



**LEBANON PLANNING BOARD
NOVEMBER 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: 477 794 320#). If you have trouble accessing this meeting, please [email tim.corwin@lebanonnh.gov](mailto:tim.corwin@lebanonnh.gov).

2. Notice of Regional Impact

3. Deliberation

- A. **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 - Deliberation continued from October 14, 2024**

4. Public Hearing Items

- A. **XYZ Dairy, LLC, River Park Drive (Tax Map 44, Lots 21 - 30, and Tax Map 44, Lot 7), zoned CB, IND-L and R-3:** Appeal of administrative decision made on September 10, 2024, that conditions 1, 2, 4, 5, 7 and 14-4 of the River Park development Site Plan approval as set forth in the Notice of Action dated September 9, 2019, for PB2018-34-SPA, have not yet been satisfied and, consequently, that construction of Phase 1 may not commence. **PB2024-40-AAD - Continued from October 14, 2024**
- B. **Irma Muzzy Estate & City of Lebanon, 192 Mascoma Street (Tax Map 90, Lot 19) and 0 Mascoma Street (Tax Map 90, Lot 20), zoned R-3:** Request for approval of a Boundary Line Adjustment between lands located at 192 & 0 Mascoma Street. **PB2024-43-BLA**
- C. **Lebanon Housing Authority, 31 Romano Circle (Tax Map 101, Lot 20), zoned R-2:** Request for Site Plan Review to construct a +/- 3,882 sq ft. two story accessory office building for the existing multi-family complex, together with associated site improvements, including relocating a basketball court and new parking spaces. **PB2024-41-SPR - Postponed to December 9, 2024**
- D. **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 October 14, 2024**

5. Other Business

6. Approval of Minutes

- A. September 16, 2024
- B. September 23, 2024
- C. September 30, 2024
- D. October 14, 2024

7. 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

PLANNING BOARD

November 12, 2024 Meeting

Staff Memorandum – PB2024-43-BLA

APPLICATION INFORMATION

Agenda Item: 4.B

Application ID: PB2024-43-BLA

Application Type:
Boundary Line Adjustment

Property Location & Tax Map:

- 192 Mascoma Street (Tax Map 90, Lot 19)
- 0 Mascoma Street (Tax Map 90, Lot 20)

Applicants/Property Owners:

- Irma Muzzy Estate
- City of Lebanon

Zoning District:

Residential Three (R-3)

LEGAL NOTICE

Irma Muzzy Estate & City of Lebanon, 192 Mascoma Street (Tax Map 90, Lot 19) and 0 Mascoma Street (Tax Map 90, Lot 20), zoned R-3: Request for approval of a Boundary Line Adjustment between lands located at 192 & 0 Mascoma Street. PB2024-43-BLA

PLANS AND APPLICATION MATERIALS

- ▶ Application forms (2 pages)
- ▶ Excerpt from the minutes of the February 5, 1968 City Council meeting (1 page)
- ▶ Plat titled, "Parcel Transfer – Donald A. & Irma W. Muzzy – City of Lebanon," dated September 19, 1967, prepared by K.A. LeClair Assoc., Inc., Proj. No. 67967
- ▶ Easement plan titled, "192 Mascoma Street," dated July 19, 2019, prepared by Haynor/Swanson Inc., Proj. No. 5555 (1 page)
- ▶ Letter dated January 24, 1968 from Larry Gardner (1 page)
- ▶ Unsigned quitclaim deed from the City of Lebanon to Donald & Irma Muzzy (2 pages)
- ▶ Excerpt from the draft minutes of the October 16, 2024 City Council meeting (3 pages)

COMPLETENESS REVIEW

This application has been reviewed in accordance with the Lebanon Subdivision Regulations. The Planning and Development Department recommends that the Board find that the application is complete enough to accept jurisdiction and to commence review.

BACKGROUND

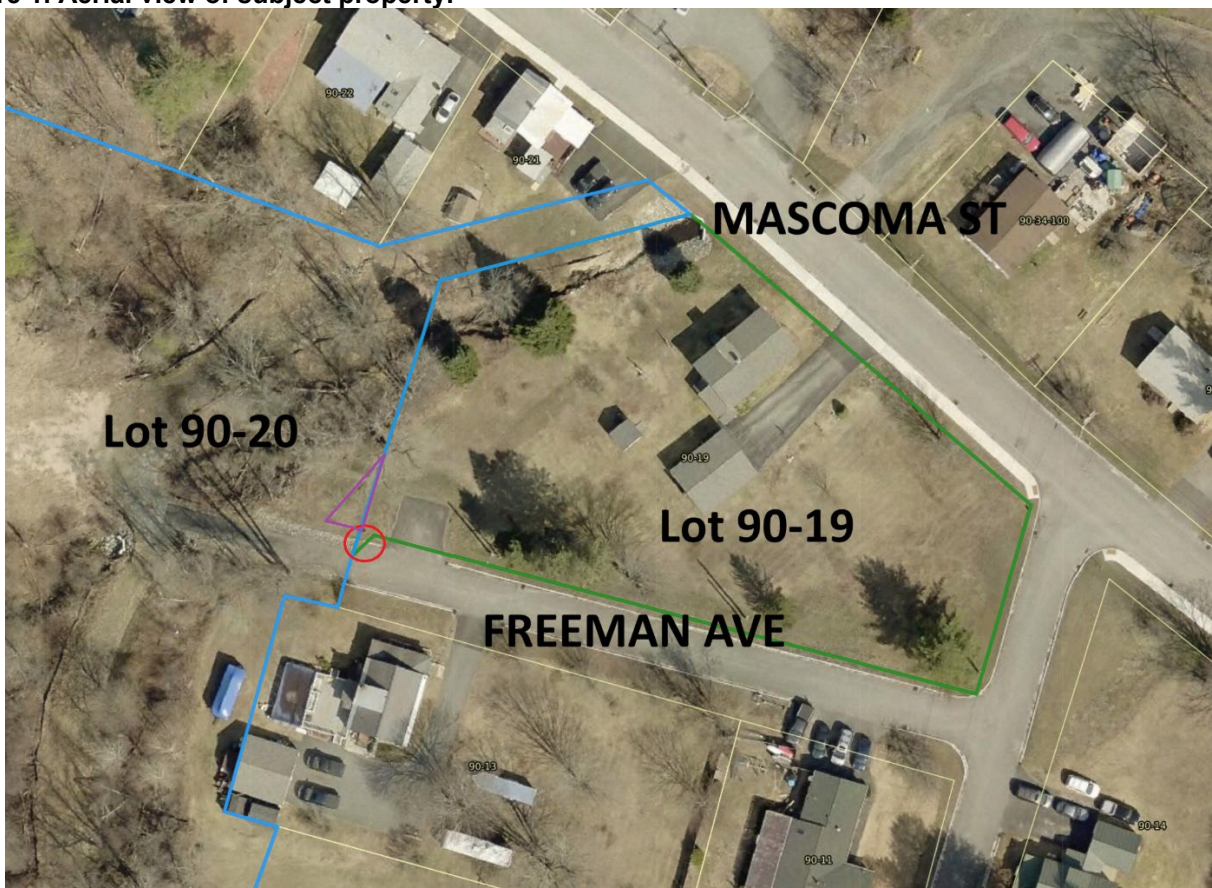
In February 1968, the City Council approved a conveyance of ~1,270 sq. ft. of City-owned land located between Mascoma Street and Freeman Ave (Tax Map 90, Lot 20) to Donald and Irma Muzzy to be annexed property owned by the Muzzys at 192 Mascoma Street (Tax Map 90, Lot 19), in exchange for a conveyance of ~275 sq. ft. from the Muzzys to the City (see attached excerpt from the February 5, 1968 City Council meeting minutes). In March 1968, a plat was recorded showing the exchange. See attached plat titled, "Parcel Transfer – Donald A. & Irma W. Muzzy – City of Lebanon," recorded in the Grafton County Registry of Deeds (GRCD) in Book 1060, Page 67. See *also* attached easement

plan titled, "192 Mascoma Street" for a graphic depiction of the ~1,270 sq. ft. of City-owned land to be conveyed to Muzzy.¹ The Muzzy-to-City deed was also recorded at this time (recorded at the GRCD in Book 1068, Page 134). However, for reasons unknown, the City-to-Muzzy deed was never signed or recorded. Moreover, there is no indication that the Planning Board ever approved or signed the plat that was recorded in 1968, even though such approval would have been required pursuant to the Subdivision Regulations that were in effect at that time (as has been recently determined by the City's legal counsel).

The property at 192 Mascoma Street is currently under agreement to be sold. The parties to the agreement have informed the City that the unresolved City-to-Muzzy conveyance issue has been discovered as part of a title search and is currently preventing the purchase from moving forward. Having been made aware of this issue, City staff located a copy of the unsigned deed in the City Clerk's files, along with a cover letter from the City's legal counsel at that time, Larry Gardner. Staff has not found any information as to why the City-to-Muzzy conveyance was not completed 50+ years ago.

Because so much time has passed since the 1968 authorization, the City Council took action on October 16, 2024 to reauthorize the transfer (see attached excerpt of the October 16, 2024 City Council draft meeting minutes). In addition, there is no evidence that the land swap ever went before the Planning Board as a boundary line adjustment, although it would have been required to as noted above. Consequently, before the City can execute the deed for the City-to-Muzzy transfer, the Planning Board will need to retroactively approve the 1968 recorded plat showing the City/Muzzy land exchange.

Figure 1. Aerial view of subject property.



APPLICATION OVERVIEW

This is a request for a Boundary Line Adjustment between lands located at 192 Mascoma Street (Tax Map 90, Lot 19) and 0 Mascoma Street (Tax Map 90, Lot 20), as follows:

- A ~1,270 sq. ft. portion of Tax Map 90, Lot 20, owned by the City, to Tax Map 90, Lot 19, owned by the Muzzy Estate.
 - *This portion of the transfer was authorized by the City Council in 1968, is reflected on the plat recorded in 1968, was reauthorized by the City Council in 2024, and is not reflected on the City's Tax Map. The ~1,270 sq. ft. area is roughly outlined in purple in Figure 1 above.*
- A ~275 sq. ft. portion of Tax Map 90, Lot 19, owned by the Muzzy Estate, to Tax Map 90, Lot 20, owned by the City.
 - *This portion of the transfer was authorized by the City Council in 1968, is reflected on the plat recorded in 1968, and is also reflected on the City's Tax Map. The ~275 sq. ft. area is circled in red in Figure 1 above.*

STAFF COMMENTS

Both lots currently conform to the applicable minimum lot sizes and dimensional requirements as set forth in the Zoning Ordinance and will continue to after reconfiguration.

STAFF RECOMMENDATIONS

If the Board moves to approve this application, then based on the information reviewed by City staff, the Planning and Development Department recommends that the Board approve the application with the following condition:

1. The applicants shall provide draft copies of the City-to-Muzzy land transfer for review to ensure the transfer will be completed properly for Assessing and recording purposes.

Attachments

cc (via e-mail): Shaun Mulholland, City Manager
 David Brooks, Deputy City Manager
 Nancy Wright, Executor of the Irma Muzzy Estate
 File

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
MINOR SITE PLAN REVIEW	☐	☐	OTHER

PROPERTY OWNER (APPLICANT):

NAME: Irma Muzzey (Nancy Wright authorized) TEL.#: 802-356-1343

MAILING ADDRESS: PO Box 166 South Strafford, VT 05070

E-MAIL ADDRESS: nancywright62828@gmail.com

CO-APPLICANT, AGENT, OR LESSEE:

NAME: City of Lebanon TEL.#: 603-448-1457

MAILING ADDRESS: 51 N Park St Lebanon, NH 03766

E-MAIL ADDRESS: planning@lebanonnh.gov

PROJECT LOCATION:

TAX MAP #: 90 LOT#: 19 & 20 PLOT #: ZONE: R-3

STREET ADDRESS OF PROJECT: 192 Mascoma Street & 0 Mascoma Street

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

SCOPE OF PROJECT:

Boundary line adjustment between 192 & 0 Mascoma St

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: _____

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 November 12, 2024, unless I personally request, in writing, that the Board delay its determination of completeness to a later date.

PROPERTY OWNER: City of Lebanon

DATE: November 11, 2024

Shaun Mulholland
 Shaun Mulholland (Nov 11, 2024 17:08 EST)
 PRINT NAME: Shaun Mulholland, City Manager

DATE RECEIVED	FILE # (Map/Lot)	APPLICATION #	FEE - \$ AMOUNT	DATE PAID	VOUCHER #

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
MINOR SITE PLAN REVIEW	☐	☐	OTHER

PROPERTY OWNER (APPLICANT):

NAME: Irma Muzzy (Nancy Wright authorized) TEL.#:802-356-1343

MAILING ADDRESS: PO Box 166 South Strafford, VT 05070

E-MAIL ADDRESS: nancywright62828@gmail.com

CO-APPLICANT, AGENT, OR LESSEE:

NAME: City of Lebanon TEL.#: 603-448-1457

MAILING ADDRESS: 51 N Park St Lebanon, NH 03766

E-MAIL ADDRESS: planning@lebanonnh.gov

PROJECT LOCATION:

TAX MAP #: 90 LOT#: 19 & 20 PLOT #: ZONE: R-3

STREET ADDRESS OF PROJECT: 192 Mascoma Street & 0 Mascoma Street

IS THIS PROPERTY LOCATED IN THE: **WETLANDS** ☒ YES ☐ NO **HISTORIC DISTRICT** ☐ YES ☒ NO

FLOOD PLAIN ☐ YES ☒ NO

SCOPE OF PROJECT:

Boundary line adjustment between 192 & 0 Mascoma St

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: _____

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 November 12, 2024, unless I personally request, in writing, that the Board delay its determination of completeness to a later date.

PROPERTY OWNER: Irma Muzzy Estate DATE: November 11, 2024

Nancy A Wright
Nancy A Wright (Nov 11, 2024 18:20 EST)

PRINT NAME: Nancy Wright, Authorized Representative

DATE RECEIVED	FILE # (Map/Lot)	APPLICATION #	FEE - \$ AMOUNT	DATE PAID	VOUCHER #

February 5, 1968

Notice of regular meeting was delivered to each Councilor by the Lebanon Police Department by order of the City Clerk on February 2, 1968.

Meeting called to order at 7:30 P.M. by Mayor Edson. Councilor George Papademas was absent.

Motion of Paul Goodhue, seconded by Carl Foster, that minutes of the regular meeting of January 15, 1968, minutes of the Public Hearing of January 17, 1968 and minutes of the special meeting of January 29, 1968 be accepted as corrected. Motion voted for and adopted by unanimous vote.

Motion of Carl Foster, seconded by Laurence Howard, that the following Amendment to Ordinance #2, The Zoning Ordinance be adopted:

Amend the Zoning Ordinance of the City of Lebanon, New Hampshire and the Official Zoning Map by extending the present Business Zone General (B-G) by the reclassification of the herein described tract of land from its present classification of Residential Single Family Zone (R-SF) to Business Zone General (B-G):

Bounded Easterly by Relocated Route 120
Northerly by the highway leading from Relocated Route 120 to
Hanover Street, known as Evans Drive;
Westerly by a line westerly of and parallel to the center line
of relocated Route 120, westerly 1000' (one thousand feet);
And Southerly by the present Business Zone General (B-G) line.

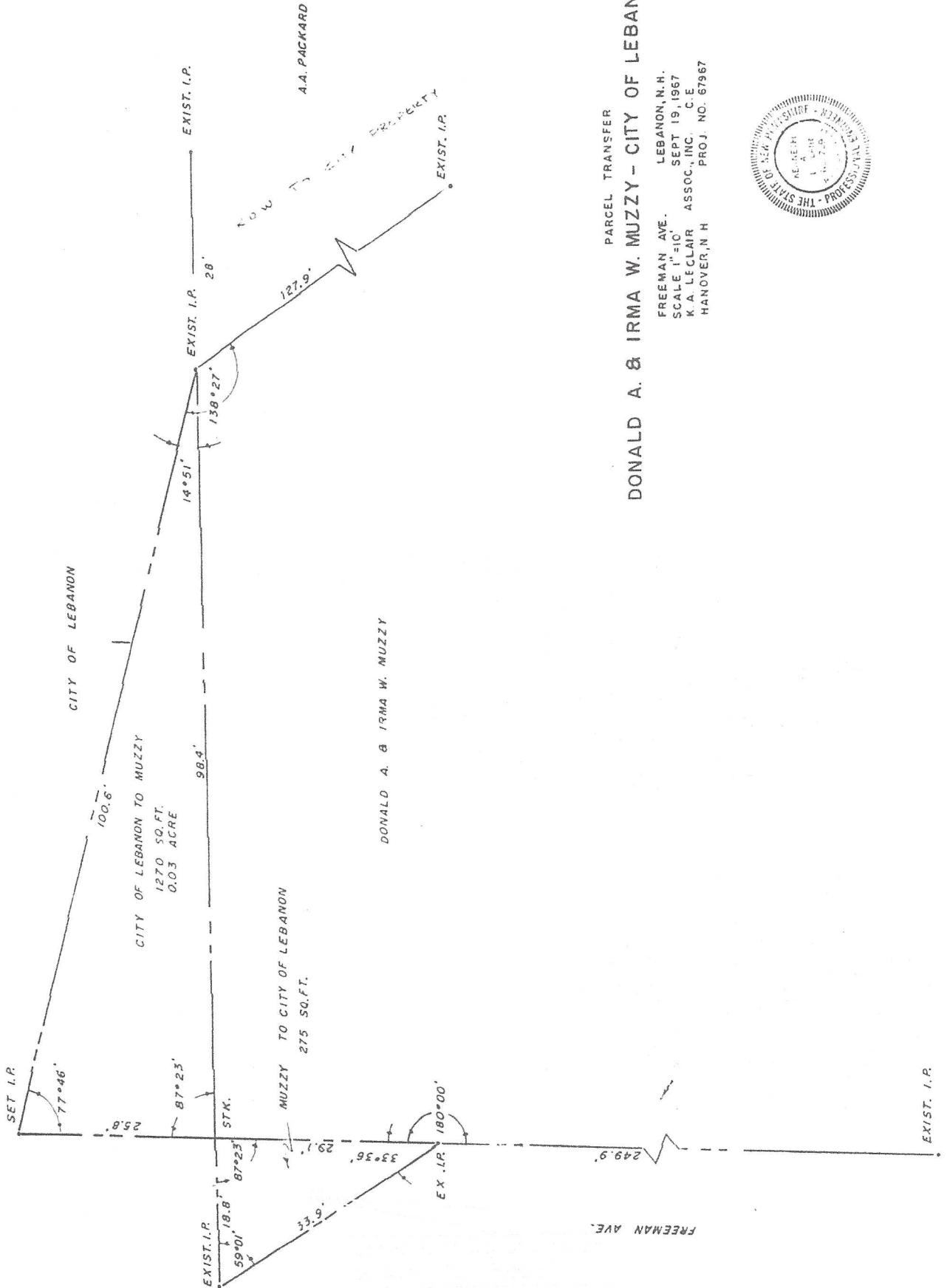
Seven voted for the Motion. Paul Goodhue voted against. Motion declared adopted by the Mayor.

Motion of Mary Demers, seconded by Louis Tremblay, that the City Council accept the report of the Welfare Committee. Seven voted for the Motion. Carl Foster abstained from voting. Motion declared adopted by the Mayor.

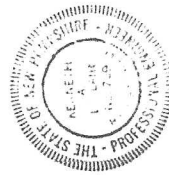
Resolution of Paul Goodhue, seconded by Carl Foster, Resolved; That the City of Lebanon shall convey a parcel of land consisting of 1,270 square feet, being a portion of the land deeded to the City by Kenneth R. Spaulding and Eunice L. Spaulding by deed dated December 14, 1954, recorded in the Grafton County Registry of Deeds in Book 860, Page 191, located northerly of Freeman Avenue, to Donald A. Muzzy and Irma W. Muzzy, in consideration of a conveyance by Donald A. and Irma W. Muzzy to the City of Lebanon of a parcel of land located westerly of Freeman Avenue, consisting of 275 square feet; both parcels shown on a Plan of Kenneth A. LeClair Associates, Inc. dated September 19, 1967, there being no other consideration for the exchange of land.

Further, that the City Manager is hereby authorized to execute on behalf of the City of Lebanon, the deed from the City to Mr. and Mrs. Muzzy and to accept the conveyance from Mr. and Mrs. Muzzy to the City and to take any and all other necessary steps to carry out the purpose of this vote, including a title search on the Muzzy property.
Resolution voted for and adopted by unanimous vote.

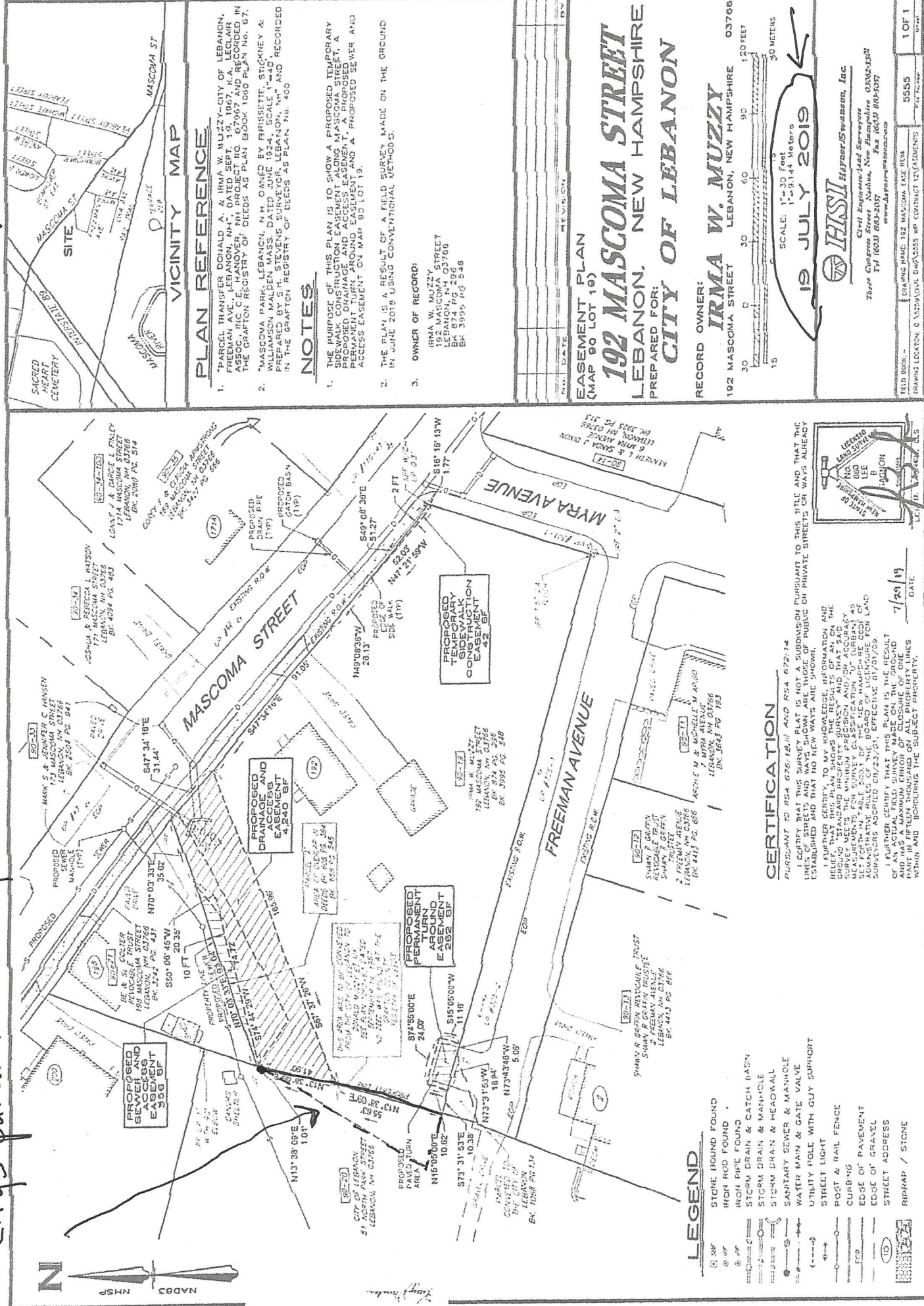
Motion of Louis Tremblay, seconded by Mary Demers, that the City Council authorize the City Manager to make necessary arrangements in the bidding procedures for two new police cruisers. Motion voted for and adopted by unanimous vote.



PARCEL TRANSFER
 DONALD A. & IRMA W. MUZZY - CITY OF LEBANON
 FREEMAN AVE. LEBANON, N.H.
 SCALE 1"=10' SEPT 19, 1967
 K.A. LECCLAIR ASSOC., INC. C.E.
 HANOVER, N.H. PROJ. NO. 67967



City's parcel to be conveyed to Muzzy. Map recorded without boundary description.



PLAN REFERENCE

1. TOWN OF LEBANON, NH, A. IRMA W. MUZZY, CITY OF LEBANON, FREEMAN, NH, LEBANON, NH, DATED SEPT. 19, 1967, K.A. LECLAIR ASSOC., INC. C.E. HANOVER, NH PROJECT NO. 67067 AND RECORDED IN THE GRAFTON REGISTRY OF DEEDS AS PLAN BOOK 1000 PLAN NO. 67.

2. "MASCOMA PARK, LEBANON, NH, OWNED BY FRISSETTE, STICKNEY & WILLIAMSON MALDEN MASS. DATED JUNE 1924, SCALE 1"=40', PREPARED BY S.H. STEVENS, SURVEYOR, LEBANON, NH, AND RECORDED IN THE GRAFTON REGISTRY OF DEEDS AS PLAN NO. 400

NOTES

1. THE PURPOSE OF THIS PLAN IS TO SHOW A PROPOSED TEMPORARY PERMANENT TURN AROUND EASEMENT AND ACCESS EASEMENT, A PERMANENT TURN AROUND EASEMENT AND A PROPOSED SEWER AND ACCESS EASEMENT ON MAP 90 LOT 19.

2. THE PLAN IS A RESULT OF A FIELD SURVEY MADE ON THE GROUND IN JUNE 2019 USING CONVENTIONAL METHODS.

3. OWNER OF RECORD:

IRMA W. MUZZY
192 MASCOMA STREET
LEBANON, NH 03768
BK 674 PG 296
BK 5935 PG 548

EASEMENT PLAN
(MAP 90 LOT 19)

192 MASCOMA STREET
LEBANON, NEW HAMPSHIRE
PREPARED FOR:
CITY OF LEBANON

RECORD OWNER:
IRMA W. MUZZY
192 MASCOMA STREET
LEBANON, NEW HAMPSHIRE 03768

SCALE: 1"=30 Feet
1"=91.44 Meters

19 JULY 2019

IRMA W. MUZZY
192 MASCOMA STREET
LEBANON, NEW HAMPSHIRE 03768

CERTIFICATION

I, SURVEYOR, DO HEREBY CERTIFY THAT THIS SURVEY WAS MADE IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE BOARD OF LICENSURE FOR LAND SURVEYORS, EFFECTIVE 01/01/09.

I FURTHER CERTIFY THAT THIS PLAN IS THE RESULT OF A FIELD SURVEY MADE ON THE GROUND AND HAS A MAXIMUM ERROR OF CLOSURE OF ONE PART IN FIFTY THOUSAND ON ALL PROPERTY LINES WITHIN AND BOUNDING THE SUBJECT PROPERTY.

DATE: 7/29/19

192 Mascoma St. Lebanon, NH

LAW OFFICES OF
TESREAU, STEBBINS & JOHNSON
NATIONAL BANK BUILDING
LEBANON, NEW HAMPSHIRE
03766

CHARLES F. TESREAU
S. JOHN STEBBINS
WILLIAM R. JOHNSON
DAVID H. BRADLEY
LAURENCE F. GARDNER

TELEPHONE
AREA CODE 603
LEBANON OFFICE
448-2211
HANOVER OFFICE
643-3737

January 24, 1968

Mr. Kenneth D. Boehner
City Manager
Lebanon, New Hampshire

Re: Muzzy Property Transfer

Dear Ken:

Enclosed are the following documents and instruments to carry out the transfer and exchange of deeds between the City and Mr. and Mrs. Donald A. Muzzy:

- (1) A quitclaim deed from Mr. and Mrs. Muzzy to the City. Please note that there is included a partial release of mortgage from the Mascoma Savings Bank, said mortgage being noted in the title report.
- (2) A quitclaim deed from the City to Mr. and Mrs. Muzzy.
- (3) A title opinion as to the real estate owned by Mr. and Mrs. Muzzy.
- (4) A draft of the Resolution of Lebanon City Council as to the exchange of property.

As this completes our services, I am enclosing our statement, only as to the title search on the Muzzy property.

OFFICE OF THE CITY ATTORNEY

By Laurence F. Gardner
Laurence F. Gardner

LFG:gc

Enclosures

QUITCLAIM DEED

KNOW ALL MEN BY THESE PRESENTS, that the CITY OF LEBANON, a municipal corporation in the County of Grafton and State of New Hampshire, existing under the laws of the State of New Hampshire, for consideration paid, grants to Donald A. Muzzy and Irma W. Muzzy, husband and wife, both of said Lebanon, as joint tenants with right of survivorship, with QUITCLAIM covenants;

A certain parcel of land located in Lebanon, County of Grafton, State of New Hampshire, located westerly of other land of the Grantees herein and bounded and described as follows:

Beginning at an existing iron pin as shown on a certain Plan entitled "Parcel Transfer Donald A. & Irma W. Muzzy - City of Lebanon, Freeman Ave., Lebanon, N. H., Sept. 19, 1967, K. A. LeClair Assoc., Inc. C.E. Hanover, N. H. Proj. No. 67967" recorded herewith.

Thence turning at an interior angle $14^{\circ} 51'$ and running 100.6 feet along other land of the Grantor to an iron pin;

Thence turning at an interior angle of $77^{\circ} 46'$ and running 25.8 feet to a stake and the northwesterly corner of another parcel of land conveyed by the Grantees to the City of Lebanon and as shown on said Plan;

Thence turning at an interior angle of $87^{\circ} 23'$ and running 98.4 feet to the point of beginning.

The above described parcel is intended to include 1,270 square feet.

Meaning and intending hereby to convey a portion of the premises conveyed to the Grantor herein by Kenneth R. Spaulding and Eunice L. Spaulding, by deed dated December 14, 1954, recorded in the Grafton County Registry of Deeds in Book 860, Page 191.

The conveyance of the above described premises by the Grantor was duly authorized by a Vote of the Lebanon City Council, dated _____, 1968 and duly recorded in the Lebanon City Records.

The consideration for this deed is less than One Hundred Dollars.

IN WITNESS WHEREOF, the CITY OF LEBANON has hereunto caused its hand and seal to be affixed, this _____ day of _____, 1968.

Witness:

CITY OF LEBANON

By _____

City Manager
Duly Authorized

STATE OF NEW HAMPSHIRE
Grafton County, ss.

_____, 1968

Personally appeared Kenneth D. Boehner, who acknowledged himself to be the City Manager of the City of Lebanon, a municipal corporation, and that he, being authorized so to do, executed the foregoing instrument for the purposes therein contained, by signing the name of the City by himself.

Before me,

Justice of the Peace
Notary Public

Councilor Heistad MOVED to approve the October 2, 2024, minutes as written and presented in the October 16, 2024, City Council agenda packet.
Seconded by Councilor Wilkie.

Roll Call Vote:

Assistant Mayor Below, and Councilors Heistad, Hill, Simon, Whittlesey, Wilkie, Zook all voting Yea.

None voted Nay.

Absent from vote: Mayor McNamara, Councilor Sykes

***The Vote on the Motion was approved (7-0)**

7. APPOINTMENTS:

- A. Planning Board, Brian Ceglarski (Alternate Member): Recommended by City Manager Mulholland

Councilor Sykes joined the meeting at 7:05pm.

Councilor Simon MOVED to NOMINATE Brian Ceglarski as an Alternate Member of the Planning Board. Term: 10/2024-10/2027

Seconded by Councilor Wilkie.

Roll Call Vote:

Assistant Mayor Below, and Councilors Heistad, Hill, Simon, Sykes, Whittlesey, Wilkie, Zook all voting Yea.

None voted Nay.

Absent from vote: Mayor McNamara

***The Vote on the Motion was approved (8-0)**

8. PUBLIC HEARING ITEMS: NONE

9. OLD BUSINESS: NONE

10. NEW BUSINESS:

- A. Reauthorization of Conveyance of City Land at 0 Mascoma Street (Tax Map 90, Lot 20) to Adjacent Parcel at 192 Mascoma Street (Tax Map 90, Lot 19)

Included in the agenda packet: **(All supportive documents, including legal documents, maps and additional information can be found on pages 19-28, Council agenda packet)**

1. Excerpt of minutes from City Council meeting of February 5, 1968.
2. Plan of “Parcel Transfer, Donald A. & Irma W. Muzzy – City of Lebanon”, prepared by K.A. LeClair Associates, Inc., dated September 19, 1967, recorded March 12, 1968 at GCRD Bk.1060, pg. 0067
3. Quitclaim Deed from Donald A. & Irma W. Muzzy to City of Lebanon, dated February 16, 1968, recorded March 12, 1968 at GCRD Bk. 1068, pg. 0134.
4. Draft Quitclaim Deed from City of Lebanon to Donald A. & Irma W. Muzzy, along with a title

1 opinion and a cover page from Attorney Larry Gardner, dated January 24, 1968.

2
3 Deputy City Manager Brooks reviewed the background information.

4
5 **BACKGROUND**

6 On February 5, 1968, the City Council passed a resolution approving the conveyance of a +/- 1,270
7 square foot parcel from a City-owned property at 0 Mascoma Street (Tax Map 90, Lot 20) to an
8 adjacent property at 192 Mascoma Street (Tax Map 90, Lot 19), then owned by Donald and Irma
9 Muzzy, in exchange for the conveyance of +/-275 square foot parcel from Muzzy to the City. The
10 land areas to be transferred were depicted on a September 1967 plan prepared by K.A. LeClair
11 Associates.

12 Subsequently, in March 1968, the LeClair plan and the Muzzy-to-City quitclaim deed were
13 recorded at the Grafton County Registry of Deeds. However, the City-to-Muzzy quitclaim deed
14 was never signed or recorded. A copy of the unsigned quitclaim deed was found in the City Clerk's
15 records, along with a January 1968 title opinion and cover letter from Attorney Larry Gardner.
16 Thus far, no information has been found as to why the City-to-Muzzy conveyance was not signed
17 and recorded at the same time as the other documents.

18 Both Donald and Irma Muzzy are now deceased, and the property at 192 Mascoma Street is
19 currently held by the Estate of Irma Muzzy. Presently, a prospective buyer is in contract to
20 purchase the 192 Mascoma Street property from the Muzzy Estate, but the failure to complete the
21 City-to-Muzzy conveyance was uncovered through a title search and is currently holding up the
22 closing.

23 Because so much time has passed, the City Manager requests and recommends that the City
24 Council re-authorize the land conveyance to the prospective purchaser of 192 Mascoma Street,
25 and to re-authorize the City Manager to execute the deed and take all other actions necessary to
26 complete the conveyance transaction.

27
28 **Council Comments: NONE**

29
30 **ACTION:**

31 *Councilor Whittlesey MOVED the following resolution:*

32
33 *WHEREAS, on February 5, 1968, the Lebanon City Council approved the conveyance of a*
34 *parcel of land consisting of 1,270 square feet, from a City-owned property located at 0*
35 *Mascoma Street, Tax Map 90, Lot 20, to Donald A. and Irma W. Muzzy, owners of property*
36 *at 192 Mascoma Street, Tax Map 90, Lot 19, in exchange for the conveyance of a parcel of*
37 *land consisting of 275 square feet, from Donald A. and Irma W. Muzzy to the City of Lebanon,*
38 *both parcels as shown on a Parcel Transfer Plan, prepared by Kenneth A. LeClair Associates,*
39 *Inc., dated September 19, 1967; and*

40
41 *WHEREAS, on March 12, 1968, the LeClair Parcel Transfer Plan, and the Muzzy-to-City of*
42 *Lebanon Quitclaim Deed were recorded in the Grafton County Registry of Deeds, pursuant*
43 *to the City Council's authorization; and*

44
45 *WHEREAS, the corresponding City of Lebanon-to-Muzzy Quitclaim Deed was never*
46 *executed or recorded by the City Manager as authorized by the City Council; and*

WHEREAS, both Donald and Irma Muzzy are now deceased, and the property at 192 Mascoma Street is held by the Estate of Irma Muzzy and is in contract to be purchased by a third party.

NOW THEREFORE BE IT RESOLVED, the Lebanon City Council hereby reaffirms the February 5, 1968 decision to convey a portion of City-owned property, consisting of 1,270 square feet, located at 0 Mascoma Street, Tax Map 90, Lot 20, to the prospective purchaser of property at 192 Mascoma Street, Tax Map 90, Lot 19, and hereby reauthorizes the City Manager to execute the deed on behalf of the City, and to take all other actions necessary to complete the conveyance transaction.

Seconded by Councilor Simon.

Discussion:

Deputy City Manager Brooks asked that the language in the motion in the last paragraph be revised to read “NOW THEREFORE BE IT RESOLVED, the Lebanon City Council hereby reaffirms the February 5, 1968 decision to convey a portion of City-owned property, consisting of 1,270 square feet, located at 0 Mascoma Street, Tax Map 90, Lot 20, to the estate of Irma Muzzy, or its successor-in-interest as owner of property at 192 Mascoma Street Tax Map 90, Lot 19, and hereby reauthorizes the City Manager to execute the deed on behalf of the City, and to take all other actions necessary to complete the conveyance transaction.”

Councilor Whittlesey MOVED the amended MOTION.

Seconded by Councilor Simon.

Roll Call Vote:

Assistant Mayor Below, and Councilors Heistad, Hill, Simon, Sykes, Whittlesey, Wilkie, Zook all voting Yea.

None voted Nay.

Absent from vote: Mayor McNamara

***The Vote on the Motion was approved (8-0)**

B. Work Session: Overview and Presentations of the 2025-2030 Capital Improvements Program (CIP) and Capital Budget

Included in the agenda packet: **(All supportive documents, information and the complete presentation can be found on pages 29-128, Council agenda packet)**

1. 2025 Capital Improvements Plan Presentation
2. 2025-2030 Capital Improvements Program and Other Capital Projects packet

Tim Corwin, Deputy Planning and Development Director, reviewed the background. Please note: As part of the preparation and review of the annual budget, the City Manager, Planning & Development Department, and other City departments were present on October 16, 2024, and reviewed their portions of the 2025-2030 CIP, their recommended 2025 Capital Budget items, and answered questions from the City Council.

LAW OFFICES OF
TESREAU, STEBBINS & JOHNSON
NATIONAL BANK BUILDING
LEBANON, NEW HAMPSHIRE
03766

CHARLES F. TESREAU
S. JOHN STEBBINS
WILLIAM R. JOHNSON
DAVID H. BRADLEY
LAURENCE F. GARDNER

TELEPHONE
AREA CODE 603
LEBANON OFFICE
448-2211
HANOVER OFFICE
643-3737

January 24, 1968

Mr. Kenneth D. Boehner
City Manager
Lebanon, New Hampshire

Re: Donald A. & Irma W. Muzzy Property
Lebanon, New Hampshire

Dear Mr. Boehner:

As you requested, an examination of title was made as to the property owned by Mr. and Mrs. Donald A. Muzzy, portion of which is being conveyed to the City. This examination at the Grafton County Registry of Deeds covered a period from November 1, 1943 to January 22, 1968 at 4 p.m.

The premises which were the subject of the title examination, are described in a deed from Allen R. and Nora T. Kidder to Mr. and Mrs. Muzzy dated January 26, 1950 and recorded in Book 874, Page 296 in said Records.

On the basis of the above described examination of title, it is my opinion that title now vests in Donald A. and Irma W. Muzzy, as joint tenants, subject to:

(1) A right of way reserved in a deed from George M. and Mary C. Cilbrith to the Mascoma Savings Bank, dated December 28, 1935 and recorded in said Registry in Book 657, Page 231.

(2) An undischarged mortgage to the Mascoma Savings Bank from Mr. and Mrs. Muzzy dated October 10, 1961 and recorded in Book 963, Page 207.

(3) Whatever a view and accurate survey of the premises might reveal.

TESREAU, STEBBINS & JOHNSON

By Laurence F. Gardner
Laurence F. Gardner

LFG:gc



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 440,054 SF, with 14 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 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
440,054 SF, with 14 total buildings. Parking, landscaping, access, utilities, and other site
improvements are proposed as part of the Project.

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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.

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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.

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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.

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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.

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October 25, 2024

Ref: 52933.00

Tim Corwin
Deputy Planning and Development Director
City of Lebanon
51 North Park Street
Lebanon, NH 03766

Re: Trip-Generation Letter
Lebanon Brickyard Residential Development
Hanover Street, Lebanon, New Hampshire

Dear Tim:

VHB prepared and submitted an August 2024 Traffic Impact Study for the proposed Lebanon Brickyard residential development to be located along the west side of Hanover Street in Lebanon, New Hampshire. At that time, the development program consisted of constructing 474 apartment units in 10 four-story buildings. During the local permitting process, the development program has changed to consist of 474 multifamily units to include 422 apartment units, 51 townhouse units, and 1 residential unit for the property caretaker within the maintenance building. VHB has prepared this letter to summarize the trip-generation estimates for the revised build program and provide a comparison to the site trips estimated within the Traffic Impact Study. In summary, the additional trips to be generated by the current development would generally result in the same intersection operational results as those documented within the August 2024 Traffic Impact Study.

Trip Generation Methodology

To estimate the volume of traffic to be generated by the proposed project, trip rates that are published in the Institute of Transportation Engineers (ITE) Trip Generation Manual¹ were reviewed. The site trips were estimated using ITE Land Use Code 221: Multifamily Housing (Mid-Rise) for 301 apartment units (4-10 residential floors), ITE Land Use Code 220: Multifamily Housing (Low-Rise) for 121 apartment units (2-3 residential floors), and ITE Land Use Code 220: Multifamily Housing (Low-Rise) for 51 townhouse units (2-3 residential floors). The property caretaker is not anticipated to generate vehicle trips to and from the site during the peak time periods (i.e., these trips would occur off-peak). Table 1 summarizes the peak hour trip-generation estimates of the proposed development. In addition, Table 1 includes a trip comparison to those estimates evaluated within the August 2024 Traffic Impact Study. The trip-generation calculations are attached to this letter. These site trips may be higher than anticipated as residents may use the other modes of available transportation rather than personal vehicles (e.g., Advance Transit, Upper Valley Loop Trail, and pedestrian bridge over I-89).

¹ Institute of Transportation Engineers. Trip Generation Manual, 11th ed. Washington, DC, Sept. 2021.



Table 1 Trip-Generation Summary

Peak Hour/Direction	Mid-Rise Multifamily Trips ^a	Low-Rise Multifamily Trips ^b	Total Proposed Trips ^c	Traffic Study Trips ^d	Additional Trips ^e
Weekday AM					
Enter	28	18	46	45	1
Exit	93	58	151	152	(1)
Total	121	76	197	197	0
Weekday PM					
Enter	72	60	132	113	19
Exit	46	35	81	72	9
Total	118	95	213	185	28
Saturday Midday					
Enter	62	36	98	97	1
Exit	59	35	94	93	1
Total	121	71	192	190	2

a ITE Land Use Code 221: Multifamily Housing (Mid-Rise) for 301 units.

b ITE Land Use Code 220: Multifamily Housing (Low-Rise) for 172 units (121 apartment units and 51 townhouse units).

c Mid-Rise Multifamily Trips plus Low-Rise Multifamily Trips.

d ITE Land Use Code 221: Multifamily Housing (Mid-Rise) for 474 units.

e Traffic Study Trips minus Total Proposed Trips.



In comparison to the project evaluated within the Traffic Impact Study, the proposed development program is estimated to result in the same total trips during the weekday AM peak hour, 28 additional vehicle trips (19 entering and 9 exiting) during the weekday PM peak hour, and 2 additional vehicle trips (1 entering and 1 exiting) during the Saturday midday peak hour. Based on ITE methodologies² and New Hampshire Department of Transportation (NHDOT) guidance,³ a development may result in a change in vehicular operations (i.e., noticeably drop level of service or increase volume-to-capacity ratios) if the addition of site trips would increase peak hour traffic volumes at an intersection by 100 vehicles or more. 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. As shown in Table 1, the additional trips to be generated by the proposed build program would generally result in the same intersection operational results documented within the August 2024 Traffic Impact Study.

Sincerely,

VHB

A handwritten signature in blue ink that reads "Jason R. Plourde".

Jason R. Plourde, PE, PTP
Transportation Systems Team Leader

Attachments

² ITE Recommended Practice: Multimodal Transportation Impact Analysis for Site Development. Washington, DC: Institute of Transportation Engineers. 2023.

³ Bollinger, Robert E. Inter-Department Communication. New Hampshire Department of Transportation, Bureau of Traffic. 17 Feb. 2010.

Attachments

Trip-Generation 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: 301 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	1,368	684	684	1,390	695	695
	AM PEAK OF GENERATOR	105	27	78	102	27	76
	PM PEAK OF GENERATOR	117	70	47	112	67	45
	AM PEAK (ADJACENT ST)	111	26	86	121	28	93
	PM PEAK (ADJACENT ST)	117	72	46	118	72	46

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	1,376	688	688	1,346	673	673
	PEAK OF GENERATOR	117	60	58	121	62	59

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	1,136	568	568	1,092	546	546
	PEAK OF GENERATOR	96	53	43	94	52	42

ITE TRIP GENERATION WORKSHEET
(11th Edition, Updated 2021)

LANDUSE: Multifamily Housing (Low-Rise): 2-3 Story - Not Close to Rail Transit
LANDUSE CODE: 220 Independent Variable --- Number of Dwelling Units
SETTING/LOCATION: General Urban/Suburban
JOB NAME: 172 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	22	0.86	6.74	2.46	12.50	229	33	494	50%	50%
	AM PEAK OF GENERATOR	40	0.76	0.47	0.25	0.98	234	12	1,103	24%	76%
	PM PEAK OF GENERATOR	38	0.80	0.57	0.25	1.26	231	12	1,103	62%	38%
	AM PEAK (ADJACENT ST)	49	0.79	0.40	0.13	0.73	249	12	1,103	24%	76%
	PM PEAK (ADJACENT ST)	59	0.84	0.51	0.08	1.04	241	12	1,103	63%	37%

TRIPS:		BY AVERAGE			BY REGRESSION		
		Total	Enter	Exit	Total	Enter	Exit
	DAILY	1,160	580	580	1,178	589	589
	AM PEAK OF GENERATOR	81	19	61	88	21	67
	PM PEAK OF GENERATOR	98	61	37	107	66	41
	AM PEAK (ADJACENT ST)	69	17	52	76	18	58
	PM PEAK (ADJACENT ST)	88	55	32	95	60	35

SATURDAY

RATES:		# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
				Average	Low	High	Average	Low	High	Enter	Exit
	DAILY	1	--	4.55	4.55	4.55	282	282	282	50%	50%
	PEAK OF GENERATOR	1	--	0.41	0.41	0.41	282	282	282	51%	49%

TRIPS:		BY AVERAGE			BY REGRESSION		
		Total	Enter	Exit	Total	Enter	Exit
	DAILY	784	392	392	--	--	--
	PEAK OF GENERATOR	71	36	35	--	--	--

SUNDAY

RATES:		# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
				Average	Low	High	Average	Low	High	Enter	Exit
	DAILY	1	--	3.86	3.86	3.86	282	282	282	50%	50%
	PEAK OF GENERATOR	1	--	0.36	0.36	0.36	282	282	282	55%	45%

TRIPS:		BY AVERAGE			BY REGRESSION		
		Total	Enter	Exit	Total	Enter	Exit
	DAILY	664	332	332	--	--	--
	PEAK OF GENERATOR	62	34	28	--	--	--

Site Plans

Issued for	Permitting
Date Issued	May 10, 2024
Latest Issue	October 24, 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 NOTE:

TOMEHOMES REQUIRE 2 SPACES PER UNIT AS THE USE IS CONSIDERED DWELLING, ONE-FAMILY. EACH TOWNHOUSE PROVIDES 2 SPACES FULFILLING THE REQUIREMENT AT EACH UNIT. MULTIFAMILY PARKING CALCULATIONS WERE DONE SEPARATELY.

Multifamily Parking Requirements:

DWELLING, STUDIO APARTMENT	316 UNITS	x	1.0 SPACES	/	1 UNIT	=	316 SPACES
DWELLING, APARTMENT, ONE BEDROOM AND UP	106 UNITS	x	1.5 SPACES	/	1 UNIT	=	159 SPACES
TOTAL PARKING REQUIRED = 475 SPACES							
TOTAL PARKING PROVIDED (111% OF REQUIRED) = 527 SPACES							
MAXIMUM PARKING ALLOWED (120% OF REQUIRED) = 570 SPACES							

EV Parking Requirements (Included within Total Parking Required):

EVSE-INSTALLED PARKING SPACES*	527 SPACES	x	5%	=	27 SPACES
EV-READY PARKING SPACES (EVR)*	527 SPACES	x	20%	=	106 SPACES
EV-CAPABLE PARKING SPACES (EVC)*	527 SPACES	x	65%	=	343 SPACES
TOTAL EV PARKING REQUIRED (INCLUDED IN TOTAL PARKING REQUIRED)					= 476 SPACES

* REQUIRED EVSE-INSTALLED PARKING SPACES = 5% OF TOTAL PROVIDED PARKING
** REQUIRED EV-READY PARKING SPACES = 20% OF TOTAL PROVIDED PARKING
*** REQUIRED EV-CAPABLE PARKING SPACES = 65% OF TOTAL PROVIDED PARKING

Multifamily Parking Summary Chart

Description	Size		Spaces	
	Required	Provided	Required	Provided
STANDARD SPACES	9 x 18	9 x 18*	0	31
EVSE-INSTALLED PARKING SPACES**	9 x 18	9 x 18	27	28**
EV-READY PARKING SPACES***	9 x 18	9 x 18	106	108***
EV-CAPABLE PARKING SPACES****	9 x 18	9 x 18	343	345****
TOTAL/VAN ACCESSIBLE SPACES*****	8 x 18	9 x 18	10 / 2	15*****
LOADING BAYS			0	0

* 8 x 18 SPACES BELOW BUILDINGS REQUESTED AS ALTERNATE PARKING DESIGN PER SECTION 6.5.E(3) OF THE SITE PLAN REVIEW REGULATIONS. 9 x 16 SPACES AT LANDSCAPE AREAS PER SECTION 6.5.E(3) OF THE SITE PLAN REVIEW REGULATIONS.
** 28 SPACES LOCATED EXTERNALLY, 0 INTERNALLY
*** 98 SPACES LOCATED EXTERNALLY, 10 INTERNALLY
**** 128 SPACES LOCATED EXTERNALLY, 217 INTERNALLY
***** ADA/STATE/LOCAL REQUIREMENTS
***** INCLUDES 2 ACCESSIBLE STALLS BELOW EACH APARTMENT BUILDING
***** ACCESSIBLE SPACES ARE INCLUDED IN THE PARKING TOTAL

Multifamily Bicycle Parking Requirements:

SHORT TERM PARKING	422 UNITS	x	0.15 SPACES	/	1 UNIT	=	64 SPACES
LONG TERM PARKING	422 UNITS	x	0.3 SPACES	/	1 UNIT	=	127 SPACES
TOTAL PARKING REQUIRED = 191 SPACES							

Bicycle Parking Summary Chart

Description	Spaces	
	Required	Provided
SHORT TERM SPACES	64	70
LONG TERM SPACES	127	127
TOTAL SPACES	191	197



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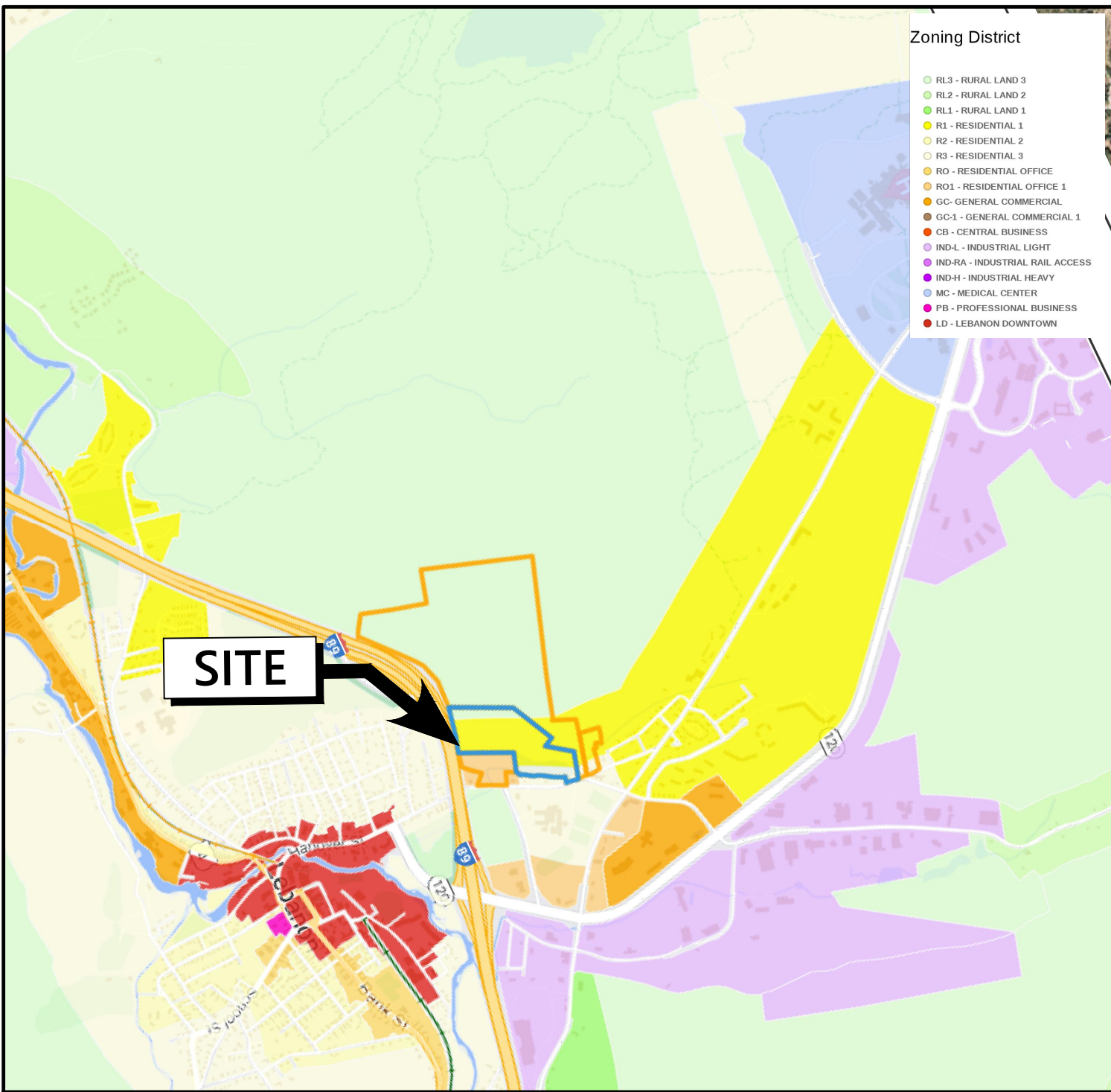


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48	0089-1202	Building 3 Proposed Plan & Elevations	August 2, 2024
49	0089-1203	Building 2 Proposed Plan & Elevations	August 2, 2024
50	0089-1204	Building 4-5 Proposed Plan & Elevations	August 2, 2024

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 (R-1)	Required (R-3)	Required (R-O-1)	Required (RL-3)	Required (PURD)	Provided (PURD)
MINIMUM LOT AREA	0.2 Acres	0.2 Acres	0.2 Acres	10.0 Acres	28.5 Acres	126.3 Acres
FRONTAGE	NA	NA	NA	20.0 Feet	20.0 Feet	932.0 Feet
FRONT YARD SETBACK	20 Feet	20 Feet	20 Feet	50 Feet	20 Feet	21 Feet
SIDE YARD SETBACK	15 Feet	15 Feet	15 Feet	50 Feet	15 Feet	89 Feet
REAR YARD SETBACK	20 Feet	20 Feet	20 Feet	50 Feet	20 Feet	127 Feet
MINIMUM LOT WIDTH	75 Feet	75 Feet	75 Feet	NA	75 Feet	932 Feet
MAXIMUM BUILDING HEIGHT*	45/55 Feet	35 Feet	45 Feet	35 Feet	55 Feet	55 Feet (R-1) 45 Feet (R-O-1) 35 Feet (R-3)
MAXIMUM BUILDING COVERAGE	25.0 %	25.0 %	25.0 %	1.0 %	25.0 %	7.2 %
MAXIMUM BUILDING COVERAGE	1,375,407 SF	1,375,407 SF	1,375,407 SF	55,016 SF	1,375,407 SF	89,350 SF
GROSS FLOOR AREA	N/A	N/A	N/A	N/A	N/A	440,054 SF
IMPERVIOUS COVERAGE	N/A	N/A	N/A	N/A	N/A	330,185 SF (26.6%)
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

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London E1, England
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Scott G. Goddard

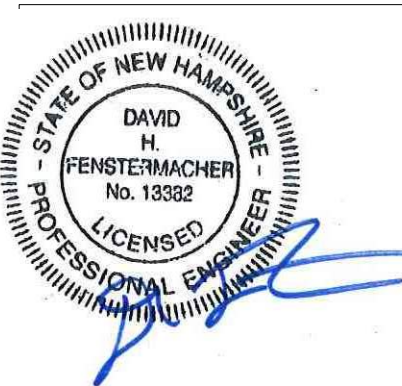
291 Main Street
Suite 8

Northborough, MA 01532

Site Information

	EXISTING	PROPOSED
GROSS FLOOR AREA	13,325 SF*	TOTAL: 440,054 SF 75,600 SF (BLDG 2, 4 AND 5) 56,700 SF (BLDG 3) 34,650 SF (BLDG 1) 4,400 SF (MAINTENANCE BLDG) 2,304 SF (TOWNHOMES)
BUILDING HEIGHT	+/- 30' (FORMER CHIMNEY)	55' (BLDG 2, 4 AND 5) 45' (TOWNHOMES, BLDGS 1 AND 3) 35' (MAINTENANCE BLDG)
NUMBER OF STORIES; GROSS FLOOR AREA OF EACH STORY	1 STORY, 8,179 SF (48-4) 2 STORIES, 1,595 SF (63-1)	5 STORIES, 18,900 SF (BLDG 2, 4 AND 5) 4 STORIES, 18,900 SF (BLDG 3) 4 STORIES, 11,550 SF (BLDG 1) 2 STORIES, 2,200 SF (MAINTENANCE BLDG) 3 STORIES, 768 SF (TOWNHOMES)
LAND USE	MANUFACTURING, STORAGE	MULTIFAMILY RESIDENTIAL

* PER CITY OF LEBANON TAX ASSESSOR DATABASE



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			TOP OF CURB ELEVATION
		BASELINE			BOTTOM OF CURB ELEVATION
		CONSTRUCTION LAYOUT			SPOT ELEVATION
		ZONING LINE			TOP & BOTTOM OF WALL ELEVATION
		TOWN LINE			
		LIMIT OF DISTURBANCE			TEST PIT LOCATION
		WETLAND LINE WITH FLAG			MONITORING WELL
		FLOODPLAIN			UNDERDRAIN
		BORDERING LAND SUBJECT TO FLOODING			DRAIN
		WETLAND BUFFER ZONE			ROOF DRAIN
		NO DISTURB ZONE			SEWER
		200' RIVERFRONT AREA			FORCE MAIN
					OVERHEAD WIRE
		GRAVEL ROAD			WATER
		EDGE OF PAVEMENT			FIRE PROTECTION
		BITUMINOUS BERM			DOMESTIC WATER
		BITUMINOUS CURB			GAS
		CONCRETE CURB			ELECTRIC
		CURB AND GUTTER			STEAM
		EXTRUDED CONCRETE CURB			TELEPHONE
		MONOLITHIC CONCRETE CURB			FIRE ALARM
		PRECAST CONC. CURB			CABLE TV
		SLOPED GRAN. EDGING			CATCH BASIN CONCENTRIC
		VERT. GRAN. CURB			CATCH BASIN ECCENTRIC
		LIMIT OF CURB TYPE			DOUBLE CATCH BASIN CONCENTRIC
		SAWCUT			DOUBLE CATCH BASIN ECCENTRIC
					GUTTER INLET
		BUILDING			DRAIN MANHOLE CONCENTRIC
		BUILDING ENTRANCE			DRAIN MANHOLE ECCENTRIC
		LOADING DOCK			TRENCH DRAIN
		BOLLARD			PLUG OR CAP
		DUMPSTER PAD			CLEANOUT
		SIGN			FLARED END SECTION
		DOUBLE SIGN			HEADWALL
					SEWER MANHOLE CONCENTRIC
		STEEL GUARDRAIL			SEWER MANHOLE ECCENTRIC
		WOOD GUARDRAIL			CURB STOP & BOX
					WATER VALVE & BOX
		PATH			TAPPING SLEEVE, VALVE & BOX
		APPROXIMATE LIMIT OF CLEARING			FIRE DEPARTMENT CONNECTION
		WIRE FENCE			FIRE HYDRANT
		FENCE			WATER METER
		STOCKADE FENCE			POST INDICATOR VALVE
		STONE WALL			WATER WELL
		RETAINING WALL			GAS GATE
		STREAM / POND / WATER COURSE			GAS METER
		DETENTION BASIN			ELECTRIC MANHOLE
		HAY BALES			ELECTRIC METER
		SILT FENCE			LIGHT POLE
		SILT SOCK / STRAW WATTLE			TELEPHONE MANHOLE
					TRANSFORMER PAD
		MINOR CONTOUR			UTILITY POLE
		MAJOR CONTOUR			GUY POLE
					GUY WIRE & ANCHOR
		PARKING COUNT			HAND HOLE
		COMPACT PARKING STALLS			PULL BOX
		DOUBLE YELLOW LINE			MATCHLINE
		STOP LINE			
		CROSSWALK			
		ACCESSIBLE CURB RAMP			
		ACCESSIBLE PARKING			
		VAN-ACCESSIBLE PARKING			

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
LDD	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

- THE PURPOSE OF THESE SITE PLANS ARE TO SHOW A PROPOSED SITE DESIGN FOR THE PERMITTING OF A MULTI-FAMILY RESIDENTIAL PROJECT.
- CONTRACTOR SHALL NOTIFY "DIG-SAFE" (1-888-344-7233) AT LEAST 72 HOURS BEFORE EXCAVATING.
- CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
- 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).
- AREAS DISTURBED DURING CONSTRUCTION AND NOT RESTORED WITH IMPERVIOUS SURFACES (BUILDINGS, PAVEMENTS, WALKS, ETC.) SHALL RECEIVE 6-INCHES LOAM AND SEED.
- WITHIN THE LIMITS OF THE BUILDING FOOTPRINT, THE SITE CONTRACTOR SHALL PERFORM EARTHWORK OPERATIONS REQUIRED UP TO SUBGRADE ELEVATIONS.
- 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.
- 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 CONTRACT DOCUMENTS, AND IN THE CONTRACT DOCUMENTS. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, AND FIRE HYDRANTS, WITHOUT APPROPRIATE PERMITS.
- TRAFFIC SIGNAGE AND PAVEMENT MARKINGS SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
- 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.
- IN THE EVENT THAT SUSPECTED CONTAMINATED SOIL, GROUNDWATER, AND OTHER MEDIA ARE ENCOUNTERED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES BASED ON VISUAL OLFATORY, 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.
- CONTRACTOR SHALL PREVENT DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE AND SHALL BE RESPONSIBLE FOR CLEANUP, REPAIRS AND CORRECTIVE ACTION IF SUCH OCCURS.
- DAMAGE RESULTING FROM CONSTRUCTION LOADS AND ACTIVITIES SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO OWNER.
- 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.
- 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 OWNER HAS ALSO FILED A NOTICE OF INTENT WITH THE EPA.
- 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.
- TREE CLEARING SHALL NOT BE CONDUCTED DURING JUNE 1 TO JULY 31 IN ORDER TO MINIMIZE ADVERSE IMPACTS TO THE NORTHERN LONG EARED BAT.
- CONTRACTOR TO FOLLOW STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (NHDOT) AND GUIDE FOR THE DEVELOPMENT OF BICYCLE FACILITIES (AASHTO) FOR CONSTRUCTIONS STANDARDS.

Utilities

- 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

- 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.
- 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.
- SET CATCH BASIN RIMS, AND INVERTS OF SEWERS, DRAINS, AND DITCHES IN ACCORDANCE WITH ELEVATIONS ON THE GRADING AND UTILITY PLANS.
- 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:
 - PAVEMENTS AND CONCRETE SURFACES: FLUSH
 - ALL SURFACES ALONG ACCESSIBLE ROUTES: FLUSH
 - LANDSCAPE, LOAM AND SEED, AND OTHER EARTH SURFACE AREAS: ONE INCH ABOVE SURROUNDING AREA AND TAPER EARTH TO THE RIM ELEVATION.

- 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.
- 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.
- UTILITY PIPE MATERIALS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED ON THE PLAN:
 - WATER PIPES SHALL BE CEMENT LINED DUCTILE IRON CLASS 52.
 - SANITARY SEWER PIPES SHALL BE POLYVINYL CHLORIDE (PVC) SEWER PIPE STD 35.
 - STORM DRAINAGE PIPES SHALL BE SMOOTH INTERIOR DUAL WALL HIGH DENSITY POLYETHYLENE (HDPE).

- CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR AND SHALL FURNISH EXCAVATION, INSTALLATION, AND BACKFILL OF ELECTRICAL FURNISHED SITEMWORK RELATED ITEMS SUCH AS PULL BOXES, CONDUITS, DUCT BANKS, LIGHT POLE BASES, AND CONCRETE PADS. SITE CONTRACTOR SHALL FURNISH CONCRETE ENCASEMENT OF DUCT BANKS IF REQUIRED BY THE UTILITY COMPANY AND AS INDICATED ON THE DRAWINGS.
- CONTRACTOR SHALL EXCAVATE AND BACKFILL TRENCHES FOR GAS IN ACCORDANCE WITH GAS COMPANY'S REQUIREMENTS.
- 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.
- CONTRACTOR TO NOTIFY ENGINEER IN ADVANCE OF ANY INSTALLATION OF UNDERGROUND DETENTION, INFILTRATION OR FILTERING SYSTEMS. A LETTER SIGNED BY A QUALIFIED ENGINEER MUST BE PROVIDED TO DES STATING THAT THE INDIVIDUAL OBSERVED ANY UNDERGROUND DETENTION, INFILTRATION, OR FILTERING SYSTEMS PRIOR TO BACKFILLING, AND WHETHER, IN HIS OR HER PROFESSIONAL OPINION, THE SYSTEM(S) CONFORM TO THE APPROVED PLANS AND SPECIFICATIONS.

Layout and Materials

- DIMENSIONS ARE FROM THE FACE OF CURB, FACE OF BUILDING, FACE OF WALL, AND CENTER LINE OF PAVEMENT MARKINGS, UNLESS OTHERWISE NOTED.
- CURB RADII ARE 3 FEET UNLESS OTHERWISE NOTED.
- CURBING SHALL BE PRECAST CONCRETE (PCC) WITHIN THE SITE UNLESS OTHERWISE INDICATED ON THE PLANS.
- 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.
- PROPOSED BOUNDS AND ANY EXISTING PROPERTY LINE MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A LICENSED LAND SURVEYOR (LLS).
- 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

- 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, FOUNDATIONS AND UNSUITABLE MATERIAL BENEATH AND FOR A DISTANCE OF 10 FEET BEYOND THE PROPOSED BUILDING FOOTPRINT INCLUDING EXTERIOR COLUMNS.
- 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.
- CONTRACTOR SHALL DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUTES.
- 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 RELATED TO ANY CONDITIONS DISCOVERED DURING EXECUTION OF THE WORK.
- 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 ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY CLAIMS OF LOSS, DAMAGE, EXPENSE, DELAY, INJURY OR 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 AMENDMENT INVOLVING THE ISSUES OF PRESENCE, DISCOVERY, REMOVAL, ABATEMENT OR DISPOSAL OF ASBESTOS OR OTHER HAZARDOUS MATERIALS.

Existing Conditions Information

- BASE PLAN: PROVIDED BY VHB, INC., DATED NOVEMBER, 2022. FIELD SURVEY OF PROJECT LOCUS PROVIDED BY VHB, IN SEPTEMBER THRU NOVEMBER, 2022.
- TOPOGRAPHY: ELEVATIONS ARE BASED ON NAVD 1988.

Local Permits

- NOTICE OF ACTION ISSUED BY THE PLANNING BOARD: PENDING
- BUILDING PERMIT TO BE SUBMITTED.
- WATER USE PERMIT TO BE SUBMITTED
- SEWER USE PERMIT TO BE SUBMITTED

State Permits

- NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES (NHDES) ALTERATION OF TERRAIN PERMIT AOT-TO BE SUBMITTED.
- NHDES SEWER CONNECTION PERMIT TO BE SUBMITTED.
- NHDES WETLANDS AND NON-SITE SPECIFIC PERMIT TO BE SUBMITTED.

Federal Permits

- US EPA NPDES CONSTRUCTION GENERAL PERMIT (CGP) NOTICE OF INTENT TO BE SUBMITTED

Document Use

- THESE PLANS AND CORRESPONDING CADD 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 AUTOMATED CONVERSION OF THIS DOCUMENT SHALL BE AT THE USER'S SOLE RISK WITHOUT LIABILITY OR LEGAL EXPOSURE TO VHB.
- 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.
- 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.
- 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 NHFGreview@wildlife.nh.gov. EMAIL SUBJECT LINE:
 - 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.
 - 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 FIS 1002.04.
 - THE NHF&G, INCLUDING ITS EMPLOYEES AND AUTHORIZED AGENTS, SHALL HAVE ACCESS TO THE PROPERTY DURING THE TERM OF THE PERMIT.
- ENV-WQ 1506.15 REQUIRES THAT:
 - 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. TUBE REINFORCEMENT MATS SHALL BE COVERED WITH SOIL TO PREVENT EXPOSURE OF THE MATS TO THE SURFACE.



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The Brickyard
Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

No.	Revision	Date	Apprv.
1	Response to Comments Update	08/06/24	DF
2	Revised Layout Resubmission	10/24/24	DF

Designed by	TMD	Checked by	MJV
Issued for		Date	

Permitting May 10, 2024

Not Approved for Construction

Drawing Title

Legend and General Notes

Drawing Number

C1.0

Sheet 1 of 50



Project Number
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- 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

TRAILS

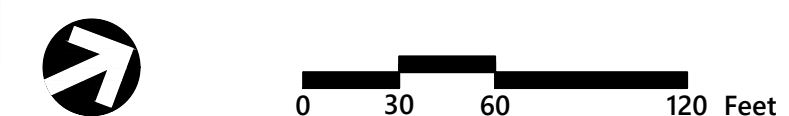
LEBANON CONSERVATION & PUBLIC LANDS
PROTECTION LEVEL

Limited
Permanent
Sub-Div Open Space

NH CONSERVATION LAND

125 Feet

PROJECT LIMIT OF WORK



**174 Hanover Street Extension
Lebanon, New Hampshire 03766**

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TMD	MJV

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Drawing Title

Abutter and Zoning Plan



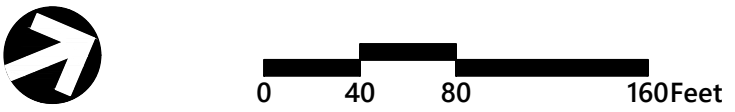
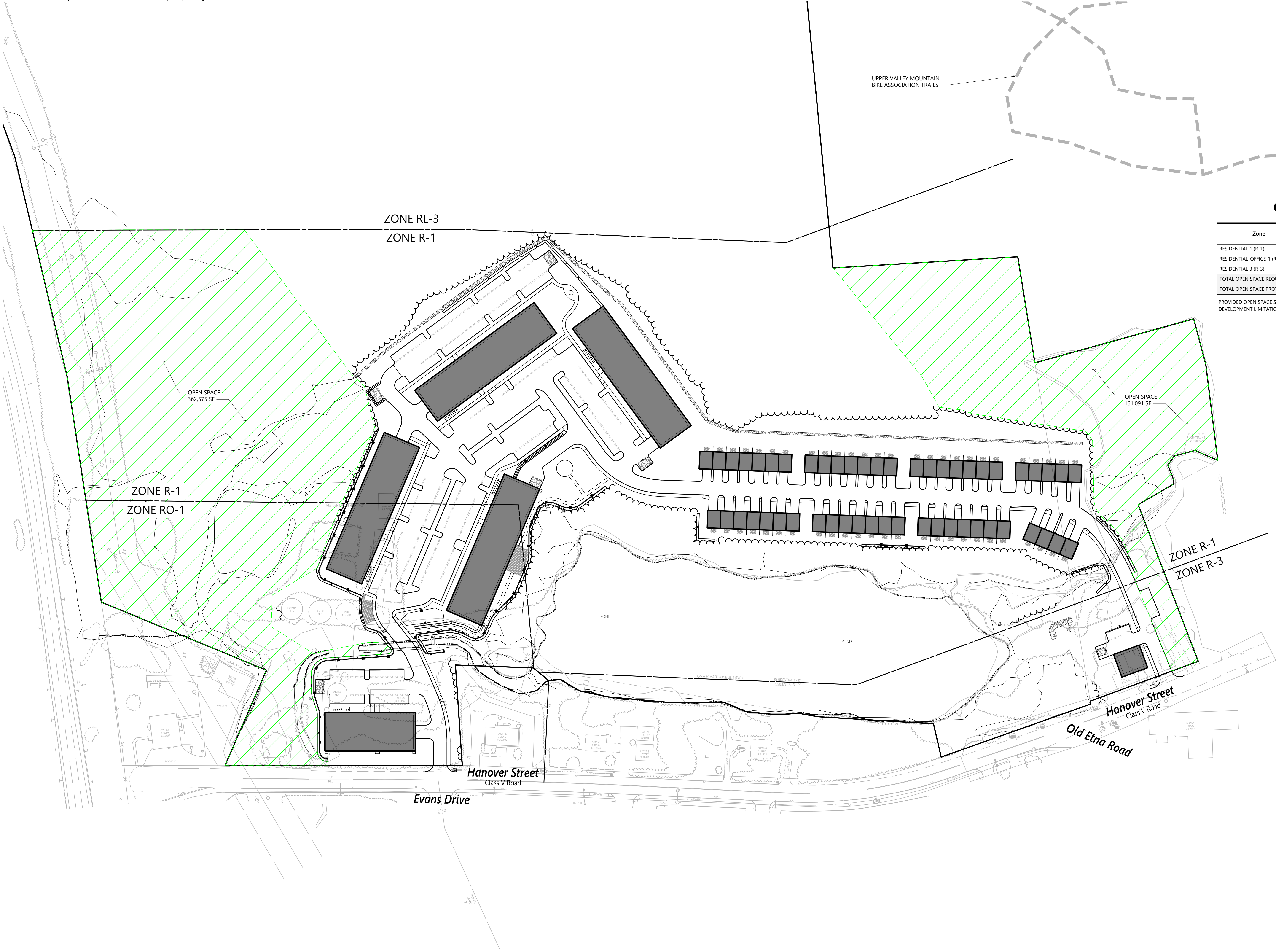
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Open Space Calculations

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.



The Brickyard
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174 Hanover Street Extension
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Issued for Permitting	Date May 10, 2024

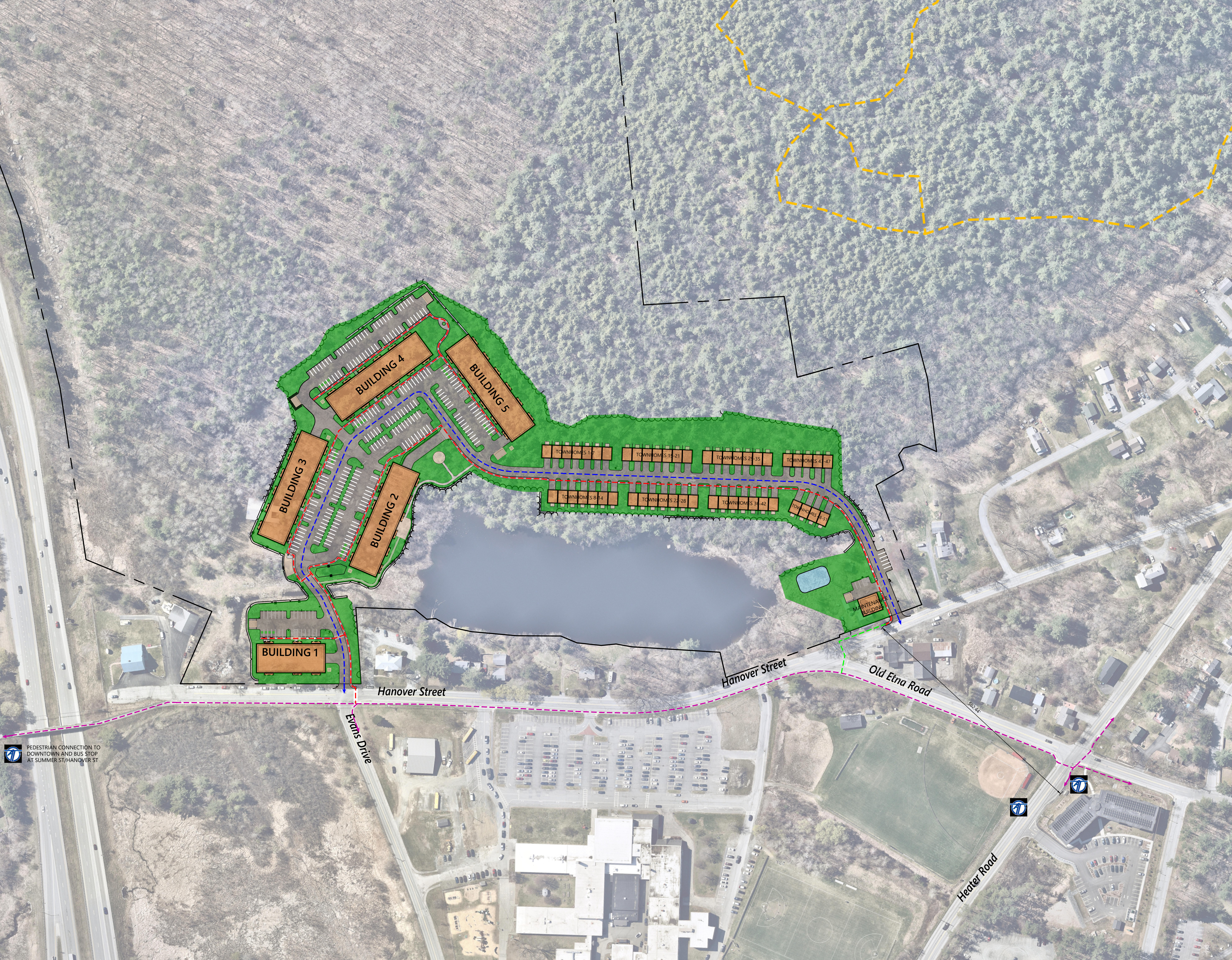
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Drawing Title
Open Space Plan
Drawing Number



C1.2

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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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TMD	MJV

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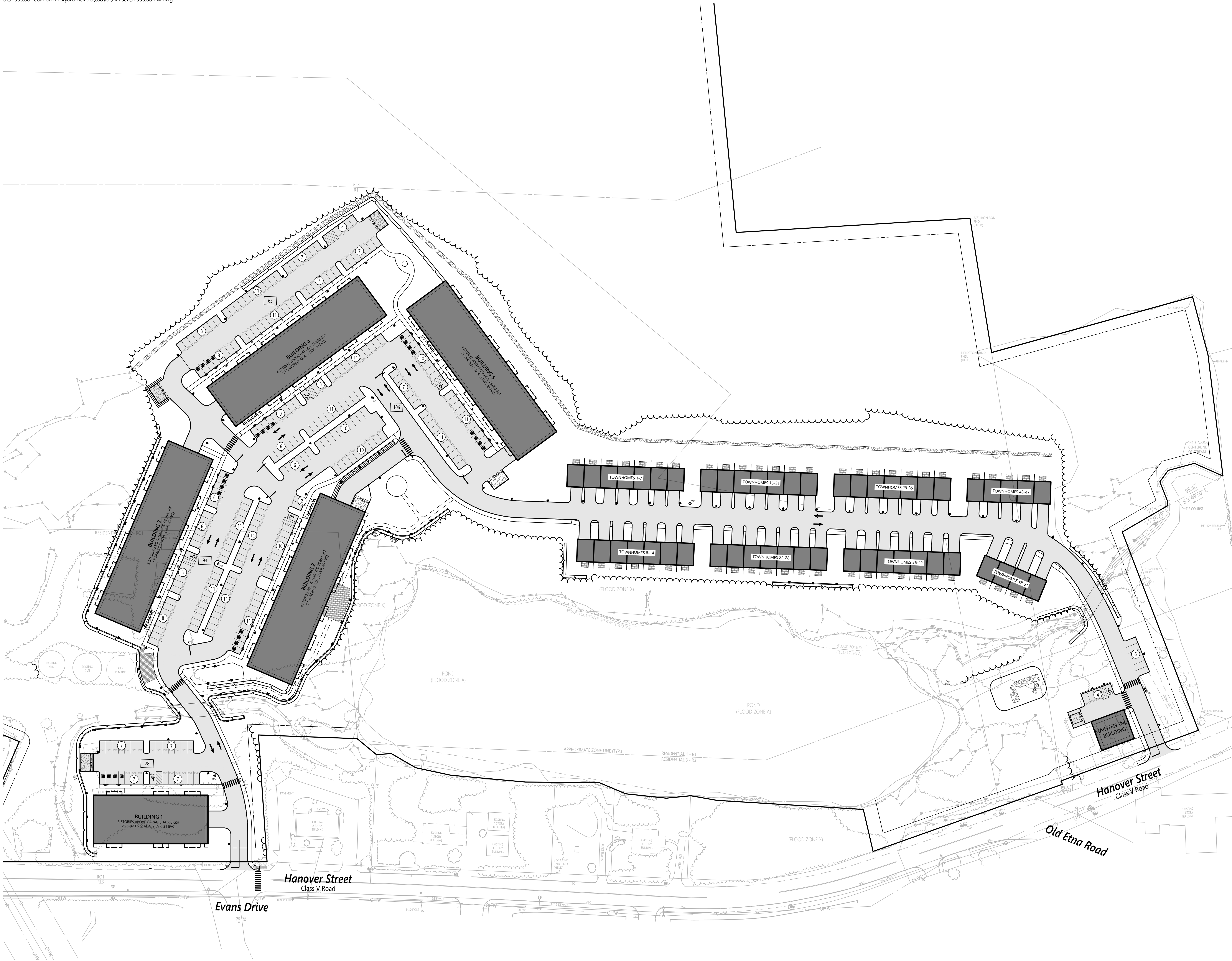
Access and Circulation Plan

Drawing Number: C1.3

Sheet 4 of 50

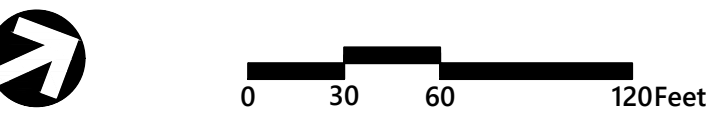
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Notes

- EVC ELECTRIC VEHICLE CAPABLE PARKING SPACE
EVR ELECTRIC VEHICLE READY PARKING SPACE



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1	Response to Comments Update	08/06/24	DF
2	Revised Layout	10/09/2024	DF
3	Revised Layout Resubmission	10/24/24	DF

Designed by	TMD	Checked by	MJV
Issued for	Permitting	Date	May 10, 2024

Not Approved for Construction
Drawing Title
Overall Site Plan



C1.4

Sheet 5 of 50

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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



The Brickyard Residential Development

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3	Revised Layout Resubmission	10/24/24	DF

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Checked by MJV
Issued for Permitting
Date May 10, 2024

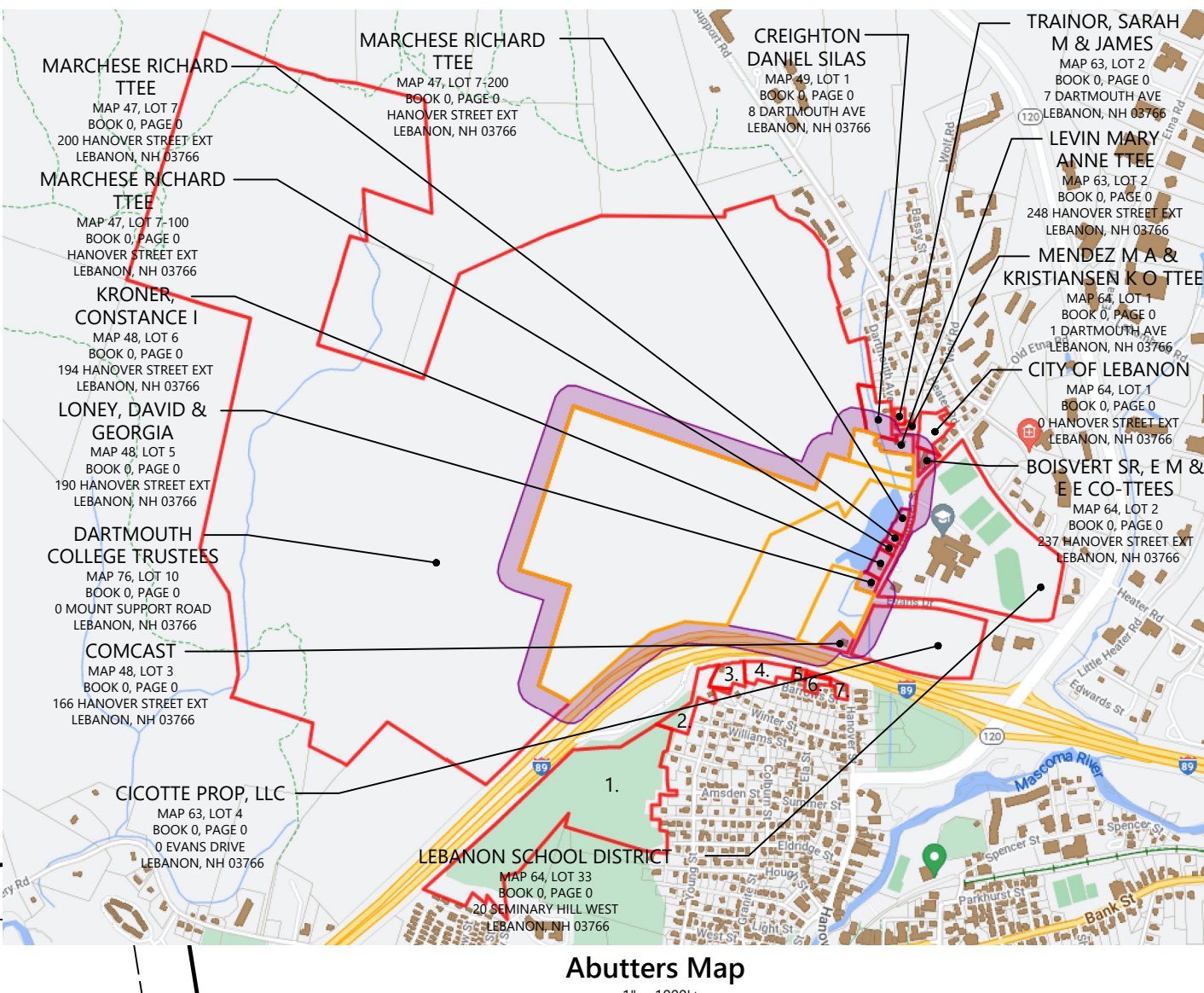
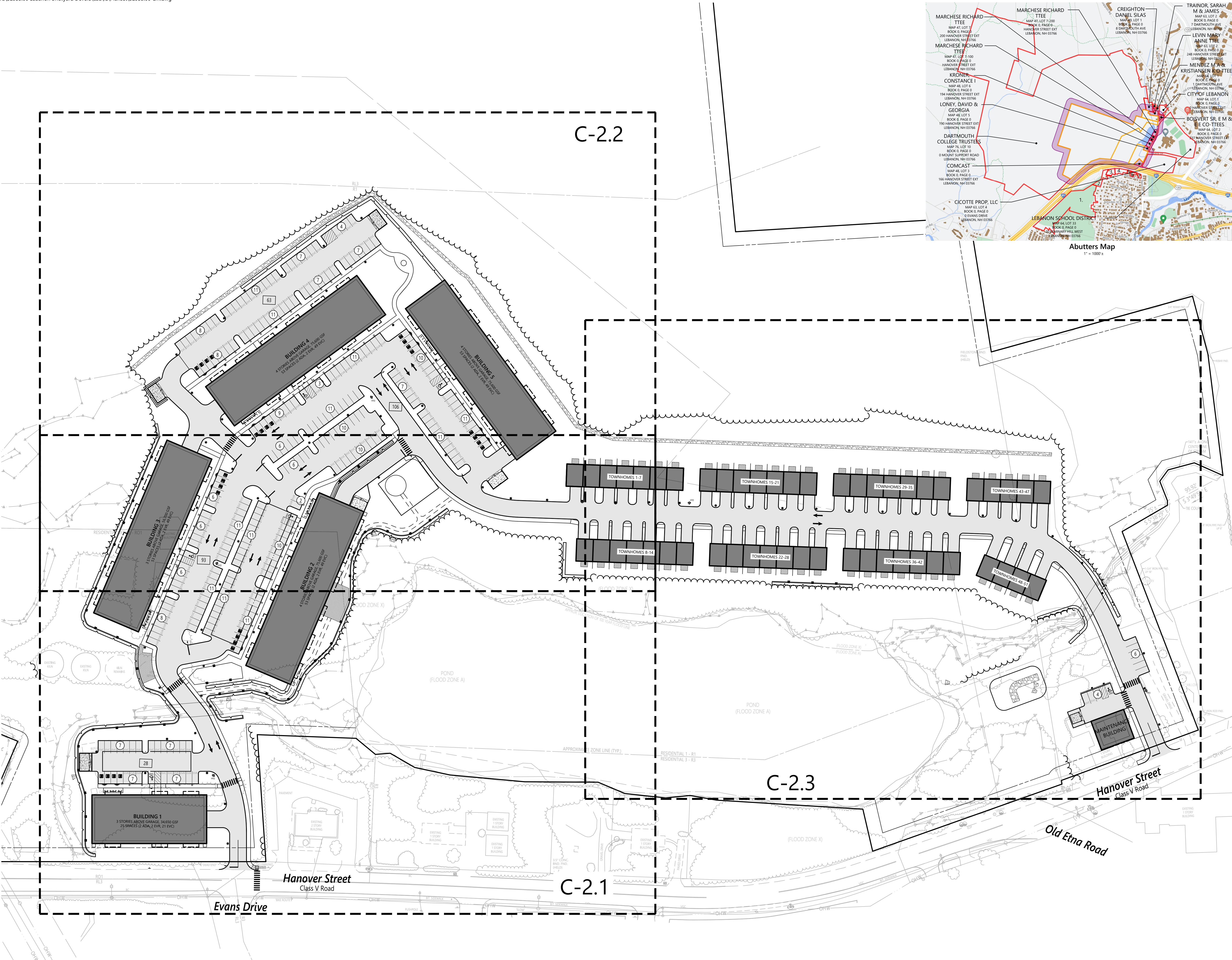
Not Approved for Construction
Drawing Title
Overall Layout and
Materials Plan

Drawing Number

C2.0

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Sign Summary

M.U.T.C.D. Number	Specification Width	Height	Desc.
R1-1	30"	30"	
R7-1	12"	18"	
R7-8	12"	18"	
R7-8P	12"	6"	
D9-11B	12"	18"	
D9-11BP	12"	12"	

SNOW STORAGE AREA



The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

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Designed by: TMD
Issued for: Permitting
Checked by: MJV
Date: May 10, 2024

Not Approved for Construction
Drawing Title: Layout and Materials
Plan 1

Sheet 7 of 50
Project Number 52933.00
Page 37 of 476

C2.1

DAVID H. FENSTERMACHER
No. 15382
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW HAMPSHIRE



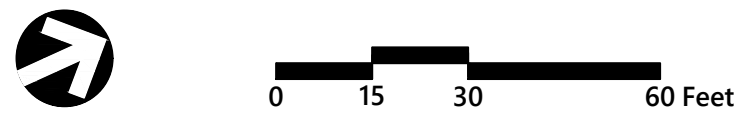




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SNOW STORAGE AREA



The Brickyard Residential Development

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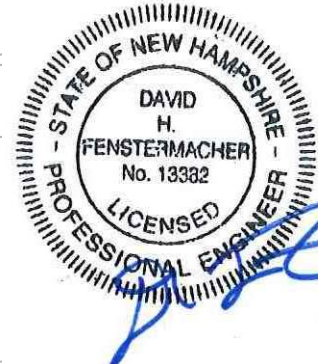
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Designed by	TMD	Checked by	MJV
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Layout and Materials
Plan 3



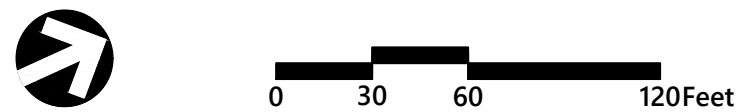
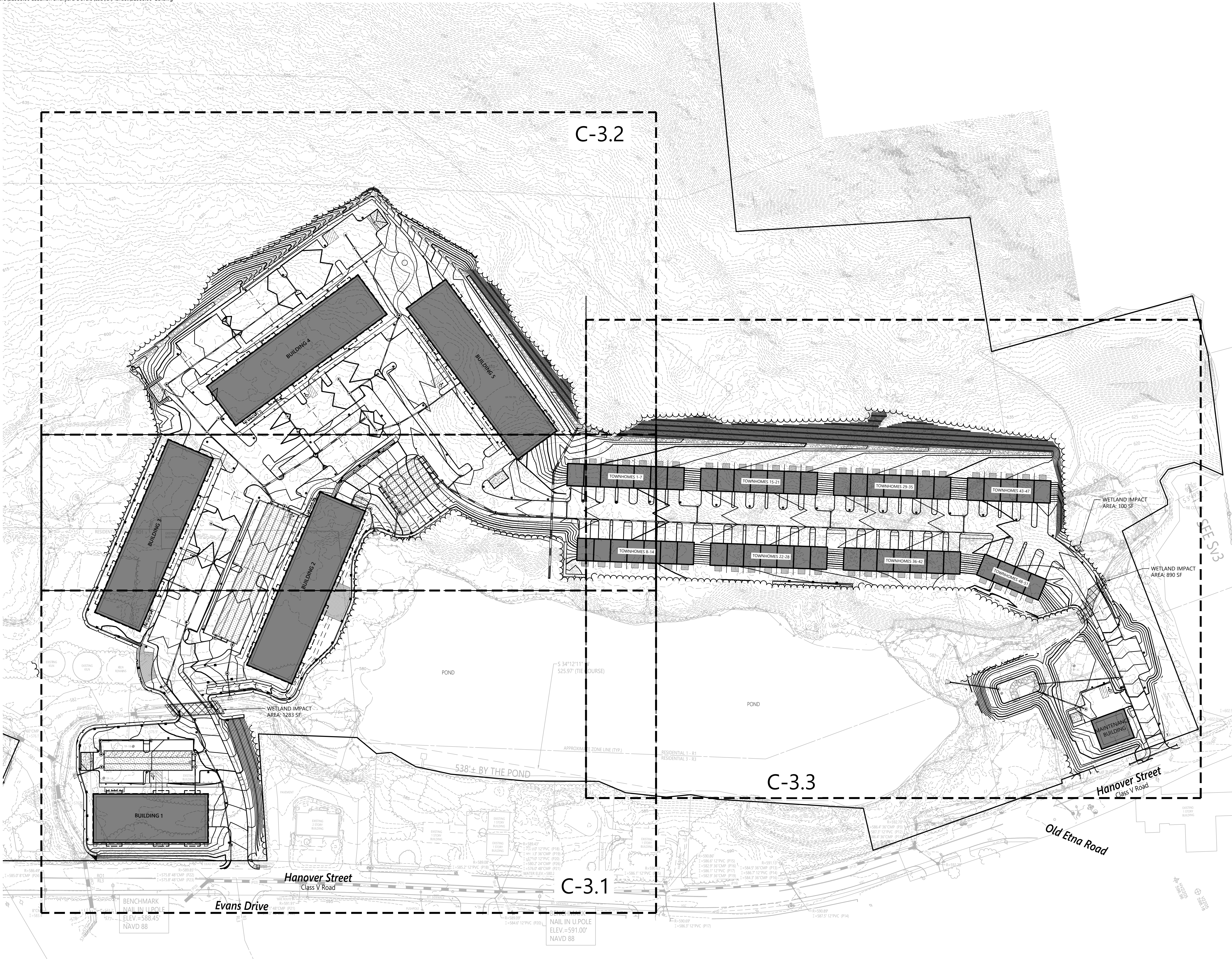
C2.3

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The Brickyard Residential Development

174 Hanover Street Extension
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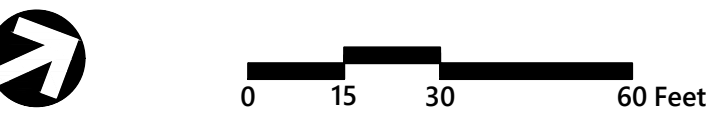
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Overall Grading
and Drainage Plan



C3.0

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Project Number
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74 Hanover Street Extension
Lebanon, New Hampshire 03766

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C3.1

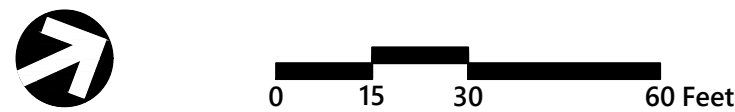
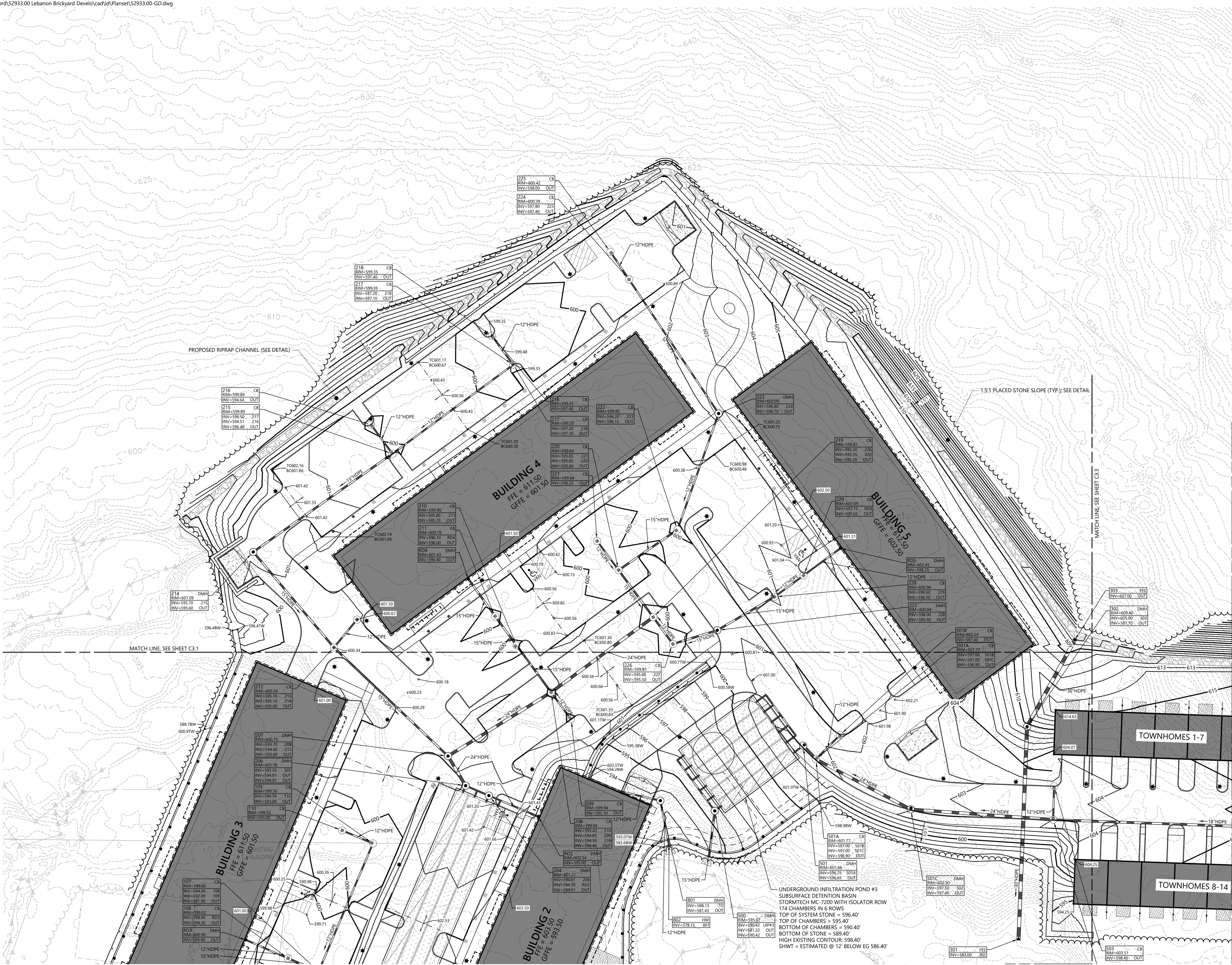
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Project Number

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The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

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1	Response to Comments Update	08/06/24	DF
2	Revised Layout Resubmission	10/24/24	DF

Designed by **TMD** Checked by **MJV**

Issued for **Permitting** Date **May 10, 2024**

Not Approved for Construction

Drawing Title
**Grading and Drainage
Plan 2**

Drawing Number

C3.2

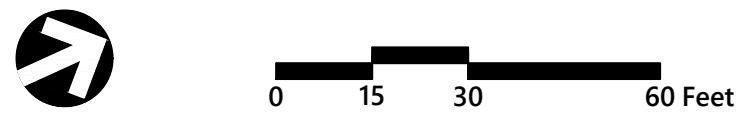
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Project Number
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Professional Engineer
DAVID H. FENSTERMACHER
No. 15392
LICENSED



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Suite 200
Bedford, NH 03110
603.391.3900



The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

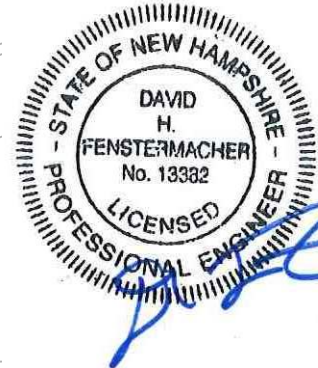
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Date May 10, 2024

Permitting

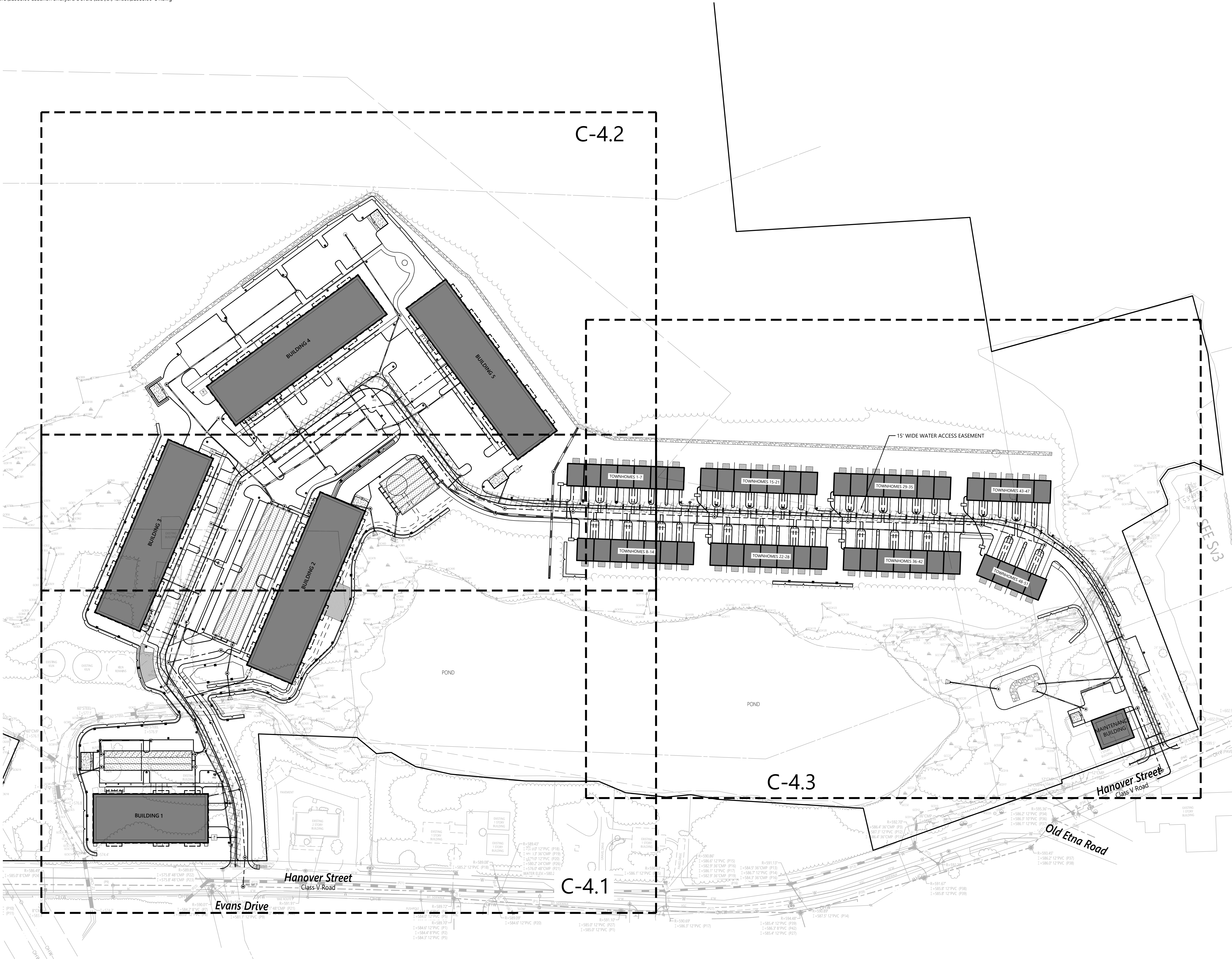
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Drawing Title
Grading and Drainage
Plan 3

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C3.3
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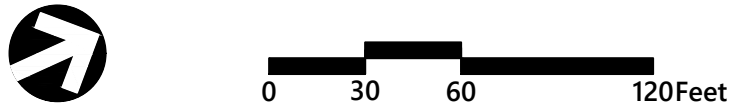




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NOTE:
1) AN ACCESS AND MAINTENANCE EASEMENT BENEFITING THE CITY OF LEBANON WILL BE PROVIDED FOLLOWING WATER INFRASTRUCTURE ACROSS THE SITE, WHICH WILL BE OWNED BY THE CITY OF LEBANON. THE EASEMENT BOUNDARIES WILL BE PROVIDED FOR CITY REVIEW FOLLOWING 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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Issued for	Permitting	Date	May 10, 2024

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Overall Utility Plan

Drawing Number



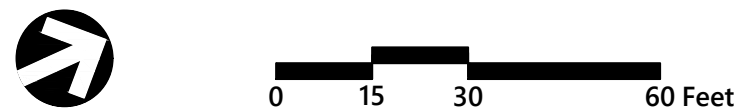
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Utility Plan 1

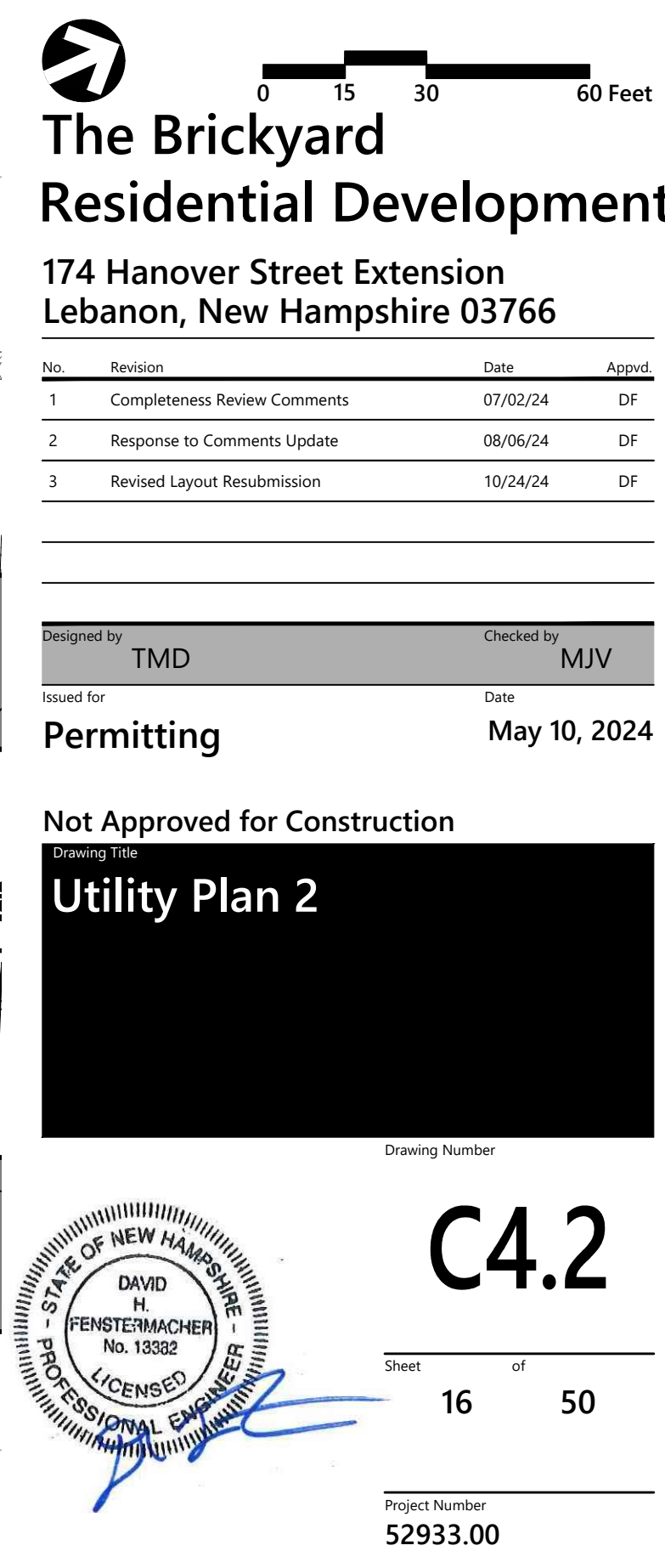
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C4.1

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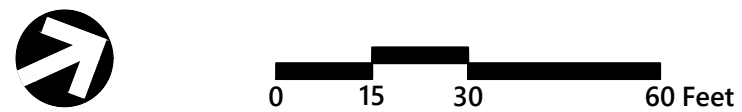
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Utility Plan 3

STATE OF NEW HAMPSHIRE
DAVID H. FENSTERMACHER
No. 15382
LICENSED PROFESSIONAL ENGINEER

C4.3

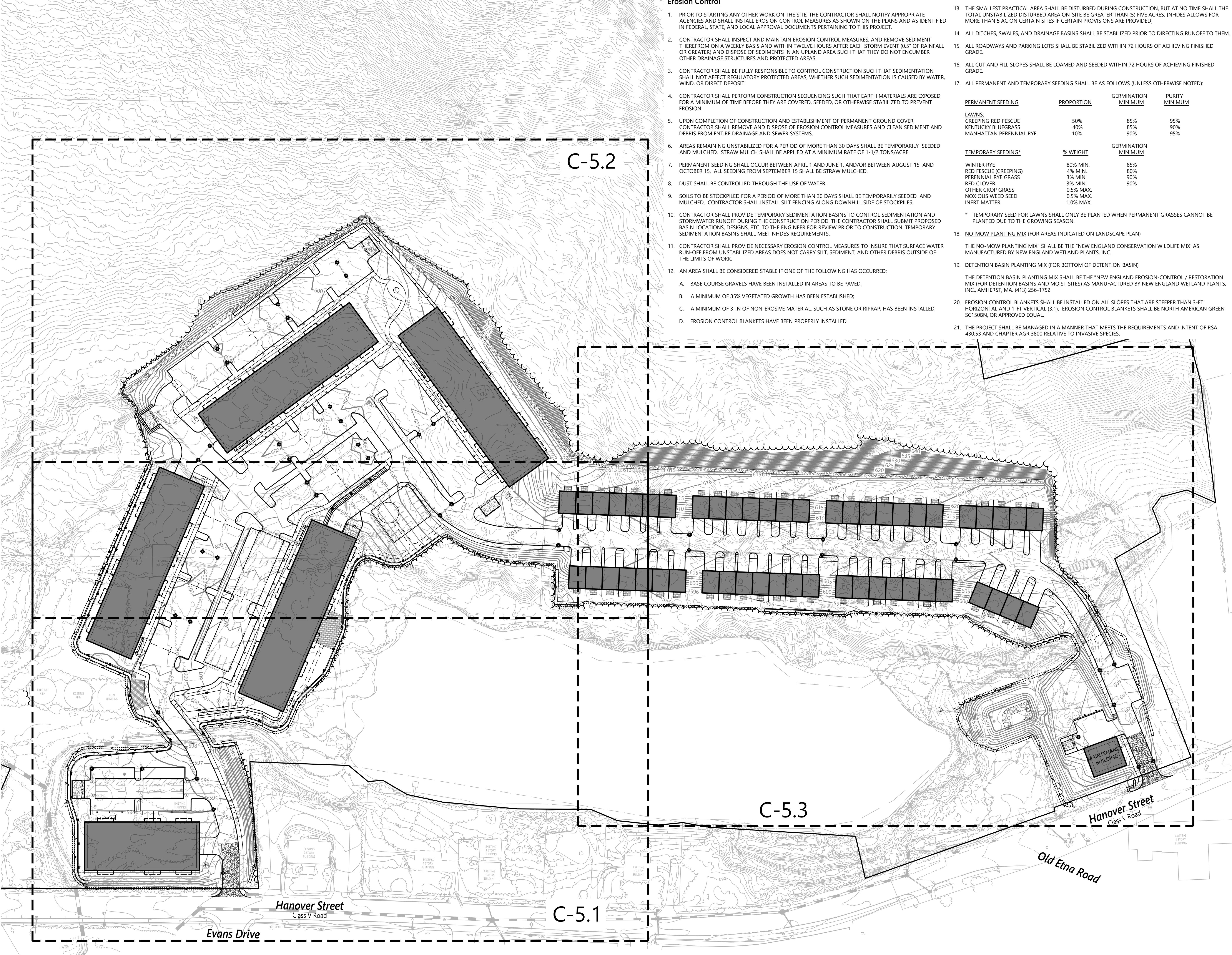
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Project Number: 52933.00

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2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900



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, SEED,ED, 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 SEED,ED AND MULCH,ED. 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 MULCH,ED.
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 SEED,ED AND MULCH,ED. 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 SEED,ED 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)

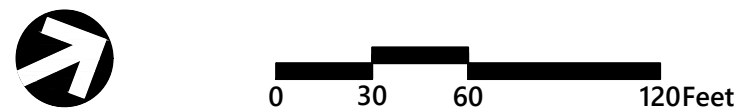
THE NO-MOW PLANTING MIX* SHALL BE THE "NEW ENGLAND CONSERVATION WILDLIFE MIX" AS MANUFACTURED BY NEW ENGLAND WETLAND PLANTS, INC.

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-FT 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 Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

No.	Revision	Date	Appr'd.
1	Response to Comments Update	08/06/24	DF
2	Revised Layout Resubmission	10/24/24	DF

Designed by	TMD	Checked by	MJV
Issued for		Date	May 10, 2024

Permitting

Not Approved for Construction

Overall Erosion
Control Plan



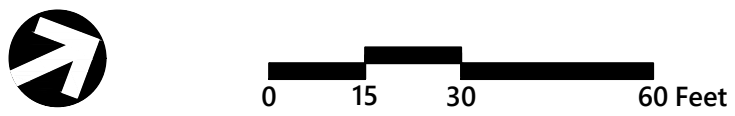
C5.0

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Project Number
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174 Hanover Street Extension
Lebanon, New Hampshire 03766

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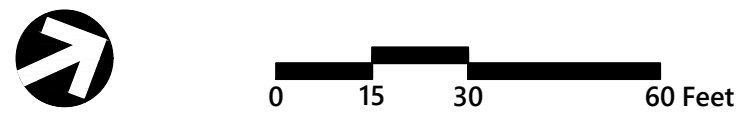
Drawing Title
Erosion Control Plan 1

Drawing Number



C5.1

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**The Brickyard
Residential Development**

174 Hanover Street Extension
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Permitting

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Drawing Title
Erosion Control Plan 2

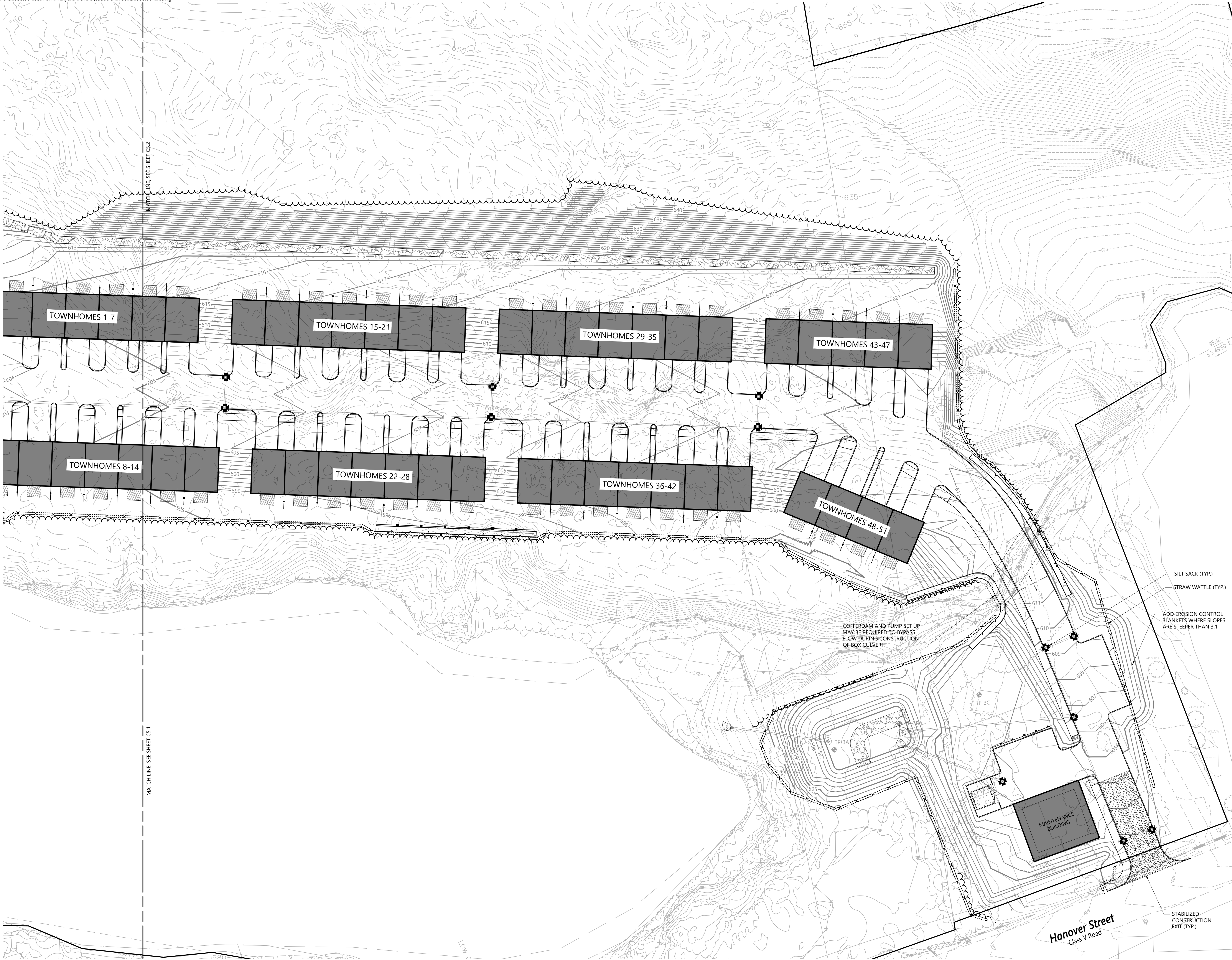
Drawing Number
C5.2

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52933.00

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STATE OF NEW HAMPSHIRE
DAVID H. FENSTERMACHER
No. 15392
LICENSED PROFESSIONAL ENGINEER



The Brickyard
Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

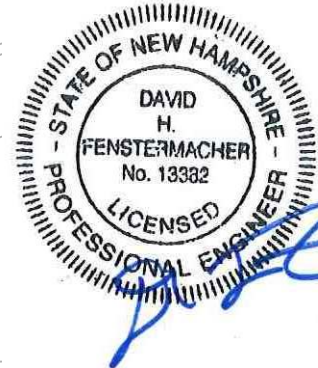
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1	Response to Comments Update	08/06/24	DF
2	Revised Layout Resubmission	10/24/24	DF

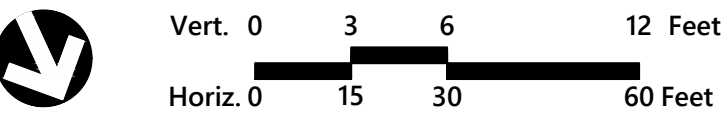
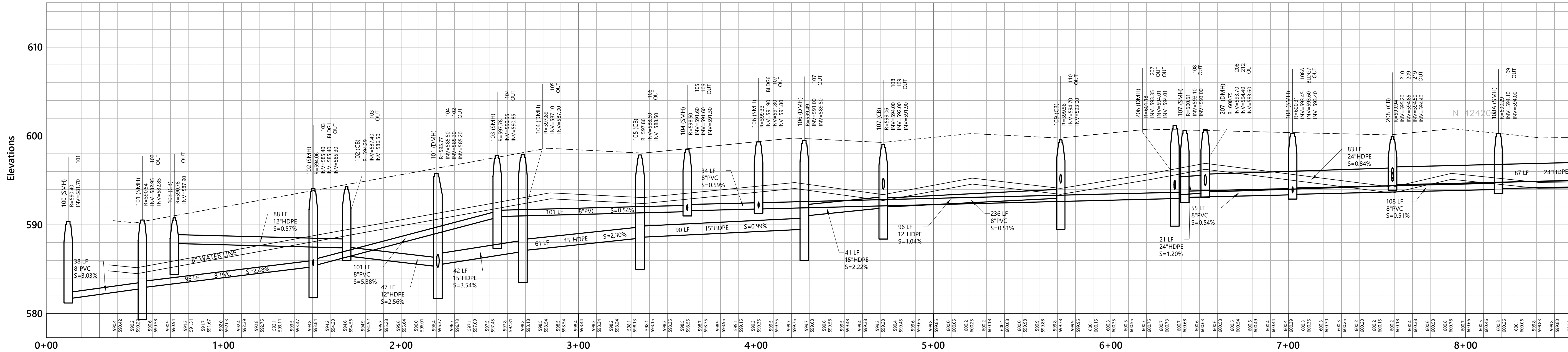
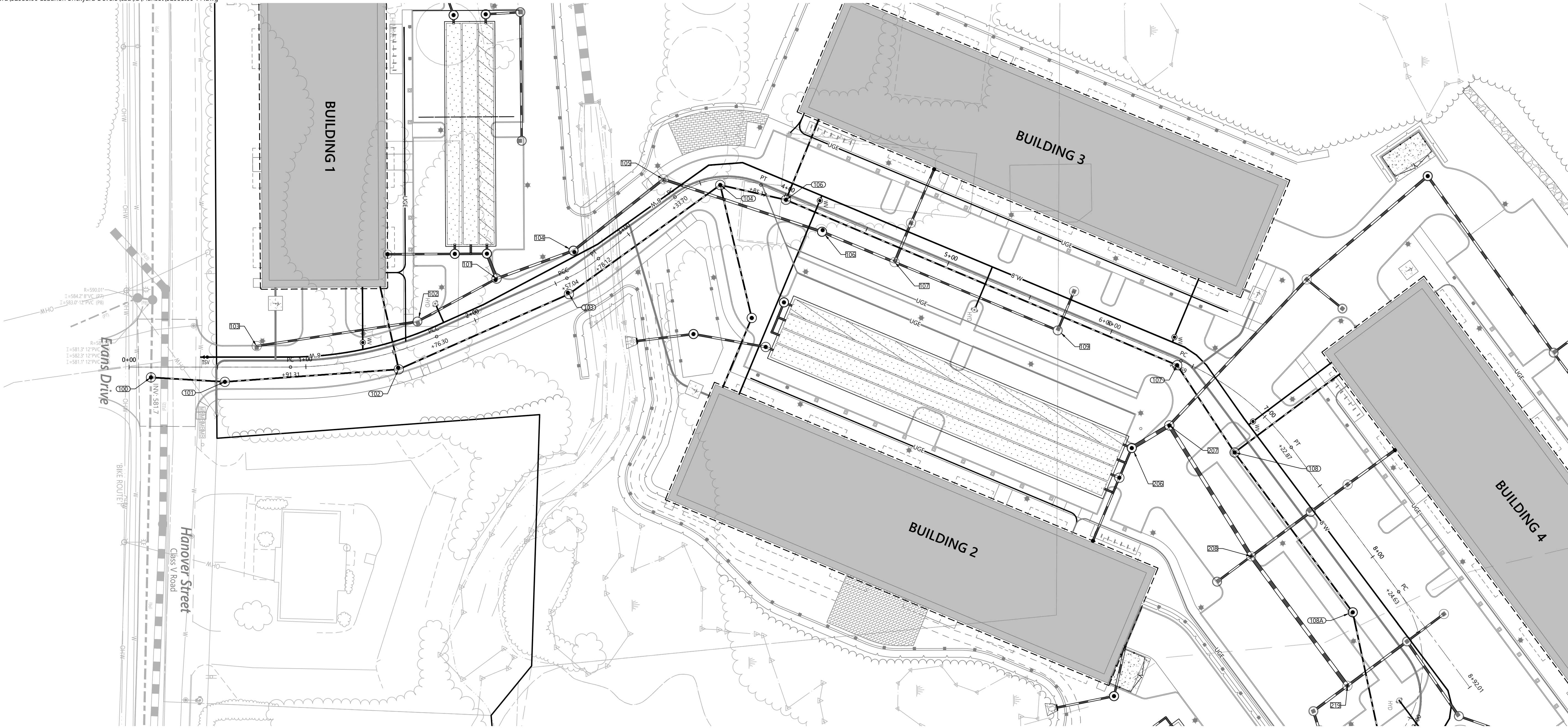
Designed by	TMD	Checked by	MJV
Issued for		Date	May 10, 2024

Permitting

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Erosion Control Plan 3





The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

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Designed by
TMD

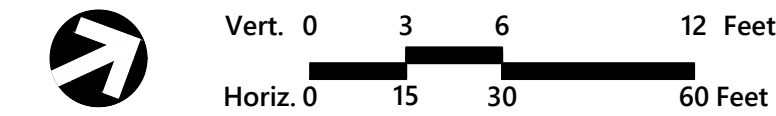
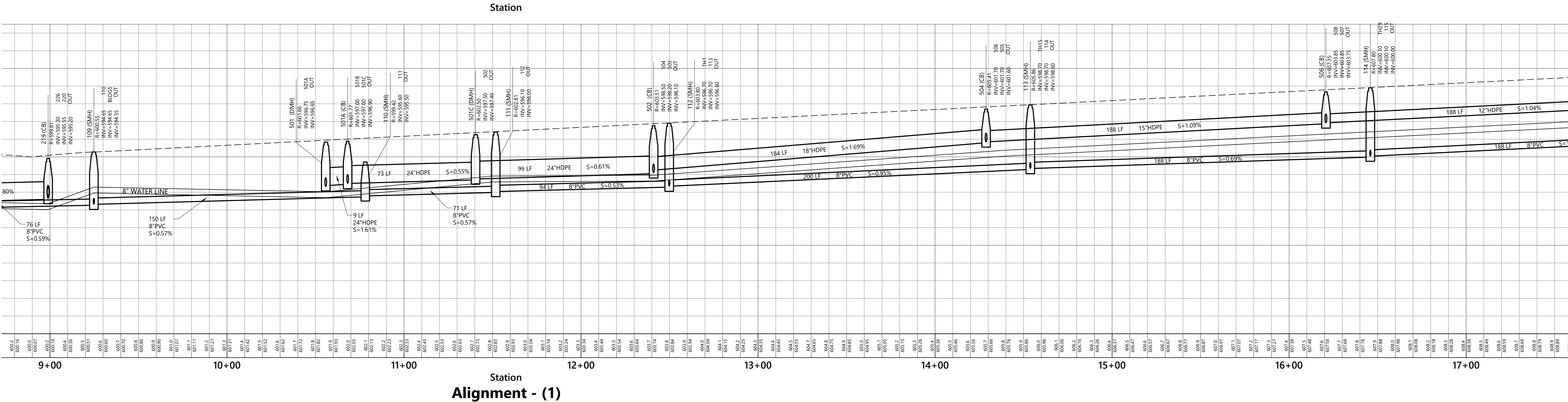
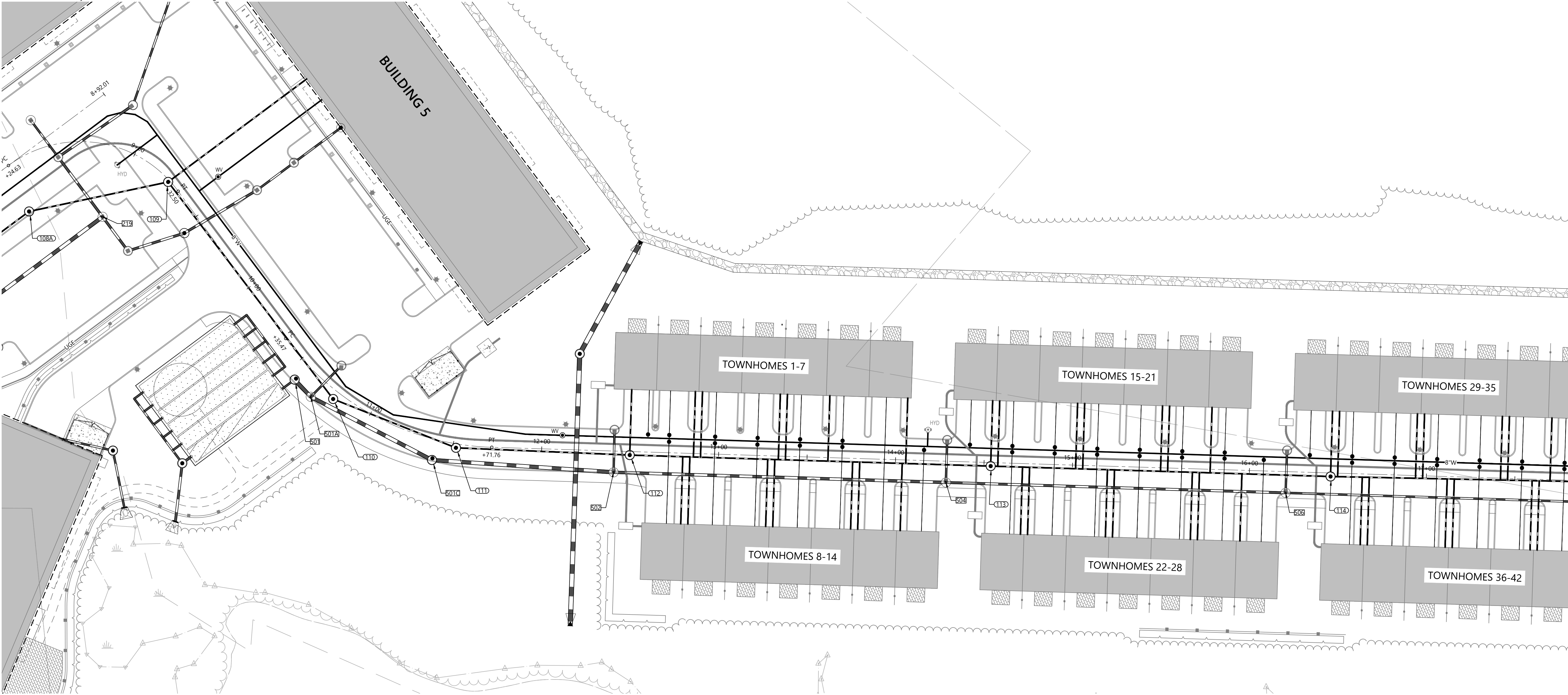
Checked by
MJV

Issued for

Date
May 10, 2024

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Drawing Title
**Plan and Profile 1
Sewer, Drainage and Water**



The Brickyard Residential Development

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Drawing Title
Plan and Profile 2
Sewer, Drainage and Water

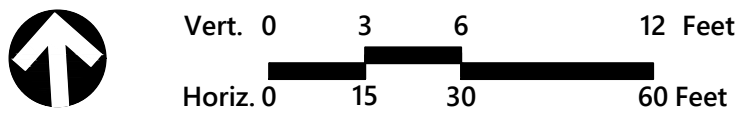
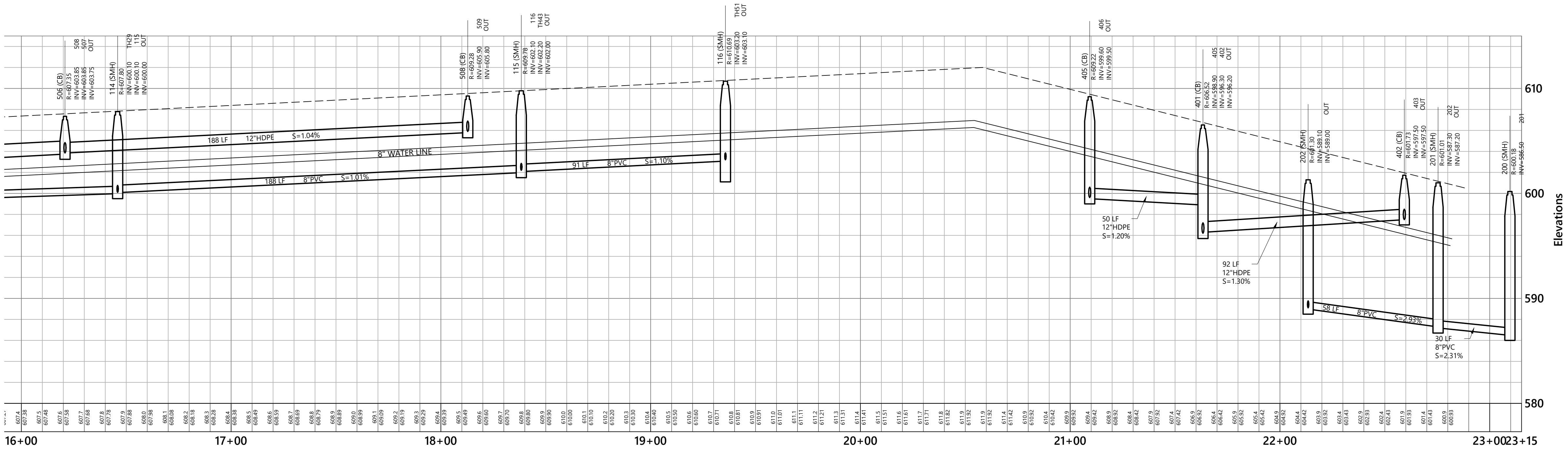


C6.2

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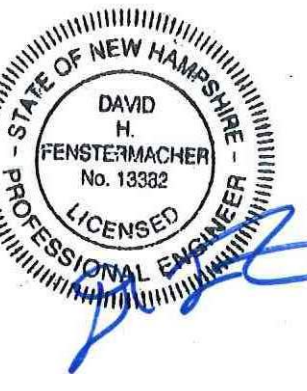
The Brickyard Residential Development

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Lebanon, New Hampshire 03766

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Designed by	Checked by
TMD	MJV
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Drawing Title
Plan and Profile 3
Sewer, Drainage and Water



C6.3

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Bollard 12/19/2018
 N.T.S. Source: VHB REV LD_700

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

STANDARD DUTY FLEXIBLE PAVEMENT

NOTES

PAVEMENT SECTIONS ARE SUBJECT TO CHANGE AND WILL BE BASED ON THE RESULTS OF FURTHER GEOTECHNICAL INVESTIGATIONS.

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	LD_702

NOTES

1. PAVEMENT MARKINGS TO BE INSTALLED FOR ON SITE WORK IN LOCATIONS SHOWN.

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	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_847

Future EV Charging Vault
N.T.S.

Modular Retaining Wall			10/20
N.T.S.	Source: VHB	REV	LD_750

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Issued for Permitting	Date May 10, 2024

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Detail Sheet 1

Drawing Number

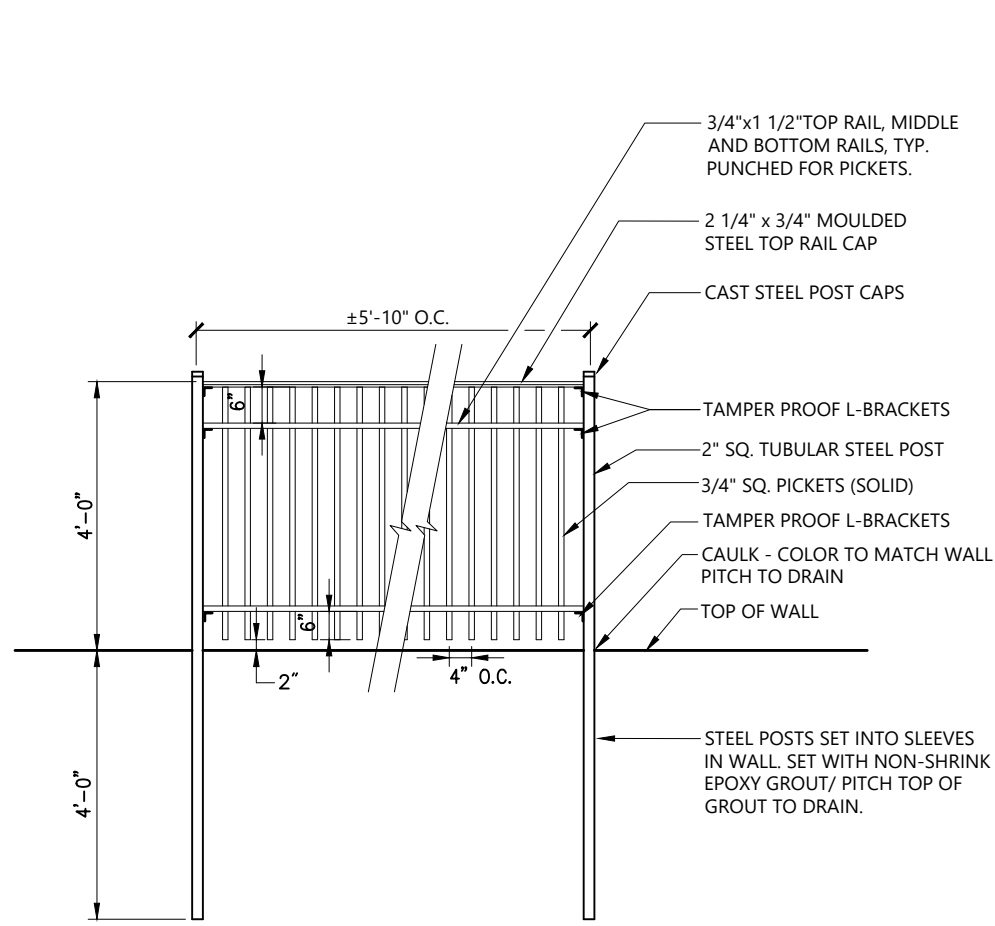
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Project Number
52933.00

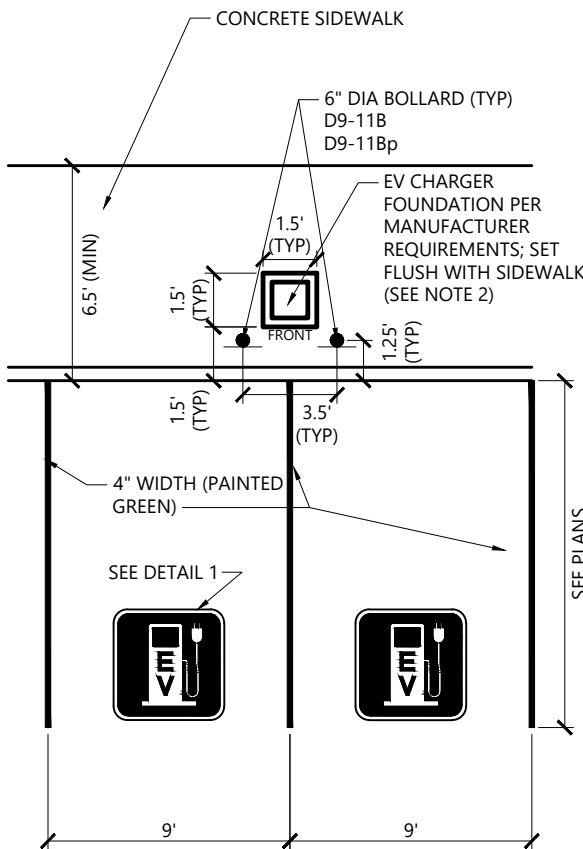


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- NOTES:
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, BASED ON FIELD MEASUREMENTS, FOR APPROVAL PRIOR TO FABRICATION.
 - ALL STEEL SHALL BE HOT DIPPED GALVANIZED WITH FACTORY APPLIED EPOXY ENAMEL FINISH TO MATCH EXISTING FENCE.

4' Ht. Metal Fence on Wall 5/23
N.T.S. Source: VHB LD_

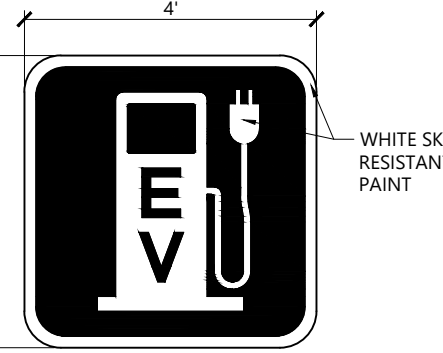


- NOTES
- ALL DIMENSION TO CENTER OF STRIPING.
 - FOR FUTURE EV CHARGING LOCATIONS, CONTRACTOR SHALL INSTALL A 18"W x 18"H x 24"D CONCRETE SECTION WITH EV CHARGING VAULT INSET WITHIN (SEE DETAIL).

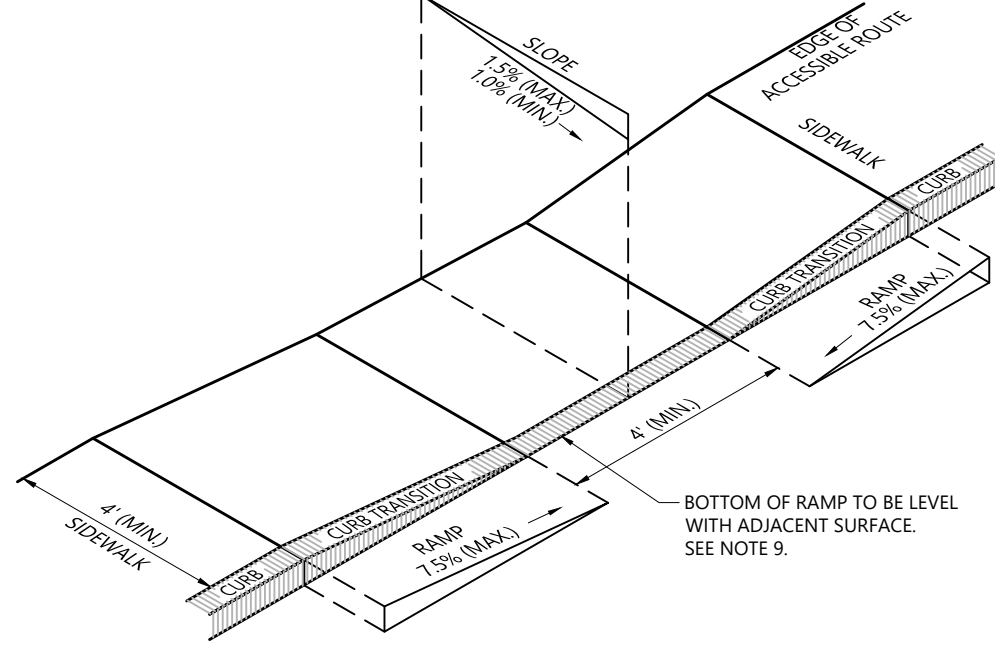
Electric Vehicle Charging Spaces
N.T.S. Source: VHB

Sign Summary

M.U.T.C.D. Number	Specification	Width	Height	Desc.
D9-11B	12"	18"		
D9-11BP	12"	12"		



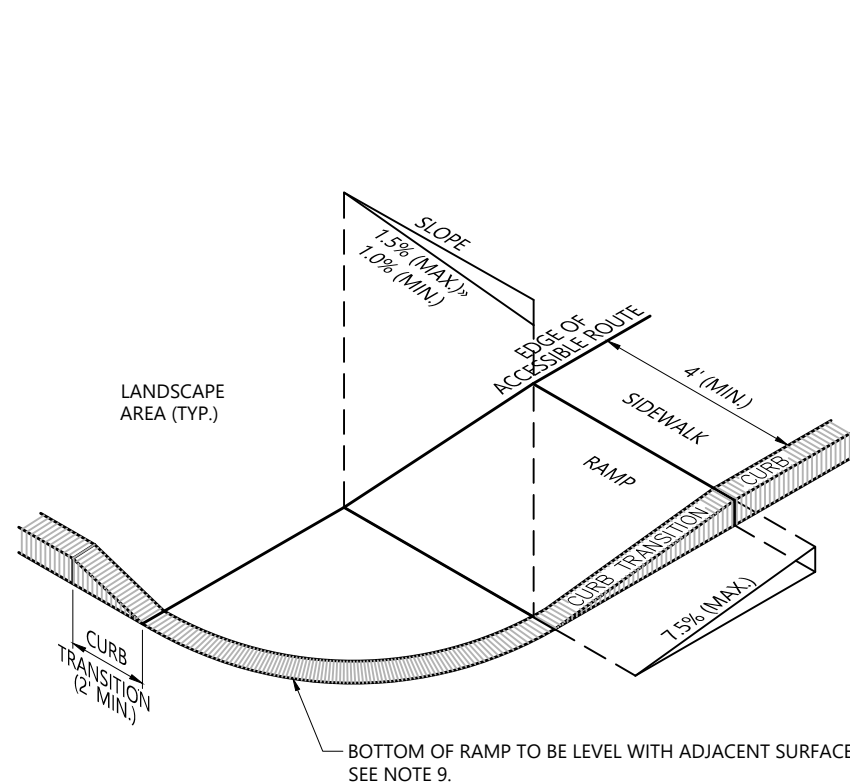
DETAIL 1



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.

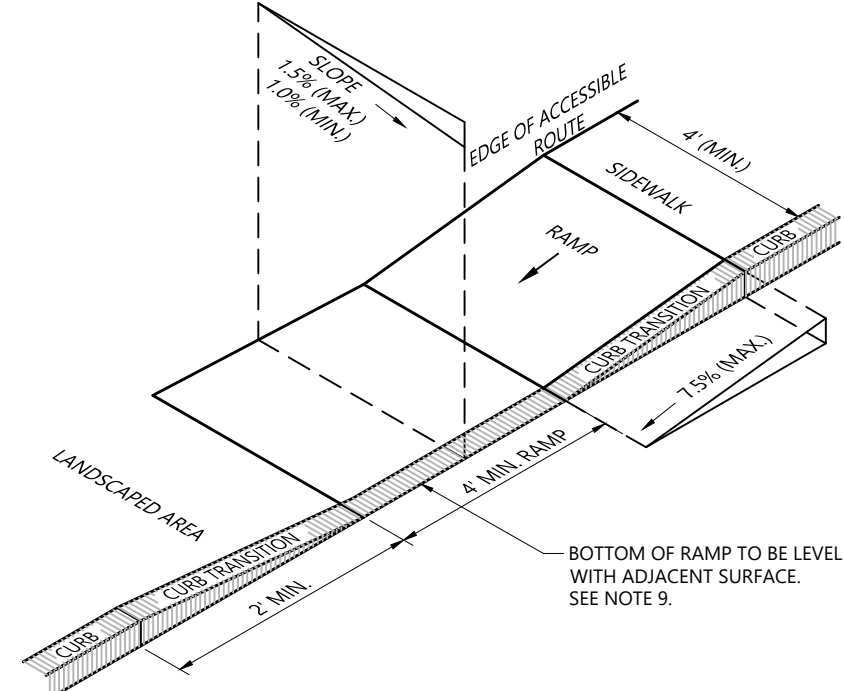
Accessible Curb Ramp (ACR) Type 'A' 12/20
N.T.S. Source: VHB REV LD_500



NOTES

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- ELIMINATE CURBING AT RAMP WHERE IT ABUTS ROADWAY, EXCEPT WHERE VERTICAL CURBING IS INDICATED ON THE DRAWINGS TO BE INSTALLED AND SET FLUSH.

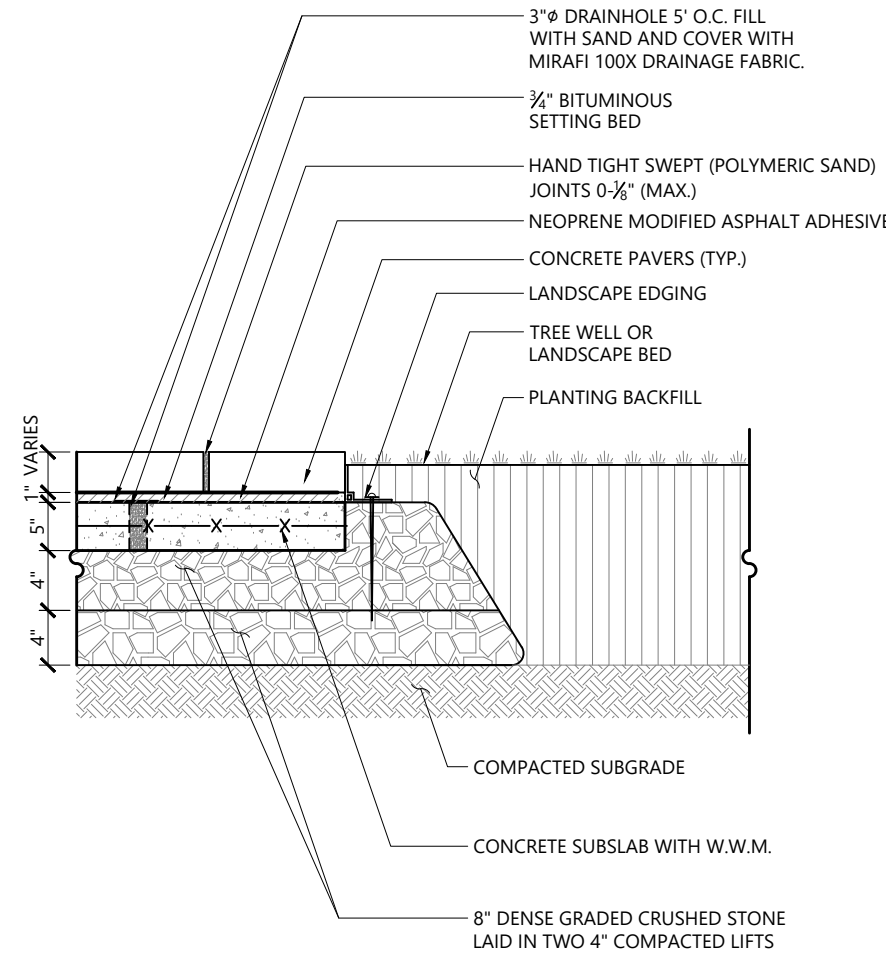
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N.T.S. Source: VHB REV LD_501



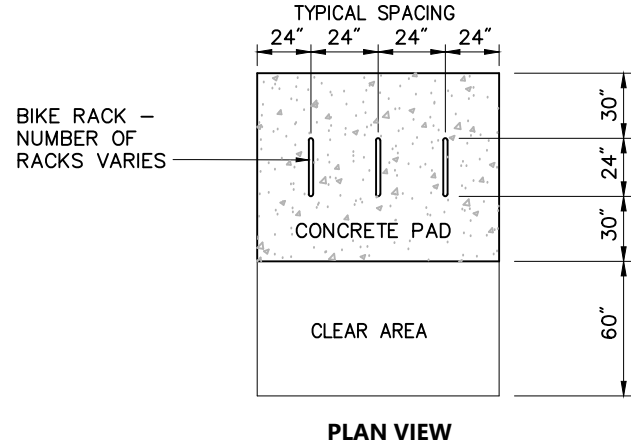
NOTES

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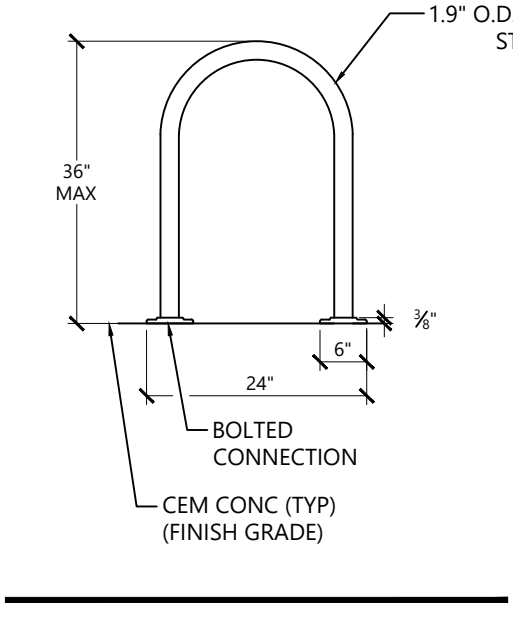
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N.T.S. Source: VHB REV LD_506



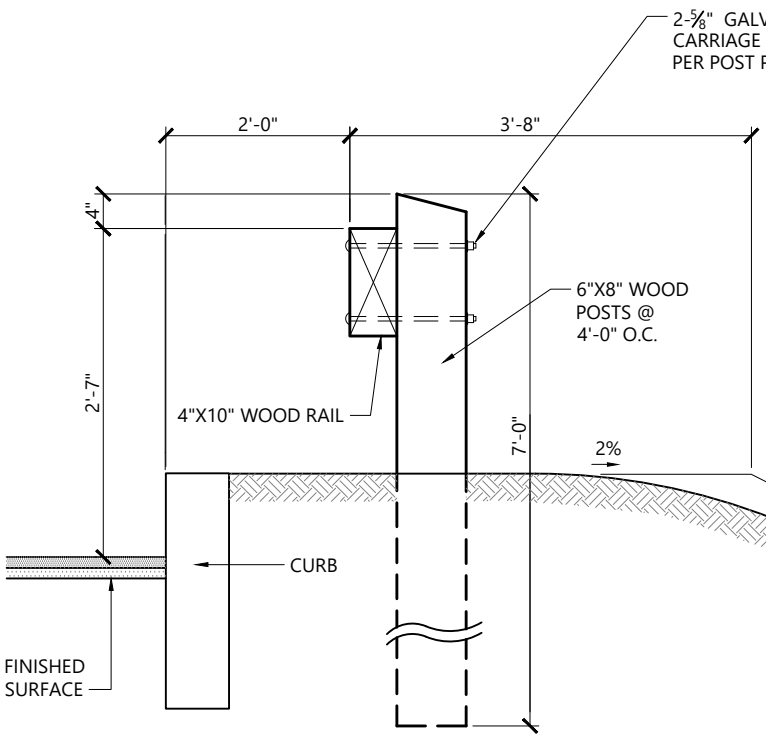
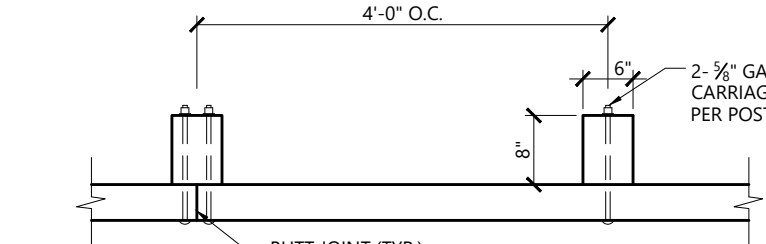
Unit Paver on Concrete Base at Landscape Edge 1/16
N.T.S. Source: VHB REV LD_830-B



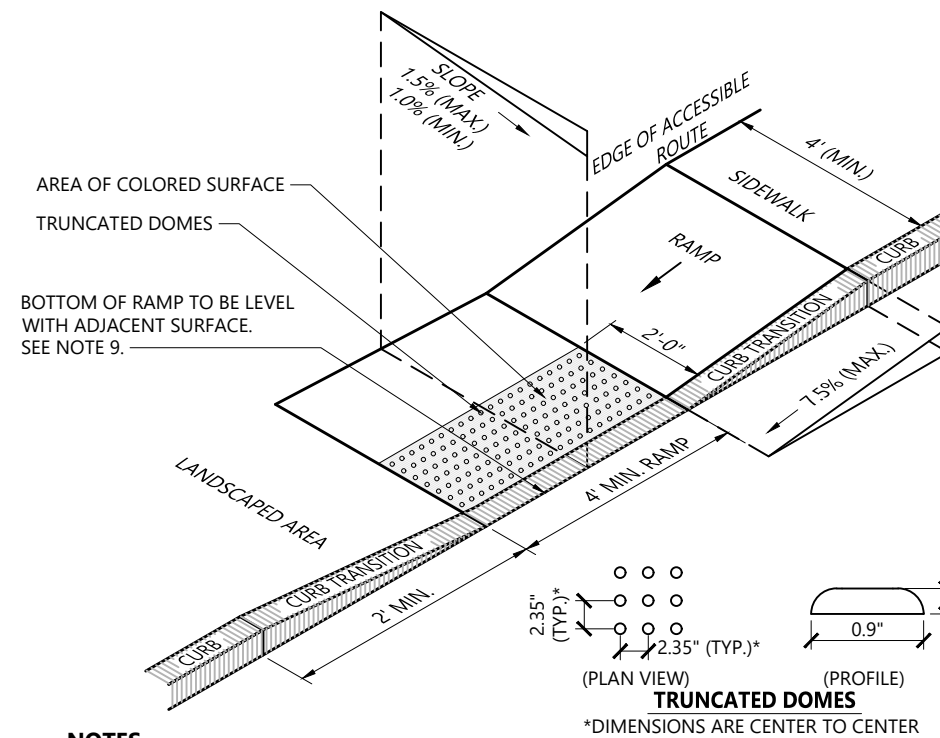
PLAN VIEW



Bicycle Parking
N.T.S. Source: VHB



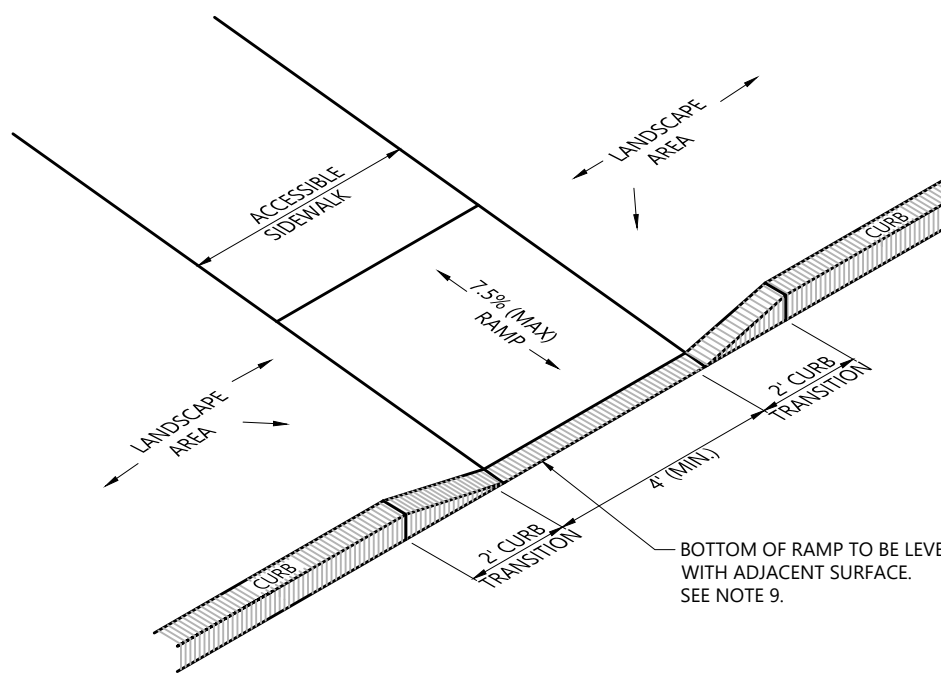
Wood Guardrail 10/20
N.T.S. Source: VHB REV LD_450



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- 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.

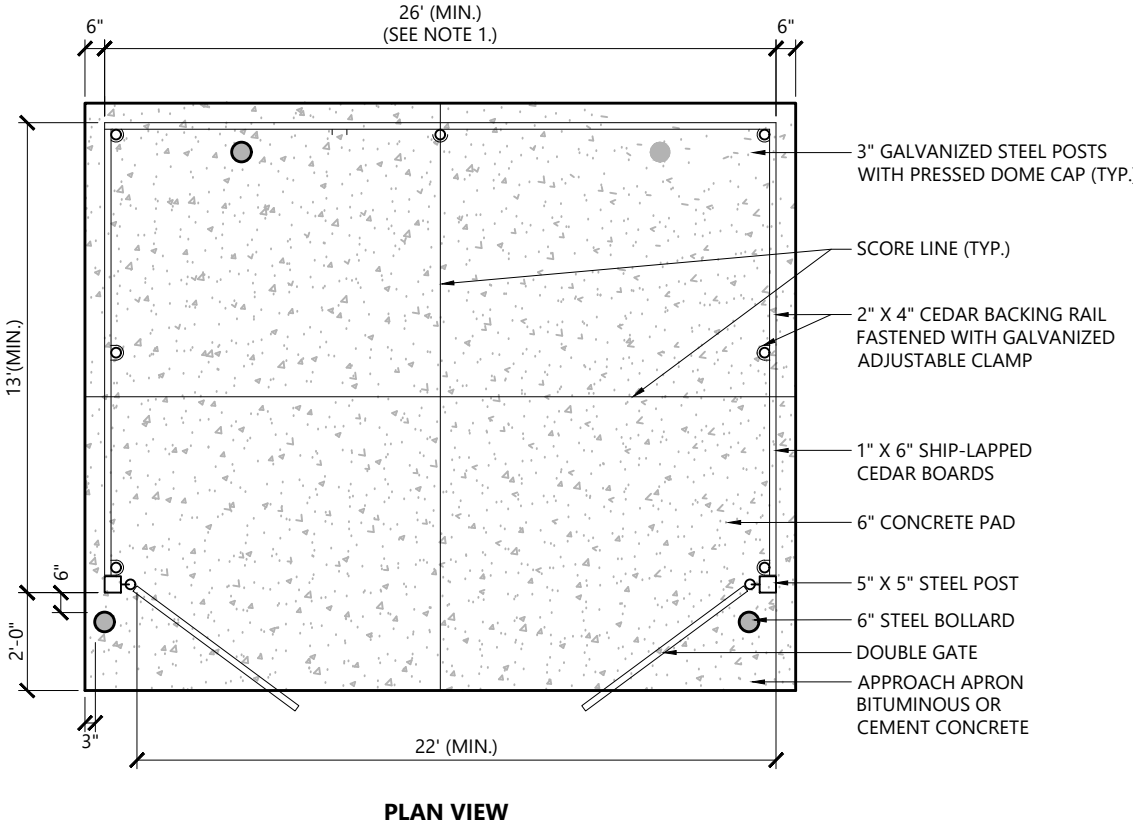
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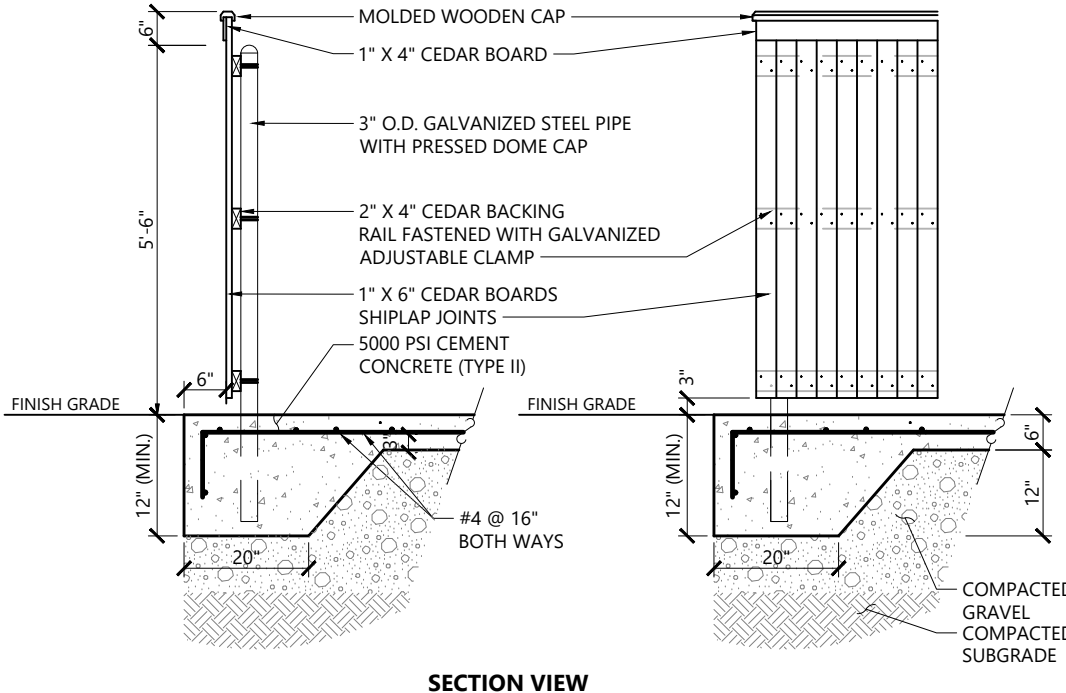
- THE MAXIMUM ALLOWABLE SIDEWALK AND CURB RAMP CROSS SLOPES SHALL BE 1.5 (1% MIN.).
- THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
- THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE AT CURB RAMPS SHALL BE 7.5%.
- A MINIMUM OF 3 FEET CLEAR SHALL BE MAINTAINED AT ANY 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 ROADWAYS.

Accessible Curb Ramp (ACR) Type 'M' 12/20
N.T.S. Source: VHB REV LD_512



Double Dumpster Pad w/ Enclosure

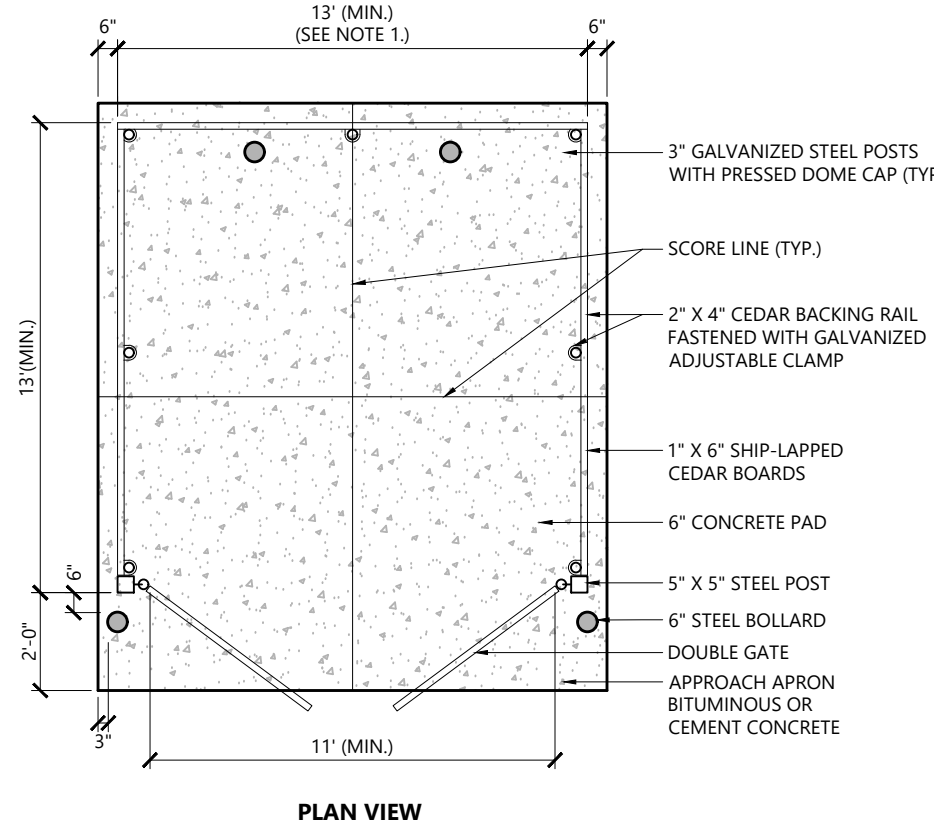
N.T.S. Source: VHB



SECTION VIEW

NOTES

- DUMPSTER PAD DIMENSIONS SHOWN AS MINIMUM. REFER TO PLAN FOR ACTUAL DIMENSION.
- PAD DESIGNED FOR TWO 6 YARD DUMPSTERS.



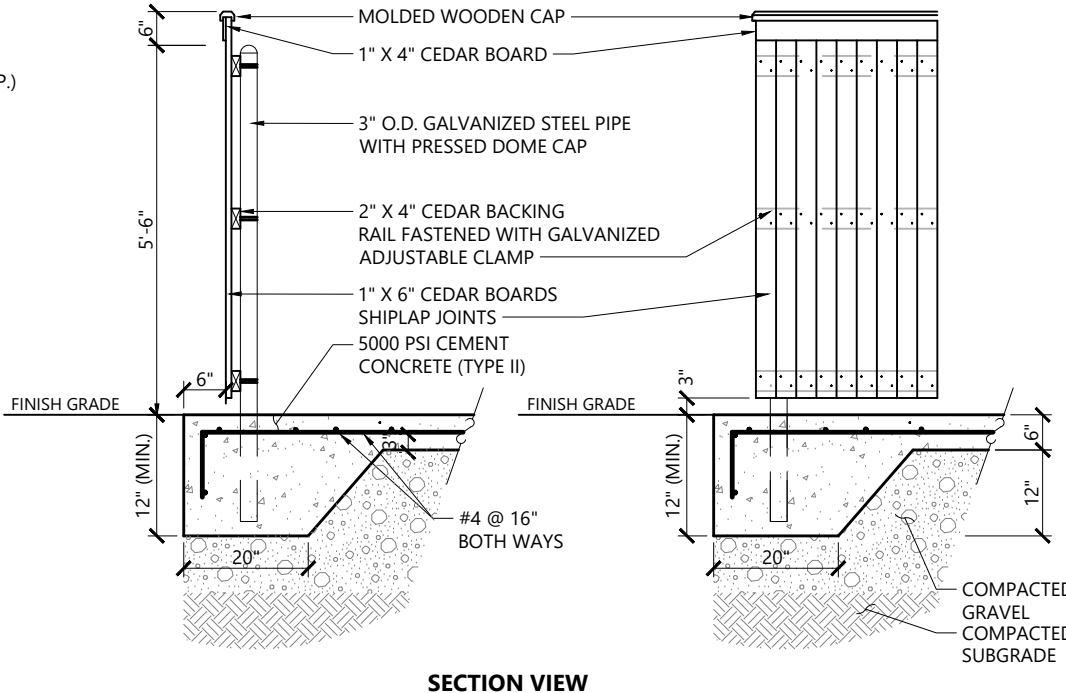
PLAN VIEW

NOTES

- DUMPSTER PAD DIMENSIONS SHOWN AS MINIMUM. REFER TO PLAN FOR ACTUAL DIMENSION.
- PAD DESIGNED FOR 6 YARD DUMPSTER.

Dumpster Pad w/ Enclosure

N.T.S. Source: VHB



SECTION VIEW

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
2	Revised Layout Resubmission	10/24/24	DF

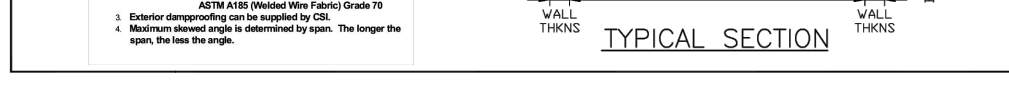
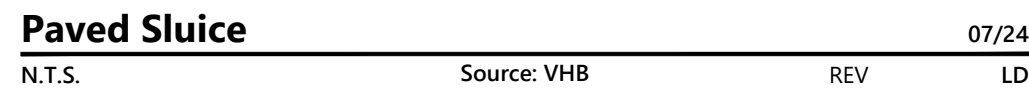
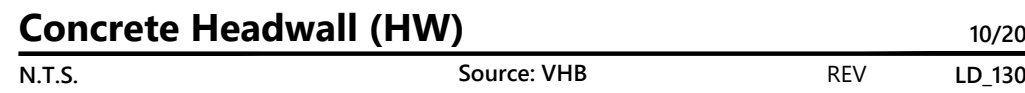
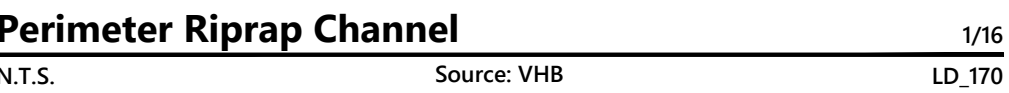
Designed by MJV
Issued for Permitting
Checked by
Date May 10, 2024

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Detail Sheet 2



C7.2

Sheet 26 of 50



**174 Hanover Street Extension
Lebanon, New Hampshire 03766**

Designed by TMD	Checked by MJV
Issued for Permitting	Date May 10, 2024

Detail Sheet 3



Page 58 of 4



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

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 TO MANAGE PROJECT IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGS 3800 RELATIVE TO INVASIVE SPECIES.
3. 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.
4. 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.
5. 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.
6. 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.
7. AREAS REMAINING UNSTABILIZED FOR A PERIOD OF MORE THAN 30 DAYS SHALL BE TEMPORARILY SEED, MULCHED, AND MULCH SHALL BE APPLIED AT A MINIMUM RATE OF 1-1/2 TONS/ACRE.
8. 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 MULCH.
9. DUST SHALL BE CONTROLLED THROUGH THE USE OF WATER.
10. 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.
11. 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.
12. 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.
13. 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.
14. AT NO TIME SHALL THE TOTAL UNSTABILIZED DISTURBED AREA ON-SITE BE GREATER THAN (5) FIVE ACRES.
15. ALL DITCHES, SWALES, AND DRAINAGE BASINS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
16. ALL ROADWAYS AND PARKING LOTS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
17. ALL CUT AND FILL SLOPES SHALL BE LOAMED AND SEED, WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
18. 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.

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. 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

18. 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

1. 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.
2. 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.
3. 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

1. 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 FILTREX, DEGRADABLE WOBEN 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

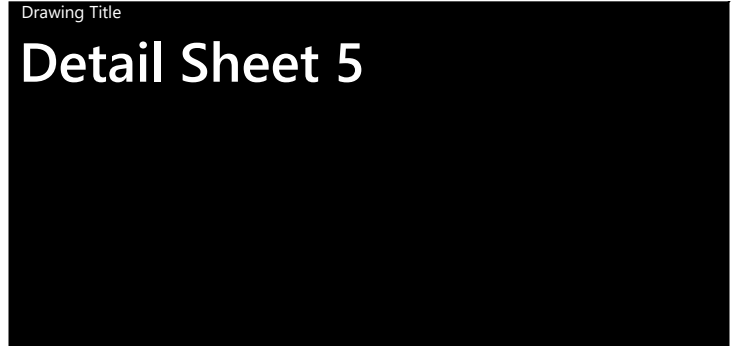
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Designed by	Checked by
TMD	MJV

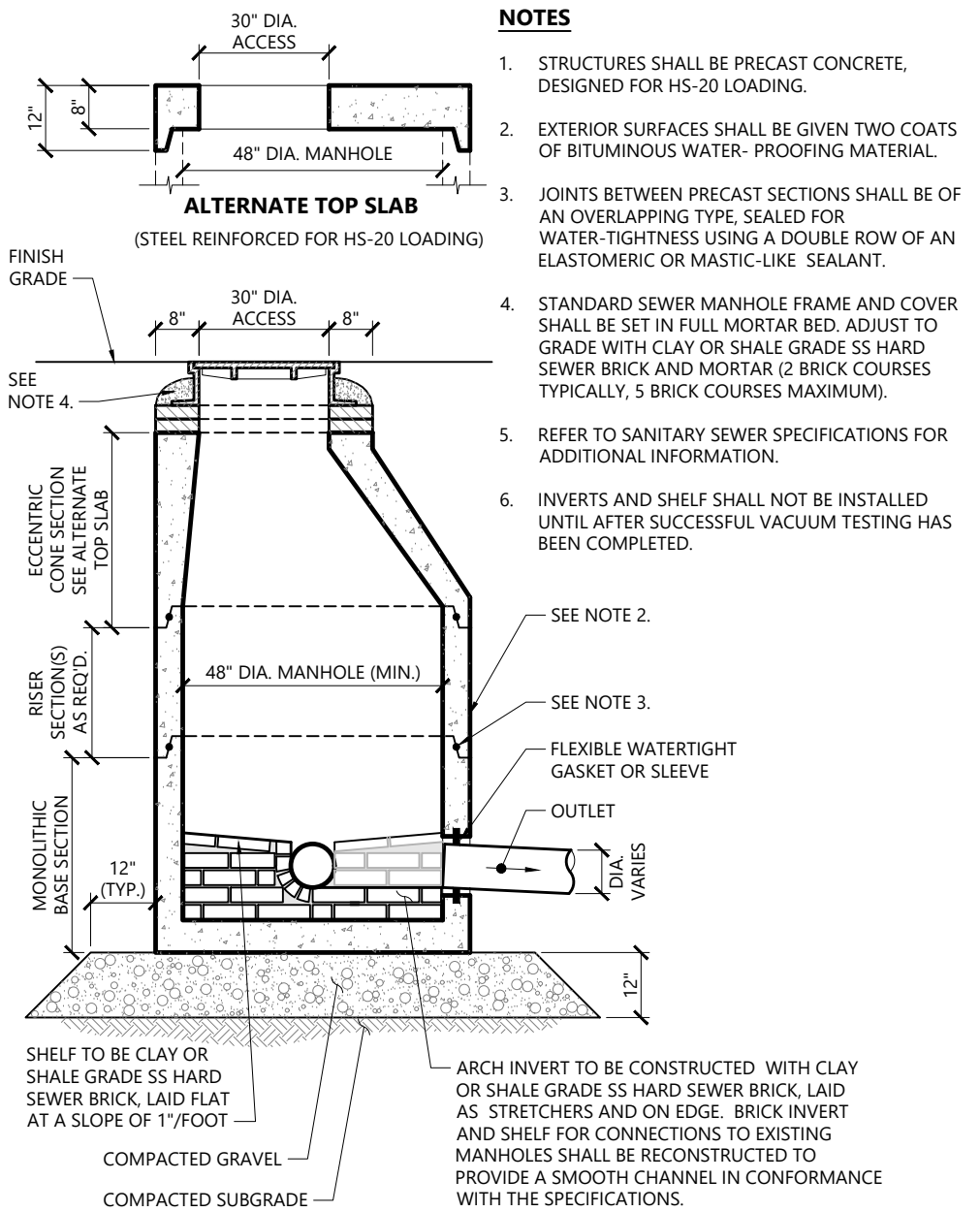
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Date

Permitting
May 10, 2024

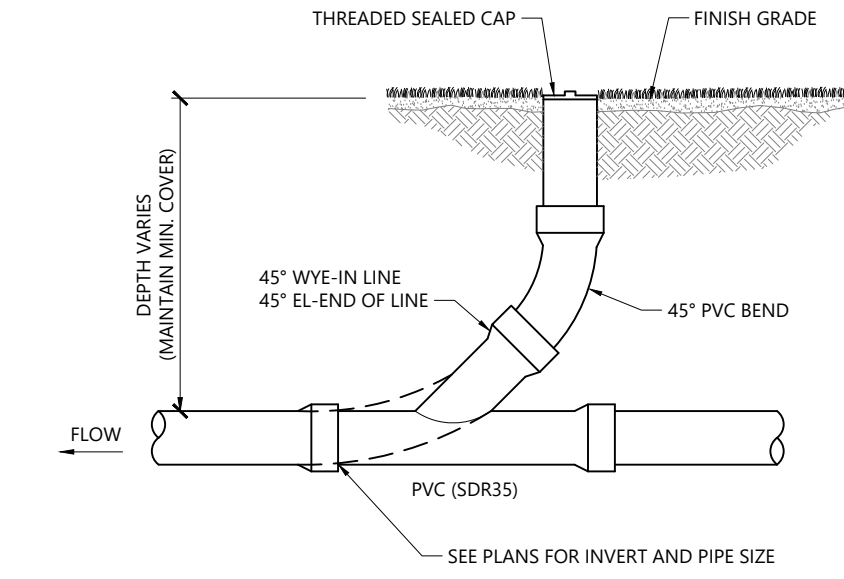
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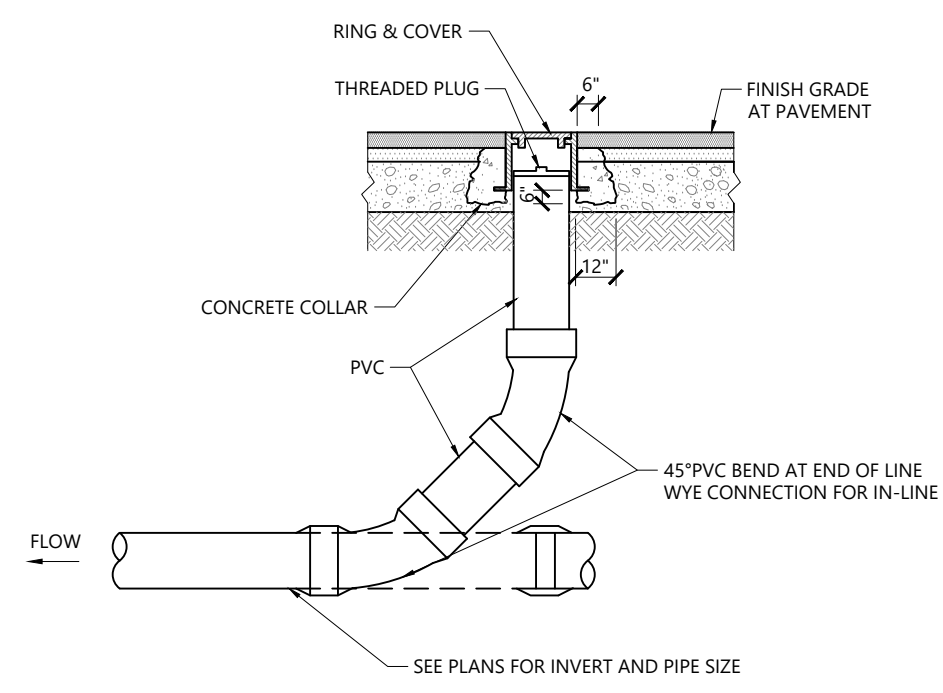
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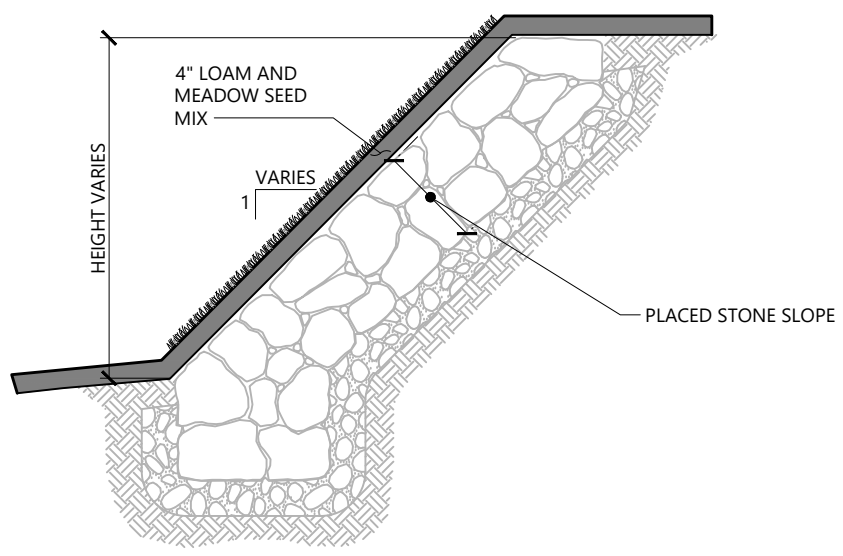
Sanitary Sewer Manhole (SMH)
N.T.S. Source: VHB 1/16 LD_200 NH



Cleanout - Landscape Area
N.T.S. Source: VHB 1/16 LD_302

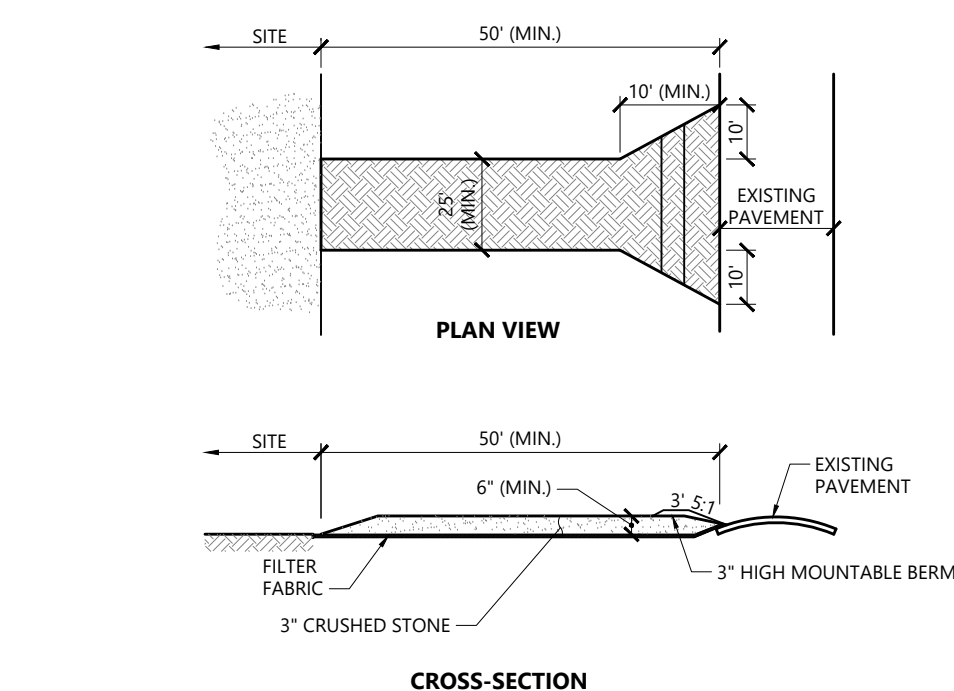


Cleanout - Paved Area
N.T.S. Source: VHB 1/16 LD_303



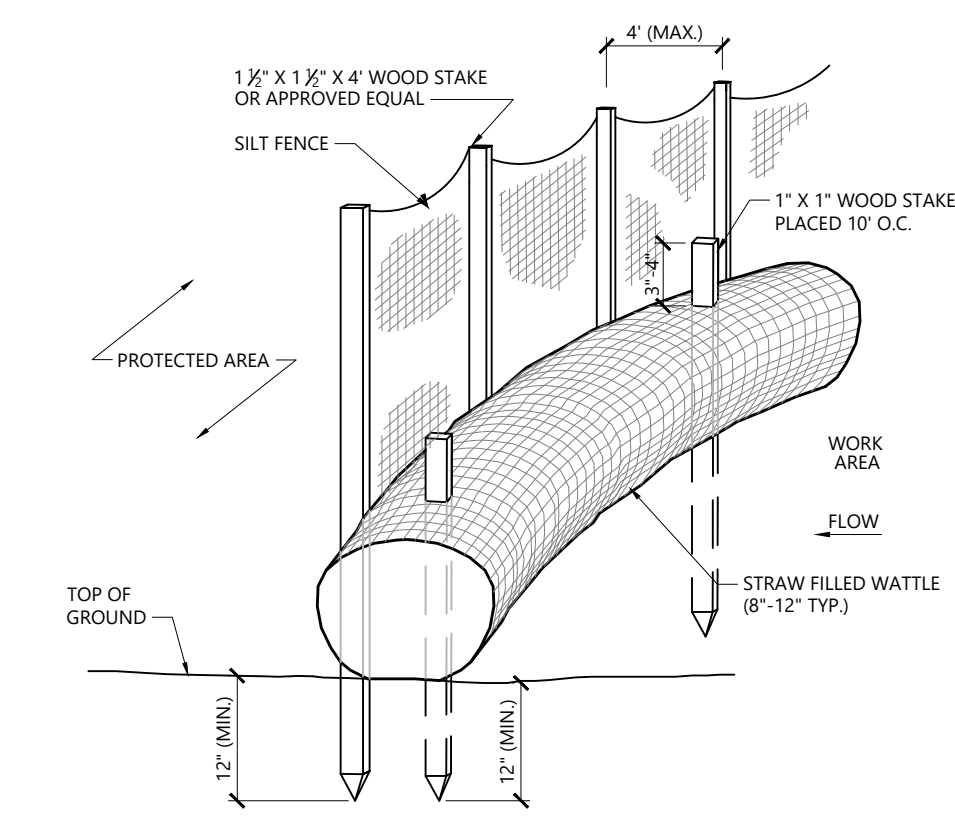
- NOTES**
1. EROSION CONTROL BLANKETS SHALL BE USED DURING GROWTH.
 2. CONTRACTOR TO REPAIR SLOPE IF EVIDENCE OF EROSION IS PRESENT PRIOR TO CERTIFICATE OF OCCUPANCY.
 3. CONTRACTOR TO ENSURE 4" OF LOAM ABOVE FACE OF ROCK.

Loam and Meadow Mix Stone Slope
N.T.S. Source: VHB 1/16 REV LD_760



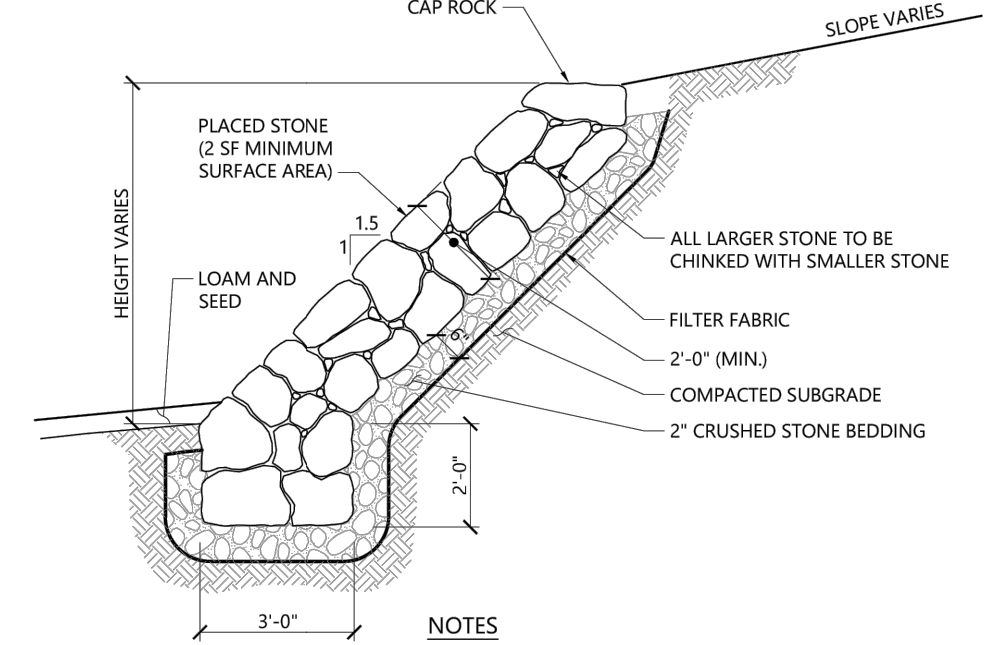
- NOTES**
1. EXIT WIDTH SHALL BE A TWENTY-FIVE (25) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
 2. THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING 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.
 3. STABILIZED CONSTRUCTION EXIT SHALL BE REMOVED PRIOR TO FINAL FINISH MATERIALS BEING INSTALLED.

Stabilized Construction Exit
N.T.S. Source: VHB 5/17 REV LD_682-NH



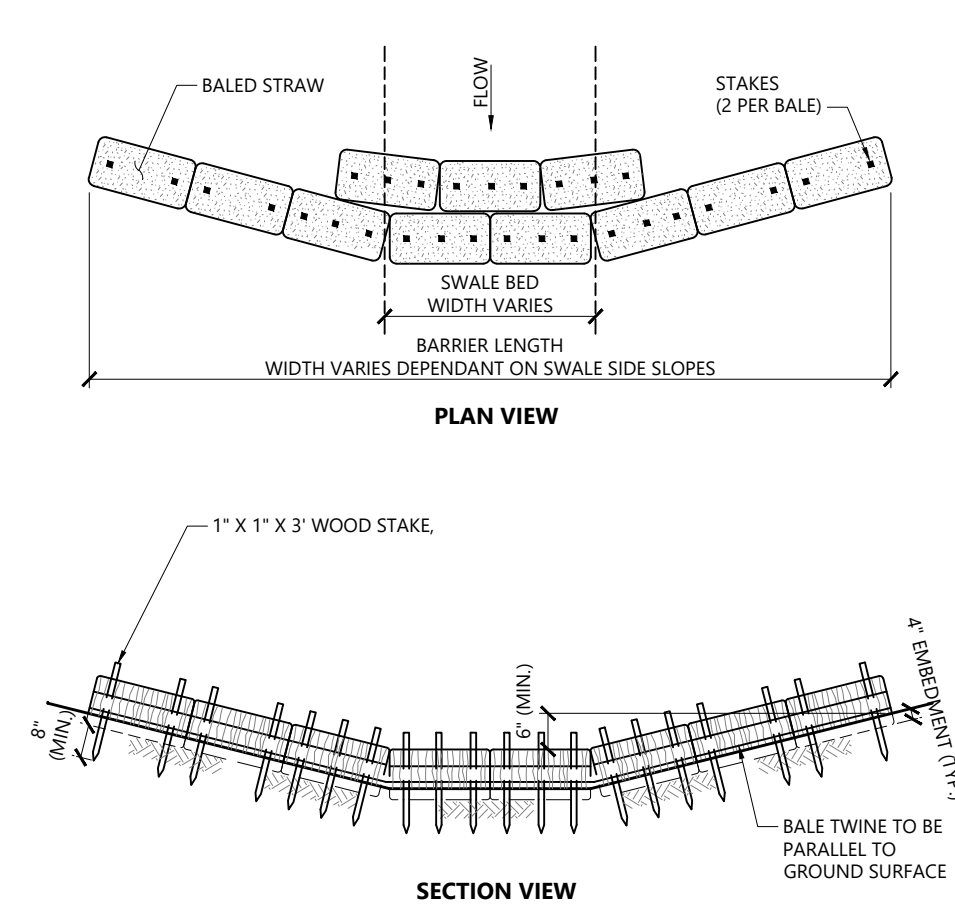
- NOTES**
1. STRAW WATTLE SHALL BE AS MANUFACTURED BY EARTHSAVER OR APPROVED EQUAL.
 2. STRAW WATTLES SHALL OVERLAP A MINIMUM OF 12 INCHES.
 3. STRAW WATTLE SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS, AND REPAIR OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.
 4. TEMPORARY STRAW WATTLES TO BE REMOVED BY CONTRACTOR. ALL OTHERS TO REMAIN IN PLACE UNLESS DIRECTED OTHERWISE BY ENGINEER.
 5. IF NON BIODEGRADABLE NETTING IS USED THE NETTING SHALL BE COLLECTED AND DISPOSED OF OFFSITE.

Straw Wattle - Erosion Control Barrier
N.T.S. Source: VHB 10/21 REV LD_659-A



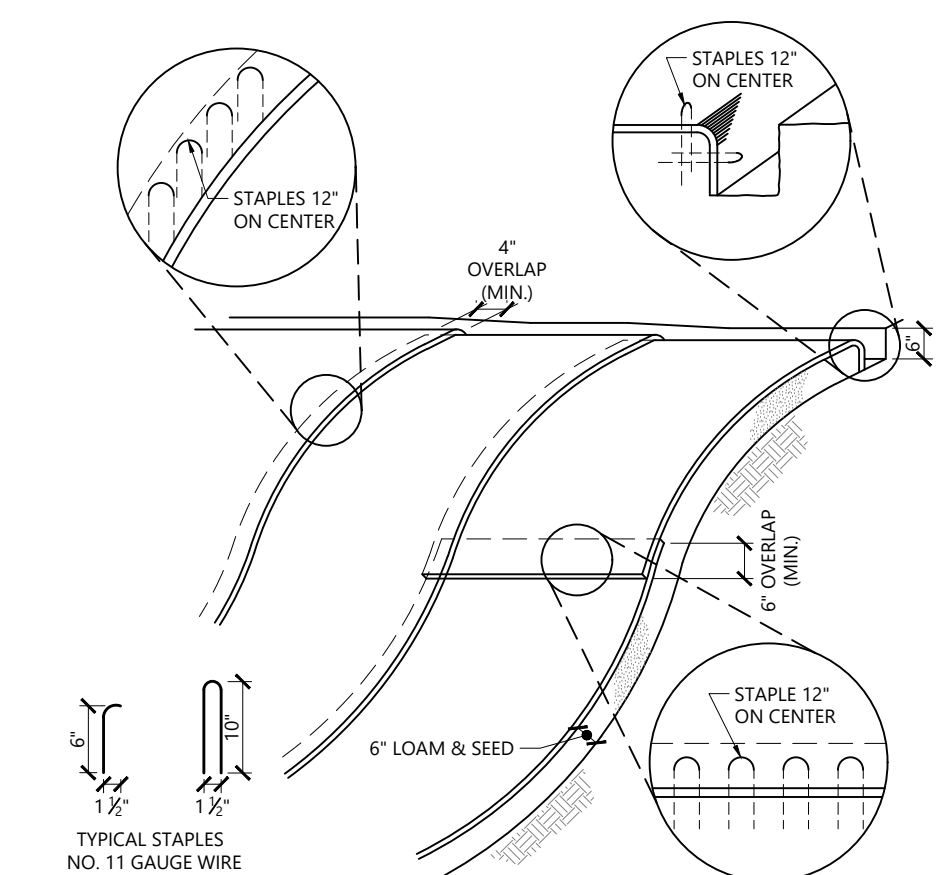
- NOTES**
1. SLOPE TO BE FOUNDED ON UNDISTURBED MATERIAL OR GRAVEL AND COMPACTED CONSISTENT WITH GEOTECHNICAL ENGINEERS RECOMMENDATIONS.
 2. GAP IN STONE TO BE FILLED WITH SOIL AND MEADOW MIX ONCE SLOPE HAS BEEN COMPLETED.
 3. WHERE EXISTING ROCK IS PRESENT, USE AN EXPOSED ROCK CUT AT 1:1 TO ESTABLISH SLOPE.

Placed Stone Slope
N.T.S. Source: VHB 1/16 LD_760



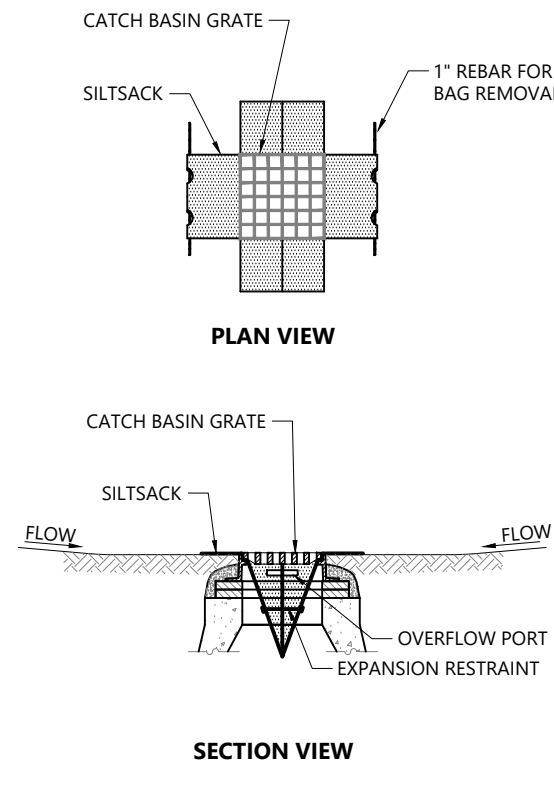
- NOTES**
1. THIS CHECKDAM SHALL BE INSTALLED IN A DRAINAGE SWALE WITH BED WIDTHS OF 2 FT. OR MORE.
 2. THE DISTANCE BETWEEN BALE CHECKDAMS SHALL BE DETERMINED BY THE SLOPE OF THE SWALE. CHECKDAMS SHALL BE SET AT EVERY 2 FT. DROP IN SWALE ELEVATION.
 3. BALES SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS AND REPAIR OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.
 4. INSTALL 3 STAKES PER BALE WITHIN SWALE BED AREA.

Straw Bale Checkdam (Wide Swale)
N.T.S. Source: VHB 1/16 REV LD_670



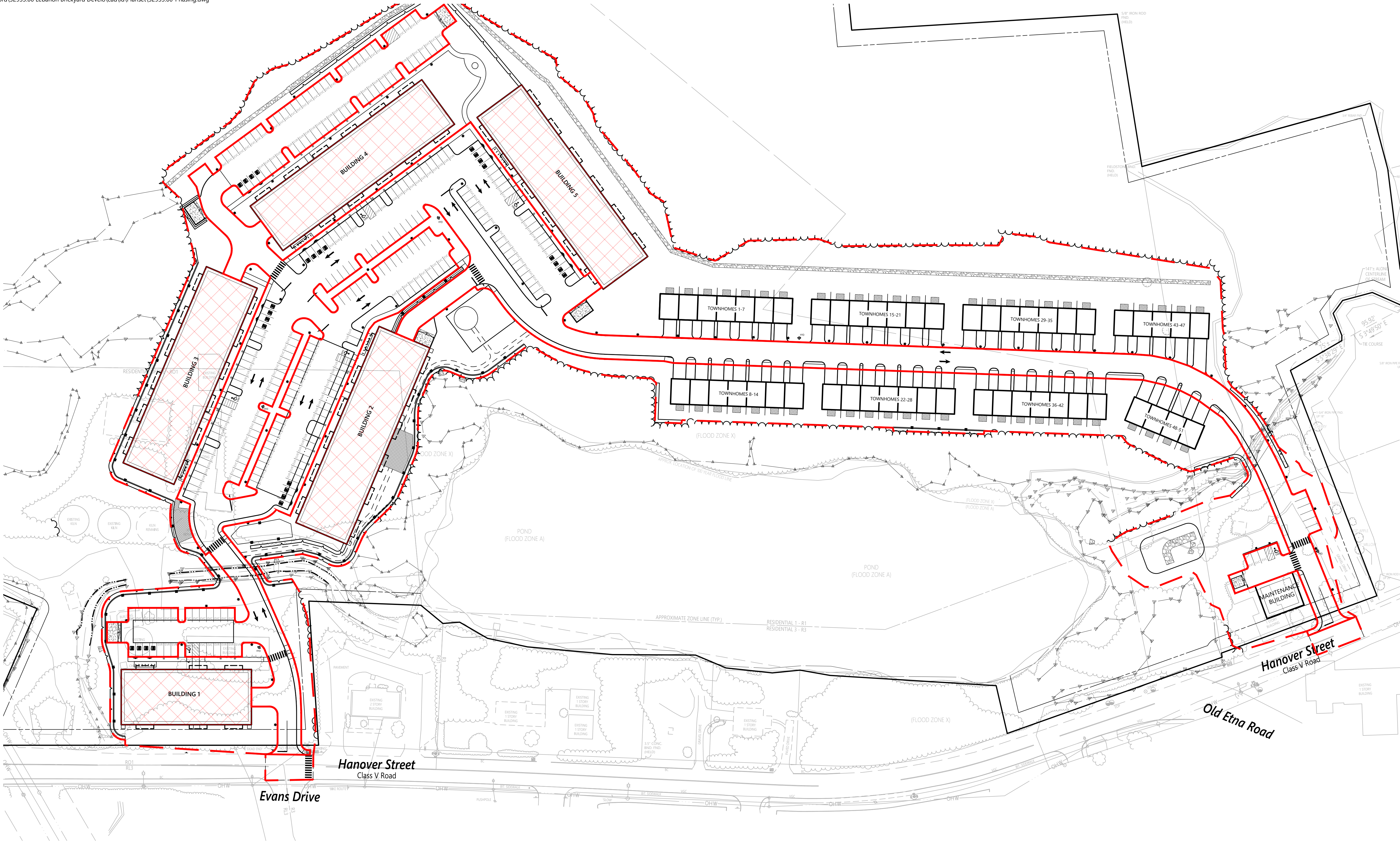
- NOTES**
1. BEGIN AT THE TOP OF BLANKET INSTALLATION AREA BY ANCHORING BLANKET IN A 6" DEEP TRENCH BACKFILL AND COMPACT TRENCH AFTER STAPLING.
 2. ROLL THE BLANKET DOWN THE SWALE IN THE DIRECTION OF THE WATER FLOW.
 3. THE EDGES OF BLANKETS MUST BE STAPLED WITH APPROX. 4 INCH OVERLAP WHERE 2 OR MORE STRIP WIDTHS ARE REQUIRED.
 4. WHEN BLANKETS MUST BE SPLICED DOWN THE SWALE, PLACE UPPER BLANKET END OVER LOWER END WITH 6 INCH (MIN) OVERLAP AND STAPLE BOTH TOGETHER.
 5. METHOD OF INSTALLATION SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS.
 6. EROSION CONTROL BLANKETS SHALL BE USED IN ALL AREAS WHERE SLOPES EXCEED 3:1.

Erosion Control Blanket Slope Installation
N.T.S. Source: VHB 10/20 REV LD_680



- NOTES**
1. INSTALL SILTSACK IN ALL CATCH BASINS WHERE INDICATED ON THE PLAN BEFORE COMMENCING WORK OR IN PAVED AREAS AFTER BINDER COURSE IS PLACED AND STRAW BALES HAVE BEEN REMOVED.
 2. GRATE TO BE PLACED OVER SILTSACK.
 3. SILTSACK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS AND CLEANING OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED. MAINTAIN UNTIL UPSTREAM AREAS HAVE BEEN PERMANENTLY STABILIZED.

Siltsock Sediment Trap
N.T.S. Source: VHB 1/20 REV LD_674



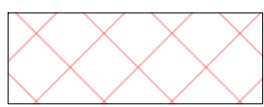
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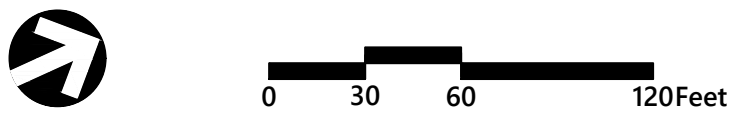
Phase	Summary Of Improvements	Estimated Start
Phase 1	Roadway, Utilities, Parking Lots, Building Foundations	Late 2024 - Early 2025
Phase 2	Maintenance Building, Building 1	Late 2025 - Early 2026 Anticipated
Phase 3 (A through D)	Buildings A-D as Occupied	Phase A Upon Completion of Phase 2 Phase B-D based on Occupancy and Market
Phase 4	Townhomes 1-51	Upon completion of Phase 3

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.

LEGEND

-  FOUNDATION TO BE CONSTRUCTED IN THIS PHASE
-  LIMIT OF GRADING
-  ROADWAY AND PARKING LOT INSTALLATION



The Brickyard
Residential Development
174 Hanover Street Extension
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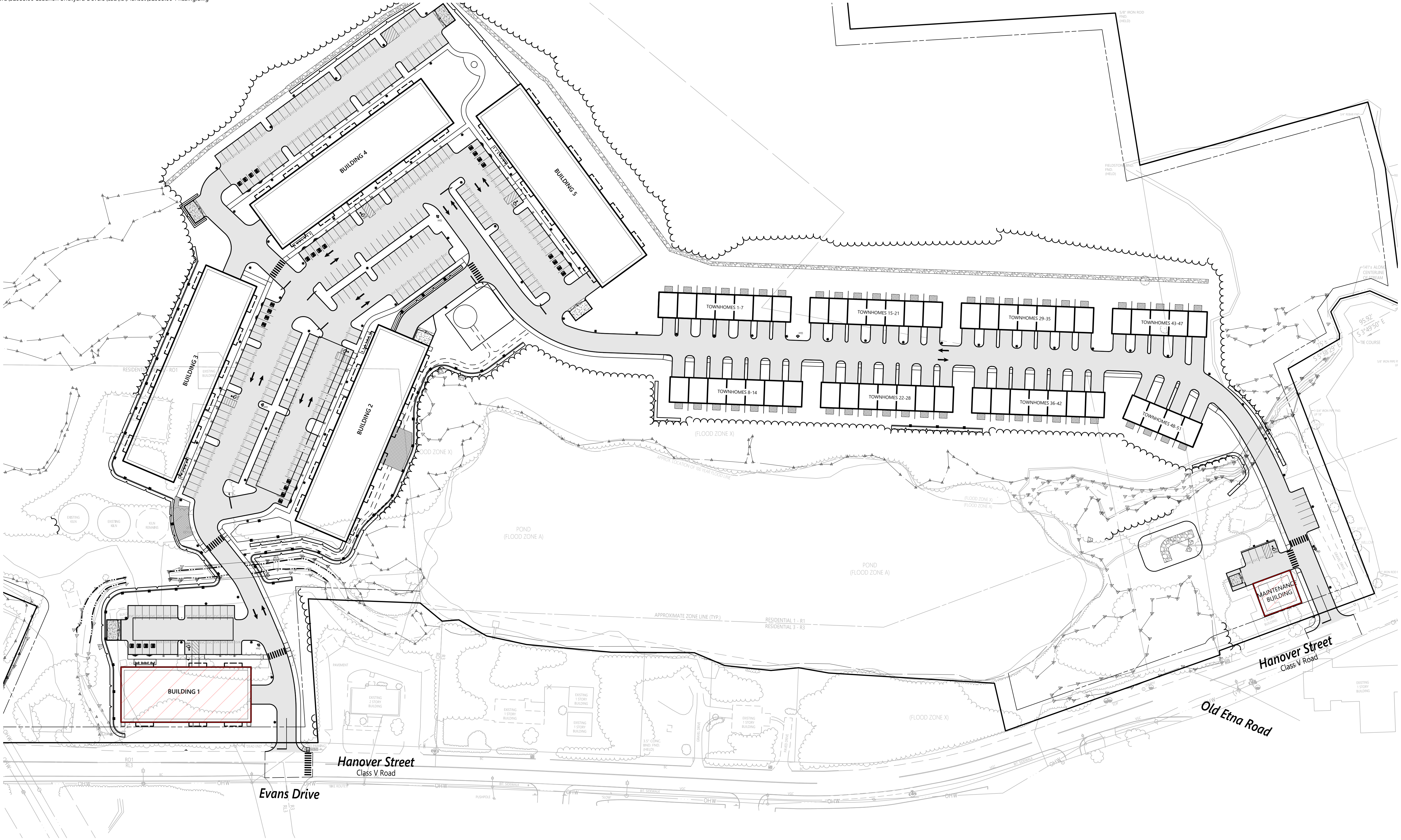
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Issued for	Permitting	Date	May 10, 2024

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Drawing Title
Phasing Plans



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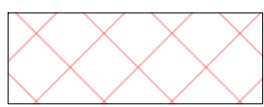
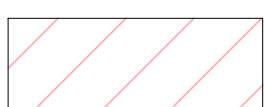
Phasing Schedule

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LEGEND

-  FOUNDATION TO BE CONSTRUCTED IN THIS PHASE
-  BUILDING TO BE CONSTRUCTED IN THIS PHASE



0 30 60 120Feet

The Brickyard Residential Development

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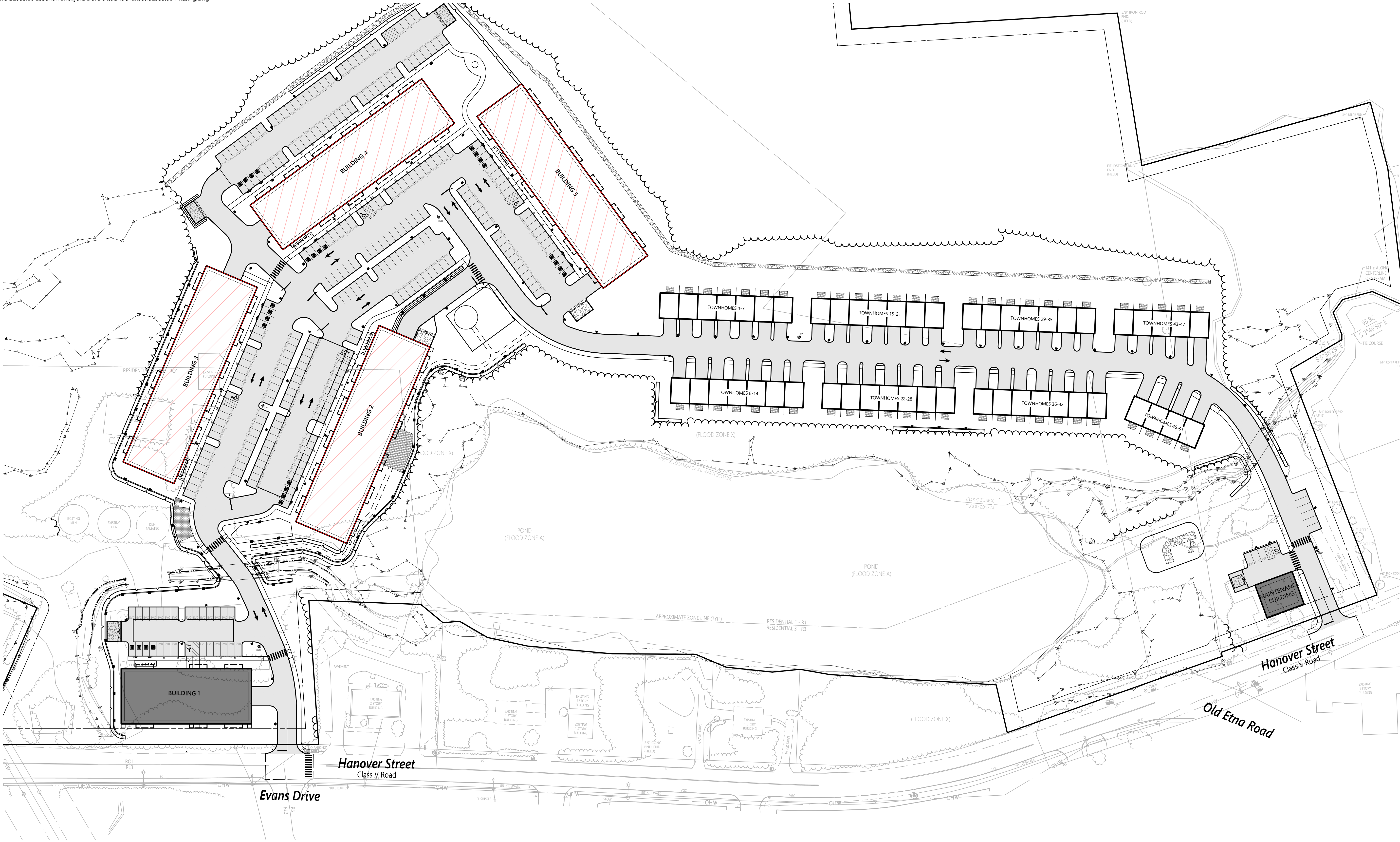
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Project Number
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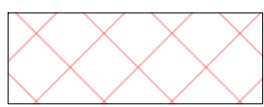
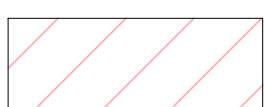
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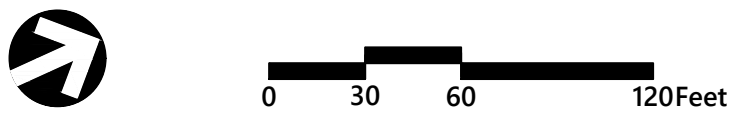
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Note

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LEGEND

-  FOUNDATION TO BE CONSTRUCTED IN THIS PHASE
-  BUILDING TO BE CONSTRUCTED IN THIS PHASE
-  BUILDING ALREADY CONSTRUCTED IN THIS PHASE



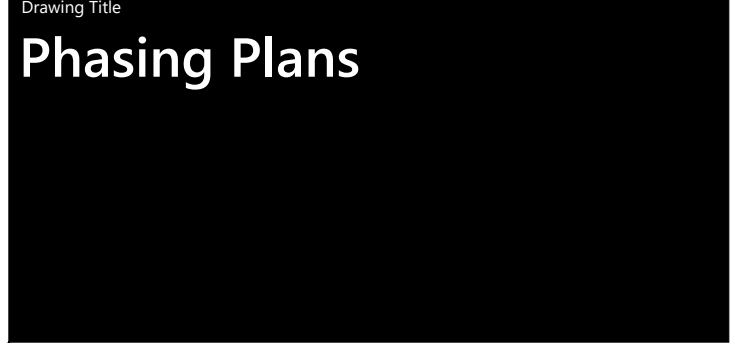
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Issued for		Date	May 10, 2024

Permitting

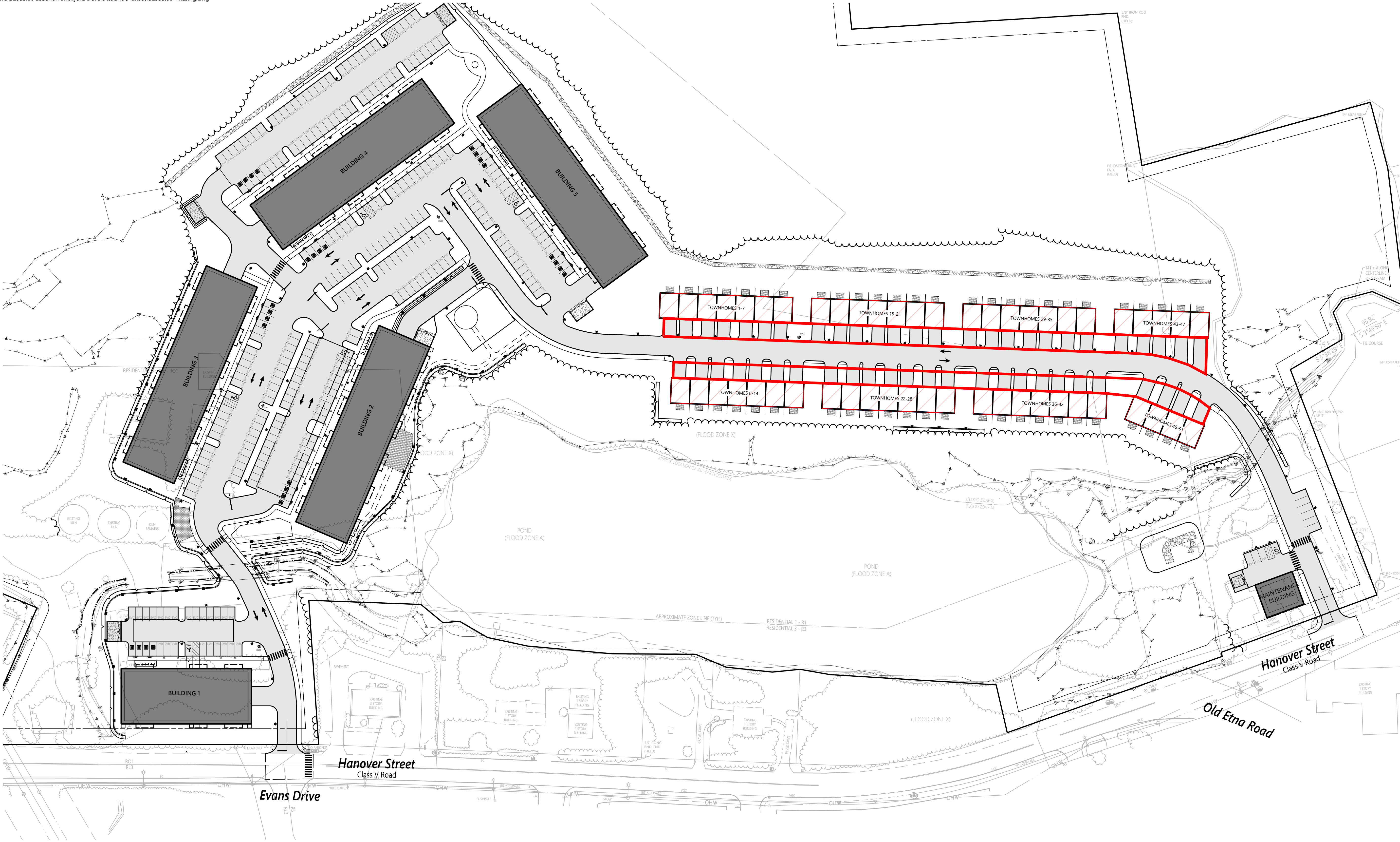
Not Approved for Construction



C8.3

Sheet 32 of 50

Project Number
52933.00



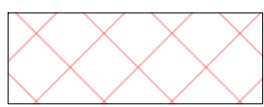
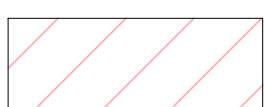
Phasing Schedule

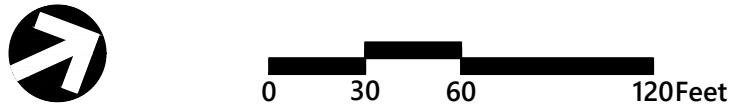
Phase	Summary Of Improvements	Estimated Start
Phase 1	Roadway, Utilities, Parking Lots, Building Foundations	Late 2024 - Early 2025
Phase 2	Maintenance Building, Building 1	Late 2025 - Early 2026 Anticipated
Phase 3 (A through D)	Buildings A-D as Occupied	Phase A Upon Completion of Phase 2 Phase B-D based on Occupancy and Market
Phase 4	Townhomes 1-51	Upon completion of Phase 3

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
-  DRIVEWAY INSTALLATION



The Brickyard
Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

No.	Revision	Date	Appr'd.
1	Revised Layout Resubmission	10/24/24	DF

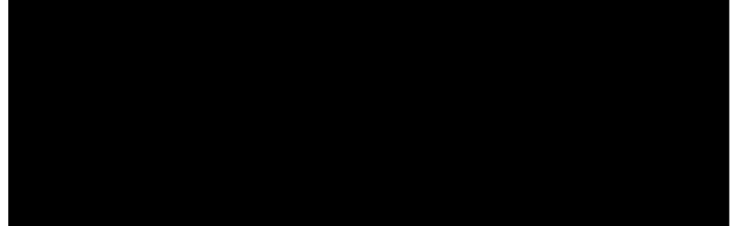
Designed by	TMD	Checked by	MJV
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Issued for
Permitting

Date
May 10, 2024

Not Approved for Construction

Phasing Plans



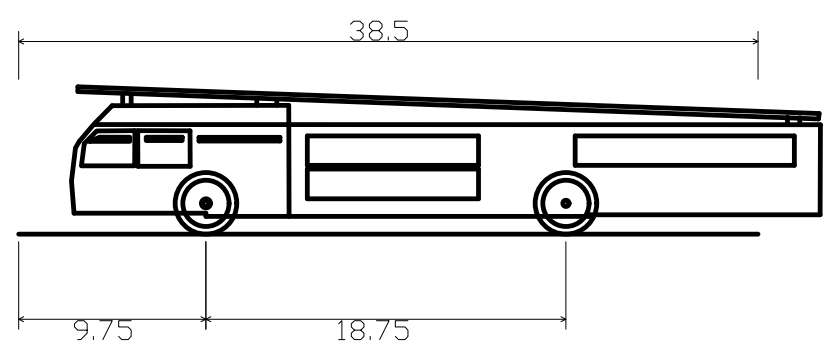
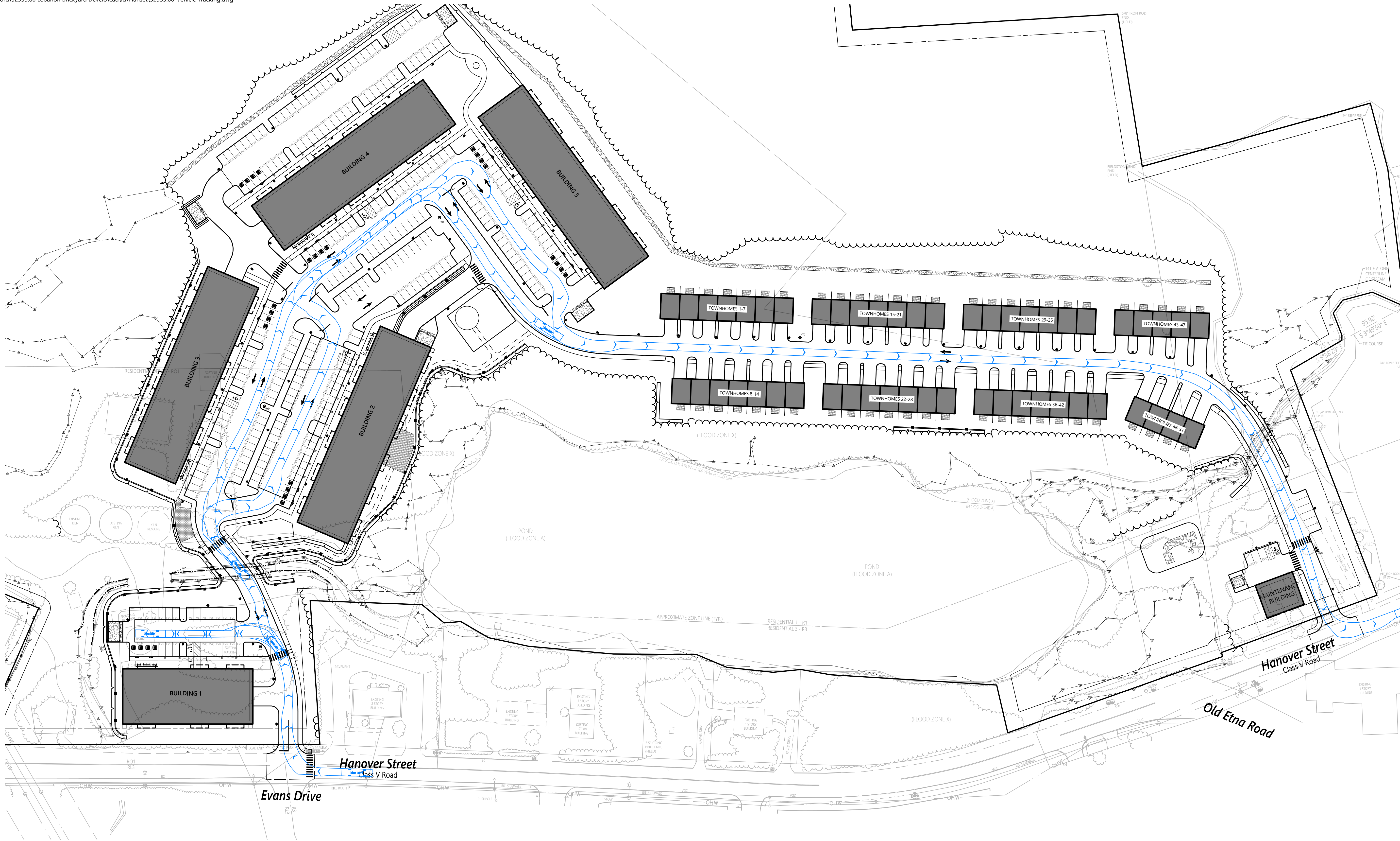
C8.4

Sheet 33 of 50

Project Number
52933.00



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900



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



The Brickyard Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

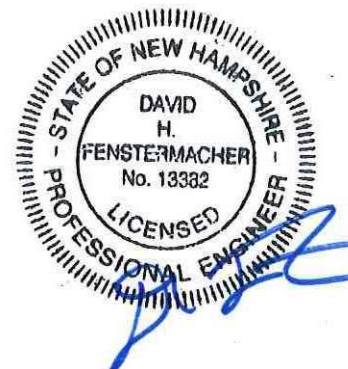
No.	Revision	Date	Apprvd.
1	Response to Comments Update	08/06/24	DF
2	Revised Layout Resubmission	10/24/24	DF

Designed by	Checked by
TMD	MJV

Issued for: Permitting Date: May 10, 2024

Not Approved for Construction

Vehicle Tracking
City of Lebanon Firetruck

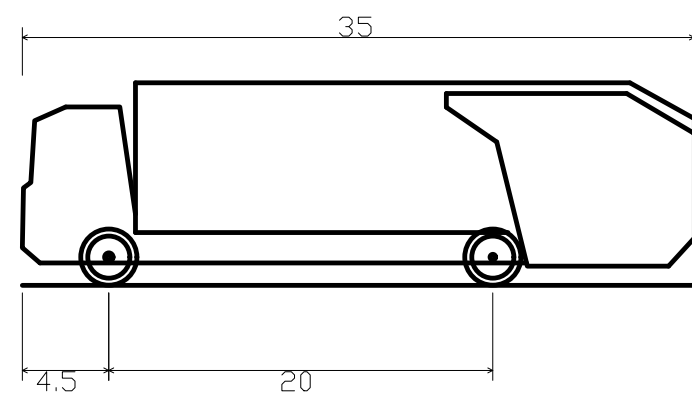
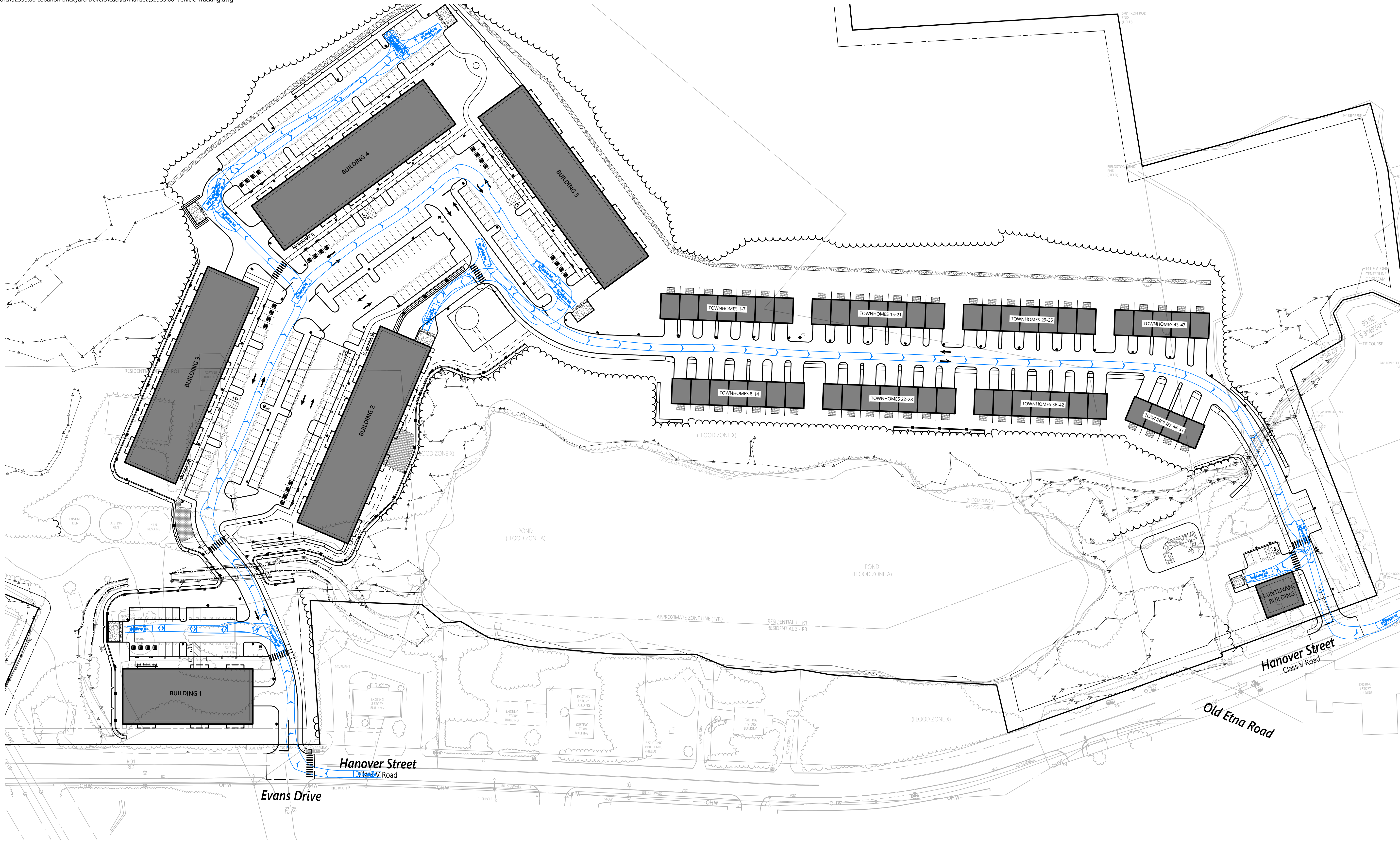


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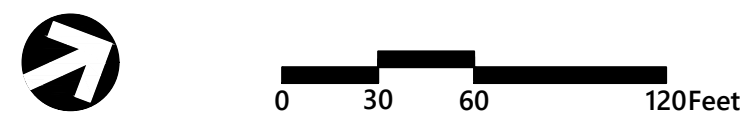
Sheet 34 of 50



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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Designed by TMD
Checked by MJV

Issued for Permitting
Date May 10, 2024

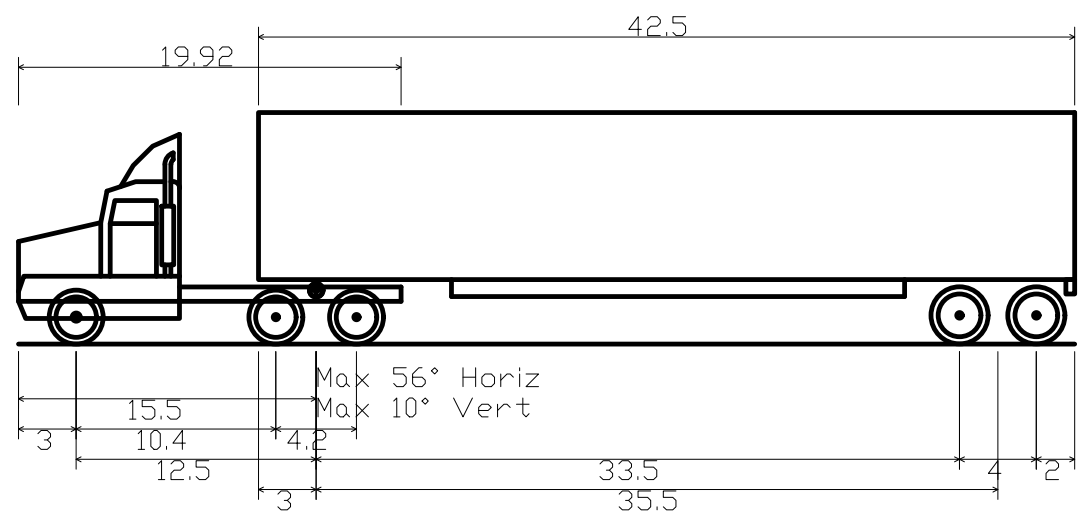
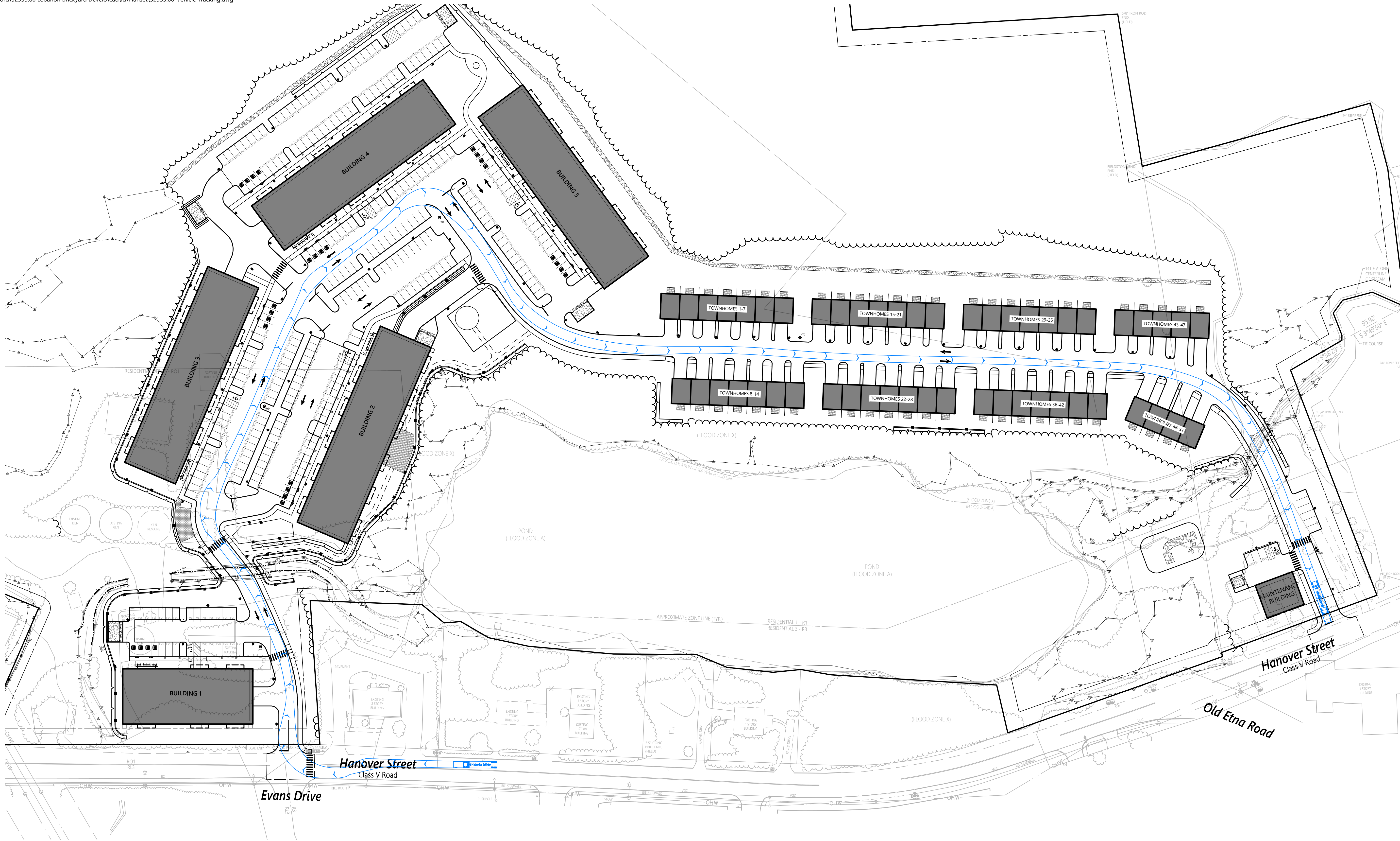
Not Approved for Construction

Vehicle Tracking
Garbage Truck

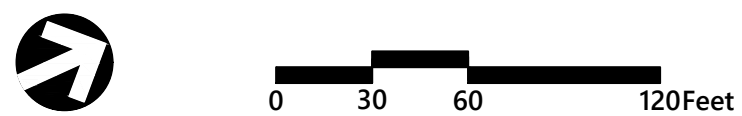
Professional Engineer Seal for David H. Fenstermacher, No. 15352, State of New Hampshire. Sheet 35 of 50.



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900



WB-50 - Intermediate Semi-Trailer
Overall Length 55.000ft
Overall Width 8.500ft
Overall Body Height 12.052ft
Min Body Ground Clearance 1.334ft
Max Track Width 8.500ft
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 TMD
Checked by MJV

Issued for Permitting
Date May 10, 2024

Not Approved for Construction

Drawing Title
**Vehicle Tracking
WB-50**



C9.3

Sheet 36 of 50

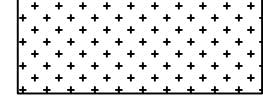
Project Number
52933.00

Plant Maintenance Notes

1. 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.
2. CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, AND EQUIPMENT FOR THE COMPLETE LANDSCAPE MAINTENANCE WORK. WATER SHALL BE PROVIDED BY THE CONTRACTOR.
3. WATERING SHALL BE REQUIRED DURING THE GROWING SEASON, WHEN NATURAL RAINFALL IS BELOW ONE INCH PER WEEK.
4. WATER SHALL BE APPLIED IN SUFFICIENT QUANTITY TO THOROUGHLY SATURATE THE SOIL IN THE ROOT ZONE OF EACH PLANT.
5. 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.
6. 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.
7. 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.

Planting Notes

1. ALL PROPOSED PLANTING LOCATIONS SHALL BE STAKED AS SHOWN ON THE PLANS FOR FIELD REVIEW AND APPROVAL BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
2. CONTRACTOR SHALL VERIFY LOCATIONS OF ALL BELOW GRADE AND ABOVE GROUND UTILITIES AND NOTIFY OWNERS REPRESENTATIVE OF CONFLICTS.
3. 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.
4. 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.
5. ALL TREES SHALL BE BALLED AND BURLAPPED, UNLESS OTHERWISE NOTED IN THE DRAWINGS OR SPECIFICATION, OR APPROVED BY THE OWNER'S REPRESENTATIVE.
6. 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.
7. ANY PROPOSED PLANT SUBSTITUTIONS MUST BE REVIEWED BY LANDSCAPE ARCHITECT AND APPROVED IN WRITING BY THE OWNER'S REPRESENTATIVE.
8. ALL PLANT MATERIALS INSTALLED SHALL MEET THE SPECIFICATIONS OF THE "AMERICAN STANDARDS FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN AND CONTRACT DOCUMENTS.
9. ALL PLANT MATERIALS SHALL BE GUARANTEED FOR ONE YEAR FOLLOWING DATE OF FINAL ACCEPTANCE.
10. 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.
11. ALL DISTURBED AREAS NOT OTHERWISE NOTED ON CONTRACT DOCUMENTS SHALL BE LOAM AND SEEDDED OR MULCHED AS DIRECTED BY OWNER'S REPRESENTATIVE.
12. THESE PLANS ARE INTENDED FOR PLANTING PURPOSES. REFER TO SITE / CIVIL DRAWINGS FOR ALL OTHER SITE CONSTRUCTION INFORMATION.



SHRUB LIST

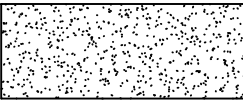
CODE	BOTANICAL NAME	COMMON NAME
SHRUBS		
CAH	Clethra alnifolia 'Hummingbird'	'Hummingbird' Summersweet
CAE	Cornus alba 'Elegantissima'	Variegated RedTwig Dogwood
CR	Cornus racemosa	Gray Dogwood
CS	Cornus sericea	Red Twig Dogwood
CS1	Cornus stolonifera	Red Osier Dogwood
FG	Fothergilla gardenii	Dwarf Fothergilla
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'	Shenandoah Switch Grass
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SEEDING

1. 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.
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 MANUFACTURERS RECOMMENDATIONS.



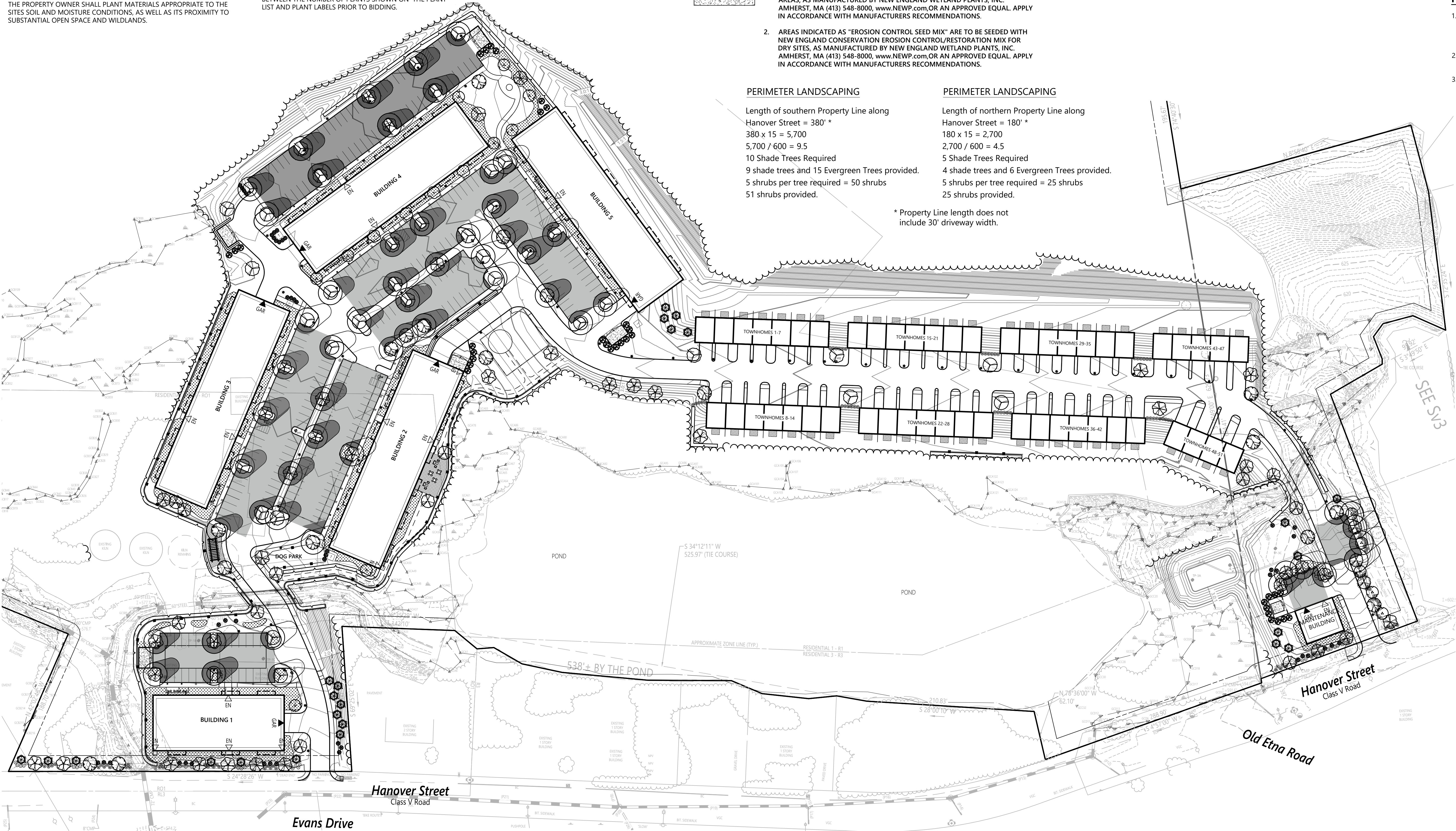
PERIMETER LANDSCAPING

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.



PLANT SCHEDULE - TREES

CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE
DECIDUOUS TREES				
AR	18	Acer rubrum	Red Maple	2 1/2 - 3" CAL.
BN	22	Betula nigra 'Heritage'	Heritage River Birch	10 - 12' HT./Multi-Stem
NS	21	Nyssa sylvatica	Black Tupelo	2 1/2 - 3" CAL.
PO	11	Platanus occidentalis	American Sycamore	2 1/2 - 3" CAL.
TA	16	Tilia americana	American Linden	2 1/2 - 3" CAL.
TC	23	Tilia cordata 'Greenspire'	Greenspire Littleleaf Linden	2 1/2 - 3" CAL.

EVERGREEN TREES

JVB	19	Juniperus virginiana 'Blue Arrow'	Blue Arrow Juniper	6 - 7' HT.
JVC	27	Juniperus virginiana 'Corcorcor' TM	Emerald Sentinal Juniper	6 - 7' HT.
PG	24	Picea glauca	White Spruce	6 - 7' HT.
TO	34	Thuja occidentalis 'Nigra'	Dark American Arborvitae	6 - 7' HT.

FLOWERING TREES

ACS	14	Amelanchier canadensis	Shadblow Serviceberry	8 - 10' HT./Multi-Stem
MS	4	Malus hybrid 'Spring Snow'	Spring Snow Crab Apple	2 1/2 - 3" CAL.

SHRUBS

IG	102	Ilex glabra	Inkberry	2 - 3' HT.
RC	55	Rhododendron x 'Cunningham's Blush'	Cunningham's Blush Rhododendron	24 - 30" HT.

Planting Requirements

1. 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.
2. DECIDUOUS TREES TO BE A MINIMUM 2.5 TO 3 INCHES IN CALIPER.
3. 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.

4,158 sf parking area
x 30% = 1,247 sf
Shade area = 1,427 sf (30.1%)

SHADE TREE CALCULATION PARKING LOTS

69,245 sf parking area
x 30% = 20,774 sf
Shade area = 22,505 sf (32.5%)

The Brickyard
Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

No.	Revision	Date	Apprd.
1	Completeness Review Comments	07/02/24	DF
2	Revised Layout Resubmission	10/24/24	DF

Designed by	EJB	Checked by	
Issued for	Permitting	Date	May 10, 2024

Not Approved for Construction

Overall Landscape and
Tree Shading Plan

Drawing Number

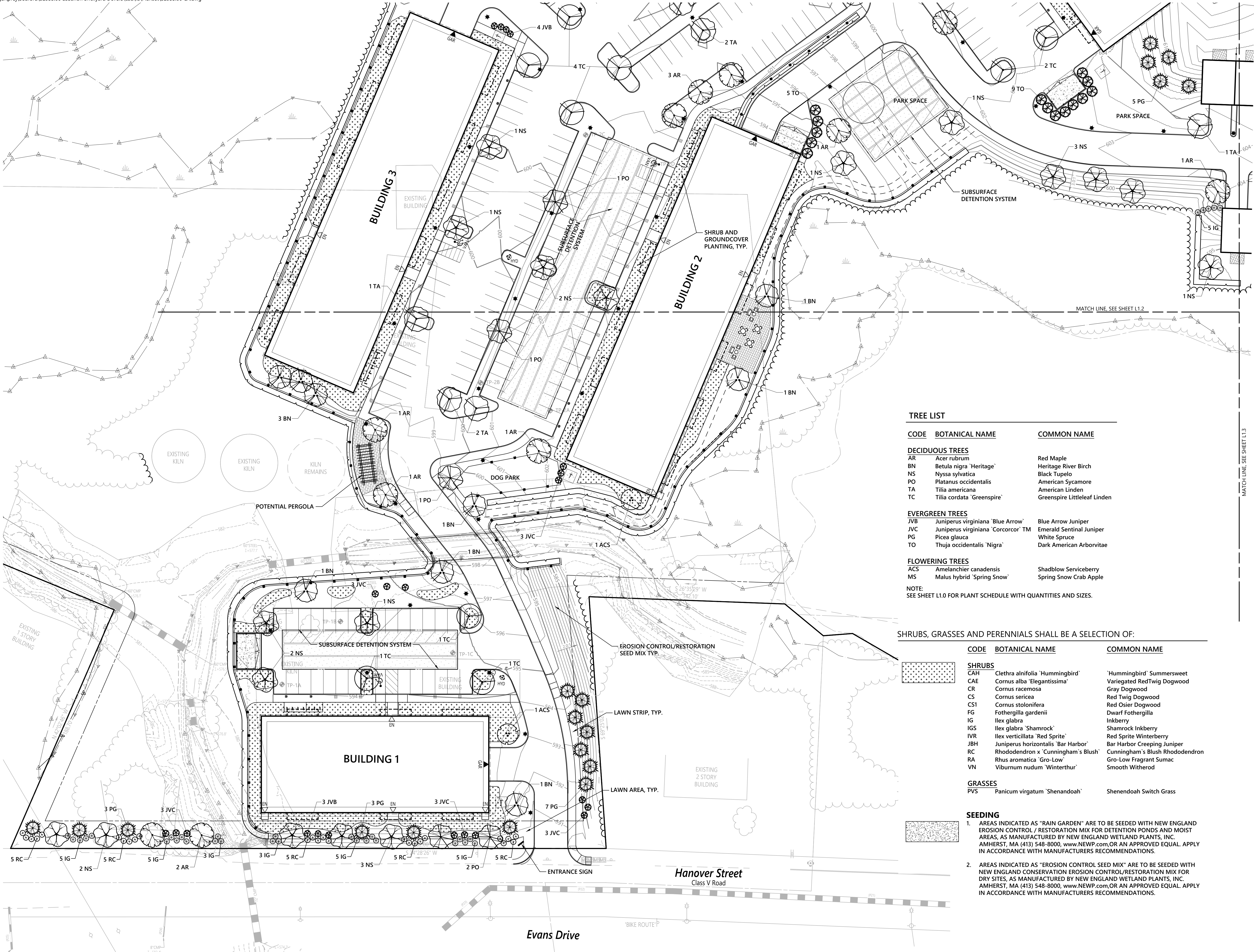
L1.0

Sheet 37 of 50

Project Number
52933.00



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900



TREE LIST

CODE	BOTANICAL NAME	COMMON NAME
DECIDUOUS TREES		
AR	Acer rubrum	Red Maple
BN	Betula nigra 'Heritage'	Heritage River Birch
NS	Nyssa sylvatica	Black Tupelo
PO	Platanus occidentalis	American Sycamore
TA	Tilia americana	American Linden
TC	Tilia cordata 'Greenspire'	Greenspire Littleleaf Linden

EVERGREEN TREES		
JVB	Juniperus virginiana 'Blue Arrow'	Blue Arrow Juniper
JVC	Juniperus virginiana 'Corcorcor' TM	Emerald Sentinal Juniper
PG	Picea glauca	White Spruce
TO	Thuja occidentalis 'Nigra'	Dark American Arborvitae

FLOWERING TREES		
ACS	Amelanchier canadensis	Shadblow Serviceberry
MS	Malus hybrid 'Spring Snow'	Spring Snow Crab Apple

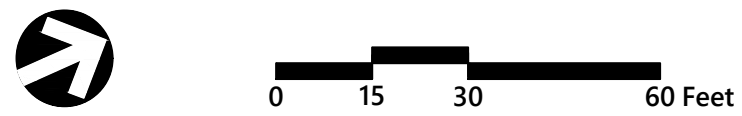
NOTE:
SEE SHEET L1.0 FOR PLANT SCHEDULE WITH QUANTITIES AND SIZES.

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'	Shenandoah Switch Grass

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.
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Residential Development

174 Hanover Street Extension
Lebanon, New Hampshire 03766

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Designed by	Checked by
EJB	

Issued for
Permitting

Date
May 10, 2024

Not Approved for Construction

Landscape
Plan 1

L1.1

Sheet
38 of
50

Project Number
52933.00



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

	<u>CODE</u>	<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>
	CAH	Clethra alnifolia 'Hummingbird'	'Hummingbird' Summersweet
	CAE	Cornus alba 'Elegantissima'	Variegated RedTwig Dogwood
	CR	Cornus racemosa	Gray Dogwood
	CS	Cornus sericea	Red Twig Dogwood
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	FG	Fothergilla gardenii	Dwarf Fothergilla
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	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 Withered	

PVS	<i>Panicum virgatum</i> 'Shenandoah'	Shenandoah Switch Grass
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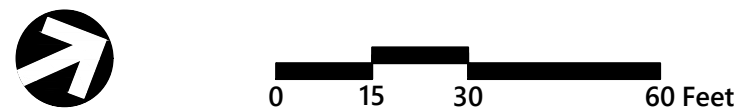
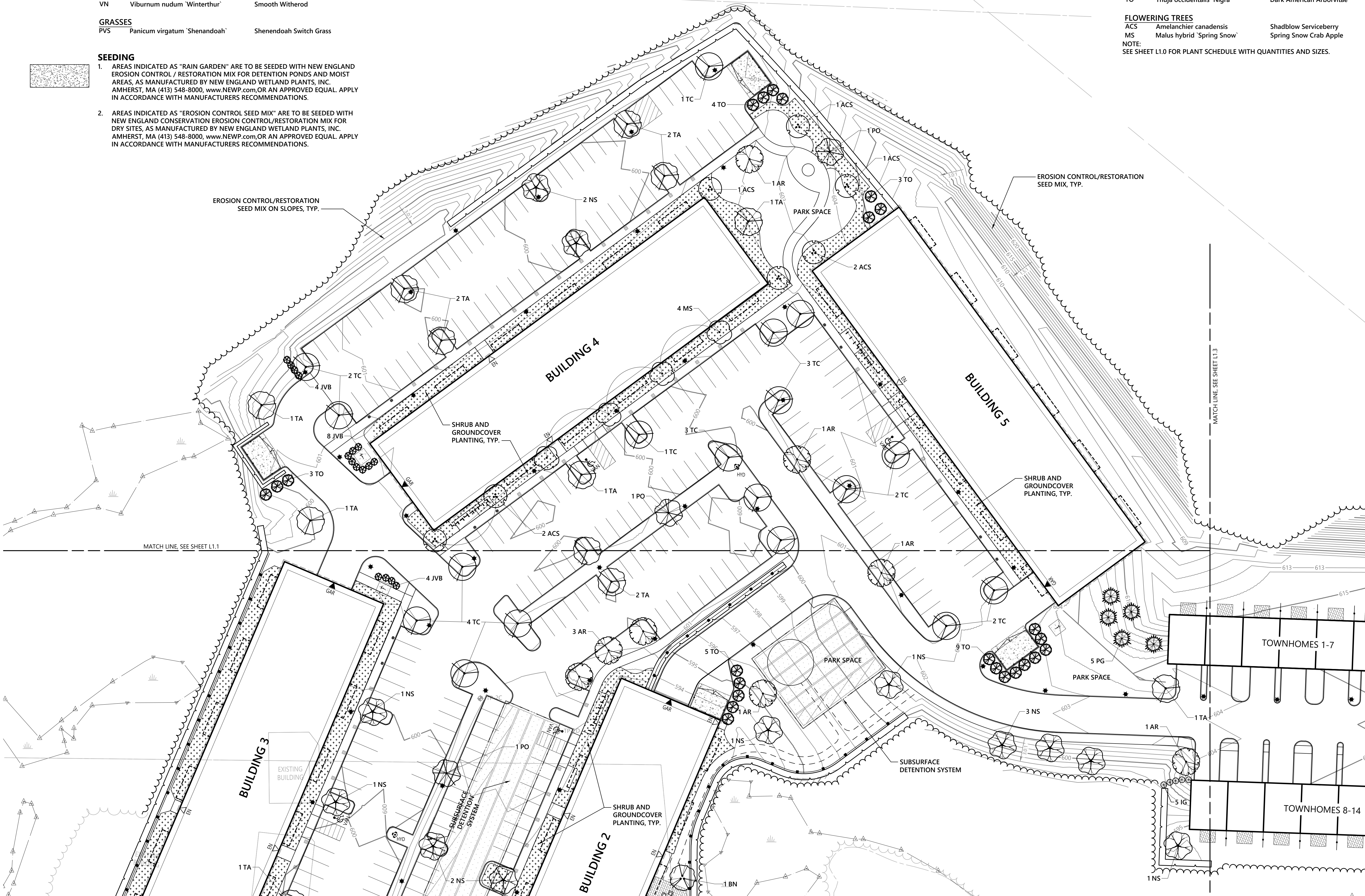
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<u>CODE</u>	<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>
<u>DECIDUOUS TREES</u>		
AR	Acer rubrum	Red Maple
BN	Betula nigra 'Heritage'	Heritage River Birch
NS	Nyssa sylvatica	Black Tupelo
PO	Platanus occidentalis	American Sycamore
TA	Tilia americana	American Linden
TC	Tilia cordata 'Greenspire'	Greenspire Littleleaf Linden

JVB	Juniperus virginiana 'Blue Arrow'	Blue Arrow Juniper
JVC	Juniperus virginiana 'Corcorcor'™	Emerald Sentinal Juniper
PG	Picea glauca	White Spruce
TO	Thuja occidentalis 'Nigra'	Dark American Arborvitae

ACS	Amelanchier canadensis	Shadblow Serviceberry
MS	Malus hybrid 'Spring Snow'	Spring Snow Crab Apple

NOTE:
SEE SHEET L1.0 FOR PLANT SCHEDULE WITH QUANTITIES AND SIZES



174 Hanover Street Extension
Lebanon, New Hampshire 03766

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Designed by EJB	Checked by
Issued for	Date
Permitting	May 10, 2024

Not Approved for Construction

Landscape

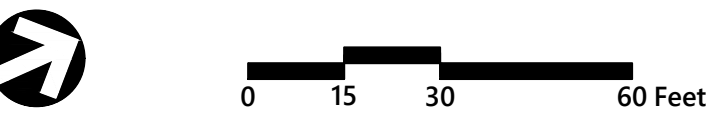
Plan 2

Drawing Number

L1.2

Sheet 39 of 50

Project Number
52933.00



74 Hanover Street Extension
Lebanon, New Hampshire 03766

Designed by **EJB** Checked by _____

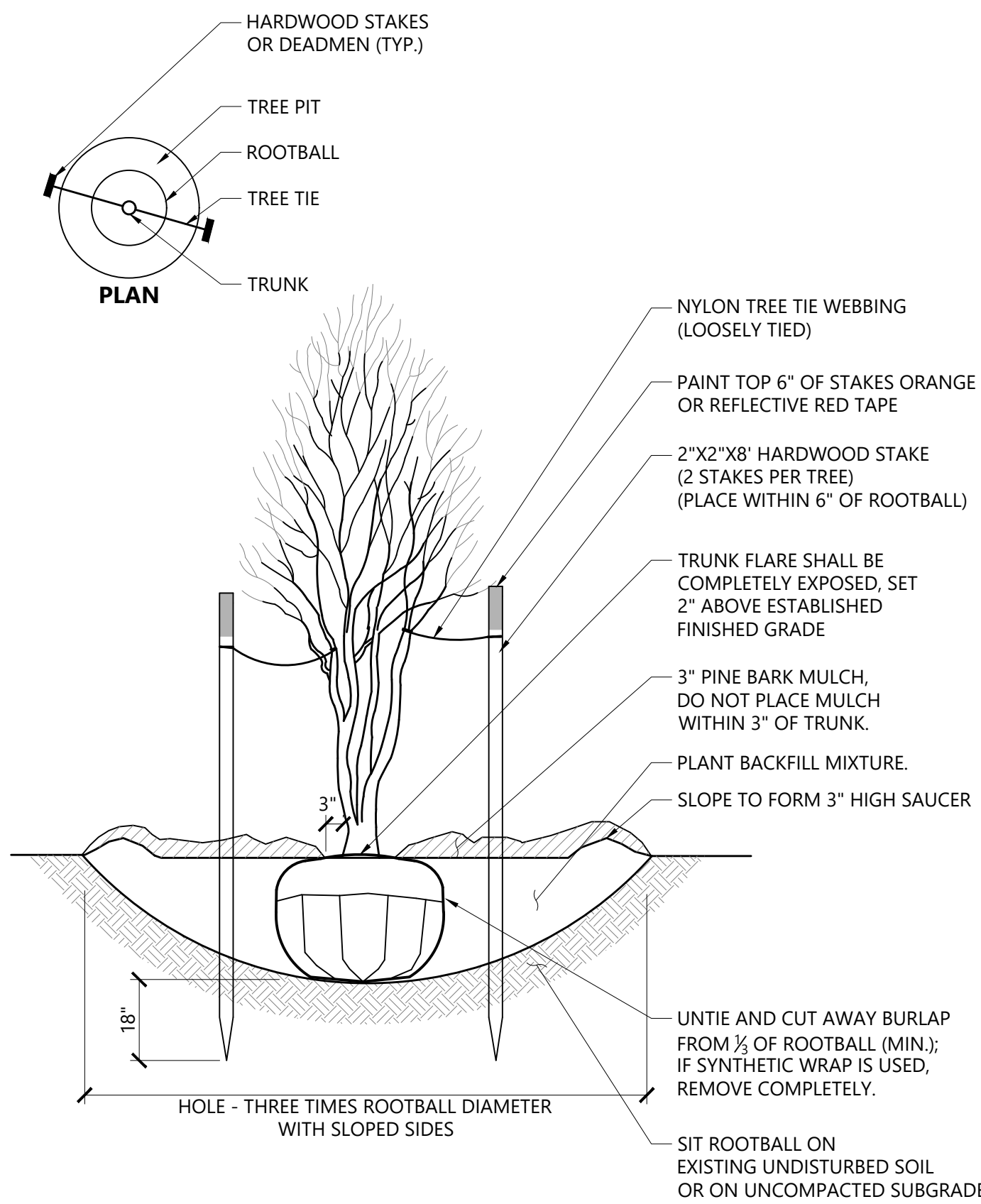
Not Approved for Construction

Drawing Number

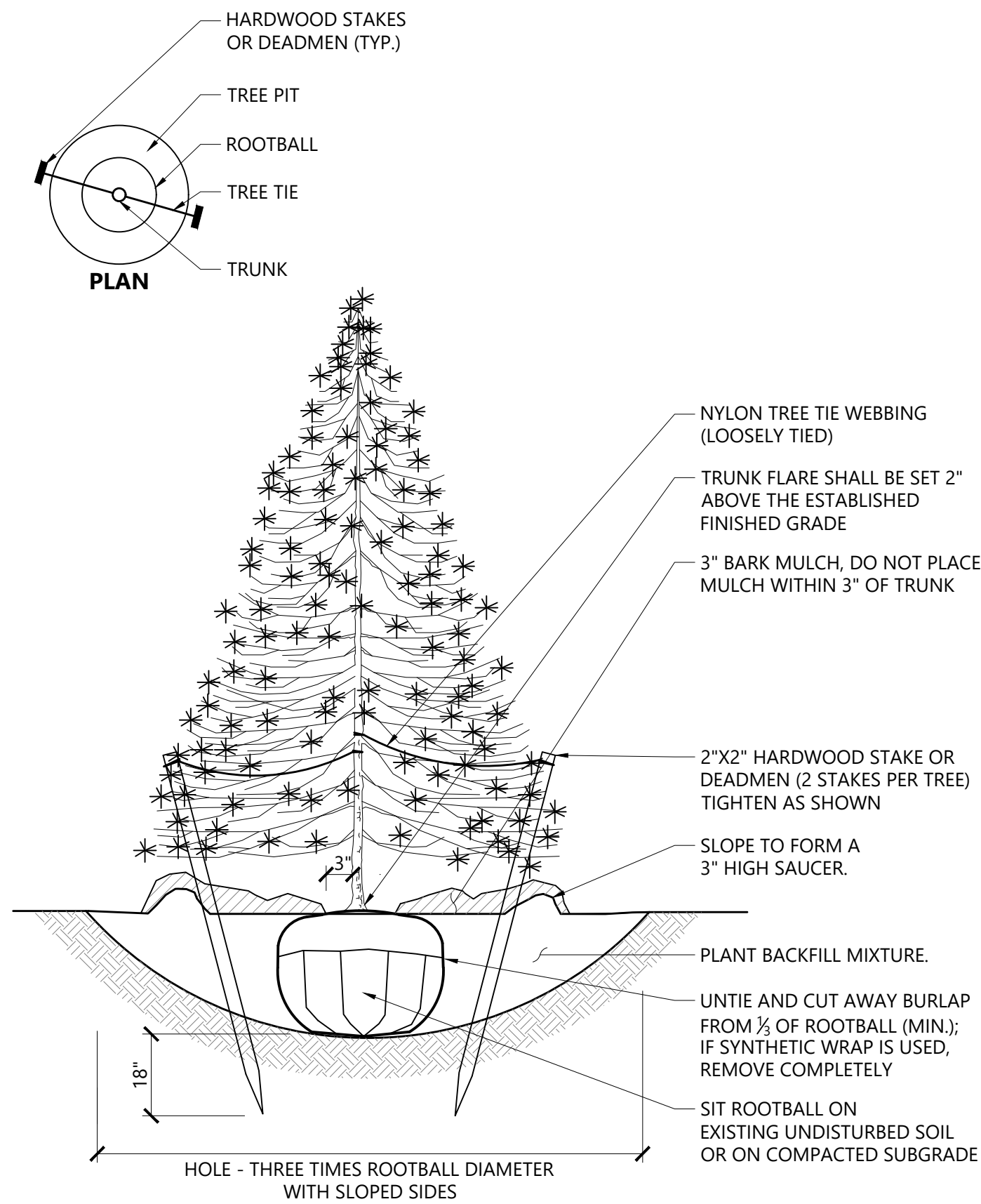
Sheet 40 of 50

Project Number
52933.00

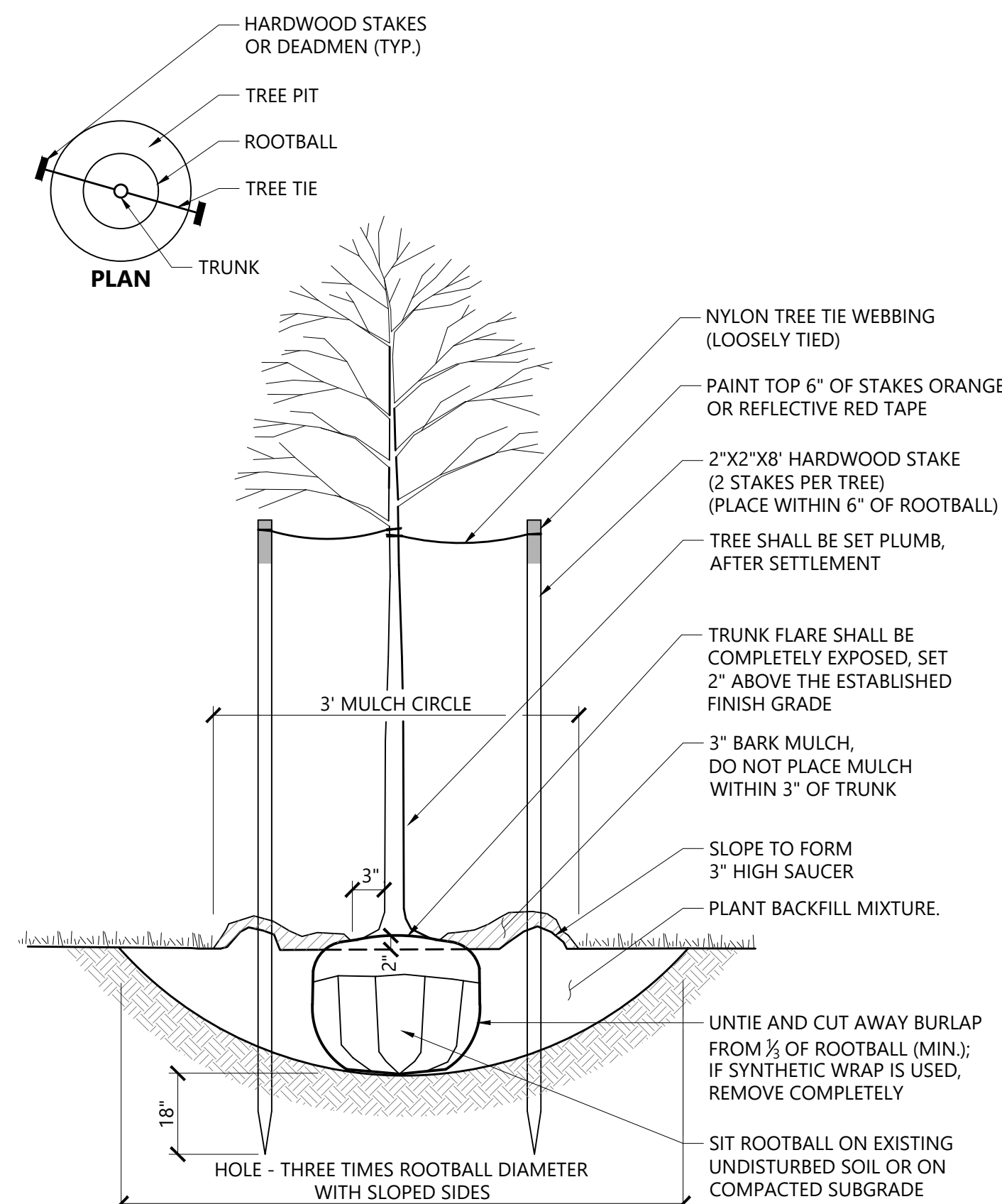
Saved Thursday, October 24, 2024 6:07:32 PM DBOSWORTH Plotted Friday, October 25, 2024 5:27:56 PM Derek Bosworth



Multistem Tree Planting		9/21
N.T.S.	Source: VHB	LD_606

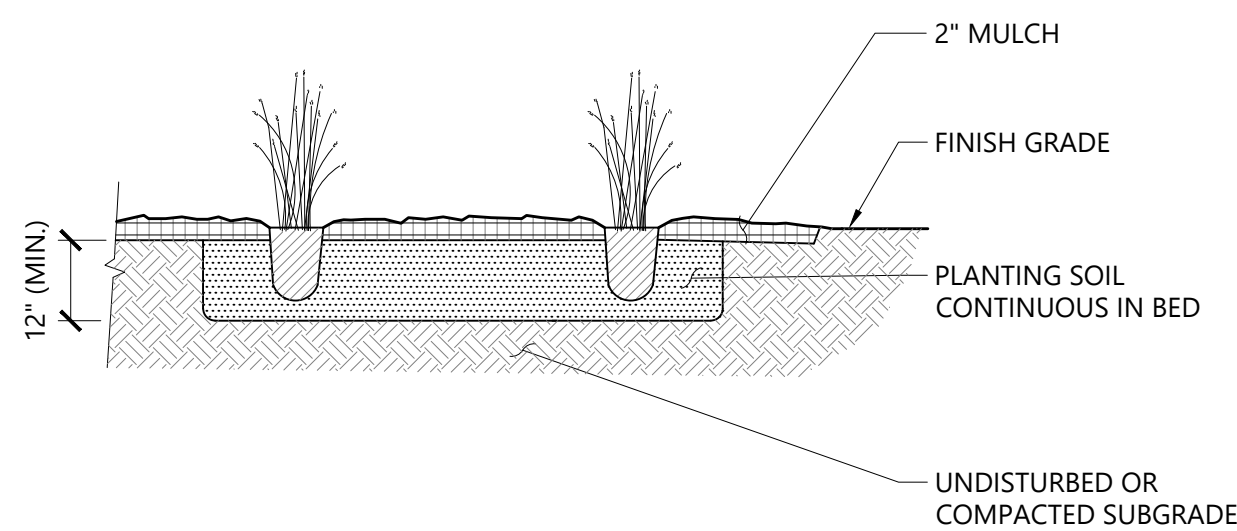
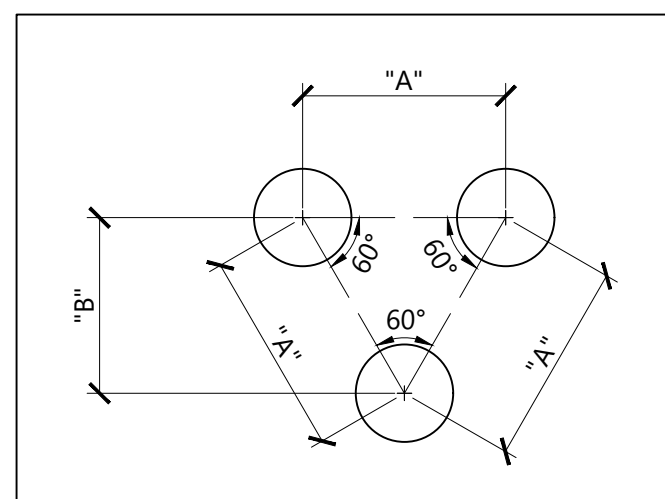


Evergreen Tree Planting		9/21
N.T.S.	Source: VHB	LD_604

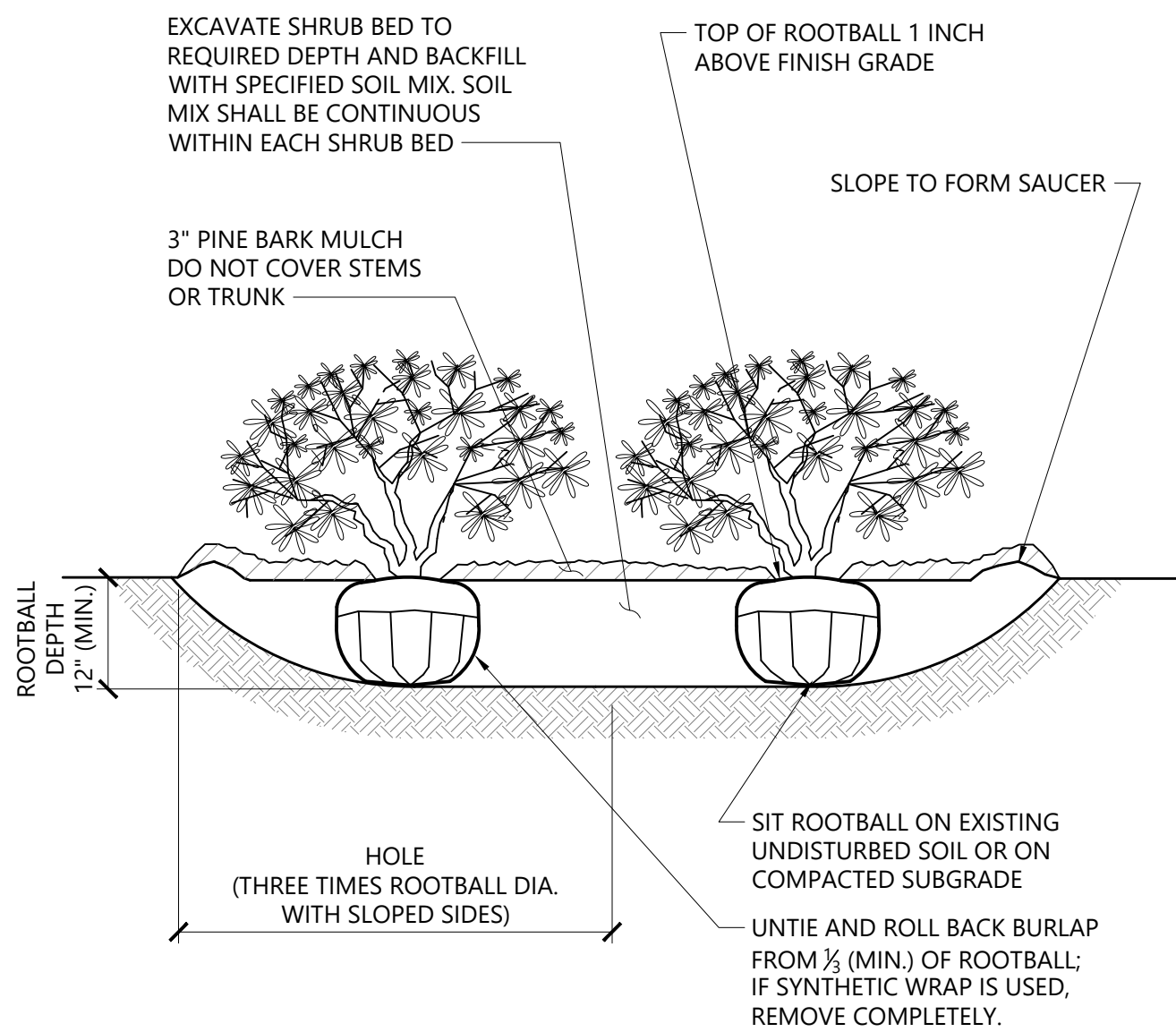


Tree Planting (For Trees Under 4" Caliper)		9/21
N.T.S.	Source: VHB	LD_602

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.



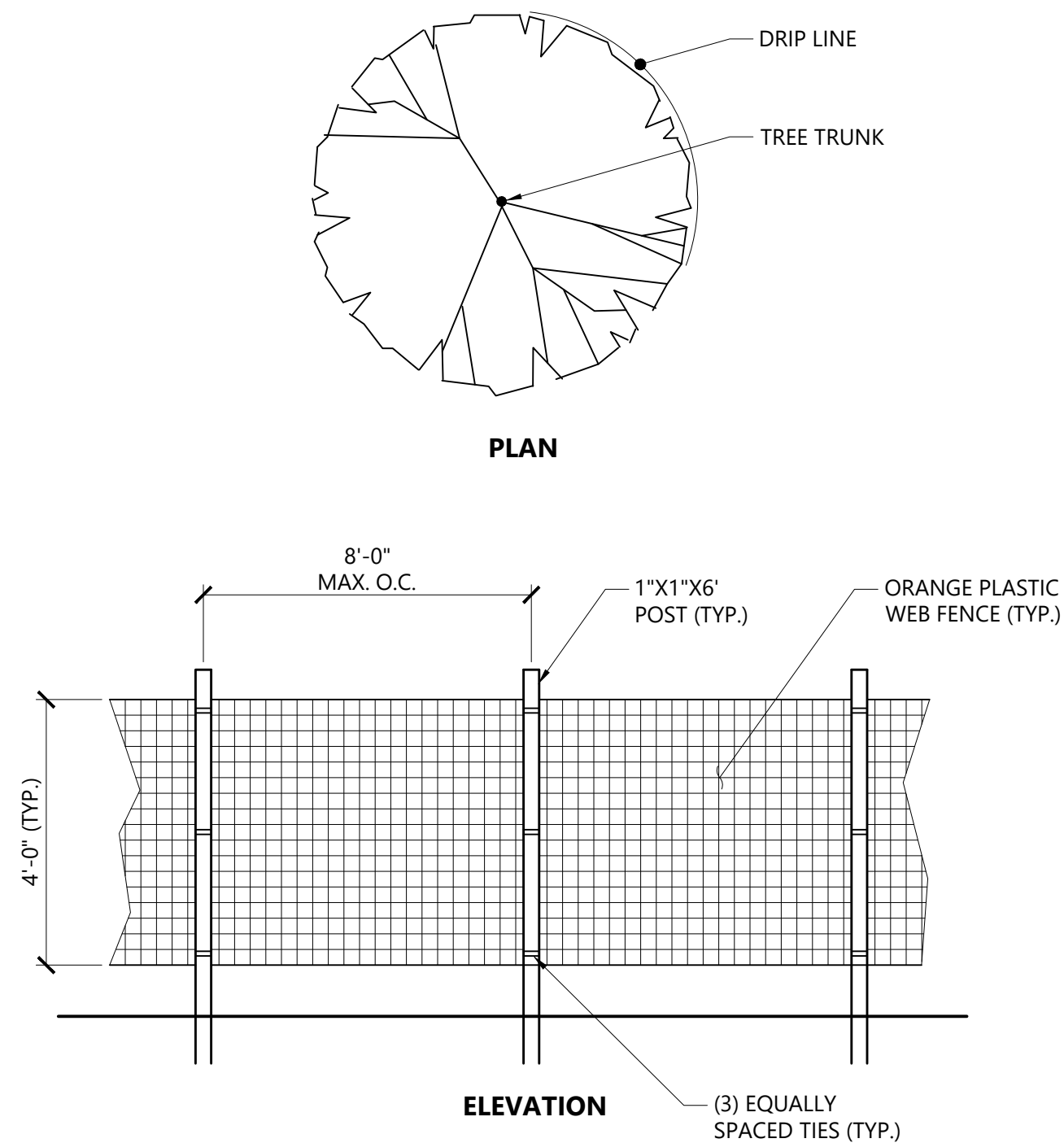
Perennial and Ornamental Grass Planting		1/16
N.T.S.	Source: VHB	LD_618



NOTES

1. LOOSEN ROOTS AT THE OUTER EDGE OF ROOTBALL OF CONTAINER GROWN SHRUBS.

Shrub Bed Planting		1/16
N.T.S.	Source: VHB	LD_601



NOTES

1. INSTALL TREE PROTECTION FENCE AT THE DRIVE LINE OF EXISTING TREES TO REMAIN.

Tree Protection Fence 1/16
 N.T.S. Source: VHB LD_610

The Brickyard Residential Development

**174 Hanover Street Extension
Lebanon, New Hampshire 03766**

No.	Revision	Date	Apprvd.
1	Revised Layout Resubmission	10/24/24	DF

Designed by	Checked by
EJB	

Permitting May 10, 2024

Not Approved for Construction

Landscape

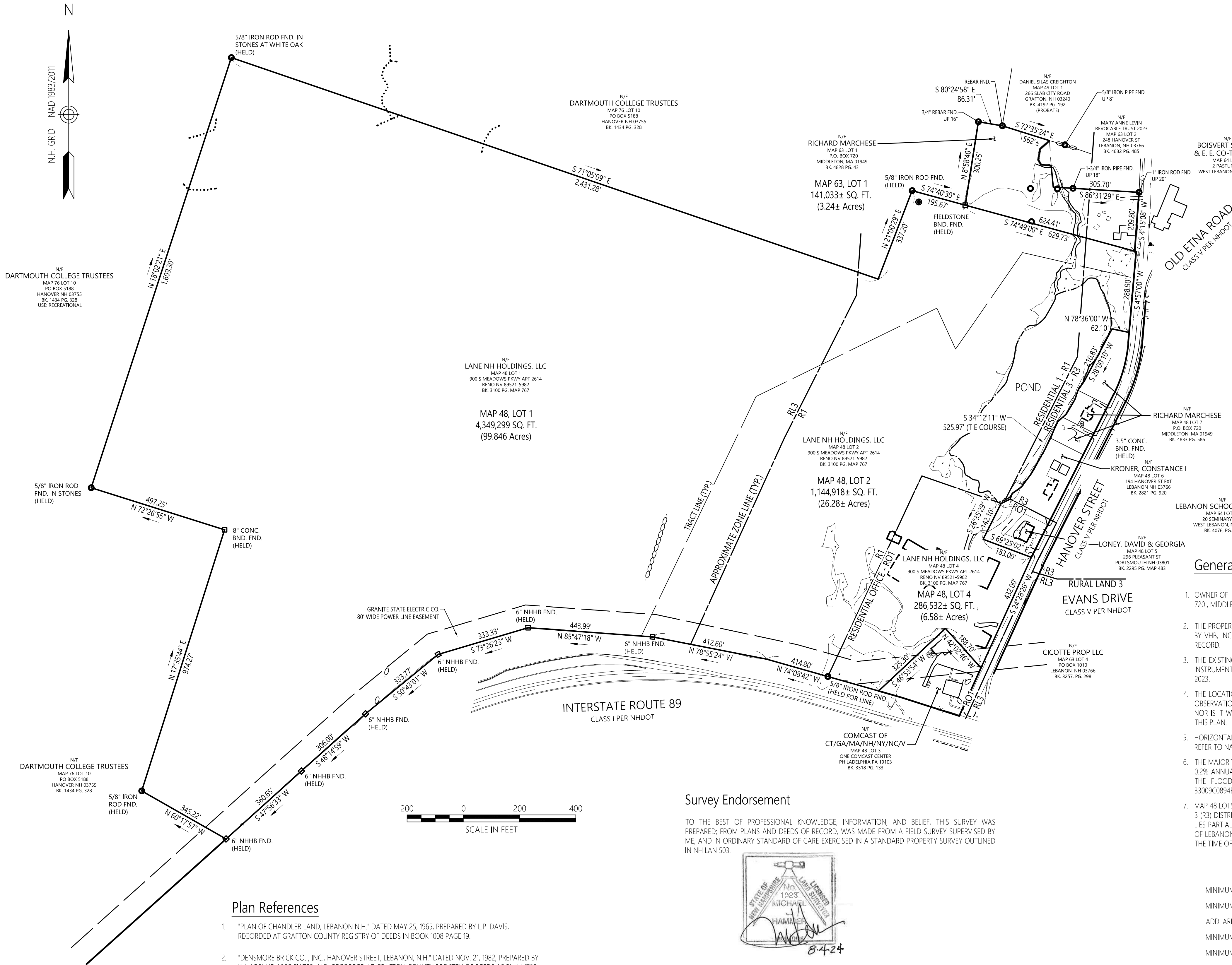
Details

Drawing Number

L2.1

Sheet 41 of 50

Project Number
52933.00

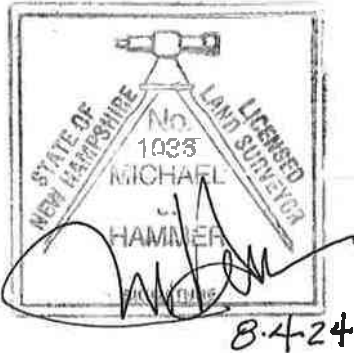


Plan References

- "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.

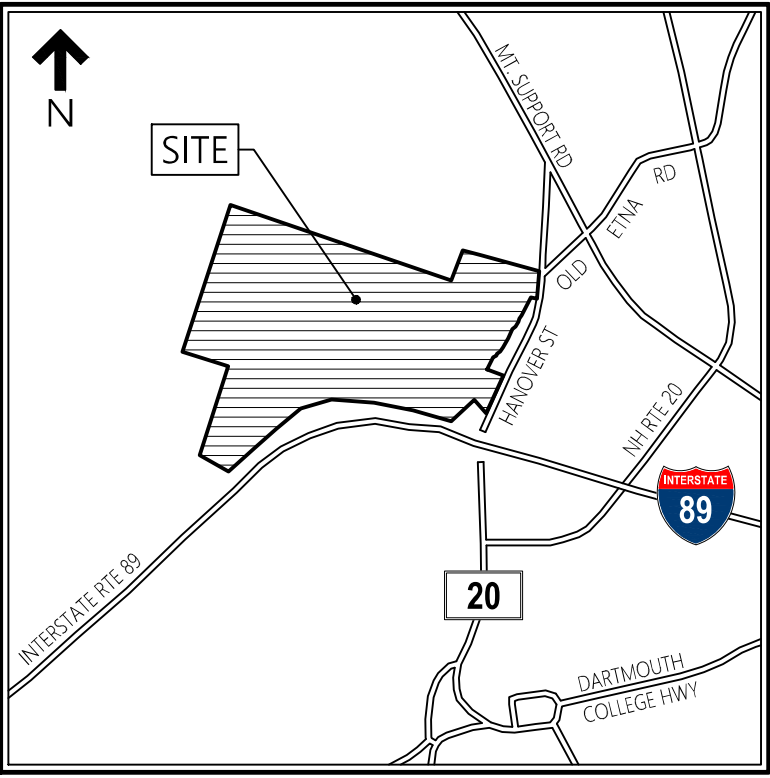
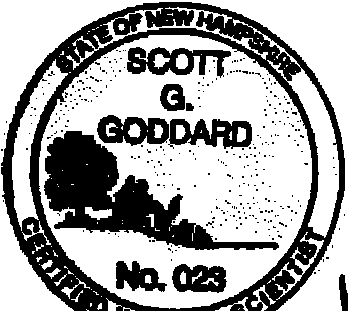
Survey Endorsement

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)



Locus Map

(NOT TO SCALE)

Legend

- ① DRAIN MANHOLE
- ② CATCH BASIN
- ③ SEWER MANHOLE
- ④ ELECTRIC MANHOLE
- ⑤ TELEPHONE MANHOLE
- ⑥ MANHOLE
- ⑦ HAND HOLE
- ⑧ WATER GATE
- ⑨ FIRE HYDRANT
- ⑩ GAS GATE
- ⑪ BOLLARD
- ⑫ STREET SIGN
- ⑬ LIGHT POLE
- ⑭ UTILITY POLE
- ⑮ GUY POLE
- ⑯ GUY WIRE
- ⑰ MONITORING WELL
- ⑱ FLOOD LIGHT
- ⑲ PEDESTRIAN SIGNAL
- ⑳ MAST ARM
- ㉑ FLASHING SIGNAL
- ㉒ WELL
- ㉓ MARSH
- ㉔ F.F.E. = 45.27'
- ㉕ FINISHED FLOOR ELEVATION
- ㉖ DASHED WHITE LINE
- ㉗ EDGE OF PAVEMENT
- ㉘ VERTICAL GRANITE CURB
- ㉙ SLOPED GRANITE EDGE
- ㉚ GUARD RAIL
- ㉛ CHAIN LINK FENCE
- ㉜ DRAINAGE LINE
- ㉝ SEWER LINE
- ㉞ OVERHEAD WIRE
- ㉟ UNDERGROUND ELECTRIC
- ㊱ TELEPHONE LINE
- ㊲ GAS LINE
- ㊳ WATER LINE
- ㊴ STONE WALL
- ㊵ TREE LINE
- ㊶ LIMIT OF BANK
- ㊷ VEGETATED WETLAND BOUNDARY

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, NH", 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.

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

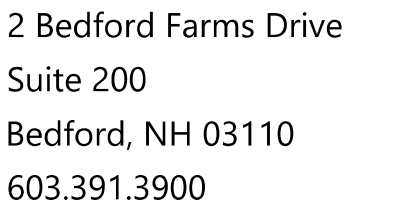
Boundary
Plan of Land

Drawing Number

Sv-1

Sheet 42 of 50

Project Number
52933.00



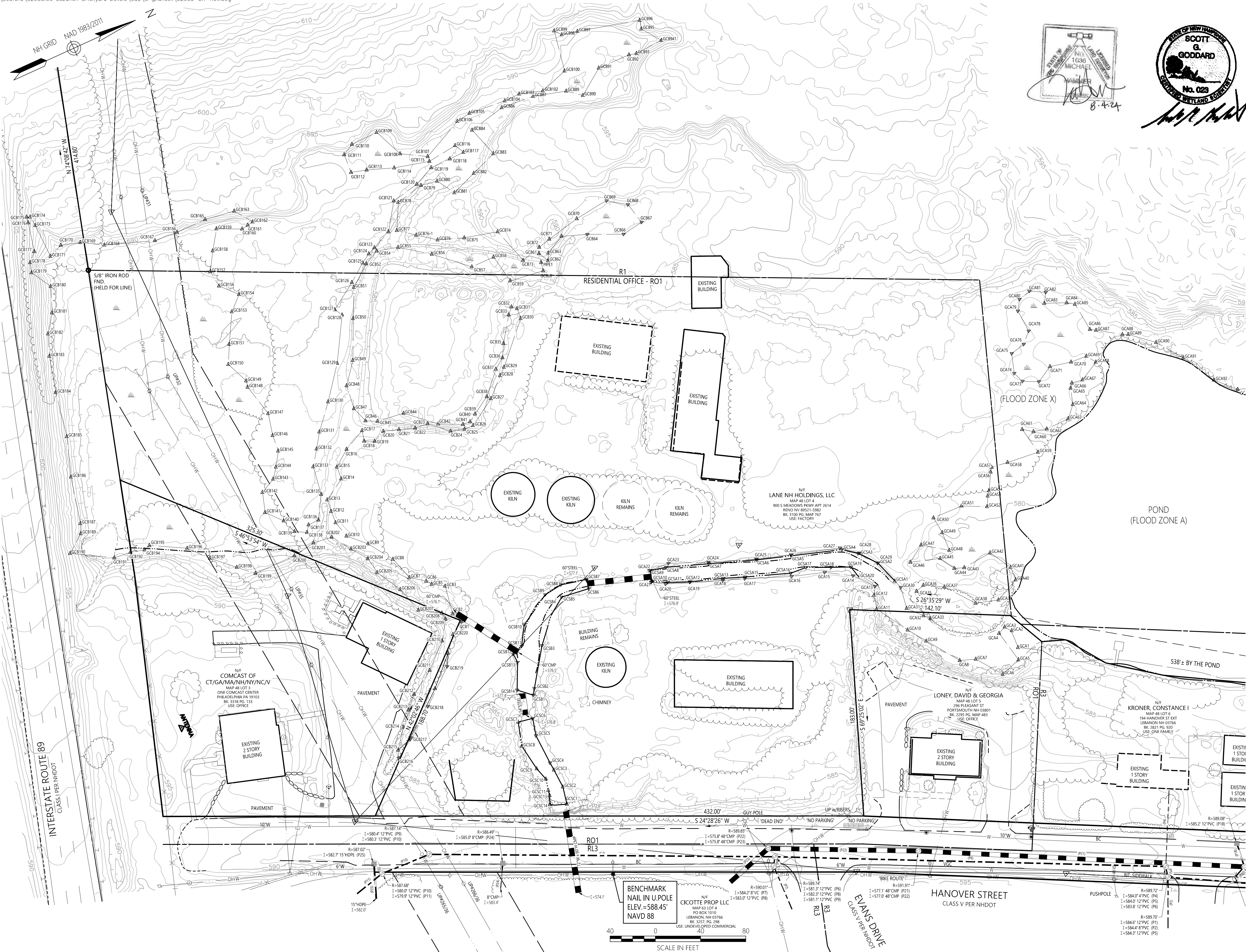
- ① DRAIN MANHOLE
- ▢ CATCH BASIN
- Ⓢ SEWER MANHOLE
- ⓔ ELECTRIC MANHOLE
- Ⓣ TELEPHONE MANHOLE
- MANHOLE
- HAND HOLE
- WATER GATE
- FIRE HYDRANT
- GAS GATE
- BOLLARD
- STREET SIGN
- ☆ LIGHT POLE
- UTILITY POLE
- GUY POLE
- GUY WIRE
- MONITORING WELL
- FLOOD LIGHT
- PEDESTRIAN SIGNAL
- MAST ARM
- FLASHING SIGNAL
- WELL
- MARSH

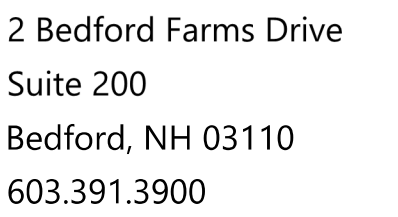
EOB	DWLT	DASHED WHITE LINE
VOC		EDGE OF PAVEMENT
SGE		VERTICAL GRANITE CURB
		SLOPED GRANITE EDGE
		GUARD RAIL
		CHAIN LINK FENCE
		DRAINAGE LINE
		SEWER LINE
- OHW		OVERHEAD WIRE
- E		UNDERGROUND ELECTRIC
- G		TELEPHONE LINE
- W		GAS LINE
		WATER LINE
		STONE WALL
		TREE LINE
		LIMIT OF BANK
WFT-100		VEGETATED WETLAND BOUNDARY

Designed by	Checked by
Issued for	Date
	April 1, 2024

Sv-2

Project Number
52933.00





- ① DRAIN MANHOLE
- ② CATCH BASIN
- ③ SEWER MANHOLE
- ④ ELECTRIC MANHOLE
- ⑤ TELEPHONE MANHOLE
- ⑥ MANHOLE
- ⑦ HAND HOLE
- ⑧ WATER GATE
- ⑨ FIRE HYDRANT
- ⑩ GAS GATE
- ⑪ BOLLARD
- ⑫ STREET SIGN
- ⑬ LIGHT POLE
- ⑭ UTILITY POLE
- ⑮ GUY POLE
- ⑯ GUY WIRE
- ⑰ MONITORING WELL
- ⑱ FLOOD LIGHT
- ⑲ PEDESTRIAN SIGNAL
- ⑳ MAST ARM
- ㉑ FLASHING SIGNAL

	FINISHED FLOOR ELEVATION
	DOUBLE YELLOW LINE
	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

No.	Revision	Date	Appvd.
1	RESPONSE TO COMMENTS UPDATE	8/06/2024	MJH

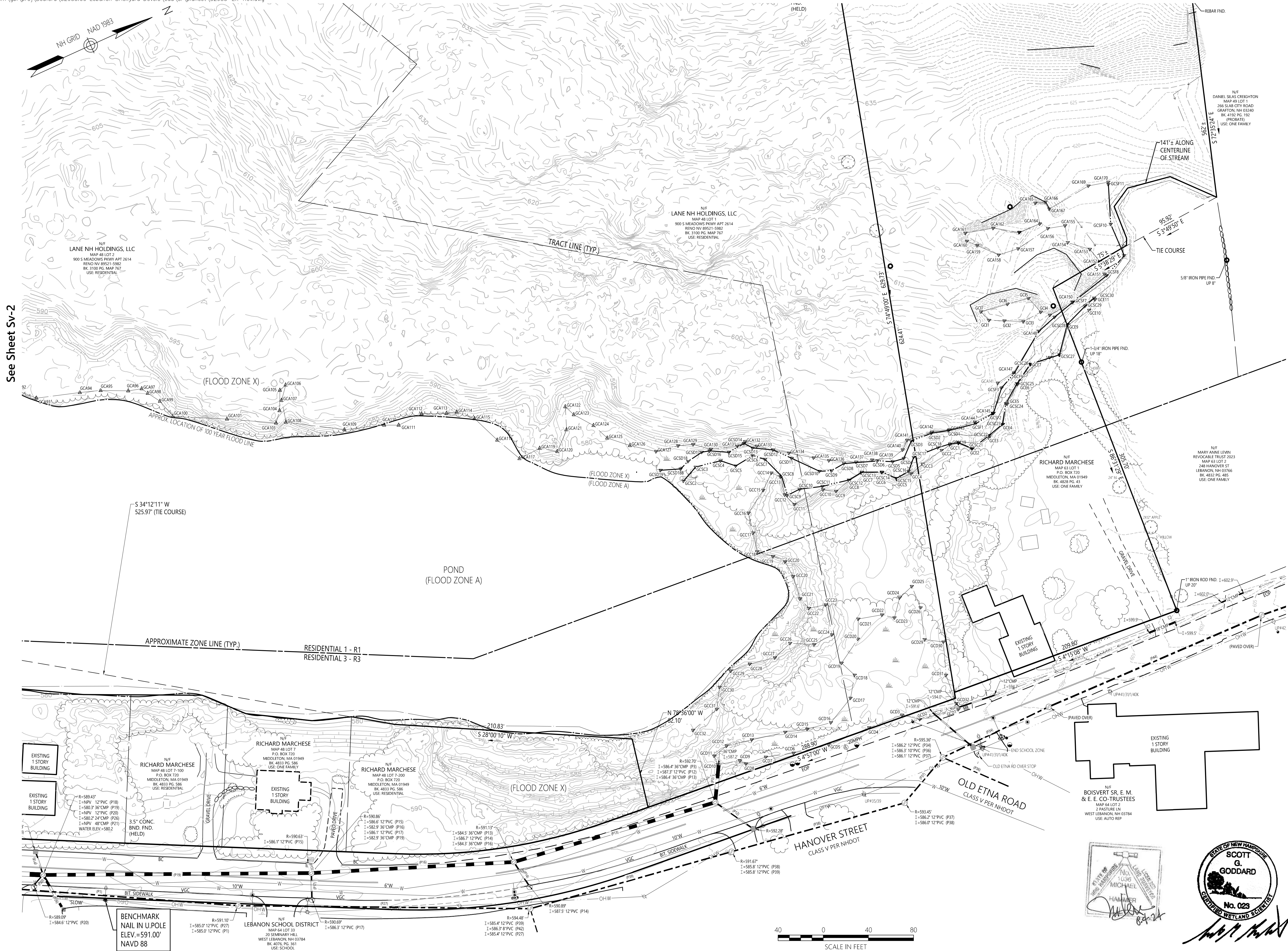
Designed by	Checked by
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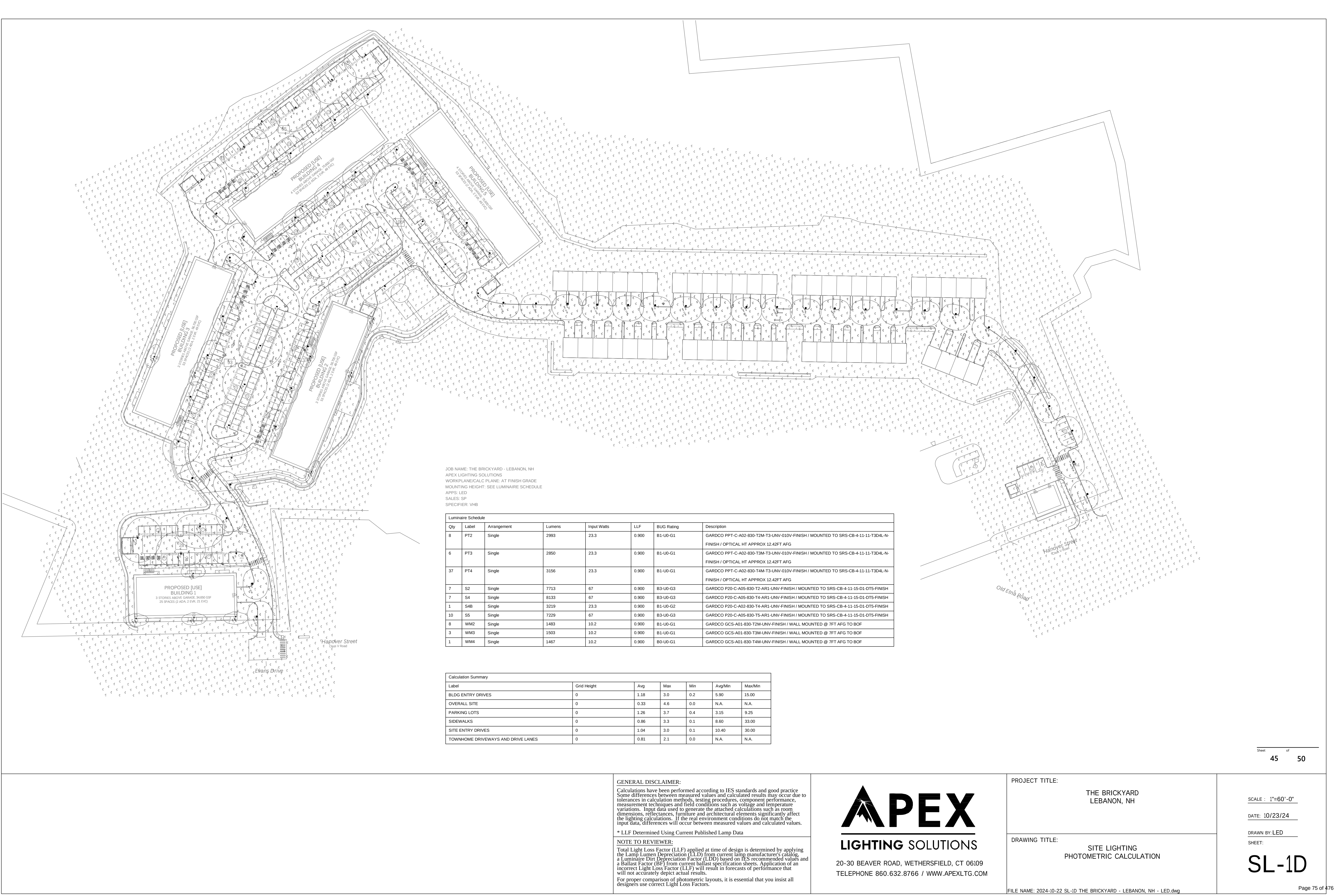
Issued for _____ Date **April 1, 2024**

Drawing Number

Sheet 44 of 50

Project Number
52933.00





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: VMB

Luminaire Schedule							
Qty	Label	Arrangement	Lumens	Input Watts	LLF	BUG Rating	Description
8	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
6	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
37	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
7	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
7	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
1	S4B	Single	3219	23.3	0.900	B1-U0-G2	GARDCO P20-C-A02-830-T4-AR1-UNV-FINISH / MOUNTED TO SRS-CB-4-11-15-D1-DT5-FINISH
10	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
8	WM2	Single	1483	10.2	0.900	B1-U0-G1	GARDCO GCS-A01-830-T2M-UNV-FINISH / WALL MOUNTED @ 7FT AFG TO BOF
3	WM3	Single	1503	10.2	0.900	B1-U0-G1	GARDCO GCS-A01-830-T3M-UNV-FINISH / WALL MOUNTED @ 7FT AFG TO BOF
1	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	1.18	3.0	0.2	5.90	15.00
OVERALL SITE	0	0.33	4.6	0.0	N.A.	N.A.
PARKING LOTS	0	1.26	3.7	0.4	3.15	9.25
SIDEWALKS	0	0.86	3.3	0.1	8.60	33.00
SITE ENTRY DRIVES	0	1.04	3.0	0.1	10.40	30.00
TOWNHOME DRIVEWAYS AND DRIVE LANES	0	0.81	2.1	0.0	N.A.	N.A.

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 45 of 50

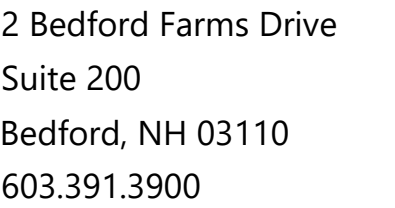
SCALE : 1"=60'-0"

DATE: 10/23/24

DRAWN BY: LED

SHEET:

SL-1D



WM4 07/31
 N.T.S. Source: VHB LD

WM3 07/31
 N.T.S. Source: VHB LD

WM2 07/31
N.T.S. Source: VHB LD

174 Hanover Street Extension
Lebanon, New Hampshire 03766

Designed by TMD	Checked by MJV
Issued for Permitting	Date May 10, 2024

Drawing Number

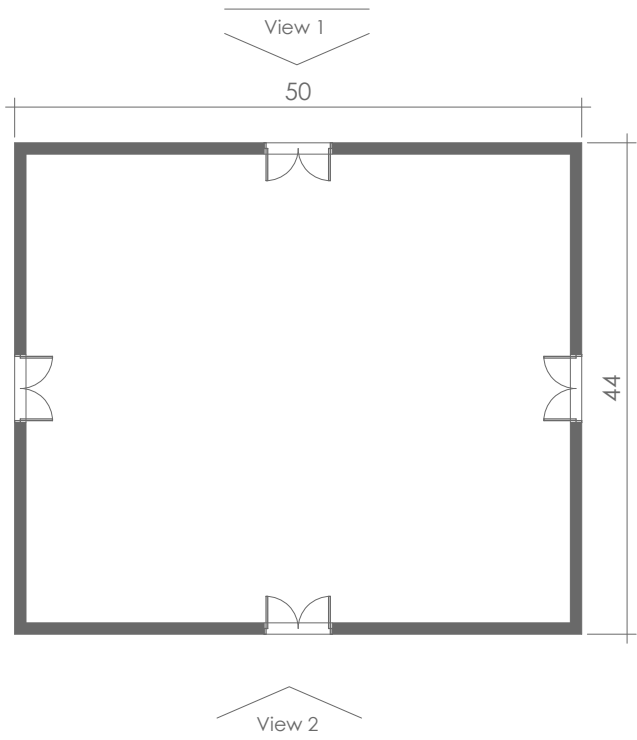
NOTES

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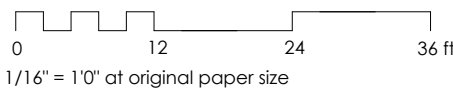
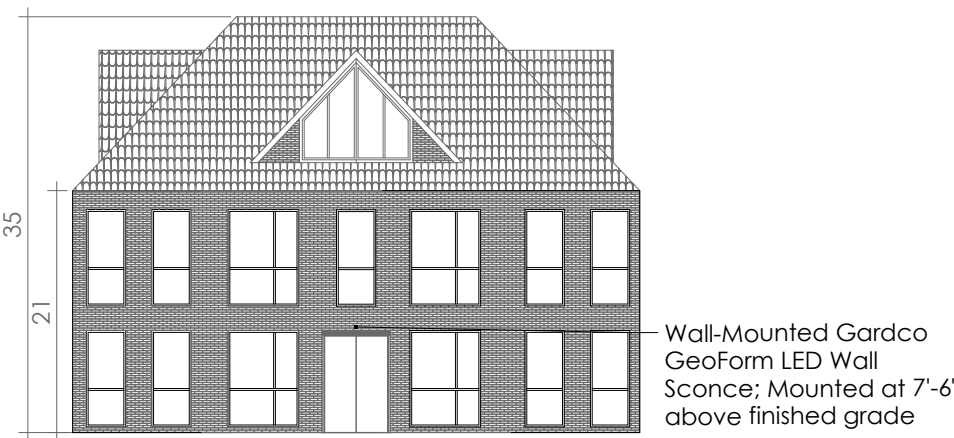
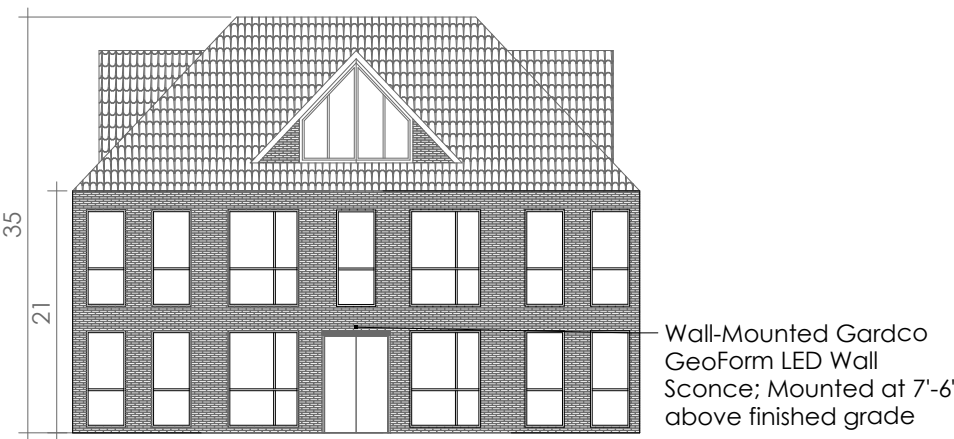
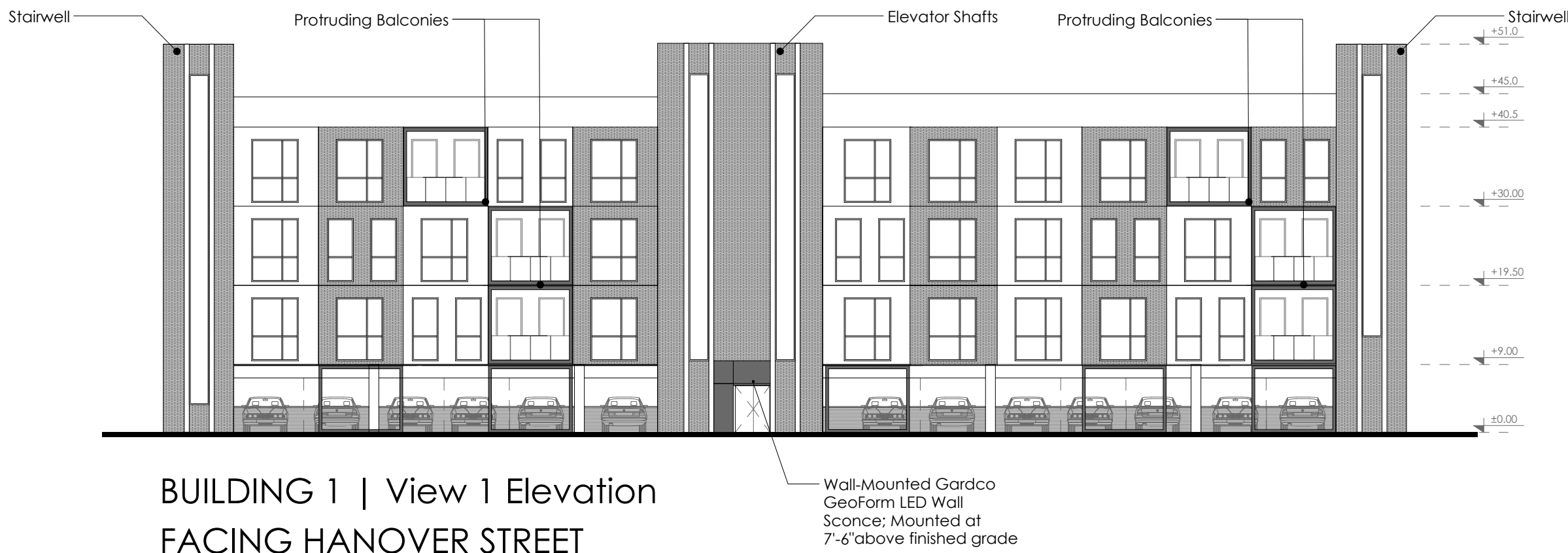
Please note that the plans and elevations are design intent only. The architectural details shown for illustrative purposes and refinements may be necessary as the design phase progresses.



BUILDING 1 | Parking Level Plan



MAINTENANCE BUILDING | GROUND FLOOR PLAN



Sheet of 47 50

P3	Submission	VT	24/08/02
P2	Submission	SS	24/08/02
P1	Submission	SS	24/05/07



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

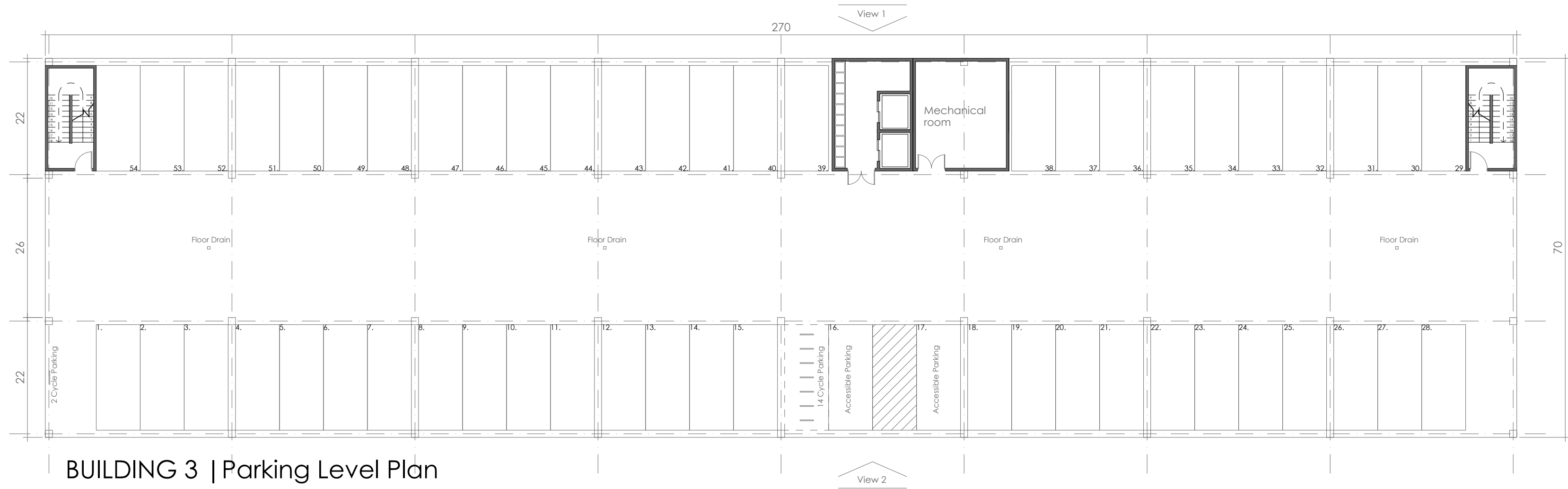
CHECKED
VT

1b, Rustel Road, London, W14 8JA,
+44 7473607166, www.studiointegrate.co.uk

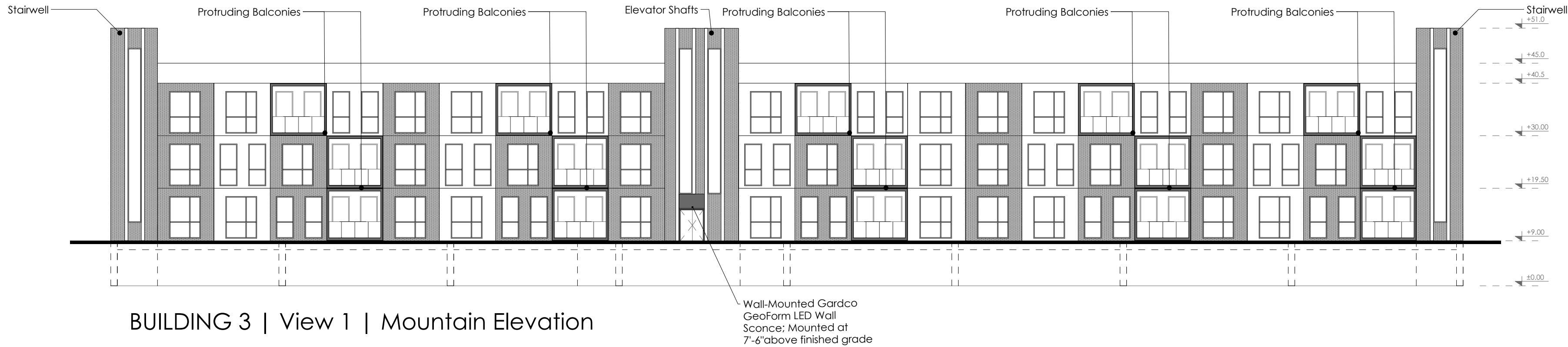
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Please note that the plans and elevations are design intent only. The architectural details shown for illustrative purposes and refinements may be necessary as the design phase progresses.



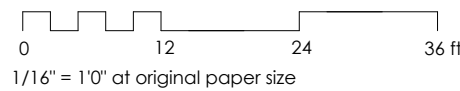
BUILDING 3 | Parking Level Plan



BUILDING 3 | View 1 | Mountain Elevation



BUILDING 3 | 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

REV	DESCRIPTION	DRN	DATE
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CLIENT

PROJECT
Lebanon NH

DRAWING STATUS
PLANNING

DRAWING NAME
BUILDING 2 | PROPOSED PLAN & ELEVATIONS

DRAWING NO. 0089-1202-F3
REV F3

DATE 24/08/02
DRAWN SS

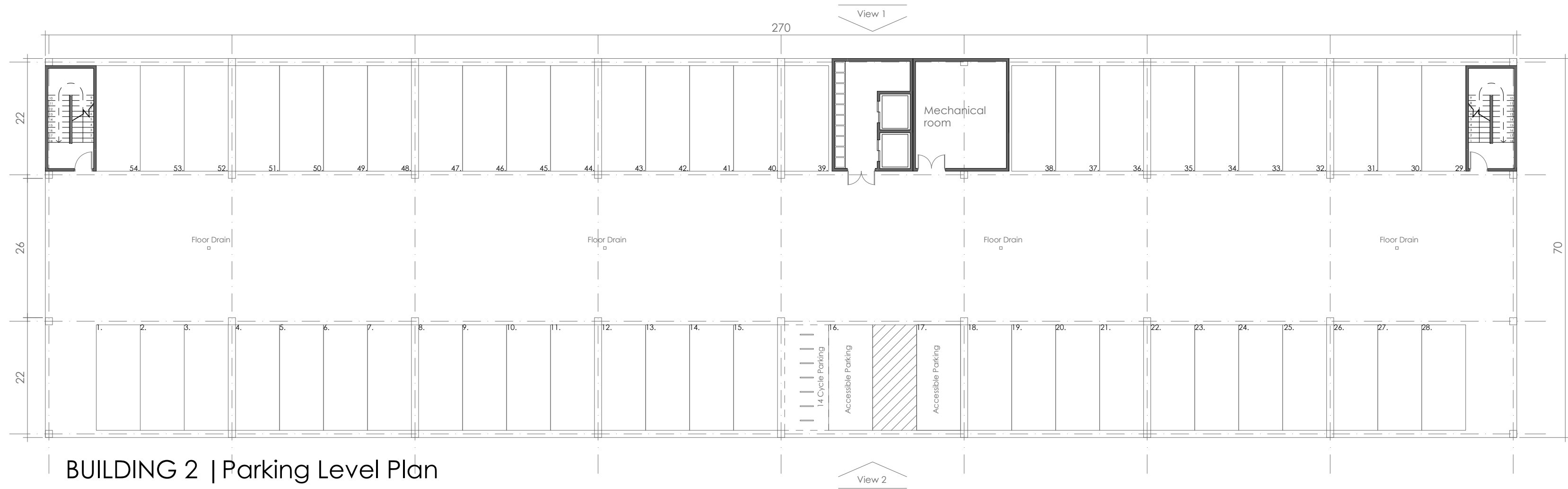
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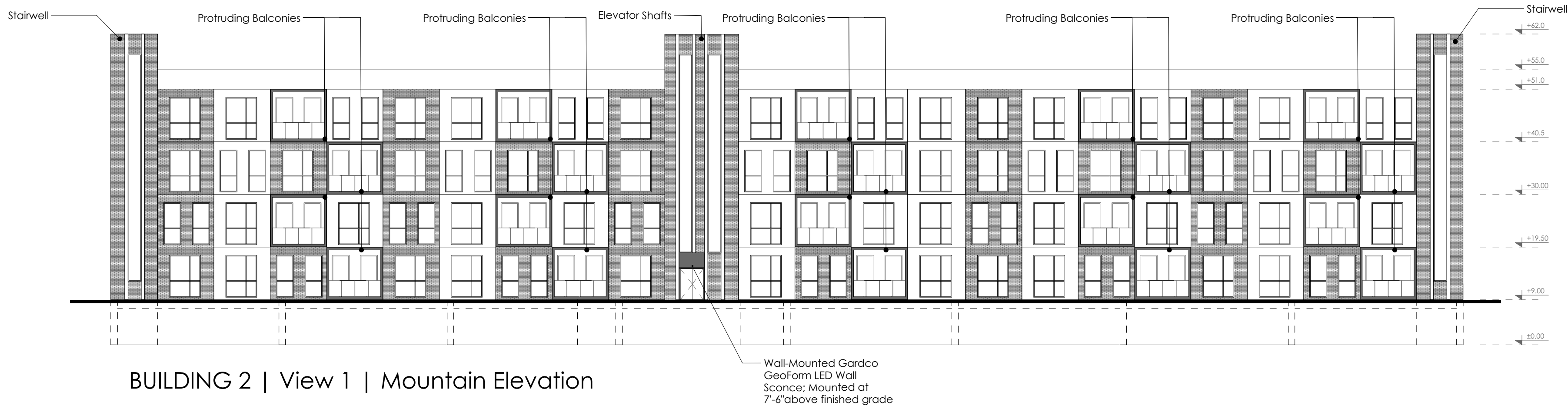
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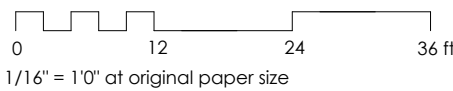
BUILDING 2 | Parking Level Plan



BUILDING 2 | View 1 | Mountain Elevation



BUILDING 2 | View 2 | Lake Elevation



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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 3-5 | PROPOSED PLAN & ELEVATIONS

DRAWING NO. REV
0089-1203-P3 P3

DATE DRAWN
24/08/02 SS

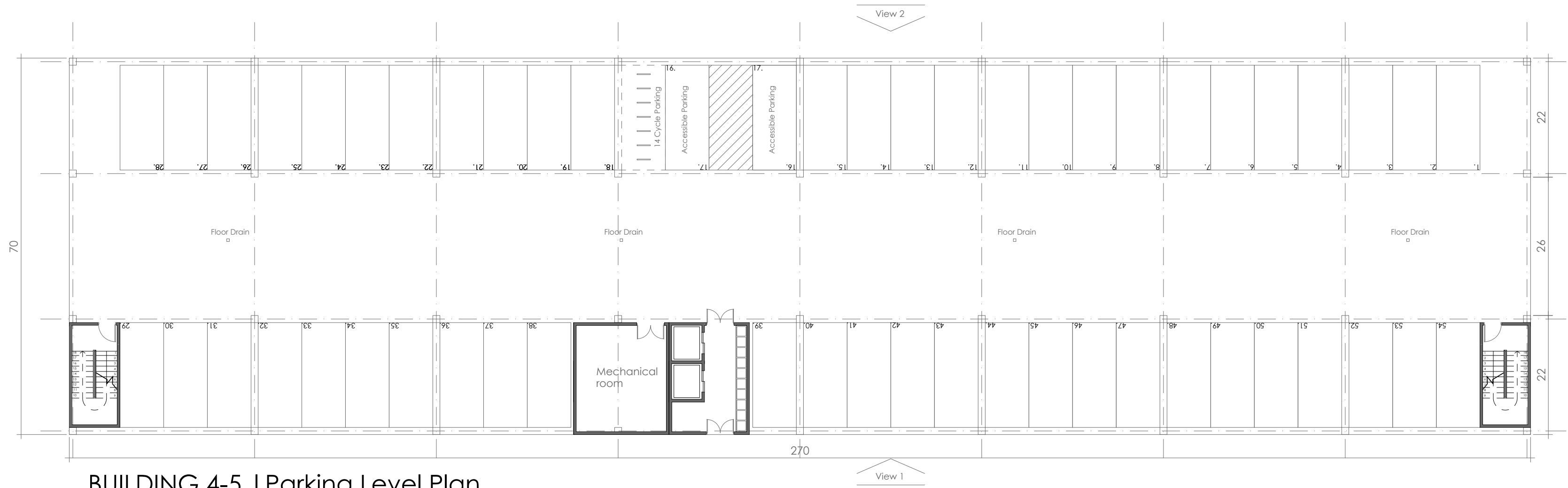
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BUILDING 4-5 | Parking Level Plan



BUILDING 4-5 | View 1 | Lake Elevation



BUILDING 4-5 | View 2 | Mountain Elevation

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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

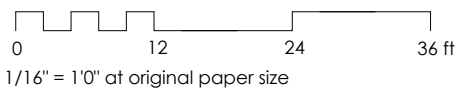
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BUILDING 7-10 | PROPOSED PLAN & ELEVATIONS

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The Brickyard Residential Development

Lebanon, New Hampshire

PREPARED FOR

Brickyard One Nominee Trust
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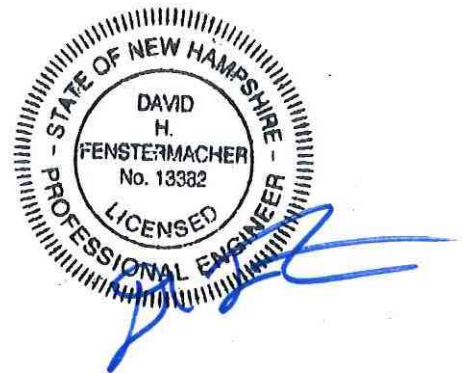


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1

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 13.5 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 5 apartment buildings that total 422 residential units, 51 townhome 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 one surface basin and three 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 108.1 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 swales (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	108.1	32.8	71
Total				108.1	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 5 apartment buildings that total 422 residential units, 51 townhomes 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 108.1-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 Townhomes and roadway	2.51	5.0	93
		PR-2	Building 3, parking and driveway area	2.21	5.0	91
		PR-3	Parking, driveway, Buildings 2, 4, & 5	4.26	5.0	92
		PR-4	Northeastern edge of site around Maintenance Building	0.58	5.0	82
		PR-5	Densmore Pond and direct runoff	9.65	5.0	84
		PR-6	Undeveloped western portion of study area	63.07	32.8	70
		PR-7	Undeveloped northwestern portion of study area directed through project	24.25	23.6	70
		PR-8	North of development area	1.59	11.6	72
Total				±108.1	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 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	90.4	141.8	192.7	255.8
		Proposed	28.0	79.9	128.4	173.4	229.8

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	4.5	

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): 3,770 CF
 - Minimum groundwater recharge provided: **39,202 CF**
- › Minimum water quality volume required (City of Lebanon): 3,770 CF
 - Water quality volume provided: **39,202 CF**
- › Minimum water quality volume required (NHDES AOT): 26,194 CF
 - Water quality volume provided: **39,202 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. NHDES allows 0.1 acre-ft increase in 2-YR post-development.**
- › Maximum 10% Effective Impervious Cover (EIC): **All impervious areas are connected to infiltration systems or are disconnected impervious.**

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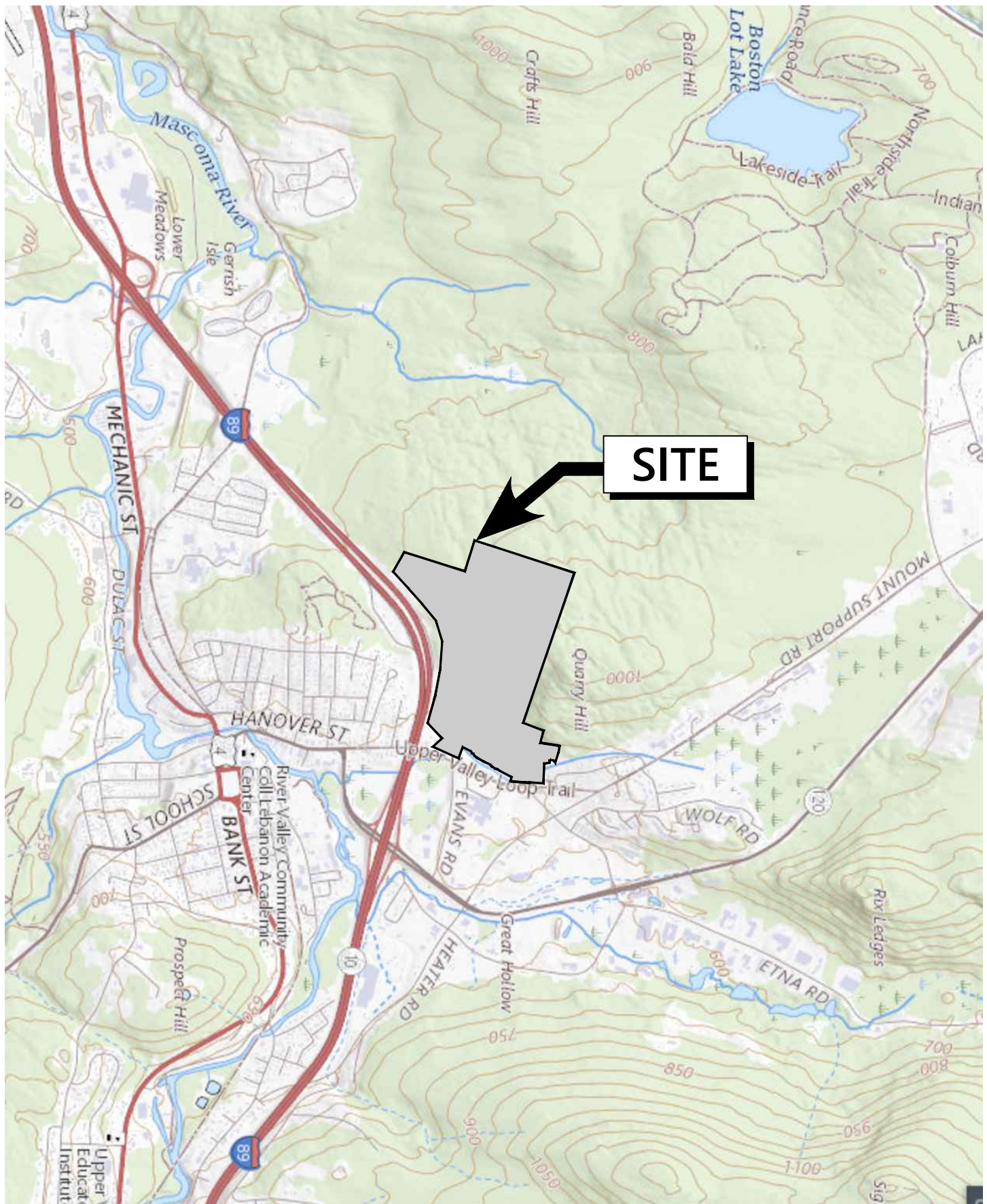


6

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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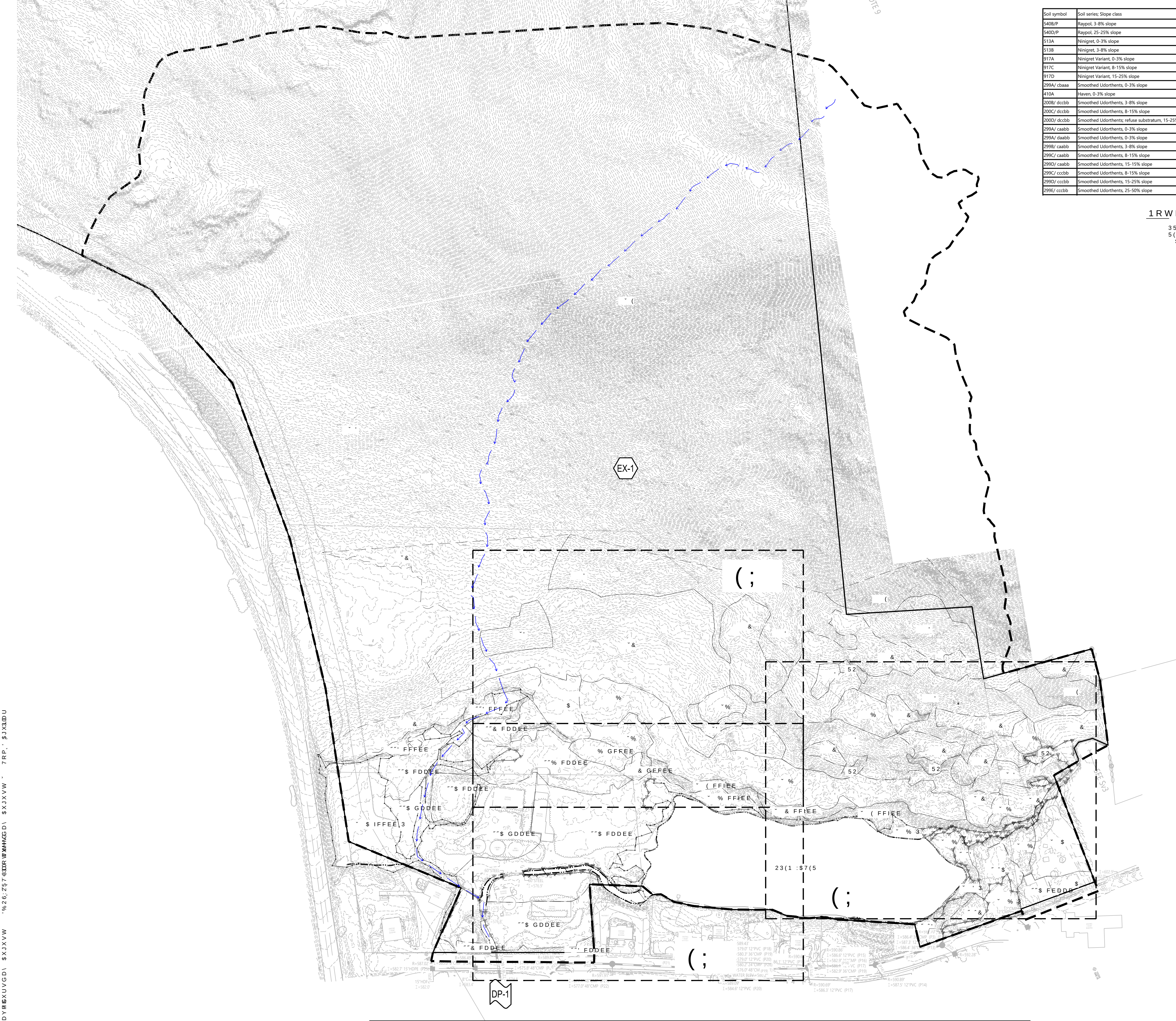


Site USGS Map
Lebanon Brickyard Development
Lebanon, NH 03766

Figure 1

November 2023

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Soil symbol	Soil series: Slope class	600C/fccb/P	Endoaquents, 8-15% slope	+ 6" %
540B/P	Raypol, 3-8% slope	+ 6" %	600A/fccb/P	Endoaquents, 0-3% slope
540D/P	Raypol, 25-25% slope	+ 6" %	600A/fcdc/P	Endoaquents, 0-3% slope
513A	Ninigret, 0-3% slope	+ 6" %	336B	Pittstown, very stony, 3-8% slope
513B	Ninigret, 3-8% slope	+ 6" %	331A	Bernardston, very stony, 0-3% slope
917A	Ninigret Variant, 0-3% slope	+ 6" %	331B	Bernardston, very stony, 3-8% slope
917C	Ninigret Variant, 8-15% slope	+ 6" %	331C	Bernardston, very stony, 8-15% slope
917D	Ninigret Variant, 15-25% slope	+ 6" %	45B	Montauk, very stony, 3-8% slope
299A/cbaaa	Smoothed Udorthents, 0-3% slope	+ 6" %	45C	Montauk, very stony, 8-15% slope
410A	Haven, 0-3% slope	+ 6" %	45D	Montauk, very stony, 15-25% slope
200B/dccbb	Smoothed Udorthents, 3-8% slope	+ 6" %	141B	Hollis-rock outcrop - Chatfield complex, 3-8% slope
200C/dccbb	Smoothed Udorthents, 8-15% slope	+ 6" %	141C	Hollis-rock outcrop - Chatfield complex, 8-15% slope
200D/dccbb	Smoothed Udorthents; refuse substratum, 15-25% slope	+ 6" %	441D	Hollis-rock outcrop - Chatfield complex, 15-25% slope
299A/caabb	Smoothed Udorthents, 0-3% slope	+ 6" %	141E	Hollis-rock outcrop - Chatfield complex, 25-50% slope
299B/caabb	Smoothed Udorthents, 3-8% slope	+ 6" %	250B	Chatfield - Hollis - Montauk complex, very stony, 8-15% slope
299C/caabb	Smoothed Udorthents, 8-15% slope	+ 6" %	250C	Chatfield - Hollis - Montauk complex, very stony, 8-15% slope
299D/caabb	Smoothed Udorthents, 15-15% slope	+ 6" %	250D	Chatfield - Hollis - Montauk complex, very stony, 15-25% slope
299C/ccbb	Smoothed Udorthents, 8-15% slope	+ 6" %	500B/cfcb	Udorthents, loamy, 3-8% slope
299D/ccbb	Smoothed Udorthents, 15-25% slope	+ 6" %	500C/cfcb	Udorthents, loamy, 8-15% slope
299E/ccbb	Smoothed Udorthents, 25-50% slope	+ 6" %	500E/cfcb	Udorthents, loamy, 25-50% slope
		RO	Rack outcrop	

1RWHV

35(3\$5(')25 %5.&.<\$5' 21(120,1((75867)25 7+(%5.&.<\$5' 5(6,'(17,\$/ '9(/230(17 /2&\$7(' 21 +\$192(5 675((7 '7\$; 0\$36 \$1'. .



%HGIRUG)DUPV

6XLWH

%HGIRUG 1+

/HJHQG

SYMBOLS



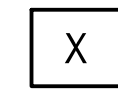
DESIGN POINT



DRAINAGE AREA DESIGNATION



POND



REACH

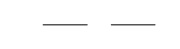
LINETYPES



DRAINAGE AREA BOUNDARY



TIME OF CONCENTRATION FLOW LINE



LIMITS OF SITE SPECIFIC SOIL SURVEY

15&6 62,/ &/(\$66.)&\$7.216

26A

1' 6'25 /2\$0< 6\$1' 6/23(6 +6" %

26B

1' 6'25 /2\$0< 6\$1' 6/23(6 +6" %

26E

1' 6'25 /2\$0< 6\$1' 6/23(6 +6" %

63C

&+\$5/721),1(6\$1'< /2\$0 6/23(6 9(5< 6721< +6" %

331C

%(51\$5'6721 6./7 /2\$0 6/23(6 9(5< 6721< +6" %

331D

%(51\$5'6721 6./7 /2\$0 6/23(6 9(5< 6721< +6" %

341B

67.66,1' 6./7 /2\$0 6/23(6 9(57 6721< +6" %

361D

&\$5',*\$1 .(\$56\$5*(52& 287&523 6/23(6 +6" %

361E

&\$5',*\$1 .(\$56\$5*(52& 287&523 6/23(6 +6" %

53A

%,.1+\$09./1(6./7 /2\$0 +6" %

W

:\$7(5



)HHW

7KH %ULFN\DUG

5HVLGHQWLD O'H

^ +DQRYHU 6WUHHW

/HEDQRQ 1HZ +DPSVKLUH

1R SHYLVLRQ 'DWH \$\$\$YQ

HVLJQHGEI 70' &KHFNHGEI 0-9

VVXHGRU 'DWH

3HUPLWWLQJ -XOI

1RW \$\$\$SURYHG IRU &RQVWUXFW

UDZLQJ 7LWOH

[[LVWLQJ &RQGLV

6WRUPZDWHU OD

3ODQ

'UDZLQJ 1XPEHU

EX-1

6KHHW RI

SURMHFW 1XPEHU



2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

Legend

SYMBOLS



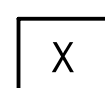
DESIGN POINT



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

No. Revision Date Appr.

Designed by TMD Checked by

Issued for Permitting Date July 6, 2024

Not Approved for Construction

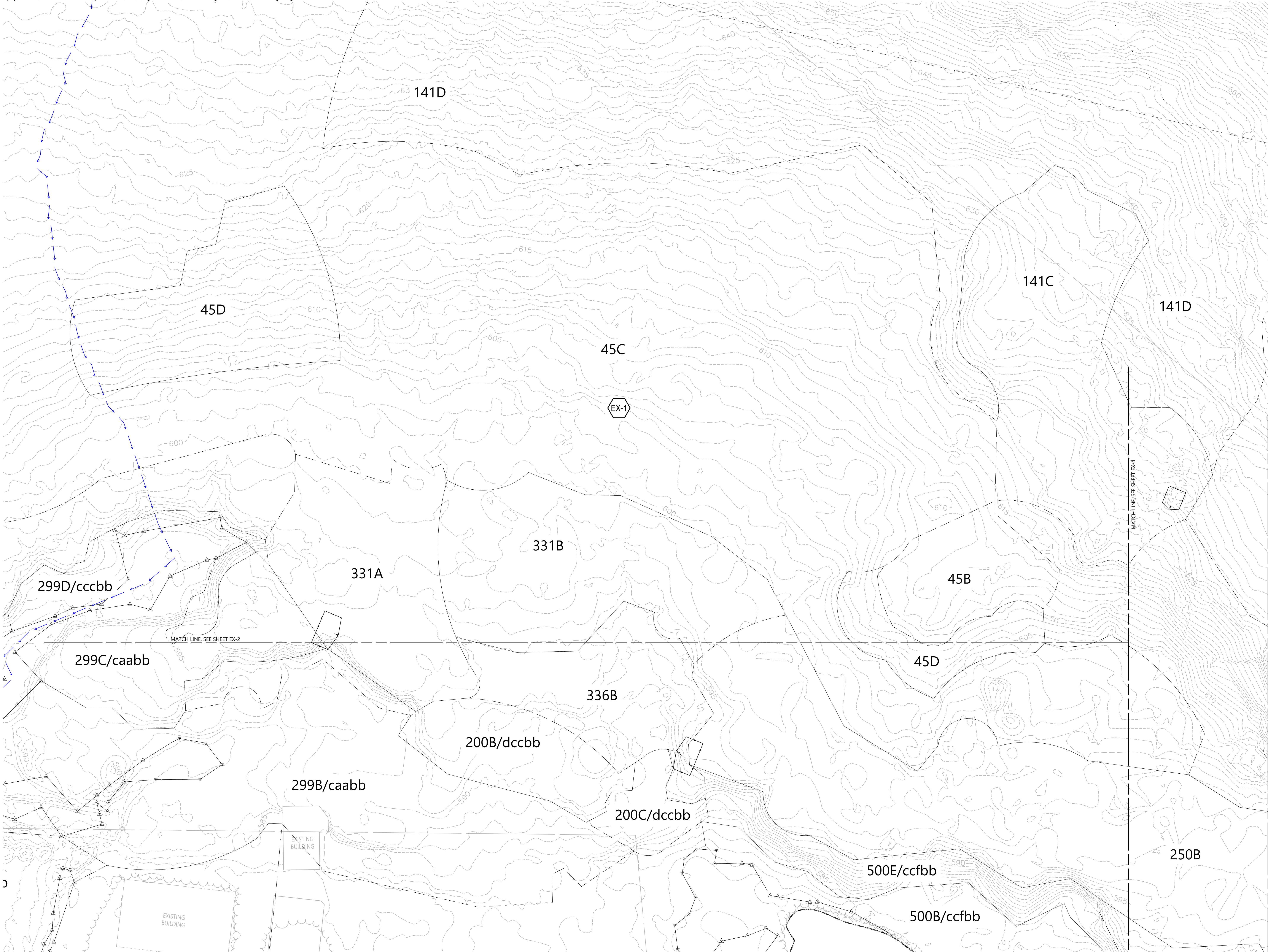
Existing Conditions
Stormwater Management
Plan

Drawing Number

EX-2

Sheet 2 of 4

Project Number
52933.00



Legend

X

DESIGN POINT

X

DRAINAGE AREA DESIGNATION

X

POND

X

REACH

LINETYPES

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

534

BINGHAMVILLE SILT LOAM, HSG C/D

W

WATER

0

15

30

60

Feet

The Brickyard

Residential Development

174 Hanover Street

Lebanon, New Hampshire 03677

No.

Revision

Date

Appr'd.

Designed by

TMD

Checked by

Issued for

Permitting

Date

July 6, 2024

Not Approved for Construction

Drawing Title

Existing Conditions

Stormwater Management

Plan

Drawing Number

EX-3

Sheet

3

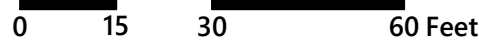
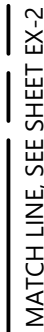
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4

Project Number

52933.00

Page 107 of 476

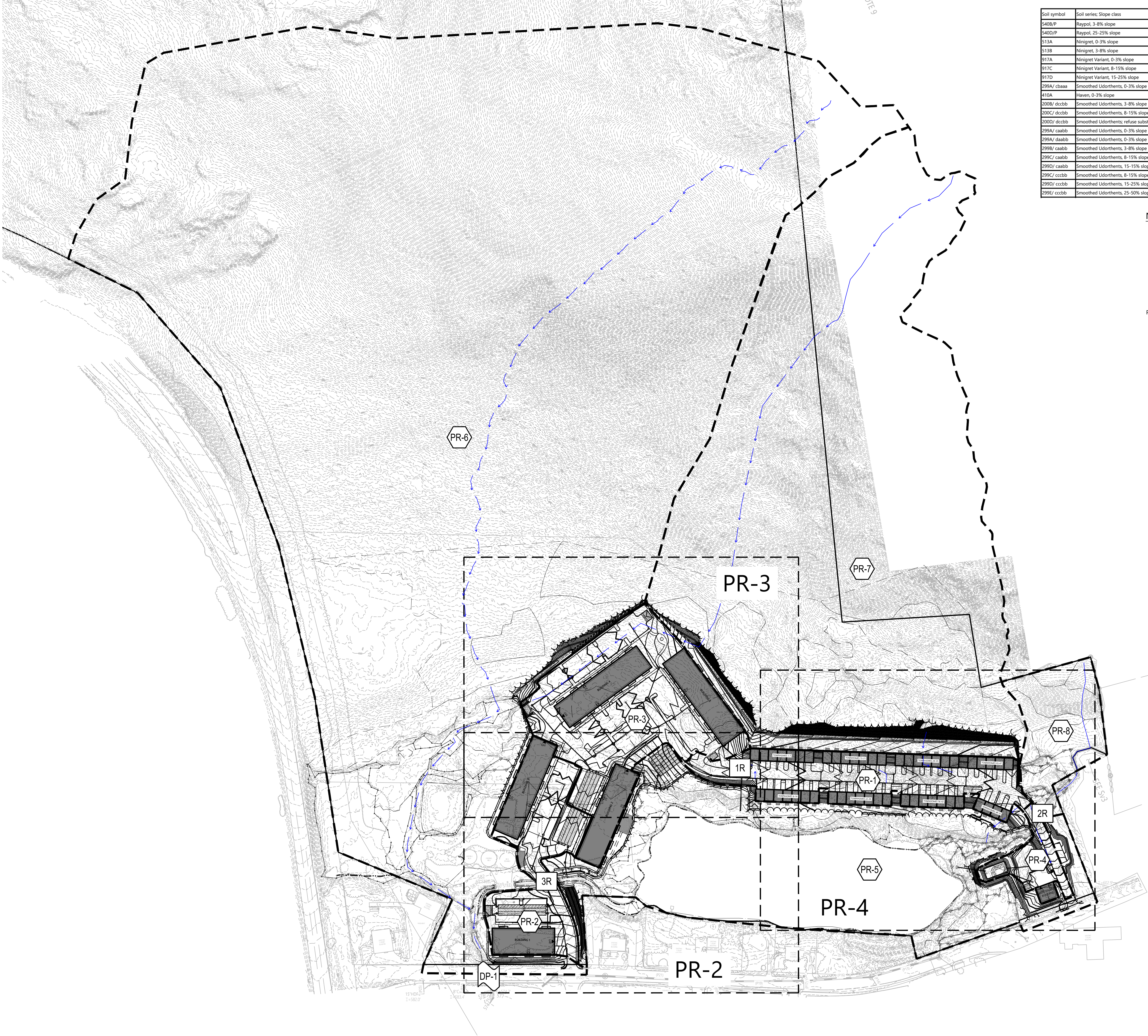


174 Hanover Street
Lebanon, New Hampshire 03677

Issued for **Permitting** Date **July 6, 2024**

Drawing Number

Project Number
52933.00



Soil symbol	Soil series: Slope class		600C/ fccbb/P	Endoaquents, 8-15% slope	HSG B
540B/P	Raypol, 3-8% slope	HSG D	600A/fccbb/P	Endoaquents, 0-3% slope	HSG B
540D/P	Raypol, 25-25% slope	HSG D	600A/fccdd/P	Endoaquents, 0-3% slope	HSG B
513A	Ninigret, 0-3% slope	HSG B	336B	Pittstown, very stony, 3-8% slope	HSG C
513B	Ninigret, 3-8% slope	HSG B	331A	Bernardston, very stony, 0-3% slope	HSG C
917A	Ninigret Variant, 0-3% slope	HSG C	331B	Bernardston, very stony, 3-8% slope	HSG C
917C	Ninigret Variant, 8-15% slope	HSG C	331C	Bernardston, very stony, 8-15% slope	HSG C
917D	Ninigret Variant, 15-25% slope	HSG C	45B	Montauk, very stony, 3-8% slope	HSG C
299A/ cbaaa	Smoothed Udorthents, 0-3% slope	HSG A	45C	Montauk, very stony, 8-15% slope	HSG C
410A	Haven, 0-3% slope	HSG B	45D	Montauk, very stony, 15-25% slope	HSG C
200B/ dcbcb	Smoothed Udorthents, 3-8% slope	HSG B	141B	Hollis-rock outcrop - Chatfield complex, 3-8% slope	HSG C
200C/ dcbcb	Smoothed Udorthents, 8-15% slope	HSG B	141C	Hollis-rock outcrop - Chatfield complex, 8-15% slope	HSG C
200D/ dcbcb	Smoothed Udorthents; refuse substratum, 15-25% slope	HSG B	141D	Hollis-rock outcrop - Chatfield complex, 15-25% slope	HSG C
299A/ caabb	Smoothed Udorthents, 0-3% slope	HSG B	141E	Hollis-rock outcrop - Chatfield complex, 25-50% slope	HSG C
299B/ daabb	Smoothed Udorthents, 0-3% slope	HSG B	250B	Chatfield - Hollis - Montauk complex, very stony, 3-8% slope	HSG C
299B/ caabb	Smoothed Udorthents, 3-8% slope	HSG B	250C	Chatfield - Hollis - Montauk complex, very stony, 8-15% slope	HSG C
299C/ caabb	Smoothed Udorthents, 8-15% slope	HSG B			
299D/ caabb	Smoothed Udorthents, 15-15% slope	HSG B	250D	Chatfield - Hollis - Montauk complex, very stony, 15-25% slope	HSG B
299C/ cccbb	Smoothed Udorthents, 8-15% slope	HSG B	500B/cfbb	Udorthents, loamy, 3-8% slope	HSG B
299D/ cccbb	Smoothed Udorthents, 15-25% slope	HSG B	500C/cfbb	Udorthents, loamy, 8-15% slope	HSG B
299E/ cccbb	Smoothed Udorthents, 25-50% slope	HSG B	500E/cfbb	Udorthents, loamy, 25-50% slope	HSG B
		RO		Rock outcrop	

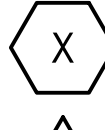
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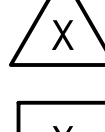
- 1) PREPARED FOR BRICKYARD ONE NOMINEE TRUST FOR THE BRICKYARD RESIDENTIAL DEVELOPMENT, LOCATED ON HANOVER STREET, TAX MAPS 48-1, 2, 4 AND 63-1.
- 2) IMPERVIOUS COVER CALCULATIONS
 - EXISTING IMPERVIOUS: 0.75 AC
 - NEW IMPERVIOUS: 7.57 AC
 - NET NEW IMPERVIOUS: 6.82 AC
 - GROUNDWATER RECHARGE REQUIRED PER ENV-WQ 1500: 3,770 CF (SEE WORKSHEET)
 - GROUNDWATER RECHARGE PROVIDED: 39,202 CF
- 3) APPROXIMATE DISTURBED AREA IS ±13.5 AC
- 4) CONSTRUCTION SEQUENCE: REFER TO PHASING PLAN FOR DETAILS. ROADWAY, PARKING, UTILITIES AND BUILDINGS 1 AND MAINTENANCE BUILDING CONSTRUCTED FIRST.

Legend

SYMBOLS

- 

DESIGN POINT
- 

DRAINAGE AREA DESIGNATION
- 

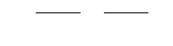
POND
- 

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
- 

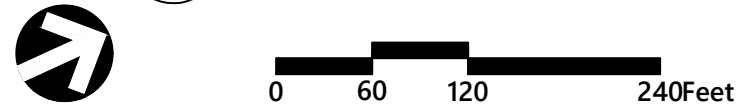
STISSING SILT LOAM, 3-8% SLOPES, VERT STONY, HSG C/D
- 

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	October 14, 2024

Permitting

Not Approved for Construction

Proposed Conditions
Stormwater Management
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
- 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

174 Hanover Street
Lebanon, New Hampshire 03677

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Designed by TMD	Checked by
Issued for Permitting	Date October 14, 2024

Not Approved for Construction

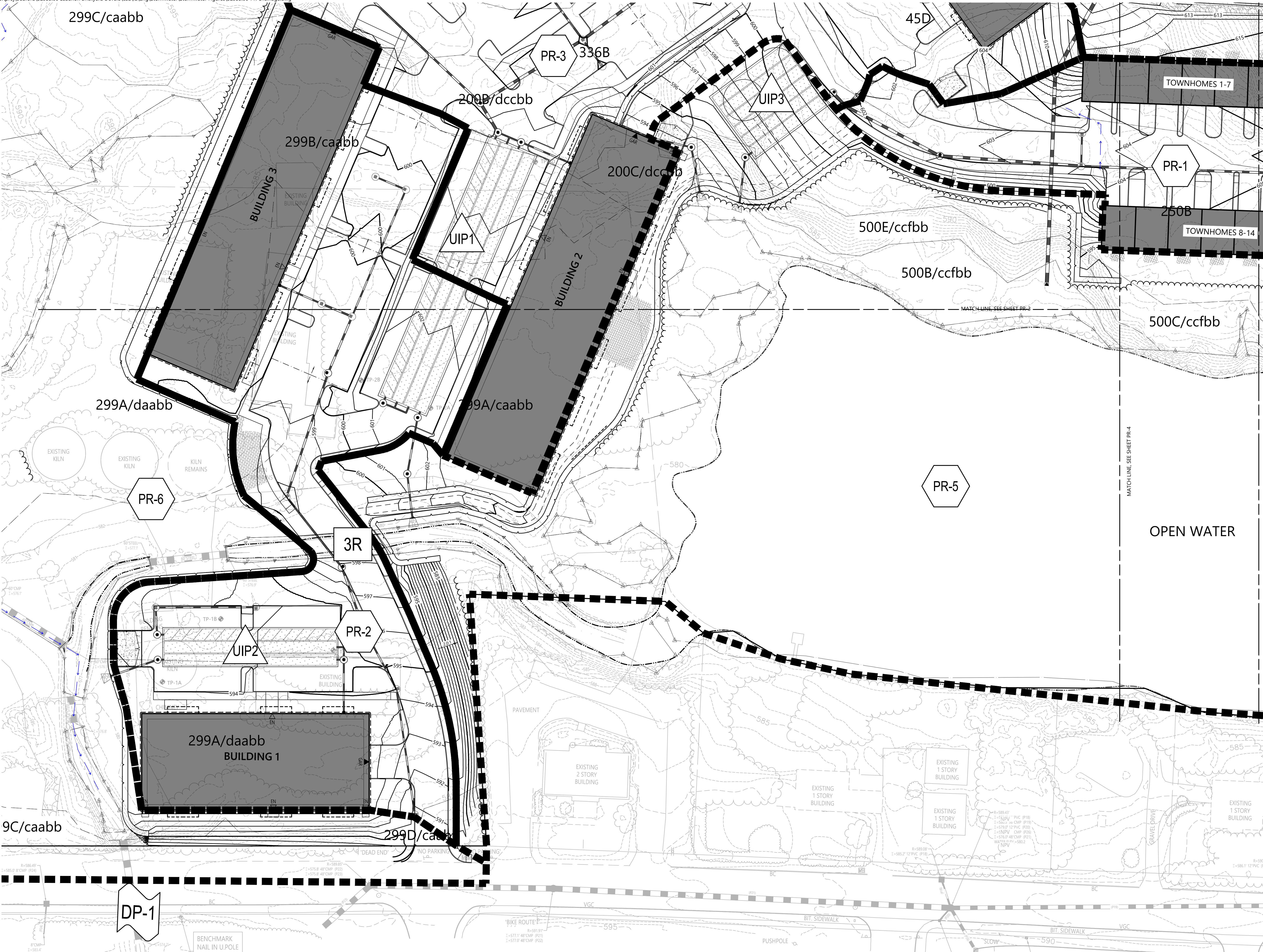
Drawing Title
**Proposed Conditions
Stormwater Management
Plan**

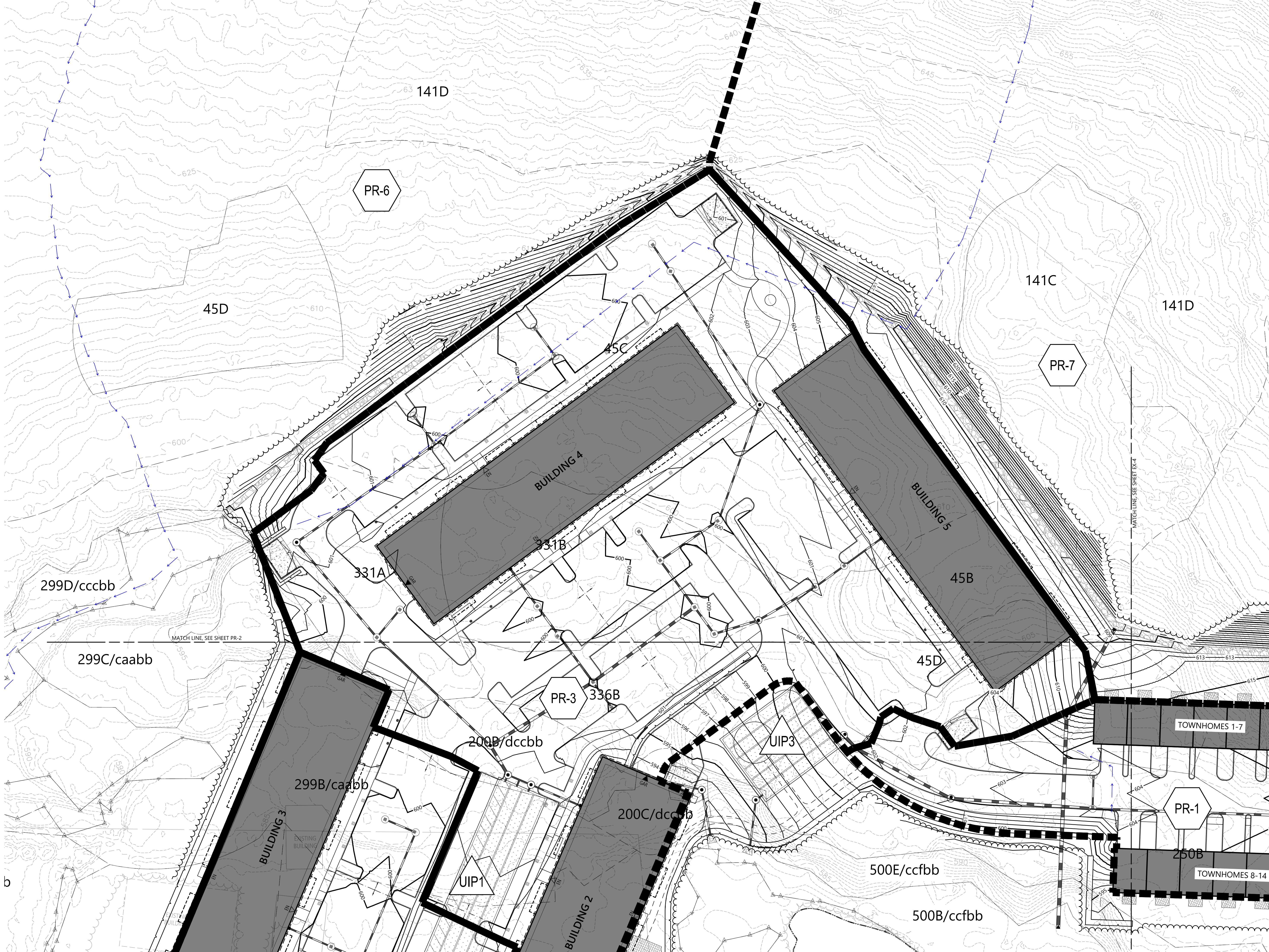
Drawing Number

PR-2

Sheet 2 of 4

Project Number
52933.00





Legend

SYMBOLS

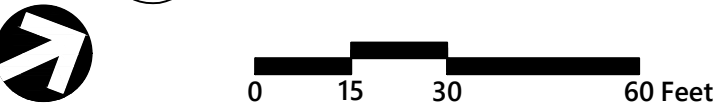
- DESIGN POINT
- DRAINAGE AREA DESIGNATION
- POND
- REACH

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
- 26C 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



The Brickyard Residential Development

174 Hanover Street
Lebanon, New Hampshire 03677

No.	Revision	Date	Appr.

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TMD	
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Not Approved for Construction
Drawing Title
**Proposed Conditions
Stormwater Management
Plan**



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
- 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



0 15 30 60 Feet

The Brickyard Residential Development

174 Hanover Street
Lebanon, New Hampshire 03677

No. Revision Date Appr.

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Issued for Permitting Date October 14, 2024

Not Approved for Construction

Drawing Title
**Proposed Conditions
Stormwater Management
Plan**

Drawing Number

PR-4

Sheet of
4 4

Project Number
52933.00

Soil symbol	Soil series: Slope class		600C/fccbb/P	Endoaquents, 8-15% slope	HSG B
540B/P	Raypol, 3-8% slope	HSG D	600A/fccbb/P	Endoaquents, 0-3% slope	HSG B
540D/P	Raypol, 25-25% slope	HSG D	600A/fccdd/P	Endoaquents, 0-3% slope	HSG B
513A	Ninigret, 0-3% slope	HSG B	336B	Pittstown, very stony, 3-8% slope	HSG C
513B	Ninigret, 3-8% slope	HSG B	331A	Bernardston, very stony, 0-3% slope	HSG C
917A	Ninigret Variant, 0-3% slope	HSG C	331B	Bernardston, very stony, 3-8% slope	HSG C
917C	Ninigret Variant, 8-15% slope	HSG C	331C	Bernardston, very stony, 8-15% slope	HSG C
917D	Ninigret Variant, 15-25% slope	HSG C	45B	Montauk, very stony, 3-8% slope	HSG C
299A/cbaaa	Smoothed Udorthents, 0-3% slope	HSG A	45C	Montauk, very stony, 8-15% slope	HSG C
410A	Haven, 0-3% slope	HSG B	45D	Montauk, very stony, 15-25% slope	HSG C
200B/dccbb	Smoothed Udorthents, 3-8% slope	HSG B	141B	Hollis-rock outcrop - Chaffield complex, 3-8% slope	HSG C
200C/dccbb	Smoothed Udorthents, 8-15% slope	HSG B	141C	Hollis-rock outcrop - Chaffield complex, 8-15% slope	HSG C
200D/dccbb	Smoothed Udorthents; refuse substratum, 15-25% slope	HSG B	141D	Hollis-rock outcrop - Chaffield complex, 15-25% slope	HSG C
299A/caabb	Smoothed Udorthents, 0-3% slope	HSG B	141E	Hollis-rock outcrop - Chaffield complex, 25-50% slope	HSG C
299A/daabb	Smoothed Udorthents, 0-3% slope	HSG B	250B	Chaffield - Hollis - Montauk complex, very stony, 3-8% slope	HSG C
299B/caabb	Smoothed Udorthents, 3-8% slope	HSG B	250C	Chaffield - Hollis - Montauk complex, very stony, 8-15% slope	HSG C
299C/caabb	Smoothed Udorthents, 8-15% slope	HSG B	250D	Chaffield - Hollis - Montauk complex, very stony, 15-25% slope	HSG B
299D/caabb	Smoothed Udorthents, 15-15% slope	HSG B	500B/ccfbb	Udorthents, loamy, 3-8% slope	HSG B
299C/ccfbb	Smoothed Udorthents, 8-15% slope	HSG B	500C/ccfbb	Udorthents, loamy, 8-15% slope	HSG B
299D/ccfbb	Smoothed Udorthents, 15-25% slope	HSG B	500E/ccfbb	Udorthents, loamy, 25-50% slope	HSG B
299E/ccfbb	Smoothed Udorthents, 25-50% slope	HSG B	RO	Rock 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.

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

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



The Brickyard
Residential Development

174 Hanover Street
Lebanon, New Hampshire 03677

No. Revision Date Apprd.

Designed by TMD Checked by MJV

Issued for July 6, 2024

Permitting

Not Approved for Construction

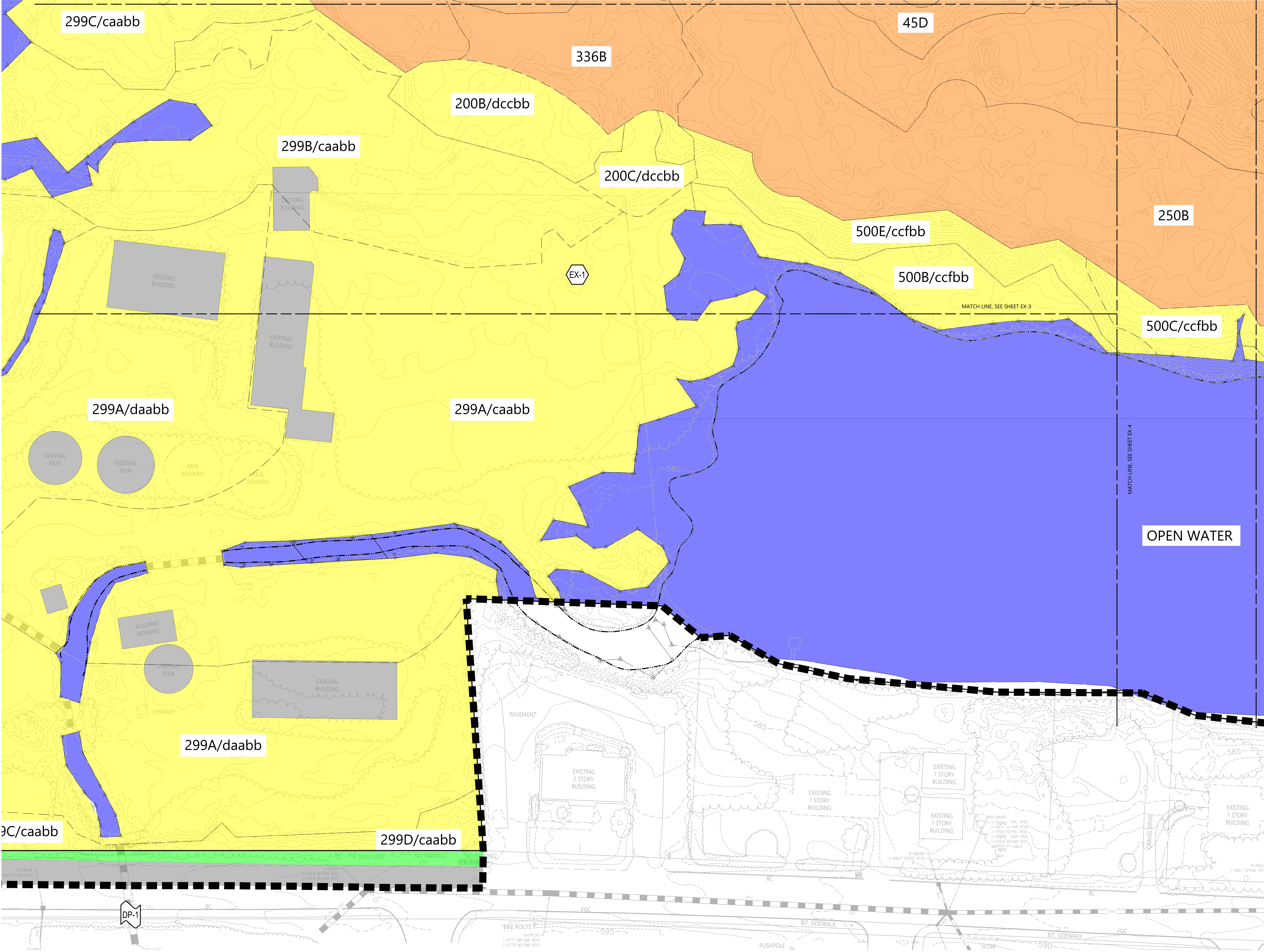
Existing Conditions
Color Coded Soils
Plan

Drawing Number

EX-1

Sheet of 1 4

Project Number
52933.00



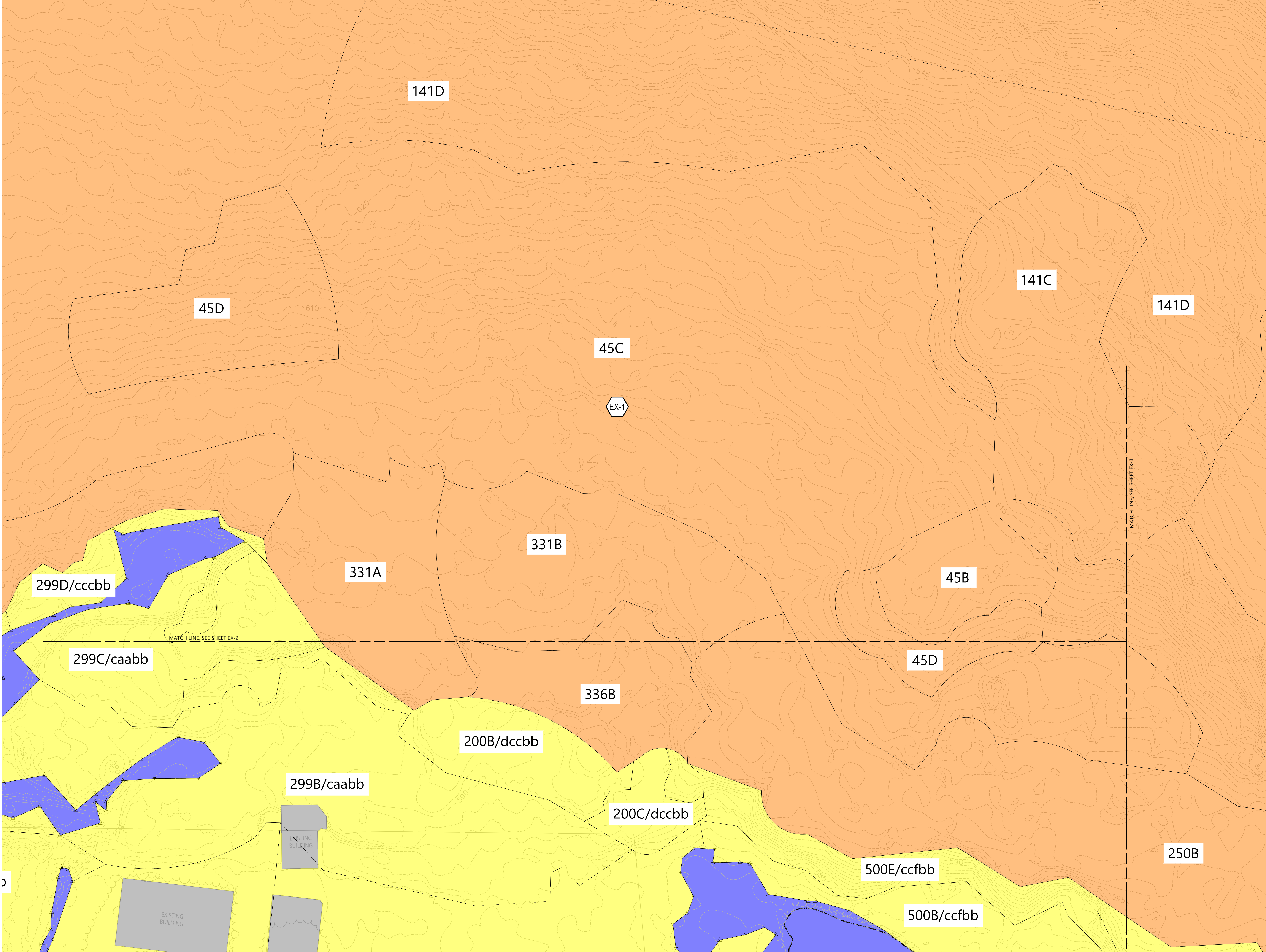
Legend	
SYMBOLS	
	DESIGN POINT
	DRAINAGE AREA DESIGNATION
	POND
	REACH
LINETYPES	
	DRAINAGE AREA BOUNDARY
	TIME OF CONCENTRATION FLOW LINE
	LIMITS OF SITE SPECIFIC SOIL SURVEY
	NRCS SOIL BOUNDARY
	HYDROLOGIC SOIL GROUP A
	HYDROLOGIC SOIL GROUP B
	HYDROLOGIC SOIL GROUP C
	HYDROLOGIC SOIL GROUP D
	WATER SURFACE
	IMPERVIOUS AREA

The Brickyard Residential Development
174 Hanover Street
Lebanon, New Hampshire 03677

No.	Revision	Date	Appr'd.

Designed by **TMD** Checked by **TMD**
Issued for **Permitting** Date **July 6, 2024**

Not Approved for Construction
Drawing Title
Existing Conditions Color Coded Soils Plan

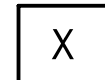




2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

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




The Brickyard Residential Development

174 Hanover Street
Lebanon, New Hampshire 03677

No.	Revision	Date	Apprd.

Designed by	Checked by
TMD	

Issued for	Date
Permitting	July 6, 2024

Not Approved for Construction

Drawing Title

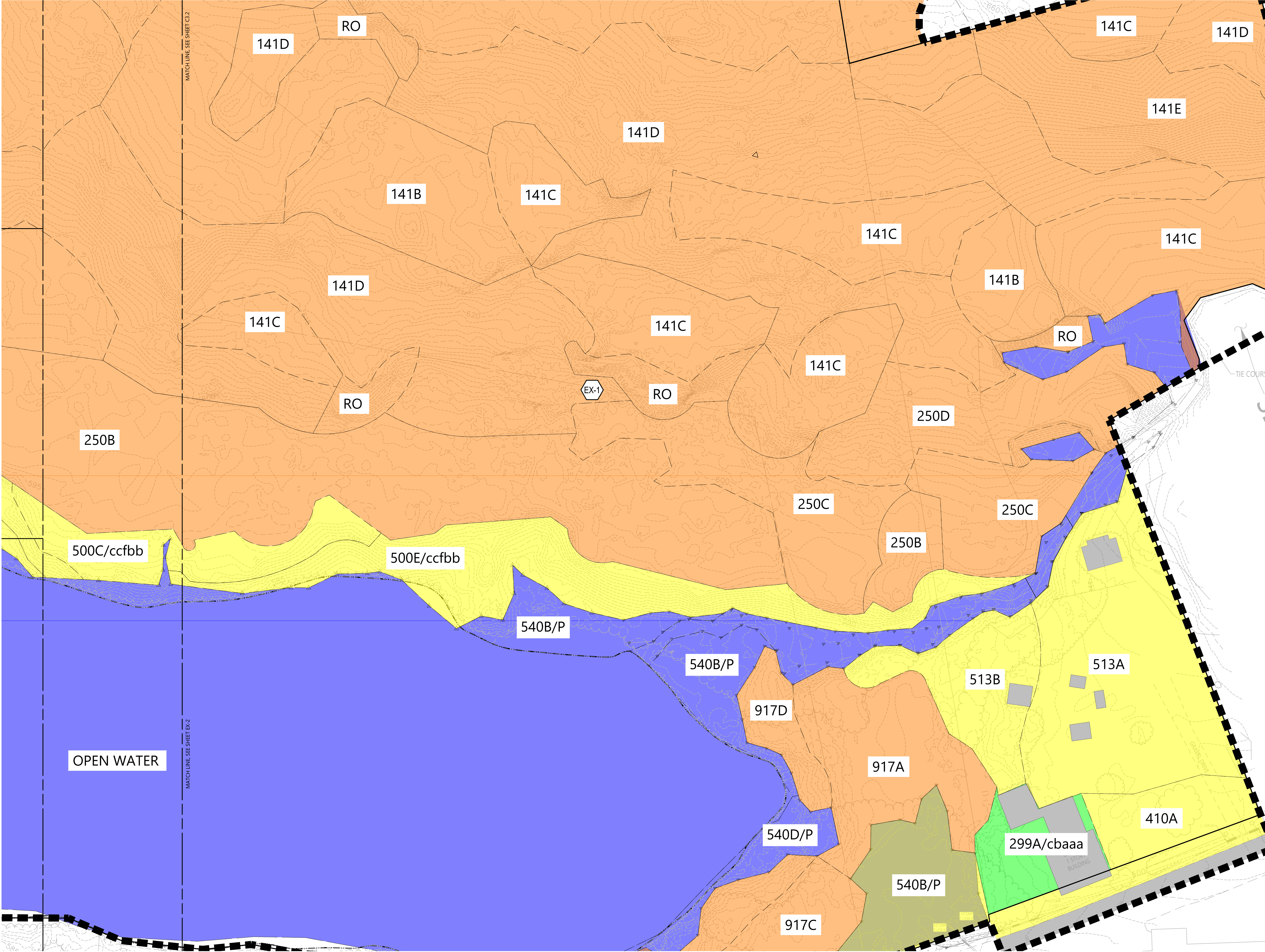
Existing Conditions Color Coded Soils Plan

Drawing Number

EX-3

Sheet 3 of 4

Project Number
52933.00





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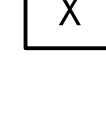
Legend

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



**The Brickyard
Residential Development**

174 Hanover Street
Lebanon, New Hampshire 03677

No.	Revision	Date	Appr.

Designed by
TMD

Checked by

Issued for
Permitting

Date
July 6, 2024

Not Approved for Construction

Drawing Title

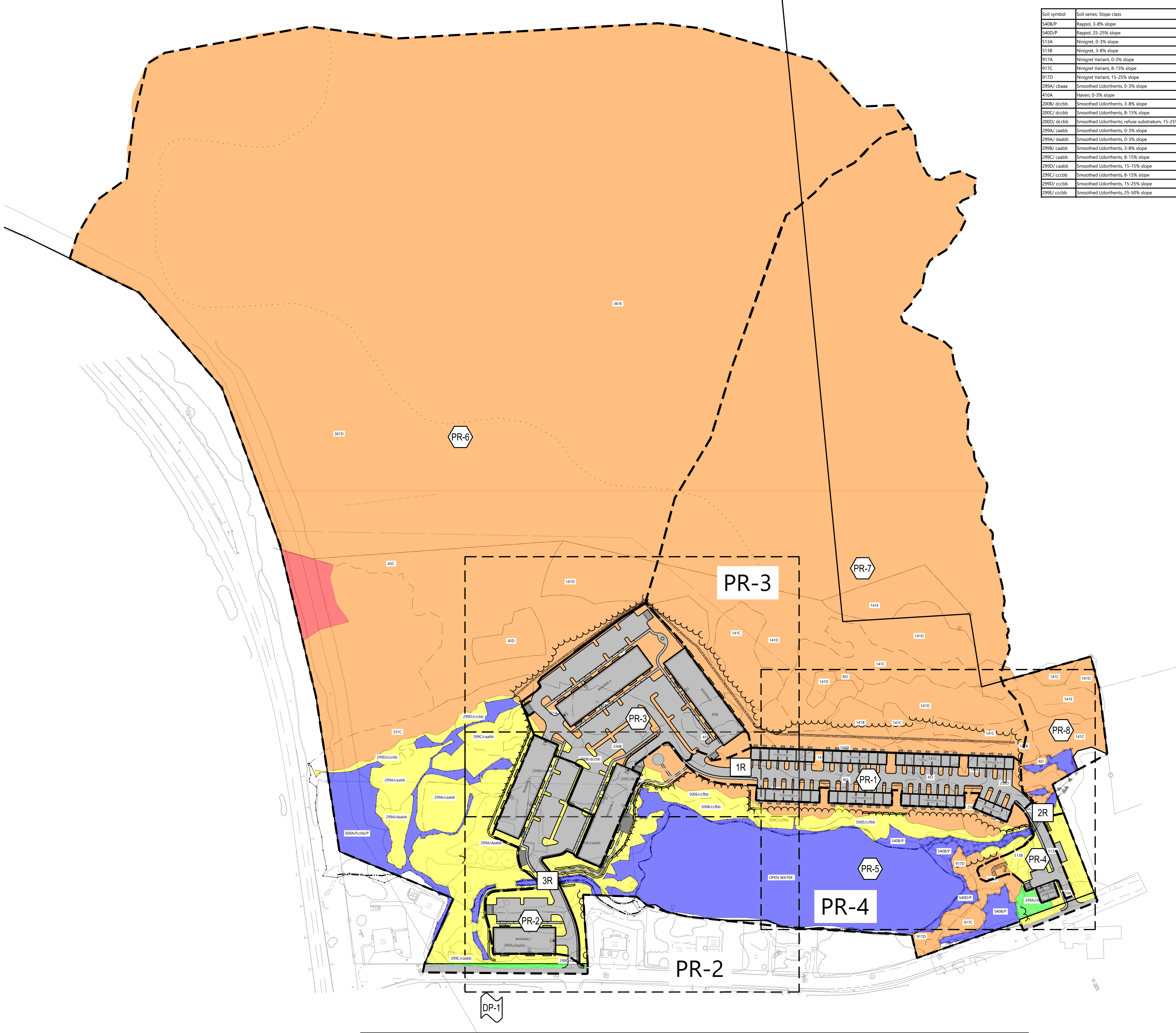
**Existing Conditions
Color Coded Soils
Plan**

Drawing Number

EX-4

Sheet 4 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	HSG B
540D/P	Raypol, 25-25% slope	HSG D	600A/fccd/P	Endoaquents, 0-3% slope	HSG B
513A	Ninigret, 0-3% slope	HSG B	336B	Pittstown, very stony, 3-8% slope	HSG C
513B	Ninigret, 3-8% slope	HSG B	331A	Bernardston, very stony, 0-3% slope	HSG C
917A	Ninigret Variant, 0-3% slope	HSG C	331B	Bernardston, very stony, 3-8% slope	HSG C
917C	Ninigret Variant, 8-15% slope	HSG C	331C	Bernardston, very stony, 8-15% slope	HSG C
917D	Ninigret Variant, 15-25% slope	HSG C	45B	Montauk, very stony, 3-8% slope	HSG C
299A/ cbaaa	Smoothed Udorthents, 0-3% slope	HSG A	45C	Montauk, very stony, 8-15% slope	HSG C
410A	Haven, 0-3% slope	HSG B	45D	Montauk, very stony, 15-25% slope	HSG C
200B/ dcbbb	Smoothed Udorthents, 3-8% slope	HSG B	141B	Hollis-rock outcrop - Chatfield complex, 3-8% slope	HSG C
200C/ dcbbb	Smoothed Udorthents, 8-15% slope	HSG B	141C	Hollis-rock outcrop - Chatfield complex, 8-15% slope	HSG C
200D/ dcbbb	Smoothed Udorthents; refuse substratum, 15-25% slope	HSG B	141D	Hollis-rock outcrop - Chatfield complex, 15-25% slope	HSG C
299A/ caabb	Smoothed Udorthents, 0-3% slope	HSG B	141E	Hollis-rock outcrop - Chatfield complex, 25-50% slope	HSG C
200D/ dcbbb	Smoothed Udorthents; refuse substratum, 15-25% slope	HSG B	250B	Chatfield - Hollis - Montauk complex, very stony, 3-8% slope	HSG C
299B/ caabb	Smoothed Udorthents, 3-8% slope	HSG B	250C	Chatfield - Hollis - Montauk complex, very stony, 8-15% slope	HSG C
299C/ caabb	Smoothed Udorthents, 8-15% slope	HSG B	250D	Chatfield - Hollis - Montauk complex, very stony, 15-25% slope	HSG C
299D/ caabb	Smoothed Udorthents, 15-15% slope	HSG B	500B/ccfbb	Udorthents, loamy, 3-8% slope	HSG B
299D/ cccbb	Smoothed Udorthents, 8-15% slope	HSG B	500C/ccfbb	Udorthents, loamy, 8-15% slope	HSG B
299D/ cccbb	Smoothed Udorthents, 15-25% slope	HSG B	500E/ccfbb	Udorthents, loamy, 25-50% slope	HSG B
299E/ cccbb	Smoothed Udorthents, 25-50% slope	HSG B	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
 - 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
 - 534 BINGHAMVILLE SILT LOAM, HSG C/D
 - W WATER

vhb

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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
- 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 60 120 240Feet

The Brickyard
Residential Development
174 Hanover Street
Lebanon, New Hampshire 03677

No.	Revision	Date	Apprd.

Designed by	TMD	Checked by	MJV
Issued for	Permitting	Date	October 14, 2024

Not Approved for Construction

Drawing Title

Proposed Conditions
Color Coded Soils
Plan

Drawing Number

PR-1

Sheet 1 of 4

Project Number
52933.00

Page 117 of 476



2 Bedford Farms Drive
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Legend

SYMBOLS

- DESIGN POINT
- DRAINAGE AREA DESIGNATION
- POND
- REACH

LINE TYPES

- 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 Permitting Date October 14, 2024

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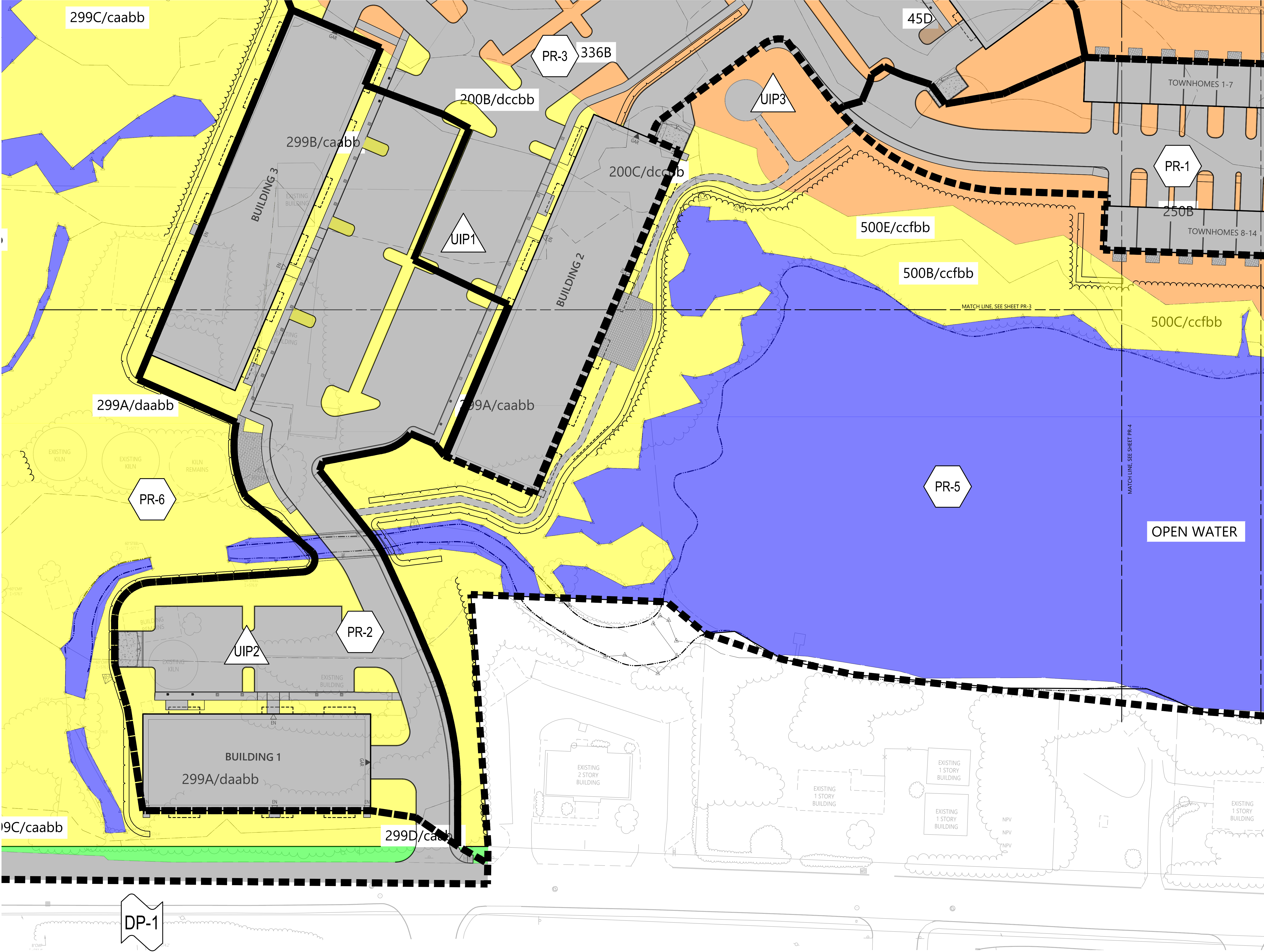
Proposed Conditions
Stormwater Management
Plan

Drawing Number

PR-2

Sheet 2 of 4

Project Number
52933.00





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Legend

SYMBOLS



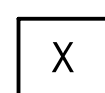
DESIGN POINT



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 October 14, 2024

Not Approved for Construction

Drawing Title

Proposed Conditions

Stormwater Management

Plan

Drawing Number

PR-3

Sheet

of

3

4

Project Number

52933.00



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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 Appr.

Designed by TMD Checked by

Issued for Permitting Date October 14, 2024

Not Approved for Construction

Proposed Conditions
Stormwater Management
Plan

Drawing Number

PR-4

Sheet

of

4

4

Project Number

52933.00

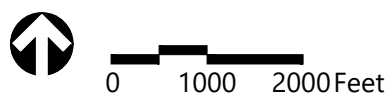
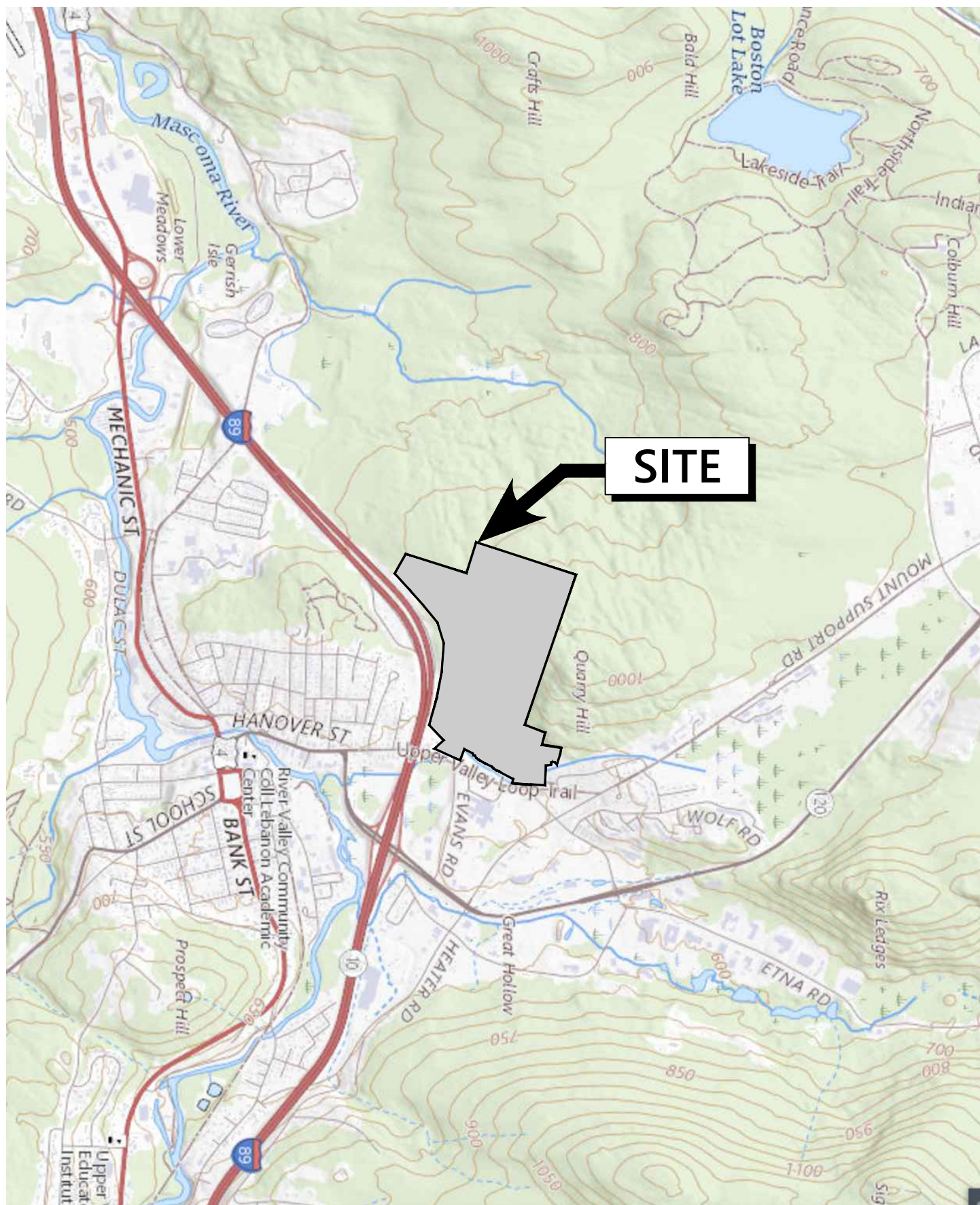
Appendix A: Supporting Data

- › 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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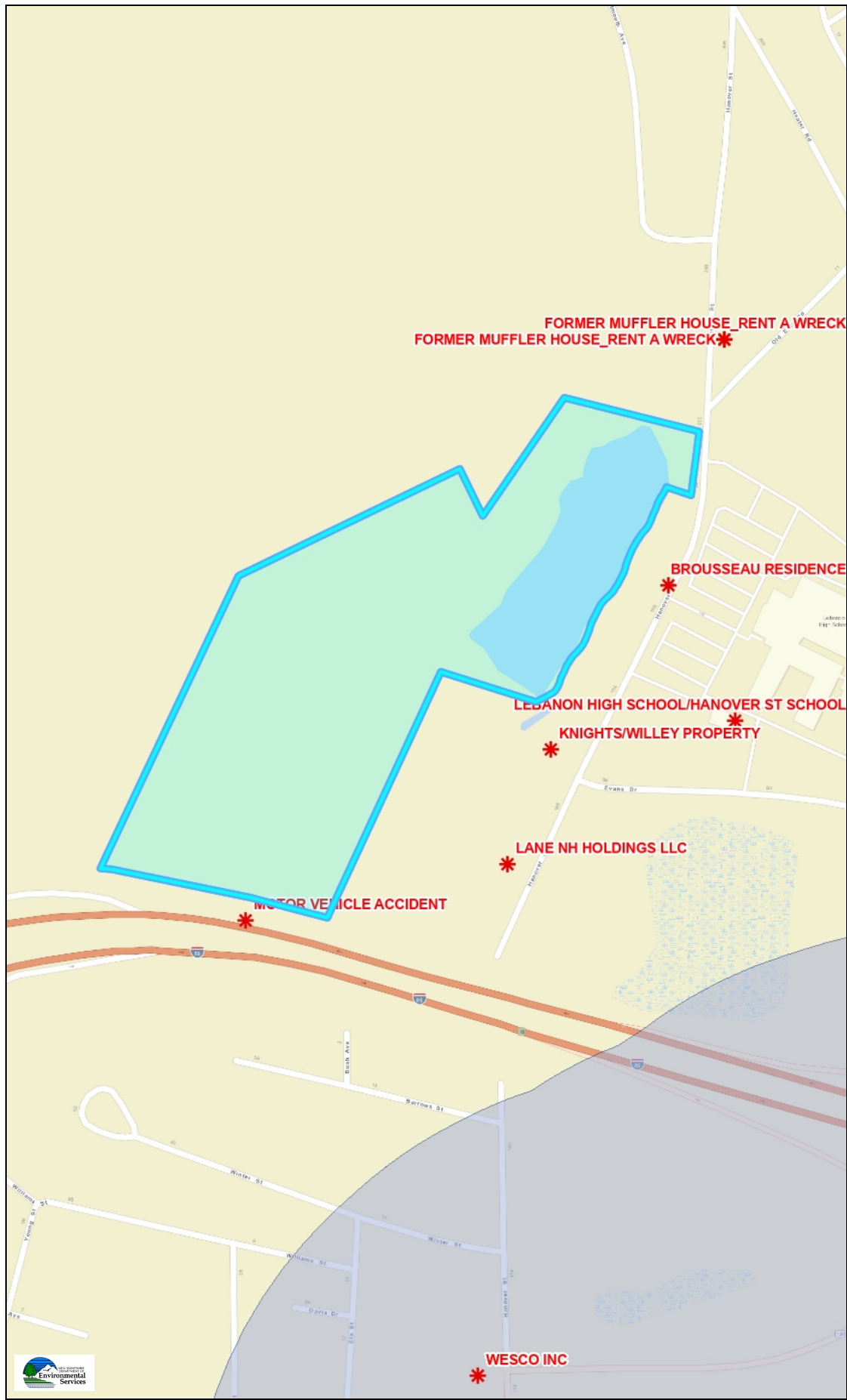


Site USGS Map
Lebanon Brickyard Development
Lebanon, NH 03766

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

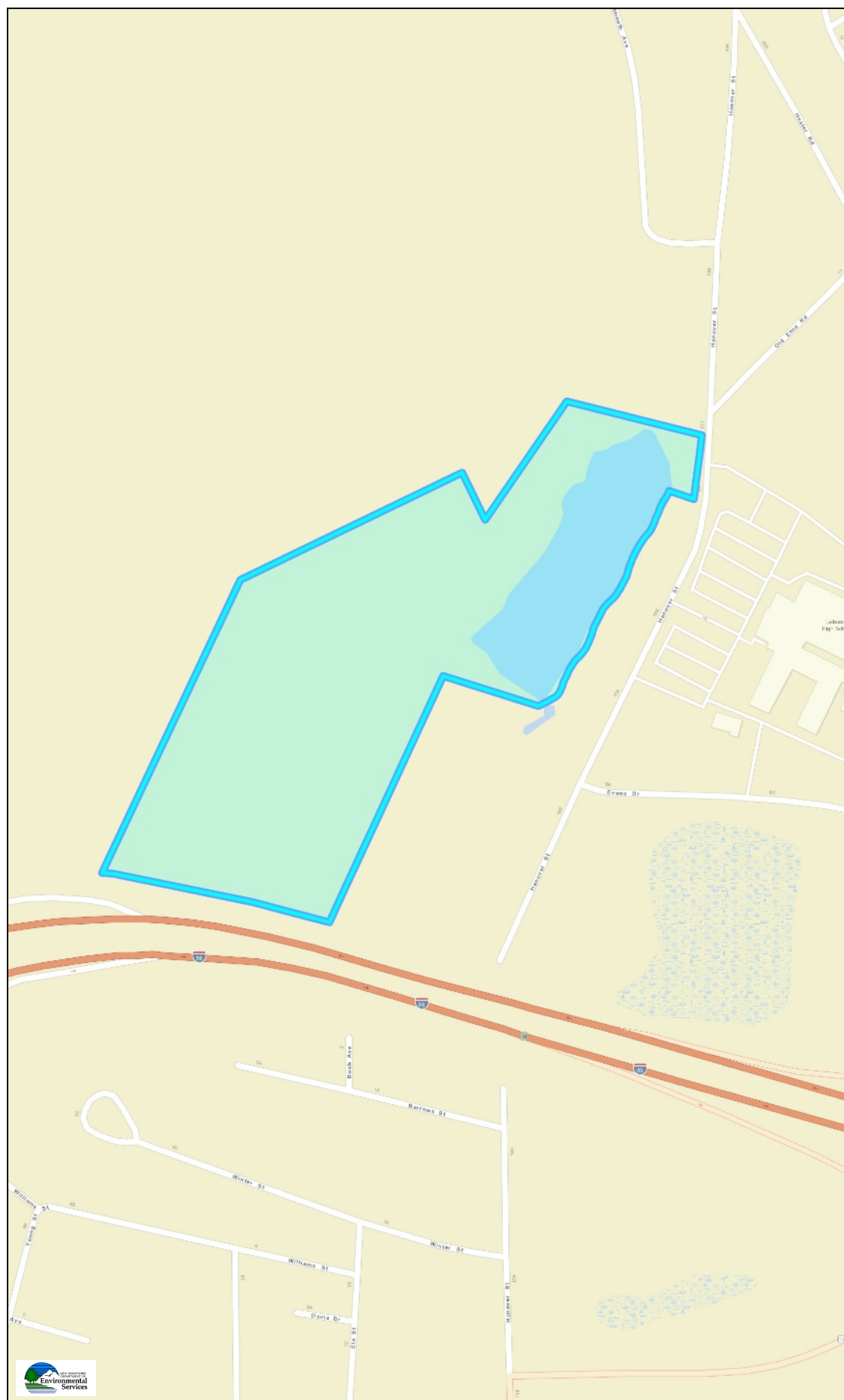
© NH DES, <http://des.nh.gov>

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@dncr.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@dncr.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.

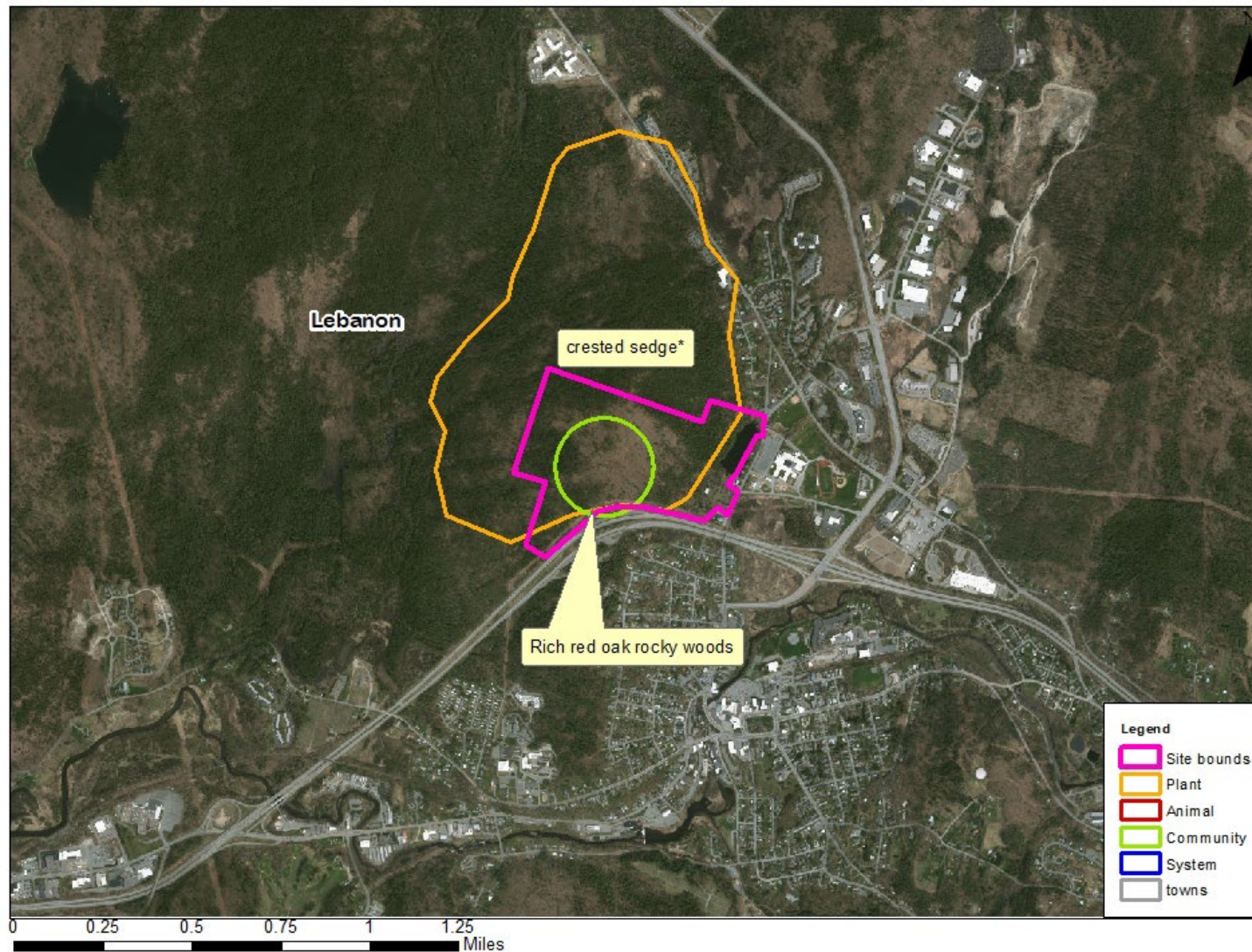


NHB DataCheck Results Letter

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

NH Natural Heritage Bureau

Please note: maps and NHB record pages are **confidential** and shall be redacted from public documents.

NHB23-2953

EOCODE:

PMCPY033A0*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:

Location

Survey 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

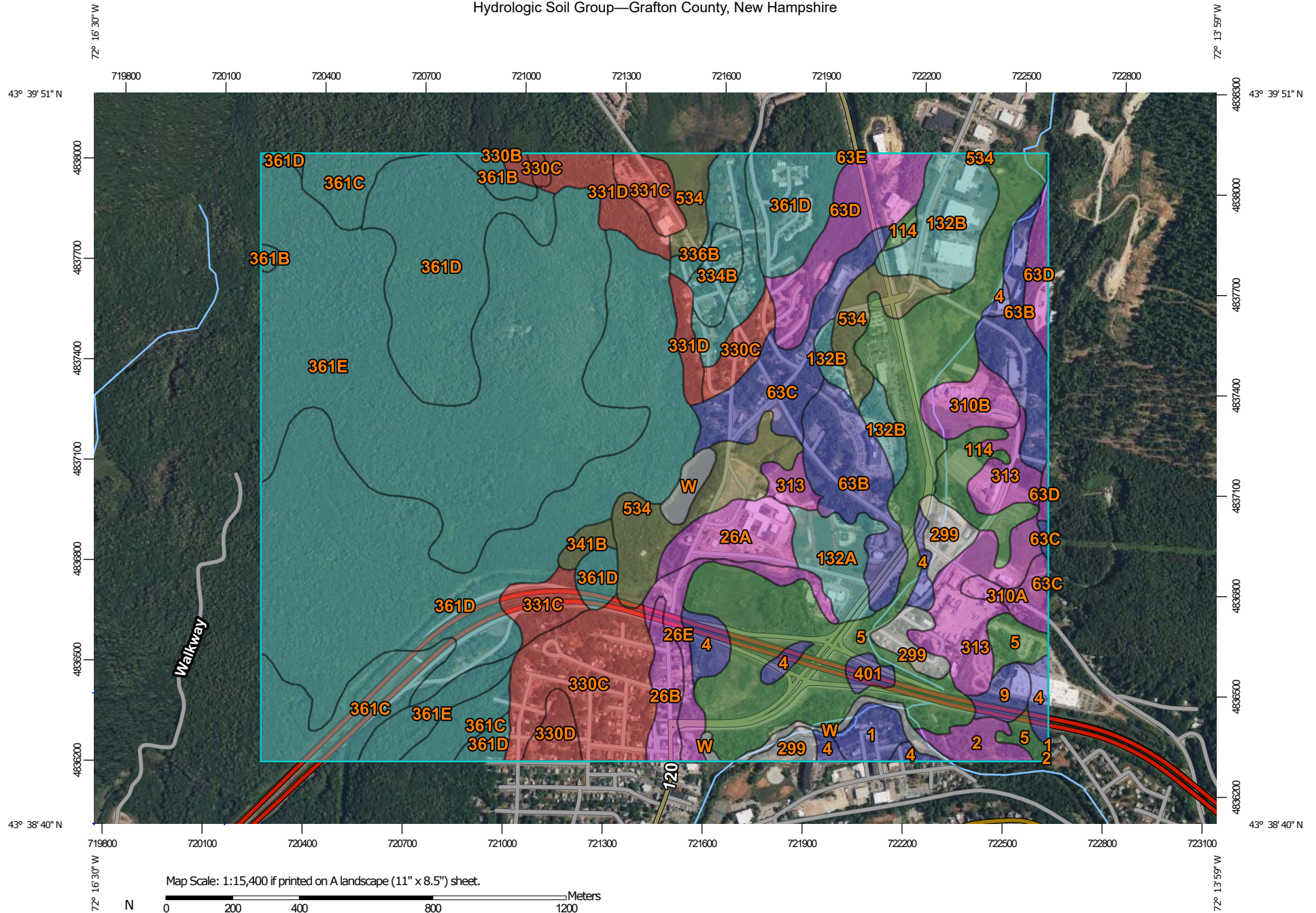
First reported: 1962-06-29

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.

0 200 400 800 1200 Meters

0 500 1000 2000 3000 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge ticks: UTM Zone 18N WGS84



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

7/30/2024
Page 1 of 5
Page 139 of 476

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

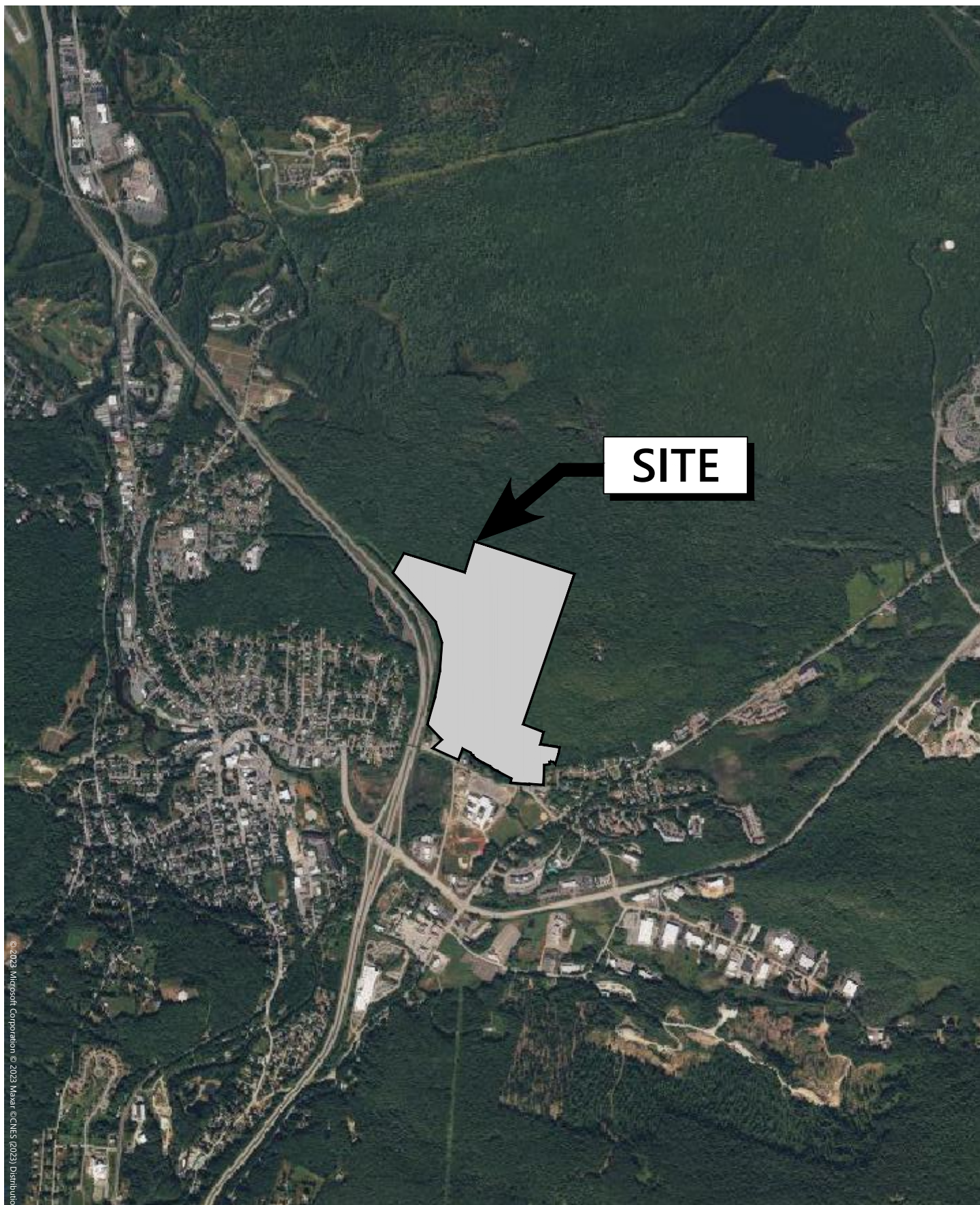
Aggregation Method: Dominant Condition

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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Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

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BMP Worksheets

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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
4.26	ac	A = Area draining to the practice	
3.46	ac	A _I = Impervious area draining to the practice	
0.81	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.78	unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)	
3.32	ac-in	WQV = 1" x R _v x A	
12,069	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
3,017	cf	25% x WQV (check calc for sediment forebay volume)	
Isolator Row		Method of pretreatment? (not required for clean or roof runoff)	
5,342	cf	V _{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
21,369	cf	V = Volume ¹ (attach a stage-storage table)	≥ WQV
7,712	sf	A _{SA} = Surface area of the bottom of the pond	
0.50	iph	K _{sat} _{DESIGN} = Design infiltration rate ²	
37.6	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
596.66	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
598.18	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
2.21	ac	A = Area draining to the practice	
1.76	ac	A _I = Impervious area draining to the practice	
0.80	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.77	unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)	
1.70	ac-in	WQV = 1" x R _v x A	
6,159	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
1,540	cf	25% x WQV (check calc for sediment forebay volume)	
Isolator Row		Method of pretreatment? (not required for clean or roof runoff)	
2,122	cf	V _{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
6,366	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	
41.1	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	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/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
586.95	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
588.25	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



INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.06)

UIP#3

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
2.51 ac	A = Area draining to the practice	
1.97 ac	A _I = Impervious area draining to the practice	
0.79 decimal	I = Percent impervious area draining to the practice, in decimal form	
0.76 unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)	
1.90 ac-in	WQV = 1" x R _v x A	
6,902 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
1,725 cf	25% x WQV (check calc for sediment forebay volume)	
Isolator Row	Method of pretreatment? (not required for clean or roof runoff)	
2,680 cf	V _{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
8,039 cf	V = Volume ¹ (attach a stage-storage table)	≥ WQV
3,724 sf	A _{SA} = Surface area of the bottom of the pond	
0.50 iph	K _{sat} _{DESIGN} = Design infiltration rate ²	
44.5 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	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
-	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
596.75 ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
597.78 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



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).	
0.58	ac	A = Area draining to the practice	
0.29	ac	A _i = Impervious area draining to the practice	
0.51	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.51	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.29	ac-in	WQV = 1" x Rv x A	
1,064	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
266	cf	25% x WQV (check calc for sediment forebay volume)	
798	cf	75% x WQV (check calc for surface sand filter volume)	
Sediment Forebay		Method of Pretreatment? (not required for clean or roof runoff)	
857	cf	V _{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
1,720	sf	A _{SA} = Surface area of the practice	
0.50	iph	Ksat _{DESIGN} = Design infiltration rate ¹	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
14.8	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'
596.60	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

YES	ac	Drainage Area no larger than 5 ac?	← yes
3,428	cf	V = Volume of storage ³ (attach a stage-storage table)	≥ WQV
18.0	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	
3.0	:1	Pond side slopes	≥ 3:1
Sheet	L1.3	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
	acres	Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.) A _{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	≤ 5:1
	inches	D _{FC} = Filter course thickness	12", or 18" if within GPA
Sheet		Note what sheet in the plan set contains the filter course spec.	mod. 304.1 (see spec)

1. Rate of the limiting layer (either the filter course or the underlying soil). K_{sat_design} includes factor of safety. See Env-Wq 1504.14 for guidance on determining the infiltration rate.
2. See lines 34, 40 and 48 for required depths of filter media.
3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet structure, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

[illegible]

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

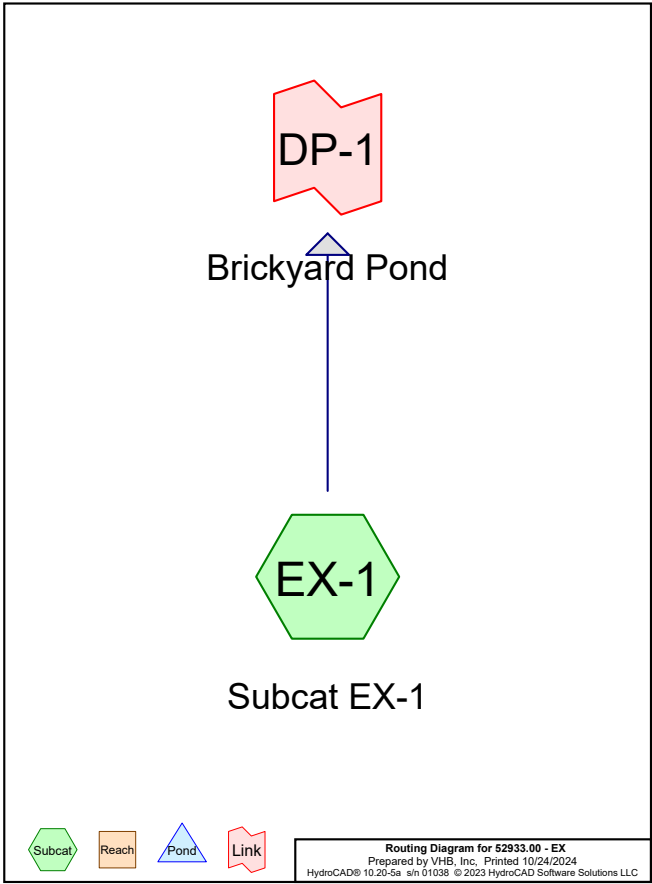
Appendix B: Hydrologic Calculations

- › 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

Project Notes

Rainfall events imported from "5262101 - EX.hcp"

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)
0.12	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)
4.52	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)
90.23	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)
108.11	71	TOTAL AREA

52933.00 - EX

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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
95.12	HSG C	EX-1
0.78	HSG D	EX-1
0.00	Other	
108.11	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	0.12	0.00	0.00	0.72	>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	4.52	0.25	0.00	6.98	Water Surface, 0% imp	EX-1
0.03	6.07	90.23	0.53	0.00	96.87	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	95.12	0.78	0.00	108.11	TOTAL AREA	

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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=108.11 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 af

Total Runoff Area = 108.11 ac Runoff Volume = 4.4 af Average Runoff Depth = 0.49"
99.31% Pervious = 107.37 ac 0.69% Impervious = 0.74 ac

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Type II 24-hr 2-year Rainfall=2.50"

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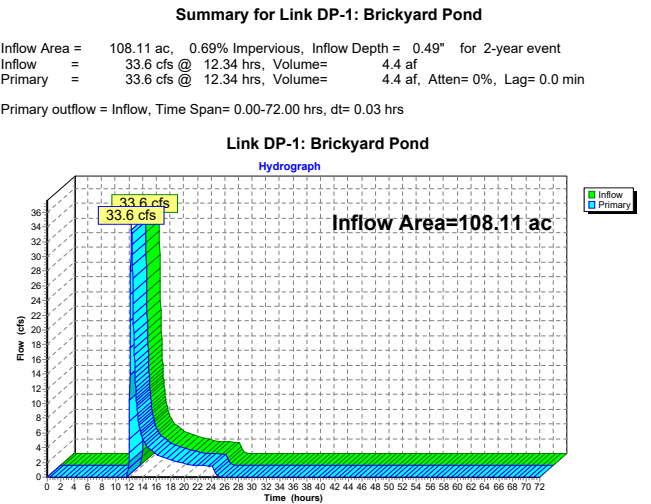
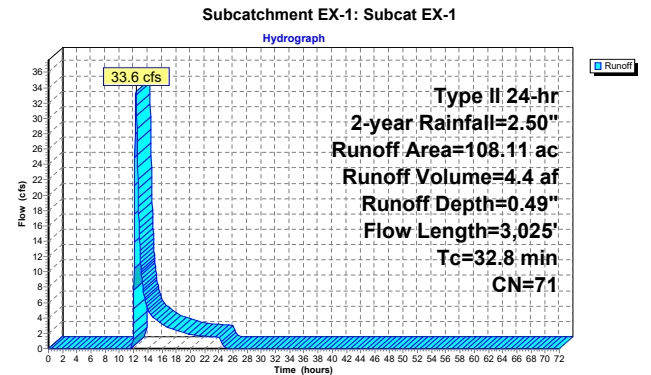
Summary for Subcatchment EX-1: Subcat EX-1

Runoff = 33.6 cfs @ 12.34 hrs, Volume= 4.4 af, Depth= 0.49"
Routed to Link DP-1 : Brickyard 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	39	>75% Grass cover, Good, HSG A
0.48	61	>75% Grass cover, Good, HSG B
0.12	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
4.52	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
90.23	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
108.11	71	Weighted Average
107.37		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			



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=108.11 ac 0.69% Impervious Runoff Depth=1.11"
Flow Length=3,025' Tc=32.8 min CN=71 Runoff=90.4 cfs 10.0 af

Link DP-1: Brickyard Pond

Inflow=90.4 cfs 10.0 af
Primary=90.4 cfs 10.0 af

Total Runoff Area = 108.11 ac Runoff Volume = 10.0 af Average Runoff Depth = 1.11"
99.31% Pervious = 107.37 ac 0.69% Impervious = 0.74 ac

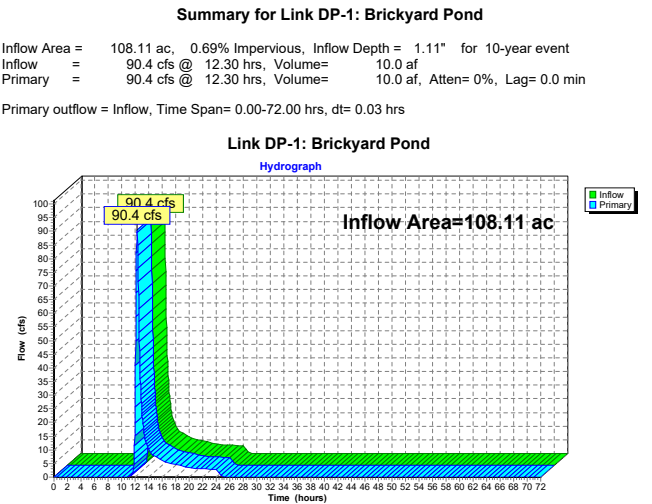
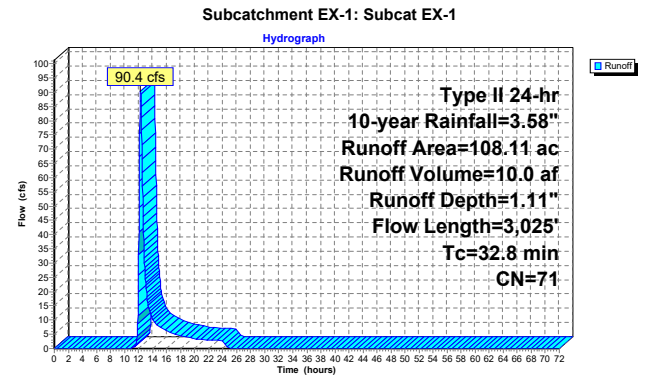
Summary for Subcatchment EX-1: Subcat EX-1

Runoff = 90.4 cfs @ 12.30 hrs, Volume= 10.0 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
0.12	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
4.52	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
90.23	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
108.11	71	Weighted Average
107.37		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			



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=108.11 ac 0.69% Impervious Runoff Depth=1.67"
Flow Length=3,025' Tc=32.8 min CN=71 Runoff=141.8 cfs 15.1 af

Link DP-1: Brickyard Pond Inflow=141.8 cfs 15.1 af
Primary=141.8 cfs 15.1 af

Total Runoff Area = 108.11 ac Runoff Volume = 15.1 af Average Runoff Depth = 1.67"
99.31% Pervious = 107.37 ac 0.69% Impervious = 0.74 ac

Summary for Subcatchment EX-1: Subcat EX-1

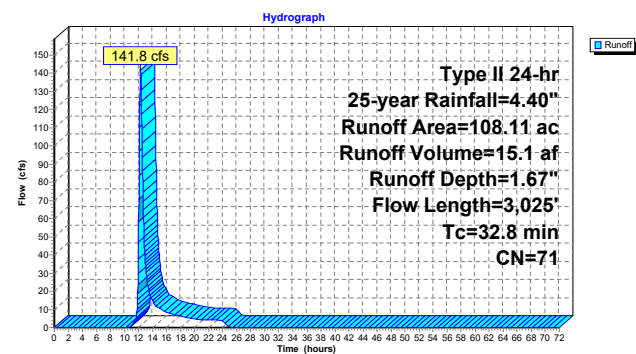
Runoff = 141.8 cfs @ 12.29 hrs, Volume= 15.1 af, Depth= 1.67"
Routed to Link DP-1 : Brickyard Pond

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
0.12	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
4.52	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
90.23	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
108.11	71	Weighted Average
107.37		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			

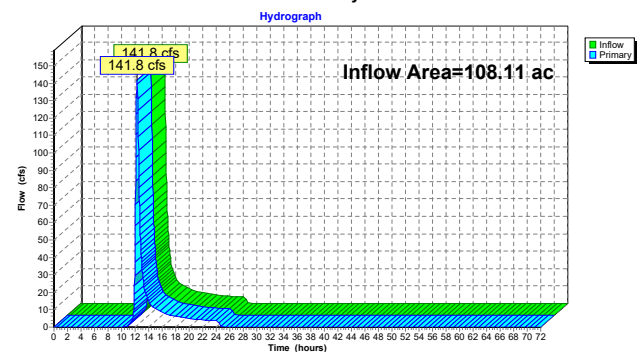
Subcatchment EX-1: Subcat EX-1



Summary for Link DP-1: Brickyard Pond

Inflow Area = 108.11 ac, 0.69% Impervious, Inflow Depth = 1.67" for 25-year event
Inflow = 141.8 cfs @ 12.29 hrs, Volume= 15.1 af
Primary = 141.8 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



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=108.11 ac 0.69% Impervious Runoff Depth=2.23"
Flow Length=3,025' Tc=32.8 min CN=71 Runoff=192.7 cfs 20.1 af

Link DP-1: Brickyard Pond Inflow=192.7 cfs 20.1 af
Primary=192.7 cfs 20.1 af

Total Runoff Area = 108.11 ac Runoff Volume = 20.1 af Average Runoff Depth = 2.23"
99.31% Pervious = 107.37 ac 0.69% Impervious = 0.74 ac

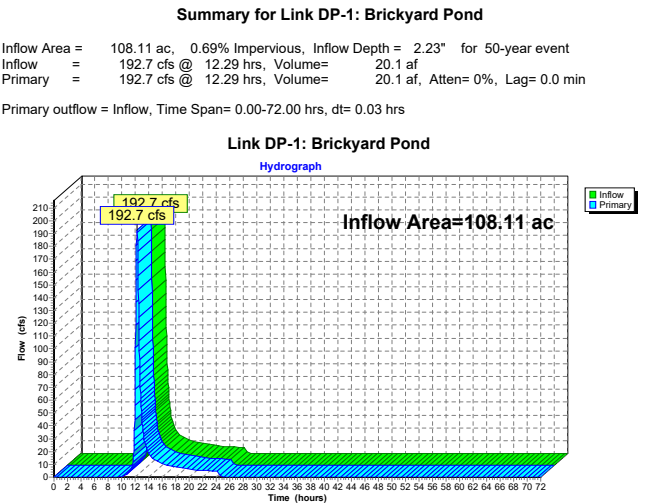
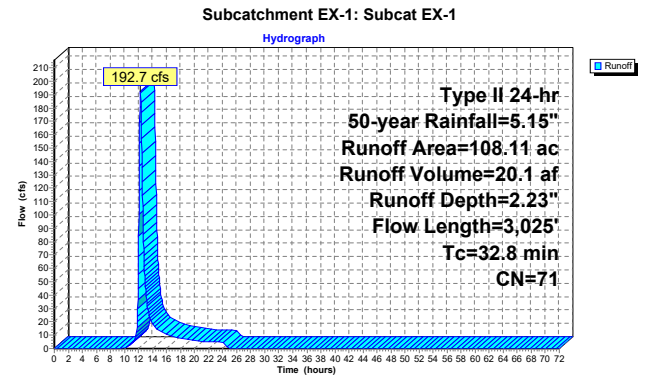
Summary for Subcatchment EX-1: Subcat EX-1

Runoff = 192.7 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
0.12	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
4.52	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
90.23	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
108.11	71	Weighted Average
107.37		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			



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=108.11 ac 0.69% Impervious Runoff Depth=2.92"
Flow Length=3,025' Tc=32.8 min CN=71 Runoff=255.8 cfs 26.3 af

Link DP-1: Brickyard Pond Inflow=255.8 cfs 26.3 af
Primary=255.8 cfs 26.3 af

Total Runoff Area = 108.11 ac Runoff Volume = 26.3 af Average Runoff Depth = 2.92"
99.31% Pervious = 107.37 ac 0.69% Impervious = 0.74 ac

Summary for Subcatchment EX-1: Subcat EX-1

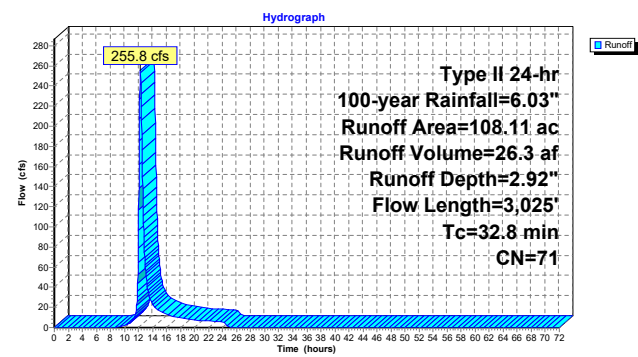
Runoff = 255.8 cfs @ 12.28 hrs, Volume= 26.3 af, Depth= 2.92"
Routed to Link DP-1 : Brickyard Pond

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
0.12	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
4.52	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
90.23	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
108.11	71	Weighted Average
107.37		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			

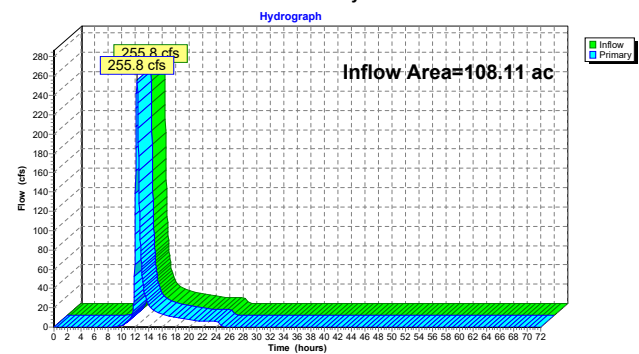
Subcatchment EX-1: Subcat EX-1



Summary for Link DP-1: Brickyard Pond

Inflow Area = 108.11 ac, 0.69% Impervious, Inflow Depth = 2.92" for 100-year event
Inflow = 255.8 cfs @ 12.28 hrs, Volume= 26.3 af
Primary = 255.8 cfs @ 12.28 hrs, Volume= 26.3 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

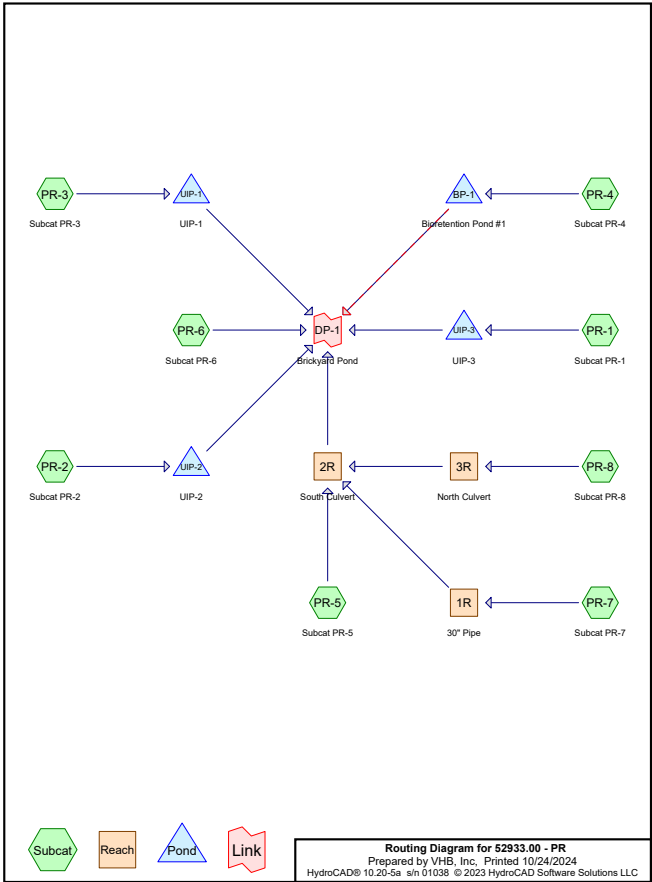


Proposed Conditions

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Project Notes

Rainfall events imported from "5262101 - EX.hcp"



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

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.31	39	>75% Grass cover, Good, HSG A (PR-4, PR-5, PR-6)
2.55	61	>75% Grass cover, Good, HSG B (PR-2, PR-3, PR-4, PR-5, PR-6, PR-8)
3.85	74	>75% Grass cover, Good, HSG C (PR-1, PR-3, PR-4, PR-5, PR-6, PR-7, PR-8)
0.01	80	>75% Grass cover, Good, HSG D (PR-4, PR-5, PR-8)
0.00	30	Brush, Good, HSG A (PR-5)
1.00	48	Brush, Good, HSG B (PR-2, PR-5, PR-6, PR-8)
0.07	65	Brush, Good, HSG C (PR-5)
0.04	98	Paved parking, HSG A (PR-4, PR-6)
1.64	98	Paved parking, HSG B (PR-2, PR-3, PR-4, PR-5, PR-6)
2.94	98	Paved parking, HSG C (PR-1, PR-3, PR-4, PR-5, PR-7)
0.01	98	Paved parking, HSG D (PR-4)
0.02	98	Roofs, HSG A (PR-4)
1.16	98	Roofs, HSG B (PR-2, PR-3, PR-4, PR-6)
1.77	98	Roofs, HSG C (PR-1, PR-3)
2.18	98	Water Surface, 0% imp, HSG B (PR-5, PR-6, PR-8)
4.52	98	Water Surface, 0% imp, HSG C (PR-5, PR-8)
0.24	98	Water Surface, 0% imp, HSG D (PR-4, PR-5, PR-8)
0.01	30	Woods, Good, HSG A (PR-5)
3.29	55	Woods, Good, HSG B (PR-3, PR-5, PR-6, PR-8)
81.97	70	Woods, Good, HSG C (PR-1, PR-3, PR-5, PR-6, PR-7, PR-8)
0.53	77	Woods, Good, HSG D (PR-5, PR-6)
108.11	73	TOTAL AREA

Soil Listing (all nodes)		
Area (acres)	Soil Group	Subcatchment Numbers
0.38	HSG A	PR-4, PR-5, PR-6
11.83	HSG B	PR-2, PR-3, PR-4, PR-5, PR-6, PR-8
95.12	HSG C	PR-1, PR-3, PR-4, PR-5, PR-6, PR-7, PR-8
0.78	HSG D	PR-4, PR-5, PR-6, PR-8
0.00	Other	
108.11	TOTAL AREA	

Ground Covers (all nodes)							
HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.31	2.55	3.85	0.01	0.00	6.72	>75% Grass cover, Good	PR-1, PR-2, PR-3, PR-4, PR-5, PR-6, PR-7, PR-8
0.00	1.00	0.07	0.00	0.00	1.07	Brush, Good	PR-2, PR-5, PR-6, PR-8
0.04	1.64	2.94	0.01	0.00	4.63	Paved parking	PR-1, PR-2, PR-3, PR-4, PR-5, PR-6, PR-7
0.02	1.16	1.77	0.00	0.00	2.95	Roofs	PR-1, PR-2, PR-3, PR-4, PR-6
0.00	2.18	4.52	0.24	0.00	6.93	Water Surface, 0% imp	PR-4, PR-5, PR-6, PR-8
0.01	3.29	81.97	0.53	0.00	85.81	Woods, Good	PR-1, PR-3, PR-5, PR-6, PR-7, PR-8
0.38	11.83	95.12	0.78	0.00	108.11	TOTAL AREA	

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	1R	590.60	583.00	270.0	0.0281	0.013	0.0	30.0	0.0	
2	2R	579.50	579.00	50.0	0.0100	0.011	96.0	108.0	0.0	
3	3R	602.00	600.00	60.0	0.0333	0.011	96.0	120.0	0.0	
4	BP-1	595.00	594.80	20.0	0.0100	0.013	0.0	18.0	0.0	
5	UIP-1	592.50	591.06	25.0	0.0576	0.013	0.0	24.0	0.0	
6	UIP-2	583.00	582.80	20.0	0.0100	0.013	0.0	24.0	0.0	
7	UIP-3	592.30	592.00	10.0	0.0300	0.013	0.0	15.0	0.0	

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=2.51 ac 78.61% Impervious Runoff Depth=1.78" Tc=5.0 min CN=93 Runoff=7.8 cfs 0.4 af
Subcatchment PR-2: Subcat PR-2	Runoff Area=2.21 ac 79.75% Impervious Runoff Depth=1.61" Tc=5.0 min CN=91 Runoff=6.4 cfs 0.3 af
Subcatchment PR-3: Subcat PR-3	Runoff Area=4.26 ac 78.36% Impervious Runoff Depth=1.69" Tc=5.0 min CN=92 Runoff=12.8 cfs 0.6 af
Subcatchment PR-4: Subcat PR-4	Runoff Area=0.58 ac 50.57% Impervious Runoff Depth=1.00" Tc=5.0 min CN=82 Runoff=1.1 cfs 0.0 af
Subcatchment PR-5: Subcat PR-5	Runoff Area=9.65 ac 1.30% Impervious Runoff Depth=1.12" Tc=5.0 min CN=84 Runoff=19.9 cfs 0.9 af
Subcatchment PR-6: Subcat PR-6	Runoff Area=63.07 ac 0.08% Impervious Runoff Depth=0.46" Flow Length=3,025' Tc=32.8 min CN=70 Runoff=17.5 cfs 2.4 af
Subcatchment PR-7: Subcat PR-7	Runoff Area=24.25 ac 0.20% Impervious Runoff Depth=0.46" Flow Length=1,740' Tc=23.6 min CN=70 Runoff=8.5 cfs 0.9 af
Subcatchment PR-8: Subcat PR-8	Runoff Area=1.59 ac 0.00% Impervious Runoff Depth=0.53" Flow Length=410' Tc=11.6 min CN=72 Runoff=1.1 cfs 0.1 af
Reach 1R: 30" Pipe	Avg. Flow Depth=0.59' Max Vel=9.53 fps Inflow=8.5 cfs 0.9 af 30.0" Round Pipe n=0.013 L=270.0' S=0.0281 ' Capacity=68.8 cfs Outflow=8.5 cfs 0.9 af
Reach 2R: South Culvert	Avg. Flow Depth=0.40' Max Vel=6.89 fps Inflow=21.9 cfs 1.9 af 96.0" x 108.0" Box Pipe n=0.011 L=50.0' S=0.0100 ' Capacity=1,604.0 cfs Outflow=21.9 cfs 1.9 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=595.52' Storage=1,226 cf Inflow=1.1 cfs 0.0 af Discarded=0.0 cfs 0.0 af Primary=0.0 cfs 0.0 af Outflow=0.0 cfs 0.0 af
Pond UIP-1: UIP-1	Peak Elev=595.96' Storage=20,830 cf Inflow=12.8 cfs 0.6 af Discarded=0.1 cfs 0.5 af Primary=0.0 cfs 0.0 af Outflow=0.1 cfs 0.5 af
Pond UIP-2: UIP-2	Peak Elev=585.88' Storage=7,450 cf Inflow=6.4 cfs 0.3 af Discarded=0.0 cfs 0.2 af Primary=0.2 cfs 0.1 af Outflow=0.3 cfs 0.3 af
Pond UIP-3: UIP-3	Peak Elev=595.71' Storage=9,211 cf Inflow=7.8 cfs 0.4 af Discarded=0.0 cfs 0.2 af Primary=0.4 cfs 0.1 af Outflow=0.5 cfs 0.4 af
Link DP-1: Brickyard Pond	Inflow=28.0 cfs 4.5 af Primary=28.0 cfs 4.5 af

Total Runoff Area = 108.11 ac Runoff Volume = 5.6 af Average Runoff Depth = 0.62"
92.99% Pervious = 100.53 ac 7.01% Impervious = 7.58 ac

Summary for Subcatchment PR-1: Subcat PR-1

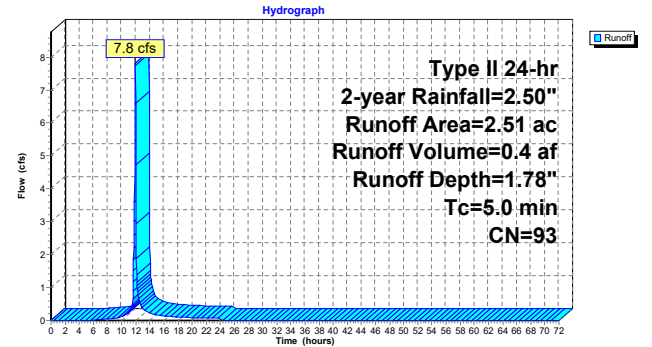
Runoff = 7.8 cfs @ 11.96 hrs, Volume= 0.4 af, Depth= 1.78"
Routed to Pond UIP-3 : UIP-3

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
0.54	74	>75% Grass cover, Good, HSG C
1.07	98	Paved parking, HSG C
0.90	98	Roofs, HSG C
0.00	70	Woods, Good, HSG C
2.51	93	Weighted Average
0.54		21.39% Pervious Area
1.97		78.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-1: Subcat PR-1



Summary for Subcatchment PR-2: Subcat PR-2

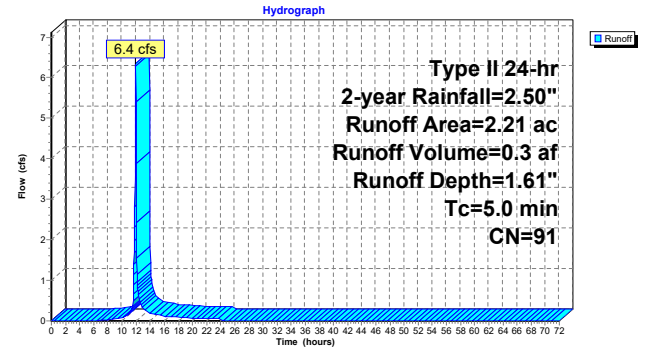
Runoff = 6.4 cfs @ 11.96 hrs, Volume= 0.3 af, Depth= 1.61"
Routed to Pond UIP-2 : UIP-2

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 2-year Rainfall=2.50"

Area (ac)	CN	Description
0.45	61	>75% Grass cover, Good, HSG B
0.00	48	Brush, Good, HSG B
1.07	98	Paved parking, HSG B
0.69	98	Roofs, HSG B
2.21	91	Weighted Average
0.45		20.25% Pervious Area
1.76		79.75% 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

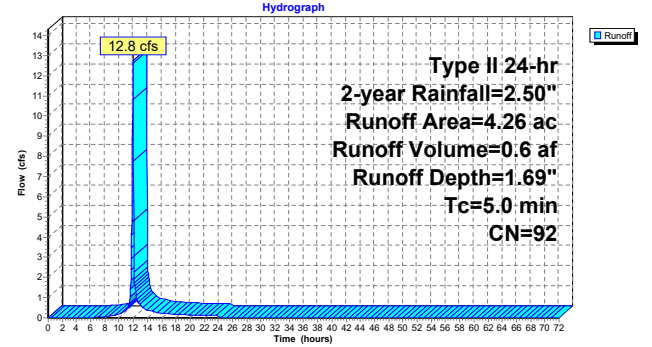
Runoff = 12.8 cfs @ 11.96 hrs, Volume= 0.6 af, Depth= 1.69"
Routed to Pond UIP-1 : UIP-1

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
0.10	61	>75% Grass cover, Good, HSG B
0.80	74	>75% Grass cover, Good, HSG C
0.29	98	Paved parking, HSG B
1.74	98	Paved parking, HSG C
0.43	98	Roofs, HSG B
0.87	98	Roofs, HSG C
0.00	55	Woods, Good, HSG B
0.02	70	Woods, Good, HSG C
4.26	92	Weighted Average
0.92		21.64% Pervious Area
3.33		78.36% 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

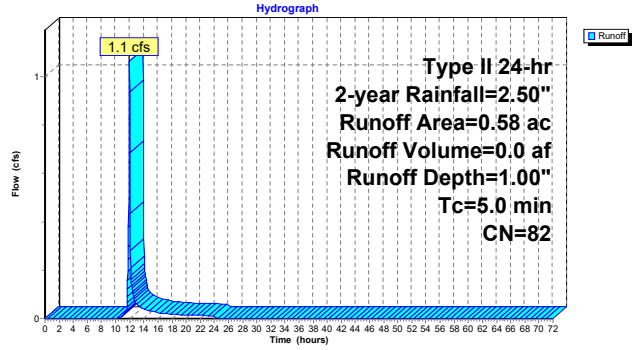
Runoff = 1.1 cfs @ 11.97 hrs, Volume= 0.0 af, Depth= 1.00"
 Routed to Pond BP-1 : Bioretention Pond #1

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
0.20	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
0.01	98	Paved parking, HSG A
0.20	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
0.58	82	Weighted Average
0.29		49.43% Pervious Area
0.29		50.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-4: Subcat PR-4



Summary for Subcatchment PR-5: Subcat PR-5

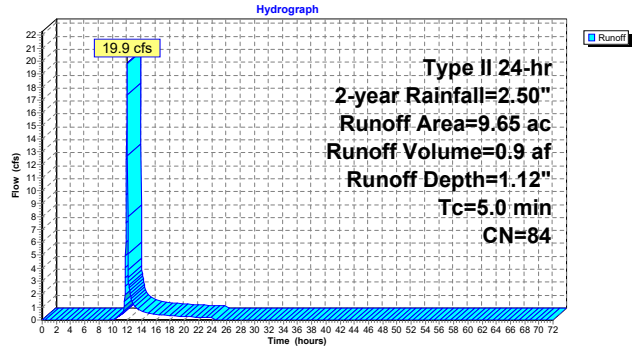
Runoff = 19.9 cfs @ 11.96 hrs, Volume= 0.9 af, Depth= 1.12"
 Routed to Reach 2R : South Culvert

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
1.24	61	>75% Grass cover, Good, HSG B
1.20	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
0.08	98	Paved parking, HSG B
0.05	98	Paved parking, 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
0.83	55	Woods, Good, HSG B
0.40	70	Woods, Good, HSG C
0.00	77	Woods, Good, HSG D
9.65	84	Weighted Average
9.52		98.70% Pervious Area
0.13		1.30% 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

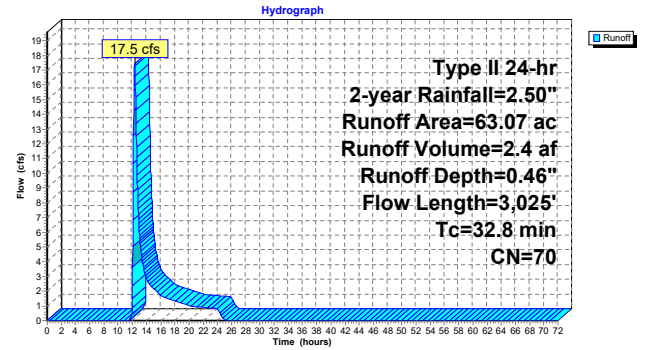
Runoff = 17.5 cfs @ 12.35 hrs, Volume= 2.4 af, Depth= 0.46"
Routed to Link DP-1 : Brickyard Pond

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
0.21	39	>75% Grass cover, Good, HSG A
0.56	61	>75% Grass cover, Good, HSG B
0.22	74	>75% Grass cover, Good, HSG C
0.00	30	Brush, Good, HSG A
0.84	48	Brush, Good, HSG B
0.03	98	Paved parking, HSG A
0.01	98	Paved parking, HSG B
0.01	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
57.00	70	Woods, Good, HSG C
0.53	77	Woods, Good, HSG D
63.07	70	Weighted Average
63.02		99.92% Pervious Area
0.05		0.08% 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-6: Subcat PR-6



Summary for Subcatchment PR-7: Subcat PR-7

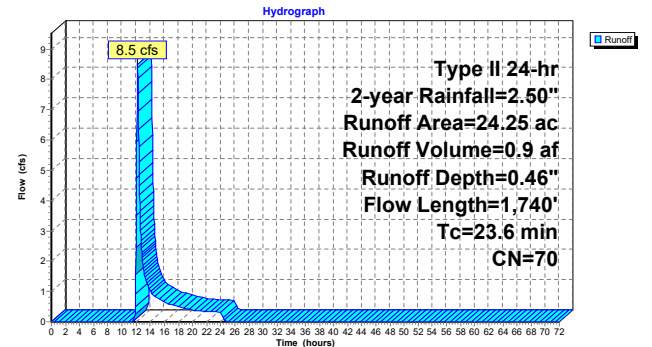
Runoff = 8.5 cfs @ 12.21 hrs, Volume= 0.9 af, Depth= 0.46"
Routed to Reach 1R : 30" Pipe

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
0.98	74	>75% Grass cover, Good, HSG C
0.05	98	Paved parking, HSG C
23.23	70	Woods, Good, HSG C
24.25	70	Weighted Average
24.21		99.80% Pervious Area
0.05		0.20% 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
1.0	260	0.0103	4.38	96.25	Channel Flow, Area= 22.0 sf Perim= 17.6' r= 1.25' n= 0.040 Earth, cobble bottom, clean sides
23.6	1,740	Total			

Subcatchment PR-7: Subcat PR-7



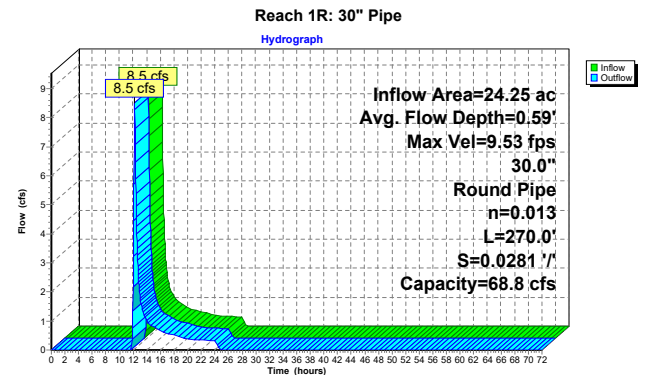
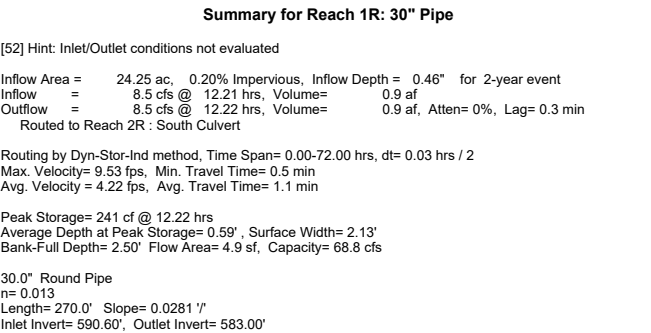
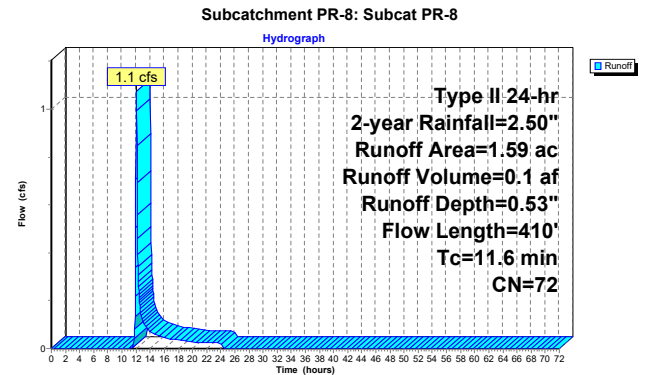
Summary for Subcatchment PR-8: Subcat PR-8

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
0.03	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.02	48	Brush, Good, HSG B
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
1.33	70	Woods, Good, HSG C
1.59	72	Weighted Average
1.59		100.00% Pervious 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			



Stage-Area-Storage for Reach 1R: 30" Pipe

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
590.60	0.0	0
590.65	0.0	6
590.70	0.1	18
590.75	0.1	32
590.80	0.2	50
590.85	0.3	69
590.90	0.3	90
590.95	0.4	113
591.00	0.5	137
591.05	0.6	162
591.10	0.7	189
591.15	0.8	216
591.20	0.9	245
591.25	1.0	274
591.30	1.1	304
591.35	1.2	334
591.40	1.4	366
591.45	1.5	397
591.50	1.6	430
591.55	1.7	462
591.60	1.8	495
591.65	2.0	528
591.70	2.1	562
591.75	2.2	595
591.80	2.3	629
591.85	2.5	663
591.90	2.6	696
591.95	2.7	730
592.00	2.8	764
592.05	3.0	797
592.10	3.1	830
592.15	3.2	863
592.20	3.3	896
592.25	3.4	928
592.30	3.6	960
592.35	3.7	991
592.40	3.8	1,022
592.45	3.9	1,052
592.50	4.0	1,081
592.55	4.1	1,109
592.60	4.2	1,137
592.65	4.3	1,163
592.70	4.4	1,188
592.75	4.5	1,213
592.80	4.6	1,235
592.85	4.7	1,256
592.90	4.7	1,276
592.95	4.8	1,293
593.00	4.8	1,308
593.05	4.9	1,319
593.10	4.9	1,325

Summary for Reach 2R: South Culvert

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 35.49 ac, 0.49% Impervious, Inflow Depth = 0.64" for 2-year event
Inflow = 21.9 cfs @ 11.97 hrs, Volume= 1.9 af
Outflow = 21.9 cfs @ 11.97 hrs, Volume= 1.9 af, Atten= 0%, Lag= 0.1 min
Routed to Link DP-1 : Brickyard Pond

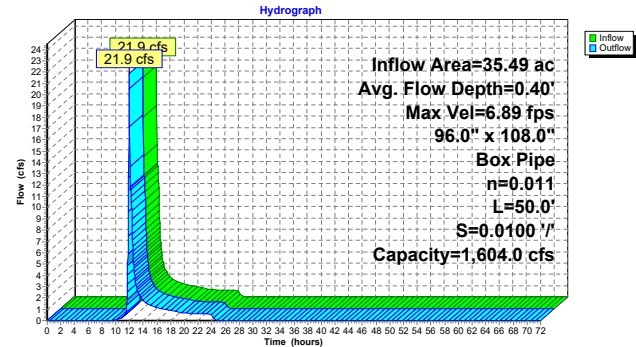
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 6.89 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.85 fps, Avg. Travel Time= 0.3 min

Peak Storage= 159 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.40' , 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= 579.50', Outlet Invert= 579.00'



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)
579.50	0.0	0	584.80	42.4	2,120
579.60	0.8	40	584.90	43.2	2,160
579.70	1.6	80	585.00	44.0	2,200
579.80	2.4	120	585.10	44.8	2,240
579.90	3.2	160	585.20	45.6	2,280
580.00	4.0	200	585.30	46.4	2,320
580.10	4.8	240	585.40	47.2	2,360
580.20	5.6	280	585.50	48.0	2,400
580.30	6.4	320	585.60	48.8	2,440
580.40	7.2	360	585.70	49.6	2,480
580.50	8.0	400	585.80	50.4	2,520
580.60	8.8	440	585.90	51.2	2,560
580.70	9.6	480	586.00	52.0	2,600
580.80	10.4	520	586.10	52.8	2,640
580.90	11.2	560	586.20	53.6	2,680
581.00	12.0	600	586.30	54.4	2,720
581.10	12.8	640	586.40	55.2	2,760
581.20	13.6	680	586.50	56.0	2,800
581.30	14.4	720	586.60	56.8	2,840
581.40	15.2	760	586.70	57.6	2,880
581.50	16.0	800	586.80	58.4	2,920
581.60	16.8	840	586.90	59.2	2,960
581.70	17.6	880	587.00	60.0	3,000
581.80	18.4	920	587.10	60.8	3,040
581.90	19.2	960	587.20	61.6	3,080
582.00	20.0	1,000	587.30	62.4	3,120
582.10	20.8	1,040	587.40	63.2	3,160
582.20	21.6	1,080	587.50	64.0	3,200
582.30	22.4	1,120	587.60	64.8	3,240
582.40	23.2	1,160	587.70	65.6	3,280
582.50	24.0	1,200	587.80	66.4	3,320
582.60	24.8	1,240	587.90	67.2	3,360
582.70	25.6	1,280	588.00	68.0	3,400
582.80	26.4	1,320	588.10	68.8	3,440
582.90	27.2	1,360	588.20	69.6	3,480
583.00	28.0	1,400	588.30	70.4	3,520
583.10	28.8	1,440	588.40	71.2	3,560
583.20	29.6	1,480	588.50	72.0	3,600
583.30	30.4	1,520			
583.40	31.2	1,560			
583.50	32.0	1,600			
583.60	32.8	1,640			
583.70	33.6	1,680			
583.80	34.4	1,720			
583.90	35.2	1,760			
584.00	36.0	1,800			
584.10	36.8	1,840			
584.20	37.6	1,880			
584.30	38.4	1,920			
584.40	39.2	1,960			
584.50	40.0	2,000			
584.60	40.8	2,040			
584.70	41.6	2,080			

Summary for Reach 3R: North Culvert

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.59 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

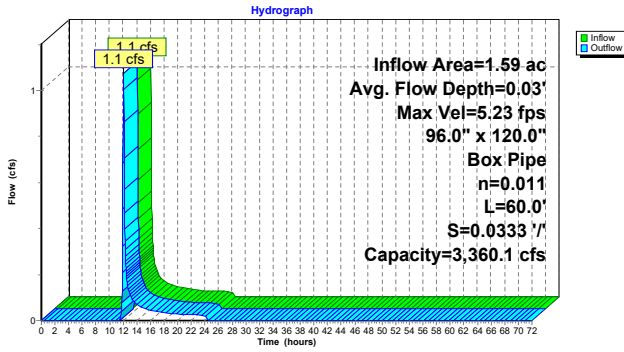
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 5.23 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 5.23 fps, Avg. Travel Time= 0.2 min

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 = 0.58 ac, 50.57% Impervious, Inflow Depth = 1.00" for 2-year event
Inflow = 1.1 cfs @ 11.97 hrs, Volume= 0.0 af
Outflow = 0.0 cfs @ 16.15 hrs, Volume= 0.0 af, Atten= 98%, Lag= 251.3 min
Discarded = 0.0 cfs @ 16.15 hrs, Volume= 0.0 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= 595.52' @ 16.15 hrs Surf.Area= 1,985 sf Storage= 1,226 cf

Plug-Flow detention time= 593.5 min calculated for 0.0 af (100% of inflow)
Center-of-Mass det. time= 593.6 min (1,438.3 - 844.7)

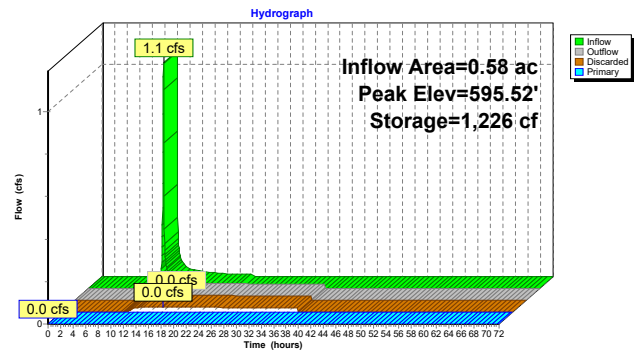
Volume	Invert	Avail.Storage	Storage Description			
#1	593.50'	11,782 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
593.50	1,720	169.6	0.0	0	0	1,720
595.00	1,720	169.6	10.0	258	258	1,974
598.00	3,501	226.2	100.0	7,675	7,933	3,853
599.00	4,208	245.6	100.0	3,849	11,782	4,619

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. Gate 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=0.0 cfs @ 16.15 hrs HW=595.52' (Free Discharge)
4=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=593.50' TW=0.00' (Dynamic Tailwater)
1=Culvert (Controls 0.0 cfs)
2=Orifice (Controls 0.0 cfs)
3=Gate (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	1,720	0	598.80	4,061	10,955
593.60	1,720	17	598.90	4,134	11,365
593.70	1,720	34	599.00	4,208	11,782
593.80	1,720	52			
593.90	1,720	69			
594.00	1,720	86			
594.10	1,720	103			
594.20	1,720	120			
594.30	1,720	138			
594.40	1,720	155			
594.50	1,720	172			
594.60	1,720	189			
594.70	1,720	206			
594.80	1,720	224			
594.90	1,720	241			
595.00	1,720	258			
595.10	1,769	432			
595.20	1,819	612			
595.30	1,870	796			
595.40	1,921	986			
595.50	1,973	1,181			
595.60	2,026	1,381			
595.70	2,080	1,586			
595.80	2,134	1,797			
595.90	2,189	2,013			
596.00	2,244	2,234			
596.10	2,300	2,461			
596.20	2,357	2,694			
596.30	2,415	2,933			
596.40	2,473	3,177			
596.50	2,532	3,428			
596.60	2,592	3,684			
596.70	2,652	3,946			
596.80	2,713	4,214			
596.90	2,775	4,489			
597.00	2,838	4,769			
597.10	2,901	5,056			
597.20	2,965	5,350			
597.30	3,029	5,649			
597.40	3,095	5,955			
597.50	3,161	6,268			
597.60	3,227	6,588			
597.70	3,295	6,914			
597.80	3,363	7,247			
597.90	3,432	7,586			
598.00	3,501	7,933			
598.10	3,569	8,286			
598.20	3,637	8,647			
598.30	3,706	9,014			
598.40	3,776	9,388			
598.50	3,846	9,769			
598.60	3,917	10,157			
598.70	3,989	10,553			

Summary for Pond UIP-1: UIP-1

Inflow Area = 4.26 ac, 78.36% Impervious, Inflow Depth = 1.69" for 2-year event
Inflow = 12.8 cfs @ 11.96 hrs, Volume= 0.6 af
Outflow = 0.1 cfs @ 10.05 hrs, Volume= 0.5 af, Atten= 99%, Lag= 0.0 min
Discarded = 0.1 cfs @ 10.05 hrs, Volume= 0.5 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= 595.96' @ 24.04 hrs Surf.Area= 7,713 sf Storage= 20,830 cf

Plug-Flow detention time= 1,665.1 min calculated for 0.5 af (79% of inflow)
Center-of-Mass det. time= 1,582.8 min (2,385.8 - 803.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	592.30'	12,256 cf	37.58'W x 205.22'L x 6.75'H Field A 52,061 cf Overall - 21,421 cf Embedded = 30,640 cf x 40.0% Voids
#2A	593.05'	21,421 cf	ADS StormTech MC-7200 +Cap x 120 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 120 Chambers in 4 Rows Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf
33,677 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 Contraction(s)
#3	Discarded	592.30'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.01'
#4	Device 1	596.05'	12.0" W x 15.0" H Vert. Orifice C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.1 cfs @ 10.05 hrs HW=592.37' (Free Discharge)
3=Exfiltration (Exfiltration Controls 0.1 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 (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 4 rows = 316.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

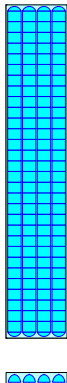
30 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 203.22' Row Length +12.0" End Stone x 2 = 205.22' Base Length
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

120 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 4 Rows = 21,421.1 cf Chamber Storage

52,060.9 cf Field - 21,421.1 cf Chambers = 30,639.8 cf Stone x 40.0% Voids = 12,255.9 cf Stone Storage

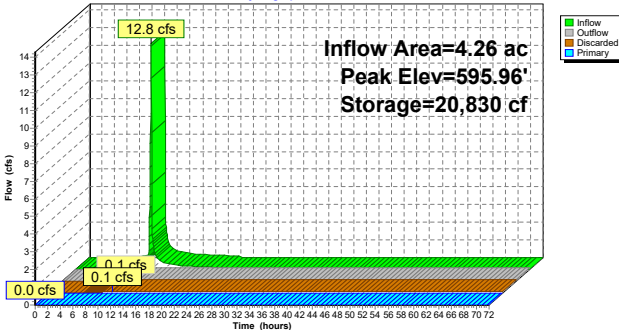
Chamber Storage + Stone Storage = 33,677.0 cf = 0.8 af
Overall Storage Efficiency = 64.7%
Overall System Size = 205.22' x 37.58' x 6.75'

120 Chambers
1,928.2 cy Field
1,134.8 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	7,713	0	597.60	7,713	29,083
592.40	7,713	309	597.70	7,713	29,442
592.50	7,713	617	597.80	7,713	29,783
592.60	7,713	926	597.90	7,713	30,115
592.70	7,713	1,234	598.00	7,713	30,436
592.80	7,713	1,543	598.10	7,713	30,746
592.90	7,713	1,851	598.20	7,713	31,055
593.00	7,713	2,160	598.30	7,713	31,363
593.10	7,713	2,465	598.40	7,713	31,672
593.20	7,713	2,769	598.50	7,713	31,980
593.30	7,713	3,072	598.60	7,713	32,289
593.40	7,713	3,374	598.70	7,713	32,597
593.50	7,713	3,675	598.80	7,713	32,906
593.60	7,713	3,975	598.90	7,713	33,214
593.70	7,713	4,274	599.00	7,713	33,523
593.80	7,713	4,572			
593.90	7,713	4,869			
594.00	7,713	5,165			
594.10	7,713	5,460			
594.20	7,713	5,755			
594.30	7,713	6,049			
594.40	7,713	6,342			
594.50	7,713	6,635			
594.60	7,713	6,927			
594.70	7,713	7,218			
594.80	7,713	7,508			
594.90	7,713	7,797			
595.00	7,713	8,085			
595.10	7,713	8,372			
595.20	7,713	8,658			
595.30	7,713	8,943			
595.40	7,713	9,227			
595.50	7,713	9,510			
595.60	7,713	9,792			
595.70	7,713	10,073			
595.80	7,713	10,353			
595.90	7,713	10,632			
596.00	7,713	10,910			
596.10	7,713	11,187			
596.20	7,713	11,463			
596.30	7,713	11,738			
596.40	7,713	12,012			
596.50	7,713	12,285			
596.60	7,713	12,557			
596.70	7,713	12,828			
596.80	7,713	13,098			
596.90	7,713	13,367			
597.00	7,713	13,635			
597.10	7,713	13,902			
597.20	7,713	14,168			
597.30	7,713	14,433			
597.40	7,713	14,697			
597.50	7,713	14,960			

Summary for Pond UIP-2: UIP-2

Inflow Area = 2.21 ac, 79.75% Impervious, Inflow Depth = 1.61" for 2-year event

Inflow = 6.4 cfs @ 11.96 hrs, Volume= 0.3 af

Outflow = 0.3 cfs @ 13.12 hrs, Volume= 0.3 af, Atten= 95%, Lag= 69.8 min

Discarded = 0.0 cfs @ 10.17 hrs, Volume= 0.2 af

Primary = 0.2 cfs @ 13.12 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= 585.88' @ 13.12 hrs Surf.Area= 3,594 sf Storage= 7,450 cf

Plug-Flow detention time= 1,057.1 min calculated for 0.3 af (100% of inflow)

Center-of-Mass det. time= 1,057.8 min (1,865.8 - 808.0)

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'	24.0" 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= 3.14 sf
#2	Device 1	585.50'	4.0" W x 24.0" 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 @ 10.17 hrs HW=583.07' (Free Discharge)
4=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.2 cfs @ 13.12 hrs HW=585.88' TW=0.00' (Dynamic Tailwater)
1=Culvert (Passes 0.2 cfs of 19.8 cfs potential flow)
2=Orifice/Grate (Orifice Controls 0.2 cfs @ 1.97 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

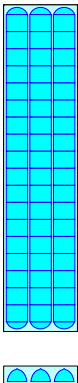
18 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 124.12' Row Length +12.0" End Stone x 2 = 126.12' Base Length
3 Rows x 100.0" Wide x 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width
9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

54 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 3 Rows = 9,734.3 cf Chamber Storage

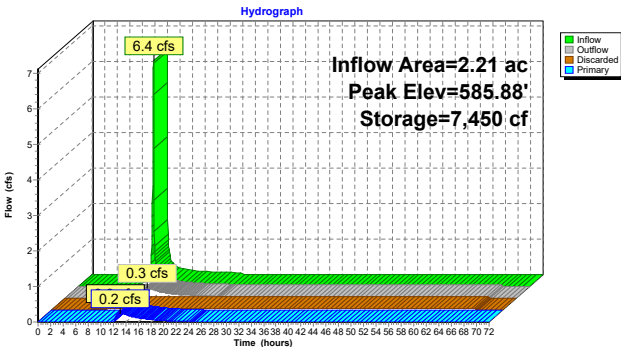
24,261.7 cf Field - 9,734.3 cf Chambers = 14,527.4 cf Stone x 40.0% Voids = 5,811.0 cf Stone Storage

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



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 Pond UIP-3: UIP-3

Inflow Area = 2.51 ac, 78.61% Impervious, Inflow Depth = 1.78" for 2-year event
Inflow = 7.8 cfs @ 11.96 hrs, Volume = 0.4 af
Outflow = 0.5 cfs @ 12.69 hrs, Volume = 0.4 af, Atten= 94%, Lag= 44.0 min
Discarded = 0.0 cfs @ 9.36 hrs, Volume = 0.2 af
Primary = 0.4 cfs @ 12.69 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= 595.71' @ 12.69 hrs Surf.Area= 3,724 sf Storage= 9,211 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1,069.4 min (1,866.8 - 797.5)

Volume	Invert	Avail. Storage	Storage Description
#1A	592.30'	6,065 cf	55.75'W x 66.79'L x 6.75'H Field A 25,135 cf Overall - 9,971 cf Embedded = 15,163 cf x 40.0% Voids
#2A	593.05'	9,971 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 6 Rows Cap Storage= 39.5 cf x 2 x 6 rows = 474.0 cf
		16,037 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	592.30'	0.500 in/hr Exfiltration over Surface area
#2	Primary	592.30'	15.0" Round Culvert L= 10.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 592.30' / 592.00' S= 0.0300' /' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	596.30'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Device 2	595.30'	6.0" W x 12.0" H Vert. Orifice C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.0 cfs @ 9.36 hrs HW=592.37' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.4 cfs @ 12.69 hrs HW=595.71' TW=0.00' (Dynamic Tailwater)
2=Culvert (Passes 0.4 cfs of 9.9 cfs potential flow)
3=Sharp-Crested Rectangular Weir (Controls 0.0 cfs)
4=Orifice (Orifice Controls 0.4 cfs @ 2.06 fps)

Pond UIP-3: UIP-3 - 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 6 rows = 474.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

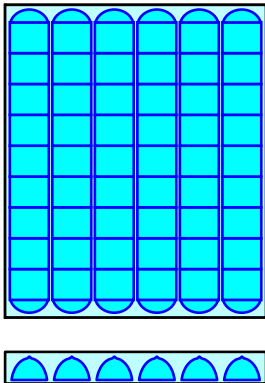
9 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 64.79' Row Length +12.0" End Stone x 2 = 66.79'
Base Length
6 Rows x 100.0" Wide + 9.0" Spacing x 5 + 12.0" Side Stone x 2 = 55.75' Base Width
9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

54 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 6 Rows = 9,971.3 cf Chamber Storage

25,134.5 cf Field - 9,971.3 cf Chambers = 15,163.3 cf Stone x 40.0% Voids = 6,065.3 cf Stone Storage

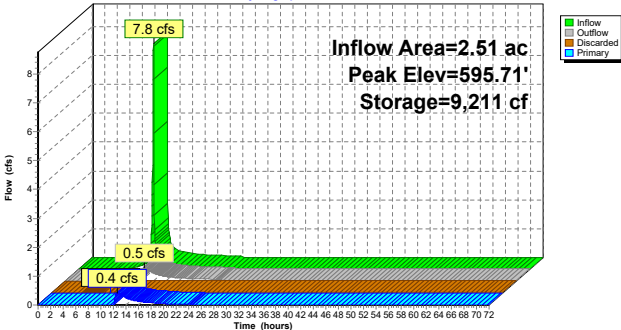
Chamber Storage + Stone Storage = 16,036.6 cf = 0.4 af
Overall Storage Efficiency = 63.8%
Overall System Size = 66.79' x 55.75' x 6.75'

54 Chambers
930.9 cy Field
561.6 cy Stone



Pond UIP-3: UIP-3

Hydrograph



Stage-Area-Storage for Pond UIP-3: UIP-3

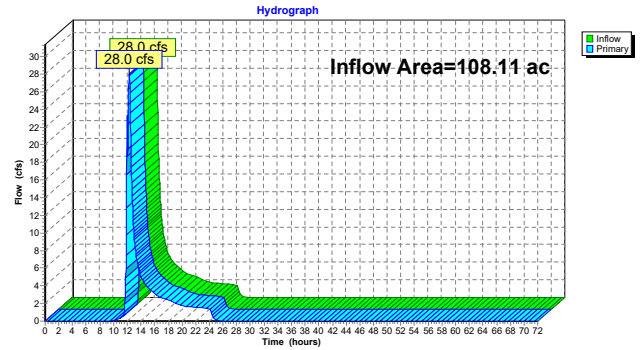
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
592.30	3,724	0	597.60	3,724	13,821
592.40	3,724	149	597.70	3,724	13,993
592.50	3,724	298	597.80	3,724	14,157
592.60	3,724	447	597.90	3,724	14,317
592.70	3,724	596	598.00	3,724	14,472
592.80	3,724	745	598.10	3,724	14,622
592.90	3,724	894	598.20	3,724	14,771
593.00	3,724	1,043	598.30	3,724	14,919
593.10	3,724	1,192	598.40	3,724	15,068
593.20	3,724	1,341	598.50	3,724	15,217
593.30	3,724	1,490	598.60	3,724	15,366
593.40	3,724	1,639	598.70	3,724	15,515
593.50	3,724	1,788	598.80	3,724	15,664
593.60	3,724	1,937	598.90	3,724	15,813
593.70	3,724	2,086	599.00	3,724	15,962
593.80	3,724	2,235			
593.90	3,724	2,384			
594.00	3,724	2,533			
594.10	3,724	2,682			
594.20	3,724	2,831			
594.30	3,724	2,980			
594.40	3,724	3,129			
594.50	3,724	3,278			
594.60	3,724	3,427			
594.70	3,724	3,576			
594.80	3,724	3,725			
594.90	3,724	3,874			
595.00	3,724	4,023			
595.10	3,724	4,172			
595.20	3,724	4,321			
595.30	3,724	4,470			
595.40	3,724	4,619			
595.50	3,724	4,768			
595.60	3,724	4,917			
595.70	3,724	5,066			
595.80	3,724	5,215			
595.90	3,724	5,364			
596.00	3,724	5,513			
596.10	3,724	5,662			
596.20	3,724	5,811			
596.30	3,724	5,960			
596.40	3,724	6,109			
596.50	3,724	6,258			
596.60	3,724	6,407			
596.70	3,724	6,556			
596.80	3,724	6,705			
596.90	3,724	6,854			
597.00	3,724	7,003			
597.10	3,724	7,152			
597.20	3,724	7,301			
597.30	3,724	7,450			
597.40	3,724	7,599			
597.50	3,724	7,748			

Summary for Link DP-1: Brickyard Pond

Inflow Area = 108.11 ac, 7.01% Impervious, Inflow Depth = 0.50" for 2-year event
Inflow = 28.0 cfs @ 12.29 hrs, Volume= 4.5 af
Primary = 28.0 cfs @ 12.29 hrs, Volume= 4.5 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=2.51 ac 78.61% Impervious Runoff Depth=2.81" Tc=5.0 min CN=93 Runoff=12.0 cfs 0.6 af
Subcatchment PR-2: Subcat PR-2	Runoff Area=2.21 ac 79.75% Impervious Runoff Depth=2.62" Tc=5.0 min CN=91 Runoff=10.0 cfs 0.5 af
Subcatchment PR-3: Subcat PR-3	Runoff Area=4.26 ac 78.36% Impervious Runoff Depth=2.71" Tc=5.0 min CN=92 Runoff=19.9 cfs 1.0 af
Subcatchment PR-4: Subcat PR-4	Runoff Area=0.58 ac 50.57% Impervious Runoff Depth=1.85" Tc=5.0 min CN=82 Runoff=2.0 cfs 0.1 af
Subcatchment PR-5: Subcat PR-5	Runoff Area=9.65 ac 1.30% Impervious Runoff Depth=2.01" Tc=5.0 min CN=84 Runoff=35.3 cfs 1.6 af
Subcatchment PR-6: Subcat PR-6	Runoff Area=63.07 ac 0.08% Impervious Runoff Depth=1.06" Flow Length=3,025' Tc=32.8 min CN=70 Runoff=49.3 cfs 5.6 af
Subcatchment PR-7: Subcat PR-7	Runoff Area=24.25 ac 0.20% Impervious Runoff Depth=1.06" Flow Length=1,740' Tc=23.6 min CN=70 Runoff=23.8 cfs 2.1 af
Subcatchment PR-8: Subcat PR-8	Runoff Area=1.59 ac 0.00% Impervious Runoff Depth=1.17" Flow Length=410' Tc=11.6 min CN=72 Runoff=2.6 cfs 0.2 af
Reach 1R: 30" Pipe	Avg. Flow Depth=1.01' Max Vel=12.73 fps Inflow=23.8 cfs 2.1 af 30.0" Round Pipe n=0.013 L=270.0' S=0.0281' Capacity=68.8 cfs Outflow=23.8 cfs 2.1 af
Reach 2R: South Culvert	Avg. Flow Depth=0.63' Max Vel=8.96 fps Inflow=44.9 cfs 3.9 af 96.0" x 108.0" Box Pipe n=0.011 L=50.0' S=0.0100' Capacity=1,604.0 cfs Outflow=44.9 cfs 3.9 af
Reach 3R: North Culvert	Avg. Flow Depth=0.06' Max Vel=5.23 fps Inflow=2.6 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=596.18' Storage=2,637 cf Inflow=2.0 cfs 0.1 af Discarded=0.0 cfs 0.1 af Primary=0.0 cfs 0.0 af Outflow=0.0 cfs 0.1 af
Pond UIP-1: UIP-1	Peak Elev=596.57' Storage=24,250 cf Inflow=19.9 cfs 1.0 af Discarded=0.1 cfs 0.5 af Primary=1.2 cfs 0.3 af Outflow=1.3 cfs 0.8 af
Pond UIP-2: UIP-2	Peak Elev=596.95' Storage=10,367 cf Inflow=10.0 cfs 0.5 af Discarded=0.0 cfs 0.2 af Primary=1.9 cfs 0.3 af Outflow=1.9 cfs 0.5 af
Pond UIP-3: UIP-3	Peak Elev=596.75' Storage=11,969 cf Inflow=12.0 cfs 0.6 af Discarded=0.0 cfs 0.2 af Primary=6.2 cfs 0.3 af Outflow=6.3 cfs 0.6 af
Link DP-1: Brickyard Pond	Inflow=79.9 cfs 10.4 af Primary=79.9 cfs 10.4 af

Total Runoff Area = 108.11 ac Runoff Volume = 11.6 af Average Runoff Depth = 1.29"
92.99% Pervious = 100.53 ac 7.01% Impervious = 7.58 ac

Summary for Subcatchment PR-1: Subcat PR-1

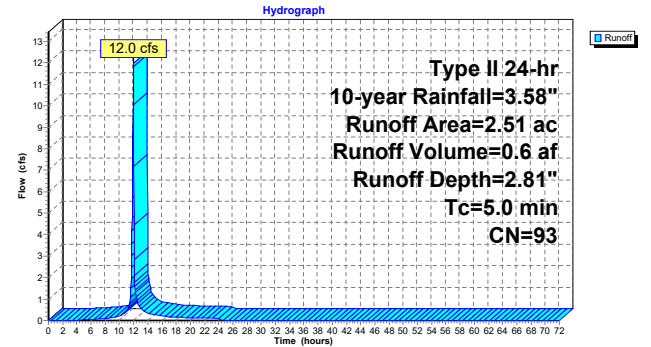
Runoff = 12.0 cfs @ 11.96 hrs, Volume= 0.6 af, Depth= 2.81"
Routed to Pond UIP-3 : UIP-3

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
0.54	74	>75% Grass cover, Good, HSG C
1.07	98	Paved parking, HSG C
0.90	98	Roofs, HSG C
0.00	70	Woods, Good, HSG C
2.51	93	Weighted Average
0.54		21.39% Pervious Area
1.97		78.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-1: Subcat PR-1



Summary for Subcatchment PR-2: Subcat PR-2

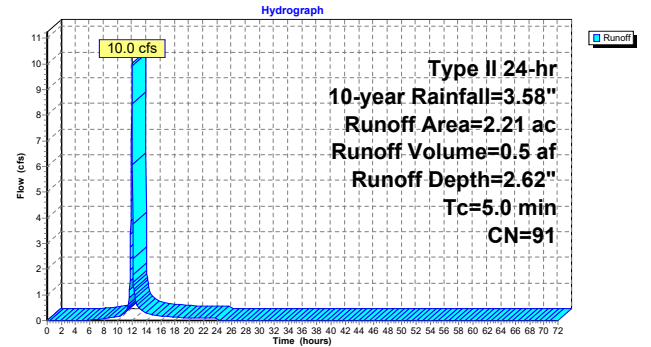
Runoff = 10.0 cfs @ 11.96 hrs, Volume= 0.5 af, Depth= 2.62"
Routed to Pond UIP-2 : UIP-2

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
0.45	61	>75% Grass cover, Good, HSG B
0.00	48	Brush, Good, HSG B
1.07	98	Paved parking, HSG B
0.69	98	Roofs, HSG B
2.21	91	Weighted Average
0.45		20.25% Pervious Area
1.76		79.75% 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

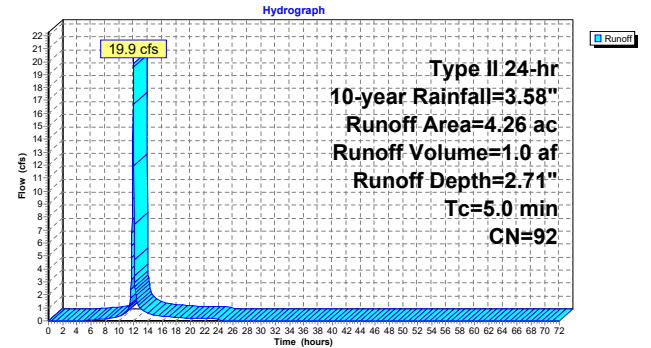
Runoff = 19.9 cfs @ 11.96 hrs, Volume= 1.0 af, Depth= 2.71"
Routed to Pond UIP-1 : UIP-1

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
0.10	61	>75% Grass cover, Good, HSG B
0.80	74	>75% Grass cover, Good, HSG C
0.29	98	Paved parking, HSG B
1.74	98	Paved parking, HSG C
0.43	98	Roofs, HSG B
0.87	98	Roofs, HSG C
0.00	55	Woods, Good, HSG B
0.02	70	Woods, Good, HSG C
4.26	92	Weighted Average
0.92		21.64% Pervious Area
3.33		78.36% 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



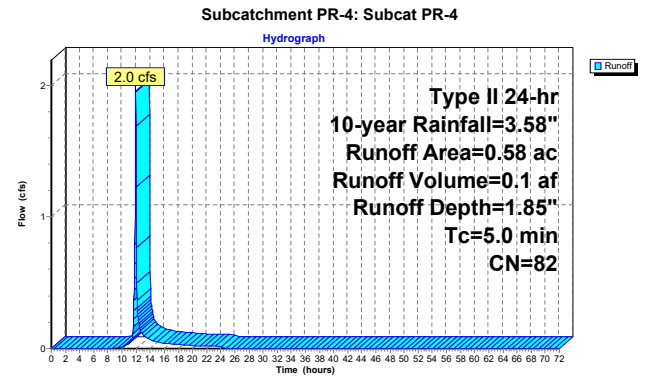
Summary for Subcatchment PR-4: Subcat PR-4

Runoff = 2.0 cfs @ 11.96 hrs, Volume= 0.1 af, Depth= 1.85"
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
0.20	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
0.01	98	Paved parking, HSG A
0.20	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
0.58	82	Weighted Average
0.29		49.43% Pervious Area
0.29		50.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,



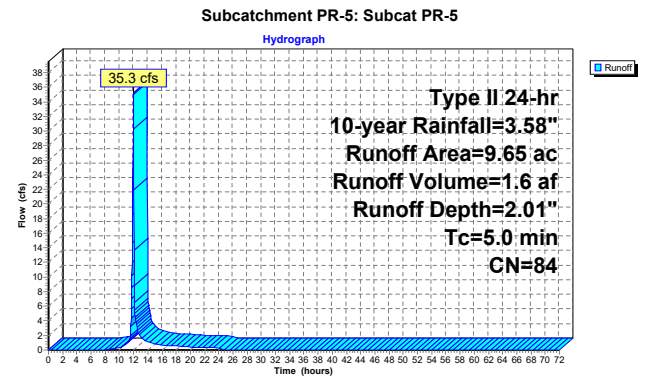
Summary for Subcatchment PR-5: Subcat PR-5

Runoff = 35.3 cfs @ 11.96 hrs, Volume= 1.6 af, Depth= 2.01"
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
1.24	61	>75% Grass cover, Good, HSG B
1.20	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
0.08	98	Paved parking, HSG B
0.05	98	Paved parking, 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
0.83	55	Woods, Good, HSG B
0.40	70	Woods, Good, HSG C
0.00	77	Woods, Good, HSG D
9.65	84	Weighted Average
9.52		98.70% Pervious Area
0.13		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,



Summary for Subcatchment PR-6: Subcat PR-6

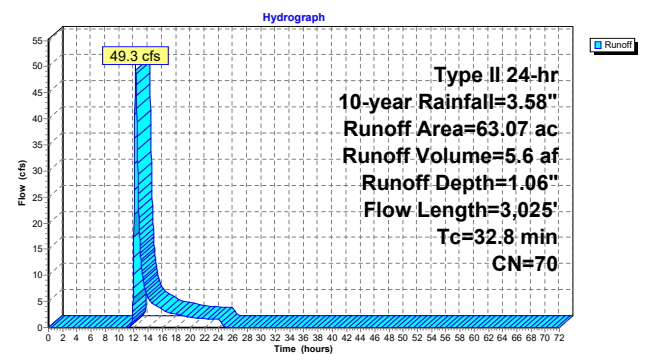
Runoff = 49.3 cfs @ 12.31 hrs, Volume= 5.6 af, Depth= 1.06"
Routed to Link DP-1 : Brickyard Pond

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
0.21	39	>75% Grass cover, Good, HSG A
0.56	61	>75% Grass cover, Good, HSG B
0.22	74	>75% Grass cover, Good, HSG C
0.00	30	Brush, Good, HSG A
0.84	48	Brush, Good, HSG B
0.03	98	Paved parking, HSG A
0.01	98	Paved parking, HSG B
0.01	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
57.00	70	Woods, Good, HSG C
0.53	77	Woods, Good, HSG D
63.07	70	Weighted Average
63.02		99.92% Pervious Area
0.05		0.08% 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-6: Subcat PR-6



Summary for Subcatchment PR-7: Subcat PR-7

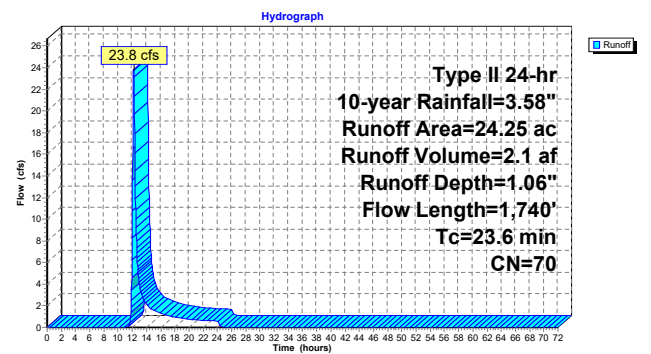
Runoff = 23.8 cfs @ 12.19 hrs, Volume= 2.1 af, Depth= 1.06"
Routed to Reach 1R : 30" Pipe

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
0.98	74	>75% Grass cover, Good, HSG C
0.05	98	Paved parking, HSG C
23.23	70	Woods, Good, HSG C
24.25	70	Weighted Average
24.21		99.80% Pervious Area
0.05		0.20% 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
1.0	260	0.0103	4.38	96.25	Channel Flow, Area= 22.0 sf Perim= 17.6' r= 1.25' n= 0.040 Earth, cobble bottom, clean sides
23.6	1,740	Total			

Subcatchment PR-7: Subcat PR-7



Summary for Subcatchment PR-8: Subcat PR-8

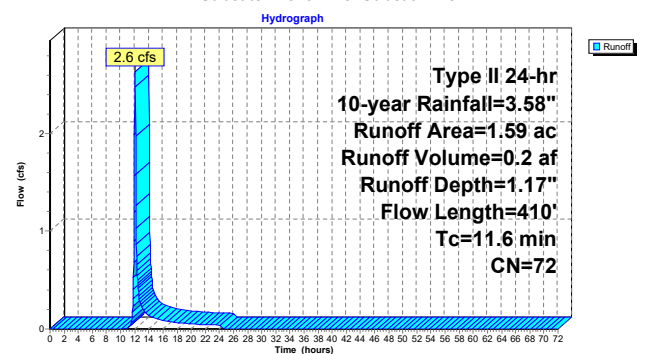
Runoff = 2.6 cfs @ 12.04 hrs, Volume= 0.2 af, Depth= 1.17"
Routed to Reach 3R : North Culvert

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
0.03	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.02	48	Brush, Good, HSG B
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
1.33	70	Woods, Good, HSG C
1.59	72	Weighted Average
1.59		100.00% Pervious 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			

Subcatchment PR-8: Subcat PR-8



Summary for Reach 1R: 30" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 24.25 ac, 0.20% Impervious, Inflow Depth = 1.06" for 10-year event
Inflow = 23.8 cfs @ 12.19 hrs, Volume= 2.1 af
Outflow = 23.8 cfs @ 12.19 hrs, Volume= 2.1 af, Atten= 0%, Lag= 0.3 min
Routed to Reach 2R : South Culvert

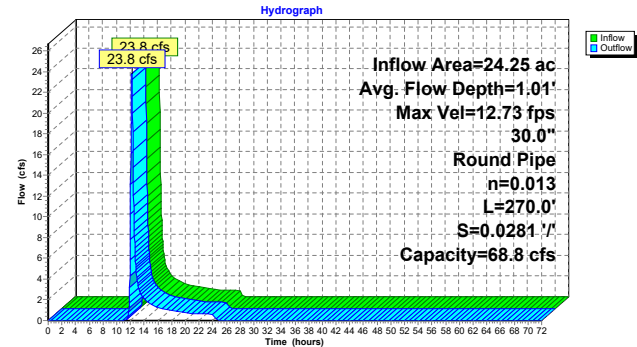
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 12.73 fps, Min. Travel Time= 0.4 min
Avg. Velocity= 5.13 fps, Avg. Travel Time= 0.9 min

Peak Storage= 504 cf @ 12.19 hrs
Average Depth at Peak Storage= 1.01' , Surface Width= 2.46'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 68.8 cfs

30.0" Round Pipe
n= 0.013
Length= 270.0' Slope= 0.0281 '/'
Inlet Invert= 590.60', Outlet Invert= 583.00'



Reach 1R: 30" Pipe



Stage-Area-Storage for Reach 1R: 30" Pipe

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
590.60	0.0	0
590.65	0.0	6
590.70	0.1	18
590.75	0.1	32
590.80	0.2	50
590.85	0.3	69
590.90	0.3	90
590.95	0.4	113
591.00	0.5	137
591.05	0.6	162
591.10	0.7	189
591.15	0.8	216
591.20	0.9	245
591.25	1.0	274
591.30	1.1	304
591.35	1.2	334
591.40	1.4	366
591.45	1.5	397
591.50	1.6	430
591.55	1.7	462
591.60	1.8	495
591.65	2.0	528
591.70	2.1	562
591.75	2.2	595
591.80	2.3	629
591.85	2.5	663
591.90	2.6	696
591.95	2.7	730
592.00	2.8	764
592.05	3.0	797
592.10	3.1	830
592.15	3.2	863
592.20	3.3	896
592.25	3.4	928
592.30	3.6	960
592.35	3.7	991
592.40	3.8	1,022
592.45	3.9	1,052
592.50	4.0	1,081
592.55	4.1	1,109
592.60	4.2	1,137
592.65	4.3	1,163
592.70	4.4	1,188
592.75	4.5	1,213
592.80	4.6	1,235
592.85	4.7	1,256
592.90	4.7	1,276
592.95	4.8	1,293
593.00	4.8	1,308
593.05	4.9	1,319
593.10	4.9	1,325

Summary for Reach 2R: South Culvert

[52] Hint: Inlet/Outlet conditions not evaluated

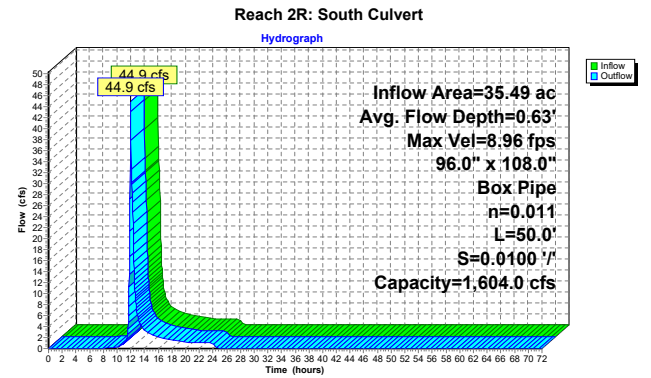
Inflow Area = 35.49 ac, 0.49% Impervious, Inflow Depth = 1.32" for 10-year event
Inflow = 44.9 cfs @ 11.97 hrs, Volume= 3.9 af
Outflow = 44.9 cfs @ 11.98 hrs, Volume= 3.9 af, Atten= 0%, Lag= 0.1 min
Routed to Link DP-1 : Brickyard Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 8.96 fps, Min. Travel Time= 0.1 min
Avg. Velocity= 3.05 fps, Avg. Travel Time= 0.3 min

Peak Storage= 250 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.63' , 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= 579.50', Outlet Invert= 579.00'





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)
579.50	0.0	0	584.80	42.4	2,120
579.60	0.8	40	584.90	43.2	2,160
579.70	1.6	80	585.00	44.0	2,200
579.80	2.4	120	585.10	44.8	2,240
579.90	3.2	160	585.20	45.6	2,280
580.00	4.0	200	585.30	46.4	2,320
580.10	4.8	240	585.40	47.2	2,360
580.20	5.6	280	585.50	48.0	2,400
580.30	6.4	320	585.60	48.8	2,440
580.40	7.2	360	585.70	49.6	2,480
580.50	8.0	400	585.80	50.4	2,520
580.60	8.8	440	585.90	51.2	2,560
580.70	9.6	480	586.00	52.0	2,600
580.80	10.4	520	586.10	52.8	2,640
580.90	11.2	560	586.20	53.6	2,680
581.00	12.0	600	586.30	54.4	2,720
581.10	12.8	640	586.40	55.2	2,760
581.20	13.6	680	586.50	56.0	2,800
581.30	14.4	720	586.60	56.8	2,840
581.40	15.2	760	586.70	57.6	2,880
581.50	16.0	800	586.80	58.4	2,920
581.60	16.8	840	586.90	59.2	2,960
581.70	17.6	880	587.00	60.0	3,000
581.80	18.4	920	587.10	60.8	3,040
581.90	19.2	960	587.20	61.6	3,080
582.00	20.0	1,000	587.30	62.4	3,120
582.10	20.8	1,040	587.40	63.2	3,160
582.20	21.6	1,080	587.50	64.0	3,200
582.30	22.4	1,120	587.60	64.8	3,240
582.40	23.2	1,160	587.70	65.6	3,280
582.50	24.0	1,200	587.80	66.4	3,320
582.60	24.8	1,240	587.90	67.2	3,360
582.70	25.6	1,280	588.00	68.0	3,400
582.80	26.4	1,320	588.10	68.8	3,440
582.90	27.2	1,360	588.20	69.6	3,480
583.00	28.0	1,400	588.30	70.4	3,520
583.10	28.8	1,440	588.40	71.2	3,560
583.20	29.6	1,480	588.50	72.0	3,600
583.30	30.4	1,520			
583.40	31.2	1,560			
583.50	32.0	1,600			
583.60	32.8	1,640			
583.70	33.6	1,680			
583.80	34.4	1,720			
583.90	35.2	1,760			
584.00	36.0	1,800			
584.10	36.8	1,840			
584.20	37.6	1,880			
584.30	38.4	1,920			
584.40	39.2	1,960			
584.50	40.0	2,000			
584.60	40.8	2,040			
584.70	41.6	2,080			

Summary for Reach 3R: North Culvert

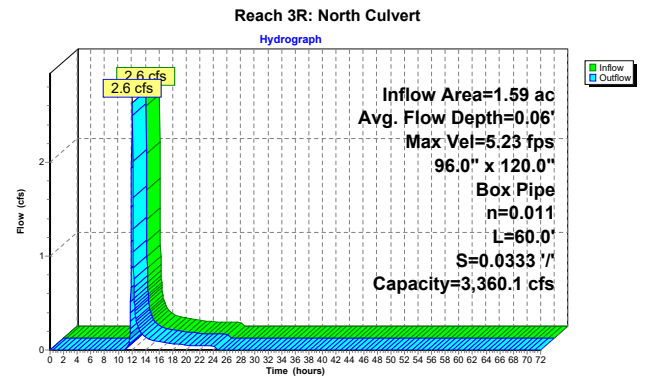
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.59 ac, 0.00% Impervious, Inflow Depth = 1.17" for 10-year event
Inflow = 2.6 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'



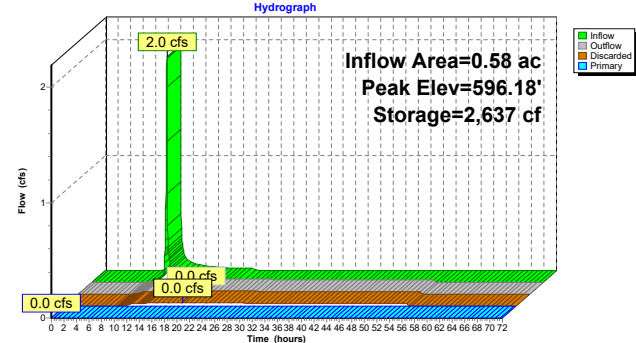
Stage-Area-Storage for Reach 3R: North Culvert

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 =	0.58 ac @ 50.57% Impervious, Inflow Depth = 1.85" for 10-year event					
Inflow =	2.0 cfs @	11.96 hrs,	Volume=	0.1 af		
Outflow =	0.0 cfs @	18.88 hrs,	Volume=	0.1 af,	Atten= 99%, Lag= 415.2 min	
Discarded =	0.0 cfs @	18.88 hrs,	Volume=	0.1 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= 596.18' @ 18.88 hrs Surf.Area= 2,343 sf Storage= 2,637 cf						
Plug-Flow detention time= 1,045.2 min calculated for 0.1 af (100% of inflow)						
Center-of-Mass det. time= 1,045.6 min (1,872.4 - 826.8)						
Volume	Invert	Avail.Storage	Storage Description			
#1	593.50'	11,782 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	1,720	169.6	0.0	0	0	1,720
595.00	1,720	169.6	10.0	258	258	1,974
598.00	3,501	226.2	100.0	7,675	7,933	3,853
599.00	4,208	245.6	100.0	3,849	11,782	4,619
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= 0.01000' /' 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=0.0 cfs @ 18.88 hrs HW=596.18' (Free Discharge)						
4=Exfiltration (Exfiltration Controls 0.0 cfs)						
Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=593.50' TW=0.00' (Dynamic Tailwater)						
1=Culvert (Controls 0.0 cfs)						
2=Orifice (Controls 0.0 cfs)						
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	1,720	0	598.80	4,061	10,955
593.60	1,720	17	598.90	4,134	11,365
593.70	1,720	34	599.00	4,208	11,782
593.80	1,720	52			
593.90	1,720	69			
594.00	1,720	86			
594.10	1,720	103			
594.20	1,720	120			
594.30	1,720	138			
594.40	1,720	155			
594.50	1,720	172			
594.60	1,720	189			
594.70	1,720	206			
594.80	1,720	224			
594.90	1,720	241			
595.00	1,720	258			
595.10	1,769	432			
595.20	1,819	612			
595.30	1,870	796			
595.40	1,921	986			
595.50	1,973	1,181			
595.60	2,026	1,381			
595.70	2,080	1,586			
595.80	2,134	1,797			
595.90	2,189	2,013			
596.00	2,244	2,234			
596.10	2,300	2,461			
596.20	2,357	2,694			
596.30	2,415	2,933			
596.40	2,473	3,177			
596.50	2,532	3,428			
596.60	2,592	3,684			
596.70	2,652	3,946			
596.80	2,713	4,214			
596.90	2,775	4,489			
597.00	2,838	4,769			
597.10	2,901	5,056			
597.20	2,965	5,350			
597.30	3,029	5,649			
597.40	3,095	5,955			
597.50	3,161	6,268			
597.60	3,227	6,588			
597.70	3,295	6,914			
597.80	3,363	7,247			
597.90	3,432	7,586			
598.00	3,501	7,933			
598.10	3,569	8,286			
598.20	3,637	8,647			
598.30	3,706	9,014			
598.40	3,776	9,388			
598.50	3,846	9,769			
598.60	3,917	10,157			
598.70	3,989	10,553			

Summary for Pond UIP-1: UIP-1

Inflow Area = 4.26 ac, 78.36% Impervious, Inflow Depth = 2.71" for 10-year event
Inflow = 19.9 cfs @ 11.96 hrs, Volume= 1.0 af
Outflow = 1.3 cfs @ 12.57 hrs, Volume= 0.8 af, Atten= 93%, Lag= 36.8 min
Discarded = 0.1 cfs @ 8.43 hrs, Volume= 0.5 af
Primary = 1.2 cfs @ 12.57 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= 596.57' @ 12.57 hrs Surf.Area= 7,713 sf Storage= 24,250 cf

Plug-Flow detention time= 1,046.2 min calculated for 0.8 af (85% of inflow)
Center-of-Mass det. time= 978.9 min (1,768.5 - 789.7)

Volume	Invert	Avail. Storage	Storage Description
#1A	592.30'	12,256 cf	37.58'W x 205.22'L x 6.75'H Field A 52,061 cf Overall - 21,421 cf Embedded = 30,640 cf x 40.0% Voids
#2A	593.05'	21,421 cf	ADS_StormTech MC-7200 +Cap x 120 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 120 Chambers in 4 Rows Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf
		33,677 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'	12.0" W x 15.0" H Vert. Orifice C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.1 cfs @ 8.43 hrs HW=592.37' (Free Discharge)
3=Exfiltration (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=1.2 cfs @ 12.57 hrs HW=596.57' TW=0.00' (Dynamic Tailwater)
1=Culvert (Passes 1.2 cfs of 23.4 cfs potential flow)
2=Sharp-Crested Rectangular Weir (Controls 0.0 cfs)
4=Orifice (Orifice Controls 1.2 cfs @ 2.32 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 4 rows = 316.0 cf

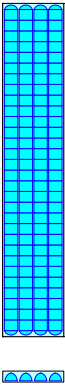
100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

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
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

120 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 4 Rows = 21,421.1 cf Chamber Storage
52,060.9 cf of Field - 21,421.1 cf of Chambers = 30,639.8 cf Stone x 40.0% Voids = 12,255.9 cf Stone Storage

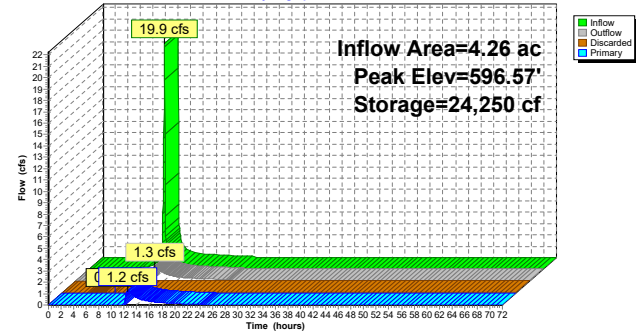
Chamber Storage + Stone Storage = 33,677.0 cf = 0.8 af
Overall Storage Efficiency = 64.7%
Overall System Size = 205.22' x 37.58' x 6.75'

120 Chambers
1,928.2 cy Field
1,134.8 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	7,713	0	597.60	7,713	29,083
592.40	7,713	309	597.70	7,713	29,442
592.50	7,713	617	597.80	7,713	29,783
592.60	7,713	926	597.90	7,713	30,115
592.70	7,713	1,234	598.00	7,713	30,436
592.80	7,713	1,543	598.10	7,713	30,746
592.90	7,713	1,851	598.20	7,713	31,055
593.00	7,713	2,160	598.30	7,713	31,363
593.10	7,713	2,469	598.40	7,713	31,672
593.20	7,713	2,777	598.50	7,713	31,980
593.30	7,713	3,086	598.60	7,713	32,289
593.40	7,713	3,394	598.70	7,713	32,597
593.50	7,713	3,703	598.80	7,713	32,906
593.60	7,713	4,011	598.90	7,713	33,214
593.70	7,713	4,320	599.00	7,713	33,523
593.80	7,713	4,628			
593.90	7,713	4,937			
594.00	7,713	5,245			
594.10	7,713	5,554			
594.20	7,713	5,862			
594.30	7,713	6,171			
594.40	7,713	6,479			
594.50	7,713	6,788			
594.60	7,713	7,096			
594.70	7,713	7,405			
594.80	7,713	7,713			
594.90	7,713	8,021			
595.00	7,713	8,330			
595.10	7,713	8,638			
595.20	7,713	8,947			
595.30	7,713	9,255			
595.40	7,713	9,564			
595.50	7,713	9,872			
595.60	7,713	10,181			
595.70	7,713	10,490			
595.80	7,713	10,798			
595.90	7,713	11,107			
596.00	7,713	11,415			
596.10	7,713	11,724			
596.20	7,713	12,032			
596.30	7,713	12,341			
596.40	7,713	12,649			
596.50	7,713	12,958			
596.60	7,713	13,266			
596.70	7,713	13,575			
596.80	7,713	13,883			
596.90	7,713	14,192			
597.00	7,713	14,500			
597.10	7,713	14,809			
597.20	7,713	15,117			
597.30	7,713	15,426			
597.40	7,713	15,734			
597.50	7,713	16,043			

Summary for Pond UIP-2: UIP-2

Inflow Area = 2.21 ac, 79.75% Impervious, Inflow Depth = 2.62" for 10-year event
Inflow = 10.0 cfs @ 11.96 hrs, Volume= 0.5 af
Outflow = 1.9 cfs @ 12.12 hrs, Volume= 0.5 af, Atten= 81%, Lag= 9.5 min
Discarded = 0.0 cfs @ 8.58 hrs, Volume= 0.2 af
Primary = 1.9 cfs @ 12.12 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= 586.95' @ 12.12 hrs Surf.Area= 3,594 sf Storage= 10,367 cf

Plug-Flow detention time= 684.8 min calculated for 0.5 af (100% of inflow)
Center-of-Mass det. time= 685.6 min (1,479.9 - 794.3)

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'	24.0" 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= 3.14 sf
#2	Device 1	585.50'	4.0" W x 24.0" 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 @ 8.58 hrs HW=583.07' (Free Discharge)
4=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=1.9 cfs @ 12.12 hrs HW=586.95' TW=0.00' (Dynamic Tailwater)
1=Culvert (Passes 1.9 cfs of 26.0 cfs potential flow)
2=Orifice/Grate (Orifice Controls 1.9 cfs @ 3.87 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 + 9.0" Spacing = 109.0" C-C Row Spacing

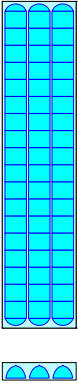
18 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 124.12' Row Length +12.0" End Stone x 2 = 126.12' Base Length
3 Rows x 100.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width
9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

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 of Field - 9,734.3 cf Chambers = 14,527.4 cf Stone x 40.0% Voids = 5,811.0 cf Stone Storage

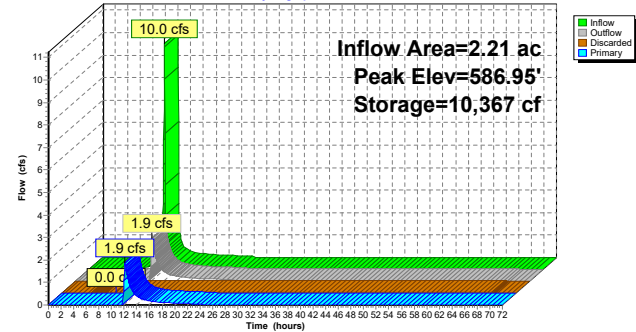
Chamber Storage + Stone Storage = 15,545.2 cf = 0.4 af
Overall Storage Efficiency = 64.1%
Overall System Size = 126.12' x 28.50' x 6.75'

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 Pond UIP-3: UIP-3

Inflow Area = 2.51 ac, 78.61% Impervious, Inflow Depth = 2.81" for 10-year event
Inflow = 12.0 cfs @ 11.96 hrs, Volume= 0.6 af
Outflow = 6.3 cfs @ 12.04 hrs, Volume= 0.6 af, Atten= 48%, Lag= 5.2 min
Discarded = 0.0 cfs @ 7.53 hrs, Volume= 0.2 af
Primary = 6.2 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= 596.75' @ 12.04 hrs Surf.Area= 3,724 sf Storage= 11,969 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 683.0 min (1,467.7 - 784.7)

Volume	Invert	Avail. Storage	Storage Description
#1A	592.30'	6,065 cf	55.75'W x 66.79'L x 6.75'H Field A 25,135 cf Overall - 9,971 cf Embedded = 15,163 cf x 40.0% Voids
#2A	593.05'	9,971 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 6 Rows Cap Storage= 39.5 cf x 2 x 6 rows = 474.0 cf
16,037 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	592.30'	0.500 in/hr Exfiltration over Surface area
#2	Primary	592.30'	15.0" Round Culvert L= 10.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 592.30' / 592.00' S= 0.0300' / Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	596.30'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Device 2	595.30'	6.0" W x 12.0" H Vert. Orifice C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.0 cfs @ 7.53 hrs HW=592.37' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=6.0 cfs @ 12.04 hrs HW=596.73' TW=0.00' (Dynamic Tailwater)
2=Culvert (Passes 6.0 cfs of 11.5 cfs potential flow)
3=Sharp-Crested Rectangular Weir (Weir Controls 3.7 cfs @ 2.16 fps)
4=Orifice (Orifice Controls 2.3 cfs @ 4.60 fps)

Pond UIP-3: UIP-3 - 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 6 rows = 474.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

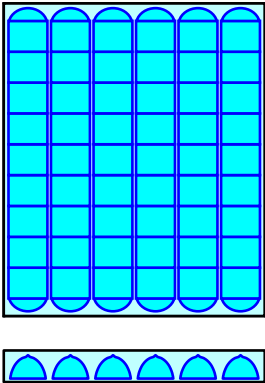
9 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 64.79' Row Length +12.0" End Stone x 2 = 66.79' Base Length
6 Rows x 100.0" Wide + 9.0" Spacing x 5 + 12.0" Side Stone x 2 = 55.75' Base Width
9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

54 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 6 Rows = 9,971.3 cf Chamber Storage

25,134.5 cf Field - 9,971.3 cf Chambers = 15,163.3 cf Stone x 40.0% Voids = 6,065.3 cf Stone Storage

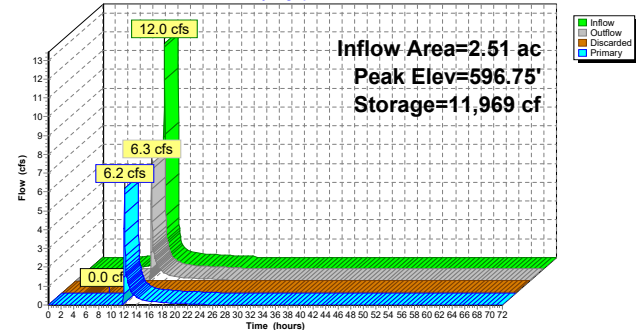
Chamber Storage + Stone Storage = 16,036.6 cf = 0.4 af
Overall Storage Efficiency = 63.8%
Overall System Size = 66.79' x 55.75' x 6.75'

54 Chambers
930.9 cy Field
561.6 cy Stone



Pond UIP-3: UIP-3

Hydrograph



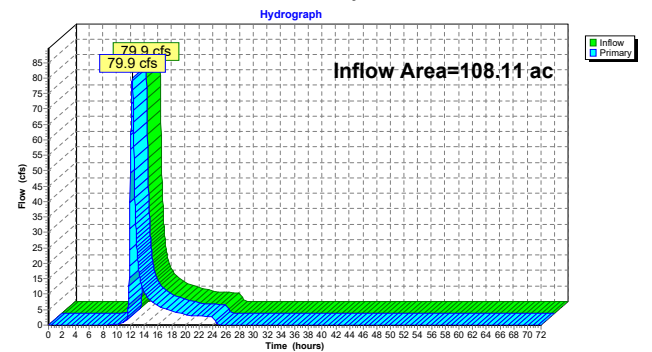
Stage-Area-Storage for Pond UIP-3: UIP-3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
592.30	3,724	0	597.60	3,724	13,821
592.40	3,724	149	597.70	3,724	13,993
592.50	3,724	298	597.80	3,724	14,157
592.60	3,724	447	597.90	3,724	14,317
592.70	3,724	596	598.00	3,724	14,472
592.80	3,724	745	598.10	3,724	14,622
592.90	3,724	894	598.20	3,724	14,771
593.00	3,724	1,043	598.30	3,724	14,919
593.10	3,724	1,192	598.40	3,724	15,068
593.20	3,724	1,341	598.50	3,724	15,217
593.30	3,724	1,490	598.60	3,724	15,366
593.40	3,724	1,639	598.70	3,724	15,515
593.50	3,724	1,788	598.80	3,724	15,664
593.60	3,724	1,937	598.90	3,724	15,813
593.70	3,724	2,086	599.00	3,724	15,962
593.80	3,724	2,235			
593.90	3,724	2,384			
594.00	3,724	2,533			
594.10	3,724	2,682			
594.20	3,724	2,831			
594.30	3,724	2,980			
594.40	3,724	3,129			
594.50	3,724	3,278			
594.60	3,724	3,427			
594.70	3,724	3,576			
594.80	3,724	3,725			
594.90	3,724	3,874			
595.00	3,724	4,023			
595.10	3,724	4,172			
595.20	3,724	4,321			
595.30	3,724	4,470			
595.40	3,724	4,619			
595.50	3,724	4,768			
595.60	3,724	4,917			
595.70	3,724	5,066			
595.80	3,724	5,215			
595.90	3,724	5,364			
596.00	3,724	5,513			
596.10	3,724	5,662			
596.20	3,724	5,811			
596.30	3,724	5,960			
596.40	3,724	6,109			
596.50	3,724	6,258			
596.60	3,724	6,407			
596.70	3,724	6,556			
596.80	3,724	6,705			
596.90	3,724	6,854			
597.00	3,724	7,003			
597.10	3,724	7,152			
597.20	3,724	7,301			
597.30	3,724	7,450			
597.40	3,724	7,599			
597.50	3,724	7,748			

Summary for Link DP-1: Brickyard Pond

Inflow Area = 108.11 ac, 7.01% Impervious, Inflow Depth = 1.15" for 10-year event
Inflow = 79.9 cfs @ 12.25 hrs, Volume= 10.4 af
Primary = 79.9 cfs @ 12.25 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



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=2.51 ac 78.61% Impervious Runoff Depth=3.61"
Tc=5.0 min CN=93 Runoff=15.1 cfs 0.8 af

Subcatchment PR-2: Subcat PR-2
Runoff Area=2.21 ac 79.75% Impervious Runoff Depth=3.40"
Tc=5.0 min CN=91 Runoff=12.8 cfs 0.6 af

Subcatchment PR-3: Subcat PR-3
Runoff Area=4.26 ac 78.36% Impervious Runoff Depth=3.50"
Tc=5.0 min CN=92 Runoff=25.2 cfs 1.2 af

Subcatchment PR-4: Subcat PR-4
Runoff Area=0.58 ac 50.57% Impervious Runoff Depth=2.55"
Tc=5.0 min CN=82 Runoff=2.7 cfs 0.1 af

Subcatchment PR-5: Subcat PR-5
Runoff Area=9.65 ac 1.30% Impervious Runoff Depth=2.73"
Tc=5.0 min CN=84 Runoff=47.4 cfs 2.2 af

Subcatchment PR-6: Subcat PR-6
Runoff Area=63.07 ac 0.08% Impervious Runoff Depth=1.60"
Flow Length=3,025' Tc=32.8 min CN=70 Runoff=78.6 cfs 8.4 af

Subcatchment PR-7: Subcat PR-7
Runoff Area=24.25 ac 0.20% Impervious Runoff Depth=1.60"
Flow Length=1,740' Tc=23.6 min CN=70 Runoff=37.7 cfs 3.2 af

Subcatchment PR-8: Subcat PR-8
Runoff Area=1.59 ac 0.00% Impervious Runoff Depth=1.75"
Flow Length=410' Tc=11.6 min CN=72 Runoff=4.0 cfs 0.2 af

Reach 1R: 30" Pipe
Avg. Flow Depth=1.32' Max Vel=14.34 fps Inflow=37.7 cfs 3.2 af
30.0" Round Pipe n=0.013 L=270.0' S=0.0281' Capacity=68.8 cfs Outflow=37.7 cfs 3.2 af

Reach 2R: South Culvert
Avg. Flow Depth=0.79' Max Vel=10.23 fps Inflow=64.6 cfs 5.7 af
96.0" x 108.0" Box Pipe n=0.011 L=50.0' S=0.0100' Capacity=1,604.0 cfs Outflow=64.7 cfs 5.7 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=596.53' Storage=3,509 cf Inflow=2.7 cfs 0.1 af
Discarded=0.0 cfs 0.1 af Primary=0.0 cfs 0.0 af Outflow=0.1 cfs 0.1 af

Pond UIP-1: UIP-1
Peak Elev=597.39' Storage=28,237 cf Inflow=25.2 cfs 1.2 af
Discarded=0.1 cfs 0.5 af Primary=5.3 cfs 0.6 af Outflow=5.4 cfs 1.1 af

Pond UIP-2: UIP-2
Peak Elev=587.84' Storage=12,489 cf Inflow=12.8 cfs 0.6 af
Discarded=0.0 cfs 0.2 af Primary=6.2 cfs 0.4 af Outflow=6.2 cfs 0.6 af

Pond UIP-3: UIP-3
Peak Elev=597.17' Storage=12,949 cf Inflow=15.1 cfs 0.8 af
Discarded=0.0 cfs 0.2 af Primary=12.2 cfs 0.5 af Outflow=12.3 cfs 0.7 af

Link DP-1: Brickyard Pond
Inflow=128.4 cfs 15.6 af
Primary=128.4 cfs 15.6 af

Total Runoff Area = 108.11 ac Runoff Volume = 16.8 af Average Runoff Depth = 1.87"
92.99% Pervious = 100.53 ac 7.01% Impervious = 7.58 ac

Summary for Subcatchment PR-1: Subcat PR-1

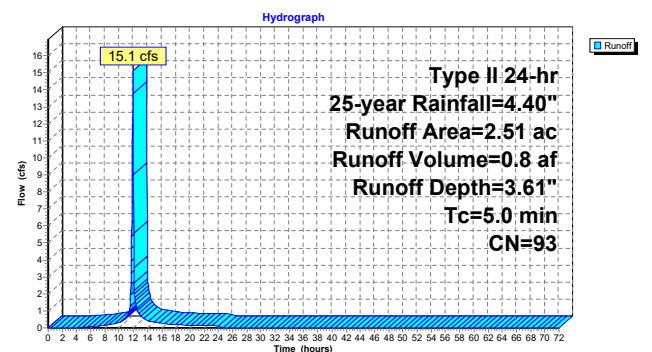
Runoff = 15.1 cfs @ 11.96 hrs, Volume= 0.8 af, Depth= 3.61"
Routed to Pond UIP-3 : UIP-3

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
0.54	74	>75% Grass cover, Good, HSG C
1.07	98	Paved parking, HSG C
0.90	98	Roofs, HSG C
0.00	70	Woods, Good, HSG C
2.51	93	Weighted Average
0.54		21.39% Pervious Area
1.97		78.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-1: Subcat PR-1



Summary for Subcatchment PR-2: Subcat PR-2

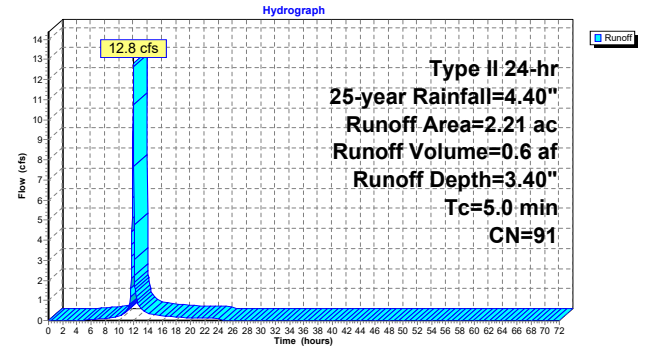
Runoff = 12.8 cfs @ 11.96 hrs, Volume= 0.6 af, Depth= 3.40"
Routed to Pond UIP-2 : UIP-2

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
0.45	61	>75% Grass cover, Good, HSG B
0.00	48	Brush, Good, HSG B
1.07	98	Paved parking, HSG B
0.69	98	Roofs, HSG B
2.21	91	Weighted Average
0.45		20.25% Pervious Area
1.76		79.75% 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

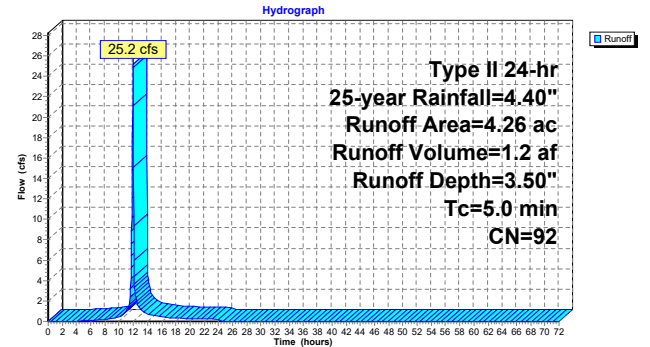
Runoff = 25.2 cfs @ 11.96 hrs, Volume= 1.2 af, Depth= 3.50"
Routed to Pond UIP-1 : UIP-1

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
0.10	61	>75% Grass cover, Good, HSG B
0.80	74	>75% Grass cover, Good, HSG C
0.29	98	Paved parking, HSG B
1.74	98	Paved parking, HSG C
0.43	98	Roofs, HSG B
0.87	98	Roofs, HSG C
0.00	55	Woods, Good, HSG B
0.02	70	Woods, Good, HSG C
4.26	92	Weighted Average
0.92		21.64% Pervious Area
3.33		78.36% 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

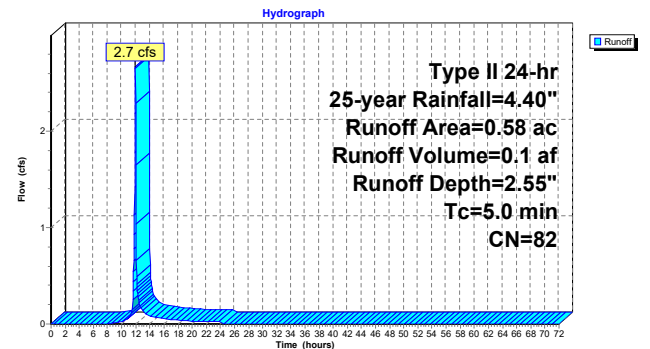
Runoff = 2.7 cfs @ 11.96 hrs, Volume= 0.1 af, Depth= 2.55"
Routed to Pond BP-1 : Bioretention Pond #1

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
0.20	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
0.01	98	Paved parking, HSG A
0.20	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
0.58	82	Weighted Average
0.29		49.43% Pervious Area
0.29		50.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-4: Subcat PR-4



Summary for Subcatchment PR-5: Subcat PR-5

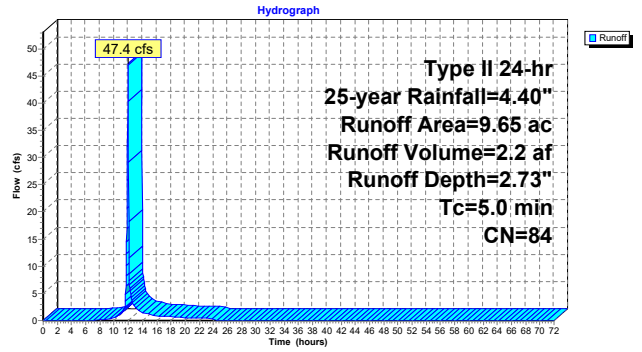
Runoff = 47.4 cfs @ 11.96 hrs, Volume= 2.2 af, Depth= 2.73"
Routed to Reach 2R : South Culvert

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
1.24	61	>75% Grass cover, Good, HSG B
1.20	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
0.08	98	Paved parking, HSG B
0.05	98	Paved parking, 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
0.83	55	Woods, Good, HSG B
0.40	70	Woods, Good, HSG C
0.00	77	Woods, Good, HSG D
9.65	84	Weighted Average
9.52		98.70% Pervious Area
0.13		1.30% 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

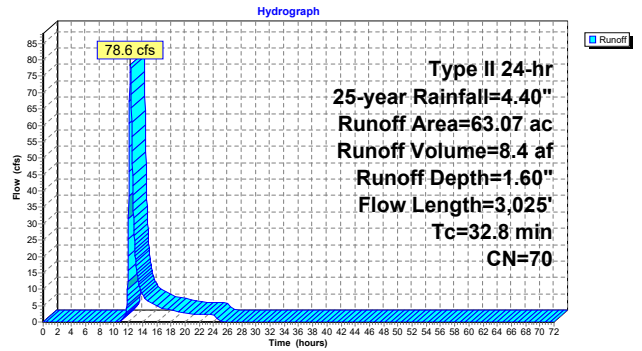
Runoff = 78.6 cfs @ 12.29 hrs, Volume= 8.4 af, Depth= 1.60"
Routed to Link DP-1 : Brickyard Pond

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
0.21	39	>75% Grass cover, Good, HSG A
0.56	61	>75% Grass cover, Good, HSG B
0.22	74	>75% Grass cover, Good, HSG C
0.00	30	Brush, Good, HSG A
0.84	48	Brush, Good, HSG B
0.03	98	Paved parking, HSG A
0.01	98	Paved parking, HSG B
0.01	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
57.00	70	Woods, Good, HSG C
0.53	77	Woods, Good, HSG D
63.07	70	Weighted Average
63.02		99.92% Pervious Area
0.05		0.08% 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-6: Subcat PR-6



Summary for Subcatchment PR-7: Subcat PR-7

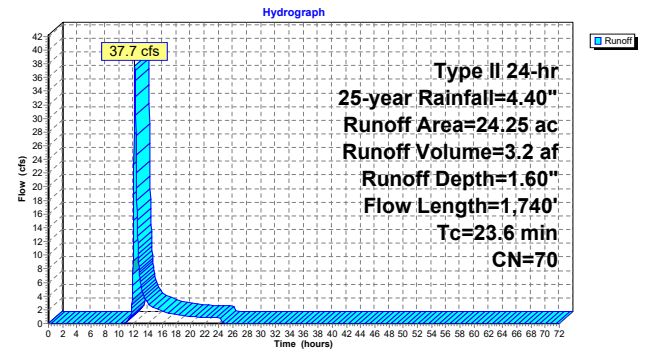
Runoff = 37.7 cfs @ 12.18 hrs, Volume= 3.2 af, Depth= 1.60"
Routed to Reach 1R : 30" Pipe

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
0.98	74	>75% Grass cover, Good, HSG C
0.05	98	Paved parking, HSG C
23.23	70	Woods, Good, HSG C
24.25	70	Weighted Average
24.21		99.80% Pervious Area
0.05		0.20% 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
1.0	260	0.0103	4.38	96.25	Channel Flow, Area= 22.0 sf Perim= 17.6' r= 1.25' n= 0.040 Earth, cobble bottom, clean sides
23.6	1,740	Total			

Subcatchment PR-7: Subcat PR-7



Summary for Subcatchment PR-8: Subcat PR-8

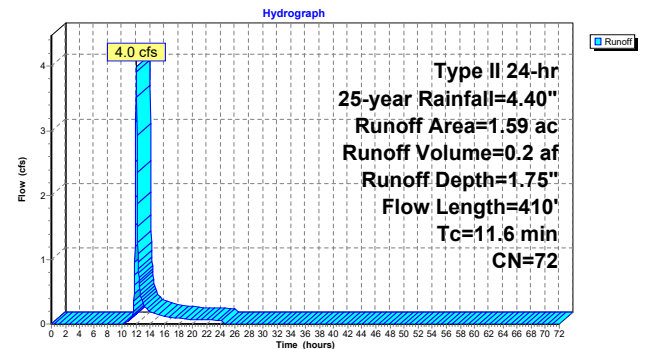
Runoff = 4.0 cfs @ 12.04 hrs, Volume= 0.2 af, Depth= 1.75"
Routed to Reach 3R : North Culvert

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
0.03	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.02	48	Brush, Good, HSG B
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
1.33	70	Woods, Good, HSG C
1.59	72	Weighted Average
1.59		100.00% Pervious 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			

Subcatchment PR-8: Subcat PR-8



Summary for Reach 1R: 30" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

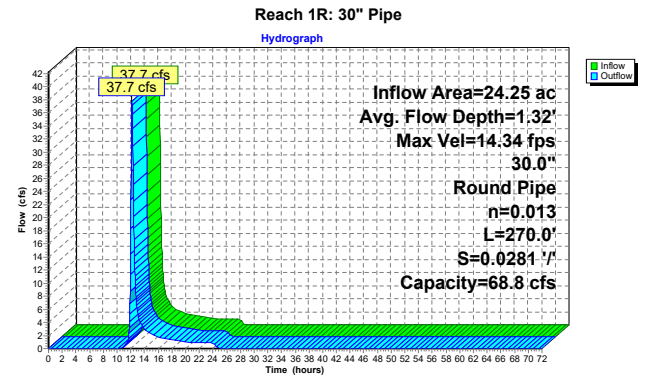
Inflow Area = 24.25 ac, 0.20% Impervious, Inflow Depth = 1.60" for 25-year event
Inflow = 37.7 cfs @ 12.18 hrs, Volume= 3.2 af
Outflow = 37.7 cfs @ 12.18 hrs, Volume= 3.2 af, Atten= 0%, Lag= 0.2 min
Routed to Reach 2R : South Culvert

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 14.34 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 5.61 fps, Avg. Travel Time= 0.8 min

Peak Storage= 710 cf @ 12.18 hrs
Average Depth at Peak Storage= 1.32' , Surface Width= 2.50'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 68.8 cfs

30.0" Round Pipe
n= 0.013
Length= 270.0' Slope= 0.0281 1'
Inlet Invert= 590.60', Outlet Invert= 583.00'





Stage-Area-Storage for Reach 1R: 30" Pipe

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
590.60	0.0	0
590.65	0.0	6
590.70	0.1	18
590.75	0.1	32
590.80	0.2	50
590.85	0.3	69
590.90	0.3	90
590.95	0.4	113
591.00	0.5	137
591.05	0.6	162
591.10	0.7	189
591.15	0.8	216
591.20	0.9	245
591.25	1.0	274
591.30	1.1	304
591.35	1.2	334
591.40	1.4	366
591.45	1.5	397
591.50	1.6	430
591.55	1.7	462
591.60	1.8	495
591.65	2.0	528
591.70	2.1	562
591.75	2.2	595
591.80	2.3	629
591.85	2.5	663
591.90	2.6	696
591.95	2.7	730
592.00	2.8	764
592.05	3.0	797
592.10	3.1	830
592.15	3.2	863
592.20	3.3	896
592.25	3.4	928
592.30	3.6	960
592.35	3.7	991
592.40	3.8	1,022
592.45	3.9	1,052
592.50	4.0	1,081
592.55	4.1	1,109
592.60	4.2	1,137
592.65	4.3	1,163
592.70	4.4	1,188
592.75	4.5	1,213
592.80	4.6	1,235
592.85	4.7	1,256
592.90	4.7	1,276
592.95	4.8	1,293
593.00	4.8	1,308
593.05	4.9	1,319
593.10	4.9	1,325

Summary for Reach 2R: South Culvert

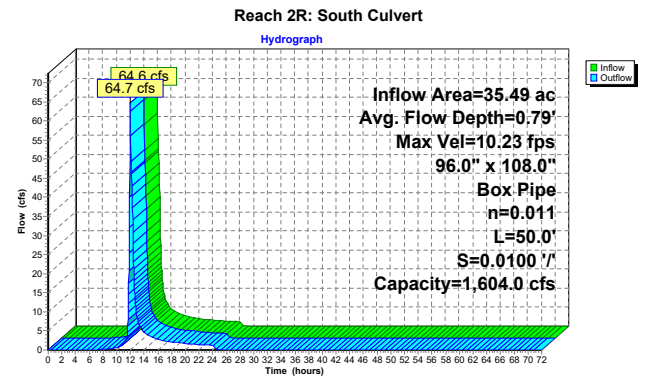
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 35.49 ac, 0.49% Impervious, Inflow Depth = 1.92" for 25-year event
Inflow = 64.6 cfs @ 11.98 hrs, Volume= 5.7 af
Outflow = 64.7 cfs @ 11.98 hrs, Volume= 5.7 af, Atten= 0%, Lag= 0.0 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= 10.23 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.22 fps, Avg. Travel Time= 0.3 min

Peak Storage= 316 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.79' , 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= 579.50', Outlet Invert= 579.00'



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)
579.50	0.0	0	584.80	42.4	2,120
579.60	0.8	40	584.90	43.2	2,160
579.70	1.6	80	585.00	44.0	2,200
579.80	2.4	120	585.10	44.8	2,240
579.90	3.2	160	585.20	45.6	2,280
580.00	4.0	200	585.30	46.4	2,320
580.10	4.8	240	585.40	47.2	2,360
580.20	5.6	280	585.50	48.0	2,400
580.30	6.4	320	585.60	48.8	2,440
580.40	7.2	360	585.70	49.6	2,480
580.50	8.0	400	585.80	50.4	2,520
580.60	8.8	440	585.90	51.2	2,560
580.70	9.6	480	586.00	52.0	2,600
580.80	10.4	520	586.10	52.8	2,640
580.90	11.2	560	586.20	53.6	2,680
581.00	12.0	600	586.30	54.4	2,720
581.10	12.8	640	586.40	55.2	2,760
581.20	13.6	680	586.50	56.0	2,800
581.30	14.4	720	586.60	56.8	2,840
581.40	15.2	760	586.70	57.6	2,880
581.50	16.0	800	586.80	58.4	2,920
581.60	16.8	840	586.90	59.2	2,960
581.70	17.6	880	587.00	60.0	3,000
581.80	18.4	920	587.10	60.8	3,040
581.90	19.2	960	587.20	61.6	3,080
582.00	20.0	1,000	587.30	62.4	3,120
582.10	20.8	1,040	587.40	63.2	3,160
582.20	21.6	1,080	587.50	64.0	3,200
582.30	22.4	1,120	587.60	64.8	3,240
582.40	23.2	1,160	587.70	65.6	3,280
582.50	24.0	1,200	587.80	66.4	3,320
582.60	24.8	1,240	587.90	67.2	3,360
582.70	25.6	1,280	588.00	68.0	3,400
582.80	26.4	1,320	588.10	68.8	3,440
582.90	27.2	1,360	588.20	69.6	3,480
583.00	28.0	1,400	588.30	70.4	3,520
583.10	28.8	1,440	588.40	71.2	3,560
583.20	29.6	1,480	588.50	72.0	3,600
583.30	30.4	1,520			
583.40	31.2	1,560			
583.50	32.0	1,600			
583.60	32.8	1,640			
583.70	33.6	1,680			
583.80	34.4	1,720			
583.90	35.2	1,760			
584.00	36.0	1,800			
584.10	36.8	1,840			
584.20	37.6	1,880			
584.30	38.4	1,920			
584.40	39.2	1,960			
584.50	40.0	2,000			
584.60	40.8	2,040			
584.70	41.6	2,080			

Summary for Reach 3R: North Culvert

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.59 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

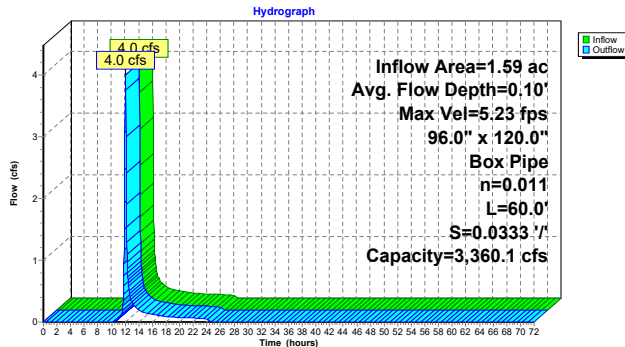
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 5.23 fps, Min. Travel Time= 0.2 min
Avg. Velocity= 5.23 fps, Avg. Travel Time= 0.2 min

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 = 0.58 ac, 50.57% Impervious, Inflow Depth = 2.55" for 25-year event
Inflow = 2.7 cfs @ 11.96 hrs, Volume= 0.1 af
Outflow = 0.1 cfs @ 14.97 hrs, Volume= 0.1 af, Atten= 98%, Lag= 180.4 min
Discarded = 0.0 cfs @ 14.97 hrs, Volume= 0.1 af
Primary = 0.0 cfs @ 14.97 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= 596.53' @ 14.97 hrs Surf.Area= 2,551 sf Storage= 3,509 cf

Plug-Flow detention time= 1,165.8 min calculated for 0.1 af (100% of inflow)
Center-of-Mass det. time= 1,166.3 min (1,984.0 - 817.7)

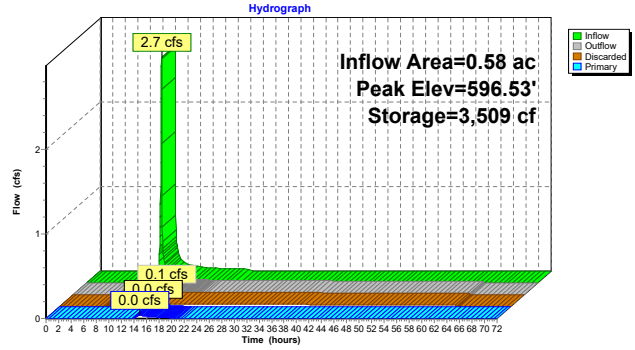
Volume	Invert	Avail.Storage	Storage Description			
#1	593.50'	11,782 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
593.50	1,720	169.6	0.0	0	0	1,720
595.00	1,720	169.6	10.0	258	258	1,974
598.00	3,501	226.2	100.0	7,675	7,933	3,853
599.00	4,208	245.6	100.0	3,849	11,782	4,619

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=0.0 cfs @ 14.97 hrs HW=596.53' (Free Discharge)
4=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 14.97 hrs HW=596.53' TW=0.00' (Dynamic Tailwater)
1=Culvert (Passes 0.0 cfs of 6.7 cfs potential flow)
2=Orifice (Orifice Controls 0.0 cfs @ 0.57 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	1,720	0	598.80	4,061	10,955
593.60	1,720	17	598.90	4,134	11,365
593.70	1,720	34	599.00	4,208	11,782
593.80	1,720	52			
593.90	1,720	69			
594.00	1,720	86			
594.10	1,720	103			
594.20	1,720	120			
594.30	1,720	138			
594.40	1,720	155			
594.50	1,720	172			
594.60	1,720	189			
594.70	1,720	206			
594.80	1,720	224			
594.90	1,720	241			
595.00	1,720	258			
595.10	1,769	432			
595.20	1,819	612			
595.30	1,870	796			
595.40	1,921	986			
595.50	1,973	1,181			
595.60	2,026	1,381			
595.70	2,080	1,586			
595.80	2,134	1,797			
595.90	2,189	2,013			
596.00	2,244	2,234			
596.10	2,300	2,461			
596.20	2,357	2,694			
596.30	2,415	2,933			
596.40	2,473	3,177			
596.50	2,532	3,428			
596.60	2,592	3,684			
596.70	2,652	3,946			
596.80	2,713	4,214			
596.90	2,775	4,489			
597.00	2,838	4,769			
597.10	2,901	5,056			
597.20	2,965	5,350			
597.30	3,029	5,649			
597.40	3,095	5,955			
597.50	3,161	6,268			
597.60	3,227	6,588			
597.70	3,295	6,914			
597.80	3,363	7,247			
597.90	3,432	7,586			
598.00	3,501	7,933			
598.10	3,569	8,286			
598.20	3,637	8,647			
598.30	3,706	9,014			
598.40	3,776	9,388			
598.50	3,846	9,769			
598.60	3,917	10,157			
598.70	3,989	10,553			

Summary for Pond UIP-1: UIP-1

Inflow Area = 4.26 ac, 78.36% Impervious, Inflow Depth = 3.50" for 25-year event
Inflow = 25.2 cfs @ 11.96 hrs, Volume= 1.2 af
Outflow = 5.4 cfs @ 12.10 hrs, Volume= 1.1 af, Atten= 79%, Lag= 8.8 min
Discarded = 0.1 cfs @ 7.17 hrs, Volume= 0.5 af
Primary = 5.3 cfs @ 12.10 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= 597.39' @ 12.10 hrs Surf.Area= 7,713 sf Storage= 28,237 cf

Plug-Flow detention time= 798.7 min calculated for 1.1 af (88% of inflow)
Center-of-Mass det. time= 741.8 min (1,524.4 - 782.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	592.30'	12,256 cf	37.58"W x 205.22"L x 6.75"H Field A 52,061 cf Overall - 21,421 cf Embedded = 30,640 cf x 40.0% Voids
#2A	593.05'	21,421 cf	ADS StormTech MC-7200 +Cap x 120 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 120 Chambers in 4 Rows Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf
		33,677 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 Contraction(s)
#3	Discarded	592.30'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.01'
#4	Device 1	596.05'	12.0" W x 15.0" H Vert. Orifice C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.1 cfs @ 7.17 hrs HW=592.37' (Free Discharge)
3=Exfiltration (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=5.2 cfs @ 12.10 hrs HW=597.38' TW=0.00' (Dynamic Tailwater)
1=Culvert (Passes 5.2 cfs of 26.3 cfs potential flow)
2=Sharp-Crested Rectangular Weir (Weir Controls 0.4 cfs @ 0.94 fps)
4=Orifice (Orifice Controls 4.9 cfs @ 3.89 fps)

Pond UIP-1: UIP-1 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-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 4 Rows = 316.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

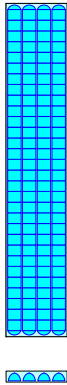
30 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 203.22' Row Length +12.0" End Stone x 2 =
205.22' Base Length
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

120 Chambers x 175.9 cf + 39.5 cf of Cap Volume x 2 x 4 Rows = 21,421.1 cf of Chamber Storage

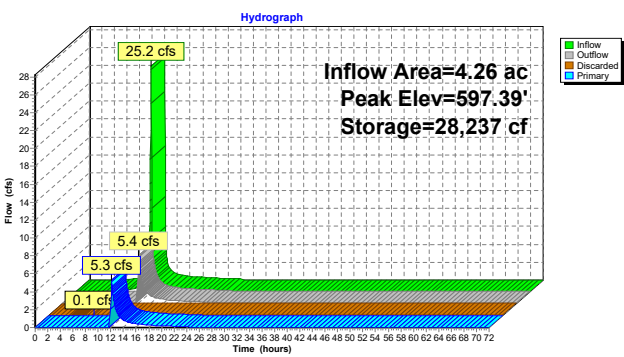
52,060.9 cf of Field - 21,421.1 cf of Chambers = 30,639.8 cf of Stone x 40.0% Voids = 12,255.9 cf of Stone Storage

Chamber Storage + Stone Storage = 33,677.0 cf = 0.8 af
Overall Storage Efficiency = 64.7%
Overall System Size = 205.22' x 37.58' x 6.75'

120 Chambers
1,928.2 cy Field
1,134.8 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	7,713	0	597.60	7,713	29,083
592.40	7,713	309	597.70	7,713	29,442
592.50	7,713	617	597.80	7,713	29,783
592.60	7,713	926	597.90	7,713	30,115
592.70	7,713	1,234	598.00	7,713	30,438
592.80	7,713	1,543	598.10	7,713	30,746
592.90	7,713	1,851	598.20	7,713	31,055
593.00	7,713	2,160	598.30	7,713	31,363
593.10	7,713	2,651	598.40	7,713	31,672
593.20	7,713	3,324	598.50	7,713	31,980
593.30	7,713	3,996	598.60	7,713	32,289
593.40	7,713	4,665	598.70	7,713	32,597
593.50	7,713	5,334	598.80	7,713	32,906
593.60	7,713	6,000	598.90	7,713	33,214
593.70	7,713	6,665	599.00	7,713	33,523
593.80	7,713	7,327			
593.90	7,713	7,988			
594.00	7,713	8,646			
594.10	7,713	9,302			
594.20	7,713	9,955			
594.30	7,713	10,605			
594.40	7,713	11,253			
594.50	7,713	11,897			
594.60	7,713	12,539			
594.70	7,713	13,177			
594.80	7,713	13,812			
594.90	7,713	14,443			
595.00	7,713	15,070			
595.10	7,713	15,693			
595.20	7,713	16,311			
595.30	7,713	16,926			
595.40	7,713	17,535			
595.50	7,713	18,140			
595.60	7,713	18,740			
595.70	7,713	19,335			
595.80	7,713	19,923			
595.90	7,713	20,506			
596.00	7,713	21,083			
596.10	7,713	21,654			
596.20	7,713	22,217			
596.30	7,713	22,774			
596.40	7,713	23,323			
596.50	7,713	23,864			
596.60	7,713	24,397			
596.70	7,713	24,921			
596.80	7,713	25,436			
596.90	7,713	25,940			
597.00	7,713	26,434			
597.10	7,713	26,916			
597.20	7,713	27,385			
597.30	7,713	27,839			
597.40	7,713	28,277			
597.50	7,713	28,694			

Summary for Pond UIP-2: UIP-2

Inflow Area = 2.21 ac, 79.75% Impervious, Inflow Depth = 3.40" for 25-year event
Inflow = 12.8 cfs @ 11.96 hrs, Volume= 0.6 af
Outflow = 6.2 cfs @ 12.05 hrs, Volume= 0.6 af, Atten= 52%, Lag= 5.4 min
Discarded = 0.0 cfs @ 7.35 hrs, Volume= 0.2 af
Primary = 6.2 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= 587.84' @ 12.05 hrs Surf.Area= 3,594 sf Storage= 12,489 cf
Plug-Flow detention time= 543.7 min calculated for 0.6 af (100% of inflow)
Center-of-Mass det. time= 543.6 min (1,330.6 - 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'	24.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 583.00' / 582.80' S= 0.0100 1' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	585.50'	4.0" W x 24.0" 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 @ 7.35 hrs HW=583.07' (Free Discharge)
4=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=6.0 cfs @ 12.05 hrs HW=587.83' TW=0.00' (Dynamic Tailwater)
1=Culvert (Passes 6.0 cfs of 29.6 cfs potential flow)
2=Orifice/Grate (Orifice Controls 3.6 cfs @ 5.40 fps)
3=Sharp-Crested Rectangular Weir (Weir Controls 2.4 cfs @ 1.87 fps)

Pond UIP-2: UIP-2 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-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 + 9.0" Spacing = 109.0" C-C Row Spacing

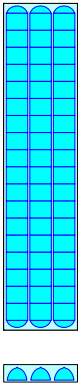
18 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 124.12' Row Length +12.0" End Stone x 2 =
126.12' Base Length
3 Rows x 100.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width
9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

54 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 3 Rows = 9,734.3 cf Chamber Storage

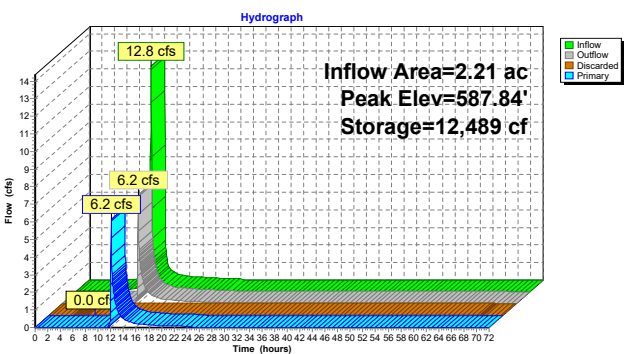
24,261.7 cf Field - 9,734.3 cf Chambers = 14,527.4 cf Stone x 40.0% Voids = 5,811.0 cf Stone Storage

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



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 Pond UIP-3: UIP-3

Inflow Area = 2.51 ac, 78.61% Impervious, Inflow Depth = 3.61" for 25-year event
Inflow = 15.1 cfs @ 11.96 hrs, Volume= 0.8 af
Outflow = 12.3 cfs @ 12.01 hrs, Volume= 0.7 af, Atten= 19%, Lag= 3.1 min
Discarded = 0.0 cfs @ 6.33 hrs, Volume= 0.2 af
Primary = 12.2 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= 597.17' @ 12.00 hrs Surf.Area= 3,724 sf Storage= 12,949 cf
Plug-Flow detention time= 553.4 min calculated for 0.7 af (97% of inflow)
Center-of-Mass det. time= 538.3 min (1,316.2 - 777.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	592.30'	6,065 cf	55.75'W x 66.79'L x 6.75'H Field A 25,135 cf Overall - 9,971 cf Embedded = 15,163 cf x 40.0% Voids 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 6 Rows Cap Storage= 39.5 cf x 2 x 6 rows = 474.0 cf
#2A	593.05'	9,971 cf	
		16,037 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	592.30'	0.500 in/hr Exfiltration over Surface area
#2	Primary	592.30'	15.0" Round Culvert L= 10.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 592.30' / 592.00' S= 0.0300 /' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	596.30'	4.0" long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Device 2	595.30'	6.0" W x 12.0" H Vert. Orifice C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.0 cfs @ 6.33 hrs HW=592.37' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=12.2 cfs @ 12.01 hrs HW=597.16' TW=0.00' (Dynamic Tailwater)
2=Culvert (Inlet Controls 12.2 cfs @ 9.90 fps)
3=Sharp-Crested Rectangular Weir (Passes < 9.9 cfs potential flow)
4=Orifice (Passes < 2.8 cfs potential flow)

Pond UIP-3: UIP-3 - Chamber Wizard Field A

Chamber Model = ADS StormTechMC-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 6 rows = 474.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

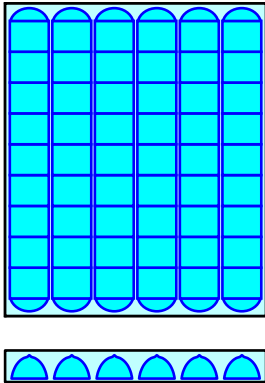
9 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 64.79' Row Length +12.0" End Stone x 2 = 66.79' Base Length
6 Rows x 100.0" Wide + 9.0" Spacing x 5 + 12.0" Side Stone x 2 = 55.75' Base Width
9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

54 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 6 Rows = 9,971.3 cf Chamber Storage

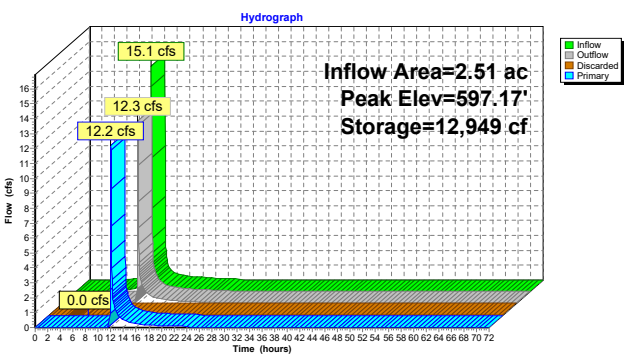
25,134.5 cf Field - 9,971.3 cf Chambers = 15,163.3 cf Stone x 40.0% Voids = 6,065.3 cf Stone Storage

Chamber Storage + Stone Storage = 16,036.6 cf = 0.4 af
Overall Storage Efficiency = 63.8%
Overall System Size = 66.79' x 55.75' x 6.75'

54 Chambers
930.9 cy Field
561.6 cy Stone



Pond UIP-3: UIP-3



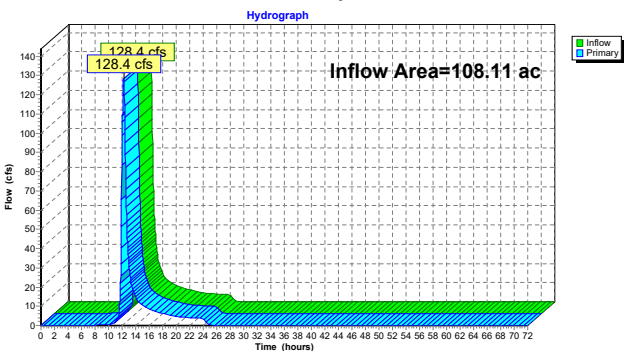
Stage-Area-Storage for Pond UIP-3: UIP-3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
592.30	3,724	0	597.60	3,724	13,821
592.40	3,724	149	597.70	3,724	13,993
592.50	3,724	298	597.80	3,724	14,157
592.60	3,724	447	597.90	3,724	14,317
592.70	3,724	596	598.00	3,724	14,472
592.80	3,724	745	598.10	3,724	14,622
592.90	3,724	894	598.20	3,724	14,771
593.00	3,724	1,043	598.30	3,724	14,919
593.10	3,724	1,277	598.40	3,724	15,068
593.20	3,724	1,595	598.50	3,724	15,217
593.30	3,724	1,913	598.60	3,724	15,366
593.40	3,724	2,230	598.70	3,724	15,515
593.50	3,724	2,547	598.80	3,724	15,664
593.60	3,724	2,862	598.90	3,724	15,813
593.70	3,724	3,177	599.00	3,724	15,962
593.80	3,724	3,491			
593.90	3,724	3,804			
594.00	3,724	4,115			
594.10	3,724	4,426			
594.20	3,724	4,735			
594.30	3,724	5,043			
594.40	3,724	5,350			
594.50	3,724	5,656			
594.60	3,724	5,959			
594.70	3,724	6,262			
594.80	3,724	6,563			
594.90	3,724	6,862			
595.00	3,724	7,159			
595.10	3,724	7,454			
595.20	3,724	7,748			
595.30	3,724	8,039			
595.40	3,724	8,328			
595.50	3,724	8,615			
595.60	3,724	8,900			
595.70	3,724	9,181			
595.80	3,724	9,461			
595.90	3,724	9,738			
596.00	3,724	10,011			
596.10	3,724	10,282			
596.20	3,724	10,550			
596.30	3,724	10,815			
596.40	3,724	11,075			
596.50	3,724	11,333			
596.60	3,724	11,586			
596.70	3,724	11,836			
596.80	3,724	12,080			
596.90	3,724	12,320			
597.00	3,724	12,556			
597.10	3,724	12,785			
597.20	3,724	13,009			
597.30	3,724	13,226			
597.40	3,724	13,435			
597.50	3,724	13,634			

Summary for Link DP-1: Brickyard Pond

Inflow Area = 108.11 ac, 7.01% Impervious, Inflow Depth = 1.73" for 25-year event
Inflow = 128.4 cfs @ 12.24 hrs, Volume= 15.6 af
Primary = 128.4 cfs @ 12.24 hrs, Volume= 15.6 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=2.51 ac 78.61% Impervious Runoff Depth=4.35" Tc=5.0 min CN=93 Runoff=18.0 cfs 0.9 af
Subcatchment PR-2: Subcat PR-2	Runoff Area=2.21 ac 79.75% Impervious Runoff Depth=4.13" Tc=5.0 min CN=91 Runoff=15.4 cfs 0.8 af
Subcatchment PR-3: Subcat PR-3	Runoff Area=4.26 ac 78.36% Impervious Runoff Depth=4.24" Tc=5.0 min CN=92 Runoff=30.1 cfs 1.5 af
Subcatchment PR-4: Subcat PR-4	Runoff Area=0.58 ac 50.57% Impervious Runoff Depth=3.21" Tc=5.0 min CN=82 Runoff=3.3 cfs 0.2 af
Subcatchment PR-5: Subcat PR-5	Runoff Area=9.65 ac 1.30% Impervious Runoff Depth=3.41" Tc=5.0 min CN=84 Runoff=58.5 cfs 2.7 af
Subcatchment PR-6: Subcat PR-6	Runoff Area=63.07 ac 0.08% Impervious Runoff Depth=2.15" Flow Length=3,025' Tc=32.8 min CN=70 Runoff=107.7 cfs 11.3 af
Subcatchment PR-7: Subcat PR-7	Runoff Area=24.25 ac 0.20% Impervious Runoff Depth=2.15" Flow Length=1,740' Tc=23.6 min CN=70 Runoff=51.5 cfs 4.3 af
Subcatchment PR-8: Subcat PR-8	Runoff Area=1.59 ac 0.00% Impervious Runoff Depth=2.31" Flow Length=410' Tc=11.6 min CN=72 Runoff=5.3 cfs 0.3 af
Reach 1R: 30" Pipe	Avg. Flow Depth=1.61' Max Vel=15.38 fps Inflow=51.5 cfs 4.3 af 30.0" Round Pipe n=0.013 L=270.0' S=0.0281' Capacity=68.8 cfs Outflow=51.5 cfs 4.3 af
Reach 2R: South Culvert	Avg. Flow Depth=0.93' Max Vel=11.21 fps Inflow=83.7 cfs 7.4 af 96.0" x 108.0" Box Pipe n=0.011 L=50.0' S=0.0100' Capacity=1,604.0 cfs Outflow=83.7 cfs 7.4 af
Reach 3R: North Culvert	Avg. Flow Depth=0.11' Max Vel=5.87 fps Inflow=5.3 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=596.60' Storage=3,682 cf Inflow=3.3 cfs 0.2 af Discarded=0.0 cfs 0.1 af Primary=0.2 cfs 0.0 af Outflow=0.2 cfs 0.2 af
Pond UIP-1: UIP-1	Peak Elev=598.10' Storage=30,743 cf Inflow=30.1 cfs 1.5 af Discarded=0.1 cfs 0.5 af Primary=18.4 cfs 0.9 af Outflow=18.5 cfs 1.4 af
Pond UIP-2: UIP-2	Peak Elev=588.25' Storage=13,318 cf Inflow=15.4 cfs 0.8 af Discarded=0.0 cfs 0.2 af Primary=12.4 cfs 0.5 af Outflow=12.4 cfs 0.8 af
Pond UIP-3: UIP-3	Peak Elev=597.78' Storage=14,124 cf Inflow=18.0 cfs 0.9 af Discarded=0.0 cfs 0.2 af Primary=13.0 cfs 0.6 af Outflow=13.1 cfs 0.9 af
Link DP-1: Brickyard Pond	Inflow=173.4 cfs 20.8 af Primary=173.4 cfs 20.8 af

Total Runoff Area = 108.11 ac Runoff Volume = 22.0 af Average Runoff Depth = 2.44"
92.99% Pervious = 100.53 ac 7.01% Impervious = 7.58 ac

Summary for Subcatchment PR-1: Subcat PR-1

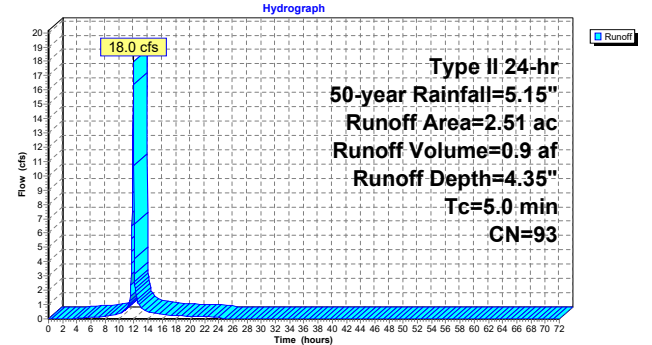
Runoff = 18.0 cfs @ 11.96 hrs, Volume= 0.9 af, Depth= 4.35"
Routed to Pond UIP-3 : UIP-3

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
0.54	74	>75% Grass cover, Good, HSG C
1.07	98	Paved parking, HSG C
0.90	98	Roofs, HSG C
0.00	70	Woods, Good, HSG C
2.51	93	Weighted Average
0.54		21.39% Pervious Area
1.97		78.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-1: Subcat PR-1



Summary for Subcatchment PR-2: Subcat PR-2

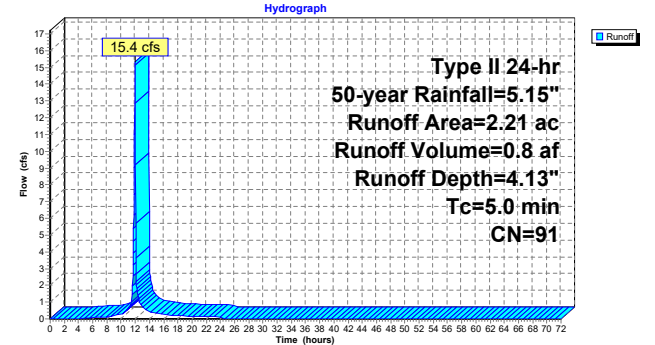
Runoff = 15.4 cfs @ 11.96 hrs, Volume= 0.8 af, Depth= 4.13"
Routed to Pond UIP-2 : UIP-2

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
0.45	61	>75% Grass cover, Good, HSG B
0.00	48	Brush, Good, HSG B
1.07	98	Paved parking, HSG B
0.69	98	Roofs, HSG B
2.21	91	Weighted Average
0.45		20.25% Pervious Area
1.76		79.75% 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



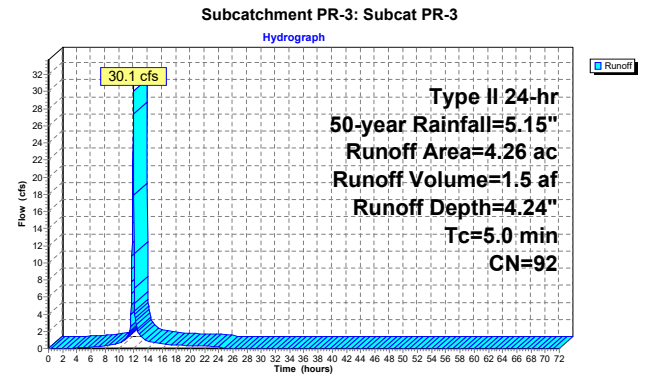
Summary for Subcatchment PR-3: Subcat PR-3

Runoff = 30.1 cfs @ 11.96 hrs, Volume= 1.5 af, Depth= 4.24"
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
0.10	61	>75% Grass cover, Good, HSG B
0.80	74	>75% Grass cover, Good, HSG C
0.29	98	Paved parking, HSG B
1.74	98	Paved parking, HSG C
0.43	98	Roofs, HSG B
0.87	98	Roofs, HSG C
0.00	55	Woods, Good, HSG B
0.02	70	Woods, Good, HSG C
4.26	92	Weighted Average
0.92		21.64% Pervious Area
3.33		78.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,



Summary for Subcatchment PR-4: Subcat PR-4

Runoff = 3.3 cfs @ 11.96 hrs, Volume= 0.2 af, Depth= 3.21"
Routed to Pond BP-1 : Bioretention Pond #1

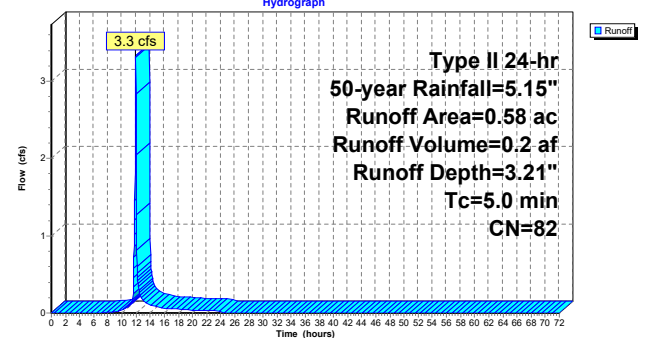
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type II 24-hr 50-year Rainfall=5.15"

Area (ac)	CN	Description
0.00	39	>75% Grass cover, Good, HSG A
0.20	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
0.01	98	Paved parking, HSG A
0.20	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
0.58	82	Weighted Average
0.29		49.43% Pervious Area
0.29		50.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,



Subcatchment PR-4: Subcat PR-4



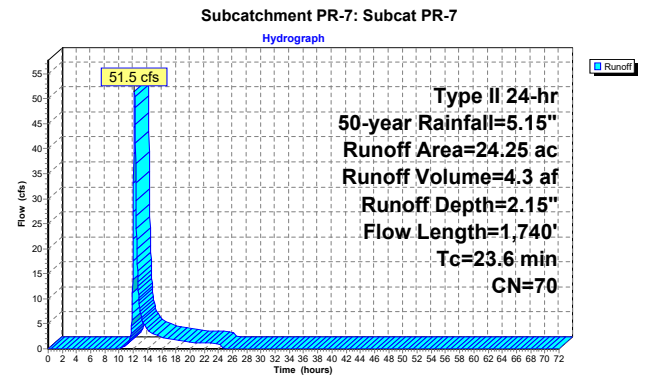
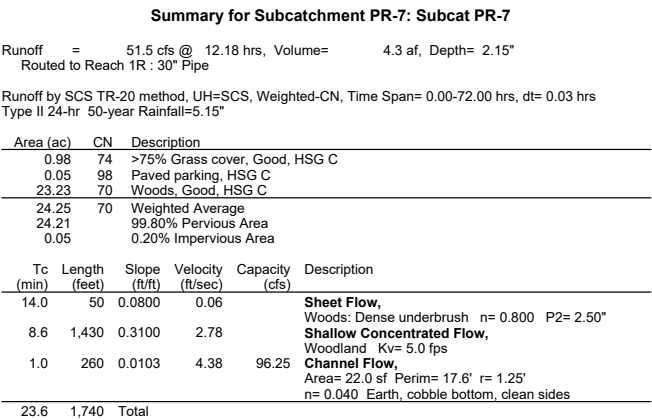
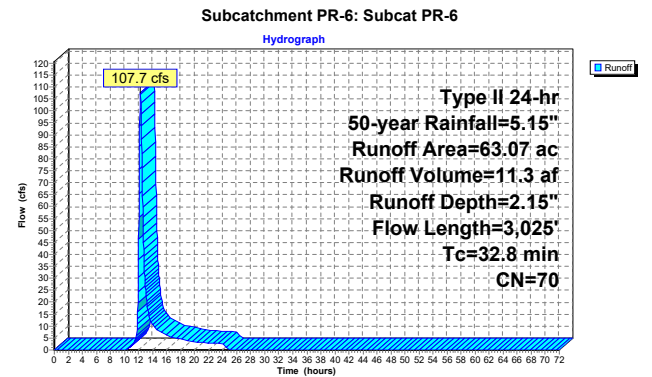
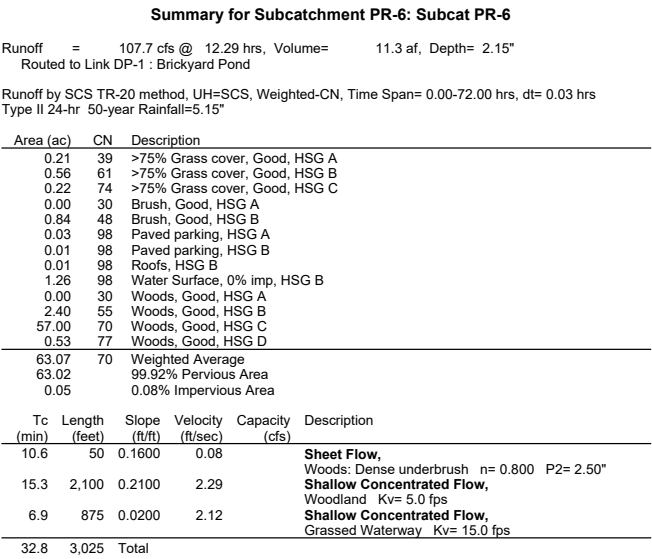
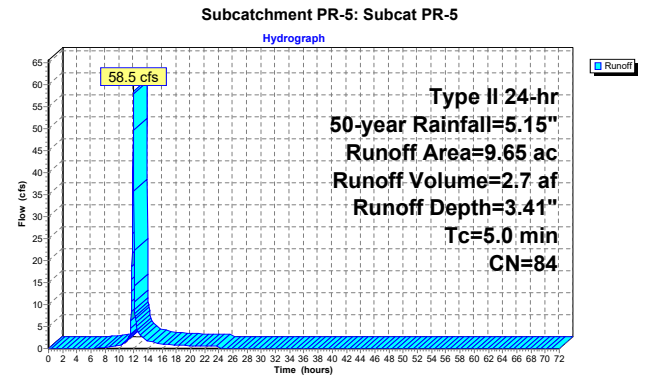
Summary for Subcatchment PR-5: Subcat PR-5

Runoff = 58.5 cfs @ 11.96 hrs, Volume= 2.7 af, Depth= 3.41"
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
1.24	61	>75% Grass cover, Good, HSG B
1.20	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
0.08	98	Paved parking, HSG B
0.05	98	Paved parking, 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
0.83	55	Woods, Good, HSG B
0.40	70	Woods, Good, HSG C
0.00	77	Woods, Good, HSG D
9.65	84	Weighted Average
9.52		98.70% Pervious Area
0.13		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,



Summary for Subcatchment PR-8: Subcat PR-8

Runoff = 5.3 cfs @ 12.04 hrs, Volume= 0.3 af, Depth= 2.31"

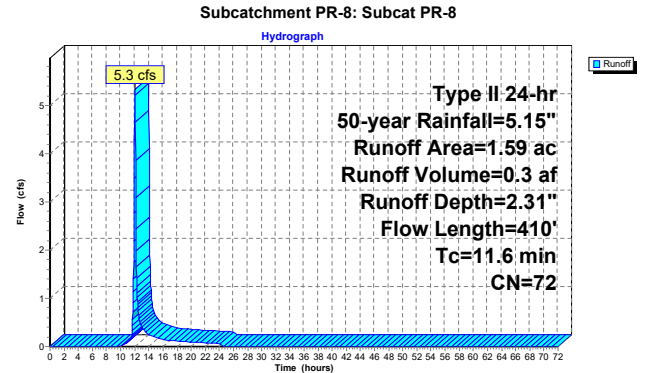
Routed to Reach 3R : North Culvert

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
0.03	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.02	48	Brush, Good, HSG B
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
1.33	70	Woods, Good, HSG C
1.59	72	Weighted Average
1.59		100.00% Pervious 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			



Summary for Reach 1R: 30" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 24.25 ac, 0.20% Impervious, Inflow Depth = 2.15" for 50-year event

Inflow = 51.5 cfs @ 12.18 hrs, Volume= 4.3 af

Outflow = 51.5 cfs @ 12.18 hrs, Volume= 4.3 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= 15.38 fps, Min. Travel Time= 0.3 min

Avg. Velocity = 5.95 fps, Avg. Travel Time= 0.8 min

Peak Storage= 904 cf @ 12.18 hrs

Average Depth at Peak Storage= 1.61' , Surface Width= 2.39'

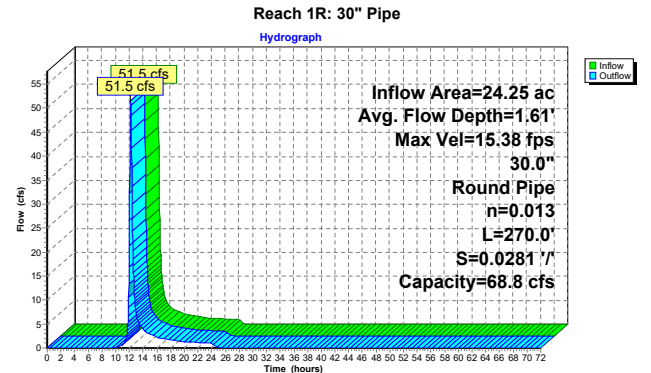
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 68.8 cfs

30.0" Round Pipe

n= 0.013

Length= 270.0' Slope= 0.0281 '/'

Inlet Invert= 590.60', Outlet Invert= 583.00'



Stage-Area-Storage for Reach 1R: 30" Pipe

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
590.60	0.0	0
590.65	0.0	6
590.70	0.1	18
590.75	0.1	32
590.80	0.2	50
590.85	0.3	69
590.90	0.3	90
590.95	0.4	113
591.00	0.5	137
591.05	0.6	162
591.10	0.7	189
591.15	0.8	216
591.20	0.9	245
591.25	1.0	274
591.30	1.1	304
591.35	1.2	334
591.40	1.4	366
591.45	1.5	397
591.50	1.6	430
591.55	1.7	462
591.60	1.8	495
591.65	2.0	528
591.70	2.1	562
591.75	2.2	595
591.80	2.3	629
591.85	2.5	663
591.90	2.6	696
591.95	2.7	730
592.00	2.8	764
592.05	3.0	797
592.10	3.1	830
592.15	3.2	863
592.20	3.3	896
592.25	3.4	928
592.30	3.6	960
592.35	3.7	991
592.40	3.8	1,022
592.45	3.9	1,052
592.50	4.0	1,081
592.55	4.1	1,109
592.60	4.2	1,137
592.65	4.3	1,163
592.70	4.4	1,188
592.75	4.5	1,213
592.80	4.6	1,235
592.85	4.7	1,256
592.90	4.7	1,276
592.95	4.8	1,293
593.00	4.8	1,308
593.05	4.9	1,319
593.10	4.9	1,325

Summary for Reach 2R: South Culvert

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 35.49 ac, 0.49% Impervious, Inflow Depth = 2.50" for 50-year event
Inflow = 83.7 cfs @ 11.98 hrs, Volume= 7.4 af
Outflow = 83.7 cfs @ 11.98 hrs, Volume= 7.4 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-1 : Brickyard Pond

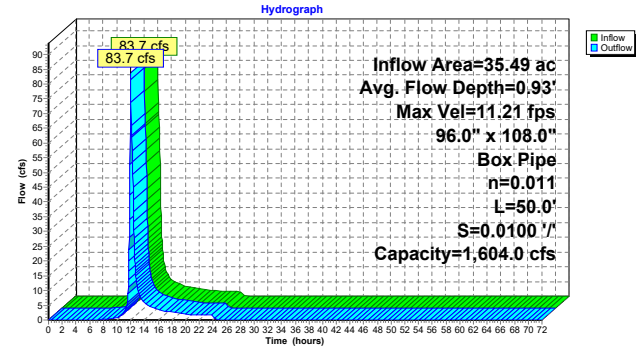
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 11.21 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.38 fps, Avg. Travel Time= 0.2 min

Peak Storage= 373 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.93', 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= 579.50', Outlet Invert= 579.00'



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)
579.50	0.0	0	584.80	42.4	2,120
579.60	0.8	40	584.90	43.2	2,160
579.70	1.6	80	585.00	44.0	2,200
579.80	2.4	120	585.10	44.8	2,240
579.90	3.2	160	585.20	45.6	2,280
580.00	4.0	200	585.30	46.4	2,320
580.10	4.8	240	585.40	47.2	2,360
580.20	5.6	280	585.50	48.0	2,400
580.30	6.4	320	585.60	48.8	2,440
580.40	7.2	360	585.70	49.6	2,480
580.50	8.0	400	585.80	50.4	2,520
580.60	8.8	440	585.90	51.2	2,560
580.70	9.6	480	586.00	52.0	2,600
580.80	10.4	520	586.10	52.8	2,640
580.90	11.2	560	586.20	53.6	2,680
581.00	12.0	600	586.30	54.4	2,720
581.10	12.8	640	586.40	55.2	2,760
581.20	13.6	680	586.50	56.0	2,800
581.30	14.4	720	586.60	56.8	2,840
581.40	15.2	760	586.70	57.6	2,880
581.50	16.0	800	586.80	58.4	2,920
581.60	16.8	840	586.90	59.2	2,960
581.70	17.6	880	587.00	60.0	3,000
581.80	18.4	920	587.10	60.8	3,040
581.90	19.2	960	587.20	61.6	3,080
582.00	20.0	1,000	587.30	62.4	3,120
582.10	20.8	1,040	587.40	63.2	3,160
582.20	21.6	1,080	587.50	64.0	3,200
582.30	22.4	1,120	587.60	64.8	3,240
582.40	23.2	1,160	587.70	65.6	3,280
582.50	24.0	1,200	587.80	66.4	3,320
582.60	24.8	1,240	587.90	67.2	3,360
582.70	25.6	1,280	588.00	68.0	3,400
582.80	26.4	1,320	588.10	68.8	3,440
582.90	27.2	1,360	588.20	69.6	3,480
583.00	28.0	1,400	588.30	70.4	3,520
583.10	28.8	1,440	588.40	71.2	3,560
583.20	29.6	1,480	588.50	72.0	3,600
583.30	30.4	1,520			
583.40	31.2	1,560			
583.50	32.0	1,600			
583.60	32.8	1,640			
583.70	33.6	1,680			
583.80	34.4	1,720			
583.90	35.2	1,760			
584.00	36.0	1,800			
584.10	36.8	1,840			
584.20	37.6	1,880			
584.30	38.4	1,920			
584.40	39.2	1,960			
584.50	40.0	2,000			
584.60	40.8	2,040			
584.70	41.6	2,080			

Summary for Reach 3R: North Culvert

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.59 ac, 0.00% Impervious, Inflow Depth = 2.31" for 50-year event
Inflow = 5.3 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

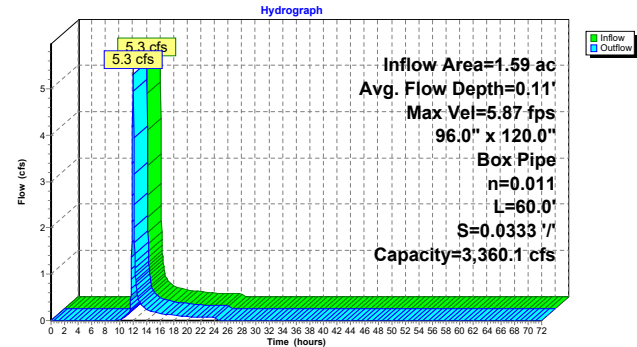
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 5.87 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 5.23 fps, Avg. Travel Time= 0.2 min

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 = 0.58 ac, 50.57% Impervious, Inflow Depth = 3.21" for 50-year event
Inflow = 3.3 cfs @ 11.96 hrs, Volume= 0.2 af
Outflow = 0.2 cfs @ 12.57 hrs, Volume= 0.2 af, Atten= 93%, Lag= 36.4 min
Discarded = 0.0 cfs @ 12.57 hrs, Volume= 0.1 af
Primary = 0.2 cfs @ 12.57 hrs, Volume= 0.0 af
Routed to Link DP-1 : Brickyard Pond

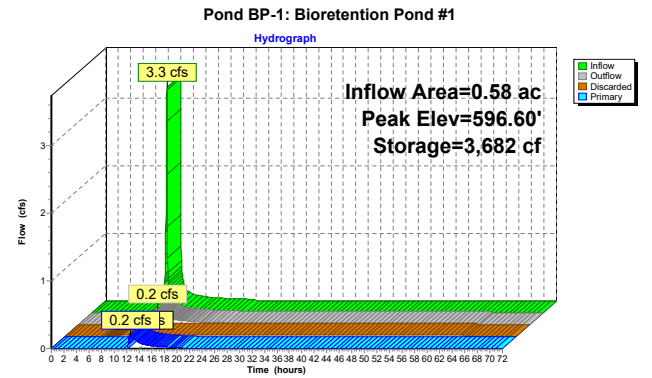
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 596.60' @ 12.57 hrs Surf.Area= 2,592 sf Storage= 3,682 cf

Plug-Flow detention time= 948.8 min calculated for 0.2 af (100% of inflow)
Center-of-Mass det. time= 949.4 min (1,760.5 - 811.1)

Volume	Invert	Avail. Storage	Storage Description			
#1	593.50'	11,782 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	1,720	169.6	0.0	0	0	1,720
595.00	1,720	169.6	10.0	258	258	1,974
598.00	3,501	226.2	100.0	7,675	7,933	3,853
599.00	4,208	245.6	100.0	3,849	11,782	4,619
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=0.0 cfs @ 12.57 hrs HW=596.60' (Free Discharge)
4=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.2 cfs @ 12.57 hrs HW=596.60' TW=0.00' (Dynamic Tailwater)
1=Culvert (Passes 0.2 cfs of 7.1 cfs potential flow)
2=Orifice (Orifice Controls 0.2 cfs @ 1.01 fps)
3=Grate (Controls 0.0 cfs)



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	1,720	0	598.80	4,061	10,955
593.60	1,720	17	598.90	4,134	11,365
593.70	1,720	34	599.00	4,208	11,782
593.80	1,720	52			
593.90	1,720	69			
594.00	1,720	86			
594.10	1,720	103			
594.20	1,720	120			
594.30	1,720	138			
594.40	1,720	155			
594.50	1,720	172			
594.60	1,720	189			
594.70	1,720	206			
594.80	1,720	224			
594.90	1,720	241			
595.00	1,720	258			
595.10	1,769	432			
595.20	1,819	612			
595.30	1,870	796			
595.40	1,921	986			
595.50	1,973	1,181			
595.60	2,026	1,381			
595.70	2,080	1,586			
595.80	2,134	1,797			
595.90	2,189	2,013			
596.00	2,244	2,234			
596.10	2,300	2,461			
596.20	2,357	2,694			
596.30	2,415	2,933			
596.40	2,473	3,177			
596.50	2,532	3,428			
596.60	2,592	3,684			
596.70	2,652	3,946			
596.80	2,713	4,214			
596.90	2,775	4,489			
597.00	2,838	4,769			
597.10	2,901	5,056			
597.20	2,965	5,350			
597.30	3,029	5,649			
597.40	3,095	5,955			
597.50	3,161	6,268			
597.60	3,227	6,588			
597.70	3,295	6,914			
597.80	3,363	7,247			
597.90	3,432	7,586			
598.00	3,501	7,933			
598.10	3,569	8,286			
598.20	3,637	8,647			
598.30	3,706	9,014			
598.40	3,776	9,388			
598.50	3,846	9,769			
598.60	3,917	10,157			
598.70	3,989	10,553			

Summary for Pond UIP-1: UIP-1

Inflow Area = 4.26 ac, 78.36% Impervious, Inflow Depth = 4.24" for 50-year event

Inflow = 30.1 cfs @ 11.96 hrs, Volume= 1.5 af

Outflow = 18.5 cfs @ 12.03 hrs, Volume= 1.4 af, Atten= 38%, Lag= 4.6 min

Discarded = 0.1 cfs @ 6.30 hrs, Volume= 0.5 af

Primary = 18.4 cfs @ 12.03 hrs, Volume= 0.9 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= 598.10' @ 12.03 hrs Surf.Area= 7,713 sf Storage= 30,743 cf

Plug-Flow detention time= 659.5 min calculated for 1.4 af (90% of inflow)

Center-of-Mass det. time= 608.6 min (1,386.1 - 777.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	592.30'	12,256 cf	37.58'W x 205.22'L x 6.75'H Field A
			52,061 cf Overall - 21,421 cf Embedded = 30,640 cf x 40.0% Voids
#2A	593.05'	21,421 cf	ADS_StormTech MC-7200 +Cap x 120 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
			120 Chambers in 4 Rows
			Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf
		33,677 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 'H' 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 Contraction(s)
#3	Discarded	592.30'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.01'
#4	Device 1	596.05'	12.0" W x 15.0" H Vert. Orifice C= 0.600
			Limited to weir flow at low heads

Discarded OutFlow Max=0.1 cfs @ 6.30 hrs HW=592.37' (Free Discharge)

3=Exfiltration (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=18.1 cfs @ 12.03 hrs HW=598.08' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 18.1 cfs of 28.6 cfs potential flow)

2=Sharp-Crested Rectangular Weir (Weir Controls 11.0 cfs @ 2.90 fps)

4=Orifice (Orifice Controls 7.1 cfs @ 5.67 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 4 rows = 316.0 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

4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width

9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

120 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 4 Rows = 21,421.1 cf Chamber Storage

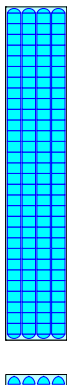
52,060.9 cf Field - 21,421.1 cf Chambers = 30,639.8 cf Stone x 40.0% Voids = 12,255.9 cf Stone Storage

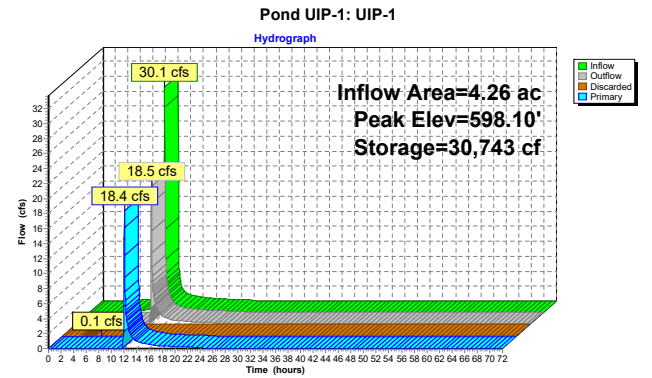
Chamber Storage + Stone Storage = 33,677.0 cf = 0.8 af

Overall Storage Efficiency = 64.7%

Overall System Size = 205.22' x 37.58' x 6.75'

120 Chambers
1,928.2 cy Field
1,134.8 cy Stone





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	7,713	0	597.60	7,713	29,083
592.40	7,713	309	597.70	7,713	29,442
592.50	7,713	617	597.80	7,713	29,783
592.60	7,713	926	597.90	7,713	30,115
592.70	7,713	1,234	598.00	7,713	30,436
592.80	7,713	1,543	598.10	7,713	30,746
592.90	7,713	1,851	598.20	7,713	31,055
593.00	7,713	2,160	598.30	7,713	31,363
593.10	7,713	2,651	598.40	7,713	31,672
593.20	7,713	3,324	598.50	7,713	31,980
593.30	7,713	3,996	598.60	7,713	32,289
593.40	7,713	4,665	598.70	7,713	32,597
593.50	7,713	5,334	598.80	7,713	32,906
593.60	7,713	6,000	598.90	7,713	33,214
593.70	7,713	6,665	599.00	7,713	33,523
593.80	7,713	7,327			
593.90	7,713	7,988			
594.00	7,713	8,646			
594.10	7,713	9,302			
594.20	7,713	9,955			
594.30	7,713	10,605			
594.40	7,713	11,253			
594.50	7,713	11,897			
594.60	7,713	12,539			
594.70	7,713	13,177			
594.80	7,713	13,812			
594.90	7,713	14,443			
595.00	7,713	15,070			
595.10	7,713	15,693			
595.20	7,713	16,311			
595.30	7,713	16,926			
595.40	7,713	17,535			
595.50	7,713	18,140			
595.60	7,713	18,740			
595.70	7,713	19,335			
595.80	7,713	19,923			
595.90	7,713	20,506			
596.00	7,713	21,083			
596.10	7,713	21,654			
596.20	7,713	22,217			
596.30	7,713	22,774			
596.40	7,713	23,323			
596.50	7,713	23,864			
596.60	7,713	24,397			
596.70	7,713	24,921			
596.80	7,713	25,436			
596.90	7,713	25,940			
597.00	7,713	26,434			
597.10	7,713	26,916			
597.20	7,713	27,385			
597.30	7,713	27,839			
597.40	7,713	28,277			
597.50	7,713	28,694			

Summary for Pond UIP-2: UIP-2

Inflow Area = 2.21 ac, 79.75% Impervious, Inflow Depth = 4.13" for 50-year event
Inflow = 15.4 cfs @ 11.96 hrs, Volume= 0.8 af
Outflow = 12.4 cfs @ 12.01 hrs, Volume= 0.8 af, Atten= 19%, Lag= 3.1 min
Discarded = 0.0 cfs @ 6.48 hrs, Volume= 0.2 af
Primary = 12.4 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= 588.25' @ 12.01 hrs Surf.Area= 3,594 sf Storage= 13,318 cf
Plug-Flow detention time= 457.8 min calculated for 0.8 af (100% of inflow)
Center-of-Mass det. time= 458.8 min (1,240.4 - 781.7)

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

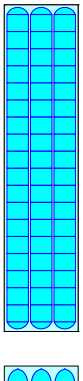
Storage Group A created with Chamber Wizard

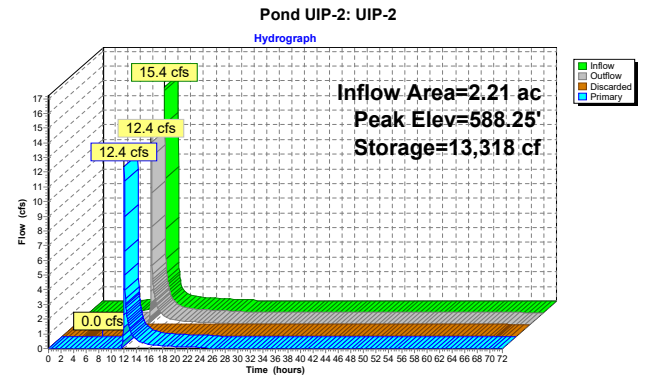
Device	Routing	Invert	Outlet Devices
#1	Primary	583.00'	24.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 583.00' / 582.80' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	585.50'	4.0" W x 24.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow 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 @ 6.48 hrs HW=583.07' (Free Discharge)
4=Exfiltration (Exfiltration Controls 0.0 cfs)
Primary OutFlow Max=12.0 cfs @ 12.01 hrs HW=588.23' TW=0.00' (Dynamic Tailwater)
1=Culvert (Passes 12.0 cfs of 31.1 cfs potential flow)
2=Orifice/Grate (Orifice Controls 4.2 cfs @ 6.23 fps)
3=Sharp-Crested Rectangular Weir (Weir Controls 7.8 cfs @ 2.79 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 + 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 + 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 of Chamber Storage
24,261.7 cf of Field - 9,734.3 cf Chambers = 14,527.4 cf of Stone x 40.0% Voids = 5,811.0 cf of 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





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 Pond UIP-3: UIP-3
Inflow Area = 2.51 ac, 78.61% Impervious, Inflow Depth = 4.35" for 50-year event
Inflow = 18.0 cfs @ 11.96 hrs, Volume= 0.9 af
Outflow = 13.1 cfs @ 12.01 hrs, Volume= 0.9 af, Atten= 27%, Lag= 3.4 min
Discarded = 0.0 cfs @ 5.55 hrs, Volume= 0.2 af
Primary = 13.0 cfs @ 12.01 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= 597.78' @ 12.01 hrs Surf.Area= 3,724 sf Storage= 14,124 cf

Plug-Flow detention time= 467.5 min calculated for 0.9 af (98% of inflow)
Center-of-Mass det. time= 453.5 min (1,226.5 - 773.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	592.30'	6,065 cf	55.75'W x 66.79'L x 6.75'H Field A
			25,135 cf Overall - 9,971 cf Embedded = 15,163 cf x 40.0% Voids
#2A	593.05'	9,971 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 6 Rows
			Cap Storage= 39.5 cf x 2 x 6 rows = 474.0 cf
		16,037 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	592.30'	0.500 in/hr Exfiltration over Surface area
#2	Primary	592.30'	15.0" Round Culvert
			L= 10.0' CMP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 592.30' / 592.00' S= 0.0300 ' Cc= 0.900
			n= 0.013, Flow Area= 1.23 sf
#3	Device 2	596.30'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Device 2	595.30'	6.0" W x 12.0" H Vert. Orifice C= 0.600
			Limited to weir flow at low heads

Discarded OutFlow Max=0.0 cfs @ 5.55 hrs HW=592.37' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.0 cfs)
Primary OutFlow Max=13.0 cfs @ 12.01 hrs HW=597.75' TW=0.00' (Dynamic Tailwater)
2=Culvert (Inlet Controls 13.0 cfs @ 10.58 fps)
3=Sharp-Crested Rectangular Weir (Passes < 21.2 cfs potential flow)
4=Orifice (Passes < 3.4 cfs potential flow)

Pond UIP-3: UIP-3 - 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 6 rows = 474.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

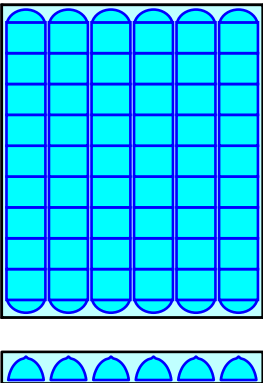
9 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 64.79' Row Length +12.0" End Stone x 2 = 66.79' Base Length
6 Rows x 100.0" Wide + 9.0" Spacing x 5 + 12.0" Side Stone x 2 = 55.75' Base Width
9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

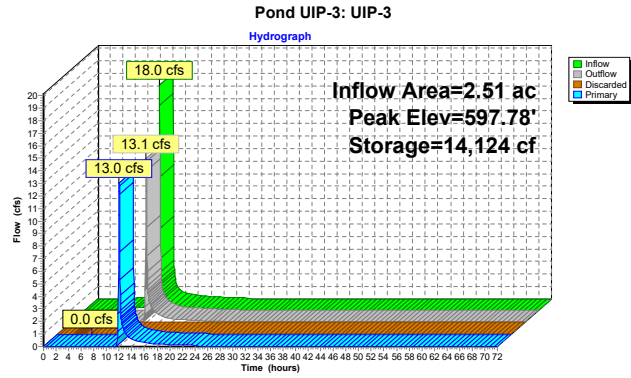
54 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 6 Rows = 9,971.3 cf of Chamber Storage

25,134.5 cf of Field - 9,971.3 cf Chambers = 15,163.3 cf of Stone x 40.0% Voids = 6,065.3 cf of Stone Storage

Chamber Storage + Stone Storage = 16,036.6 cf = 0.4 af
Overall Storage Efficiency = 63.8%
Overall System Size = 66.79' x 55.75' x 6.75'

54 Chambers
930.9 cy Field
561.6 cy Stone





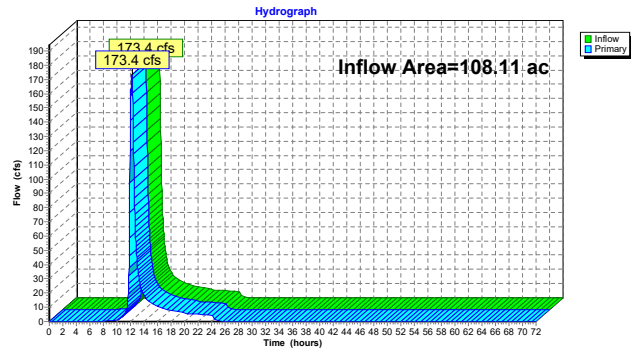
Stage-Area-Storage for Pond UIP-3: UIP-3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
592.30	3,724	0	597.60	3,724	13,821
592.40	3,724	149	597.70	3,724	13,993
592.50	3,724	298	597.80	3,724	14,157
592.60	3,724	447	597.90	3,724	14,317
592.70	3,724	596	598.00	3,724	14,472
592.80	3,724	745	598.10	3,724	14,622
592.90	3,724	894	598.20	3,724	14,771
593.00	3,724	1,043	598.30	3,724	14,919
593.10	3,724	1,192	598.40	3,724	15,068
593.20	3,724	1,341	598.50	3,724	15,217
593.30	3,724	1,490	598.60	3,724	15,366
593.40	3,724	1,639	598.70	3,724	15,515
593.50	3,724	1,788	598.80	3,724	15,664
593.60	3,724	1,937	598.90	3,724	15,813
593.70	3,724	2,086	599.00	3,724	15,962
593.80	3,724	2,235			
593.90	3,724	2,384			
594.00	3,724	2,533			
594.10	3,724	2,682			
594.20	3,724	2,831			
594.30	3,724	2,980			
594.40	3,724	3,129			
594.50	3,724	3,278			
594.60	3,724	3,427			
594.70	3,724	3,576			
594.80	3,724	3,725			
594.90	3,724	3,874			
595.00	3,724	4,023			
595.10	3,724	4,172			
595.20	3,724	4,321			
595.30	3,724	4,470			
595.40	3,724	4,619			
595.50	3,724	4,768			
595.60	3,724	4,917			
595.70	3,724	5,066			
595.80	3,724	5,215			
595.90	3,724	5,364			
596.00	3,724	5,513			
596.10	3,724	5,662			
596.20	3,724	5,811			
596.30	3,724	5,960			
596.40	3,724	6,109			
596.50	3,724	6,258			
596.60	3,724	6,407			
596.70	3,724	6,556			
596.80	3,724	6,705			
596.90	3,724	6,854			
597.00	3,724	7,003			
597.10	3,724	7,152			
597.20	3,724	7,301			
597.30	3,724	7,450			
597.40	3,724	7,599			
597.50	3,724	7,748			

Summary for Link DP-1: Brickyard Pond

Inflow Area = 108.11 ac, 7.01% Impervious, Inflow Depth = 2.30" for 50-year event
Inflow = 173.4 cfs @ 12.23 hrs, Volume= 20.8 af
Primary = 173.4 cfs @ 12.23 hrs, Volume= 20.8 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=2.51 ac 78.61% Impervious Runoff Depth=5.21" Tc=5.0 min CN=93 Runoff=21.3 cfs 1.1 af
Subcatchment PR-2: Subcat PR-2	Runoff Area=2.21 ac 79.75% Impervious Runoff Depth=4.99" Tc=5.0 min CN=91 Runoff=18.3 cfs 0.9 af
Subcatchment PR-3: Subcat PR-3	Runoff Area=4.26 ac 78.36% Impervious Runoff Depth=5.10" Tc=5.0 min CN=92 Runoff=35.8 cfs 1.8 af
Subcatchment PR-4: Subcat PR-4	Runoff Area=0.58 ac 50.57% Impervious Runoff Depth=4.01" Tc=5.0 min CN=82 Runoff=4.1 cfs 0.2 af
Subcatchment PR-5: Subcat PR-5	Runoff Area=9.65 ac 1.30% Impervious Runoff Depth=4.22" Tc=5.0 min CN=84 Runoff=71.7 cfs 3.4 af
Subcatchment PR-6: Subcat PR-6	Runoff Area=63.07 ac 0.08% Impervious Runoff Depth=2.83" Flow Length=3,025' Tc=32.8 min CN=70 Runoff=144.0 cfs 14.9 af
Subcatchment PR-7: Subcat PR-7	Runoff Area=24.25 ac 0.20% Impervious Runoff Depth=2.83" Flow Length=1,740' Tc=23.6 min CN=70 Runoff=68.6 cfs 5.7 af
Subcatchment PR-8: Subcat PR-8	Runoff Area=1.59 ac 0.00% Impervious Runoff Depth=3.02" Flow Length=410' Tc=11.6 min CN=72 Runoff=7.0 cfs 0.4 af
Reach 1R: 30" Pipe	Avg. Flow Depth=2.04' Max Vel=15.98 fps Inflow=68.6 cfs 5.7 af 30.0' Round Pipe n=0.013 L=270.0' S=0.0281' Capacity=68.6 cfs Outflow=68.6 cfs 5.7 af
Reach 2R: South Culvert	Avg. Flow Depth=1.09' Max Vel=12.19 fps Inflow=106.9 cfs 9.5 af 96.0' x 108.0' Box Pipe n=0.011 L=50.0' S=0.0100' Capacity=1,604.0 cfs Outflow=106.9 cfs 9.5 af
Reach 3R: North Culvert	Avg. Flow Depth=0.13' Max Vel=6.63 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=596.74' Storage=4,063 cf Inflow=4.1 cfs 0.2 af Discarded=0.0 cfs 0.1 af Primary=0.8 cfs 0.1 af Outflow=0.8 cfs 0.2 af
Pond UIP-1: UIP-1	Peak Elev=598.59' Storage=32,250 cf Inflow=35.8 cfs 1.8 af Discarded=0.1 cfs 0.5 af Primary=30.1 cfs 1.2 af Outflow=30.2 cfs 1.7 af
Pond UIP-2: UIP-2	Peak Elev=588.52' Storage=13,756 cf Inflow=18.3 cfs 0.9 af Discarded=0.0 cfs 0.2 af Primary=17.2 cfs 0.7 af Outflow=17.3 cfs 0.9 af
Pond UIP-3: UIP-3	Peak Elev=598.75' Storage=15,585 cf Inflow=21.3 cfs 1.1 af Discarded=0.0 cfs 0.2 af Primary=14.3 cfs 0.8 af Outflow=14.3 cfs 1.1 af
Link DP-1: Brickyard Pond	Inflow=229.8 cfs 27.1 af Primary=229.8 cfs 27.1 af

Total Runoff Area = 108.11 ac Runoff Volume = 28.4 af Average Runoff Depth = 3.15"
92.99% Pervious = 100.53 ac 7.01% Impervious = 7.58 ac

Summary for Subcatchment PR-1: Subcat PR-1

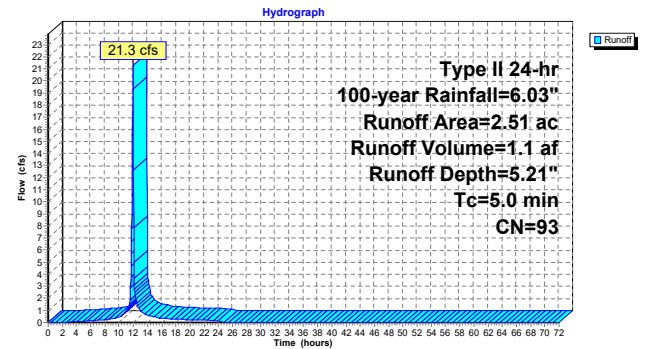
Runoff = 21.3 cfs @ 11.96 hrs, Volume= 1.1 af, Depth= 5.21"
Routed to Pond UIP-3 : UIP-3

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
0.54	74	>75% Grass cover, Good, HSG C
1.07	98	Paved parking, HSG C
0.90	98	Roofs, HSG C
0.00	70	Woods, Good, HSG C
2.51	93	Weighted Average
0.54		21.39% Pervious Area
1.97		78.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-1: Subcat PR-1



Summary for Subcatchment PR-2: Subcat PR-2

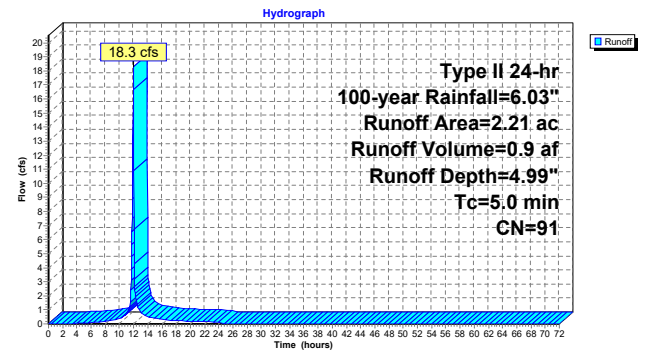
Runoff = 18.3 cfs @ 11.96 hrs, Volume= 0.9 af, Depth= 4.99"
Routed to Pond UIP-2 : UIP-2

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
0.45	61	>75% Grass cover, Good, HSG B
0.00	48	Brush, Good, HSG B
1.07	98	Paved parking, HSG B
0.69	98	Roofs, HSG B
2.21	91	Weighted Average
0.45		20.25% Pervious Area
1.76		79.75% 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

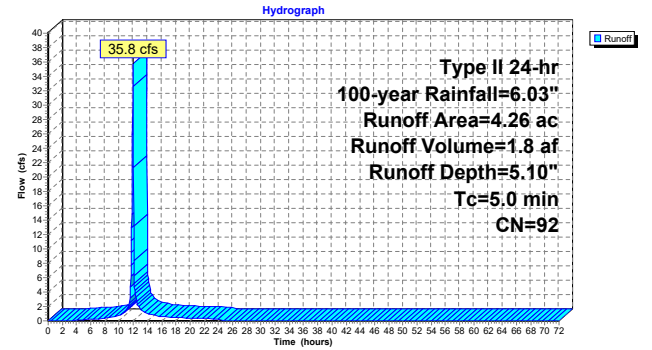
Runoff = 35.8 cfs @ 11.96 hrs, Volume= 1.8 af, Depth= 5.10"
Routed to Pond UIP-1 : UIP-1

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
0.10	61	>75% Grass cover, Good, HSG B
0.80	74	>75% Grass cover, Good, HSG C
0.29	98	Paved parking, HSG B
1.74	98	Paved parking, HSG C
0.43	98	Roofs, HSG B
0.87	98	Roofs, HSG C
0.00	55	Woods, Good, HSG B
0.02	70	Woods, Good, HSG C
4.26	92	Weighted Average
0.92		21.64% Pervious Area
3.33		78.36% 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

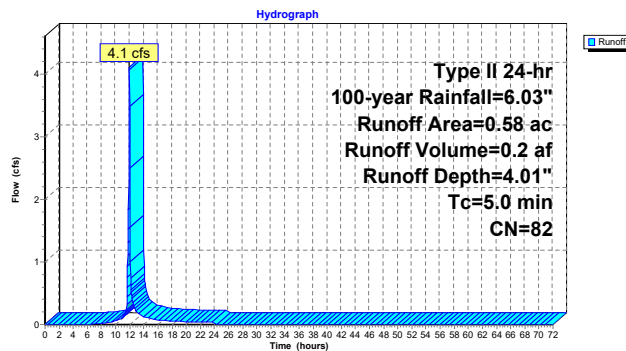
Runoff = 4.1 cfs @ 11.96 hrs, Volume= 0.2 af, Depth= 4.01"
 Routed to Pond BP-1 : Bioretention Pond #1

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
0.20	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
0.01	98	Paved parking, HSG A
0.20	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
0.58	82	Weighted Average
0.29		49.43% Pervious Area
0.29		50.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PR-4: Subcat PR-4



Summary for Subcatchment PR-5: Subcat PR-5

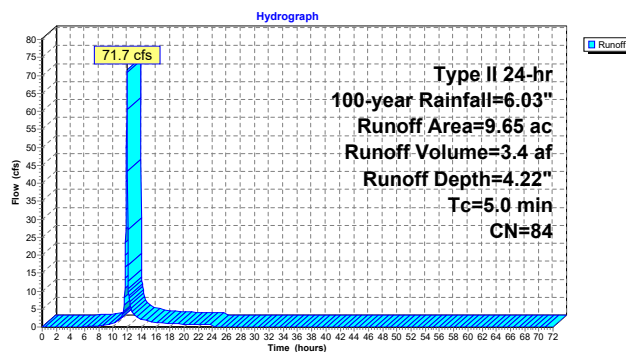
Runoff = 71.7 cfs @ 11.96 hrs, Volume= 3.4 af, Depth= 4.22"
 Routed to Reach 2R : South Culvert

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
1.24	61	>75% Grass cover, Good, HSG B
1.20	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
0.08	98	Paved parking, HSG B
0.05	98	Paved parking, 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
0.83	55	Woods, Good, HSG B
0.40	70	Woods, Good, HSG C
0.00	77	Woods, Good, HSG D
9.65	84	Weighted Average
9.52		98.70% Pervious Area
0.13		1.30% 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

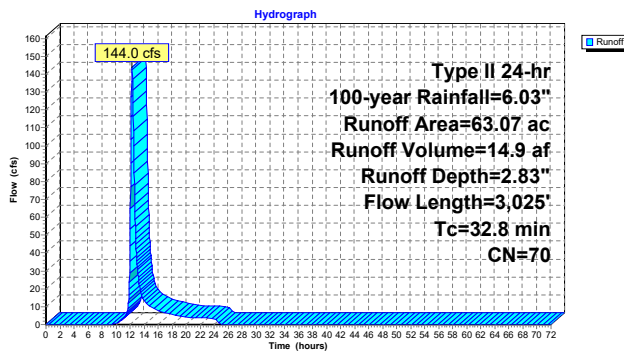
Runoff = 144.0 cfs @ 12.28 hrs, Volume= 14.9 af, Depth= 2.83"
Routed to Link DP-1 : Brickyard Pond

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
0.21	39	>75% Grass cover, Good, HSG A
0.56	61	>75% Grass cover, Good, HSG B
0.22	74	>75% Grass cover, Good, HSG C
0.00	30	Brush, Good, HSG A
0.84	48	Brush, Good, HSG B
0.03	98	Paved parking, HSG A
0.01	98	Paved parking, HSG B
0.01	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
57.00	70	Woods, Good, HSG C
0.53	77	Woods, Good, HSG D
63.07	70	Weighted Average
63.02		99.92% Pervious Area
0.05		0.08% 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-6: Subcat PR-6



Summary for Subcatchment PR-7: Subcat PR-7

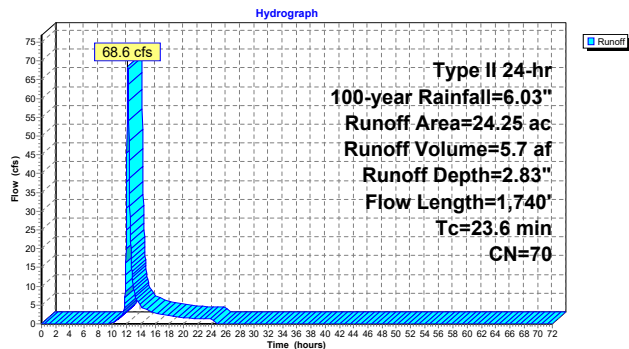
Runoff = 68.6 cfs @ 12.17 hrs, Volume= 5.7 af, Depth= 2.83"
Routed to Reach 1R : 30" Pipe

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
0.98	74	>75% Grass cover, Good, HSG C
0.05	98	Paved parking, HSG C
23.23	70	Woods, Good, HSG C
24.25	70	Weighted Average
24.21		99.80% Pervious Area
0.05		0.20% 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
1.0	260	0.0103	4.38	96.25	Channel Flow, Area= 22.0 sf Perim= 17.6' r= 1.25' n= 0.040 Earth, cobble bottom, clean sides
23.6	1,740	Total			

Subcatchment PR-7: Subcat PR-7



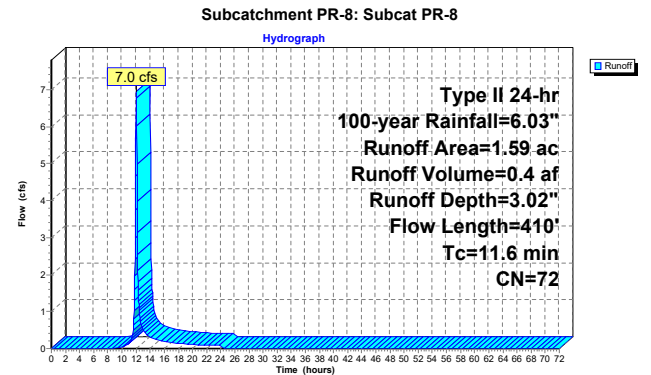
Summary for Subcatchment PR-8: Subcat PR-8

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
0.03	74	>75% Grass cover, Good, HSG C
0.00	80	>75% Grass cover, Good, HSG D
0.02	48	Brush, Good, HSG B
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
1.33	70	Woods, Good, HSG C
1.59	72	Weighted Average
1.59		100.00% Pervious 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			



Summary for Reach 1R: 30" Pipe

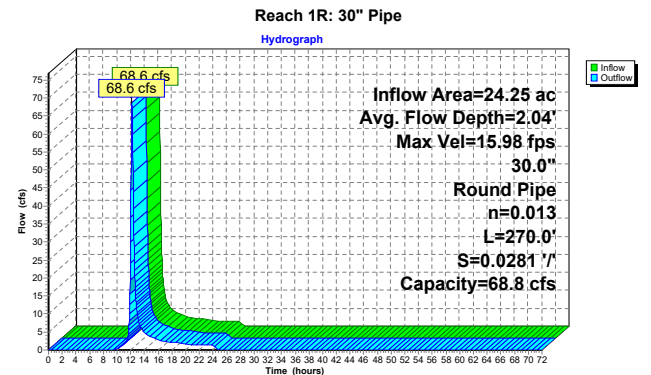
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 24.25 ac, 0.20% Impervious, Inflow Depth = 2.83" for 100-year event
Inflow = 68.6 cfs @ 12.17 hrs, Volume= 5.7 af
Outflow = 68.6 cfs @ 12.18 hrs, Volume= 5.7 af, Atten= 0%, Lag= 0.3 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= 15.98 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 6.30 fps, Avg. Travel Time= 0.7 min

Peak Storage= 1,159 cf @ 12.18 hrs
Average Depth at Peak Storage= 2.04', Surface Width= 1.94'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 68.8 cfs

30.0" Round Pipe
n= 0.013
Length= 270.0' Slope= 0.0281 '/'
Inlet Invert= 590.60', Outlet Invert= 583.00'



Stage-Area-Storage for Reach 1R: 30" Pipe

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
590.60	0.0	0
590.65	0.0	6
590.70	0.1	18
590.75	0.1	32
590.80	0.2	50
590.85	0.3	69
590.90	0.3	90
590.95	0.4	113
591.00	0.5	137
591.05	0.6	162
591.10	0.7	189
591.15	0.8	216
591.20	0.9	245
591.25	1.0	274
591.30	1.1	304
591.35	1.2	334
591.40	1.4	366
591.45	1.5	397
591.50	1.6	430
591.55	1.7	462
591.60	1.8	495
591.65	2.0	528
591.70	2.1	562
591.75	2.2	595
591.80	2.3	629
591.85	2.5	663
591.90	2.6	696
591.95	2.7	730
592.00	2.8	764
592.05	3.0	797
592.10	3.1	830
592.15	3.2	863
592.20	3.3	896
592.25	3.4	928
592.30	3.6	960
592.35	3.7	991
592.40	3.8	1,022
592.45	3.9	1,052
592.50	4.0	1,081
592.55	4.1	1,109
592.60	4.2	1,137
592.65	4.3	1,163
592.70	4.4	1,188
592.75	4.5	1,213
592.80	4.6	1,235
592.85	4.7	1,256
592.90	4.7	1,276
592.95	4.8	1,293
593.00	4.8	1,308
593.05	4.9	1,319
593.10	4.9	1,325

Summary for Reach 2R: South Culvert

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 35.49 ac, 0.49% Impervious, Inflow Depth = 3.22" for 100-year event
Inflow = 106.9 cfs @ 11.98 hrs, Volume= 9.5 af
Outflow = 106.9 cfs @ 11.98 hrs, Volume= 9.5 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-1 : Brickyard Pond

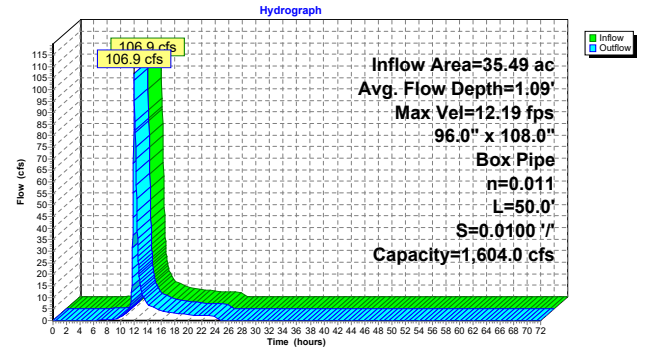
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 12.19 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.57 fps, Avg. Travel Time= 0.2 min

Peak Storage= 438 cf @ 11.98 hrs
Average Depth at Peak Storage= 1.09' , 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= 579.50', Outlet Invert= 579.00'



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)
579.50	0.0	0	584.80	42.4	2,120
579.60	0.8	40	584.90	43.2	2,160
579.70	1.6	80	585.00	44.0	2,200
579.80	2.4	120	585.10	44.8	2,240
579.90	3.2	160	585.20	45.6	2,280
580.00	4.0	200	585.30	46.4	2,320
580.10	4.8	240	585.40	47.2	2,360
580.20	5.6	280	585.50	48.0	2,400
580.30	6.4	320	585.60	48.8	2,440
580.40	7.2	360	585.70	49.6	2,480
580.50	8.0	400	585.80	50.4	2,520
580.60	8.8	440	585.90	51.2	2,560
580.70	9.6	480	586.00	52.0	2,600
580.80	10.4	520	586.10	52.8	2,640
580.90	11.2	560	586.20	53.6	2,680
581.00	12.0	600	586.30	54.4	2,720
581.10	12.8	640	586.40	55.2	2,760
581.20	13.6	680	586.50	56.0	2,800
581.30	14.4	720	586.60	56.8	2,840
581.40	15.2	760	586.70	57.6	2,880
581.50	16.0	800	586.80	58.4	2,920
581.60	16.8	840	586.90	59.2	2,960
581.70	17.6	880	587.00	60.0	3,000
581.80	18.4	920	587.10	60.8	3,040
581.90	19.2	960	587.20	61.6	3,080
582.00	20.0	1,000	587.30	62.4	3,120
582.10	20.8	1,040	587.40	63.2	3,160
582.20	21.6	1,080	587.50	64.0	3,200
582.30	22.4	1,120	587.60	64.8	3,240
582.40	23.2	1,160	587.70	65.6	3,280
582.50	24.0	1,200	587.80	66.4	3,320
582.60	24.8	1,240	587.90	67.2	3,360
582.70	25.6	1,280	588.00	68.0	3,400
582.80	26.4	1,320	588.10	68.8	3,440
582.90	27.2	1,360	588.20	69.6	3,480
583.00	28.0	1,400	588.30	70.4	3,520
583.10	28.8	1,440	588.40	71.2	3,560
583.20	29.6	1,480	588.50	72.0	3,600
583.30	30.4	1,520			
583.40	31.2	1,560			
583.50	32.0	1,600			
583.60	32.8	1,640			
583.70	33.6	1,680			
583.80	34.4	1,720			
583.90	35.2	1,760			
584.00	36.0	1,800			
584.10	36.8	1,840			
584.20	37.6	1,880			
584.30	38.4	1,920			
584.40	39.2	1,960			
584.50	40.0	2,000			
584.60	40.8	2,040			
584.70	41.6	2,080			

Summary for Reach 3R: North Culvert

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.59 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

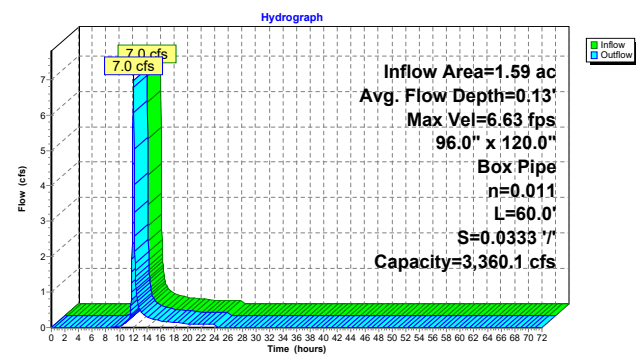
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 6.63 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 5.24 fps, Avg. Travel Time= 0.2 min

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 = 0.58 ac, 50.57% Impervious, Inflow Depth = 4.01" for 100-year event
Inflow = 4.1 cfs @ 11.96 hrs, Volume= 0.2 af
Outflow = 0.8 cfs @ 12.12 hrs, Volume= 0.2 af, Atten= 80%, Lag= 9.4 min
Discarded = 0.0 cfs @ 12.12 hrs, Volume= 0.1 af
Primary = 0.8 cfs @ 12.12 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= 596.74' @ 12.12 hrs Surf.Area= 2,679 sf Storage= 4,063 cf

Plug-Flow detention time= 769.5 min calculated for 0.2 af (100% of inflow)
Center-of-Mass det. time= 770.2 min (1,574.9 - 804.7)

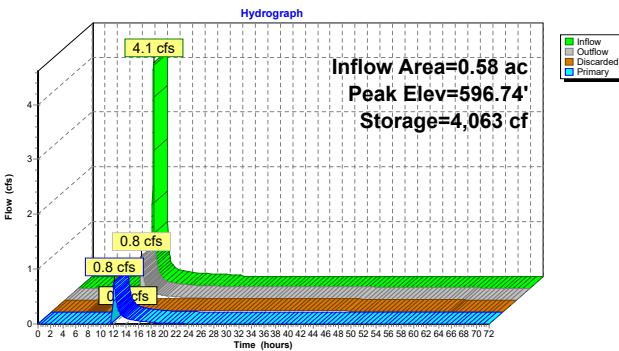
Volume	Invert	Avail.Storage	Storage Description			
#1	593.50'	11,782 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation	Surf.Area	Perim.	Voids	Inc.Store	Cum.Store	Wet.Area
	(sq-ft)	(feet)	(%)	(cubic-feet)	(cubic-feet)	(sq-ft)
593.50	1,720	169.6	0.0	0	0	1,720
595.00	1,720	169.6	10.0	258	258	1,974
598.00	3,501	226.2	100.0	7,675	7,933	3,853
599.00	4,208	245.6	100.0	3,849	11,782	4,619

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 '/ft 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=0.0 cfs @ 12.12 hrs HW=596.74' (Free Discharge)
4=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.8 cfs @ 12.12 hrs HW=596.74' TW=0.00' (Dynamic Tailwater)
1=Culvert (Passes 0.8 cfs of 7.8 cfs potential flow)
2=Orifice (Orifice Controls 0.8 cfs @ 1.58 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	1,720	0	598.80	4,061	10,955
593.60	1,720	17	598.90	4,134	11,365
593.70	1,720	34	599.00	4,208	11,782
593.80	1,720	52			
593.90	1,720	69			
594.00	1,720	86			
594.10	1,720	103			
594.20	1,720	120			
594.30	1,720	138			
594.40	1,720	155			
594.50	1,720	172			
594.60	1,720	189			
594.70	1,720	206			
594.80	1,720	224			
594.90	1,720	241			
595.00	1,720	258			
595.10	1,769	432			
595.20	1,819	612			
595.30	1,870	796			
595.40	1,921	986			
595.50	1,973	1,181			
595.60	2,026	1,381			
595.70	2,080	1,586			
595.80	2,134	1,797			
595.90	2,189	2,013			
596.00	2,244	2,234			
596.10	2,300	2,461			
596.20	2,357	2,694			
596.30	2,415	2,933			
596.40	2,473	3,177			
596.50	2,532	3,428			
596.60	2,592	3,684			
596.70	2,652	3,946			
596.80	2,713	4,214			
596.90	2,775	4,489			
597.00	2,838	4,769			
597.10	2,901	5,056			
597.20	2,965	5,350			
597.30	3,029	5,649			
597.40	3,095	5,955			
597.50	3,161	6,268			
597.60	3,227	6,588			
597.70	3,295	6,914			
597.80	3,363	7,247			
597.90	3,432	7,586			
598.00	3,501	7,933			
598.10	3,569	8,286			
598.20	3,637	8,647			
598.30	3,706	9,014			
598.40	3,776	9,388			
598.50	3,846	9,769			
598.60	3,917	10,157			
598.70	3,989	10,553			

Behind Townhomes

Summary for Pond UIP-1: UIP-1

Inflow Area = 4.26 ac, 78.36% Impervious, Inflow Depth = 5.10" for 100-year event
Inflow = 35.8 cfs @ 11.96 hrs, Volume= 1.8 af
Outflow = 30.2 cfs @ 12.00 hrs, Volume= 1.7 af, Atten= 16%, Lag= 2.6 min
Discarded = 0.1 cfs @ 5.49 hrs, Volume= 0.5 af
Primary = 30.1 cfs @ 12.00 hrs, Volume= 1.2 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= 598.59' @ 12.00 hrs Surf.Area= 7,713 sf Storage= 32,250 cf

Plug-Flow detention time= 549.6 min calculated for 1.7 af (92% of inflow)
Center-of-Mass det. time= 505.0 min (1,277.7 - 772.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	592.30'	12,256 cf	37.58'W x 205.22'L x 6.75'H Field A 52,061 cf Overall - 21,421 cf Embedded = 30,640 cf x 40.0% Voids
#2A	593.05'	21,421 cf	ADS StormTech MC-7200 +Cap x 120 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 120 Chambers in 4 Rows Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf
		33,677 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'	12.0" W x 15.0" H Vert. Orifice C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.1 cfs @ 5.49 hrs HW=592.37' (Free Discharge)
3=Exfiltration (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=30.1 cfs @ 12.00 hrs HW=598.59' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 30.1 cfs @ 9.58 fps)
2=Sharp-Crested Rectangular Weir (Passes < 22.6 cfs potential flow)
4=Orifice (Passes < 8.3 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 4 rows = 316.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

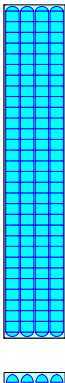
30 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 203.22' Row Length +12.0" End Stone x 2 = 205.22' Base Length
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

120 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 4 Rows = 21,421.1 cf Chamber Storage

52,060.9 cf Field - 21,421.1 cf Chambers = 30,639.8 cf Stone x 40.0% Voids = 12,255.9 cf Stone Storage

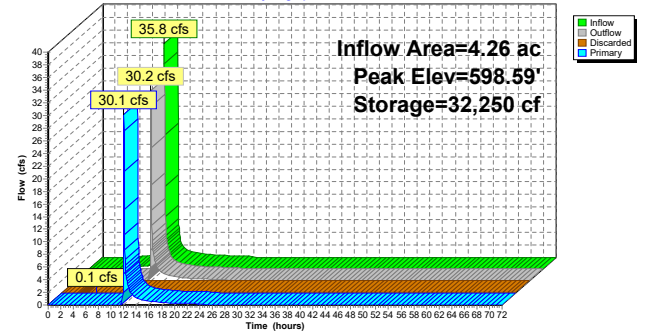
Chamber Storage + Stone Storage = 33,677.0 cf = 0.8 af
Overall Storage Efficiency = 64.7%
Overall System Size = 205.22' x 37.58' x 6.75'

120 Chambers
1,928.2 cy Field
1,134.8 cy Stone



Pond UIP-1: UIP-1

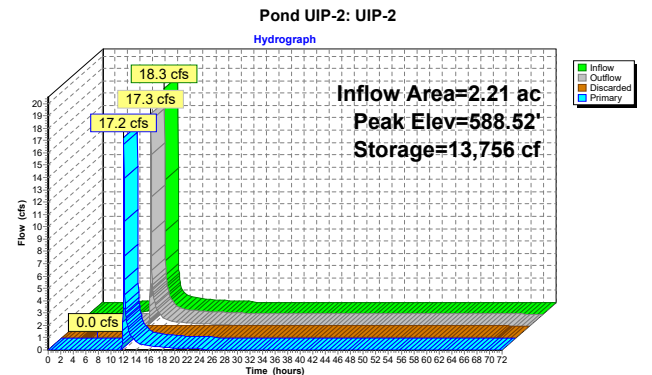
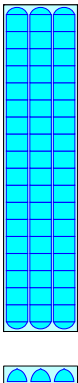
Hydrograph



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	7,713	0	597.60	7,713	29,083
592.40	7,713	309	597.70	7,713	29,442
592.50	7,713	617	597.80	7,713	29,783
592.60	7,713	926	597.90	7,713	30,115
592.70	7,713	1,234	598.00	7,713	30,436
592.80	7,713	1,543	598.10	7,713	30,746
592.90	7,713	1,851	598.20	7,713	31,055
593.00	7,713	2,160	598.30	7,713	31,363
593.10	7,713	2,465	598.40	7,713	31,672
593.20	7,713	2,769	598.50	7,713	31,980
593.30	7,713	3,072	598.60	7,713	32,289
593.40	7,713	3,374	598.70	7,713	32,597
593.50	7,713	3,675	598.80	7,713	32,906
593.60	7,713	3,976	598.90	7,713	33,214
593.70	7,713	4,276	599.00	7,713	33,523
593.80	7,713	4,576	Behind Townhomes		
593.90	7,713	4,876			
594.00	7,713	5,176			
594.10	7,713	5,476			
594.20	7,713	5,776			
594.30	7,713	6,076			
594.40	7,713	6,376			
594.50	7,713	6,676			
594.60	7,713	6,976			
594.70	7,713	7,276			
594.80	7,713	7,576			
594.90	7,713	7,876			
595.00	7,713	8,176			
595.10	7,713	8,476			
595.20	7,713	8,776			
595.30	7,713	9,076			
595.40	7,713	9,376			
595.50	7,713	9,676			
595.60	7,713	9,976			
595.70	7,713	10,276			
595.80	7,713	10,576			
595.90	7,713	10,876			
596.00	7,713	11,176			
596.10	7,713	11,476			
596.20	7,713	11,776			
596.30	7,713	12,076			
596.40	7,713	12,376			
596.50	7,713	12,676			
596.60	7,713	12,976			
596.70	7,713	13,276			
596.80	7,713	13,576			
596.90	7,713	13,876			
597.00	7,713	14,176			
597.10	7,713	14,476			
597.20	7,713	14,776			
597.30	7,713	15,076			
597.40	7,713	15,376			
597.50	7,713	15,676			

Summary for Pond UIP-2: UIP-2			
Inflow Area =	2.21 ac, 79.75% Impervious, Inflow Depth = 4.99"	for 100-year event	
Inflow =	18.3 cfs @ 11.96 hrs, Volume=	0.9 af	
Outflow =	17.3 cfs @ 11.98 hrs, Volume=	0.9 af, Atten= 6%, Lag= 1.6 min	
Discarded =	0.0 cfs @ 5.67 hrs, Volume=	0.2 af	
Primary =	17.2 cfs @ 11.98 hrs, Volume=	0.7 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= 588.52' @ 11.98 hrs Surf.Area= 3,594 sf Storage= 13,756 cf			
Plug-Flow detention time= 390.1 min calculated for 0.9 af (100% of inflow)			
Center-of-Mass det. time= 390.1 min (1,166.6 - 776.6)			
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'	24.0" 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= 3.14 sf
#2	Device 1	585.50'	4.0" W x 24.0" 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 @ 5.67 hrs HW=583.07' (Free Discharge)			
4=Exfiltration (Exfiltration Controls 0.0 cfs)			
Primary OutFlow Max=16.8 cfs @ 11.98 hrs HW=588.49' TW=0.00' (Dynamic Tailwater)			
1=Culvert (Passes 16.8 cfs of 32.1 cfs potential flow)			
2=Orifice/Grate (Orifice Controls 4.5 cfs @ 6.72 fps)			
3=Sharp-Crested Rectangular Weir (Weir Controls 12.3 cfs @ 3.26 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 + 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 + 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	



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			

Behind Townhomes

Summary for Pond UIP-3: UIP-3

Inflow Area = 2.51 ac, 78.61% Impervious, Inflow Depth = 5.21" for 100-year event
Inflow = 21.3 cfs @ 11.96 hrs, Volume= 1.1 af
Outflow = 14.3 cfs @ 12.02 hrs, Volume= 1.1 af, Atten= 33%, Lag= 3.9 min
Discarded = 0.0 cfs @ 4.80 hrs, Volume= 0.2 af
Primary = 14.3 cfs @ 12.02 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= 598.75' @ 12.02 hrs Surf.Area= 3,724 sf Storage= 15,585 cf

Plug-Flow detention time= 397.3 min calculated for 1.1 af (98% of inflow)
Center-of-Mass det. time= 385.2 min (1,153.6 - 768.4)

Volume	Invert	Avail. Storage	Storage Description
#1A	592.30'	6,065 cf	55.75'W x 66.79'L x 6.75'H Field A 25,135 cf Overall - 9,971 cf Embedded = 15,163 cf x 40.0% Voids
#2A	593.05'	9,971 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 6 Rows Cap Storage= 39.5 cf x 2 x 6 rows = 474.0 cf
		16,037 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	592.30'	0.500 in/hr Exfiltration over Surface area
#2	Primary	592.30'	15.0" Round Culvert L= 10.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 592.30' / 592.00' S= 0.0300' /' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	596.30'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Device 2	595.30'	6.0" W x 12.0" H Vert. Orifice C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.0 cfs @ 4.80 hrs HW=592.37' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=14.2 cfs @ 12.02 hrs HW=598.71' TW=0.00' (Dynamic Tailwater)
2=Culvert (Inlet Controls 14.2 cfs @ 11.58 fps)
3=Sharp-Crested Rectangular Weir (Passes < 43.0 cfs potential flow)
4=Orifice (Passes < 4.1 cfs potential flow)

Pond UIP-3: UIP-3 - 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 6 rows = 474.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

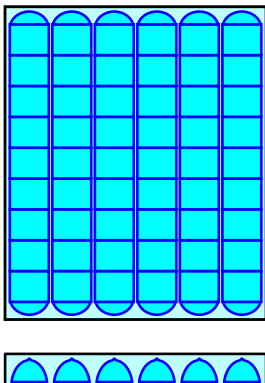
9 Chambers/Row x 6.59' Long +2.73' Cap Length x 2 = 64.79' Row Length +12.0" End Stone x 2 = 66.79' Base Length
6 Rows x 100.0" Wide + 9.0" Spacing x 5 + 12.0" Side Stone x 2 = 55.75' Base Width
9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

54 Chambers x 175.9 cf + 39.5 cf Cap Volume x 2 x 6 Rows = 9,971.3 cf Chamber Storage

25,134.5 cf Field - 9,971.3 cf Chambers = 15,163.3 cf Stone x 40.0% Voids = 6,065.3 cf Stone Storage

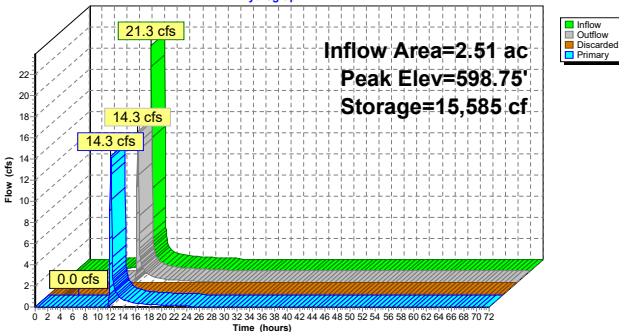
Chamber Storage + Stone Storage = 16,036.6 cf = 0.4 af
Overall Storage Efficiency = 63.8%
Overall System Size = 66.79' x 55.75' x 6.75'

54 Chambers
930.9 cy Field
561.6 cy Stone



Pond UIP-3: UIP-3

Hydrograph

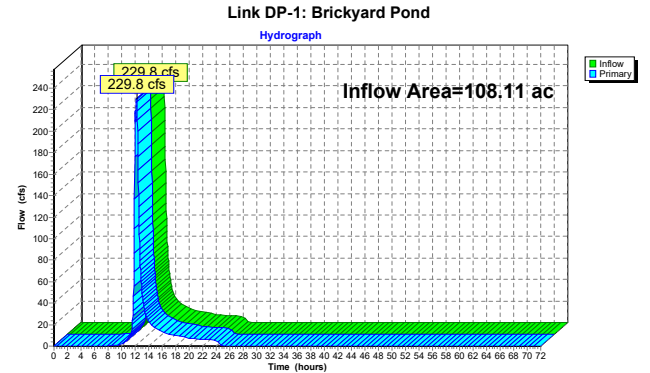


Stage-Area-Storage for Pond UIP-3: UIP-3					
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
592.30	3,724	0	597.60	3,724	13,821
592.40	3,724	149	597.70	3,724	13,993
592.50	3,724	298	597.80	3,724	14,157
592.60	3,724	447	597.90	3,724	14,317
592.70	3,724	596	598.00	3,724	14,472
592.80	3,724	745	598.10	3,724	14,622
592.90	3,724	894	598.20	3,724	14,771
593.00	3,724	1,043	598.30	3,724	14,919
593.10	3,724	1,277	598.40	3,724	15,068
593.20	3,724	1,595	598.50	3,724	15,217
593.30	3,724	1,913	598.60	3,724	15,366
593.40	3,724	2,230	598.70	3,724	15,515
593.50	3,724	2,547	598.80	3,724	15,664
593.60	3,724	2,862	598.90	3,724	15,813
593.70	3,724	3,177	599.00	3,724	15,962
593.80	3,724	3,491	Behind Townhomes		
593.90	3,724	3,804			
594.00	3,724	4,115			
594.10	3,724	4,426			
594.20	3,724	4,735			
594.30	3,724	5,043			
594.40	3,724	5,350			
594.50	3,724	5,656			
594.60	3,724	5,959			
594.70	3,724	6,262			
594.80	3,724	6,563			
594.90	3,724	6,862			
595.00	3,724	7,159			
595.10	3,724	7,454			
595.20	3,724	7,748			
595.30	3,724	8,039			
595.40	3,724	8,328			
595.50	3,724	8,615			
595.60	3,724	8,900			
595.70	3,724	9,181			
595.80	3,724	9,461			
595.90	3,724	9,738			
596.00	3,724	10,011			
596.10	3,724	10,282			
596.20	3,724	10,550			
596.30	3,724	10,815			
596.40	3,724	11,075			
596.50	3,724	11,333			
596.60	3,724	11,586			
596.70	3,724	11,836			
596.80	3,724	12,080			
596.90	3,724	12,320			
597.00	3,724	12,556			
597.10	3,724	12,785			
597.20	3,724	13,009			
597.30	3,724	13,226			
597.40	3,724	13,435			
597.50	3,724	13,634			

Summary for Link DP-1: Brickyard Pond

Inflow Area = 108.11 ac, 7.01% Impervious, Inflow Depth = 3.01" for 100-year event
Inflow = 229.8 cfs @ 12.22 hrs, Volume= 27.1 af
Primary = 229.8 cfs @ 12.22 hrs, Volume= 27.1 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs



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 10/25/2024

Checked by

TMD

Date 10/25/2024

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)	(%)	(%)
207	O-18	(N/A)	(N/A)	2.64	7.07	24		0.013	0.01	24.8	22.72	18.82	8.08	600.75	595.16	601.18	594.77	593.6	593.35	82.8	74.6
106 (4) (PR Drain (4))	CB-105	(N/A)	(N/A)	0.71	7.07	15		0.013	0.01	94.5	6.3	5.06	5.71	599.49	590.41	597.86	589.56	589.5	588.6	80.2	74.7
CB-226	CB-219	0.04	0.9	0.654	7.07	15		0.013	0.008	24	5.9	4.66	5.33	599.81	596.38	599.81	596.26	595.5	595.3	79	73.5
CB-220	CB-219	0.07	0.9	0.552	7.07	15		0.013	0.006	42	4.98	3.94	4.5	599.64	596.64	599.81	596.35	595.8	595.55	79	65.6
CB-212	207	0.09	0.82	0.521	7.07	15		0.013	0.005	113.4	4.7	3.71	4.24	600.34	595.84	600.75	595.18	595	594.4	78.9	64.6
CB-508	CB-506	0.22	(N/A)	0.387	7.07	12		0.013	0.01	192	3.59	2.76	5.04	609.28	606.51	607.35	604.66	605.8	603.85	76.8	76.2
CB-506	CB-504	0.27	(N/A)	0.708	7.07	15		0.013	0.011	192	6.67	5.05	5.98	607.35	604.66	605.41	602.71	603.75	601.7	75.6	77
CB-208	207	0.15	0.9	2.12	7.07	24		0.013	0.008	87.3	20.26	15.11	7.07	599.94	595.8	600.75	595.16	594.4	593.7	74.6	71.6
CB-105	104	0.29	0.9	0.971	7.07	15		0.013	0.022	64.9	9.48	6.92	8.43	597.86	589.56	597.89	587.9	588.5	587.1	72.9	74.1
RD6	CB-108	0.56	0.8	0.448	7.07	12		0.013	0.015	33	4.38	3.19	6.09	600.92	595.67	599.02	595.04	594.9	594.4	72.8	70.2
CB-227	CB-226	0.03	0.9	0.618	7.07	15		0.013	0.009	33.4	6.12	4.4	5.43	600.64	596.75	599.81	596.39	595.9	595.6	71.9	65.4
501C (PR Drain (4))	CB-501A	(N/A)	(N/A)	1.599	7.07	24		0.013	0.005	79.1	16.09	11.39	5.55	602.53	598.64	601.7	598.21	597.4	597	70.8	61.4
RD-5	CB-229	0.52	0.82	0.426	7.07	12		0.013	0.015	33	4.38	3.04	6.03	603.13	599	601.09	598.37	598.25	597.75	69.3	68.2
CB-211	CB-210	0.12	0.9	0.543	7.07	15		0.013	0.008	27.4	5.67	3.87	4.97	600.09	596.8	599.9	596.56	596	595.8	68.3	62.1
CB-502	501C (PR Drain (4))	0.27	(N/A)	1.599	7.07	24		0.013	0.006	101.3	17.41	11.39	5.91	603.51	599.31	602.53	598.68	598.1	597.5	65.5	59.8
CB-228	CB-227	0.08	0.9	0.591	7.07	15		0.013	0.01	47.7	6.61	4.21	5.71	600.95	597.33	600.64	596.73	596.5	596	63.7	62.2
CB-101	O-17	0.02	0.9	1.079	7.07	18		0.013	0.013	15.1	12.1	7.69	7.25	595.77	586.28	594.74	585.92	585.2	585	63.5	66.6
CB-210	CB-208	0.1	0.83	0.626	7.07	15		0.013	0.012	40.6	7.05	4.46	6.08	599.9	596.56	599.94	595.92	595.7	595.2	63.3	63.2
CB-504	CB-502	0.28	(N/A)	1.159	7.07	18		0.013	0.017	187.8	13.49	8.26	8.02	605.41	602.71	603.51	599.35	601.6	598.5	61.2	65.4
104	CB-101	(N/A)	(N/A)	0.971	7.07	15		0.013	0.032	46.3	11.63	6.92	9.88	597.89	588.06	595.77	586.22	587	585.5	59.5	71
214	CB-212	(N/A)	(N/A)	0.402	7.07	15		0.013	0.006	90	4.82	2.86	4.09	601.09	596.3	600.34	595.84	595.6	595.1	59.4	57.3
CB-217	CB-215	0.19	0.68	0.219	7.07	12		0.013	0.006	106.7	2.66	1.56	3.52	599.45	597.65	599.89	597.09	597.1	596.5	58.8	57
CB-215	214	0.17	0.65	0.402	7.07	15		0.013	0.006	122.6	4.88	2.86	4.14	599.89	597.09	601.09	596.38	596.4	595.7	58.7	54.7
RD-2	O-19	0.54	0.8	0.432	7.07	12		0.013	0.023	38.7	5.43	3.08	7.14	603.37	595.75	601.21	594.65	595	594.1	56.7	64.9
CB-107	106 (4) (PR Drain (4))	0.11	0.71	0.71	7.07	15		0.013	0.02	44.5	9.19	5.06	7.67	599.06	592.81	599.49	591.68	591.9	591	55.1	63.5
CB-222	CB-220	0.21	0.77	0.352	7.07	15		0.013	0.005	56.4	4.71	2.51	3.9	600.06	596.8	599.64	596.64	596.15	595.85	53.3	57.5
CB-224	223 (PR Drain (4))	0.1	0.9	0.191	7.07	12		0.013	0.005	116	2.56	1.36	3.31	600.16	597.92	601.75	597.29	597.4	596.8	53.1	50.6
RD-1	O-16	0.33	0.82	0.271	7.07	12		0.013	0.011	37.7	3.65	1.93	4.71	594.5	589.99	594.65	589.52	589.4	589	52.8	55.4
CB-229	CB-228	0.11	0.84	0.519	7.07	12		0.013	0.04	26	7.16	3.7	9.19	601.09	598.47	600.95	597.14	597.65	596.6	51.7	68.1
223 (PR Drain (4))	CB-222	(N/A)	(N/A)	0.191	7.07	12		0.013	0.006	90.4	2.65	1.36	3.4	601.75	597.21	600.06	596.8	596.7	596.2	51.3	55.4
CB-108	CB-107	0.07	0.9	0.511	7.07	15		0.013	0.012	24	7.22	3.64	5.9	599.02	595.07	599.06	594.64	594.3	594	50.4	56.5
RD-4	CB-211	0.53	0.82	0.435	7.07	15		0.013	0.009	33	6.16	3.1	5.03	601.43	597.11	600.09	596.73	596.4	596.1	50.3	53.4
CB-501A	O-20	0.05	0.9	1.689	7.07	24		0.013	0.011	13.3	23.99	12.04	7.64	601.7	598.15	601.66	597.84	596.9	596.75	50.2	58.3
CB-503	CB-502	0.25	(N/A)	0.211	7.07	12		0.013	0.008	24	3.25	1.5	4.06	603.51	599.35	603.51	599.31	598.4	598.2	46.2	103.1
CB-219	CB-208	0.04	0.9	1.242	7.07	24		0.013	0.008	91.2	19.81	8.85	6.13	599.81	596.26	599.94	595.8	595.2	594.5	44.7	59.1
CB-507	CB-506	0.26	(N/A)	0.213	7.07	12		0.013	0.012	24	3.98	1.52	4.73	607.35	604.67	607.35	604.66	604.15	603.85	38.1	66.7
CB-509	CB-508	0.24	(N/A)	0.203	7.07	12		0.013	0.017	24	4.6	1.44	5.18	609.28	606.81	609.28	606.51	606.3	605.9	31.4	56
CB-505	CB-504	0.26	(N/A)	0.213	7.07	12		0.013	0.021	24	5.14	1.52	5.7	605.41	602.72	605.41	602.71	602.2	601.7	29.5	76.8
CB-109	CB-107	0.09	0.74	0.121	7.07	12		0.013	0.01	100	3.56	0.86	3.74	599.56	593.39	599.06	592.81	593	592	24.1	60
CB-209	CB-208	0.13	0.9	0.117	7.07	12		0.013	0.01	24	3.64	0.83	3.76	599.94	595.8	599.94	595.8	595.1	594.85	22.9	82.7
CB-225	CB-224	0.12	0.84	0.101	7.07	12		0.013	0.008	24	3.25	0.72	3.32	600.22	598.35	600.16	598.12	598	597.8	22.1	33.7

Stormcad Conduit Output Table - Hydraulic Pipe Analysis

25-YR

Project

The Brickyard Residential I

[Project # 52933

Calculated by

DJB

Date 10/25/2024

Checked by

TMD

Date 10/25/2024

[illegible]

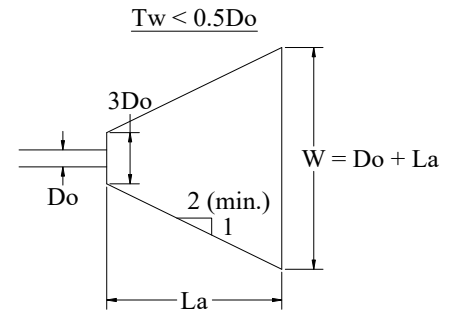
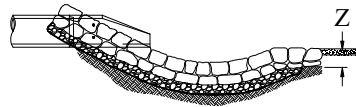
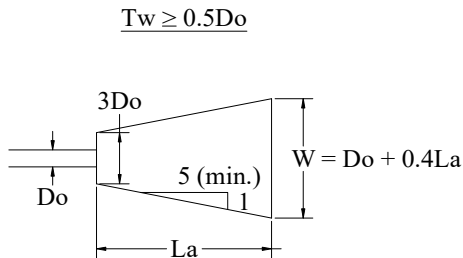
Riprap Channel Design Calculations

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Outfall Riprap Sizing and Velocity Calculations

Project	Brickyard Residential Development	Project #	52933.00
Calculated by	DJB	Date	10/25/2024
Checked by	TMD	Date	10/25/2024



OUTLET DESCRIPTION:

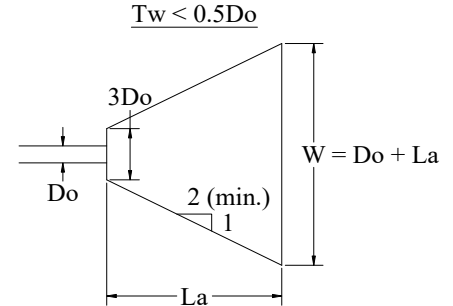
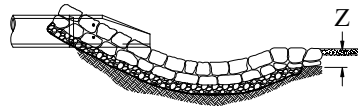
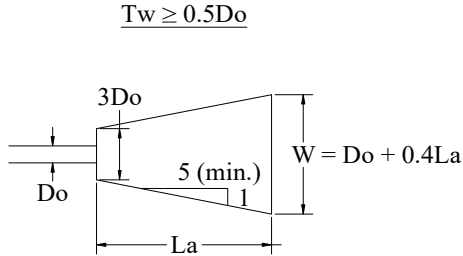
		FES-301	FES-400	FES-700	FES-1001	
Design Storm	(yr)	25	25	25	50	
Flow / Discharge (Q)	(cfs)	37.7	2.7	2.7	0.2	
Defined Channel ?	-	NO	NO	NO	NO	
Defined Channel Width	(ft)	0	0	0	0	
Outlet Pipe Diameter (D_o)	(in)	30	12	12	12	
Tailwater Condition (T_w)	(ft)	$T_w < 0.5D$	$T_w \geq 0.5D$	$T_w < 0.5D$	$T_w < 0.5D$	
Apron Length (L_A)	(ft)	12	6	6	6	
Apron Width at Outlet ($3D_o$)	(ft)	7.5	3	3	3	
Apron Width at End (W)	(ft)	14.5	3.4	7	7	
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 $T_w \geq 0.5D$
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 $T_w \geq 0.5D$
	or apron width = channel width if a well defined channel exists	
Rock Riprap:	Median Diameter (d_{50}) = From Virginia DCR Handbook - Plate 3.18-3 or 4	
	Largest stone dia = 1.5 x d_{50}	
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	10/25/2025
Checked by	TMD	Date	10/25/2025



OUTLET DESCRIPTION:

		HW-201	HW-501	HW-802	HW-914	
Design Storm	(yr)	25	25	25	25	
Flow / Discharge (Q)	(cfs)	5.2	12.2	2.0	6.0	
Defined Channel ?	-	NO	NO	NO	NO	
Defined Channel Width	(ft)	0	0	0	0	
Outlet Pipe Diameter (D_o)	(in)	12	15	12	12	
Tailwater Condition (T_w)	(ft)	$T_w < 0.5D$	$T_w < 0.5D$	$T_w < 0.5D$	$T_w < 0.5D$	
Apron Length (L_A)	(ft)	6	6	6	6	
Apron Width at Outlet ($3D_o$)	(ft)	3	3.75	3	3	
Apron Width at End (W)	(ft)	7	7.25	7	7	
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 $T_w \geq 0.5D$
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 $T_w \geq 0.5D$
	or apron width = channel width if a well defined channel exists	
Rock Riprap:	Median Diameter (d_{50}) = From Virginia DCR Handbook - Plate 3.18-3 or 4	
	Largest stone dia = 1.5 x d_{50}	
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 5
Calculated by:	TMD	Date:	10/25/2024
Checked by:	DHF	Date:	10/25/2024
Title	Perimeter Swale Design Calculations		

Site Data

Segment: Behind Townhomes

Storm Event = 100 year Q = CIA
Tributary Area = 477,758 ft²

C = 0.25
i = 5.72 in/hr
A = 10.96781 acres

Q_{Design} = 15.68 ft³/sec

Channel Data

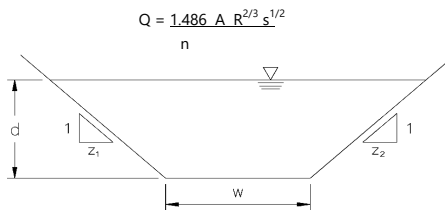
$Q = 1.486 A R^{2/3} s^{1/2}$

n = 0.04
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} = 94.73 ft³/sec
V_{Full} = 4.31 ft/sec

d_{Design} = 0.8 ft
A_{Design} = 5.92
V_{Design} = 2.65 ft/sec





Computations

Project:	52933.00	Project	Brickyard Residential Development
Location:	Lebanon, NH	Sheet	2 of 5
Calculated by:	TMD	Date:	10/25/2024
Checked by:	DHF	Date:	10/25/2024
Title	Perimeter Swale Design Calculations		

Site Data

Segment: Behind Building 5

Storm Event = 100 year Q = CIA
Tributary Area = 315,449 ft²

C = 0.25
i = 4.2 in/hr
A = 7.241713 acres

Q_{Design} = 13.95 ft³/sec

Channel Data

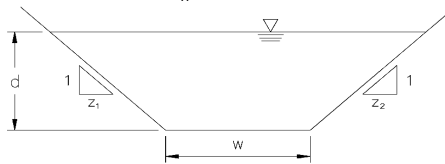
$Q = 1.486 A R^{2/3} s^{1/2}$

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} = 0.7 ft
A_{Design} = 4.97
V_{Design} = 2.81 ft/sec





Computations

Project:	52933.00	Project	Brickyard Residential Development
Location:	Lebanon, NH	Sheet	3 of 5
Calculated by:	TMD	Date:	10/25/2024
Checked by:	DHF	Date:	10/25/2024
Title	Perimeter Swale Design Calculations		

Site Data

Segment: Behind Building 5 Wall

Storm Event = 100 year Q = CIA
Tributary Area = 263,219 ft²

C = 0.25
i = 4.2 in/hr
A = 6.042677 acres

Q_{Design} = 6.34 ft³/sec

Channel Data

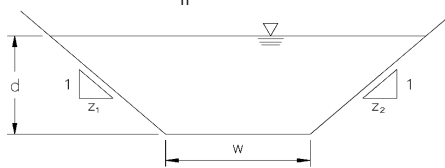
$Q = 1.486 A R^{2/3} s^{1/2}$

n = 0.035
s = 0.08 ft/ft
z₁ = 3 ft/ft
z₂ = 3 ft/ft
w = 2 ft
d_{Full} = 0.67 ft

A = 2.6867 ft²
P_w = 6.24 ft
R_h = 0.43 ft

Q_{Full} = 18.35 ft³/sec
V_{Full} = 6.83 ft/sec

d_{Design} = 0.25 ft
A_{Design} = 0.69
V_{Design} = 9.23 ft/sec





Computations

Project:	52933.00	Project	Brickyard Residential Development
Location:	Lebanon, NH	Sheet	4 of 5
Calculated by:	TMD	Date:	10/25/2024
Checked by:	DHF	Date:	10/25/2024
Title	Perimeter Swale Design Calculations		

Site Data

Segment: Behind Building 4 Wall

Storm Event = 100 year Q = CIA
Tributary Area = 202,312 ft²

C = 0.25
i = 3.8 in/hr
A = 4.644444 acres

Q_{Design} = 4.41 ft³/sec

Channel Data

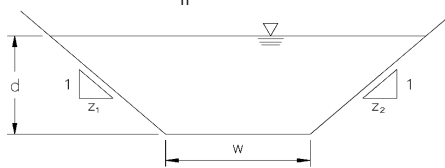
$Q = 1.486 A R^{2/3} s^{1/2}$

n = 0.035
s = 0.08 ft/ft
z₁ = 3 ft/ft
z₂ = 3 ft/ft
w = 3 ft
d_{Full} = 0.67 ft

A = 3.3567 ft²
P_w = 7.24 ft
R_h = 0.46 ft

Q_{Full} = 24.09 ft³/sec
V_{Full} = 7.18 ft/sec

d_{Design} = 0.2 ft
A_{Design} = 0.72
V_{Design} = 6.13 ft/sec





Computations

Project:	52933.00	Project	Brickyard Residential Development
Location:	Lebanon, NH	Sheet	5 of 5
Calculated by:	TMD	Date:	10/25/2024
Checked by:	DHF	Date:	10/25/2024
Title	Perimeter Swale Design Calculations		

Site Data

Segment: Behind Building 4

Storm Event = 100 year Q = CIA
Tributary Area = 246,543 ft²

C = 0.25
i = 3.8 in/hr
A = 5.659848 acres

Q_{Design} = 9.79 ft³/sec

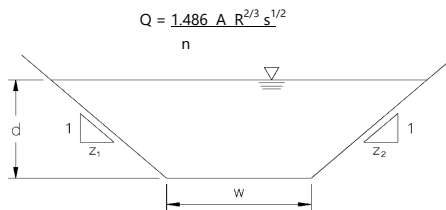
Channel Data

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} = 0.54 ft
A_{Design} = 3.57
V_{Design} = 2.74 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:

- CxA values from StormCAD analysis
- Grate Types:

Name	Type	Area (sf)
East Jordan 5520M5 (Single)	A	1.51
East Jordan 5520M5 (Double)	B	3.01

- Head = 6" for sag, 2" for in-line
- 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.

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	

Memorandum

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

Memorandum

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

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.	
	

Memorandum

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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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

in the mineral horizons.

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 3 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 3. 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.

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 Ansonia 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,

white pine and hemlock.

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
U.S.A.



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SITE-SPECIFIC SOIL CLASSIFICATIONS

Soil symbol	Soil series: Slope class
540B/P	Regisol, 2-8% slope
540A/P	Regisol, 25-25% slope
513A	Wingpet, 0-3% slope
513B	Wingpet, 3-8% slope
517A	Wingpet Variant, 0-3% slope
517C	Wingpet Variant, 8-15% slope
517D	Wingpet Variant, 15-25% slope
299A/cbaaa	Smoothed Ustorthents, 0-3% slope
410A	Agren, 0-3% slope
540B/cabb	Smoothed Ustorthents, 3-8% slope
540C/cabb	Smoothed Ustorthents, 8-15% slope
540D/cabb	Smoothed Ustorthents, 15-25% slope
299A/caabb	Smoothed Ustorthents, 0-3% slope
299A/daabb	Smoothed Ustorthents, 0-3% slope
540B/caabb	Smoothed Ustorthents, 3-8% slope
540C/caabb	Smoothed Ustorthents, 8-15% slope
540D/caabb	Smoothed Ustorthents, 15-25% slope
540E/cabb	Smoothed Ustorthents, 15-25% slope
540F/cabb	Smoothed Ustorthents, 25-50% slope
540G/cabb	Subaqueous, 8-15% slope
540H/cabb	Subaqueous, 0-3% slope
540I/cabb	Subaqueous, 3-8% slope
540J/cabb	Subaqueous, 8-15% slope
540K/cabb	Subaqueous, 15-25% slope
540L/cabb	Subaqueous, 25-50% slope
540M/cabb	Subaqueous, 50-75% slope
540N/cabb	Subaqueous, 75-100% slope
540O/cabb	Subaqueous, 100-150% slope
540P/cabb	Subaqueous, 150-200% slope
540Q/cabb	Subaqueous, 200-250% slope
540R/cabb	Subaqueous, 250-300% slope
540S/cabb	Subaqueous, 300-350% slope
540T/cabb	Subaqueous, 350-400% slope
540U/cabb	Subaqueous, 400-450% slope
540V/cabb	Subaqueous, 450-500% slope
540W/cabb	Subaqueous, 500-550% slope
540X/cabb	Subaqueous, 550-600% slope
540Y/cabb	Subaqueous, 600-650% slope
540Z/cabb	Subaqueous, 650-700% slope
540AA/cabb	Subaqueous, 700-750% slope
540AB/cabb	Subaqueous, 750-800% slope
540AC/cabb	Subaqueous, 800-850% slope
540AD/cabb	Subaqueous, 850-900% slope
540AE/cabb	Subaqueous, 900-950% slope
540AF/cabb	Subaqueous, 950-1000% slope
540AG/cabb	Subaqueous, 1000-1050% slope
540AH/cabb	Subaqueous, 1050-1100% slope
540AI/cabb	Subaqueous, 1100-1150% slope
540AJ/cabb	Subaqueous, 1150-1200% slope
540AK/cabb	Subaqueous, 1200-1250% slope
540AL/cabb	Subaqueous, 1250-1300% slope
540AM/cabb	Subaqueous, 1300-1350% slope
540AN/cabb	Subaqueous, 1350-1400% slope
540AO/cabb	Subaqueous, 1400-1450% slope
540AP/cabb	Subaqueous, 1450-1500% slope
540AQ/cabb	Subaqueous, 1500-1550% slope
540AR/cabb	Subaqueous, 1550-1600% slope
540AS/cabb	Subaqueous, 1600-1650% slope
540AT/cabb	Subaqueous, 1650-1700% slope
540AU/cabb	Subaqueous, 1700-1750% slope
540AV/cabb	Subaqueous, 1750-1800% slope
540AW/cabb	Subaqueous, 1800-1850% slope
540AX/cabb	Subaqueous, 1850-1900% slope
540AY/cabb	Subaqueous, 1900-1950% slope
540AZ/cabb	Subaqueous, 1950-2000% slope
540BA/cabb	Subaqueous, 2000-2050% slope
540BB/cabb	Subaqueous, 2050-2100% slope
540BC/cabb	Subaqueous, 2100-2150% slope
540BD/cabb	Subaqueous, 2150-2200% slope
540BE/cabb	Subaqueous, 2200-2250% slope
540BF/cabb	Subaqueous, 2250-2300% slope
540BG/cabb	Subaqueous, 2300-2350% slope
540BH/cabb	Subaqueous, 2350-2400% slope
540BI/cabb	Subaqueous, 2400-2450% slope
540BJ/cabb	Subaqueous, 2450-2500% slope
540BK/cabb	Subaqueous, 2500-2550% slope
540BL/cabb	Subaqueous, 2550-2600% slope
540BM/cabb	Subaqueous, 2600-2650% slope
540BN/cabb	Subaqueous, 2650-2700% slope
540BO/cabb	Subaqueous, 2700-2750% slope
540BP/cabb	Subaqueous, 2750-2800% slope
540BQ/cabb	Subaqueous, 2800-2850% slope
540BR/cabb	Subaqueous, 2850-2900% slope
540BS/cabb	Subaqueous, 2900-2950% slope
540BT/cabb	Subaqueous, 2950-3000% slope
540BU/cabb	Subaqueous, 3000-3050% slope
540BV/cabb	Subaqueous, 3050-3100% slope
540BW/cabb	Subaqueous, 3100-3150% slope
540BX/cabb	Subaqueous, 3150-3200% slope
540BY/cabb	Subaqueous, 3200-3250% slope
540BZ/cabb	Subaqueous, 3250-3300% slope
540CA/cabb	Subaqueous, 3300-3350% slope
540CB/cabb	Subaqueous, 3350-3400% slope
540CC/cabb	Subaqueous, 3400-3450% slope
540CD/cabb	Subaqueous, 3450-3500% slope
540CE/cabb	Subaqueous, 3500-3550% slope
540CF/cabb	Subaqueous, 3550-3600% slope
540CG/cabb	Subaqueous, 3600-3650% slope
540CH/cabb	Subaqueous, 3650-3700% slope
540CI/cabb	Subaqueous, 3700-3750% slope
540CJ/cabb	Subaqueous, 3750-3800% slope
540CK/cabb	Subaqueous, 3800-3850% slope
540CL/cabb	Subaqueous, 3850-3900% slope
540CM/cabb	Subaqueous, 3900-3950% slope
540CN/cabb	Subaqueous, 3950-4000% slope
540CO/cabb	Subaqueous, 4000-4050% slope
540CP/cabb	Subaqueous, 4050-4100% slope
540CQ/cabb	Subaqueous, 4100-4150% slope
540CR/cabb	Subaqueous, 4150-4200% slope
540CS/cabb	Subaqueous, 4200-4250% slope
540CT/cabb	Subaqueous, 4250-4300% slope
540CU/cabb	Subaqueous, 4300-4350% slope
540CV/cabb	Subaqueous, 4350-4400% slope
540CW/cabb	Subaqueous, 4400-4450% slope
540CX/cabb	Subaqueous, 4450-4500% slope
540CY/cabb	Subaqueous, 4500-4550% slope
540CZ/cabb	Subaqueous, 4550-4600% slope
540DA/cabb	Subaqueous, 4600-4650% slope
540DB/cabb	Subaqueous, 4650-4700% slope
540DC/cabb	Subaqueous, 4700-4750% slope
540DD/cabb	Subaqueous, 4750-4800% slope
540DE/cabb	Subaqueous, 4800-4850% slope
540DF/cabb	Subaqueous, 4850-4900% slope
540DG/cabb	Subaqueous, 4900-4950% slope
540DH/cabb	Subaqueous, 4950-5000% slope
540DI/cabb	Subaqueous, 5000-5050% slope
540DJ/cabb	Subaqueous, 5050-5100% slope
540DK/cabb	Subaqueous, 5100-5150% slope
540DL/cabb	Subaqueous, 5150-5200% slope
540DM/cabb	Subaqueous, 5200-5250% slope
540DN/cabb	Subaqueous, 5250-5300% slope
540DO/cabb	Subaqueous, 5300-5350% slope
540DP/cabb	Subaqueous, 5350-5400% slope
540DQ/cabb	Subaqueous, 5400-5450% slope
540DR/cabb	Subaqueous, 5450-5500% slope
540DS/cabb	Subaqueous, 5500-5550% slope
540DT/cabb	Subaqueous, 5550-5600% slope
540DU/cabb	Subaqueous, 5600-5650% slope
540DV/cabb	Subaqueous, 5650-5700% slope
540DW/cabb	Subaqueous, 5700-5750% slope
540DX/cabb	Subaqueous, 5750-5800% slope
540DY/cabb	Subaqueous, 5800-5850% slope
540DZ/cabb	Subaqueous, 5850-5900% slope
540EA/cabb	Subaqueous, 5900-5950% slope
540EB/cabb	Subaqueous, 5950-6000% slope
540EC/cabb	Subaqueous, 6000-6050% slope
540ED/cabb	Subaqueous, 6050-6100% slope
540EE/cabb	Subaqueous, 6100-6150% slope
540EF/cabb	Subaqueous, 6150-6200% slope
540EG/cabb	Subaqueous, 6200-6250% slope
540EH/cabb	Subaqueous, 6250-6300% slope
540EI/cabb	Subaqueous, 6300-6350% slope
540EJ/cabb	Subaqueous, 6350-6400% slope
540EK/cabb	Subaqueous, 6400-6450% slope
540EL/cabb	Subaqueous, 6450-6500% slope
540EM/cabb	Subaqueous, 6500-6550% slope
540EN/cabb	Subaqueous, 6550-6600% slope
540EO/cabb	Subaqueous, 6600-6650% slope
540EP/cabb	Subaqueous, 6650-6700% slope
540EQ/cabb	Subaqueous, 6700-6750% slope
540ER/cabb	Subaqueous, 6750-6800% slope
540ES/cabb	Subaqueous, 6800-6850% slope
540ET/cabb	Subaqueous, 6850-6900% slope
540EU/cabb	Subaqueous, 6900-6950% slope
540EV/cabb	Subaqueous, 6950-7000% slope
540EW/cabb	Subaqueous, 7000-7050% slope
540EX/cabb	Subaqueous, 7050-7100% slope
540EY/cabb	Subaqueous, 7100-7150% slope
540EZ/cabb	Subaqueous, 7150-7200% slope
540FA/cabb	Subaqueous, 7200-7250% slope
540FB/cabb	Subaqueous, 7250-7300% slope
540FC/cabb	Subaqueous, 7300-7350% slope
540FD/cabb	Subaqueous, 7350-7400% slope
540FE/cabb	Subaqueous, 7400-7450% slope
540FF/cabb	Subaqueous, 7450-7500% slope
540FG/cabb	Subaqueous, 7500-7550% slope
540FH/cabb	Subaqueous, 7550-7600% slope
540FI/cabb	Subaqueous, 7600-7650% slope
540FJ/cabb	Subaqueous, 7650-7700% slope
540FK/cabb	Subaqueous, 7700-7750% slope
540FL/cabb	Subaqueous, 7750-7800% slope
540FM/cabb	Subaqueous, 7800-7850% slope
540FN/cabb	Subaqueous, 7850-7900% slope
540FO/cabb	Subaqueous, 7900-7950% slope
540FP/cabb	Subaqueous, 7950-8000% slope
540FQ/cabb	Subaqueous, 8000-8050% slope
540FR/cabb	Subaqueous, 8050-8100% slope
540FS/cabb	Subaqueous, 8100-8150% slope
540FT/cabb	Subaqueous, 8150-8200% slope
540FU/cabb	Subaqueous, 8200-8250% slope
540FV/cabb	Subaqueous, 8250-8300% slope
540FW/cabb	Subaqueous, 8300-8350% slope
540FX/cabb	Subaqueous, 8350-8400% slope
540FY/cabb	Subaqueous, 8400-8450% slope
540FZ/cabb	Subaqueous, 8450-8500% slope
540GA/cabb	Subaqueous, 8500-8550% slope
540GB/cabb	Subaqueous, 8550-8600% slope
540GC/cabb	Subaqueous, 8600-8650% slope
540GD/cabb	Subaqueous, 8650-8700% slope
540GE/cabb	Subaqueous, 8700-8750% slope
540GF/cabb	Subaqueous, 8750-8800% slope
540GG/cabb	Subaqueous, 8800-8850% slope
540GH/cabb	Subaqueous, 8850-8900% slope
540GI/cabb	Subaqueous, 8900-8950% slope
540GJ/cabb	Subaqueous, 8950-9000% slope
540GK/cabb	Subaqueous, 9000-9050% slope
540GL/cabb	Subaqueous, 9050-9100% slope
540GM/cabb	Subaqueous, 9100-9150% slope
540GN/cabb	Subaqueous, 9150-9200% slope
540GO/cabb	Subaqueous, 9200-9250% slope
540GP/cabb	Subaqueous, 9250-9300% slope
540GQ/cabb	Subaqueous, 9300-9350% slope
540GR/cabb	Subaqueous, 9350-9400% slope
540GS/cabb	Subaqueous, 9400-9450% slope
540GT/cabb	Subaqueous, 9450-9500% slope
540GU/cabb	Subaqueous, 9500-9550% slope
540GV/cabb	Subaqueous, 9550-9600% slope
540GW/cabb	Subaqueous, 9600-9650% slope
540GX/cabb	Subaqueous, 9650-9700% slope
540GY/cabb	Subaqueous, 9700-9750% slope
540GZ/cabb	Subaqueous, 9750-9800% slope
540HA/cabb	Subaqueous, 9800-9850% slope
540HB/cabb	Subaqueous, 9850-9900% slope
540HC/cabb	Subaqueous, 9900-9950% slope
540HD/cabb	Subaqueous, 9950-10000% slope
540HE/cabb	Subaqueous, 10000-10050% slope
540HF/cabb	Subaqueous, 10050-10100% slope
540HG/cabb	Subaqueous, 10100-10150% slope
540HH/cabb	Subaqueous, 10150-10200% slope
540HI/cabb	Subaqueous, 10200-10250% slope
540HJ/cabb	Subaqueous, 10250-10300% slope
540HK/cabb	Subaqueous, 10300-10350% slope
540HL/cabb	Subaqueous, 10350-10400% slope
540HM/cabb	Subaqueous, 10400-10450% slope
540HN/cabb	Subaqueous, 10450-10500% slope
540HO/cabb	Subaqueous, 10500-10550% slope
540HP/cabb	Subaqueous, 10550-10600% slope
540HQ/cabb	Subaqueous, 10600-10650% slope
540HR/cabb	Subaqueous, 10650-10700% slope
540HS/cabb	Subaqueous, 10700-10750% slope
540HT/cabb	Subaqueous, 10750-10800% slope
540HU/cabb	Subaqueous, 10800-10850% slope
540HV/cabb	Subaqueous, 10850-10900% slope
540HW/cabb	Subaqueous, 10900-10950% slope
540HX/cabb	Subaqueous, 10950-11000% slope
540HY/cabb	Subaqueous, 11000-11050% slope
540HZ/cabb	Subaqueous, 11050-11100% slope
540IA/cabb	Subaqueous, 11100-11150% slope
540IB/cabb	Subaqueous, 11150-11200% slope
540IC/cabb	Subaqueous, 11200-11250% slope
540ID/cabb	Subaqueous, 11250-11300% slope
540IE/cabb	Subaqueous, 11300-11350% slope
540IF/cabb	Subaqueous, 11350-11400% slope
540IG/cabb	Subaqueous, 11400-11450% slope
540IH/cabb	Subaqueous, 11450-11500% slope
540II/cabb	Subaqueous, 11500-11550% slope
540IJ/cabb	Subaqueous, 11550-11600% slope
540IK/cabb	Subaqueous, 11600-11650% slope
540IL/cabb	Subaqueous, 11650-11700% slope
540IM/cabb	Subaqueous, 11700-11750% slope
540IN/cabb	Subaqueous, 11750-11800% slope
540IO/cabb	Subaqueous, 11800-11850% slope
540IP/cabb	Subaqueous, 11850-11900% slope
540IQ/cabb	Subaqueous, 11900-11950% slope
540IR/cabb	Subaqueous, 11950-12000% slope
540IS/cabb	Subaqueous, 12000-12050% slope
540IT/cabb	Subaqueous, 12050-12100% slope
540IU/cabb	Subaqueous, 12100-12150% slope
540IV/cabb	Subaqueous, 12150-12200% slope
540IW/cabb	Subaqueous, 12200-12250% slope
540IX/cabb	Subaqueous, 12250-12300% slope
540IY/cabb	Subaqueous, 12300-12350% slope
540IZ/cabb	Subaqueous, 12350-12400% slope
540JA/cabb	Subaqueous, 12400-12450% slope
540JB/cabb	Subaqueous, 12450-12500% slope
540JC/cabb	Subaqueous, 12500-12550% slope
540JD/cabb	Subaqueous, 12550-12600% slope
540JE/cabb	Subaqueous, 12600-12650% slope
540JF/cabb	Subaqueous, 12650-12700% slope
540JG/cabb	Subaqueous, 12700-12750% slope
540JH/cabb	Subaqueous, 12750-12800% slope
540JI/cabb	Subaqueous, 12800-12850% slope
540JJ/cabb	Subaqueous, 12850-12900% slope
540JK/cabb	Subaqueous, 12900-12950% slope
540JL/cabb	Subaqueous, 12950-13000% slope
540JM/cabb	Subaqueous, 13000-13050% slope
540JN/cabb	Subaqueous, 13050-13100% slope
540JO/cabb	Subaqueous, 13100-13150% slope
540JP/cabb	Subaqueous, 13150-13200% slope
540JQ/cabb	Subaqueous, 13200-13250% slope
540JR/cabb	Subaqueous, 13250-13300% slope
540JS/cabb	Subaqueous, 13300-13350% slope
540JT/cabb	Subaqueous, 13350-13400% slope
540JU/cabb	Subaqueous, 13400-13450% slope
540JV/cabb	Subaqueous, 13450-13500% slope
540JW/cabb	Subaqueous, 13500-13550% slope
540JX/cabb	Subaqueous, 13550-13600% slope
540JY/cabb	Subaqueous, 13600-13650% slope
540JZ/cabb	Subaqueous, 13650-13700% slope
540KA/cabb	Subaqueous, 13700-13750% slope
540KB/cabb	Subaqueous, 13750-13800% slope
540KC/cabb	Subaqueous, 13800-13850% slope
540KD/cabb	Subaqueous, 13850-13900% slope
540KE/cabb	Subaqueous, 13900-13950% slope
540KF/cabb	Subaqueous, 13950-14000% slope
540KG/cabb	Subaqueous, 14000-14050% slope
540KH/cabb	Subaqueous, 14050-14100% slope
540KI/cabb	Subaqueous, 14100-14150% slope
540KJ/cabb	Subaqueous, 14150-14200% slope
540KK/cabb	Subaqueous, 14200-14250% slope
540KL/cabb	Subaqueous, 14250-14300% slope
540KM/cabb	Subaqueous, 14300-14350% slope
540KN/cabb	Subaqueous, 14350-14400% slope
540KO/cabb	Subaqueous, 14400-14450% slope
540KP/cabb	Subaqueous, 14450-14500% slope
540KQ/cabb	Subaqueous, 14500-14550% slope
540KR/cabb	Subaqueous, 14550-14600% slope
540KS/cabb	Subaqueous, 14600-14650% slope
540KT/cabb	Subaqueous, 14650-14700% slope
540KU/cabb	Subaqueous, 14700-14750% slope
540KV/cabb	Subaqueous, 14750-14800% slope
540KW/cabb	Subaqueous, 14800-14850% slope
540KX/cabb	Subaqueous, 14850-14900% slope
540KY/cabb	Subaqueous, 14900-14950% slope
540KZ/cabb	Subaqueous, 14950-15000% slope
540LA/cabb	Subaqueous, 15000-15050% slope
540LB/cabb	Subaqueous, 15050-15100% slope
540LC/cabb	Subaqueous, 15100-15150% slope
540LD/cabb	Subaqueous, 15150-15200% slope
540LE/cabb	Subaqueous, 15200-15250% slope
540LF/cabb	Subaqueous, 15250-15300% slope
540LG/cabb	Subaqueous, 15300-15350% slope
540LH/cabb	Subaqueous,

Appendix E: Inspection & Maintenance Manual

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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;

- 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 Inspection & 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 <i>(List Items/Comments)</i>	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 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.



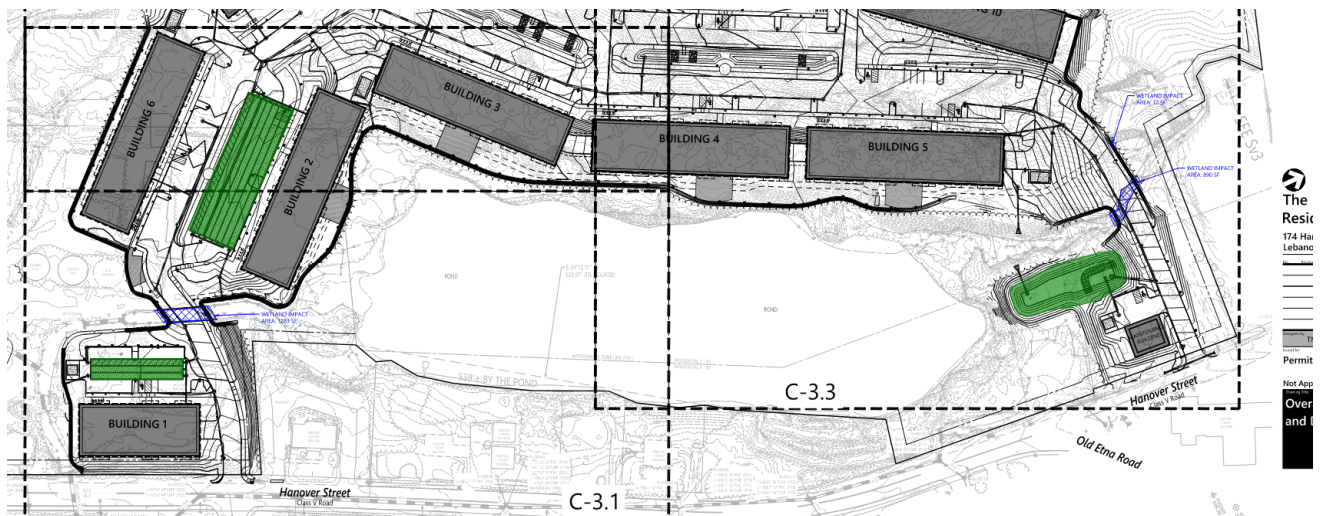
III. PFAS Sampling Data

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.



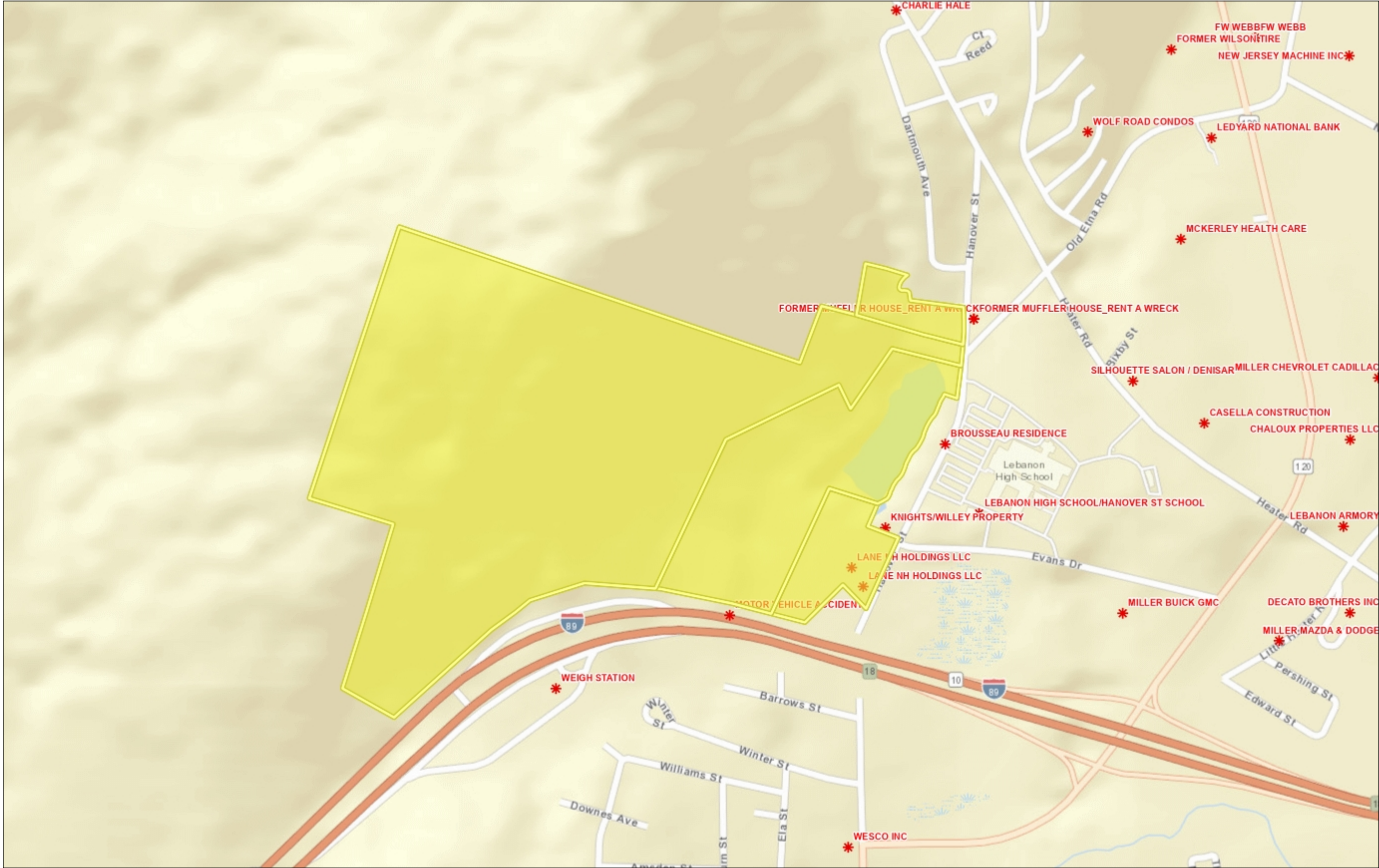


V. Potential Impacts

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.

0.3 0 0.14 0.3 Miles

WGS_1984_Web_Mercator_Auxiliary_Sphere
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THIS MAP IS NOT TO BE USED FOR NAVIGATION

8/5/2024

On-premise Use Facility Containing Fuel Oil Project Report

1 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

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
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**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	CERTIFICATE OF NO FURTHER ACTION & FILE CLOSE OUT MEMO	06/20/2000 .04 MB
4425180	REPORT TO DES	INITIAL RESPONSE ACTION REPORT 9-MAR-00	03/13/2000 .62 MB

12/21/1998	Initial Response Budget Received	CHWASCIAC	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	WORKSCOPE FOR INITIAL RESPONSE ACTION	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	CHWASCIAC	11/05/1997	Initial Response Budget Approved	

Activity Documents (1)

Document Type	Document Title	Document Date	File Size
4425182	WORKSCOPE/BUDGET	WORKSCOPE FOR CONTINUING PRODUCT RECOVERY AND ER WORK	11/05/1997 .09 MB

8/5/2024

On-premise Use Facility Containing Fuel Oil Project Report

3 of 5

Site Number: 199708025

Project Number: 0007212

Name and Address: BROUSSEAU RESIDENCE
200 HANOVER STREET
LEBANON

Responsible Party: TIM BROUSSEAU
LEBANON NH 03766

PHONE: 603-448-6503

[Mapit](#)

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

On-premise Use Facility Containing Fuel Oil Project Report

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	CHWASCIAC	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
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

No Vapor Recovery Information

8/5/2024

Hazardous Waste Generator Report

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

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

iscrepeny

8/5/2024

On-premise Use Facility Containing Fuel Oil Project Report

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
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

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
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**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	WORKSCOPE FOR SOIL REMOVAL AND RESTORATION	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	RESULTS OF TEST EXCAVATIONS 19-JAN-98	01/22/1998 .08 MB

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

No Vapor Recovery Information

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**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
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**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	BLED SOE	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	BLED SOE	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
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**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
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

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

	BLED SOE	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
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

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
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**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
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**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
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

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
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**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
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**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
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**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
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**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	

8/5/2024

Leaking Underground Storage Tank Project Report

13 of 13

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

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)	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

8/5/2024

Unsolicited Site Assessment (HWRB reviewed) Project Report

1 of 2

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	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	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

Eligibile:

Eligibilty Determined on:

MTBE: N

Brownfield: Y

No Vapor Recovery Information

8/5/2024

Underground Storage Tank Facility Report

1 of 2

Site Number: 198805017

System Name and Address: LANE NH HOLDINGS LLC
HANOVER ST EXT
LEBANON
[Mapit](#)

Registration Date: 04/16/2006

Facility Id: 0114000

Facility Owner: LANE NH HOLDINGS LLC
1660 BRADY CIRCLE
CARLSBAD CA 92008

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		

8/5/2024

Underground Storage Tank Facility Report

2 of 2

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

8/5/2024

Underground Injection Control Project Report

1 of 2

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

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

8/5/2024

Hazardous Waste Generator Report

1 of 3

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

8/5/2024

Hazardous Waste Generator Report

2 of 3

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:

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

8/5/2024

Hazardous Waste Generator Report

3 of 3

EPA Id: NHD510107642

Handler Id: 0006268

Current Name and Address: **BOISVERT EUGENE**
237 HANOVER ST
LEBANON

[Mapit](#)

Contact Information: **EUGENE BOISVERT**
2 PASTURE LN
WEST LEBANON NH 03784

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
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**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

8/5/2024

Leaking Underground Storage Tank Project Report

2 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

PHONE: 603-298-8482

[Mapit](#)

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

8/5/2024

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

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

8/5/2024

Leaking Underground Storage Tank Project Report

4 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

PHONE: 603-298-8482

[Mapit](#)

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
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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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	WORK SCOPE AUTHORIZATION FOR OFF-SITE WELL INSTALLATION	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	EMAIL REGARDING PROPOSED WELL LOCATIONS	03/04/2010 .04 MB
4220885	FIGURES	SITE PLAN DEPICTING PROPOSED WELL LOCATIONS	03/01/2010 .60 MB

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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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
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**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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8/5/2024

Leaking Underground Storage Tank Project Report

45 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

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
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	SITE INVESTIGATION REPORT 20-NOV-1997	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	SITE INVESTIGATION REQUEST	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	SITE INVESTIGATION REQUEST	08/04/1993	.05 MB

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**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
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**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
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**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
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**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	

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

Underground Storage Tank Facility Report

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

Site Number: 199308002

System Name and Address: FORMER MUFFLER HOUSE/RENT A WRECK
237 HANOVER ST
LEBANON

[Mapit](#)

Registration Date: 09/05/1996

Facility Id: 0114946

Facility Owner: EUGENE E BOISVERT
2 PASTURE LN
W LEBANON NH 03784

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

Suggested Edits for PB Meeting of September 16, 2024

p.3, lines 40: Change “sound proofing” to “soundproofing” (i.e. one word, no hyphen).

p.3, line 44: Insert “range” between “per month” and “(average \$1,300 or \$1,400 . . .”.

p.4, line 7: Change “an” to “and”.

p.4, line 31: Change “26” to “2026”.

p.4, lines 31-32: Change “. . . very little time to get the full understand what how active and substantial is defined today.” to “. . . very little time to gain a full understanding of how ‘active and substantial’ is defined today.” [The reference in single quotes is back to the end of the preceding paragraph, lines 23-24)

p.5, line 39: Insert “a” between “partial” and “waiver”.

p. 10, line 4: Change “engineer or record” to “engineer of record”.

p.12, line 41: Change “an” to **EITHER “a” OR “any”**.

p.13, line 1: Insert “be” between “not” and “because” (so as to read “. . . but could not be because there was not enough time.”).

DRAFT

**LEBANON PLANNING BOARD
COMMUNITY ROOM, KILTON LIBRARY OR
REMOTE VIA MICROSOFT TEAMS
LEBANONNH.GOV/LIVE
MONDAY, SEPTEMBER 16, 2024 6:30 PM**

MEMBERS PRESENT: Andrew Faunce (Chair), Richard Ford Burley (Vice Chair), Kathie Romano, Patrick Kennelly, Karen Zook (City Council Rep), Brandon Hill, Jeremy Rutter (REMOTE)

MEMBERS ABSENT: NONE

STAFF PRESENT: Tim Corwin (Deputy Planning Director), Brian Vincent (City Engineer)

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.

Mr. Rutter explained he was attending remotely because he is recuperating from knee replacement surgery. He said he was attending as an observer only and would not participate in any votes at this meeting.

2. NOTICE OF REGIONAL IMPACT

The following additional application was received by the Planning and Development Department on September 10, 2024:

- **XYZ Dairy, LLC, River Park Drive (Tax Map 44, Lots 21 - 30, and Tax Map 44, Lot 7), zoned CB, IND-L and R-3: Appeal of administrative decision made on September 10, 2024, that conditions 1, 2, 4, 5, 7 and 14-4 of the River Park development Site Plan approval as set forth in the Notice of Action dated September 9, 2019, for PB2018-34-SPA, have not yet been satisfied and, consequently, that construction of Phase 1 may not commence. PB2024-40-AAD**

Mr. Corwin said staff recommends the application does not have the potential for regional impact.

A MOTION was made by Richard Ford Burley that the application of XYZ Dairy, LLC, River Park Drive (Tax Map 44, Lots 21 - 30, and Tax Map 44, Lot 7), zoned CB, IND-L and R-3: Appeal of administrative decision made on September 10, 2024, that conditions 1, 2, 4, 5, 7 and 14-4 of the River Park development Site Plan approval as set forth in the Notice of Action dated September 9, 2019, for PB2018-34-SPA, have not yet been satisfied and, consequently, that construction of Phase 1 may not commence does not have the potential for regional impact.

The motion was seconded by Patrick Kennelly.

****The MOTION was approved (5-0, with Romano abstaining).***

3. PUBLIC HEARING ITEMS

A. The Muse Lebanon, LLC (applicant), City of Lebanon (property owner), 20 Spencer Street (Tax Map 92, Lot 31), zoned LD: Request for Site Plan Review for a proposed +/-76,064 sq. ft. multi-family building with 80 affordable housing units, together with parking, utilities, landscaping, access, and other related site improvements. Applicant also requests a Conditional Use Permit pursuant to Article III, Section 307.6.B.2 of the Zoning Ordinance to waive the requirement to reserve space within the street level story of the building for non-residential uses. PB2024-36-SPR

Mr. Corwin noted this is a continuation of the discussion that began at the September 09, 2024 Planning Board meeting.

Deputy City Manager David Brooks introduced the team: Mr. Steve Tamposi, Mr. Daniel Riggs, Mr. Nick Olen, and Mr. Jake Tamposi, who were present on behalf of the applicant.

Mr. Olen outlined the benefits of the project and reviewed the goals:

- Provide affordable housing
- Create spaces for artists
- Develop a site that is connects with the Spencer Street streetscape and the Rail Trail
- Construct a building that is sustainable and lasting

He said the building would be renovated into an apartment building with live/work units on the upper floors and an artist gallery space on the ground floor. He explained that live/work units would be larger than typical apartments to accommodate a dedicated artist workspace.

Ms. Romano asked what research had been done to decide one-, two-, or three-bedroom units. Mr. Jake Tamposi said the breakdown of units is driven by both the market need and by certain scoring categories for the financing application with New Hampshire housing, where the state of New Hampshire has a demonstrated need for certain types of units.

1 Mr. Olen said the building has to be located above the floodplain. He said the east side of the
2 building is most closely located to the floodplain on the property. The group discussed the
3 stormwater requirements of the property, given that it is a brownfield site, and how water
4 treatment may be provided.

5
6 Ms. Romano asked about the security at the gallery entrance, where public bench seating is
7 planned. Mr. Steve Tamposi said an onsite manager will be present and a fob system will be
8 installed for secure entry.

9
10 Mr. Ford Burley asked where the accessible parking spots will be located, noting some southern
11 facing areas of parking lots can get quite hot in the sun which is challenging for persons with
12 certain disabilities. He asked if these parking spots could be shaded or located in shaded areas.
13 Mr. Olen noted that EV spaces have been added to the plans.

14
15 Mr. Hill asked if the fire department has reviewed the parking and turnaround plans to ensure
16 emergency vehicles are able to navigate those spaces. Mr. Steve Tamposi confirmed the plans
17 had been reviewed by the fire department.

18
19 The group discussed the height of the first floor, and Mr. Corwin stated that, for this application,
20 the first floor height must meet the 12-foot minimum height and 10-foot minimum height for the
21 other floors. He said if the floor heights change during the evolution of the design, the project
22 team can amend the application by requesting a conditional use permit.

23
24 The group discussed the type of artistry work that might be conducted by the residents, and if
25 special conditioning might be required to accommodate these activities. Mr. Jake Tamposi said
26 the types of artistic endeavors that could take place in those units will be restricted by the
27 building code for residential use and good housekeeping in terms of property management. He
28 said it would be unlikely that a sculptor with a kiln would reside here because the leases wouldn't
29 allow that type of use. He said the space would have acoustical standards to ensure that sound
30 pollution will not transfer from one unit to another. Mr. Corwin discussed how art studio use can
31 be quantified as a permissible accessory use to multi-family dwelling use, but he said specific
32 uses may have to be reviewed by the zoning administrator to ensure compliance with zoning
33 ordinances. He said the studio would also qualify for a home business permit in a residential
34 zone, and he noted that Downtown Lebanon is not purely residential zoning.

35
36 Mr. Corwin said fire safety and ventilation needs that resulted from specific art activities would
37 be addressed in the building permit application. Mr. Tamposi noted that the interior design plans
38 have not been finalized yet.

39
40 Mr. Kennelly noted that sound proofing is not easy and can be expensive. Ms. Romano noted
41 that these kinds of elements may greatly increase the cost of the renovation and reminded the
42 group that these are intended to be affordable residential units. Mr. Tamposi said the rent and
43 total housing cost should be no greater than 30% of the resident's income, which he said, based
44 on their estimates, would fall in the \$600-\$2,000 per month (average \$1,300 or \$1,400 per
45 month).

1 Mr. Olen gave an overview of the traffic research they conducted and submitted with the plan.
2 The group discussed how traffic peaks on Bank Street between 9:00am and 10:00am (618 trips)
3 on Saturdays, which is higher than the determined peak hours 3:00pm-5:00pm (427). He said this
4 volume of traffic does not approach the highest use and therefore they are requesting a waiver of
5 the traffic study requirement. The group discussed things that may impact traffic during the
6 different seasons of the year, and other plans that the City already has for changes to the signage
7 an traffic flow in and around the Colburn Park area.

8
9 Mr. Corwin noted that the Lebanon Pedestrian & Bicycle Committee reviewed the plans and
10 submitted some recommendations:

- 11 1. Install a rapid flashing beacon at the crosswalk
- 12 2. Bring back Spencer Street stop sign at the CCBA curve
- 13 3. Make Parkhurst, Spencer, and Campbell Streets a three-way stop.
- 14 4. Make the Rail Trail Crossing safer by adding speed tables to Spencer Street, extend
15 blinking light signage, or raise the Northern Rail Trail crossing.

16
17 Mr. Corwin said these suggestions would have to be reviewed by DPW and some or all of these
18 suggestions could be made conditions of approval if the Board desires.

19
20 Mr. Olen said the team wants to ask for a three-year extension to align the timing for the project
21 deadlines better with the overall development agreement. Mr. Corwin said the Board does have
22 the ability under City regulations and state statute to extend the two-year active and substantial
23 development timeline up to five years. He said it can also change the definition of what
24 constitutes active and substantial development.

25
26 Mr. Brooks said under the development agreement that was negotiated and approved by the City
27 Council, the team must get all of its entitlements and funding lined up before closing on the
28 property. He said a funding application deadline is approaching in the next few weeks, and if
29 funding isn't secured in this round the team may have to wait a full 12 months to be able to apply
30 for the funding again (Fall of 2025). He said that may mean construction would not start until the
31 spring of 26, which leaves very little time to get the full understand what how active and
32 substantial is defined today.

33
34 Mr. Jake Tamposi said competition for these funds is very strong and typically New Hampshire
35 housing has only been doing one funding round for each type of project per year, so it is
36 beneficial to have a little bit more time because some projects apply several times before being
37 funded. He said having that flexibility and having certainty around entitlements is very important
38 to keep the project on track and make sure it continues to be competitive in both the current
39 round and any potential future rounds.

40
41 The group agreed to extend the two-year timeframe for obtaining a building permit to five years.

42
43 The group discussed the landscaping and stormwater management waivers that are being
44 requested. They also discussed the playground area that would be adjacent to the Rail Trail
45 corridor space. Mr. Brooks confirmed this proposal is not prohibited by the terms of the 2003
46 agreement that the City has with the state regarding the Rail Trail.

1 Chair Faunce opened the public comment portion of the meeting.

2
3 Ms. Meg Carlton (Hanover) said she is the owner of an abutting property to 20 Spencer Street.
4 She said there is nothing in the City codes that addresses the issue of hydrostatic pressure and
5 what it does to the floodplain. She said this is a very large building that will add hydrostatic
6 pressure on the groundwater. She said, after the Spencer Street improvements were made last
7 year, the area had its first flood in a very long time when water came up through the drain and
8 the road had to be closed. She said she did not know how the additional flows from this project
9 may affect that.

10
11 She also said the images of the renovated mill building look to her like a really attractive
12 concrete prison building and it doesn't appear to be a place where creative endeavors will take
13 place.

14
15 Mr. Brian Vincent said he believed the foundation will be a shallow spread footing foundation
16 for this project, and said he advised the project team to limit the foundation depth to five feet
17 because the water table is so shallow in the area. He recommended that the Board see a
18 geotechnical review of the hydrostatic pressure and the water table. He noted that the flooding
19 last year was from the Mascoma River and not from stormwater. He said the stormwater
20 management plan for this project was designed to minimize the risk of stormwater flow
21 coinciding with peak water surface elevation to prevent the rise in water through the drains.

22
23 Mr. Kennelly asked if any plans were being made for embodied energy in the materials for the
24 project. Mr. Olen said the primary focus was on affordability and keeping energy, heating, and
25 cooling costs low for residents.

26
27 Ms. Chris Hidari (Ward 3) noted that, currently, bikers on the Rail Trail often do not follow
28 speed limits or even good biking practices. She said if this project is going to add even more
29 traffic to the Rail Trail, some consideration should be made to address speed and unsafe biking
30 activities.

31
32 Chair Faunce closed the public comment portion of the meeting.

33
34 The group discussed the waiver requests that are part of the application. The group agreed to
35 waive the traffic study requirement in favor of adding some of the suggestions of the Ped & Bike
36 committee.

37
38 ***A MOTION was made by Richard Ford Burley that, for the application of The Muse Lebanon,***
39 ***LLC, PB2024-36-SPR, the Lebanon Planning Board approves partial waiver for Section***
40 ***5.1.G.2 in light of the discussion at the meeting.***

41
42 ***The motion was seconded by Kathie Romano.***

43
44 ****The MOTION was approved (6-0).***

1 *A MOTION was made by Richard Ford Burley that, for the application of The Muse Lebanon,*
2 *LLC, PB2024-36-SPR, the Lebanon Planning Board approves partial waivers for the*
3 *following Sections of the Site Plan Regulations:*

- 4
- 5 *• Section 6.2.B.1.a – perimeter landscaping requirements*
- 6 *• Section 6.2.B.4 – requiring all trees to be planted a minimum of 8 ft. from any property line*
- 7 *• Section 6.2.B.6 – additional buffer requirements*
- 8 *• Section 6.2.D.1 – landscaping around buildings requirements*
- 9 *• Section 6.6.C.1.2.K – requiring test pit data for stormwater management design*
- 10 *• Section 6.6.G – stormwater management design standards for redevelopment*
- 11

12 *The motion was seconded by Kathie Romano.*

13

14 **The MOTION was approved (6-0).*

15

16

17 At 8:44pm, Mr. Hill left the meeting.

18

19

20 *A MOTION was made by Richard Ford Burley:*

21 *At duly-noticed meetings of the Lebanon Planning Board held on September 9, 2024 and*
22 *September 16, 2024, there appeared representatives on behalf of The Muse Lebanon, LLC*
23 *(applicant) and the City of Lebanon (property owner) regarding 20 Spencer Street (Tax Map*
24 *92, Lot 31), zoned LD, requesting a Conditional Use Permit per Section 307.6.B.2 of the Zoning*
25 *Ordinance to waive the requirement that a portion of the street level story of the proposed multi-*
26 *family building is reserved for a non-residential use. PB2024-36-SPR,*

27

28 ***I. FINDINGS OF FACT***

29 *Based on testimony given, application materials presented, and supporting documents*
30 *submitted, the Planning Board makes the following findings of fact:*

- 31 *1. The Muse Lebanon, LLC proposes to redevelop the subject property with a +/-76,064 sq.*
32 *ft. multi-family building containing 80 affordable dwelling units.*
- 33
- 34 *2. Pursuant to Section 307.6.B.1, a portion of the street level story of the new building at*
35 *the subject property is required to be reserved for non-residential uses.*
- 36
- 37 *3. Pursuant to Section 307.6.B.2, the applicant requests a Conditional Use Permit to waive*
38 *the requirements of Section 307.6.B.1.*
- 39
- 40 *4. In order to grant the requested Conditional Use Permit, the Board must find the*
41 *applicant's proposal satisfies the Enhanced Performance Standards set forth in Section*
42 *302.4.D as well as the specific requirements of Section 307.6.B.2.*
- 43

44 ***II. CONCLUSIONS OF LAW***

45 *As a result of the above findings of fact and based on testimony given, application materials*
46 *presented, and supporting documents submitted, the Planning Board concludes the following*

1 *with respect to the Enhanced Performance Standards set forth in Section 302.4.D and the*
2 *criteria set forth in Section 307.6.B.2 of the Zoning Ordinance:*

- 3 1. *The site is suitable for the proposal. (§302.4.D.1)*
- 4 2. *The external impacts of the proposed use on abutting properties and the neighborhood*
5 *are commensurate with the impacts of adjacent existing uses or other uses permitted in*
6 *the zoning district. (§302.4.D.2)*
- 7 3. *The proposal does satisfy the criteria of Section 302.4.D.3*
- 8 4. *The proposal does satisfy the criteria of Section 302.4.D.4*
- 9 5. *The proposal does satisfy the criteria of Section 302.4.D.5*
- 10 6. *Non-residential uses on the street level story are not inappropriate given the unique*
11 *characteristics of the subject property. (Section 307.6.B.2.a)*
- 12 7. *The proposal does provide improvements to streetscapes, public ways, or public spaces*
13 *that implement recommendations for downtown Lebanon in current plans, policies, or*
14 *programs adopted by the City of Lebanon including but not limited to the Master Plan,*
15 *Downtown Visioning Study, and the Capital Improvement Program. (Section*
16 *307.6.B.2.b)*
- 17 8. *The proposal does include a high-quality design with attention to architectural quality*
18 *and detail, universal accessibility, and/or environmental sustainability. (Section*
19 *307.6.B.2.c)*

20 21 **III. DECISION**

22 *Now therefore be it resolved that the Planning Board, on this 16th day of September, 2024,*
23 *hereby grants the request of The Muse Lebanon, LLC for a Conditional Use Permit per Section*
24 *307.6.B.2, as set forth above and per testimony, plans, and materials submitted.*

25 *The motion was seconded by Kathie Romano.*

26
27 **The MOTION was approved (6-0).*

28 29 30 **MOTION ON THE SITE PLAN APPLICATION**

31 *A MOTION made by Richard Ford Burley that the Lebanon Planning Board approve the*
32 *application of The Muse Lebanon, LLC (applicant) and the City of Lebanon (property owner),*
33 *regarding 20 Spencer Street (Tax Map 92, Lot 31), zoned LD, PB2024-36-SPR, for Site Plan*
34 *approval to construct a +/-76,064 sq. ft. multi-family building with 80 affordable housing units,*
35 *together with parking, utilities, landscaping, access, and other related site improvements as*
36 *shown on a plan set titled "Muse Apartments," prepared by TFMoran, Inc., dated August 12,*
37 *2024, last revised August 26, 2024, File 96202.01, including any and all submissions and*
38 *testimony provided for and during the public hearing.*

39 *In support of its decision, the Board finds that the applicant has submitted plans, testimony,*
40 *technical data, information, reports, and studies that together satisfactorily demonstrate*
41 *compliance with the applicable requirements of the Site Plan Review Regulations, except as may*
42 *reasonably be addressed through the imposition of certain conditions of approval, set forth*
43 *below, and except as may have been waived pursuant to Section 7.1.*

44 *This approval is subject to the following conditions:*

General Conditions

- 1. It shall be the applicant's responsibility to be familiar with and aware of these conditions of approval, and it shall be the applicant's responsibility to satisfy these conditions of approval and to satisfy them within the relevant timeframes outlined below.**
- 2. The development is subject to the Site Plan Review Regulations adopted May 13, 1991, last revised January 23, 2023, and the Zoning Ordinance adopted January 16, 2013, last amended April 3, 2024, which are the regulations in effect at the time the application was submitted.**
- 3. A building permit must be applied for and issued within three and a half (3.5) years of the date of this approval (4.10.A), subject to an extension if applied for by the applicant and if approved by the Planning Board per Section 4.10.B. This extension of 1.5 years from the usual two is granted by the Board due to the nature and timeline of the funding cycle for affordable housing grants from the New Hampshire Housing Finance Authority.**
- 4. "Active and substantial development," as defined in Section 8.4.A.1 of the Site Plan Review Regulations, shall be achieved within five (5) years of the date of this approval (8.4.A.2). If active and substantial development is not achieved within five (5) years of the date of the Planning Board's approval, the development shall be subject to any changes in the City's land use regulations. This extension of three years from the usual two is granted by the Board due to the nature and timeline of the funding cycle for affordable housing grants for the New Hampshire Housing Finance Authority.**
- 5. "Substantial completion," as defined in Section 8.4.B.1 of the Site Plan Review Regulations, shall be achieved within five (5) years of the date of this approval. If substantial completion is not achieved within five (5) years of the date of the Planning Board's approval, the development shall be subject to any changes in the City's land use regulations.**
- 6. 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.**
- 7. The applicant shall implement and maintain NHDES Site Specific Best Management Practices before, during, and after construction.**
- 8. Prior to the start of any construction activities on the property, erosion control measures, including edge-of-disturbance fencing if applicable, shall be installed and maintained before and during any site work, to be verified by the City Engineer or City's third-party inspector on site.**
- 9. The property owner is responsible for the maintenance and operation of the stormwater management system in accord with the O&M plan, and such responsibility shall run with the land. (Section 6.6.H.2.b of the Site Plan Review Regulations).**
- 10. All service areas and facilities, including garbage and waste disposal containers, recycling bins, electrical and mechanical equipment such as transformers and compressors, meter clusters, and other utility elements must be screened in accordance with Section 6.2.B.8 and Section 6.10.B.5 of the Site Plan Review Regulations.**

Conditions to be Satisfied Prior to Application for a Building Permit and Prior to the Start of Any Construction Activities

- 1 **11. Within 45 days of the Planning Board's approval, the applicant shall address comments**
2 **set forth in the memo dated September 9, 2024, from Duane Egner, Lebanon Fire**
3 **Inspector, to the satisfaction of the Fire Department.**
- 4 **12. Within 45 days of the Planning Board's approval, the applicant shall make the following**
5 **revisions to the plan set to the satisfaction of the Planning and Development Department**
6 **and the City Engineer:**
- 7 a) **Any changes made pursuant to Condition of Approval #11 above.**
 - 8 b) **Depict all off-site information required by Sections 5.1.E.7, 9, and 17, within 200**
9 **ft of the site.**
 - 10 c) **Provide that all curbing shall be granite as required by Section 6.5.F.1.**
 - 11 d) **Add plan note regarding the groundwater management permit for the property**
12 **and any ongoing monitoring and reporting requirements.**
 - 13 e) **On the cover sheet:**
 - 14 i. **Identify the proposed use and the maximum number of permitted parking**
15 **spaces per Section 607 of the Zoning Ordinance.**
 - 16 ii. **Add sheet numbers to Table of Contents and add sheet numbers in the**
17 **lower right-hand corner of all plan sheets with a prominent font size.**
 - 18 f) **On the existing conditions plan, confirm/clarify use of "floodway" terminology**
19 **and associated elevations.**
 - 20 g) **On Sheet C-05 (or additional plan sheet):**
 - 21 i. **Remove snow storage areas that overlap with handicap accessible**
22 **signage.**
 - 23 ii. **Add dashed line on the inside of the curb to the legend.**
 - 24 iii. **Add note indicating that on-site hydrant(s) will be dedicated to the City**
25 **for ownership and maintenance.**
 - 26 h) **On Sheets C-05 through C-10, depict outline of entrance features.**
 - 27 i) **On Sheet C-05 or additional plan sheet, delineate easement area to be conveyed**
28 **to the City for the purpose of maintaining the sidewalk (if deemed necessary by**
29 **the City's legal counsel) and the on-site hydrant(s), and for the purpose of**
30 **accessing the water shut-off valve.**
 - 31 j) **On Sheet C-06, amend Note 2 to provide that replacement of pipe shall require**
32 **coordination with and approval by the City Engineer.**
 - 33 k) **On Sheet C-10:**
 - 34 i. **Provide landscaping for the freestanding sign as required by Section**
35 **608.4.A.4.b.i of the Zoning Ordinance.**
 - 36 l) **On Sheet A-200:**
 - 37 ▪ **Amend to demonstrate compliance with the minimum story height**
38 **requirements of Section 307.8.C of the Zoning Ordinance.**
 - 39 ▪ **Identify length/width measurements for each elevation.**
 - 40 m) **Amend the cover sheet to provide description of plan revisions (5.1.E.4.d).**
- 41 **The applicant shall provide the Planning and Development Department with one (1) full**
42 **size copy of the revised plan set, and a digital copy of the revised plan set saved in a PDF-**
43 **A format for archival purposes.**
44

13. *The applicant shall obtain a Floodplain Permit from the Floodplain Administrator and shall verify with the Building Inspector that development complies with the applicable floodplain-related requirements of the Building Code.*
14. *The applicant shall provide a letter or certification from the engineer or record or other qualified design professional confirming that the approved plan set meets the accessibility standards of the State of New Hampshire Building Code.*
15. *The applicant shall schedule and hold a pre-building permit application meeting with the Planning and Development Department, City Building Inspectors, City Engineer/Department of Public Works, and Fire Department, in order to help streamline the building permit review process and to review applicable code requirements.*
16. *The applicant shall obtain approval from the City Council or the City Manager's office for any additional water and/or sewer flows in accordance with the applicable Chapter 136 and 182 of the City Code.*
17. *All engineering review fees shall be paid in full as required by Section 4.7.E.1 of the Site Plan Review Regulations.*
18. *The applicant shall apply to the Department of Public Works for an Excavation Permit, Driveway Permit, and Stormwater Permit.*

Conditions to be Satisfied Prior to the Issuance of a Building Permit

19. *Prior to the start of any construction activities on the property, the applicant shall record in the Grafton County Registry of Deeds notice of the stormwater management and erosion and sediment control plans as required per Section 6.6.H.2.d of the Site Plan Review Regulations. Such notice shall be reviewed by the Planning & Development Department prior to recording.*
20. *Prior to the start of any construction activities on the property 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 third-party inspector, for which the applicant shall be responsible for all inspection fees related to (a) on-site work related to sewer, water, temporary sedimentation and erosion control, and drainage improvements, and (b) all off-site work within the City's right-of-way (including but not limited to water, sewer, driveways, drainage), in accordance with Section 8.2 of the Site Plan Review Regulations. The applicant shall provide funding for inspection services in a form and amount acceptable to the City and shall sign an Infrastructure Inspection Agreement.*
21. *The development shall be subject to City of Lebanon Impact Fees, pursuant to Section 213 of the Zoning Ordinance. The Impact Fee shall be calculated at the time of Building Permit issuance based on the Impact Fee Schedule adopted on May 20, 2024. 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.*
22. *All water and sewer fees shall be paid as set forth in City Code Chapter 68.*

- 1 **23. The applicant shall obtain from the Department of Public Works an Excavation Permit,**
2 **Driveway Permit, and Stormwater Permit.**
3 **24. Prior to the start of any construction activities on the property, the applicant shall obtain**
4 **or update (if appropriate) any required Federal or State approvals, including but not**
5 **limited to:**
6 **a) EPA Stormwater Pollution Prevention Plan (SWPPP)**
7 **b) NHDES Sewer Connection Permit**
8

9 **Conditions to be Satisfied Prior to the Issuance of a Certificate of Occupancy**

- 10 **25. The applicant shall enter into an agreement with the City of Lebanon and the State of**
11 **New Hampshire for the construction of the proposed 2,560 sq. ft. playground depicted**
12 **on the Site Layout Plan sheet, dated August 12, 2024, last revised August 26, 2024,**
13 **prepared by TFMoran, Inc., File 96202.01.**
14 **26. The applicant shall grant an easement or other authorization to the City in a form**
15 **acceptable to the Department of Public Works to access the on-site water shut-off valves**
16 **and, if deemed necessary by the City's legal counsel, to maintain the sidewalk along the**
17 **property frontage.**
18 **27. The applicant shall dedicate the on-site hydrant(s) to the City for ownership and**
19 **maintenance, subject to appropriate easements. Said conveyance and easements shall be**
20 **approved by the City Attorney and the Department of Public Works and recorded in the**
21 **Grafton County Registry of Deeds. The applicant shall also dedicate the sidewalk along**
22 **the property frontage for ownership and maintenance if deemed necessary by the City's**
23 **legal counsel.**
24 **28. The impact fee calculated pursuant to Condition of Approval #21 shall be paid.**
25 **29. Third-party engineer or design engineer inspection reports and contractor as-built**
26 **drawings provided by the applicants (PDF format and CAD .dwg format, using the NH**
27 **State Plane Coordinate System), including tie sheets, shall be reviewed and approved by**
28 **the City Engineer.**
29 **30. All improvements depicted on the plan shall be completed, and shall be constructed as**
30 **depicted on the approved plan, including any modifications to the plan as may be**
31 **approved by the Planning Board in accordance with the Site Plan Review Regulations.**
32 **31. The applicant shall work with the Department of Public Works to evaluate the feasibility**
33 **and desirability of implementing Recommendation 2A or 2B from the Pedestrian and**
34 **Bicyclist Advisory Committee included in the staff memo prepared for the 9/16/24**
35 **meeting and shall be responsible for implementing any such recommendations in**
36 **accordance with required city procedures.**
37

38 **The motion was seconded by Patrick Kennelly.**

39
40 ***The MOTION was approved (5-0).**
41

42 At 8:56pm, Chair Faunce called a three-minute recess.

43 At 9:05pm, the meeting resumed.

44 **9. OTHER BUSINESS**

A. Review of DRAFT Housing Opportunity Planning (HOP) Grant Support Letter

Chair Faunce shared a draft of the HOP Grant Support letter. Mr. Corwin said this grant is being sought to fund a consultant to help the Lebanon Housing Task Force update the Housing Chapter of the Master Plan.

*A MOTION was made by Richard Ford Burley to authorize Andrew Faunce as the Chair of the Lebanon Planning Board to sign the Housing Opportunity Planning (HOP) Grant Support Letter on behalf of the Lebanon Planning Board.
The motion was seconded by Kathie Romano.*

**The MOTION was approved (5-0).*

B. Planning Board Representative to the Lebanon Housing Task Force

Chair Faunce said he has an interest in the goals of the committee, but he would support another member who may also have an interest in working on the committee.

A MOTION was made by Richard Ford Burley to nominate Andrew Faunce as the Planning Board Representative to the Lebanon Housing Task Force.

The motion was seconded by Kathie Romano.

**The MOTION was approved (5-0).*

10. APPROVAL OF MINUTES

August 6, 2024 Site Walk

August 7, 2024 Site Walk

August 12, 2024 Meeting

A MOTION was made by Richard Ford Burley to approve the August 6, 2024 and August 7, 2024 Site Walk Minutes, and the August 12, 2024 Meeting Minutes as amended.

The motion was seconded by Patrick Kennelly.

**The MOTION was approved (5-0).*

Mr. Corwin shared these reminders:

- At the City Council meeting on Wednesday, September 18, 2024 the results of the Route 120 Corridor study and findings of the Pattern Zone project will be presented. Mr. Corwin encouraged members of the Board to attend
- The Planning Board agenda for the September 23, 2024 work session will include zoning amendments related to the outcomes of the Route 120 Corridor Study and the Pattern Zoning project
- The Housing and Economy Conference will be held on October 23, 2024 by the New Hampshire Housing Authority. He said the Planning Department will cover the registration fee for an Planning Board member who would like to attend

Mr. Corwin asked if the Board would be willing to meet at a special meeting on September 30, 2024 to discuss the application for One Foundry Street, Applicant LWM Residential LLC, which

1 was supposed to be heard at the September 09, 2024 meeting but could not because there was not
2 enough time. The group agreed to hold the September 30, 2024 meeting at 6:30pm in Council
3 Chambers.

4
5 At 9:22pm, Mr. Hill rejoined the meeting.

6
7 **11. ADJOURNMENT**

8
9 *A MOTION was made by Richard Ford Burley to adjourn the meeting at 9:23pm.*
10 *The motion was seconded by Brandon Hill.*

11
12 **The MOTION was approved (6-0).*

13 The meeting was adjourned at 9:23pm.

14
15 Respectfully submitted,
16 Paula Roux
17 Recording Secretary
18

Suggested Edits for PB Meeting of September 23, 2024

p.2, line 42: Change “that additional Planning Boar review is required, or a new conditional use permit is required.” to “**whether** additional Planning **Board review or a new conditional use permit may be required.**”

p.3, line 15: Change “. . . commercial building to the City’s assessing records.” to “. . . commercial building **in** the City’s assessing records.”

p.3, line 44: Change “is” to “**are**” [subject of sentence is “The external impacts”].

p.4, line 3: Change “is” to “**are**” [subject of sentence is “The criteria”].

p.5, line 15: Insert hyphen between “decision” and “making” (i.e. change to “**decision-making**”).

p.5, line 4: Change “Proc” in heading to “**Procedures**”.

p.5, lines 30-32: Change “Mr. Corwin said it may not be helpful for the Board to review the projects that this point be3causwe the information may be subject to change over the next two months because the Planning Department provides comments and asks questions so the information changes as departments address Staff input.” to “Mr. Corwin said it may not be helpful for the Board to review the projects **at this point. The information** may be subject to change over the next two months because the Planning Department provides comments and asks **questions,** so the information changes as departments address Staff input.”

p.5, line 43: Change “. . . so understand what is happening as it is happening and said the Board did not realize . . . “ to “. . . so **as to** understand what is happening as it is **happening. He noted that the Board** did not realize . . . “.

p.6, line 2: Change “they” to “**the Board**”.

p.6, lines 9-10: Change “. . . but is often what may drives how the CIP list develops and changes because grant opportunities may arise. Mr. Reichert also said what the City really wants . . . ” to “. . . but is often what may **drive** how the CIP list develops and changes because grant opportunities may arise. Mr. Reichert also **noted that** what the City really wants . . . ”.

p.6, lines 17-19: “Mr. Corwin said it is a recommendation that Form 1 (description of project) and Form 2 (financial information – cost and how funded).” **INCOMPLETE AND UNINTELLIGIBLE SENTENCE**

p.6, line 28: Change “he sent” to “**he had circulated**”.

p.7, line 16: “Change “he was” to “**she had been**”.

p.7, lines 17-19: Change “two active members resigned” to “two active members **had** resigned” [17]. Capitalize “Committee” three times to conform with usage of the term in lines 13 and 16; insert “**finally**” after the first of these capitalizations.

p.7, line 28: Insert “General Commercial 1” after “GC1” (to conform with parenthesis after CBD in preceding line).

p.7, lines 30-31: Capitalize zoning designations for General Commercial and Light Industrial (three times in these two lines).

p.7, lines 37-39: “Mr. Reichert said rezoning the area around the proposed Central Business District at GC1 give the area a more neighborhood feel and a centralized downtown. He said feedback from residents is that the area currently doesn’t have a sense of place and allowing the central business district zoning should promote that type of development (similar to Downtown Lebanon).” Change to “Mr. Reichert said rezoning the area around the proposed Central Business District to General Commercial 1 will give the area more of a neighborhood feeling as well as a centralized downtown. He said feedback from residents is that the area currently doesn’t have a sense of place and allowing the Central Business District zoning should promote that type of development (similar to Downtown Lebanon).”

p.8, line 10: Change “preserved” to “conserved”.

p.8, line 16: Insert “the” between “cover” and “entirety”.

p.8, line 21: Change “residential single and multi-family” to “residential single- and multi-family”.

p.8, line 23: Change “. . . as a model . . .” to “. . . as models to . . .”.

p.8, line 31: Change “Develop an incorporate . . .” to ““Develop and incorporate . . .”.

p.8, line 39: Change “Reduce the size required for a lot & Reduce setback requirements” to “Reduce the size required for a lot and reduce setback requirements”.

p.8, line 42: Change “He said one question is whether the City should require owners . . .” to “He said one question that remains unresolved is whether the City should require owners . . .”

DRAFT

**LEBANON PLANNING BOARD
CITY COUNCIL CHAMBERS OR
REMOTE VIA MICROSOFT TEAMS
LEBANONNH.GOV/LIVE
MONDAY, SEPTEMBER 23, 2024 6:30 PM**

MEMBERS PRESENT: Andrew Faunce (Chair), Richard Ford Burley (Vice Chair), Kathie Romano, Patrick Kennelly, Karen Zook (City Council Rep), Brandon Hill, Jeremy Rutter (REMOTE), Kellan Appleton

MEMBERS ABSENT: NONE

STAFF PRESENT: Tim Corwin (Deputy Planning Director), Nate Reichert (Director of Planning & Development / Zoning Administrator), Catheryn Hembree (Associate Planner)

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.

Mr. Rutter and Ms. Zook said they were attending as members of the public and would not participate in any votes.

2. PUBLIC HEARING ITEMS

- **Jennifer Caine Russell & Nick Russell (applicants), Spencer Street Storage, LLC (property owner), 10 Spencer Street (Tax Map 92, Lot 33), zoned LD: Applicants request a Conditional Use Permit pursuant to Article III, Section 307.2 of the Zoning Ordinance to allow an art studio use within the existing building. PB2024-37-CUP**

A MOTION was made by Richard Ford Burley that the application of Jennifer Caine Russell & Nick Russell (applicants), Spencer Street Storage, LLC (property owner), 10 Spencer Street (Tax Map 92, Lot 33), zoned LD is complete enough for the Planning Board to accept jurisdiction and commence review. The Motion was seconded by Kathie Romano.

**The MOTION was approved (6-0).*

Mr. Corwin said the applicant is requesting a conditional use permit for a proposed art studio use

1 at 10 Spencer St., which just happens to be next door to another application that the Board
2 recently decided for a multifamily development at 20 Spencer St., also for art studio use. He
3 noted the use is allowed by conditional use permit, provided that the applicant demonstrates
4 compliance with the applicable criteria. He read the criteria set forth in Section 302.d.4 of the
5 zoning ordinance. He noted this Conditional Use Permit request does not automatically trigger a
6 site plan review, but the Board could require it if it desires. Mr. Corwin said a site plan (with
7 proposed improvements) had been submitted earlier in the day and had not been fully reviewed
8 by Staff.

9
10 Mr. Frank J. Barrett (Jay) was present on behalf of the client. He said he is the architect on the
11 project. Mr. Nicholas Russell, Ms. Jennifer Cane Russell, and Mr. Enrico Riley were also present
12 as the applicants. Mr. Russell said Ms. Russell and Mr. Riley would occupy 50-60% of the
13 building and rent the rest to two or three other tenants. He said their plan is to fully renovate and
14 restore the building.

15
16 Mr. Ford Burley gave a brief history of the building at 10 Spencer Street. Mr. Barrett gave an
17 overview of the design plans for the renovation. The group discussed landscaping and parking
18 spaces planned as part of the project.

19
20 Ms. Romano said a roof overhang over the loading dock area, which was included in previous
21 plan documents but not in the plans currently submitted for this meeting, will be included. Mr.
22 Barrett said the overhang may not be included in the final plans.

23
24 Ms. Romano noted a down staircase which seems to lead to a basement and asked whether the
25 floodplain impacted the project plans. Mr. Corwin said a Building Permit and a Flood Plain
26 Permit will be required. Mr. Reichert gave an overview of the requirements for the building code
27 for flood zone work. Mr. Barrett said flood vents may be added, if needed, or the owners may
28 discontinue use of the basement, based on the decision of the Building Inspector.

29
30 Mr. Ford Burley asked if the building would have a storefront or a display in the front of the
31 building. Mr. Russell said the building is not intended as a gallery space but for office use.

32
33 Chair Faunce opened the public comment portion of the hearing.

34
35 Mr. Reichert asked what type of art would be created in the building and asked about the
36 processes and materials that might be used. Mr. Russell said drawing and painting are the types
37 of art anticipated and that non-toxic paint would be utilized.

38
39 Chair Faunce asked Mr. Corwin what if the artistic use of the space changed over time. Mr.
40 Corwin said the zoning administrator would determine whether the change in the use is
41 consistent with the conditional use permit approval given by the Planning Board and can decide
42 that additional Planning Board review is required, or a new conditional use permit is required. He
43 said the Planning Board could make it a condition of approval. The group discussed at length
44 whether changes in artist activity would be governed by the Planning Board's condition of
45 approval or if that is already regulated by the Building Code. Mr. Corwin suggested using
46 language from the anti-nuisance provisions in Section 212.1 of the Zoning Ordinance.

The following MOTION was made by Richard Ford Burley:

On September 23, 2024, at a duly-noticed meeting of the Lebanon Planning Board, there appeared applicants Jennifer Caine Russell & Nick Russell and their representative, Jay Barrett, AIA, of Barrett Architecture, regarding 10 Spencer Street (Tax Map 92, Lot 33), zoned LD, requesting a Conditional Use Permit pursuant to §307.2 of the Zoning Ordinance to allow an art studio use within the existing building. PB2024-37-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 subject property is +/-0.31 acres and is improved with a 13,503 sq. ft. (gross) one-story commercial building to the City's assessing records. According to the applicant, the building is currently vacant.*
- 2. The prior use of the building was a "rug cleaning" business which was approved by Special Exception from the Zoning Board of Adjustment on January 17, 1996 (ZB92-33-96).*
- 3. The applicant now proposes to utilize the building for a proposed "art studio" use.*
- 4. "Art studio" – an undefined use - is allowed in the Lebanon Downtown (LD) District by Conditional Use Permit from the Planning Board pursuant to Section 307.2 of the Zoning Ordinance.*
- 5. Per Section 302.4.B of the Zoning Ordinance, the Planning Board may grant a Conditional Use Permit if it finds that the proposal meets the Enhanced Performance Standards set forth in Section 302.4.D.*
- 6. The applicant submitted testimony addressing the Section 302.4.D criteria in a letter from Frank J. Barrett, AIA, of Barrett Architecture, dated August 11, 2024.*

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:

- 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)*

- 1
2 **3. The criteria set forth in Section 302.4.D.3, 4 and 5 relate to new building construction and,**
3 **since no new building construction is proposed, is inapplicable to the subject application.**
4
5

6 **III. DECISION**
7

8 ***Now therefore be it resolved, the Planning Board, on this 23rd day of September, 2024, hereby***
9 ***grants the request of Jennifer Caine Russell & Nick Russell for a Conditional Use Permit per***
10 ***Section 307.2 of the Zoning Ordinance to allow an art studio use within the existing building***
11 ***at 10 Spencer Street (Tax Map 92, Lot 33) as set forth above and per testimony, plans, and***
12 ***materials submitted, and per the following conditions:***
13

- 14 **1. The applicant shall obtain a zoning permit and building permit from the Planning &**
15 **Development Department.**
16
17 **2. Prior to applying for a zoning permit and building permit, the applicant shall provide a**
18 **site plan to the Planning & Development Department which shall be substantially**
19 **similar to the site plan submitted by the applicant at the public hearing in order to**
20 **determine compliance with the Zoning Ordinance and to make a site plan review**
21 **jurisdictional determination per Section 3.1 of the Site Plan Review Regulations.**
22
23 **3. Prior to application for a zoning permit and building permit, the applicant shall revise**
24 **the floor plan for consistency with the site plan, as may be amended per condition of**
25 **approval #2.**
26
27 **4. The applicant shall apply for a floodplain permit at the time of application for a zoning**
28 **permit and building permit.**
29
30 **5. Prior to issuance of a Certificate of Occupancy, the applicant shall make the**
31 **improvements as shown on the site plan submitted by the applicant at the public**
32 **hearing, as may be amended per condition of approval #2.**
33
34 **6. Impact fees calculated pursuant to Section 213 of the Zoning Ordinance shall be**
35 **assessed prior to the issuance of a zoning permit and shall be paid prior to the issuance**
36 **of a Certificate of Occupancy.**
37
38 **7. The art studio use may occupy the entire building or any portion thereof.**
39
40 **8. The art studio use shall not emit noise, odors, dust, and smoke that is obnoxious,**
41 **harmful or a nuisance to abutting properties or the neighborhood.**
42

43 ***The Motion was seconded by Kathie Romano.***
44

45 ****The MOTION was approved (6-0).***
46

1 Chair Faunce introduced Kellan Appleton as a regular member of the Planning Board.

2
3 **3. STUDY ITEMS**

4 **A. CIP Policies & Proc Discussion**

5
6 Chair Faunce said the Board had suggested a few changes to the CIP process:

- 7 • Have materials submitted to the Board in time enough for review & to identify questions /
8 areas for discussion
9 • Board to schedule a second meeting with those departments with which the Board has those
10 interests
11 • Encourage / require information of the ongoing expense of the improvement to help City
12 Council better understand ongoing implications / costs carried by either taxes or fees
13 • Provide the Board with the “spend” over the last three years from the CIP to know how much
14 of the activity actually happens
15 • Make the Board’s time for decision making an opportunity for comment from the Board to
16 the City Council
17

18 Chair Faunce suggested the group discuss the process step by step.
19

20 **Step 1: January Planning Board Work Session – Prepare preliminary CIP project list**

21 Chair Faunce noted this Planning Board has not been doing this step.
22

23 **Step 2: End of March/early April – Delivery of CIP instructions to City Staff Department Heads**

24 Departments provide all CIP projects and complete Forms 1&2
25
26

27 **Step 3: Mid-May – Submission of CIP projects to City Manager/Planning & Development Department**

28 The suggestion was made that the Planning Board could receive this information at this time as
29 well. Mr. Corwin said it may not be helpful for the Board to review the projects at this point
30 because the information may be subject to change over the next two months because the
31 Planning Department provides comments and asks questions so the information changes as
32 departments address Staff input. He suggested that a project list be provided to the Board to be
33 discussed at the May Planning Board work session.
34
35

36 **Step 4: Late June: Planning Director, City Manager, Finance Director meet to discuss CIP items**

37 It was suggested that a member of the Planning Board could be included in that meeting. Mr.
38 Corwin said he would present the idea to the City Manager’s office and get feedback and provide
39 a response at the next Planning Board work session.
40
41

42 Mr. Ford Burley said he’s thinking of ways the Planning Board could follow the process more
43 closely so understand what is happening as it is happening and said the Board did not realize
44 how the process worked by the time it got involved in the process last year.
45

Mr. Corwin explained why the process had been streamlined in the past to the steps currently used. He said they could review the way the rules and procedures were written prior to the revisions in April 2023. He expressed concern over balancing the work the Board must do at its regular meeting with the additional time it will need to be more involved in the CIP process.

Ms. Romano asked how many new items appear on the list that were not on previous lists. Mr. Corwin said he could analyze the past lists, but he said there are maybe four or five new projects each year. The group discussed how funding CIP projects is not in the purview of the Planning Board but is often what may drives how the CIP list develops and changes because grant opportunities may arise. Mr. Reichert also said what the City really wants to get done will get prioritized on the list.

Mr. Hill asked if the Planning Board could be asked if it has something to add to the CIP list for consideration. Mr. Corwin said there is an opportunity to do that when the capital budget (as adopted by the City Council) is presented to the Planning Board in January/February.

Mr. Ford Burley asked when the Board gets the longer-term costs of projects. Mr. Corwin said it is a recommendation that Form 1 (description of project) and Form 2 (financial information – cost and how funded). He suggested that perhaps the Board can add a step to the procedures to officially adopt the forms as part of the discussion in January/February when it reviews the previous year's CIP and adopted capital budget.

Mr. Corwin said he will edit the existing policies and procedures to include the Board's suggestions and make them available for review/adoption by the Board in January/February.

B. Review of updated Conditional Use Permit Application

Mr. Corwin said he sent a draft of the updated CUP Application. He reviewed the edits that had been made to the existing form. The group discussed what information/documentation should be required to apply for a Conditional Use Permit.

The suggestion was made to make the following edit to the first page of the draft application that was included in the meeting agenda packet (see highlighted portion of image):

☐ Filing fee

☐ This form, fully completed

☐ A written narrative providing responses to the information required per sections II, III.A, and III.B below

☐ A scaled site plan identifying existing and proposed conditions and improvements including but not limited to buildings, structures, relevant setbacks and measurements, natural features, utilities, parking, access drives, landscaping, and lighting

Note: existing and proposed conditions shall normally be shown on separate plan sheets unless otherwise approved by Planning & Development Department staff, with the same orientation and scale (i.e. sheets should appear as if layered upon the same base drawing).

☐ Optional: photos and any other materials in support of the application

A MOTION was made by Richard Ford Burley to adopt the updated Conditional Use Permit Application as amended. The Motion was seconded by Brandon Hill.

****The MOTION was approved (6-0).***

C. Review of Proposed Amendments to Zoning Ordinance RE: Rte 120 Corridor Study & Pattern Zone Project

1 Mr. Corwin gave an overview of the proposed zoning amendments which will be proposed to the
2 City Council. He said this is an initial review for the Planning Board to give feedback before the
3 amendments go to the City Council; he said the amendments will be officially presented to the
4 Board in November.

5
6 He said there are three “buckets” of proposed zoning amendments:

- 7 1. Related to Route 120 Corridor study
- 8 2. Related to Route 120 Corridor study
- 9 3. Related to Pattern Zone project

10
11
12 [Chair Faunce suggested that the Board discuss item **5A: OTHER BUSINESS: Mascoma**
13 **River Local Advisory Committee Nominations** while the zoning amendment presentation was
14 being accessed because there may not be time to discuss it after the presentation.

15
16 Ms. Romano said he was the representative on the Committee in the past. She said it has been
17 difficult to find members to participate and two active members resigned. She said the committee
18 just stopped meeting. She spoke about the activities and aims of the committee. Chair Faunce
19 asked Board members to think of others who could be on the committee.]

20
21
22 Mr. Reichert gave an overview of the Route 120 Corridor study. He said housing of all shapes
23 and forms is needed to meet the demand in the community. He said the study involved public
24 engagement with people who live in the area. He said consultants were hired to give feedback on
25 zoning changes that could make the area more accessible:

- 26
- 27 • Rezone part of Northern Lebanon to CBD (Central Business District)
- 28 • Rezone the area around the central business district to GC1

29
30 He said rezoning the areas to general commercial (as opposed to the current light industrial
31 zones) will allow for more residential development. He said full general commercial zoning
32 allows for multi-family dwellings and dwelling units above the first floor. He said this change in
33 zoning would also allow another fire station to be built in the area.

34
35 He said another major part of the study was related to the large Wildlife Corridor and how to
36 make an interconnected animal passageway in the area.

37 Mr. Jay Campion said he wants to develop his own mixed-use park/development and rezoning
38 the area to the general commercial zone would enable him to do that. He discussed the
39 challenges of development in the area under the current zones. He discussed the planning work
40 that has been done on his project so far, including a “zone swap” for two areas that will enable
41 his planned business park project to move forward.

42
43 Mr. Reichert said rezoning the area around the proposed Central Business District at GC1 give
44 the area a more neighborhood feel and a centralized downtown. He said feedback from residents
45 is that the area currently doesn’t have a sense of place and allowing the central business district
46 zoning should promote that type of development (similar to Downtown Lebanon).

Ms. Hembree shared the following recommendations:

Recommendation 1.1: Formalize and map a 100-ft wide Wildlife Corridor Passage Overlay District that connects the three existing wildlife corridors, preserving the existing natural features and landscape to allow for the safe passage of wildlife...

Recommendation 1.4: If a parcel of developable land borders conservation lands, consider requiring a 100-foot wooded or landscaped buffer between the property line and any new development to maintain a natural buffered area between existing preserved lands and any new development.

Recommendation 1.8: Require that any future development within 250 feet of wetlands include a certain percentage of total site land cover as permeable surfaces.

Recommendation 1.9: Expand the coverage area of the Steep Slopes District to cover entirety of the Study Area where slopes greater than or equal to 25 percent are located in order to preserve the natural character of neighboring conservation lands, ridgelines, and rock formations. Consider special exceptions...

Recommendation 3.4: Upon the completion of the City's public residential single and multi-family construction projects on City-owned land at Barrows Street, Hanover Street Extension, Seminary Hill, and South Main Street, consider using these projects as a model to guide future development in the Study Area....

Ms. Hembree explained that the consultants recommended a Pattern Zones Overlay District and shared the following recommendation:

Recommendation 3.6: As recommended in the Lebanon Open Space Plan (2021), consider implementing the following measures:

- Develop an incorporate a maximum lot coverage limitation to ensure that a portion of all lots remains as greenspace
- Allow for reductions in parking provided on site
- In addition to encouraging adjoining properties to share parking to reduce the creation of new or expanded impervious surfaces, amend Section 607.5...

Mr. Reichert said some recommendations related to the Pattern Zoning concept are basically legalizing what is already being done:

- Reduce the size required for a lot & Reduce setback requirements
- Change the width of driveway/street access

He said one question is whether the City should require owners to use designs that have been approved for Pattern Zoning or let owners create their own designs.

A MOTION was made by Richard Ford Burley to extend the meeting to 9:45pm. The Motion was seconded by Kathie Romano.

1
2 **The MOTION was approved (6-0).*

3
4 The group discussed the other possible lot and parking requirements that could be made part of
5 the Pattern Zoning requirements. Mr. Ford Burley asked Mr. Reichert to send all the proposed
6 amendments to Board members for review and feedback.
7

8 **D. Review of Draft Amendments to Planning Board Rules of Procedure**

9 Postponed to the October 28 Planning Board Work Session

10
11 **4. COMMITTEE REPORTS**

12 None

13
14 **5. OTHER BUSINESS**

15
16 **B. Planning Board Process Improvement / Implementation of Rules of Procedure**

17 Postponed to the October 28 Planning Board Work Session

18 **C. Planning Board Training – “Planning Board Basics”**

19 Postponed to the October 28 Planning Board Work Session
20

21 **6. APPROVAL OF MINUTES**

22 None

23
24 The Board members agreed to meet at a special meeting on September 30 at 6:30 in City Council
25 Chambers to review the application by LVM Residential, LLC 1 Foundry Street (Tax Map 91,
26 Lot 263) and 43 Mechanic Street (Tax Map 106, Lot 34), zoned LD: Pursuant to Section 9.1 of
27 the Site Plan Review Regulations, applicant requests modifications to a previously approved Site
28 Plan (PB2022-36-SPR & PB2023-38-SPA).
29

30 **7. ADJOURNMENT**

31
32 *A MOTION was made by Richard Ford Burley to adjourn the meeting at 9:40pm.*
33 *The motion was seconded by Brandon Hill.*

34
35 **The MOTION was approved (6-0).*

36 The meeting was adjourned at 9:40pm.

37
38 Respectfully submitted,

39 Paula Roux

40 Recording Secretary
41

Suggested Edits for PB Meeting of September 30, 2024

p.1, line 22: Insert “SPA” after “PB2024-35-”.

p.2, lines 22-23: Change “He said the new plan shows how the fire trucks can move through the parking lot. He said, when needed, collapsable bollards will be used . . . ” to “He said the new plan shows how the fire trucks can move through the parking lot: when needed, collapsable bollards will be used . . . ”.

p.2, line 34: Change “. . . the number transformers . . . ” to “. . . the number of transformers . . . ”.

p.2, line 42” Change “is” to “are” [subject of clause is “parking lots”].

p.3, line 8: Change “. . . that was on previous plans was removed . . . ” to “. . . that was on previous plans had been removed . . . ”.

p.3, line 36 and p.4, line 26: **Insert missing wording between “Based” and “the Planning Board concludes the following” (something like “the evidence presented” . . . ??).**

p.3, line 46 to p.4, line 1 and again on p.4, line 37: Insert “LD” between “in the” and “zoning district”.

p.4, lines 32, 34, and 38: Replace “sigill sign” with the word “Section” as in the rest of this motion?

DRAFT

**LEBANON PLANNING BOARD
CITY COUNCIL CHAMBERS OR
REMOTE VIA MICROSOFT TEAMS
LEBANONNH.GOV/LIVE
MONDAY, SEPTEMBER 30, 2024 6:30 PM**

MEMBERS PRESENT: Andrew Faunce (Chair), Kathie Romano, Patrick Kennelly, Karen Zook (City Council Rep), Jeremy Rutter (REMOTE), Kellan Appleton

MEMBERS ABSENT: Richard Ford Burley (Vice Chair), Brandon Hill

STAFF PRESENT: Tim Corwin (Deputy Planning Director), Nate Reichert (Director of Planning & Development / Zoning Administrator), Catheryn Hembree (Associate Planner)

1. CALL TO ORDER

Chair Faunce called the meeting to order at 6:32pm.

Mr. Corwin reviewed the City's meeting in-person and REMOTE attendance policies and procedures.

2. PUBLIC HEARING ITEMS

A. REVISED NOTICE - LWM Residential, LLC, 1 Foundry Street (Tax Map 91, Lot 263) and 43 Mechanic Street (Tax Map 106, Lot 34), zoned LD: Pursuant to Section 9.1 of the Site Plan Review Regulations, applicant requests modifications to a previously approved Site Plan (PB2022-36-SPR & PB2023-38-SPA) for a proposed multi-family housing development. Applicant proposes to reduce the number of dwelling units from 183 to 155 and to eliminate construction of 2 of the 4 proposed residential buildings, together with related modifications to parking, utilities, landscaping, access, and other site improvements. Applicant also requests (i) a Conditional Use Permit pursuant to Article III, Section 307.9 of the Zoning Ordinance to allow a parking area in the front yard of the lot, and (ii) a Conditional Use Permit pursuant to Article III, Section 307.7.C of the Zoning Ordinance to waive the maximum 15 ft. front yard requirement for residential buildings in the LD District. PB2024-35-

A MOTION was made by Patrick Kennelly that the application of LWM Residential, LLC, 1 Foundry Street (Tax Map 91, Lot 263) and 43 Mechanic Street (Tax Map 106, Lot 34,

PB2024-35-SPA is complete enough for the Planning Board to accept jurisdiction and commence review. The Motion was seconded by Kellan Appleton.

Mr. Rutter, who is attending remotely, confirmed he is attending as a member of the public and would not participate in any votes.

****The MOTION was approved (5-0).***

Mr. Jon Livadas and Mr. Nik Fiore (Engineering Ventures) were present on behalf of the applicant.

Mr. Fiore gave an overview of the changes that have been made to the project plans, and the group discussed the following:

- Removal of the new building at 25 Mechanic St.
- Building 2 (two-story brick building) at One Foundry no longer being renovated into apartments – will be demolished and made into parking/landscaping
- The reduction in unit counts from 184 to 155 (He noted the Staff memo included in the agenda packet incorrectly stated the number was reduced to 148 units)
- Parking spaces increased from 213 to 239 spaces

The group discussed the Fire Department's request for an updated plan to provide enough space for fire trucks to navigate through the site. He said the new plan shows how the fire trucks can move through the parking lot. He said, when needed, collapsable bollards will be used in the pedestrian plaza to provide access for fire trucks.

Mr. Kennelly asked why the number of units was reduced but the number of parking spaces increased in the new plan. Mr. Livadas said they do not want to have insufficient parking.

The group discussed how parking spots would be assigned and if signage will discourage people other than residents from parking in the lots. Mr. Livadas said a property manager will be onsite to ensure assigned spaces are adhered to. He said residents may have to pay for additional spaces if needed. It was noted that the current number of spaces allotted for each unit is 1.6/unit.

The group discussed the number transformers on the site and the applicant's request for a waiver from screening around the transformers.

The group discussed how the new floodplain designation may impact the project. Mr. Fiore said they have not received any information that the new designation would change the site.

The group discussed the landscaping plan and the location of the parking lots that now will basically be in the "front yard" of the site. Chair Faunce said, while parking lots located close to the street is not unprecedented in the area, the regulations now call for a different configuration. Mr. Fiore noted the landscaping would provide a greenspace buffer between the parking lots and the street.

Mr. Corwin reviewed the parts of the Staff memo, noting that the Board did not have a chance to

1 review it prior to the meeting. He said Staff had provided the applicant with a list of comments in
2 a September 8, 2024 document, and the applicant provided detailed responses and an updated
3 site plan.

4
5 Chair Faunce opened the public comment portion of the meeting.
6 Chair Faunce closed the public comment portion of the meeting.
7

8 Ms. Romano asked if the gathering space that was on previous plans was removed and suggested
9 incorporating benches or a seating wall in the design for the public to use and to encourage
10 public gathering to enjoy downtown Lebanon and the river.

11
12 Mr. Livadas said the timeline for the project is that demolition work would be done first and
13 construction could possibly begin a year from now.
14

15
16 ***A MOTION was made by Andrew Faunce that for the application of LWM Residential, LLC,***
17 ***PB2024-35-SPA, the Lebanon Planning Board approves partial waivers from the following***
18 ***sections of the Site Plan Review Regulations:***

- 19 • ***Section 6.2.B.8 – requirement to screen electrical transformers***
20 • ***Section 6.2 and 6.10.C.3 – perimeter landscaping requirements***
21

22 ***The Motion was seconded by Kellan Appleton.***

23
24 ****The MOTION was approved (5-0).***
25
26

27
28 ***A MOTION was made by Patrick Kennelly:***
29

30 ***At a duly noticed meeting of the Lebanon Planning Board held on September 30, 2024, there***
31 ***appeared representatives on behalf of LWM Residential, LLC, regarding 1 Foundry Street***
32 ***(Tax Map 91, Lot 263), zoned LD, requesting a Conditional Use Permit per Section 307.7.C of***
33 ***the Zoning Ordinance to waive the maximum 15 ft. front yard requirement for buildings in the***
34 ***LD District. PB2024-35-SPA***
35

36 ***Based on the Planning Board concludes the following with respect to the Enhanced***
37 ***Performance Standards set forth in Section 302.4.D and the criteria set forth in Section***
38 ***307.7.C of the Zoning Ordinance:***
39

- 40 ***1. The proposed front yard area will provide an adequate buffer to abutting residential***
41 ***properties through site layout, landscaping, or fencing. (§307.7.C.1)***
42
43 ***2. The site is suitable for the proposal. (§302.4.D.1)***
44
45 ***3. The external impacts of the proposed use on abutting properties and the neighborhood are***
46 ***commensurate with the impacts of adjacent existing uses or other uses permitted in the zoning***

1 *district. (§302.4.D.2)*

2
3 *4. The proposal does satisfy the criteria of Section 302.4.D.3.*

4
5 *5. The proposal does satisfy the criteria of Section 302.4.D.4.*

6
7 *6. The proposal does satisfy the criteria of Section 302.4.D.5.*

8
9 *Now therefore be it resolved that the Planning Board, on this 30th day of September 2024,*
10 *hereby grants the request of LWM Residential, LLC for a Conditional Use Permit per Section*
11 *307.7.C, as set forth above and per testimony, plans, and materials submitted.*

12
13 *The Motion was seconded by Kathie Romano.*

14
15 **The MOTION was approved (5-0).*

16
17
18
19 *A MOTION was made by Patrick Kennelly:*

20
21 *At a duly noticed meeting of the Lebanon Planning Board held on September 30, 2024, there*
22 *appeared representatives on behalf of LWM Residential, LLC, regarding 1 Foundry Street*
23 *(Tax Map 91, Lot 263), zoned LD, requesting a Conditional Use Permit per Section 307.9.B of*
24 *the Zoning Ordinance to allow a parking area in the front yard of the lot. PB2024-35-SPA*

25
26 *Based on the Planning Board concludes the following with respect to the Enhanced*
27 *Performance Standards set forth in Section 302.4.D and the criteria set forth in Section*
28 *307.9.B of the Zoning Ordinance:*

29
30 *1. The proposed parking lot at the front of the property along Mechanic Street is an improved*
31 *surface in existence as of January 20, 2021, and there is no other location on the lot to provide*
32 *parking. (§307.9.B)*

33
34 *2. The site is suitable for the proposal. (§302.4.D.1)*

35
36 *3. The external impacts of the proposed use on abutting properties and the neighborhood are*
37 *commensurate with the impacts of adjacent existing uses or other uses permitted in the zoning*
38 *district. (§302.4.D.2)*

39
40 *4. The proposal does satisfy the criteria of Section 302.4.D.3.*

41
42 *5. The proposal does satisfy the criteria of Section 302.4.D.4.*

43
44 *6. The proposal does satisfy the criteria of Section 302.4.D.5.*

45
46 *Now therefore be it resolved that the Planning Board, on this 30th day of September 2024,*

1 *hereby grants the request of LWM Residential, LLC for a Conditional Use Permit per Section*
2 *307.9.B, as set forth above and per testimony, plans, and materials submitted.*

3
4 *The Motion was seconded by Kellan Appleton.*

5
6 **The MOTION was approved (5-0).*
7
8

9 *A MOTION was made by Kellan Appleton that the Lebanon Planning Board approve the*
10 *application of LWM Residential, LLC, PB2024-35-SPA, for a modification pursuant to*
11 *Section 9.1 of the Site Plan Review Regulations to a previously approved Site Plan (PB2022-*
12 *36-SPR & PB2023-38-SPA) for a phased, 183-unit multi-family complex at 1 Foundry Street*
13 *(Tax Map 91, Lot 263) and 43 Mechanic Street (Tax Map 106, Lot 34), zoned LD. Applicant*
14 *proposes to reduce the number of dwelling units to 148 and to eliminate construction of 2 of*
15 *the 4 proposed residential buildings, together with related modifications to parking, utilities,*
16 *landscaping, access, and other site improvements, as set forth on a plan set titled, "Lebanon*
17 *Woolen Mill," prepared by RODE Architects, dated August 12, 2024, last revised September*
18 *16, 2024, EV Project: 22122, and including any and all submissions and testimony provided*
19 *for and during the public hearing.*
20

21 *In support of its decision, the Board finds that the applicant has submitted plans, testimony,*
22 *technical data, information, reports, and studies that together satisfactorily demonstrate*
23 *compliance with the applicable requirements of the Site Plan Review Regulations, except as*
24 *may reasonably be addressed through the imposition of certain conditions of approval, set*
25 *forth below, and except as may have been waived pursuant to Section 7.1.*
26

27 *This approval is subject to the following conditions:*
28

- 29 *1. The applicant shall comply with the Planning Board Notices of Action for PB2022-36-*
30 *SPR dated October 24, 2022, and for PB2023-38-SPA dated December 11, 2023, and*
31 *shall satisfy and comply with all conditions of approval thereof except as may be*
32 *superseded by the conditions below.*
33
- 34 *2. Within 45 days of the Planning Board's approval, the applicant shall address the*
35 *comments set forth in the letter dated September 23, 2024, from Steve Keach, PE, of*
36 *Keach-Nordstrom Associates, Inc., to the satisfaction of the City Engineer.*
37
- 38 *3. Within 45 days of the Planning Board's approval, the applicant shall, to the*
39 *satisfaction of the Planning & Development Department, address the comments set*
40 *forth in the e-mail sent September 8, 2024, from the Deputy Planning and*
41 *Development Director to the applicant.*
42
- 43 *4. Within 45 days of the Planning Board's approval, the applicant shall address the*
44 *comments set forth in the memo dated September 9, 2024, from Duane Egner, Fire*
45 *Inspector, to the satisfaction of the Fire Department.*
46

1 5. *Prior to any construction activities and prior to the application for a Building Permit,*
2 *the applicant shall make the following revisions to the plan set to the satisfaction of the*
3 *Planning and Development Department and the City Engineer:*

- 4 a. *Any changes made pursuant to Conditions of Approval #2, #3 and #4 above.*
5 b. *Amend the cover sheet to provide description of plan revisions (Section*
6 *5.1.E.4.d).*

7
8 *The applicant shall provide the Planning and Development Department with one (1)*
9 *full size copy of the revised plan set, and a digital copy of the revised plan set saved in a*
10 *PDF-A format for archival purposes.*

11
12 6. *Prior to the start of any construction activities on the property and prior to the issuance*
13 *of a building permit, the applicant shall record in the Grafton County Registry of*
14 *Deeds notice of the stormwater management and erosion and sediment control plans as*
15 *required per Section 6.6.H.2.d of the Site Plan Review Regulations. Such notice shall*
16 *be reviewed by the Planning & Development Department prior to recording.*

17
18 7. *Condition #6 set forth in the Planning Board Notice of Action for PB2023-38-SPA,*
19 *dated December 11, 2023, is hereby stricken and replaced with the following:*

20
21 *Pursuant to Section 4.9 of the Site Plan Review Regulations, the project may be*
22 *constructed in phases per the phasing plan submitted for PB2024-35-SPA and per*
23 *the conditions of approval set forth in the Planning Board Notices of Action for*
24 *PB2022-36-SPR dated October 24, 2022, and for PB2023-38-SPA dated December*
25 *11, 2023, and as set forth above.*

26
27 *The Motion was seconded by Patrick Kennelly.*

28
29 It was noted that the number of units in paragraph one of the Motion should be 155 and not 148.

30
31 *A MOTION was made by Kellan Appleton to amend the previous Motion to correct the*
32 *number of units from 148 to 155.*

33
34 *The Motion was seconded by Patrick Kennelly.*

35
36 **The AMENDED MOTION was approved (5-0).*

37
38 **3. STUDY ITEMS**

39
40 **A. Review of Proposed Amendments to Zoning Ordinance RE: Rte 120 Corridor Study**
41 **& Pattern Zone Project (Continued from 09-23-24 meeting)**

42
43 Mr. Reichert gave an overview of the goals of the proposed amendments to the zoning ordinance
44 related to Pattern Zone Project.

45
46 The group discussed the following recommendations / ideas at length:

- Reduce Minimum Lot Sizes & Widths
- Reduce Setbacks
- Review Current Parking Requirements
- Increase Maximum Building Coverage
- Allow More Homes Per Lot
- Eliminate Lot Area Per Unit
- Cottage Court Style Land Division
- Eliminate Lot Frontage
- Allow Small Multi-Dwellings
- Dense Housing (Roommates)
- Create a Medical Center Two Zoning District

In addition to the general discussion about the proposed zoning ideas to facilitate the development of pattern zone projects, Mr. Reichert asked the Board to consider the following:

- Change the zoning for Romano Circle (owned by the Lebanon Housing Authority) from R2 to RO to allow them to make changes without having to seek an expansion of non-conforming use from the Zoning Board.
- A resident request to rezone a property in RL1 to General Commercial to allow the resident to build a storage unit facility in a primarily residential area

4. ADJOURNMENT

*A MOTION was made by Kathie Romano to adjourn the meeting at 9:28pm.
The motion was seconded by Patrick Kennelly.*

**The MOTION was approved (5-0).*

The meeting was adjourned at 9:28pm.

Respectfully submitted,
Paula Roux
Recording Secretary

DRAFT

**LEBANON PLANNING BOARD
COMMUNITY ROOM, KILTON LIBRARY OR
REMOTE VIA MICROSOFT TEAMS
LEBANONNH.GOV/LIVE
MONDAY, OCTOBER 14, 2024 6:30 PM**

MEMBERS PRESENT: Andrew Faunce (Chair), Richard Ford Burley (Vice Chair), Kathie Romano, Patrick Kennelly, Karen Zook (City Council Rep), Jeremy Rutter, Eric Stacey

MEMBERS ABSENT: Brandon Hill, Kellan Appleton

STAFF PRESENT: Nathan Reichert (Planning & Development Director), Tim Corwin (Deputy Planning Director), Brian Vincent (City Engineer)

OTHERS PRESENT: Christine Johnston, Esq. (Legal Counsel for the Planning Board)

1. CALL TO ORDER

Chair Faunce called the meeting to order at 6:32pm.

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 October 14, 2024:

- **Lebanon Housing Authority, 31 Romano Circle (Tax Map 101, Lot 20), zoned R-2: Request for a site plan review to construct a +/- 2,235 sq ft. two story office building, together with associated site improvements, including relocating a basketball court and 12 new parking spaces. PB2024-41-SPR**

Mr. Corwin said Staff recommends the application does not have the potential for regional impact.

A MOTION was made by Kathie Romano that the application of the Lebanon Housing Authority, 31 Romano Circle (Tax Map 101, Lot 20), zoned R-2 does not have the potential for regional impact. The motion was seconded by Richard Ford Burley.

**The MOTION was approved (7-0).*

Chair Faunce introduced Mr. Eric Stacey as Lebanon Planning Board a new member.

Chair Faunce said the agenda for the Public Hearing Items would be in the order of 3A., 3B, 3D, and then 3C., which is out of the order of the agenda for this meeting.

Mr. Corwin stated that Staff recommends that the application is complete enough for the Planning Board to accept jurisdiction and commence review.

A MOTION was made by Jeremy Rutter that the application of Lebanon Housing Authority, 31 Romano Circle (Tax Map 101, Lot 20), zoned R-2 is complete enough for the Planning Board to accept jurisdiction and commence review. The motion was seconded by Richard Ford Burley.

****The MOTION was approved (7-0).***

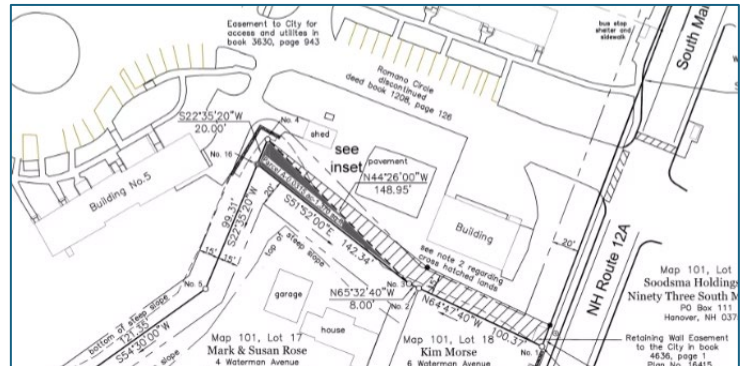
3. PUBLIC HEARING ITEMS

A. Mark & Susan Rose, Sr. and Lebanon Housing Authority, Mark & Susan Rose Sr. and Lebanon Housing Authority, 4 Waterman Avenue & 31 Romano Circle (Tax Map 101, Lot 17, and Tax Map 101, Lot 20, zoned R-2: Request for approval of a Boundary Line Adjustment. PB2024-39-BLA

Mr. Corwin said there is one suggested Condition of Approval, which is that the Discontinuance of Romano Circle be finalized before the plat is finalized.

Mr. Tim Rockwood (land surveyor) gave an overview of the project. He said the application is for a boundary line adjustment for a triangular piece of property.

Ms. Dida Alonso (Director of Lebanon Housing Authority) said the piece of property is unbuildable, but it will help LHA achieve another proposed project for a new office building at Romano Circle. She said the proposed boundary line adjustment will allow flexibility with the positioning of the building related to setbacks.



She explained that the City Council had approved that LHA become owner of the entry driveway to Romano Circle, which is a cul-de-sac, but the road will continue to be called Romano Circle. She said all the residents that live there are residents under LHA.

Chair Faunce opened the public comment portion of the hearing.
Chair Faunce closed the public comment portion of the hearing.

A MOTION was made by Richard Ford Burley that the Lebanon Planning Board approves the application of Mark & Susan Rose Sr. and Lebanon Housing Authority, for a proposed boundary line adjustment between 4 Waterman Avenue & 31 Romano Circle (Tax Map 101, Lot 17 and Tax Map 101, Lot 20), PB2024-39-BLA, as shown on a plat titled "Minor Lot Line Adjustment – Lebanon Housing Authority – Mark & Susan Rose," prepared by Rockwood Land

Services, LLC, dated September 4, 2024, last revised October 7, 2024, Project No. 1424-1, including any and all supplemental submissions and testimony provided during the public hearing, subject to the conditions as presented in the packet for this meeting with the additional condition that the discontinuance of Romano Circle shall be finalized.

The Motion was seconded by Kathie Romano.

**The MOTION was approved (7-0).*

B. 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 September 9, 2024

Mr. Corwin said the applicant has heard the comments made by the Board and by the public in previous meetings and has redesigned the layout of the project. He said the purpose of the discussion at this meeting is for the Board to familiarize itself with the proposed design changes.

Mr. Dave Fenstermacher (VHB), Mr. Rich Whitehouse (VHB), and Mr. Gil Aleixo (Brickyard One Nominee Trust) were present on behalf of the applicant.

Overview of comments/concerns

Mr. Fenstermacher gave an overview of the concerns and comments that have been made, as well as some information from the Route 120 Corridor Study that he said impacted the changes that have been proposed. He noted the following feedback about the project:

- Provide more housing in a cohesive, sustainable way.
- Need for better, safer pedestrian connections
- Rezone existing light industrial to residential, highlighting the need for residential higher bedroom counts in the multifamily developments
- Incorporate climate resiliency measures and new development
- Preserve the historic features of the former Brickyard site
- Incorporate community use and retail and commercial
- Preserve and expand existing quality of life values such as green space
- New development should be a combination of mixed-use as an adaptive reuse

Overview of proposed redesign

He said the proposed redesign includes the following:

- Mixture of studio, one-bedroom, and townhome options
- Focused massing to the south side of the site toward I-89
- Replaced half of the larger multifamily buildings with smaller-scale townhouses
- Pond west bank enhancements
- Reduced total disturbance areas and total impervious areas (reduced building heights)
- Reduced amount of parking
- Reduced water & sewer demands by proposing fewer bedrooms
- Greatly reduced required earthwork and blasting needed for construction
- Increased area of green/community spaces to provide recreation opportunities

Design Change - Quantities

	Original Design	Revised Design
Number of Multifamily Buildings	10 Buildings	5 Buildings
Number of Units in Multifamily Buildings	473 Units	422 Units
Number of Townhomes	0 Townhomes	51 Townhomes
Number of Parking Spaces for Multifamily Units (Total Covered)	787 spaces (502 covered spaces)	541 spaces (237 covered spaces)
Reduction in Proposed Impervious Area	N/A	+/- 85,380 SF (1.96 AC)

He shared the revised site layout, which includes five buildings and parking with 541 spaces. He confirmed that the current design includes all rental properties, but he said there may be consideration for ownership in the future.

Revised Site Layout



He said they are working with the City to develop defined crosswalks and additional sidewalks on Hanover Street. He said they also met with Advance Transit to discuss the nearby pedestrian bridge and potential new bus stops that may be needed for the area.

He said they plan to present their technical review, which would include a fiscal impact analysis, engineered sites plans, a traffic report, stormwater management plans, and wetlands review and at a November Planning Board meeting.

Mr. Fenstermacher said there will be a barrier between the backyards for the units and the pond. He noted the additional gathering spaces make it feel less crowded. He also confirmed EV chargers would be located in the parking lots. He said handicapped parking spaces could be shaded or located under the buildings. Mr. Kennelly asked if the height variances were for two of the buildings and Mr. Fenstermacher confirmed they were for Buildings 4 and 5. He said Buildings 1, 2, and 3 are under 45 feet high.

Mr. Aleixo confirmed the townhomes will be 3-bedroom homes and the rest would be one-bedroom and studio units. Mr. Corwin confirmed that one parking space is required for studio units and 1.5 spaces are required for one- or more bedroom units per the zoning ordinance. Mr. Stacey asked who the proposed tenants would be, and Mr. Aleixo said professionals who work at the hospital and Dartmouth College. He confirmed that the expansion of the number of one-bedroom units matches the demographics of the area.

1 Chair Faunce said several other City boards and committees have provided either questions or
2 comments about this project and will attend a future Planning Board meeting to discuss them.

3
4 Mr. Rutter said there are many depressions on the ground and other elements that may be
5 remnants of buildings or other structures in SV1 and SV3 areas. He asked whether an archeologist
6 will survey the site and provide a report of what is there, including impervious surfaces on the site.
7 He said petroleum was used on that site so it would be good to know what is under the ground as
8 well because it is a brownfield site.

9
10 Ms. Romano asked about plans to extend a sidewalk on the property side of Hanover Street from
11 the northern entrance down to the entrance into the parking lot of the school. Mr. Fenstermacher
12 said that another survey will be done for the north side of Hanover Street to determine the
13 wetlands in that area.

14
15 Mr. Ford Burley asked if red bricks could be used in the construction of the buildings, given that it
16 is located at a former brickyard. He noted that Buildings 3 and 4 do not have the same access to
17 the greenspace as other buildings on the site and asked if benches could be added to encourage
18 congregation. He suggested an additional park/playground could be added near the townhouses.

19
20 Mr. Rutter asked if consideration has been given to changing the nature of the pedestrian bridge
21 over I-89 (from pedestrian to vehicle). Mr. Fenstermacher said the plans for the project will not
22 interfere with historical plans for the future redesign the bridge. The group discussed past and
23 current plans related to the pedestrian bridge, and the importance of it to the connectivity of the
24 new residential project and downtown Lebanon (for recreation and emergency vehicle
25 accessibility).

26
27 Mr. Fenstermacher said the northern entrance of the site will include parking spaces that can be
28 used by trail walkers/hikers who want to access the trails behind the proposed buildings and to the
29 network of trails near and around Boston Lot.

30
31 Mr. Rutter noted that none of the plans include the quarries at the very top of the site and
32 underneath where the townhouses would be located. He said the quarries deserve some kind of
33 mention in the project.

34 35 **Public comment portion**

36 Chair Faunce opened the public comment portion of the public hearing.

37
38 Ms. Nicole Ford Burley (City Historian, Chair of the Lebanon Heritage Commission) said the
39 Heritage Commission had submitted questions about this project a few months ago and received a
40 response from the applicant. She said the Commission's recommendations based on those
41 responses are included in the agenda packet for this meeting. She said the Commission has
42 requested the following:

- 43 1. Historical survey and Archeological survey
- 44 • Study of the Brickyard
 - 45 • Study of the Chandler cabins (northeast side of site)
 - 46 • Study of the quarries (earliest ones date from the first half of 19th century)

2. Preserve / rehabilitate the beehive kilns (not just allowed to stand)
3. Provide public access to the kilns
4. Make the site accessible to the public and add interpretive signage
5. Enact recommendations that come from preservation professionals

Ms. Mary Davis (Ward 2) said she lives in Renihan Meadows condominium development, which is part of the Densmore Brickyard. She said she and other residents have had flooding problems for years until a basement dewatering system was installed in 2004 at a cost of \$250,000. She said the cost for clean up and repairs after flooding events cost the condo board about \$40,000 per year. She said the ground in the Brickyard does not absorb water. Chair Faunce noted that the Conservation Commission is looking at the hydrological properties of the soils that will be disturbed for the project.

Mr. Tony Palazzo (Ward 3) said there are no retention basins for stormwater runoff and said there may be real problems if the pond becomes polluted. He said it would probably stay that way for a very long time.

Mr. Bill Lamb (Ward 3) read the objectives of a PURD and said he's concerned that this project does not fulfill the objectives of a PURD. He said he did not believe the Planning Board has the legal right to approve this project as a PURD.

Ms. Jeanette Hutchins (Ward 1) said she read the project statement of the Upper Valley chapter of the GSOP (Granite State Organizing Project) at a September Planning Board meeting. She said one focus of the GSOP is on affordable and workforce housing. She said the ideal tenants for the units were said to be professionals from the hospital and college. She said not all people that work at the college and hospital are professionals. She asked that ancillary staff (maintenance, housekeeping) be included as ideal tenants. She also said she would encourage the use of red brick in the buildings on the site.

Dr. David Kroner (Ward 2) said he lives across the pond from the site. He thanked all the Lebanon residents for their input on this project and Mr. Corwin for always responding promptly to his emails and requests. He said he's lived near the pond for 39 years and has always had a problem with flooding due to beaver dams. He said beavers are dangerous and carry disease.

He said he did have to call the current owners of the property recently because the level of the pond was rising and said within 48 hours, they had the pond draining. He said he believes they have been listening to the concerns of the public and commended them on that. He said the area does need more affordable housing. He also asked if they would consider the nearby houses' basements and plaster that will fracture during any blasting that might go on at the site.

Ms. Romano said when the Kimball Street water lines were redone this summer, the City offered to inspect the structural integrity of the homes in the area before the blasting so any damage could be documented.

1 **Ms. Jenny Lamb (Ward 3)** asked if the project was not a PURD and was under the standard
2 zoning, how many units would be allowed. Mr. Fenstermacher said he could calculate that and
3 provide the information. She also asked if the pedestrian bridge were to be redesigned, would
4 taxpayers pay for the project or would that be part of the Brickyard residential project.

5
6 Chair Faunce said if there were interest amongst the City to redesign the bridge, it might make
7 sense to explore whether there are Co funding opportunities to do so. Ms. Lamb said perhaps
8 rather than build a bridge and invite traffic to come, limit development and utilize the traffic
9 access and egress that's available now.

10
11 **Ms. Alice Dansby (Ward 2)** said it doesn't make sense to allow 600+ more cars into an area that
12 is already a traffic problem. She asked what the plan is for Evans Drive regarding additional stop
13 lights that would have to be added. She asked if anyone has estimated what the costs of the traffic
14 alone will be. Chair Faunce said the traffic study will be included in the technical review at the
15 next meeting (second Tuesday of November).

16
17 **Ms. Chris Hadari** said other proposals are increasing parking because of residents' demand but
18 this project is decreasing parking. She said the City is trying to be more walkable and bring eco-
19 friendly things for Lebanon. She said making the bridge accessible to cars is not going to achieve
20 these goals – it is just going to allow more cars in the area. She said the recent perceived trends
21 that people will walk or bike or use public transportation are changing. She said we need to focus
22 on what the vision and plan are for the people of Lebanon who live here now, not on the people
23 who aren't here yet. She said it's important to have housing for the people who are working and
24 want to live here, but the interests of the current taxpayers are also important.

25
26 Ms. Romano commented it seems to be that Lebanon or Hartford that are expected to provide
27 affordable housing and asked why Hanover can't provide some of that housing. Lebanon certainly
28 wants to do its part, but it shouldn't be the sole provider of affordable housing in in this area.

29
30 **Mr. John Weatherly (Ward 3)** said the City has been struggling with large-scale residential
31 development projects for the last 10 years and many have been told the City doesn't have
32 stormwater capacity. He asked why the City now has the capacity for this project. He also noted
33 that residents of this development who need more than 1.5 parking spaces will park on the street
34 and over the bridge (if is accessible to vehicles), which he said is dangerous for school kids who
35 are walking to school. Ms. Romano said the capacity issues were not with stormwater but with
36 sanitary sewer and the connector pipe (that delivered sewage to the plant) has been enlarged.

37
38 Mr. Ford Burley noted that the newly created Housing Task Force are working on solutions for the
39 Upper Valley and encouraged residents to follow its progress.

40
41 Ms. Hutchins noted that she did not mean to imply Lebanon was responsible for providing all
42 workforce housing. She said she just wanted to encourage the owner of this project to include
43 accommodations for pricing that will allow for workforce housing.

44
45 **Ms. Kate Weatherly (Ward 3)** said she's concerned about the entrances/exits of the project site
46 and the traffic that comes off Route 89 onto Route 120 at the same time the children go to school.

1 She said she lived in an area that experienced a lot of effects from blasting from the Prospect
2 Street project. Mr. Ford Burley said the traffic will be discussed at the next meeting during the
3 technical review, but the traffic study is included in the Planning Board agenda for the August 8,
4 2024 meeting (accessible via the City's website). Mr. Fenstermacher said one of the intents of the
5 redesign of this project was to minimize blasting or to eliminate it if possible.
6

7 Ms. Dansby said Vital Communities housing studies stated the number of new rental units the City
8 needed to add 534 rental units by 2030 in order to have healthy, responsible development and do
9 its share of meeting housing needs for the Upper Valley. She said this proposal seeks to add as
10 many as it was said by the data in the studies that we needed to add in 20 years. She said,
11 according to the mission statement of the City of Lebanon, the Board is obligated to say no to any
12 exceptions requested by this development because rental units have been overbuilt in the City.
13 Chair Faunce said the dates of the Housing Task Force meetings are provided on the City's
14 website and encouraged her to review the activities of that committee.
15

16 Chair Faunce closed the public comment portion of the public hearing.
17

18 ***A MOTION was made by Andrew Faunce to continue the public hearing to the November 12,***
19 ***2024 Planning Board meeting at 6:30pm in City Council Chambers in City Hall. The Motion***
20 ***was seconded by Jeremy Rutter.***
21

22 ****The MOTION was approved (6-0).***

23 At 8:14pm, Chair Faunce called for a brief recess.

24 At 8:25pm, the meeting resumed.
25

26
27 **D. XYZ Dairy, LLC, River Park Drive (Tax Map 44, Lots 21 - 30 & Tax Map 44, Lot 7),**
28 **zoned CBD, IND-L and R-3: Applicant requests a 2-year extension of the River Park**
29 **Subdivision approval (PB2011-01-FMAJ) and Site Plan approval (PB2010-25-SPR),**
30 **as most recently amended on September 9, 2019 (PB2018-34-SPA) and extended on**
31 **October 12, 2021 (PB2021-29-EXT). PB2024-34-EXT**
32

33 Ms. Romano recused herself from the discussion. Chair Faunce said Mr. Stacey will sit with the
34 Board but will not participate in any decisions that may be made for this application.
35

36 Chair Faunce noted that the public hearing had been continued from the September 09, 2024
37 meeting so that the Board could have more time to deliberate over the request for extension. He
38 said some additional information has been generated by staff that has been included in the packet
39 so it seems appropriate to continue with the hearing. He said Mr. Corwin can provide the Board
40 with information regarding the new materials for this evening and the Board can entertain
41 additional testimony from the applicant. He said the Board will then go into deliberative session.
42

43 Mr. Corwin said one new item for consideration is how the Planning Board's Conditions of
44 Approval should be administered and confirmed should the extension request be granted.
45

1 He said there also was some discussion about a stormwater pipe that runs across the Route 10 and
2 the role that that pipe played in the delay of the River Park development. He said the stormwater
3 pipe has been shown on the River Park plan since the very beginning and the approved plans show
4 how that pipe is to be rerouted. He clarified that the developer has been aware of that pipe since
5 the very beginning of the process.

6
7 He said the City Engineer reminded him that he met with the applicant in early May, at which
8 point it was discussed that the proposed temporary stormwater bypass solution would be
9 abandoned and the applicant intended to continue with the approved site plan as is.

10
11 He said the staff memo points out that the building permit is now expired, and he said that
12 decision was upheld by the State Building Code Board of Appeals.

13
14 Mr. Chet Clem (Lyme Properties) and Mr. David Clem (XYZ Dairy) were present on behalf of the
15 applicant. Mr. Chet Clem said he was not aware of what additional information was provided to
16 the Board prior to this evening's meeting and he received no additional staff memo. He said this is
17 the first that he's heard of additional information being provided to the Board.

18
19 He said he is happy to provide any and all previous communications to the City on the
20 characterization of the temporary bypass line versus the previously approved line versus the
21 alternatives that were in discussion between XYZ Dairy and the City in 2022 and 2023 trying to
22 value engineer more affordable solution to these City's stormwater pipe on XYZ's property with
23 no easement, which represents a \$600,000 expense to XYZ.

24 25 **Temporary Bypass Line**

26 He said the temporary bypass line, which has been approved by the state of New Hampshire for
27 the purposes of temporary bypass to allow the project to proceed, is still in consideration and is the
28 jurisdiction of the state. He said Mr. Corn is referencing is that alternative designs for an
29 alternative storm water solution were abandoned by XYZ Dairy in the interest of proceeding due
30 to the tenant that it has been trying to secure and due to the time sensitivity. He said they felt work
31 to get that through the process wasn't worth the effort given that they had to meet the time
32 sensitivity of their tenant.

33
34 He said they were aware of the pipe from the get-go, and it has never been their insinuation that
35 they weren't. He said they called it out in a comprehensive memo to the City Manager well in
36 advance of mobilization that they did not have complete information (elevations, material), but
37 they knew that the pipe was there, which is why we did the exploratory excavation in November
38 of 2022 to answer those questions for themselves and their construction manager.

39
40 He said he objects with Mr. Corwin's classification of the decision of the State Appeal Board. He
41 said the Board did uphold the definition of work and that work must be physical and onsite, which
42 he said is in contrast with the building inspector's own decision. He said the matter was remanded
43 back to the BCBA, to the City's Building Code Board of Appeals. He said the matter is ongoing.

44
45 Chair Faunce asked if the matter was remanded to the City's Zoning Board or to City Staff. Mr.
46 Corwin said the matter is over. He said the applicant is suing the City to reinstate the building

1 permit and they did not appeal the State Building Code Board of Appeals decision. He said they
2 have not communicated with the City at all about this matter other than to file a lawsuit. He said
3 the building permit as of today is expired and that went unappealed. He said if they are successful
4 in their lawsuit, then they're asking the court to reinstate the building permit. He said as of today, it
5 is not valid and there is no building permit.

7 **Timeline from 2020-2024 RE extension of excavation permit**

8 Mr. Ford Burley asked for a clear timeline of events from 2020 to present related to the application
9 an extension for the excavation permit for Route 10, filed with the NHDOT, at the southern
10 entrance of the site. He said the materials in the meeting agenda packet seems to have a gap
11 between the applicant's last correspondence with NHDOT in September of 2020 and June of 2024
12 when there was a communication from the site construction manager and NHDOT.

13
14 Mr. Clem said space in the communications occurred because he said they thought that the matter
15 had been put to bed after the correspondence with NHDOT in 2020. He said it was quite a surprise
16 when it resurfaced after that gap in time, having already had numerous meetings with NHDOT and
17 the matter was not brought up. He said the issue resurfaced on June 5, 2024 when they were not
18 aware that NHDOT was going to seek a third traffic study.

19
20 Mr. Ford Burley said he read that, in 2020, Mr. Chris Turgeon of the NHDOT "highly
21 recommends that they contact NHDOT immediately to get the process the excavation process
22 started so as not to delay construction," in an email included in the agenda packet materials. He
23 said it appears that Mr. Clem corresponded back and forth with the NHDOT a few times and then
24 did not hear back. He asked Mr. Clem why he did not reach back out to Mr. Turgeon. He said if he
25 had sent an email to someone at the state and no one responded to it, he would assume it had
26 gotten lost. He also asked why Mr. Clem did not apply for the excavation permit until June of this
27 year.

28
29 Mr. Clem said in 2020, work was stopped due to the COVID pandemic. He said they had
30 suspended construction on the building, which was due to start prior to the infrastructure project.
31 He said that the construction timeframe for the building is 16 months and the timeframe for the
32 infrastructure work is approximately 3 months. He said that means they need about a year head
33 start in which to proceed on the building.

34
35 He said in 2020, they were informed by the previous Lebanon City Engineer of the scope of
36 paving to be done on Route 10 and they proactively reached out to NHDOT, seeking to coordinate
37 for efficiency. He said they communicated back and forth, including the five years it took to get
38 approval in the first place.

39
40 He said they had supplied substantial information to the NHDOT addressing the fact that they felt
41 that they were in good standing and received no response. He said the matter of filing the
42 excavation permit did not come up until 2024 because they had initiated the construction of the
43 building in November of 2022, then they were stalled until July of 2023, then sought to
44 recommence in August of 2023.

1 He said, in the course of rebidding the project and of making the business decisions of how they
2 would proceed, they sought to do the infrastructure upfront. He said it wasn't their desire, and they
3 sought amendments to avoid that, but they were trying to get it done.

4
5 He said, given the fact that the building permit was revoked on February 1, he said they spent
6 months in the City's appeal process to get the BCBA to reach that decision in May. He said that
7 was when they felt like they had the green light to proceed, never anticipating that the City would,
8 in effect, sue its own board by taking it to the state appeal. He said that's why they filed that then.
9 He said they have provided the information relating to the communication Mr. Turgeon many
10 times before, believing it was the answer to the question posed.

11 12 **Correspondence RE TIF District**

13 Mr. Ford Burley asked about the correspondence in 2021 regarding a TIF district. He said the
14 minutes of a Planning Board meeting for October 12, 2021 when one of the extensions was
15 requested.

16
17 Mr. Clem said the TIF district (or tax increment financing district) was center to a public private
18 partnership proposal. He said XYZ Dairy had done that back in the original permitting process but
19 gotten nowhere with it. He said he returned to the project in 2019 after having worked in the TIF
20 district in Quincy, Massachusetts and seeing the impact of that. He said it was on his radar when
21 the City Manager and the City Fire Chief approached them in 2020, looking to relocate the West
22 Lebanon Fire Station, and they offered a location and offered a 10-point deal structure to try to do
23 that expeditiously. He said included in that deal was the idea of a public private partnership, given
24 the fact that their already approved, already engineered (at their sole dollar) infrastructure (that
25 had already passed through the state, the local and state regulatory bodies), was shovel ready and
26 thus could be a "two birds with one stone" situation. He said those conversations were fruitless.
27 He said, in 2021, as vice chair of the West Lebanon Revitalization Advisory Committee and in the
28 face of the City entertaining a TIF district in downtown Lebanon and a TIF district at the Airport,
29 to facilitate an upfront, taxpayer-subsidized investment in making that pad ready, the West
30 Lebanon Committee unanimously voted for consideration of a TIF district in West Lebanon, along
31 with equal consideration of all their zoning changes that have been done, including height
32 increases, etcetera, to be applied equally to West Lebanon.

33
34 He said, in the course of that, the City Manager came to the next meeting and said that he was not
35 interested in entertaining a TIF district. He said it was not a City Council decision. He said they
36 have gone back and forth for a couple of years to also include the fact that we then found
37 ourselves in competition with the City in response to an RFP for a large life science company and
38 the state BEA asked why a TIF district was not offered to River Park when it was being doing
39 elsewhere in the city. He said it was then, and only then, that the City Manager suggested
40 consideration of a TIF district for River Park River Park, which was not their initial goal.

41
42 He said there were conversations to that effect in 2021 and 2022, until the point that those
43 conversations fell apart in July or August of 2022, when it became clear that the TIF district would
44 be a TIF in name only because the City was requesting the entirety of the property in collateral.
45

1 Mr. Ford Burley asked if he thought the negotiations about the TIF district held up any of the
2 infrastructure work on the site. Mr. Clem said the document that Mr. Ford Burley was referencing
3 is the request for an extension and that was granted so because of the conversations with City
4 Manager Mulholland. He said the City Manager came to that meeting and endorsed the extension
5 because of those more time was needed and because they were still dealing with the impacts of
6 COVID. He said by July of 2022 / August 2022, they were completing the cross-country
7 connector infrastructure.

8
9 He said they internally reached the decision that were barking up the wrong tree to try to reach a
10 mutually beneficial public-private partnership, and so they decided to proceed on their own.

11 12 **Public Comment portion**

13 Chair Faunce opened the public comment portion of the public hearing.

14
15 Ms. Kathie Romano (Ward 1) spoke as a member of the public. She requested that the Board to
16 consider two issues when it makes its decision:

- 17 1. The issue of fairness in terms of how the Board treats every applicant who comes before it.
18 She said this development, which was approved in 2010 still doesn't have a single building
19 built and, because of a number of extensions granted over the last 14 years, they currently
20 have until 2040 to finish the build-out of this development. She said they're asking for a
21 two-year extension to put the first building up. She said if it took 16 years for the first
22 building, how many years is it going to take for the rest of the buildings.
23
- 24 2. The issue of setting a precedent and fairness. She said the issue has something to do with
25 these extensions during the COVID period and even outside of that period. She said
26 occasionally, applicants do come and ask for a two-year extension, and if there's good
27 reason, the Board usually grants it. She said sometimes the board has granted a second
28 two-year extension. She said she could not remember in the last decade any other
29 development that was granted a third two-year extension other than River Park, and they've
30 had a fourth and a fifth two-year extension. She said this may be their 6th request for an
31 extension and there isn't even one building.
32

33 She said does the Board want to say to every applicant that the Board will give them two
34 years, but if they don't make it in two years, come back and we'll give you another two.
35 Come back and we'll give you another two. Come back and we'll give you another two
36 because they're going to say, well, you know, the Board gave it this applicant, why not
37 give it to us?
38

39 She said one of the things that happened in one of those extension periods, either 2019 or
40 2021, this applicant came before the Board with a reordering of the phases of the
41 development. She said because of the cry for residential housing, for the one apartment
42 building in this development, they asked to be able to build it earlier than it was slated to
43 be built within. She said it had originally been approved as an 80-apartment building with
44 about 120 parking spaces. She said it was approved with an increase of over 50% in the
45 number of apartments in the building, but not one single extra parking space.
46

1 She said the reason the applicant gave was that people living there are going to work at the
2 corporations in the development and won't need a car. She said they also said they were
3 going to be building a parking garage. She said but, when they reordered the phases, the
4 parking garage was planned for a phase after the phase where the building may be built.
5 She said the people would have to park in a vacant lot until they get to the basically the
6 fifth phase of the building. She said the City has no financial guarantee that that parking
7 garage will be built. She said if the apartment house is built and people are parking on a
8 vacant lot, and this developer decides not to go any farther, the taxpayers of the City of
9 Lebanon are stuck with what to do with these people that are parking on a vacant lot. She
10 said the taxpayers of the city of Lebanon are not going to want to pay for that parking
11 garage.

12
13 She said a couple weeks ago the Board approved a development and one of the conditions
14 in the approval was this wording: "If active and substantial development is not achieved
15 within five years of Planning Board approval, the development shall be subject to any
16 changes in the City's Land Use Regulations." She said she believed this development is
17 subject to the Land Use Regulations of 2010 and, if they get an extension and build the
18 first phase and finish that by January of 2027, they'll still be subject to the regulations of
19 2010 unless the Board puts additional conditions. She said how can the Board give an
20 applicant permission to use regulations that are more than a generation old

21
22 She said it appears that the Board has three choices:

- 23 1. Approve their request and give them another two years to do something they haven't
24 done in the last 14 years.
- 25 2. Approve their request but put some conditions in with regard to financial security and
26 other stipulations so the City has sufficient financial guarantees that the infrastructure
27 needed will be completed whenever they first build something that requires temporary
28 parking.
- 29 3. Deny the request for the extension and say the Board doesn't want to be in the business
30 of giving people 32 years to build something

31
32 He invited the applicant to share their thoughts on the information that was shared.

33
34 Mr. Clem said it was their desire to build this project long ago and the timeline of events
35 showcases why it is where it is today. He said the insinuation that this is just another extension to
36 "kick the can down the road" doesn't stand up to the analysis of what has transpired.

37
38 He said his last comment is in response to issues outside of their control and delays beyond their
39 control, they filed a request for extension 98 days ago. He said, on top of all the other delays that
40 have been incurred this year and last year, their ongoing efforts to develop River Park for a
41 perspective tenant, who has been patiently watching, waiting, and wondering what's going, have
42 been put on hold while we wait for this extension in the building permit matter to be adjudicated.
43 He said he hoped the Board can reach a decision this evening, so that those efforts can proceed.

44
45 Chair Faunce closed the public comment portion of the meeting and said the Board would move
46 on to the deliberative portion of the public hearing.

Board deliberation

Mr. Ford Burley said he felt the question the Board should focus on is this: Which phase one infrastructure improvements are not yet complete and whether the reason they are complete or not is outside of the control of the applicant. He read the wording of the extension application requirements:

“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.”

Mr. Ford Burley itemized the Phase I infrastructure improvements:

- Temporary parking lots on LOT 2 and three
- Roadway-sufficient access Lot 3
- Southern Way development entrance intersection
- Extension of Crafts Ave - complete
- Installation of water and sewer lines necessary for LOT 1 - complete
- Installation of other utilities

Mr. Kennelly said he is looking for the reasons for the delay and the need for the extension. He said the applicant has said the reasons are the building permit expiration, the issues with NHDOT, and maybe issues with the stormwater pipe.

He said the question he had regarding the NHDOT is why the applicant did not fulfill the NHDOT requirement to complete a traffic study. He said the applicant may have felt they did not have to do it. He said if the NHDOT asked him to do something, he would do it.

Mr. Kennelly said it does seem like a reasonable request, but maybe the applicant thought it was taken care of in 2020, or maybe, by 2024 when the issue resurfaced, the applicant felt there was not enough time to get it done - but he said there seems to have been ample time to get it done. He said it seems like the applicant was more focused on the building permit issues and did not pay attention to the traffic study request. He said for a project of this size and scope, he did not know if the applicant can only focus on one issue at a time.

Mr. Ford Burley said, regarding the building permit, which expired on or was invalidated on February 1, 2024, the applicant did have the option of applying for a new building permit. He said the City offered to transfer the money they already put into the first building permit to whatever the updated fee structure would be for the new building permit.

Mr. Ford Burley said he also had a concern from testimony from a previous meeting where the applicant repeatedly mentioned a \$4 million price tag for the infrastructure development and that they did not want to pay into without the guarantee of a building on the other end of it.

Chair Faunce said he had asked the applicant what the priorities were for getting the application. He said the applicant made a fair amount of testimony relating to looking for ways to offset costs.

1 He said the applicant may have been looking for ways to offset costs and perhaps relocate to find
2 some way to justify others contributing to the cost of the infrastructure.

3
4 He said testimony began with some of the work Mr. Clem did as chair of the West Lebanon
5 Revitalization Committee, such as the plan to bring to a West Lebanon Advance Transit hub into
6 River Park, working on trail access, sending a memo and introducing City officials to a public-
7 private Partnership proposal to offset cost for providing access to Road Park Drive, attempting to
8 revitalize the 2020 failed effort to cost share on relocating the City's pipe, and proposing
9 additional ways to offset higher construction costs, including a TIF.

10
11 He said that testimony suggests that the most pressing issue for developer was 'how do I pay for
12 this and how do I get things done as quickly as possible in order to satisfy my obligations for the
13 level of development required to advance the project.' He said it seems that the incredibly
14 important milestone to have an official status of complete did not seem to be the focus at that time.
15 He said he thought things haven't concluded in this because at the last extension efforts were not
16 made more quickly at that time to focus on the doing rather than the financing. Chair Faunce said
17 he knows these are large projects and he understands the importance of it.

18
19 He said all this testimony added to other testimony regarding the costs of infrastructure reads as
20 though the applicant is trying to make this work within a financial space. He said these concerns
21 are real and can be part of this kind of project.

22
23 City Attorney Ms. Christine Johnston, Esq. confirmed that, regardless of what decision the Board
24 may make in this situation, the decision should be vetted by Legal Counsel. Chair Faunce any
25 suggestion of a decision made either by a straw poll for an unbinding informal opinion of the
26 group which will form instructions to Staff with Legal Counsel on how to develop a Motion that is
27 suitable in a legally sustainable manner. Chair Faunce said he would not want to put a decision
28 this significant on the lay persons of the Board. He said the goal of the Board right now is to
29 understand how they feel about the issues up for discussion and to discuss the issues with vigor.

30
31 He suggested the deliberation should be continued into the next meeting so they will have the
32 tools developed by Staff and Counsel to support the decision intimated by a straw poll.

33
34 Mr. Ford Burley said the applicant has done some things, but they all have to be done. He said the
35 southerly entrance roadwork is a big sticking point. Chair Faunce said he felt the applicants are
36 having difficulty with a focus on cost relative to revenues coming in. He said the issue with
37 respect to communication with NHDOT is unsatisfactory and he would not go from 2020 to 2024
38 on the assumption that everything was good. He said the applicant may have been constrained by
39 their finances and maybe that changed their calculations.

40
41 Mr. Ford Burley said he did not think this passes the bar of "beyond the control of the applicant."
42 Mr. Kennelly said they have to consider the reasons that have been offered.

43 44 **Decision discussion**

45 Mr. Rutter said he understands they can deny the extension strictly because the applicant did not
46 meet the levels of what they need to show, but he suggested maybe they take Ms. Romano's

1 suggestion to grant the extension but with conditions that keep the applicant on track to complete
2 the project. The group discussed this idea at length.

3
4 Attorney Johnston confirmed the City cannot legally grant an extension and state it is the “last
5 one” for the applicant. Chair Faunce suggested a Condition of Approval could be that there must
6 be some ongoing (for example, every three or six months) engagement between the developer and
7 the City regarding activity toward the fulfillment of the plans. Mr. Rutter said the fluidity of the
8 communication between the two parties concerned does not have a very good track record and so
9 to improve that communication the Board would need a lot of assistance from Legal Counsel.
10 Attorney Johnston said that the City’s Legal Counsel could help with that.

11
12 Ms. Zook said the challenge with that sort of solution is that it's only enforceable in one direction,
13 and, in a situation where communication between the two parties is monitored, she did not see
14 how the City could help effectively. Attorney Johnston clarified that a Condition of Approval is
15 enforceable against an applicant and what the City would be undertaking to fulfill whatever its
16 obligations might be under that would have no impact on the applicant. She said if a schedule was
17 established, the applicant would be held to their part and would not be punished for anything that
18 the City might do or not do.

19
20 Chair Faunce said more regular face-to-face time between parties gives an opportunity to reset the
21 reality of what is being done. Ms. Zook said she is not sure it’s the nature of the communication
22 between the parties that is necessarily being reflected in what has happened. She said the applicant
23 has an obligation to demonstrate that they have pursued everything that would bring the project to
24 completion, and she said she is not sure that even gets to the root of the problem.

25
26 ***A MOTION was made by Richard Ford Burley to extend the meeting to 9:50pm. The Motion***
27 ***was seconded by Jeremy Rutter.***

28 ****The MOTION was approved (5-0).***

29 Chair Faunce called for a straw poll of the participating members

30
31 ***Straw Poll Vote***

32 ***Rutter – approve extension***

33 ***Faunce - deny extension***

34 ***Ford-Burley - deny extension***

35 ***Zook - deny extension***

36 ***Kennelly - deny extension***

37 ***(4-1 in favor of denying the extension)***

38
39 Chair Faunce said the Board should direct Staff and Legal Counsel to write a motion that reflects
40 the results of the straw poll.

41
42 ***A MOTION was made by Andrew Faunce to direct City Staff and the City’s Legal Counsel to***
43 ***prepare a draft motion related to the straw poll taken in this meeting. He further moved that the***
44 ***draft motion would be reviewed and decided upon by the Planning Board in one month’s time***
45 ***(at a November Planning Board meeting).***

1
2 ***The motion was seconded by Richard Ford Burley.***

3
4 ****The MOTION was approved (5-0).***

5
6
7 Chair Faunce said Item 3C would be discussed next, if the applicant feels it would be helpful,
8 given that it is impacted by the previous discussion of Item 3D.

9
10 **C. XYZ Dairy, LLC, River Park Drive (Tax Map 44, Lots 21 - 30, and Tax Map 44, Lot**
11 **7), zoned CB, IND-L and R-3: Appeal of administrative decision made on September**
12 **10, 2024, that conditions 1, 2, 4, 5, 7 and 14-4 of the River Park development Site Plan**
13 **approval as set forth in the Notice of Action dated September 9, 2019, for PB2018-34-**
14 **SPA, have not yet been satisfied and, consequently, that construction of Phase 1 may**
15 **not commence. PB2024-40-AAD**

16
17 Mr. David Clem said the Board has been correct and acknowledging that there is considerable
18 tension between Staff In the planning and building Department and XYZ Dairy. He said they have
19 endeavored to fulfil a project and deal with issues beyond their control in terms of what
20 information is submitted by the City to the state without them seeing it or without our engineers
21 being able to see it even though they stamped original construction drawings. He said this project
22 has had over 84 public hearings and he does not understand why the Staff has not been willing to
23 help. He said they have endeavored diligently to pursue accomplishing work. He said they have
24 facilitated 6+ acres of open space on the river, built four single-family homes on Crafts Ave.,
25 made significant improvements to the infrastructure for West Lebanon. He said he takes exception
26 to the notion that they don't have the economic capacity to complete the project and that that is the
27 reason they're dodging and not fulfilling the conditions. He said that information or that opinion is
28 not based on fact.

29 He said he does not understand why this Board takes the position that they have an endeavor to
30 fulfill the requirements. He said the issue with NHDOT came as a complete shock to them – he
31 said the person who originally asked for additional traffic studies wasn't aware of the traffic
32 studies that they had already done and paid for, and the program hasn't changed, and the
33 assumptions mandated by those traffic studies have not been realized.

34 Chair Faunce asked the applicant if it would be helpful to discuss Agenda Item 3C and Mr. Chet
35 Clem said yes it would.

36
37 ***A MOTION was made by Richard Ford Burley to extend the meeting to 10:00pm. The Motion***
38 ***was seconded by Jeremy Rutter.***

39 ****The MOTION was approved (5-0).***

40 Mr. Corwin stated that Staff recommends that the application is complete enough for the Planning
41 Board to accept jurisdiction and commence review.
42

1 ***A MOTION was made by Richard Ford Burley that the application of XYZ Dairy, LLC, River***
2 ***Park Drive (Tax Map 44, Lots 21 - 30, and Tax Map 44, Lot 7), zoned CB, IND-L and R-3:***
3 ***Appeal of administrative decision made on September 10, 2024, that conditions 1, 2, 4, 5, 7 and***
4 ***14-4 of the River Park development Site Plan approval as set forth in the Notice of Action dated***
5 ***September 9, 2019, for PB2018-34-SPA, have not yet been satisfied and, consequently, that***
6 ***construction of Phase 1 may not commence. PB2024-40-AAD is complete enough for the***
7 ***Planning Board to accept jurisdiction and commence review. The motion was seconded by***
8 ***Jeremy Rutter.***

9
10 ****The MOTION was approved (5-0).***

11
12 Mr. Corwin said per the September 9, 2019 Notice of Action, which he said technically was a site
13 plan amendment but remains sort a controlling decision for the River Park development, any
14 disagreement about the Conditions of Approval are appealable to the Planning Board. He said he
15 had heard from the City Engineer that the applicant was intending to begin construction on Phase I
16 infrastructure work as of July 1, 2024. He said typically, when a developer is beginning
17 construction, they'll coordinate with Staff to ensure that all Planning Board conditions have been
18 satisfied. He said he did not hear from the applicant, reached out to the applicant and provided the
19 conditions of both the site plan approval and subdivision approval that he needed assistance with
20 in verifying compliance. He said that was not a determination that the conditions haven't been met,
21 but it was a question to the applicant to verify these conditions have been met. He said this is a
22 request that is routinely made to developers. He said typically there is a response as a status update
23 and communication back and forth to work where the process stands.
24 He said he received no response from the applicant, but it was his understanding that the applicant
25 was to begin construction on July 1st. He said he did receive a draft performance bond and
26 security agreement from the applicant's Legal Counsel on or about June 25, 2024. He said that was
27 a condition tied to the subdivision approval and Staff provided comments to those and sent those
28 back on or about July 25.

29
30 He said he did not receive a response, but that's the only communication that Planning Staff
31 specifically has had with the applicant relative to fulfilling conditions of approval. He said at the
32 September 9th public hearing, the applicant seemed to suggest that they have satisfied the site plan
33 conditions of approval and necessary to proceed with construction of a Phase I. He said he made it
34 clear that, having heard no response to the to the routine questions that that staff asked earlier in
35 the summer, that the condition have not been satisfied if no information was provided to
36 substantiate compliance. He said now, a very routine request for an extraordinarily complex
37 project has turned into an appeal, which is very unusual.

38 39 **Conditions and actions by applicant to meet them**

40 Mr. Ford Burley asked the following questions regarding the Conditions:

41 Condition 1 – The applicant shall submit final designs, including construction drawings of all
42 infrastructure features associated with each phase, including proposed on- and off-site roadway
43 and parking areas, sidewalk, water and sewer utilities, and storm drainage systems to the City
44 Engineer for approval, which shall not be unreasonably withheld.

45
46 Mr. Ford Burley said the applicant said they have submitted updated drawings to the DPW and

1 NHDOT on June 7, 2024. City Engineer Brian Vincent said, in June, they did receive an
2 excavation permit application that included two plan sets: one was for off-site construction of
3 Route 10 and the other one was for site development and on the project property itself. He said
4 both were focused on roadway and infrastructure construction.

5
6 Mr. Corwin said it was not conveyed that it was the applicant's intent to satisfy Condition 1 by
7 submitting the plan set as part of their excavation permit application. He said Staff can now review
8 the plan set for conformance and compliance with Condition 1.

9
10 Mr. Chet Clem said Condition 1 makes clear that the materials need to be submitted to the City
11 Engineer for approval, so it's not relevant to the Planning Department. He said the June 7
12 submittal was the fourth time these plans have been submitted to the City. Mr. Ford Burley noted
13 the Planning Department is responsible for ensuring the Planning Board's Conditions of Approval
14 have been met so it needs to know the plans have been submitted. Mr. Clem said the timing of the
15 request overlapped with the process of completing the performance bond security agreement,
16 which became their focus. He said it seemed the requirement had been met because the plans had
17 been submitted three times previously and to the City Engineer in June. Mr. Corwin said it is not
18 clear why the applicant couldn't clarify that point as a matter of courtesy. He said a simple
19 explanation would have avoided the Board and all parties spending time on this.

20
21 Mr. Ford Burley said the discussion may have to be continued to another meeting because time is
22 running out for this meeting. Mr. Clem said they have a tenant for whom they have everything
23 lined up to continue to build for so building is imminent. He said the only thing keeping the
24 building from being built are the issues that they have been dealing with all year. Mr. David Clem
25 said they hope the issues will be resolved in an evidencia hearing in Superior Court on Thursday.

26
27 Mr. Chet Clem asked if there are any conditions that Staff believes have not been met. Mr. Corwin
28 said the purpose of this hearing is for the Board to make a determination as to whether the
29 applicant has complied with the conditions. He said the applicant will not respond to Planning
30 Staff, so they are here now for the Board to make its determination.

31
32 ***A MOTION by Richard Ford Burley that discussion of the application of XYZ Dairy, LLC,***
33 ***River Park Drive (Tax Map 44, Lots 21 - 30, and Tax Map 44, Lot 7), zoned CB, IND-L and R-***
34 ***3: Appeal of administrative decision made on September 10, 2024, that conditions 1, 2, 4, 5, 7***
35 ***and 14-4 of the River Park development Site Plan approval as set forth in the Notice of Action***
36 ***dated September 9, 2019, for PB2018-34-SPA, have not yet been satisfied and, consequently,***
37 ***that construction of Phase 1 may not commence. PB2024-40-AAD be continued until the next***
38 ***Planning Board meeting.***

39
40 ***The motion was seconded by Patrick Kennelly.***

41
42 ****The MOTION was approved (5-0).***

43
44
45
46 Ms. Romano and Mr. Stacey rejoined the meeting as participating members of the Board.

1
2 **1. OTHER BUSINESS**

3 None

4
5 **2. APPROVAL OF MINUTES**

- 6 • September 09, 2024
7 • September 16, 2024
8 • September 23, 2024
9 • September 30, 2024

10
11 Mr. Ford Burley said there was not enough time remaining to review and approve the minutes
12 from the September meetings.

13
14 *A MOTION was made by Richard Ford Burley that the approval of minutes for the September*
15 *09, 2024, September 16, 2024, September 23, 2024, and September 30, 2024 Planning Board*
16 *meetings be considered at the next Planning Board Work Session meeting. The motion was*
17 *seconded by Andrew Faunce.*

18
19 **The MOTION was approved (7-0).*

20 Mr. Corwin provided edits to the minutes to the Board members for review and consideration
21 prior to the next Work Session meeting.

22
23 **3. ADJOURNMENT**

24
25 *A MOTION was made by Richard Ford Burley to adjourn the meeting at 9:57pm. The motion*
26 *was seconded by Andrew Faunce.*

27
28 **The MOTION was approved (7-0).*

29
30 The meeting was adjourned at 9:57pm.

31
32 Respectfully submitted,

33 Paula Roux

34 Recording Secretary