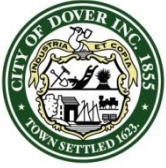


CITY OF DOVER

PLANNING TECHNICAL REVIEW COMMITTEE –AGENDA

Meeting Type: Regular Meeting
Meeting Location: Council Conference Room, City Hall, 288 Central Ave, Dover NH 03820
Meeting Date: **Thursday, July 13, 2023**
Meeting Time: **10:30 AM**

1. 10:30 AM- 11:15 AM: Site Review for Horizons Engineering Inc. (Owners: Zeland Schwartz Trustee, The Zeland Schwartz Revocable Trust), Assessor's Map A, Lot 45-A-2, zoned R-40, located at 36 Olive Meadow Lane. (Proposal is to build 32 individual units through Transfer of Development Rights.)(SITE-2023-0005).



City of Dover, New Hampshire SITE REVIEW APPLICATION

[Revision Date: July 1, 2021]

Office Use Only

Project #: _____

Date Received: _____

Amount Paid: _____

Time Received: _____

APPLICANT AND OWNER INFORMATION

Name of Applicant: GSD Communities Telephone # 603-834-2317/207-347-1504

Address of Applicant: 55 Briggs Way Durham, NH 03824

E-Mail Address: john@gsdnh.com maggie@gsdnh.com

The Zeland Schwartz

Name of Property Owner (if different from applicant): Revocable Trust Telephone # 207-347-1504

Address of Property Owner: 14 Huckins Road Madbury, NH 03832

PROPERTY INFORMATION

Address of Property: 36 Olive Meadow Lane

Assessor's Map # A45 Lot(s) # A2

Zoning District(s) R-40 Overlay District(s) Wetland & Conservation

Size of Parcel: 1,093,356 sq. ft. 25.1 ac. Property Deed: Book 4961 Page: 475

Existing Use of Property: Child daycare and vacant property

SITE PLAN INFORMATION

Describe Proposed Use: 32 individual unit affordable housing development

Area of Parcel to be Developed: _____ 4.0ac sq. ft.

If Multi-family Residential: Number of Units 32 & Buildings Proposed 34

If lodging: Number of Units _____ & number of Buildings _____

Number of Parking Spaces: Existing 51 Proposed _____

Highway Access (check where applicable): ☒ City Street _____ State Highway _____

Number of Employees Total: 8 In Maximum Shift: 8

Disposition of Parcel:

Building Setbacks:

Building Footprint 19,600 sq. ft.

Front Yard 40 ft.

Total Building Area 37,520 sq. ft.
assuming 2-story units

Rear Yard 30 ft.

Paved Area 59,940 sq. ft.

Side Yard: Right 25 ft. Left 25 ft.

City Water? ☒ Yes ☐ No How far is city water from the property? Existing water lines on property
City Sewer? ☒ Yes ☐ No How far is city sewer from the property? Existing sewer lines on property

TRANSFER OF DEVELOPMENT RIGHTS INFORMATION

Type of TRANSFER OF DEVELOPMENT RIGHT REQUEST (Check All That Apply):

☒ Residential ☐ Residential (reduced size) ☐ Industrial | ☐ Purchase ☐ Land Preservation

Relief sought (Check All That Apply):

☐ Lot Size ☐ Frontage ☐ Setback ☐ 30' Buffer ☒ Increase by 32 units

Describe Proposed Use or Activity that requires TDR; describe any impacts and document mitigation:

The total land area of the parcel does not allow this number of units. The development will provide
affordable housing for families in perpetuity. The remainder of the parcel can be put into conservation.
Need for increase in residential density. Adequately setback and screened from abutting properties.

BUILDING INFORMATION

Type of Building to be Built: 32 single family units, one 26'x36' community building, and one 24'x36' maintenance building

Height of Building: 25' max Finished Floor Elevation: varies

Number of Seats (where applicable) _____

Estimated value of construction: _____ Refuse removal: Public/Private (circle one)

WAIVER REQUESTS

Site Review Regulations section(s) to be waived: _____

Justification for waiver request(s) (*attach additional sheets as needed*):

SURVEYOR INFORMATION

Name of Surveyor and Company (Licensed in N.H.) Horizons Engineering, Inc. Andrew Nadeau

Address 5 Railroad Street Newmarket, NH 03857 Telephone #: 603-659-4979

Professional License #: LLS947 E-mail address: anadeau@horizonsengineering.com

ENGINEER INFORMATION

Name of Engineer and Company (Licensed in N.H.) Michael Sievert Horizons Engineering, Inc.

Address 5 Railroad Street Newmarket, NH 03857 Telephone #: 603-659-4979

Professional License #: P.E. 8397 E-mail address: msievert@horizonsengineering.com

ARCHITECT INFORMATION

Name of Architect and Company (Licensed in N.H.) Margaret Randolph GSD Studios

Address 22 Jady Hill Ave. Exeter, NH 03833 Telephone #: 207-347-1504

Professional License #: RA04225 E-mail address: maggie@gsdnh.com

LANDSCAPE ARCHITECT INFORMATION

Name of Landscape Architect and Company (Licensed in N.H.) N/A

Address _____ Telephone #: _____

Professional License #: _____ E-mail address: _____

SOIL SCIENTIST INFORMATION

Name of Soil Scientist and Company (Licensed in N.H.) Mark West West Environmental, Inc.

Address 48 Stevens Hill Road, Nottingham, NH 03290 Telephone #: 603-734-4298

Professional License #: 00010 E-mail address: mark@westenv.net

CONSERVATION EASEMENT HOLDER

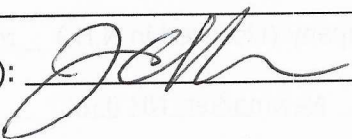
Name of Easement Holder: _____ Telephone # _____

Address Easement Holder: _____

SIGNATURES

I/We hereby submit this application to the City of Dover Planning Board and attest that to the best of my knowledge all of the information on this application form and in the accompanying application materials and documentation is true and accurate. Furthermore, I/we submit that the existing conditions sheet of the plan represents the lot in question, and that no alteration of the site shall take place during Planning Board review up to and including the pre-construction meeting. As applicant or as agent, I attest that I am duly authorized to act in this capacity.

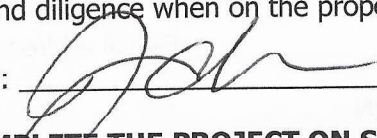
Signature of Property Owner: _____ Date: _____

Signature of Applicant (if different from owner):  Date: 21 JUN 23

Signature of Agent: _____ Date: _____

AUTHORIZATION TO ENTER SUBJECT PROPERTY

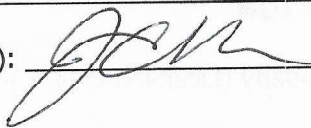
I, and my successors, hereby authorize members of the Dover Planning Board, Planning Department and other pertinent City Departments and boards to enter my property for the purpose of evaluating this application, including performing inspections during the application phase, post-approval phase, construction phase and occupancy phase. It is understood that these individuals must use all reasonable care, courtesy, and diligence when on the property.

Signature of Property Owner:  Date: 21 JUN 23

AUTHORIZATION TO COMPLETE THE PROJECT ON SUBJECT PROPERTY

I, and my successors, hereby the City of Dover or its assigns to enter my property for the purpose of completing the site work as required by the approved plan should the letter or credit or other surety be called. It is understood that these individuals must use all reasonable care, courtesy, and diligence when on the property.

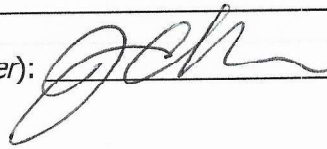
Signature of Property Owner: _____ Date: _____

Signature of Applicant (if different from owner):  Date: 21 JUN 23

CERTIFICATION OF FEES

I, and my successors, hereby certify that I understand that the City of Dover collects impact fees, utility investment fees and inspection fees for projects developed in Dover. Said fees must be paid before a Certificate of Occupancy can be obtained for a structure, unless a different payment schedule is agreed to by the applicant and the City prior to approvals being issued by the Dover Planning Board. Additionally, should the property be in "Current Use" it will be subject to the Land Use Change Tax.

Signature of Property Owner: _____ Date: _____

Signature of Applicant (if different from owner):  Date: 21 JUN 23

***CITY OF DOVER SITE REVIEW
LIST OF ABUTTERS***

Pursuant to RSA 676:4, the State Law of New Hampshire, the City of Dover is required to notify the applicant, abutters (including holders of conservation easements), and any professional whose seal is on the plan, of the public hearing by certified mail, return receipt requested. Staff will provide the abutter information, while the applicant must provide accurate contact information for the owner, applicant and professional agents representing the project.

Owner:

TAX MAP	LOT #	PROPERTY OWNER	MAILING ADDRESS

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS



City of Dover, New Hampshire SITE PLAN REVIEW SUBMISSION CHECKLIST

[Revision Date: June 4, 2019]

This site plan review checklist, as required by Chapter 153-6-B(2), should be completed by the applicant. It is intended to assist the applicant in the planning process of preparing a Site Plan Review application for Planning Board action. The size of the project will determine the types of information required for review, therefore, a **pre-application conference** with the Planning Department to determine the list of items that must be completed is strongly encouraged.

The first step would be to appear before the Technical Review Committee, to apply, eight (8) folded copies of the site plan with scale of not less than 1"=50' or 1"=100' for larger site plans, need to be provided, along with payment of plan review fees.

Two weeks prior to Planning Board, three (3) full size and twelve (12) half size (11x17), folded, copies of the plan set and materials, including response to TRC comments, will be due. Abutter/Notice Fees will be invoiced and need to be paid 28 hours prior to the Planning Board meeting.

The applicant is cautioned that this checklist is only a guide and is not intended to be a complete list of all site plan review requirements. Please refer to the Site Plan Review Regulations for full details.

APPLICANT: GSD Communities File Number: _____

PROJECT TITLE: Cottages at Olive Meadow Lane

PROPERTY LOCATION: 36 Olive Meadow Lane Tax Map: A45 Lot: A2

	Where/How Provided	Reviewed
1. Completed and signed Application form		
2. Plan Review Fees are provided		
3. Electronic copy of the engineered/surveyed plan layout		
4. Electronic copy of supplementary materials and application		
5. Traffic Impact Assessment and Analysis (Standard or Advanced)		
6. Waiver requests to the Site Plan Review Regulations, with written justification		
7. Conditional Use Permit applications		
8. A colored rendering of the streetscape that will be created along the existing public right-of-way		
9. A colored architectural plan showing all sides of buildings		
10. Folded copies of site plan w/scale of not less than 1"=50' or 1"=100' for larger site plans, for TRC. Plans shall contain the following items as appropriate:		
Location map at appropriate scale		
Proposed Project name and title and Planning File #		
Date, north arrow and scale		
Names of all abutting property owners		
Name and address of owners and/or applicants		
Signature & stamp of NH licensed land surveyor and/or engineer		
Zoning District boundaries, including any special or overlay districts		
Location of Conservation District areas		
Location, names and widths of existing and proposed streets, including pavement widths, grades, curbs and crosswalks		
Location and widths of existing & proposed easements & right of ways		
Location and width of existing and proposed access/egress ways		

	Explain How Provided	Reviewed
Depict pedestrian walkways and accessible access		
Existing and proposed property lines with dimensions and bearings tied into Dover's Geographic Information System coordinate system		
Existing and proposed topographic information at two foot intervals		
Existing and proposed buildings and structure locations		
Minimum building setbacks or build to lines on all lots		
Location and size of existing and proposed electric, telephone, gas cable and other underground utilities		
Existing and proposed water lines and fire hydrants, including materials and capacity needed		
Location and materials of sanitary sewage facilities within project site and projected additional peak hour sewer load		
Existing and proposed stormwater lines and facilities		
Lighting plan depicting all existing and proposed exterior light fixtures and a lighting level analysis for parking lots		
Location of Flood Hazard Zone		
Location of all bodies of water and watercourses		
Location of wetlands and buffers		
Neighborhood plan with aerial underlay showing how project relates to abutting uses within the plan set		
Existing natural features and/or significant vegetation on property		
Depict existing contours up to 100 ft. beyond project limits		
Landscape plan depicting existing and proposed landscaping, prepared by a licensed Professional Landscape Architect		
Location of parking layout delineating spaces and arrangement; note addressing maximum required spaces		
Location, material and size of existing and proposed pavement area		
Location of proposed fire lanes		
Specify finished floor elevations of buildings		
Location of solid waste disposal facilities (dumpster, pad and screening, etc.), including required screening		
Depict all service, storage, loading bays and utility areas		
All applicable Dover Common Site Plan notes		
11. Additional Information if appropriate		
Stormwater Management Plan depicting the existing & proposed storm drainage system and engineered drainage analysis		
Stormwater Management System Operation and Maintenance Plan		
Letter to Serve from Public and Private Utilities		
Erosion and Sedimentation Control Plan		
Landscape Operation and Maintenance Plan		
Proposed restrictive covenants or homeowners association documents		
Dates and permit numbers of all required state and federal permits		
If wetland buffer, indicate placards locations, as applicable		
Depict test boring locations, groundwater elevations and soil profiles and/or soils types call-outs		
Location of proposed drive-in facilities		
Provide additional exhibits/technical data determined appropriate by the Planning Board or its staff as required		

REVIEWED BY: _____ DATE _____ TRC DATE _____

CITY OF DOVER PLANNING DEPARTMENT
Revised November 28, 2022

APPLICANT: GSD Communities FILE NUMBER: _____

List of Common Site Plan Notes

The following list of commonly required notes is intended to be used as a guide to applicants and should not be construed as a comprehensive note requirement list for all projects. A preapplication conference with the Planning Department is suggested to help determine the actual notes that may be required.

1. The intent of this plan is to *(describe the purpose of the plan)*.
Develop the existing property into an affordable/workforce housing community.
2. Owners of Record are: The Zeland Schwartz Revocable Trust
14 Huckins Road
Madbury, NH 03832

Authorized Signature
3. The parcel(s) is *(are)* shown as Lot No. A2, Map A45 of the City of Dover Tax Assessor's Maps.
4. The subject parcel(s) contains 25.1 acres or 1,093,356 sq. ft. area of land.
5. Title reference for the project parcel(s) is the Strafford County Registry of Deeds, Book No. 4961, Page No. 475.
6. Reference Plans: *(List all reference plans and their SCRD #)*
7. All applicable right-of-way, conservation, slope, construction, power line, cross travel, or other easements shall be referenced in a note.
8. Current zoning dimensional and density requirements in effect are as follows:

Required:

Provided:

- a. Zoning district R-40 sub-district Wetland, Conservation
- b. Minimum lot size: _____ acres (sq. ft.)
- c. Minimum lot frontage: _____ ft.
- d. Minimum yard setbacks/build-to-lines:
Front _____ ft.
Side _____ ft.
Rear _____ ft.
Abut-a-street _____ ft.
- e. Maximum/minimum lot coverage _____ %
- f. Minimum/maximum bldg. height _____ ft./stories

This property falls within the following zoning overlay districts: *(List districts)*

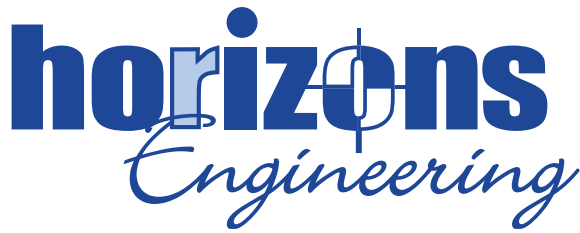
Wetland, Conservation

9. List any variances or special exceptions granted by the Zoning Board of Adjustment or Conditional Use Permits granted by the Planning Board for the proposed use or structure, including the case number and date of decision and any conditions.
10. Property line information has been obtained from a survey performed by *(surveyor)* on *(date)* with an error not greater than 1 in 10,000 *(or has been obtained from Existing Conditions Plan, prepared by (surveyor))*.
11. Subject parcel *is (is not)* located within a Federally designated flood hazard area (Community panel number 33017C0xxxD, Effective Date: September 30, 2015).
12. Wetlands were delineated by Mark West, West Environ, Certified Wetlands Scientist, Certification Number 10, in accordance with Chapter 170-27.1 of the Zoning Ordinance, on _____, 20____.
13. As-built plans of the subdivision shall be submitted on paper and in digital format AutoCAD DWG, AutoCAD DXF or ESRI format to the City of Dover Engineer's Office upon completion of project if a street is proposed for City acceptance. As-built plans shall be prepared and certified correct by a L.L.S. or P.E. Digital files shall be geo-referenced to New Hampshire State Plane Coordinates NAD83 and shall be expressed in feet.
14. The installation of electric power, cable television and telephone lines shall be underground throughout the site for which development is proposed.
15. The subject parcel(s) is (are) served by municipal water and sewer *(or is served by on-site well and septic system)*.
16. All construction shall conform with the State of New Hampshire Department of Transportation (NHDOT) "Standard Specifications for Road and Bridge Construction" and with the City of Dover Community Services Regulations and standard specification for construction. The more stringent specification shall apply.
17. All erosion control notes shall include provisions for construction sequencing, temporary erosion control measures, and permanent standards such as loam spread rate for disturbed areas, rates of lime, type and rates for fertilizer, and seed and mulch mixture with rates of application.
18. The limits of construction disturbance that are located in or within the 50 ft. of Conservation and Wetland Districts shall be staked, flagged and clearly identified prior any earth disturbing activity occurs.
19. All treatment swales to be constructed shall have sod bottoms.
20. A letter of credit for the cost of revegetating all disturbed areas on the site shall be submitted, and the approved construction sign installed prior to any earth disturbing activity occurs.
21. A pre-construction conference with the developer, the design engineer, the earthwork contractor and the City Engineer shall occur prior to any earth disturbing activity.
22. Site Construction hours shall be limited to Monday-Friday 7 AM-6 PM, Saturday and Sunday 9 AM-4 PM. Hours of construction must be documented on a site construction sign along with the contact information for the general contractor. Said signage must be located and approved by the City Engineer or Planning Director.

23. Building addresses (including apt/unit numbers if applicable) shall be assigned by the Building Official at the time of issuance of a building permit.
24. The proposed use for the site (structure) is ^{32 individual unit affordable} housing development. (More specific uses are encouraged, such as single family, duplex, multi-family, restaurant, hotel, doctor's office, etc. Should more than one use be proposed, an indication of the percentage of each use is suggested.)
25. The following federal and state permits have been issued for the subject property: (*List permit type, number and date of issuance.*) TO BE APPLIED FOR BY AUGUST 2023: NHDES AoT, Sewer Discharge
26. Commercial vehicle route during construction shall conform to Dover City Code or be coordinated with the Community Services Director.
27. Any retaining wall taller than four feet (4') requires issuance of a building permit from Inspection Services.
28. Any fence taller than seven feet (7') requires the issuance of a building permit from Inspection Services.
29. Applicant shall complete Land Use Development Tracking Form, most recently revised version, utilizing the online Pollution Tracking and Accounting Pilot Project (PTAPP) portal.
<https://www.unh.edu/unhsc/ptapp>
30. The owner of record shall record at the Registry of Deeds documentation sufficient to provide notice to all persons/entities that may acquire any property subject to the requirements and responsibilities described in the approved STORMWATER Management Plan. The notice shall comply with the applicable requirements for recording contained in RSA 477 and 478. The notice need not set forth the requirements at length, so long as it is sufficient to provide notice to prospective purchasers to the requirements for maintenance and reporting.
31. Fire department access road(s) shall be installed and maintained to support the imposed loads of fire apparatus in all weather conditions at all times.
32. The maximum parking space calculation is _____ (broken down) and _____ spaces are provided.
33. Exterior lighting shall be cut-off type fixtures per Chapter 153-14-E and shall provide lighting directed on-site only.
34. Topographic survey performed by Horizons Engineering on (*dates*).
35. Elevations are based on U.S.G.S. NVD 1988 datum. (**or** Elevations depicted are based on information obtained from the City Engineer's Office and was derived from coordinates for control stations _____ and _____. These coordinates have not been adjusted to 1983 datum).
36. A security system shall be installed as required by Chapter 45, Article I, section 45-2 of the Code of the City of Dover. (*If a business establishment or multi-family dwelling contained in a new, altered or repaired structure*)
37. Approved backflow preventers shall be provided for both fire and domestic water lines.

- 38. The (*existing or proposed*) structure shall be served by a sprinkler system as required by Chapter 81- 30 of the Code of the City of Dover and the adopted State of NH Building and Fire Codes.
- 39. Sprinkler connections must be flushed in accordance with NFPA 24 and a Contractor’s Material and Test Certificate for Underground Piping form must be completed and approved by Inspection Services prior to connection of the backflow device.
- 40. Fire department connection(s) shall be located on the street side of the building per NFPA 13. Access to the FDC shall maintain a clear and unobstructed path at all times.
- 41. The site layout is designed in compliance with applicable accessibility regulations. The proposed structure will be also be designed in accordance with applicable accessibility regulations. (i.e. IBC, ANSI-117.1) and NH RSA 155-A:5.

REMARKS:



5 Railroad Street, Newmarket, NH 03857 • Ph 603-659-4979 • Fax 603-659-4627 • www.horizonsengineering.com

Letter of Intent – Site Plan Review and TDR Application

For

GSD Communities, LLC

Workforce Housing Development

Tax Map A45 Lot A2

June 14, 2023

The Subject Property

The subject parcel is located at 36 Olive Meadow Lane within the R-40 zoning district. The 25.1-acre parcel is bordered on all sides by residential property. The access to the subject parcel is via Olive Meadow Lane and there are 7 single family residential lots which front on Olive Meadow Lane. The property is serviced by municipal water and sewer, underground utilities, and natural gas.

The parcel is currently developed with a 10,000-sf single story building currently used as a child daycare. There is an access road from the cul-de-sac to the existing building, and there are 51 parking spaces on site. The area currently developed with the daycare building is approximately 2.6 acres. This building will be retained and continue to be operated as a childcare facility. The remainder of the parcel is wooded and undeveloped. 14.1 acres is upland, and 11.0 acres is wetland. The parcel does not have steep slopes in the area proposed for development. There is a small area on the northerly corner of the parcel that meets the requirements for steep slopes, but this area is outside of the proposed development. The parcel is also subject to the Wetland Overlay District and Conservation District.

GSD Communities, LLC Affordable/Workforce Housing Cottage Development Proposal

The proposal by GSD Communities, LLC is to develop the existing property into a affordable/workforce housing development. The style of the development will be small single family detached “Cottage” in clusters. Three of the clusters will have a driveway for parking and will front on connected green space and one of the larger clusters will have a central green space with onsite remote parking. There is a main access road with some parking situated

Horizons Engineering, Inc.

MAINE • NEW HAMPSHIRE • VERMONT

along the road and a loop is provided for circulation and emergency vehicle access. Small connector roads divide the clusters and provide alternate access throughout the development.

The proposed developed area encompasses approximately 4.0 acres of the subject. Including the existing 2.6 acres currently developed, the remaining 18.5 acres will remain as open space. The units are less than 1200 sf, total with kitchen/living area, 2-4 bedrooms and 2 baths. There is a small front porch.

The development is in accordance with the City of Dover Zoning Ordinance Section 170-27.2 Transfer of Development Rights. This project specifically falls under section G(3)(a). The submission includes the calculations for a Yield plan based on section G(3)(a)I 1-4. The developable area yields 7 lots meeting the minimum requirements for development in the R-40 District and establishes the base number of units. The transfer meets the requirements of section ii.2 because of the size of the units. These units will be rental units and will meet the HUD Fair Market Rental rates for Dover, NH.

In accordance with the City of Dover Zoning Ordinance Section 170-15, it appears the required usable recreation space for this development would be 9700 SF. Incorporated into the proposed site plan are three active recreation areas that total approximately 5000 SF. These three areas will be set up for children with swings, etc. The other green space surrounding the units with walkways is intended to be space for recreation including, walking, outdoor grilling, and sitting areas. In addition to this area, there is approximately 11 acres of open space, that will be restricted from future development. Some of this area may have future walking trails.

A. Request for Technical Review Committee and Site Plan Approval

In accordance with the Dover Code chapter 149, Site Review Regulations, this revised submission package includes the Application for Conditional Use, Fees, and the following plans and supporting documentation are included:

1. Cover Sheet
2. Existing Conditions Plan
3. Overall plan
4. Site Plan
5. Grading, Drainage, & Erosion Control Plan
6. Utility Plan
7. Road Plan and Profile
8. Neighborhood Plan
9. Construction Details
10. Proposed Building Floor Plans and Elevations

Horizons Engineering, Inc.

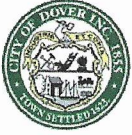
- 11. Site Perspectives
- 12. Street Perspectives
- 13. Drainage Report
- 14. Traffic Report

If you have any questions or need additional information, please do not hesitate to contact me.

Sincerely;

A handwritten signature in dark ink, reading "Michael J. Sievert". The signature is fluid and cursive, with the first name "Michael" and last name "Sievert" clearly legible.

Michael J. Sievert PE
MJS Engineering



CITY OF DOVER, NEW HAMPSHIRE PLANNING APPLICATION OWNER AUTHORIZATION

OWNER AUTHORIZATION

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

Property Owner Name:

ZELAND SCHWARTZ REVOCABLE TRUST

Signature(s) of Property Owner(s):

Date:

Signature of Applicant:
if different from owner

[Signature]

Date:

21 JUNE 2023

AUTHORIZATION TO ENTER SUBJECT PROPERTY

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

Property Owner Name:

ZELAND SCHWARTZ REVOCABLE TRUST

Signature(s) of Property Owner(s):

Date:

Signature of Applicant:
if different from owner

[Signature]

Date:

21 JUNE 2023

IF SIGN PERMIT, SIGN PERMIT APPLICATION INFORMATION

If the sign permit applicant is not the property owner, this form must be completed and included as part of application submission.

I have read this application and state that, to the best of my knowledge, the information provided is true and that the proposed sign(s) will comply with all applicable regulations in Section 170-32 of the Zoning Ordinance of the City of Dover and shall conform to the submitted materials and designs. Furthermore, after 90 days, any application still waiting information will be denied.

Address of Sign Location:

Sign Permit Application Type:
(check one)

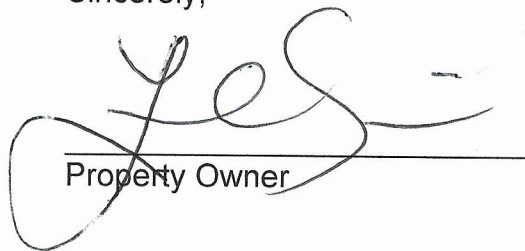
- ☐ Permanent Sign
- ☐ Temporary Sign
- ☐ Community Sign

City of Dover
Planning Board
288 Central Avenue
Dover, NH 03820

Dear Chairperson:

I hereby authorize John and Margaret Randolph and Horizons Engineering, Inc., to pursue Site Plan Approval through the City of Dover, NH Planning Department, including application for any other local, state, and federal permits/requirements as needed to obtain final site plan approval from City of Dover Planning Board on property identified as Tax Map A-45 Lot A-2 on the City of Dover Tax Maps located at 36 Olive Meadow Lane.

Sincerely,



Property Owner



Date

City of Dover
Planning Board
288 Central Avenue
Dover, NH 03820

Dear Chairperson:

I hereby authorize Michael J. Sievert and Travis Letellier of Horizons Engineering, Inc. to represent me at the Dover Planning Board and Technical Review Committee meetings for site plan review approval. The subject parcel is shown on Tax Map A-45 as Lot A-2 located at 36 Olive Meadow Lane.

Sincerely,



Applicant: John or Margaret Randolph

21 JUNE 2023
Date

PRELIMINARY

TRAFFIC IMPACT STUDY

FOR PROPOSED

36 OLIVE MEADOW LANE

DOVER, NEW HAMPSHIRE

Prepared For: John Randolph

Prepared By: William Bray, P.E., Senior Managing Engineer
Jacob Sirois, Engineer 1

June 22, 2023

Introduction

John Randolph is proposing development of a residential community, located at 36 Olive Meadow Lane in the City of Dover (refer to Image 1 for location of the proposed project). The residential development consists of 32 affordable housing, cottage-style dwelling units. In addition to the residential development, the project will develop a community center building of approximately 600-square feet for the residents use only, as well as a small office/maintenance building of 500-square feet for two maintenance people for the proposed development. The proposed development is located on the parcel to the rear (northeast) of the existing childcare facility and will be accessed by two site drives that will intersect with Olive Meadow Lane on both sides of the existing childcare facility. Olive Meadow Lane is a local roadway which intersects with the eastern side of 6th Street.

The purpose of this traffic impact study is to examine existing traffic conditions in the general vicinity of the proposed project, estimate the total number of site trips generated by the project, and make a determination as to whether the existing transportation system can safely accommodate the site generated traffic.

Image 1 Proposed Development Site



Existing Traffic Conditions

Manual turning movement traffic counts were conducted at the intersection of Olive Meadow Lane and 6th Street to establish “peak” hour travel conditions at the study intersection. The morning and evening traffic data was collected on May 18, 2023. All vehicular traffic entering the intersection was recorded in 15-minute intervals between the hours of 7:00 and 9:00 a.m. and, again, between 3:00 and 6:00 p.m. From a summary of the data, peak hour times were established for both “peak” commuter travel periods. The morning peak hour occurs between 7:30 and 8:30 a.m., and the evening peak hour falls between 4:00 and 5:00 p.m. Copies of the peak hour summary reports for the intersection of Olive Meadow Lane and 6th Street are attached in the Appendix.

Seasonal Adjustments: In order to evaluate the effects of seasonal fluctuation of traffic volumes at the study intersection, the peak hour traffic data was adjusted in accordance with New Hampshire DOT (NHDOT) guidelines.

Olive Meadow Lane is considered a local roadway. Therefore, no seasonal adjustment is required for the volumes recorded on Olive Meadow Lane.

6th Street, in the vicinity of Olive Meadow Lane, is classified as an Urban Collector (Group 4) requiring a seasonal adjustment of 1.03. The seasonal adjustment has been applied, accordingly, to the through volumes on 6th Street. Figure 1, attached in the Appendix, illustrates the 2023 Design Hour Traffic Volumes, which include the seasonal adjustment on 6th Street.

Future Traffic Growth

This traffic study has been prepared based upon a projected build-out year of 2025.

NHDOT’s historical Traffic Volume Reports show traffic volumes on the section of 6th Street, west of Indian Brook Drive, have decreased by approximately 3% during their most current annual traffic count data. To be conservative in this traffic impact study, we have applied an annual growth rate of 1/2% per year to the 2023 turning movement counts to forecast 2025 design hour traffic conditions. Figure 2, attached in the Appendix, presents the 2025 Design Hour Traffic Volumes.

Site Trip Generation

Trip generation estimates for the proposed development are based upon the latest edition (11th) of the Institute of Transportation Engineer’s (ITE) **TRIP GENERATION** manual (TGM). Daily and peak hour site trip projections were estimated using the relevant land use code from the TGM: LUC #223 – Affordable Housing-Income Units, described in the TGM as: *multi-family housing that is rented at below market rate to households that include at least one employed member. Eligibility to live in affordable housing can be a function of limited household income and resident age.*

The following Table 1.1 presents the trip generation calculations for the proposed 32 affordable housing cottage-style dwelling unit project.

Table 1.1
ITE Trip Generation Calculations

Land Use	Affordable Housing-Income Limits - LUC 223							
Time Period	Dwelling Units	Trip Generation Rate Trips/Dwelling Units	Trips Generated	Distribution Entering / Exiting			Enter	Exit
Weekday	32	4.81	154	50%	/	50%	77	77
AM Weekday Peak Hour (Street)	32	0.36	12	26%	/	74%	3	9
PM Weekday Peak Hour (Street)	32	0.46	15	59%	/	41%	9	6
AM Weekday Peak Hour (Generator)	32	0.36	12	26%	/	74%	3	9
PM Weekday Peak Hour (Generator)	32	0.50	16	58%	/	42%	9	7

The preceding trip generation summary table shows the proposed development is estimated to generate 12 trips during the AM peak hour of the (street) and 15 trips in the PM peak hour of the (street). Peak hour trip generation values forecast for the peak hour of the site (generator) are similar at 12 trips in the AM peak hour and 16 trips in the PM peak hour.

Site Trip Assignment

Peak hour site trips generated by the proposed multi-family housing development during both the morning and evening peak hours were assigned through the intersection of 6th Street and Olive Meadow Lane based upon existing directional distribution patterns collected at the intersection on May 18, 2023. Copies of the peak hour summary sheets are attached in the Appendix for reference.

Figure 3, enclosed in the Appendix, illustratively presents the AM and PM peak hour travel assignments through the study intersection of 6th Street and Olive Meadow Lane.

2025 Pre-Development Traffic

Other Development Traffic: Traffic generated by projects that have been approved by the local planning board and/or the NHDOT, yet are not opened, must be included in the estimate of pre-development traffic. The existing daycare facility located within the proposed development area maintains an approved capacity of 166 students. The daycare manager reports a total of 49 students were in attendance on May 18, 2023, the date of the on-site traffic data surveys conducted at the 6th Street/Olive Meadow Lane intersection. A secondary traffic survey conducted on the same date of May 18, 2023, measured vehicles both entering and leaving the existing daycare facility. A summary table of the traffic data collected at the entrance to the daycare is attached for reference. From a summary of the data, it was determined the morning peak hour occurred between 7:30 and 8:30 a.m. The evening peak hour falls between 4:00 and 5:00 p.m. A total of 54 trips were observed in the morning peak hour and a similar total of 51 trips were recorded in the evening peak hour. A trip rate per student was determined for both peak hours with the mathematical division of peak hour trips observed by 49 students: the number of students in attendance on May 18, 2023, the date of the traffic survey. The morning peak hour trip rate is 1.10 trips per student; the evening peak hour trip rate is slightly less at 1.04 trips per student.

The daycare manager anticipates a modest increase of 50 additional students over the next five to 10 years for a combined total of 100 students (existing 49 students and 51 new students). Accordingly, the added trips generated by the increased number of students at the daycare must be accounted for in evaluating the traffic impacts of the proposed affordable housing development on the 6th Street/Olive Meadow Lane intersection. The added 51 students will generate a total of 56 trips in the morning peak hour and 53 trips in the evening peak hour. These added vehicle peak hour trips were appropriately dispersed through the study intersection applying the same directional patterns that currently were

measured at the study intersection. Figure 4 illustratively presents the assignment of the added daycare trips at the study intersection.

2025 Pre-Development Traffic: The Other Development trips presented on Figure 4 are combined with the 2025 Design Hour Traffic forecasts, shown on Figure 2, to estimate 2025 pre-development traffic conditions for the study intersection. These 2025 pre-development traffic projections are highlighted on Figure 5 in the Appendix.

2025 Post-Development Traffic

2025 Post-Development Traffic: 2025 post-development traffic estimates were prepared for the study intersection at 6th Street and Olive Meadow Lane by combining the 2025 pre-development traffic, shown on Figure 5, with the site trip assignment highlighted on Figure 3 to create the projected 2025 Post-Development Traffic Conditions at the study intersection. Figure 6 illustratively presents the expected 2025 Post-Development Traffic conditions for the study intersection.

Left-Turn Lane Warrant Analysis

The National Cooperative Highway Research Program (NCHRP) report 457 provides a process to determine if projected traffic conditions at an intersection warrant a dedicated left-turn lane from the major street to the lower volume roadway. The NCHRP process uses four traffic inputs in determining if a dedicated left-turn lane is warranted: 1) posted speed limit; 2) advancing volume of traffic (both left-turn and through volumes); 3) opposing volume of through traffic and, 4) percent of left-turns in the advancing volume.

The NCHRP report stipulates that, where applicable, the traffic volumes used for the analysis represent “average” travel conditions. However, this traffic study applies the 2025 Post-Development Traffic Volumes, which are representative of “peak” travel conditions to provide a conservative assessment on whether prevailing travel conditions under 2025 post-development conditions warrant construction of a dedicated left-turn lane on the southbound approach of 6th Street. The traffic inputs used in the analysis are presented in the following Table 2.1:

Table 2.1 NCHRP Report 457 Analysis - Left Turn Lane Warrant				
Time Period	Advancing Volume (Va)	Opposing Volume (Vo)	Percent Left-Turns	Warrant Met (Yes/No)
Weekday AM Peak Hour	335	141	11%	No
Weekday PM Peak Hour	134	339	15%	No

As shown in the preceding table 2.1, a dedicated left-turn lane is not warranted on the southbound approach of 6th Street. A copy of Figure 2-5, a computer summary report through the NCHRP 457 process, is attached for reference.

Capacity Analysis

Capacity analyses of both 2025 Pre- and Post-development traffic conditions were performed for the study intersection at 6th Street and Olive Meadow Lane utilizing the Synchro and SimTraffic computer traffic models.

Levels of Service rankings are similar to the academic grading system, where an “A” is very good with little delay and “F” represents very poor conditions.

The following tables presents the relationship between delay and Level of Service for an unsignalized intersection:

Level of Service Criteria for Unsignalized Intersections

<u>Level of Service</u>	<u>Total Control Delay (sec/veh)</u>
A	Up to 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	Greater than 50.0

Table 3.1 summarizes the results of the capacity analysis performed for the study intersection at 6th Street and Olive Meadow Lane. The table compares the results determined for both peak hour time periods based upon 2025 pre- and post-development travel conditions.

Table 3.1
Level of Service Summary
2025 Pre- and Post-Development Conditions

<u>Intersection/Approach</u>	2025 Pre-Development				2025 Post-Development			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	<u>Delay</u> <u>(sec.)</u>	<u>LOS</u>	<u>Delay</u> <u>(sec.)</u>	<u>LOS</u>	<u>Delay</u> <u>(sec.)</u>	<u>LOS</u>	<u>Delay</u> <u>(sec.)</u>	<u>LOS</u>
6 th Street @ Olive Meadow Lane								
- 6 th Street NB – Through	1 sec.	A	1 sec.	A	1 sec.	A	1 sec.	A
- 6 th Street NB - Right	1 sec.	A	1 sec.	A	1 sec.	A	1 sec.	A
- 6 th Street SB – Left-Turn	3 secs.	A	3 secs.	A	3 secs.	A	3 secs.	A
- 6 th Street SB - Through	1 sec.	A	1 sec.	A	1 sec.	A	1 sec.	A
- Olive Meadow Lane – Left-turn	7 secs.	A	7 secs.	A	7 secs.	A	7 secs.	A
- Olive Meadow Lane – Right-Turn	4 secs.	A	4 secs.	A	4 secs.	A	4 secs.	A
- Overall Intersection	1 sec.	A	1 sec.	A	1 sec.	A	1 sec.	A

As shown in the preceding table, the intersection capacity analysis of both 2025 pre- and post-development traffic conditions demonstrates that the proposed affordable housing development has minimal impact on traffic operations at the study intersection of 6th Street and Olive Meadow Lane. Overall, the intersection is projected to operate at a Level of Service A or the very “best” level of service under both the 2025 Pre and Post-Development Traffic Loadings.

Vehicle Sight Distance

Barton and Loguidice measured intersection sight distance from the Olive Meadow Lane approach at 6th Street based upon the current posted speed limit of 30mph. We consulted the latest edition of the AASHTO Greenbook (A policy on Geometric Design of Highways and Streets), and the Institute of Transportation Engineers handbook for intersection sight distance. Specifically, we referenced a stop-controlled condition on the Olive Meadow Lane approach with free-flowing traffic on both approaches of 6th Street. Following NHDOT guidelines, we utilized both an eye height and object height of 3'-9 inches for passenger cars and measured from a point 10-feet away from the edge of travel way.

Sight distance, based upon a 30mph posted speed on 6th Street, the AASHTO requirements for passenger vehicles are based upon a gap of 6.5 seconds for right-turns and 7.5 seconds for left-turns. This corresponds to a required sight distance of 286 feet for right-turn and 331 feet for left-turn movements from the Olive Meadow Lane approach.

Our field measurements, in accordance with AASHTO standards, looking both left and right from Olive Meadow Lane directionally onto 6th Street indicate existing sight distances are in excess of the requirements based upon a posted speed of 30mph. Looking left from Olive Meadow Lane we measured a sight distance in excess of 400-feet and a similar measurement of 400-feet was recorded to the right.

Summary

1. The proposed 32-unit affordable housing project located on the dead-end section of Olive Meadow Lane is projected to generate approximately 12 trips in the morning peak hour and an additional 15 trips during the PM peak hour.
2. Manual vehicle traffic data was gathered at the 6th Street/Olive Meadow Lane intersection during the morning and evening commuter hours to establish existing peak traffic volumes at the study intersection. Summaries of the traffic data for both time periods show the peak volumes of traffic circulating to/from 6th Street from Olive Meadow Lane. In the morning peak hour, a total of 63 vehicles, about one vehicle per minute, either entered or exited the Olive Meadow Lane approach. Twenty-nine (29) of the vehicles entered and 34 exited. Trends observed in the evening peak hour were similar, with a total of 65 vehicles; again, roughly one vehicle trip every minute during the busiest time period of a typical weekday. Thirty-three of the vehicle trips entered Olive Meadow Lane and 32 trips were observed leaving Olive Meadow Lane.
3. The existing Daycare facility located within the general area of the proposed affordable housing development based upon recorded traffic data collected on May 18, 2023, with a total of 49 students in attendance, generates about 50 of the total observed trips entering/exiting Olive Meadow Lane to/from 6th Street.
4. The existing daycare facility maintains City of Dover approval for a total capacity of 166 students. The operators of the daycare are estimating that an additional 50 students, potentially, could be added at the facility over the next five to 10 years. This traffic report provides an analytical process whereby trip generation for the added 50-students is estimated. Traffic data collected at the driveway entrance estimates an additional peak hour trip is generated for each additional daycare student. To present a very conservative approach, all the added daycare trips are assumed to be students from outside of Olive Meadow Lane. When, in fact, it is highly likely that several students residing within the proposed affordable housing development will attend the existing daycare. A mathematical process is not available to precisely estimate the number of students that attend the daycare from the proposed development. The projected increase in vehicle trips generated by the added 50 students during both peak hours were assigned through the study intersection, based upon existing directional patterns. Figure 4 in the Appendix illustratively presents the added trips that can be expected from the increased number of students attending the daycare facility.
5. A capacity analysis was performed for the unsignalized study intersection at 6th Street and Olive Meadow Lane based upon 2025 Pre and Post-Development travel conditions. The analysis shows that the proposed 32-unit affordable housing development has no measurable impact on traffic operations on at the study intersection. Overall, the study intersection operates at level of Service A under both pre- and post-development travel conditions.
6. A left-turn lane warrant analysis was performed for the southbound approach of 6th Street at Olive Meadow Lane to determine if predicted peak hour traffic conditions meet the warrants for construction of a dedicated left-turn on the southbound approach of 6th Street for motorists turning left onto Olive Meadow Lane. The analyses were conducted using the National Cooperative Highway Research program (NCHRP) 457 Report process. The results of the analyses conclude a dedicated left-turn lane is not required.

7. Vehicle sight distance was measured for both directions of travel from the Olive Meadow Lane approach at the 6th Street intersection. Field measurements confirm that both sightlines from the side-street approach meet and exceed the minimum sight distance standard for a posted speed limit of 30mph, the current posted speed limit on 6th Street. The AASHTO Manual (A Policy on Geometric Design of Highways and Streets) recommends 331 feet for a left-turn movement and 287 feet for a right-turn movement. Sight distance measurements in excess of 400-feet were recorded for both directions of travel from Olive Meadow Lane. Acceptable sight distance is met on both approaches of Olive Meadow Lane.

William J. Bray, P.E. Date: 08/09/2022

APPENDIX

Traffic Solutions

17 Mount View Dr
Gorham, ME 04038

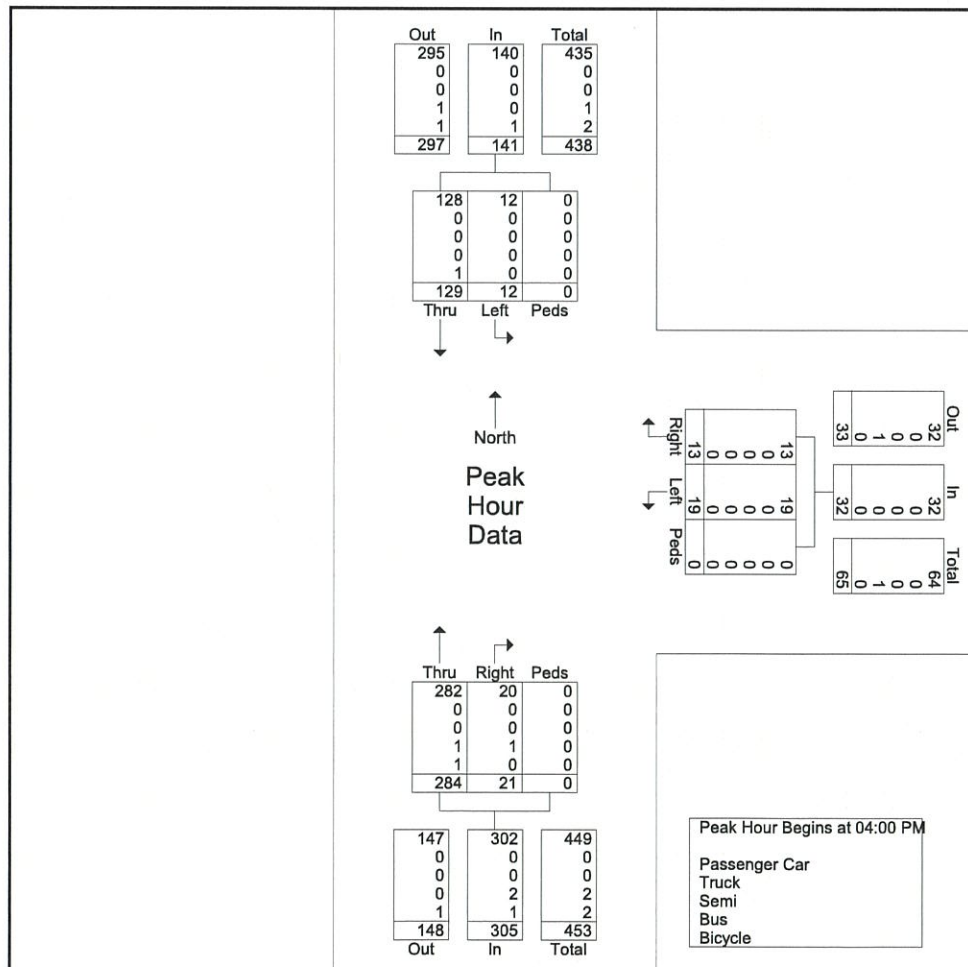
File Name : Dover Six St & Olive Meadow Lane 05-18-2023 PM

Site Code : 00000000

Start Date : 5/18/2023

Page No : 4

	From North				From East				From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 04:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	36	3	0	39	3	3	0	6	5	75	0	80	125
04:15 PM	32	3	0	35	2	3	0	5	5	69	0	74	114
04:30 PM	22	0	0	22	3	6	0	9	5	64	0	69	100
04:45 PM	39	6	0	45	5	7	0	12	6	76	0	82	139
Total Volume	129	12	0	141	13	19	0	32	21	284	0	305	478
% App. Total	91.5	8.5	0		40.6	59.4	0		6.9	93.1	0		
PHF	.827	.500	.000	.783	.650	.679	.000	.667	.875	.934	.000	.930	.860
Passenger Car	128	12	0	140	13	19	0	32	20	282	0	302	474
% Passenger Car	99.2	100	0	99.3	100	100	0	100	95.2	99.3	0	99.0	99.2
Truck	0	0	0	0	0	0	0	0	0	0	0	0	0
% Truck	0	0	0	0	0	0	0	0	0	0	0	0	0
Semi	0	0	0	0	0	0	0	0	0	0	0	0	0
% Semi	0	0	0	0	0	0	0	0	0	0	0	0	0
Bus	0	0	0	0	0	0	0	0	1	1	0	2	2
% Bus	0	0	0	0	0	0	0	0	4.8	0.4	0	0.7	0.4
Bicycle	1	0	0	1	0	0	0	0	0	1	0	1	2
% Bicycle	0.8	0	0	0.7	0	0	0	0	0	0.4	0	0.3	0.4



Traffic Solutions

17 Mount View Dr
Gorham, ME 04038

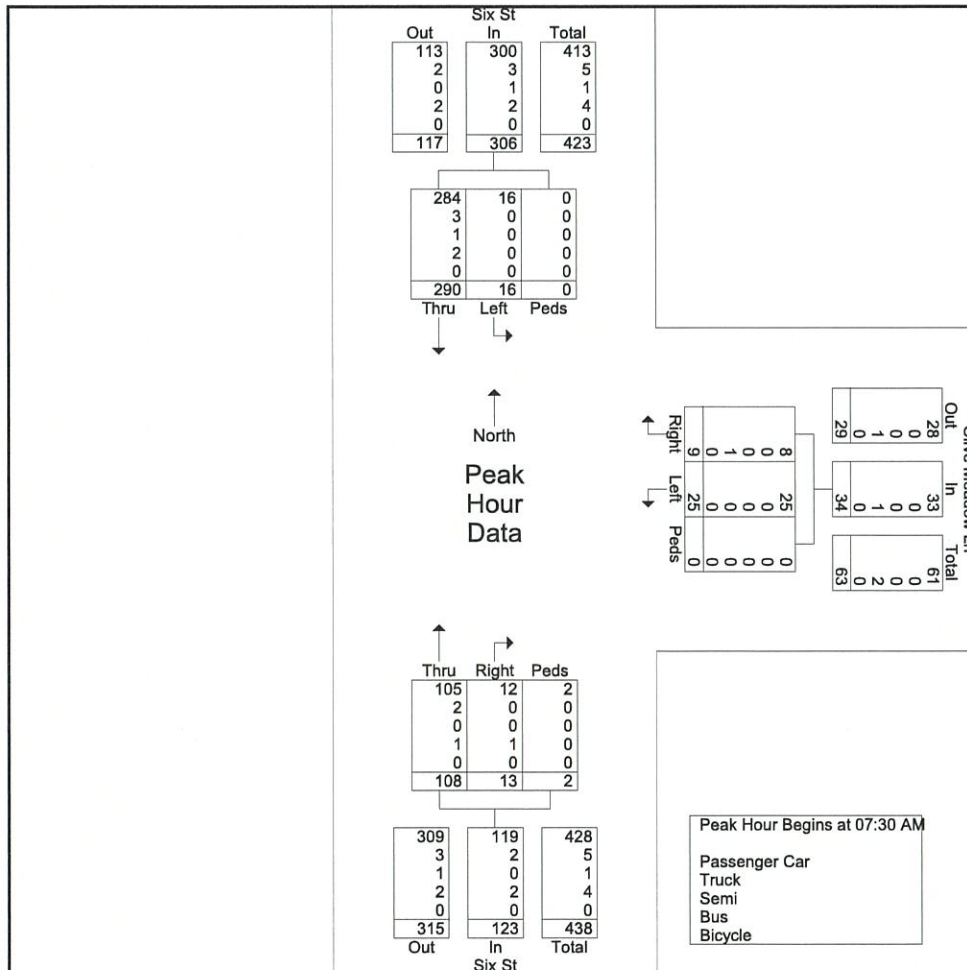
File Name : Dover Six St & Olive Meadow Lane 05-18-2023 AM

Site Code : 05182301

Start Date : 5/18/2023

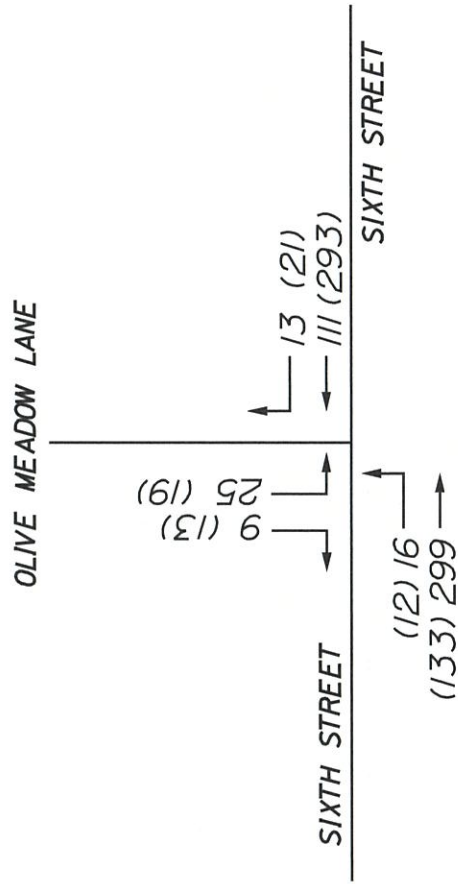
Page No : 4

	Six St From North				Olive Meadow Ln From East				Six St From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	73	5	0	78	4	11	0	15	5	24	2	31	124
07:45 AM	82	7	0	89	4	6	0	10	4	15	0	19	118
08:00 AM	77	3	0	80	0	4	0	4	4	35	0	39	123
08:15 AM	58	1	0	59	1	4	0	5	0	34	0	34	98
Total Volume	290	16	0	306	9	25	0	34	13	108	2	123	463
% App. Total	94.8	5.2	0		26.5	73.5	0		10.6	87.8	1.6		
PHF	.884	.571	.000	.860	.563	.568	.000	.567	.650	.771	.250	.788	.933
Passenger Car	284	16	0	300	8	25	0	33	12	105	2	119	452
% Passenger Car	97.9	100	0	98.0	88.9	100	0	97.1	92.3	97.2	100	96.7	97.6
Truck	3	0	0	3	0	0	0	0	0	2	0	2	5
% Truck	1.0	0	0	1.0	0	0	0	0	0	1.9	0	1.6	1.1
Semi	1	0	0	1	0	0	0	0	0	0	0	0	1
% Semi	0.3	0	0	0.3	0	0	0	0	0	0	0	0	0.2
Bus	2	0	0	2	1	0	0	1	1	1	0	2	5
% Bus	0.7	0	0	0.7	11.1	0	0	2.9	7.7	0.9	0	1.6	1.1
Bicycle	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycle	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Count Data Olive Meadow Lane
Intersection of Olive Meadow Lane & Honey Tree Learning Center

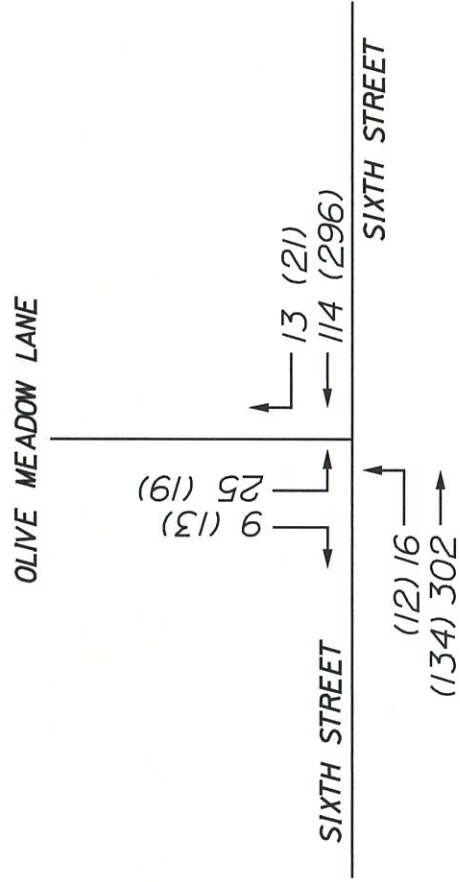
Time		Enter			Exit			
AM		Passenger Car	Bus	Pedestrian	Passenger Car	Bus	Pedestrian	
7:00-7:15		2			0			
7:15-7:30		10			1			
7:30-7:45		9			13			Morning Peak Hour 7:30 to 8:30 AM
7:45-8:00		9			6			
8:00-8:15		7			6			
8:15-8:30		2			2			
8:30-8:45		5			4			
8:45-9:00		2			2			
Total (AM)		46			34			
PM								
3:00-3:15		2			3			
3:15-3:30		1			1			
3:30-3:45		1			1			
3:45-4:00		8			7			
4:00-4:15		5	1		4			Evening Peak Hour 4:00 to 5:00 PM
4:15-4:30		4			5	1		
4:30-4:45		5			8			
4:45-5:00		9			9			
5:00-5:15		7			13			
5:15-5:30		0			1			
5:30-5:45				2			2	
5:45-6:00		0			0			
Total (PM)		42	1	2	52	1	2	



2023 DESIGN HOUR TRAFFIC

FIGURE 1

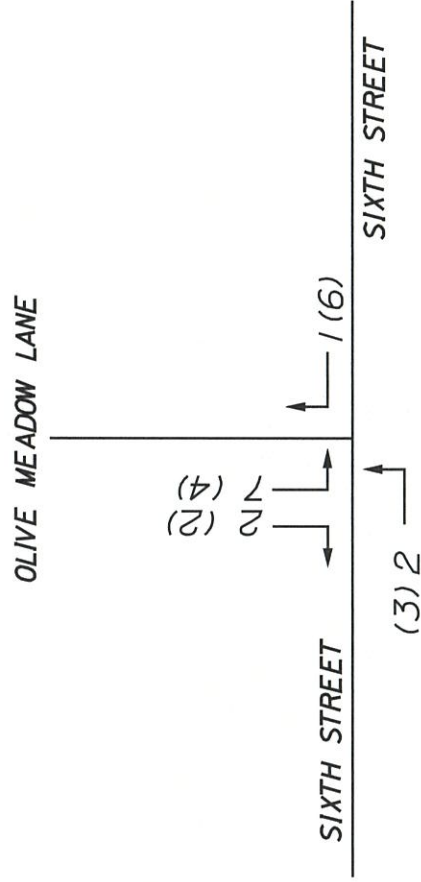
LEGEND:
XX = AM PEAK HOUR
(XX) = PM PEAK HOUR



2025 DESIGN HOUR TRAFFIC

FIGURE 2

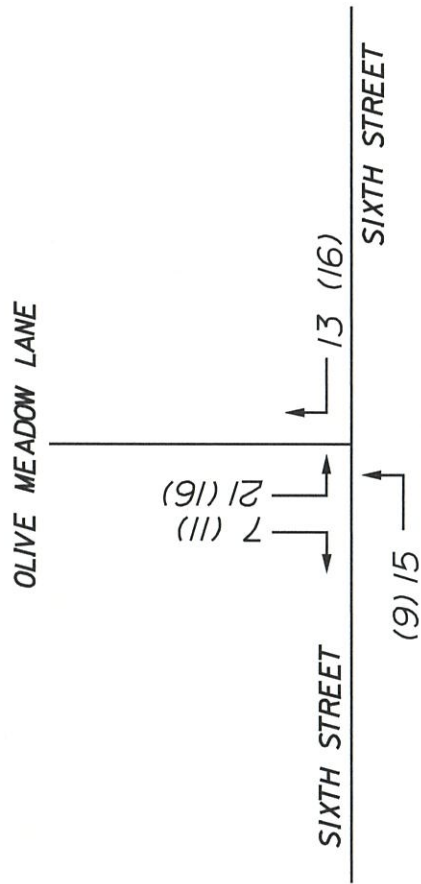
LEGEND:
XX = AM PEAK HOUR
(XX) = PM PEAK HOUR



SITE TRIP ASSIGNMENT

FIGURE 3

LEGEND:
XX = AM PEAK HOUR
(XX) = PM PEAK HOUR



OTHER DEVELOPMENT TRAFFIC

FIGURE 4

LEGEND:
XX = AM PEAK HOUR
(XX) = PM PEAK HOUR

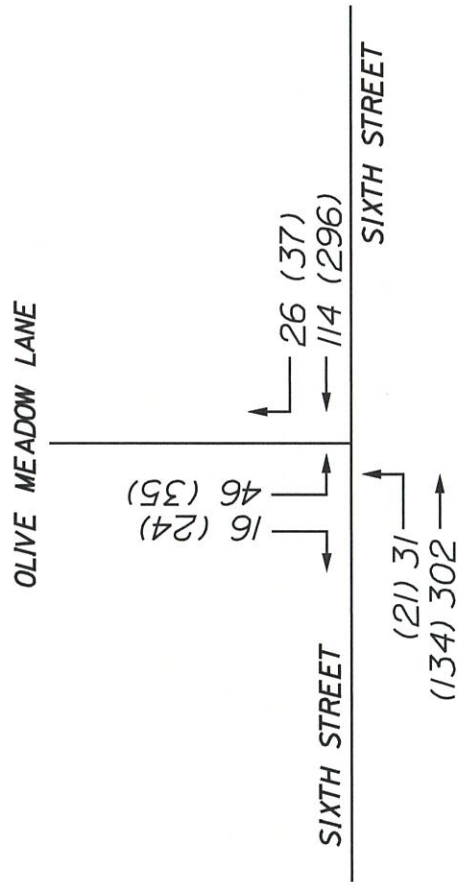
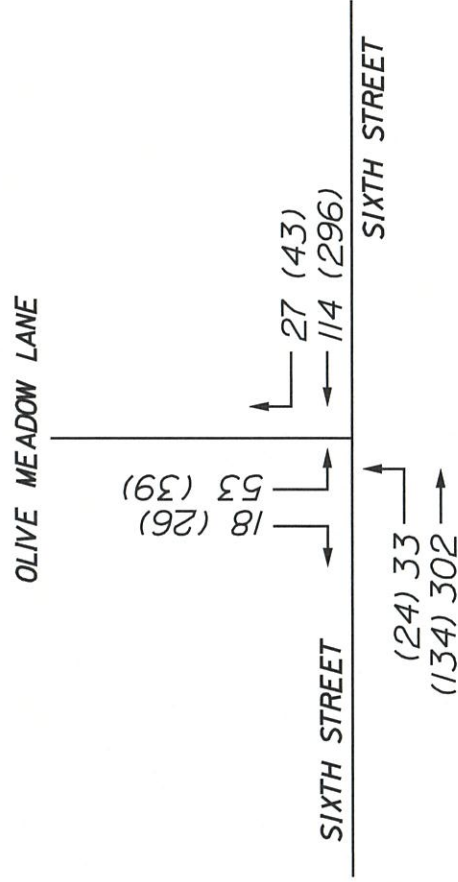


FIGURE 5



2025 POST-DEVELOPMENT TRAFFIC

FIGURE 6

LEGEND:
XX = AM PEAK HOUR
(XX) = PM PEAK HOUR

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

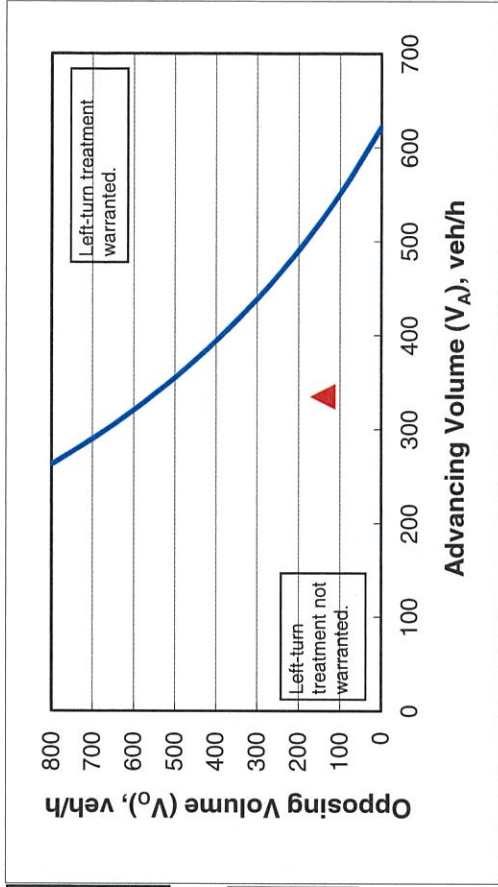
2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	30
Percent of left-turns in advancing volume (V_A), %:	11%
Advancing volume (V_A), veh/h:	335
Opposing volume (V_O), veh/h:	141

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	525
Guidance for determining the need for a major-road left-turn bay: Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

AM Peak Hour Summary

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

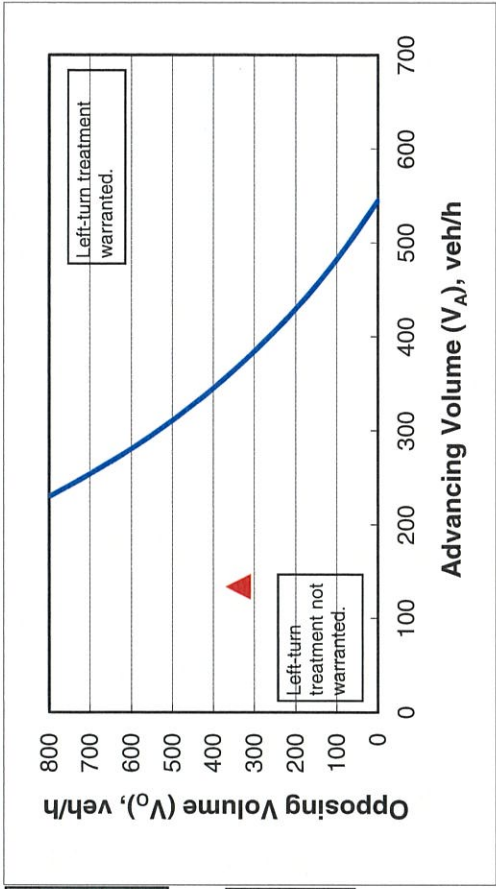
2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	30
Percent of left-turns in advancing volume (V_A), %:	15%
Advancing volume (V_A), veh/h:	134
Opposing volume (V_O), veh/h:	339

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	369
Guidance for determining the need for a major-road left-turn bay: Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

PM Peak Hour Summary

Summary of All Intervals

Run Number	1	3	4	6	7	Avg
Start Time	6:55	6:55	6:55	6:55	6:55	6:55
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	65	65	65	65	65	65
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	495	559	524	490	557	525
Vehs Exited	498	564	527	485	562	527
Starting Vehs	7	10	11	4	12	7
Ending Vehs	4	5	8	9	7	6
Travel Distance (mi)	169	191	179	166	190	179
Travel Time (hr)	6.2	6.9	6.6	6.0	6.9	6.5
Total Delay (hr)	0.3	0.3	0.4	0.3	0.3	0.3
Total Stops	71	75	64	54	73	67
Fuel Used (gal)	5.3	5.9	5.5	5.1	5.8	5.5

Interval #0 Information Seeding

Start Time	6:55
End Time	7:00
Total Time (min)	5
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	3	4	6	7	Avg
Vehs Entered	495	559	524	490	557	525
Vehs Exited	498	564	527	485	562	527
Starting Vehs	7	10	11	4	12	7
Ending Vehs	4	5	8	9	7	6
Travel Distance (mi)	169	191	179	166	190	179
Travel Time (hr)	6.2	6.9	6.6	6.0	6.9	6.5
Total Delay (hr)	0.3	0.3	0.4	0.3	0.3	0.3
Total Stops	71	75	64	54	73	67
Fuel Used (gal)	5.3	5.9	5.5	5.1	5.8	5.5

3: 6th Street & Olive Meadow Lane Performance by movement

Movement	SEL	SET	NWT	NWR	SWL	SWR	All
Denied Del/Veh (s)	0.2	0.3	0.2	0.2	0.1	0.1	0.2
Total Del/Veh (s)	2.6	0.7	0.5	0.3	7.1	3.7	1.4

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	1.9

Intersection: 3: 6th Street & Olive Meadow Lane

Movement	SE	SW
Directions Served	LT	LR
Maximum Queue (ft)	44	69
Average Queue (ft)	5	30
95th Queue (ft)	26	58
Link Distance (ft)	859	719
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	3	4	6	7	Avg
Start Time	6:55	6:55	6:55	6:55	6:55	6:55
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	65	65	65	65	65	65
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	501	570	533	504	568	535
Vehs Exited	504	575	537	499	572	537
Starting Vehs	7	10	11	4	11	7
Ending Vehs	4	5	7	9	7	6
Travel Distance (mi)	171	194	182	171	194	182
Travel Time (hr)	6.3	7.1	6.7	6.2	7.1	6.7
Total Delay (hr)	0.3	0.3	0.4	0.3	0.4	0.3
Total Stops	76	86	69	64	78	75
Fuel Used (gal)	5.4	6.1	5.6	5.3	6.0	5.7

Interval #0 Information Seeding

Start Time	6:55
End Time	7:00
Total Time (min)	5
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	3	4	6	7	Avg
Vehs Entered	501	570	533	504	568	535
Vehs Exited	504	575	537	499	572	537
Starting Vehs	7	10	11	4	11	7
Ending Vehs	4	5	7	9	7	6
Travel Distance (mi)	171	194	182	171	194	182
Travel Time (hr)	6.3	7.1	6.7	6.2	7.1	6.7
Total Delay (hr)	0.3	0.3	0.4	0.3	0.4	0.3
Total Stops	76	86	69	64	78	75
Fuel Used (gal)	5.4	6.1	5.6	5.3	6.0	5.7

3: 6th Street & Olive Meadow Lane Performance by movement

Movement	SEL	SET	NWT	NWR	SWL	SWR	All
Denied Del/Veh (s)	0.2	0.3	0.2	0.2	0.1	0.1	0.2
Total Del/Veh (s)	2.6	0.7	0.6	0.4	7.0	3.6	1.4

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	2.0

Intersection: 3: 6th Street & Olive Meadow Lane

Movement	SE	SW
Directions Served	LT	LR
Maximum Queue (ft)	44	69
Average Queue (ft)	5	31
95th Queue (ft)	26	57
Link Distance (ft)	859	719
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	3	4	6	7	Avg
Start Time	3:55	3:55	3:55	3:55	3:55	3:55
End Time	5:00	5:00	5:00	5:00	5:00	5:00
Total Time (min)	65	65	65	65	65	65
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	530	552	532	566	571	550
Vehs Exited	532	558	536	560	570	551
Starting Vehs	10	10	11	3	9	8
Ending Vehs	8	4	7	9	10	6
Travel Distance (mi)	181	188	182	192	194	187
Travel Time (hr)	6.6	6.9	6.7	7.0	7.0	6.8
Total Delay (hr)	0.3	0.3	0.3	0.3	0.3	0.3
Total Stops	70	73	69	50	68	66
Fuel Used (gal)	5.6	5.8	5.6	6.0	6.0	5.8

Interval #0 Information Seeding

Start Time	3:55
End Time	4:00
Total Time (min)	5
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	4:00
End Time	5:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	3	4	6	7	Avg
Vehs Entered	530	552	532	566	571	550
Vehs Exited	532	558	536	560	570	551
Starting Vehs	10	10	11	3	9	8
Ending Vehs	8	4	7	9	10	6
Travel Distance (mi)	181	188	182	192	194	187
Travel Time (hr)	6.6	6.9	6.7	7.0	7.0	6.8
Total Delay (hr)	0.3	0.3	0.3	0.3	0.3	0.3
Total Stops	70	73	69	50	68	66
Fuel Used (gal)	5.6	5.8	5.6	6.0	6.0	5.8

3: 6th Street & Olive Meadow Lane Performance by movement

Movement	SEL	SET	NWT	NWR	SWL	SWR	All
Denied Del/Veh (s)	0.2	0.2	0.3	0.3	0.1	0.1	0.2
Total Del/Veh (s)	3.1	0.3	0.9	0.6	7.1	4.1	1.4

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	1.9

Intersection: 3: 6th Street & Olive Meadow Lane

Movement	SE	SW
Directions Served	LT	LR
Maximum Queue (ft)	40	66
Average Queue (ft)	6	29
95th Queue (ft)	28	56
Link Distance (ft)	859	719
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	4	5	6	7	Avg
Start Time	3:55	3:55	3:55	3:55	3:55	3:55
End Time	5:00	5:00	5:00	5:00	5:00	5:00
Total Time (min)	65	65	65	65	65	65
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	549	546	490	585	591	552
Vehs Exited	552	549	489	578	592	552
Starting Vehs	11	11	3	3	9	7
Ending Vehs	8	8	4	10	8	7
Travel Distance (mi)	187	186	166	198	201	188
Travel Time (hr)	6.9	6.8	6.1	7.3	7.3	6.9
Total Delay (hr)	0.4	0.4	0.3	0.4	0.3	0.3
Total Stops	76	71	61	56	76	68
Fuel Used (gal)	5.9	5.8	5.1	6.2	6.2	5.8

Interval #0 Information Seeding

Start Time	3:55
End Time	4:00
Total Time (min)	5
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	4:00
End Time	5:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	4	5	6	7	Avg
Vehs Entered	549	546	490	585	591	552
Vehs Exited	552	549	489	578	592	552
Starting Vehs	11	11	3	3	9	7
Ending Vehs	8	8	4	10	8	7
Travel Distance (mi)	187	186	166	198	201	188
Travel Time (hr)	6.9	6.8	6.1	7.3	7.3	6.9
Total Delay (hr)	0.4	0.4	0.3	0.4	0.3	0.3
Total Stops	76	71	61	56	76	68
Fuel Used (gal)	5.9	5.8	5.1	6.2	6.2	5.8

3: 6th Street & Olive Meadow Lane Performance by movement

Movement	SEL	SET	NWT	NWR	SWL	SWR	All
Denied Del/Veh (s)	0.2	0.2	0.3	0.3	0.1	0.1	0.2
Total Del/Veh (s)	3.1	0.4	0.9	0.6	7.2	4.1	1.4

Total Network Performance

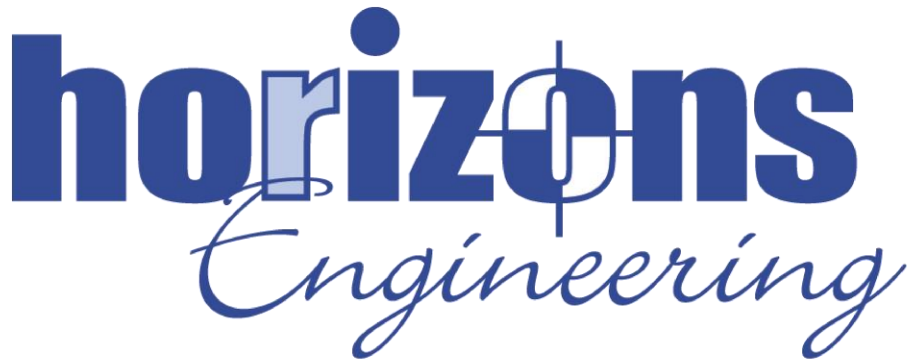
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	1.9

Intersection: 3: 6th Street & Olive Meadow Lane

Movement	SE	NW	SW
Directions Served	LT	TR	LR
Maximum Queue (ft)	49	10	69
Average Queue (ft)	7	0	30
95th Queue (ft)	32	7	56
Link Distance (ft)	859	918	719
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

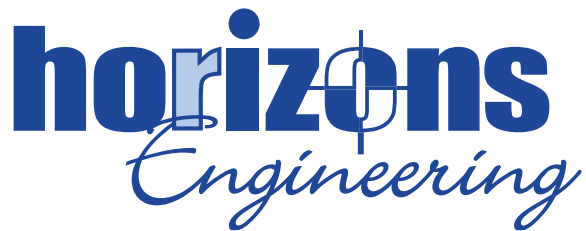


DRAINAGE REPORT

Prepared for:

**John Randolph
Tax Map A45, Lot A2**

APPENDIX E



5 Railroad Street, Newmarket, NH 03857 • Ph 603-659-4979 • Fax 603-659-4627 • www.horizonsengineering.com

Table of Contents

1. Project Background / Purpose	1
2. Methodology	1
3. Soils	1
4. Pre-Development Conditions	1
5. Post-Development Conditions	1
6. Erosion & Sediment Control	2
7. Conclusion	2

Appendix Letter	Description
A	Drainage Plans
B	Pre-Development Drainage Analysis
C	Post-Development Drainage Analysis
D	Soils Report

Horizons Engineering, Inc.

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1. Project Background / Purpose

The proposal by John Randolph is to develop the existing property into an affordable/workforce housing development. The style of the development will be small single family detached “Cottages” in clusters. Each cluster will have a central green space for community use. There is a main access road with parking situated along the road and in front of some units. The developed area encompasses approximately 4 acres of the subject parcel with the remaining land containing the existing daycare center, parking, and open space. The units are 560 sf, with kitchen/living, 2, 3 of 4 bedrooms, and a bath. There is a small front porch and an attached storage shed.

2. Methodology

The watershed areas have been determined via inspection by our office and a topographical survey of the site. This analysis utilizes HydroCAD modeling software which models the runoff based on the SCS TR-20 method and the time of concentration based on the SCS TR-55 method. This analysis compares the runoff rates for the 2, 10, and 25-year USDA/SCS Type III 24-hour extreme storm events.

3. Soils

The soils on site consist mostly of very rocky fine sandy loam and silt loam with Hydrologic Soil Groups determined to be A, B, and D. The soils in this analysis have been identified in accordance with the NRCS Web Soil Survey.

Soil Types

Label	Description	HSG:
Be	Biddeford silty clay loam	D
EaB	Elmwood fine sandy loam, 3-8%	B
GsC	Gloucester very stony find sandy loam, 8-15%	A
HaB	Hinkley loamy sand, 3-8%	A
HfB	Hollis-Gloucester fine sandy loams, 3-8%	D
ScA	Scantic silt loam, 0-3%	D
SwA	Swanton fine sandy loam, 0-3%	D
WdC	Windsor loamy sand, 8-15%	A
WfB	Windsor loamy fine sand, clay subsoil variant, 0-8%	A

4. Pre-Development Conditions

The subject parcel drains from the west by Back River Road down to Bellamy River in the east. The south west portion of the property had a more gradual slope (10-15%). The existing building is located near the road with the steeper sloped areas covered by trees.

The first point of analysis is the adjacent stream, a large portion of the forested area in the northeast drains directly into the stream. The remainder of the water drains to the property located to the southeast of the property.

5. Post-Development Conditions

The project proposes the construction of 32 single-family, 2, 3, and 4-bedroom cottages. The cottages are in four clusters of 6-10 units. Each cluster of homes will be built around a small green space. The clusters will be accessed by a loop road with walkways interior. Parking is located around the loop road and in front of some of the units.

The natural drainage is maintained where possible. The overall site will drain to the exterior of the development along the loop road which will collect stormwater in a closed curb and drain system.

The closed drainage system will outlet into a new underground detention and infiltration system that will be constructed under the proposed loop road at the lowest point.

Comparison of Pre- and Post-Development Conditions

The following tables quantify the peak rate of discharge and discharge rate leaving the parcel at the two points of interest (POI) as shown on the Pre- and Post-Development Drainage Plan. The analysis has been modeled using extreme rainfall quantities.

Table 1: Peak Rate of Runoff at POI#1 Summary Table

Storm	Pre-Development (cfs)	Post-Development (cfs)	Difference
2-Year	2.3	2.5	0.2
10-Year	6.7	6.1	0.6
25-Year	10.9	11.4	0.5

Table 2: Peak Rate of Runoff at POI#2 Summary Table

Storm	Pre-Development (cfs)	Post-Development (cfs)	Difference
2-Year	3.4	3.1	-0.3
10-Year	6.7	6.0	-0.7
25-Year	9.4	8.3	-1.1

As shown in Tables 1 and 2, the overall peak runoff from the property is decreased for the 2-, 10- and 25-year storms in the post-development drainage in aggregate. Both points of interest combine in the adjacent stream shortly after leaving the property therefore an analysis of the points in aggregate is appropriate in this case.

6. Erosion & Sediment Control

Temporary and permanent practices are used to prevent and minimize erosion and sedimentation on site. The installation of Silt Soxx™ at the perimeter of construction areas will provide sediment retention during the construction phase of the development. Erosion control matting is proposed on all spillways, steep slopes and swales to prevent erosion prior to the establishment of permanent vegetation. In addition, stone check dams will be used to help control erosion in the treatment swale.

7. Conclusion

The enclosed comparative hydrologic model provides sufficient evidence that the stormwater design will mitigate the typical increase in peak rate of stormwater discharge resulting from the proposed development of the site. Stormwater treatment practices will provide treatment of runoff from proposed paved surfaces. The use of erosion and sediment controls and proper construction practices will minimize the impact of this project to downstream surface waters.

6. Erosion & Sediment Control

Temporary and permanent practices are used to prevent and minimize erosion and sedimentation on site. The installation of Silt Soxx™ at the perimeter of construction areas will provide sediment retention during the construction phase of the development. Erosion control matting is proposed on all spillways, steep slopes and swales to prevent erosion prior to the establishment of permanent vegetation. In addition, stone check dams will be used to help control erosion in the treatment swale.

7. Conclusion

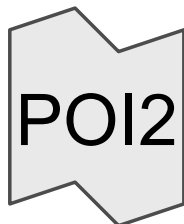
The enclosed comparative hydrologic model provides sufficient evidence that the stormwater design will mitigate the typical increase in peak rate of stormwater discharge resulting from the proposed development of the site. Stormwater treatment practices will provide treatment of runoff from proposed paved surfaces. The use of erosion and sediment controls and proper construction practices will minimize the impact of this project to downstream surface waters.

APPENDIX A

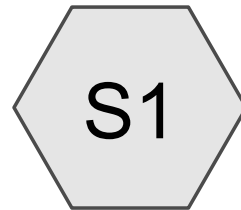
APPENDIX B



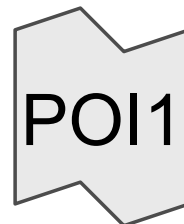
Existing S2



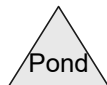
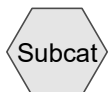
Point Of Interest #2



Existing S1



Point Of Interest #1



Routing Diagram for 230277_PRE

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HydroCAD® 10.20-2g s/n 01179 © 2022 HydroCAD Software Solutions LLC

Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 6516 NH Merrimack East

Rainfall events imported from "NRCS-Rain.txt" for 6520 NH Strafford

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	NRCC 24-hr	D	Default	24.00	1	3.05	2
2	10-Year	NRCC 24-hr	D	Default	24.00	1	4.57	2
3	25-Year	NRCC 24-hr	D	Default	24.00	1	5.77	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.410	39	>75% Grass cover, Good, HSG A (S1)
1.687	80	>75% Grass cover, Good, HSG D (S1, S2)
0.749	98	Paved roads w/curbs & sewers, HSG D (S1, S2)
0.239	98	Roofs, HSG D (S1, S2)
2.568	30	Woods, Good, HSG A (S1)
9.715	77	Woods, Good, HSG D (S1, S2)
15.368	70	TOTAL AREA

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
2.979	HSG A	S1
0.000	HSG B	
0.000	HSG C	
12.390	HSG D	S1, S2
0.000	Other	
15.368		TOTAL AREA

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.410	0.000	0.000	1.687	0.000	2.097	>75% Grass cover, Good	S1, S2
0.000	0.000	0.000	0.749	0.000	0.749	Paved roads w/curbs & sewers	S1, S2
0.000	0.000	0.000	0.239	0.000	0.239	Roofs	S1, S2
2.568	0.000	0.000	9.715	0.000	12.283	Woods, Good	S1, S2
2.979	0.000	0.000	12.390	0.000	15.368	TOTAL AREA	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentS1: Existing S1

Runoff Area=512,211 sf 4.96% Impervious Runoff Depth>0.49"
Flow Length=961' Tc=56.5 min CN=67 Runoff=2.29 cfs 0.481 af

SubcatchmentS2: Existing S2

Runoff Area=157,229 sf 11.23% Impervious Runoff Depth>1.13"
Flow Length=416' Tc=18.3 min CN=80 Runoff=3.35 cfs 0.340 af

Link POI1: Point Of Interest #1

Inflow=2.29 cfs 0.481 af
Primary=2.29 cfs 0.481 af

Link POI2: Point Of Interest #2

Inflow=3.35 cfs 0.340 af
Primary=3.35 cfs 0.340 af

Total Runoff Area = 15.368 ac Runoff Volume = 0.821 af Average Runoff Depth = 0.64"
93.57% Pervious = 14.380 ac 6.43% Impervious = 0.988 ac

Summary for Subcatchment S1: Existing S1

Runoff = 2.29 cfs @ 12.88 hrs, Volume= 0.481 af, Depth> 0.49"
 Routed to Link POI1 : Point Of Interest #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 2-Year Rainfall=3.05"

Area (sf)	CN	Description
17,700	98	Paved roads w/curbs & sewers, HSG D
7,685	98	Roofs, HSG D
111,869	30	Woods, Good, HSG A
321,418	77	Woods, Good, HSG D
17,875	39	>75% Grass cover, Good, HSG A
35,664	80	>75% Grass cover, Good, HSG D
512,211	67	Weighted Average
486,826		95.04% Pervious Area
25,385		4.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	150	0.0500	0.07		Sheet Flow, A-B Sheet
					Woods: Dense underbrush n= 0.800 P2= 3.00"
4.1	348	0.0800	1.41		Shallow Concentrated Flow, B-C Shallow
					Woodland Kv= 5.0 fps
15.4	463	0.0100	0.50		Shallow Concentrated Flow, C-D Shallow
					Woodland Kv= 5.0 fps
56.5	961	Total			

Summary for Subcatchment S2: Existing S2

Runoff = 3.35 cfs @ 12.28 hrs, Volume= 0.340 af, Depth> 1.13"
 Routed to Link POI2 : Point Of Interest #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 2-Year Rainfall=3.05"

Area (sf)	CN	Description
14,917	98	Paved roads w/curbs & sewers, HSG D
2,742	98	Roofs, HSG D
0	30	Woods, Good, HSG A
101,758	77	Woods, Good, HSG D
0	39	>75% Grass cover, Good, HSG A
37,812	80	>75% Grass cover, Good, HSG D
157,229	80	Weighted Average
139,570		88.77% Pervious Area
17,659		11.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	150	0.0500	0.18		Sheet Flow, A-B Sheet Grass: Dense n= 0.240 P2= 3.00"
4.2	266	0.0450	1.06		Shallow Concentrated Flow, B-C Shallow Woodland Kv= 5.0 fps
18.3	416	Total			

Summary for Link POI1: Point Of Interest #1

Inflow Area = 11.759 ac, 4.96% Impervious, Inflow Depth > 0.49" for 2-Year event
 Inflow = 2.29 cfs @ 12.88 hrs, Volume= 0.481 af
 Primary = 2.29 cfs @ 12.88 hrs, Volume= 0.481 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link POI2: Point Of Interest #2

Inflow Area = 3.609 ac, 11.23% Impervious, Inflow Depth > 1.13" for 2-Year event
 Inflow = 3.35 cfs @ 12.28 hrs, Volume= 0.340 af
 Primary = 3.35 cfs @ 12.28 hrs, Volume= 0.340 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentS1: Existing S1

Runoff Area=512,211 sf 4.96% Impervious Runoff Depth>1.27"
Flow Length=961' Tc=56.5 min CN=67 Runoff=6.70 cfs 1.246 af

SubcatchmentS2: Existing S2

Runoff Area=157,229 sf 11.23% Impervious Runoff Depth>2.25"
Flow Length=416' Tc=18.3 min CN=80 Runoff=6.67 cfs 0.678 af

Link POI1: Point Of Interest #1

Inflow=6.70 cfs 1.246 af
Primary=6.70 cfs 1.246 af

Link POI2: Point Of Interest #2

Inflow=6.67 cfs 0.678 af
Primary=6.67 cfs 0.678 af

Total Runoff Area = 15.368 ac Runoff Volume = 1.924 af Average Runoff Depth = 1.50"
93.57% Pervious = 14.380 ac 6.43% Impervious = 0.988 ac

Summary for Subcatchment S1: Existing S1

Runoff = 6.70 cfs @ 12.81 hrs, Volume= 1.246 af, Depth> 1.27"
 Routed to Link POI1 : Point Of Interest #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 10-Year Rainfall=4.57"

Area (sf)	CN	Description
17,700	98	Paved roads w/curbs & sewers, HSG D
7,685	98	Roofs, HSG D
111,869	30	Woods, Good, HSG A
321,418	77	Woods, Good, HSG D
17,875	39	>75% Grass cover, Good, HSG A
35,664	80	>75% Grass cover, Good, HSG D
512,211	67	Weighted Average
486,826		95.04% Pervious Area
25,385		4.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	150	0.0500	0.07		Sheet Flow, A-B Sheet
					Woods: Dense underbrush n= 0.800 P2= 3.00"
4.1	348	0.0800	1.41		Shallow Concentrated Flow, B-C Shallow
					Woodland Kv= 5.0 fps
15.4	463	0.0100	0.50		Shallow Concentrated Flow, C-D Shallow
					Woodland Kv= 5.0 fps
56.5	961	Total			

Summary for Subcatchment S2: Existing S2

Runoff = 6.67 cfs @ 12.27 hrs, Volume= 0.678 af, Depth> 2.25"
 Routed to Link POI2 : Point Of Interest #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 10-Year Rainfall=4.57"

Area (sf)	CN	Description
14,917	98	Paved roads w/curbs & sewers, HSG D
2,742	98	Roofs, HSG D
0	30	Woods, Good, HSG A
101,758	77	Woods, Good, HSG D
0	39	>75% Grass cover, Good, HSG A
37,812	80	>75% Grass cover, Good, HSG D
157,229	80	Weighted Average
139,570		88.77% Pervious Area
17,659		11.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	150	0.0500	0.18		Sheet Flow, A-B Sheet Grass: Dense n= 0.240 P2= 3.00"
4.2	266	0.0450	1.06		Shallow Concentrated Flow, B-C Shallow Woodland Kv= 5.0 fps
18.3	416	Total			

Summary for Link POI1: Point Of Interest #1

Inflow Area = 11.759 ac, 4.96% Impervious, Inflow Depth > 1.27" for 10-Year event
 Inflow = 6.70 cfs @ 12.81 hrs, Volume= 1.246 af
 Primary = 6.70 cfs @ 12.81 hrs, Volume= 1.246 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link POI2: Point Of Interest #2

Inflow Area = 3.609 ac, 11.23% Impervious, Inflow Depth > 2.25" for 10-Year event
 Inflow = 6.67 cfs @ 12.27 hrs, Volume= 0.678 af
 Primary = 6.67 cfs @ 12.27 hrs, Volume= 0.678 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentS1: Existing S1

Runoff Area=512,211 sf 4.96% Impervious Runoff Depth>2.02"
Flow Length=961' Tc=56.5 min CN=67 Runoff=10.85 cfs 1.979 af

SubcatchmentS2: Existing S2

Runoff Area=157,229 sf 11.23% Impervious Runoff Depth>3.22"
Flow Length=416' Tc=18.3 min CN=80 Runoff=9.42 cfs 0.968 af

Link POI1: Point Of Interest #1

Inflow=10.85 cfs 1.979 af
Primary=10.85 cfs 1.979 af

Link POI2: Point Of Interest #2

Inflow=9.42 cfs 0.968 af
Primary=9.42 cfs 0.968 af

Total Runoff Area = 15.368 ac Runoff Volume = 2.947 af Average Runoff Depth = 2.30"
93.57% Pervious = 14.380 ac 6.43% Impervious = 0.988 ac

Summary for Subcatchment S1: Existing S1

Runoff = 10.85 cfs @ 12.78 hrs, Volume= 1.979 af, Depth> 2.02"
 Routed to Link POI1 : Point Of Interest #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 25-Year Rainfall=5.77"

Area (sf)	CN	Description
17,700	98	Paved roads w/curbs & sewers, HSG D
7,685	98	Roofs, HSG D
111,869	30	Woods, Good, HSG A
321,418	77	Woods, Good, HSG D
17,875	39	>75% Grass cover, Good, HSG A
35,664	80	>75% Grass cover, Good, HSG D
512,211	67	Weighted Average
486,826		95.04% Pervious Area
25,385		4.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	150	0.0500	0.07		Sheet Flow, A-B Sheet
					Woods: Dense underbrush n= 0.800 P2= 3.00"
4.1	348	0.0800	1.41		Shallow Concentrated Flow, B-C Shallow
					Woodland Kv= 5.0 fps
15.4	463	0.0100	0.50		Shallow Concentrated Flow, C-D Shallow
					Woodland Kv= 5.0 fps
56.5	961	Total			

Summary for Subcatchment S2: Existing S2

Runoff = 9.42 cfs @ 12.27 hrs, Volume= 0.968 af, Depth> 3.22"
 Routed to Link POI2 : Point Of Interest #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 25-Year Rainfall=5.77"

Area (sf)	CN	Description
14,917	98	Paved roads w/curbs & sewers, HSG D
2,742	98	Roofs, HSG D
0	30	Woods, Good, HSG A
101,758	77	Woods, Good, HSG D
0	39	>75% Grass cover, Good, HSG A
37,812	80	>75% Grass cover, Good, HSG D
157,229	80	Weighted Average
139,570		88.77% Pervious Area
17,659		11.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	150	0.0500	0.18		Sheet Flow, A-B Sheet Grass: Dense n= 0.240 P2= 3.00"
4.2	266	0.0450	1.06		Shallow Concentrated Flow, B-C Shallow Woodland Kv= 5.0 fps
18.3	416	Total			

Summary for Link POI1: Point Of Interest #1

Inflow Area = 11.759 ac, 4.96% Impervious, Inflow Depth > 2.02" for 25-Year event
 Inflow = 10.85 cfs @ 12.78 hrs, Volume= 1.979 af
 Primary = 10.85 cfs @ 12.78 hrs, Volume= 1.979 af, Atten= 0%, Lag= 0.0 min

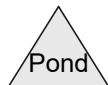
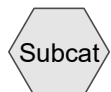
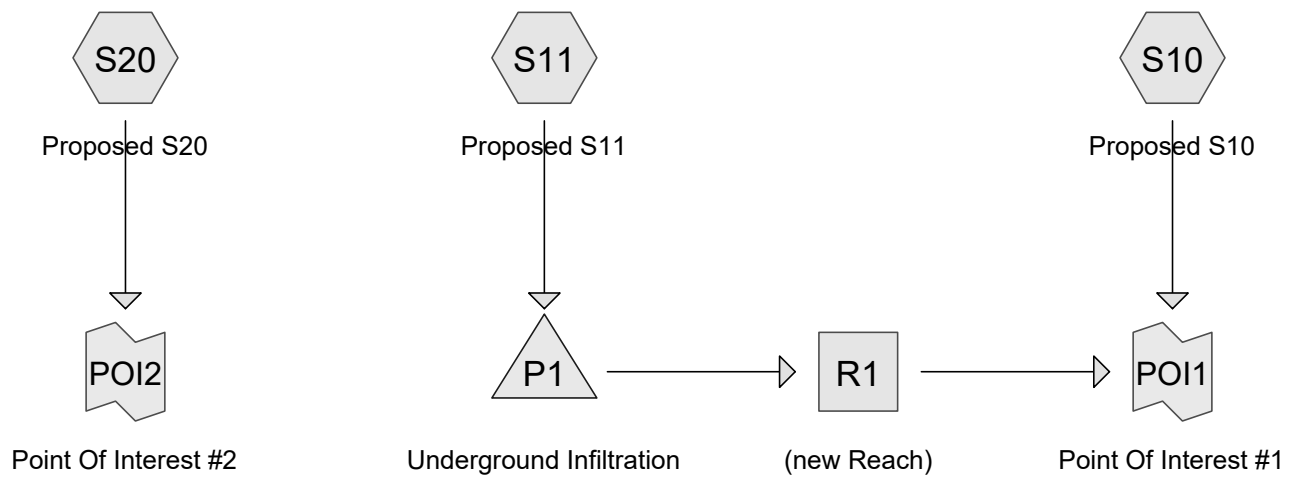
Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link POI2: Point Of Interest #2

Inflow Area = 3.609 ac, 11.23% Impervious, Inflow Depth > 3.22" for 25-Year event
 Inflow = 9.42 cfs @ 12.27 hrs, Volume= 0.968 af
 Primary = 9.42 cfs @ 12.27 hrs, Volume= 0.968 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

APPENDIX C



Routing Diagram for 230277_POST

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Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 6516 NH Merrimack East

Rainfall events imported from "NRCS-Rain.txt" for 6520 NH Strafford

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Page 3

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	NRCC 24-hr	D	Default	24.00	1	3.05	2
2	10-Year	NRCC 24-hr	D	Default	24.00	1	4.57	2
3	25-Year	NRCC 24-hr	D	Default	24.00	1	5.77	2

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Page 4

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.943	39	>75% Grass cover, Good, HSG A (S10, S11)
2.518	80	>75% Grass cover, Good, HSG D (S10, S11, S20)
2.191	98	Paved roads w/curbs & sewers, HSG D (S10, S11, S20)
0.461	98	Roofs, HSG D (S10, S11)
0.145	98	Unconnected roofs, HSG D (S20)
0.951	30	Woods, Good, HSG A (S10)
8.158	77	Woods, Good, HSG D (S10, S20)
15.368	76	TOTAL AREA

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Page 5

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.894	HSG A	S10, S11
0.000	HSG B	
0.000	HSG C	
13.474	HSG D	S10, S11, S20
0.000	Other	
15.368		TOTAL AREA

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Page 6

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.943	0.000	0.000	2.518	0.000	3.462	>75% Grass cover, Good	S1 0, S1 1, S2 0
0.000	0.000	0.000	2.191	0.000	2.191	Paved roads w/curbs & sewers	S1 0, S1 1, S2 0
0.000	0.000	0.000	0.461	0.000	0.461	Roofs	S1 0, S1 1
0.000	0.000	0.000	0.145	0.000	0.145	Unconnected roofs	S2 0
0.951	0.000	0.000	8.158	0.000	9.109	Woods, Good	S1 0, S2 0
1.894	0.000	0.000	13.474	0.000	15.368	TOTAL AREA	

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Page 7

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	P1	151.00	150.00	20.0	0.0500	0.012	0.0	12.0	0.0

230277_POST

NRCC 24-hr D 2-Year Rainfall=3.05"

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Page 8

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentS10: Proposed S10

Runoff Area=360,244 sf 2.82% Impervious Runoff Depth>0.69"
Flow Length=961' Tc=56.5 min CN=72 Runoff=2.50 cfs 0.479 af

SubcatchmentS11: Proposed S11

Runoff Area=147,446 sf 53.50% Impervious Runoff Depth>1.14"
Tc=6.0 min CN=80 Runoff=4.68 cfs 0.321 af

SubcatchmentS20: Proposed S20

Runoff Area=161,744 sf 20.28% Impervious Runoff Depth>1.25"
Flow Length=466' Tc=27.9 min CN=82 Runoff=3.11 cfs 0.386 af

Reach R1: (new Reach)

Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.250 L=300.0' S=0.0067 '/' Capacity=12.34 cfs Outflow=0.00 cfs 0.000 af

Pond P1: Underground Infiltration

Peak Elev=148.88' Storage=5,239 cf Inflow=4.68 cfs 0.321 af
Discarded=0.40 cfs 0.304 af Primary=0.00 cfs 0.000 af Outflow=0.40 cfs 0.304 af

Link POI1: Point Of Interest #1

Inflow=2.50 cfs 0.479 af
Primary=2.50 cfs 0.479 af

Link POI2: Point Of Interest #2

Inflow=3.11 cfs 0.386 af
Primary=3.11 cfs 0.386 af

Total Runoff Area = 15.368 ac Runoff Volume = 1.186 af Average Runoff Depth = 0.93"
81.80% Pervious = 12.571 ac 18.20% Impervious = 2.797 ac

Summary for Subcatchment S10: Proposed S10

Runoff = 2.50 cfs @ 12.83 hrs, Volume= 0.479 af, Depth> 0.69"
 Routed to Link POI1 : Point Of Interest #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 2-Year Rainfall=3.05"

Area (sf)	CN	Description
8,859	98	Paved roads w/curbs & sewers, HSG D
1,311	98	Roofs, HSG D
41,434	30	Woods, Good, HSG A
274,111	77	Woods, Good, HSG D
6,806	39	>75% Grass cover, Good, HSG A
27,723	80	>75% Grass cover, Good, HSG D
360,244	72	Weighted Average
350,074		97.18% Pervious Area
10,170		2.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	150	0.0500	0.07		Sheet Flow, A-B Sheet
					Woods: Dense underbrush n= 0.800 P2= 3.00"
4.1	348	0.0800	1.41		Shallow Concentrated Flow, B-C Shallow
					Woodland Kv= 5.0 fps
15.4	463	0.0100	0.50		Shallow Concentrated Flow, C-D Shallow
					Woodland Kv= 5.0 fps
56.5	961	Total			

Summary for Subcatchment S11: Proposed S11

Runoff = 4.68 cfs @ 12.13 hrs, Volume= 0.321 af, Depth> 1.14"
 Routed to Pond P1 : Underground Infiltration

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 2-Year Rainfall=3.05"

Area (sf)	CN	Description
60,111	98	Paved roads w/curbs & sewers, HSG D
18,775	98	Roofs, HSG D
0	30	Woods, Good, HSG A
0	77	Woods, Good, HSG D
34,280	39	>75% Grass cover, Good, HSG A
34,280	80	>75% Grass cover, Good, HSG D
147,446	80	Weighted Average
68,560		46.50% Pervious Area
78,886		53.50% Impervious Area

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NRCC 24-hr D 2-Year Rainfall=3.05"

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Page 10

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

Summary for Subcatchment S20: Proposed S20

Runoff = 3.11 cfs @ 12.40 hrs, Volume= 0.386 af, Depth> 1.25"
 Routed to Link POI2 : Point Of Interest #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 2-Year Rainfall=3.05"

Area (sf)	CN	Description
26,482	98	Paved roads w/curbs & sewers, HSG D
6,319	98	Unconnected roofs, HSG D
0	30	Woods, Good, HSG A
81,241	77	Woods, Good, HSG D
0	39	>75% Grass cover, Good, HSG A
47,702	80	>75% Grass cover, Good, HSG D
161,744	82	Weighted Average
128,943		79.72% Pervious Area
32,801		20.28% Impervious Area
6,319		19.26% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	150	0.0500	0.18		Sheet Flow, A-B Sheet
					Grass: Dense n= 0.240 P2= 3.00"
3.0	266	0.0450	1.48		Shallow Concentrated Flow, B-C Shallow
					Short Grass Pasture Kv= 7.0 fps
10.8	50	0.0300	0.08		Sheet Flow, C-D Sheet
					Woods: Light underbrush n= 0.400 P2= 3.00"
27.9	466	Total			

Summary for Reach R1: (new Reach)

Inflow Area = 3.385 ac, 53.50% Impervious, Inflow Depth = 0.00" for 2-Year event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Routed to Link POI1 : Point Of Interest #1

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity= 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 1.00' Flow Area= 33.3 sf, Capacity= 12.34 cfs

230277_POST

NRCC 24-hr D 2-Year Rainfall=3.05"

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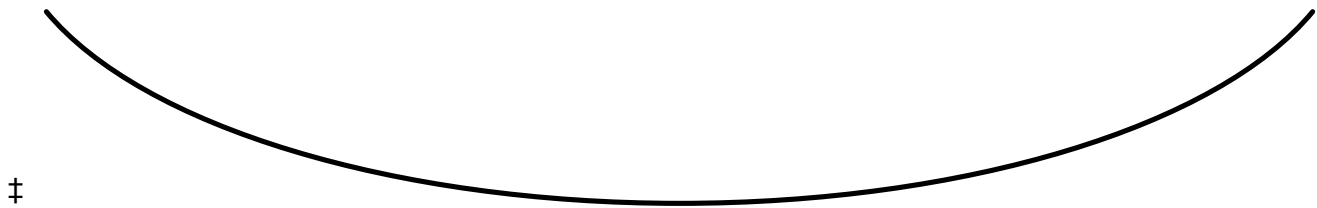
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Page 11

50.00' x 1.00' deep Parabolic Channel, n= 0.250

Length= 300.0' Slope= 0.0067 '/'

Inlet Invert= 142.00', Outlet Invert= 140.00'

**Summary for Pond P1: Underground Infiltration**

Inflow Area = 3.385 ac, 53.50% Impervious, Inflow Depth > 1.14" for 2-Year event
 Inflow = 4.68 cfs @ 12.13 hrs, Volume= 0.321 af
 Outflow = 0.40 cfs @ 11.65 hrs, Volume= 0.304 af, Atten= 91%, Lag= 0.0 min
 Discarded = 0.40 cfs @ 11.65 hrs, Volume= 0.304 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Reach R1 : (new Reach)

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 148.88' @ 13.55 hrs Surf.Area= 3,860 sf Storage= 5,239 cf

Plug-Flow detention time= 129.8 min calculated for 0.303 af (94% of inflow)
 Center-of-Mass det. time= 110.2 min (925.5 - 815.4)

Volume	Invert	Avail.Storage	Storage Description
#1	146.40'	6,474 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 23,160 cf Overall - 6,974 cf Embedded = 16,186 cf x 40.0% Voids
#2	147.40'	6,974 cf	48.0" Round Pipe Storage x 3 Inside #1 L= 185.0'
		13,449 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
146.40	3,860	0	0
152.40	3,860	23,160	23,160

Device	Routing	Invert	Outlet Devices
#1	Primary	151.00'	12.0" Round Culvert X 2.00 L= 20.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 151.00' / 150.00' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Discarded	146.40'	4.500 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.40 cfs @ 11.65 hrs HW=146.47' (Free Discharge)

↑ **2=Exfiltration** (Exfiltration Controls 0.40 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=146.40' (Free Discharge)

↑ **1=Culvert** (Controls 0.00 cfs)

Summary for Link POI1: Point Of Interest #1

Inflow Area = 11.655 ac, 17.54% Impervious, Inflow Depth > 0.49" for 2-Year event
Inflow = 2.50 cfs @ 12.83 hrs, Volume= 0.479 af
Primary = 2.50 cfs @ 12.83 hrs, Volume= 0.479 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link POI2: Point Of Interest #2

Inflow Area = 3.713 ac, 20.28% Impervious, Inflow Depth > 1.25" for 2-Year event
Inflow = 3.11 cfs @ 12.40 hrs, Volume= 0.386 af
Primary = 3.11 cfs @ 12.40 hrs, Volume= 0.386 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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NRCC 24-hr D 10-Year Rainfall=4.57"

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Page 13

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentS10: Proposed S10

Runoff Area=360,244 sf 2.82% Impervious Runoff Depth>1.60"
Flow Length=961' Tc=56.5 min CN=72 Runoff=6.06 cfs 1.105 af

SubcatchmentS11: Proposed S11

Runoff Area=147,446 sf 53.50% Impervious Runoff Depth>2.27"
Tc=6.0 min CN=80 Runoff=9.17 cfs 0.639 af

SubcatchmentS20: Proposed S20

Runoff Area=161,744 sf 20.28% Impervious Runoff Depth>2.41"
Flow Length=466' Tc=27.9 min CN=82 Runoff=5.96 cfs 0.746 af

Reach R1: (new Reach)

Avg. Flow Depth=0.22' Max Vel=0.13 fps Inflow=0.76 cfs 0.074 af
n=0.250 L=300.0' S=0.0067 '/' Capacity=12.34 cfs Outflow=0.46 cfs 0.073 af

Pond P1: Underground Infiltration

Peak Elev=151.30' Storage=11,728 cf Inflow=9.17 cfs 0.639 af
Discarded=0.40 cfs 0.348 af Primary=0.76 cfs 0.074 af Outflow=1.16 cfs 0.422 af

Link POI1: Point Of Interest #1

Inflow=6.06 cfs 1.179 af
Primary=6.06 cfs 1.179 af

Link POI2: Point Of Interest #2

Inflow=5.96 cfs 0.746 af
Primary=5.96 cfs 0.746 af

Total Runoff Area = 15.368 ac Runoff Volume = 2.491 af Average Runoff Depth = 1.94"
81.80% Pervious = 12.571 ac 18.20% Impervious = 2.797 ac

Summary for Subcatchment S10: Proposed S10

Runoff = 6.06 cfs @ 12.78 hrs, Volume= 1.105 af, Depth> 1.60"
 Routed to Link POI1 : Point Of Interest #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 10-Year Rainfall=4.57"

Area (sf)	CN	Description
8,859	98	Paved roads w/curbs & sewers, HSG D
1,311	98	Roofs, HSG D
41,434	30	Woods, Good, HSG A
274,111	77	Woods, Good, HSG D
6,806	39	>75% Grass cover, Good, HSG A
27,723	80	>75% Grass cover, Good, HSG D
360,244	72	Weighted Average
350,074		97.18% Pervious Area
10,170		2.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	150	0.0500	0.07		Sheet Flow, A-B Sheet
					Woods: Dense underbrush n= 0.800 P2= 3.00"
4.1	348	0.0800	1.41		Shallow Concentrated Flow, B-C Shallow
					Woodland Kv= 5.0 fps
15.4	463	0.0100	0.50		Shallow Concentrated Flow, C-D Shallow
					Woodland Kv= 5.0 fps
56.5	961	Total			

Summary for Subcatchment S11: Proposed S11

Runoff = 9.17 cfs @ 12.13 hrs, Volume= 0.639 af, Depth> 2.27"
 Routed to Pond P1 : Underground Infiltration

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 10-Year Rainfall=4.57"

Area (sf)	CN	Description
60,111	98	Paved roads w/curbs & sewers, HSG D
18,775	98	Roofs, HSG D
0	30	Woods, Good, HSG A
0	77	Woods, Good, HSG D
34,280	39	>75% Grass cover, Good, HSG A
34,280	80	>75% Grass cover, Good, HSG D
147,446	80	Weighted Average
68,560		46.50% Pervious Area
78,886		53.50% Impervious Area

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NRCC 24-hr D 10-Year Rainfall=4.57"

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Page 15

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

Summary for Subcatchment S20: Proposed S20

Runoff = 5.96 cfs @ 12.39 hrs, Volume= 0.746 af, Depth> 2.41"
 Routed to Link POI2 : Point Of Interest #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 10-Year Rainfall=4.57"

Area (sf)	CN	Description
26,482	98	Paved roads w/curbs & sewers, HSG D
6,319	98	Unconnected roofs, HSG D
0	30	Woods, Good, HSG A
81,241	77	Woods, Good, HSG D
0	39	>75% Grass cover, Good, HSG A
47,702	80	>75% Grass cover, Good, HSG D
161,744	82	Weighted Average
128,943		79.72% Pervious Area
32,801		20.28% Impervious Area
6,319		19.26% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	150	0.0500	0.18		Sheet Flow, A-B Sheet Grass: Dense n= 0.240 P2= 3.00"
3.0	266	0.0450	1.48		Shallow Concentrated Flow, B-C Shallow Short Grass Pasture Kv= 7.0 fps
10.8	50	0.0300	0.08		Sheet Flow, C-D Sheet Woods: Light underbrush n= 0.400 P2= 3.00"
27.9	466	Total			

Summary for Reach R1: (new Reach)

Inflow Area = 3.385 ac, 53.50% Impervious, Inflow Depth = 0.26" for 10-Year event
 Inflow = 0.76 cfs @ 12.91 hrs, Volume= 0.074 af
 Outflow = 0.46 cfs @ 14.07 hrs, Volume= 0.073 af, Atten= 40%, Lag= 69.6 min
 Routed to Link POI1 : Point Of Interest #1

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.13 fps, Min. Travel Time= 37.2 min
 Avg. Velocity= 0.07 fps, Avg. Travel Time= 69.3 min

Peak Storage= 1,022 cf @ 13.45 hrs
 Average Depth at Peak Storage= 0.22' , Surface Width= 23.37'
 Bank-Full Depth= 1.00' Flow Area= 33.3 sf, Capacity= 12.34 cfs

50.00' x 1.00' deep Parabolic Channel, n= 0.250

Length= 300.0' Slope= 0.0067 '/'

Inlet Invert= 142.00', Outlet Invert= 140.00'



Summary for Pond P1: Underground Infiltration

Inflow Area = 3.385 ac, 53.50% Impervious, Inflow Depth > 2.27" for 10-Year event
 Inflow = 9.17 cfs @ 12.13 hrs, Volume= 0.639 af
 Outflow = 1.16 cfs @ 12.91 hrs, Volume= 0.422 af, Atten= 87%, Lag= 47.0 min
 Discarded = 0.40 cfs @ 10.90 hrs, Volume= 0.348 af
 Primary = 0.76 cfs @ 12.91 hrs, Volume= 0.074 af
 Routed to Reach R1 : (new Reach)

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 151.30' @ 12.91 hrs Surf.Area= 3,860 sf Storage= 11,728 cf

Plug-Flow detention time= 156.8 min calculated for 0.420 af (66% of inflow)
 Center-of-Mass det. time= 75.2 min (871.1 - 795.9)

Volume	Invert	Avail.Storage	Storage Description
#1	146.40'	6,474 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 23,160 cf Overall - 6,974 cf Embedded = 16,186 cf x 40.0% Voids
#2	147.40'	6,974 cf	48.0" Round Pipe Storage x 3 Inside #1 L= 185.0'
		13,449 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
146.40	3,860	0	0
152.40	3,860	23,160	23,160

Device	Routing	Invert	Outlet Devices
#1	Primary	151.00'	12.0" Round Culvert X 2.00 L= 20.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 151.00' / 150.00' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Discarded	146.40'	4.500 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.40 cfs @ 10.90 hrs HW=146.46' (Free Discharge)

↑ **2=Exfiltration** (Exfiltration Controls 0.40 cfs)

Primary OutFlow Max=0.75 cfs @ 12.91 hrs HW=151.30' (Free Discharge)

↑ **1=Culvert** (Inlet Controls 0.75 cfs @ 1.87 fps)

Summary for Link POI1: Point Of Interest #1

Inflow Area = 11.655 ac, 17.54% Impervious, Inflow Depth > 1.21" for 10-Year event
Inflow = 6.06 cfs @ 12.78 hrs, Volume= 1.179 af
Primary = 6.06 cfs @ 12.78 hrs, Volume= 1.179 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link POI2: Point Of Interest #2

Inflow Area = 3.713 ac, 20.28% Impervious, Inflow Depth > 2.41" for 10-Year event
Inflow = 5.96 cfs @ 12.39 hrs, Volume= 0.746 af
Primary = 5.96 cfs @ 12.39 hrs, Volume= 0.746 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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NRCC 24-hr D 25-Year Rainfall=5.77"

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Page 18

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentS10: Proposed S10

Runoff Area=360,244 sf 2.82% Impervious Runoff Depth>2.44"
Flow Length=961' Tc=56.5 min CN=72 Runoff=9.26 cfs 1.679 af

SubcatchmentS11: Proposed S11

Runoff Area=147,446 sf 53.50% Impervious Runoff Depth>3.24"
Tc=6.0 min CN=80 Runoff=12.89 cfs 0.913 af

SubcatchmentS20: Proposed S20

Runoff Area=161,744 sf 20.28% Impervious Runoff Depth>3.40"
Flow Length=466' Tc=27.9 min CN=82 Runoff=8.30 cfs 1.052 af

Reach R1: (new Reach)

Avg. Flow Depth=0.46' Max Vel=0.22 fps Inflow=5.50 cfs 0.287 af
n=0.250 L=300.0' S=0.0067 '/' Capacity=12.34 cfs Outflow=2.29 cfs 0.285 af

Pond P1: Underground Infiltration

Peak Elev=152.02' Storage=12,862 cf Inflow=12.89 cfs 0.913 af
Discarded=0.40 cfs 0.382 af Primary=5.50 cfs 0.287 af Outflow=5.90 cfs 0.669 af

Link POI1: Point Of Interest #1

Inflow=11.38 cfs 1.964 af
Primary=11.38 cfs 1.964 af

Link POI2: Point Of Interest #2

Inflow=8.30 cfs 1.052 af
Primary=8.30 cfs 1.052 af

Total Runoff Area = 15.368 ac Runoff Volume = 3.644 af Average Runoff Depth = 2.84"
81.80% Pervious = 12.571 ac 18.20% Impervious = 2.797 ac

Summary for Subcatchment S10: Proposed S10

Runoff = 9.26 cfs @ 12.77 hrs, Volume= 1.679 af, Depth> 2.44"
 Routed to Link POI1 : Point Of Interest #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 25-Year Rainfall=5.77"

Area (sf)	CN	Description
8,859	98	Paved roads w/curbs & sewers, HSG D
1,311	98	Roofs, HSG D
41,434	30	Woods, Good, HSG A
274,111	77	Woods, Good, HSG D
6,806	39	>75% Grass cover, Good, HSG A
27,723	80	>75% Grass cover, Good, HSG D
360,244	72	Weighted Average
350,074		97.18% Pervious Area
10,170		2.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.0	150	0.0500	0.07		Sheet Flow, A-B Sheet
					Woods: Dense underbrush n= 0.800 P2= 3.00"
4.1	348	0.0800	1.41		Shallow Concentrated Flow, B-C Shallow
					Woodland Kv= 5.0 fps
15.4	463	0.0100	0.50		Shallow Concentrated Flow, C-D Shallow
					Woodland Kv= 5.0 fps
56.5	961	Total			

Summary for Subcatchment S11: Proposed S11

Runoff = 12.89 cfs @ 12.13 hrs, Volume= 0.913 af, Depth> 3.24"
 Routed to Pond P1 : Underground Infiltration

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 25-Year Rainfall=5.77"

Area (sf)	CN	Description
60,111	98	Paved roads w/curbs & sewers, HSG D
18,775	98	Roofs, HSG D
0	30	Woods, Good, HSG A
0	77	Woods, Good, HSG D
34,280	39	>75% Grass cover, Good, HSG A
34,280	80	>75% Grass cover, Good, HSG D
147,446	80	Weighted Average
68,560		46.50% Pervious Area
78,886		53.50% Impervious Area

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NRCC 24-hr D 25-Year Rainfall=5.77"

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Page 20

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

Summary for Subcatchment S20: Proposed S20

Runoff = 8.30 cfs @ 12.39 hrs, Volume= 1.052 af, Depth> 3.40"
 Routed to Link POI2 : Point Of Interest #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 25-Year Rainfall=5.77"

Area (sf)	CN	Description
26,482	98	Paved roads w/curbs & sewers, HSG D
6,319	98	Unconnected roofs, HSG D
0	30	Woods, Good, HSG A
81,241	77	Woods, Good, HSG D
0	39	>75% Grass cover, Good, HSG A
47,702	80	>75% Grass cover, Good, HSG D
161,744	82	Weighted Average
128,943		79.72% Pervious Area
32,801		20.28% Impervious Area
6,319		19.26% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	150	0.0500	0.18		Sheet Flow, A-B Sheet Grass: Dense n= 0.240 P2= 3.00"
3.0	266	0.0450	1.48		Shallow Concentrated Flow, B-C Shallow Short Grass Pasture Kv= 7.0 fps
10.8	50	0.0300	0.08		Sheet Flow, C-D Sheet Woods: Light underbrush n= 0.400 P2= 3.00"
27.9	466	Total			

Summary for Reach R1: (new Reach)

Inflow Area = 3.385 ac, 53.50% Impervious, Inflow Depth = 1.02" for 25-Year event
 Inflow = 5.50 cfs @ 12.27 hrs, Volume= 0.287 af
 Outflow = 2.29 cfs @ 12.92 hrs, Volume= 0.285 af, Atten= 58%, Lag= 39.1 min
 Routed to Link POI1 : Point Of Interest #1

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.22 fps, Min. Travel Time= 22.7 min
 Avg. Velocity= 0.11 fps, Avg. Travel Time= 46.1 min

Peak Storage= 3,118 cf @ 12.54 hrs
 Average Depth at Peak Storage= 0.46' , Surface Width= 33.90'
 Bank-Full Depth= 1.00' Flow Area= 33.3 sf, Capacity= 12.34 cfs

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NRCC 24-hr D 25-Year Rainfall=5.77"

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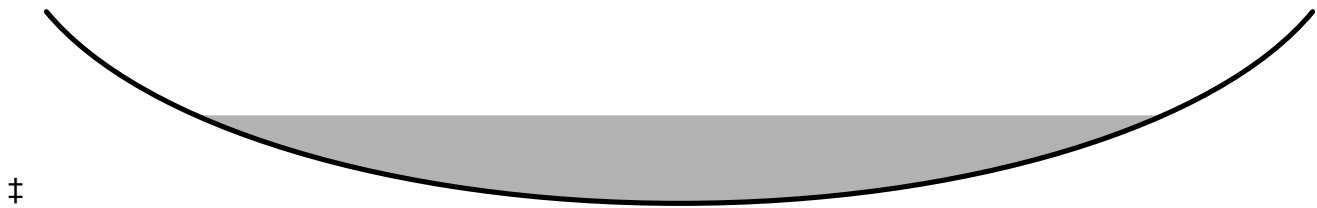
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Page 21

50.00' x 1.00' deep Parabolic Channel, n= 0.250

Length= 300.0' Slope= 0.0067 '/'

Inlet Invert= 142.00', Outlet Invert= 140.00'

**Summary for Pond P1: Underground Infiltration**

Inflow Area = 3.385 ac, 53.50% Impervious, Inflow Depth > 3.24" for 25-Year event
 Inflow = 12.89 cfs @ 12.13 hrs, Volume= 0.913 af
 Outflow = 5.90 cfs @ 12.27 hrs, Volume= 0.669 af, Atten= 54%, Lag= 8.2 min
 Discarded = 0.40 cfs @ 10.20 hrs, Volume= 0.382 af
 Primary = 5.50 cfs @ 12.27 hrs, Volume= 0.287 af
 Routed to Reach R1 : (new Reach)

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 152.02' @ 12.27 hrs Surf.Area= 3,860 sf Storage= 12,862 cf

Plug-Flow detention time= 111.3 min calculated for 0.667 af (73% of inflow)
 Center-of-Mass det. time= 39.8 min (825.2 - 785.4)

Volume	Invert	Avail.Storage	Storage Description
#1	146.40'	6,474 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 23,160 cf Overall - 6,974 cf Embedded = 16,186 cf x 40.0% Voids
#2	147.40'	6,974 cf	48.0" Round Pipe Storage x 3 Inside #1 L= 185.0'
		13,449 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
146.40	3,860	0	0
152.40	3,860	23,160	23,160

Device	Routing	Invert	Outlet Devices
#1	Primary	151.00'	12.0" Round Culvert X 2.00 L= 20.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 151.00' / 150.00' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Discarded	146.40'	4.500 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.40 cfs @ 10.20 hrs HW=146.46' (Free Discharge)

↑ **2=Exfiltration** (Exfiltration Controls 0.40 cfs)

Primary OutFlow Max=5.29 cfs @ 12.27 hrs HW=151.99' (Free Discharge)

↑ **1=Culvert** (Inlet Controls 5.29 cfs @ 3.38 fps)

Summary for Link POI1: Point Of Interest #1

Inflow Area = 11.655 ac, 17.54% Impervious, Inflow Depth > 2.02" for 25-Year event
Inflow = 11.38 cfs @ 12.83 hrs, Volume= 1.964 af
Primary = 11.38 cfs @ 12.83 hrs, Volume= 1.964 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link POI2: Point Of Interest #2

Inflow Area = 3.713 ac, 20.28% Impervious, Inflow Depth > 3.40" for 25-Year event
Inflow = 8.30 cfs @ 12.39 hrs, Volume= 1.052 af
Primary = 8.30 cfs @ 12.39 hrs, Volume= 1.052 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

APPENDIX D



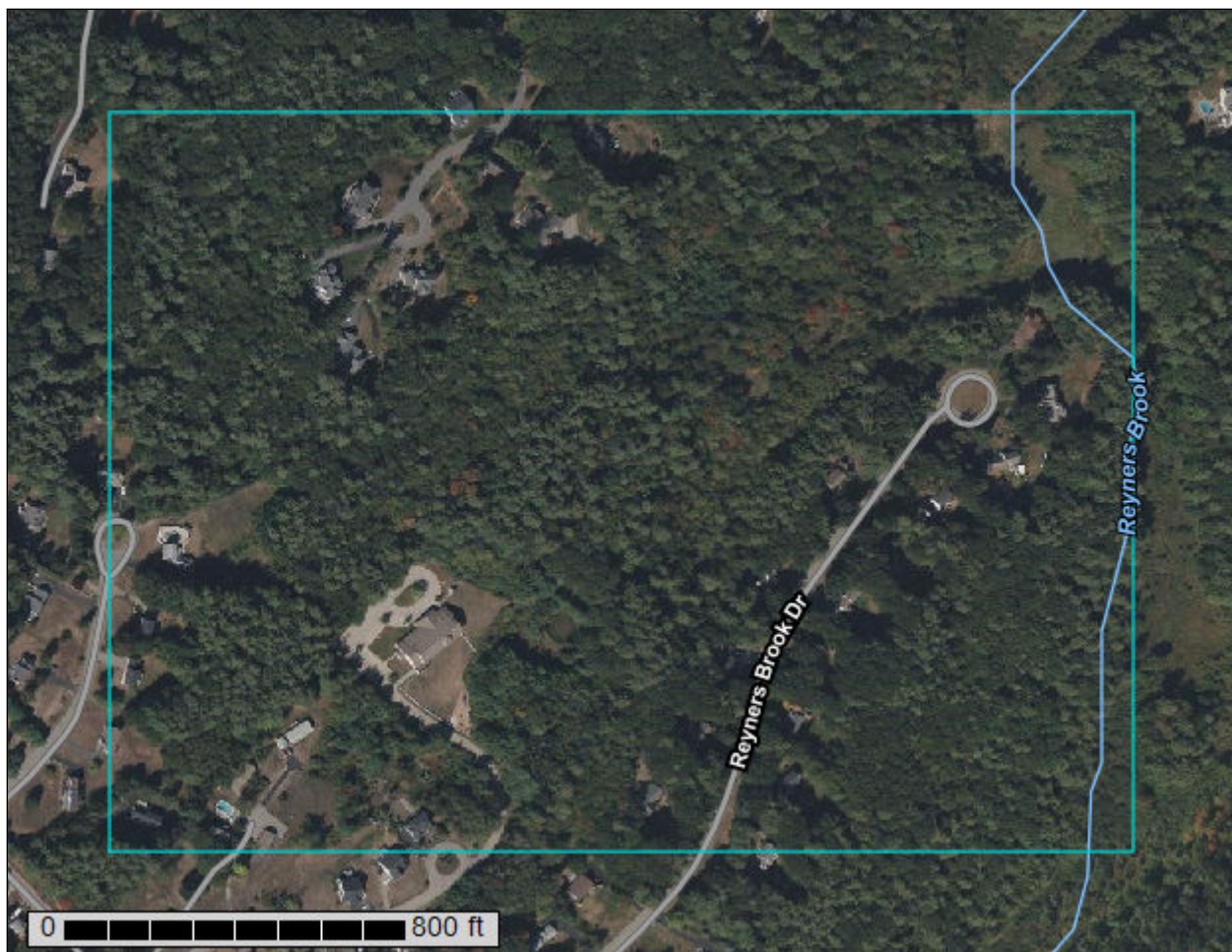
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

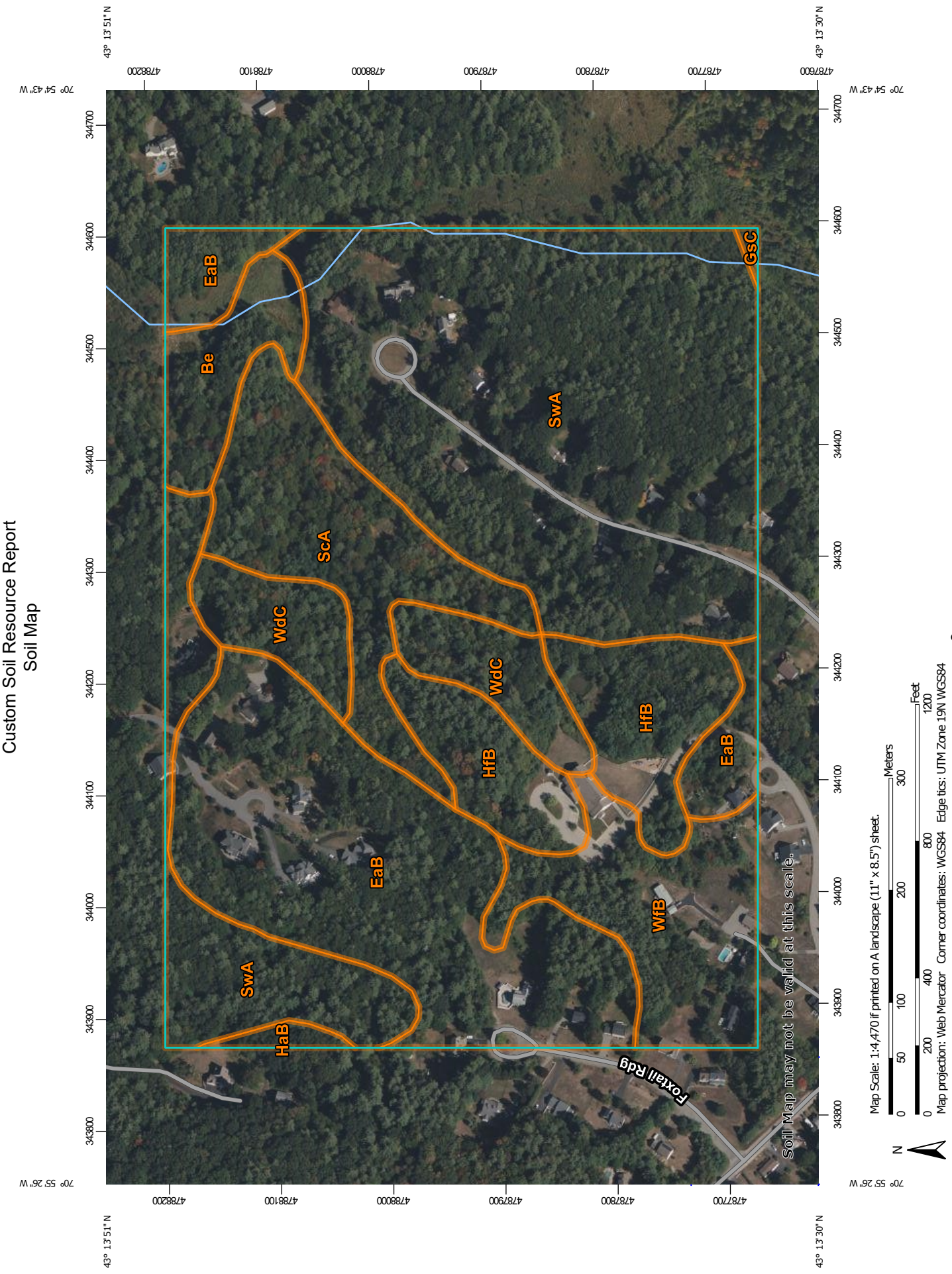
A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Strafford County, New Hampshire**



May 24, 2023

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Stafford County, New Hampshire
Survey Area Data: Version 23, Sep 9, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Be	Biddeford silty clay loam	3.5	3.6%
EaB	Elmwood fine sandy loam, 3 to 8 percent slopes	22.2	23.1%
GsC	Gloucester very stony fine sandy loam, 8 to 15 percent slopes	0.1	0.1%
HaB	Hinckley loamy sand, 3 to 8 percent slopes	0.5	0.5%
HfB	Hollis-Gloucester fine sandy loams, 3 to 8 percent slopes	8.6	8.9%
ScA	Scantic silt loam, 0 to 3 percent slopes	9.3	9.7%
SwA	Swanton fine sandy loam, 0 to 3 percent slopes	38.1	39.6%
WdC	Windsor loamy sand, 8 to 15 percent slopes	5.9	6.2%
WfB	Windsor loamy fine sand, clay subsoil variant, 0 to 8 percent slopes	7.9	8.3%
Totals for Area of Interest		96.1	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different

management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Strafford County, New Hampshire

Be—Biddeford silty clay loam

Map Unit Setting

National map unit symbol: 9d6m
Elevation: 0 to 200 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Biddeford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Biddeford

Setting

Landform: Marine terraces
Parent material: Glaciomarine

Typical profile

H1 - 0 to 7 inches: silty clay loam
H2 - 7 to 26 inches: silty clay
H3 - 26 to 41 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C/D
Ecological site: F144BY002ME - Marine Terrace Depression
Hydric soil rating: Yes

Minor Components

Not named wet

Percent of map unit: 10 percent
Landform: Marine terraces
Hydric soil rating: Yes

Scantic

Percent of map unit: 5 percent

Custom Soil Resource Report

Landform: Marine terraces
Hydric soil rating: Yes

EaB—Elmwood fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9d71
Elevation: 0 to 1,000 feet
Mean annual precipitation: 28 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 120 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Elmwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Elmwood

Setting

Parent material: Glaciomarine

Typical profile

H1 - 0 to 16 inches: fine sandy loam
H2 - 16 to 20 inches: fine sandy loam
H3 - 20 to 43 inches: silty clay

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 10 percent

Custom Soil Resource Report

Hydric soil rating: No

Deerfield

Percent of map unit: 5 percent

Hydric soil rating: No

GsC—Gloucester very stony fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9d76

Elevation: 0 to 1,440 feet

Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Not prime farmland

Map Unit Composition

Gloucester and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gloucester

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: very stony fine sandy loam

H2 - 14 to 28 inches: very gravelly loamy sand

H3 - 28 to 40 inches: very gravelly coarse sand

Properties and qualities

Slope: 8 to 15 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A

Ecological site: F144BY601ME - Dry Sand

Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 5 percent
Hydric soil rating: No

Hollis

Percent of map unit: 5 percent
Hydric soil rating: No

Acton

Percent of map unit: 5 percent
Hydric soil rating: No

HaB—Hinckley loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svm8
Elevation: 0 to 1,430 feet
Mean annual precipitation: 36 to 53 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Hinckley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Outwash deltas, outwash terraces, moraines, kames, outwash plains, kame terraces, eskers
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 8 percent
Landform: Outwash deltas, outwash terraces, moraines, kames, outwash plains, kame terraces, eskers
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

Percent of map unit: 5 percent
Landform: Outwash deltas, outwash terraces, moraines, outwash plains, kame terraces
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Head slope, side slope, base slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

Agawam

Percent of map unit: 2 percent
Landform: Outwash deltas, outwash terraces, moraines, kames, outwash plains, kame terraces, eskers
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

HfB—Hollis-Gloucester fine sandy loams, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9d7s
Elevation: 30 to 1,100 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Hollis and similar soils: 55 percent
Gloucester and similar soils: 35 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hollis

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 18 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Gloucester

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: fine sandy loam

Custom Soil Resource Report

H2 - 14 to 28 inches: very gravelly loamy sand

H3 - 28 to 40 inches: very gravelly coarse sand

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: A

Ecological site: F144AY032NH - Dry Till Uplands

Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 5 percent

Hydric soil rating: No

Acton

Percent of map unit: 3 percent

Hydric soil rating: No

Leicester

Percent of map unit: 2 percent

Landform: Depressions

Hydric soil rating: Yes

ScA—Scantic silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9d8s

Elevation: 0 to 260 feet

Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Farmland of local importance

Map Unit Composition

Scantic and similar soils: 85 percent

Minor components: 15 percent

Custom Soil Resource Report

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scantic

Setting

Landform: Marine terraces

Typical profile

H1 - 0 to 13 inches: silt loam

H2 - 13 to 23 inches: silty clay loam

H3 - 23 to 40 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Depth to water table: About 0 to 12 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: C/D

Ecological site: F144AY019NH - Wet Lake Plain

Hydric soil rating: Yes

Minor Components

Swanton

Percent of map unit: 5 percent

Landform: Marine terraces

Hydric soil rating: Yes

Biddeford

Percent of map unit: 5 percent

Landform: Marine terraces

Hydric soil rating: Yes

Not named wet

Percent of map unit: 5 percent

Landform: Marine terraces

Hydric soil rating: Yes

SwA—Swanton fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9d90

Custom Soil Resource Report

Elevation: 0 to 260 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition

Swanton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swanton

Setting

Landform: Marine terraces

Typical profile

H1 - 0 to 19 inches: fine sandy loam
H2 - 19 to 26 inches: sandy loam
H3 - 26 to 41 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F144AY028MA - Wet Outwash
Hydric soil rating: Yes

Minor Components

Not named wet

Percent of map unit: 10 percent
Landform: Marine terraces
Hydric soil rating: Yes

Scantic

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

WdC—Windsor loamy sand, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2svkq
Elevation: 0 to 1,260 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Windsor and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor

Setting

Landform: — error in exists on —
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, riser
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
Ap - 1 to 11 inches: loamy sand
Bw - 11 to 31 inches: loamy sand
C - 31 to 65 inches: sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A

Custom Soil Resource Report

Ecological site: F144AY022MA - Dry Outwash

Hydric soil rating: No

Minor Components

Hinckley

Percent of map unit: 10 percent

Landform: Kames, outwash plains, eskers, deltas

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Head slope, nose slope, side slope, crest, rise

Down-slope shape: Convex

Across-slope shape: Convex, linear

Hydric soil rating: No

Deerfield

Percent of map unit: 5 percent

Landform: Terraces, outwash plains, deltas

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread, tal

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

WfB—Windsor loamy fine sand, clay subsoil variant, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9d9b

Elevation: 0 to 280 feet

Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Windsor variant and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor Variant

Typical profile

H1 - 0 to 26 inches: loamy fine sand

H2 - 26 to 30 inches: loamy sand

H3 - 30 to 42 inches: silt loam

Properties and qualities

Slope: 0 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Custom Soil Resource Report

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: About 24 to 36 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: A

Ecological site: F144AY022MA - Dry Outwash

Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 15 percent

Hydric soil rating: No

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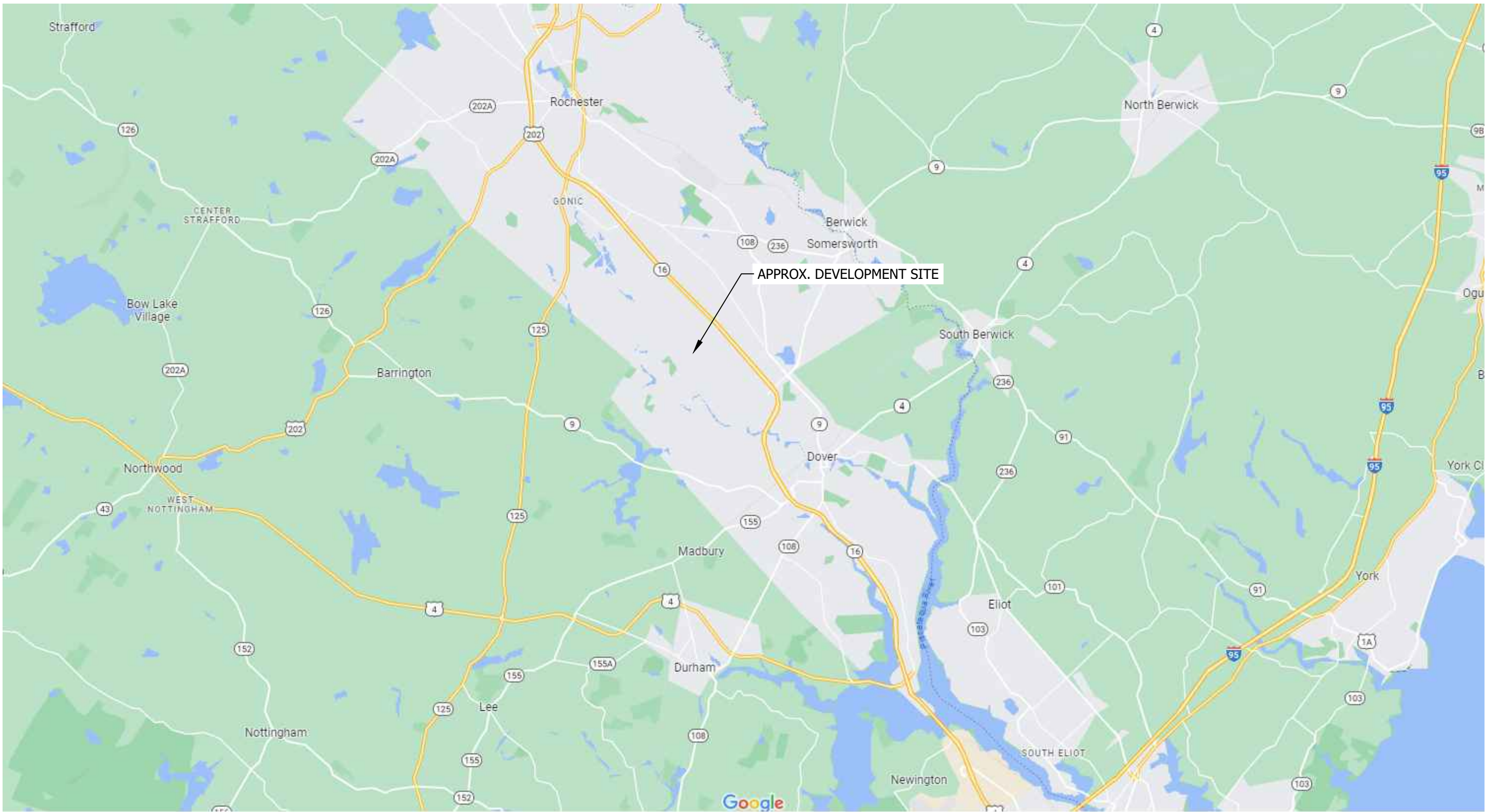
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OLIVE MEADOW LANE POCKET COMMUNITY

DOVER, NEW HAMPSHIRE

JUNE 2023



LOCUS MAP
SCALE: 1"=10,000'

SHEET INDEX	
C100	EXISTING CONDITIONS PLAN
C100.1	SITE CONTEXT PLAN
C101	SITE & UTILITY PLAN
C102	GRADING AND EROSION CONTROL PLAN
C103	UTILITY PLAN
C104-C105	PLAN & PROFILE SHEETS
C200	LANDSCAPING PLAN
C201	LIGHTING PLAN
C501-C508	CONSTRUCTION DETAILS

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36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

COVER & INDEX PLAN

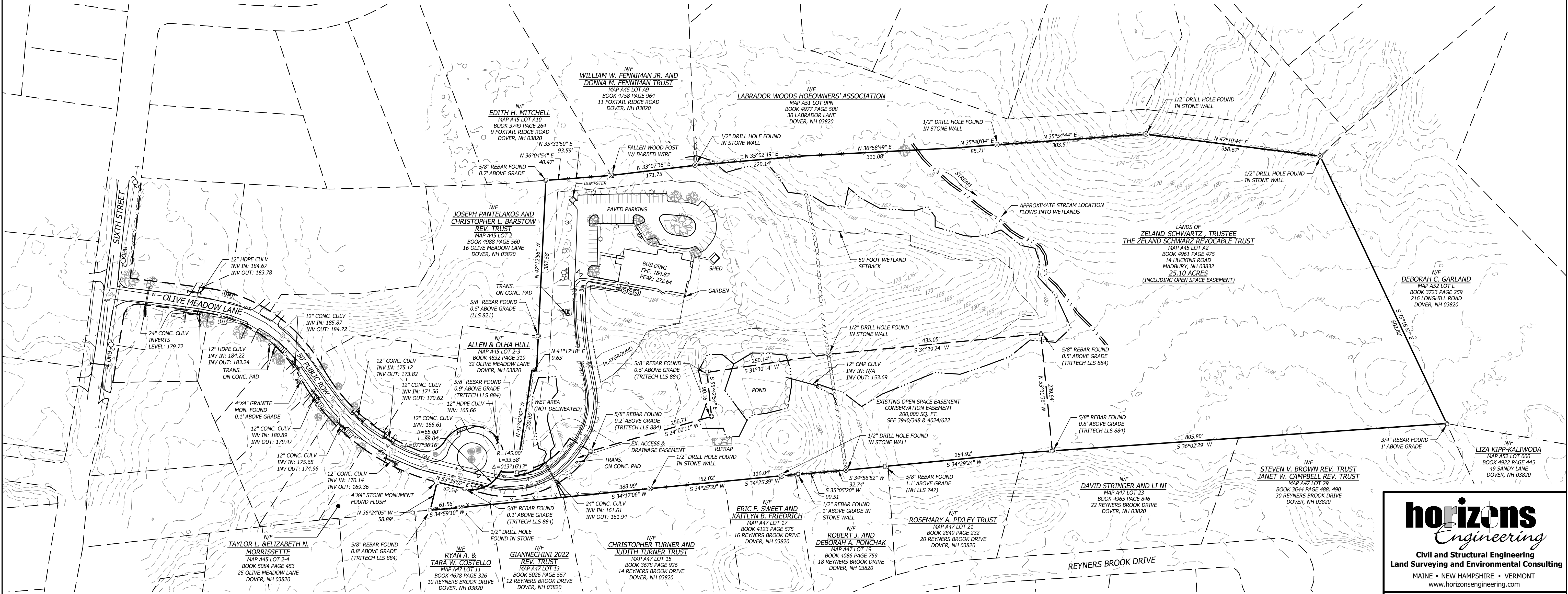
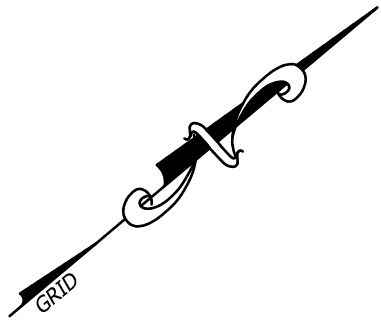
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DATE OF PRINT
JUNE 19 2023
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CHECK'D BY: MJS	ARCHIVE #: H-____
COVER	

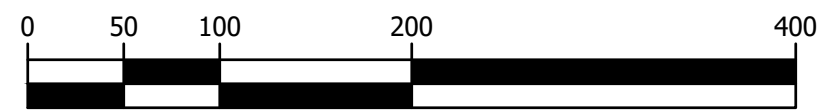


GENERAL NOTES

- OWNER OF RECORD:
ZELAND SCHWARTZ, TRUSTEE OF THE ZELAND SCHWARTZ REVOCABLE TRUST DATED JULY 9, 2019
14 HUCKINS ROAD
MADBURY, NH 03832
- REFERENCE DEED:
 - WARRANTY DEED FROM PARACOSM, LLC TO ZELAND SCHWARTZ, TRUSTEE OF THE ZELAND SCHWARTZ REVOCABLE TRUST DATED JULY 9, 2019, RECORDED IN THE STRAFFORD COUNTY REGISTRY OF DEEDS AS BOOK 4961, PAGE 475.
- REFERENCE PLANS:
 - "AMENDED OPEN SPACE SUBDIVISION PLAN OF OLIVE MEADOW OLIVE MEADOW LANE DOVER, NEW HAMPSHIRE" PREPARED BY TRITECH ENGINEERING, DATED JANUARY OF 2012 AND RECORDED IN THE STRAFFORD COUNTY REGISTRY OF DEEDS AS PLAN BOOK 103, PAGE 81-82.
- THIS PLAN IS BASED ON A FIELD SURVEY COMPLETED BY HORIZONS ENGINEERING, INC. IN MAY, 2023 USING A CARLSON BRX-7 GNSS & LEICA TS13 ROBOTIC TOTAL STATION.
- THE BEARINGS SHOWN HEREON REFER TO GRID NORTH AND ARE BASED ON THE NEW HAMPSHIRE COORDINATE SYSTEM NAD83. CONTOURS SHOWN HEREON ARE A COMBINATION OF A TOPOGRAPHIC SURVEY AND FROM PUBLICLY AVAILABLE LIDAR ELEVATION DATA (LIDAR IN WETLANDS AND FAR EAST SIDE OF LOT).
- PROPERTY IS ZONED RURAL RESIDENTIAL (R-40)
- THE WETLANDS SHOWN HEREON WERE DELINEATED IN APRIL, 2023 BY MARK WEST OF WEST ENVIRONMENTAL, INC. AND LOCATED DURING THE FIELD SURVEY.
- THE PREMISES ARE LOT LOCATED WITHIN A DEFINED FLOOD HAZARD ZONE.
- UNDERGROUND UTILITIES AS SHOWN HEREON ARE BASED ON SURFACE STRUCTURES AND RECORD PLANS PROVIDED BY THE CITY OF DOVER, AND SHOULD BE CONSIDERED APPROXIMATE.

LEGEND

⊙	IRON PIPE OR ROD FOUND (DIMENSIONS LABELED ON PLAN)
○	CALCULATED CORNER
⊗	DRILL HOLE FOUND
⊠	STONE MONUMENT FOUND
⊞	LIGHT POLE
⊞	GATE VALVE
⊞	WATER HYDRANT
⊞	SEWER MANHOLE
⊞	ELECTRIC METER
⊞	MAILBOX
—	DECIDUOUS TREE
—	TREE LINE
—	ABUTTER PROPERTY LINE
—	PROPERTY LINE
—	EASEMENT OR RIGHT OF WAY
—	EDGE OF WATER/WETLAND
—	STONE WALL
—	PAVED ROAD
—	FENCING
—	BARBED WIRE
—	EX. WATER
—	EX. SEWER/FORCEMAIN
—	EX. UG GAS
—	EX. UG ELEC/CABLE



SCALE IN FEET
SCALE: 1" = 100'

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EXISTING CONDITIONS SURVEY PREPARED FOR

ZELAND SCHWARTZ, TRUSTEE OF
THE ZELAND SCHWARTZ REVOCABLE
TRUST DATED JULY 9, 2019

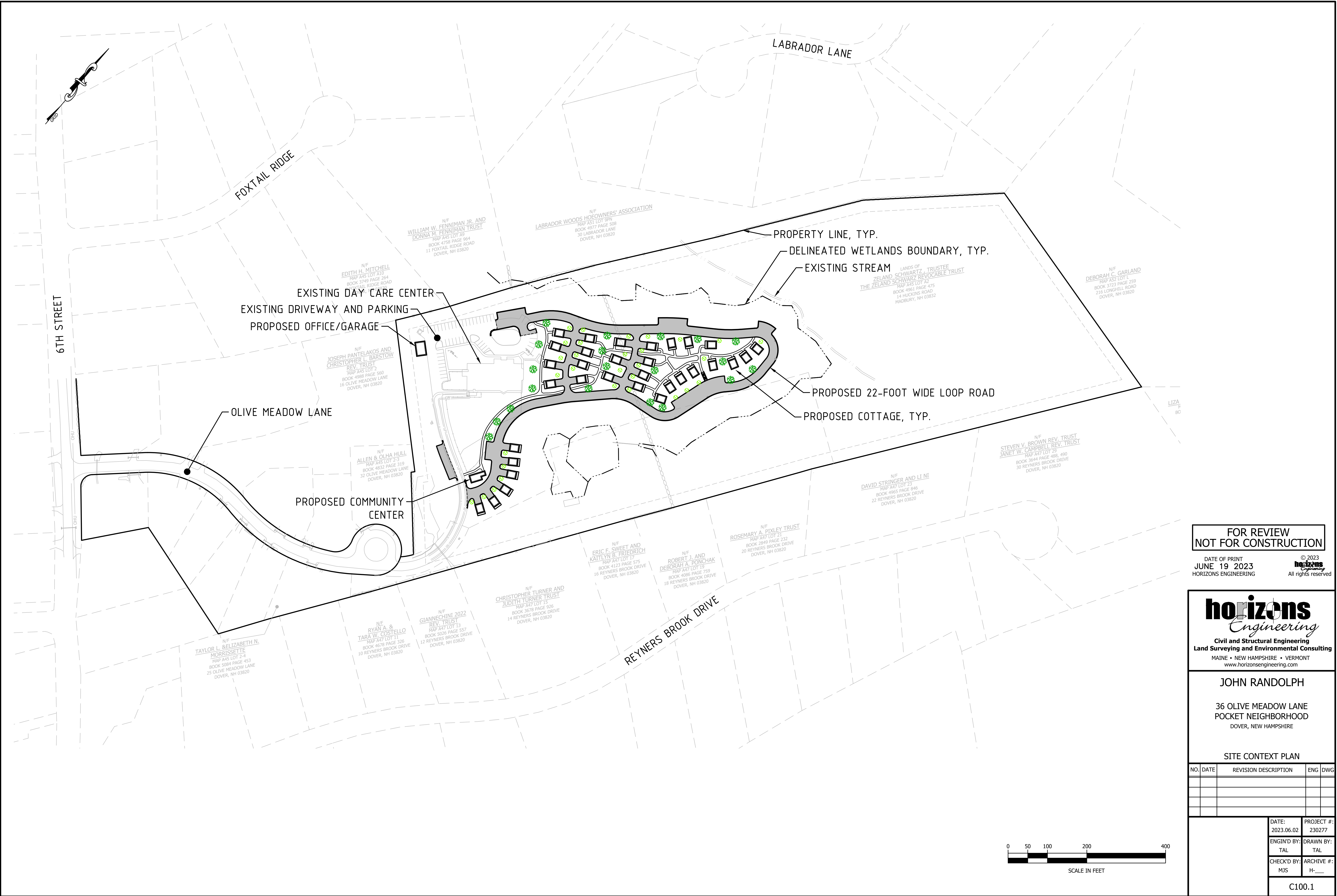
LOCATED AT
36 OLIVE MEADOW LANE
DOVER, STRAFFORD COUNTY, NEW HAMPSHIRE
DOVER TAX MAP A45 LOT A2
DEED BOOK 4961 PAGE 475

NO.	DATE	REVISION DESCRIPTION	ENG	DWG



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SHEET 1 OF 1



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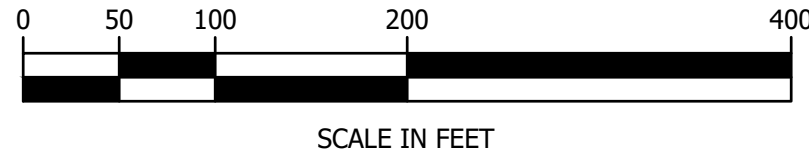
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36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

SITE CONTEXT PLAN

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: 2023.06.02	PROJECT #: 230277
ENG'ND BY: TAL	DRAWN BY: TAL
CHECK'D BY: MJS	ARCHIVE #: H-___
C100.1	



1. THE INTENT OF THIS PLAN IS TO DEVELOP THE EXISTING PROPERTY INTO AN AFFORDABLE/WORKFORCE HOUSING COMMUNITY.
2. CURRENT OWNER OF RECORD: SCHWARTZ ZEELAND TRUSTEE
14, HUCKINS ROAD
MADBURY, NH 03832 OWNER SIGNATURE: _____
3. SUBJECT PARCEL IS LOCATED IN THE CITY OF DOVER, COUNTY OF STRAFFORD AND THE STATE OF NEW HAMPSHIRE.
4. TOTAL LOT AREA: 1,093,356 SQ. FT. = 25.1 ACRES
5. TAX MAP A45, LOT A2 OF THE CITY OF DOVER TAX ASSESSOR'S MAPS.
6. PROJECT DEED REFERENCE: STRAFFORD COUNTY REGISTRY OF DEEDS BOOK NO. 4961, PAGE NO. 475
7. ZONING: R-40
MIN. LOT SIZE: 40,000 SQ. FT.
MIN. FRONTAGE: 150 FT.
MIN. SETBACKS:
MIN. FRONT: 40 FT.
MIN. SIDE: 25 FT.
MIN. REAR: 30 FT.
MAX. BUILDING HEIGHT: 35 FT.
MAX. LOT COVERAGE: 10%
8. THIS PROPERTY FALLS WITHIN THE FOLLOWING ZONING OVERLAY DISTRICTS: WETLANDS, CONSERVATION.

IN THE MONTH OF OCTOBER, 2018 MICHAEL MARIANO, STATE OF NEW HAMPSHIRE CERTIFIED SOIL SCIENTIST, NH CERTIFIED WETLAND SCIENTIST, CONDUCTED AN ON-SITE WETLANDS DELINEATION OF THE SUBJECT PARCEL. WETLANDS WERE IDENTIFIED BASED ON THE CITY OF DOVER ZONING ORDINANCE (170-271) AND ON STATE AND FEDERAL CRITERIA OUTLINES IN THE "CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL" (DEPT. OF THE ARMY 1987) ON THIS SITE. WETLANDS BASED ON LOCAL CRITERIA SHARE THE SAME BOUNDARIES WITH THOSE BASED ON STATE AND FEDERAL CRITERIA. NO VERY POORLY DRAINED SOILS WERE FOUND.
9. ON JUNE 22, 2020 JOSEPH W. NOEL, CERTIFIED SOIL SCIENTIST COMPLETED A SITE SPECIFIC SOIL MAP IN ACCORDANCE WITH "SITE SPECIFIC SOIL MAPPING STANDARDS FOR NEW HAMPSHIRE AND VERMONT" (SOCIETY OF SOIL SCIENTISTS OF NORTHERN

4. A PORTION OF THE SUBJEC PARCEL IS TO BE PERMANENTLY DESIGNATED SPECIAL FLOOD HAZARD ZONE (FLOOD ZONE A - PANE 0340E. MAP NO. 33007C0340E, DATE 9-30-2015)
12. LOTS ARE SERVICED BY CITY WATER AND MUNICIPAL SEWER.
13. AS-BUILT PLANS OF THE SUBDIVISION SHALL BE SUBMITTED ON PAPER AND IN DIGITAL FORMAT AUTOCAD DWG, AUTOCAD DXF OR ESRF FORMAT TO THE CITY OF DOVER ENGINEER'S OFFICE UPON COMPLETION OF PROJECT IF A STREET IS PROPOSED FOR CITY ACCEPTANCE. AS-BUILT PLANS SHALL BE PREPARED AND CERTIFIED CORRECT BY A L.L.S. OR P.E. DIGITAL FILES OF THE CITY OF DOVER REFLECTED TO THE CORRECT PLANE COORDINATES NAD83 AND SHALL BE EXPRESSED IN FEET.
14. THE INSTALLATION OF THE ELECTRICAL POWER, CABLE TELEVISION AND TELEPHONE LINES SHALL BE UNDERGROUND THROUGHOUT THE SITE FOR WHICH DEVELOPMENT IS PROPOSED.
15. ALL CONSTRUCTION SHALL CONFORM WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION (NHDOT) "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" AND WITH THE CITY OF DOVER COMMUNITY SERVICES REGULATIONS AND STANDARD SPECIFICATION FOR CONSTRUCTION. THE MORE STRINGENT SPECIFICATION SHALL APPLY.
16. THE LIMITS OF CONSTRUCTION DISTURBANCE THAT ARE LOCATED IN OR WITHIN THE 50 FT OF CONSERVATION AND WETLAND DISTRICTS SHALL BE STAKED, FLAGGED AND CLEARLY IDENTIFIED PRIOR TO ANY EARTH DISTURBING ACTIVITY OCCURS.
17. ALL TREATMENT SWALES TO BE CONSTRUCTED SHALL HAVE SOFT BOTTOMS.
18. A LETTER OF CREDIT FOR THE COST OF REVEGETATING ALL DISTURBED AREAS ON THE SITE SHALL BE SUBMITTED, AND THE APPROVED CONSTRUCTION SIGN INSTALLED PRIOR TO ANY EARTH DISTURBING ACTIVITY.
19. A PRE-CONSTRUCTION CONFERENCE WITH THE DEVELOPER, THE DESIGN ENGINEER, THE EARTHWORK CONTRACTOR AND THE CITY ENGINEER SHALL OCCUR PRIOR TO ANY EARTH DISTURBING ACTIVITY.
20. SITE CONSTRUCTION HOURS SHALL BE LIMITED TO MONDAY-FRIDAY 7 AM-6 PM. HOURS OF CONSTRUCTION MUST BE DETERMINED BY A MEETING WITH THE CITY ENGINEER AND THE INFORMATION FOR THE GENERAL CONTRACTOR, SUD SIGNAGE MUST BE LOCATED AND APPROVED BY THE CITY ENGINEER OR ASSISTANT CITY MANAGER.
21. BUILDING ADDRESSES (INCLUDING APT./UNIT NUMBERS IF APPLICABLE) SHALL BE ASSIGNED BY THE BUILDING OFFICIAL AT THE TIME OF ISSUANCE OF A BUILDING PERMIT.

21. THE PROPOSED USE FOR THE SITE IS SINGLE FAMILY COTTAGES FOR WORK FORCE HOUSING. 32 TOTAL, 2, 3 AND 4 BEDROOM UNITS.
22. THE FOLLOWING FEDERAL AND STATE PERMITS HAVE BEEN ISSUED FOR THE SUBJECT PROPERTY:
A. ALTERATION OF TERRAIN
B. NIDES SEWER DISCHARGE
C. NHDES SHORELAND
23. COMMERCIAL VEHICLE ROUTE DURING CONSTRUCTION SHALL CONFORM TO DORSET CITY CODE OR BE COORDINATED WITH THE COMMUNITY SERVICES DIRECTOR.
24. ANY RETAINING WALL OVER FOUR FEET (4') REQUIRES THE ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.
25. AND FENCE TALLER THAN SEVEN FEET (7') REQUIRES THE ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.
26. THE OWNER OF RECORD SHALL RECORD AT THE REGISTRY OF DEEDS DOCUMENTATION SUFFICIENT TO PROVIDE NOTICE TO ALL PERSONS WHOSE INTERESTS MAY AFFECT ANY PROPERTY SUBJECT TO THE REQUIREMENTS AND RESPONSIBILITIES DESCRIBED IN THE APPROVED STORMWATER MANAGEMENT PLAN. THE NOTICE SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS FOR RECORDING CONTAINED IN RSA 477 AND 478. THE NOTICE NEED NOT SET FORTH THE REQUIREMENTS AT LENGTH, SO LONG AS SUFFICIENT TO PROVIDE NOTICE TO ALL PROSPECTIVE PURCHASERS TO THE REQUIREMENTS FOR MAINTENANCE AND REPORTING.
27. FIRE DEPARTMENT ACCESS ROADS SHALL BE INSTALLED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF FIRE APPARATUS IN ALL WEATHER CONDITIONS AT ALL TIMES.
28. MAXIMUM ALLOWED PARKING SPACE CALCULATION:

USE	UNITS	STANDARD	ALLOWED	PROVIDED
RESIDENTIAL	32	14 SPACES/UNIT + 0.5 GUEST SPACES/UNIT	61	73
29. EXTERIOR LIGHTING SHALL BE CUT-OFF TYPE FIXTURES PER CHAPTER 153:14-E AND SHALL PROVIDE LIGHTING DIRECTED ON-SITE ONLY.
30. TOPOGRAPHIC SURVEY PERFORMED BY HORIZONS ENGINEERING IN MAY, 2023.
31. ELEVATIONS ARE BASED ON NEW HAMPSHIRE STATE PLANE COORDINATES SPC (2800 NH). (VERTICAL DATUM: NAVD83). (DOVER GIS)

35. APPROVED BACKFLOW PREVENTERS SHALL BE PROVIDED FOR BOTH FIRE AND DOMESTIC WATER.
36. A LETTER OF CREDIT FOR THE COST OF REVEGETATING ALL DISTURBED AREAS ON THE SITE SHALL BE SUBMITTED, AND THE APPROVED CONSTRUCTION SIGN INSTALLED PRIOR TO ANY EARTH DISBURING ACTIVITIES OCCURS.
37. EXISTING DAYCARE BUILDING SHALL REMAIN IN SERVICE ON SITE.
38. PROPOSED COTTAGES HAVE A MINIMUM 14' OF SPACE BETWEEN THEM.
39. RIDESHARE PROGRAM TO BE OFFERED TO EMPLOYEES OF HARMONY HOMES ASSISTED LIVING, AN ANTICIPATED MINIMUM OF 20% OF RESIDENTS WOULD RIDESHARE OR CARPOOL. CARPOOLING IS COMMON AMONG CURRENT EMPLOYEES
40. RESIDENTS' WORK FOR OTHER COMPANIES WOULD ALSO BE ABLE TO CAR POOL; COMPANIES WOULD BE ENCOURAGED TO PROVIDE RIDESHARING OPPORTUNITIES FOR THEIR EMPLOYEES AS WELL.
41. IT IS ANTICIPATED THAT APPROXIMATELY 10% OF RESIDENTS WOULD WORK FROM HOME.
42. ANY MODIFICATION TO OWNERSHIP RIGHTS, SUCH AS THE CREATION OF CONDOMINIUMS, WOULD REQUIRE PLANNING BOARD APPROVAL.
43. ANY INTERIOR STONE WALLS WILL BE REUSED ON SITE.
44. APPLICANT SHALL COMPLETE LAND USE DEVELOPMENT TRACKING FORM, MOST RECENTLY REVISED VERSION, UTILIZING THE ONLINE POLLUTION TRACKING AND ACCOUNTING PILOT PROJECT (PTAPP) PORTAL: <https://www.unh.edu/unhscs/ptapp>
45. THE SITE LAYOUT IS DESIGNED IN COMPLIANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS. THE PROPOSED STRUCTURE WILL ALSO BE DESIGNED IN ACCORDANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS. (I.E. BC, ANSI-117.1) AND NH RSA 155-A:5.
46. A FENCE, PER THE AGREEMENT WITH RED BARN DRIVE HOA, SHALL BE INSTALLED IN THE 30' BUFFER.
47. NO SUSTAINED STEEP SLOPES (>20%) WITH AN AREA OF 2,000 SQUARE FEET OR MORE EXIST WITHIN THE PROPOSED DEVELOPMENT AREA.



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JOHN RANDOLPH

36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

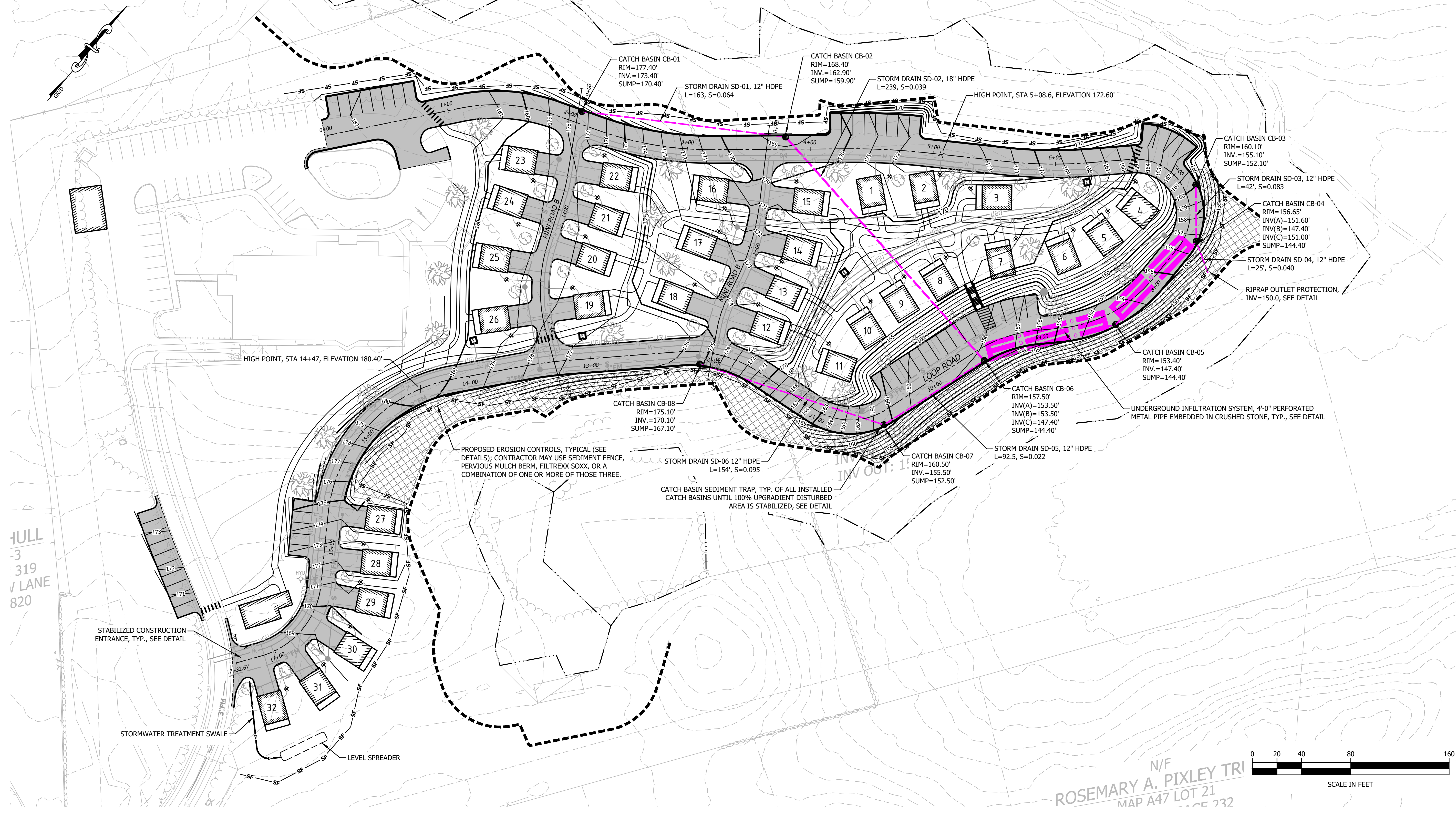
SITE PLAN

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

	DATE:	PROJECT #
	2023.06.02	230277
	ENGINE'D BY:	DRAWN BY:
	TAL	TAL
	CHECK'D BY:	ARCHIVE #
	MJS	H-____
C101		

N/F
WILLIAM W. FENNIMAN JR. AND
DONNA M. FENNIMAN TRUST
MAP A45 LOT A9
BOOK 4758 PAGE 964
11 FOXTAIL RIDGE ROAD
DOVER, NH 03820

N/F
LABRADOR WOODS HOEOWNERS' ASSOCIATION
MAP A51 LOT 9PN
BOOK 4977 PAGE 508
30 LABRADOR LANE
DOVER, NH 03820



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GRADING, DRAINAGE & EROSION
CONTROL PLAN

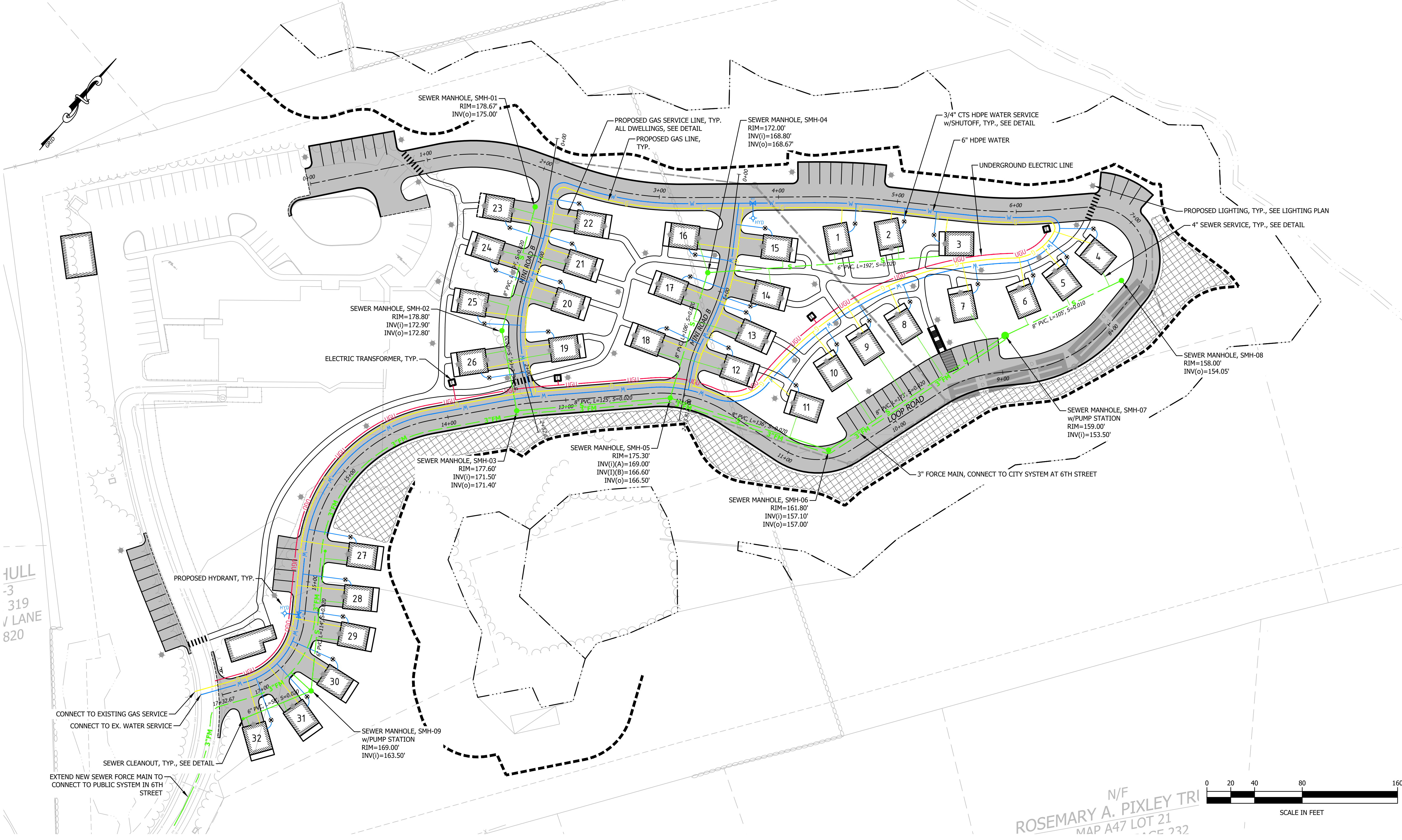
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DATE: 2023.06.02	PROJECT #: 230277
ENGINE'D BY: TAL	DRAWN BY: TAL
CHECK'D BY: MJS	ARCHIVE #: H-___

C102

N/F
WILLIAM W. FENNIMAN JR. AND
DONNA M. FENNIMAN TRUST
MAP A45 LOT A9
BOOK 4758 PAGE 964
11 FOXTAIL RIDGE ROAD
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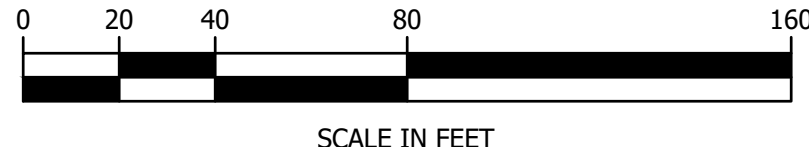
UTILITY PLAN

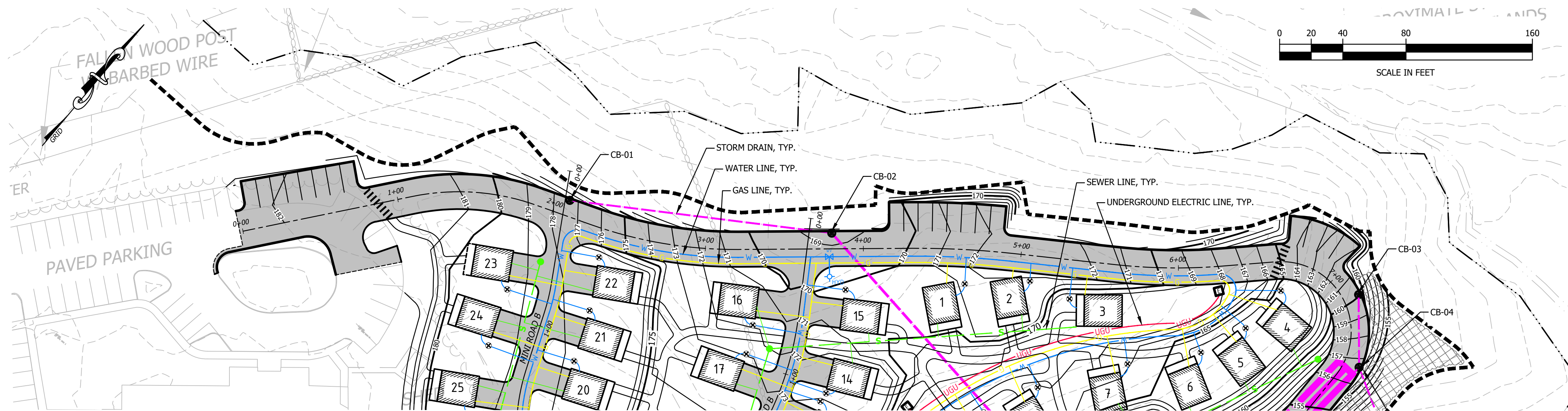
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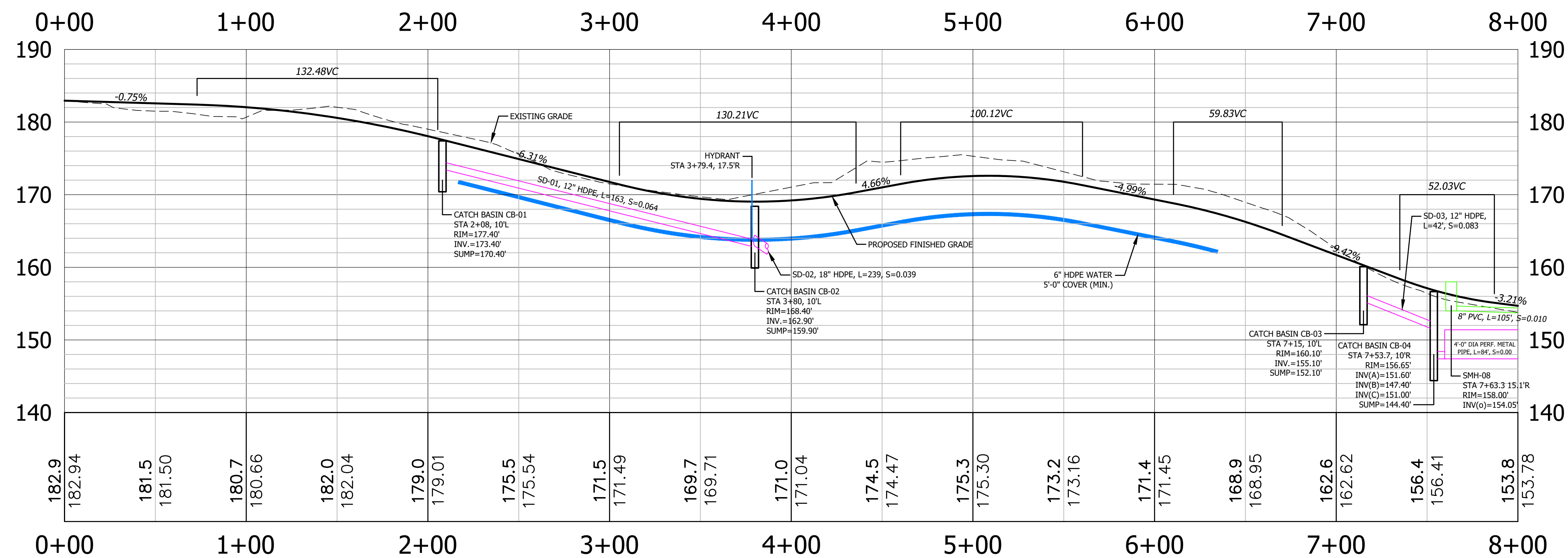
C102

N/F
ROSEMARY A. PIXLEY TR
MAP A47 LOT 21
PAGE 232





LOOP ROAD PLAN VIEW
STA: 0+00 to STA: 8+00
SCALE: 1"=40'



LOOP ROAD PROFILE VIEW
STA: 0+00 to STA: 8+00
SCALE(H): 1"=40'
SCALE(V): 1"=10'

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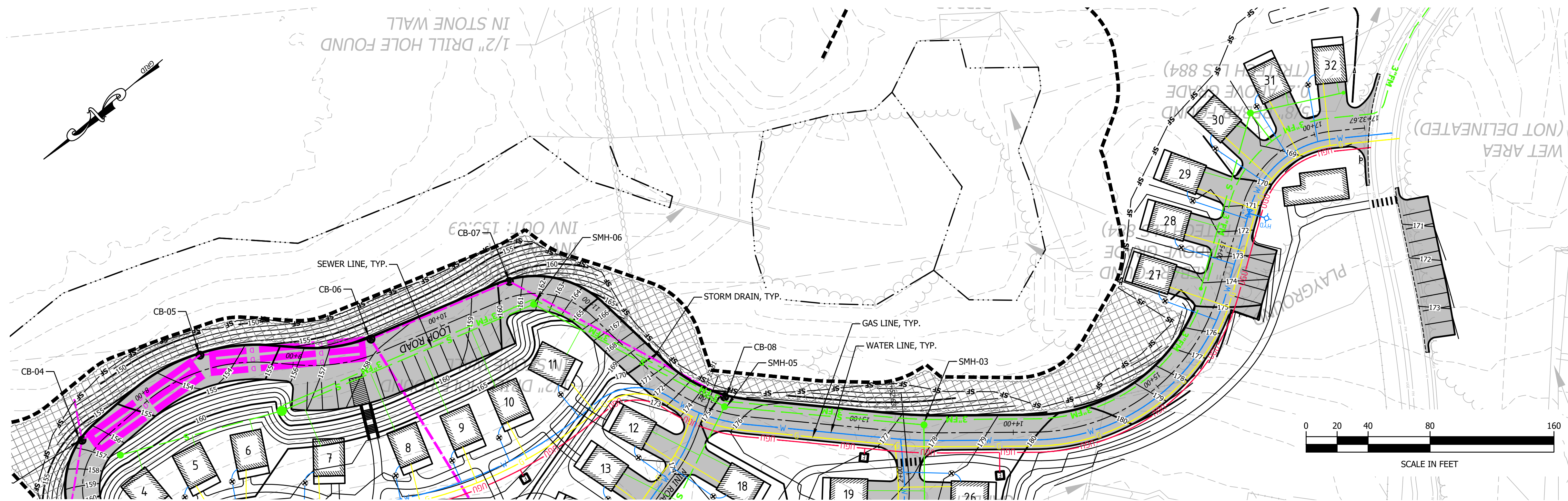
36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

PLAN & PROFILE SHEET 1 OF 2

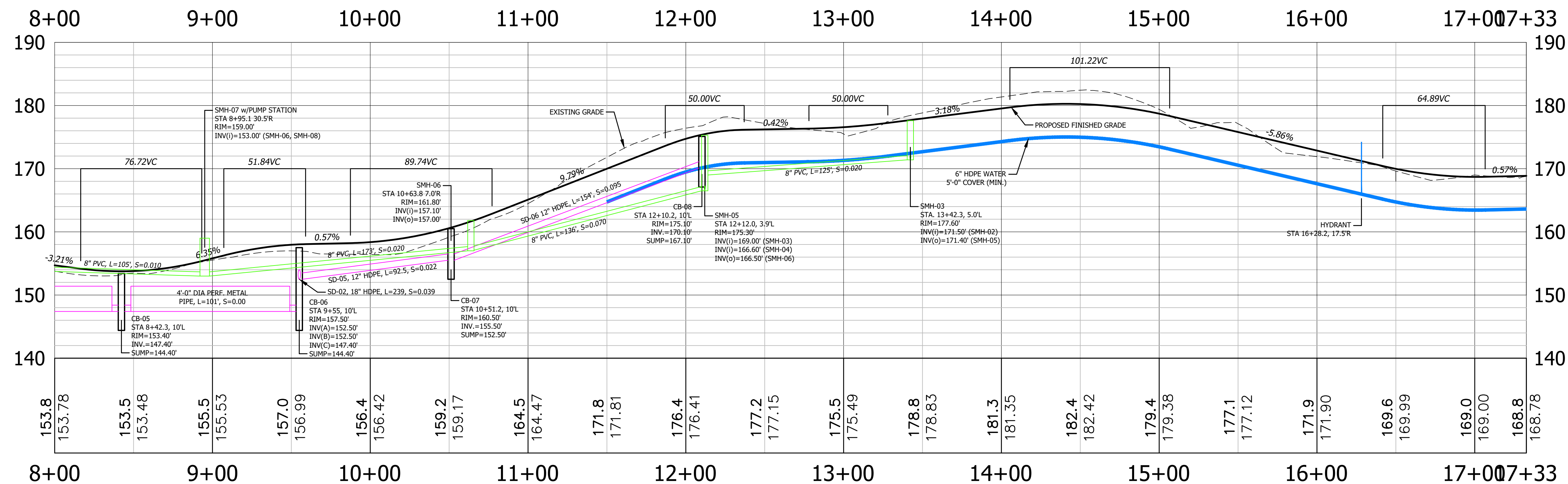
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CHECK'D BY: MJS	ARCHIVE #: H-___

C104



LOOP ROAD PLAN VIEW
STA: 8+00 to STA: 17+33
SCALE: 1"=40'



LOOP ROAD
STA: 8+00 to STA: 17+33
SCALE(H): 1"=40'
SCALE(V): 1"=10'

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PLAN & PROFILE SHEET 2 OF 2

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C105



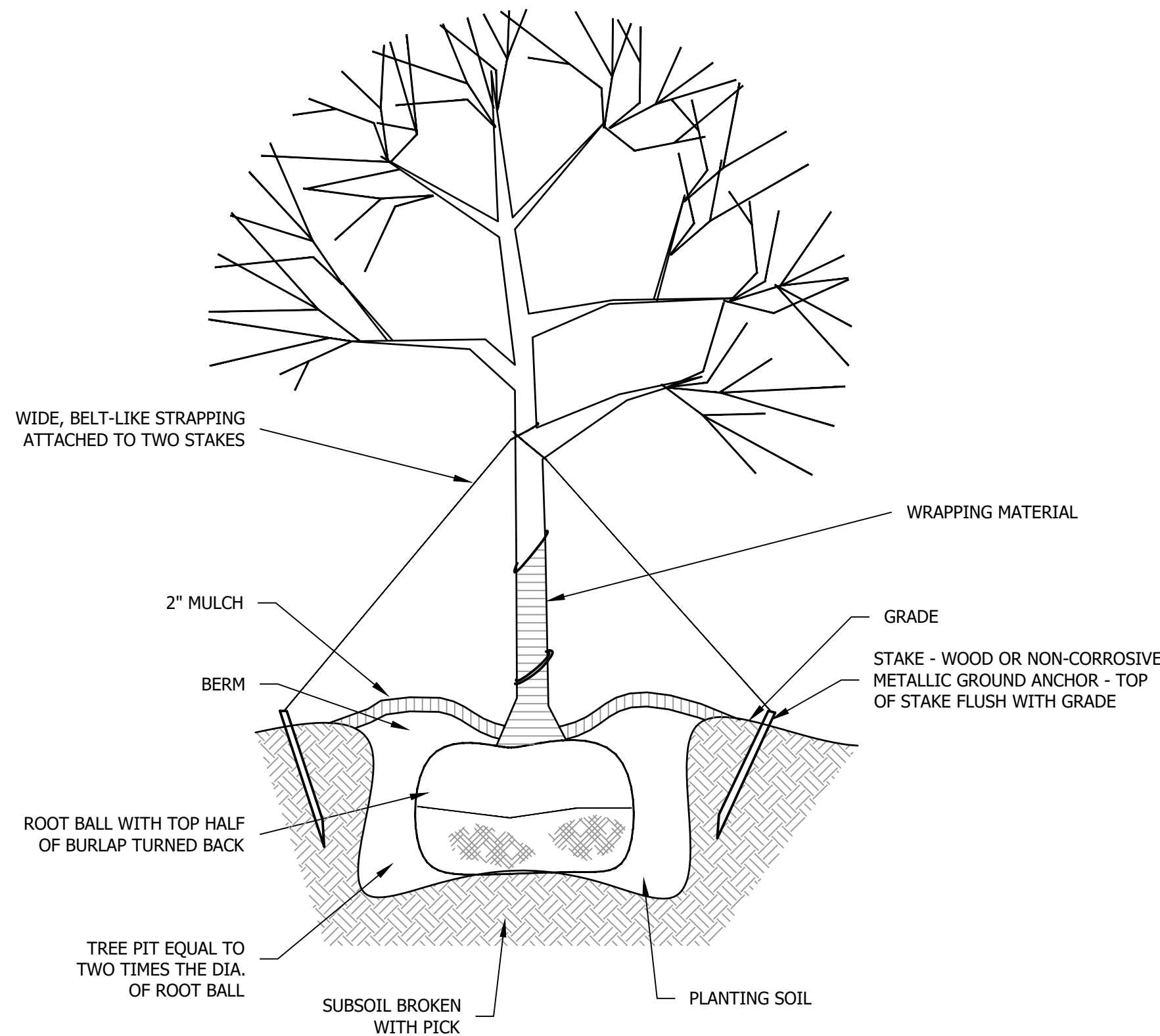
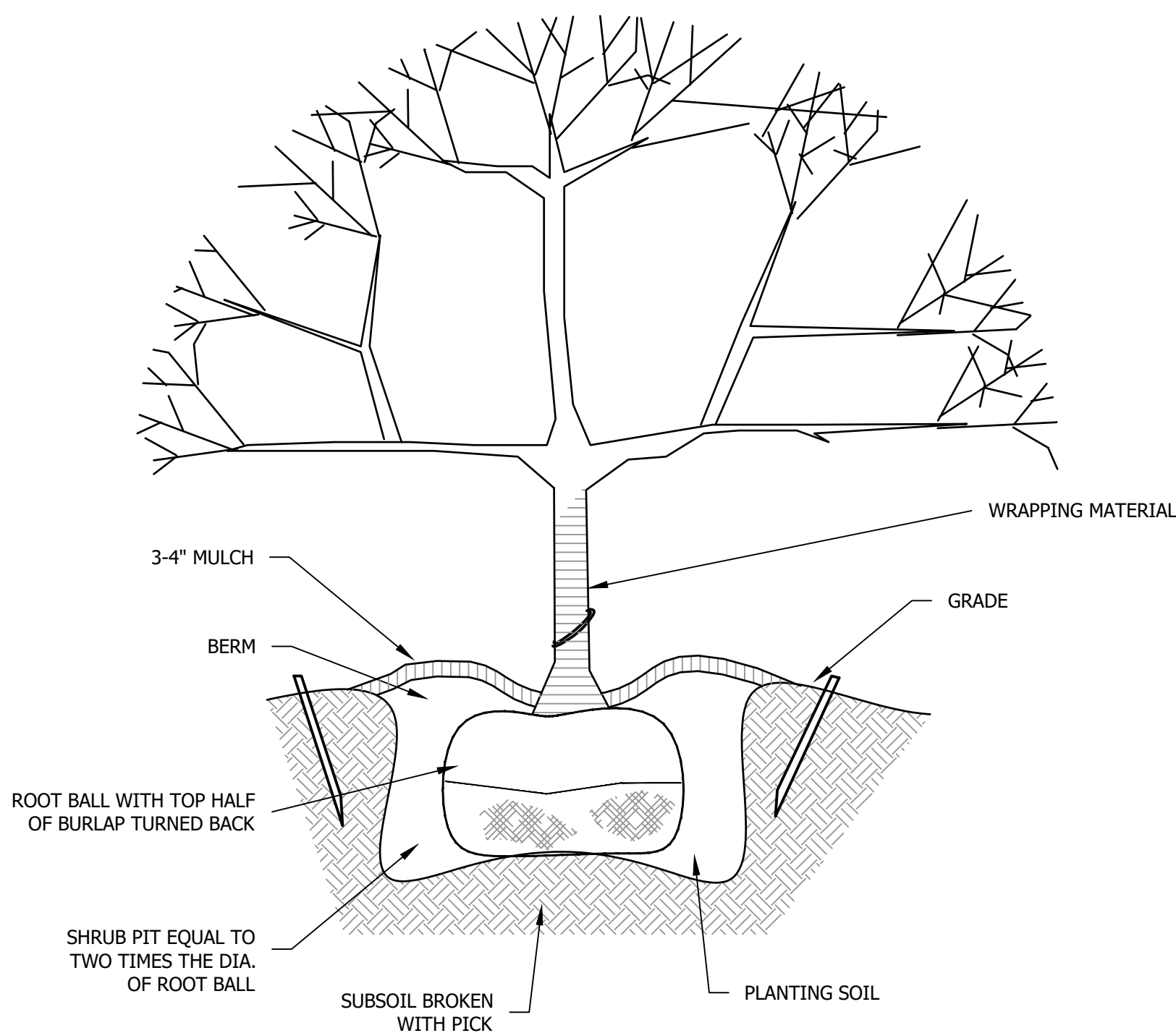
LANDSCAPE/PLANTING NOTES:

PREPARING A SITE

1. MEASURE THE HEIGHT AND DIAMETER OF ROOT BALL.
2. DIG TO THE DEPTH OF ROOT BALL, LEAVE BOTTOM OF SPACE FIRM.
3. DIG THE SPACE AT LEAST 2 TIMES THE DIAMETER OF THE ROOT BALL.
4. BREAK UP COMPACTED SOIL. SIDES OF PLANTING SPACE SHOULD NOT BE COMPACTED.
5. DO NOT AMEND SOIL UNLESS PLANTING IN BUILDING RUBBLE, POOR, OR SEVERELY DISTURBED SOILS.

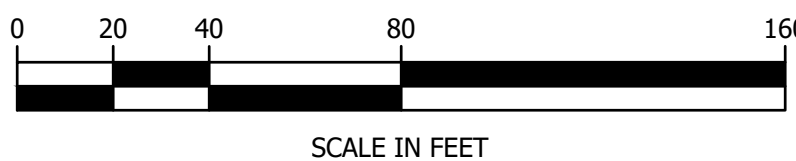
PLANTING

1. LIFT SHRUB/TREE INTO SPACE BY ROOT BALL, NOT THE TRUNK.
2. BALANCE SHRUB/TREE UPRIGHT IN PLANTING SPACE.
3. CUT AWAY STRINGS AND BURLAP OR PLASTIC, EXPOSING ROOT BALL. DO NOT REMOVE SOIL FROM ROOT BALL.
4. IF SHRUB/TREE IS CONTAINER GROWN, CUT AWAY AND REMOVE CONTAINER.
5. PRUNE DEAD OR CRUSHED ROOTS AND STRAIGHTEN OR CUT CIRCLING ROOTS. MAKE CLEAN CUTS.
6. BEGIN REFILLING WITH SOIL, WATERING AS YOU FILL TO FIRMLY SET SHRUB/TREE. GENTLY TAMP.
7. FILL SOIL UP TO SHRUB/TREE BASE JUST ABOVE WHERE ROOTS BEGIN TO BRANCH.
8. PRUNE ONLY DEAD OR INJURED BRANCHES. DO NOT PAINT WOUNDS.
9. REMOVE SHRUB/TREE WRAP, TAPE, OR STRING ON TRUNK. TRUNKS SHOULD BE WRAPPED ONLY TO PROTECT THEM IN TRANSIT TO PLANTING SITE.
10. STAKE AND BRACE MOST SHRUBS/TREES AT PLANTING TIME. SUPPORT SHRUB/TREE BUT ALLOW IT TO MOVE OR SWAY.
11. USE WIDE BELT-LIKE STRAPPING ATTACHED TO TWO STURDY STAKES. DO NOT USE ROPE, OR WIRE THROUGH A RUBBER HOSE.
12. MULCH LIGHTLY WITH ABOUT 2-3" OF COMPOSTED MATERIAL AT LEAST TO THE DIAMETER OF CROWN OF SHRUB/TREE. LEAVE 3" CIRCLE OF BARE SOIL AROUND THE TRUNK. DEEP LAYERS OF MULCH CAN BE HARMFUL.
13. DO NOT PLANT FLOWERS UNDER SHRUB/TREE.
14. DO NOT FERTILIZE AT PLANTING TIME.



SHRUB/TREE PLANTING AND GUYING DETAIL

FOR DECIDUOUS AND EVERGREEN TREES
NOT TO SCALE



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LANDSCAPING PLAN

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C200

LIGHTING SCHEDULE

Symbol	Label	QTY	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Filename	Lumens per Lamp	Lumen Multiplier	LLF	Wattage	Efficiency	Distribution
	B	16	Lithonia Lighting	RADE LED P2 30K SYM MVOLT BTS BCC DDBXD	RADE LED P2 30K SYM DDBXD; mounted at 3.5ft	LED	1	RADE_LED_P2_30K_SYM_DDB_XD.ies	589	1	0.9	8	100%	TYPE VS, BUG RATING: B0 - U1 - G0
	D	64	Lithonia Lighting	WF6 LL LED 27K MVOLT	LED Ultra Thin Wafer Low Lumen 2700K; 120 - 277V; mounted at 9ft	LED	1	WF6_LL_LED_27K_MVOLT.ies	819	1	0.9	12.7	100%	DIRECT, SC-0=1.24, SC-90=1.24
	R-ASY	9	Lithonia Lighting	RADPT LED P2 30K ASY MVOLT RADPT20 HS DDBXD with RSS 16 4B T20 DDBXD	RADEAN Post-Top with P2 3000K Asymmetric distribution with house-side shield; mounted at 16ft	LED	1	RADPT_P2_30K_ASY_HS.ies	4205	1	0.9	38.0107	100%	TYPE IV, VERY SHORT, BUG RATING: B1 - U2 - G2
	R-P	7	Lithonia Lighting	RADPT LED P2 30K PATH MVOLT RADPT20 HS DDBXD with RSS 16 4B T20 DDBXD	RADEAN Post-Top with P2 3000K Pathway distribution with house-side shield; mounted at 16ft	LED	1	RADPT_P2_30K_PATH_HS.ies	3509	1	0.9	38.0107	100%	TYPE IV, SHORT, BUG RATING: B1 - U2 - G2

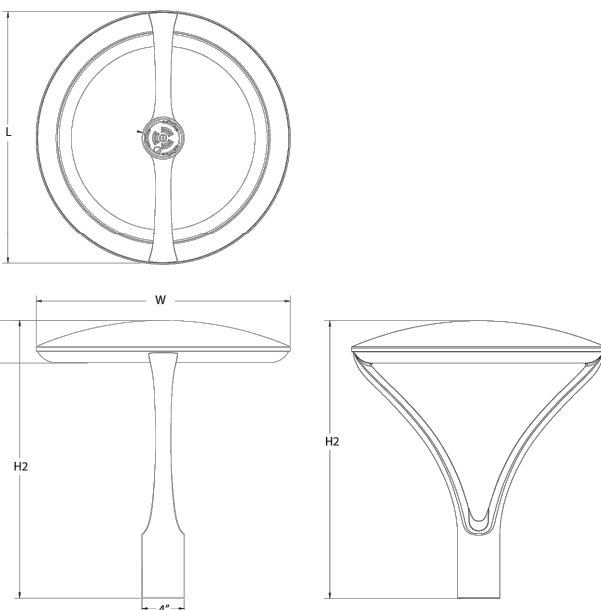


Radean Post Top LED Area Luminaire



Specifications

EPA: 1.02 ft² (0.105 m²)
Length: 24" (61cm)
Width: 24" (61cm)
H1 Luminaire Height: 4" (10.16cm)
H2 Luminaire Height: 26" (66.04cm)
Weight: 38lbs (17.24Kg)



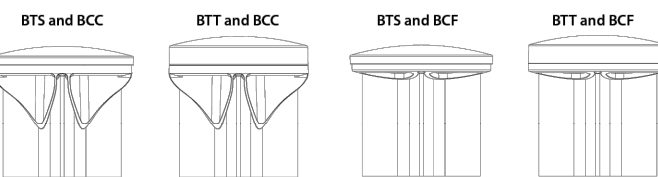
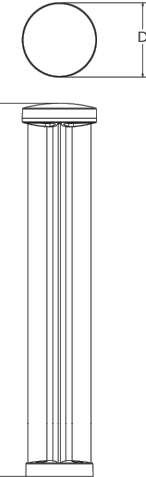
R-ASY AND R-P STYLE LIGHTING

NTS



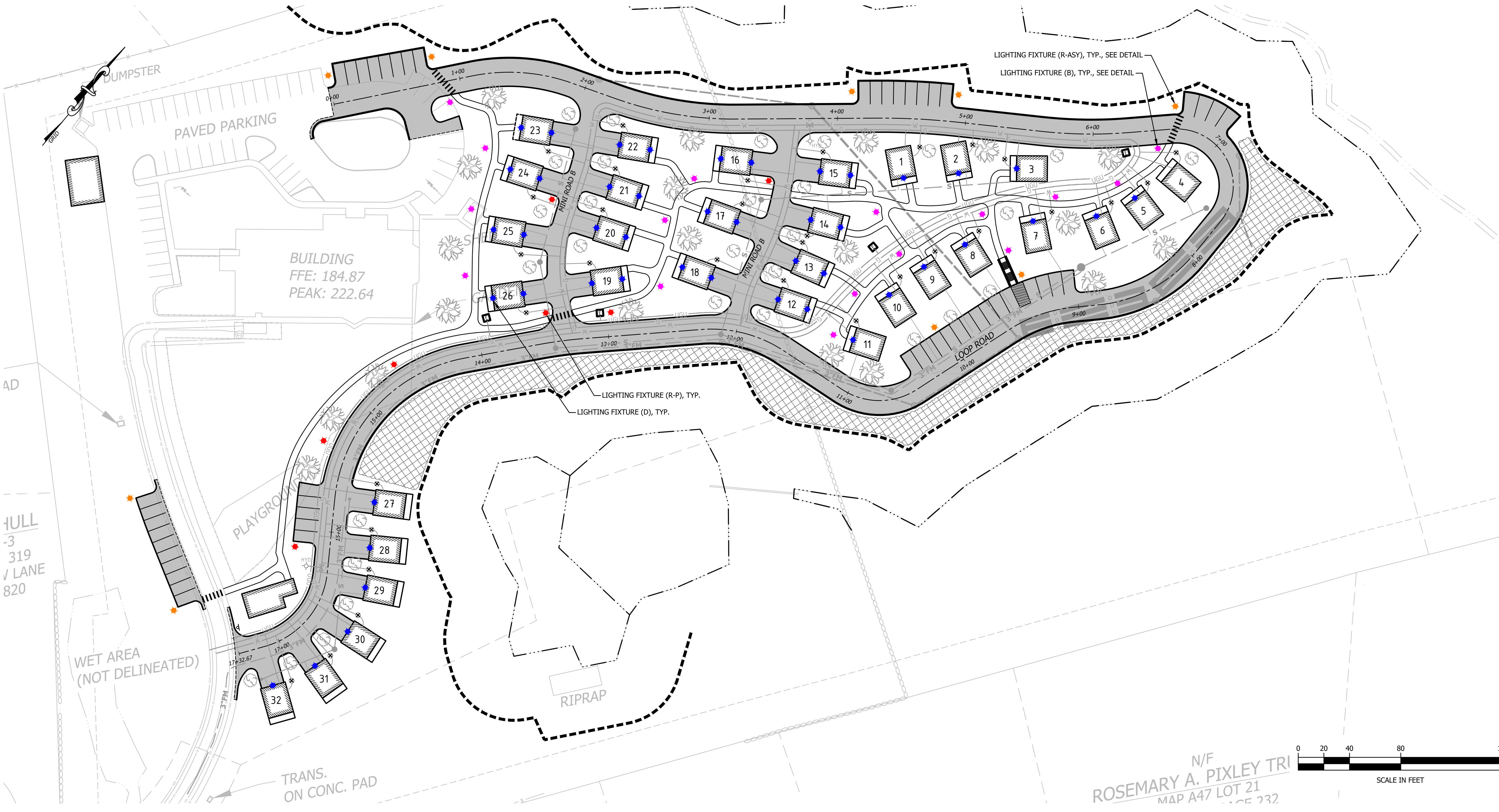
Specifications
Diameter: D = 8.25" (20.96cm)
Height: H = 41.5" Standard (105.41cm)
Weight (max): 20lbs (9.07Kg)

RADEAN Bollard LED Site Luminaire



BOLLARD (B) STYLE LIGHTING

NTS



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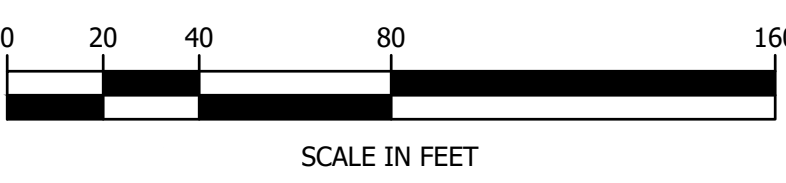
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36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

LIGHTING PLAN

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C201



N/F
ROSEMARY A. PIXLEY TR
MAP A47 LOT 21
AGE 232

CONSTRUCTION SEQUENCING AND EROSION CONTROL NOTES:

AREA OF DISTURBANCE/STABILIZATION

- A. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT IN NO CASE SHALL THE AREA OF UNSTABILIZED SOIL EXCEED 5 ACRES AT ANY ONE TIME BEFORE THE AREA IS STABILIZED.
- B. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
1. IN AREAS TO BE PAVED, BASE COURSE GRAVELS MEETING THE GRADATION REQUIREMENTS OF NHDOT STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, 2006, ITEM NO. 304.1 OR 304.2 HAVE BEEN INSTALLED;
 2. IN AREAS NOT TO BE PAVED
 - 2.A. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
 - 2.B. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
 - 2.C. EROSION CONTROL BLANKETS HAVE BEEN INSTALLED IN ACCORDANCE WITH ENV-WQ 1506.03.
- C. DISTURBED AREAS SHALL BE TEMPORARILY STABILIZED WITHIN 45 DAYS AND PERMANENTLY STABILIZED NO LATER THAN 3 DAYS AFTER FINAL GRADING.

EROSION CONTROL PRACTICES:

- A. INSTALLATION:
1. INSTALL ALL EROSION CONTROLS AS SHOWN ON THE GRADING PLAN, TYPICAL DETAILS, AND IN CONFORMANCE WITH THE EROSION AND SEDIMENT CONTROL NOTES ON THIS PAGE. MANUFACTURER'S SPECIFICATIONS SHALL BE FOLLOWED.
- B. INSPECTION:
1. INSPECT ALL EROSION CONTROLS WEEKLY AND AFTER EVERY RAIN EVENT OF 0.5 INCHES OR GREATER UNLESS OTHERWISE NOTED.
 2. TEMPORARY STABILIZATION PRACTICES SHALL BE INSPECTED ONCE PER WEEK DURING CONSTRUCTION UNTIL EXPOSED SURFACES ARE STABILIZED.
 3. ANY SIGNS OF RILL OR GULLY EROSION SHALL BE IMMEDIATELY REPAIRED.
- C. MAINTENANCE:
1. MAINTAIN EROSION CONTROLS PER THE TYPICAL DETAILS AND IN CONFORMANCE WITH THE EROSION AND SEDIMENT CONTROL NOTES ON THIS PAGE.
- D. REMOVAL
1. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE 85% VEGETATIVE COVER HAS BEEN ESTABLISHED.
 2. AFTER REMOVAL, ALL DISTURBED AREAS SHALL BE REGRADED, FERTILIZED, AND RESEEDED. MONITOR TO ENSURE VEGETATIVE GROWTH IS ESTABLISHED AND REPAIR AS NEEDED UNTIL MINIMUM OF 85% VEGETATIVE COVER IS ESTABLISHED.

PROTECTED SHORELAND REQUIREMENTS

- A. ALL WORK SHALL CONFORM TO THE COMPREHENSIVE SHORELAND PROTECTION ACT AND CITY OF DOVER SHORELAND PROTECTION OVERLAY DISTRICT.
- B. WITHIN 3 DAYS OF FINAL GRADING OR TEMPORARY SUSPENSION OF WORK IN AN AREA THAT IS IN THE PROTECTED SHORELAND, ALL EXPOSED SOIL AREAS SHALL BE STABILIZED BY:
1. SEEDING AND MULCHING, IF DURING THE GROWING SEASON
 2. MULCHING WITH TACK OR NETTING IF NOT WITHIN THE GROWING SEASON
 3. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
 4. EROSION CONTROL BLANKETS HAVE BEEN INSTALLED IN ACCORDANCE WITH ENV-WQ 1506.03.
- C. FERTILIZER
1. LOW PHOSPHATE, SLOW RELEASE NITROGEN FERTILIZER (NOT MORE THAN 2% PHOSPHORUS AND A NITROGEN COMPONENT WHICH IS AT LEAST 50% SLOW RELEASE NITROGEN COMPONENTS) SHALL BE USED BEYOND 25 FEET FROM THE REFERENCE LINE.
 2. APPLY 10-0-10 LOW PHOSPHATE FERTILIZER AT A RATE OF 600 lb./ac.
 3. APPLY LIMESTONE (EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS/ACRE.

COLD WEATHER SITE STABILIZATION

- A. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY 30TH NOVEMBER, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
- B. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
- C. AFTER 15TH OCTOBER, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.

TEMPORARY VEGETATION

(REFER TO PROTECTED SHORELAND REQUIREMENTS FOR WORK WITHIN THE PROTECTED SHORELAND)

- A. SITE PREPARATION
1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES AS SPECIFIED ABOVE.
 2. ENSURE RUNOFF IS DIVERTED FROM SEEDBED AREA.
 3. ON SLOPES OF 4:1 OR STEEPER, CREATE HORIZONTAL GROOVES PERPENDICULAR TO THE DIRECTION OF THE SLOPE TO CATCH SEED AND REDUCE RUNOFF.
- B. SEED BED PREPARATION
1. REMOVE STONES AND TRASH FROM AREA TO BE SEEDBED.
 2. COMPACTED SOIL SHALL BE LOOSENED TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME, AND SEED.
 3. APPLY FERTILIZER AT A RATE OF 600 LBS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS PER ACRE.
- C. SEEDING
1. SEED PER THE FOLLOWING RECOMMENDATIONS

SEASON	APPLICATION DATE	MIXTURE TYPE	QUANTITY (lb./Ac.)
EARLY SPRING	NO LATER THAN 5/15	OATS	80
LATE SPRING/ FALL	4/1 TO 6/1 & 8/15 TO 9/15	PERENNIAL RYE	30
EARLY SPRING/ FALL	4/1 TO 5/15 & 8/15 TO 9/15	ANNUAL RYE	40
FALL	8/15 TO 9/15	WINTER RYE	112

2. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL, CULTIPACKER TYPE SEEDER OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). NORMAL SEEDING DEPTH IS FROM ¼ TO ½ INCH. HYDROSEEDING THAT INCLUDES MULCH MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING.
 3. TEMPORARY SEEDING SHOULD TYPICALLY OCCUR PRIOR TO SEPTEMBER 15TH.
 4. AREAS SEEDBED BETWEEN MAY 15TH AND AUGUST 15TH SHOULD BE COVERED WITH HAY OR STRAW MULCH.
 5. VEGETATED GROWTH COVERING AT LEAST 85% OF THE DISTURBED AREA SHOULD BE ACHIEVED PRIOR TO OCTOBER 15TH. IF THIS CONDITION IS NOT ACHIEVED, IMPROVE OTHER TEMPORARY STABILIZATION MEASURES FOR OVERWINTER PROTECTION.
- D. MAINTENANCE
1. TEMPORARY SEEDING SHOULD BE INSPECTED WEEKLY AND AFTER ANY RAINFALL EXCEEDING ¼ INCH IN 24 HOURS ON ACTIVE CONSTRUCTION SITES. TEMPORARY SEEDING SHOULD ALSO BE INSPECTED JUST PRIOR TO SEPTEMBER 15, TO ASCERTAIN WHETHER ADDITIONAL SEEDING IS REQUIRED TO PROVIDE STABILIZATION OVER THE WINTER PERIOD.
 2. BASED ON INSPECTION, AREAS SHOULD BE RESEEDED TO ACHIEVE FULL STABILIZATION OF EXPOSED SOILS. IF IT IS TOO LATE IN THE PLANTING SEASON TO APPLY ADDITIONAL SEED, THEN OTHER TEMPORARY STABILIZATION MEASURES SHOULD BE IMPLEMENTED.
 3. AT A MINIMUM, 85% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION.
 4. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHOULD BE MADE AND AREAS SHOULD BE RESEEDED, WITH OTHER TEMPORARY MEASURES (E.G., MULCH) USED TO PROVIDE EROSION PROTECTION DURING THE PERIOD OF VEGETATION ESTABLISHMENT.

PERMANENT VEGETATION

(REFER TO PROTECTED SHORELAND REQUIREMENTS FOR WORK WITHIN THE PROTECTED SHORELAND)

- A. SITE PREPARATION
1. REFER TO SITE PREPARATION FOR TEMPORARY SEEDING.
- B. SEED BED PREPARATION
1. WORK LIME AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH A DISC, SPRING TOOTH HARROW OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OPERATION SHOULD BE ON THE GENERAL CONTOUR. CONTINUE TILLAGE UNTIL A REASONABLY UNIFORM, FINE SEEDBED IS PREPARED. ALL BUT CLAY OR SILTY SOILS AND COARSE SANDS SHOULD BE ROLLED TO FIRM THE SEEDBED WHEREVER FEASIBLE.
 2. REMOVE FROM THE SURFACE ALL STONES 2 INCHES OR LARGER IN ANY DIMENSION. REMOVE ALL OTHER DEBRIS, SUCH AS WIRE, CABLE, TREE ROOTS, CONCRETE, CLODS, LUMPS, TRASH OR OTHER UNSUITABLE MATERIAL.
 3. INSPECT SEEDBED JUST BEFORE SEEDING. IF TRAFFIC HAS LEFT THE SOIL COMPACTED, THE AREA MUST BE TILLED AND FIRMED AS ABOVE.
 4. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED.
 5. APPLY FERTILIZER AT A RATE OF 600 LBS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS PER ACRE.
- C. SEEDING
1. UNLESS OTHERWISE NOTED, GRASS SEED MIXTURE 'C' SHALL BE APPLIED AT THE SPECIFIED RATE AS NOTED IN THE 'SEED MIXTURES FOR PERMANENT VEGETATION' TABLE.
 2. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL, CULTIPACKER TYPE SEEDER OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). NORMAL SEEDING DEPTH IS FROM ¼ TO ½ INCH. HYDROSEEDING THAT INCLUDES MULCH MAY BE LEFT ON SOIL SURFACE. SEEDING OPERATIONS SHOULD BE ON THE CONTOUR.
 3. WHERE FEASIBLE, EXCEPT WHERE EITHER A CULTIPACKER TYPE SEEDER OR HYDROSEEDER IS USED, THE SEEDBED SHOULD BE FIRMED FOLLOWING SEEDING OPERATIONS WITH A ROLLER, OR LIGHT DRAG.
 4. WHEN HYDROSEEDING (HYDRAULIC APPLICATION), PREPARE THE SEEDBED AS SPECIFIED ABOVE OR BY HAND RAKING TO LOOSEN AND SMOOTH THE SOIL AND TO REMOVE SURFACE STONES LARGER THAN 2 INCHES IN DIAMETER.
 5. SLOPES MUST BE NO STEEPER THAN 2 TO 1.
 6. LIME AND FERTILIZER MAY BE APPLIED SIMULTANEOUSLY WITH THE SEED. THE USE OF FIBER MULCH ON CRITICAL AREAS IS NOT RECOMMENDED (UNLESS IT IS USED TO HOLD STRAW OR HAY). BETTER PROTECTION IS GAINED BY USING STRAW MULCH AND HOLDING IT WITH ADHESIVE MATERIALS OR 500 POUNDS PER ACRE OF WOOD FIBER MULCH.
 7. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING.
- D. MAINTENANCE
1. PERMANENTLY SEEDBED AREAS SHOULD BE INSPECTED MONTHLY.
 2. MOW SEEDBED AREAS AS NECESSARY.
 3. BASED ON INSPECTION, AREAS SHOULD BE REPAIRED AND/OR RESEEDED TO ENSURE 85% OF THE SOIL SURFACE IS COVERED BY VEGETATION.

MULCHING & EROSION CONTROL MATTING

- A. GENERAL
1. APPLY PRIOR TO A STORM EVENT. CLOSELY MONITOR THE WEATHER TO HAVE ADEQUATE WARNING OF SIGNIFICANT STORMS.
 2. MULCHING WITHIN A SPECIFIED TIME PERIOD FROM ORIGINAL SOIL EXPOSURE
 - 2.A. WITHIN 100 FEET OF WETLANDS THE TIME PERIOD SHOULD BE NO GREATER THAN 7 DAYS.
 - 2.B. IN OTHER AREAS IT SHALL BE NO GREATER THAN 14 DAYS.
- B. TEMPORARY MULCHING
1. HAY OR STRAW MULCHES
 - 1.A. ORGANIC MULCHES INCLUDING HAY AND STRAW SHALL BE AIR-DRIED, FREE OF UNDESIRABLE SEEDS AND COARSE MATERIALS.
 - 1.B. APPLICATION RATE SHALL BE 2 BALES/1,000 SF (70-90 POUNDS) OR 1.5-2.0 TONS/ACRE TO COVER 75-90% OF THE GROUND.
 - 1.C. ANCHORING
 - 1.C.1. EROSION CONTROL BLANKETS SHALL BE OF A WOVEN ORGANIC MATERIAL SUCH AS COCO MATTING. IT SHALL NOT CONSIST OF WELDED PLASTIC OR BIODEGRADABLE NETTING. INSTALL PER MANUFACTURERS SPECIFICATIONS.
 - 1.C.2. TACKIFIER: APPLY POLYMER OR ORGANIC TACKIFIER TO ANCHOR HAY OR STRAW MULCH. APPLY PER MANUFACTURER'S SPECIFICATIONS. TYPICAL APPLICATION RATES ARE 40-60 LBS/ACRE FOR POLYMER MATERIAL AND 80-120 LBS/ACRE FOR ORGANIC LIQUID.
- 1.D. WINTER APPLICATION: APPLY TO A DEPTH OF 4 INCHES OR DOUBLE THE ABOVE LISTED APPLICATION RATE. NOTE THAT IF SEEDING IS NECESSARY, MULCH WILL NEED TO BE REMOVED AND THE AREA SEEDBED AND MULCHED IN THE SPRING.
- 1.E. MAINTENANCE
- 1.E.1. INSPECT PERIODICALLY AND AFTER RAIN STORMS FOR RILLS OR DISPLACEMENT OF MULCH. REPAIR AS NECESSARY. CONTINUE INSPECTIONS UNTIL 85% VEGETATIVE COVER IS ESTABLISHED.
2. EROSION CONTROL BLANKET OR MATTING
- 2.A. EROSION CONTROL BLANKETS SHALL BE OF A WOVEN ORGANIC MATERIAL SUCH AS COCO MATTING. IT SHALL NOT CONSIST OF WELDED PLASTIC OR BIODEGRADABLE NETTING.
 - 2.B. REFER TO PLANS FOR TYPICAL EROSION CONTROL MATTING DETAIL.
 - 2.C. APPLICATION AND TIMING
 - 2.C.1. DURING THE GROWING SEASON (APRIL 15 - SEPTEMBER 15) USE ON THE BASE OF GRASSSED WATERWAYS, STEEP SLOPES (15% OR GREATER), ANY DISTURBED SOIL WITHIN 100 FEET OF LAKES, STREAMS, AND WETLANDS.
 - 2.C.2. DURING THE LATE FALL AND WINTER (SEPTEMBER 15 - APRIL 15) IN ADDITION TO THOSE LISTED ABOVE, USE ON SIDE SLOPES OF GRASSSED WATERWAYS AND MODERATE SLOPES (GREATER THAN 8%).
3. MAINTENANCE
- 3.A. INSPECT PERIODICALLY AND BEFORE AND AFTER STORM EVENTS TO ENSURE CONTACT WITH THE SOIL UNTIL 85% VEGETATIVE COVER IS ESTABLISHED. REPAIR AND RESTAPLE AS NECESSARY.
- C. PERMANENT MULCHING
1. WOOD CHIPS OR GROUND BARK
 - 1.A. APPLY TO A THICKNESS OF 2 TO 6 INCHES. TYPICAL APPLICATION RATES ARE 10-20 TONS/ACRE OR 460-920 POUNDS/1,000 SF.
 - 1.B. MAINTENANCE: INSPECT ANNUALLY AND AFTER RAIN EVENTS OF 2.5 INCHES OR MORE IN A 24 HOUR PERIOD. REPAIR/REPLACE AS NECESSARY.
 2. EROSION CONTROL MIX
 - 2.A. COMPOSITION OF THE MIX SHALL BE AS FOLLOWS:
 - 2.A.1. ORGANIC MATTER CONTENT SHALL BE BETWEEN 25-65% DRY WEIGHT BASIS.
 - 2.A.2. PARTICLE SIZE BY WEIGHT SHOULD BE 100% PASSING THE 3" SCREEN, 90-100% PASSING THE 1" SCREEN, 70-100% PASSING THE 0.75 INCH SCREEN, AND 30-75% PASSING THE 0.25 INCH SCREEN.
 - 2.A.3. THE ORGANIC PORTION SHALL BE ELONGATED AND FIBROUS. IT SHALL NOT CONTAIN WOOD AND BARK CHIPS, GROUND CONSTRUCTION DEBRIS, OR REPROCESSSED WOOD PRODUCTS.
 - 2.A.4. THE MIX SHALL NOT CONTAIN SILTS, CLAYS, OR FINE SANDS.
 - 2.A.5. SOLUBLE SALTS CONTENT SHALL BE < 4.0MMHOS/CM AND A pH OF 5.0-8.0.
 - 2.B. PLACEMENT OF BERM
 - 2.B.1. PLACE BERM ALONG A LEVEL CONTOUR. BERM MUST BE A MINIMUM OF 12" HIGH ON THE UPHILL SIDE AND 2 FEET WIDE.
 - 2.C. MAINTENANCE: INSPECT PERIODICALLY AND AUGMENT AS NEEDED TO MAINTAIN INITIAL THICKNESS. REPLACE IF NO LONGER FUNCTIONING AS INTENDED.

SOIL STOCKPILES

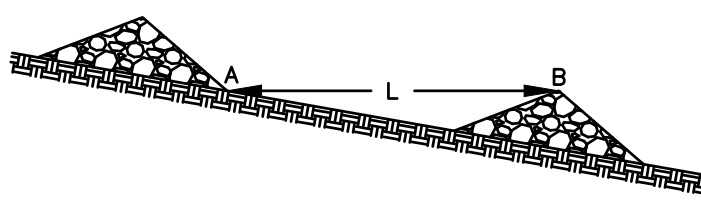
- A. GENERAL
1. STOCKPILES MUST BE LOCATED 50 FEET FROM DITCHES AND CULVERT INLETS.
- B. PROTECTION OF STOCKPILES
1. PROTECT SOIL AND AGGREGATE STOCKPILES WITH TEMPORARY PERIMETER SEDIMENT BARRIERS SUCH AS SILT FENCE OR SILT SOCK.
 2. COVER ACTIVE STOCKPILES WITH ANCHORED PROTECTIVE COVERING PRIOR TO EXPECTED STORM EVENTS.
 3. INACTIVE STOCKPILES SHALL BE COVERED WITH ANCHORED TARPS OR TEMPORARILY SEEDBED AND MULCHED PER THE TEMPORARY VEGETATION AND MULCHING NOTES ON THIS PAGE.
 4. STOCKPILES THAT ARE A SOURCE OF DUST SHALL BE COVERED.

DUST CONTROL

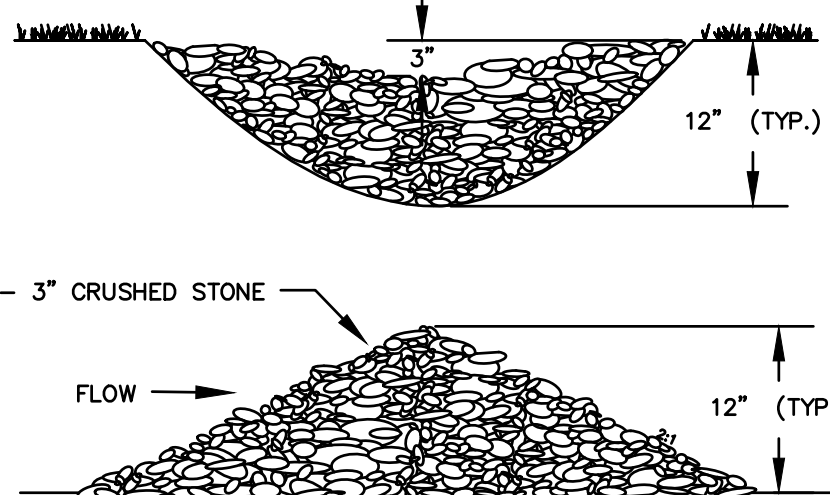
- A. DUST SHALL BE CONTROLLED ON SITE DURING CONSTRUCTION BY IMPLEMENTING THE FOLLOWING DUST CONTROL MEASURES
1. MULCHING AND VEGETATIVE COVER TO REDUCE DUST.
 2. MECHANICAL SWEEPERS AND FINE WATER SPRAYS.
 3. COVER SURFACES WITH CRUSHED STONE OR COARSE GRAVEL.

ADDITIONAL NOTES:

1. NO FUEL SHALL BE STORED ON SITE DURING CONSTRUCTION.
2. DURING CONSTRUCTION DUST SHALL BE PREVENTED FROM BECOMING A SAFETY OR HEALTH HAZARD BY THE IMPLEMENTATION OF ACCEPTED CONTROL METHODS SUCH AS WATERING.
3. ALL CONSTRUCTION MATERIALS THAT ARE SPILLED OR DEPOSITED ON THE PUBLIC ROADWAYS SHALL BE REMOVED BY THE CONTRACTOR.
4. DO NOT BEGIN CONSTRUCTION UNTIL ALL LOCAL, STATE, AND FEDERAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
5. THE GENERAL CONTRACTOR IS RESPONSIBLE TO VERIFY ALL DIMENSIONS, ELEVATIONS AND CONDITIONS AT THE SITE. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE DESIGN ENGINEER BEFORE PROCEEDING WITH THE AFFECTED PART OF THE WORK.



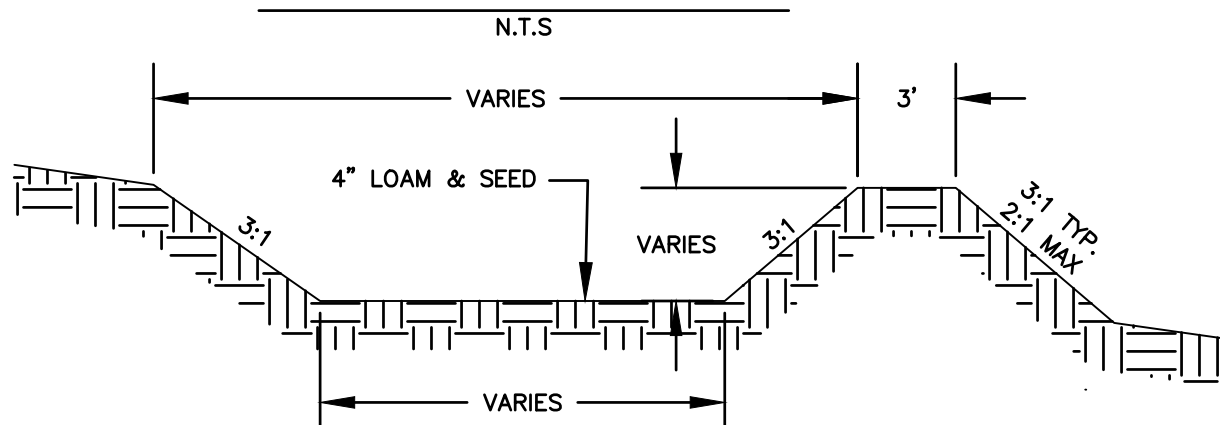
STONE CHECK DAM
PROFILE VIEW



- 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, AIR AND WATER POLLUTION WILL BE MINIMIZED.
 5. STRUCTURES SHALL BE REMOVED FROM THE CHANNEL WHEN THEIR USEFUL LIFE HAS BEEN COMPLETED.

- MAINTENANCE NOTES:
1. TEMPORARY GRADE STABILIZATION STRUCTURES SHOULD BE INSPECTED AFTER EACH STORM AND DAILY DURING PROLONGED STORM EVENTS. ANY DAMAGE TO THE STRUCTURES SHALL BE REPAIRED IMMEDIATELY.
 2. PARTICULAR ATTENTION SHOULD BE GIVEN TO END RUN AND EROSION AT THE DOWNSTREAM TOE OF THE STRUCTURE.
 3. WHEN REMOVING THE STRUCTURES, THE DISTURBED AREAS SHALL BE BROUGHT UP TO EXISTING CHANNEL GRADE AND THE AREAS PREPARED, SEEDBED AND MULCHED.
 4. SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURES WHEN IT REACHES 1/2 THE ORIGINAL HEIGHT OF THE STRUCTURE.

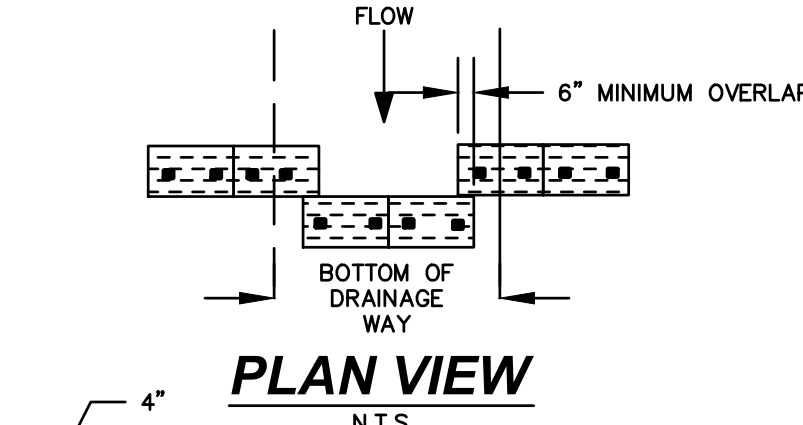
STONE CHECK DAM



CONVEYANCE SWALE DETAIL

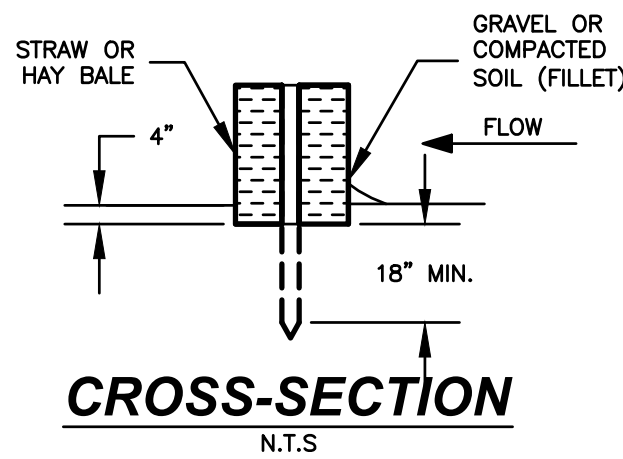
- CONSTRUCTION NOTES:
1. REFER TO BERM CONSTRUCTION NOTES IN STORMWATER POND DETAIL FOR BERM CONSTRUCTION REQUIREMENTS.
 2. SWALE SHALL HAVE GREATER THAN 85% VEGETATIVE GROWTH PRIOR TO RECEIVING RUNOFF.
 3. REFER TO PERMANENT VEGETATION REQUIREMENTS FOR SEEDING REQUIREMENTS. SEED MIX 'C' SHALL BE APPLIED AT THE SPECIFIED RATE ON SHEET D1.

- MAINTENANCE NOTES:
1. INSPECT ANNUALLY FOR EROSION, SEDIMENT ACCUMULATION, VEGETATION LOSS, AND PRESENCE OF INVASIVE SPECIES.
 2. PERFORM PERIODIC MOWING. DO NOT MOW GRASS SHORTER THAN 4 INCHES.
 3. REMOVE DEBRIS AND ACCUMULATED SEDIMENT BASED ON INSPECTION.
 4. REPAIR ERODED AREAS, REMOVE INVASIVE SPECIES AND DEAD VEGETATION, AND RESEED WITH APPLICABLE GRASS MIX AS WARRANTED BY INSPECTION.



PLAN VIEW

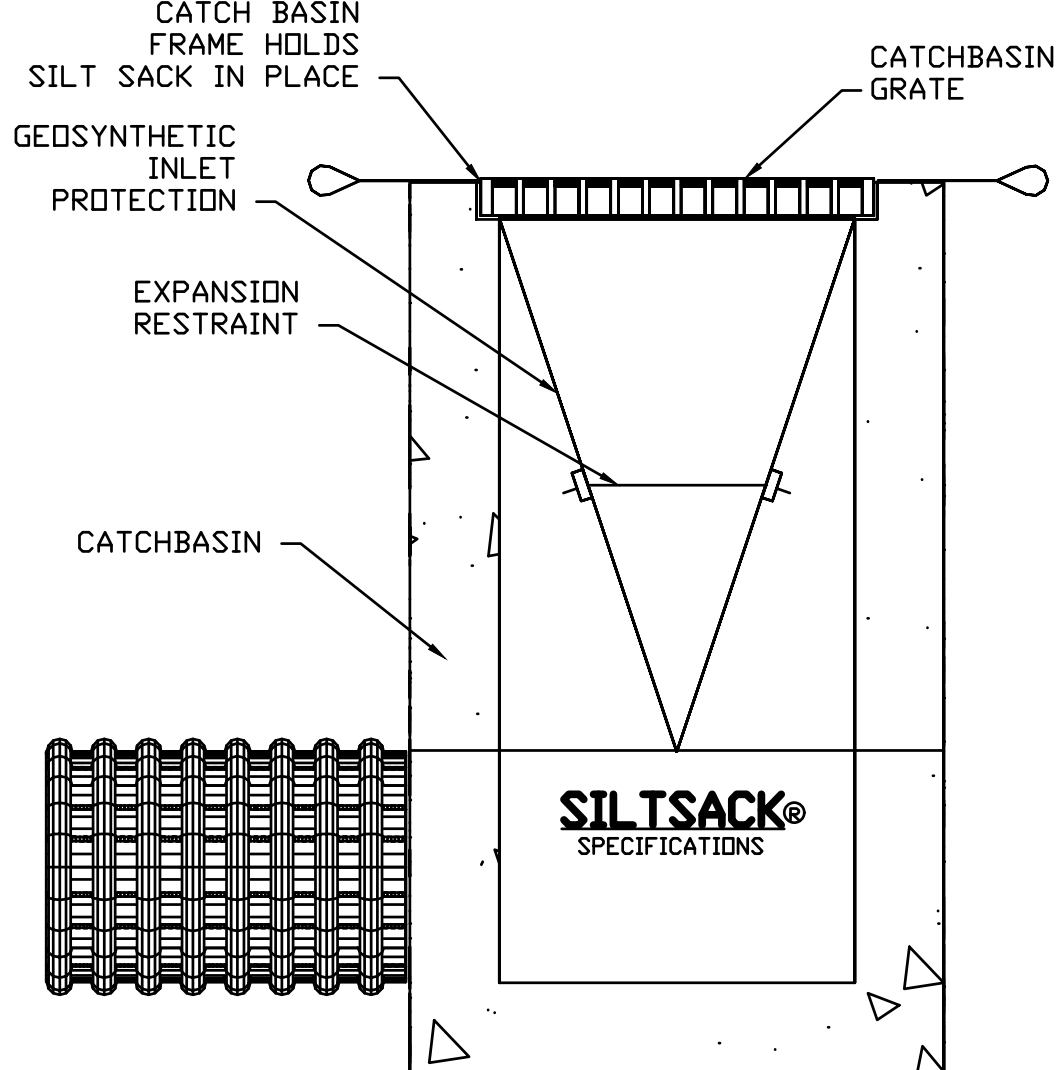
DRAINAGE WAY
CROSS-SECTION



CROSS-SECTION

HAY BALE INLET PROTECTION DETAIL

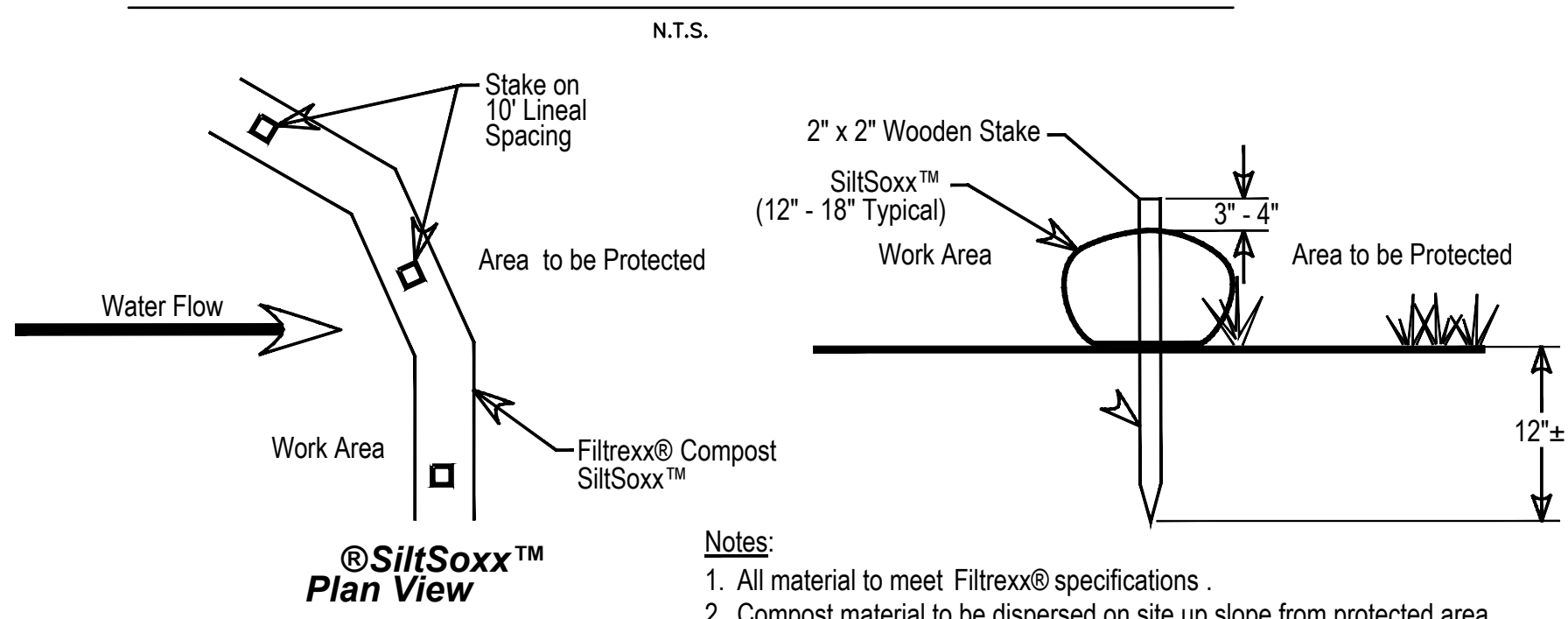
N.T.S.



NOTES:

1. GEOSYNTHETIC SEDIMENT FILTER TRAP SHALL BE 'REGULAR FLOW SILTSACK®' OR APPROVED EQUAL. SPECIFICATIONS FOR SILTSACK® ARE DETAILED.
2. FILTER TRAPS SHALL BE INSPECTED AFTER EVERY RAIN EVENT OF 0.25" OR GREATER AND SEDIMENTS SHALL BE REMOVED FROM TRAP WHEN SEDIMENT HAS REACHED TWO THIRDS OF THE DEPTH OF THE TRAP, OR IF PONDING OF WATER AT SURFACE BEGINS TO OCCUR. DO NOT PUNCTURE FILTER TRAP TO MITIGATE PONDING.

CATCH BASIN GEOSYNTHETIC SEDIMENT TRAP



Notes:

1. All material to meet Filtrxx® specifications.
2. Compost material to be dispersed on site up slope from protected area.

SILT SOXX DETAIL

FOR REVIEW
NOT FOR CONSTRUCTION

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Civil and Structural Engineering
Land Surveying and Environmental Consulting

MAINE • NEW HAMPSHIRE • VERMONT
www.horizonsengineering.com

JOHN RANDOLPH

36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

CONSTRUCTION DETAILS

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE:	PROJECT #:
2023.06.02	230277
ENGINE'D BY:	DRAWN BY:
TAL	TAL
CHECK'D BY:	ARCHIVE #:
MJS	H-___

C501

SEED MIXTURE SELECTION BASED ON SOIL TYPE				
USE	SEEDING MIXTURE	SOIL DRAINAGE		
		DROUGHTY	WELL DRAINED	MODERATELY WELL DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	FAIR	GOOD	GOOD
	B	POOR	GOOD	FAIR
	C	POOR	GOOD	EXCELLENT
	D	FAIR	EXCELLENT	EXCELLENT
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A	GOOD	GOOD	GOOD
	C	GOOD	EXCELLENT	EXCELLENT
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES.	A	GOOD	GOOD	GOOD
	B	GOOD	GOOD	EXCELLENT
PLAY AREAS AND ATHLETIC FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.)	E	FAIR	EXCELLENT	EXCELLENT
	F	FAIR	EXCELLENT	EXCELLENT

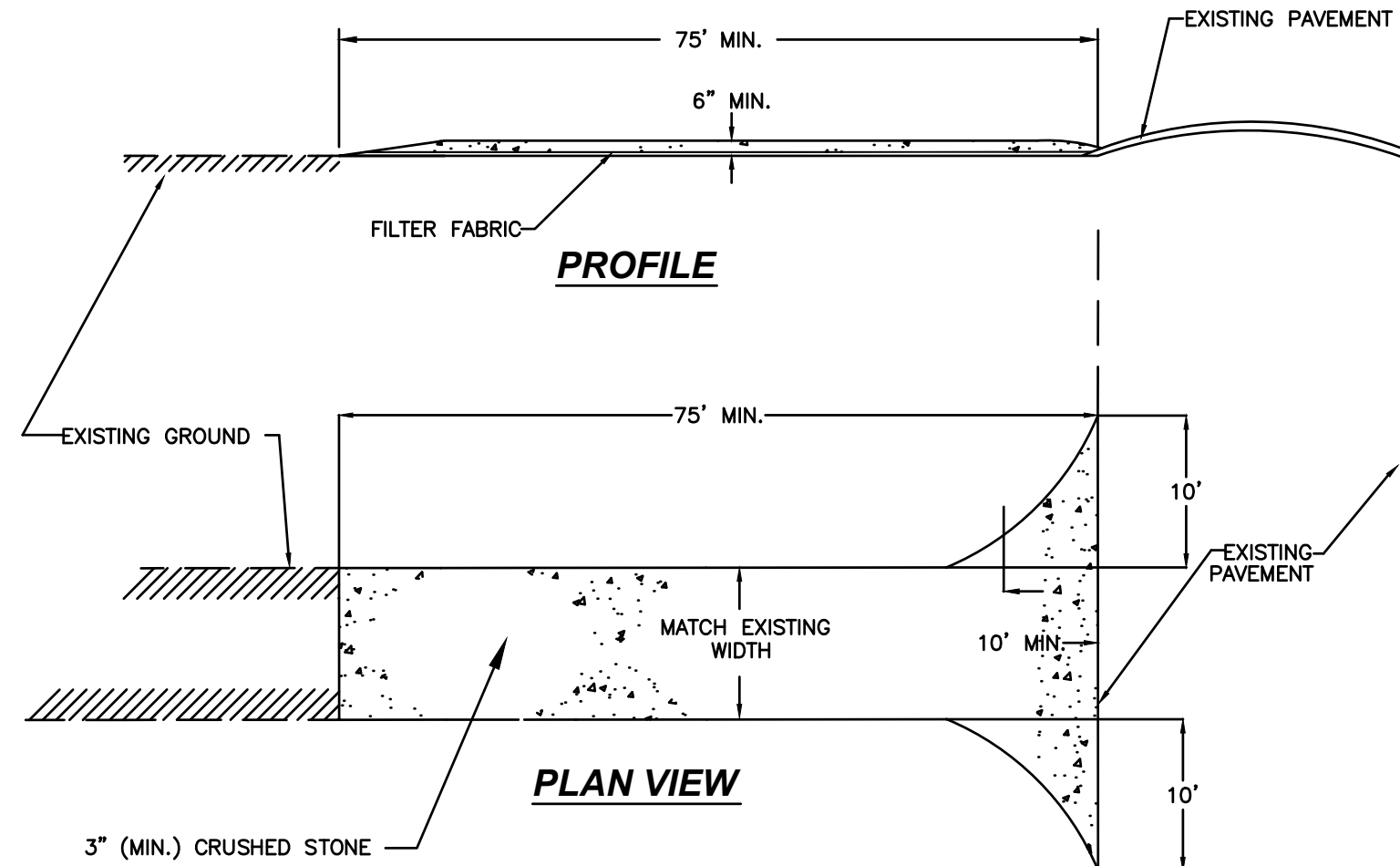
NOTE: POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREAS AND ATHLETIC FIELDS.

SEED MIXTURES FOR PERMANENT VEGETATION				
MIXTURE	SPECIES	POUNDS PER ACRE	POUNDS PER 1,000 SF	
A	TALL FESCUE	20	0.45	
	CREeping RED FESCUE	20	0.45	
	BIRDTOp	2	0.05	
	TOTAL	42	0.95	
B	TALL FESCUE	15	0.35	
	CREeping RED FESCUE	10	0.25	
	CROWN VETCH	15	0.35	
	OR FLATPEA	30	0.75	
	TOTAL	40 OR 55	0.95 OR 1.35	
C	TALL FESCUE	20	0.45	
	CREeping RED FESCUE	20	0.45	
	BIRDSEED TREFOIL	8	0.20	
	TOTAL	48	1.10	
D	TALL FESCUE	20	0.45	
	FLATPEA	30	0.75	
	TOTAL	50	1.20	
E	CREeping RED FESCUE	50	1.15	
	KENTUCKY BLUEGRASS	50	1.15	
	TOTAL	100	2.30	
F	TALL FESCUE	150	3.60	

CONSTRUCTION SEQUENCING:

THE ESTIMATED START OF CONSTRUCTION IS SPRING 2024 AND THE ESTIMATED END OF CONSTRUCTION IS SUMMER 2025. THE FOLLOWING CONSTRUCTION SEQUENCING SHALL BE FOLLOWED:

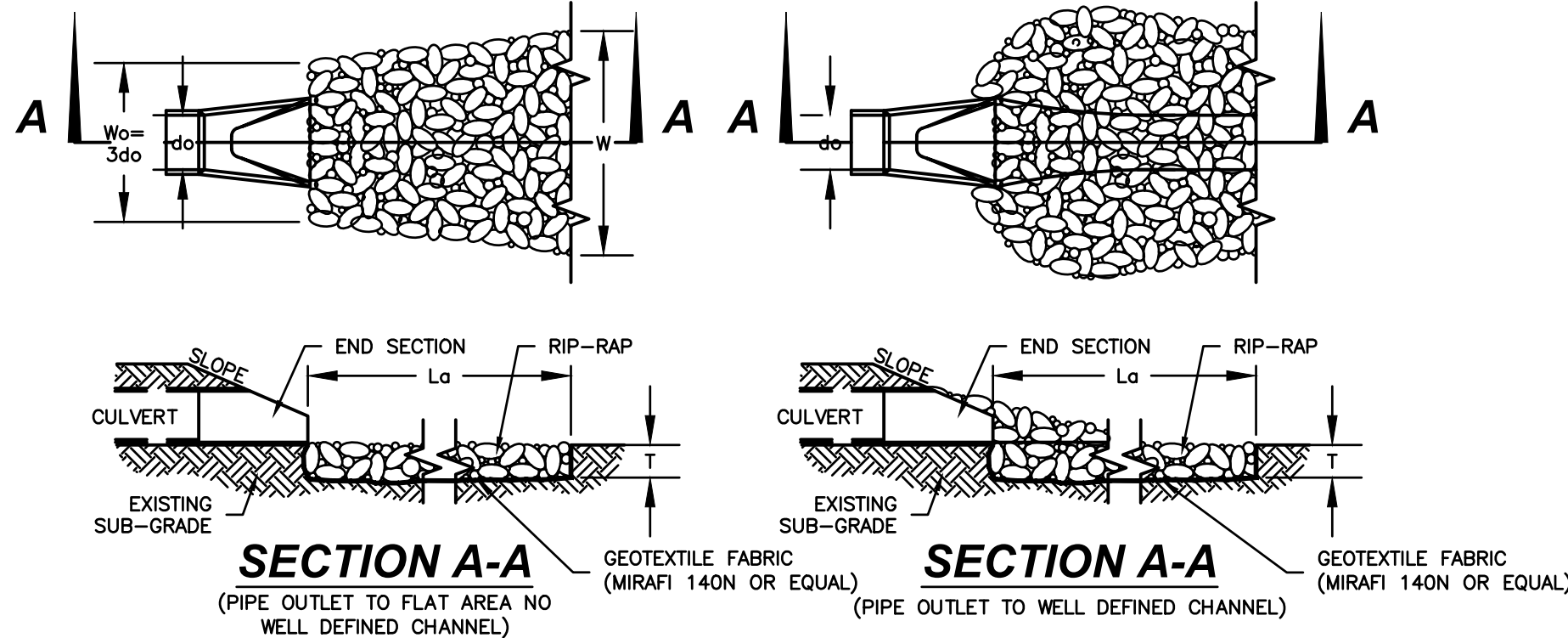
- SCHEDULE A PRE-CONSTRUCTION MEETING WITH CITY OFFICIALS, OWNER, AND CONTRACTORS IF REQUIRED BY THE CONDITIONS OF APPROVAL PRIOR TO BEGINNING CONSTRUCTION.
- CONTACT DIG-SAFE, INDIVIDUAL UTILITIES, AND CITY DEPARTMENTS TO GET ALL UTILITIES MARKED PRIOR TO START OF CONSTRUCTION.
- THE OWNER OR SITE GENERAL CONTRACTOR SHALL FILE A NOTICE OF INTENT (NOI) FOR COVERAGE UNDER THE EPA'S CONSTRUCTION GENERAL PERMIT (CGP). A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) SHALL BE AVAILABLE ON SITE.
- CONSTRUCT STABILIZED CONSTRUCTION ENTRANCES IN ACCORDANCE WITH THE STABILIZED CONSTRUCTION ENTRANCE DETAIL. A CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED AT THE BACK ROAD AND MCKONE LANE ACCESS POINTS.
- CONSTRUCT AND STABILIZE ALL TEMPORARY AND PERMANENT SEDIMENT AND EROSION CONTROLS INCLUDING SWALES AND SEDIMENT TRAPS.
- SEDIMENT AND EROSION PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH MOVING OPERATIONS AND SHALL FULLY ENCOMPASS ALL WORK COMPLETED DURING EACH PHASE.
- INSTALL SWALES AND TEMPORARY SEDIMENT TRAPS PRIOR TO ROUGH GRADING. THE LOCATION OF THE SEDIMENT TRAPS ARE SHOWN ON THE GRADING PLANS. A SEDIMENT TRAP DETAIL, INCLUDING SIZING INFORMATION, IS SHOWN ON SHEET D2.
- CONSTRUCTION OF THE STORMWATER PONDS AND TREATMENT SWALES SHALL BEGIN AFTER ALL CONTRIBUTING DISTURBED AREAS HAVE BEEN STABILIZED.
- THIS PROJECT SHALL BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 450:53 AND CHAPTER Agr 3800 RELATIVE TO INVASIVE SPECIES.
- INSTALL TEMPORARY CONSTRUCTION GATE AT NEW ENTRANCE ROAD FOR SAFETY PURPOSES.
- CLEAR AND GRUB THE ROADWAY AND PARKING AREAS, AND THE HOUSING AREA TO THE SOUTHWEST. REMOVE ORGANICS ONLY FROM THOSE AREAS THAT CAN BE WORKED AND STABILIZED WITHIN 45 DAYS OF REMOVAL. LOAM STOCKPILES SHALL BE STORED ON THE EXISTING CLEARED AREA TO THE SOUTHEAST OF THE ROADWAY. STOCKPILES SHALL BE TEMPORARILY STABILIZED WITH MULCH. STUMPS MAY BE DISPOSED OF ON OR OFFSITE IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS.
- MINIMIZE DISTURBANCE OF PREVIOUSLY STABILIZED SOILS ON SITE, THAT ARE OUTSIDE OF THE ROADWAY AND STORMWATER CONTROL AREAS.
- TOTAL SITE DISTURBANCE DEPICTED ON THESE PLANS IS APPROXIMATELY 178,100 SF (~4.1 AC.).
- REFER TO VEGETATION AND EROSION CONTROL NOTES ON THIS PLAN DURING CONSTRUCTION.
- THE ROAD CONSTRUCTION FOR THIS PROJECT WILL BE CONSTRUCTED IN ONE PHASE.
- ALL CONSTRUCTION SHALL FOLLOW EROSION CONTROL REQUIREMENTS AND CONSTRUCTION SEQUENCE AND SHALL BE STABILIZED WITHIN 45 DAYS OF COMPLETION.
- ROAD CONSTRUCTION
 - PROCEED WITH ROAD CONSTRUCTION IN THE LOCATION AND TO GRADES AS SHOWN ON THE PLANS. EXCAVATE ROADWAY TO SUBGRADE.
 - PLACE SELECT FILLS IN LOCATIONS AND TO THE GRADES SHOWN ON PLANS PER THE APPLICABLE DETAILS AND THE FOLLOWING:
 - PLACE FILL MATERIAL MEETING THE SPECIFICATION OF NHDOT 304.1 IN MAXIMUM 12" LIFTS AND COMPACT TO 95% MAXIMUM DRY DENSITY.
 - ALL MATERIAL SHALL BE FREE OF DELETERIOUS MATERIALS SUCH AS LOAM, STUMPS, BRUSH, AND ROCKS LARGER THAN 3/4 THE DEPTH OF THE LIFT BEING PLACED.
 - LOAM AND SEED SLOPES WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
 - BASE MATERIALS:
 - BANK RUN AND CRUSHED GRAVEL SHALL BE PLACED IN 6" LIFTS AND COMPACTED TO 95% MAXIMUM DRY DENSITY TO THE DEPTHS SPECIFIED IN THE ROAD CROSS-SECTION DETAILS.
 - PAVEMENT:
 - PLACE AS SOON AS POSSIBLE AFTER THE SELECT MATERIALS ARE INSTALLED AND ACCEPTED TO ELIMINATE SOIL EROSION.
 - STABILIZE ALL ROADWAYS WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
 - DRIVEWAY APRONS SHALL BE INCLUDED IF BASE GRAVELS HAVE BEEN PLACED.
- UNDERGROUND UTILITIES SHALL BE INSTALLED WITH THE PROGRESS OF THE ROAD CONSTRUCTION. ELECTRICAL AND COMMUNICATION CONDUITS SHALL BE INSTALLED BY LICENSED PROFESSIONALS AND IN ACCORDANCE WITH THE SPECIFIC STANDARDS. THE SEWER FORCEMAIN AND WATER LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS HEREIN.
- INSPECT, MAINTAIN, AND IF NECESSARY REPAIR ALL EROSION AND SEDIMENT CONTROL MEASURES AS STATED IN THE EROSION CONTROL NOTES ON THIS SHEET. PROVIDE AN EROSION CONTROL LOG INDICATING THE DATE INSPECTED, WHO INSPECTED, WHAT WAS FOUND, AND WHAT WAS DONE (IF ANYTHING).
- REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AFTER SITE IS STABILIZED AND RESEED ANY AREAS DISTURBED BY REMOVAL. THE APPROXIMATE DATE FOR REMOVAL OF EROSION CONTROLS IS AUGUST 2018.
- IF NECESSARY, ALL DRAINAGE STRUCTURES AND PIPES SHALL BE FLUSHED/PUMPED FREE OF SEDIMENT AFTER STABILIZATION IS COMPLETE.
- LOT DISTURBANCE, OTHER THAN THAT SHOWN ON THE APPROVED PLANS, SHALL NOT COMMENCE UNTIL AFTER THE ROADWAY HAS THE BASE COURSE TO DESIGN ELEVATION AND THE ASSOCIATED DRAINAGE IS COMPLETE AND STABLE.
- UNIT CONSTRUCTION
 - UNITS WILL BE CONSTRUCTED IN GROUPS OF 10-15.
 - CONSTRUCTION OF UNITS WILL BEGIN ON THE GROUP ON THE EAST SIDE AND PROCEED TO THE WEST SIDE, FROM SOUTH TO NORTH.
 - UTILITY CONNECTIONS SHALL BE COORDINATED WITH FOUNDATION CONSTRUCTION



STABILIZED CONSTRUCTION ENTRANCE DETAIL

STABILIZED CONSTRUCTION ENTRANCE NOTES:

- GRADE AND COMPACT ACCESS ROAD ENTRANCE AS NECESSARY. PLACE FILTER FABRIC (MIRAFI OR EQUAL) AND PLACE 6" OF 3" CRUSHED STONE TO MATCH SLOPE OF EXISTING ROAD.
- PROVIDE NECESSARY SWALES OR DIVERSIONS TO MINIMIZE DIRECT FLOW OF WATER ONTO STONE AREA.
- CONSTRUCTION ENTRANCE SHALL BE MAINTAINED AS NECESSARY TO REMOVE SILT FROM TIRES PRIOR TO ENTERING PUBLIC ROADS. A SMALL SWALE SHALL BE CONSTRUCTED ON THE DOWN GRADIENT SIDE TO TRAP ANY SILT WASHED FROM THE STONE ENTRANCE.



RIP-RAP GRADATION

d50	% OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE (INCHES)
100	9	TO 12
85	7.8	TO 10.8
50	6	TO 9
15	1.8	TO 3

d50	% OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE (INCHES)
100	12	TO 16
85	10.4	TO 14.4
50	8	TO 12
15	2.4	TO 4

RIP RAP DIMENSION TABLE

LOCATION	W0	W	La	T	d50
RIP RAP OUTLET #1 - 30" HDPE OUTLET PIPE	3.75'	12.5'	10'	30"	9.5"
RIP RAP #1 - 15" BIORETENTION OUTLET PIPE	3.75'	9'	25'	24"	12"
RIP RAP CHANNEL #1 - BIORETENTION SPILLWAY	SEE GRADING PLAN			24"	24"
RIP RAP CHANNEL #2 - SEDIMENT FOREBAY SPILLWAY				18"	24"

CONSTRUCTION SPECIFICATIONS:

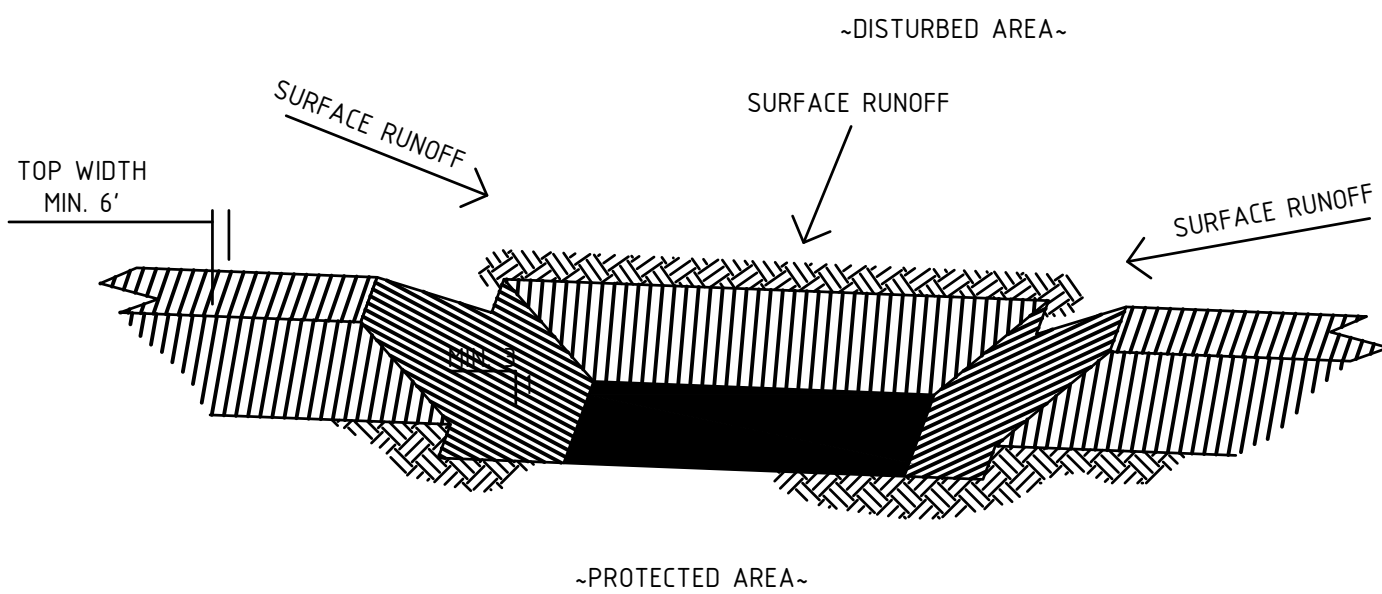
- PREPARE THE SUB-GRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIP-RAP TO THE GRADES SHOWN ON THE PLANS.
- MINIMUM 6" SAND/GRAVEL BEDDING OR GEOTEXTILE FABRIC (MIRAFI 140N OR EQUAL) REQUIRED UNDER ALL ROCK RIP-RAP.
- THE ROCK OR GRAVEL USED FOR FILTER OR RIP-RAP SHALL CONFORM TO THE SPECIFIED GRADATION.
- GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF 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 (2) PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
- 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.

MAINTENANCE NOTES:

- OUTLETS SHALL BE INSPECTED AND CLEANED ANNUALLY AND AFTER ANY MAJOR STORM EVENT. ANY EROSION OR DAMAGE TO THE RIP-RAP SHALL BE REPAIRED IMMEDIATELY.
- THE CHANNEL IMMEDIATELY DOWNSTREAM FROM THE OUTLET SHOULD BE CHECKED TO SEE THAT NO EROSION IS 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 THE OUTLET PROTECTION APRON.

PIPE OUTLET PROTECTION DETAIL

NOT TO SCALE

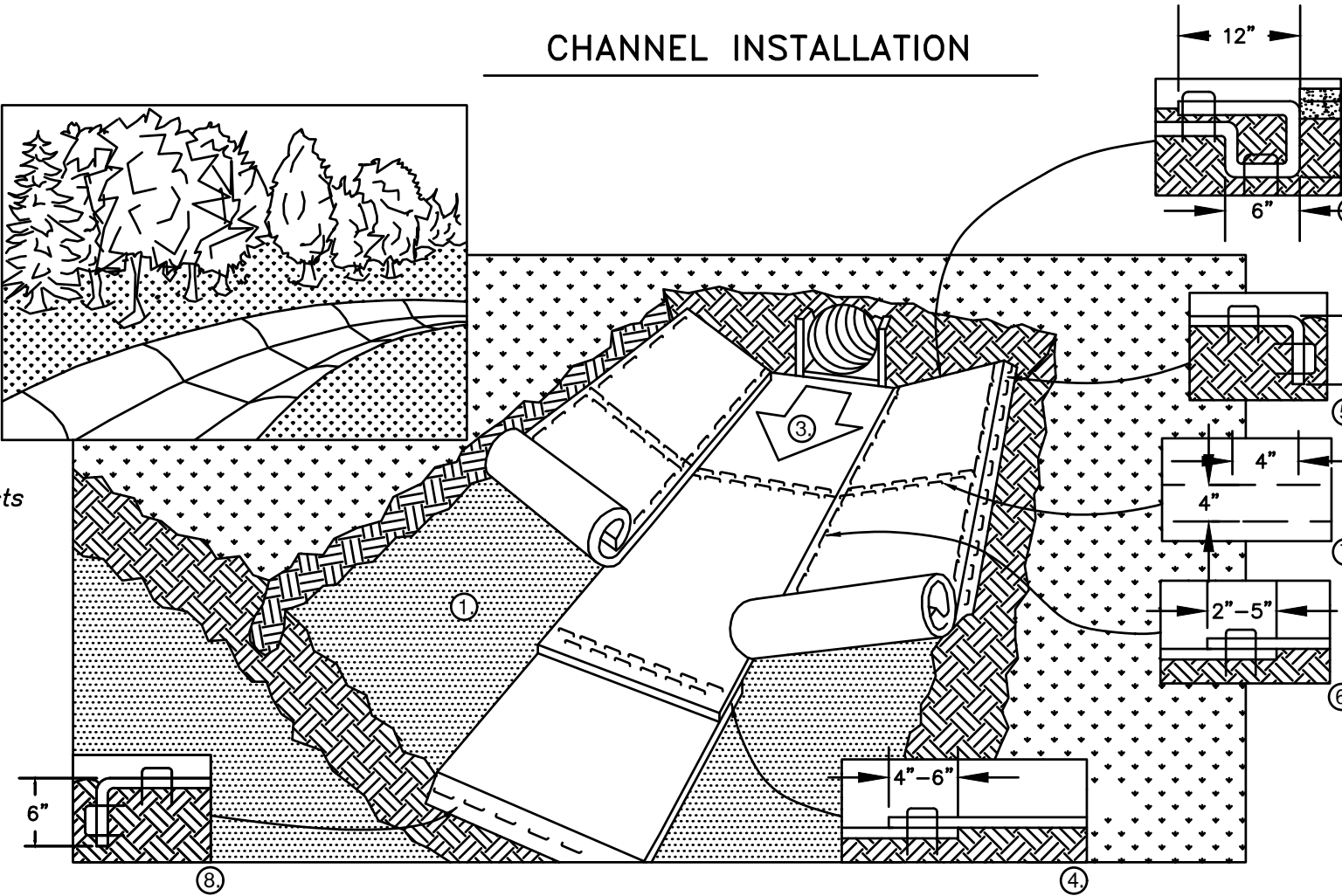


NOTES:

- SEDIMENT TRAPS SHOULD BE BUILT AS NEAR TO THE DISTURBED AREA AS POSSIBLE.
- THE DRAINAGE AREA TREATED BY A SEDIMENT TRAP MUST BE LESS THAN 5 ACRES.
- SIDE SLOPES OF A SEDIMENT TRAP MUST BE 3H:1V OR FLATTER.
- EMBANKMENTS MUST BE UNDER 4 FEET IN HEIGHT. THE HEIGHT IS MEASURED FROM THE TOE OF THE DOWNSTREAM SIDE OF THE EMBANKMENT TO THE TOP.
- SEDIMENT MUST BE REMOVED WHEN SEDIMENT HAS ACCUMULATED TO 50% OF THE ORIGINAL VOLUME.

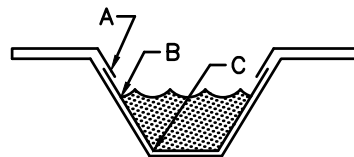
TEMPORARY SEDIMENT TRAP DETAIL

N.T.S



- PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
- BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30 CM) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) ACROSS THE WIDTH OF THE RECP's.
- ROLL CENTER RECP's IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM*, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
- PLACE CONSECUTIVE RECP's END OVER END (SHINGLE STYLE) WITH A 4" - 6" (10 CM - 15 CM) OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" (10 CM) APART AND 4" (10 CM) ON CENTER TO SECURE RECP's.
- FULL LENGTH EDGE OF RECP's AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
- ADJACENT RECP's MUST BE OVERLAPPED APPROXIMATELY 2" - 5" (5 CM -12.5 CM) (DEPENDING ON RECP's TYPE) AND STAPLED.
- IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT (9 M - 12 M) INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" (10 CM) APART AND 4" (10 CM) ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
- THE TERMINAL END OF THE RECP's MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

* IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY ANCHOR THE RECP's.



CRITICAL POINTS

- OVERLAPS AND SEAMS
- PROJECTED WATER LINE
- CHANNEL BOTTOM/SIDE SLOPE VERTICES

NOTE:

- HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.

** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 cm) MAY BE REQUIRED.

TYPICAL TURF REINFORCEMENT MATTING DETAIL

N.T.S

NOTES:

- ALL SEDIMENT FOREBAY SPILLWAYS FOR TREATMENT SWALES AND ALL 2:1 SLOPES SHALL BE LINED WITH NORTH AMERICAN GREEN SC150BN EROSION CONTROL BLANKET OR APPROVED EQUAL.
- FOR SALES CONTACT: E.J. PRESCOTT, INC. 210 SHEEP DAVIS RD. CONCORD, NH 603-224-9545

FOR REVIEW
NOT FOR CONSTRUCTION

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JOHN RANDOLPH

36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

CONSTRUCTION DETAILS

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: 2023.06.02 PROJECT #: 230277

ENG'D BY: TAL DRAWN BY: TAL

CHECK'D BY: MJS ARCHIVE #: H-___

C502



N.T.S

SCALE: N.T.S.

N.T.S



C503

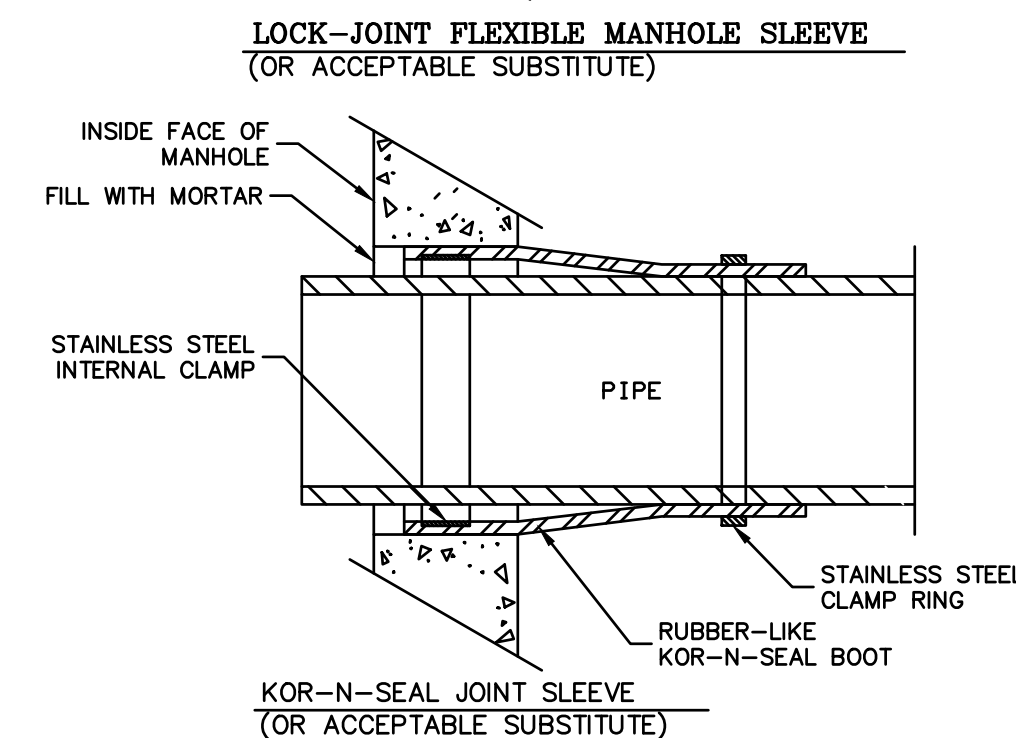
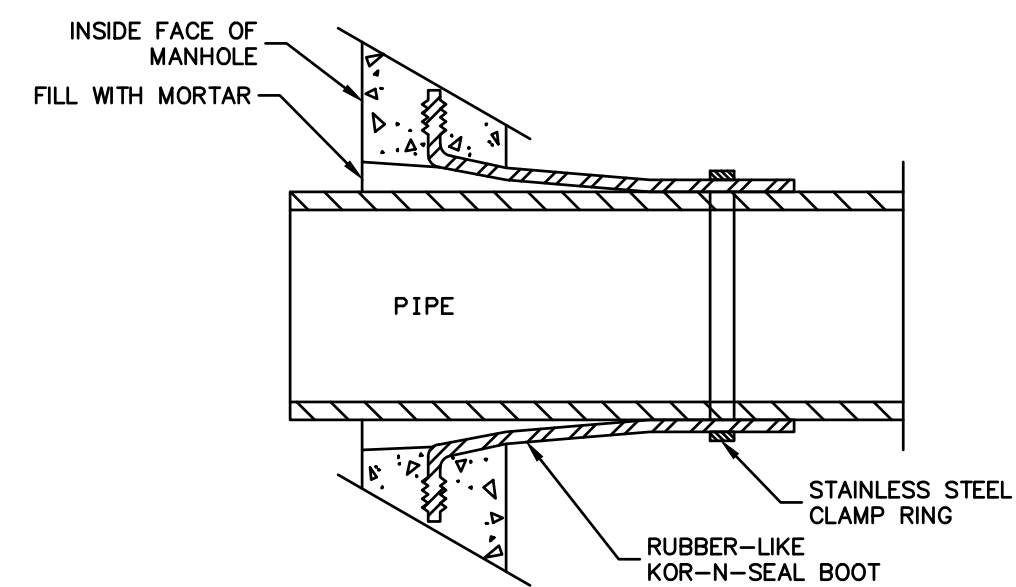


**MANHOLE CONSTRUCTION MATERIAL REQUIREMENTS
(PER Env-Wq 704.10 NUMERATION)**

- (A) ALL COMPONENT PARTS OF MANHOLE STRUCTURES SHALL HAVE THE STRENGTH, LEAK RESISTANCE, AND SPACE NECESSARY FOR THE INTENDED SERVICE.
- (B) MANHOLE STRUCTURES SHALL HAVE A LIFE EXPECTANCY IN EXCESS OF 25 YEARS.
- (C) MANHOLE STRUCTURES SHALL BE DESIGNED TO WITHSTAND H-20 LOADING AND SHALL NOT LEAK IN EXCESS OF 1 GPD PER VERTICAL FOOT OF MANHOLE FOR THE LIFE OF THE STRUCTURE.
- (D) BARRELS AND CONE SECTIONS SHALL BE CONSTRUCTED OF PRECAST REINFORCED CONCRETE.
- (E) BASE SECTIONS SHALL BE MONOLITHIC CONSTRUCTION TO A POINT AT LEAST SIX INCHES ABOVE THE CROWN OF THE INCOMING PIPE.
- (F) HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF AN OVERLAPPING TYPE, SEALED FOR WATER TIGHTNESS USING A DOUBLE ROW OF AN ELASTOMERIC OR MASTIC-LIKE SEALANT.
- (G) PIPE TO MANHOLE JOINTS SHALL BE AS FOLLOWS:
- (1) ELASTOMERIC, RUBBER SLEEVE WITH WATER TIGHT JOINTS AT THE MANHOLE OPENING AND PIPE SURFACES;
 - (2) CAST INTO THE WALL OR SECURED WITH STAINLESS STEEL CLAMPS;
 - (3) ELASTOMERIC SEALING RING CAST IN THE MANHOLE OPENING WITH SEAL FORMED ON THE SURFACE OF THE PIPE BY COMPRESSION OF THE RING; AND
 - (4) NON-SHRINK GROUTED JOINTS WHERE WATERTIGHT BONDING TO THE MANHOLE AND PIPE CAN BE OBTAINED.
- (H) MANHOLE CONE SECTIONS SHALL BE ECCENTRIC IN SHAPE.
- (I) ALL PRECAST SECTIONS AND BASES SHALL HAVE THE DATE OF MANUFACTURE AND THE NAME OF THE TRADEMARK OF THE MANUFACTURER IMPRESSED OR INDELIBLY MARKED ON THE INSIDE OF THE WALL.
- (J) MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF THE PIPE AND FLOW. AT CHANGES IN DIRECTIONS, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL.
- UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY. INVERTS AND SHELVES SHALL BE PLACED AFTER TESTING.
- (K) MATERIALS FOR CONSTRUCTION FOR MANHOLES SHALL BE AS FOLLOWS:
- (1) CONCRETE FOR CAST-IN-PLACE OR COMPLETE MANHOLES SHALL CONFORM TO THE REQUIREMENTS FOR CLASS AA CONCRETE IN THE NH DOT'S "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION";
 - (2) REINFORCING FOR CAST-IN-PLACE CONCRETE SHALL BE STEEL OR STRUCTURAL FIBERS THAT CONFORM TO THE REQUIREMENTS OF THE NH DOT'S "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION";
 - (3) PRECAST CONCRETE BARREL SECTIONS, CONES, AND BASES SHALL CONFORM TO ASTM C479-06;
 - (4) THE MANHOLE FRAME AND COVER SHALL PROVIDE A 30-INCH DIAMETER CLEAR OPENING;
 - (5) THE MANHOLE COVER SHALL HAVE THE WORD "SEWER" IN 3-INCH LETTERS CAST INTO THE TOP SURFACE;
 - (6) THE CASTINGS SHALL BE OF EVEN-GRAINED CAST IRON, SMOOTH, AND FREE FROM SCALE, LUMPS, BLISTERS, SAND HOLES AND DEFECTS;
 - (7) CONTACT SURFACES OF COVERS AND FRAMES SHALL BE MACHINED AT THE FOUNDRY TO PREVENT ROCKING OF COVERS IN ANY ORIENTATION;
 - (8) CASTINGS SHALL BE EQUAL TO CLASS 30, CONFORMING TO ASTM A48/48M-03;
 - (9) BRICK MASONRY FOR SHELF, INVERT AND GRADE ADJUSTMENT SHALL COMPLY WITH ASTM C32-05, CLAY OR SHALE, FOR GRADE SS HARD BRICK;
 - (10) MORTAR SHALL BE COMPOSED OF PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION;
 - (11) PROPORTIONS IN MORTAR OF PARTS BY VOLUME SHALL BE:
 - (a) 4.5 PARTS SAND AND 1.5 PARTS CEMENT; OR
 - (b) 4.5 PARTS SAND, 1.0 PART CEMENT AND 0.5 PART HYDRATED LIME;
 - (12) CEMENT SHALL BE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C150-05;
 - (13) HYDRATED LIME SHALL BE TYPE S CONFORMING TO THE ASTM C207-06 "STANDARD SPECIFICATIONS FOR HYDRATED LIME FOR MASONRY PURPOSES";
 - (14) SAND SHALL CONSIST OF INERT NATURAL SAND CONFORMING TO THE ASTM C33-03 "STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES";
- (N) THE MINIMUM INTERNAL DIAMETER OF MANHOLE SHALL BE 48 INCHES.
- (S) IN THE FLOW CHANNEL, A DROP OF AT LEAST 0.1 FEET SHALL BE PROVIDED BETWEEN THE INGOING AND OUTGOING SEWERS ON ALL MANHOLES.

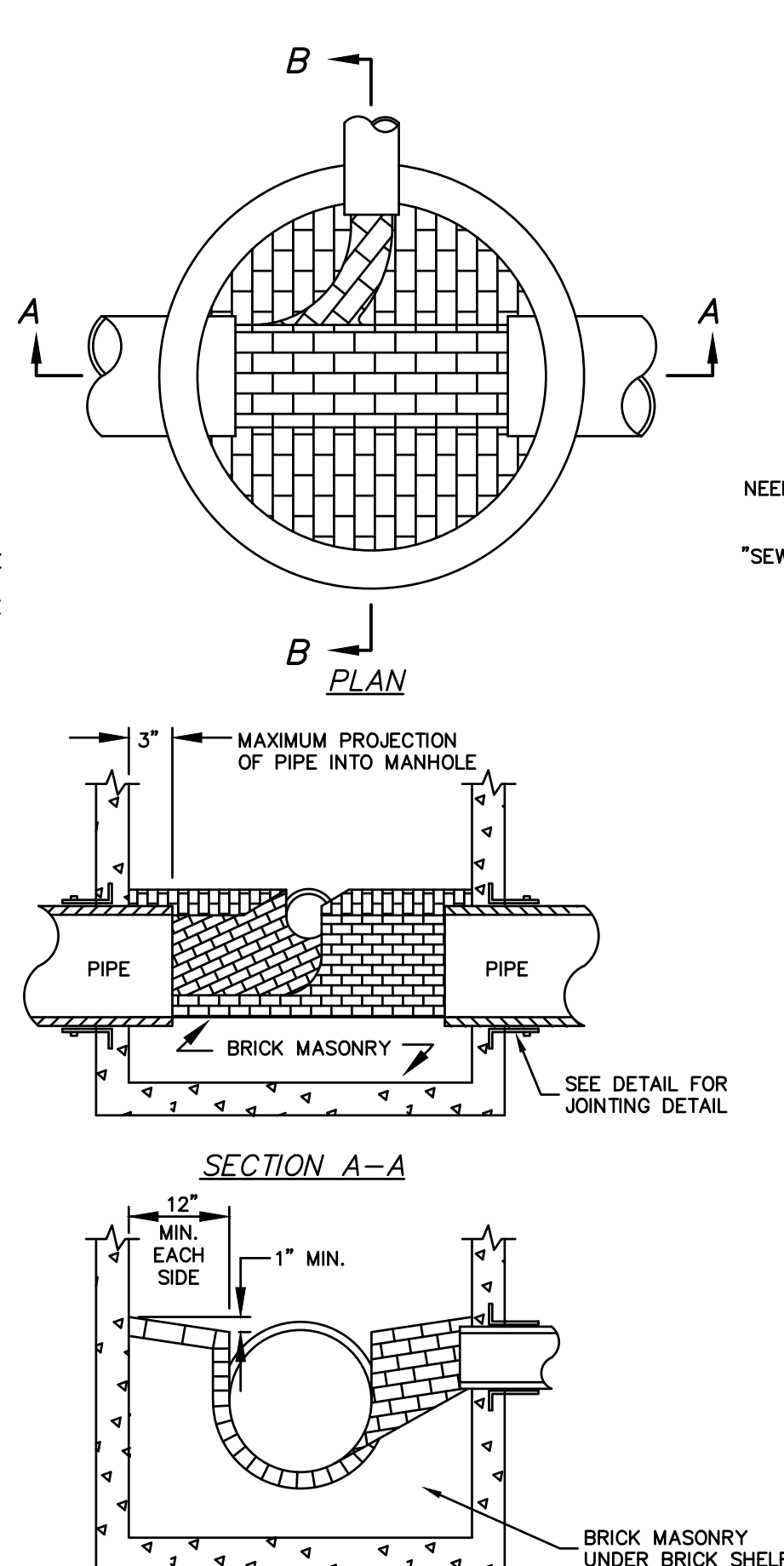
MANHOLE TESTING REQUIREMENTS (Env-Wq 704.10)

- (X) MANHOLES SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST.*
- (Y) THE MANHOLE VACUUM TEST SHALL CONFORM TO THE FOLLOWING:
- (1) THE INITIAL VACUUM GAUGE TEST PRESSURE SHALL BE 10 INCHES Hg; AND
 - (2) THE MINIMUM ACCEPTABLE TEST HOLD TIME FOR A 1-INCH Hg PRESSURE DROP TO 9 INCHES Hg SHALL BE:
 - (a) NOT LESS THAN 2 MINUTES FOR MANHOLES LESS THAN 10 FEET DEEP;
 - (b) NOT LESS THAN 2.5 MINUTES FOR MANHOLES 10 TO 15 FEET DEEP
- (Z) THE MANHOLE SHALL BE REPAIRED AND RETESTED IF THE TEST HOLD TIMES FAIL TO ACHIEVE THE ACCEPTANCE LIMITS SPECIFIED IN (Y) ABOVE.
- *MANHOLE TESTING MUST BE CONDUCTED PRIOR TO INVERT AND SHELF PLACEMENT.



DETAIL "A" - PIPE TO MANHOLE JOINTS
N.T.S.

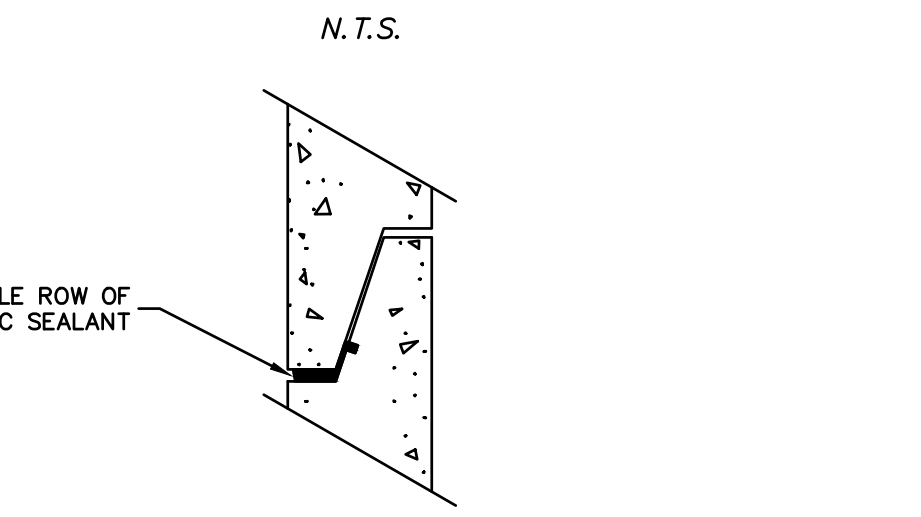
- NOTES:
1. USE LOCK-JOINT FLEXIBLE MANHOLE SLEEVE FOR FACTORY INSTALLED APPLICATIONS AND KOR-N-SEAL SLEEVE FOR IN FIELD INSTALLATIONS.
 2. ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE W/ MANUFACTURERS' WRITTEN INSTRUCTIONS.



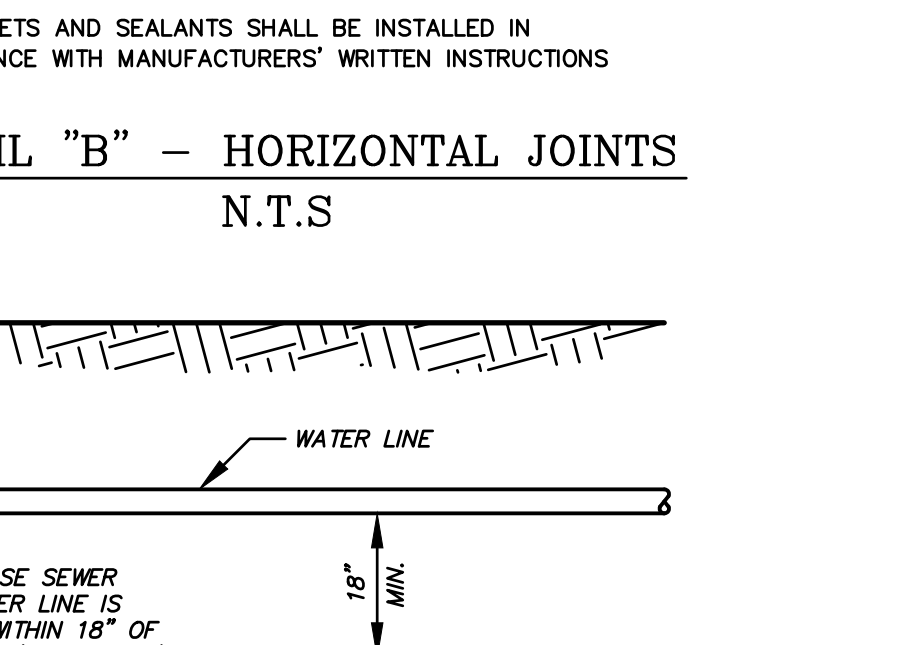
TYPICAL SEWER MANHOLE INVERT
N.T.S.

- NOTES:
1. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. INVERT BRICKS SHALL BE LAID ON EDGE.
 2. INVERT AND SHELF TO BE PLACED AFTER LEAKAGE TEST.
 3. ALTERNATE INVERT DETAILS: REPLACE BRICK INVERT W/ CAST-IN-PLACE CONCRETE.

TYPICAL SEWER MANHOLE INVERT
N.T.S.



DETAIL "B" - HORIZONTAL JOINTS
N.T.S.



DETAIL "B" - HORIZONTAL JOINTS
N.T.S.



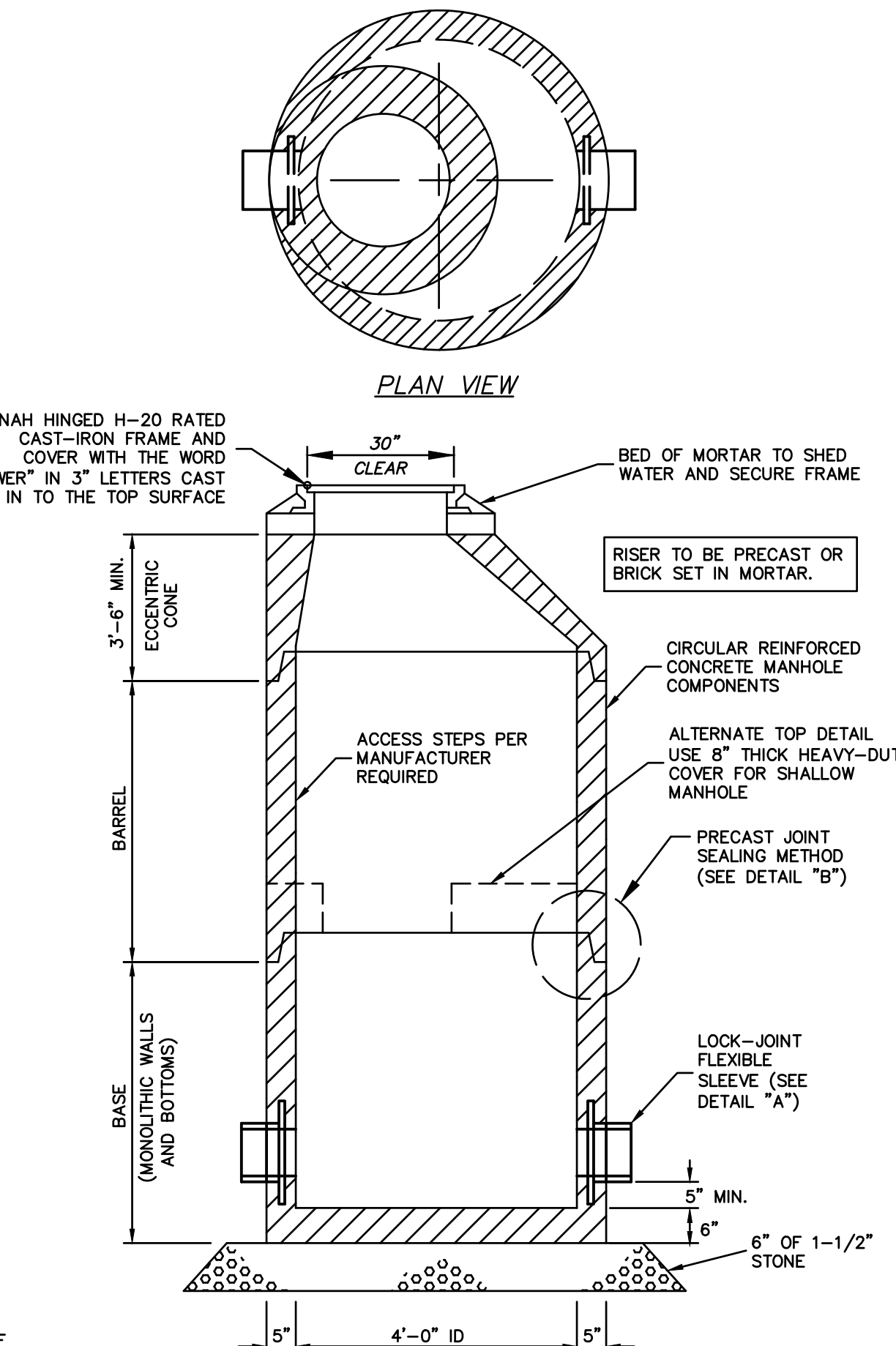
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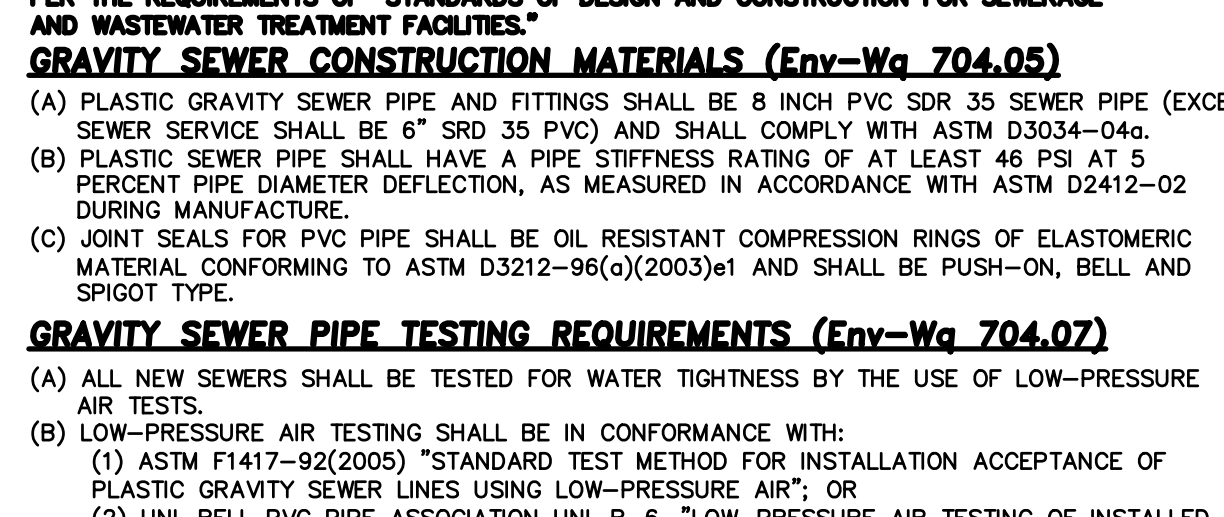
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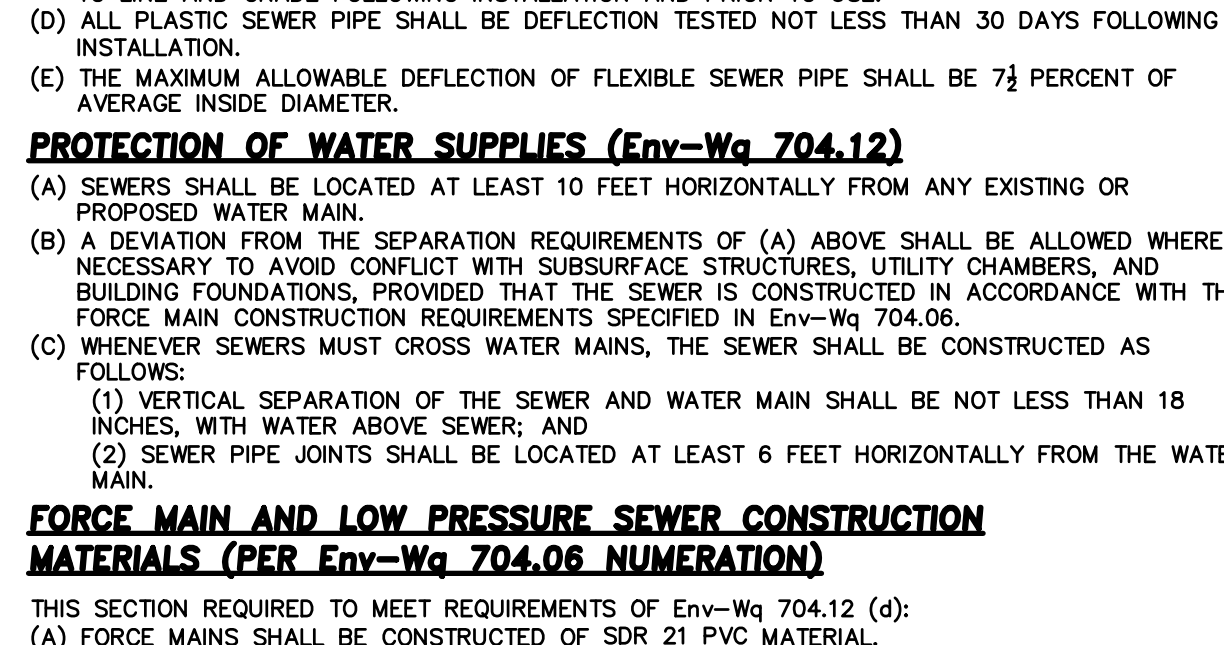
TYPICAL SEWER MANHOLE INVERT
N.T.S.

- NOTES:
1. SMH #1 IS A STANDARD MANHOLE WITH ECCENTRIC CONE TOP.
 2. THERE SHALL BE NO STEPS INSTALLED WITHIN THE MANHOLE.

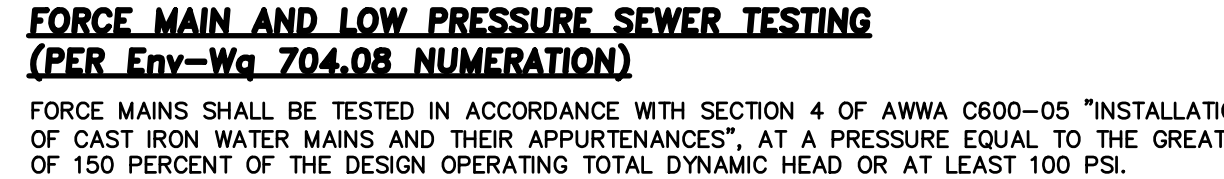
TYPICAL SEWER MANHOLE INVERT
N.T.S.



DETAIL "B" - HORIZONTAL JOINTS
N.T.S.



DETAIL "B" - HORIZONTAL JOINTS
N.T.S.



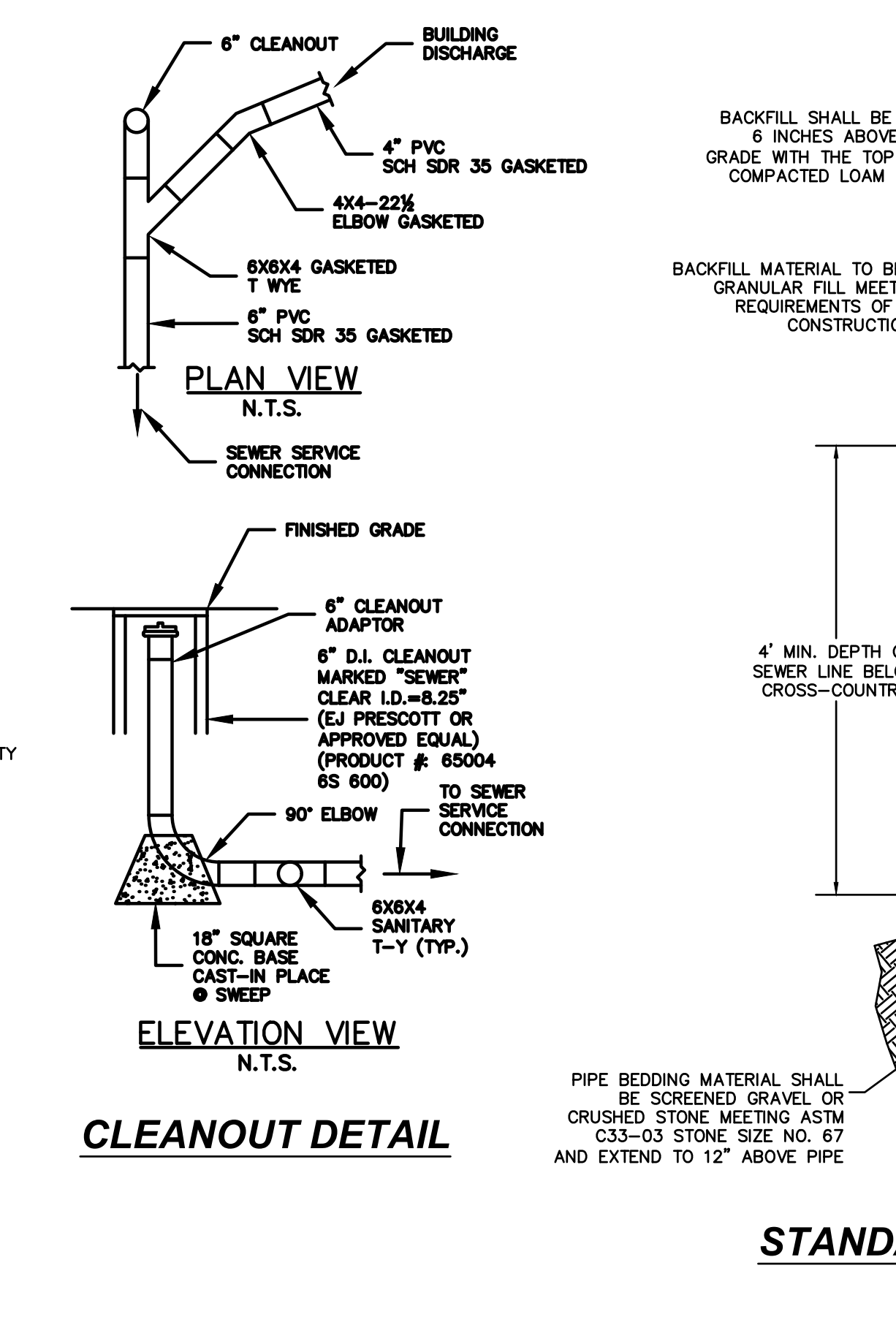
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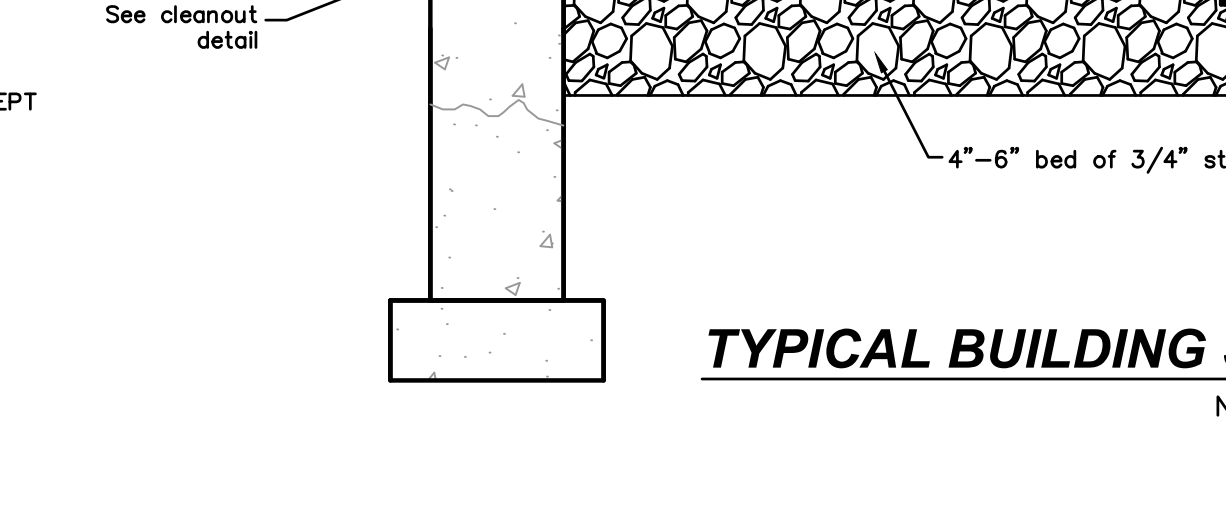
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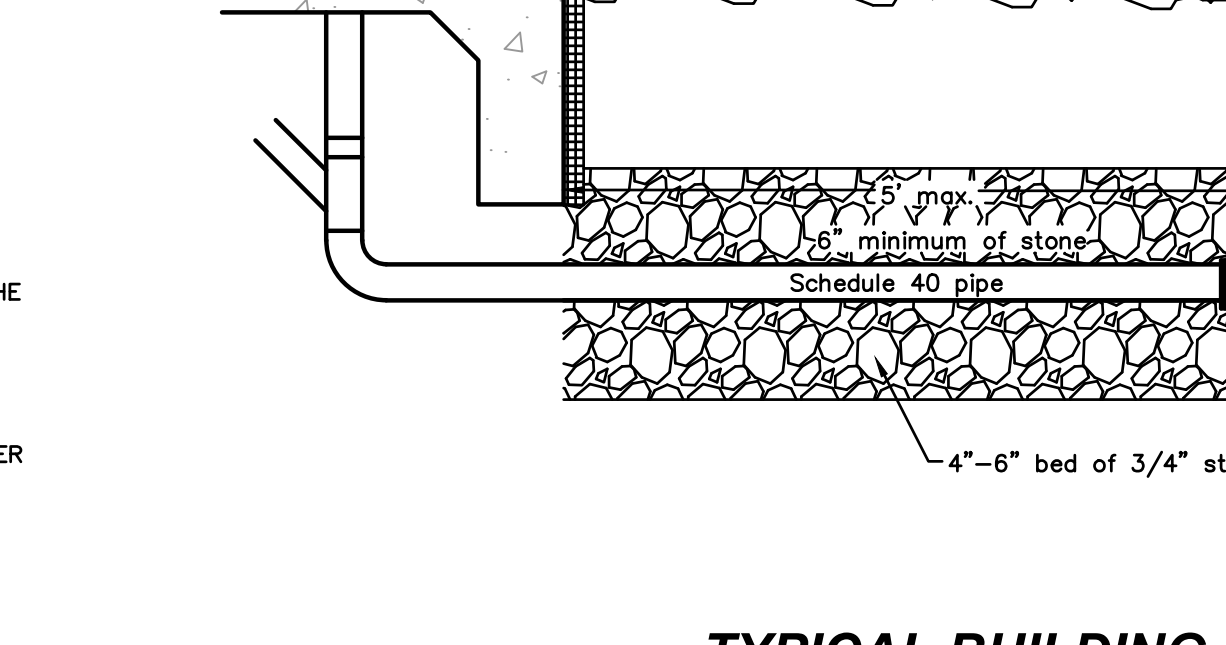
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N.T.S.



DETAIL "B" - HORIZONTAL JOINTS
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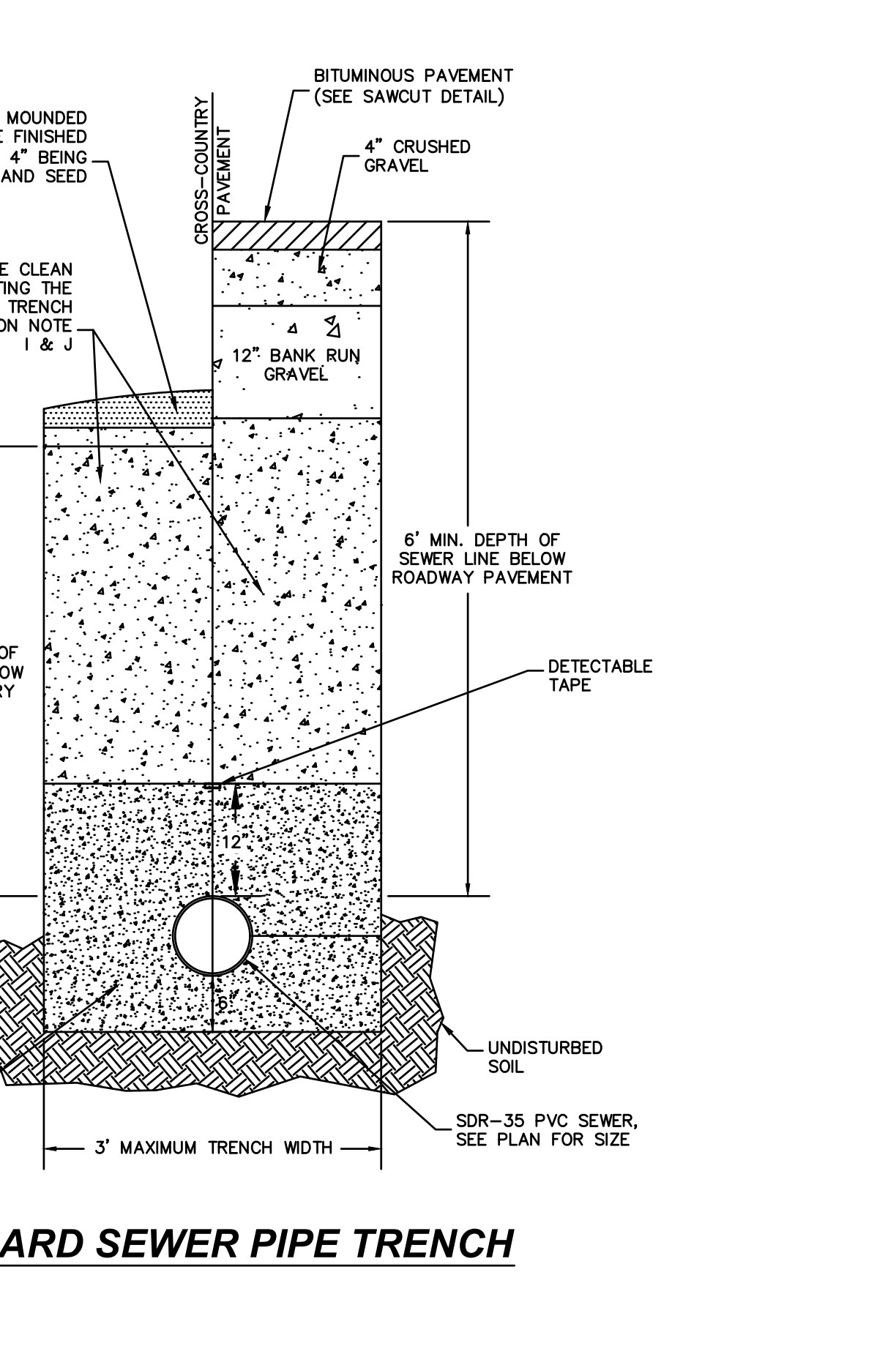
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DETAIL "B" - HORIZONTAL JOINTS
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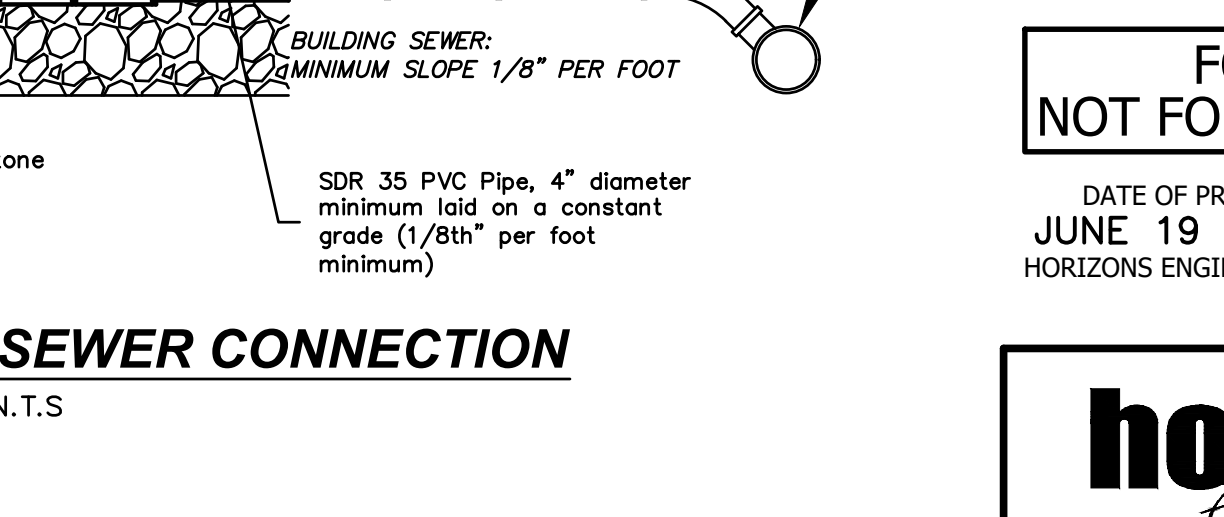
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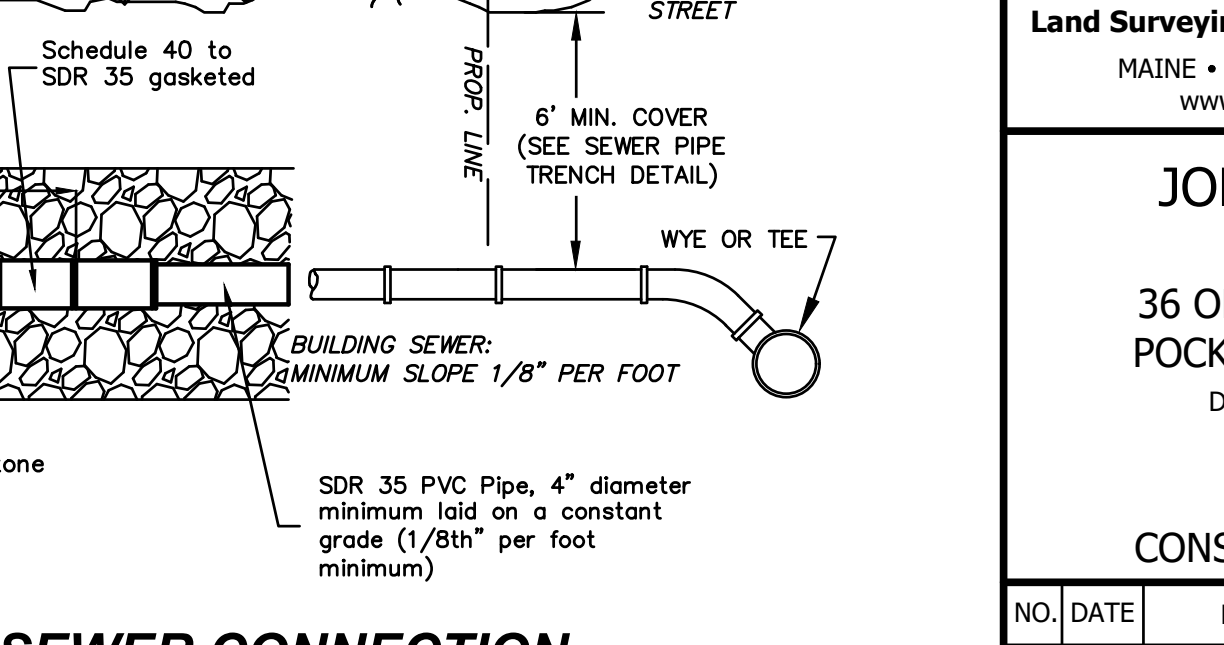
TYPICAL SEWER MANHOLE INVERT
N.T.S.

- NOTES:
1. SMH #1 IS A STANDARD MANHOLE WITH ECCENTRIC CONE TOP.
 2. THERE SHALL BE NO STEPS INSTALLED WITHIN THE MANHOLE.

TYPICAL SEWER MANHOLE INVERT
N.T.S.



DETAIL "B" - HORIZONTAL JOINTS
N.T.S.



DETAIL "B" - HORIZONTAL JOINTS
N.T.S.



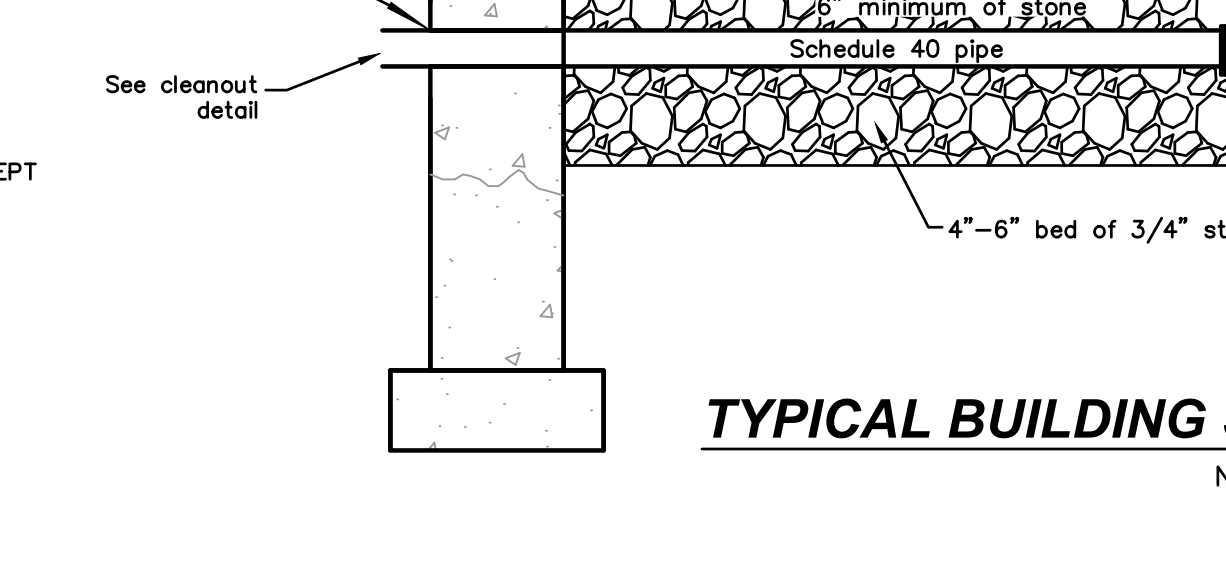
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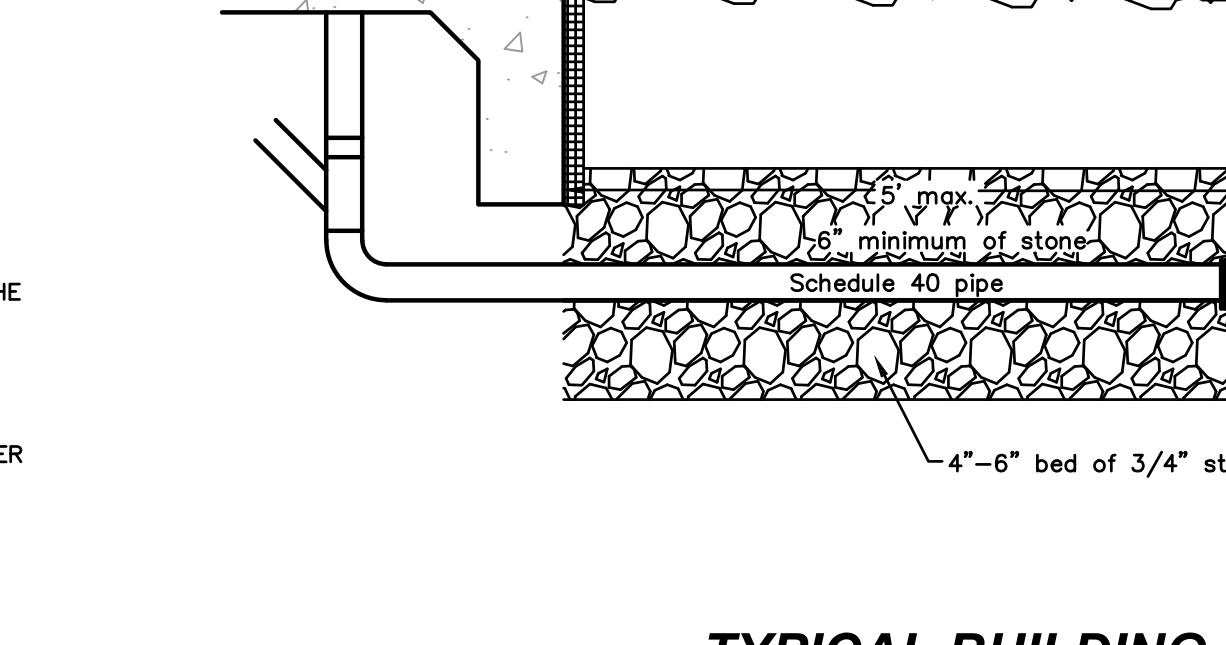
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DETAIL "B" - HORIZONTAL JOINTS
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TYPICAL SEWER MANHOLE INVERT
N.T.S.



DETAIL "B" - HORIZONTAL JOINTS
N.T.S.



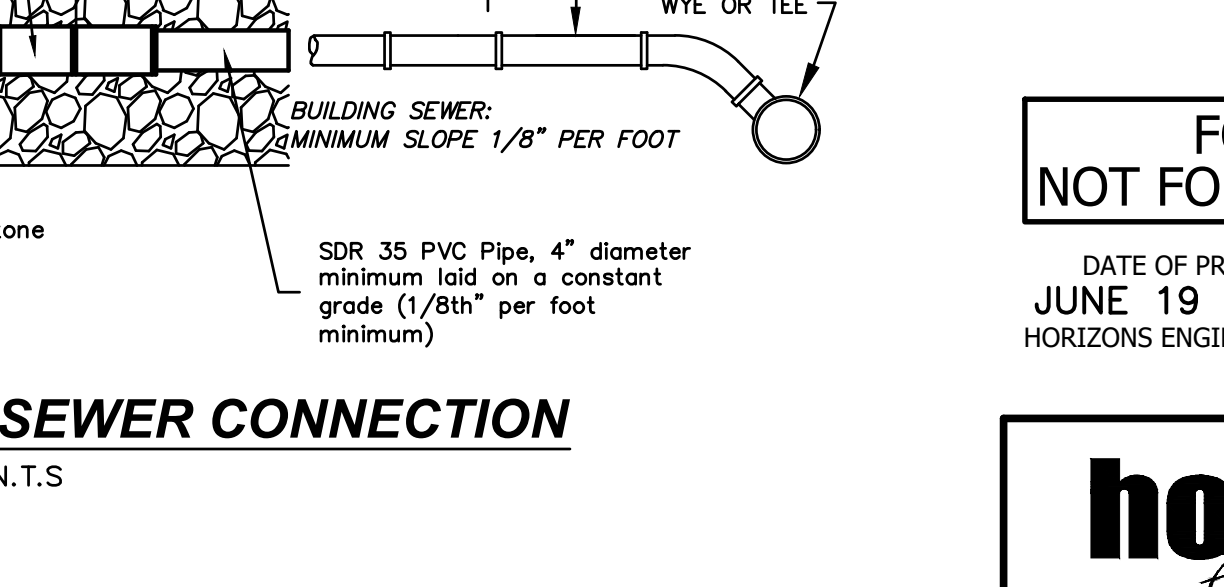
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DETAIL "B" - HORIZONTAL JOINTS
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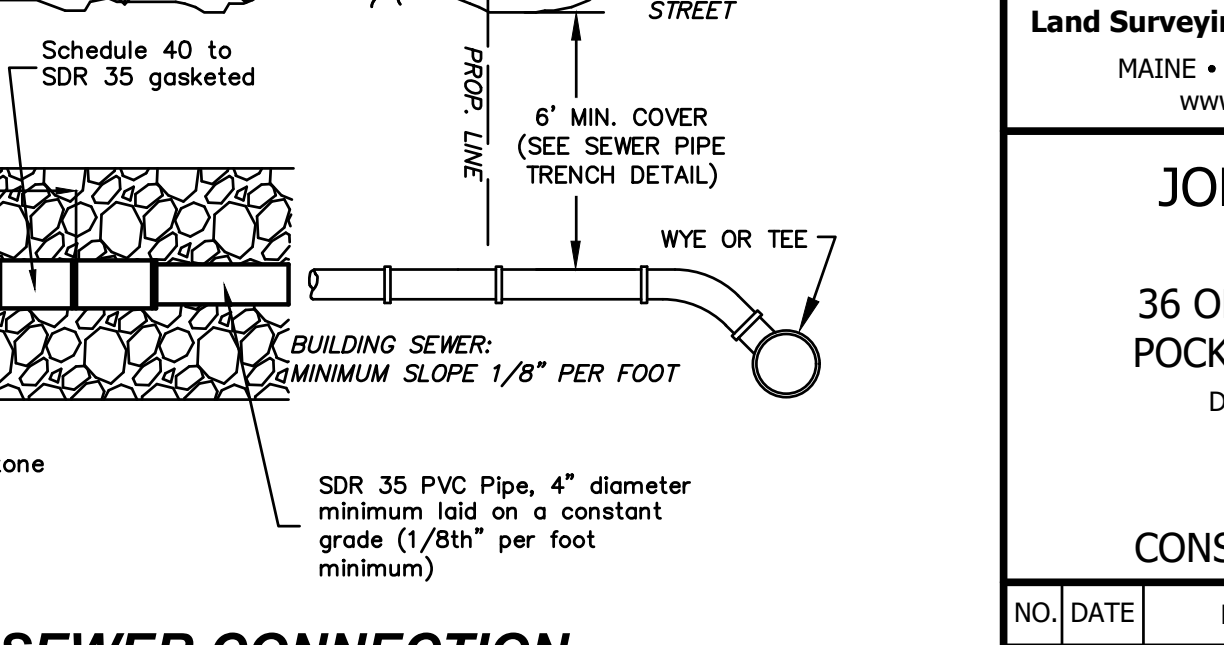
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TYPICAL SEWER MANHOLE INVERT
N.T.S.



DETAIL "B" - HORIZONTAL JOINTS
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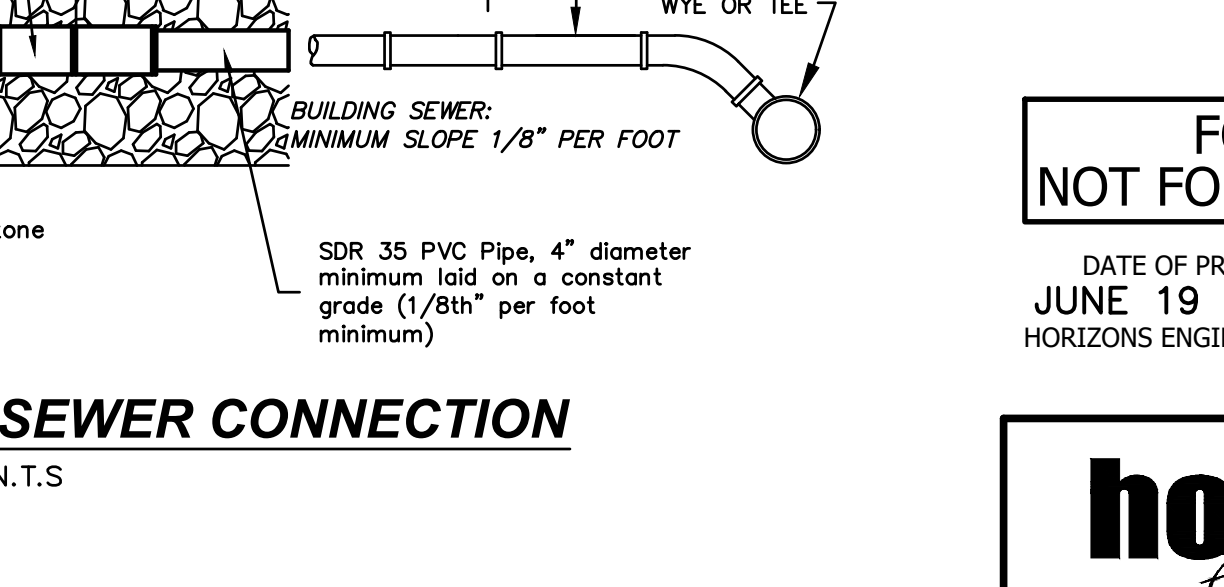
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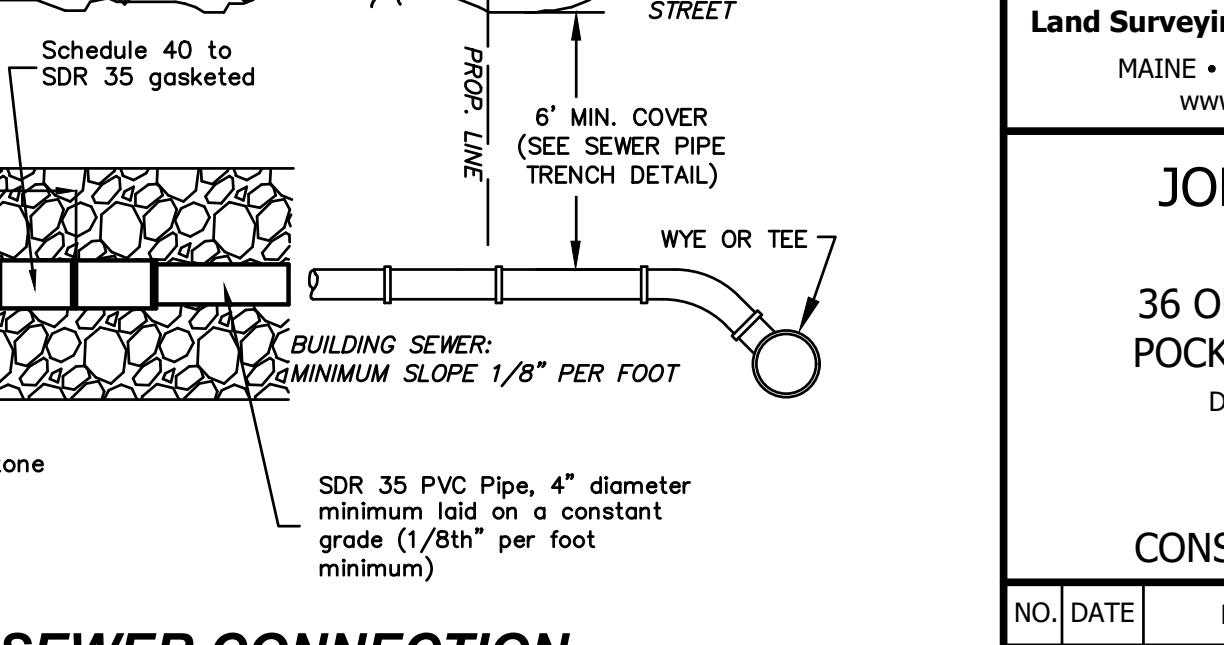
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TYPICAL SEWER MANHOLE INVERT
N.T.S.



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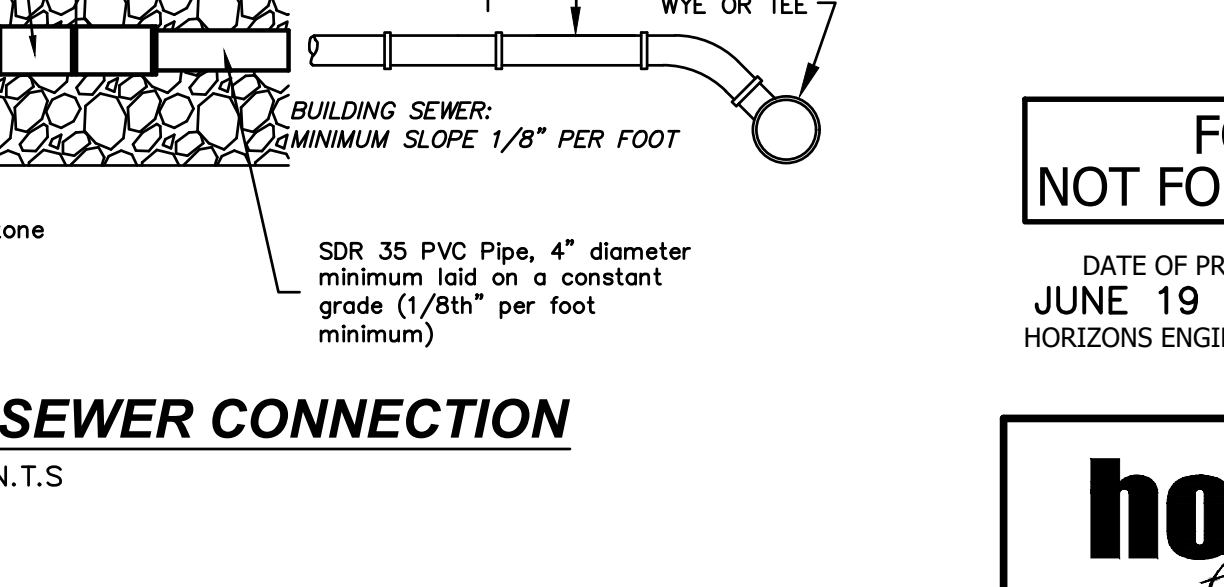
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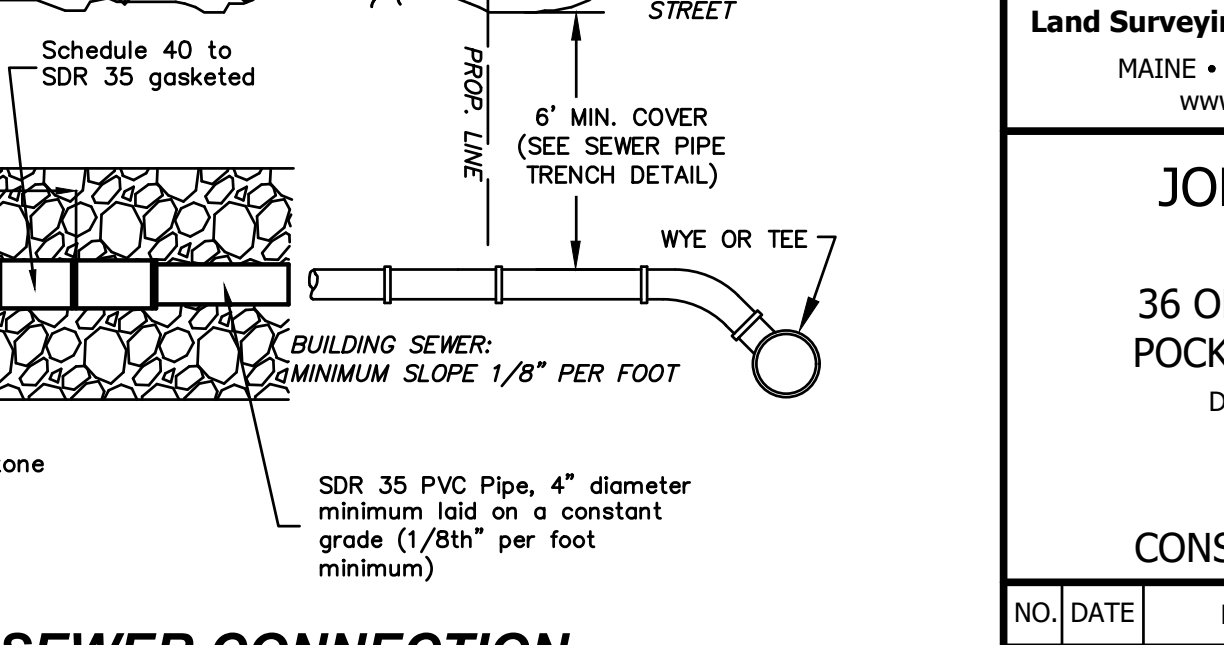
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TYPICAL SEWER MANHOLE INVERT
N.T.S.



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N.T.S.



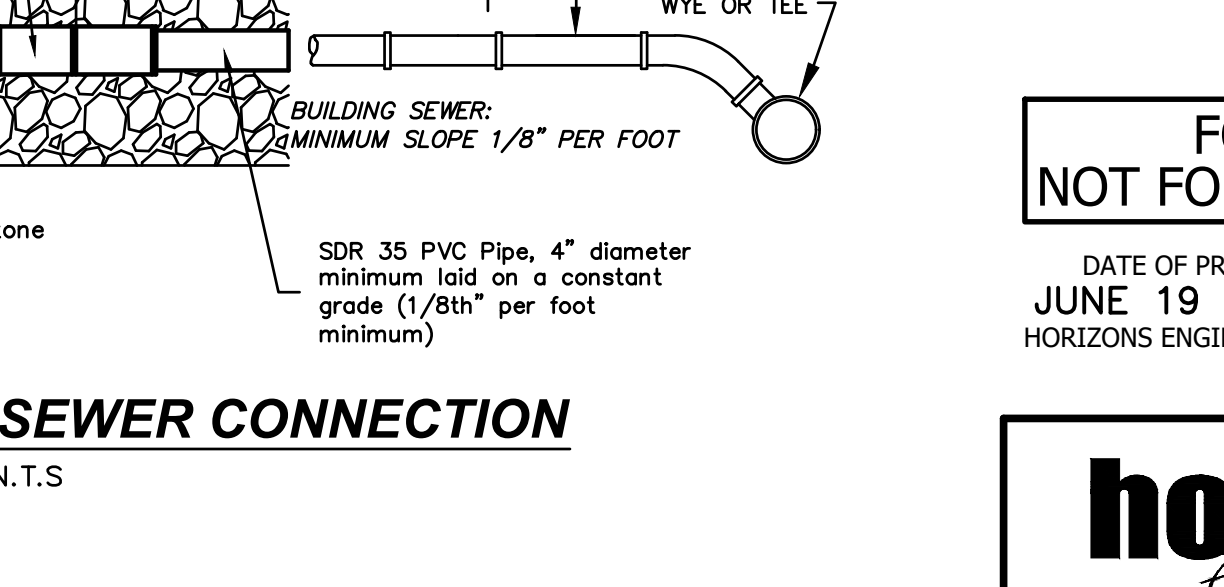
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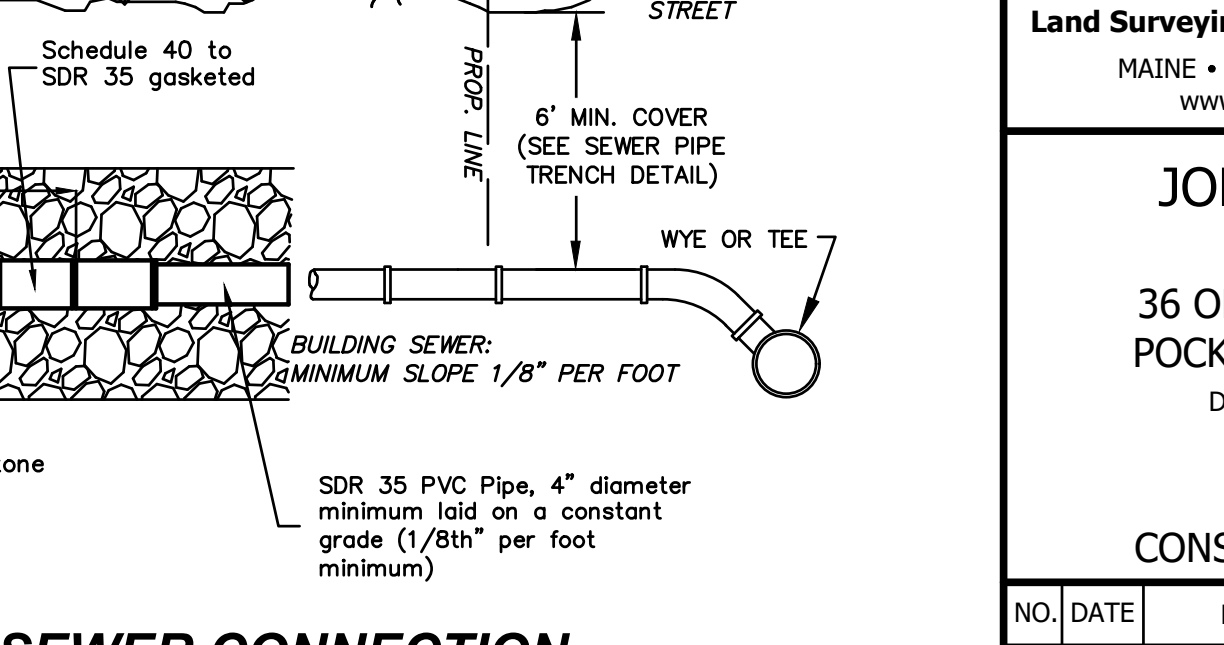
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TYPICAL SEWER MANHOLE INVERT
N.T.S.



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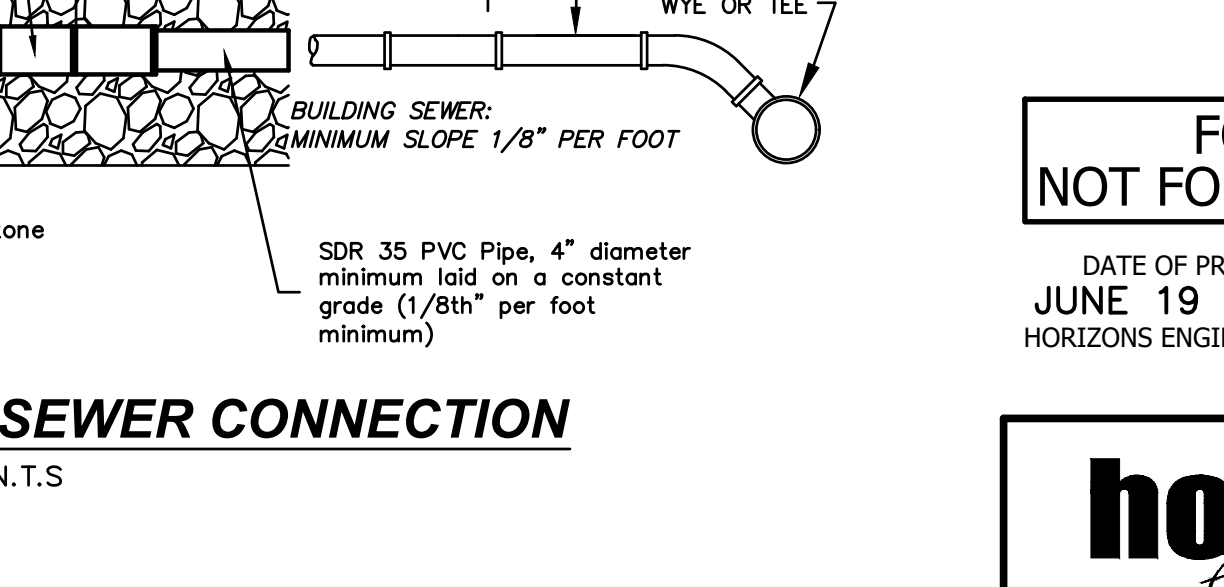
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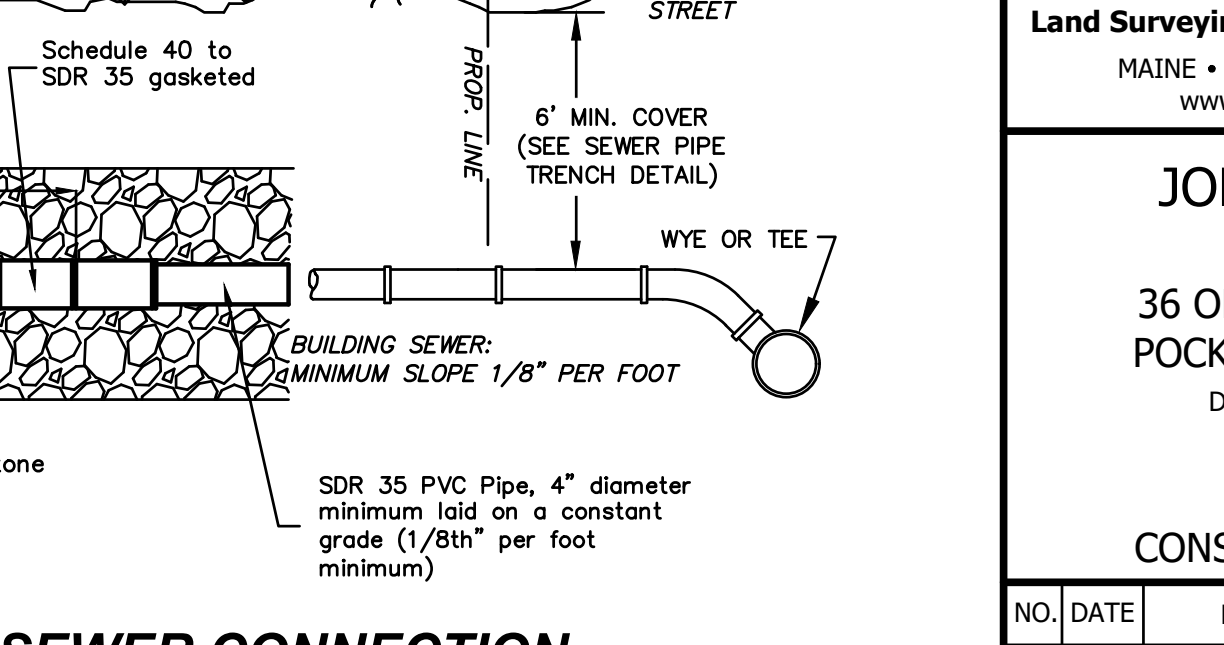
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TYPICAL SEWER MANHOLE INVERT
N.T.S.



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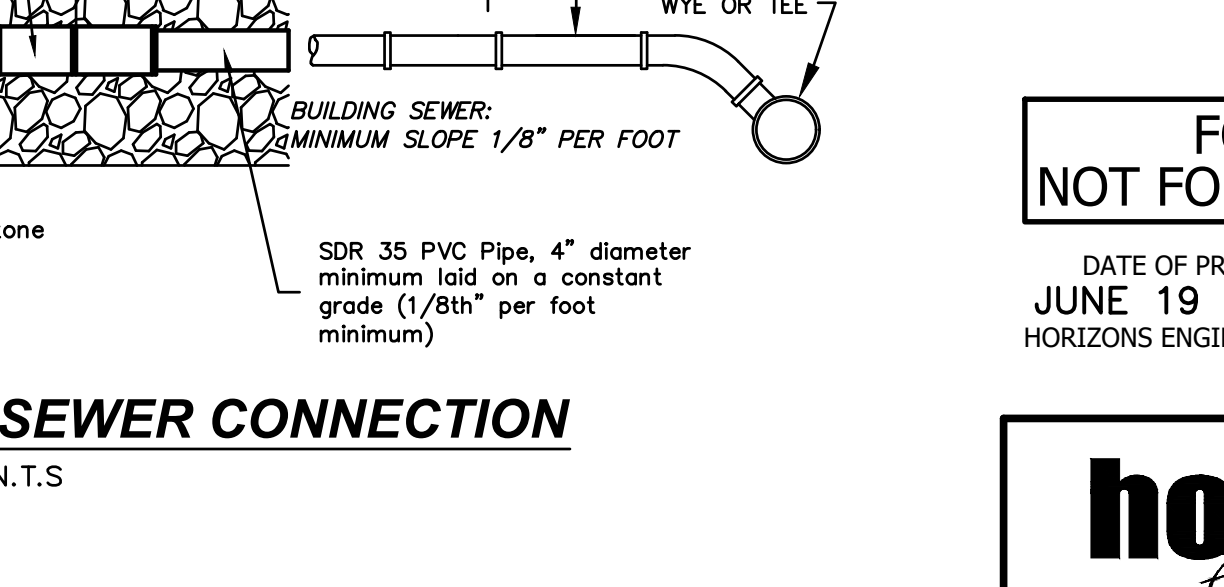
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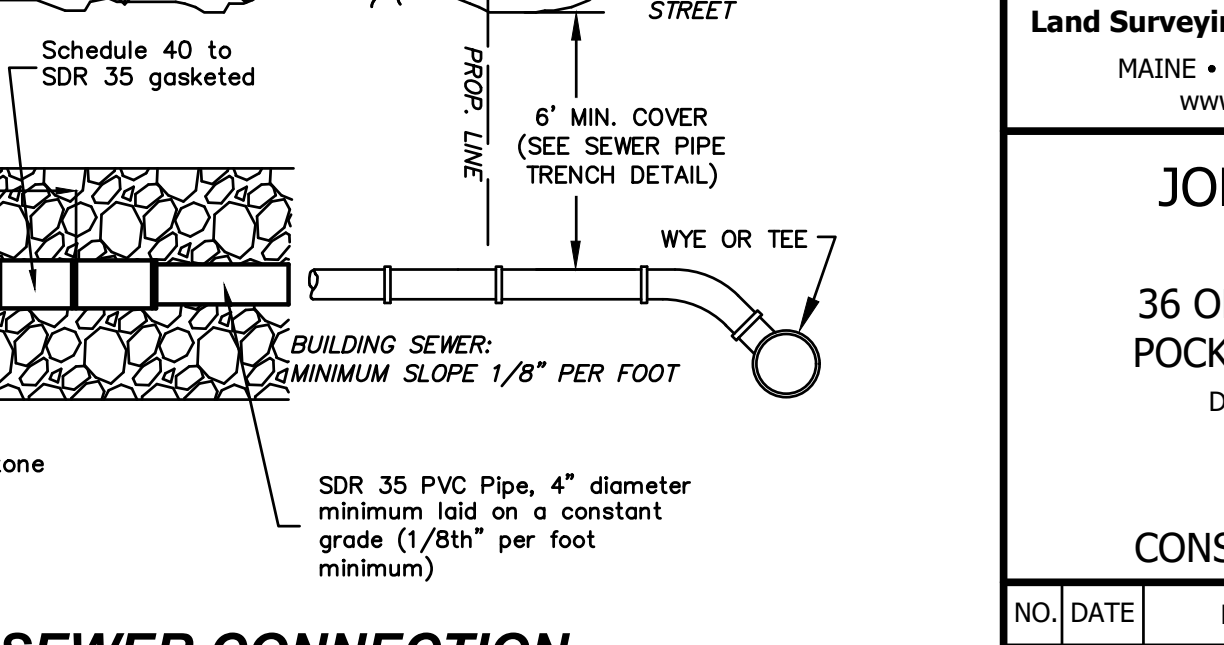
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TYPICAL SEWER MANHOLE INVERT
N.T.S.



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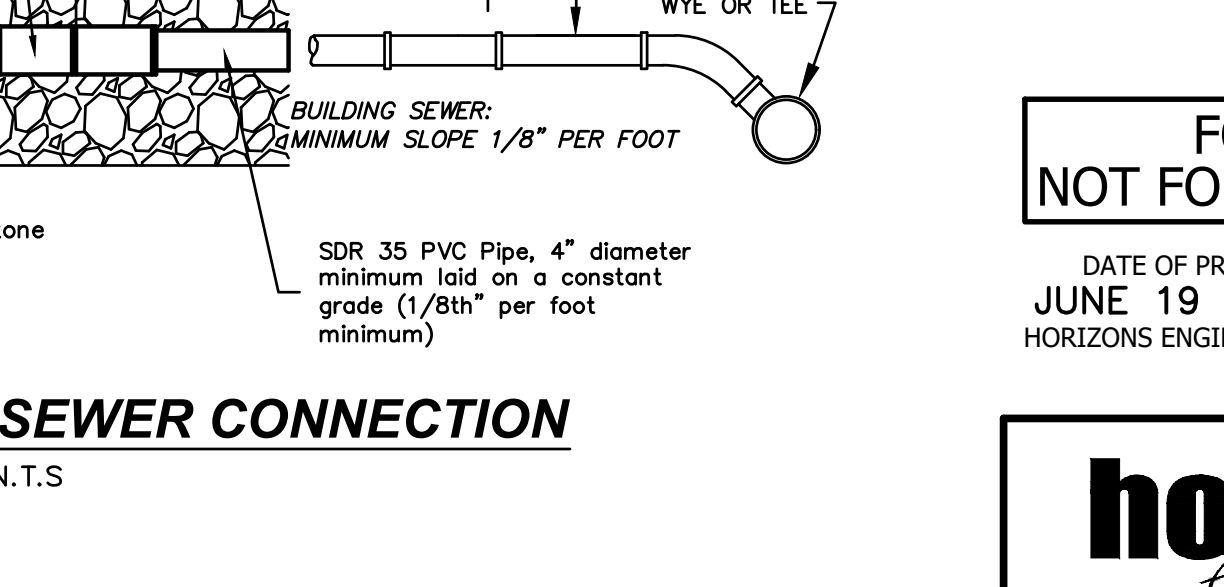
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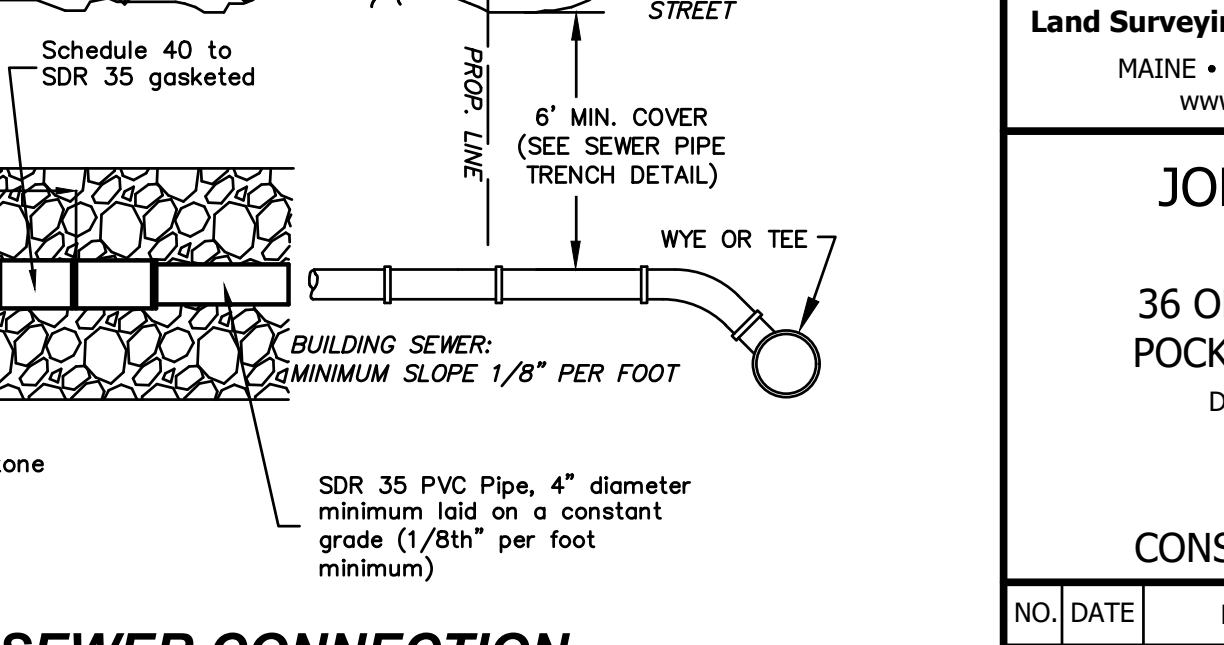
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TYPICAL SEWER MANHOLE INVERT
N.T.S.



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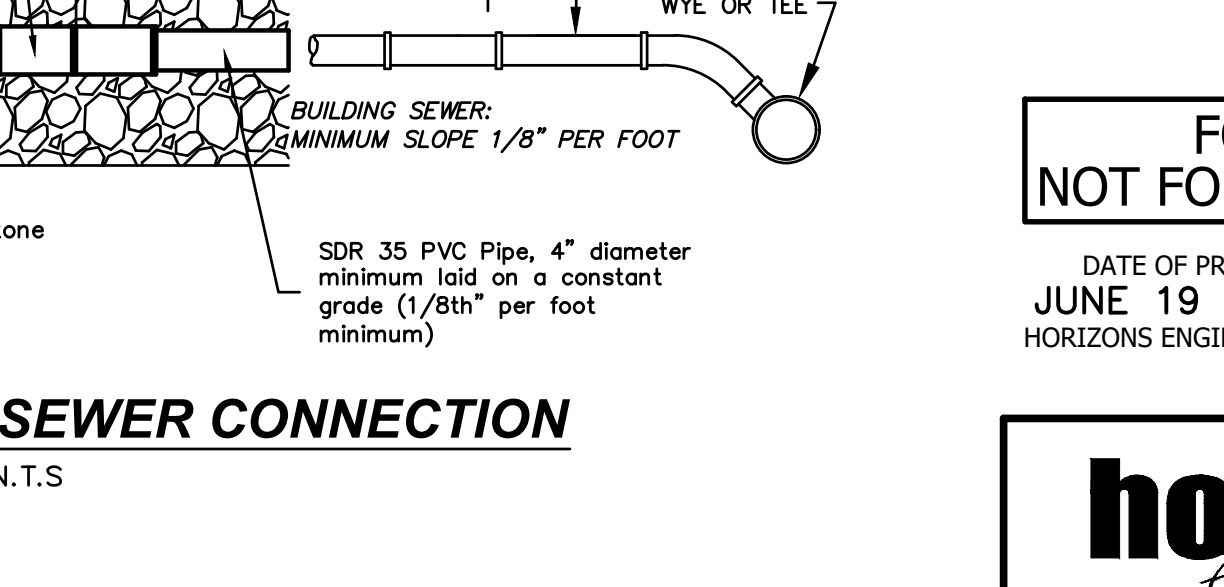
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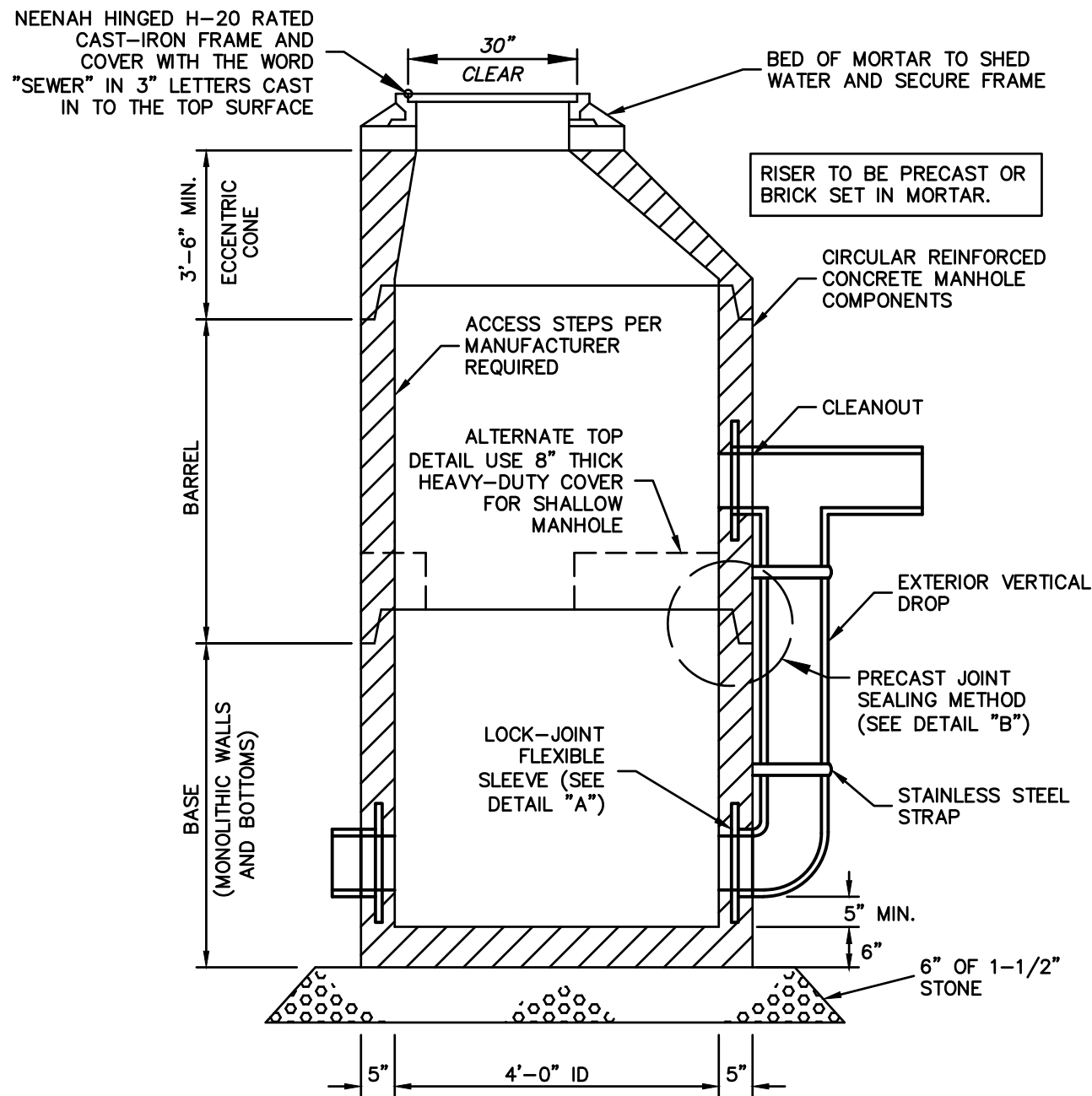
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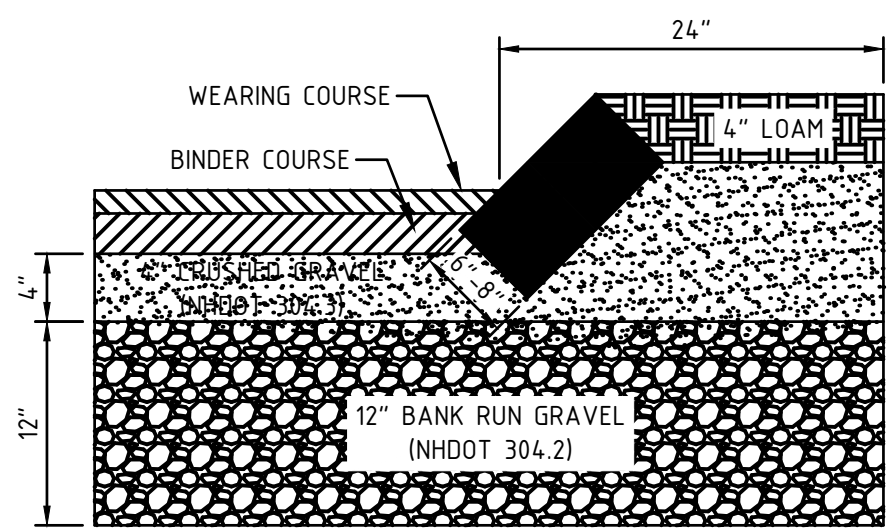
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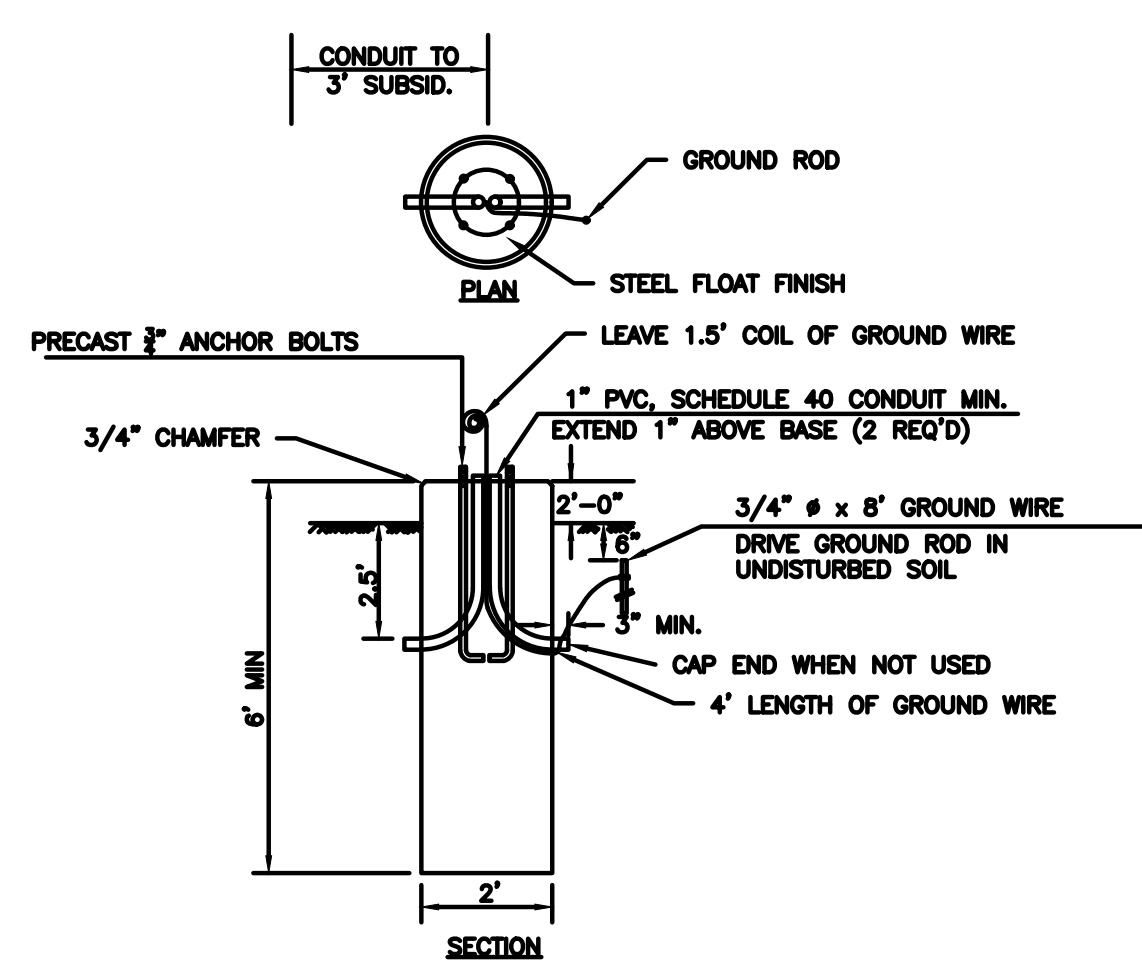
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N.T.S.



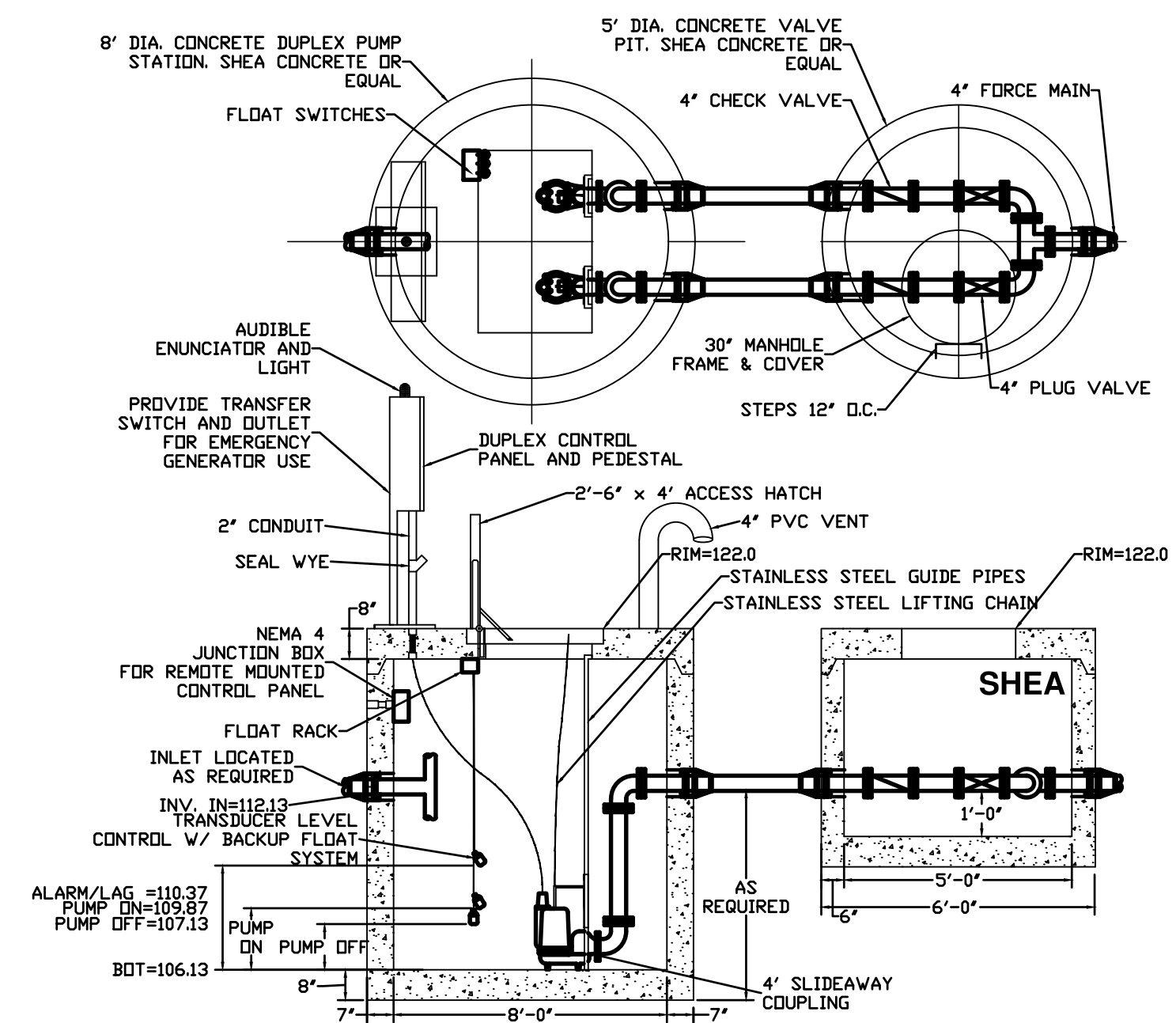
SECTION VIEW
NOTES:
1. SMH #1 IS A STANDARD MANHOLE WITH ECCENTRIC CONE TOP.
2. THERE SHALL BE NO STEPS INSTALLED WITHIN THE MANHOLE.
MANHOLE WITH EXTERIOR DROP
N.T.S.



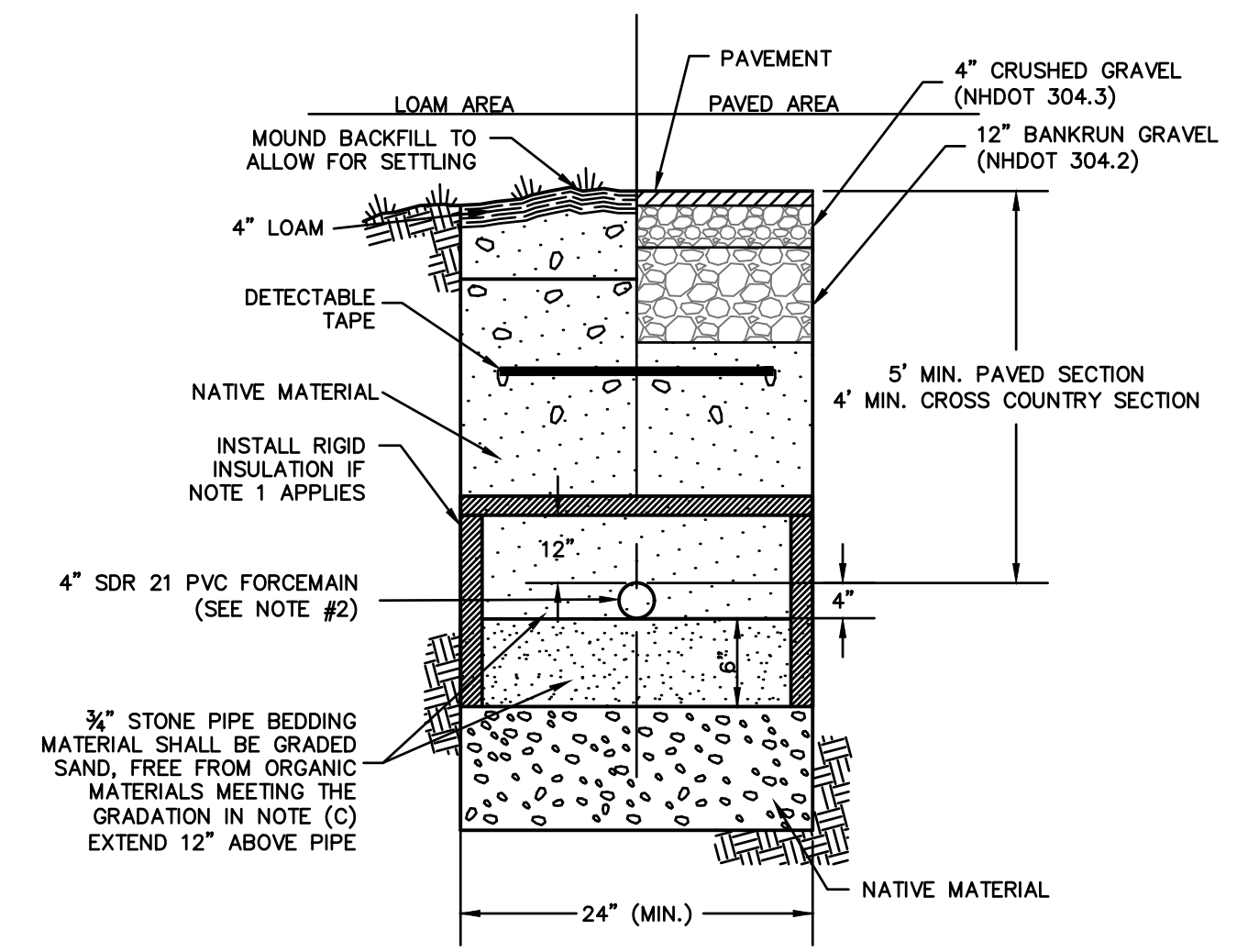
NOTES:
1. REMOVE LOAM TO A MINIMUM DEPTH OF 8\"/>



CONCRETE LIGHT POLE BASE
N.T.S.



PROPOSED PUMP STATION & VALVE PIT DETAIL
NOT TO SCALE
NOTES:
1. CONCRETE, 4,000 PSI MINIMUM AFTER 28 DAYS.
2. REINFORCED STEEL CONFORMS TO LATEST ASTM A185
3. BUTYL RESIN SECTION JOINT CONFORMS TO LATEST ASTM C990 SPEC
4. PUMP MODEL - LIBERTY 3XLM033A - 3HP MONOVANE. 3\"/>



SEWER FORCEMAIN TRENCH
N.T.S.
NOTES:
1. USE RIGID INSULATION AS SHOWN IF PIPE COVER IS LESS THAN 4\"/>

TRENCH CONSTRUCTION (PER Env-Wq 704.09 NUMERATION)

- (A) TRENCH DIMENSIONS SHALL BE AS FOLLOWS:
(1) FOR SEWER PIPE LESS THAN 15\"/>
- (B) PIPE TRENCH BEDDING MATERIAL AND FILL MATERIAL FOR EXCAVATION BELOW GRADE SHALL BE SCREENED GRAVEL OR CRUSHED STONE TO ASTM C33-03 STONE SIZE NO. 67.
(C) THE PIPE SAND BLANKET MATERIAL SHALL BE GRADED SAND, FREE FROM ORGANIC MATERIALS, GRADED SUCH THAT 100% PASSES THROUGH A 1/2 INCH SIEVE AND A MAXIMUM OF 15% PASSES THROUGH A #200 SIEVE.
(E) PIPE BEDDING MATERIAL SHALL EXTEND FROM A HORIZONTAL PLANE THROUGH THE PIPE AXIS TO 6 INCHES BELOW THE BOTTOM OF THE OUTSIDE SURFACE OF THE PIPE.
(F) PIPE SAND MATERIAL SHALL COVER THE PIPE A MINIMUM OF 12 INCHES ABOVE THE CROWN OF THE OUTSIDE SURFACE.
(G) COMPACTION SHALL BE IN 12 INCH LAYERS FOR BEDDING AND BLANKET MATERIALS.
(H) BACKFILL MATERIALS SHALL BE COMPACTED IN 3-FOOT LAYERS TO THE GROUND SURFACE EXCEPT FOR ROAD CONSTRUCTION (OR OTHER PAVED AREAS) WHERE THE FINAL 3 FEET SHALL BE COMPACTED IN 12-INCH LAYERS TO THE ROAD BASE SURFACE.
(I) TRENCH BACKFILL MATERIAL IN ROADWAY LOCATIONS SHALL BE NATURAL MATERIALS EXCAVATED FROM THE TRENCH DURING CONSTRUCTION, EXCLUDING: DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT OR CLAY, ALL EXCAVATED LEDGE MATERIAL, AND ALL ROCKS OVER SIX INCHES IN LARGEST DIMENSION, OR ANY MATERIAL WHICH AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.
(J) TRENCH BACKFILL AT CROSS-COUNTRY LOCATIONS SHALL BE AS DESCRIBED IN (I) ABOVE, EXCEPT THAT TOP SOIL, LOAM, MUCK OR PEAT, MAY BE USED PROVIDED THE COMPLETED CONSTRUCTION WILL BE STABLE, AND PROVIDED THAT ACCESS TO THE SEWER FOR MAINTENANCE AND RECONSTRUCTION IS PRESERVED.
(K) BACKFILL SHALL BE MOUNDED 6 INCHES ABOVE ORIGINAL GROUND AT CROSS-COUNTRY LOCATIONS.
(L) BASE COURSE FOR TRENCH REPAIR SHALL MEET THE REQUIREMENTS OF DIVISION 300 OF THE \"STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION\" OF THE NH DOT.
(O) PRECAUTIONS SHALL BE TAKEN TO AVOID GROUNDWATER POOLING AT THE SURFACE BY PROVIDING DRAINAGE TO A SUITABLE OUTLET AT CATCH BASINS OR RUNOFF SWALES.

FORCE MAIN AND LOW PRESSURE SEWER CONSTRUCTION MATERIALS (PER Env-Wq 704.06 NUMERATION)

THIS SECTION REQUIRED TO MEET REQUIREMENTS OF Env-Wq 704.12 (d):
(A) FORCE MAINS SHALL BE CONSTRUCTED OF SDR 21 PVC MATERIAL.
(B) FORCE MAINS SHALL BE TREATED AS GRAVITY SEWERS FOR PURPOSES OF FOUNDATION BEDDING AND BACKFILL REQUIREMENTS.
(C) PVC PIPE USED FOR FORCE MAINS SHALL CONFORM TO ASTM D2241-05 OR ASTM D1785-05.

FORCE MAIN AND LOW PRESSURE SEWER TESTING (PER Env-Wq 704.08 NUMERATION)

FORCE MAINS SHALL BE TESTED IN ACCORDANCE WITH SECTION 4 OF AWWA C600-05 \"INSTALLATION OF CAST IRON WATER MAINS AND THEIR APPURTENANCES\", AT A PRESSURE EQUAL TO THE GREATER OF 150 PERCENT OF THE DESIGN OPERATING TOTAL DYNAMIC HEAD OR AT LEAST 100 PSI.

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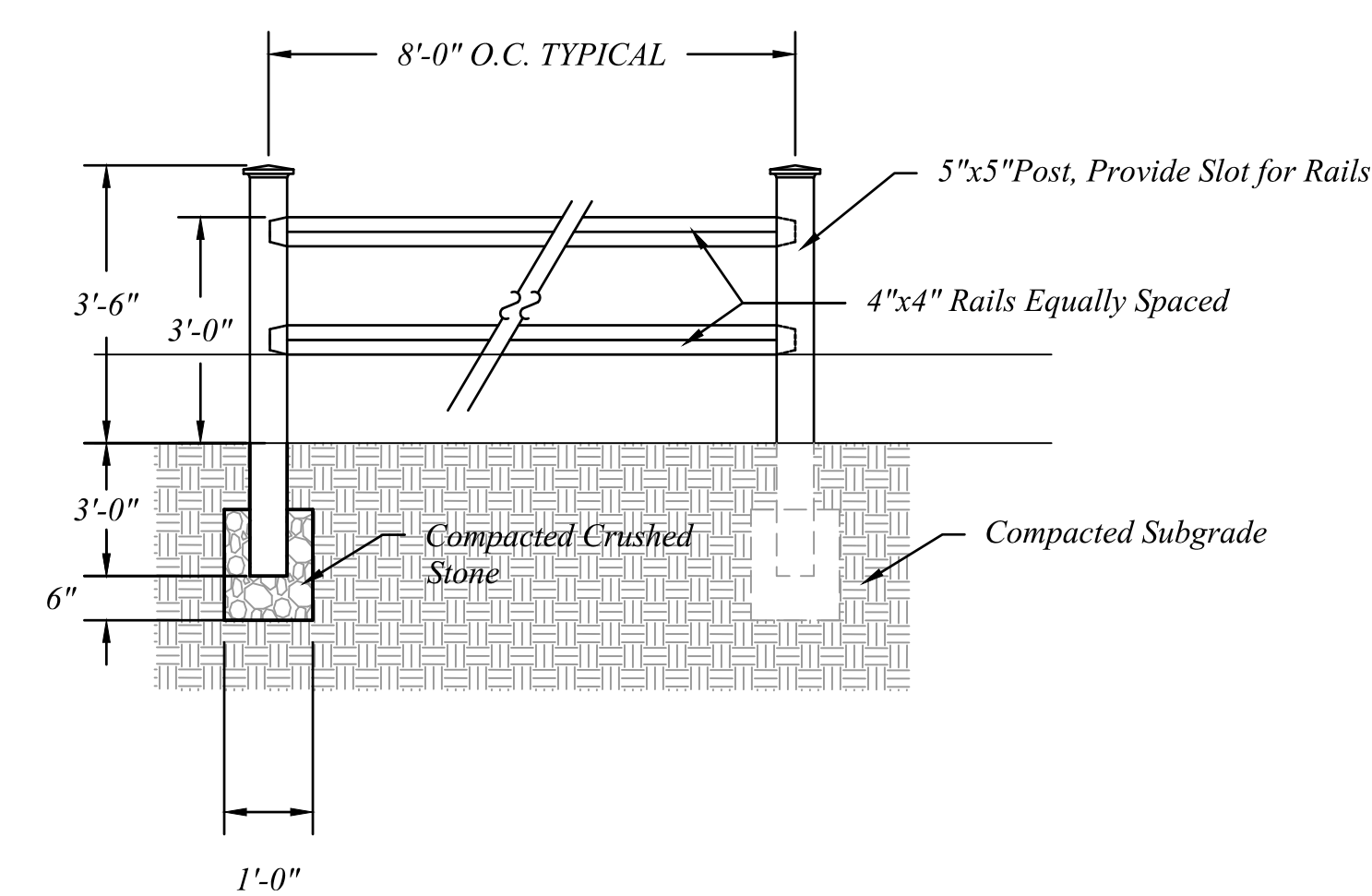
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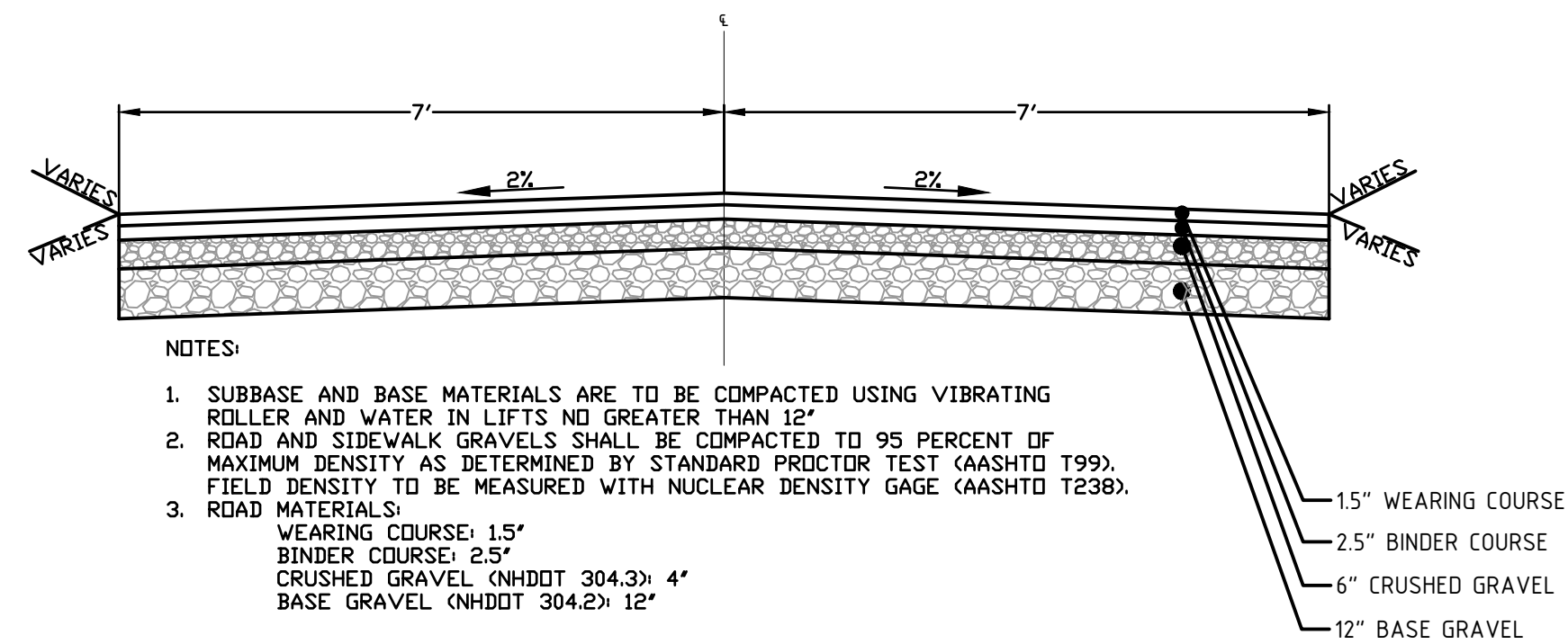
CONSTRUCTION DETAILS

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

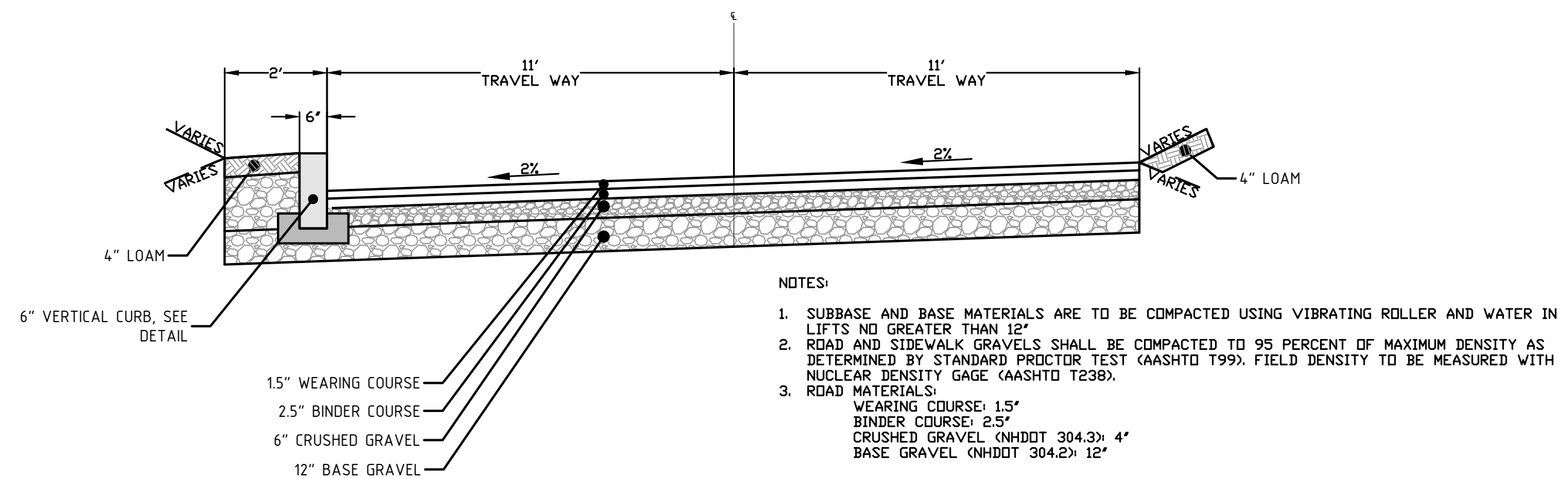
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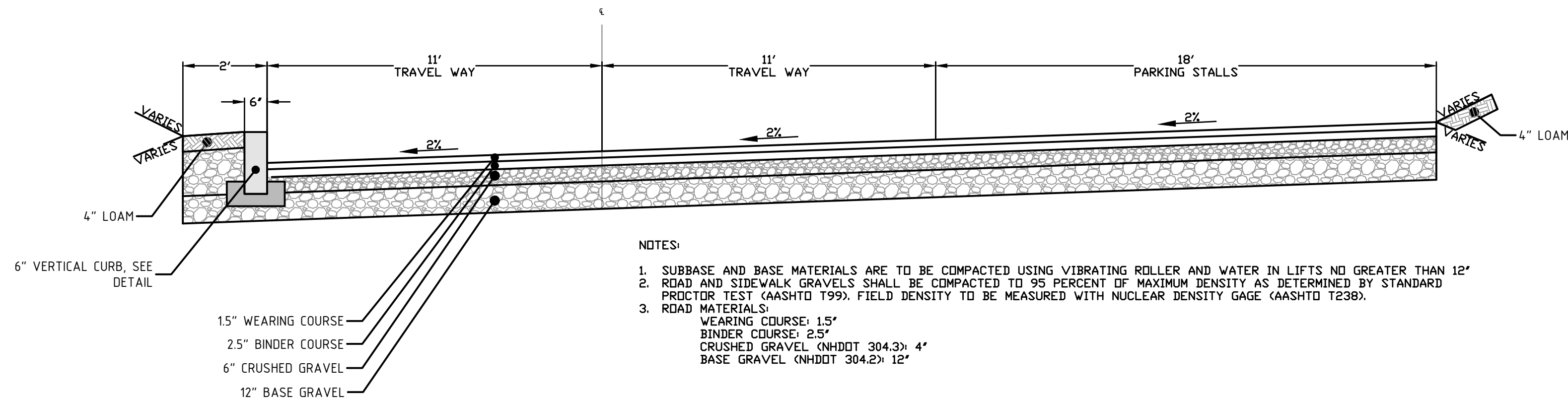
2 RAIL DIAMOND RAIL CEDAR FENCE



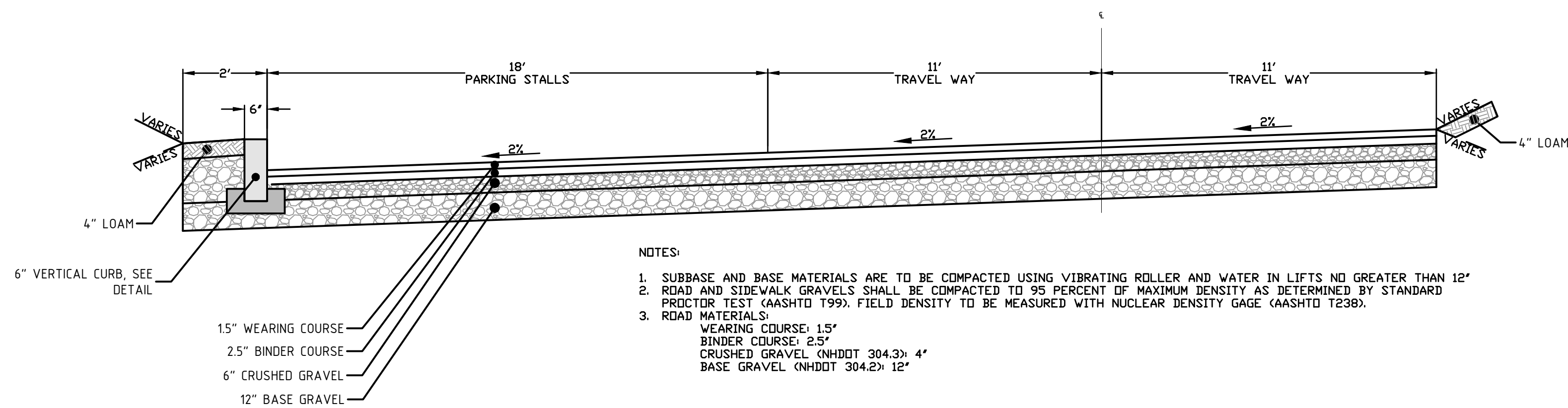
PRIVATE ROAD (MINI ROAD A & B) CROSS-SECTION
NTS



PRIVATE ROAD (LOOP ROAD) CROSS-SECTION
STA 0+77 TO STA 4+16
STA 4+88 TO STA 6+66
STA 6+98 TO STA 9+01
STA 10+40 TO STA 15+65
NTS



PRIVATE ROAD (LOOP ROAD) CROSS-SECTION w/PARKING, RIGHT:
STA 9+01 TO STA 10+40
STA 15+65 TO STA 16+10
NTS



PRIVATE ROAD (LOOP ROAD) CROSS-SECTION w/PARKING, LEFT:
STA 0+00 TO STA 0+77
STA 4+16 TO STA 4+88
STA 6+66 TO STA 6+98
NTS

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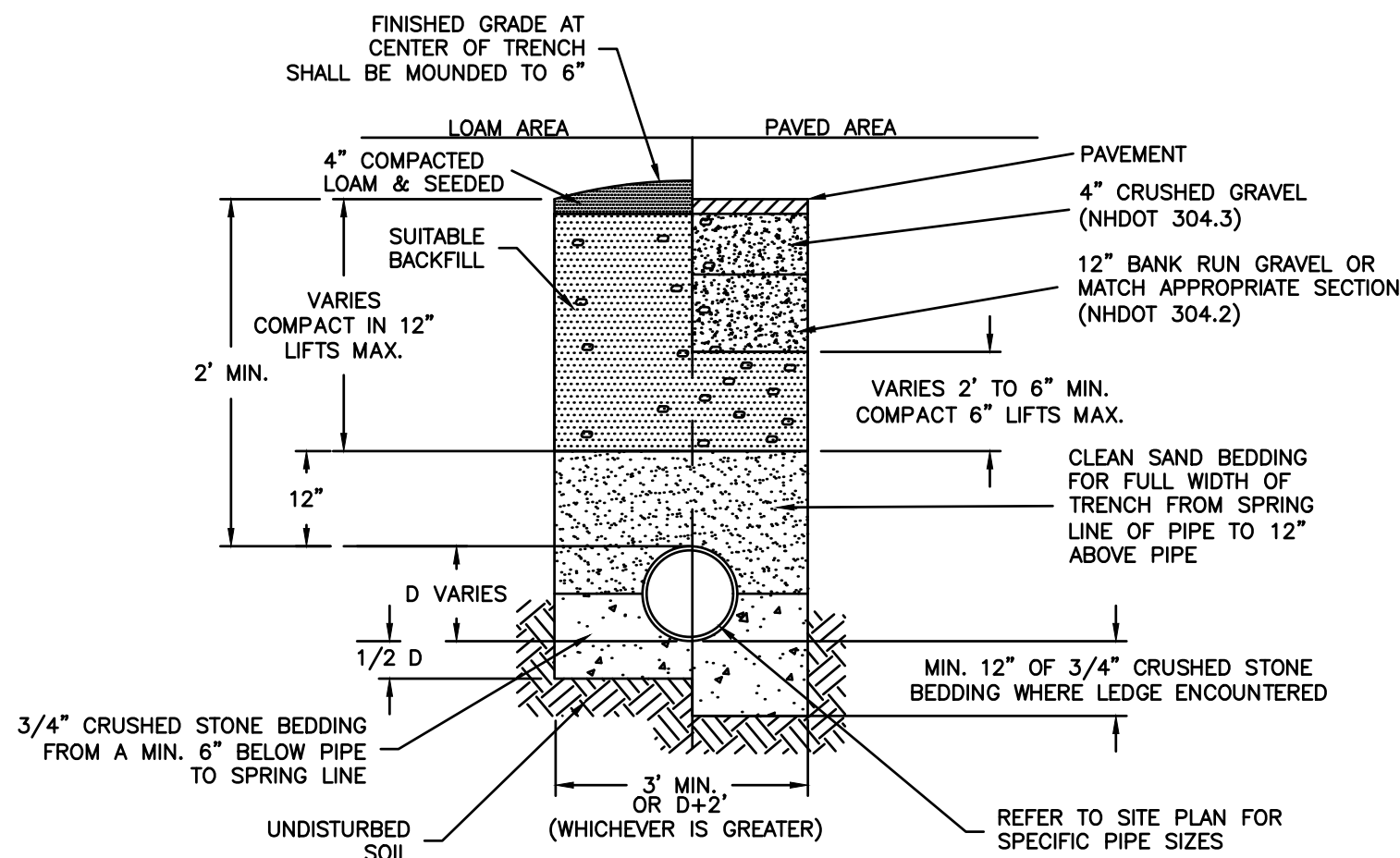
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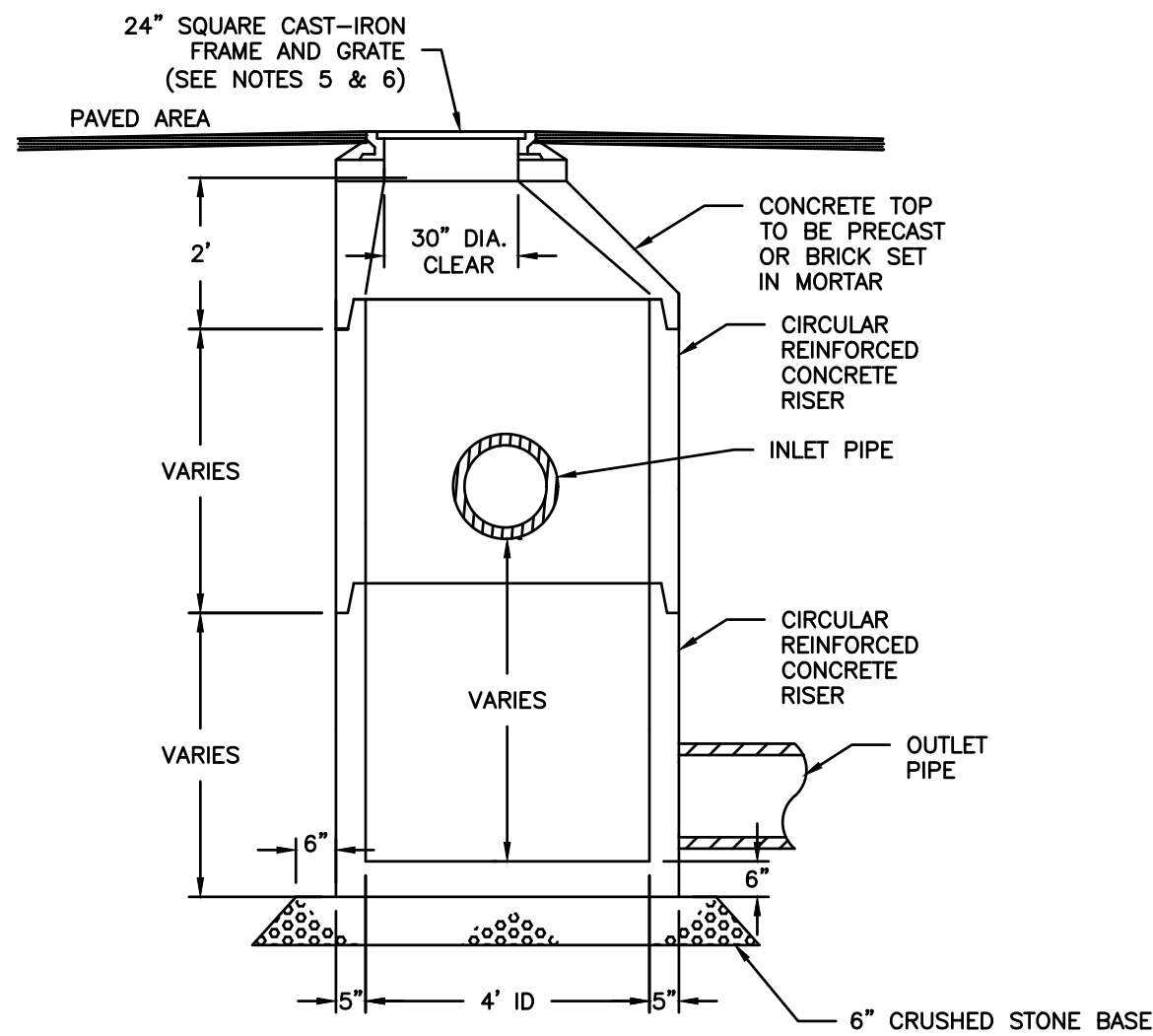
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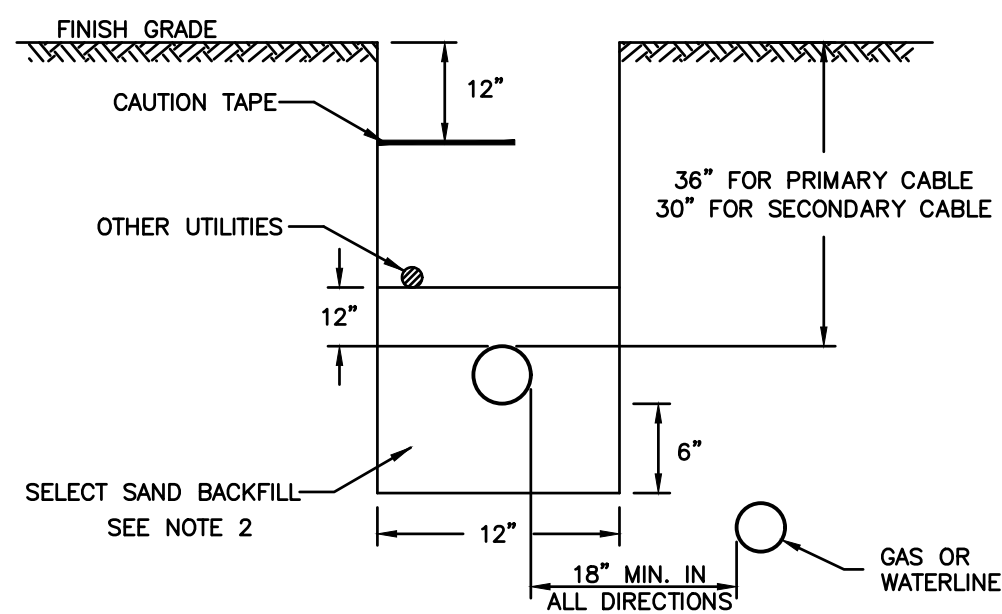
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STANDARD DRAINAGE PIPE TRENCH
N.T.S.

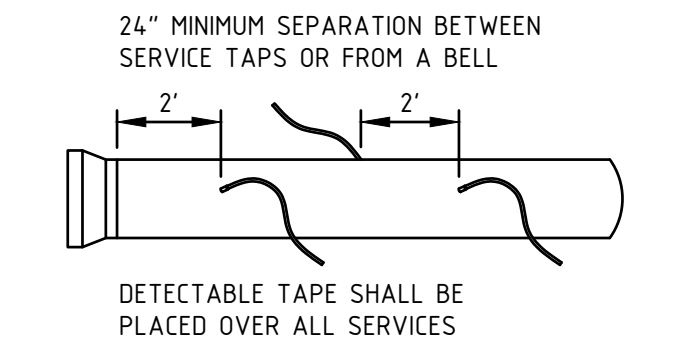
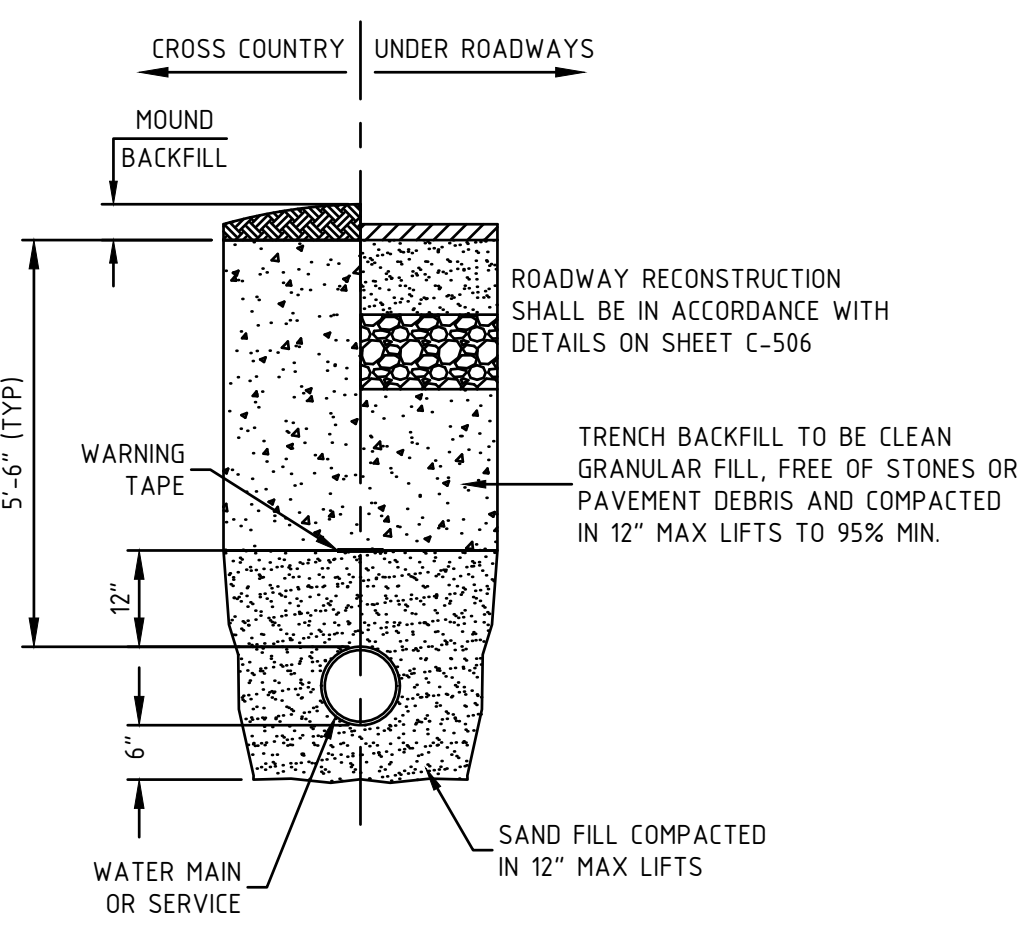


TYPICAL DRAIN MANHOLE
N.T.S.

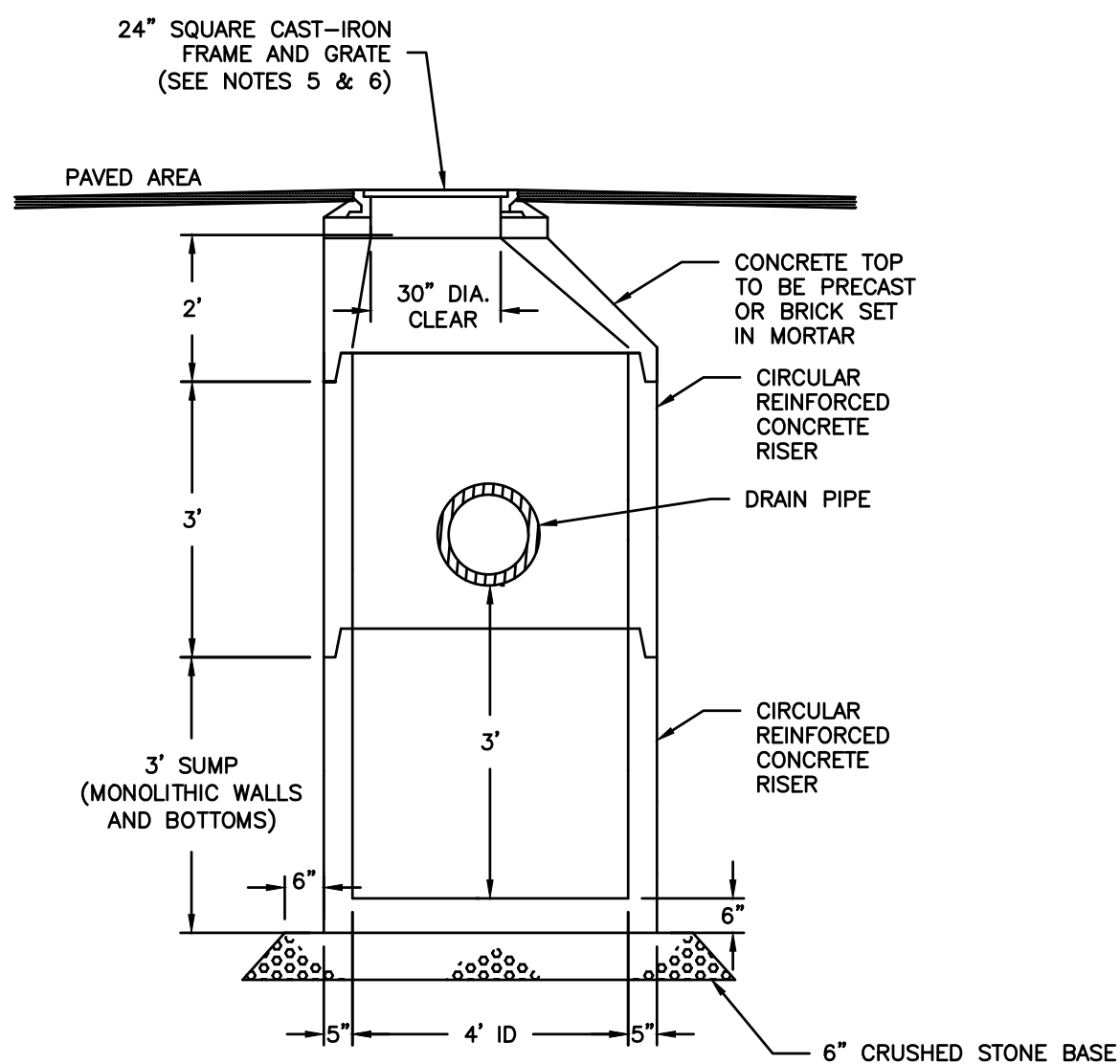


TELEPHONE & ELECTRIC TRENCH
N.T.S.

- NOTES:
- CONSTRUCTION TO BE IN ACCORDANCE WITH PSNH CONSTRUCTION STANDARDS FOR NEW ELECTRICAL SERVICE WORK BY CONTRACTORS, MOST RECENT EDITION.
 - SELECT SAND BACKFILL SHALL CONSIST OF A FINE GRANULAR MATERIAL OF WHICH 100% SHALL PASS THROUGH A 1/4" SIEVE. EXCEPT NATURALLY OCCURRING SMOOTH ROUND PEBBLES NO GREATER THAN 3/8" IN DIAMETER ARE PERMITTED AS LONG AS THEIR TOTAL VOLUME PER CUBIC FOOT OF SAND DOES NOT EXCEED 1%. THE SAND SHALL BE COMPLETELY FREE OF FROZEN LUMPS, ROCKS, STONES, DEBRIS AND RUBBISH. BACKFILL SHALL BE THOROUGHLY COMPACTED IN 6" LIFTS.
 - CONDUIT SIZES TO BE 5" 3-PHASE PRIMARY AND 4" 3-PHASE SECONDARY. ALL CONDUIT SIZES TO BE VERIFIED BY PSNH.
 - ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND WHERE APPLICABLE THE NATIONAL ELECTRIC CODE.

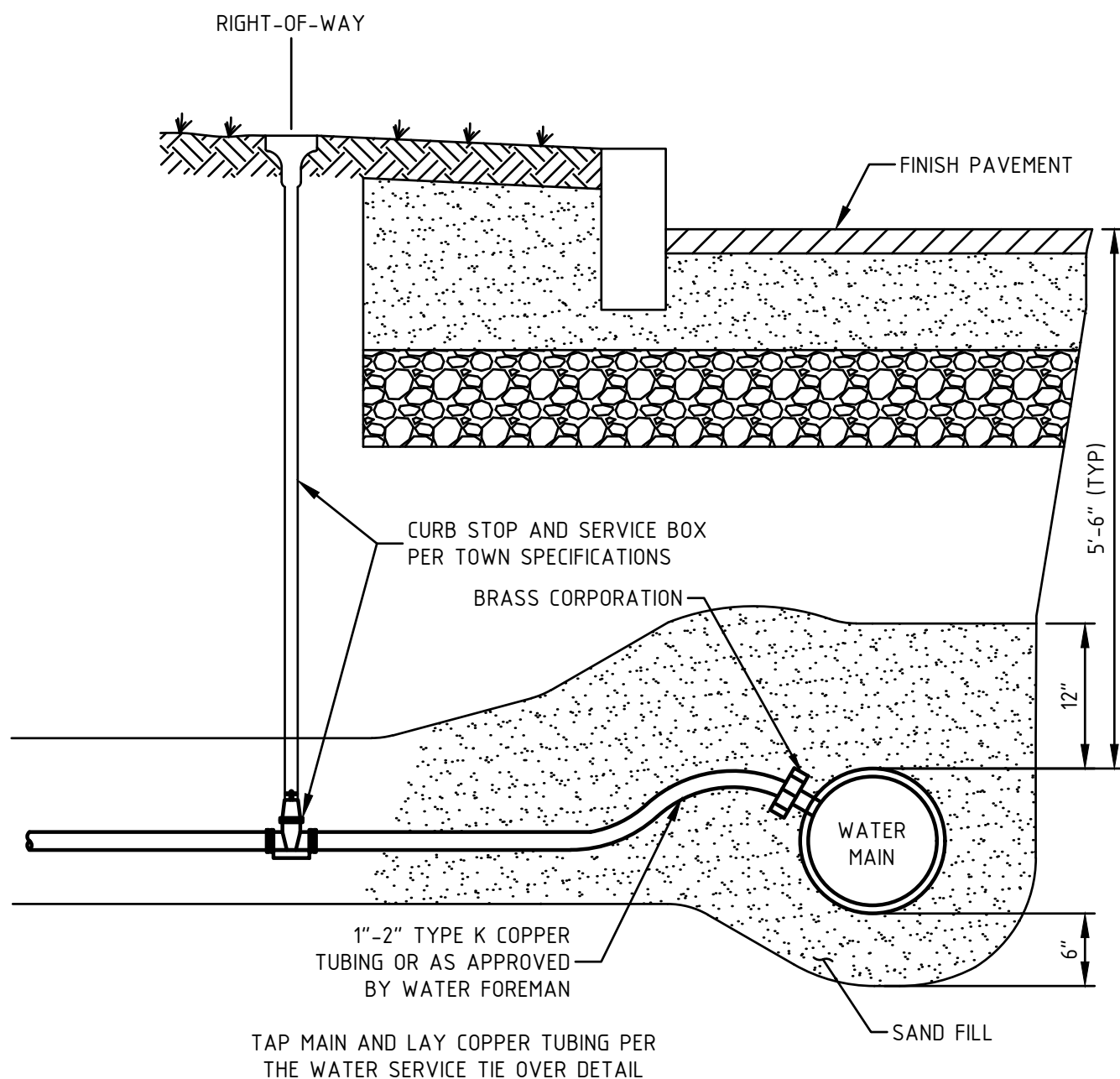


WATER MAIN TRENCH DETAIL
N.T.S.

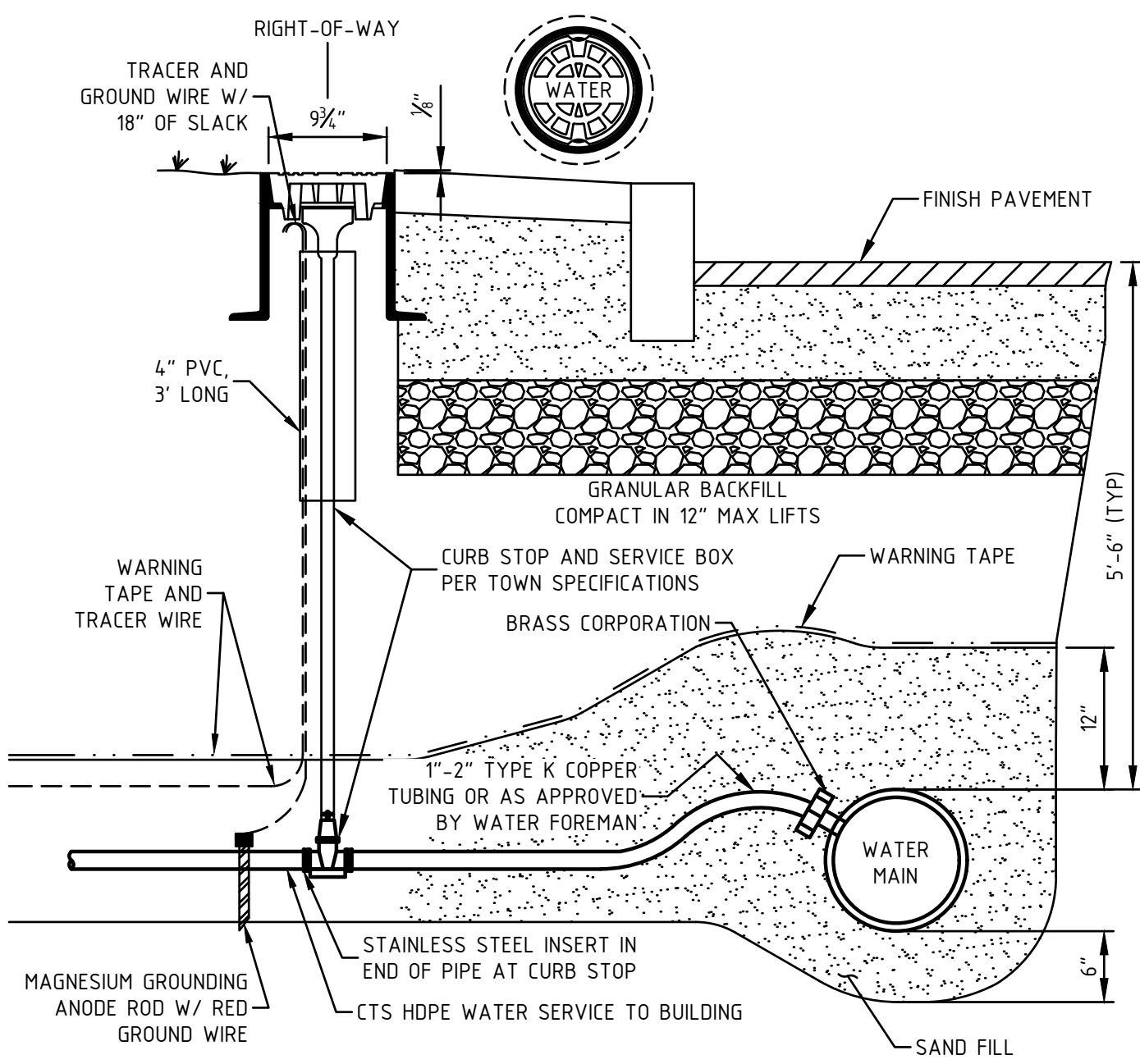


TYPICAL CATCH BASIN DETAIL
N.T.S.

- DRAINAGE STRUCTURE NOTES:
- DRAINAGE STRUCTURE MATERIALS SHALL COMPLY WITH NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION, DIVISION 600, SECTION 604.
 - SITE CONTRACTOR SHALL BACKFILL AROUND DRAINAGE STRUCTURES IN 6 TO 8 INCH LIFTS, ATTAINING 95% MAXIMUM PROCTOR DENSITY FOR EACH LIFT.
 - PIPE OPENINGS SHALL BE FULLY MORTARED ON OUTSIDE PRIOR TO BACK FILLING. INSIDE OF PIPE OPENINGS SHALL BE MORTARED AND ALLOWED TO CURE PER MANUFACTURERS REQUIREMENTS PRIOR TO RECEIVING RUNOFF.
 - JOINTS BETWEEN ADJACENT RISERS SHALL BE FULLY SEALED WITH ELASTOMERIC SEALANT PER MANUFACTURERS REQUIREMENTS.
 - WHEN FRAME/GRATE ARE LOCATED IN A PAVED AREA, THEY SHALL BE BROUGHT TO FINISH GRADE AFTER BINDER COURSE PAVEMENT IS PLACED. THE EXCAVATION REQUIRED AROUND THE GRATE AND FRAME SHALL BE BACKFILLED FLUSH WITH THE TOP OF BINDER COURSE WITH NHDOT CLASS B CONCRETE.
 - FRAME AND GRATE: CATCH BASINS: NEENAH LIFTMATE OR PAMREX

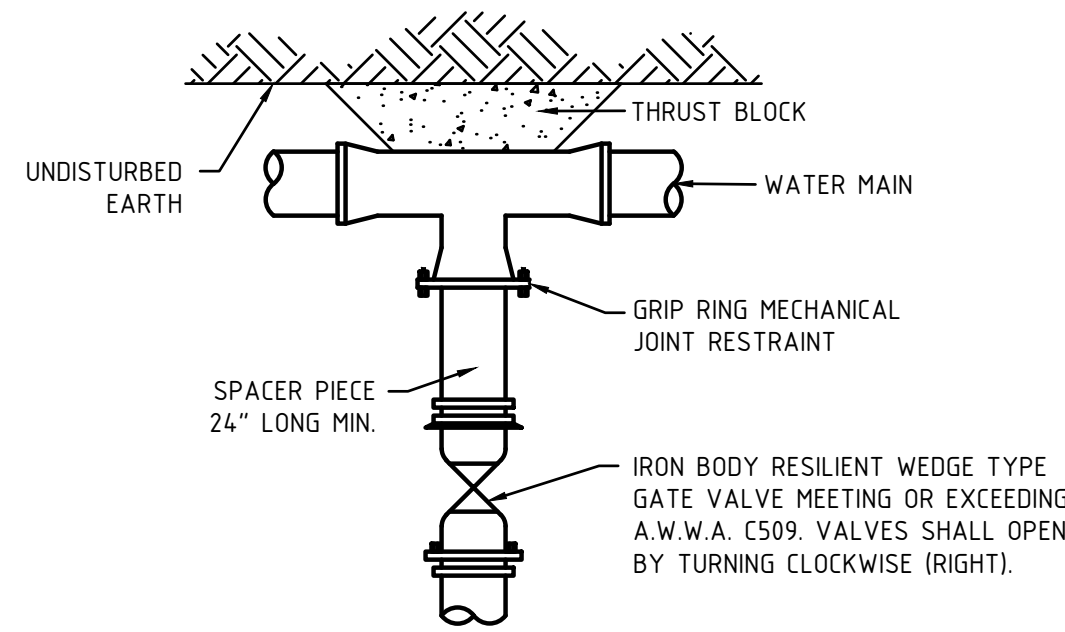


WATER SERVICE INSTALLATION
N.T.S.

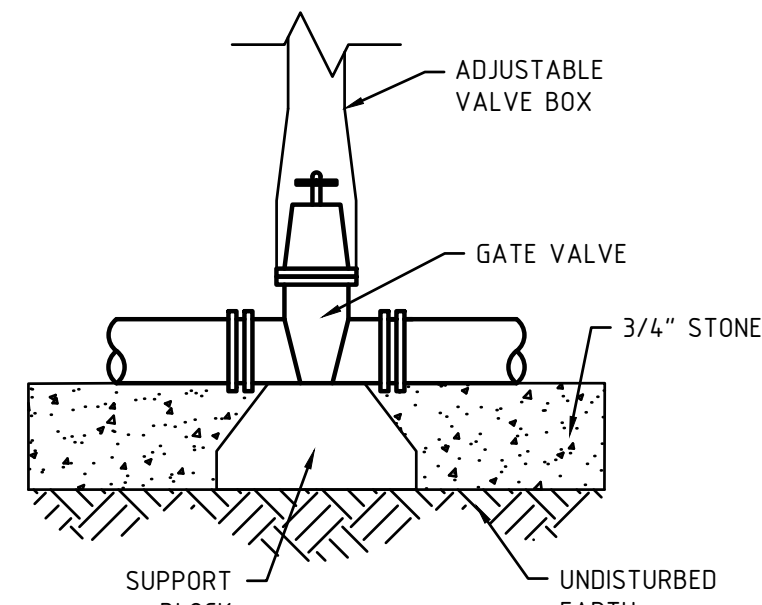


WATER SERVICE TRACER WIRE INSTALLATION
N.T.S.

- NOTES:
- LOCATOR BOX:
- LOCATOR BOX AND COVER SHALL BE CAST IRON.
 - LOCATOR BOXES SHALL BE SET AT 500' INTERVALS AND AT BENDS.
 - PROVIDE 18" WIRE LOOP INSIDE THE LOCATOR BOX.
 - LOCATOR BOXES SHALL BE SET AT GRADE IN CROSS COUNTRY LOCATIONS AND 1/4" BELOW PAVEMENT, TAPERED OVER 2'.
- TRACER WIRE:
- CONTINUOUS, DIRECT BURIAL RATED.
 - 12 AWG HIGH STRENGTH SOLID CORE COPPER CLAD STEEL.
 - COATING COLOR SHALL CONFORM TO THE APWA UNIFORM COLOR CODE.
- REPAIRS:
- SPLICES SHALL BE MADE WITH CORROSION PROOF, LOCKABLE WIRE CONNECTORS.

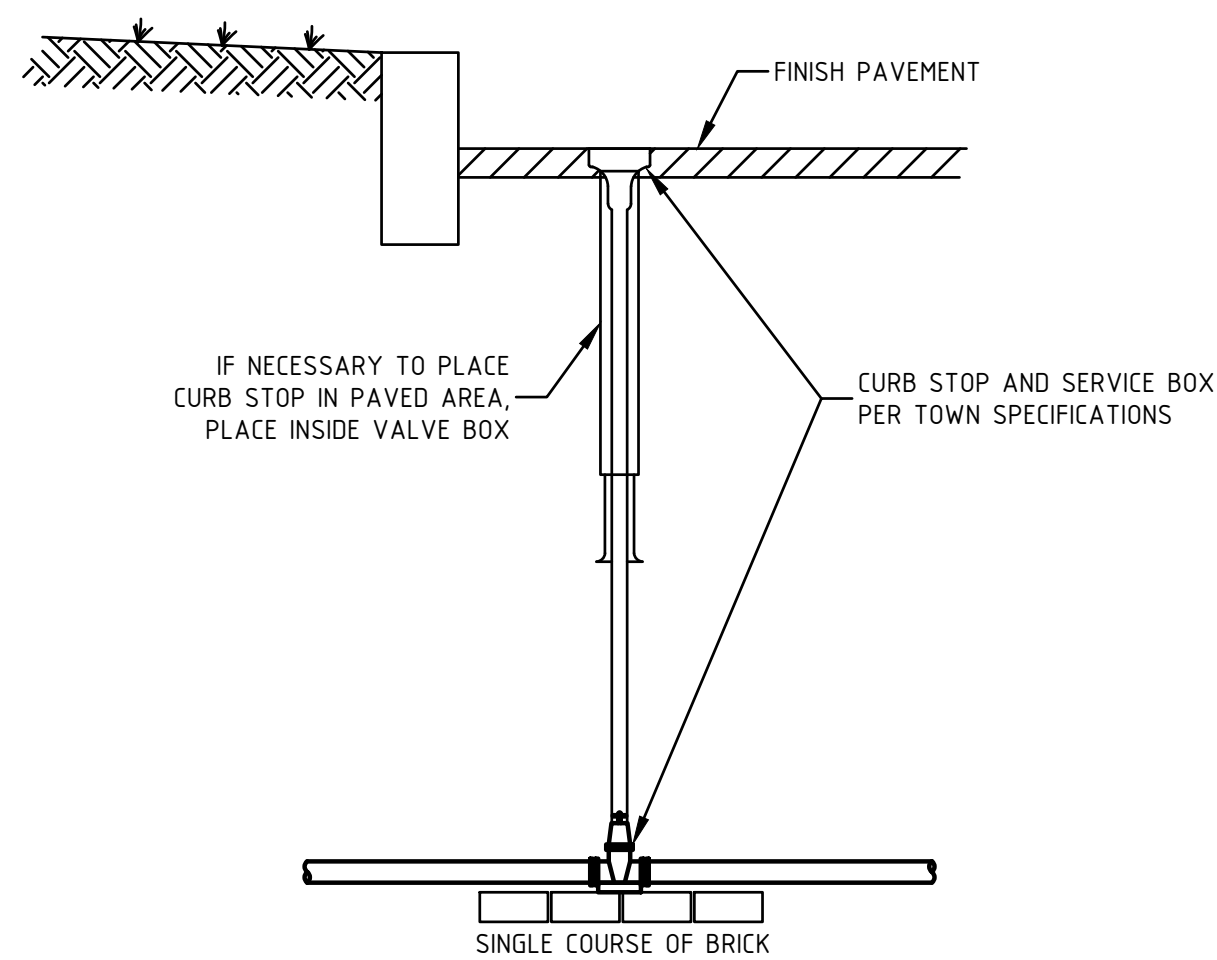


PLAN VIEW



ELEVATION VIEW

TYPICAL VALVE CONNECTION
N.T.S.



CURB STOP IN PAVEMENT
N.T.S.

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36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

CONSTRUCTION DETAILS

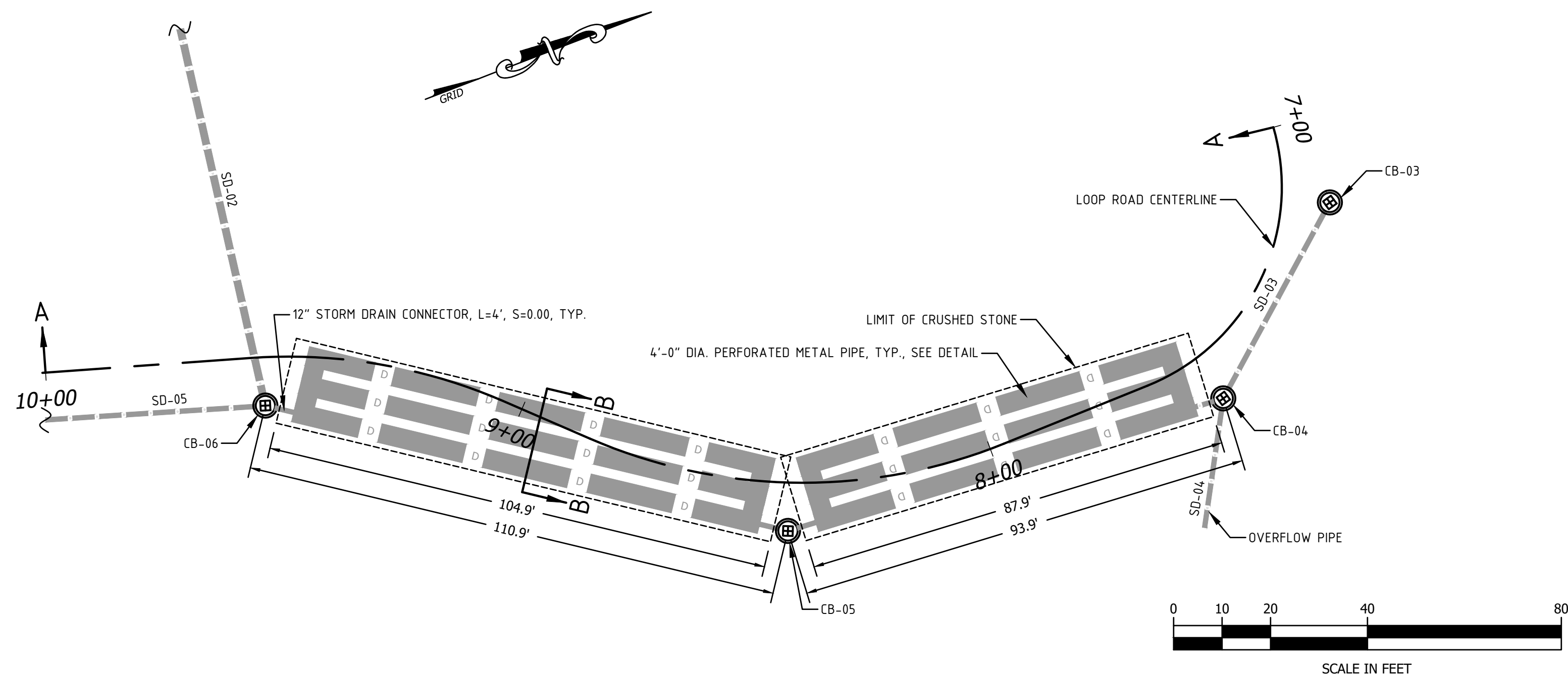
NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: 2023.06.02 PROJECT #: 230277

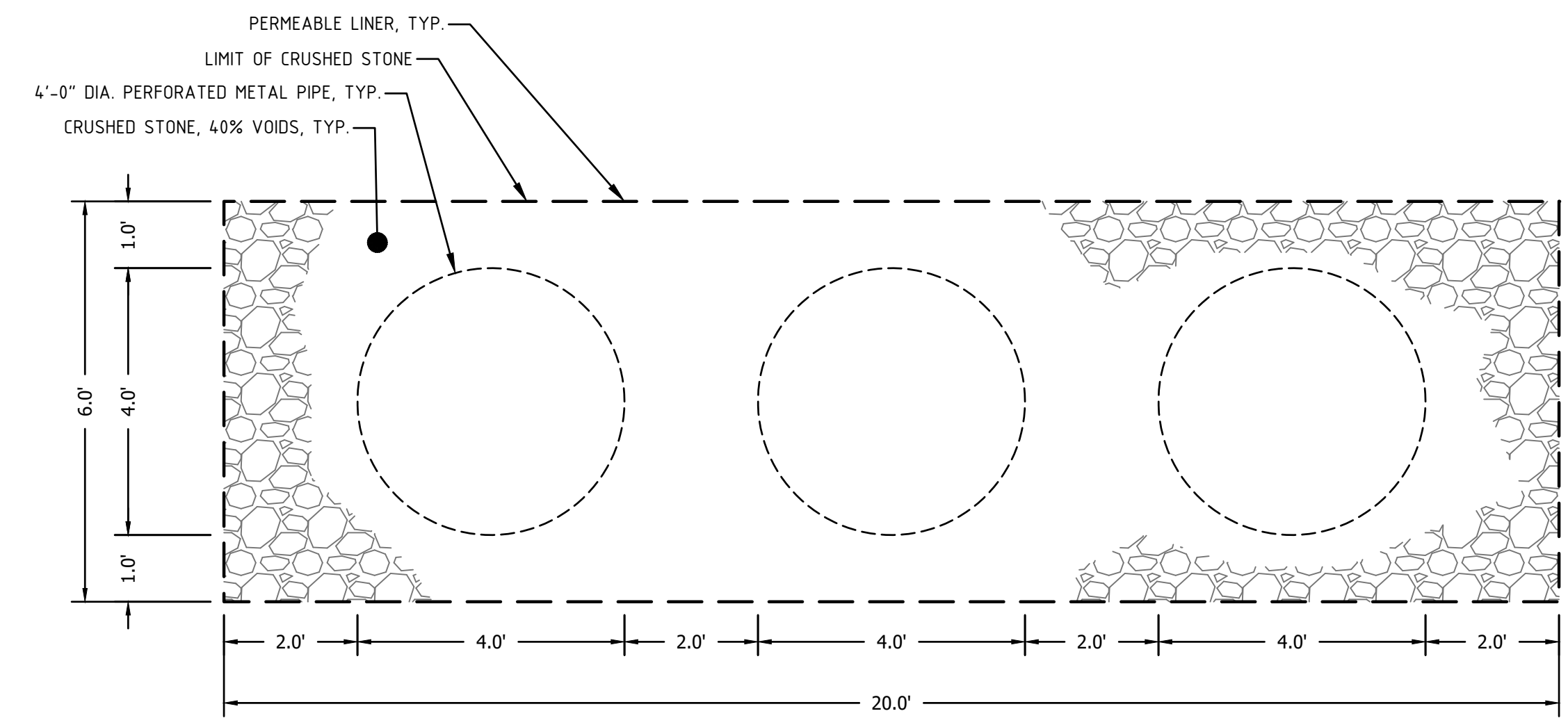
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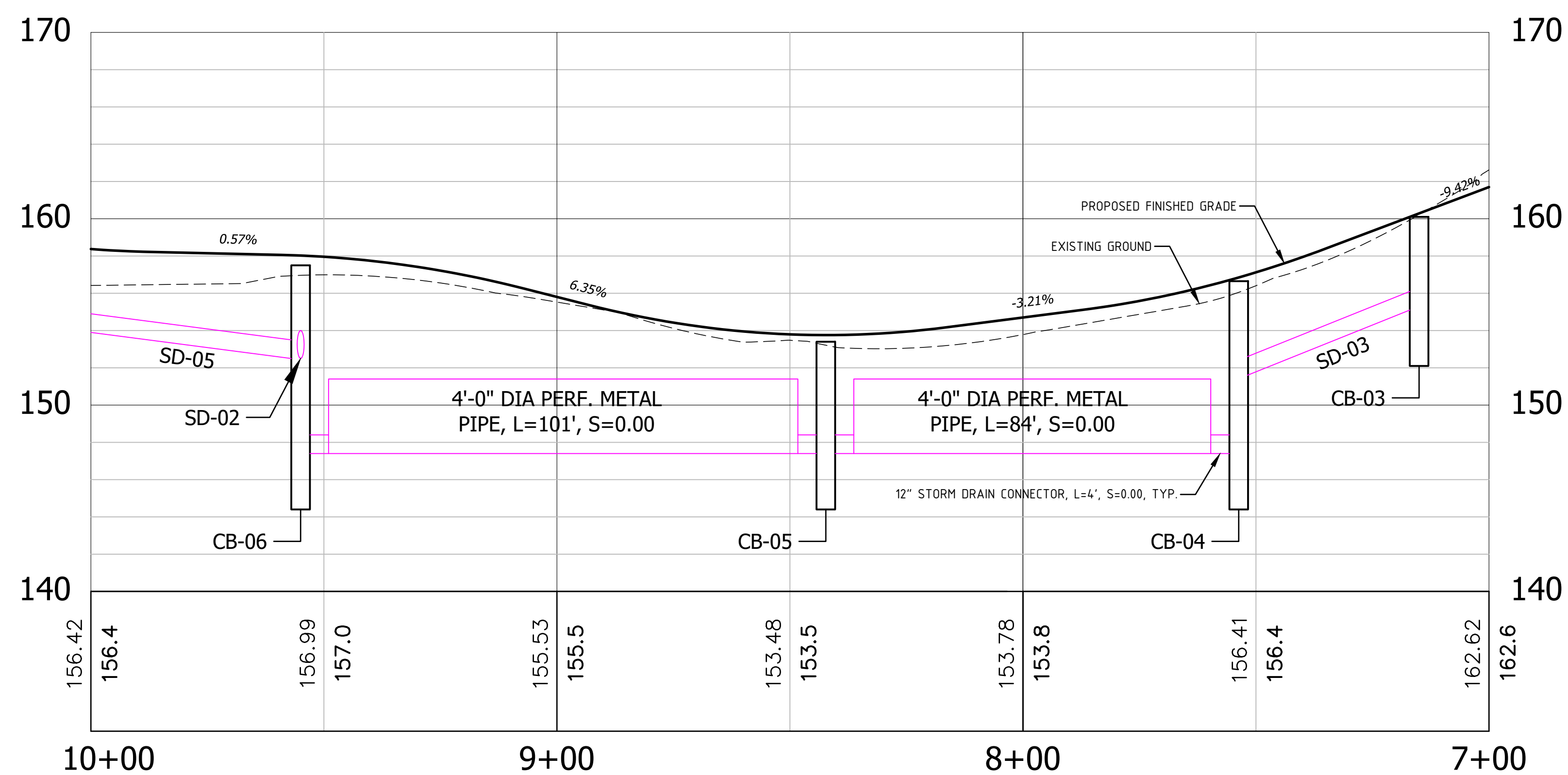
C507



UNDERGROUND DETENTION AND INFILTRATION SYSTEM PLAN VIEW
SCALE: 1"=20'



UNDERGROUND DETENTION AND INFILTRATION SYSTEM CROSS SECTION B-B
SCALE: 1"=2'



UNDERGROUND DETENTION AND INFILTRATION SYSTEM CROSS SECTION A-A
STA: 7+00 to STA: 10+00
SCALE(H): 1"=20'
SCALE(V): 1"=5'

FOR REVIEW
NOT FOR CONSTRUCTION

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JOHN RANDOLPH

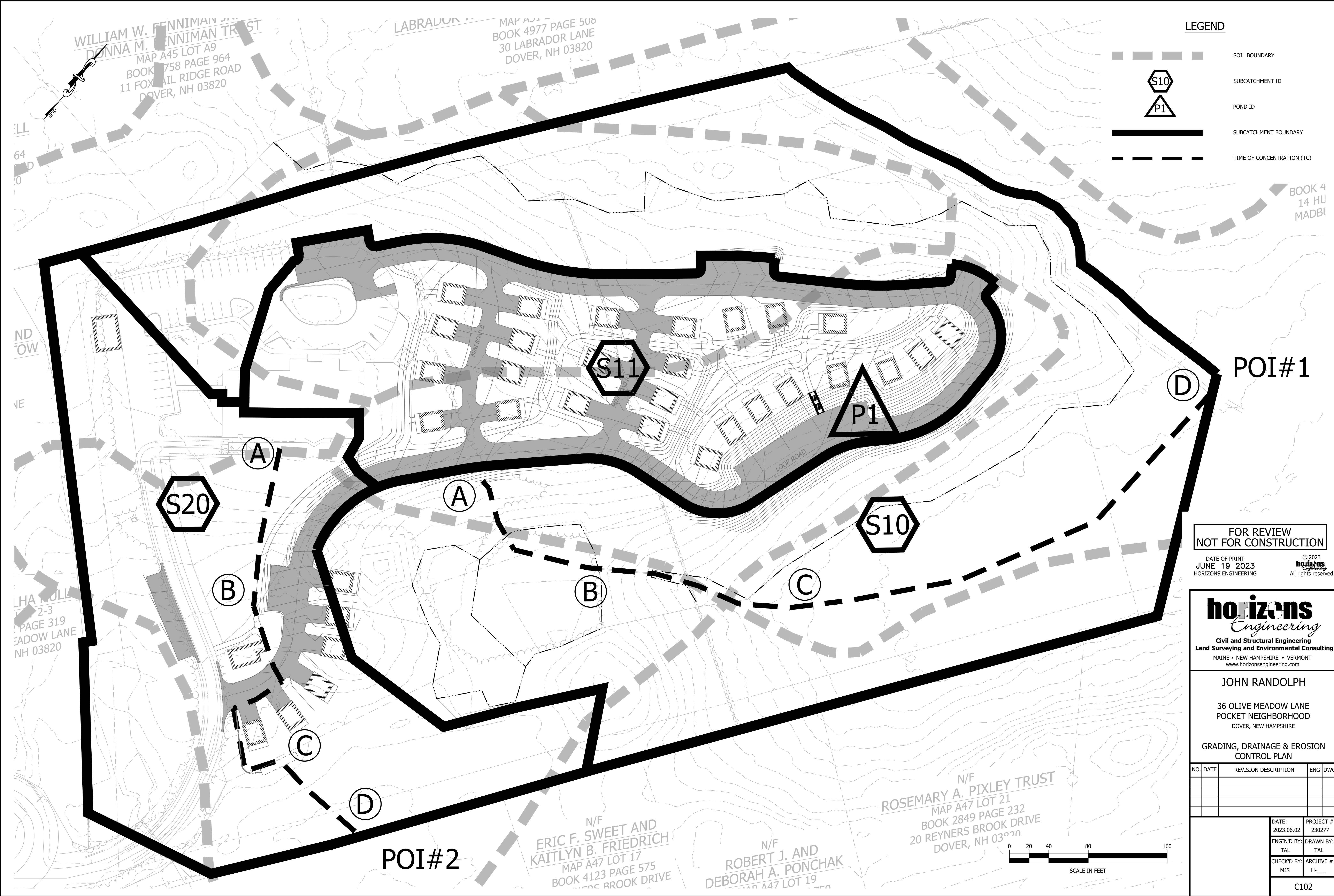
36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

CONSTRUCTION DETAILS

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C508



LEGEND

- SOIL BOUNDARY
- SUBCATCHMENT ID
- POND ID
- SUBCATCHMENT BOUNDARY
- TIME OF CONCENTRATION (TC)

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36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

GRADING, DRAINAGE & EROSION
CONTROL PLAN

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

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C102

