CMA ENGINEERS, INC.
CIVIL | ENVIRONMENTAL | STRUCTURAL

35 Bow Street
Portsmouth, New Hampshire
03801-3819

P: 603|431|6196
*www.cmaengineers.com*

April 1, 2024

Mark Connors, Town Planner
Town of Stratham
10 Bunker Hill Avenue
Stratham, NH 03885

**Re: Windsong Subdivision**
**Map 6, Lot 167**
**CMA # 1325**

Dear Mark,

The applicant, Chinburg Properties, Inc. of Newmarket, NH, is proposing to construct a six-lot subdivision off Bunker Hill Ave. On the Town's behalf, CMA Engineers has reviewed the application for conformance with the Town of Stratham, NH, Site Plan Review Regulations. CMA Engineers has received the following information for review, all prepared by Beals Associates, PLLC of Stratham, NH:

1) Windsong Place, Bunker Hill Ave, Tax Map 6, Lot 167, dated February 2024 (10 sheets)
2) Display Plan dated February 2024
3) Drainage Analysis & Sediment and Erosion Control Plan, dated February 1, 2024
4) Lot Size by Soil Type and Test Pit Logs, dated February 5, 2024
5) Town of Stratham Subdivision Application dated February 2, 2024

## Background:

The project includes construction of a six-lot subdivision with a cul-de-sac off Bunker Hill Ave. Each lot will be served by an individual well and septic system. The existing parcel is 13.19-acres in the in the Residential/Agriculture (RA) Zone in Stratham (Tax Map 6, Lot 167). The lot is currently mostly undeveloped, forested with an existing house, garage, and paved driveway. Proposed stormwater management includes a combination of closed drainage, swales, and two infiltration ponds, one with a sediment forebay.

## SUBDIVISION REGULATIONS

### 4.3 – Soils-Based Lot Size Determination

*4.3.1.c.1.i.* – It does not appear that the correct minimum lot size by soil classification values (from Table 4.3.5) are used for soils 343-H C and 323-H B and C. The calculations do not include the multiples in the denominator, based on the number of bedrooms.

The number of proposed bedrooms for each house is not shown.

## 4.4 Design Standards

*4.4.1.b.iv.* – Lots 3 and 4 appear to have a portion with a width of less than 50'.

*4.4.3.a.ii.* – It is not clear that the street meets the maximum length of 1000'. Is the length of the cul-de-sac included in the maximum length?

*4.4.5* – Is the Planning Board requiring installation of sidewalks?

*4.4.7b.i.* – Note 10 on Sheet 3 indicates that all homes will have sprinkler systems, but each home is served by a private well. Are individual storage tanks proposed?

## 4.5 Construction Standards

*4.5.1.f.* – Portions of the roadway and cul-de-sac have sideslopes in excess of the maximum slopes specified here and in the Town of Stratham Road Cross Section and Town of Stratham Cul-de-sac details. Retaining walls should be considered.

## Addendum A

Provide a detail in conformance with Figure B Town of Stratham Cul-De-Sac.

Figure 1 specifies a minimum curb radius of 30' but 25' is shown on the plans.

## Addendum C Stormwater Management & Erosion Control Specifications

The stormwater design uses closed drainage, swales, sheet flow, and two infiltration ponds (one with a sediment forebay) for the treatment and management of stormwater. There are no increases in peak flow rates post-development.

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We have the following comments on the **drainage design** that relate to Town Ordinances:

## C. Best Management Practices

*iv.d.* – The applicant should provide calculations that show that stormwater features drain within 72 hours.

*iv.h.* – The stormwater system is required to remove Total Nitrogen in accordance with the NH Small MS4 General Permit requirements. The applicant should show compliance with this standard.

*iv.i.* – The applicant should show the required groundwater recharge volume (GRv) infiltration standard is met.

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We have the following comments that relate to the **stormwater design with respect to the NHDES Stormwater Manual** that are not covered above:

a) The applicant should show the 2-year storm volumes pre- and post-development and demonstrate that channel protection requirements are met.

b) Infiltration pond #2 does not have 3' or greater separation from groundwater. Additionally, the Infiltration Pond Detail on Sheet 5 should show the required 6" of coarse sand or pea gravel. Verify that the pond can hold the 50-year, 24-hour storm without overtopping.

c) The applicant should complete the appropriate BMP worksheet for the infiltration practices. This worksheet includes important design information including the design infiltration rate, time to drain, separation from the seasonal high-water table, peak elevations of storm events, etc.

d) The drain time of the practices should be provided.

e) The applicant conducted one test pit in the location of each proposed infiltration pond #2. The NHDES stormwater manual requires 2 test pits for a pond of this size.

---

We have the following comments that relate to the **stormwater design in general**, that have not previously been discussed:

a) The plans show (2) 22' outlet pipes from infiltration pond #1, but the model shows 24' pipes.

b) The Inspection and Maintenance Plan indicates that the maintenance of the infiltration ponds is the responsibility of the individual homeowners. What are the details of this? Is there an HOA or deed restrictions, covenants, etc.? Who maintains the log form and inspection checklist?

c) The discharge pipe into the swale on the edge of the roadway needs to be reconfigured. The angle of the headwall is too sharp and should be more perpendicular to the roadway. Additionally, there should be more space for the swale construction.

d) The swale sections constructed in fill areas should have flat berm sections outside of the swale, rather than coming to a sharp point.

---

We have the following comments on the **design plans**:

a) The Subdivision Plan and Existing Conditions Plan erroneously show Bunker Hill "Road" instead of Ave.

b) There are two Notes 4. On the Subdivision Plan.

c) The surveyor should sign the plans.

d) The plans should indicate that the existing house, garage, shed, and which trees are to be removed.

e) Note 11 on Sheet 3 indicates utilities are proposed to be underground but these are not shown on the plan.

f) Is outlet/inlet protection (riprap aprons or flared end sections) proposed for the culverts? This should be shown on the plan.

g) The size and material of the proposed underdrain pipes should be indicated on the profiles and cross-sections.

h) The Typical Cross-Section indicated a right-of-way width of 60' but the Road Cross Sections X1 & X2 (Sheets 7 & 8) indicate a 50'ROW.

i) A stop sign and road sign are indicated on the plans but no details are provided. The plans should also show a stop bar.

Should you have any questions, please do not hesitate to contact us.

Very truly yours,

CMA ENGINEERS, INC.

Jodie Bray Strickland, P.E.
Project Manager

Phil Corbett, P.E.
Vice President

JBS/vpt

cc: Christian Smith, P.E., Beals Associates, PLLC

# TOWN OF STRATHAM

*Incorporated 1716*
10 Bunker Hill Avenue · Stratham, NH 03885
Town Clerk/Tax Collector 603-772-4741
Select Board/Administration/Assessing 603-772-7391
Code Enforcement/Building Inspections/Planning 603-772-7391
Fax (All Offices) 603-775-0517


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**TO:** Christian Smith, Beals Associates

**FROM:** Mark Connors, Planning & Community Development Director

**RE:** **Windsong Place Subdivision Staff Comments**

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The Town of Stratham has reviewed the

1) Please show the area of disturbance on the plan and include the total square-footage. There has been a question of whether the development requires an AOT Permit.
2) A clear Purpose Statement should be noted as the first note of the Subdivision Plan. "The intent of this plan is to subdivide…"
3) The dimension for lot depth should be shown on the plan for each lot consistent with the definition as provided in the Zoning Ordinance.
4) Staff would strongly encourage that some mature landscaping be preserved and incorporated into the development consistent with Section 4.4.1.b(ii) of the Subdivision Regulations. The subdivision Bunker Hill Commons (Market Street & Bittersweet Lane), is an example of where this was executed successfully.
5) A certified wetland scientist should sign the plan sheet where the wetland is delineated.
6) Staff would strongly recommend a landscaping plan to help provide some screening of the detention pond located at the end of the cul-de-sac.
7) The ownership/responsibility of the road and associated drainage facilities should be clearly noted on the plan.
8) The Fire Department has indicated that the Department lacks an adequate water source to tap into in the immediate vicinity of the planned development in the event of a fire. While the home sprinkler systems will be helpful for safety and home evacuation efforts, there is no available water source for the Department to tap into once the sprinkler systems are expended. The Fire Department would therefore request that a water cistern be sited within the development to aid in fire response.
9) Accessibility to the infiltration basin on Lot 6 for maintenance purposes may present challenges. Will some kind of accessway be provided in order for maintenance vehicles to reach that location or could the basin be sited closer to the right-of-way?
10) The amount of buildable upland (in square feet) should be indicated for each lot per Section 4.3.1.b of the Subdivision Regulations.
11) Conceptual driveway locations should be shown for each lot to show the lot can meet the driveway minimum site distance requirements.

12) Staff would recommend renaming Sheet 3 as the development does not meet the statutory requirements to qualify as a site plan and may cause confusion.

13) Note 11 on Sheet 3 should be revised to note the type of sprinkler systems proposed and to note that they would fully serve all living spaces as previously indicated.

14) The plan sheet numbers should be in order as they appear in the plan set.

15) The Revision Block should include dates when the plans were completed/revised.

16) Staff would recommend that you file a demolition permit in the near future. The Town has a Demolition Delay Ordinance (Section 16.5 of the Zoning Ordinance) for historic properties and the existing residence on the lot would qualify. Filing a Demolition Permit would initiate a meeting of the Demolition Review Committee which would provide the applicant/Planning Board greater clarity regarding whether any type of mitigation would be requested.

BA BEALS ASSOCIATES, PLLC
Land Planning • Civil Engineering
Landscape Architecture • Septic Design & Evaluation
Stratham, NH

Stratham Planning Board
10 Bunker Hill Avenue
Stratham, NH 03885

April. 15, 2024

Ref: Map 6 Lot 167
Windsong Place Subdivision

Dear Mr., Chairman & Members of the Board:

We are in receipt of review comments from CMA Engineers, dated April 1, 2024 and we offer the following responses to the noted comments. Each comment is followed by our response in **bold**.

SUBDIVISION REGULATIONS

4.3 – Soils-Based Lot Size Determination

*4.3.1.c.1.i.* – It does not appear that the correct minimum lot size by soil classification values (from Table 4.3.5) are used for soils 343-H C and 323-H B and C. The calculations do not include the multiples in the denominator, based on the number of bedrooms. The number of proposed bedrooms for each house is not shown.

**Response: The soils values have been revised and updated calcs for the estimated 4 bedroom homes.**

4.4 Design Standards

*4.4.1.b.iv*. – Lots 3 and 4 appear to have a portion with a width of less than 50'.

**Response: Lot 4 is greater than 50' and Lot 3 is due to the external boundary.**

*4.4.3.a.ii.* – It is not clear that the street meets the maximum length of 1000'. Is the length of the cul-de-sac included in the maximum length?

**Response: The total length is less than 1000' feet as shown.**

*4.4.5* – Is the Planning Board requiring installation of sidewalks?

**Response: Sidewalks are not required.**

*4.4.7b.i.* – Note 10 on Sheet 3 indicates that all homes will have sprinkler systems, but each home is served by a private well. Are individual storage tanks proposed?

**Response: If sprinkler systems will be provided over a water cistern, pressure tanks will be provided in the basements.**

4.5 Construction Standards

*4.5.1.f.* – Portions of the roadway and cul-de-sac have side slopes in excess of the maximum slopes specified here and in the Town of Stratham Road Cross Section and Town of Stratham Cul-de-sac details. Retaining walls should be considered.

**Response: This will be discussed with the board and possible guardrail use.**

Addendum A

Provide a detail in conformance with Figure B Town of Stratham Cul-De-Sac. Figure 1 specifies a minimum curb radius of 30' but 25' is shown on the plans.

**Response: The radius has been revised.**

Addendum C Stormwater Management & Erosion Control Specifications

The stormwater design uses closed drainage, swales, sheet flow, and two infiltration ponds (one with a sediment forebay) for the treatment and management of stormwater. There are no increases in peak flow rates post-development.

We have the following comments on the drainage design that relate to Town Ordinances:

C. Best Management Practices

*iv.d.* – The applicant should provide calculations that show that stormwater features drain within 72 hours.

**Response: NHDES Infiltration Practice BMP worksheets are provided as part of this response.**

*iv.h.* – The stormwater system is required to remove Total Nitrogen in accordance with the NH Small MS4 General Permit requirements. The applicant should show compliance with this standard.

**Response: The use of infiltration BMPs provided for 60% Total Nitrogen removal per the NHDES Pollutant Removal Efficiency table that is included as part of this response submittal.**

*iv.i.* – The applicant should show the required groundwater recharge volume (GRv) infiltration standard is met.

**Response: NHDES Infiltration Practice BMP worksheet is provided as part of this response.**

We have the following comments that relate to the stormwater design with respect to the NHDES Stormwater Manual that are not covered above:

a) The applicant should show the 2-year storm volumes pre- and post-development and demonstrate that channel protection requirements are met.
**Response: Channel protection volumes have been added to the drainage analysis narrative showing compliance.**

b) Infiltration pond #2 does not have 3' or greater separation from groundwater. Additionally, the Infiltration Pond Detail on Sheet 5 should show the required 6" of coarse sand or pea gravel. Verify that the pond can hold the 50-year, 24-hour storm without overtopping.
**Response: Per NHDES regulations, separation can be reduced to 1 foot if treated prior to entering the practice.**

c) The applicant should complete the appropriate BMP worksheet for the infiltration practices. This worksheet includes important design information including the design infiltration rate, time to drain, separation from the seasonal high-water table, peak elevations of storm events, etc.
**Response: NHDES Infiltration Practice BMP worksheets are provided as part of this response.**

d) The drain time of the practices should be provided.
**Response: NHDES Infiltration Practice BMP worksheets are provided as part of this response.**

e) The applicant conducted one test pit in the location of each proposed infiltration pond #2. The NHDES stormwater manual requires 2 test pits for a pond of this size.
**Response: Meeting NHDES regulations, 2 test pits (TPD2 and TPD3) were provided for IP#1 and 1 test pit (TPD1) was provided for IP#2.**

We have the following comments that relate to the stormwater design in general, that have not previously been discussed:

a) The plans show (2) 22' outlet pipes from infiltration pond #1, but the model shows 24' pipes.

**Response: The plans have been revised to 24 feet.**

b) The Inspection and Maintenance Plan indicates that the maintenance of the infiltration ponds is the responsibility of the individual homeowners. What are the details of this? Is there an HOA or deed restrictions, covenants, etc.? Who maintains the log form and inspection checklist?
**Response: It will be the responsibility of the individual lot owner to inspect and maintain the forebay and/or infiltration pond, along with forms and checklists, and this will be listed as a deed restriction. Note #12 has been added to the Development Plan noting ownership responsibilities.**

c) The discharge pipe into the swale on the edge of the roadway needs to be reconfigured. The angle of the headwall is too sharp and should be more perpendicular to the roadway. Additionally, there should be more space for the swale construction.
**Response: This has been revised as requested.**

d) The swale sections constructed in fill areas should have flat berm sections outside of the swale, rather than coming to a sharp point.
**Response: This has been revised as requested.**

We have the following comments on the design plans:

a) The Subdivision Plan and Existing Conditions Plan erroneously show Bunker Hill "Road" instead of Ave.
**Response: Plans have been revised to Avenue.**

b) There are two Notes 4. On the Subdivision Plan.
**Response: The additional "4" has been removed.**

c) The surveyor should sign the plans.
**Response: The plans have been signed by the surveyor.**

d) The plans should indicate that the existing house, garage, shed, and which trees are to be removed.
**Response: This is noted on the plan and profile.**

e) Note 11 on Sheet 3 indicates utilities are proposed to be underground but these are not shown on the plan.
**Response: These will be provided when the utility company provides their response.**

f) Is outlet/inlet protection (riprap aprons or flared end sections) proposed for the culverts? This should be shown on the plan.
**Response: Additional riprap aprons have been added to the plans.**

g) The size and material of the proposed underdrain pipes should be indicated on the profiles and cross-sections.
**Response: A reference note has been added to the plan.**

h) The Typical Cross-Section indicated a right-of-way width of 60' but the Road Cross Sections X1 & X2 (Sheets 7 & 8) indicate a 50'ROW.
**Response: This has been revised.**

i) A stop sign and road sign are indicated on the plans but no details are provided. The plans should also show a stop bar.
**Response: A sign detail has been added and the addition of a stop bar will be per NHDOT.**

Thank you for your timely and professional review of the submitted plans. We hope the information provided address your concerns. Please feel free to contact our office if you have any additional question and/or comments.

Very Truly Yours,

BEALS ASSOCIATES, PLLC

Christian O Smith

Christian O. Smith, PE
Principal

BA BEALS ASSOCIATES, PLLC
Land Planning • Civil Engineering
Landscape Architecture • Septic Design & Evaluation
Stratham, NH

Stratham Planning Board,
10 Bunker Hill Avenue
Stratham, NH 03885

April. 15, 2024

Ref: Map 6 Lot 167
Windsong Place Subdivision

Dear Mr., Chairman & Members of the Board:

We are in receipt of a review comments from the planning office and we offer the following responses to the noted comments. Each comment is followed by our response in **bold**.

1) Please show the area of disturbance on the plan and include the total square-footage. There has been a question of whether the development requires an AOT Permit.
   **Response: The note has been revised to reflect the area of disturbance which is below the AoT permit requirement.**
2) A clear Purpose Statement should be noted as the first note of the Subdivision Plan. "The intent of this plan is to subdivide…"
   **Response: The purpose statement has been added.**
3) The dimension for lot depth should be shown on the plan for each lot consistent with the definition as provided in the Zoning Ordinance.
   **Response: Lot depth dimensions have been added to the plans.**
4) Staff would strongly encourage that some mature landscaping be preserved and incorporated into the development consistent with Section 4.4.1.b(ii) of the Subdivision Regulations. The subdivision Bunker Hill Commons (Market Street & Bittersweet Lane), is an example of where this was executed successfully.
   **Response: The Applicant is willing to retain existing vegetation within the building setback that is not required to be removed. See Landscape Plan (Sheet 11) that has been added to the plan set.**
5) A certified wetland scientist should sign the plan sheet where the wetland is delineated.
   **Response: A wetland scientist stamp and signature has been added to the plans.**
6) Staff would strongly recommend a landscaping plan to help provide some screening of the detention pond located at the end of the cul-de-sac.
   **Response: See Landscape Plan (Sheet 11) that has been added to the plan set.**
7) The ownership/responsibility of the road and associated drainage facilities should be clearly noted on the plan.
   **Response: Note #12 has been added to the Development Plan noting ownership responsibilities.**
8) The Fire Department has indicated that the Department lacks an adequate water source to tap into in the immediate vicinity of the planned development in the event of a fire. While the home sprinkler systems will be helpful for safety and home evacuation efforts, there is no available water source for the Department to tap into once the sprinkler systems are expended. The Fire Department would therefore request that a water cistern be sited within the development to aid in fire response.

**Response: Sprinkler systems have been proposed. The applicant will verify if a water cistern is preferred by the Fire Department instead of the sprinkler systems.**

9) Accessibility to the infiltration basin on Lot 6 for maintenance purposes may present challenges. Will some kind of accessway be provided in order for maintenance vehicles to reach that location or could the basin be sited closer to the right-of-way?
**Response: The proposed easement provides access to the pond.**
10) The amount of buildable upland (in square feet) should be indicated for each lot per Section 4.3.1.b of the Subdivision Regulations.
**Response: Buildable upland areas have been added to the plans.**
11) Conceptual driveway locations should be shown for each lot to show the lot can meet the driveway minimum site distance requirements.
**Response: Possible driveway locations have been added as requested.**
12) Staff would recommend renaming Sheet 3 as the development does not meet the statutory requirements to qualify as a site plan and may cause confusion.
**Response: The title has been revised to Development plan.**
13) Note 11 on Sheet 3 should be revised to note the type of sprinkler systems proposed and to note that they would fully serve all living spaces as previously indicated.
**Response: When a manufacturer is selected by the applicant, that information will be provided to the Town. Sprinkler systems, if supplied over a water cistern, will fully serve all living spaces.**
14) The plan sheet numbers should be in order as they appear in the plan set.
**Response: The plan sheet numbers have been revised.**
15) The Revision Block should include dates when the plans were completed/revised.
**Response: Revision dated have been added.**
16) Staff would recommend that you file a demolition permit in the near future. The Town has a Demolition Delay Ordinance (Section 16.5 of the Zoning Ordinance) for historic properties and the existing residence on the lot would qualify. Filing a Demolition Permit would initiate a meeting of the Demolition Review Committee which would provide the applicant/Planning Board greater clarity regarding whether any type of mitigation would be requested.
**Response: Comment noted.**

Very Truly Yours,

BEALS ASSOCIATES, PLLC

Christian O Smith

Christian O. Smith, PE
Principal

# *WINDSONG PLACE*
# *BUNKER HILL AVE*
# *TAX MAP 6, LOT 167*

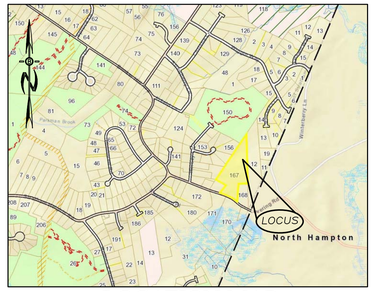
NOT FOR CONSTRUCTION


CIVIL ENGINEERS:

BEALS ASSOCIATES, PLLC

70 PORTSMOUTH AVE,
THIRD FLOOR, SUITE 2
STRATHAM, N.H. 03885
PHONE: 603-583-4860,
FAX. 603-583-4863


STATE OF NEW HAMPSHIRE – CHRISTIAN O. SMITH No.9900 – PROFESSIONAL ENGINEER




LOCATION MAP
NTS

INDEX



## RECORD OWNER

LANZILLO IRREVOCABLE TRUST
LANZILLO, KENNETH F. - TRUSTEE
LANZILLO, KENNETH F. JR - TRUS
939 OCEAN BLVD UNIT 3
HAMPTON, NH 03842

## APPLICANT:

CHINBURG PROPERTIES INC
3 PENSTOCK WAY
NEWMARKET, NH 03857

## LAND SURVEYORS:

NORTHAM SURVEY LLC

686 Central Ave, Ste 100, Dover NH 03820 (603) 953-3164 www.northamsurvey.com

## WETLAND / SOIL CONSULTANT:

GOVE ENVIRONMENTAL SERVICES INC.
8 CONTINENTAL DRIVE,
BLDG 2 UNIT H
EXETER, NH 03833
1-603-778-0644

STATE OF NEW HAMPSHIRE – JAMES P. GOVE 1-17-2024 – No. 604 – CERTIFIED SOIL SCIENTIST

STATE OF NEW HAMPSHIRE – JAMES P. GOVE 10-7-23 – No. 0051 – CERTIFIED WETLAND SCIENTIST

### PLAN SET LEGEND

| | | | |
|---|---|---|---|
| 5/8" REBAR | ● | DRAINAGE LINE | D D |
| DRILL HOLE | ◉ | OVERHEAD ELEC. LINE | OHE |
| CONC. BOUND | ⊡ | STONE WALL | |
| UTILITY POLE | ○ | TREE LINE | |
| DRAIN MANHOLE | Ⓓ | SOIL LINES | |
| EXISTING LIGHT POLE | ☼ | WETLAND SETBACK | |
| EXISTING CATCH BASIN | □ | BUILDING SETBACK LINES | |
| PROPOSED CATCH BASIN | ⊞ | EXIST. CONTOUR | 100 |
| PINES, ETC. | ✳ | PROP. CONTOUR | 100 |
| MAPLES, ETC. | ✿ | ABUT. PROPERTY LINES | |
| EXIST. SPOT GRADE | 96x69 | EXIST. PROPERTY LINES | |
| SINGLE POST SIGN | —o— | PROP. PROPERTY LINES | |
| 4000 SF SEPTIC RESERVE AREA | | PROP. WELL W/ 75' PROTECTIVE RAD. | ⊗ |

REQUIRED PERMITS

NHDES SUBDIVISION APPROVAL #: SA 2024...
NPDES APPROVAL NUMBER:
NHDOT DRIVEWAY PERMIT

| REVISIONS: | DATE: |
|---|---|
| ISSUED | 2-4-24 |
| REVISED PER REVIEW | 4-12-24 |
| | |
| | |
| | |

NH-1500 WINDSONG PLACE ISSUED FEB. 2024

NOTES:

1. THE INTENT OF THIS PLAN IS TO SUBDIVIDE THE SUBJECT PARCEL INTO SIX LOTS .
2. SUBJECT PARCEL: TAX MAP 6 LOT 167
   189 BUNKER HILL AVENUE
   STRATHAM, NEW HAMPSHIRE
   NS PROJECT #992
3. OWNER OF RECORD: KENNETH F. LANZILLO IRREVOCABLE TRUST
   KENNETH F. LANZILLO & KENNETH F. LANZILLO, JR., TRUSTEES
   939 OCEAN BOULEVARD, UNIT 3
   HAMPTON, NEW HAMPSHIRE
   R.C.R.D. BOOK 4624, PAGE 2000
4. PARCEL AREA: 606,024 S.F. OR 13.1924 AC
5. DIMENSIONAL REQUIREMENTS: ZONE: RESIDENTIAL/AGRICULTURE (RA)

| | |
|---|---|
| MIN LOT AREA: | 2.0 AC. |
| MIN LOT FRONTAGE: | 200' |
| MIN FRONT SETBACK: | 30' |
| MIN SIDE/REAR SETBACK | 20' |
| MAX BUILDING HEIGHT: | 35' |
| MAX % BUILDING COVER: | 20% |
| MIN % OPEN SPACE: | 60% |
| WETLAND SETBACK: | 50' |
| WETLAND NO DISTURB BUFFER: | 25' |

ZONING INFORMATION SHOWN HEREON IS PER THE TOWN OF STRATHAM ZONING ORDINANCE LAST AMENDED MARCH 2023. ADDITIONAL REGULATIONS APPLY, THE LAND OWNER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE TOWN, STATE, AND FEDERAL REGULATIONS.

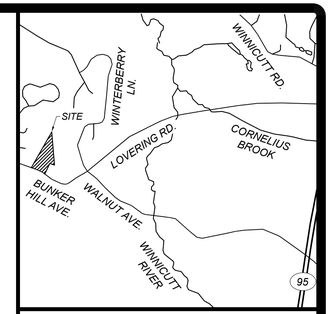
6. FLOOD HAZARD ZONE: "X" "AREA OF MINIMAL FLOOD HAZARD", PER FIRM MAP #33015C0410F, DATED JANUARY 29, 2021.

NOTES (CONT.):

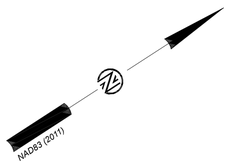
6. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH THE CURRENT LEGAL DESCRIPTIONS. IT IS NOT AN ATTEMPT TO DEFINE UNWRITTEN RIGHTS, DETERMINE THE EXTENT OF OWNERSHIP, OR DEFINE THE LIMITS OF TITLE.
7. FIELD SURVEY COMPLETED BY NORTHAM SURVEY, LLC IN DECEMBER 2023 USING A TRIMBLE S5 TOTAL STATION WITH A TRIMBLE TSC3 DATA COLLECTOR, A TRIMBLE R12 GPS RECEIVER AND A SOKKIA B31 AUTO LEVEL.
8. HORIZONTAL DATUM IS NAD83(2011) NEW HAMPSHIRE STATE PLANE COORDINATES PER STATIC GPS OBSERVATIONS.
9. THE VERTICAL DATUM IS NAVD88 PER STATIC GPS OBSERVATIONS.
10. EASEMENTS, RIGHTS, AND RESTRICTIONS SHOWN OR IDENTIFIED ARE THOSE WHICH WERE FOUND DURING RESEARCH PERFORMED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS. OTHER RIGHTS, EASEMENTS, OR RESTRICTIONS MAY EXIST WHICH A TITLE EXAMINATION OF SUBJECT PARCEL(S) WOULD DETERMINE.
11. THE LOCATION OF UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. NORTHAM SURVEY LLC MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UNDERGROUND UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE.

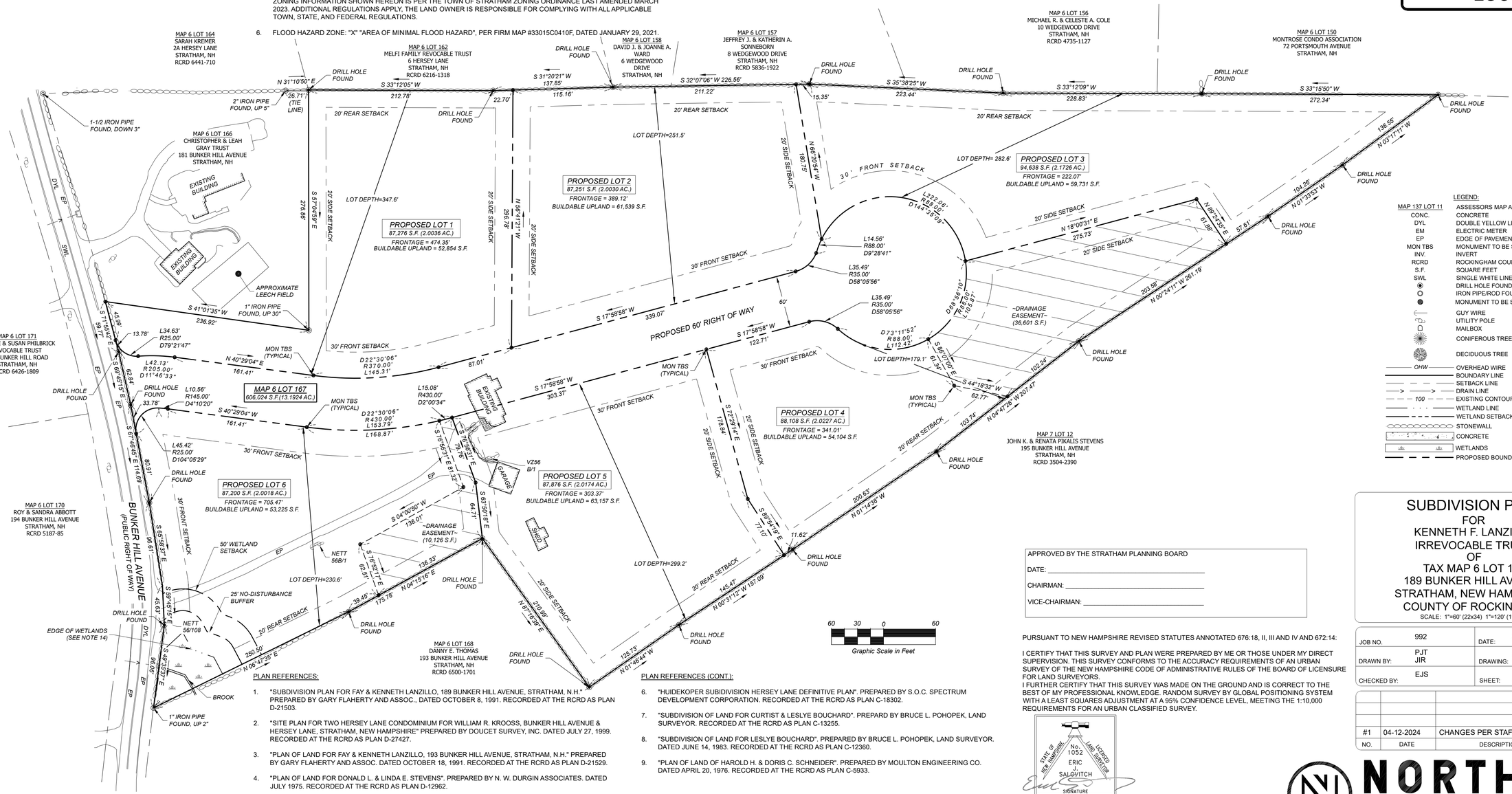
NOTES (CONT.):

14. US ARMY CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1 (JAN 1987). AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2012 AND FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4, NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE..
    WETLANDS DELINEATED BY GOVE ENVIRONMENTAL SERVICES, INC. STAFF: JAMES P. GOVE, CWS 051, CSS 004




LOCUS




PLAN REFERENCES:

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2. "SITE PLAN FOR TWO HERSEY LANE CONDOMINIUM FOR WILLIAM R. KROOSS, BUNKER HILL AVENUE & HERSEY LANE, STRATHAM, NEW HAMPSHIRE" PREPARED BY DOUCET SURVEY, INC. DATED JULY 27, 1999. RECORDED AT THE RCRD AS PLAN D-27427.
3. "PLAN OF LAND FOR FAY & KENNETH LANZILLO, 193 BUNKER HILL AVENUE, STRATHAM, N.H." PREPARED BY GARY FLAHERTY AND ASSOC. DATED OCTOBER 18, 1991. RECORDED AT THE RCRD AS PLAN D-21529.
4. "PLAN OF LAND FOR DONALD L. & LINDA E. STEVENS". PREPARED BY N. W. DURGIN ASSOCIATES. DATED JULY 1975. RECORDED AT THE RCRD AS PLAN D-12962.
5. "WEDGEWOOD SUBDIVISIONTRATHAM N.H. DEFINITIVE PLAN". PREPARED BY S.O.C. SPECTRUM DEVELOPMENT CORPORATION. DATED AUGUST 4, 1986. RECORDED AT THE RCRD AS PLAN D-15677.

PLAN REFERENCES (CONT.):

6. "HUIDEKOPER SUBIDIVISION HERSEY LANE DEFINITIVE PLAN". PREPARED BY S.O.C. SPECTRUM DEVELOPMENT CORPORATION. RECORDED AT THE RCRD AS PLAN C-18302.
7. "SUBDIVISION OF LAND FOR CURTIST & LESLYE BOUCHARD". PREPARD BY BRUCE L. POHOPEK, LAND SURVEYOR. RECORDED AT THE RCRD AS PLAN C-13255.
8. "SUBDIVISION OF LAND FOR LESLYE BOUCHARD". PREPARED BY BRUCE L. POHOPEK, LAND SURVEYOR. DATED JUNE 14, 1983. RECORDED AT THE RCRD AS PLAN C-12360.
9. "PLAN OF LAND OF HAROLD H. & DORIS C. SCHNEIDER". PREPARED BY MOULTON ENGINEERING CO. DATED APRIL 20, 1976. RECORDED AT THE RCRD AS PLAN C-5933.

LEGEND:

| | |
|---|---|
| MAP 137 LOT 11 | ASSESSORS MAP AND LOT NUMBER |
| CONC. | CONCRETE |
| DYL | DOUBLE YELLOW LINE |
| EM | ELECTRIC METER |
| EP | EDGE OF PAVEMENT |
| MON TBS | MONUMENT TO BE SET |
| INV. | INVERT |
| RCRD | ROCKINGHAM COUNTY REGISTRY OF DEEDS |
| S.F. | SQUARE FEET |
| SWL | SINGLE WHITE LINE |
| ◉ | DRILL HOLE FOUND/SET |
| ○ | IRON PIPE/ROD FOUND |
| ● | MONUMENT TO BE SET |
| | GUY WIRE |
| | UTILITY POLE |
| | MAILBOX |
| | CONIFEROUS TREE |
| | DECIDUOUS TREE |
| OHW | OVERHEAD WIRE |
| | BOUNDARY LINE |
| | SETBACK LINE |
| | DRAIN LINE |
| 100 | EXISTING CONTOUR |
| | WETLAND LINE |
| | WETLAND SETBACK |
| | STONEWALL |
| | CONCRETE |
| | WETLANDS |
| | PROPOSED BOUNDARY LINE |

APPROVED BY THE STRATHAM PLANNING BOARD

DATE: _____

CHAIRMAN: _____

VICE-CHAIRMAN: _____

PURSUANT TO NEW HAMPSHIRE REVISED STATUTES ANNOTATED 676:18, II, III AND IV AND 672:14:

I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION. THIS SURVEY CONFORMS TO THE ACCURACY REQUIREMENTS OF AN URBAN SURVEY OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS.
I FURTHER CERTIFY THAT THIS SURVEY WAS MADE ON THE GROUND AND IS CORRECT TO THE BEST OF MY PROFESSIONAL KNOWLEDGE. RANDOM SURVEY BY GLOBAL POSITIONING SYSTEM WITH A LEAST SQUARES ADJUSTMENT AT A 95% CONFIDENCE LEVEL, MEETING THE 1:10,000 REQUIREMENTS FOR AN URBAN CLASSIFIED SURVEY.




LICENSED LAND SURVEYOR

APRIL 13, 2024
DATE

# SUBDIVISION PLAN
FOR
KENNETH F. LANZILLO
IRREVOCABLE TRUST
OF
TAX MAP 6 LOT 167
189 BUNKER HILL AVENUE
STRATHAM, NEW HAMPSHIRE
COUNTY OF ROCKINGHAM
SCALE: 1"=60' (22x34) 1"=120' (11x17)

| | | | |
|---|---|---|---|
| JOB NO. | 992 | DATE: | 2-2-24 |
| DRAWN BY: | PJT JIR | DRAWING: | 992 SURVEY.DWG |
| CHECKED BY: | EJS | SHEET: | 1 |

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | | |
| | | | |
| #1 | 04-12-2024 | CHANGES PER STAFF COMMENTS | PJN |

NORTHAM SURVEY LLC
686 Central Ave, Ste 100, Dover, NH 03820 | (603) 953-3164 | www.northamsurvey.com

NOTES:

1. SUBJECT PARCEL: TAX MAP 6 LOT 167
189 BUNKER HILL AVENUE
STRATHAM, NEW HAMPSHIRE
NS PROJECT #992

2. OWNER OF RECORD: KENNETH F. LANZILLO IRREVOCABLE TRUST
KENNETH F. LANZILLO & KENNETH F. LANZILLO, JR., TRUSTEES
939 OCEAN BOULEVARD, UNIT 3
HAMPTON, NEW HAMPSHIRE
R.C.R.D. BOOK 4624, PAGE 2000

3. PARCEL AREA: 606,024 S.F. OR 13.1924 AC

4. DIMENSIONAL REQUIREMENTS: ZONE: RESIDENTIAL/AGRICULTURE (RA)

| | |
|---|---|
| MIN LOT AREA: | 2.0 AC. |
| MIN LOT FRONTAGE: | 200' |
| MIN FRONT SETBACK: | 30' |
| MIN SIDE/REAR SETBACK | 20' |
| MAX BUILDING HEIGHT: | 35' |
| MAX % BUILDING COVER: | 20% |
| MIN % OPEN SPACE: | 60% |
| WETLAND SETBACK: | 50' |
| WETLAND NO DISTURB BUFFER: | 25' |

ZONING INFORMATION SHOWN HEREON IS PER THE TOWN OF STRATHAM ZONING ORDINANCE LAST AMENDED MARCH 2023. ADDITIONAL REGULATIONS APPLY, THE LAND OWNER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE TOWN, STATE, AND FEDERAL REGULATIONS.

5. FLOOD HAZARD ZONE: "X" "AREA OF MINIMAL FLOOD HAZARD", PER FIRM MAP #33015C0410F, DATED JANUARY 29, 2021.

NOTES (CONT.):

6. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH THE CURRENT LEGAL DESCRIPTIONS. IT IS NOT AN ATTEMPT TO DEFINE UNWRITTEN RIGHTS, DETERMINE THE EXTENT OF OWNERSHIP, OR DEFINE THE LIMITS OF TITLE.

7. FIELD SURVEY COMPLETED BY NORTHAM SURVEY, LLC IN DECEMBER 2023 USING A TRIMBLE S5 TOTAL STATION WITH A TRIMBLE TSC5 DATA COLLECTOR, A TRIMBLE R12 GPS RECEIVER AND A DJI M350 LIDAR DRONE.

8. HORIZONTAL DATUM IS NAD83(2011) NEW HAMPSHIRE STATE PLANE COORDINATES PER STATIC GPS OBSERVATIONS.

9. THE VERTICAL DATUM IS NAVD88 PER STATIC GPS OBSERVATIONS. THE CONTOUR INTERVAL IS 2 FEET.

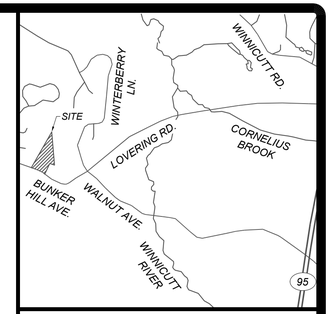
10. EASEMENTS, RIGHTS, AND RESTRICTIONS SHOWN OR IDENTIFIED ARE THOSE WHICH WERE FOUND DURING RESEARCH PERFORMED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS. OTHER RIGHTS, EASEMENTS, OR RESTRICTIONS MAY EXIST WHICH A TITLE EXAMINATION OF SUBJECT PARCEL(S) WOULD DETERMINE.

11. THE LOCATION OF UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. NORTHAM SURVEY LLC MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UNDERGROUND UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE.

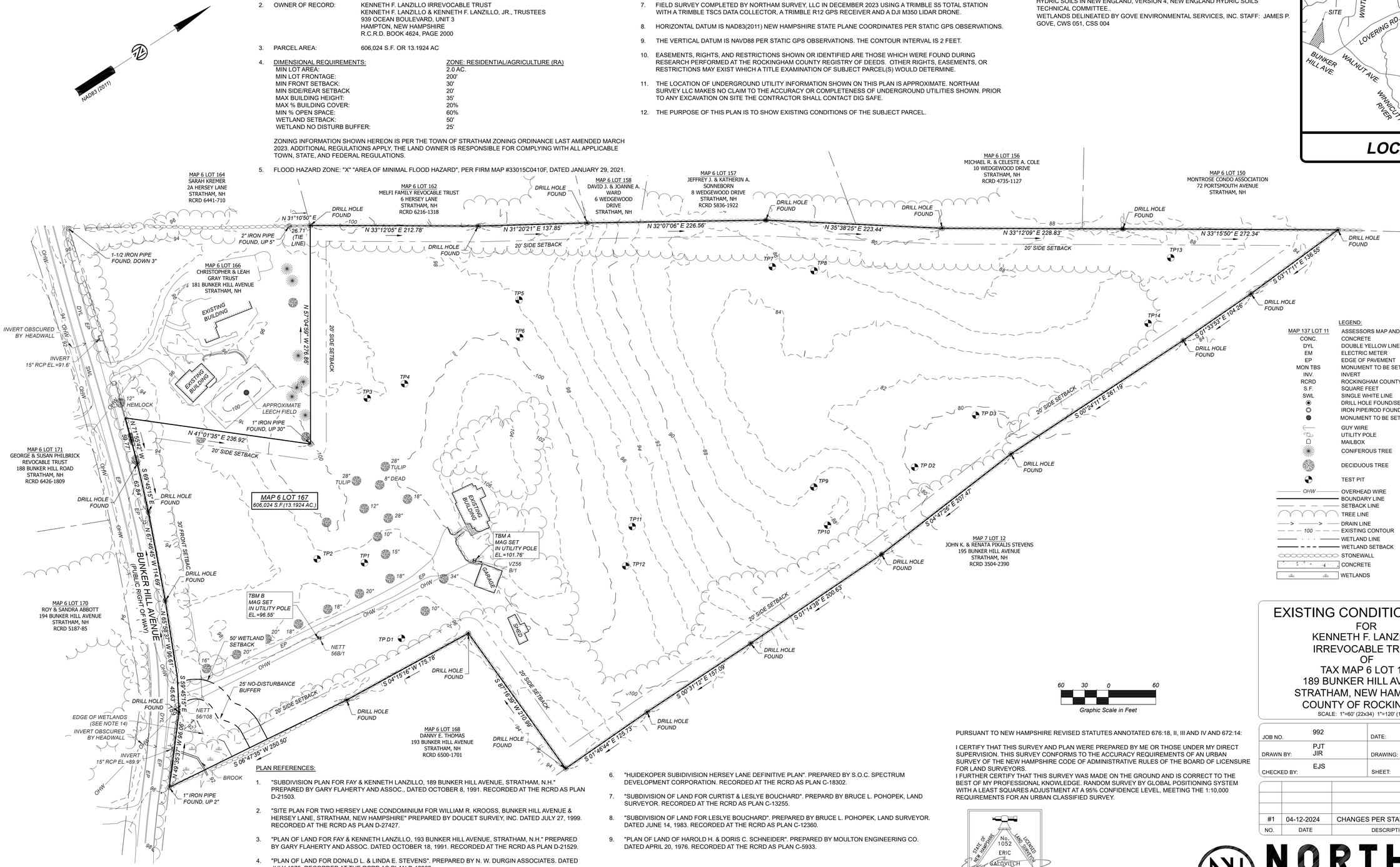
12. THE PURPOSE OF THIS PLAN IS TO SHOW EXISTING CONDITIONS OF THE SUBJECT PARCEL.

NOTES (CONT.):

14. US ARMY CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1 (JAN 1987). AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2012 AND FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4, NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE..
WETLANDS DELINEATED BY GOVE ENVIRONMENTAL SERVICES, INC. STAFF: JAMES P. GOVE, CWS 051, CSS 004




LOCUS

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8. "SUBDIVISION OF LAND FOR LESLYE BOUCHARD". PREPARED BY BRUCE L. POHOPEK, LAND SURVEYOR. DATED JUNE 14, 1983. RECORDED AT THE RCRD AS PLAN C-12360.
9. "PLAN OF LAND OF HAROLD H. & DORIS C. SCHNEIDER". PREPARED BY MOULTON ENGINEERING CO. DATED APRIL 20, 1976. RECORDED AT THE RCRD AS PLAN C-5933.

60 30 0 60

Graphic Scale in Feet

LEGEND:

| | |
|---|---|
| MAP 137 LOT 11 | ASSESSORS MAP AND LOT NUMBER |
| CONC. | CONCRETE |
| DYL | DOUBLE YELLOW LINE |
| EM | ELECTRIC METER |
| EP | EDGE OF PAVEMENT |
| MON TBS | MONUMENT TO BE SET |
| INV. | INVERT |
| RCRD | ROCKINGHAM COUNTY REGISTRY OF DEEDS |
| S.F. | SQUARE FEET |
| SWL | SINGLE WHITE LINE |
| ⦿ | DRILL HOLE FOUND/SET |
| ○ | IRON PIPE/ROD FOUND |
| ● | MONUMENT TO BE SET |
| | GUY WIRE |
| | UTILITY POLE |
| | MAILBOX |
| | CONIFEROUS TREE |
| | DECIDUOUS TREE |
| | TEST PIT |
| OHW | OVERHEAD WIRE |
| | BOUNDARY LINE |
| | SETBACK LINE |
| | TREE LINE |
| | DRAIN LINE |
| 100 | EXISTING CONTOUR |
| | WETLAND LINE |
| | WETLAND SETBACK |
| | STONEWALL |
| | CONCRETE |
| | WETLANDS |

# EXISTING CONDITIONS PLAN
FOR
KENNETH F. LANZILLO
IRREVOCABLE TRUST
OF
TAX MAP 6 LOT 167
189 BUNKER HILL AVENUE
STRATHAM, NEW HAMPSHIRE
COUNTY OF ROCKINGHAM

SCALE: 1"=60' (22x34) 1"=120' (11x17)

| | | | |
|---|---|---|---|
| JOB NO. | 992 | DATE: | 2024-02-02 |
| DRAWN BY: | PJT JIR | DRAWING: | 992 SURVEY.DWG |
| CHECKED BY: | EJS | SHEET: | 2 |

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| #1 | 04-12-2024 | CHANGES PER STAFF COMMENTS | PJN |

PURSUANT TO NEW HAMPSHIRE REVISED STATUTES ANNOTATED 676:18, II, III AND IV AND 672:14:

I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION. THIS SURVEY CONFORMS TO THE ACCURACY REQUIREMENTS OF AN URBAN SURVEY OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS.
I FURTHER CERTIFY THAT THIS SURVEY WAS MADE ON THE GROUND AND IS CORRECT TO THE BEST OF MY PROFESSIONAL KNOWLEDGE. RANDOM SURVEY BY GLOBAL POSITIONING SYSTEM WITH A LEAST SQUARES ADJUSTMENT AT A 95% CONFIDENCE LEVEL, MEETING THE 1:10,000 REQUIREMENTS FOR AN URBAN CLASSIFIED SURVEY.

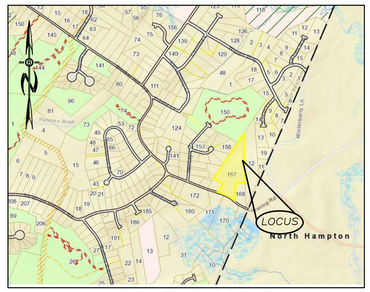
STATE OF NEW HAMPSHIRE — No. 1052 — ERIC SALOVITCH — LICENSED LAND SURVEYOR

SIGNATURE

LICENSED LAND SURVEYOR

APRIL 13, 2024
DATE

NORTHAM SURVEY LLC
686 Central Ave, Ste 100, Dover, NH 03820 | (603) 953-3164 | www.northamsurvey.com




LOCATION MAP
NTS

## WETLAND NOTES

THE LIMITS OF JURISDICTIONAL WETLANDS AS SHOWN ON THIS PLAN WERE DELINEATED BY GOVE ENVIRONMENTAL SERVICES, INC., IN ACCORDANCE WITH:

1. US ARMY CORPS OF ENGINEERS REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, TECHNICAL REPORT ERDC/EL TR-12-1, JANUARY 2012, VERSION 2.0
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 7.0. UNITED STATES DEPARTMENT OF AGRICULTURE (2010).
3. NORTH AMERICAN DIGITAL FLORA: NATIONAL WETLAND PLANT LIST, VERSION 2.2.1 (2009).

4. HIGH INTENSITY SOIL MAPPING WAS PERFORMED BY G.E.S. USING THE STANDARDS OF THE SOCIETY OF SOIL SCIENTISTS OF NORTHERN NEW ENGLAND SPECIAL PUBLICATION NUMBER 1, HIGH INTENSITY SOIL MAPS FOR NEW HAMPSHIRE STANDARDS, JAN 1994

STATE OF NEW HAMPSHIRE
JAMES P. GOVE
10-17-23
No. 0051
CERTIFIED WETLAND SCIENTIST

This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for infiltration requirements by the NH DES Alteration of Terrain Bureau. It was produced by a professional soil scientist and is not a product of the USDA Natural Resources Conservation Service. There is a report that accompanies this map.
The site specific soil map was produced 1-11-2024 and was prepared by James P. Gove, CSS # 004, Gove Environmental Services, Inc.
SOIL IDENTIFICATION LEGEND

| Map Unit Symbol | Map Unit Name | HISS Symbol | Hydrologic Soil Group |
|---|---|---|---|
| 38 | Eldridge, fine sandy loam | 343 | C |
| 448 | Scituate, fine sandy loam | 323 | C |
| 439 | Shaker, fine sandy loam | 543 | C |

SLOPE PHASE:
A=0-3%, B=3-8%, C=8-15%, D=15-25%, E=25%+

STATE OF NEW HAMPSHIRE
JAMES P. GOVE
1-17-2024
No. 004
CERTIFIED SOIL SCIENTIST

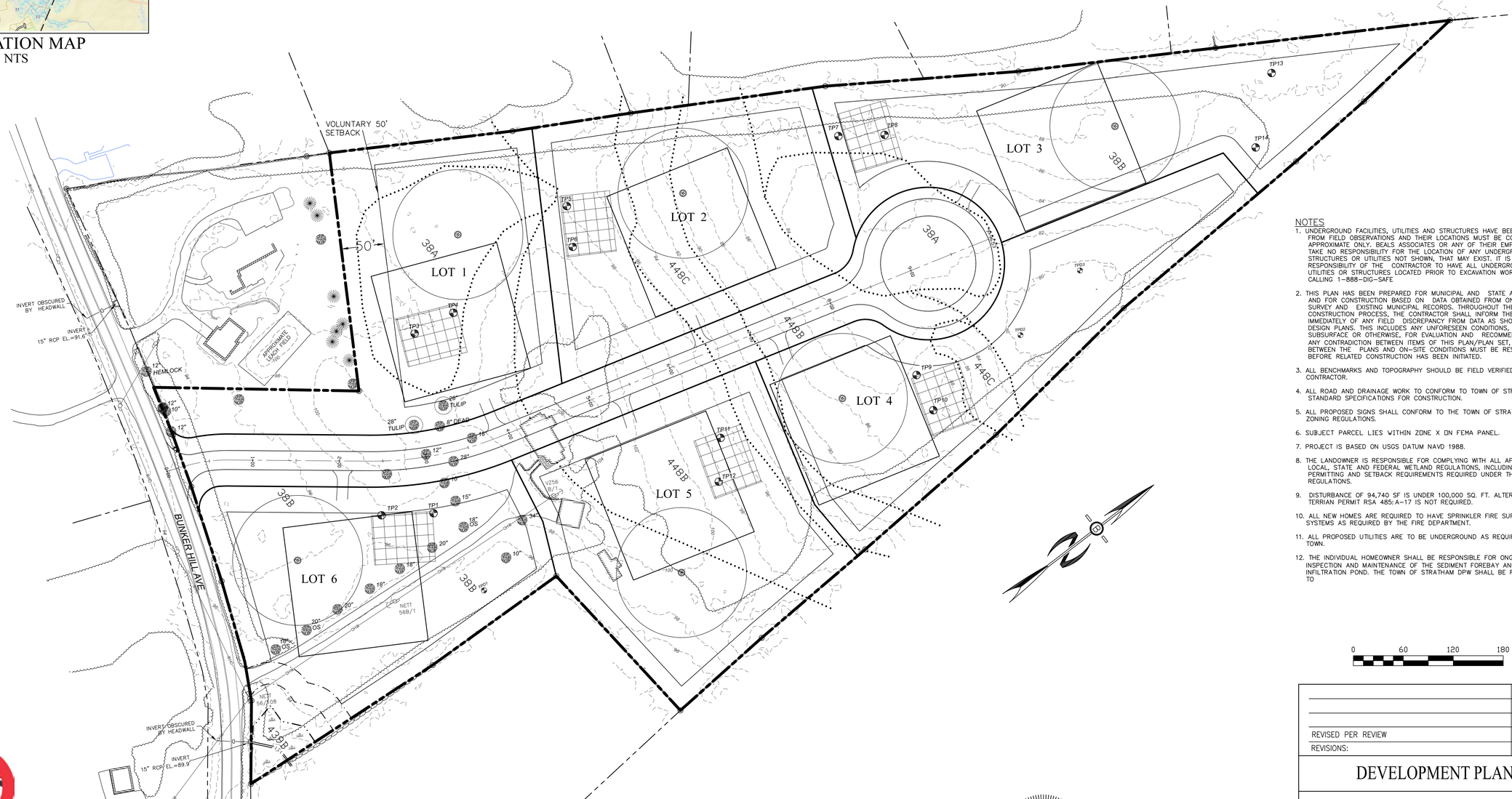
## ZONING REQUIREMENTS

| | |
|---|---|
| ZONE | R/A |
| LOT AREA MIN. | 2 ACRE |
| LOT FRONTAGE | 200 FT. |
| FRONT YARD | 50 FT. |
| SIDE & REAR YARD | 50 FT. |
| WETLAND SETBACK | 50 FT. HYDRIC B & 75 FT. HYDRIC A |
| BUILDING HEIGHT | 34 FT. |

PREPARED FOR:

CHINBURG PROPERTIES INC
3 PENSTOCK WAY
NEWMARKET, NH 03857

BEALS ASSOCIATES, PLLC
70 PORTSMOUTH AVE,
THIRD FLOOR, SUITE 2
STRATHAM, N.H. 03885
PHONE: 603-583-4860,
FAX. 603-583-4863




## NOTES

1. UNDERGROUND FACILITIES, UTILITIES AND STRUCTURES HAVE BEEN LOCATED FROM FIELD OBSERVATIONS AND THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. BEALS ASSOCIATES OR ANY OF THEIR EMPLOYEES TAKE NO RESPONSIBILITY FOR THE LOCATION OF ANY UNDERGROUND STRUCTURES OR UTILITIES NOT SHOWN, THAT MAY EXIST. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL UNDERGROUND UTILITIES OR STRUCTURES LOCATED PRIOR TO EXCAVATION WORK BY CALLING 1-888-DIG-SAFE
2. THIS PLAN HAS BEEN PREPARED FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA AS SHOWN ON THE DESIGN PLANS. THIS INCLUDES ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS OF THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED.
3. ALL BENCHMARKS AND TOPOGRAPHY SHOULD BE FIELD VERIFIED BY THE CONTRACTOR.
4. ALL ROAD AND DRAINAGE WORK TO CONFORM TO TOWN OF STRATHAM STANDARD SPECIFICATIONS FOR CONSTRUCTION.
5. ALL PROPOSED SIGNS SHALL CONFORM TO THE TOWN OF STRATHAM ZONING REGULATIONS.
6. SUBJECT PARCEL LIES WITHIN ZONE X ON FEMA PANEL.
7. PROJECT IS BASED ON USGS DATUM NAVD 1988.
8. THE LANDOWNER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL WETLAND REGULATIONS, INCLUDING ANY PERMITTING AND SETBACK REQUIREMENTS REQUIRED UNDER THESE REGULATIONS.
9. DISTURBANCE OF 94,740 SF IS UNDER 100,000 SQ. FT. ALTERATION OF TERRIAN PERMIT RSA 485: A-17 IS NOT REQUIRED.
10. ALL NEW HOMES ARE REQUIRED TO HAVE SPRINKLER FIRE SUPPRESSION SYSTEMS AS REQUIRED BY THE FIRE DEPARTMENT.
11. ALL PROPOSED UTILITIES ARE TO BE UNDERGROUND AS REQUIRED BY THE TOWN.
12. THE INDIVIDUAL HOMEOWNER SHALL BE RESPONSIBLE FOR ONGOING INSPECTION AND MAINTENANCE OF THE SEDIMENT FOREBAY AND/OR INFILTRATION POND. THE TOWN OF STRATHAM DPW SHALL BE RESPONSIBLE TO

0 60 120 180

UNDERGROUND FACILITIES, UTILITIES.
1-888-DIG-SAFE (1-888-344-7233).
AND EXETER DPW (603) 773-6157

## APPROVAL BLOCK

APPROVED TOWN OF STRATHAM PLANNING BOARD

CHAIRPERSON DATE

STATE OF NEW HAMPSHIRE
CHRISTIAN O. SMITH
No.9900
PROFESSIONAL ENGINEER

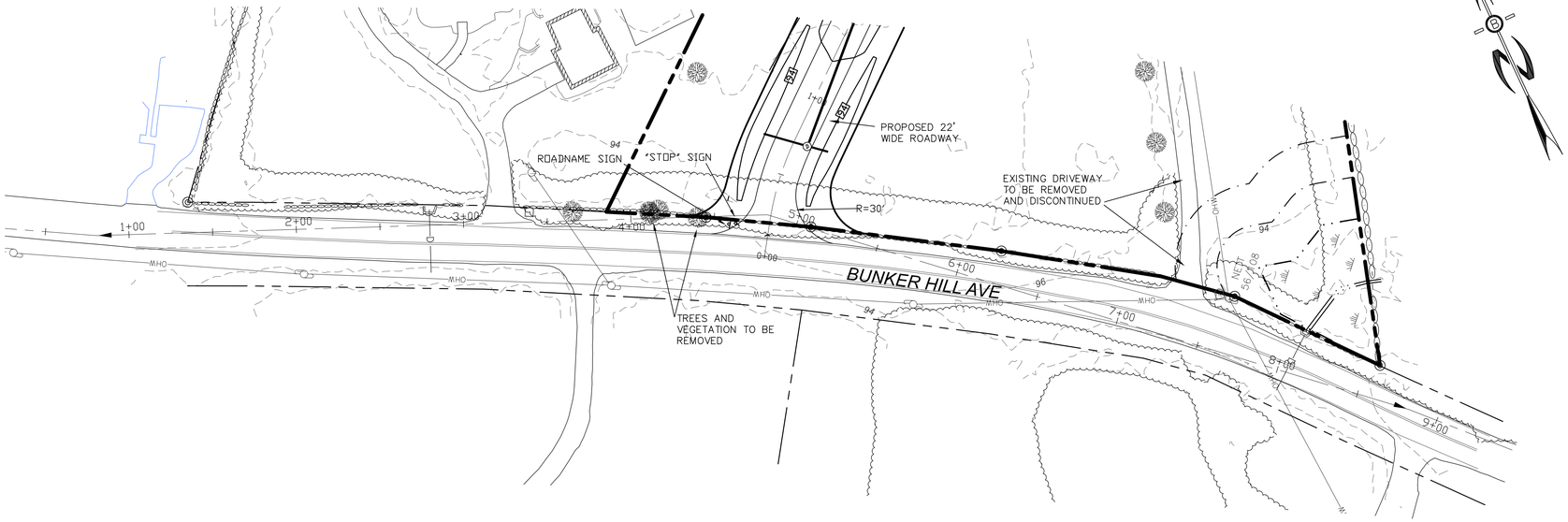
PARENT PARCEL
189 BUNKER HILL AVE
TAX MAP 6 LOT 167
13 ac +/-

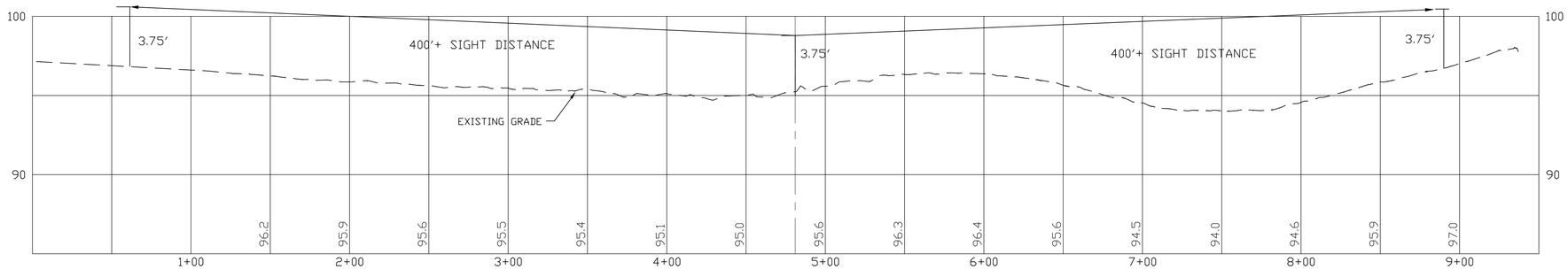
| | |
|---|---|
| | |
| | |
| | |
| REVISED PER REVIEW | 4-12-24 |
| REVISIONS: | DATE: |

# DEVELOPMENT PLAN

PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

| | | | |
|---|---|---|---|
| DATE: | FEB. 2024 | SCALE: | 1"=60' |
| PROJ. N0: | NH-1500 | SHEET NO. | 3 |




PREPARED FOR:

CHINBURG PROPERTIES INC
3 PENSTOCK WAY
NEWMARKET, NH 03857

BEALS ASSOCIATES, PLLC
70 PORTSMOUTH AVE,
THIRD FLOOR, SUITE 2
STRATHAM, N.H. 03885
PHONE: 603-583-4860,
FAX. 603-583-4863

## NOTES

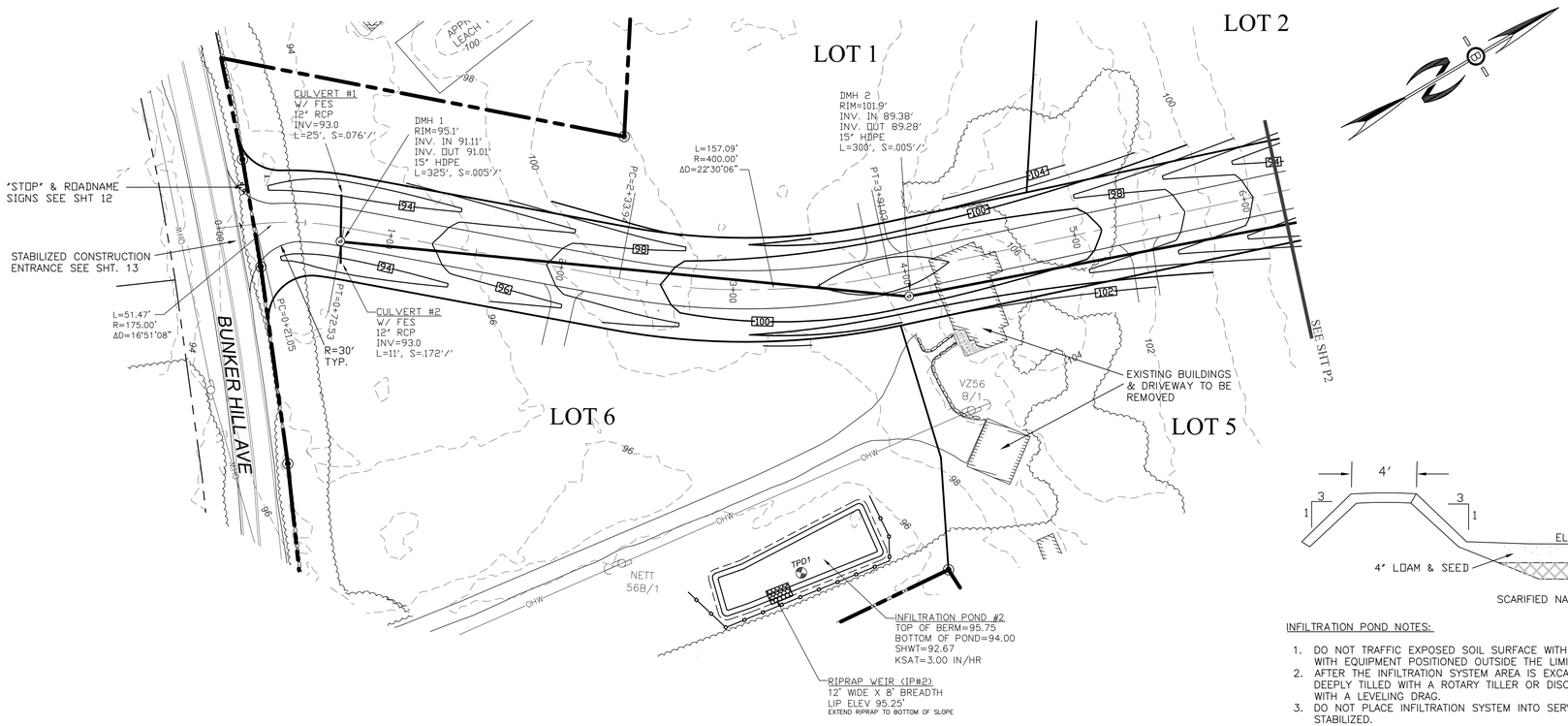
1. ALL ELECTRICAL, TELEPHONE, CABLE TELEVISION AND ALARM LINES TO BE UNDERGROUND. THE SIZE AND LOCATION IS TO BE DETERMINED BY APPROPRIATE UTILITY COMPANY.
2. ALL BENCHMARKS AND TOPOGRAPHY SHOULD BE FIELD VERIFIED BY THE CONTRACTOR, ENGINEER TO BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCY.
3. ALL CONSTRUCTION METHODS AND MATERIALS WILL CONFORM TO THE TOWN STANDARD SPECIFICATIONS AND TO N.H.D.O.T. STANDARDS AND REGULATIONS.
4. ALL DRAINAGE STRUCTURE AND SWALES WILL BE BUILT AND STABILIZED PRIOR TO HAVING RUN-OFF DIRECTED TO THEM.
5. SEE DETAIL SHEETS FOR STANDARD CONSTRUCTION NOTES AND DETAILS.
6. PROPOSED UNDER DRAINS TO BE INSTALLED AS SHOWN ON THE TYPICAL ROAD CROSS SECTION DETAIL AND TIE INTO DRAINAGE STRUCTURES.


PROFILE SCALES:
HORIZONTAL: 1"=40' VERTICAL: 1"=4'

# ROADWAY ACCESS PLAN

PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

| | | | |
|---|---|---|---|
| DATE: | FEB. 2024 | SCALE | 1" = 40' |
| PROJ. N0: | NH-1500 | SHEET NO. | 4 |



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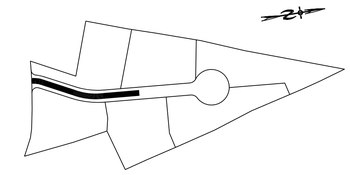
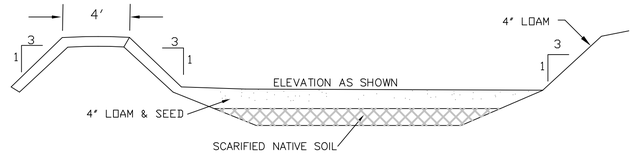
PHONE: 603-583-4860,
FAX. 603-583-4863



LOCATION LEGEND

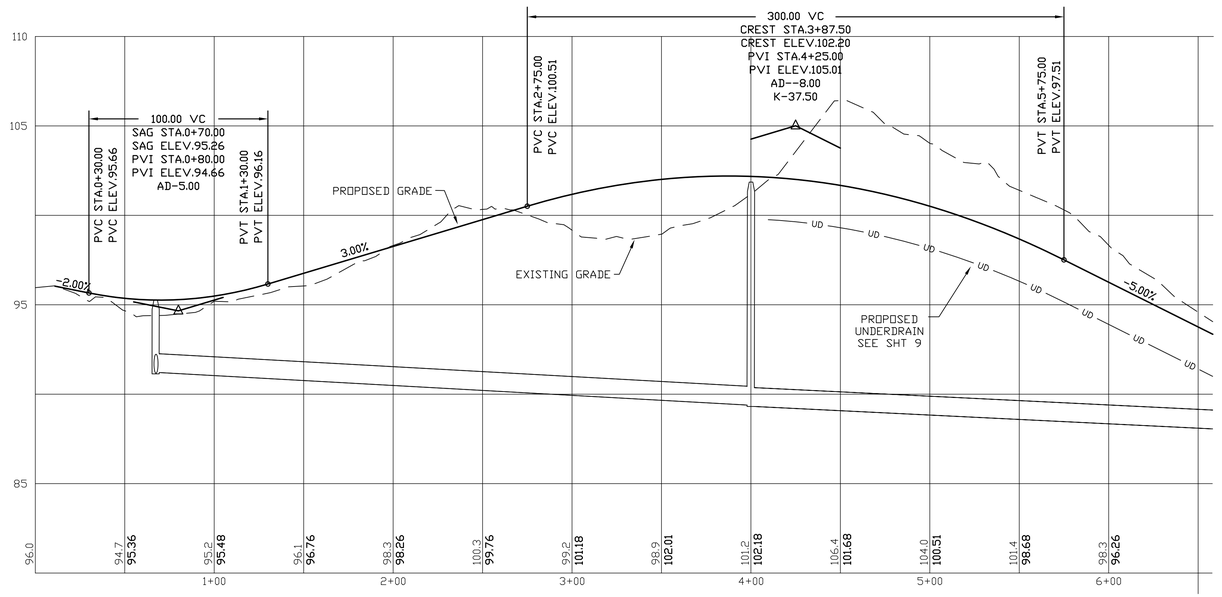



INFILTRATION POND NOTES:

1. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATION WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION SYSTEM.
2. AFTER THE INFILTRATION SYSTEM AREA IS EXCAVATED TO THE FINAL DESIGN ELEVATION, THE FLOOR SHOULD BE DEEPLY TILLED WITH A ROTARY TILLER OR DISC HARROW TO RESTORE INFILTRATION RATES, FOLLOWED BY A PASS WITH A LEVELING DRAG.
3. DO NOT PLACE INFILTRATION SYSTEM INTO SERVICE UNTIL THE CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.

## INFILTRATION POND DETAIL

NOT TO SCALE




## NOTES

1. ALL ELECTRICAL, TELEPHONE, CABLE TELEVISION AND ALARM LINES TO BE UNDERGROUND. THE SIZE AND LOCATION IS TO BE DETERMINED BY APPROPRIATE UTILITY COMPANY.
2. ALL BENCHMARKS AND TOPOGRAPHY SHOULD BE FIELD VERIFIED BY THE CONTRACTOR, ENGINEER TO BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCY.
3. ALL CONSTRUCTION METHODS AND MATERIALS WILL CONFORM TO THE TOWN STANDARD SPECIFICATIONS AND TO N.H.D.O.T. STANDARDS AND REGULATIONS.
4. ALL DRAINAGE STRUCTURE AND SWALES WILL BE BUILT AND STABILIZED PRIOR TO HAVING RUN-OFF DIRECTED TO THEM.
5. SEE DETAIL SHEETS FOR STANDARD CONSTRUCTION NOTES AND DETAILS.

PROFILE SCALES:
HORIZONTAL: 1"=40' VERTICAL: 1"=4'


0 40 80 120

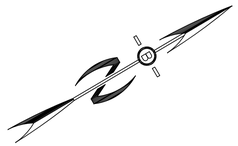
SCALE: 1"=40'

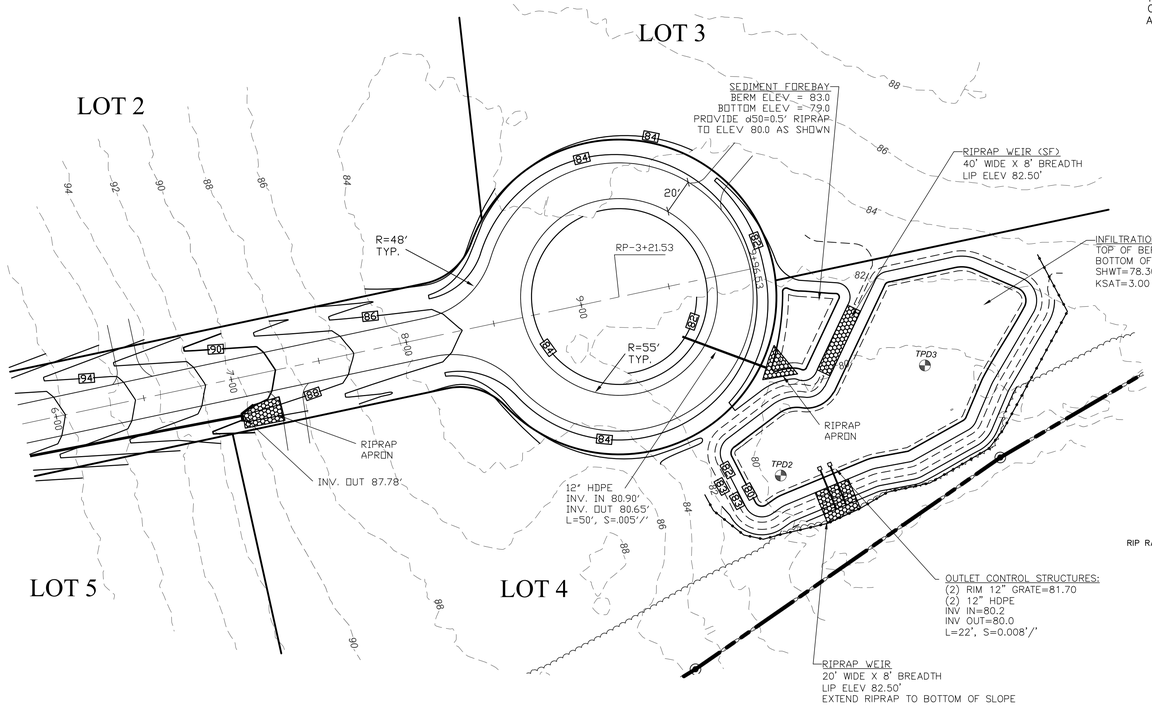
| | |
|---|---|
| | |
| | |
| REVISED PER REVIEW | 4-12-24 |
| REVISIONS: | DATE: |

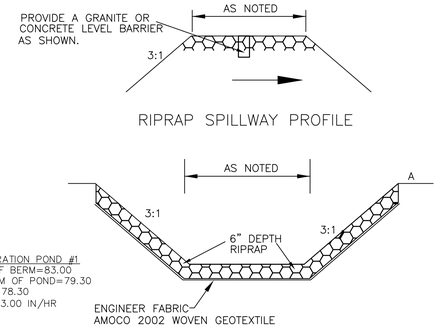
# PLAN AND PROFILE

PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

| | | | |
|---|---|---|---|
| DATE: | FEB. 2024 | SCALE: | 1" =40' |
| PROJ. N0: | NH-1500 | SHEET NO. | 5 |






PREPARED FOR:

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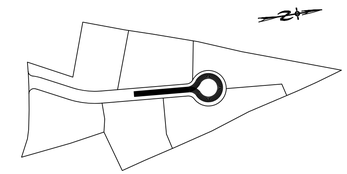
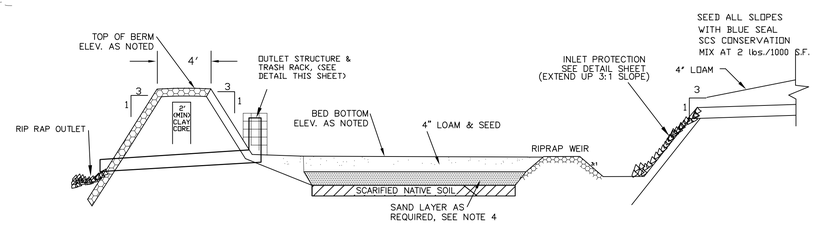


LOCATION LEGEND




## CROSS SECTION OF INFILTRATION BASIN

NOT TO SCALE

INFILTRATION BASIN NOTES:

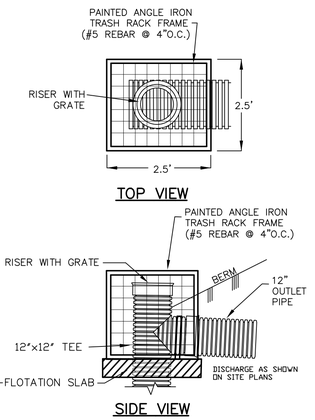
1. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATION WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION SYSTEM.
2. AFTER THE INFILTRATION SYSTEM AREA IS EXCAVATED TO THE FINAL DESIGN ELEVATION, THE FLOOR SHOULD BE DEEPLY TILLED WITH A ROTARY TILLER OR DISC HARROW TO RESTORE INFILTRATION RATES. FOLLOWED BY A PASS WITH A LEVELING DRAG.
3. DO NOT PLACE INFILTRATION SYSTEM INTO SERVICE UNTIL THE CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
4. REMOVE LOAM AND ORGANICS FROM EXISTING SOILS. IF NECESSARY, REPLACE WITH MATERIAL MEETING ASTM C-33 SPECIFICATIONS TO REQUIRED ELEVATION BELOW BED BOTTOM LOAM AND SEED.

Construction Sequence

Protect infiltration basin area from compaction prior to installation.
1. After installation, protect sediment-laden water from entering inlets and pipes.
2. Install and maintain proper Erosion and Sediment Control Measures during construction.
3. If necessary, excavate Infiltration basin bottom to an uncompacted subgrade free from rocks and debris. Do NOT compact subgrade.
4. Install Outlet Control Structures.
5. Seed and stabilize topsoil. (Vegetate if appropriate with native plantings.)
6. Do not remove Inlet Protection or other Erosion and Sediment Control measures until site is fully stabilized.
7. Any sediment that enters inlets during construction is to be removed within 24 hours.

Maintenance and Inspection

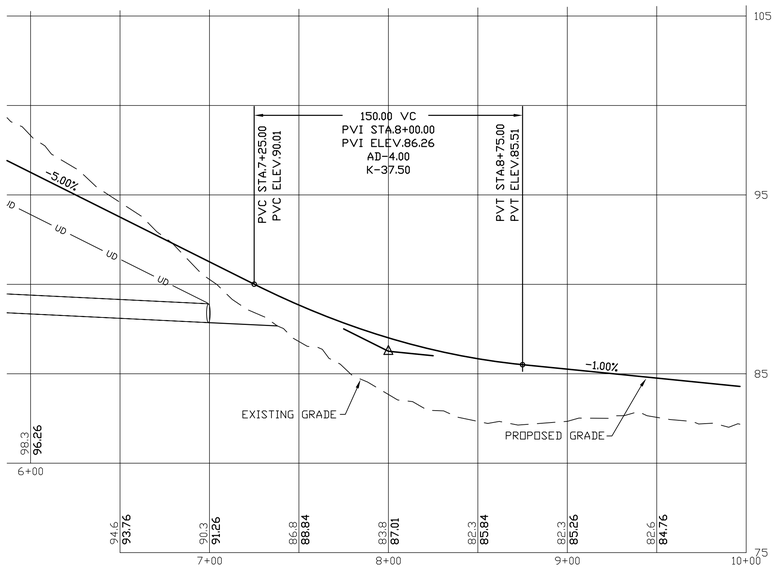
- Catch Basins and Inlets (upgradient of infiltration basin) should be inspected and cleaned on an annual basis.
- The vegetation along the surface of the Infiltration basin should be maintained in good condition, and any bare spots immediately revegetated.
- Vehicles should not be parked or driven on an Infiltration Basin, and care should be taken to avoid excessive compaction by mowers.
- Inspect the completed basin and make sure that runoff drains down within 72 hours.
- Also inspect for accumulation of sediment, damage to outlet control structures, erosion control measures, signs of water contamination/spills, and slope stability in the berms.
- Mosquito's should not be a problem if the water drains in 72 hours. Mosquitoes require a considerably long breeding period with relatively static water levels.
- Mow only as appropriate for vegetative cover species.
- Remove sediment from basin accumulations. Restore original cross section and infiltration rate. Properly dispose of sediment.




NOTES:
PROVIDE 3'X3'X6" CONCRETE ANTI-FLOTATION SLAB WITH NON-CORROSIVE HOLDING STRAPS AND GASKETED 12" DIA CENTERED RECEIVING HOLE FOR RISER EXTENSION INTO GRAVEL LAYERS.

## OUTLET CONTROL STRUCTURE

NOT TO SCALE




PROFILE SCALES:
HORIZONTAL: 1"=40' VERTICAL: 1"=4'


0 40 80 120

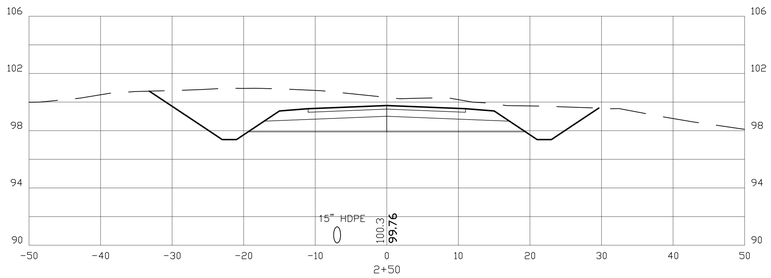
SCALE: 1"=40'

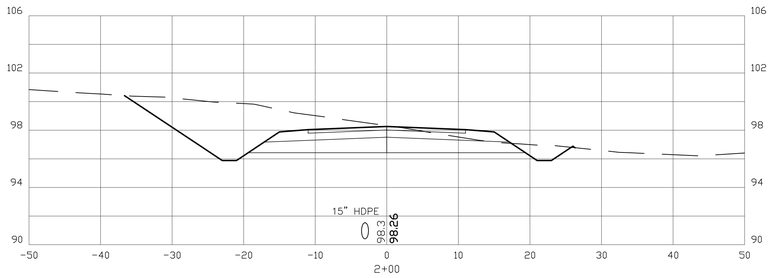
| | |
|---|---|
| | |
| | |
| | |
| REVISED PER REVIEW | 4-12-24 |
| REVISIONS: | DATE: |

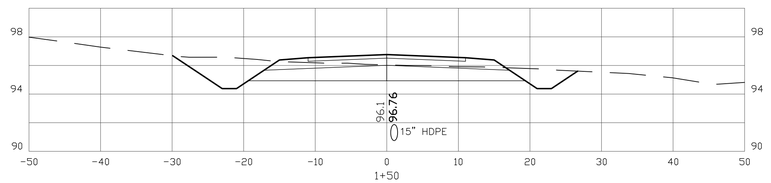
# PLAN AND PROFILE

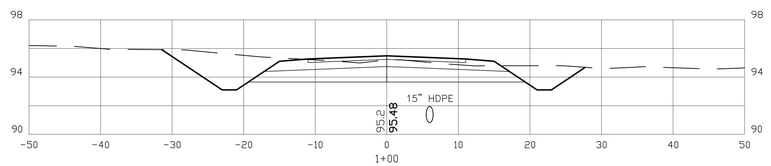
PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

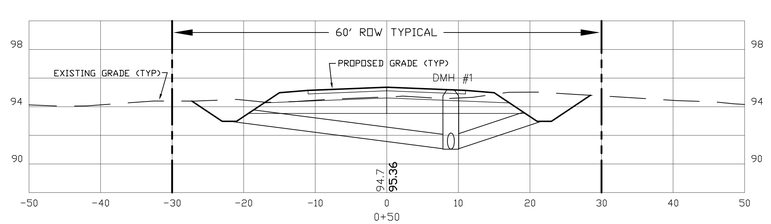
| | | | |
|---|---|---|---|
| DATE: | FEB. 2024 | SCALE: | 1"=40' |
| PROJ. N0: | NH-1500 | SHEET NO. | 6 |

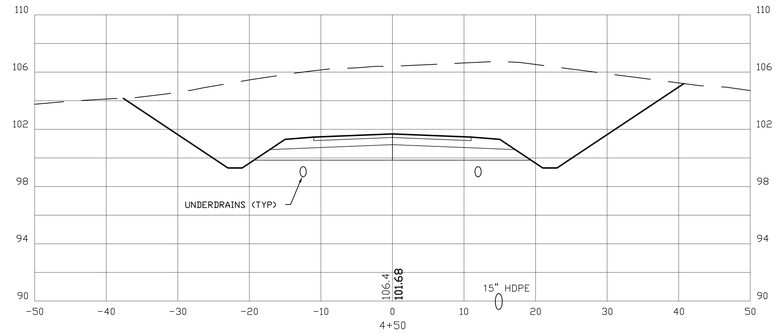


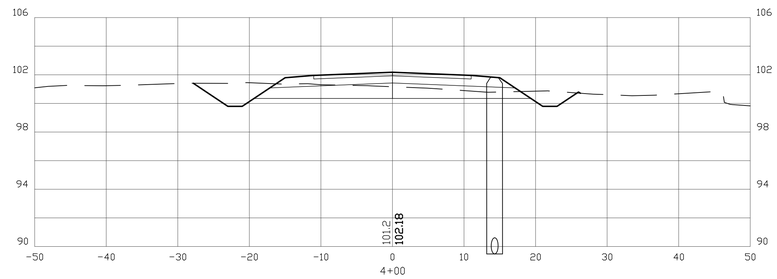



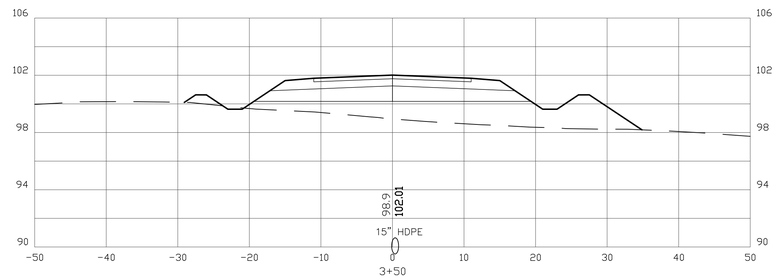



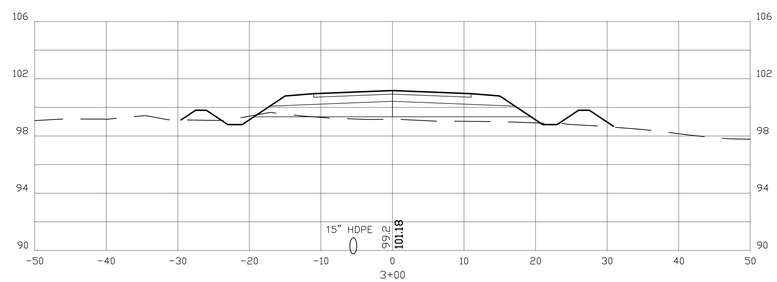

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STATE OF NEW HAMPSHIRE
CHRISTIAN O. SMITH
No. 9900
LICENSED PROFESSIONAL ENGINEER

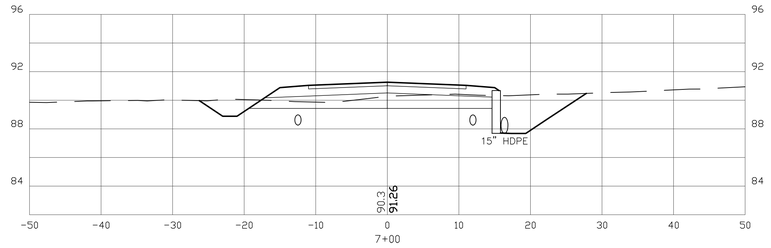
CROSS SECTION SCALES:
HORIZONTAL: 1"=10' VERTICAL: 1"=5'

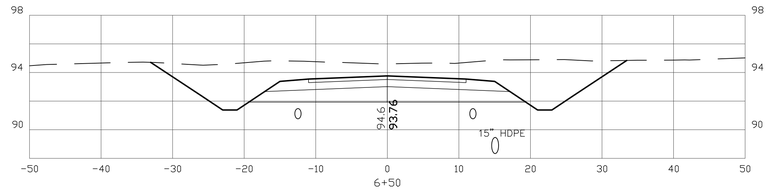
| REVISIONS: | DATE: |
|---|---|
| REVISED PER REVIEW | 4-12-24 |

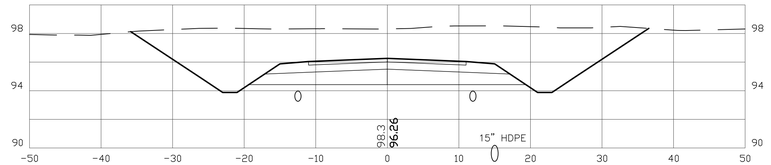
# ROAD CROSS SECTIONS X1

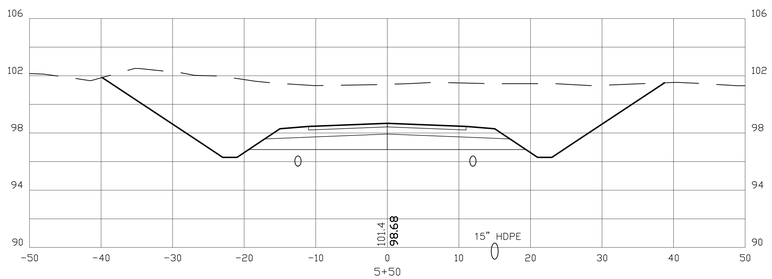
PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

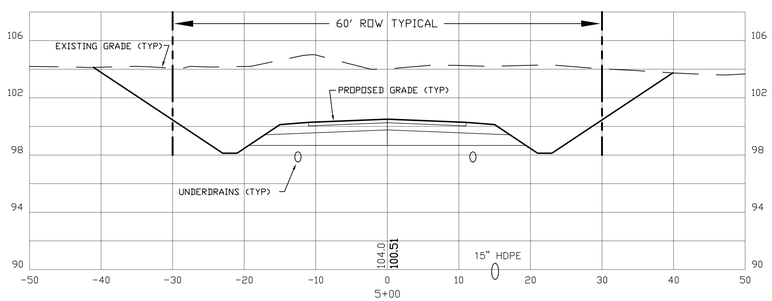
| | | | |
|---|---|---|---|
| DATE: | FEB. 2024 | SCALE: | 1" = 10' |
| PROJ. N0: | NH-1500 | SHT NO. | 7 |

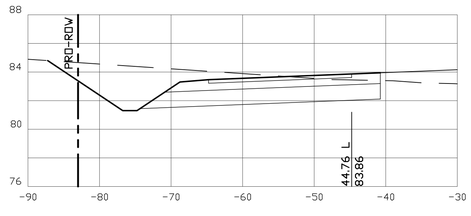


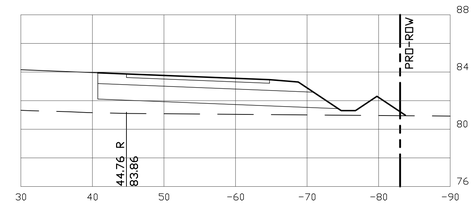



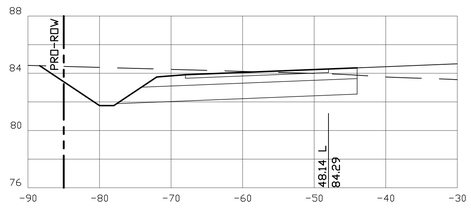



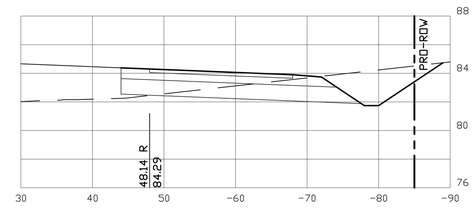



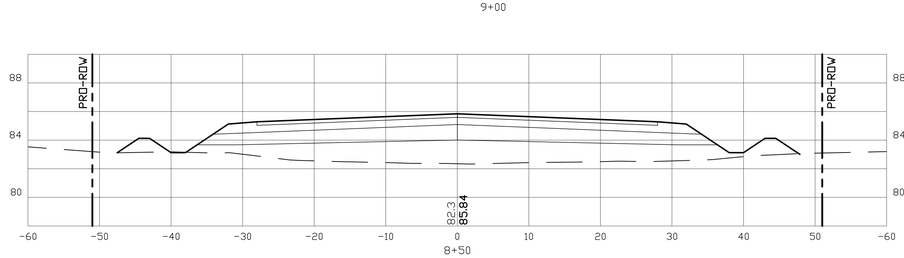



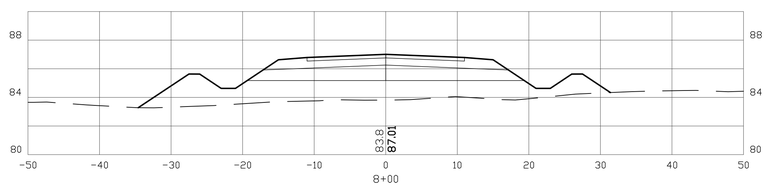



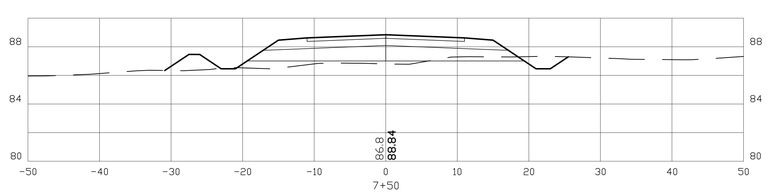

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STATE OF NEW HAMPSHIRE
CHRISTIAN O. SMITH
No.9900
LICENSED PROFESSIONAL ENGINEER

CROSS SECTION SCALES:
HORIZONTAL: 1"=10' VERTICAL: 1"=5'

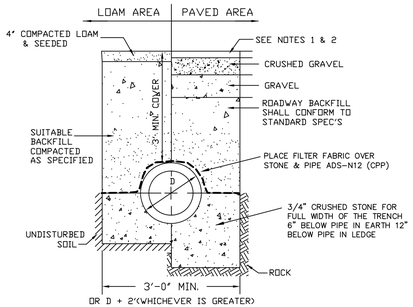
| REVISIONS: | DATE: |
|---|---|
| REVISED PER REVIEW | 4-12-24 |

# ROAD CROSS SECTIONS X2

PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

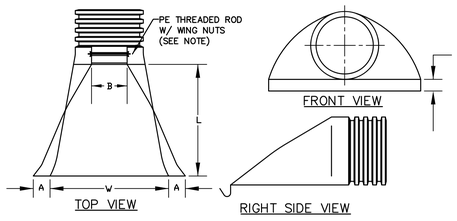
| | | | |
|---|---|---|---|
| DATE: | FEB. 2024 | SCALE: | 1" = 10' |
| PROJ. N0: | NH-1500 | SHT NO. | 8 |

| TABLE 7-24--RECOMMENDED RIP RAP GRADATION RANGES | | | |
|---|---|---|---|
| THICKNESS OF RIP RAP = 1.12 FEET | | | |
| d50 SIZE= | 0.50 | FEET | 6 INCHES |
| % OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE | SIZE OF STONE (INCHES) FROM | | TO |
| 100% | 9 | | 12 |
| 85% | 8 | | 11 |
| 50% | 6 | | 9 |
| 15% | 2 | | 3 |




NOTE:
1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM TO SUBDIVISION SPEC'S.

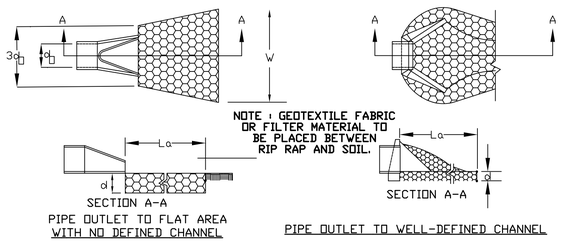
## TYPICAL DRAINAGE TRENCH DETAIL




| PART No. | PIPE SIZE | A | B(MAX) | H | L | W |
|---|---|---|---|---|---|---|
| 1510-NP | 15" 375 mm | 6.5" 165 mm | 10" 254 mm | 6.5" 165 mm | 25" 635 mm | 29" 735 mm |
| 1810-NP | 18" 450 mm | 7.5" 190 mm | 15" 380 mm | 6.5" 165 mm | 32" 812 mm | 35" 890 mm |
| 2410-NP | 24" 600 mm | 7.5" 190 mm | 18" 450 mm | 6.5" 165 mm | 36" 900 mm | 45" 1140 mm |
| 3010-NP | 30" 750 mm | 10.5" 266 mm | N/A | 7.0" 178 mm | 53" 1345 mm | 68" 1725 mm |
| 3610-NP | 36" 900 mm | 10.5" 266 mm | N/A | 7.0" 178 mm | 53" 1345 mm | 68" 1725 mm |

NOTE: PE THREADED ROD W/ WING NUTS PROVIDED FOR END SECTIONS 15"-24". 30" & 36" END SECTIONS TO BE WELDED PER MANUFACTURER'S RECOMMENDATIONS.

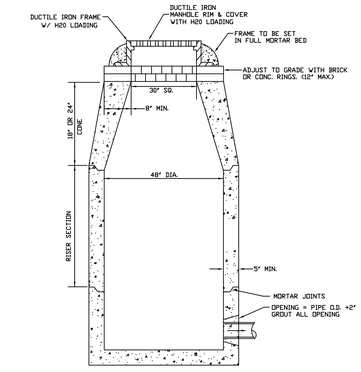
## ADS N-12 FLARED END SECTIONS
NOT TO SCALE (ALL DIMENSIONS ARE NOMINAL)




**CONSTRUCTION SPECIFICATIONS**
1. THE SUB GRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIP RAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE ROCK OR GRAVEL USED FOR FILTER OF RIP RAP SHALL CONFORM TO THE SPECIFIED GRADATION. 3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIP RAP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
4. STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.
5. STONE FOR RIRAP SHALL BE ANGULAR OR SUBANGULAR. THE STONES SHOULD BE SHAPED SO THAT THE LEAST DIMENSION OF THE STONE FRAGMENT SHALL BE NOT LESS THAN ONE-THIRD OF THE GREATEST DIMENSION OF THE FRAGMENT.
6. FLAT ROCKS SHALL NOT USED FOR RIP RAP. VOIDS IN THE ROCK RIPRAP SHOULD BE FILLED WITH SPALLS AND SMALLER ROCKS.

**MAINTENANCE**
1. THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR STORM. IF THE RIP RAP HAS BEEN DISPLACED, UNDERMINED OR DAMAGED, IT SHOULD BE REPAIRED IMMEDIATELY. THE CHANNEL IMMEDIATELY BELOW THE OUTLET SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO OUTLET PROTECTION.

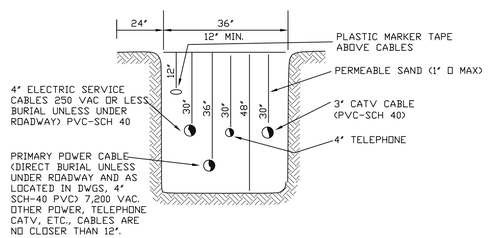
## PIPE OUTLET PROTECTION




## PRECAST DRAIN MANHOLE
NOT TO SCALE

NOTE: ALL UTILITIES SHALL BE REVIEWED AND APPROVED BY APPROPRIATE UTILITY COMPANY.

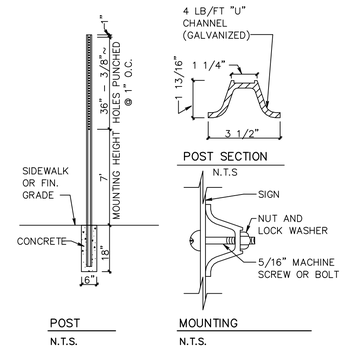
SERVICE BOX CONNECTIONS SHALL BE "FLUSH MOUNT" TO GREATEST EXTENT POSSIBLE AND LOCATED AT PROPERTY LINE CORNERS.



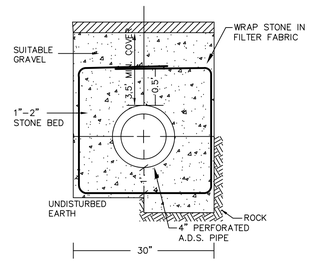

## UTILITY TRENCH DETAIL

## TRAFFIC CONTROL SCHEDULE

| SIGN NUMBER | SIGN | SIZE OF SIGN WIDTH | SIZE OF SIGN HEIGHT | DESCRIPTION | MOUNT TYPE | MOUNT HEIGHT |
|---|---|---|---|---|---|---|
| R1-1 | STOP | 30" | 30" | WHITE ON RED | CHANNEL | 7'-0" |
| R2-1 | SPEED LIMIT 25 | 18" | 24" | BLACK ON WHITE | CHANNEL | 7'-0" |
| W14-2 | NO OUTLET | 24" | 24" | BLACK ON YELLOW | CHANNEL | 7'-0" |



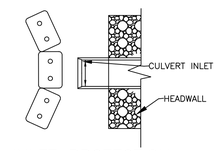

## STREET SIGN DETAIL



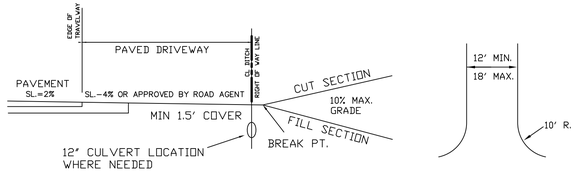

## UNDERDRAIN TRENCH DETAIL
NOT TO SCALE

## CONSTRUCTION SPECIFICATIONS
FOR STRAW OR HAY BALE BARRIERS

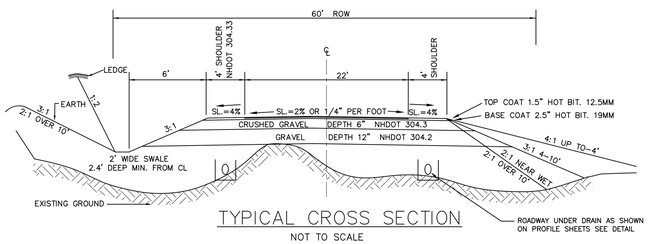
1. STRUCTURES SHALL BE INSTALLED ACCORDING TO THE DIMENSIONS SHOWN ON THE PLANS AT THE APPROPRIATE SPACING.
2. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER SO THAT EROSION AND AIR AND WATER POLLUTION WILL BE MINIMIZED.
3. WHEN HAY BALES ARE USED, THE BALES SHALL BE EMBEDDED AT LEAST 4 INCHES INTO THE SOIL. WHEN TIMBER STRUCTURES ARE USED, THE TIMBER SHALL EXTEND AT LEAST 18 INCHES INTO THE SOIL.
4. HAY OR STRAW BALES SHALL BE ANCHORED INTO THE SOIL USING 2" X 2" STAKES DRIVEN THROUGH THE BALES AND AT LEAST 18 INCHES INTO THE SOIL.
5. SEEDING, FERTILIZING, AND MULCHING SHALL CONFORM TO THE RECOMMENDATIONS IN THE APPROPRIATE VEGETATIVE BMP.
6. STRUCTURES SHALL BE REMOVED FROM THE CHANNEL WHEN THEIR USEFUL LIFE HAS BEEN COMPLETED.




## INLET PROTECTION
NORMAL USE AT CULVERT INLETS
NOT TO SCALE




## TYPICAL RURAL DRIVEWAY - CROSS SECTION
NOT TO SCALE




## TYPICAL CROSS SECTION
NOT TO SCALE


PREPARED FOR:
CHINBURG PROPERTIES INC
3 PENSTOCK WAY
NEWMARKET, NH 03857


BEALS ASSOCIATES, PLLC
70 PORTSMOUTH AVE,
THIRD FLOOR, SUITE 2
STRATHAM, N.H. 03885
PHONE: 603-583-4860,
FAX. 603-583-4863


| REVISIONS: | DATE: |
|---|---|
| | |

# CONSTRUCTION DETAILS D1

PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

| DATE: | FEB. 2024 | SCALE | NTS' |
|---|---|---|---|
| PROJ. NO: | NH-1500 | SHEET NO. | 9 |

# WINTER MAINTENANCE

1. ALL DISTURBED AREAS THAT DO NOT HAVE AT LEAST 85% VEGETATIVE COVERAGE PRIOR TO OCTOBER 15TH, SHALL BE STABILIZED BY APPLYING MULCH AT A RATE OF 3–4 TONS PER ACRE. ALL SIDE SLOPES, STEEPER THAN 4:1, THAT ARE NOT DIRECTED TO SWALES OR DETENTION BASINS, SHALL BE LINED WITH BIODEGRADABLE/PHOTODEGRADABLE "JUTE MATTING" (EXCELSIOR'S CURLEX II OR EQUAL). ALL OTHER SLOPES SHALL BE MULCHED AND TACKED AT A RATE OF 3–4 TONS PER ACRE. THE APPLICATION OF MULCH AND/OR JUTE MATTING SHALL NOT OCCUR OVER EXISTING SNOW COVER. IF THE SITE IS ACTIVE AFTER NOVEMBER 15TH, ANY SNOW THAT ACCUMULATES ON DISTURBED AREAS SHALL BE REMOVED. PRIOR TO SPRING THAW ALL AREAS WILL BE STABILIZED, AS DIRECTED ABOVE.

2. ALL SWALES THAT DO NOT HAVE FULLY ESTABLISHED VEGETATION SHALL BE EITHER LINED WITH TEMPORARY JUTE MATTING OR TEMPORARY STONE CHECK DAMS (APPROPRIATELY SPACED). STONE CHECK DAMS WILL BE MAINTAINED THROUGHOUT THE WINTER MONTHS. IF THE SWALES ARE TO BE MATTED WITH PERMANENT LINERS OR RIPRAP WITH ENGINEERING FABRIC, THIS SHALL BE COMPLETED PRIOR TO WINTER SHUTDOWN OR AS SOON AS THEY ARE PROPERLY GRADED AND SHAPED.

3. PRIOR TO OCT. 15TH ALL ROADWAY AND PARKING AREAS SHALL BE BROUGHT UP TO AND THROUGH THE BANK RUN GRAVEL APPLICATION. IF THESE AREAS' ELEVATIONS ARE PROPOSED TO REMAIN BELOW THE PROPOSED SUBGRADE ELEVATION, THE SUBGRADE MATERIAL SHALL BE ROUGHLY CROWNED AND A 3" LAYER OF CRUSHED GRAVEL SHALL BE PLACED AND COMPACTED. THIS WILL ALLOW THE SUBGRADE TO SHED RUNOFF AND WILL REDUCE ROADWAY EROSION. THIS CRUSHED GRAVEL DOES NOT HAVE TO CONFORM TO NH DOT 304.3, BUT SHALL HAVE BETWEEN 15–25% PASSING THE #200 SIEVE AND THE LARGEST STONE SIZE SHALL BE 2". IF THE SITE IS ACTIVE AFTER NOVEMBER 15TH, ANY ACCUMULATED SNOW SHALL BE REMOVED FROM ALL ROADWAY AND PARKING AREAS.

4. AFTER OCTOBER 15TH, THE END OF NEW HAMPSHIRE'S AVERAGE GROWING SEASON, NO ADDITIONAL LOAM SHALL BE SPREAD ON SIDE SLOPES AND SWALES. THE STOCKPILES THAT WILL BE LEFT UNDISTURBED UNTIL SPRING SHALL BE SEEDED BY THIS DATE. AFTER OCTOBER 15TH, ANY NEW OR DISTURBED PILES SHALL BE MULCHED AT A RATE OF 3–4 TONS PER ACRE. ALL STOCKPILES THAT WILL REMAIN THROUGHOUT THE WINTER SHALL BE SURROUNDED WITH SILT FENCING.

## TEMPORARY EROSION CONTROL MEASURES

1. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT NO MORE THAN 5 ACRES OF LAND SHALL BE EXPOSED BEFORE DISTURBED AREAS ARE STABILIZED*.
2. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND AT LOCATIONS AS REQUIRED OR DIRECTED BY THE ENGINEER ALL DISTURBED AREAS SHALL BE RETURNED TO ORIGINAL GRADES AND ELEVATIONS.
3. DISTURBED AREAS SHALL BE LOAMED WITH A MINIMUM OF 4" OF LOAM AND SEEDED WITH NOT LESS THAN 1.10 POUNDS OF SEED PER 1000 SQUARE FEET OF AREA. (48 POUNDS PER ACRE) SEE SEED SPECIFICATIONS THIS SHEET.
4. SILT FENCES AND OTHER EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY RAIN EVENT GREATER THAN 0.5" DURING THE LIFE OF THE PROJECT. ALL DAMAGED AREAS SHALL BE REPAIRED, SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED OF.
5. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, THE TEMPORARY EROSION CONTROL MEASURES ARE TO BE REMOVED AND THE AREA DISTURBED BY THE REMOVAL SMOOTHED AND RE–VEGETATED.
6. AREAS MUST BE SEEDED AND MULCHED WITHIN 3 DAYS OF FINAL GRADING, PERMANENTLY STABILIZED WITHIN 15 DAYS OF FINAL GRADING, OR TEMPORARILY STABILIZED WITHIN 30 DAYS OF INITIAL DISTURBANCE OF SOIL.

* AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:

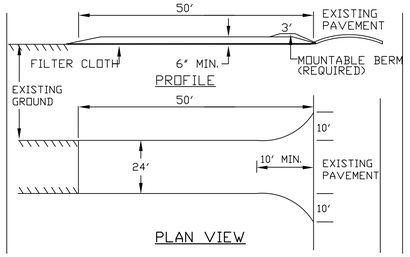
- BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED.
- A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED.
- A MINIMUM OF 3 INCHES OF NON–EROSIVE MATERIAL SUCH AS RIPRAP HAS BEEN INSTALLED.
- EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

## CONSTRUCTION SPECIFICATIONS

1. STRUCTURES SHALL BE INSTALLED ACCORDING TO THE DIMENSIONS SHOWN ON THE PLANS AT THE APPROPRIATE SPACING.
2. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER SO THAT EROSION AND AIR AND WATER POLLUTION WILL BE MINIMIZED.
3. WHEN TIMBER STRUCTURES ARE USED, THE TIMBER SHALL EXTEND AT LEAST 18" INTO THE SOIL.
4. STRAW BALES SHALL BE ANCHORED INTO THE SOIL USING 2" X 2" STAKES DRIVEN THROUGH THE BALES AND AT LEAST 18 INCHES IN TO THE SOIL.
5. SEEDING, FERTILIZING, AND MULCHING SHALL CONFORM TO THE RECOMMENDATIONS IN THE APPROPRIATED VEGETATIVE BMP.
6. STRUCTURES SHALL BE REMOVED FROM THE CHANNEL WHEN THEIR USEFUL LIFE HAS BEEN COMPLETED.
7. THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES THE CONTRACTOR SHALL TAKE PRECAUTIONS AND INSTRUCTIONS FROM THE PLANNING DEPARTMENT IN ORDER TO PREVENT, ABATE AND CONTROL THE EMISSION OF FUGITIVE DUST INCLUDING BUT NOT LIMITED TO WETTING, COVERING, SHIELDING, OR VACUUMING.
8. THE NH COMMISSIONER OF AGRICULTURE PROHIBITS THE COLLECTION, POSSESSION, IMPORTATION, TRANSPORTATION, SALE, PROPAGATION, TRANSPLANTATION, OR CULTIVATION OF PLANTS BANNED BY NH LAW RSA 430:53 AND NH CODE ADMINISTRATIVE RULES AGR 3800. THE PROJECT SHALL MEET ALL REQUIREMENTS AND THE INTENT OF . RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES
9. THE CONSTRUCTION SITE OPERATOR AND OWNER SHALL SUBMIT A NOTICE OF INTENT (NOI) TO USEPA, WASHINGTON, DC, STORMWATER NOTICE PROCESSING CENTER AT LEAST FORTEEN DAYS PRIOR TO COMMENCEMENT OF WORK ON SITE. EPA WILL POST THE NOI AT http://cfpubl.epa.gov/npdes/stormwater/noi/noisearch.cfm. AUTHORIZATION IS GRANTED UNDER THE PERMIT ONCE THE NOI IS SHOWN IN "ACTIVE STATUS".

# CONSTRUCTION SEQUENCE

1. CUT AND REMOVE TREES IN CONSTRUCTION AREAS AS REQUIRED OR DIRECTED.
2. CONSTRUCT AND/OR INSTALL TEMPORARY AND PERMANENT SEDIMENT EROSION AND DETENTION CONTROL FACILITIES AS REQUIRED. EROSION, SEDIMENT AND DETENTION CONTROL FACILITIES SHALL BE INSTALLED AND STABILIZED PRIOR TO ANY EARTH MOVING OPERATION AND PRIOR TO DIRECTING RUNOFF TO THEM. RUNOFF MUST BE DIRECTED TO TEMPORARY PRACTICES UNTIL STORMWATER BMP'S ARE STABILIZED.
3. CLEAR, CUT, GRUB AND DISPOSE OF DEBRIS IN APPROVED FACILITIES. STUMPS AND DEBRIS ARE TO BE REMOVED FROM SITE AND DISPOSED OF PER STATE AND LOCAL REGULATIONS.
4. EXCAVATE AND STOCKPILE TOPSOIL /LOAM. ALL AREAS SHALL BE STABILIZED IMMEDIATELY AFTER GRADING.
5. CONSTRUCT TEMPORARY CULVERTS AS REQUIRED OR DIRECTED.
6. CONSTRUCT THE ROADWAY/DRIVEWAYS AND ITS ASSOCIATED DRAINAGE STRUCTURES. ALL ROADWAYS, PARKING AREAS, AND CUT/FILL SLOPES SHALL BE STABILIZED AND/OR LOAMED AND SEEDED WITHIN 72–HOURS OF ACHIEVING FINISH GRADE AS APPLICABLE.
7. INSTALL PIPE AND CONSTRUCTION ASSOCIATED APPURTENANCES AS REQUIRED OR DIRECTED. ALL DISTURBED AREAS SHALL STABILIZED IMMEDIATELY AFTER GRADING.
8. BEGIN PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES AND DISTURBED AREAS SHALL BE SEEDED OR MULCHED AS REQUIRED, OR DIRECTED.
9. DAILY OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINAGE CHECK DAMS, DITCHES, SEDIMENT TRAPS, ETC. TO PREVENT EROSION ON THE SITE AND PREVENT ANY SILTATION OF ABUTTING WATERS OR PROPERTY.
10. INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION
11. COMPLETE PERMANENT SEEDING AND LANDSCAPING
12. REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER SEEDING AREAS HAVE ESTABLISHED THEMSELVES AND SITE IMPROVEMENTS ARE COMPLETE. SMOOTH AND REVEGETATE ALL DISTURBED AREAS.
13. ALL SWALES AND DRAINAGE STRUCTURES WILL BE CONSTRUCTED AND STABILIZED PRIOR TO HAVING RUNOFF DIRECTED TO THEM.
14. FINISH PAVING ALL ROADWAYS/DRIVEWAYS.
15. LOT DISTURBANCE OTHER THAN THAT SHOWN ON THE APPROVED PLANS SHALL NOT COMMENCE UNTIL THE ROADWAY HAS THE BASE COURSE TO DESIGN ELEVATION AND THE ASSOCIATED DRAINAGE IS COMPLETE AND STABLE.

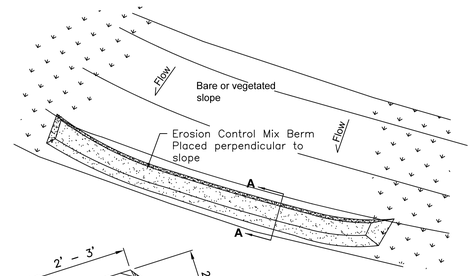



1. STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 3 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET, EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3. THE THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS OR 10 FEET, WHICH EVER IS GREATER. 5. GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE. FILTER CLOTH IS NOT REQUIRED FOR A SINGLE FAMILY RESIDENCE LOT.
6. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL 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 AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED, OR TRACKED ONTO PUBLIC RIGHT–OF–WAY MUST BE REMOVED PROMPTLY.

## STABILIZED CONSTRUCTION ENTRANCE

# SEEDING SPECIFICATIONS

1. GRADING AND SHAPING
   A. SLOPES SHALL NOT BE STEEPER THAN 2:1;3:1 SLOPES OR FLATTER ARE PREFERRED. WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.
2. SEEDBED PREPARATION
   A. SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
   B. STONES LARGER THAN 4 INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEEDBED AND MIX FERTILIZER AND LIME INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.
3. ESTABLISHING A STAND
   A. LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING AND INCORPORATED INTO THE SOIL KINDS AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:
      AGRICULTURAL LIMESTONE, 2 TONS PER ACRE OR 100 LBS PER 1,000 SQ. FT..
      NITROGEN(N), 50 LBS PER ACRE OR 1. 1 LBS PER 1,000 SQ.FT.
      PHOSPHATE(P2O5), 100 LBS PER ACRE OR 2. 2 LBS PER 1,000 SQ.FT.
      POTASH(K2O), 100 LBS PER ACRE OR 2. 2 LBS PER 1,000 SQ.FT.
      (NOTE: THIS IS THE EQUIVALENT OF 500 LBS PER ACRE OF 10–20–20 FERTILIZER OR 1,000 LBS PER ACRE OF 5–10–10.)
   B. SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH .25 INCH OF SOIL OR LESS, BY CULTIPACKING OR RAKING.
   C. REFER TO TABLE(G–E1 THIS SHEET) FOR APPROPRIATE SEED MIXTURES AND TABLE(H–E1 THIS SHEET) FOR RATES OF SEEDING. ALL LEGUMES (CROWN VETCH, BIRDS FOOT TREFOIL, AND FLAT PEA) MUST BE INOCULATED WITH THEIR SPECIFIC INOCULANT.
   D. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 10 TO SEPTEMBER 1.
4. MULCH
   A. HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.
   B. MULCH WILL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE BEST MANAGEMENT PRACTICE FOR MULCHING. HAY OR STRAW MULCH SHALL BE PLACED AT A RATE OF 90 LBS PER 1000 SQ. FT.
5. MAINTENANCE TO ESTABLISH A STAND
   A. PLANTED AREA SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.
   B. FERTILIZATION NEEDS SHOULD BE DETERMINED BY ONSITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIAL STAKE 2 TO 3 YEARS TO BECOME ESTABLISHED.
   C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, OCCASIONAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.




Mix material should consist of 30–50% large (1–3") particles. The organic matter content should be 25%–65%, dry weight basis. The organic matter may originate from a variety of vegetative sources, but needs to be fibrous and elongated. The mix shall be free of silt, clay, fine sand, refuse and contaminants or any material toxic to plant growth.

Erosion Control Mix berms are effective filters for overland flow conditions and should not be used to filter concentrated flow such as that found in drainage ditchs, streams, etc.

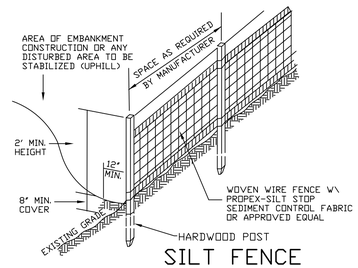
## Erosion Control Mix Berm

### CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES AND FILTER CLOTH SHALL BE FASTENED TO WOVEN WIRE EVERY 24" AT TOP MID AND BOTTOM SECTIONS AND BE EMBEDDED INTO GROUND A MINIMUM OF 8". 2. THE FENCE POSTS SHALL BE A MINIMUM 48" LONG, SPACED A MAXIMUM 10' APART, AND DRIVEN A MINIMUM OF 16" INTO THE GROUND.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THE ENDS OF THE FABRIC SHALL BE OVERLAPPED BY SIX INCHES, FOLDED AND STAPLED TO PREVENT SEDIMENT FROM BY–PASSING.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SEDIMENT REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE AND PROPERLY DISPOSED OF.
5. PLACE THE ENDS OF THE SILT FENCE UP CONTOUR TO PROVIDE FOR SEDIMENT STORAGE.
6. SILT FENCES SHALL BE REMOVED WHEN NO LONGER NEEDED AND THE SEDIMENT COLLECTED SHALL BE DISPOSED AS DIRECTED BY THE ENGINEER. THE AREA DISTURBED BY THE REMOVAL SHALL BE SMOOTHED AND RE–VEGETATED

### MAINTENANCE

1. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE MADE IMMEDIATELY.
2. IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
4. SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.




## SILT FENCE

## SEEDING GUIDE

| USE | SEEDING MIXTURE 1/ | DROUGHTY | WELL DRAINED | MODERATELY WELL DRAINED | POORLY DRAINED |
|---|---|---|---|---|---|
| STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS | A | FAIR | GOOD | GOOD | FAIR |
| | B | POOR | GOOD | FAIR | FAIR |
| | C | POOR | GOOD | EXCELLENT | GOOD |
| | D | FAIR | FAIR | GOOD | EXCELLENT |
| | E | FAIR | EXCELLENT | EXCELLENT | POOR |
| WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER. | A | GOOD | GOOD | GOOD | FAIR |
| | C | GOOD | EXCELLENT | EXCELLENT | FAIR |
| | D | GOOD | EXCELLENT | EXCELLENT | FAIR |
| LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES. | A | GOOD | GOOD | GOOD | FAIR |
| | B | GOOD | GOOD | FAIR | POOR |
| | C | GOOD | EXCELLENT | EXCELLENT | FAIR |
| | D | FAIR | GOOD | GOOD | EXCELLENT |
| PLAY AREAS AND ATHLETIC FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.) | F | FAIR | EXCELLENT | EXCELLENT | 2/ |
| | G | FAIR | EXCELLENT | EXCELLENT | 2/ |
| GRAVEL PIT. SEE NH–PM–24 IN APPENDIX FOR RECOMMENDATION REGARDING RECLAMATION OF SAND AND GRAVEL PITS. | | | | | |

1/ REFER TO SEEDING MIXTURES AND RATES IN TABLE 7–36.
2/ POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREA AND ATHLETIC FIELDS.

NOTE: TEMPORARY SEED MIX FOR STABILIZATION OF TURF SHALL BE WINTER RYE OR OATS AT A RATE OF 2.5 LBS. PER 1000 S.F. AND SHALL BE PLACED PRIOR TO OCT. 15, IF PERMANENT SEEDING NOT YET COMPLETE.

SEEDING RATES

| MIXTURE | POUNDS PER ACRE | POUNDS PER 1,000 Sq. Ft. |
|---|---|---|
| A. TALL FESCUE | 20 | 0.45 |
| CREEPING RED FESCUE | 20 | 0.45 |
| RED TOP | 2 | 0.05 |
| TOTAL | 42 | 0.95 |
| B. TALL FESCUE | 15 | 0.35 |
| CREEPING RED FESCUE | 10 | 0.25 |
| CROWN VETCH OR | 15 | 0.35 |
| FLAT PEA | 30 | 0.75 |
| TOTAL | 40 OR 55 | 0.95 OR 1.35 |
| C. TALL FESCUE | 20 | 0.45 |
| CREEPING RED FESCUE | 20 | 0.45 |
| BIRDS FOOT TREFOIL | 8 | 0.20 |
| TOTAL | 48 | 1.10 |
| D. TALL FESCUE | 20 | 0.45 |
| FLAT PEA | 30 | 0.75 |
| TOTAL | 50 | 1.20 |
| E. CREEPING RED FESCUE 1/ | 50 | 1.15 |
| KENTUCKY BLUEGRASS 1/ | 50 | 1.15 |
| TOTAL | 100 | 2.30 |
| F. TALL FESCUE 1 | 150 | 3.60 |

1/ FOR HEAVY USE ATHLETIC FIELDS CONSULT THE UNIVERSITY OF NEW HAMPSHIRE COOPERATIVE EXTENSION TURF SPECIALIST FOR CURRENT VARIETIES AND SEEDING RATES.

PREPARED FOR:

CHINBURG PROPERTIES INC
3 PENSTOCK WAY
NEWMARKET, NH 03857


BEALS ASSOCIATES, PLLC
70 PORTSMOUTH AVE,
THIRD FLOOR, SUITE 2
STRATHAM, N.H. 03885
PHONE: 603-583-4860,
FAX. 603-583-4863


| REVISIONS: | DATE: |
|---|---|
| | |

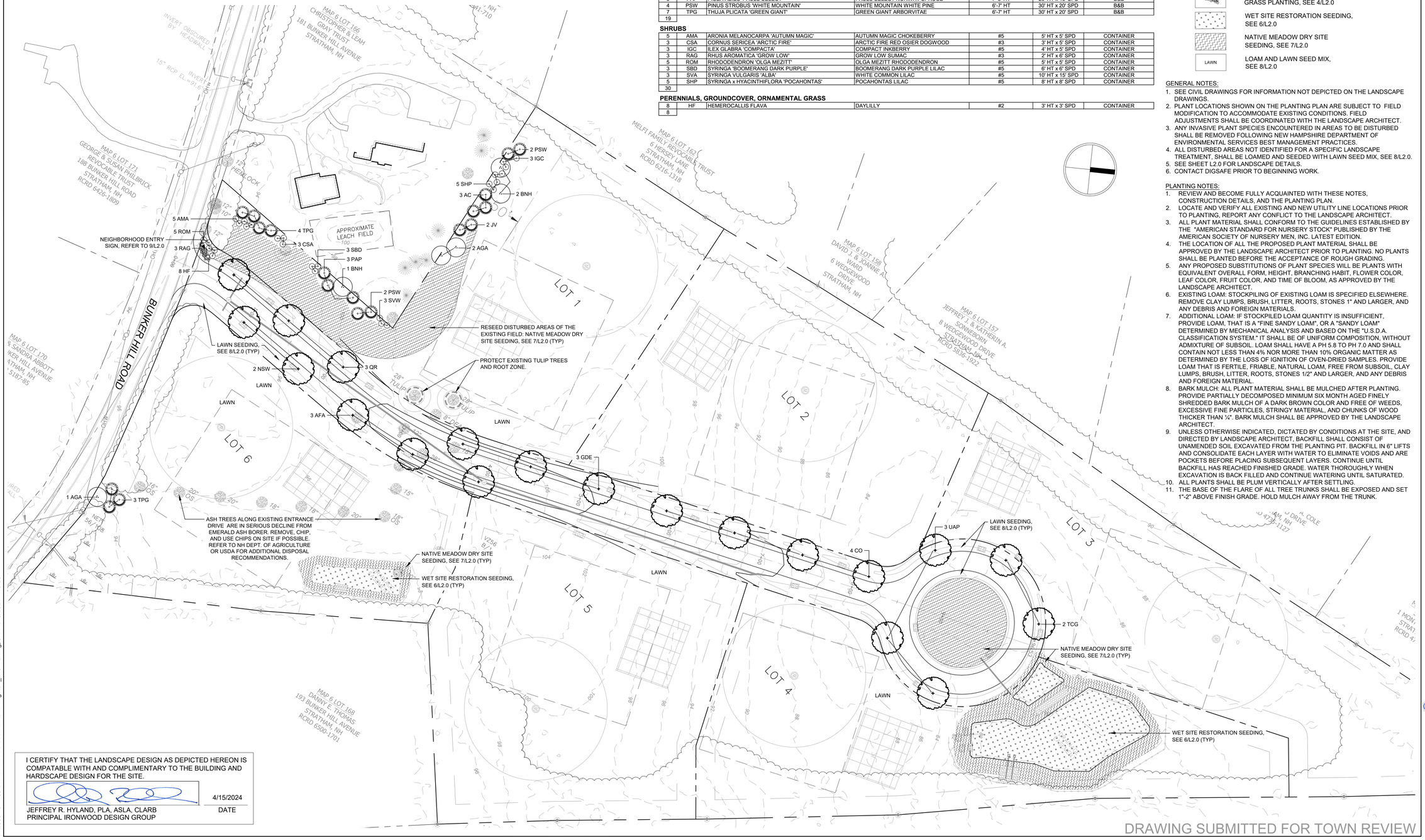
# EROSION & SEDIMENTATION

PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

| DATE: | FEB. 2024 | SCALE | NTS |
|---|---|---|---|
| PROJ. N0: | NH-1500 | SHEET NO. | 10 |

PLANTING NOTES (CONTINUED):

12. IF EXISTING UNAMENDED TOP SOIL IS POOR AND NOT ACCEPTED, PROVIDE PLANTING SOIL MIXTURE CONSISTING OF 7 PARTS LOAM AND 1 PART COMPOST. MIX QUANTITY OF FERTILIZER AND SOIL AMENDMENTS AS RECOMMENDED BY SOIL ANALYSIS AND APPROVED BY THE LANDSCAPE ARCHITECT.
13. WATERING: FLOOD ALL PLANTS WITH WATER TWICE WITHIN THE FIRST 24 HOURS AFTER PLANTING.
14. LOAMING: LOOSEN SUBGRADE AND EXISTING LOAM AREAS BY DISCING OR ROTOTILLING TO MINIMUM DEPTH OF 6". REMOVE STONES GREATER THAN 1" AND ALL RUBBISH AND DEBRIS. PLACE LOAM IN TWO EQUAL LIFTS MIXING FIRST APPLICATION INTO LOOSENED SUBGRADE THEN PLACE SECOND LIFT TO BRING LOAM AFTER SETTLING AND COMPACTING TO THE LINES AND GRADES SHOWN ON THE PLANS. DO NOT HANDLE LOAM OR SUBSOIL IF IT IS WET OR FROZEN.
15. AFTER LOAM HAS BEEN SPREAD, IT SHALL BE CAREFULLY PREPARED BY SCARIFYING AND HAND RAKING. ALL LARGE STIFF CLODS, LUMPS, BRUSH, ROOTS, STUMPS, LITTER AND FOREIGN MATTER, AND STONES OVER 1/2" IN DIAMETER SHALL BE REMOVED FROM THE LOAM. LOAM SHALL ALSO BE FREE OF SMALLER STONES IN EXCESSIVE QUANTITIES AS DETERMINED BY THE LANDSCAPE ARCHITECT.
16. FINE GRADING: SET SUFFICIENT GRADE STAKES FOR CHECKING THE FINISHED GRADES. STAKES MUST BE SET AT THE BOTTOM AND TOP OF SLOPES. GRADES SHALL BE ESTABLISHED THAT ARE ACCURATE TO +/- 1/10TH OF A FOOT. CONNECT CONTOURS AND SPOT ELEVATIONS WITH AN EVEN SLOPE. ALL GRADING WILL INSURE DRAINAGE AWAY FROM STRUCTURES.
17. FINE GRADE LAWN AREAS TO SMOOTH, FREE DRAINING, EVEN SURFACES WITH FINE TEXTURE. ROLL, RAKE AND DRAW LAWN AREAS TO FLATTEN RIDGES AND FILL DEPRESSIONS, EXCEPT AT SELECT AREAS SHOW ON THE DRAWINGS. CONTROL MOISTURE CONTENT TO MAINTAIN OPTIMUM CONDITIONS, BUT DO NOT CREATE A MUDDY CONDITION. APPLY TACKIFIED MULCH TO ALL SEEDED AREAS.
18. ROLLING - TYPICAL: ROLL THE ENTIRE AREA WITH A HAND ROLLER WEIGHTING NOT MORE THAN 100 POUNDS. DURING THE ROLLING, ALL DEPRESSIONS CAUSED BY SETTLEMENT OF ROLLING SHALL BE FILLED WITH ADDITIONAL LOAM AND THE SURFACE SHALL BE RE-GRADED AND ROLLED UNTIL PRESENTING A SMOOTH AND EVEN FINISH TO THE REQUIRED GRADE OR TO THE SHAPES AND CONFIGURATIONS AS SHOWN ON THE DETAILS.
19. THE SILT FENCE SHALL BE LIMIT OF SEEDING UNLESS OTHERWISE INDICATED ON THE DRAWINGS. ALL AREAS DISTURBED OUTSIDE THE LIMIT OF WORK SHALL BE SEEDED AS INDICATED ON THE DRAWINGS.
20. IN CASE OF DISCREPANCIES BETWEEN THE QUANTITIES SHOWN ON THE PLANT SCHEDULE AND THE QUANTITIES SHOWN ON THE PLANTING PLAN, THE QUANTITIES ON THE PLANTING PLAN SHALL BE PROVIDED BY THE CONTRACTOR.




# Plant Schedule

**DECIDUOUS SHADE TREES**

| QTY. | ABRV. | SCIENTIFIC NAME | COMMON NAME | SIZE | APPROX. SIZE AT MATURITY | REMARKS |
|---|---|---|---|---|---|---|
| 3 | AFA | ACER FREEMANII 'AUTUMN BLAZE' | AUTUMN BLAZE MAPLE | 3" CAL | 40' HT x 30' SPD | B&B |
| 4 | CO | CARYA OVATA | SHAGBARK HICKORY | 3" CAL | 50' HT x 30' SPD | B&B |
| 3 | GDE | GYMNOCLADUS DIOISCUS 'ESPRESSO' | ESPRESSO KENTUCKY COFFEETREE | 3" CAL | 40' HT x 30' SPD | B&B |
| 2 | NSW | NYSSA SYLVATICA 'WILDFIRE' | WILDFIRE BLACK GUM | 3" CAL | 40' HT x 30' SPD | B&B |
| 3 | QR | QUERCUS RUBRA | RED OAK | 3" CAL | 60' HT x 50' SPD | B&B |
| 2 | TCG | TILIA CORDATA 'GREENSPIRE' | GREENSPIRE LITTLELEAF LINDEN | 3" CAL | 40' HT x 30' SPD | B&B |
| 3 | UAP | ULMUS AMERICANA 'PRINCETON' | PRINCETON AMERICAN ELM | 3" CAL | 60' HT x 40' SPD | B&B |
| 20 | | | | | | |

**DECIDUOUS UNDERSTORY TREES**

| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | AGA | AMELANCHIER X GRANDIFLORA 'AUTUMN BRILLIANCE' | AUTUMN BRILLIANCE SERVICEBERRY | 10'-12' HT | 20' HT x 20' SPD | B&B, MULTI-STEMMED |
| 3 | BNH | BETULA NIGRA 'HERITAGE' | HERITAGE RIVER BIRCH | 8'-10' HT | 40' HT x 20' SPD | B&B, MULTI-STEMMED |
| 6 | | | | | | |

**EVERGREEN TREES**

| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | AC | ABIES CONCOLOR | WHITE FIR | 6'-7' HT | 30' HT x 15' SPD | B&B |
| 2 | JV | JUNIPERUS VIRGINIANA | EASTERN RED CEDAR | 7'-8' HT | 30' HT x 15' SPD | B&B |
| 3 | PAP | PICEA ABIES 'PAULS SELECT' | PAULS SELECT NORWAY SPRUCE | 7'-8' HT | 20' HT x 15' SPD | B&B |
| 4 | PSW | PINUS STROBUS 'WHITE MOUNTAIN' | WHITE MOUNTAIN WHITE PINE | 6'-7' HT | 30' HT x 20' SPD | B&B |
| 7 | TPG | THUJA PLICATA 'GREEN GIANT' | GREEN GIANT ARBORVITAE | 6'-7' HT | 30' HT x 20' SPD | B&B |
| 19 | | | | | | |

**SHRUBS**

| | | | | | | |
|---|---|---|---|---|---|---|
| 5 | AMA | ARONIA MELANOCARPA 'AUTUMN MAGIC' | AUTUMN MAGIC CHOKEBERRY | #5 | 5' HT x 5' SPD | CONTAINER |
| 3 | CSA | CORNUS SERICEA 'ARCTIC FIRE' | ARCTIC FIRE RED OSIER DOGWOOD | #3 | 3' HT x 5' SPD | CONTAINER |
| 3 | IGC | ILEX GLABRA 'COMPACTA' | COMPACT INKBERRY | #5 | 4' HT x 5' SPD | CONTAINER |
| 3 | RAG | RHUS AROMATICA 'GROW LOW' | GROW LOW SUMAC | #3 | 2' HT x 6' SPD | CONTAINER |
| 5 | ROM | RHODODENDRON 'OLGA MEZITT' | OLGA MEZITT RHODODENDRON | #5 | 5' HT x 5' SPD | CONTAINER |
| 3 | SBD | SYRINGA 'BOOMERANG DARK PURPLE' | BOOMERANG DARK PURPLE LILAC | #5 | 6' HT x 6' SPD | CONTAINER |
| 3 | SVA | SYRINGA VULGARIS 'ALBA' | WHITE COMMON LILAC | #5 | 10' HT x 15' SPD | CONTAINER |
| 5 | SHP | SYRINGA x HYACINTHIFLORA 'POCAHONTAS' | POCAHONTAS LILAC | #5 | 8' HT x 8' SPD | CONTAINER |
| 30 | | | | | | |

**PERENNIALS, GROUNDCOVER, ORNAMENTAL GRASS**

| | | | | | | |
|---|---|---|---|---|---|---|
| 8 | HF | HEMEROCALLIS FLAVA | DAYLILLY | #2 | 3' HT x 3' SPD | CONTAINER |
| 8 | | | | | | |

# Legend

- DECIDUOUS TREE PLANTING, SEE 1/L2.0
- DECIDUOUS MULTI-STEMMED TREE PLANTING, SEE 3/L2.0
- EVERGREEN TREE PLANTING, SEE 2/L2.0
- SHRUB PLANTING, SEE 5/L2.0
- PERENNIAL, GROUNDCOVER, ORNAMENTAL GRASS PLANTING, SEE 4/L2.0
- WET SITE RESTORATION SEEDING, SEE 6/L2.0
- NATIVE MEADOW DRY SITE SEEDING, SEE 7/L2.0
- LOAM AND LAWN SEED MIX, SEE 8/L2.0 (LAWN)

GENERAL NOTES:

1. SEE CIVIL DRAWINGS FOR INFORMATION NOT DEPICTED ON THE LANDSCAPE DRAWINGS.
2. PLANT LOCATIONS SHOWN ON THE PLANTING PLAN ARE SUBJECT TO FIELD MODIFICATION TO ACCOMMODATE EXISTING CONDITIONS. FIELD ADJUSTMENTS SHALL BE COORDINATED WITH THE LANDSCAPE ARCHITECT.
3. ANY INVASIVE PLANT SPECIES ENCOUNTERED IN AREAS TO BE DISTURBED SHALL BE REMOVED FOLLOWING NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES BEST MANAGEMENT PRACTICES.
4. ALL DISTURBED AREAS NOT IDENTIFIED FOR A SPECIFIC LANDSCAPE TREATMENT, SHALL BE LOAMED AND SEEDED WITH LAWN SEED MIX, SEE 8/L2.0.
5. SEE SHEET L2.0 FOR LANDSCAPE DETAILS.
6. CONTACT DIGSAFE PRIOR TO BEGINNING WORK.

PLANTING NOTES:

1. REVIEW AND BECOME FULLY ACQUAINTED WITH THESE NOTES, CONSTRUCTION DETAILS, AND THE PLANTING PLAN.
2. LOCATE AND VERIFY ALL EXISTING AND NEW UTILITY LINE LOCATIONS PRIOR TO PLANTING, REPORT ANY CONFLICT TO THE LANDSCAPE ARCHITECT.
3. ALL PLANT MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE "AMERICAN STANDARD FOR NURSERY STOCK" PUBLISHED BY THE AMERICAN SOCIETY OF NURSERY MEN, INC. LATEST EDITION.
4. THE LOCATION OF ALL THE PROPOSED PLANT MATERIAL SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO PLANTING. NO PLANTS SHALL BE PLANTED BEFORE THE ACCEPTANCE OF ROUGH GRADING.
5. ANY PROPOSED SUBSTITUTIONS OF PLANT SPECIES WILL BE PLANTS WITH EQUIVALENT OVERALL FORM, HEIGHT, BRANCHING HABIT, FLOWER COLOR, LEAF COLOR, FRUIT COLOR, AND TIME OF BLOOM, AS APPROVED BY THE LANDSCAPE ARCHITECT.
6. EXISTING LOAM: STOCKPILING OF EXISTING LOAM IS SPECIFIED ELSEWHERE. REMOVE CLAY LUMPS, BRUSH, LITTER, ROOTS, STONES 1" AND LARGER, AND ANY DEBRIS AND FOREIGN MATERIALS.
7. ADDITIONAL LOAM: IF STOCKPILED LOAM QUANTITY IS INSUFFICIENT, PROVIDE LOAM, THAT IS A "FINE SANDY LOAM", OR A "SANDY LOAM" DETERMINED BY MECHANICAL ANALYSIS AND BASED ON THE "U.S.D.A. CLASSIFICATION SYSTEM." IT SHALL BE OF UNIFORM COMPOSITION, WITHOUT ADMIXTURE OF SUBSOIL. LOAM SHALL HAVE A PH 5.8 TO PH 7.0 AND SHALL CONTAIN NOT LESS THAN 4% NOR MORE THAN 10% ORGANIC MATTER AS DETERMINED BY THE LOSS OF IGNITION OF OVEN-DRIED SAMPLES. PROVIDE LOAM THAT IS FERTILE, FRIABLE, NATURAL LOAM, FREE FROM SUBSOIL, CLAY LUMPS, BRUSH, LITTER, ROOTS, STONES 1/2" AND LARGER, AND ANY DEBRIS AND FOREIGN MATERIAL.
8. BARK MULCH: ALL PLANT MATERIAL SHALL BE MULCHED AFTER PLANTING. PROVIDE PARTIALLY DECOMPOSED MINIMUM SIX MONTH AGED FINELY SHREDDED BARK MULCH OF A DARK BROWN COLOR AND FREE OF WEEDS, EXCESSIVE FINE PARTICLES, STRINGY MATERIAL, AND CHUNKS OF WOOD THICKER THAN ¼". BARK MULCH SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT.
9. UNLESS OTHERWISE INDICATED, DICTATED BY CONDITIONS AT THE SITE, AND DIRECTED BY LANDSCAPE ARCHITECT, BACKFILL SHALL CONSIST OF UNAMENDED SOIL EXCAVATED FROM THE PLANTING PIT. BACKFILL IN 6" LIFTS AND CONSOLIDATE EACH LAYER WITH WATER TO ELIMINATE VOIDS AND ARE POCKETS BEFORE PLACING SUBSEQUENT LAYERS. CONTINUE UNTIL BACKFILL HAS REACHED FINISHED GRADE. WATER THOROUGHLY WHEN EXCAVATION IS BACK FILLED AND CONTINUE WATERING UNTIL SATURATED.
10. ALL PLANTS SHALL BE PLUM VERTICALLY AFTER SETTLING.
11. THE BASE OF THE FLARE OF ALL TREE TRUNKS SHALL BE EXPOSED AND SET 1"-2" ABOVE FINISH GRADE. HOLD MULCH AWAY FROM THE TRUNK.

I CERTIFY THAT THE LANDSCAPE DESIGN AS DEPICTED HEREON IS COMPATABLE WITH AND COMPLIMENTARY TO THE BUILDING AND HARDSCAPE DESIGN FOR THE SITE.

JEFFREY R. HYLAND, PLA, ASLA, CLARB
PRINCIPAL IRONWOOD DESIGN GROUP

4/15/2024
DATE

DRAWING SUBMITTED FOR TOWN REVIEW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Landscape Architecture • Planning
Exeter, New Hampshire | 603.772.0590 | www.FeWood.com


# WINDSONG PLACE

Bunker Hill Ave., Stratham, NH 03885
TAX MAP 6, LOT 167

SHEET TITLE

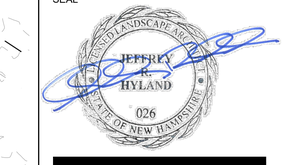
## LANDSCAPE PLAN

REVISION LOG

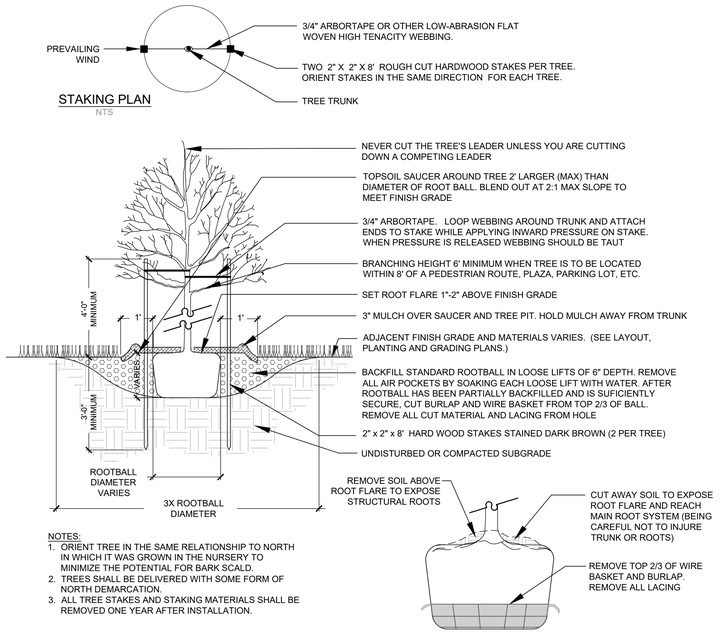
| REV# | DATE | DESCRIPTION |
|---|---|---|

| | |
|---|---|
| PROJECT NO. | 23034.0 |
| DESIGN BY | J. HYLAND |
| DRAWN BY | S. WRIGHT |
| CHECKED BY | D.JENSEN / J. HYLAND |
| DATE | APRIL 17, 2024 |
| SCALE | 0' 50' 100' SCALE: 1" = 50'-0" |

SEAL




L1.0

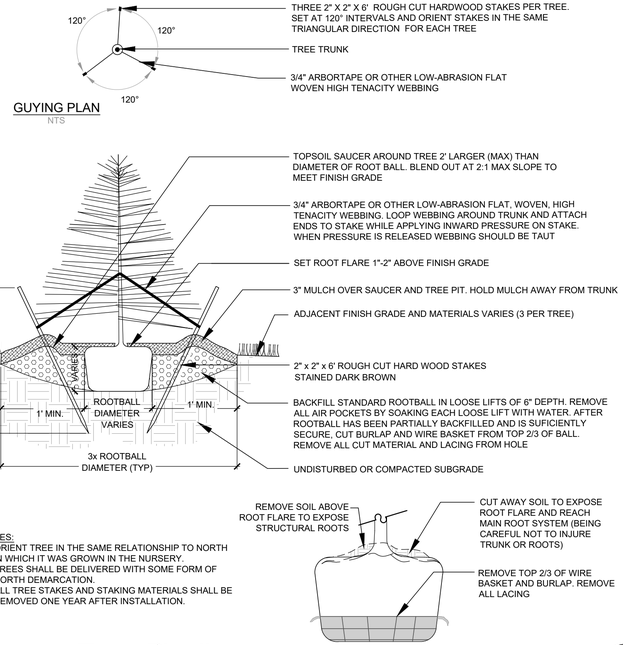



## Deciduous Tree Planting

Not to Scale



1 L2.0

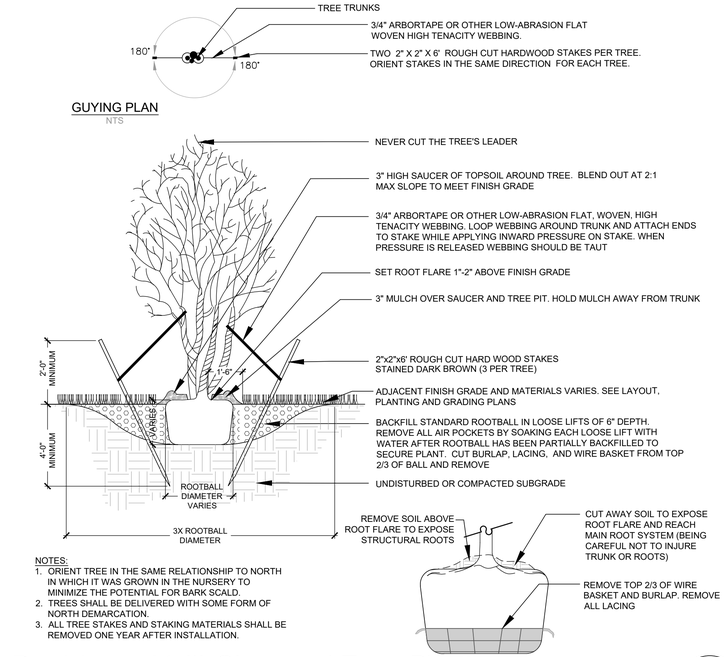



## Evergreen Tree Planting

Not to Scale



2 L2.0

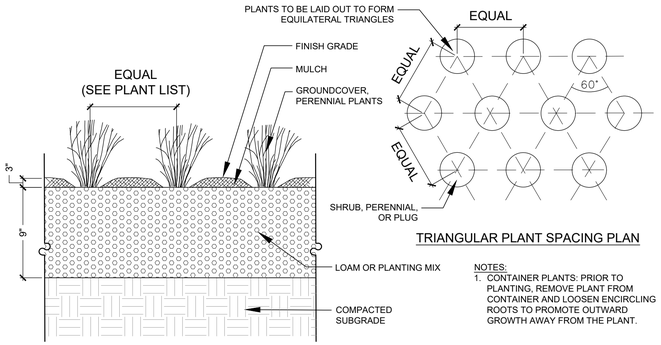



## Deciduous Multi-Stemmed Tree Planting

Not to Scale



3 L2.0

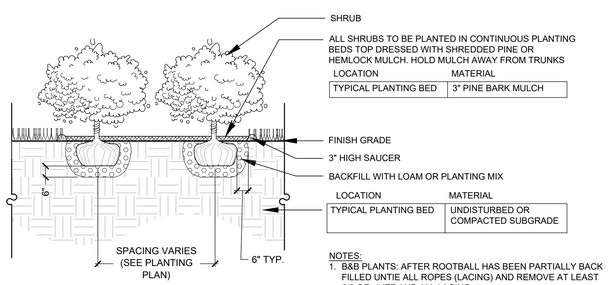



## Perennial, Groundcover, Ornamental Grass Planting

Not to Scale



4 L2.0

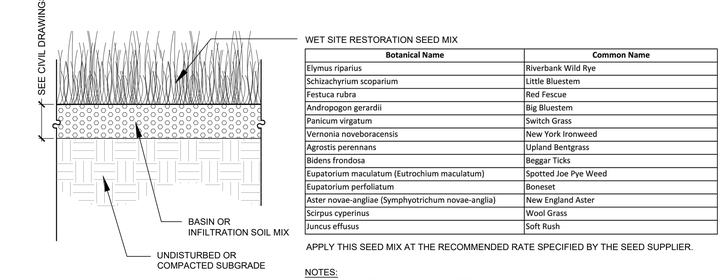



## Shrub Planting

Not to Scale



5 L2.0

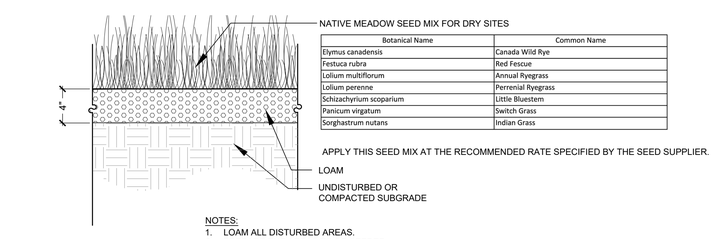



## Wet Site Restoration Seeding

Not to Scale



6 L2.0

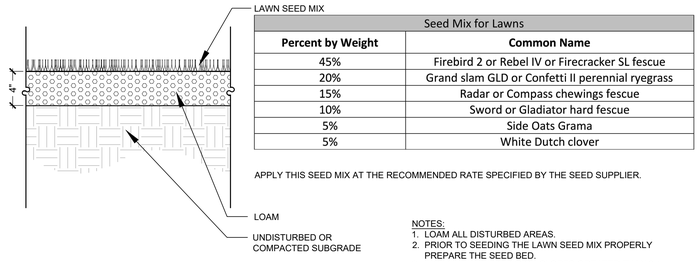



## Loam and Native Meadow Dry Site Seeding

Not to Scale



7 L2.0

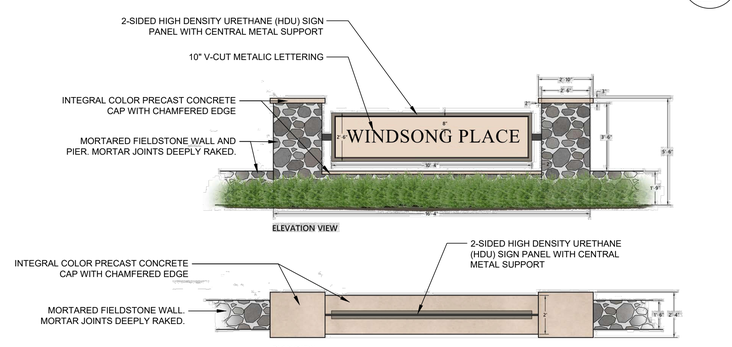



## Loam and Lawn Seeding

Not to Scale



8 L2.0




## Neighborhood Entry Sign

Not to Scale



9 L2.0

DRAWING SUBMITTED FOR TOWN REVIEW

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# WINDSONG PLACE

Bunker Hill Ave., Stratham, NH 03885
TAX MAP 6, LOT 167

SHEET TITLE

## LANDSCAPE DETAILS

REVISION LOG

| REV# | DATE | DESCRIPTION |
|---|---|---|
| - | - | - |
| △ | | |
| △ | | |
| △ | | |

| | |
|---|---|
| PROJECT NO. | 23034.0 |
| DESIGN BY | J. HYLAND |
| DRAWN BY | S. WRIGHT |
| CHECKED BY | D.JENSEN / J. HYLAND |
| DATE | APRIL 17, 2024 |
| SCALE | AS NOTED |

SEAL


L2.0

# DRAINAGE ANALYSIS
# &
# SEDIMENT AND EROSION CONTROL PLAN

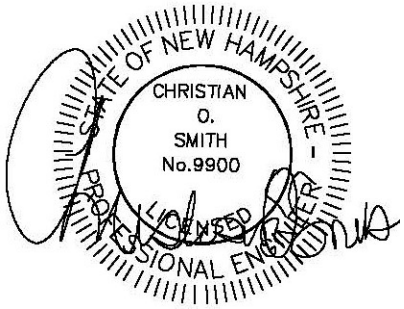
Prepared for:

**CHINBURG PROPERTIES INC**
**WINDSONG PLACE**
**RESIDENTIAL SUBDIVISION**

Prepared by:

**BEALS ASSOCIATES, PLLC**
**70 PORTSMOUTH AVENUE**
**STRATHAM, NH 03885**

Project Number:
NH-1500
Bunker Hill Road
Stratham, New Hampshire
**February 1, 2024**
**Revised April 15, 2024**



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## 1.0 ANALYSIS SUMMARY

Chinburg Properties Inc proposes to construct a residential site plan to establish a subdivision on a 13.9+/- acre parcel of land located off Bunker Hill Road in Stratham, New Hampshire. A drainage analysis of 28.6+/- acres of the proposed site improvement was conducted for the purpose of estimating the peak rate of stormwater run-off and to subsequently design adequate drainage structures. Two models were compiled: one for the area in its existing (pre-construction) condition and a second for its proposed (post-construction) condition. The analysis was conducted using Extreme Precipitation data provided by Cornell University for the following 24-hour duration storm events:

| Storm Event | Rainfall Depth (inches) |
|---|---|
| 2-Year | 3.25 |
| 10-Year | 4.94 |
| 25Year | 6.28 |

These storm events use the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment to model the rainfall and predict stormwater runoff flows and volumes. A Type III storm pattern was used in the model. The purpose of this analysis is to estimate the peak rates of run-off from the site for detention adequacy purposes, and to compare the peak rate of run-off between the existing and proposed conditions.

### Peak Rate of Discharge

| | | Component Peak Rate of Discharge (CFS) | | |
|---|---|---|---|---|
| **Analysis Point # Analysis Point Description** | **Condition** | **2-Year** | **10-Year** | **25-Year** |
| Reach #<100> Flow to Northeast | Existing | 5.92 | 14.30 | 22.93 |
| | Proposed | 1.31 | 9.34 | 20.42 |
| Reach #<200> Flow to South | Existing | 3.11 | 6.58 | 9.65 |
| | Proposed | 2.48 | 4.87 | 6.98 |
| Reach #<300> Flow to Southeast | Existing | 1.67 | 3.67 | 5.42 |
| | Proposed | 1.45 | 3.33 | 4.97 |

### Channel Protection

| Analysis Point # Analysis Point Description | Condition | 2-Year Storm Volume (Acre-Feet) |
|---|---|---|
| Reach #<100> Flow to Northeast | Existing | 1.139 |
| | Proposed | 0.162 |
| Reach #<200> Flow to South | Existing | 0.296 |
| | Proposed | 0.231 |
| Reach #<300> Flow to Southeast | Existing | 0.259 |
| | Proposed | 0.148 |

The proposed 6 lot residential subdivision includes a paved roadway into the subdivision ending in a cul-de-sac. The proposed improvement area includes three different subcatchments. The peak rate of run-off in the proposed conditions is decreased from that of the existing conditions, due to the addition of two infiltration ponds. All paved roadway runoff receives treatment from grass-lined swales, a forebay, and an infiltration pond prior to discharging overland. In addition, the potential for increased erosion and sedimentation is handled by way of silt barriers surrounding the disturbed areas. The use of Best Management Practices per the Rockingham Conservation District / DES Handbook have been applied to the design of these structures and will be observed during all stages of construction. All land disturbed during construction will be stabilized within 30 days of groundbreaking. Existing wetlands and abutters will suffer no adverse effects resulting from this proposed development.

## 2.0 EXISTING CONDITIONS ANALYSIS

The existing property is located on a parcel consisting of woodlands, a residential home, and extensive lawn areas. The existing topography is such that the site analysis is divided into three subcatchments within the area proposed to be improved, and includes a large area of contributing off-site area comprised of residential houses. Final Reach #<100> flows towards the northeast of the proposed improvement area, Final Reach #<200> flows towards the South, and Reach #300 flows toward the east of the proposed improvement area.

Classified by a combination of Site-Specific and NRCS Soil Mapping, the land of the site is composed of relatively flat slopes and soils categorized into the Hydrologic Soil Groups (HSG) A, B, C, and D (See appendix for Hiss/HSG designations). The majority of the area to be developed is comprised of Eldrige and Scituate soils.

## 3.0 PROPOSED CONDITIONS ANALYSIS

The addition of the impervious area, clearing of trees, and grading of slopes causes an increase in the curve number (Cn) and a decrease in the time of concentration (Tc) which results in a potential increase in peak rates of run-off from the site. To reduce these flows to pre-development conditions, various stormwater management systems will be proposed. A pipe network consisting of catchbasins with deep sumps and oil-debris separators combined with grass-lined swales controls the conveyance of stormwater. The proposed development divides the site into several different post-construction subcatchments, but ultimately the three main subcatchments match the pre-construction analysis. The run-off is directed to off-site areas through HydroCAD “reaches” and “ponds”, consisting of a two infiltration ponds.

In an effort to prevent the sedimentation of abutting properties, the paved roadway will be graded to flow into a closed drainage system, grass-lined swales, a sediment forebay prior to flowing towards an infiltration pond. During construction, appropriate Best Management Practices (BMP's) will be applied so as to negate the potential for sediment-laden run-off to discharge off-site prior to the final stabilization of the proposed grading. The structures outlined in this proposal provide for adequate treatment of stormwater run-off for sediment control.

## 4.0 SEDIMENT & EROSION CONTROL PLANS BEST MANAGEMENT PRACTICES (BMP's)

The proposed site development is protected from erosion and the roadways and abutting properties are protected from sediment by the use of Best Management Practices as outlined in the New Hampshire Stormwater Manual. Any area disturbed by construction will be re-stabilized within 30 days, and abutting properties and wetlands will not be adversely affected by this development. All swales and drainage structures will be constructed and stabilized prior to having run-off directed to them.

### 4.1 Silt Barrier / Construction Fence

The plan set demonstrates the location of silt barriers for sediment control. Sheet E-1, Erosion and Sediment Control Details, has the specifications for installation and maintenance of the silt barriers selected for the site. In areas where the limits of construction need to be emphasized to operators, construction fence for added visibility will be installed. Orange construction fence will be VISI Perimeter Fence by Conwed Plastic Fencing, or approved equal. The four-foot construction fencing is to be installed using six-foot posts buried at least two feet into the ground spaced six to eight feet apart.

### 4.2 Vegetated Stabilization

All areas that are disturbed during construction will be stabilized with vegetated material within 30 days of disturbance. Construction will be managed in such a manner that erosion is prevented and that no abutter's property will be subjected to any siltation, unless otherwise permitted. All areas to be planted with grass for long-term cover will follow the specifications on Sheet E-1 using the seeding mixture below:

| Mixture C | Pounds per Acre | Pounds per 1,000 sf |
|---|---|---|
| Tall Fescue | 20 | 0.45 |
| Creeping Red Fescue | 20 | 0.45 |
| Birdsfoot Trefoil | 8 | 0.20 |
| **Total** | **48** | **1.10** |

### 4.3 Stabilized Construction Entrance/Exit

A temporary gravel construction entrance/exit provides an area where mud can be dislodged from tires before the vehicle leaves the construction site to reduce the amount of mud and sediment transported onto paved municipal and state roads. The stone size for the gravel pad should be between 1- and 2-inch coarse aggregate and the pad itself constructed to a minimum length of 50' for the full width of the access road. The aggregate should be placed at least six inches thick. Plan and profile view details are shown on Sheet E1 - Sediment and Erosion Control Detail Plan.

4.2 Drainage Swales / Stormwater Conveyance Channels

Drainage swales will be stabilized with vegetation for long term cover as outlined below using seed mixture C. As a general rule, velocities in the swale should not exceed 3.0 feet per second for a vegetated swale although velocities as high as 4.5 FPS are allowed under certain soil conditions.

4.5 Level Spreaders

Level spreaders enable any run-off directed towards them to be spread evenly into sheet flow prior to discharge into wetlands or treatment by a filter strip, thus allowing for better filter strip efficiency and a lesser potential for erosion.

4.6 Vegetated Buffers

Vegetated buffers are areas of land with natural or planted vegetation designed to receive sheet run-off from upgradient development. These natural areas, preferably wooded, are effective in removing sediment and sediment-laden pollutants from such run-off, although their effectiveness is severely diminished when forced to deal with concentrated flow and must therefore be equipped with a level-spreading device. Vegetated buffers should not have a slope exceeding fifteen percent and have a minimum length of seventy-five feet.

4.6 Filter Strips

Filter strips are areas of land with natural or planted vegetation designed to receive sheet run-off from upgradient development. These natural areas, preferably wooded, are effective in removing sediment and sediment-laden pollutants from such run-off, although their effectiveness is severely diminished when forced to deal with concentrated flow and must therefore be equipped with a level-spreading device. Filter strips should not have a slope exceeding fifteen percent and have a minimum length of seventy-five feet.

4.4 Environmental Dust Control

Dust will be controlled on the site using multiple Best Management Practices. Mulching and temporary seeding will be the first line of protection to be utilized where problems occur. If dust problems are not solved by these applications, the use of water and calcium chloride can be applied. Calcium chloride will be applied at a rate that will keep the surface moist but not cause pollution.

4.5 Construction Sequence

1. Cut and remove trees in construction areas as directed or required.

2. Construct and/or install temporary and permanent sediment erosion and detention control facilities, as required. Erosion, sediment, and facilities shall be installed and stabilized prior to any earth moving operation, and prior to directing run-off to them.

3. Clear, cut, grub, and dispose of debris in approved facilities.

4. Excavate and stockpile topsoil / loam. All disturbed areas shall be stabilized immediately after grading.

5. Construct the roadway and its associated drainage structures.

6. Begin permanent and temporary seeding and mulching. All cut and fill slopes and disturbed areas shall be seeded and mulched as required or directed.

7. Daily, or as required, construct temporary berms, drainage ditches, sediment traps, etc. to prevent erosion on the site and prevent any siltation of abutting waters or property.

8. Inspect and maintain all erosion and sediment control measures during construction.

9. Complete permanent seeding and landscaping.

10. Remove temporary erosion control measures after seeding areas have established themselves and site improvements are complete. Smooth and re-vegetate all disturbed areas.

11. All swales and drainage structures will be constructed and stabilized prior to having run-off being directed to them.

12. Finish paving all roadways.

4.6 Temporary Erosion Control Measures

1. The smallest practical area of land shall be exposed at any one time.

2. Erosion and sediment control measures shall be installed as shown on the plans and at locations as required, or directed by the engineer.

3. All disturbed areas shall be returned to original grades and elevations. Disturbed areas shall be loamed with a minimum of 4” of loam and seeded with not less than 1.10 pound of seed per 1,000 square feet (48 pounds per acre) of area.

4. Silt barriers shall be inspected periodically and after every rainstorm during the life of the project. All damaged areas shall be repaired and sediment deposits shall periodically be removed and properly disposed of.

5. After all disturbed areas have been stabilized, the temporary erosion control measures are to be removed and the area disturbed by the removal smoothed and revegetated.

6. Areas must be seeded and mulched within 5 days of final grading, permanently stabilized within 15 days of final grading, or temporarily stabilized within 30 days of initial disturbance of soil.

4.7 Inspection and Maintenance Schedule

Silt barriers shall be inspected during and after storm events to ensure that the fence still has integrity and is not allowing sediment to pass.

## 5.0 CONCLUSION

This proposed site development off of Bunker Hill Road in Stratham, NH will have no adverse effect on the abutting property owners by way of stormwater run-off or siltation. The post-construction peak rates of run-off for the site will be lower than the existing conditions for the storm events, as shown in the tables above. Appropriate steps will be taken to eliminate erosion and sedimentation; these will be accomplished through the construction of a drainage system consisting of a forebay and two infiltration ponds. The Best Management Practices developed by the State of New Hampshire have been utilized in the design of this system and these applications will be enforced throughout the construction process.

An Alteration of Terrain Permit (RSA 485: A-17) is not required for this project due to the area of disturbance being less than 100,000 square feet.

Respectfully Submitted,

BEALS ASSOCIATES, *PLLC.*

Christian O. Smith

Christian O Smith, PE
Principal

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

# ROUNDWATER RECHARGE VOLULME (GRV) CALCULATION (Env-Wq 1507.04)

| | | | |
|---|---|---|---|
| | ac | Area of HSG A soil that was replaced by impervious cover | 0.40" |
| - | ac | Area of HSG B soil that was replaced by impervious cover | 0.25" |
| 1.38 | ac | Area of HSG C soil that was replaced by impervious cover | 0.10" |
| | ac | Area of HSG D soil or impervious cover that was replaced by impervious cover | 0.0" |
| 0.10 | inches | Rd = Weighted groundwater recharge depth | |
| 0.1379 | ac-in | GRV = AI * Rd | |
| 501 | cf | GRV conversion (ac-in x 43,560 sf/ac x 1ft/12”) | |

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

Required = 501 cubic feet

Provided = 53,274 cubic feet (see calculation below)

Infiltration Pond #1 2-Year storm infiltration = 1.149 acre-feet
Infiltration Pond #2 2-Year storm infiltration = 0.074 acre-feet

Sum of Bioretention and Infiltration Ponds = 1.223 acre-feet = 53,274 cubic-feet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

# INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.06)

**Infiltration Pond #1 (IP#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** |
| 20.98 | ac | A = Area draining to the practice | |
| 2.79 | ac | $A_I$ = Impervious area draining to the practice | |
| 0.13 | decimal | I = Percent impervious area draining to the practice, in decimal form | |
| 0.17 | unitless | Rv = Runoff coefficient = 0.05 + (0.9 x I) | |
| 3.56 | ac-in | WQV= 1" x Rv x A | |
| 12,923 | cf | WQV conversion (ac-in x 43,560 sf/ac x 1ft/12") | |
| 3,231 | cf | 25% x WQV (check calc for sediment forebay volume) | |
| Forebay | | Method of pretreatment? (not required for clean or roof runoff) | |
| 7,478 | cf | $V_{SED}$ = Sediment forebay volume, if used for pretreatment | ≥ **25%WQV** |
| 42,643 | cf | V = Volume[1] (attach a stage-storage table) | ≥ **WQV** |
| 8,936 | sf | $A_{SA}$ = Surface area of the bottom of the pond | |
| 3.00 | iph | $Ksat_{DESIGN}$ = Design infiltration rate[2] | |
| 5.8 | hours | $T_{DRAIN}$ = Drain time = V / ($A_{SA}$ * $I_{DESIGN}$) | ≤ **72-hrs** |
| 79.30 | feet | $E_{BTM}$ = Elevation of the bottom of the basin | |
| 78.30 | feet | $E_{SHWT}$ = Elevation of SHWT (if none found, enter the lowest elevation of the test pit) | |
| 74.80 | feet | $E_{ROCK}$ = Elevation of bedrock (if none found, enter the lowest elevation of the test pit) | |
| 1.00 | feet | $D_{SHWT}$ = Separation from SHWT | ≥ *[3] |
| 4.5 | feet | $D_{ROCK}$ = Separation from bedrock | ≥ *[3] |
| | ft | $D_{amend}$ = Depth of amended soil, if applicable due high infiltation rate | ≥ **24"** |
| | ft | $D_T$ = Depth of trench, if trench proposed | **4 - 10 ft** |
| | Yes/No | If a trench or underground system is proposed, has observation well been provided? | ←**yes** |
| | | If a trench is proposed, does materialmeet 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** |
| 3.0 | :1 | If a basin is proposed, pond side slopes. | ≥**3:1** |
| 82.56 | ft | Peak elevation of the 10-year storm event (infiltration can be used in analysis) | |
| 82.97 | ft | Peak elevation of the 50-year storm event (infiltration can be used in analysis) | |
| 83.00 | 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. $Ksat_{DESIGN}$ 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:**

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

# INFILTRATION PRACTICE CRITERIA
# (Env-Wq 1508.06)

**Infiltration Pond #2 (IP#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** |
| 0.72 | ac | A = Area draining to the practice | |
| 0.08 | ac | $A_I$ = Impervious area draining to the practice | |
| 0.12 | decimal | I = Percent impervious area draining to the practice, in decimal form | |
| 0.15 | unitless | Rv = Runoff coefficient = 0.05 + (0.9 x I) | |
| 0.11 | ac-in | WQV= 1" x Rv x A | |
| 406 | cf | WQV conversion (ac-in x 43,560 sf/ac x 1ft/12") | |
| 101 | cf | 25% x WQV (check calc for sediment forebay volume) | |
| N/A | | Method of pretreatment? (not required for clean or roof runoff) | |
| | cf | $V_{SED}$ = Sediment forebay volume, if used for pretreatment | **≥ 25%WQV** |
| 4,727 | cf | V = Volume[1] (attach a stage-storage table) | **≥ WQV** |
| 2,068 | sf | $A_{SA}$ = Surface area of the bottom of the pond | |
| 3.00 | iph | $Ksat_{DESIGN}$ = Design infiltration rate[2] | |
| 0.8 | hours | $I_{DRAIN}$ = Drain time = V / ($A_{SA}$ * $I_{DESIGN}$) | **≤ 72-hrs** |
| 94.00 | feet | $E_{BTM}$ = Elevation of the bottom of the basin | |
| 92.67 | feet | $E_{SHWT}$ = Elevation of SHWT (if none found, enter the lowest elevation of the test pit) | |
| 89.33 | feet | $E_{ROCK}$ = Elevation of bedrock (if none found, enter the lowest elevation of the test pit) | |
| 1.33 | feet | $D_{SHWT}$ = Separation from SHWT | **≥ *** [3] |
| 4.7 | feet | $D_{ROCK}$ = Separation from bedrock | **≥ *** [3] |
| | ft | $D_{amend}$ = Depth of amended soil, if applicable due high infiltation rate | **≥ 24"** |
| | ft | $D_T$ = Depth of trench, if trench proposed | **4 - 10 ft** |
| | Yes/No | If a trench or underground system is proposed, has observation well been provided? | ←**yes** |
| | | If a trench is proposed, does materialmeet 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** |
| 3.0 | :1 | If a basin is proposed, pond side slopes. | **≥3:1** |
| 95.09 | ft | Peak elevation of the 10-year storm event (infiltration can be used in analysis) | |
| 95.44 | ft | Peak elevation of the 50-year storm event (infiltration can be used in analysis) | |
| 95.75 | 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. $Ksat_{DESIGN}$ 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:**

# Pollutant Removal Efficiencies for Best Management Practices for Use in Pollutant Loading Analysis

Best Management Practice (BMP) removal efficiencies for pollutant loading analysis for total suspended solids (TSS), total nitrogen (TN), and total phosphorus (TP) are presented in the table below. These removal efficiencies were developed by reviewing various literature sources and using best professional judgment based on literature values and general expectation of how values for different BMPS should relate to one another. The intent is to update this information and add BMPs and removal efficiencies for other parameters as more information/data becomes available in the future.

NHDES will consider other BMP removal efficiencies if sufficient documentation is provided.

Please note that all BMPs must be designed in accordance with the specifications in the Alteration of Terrain (AoT) Program Administrative Rules (Env-Wq 1500). If BMPs are not designed in accordance with the AoT Rules, NHDES may require lower removal efficiencies to be used in the analysis.

BMP in Series: When BMPs are placed in series, the BMP with the highest removal efficiency shall be the efficiency used in the model for computing annual loadings. Adding efficiencies together is generally not allowed because removals typically decrease rapidly with decreasing influent concentration and, in the case of primary BMPs (i.e., stormwater ponds, infiltration and filtering practices), pre-treatment is usually part of the design and is therefore, most likely already accounted for in the efficiencies cited for these BMPs.

| Pollutant Removal Efficiencies for Best Management Practices for Use in Pollutant Loading Analysis | | | | Values Accepted for Loading Analyses | | |
|---|---|---|---|---|---|---|
| **BMP Type** | **BMP** | **Notes** | **Lit. Ref.** | **TSS** | **TN** | **TP** |
| Stormwater Ponds | Wet Pond | | B, F | 70% | 35% | 45% |
| | Wet Extended Detention Pond | | A, B | 80% | 55% | 68% |
| | Micropool Extended Detention Pond | TBA | | | | |
| | Multiple Pond System | TBA | | | | |
| | Pocket Pond | TBA | | | | |
| Stormwater Wetlands | Shallow Wetland | | A, B, F, I | 80% | 55% | 45% |
| | Extended Detention Wetland | | A, B, F, I | 80% | 55% | 45% |
| | Pond/Wetland System | TBA | | | | |
| | Gravel Wetland | | H | 95% | 85% | 64% |
| Infiltration Practices | Infiltration Trench (≥75 ft from surface water) | | B, D, I | 90% | 55% | 60% |
| | Infiltration Trench (<75 ft from surface water) | | B, D, I | 90% | 10% | 60% |
| | Infiltration Basin (≥75 ft from surface water) | | A, F, B, D, I | 90% | 60% | 65% |
| | Infiltration Basin (<75 ft from surface water) | | A, F, B, D, I | 90% | 10% | 65% |
| | Dry Wells | | | 90% | 55% | 60% |
| | Drip Edges | | | 90% | 55% | 60% |
| Filtering Practices | Aboveground or Underground Sand Filter that infiltrates WQV (≥75 ft from surface water) | | A, F, B, D, I | 90% | 60% | 65% |
| | Aboveground or Underground Sand Filter that infiltrates WQV (<75 ft from surface water) | | A, F, B, D, I | 90% | 10% | 65% |
| | Aboveground or Underground Sand Filter with underdrain | | A, I, F, G, H | 85% | 10% | 45% |
| | Tree Box Filter | TBA | | | | |
| | Bioretention System | | I, G, H | 90% | 65% | 65% |
| | Permeable Pavement that infiltrates WQV (≥75 ft from surface water) | | A, F, B, D, I | 90% | 60% | 65% |
| | Permeable Pavement that infiltrates WQV (<75 ft from surface water) | | A, F, B, D, I | 90% | 10% | 65% |
| | Permeable Pavement with underdrain | | Use TN and TP values for sand filter w/ underdrain and outlet pipe | 90% | 10% | 45% |

| Pollutant Removal Efficiencies for Best Management Practices for Use in Pollutant Loading Analysis | | | | Values Accepted for Loading Analyses | | |
|---|---|---|---|---|---|---|
| **BMP Type** | **BMP** | **Notes** | **Lit. Ref.** | **TSS** | **TN** | **TP** |
| Treatment Swales | Flow Through Treatment Swale | TBA | | | | |
| Vegetated Buffers | Vegetated Buffers | | A, B, I | 73% | 40% | 45% |
| Pre-Treatment Practices | Sediment Forebay | TBA | | | | |
| | Vegetated Filter Strip | | A, B, I | 73% | 40% | 45% |
| | Vegetated Swale | | A, B, C, F, H, I | 65% | 20% | 25% |
| | Flow-Through Device - Hydrodynamic Separator | | A, B, G, H | 35% | 10% | 5% |
| | Flow-Through Device - ADS Underground Multichamber Water Quality Unit (WQU) | | G, H | 72% | 10% | 9% |
| | Other Flow-Through Devices | TBA | | | | |
| | Off-line Deep Sump Catch Basin | | J, K, L, M | 15% | 5% | 5% |