoat. All poles include base cover, hand hole, ground lug and top cap. Anchor bolts and templates are ordered as a separate accessory.

CUT TO 11' POLE HEIGHT

Ordering guide

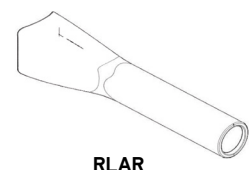
example: SRS-CB-5-7-25-T2D4L-N-BZ

Family	Base	Pole Shaft Size (in.)	Pole Gauge/ Wall Thickness	Height (ft) ⁵	Drilling/Tenon Configurations ¹	Drilling Template ²	Finish	Options ³
SRS	CB	4	11	11	T3D	N	FINI	
SRS	CB Carbon Steel Base w/ Base Cover	3	11 11 ga. / 0.120"	10 12 14 16	Drilling D1 1 Way D1@180 1 Way @ 180 D2 2 Way @ 180 D2@90 2 Way @ 90 D3 3 Way @ 90 D3@120 3 Way @ 120 D4 4 Way @ 90	DT1 Drill Template 1 DT2 Drill Template 2 DT3 Drill Template 3 DT4 Drill Template 4 DT5 Drill Template 5 DT6 Drill Template 6 DTX-xxx ^{6,7} Custom Template See drill template chart for details.	BK Black BZ Bronze WH White DG Dark Grey MG Medium Grey GY3 ⁸ Light Grey, Smooth SSDGY ⁸ SolarForm Dark Grey (RAL7011) GV Galvanized (No Paint) FP/GV Finished Textured Paint over Galvanized (Specify, ex: MG/GV) OC Optional Color Paint (ex: RAL7024) SC ⁶ Special/Custom Color (Specify, must supply color chip)	FES ⁹ Festoon Outlet VDA Vibration Dampener AHH ⁶ Additional Hand Hole DR ^{6,8} Duplex Receptacle VPA Vandalproof Screws GFI ⁶ DR with GFI (120V only) BAC ⁹ Buy American Compliant CL1/2 ⁶ Coupling 1/2" CL3/4 ⁶ Coupling 3/4" CL1 ⁶ Coupling 1" CL1-1/4 ⁶ Coupling 1-1/4" CL1-1/2 ⁶ Coupling 1-1/2" NL1/2 ⁶ Nipple 1/2" NL3/4 ⁶ Nipple 3/4" NL1 ⁶ Nipple 1" NL1-1/4 ⁶ Nipple 1-1/4" NL1-1/2 ⁶ Nipple 1-1/2" For FES, AHH, DR, GFI, CL*, and NL* options, indicate height in inches above base and orientation to hand hole. See page 2 and 3 for details.
		4	11 11 ga. / 0.120"	10 12 14 16 20 25	T2D4L 2-3/8" OD x 4" length T2D6L ⁸ 2-3/8" OD x 6" length T3D4L 3" OD x 4" length T4D6L 4" OD x 6" length	N No Drilling Template (for Tenon and Plain Top Options)		
		5	11 11 ga. / 0.120"	20 25 30	No Drilling/No Tenon			
			7 7 ga. / 0.180"	25 30	P Plain Top			
L/SRS								

- See Drilling Configurations on Page 3.
- See Luminaire Drilling Templates on Page 3
- Not all options available with all configurations. Consult factory for more details
- Options listed with **gray text** will be shipped with the Legacy SRS design. Use the L/SRS family code whenever these options are specified.
- Pole heights can be cut to length. Specify as a whole number in ft. (ex. 11, 13) or to the inch as a decimal (ex. 15.33 = 15' 4") or as "15FT 4IN" for Legacy designs.
- Option must be specified, including install location, by the customer before order release. FES, DR, GFI, AHH options typically must be placed 12-18" away from standard hand hole (20" or 12" above base).
- Custom drill templates (DTX) require factory quote.
- Option not available with Legacy SRS designs.
- Failure to properly select the "BAC" suffix could result in you receiving product that is not BAA compliant product with no recourse for an RMA or refund. This BAC designation hereunder does not address (i) the applicability of, or availability of a waiver under, the Trade Agreements Act, or (ii) the "Buy America" domestic content requirements imposed on states, localities, and other non-federal entities as a condition of receiving funds administered by the Department of Transportation or other federal agencies.
- Consult Signify to confirm whether specific accessories are BAA-compliant.

Accessories ¹⁰

Service	Pole Size	12NC	Description (Diameter x Length x Hook)
Anchor Bolts + Templates			
For shipment with the pole (order 1 per pole)	3" Poles	912401597399	AB 3/4x17x3-G DEC w/ 8.5 BC ABT
	4" & 5" Poles	912401597397	AB 3/4x24x3-G DEC w/ 8.5 BC ABT
For Pre-Ship service (order 1 per pole)	3" Poles	912401597407	AB 3/4x17x3-G DEC w/ 8.5 BC ABT-RS
	4" & 5" Poles	912401597405	AB 3/4x24x3-G DEC w/ 8.5 BC ABT-RS
Part No.	Pole Size	Description	
RLAR-1A-R4@4.9-(finish)	4" Poles	Cast Aluminum mounting arm, 15" long with DT6 drill pattern (order 1 per luminaire).	
RLAR-1A-R5@6-(finish)	5" Poles	For use with Lumec Roadway and Gardco SolarForm luminaires. (For SolarForm: use RLAR bracket to mount horizontally, use T2D6L tenon to mount vertically). Specify finish to match pole.	



RLAR

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Agenda Item 4.A
8/12/24 Planning Bd Mtg

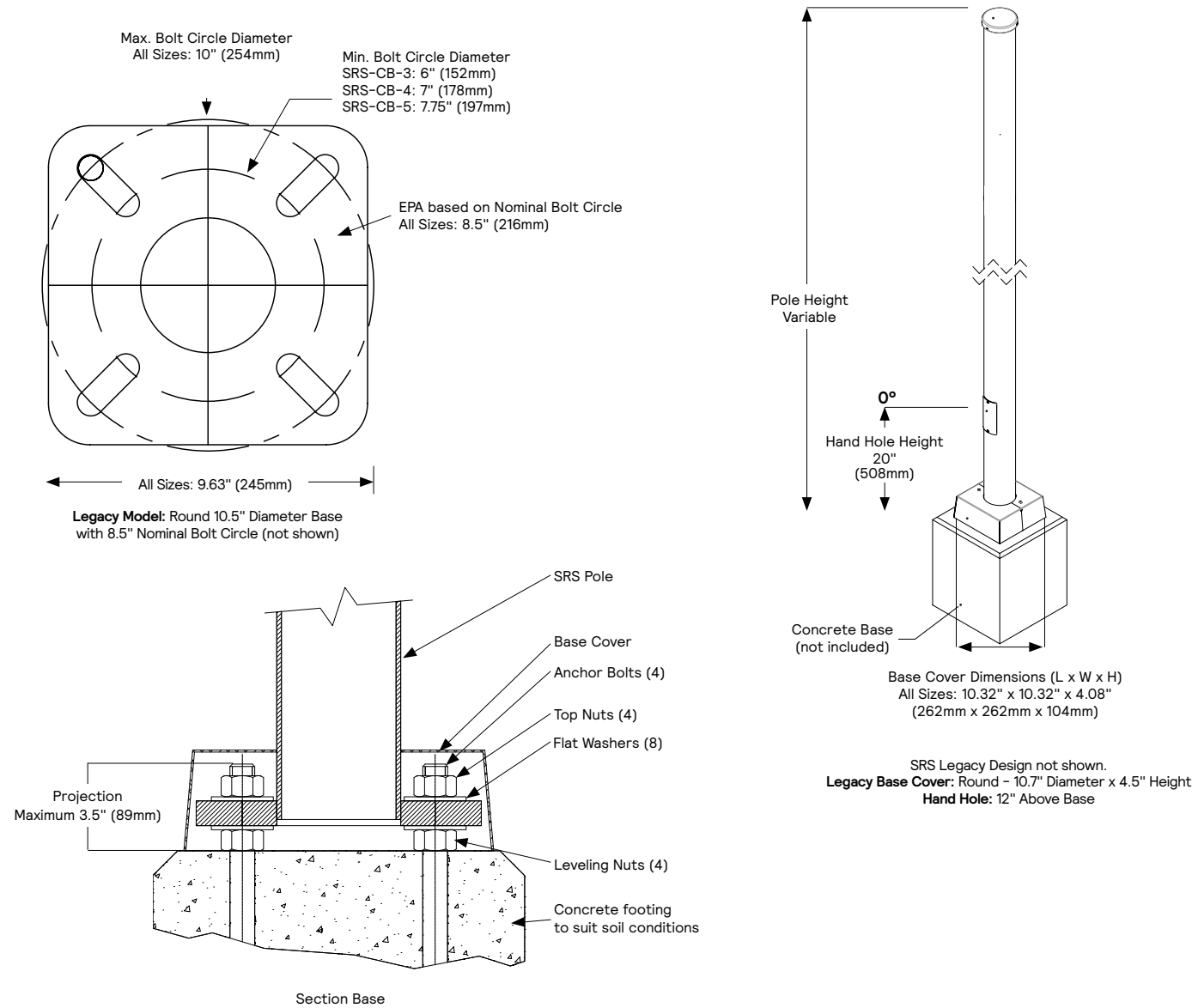
Poles Straight Round Steel

Quick Ship ordering guide

example: SRS-CB-4-11-20-D1-DT5-BZ-RS

Family	Base	Pole Shaft Size (in.)	Pole Gauge/ Wall Thickness	Height (ft.) ⁵	Drilling Configuration	Drilling Template	Finish	Options
SRS Straight Round Steel	CB Carbon Steel Base w/ Cover	4	11 11 ga. / 0.120"	20 25	D1 1 Way D1@180 1 Way @ 180 D2 2 Way @ 180 D2@90 2 Way @ 90 D3 3 Way @ 90 D3@120 3 Way @ 120 D4 4 Way @ 90	DT5 Drill Template 5	BZ Bronze MG Medium Grey BK Black	RS RapidShip*

Dimensions



* Anchor Bolt Lock Washers are not normally required and are not included in standard anchor bolt sets. They are available upon request at additional cost.

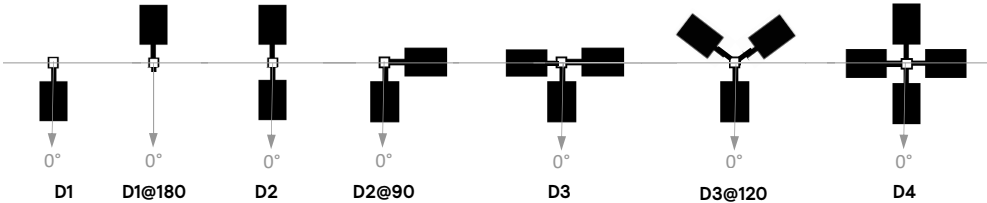
** Grouting should include a drainage slot or tube (by others) to permit water to drain from the base of the pole. Failure to provide drainage may weaken the pole base structure over time and may result in pole base failure, for which Gardco is not responsible.

NOTE: Factory supplied template must be used when setting anchor bolts. Gardco will not honor any claim for incorrect anchorage placement from failure to use factory supplied templates.

Poles Straight Round Steel

Drilling Configuration

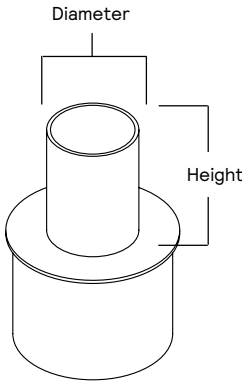
Code	Description
D1	Single luminaire
D1@180	Single luminaire @ 180
D2	Two luminaires @ 180
D2@90	Two luminaires @ 90
D3	Three luminaires @ 90
D3@120	Three luminaires @ 120
D4	Four luminaires @ 90



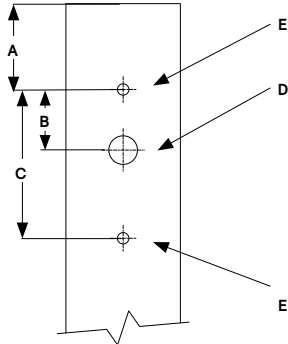
Ref. access door at 0° for all
Legacy design places access door at 180°

Tenon Dimensions

Tenon	Diameter	Height
T2D4L	2.375" (60mm)	4" (102mm)
T2D6L	2.375" (60mm)	6" (152mm)
T3D4L	3" (76mm)	4" (102mm)
T4D6L	4" (102mm)	6" (152mm)



Pole Top Drilling



Luminaire Drill Pattern

Code	Description	Luminaires	Pole Drilling				
			A To Pole Top	B	C Full Extent	D Wireway Hole	E Bolt Hole
DT1	Drill Template 1	Gardco SlenderForm Round SFRA	2.25" (57mm)	1.5" (38.1mm)	3" (76mm)	0.875" (22.2mm)	0.40" (10.2mm)
DT2	Drill Template 2	Gardco SlenderForm Square - SFA Gardco Gullwing - GL13, GL18 Gardco Form Ten - EH14L, EH19L, CAL17, CAL22, MAL17, MAL22	2.25" (57mm)	2.17" (55mm)	3.84" (98mm)	0.875" (22.2mm)	0.39" (9.9mm)
DT3	Drill Template 3	Gardco PowerForm PFAS	2.25" (57mm)	1.75" (44mm)	3.84" (98mm)	0.875" (22.2mm)	0.41" (10.4mm)
DT4	Drill Template 4	Gen1 Stonco/Keene AL150-G1, AL200-G1	2.5" (64mm)	1.7" (43mm)	3.5" (89mm)	0.875" (22.2mm)	0.41" (10.4mm)
DT5	Drill Template 5	Gardco EcoForm Gen2 - ECF-S, ECF-L Gardco PureForm Gen2 - P15, P20, P26, P34 OptiForm Small - OPF-S OptiForm Med - OPF-M OptiForm Large - OPF-L	3" (76mm)	1" (25mm)	3" (76mm)	1" (25mm)	0.41" (10.4mm)
DT6	Drill Template 6	Hole pattern drilled for the following: Attach RLAR bracket accessory, suitable for use with: Lumec Capella CPLM, CPLS Lumec RoadStar GPLM, GPLS Lumec RoadFocus RFS, RFM, RFL Lumec RoadView RVM, RVS Lumec MiniView SVS Lumec StreetView SVM Gardco SolarForm BRP710	2.5" (64mm)	1" (25mm)	2" (50mm)	0.875" (22mm)	0.5" (12.7mm)

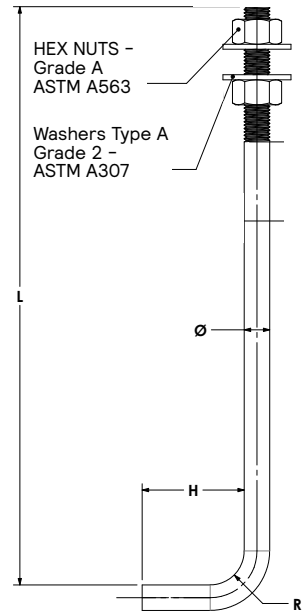
Poles Straight Round Steel

Pole Data

Product Catalog Number	Pole Specs				Anchor Bolt Data				
	Height (ft.)	Pole Diameter (in.)	Wall Thickness (in.)	Pole Weight (lbs)	Bolt Circle (in.)	Legacy Bolt Circle (in.)	Anchor Bolt Spec (in.)	Legacy Anchor Bolt Spec (in.)	Anchor Bolt Max Proj. (in.)
● SRS-CB-3-11-10	10	3	0.12	37	8.5 (6-10)	8.5 (8-9)	3/4 x 17 x 3	3/4 x 17 x 3	3.5
● SRS-CB-3-11-12	12	3	0.12	44	8.5 (6-10)	8.5 (8-9)	3/4 x 17 x 3	3/4 x 17 x 3	3.5
● SRS-CB-3-11-14	14	3	0.12	52	8.5 (6-10)	8.5 (8-9)	3/4 x 17 x 3	3/4 x 17 x 3	3.5
● SRS-CB-3-11-16	16	3	0.12	59	8.5 (6-10)	8.5 (8-9)	3/4 x 17 x 3	3/4 x 17 x 3	3.5
SRS-CB-4-11-10	10	4	0.12	50	8.5 (7-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
SRS-CB-4-11-12	12	4	0.12	59	8.5 (7-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
SRS-CB-4-11-14	14	4	0.12	69	8.5 (7-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
SRS-CB-4-11-16	16	4	0.12	79	8.5 (7-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
SRS-CB-4-11-20	20	4	0.12	99	8.5 (7-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
SRS-CB-4-11-25	25	4	0.12	123	8.5 (7-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
SRS-CB-5-11-20	20	5	0.12	124	8.5 (7.75-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
SRS-CB-5-11-25	25	5	0.12	155	8.5 (7.75-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
● SRS-CB-5-11-30	30	5	0.12	186	8.5 (7.75-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
SRS-CB-5-7-25	25	5	0.18	229	8.5 (7.75-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
● SRS-CB-5-7-30	30	5	0.18	275	8.5 (7.75-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5

● SRS Legacy Design

Standard Anchor Bolt



Pole Data (cont.)

Product Catalog Number	AASHTO 2001 - EPA ft ²								CSA - EPA ft ²							
	80 MPH	90 MPH	100 MPH	110 MPH	120 MPH	130 MPH	140 MPH	150 MPH	300 Pa 79 MPH	400 Pa 91 MPH	500 Pa 102 MPH	600 Pa 111 MPH	700 Pa 120 MPH	800 Pa 129 MPH	900 Pa 136 MPH	1000 Pa 144 MPH
● SRS-CB-3-11-10	14.20	10.96	8.66	6.93	5.61	4.61	3.79	3.15	15.28	11.12	8.62	6.96	5.76	4.87	4.18	3.62
● SRS-CB-3-11-12	11.47	8.75	6.80	5.35	4.26	3.40	2.72	2.17	12.13	8.68	6.61	5.24	4.26	3.50	2.94	2.48
● SRS-CB-3-11-14	9.22	6.99	5.38	4.12	3.18	2.45	1.86	1.39	9.68	6.76	5.02	3.85	3.03	2.40	1.92	1.53
● SRS-CB-3-11-16	6.51	4.79	3.56	2.68	1.98	1.45	1.02	N/A	7.66	5.18	3.68	2.70	1.98	1.45	1.04	N/A
SRS-CB-4-11-10	26.56	20.65	16.39	13.26	10.94	9.24	7.90	6.82	28.97	21.28	16.66	13.58	11.38	9.73	8.45	7.43
SRS-CB-4-11-12	21.80	16.80	13.23	10.57	8.62	7.25	6.17	5.32	23.58	17.13	13.26	10.69	8.83	7.46	6.37	5.53
SRS-CB-4-11-14	18.19	13.87	10.77	8.48	6.82	5.71	4.83	4.12	19.44	13.93	10.63	8.42	6.84	5.67	4.73	4.01
SRS-CB-4-11-16	15.30	11.51	8.80	6.78	5.35	4.44	3.71	3.15	16.14	11.35	8.48	6.55	5.20	4.17	3.38	2.74
SRS-CB-4-11-20	10.47	7.57	5.49	3.97	2.89	2.31	1.86	1.51	10.98	7.29	5.06	3.59	2.53	1.74	1.12	N/A
SRS-CB-4-11-25	6.35	4.15	2.56	1.41	N/A	N/A	N/A	N/A	6.12	3.38	1.74	N/A	N/A	N/A	N/A	N/A
SRS-CB-5-11-20	17.94	13.29	10.30	8.31	6.78	5.64	4.73	4.03	19.67	13.56	9.89	7.45	5.71	4.40	3.68	3.15
SRS-CB-5-11-25	11.74	8.19	6.08	4.75	3.77	3.03	2.45	2.00	12.72	8.04	5.23	3.36	2.01	1.02	N/A	N/A
● SRS-CB-5-11-30	7.29	4.48	2.95	2.11	1.51	1.08	N/A	N/A	7.29	3.64	1.47	N/A	N/A	N/A	N/A	N/A
SRS-CB-5-7-25	19.65	14.46	11.14	8.93	7.29	6.02	5.04	4.26	21.58	14.69	10.55	7.78	5.82	4.34	3.56	3.01
● SRS-CB-5-7-30	13.62	9.48	6.99	5.46	4.32	3.47	2.80	2.27	14.22	8.85	5.63	3.48	1.94	N/A	N/A	N/A

- Warning:** Additional wind loading, in terms of EPA, from banners, cameras, floodlights and other accessories attached to the pole, must be added to the luminaire(s) EPA before selecting the pole with the appropriate wind load capability. Specifying BAA or BAC compliant poles may result in different EPA ratings.
 - Factory supplied template must be used when setting anchor bolts. Gardco will not honor any claim for incorrect anchorage placement resulting from failure to use factory supplied templates. Exact length of anchor bolts may vary.
 - EPA ratings are based on the listed, optimal nominal dimension of the bolt circle listed above. The bolt circle has limited variability but the EPA rating will change.
- Note:** Above EPA (Effective Projected Area) rating is in accordance with AASHTO 2001, with a 50 pound load (22.7 kg) placed at 1 foot (305mm) above its center.

Specifications

Pole shaft

The pole shaft is fabricated from a single piece of 11 ga (0.1196") or 7 ga (0.180") high tensile carbon steel. The formed steel plate is longitudinally welded providing minimum yield strength of 50 ksi. Shaft includes factory installed copper ground lug, 10-7 copper wire, and ground lug screw.

Anchor Base

The pole anchor base is fabricated from 44W structural quality carbon steel with a minimum yield strength of 44 ksi. The base plate is circumferentially welded on both top and bottom.

Anchor Bolts

Anchor bolts are fabricated from a commercial quality hot rolled carbon steel bar that meets or exceeds a minimum guaranteed yield strength of 55 ksi. Bolts have an "L" bend on one end and threaded on the opposite end. Anchor bolts are galvanized in accordance with ASTM A-153.6 C1.C. Four (4) properly sized bolts, each furnished with two (2) regular hex nuts and two (2) flat washers, are provided per pole (priced and ordered separately), unless otherwise specified. Conforms to AASHTO M 314 90 and ASTM F1554.

Customer Specified Options

The options, DTX, FES, DR, GFI, AHH, CL*, and NL* require factory quotation. Poles with custom drilling templates (DTX) are provided as a service, however Signify holds no liability for improper installation and safety when using non-Signify luminaires or attachments on Gardco poles via drilling, tenon mounting, or coupling and nipple mounting. It is the responsibility of the customer to ensure the pole is loaded and installed in a safe manner to the limitations of the pole structure. See "Warning" paragraph for more details.

Base Cover

A two-piece painted square aluminum base cover that completely conceals the entire base plate and anchorage. Base cover is provided standard. Legacy model includes a round 0.125" thick composite base cover.

Hand hole

The hand hole has a nominal rectangular 2"x4.5" inside opening in the pole shaft. Included is an aluminum cover plate, EPDM gasket, and captive attachment screws. The hand hole is located 20" above the base and 0° clockwise with respect to the luminaire arm when viewed from the top of the pole for one arm. For two arms the hand hole is located directly under one arm. Legacy design includes an easy to install, self-contained Swing Latch hand hole cover assembly. U.S. Patent Swing Latch cover is fabricated from durable polycarbonate/ABS blend plastic. All pole assemblies are provided with a 2.50" x 5.00" rectangular hand hole.

Pole Top Cap

Each pole assembly is provided with a removable aluminum pole top cap painted to match the specified pole and attached with three pressure screws. Legacy design is provided with a removable plastic top push cap. Finish is Black.

Finish

Poles are available with Gardco's standard textured color finishes - Black, White, Bronze, Dark Grey, Medium Grey, and Lumec GY3 for a match with roadway luminaire finishes. Optional Galvanized finish and custom colors also available. Legacy design is provided with gloss paint on standard finishes.

Couplings and Nipples

Couplings (NPSC standard internal threads) and Nipples (NPT standard external threads) are available to mount 3rd party objects to the pole. For most applications Couplings and Nipples must be at least 4' from the base of the pole. Lengths are as follows:

Couplings < 1" dia. = 1" length
Couplings >= 1" dia. = 1.5" length
Nipples < 1" dia. = 1.5" length
Nipples >= 1" dia. = 2" length

Legacy pole designs may deviate from specifications listed here. See "Customer Specified Options" paragraph for more details.

Duplex Receptacle (DR and GFI)

DR and GFI options are placed at 2' below the pole top on the same side as the hand hole unless otherwise specified. DR or GFI options cannot be placed within 1' of the the hand hole. Options can typically be placed 32" above base for utility purposes. Maximum output of the receptacles are 15A.

General Pole Information

Design

EPA specs conform to AASHTO 2001. The poles as charted are designed to withstand dead loads and predicted dynamic loads developed by variable wind pressure with an additional 2.5 gust factor under the following conditions: The charted weights include luminaire(s) and/or mounting bracket(s). Poles installed in areas of known abnormal conditions may require special consideration. For example: coastal areas, airports and areas of special winds. Poles are designed for ground mounted applications. Poles mounted on structures (such as buildings and bridges) may also necessitate special consideration requiring Gardco's recommendation. Height correction factors and drag coefficients are applied to the entire structure. An appropriate safety factor is maintained based on the minimum yield strength of the material incorporated in the pole.

Warning

This design information is intended as a general guideline only. The customer is solely responsible for proper selection of pole, luminaire, accessory and foundation under the given site conditions and intended usage. The addition of any items to the pole, in addition to the luminaire, will dramatically impact the EPA load on that pole. It is strongly recommended that a qualified professional be consulted to analyze the loads given the user's specific needs to ensure proper selection of the pole, luminaire, accessories, and foundation. Gardco assumes no responsibility for such proper analysis or product selections. Failure to ensure proper site analysis, pole selection, loads and installation can result in pole failure, leading to serious injury or property damage.

Warranty

Gardco Steel poles are covered by a 3-year structural and finish warranty. Legacy designs are covered by a 1-year warranty. For more information visit [signify.com/warranties](https://www.signify.com/warranties).



THE BRICKYARD - HANOVER STREET
LEBANON, NH
S2

Gardco PureForm LED area small round features a sleek, low profile design and is available with two light engines. ComfortEdge optics provide a unique and lower glare lighting solution designed to enhance visual comfort for pedestrian applications, while precision optics maximize efficiency and spacing. PureForm P20 is available with multiple optical distributions with output up to 17,000 lumens. A full range of control options provides additional energy savings.

Project: _____

Location: _____

Cat.No: _____

Type: _____

Lumens: _____ Qty: _____

Notes: _____

Ordering guide

Example: P20-P-A05-740-T3M-HIS-AR1-UNV-DALI-WIAPHW-MG

Prefix	Catalog Code	Lumens	CCT/CRI	Distribution	Shielding	Mounting	Voltage
P20	C	A05	830	T2		AR1	UNV
P20 PureForm area small round	P Precision optics	A01 ⁴ 2500 A02 ⁴ 3500 A03 ⁴ 5000 A04 7000 A05 9000 A06 11000 A07 13500 A08 16000 A09 17000 A10 19000	730 70CRI, 3000K 740 70CRI, 4000K 750 70CRI, 5000K 830 80CRI, 3000K 840 80CRI, 4000K 827 ¹ 80CRI, 2700K (ETOr)	AFR Auto front row AFR-90 AFR rotated left 90° AFR-270 AFR rotated left 270° T2M Type 2 Medium T2M-90 T2M rotated left 90° T2M-270 T2M rotated left 270° T3M Type 3 Medium T3M-90 T3M rotated left 90° T3M-270 T3M rotated left 270° T4M Type 4 Medium T4M-90 T4M rotated left 90° T4M-270 T4M rotated left 270°	T4W Type 4 Wide T4W-90 T4W rotated left 90° T4W-270 T4W rotated left 270° T5N Type 5 Narrow T5M Type 5 Medium T5W Type 5 Wide LCL LEED corner optic left LCR LEED corner optic right BLC Back light control BLC-90 BLC rotated left 90° BLC-270 BLC rotated left 270°	None - Internal house side shield (clip-on) HIS ²	AR1 ¹² Arm mount (standard) The following mounting kits must be ordered separately (see accessories) JNV 120-277V 347 347V 480 480V HVU 374-480V
	C Comfort optics	A01 ⁴ 2000 A02 3500 A03 5000 A04 7000 A05 9000 A06 11000 A07 13500 A08 ¹¹ 16000 A09 ¹¹ 17000	830 80CRI, 3000K 840 80CRI, 4000K 827 ¹ 80CRI, 2700K (ETOr) 835 ¹ 80CRI, 3500K (ETOr) 750 ¹ 70CRI, 5000K (ETOr)	T2 Type 2 T3 Type 3 T4 Type 4 T5 Type 5	None - Luminaire drilled for external house shield (must be accompanied by P20-EHS-BK accessory, ordered separately) EHS	RAM Retrofit arm mount kit WAL Wall mount	
Driver type	Dimming Controls (only one may be selected)			Lighting controls ⁸ (only one may be selected)		Emergency	Finish
010V							FINISH
0-10V							Standard textured finish
010V 0-10V	None DLEA	- Dimming leads externally accessible (controls by others)	None PCB ^{4,10} Photocontrol button		None EM ^{4,12} Emergency battery backup (0°C to +40°C/32°F to +104°F)		BK Black
	FAWS	Field adjustable wattage selector	TLR5 5-pin twist lock w/ 0-10v driver		EMC Emergency battery pack, cold rated (-20°C to +40°C/-4°F to +104°F)		WH White
	BL50L2 ²	PIR motion response dim to 50% L2 lens	TLR7 7-pin twist lock w/ 0-10v driver (non-D4i)		4,7,9,13		BZ Bronze
	BL50L3 ²	PIR motion response dim to 50% L3 lens	TLRPC ^{4,10} 7-pin twist lock w/ 0-10v driver (non-D4i) & on/off photocell		Fusing		DG Dark gray
	BL30MW ³	Microwave motion sensor factory set at 50% dimming					MG Medium gray
DALI							Customer specified
DALI SR/ DALI	None CS50 ^{5,6}	- Security 50 % dimming, 7 hours	None PCB ^{4,10} Photocontrol button		None F1 ¹⁰ Single Fuse (120V, 277V, or 347V)		OC Optional color (specify optional color or RAL, contact factory)
	CM50 ^{5,6}	Median 50 % dimming, 8 hours	TR5 ^{5,6} 5-pin twist lock SR/DALI driver		F2 ^{10,11} Double Fuse (208V, 240V, or 480V)		
	CS30 ^{5,6}	Security 30 % dimming, 7 hours	TR7 ^{5,6} 7-pin twist lock SR/DALI driver (D4i)		F3 ^{10,11} Double Fuse Canadian double pole (208V, 240V, or 480V)		SC Special color (must supply color chip, requires factory quote)
	CM30 ^{5,6}	Median 30 % dimming, 8 hours	TLP ^{4,6,10} & on/off photocell		Surge Protection		
	SRDR ^{5,6}	SR driver connected to Zhaga socket (D4i)			None SP1 Surge Protector 10kV / 10kA (standard)		
	WIAPLW ^{5,6}	Wireless Interact outdoor low mounting (7-15'), white housing			SP2 Surge Protector 20kV/ 10kA (option)		
	WIAPLB ^{5,6}	Wireless Interact outdoor low mounting (7-15'), black housing					
	WIAPHW ^{5,6}	Wireless Interact outdoor low mounting (15-40'), white housing					
	WIAPHB ^{5,6}	Wireless Interact outdoor low mounting (15-40'), black housing					

- Extended lead times apply. Contact factory for details.
- Available with Area Optics Lumen packages A09 and below only. Not allowed with Comfort optics
- Available with Comfort Optics only at 120-347V. Not allowed with Area Optics
- Not available at 347-480V(HVU)
- Not available at 347-480V(HVU) for Pixelated (P-Axx) optic lumen packages A01-A05 and Comfort (C-Axx) optic lumen packages A01-A09
- Not available at 120-277V(UNV) for Pixelated (P-Axx) optic lumen packages A01-A02 and Comfort (C-Axx) optic lumen packages A01-A02
- Not available with Comfort (C-Axx) optic lumen packages A07-A09
- If selected with Dimming control, DIM leads from receptacle will not be connected to driver
- Available only with Comfort Optics
- Must specify input voltage. UNV and HVU not valid.
- Not available with Emergency options
- Mounts to a 4-5" OD round pole with adapter included for square poles.
- Not available with BL50LX, BL50MW, SRDR, OMS, Or WIAP options due to mechanical conflict

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P20 PureForm LED small round

Agenda Item 4.A
8/12/24 Planning Bd Mtg

PureForm P20 Accessories (ordered separately, field installed)

Mounting Accessories

P20-RAM-G2-(F) Retrofit Arm mount kit
P20-WS-G2-(F) Wall mount with surface conduit rear entry permitted
P20-EHS-BK ¹ External House Side Shield, Black

(F) = Specify finish

1. EHS must also be selected in the luminaire catalog code and ships separately.

PureForm P20 Precision optics lumen values

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A01	14	AFR	2,875	B1-U0-G1	194	3,035	B1-U0-G1	205	3,035	B1-U0-G1	205	2,544	B1-U0-G1	172	2,710	B1-U0-G1	183
		T2M	2,775	B1-U0-G1	188	2,930	B1-U0-G1	198	2,930	B1-U0-G1	198	2,456	B1-U0-G1	166	2,616	B1-U0-G1	177
		T3M	2,780	B1-U0-G1	188	2,934	B1-U0-G1	198	2,934	B1-U0-G1	198	2,460	B1-U0-G1	166	2,620	B1-U0-G1	177
		T4M	2,744	B1-U0-G1	185	2,897	B1-U0-G1	196	2,897	B1-U0-G1	196	2,429	B1-U0-G1	164	2,587	B1-U0-G1	175
		T4W	2,638	B1-U0-G1	178	2,785	B1-U0-G1	188	2,785	B1-U0-G1	188	2,334	B1-U0-G1	158	2,486	B1-U0-G1	168
		T5M	2,830	B2-U0-G1	191	2,988	B2-U0-G1	202	2,988	B2-U0-G1	202	2,504	B2-U0-G1	169	2,667	B2-U0-G1	180
		T5N	2,849	B2-U0-G0	193	3,008	B2-U0-G0	203	3,008	B2-U0-G0	203	2,521	B2-U0-G0	170	2,685	B2-U0-G0	181
		T5W	2,671	B2-U0-G1	181	2,820	B2-U0-G1	191	2,820	B2-U0-G1	191	2,364	B2-U0-G1	160	2,517	B2-U0-G1	170
		BLC	1,908	B0-U0-G1	129	2,014	B0-U0-G1	136	2,014	B0-U0-G1	136	1,688	B0-U0-G1	114	1,798	B0-U0-G1	122
A02	21	LCL/LCR	1,506	B0-U0-G1	102	1,589	B0-U0-G1	107	1,589	B0-U0-G1	107	1,332	B0-U0-G1	90	1,419	B0-U0-G1	96
		AFR	4,094	B1-U0-G1	197	4,323	B1-U0-G1	208	4,323	B1-U0-G1	208	3,623	B1-U0-G1	174	3,859	B1-U0-G1	186
		T2M	3,952	B1-U0-G1	190	4,173	B1-U0-G1	201	4,173	B1-U0-G1	201	3,498	B1-U0-G1	168	3,725	B1-U0-G1	179
		T3M	3,958	B1-U0-G1	190	4,179	B1-U0-G1	201	4,179	B1-U0-G1	201	3,503	B1-U0-G1	168	3,731	B1-U0-G1	179
		T4M	3,908	B1-U0-G1	188	4,126	B1-U0-G1	198	4,126	B1-U0-G1	198	3,459	B1-U0-G1	166	3,683	B1-U0-G1	177
		T4W	3,756	B1-U0-G2	181	3,966	B1-U0-G2	191	3,966	B1-U0-G2	191	3,324	B1-U0-G2	160	3,540	B1-U0-G2	170
		T5M	4,030	B2-U0-G1	194	4,255	B2-U0-G1	205	4,255	B2-U0-G1	205	3,567	B2-U0-G1	172	3,798	B2-U0-G1	183
		T5N	4,057	B2-U0-G1	195	4,283	B2-U0-G1	206	4,283	B2-U0-G1	206	3,590	B2-U0-G1	173	3,824	B2-U0-G1	184
		T5W	3,804	B3-U0-G2	183	4,016	B3-U0-G2	193	4,016	B3-U0-G2	193	3,366	B2-U0-G1	162	3,585	B2-U0-G2	172
A03	31	BLC	2,717	B0-U0-G1	131	2,869	B0-U0-G1	138	2,869	B0-U0-G1	138	2,405	B0-U0-G1	116	2,561	B0-U0-G1	123
		LCL/LCR	2,144	B1-U0-G1	103	2,264	B1-U0-G1	109	2,264	B1-U0-G1	109	1,897	B0-U0-G1	91	2,021	B1-U0-G1	97
		AFR	5,696	B2-U0-G1	187	6,013	B2-U0-G2	197	6,013	B2-U0-G2	197	5,040	B1-U0-G1	165	5,368	B1-U0-G1	176
		T2M	5,498	B1-U0-G1	180	5,805	B1-U0-G2	190	5,805	B1-U0-G2	190	4,866	B1-U0-G1	159	5,182	B1-U0-G1	170
		T3M	5,507	B1-U0-G2	180	5,814	B1-U0-G2	190	5,814	B1-U0-G2	190	4,873	B1-U0-G1	160	5,190	B1-U0-G1	170
		T4M	5,437	B1-U0-G2	178	5,740	B1-U0-G2	188	5,740	B1-U0-G2	188	4,812	B1-U0-G1	158	5,124	B1-U0-G1	168
		T4W	5,226	B1-U0-G2	171	5,517	B1-U0-G2	181	5,517	B1-U0-G2	181	4,625	B1-U0-G2	152	4,925	B1-U0-G2	161
		T5M	5,607	B3-U0-G1	184	5,919	B3-U0-G1	194	5,919	B3-U0-G1	194	4,962	B3-U0-G1	163	5,284	B3-U0-G1	173
		T5N	5,644	B3-U0-G1	185	5,959	B3-U0-G1	195	5,959	B3-U0-G1	195	4,995	B2-U0-G1	164	5,319	B3-U0-G1	174
A04	44	T5W	5,292	B3-U0-G2	173	5,587	B3-U0-G2	183	5,587	B3-U0-G2	183	4,683	B3-U0-G2	153	4,988	B3-U0-G2	163
		BLC	3,780	B0-U0-G1	124	3,991	B0-U0-G1	131	3,991	B0-U0-G1	131	3,345	B0-U0-G1	110	3,562	B0-U0-G1	117
		LCL/LCR	2,983	B1-U0-G1	98	3,149	B1-U0-G1	103	3,149	B1-U0-G1	103	2,640	B1-U0-G1	87	2,811	B1-U0-G1	92
		AFR	8,079	B2-U0-G2	188	8,529	B2-U0-G2	198	8,529	B2-U0-G2	198	7,149	B2-U0-G2	166	7,614	B2-U0-G2	177
		T2M	7,799	B2-U0-G2	181	8,234	B2-U0-G2	192	8,234	B2-U0-G2	192	6,902	B2-U0-G2	161	7,350	B2-U0-G2	171
		T3M	7,811	B2-U0-G2	182	8,246	B2-U0-G2	192	8,246	B2-U0-G2	192	6,912	B2-U0-G2	161	7,361	B2-U0-G2	171
		T4M	7,712	B1-U0-G2	179	8,142	B1-U0-G2	189	8,142	B1-U0-G2	189	6,825	B1-U0-G2	159	7,268	B1-U0-G2	169
		T4W	7,412	B1-U0-G2	172	7,825	B2-U0-G3	182	7,825	B2-U0-G3	182	6,559	B1-U0-G2	153	6,986	B1-U0-G2	163
		T5M	7,953	B3-U0-G1	185	8,396	B3-U0-G2	195	8,396	B3-U0-G2	195	7,038	B3-U0-G1	164	7,495	B3-U0-G1	174
A04	44	T5N	8,005	B3-U0-G1	186	8,452	B3-U0-G1	197	8,452	B3-U0-G1	197	7,084	B3-U0-G1	165	7,545	B3-U0-G1	176
		T5W	7,506	B3-U0-G2	175	7,925	B3-U0-G2	184	7,925	B3-U0-G2	184	6,643	B3-U0-G2	155	7,074	B3-U0-G2	165
		BLC	5,361	B0-U0-G2	125	5,660	B0-U0-G2	132	5,660	B0-U0-G2	132	4,745	B0-U0-G2	110	5,053	B0-U0-G2	118
		LCL/LCR	4,231	B1-U0-G1	98	4,467	B1-U0-G1	104	4,467	B1-U0-G1	104	3,744	B1-U0-G1	87	3,988	B1-U0-G1	93

P20 PureForm LED small round

PureForm P20 Precision optics lumen values

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A05	53	AFR	9,573	B2-U0-G2	178	10,107	B2-U0-G2	188	10,107	B2-U0-G2	188	8,472	B2-U0-G2	157	9,022	B2-U0-G2	167
		T2M	9,241	B2-U0-G2	171	9,756	B2-U0-G2	181	9,756	B2-U0-G2	181	8,178	B2-U0-G2	152	8,710	B2-U0-G2	162
		T3M	9,255	B2-U0-G2	172	9,771	B2-U0-G2	181	9,771	B2-U0-G2	181	8,191	B2-U0-G2	152	8,723	B2-U0-G2	162
		T4M	9,138	B1-U0-G2	170	9,648	B1-U0-G2	179	9,648	B1-U0-G2	179	8,087	B1-U0-G2	150	8,613	B1-U0-G2	160
		T4W	8,783	B2-U0-G3	163	9,273	B2-U0-G3	172	9,273	B2-U0-G3	172	7,773	B2-U0-G3	144	8,278	B2-U0-G3	154
		T5M	9,423	B3-U0-G2	175	9,949	B3-U0-G2	185	9,949	B3-U0-G2	185	8,339	B3-U0-G2	155	8,881	B3-U0-G2	165
		T5N	9,486	B3-U0-G1	176	10,015	B3-U0-G2	186	10,015	B3-U0-G2	186	8,395	B3-U0-G1	156	8,940	B3-U0-G1	166
		T5W	8,895	B3-U0-G3	165	9,390	B3-U0-G3	174	9,390	B3-U0-G3	174	7,871	B3-U0-G2	146	8,383	B3-U0-G3	156
		BLC	6,353	B0-U0-G2	118	6,707	B0-U0-G2	124	6,707	B0-U0-G2	124	5,622	B0-U0-G2	104	5,988	B0-U0-G2	111
		LCL/LCR	5,013	B1-U0-G1	93	5,293	B1-U0-G1	98	5,293	B1-U0-G1	98	4,437	B1-U0-G1	82	4,725	B1-U0-G1	88
A06	69	AFR	11,828	B3-U0-G2	170	12,487	B3-U0-G3	180	12,487	B3-U0-G3	180	10,467	B2-U0-G2	151	11,148	B3-U0-G2	161
		T2M	11,418	B2-U0-G2	164	12,054	B3-U0-G3	174	12,054	B3-U0-G3	174	10,104	B2-U0-G2	146	10,761	B2-U0-G2	155
		T3M	11,435	B2-U0-G2	165	12,073	B2-U0-G3	174	12,073	B2-U0-G3	174	10,120	B2-U0-G2	146	10,778	B2-U0-G2	155
		T4M	11,291	B2-U0-G2	163	11,920	B2-U0-G2	172	11,920	B2-U0-G2	172	9,992	B1-U0-G2	144	10,641	B2-U0-G2	153
		T4W	10,852	B2-U0-G3	156	11,457	B2-U0-G3	165	11,457	B2-U0-G3	165	9,603	B2-U0-G3	138	10,228	B2-U0-G3	147
		T5M	11,643	B4-U0-G2	168	12,292	B4-U0-G2	177	12,292	B4-U0-G2	177	10,304	B3-U0-G2	148	10,973	B3-U0-G2	158
		T5N	11,721	B3-U0-G2	169	12,374	B3-U0-G2	178	12,374	B3-U0-G2	178	10,372	B3-U0-G2	149	11,046	B3-U0-G2	159
		T5W	10,990	B4-U0-G3	158	11,602	B4-U0-G3	167	11,602	B4-U0-G3	167	9,725	B4-U0-G3	140	10,357	B4-U0-G3	149
		BLC	7,849	B0-U0-G2	113	8,287	B0-U0-G2	119	8,287	B0-U0-G2	119	6,946	B0-U0-G2	100	7,398	B0-U0-G2	107
		LCL/LCR	6,194	B1-U0-G2	89	6,540	B1-U0-G2	94	6,540	B1-U0-G2	94	5,482	B1-U0-G2	79	5,838	B1-U0-G2	84
A07	89	AFR	14,894	B3-U0-G3	168	15,724	B3-U0-G3	177	15,724	B3-U0-G3	177	13,181	B3-U0-G3	148	14,037	B3-U0-G3	158
		T2M	14,378	B3-U0-G3	162	15,179	B3-U0-G3	171	15,179	B3-U0-G3	171	12,724	B3-U0-G3	143	13,551	B3-U0-G3	152
		T3M	14,400	B3-U0-G3	162	15,203	B3-U0-G3	171	15,203	B3-U0-G3	171	12,743	B3-U0-G3	143	13,572	B3-U0-G3	153
		T4M	14,218	B2-U0-G3	160	15,010	B2-U0-G3	169	15,010	B2-U0-G3	169	12,582	B2-U0-G3	142	13,400	B2-U0-G3	151
		T4W	13,665	B2-U0-G3	154	14,427	B3-U0-G3	162	14,427	B3-U0-G3	162	12,093	B2-U0-G3	136	12,879	B2-U0-G3	145
		T5M	14,661	B4-U0-G2	165	15,479	B4-U0-G2	174	15,479	B4-U0-G2	174	12,974	B4-U0-G2	146	13,818	B4-U0-G2	155
		T5N	14,759	B4-U0-G2	166	15,582	B4-U0-G2	175	15,582	B4-U0-G2	175	13,061	B3-U0-G2	147	13,910	B4-U0-G2	156
		T5W	13,838	B4-U0-G3	156	14,610	B4-U0-G3	164	14,610	B4-U0-G3	164	12,246	B4-U0-G3	138	13,042	B4-U0-G3	147
		BLC	9,884	B1-U0-G2	111	10,435	B1-U0-G2	117	10,435	B1-U0-G2	117	8,747	B1-U0-G2	98	9,316	B1-U0-G2	105
		LCL/LCR	7,800	B1-U0-G2	88	8,235	B1-U0-G2	93	8,235	B1-U0-G2	93	6,903	B1-U0-G2	78	7,351	B1-U0-G2	83
A08	105	AFR	17,449	B3-U0-G3	166	18,422	B3-U0-G3	175	18,422	B3-U0-G3	175	15,442	B3-U0-G3	147	16,445	B3-U0-G3	156
		T2M	16,844	B3-U0-G3	160	17,783	B3-U0-G3	169	17,783	B3-U0-G3	169	14,906	B3-U0-G3	142	15,875	B3-U0-G3	151
		T3M	16,870	B3-U0-G3	160	17,811	B3-U0-G3	169	17,811	B3-U0-G3	169	14,929	B3-U0-G3	142	15,900	B3-U0-G3	151
		T4M	16,657	B2-U0-G3	158	17,585	B2-U0-G3	167	17,585	B2-U0-G3	167	14,740	B2-U0-G3	140	15,699	B2-U0-G3	149
		T4W	16,009	B3-U0-G3	152	16,902	B3-U0-G4	161	16,902	B3-U0-G4	161	14,168	B2-U0-G3	135	15,088	B3-U0-G3	144
		T5M	17,176	B4-U0-G2	163	18,134	B4-U0-G2	172	18,134	B4-U0-G2	172	15,200	B4-U0-G2	145	16,188	B4-U0-G2	154
		T5N	17,291	B4-U0-G2	164	18,255	B4-U0-G2	174	18,255	B4-U0-G2	174	15,301	B4-U0-G2	146	16,296	B4-U0-G2	155
		T5W	16,212	B4-U0-G3	154	17,116	B4-U0-G3	163	17,116	B4-U0-G3	163	14,347	B4-U0-G3	136	15,280	B4-U0-G3	145
		BLC	11,580	B1-U0-G2	110	12,225	B1-U0-G2	116	12,225	B1-U0-G2	116	10,248	B1-U0-G2	97	10,914	B1-U0-G2	104
		LCL/LCR	9,138	B1-U0-G2	87	9,647	B2-U0-G2	92	9,647	B2-U0-G2	92	8,087	B1-U0-G2	77	8,612	B1-U0-G2	82

P20 PureForm LED small round

PureForm P20 Precision optics lumen values

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A09	112	AFR	18,289	B3-U0-G3	164	19,309	B3-U0-G3	173	19,309	B3-U0-G3	173	16,185	B3-U0-G3	145	17,237	B3-U0-G3	154
		T2M	17,655	B3-U0-G3	158	18,639	B3-U0-G3	167	18,639	B3-U0-G3	167	15,624	B3-U0-G3	140	16,640	B3-U0-G3	149
		T3M	17,682	B3-U0-G3	158	18,668	B3-U0-G3	167	18,668	B3-U0-G3	167	15,648	B3-U0-G3	140	16,665	B3-U0-G3	149
		T4M	17,459	B2-U0-G3	156	18,432	B2-U0-G3	165	18,432	B2-U0-G3	165	15,450	B2-U0-G3	138	16,454	B2-U0-G3	147
		T4W	16,780	B3-U0-G4	150	17,716	B3-U0-G4	159	17,716	B3-U0-G4	159	14,850	B3-U0-G3	133	15,815	B3-U0-G3	142
		T5M	18,003	B4-U0-G2	161	19,007	B4-U0-G2	170	19,007	B4-U0-G2	170	15,932	B4-U0-G2	143	16,968	B4-U0-G2	152
		T5N	18,123	B4-U0-G2	162	19,133	B4-U0-G2	171	19,133	B4-U0-G2	171	16,038	B4-U0-G2	144	17,081	B4-U0-G2	153
		T5W	16,993	B4-U0-G3	152	17,940	B4-U0-G4	161	17,940	B4-U0-G4	161	15,038	B4-U0-G3	135	16,016	B4-U0-G3	143
		BLC	12,137	B1-U0-G3	109	12,814	B1-U0-G3	115	12,814	B1-U0-G3	115	10,741	B1-U0-G2	96	11,439	B1-U0-G2	102
LCL/LCR	9,578	B2-U0-G2	86	10,112	B2-U0-G2	90	10,112	B2-U0-G2	90	8,476	B1-U0-G2	76	9,027	B1-U0-G2	81		
A10	121	AFR	20,004	B3-U0-G3	165	21,119	B3-U0-G3	174	21,119	B3-U0-G3	174	17,703	B3-U0-G3	146	18,853	B3-U0-G3	155
		T2M	19,311	B3-U0-G3	159	20,387	B3-U0-G3	168	20,387	B3-U0-G3	168	17,089	B3-U0-G3	141	18,200	B3-U0-G3	150
		T3M	19,340	B3-U0-G3	159	20,419	B3-U0-G3	168	20,419	B3-U0-G3	168	17,115	B3-U0-G3	141	18,228	B3-U0-G3	150
		T4M	19,096	B2-U0-G3	157	20,160	B2-U0-G3	166	20,160	B2-U0-G3	166	16,899	B2-U0-G3	139	17,997	B2-U0-G3	148
		T4W	18,354	B3-U0-G4	151	19,377	B3-U0-G4	160	19,377	B3-U0-G4	160	16,242	B3-U0-G4	134	17,298	B3-U0-G4	143
		T5M	19,691	B4-U0-G2	162	20,789	B4-U0-G2	171	20,789	B4-U0-G2	171	17,426	B4-U0-G2	144	18,559	B4-U0-G2	153
		T5N	19,822	B4-U0-G2	163	20,928	B4-U0-G2	172	20,928	B4-U0-G2	172	17,542	B4-U0-G2	145	18,682	B4-U0-G2	154
		T5W	18,587	B5-U0-G4	153	19,623	B5-U0-G4	162	19,623	B5-U0-G4	162	16,448	B4-U0-G3	136	17,517	B4-U0-G3	144
		BLC	13,276	B1-U0-G3	109	14,016	B1-U0-G3	116	14,016	B1-U0-G3	116	11,748	B1-U0-G2	97	12,512	B1-U0-G3	103
		LCL/LCR	10,476	B2-U0-G2	86	11,060	B2-U0-G2	91	11,060	B2-U0-G2	91	9,271	B1-U0-G2	76	9,873	B2-U0-G2	81

PureForm P20 Comfort optics lumen values

Perf. Package	System Watts	Dist. Type	80 CRI			80 CRI		
			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A01	13	T2	1,596	B1-U0-G1	123	1,708	B1-U0-G1	131
		T3	1,520	B1-U0-G1	117	1,626	B1-U0-G1	125
		T4	1,683	B1-U0-G1	129	1,801	B1-U0-G1	139
		T5	1,496	B1-U0-G1	115	1,601	B1-U0-G1	123
A02	23	T2	3,053	B1-U0-G1	133	3,267	B1-U0-G1	142
		T3	2,907	B1-U0-G1	126	3,111	B1-U0-G1	135
		T4	3,219	B1-U0-G2	140	3,444	B1-U0-G2	150
		T5	2,862	B2-U0-G1	124	3,062	B2-U0-G1	133
A03	35	T2	4,256	B2-U0-G2	122	4,553	B2-U0-G2	130
		T3	4,052	B2-U0-G2	116	4,336	B2-U0-G2	124
		T4	4,487	B2-U0-G2	128	4,801	B2-U0-G2	137
		T5	3,989	B3-U0-G2	114	4,268	B3-U0-G2	122
A04	50	T2	5,999	B2-U0-G2	120	6,419	B2-U0-G2	128
		T3	5,712	B2-U0-G2	114	6,112	B2-U0-G2	122
		T4	6,325	B2-U0-G2	127	6,768	B2-U0-G2	135
		T5	5,623	B3-U0-G2	112	6,016	B3-U0-G2	120
A05	67	T2	7,713	B3-U0-G3	115	8,253	B3-U0-G3	123
		T3	7,344	B3-U0-G3	110	7,858	B3-U0-G3	117
		T4	8,132	B3-U0-G3	121	8,702	B3-U0-G3	130
		T5	7,229	B3-U0-G3	108	7,735	B3-U0-G3	115
A06	82	T2	9,159	B3-U0-G3	112	9,800	B3-U0-G3	120
		T3	8,721	B3-U0-G3	106	9,332	B3-U0-G3	114
		T4	9,657	B3-U0-G3	118	10,333	B3-U0-G3	126
		T5	8,585	B3-U0-G3	105	9,186	B3-U0-G3	112
A07	107	T2	11,462	B3-U0-G3	107	12,264	B3-U0-G3	115
		T3	10,914	B3-U0-G3	102	11,678	B3-U0-G3	109
		T4	12,086	B3-U0-G3	113	12,932	B3-U0-G3	121
		T5	10,744	B4-U0-G3	100	11,496	B4-U0-G3	107
A08	137	T2	13,503	B3-U0-G3	99	14,448	B3-U0-G3	105
		T3	12,827	B3-U0-G3	94	13,724	B3-U0-G3	100
		T4	14,237	B3-U0-G3	104	15,234	B3-U0-G3	111
		T5	12,656	B4-U0-G3	92	13,542	B4-U0-G3	99
A09	143	T2	14,569	B3-U0-G3	102	15,589	B3-U0-G3	109
		T3	13,872	B3-U0-G3	97	14,843	B3-U0-G3	104
		T4	15,361	B3-U0-G3	107	16,436	B3-U0-G4	115
		T5	13,655	B4-U0-G3	95	14,611	B4-U0-G3	102

P20 PureForm LED small round

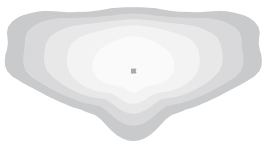
Predicted Lumen Depreciation Data

Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions. L70 is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published L70 hours limited to 6 times actual LED test hours

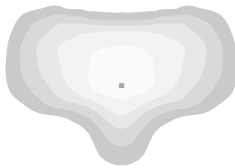
Optic type	Ambient Temperature °C	Calculated L ₇₀ Hours	L ₇₀ reported per TM-21	Lumen Maintenance % at 60,000 hrs
Precision (A01-A09)	25°C	>100,000 hours	>72,000 hours	95.60%
Comfort (P01-P09)	25°C	>100,000 hours	>100,000 hours	89.10%

Precision Optical Distributions

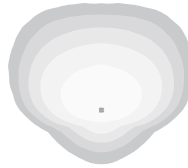
Type 2 Medium



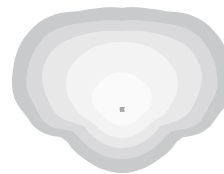
Type 3 Medium



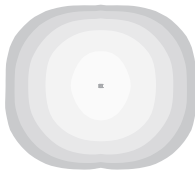
Type 4 Medium



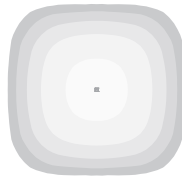
Type 4 Wide



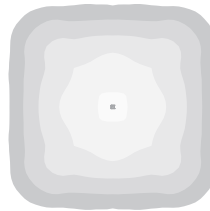
Type 5 Narrow



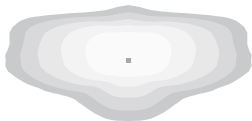
Type 5 Medium



Type 5 Wide



Autofront Row



Back Light Control



LCL



LCR



Comfort Optical Distributions

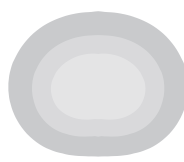
Type 2



Type 3



Type 4



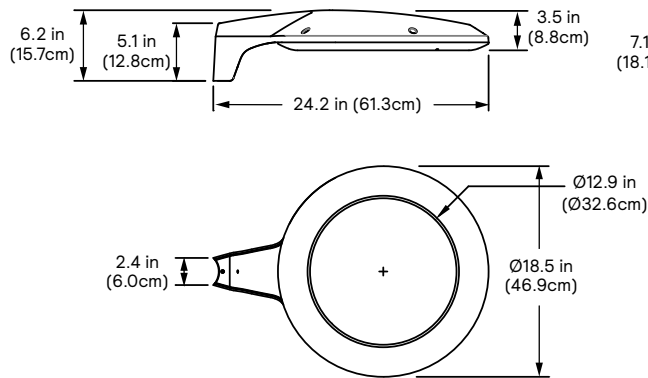
Type 5



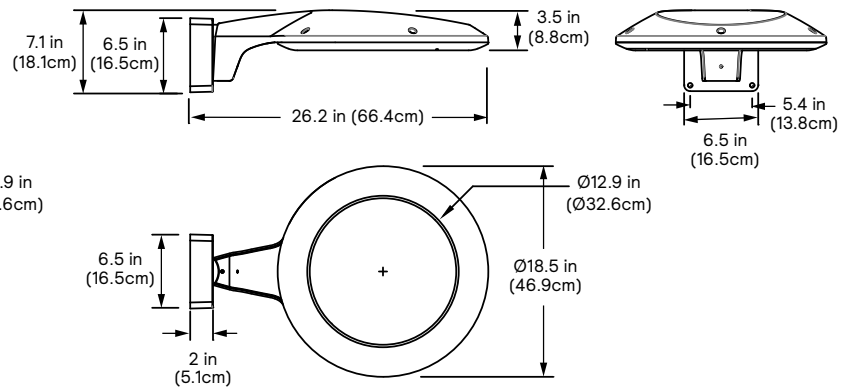
P20 PureForm LED small round

Dimensions

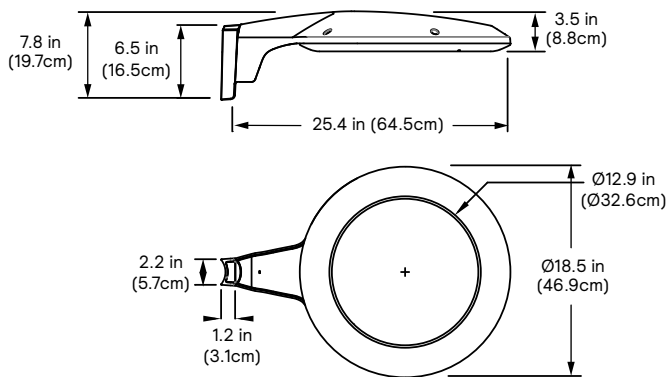
Standard Arm (AR1)



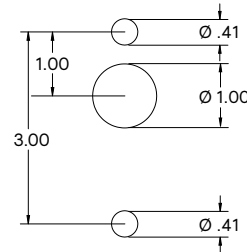
Wall Mount (WAL)



Retrofit Arm (RAM)



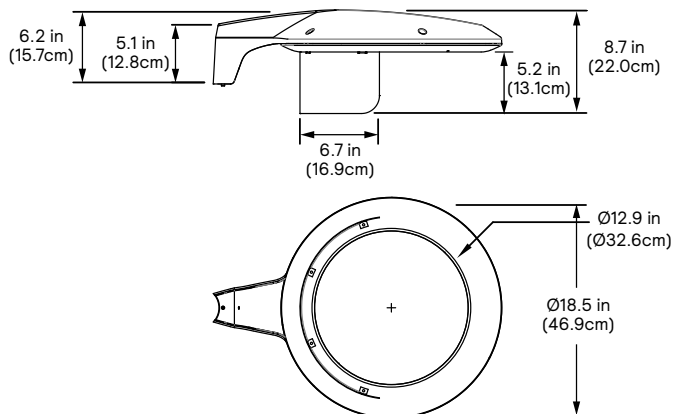
Mounting Hole Pattern



Weight: 18 Lbs (8.0 kg)

EPA: .26ft² (.02m²)

With External House Shield option (EHS)



P20 PureForm LED small round

Specifications

Housing

One-piece cast aluminum housing with integral arm and die cast light engine frame. All die-cast parts are made of low-copper, die-cast aluminum alloy for a high resistance to corrosion. Luminaire housing rated to IP66, tested in accordance to Section 9 of IEC 60598-1.

Vibration resistance

Luminaire is tested and rated Level 2 for Bridge and Overpass application (formerly 3G) cycles conforming to standards set forth by ANSI C136.31-2023. Testing includes vibration to 3G acceleration in three axes, all performed on the same luminaire.

Light engine

Comfort Edge technology provides low-glare, uniform illumination. Composed of LEDs strategically positioned on the edge of the optical plate. Light engine luminous opening size optimized to best achieve a balance between lumen output and optical performance with the need to provide visual comfort. LEDs are mounted directly to the housing to provide heat conduction and ensure maximized LED lifetime and performance. Light engine is RoHS compliant and available in 4 IES distribution options. Standard color temperatures: 3000K +/- 130K, 4000K +/- 130K, 5000K +/- 225K. Minimum CRI of 70. Also available in 2700K and 3500K color temperatures with extended leadtimes. Contact factory for details.

Precision LED Modules are comprised of 40 count LEDs mounted to metal clad printed circuit board and sealed to a polymer optic plate to meet IP66 rating.

Energy saving benefits

System efficacy up to 215 lms/W with significant energy savings over Pulse Start Metal Halide luminaires. Optional control options provide added energy savings during unoccupied periods.

Optical systems

ComfortEdge technology provides a unique and lower perceived glare lighting solution designed to enhance visual comfort for pedestrian applications. Available in IES distribution types 2, 3, 4, and 5 available up to 17,000 lumens.

Precision optics are available in type 2, 3, 4, 5 and Backlight Control (BLC) distributions available. Internal shield option mounts to LED optics to provide additional cutoff, and dedicated BLC optics provide the most stringent cutoff to meet requirements around property lines. Performance tested per LM-79 and TM-15 (IESNA) certifying its photometric performance. Luminaire designed with 0% uplight (UO per IESNA TM-15).

Mounting

Standard luminaire arm mounts to 4" round poles. Can also be used with 5" O.D. poles. Square pole adapter included with every luminaire. PureForm features a retrofit arm kit. When specified with the retrofit arm (RAM) option, PureForm seamlessly simplifies site conversions to LED by eliminating the need for additional pole drilling on most existing poles. RAM will be boxed separately. Also optional are wall mounting accessories.

Emergency Battery Backup (EM)

Emergency battery pack included integral to the luminaire, allowing for a consistent look between emergency and non-emergency luminaires. EM suitable for use in ambient temperature conditions from 0°C (+32°F) to +40°C (+104°F). EMC suitable for use in ambient temperatures from -20°C (-4°F) to +40°C (+104°F). The system is designed to have a secondary driver with relay to immediately detect AC power loss to power luminaire for a minimum of 90 minutes from the time power is lost. Available with 120-277V, or 'UNV' only.

Controls

0-10V Dimming Control Options

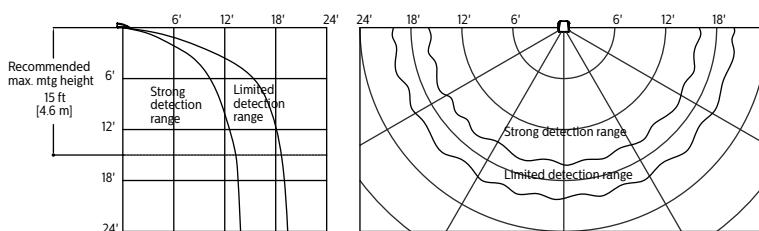
DLEA: Access to 0-10V dimming leads supplied through the yoke of the luminaire (for secondary dimming controls by others). Cannot be used with other control options.

BL50L2/BL50L3: Motion Response module is mounted integral to luminaire factory pre-programmed to 50% dimming when not ordered with other control options. BL50Lx options are set/operate in the following fashion: The motion sensor is set to a constant 50%. When motion is detected by the PIR sensor, the luminaire returns to full power/light output. Dimming on low is factory set to 50% with 5 minutes default in "full power" prior to dimming back to low. When no motion is detected for 5 minutes, the motion response system

reduces the wattage by 50%, to 50% of the normal constant wattage reducing the light level. Other dimming settings can be provided if different dimming levels are required. Contact technical support for details.

Infrared Motion Response Lenses (BL50L2/BL50L3): Lens #2 is designed for mounting heights 8' to 15'. Lens #3 is designed for higher mounting heights up to 20' with a 40' diameter coverage area.

Microwave Motion Response (BL30MW): Motion response luminaires include a high frequency microwave sensor, 5.8GHz +/- 75MHz microwave ISM continuous wave band with 360° coverage area, <0.5 mW transmitting power and <1 W standby power. Factory programmed settings dim fixture to 30% with time delay of 5 minutes with no stand-by period. When motion is detected, the luminaire returns to 100% full light output and will remain on full power for 5 minutes.



Field Adjustable Wattage Selector (FAWS): Luminaire equipped with the ability to manually adjust the wattage in the field to reduce total luminaire lumen output and light levels. Comes pre-set to the highest of 10 output positions. Consult factory for specific dimming settings for each position.

0-10V Lighting Control Options

Button Photocontrol (PCB): Button style design for internal luminaires

FAWS Position	Percent of Typical Lumen Output	FAWS Position	Percent of Typical Lumen Output
1	25%	6	80%
2	50%	7	85%
3	55%	8	90%
4	65%	9	95%
5	75%	10	100%

Note: Typical value accuracy +/- 5%

mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4Fc of ambient light.

Twist-Lock Receptacle (TLR5/TLR7/ TLRPC): TLR options come with 5 pin or with 7 pins connected to 0-10V driver and not all pins will be connected. Dimming Receptacle Type B (5-pin) and Type D-24 (7-pin) in accordance to ANSI C136.41. Can be used with third-party control system. Receptacle located on top of luminaire housing. When specified with receptacle and photoelectric cell (TLRPC), 7-pin receptacle is supplier and voltage must be specified. When ordering Twist-lock receptacle (TLR5 or TLR7), photocell or shunting cap is not included. If Twistlock receptacle option is ordered with Dimming Control option, then dimming leads from driver will not be connected to TLR but consumed by selected device. Devices installed to NEMA twist-lock Receptacle must be IPX6 rated.

Sensor Ready(SR)/DALI Control Options

Automatic Profile Dimming (CS/CM/CE/CA): Standard dimming profiles provide flexibility towards energy savings goals while optimizing light levels during specific dark hours. Dimming profiles include two dimming settings including dim to 30% or 50% of the total lumen output. When used in combination with not programmed motion response it overrides the controller's schedule when motion is detected. After 5 minutes with no motion, it will return to the automatic dimming profile schedule. Automatic dimming profile scheduled with the following settings:

- **CS50/CS30:** Security for 7 hours night duration (Ex., 11 PM – 6 AM)
- **CM50/CM30:** Median for 8 hours night duration (Ex., 10 PM – 6 AM)

All above profiles are calculated from mid point of the night. Dimming is set for 6 hours after the mid point and 1 or 2 hours before depending of the duration of dimming. Time clock or photocell is required for on/off functionality to allow for midpoint calculation. Cannot be used with other dimming control options.

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Specifications (cont'd)

Sensor Ready Zhaga Socket Connector (SRDR): Product is D4i Certified and equipped with Sensor Ready drivers connected to 4-pin Zhaga Book 18 compliant receptacle designed for sensor and other control system applications. Receptacle is rated IP66 assembly in a compact design that provides a sealed electrical interface and rated UV resistance, mounted on underside of the luminaire, protective dust cap included. When a controller not provided by Signify is used with Sensor Ready Zhaga socket connector, the controller must be certified to work with the Xitanium SR LED drivers as part of the SR certified program. SRDR can be used with NEMA 7-pin twist lock receptacle, which is mounted on top of the luminaire. D4i certification validates compliance with specifications for data exchange in connected lighting systems, ensuring interoperability, compatibility, and efficient operation. It also assures customers that the device meets industry standards.

Outdoor Interact:

Scalable connected sensor with integral occupancy and daylight sensing, supports wireless mesh connectivity. Sensor works in the Foundation mode when configured without a gateway or in an Interact Advanced mode if a compatible gateway (can be added later) is used. Interact offers an app, a portal and a broad portfolio of Interact ready Indoor and Outdoor luminaires, lamps and retrofit kits all working on the same system. Startup is implemented via Interact Pro App (available in iOS® or Android®) and Bluetooth® connectivity. The app provides flexibility to choose between a gateway or non gateway mode for setup. Setup with the gateway requires wired Internet access to the gateway. Prepare project configuration steps remotely and use IRT9015 remote accessory (ordered separately) or the App on-site to identify and group devices together. WIAP includes SR driver and SR receptacle. Daylight harvesting supported through dimming – activated via the Interact app. Sensors are available in black or white finish and high or low mounting height lenses. IP66 rated.

For more information on Interact visit:

www.interact-lighting.com/interactproscalablesystem

SR/DALI Lighting Control Options

Button Photocontrol (PCB): Button style design for internal luminaires mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4Fc of ambient light.

Twist-Lock Receptacle (TR5/TR7/ TLP): TLR5 includes with 5 pin (Type B) receptacle connected to SR/DALI driver all applicable connections made to driver and is not D4i compliant. TR7 includes (Type D-24) connected to SR/ DALI driver with all leads connected for use of 3rd party control systems. Receptacles are in accordance to ANSI C136.41. Receptacle located on top of luminaire housing. When specified with receptacle and photoelectric cell (TRPC), 7-pin receptacle is supplied and voltage must be specified. When ordering Twist-lock receptacle (TR5 or TR7), photocell or shorting cap is not included.

Listings

UL/cUL wet location listed to the UL 1598 standard, suitable for use in ambient temperatures from -40° to 40°C (-40° to 104°F). Most PureForm P20 comfort configurations are qualified under Standard DesignLights Consortium® category. Consult DLC Qualified Products list to confirm your specific luminaire selection is approved. CCTs 3000K and warmer are Dark Sky Approved.

Finish

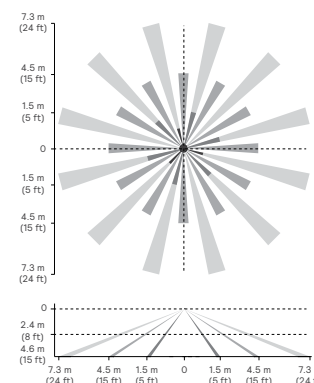
Each standard color luminaire receives a fade and abrasion resistant, electrostatically applied, thermally cured, triglycidal isocyanurate (TGIC) textured polyester powdercoat finish. The surface treatment achieves a minimum of 1000 hours for salt spray resistant finish in accordance with testing performed and per ASTM B117 standard. Standard colors include bronze (BZ), black (BK), white (WH), dark gray (DG), and medium gray (MG). Consult factory for specs on optional or custom colors.

Warranty

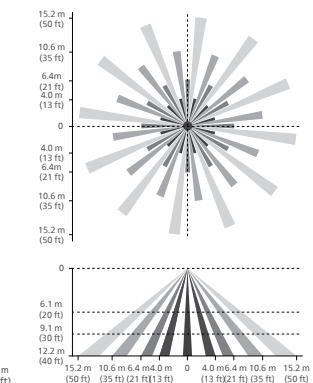
PureForm luminaires feature a 5-year limited warranty.

See signify.com/warranties for complete details and exclusions.

LW low sensor



HW high sensor



Note: The beam patterns shown are intended solely as a general guide and are not to scale. Sensing capabilities and coverage area depend on many factors including the size, speed and direction of travel of persons and vehicles; sensor mounting height; environmental and site conditions; etc.

GENLYTE
SOLUTIONS

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THE BRICKYARD - HANOVER STREET
LEBANON, NH
S3

Gardco PureForm LED area small round features a sleek, low profile design and is available with two light engines. ComfortEdge optics provide a unique and lower glare lighting solution designed to enhance visual comfort for pedestrian applications, while precision optics maximize efficiency and spacing. PureForm P20 is available with multiple optical distributions with output up to 17,000 lumens. A full range of control options provides additional energy savings.

Project: _____
Location: _____
Cat.No: _____
Type: _____
Lumens: _____ Qty: _____
Notes: _____

Ordering guide

Example: P20-P-A05-740-T3M-HIS-AR1-UNV-DALI-WIAPHW-MG

Prefix	Catalog Code	Lumens	CCT/CRI	Distribution	Shielding	Mounting	Voltage	
P20	C	A05	830	T3		AR1	UNV	
P20 PureForm area small round	P Precision optics	A01 ⁴ 2500 A02 ⁴ 3500 A03 ⁴ 5000 A04 7000 A05 9000 A06 11000 A07 13500 A08 16000 A09 17000 A10 19000	730 70CRI, 3000K 740 70CRI, 4000K 750 70CRI, 5000K 830 80CRI, 3000K 840 80CRI, 4000K 827 ¹ 80CRI, 2700K (ETOr)	AFR Auto front row AFR-90 AFR rotated left 90° AFR-270 AFR rotated left 270° T2M Type 2 Medium T2M-90 T2M rotated left 90° T2M-270 T2M rotated left 270° T3M Type 3 Medium T3M-90 T3M rotated left 90° T3M-270 T3M rotated left 270° T4M Type 4 Medium T4M-90 T4M rotated left 90° T4M-270 T4M rotated left 270°	T4W Type 4 Wide T4W-90 T4W rotated left 90° T4W-270 T4W rotated left 270° T5N Type 5 Narrow T5M Type 5 Medium T5W Type 5 Wide LCL LEED corner optic left LCR LEED corner optic right BLC Back light control BLC-90 BLC rotated left 90° BLC-270 BLC rotated left 270°	None - Internal house side shield (clip-on) HIS ²	AR1 ¹² Arm mount (standard) The following mounting kits must be ordered separately (see accessories) RAM Retrofit arm mount kit WAL Wall mount	120 120V 208 208V 240 240V 277 10-77V JNV 120-277V 347 347V 480 480V HVU 374-480V
	C Comfort optics	A01 ⁴ 2000 A02 3500 A03 5000 A04 7000 A05 9000 A06 11000 A07 13500 A08 ¹¹ 16000 A09 ¹¹ 17000	830 80CRI, 3000K 840 80CRI, 4000K 827 ¹ 80CRI, 2700K (ETOr) 835 ¹ 80CRI, 3500K (ETOr) 750 ¹ 70CRI, 5000K (ETOr)	T2 Type 2 T3 Type 3 T4 Type 4 T5 Type 5	None - Luminaire drilled for external house shield (must be accompanied by P20-EHS-BK accessory, ordered separately) EHS			
Driver type	Dimming Controls (only one may be selected)			Lighting controls ⁸ (only one may be selected)		Emergency	Finish	
010V							FINISH	
0-10V							Standard textured finish	
010V 0-10V	None DLEA	- Dimming leads externally accessible (controls by others)	None PCB ^{4,10} Photocontrol button		None EM ^{4,12} Emergency battery backup (0°C to +40°C/32°F to +104°F)		BK Black	
	FAWS	Field adjustable wattage selector	TLR5 5-pin twist lock w/ 0-10v driver		EMC Emergency battery pack, cold rated (-20°C to +40°C/-4°F to +104°F)		WH White	
	BL50L2 ²	PIR motion response dim to 50% L2 lens	TLR7 7-pin twist lock w/ 0-10v driver (non-D4i)		4,7,9,13		BZ Bronze	
	BL50L3 ²	PIR motion response dim to 50% L3 lens	TLRPC ^{4,10} 7-pin twist lock w/ 0-10v driver (non-D4i) & on/off photocell		Fusing		DG Dark gray	
	BL30MW ³	Microwave motion sensor factory set at 50% dimming					MG Medium gray	
DALI							Customer specified	
DALI SR/ DALI	None CS50 ^{5,6}	- Security 50 % dimming, 7 hours	None PCB ^{4,10} Photocontrol button		None F1 ¹⁰ Single Fuse (120V, 277V, or 347V)		OC Optional color (specify optional color or RAL, contact factory)	
	CM50 ^{5,6}	Median 50 % dimming, 8 hours	TR5 ^{5,6} 5-pin twist lock SR/DALI driver		F2 ^{10,11} Double Fuse (208V, 240V, or 480V)			
	CS30 ^{5,6}	Security 30 % dimming, 7 hours	TR7 ^{5,6} 7-pin twist lock SR/DALI driver (D4i)		F3 ^{10,11} Double Fuse Canadian double pole (208V, 240V, or 480V)		SC Special color (must supply color chip, requires factory quote)	
	CM30 ^{5,6}	Median 30 % dimming, 8 hours	TLP ^{4,6,10} & on/off photocell		Surge Protection			
	SRDR ^{5,6}	SR driver connected to Zhaga socket (D4i)			None SP1 Surge Protector 10kV / 10kA (standard)			
	WIAPLW ^{5,6}	Wireless Interact outdoor low mounting (7-15'), white housing			SP2 Surge Protector 20kV/ 10kA (option)			
	WIAPLB ^{5,6}	Wireless Interact outdoor low mounting (7-15'), black housing						
	WIAPHW ^{5,6}	Wireless Interact outdoor low mounting (15-40'), white housing						
	WIAPHB ^{5,6}	Wireless Interact outdoor low mounting (15-40'), black housing						

- Extended lead times apply. Contact factory for details.
- Available with Area Optics Lumen packages A09 and below only. Not allowed with Comfort optics
- Available with Comfort Optics only at 120-347V. Not allowed with Area Optics
- Not available at 347-480V(HVU)
- Not available at 347-480V(HVU) for Pixelated (P-Axx) optic lumen packages A01-A05 and Comfort (C-Axx) optic lumen packages A01-A09
- Not available at 120-277V(UNV) for Pixelated (P-Axx) optic lumen packages A01-A02 and Comfort (C-Axx) optic lumen packages A01-A02
- Not available with Comfort (C-Axx) optic lumen packages A07-A09
- If selected with Dimming control, DIM leads from receptacle will not be connected to driver
- Available only with Comfort Optics
- Must specify input voltage. UNV and HVU not valid.
- Not available with Emergency options
- Mounts to a 4-5" OD round pole with adapter included for square poles.
- Not available with BL50LX, BL50MW, SRDR, OMS, Or WIAP options due to mechanical conflict

P20 PureForm LED small round

PureForm P20 Accessories (ordered separately, field installed)

Mounting Accessories

P20-RAM-G2-(F) Retrofit Arm mount kit
P20-WS-G2-(F) Wall mount with surface conduit rear entry permitted
P20-EHS-BK ¹ External House Side Shield, Black

(F) = Specify finish

1. EHS must also be selected in the luminaire catalog code and ships separately.

PureForm P20 Precision optics lumen values

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A01	14	AFR	2,875	B1-U0-G1	194	3,035	B1-U0-G1	205	3,035	B1-U0-G1	205	2,544	B1-U0-G1	172	2,710	B1-U0-G1	183
		T2M	2,775	B1-U0-G1	188	2,930	B1-U0-G1	198	2,930	B1-U0-G1	198	2,456	B1-U0-G1	166	2,616	B1-U0-G1	177
		T3M	2,780	B1-U0-G1	188	2,934	B1-U0-G1	198	2,934	B1-U0-G1	198	2,460	B1-U0-G1	166	2,620	B1-U0-G1	177
		T4M	2,744	B1-U0-G1	185	2,897	B1-U0-G1	196	2,897	B1-U0-G1	196	2,429	B1-U0-G1	164	2,587	B1-U0-G1	175
		T4W	2,638	B1-U0-G1	178	2,785	B1-U0-G1	188	2,785	B1-U0-G1	188	2,334	B1-U0-G1	158	2,486	B1-U0-G1	168
		T5M	2,830	B2-U0-G1	191	2,988	B2-U0-G1	202	2,988	B2-U0-G1	202	2,504	B2-U0-G1	169	2,667	B2-U0-G1	180
		T5N	2,849	B2-U0-G0	193	3,008	B2-U0-G0	203	3,008	B2-U0-G0	203	2,521	B2-U0-G0	170	2,685	B2-U0-G0	181
		T5W	2,671	B2-U0-G1	181	2,820	B2-U0-G1	191	2,820	B2-U0-G1	191	2,364	B2-U0-G1	160	2,517	B2-U0-G1	170
		BLC	1,908	B0-U0-G1	129	2,014	B0-U0-G1	136	2,014	B0-U0-G1	136	1,688	B0-U0-G1	114	1,798	B0-U0-G1	122
LCL/LCR	1,506	B0-U0-G1	102	1,589	B0-U0-G1	107	1,589	B0-U0-G1	107	1,332	B0-U0-G1	90	1,419	B0-U0-G1	96		
A02	21	AFR	4,094	B1-U0-G1	197	4,323	B1-U0-G1	208	4,323	B1-U0-G1	208	3,623	B1-U0-G1	174	3,859	B1-U0-G1	186
		T2M	3,952	B1-U0-G1	190	4,173	B1-U0-G1	201	4,173	B1-U0-G1	201	3,498	B1-U0-G1	168	3,725	B1-U0-G1	179
		T3M	3,958	B1-U0-G1	190	4,179	B1-U0-G1	201	4,179	B1-U0-G1	201	3,503	B1-U0-G1	168	3,731	B1-U0-G1	179
		T4M	3,908	B1-U0-G1	188	4,126	B1-U0-G1	198	4,126	B1-U0-G1	198	3,459	B1-U0-G1	166	3,683	B1-U0-G1	177
		T4W	3,756	B1-U0-G2	181	3,966	B1-U0-G2	191	3,966	B1-U0-G2	191	3,324	B1-U0-G2	160	3,540	B1-U0-G2	170
		T5M	4,030	B2-U0-G1	194	4,255	B2-U0-G1	205	4,255	B2-U0-G1	205	3,567	B2-U0-G1	172	3,798	B2-U0-G1	183
		T5N	4,057	B2-U0-G1	195	4,283	B2-U0-G1	206	4,283	B2-U0-G1	206	3,590	B2-U0-G1	173	3,824	B2-U0-G1	184
		T5W	3,804	B3-U0-G2	183	4,016	B3-U0-G2	193	4,016	B3-U0-G2	193	3,366	B2-U0-G1	162	3,585	B2-U0-G2	172
		BLC	2,717	B0-U0-G1	131	2,869	B0-U0-G1	138	2,869	B0-U0-G1	138	2,405	B0-U0-G1	116	2,561	B0-U0-G1	123
LCL/LCR	2,144	B1-U0-G1	103	2,264	B1-U0-G1	109	2,264	B1-U0-G1	109	1,897	B0-U0-G1	91	2,021	B1-U0-G1	97		
A03	31	AFR	5,696	B2-U0-G1	187	6,013	B2-U0-G2	197	6,013	B2-U0-G2	197	5,040	B1-U0-G1	165	5,368	B1-U0-G1	176
		T2M	5,498	B1-U0-G1	180	5,805	B1-U0-G2	190	5,805	B1-U0-G2	190	4,866	B1-U0-G1	159	5,182	B1-U0-G1	170
		T3M	5,507	B1-U0-G2	180	5,814	B1-U0-G2	190	5,814	B1-U0-G2	190	4,873	B1-U0-G1	160	5,190	B1-U0-G1	170
		T4M	5,437	B1-U0-G2	178	5,740	B1-U0-G2	188	5,740	B1-U0-G2	188	4,812	B1-U0-G1	158	5,124	B1-U0-G1	168
		T4W	5,226	B1-U0-G2	171	5,517	B1-U0-G2	181	5,517	B1-U0-G2	181	4,625	B1-U0-G2	152	4,925	B1-U0-G2	161
		T5M	5,607	B3-U0-G1	184	5,919	B3-U0-G1	194	5,919	B3-U0-G1	194	4,962	B3-U0-G1	163	5,284	B3-U0-G1	173
		T5N	5,644	B3-U0-G1	185	5,959	B3-U0-G1	195	5,959	B3-U0-G1	195	4,995	B2-U0-G1	164	5,319	B3-U0-G1	174
		T5W	5,292	B3-U0-G2	173	5,587	B3-U0-G2	183	5,587	B3-U0-G2	183	4,683	B3-U0-G2	153	4,988	B3-U0-G2	163
		BLC	3,780	B0-U0-G1	124	3,991	B0-U0-G1	131	3,991	B0-U0-G1	131	3,345	B0-U0-G1	110	3,562	B0-U0-G1	117
LCL/LCR	2,983	B1-U0-G1	98	3,149	B1-U0-G1	103	3,149	B1-U0-G1	103	2,640	B1-U0-G1	87	2,811	B1-U0-G1	92		
A04	44	AFR	8,079	B2-U0-G2	188	8,529	B2-U0-G2	198	8,529	B2-U0-G2	198	7,149	B2-U0-G2	166	7,614	B2-U0-G2	177
		T2M	7,799	B2-U0-G2	181	8,234	B2-U0-G2	192	8,234	B2-U0-G2	192	6,902	B2-U0-G2	161	7,350	B2-U0-G2	171
		T3M	7,811	B2-U0-G2	182	8,246	B2-U0-G2	192	8,246	B2-U0-G2	192	6,912	B2-U0-G2	161	7,361	B2-U0-G2	171
		T4M	7,712	B1-U0-G2	179	8,142	B1-U0-G2	189	8,142	B1-U0-G2	189	6,825	B1-U0-G2	159	7,268	B1-U0-G2	169
		T4W	7,412	B1-U0-G2	172	7,825	B2-U0-G3	182	7,825	B2-U0-G3	182	6,559	B1-U0-G2	153	6,986	B1-U0-G2	163
		T5M	7,953	B3-U0-G1	185	8,396	B3-U0-G2	195	8,396	B3-U0-G2	195	7,038	B3-U0-G1	164	7,495	B3-U0-G1	174
		T5N	8,005	B3-U0-G1	186	8,452	B3-U0-G1	197	8,452	B3-U0-G1	197	7,084	B3-U0-G1	165	7,545	B3-U0-G1	176
		T5W	7,506	B3-U0-G2	175	7,925	B3-U0-G2	184	7,925	B3-U0-G2	184	6,643	B3-U0-G2	155	7,074	B3-U0-G2	165
		BLC	5,361	B0-U0-G2	125	5,660	B0-U0-G2	132	5,660	B0-U0-G2	132	4,745	B0-U0-G2	110	5,053	B0-U0-G2	118
LCL/LCR	4,231	B1-U0-G1	98	4,467	B1-U0-G1	104	4,467	B1-U0-G1	104	3,744	B1-U0-G1	87	3,988	B1-U0-G1	93		

P20 PureForm LED small round

PureForm P20 Precision optics lumen values

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A05	53	AFR	9,573	B2-U0-G2	178	10,107	B2-U0-G2	188	10,107	B2-U0-G2	188	8,472	B2-U0-G2	157	9,022	B2-U0-G2	167
		T2M	9,241	B2-U0-G2	171	9,756	B2-U0-G2	181	9,756	B2-U0-G2	181	8,178	B2-U0-G2	152	8,710	B2-U0-G2	162
		T3M	9,255	B2-U0-G2	172	9,771	B2-U0-G2	181	9,771	B2-U0-G2	181	8,191	B2-U0-G2	152	8,723	B2-U0-G2	162
		T4M	9,138	B1-U0-G2	170	9,648	B1-U0-G2	179	9,648	B1-U0-G2	179	8,087	B1-U0-G2	150	8,613	B1-U0-G2	160
		T4W	8,783	B2-U0-G3	163	9,273	B2-U0-G3	172	9,273	B2-U0-G3	172	7,773	B2-U0-G3	144	8,278	B2-U0-G3	154
		T5M	9,423	B3-U0-G2	175	9,949	B3-U0-G2	185	9,949	B3-U0-G2	185	8,339	B3-U0-G2	155	8,881	B3-U0-G2	165
		T5N	9,486	B3-U0-G1	176	10,015	B3-U0-G2	186	10,015	B3-U0-G2	186	8,395	B3-U0-G1	156	8,940	B3-U0-G1	166
		T5W	8,895	B3-U0-G3	165	9,390	B3-U0-G3	174	9,390	B3-U0-G3	174	7,871	B3-U0-G2	146	8,383	B3-U0-G3	156
		BLC	6,353	B0-U0-G2	118	6,707	B0-U0-G2	124	6,707	B0-U0-G2	124	5,622	B0-U0-G2	104	5,988	B0-U0-G2	111
		LCL/LCR	5,013	B1-U0-G1	93	5,293	B1-U0-G1	98	5,293	B1-U0-G1	98	4,437	B1-U0-G1	82	4,725	B1-U0-G1	88
A06	69	AFR	11,828	B3-U0-G2	170	12,487	B3-U0-G3	180	12,487	B3-U0-G3	180	10,467	B2-U0-G2	151	11,148	B3-U0-G2	161
		T2M	11,418	B2-U0-G2	164	12,054	B3-U0-G3	174	12,054	B3-U0-G3	174	10,104	B2-U0-G2	146	10,761	B2-U0-G2	155
		T3M	11,435	B2-U0-G2	165	12,073	B2-U0-G3	174	12,073	B2-U0-G3	174	10,120	B2-U0-G2	146	10,778	B2-U0-G2	155
		T4M	11,291	B2-U0-G2	163	11,920	B2-U0-G2	172	11,920	B2-U0-G2	172	9,992	B1-U0-G2	144	10,641	B2-U0-G2	153
		T4W	10,852	B2-U0-G3	156	11,457	B2-U0-G3	165	11,457	B2-U0-G3	165	9,603	B2-U0-G3	138	10,228	B2-U0-G3	147
		T5M	11,643	B4-U0-G2	168	12,292	B4-U0-G2	177	12,292	B4-U0-G2	177	10,304	B3-U0-G2	148	10,973	B3-U0-G2	158
		T5N	11,721	B3-U0-G2	169	12,374	B3-U0-G2	178	12,374	B3-U0-G2	178	10,372	B3-U0-G2	149	11,046	B3-U0-G2	159
		T5W	10,990	B4-U0-G3	158	11,602	B4-U0-G3	167	11,602	B4-U0-G3	167	9,725	B4-U0-G3	140	10,357	B4-U0-G3	149
		BLC	7,849	B0-U0-G2	113	8,287	B0-U0-G2	119	8,287	B0-U0-G2	119	6,946	B0-U0-G2	100	7,398	B0-U0-G2	107
		LCL/LCR	6,194	B1-U0-G2	89	6,540	B1-U0-G2	94	6,540	B1-U0-G2	94	5,482	B1-U0-G2	79	5,838	B1-U0-G2	84
A07	89	AFR	14,894	B3-U0-G3	168	15,724	B3-U0-G3	177	15,724	B3-U0-G3	177	13,181	B3-U0-G3	148	14,037	B3-U0-G3	158
		T2M	14,378	B3-U0-G3	162	15,179	B3-U0-G3	171	15,179	B3-U0-G3	171	12,724	B3-U0-G3	143	13,551	B3-U0-G3	152
		T3M	14,400	B3-U0-G3	162	15,203	B3-U0-G3	171	15,203	B3-U0-G3	171	12,743	B3-U0-G3	143	13,572	B3-U0-G3	153
		T4M	14,218	B2-U0-G3	160	15,010	B2-U0-G3	169	15,010	B2-U0-G3	169	12,582	B2-U0-G3	142	13,400	B2-U0-G3	151
		T4W	13,665	B2-U0-G3	154	14,427	B3-U0-G3	162	14,427	B3-U0-G3	162	12,093	B2-U0-G3	136	12,879	B2-U0-G3	145
		T5M	14,661	B4-U0-G2	165	15,479	B4-U0-G2	174	15,479	B4-U0-G2	174	12,974	B4-U0-G2	146	13,818	B4-U0-G2	155
		T5N	14,759	B4-U0-G2	166	15,582	B4-U0-G2	175	15,582	B4-U0-G2	175	13,061	B3-U0-G2	147	13,910	B4-U0-G2	156
		T5W	13,838	B4-U0-G3	156	14,610	B4-U0-G3	164	14,610	B4-U0-G3	164	12,246	B4-U0-G3	138	13,042	B4-U0-G3	147
		BLC	9,884	B1-U0-G2	111	10,435	B1-U0-G2	117	10,435	B1-U0-G2	117	8,747	B1-U0-G2	98	9,316	B1-U0-G2	105
		LCL/LCR	7,800	B1-U0-G2	88	8,235	B1-U0-G2	93	8,235	B1-U0-G2	93	6,903	B1-U0-G2	78	7,351	B1-U0-G2	83
A08	105	AFR	17,449	B3-U0-G3	166	18,422	B3-U0-G3	175	18,422	B3-U0-G3	175	15,442	B3-U0-G3	147	16,445	B3-U0-G3	156
		T2M	16,844	B3-U0-G3	160	17,783	B3-U0-G3	169	17,783	B3-U0-G3	169	14,906	B3-U0-G3	142	15,875	B3-U0-G3	151
		T3M	16,870	B3-U0-G3	160	17,811	B3-U0-G3	169	17,811	B3-U0-G3	169	14,929	B3-U0-G3	142	15,900	B3-U0-G3	151
		T4M	16,657	B2-U0-G3	158	17,585	B2-U0-G3	167	17,585	B2-U0-G3	167	14,740	B2-U0-G3	140	15,699	B2-U0-G3	149
		T4W	16,009	B3-U0-G3	152	16,902	B3-U0-G4	161	16,902	B3-U0-G4	161	14,168	B2-U0-G3	135	15,088	B3-U0-G3	144
		T5M	17,176	B4-U0-G2	163	18,134	B4-U0-G2	172	18,134	B4-U0-G2	172	15,200	B4-U0-G2	145	16,188	B4-U0-G2	154
		T5N	17,291	B4-U0-G2	164	18,255	B4-U0-G2	174	18,255	B4-U0-G2	174	15,301	B4-U0-G2	146	16,296	B4-U0-G2	155
		T5W	16,212	B4-U0-G3	154	17,116	B4-U0-G3	163	17,116	B4-U0-G3	163	14,347	B4-U0-G3	136	15,280	B4-U0-G3	145
		BLC	11,580	B1-U0-G2	110	12,225	B1-U0-G2	116	12,225	B1-U0-G2	116	10,248	B1-U0-G2	97	10,914	B1-U0-G2	104
		LCL/LCR	9,138	B1-U0-G2	87	9,647	B2-U0-G2	92	9,647	B2-U0-G2	92	8,087	B1-U0-G2	77	8,612	B1-U0-G2	82

P20 PureForm LED small round

PureForm P20 Precision optics lumen values

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A09	112	AFR	18,289	B3-U0-G3	164	19,309	B3-U0-G3	173	19,309	B3-U0-G3	173	16,185	B3-U0-G3	145	17,237	B3-U0-G3	154
		T2M	17,655	B3-U0-G3	158	18,639	B3-U0-G3	167	18,639	B3-U0-G3	167	15,624	B3-U0-G3	140	16,640	B3-U0-G3	149
		T3M	17,682	B3-U0-G3	158	18,668	B3-U0-G3	167	18,668	B3-U0-G3	167	15,648	B3-U0-G3	140	16,665	B3-U0-G3	149
		T4M	17,459	B2-U0-G3	156	18,432	B2-U0-G3	165	18,432	B2-U0-G3	165	15,450	B2-U0-G3	138	16,454	B2-U0-G3	147
		T4W	16,780	B3-U0-G4	150	17,716	B3-U0-G4	159	17,716	B3-U0-G4	159	14,850	B3-U0-G3	133	15,815	B3-U0-G3	142
		T5M	18,003	B4-U0-G2	161	19,007	B4-U0-G2	170	19,007	B4-U0-G2	170	15,932	B4-U0-G2	143	16,968	B4-U0-G2	152
		T5N	18,123	B4-U0-G2	162	19,133	B4-U0-G2	171	19,133	B4-U0-G2	171	16,038	B4-U0-G2	144	17,081	B4-U0-G2	153
		T5W	16,993	B4-U0-G3	152	17,940	B4-U0-G4	161	17,940	B4-U0-G4	161	15,038	B4-U0-G3	135	16,016	B4-U0-G3	143
		BLC	12,137	B1-U0-G3	109	12,814	B1-U0-G3	115	12,814	B1-U0-G3	115	10,741	B1-U0-G2	96	11,439	B1-U0-G2	102
LCL/LCR	9,578	B2-U0-G2	86	10,112	B2-U0-G2	90	10,112	B2-U0-G2	90	8,476	B1-U0-G2	76	9,027	B1-U0-G2	81		
A10	121	AFR	20,004	B3-U0-G3	165	21,119	B3-U0-G3	174	21,119	B3-U0-G3	174	17,703	B3-U0-G3	146	18,853	B3-U0-G3	155
		T2M	19,311	B3-U0-G3	159	20,387	B3-U0-G3	168	20,387	B3-U0-G3	168	17,089	B3-U0-G3	141	18,200	B3-U0-G3	150
		T3M	19,340	B3-U0-G3	159	20,419	B3-U0-G3	168	20,419	B3-U0-G3	168	17,115	B3-U0-G3	141	18,228	B3-U0-G3	150
		T4M	19,096	B2-U0-G3	157	20,160	B2-U0-G3	166	20,160	B2-U0-G3	166	16,899	B2-U0-G3	139	17,997	B2-U0-G3	148
		T4W	18,354	B3-U0-G4	151	19,377	B3-U0-G4	160	19,377	B3-U0-G4	160	16,242	B3-U0-G4	134	17,298	B3-U0-G4	143
		T5M	19,691	B4-U0-G2	162	20,789	B4-U0-G2	171	20,789	B4-U0-G2	171	17,426	B4-U0-G2	144	18,559	B4-U0-G2	153
		T5N	19,822	B4-U0-G2	163	20,928	B4-U0-G2	172	20,928	B4-U0-G2	172	17,542	B4-U0-G2	145	18,682	B4-U0-G2	154
		T5W	18,587	B5-U0-G4	153	19,623	B5-U0-G4	162	19,623	B5-U0-G4	162	16,448	B4-U0-G3	136	17,517	B4-U0-G3	144
		BLC	13,276	B1-U0-G3	109	14,016	B1-U0-G3	116	14,016	B1-U0-G3	116	11,748	B1-U0-G2	97	12,512	B1-U0-G3	103
		LCL/LCR	10,476	B2-U0-G2	86	11,060	B2-U0-G2	91	11,060	B2-U0-G2	91	9,271	B1-U0-G2	76	9,873	B2-U0-G2	81

PureForm P20 Comfort optics lumen values

Perf. Package	System Watts	Dist. Type	80 CRI			80 CRI		
			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A01	13	T2	1,596	B1-U0-G1	123	1,708	B1-U0-G1	131
		T3	1,520	B1-U0-G1	117	1,626	B1-U0-G1	125
		T4	1,683	B1-U0-G1	129	1,801	B1-U0-G1	139
		T5	1,496	B1-U0-G1	115	1,601	B1-U0-G1	123
A02	23	T2	3,053	B1-U0-G1	133	3,267	B1-U0-G1	142
		T3	2,907	B1-U0-G1	126	3,111	B1-U0-G1	135
		T4	3,219	B1-U0-G2	140	3,444	B1-U0-G2	150
		T5	2,862	B2-U0-G1	124	3,062	B2-U0-G1	133
A03	35	T2	4,256	B2-U0-G2	122	4,553	B2-U0-G2	130
		T3	4,052	B2-U0-G2	116	4,336	B2-U0-G2	124
		T4	4,487	B2-U0-G2	128	4,801	B2-U0-G2	137
		T5	3,989	B3-U0-G2	114	4,268	B3-U0-G2	122
A04	50	T2	5,999	B2-U0-G2	120	6,419	B2-U0-G2	128
		T3	5,712	B2-U0-G2	114	6,112	B2-U0-G2	122
		T4	6,325	B2-U0-G2	127	6,768	B2-U0-G2	135
		T5	5,623	B3-U0-G2	112	6,016	B3-U0-G2	120
A05	67	T2	7,713	B3-U0-G3	115	8,253	B3-U0-G3	123
		T3	7,344	B3-U0-G3	110	7,858	B3-U0-G3	117
		T4	8,132	B3-U0-G3	121	8,702	B3-U0-G3	130
		T5	7,229	B3-U0-G3	108	7,735	B3-U0-G3	115
A06	82	T2	9,159	B3-U0-G3	112	9,800	B3-U0-G3	120
		T3	8,721	B3-U0-G3	106	9,332	B3-U0-G3	114
		T4	9,657	B3-U0-G3	118	10,333	B3-U0-G3	126
		T5	8,585	B3-U0-G3	105	9,186	B3-U0-G3	112
A07	107	T2	11,462	B3-U0-G3	107	12,264	B3-U0-G3	115
		T3	10,914	B3-U0-G3	102	11,678	B3-U0-G3	109
		T4	12,086	B3-U0-G3	113	12,932	B3-U0-G3	121
		T5	10,744	B4-U0-G3	100	11,496	B4-U0-G3	107
A08	137	T2	13,503	B3-U0-G3	99	14,448	B3-U0-G3	105
		T3	12,827	B3-U0-G3	94	13,724	B3-U0-G3	100
		T4	14,237	B3-U0-G3	104	15,234	B3-U0-G3	111
		T5	12,656	B4-U0-G3	92	13,542	B4-U0-G3	99
A09	143	T2	14,569	B3-U0-G3	102	15,589	B3-U0-G3	109
		T3	13,872	B3-U0-G3	97	14,843	B3-U0-G3	104
		T4	15,361	B3-U0-G3	107	16,436	B3-U0-G4	115
		T5	13,655	B4-U0-G3	95	14,611	B4-U0-G3	102

P20 PureForm LED small round

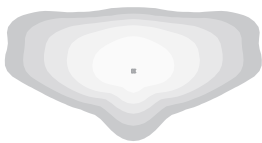
Predicted Lumen Depreciation Data

Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions. L70 is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published L70 hours limited to 6 times actual LED test hours

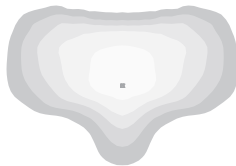
Optic type	Ambient Temperature °C	Calculated L ₇₀ Hours	L ₇₀ reported per TM-21	Lumen Maintenance % at 60,000 hrs
Precision (A01-A09)	25°C	>100,000 hours	>72,000 hours	95.60%
Comfort (P01-P09)	25°C	>100,000 hours	>100,000 hours	89.10%

Precision Optical Distributions

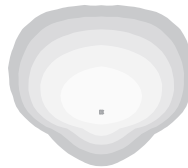
Type 2 Medium



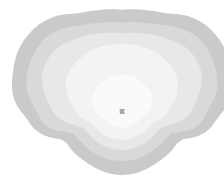
Type 3 Medium



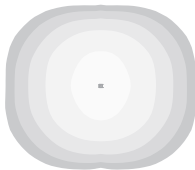
Type 4 Medium



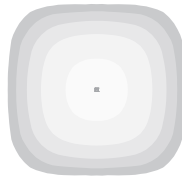
Type 4 Wide



Type 5 Narrow



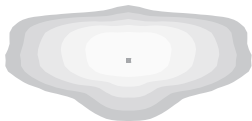
Type 5 Medium



Type 5 Wide



Autofront Row



Back Light Control



LCL



LCR



Comfort Optical Distributions

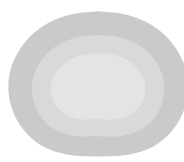
Type 2



Type 3



Type 4



Type 5

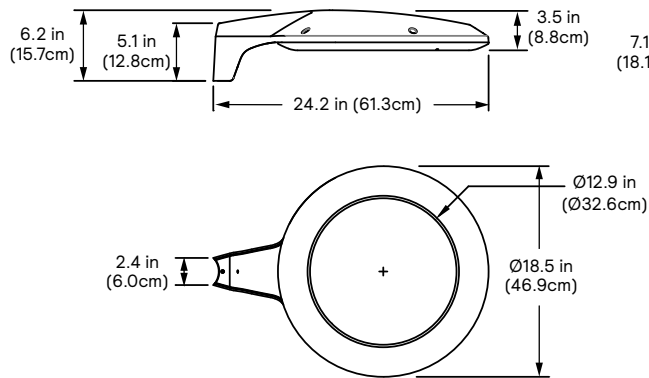


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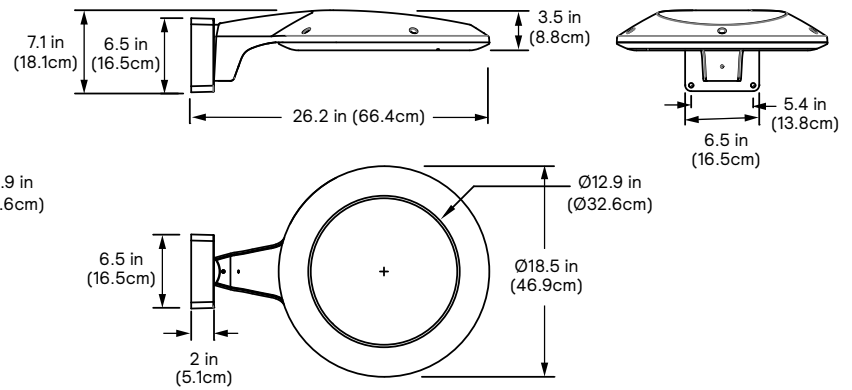
P20 PureForm LED small round

Dimensions

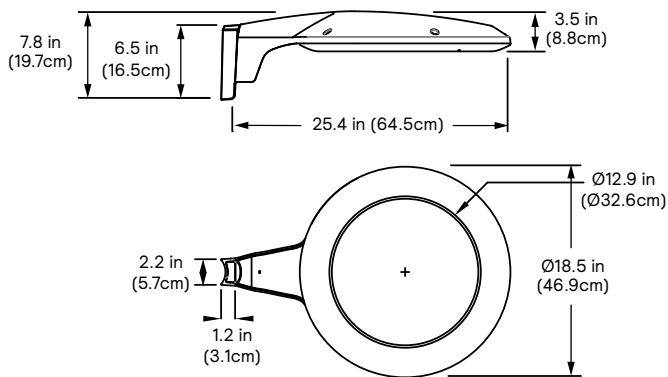
Standard Arm (AR1)



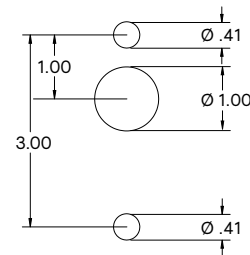
Wall Mount (WAL)



Retrofit Arm (RAM)

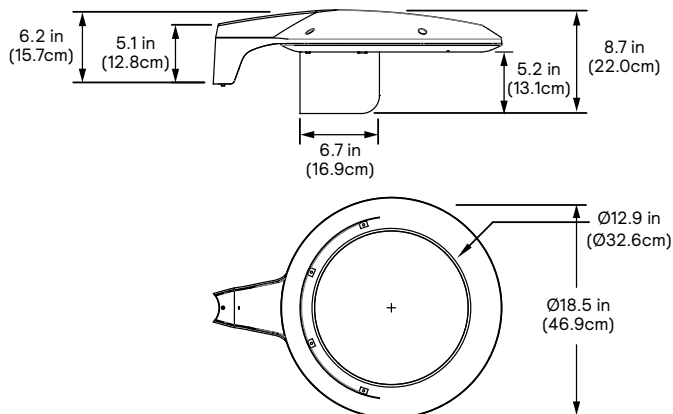


Mounting Hole Pattern



Weight: 18 Lbs (8.0 kg)
EPA: .26ft² (.02m²)

With External House Shield option (EHS)



P20 PureForm LED small round

Specifications

Housing

One-piece cast aluminum housing with integral arm and die cast light engine frame. All die-cast parts are made of low-copper, die-cast aluminum alloy for a high resistance to corrosion. Luminaire housing rated to IP66, tested in accordance to Section 9 of IEC 60598-1.

Vibration resistance

Luminaire is tested and rated Level 2 for Bridge and Overpass application (formerly 3G) cycles conforming to standards set forth by ANSI C136.31-2023. Testing includes vibration to 3G acceleration in three axes, all performed on the same luminaire.

Light engine

Comfort Edge technology provides low-glare, uniform illumination. Composed of LEDs strategically positioned on the edge of the optical plate. Light engine luminous opening size optimized to best achieve a balance between lumen output and optical performance with the need to provide visual comfort. LEDs are mounted directly to the housing to provide heat conduction and ensure maximized LED lifetime and performance. Light engine is RoHS compliant and available in 4 IES distribution options. Standard color temperatures: 3000K +/- 130K, 4000K +/- 130K, 5000K +/- 225K. Minimum CRI of 70. Also available in 2700K and 3500K color temperatures with extended leadtimes. Contact factory for details.

Precision LED Modules are comprised of 40 count LEDs mounted to metal clad printed circuit board and sealed to a polymer optic plate to meet IP66 rating.

Energy saving benefits

System efficacy up to 215 lms/W with significant energy savings over Pulse Start Metal Halide luminaires. Optional control options provide added energy savings during unoccupied periods.

Optical systems

ComfortEdge technology provides a unique and lower perceived glare lighting solution designed to enhance visual comfort for pedestrian applications. Available in IES distribution types 2, 3, 4, and 5 available up to 17,000 lumens.

Precision optics are available in type 2, 3, 4, 5 and Backlight Control (BLC) distributions available. Internal shield option mounts to LED optics to provide additional cutoff, and dedicated BLC optics provide the most stringent cutoff to meet requirements around property lines. Performance tested per LM-79 and TM-15 (IESNA) certifying its photometric performance. Luminaire designed with 0% uplight (UO per IESNA TM-15).

Mounting

Standard luminaire arm mounts to 4" round poles. Can also be used with 5" O.D. poles. Square pole adapter included with every luminaire. PureForm features a retrofit arm kit. When specified with the retrofit arm (RAM) option, PureForm seamlessly simplifies site conversions to LED by eliminating the need for additional pole drilling on most existing poles. RAM will be boxed separately. Also optional are wall mounting accessories.

Emergency Battery Backup (EM)

Emergency battery pack included integral to the luminaire, allowing for a consistent look between emergency and non-emergency luminaires. EM suitable for use in ambient temperature conditions from 0°C (+32°F) to +40°C (+104°F). EMC suitable for use in ambient temperatures from -20°C (-4°F) to +40°C (+104°F). The system is designed to have a secondary driver with relay to immediately detect AC power loss to power luminaire for a minimum of 90 minutes from the time power is lost. Available with 120-277V, or 'UNV' only.

Controls

0-10V Dimming Control Options

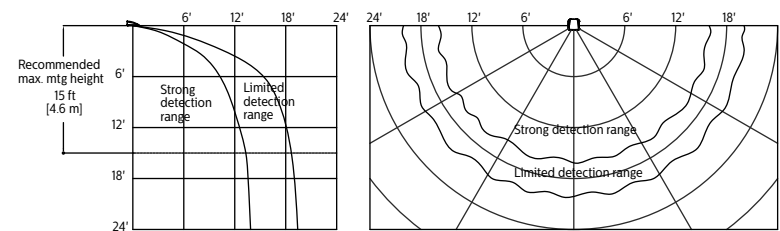
DLEA: Access to 0-10V dimming leads supplied through the yoke of the luminaire (for secondary dimming controls by others). Cannot be used with other control options.

BL50L2/BL50L3: Motion Response module is mounted integral to luminaire factory pre-programmed to 50% dimming when not ordered with other control options. BL50Lx options are set/operate in the following fashion: The motion sensor is set to a constant 50%. When motion is detected by the PIR sensor, the luminaire returns to full power/light output. Dimming on low is factory set to 50% with 5 minutes default in "full power" prior to dimming back to low. When no motion is detected for 5 minutes, the motion response system

reduces the wattage by 50%, to 50% of the normal constant wattage reducing the light level. Other dimming settings can be provided if different dimming levels are required. Contact technical support for details.

Infrared Motion Response Lenses (BL50L2/BL50L3): Lens #2 is designed for mounting heights 8' to 15'. Lens #3 is designed for higher mounting heights up to 20' with a 40' diameter coverage area.

Microwave Motion Response (BL30MW): Motion response luminaires include a high frequency microwave sensor, 5.8GHz +/- 75MHz microwave ISM continuous wave band with 360° coverage area, <0.5 mW transmitting power and <1 W standby power. Factory programmed settings dim fixture to 30% with time delay of 5 minutes with no stand-by period. When motion is detected, the luminaire returns to 100% full light output and will remain on full power for 5 minutes.



Field Adjustable Wattage Selector (FAWS): Luminaire equipped with the ability to manually adjust the wattage in the field to reduce total luminaire lumen output and light levels. Comes pre-set to the highest of 10 output positions. Consult factory for specific dimming settings for each position.

0-10V Lighting Control Options

Button Photocontrol (PCB): Button style design for internal luminaires

FAWS Position	Percent of Typical Lumen Output	FAWS Position	Percent of Typical Lumen Output
1	25%	6	80%
2	50%	7	85%
3	55%	8	90%
4	65%	9	95%
5	75%	10	100%

Note: Typical value accuracy +/- 5%

mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4Fc of ambient light.

Twist-Lock Receptacle (TLR5/TLR7/ TLRPC): TLR options come with 5 pin or with 7 pins connected to 0-10V driver and not all pins will be connected. Dimming Receptacle Type B (5-pin) and Type D-24 (7-pin) in accordance to ANSI C136.41. Can be used with third-party control system. Receptacle located on top of luminaire housing. When specified with receptacle and photoelectric cell (TLRPC), 7-pin receptacle is supplier and voltage must be specified. When ordering Twist-lock receptacle (TLR5 or TLR7), photocell or shunting cap is not included. If Twistlock receptacle option is ordered with Dimming Control option, then dimming leads from driver will not be connected to TLR but consumed by selected device. Devices installed to NEMA twist-lock Receptacle must be IPX6 rated.

Sensor Ready(SR)/DALI Control Options

Automatic Profile Dimming (CS/CM/CE/CA): Standard dimming profiles provide flexibility towards energy savings goals while optimizing light levels during specific dark hours. Dimming profiles include two dimming settings including dim to 30% or 50% of the total lumen output. When used in combination with not programmed motion response it overrides the controller's schedule when motion is detected. After 5 minutes with no motion, it will return to the automatic dimming profile schedule. Automatic dimming profile scheduled with the following settings:

- **CS50/CS30:** Security for 7 hours night duration (Ex., 11 PM – 6 AM)
- **CM50/CM30:** Median for 8 hours night duration (Ex., 10 PM – 6 AM)

All above profiles are calculated from mid point of the night. Dimming is set for 6 hours after the mid point and 1 or 2 hours before depending of the duration of dimming. Time clock or photocell is required for on/off functionality to allow for midpoint calculation. Cannot be used with other dimming control options.

P20 PureForm LED small round

Specifications (cont'd)

Sensor Ready Zhaga Socket Connector (SRDR): Product is D4i Certified and equipped with Sensor Ready drivers connected to 4-pin Zhaga Book 18 compliant receptacle designed for sensor and other control system applications. Receptacle is rated IP66 assembly in a compact design that provides a sealed electrical interface and rated UV resistance, mounted on underside of the luminaire, protective dust cap included. When a controller not provided by Signify is used with Sensor Ready Zhaga socket connector, the controller must be certified to work with the Xitanium SR LED drivers as part of the SR certified program. SRDR can be used with NEMA 7-pin twist lock receptacle, which is mounted on top of the luminaire. D4i certification validates compliance with specifications for data exchange in connected lighting systems, ensuring interoperability, compatibility, and efficient operation. It also assures customers that the device meets industry standards.

Outdoor Interact:

Scalable connected sensor with integral occupancy and daylight sensing, supports wireless mesh connectivity. Sensor works in the Foundation mode when configured without a gateway or in an Interact Advanced mode if a compatible gateway (can be added later) is used. Interact offers an app, a portal and a broad portfolio of Interact ready Indoor and Outdoor luminaires, lamps and retrofit kits all working on the same system. Startup is implemented via Interact Pro App (available in iOS® or Android®) and Bluetooth® connectivity. The app provides flexibility to choose between a gateway or non gateway mode for setup. Setup with the gateway requires wired Internet access to the gateway. Prepare project configuration steps remotely and use IRT9015 remote accessory (ordered separately) or the App on-site to identify and group devices together. WIAP includes SR driver and SR receptacle. Daylight harvesting supported through dimming – activated via the Interact app. Sensors are available in black or white finish and high or low mounting height lenses. IP66 rated.

For more information on Interact visit:

www.interact-lighting.com/interactproscalablesystem

SR/DALI Lighting Control Options

Button Photocontrol (PCB): Button style design for internal luminaires mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4Fc of ambient light.

Twist-Lock Receptacle (TR5/TR7/ TLP): TLR5 includes with 5 pin (Type B) receptacle connected to SR/DALI driver all applicable connections made to driver and is not D4i compliant. TR7 includes (Type D-24) connected to SR/ DALI driver with all leads connected for use of 3rd party control systems. Receptacles are in accordance to ANSI C136.41. Receptacle located on top of luminaire housing. When specified with receptacle and photoelectric cell (TRPC), 7-pin receptacle is supplied and voltage must be specified. When ordering Twist-lock receptacle (TR5 or TR7), photocell or shorting cap is not included.

Listings

UL/cUL wet location listed to the UL 1598 standard, suitable for use in ambient temperatures from -40° to 40°C (-40° to 104°F). Most PureForm P20 comfort configurations are qualified under Standard DesignLights Consortium® category. Consult DLC Qualified Products list to confirm your specific luminaire selection is approved. CCTs 3000K and warmer are Dark Sky Approved.

Finish

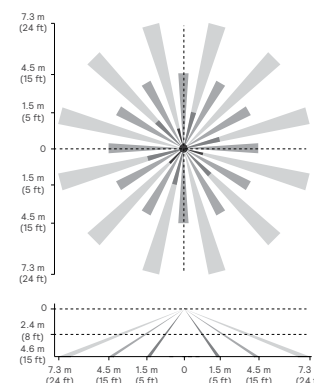
Each standard color luminaire receives a fade and abrasion resistant, electrostatically applied, thermally cured, triglycidic isocyanurate (TGIC) textured polyester powdercoat finish. The surface treatment achieves a minimum of 1000 hours for salt spray resistant finish in accordance with testing performed and per ASTM B117 standard. Standard colors include bronze (BZ), black (BK), white (WH), dark gray (DG), and medium gray (MG). Consult factory for specs on optional or custom colors.

Warranty

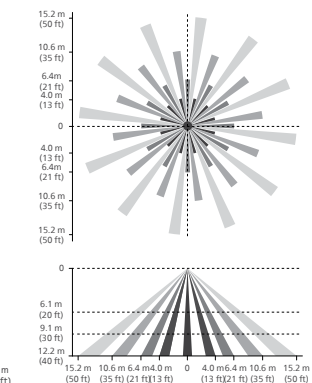
PureForm luminaires feature a 5-year limited warranty.

See signify.com/warranties for complete details and exclusions.

LW low sensor



HW high sensor



Note: The beam patterns shown are intended solely as a general guide and are not to scale. Sensing capabilities and coverage area depend on many factors including the size, speed and direction of travel of persons and vehicles; sensor mounting height; environmental and site conditions; etc.

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THE BRICKYARD - HANOVER STREET
LEBANON, NH
S4

Gardco PureForm LED area small round features a sleek, low profile design and is available with two light engines. ComfortEdge optics provide a unique and lower glare lighting solution designed to enhance visual comfort for pedestrian applications, while precision optics maximize efficiency and spacing. PureForm P20 is available with multiple optical distributions with output up to 17,000 lumens. A full range of control options provides additional energy savings.

Project: _____
Location: _____
Cat.No: _____
Type: _____
Lumens: _____ Qty: _____
Notes: _____

Ordering guide

Example: P20-P-A05-740-T3M-HIS-AR1-UNV-DALI-WIAPHW-MG

Prefix	Catalog Code	Lumens	CCT/CRI	Distribution	Shielding	Mounting	Voltage
P20	C	A05	830	T4		AR1	UNV
P20 PureForm area small round	P Precision optics	A01 ⁴ 2500 A02 ⁴ 3500 A03 ⁴ 5000 A04 7000 A05 9000 A06 11000 A07 13500 A08 16000 A09 17000 A10 19000	730 70CRI, 3000K 740 70CRI, 4000K 750 70CRI, 5000K 830 80CRI, 3000K 840 80CRI, 4000K 827 ¹ 80CRI, 2700K (ETOr)	AFR Auto front row AFR-90 AFR rotated left 90° AFR-270 AFR rotated left 270° T2M Type 2 Medium T2M-90 T2M rotated left 90° T2M-270 T2M rotated left 270° T3M Type 3 Medium T3M-90 T3M rotated left 90° T3M-270 T3M rotated left 270° T4M Type 4 Medium T4M-90 T4M rotated left 90° T4M-270 T4M rotated left 270°	None - HIS ² Internal house side shield (clip-on)	AR1 ¹² Arm mount (standard) The following mounting kits must be ordered separately (see accessories) RAM Retrofit arm mount kit WAL Wall mount	120 120V 208 208V 240 240V 277 10-77V JNV 120-277V 347 347V 480 480V HVV 374-480V
	C Comfort optics	A01 ⁴ 2000 A02 3500 A03 5000 A04 7000 A05 9000 A06 11000 A07 13500 A08 ¹¹ 16000 A09 ¹¹ 17000	830 80CRI, 3000K 840 80CRI, 4000K 827 ¹ 80CRI, 2700K (ETOr) 835 ¹ 80CRI, 3500K (ETOr) 750 ¹ 70CRI, 5000K (ETOr)	T2 Type 2 T3 Type 3 T4 Type 4 T5 Type 5	None - EHS Luminaire drilled for external house shield (must be accompanied by P20-EHS-BK accessory, ordered separately)		
Driver type	Dimming Controls (only one may be selected)			Lighting controls ⁸ (only one may be selected)		Emergency	Finish
010V							FINISH
0-10V							Standard textured finish
010V 0-10V	None DLEA FAWS BL50L2 ² BL50L3 ² BL30MW ³	- Dimming leads externally accessible (controls by others) Field adjustable wattage selector PIR motion response dim to 50% L2 lens PIR motion response dim to 50% L3 lens Microwave motion sensor factory set at 50% dimming	None PCB ^{4,10} TLR5 TLR7 TLRPC ^{4,10}		- Photocontrol button 5-pin twist lock w/ 0-10v driver 7-pin twist lock w/ 0-10v driver (non-D4i) 7-pin twist lock w/ 0-10v driver (non-D4i) & on/off photocell	None - EM ^{4,12} Emergency battery backup (0°C to +40°C/32°F to +104°F) EMC 4,7,9,13 Emergency battery pack, cold rated (-20°C to +40°C/-4°F to +104°F) Fusing None - F1 ¹⁰ Single Fuse (120V, 277V, or 347V) F2 ^{10,11} Double Fuse (208V, 240V, or 480V) F3 ^{10,11} Double Fuse Canadian double pole (208V, 240V, or 480V) Surge Protection None SP1 Surge Protector 10kV / 10kA (standard) SP2 Surge Protector 20kV/ 10kA (option)	BK Black WH White BZ Bronze DG Dark gray MG Medium gray
DALI							Customer specified
DALI SR/ DALI	None CS50 ^{5,6} CM50 ^{5,6} CS30 ^{5,6} CM30 ^{5,6} SRDR ^{5,6} WIAPLW ^{5,6} WIAPLB ^{5,6} WIAPHW ^{5,6} WIAPHB ^{5,6}	- Security 50 % dimming, 7 hours Median 50 % dimming, 8 hours Security 30 % dimming, 7 hours Median 30 % dimming, 8 hours SR driver connected to Zhaga socket (D4i) Wireless Interact outdoor low mounting (7-15'), white housing Wireless Interact outdoor low mounting (7-15'), black housing Wireless Interact outdoor low mounting (15-40'), white housing Wireless Interact outdoor low mounting (15-40'), black housing	None PCB ^{4,10} TR5 ^{5,6} TR7 ^{5,6} TLP ^{4,6,10}		- Photocontrol button 5-pin twist lock SR/DALI driver 7-pin twist lock SR/DALI driver (D4i) 7-pin twist lock SR/DALI driver (D4i) & on/off photocell		OC Optional color (specify optional color or RAL, contact factory) SC Special color (must supply color chip, requires factory quote)

- Extended lead times apply. Contact factory for details.
- Available with Area Optics Lumen packages A09 and below only. Not allowed with Comfort optics
- Available with Comfort Optics only at 120-347V. Not allowed with Area Optics
- Not available at 347-480V(HVV)
- Not available at 347-480V(HVV) for Pixelated (P-Axx) optic lumen packages A01-A05 and Comfort (C-Axx) optic lumen packages A01-A09
- Not available at 120-277V(UNV) for Pixelated (P-Axx) optic lumen packages A01-A02 and Comfort (C-Axx) optic lumen packages A01-A02
- Not available with Comfort (C-Axx) optic lumen packages A07-A09
- If selected with Dimming control, DIM leads from receptacle will not be connected to driver
- Available only with Comfort Optics
- Must specify input voltage. UNV and HVU not valid.
- Not available with Emergency options
- Mounts to a 4-5" OD round pole with adapter included for square poles.
- Not available with BL50LX, BL50MW, SRDR, OMS, Or WIAP options due to mechanical conflict

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P20 PureForm LED small round

PureForm P20 Accessories (ordered separately, field installed)

Mounting Accessories

P20-RAM-G2-(F) Retrofit Arm mount kit
P20-WS-G2-(F) Wall mount with surface conduit rear entry permitted
P20-EHS-BK ¹ External House Side Shield, Black

(F) = Specify finish

1. EHS must also be selected in the luminaire catalog code and ships separately.

PureForm P20 Precision optics lumen values

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A01	14	AFR	2,875	B1-U0-G1	194	3,035	B1-U0-G1	205	3,035	B1-U0-G1	205	2,544	B1-U0-G1	172	2,710	B1-U0-G1	183
		T2M	2,775	B1-U0-G1	188	2,930	B1-U0-G1	198	2,930	B1-U0-G1	198	2,456	B1-U0-G1	166	2,616	B1-U0-G1	177
		T3M	2,780	B1-U0-G1	188	2,934	B1-U0-G1	198	2,934	B1-U0-G1	198	2,460	B1-U0-G1	166	2,620	B1-U0-G1	177
		T4M	2,744	B1-U0-G1	185	2,897	B1-U0-G1	196	2,897	B1-U0-G1	196	2,429	B1-U0-G1	164	2,587	B1-U0-G1	175
		T4W	2,638	B1-U0-G1	178	2,785	B1-U0-G1	188	2,785	B1-U0-G1	188	2,334	B1-U0-G1	158	2,486	B1-U0-G1	168
		T5M	2,830	B2-U0-G1	191	2,988	B2-U0-G1	202	2,988	B2-U0-G1	202	2,504	B2-U0-G1	169	2,667	B2-U0-G1	180
		T5N	2,849	B2-U0-G0	193	3,008	B2-U0-G0	203	3,008	B2-U0-G0	203	2,521	B2-U0-G0	170	2,685	B2-U0-G0	181
		T5W	2,671	B2-U0-G1	181	2,820	B2-U0-G1	191	2,820	B2-U0-G1	191	2,364	B2-U0-G1	160	2,517	B2-U0-G1	170
		BLC	1,908	B0-U0-G1	129	2,014	B0-U0-G1	136	2,014	B0-U0-G1	136	1,688	B0-U0-G1	114	1,798	B0-U0-G1	122
A02	21	LCL/LCR	1,506	B0-U0-G1	102	1,589	B0-U0-G1	107	1,589	B0-U0-G1	107	1,332	B0-U0-G1	90	1,419	B0-U0-G1	96
		AFR	4,094	B1-U0-G1	197	4,323	B1-U0-G1	208	4,323	B1-U0-G1	208	3,623	B1-U0-G1	174	3,859	B1-U0-G1	186
		T2M	3,952	B1-U0-G1	190	4,173	B1-U0-G1	201	4,173	B1-U0-G1	201	3,498	B1-U0-G1	168	3,725	B1-U0-G1	179
		T3M	3,958	B1-U0-G1	190	4,179	B1-U0-G1	201	4,179	B1-U0-G1	201	3,503	B1-U0-G1	168	3,731	B1-U0-G1	179
		T4M	3,908	B1-U0-G1	188	4,126	B1-U0-G1	198	4,126	B1-U0-G1	198	3,459	B1-U0-G1	166	3,683	B1-U0-G1	177
		T4W	3,756	B1-U0-G2	181	3,966	B1-U0-G2	191	3,966	B1-U0-G2	191	3,324	B1-U0-G2	160	3,540	B1-U0-G2	170
		T5M	4,030	B2-U0-G1	194	4,255	B2-U0-G1	205	4,255	B2-U0-G1	205	3,567	B2-U0-G1	172	3,798	B2-U0-G1	183
		T5N	4,057	B2-U0-G1	195	4,283	B2-U0-G1	206	4,283	B2-U0-G1	206	3,590	B2-U0-G1	173	3,824	B2-U0-G1	184
		T5W	3,804	B3-U0-G2	183	4,016	B3-U0-G2	193	4,016	B3-U0-G2	193	3,366	B2-U0-G1	162	3,585	B2-U0-G2	172
A03	31	BLC	2,717	B0-U0-G1	131	2,869	B0-U0-G1	138	2,869	B0-U0-G1	138	2,405	B0-U0-G1	116	2,561	B0-U0-G1	123
		LCL/LCR	2,144	B1-U0-G1	103	2,264	B1-U0-G1	109	2,264	B1-U0-G1	109	1,897	B0-U0-G1	91	2,021	B1-U0-G1	97
		AFR	5,696	B2-U0-G1	187	6,013	B2-U0-G2	197	6,013	B2-U0-G2	197	5,040	B1-U0-G1	165	5,368	B1-U0-G1	176
		T2M	5,498	B1-U0-G1	180	5,805	B1-U0-G2	190	5,805	B1-U0-G2	190	4,866	B1-U0-G1	159	5,182	B1-U0-G1	170
		T3M	5,507	B1-U0-G2	180	5,814	B1-U0-G2	190	5,814	B1-U0-G2	190	4,873	B1-U0-G1	160	5,190	B1-U0-G1	170
		T4M	5,437	B1-U0-G2	178	5,740	B1-U0-G2	188	5,740	B1-U0-G2	188	4,812	B1-U0-G1	158	5,124	B1-U0-G1	168
		T4W	5,226	B1-U0-G2	171	5,517	B1-U0-G2	181	5,517	B1-U0-G2	181	4,625	B1-U0-G2	152	4,925	B1-U0-G2	161
		T5M	5,607	B3-U0-G1	184	5,919	B3-U0-G1	194	5,919	B3-U0-G1	194	4,962	B3-U0-G1	163	5,284	B3-U0-G1	173
		T5N	5,644	B3-U0-G1	185	5,959	B3-U0-G1	195	5,959	B3-U0-G1	195	4,995	B2-U0-G1	164	5,319	B3-U0-G1	174
A04	44	T5W	5,292	B3-U0-G2	173	5,587	B3-U0-G2	183	5,587	B3-U0-G2	183	4,683	B3-U0-G2	153	4,988	B3-U0-G2	163
		BLC	3,780	B0-U0-G1	124	3,991	B0-U0-G1	131	3,991	B0-U0-G1	131	3,345	B0-U0-G1	110	3,562	B0-U0-G1	117
		LCL/LCR	2,983	B1-U0-G1	98	3,149	B1-U0-G1	103	3,149	B1-U0-G1	103	2,640	B1-U0-G1	87	2,811	B1-U0-G1	92
		AFR	8,079	B2-U0-G2	188	8,529	B2-U0-G2	198	8,529	B2-U0-G2	198	7,149	B2-U0-G2	166	7,614	B2-U0-G2	177
		T2M	7,799	B2-U0-G2	181	8,234	B2-U0-G2	192	8,234	B2-U0-G2	192	6,902	B2-U0-G2	161	7,350	B2-U0-G2	171
		T3M	7,811	B2-U0-G2	182	8,246	B2-U0-G2	192	8,246	B2-U0-G2	192	6,912	B2-U0-G2	161	7,361	B2-U0-G2	171
		T4M	7,712	B1-U0-G2	179	8,142	B1-U0-G2	189	8,142	B1-U0-G2	189	6,825	B1-U0-G2	159	7,268	B1-U0-G2	169
		T4W	7,412	B1-U0-G2	172	7,825	B2-U0-G3	182	7,825	B2-U0-G3	182	6,559	B1-U0-G2	153	6,986	B1-U0-G2	163
		T5M	7,953	B3-U0-G1	185	8,396	B3-U0-G2	195	8,396	B3-U0-G2	195	7,038	B3-U0-G1	164	7,495	B3-U0-G1	174
A04	44	T5N	8,005	B3-U0-G1	186	8,452	B3-U0-G1	197	8,452	B3-U0-G1	197	7,084	B3-U0-G1	165	7,545	B3-U0-G1	176
		T5W	7,506	B3-U0-G2	175	7,925	B3-U0-G2	184	7,925	B3-U0-G2	184	6,643	B3-U0-G2	155	7,074	B3-U0-G2	165
		BLC	5,361	B0-U0-G2	125	5,660	B0-U0-G2	132	5,660	B0-U0-G2	132	4,745	B0-U0-G2	110	5,053	B0-U0-G2	118
		LCL/LCR	4,231	B1-U0-G1	98	4,467	B1-U0-G1	104	4,467	B1-U0-G1	104	3,744	B1-U0-G1	87	3,988	B1-U0-G1	93

P20 PureForm LED small round

PureForm P20 Precision optics lumen values

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A05	53	AFR	9,573	B2-U0-G2	178	10,107	B2-U0-G2	188	10,107	B2-U0-G2	188	8,472	B2-U0-G2	157	9,022	B2-U0-G2	167
		T2M	9,241	B2-U0-G2	171	9,756	B2-U0-G2	181	9,756	B2-U0-G2	181	8,178	B2-U0-G2	152	8,710	B2-U0-G2	162
		T3M	9,255	B2-U0-G2	172	9,771	B2-U0-G2	181	9,771	B2-U0-G2	181	8,191	B2-U0-G2	152	8,723	B2-U0-G2	162
		T4M	9,138	B1-U0-G2	170	9,648	B1-U0-G2	179	9,648	B1-U0-G2	179	8,087	B1-U0-G2	150	8,613	B1-U0-G2	160
		T4W	8,783	B2-U0-G3	163	9,273	B2-U0-G3	172	9,273	B2-U0-G3	172	7,773	B2-U0-G3	144	8,278	B2-U0-G3	154
		T5M	9,423	B3-U0-G2	175	9,949	B3-U0-G2	185	9,949	B3-U0-G2	185	8,339	B3-U0-G2	155	8,881	B3-U0-G2	165
		T5N	9,486	B3-U0-G1	176	10,015	B3-U0-G2	186	10,015	B3-U0-G2	186	8,395	B3-U0-G1	156	8,940	B3-U0-G1	166
		T5W	8,895	B3-U0-G3	165	9,390	B3-U0-G3	174	9,390	B3-U0-G3	174	7,871	B3-U0-G2	146	8,383	B3-U0-G3	156
		BLC	6,353	B0-U0-G2	118	6,707	B0-U0-G2	124	6,707	B0-U0-G2	124	5,622	B0-U0-G2	104	5,988	B0-U0-G2	111
		LCL/LCR	5,013	B1-U0-G1	93	5,293	B1-U0-G1	98	5,293	B1-U0-G1	98	4,437	B1-U0-G1	82	4,725	B1-U0-G1	88
A06	69	AFR	11,828	B3-U0-G2	170	12,487	B3-U0-G3	180	12,487	B3-U0-G3	180	10,467	B2-U0-G2	151	11,148	B3-U0-G2	161
		T2M	11,418	B2-U0-G2	164	12,054	B3-U0-G3	174	12,054	B3-U0-G3	174	10,104	B2-U0-G2	146	10,761	B2-U0-G2	155
		T3M	11,435	B2-U0-G2	165	12,073	B2-U0-G3	174	12,073	B2-U0-G3	174	10,120	B2-U0-G2	146	10,778	B2-U0-G2	155
		T4M	11,291	B2-U0-G2	163	11,920	B2-U0-G2	172	11,920	B2-U0-G2	172	9,992	B1-U0-G2	144	10,641	B2-U0-G2	153
		T4W	10,852	B2-U0-G3	156	11,457	B2-U0-G3	165	11,457	B2-U0-G3	165	9,603	B2-U0-G3	138	10,228	B2-U0-G3	147
		T5M	11,643	B4-U0-G2	168	12,292	B4-U0-G2	177	12,292	B4-U0-G2	177	10,304	B3-U0-G2	148	10,973	B3-U0-G2	158
		T5N	11,721	B3-U0-G2	169	12,374	B3-U0-G2	178	12,374	B3-U0-G2	178	10,372	B3-U0-G2	149	11,046	B3-U0-G2	159
		T5W	10,990	B4-U0-G3	158	11,602	B4-U0-G3	167	11,602	B4-U0-G3	167	9,725	B4-U0-G3	140	10,357	B4-U0-G3	149
		BLC	7,849	B0-U0-G2	113	8,287	B0-U0-G2	119	8,287	B0-U0-G2	119	6,946	B0-U0-G2	100	7,398	B0-U0-G2	107
		LCL/LCR	6,194	B1-U0-G2	89	6,540	B1-U0-G2	94	6,540	B1-U0-G2	94	5,482	B1-U0-G2	79	5,838	B1-U0-G2	84
A07	89	AFR	14,894	B3-U0-G3	168	15,724	B3-U0-G3	177	15,724	B3-U0-G3	177	13,181	B3-U0-G3	148	14,037	B3-U0-G3	158
		T2M	14,378	B3-U0-G3	162	15,179	B3-U0-G3	171	15,179	B3-U0-G3	171	12,724	B3-U0-G3	143	13,551	B3-U0-G3	152
		T3M	14,400	B3-U0-G3	162	15,203	B3-U0-G3	171	15,203	B3-U0-G3	171	12,743	B3-U0-G3	143	13,572	B3-U0-G3	153
		T4M	14,218	B2-U0-G3	160	15,010	B2-U0-G3	169	15,010	B2-U0-G3	169	12,582	B2-U0-G3	142	13,400	B2-U0-G3	151
		T4W	13,665	B2-U0-G3	154	14,427	B3-U0-G3	162	14,427	B3-U0-G3	162	12,093	B2-U0-G3	136	12,879	B2-U0-G3	145
		T5M	14,661	B4-U0-G2	165	15,479	B4-U0-G2	174	15,479	B4-U0-G2	174	12,974	B4-U0-G2	146	13,818	B4-U0-G2	155
		T5N	14,759	B4-U0-G2	166	15,582	B4-U0-G2	175	15,582	B4-U0-G2	175	13,061	B3-U0-G2	147	13,910	B4-U0-G2	156
		T5W	13,838	B4-U0-G3	156	14,610	B4-U0-G3	164	14,610	B4-U0-G3	164	12,246	B4-U0-G3	138	13,042	B4-U0-G3	147
		BLC	9,884	B1-U0-G2	111	10,435	B1-U0-G2	117	10,435	B1-U0-G2	117	8,747	B1-U0-G2	98	9,316	B1-U0-G2	105
		LCL/LCR	7,800	B1-U0-G2	88	8,235	B1-U0-G2	93	8,235	B1-U0-G2	93	6,903	B1-U0-G2	78	7,351	B1-U0-G2	83
A08	105	AFR	17,449	B3-U0-G3	166	18,422	B3-U0-G3	175	18,422	B3-U0-G3	175	15,442	B3-U0-G3	147	16,445	B3-U0-G3	156
		T2M	16,844	B3-U0-G3	160	17,783	B3-U0-G3	169	17,783	B3-U0-G3	169	14,906	B3-U0-G3	142	15,875	B3-U0-G3	151
		T3M	16,870	B3-U0-G3	160	17,811	B3-U0-G3	169	17,811	B3-U0-G3	169	14,929	B3-U0-G3	142	15,900	B3-U0-G3	151
		T4M	16,657	B2-U0-G3	158	17,585	B2-U0-G3	167	17,585	B2-U0-G3	167	14,740	B2-U0-G3	140	15,699	B2-U0-G3	149
		T4W	16,009	B3-U0-G3	152	16,902	B3-U0-G4	161	16,902	B3-U0-G4	161	14,168	B2-U0-G3	135	15,088	B3-U0-G3	144
		T5M	17,176	B4-U0-G2	163	18,134	B4-U0-G2	172	18,134	B4-U0-G2	172	15,200	B4-U0-G2	145	16,188	B4-U0-G2	154
		T5N	17,291	B4-U0-G2	164	18,255	B4-U0-G2	174	18,255	B4-U0-G2	174	15,301	B4-U0-G2	146	16,296	B4-U0-G2	155
		T5W	16,212	B4-U0-G3	154	17,116	B4-U0-G3	163	17,116	B4-U0-G3	163	14,347	B4-U0-G3	136	15,280	B4-U0-G3	145
		BLC	11,580	B1-U0-G2	110	12,225	B1-U0-G2	116	12,225	B1-U0-G2	116	10,248	B1-U0-G2	97	10,914	B1-U0-G2	104
		LCL/LCR	9,138	B1-U0-G2	87	9,647	B2-U0-G2	92	9,647	B2-U0-G2	92	8,087	B1-U0-G2	77	8,612	B1-U0-G2	82

P20 PureForm LED small round

PureForm P20 Precision optics lumen values

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A09	112	AFR	18,289	B3-U0-G3	164	19,309	B3-U0-G3	173	19,309	B3-U0-G3	173	16,185	B3-U0-G3	145	17,237	B3-U0-G3	154
		T2M	17,655	B3-U0-G3	158	18,639	B3-U0-G3	167	18,639	B3-U0-G3	167	15,624	B3-U0-G3	140	16,640	B3-U0-G3	149
		T3M	17,682	B3-U0-G3	158	18,668	B3-U0-G3	167	18,668	B3-U0-G3	167	15,648	B3-U0-G3	140	16,665	B3-U0-G3	149
		T4M	17,459	B2-U0-G3	156	18,432	B2-U0-G3	165	18,432	B2-U0-G3	165	15,450	B2-U0-G3	138	16,454	B2-U0-G3	147
		T4W	16,780	B3-U0-G4	150	17,716	B3-U0-G4	159	17,716	B3-U0-G4	159	14,850	B3-U0-G3	133	15,815	B3-U0-G3	142
		T5M	18,003	B4-U0-G2	161	19,007	B4-U0-G2	170	19,007	B4-U0-G2	170	15,932	B4-U0-G2	143	16,968	B4-U0-G2	152
		T5N	18,123	B4-U0-G2	162	19,133	B4-U0-G2	171	19,133	B4-U0-G2	171	16,038	B4-U0-G2	144	17,081	B4-U0-G2	153
		T5W	16,993	B4-U0-G3	152	17,940	B4-U0-G4	161	17,940	B4-U0-G4	161	15,038	B4-U0-G3	135	16,016	B4-U0-G3	143
		BLC	12,137	B1-U0-G3	109	12,814	B1-U0-G3	115	12,814	B1-U0-G3	115	10,741	B1-U0-G2	96	11,439	B1-U0-G2	102
LCL/LCR	9,578	B2-U0-G2	86	10,112	B2-U0-G2	90	10,112	B2-U0-G2	90	8,476	B1-U0-G2	76	9,027	B1-U0-G2	81		
A10	121	AFR	20,004	B3-U0-G3	165	21,119	B3-U0-G3	174	21,119	B3-U0-G3	174	17,703	B3-U0-G3	146	18,853	B3-U0-G3	155
		T2M	19,311	B3-U0-G3	159	20,387	B3-U0-G3	168	20,387	B3-U0-G3	168	17,089	B3-U0-G3	141	18,200	B3-U0-G3	150
		T3M	19,340	B3-U0-G3	159	20,419	B3-U0-G3	168	20,419	B3-U0-G3	168	17,115	B3-U0-G3	141	18,228	B3-U0-G3	150
		T4M	19,096	B2-U0-G3	157	20,160	B2-U0-G3	166	20,160	B2-U0-G3	166	16,899	B2-U0-G3	139	17,997	B2-U0-G3	148
		T4W	18,354	B3-U0-G4	151	19,377	B3-U0-G4	160	19,377	B3-U0-G4	160	16,242	B3-U0-G4	134	17,298	B3-U0-G4	143
		T5M	19,691	B4-U0-G2	162	20,789	B4-U0-G2	171	20,789	B4-U0-G2	171	17,426	B4-U0-G2	144	18,559	B4-U0-G2	153
		T5N	19,822	B4-U0-G2	163	20,928	B4-U0-G2	172	20,928	B4-U0-G2	172	17,542	B4-U0-G2	145	18,682	B4-U0-G2	154
		T5W	18,587	B5-U0-G4	153	19,623	B5-U0-G4	162	19,623	B5-U0-G4	162	16,448	B4-U0-G3	136	17,517	B4-U0-G3	144
		BLC	13,276	B1-U0-G3	109	14,016	B1-U0-G3	116	14,016	B1-U0-G3	116	11,748	B1-U0-G2	97	12,512	B1-U0-G3	103
		LCL/LCR	10,476	B2-U0-G2	86	11,060	B2-U0-G2	91	11,060	B2-U0-G2	91	9,271	B1-U0-G2	76	9,873	B2-U0-G2	81

PureForm P20 Comfort optics lumen values

Perf. Package	System Watts	Dist. Type	80 CRI			80 CRI		
			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A01	13	T2	1,596	B1-U0-G1	123	1,708	B1-U0-G1	131
		T3	1,520	B1-U0-G1	117	1,626	B1-U0-G1	125
		T4	1,683	B1-U0-G1	129	1,801	B1-U0-G1	139
		T5	1,496	B1-U0-G1	115	1,601	B1-U0-G1	123
A02	23	T2	3,053	B1-U0-G1	133	3,267	B1-U0-G1	142
		T3	2,907	B1-U0-G1	126	3,111	B1-U0-G1	135
		T4	3,219	B1-U0-G2	140	3,444	B1-U0-G2	150
		T5	2,862	B2-U0-G1	124	3,062	B2-U0-G1	133
A03	35	T2	4,256	B2-U0-G2	122	4,553	B2-U0-G2	130
		T3	4,052	B2-U0-G2	116	4,336	B2-U0-G2	124
		T4	4,487	B2-U0-G2	128	4,801	B2-U0-G2	137
		T5	3,989	B3-U0-G2	114	4,268	B3-U0-G2	122
A04	50	T2	5,999	B2-U0-G2	120	6,419	B2-U0-G2	128
		T3	5,712	B2-U0-G2	114	6,112	B2-U0-G2	122
		T4	6,325	B2-U0-G2	127	6,768	B2-U0-G2	135
		T5	5,623	B3-U0-G2	112	6,016	B3-U0-G2	120
A05	67	T2	7,713	B3-U0-G3	115	8,253	B3-U0-G3	123
		T3	7,344	B3-U0-G3	110	7,858	B3-U0-G3	117
		T4	8,132	B3-U0-G3	121	8,702	B3-U0-G3	130
		T5	7,229	B3-U0-G3	108	7,735	B3-U0-G3	115
A06	82	T2	9,159	B3-U0-G3	112	9,800	B3-U0-G3	120
		T3	8,721	B3-U0-G3	106	9,332	B3-U0-G3	114
		T4	9,657	B3-U0-G3	118	10,333	B3-U0-G3	126
		T5	8,585	B3-U0-G3	105	9,186	B3-U0-G3	112
A07	107	T2	11,462	B3-U0-G3	107	12,264	B3-U0-G3	115
		T3	10,914	B3-U0-G3	102	11,678	B3-U0-G3	109
		T4	12,086	B3-U0-G3	113	12,932	B3-U0-G3	121
		T5	10,744	B4-U0-G3	100	11,496	B4-U0-G3	107
A08	137	T2	13,503	B3-U0-G3	99	14,448	B3-U0-G3	105
		T3	12,827	B3-U0-G3	94	13,724	B3-U0-G3	100
		T4	14,237	B3-U0-G3	104	15,234	B3-U0-G3	111
		T5	12,656	B4-U0-G3	92	13,542	B4-U0-G3	99
A09	143	T2	14,569	B3-U0-G3	102	15,589	B3-U0-G3	109
		T3	13,872	B3-U0-G3	97	14,843	B3-U0-G3	104
		T4	15,361	B3-U0-G3	107	16,436	B3-U0-G4	115
		T5	13,655	B4-U0-G3	95	14,611	B4-U0-G3	102

P20 PureForm LED small round

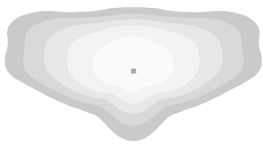
Predicted Lumen Depreciation Data

Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions. L70 is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published L70 hours limited to 6 times actual LED test hours

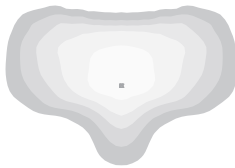
Optic type	Ambient Temperature °C	Calculated L ₇₀ Hours	L ₇₀ reported per TM-21	Lumen Maintenance % at 60,000 hrs
Precision (A01-A09)	25°C	>100,000 hours	>72,000 hours	95.60%
Comfort (P01-P09)	25°C	>100,000 hours	>100,000 hours	89.10%

Precision Optical Distributions

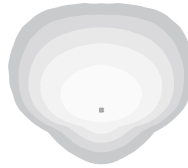
Type 2 Medium



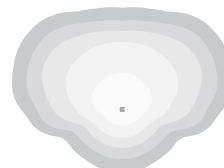
Type 3 Medium



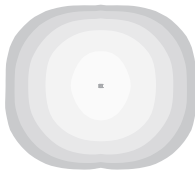
Type 4 Medium



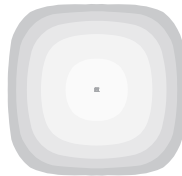
Type 4 Wide



Type 5 Narrow



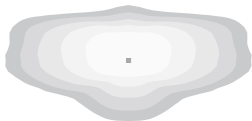
Type 5 Medium



Type 5 Wide



Autofront Row



Back Light Control



LCL



LCR



Comfort Optical Distributions

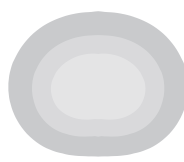
Type 2



Type 3



Type 4



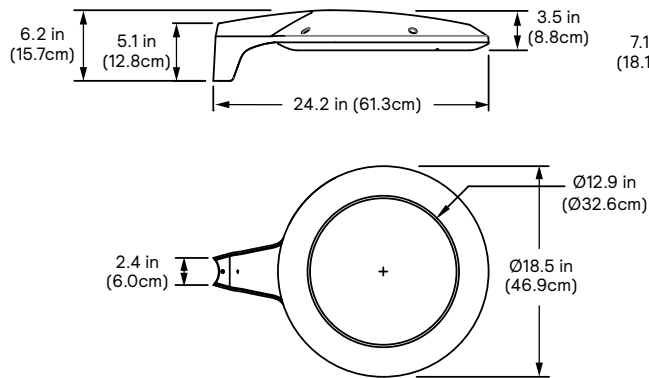
Type 5



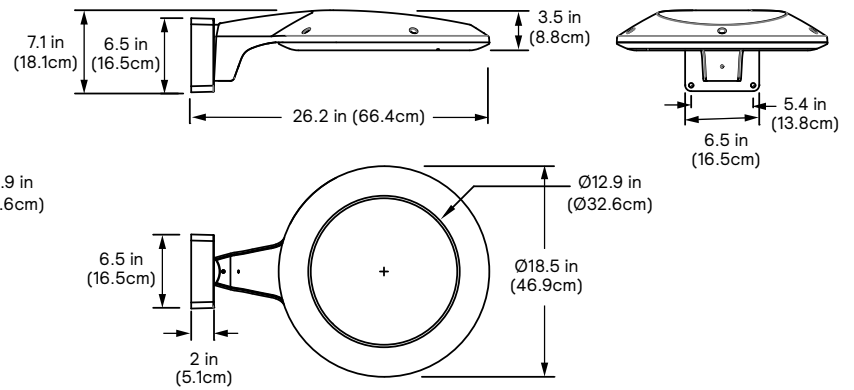
P20 PureForm LED small round

Dimensions

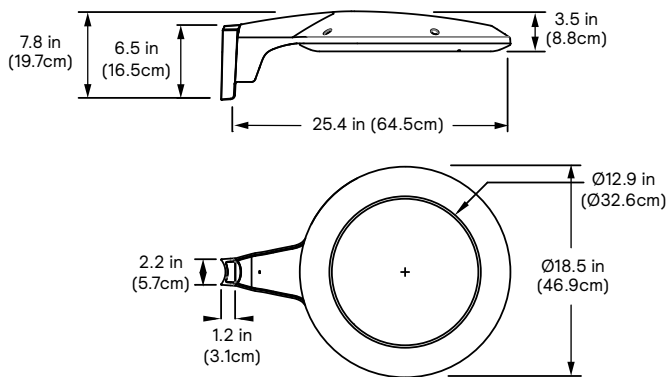
Standard Arm (AR1)



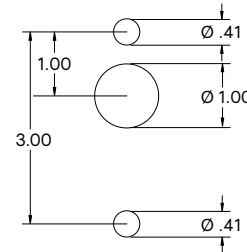
Wall Mount (WAL)



Retrofit Arm (RAM)



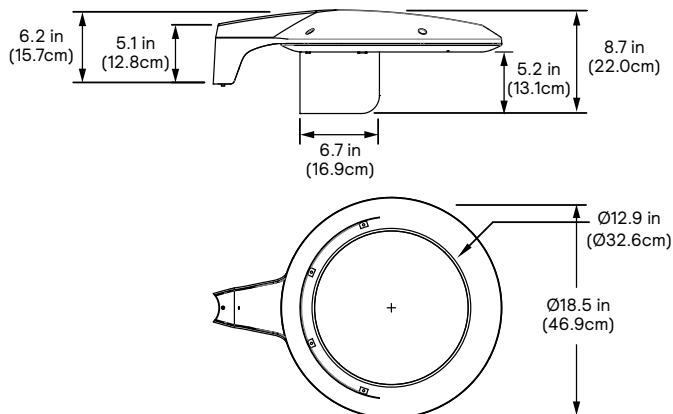
Mounting Hole Pattern



Weight: 18 Lbs (8.0 kg)

EPA: .26ft² (.02m²)

With External House Shield option (EHS)



P20 PureForm LED small round

Specifications

Housing

One-piece cast aluminum housing with integral arm and die cast light engine frame. All die-cast parts are made of low-copper, die-cast aluminum alloy for a high resistance to corrosion. Luminaire housing rated to IP66, tested in accordance to Section 9 of IEC 60598-1.

Vibration resistance

Luminaire is tested and rated Level 2 for Bridge and Overpass application (formerly 3G) cycles conforming to standards set forth by ANSI C136.31-2023. Testing includes vibration to 3G acceleration in three axes, all performed on the same luminaire.

Light engine

Comfort Edge technology provides low-glare, uniform illumination. Composed of LEDs strategically positioned on the edge of the optical plate. Light engine luminous opening size optimized to best achieve a balance between lumen output and optical performance with the need to provide visual comfort. LEDs are mounted directly to the housing to provide heat conduction and ensure maximized LED lifetime and performance. Light engine is RoHS compliant and available in 4 IES distribution options. Standard color temperatures: 3000K +/- 130K, 4000K +/- 130K, 5000K +/- 225K. Minimum CRI of 70. Also available in 2700K and 3500K color temperatures with extended leadtimes. Contact factory for details.

Precision LED Modules are comprised of 40 count LEDs mounted to metal clad printed circuit board and sealed to a polymer optic plate to meet IP66 rating.

Energy saving benefits

System efficacy up to 215 lms/W with significant energy savings over Pulse Start Metal Halide luminaires. Optional control options provide added energy savings during unoccupied periods.

Optical systems

ComfortEdge technology provides a unique and lower perceived glare lighting solution designed to enhance visual comfort for pedestrian applications. Available in IES distribution types 2, 3, 4, and 5 available up to 17,000 lumens.

Precision optics are available in type 2, 3, 4, 5 and Backlight Control (BLC) distributions available. Internal shield option mounts to LED optics to provide additional cutoff, and dedicated BLC optics provide the most stringent cutoff to meet requirements around property lines. Performance tested per LM-79 and TM-15 (IESNA) certifying its photometric performance. Luminaire designed with 0% uplight (UO per IESNA TM-15).

Mounting

Standard luminaire arm mounts to 4" round poles. Can also be used with 5" O.D. poles. Square pole adapter included with every luminaire. PureForm features a retrofit arm kit. When specified with the retrofit arm (RAM) option, PureForm seamlessly simplifies site conversions to LED by eliminating the need for additional pole drilling on most existing poles. RAM will be boxed separately. Also optional are wall mounting accessories.

Emergency Battery Backup (EM)

Emergency battery pack included integral to the luminaire, allowing for a consistent look between emergency and non-emergency luminaires. EM suitable for use in ambient temperature conditions from 0°C (+32°F) to +40°C (+104°F). EMC suitable for use in ambient temperatures from -20°C (-4°F) to +40°C (+104°F). The system is designed to have a secondary driver with relay to immediately detect AC power loss to power luminaire for a minimum of 90 minutes from the time power is lost. Available with 120-277V, or 'UNV' only.

Controls

0-10V Dimming Control Options

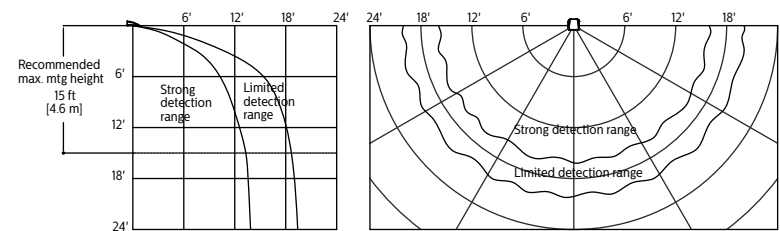
DLEA: Access to 0-10V dimming leads supplied through the yoke of the luminaire (for secondary dimming controls by others). Cannot be used with other control options.

BL50L2/BL50L3: Motion Response module is mounted integral to luminaire factory pre-programmed to 50% dimming when not ordered with other control options. BL50Lx options are set/operate in the following fashion: The motion sensor is set to a constant 50%. When motion is detected by the PIR sensor, the luminaire returns to full power/light output. Dimming on low is factory set to 50% with 5 minutes default in "full power" prior to dimming back to low. When no motion is detected for 5 minutes, the motion response system

reduces the wattage by 50%, to 50% of the normal constant wattage reducing the light level. Other dimming settings can be provided if different dimming levels are required. Contact technical support for details.

Infrared Motion Response Lenses (BL50L2/BL50L3): Lens #2 is designed for mounting heights 8' to 15'. Lens #3 is designed for higher mounting heights up to 20' with a 40' diameter coverage area.

Microwave Motion Response (BL30MW): Motion response luminaires include a high frequency microwave sensor, 5.8GHz +/- 75MHz microwave ISM continuous wave band with 360° coverage area, <0.5 mW transmitting power and <1 W standby power. Factory programmed settings dim fixture to 30% with time delay of 5 minutes with no stand-by period. When motion is detected, the luminaire returns to 100% full light output and will remain on full power for 5 minutes.



Field Adjustable Wattage Selector (FAWS): Luminaire equipped with the ability to manually adjust the wattage in the field to reduce total luminaire lumen output and light levels. Comes pre-set to the highest of 10 output positions. Consult factory for specific dimming settings for each position.

0-10V Lighting Control Options

Button Photocontrol (PCB): Button style design for internal luminaires

FAWS Position	Percent of Typical Lumen Output	FAWS Position	Percent of Typical Lumen Output
1	25%	6	80%
2	50%	7	85%
3	55%	8	90%
4	65%	9	95%
5	75%	10	100%

Note: Typical value accuracy +/- 5%

mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4Fc of ambient light.

Twist-Lock Receptacle (TLR5/TLR7/ TLRPC): TLR options come with 5 pin or with 7 pins connected to 0-10V driver and not all pins will be connected. Dimming Receptacle Type B (5-pin) and Type D-24 (7-pin) in accordance to ANSI C136.41. Can be used with third-party control system. Receptacle located on top of luminaire housing. When specified with receptacle and photoelectric cell (TLRPC), 7-pin receptacle is supplier and voltage must be specified. When ordering Twist-lock receptacle (TLR5 or TLR7), photocell or shunting cap is not included. If Twistlock receptacle option is ordered with Dimming Control option, then dimming leads from driver will not be connected to TLR but consumed by selected device. Devices installed to NEMA twist-lock Receptacle must be IPX6 rated.

Sensor Ready(SR)/DALI Control Options

Automatic Profile Dimming (CS/CM/CE/CA): Standard dimming profiles provide flexibility towards energy savings goals while optimizing light levels during specific dark hours. Dimming profiles include two dimming settings including dim to 30% or 50% of the total lumen output. When used in combination with not programmed motion response it overrides the controller's schedule when motion is detected. After 5 minutes with no motion, it will return to the automatic dimming profile schedule. Automatic dimming profile scheduled with the following settings:

- **CS50/CS30:** Security for 7 hours night duration (Ex., 11 PM – 6 AM)
- **CM50/CM30:** Median for 8 hours night duration (Ex., 10 PM – 6 AM)

All above profiles are calculated from mid point of the night. Dimming is set for 6 hours after the mid point and 1 or 2 hours before depending of the duration of dimming. Time clock or photocell is required for on/off functionality to allow for midpoint calculation. Cannot be used with other dimming control options.

P20 PureForm LED small round

Specifications (cont'd)

Sensor Ready Zhaga Socket Connector (SRDR): Product is D4i Certified and equipped with Sensor Ready drivers connected to 4-pin Zhaga Book 18 compliant receptacle designed for sensor and other control system applications. Receptacle is rated IP66 assembly in a compact design that provides a sealed electrical interface and rated UV resistance, mounted on underside of the luminaire, protective dust cap included. When a controller not provided by Signify is used with Sensor Ready Zhaga socket connector, the controller must be certified to work with the Xitanium SR LED drivers as part of the SR certified program. SRDR can be used with NEMA 7-pin twist lock receptacle, which is mounted on top of the luminaire. D4i certification validates compliance with specifications for data exchange in connected lighting systems, ensuring interoperability, compatibility, and efficient operation. It also assures customers that the device meets industry standards.

Outdoor Interact:

Scalable connected sensor with integral occupancy and daylight sensing, supports wireless mesh connectivity. Sensor works in the Foundation mode when configured without a gateway or in an Interact Advanced mode if a compatible gateway (can be added later) is used. Interact offers an app, a portal and a broad portfolio of Interact ready Indoor and Outdoor luminaires, lamps and retrofit kits all working on the same system. Startup is implemented via Interact Pro App (available in iOS® or Android®) and Bluetooth® connectivity. The app provides flexibility to choose between a gateway or non gateway mode for setup. Setup with the gateway requires wired Internet access to the gateway. Prepare project configuration steps remotely and use IRT9015 remote accessory (ordered separately) or the App on-site to identify and group devices together. WIAP includes SR driver and SR receptacle. Daylight harvesting supported through dimming - activated via the Interact app. Sensors are available in black or white finish and high or low mounting height lenses. IP66 rated.

For more information on Interact visit:

www.interact-lighting.com/interactproscalablesystem

SR/DALI Lighting Control Options

Button Photocontrol (PCB): Button style design for internal luminaires mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4Fc of ambient light.

Twist-Lock Receptacle (TR5/TR7/ TLP): TLR5 includes with 5 pin (Type B) receptacle connected to SR/DALI driver all applicable connections made to driver and is not D4i compliant. TR7 includes (Type D-24) connected to SR/ DALI driver with all leads connected for use of 3rd party control systems. Receptacles are in accordance to ANSI C136.41. Receptacle located on top of luminaire housing. When specified with receptacle and photoelectric cell (TRPC), 7-pin receptacle is supplied and voltage must be specified. When ordering Twist-lock receptacle (TR5 or TR7), photocell or shorting cap is not included.

Listings

UL/cUL wet location listed to the UL 1598 standard, suitable for use in ambient temperatures from -40° to 40°C (-40° to 104°F). Most PureForm P20 comfort configurations are qualified under Standard DesignLights Consortium® category. Consult DLC Qualified Products list to confirm your specific luminaire selection is approved. CCTs 3000K and warmer are Dark Sky Approved.

Finish

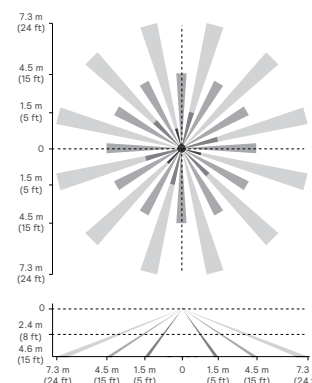
Each standard color luminaire receives a fade and abrasion resistant, electrostatically applied, thermally cured, triglycidal isocyanurate (TGIC) textured polyester powdercoat finish. The surface treatment achieves a minimum of 1000 hours for salt spray resistant finish in accordance with testing performed and per ASTM B117 standard. Standard colors include bronze (BZ), black (BK), white (WH), dark gray (DG), and medium gray (MG). Consult factory for specs on optional or custom colors.

Warranty

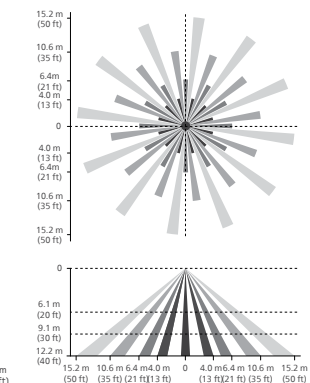
PureForm luminaires feature a 5-year limited warranty.

See signify.com/warranties for complete details and exclusions.

LW low sensor



HW high sensor



Note: The beam patterns shown are intended solely as a general guide and are not to scale. Sensing capabilities and coverage area depend on many factors including the size, speed and direction of travel of persons and vehicles; sensor mounting height; environmental and site conditions; etc.

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THE BRICKYARD - HANOVER STREET
LEBANON, NH
S5

Gardco PureForm LED area small round features a sleek, low profile design and is available with two light engines. ComfortEdge optics provide a unique and lower glare lighting solution designed to enhance visual comfort for pedestrian applications, while precision optics maximize efficiency and spacing. PureForm P20 is available with multiple optical distributions with output up to 17,000 lumens. A full range of control options provides additional energy savings.

Project: _____
Location: _____
Cat.No: _____
Type: _____
Lumens: _____ Qty: _____
Notes: _____

Ordering guide

Example: P20-P-A05-740-T3M-HIS-AR1-UNV-DALI-WIAPHW-MG

Prefix	Catalog Code	Lumens	CCT/CRI	Distribution	Shielding	Mounting	Voltage
P20	C	A05	830	T5		AR1	UNV
P20 PureForm area small round	P Precision optics	A01 ⁴ 2500 A02 ⁴ 3500 A03 ⁴ 5000 A04 7000 A05 9000 A06 11000 A07 13500 A08 16000 A09 17000 A10 19000	730 70CRI, 3000K 740 70CRI, 4000K 750 70CRI, 5000K 830 80CRI, 3000K 840 80CRI, 4000K 827 ¹ 80CRI, 2700K (ETOr)	AFR Auto front row AFR-90 AFR rotated left 90° AFR-270 AFR rotated left 270° T2M Type 2 Medium T2M-90 T2M rotated left 90° T2M-270 T2M rotated left 270° T3M Type 3 Medium T3M-90 T3M rotated left 90° T3M-270 T3M rotated left 270° T4M Type 4 Medium T4M-90 T4M rotated left 90° T4M-270 T4M rotated left 270°	T4W Type 4 Wide T4W-90 T4W rotated left 90° T4W-270 T4W rotated left 270° T5N Type 5 Narrow T5M Type 5 Medium T5W Type 5 Wide LCL LEED corner optic left LCR LEED corner optic right BLC Back light control BLC-90 BLC rotated left 90° BLC-270 BLC rotated left 270°	None - Internal house side shield (clip-on) HIS ²	AR1 ¹² Arm mount (standard) The following mounting kits must be ordered separately (see accessories) JNV 120-277V 480 480V HVV 374-480V
	C Comfort optics	A01 ⁴ 2000 A02 3500 A03 5000 A04 7000 A05 9000 A06 11000 A07 13500 A08 ¹¹ 16000 A09 ¹¹ 17000	830 80CRI, 3000K 840 80CRI, 4000K 827 ¹ 80CRI, 2700K (ETOr) 835 ¹ 80CRI, 3500K (ETOr) 750 ¹ 70CRI, 5000K (ETOr)	T2 Type 2 T3 Type 3 T4 Type 4 T5 Type 5	None - Luminaire drilled for external house shield (must be accompanied by P20-EHS-BK accessory, ordered separately) EHS	RAM Retrofit arm mount kit WAL Wall mount	
Driver type	Dimming Controls (only one may be selected)			Lighting controls ⁸ (only one may be selected)		Emergency	Finish
010V							FINISH
0-10V					None - Emergency battery backup (0°C to +40°C/32°F to +104°F) EM ^{4,12}		Standard textured finish
010V 0-10V	None DLEA	- Dimming leads externally accessible (controls by others)	None PCB ^{4,10} Photocontrol button TLR5 5-pin twist lock w/ 0-10v driver TLR7 7-pin twist lock w/ 0-10v driver (non-D4i) TLRPC ^{4,10} 7-pin twist lock w/ 0-10v driver (non-D4i) & on/off photocell		EMC ^{4,7,9,13} Emergency battery pack, cold rated (-20°C to +40°C/-4°F to +104°F)		BK Black WH White BZ Bronze DG Dark gray MG Medium gray
					Fusing		
DALI					None - Single Fuse (120V, 277V, or 347V) F1 ¹⁰		Customer specified
DALI SR/ DALI		None CS50 ^{5,6} Median 50 % dimming, 8 hours CM50 ^{5,6} Security 30 % dimming, 7 hours CS30 ^{5,6} Median 30 % dimming, 8 hours CM30 ^{5,6} SR driver connected to Zhaga socket (D4i) SRDR ^{5,6} Wireless Interact outdoor low mounting (7-15'), white housing WIAPLW ^{5,6} Wireless Interact outdoor low mounting (7-15'), black housing WIAPLB ^{5,6} Wireless Interact outdoor low mounting (15-40'), white housing WIAPHW ^{5,6} Wireless Interact outdoor low mounting (15-40'), black housing	None PCB ^{4,10} Photocontrol button TR5 ^{5,6} 5-pin twist lock SR/DALI driver TR7 ^{5,6} 7-pin twist lock SR/DALI driver (D4i) TLP ^{4,6,10} & on/off photocell		F2 ^{10,11} Double Fuse (208V, 240V, or 480V) F3 ^{10,11} Double Fuse Canadian double pole (208V, 240V, or 480V)		OC Optional color (specify optional color or RAL, contact factory) SC Special color (must supply color chip, requires factory quote)
					Surge Protection		
					None SP1 Surge Protector 10kV / 10kA (standard) SP2 Surge Protector 20kV/ 10kA (option)		

- Extended lead times apply. Contact factory for details.
- Available with Area Optics Lumen packages A09 and below only. Not allowed with Comfort optics
- Available with Comfort Optics only at 120-347V. Not allowed with Area Optics
- Not available at 347-480V(HVV)
- Not available at 347-480V(HVV) for Pixelated (P-Axx) optic lumen packages A01-A05 and Comfort (C-Axx) optic lumen packages A01-A09
- Not available at 120-277V(UNV) for Pixelated (P-Axx) optic lumen packages A01-A02 and Comfort (C-Axx) optic lumen packages A01-A02
- Not available with Comfort (C-Axx) optic lumen packages A07-A09
- If selected with Dimming control, DIM leads from receptacle will not be connected to driver
- Available only with Comfort Optics
- Must specify input voltage. UNV and HVU not valid.
- Not available with Emergency options
- Mounts to a 4-5" OD round pole with adapter included for square poles.
- Not available with BL50LX, BL50MW, SRDR, OMS, Or WIAP options due to mechanical conflict

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P20 PureForm LED small round

PureForm P20 Accessories (ordered separately, field installed)

Mounting Accessories

P20-RAM-G2-(F) Retrofit Arm mount kit
P20-WS-G2-(F) Wall mount with surface conduit rear entry permitted
P20-EHS-BK ¹ External House Side Shield, Black

(F) = Specify finish

1. EHS must also be selected in the luminaire catalog code and ships separately.

PureForm P20 Precision optics lumen values

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A01	14	AFR	2,875	B1-U0-G1	194	3,035	B1-U0-G1	205	3,035	B1-U0-G1	205	2,544	B1-U0-G1	172	2,710	B1-U0-G1	183
		T2M	2,775	B1-U0-G1	188	2,930	B1-U0-G1	198	2,930	B1-U0-G1	198	2,456	B1-U0-G1	166	2,616	B1-U0-G1	177
		T3M	2,780	B1-U0-G1	188	2,934	B1-U0-G1	198	2,934	B1-U0-G1	198	2,460	B1-U0-G1	166	2,620	B1-U0-G1	177
		T4M	2,744	B1-U0-G1	185	2,897	B1-U0-G1	196	2,897	B1-U0-G1	196	2,429	B1-U0-G1	164	2,587	B1-U0-G1	175
		T4W	2,638	B1-U0-G1	178	2,785	B1-U0-G1	188	2,785	B1-U0-G1	188	2,334	B1-U0-G1	158	2,486	B1-U0-G1	168
		T5M	2,830	B2-U0-G1	191	2,988	B2-U0-G1	202	2,988	B2-U0-G1	202	2,504	B2-U0-G1	169	2,667	B2-U0-G1	180
		T5N	2,849	B2-U0-G0	193	3,008	B2-U0-G0	203	3,008	B2-U0-G0	203	2,521	B2-U0-G0	170	2,685	B2-U0-G0	181
		T5W	2,671	B2-U0-G1	181	2,820	B2-U0-G1	191	2,820	B2-U0-G1	191	2,364	B2-U0-G1	160	2,517	B2-U0-G1	170
		BLC	1,908	B0-U0-G1	129	2,014	B0-U0-G1	136	2,014	B0-U0-G1	136	1,688	B0-U0-G1	114	1,798	B0-U0-G1	122
		LCL/LCR	1,506	B0-U0-G1	102	1,589	B0-U0-G1	107	1,589	B0-U0-G1	107	1,332	B0-U0-G1	90	1,419	B0-U0-G1	96
A02	21	AFR	4,094	B1-U0-G1	197	4,323	B1-U0-G1	208	4,323	B1-U0-G1	208	3,623	B1-U0-G1	174	3,859	B1-U0-G1	186
		T2M	3,952	B1-U0-G1	190	4,173	B1-U0-G1	201	4,173	B1-U0-G1	201	3,498	B1-U0-G1	168	3,725	B1-U0-G1	179
		T3M	3,958	B1-U0-G1	190	4,179	B1-U0-G1	201	4,179	B1-U0-G1	201	3,503	B1-U0-G1	168	3,731	B1-U0-G1	179
		T4M	3,908	B1-U0-G1	188	4,126	B1-U0-G1	198	4,126	B1-U0-G1	198	3,459	B1-U0-G1	166	3,683	B1-U0-G1	177
		T4W	3,756	B1-U0-G2	181	3,966	B1-U0-G2	191	3,966	B1-U0-G2	191	3,324	B1-U0-G2	160	3,540	B1-U0-G2	170
		T5M	4,030	B2-U0-G1	194	4,255	B2-U0-G1	205	4,255	B2-U0-G1	205	3,567	B2-U0-G1	172	3,798	B2-U0-G1	183
		T5N	4,057	B2-U0-G1	195	4,283	B2-U0-G1	206	4,283	B2-U0-G1	206	3,590	B2-U0-G1	173	3,824	B2-U0-G1	184
		T5W	3,804	B3-U0-G2	183	4,016	B3-U0-G2	193	4,016	B3-U0-G2	193	3,366	B2-U0-G1	162	3,585	B2-U0-G2	172
		BLC	2,717	B0-U0-G1	131	2,869	B0-U0-G1	138	2,869	B0-U0-G1	138	2,405	B0-U0-G1	116	2,561	B0-U0-G1	123
		LCL/LCR	2,144	B1-U0-G1	103	2,264	B1-U0-G1	109	2,264	B1-U0-G1	109	1,897	B0-U0-G1	91	2,021	B1-U0-G1	97
A03	31	AFR	5,696	B2-U0-G1	187	6,013	B2-U0-G2	197	6,013	B2-U0-G2	197	5,040	B1-U0-G1	165	5,368	B1-U0-G1	176
		T2M	5,498	B1-U0-G1	180	5,805	B1-U0-G2	190	5,805	B1-U0-G2	190	4,866	B1-U0-G1	159	5,182	B1-U0-G1	170
		T3M	5,507	B1-U0-G2	180	5,814	B1-U0-G2	190	5,814	B1-U0-G2	190	4,873	B1-U0-G1	160	5,190	B1-U0-G1	170
		T4M	5,437	B1-U0-G2	178	5,740	B1-U0-G2	188	5,740	B1-U0-G2	188	4,812	B1-U0-G1	158	5,124	B1-U0-G1	168
		T4W	5,226	B1-U0-G2	171	5,517	B1-U0-G2	181	5,517	B1-U0-G2	181	4,625	B1-U0-G2	152	4,925	B1-U0-G2	161
		T5M	5,607	B3-U0-G1	184	5,919	B3-U0-G1	194	5,919	B3-U0-G1	194	4,962	B3-U0-G1	163	5,284	B3-U0-G1	173
		T5N	5,644	B3-U0-G1	185	5,959	B3-U0-G1	195	5,959	B3-U0-G1	195	4,995	B2-U0-G1	164	5,319	B3-U0-G1	174
		T5W	5,292	B3-U0-G2	173	5,587	B3-U0-G2	183	5,587	B3-U0-G2	183	4,683	B3-U0-G2	153	4,988	B3-U0-G2	163
		BLC	3,780	B0-U0-G1	124	3,991	B0-U0-G1	131	3,991	B0-U0-G1	131	3,345	B0-U0-G1	110	3,562	B0-U0-G1	117
		LCL/LCR	2,983	B1-U0-G1	98	3,149	B1-U0-G1	103	3,149	B1-U0-G1	103	2,640	B1-U0-G1	87	2,811	B1-U0-G1	92
A04	44	AFR	8,079	B2-U0-G2	188	8,529	B2-U0-G2	198	8,529	B2-U0-G2	198	7,149	B2-U0-G2	166	7,614	B2-U0-G2	177
		T2M	7,799	B2-U0-G2	181	8,234	B2-U0-G2	192	8,234	B2-U0-G2	192	6,902	B2-U0-G2	161	7,350	B2-U0-G2	171
		T3M	7,811	B2-U0-G2	182	8,246	B2-U0-G2	192	8,246	B2-U0-G2	192	6,912	B2-U0-G2	161	7,361	B2-U0-G2	171
		T4M	7,712	B1-U0-G2	179	8,142	B1-U0-G2	189	8,142	B1-U0-G2	189	6,825	B1-U0-G2	159	7,268	B1-U0-G2	169
		T4W	7,412	B1-U0-G2	172	7,825	B2-U0-G3	182	7,825	B2-U0-G3	182	6,559	B1-U0-G2	153	6,986	B1-U0-G2	163
		T5M	7,953	B3-U0-G1	185	8,396	B3-U0-G2	195	8,396	B3-U0-G2	195	7,038	B3-U0-G1	164	7,495	B3-U0-G1	174
		T5N	8,005	B3-U0-G1	186	8,452	B3-U0-G1	197	8,452	B3-U0-G1	197	7,084	B3-U0-G1	165	7,545	B3-U0-G1	176
		T5W	7,506	B3-U0-G2	175	7,925	B3-U0-G2	184	7,925	B3-U0-G2	184	6,643	B3-U0-G2	155	7,074	B3-U0-G2	165
		BLC	5,361	B0-U0-G2	125	5,660	B0-U0-G2	132	5,660	B0-U0-G2	132	4,745	B0-U0-G2	110	5,053	B0-U0-G2	118
		LCL/LCR	4,231	B1-U0-G1	98	4,467	B1-U0-G1	104	4,467	B1-U0-G1	104	3,744	B1-U0-G1	87	3,988	B1-U0-G1	93

P20 PureForm LED small round

PureForm P20 Precision optics lumen values

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A05	53	AFR	9,573	B2-U0-G2	178	10,107	B2-U0-G2	188	10,107	B2-U0-G2	188	8,472	B2-U0-G2	157	9,022	B2-U0-G2	167
		T2M	9,241	B2-U0-G2	171	9,756	B2-U0-G2	181	9,756	B2-U0-G2	181	8,178	B2-U0-G2	152	8,710	B2-U0-G2	162
		T3M	9,255	B2-U0-G2	172	9,771	B2-U0-G2	181	9,771	B2-U0-G2	181	8,191	B2-U0-G2	152	8,723	B2-U0-G2	162
		T4M	9,138	B1-U0-G2	170	9,648	B1-U0-G2	179	9,648	B1-U0-G2	179	8,087	B1-U0-G2	150	8,613	B1-U0-G2	160
		T4W	8,783	B2-U0-G3	163	9,273	B2-U0-G3	172	9,273	B2-U0-G3	172	7,773	B2-U0-G3	144	8,278	B2-U0-G3	154
		T5M	9,423	B3-U0-G2	175	9,949	B3-U0-G2	185	9,949	B3-U0-G2	185	8,339	B3-U0-G2	155	8,881	B3-U0-G2	165
		T5N	9,486	B3-U0-G1	176	10,015	B3-U0-G2	186	10,015	B3-U0-G2	186	8,395	B3-U0-G1	156	8,940	B3-U0-G1	166
		T5W	8,895	B3-U0-G3	165	9,390	B3-U0-G3	174	9,390	B3-U0-G3	174	7,871	B3-U0-G2	146	8,383	B3-U0-G3	156
		BLC	6,353	B0-U0-G2	118	6,707	B0-U0-G2	124	6,707	B0-U0-G2	124	5,622	B0-U0-G2	104	5,988	B0-U0-G2	111
		LCL/LCR	5,013	B1-U0-G1	93	5,293	B1-U0-G1	98	5,293	B1-U0-G1	98	4,437	B1-U0-G1	82	4,725	B1-U0-G1	88
A06	69	AFR	11,828	B3-U0-G2	170	12,487	B3-U0-G3	180	12,487	B3-U0-G3	180	10,467	B2-U0-G2	151	11,148	B3-U0-G2	161
		T2M	11,418	B2-U0-G2	164	12,054	B3-U0-G3	174	12,054	B3-U0-G3	174	10,104	B2-U0-G2	146	10,761	B2-U0-G2	155
		T3M	11,435	B2-U0-G2	165	12,073	B2-U0-G3	174	12,073	B2-U0-G3	174	10,120	B2-U0-G2	146	10,778	B2-U0-G2	155
		T4M	11,291	B2-U0-G2	163	11,920	B2-U0-G2	172	11,920	B2-U0-G2	172	9,992	B1-U0-G2	144	10,641	B2-U0-G2	153
		T4W	10,852	B2-U0-G3	156	11,457	B2-U0-G3	165	11,457	B2-U0-G3	165	9,603	B2-U0-G3	138	10,228	B2-U0-G3	147
		T5M	11,643	B4-U0-G2	168	12,292	B4-U0-G2	177	12,292	B4-U0-G2	177	10,304	B3-U0-G2	148	10,973	B3-U0-G2	158
		T5N	11,721	B3-U0-G2	169	12,374	B3-U0-G2	178	12,374	B3-U0-G2	178	10,372	B3-U0-G2	149	11,046	B3-U0-G2	159
		T5W	10,990	B4-U0-G3	158	11,602	B4-U0-G3	167	11,602	B4-U0-G3	167	9,725	B4-U0-G3	140	10,357	B4-U0-G3	149
		BLC	7,849	B0-U0-G2	113	8,287	B0-U0-G2	119	8,287	B0-U0-G2	119	6,946	B0-U0-G2	100	7,398	B0-U0-G2	107
		LCL/LCR	6,194	B1-U0-G2	89	6,540	B1-U0-G2	94	6,540	B1-U0-G2	94	5,482	B1-U0-G2	79	5,838	B1-U0-G2	84
A07	89	AFR	14,894	B3-U0-G3	168	15,724	B3-U0-G3	177	15,724	B3-U0-G3	177	13,181	B3-U0-G3	148	14,037	B3-U0-G3	158
		T2M	14,378	B3-U0-G3	162	15,179	B3-U0-G3	171	15,179	B3-U0-G3	171	12,724	B3-U0-G3	143	13,551	B3-U0-G3	152
		T3M	14,400	B3-U0-G3	162	15,203	B3-U0-G3	171	15,203	B3-U0-G3	171	12,743	B3-U0-G3	143	13,572	B3-U0-G3	153
		T4M	14,218	B2-U0-G3	160	15,010	B2-U0-G3	169	15,010	B2-U0-G3	169	12,582	B2-U0-G3	142	13,400	B2-U0-G3	151
		T4W	13,665	B2-U0-G3	154	14,427	B3-U0-G3	162	14,427	B3-U0-G3	162	12,093	B2-U0-G3	136	12,879	B2-U0-G3	145
		T5M	14,661	B4-U0-G2	165	15,479	B4-U0-G2	174	15,479	B4-U0-G2	174	12,974	B4-U0-G2	146	13,818	B4-U0-G2	155
		T5N	14,759	B4-U0-G2	166	15,582	B4-U0-G2	175	15,582	B4-U0-G2	175	13,061	B3-U0-G2	147	13,910	B4-U0-G2	156
		T5W	13,838	B4-U0-G3	156	14,610	B4-U0-G3	164	14,610	B4-U0-G3	164	12,246	B4-U0-G3	138	13,042	B4-U0-G3	147
		BLC	9,884	B1-U0-G2	111	10,435	B1-U0-G2	117	10,435	B1-U0-G2	117	8,747	B1-U0-G2	98	9,316	B1-U0-G2	105
		LCL/LCR	7,800	B1-U0-G2	88	8,235	B1-U0-G2	93	8,235	B1-U0-G2	93	6,903	B1-U0-G2	78	7,351	B1-U0-G2	83
A08	105	AFR	17,449	B3-U0-G3	166	18,422	B3-U0-G3	175	18,422	B3-U0-G3	175	15,442	B3-U0-G3	147	16,445	B3-U0-G3	156
		T2M	16,844	B3-U0-G3	160	17,783	B3-U0-G3	169	17,783	B3-U0-G3	169	14,906	B3-U0-G3	142	15,875	B3-U0-G3	151
		T3M	16,870	B3-U0-G3	160	17,811	B3-U0-G3	169	17,811	B3-U0-G3	169	14,929	B3-U0-G3	142	15,900	B3-U0-G3	151
		T4M	16,657	B2-U0-G3	158	17,585	B2-U0-G3	167	17,585	B2-U0-G3	167	14,740	B2-U0-G3	140	15,699	B2-U0-G3	149
		T4W	16,009	B3-U0-G3	152	16,902	B3-U0-G4	161	16,902	B3-U0-G4	161	14,168	B2-U0-G3	135	15,088	B3-U0-G3	144
		T5M	17,176	B4-U0-G2	163	18,134	B4-U0-G2	172	18,134	B4-U0-G2	172	15,200	B4-U0-G2	145	16,188	B4-U0-G2	154
		T5N	17,291	B4-U0-G2	164	18,255	B4-U0-G2	174	18,255	B4-U0-G2	174	15,301	B4-U0-G2	146	16,296	B4-U0-G2	155
		T5W	16,212	B4-U0-G3	154	17,116	B4-U0-G3	163	17,116	B4-U0-G3	163	14,347	B4-U0-G3	136	15,280	B4-U0-G3	145
		BLC	11,580	B1-U0-G2	110	12,225	B1-U0-G2	116	12,225	B1-U0-G2	116	10,248	B1-U0-G2	97	10,914	B1-U0-G2	104
		LCL/LCR	9,138	B1-U0-G2	87	9,647	B2-U0-G2	92	9,647	B2-U0-G2	92	8,087	B1-U0-G2	77	8,612	B1-U0-G2	82

P20 PureForm LED small round

PureForm P20 Precision optics lumen values

Perf. Package	System Watts	Dist. Type	70 CRI			70 CRI			70 CRI			80 CRI			80 CRI		
			3000K			4000K			5000K			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A09	112	AFR	18,289	B3-U0-G3	164	19,309	B3-U0-G3	173	19,309	B3-U0-G3	173	16,185	B3-U0-G3	145	17,237	B3-U0-G3	154
		T2M	17,655	B3-U0-G3	158	18,639	B3-U0-G3	167	18,639	B3-U0-G3	167	15,624	B3-U0-G3	140	16,640	B3-U0-G3	149
		T3M	17,682	B3-U0-G3	158	18,668	B3-U0-G3	167	18,668	B3-U0-G3	167	15,648	B3-U0-G3	140	16,665	B3-U0-G3	149
		T4M	17,459	B2-U0-G3	156	18,432	B2-U0-G3	165	18,432	B2-U0-G3	165	15,450	B2-U0-G3	138	16,454	B2-U0-G3	147
		T4W	16,780	B3-U0-G4	150	17,716	B3-U0-G4	159	17,716	B3-U0-G4	159	14,850	B3-U0-G3	133	15,815	B3-U0-G3	142
		T5M	18,003	B4-U0-G2	161	19,007	B4-U0-G2	170	19,007	B4-U0-G2	170	15,932	B4-U0-G2	143	16,968	B4-U0-G2	152
		T5N	18,123	B4-U0-G2	162	19,133	B4-U0-G2	171	19,133	B4-U0-G2	171	16,038	B4-U0-G2	144	17,081	B4-U0-G2	153
		T5W	16,993	B4-U0-G3	152	17,940	B4-U0-G4	161	17,940	B4-U0-G4	161	15,038	B4-U0-G3	135	16,016	B4-U0-G3	143
		BLC	12,137	B1-U0-G3	109	12,814	B1-U0-G3	115	12,814	B1-U0-G3	115	10,741	B1-U0-G2	96	11,439	B1-U0-G2	102
LCL/LCR	9,578	B2-U0-G2	86	10,112	B2-U0-G2	90	10,112	B2-U0-G2	90	8,476	B1-U0-G2	76	9,027	B1-U0-G2	81		
A10	121	AFR	20,004	B3-U0-G3	165	21,119	B3-U0-G3	174	21,119	B3-U0-G3	174	17,703	B3-U0-G3	146	18,853	B3-U0-G3	155
		T2M	19,311	B3-U0-G3	159	20,387	B3-U0-G3	168	20,387	B3-U0-G3	168	17,089	B3-U0-G3	141	18,200	B3-U0-G3	150
		T3M	19,340	B3-U0-G3	159	20,419	B3-U0-G3	168	20,419	B3-U0-G3	168	17,115	B3-U0-G3	141	18,228	B3-U0-G3	150
		T4M	19,096	B2-U0-G3	157	20,160	B2-U0-G3	166	20,160	B2-U0-G3	166	16,899	B2-U0-G3	139	17,997	B2-U0-G3	148
		T4W	18,354	B3-U0-G4	151	19,377	B3-U0-G4	160	19,377	B3-U0-G4	160	16,242	B3-U0-G4	134	17,298	B3-U0-G4	143
		T5M	19,691	B4-U0-G2	162	20,789	B4-U0-G2	171	20,789	B4-U0-G2	171	17,426	B4-U0-G2	144	18,559	B4-U0-G2	153
		T5N	19,822	B4-U0-G2	163	20,928	B4-U0-G2	172	20,928	B4-U0-G2	172	17,542	B4-U0-G2	145	18,682	B4-U0-G2	154
		T5W	18,587	B5-U0-G4	153	19,623	B5-U0-G4	162	19,623	B5-U0-G4	162	16,448	B4-U0-G3	136	17,517	B4-U0-G3	144
		BLC	13,276	B1-U0-G3	109	14,016	B1-U0-G3	116	14,016	B1-U0-G3	116	11,748	B1-U0-G2	97	12,512	B1-U0-G3	103
		LCL/LCR	10,476	B2-U0-G2	86	11,060	B2-U0-G2	91	11,060	B2-U0-G2	91	9,271	B1-U0-G2	76	9,873	B2-U0-G2	81

PureForm P20 Comfort optics lumen values

Perf. Package	System Watts	Dist. Type	80 CRI			80 CRI		
			3000K			4000K		
			Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
A01	13	T2	1,596	B1-U0-G1	123	1,708	B1-U0-G1	131
		T3	1,520	B1-U0-G1	117	1,626	B1-U0-G1	125
		T4	1,683	B1-U0-G1	129	1,801	B1-U0-G1	139
		T5	1,496	B1-U0-G1	115	1,601	B1-U0-G1	123
A02	23	T2	3,053	B1-U0-G1	133	3,267	B1-U0-G1	142
		T3	2,907	B1-U0-G1	126	3,111	B1-U0-G1	135
		T4	3,219	B1-U0-G2	140	3,444	B1-U0-G2	150
		T5	2,862	B2-U0-G1	124	3,062	B2-U0-G1	133
A03	35	T2	4,256	B2-U0-G2	122	4,553	B2-U0-G2	130
		T3	4,052	B2-U0-G2	116	4,336	B2-U0-G2	124
		T4	4,487	B2-U0-G2	128	4,801	B2-U0-G2	137
		T5	3,989	B3-U0-G2	114	4,268	B3-U0-G2	122
A04	50	T2	5,999	B2-U0-G2	120	6,419	B2-U0-G2	128
		T3	5,712	B2-U0-G2	114	6,112	B2-U0-G2	122
		T4	6,325	B2-U0-G2	127	6,768	B2-U0-G2	135
		T5	5,623	B3-U0-G2	112	6,016	B3-U0-G2	120
A05	67	T2	7,713	B3-U0-G3	115	8,253	B3-U0-G3	123
		T3	7,344	B3-U0-G3	110	7,858	B3-U0-G3	117
		T4	8,132	B3-U0-G3	121	8,702	B3-U0-G3	130
		T5	7,229	B3-U0-G3	108	7,735	B3-U0-G3	115
A06	82	T2	9,159	B3-U0-G3	112	9,800	B3-U0-G3	120
		T3	8,721	B3-U0-G3	106	9,332	B3-U0-G3	114
		T4	9,657	B3-U0-G3	118	10,333	B3-U0-G3	126
		T5	8,585	B3-U0-G3	105	9,186	B3-U0-G3	112
A07	107	T2	11,462	B3-U0-G3	107	12,264	B3-U0-G3	115
		T3	10,914	B3-U0-G3	102	11,678	B3-U0-G3	109
		T4	12,086	B3-U0-G3	113	12,932	B3-U0-G3	121
		T5	10,744	B4-U0-G3	100	11,496	B4-U0-G3	107
A08	137	T2	13,503	B3-U0-G3	99	14,448	B3-U0-G3	105
		T3	12,827	B3-U0-G3	94	13,724	B3-U0-G3	100
		T4	14,237	B3-U0-G3	104	15,234	B3-U0-G3	111
		T5	12,656	B4-U0-G3	92	13,542	B4-U0-G3	99
A09	143	T2	14,569	B3-U0-G3	102	15,589	B3-U0-G3	109
		T3	13,872	B3-U0-G3	97	14,843	B3-U0-G3	104
		T4	15,361	B3-U0-G3	107	16,436	B3-U0-G4	115
		T5	13,655	B4-U0-G3	95	14,611	B4-U0-G3	102

P20 PureForm LED small round

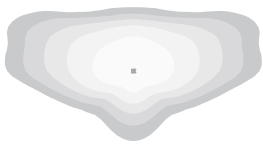
Predicted Lumen Depreciation Data

Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions. L70 is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published L70 hours limited to 6 times actual LED test hours

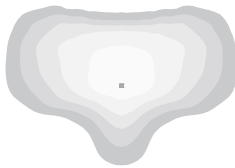
Optic type	Ambient Temperature °C	Calculated L ₇₀ Hours	L ₇₀ reported per TM-21	Lumen Maintenance % at 60,000 hrs
Precision (A01-A09)	25°C	>100,000 hours	>72,000 hours	95.60%
Comfort (P01-P09)	25°C	>100,000 hours	>100,000 hours	89.10%

Precision Optical Distributions

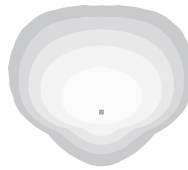
Type 2 Medium



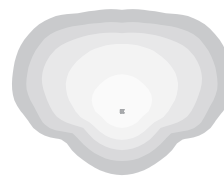
Type 3 Medium



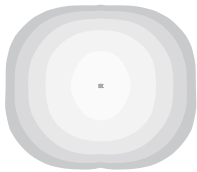
Type 4 Medium



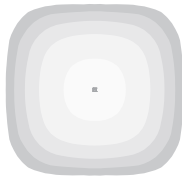
Type 4 Wide



Type 5 Narrow



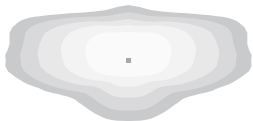
Type 5 Medium



Type 5 Wide



Autofront Row



Back Light Control



LCL



LCR



Comfort Optical Distributions

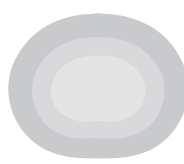
Type 2



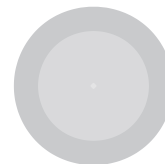
Type 3



Type 4



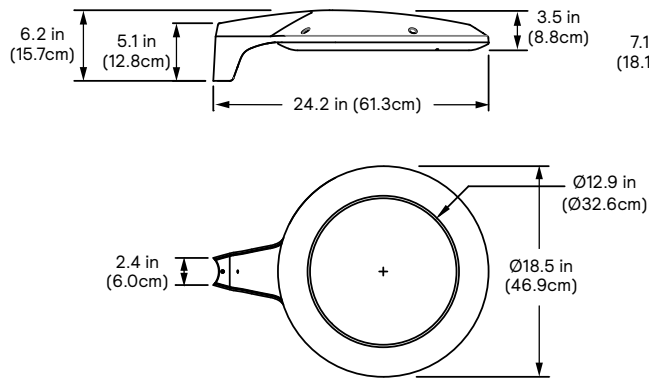
Type 5



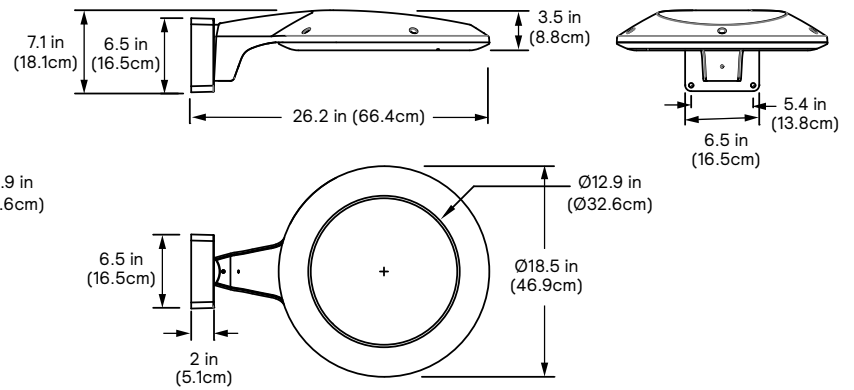
P20 PureForm LED small round

Dimensions

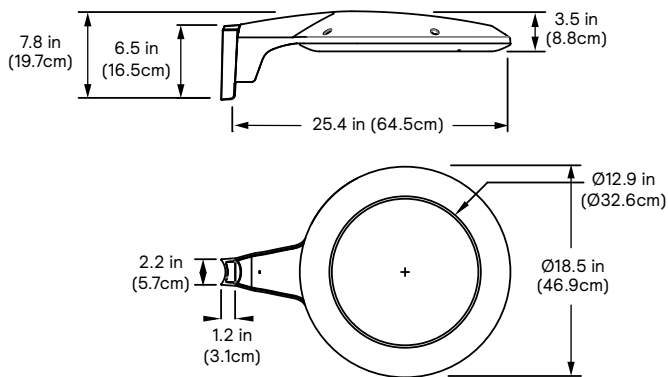
Standard Arm (AR1)



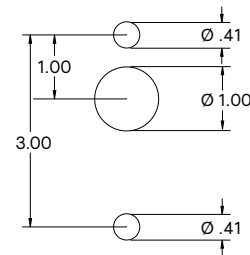
Wall Mount (WAL)



Retrofit Arm (RAM)



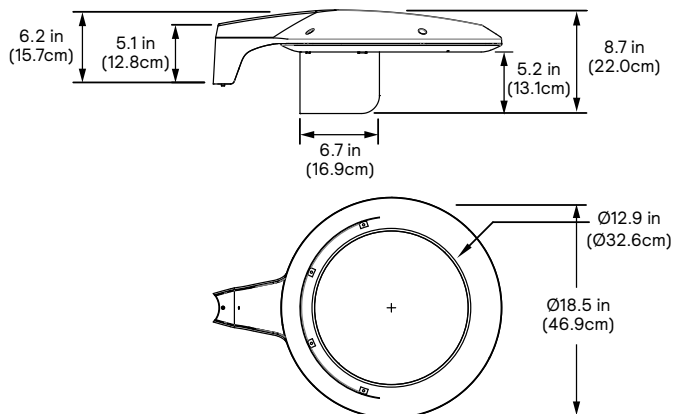
Mounting Hole Pattern



Weight: 18 Lbs (8.0 kg)

EPA: .26ft² (.02m²)

With External House Shield option (EHS)



P20 PureForm LED small round

Specifications

Housing

One-piece cast aluminum housing with integral arm and die cast light engine frame. All die-cast parts are made of low-copper, die-cast aluminum alloy for a high resistance to corrosion. Luminaire housing rated to IP66, tested in accordance to Section 9 of IEC 60598-1.

Vibration resistance

Luminaire is tested and rated Level 2 for Bridge and Overpass application (formerly 3G) cycles conforming to standards set forth by ANSI C136.31-2023. Testing includes vibration to 3G acceleration in three axes, all performed on the same luminaire.

Light engine

Comfort Edge technology provides low-glare, uniform illumination. Composed of LEDs strategically positioned on the edge of the optical plate. Light engine luminous opening size optimized to best achieve a balance between lumen output and optical performance with the need to provide visual comfort. LEDs are mounted directly to the housing to provide heat conduction and ensure maximized LED lifetime and performance. Light engine is RoHS compliant and available in 4 IES distribution options. Standard color temperatures: 3000K +/- 130K, 4000K +/- 130K, 5000K +/- 225K. Minimum CRI of 70. Also available in 2700K and 3500K color temperatures with extended leadtimes. Contact factory for details.

Precision LED Modules are comprised of 40 count LEDs mounted to metal clad printed circuit board and sealed to a polymer optic plate to meet IP66 rating.

Energy saving benefits

System efficacy up to 215 lms/W with significant energy savings over Pulse Start Metal Halide luminaires. Optional control options provide added energy savings during unoccupied periods.

Optical systems

ComfortEdge technology provides a unique and lower perceived glare lighting solution designed to enhance visual comfort for pedestrian applications. Available in IES distribution types 2, 3, 4, and 5 available up to 17,000 lumens.

Precision optics are available in type 2, 3, 4, 5 and Backlight Control (BLC) distributions available. Internal shield option mounts to LED optics to provide additional cutoff, and dedicated BLC optics provide the most stringent cutoff to meet requirements around property lines. Performance tested per LM-79 and TM-15 (IESNA) certifying its photometric performance. Luminaire designed with 0% uplight (UO per IESNA TM-15).

Mounting

Standard luminaire arm mounts to 4" round poles. Can also be used with 5" O.D. poles. Square pole adapter included with every luminaire. PureForm features a retrofit arm kit. When specified with the retrofit arm (RAM) option, PureForm seamlessly simplifies site conversions to LED by eliminating the need for additional pole drilling on most existing poles. RAM will be boxed separately. Also optional are wall mounting accessories.

Emergency Battery Backup (EM)

Emergency battery pack included integral to the luminaire, allowing for a consistent look between emergency and non-emergency luminaires. EM suitable for use in ambient temperature conditions from 0°C (+32°F) to +40°C (+104°F). EMC suitable for use in ambient temperatures from -20°C (-4°F) to +40°C (+104°F). The system is designed to have a secondary driver with relay to immediately detect AC power loss to power luminaire for a minimum of 90 minutes from the time power is lost. Available with 120-277V, or 'UNV' only.

Controls

0-10V Dimming Control Options

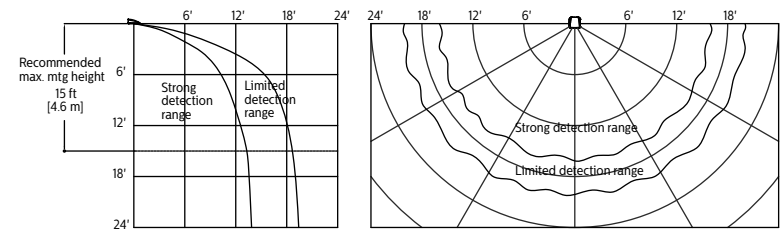
DLEA: Access to 0-10V dimming leads supplied through the yoke of the luminaire (for secondary dimming controls by others). Cannot be used with other control options.

BL50L2/BL50L3: Motion Response module is mounted integral to luminaire factory pre-programmed to 50% dimming when not ordered with other control options. BL50Lx options are set/operate in the following fashion: The motion sensor is set to a constant 50%. When motion is detected by the PIR sensor, the luminaire returns to full power/light output. Dimming on low is factory set to 50% with 5 minutes default in "full power" prior to dimming back to low. When no motion is detected for 5 minutes, the motion response system

reduces the wattage by 50%, to 50% of the normal constant wattage reducing the light level. Other dimming settings can be provided if different dimming levels are required. Contact technical support for details.

Infrared Motion Response Lenses (BL50L2/BL50L3): Lens #2 is designed for mounting heights 8' to 15'. Lens #3 is designed for higher mounting heights up to 20' with a 40' diameter coverage area.

Microwave Motion Response (BL30MW): Motion response luminaires include a high frequency microwave sensor, 5.8GHz +/- 75MHz microwave ISM continuous wave band with 360° coverage area, <0.5 mW transmitting power and <1 W standby power. Factory programmed settings dim fixture to 30% with time delay of 5 minutes with no stand-by period. When motion is detected, the luminaire returns to 100% full light output and will remain on full power for 5 minutes.



Field Adjustable Wattage Selector (FAWS): Luminaire equipped with the ability to manually adjust the wattage in the field to reduce total luminaire lumen output and light levels. Comes pre-set to the highest of 10 output positions. Consult factory for specific dimming settings for each position.

0-10V Lighting Control Options

Button Photocontrol (PCB): Button style design for internal luminaires

FAWS Position	Percent of Typical Lumen Output	FAWS Position	Percent of Typical Lumen Output
1	25%	6	80%
2	50%	7	85%
3	55%	8	90%
4	65%	9	95%
5	75%	10	100%

Note: Typical value accuracy +/- 5%

mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4Fc of ambient light.

Twist-Lock Receptacle (TLR5/TLR7/ TLRPC): TLR options come with 5 pin or with 7 pins connected to 0-10V driver and not all pins will be connected. Dimming Receptacle Type B (5-pin) and Type D-24 (7-pin) in accordance to ANSI C136.41. Can be used with third-party control system. Receptacle located on top of luminaire housing. When specified with receptacle and photoelectric cell (TLRPC), 7-pin receptacle is supplier and voltage must be specified. When ordering Twist-lock receptacle (TLR5 or TLR7), photocell or shunting cap is not included. If Twistlock receptacle option is ordered with Dimming Control option, then dimming leads from driver will not be connected to TLR but consumed by selected device. Devices installed to NEMA twist-lock Receptacle must be IPX6 rated.

Sensor Ready(SR)/DALI Control Options

Automatic Profile Dimming (CS/CM/CE/CA): Standard dimming profiles provide flexibility towards energy savings goals while optimizing light levels during specific dark hours. Dimming profiles include two dimming settings including dim to 30% or 50% of the total lumen output. When used in combination with not programmed motion response it overrides the controller's schedule when motion is detected. After 5 minutes with no motion, it will return to the automatic dimming profile schedule. Automatic dimming profile scheduled with the following settings:

- **CS50/CS30:** Security for 7 hours night duration (Ex., 11 PM – 6 AM)
- **CM50/CM30:** Median for 8 hours night duration (Ex., 10 PM – 6 AM)

All above profiles are calculated from mid point of the night. Dimming is set for 6 hours after the mid point and 1 or 2 hours before depending of the duration of dimming. Time clock or photocell is required for on/off functionality to allow for midpoint calculation. Cannot be used with other dimming control options.

P20 PureForm LED small round

Specifications (cont'd)

Sensor Ready Zhaga Socket Connector (SRDR): Product is D4i Certified and equipped with Sensor Ready drivers connected to 4-pin Zhaga Book 18 compliant receptacle designed for sensor and other control system applications. Receptacle is rated IP66 assembly in a compact design that provides a sealed electrical interface and rated UV resistance, mounted on underside of the luminaire, protective dust cap included. When a controller not provided by Signify is used with Sensor Ready Zhaga socket connector, the controller must be certified to work with the Xitanium SR LED drivers as part of the SR certified program. SRDR can be used with NEMA 7-pin twist lock receptacle, which is mounted on top of the luminaire. D4i certification validates compliance with specifications for data exchange in connected lighting systems, ensuring interoperability, compatibility, and efficient operation. It also assures customers that the device meets industry standards.

Outdoor Interact:

Scalable connected sensor with integral occupancy and daylight sensing, supports wireless mesh connectivity. Sensor works in the Foundation mode when configured without a gateway or in an Interact Advanced mode if a compatible gateway (can be added later) is used. Interact offers an app, a portal and a broad portfolio of Interact ready Indoor and Outdoor luminaires, lamps and retrofit kits all working on the same system. Startup is implemented via Interact Pro App (available in iOS® or Android®) and Bluetooth® connectivity. The app provides flexibility to choose between a gateway or non gateway mode for setup. Setup with the gateway requires wired Internet access to the gateway. Prepare project configuration steps remotely and use IRT9015 remote accessory (ordered separately) or the App on-site to identify and group devices together. WIAP includes SR driver and SR receptacle. Daylight harvesting supported through dimming - activated via the Interact app. Sensors are available in black or white finish and high or low mounting height lenses. IP66 rated.

For more information on Interact visit:

www.interact-lighting.com/interactproscalablesystem

SR/DALI Lighting Control Options

Button Photocontrol (PCB): Button style design for internal luminaires mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4Fc of ambient light.

Twist-Lock Receptacle (TR5/TR7/ TLP): TLR5 includes with 5 pin (Type B) receptacle connected to SR/DALI driver all applicable connections made to driver and is not D4i compliant. TR7 includes (Type D-24) connected to SR/ DALI driver with all leads connected for use of 3rd party control systems. Receptacles are in accordance to ANSI C136.41. Receptacle located on top of luminaire housing. When specified with receptacle and photoelectric cell (TRPC), 7-pin receptacle is supplied and voltage must be specified. When ordering Twist-lock receptacle (TR5 or TR7), photocell or shorting cap is not included.

Listings

UL/cUL wet location listed to the UL 1598 standard, suitable for use in ambient temperatures from -40° to 40°C (-40° to 104°F). Most PureForm P20 comfort configurations are qualified under Standard DesignLights Consortium® category. Consult DLC Qualified Products list to confirm your specific luminaire selection is approved. CCTs 3000K and warmer are Dark Sky Approved.

Finish

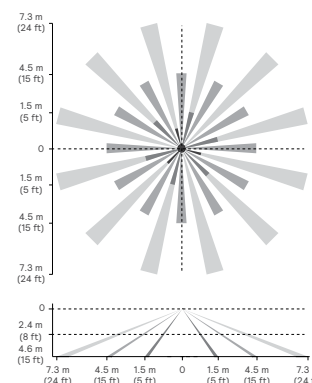
Each standard color luminaire receives a fade and abrasion resistant, electrostatically applied, thermally cured, triglycidal isocyanurate (TGIC) textured polyester powdercoat finish. The surface treatment achieves a minimum of 1000 hours for salt spray resistant finish in accordance with testing performed and per ASTM B117 standard. Standard colors include bronze (BZ), black (BK), white (WH), dark gray (DG), and medium gray (MG). Consult factory for specs on optional or custom colors.

Warranty

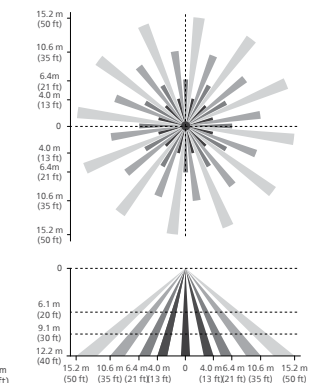
PureForm luminaires feature a 5-year limited warranty.

See signify.com/warranties for complete details and exclusions.

LW low sensor



HW high sensor



Note: The beam patterns shown are intended solely as a general guide and are not to scale. Sensing capabilities and coverage area depend on many factors including the size, speed and direction of travel of persons and vehicles; sensor mounting height; environmental and site conditions; etc.

GENLYTE
SOLUTIONS

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THE BRICKYARD - HANOVER STREET
LEBANON, NH
S2, S4 & S5 POLE

The **Gardco SRS Straight Round Steel** pole consists of a one-piece high tensile carbon steel tube welded and secured to the carbon steel base plate providing excellent strength and integrity. The poles are finished with an electrostatically applied, thermally cured polyester powdercoat. All poles include base cover, hand hole, ground lug and top cap. Anchor bolts and templates are ordered as a separate accessory.

CUT TO 15' POLE HEIGHT

Ordering guide

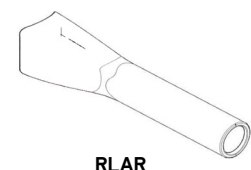
example: SRS-CB-5-7-25-T2D4L-N-BZ

Family	Base	Pole Shaft Size (in.)	Pole Gauge/Wall Thickness	Height (ft) ⁵	Drilling/Tenon Configurations ¹	Drilling Template ²	Finish	Options ³
SRS	CB	4	11	15	D1	DT5	FINI	
SRS	CB Carbon Steel Base w/ Base Cover	3	11 11 ga. / 0.120"	10 12 14 16	D1 1 Way D1@180 1 Way @ 180 D2 2 Way @ 180 D2@90 2 Way @ 90 D3 3 Way @ 90 D3@120 3 Way @ 120 D4 4 Way @ 90	DT1 Drill Template 1 DT2 Drill Template 2 DT3 Drill Template 3 DT4 Drill Template 4 DT5 Drill Template 5 DT6 Drill Template 6 [DTX-xxx] ^{6,7} Custom Template See drill template chart for details.	BK Black BZ Bronze WH White DG Dark Grey MG Medium Grey GY3 ⁸ Light Grey, Smooth SSDGY ⁸ SolarForm Dark Grey (RAL7011) GV Galvanized (No Paint) FP/GV Finished Textured Paint over Galvanized (Specify, ex: MG/GV) OC Optional Color Paint (ex: RAL7024) SC ⁶ Special/Custom Color (Specify, must supply color chip)	FES ⁹ Festoon Outlet VDA Vibration Dampener AHH ⁶ Additional Hand Hole DR ^{6,8} Duplex Receptacle VPA Vandalproof Screws GFI ⁶ DR with GFI (120V only) BAC ⁹ Buy American Compliant CL1/2 ⁶ Coupling 1/2" CL3/4 ⁶ Coupling 3/4" CL1 ⁶ Coupling 1" CL1-1/4 ⁶ Coupling 1-1/4" CL1-1/2 ⁶ Coupling 1-1/2" NL1/2 ⁶ Nipple 1/2" NL3/4 ⁶ Nipple 3/4" NL1 ⁶ Nipple 1" NL1-1/4 ⁶ Nipple 1-1/4" NL1-1/2 ⁶ Nipple 1-1/2"
		4	11 11 ga. / 0.120"	10 12 14 16 20 25	T2D4L 2-3/8" OD x 4" length T2D6L ⁸ 2-3/8" OD x 6" length T3D4L 3" OD x 4" length T4D6L 4" OD x 6" length	N No Drilling Template (for Tenon and Plain Top Options)		
		5	11 11 ga. / 0.120"	20 25 30	No Drilling/No Tenon			
			7 7 ga. / 0.180"	25 30	P Plain Top			
L/SRS					No Drilling/No Tenon			

- See Drilling Configurations on Page 3.
- See Luminaire Drilling Templates on Page 3
- Not all options available with all configurations. Consult factory for more details
- Options listed with **gray text** will be shipped with the Legacy SRS design. Use the L/SRS family code whenever these options are specified.
- Pole heights can be cut to length. Specify as a whole number in ft. (ex. 11, 13) or to the inch as a decimal (ex. 15.33 = 15' 4") or as "15FT 4IN" for Legacy designs.
- Option must be specified, including install location, by the customer before order release. FES, DR, GFI, AHH options typically must be placed 12-18" away from standard hand hole (20" or 12" above base).
- Custom drill templates (DTX) require factory quote.
- Option not available with Legacy SRS designs.
- Failure to properly select the "BAC" suffix could result in you receiving product that is not BAA compliant product with no recourse for an RMA or refund. This BAC designation hereunder does not address (i) the applicability of, or availability of a waiver under, the Trade Agreements Act, or (ii) the "Buy America" domestic content requirements imposed on states, localities, and other non-federal entities as a condition of receiving funds administered by the Department of Transportation or other federal agencies.
- Consult Signify to confirm whether specific accessories are BAA-compliant.

Accessories ¹⁰

Service	Pole Size	12NC	Description (Diameter x Length x Hook)
Anchor Bolts + Templates			
For shipment with the pole (order 1 per pole)	3" Poles	912401597399	AB 3/4x17x3-G DEC w/ 8.5 BC ABT
	4" & 5" Poles	912401597397	AB 3/4x24x3-G DEC w/ 8.5 BC ABT
For Pre-Ship service (order 1 per pole)	3" Poles	912401597407	AB 3/4x17x3-G DEC w/ 8.5 BC ABT-RS
	4" & 5" Poles	912401597405	AB 3/4x24x3-G DEC w/ 8.5 BC ABT-RS
Part No.	Pole Size	Description	
RLAR-1A-R4@4.9-(finish)	4" Poles	Cast Aluminum mounting arm, 15" long with DT6 drill pattern (order 1 per luminaire).	
RLAR-1A-R5@6-(finish)	5" Poles	For use with Lumec Roadway and Gardco SolarForm luminaires. (For SolarForm: use RLAR bracket to mount horizontally, use T2D6L tenon to mount vertically). Specify finish to match pole.	



RLAR

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Poles

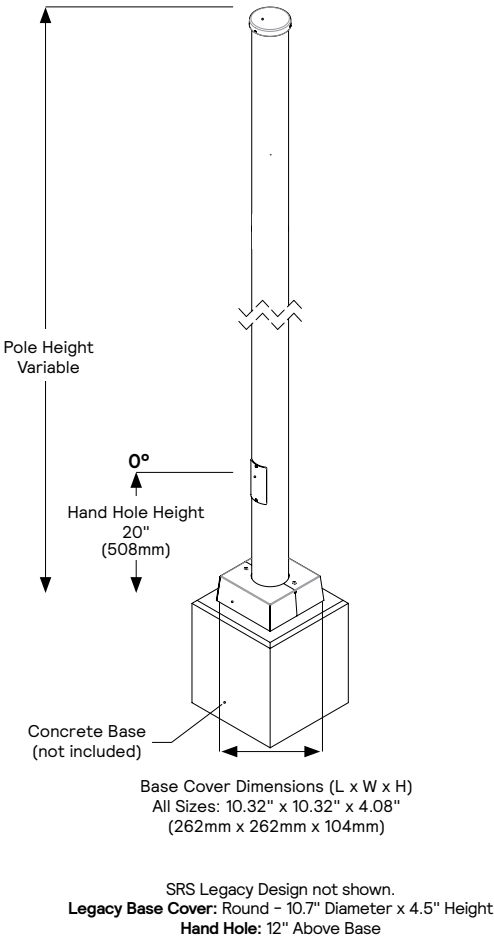
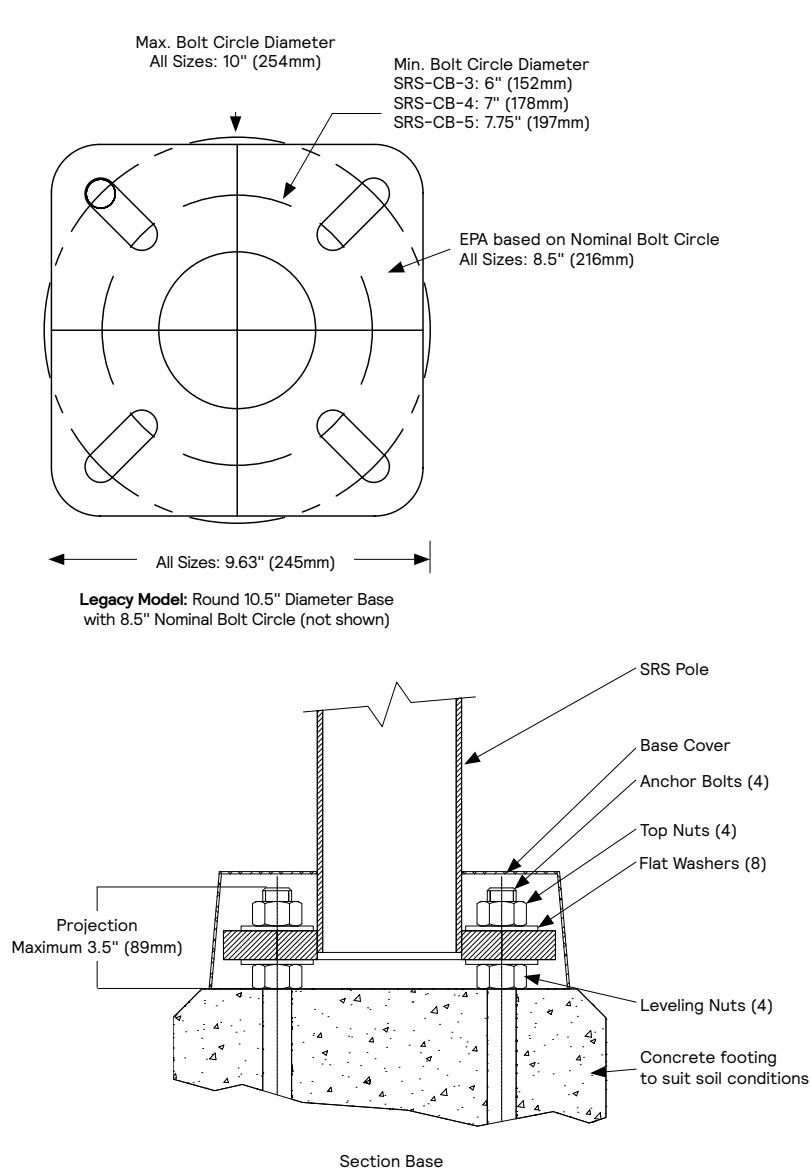
Straight Round Steel

Quick Ship ordering guide

example: SRS-CB-4-11-20-D1-DT5-BZ-RS

Family	Base	Pole Shaft Size (in.)	Pole Gauge/ Wall Thickness	Height (ft.) ⁵	Drilling Configuration	Drilling Template	Finish	Options
SRS Straight Round Steel	CB Carbon Steel Base w/ Cover	4	11 11 ga. / 0.120"	20 25	D1 1 Way D1@180 1 Way @ 180 D2 2 Way @ 180 D2@90 2 Way @ 90 D3 3 Way @ 90 D3@120 3 Way @ 120 D4 4 Way @ 90	DT5 Drill Template 5	BZ Bronze MG Medium Grey BK Black	RS RapidShip*

Dimensions



* Anchor Bolt Lock Washers are not normally required and are not included in standard anchor bolt sets. They are available upon request at additional cost.

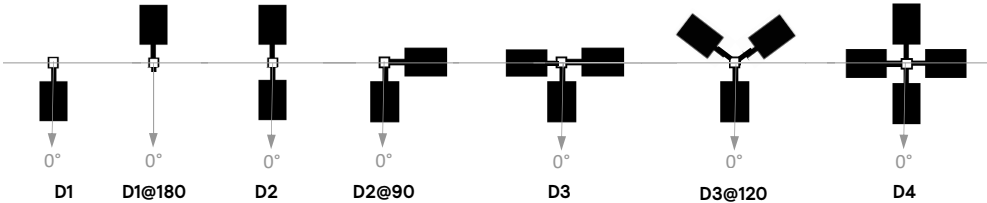
** Grouting should include a drainage slot or tube (by others) to permit water to drain from the base of the pole. Failure to provide drainage may weaken the pole base structure over time and may result in pole base failure, for which Gardco is not responsible.

NOTE: Factory supplied template must be used when setting anchor bolts. Gardco will not honor any claim for incorrect anchorage placement from failure to use factory supplied templates.

Poles Straight Round Steel

Drilling Configuration

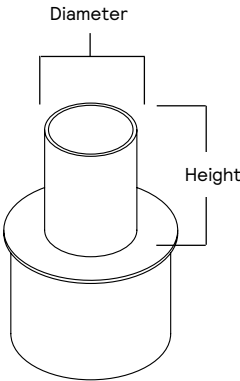
Code	Description
D1	Single luminaire
D1@180	Single luminaire @ 180
D2	Two luminaires @ 180
D2@90	Two luminaires @ 90
D3	Three luminaires @ 90
D3@120	Three luminaires @ 120
D4	Four luminaires @ 90



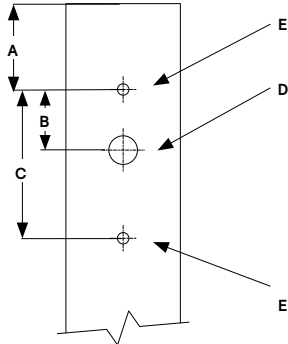
Ref. access door at 0° for all
Legacy design places access door at 180°

Tenon Dimensions

Tenon	Diameter	Height
T2D4L	2.375" (60mm)	4" (102mm)
T2D6L	2.375" (60mm)	6" (152mm)
T3D4L	3" (76mm)	4" (102mm)
T4D6L	4" (102mm)	6" (152mm)



Pole Top Drilling



Luminaire Drill Pattern

Code	Description	Luminaires	Pole Drilling				
			A To Pole Top	B	C Full Extent	D Wireway Hole	E Bolt Hole
DT1	Drill Template 1	Gardco SlenderForm Round SFRA	2.25" (57mm)	1.5" (38.1mm)	3" (76mm)	0.875" (22.2mm)	0.40" (10.2mm)
DT2	Drill Template 2	Gardco SlenderForm Square - SFA Gardco Gullwing - GL13, GL18 Gardco Form Ten - EH14L, EH19L, CAL17, CAL22, MAL17, MAL22	2.25" (57mm)	2.17" (55mm)	3.84" (98mm)	0.875" (22.2mm)	0.39" (9.9mm)
DT3	Drill Template 3	Gardco PowerForm PFAS	2.25" (57mm)	1.75" (44mm)	3.84" (98mm)	0.875" (22.2mm)	0.41" (10.4mm)
DT4	Drill Template 4	Gen1 Stonco/Keene AL150-G1, AL200-G1	2.5" (64mm)	1.7" (43mm)	3.5" (89mm)	0.875" (22.2mm)	0.41" (10.4mm)
DT5	Drill Template 5	Gardco EcoForm Gen2 - ECF-S, ECF-L Gardco PureForm Gen2 - P15, P20, P26, P34 OptiForm Small - OPF-S OptiForm Med - OPF-M OptiForm Large - OPF-L	3" (76mm)	1" (25mm)	3" (76mm)	1" (25mm)	0.41" (10.4mm)
DT6	Drill Template 6	Hole pattern drilled for the following: Attach RLAR bracket accessory, suitable for use with: Lumec Capella CPLM, CPLS Lumec RoadStar GPLM, GPLS Lumec RoadFocus RFS, RFM, RFL Lumec RoadView RVM, RVS Lumec MiniView SVS Lumec StreetView SVM Gardco SolarForm BRP710	2.5" (64mm)	1" (25mm)	2" (50mm)	0.875" (22mm)	0.5" (12.7mm)

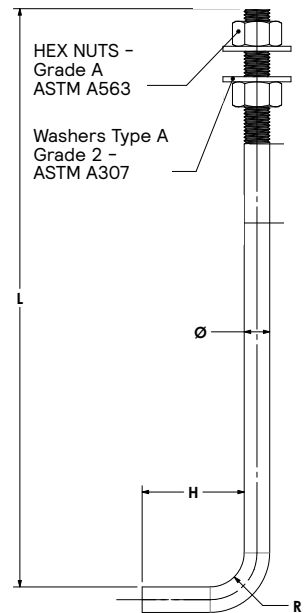
Poles Straight Round Steel

Pole Data

Product Catalog Number	Pole Specs				Anchor Bolt Data				
	Height (ft.)	Pole Diameter (in.)	Wall Thickness (in.)	Pole Weight (lbs)	Bolt Circle (in.)	Legacy Bolt Circle (in.)	Anchor Bolt Spec (in.)	Legacy Anchor Bolt Spec (in.)	Anchor Bolt Max Proj. (in.)
● SRS-CB-3-11-10	10	3	0.12	37	8.5 (6-10)	8.5 (8-9)	3/4 x 17 x 3	3/4 x 17 x 3	3.5
● SRS-CB-3-11-12	12	3	0.12	44	8.5 (6-10)	8.5 (8-9)	3/4 x 17 x 3	3/4 x 17 x 3	3.5
● SRS-CB-3-11-14	14	3	0.12	52	8.5 (6-10)	8.5 (8-9)	3/4 x 17 x 3	3/4 x 17 x 3	3.5
● SRS-CB-3-11-16	16	3	0.12	59	8.5 (6-10)	8.5 (8-9)	3/4 x 17 x 3	3/4 x 17 x 3	3.5
SRS-CB-4-11-10	10	4	0.12	50	8.5 (7-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
SRS-CB-4-11-12	12	4	0.12	59	8.5 (7-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
SRS-CB-4-11-14	14	4	0.12	69	8.5 (7-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
SRS-CB-4-11-16	16	4	0.12	79	8.5 (7-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
SRS-CB-4-11-20	20	4	0.12	99	8.5 (7-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
SRS-CB-4-11-25	25	4	0.12	123	8.5 (7-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
SRS-CB-5-11-20	20	5	0.12	124	8.5 (7.75-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
SRS-CB-5-11-25	25	5	0.12	155	8.5 (7.75-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
● SRS-CB-5-11-30	30	5	0.12	186	8.5 (7.75-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
SRS-CB-5-7-25	25	5	0.18	229	8.5 (7.75-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5
● SRS-CB-5-7-30	30	5	0.18	275	8.5 (7.75-10)	8.5 (8-9)	3/4 x 24 x 3	3/4 x 24 x 3	3.5

● SRS Legacy Design

Standard Anchor Bolt



Pole Data (cont.)

Product Catalog Number	AASHTO 2001 - EPA ft ²								CSA - EPA ft ²							
	80 MPH	90 MPH	100 MPH	110 MPH	120 MPH	130 MPH	140 MPH	150 MPH	300 Pa 79 MPH	400 Pa 91 MPH	500 Pa 102 MPH	600 Pa 111 MPH	700 Pa 120 MPH	800 Pa 129 MPH	900 Pa 136 MPH	1000 Pa 144 MPH
● SRS-CB-3-11-10	14.20	10.96	8.66	6.93	5.61	4.61	3.79	3.15	15.28	11.12	8.62	6.96	5.76	4.87	4.18	3.62
● SRS-CB-3-11-12	11.47	8.75	6.80	5.35	4.26	3.40	2.72	2.17	12.13	8.68	6.61	5.24	4.26	3.50	2.94	2.48
● SRS-CB-3-11-14	9.22	6.99	5.38	4.12	3.18	2.45	1.86	1.39	9.68	6.76	5.02	3.85	3.03	2.40	1.92	1.53
● SRS-CB-3-11-16	6.51	4.79	3.56	2.68	1.98	1.45	1.02	N/A	7.66	5.18	3.68	2.70	1.98	1.45	1.04	N/A
SRS-CB-4-11-10	26.56	20.65	16.39	13.26	10.94	9.24	7.90	6.82	28.97	21.28	16.66	13.58	11.38	9.73	8.45	7.43
SRS-CB-4-11-12	21.80	16.80	13.23	10.57	8.62	7.25	6.17	5.32	23.58	17.13	13.26	10.69	8.83	7.46	6.37	5.53
SRS-CB-4-11-14	18.19	13.87	10.77	8.48	6.82	5.71	4.83	4.12	19.44	13.93	10.63	8.42	6.84	5.67	4.73	4.01
SRS-CB-4-11-16	15.30	11.51	8.80	6.78	5.35	4.44	3.71	3.15	16.14	11.35	8.48	6.55	5.20	4.17	3.38	2.74
SRS-CB-4-11-20	10.47	7.57	5.49	3.97	2.89	2.31	1.86	1.51	10.98	7.29	5.06	3.59	2.53	1.74	1.12	N/A
SRS-CB-4-11-25	6.35	4.15	2.56	1.41	N/A	N/A	N/A	N/A	6.12	3.38	1.74	N/A	N/A	N/A	N/A	N/A
SRS-CB-5-11-20	17.94	13.29	10.30	8.31	6.78	5.64	4.73	4.03	19.67	13.56	9.89	7.45	5.71	4.40	3.68	3.15
SRS-CB-5-11-25	11.74	8.19	6.08	4.75	3.77	3.03	2.45	2.00	12.72	8.04	5.23	3.36	2.01	1.02	N/A	N/A
● SRS-CB-5-11-30	7.29	4.48	2.95	2.11	1.51	1.08	N/A	N/A	7.29	3.64	1.47	N/A	N/A	N/A	N/A	N/A
SRS-CB-5-7-25	19.65	14.46	11.14	8.93	7.29	6.02	5.04	4.26	21.58	14.69	10.55	7.78	5.82	4.34	3.56	3.01
● SRS-CB-5-7-30	13.62	9.48	6.99	5.46	4.32	3.47	2.80	2.27	14.22	8.85	5.63	3.48	1.94	N/A	N/A	N/A

- Warning:** Additional wind loading, in terms of EPA, from banners, cameras, floodlights and other accessories attached to the pole, must be added to the luminaire(s) EPA before selecting the pole with the appropriate wind load capability. Specifying BAA or BAC compliant poles may result in different EPA ratings.
 - Factory supplied template must be used when setting anchor bolts. Gardco will not honor any claim for incorrect anchorage placement resulting from failure to use factory supplied templates. Exact length of anchor bolts may vary.
 - EPA ratings are based on the listed, optimal nominal dimension of the bolt circle listed above. The bolt circle has limited variability but the EPA rating will change.
- Note:** Above EPA (Effective Projected Area) rating is in accordance with AASHTO 2001, with a 50 pound load (22.7 kg) placed at 1 foot (305mm) above its center.

Specifications

Pole shaft

The pole shaft is fabricated from a single piece of 11 ga (0.1196") or 7 ga (0.180") high tensile carbon steel. The formed steel plate is longitudinally welded providing minimum yield strength of 50 ksi. Shaft includes factory installed copper ground lug, 10-7 copper wire, and ground lug screw.

Anchor Base

The pole anchor base is fabricated from 44W structural quality carbon steel with a minimum yield strength of 44 ksi. The base plate is circumferentially welded on both top and bottom.

Anchor Bolts

Anchor bolts are fabricated from a commercial quality hot rolled carbon steel bar that meets or exceeds a minimum guaranteed yield strength of 55 ksi. Bolts have an "L" bend on one end and threaded on the opposite end. Anchor bolts are galvanized in accordance with ASTM A-153.6 C1.C. Four (4) properly sized bolts, each furnished with two (2) regular hex nuts and two (2) flat washers, are provided per pole (priced and ordered separately), unless otherwise specified. Conforms to AASHTO M 314 90 and ASTM F1554.

Customer Specified Options

The options, DTX, FES, DR, GFI, AHH, CL*, and NL* require factory quotation. Poles with custom drilling templates (DTX) are provided as a service, however Signify holds no liability for improper installation and safety when using non-Signify luminaires or attachments on Gardco poles via drilling, tenon mounting, or coupling and nipple mounting. It is the responsibility of the customer to ensure the pole is loaded and installed in a safe manner to the limitations of the pole structure. See "Warning" paragraph for more details.

Base Cover

A two-piece painted square aluminum base cover that completely conceals the entire base plate and anchorage. Base cover is provided standard. Legacy model includes a round 0.125" thick composite base cover.

Hand hole

The hand hole has a nominal rectangular 2"x4.5" inside opening in the pole shaft. Included is an aluminum cover plate, EPDM gasket, and captive attachment screws. The hand hole is located 20" above the base and 0° clockwise with respect to the luminaire arm when viewed from the top of the pole for one arm. For two arms the hand hole is located directly under one arm. Legacy design includes an easy to install, self-contained Swing Latch hand hole cover assembly. U.S. Patent Swing Latch cover is fabricated from durable polycarbonate/ABS blend plastic. All pole assemblies are provided with a 2.50" x 5.00" rectangular hand hole.

Pole Top Cap

Each pole assembly is provided with a removable aluminum pole top cap painted to match the specified pole and attached with three pressure screws. Legacy design is provided with a removable plastic top push cap. Finish is Black.

Finish

Poles are available with Gardco's standard textured color finishes - Black, White, Bronze, Dark Grey, Medium Grey, and Lumec GY3 for a match with roadway luminaire finishes. Optional Galvanized finish and custom colors also available. Legacy design is provided with gloss paint on standard finishes.

Couplings and Nipples

Couplings (NPSC standard internal threads) and Nipples (NPT standard external threads) are available to mount 3rd party objects to the pole. For most applications Couplings and Nipples must be at least 4' from the base of the pole. Lengths are as follows:

Couplings < 1" dia. = 1" length
Couplings >= 1" dia. = 1.5" length
Nipples < 1" dia. = 1.5" length
Nipples >= 1" dia. = 2" length

Legacy pole designs may deviate from specifications listed here. See "Customer Specified Options" paragraph for more details.

Duplex Receptacle (DR and GFI)

DR and GFI options are placed at 2' below the pole top on the same side as the hand hole unless otherwise specified. DR or GFI options cannot be placed within 1' of the the hand hole. Options can typically be placed 32" above base for utility purposes. Maximum output of the receptacles are 15A.

General Pole Information

Design

EPA specs conform to AASHTO 2001. The poles as charted are designed to withstand dead loads and predicted dynamic loads developed by variable wind pressure with an additional 2.5 gust factor under the following conditions: The charted weights include luminaire(s) and/or mounting bracket(s). Poles installed in areas of known abnormal conditions may require special consideration. For example: coastal areas, airports and areas of special winds. Poles are designed for ground mounted applications. Poles mounted on structures (such as buildings and bridges) may also necessitate special consideration requiring Gardco's recommendation. Height correction factors and drag coefficients are applied to the entire structure. An appropriate safety factor is maintained based on the minimum yield strength of the material incorporated in the pole.

Warning

This design information is intended as a general guideline only. The customer is solely responsible for proper selection of pole, luminaire, accessory and foundation under the given site conditions and intended usage. The addition of any items to the pole, in addition to the luminaire, will dramatically impact the EPA load on that pole. It is strongly recommended that a qualified professional be consulted to analyze the loads given the user's specific needs to ensure proper selection of the pole, luminaire, accessories, and foundation. Gardco assumes no responsibility for such proper analysis or product selections. Failure to ensure proper site analysis, pole selection, loads and installation can result in pole failure, leading to serious injury or property damage.

Warranty

Gardco Steel poles are covered by a 3-year structural and finish warranty. Legacy designs are covered by a 1-year warranty. For more information visit [signify.com/warranties](https://www.signify.com/warranties).

LEBANON PLANNING BOARD
DRAFT MOTION FOR PB2024-31-CUP
August 12, 2024 Meeting
Agenda Item 4.B

1. MOTION RE: COMPLETENESS

Date: July 8, 2024

On July 8, 2024, the Board determined the application of XYZ Dairy, LLC, regarding 0 Beyerle Street & 51 Crafts Avenue (Tax Map 58, Lot 18 & Tax Map 58, Lot 19), zoned R-3, for a Conditional Use Permit pursuant to Sections 310.2 and 509 of the Zoning Ordinance for a proposed cottage development with 16 dwelling units is complete enough for the Planning Board to accept jurisdiction and commence review.

2. MOTION RE: APPLICATION

Date: August 12, 2024

On July 12, 2024, at a duly-noticed meeting of the Lebanon Planning Board, there appeared Chet Clem representing XYZ Dairy, LLC, regarding 0 Beyerle Street & 51 Crafts Avenue (Tax Map 58, Lot 18 & Tax Map 58, Lot 19), zoned R-3, requesting a Conditional Use Permit pursuant to Sections 310.2 and 509 of the Zoning Ordinance for a proposed cottage development with 16 dwelling units. PB2024-02-CUP

I. FINDINGS OF FACT

Based on testimony given, application materials presented, and supporting documents submitted, the Planning Board makes the following findings of fact:

1. The properties are located within the Residential Three (R-3) District north of the West Lebanon Central Business District. The property at 51 Crafts Ave. fronts on the west side of the street across from the intersection of Crafts Ave. and Beyerle St., and is currently improved with a two (2)-story, one-family dwelling constructed in 1941. The property at “0 Beyerle St.” lies immediately to the west of 51 Crafts Ave., and does not currently have frontage onto any existing roadway, as the extension of Beyerle St. to the west of Crafts Ave. and the creation of Lincoln Ave. (once planned to run parallel to Crafts Ave., to the west) never took place.
2. The applicant proposes to construct a 16-unit Cottage Development on “0 Beyerle St.”, as described in Section 509 of the Lebanon Zoning Ordinance.
3. The applicant, to this end, also proposes (separately but in advance of site plan approval) to amend the property boundaries of the 51 Crafts Ave. and 0 Beyerle St. properties to provide 0 Beyerle St. with 42 feet of frontage onto Crafts Ave., between the properties at 51 Crafts Ave. and the adjacent 43 Crafts Ave.
4. “Cottage Developments” are allowed in the R3 District by Conditional Use Permit from the Planning Board, in accordance with Section 302.4.D and the requirements of Section 509 of the Zoning Ordinance. The Planning Board may therefore grant a Conditional Use Permit for a cottage development use if it finds that the proposal meets the Enhanced

Performance Standards set forth in Section 302.4.D and the additional requirements set forth in Section 509.

5. The applicant has submitted testimony addressing the Section 302.4.D criteria and Section 509 requirements in an application received by the Planning and Development Department on May 13, 2024, as well as in supplemental written materials provided by the applicant on May 31, 2024, July 5, 2024, and July 8, 2024, including a preliminary conceptual sketch of the proposed cottage development titled "Illustrative Site Plan – Sheet S-1," dated July 8, 2024 ("illustrative site plan").

6. _____

7. _____

II. CONCLUSIONS OF LAW

As a result of the above findings of fact and based on testimony given, application materials presented, and supporting documents submitted, the Planning Board concludes the following with respect to the Enhanced Performance Standards set forth in §302.4.D of the Zoning Ordinance and the cottage development criteria set forth in §509 of the Zoning Ordinance:

1. The site **is** suitable for the proposal. (§302.4.D.1)

2. The external impacts of the proposed use on abutting properties and the neighborhood **is commensurate** with the impacts of adjacent existing uses or other uses permitted in the zoning district. (§302.4.D.2)

3. The proposed layout and design of the site **is compatible** with the established character of the neighborhood and shall mitigate any external impacts on abutters, the neighborhood, and nearby public ways and infrastructure. (§302.4.D.3)

4. The design of the new buildings **are** compatible with the established character of the neighborhood. (§302.4.D.4)

5. The proposed use and layout of the site, including all related development activities, to the greatest extent practicable **will preserve** identified natural, cultural, historic, and scenic resources on the site and **will not degrade** such identified resources on abutting properties. (§302.4.D.5)

6. The proposed use **is allowed** by conditional use on the proposed property. (§509.2)

7. The proposed number of cottages **meets** the number and arrangement of units requirements for cottage developments, with the number of cottages being between 3 and 16, located in one or more clusters of a minimum of 3 units each, making efficient use of land and encouraging a sense of community among residents. (§509.3)

8. The proposed lot **has** a lot size exceeding the 40,000 sq. ft. minimum lot size for cottage developments in the R-3 District. (§509.4)

9. The illustrative site plan accompanying the Conditional Use Permit application indicates that the proposed design **meets** the density requirement of 2,500 sq. ft. of lot area per cottage and the maximum building coverage requirement of 35%. (§509.5)

10. The illustrative site plan accompanying the Conditional Use Permit application **delineates** a building site for each detached cottage of no less than 1,500 sq. ft. (§509.6.A)

11. The illustrative site plan accompanying the Conditional Use Permit application **indicates** that at least 50% of the cottages in the development will be detached units. (§509.6.B)

12. The illustrative site plan accompanying the Conditional Use Permit application **indicates** that the minimum setback between units within the development will be 10 feet, measured from the nearest point of the exterior walls. (§509.6.C)

13. The illustrative site plan accompanying the Conditional Use Permit application **indicates** that the design will meet the common open space requirements for cottage developments, including that a minimum of 400 square feet of common open space per cottage and per cluster will be provided, that the common open space area for each cluster will be contiguous and will abut all of the cottages in the cluster, and that the cottages will be oriented around and have their main entry from the common open space. (§509.6.D)

14. The illustrative site plan and illustrative architectural renderings accompanying the Conditional Use Permit application **indicate** that the design will meet the roofs and porches requirements for cottage developments, with the highest point of a cottage not exceeding 24 feet, and with each cottage having an unenclosed, covered front primary

entry and porch of at least 60 square feet in size, oriented toward a common open space. (§509.6.E)

15. The illustrative site plan accompanying the Conditional Use Permit application **indicates** that the design will meet the parking location and screening requirements for cottage developments, with (a) parking areas and driveways complying with applicable minimum yard requirements for the underlying zone, (b) parking areas screened from public streets and adjacent residential uses by landscaping or architectural screening, (c) no parking areas within the minimum required front yard, and (d) parking areas separated from the common open space by landscaping or an architectural screen. (§509.6.F)
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III. DECISION

Now therefore be it resolved, the Planning Board, on this **12th day of August, 2024**, hereby **GRANTS** the request of XYZ Dairy, LLC, for a Conditional Use Permit per Sections 310.2 and 509 of the Zoning Ordinance for a proposed cottage development with 16 dwelling units at as set forth above and per testimony, plans, and materials submitted, and per the following conditions:

1. In presenting preliminary conceptual sketches of a proposed cottage development, the Board finds that the applicant has demonstrated that the site **is acceptable** for a cottage development use (§302.4.D.1) so long as the finalized designs for the development, to be presented at the time of Site Plan Review, meet the requirements of Section 509 of the Lebanon Zoning Ordinance as well as all other relevant and applicable Zoning Ordinance and Site Plan Review Regulations. This determination relative to conditional use should not be taken as an endorsement of the sketches and designs as presented, the details of which will be subject to further review during the process of Site Plan Review.
2. The conditional use permit shall expire if a site plan review application is not submitted to the Planning and Development Department and accepted as complete by the Planning Board within two (2) years of the date of the conditional use permit approval. (Section 302.4.H.1.a of the Zoning Ordinance) The applicant shall submit an application to the Planning Board for a boundary line adjustment between the subject lots either before or contemporaneously with the Site Plan application.



CITY OF LEBANON ~ PLANNING & DEVELOPMENT

PLANNING BOARD

August 12, 2024 Meeting

Staff Memorandum – PB2024-34-EXT

APPLICATION INFORMATION

Agenda Item: 4.D

Application ID#:
PB2024-34-EXT

Application Type:
Extension

Property Location:
North Main Street,
West Lebanon

Property Owner/Applicant:
XYZ Dairy, LLC

Property Size:
+/-38.18 Ac. (combined tract)

Zoning District(s):

- Central Business District (CBD)
- Light Industrial (IND-L)
- Residential Three (R-3)

Overlay District:

- Wetlands Conservation District
- Flood Plain District

Attachments:

- Notice of Action for PB2011-01-FMAJ dated October 11, 2011 (7 pages)
- Notice of Action for PB2018-34-EXT dated September 9, 2019 (17 pages)
- Notice of Action for PB2021-19-EXT dated October 21, 2021 (2 pages)

LEGAL NOTICE

XYZ Dairy, LLC, River Park Drive (Tax Map 44, Lots 21 - 30 & Tax Map 44, Lot 7), zoned CBD, IND-L and R-3: Applicant requests a 2-year extension of the River Park Subdivision approval (PB2011-01-FMAJ) and Site Plan approval (PB2010-25-SPR), as most recently amended on September 9, 2019 (PB2018-34-SPA) and extended on October 12, 2021 (PB2021-29-EXT). PB2024-34-EXT

APPLICATION MATERIALS

- Application form
- Letter from Chet Clem, Lyme Properties, dated July 8, 2024
- Certified Notification List
- Fee Schedule

COMPLETENESS REVIEW

This application has been reviewed in accordance with the Lebanon Site Plan Review Regulations. The Planning and Development Department recommends that the Board find that the application is complete enough to accept jurisdiction and to commence review.

Although the application is complete with respect to the requirements of the Site Plan Review Regulations, note that per condition of approval #3 of the Planning Board's Notice of Action dated September 9, 2019 for PB2018-34-SPA, the applicant is required to provide an updated phasing schedule in connection with an extension request. An updated phasing schedule has not been provided. The applicant has also not provided any information with respect to the applicable extension criteria found in conditions of approval 3 and 29.

APPLICATION OVERVIEW

The applicant's request is set forth in the attached letter dated July 8, 2024, from Chet Clem of Lyme Properties:

"Lyme Properties operating as the development agent for XYZ Dairy, LLC hereby requests a 2-year extension of the River Park West Lebanon Site Plan (#PB2010-25-SPR) and Subdivision Approvals (#PB2011-01-FMAJ, October 11, 2011) as most recently amended on September 9, 2019 (#PB2018-34-SPA) and extended by this Board on October 12, 2021 (#PB2021-29-EXT).

In accordance with Section 4.10 of the Lebanon Site Plan Review Regulations, this extension request is due to delays ***attributable to unusual circumstances beyond the control of the Applicant.***

We request that this matter be added to the agenda for consideration at the regularly scheduled August 12, 2024 hearing of the Lebanon Planning Board.” (emphasis in original)

The above constitutes the entirety of the applicant’s request. Other than the application form, certified notification list, and fee schedule, no additional information or materials were provided by the applicant in support of the extension request.

BACKGROUND

A. Subdivision Approval

On October 11, 2011, the Planning Board granted subdivision approval for a 22-lot phased development known as River Park (PB2011-01-FMAJ). The development includes 11 residential lots located within the R-3 district at the southerly end of the property and two additional residential lots in the R-3 district at the northerly end of the site. Five parcels are located in the CBD district and 3 parcels are within the IND-L district, all of which will be served by a new development roadway. One additional lot was created to provide open space for the overall development along the river. A copy of the October 11, 2011 Notice of Action is attached for reference.

The applicant was granted a two-year extension to the approved subdivision on September 9, 2013 (PB2013-21-EXT). Subsequently, the applicant requested and was granted an amendment to the subdivision approval on May 11, 2015 (PB2015-07-FMAJ). The amendment addressed minor alterations to the layout of the development roadways and select lots.

Following additional extensions approved by the Planning Board on November 9, 2015 (PB2015-33-EXT), November 14, 2016 (PB2016-28-EXT), and October 10, 2017 (PB2017-17-AAD), the River Park Subdivision plat was recorded on January 2, 2018 in the Grafton County Registry of Deeds, together with a Notice of Restriction (for background discussion of the Notice of Restriction, see footnote 1).

B. Site Plan Approval

On October 24, 2011, the Planning Board granted site plan approval for the River Park development (PB2010-25-SPR). As originally approved, the development would consist of eight (8) non-residential or multi-family residential buildings totaling 839,145 square feet plus two parking garages for 1,393 vehicles on the 7 parcels within the CBD and IND-L zoning districts.

The applicant was granted an extension to the approved site plan on September 9, 2013 (PB2013-22-EXT). On June 8, 2015, the applicant was granted a site plan amendment for the layout of Lot 1, which included changes to the building footprint, parking layout, vehicular circulation, loading location of the building, landscaping, lighting, and the drainage and engineering of the site (PB2015-10-SPA). On November 9, 2015, the applicant was granted additional time within which to obtain Building Permits for each approved development phase (PB2015-34-EXT). An additional extension was granted on November 14, 2016 (in connection with PB2016-28-EXT).

On September 9, 2019, the Planning Board approved an amendment to the site plan to, among other things, change the sequencing of the project phasing and increase the number of residential dwelling units from 80 to 125 in Building #8 (PB2018-34-SPA). The 2019 Notice of Action was written to supersede and replace all prior Notices of Action relating to the River Park site plan approval. On October 12, 2021,

the Planning Board approved a request to extend the phasing deadlines (PB2021-19-EXT). A copy of the September 9, 2019 and October 12, 2021 Notices of Action are attached for reference.

STAFF COMMENTS

1. **Imprecise Request.** The applicant has requested a “2-year extension” but has not specified what the “2-year extension” is relative to. As part of their application, the applicant as a matter of course would have presumably identified precisely what it is they are requesting to ensure that the Board clearly understands the request. It is particularly important that the applicant do so in this case given that the approvals are very old and extremely complex, and the history of the project is convoluted and confusing. None of the current Planning Board members were on the Board when the project was originally approved in 2011 nor were any of the current Board members on the Board at the time of the 2019 Site Plan amendment. Only two of the current Planning Board members were on the Board for the 2021 extension request (one of whom was and continues to be recused from hearing the application). For these reasons, determining what exactly the applicant is requesting should not be left to the Board to guess.
2. **Subdivision Extension Not Required.** In addition to an extension of the Site Plan approval, the applicant has also requested an extension to the subdivision approval. Condition of approval #14 of the 10/11/11 Notice of Action for the Subdivision approval provides as follows: “The applicant acknowledges that the overall build-out of the River Park development will occur in seven (7) phases over an extended period of time in accordance with the application materials submitted to the Planning Board for Site Plan application (#PB2010-25-SPR).” Consequently, because the timeframes associated with the River Park development are per the Site Plan approval, it is not clear why the applicant is requesting an extension of the Subdivision approval. The last extension granted for the Subdivision was in 2017, and that extension was specifically to allow additional time for the plat to be recorded (which was accomplished on January 2, 2018). In other words, once the subdivision plat was recorded, the timelines in the subdivision approval were satisfied. (By way of background, note that the plat was recorded even though the conditions of the Subdivision approval had not been fully satisfied – most notably, without providing security for the completion of the infrastructure improvements. In lieu of completing the conditions of approval, a “Notice of Restriction” was recorded with the plat. This was done based on questionable legal advice from the City’s legal counsel in an effort to accommodate the applicant.)¹

¹ *From the staff memo for PB2022-23-SPA:* In the past, the City has allowed the recording of subdivision plats where neither the required improvements have been constructed nor has security for the construction of the required improvements been provided. For reasons unknown but presumably a result of questionable legal advice, the City, in an effort to be flexible and accommodating, has allowed applicants to record approved subdivision plats with a document titled “Notice of Restriction” *in lieu of* the requisite security or completion of improvements. This was permitted for at least 4 large developments: River Park, Rock Ridge, Prospect Hills, and Altaria. These Notices of Restriction (which are presumably legally enforceable since they were agreed to and signed by the developers) require the construction of required improvements or the provision of security for those improvements prior to the sale of individual lots, in the same spirit and with the same effect as Section 7.11 and 7.12 of the Subdivision Regulations.

However, to the best of staff’s knowledge, there is no legal basis for allowing a plat to be recorded with such a “Notice of Restriction” – there is nothing in the Subdivision Regulations, state statute or any of the Planning Board approvals that authorize the recording of a “Notice of Restriction” at all and certainly not *in lieu of* the requisite security or completion of improvements. Nor were any waivers ever requested from Sections 7.11 and 7.12 of the Subdivision Regulations for any of these developments (as far as staff is aware), nor was there any other sort of approval by or acknowledgement from the Planning Board that the Board was in any way approving the recording of a “Notice of Restriction” for these developments (as far as staff is aware).

The River Park subdivision plat should not have been recorded without providing security. The recording of a “Notice of Restriction” in lieu of security or construction is simply not authorized under the Subdivision Regulations or state statute. The

3. Standard of Review. The applicant states that, “In accordance with **Section 4.10 of the Lebanon Site Plan Review Regulations**, this extension request is due to delays attributable to unusual circumstances beyond the control of the Applicant.” (emphasis added). Section 4.10.A of the applicable Site Plan Review Regulations² provides as follows:

Any approved site plan for which a Building Permit has not been obtained within one (1) year of the date of the original approval shall be considered void, unless the Board grants an extension for good cause. A request for an extension of the site plan approval shall be submitted by the applicant to the Planning Office prior to such expiration date. Requests for extension of the site plan approval received after the expiration date shall not be considered by the Board. An extension shall be for up to one (1) additional year beyond the original expiration date. The Board shall grant no more than one extension for any site plan. (NOTE: The expiration provisions of this paragraph shall not be waivable under the procedures set forth in Article VII - “Waiver Procedures” of these Regulations; however, the Planning Board may, for good cause stated in its written Notice of Action, specify some alternative expiration date.)

However, given that Section 4.10.A allows only one (1) extension and the applicant is now requesting a 6th extension, Section 4.10.A has not been adhered to by the Board or the applicant. Rather, the applicable standards for River Park Site Plan extension requests appear to be set forth in Conditions 3 and 29 of the 9/9/19 Notice of Action:

- Condition 3: “In determining whether to grant any requested extensions, the Board shall consider the totality of the circumstances, including the extent and complexity of the conditions-precedent, and whether the need for more time is attributable to circumstances beyond the control of the applicant, rather than to the applicant’s neglect or failure to proceed with reasonable promptness.”
 - Condition 29: “It is the intent and effect of this approval [...] that upon completion of the Phase 1 infrastructure improvements within 5 years of the final subdivision approval [...] the subdivision as a whole, including all phases, shall vest as provided in RSA 674:39, II [...] provided that the applicant and its successors-in-interest continue to comply with all conditions of this approval and of the Planning Board’s approval of Final Major Subdivision application #PB2011-01-FMAJ, including the time limits set forth in the phasing plan, **unless such a limit is extended for good cause by the Planning Board**, acting upon an application submitted prior to the expiration of such limit.” (emphasis added)
4. Application Deficiency. Pursuant to conditions 3 and 29 cited above, River Park was, for reasons unknown, apparently approved with a seemingly limitless ability to request extensions. Nevertheless, the applicant must still demonstrate compliance with the applicable criteria which appear to be the following:
- “[T]he need for more time is attributable to circumstances beyond the control of the applicant, rather than to the applicant’s neglect or failure to proceed with reasonable promptness.” (9/9/19 Notice of Action, condition #3)

fact that the River Park plat has been recorded when it should not have been has made what already is a confusing and complex request even more confusing and complex. [Note that with respect to all future subdivision applications, City staff will follow the procedures set forth in the Subdivision Regulations and will no longer allow plats to be recorded with a so-called “Notice of Restriction” in lieu of the requisite security or completion of improvements.]

² Per the 9/9/19 Notice of Action, the Site Plan approval is subject to the Site Plan Review Regulations dated May 8, 1977, last revised November 9, 2009. See staff comment #5 for further discussion.

- There is “good cause”. (9/9/19 Notice of Action)

The application states that the extension request is “due to delays attributable to unusual circumstances beyond the control of the Applicant” but does not otherwise include any information or evidence relative to the applicable extension criteria as set forth in conditions 3 and 29 of the 9/9/19 Notice of Action.

Moreover, per condition of approval 3 of the 9/9/19 Notice of Action, the applicant must provide an updated phasing plan in connection with any extension request: “If the applicant anticipates being unable to meet any time deadline(s) set forth in this decision with respect to any phase(s), **the applicant shall submit an updated phasing schedule to the Planning Board for review and approval** in accordance with Section 4.9.E of the Site Plan Review Regulations.”³ (emphasis added). An updated phasing plan as required by condition 3 has not been provided. The current phasing plan is found on page 5 of the 9/9/19 Notice of Action.

Note that the updated phasing plan must include the following:

- *Commencement dates for each phase.* [See condition 3: “For purposes of this decision, **the commencement dates referenced on the New Phasing Plan**⁴ and in this decision shall be deemed to be the date by which a Building Permit shall have been applied for[.]” (emphasis added)]
- *Deadlines for the construction of improvements for each phase.* (See condition 29: “As set forth in Section 4.10(C) of those Regulations, the deadlines for the construction of improvements within each phase shall be as stated in the approved phasing plan[.]”).⁵

Staff also recommends that the Board require an updated phasing plan that conforms to all of the required phasing plan criteria as set forth in Section 4.9.C (it is not clear how the phasing plan was approved without compliance with the required criteria). The current phasing plan is deficient with respect to the bolded criteria below (i.e. 4.9.C.2, 3 and 4):

- C. The applicant shall submit with the application a proposed phasing schedule, which shall be included as part of any approval. The phasing schedule shall include the following information, for each phase:

³ Section 4.9.E from the Site Plan Review Regulations dated May 8, 1977, last revised November 9, 2009:

- E. If the applicant anticipates being unable to meet any time deadline(s) set forth in the approved phasing schedule with respect to any phase, he or she may apply to the Planning Board for an extension of up to one year, pursuant to Section 4.10 of these Regulations. The request for an extension shall be submitted to the Planning Office prior to the expiration of the deadline(s) involved.

If the applicant fails to meet any such deadline, or extension thereof, then the approval of that phase and all subsequent phases shall be considered void, and such phase(s) shall no longer be presumed “vested.” However, the applicant may resubmit the application for such phase(s) to the Board for further review and re-approval in light of changes in ordinances, regulations, or other material circumstances which have occurred in the City of Lebanon since the original approval.

⁴ Commencement dates are included within the decision but not within the phasing plan itself. Note that requiring the “commencement date” for each phase is unique to River Park – there is no such requirement in the phasing plan requirements of Section 4.10 of the applicable Site Plan Review Regulations.

⁵ Construction deadlines are included within the decision but now within the phasing plan itself.

1. A specification of all improvements, on-site or off-site, to be installed as part of that phase;
 2. A deadline for the posting of any required security for that phase;
 3. A deadline for the completion of such improvements subsequent to the posting of such security, and;
 4. A date by which a Building Permit must be obtained to prevent the approval for that phase from being considered void pursuant to Section 4.10 of these Regulations.
5. Regulatory Changes. Staff recommends that any extension approval is conditioned on compliance with the City's current land use regulations. Per the 9/9/19 Notice of Action, the Site Plan approval is subject to the Site Plan Review Regulations dated May 8, 1977, last revised November 9, 2009 and the Zoning Ordinance dated December 5, 1990, last revised July 21, 2010. However, it is not clear why this project should continue to be subject to the 2009 Site Plan Review Regulations and the 2010 Zoning Ordinance. Significant changes to both sets of regulations have been adopted since the original 2011 River Park approvals. For example, the Zoning Ordinance now requires a minimum number of EV-designed parking spaces for new development and the Site Plan Review Regulations require certain building design criteria and minimum bicycle parking requirements.

Moreover, other than the installation of a cross country water and sewer line from Crafts Avenue to Lot 1 of the development, no site work relative to the approved Site Plan has been completed. In the meantime, multiple developments in the City have been approved and constructed pursuant to the City's current land use regulations. As a fundamental issue of fairness, it is not clear why those developments needed to comply but River Park should still benefit from 15-year old land use regulations. In fact, it is not immediately clear that the Board has the legal authority to grant an extension *without* requiring compliance with current land use regulations. If the Board is inclined to allow the development to continue to be subject to the 2009 Site Plan Review Regulations and the 2010 Zoning Ordinance, staff recommends that the Board obtain an opinion from the City's legal counsel to verify that the Board has the authority to do so.

6. Impact Fees. The River Park development is subject to the following condition as set forth in the October 12, 2021 Notice of Action:

In accordance with the City's Impact Fee Ordinance fee schedule adopted on September 13, 2010, this application is exempt from impact fees for a period of 5 years from the date of the Planning Board's final approval. Building permits obtained after the 5-year period shall be subject to impact fees in existence at the time of the Building Permit application submission. [Note: The River Park subdivision plat (#PB2011-01-FMAJ) was recorded on January 2, 2018, representing the final approval for the subdivision and starting the 5-year exemption period; ~~which~~. The 5-year exemption period shall now expire on January 2, ~~2023~~ 2025.]

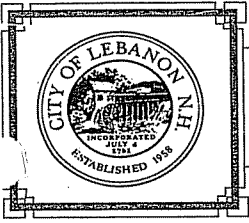
The above-referenced condition was originally included as condition 25 in the 10/24/11 Site Plan approval Notice of Action. It is not clear why River Park was given a 5-year exemption from impact fees. Adoption of both the impact fee ordinance on 7/15/09 and the impact fee schedule on 9/13/10 predate the site plan completeness determination on 11/8/10. Perhaps the Site Plan legal notice predated 9/13/10. Nevertheless, similar to the comments made in Staff Comment #5 above, it is not clear why the River Park development should still be exempt from impact fees

when every other development in the City constructed since adoption of the 9/13/10 fee schedule has had to pay them. Moreover, it is not clear what legal authority the Board has to permit such an exemption. Staff recommends that any extension approval be conditioned on payment of impact fees in compliance with Section 213 of the Zoning Ordinance and the current impact fee schedule.

7. Clarification of Approved Plan Set. The applicant recently provided staff with a draft security agreement relative to Phase 1 of the River Park development. The draft security agreement references no less than 5 different plan sets. With respect to some of those, it is not clear how and by whom they were approved. Staff recommends that any extension approval clarify precisely what constitutes the approved site plan set, and that the Board verifies it has in fact reviewed and approved whatever plan set is identified as the approved plan set.
8. Conditions of Approval. Staff will prepare recommended conditions of approval following clarification of the applicant's request pursuant to Staff Comment #1 above.

Attachments

cc: Chet Clem, Lyme Properties (via e-mail)
David Clem, XYZ Dairy, LLC (via e-mail)
File



CITY OF LEBANON ~ PLANNING OFFICE
51 North Park Street ~ Lebanon, NH ~ 03766

NOTICE OF ACTION
LEBANON PLANNING BOARD

Notice is hereby given that on **May 19, 2011** the following action was taken by a majority of the Lebanon Planning Board in accordance with the City of Lebanon Subdivision Regulations.

Larry LeClair moved that the Lebanon Planning Board finds the application of **XYZ DAIRY, LLC** for Final Review of a Major Subdivision for an 8-lot Industrial Planned Unit Development (IND-PUD), #PB2011-01-FMAJ is complete enough to accept jurisdiction and commence review..

The motion was seconded by Scott Pauls. The vote on the motion was seven in favor with one abstention.

Notice is hereby given that on **October 11, 2011**, the following action was taken by a majority of the Lebanon Planning Board in accordance with the City of Lebanon Subdivision Regulations.

Larry LeClair moved that the Lebanon Planning Board **APPROVES** the Final Major Subdivision application for **XYZ DAIRY, LLC**, in accordance with the Subdivision Regulations for a 22-lot subdivision for a phased development known as River Park, located at North Main Street, Tax Map 44, Lots 3 & 7 and Tax Map 57, Lot 27, West Lebanon, NH, in the CBD, IND-L and R-3 zones, #PB2011-01-FMAJ, as shown on plan set titled "Subdivision Plan - River Park" (67 pages), prepared by Holden Engineering & Surveying, Inc., issued for permitting: June 10, 2010, latest issue: January 18, 2011, including any and all supplemental submissions and testimony provided during the public hearing, with the following conditions:

This Final Major Subdivision approval is for the development of River Park, a 22-lot subdivision, within 3 zoning districts, in accordance with the Lebanon Zoning Ordinance dated last revised July 21, 2010, and the Lebanon Subdivision Regulations dated last revised May 14, 2001.

CONDITIONS-PRECEDENT TO THE SIGNING AND RECORDING OF THE MYLAR:

(These conditions shall be satisfied within 2 years of the date of the Notice of Action.)

1. Prior to the signing and recording of the mylar and prior to the start of any construction activities on the property, which for purposes of this decision shall mean any construction, excavation, or other site work associated with the construction or installation of buildings, roadways, parking, water, sewer, or storm drainage infrastructure (this condition is not intended to preclude temporary construction trailers or site offices), the applicant shall provide two complete sets of revised plans to the Planning Office, depicting the following plan changes:
 - a) The five-foot-wide sidewalk and curbing improvements with no grass median, as proposed by the applicant along NH Route 10 and depicted on the approved subdivision plan set, running along the property frontage

Lebanon Planning Board - Notice of Action
XYZ DAIRY, LLC
Final Major Subdivision

from a point opposite Fountain Way to Chandler Street, shall be extended further south along NH Route 10 to Beyerle Street to provide a safe and convenient pedestrian connection to the existing sidewalk network on NH Route 10 and Beyerle Street to the satisfaction of the City Engineer. All curbing shall be granite and the sidewalk may be either concrete or asphalt, at the applicant's discretion, to be constructed in accordance with the City's standards.

- b) The lane striping layout for all improvements within NH Route 10 shall be revised on all applicable sheets of the approved subdivision plan set to depict 11-foot wide travel lanes, based on painted lines, with no significant changes in grading or paving width, to match the existing lane widths provided on NH Route 10 north of the project site to the satisfaction of the City Engineer, which shall not be unreasonably withheld. The additional pavement width available from narrowing the travel lanes from 12 feet to 11 feet shall be used to widen the proposed shoulder from 2 feet to 4 feet on the southbound side of NH Route 10 as depicted on Sheet 66 (Roadway Sections) of the approved subdivision plan set in order to facilitate safer bicycle use along NH Route 10, which has been designated as a Statewide Bicycle Route by the NHDOT and a Regional Bike Route in the Upper Valley Lake Sunapee Region.
- c) The lane striping layout for the development roadway shall be revised on all applicable plan sheets to depict 11-foot wide travel lanes and 5-foot wide shoulders, based on painted lines, with no significant changes in grading or paving width, to the satisfaction of the Planning Office.
- d) Sheets 15 & 16 of the approved subdivision plan set shall be revised to indicate that all proposed street trees shall have a minimum caliper of 2.5" - 3", measured 6" above finished grade level, at the time of planting, pursuant to Section 6.2.B(4) of the Site Plan Review Regulations, to the satisfaction of the Planning Office.
- e) Sheets 17 & 18 of the approved subdivision plan set shall be revised to include a note that street lights along the development roadway shall be installed to provide full cut-off optics and that the height of such fixtures shall be 20 feet above finished grade to match the height and design of all on-site light fixtures as depicted in the plan sets titled "Site Plan - River Park," prepared by Holden Engineering & Surveying, Inc., issued for permitting: June 10, 2010, latest issue: May 2, 2011, (#PB2010-25-SPR) to the satisfaction of the Planning Office.
- f) The subdivision plans shall be revised to reflect the final lot dimensions and metes and bounds, as depicted in the plan set titled "Site Plan - River Park," prepared by Holden Engineering & Surveying, Inc., issued for

Lebanon Planning Board - Notice of Action
XYZ DAIRY, LLC
Final Major Subdivision

permitting: June 10, 2010, latest issue: May 2, 2011, (#PB2010-25-SPR), to the satisfaction of the Planning Office.

- g) The subdivision plans shall be revised to depict easements for shared access for Lots 1 & 2; Lots 3 & 4; Lots 4 & 5; Lots 8, 9, & 10; and Lots 29 & 30, to the satisfaction of the Planning Office.
- 2. Prior to the signing and recording of the mylar and prior to the start of any construction activities on the property, the applicant shall submit final designs, including construction drawings, of all infrastructure features, both on- and off-site, including the streets, sidewalks, water and sewer utilities, and storm drainage systems, to the City Engineer for approval, which shall not be unreasonably withheld.
- 3. Prior to the signing and recording of the mylar and prior to the start of any construction activities on the property, excluding the single-family homes on Lots 29 and 30, the applicant shall prepare final designs and construction details for the two bridges that are part of and integral to the development roadway. Such final designs and construction details shall be submitted to the City for review and approval by the City Engineer and Planning Office to assure that the design is adequate to provide a level of service consistent with the roadway as shown on Sheets 10 & 11 of the approved subdivision plan set.
- 4. Prior to the signing and recording of the mylar and prior to the start of any construction activities on the property, the applicant shall sign a Subdivision Agreement in accordance with Section 7.4 of the Lebanon Subdivision Regulations.
- 5. Prior to the signing and recording of the mylar, the applicant shall enter into a Performance Security Agreement pursuant to Section 14.6 of the Subdivision Regulations, for all required improvements intended to serve the entire subdivision, both on- and off-site, including, but not limited to: roadways and sidewalks, sewer and water utilities within the development and the sewer main within Crafts Avenue, storm drainage systems for the development roadways, erosion control, and landscaping and street lights located within the proposed rights-of-way in an amount considered adequate by the Department of Public Works, and in a form satisfactory to the City Attorney. The Performance Security Agreement shall be secured by a surety bond, a letter of credit, or an escrow account for the full anticipated cost of such improvements.
- 6. Prior to the signing and recording of the mylar and prior to the start of any construction activities on the property, the applicant shall sign a Water & Sewer Extension and Inspection Agreement in accordance with Chapter 181 of the City Code and Section 14 of the Subdivision Regulations for water and sewer mains within the development and for the sewer main within Crafts Avenue serving the entire subdivision.
- 7. Prior to the signing and recording of the mylar and prior to the start of any construction activities on the property, the applicant shall obtain all required State approvals for the

Lebanon Planning Board - Notice of Action
XYZ DAIRY, LLC
Final Major Subdivision

subdivision including, but not limited to, the following:

- NHDES Alteration of Terrain Permit
- NHDES approval for Sewage Discharge
- NHDOT Driveway Permit for the northerly development entrance and any other improvements within the portion of NH Route 10 under NHDOT jurisdiction

8. Prior to the signing and recording of the mylar and prior to the start of any construction activities on the property, the applicant shall provide to the City for review a Traffic Signal Warrant Analysis for the south development entrance. The applicant shall also provide to the City a copy of a Traffic Signal Warrant Analysis for the north development entrance if such a Warrant Analysis is required by the NH Department of Transportation.
9. [Condition deleted.]
10. Prior to the signing and recording of the mylar, a note shall be added to the mylar noting that access to Lot 7 is limited to NH Route 10 and is subject to the NH Department of Transportation regulations.
11. Covenants and Deeds Restrictions or a conservation easement governing the common open space shall be written and recorded to ensure compliance with Section 12.2 of the Subdivision Regulations to the satisfaction of the City's attorney. As proposed by the applicant, such covenants and deed restrictions or conservation easement shall specifically allow for access to the Open Space parcel (Lot 6) along the Connecticut River frontage via a proposed pathway depicted on Lot 3 and Lot 24 and/or via any other access way that might be proposed and provided by the applicant. The construction or installation of any such pedestrian pathways to the Open Space parcel shall be subject to and in accordance with a NHDES Comprehensive Shoreland Protection permit for the development. It is the applicant's intent and the Planning Board's expectation that the Open Space (Lot 6) will be accessible to the general public.
12. Prior to the signing and recording of the mylar, the street names and numbering within the subdivision shall be approved by the City Engineer and the Lebanon Police Department to ensure compliance with the State's Enhanced 911 system. The Planning Board supports the use of the name "River Park Drive" if deemed acceptable by the City Engineer and the Lebanon Police Department.
13. Prior to the signing and recording of the mylar, the applicant shall provide a digital record drawing of the subdivision plan (CAD .dwg format using NH State Plane Coordinate system) to the Planning Office. The subdivision plan shall be recorded in the Grafton County Registry of Deeds prior to any occupancy of any new buildings within the subdivision.

GENERAL CONDITIONS OF APPROVAL:

14. The applicant acknowledges that the overall build-out of the River Park development will occur in seven (7) phases over an extended period of time in accordance with the application materials submitted to the Planning Board for Site Plan application (#PB2010-25-SPR). The applicant further acknowledges that the subdivision infrastructure, including the development roadway; extension of Crafts Avenue; water and sewer mains, excluding service connections, necessary to serve the subdivision; and storm drainage infrastructure necessary to serve the subdivision roadway will be constructed and/or installed during Phase 1 and Phase 2 as proposed by the applicant and approved by the Planning Board. The applicant shall complete all required Phase 1 subdivision infrastructure, as noted above, within a period of 5 years from the date of the Planning Board's final approval, and shall complete all required Phase 2 subdivision infrastructure, as noted above, within 5 years of commencement of Phase 2, unless, prior to the end of the 5-year period, the applicant shall have submitted an updated phasing schedule to the Planning Board and received approval for additional time to complete the subdivision infrastructure improvements. The applicant shall be required to notify the City of the date of commencement for Phase 2 for purposes of clearly establishing the time period within which required improvements must be completed.
15. Prior to the start of any construction activities within existing public rights-of-way subject to City jurisdiction, including NH Route 10 inside the urban compact area and Crafts Avenue, the applicant shall sign a Performance Security and Inspection Agreement in accordance with Section 14 of the Subdivision Regulations for completion of off-site roadway improvements along NH Route 10 within the urban compact area and for restoration of Crafts Avenue following installation of the required sewer main, to the extent such performance security has not already been provided to the City pursuant to Condition #5 of this decision. Any required agreements or performance security for improvements within NH Route 10 outside of the urban compact area shall be as approved and required by the NH Department of Transportation.
16. The applicant shall request approval from the City of Lebanon Public Safety Committee for the installation of a crosswalk across NH Route 10 at the Maple Street intersection. If such crosswalk is approved and authorized by the Public Safety Committee, the applicant shall be required to install the crosswalk and appropriate signage at the time of construction of other required improvements along NH Route 10, to the satisfaction of the City Engineer, which shall not be unreasonably withheld.
17. Prior to the start of any construction activities for which construction inspection is required pursuant to this decision or any applicable ordinance or code, the City shall retain the services of an independent 3rd party inspector, for which the applicant shall be responsible for all inspection fees related to construction and installation of on- and off-site roadways, sidewalks, water and sewer utilities, storm drainage systems, and erosion control, in accordance with Chapter 181 of the City Code and Section 14 of the Subdivision Regulations. The applicant shall provide funding for inspection services in a form acceptable to the City. Third party engineer inspection reports and as-built drawings provided by the applicant (using NH State Plane Coordinate system), including

Lebanon Planning Board - Notice of Action
XYZ DAIRY, LLC
Final Major Subdivision

tie sheets and Northing and Easting coordinates and elevations of underground utilities, shall be reviewed and approved by the City Engineer, prior to acceptance of any utility improvements by the City, and all such inspection reports shall be made available to the applicant.

18. The applicant shall comply with all other applicable provisions of Chapter 181 of the City Code, to the satisfaction of the Department of Public Works.
19. All proposed streets, sidewalks, water and sewer mains, and service lines shall be constructed pursuant to the City's standards, except as modified by the City Council for Crafts Avenue.
20. The applicant shall implement and maintain NHDES Site Specific Best Management Practices before, during, and after construction.
21. All required street trees and landscape plantings within the proposed rights-of-ways shall meet the minimum size requirements for such plantings set forth in Section 6.2.B of the Site Plan Review Regulations at the time of installation.
22. The applicant shall dedicate the completed water mains and hydrants within the subdivision, excluding service connections beyond the curb shut-off valves, to the City for ownership and maintenance, subject to appropriate easements. Said conveyance and easements shall be approved by the City Attorney and the Department of Public Works and recorded in the Grafton County Registry of Deeds prior to acceptance of any utility improvements by the City.
23. The applicant shall dedicate the completed sewer main within the Crafts Avenue right-of-way, excluding sewer lateral connections, to the City for ownership and maintenance. Said conveyances and easements shall be approved by the City Attorney and the Department of Public Works and recorded in the Grafton County Registry of Deeds prior to acceptance of any utility improvements by the City. All sewer mains within the development upstream of the Crafts Avenue right-of-way shall remain privately owned and maintained by the applicant.
24. The applicant shall comply with all applicable conditions of the Lebanon City Council's approval, dated May 18, 2011, concerning connection of City water and sewer systems for the River Park development.
25. The applicant shall offer to dedicate the extended roadway and cul-de-sac of Crafts Avenue to the City for ownership and maintenance.
26. In accordance with the City's Impact Fee Ordinance fee schedule adopted on September 13, 2010, this application is exempt from impact fees for a period of 5 years from the date of the Planning Board's final approval. Building permits obtained after the 5-year period shall be subject to impact fees in existence at the time of the Building Permit

application submission.

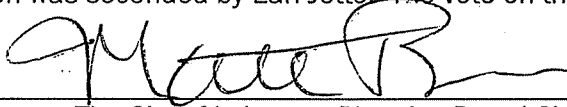
27. The Planning Board hereby grants waivers for Section 11.4.A.23 (Availability of Other Utilities) of the Subdivision Regulations.
28. Effect of Approval. This approval is a final, conditional subdivision approval for a "phased development" under Section 7.5 of the Subdivision Regulations and is a final decision of the Planning Board for purposes of RSA:15(I). Section 7.5 (c) (Review of remaining phases) shall not apply, because the entire subdivision has already been reviewed and approved under the "Review of Final Plat" process of Section 7.4. The deadlines for the construction of improvements within each phase shall be as stated in the approved phasing plan, rather than the 2-year period under Section 7.4(H). It is the intent and effect of this approval, subject to the satisfactory completion of the financial security arrangements in Condition #5 above, that upon completion of the Phase 1 infrastructure improvements within 5 years of this final approval, as set forth in Condition #14 above, the subdivision as a whole, including all phases, shall vest as provided in RSA 674:39,II, and no subsequent changes in subdivision regulations, site plan regulations, or zoning ordinances, except impact fees adopted pursuant to RSA 674:21 and 675:2-4, shall operate to affect this subdivision, provided that the applicant and its successors in interest continue to comply with all conditions of this approval and of the Planning Board's approval of Site Plan application #PB2010-25-SPR, including the time limits set forth in the phasing plan as outlined in the above-referenced Site Plan approval, unless such a limit is extended for good cause by the Planning Board, acting upon an application submitted prior to the expiration of such limit.
29. If any dispute arises over the interpretation or application of any of the above conditions, such dispute shall be resolved, by the Planning Board itself after notice and public hearing.

The motion was seconded by Earl Jette. The vote on the motion was unanimous in favor

Larry LeClair moved that the Lebanon Planning Board authorizes the Chair to sign the plat for **XYZ DAIRY, LLC**, #PB2011-01-FMAJ, as described above.

The motion was seconded by Earl Jette. The vote on the motion was unanimous in favor

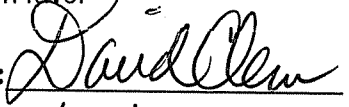
SIGNED: _____


The City of Lebanon, Planning Board Chair

DATE: _____

11-28-11

SIGNED: _____



DATED: _____

1/23/12



CITY OF LEBANON ~ PLANNING & DEVELOPMENT

LEBANON PLANNING BOARD NOTICE OF ACTION #PB2018-34-SPA

Notice is hereby given that on **JANUARY 14, 2019**, the following action was taken by a majority of the Lebanon Planning Board in accordance with the City of Lebanon Site Plan Review Regulations:

Bruce Garland moved that the Lebanon Planning Board finds the application of **XYZ DAIRY, LLC** for a Site Plan Amendment, #PB2018-34-SPA, is complete enough to accept jurisdiction and commence review.

The motion was seconded by Gregory Schwarz. The vote on the motion was 8-0.

Notice is hereby given that on **SEPTEMBER 9, 2019**, the following action was taken by a majority of the Lebanon Planning Board in accordance with the City of Lebanon Site Plan Review Regulations:

Matthew Hall moved that the Lebanon Planning Board **APPROVE** waivers for the application of **XYZ DAIRY, LLC**, #PB2018-34-SPA, from the requirements of Article VI ("Design and Construction Requirements") of the Site Plan Review Regulations, Sections 6.2, 6.5, 6.6 and 6.7, to allow the construction of temporary parking facilities on Lots 3, 4 and 5 of the River Park development.

The motion was seconded by Matthew Cole. The vote on the motion was 5-2, with Ms. Monroe and Mr. Schwarz voting against the motion. Ms. Romano and Ms. Stavis recused themselves from hearing the application.

Notice is hereby given that on **SEPTEMBER 9, 2019**, the following action was taken by a majority of the Lebanon Planning Board in accordance with the City of Lebanon Site Plan Review Regulations:

Matthew Hall moved that the Lebanon Planning Board **APPROVE** the application of XYZ DAIRY, LLC for an amendment to the Site Plan approval for the River Park mixed-use development to (i) change the sequence of the project phasing, (ii) increase the number of proposed residential dwelling units from 80 to 125, (iii) relocate the proposed sewer line from Crafts Avenue Ext. across Lot 2, and (iv) allow temporary parking facilities on Lots 2, 3, 4, and 5 for the first three phases of the development, #PB2018-34-SPA, including any and all supplemental submissions and testimony provided for and during the public hearing, and per the conditions of approval noted below.

Approval of the River Park development is in accordance with the Lebanon Zoning Ordinance dated December 5, 1990, last revised July 21, 2010, and the Lebanon Site Plan Review Regulations dated May 9, 1977, last revised November 9, 2009. The phased

build-out of River Park shall be as shown on the map and described in the chart under the heading "NEW PHASING PLAN" on page 5 of this Decision¹ (the "New Phasing Plan"), and is projected to occur over a 15-year period, unless the applicant requests and receives an extension of time for such build-out from the Planning Board.

This Site Plan approval is related to a subdivision plat for River Park that was originally approved by the Planning Board on October 11, 2011 (#PB2011-01-FMAJ), was revised on May 11, 2015 (#PB2015-07-FMAJ) and was recorded in the Grafton County Registry of Deeds on January 2, 2018.

PRIOR NOTICES OF ACTION

River Park, located at North Main Street, Tax Map 44, Lots 3 & 7 and Tax Map 58, Lot 27, in the CBD, IND-L and R-3 zones, was originally approved in 2011, and received extensions and modifications in 2013, 2015, and 2016. This Notice of Action is intended to consolidate and update all prior conditions of Site Plan approval for River Park and, therefore, is intended to supersede and replace the following Notices of Action:

- Notice of Action dated October 24, 2011, approving the site plan review application for XYZ DAIRY, LLC for a seven (7) phase development known as River Park, located at North Main Street, Tax Map 44, Lots 3 & 7 and Tax Map 57, Lot 27, West Lebanon, NH, in the CBD, IND-L and R-3 zones, #PB2010-25-SPR, as shown on plans titled "Site Plans – River Park" (Sheets numbered 1 through 5; D1 through D18; 1-1 through 1-16; 2-1 through 2-21; 3-1 through 3-16; 4-1 through 4-9; 5-1 through 5-7; 6-1 through 6-9; and 7-1 through 7-8), prepared by Holden Engineering & Surveying, Inc., issued for permitting: June 10, 2010, latest issue: May 2, 2011.
- Notice of Action dated September 9, 2013, approving the request of XYZ Dairy, LLC, for an extension of time in order to obtain Building Permits for each phase of a phased development known as River Park, located at North Main Street, Tax Map 44, Lots 3 and 7, and Tax Map 58, Lot 27, in the CBD, IND-L and R-3 zones, #PB2013-22-EXT.
- Notice of Action dated June 8, 2015, approving the application of XYZ DAIRY, LLC for a Site Plan Amendment to amend the layout of Lot 1, including changes to the building footprint, parking layout, vehicular circulation, loading location of the building, landscaping, lighting, and drainage and engineering of the site and associated site improvements, located at North Main Street, Tax Map 44, Lot 3, in the CBD district, #PB2015-10-SPA, plans titled "River Park, Proposed Amendment to Site Plan – Lot 1, West Lebanon, Grafton County, New Hampshire" prepared by Elkus/Manfredi Architects, dated April 13, 2015, and plans titled "Site Plans, River Park, River Park Drive, Lebanon, New Hampshire, Grafton County," prepared by TF Moran, dated May 26, 2015.
- Notice of Action dated November 9, 2015, approving the application XYZ DAIRY, LLC for an extension pursuant to the Site Plan Review Regulations for a 7-phase development known as River Park, located at North Main Street, Tax Map 44, Lots

¹ The New Phasing Plan replaces and supersedes the Master Phasing Plan (Sheet 5 of the Approved Plan Set).

3 and 7, and Tax Map 58, Lot 27, in the CBD, IND-L, and R-3 zones, #PB2015-34-EXT, as requested in a letter from David Clem of Lyme Properties.

- Notice of Action dated November 14, 2016, approving the request of XYZ DAIRY, LLC, for an extension of Site Plan Approval for a seven (7) phase development known as River Park, located at North Main Street, Tax Map 44, Lots 3 and 7, and Tax Map 58, Lot 27, in the CBD, IND-L, and R-3 zones, #PB2016-28-EXT.

The approval documented by this Notice of Action for #PB2018-34-SPA incorporates the following:

- The following approvals granted on October 24, 2011, as part of #PB2010-25-SPR:
 - A conditional use permit for the use of off-lot parking within the development in accordance with Section 607.5 of the Zoning Ordinance as set forth in the "Master Plan-Phasing Parking" table on Sheet 5 of the Approved Plan Set.
 - Waivers for Sections 5.2.A (Statement of Service from Utilities) and Section 7.3.C (Use of Landscape Architect) of the Site Plan Review Regulations for the overall development.
- Any and all supplemental submissions and testimony provided for and during the public hearings for #PB2010-25-SPR, #PB2013-22-EXT, #PB2015-10-SPA, #PB2015-34-EXT, #PB2016-28-EXT, and for the current application, #PB2018-34-SPA.

APPROVED SITE PLANS

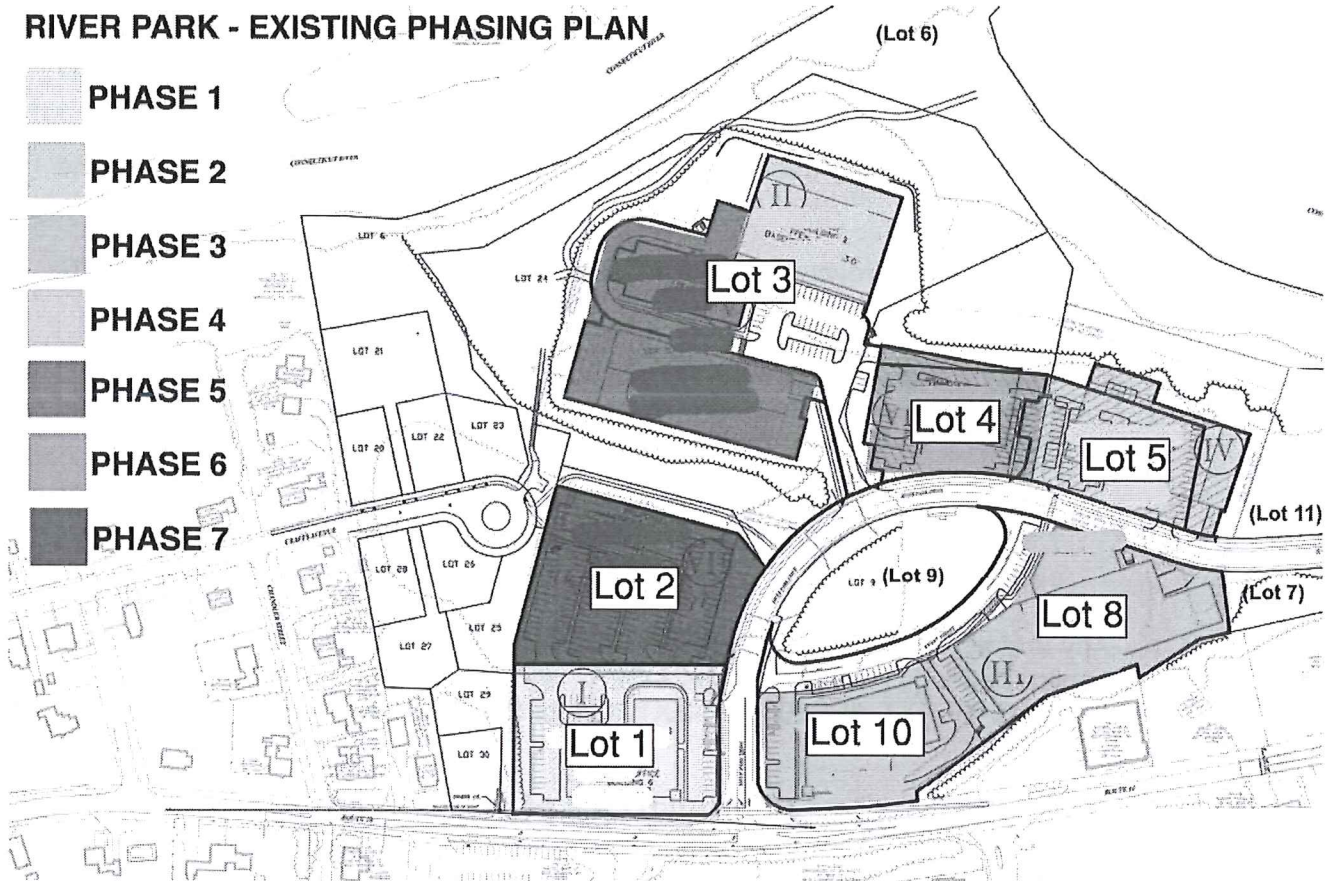
As set forth in the Notices of Action outlined above, the approved site plans for River Park consist of the following:

- Plans titled "Site Plans – River Park" (Sheets numbered 1 through 5; D1 through D18; 1-1 through 1-16; 2-1 through 2-21; 3-1 through 3-16; 4-1 through 4-9; 5-1 through 5-7; 6-1 through 6-9; and 7-1 through 7-8), prepared by Holden Engineering & Surveying, Inc., issued for permitting: June 10, 2010, latest issue: May 2, 2011 ("Approved Plan Set").
- Plans titled "River Park, Proposed Amendment to Site Plan – Lot 1, West Lebanon, Grafton County, New Hampshire" prepared by Elkus/Manfredi Architects, dated April 13, 2015, and plans titled "Site Plans, River Park, River Park Drive, Lebanon, New Hampshire, Grafton County," prepared by TF Moran, dated May 26, 2015. [These plans sets supersede and replace Sheets 1-1 through 1-16 of the Approved Plan Set].

[continued on following page]

PRIOR PHASING PLAN

River Park was originally approved as a seven (7) phase project as follows:

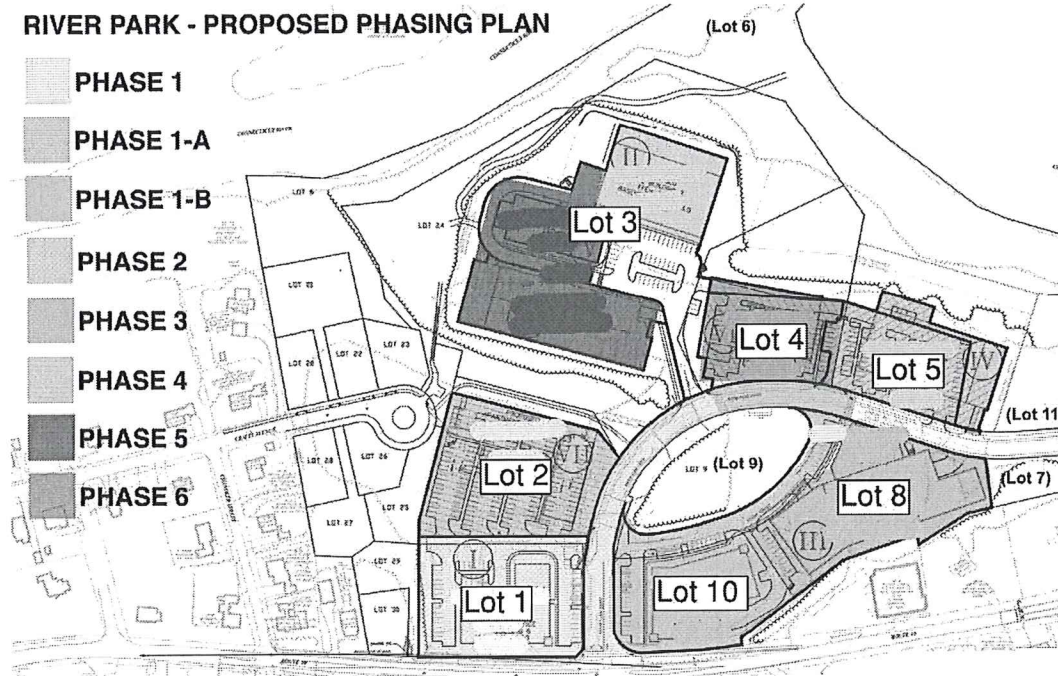
RIVER PARK - EXISTING PHASING PLAN

PRIOR PHASING -- APPROVED ON 10/24/11	
Phase	Improvements
1	48,750-square-foot building for office and retail use located on Lot 1 with temporary parking located on Lot 2. Phase 1 also includes construction of a portion of the development roadway sufficient to access the proposed building, the southerly development entrance intersection, the extension of Crafts Avenue, and the installation of water and sewer lines necessary for this portion of the site.
2	178,650-square-foot building for laboratory/office use located on Lot 3 with temporary parking located on Lots 4 and 5. Phase 2 also includes the construction of the remainder of the development roadway and the northerly access intersection.
3	95,800-square-foot building for office and retail use located on Lot 10; a 23,000-square-foot building for office and retail use and a 585-space parking garage located on Lot 8, and construction of proposed Lyman Street.
4	153,120-square-foot building for laboratory/office use located on Lot 5.
5	81,500-square-foot building for laboratory/office use and an 808-space parking garage located on Lot 3.
6	133,200-square-foot building for laboratory/office use located on Lot 4.
7	125,125-square-foot building for 80 units of multi-family housing located on Lot 2.

NEW PHASING PLAN

This Notice of Action approves the rephasing of the River Park development, as follows:

RIVER PARK - PROPOSED PHASING PLAN



NEW PHASING	
Phase	Improvements
1	46,925 ² -square-foot building for office and retail use located on Lot 1 with temporary parking located on Lot 2 and Lot 3. Phase 1 also includes construction of a portion of the development roadway sufficient to access Lot 3, the southerly development entrance intersection, the extension of Crafts Avenue, and the installation of water and sewer lines necessary for this portion of the site.
1-A	125,125-square-foot building for 125 units of multi-family housing located on Lot 2, and the construction of a temporary parking lot on Lot 3 and Lot 4. Phase 1-A also includes the extension of the development roadway and construction of proposed Lyman Street.
1-B	95,800-square-foot building for office and retail use located on Lot 10 with temporary parking on Lot 3, Lot 4, and Lot 5.
2	178,650-square-foot building for laboratory/office use located on Lot 3 with temporary parking located on Lot 3, Lot 4, and Lot 5. Phase 2 also includes the construction of the remainder of the development roadway and the northerly access intersection.
3	23,000-square-foot building for office and retail use and a 585-space parking garage located on Lot 8.
4	153,120-square-foot building for laboratory/office use located on Lot 5.
5	81,500-square-foot building for laboratory/office use and an 808-space parking garage located on Lot 3.
6	133,200-square-foot building for laboratory/office use located on Lot 4.

² Reduced from 48,750 sq. ft. per Notice of Action dated June 8, 2015, #PB2015-10-SPA. The applicant may apply to the Planning Board for a Site Plan Amendment to reallocate the 1,825 sq. ft. difference towards another building or buildings in the River Park development.

CONDITIONS OF APPROVAL***GENERAL CONDITIONS-PRECEDENT TO THE ISSUANCE OF A BUILDING PERMIT FOR EACH PHASE:***

1. The applicant shall submit final designs, including construction drawings, of all infrastructure features associated with each phase, including proposed on- and off-site roadway and parking areas, sidewalks, water and sewer utilities, and storm drainage systems, to the City Engineer for approval, which shall not be unreasonably withheld.
2. The applicant has submitted sufficient site and building information to obtain Site Plan approval for development of the site. However, the applicant shall be required to submit updated site plans, building elevations, and phasing information sufficient to demonstrate compliance with the approval to the City for review and approval by the Planning Department, prior to the issuance of Building Permits for each phase and prior to the start of any construction activities for development shown or described in all remaining phases as depicted on the New Phasing Plan. For purposes of this decision, construction activities shall include any construction, excavation, or other site work associated with the construction or installation of buildings, roadways, parking, water, sewer, or storm drainage infrastructure. All such plans and information shall be in accordance with the Site Plan Review Regulations dated last revised November 9, 2009. Such Planning Department review shall be for the purpose of ensuring that the proposed building design and uses are in substantial conformance with the approved phased development project and with the Site Plan Review Regulations referenced above.
3. The applicant shall complete all required improvements for all approved phases in accordance with the New Phasing Plan and in accordance with this decision, except that the applicant, upon written notice to the Planning Board, may elect to commence Phase 3 (including the 585-space parking garage located on Lot 8) at any time prior to the date referenced in Condition #18-1. In so doing, the applicant may commence Phase 3 prior to any one or more of the phases preceding Phase 3 in the sequence set forth in the New Phasing Plan. For purposes of this decision, the commencement dates referenced on the New Phasing Plan and in this decision shall be deemed to be the date by which a Building Permit shall have been applied for with stamped construction drawings prepared by a licensed architect and engineer for that phase, pursuant to Section 4.9.C(4) of the Site Plan Review Regulations, and the phasing deadline is tolled until the Building Permit is issued. If the applicant anticipates being unable to meet any time deadline(s) set forth in this decision with respect to any phase(s), the applicant shall submit an updated phasing schedule to the Planning Board for review and approval in accordance with Section 4.9.E of the Site Plan Review Regulations. In determining whether to grant any requested extensions, the Board shall consider the totality of the circumstances, including the extent and complexity of the conditions-precedent, and whether the need for more time is attributable to circumstances beyond the control of the applicant, rather than to the applicant's neglect or failure to proceed with reasonable promptness.
4. Prior to the start of any construction activities for which construction inspection is required pursuant to this decision or any applicable ordinance or code for each phase of the project, the City shall retain the services of an independent 3rd party

inspector, for which the applicant shall be responsible for all inspection fees related to construction and installation of on- and off-site roadways, parking, sidewalks, water and sewer utilities, storm drainage, and erosion control, in accordance with Chapter 181 of the City Code and Section 14 of the Subdivision Regulations unless waivers have been granted. The applicant shall provide funding for inspection services in a form acceptable to the City. Third party engineer inspection reports and as-built drawings provided by the applicant (using NH State Plane Coordinate system), including tie sheets and Northing and Easting coordinates and elevations of underground utilities, shall be reviewed and approved by the City Engineer, prior to acceptance of any utility improvements by the City and all inspection reports shall be made available to the applicant.

5. Edge-of-Disturbance fencing shall be installed and maintained before and during any site work for each phase under construction, to be verified by the City Engineer or City's third-party inspector on site.
6. The applicant shall be required to have at least one fire hydrant operational within the development prior to the issuance of any Building Permit for structural improvements (excluding the building foundation) to the satisfaction of the Lebanon Fire Department. Note: the Lebanon Fire Department has approved the fire hydrant on Crafts Avenue extension as satisfaction of this condition.
7. Temporary parking facilities.
 - a. Temporary parking facilities are approved in accordance with the chart attached hereto as Exhibit "A".
 - b. Prior to the issuance of a building permit for any phase involving the construction of a temporary parking facility, the applicant shall provide the Planning & Development Department with plans for the proposed temporary parking facility, together with an operation and maintenance plan.
 - c. Each temporary parking facility shall be designed to ensure the safe movement of vehicles and pedestrians to the satisfaction of the Director of the Department of Public Works and the Director of the Planning Department, which shall not be unreasonably withheld. It shall be the responsibility of the applicant to maintain each temporary parking facility in accordance with the operation and maintenance plan.
 - d. The temporary parking identified in Exhibit A may be used until such parking is replaced by the permanent parking garage included in Phase 3 or December 31, 2038, whichever is earlier.

GENERAL CONDITIONS-PRECEDENT TO THE ISSUANCE OF CERTIFICATES OF OCCUPANCY FOR EACH PHASE:

Temporary Certificates of Occupancy:

8. A water flow test shall be completed on the new water main within the development as soon as the water main is substantially complete and prior to any occupancy of any new buildings within the subdivision. Such test is for the purpose of designing

fire suppression sprinkler systems for each building and shall be witnessed and approved by the Lebanon Fire Department.

- 8a. The subdivision plat shall be recorded in the Grafton County Registry of Deeds prior to any occupancy of any new buildings within the subdivision. Note: The River Park Subdivision plat was filed on December 27, 2017 and recorded on January 2, 2018 in the Grafton County Registry of Deeds.
- 9. Prior to the issuance of any Certificate of Occupancy for each phase, the applicant shall enter into a Performance Security Agreement, pursuant to Section 8.2 of the Site Plan Review Regulations for any unfinished and outstanding improvements, unless waivers have been granted, that are required for the current development phase, both on- and off-site, including, but not limited to: parking and sidewalk improvements, sewer and water utilities, storm drainage systems, landscaping, and lighting, in an amount considered adequate by the Department of Public Works, and in a form satisfactory to the City Attorney. The Performance Security Agreement shall be secured by a surety bond, a letter of credit, or an escrow account.
- 10. Prior to the issuance of any Certificate of Occupancy for each phase, the applicant shall be required to provide the City with a copy of a recorded deed or easement, a 99-year lease, or other legal instrument acceptable to an attorney representing the City for off-lot parking in accordance with Section 607.5.A(2) of the Zoning Ordinance to ensure that the occupants of each phase have adequate on-site or off-site parking at all times.

Final Certificates of Occupancy:

- 11. Prior to the issuance of a final Certificate of Occupancy for each phase, the applicant shall dedicate the completed water mains and hydrants within the current development phase, excluding service connections beyond the curb shut-off valves, to the City for ownership and maintenance, subject to any appropriate easements. Said conveyance and easements shall be approved by the City Attorney and the Department of Public Works and recorded in the Grafton County Registry of Deeds prior to acceptance of any utility improvements by the City.
- 12. Prior to the issuance of a final Certificate of Occupancy for each phase, the applicant shall comply with all other applicable provisions of Chapter 181 of the City Code, to the satisfaction of the Department of Public Works.
- 13. Prior to the issuance of a final Certificate of Occupancy for each phase, the applicant shall provide a digital as-built record drawing for each lot (Cad .dwg format using the NH State Plane Coordinate System).

SPECIFIC CONDITIONS FOR PHASE 1:

- 14-1. The Applicant shall ensure that all trees are a minimum of ten (10) ft. from the water and sewer mains when planted.
- 14-2. The construction of Phase 1 infrastructure improvements, which commenced in 2018, shall be completed within 5 years from the date of the Planning Board's final

subdivision approval, unless the applicant requests and receives an extension of time for such build-out from the Planning Board.

- 14-3. This condition was originally Condition #14-2 in the October 24, 2011 Notice of Action, and was obviated by the Planning Board's Notice of Action dated June 8, 2015 (#PB2015-10-SPA). It is included below for historical purposes only:

Prior to the issuance of a Building Permit for Phase 1 of the development, the applicant shall provide two complete sets of revised plans to the Planning Department, depicting the following plan changes:

- a. Sheet 1 of the approved Site Plan sets shall be revised to include the tax map and lot number and abutter name and address for the adjacent islands within the Connecticut River, which are owned by the State of New Hampshire.
- b. Sheets 2 & 3 of the approved Site Plan sets shall be revised to eliminate the reference to "Lot 6" within the boundaries of proposed Lot 21.
- c. Sheet 3 of the approved Site Plan sets shall be revised to relocate the Surveyor's signature block and to properly label Lot 21.
- d. As proposed by the applicant in a letter to the Planning Board dated July 19, 2011, the Phasing Notes on Sheet 5 of the approved Site Plan sets shall be revised to push back by one year the dates of commencement for each phase of the overall development.
- e. Sheets 1-9 and 1-11, and any other applicable plan sheets, shall be revised to depict bollards or other safety measures around all propane tanks that are exposed to vehicle traffic to the satisfaction of the Lebanon Fire Department.

- 14-4. Prior to the issuance of a Building Permit for Phase 1 of the development, the applicant shall obtain all required State approvals including, but not limited to, the following:

- NHDES Alteration of Terrain Permit
- NHDES approval for Sewage Discharge

Note: this requirement has already been satisfied. Alteration of Terrain Permit #AoT-0994 dated October 6, 2015 and Sewage Discharge Permit #D2015-0802 dated September 10, 2015, have been issued by NH DES for Phase 1.

- 14-5. The requirements of Sections 6.2.B(1) of the Site Plan Review Regulations are waived for improvements on Lot 2 for Phase 1. See *also* Condition 15-3.

- 14-6. As proposed by the applicant, the southerly development entrance improvements shall be constructed as part of Phase 1 of the development. If a Traffic Signal Warrant Analysis for the southerly development entrance indicates that signalization of the intersection will be required during any phase of the development, the applicant shall be required to install and activate traffic signal improvements when actual traffic conditions warrant such implementation, pursuant to Condition 14-8 of this decision. Note: the applicant has provided a Traffic Signal Warrant Analysis as required by this condition.

- 14-7. As recommended in Phase "A" of the applicant's Traffic Impact and Site Access Study, prepared by Holden Transportation Engineering, dated August 17, 2010, the applicant shall be required to implement traffic signal timing optimization improvements at the intersection of Main Street/Bridge Street/Dana Street within 6 months following the issuance of any Certificate of Occupancy for Phase 1 of the development to the satisfaction of the Department of Public Works which shall not be unreasonably withheld. Prior to issuing any Certificate of Occupancy for Phase 1, the applicant shall provide the City with an acceptable performance security in an amount sufficient to guarantee the completion of the traffic signal timing update as required. Any performance security required under this condition for Phase 1 shall be separate from any performance security required by Condition 9 of this decision.
- 14-8. The applicant shall be required to monitor traffic volumes and distribution patterns at both the northerly and southerly development entrances to ensure the adequacy of proposed mitigation measures as outlined in the Traffic Impact and Site Access Study, prepared by Holden Transportation Engineering, dated August 17, 2010, and to determine when signalization of the southerly development intersection might be required, based on the Traffic Signal Warrant Analyses to be prepared by the applicant and provided to the City. Such monitoring shall be conducted within 6 months following the issuance of any Certificate of Occupancy for Phase 1 and for each later phase to the satisfaction of the Department of Public Works. The applicant shall be required to install and activate traffic signal improvements, to the satisfaction of the Department of Public Works, when actual traffic conditions warrant such implementation. Prior to issuing any Certificate of Occupancy for Phase 1 and for each later phase, the applicant shall provide the City with an acceptable performance security in an amount sufficient to guarantee the completion of the traffic monitoring as required. Any performance security required under this condition for Phase 1 and for each later phase shall be separate from any performance security required by Condition 9 of this decision. Note: the applicant has provided a Traffic Signal Warrant Analysis as required by this condition.
- 14-9. Prior to the issuance of a Building Permit, the applicant shall submit an updated Site Plan that reflects the correct and updated phasing schedule as approved as part of the Subdivision Amendment approved by the Planning Board May 11, 2015. Note: With the approval of the New Phasing Plan, this condition is no longer applicable.
- 14-10. Prior to the issuance of a Building Permit, the applicant shall submit an updated landscaping plan, to the satisfaction of the Planning Department, with a table indicating the proposed number, size, and species names of all the proposed plantings for Lot 1, as well as updating parking shading calculations for Lot 1 only. Note: the applicant has satisfied this condition.
- 14-11. Prior to the issuance of a Building Permit, the applicant shall submit an updated lighting plan showing the number of proposed light poles for Lot 1 and the location of any proposed lighting on the building façade, if applicable. The applicant shall also confirm that the lighting intensity on the residential lots to the south does not exceed 0.1 foot-candles, to the satisfaction of the Planning Department. Note: the applicant has satisfied this condition.

- 14-12. Prior to the issuance of a Building Permit, the applicant shall obtain approval from the Fire Department regarding the turning radius of the fire trucks and location of the proposed fire hydrants on Lot 1, and all plans shall reflect the final and approved details. Note: the applicant has satisfied this condition.
- 14-13. The applicant shall provide appropriate signage and/or pavement markings to identify the one-way circulation of the proposed driveway on site to the satisfaction of the City Engineer. Note: the applicant has satisfied this condition.
- 14-14. The applicant shall provide an accurate drainage report that shall reflect current and proposed drainage, to the satisfaction of the City Engineer. Note: the applicant has satisfied this condition.
- 14-15. The applicant shall provide a plan that demonstrates a lack of conflict between overhead utilities and landscaping, to the satisfaction of the City Engineer. Note: the applicant has satisfied this condition.
- 14-16. The requirements of Sections 5.1.E(13) and 6.2.B of the Site Plan Regulations are waived as was requested by the applicant in connection with the Site Plan Review approval for #PB2015-10-SPA.

SPECIFIC CONDITIONS FOR PHASE 1-A:

- 15-1. As proposed by the applicant, the construction of Phase 1-A improvements shall commence before the end of 2023 and shall be completed within 2 years of commencement, unless the applicant requests and receives an extension of time for such build-out from the Planning Board.
- 15-2. The applicant shall obtain all required State approvals including, but not limited to, the following:
- NHDES Alteration of Terrain Permit, if applicable
 - NHDES approval for Sewage Discharge
- 15-3. The requirements of Section 6.2.B(1) of the Site Plan Review Regulations are waived for improvements on Lot 2 for Phase 1-A.

SPECIFIC CONDITIONS FOR PHASE 1-B:

- 16-1. As proposed by the applicant, the construction of Phase 1-B improvements shall commence before the end of 2024 and shall be completed within 5 years of commencement, unless the applicant requests and receives an extension of time for such build-out from the Planning Board.
- 16-2. The applicant shall obtain all required State approvals including, but not limited to, the following:
- NHDES Alteration of Terrain Permit
 - NHDES approval for Sewage Discharge
- 16-4. The requirements of Section 6.2.B(6) of the Site Plan Review Regulations are waived for improvements on Lot 8 for Phase 1-B.

SPECIFIC CONDITIONS FOR PHASE 2:

- 17-1. As proposed by the applicant, the construction of Phase 2 infrastructure improvements shall commence before the end of 2026 and shall be completed within 5 years of commencement, unless the applicant requests and receives an extension of time for such build-out from the Planning Board.
- 17-2. Prior to the issuance of a Building Permit for Phase 2 of the development, the applicant shall provide two complete sets of revised plans to the Planning Department, depicting the following plan changes:
 - a. Landscaping on Sheet 2-15 shall be revised and foundation plantings added along the westerly side of the parking garage structure to be consistent with the relocated garage #2 layout as depicted on Sheet 5-4, dated last revised May 2, 2011.
- 17-3. The applicant shall obtain all required State approvals including, but not limited to, the following:
 - NHDES Alteration of Terrain Permit
 - NHDES approval for Sewage Discharge
 - NHDES Comprehensive Shoreland Protection permit
- 17-4. As proposed by the applicant, the northerly development entrance improvements shall be constructed as part of Phase 2 of the development. Prior to the issuance of a Building Permit and prior to the start of any construction activities for Phase 2, the applicant shall have received approval from the NH Department of Transportation for the northerly development entrance and any other improvements within the portion of NH Route 10 under NHDOT jurisdiction. Signalization of the northerly development entrance shall be subject to approval and requirement of the NH Department of Transportation.
- 17-5. As recommended in Phase "A" of the applicant's Traffic Impact and Site Access Study, prepared by Holden Transportation Engineering, dated August 17, 2010, the applicant shall be required to implement traffic signal timing optimization improvements at the intersections of Main Street/Tracy Street and Main Street/South Main Street/Maple Street within 6 months following the issuance of any Certificate of Occupancy for Phase 2 of the development. Prior to issuing any Certificate of Occupancy for Phase 2, the applicant shall provide the City with an acceptable performance security in an amount sufficient to guarantee the completion of the traffic signal timing optimization as required. Any performance security required under this condition for Phase 2 shall be separate from any performance security required by Condition 9 of this decision.

SPECIFIC CONDITIONS FOR PHASE 3:

- 18-1. As proposed by the applicant, the construction of Phase 3 improvements shall commence before the end of 2028 and shall be completed within 5 years of commencement, unless the applicant requests and receives an extension of time for such build-out from the Planning Board.
- 18-2. The applicant shall obtain all required State approvals including, but not limited to, the following:

- NHDES Alteration of Terrain Permit
- NHDES approval for Sewage Discharge

- 18-3. As recommended in Phase "B" of the applicant's Traffic Impact and Site Access Study, prepared by Holden Transportation Engineering, dated August 17, 2010, the applicant shall be required to make a payment to the City in the amount of \$274,554.00 toward design, construction and installation by the City of geometric improvements and/or traffic signal upgrades as outlined in the Study for the intersection of Main Street/Bridge Street/Dana Street intersection and/or traffic signal upgrades at Main Street/Tracy Street and Main Street/South Main Street/Maple Street intersections prior to the issuance of any Certificate of Occupancy for Phase 3 of the development.

If the City elects to pursue geometric improvements at the Main Street/Bridge Street/Dana Street intersection, the City shall determine whether any existing on-street parking spaces on Main Street will be lost due to construction of these intersection improvements. If existing on-street parking spaces are to be lost, the applicant shall, prior to the issuance of any Certificate of Occupancy for Phase 3, be required to pay to the City an amount equal to \$4,700.00 per space for each lost parking space, which is the amount estimated by the City needed to pay for land and construction costs necessary to replace such lost parking. Any funds received by the City from the applicant shall be used by the City to study the parking needs of the West Lebanon Village Central Business District and to identify locations for and/or to reconstruct such lost parking spaces. Any funds not expended by the City within a period of 6 years from receipt shall be returned to the applicant in accordance with RSA 674:21,V(j).

- 18-4. The applicant shall be required to monitor and update traffic signal timing optimization along Main Street as individual phases of the development are completed and occupied to ensure optimal traffic operations through the Main Street corridor for the duration of the project build-out. Such monitoring shall be conducted within 6 months, and updates shall be implemented within 1 year, following the issuance of any Certificate of Occupancy for Phase 3 and for each later phase, to the satisfaction of the Department of Public Works. Prior to issuing any Certificate of Occupancy for Phase 3 and for each later phase, the applicant shall provide the City with an acceptable performance security in an amount sufficient to guarantee the completion of the traffic signal timing monitoring and updates, as required. Any performance security required under this condition for Phase 3 and each later phase shall be separate from any performance security required by Condition 9 of this decision.

- 18-5. The requirements of Section 6.2.B(6) of the Site Plan Review Regulations are waived for improvements on Lot 8 for Phase 3.

SPECIFIC CONDITIONS FOR PHASE 4:

- 19-1. As proposed by the applicant, the construction of Phase 4 improvements shall commence before the end of 2030 and shall be completed within 5 years of commencement, unless the applicant requests and receives an extension of time for such build-out from the Planning Board.

- 19-2. The applicant shall obtain all required State approvals including, but not limited to, the following:
- NHDES Alteration of Terrain Permit, if applicable
 - NHDES approval for Sewage Discharge
 - NHDES Comprehensive Shoreland Protection permit

SPECIFIC CONDITIONS FOR PHASE 5:

- 20-1. As proposed by the applicant, the construction of Phase 5 improvements shall commence before the end of 2032 and shall be completed within 5 years of commencement, unless the applicant requests and receives an extension of time for such build-out from the Planning Board.
- 20-2. Prior to the issuance of a Building Permit for Phase 5 of the development, the applicant shall provide two complete sets of revised plans to the Planning Department, depicting the following plan changes:
- a. Landscaping on Sheet 5-7 shall be revised and foundation plantings added along the westerly side of the parking garage structure to be consistent with the relocated garage #2 layout as depicted on Sheet 5-4, dated last revised May 2, 2011.
- 20-3. The applicant shall obtain all required State approvals including, but not limited to, the following:
- NHDES Alteration of Terrain Permit, if applicable
 - NHDES approval for Sewage Discharge
 - NHDES Comprehensive Shoreland Protection permit

SPECIFIC CONDITIONS FOR PHASE 6:

- 21-1. As proposed by the applicant, the construction of Phase 6 improvements shall commence before the end of 2035 shall be completed within 5 years of commencement, unless the applicant requests and receives an extension of time for such build-out from the Planning Board.
- 21-2. The applicant shall obtain all required State approvals including, but not limited to, the following:
- NHDES Alteration of Terrain Permit, if applicable
 - NHDES approval for Sewage Discharge
 - NHDES Comprehensive Shoreland Protection permit

GENERAL CONDITIONS OF APPROVAL:

22. The applicant shall implement and maintain NHDES Site Specific Best Management Practices before, during, and after construction.
23. All proposed streets, sidewalks, water and sewer mains, and service lines shall be constructed pursuant to the City's standards.

-
24. All required landscape plantings shall meet the minimum size requirements for such plantings set forth in Section 6.2.B of the Site Plan Review Regulations at the time of installation.
 25. Any light fixtures used to illuminate signage, including building-mounted signage, shall be installed to light the signs from above and shall conform to the City Site Plan Review Regulations.
 26. In accordance with the City's Impact Fee Ordinance fee schedule adopted on September 13, 2010, this application is exempt from impact fees for a period of 5 years from the date of the Planning Board's final approval. Building permits obtained after the 5-year period shall be subject to impact fees in existence at the time of the Building Permit application submission. [Note: The River Park subdivision plat (#PB2011-01-FMAJ) was recorded on January 2, 2018, representing the final approval for the subdivision and starting the 5-year exemption period, which shall expire on January 2, 2023.]
 27. The applicant shall provide to the City copies of any agreements, memoranda of understanding, or licenses granting permission for Advance Transit and other local transit service providers to utilize the River Park development as a transfer point for existing and future transit routes serving West Lebanon. Any such documents shall be provided as soon as practicable and prior to the relocation of transit services from Main Street to the River Park development.
 28. The applicant is encouraged to work with tenants and residents of the River Park development to implement Transportation Demand Management measures, including flexible work hours, incentives for carpooling, adequate parking and showers and changing rooms for bicyclists, and other measures, to reduce peak hour travel and reliance on single-occupancy vehicles.
 29. Effect of Approval. This approval is a final, conditional site plan approval for a "phased development" under Section 4.9 of the Site Plan Review Regulations and is a final decision of the Planning Board for purposes of RSA 677:15, I. As set forth in Section 4.10(C) of those Regulations, the deadlines for the construction of improvements within each phase shall be as stated in the approved phasing plan, rather than the 1-year period under Section 4.10(A). It is the intent and effect of this approval, subject to the satisfactory completion of the financial security requirements set forth in Condition #5 of the Final Major Subdivision approval (#PB2011-01-FMAJ) for the development, that upon completion of the Phase 1 infrastructure improvements within 5 years of the final subdivision approval, as set forth in Condition #14-2 above, the subdivision as a whole, including all phases, shall vest as provided in RSA 674:39, II, and no subsequent changes in subdivision regulations, site plan regulations, or zoning ordinances, except impact fees adopted pursuant to RSA 674:21 and 675:2-4, shall operate to affect this phased development, provided that the applicant and its successors-in-interest continue to comply with all conditions of this approval and of the Planning Board's approval of Final Major Subdivision application #PB2011-01-FMAJ, including the time limits set forth in the phasing plan, unless such a limit is extended for good cause by the Planning Board, acting upon an application submitted prior to the expiration of such limit.

PLANNING BOARD NOTICE OF ACTION

167-197 North Main Street

#PB2018-34-SPA

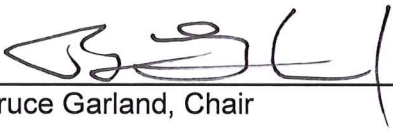
September 9, 2019

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30. If any dispute arises over the interpretation or application of any of the above conditions, such dispute shall be resolved by the Planning Board itself after notice and public hearing.

The motion was seconded by Matthew Cole. The vote on the motion was 5-2, with Ms. Monroe and Mr. Schwarz voting against the motion. Ms. Romano and Ms. Stavis recused themselves from hearing the application.

THE CITY OF LEBANON PLANNING BOARD

By:  DATE: 10/22/19
Bruce Garland, Chair

River Park

Master Plan – Proposed Phasing Parking

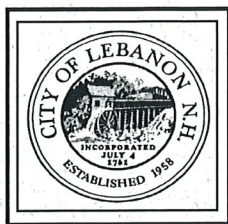
Color Code		<u>Lot #</u>	<u>Building#</u>	<u>Modified Parking Required</u>	<u>Onsite Parking Provided</u>	<u>Net Temporary Parking Needed</u>	<u>Temporary Parking Location ****</u>
	Phase 1	1	1	149	42	107	Lot 3 (120 spaces)
	Phase 1-A	2	8	132*	73	59	Lot 3 & 4 (225 spaces)
	Phase 1-B	10	3	285	30	255	Lot 3, 4, 5 (325 spaces + shared parking reduction credit of 123 spaces)
	Phase 2	3	5	209	33	0	
	Phase 3	8	Garage 1	(585)***	585	0	Garage #1 must be completed prior to Bldg 5 Certificate of Occupancy
			4	70	19	0	
	Phase 4	5	7	180	6	0	
	Phase 5	3	Garage 2	(808)***	808	0	
			2	96	0	0	
	Phase 6	4	6	156	6	0	
				1276**	209 surface 1393 Garages 1+2	421	

*Assumes 125 units X 1.5 spaces per unit required X .070 (approved reduction factor)

** Proposed totals 1276 spaces required due to increase in apartment units from 80 to 125 (Existing totals 1233 spaces)

*** Garage 1 and 2 total 1393 spaces

**** Assumes Waiver Request is granted



CITY OF LEBANON ~ PLANNING & DEVELOPMENT

NOTICE OF ACTION LEBANON PLANNING BOARD

Notice is hereby given that on **October 12, 2021**, the following action was taken by a majority of the Lebanon Planning Board in accordance with the City of Lebanon Site Plan Review Regulations:

Matthew Hall moved that the Lebanon Planning Board finds the application of XYZ Dairy, LLC for an extension of the timelines set forth in the Planning Board Notice of Action dated September 9, 2019 (PB2018-34-SPA) for the commencement of construction and completion of the River Park development, (PB2021-29-EXT) is complete enough to accept jurisdiction and commence review.

The motion was seconded by Jeremy Rutter. The vote on the motion was unanimous in favor, 6-0.

Notice is hereby given that on **October 12, 2021**, the following action was taken by a majority of the Lebanon Planning Board in accordance with the City of Lebanon Site Plan Review Regulations:

Matthew Hall moved that the Lebanon Planning Board **APPROVE** the application of XYZ Dairy, LLC, PB2021-29-EXT, for a two-year extension of the timelines set forth in the Planning Board Notice of Action dated September 9, 2019 (PB2018-34-SPA) ("2019 Notice of Action"). Consequently, the following conditions of approval from the 2019 Notice of Action are hereby revised as follows (the text of each condition to be removed is struck through; the new language is in bold and underlined):

- 14-2. The construction of Phase 1 infrastructure improvements, which commenced in 2018, shall be completed within 5 7 years from the date of the Planning Board's final subdivision approval, unless the applicant requests and receives an extension of time for such build-out from the Planning Board.
- 15-1. As proposed by the applicant, the construction of Phase 1-A improvements shall commence before the end of 2023 2025 and shall be completed within 2 years of commencement, unless the applicant requests and receives an extension of time for such build-out from the Planning Board.
- 16-1. As proposed by the applicant, the construction of Phase 1-B improvements shall commence before the end of 2024 2026 and shall be completed within 5 years of commencement, unless the applicant requests and receives an extension of time for such build-out from the Planning Board.
- 17-1. As proposed by the applicant, the construction of Phase 2 infrastructure improvements shall commence before the end of 2026 2028 and shall be completed within 5 years of commencement, unless the applicant requests and receives an extension of time for such build-out from the Planning Board.
- 18-1. As proposed by the applicant, the construction of Phase 3 improvements shall commence before the end of 2028 2030 and shall be completed within 5 years of commencement, unless the applicant requests and receives an extension of time for such build-out from the Planning Board.

PLANNING BOARD NOTICE OF ACTION

River Park Drive (Tax Map 44, Lots 3 & 7 & Tax Map 58, Lot 27)

PB2021-29-EXT

October 12, 2021

Page 2 of 2

- 19-1. As proposed by the applicant, the construction of Phase 4 improvements shall commence before the end of 2030 **2032** and shall be completed within 5 years of commencement, unless the applicant requests and receives an extension of time for such build-out from the Planning Board.
- 20-1. As proposed by the applicant, the construction of Phase 5 improvements shall commence before the end of 2032 **2034** and shall be completed within 5 years of commencement, unless the applicant requests and receives an extension of time for such build-out from the Planning Board.
- 21-1. As proposed by the applicant, the construction of Phase 6 improvements shall commence before the end of 2035 **2037** shall be completed within 5 years of commencement, unless the applicant requests and receives an extension of time for such build-out from the Planning Board.
26. In accordance with the City's Impact Fee Ordinance fee schedule adopted on September 13, 2010, this application is exempt from impact fees for a period of 5 years from the date of the Planning Board's final approval. Building permits obtained after the 5-year period shall be subject to impact fees in existence at the time of the Building Permit application submission. [Note: The River Park subdivision plat (#PB2011-01-FMAJ) was recorded on January 2, 2018, representing the final approval for the subdivision and starting the 5-year exemption period, which. The 5-year exemption period shall now expire on January 2, 2023 **2025**.]
29. Effect of Approval. This approval is a final, conditional site plan approval for a "phased development" under Section 4.9 of the Site Plan Review Regulations and is a final decision of the Planning Board for purposes of RSA 677:15, I. As set forth in Section 4.10(C) of those Regulations, the deadlines for the construction of improvements within each phase shall be as stated in the approved phasing plan, rather than the 1-year period under Section 4.10(A). It is the intent and effect of this approval, subject to the satisfactory completion of the financial security requirements set forth in Condition #5 of the Final Major Subdivision approval (#PB2011-01-FMAJ) for the development, that upon completion of the Phase 1 infrastructure improvements within 5 **7** years of the final subdivision approval, as set forth in Condition #14-2 above, the subdivision as a whole, including all phases, shall vest as provided in RSA 674:39, II, and no subsequent changes in subdivision regulations, site plan regulations, or zoning ordinances, except impact fees adopted pursuant to RSA 674:21 and 675:2-4, shall operate to affect this phased development, provided that the applicant and its successors-in-interest continue to comply with all conditions of this approval and of the Planning Board's approval of Final Major Subdivision application #PB2011-01-FMAJ, including the time limits set forth in the phasing plan, unless such a limit is extended for good cause by the Planning Board, acting upon an application submitted prior to the expiration of such limit.

The motion was seconded by Jeremy Rutter. The vote on the motion was unanimous in favor, 6-0.

THE CITY OF LEBANON

By: 

Planning Board Chair

DATE: 3/28/2022

4/7/2022

DocuSigned by:



3618E0D144454F5...

CITY OF LEBANON APPLICATION FOR

SPECIAL EXCEPTION ☐	☐	SITE PLAN REVIEW
VARIANCE ☐	☐	SUBDIVISION
MOTION FOR REHEARING ☐	☐	LOT LINE ADJUSTMENT
APPEAL OF AN ADMIN. DECISION ☐	☐	CONDITIONAL USE PERMIT

☒ OTHER Extension

PROPERTY OWNER (APPLICANT):

NAME: XYZ Dairy, LLC TEL.#: (603) 676-7800

MAILING ADDRESS: 57 Main Street, West Lebanon, NH 03784

E-MAIL ADDRESS: dclem@lymeproperties.com

CO-APPLICANT, AGENT, OR LESSEE:

NAME: Lyme Properties 2, LLC TEL.#: (603) 676-7106

MAILING ADDRESS: 57 Main Street, West Lebanon, NH 03784

E-MAIL ADDRESS: chet@lymeproperties.com

PROJECT LOCATION:

TAX MAP #: 44 LOT#: 21-30 & 7 PLOT #: ZONE: CBD, IND-L, R3

STREET ADDRESS OF PROJECT: River Park Drive, West Lebanon, NH 03784

IS THIS PROPERTY LOCATED IN THE: **WETLANDS** ☐ YES ☒ NO **HISTORIC DISTRICT** ☐ YES ☒ NO
FLOOD PLAIN ☐ YES ☒ NO

SCOPE OF PROJECT:

Request for extension of River Park West Lebanon Subdivision and Site Plan Approvals

TYPE OF OCCUPANCY:

EXISTING ☒ VACANT ☐ ONE FAMILY ☐ TWO FAMILY ☐ MULTI-FAMILY ☐ COMMERCIAL ☐ INDUSTRIAL
PROPOSED ☐ VACANT ☐ ONE FAMILY ☐ TWO FAMILY ☒ MULTI-FAMILY ☒ COMMERCIAL ☒ INDUSTRIAL

IF USE IS **COMMERCIAL** OR **INDUSTRIAL**, PLEASE NOTE **SPECIFIC**

USE: Lab, Office, Retail, Apartments

SIGNATURE BLOCK:

FOR PLANNING BOARD APPLICATIONS ONLY: I, the undersigned, hereby submit this application on the date noted below with the knowledge and understanding that the Planning Board shall determine if the submitted application is complete according to its regulations at its next regularly scheduled meeting on August 12, 2024, unless I personally request in writing, that the Board delay its determination of completeness to a later date.

PROPERTY OWNER: David Clem DATE: 7/8/2024

NOTE: IF, AS OWNER, YOU WISH TO DESIGNATE AN AGENT TO ACT ON YOUR BEHALF, PLEASE READ THE FOLLOWING AND SIGN BELOW: I hereby designate the person listed above as my agent for the purpose of procuring the necessary local permits for the proposed work as described herein. Representations made by my agent may be accepted as though made by me personally, and I understand that I am bound by any official decision made on the basis of such representation.

PROPERTY OWNER: David Clem DATE: 7/8/2024

DATE RECEIVED	FILE # (MAP/LOT)	APPLICATION #	FEE - \$ AMOUNT	DATE PAID	VOUCHER #
2024-07-08	44/21-30 & 44/7	PB2024-34-EXT			



July 8, 2024

Lebanon Planning Board
City of Lebanon
51 N Park Street
Lebanon, NH 03766

Request for Extension:

Members of the Lebanon Planning Board,

Lyme Properties operating as the development agent for XYZ Dairy, LLC hereby requests a 2-year extension of the River Park West Lebanon Site Plan (#PB2010-25-SPR) and Subdivision Approvals (#PB2011-01-FMAJ, October 11, 2011) as most recently amended on September 9, 2019 (#PB2018-34-SPA) and extended by this Board on October 12, 2021 (#PB2021-29-EXT).

In accordance with Section 4.10 of the Lebanon Site Plan Review Regulations, this extension request is due to delays ***attributable to unusual circumstances beyond the control of the Applicant.***

We request that this matter be added to the agenda for consideration at the regularly scheduled August 12, 2024 hearing of the Lebanon Planning Board.

Respectfully,

A handwritten signature in black ink that reads "Chet Clem".

Chet Clem
Lyme Properties
57 Main Street
West Lebanon, NH 03784

Cc:

David Clem, XYZ Dairy, LLC
Angela McCanna, Lyme Properties
Attorney Philip Hastings, Cleveland, Waters and Bass, P.A.
Attorney Robert Miller, Sheehan Phinney, P.A.

CERTIFIED NOTIFICATION LIST

Notice shall be sent by certified mail to the Owner; Applicant, if different from Owner; Abutters; Holders of conservation, preservation, or agricultural preservation restrictions (as defined under RSA 477:45) on the subject property; the holders of easements, rights-of-way, and other restrictions; and every engineer, architect, land surveyor, or soil or wetlands scientist whose seal appears on any plan submitted to the Board; and any other persons required by RSA 676:4, I(d). The names and mailing addresses shall be furnished by the Applicant.

672:3 Abutter. – "Abutter" means any person whose property is located in New Hampshire and adjoins or is directly across the street or stream from the land under consideration by the local land use board. For purposes of receiving testimony only, and not for purposes of notification, the term "abutter" shall include any person who is able to demonstrate that his land will be directly affected by the proposal under consideration. For purposes of receipt of notification by a municipality of a local land use board hearing, in the case of an abutting property being under a condominium or other collective form of ownership, the term abutter means the officers of the collective or association, as defined in RSA 356-B:3, XXIII. For purposes of receipt of notification by a municipality of a local land use board hearing, in the case of an abutting property being under a manufactured housing park form of ownership as defined in RSA 205-A:1, II, the term "abutter" includes the manufactured housing park owner and the tenants who own manufactured housing which adjoins or is directly across the street or stream from the land under consideration by the local land use board.

Source. 1983, 447:1. 1986, 33:2. 2002, 216:1, eff. July 15, 2002.

PLEASE PROVIDE NAMES & MAILING ADDRESSES FOR ALL PERSONS LISTED ABOVE.

Map & Lot Number: 44-21 - 44-30 & 44-7	Map & Lot Number: 44-21 - 44-30 & 44-7
Property Owner: XYZ DAIRY, LLC 57 MAIN STREET WEST LEBANON, NH 03784	Applicant, Co-Applicant, Agent, or Lessee: LYME PROPERTIES 2, LLC 57 MAIN STREET WEST LEBANON, NH 03784
Map & Lot Number: 44-13 & 50-28-E	Map & Lot Number: 44-5
DARTMOUTH COLLEGE TRUSTEES PO BOX 5188 HANOVER, NH 03755	DOWNES, ROBIN C TTEE 187 NORTH MAIN ST WEST LEBANON, NH 03784
Map & Lot Number: 44-6	Map & Lot Number: 44-9 & 58-97
193 NMWL LLC 57 MAIN ST WEST LEBANON, NH 03784	CAESD LLC 57 MAIN ST WEST LEBANON, NH 03784

Map & Lot Number: 44-10	Map & Lot Number: 44-15
DVG VENTURES LLC 10 BENNING ST #160-255 WEST LEBANON, NH 03784	CHURCHILL, WAYNE & TINA M 194 NORTH MAIN ST WEST LEBANON, NH 03784
Map & Lot Number: 44-12	Map & Lot Number: 58-12
GRAHAM, DOUGLAS 10 BENNING ST #160-255 WEST LEBANON, NH 03784	TOWNSEND III, WINTHROP I 1823 US ROUTE 5 NORTH WINDSOR, VT 05089
Map & Lot Number: 44-14	Map & Lot Number: 59-18
BURNS, TRACY A & SALLY J 198 NORTH MAIN ST WEST LEBANON, NH 03784	STENGER-CRAFT PROPERTIES LLC 112 N MAIN ST WEST LEBANON, NH 03784
Map & Lot Number: 44-19-5700	Map & Lot Number: 58-91
HOMEOWNERS AT THE FALLS ATTN: DAN CHASE, COMM MGR PO BOX 1051 NORWICH, VT 05055	JONES, BECKY P TTEE 67 CRAFTS AVE WEST LEBANON, NH 03784
Map & Lot Number: 44-4	Map & Lot Number: 58-93
SALAZAR-KISH, JOLIN M TTEE 32 LEBANON ST, STE A HANOVER, NH 03755	CUMMINGS, LAUREN H & SANDRA L 66 CRAFTS AVE WEST LEBANON, NH 03784
Map & Lot Number:	Map & Lot Number:
Map & Lot Number:	Map & Lot Number:

(Revised 2/8/2024)

FEE SCHEDULE LEBANON PLANNING BOARD

Adopted January 24, 2022

LOT LINE ADJUSTMENT (Boundary Line Adjustment)		
		TOTALS
FILING FEE	\$25.00	\$25.00
ADVERTISING FEE	\$100	\$100
NOTIFICATION FEE (see note on page 2)	\$5.00 + Current USPS rate per certified notice (see below) X _____ notices	\$5.00 \$ _____ (abutter certified)
TOTAL DUE		\$ _____

MINOR SUBDIVISION		
		TOTALS
FILING FEE	\$150.00	\$150.00
ADVERTISING FEE	\$100.00	\$100.00
NOTIFICATION FEE (see note on page 2)	\$5.00 + Current USPS rate per certified notice (see below) X _____ notices	\$5.00 \$ _____ (abutter certified)
TOTAL DUE AT TIME OF FILING		\$ _____

**Engineering Review fees may also be required. See note on page 2.

PRELIMINARY REVIEW OF A MAJOR SUBDIVISION		
		TOTALS
FILING FEE	\$200.00	\$200.00
NUMBER OF LOTS* _____	\$30.00 per lot*	
ADVERTISING FEE	\$100.00	\$100.00
NOTIFICATION FEE (see note on page 2)	\$5.00 + Current USPS rate per certified notice (see below) X _____ notices	\$5.00 \$ _____ (abutter certified)
TOTAL DUE AT TIME OF FILING		\$ _____

*Or units when the subdivision does not create individual lots.
**Engineering Review fees will also be required. See note on page 2.

FINAL REVIEW OF A MAJOR SUBDIVISION		
		TOTALS
FILING FEE	\$500.00	\$500.00
FIRST FIVE (5) LOTS*	\$75.00 per lot*	
NUMBER OF LOTS 6+*	\$150.00 per lot*	
ADVERTISING FEE	\$100.00	\$100.00
NOTIFICATION FEE (see note on page 2)	\$5.00 + Current USPS rate per certified notice (see below) X _____ notices	\$5.00 \$ _____ (abutter certified)
TOTAL DUE TIME OF FILING		\$ _____

*Or units when the subdivision does not create individual lots.
**Engineering Review fees will also be required. See note on page 2.

SITE PLAN REVIEW		
		TOTALS
FILING FEE	\$250.00	\$250.00
SQUARE FOOTAGE	\$75.00 per 1,000 sq. ft. (gross floor area)	
ADVERTISING FEE	\$100.00	\$100.00
NOTIFICATION FEE (see note on page 2)	\$5.00 + Current USPS rate per certified notice (see below) X _____ notices	\$5.00 \$ _____ (abutter certified)

SITE PLAN REVIEW		
TOTAL DUE AT TIME OF FILING		\$
**Engineering Review fees will also be required. See note on page 2.		

SITE PLAN REVIEW AMENDMENT (WITH STRUCTURAL CHANGES)		
		TOTALS
FILING FEE	\$250.00	\$250.00
SQUARE FOOTAGE	\$75.00 per 1,000 sq. ft. (gross floor area)	
ADVERTISING FEE	\$100.00	\$100.00
NOTIFICATION FEE (see note below)	\$5.00 + Current USPS rate per certified notice (see below) X _____ notices	\$5.00 \$ _____ (abutter certified)
TOTAL DUE AT TIME OF FILING		\$
**Engineering Review fees may also be required. See note below.		

OTHER		
-SITE PLAN REVIEW AMENDMENT (WITH NO STRUCTURAL CHANGES) -EXTENSION REQUESTS -CONDITIONAL USE PERMITS		
		TOTALS
FILING FEE	\$250.00	\$250.00
ADVERTISING FEE	\$100.00	\$100.00
NOTIFICATION FEE (see note below)	\$5.00 + Current USPS rate per certified notice (see below) X 16 _____ notices	\$5.00 \$ 80.64 (abutter certified)
TOTAL DUE AT TIME OF FILING		\$ 435.64
**Engineering Review fees may also be required. See note below.		

MINOR SITE PLAN REVIEW		
		TOTALS
FILING FEE	\$150.00	\$150.00
NOTIFICATION FEE (see note below)	Current USPS rate per certified notice (see below) X _____ notices	\$ _____ (abutter certified)
TOTAL DUE		\$

ENGINEERING REVIEW FEES:

After an application to the Planning Board is submitted and the filing fees identified above have been paid, the Planning & Development Department will determine the scope of required engineering review and will obtain an estimated cost from the reviewing engineer. A cost estimate of the review fees will usually be generated within two (2) – three (3) business days. Once conveyed to the applicant, the estimated review fees shall be paid by the applicant within five (5) business days, and an escrow account shall be established by the Planning & Development Department. No plans will be reviewed unless and until the review fee estimate is paid, if required.

Please note that escrow fees are only an estimate of what services will cost and actual costs of review may be less or more than the amount initially estimated. Any unused portion of the escrow will be returned to the applicant at the end of the approval process if such a surplus remains. Additionally, in the event the escrow amount does not cover the full cost of services the Applicant shall pay any remaining costs as a condition of approval. See also Section 4.7 of the Site Plan Review Regulations and Section 7.7 of the Subdivision Regulations.

NOTIFICATION FEE: CURRENT FEE as of January 2024 is \$5.04 per certified notice

THE CERTIFIED NOTIFICATION FEE IN ALL SECTIONS ABOVE INCLUDES THE FOLLOWING: ALL ABUTTERS, THE APPLICANT, PROPERTY OWNER, HOLDER OF CONSERVATION, PRESERVATION, OR AGRICULTURAL PRESERVATION RESTRICTION(S); AND EVERY ENGINEER, ARCHITECT, LAND SURVEYOR OR SOIL SCIENTIST WHOSE PROFESSIONAL SEAL APPEARS ON ANY PLAT SUBMITTED TO THE BOARD AND ANY OTHER PERSONS REQUIRED BY RSA 676:4, I(d).

APPLICATION FOR

AUGUST 12, 2024 PLANNING BOARD MEETING

SPECIAL EXCEPTION	☐	☒	SITE PLAN REVIEW
VARIANCE	☐	☐	SUBDIVISION
MOTION FOR REHEARING	☐	☐	LOT LINE ADJUSTMENT
APPEAL OF AN ADMIN. DECISION	☐	☐	CONDITIONAL USE PERMIT
☐ OTHER _____			

PROPERTY OWNER (APPLICANT):

NAME: City of Lebanon

TEL.#: (603) 448-4220

MAILING ADDRESS: 51 North Park Street, Lebanon, New Hampshire 03766

E-MAIL ADDRESS: David.Brooks@lebanonnh.gov

CO-APPLICANT, AGENT, OR LESSEE:

NAME:

TEL.#:

MAILING ADDRESS:

E-MAIL ADDRESS:

PROJECT LOCATION:

TAX MAP #: 77

LOT#: 106

PLOT #:

ZONE: R3

STREET ADDRESS OF PROJECT: 0 Barrows Street

IS THIS PROPERTY LOCATED IN THE:

WETLANDS☒ YES☐ NO**HISTORIC DISTRICT**☐ YES☒ NO**FLOOD PLAIN**☐ YES☒ NO**SCOPE OF PROJECT:**

Phase I site preparation for a 5-unit cottage development.

TYPE OF OCCUPANCY:EXISTING ☒ VACANT ☐ ONEFAMILY ☐ TWOFAMILY ☐ MULTI-FAMILY ☐ COMMERCIAL ☐ INDUSTRIALPROPOSED ☐ VACANT ☐ ONEFAMILY ☐ TWOFAMILY ☒ MULTI-FAMILY ☐ COMMERCIAL ☐ INDUSTRIALIF USE IS **COMMERCIAL** OR **INDUSTRIAL**, PLEASE NOTE **SPECIFIC**USE: Cottage Development**SIGNATURE BLOCK:**

FOR PLANNING BOARD APPLICATIONS ONLY: I, the undersigned, hereby submit this application on the date noted below with the knowledge and understanding that the Planning Board shall determine if the submitted application is complete according to its regulations at its next regularly scheduled meeting on **August 12, 2024**, unless I personally request, in writing, that the Board delay its determination of completeness to a later date.

PROPERTY

OWNER:

DATE: July 8, 2024

NOTE: IF, AS OWNER, YOU WISH TO DESIGNATE AN AGENT TO ACT ON YOUR BEHALF, PLEASE READ THE FOLLOWING AND SIGN BELOW: I hereby designate the person listed above as my agent for the purpose of procuring the necessary local permits for the proposed work as described herein. Representations made by my agent may be accepted as though made by me personally, and I understand that I am bound by any official decision made on the basis of such representation.

PROPERTY

OWNER:

DATE:

DATE RECEIVED	FILE # (MAP/LOT)	APPLICATION #	FEE - \$ AMOUNT	DATE PAID	VOUCHER #
2024-07-08	77-106	PB2024-33-SPR			



CITY MANAGER'S OFFICE
City of Lebanon, NH
51 North Park Street
Lebanon, NH 03766
(603) 448-4220 fax (603) 966-3122

TO: City of Lebanon Planning Board
FROM: David Brooks, Deputy City Manager
DATE: July 8, 2024
RE: Proposed Development of City-Owned Property situated at 0 Barrows Street,
Tax Map/Lot: 77-106

To the Lebanon Planning Board:

On April 21, 2022, the City Council unanimously adopted a "Resolution on Housing" directing the City Manager to take steps to enable, incentivize, and partner in the development of housing needs not currently being addressed by the market through a variety of actions. Since that time, zoning amendments have been adopted enabling the creation of "cottage cluster" housing developments; revising the manufactured home park regulations; and allowing the Planning Board to grant increased density bonuses for certain developments. Other zoning amendments related to Accessory Dwelling Units (ADUs) have been adopted to further streamline the regulations based on the City's ongoing experience with development of such units.

Among the additional steps outlined in the April 2022 housing resolution is to "partner with the Lebanon Housing Authority and other residential developers to utilize city-owned properties for the development of new housing units, including the possibility of a 'demonstration project' on a city-owned parcel with high visibility and an opportunity for a reasonable number of units to help overcome barriers to affordability."

On February 7, 2024, the City Council determined, in accordance with City Council Policy, CC-102, Real Property Transactions, that several City-owned parcels, including two located along Barrows Street (Tax Parcels 77-106 and 77-107), have redevelopment potential and are suitable for redevelopment as part of designated Redevelopment Areas. In May, the Council voted to discontinue the portion of Barrows Street which separated the two City-owned parcels. Following the discontinuance, the City merged the now-contiguous properties into a single parcel in early June. The City has engaged a surveyor to prepare a boundary and topographical survey of the properties, which will reflect the merged parcels.

The City has already submitted a wetlands permit application to NHDES. At its meeting in May, the Conservation Commission voted 6-1 to support the wetlands permit application to the NHDES with associated comments. The City is currently reviewing and preparing a response to a Request for More Information from NHDES.

Upon receipt of the requested NHDES permit, the City expects to begin preparing the site for development. The City will clear portions of the property and plans to use excess material generated from the ongoing Kimball-Forest Street Infrastructure Improvements capital project to

fill the small (<950 square foot) isolated wetland in the south-central portion of the property and will begin grading the site for development.

Based on the definition of “land development” in the Site Plan Review Regulations, a physical improvement or alteration to a lot that is proposed in preparation for subsequent development of the lot triggers site plan review jurisdiction pursuant to Section 3.1. Therefore, at this time, the City is submitting an application to the Planning Board for Site Plan Review of proposed land development in anticipation of a subsequent cottage development on the property pursuant to Section 509 of the Zoning Ordinance.

A project design depicting five conceptual building units was submitted with the NHDES wetlands application and is enclosed with the current Site Plan application to give the Planning Board a preliminary glimpse of the proposed project. The conceptual building footprints are based on a cottage unit design by an architect that specializes in cottage cluster projects. However, final unit designs have not yet been determined for the City’s project. The City may have an opportunity to utilize housing designs that are generated from the Pattern Zoning study that is currently underway. The City is also contacting local architects to inquire about their interest in contributing potential designs for this development project and/or for the Pattern Zoning project. The intent of this project is to provide permanently-affordable single-family owner-occupied housing opportunities – an area which is severely lacking in the current market.

As a result, the City’s current request is for initial approval of the proposed land development of the site (clearing, fill, and grading) in anticipation of future development. Once the specific housing units have been identified and the complete details of grading, drainage, access, circulation, landscaping, and lighting have been fully worked out, it is understood that the City will need to return to the Planning Board for final review and approval of the overall development project.

The application materials include an Application for Site Plan Review, a Certified Notification List, a completed and signed Technical Checklist, a digital copy of the Site Plan set in .PDF format, and a copy of the April 21, 2022 Resolution on Housing adopted by the City Council. Note that this submission is phase 1 of the project, which will consist of clearing, filling, and grading the site, and many of the required submission items are not applicable. Phase 2 will be a full site plan application with all required submission items provided or a written request for waiver, pursuant to Article VII of the Site Plan Review Regulations, for any submission requirement for which the information or data is not provided.

Councilor Whittlesey MOVED the following:

RESOLVED, the Lebanon City Council hereby directs the City Manager to take steps to Enable, Incentivize, and Partner in the development of housing needs not currently being addressed by the market through the following actions:

- 1. Prepare amendments to the Zoning Ordinance to enable the creation of “cottage cluster” housing developments on appropriate parcels in the City.**
- 2. Prepare amendments to the Zoning Ordinance to revise the regulations for Manufactured Home Parks, Manufactured Home Subdivisions, and Manufactured Home Planned Unit Residential Developments (PURDs) to better reflect the existing Manufactured Home developments within the City and manufactured homes that are in production today.**
- 3. Prepare amendments to the Zoning Ordinance to complete the Increased Density Bonuses table set forth in Section 507.1 and to develop Criteria for the Award of Bonus set forth in Section 507.2.**
- 4. Develop regulations and guidance for the creation of Housing Opportunity Zones (pursuant to RSA 79-E:4-c) and/or Residential Housing Revitalization Zones (pursuant to RSA 79-E:4-b) to incentivize desirable forms of development.**
- 5. Partner with the Lebanon Housing Authority and other residential developers to utilize city-owned properties for the development of new housing units, including the possibility of a “demonstration project” on a city-owned parcel with high visibility and an opportunity for a reasonable number of units to help overcome barriers to affordability.**
- 6. Study and evaluate the benefits and impacts of Accessory Dwelling Units (ADUs) and potential barriers to ADU development and prepare guides, fact sheets, and educational materials to help reduce potential impacts and reduce regulatory and non-regulatory barriers.**
- 7. In each of the above actions, consider enabling, incentivizing, or demonstrating affordable net zero energy or zero energy-ready homes.**

Seconded by Councilor Wilkie. The vote on the motion was unanimously approved (9-0).

CITY OF LEBANON, NH SITE PLAN REVIEW REGULATIONS TECHNICAL CHECKLIST	
PROJECT NAME: 0 Barrows Cottage Development - Phase I Site Preparation	
APPLICANT: City of Lebanon	DATE: July 8, 2024
GENERAL SUBMISSION REQUIREMENTS:	

All applications to the Planning Board for Site Plan Review must be submitted by 12:00 Noon on the day of the filing cutoff. [§4.7.B] Submissions must be accompanied by the following information or review of the application may be delayed:

A properly completed and signed Application Form *(available at www.lebanonnh.gov)*. [§5.1.A]

The appropriate filing fees. [§5.1.B]

A written project description. [§5.1.C]

A list of the names and mailing addresses of all persons to be notified, by certified mail, of the public hearing. [§5.1.D]

A completed and signed Application for Waivers *(available at www.lebanonnh.gov)* [§5.1.G.3]

A completed and signed Technical Checklist *(available at www.lebanonnh.gov)*. [§4.7.B]
[Applicants must complete the entire checklist to ensure that all necessary information and materials have been provided with the application or that written requests for waivers have been properly provided in accordance with Article VII of the Site Plan Review Regulations, as appropriate.]

Two (2) full-size sets of the Site Plan set. [§5.1.E]

A digital copy of the Site Plan set in .PDF format. [§5.1.F]

NOTE: Applications shall contain sufficient information to enable the City Staff and the Planning Board to evaluate the proposed development for compliance with the Zoning Ordinance, the Planning Board's Regulations, and other applicable City Codes, and for the Planning Board to make an informed decision.

All required application materials shall be submitted as a single inclusive package, including any appropriate waiver requests as permitted by the Regulations. Submission of a complete application package ensures that the review process by City Staff is as efficient and effective as possible.

The purpose of the filing deadline is to provide adequate time for City review of the proposal. Submission of any altered, additional, or substitute application materials required by Article V of these Regulations, subsequent to the filing deadline, other than as directed by City Staff, shall cause the application to be deemed untimely filed, and such application shall not be heard until a subsequent month.

CITY OF LEBANON, NH
SITE PLAN REVIEW REGULATIONS
TECHNICAL CHECKLIST & STORMWATER CHECKLIST

PLAN SUBMITTAL TECHNICAL CHECKLIST:

NOTE: Site plan drawings shall include the information described below pursuant to Article V of the Lebanon Site Plan Review Regulations. Plans shall be submitted on sheets no larger than 24" x 36". Plan sets with multiple sheets shall include sheets of uniform size and be bound on the left edge. When more than three (3) sheets are required, an additional cover sheet shall be attached including a table of contents. A scale of not smaller than one (1) inch equals 40 feet is suggested. All lettering shall be of a size and type that is legible.

In order to facilitate the use of the City's Geographic Information System (GIS) for planning purposes, all surveys and engineered plans submitted for Site Plan Review shall utilize the NH State Plane Coordinate system and shall reference the North American Vertical Datum of 1988 (NAVD 88), unless prior approval to use an alternate coordinate system and/or vertical datum is granted by the Planning & Development Department.

A written request for waiver shall be required, pursuant to Article VII of the Site Plan Review Regulations, for any submission requirement for which the information or data is not provided by the applicant. [§5.1.G(4)] NOTE: The submission requirements described in paragraphs 5.1.E(1) through 5.1.E(4) shall not be waivable under the procedures of Article VII of the Site Plan Review Regulations. [§5.1.E]

[Checklist begins on following page]

SITE PLAN REVIEW REGULATIONS

Plan Requirements	Info. Provided	Waiver Sought
5.1.E(1) - Vicinity sketch showing the location of the site in relation to the surrounding public street system (suggested scale: 1" = 500').	☒	N/A
5.1.E(2) - Names and mailing addresses of the Applicant; the Owner(s) of record of the site; the Owners of abutting properties; and the Holders of any easements, rights of way, or other restrictions, based on the current records of the City Assessor available at City Hall, not more than 5 days before the date of filing of the application.	☒	N/A
5.1.E(3) - Names and business addresses of the preparer(s) of the plan and every surveyor, engineer, architect, soil scientist, or wetlands scientist whose professional seal appears on any plan or document submitted to the Board.	☒	N/A
5.1.E(4) - The following information shall be provided on the first page (or cover page, if applicable) of the Site Plan: a. Name of the City and County in which the development is proposed; b. North arrow; c. Scale of the plan; d. Date of the plan and of any revisions to the plan; (NOTE: The date on the plan at the time of initial submission for application review shall be included on all subsequent submissions to the City. Any subsequent change(s) to the plan shall include a revision date and description of the revision(s).) e. The following basic site information in TABLE FORM : 1. Zoning designation for subject property; 2. Tax Map and Lot number(s) for subject property; 3. Area of lot; 4. Gross floor area of existing and proposed buildings/additions; 5. Number of existing and proposed on- and off-street parking spaces as a table. The table must identify (i) the number of required (minimum) parking spaces and the permitted (maximum) number of parking spaces and the calculations for each, (ii) future proposed, and (iii) existing parking capacity. If the site is part of an existing development or subdivision, the master table must provide such information for all related sites and phases, individually and as a project total; 6. Number of existing and proposed short- and long-term bicycle storage spaces; 7. Number of existing and proposed loading spaces; 8. Height of existing and proposed buildings/additions; 9. Number of stories and gross square footage of each; 10. Proposed use; 11. Required and proposed front, side, and rear yard setbacks 12. Maximum allowable lot coverage with existing and proposed calculations; 13. Indication of whether or not the property is subject to any City Overlay districts (for example, the Wetlands Conservation District or Flood Plain District) or to NHDES Shoreland Water Quality Protection jurisdiction.	☒ ☒ ☒ ☒ ☒ ☒ ☒ N/A N/A N/A N/A N/A ☒ N/A N/A N/A ☒ N/A ☒	N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
5.1.E(5) - Current survey certified by a land surveyor licensed in New Hampshire, depicting the perimeter boundaries of the lot(s) of the proposed site, including compass bearings, distances, and lot areas, and depicting the location of any existing improvements on the property and the width and location of any rights-of-way and/or easements on the property.	☒	☐

**SITE PLAN REVIEW REGULATIONS
TECHNICAL CHECKLIST & STORMWATER CHECKLIST**

Plan Requirements (cont.)	Info. Provided	Waiver Sought
5.1.E(6) - Existing and proposed grades, including topographic contours, with spot elevations. Where the grade is less than 20%, the contours shall be at 2-foot intervals; otherwise they shall be at 5-foot intervals. All contours shall be referenced to USGS or FEMA Flood Insurance Rate Map (FIRM) datums, as appropriate. Existing topographic information shall be prepared by a professional engineer registered in New Hampshire or land surveyor licensed in New Hampshire.	☒	☐
5.1.E(7) - Shape, size, height, and location of all existing structures located on site and within 200 feet of site.	N/A	☐
5.1.E(7) - Elevation views indicating shape, size, height, and location of all proposed structures, including expansions of or additions to existing buildings. Such elevation views shall provide sufficient detail to allow for review by the Board and City staff of the adequacy of proposed access and egress points, walkways, lighting, and other site-related improvements.	N/A	☐
5.1.E(8) - Location of existing natural features such as streams, marshes, lakes, ponds, wetlands, rock outcrops, or wooded areas, and existing man-made features such as roads and structures. Indicate those natural and man-made features that are to be removed, retained, or altered.	☒	☐
5.1.E(8) - Wetlands on the property shall be delineated by a NH Certified Wetlands Scientist, whose seal and signature shall appear on the plan. Documentation in the form of U.S. Army Corps of Engineers New England District Wetlands Delineation Data Sheets and/or other field notes and materials concerning the delineation shall be submitted.	☒	☐
5.1.E(9) - Zoning District, Tax Map and Lot number, and use of abutting properties within 200 feet of property.	☒	☐
5.1.E(9) - Location of streets, pedestrian paths/trails, and bicycle routes within 200 feet of the site boundary; and the location of curb cuts and vehicle accesses within 200 feet of the site boundary.	☒	☐
5.1.E(10) - Proposed streets, driveways, emergency vehicle accesses, parking spaces, and sidewalks, with indication of dimensions and direction of travel. Show required sight distances at curb cuts and dimensions for the inside radii of all curves.	N/A	☐
5.1.E(10) - Vehicle and bicycle parking spaces shall be numbered.	N/A	☐
5.1.E(10) - Loading spaces and facilities used in connection with any structures on the site shall be shown	N/A	☐
5.1.E(10) - Total square footage and percentage of the lot covered by impervious cover shall be shown.	N/A	☐
5.1.E(11) - Parking area safety measures including raised crosswalks/speed tables, signage, walkway lighting, striping and similar markings such as dedicated pedestrian/bicycle crossings and lanes through parking areas, fire lanes, compact and/or electric vehicle parking/charging, parking wayfinding, ADA signage and access aisles.	N/A	☐
5.1.E(12) - Size and location of all existing and proposed public and private utilities. <i>(Note: the applicant is encouraged to submit a Sewer Use Permit Application and obtain a Notice of Permitted Allocation, and to obtain a Water Use Permit prior to submission of the Site Plan Review application.)</i>	N/A	☐

SITE PLAN REVIEW REGULATIONS
TECHNICAL CHECKLIST & STORMWATER CHECKLIST

Plan Requirements (cont.)	Info. Provided	Waiver Sought
5.1.E(13) - Plan for outdoor lighting showing proposed location, mounting height, fixture type, lamp type, color correlated temperature (CCT), and wattage of all exterior free-standing lighting or building-mounted fixtures.	N/A	☐
5.1.E(13) - Analyses and illuminance-level diagrams, to include average and minimum foot-candle measurements, showing that proposed installation conforms to the lighting-level standards in Site Plan Review Regulations.	N/A	☐
5.1.E(13) - Manufacturer's specification information for each proposed light fixture and lamp (NOTE: This information may be provided on the plan or as a separate attachment).	N/A	☐
5.1.E(13) - Drawings of all relevant building elevations showing location and height of all building-mounted fixtures, the portions of any walls or architectural features to be illuminated, illumination levels of walls or architectural features, and aiming points for any remote light fixtures.	N/A	☐
5.1.E(14) - Plan for location of free-standing or building-mounted signs, including location, mounting, aiming, and shielding of any remote light fixtures for externally-lit signs.	N/A	☐
5.1.E(14) - For internally-lit signs, relevant information concerning the method of illumination and the opacity of the sign background, showing that the proposed installation conforms to the requirements of the Regulations.	N/A	☐
5.1.E(15) - The location and boundaries of any Overlay Districts established pursuant to Article IV of the Zoning Ordinance (including but not limited to the Wetlands Conservation District, Riverbank Protection District, Steep Slopes District, and Floodplain District) and, if applicable, protected shorelands pursuant to the Shoreland Water Quality Protection Act (NH RSA 483-B).	✓	☐
5.1.E(15) - For properties located within the Floodplain District, the 100-year flood elevation, floodway, shoreland protection zone, and flood plain limits shall be identified.	N/A	☐
5.1.E(16) - Landscaping plan showing proposed new plantings to be installed and existing natural vegetation to be retained. Plan shall show in detail the number, size (height and/or caliper), and species (botanical and common names) of all proposed shrubs and trees.	N/A	☐
5.1.E(16) - Existing trees over 12 inches in diameter (measured 4.5 feet above ground surface) within 25 feet of the disturbed area, must be counted and shown on the plan, if included towards fulfilling landscaping requirements.	N/A	☐
5.1.E(16) - Calculations for square footage of perimeter landscaping.	N/A	☐
5.1.E(16) - Parking lot shading calculations shall be provided by depicting new trees and shrubs at 10-year crown size.	N/A	☐
5.1.E(17) - Existing and proposed surface and subsurface storm drainage facilities, including City storm drainage facilities located within 200' of site.	✓	☐
5.1.E(17) - Plans for retention, detention, slow release, and treatment of storm water shall be provided shall be provided in accordance with the requirements of Section 6.6.	N/A	☐
5.1.E(18) - Section 6.6. Stormwater Management submission requirements.	See Stormwater Checklist	
5.1.E(19) - Plans for snow removal and storage.	N/A	☐

SITE PLAN REVIEW REGULATIONS**TECHNICAL CHECKLIST & STORMWATER CHECKLIST**

Plan Requirements (cont.)	Info. Provided	Waiver Sought
5.1.E(20) - A plan for the development showing provisions for automobile, transit, bicyclist, and pedestrian access and circulation. Such plan shall show both existing and proposed means of access to the site including connections with, public streets, sidewalks, transit stops, and formal paths/trails. Plans shall include any traffic calming and traffic control devices necessary in conjunction with the site development, as well as the location of all existing transit routes and transit stops located or passing within 1/4 mile (1,320 feet) of the property.	N/A	☐
5.1.E(21) - Construction detail drawings including, but not limited to, pavements, walks, steps, curbing, drainage structures, water and/or sewer utilities, ground-mounted signage (e.g., fire lanes, ADA parking, commercial), surface treatments, transit shelters, energy generation units (e.g., solar), bike rack style, electric vehicle charging, outdoor lighting, outdoor furniture, retaining walls, tree boxes and other site systems or structures. Accompanying specifications and cutsheets may be required.	N/A	☐
5.1.E(21) - Where applicable, roadway, drainage, water and sewer utility profile drawings shall be provided at a scale of 1"=40 feet (horizontal) and 1"=4 feet (vertical) and typical cross-section drawings shall be provided at a scale of 1"=5 feet (horizontal and vertical), unless prior approval to use an alternate scale is granted by the Reviewing Engineer. (NOTE: Ordinarily, only two (2) sets of such construction drawings shall be provided to the Planning and Development Department with the application submission.)	N/A	☐
5.1.E(22) - Depict any current and proposed easements, rights-of-way, and deed restrictions including those related to sewer, electrical utility, shared access, etc.	N/A	☐
5.1.E(23) - For multi-family structures, plans for on-site recreational facilities.	N/A	☐
5.1.E(24) - Where a fire, emergency equipment, or similar vehicle turnaround area is provided, it must have an adequate turn radius. Provide CAD Autoturn data or a similar basis of design for the turn radius, if requested by Lebanon Fire or Engineering staff. City staff may also ask for this information at any time.	N/A	☐
Supporting Documents and Information, Where Applicable	Info. Provided	Not Applicable
5.1.G(1) - An estimated timetable, to include phasing schedules, for construction and completion of buildings, parking, facilities, landscaping, and other required improvements.	N/A	☐
5.1.G(2) - Any development estimated to generate a net increase of 100 peak hour trips or 1,000 average daily trips (based upon the most current edition of the ITE Trip Generation Manual) shall prepare and submit a Traffic Impact Study in accordance with standard traffic analysis conventions as set forth by the NHDOT. The Board may, at its discretion, require the submission of a Traffic Impact Study for developments estimated to generate less than 100 peak hour trips or 1,000 average daily trips if the Board has reason to believe such development could adversely affect levels of service or have other adverse impacts.	N/A	☐
5.1.G(3) - Written requests for waivers from all applicable provisions of these Regulations shall be provided pursuant to Article VII - "Waiver Procedure". (note: use Application for Waivers form).	N/A	☐
5.1.G(4) - For multi-family dwelling developments and mixed-use developments resulting in a net increase of 50 dwelling units or more, the application shall include the information and impact statements identified in Section 6.9.B.	N/A	☐

NOTE: THE APPLICANT IS RESPONSIBLE FOR PROVIDING THE REQUIRED INFORMATION PURSUANT TO ARTICLE V OF THE SITE PLAN REVIEW REGULATIONS. PLEASE BE AWARE THAT THIS CHECKLIST IS FOR INFORMATION AND GUIDANCE ONLY AND DOES NOT REPRESENT THE LAW DICTATING SUBMITTAL REQUIREMENTS NOR IS IT COMPLETE AND INCLUSIVE THEREOF.

Completed By: Rodrick J. Finley, P.E., City Engineer

CITY OF LEBANON, NH
SITE PLAN REVIEW REGULATIONS
TECHNICAL CHECKLIST & STORMWATER CHECKLIST

CITY OF LEBANON, NH STORMWATER REVIEW REGULATIONS TECHNICAL CHECKLIST	
PROJECT NAME: 0 Barrows Cottage Development Phase I - Site Preparation	
APPLICANT: City of Lebanon	DATE: July 8, 2024

NOTE: Stormwater plans shall include the information described below pursuant to Article VI of the Lebanon Site Plan Review Regulations. Plans shall be submitted on sheets no larger than 24" x 36". Plan sets with multiple sheets shall include sheets of uniform size and be bound on the left edge. When more than three (3) sheets are required, an additional cover sheet shall be attached including a table of contents. A scale of not smaller than one (1) inch equals 40 feet is suggested. All lettering shall be of a size and type that is legible.

In order to facilitate the use of the City's Geographic Information System (GIS) for planning purposes, all surveys and engineered plans submitted shall utilize the NH State Plane Coordinate system and shall reference the North American Vertical Datum of 1988 (NAVD 88), unless prior approval to use an alternate coordinate system and/or vertical datum is granted by the Planning Office.

A written request for waiver shall be required, pursuant to Article VII of the Site Plan Review Regulations, for any submission requirement for which the information or data is not provided by the applicant. [§6.6.I]

[Stormwater checklist begins on following page]

CITY OF LEBANON, NH AUGUST 2024 SITE PLAN REVIEW REGULATIONS

[illegible]

SITE PLAN REVIEW REGULATIONS
TECHNICAL CHECKLIST & STORMWATER CHECKLIST

Plan Requirements (cont.)	Info. Provided	Waiver Sought
g. Plan references and notes (including sequence of soil disturbance)	☒	☐
h. Proposed and existing public and private utilities	☒	☐
i. Proposed project components to become property of or the responsibility of the City shall be labeled as such	☒	☐
j. Existing and proposed impervious cover, with areas used to calculate effective impervious cover (EIC, as defined herein) clearly identified and the square footage of each type identified and labeled.	☒	☐
k. Test Pit(s) locations and data where stormwater practices are proposed, as appropriate.	N/A	☐
l. Details of individual design elements shown on separate plan sheets following the Proposed Conditions SMP.	☒	☐
The Existing Conditions SMP & the Proposed Conditions SMP shall be provided on sheets no larger than 24" x 36", at a scale of one (1) inch = 20 feet for urban areas, and one (1) inch = 40 feet for non-urban areas. The City Engineer will make the final determination as to the appropriate scale, ensuring that all important site and hydrologic features are easily recognized. If plan shall encompass more than two (2) sheets, at the required 1:40 or 1:20 scale, a separate large scale representation plan sheet (e.g. 1:100) is required to be provided, so as to show entirety of site, as well as off-site contributing areas.		
6.6.C.2 - In addition to the above described SMP plan sheets, the following SMP supplemental information is required: 1. A drainage analysis that includes calculations comparing pre- and post-development stormwater runoff rates (cubic feet per minute) and volumes (cubic feet) based on a 1-inch rainstorm, and the 2-year, 25-year, 50-year, and 100-year, 24-hour frequency storms. Calculations shall include, but not be limited to, the sizing of all structures and BMPs, including sizing of emergency overflow structures based on the 50-year 24-hour frequency storm discharge rate, with 1-foot of free-board. Storm rates shall be based on current design depths from the Northeast Regional Climate Center - http://precip.eas.cornell.edu. <i>Any site that was primarily wooded in the last five years shall be considered undisturbed woods Any site from which wooded vegetation has been removed within 5 years prior to the first submission to the planning board with respect to a proposed development, or upon which, at some earlier time, clearing has occurred in anticipation of development, shall be treated as undisturbed woodland for purposes of calculating pre-development runoff volumes. For purposes of this paragraph any tree cutting which occurred without leaving stands of healthy, growing trees within areas near waters and highways, as required by RSA 227-J:9, I, shall be presumed to have occurred in anticipation of development</i>	N/A	☐

CITY OF LEBANON, NH
SITE PLAN REVIEW REGULATIONS
TECHNICAL CHECKLIST & STORMWATER CHECKLIST

Plan Requirements (cont.)	Info. Provided	Waiver Sought
2. A drainage analysis results summary tabulated (pre & post) for each proposed outfall or catchment outlet point including runoff rates and volumes for each storm event analyzed above.	N/A	☐
3. An Erosion and Sediment Control Plan for all proposed construction activities in accordance with the NH Stormwater Management Manual Volume 3, (December 2008 or current revision; downloadable from the website)	☒	☐
4. A comprehensive Operation and Maintenance Plan for long-term maintenance of all proposed stormwater management elements and BMPs including the proposed schedule of inspections and anticipated maintenance (see section H.2 Operations & Maintenance Plan for detailed requirements).	N/A	☐
<u>6.6.D</u> - Phased Development: For phased developments, the plans and calculation requirements under this section (6.6) shall apply as though the development of the entire parcel were being proposed in one single application. The review and approval process for phased development applications is provided in section 4.9 of the Lebanon Site Plan Regulations.	N/A	☐

NOTE: THE APPLICANT IS RESPONSIBLE FOR PROVIDING THE REQUIRED INFORMATION PURSUANT TO ARTICLE VI OF THE SITE PLAN REVIEW REGULATIONS. PLEASE BE AWARE THAT THIS CHECKLIST IS FOR INFORMATION AND GUIDANCE ONLY AND DOES NOT REPRESENT THE LAW DICTATING SUBMITTAL REQUIREMENTS NOR IS IT COMPLETE AND INCLUSIVE THEREOF.

Completed By: Rodrick J. Finley, P.E., City Engineer

(Last Revised 9/20/2021)

Planning office Use Only:

Date Received ___/___/___ Checklist Complete YES or NO Checked by: _____

CERTIFIED NOTIFICATION LIST

Notice shall be sent by certified mail to the Owner; Applicant, if different from Owner; Abutters; Holders of conservation, preservation, or agricultural preservation restrictions (as defined under RSA 477:45) on the subject property; the holders of easements, rights-of-way, and other restrictions; and every engineer, architect, land surveyor, or soil or wetlands scientist whose seal appears on any plan submitted to the Board; and any other persons required by RSA 676:4, I(d). The names and mailing addresses shall be furnished by the Applicant.

672:3 Abutter. – "Abutter" means any person whose property is located in New Hampshire and adjoins or is directly across the street or stream from the land under consideration by the local land use board. For purposes of receiving testimony only, and not for purposes of notification, the term "abutter" shall include any person who is able to demonstrate that his land will be directly affected by the proposal under consideration. For purposes of receipt of notification by a municipality of a local land use board hearing, in the case of an abutting property being under a condominium or other collective form of ownership, the term abutter means the officers of the collective or association, as defined in RSA 356-B:3, XXIII. For purposes of receipt of notification by a municipality of a local land use board hearing, in the case of an abutting property being under a manufactured housing park form of ownership as defined in RSA 205-A:1, II, the term "abutter" includes the manufactured housing park owner and the tenants who own manufactured housing which adjoins or is directly across the street or stream from the land under consideration by the local land use board.

Source. 1983, 447:1. 1986, 33:2. 2002, 216:1, eff. July 15, 2002.

PLEASE PROVIDE NAMES & MAILING ADDRESSES FOR ALL PERSONS LISTED ABOVE.

Map & Lot Number: 77-106	Map & Lot Number:
Property Owner: City of Lebanon 51 North Park Street Lebanon, New Hampshire 03766	Applicant, Co-Applicant, Agent, or Lessee:
Map & Lot Number: 48-2	Map & Lot Number: 77-83
Richard Marchese, Trustee Brickyard One Nominee Trust Post Office Box 720 Middleton, Massachusetts 01949	Max James Seidman & Angel Zhang 53 Winter Street Lebanon, New Hampshire 03766
Map & Lot Number: 77-85	Map & Lot Number: 77-86
Mark A. & Rebecca J. Kidder 41 Winter Street Lebanon, New Hampshire 03766	Thuy Hone & Stephen Le 37 Winter Street Lebanon, New Hampshire 03766

Map & Lot Number: 77-87	Map & Lot Number: 77-105
Wanda Jean Bachmann 29 Winter Street Lebanon, New Hampshire 03766	Randall A. & Lourie A. Herrin 44 Stoney Brook Road Lebanon, New Hampshire 03766
Map & Lot Number: 77-108	Map & Lot Number: 77-111
Home Crafters, LLC 4253 Allen Hill Road South Royalton, Vermont 05068	Zenia Mae Valdiviezo 49 Juniper Circle Lebanon, New Hampshire 03766
Map & Lot Number:	Map & Lot Number:
NHDOT District 2 7 Hazen Drive Concord, New Hampshire 03302	
Map & Lot Number: Engineer/Surveyor	Map & Lot Number: Wetlands Scientist
Pathways Consulting, LLC 240 Mechanic Street, Suite 100 Lebanon, New Hampshire 03766	Rick Van de Poll, Ph.D. Ecosystem Management Consultants of NE 30 North Sandwich Road Center Sandwich, New Hampshire 03227-3326
Map & Lot Number:	Map & Lot Number:
Map & Lot Number:	Map & Lot Number:
Map & Lot Number:	Map & Lot Number:

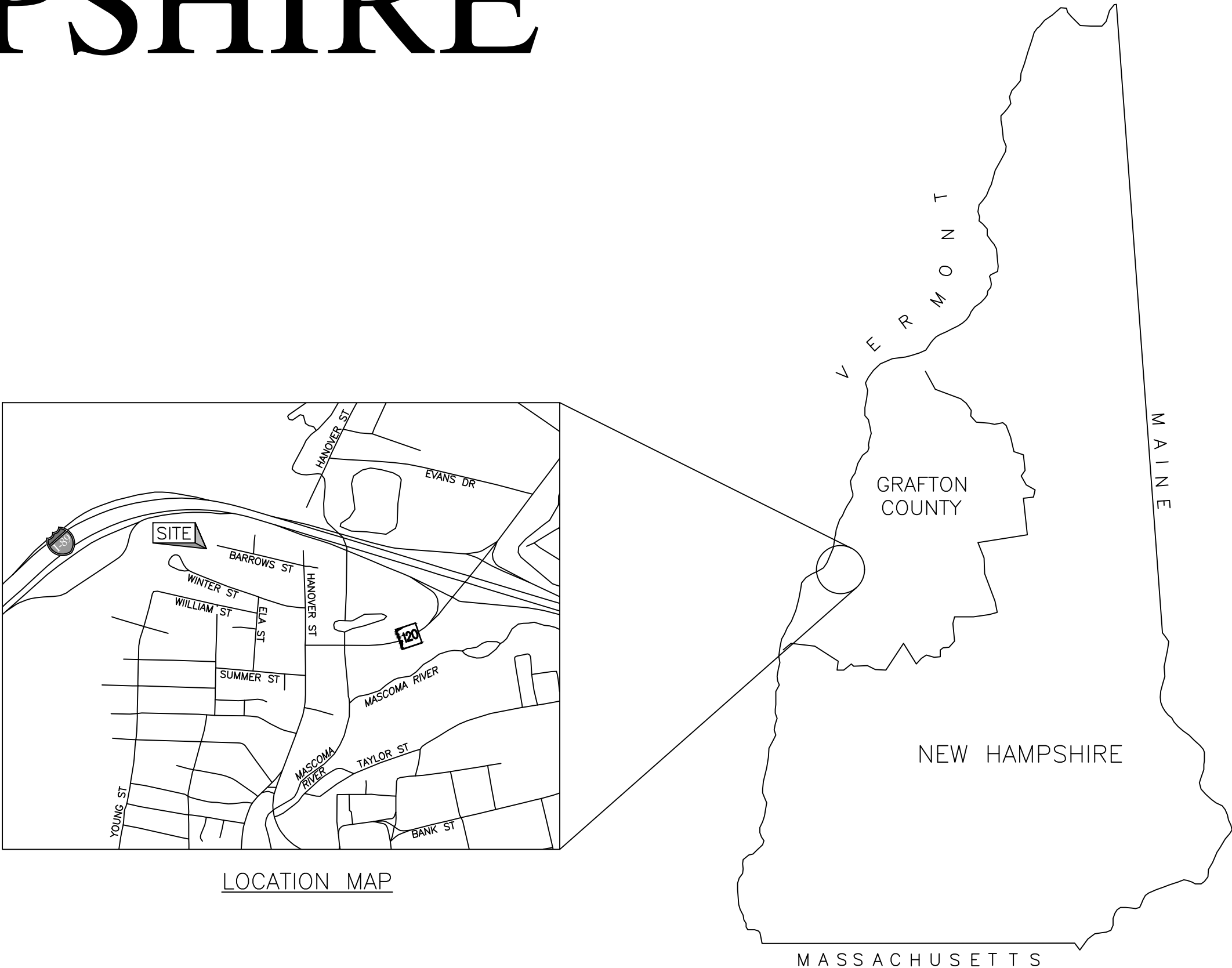
(Revised 2/8/2024)



NHDES WETLAND APPLICATION PLANS FOR THE CITY OF LEBANON RESIDENTIAL DEVELOPMENT PROJECT 0 BARROWS STREET LEBANON, NEW HAMPSHIRE APRIL 5, 2024

INDEX OF SHEETS		
SHEET	1	COVER, INDEX OF SHEETS & LOCATION MAP
SHEET	2	EXISTING CONDITIONS PLAN
SHEET	3	PROPOSED SITE PLAN
SHEET	4	CONCEPTUAL SITE DEVELOPMENT
SHEET	5	EROSION AND SEDIMENT CONTROL DETAILS
SHEET	6	MISCELLANEOUS DETAILS

FOR PERMITTING ONLY
(NOT FOR CONSTRUCTION)

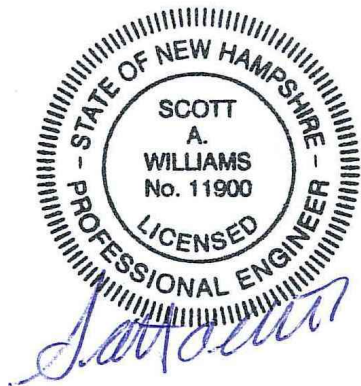


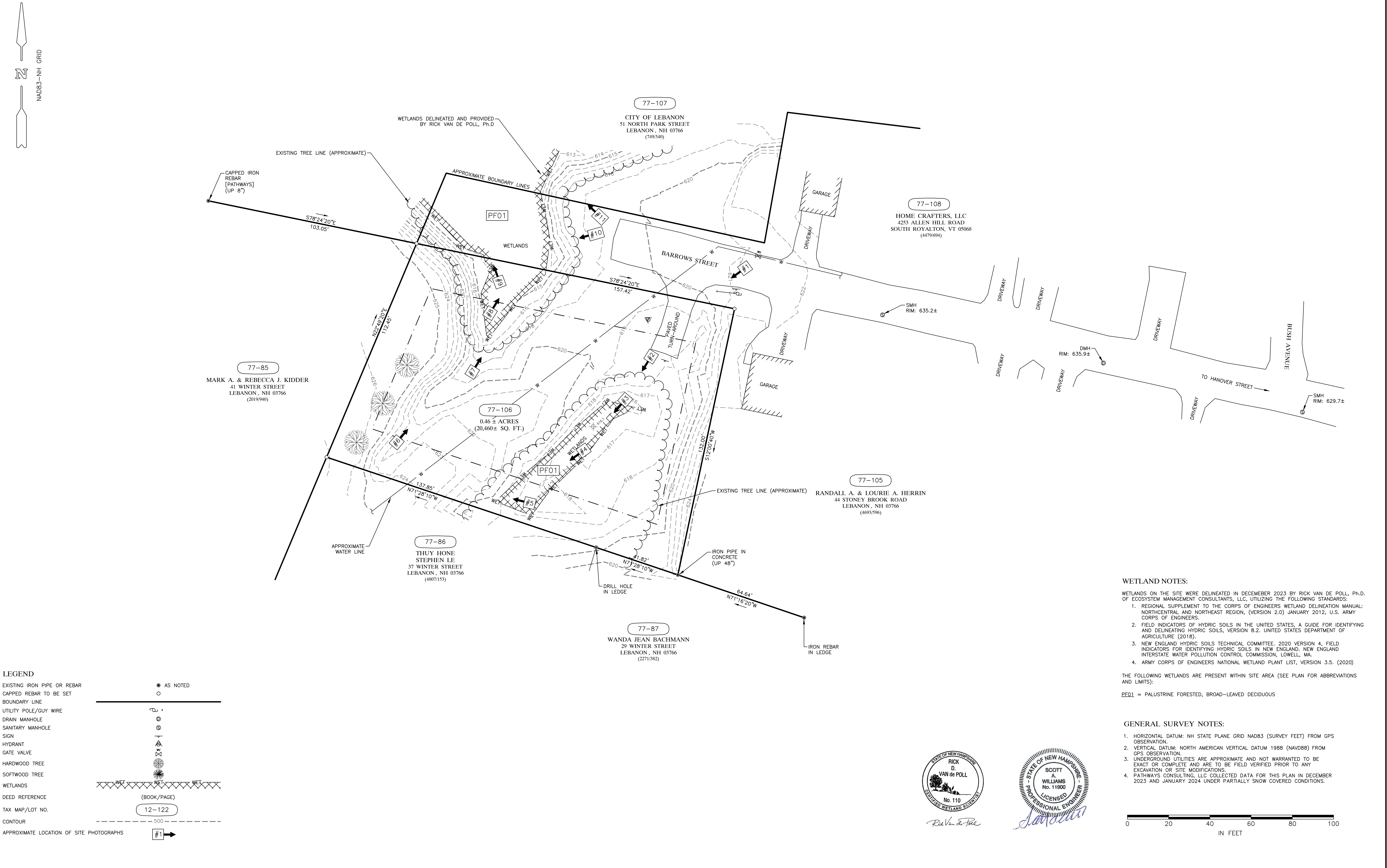
PATHWAYS PROJECT NO. 13377

CIVIL ENGINEER
PATHWAYS CONSULTING, LLC
240 MECHANIC STREET, SUITE 100
LEBANON, NEW HAMPSHIRE 03766
(603) 448-2200

RECORD OWNER:
THE CITY OF LEBANON
51 NORTH PARK STREET
LEBANON, NEW HAMPSHIRE 03766

APPLICANT:
**CITY OF LEBANON
DEPARTMENT OF PUBLIC WORKS**
193 DARTMOUTH COLLEGE HIGHWAY
LEBANON, NEW HAMPSHIRE 03766





LEGEND

EXISTING IRON PIPE OR REBAR

● AS NOTED

CAPPED REBAR TO BE SET

○

BOUNDARY LINE

—

UTILITY POLE/GUY WIRE

⊕

DRAIN MANHOLE

⊙

SANITARY MANHOLE

⊙

SIGN

⊙

HYDRANT

⊙

GATE VALVE

⊙

HARDWOOD TREE

⊙

SOFTWOOD TREE

⊙

WETLANDS

WET

DEED REFERENCE

(BOOK/PAGE)

TAX MAP/LOT NO.

12-122

CONTOUR

500

APPROXIMATE LOCATION OF SITE PHOTOGRAPHS

#1

WETLAND NOTES:

WETLANDS ON THE SITE WERE DELINEATED IN DECEMBER 2023 BY RICK VAN DE POLL, Ph.D. OF ECOSYSTEM MANAGEMENT CONSULTANTS, LLC, UTILIZING THE FOLLOWING STANDARDS:

- REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTH-CENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
- FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.2. UNITED STATES DEPARTMENT OF AGRICULTURE (2018).
- NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE. 2020 VERSION 4, FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION, LOWELL, MA.
- ARMY CORPS OF ENGINEERS NATIONAL WETLAND PLANT LIST, VERSION 3.5. (2020)

THE FOLLOWING WETLANDS ARE PRESENT WITHIN SITE AREA (SEE PLAN FOR ABBREVIATIONS AND LIMITS):

PF01 = PALUSTRINE FORESTED, BROAD-LEAVED DECIDUOUS

GENERAL SURVEY NOTES:

- HORIZONTAL DATUM: NH STATE PLANE GRID NAD83 (SURVEY FEET) FROM GPS OBSERVATION.
- VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88) FROM GPS OBSERVATION.
- UNDERGROUND UTILITIES ARE APPROXIMATE AND NOT WARRANTED TO BE EXACT OR COMPLETE AND ARE TO BE FIELD VERIFIED PRIOR TO ANY EXCAVATION OR SITE MODIFICATIONS.
- PATHWAYS CONSULTING, LLC COLLECTED DATA FOR THIS PLAN IN DECEMBER 2023 AND JANUARY 2024 UNDER PARTIALLY SNOW COVERED CONDITIONS.

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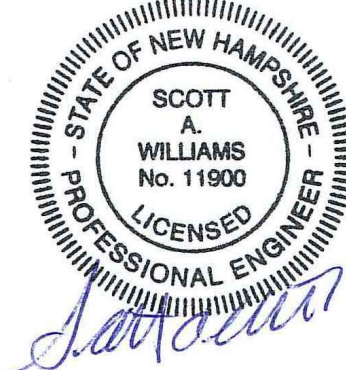
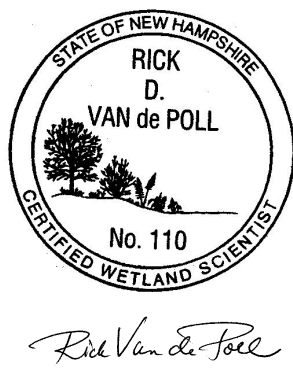
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IN FEET



REVISION NO.	DATE	DESCRIPTION	MADE BY	CHECKED BY	APPROVED BY

EXISTING CONDITIONS PLAN FOR

CITY OF LEBANON - RESIDENTIAL DEVELOPMENT PROJECT

(TAX MAP 77, LOT 106)

0 BARROWS STREET, LEBANON, NEW HAMPSHIRE 03766

PATHWAYS CONSULTING, LLC

240 MECHANIC STREET, SUITE 100

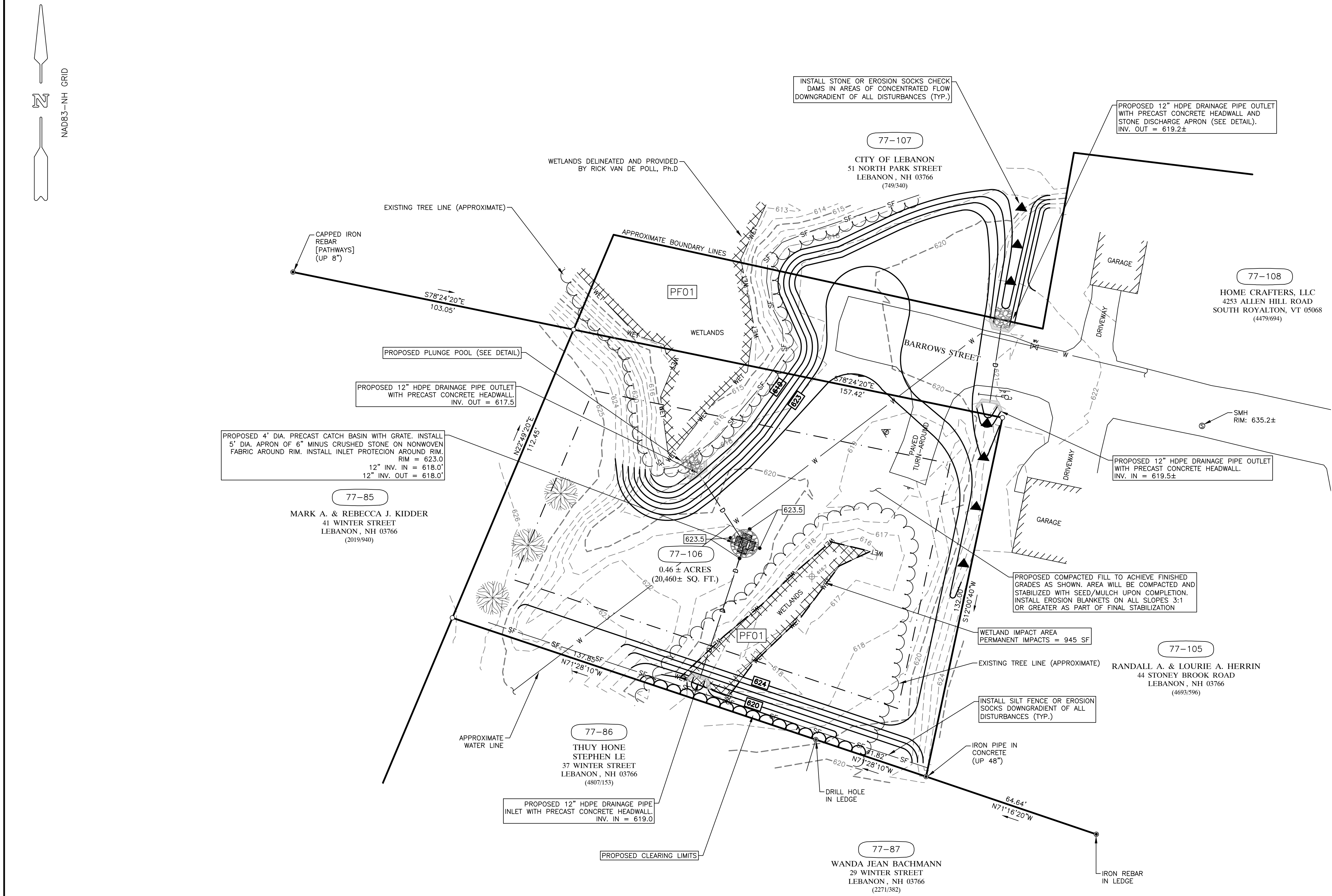
LEBANON, NEW HAMPSHIRE 03766

(603) 448-2200

SCALE: AS SHOWN
DESIGNED BY:
DRAWN BY: DAS
CHECKED BY: SAW
DATE: 04-05-24
PROJ. NO. 13377

2

SHEET 2 OF 6



GENERAL NOTES AND CONDITIONS

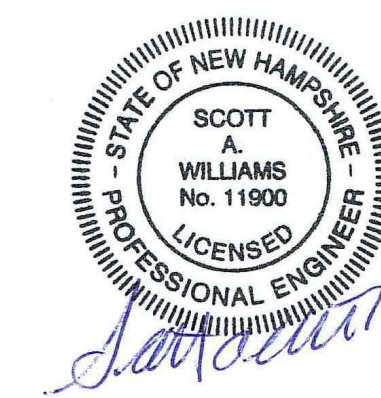
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE OWNER AND NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION CONSTRUCTION STANDARDS AND SPECIFICATIONS, UNLESS OTHERWISE SPECIFIED OR DIRECTED.
- THESE PLANS ARE TO BE UTILIZED FOR PERMITTING ONLY. CONSTRUCTION SHALL NOT BEGIN PRIOR TO OBTAINING ALL NECESSARY PERMITS AND/OR APPROVALS, INCLUDING, BUT NOT LIMITED TO A WETLANDS AND SHORELAND PERMIT FROM NHDES.
- THE OWNER AND/OR ITS CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL EQUIPMENT, MATERIALS, LABOR, TEMPORARY CONSTRUCTION STAGING AND ACCESS, GENERAL SEDIMENT AND EROSION CONTROLS, RESTORATION OF THE WORK AREA, MEANS AND METHODS, CONSTRUCTION OBSERVATION SERVICES FOR COMPLETING THE WORK IN ACCORDANCE WITH ANY REGULATORY APPROVALS AND PERMITS OBTAINED FOR THE WORK. THE OWNER IS ALSO RESPONSIBLE FOR ANY POST-CONSTRUCTION MONITORING AND REPORTING REQUIRED BY ANY REGULATORY AGENCIES.
- THE OWNER AND/OR ITS CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING DEWATERING AND/OR SEDIMENT CONTAINMENT MEASURES AS NECESSARY TO FACILITATE WORK AND TO PREVENT DISCHARGE OF SEDIMENT, TURBIDITY, AND DEBRIS INTO THE RIVER FOR THE DURATION OF THE WORK.
- THE PROJECT MAY BE SUBJECT TO A WETLAND AND/OR SHORELAND APPROVAL FROM THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES (NHDES), AND ANY RELATED PERMIT CONDITIONS. THE PROJECT MAY ALSO BE SUBJECT TO APPROVAL BY THE UNITED STATES ARMY CORPS OF ENGINEERS (USACE). PLEASE CONTACT THESE AGENCIES WITH ANY QUESTIONS ON APPROVAL CONDITIONS AND RELATED PERMITS.
- THE OWNER AND/OR ITS CONTRACTOR SHALL REVIEW AND UNDERSTAND ALL APPLICABLE ENVIRONMENTAL PERMITS AND ENSURE THAT ALL CONSTRUCTION CONDITIONS ARE MET. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH APPLICABLE PERMIT CONDITIONS AND REQUIREMENTS.
- ALL PERMIT CONDITIONS SHALL BE ADHERED TO AS PART OF THIS PROPOSED WORK AND THE OWNER AND/OR ITS CONTRACTOR SHALL BE RESPONSIBLE FOR AMENDING THE PERMITS IN THE EVENT THAT WORK WILL RESULT IN ANY CHANGE TO THE PERMITTED WORK, OR WORK OUTSIDE OF THE APPROVED WORK LIMITS.
- ALL DIMENSIONS AND FIELD CONDITIONS SHALL BE VERIFIED BY THE OWNER AND/OR ITS CONTRACTOR PRIOR TO COMMENCEMENT OF WORK. ANY DISCREPANCIES OR QUESTIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE THE START OF CONSTRUCTION.
- ALL WORK PERFORMED BY THE OWNER AND/OR ITS CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS AND REQUIREMENTS.
- THE VERTICAL AND HORIZONTAL DATUM IS BASED ON THE SURVEY PERFORMED BY PATHWAYS CONSULTING, LLC, AS IDENTIFIED ON THESE PLANS.
- UNDERGROUND UTILITIES ARE NOT SHOWN. THE OWNER AND/OR ITS CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION OF ALL UTILITIES (ABOVE AND BELOW GROUND) WITHIN THE PROJECT LIMITS, AND TO TAKE NECESSARY PRECAUTIONS TO PROTECT UTILITIES DURING CONSTRUCTION. CONTACT DIG-SAFE AT 1-800-DIG-SAFE (WWW.DIGSAFE.COM) AT LEAST 3 WORKING DAYS PRIOR TO ANY WORK.
- THE OWNER SHALL BE NOTIFIED A MINIMUM OF 48 HOURS PRIOR TO ANY CONSTRUCTION. CONSTRUCTION MAY ONLY BEGIN AFTER AUTHORIZATION FROM THE OWNER.
- THE TOWN OF ORFORD SHALL BE NOTIFIED PRIOR TO ANY WORK REQUIRING TRAFFIC IMPEDANCE, TRAFFIC CONTROLS, ROADWAY OR UTILITY DISTURBANCE. CONSTRUCTION MAY ONLY BEGIN AFTER AUTHORIZATION FROM THE TOWN OF HANOVER.
- THE ENGINEER SHALL BE NOTIFIED PRIOR TO CONSTRUCTION IF THERE ARE ANY DISCREPANCIES IN PLANS OR EXISTING DATA. CONSTRUCTION SHALL NOT PROCEED WITHOUT WRITTEN PERMISSION FROM THE OWNER.
- THE OWNER AND/OR ITS CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A STORMWATER, SEDIMENT, DEWATERING AND EROSION CONTROLS SPECIFIED ON THESE PLANS AND IN ACCORDANCE WITH ANY OTHER APPLICABLE REGULATORY REQUIREMENTS.
- THE OWNER AND/OR ITS CONTRACTOR SHALL SUPERVISE AND DIRECT ALL WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS AND METHODS, AND COORDINATION WITH OTHER TRADES.
- THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL NECESSARY COMPONENTS OF CONSTRUCTION SAFETY, PROTECTION OF ALL EXISTING UTILITIES AND/OR STRUCTURES WITHIN OR OUTSIDE THE WORK SCOPE, PROTECTION OF ADJACENT PROPERTIES, AND COMPLIANCE WITH ANY OTHER APPLICABLE STATE AND FEDERAL REGULATIONS REGARDING SITE SAFETY.
- THE OWNER AND/OR ITS CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS AND CONDITIONS FOR WORK SHOWN ON THESE PLANS PRIOR TO COMMENCING WORK.
- THE OWNER AND/OR ITS CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL AND DISPOSAL OF ALL WASTE MATERIALS SUCH AS METAL, CONCRETE, MASONRY, WOOD, VEGETATION AND DEBRIS IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS AND AS REQUIRED BY THE TOWN OF ORFORD.
- THE OWNER AND/OR ITS CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FIELD LAYOUT.
- THE OWNER AND/OR ITS CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PREVENT SILTATION, TURBIDITY AND POLLUTION INTO SURFACE WATERS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A STORMWATER, SEDIMENT, DEWATERING AND EROSION CONTROLS SPECIFIED ON THESE PLANS AND IN ACCORDANCE WITH ANY OTHER APPLICABLE REGULATORY REQUIREMENTS.
- THE OWNER AND/OR ITS CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY TRAFFIC CONTROLS, TRAFFIC BARRIERS, SIGNAGE AND MARKING IN ACCORDANCE WITH NHDOT SPECIFICATIONS. THE OWNER AND/OR ITS CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING MEANS OF EGRESS FOR ALL ADJACENT PROPERTY OWNERS DURING CONSTRUCTION.
- ALL EROSION CONTROL FACILITIES SHALL BE MAINTAINED AS OFTEN AS REQUIRED BY WEATHER CONDITIONS.
- DITCHES AND OTHER RUNOFF COLLECTION AREAS SHALL BE MAINTAINED BOTH DURING AND AFTER CONSTRUCTION TO ENSURE THE PROPER REMOVAL OF SEDIMENT.
- ALL SLOPES GREATER THAN 3:1 (3 HORIZONTAL TO 1 VERTICAL) SHALL BE STABILIZED USING MULCH NETTING. ADDITIONAL STABILIZATION MEASURES NECESSARY SHALL BE IMPLEMENTED AS REQUIRED.
- THE ENGINEER ASSUMES NO RESPONSIBILITY FOR CONSTRUCTION ON THIS SITE UNLESS RETAINED FOR CONSTRUCTION OBSERVATION SERVICES.
- THE ENGINEER SHALL BE RESPONSIBLE FOR ANY SUBSURFACE INVESTIGATION, STRUCTURAL DESIGN, VERIFYING SUBSURFACE CONDITIONS AND SOIL BEARING CAPACITIES.
- THE OWNER AND/OR ITS CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION AND CERTIFICATION OF THE PROPOSED WORK.

CONSTRUCTION SEQUENCE

- NOTIFY DIG-SAFE A MINIMUM OF THREE DAYS PRIOR TO COMMENCING CONSTRUCTION.
- CONDUCT PRE-CONSTRUCTION MEETING, AS REQUIRED BY THE NHDES.
- STAKE OR FLAG ALL CLEARING, CONSTRUCTION LIMITS AND WETLAND AREAS WITH SURVEY TAPE.
- INSTALL ALL NECESSARY TRAFFIC CONTROLS AND SIGNAGE AT SITE ENTRANCE.
- INSTALL STABILIZED CONSTRUCTION ENTRANCE, AS NEEDED, AT THE SITE ENTRANCE.
- SET UP CONSTRUCTION STAGING AREAS FOR EQUIPMENT, MATERIAL AND SOIL STORAGE WITHIN THE OWNER'S PROPERTY AND APPROVED CONSTRUCTION LIMITS. INSTALL PERIMETER CONTROLS (SILT FENCE AND CONSTRUCTION FENCE) AROUND LIMITS OF DISTURBANCE AND IF NECESSARY, AROUND STAGING AREAS.
- COMPLETE TREE CLEARING AND GRUBBING WITHIN WORK AREAS.
- INSTALL STANDARD PERIMETER EROSION CONTROL MEASURES (SILT FENCE, EROSION SOCK) AND OTHER EROSION CONTROLS, PER PLAN.
- CONSTRUCT ADDITIONAL EROSION OR SURFACE WATER CONTROLS (DIVERSION DITCHES, CHECK DAMS OR SILT FENCE), IF REQUIRED, SIMULTANEOUSLY WITH LAND CLEARING, GRUBBING, EXCAVATION AND GRADING WITHIN PROJECT AREA.
- COMPLETE SITE ACTIVITIES INCLUDING SLOPE EXCAVATION, INSTALLING STABILIZATION MEASURES, EMBANKMENT FILLING AND GRADING. STABILIZE ALL DISTURBED AREAS ON A TEMPORARY BASIS IN ACCORDANCE WITH EROSION CONTROL SPECIFICATIONS USING SEED AND MULCH, SURFACE ROUGHENING, AND ADDITIONAL MEASURES SUCH AS MULCH NETTING FOR TEMPORARY SLOPE PROTECTION ON SLOPES STEEPER THAN 3:1, UNTIL AREAS ARE READY FOR PERMANENT RESTORATION.
- INSTALL LANDSCAPING AND FINAL STABILIZATION ON ALL DISTURBED AREAS. THIS WILL INCLUDE TOPSOILING, PERMANENT SEEDING, MULCHING, STONE FILL, OR EROSION BLANKETS FOR SLOPE PROTECTION ON 3:1 SLOPES OR GREATER. ALL DISTURBED AREAS WITHIN OR ADJACENT TO THE STREAM CHANNEL SHALL BE STABILIZED WITHIN 3 DAYS OF FINAL GRADING OR WORK STOPPAGE.
- GENERAL EROSION AND SEDIMENT CONTROLS SHALL ONLY BE REMOVED ONCE ALL DISTURBED AREAS HAVE BEEN FULLY STABILIZED.
- CONTINUOUSLY INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES.
- REMOVE TRAPPED SEDIMENT FROM EROSION AND SEDIMENT CONTROL MEASURES AS APPROPRIATE AND THEN REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES ONCE PERMANENT STABILIZATION HAS BEEN ACHIEVED.
- INVASIVE SPECIES: INVASIVE SPECIES HAVE NOT BEEN IDENTIFIED WITHIN THE PROJECT LIMITS, BUT MAY EXISTING ON OR NEAR THE SITE. NO INVASIVE AREAS HAVE BEEN DELINEATED ON THE SITE. THE OWNER AND/OR ITS CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS DURING THE WORK TO IDENTIFY THE PRESENCE OF INVASIVE SPECIES, AND PREVENT THE INTRODUCTION OR SPREAD OF INVASIVE SPECIES ON THE SITE. WHERE INVASIVE SPECIES ARE ENCOUNTERED WITHIN THE WORK LIMITS, THE CONTRACTOR WILL ADDRESS THE INVASIVE SPECIES IN THE FOLLOWING MANNER:
 - INVASIVE SPECIES AREAS SHALL BE IDENTIFIED ON THE SITE, AND THE AREAS SHALL BE FLAGGED AROUND THE PERIMETER.
 - THE OWNER SHALL BE NOTIFIED IMMEDIATELY OF THE PRESENCE OF INVASIVE SPECIES.
 - IF GROUND DISTURBANCES SUCH AS GRADING OR EXCAVATION ARE TO OCCUR WITHIN THESE AREAS, THE VEGETATION (STEMS, FOLIAGE, ROOTS, ETC.) SHALL BE CUT TO THE GROUND SURFACE AND ALL VEGETATION AND SOIL MATERIALS SHALL REMOVED IN A CONTAINED MANNER, AND DISPOSED OF AT AN ON-SITE DISPOSAL PIT WITHIN THE APPROVED WORK LIMITS, IF POSSIBLE. THE DISPOSAL PIT SHALL BE DEEP ENOUGH TO ALLOW ALL INVASIVE SPECIES MATERIAL TO BE COVERED WITH AT LEAST 3 FEET OF SUITABLE SOIL COVER. THE DISPOSAL LOCATION FOR INVASIVE MATERIALS MAY BE LOCATED LANDWARD OF THE BANK STABILIZATION AREA AS LONG AS THERE IS ENOUGH ROOM TO PLACE SUITABLE COVER MATERIAL OVER THE INVASIVE MATERIALS. IF THIS IS NOT POSSIBLE, INVASIVE MATERIALS SHALL BE DISPOSED OF AT A SUITABLE OFF-SITE DISPOSAL LOCATION APPROVED BY THE OWNER AND/OR THE TOWN OF HANOVER.
 - IF NO GROUND DISTURBANCES WILL OCCUR WITHIN INVASIVE SPECIES AREAS, BUT ACCESS IS NECESSARY THROUGH THESE AREAS, THE INVASIVE VEGETATION (STEMS, FOLIAGE, ROOTS, ETC.) SHALL BE CUT TO THE GROUND SURFACE, AND THE GROUND SURFACE SHALL BE COVERED WITH POLYETHYLENE SHEETING AND CRUSHED STONE PRIOR TO TRACKING OVER THE AREA WITH EQUIPMENT OR MACHINERY.
- THE OWNER AND/OR ITS CONTRACTOR SHALL INSPECT ALL EQUIPMENT AND MACHINERY DAILY FOR LEAKING FUEL, OIL, AND HYDRAULIC FLUID PRIOR TO ENTERING SURFACE WATERS OR WETLANDS. FAULTY EQUIPMENT OR MACHINERY SHALL BE REPAIRED IMMEDIATELY.
- THE OWNER AND/OR ITS CONTRACTOR SHALL HAVE APPROPRIATE OIL SPILL KITS ON SITE AND READILY ACCESSIBLE AT ALL TIMES DURING CONSTRUCTION AND EACH OPERATOR SHALL BE TRAINED IN THE USE OF THESE MEASURES.
- ALL REFUELING OF EQUIPMENT AND MACHINERY SHALL OCCUR OUTSIDE OF SURFACE WATERS AND WETLANDS DURING CONSTRUCTION.

PROJECT DESCRIPTION

THIS PROJECT INVOLVES THE INSTALLATION OF DRAINAGE STRUCTURES AND SITE IMPROVEMENTS ON AN EXISTING UNDEVELOPED PARCEL OWNED BY THE CITY OF LEBANON FOR FUTURE RESIDENTIAL DEVELOPMENT. THERE WILL BE PERMANENT IMPACTS TO EXISTING WETLANDS. THE PROJECT WILL ALSO INCLUDE TEMPORARY SEDIMENT CONTAINMENT MEASURES AROUND THE WETLAND, TEMPORARY CONSTRUCTION STAGING AND ACCESS, SITE RESTORATION, EROSION CONTROL INSTALLATION, AND OTHER INCIDENTAL WORK.

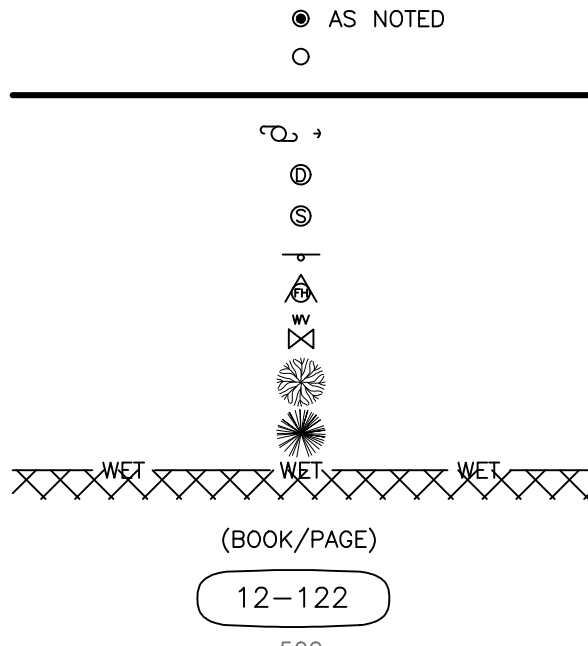


FOR PERMITTING ONLY
(NOT FOR CONSTRUCTION)

0 20 40 60 80 100
IN FEET

LEGEND

- EXISTING IRON PIPE OR REBAR
- CAPPED REBAR TO BE SET
- BOUNDARY LINE
- UTILITY POLE/GUY WIRE
- DRAIN MANHOLE
- SANITARY MANHOLE
- SIGN
- HYDRANT
- GATE VALVE
- HARDWOOD TREE
- SOFTWOOD TREE
- WETLANDS
- DEED REFERENCE
- TAX MAP/LOT NO.
- CONTOUR



SITE INFORMATION

TAX MAP AND LOT NUMBER: 77-106
ADDRESS: BARROWS STREET
ZONING DISTRICT: R-3 (RESIDENTIAL THREE DISTRICT)
EXISTING USE: UNDEVELOPED
PROPOSED USE: RESIDENTIAL HOUSING DEVELOPMENT
GROSS AREA OF PROPOSED BUILDING: N/A
AREA OF LOT: 0.46± ACRES (20,460± SQ. FT.)

GENERAL SURVEY NOTES:

- HORIZONTAL DATUM: NH STATE PLANE GRID NAD83 (SURVEY FEET) FROM GPS OBSERVATION.
- VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88) FROM GPS OBSERVATION.
- UNDERGROUND UTILITIES ARE APPROXIMATE AND NOT WARRANTED TO BE EXACT OR COMPLETE AND ARE TO BE FIELD VERIFIED PRIOR TO ANY EXCAVATION OR SITE MODIFICATIONS.
- PATHWAYS CONSULTING, LLC COLLECTED DATA FOR THIS PLAN IN DECEMBER 2023 AND JANUARY 2024 UNDER PARTIALLY SNOW COVERED CONDITIONS.

REVISION NO.	DATE	DESCRIPTION	MADE BY	CHECKED BY	APPROVED BY

PROPOSED SITE PLAN FOR
CITY OF LEBANON - RESIDENTIAL DEVELOPMENT PROJECT
(TAX MAP 77, LOT 106)

0 BARROWS STREET, LEBANON, NEW HAMPSHIRE 03766

PATHWAYS CONSULTING, LLC

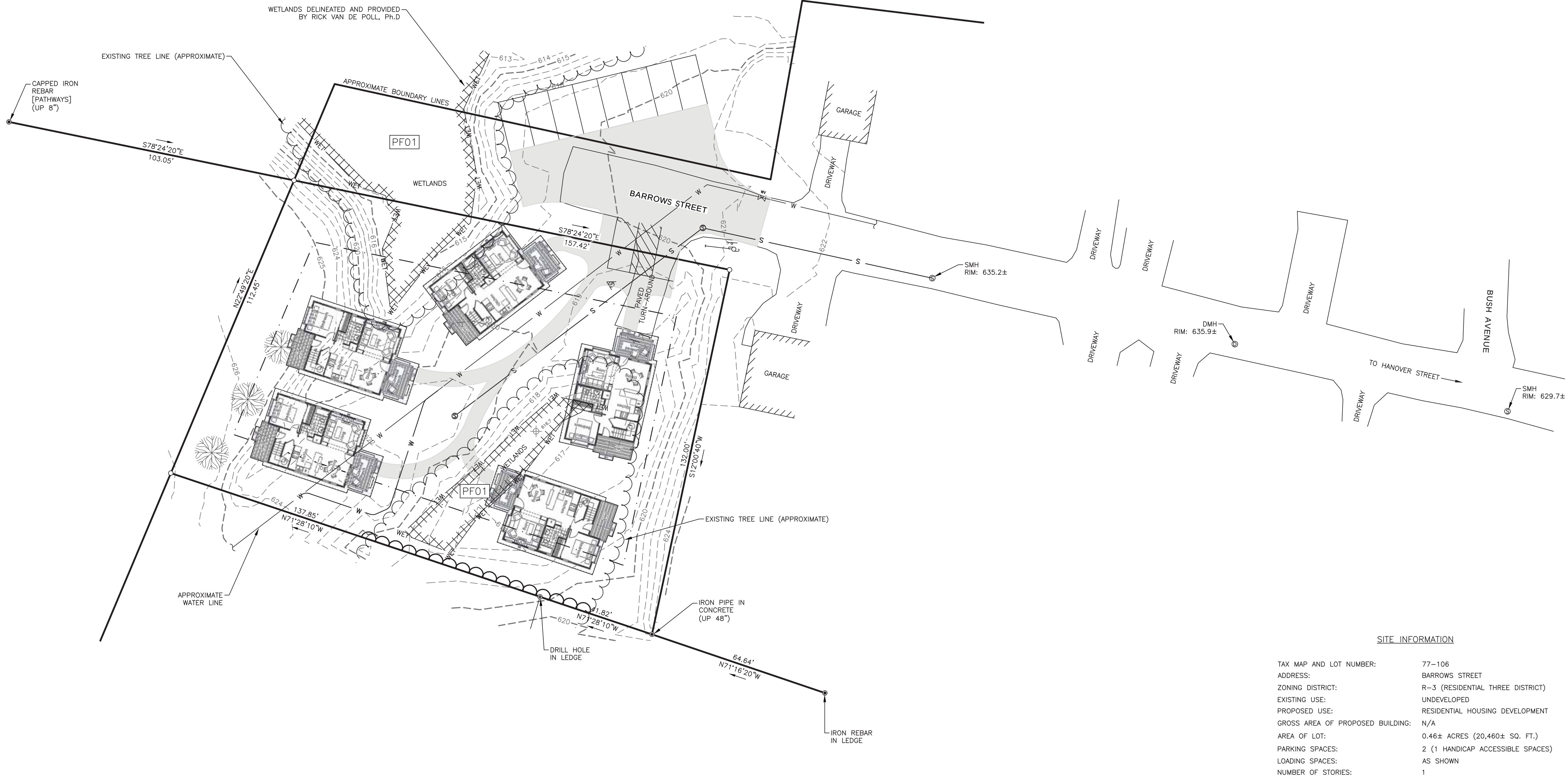
240 MECHANIC STREET, SUITE 100
LEBANON, NEW HAMPSHIRE 03766
(603) 448-2200

SCALE: AS SHOWN
DESIGNED BY: SAW
DRAWN BY: DAS
CHECKED BY: SAW
DATE: 04-05-24
PROJ. NO. 13377

3
SHEET 3 OF 6

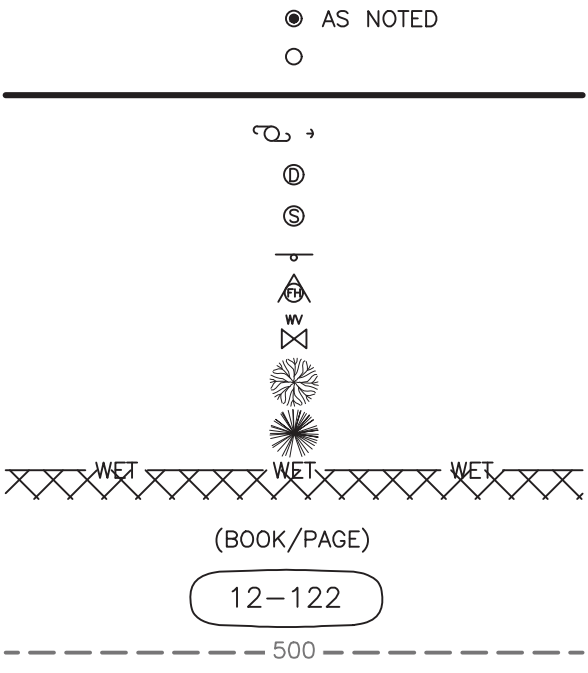


NAD83—NH GRID



LEGEND

- EXISTING IRON PIPE OR REBAR
- CAPPED REBAR TO BE SET
- BOUNDARY LINE
- UTILITY POLE/GUY WIRE
- DRAIN MANHOLE
- SANITARY MANHOLE
- SIGN
- HYDRANT
- GATE VALVE
- HARDWOOD TREE
- SOFTWOOD TREE
- WETLANDS
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- TAX MAP/LOT NO.
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SITE INFORMATION

TAX MAP AND LOT NUMBER: 77-106
ADDRESS: BARROWS STREET
ZONING DISTRICT: R-3 (RESIDENTIAL THREE DISTRICT)
EXISTING USE: UNDEVELOPED
PROPOSED USE: RESIDENTIAL HOUSING DEVELOPMENT
GROSS AREA OF PROPOSED BUILDING: N/A
AREA OF LOT: 0.46± ACRES (20,460± SQ. FT.)
PARKING SPACES: 2 (1 HANDICAP ACCESSIBLE SPACES)
LOADING SPACES: AS SHOWN
NUMBER OF STORIES: 1

LOT SIZE/DIMENSION:	AREA (SQ. FT.)	WIDTH	MAX. HEIGHT
CLASS 1	10,000	75'	35'±
CLASS 2	15,000	75'	35'±
CLASS 3	40,000	100'	35'±

BUILDING SETBACKS:	FRONT	SIDE	REAR
CLASS 1	20'	15'	20'
CLASS 2	20'	15'	20'
CLASS 3	25'	25'	30'

FOR INFORMATION ONLY



REVISION NO.	DATE	DESCRIPTION	MADE BY	CHECKED BY	APPROVED BY

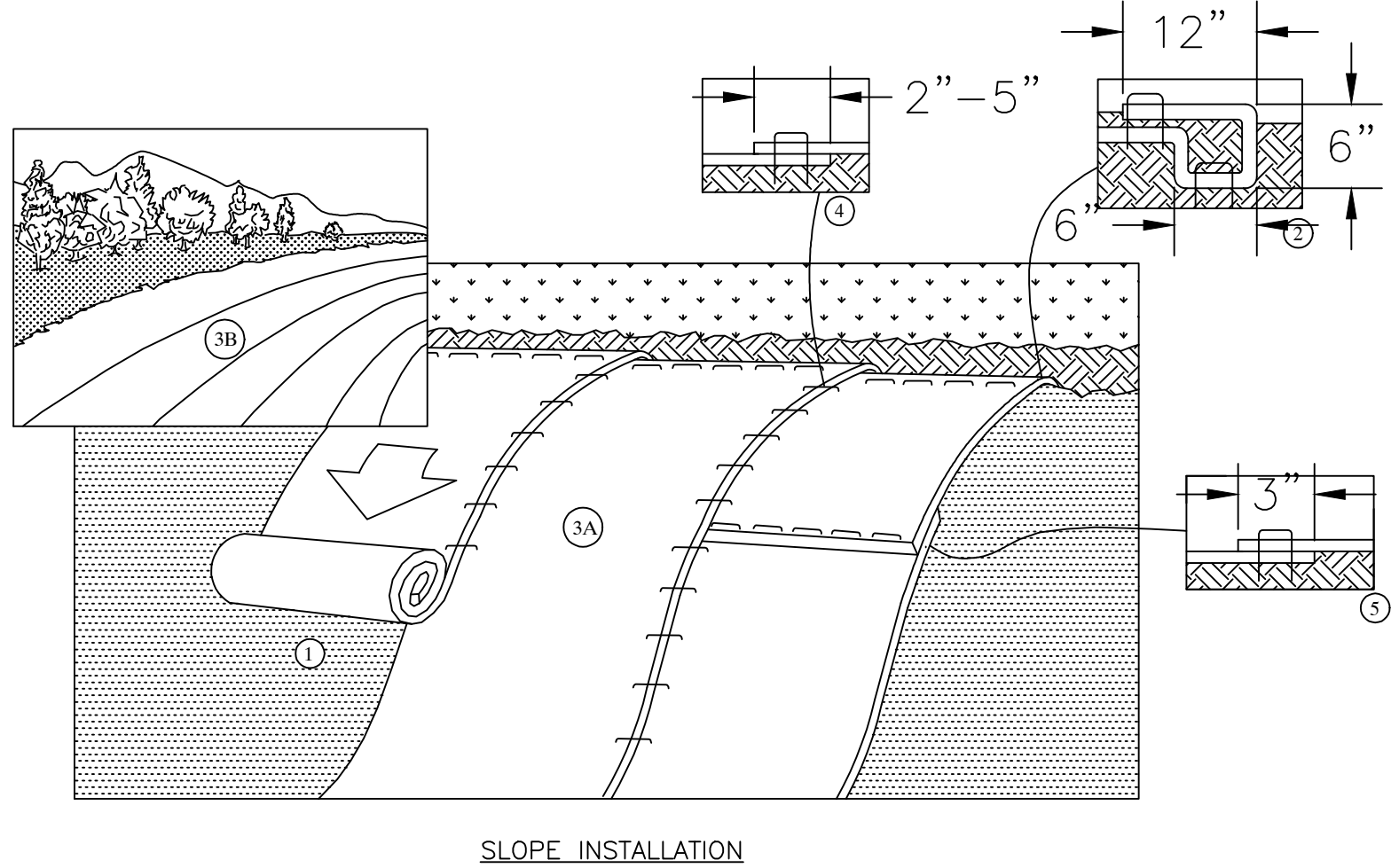
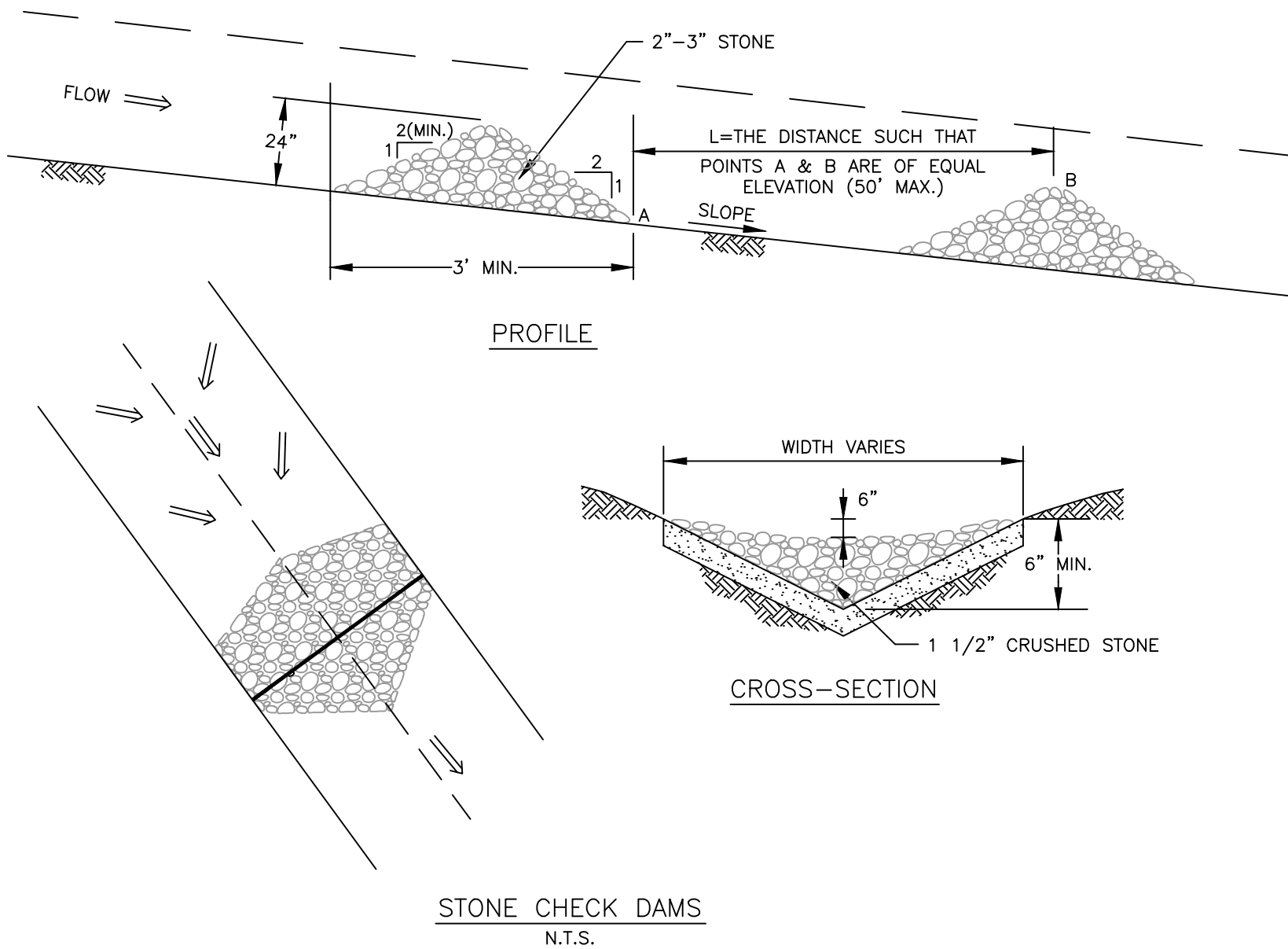
CONCEPTUAL SITE DEVELOPMENT PLAN FOR
CITY OF LEBANON - RESIDENTIAL DEVELOPMENT PROJECT
(TAX MAP 77, LOT 106)
0 BARROWS STREET, LEBANON, NEW HAMPSHIRE 03766

PATHWAYS CONSULTING, LLC
240 MECHANIC STREET, SUITE 100
LEBANON, NEW HAMPSHIRE 03766
(603) 448-2200

SCALE: AS SHOWN
DESIGNED BY:
DRAWN BY: DAS
CHECKED BY: SAW
DATE: 04-05-24
PROJ. NO. 13377

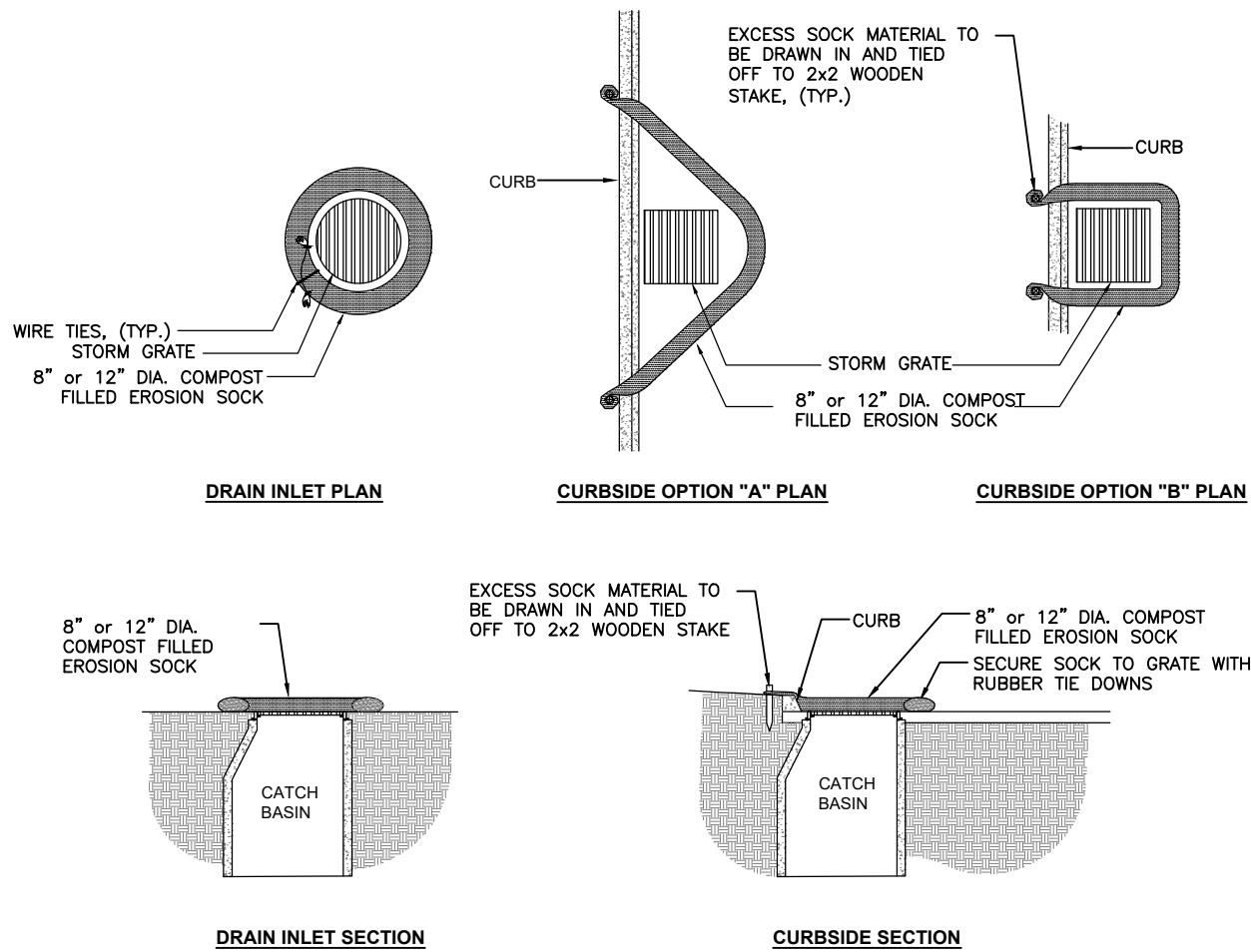
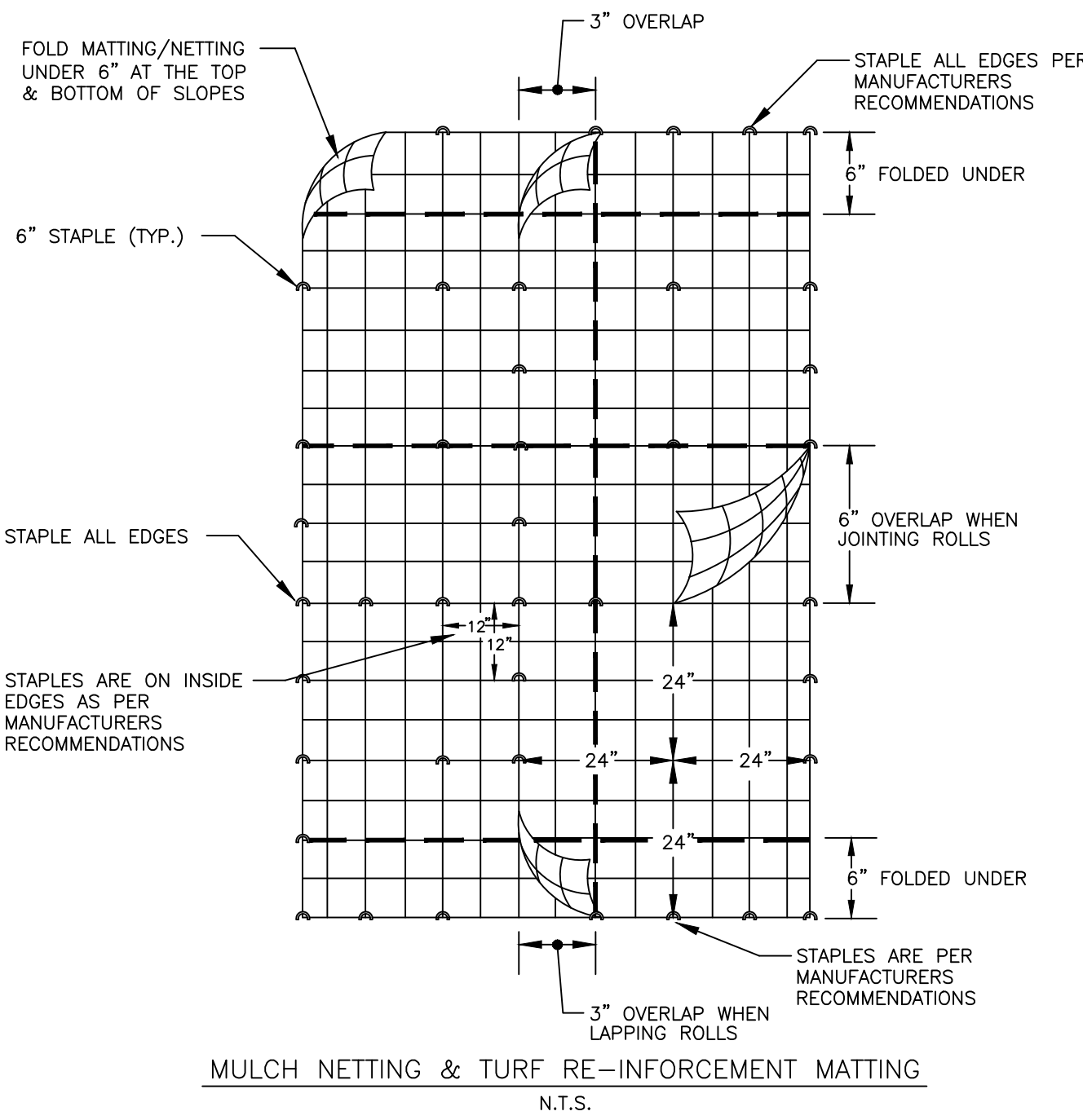
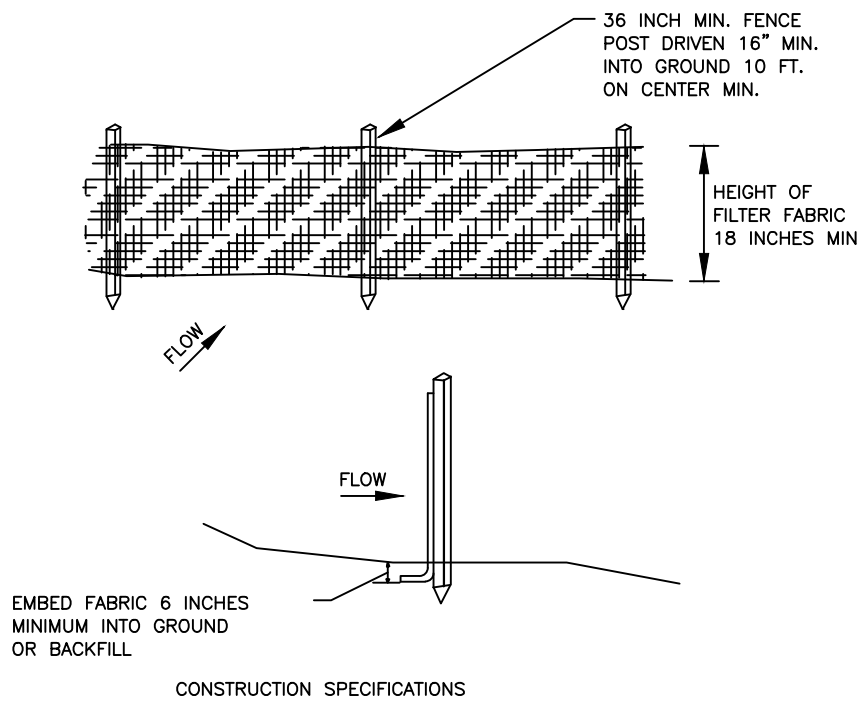
EROSION CONTROL SPECIFICATIONS

1. SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN ACCORDANCE WITH "NEW HAMPSHIRE STORMWATER MANAGEMENT", VOLUMES 1, 2, & 3, DECEMBER 2008 (OR LATEST EDITION). THE CONTRACTOR SHALL HAVE REFERENCE TO THESE PUBLICATIONS.
2. IMMEDIATE ATTENTION TO EROSION CONTROL PRACTICES DRAMATICALLY IMPROVES SOIL AND MOISTURE CONSERVATION AND REDUCES NEGATIVE IMPACTS ON WATER QUALITY. THE CONTRACTOR SHALL GIVE PRIORITY TO THE TIMELY INSTALLATION OF BOTH TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL MEASURES.
3. THE EROSION AND SEDIMENT CONTROL PRACTICES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIRED FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE PRACTICES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND MODIFIED TO ACCOUNT FOR CHANGING SITE CONDITIONS.
4. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THE PLANS SHALL BE CLEARLY FLAGGED BY SURVEY TAPE OR FENCING, IF REQUIRED, PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE CLEARING LIMITS SHALL BE PERMITTED. THE CLEARING LIMITS SHALL BE MAINTAINED FOR THE DURATION OF CONSTRUCTION.
5. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT SHALL NOT EXCEED 5 ACRES AT ANY ONE TIME BEFORE STABILIZATION, UNLESS OTHERWISE APPROVED BY NHDOT AND ADDRESSED ADEQUATELY IN THE SWPPP AND EROSION CONTROL PLANS. A CONSTRUCTION SEQUENCE HAS BEEN DEVELOPED TO FACILITATE INSTALLATION OF EROSION CONTROL MEASURES AND THE COMPLETION OF GRADING, SEEDING, AND LANDSCAPING AS SOON AS POSSIBLE WITHIN A DISTURBED AREA.
6. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES, SUCH AS CONSTRUCTED WHEEL WASH SYSTEMS OR WASH PADS, MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN AND TRACK OUT TO ROAD RIGHT OF WAY DOES NOT OCCUR FOR THE DURATION OF THE PROJECT. ANY SEDIMENT TRACKED ONTO PAVED AREAS SHALL BE REMOVED BY THE END OF THE SAME WORK DAY IT IS NOTED, AND IF NOTED ON A NON-WORK DAY, NOT LATER THAN THE END OF THE NEXT WORK DAY.
7. EARTH STOCKPILES SHALL BE SEEDDED AND MULCHED AND HAVE A SILT FENCE INSTALLED ON THE DOWNSLOPE SIDE, AT A MINIMUM. STOCKPILES SHALL BE COVERED WITH IMPERVIOUS TARPS AND/OR STABILIZED WITH TEMPORARY SEED AND MULCH TO PROTECT MATERIALS IN THE EVENT THAT THEY WILL REMAIN FOR LONGER THAN 1 MONTH.
8. INSTALL EROSION CONTROL MEASURES AS SHOWN. CLEAN ACCUMULATED SEDIMENT AS NECESSARY. LEAVE IN PLACE UNTIL DISTURBED AREAS HAVE BEEN ADEQUATELY STABILIZED.
9. DISTURBED AREAS RESULTING FROM SILT FENCE REMOVAL SHALL BE PERMANENTLY SEEDDED. CUT AND FILL SLOPES CALL FOR INTENSIVE EROSION CONTROL MEASURES. INSTALL MULCH NETTING OR OTHER SLOPE STABILIZATION MEASURES AS SHOWN ON NHDOT CONTRACT PLANS FOR ALL SLOPES 3:1 (1 RISE ON 3 RUN) AND STEEPER.
10. ALL DISTURBED AREAS SHALL BE TEMPORARILY STABILIZED WITH MULCH AND/OR MULCH NETTING BEFORE THE END OF EACH WORK DAY.
11. ROADWAYS SHALL BE STABILIZED WITH BASE COURSE AND BINDER WITHIN 3 WEEKS OF INITIAL DISTURBANCE OF THE SLOPES ON A SECTION OF ROADWAY, IN ADDITION TO COMPLETING DISTURBED SLOPES TO FINAL GRADE WITH FINAL SEEDING OR OTHER PRESCRIBED STABILIZATION.
12. WHEN WORK IS SUSPENDED WITHIN THE GROWING SEASON, ALL DISTURBED AREAS SHALL BE TEMPORARILY STABILIZED WITH SEED AND MULCH WITHIN 14 DAYS. OUTSIDE THE GROWING SEASON, ALL DISTURBED AREAS SHALL BE TEMPORARILY STABILIZED WITH MULCH; MULCH AND TACK ON SLOPES STEEPER THAN 3:1; OR EROSION MATTING ON SLOPES STEEPER THAN 2:1.
13. TEMPORARY STABILIZATION OF DISTURBED AREAS:
- SEED BED PREPARATION: TILL THREE INCHES DEEP MIXING IN FERTILIZER. APPLY 2 TONS/ACRE (100#/1,000 SQ. FT.)
- FERTILIZER: UNIFORMLY APPLY NOT LESS THAN 300#/ACRE (7#/1,000 SQ. FT.) OF 10-20-20 OR EQUIVALENT.
- SEEDING: SELECT APPROPRIATE SEEDING MIXTURE FROM TABLE 1 BELOW. SPREAD SEED UNIFORMLY. FIRM SOIL BY ROLLING OR PACKING; IF NOT FEASIBLE, THEN RAKE LIGHTLY TO COVER SEEDS.
- MULCHING: MULCH ALL DISTURBED AREAS WITH 1-½ TO 2 TONS OF STRAW PER ACRE (70-90#/1,000 SQ. FT.). ANCHOR ON ALL SLOPES 3:1 OR STEEPER AND ON SLOPES SUBJECT TO WASH OR WIND BLOWN CONDITIONS. JUTE OR OTHER BIODEGRADABLE NETTING, STAKING AND STAPLING MAY BE REQUIRED.
14. PERMANENT STABILIZATION OF DISTURBED AREAS:
- SEED BED PREPARATION: TOPSOIL (SANDY LOAM, LOAM, OR SILT LOAM), FRIABLE, FREE OF STUMPS, WOOD, AND ROOTS. STONES MORE THAN 1-½ INCHES IN DIAMETER OR LENGTH SHALL BE PLACED OVER ALL DISTURBED AREAS IN A 4" (MINIMUM) THICK LAYER. TOPSOIL SHALL BE FREE OF HERBICIDES AND TOXIC MATERIALS. TILL THREE INCHES DEEP, MIXING IN THE FERTILIZER AND LIME.
- FERTILIZER: UNIFORMLY APPLY NOT LESS THAN 500#/ACRE (12#/1,000 SQ. FT.) OF 10-20-20 OR EQUIVALENT.
- SEEDING: SPREAD SEED UNIFORMLY. FIRM SOIL BY ROLLING OR PACKING; IF NOT FEASIBLE, THEN RAKE LIGHTLY TO COVER SEEDS.
- MULCHING: MULCH ALL DISTURBED AREAS WITH 1-½ TO 2 TONS OF STRAW PER ACRE (70-90#/1,000 SQ. FT.). ANCHOR ON ALL SLOPES 3:1 OR STEEPER AND ON SLOPES SUBJECT TO WASH OR WIND BLOWN CONDITIONS. JUTE OR OTHER BIODEGRADABLE NETTING, STAKING AND STAPLING MAY BE REQUIRED.
- GRASS MATERIALS (SHADY GENERAL LAWN MIX)
- GRASS SEED SHALL BE FRESH, CLEAN, NEW-CROP SEED AND SHALL MEET THE PROVISIONS OF THE NEW HAMPSHIRE AGRICULTURAL AND VEGETABLE SEEDS LAW. SEED SPECIFIED IN THIS SECTION SHALL MEET THE FOLLOWING ANALYSIS:
- | | LBS/ACRE |
|------------------------------|--------------|
| CHEWING FESCUE "SR 5000" | 40 |
| CHAMPION PERENNIAL RYE GRASS | 30 |
| HARD FESCUE "SR 3000" | 25 |
| RED FESCUE - "PENNLAWN" | 25 |
| BLUEGRASS - "GLADE" | 10 |
| | 130 LBS/ACRE |
- OTHER SEED MIXTURES AND SEEDING RATES AS RECOMMENDED BY THE USDA - SOIL CONSERVATION SERVICE AND APPROVED BY OWNER MAY BE UTILIZED ONLY UPON PRIOR WRITTEN PERMISSION FROM THE ENGINEER.
15. MAINTENANCE: REGULAR MAINTENANCE SHALL OCCUR DURING THE CONSTRUCTION PERIOD UNTIL SUCH TIME AS PERMANENT STABILIZATION IS ESTABLISHED. MINOR MAINTENANCE ACTIVITIES RECOMMENDED ON REGULAR INSPECTION REPORTS SHALL BE ADDRESSED BY THE END OF THE NEXT WORK DAY. ADDITIONAL MAINTENANCE MAY INCLUDE:
- A. DISTURBED AREAS WILL BE FERTILIZED AND RESEEDED, WHERE NECESSARY.
- B. CATCH BASINS WILL BE CHECKED AND CLEANED AS NECESSARY.
- C. DRAINAGE AND GRASS TREATMENT SWALES SHALL BE CHECKED FREQUENTLY AND CLEANED AS REQUIRED.
- D. THE SILT FENCES AND HAYBALE DIKES WILL BE CHECKED ON A REGULAR BASIS AND REPAIRED AS NECESSARY TO CORRECT ANY DAMAGE, DETERIORATION, AND SHORT CIRCUITING. SEDIMENT WILL BE REMOVED WHEN IT REACHES ON-THIRD OF THE HEIGHT OF SILT FENCE AND ONE-HALF THE HEIGHT OF OTHER BMP'S SUCH AS EROSION CONTROL SOCKS.
- E. THE BOTTOM OF SEDIMENT BASINS SHALL BE PERIODICALLY CLEANED, WITH THE SEDIMENT REMOVED TO A SECURE LOCATION.
16. SITE VISITS: THE SWPPP MONITOR SHALL BE CONTACTED ON A REGULAR BASIS TO OBSERVE THE INSTALLATION AND MAINTENANCE OF EROSION AND SEDIMENT CONTROL PRACTICES, AND IN THE EVENT OF ANY EROSION, SEDIMENTATION OR TURBIDITY ISSUES THAT ARISE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT THE APPROVED SWPPP AND EROSION CONTROL PLANS ARE KEPT UPDATED REGULARLY.
17. ALL PERMANENT DITCHES, SWALES AND DRAINAGE STRUCTURES SHALL BE STABILIZED USING THE VEGETATIVE AND NON-STRUCTURAL BMP'S PRIOR TO DIRECTING RUNOFF TO THEM. THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROLS DAILY AND PRIOR TO ANY ANTICIPATED RAIN EVENTS. THE SWPPP MONITOR SHALL INSPECT ALL EROSION CONTROLS AT LEAST ONCE EVERY 7 DAYS AND WITHIN 24 HOURS OF ANY RAINFALL EVENT OF 0.25" OR GREATER RAINFALL THAT OCCURS WITHIN A 24 HOUR PERIOD. ALL DAMAGED SILT FENCES SHALL BE REPAIRED. SEDIMENT DEPOSITS SHALL BE REMOVED AS NECESSARY. THE MAXIMUM AMOUNT OF TIME ANY AREA MAY BE DISTURBED WITHOUT STABILIZATION SHALL BE 14 DAYS.
18. AN AREA SHALL BE CONSIDERED PERMANENTLY STABILIZED IF ONE OF THE FOLLOWING HAS OCCURRED:
- A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
- B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
- C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
- D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED; OR
- E. NON-VEGETATIVE COVER, SUCH AS HYDROSEEDING, EROSION CONTROL BLANKETS, RIPRAP, STONE FILL, GABIIONS AND/OR GEOTEXTILES HAVE BEEN PROPERLY INSTALLED.
19. WINTER CONSTRUCTION NOTES:
- A. TEMPORARY SEEDING SHALL OCCUR PRIOR TO SEPTEMBER 15TH
- B. ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH NETTING SHALL OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS;
- C. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS; AND
- D. AFTER NOVEMBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.



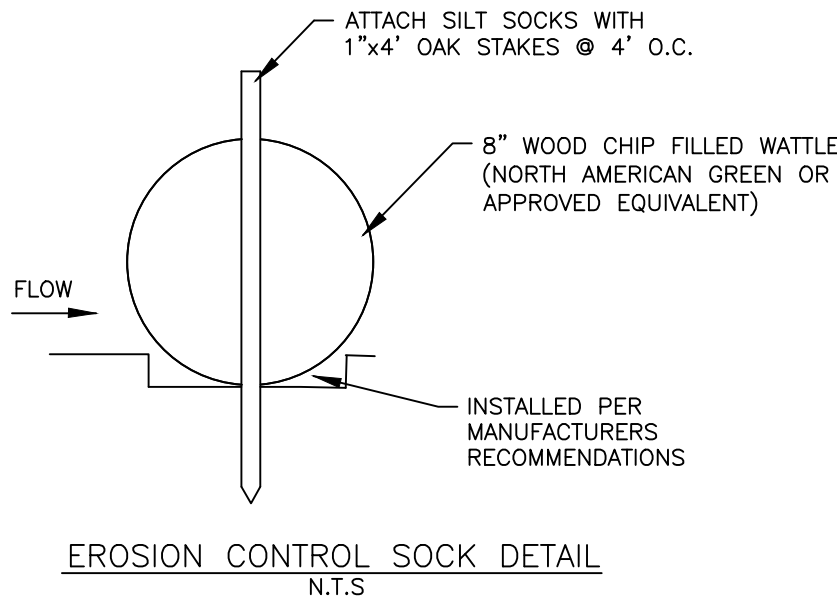
1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP'S), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP'S WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF RECP'S BACK OVER SEED AND COMPACTED SOIL. SECURE RECP'S OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE RECP'S.
3. ROLL THE RECP'S (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. RECP'S WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP'S MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP'S MUST BE STAPLED WITH APPROXIMATELY 2"-5" OVERLAP DEPENDING ON RECP'S TYPE.
5. CONSECUTIVE RECP'S SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE RECP'S WIDTH.
- NOTE:
*IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE RECP'S.

EROSION CONTROL BLANKETS
N.T.S.

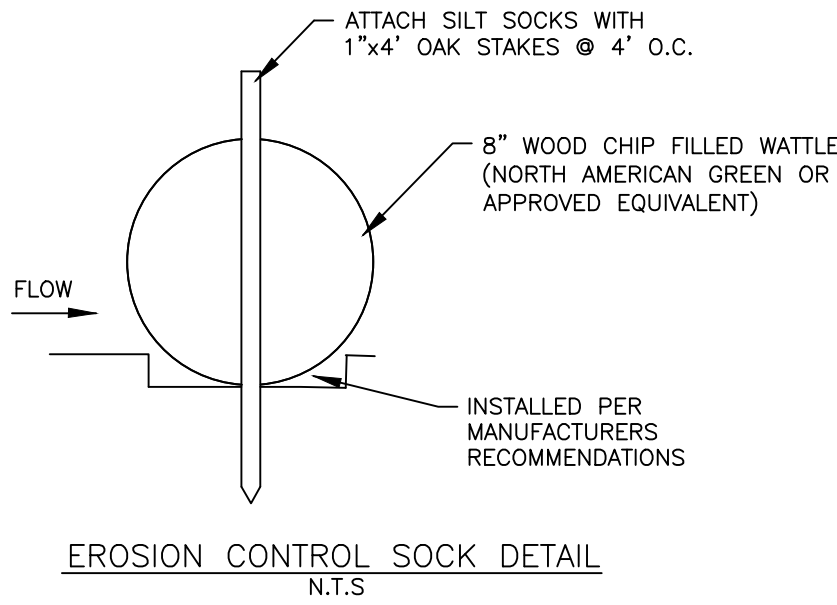


- NOTES:
1. NOT SUITABLE FOR USE IN AREAS SUBJECT TO VEHICULAR AND PEDESTRIAN TRAVEL
2. MATERIAL TO MEET MANUFACTURER SPECIFICATIONS.
3. SEDIMENT SHOULD BE REMOVED FROM BEHIND EROSION SOCK ONCE THE ACCUMULATED HEIGHT HAS REACHED THE HEIGHT OF THE SOCK.
4. CONTRACTOR IS REQUIRED TO COMPLY WITH ALL MANUFACTURER REQUIREMENTS.
5. SOCKS TO BE DEGRADABLE COMPOST SOCKS AND SHALL BE MESH TUBE OVAL TO ROUND IN CROSS-SECTION. COMPOSED OF A KNITTED BIODEGRADABLE OR PHOTODEGRADABLE MATERIAL WITH 1/4 TO 1/2 INCH OPENINGS. FABRIC MUST BE CLEAN, EVENLY WOVEN, FREE OF ENCRUSTED CONCRETE OR OTHER CONTAMINATED MATERIALS, FREE FROM CUTS, TEARS, BROKEN OR MISSING YARNS AND THIN, OPEN, OR WEAK PIECES.
6. COMPOST MAY BE DERIVED FROM GREEN MATERIAL CONSISTING OF CHIPPED, SHREDED, OR GROUND VEGETATION; OR CLEAN RECYCLED WOOD PRODUCTS. COMPOST MUST NOT BE DERIVED FROM MIXED MUNICIPAL SOLID WASTE AND BE REASONABLY FREE OF VISIBLE CONTAMINATES. COMPOST MUST NOT CONTAIN PLANT, PETROLEUM PRODUCTS, PESTICIDES OR OTHER CHEMICAL RESIDUES, HARMFUL TO ANIMAL LIFE OR PLANT GROWTH. COMPOST MUST NOT POSSESS OBJECTIONABLE ODORS.
7. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

EROSION SOCK INLET PROTECTION
N.T.S.



SILT FENCE
N.T.S.



FOR PERMITTING ONLY
(NOT FOR CONSTRUCTION)

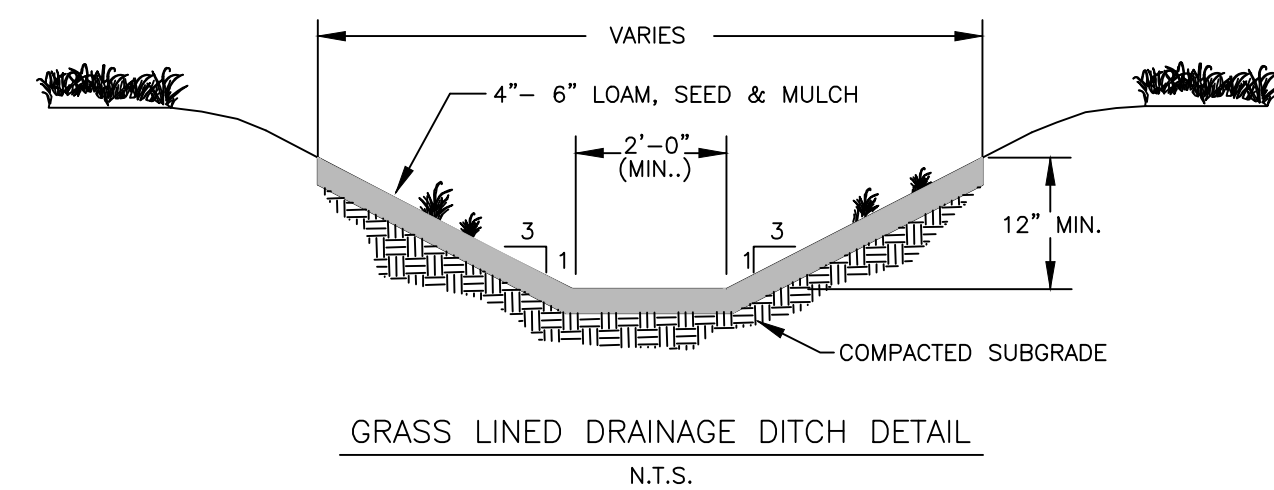
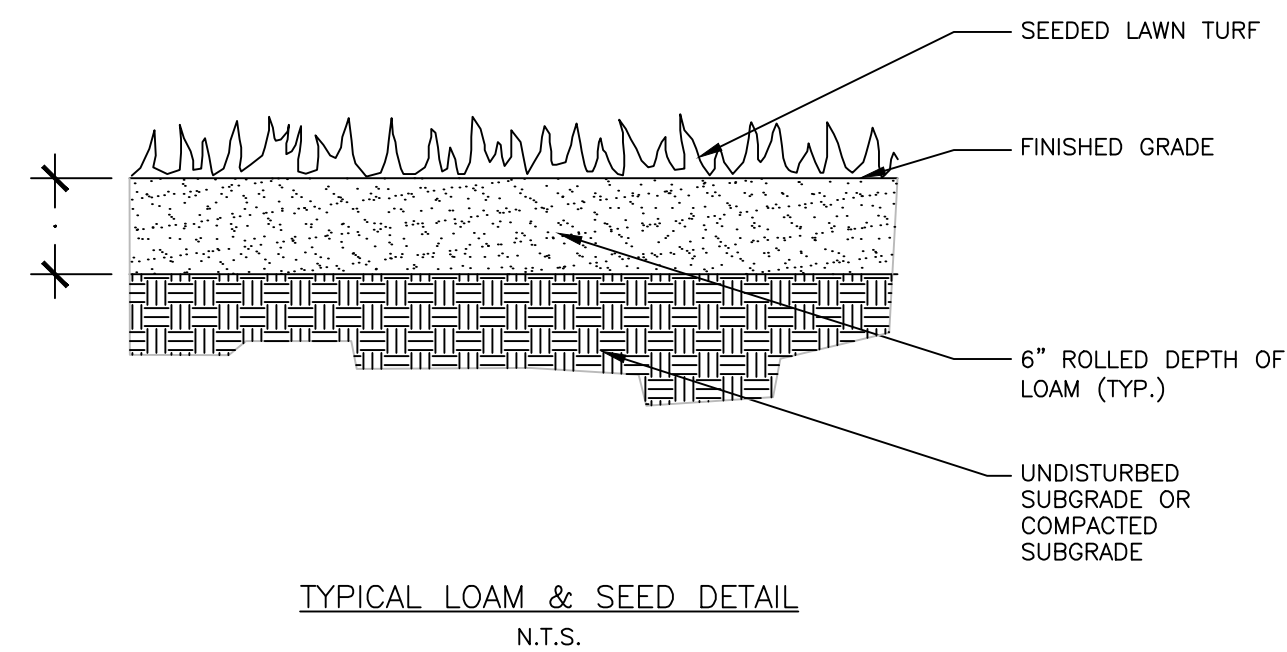
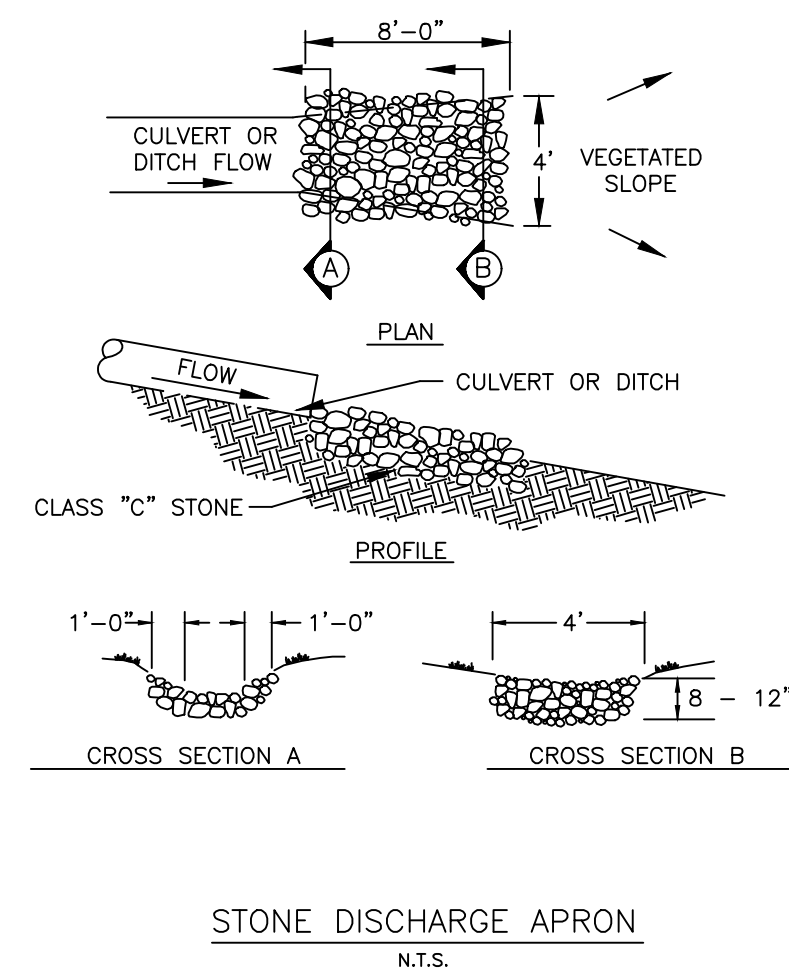
REVISION NO.	DATE	DESCRIPTION	MADE BY	CHECKED BY	APPROVED BY

EROSION AND SEDIMENT CONTROL DETAILS FOR
CITY OF LEBANON - RESIDENTIAL DEVELOPMENT PROJECT
(TAX MAP 77, LOT 106)
0 BARROWS STREET, LEBANON, NEW HAMPSHIRE 03766

PATHWAYS CONSULTING, LLC
240 MECHANIC STREET, SUITE 100
LEBANON, NEW HAMPSHIRE 03766
(603) 448-2200

SCALE: AS SHOWN
DESIGNED BY: SAW
DRAWN BY: DAS
CHECKED BY: SAW
DATE: 04-05-24
PROJ. NO. 13377

SHEET 5 OF 6

[illegible]

CONCRETE HEADWALLS WITH 45° WINGS FOR R.C. PIPE P.C.-7

PRECAST CONCRETE HEADWALL DETAIL

N.T.S.



Professional Engineer Seal for Scott A. Williams, No. 11900, State of New Hampshire.

FOR PERMITTING ONLY
(NOT FOR CONSTRUCTION)

MISCELLANEOUS DETAILS FOR
CITY OF LEBANON - RESIDENTIAL DEVELOPMENT PROJECT
(TAX MAP 77, LOT 106)
0 BARROWS STREET, LEBANON, NEW HAMPSHIRE 03766

240 MECHANIC STREET, SUITE 100
LEBANON, NEW HAMPSHIRE 03766
(603) 448-2200

SCALE: AS SHOWN
DESIGNED BY: SAW
DRAWN BY: DAS
CHECKED BY: SAW
DATE: 04-05-24
PROJ. NO. 13377

6

DRAFT

**LEBANON PLANNING BOARD
MEETING COUNCIL CHAMBERS, CITY HALL
OR REMOTE VIA MICROSOFT TEAMS
LEBANONNH.GOV/LIVE
MONDAY, JULY 08, 2024 6:30 PM**

MEMBERS PRESENT: Andrew Faunce (Chair), Richard Ford Burley (Vice Chair), Jeremy Rutter, Patrick Kennelly, Karen Zook (City Council Rep), Brandon Hill, Kathie Romano

MEMBERS ABSENT: None

STAFF PRESENT: Tim Corwin (Deputy Planning Director)

1. CALL TO ORDER

Chair Faunce called the meeting to order at 6:30pm.

Mr. Corwin reviewed the City's meeting in-person and REMOTE attendance policies and procedures.

2. NOTICE OF REGIONAL IMPACT

The following applications were received by the Planning and Development Department on or before July 08, 2024:

- **City of Lebanon, 0 Barrows Street (Tax Map 77, Lot 106), zoned R-3: Applicant requests a Conditional Use Permit per Sections 310.2 and 509 of the Zoning Ordinance for a proposed 5-unit cottage development and Site Plan Review for the first phase of the development. PB2024-33-CUPSPR**
- **XYZ Dairy, LLC, River Park Drive (Tax Map 44, Lots 21 - 30 & Tax Map 44, Lot 7), zoned CBD, IND-L and R-3: Applicant requests an extension of the timelines set forth in the Planning Board Notice of Actions dated October 12, 2021 & October 11, 2011 (PB2021-29-EXT & PB2011-04-FMAJ) for the commencement of construction and completion of the River Park development. PB2024-34-EXT**

Mr. Corwin said staff recommends that these applications do not have the potential for regional impact.

1 ***A MOTION was made by Jeremy Rutter that the applications of the City of Lebanon, 0***
2 ***Barrows Street (Tax Map 77, Lot 106), zoned R-3 and the XYZ Dairy, LLC, River Park Drive***
3 ***(Tax Map 44, Lots 21 - 30 & Tax Map 44, Lot 7), zoned CBD, IND-L and R-3 do not have the***
4 ***potential for regional impact. The Motion was seconded by Richard Ford Burley.***

5
6 ****The MOTION was approved (7-0).***

7 Chair Faunce said discussion of the Other Business Agenda Item 4A: **Gregory W Hagley and**
8 **Barley Dixon, 70 Bank Street (Tax map 92, Lot 106) zoned RO - PB2024-30-AAD** would be
9 postponed to the July 22, 2024 meeting.

10
11 He said the Public Hearing Agenda Items would be discussed out of the order of the agenda for
12 this meeting. He said Public Hearing Agenda Item 3D: **Edwards Properties, LLC, 135 Heater**
13 **Road (Tax Map 78, Lot 41), zoned IND-L - PB2024-27-CUPSPA** would be postponed to the
14 August 12, 2024 Planning Board meeting.

15 16 **3. PUBLIC HEARING ITEMS**

- 17
18 **A. Brickyard One Nominee Trust, 174 Hanover Street (Tax Map 48, Lot 4), 0 Hanover**
19 **Street (Tax Map 48, Lot 2), 0 Hanover Street (Tax Map 48, Lot 1), and 238 Hanover**
20 **Street (Tax Map 63, Lot 1), zoned R-1, R-O-1 & R-3: Site plan review for a**
21 **proposed 474-unit multi-family residential development totaling +/- 731,600 sq. ft. in**
22 **size, consisting of 11 buildings together with parking, utilities, landscaping, access,**
23 **and other related site improvements. PB2024-22-SPR.**

24
25 Mr. Corwin stated that Staff recommends that the application is complete enough for the
26 Planning Board to accept jurisdiction and commence review.

27
28 ***A MOTION was made by Jeremy Rutter that the application of Brickyard One Nominee Trust,***
29 ***174 Hanover Street (Tax Map 48, Lot 4), 0 Hanover Street (Tax Map 48, Lot 2), 0 Hanover***
30 ***Street (Tax Map 48, Lot 1), and 238 Hanover Street (Tax Map 63, Lot 1), zoned R-1, R-O-1 &***
31 ***R-3 is complete enough for the Planning Board to accept jurisdiction and commence review.***
32 ***The Motion was seconded by Patrick Kennelly.***

33
34 ****The MOTION was approved (7-0).***

35
36 Mr. Corwin said the goal for this meeting is to introduce the project, provide the Board with
37 information, and give Board members a chance to ask clarifying questions. He said the public
38 will have an opportunity to provide comments at a future meeting.

39
40 Mr. Dave Fenstermacher and Mr. Steve Fleurock of VHB were present on behalf of the
41 applicant. Mr. Fenstermacher gave an overview of the project, which was based on materials
42 included in the agenda packet for this meeting.

He reviewed the following topics:

- Location
- Zoning
- Site Overview
- Existing Site Conditions
- Proposed Site Conditions
- Site Summary

He said he will address concerns that have been raised by the City and site abutters at a future meeting.



He said the project involves 474 units (many are 3-bedroom units) on 126 acres of land at the site of the former Densmore Brickyard. He said a traffic study has been completed to address the increase in traffic that may result from the additional residences. He noted that the pond on the site is an important feature that the applicant plans to respect in the redevelopment.

The group discussed the pond at length, noting it was a man-made pond that was a source pit for the clay used to make the bricks at the brickyard. They discussed the protection of wetlands around the pond and its current condition. They also discussed potential future recreational uses of the pond as a community resource.

Mr. Rutter said the Heritage Commission was interested in ensuring that the existing structures/features (including the pond) on the site be preserved (if possible) and that the history of the brickyard be shared.

Chair Faunce noted that, should this project be implemented, it would become a neighborhood unto itself, but there does not appear to be much communal shared space included in the plans. Mr. Kennelly said adding a playground might be a good idea, and Mr. Ford Burley suggested adding swings for kids, and asked if the roofs of the structures could be used for recreation spaces. Mr. Fenstermacher said the roofs of the structures will be solar-ready and not designed for other amenities.

Chair Faunce asked if a site walk could be scheduled. Mr. Corwin said he would try to find a date that worked for as many Board members as possible. He said he would follow the City's procedures if the site walk had to be publicly noticed. Chair Faunce also requested that City Staff be able to review the applicant's traffic study.

A MOTION was made by Kathie Romano that, pursuant to Section 47.E.2 of the Site Plan Review Regulations, City Staff should obtain a peer review study of the applicant's traffic

1 *review, the cost of which is to be borne by the applicant. The Motion was seconded by Richard*
2 *Ford Burley.*

3
4 **The MOTION was approved (7-0).*

5
6 Chair Faunce stated that the Public Hearing for this application will be continued to the August
7 12, 2024 Planning Board meeting at 6:30pm, and a site visit will be scheduled prior to the
8 August 12, 2024 Planning Board meeting, which will be publicly noticed as required by law.
9

10 **A. XYZ Dairy, LLC, 0 Beyerle Street & 51 Crafts Avenue (Tax Map 58, Lot 18 & Tax**
11 **Map 58, Lot 19), zoned R-3: Request for a Conditional Use Permit pursuant to**
12 **Sections 310.2 and 509 of the Zoning Ordinance for a proposed cottage development**
13 **with 16 dwelling units and a community building, together with related site**
14 **improvements. PB2024-31-CUP**
15

16 Mr. Corwin said the idea for this application had been considered as a conceptual review at last
17 month's Planning Board meeting. He said, since that meeting, the Zoning Administrator has
18 determined that the minimum required parking spaces for the development is two spaces for each
19 unit. He said revised materials have been submitted to Staff by the applicant on Friday and
20 Monday, which Staff has not had a chance to fully review.
21

22 Mr. Corwin stated that Staff recommends that the application is complete enough for the
23 Planning Board to accept jurisdiction and commence review.
24

25 *A MOTION was made by Jeremy Rutter that the application of XYZ Dairy, LLC, 0 Beyerle*
26 *Street & 51 Crafts Avenue (Tax Map 58, Lot 18 & Tax Map 58, Lot 19), zoned R-3 is complete*
27 *enough for the Planning Board to accept jurisdiction and commence review. The Motion was*
28 *seconded by Richard Ford Burley.*

29
30 **The MOTION was approved (7-0).*

31
32 Mr. Chet Clem of Lyme Properties was present on behalf of the applicant. He provided printed
33 copies of the revised materials he submitted on Friday and Monday to Board members. He gave
34 an overview of the project.

He said the project involves 16 residential units, more than 12 cottages and 32 parking spaces and is the first privately developed cottage court under the new Section 509 ordinance.

He discussed density of the development, saying the project is below the average in terms of density per acre for cottage court development.

He discussed the concerns that have been raised about increases in traffic that the development might bring. He said a priority is to deliver a new project that is respectful of the historic neighborhood in which it is located. He said the structure located at 51 Crafts Ave will be demolished.



Mr. Clem said he still believes two parking spaces per unit is too many. He noted there are impacts to the design of the project resulting from the increase of 1.5 to 2 parking spaces, including a loss of living space, a reduction in the number of two-bedroom units, the loss of the stand-alone central community building, and a loss of open space. The group discussed the impacts of the increased parking spaces for each unit at length.

Chair Faunce opened the public comment portion of the meeting.

Mr. Henry Bromberg (Ward 1) said he supports any plan that meets City codes which increases the amount of housing in the City. He said this is a creative plan that meets City requirements.

Chair Faunce closed the public comment portion of the meeting.

Chair Faunce suggested that, since the Board did not have an opportunity to draft a motion for this application to approve or deny the request for conditional use permit, the Board take some additional time to draft a motion and continue the discussion at a future meeting. Mr. Ford Burley suggested that, since it is the first cottage development project, taking additional time to carefully word the motion might be a good idea.

A MOTION was made by Richard Ford Burley that, in light of the fact that this is the first development of its kind as a cottage development, and because the Planning Board would like to get it correct, the Planning Board continue the discussion of this application to the August 12, 2024 Planning Board meeting. The Motion was seconded by Brandon Hill.

****The MOTION was approved (7-0).***

1 Mr. Corwin said, because Section 509 of the zoning ordinance is new, amendments may need to
2 be made as new projects are proposed. He said changes could be made as part of the Planning
3 Department's annual set of zoning amendments.

4
5 **B. Recreo, LLC, 2 Mascoma Street (Tax Map 91, Lot 254), zoned LD: Applicant**
6 **requests an extension of time per Section 4.10.B of the Site Plan Review Regulations**
7 **to obtain a building permit pursuant to a site plan to construct two (2) multi-family**
8 **dwellings containing a total of 152 units together with associated site improvements,**
9 **originally approved on July 11, 2022 (PB2022-17-SPR). PB2024-25-EXT**

10
11 Mr. Corwin stated that Staff recommends that the application is complete enough for the
12 Planning Board to accept jurisdiction and commence review.

13
14 *A MOTION was made by Kathie Romano that the application of Recreo, LLC, 2 Mascoma*
15 *Street (Tax Map 91, Lot 254), zoned LD is complete enough for the Planning Board to accept*
16 *jurisdiction and commence review. The Motion was seconded by Jeremy Rutter.*

17
18 **The MOTION was approved (7-0).*

19
20 Mr. Jim Wasser of Studio Nexus and Mr. Tim Sidore of Recreo LLC, were present on behalf of
21 the applicant.

22
23 Mr. Wasser gave an overview of the project. He said the project involves two, five- and six-story
24 buildings that include 148 studio apartments and 41 one-bedroom apartments. He said the project
25 includes a parking garage to hold 99 vehicles and off-site parking for 100 cars.

26
27 The group discussed the planned site developments, the impact that the redesigned fire station
28 had on the project's development, and other possible additions/improvements that may be
29 considered for the site.

30
31 Mr. Corwin explained that the time within which to obtain the building permit is two years from
32 the date of the original approval. He said the Planning Board can extend that up to two additional
33 years based on the criteria. He said, based on Section 4.10.B, the timeframe within which to
34 achieve the active and substantial development is also two years, which can be extended upon
35 demonstration of good cause.

36
37 Mr. Corwin said when this project was approved as a phased development, the phasing plan did
38 not identify dates by which each phase needed to achieve active and substantial development and
39 achieve substantial completion in order to obtain a building permit. He said because those dates
40 are not in the approved phasing plan, the timeframe to obtain the building permit defaults to two
41 years from the date of the original approval.

42
43 Mr. Corwin noted that the applicant has updated the phasing plan, which identifies the dates by
44 which active essential development and substantial completion will be achieved for each phase
45 (for Phase I and Phase II) in order to obtain the building permit.

1 He said the criteria that the Board should consider for these extensions is Section 4.10.B and
2 Section 8.2.A.1. He said if the Board approves the proposed amended phasing plan, if the
3 applicant were to come back and request additional extensions, they would be requesting an
4 addition and extension to the approved phasing plan, and subject to just the general phasing
5 criteria under Section 4.9.

6
7 The group discussed parking and the vehicle activity calculations presented. Mr. Hill noted that
8 the present plan expects that 2/3 of the residents will not drive at the usual commute time, which
9 is not typical. Mr. Sidore said they have found with other projects in the area that tenants are
10 attracted to this kind of property because they won't need a car and can use public transportation.
11 He noted that a transportation study was done for the project.

12
13 Chair Faunce opened the public comment portion of the meeting.

14 Chair Faunce closed the public comment portion of the meeting.

15
16 ***A MOTION was made by Brandon Hill that the Lebanon Planning Board approves the***
17 ***application of Recreo, LLC, PB2024-25-EXT, for an extension of time per Section 4.10.B of***
18 ***the Site Plan Review Regulations to obtain a building permit with respect to a site plan for two***
19 ***(2) multi-family dwellings containing a total of 152 units together with associated site***
20 ***improvements, originally approved on July 11, 2022 (PB2022-17-SPR), and for an extension***
21 ***of time per Section 8.4.A.3 to achieve active and substantial development, per application***
22 ***materials submitted and including any and all submissions and testimony provided for and***
23 ***during the public hearing.***

24
25 ***In support of its decision, the Board finds that:***

- 26
27 ***1. The applicant has submitted a complete and timely request for an extension***
28 ***pursuant to Section 4.10.B of the Site Plan Review Regulations;***
29
30 ***2. Per Section 4.10.B, the applicant has demonstrated that an extension of time to***
31 ***obtain a building permit is warranted, considering the totality of the***
32 ***circumstances, including the extent and complexity of the conditions precedent,***
33 ***the extent of the progress made by the Applicant toward satisfying the conditions-***
34 ***precedent and/or starting construction, and whether the need for more time is***
35 ***attributable to unusual circumstances beyond the control of the Applicant rather***
36 ***than to the Applicant's neglect or failure to proceed with reasonable promptness;***
37 ***and***
38
39 ***3. Per Section 8.4.A.3, the applicant has demonstrated good cause for an extension***
40 ***of time to achieve active and substantial development.***
41

42 ***This approval is subject to the following conditions:***
43

1 **1. The applicant shall satisfy and comply with the Planning Board Notice of Action for**
2 **PB2022-17-SPR, dated July 11, 2022, and all conditions of approval thereof except as**
3 **may be superseded by condition #2 below.**

4
5 **2. Condition #18 set forth in the Planning Board Notice of Action for PB2022-17-SPR**
6 **dated June 27, 2022, is hereby stricken and replaced with the following:**

7
8 *Pursuant to Section 4.9 of the Site Plan Review Regulations, the project may be*
9 *constructed in phases per the phasing plan submitted for PB2024-25-EXT and per*
10 *the conditions of approval set forth in the Planning Board Notice of Action for*
11 *PB2022-17-SPR dated June 27, 2022, including but not limited to condition 4.h*
12 *(requiring the applicant to “[a]mend the phasing plan to ensure that drainage*
13 *infrastructure of sufficient capacity is in place to accommodate additional flows*
14 *and to provide required treatment from all added impervious areas to be*
15 *constructed as part of Phase 1.” The dates by which a building permit will be*
16 *obtained for each phase, by which active and substantial development will be*
17 *achieved for each phase, and by which substantial completion will be achieved for*
18 *each phase shall be as set forth in the phasing plan, as may be revised pursuant to*
19 *condition 4.h of the June 27, 2022 Notice of Action for PB2022-17-SPR. All dates*
20 *on the phasing plan shall be understood as being the last day of the month*
21 *identified.*

22
23 ***The Motion was seconded by Jeremy Rutter.***

24
25 Mr. Corwin suggested adding the following as a last sentence to Condition 2 as an
26 amendment to the Motion:

27
28 *“All future changes to the phasing plan and any extensions requests for any phase shall be*
29 *subject to and evaluated pursuant to the applicable requirements of Section 4.9.C and*
30 *Section 4.9.D of the Site Plan Review Regulations, and not Section 4.10. B or 8.4.A.1.”*

31
32 ***A MOTION was made by Brandon Hill to amend the MOTION to include “All***
33 ***future changes to the phasing plan and any extensions requests for any phase shall***
34 ***be subject to and evaluated pursuant to the applicable requirements of Section***
35 ***4.9.C and Section 4.9.D of the Site Plan Review Regulations, and not Section 4.10.***
36 ***B or 8.4.A.1.”***

37
38 ***The Motion was seconded by Jeremy Rutter.***

39
40 ****The MOTION was approved (7-0).***

41
42 **C. Women’s Information Service (WISE) of the Upper Valley Inc, 38 Bank Street (Tax**

1 **Map 92, Lot 116), zoned R-O: Request for site plan review to replace the existing**
2 **attached garage with a new two-story +/- 796 sq. ft. addition for use as a garage and**
3 **an office, together with a new 138 sq. ft. covered open entry porch. PB2024-26-SPR**
4

5 Mr. Corwin stated that Staff recommends that the application is complete enough for the
6 Planning Board to accept jurisdiction and commence review.
7

8 *A MOTION was made by Richard Ford Burley that the application of Women's Information*
9 *Service (WISE) of the Upper Valley Inc, 38 Bank Street (Tax Map 92, Lot 116), zoned R-O is*
10 *complete enough for the Planning Board to accept jurisdiction and commence review. The*
11 *Motion was seconded by Jeremy Rutter.*
12

13 **The MOTION was approved (7-0).*
14

15 Mr. Corwin said this application involves tearing down the rear portion of the existing building
16 and reconstructing it within the same area. He said the existing site plan will remain. He said the
17 second floor would be converted into office space, which would require the addition of three
18 more parking spaces, but the applicant had received a variance from the Zoning Board of
19 Administrators which allowed them not to be required to provide those additional parking
20 spaces. Mr. Corwin suggested that the applicant submit waiver requests for Article V and Article
21 VI and said the applicant has submitted a letter with those requests to the Planning Department.
22

23 Mr. Frank J. Barrett, Jr. Architect, was present on behalf of the applicant. He gave an overview
24 of the project. He said a back porch would be removed with the rear section of the building. He
25 said the replicated back section of the building will be 6 feet higher than the existing height. He
26 said no changes, alterations, or additions to the site are being proposed. Mr. Barrett said he did
27 review changes that the Fire Department may have related to the new section of the building in
28 order to meet fire safety codes.
29

30 The group discussed ADA accessibility in relation to the proposed new portion of the building.
31 Mr. Barrett said the first floor of the new addition will be accessible. Mr. Corwin said the City
32 has no requirements related to accessibility beyond what is required by the state.
33

34 Mr. Rutter noted that a bike rack is mentioned in the plan but is not on the elevations. He asked
35 how many bicycles could be accommodated. Mr. Corwin read Section 6.5.I .3 of the site plan
36 review regulations:
37

38 *"For non-residential development, secure short term bicycle parking or long-term bicycle*
39 *parking for at least 10% of the number of automobile parking stalls approved by the Planning*
40 *Board shall be provided. Alternatively, provided the applicant shall provide spaces for at least*
41 *5% of building occupants, whichever is greater, but in no case may the total be less than two*
42 *rack spaces."*
43

44 He suggested the minimum would be two spaces for bikes. He said this could be incorporated as
45 part of the approval.
46

Mr. Rutter noted there were not a lot of details about the lighting plan in the application materials and there is no indication where the lights are on the building. Mr. Corwin said the Article VI waiver request provides that the existing site plan from 2007 is still in effect, so the applicant is not required to update the site plan materials to show lighting. The group discussed whether this should be added as a condition of approval.

Chair Faunce opened the public comment portion of the meeting.

Chair Faunce closed the public comment portion of the meeting.

Mr. Corwin discussed proposed Condition of Approval # 8, which was highlighted in the draft motion language, that is related to any changes required by the Fire Department pursuant to applicable fire codes.

A MOTION was made by Richard Ford Burley that, for the application of Women's Information Service (WISE) of the Upper Valley Inc, PB2024-26-SPR, the Lebanon Planning Board approves waivers from the following sections of the Site Plan Review Regulations:

- ***Article V submission requirements – as identified in the applicant's Application for Waivers***
- ***Article VI design requirements – as identified in a letter from Jay Barrett, AIA, dated July 5, 2024***

The Motion was seconded by Jeremy Rutter.

****The MOTION was approved (7-0).***

A MOTION was made by Richard Ford Burley that the Lebanon Planning Board approves the Site Plan Review application of Women's Information Service (WISE) of the Upper Valley Inc, regarding 38 Bank Street (Tax Map 92, Lot 116), zoned R-O, PB2024-26-SPR, to replace the existing attached garage with a new two-story +/- 796 sq. ft. addition for use as a garage and an office, together with a new 138 sq. ft. covered open entry porch, as shown on a plan sheet titled, "New Addition to WISE, Inc.," dated May 6, 2024, prepared by Barrett Architecture, including any and all submissions and testimony provided for and during the public hearing.

In support of its decision, the Board finds that the applicant has submitted plans, testimony, technical data, information, reports, and studies that together satisfactorily demonstrate compliance with the applicable requirements of the Site Plan Review Regulations, except as may reasonably be addressed through the imposition of certain conditions of approval, set forth below, and except as may have been waived pursuant to Section 7.1.

This approval is subject to the following conditions:

General Conditions

- 1 1. *The Notice of Action dated January 8, 2007 for PB2006-57 and the site plan set*
2 *referenced therein shall remain in force and in effect except as may be modified per*
3 *the conditions of approval below, and except that the building footprint and proposed*
4 *bicycle rack shall match those features as they are depicted on the Site Plan sheet*
5 *titled, "New Addition to WISE, Inc.," dated May 6, 2024, prepared by Barrett*
6 *Architecture.*
7
8 2. *It shall be the applicant's responsibility to be familiar with and aware of these*
9 *conditions of approval, and it shall be the applicant's responsibility to satisfy these*
10 *conditions of approval and to satisfy them within the relevant timeframes outlined*
11 *below.*
12
13 3. *The development is subject to the Site Plan Review Regulations adopted May 13, 1991,*
14 *last revised January 23, 2023, and the Zoning Ordinance adopted January 16, 2013,*
15 *last amended February 7, 2024, which are the regulations in effect at the time the*
16 *application was submitted.*
17
18 4. *A building permit must be applied for and issued within two (2) years of the date of this*
19 *approval (4.10.A), subject to an extension if applied for by the applicant and if*
20 *approved by the Planning Board per Section 4.10.B.*
21
22 5. *"Active and substantial development," as defined in Section 8.4.A.1 of the Site Plan*
23 *Review Regulations, shall be achieved within two (2) years of the date of this approval*
24 *(8.4.A.2), subject to an extension if applied for by the applicant and if approved by the*
25 *Planning Board per Section 8.4.A.3. If active and substantial development is not*
26 *achieved within two (2) years of the date of the Planning Board's approval, the*
27 *development shall be subject to any changes in the City's land use regulations.*
28
29 6. *"Substantial completion," as defined in Section 8.4.B.1 of the Site Plan Review*
30 *Regulations, shall be achieved within five (5) years of the date of this approval. If*
31 *substantial completion is not achieved within five (5) years of the date of the Planning*
32 *Board's approval, the development shall be subject to any changes in the City's land*
33 *use regulations.*
34

35 **Conditions to be Satisfied Prior to Application for a Building Permit and Prior to the Start of**
36 **Any Construction Activities**
37

- 38 7. *The applicant shall obtain approval from the City Council or the City Manager's office*
39 *for any additional water and/or sewer flows in accordance with the applicable Chapter*
40 *136 and 182 of the City Code.*
41
42 8. *The applicant shall verify with the Fire Department whether any site changes are*
43 *required pursuant to the applicable fire codes based on the proposed height of the*
44 *building. Any such changes shall be subject the procedural requirements set forth in*
45 *Article IX of the Site Plan Review Regulations ("Modifications and Minor Alterations*
46 *to an Approved Site Plan Prior to Issuance of a Certificate of Occupancy").*

Conditions to be Satisfied Prior to the Issuance of a Building Permit

9. Pursuant to Section 213 of the Zoning Ordinance and the Impact Fee Schedule adopted on May 20, 2024, an impact fee in the amount of \$1,162.16 (+/-796 sq. ft. x \$1.49 per square foot of gross floor area) shall be assessed at the time of Building Permit issuance relative to the conversion of the second floor space to office use. In accordance with RSA 674:39, the approved site plan shall be exempt from any future changes in impact fees and methodology for five years from the date of approval; however, any building permits which are issued after the end of that five-year period shall be fully subject to whatever impact fees and methodology are in effect at the time of building permit issuance.

10. All water and sewer fees shall be paid as set forth in City Code Chapter 68.

11. Prior to the start of any construction activities on the property, the applicant shall obtain or update (if appropriate) any required State approvals.

Conditions to be Satisfied Prior to the Issuance of a Certificate of Occupancy

12. The applicant shall verify that the property is in compliance with the Planning Board's January 8, 2007 Notice of Action and approved site plan for PB2006-57, and that the bicycle rack depicted on the Site Plan sheet titled, "New Addition to WISE, Inc.," dated May 6, 2024, has been installed.

13. The impact fee calculated pursuant to Condition of Approval #9 shall be paid.

The Motion was seconded by Jeremy Rutter.

***The MOTION was approved (7-0).**

A MOTION was made by Karen Zook to extend the meeting to 9:45pm. The Motion was seconded by Richard Ford Burley.

***The MOTION was approved (7-0).**

E. SPNH Lebanon North, LLC, 402 Mount Support Road (Tax Map 24, Lot 9), zoned R-1: Pursuant to Section 9.1 of the Site Plan Review Regulations, applicant requests modifications to the phasing plan for a 204-unit multi-family complex, originally approved on February 14, 2022 (PB2021-33-SPR) and reapproved on October 9, 2023 (PB2023-34-SPR). PB2024-29-SPA

1 Mr. Corwin stated that Staff recommends that the application is complete enough for the
2 Planning Board to accept jurisdiction and commence review.

3
4 ***A MOTION was made by Richard Ford Burley that the application of SPNH Lebanon North,
5 LLC, 402 Mount Support Road (Tax Map 24, Lot 9), zoned R-1 is complete enough for the
6 Planning Board to accept jurisdiction and commence review. The Motion was seconded by
7 Jeremy Rutter.***

8
9 ****The MOTION was approved (7-0).***

10
11 Mr. Brenden Gilmore of Saxon Partners, LLC, and Mr. Nik Fiore of Engineering Ventures were
12 present on behalf of the applicant. Mr. Gilmore gave a status of the project. He said the site plan
13 has not changed, but the phasing of the project has changed. Mr. Fiore presented the updated
14 dates for the Phases of the project.

15
16 He said Phase I and Phase II have the same timeframe dates as the original plan, but Phase III
17 and IV have switched order. The group discussed the date changes and work changes in each
18 phase (if applicable) from the original plan. Mr. Corwin explained the different types of security
19 and how it relates to the process to obtain temporary Certificates of Occupancy in a phased work
20 situation.

21
22 Chair Faunce opened the public comment portion of the meeting.
23 Chair Faunce closed the public comment portion of the meeting.

24
25 ***A MOTION was made by Richard Ford Burley that the Lebanon Planning Board approves
26 the application of SPNH Lebanon North, LLC, PB2024-29-SPA, requesting modifications
27 pursuant to the phasing plan for a 204-unit multi-family complex at 402 Mount Support Road
28 (Tax Map 24, Lot 9), zoned R-1, originally approved on February 14, 2022 (PB2021-33-SPR)
29 and reapproved on October 9, 2023 (PB2023-34-SPR), per application materials submitted
30 and including any and all submissions and testimony provided for and during the public
31 hearing.***

32
33 ***In support of its decision, the Board finds that the applicant has satisfactorily demonstrated
34 that the proposed phasing plan meets the applicable requirements of Section 4.9.C and Section
35 4.9.D of the Site Plan Review Regulations.***

36
37 ***This approval is subject to the following conditions:***

- 38
39 ***1. The applicant shall satisfy and comply with the Notice of Action for PB2021-33-SPR
40 dated February 14, 2022, and all conditions of approval thereof, and with Notice of
41 Action for PB2023-34-SPA dated October 9, 2023, and all conditions of approval
42 thereof except as superseded by Condition of Approval #2 below.***
43

- 1 **2. Condition #2 set forth in the Planning Board Notice of Action for PB2023-34-SPA**
2 **dated October 9, 2023, is hereby stricken and replaced with the following:**

3
4 *Pursuant to Section 4.9 of the Site Plan Review Regulations, the project may be*
5 *constructed in phases per the phasing plan submitted for PB2024-29-SPA and*
6 *per the conditions of approval set forth in the Planning Board Notice of Action*
7 *for PB2021-33-SPR dated February 14, 2022, and in the Planning Board*
8 *Notice of Action for PB2023-34-SPA dated October 9, 2023.*

9
10 *The Motion was seconded by Brandon Hill.*

11
12 **The MOTION was approved (7-0).*

13
14 **4. OTHER BUSINESS**

15
16 **B. Review of Draft Planning Board / DEI Commission Joint Resolution on Housing**

17
18 Mr. Ford Burley said he incorporated the edits that were suggested for the joint statement. A
19 draft of the statement was included in the agenda packet materials for the meeting.

20
21 Mr. Ford Burley said the statement would be provided to the City Council at a meeting in July.
22 Ms. Zook said she would abstain from the vote to approve the statement as she is a member of
23 the City Council.

24
25 *A MOTION was made by Patrick Kennelly to accept the draft Planning Board / DEI*
26 *Commission Joint Resolution on Housing as included in the agenda packet materials for the*
27 *July 08, 2024 Planning Board meeting. The Motion was seconded by Jeremy Rutter.*

28
29 **The MOTION was approved (6-0, with Ms. Zook abstaining from the vote).*

30
31
32 **5. ADJOURNMENT**

33
34 *A MOTION was made by Richard Ford Burley to adjourn the meeting at 9:38pm. The motion*
35 *was seconded by Brandon Hill.*

36
37 **The MOTION was approved (7-0).*

38
39 The meeting was adjourned at 9:38pm.

40
41 Respectfully submitted,
42 Paula Roux
43 Recording Secretary

DRAFT

**LEBANON PLANNING BOARD
CITY COUNCIL CHAMBERS OR
REMOTE VIA MICROSOFT TEAMS
LEBANONNH.GOV/LIVE
MONDAY, JULY 22, 2024 6:30 PM**

MEMBERS PRESENT: Andrew Faunce (Chair), Richard Ford Burley (Vice Chair), Jeremy Rutter, Patrick Kennelly, Karen Zook (City Council Rep), Brandon Hill,

MEMBERS ABSENT: Kathie Romano

STAFF PRESENT: Tim Corwin (Deputy Planning Director), Shaun Mulholland (City Manager), James Wheatley (Chief, Fire Department), Carl Gross (Airport Manager), Paul Coats (Director, Recreation, Art, & Parks), Jay Cairelli (Director, Public Works), Erica Douglas (Solid Waste Manager), Brian Vincent (City Engineer), Tad Montgomery (Energy & Facilities Manager)

1. CALL TO ORDER

Chair Faunce called the meeting to order at 6:31pm.

Mr. Corwin reviewed the City's meeting in-person and REMOTE attendance policies and procedures.

2. STUDY ITEMS

A. Review & Adoption of 2025-2030 Capital Improvement Program (CIP)

Mr. Corwin gave an overview of the CIP selection, funding, and implementation process. The group discussed how the projects are ranked on the list. City Manager Mulholland said, if the City encounters an unexpected situation that would take priority over this list of projects, he would make a decision how to reprioritize the list and present it to the City Council. Mr. Rutter suggested that the CIP "instructions" to the Board included in the agenda packet should include a reminder that the figures in red are highlighted (for the Board to focus on) and figures in black should not be a concern during this discussion. City Manager Mulholland reminded that the City's fiscal year begins January 1.

Mr. Corwin shared the list of projects planned for 2025-2030, which was included as a spreadsheet in the meeting agenda packet:

Airport Runway Safety Projects

Airport Manager Gross explained that the largest Airport project is a multi-year program to create a parallel runway and make other improvements. He noted that the Airport projects are funded according to the following breakdown:

- 90% - Federal (FAA) funds
- 5% - State (NH DOT) Funds
- 5% - Local (City of Lebanon) Funds

Fire Department Project

Fire Chief Wheatley said “Station 2” refers to a new fire station in West Lebanon, which would replace the existing station. He said the Station 2 Replacement project is listed in the 2031+ column on the spreadsheet because it represents a project that is not being considered in the very near future. He said a location for the new station must be determined and the City’s debt service needs to be more favorable before that project is undertaken. The group discussed the possibility of a fire station in the northern part of Lebanon (near Centerra Parkway).

Department of Public Works Projects

DPW Director Cairelli explained the projects planned, many of which involve road or sidewalk improvements. Mr. Vincent gave a status of the South Main Street Bridge Replacement project, which he said is in the final design stage. He said the plan is to begin construction in 2025 and to keep two lanes open during the construction.

Mr. Cairelli gave an overview of the roundabout projects at Mechanic Street/ High Street and Hanover Street/High Street. Mr. Ford Burley asked whether residents on West Street will be able to turn left out of their driveways once the roundabout is implemented. Mr. Cairelli said the plans have not gotten to that level of detail in the preliminary engineering stage.

Mayor Tim MacNamara gave an overview of the genesis of the Sachem Village to DMHC Connector Road/multiuse path project. He said this project was not developed for public access; it was developed to enable easy access for emergency vehicles and public transit / Dartmouth bus vehicles. City Manager Mulholland said the “snake” design is to work around the high value wetlands in the area. Mr. Hill asked what is being done to protect wildlife in the area and preserve conservation.



Mayor MacNamara noted that the easements on the west slope are not affected by the plan and the proposed path goes through an open space area in Sachem Village. Mr. Ford Burley noted there are wildlife crossings in the area. M said that will be considered during the design phase and tired crossings will be included for amphibian crossings under the road. Mr. Hill asked if the path was ever considered for emergency vehicle

1 use only and Mayor MacNamara said the path will be used for bus service because it is an
2 integral service to the area.

3
4 Mr. Cairelli explained that the Meriden Road Safety Improvements project, which involves
5 widening the road to allow a bike lane from Messenger Street to Goodwin Park. Mr. Corwin said
6 this is an idea contained in the Walk, Bike, Ride Lebanon program which was adopted by the
7 City Council last summer. The group discussed what protections would be in place for bikers and
8 walkers from cars in the widened areas.

9
10 Mr. Cairelli discussed the Large Groundwater Well Development / Water Treatment Facility
11 Improvements projects. He said the plan is to begin drilling for the new well this summer, once
12 the permits have been obtained from the state. Mr. Rutter noted that the well may service other
13 communities, and asked if fees can be charged to those communities for services. Mr. Cairelli
14 said it is possible that such fees may be charged in the future. Mr. Kennelly asked whether other
15 locations had been considered. Mr. Cairelli said they did some test wells but there was no
16 location that could meet the needs of the entire City without enlarging the project to include
17 several wells. Mr. Kennelly if solar power could be used to power the pump for the new well and
18 Mr. Cairelli said it may be a possibility in the future. The group discussed whether solar panels
19 could be added to other City structures, such as at the landfill and the Airport hangers. Mr.
20 Montgomery noted that there is one cap cell project at the landfill that is part of Phase III Solar
21 program. Ms. Zook asked if the City can do anything to save costs if the current water treatment
22 facility system is not going to be shut down. Mr. Cairelli said he has seen other water systems
23 that blend well water and surface water, but they would have to be monitored very carefully
24 because operational issues sometimes occur.

25
26 Ms. Douglas gave an overview of the proposed landfill
27 projects. She noted that two new areas of the landfill are
28 being created during Phase 3 and Phase 4. She explained
29 that the double lining system that will be installed in those
30 new areas, which are designed to help prevent leachate,
31 should last for the lifetime of the landfill. She said the
32 increase in rates will be the equivalent of 20 years' worth of
33 4% yearly increases, according to their projections. She
34 explained what is involved in capping (or adding a
35 permanent cover) to an area of the landfill.



36 37 **Planning Department Projects**

38 Mr. Corwin gave an overview of the Goodwin Conservation Bridge project. He said the trails in
39 the conservation area provide access to Meriden Road, which fits into the safety improvement
40 project on Meriden that was mentioned earlier in the meeting. Mr. Hill said the Conservation
41 Commission has been trying to move this project forward for a long time.

42
43 Mr. Corwin explained the Safe Streets and Roads for All program. He said the City is seeking
44 \$600,000 in grant funding to prepare a comprehensive roadway safety action plan. He said the
45 goal of the plan is to reduce the number of fatalities to zero. He said this project also includes
46 updating the City's ADA / accessibility and Safe Routes to School programs.

Recreation, Arts, & Parks Projects

Mr. Coats gave an overview of the Mascoma River Greenway Extension project. He said this phase of the project gets the City closer to a trail that connects downtown Lebanon with downtown West Lebanon.

The group discussed areas where bikers can park their cars and access the new portions of the trail. Mr. Coats said trail users can park in the Powerhouse Mall and Riverside Park parking lots. Chair Faunce asked if formal agreements can be made with the Powerhouse Mall for the City to use the lots and Mr. Coats said there currently are no written agreements but the Powerhouse Mall has been very supportive of the trail use.



Mr. Coats said negotiations between the City Manager's office and the state of New Hampshire continue regarding the development of Westboro Park. He explained that, although the site is too contaminated for residential housing and the water is not safe for drinking, the site will be safe as a park once a permanent cap/barrier has been added.

He explained that another Mascoma River Greenway project involves implementing a path that offers bikers an alternative to traveling through the Valley Cemetery to connect to Mascoma Street Extension.

Lebanon School District SAU 88 CIP Projects

Business Administrator Tim Ball gave an overview of the CIP projects the school district has planned. He said the projects are relatively small because the priority has been completing the improvements to the High School and Hanover Street School, which should finish soon. He noted that a future project involves improvements to Mount Lebanon School in West Lebanon. He said the School District's CIP process is different than the City's, but he said the district's process is being reviewed to make it more like the City's process.

A MOTION was made by Richard Ford Burley that the Lebanon Planning Board approves and adopts the Capital Improvement Program (CIP) for the six-year period of 2025 – 2030 as presented in the July 22, 2024 Planning Board Meeting Agenda and hereby submit year 2025 of the CIP as the Board's recommendation to the City Council for Capital Budget Funding for 2025.

Planning Board also wishes to acknowledge and highlight the importance of the CIP program and process as an essential component of the City's overall financial and community planning

1 *effort and as a mechanism for anticipating future facility and infrastructure requirements in*
2 *order to ensure they are funded in a reasonable and systematic fashion.*

3
4 *The Motion was seconded by Andrew Faunce.*

5
6 The group discussed how the Planning Board did not have a significant role in the CIP process
7 and yet was charged with accepting and adopting it. Chair Faunce suggested that the Board
8 discuss the role of the Planning Board in the CIP process at next month's meeting.

9
10 **The MOTION was approved (5-0, with Ms. Zook abstaining from the vote).*

11
12 **B. Review of Draft Amendments to the Planning Board Rules of Procedure**

13 Chair Faunce said this item will be postponed to a future meeting.

14
15 **C. Discussion RE: review of Article IV of the Site Plan Review Regulations**

16 Chair Faunce said this item will be postponed to a future meeting.

17
18 **D. Discussion RE: review of Article V of the Site Plan Review Regulations**

19 Chair Faunce said this item will be postponed to a future meeting.

20
21 **3. COMMITTEE REPORTS**

22
23 Mr. Ford Burley said the City Council accepted and created the **Planning Board / DEI**
24 **Commission Joint Housing Task Force**. He noted a Planning Board Representative needs to
25 volunteer to participate on the task force. Chair Faunce asked Board members to consider
26 joining this committee.

27
28 Mr. Rutter asked if the letter crafted by the **Heritage Committee** was received by the
29 Planning Board prior to the site visit to the 474-housing development planned for the former
30 Densmore Brickyard location. Mr. Corwin said the letter was shared with the applicant but
31 not the Planning Board yet. He said the letter would be included in the August 12 Planning
32 Board meeting agenda materials. The group had a lengthy discussion about the protocol for
33 committee input for projects going before other City Boards and Committees. Mr. Corwin
34 suggested members of the Heritage Committee should attend the August 12 Planning Board
35 Committee meeting to discuss the project.

36 **4. OTHER BUSINESS**

37 None

38
39 **5. APPROVAL OF MINUTES – June 24, 2024**

40 Mr. Corwin said he is reviewing edits to the June 24, 2024 meeting minutes and asked that
41 the approval of these be delayed until the next meeting.

42
43 **6. ADJOURNMENT**

44
45 *A MOTION was made by Brandon Hill to adjourn the meeting at 9:18pm. The motion was*
46 *seconded by Richard Ford Burley.*

1
2
3
4
5
6
7
8

****The MOTION was approved (6-0).***

The meeting was adjourned at 9:18pm.

Respectfully submitted,
Paula Roux
Recording Secretary

DRAFT

**LEBANON PLANNING BOARD
MEETING ROOM ONE, CITY HALL
OR REMOTE VIA MICROSOFT TEAMS
LEBANONNH.GOV/LIVE
MONDAY, JUNE 24, 2024 6:30 PM**

MEMBERS PRESENT: Andrew Faunce (Chair), Richard Ford Burley (Vice Chair), Jeremy Rutter, Patrick Kennelly, Karen Zook (City Council Rep), Brandon Hill, Kathie Romano

MEMBERS ABSENT: None

STAFF PRESENT: Tim Corwin (Deputy Planning Director)

1. CALL TO ORDER

Chair Faunce called the meeting to order at 6:30pm.

Mr. Corwin reviewed the City's meeting in-person and REMOTE attendance policies and procedures.

Chair Faunce noted that a new Planning Board Representative should be named to the West Lebanon Advisory Committee (WLAC), since **Laurel** Stavis has vacated her seat on the Planning Board and will no longer be the Planning Board Representative on the WLAC.

A MOTION was made by Richard Ford Burley to appoint Andrew Faunce as the Planning Board Representative on the West Lebanon Advisory Committee. The Motion was seconded by Kathie Romano.

**The MOTION was approved (7-0).*

2. STUDY ITEMS

A. Draft Amendments to Planning Board Rules of Procedure

The group continued its review (which began in April) of the Rules of Procedure information provided in the agenda packet for the meeting. Mr. Corwin said the review of the procedures will probably continue over the next few meetings and then move forward toward a final updated draft to be presented to the City Council for approval.

The following items were discussed:

The group discussed the difference between non-public meetings and non-meetings.

Items 2.1 Regular Members –

The group discussed how an “ex-officio” member is considered a regular member when determining a quorum. Mr. Ford Burley said the City’s legal counsel is being consulted about revising the language to remove the inclusion that the City Manager nominates Planning Board members. Mr. Corwin said there could be a statutory change that would alter the language of this item to reflect how the City currently operates when nominating members.

ARTICLE II

MEMBERS AND ALTERNATES

- 2.1 REGULAR MEMBERS.** The Planning Board shall consist of nine (9) regular members, namely eight persons who shall be appointed by the City Council, by majority vote, upon nomination by the City Manager, and one member of the City Council who shall be selected by it as a member ex-officio with voting privileges.
- 2.2 ALTERNATE MEMBERS.** Alternate members of the Board shall be appointed by the City Council, by majority vote, upon nomination by the City Manager. Alternate members shall join the regular members in all presentations, public hearings, and discussions except that such alternates may not vote on any proposal or motion before the Board unless so directed by the Chair and shall not participate in the Board’s deliberations once the public hearing has closed. In the absence of any regular member, except the ex-officio member of the City Council, the Chair shall appoint an alternate member to fill such vacancy. Said alternate shall then act as a regular member.
- 2.3** All members of the Planning Board shall be residents of the City of Lebanon and shall be sworn in and take an oath of office as required by RSA 42:1.

Item 2.4 Attendance – Mr.

Rutter noted that members attending remotely are required to state for the record if anyone else is in the room with them. Mr. Corwin said that should be added to this item.

2.4

ATTENDANCE. A Board member may be excused for non-attendance ~~of at a meeting or hearing~~ for valid reasons if he or she notifies the Chair ~~or Clerk and Staff~~ at least 24 hours prior to the meeting or hearing. Any Board member may leave the Board chambers for pressing business while in regular session after notice to the Chair. After three (3) unexcused absences within a given member’s term, the Chair shall notify the City Council. At the discretion of the Chair, Board members may attend and take part in any Board meeting remotely, if it is technologically feasible and reasonable to do so and if a quorum is physically present, subject to these Rules and NH RSA 91-A. Members attending remotely must state for the record why their attendance is not practical and the Chair shall ask if any other Board member has a concern or objection regarding the absent member’s virtual attendance.

Item 2.5 Training & Item 2.6 Removal of Members – The edits were accepted as presented.

- 2.5 TRAINING.** All newly-appointed Board members shall attend one (1) orientation meeting with the Planning and Zoning-Development Director, prior to sitting as a member of the Board, unless waived or extended by the Chair at the request of the Planning and Zoning Development Director.
- 2.6 REMOVAL OF MEMBERS.** A Board member may be removed from the Board by the City Council, after a public hearing on the matter, upon written findings of inefficiency, neglect of duty, or malfeasance in office, in accordance with RSA 673:13.

Item 3.1 Election of Officers -

The group discussed the final sentence and agreed to accept it as presented.

ARTICLE III

OFFICERS AND DUTIES

- 3.1 ELECTION OF OFFICERS.** At the annual meeting, the Board shall elect a Chair and a Vice-Chair from the regular members and such other officers as it may deem necessary; but in case of failure to elect at the time specified, the election shall take place at the next meeting. The Chair and the Vice-Chair, shall hold their respective offices until the next annual meeting after election or until their successors are elected and qualified. They shall perform such duties as the Board may prescribe. ~~The office of Chair and Vice-Chair shall be held by an individual for no more than three consecutive terms per office unless waived by the Board.~~

Item 3.2 Duties of the Chair

The group accepted the edits as presented.

3.2 DUTIES OF THE CHAIR. The Chair shall call the meeting together, preside over all meetings and hearings of the Board, put all questions to a vote, maintain order, decide all questions of order and procedure, subject to these rules, and shall appoint any committees found necessary to carry out the business of the Board.

The Chair may present to the Board such matters as in the Chair's judgment require attention.

At the request of any Board member, the Chair shall direct that the yeas and nays be taken and entered on the record on any question before the Board.

When the Board has no established rule of parliamentary practice, the Chair ~~shall be may seek guidance from~~ guided as nearly as may be by Robert's Rules of Order as may be appropriate and helpful. Robert's Rules of Order shall be used as a reference only and shall not bind the Chair or the Board in any manner. ~~which may be simplified by the Chair as deemed necessary and appropriate. In the event of a challenge by a Board member of any modification of Robert's Rules by the Chair, Robert's Rules shall prevail.~~

The Chair shall exercise a general supervision over the business; ~~papers, and property~~ of the Board and shall execute all formal documents on behalf of the Board.

Item 3.4 Duties of Staff

– The group decided to delete the word “addresses” in the second paragraph and amend the line to read to “names and relevant affiliations.”

The group discussed how staff does not necessarily act as recording secretary for many City meetings.

Ms. Romano said the Board has not often stated “a summary of

facts upon which a decision is based” prior to voting during meetings, and noted that legal counsel had advised the Board to do that. Mr. Corwin said he is reviewing that part of Item 3.3 because he said the motions made during a meeting should include sufficient facts to show why the decisions were determined. He said he would bring this item back to the Board for discussion after his review.

DUTIES OF STAFF. Staff shall be in attendance at every meeting of the Planning Board as defined by Article IV of these Rules and shall arrange for the City Engineer to be present at the Board's regular meetings and as needed. Subject to these Rules and at the direction of the Board, staff shall act to support the Board. This support shall take such forms as necessary to ensure that the Board's actions and decisions are made in an educated and well-informed manner, including but not limited to: preparing reports and other duties as directed by the Chair; issuing forms as necessary for the Board's functions; compiling relevant information, maps, and records for the Board's review; sending such notices as required by law; keeping the minutes of all Board actions and proceedings; and keeping records of its examinations and other official actions.

Staff shall take such steps as necessary for the recording of meetings and the creation of complete and accurate minutes, including the provision of a recording secretary. Minutes shall, at a minimum: comply with the minimum requirements of NH RSA 91-A; show the vote of each regular member upon every question, or if absent, disqualified, or failing to vote so indicate; include the names and addresses of all witnesses; and include a summary of the facts on which a decision is based, as well as the decision rendered. Said draft minutes will be submitted to the Board for acceptance at the next regular meeting of the Board.

Item 3.4 Clerk – Mr.

Corwin explained that the new text presented replaces the current text for this item. Mr. Rutter asked if there would be any written record of requests for information that are made. Mr. Corwin said all emails to

~~The Clerk Liaison Staff~~, in consultation with the Chair, shall prepare the agenda for each meeting, provide all supportive documentation, and deliver said materials to each Board member no later than the Thursday preceding any scheduled Monday meeting. ~~The Clerk Liaison Staff~~ shall also make public notice of the agenda of each meeting in accordance with the appropriate regulations. Any Board member may request and have placed on the agenda any item for discussion with the approval of the Chair.

Requests for assistance from Staff in matters before the Board shall be made by the Board either by consensus or motion duly passed. Requests for information may be made to Staff by any Board member.

~~The Clerk Liaison Staff~~ shall perform other duties as directed by the Chair.

City employees are considered public and can be obtained by someone seeking information via RSA 91-A.

Items 3.5 through Item 4.4 - The group discussed slight changes to what was presented and agreed to accept the edits for these items.

Items 4.5 through Item

4.6 - Mr. Corwin noted that the Site Walks paragraph is new, and the **Open Meetings Item** should be **Item 4.7**. Mr. Corwin said he disagrees with the inclusion that, if fewer members than what constitutes a quorum go

on a Site Walk, a public report must be submitted of the walk at the next meeting. The group discussed what the responsibility is to report back to the Board after a Site Walk. Mr. Ford Burley said he would look into this item more thoroughly.

4.5 PLACE OF MEETING. Meetings of the Board shall normally be held at City Hall, in the City of Lebanon, or at some other public place in the City of Lebanon, or, pursuant to Section 4.6, at the site of a proposed project for the express purpose of inspecting said site as part of the review for a proposed project.

SITE WALKS. Site Walks at which a quorum of regular Board members are in attendance shall constitute meetings as defined by Article 1.34 of these rules, and shall therefore be posted and conducted according to these rules, including the taking of minutes. Site Walks conducted by fewer members than constitute a quorum shall ~~make~~ require a public reporting of the Walk at the next regular meeting. No decisions shall be made concerning an application during a Site Walk.

4.6 OPEN MEETINGS. All meetings of the Board and its committees shall be open to the public except as stipulated by ~~State Law~~ NH RSA 91-A.

Items 5.1 through 5.3

The group discussed the idea being considered in the Town of Norwich where the number of attendees that constitutes a quorum can include remote attendees.

The group agreed to amend the language of **Item 5.2** to read "A quorum shall consist of a minimum of five (5) members"

5.1 CALL TO ORDER. Meetings shall be called to order by the Chair, or in the Chair's absence, by the Vice-Chair. In the absence of both, ~~the Clerk Liaison or staff member~~ staff shall call the meeting to order after which those Board members present may elect a Chair pro tem.

5.2 QUORUM. ~~The As a public body subject to RSA 91-A, the~~ Board shall only conduct a meeting and transact business when a quorum is physically present, unless that meeting constitutes an "emergency" as defined by and subject to RSA 91-A:2, III. A quorum shall ~~be at least consist of a majority of the total membership~~ five (5) members of the Board including ex-officio members and of the Board including alternate members sitting in place of regular members.

5.3 ORDER OF BUSINESS. For each regular meeting the order of business, unless otherwise ordered by the Chair, shall be as follows, and shall be ~~shown so presented~~ on the agenda:

1. Call to Order
2. Notice of Regional Impact
3. ~~Continued Applications—~~Public Hearings Items
4. ~~New Applications—Completeness Reviews and Public Hearings~~
5. ~~Other Business~~ Approval of Minutes
6. ~~Approval of Minutes~~ Other Business
7. Adjournment

Items 5.4 Presentations During Public Hearings

- The group discussed when the public hearing should be opened and closed, and the difference between “public hearing” and “public comment.” Mr. Ford Burley said the public comment time is a portion of the public hearing. Mr. Corwin said this item now more closely reflects the Board’s current procedures.

The suggestion was made to change “shall” to “may” in **Item A**. The group discussed the different meanings of “shall” and “may” and Mr. Corwin said he would continue to review what is most appropriate.

A suggestion was made to add the word “unless” after “normally be in effect” to potentially include conditions that may affect whether the three-minute time limit is enforced for commenters in **Item C**.

Mr. Rutter noted that the reference in **Item D** to Section 7.8 is confusing. Mr. Hill said it should be changed to Section 7.9. Mr. Corwin noted that language should be added that the deliberation period may be continued at another meeting before a decision is made.

For **Item E**, Ms. Romano stated that a roll call vote is needed only if any members are attending remotely. Mr. Ford Burley suggested adding that “an explanation of the reasons for a decision should be included in the decision.” The group also discussed how and when straw poll votes are typically taken. Mr. Corwin said the Board has historically used straw polls sparingly to gauge the mindset of Board members on a decision prior to a final vote. The group discussed how the Board currently arrives at a decision and if changes should be made to the current procedure.

5.4 PRESENTATIONS DURING PUBLIC HEARINGS.

A. PRESENTATIONS. Prior to the opening of a Public Hearing, the Chair shall invite Staff to briefly describe the proposed hearing item to the Board. The Chair shall then open the Public Hearing and invite the Applicant or other Representative for the proposed hearing item to give a brief presentation to the Board, which shall be adequate so as to inform all community stakeholders, abutters and members of the public alike, as to the nature of the proposed item, including existing conditions and proposed changes, in order that they may comment on it.

B. STAFF AND BOARD QUESTIONS. After the presentation of the item, the Chair shall invite Staff to raise to the Applicant or other Representative any outstanding questions that the Planning & Development Department Staff still have concerning the item, which the Applicant or other Representative shall answer. Once the Staff questions have been answered, the Chair shall invite members of the Board to ask questions concerning the item, and invite the Applicant or Representative to respond.

C. PUBLIC COMMENT. After the Applicant or Representative has had a chance to address all of the Staff and Board questions and comments, the Chair shall invite any members of the public, in person or attending remotely, to speak on the item. Any questions should be addressed to the Chair, who will then invite the Applicant or Representative to address the issue if necessary. A time limit of three minutes for each commenter shall normally be in effect, and the Chair will ensure that the commenter and Applicant or Representative do not engage in back-and-forth commentary or argument. After a given commenter has finished speaking, the Chair may invite the Applicant or Representative to respond, at the Chair’s discretion. The Chair will grant the Applicant or Representative a chance to respond to any comments at the end of the Public Comment period.

D. DELIBERATIONS. After the Public Comment period, the Chair shall invite the members of the Board to discuss the item. If new questions arise during Deliberations, the Chair may invite the Applicant or Representative, Staff, or other relevant City representatives to answer the questions. If proposed motions are to be written or amended, this should be done during this deliberative period. Deliberation may be continued pursuant to Section 7.8.

E. DECISIONS. After the deliberative period, the Chair will invite a member or members of the Board to make a motion on the item. If the motion is included in the Staff Memo portion of the posted, publicly-available packet, only proposed amendments to the motion in question must be read into the public record. If the text of the motion is not publicly available prior to the start of the meeting, then the entire motion must be read into the public record. Once the motion has been read and seconded, the Chair shall invite the members of the Board to discuss the motion, including proposed amendments or alternatives. The Chair shall then, at their discretion, conduct a roll call vote on the motion.

Item 5.5 Permission to Address the Board –

The group discussed whether the time limit should be enforced. They also discussed what constitutes a debate.

5.5 PERMISSION REQUIRED TO ADDRESS THE BOARD. Persons other than members of the Board shall not be permitted to address the Board except by consent of the Chair. ~~Anyone wishing to address the Board during Open Discussion should indicate their intent and subject matter to the Chair prior to the meeting. At the Chair's discretion, a time limit for each speaker of 3 minutes shall normally be in effect may be imposed.~~ The speaker shall not enter into any debate with anyone present and shall speak only to the subject matter indicated. ~~A group may have one person act as its spokesperson and shall follow the same rules.~~

5.6 MINUTES. The minutes of previous meetings shall be submitted for approval at the next regular meeting or planning session. The Chair shall call for any corrections to the minutes. Following the discussion of corrections, if any, the minutes shall be approved by motion duly passed by majority vote of the members present.

Item 5.6 Minutes – Mr.

Rutter suggested adding language about whether a quorum is needed to approve minutes. The group also discussed when members should abstain from voting on decisions versus voting whether to approve meeting minutes. Mr. Corwin said if a member misses a meeting and is not familiar with the content of that meeting, it would be appropriate for **her/him** to abstain from the vote to approve the minutes.

Items 5.7 through 5.9

– The group discussed instances where a meeting may begin in one room or area and, after a temporary halt, may move to another room or area.

5.7 RECESS OF THE MEETING. The Chair may order a temporary halt to the proceedings of the meeting. Said recess should normally not exceed 30 minutes. Upon ordering the recess, the Chair shall state the time and place for reconvening.

~~**5.8 CONTINUANCE OF THE HEARING.** The Board may continue a hearing if the application cannot be disposed of on the day set. No further public notice shall be necessary provided that the date, time, and place of the continued hearing shall be announced before adjournment.~~

5.89 ADJOURNMENT OF MEETING. The Board shall adjourn each meeting to its next scheduled meeting or to a special meeting specifying time, date, and place. If the order of business has not been concluded by 9:30 PM, the Chair shall poll the attending Board members to determine if the Board should continue beyond 9:30 PM or continue the matters on the agenda to the next appropriate meeting, or continue to a special meeting specifying time, date, and place. The Chair shall then put the proposed determination to a vote.

Items 6.1-6.4

Mr. Corwin said this section is new. Mr. Ford Burley said this language is now up to date with the current RSA language. He said once the Board accepts jurisdiction over an application, it has 65 days to approve or disapprove the application. He said the timeframe extends to 95 days to approve or disapprove if the application is determined to have regional impact. He said if the Board cannot reach a decision by the time deadline, the City Council must approve it.

The group discussed the impact this procedure may have on applications that require extra time for the Board to review. Ms. Romano said the Board will depend on Staff to notify it as the timeframe expirations approach. She noted that some applicants bring incomplete applications to the Board which get continued to future meetings, and it takes extra time for the Board to make decisions on those applications. The group agreed that the Board is taking a stricter stand on completeness because delays can be a waste of time.

Mr. Corwin said **Item 6.4 Amendments** should be moved to the Procedures section. Mr. Rutter suggested that a reference to Section 9.1 and 9.2 could be added to this item.

Item 7.1 & 7.2 -

The group agreed to clarify the language that accurate transcriptions of motions are needed for Board members to make decisions during meetings as well as for the record.

Mr. Ford Burley said “ex-officio” can be removed from

Item 7.2. The group discussed whether it needs to be noted that alternate members are standing in for particular members.

Item 7.4 Waiver Requests – The group discussed the role that waiver requests play in the Board’s decisions to approve or disapprove applications.

Item 7.7 Conflict of Interest or Prejudgement – Mr. Corwin said he and Mr. Ford Burley had not reviewed this section yet and suggested the Board discuss it at another meeting. The group talked about what constitutes a conflict of interest and instances when Board members have recused themselves from discussions in the past.

Item 7.8 Vote of Absent Members

The group agreed to accept the revisions as presented. Mr. Kennelly suggested language should be added that the Chair should ask Board members to publicly state that they have “examined the record and have become familiar with the evidence presented.”

Item 7.9 Continuation of Deliberation

The group discussed whether deliberation should be allowed after the close of the public hearing. Mr. Corwin said he feels it is important that the Board has all its questions answered before the public hearing is closed. The group discussed what happens when a new idea or consideration occurs after the public hearing is closed, and what is involved in reopening a public hearing in these instances. Mr. Corwin said he would review this process more fully. Mr. Corwin said he would also check if the applicant must consent to a continuance in writing, or if a verbal consent is acceptable.

ARTICLE VII**VOTING & DELIBERATION**

6.1 MOTIONS TO BE STATED BY THE CHAIR. Accurate transcriptions of any motions must be reasonably understood by those attending the meeting and be accurately rendered in the public record. As stated in 5.4.E of these Rules, if a motion is included in the Staff Memo portion of the posted, publicly-available packet, reference to said packet shall be considered sufficient to these purposes for this purpose, and only proposed amendments must be read into the public record. If the text of the motion is not publicly available prior to the start of the meeting, then the entire motion must be read into the public record. A motion may not be withdrawn or amended by the mover without the consent of the second.

6.2 MAJORITY VOTE REQUIRED. Determinations on any matter-motion before the Board shall require the concurrence of a majority of the regular and ex-officio members present, including alternate members serving in the capacity of a regular member, and as well as regular members attending remotely as may be permitted pursuant to RSA 91-A.

6.3 TIE VOTE OR DECISION BY LESS THAN A MAJORITY. A tie vote or an approval or denial by less than a majority of the regular members present constitutes no action. If the Board is unable to obtain concurrence of a majority of regular members present on a request because of the absence of one or more Board members from the vote, it shall continue the discussion or may continue the matter to a subsequent meeting pursuant to Section 5.6.2 above.

6.5-6.8 VOTE OF ABSENT MEMBERS. Unless a Board member has attended the meetings on a matter application or has stated publicly that he or she has examined the record and become familiar with the evidence presented from a transcript of the proceedings, he or she shall not cast a vote essential on any matter directly related to the decision application.

6.9 EXTENSION OF TIME CONTINUATION OF DELIBERATION. Following the closing of the public hearing on an application, Any three Board members may request an extension of time before voting on any proposal before the Board the Board may continue deliberation to a future meeting, if and only if such an extension would not push a given application past the 65 (or 95) day deadline for action by the Board, unless the applicant consents in writing to such extension. If such an extension is requested, the Board shall schedule a special meeting not more than two weeks from the date of the request to take action on the proposal or otherwise such special meeting may be scheduled for a date agreeable by all requesters. There shall be no new business placed on the agenda of any special meeting scheduled under this section. If such an extension would push a given application past the 65 (or 95) day deadline for action by the Board, the Board will consider other alternatives, such as disapproving the site plan “without prejudice” as mentioned in section 6.2 of these Rules.

Items 9.1 through 9.5 -

The group discussed RSA 91-A and its impact on the flow of communication.

The group also discussed how communication between Board members differs from communication with members of the community. Mr. Corwin said Board members can discuss applications with members of the public once a decision has been made, but not before.

B. Site Plan Review Procedure / Potential Amendments to Article IV of SPR Regulations

Chair Faunce said discussion for this agenda item would be postponed to a future meeting.

C. Site Plan Review Procedure / Potential Amendments to Article V of SPR Regulations

Chair Faunce said discussion for this agenda item would be postponed to a future meeting.

3. COMMITTEE REPORTS

Heritage Commission - Mr. Rutter discussed a video, called "Hand to Brick," about the Densmore Brickyard that has been shared with the Heritage Commission. He said the video is very informative and interesting. He requested that Staff circulate the link to the video as a distribution, and strongly urged every member of the Board to watch the video, especially since an application for a multi-unit residential complex is being planned for the brickyard site and will be presented at the July 8 Planning Board meeting.

LEAC – Mr. Kennelly said the Committee has a lot of activity, but none that directly affects the Planning Board. Mr. Corwin said LEAC is working on the Energy Chapter of the Master Plan.

The group discussed the difference between single, two-, and multi-family dwellings. Mr. Corwin said any building containing three or more dwelling units is considered multi-family, according to Lebanon's zoning ordinance.

DEI – Mr. Ford Burley said the joint statement is being worked on and it will be discussed at a meeting tomorrow.

West Lebanon Advisory Committee – Chair Faunce said the group has been working with the Economic Development Committee about whether establishing a TIF district in West Lebanon is advisable. He said they have come to the realization that it is probably not the right tool at this time. He said there has been discussion about making a vacant lot on Church Street West (which is owned by the City) into a pop-up social place. The group discussed attempts to make West Lebanon walkable for residents.

4. OTHER BUSINESS**A. Planning Board Process Improvement / Implementation of Rules of Procedure**

Chair Faunce said discussion for this agenda item would be postponed to a future meeting.

A MOTION was made by Richard Ford Burley to extend the meeting to 9:40pm. The Motion was seconded by Karen Zook.

****The MOTION was approved (7-0).***

5. APPROVAL OF MINUTES- June 10, 2024

Amendments:

Page 3, Lines 5-6: Change “that are outside the proposed project area.” to “that concern portions of the site outside the proposed project areas”

Page 3, Line 29: Change “rain gardens” to “rain garden”

Page 3, Line 43: Change “curving” to “curbing”

Page 4, Line 1: Change “rows” to “row”

Page 4, Line 3: Change “South” to “south”

Page 4, Line 38: Change “one lane” to “one-way lane”

Page 4, Line 42: Change “the plan” to “the revised plan”

Page 6, Line 9: Add “feet” between “hundred” and “along”

Page 7, Line 37: Add “to” after “limited”

Page 8, Lines 18-20: Edit to read: “The new fire station will accommodate the largest trucks in use by the fire department. Mr. Rutter asked, if the demolition includes below-ground level penetration, whether a soil expert would be on hand to oversee that activity.”

Page 8, Line 35: Edit to read “It facilitates emergency staff vehicles coming out of the parking lot behind the new building.”

Page 8, Lines 40-41: Change “Mr. Fleurock said the building will be situated about two feet further into Church Street.” to “Mr. Fleurock said the east side of the new building will extend about two feet further into Church Street than its predecessor.”

Page 9, Line 9: Add “from the south” after parking lot

Page 9, Lines 24-25: Edit to read: “He said the Church sponsors an active community assistance program”

Page 11, Line 7: Change “Lyne” to “Lyme”

Page 12, Line 22: Hyphenate “traffic-calming”

Page 12, Line 24: Omit “there”

Page 12, Line 33: Change “unit” to “cottage development”.

A MOTION was made by Kathie Romano to approve the June 10, 2024 Meeting Minutes as amended. The motion was seconded by Brandon Hill.

****The MOTION was approved (7-0).***

6. ADJOURNMENT

A MOTION was made by Brandon Hill to adjourn the meeting at 9:35pm. The motion was seconded by Jeremy Rutter.

****The MOTION was approved (7-0).***

The meeting was adjourned at 9:35pm.

- 1 Respectfully submitted,
- 2 Paula Roux
- 3 Recording Secretary