

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, August 29, 2024**
Meeting Time: **10:30 AM**

**** Times are approximate and may change****

1. 10:30 AM – 11:00 AM: Site Review for Del Sol Dover, LLC Assessor's Map G Lot 2-1-2, zoned CM, located at Crosby Road. (Proposal is to construct one (1) 9,600 s.f. warehouse building with associated parking and infrastructure and an 807' paved extension of Crosby Road). (SITE-2024-0010)
2. 11:00 AM – 11:30 PM: Site Review for Chauvin Arnoux, Inc., Assessor's Map G, Lot 1-L, zoned CM, located at 15 Faraday Drive. (Proposal is to construct one (1) 2,356 s.f. storage building). (SITE-2024-0011)



PLAN SNAPSHOT REPORT SITE-2024-0010 FOR CITY OF DOVER, N.H.

Plan Type: Site Plan - Major
Work Class: New Construction
Status: In Review
Valuation: \$0.00
Description: "LOT 2", G/2-1 Crosby Road (extension) Site Development

Project:
District: None
Square Feet: 0.00
Assigned To: Blonigen, Rachel

App Date: 08/06/2024
Exp Date: 10/10/2024
Completed: NOT COMPLETED
Approval Expire Date:

Parcel: G0002-001000	Main	Address: Littleworth Road Dover, NH 03820	Main	Zone: CM(Non-Residential - Commercial Manuf.
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Surveyor McEaney Survey Associates P.O. Box 1166 DOVER, NH 03821 Business: (603) 742-0911	Applicant Civilworks New England Steve Haight 181 Watson Road PO Box 1166 Dover, NH 03820 Business: (603) 749-0443 Mobile: (603) 817-6651	Owner Route 108 LLC Chad Kageleiry 340 Central Avenue 202 Dover, NH 03820 Business: (603) 749-2800	Wetlands Scientist Bruce Gilday Business: (603) 228-5775
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Engineer Stephen Haight Business: (603) 749-0443	Applicant Chad Kageleiry Business: (603) 749-2800
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Plan Custom Fields

Total	0	Total2	0	Total3	0
Total4	0	Total5	0	Total6	0
Total7	0	Total8	0	Total9	0
Street Classification Type	Municipal	Net Change in # Parking Spaces (+/-)	23	Water Service	Municipal
Recording Number		Sewer Service	Municipal	Total Acres (GIS)	20.8
Deed Book	5075	Total SQFT	906048	Deed Page	142
Deed Date	20221031	Proposed Property Use	Vacant, Industrial Park	Area of Parcel to be Developed (SQFT)	142500
Number of Parking Spaces Existing	0	Number of Parking Spaces Proposed	23	Number of Employees Total	30
Number of Employees in Max Shift	1	Distance to City Water	300	Distance to City Sewer	300
Type of Building to be Built	Steel Frame w/ Metal Exterior, Warehouse Style	Estimated Construction Value	450000.00	Refuse Removal	Private
Is there an existing Conservation Easement?	No	Existing Conservation Easement Details		TotalImpactFeeSDTOD	0.00
TotalImpactFeeTHTOD	0.00	TotalImpactFee23FTOD	0.00	TotalImpactFeeA4TOD	0.00
TotalImpactFeeMHTOD	0.00	TotalImpactFeeADUTO	0.00	TotalImpactFeeAONRT	0.00
TotalImpactFeeAR55TC	0.00	TotalImpactFeeAR62TC	0.00	Sub Total Residential	0.00
TotalImpactFeeRIRCT	0.00	TotalImpactFeeOCSTO	0.00	TotalImpactFeeITWCT	0.00
TotalImpactFeeNHALT	0.00	TotalImpactFeeOIUTOD	0.00	TotalImpactFeeAFAOT	0.00
Sub Total	0.00	Total of Impact Fees to be Assessed	0.00		
Non-Residential					

Attachment File Name	Added On	Added By	Attachment Group	Notes
Signature_Steve_Haight_8/6/2024.jpg	08/06/2024 19:11	Haight, Steve		Uploaded via CSS

PLAN SNAPSHOT REPORT (SITE-2024-0010)

Invoice No.	Fee	Fee Amount	Amount Paid
INV-00008889	Planning General Application Fee	\$200.00	\$0.00
Total for Invoice INV-00008889		\$200.00	\$0.00
Grand Total for Plan		\$200.00	\$0.00

Workflow Step / Action Name	Action Type	Start Date	End Date
Review v.1		08/07/2024 10:09	
Confirm application complete v.1	Generic Action		08/07/2024 10:09
Technical Review Committee Meeting Agenda v.1	Task	08/07/2024 10:09	
Land Use Plan Technical Review v.1	Receive Submittal		
Technical Review Committee Meeting v.1	Hold Meeting		
Planning Board v.1			
Planning Board Agenda v.1	Task		
Invoice for Notices v.1	Task		
Send Notices v.1	Task		
Planner Creates Staff Recommendations v.1	Plan Activity		
Distribute Planning Board Materials v.1	Task		
Planning Board Hearing v.1	Hold Hearing		
Planning Board Decision v.1	Plan Activity		
NOD Sent to Applicant v.1	Create Report		
Final Plan v.1			
Land Use Plan Stamped and Signed v.1	Generic Action		
Recording v.1	Task		
Document Archival v.1	Generic Action		
Internal Notification of Plan Completion v.1	Generic Action		
Building Official Notifies Address v.1	Generic Action		
Pre-Con Meeting v.1	Hold Meeting		
Create/Link to Records v.1			
Create / Link to Permit - Building Major v.1	Create Sub Permit		
Create / Link to Permit - Site Work, Construction v.1	Create Sub Permit		



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: Del Sol Dover, LLC Telephone # 603-749-2800

Address of Applicant: 340 Central Avenue, Suite 202 Dover, NH 03820

E-Mail Address: chad@summitlanddev.com

Name of Property Owner (if different from applicant): _____ Telephone # _____

Address of Property Owner: _____

PROPERTY INFORMATION

Address of Property: Crosby Road Extension

Assessor's Map # G Lot(s) # 2-1

Zoning District(s) CM Overlay District(s) None

Size of Parcel: 906,049 sq. ft. 20.80 ac. Property Deed: Book 5075 Page: 142

Existing Use of Property: Vacant, Industrial Park

SITE PLAN INFORMATION

Describe Proposed Use: Commercial (Office / Warehouse)

Area of Parcel to be Developed: 142,500± sq. ft.

If Multi-family Residential: Number of Units N/A & Buildings Proposed N/A

If lodging: Number of Units N/A & number of Buildings N/A

Number of Parking Spaces: Existing 0 Proposed 23

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

Number of Employees Total: 30 In Maximum Shift: 1

Disposition of Parcel:

Building Setbacks:

Building Footprint 9,600 sq. ft. Front Yard 35 ft.

Total Building Area 9,600 sq. ft. Rear Yard 10 ft.

Paved Area 18,095 sq. ft. Side Yard: Right 10 ft. Left 10 ft.

City Water? ☒ Yes ___ No How far is city water from the property? at Crosby Road

City Sewer? ☒ Yes ___ No How far is city sewer from the property? at Crosby Road

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 _____ units

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

BUILDING INFORMATION

Type of Building to be Built: Steel Frame with Metal Exterior

Height of Building: 24.8' Finished Floor Elevation: 98.75'

Number of Seats (where applicable) N/A

Estimated value of construction: \$450,000 Refuse removal: Public ☒ Private (circle one)

WAIVER REQUESTS

Article IV 153-13 A.12 Licensed Landscape Architect
Article IV 153-13 A.17 Streetscape Renderings
Article IV 153-14 K. (1) (b) Parking Location

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

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

See attached Waiver Requests

SURVEYOR INFORMATION

Name of Surveyor and Company (Licensed in N.H.) Kevin McEneaney
McEneaney Survey Associates

Address P.O. Box 1166 Dover, NH 03821 Telephone #: 603-742-0911

Professional License #: NH LLS #661 E-mail address: kevin@surveynh.com

ENGINEER INFORMATION

Name of Engineer and Company (Licensed in N.H.) Stephen J. Haight, PE
Civilworks New England

Address P.O. Box 1166 Dover, NH 03821 Telephone #: 603-749-0443

Professional License #: NH PE #7978 E-mail address: shaight@civilworksne.com

ARCHITECT INFORMATION

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

Address _____ Telephone #: _____

Professional License #: _____ E-mail address: _____

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.) Bruce A. Gilday, CSS, CWS
BAG Land Consultants

Address 43 Rockingham Street Concord, NH 03301 Telephone #: 603-228-5775

Professional License #: NH CSS#012, NH CWS#088 E-mail address: bagilday@comcast.net

CONSERVATION EASEMENT HOLDER

Name of Easement Holder: N/A 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: 8/5/24

Signature of Applicant (if different from owner): _____ Date: _____

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: 8/5/24

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: 8/5/24

Signature of Applicant (if different from owner): _____ Date: _____

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: 8/5/24

Signature of Applicant (if different from owner): _____ Date: _____

**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
G	2-1	Del Sol Dover, LLC	340 Central Avenue, Suite 202 Dover, NH 03820

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS
Stephen J. Haight, PE	Civilworks New England	P.O. Box 1166 Dover, NH 03821
Kevin McEneaney	McEneaney Survey Associates	P.O. Box 1166 Dover, NH 03821
Bruce A. Gilday, CSS, CWS	BAG Land Consultants	43 Rockingham Street Concord, NH 03301

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS

PLANNING BOARD FEE SCHEDULE/INVOICE

(Revised July 24, 2023)

Below are the fees associated with plan review and are subject to a nonrefundable application fee to cover administrative expenses. Please complete the information below and provide payment with your application submittal. **Plan review fees shall be paid prior to technical review committee (TRC) being scheduled.** For plans not requiring TRC review, **fees are due 21 days prior** to the Planning Board meeting. Staff will coordinate abutter/notice fees, which will be invoiced and must be paid 28 hours before the Planning Board meeting for an application to be heard. Fees shall be paid by cash or check made payable to "City of Dover".

A. Plan Review Fees

1. Application fee for the following (SELECT ALL THAT APPLY):

- ☐ SUBDIVISION Application fee \$200.00 + \$150.00 x # _____ new lots created = \$ _____
- ☐ LOT LINE ADJUSTMENT Application fee \$200.00 + \$100.00 X # _____ of lots involved = \$ _____
- ☐ TRANSFER OF DEVELOPMENT RIGHTS Application fee \$200.00 = \$ _____
- ☐ SITE REVIEW – RESIDENTIAL Application fee \$200.00+ \$100.00 x # _____ per dwelling unit = \$ _____
- ☒ SITE REVIEW – NON-RESIDENTIAL Application fee \$200.00 + (not to exceed \$10,000)
 - ☐ New construction \$.15 sq. ft. x # 9,600 sq. ft. = \$ 1,440.00
 - ☐ Additions (new floor space) \$.10 per sq. ft. x # _____ sq. ft. = \$ _____
- ☐ MOTEL/HOTEL \$35.00 x # _____ per lodging unit = \$ _____
- ☐ CHANGE OF USE Application fee \$200.00 + (not to exceed \$5,000)
 - ☐ Existing floor spaces \$.10 per sq. ft. x # _____ sq. ft. = \$ _____
- ☐ CONDITIONAL USE PERMIT Application fee \$200.00 x # _____ per Application = \$ _____
- ☐ GRAVEL PIT/ EXCAVATIONS
 - ☐ Application fee \$50.00 = \$ _____
 - ☐ Permit fee \$75.00 = \$ _____
- ☐ EXTENSIONS/AMENDMENTS/WAIVERS FOR AN APPROVED PLAN Application fee \$200.00 = \$ _____
- ☐ REQUEST FOR REZONING Application fee \$200.00 = \$ _____
- ☐ DRIVEWAY WAIVER Application fee \$200.00 = \$ _____

☒ **TOTAL IMPERVIOUS PAVED AREA** (for new development, roadways or additions to existing parking lots, (not to exceed \$10,000)) Application fee of \$200.00 is N/A if it is part of a Site Review or Subdivision Plan. \$200.00 + \$.07 per sq. ft. x # 18,095 sq. ft. = \$ 1,266.65

SUBTOTAL PLAN REVIEW FEE = \$ 2,706.65

AND

B. Abutter Notification/Mailing Labels - this office will create and print the abutter list and provide labels in triplicate for each abutter. The applicant/owner will review the list for accuracy and provide to us the engineer, architect, licensed land surveyor (LLS), licensed landscape architect (LLA) and/or soil scientist whose professional seal appears on the plan with names and addresses for notices.

- ☐ Applicant & Owner, engineer, architect, LLS, LLA and/or soil scientist
 - ☐ Certified letters fee # _____ of x \$10.00 = \$ _____
- ☐ Certified letters fee: # of abutters _____ X \$10.00 = \$ _____
- ☐ First Class Mail fee (for individual owner of units within a condominium or other collective form of ownership): # of abutters _____ X \$1.00 = \$ _____
- ☐ Creating/Printing Abutter Labels in triplicate per sheet _____ x \$10.00 = \$ _____

C. Foster's newspaper public notice fee \$120.00 x # _____ applications = \$ _____

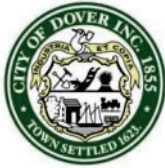
SUBTOTAL = \$ _____

TOTAL INVOICE AMOUNT = \$ _____

PLAN REVIEW FEE COLLECTED/PAID = \$ _____

BALANCE DUE = \$ _____

The amount due must be paid 28 hours prior to the Planning Board Meeting, to be heard.



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: Del Sol Dover, LLC File Number: _____

PROJECT TITLE: Lot 2 Site Development - Crosby Road Extension

PROPERTY LOCATION: Crosby Road Extension Tax Map: G Lot: 2-1

	Where/How Provided	Reviewed
1. Completed and signed Application form	X	
2. Plan Review Fees are provided	X	
3. Electronic copy of the engineered/surveyed plan layout	X	
4. Electronic copy of supplementary materials and application	X	
5. Traffic Impact Assessment and Analysis (Standard or Advanced)	X	
6. Waiver requests to the Site Plan Review Regulations, with written justification	X	
7. Conditional Use Permit applications	X	
8. A colored rendering of the streetscape that will be created along the existing public right-of-way	Waiver Requested	
9. A colored architectural plan showing all sides of buildings	X	
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:	X	
Location map at appropriate scale	X	
Proposed Project name and title and Planning File #	X	
Date, north arrow and scale	X	
Names of all abutting property owners	X	
Name and address of owners and/or applicants	X	
Signature & stamp of NH licensed land surveyor and/or engineer	X	
Zoning District boundaries, including any special or overlay districts	X	
Location of Conservation District areas	X	
Location, names and widths of existing and proposed streets, including pavement widths, grades, curbs and crosswalks	X	
Location and widths of existing & proposed easements & right of ways	X	
Location and width of existing and proposed access/egress ways	X	

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

REVIEWED BY: _____ DATE _____ TRC DATE _____

PROJECT NARRATIVE

for
DEL SOL DOVER, LLC
Site Plan Application
Lot 2 Development
Tax Map G, Lot 2-1

PROJECT OVERVIEW & SITE CHARACTERISTICS

The project parcel is shown on Tax Map G, as Lot 2-1, is located within the CM District and consists of 20.80± acres, currently undeveloped. This project proposes a minor (3 lot) subdivision, and the development of Lot 2.

These lots will be accessed from a proposed 75' wide right-of-way being shown as an extension of Crosby Road which is currently 75' wide. The intent is that, when completed, the 75' wide extension will be accepted by the City of Dover as a public right-of-way. The proposed road extension design will include associated drainage improvements and public utilities. The proposed lots, when developed, will be served by proposed utilities extending from the existing Crosby Road ROW, including municipal water and sewer connections, underground electric service, and natural gas service. There will be wetland buffer impacts associated with the ROW extension and development of Lot 2. Please see Conditional Use Permit application and narrative.

The construction of the road and lot 2 will be in conjunction. The construction consists of an 807 foot, 24-foot-wide paved road (Crosby Road extension) and the full build out of one (Tax Map G Lot 2-1, Lot 2) of the three (3) commercial lots. The commercial development consists of the construction of a 9,600-sf building, site access from the newly constructed Crosby Road extension, associated parking, gravel lay down area, underground utilities, and grading and drainage improvements. Total disturbance from the roadway and site development will be 142,500 sf.

WETLAND SETBACK IMPACT TYPE

The project will require a Conditional Use Permit from the City of Dover. Approximately 786.5 s.f. of wetland buffer will be impacted by construction Lot 2 development, and its associated drainage and grading. The project does not impact bogs, marshes, sand dunes, tidal wetlands, cedar swamps, undisturbed tidal buffer zone, or involve any work within 50 feet of a salt marsh. The project is not located within 100 feet of prime wetlands.

DRAINAGE

The parcel is located at the end of Crosby Road within an established industrial park. The proposed subdivision of the 20.80-acre lot abuts other commercial properties to the west, an active railroad track to the south and Knox Marsh Brook to the east. The site is currently undeveloped. The 20.80-acre watershed of the parcel includes the project site as well as a portion of Crosby Road. On site soils are a mix of Scantic, Deerfield, and Deerfield Variant soils. The Scantic series soils are HSG D with Deerfield and Deerfield Variant series soils being classified as HSG B.

To effectively analyze the pre-development subject parcel and proposed roadway, a 12.19 ac area was analyzed. The proposed drainage system incorporates grassed and stone lined swales for stormwater conveyance, sediment forebays for pre-treatment, and three (3) bioretention basins with internal storage reservoirs (ISR's) for stormwater treatment. A large portion of stormwater runoff from the proposed roadway is designed to drain into the stormwater drainage structures located on Lot 2-1 while the last 50+/- ft will be treated within the proposed right-of-way and proposed Lot 2-1A. The proposed stormwater system captures, stores, and treats the stormwater runoff from the site and roadway, then redirects it to the existing discharge points.

PROJECT NARRATIVE

**for
DEL SOL DOVER, LLC
Site Plan Application
Lot 2 Development
Tax Map G, Lot 2-1**

The post development watershed is modeled utilizing the same points of analysis as the predevelopment watershed, allowing direct comparison of the peak runoff between the pre- and post- developed conditions (see drainage report). Bioretention Basins with ISR's were utilized for stormwater treatment as the site is located within a "Class A – All Features" watershed as identified on the NHDES OneStop Data Mapper. This analysis indicates that the proposed stormwater measures, and stormwater management plan will treat and mitigate stormwater runoff in general accordance with ENV-Wq 1500 of the New Hampshire Code of Administrative Rules and the City of Dover's Subdivision and Site Review Regulations.

UTILITIES

The proposed project will connect to City of Dover water and sewer as well as Unitil for natural gas, and Eversource for electricity. Water, sewer, electric lines, and natural gas lines are currently located within Crosby Road. Building connections will be made per the City's Community Services Utility Division and Fire Department requirements and standards.

DEL SOL DOVER, LLC
340 Central Avenue, Suite 202
Dover, New Hampshire 03820

August 5, 2024

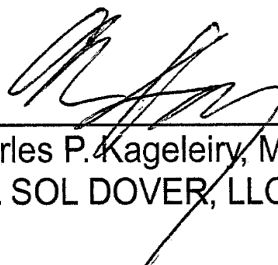
City of Dover
Planning Board
288 Central Avenue
Dover, NH 03820

Re: Crosby Road Extension Site Plan
Tax Map G, Lot 2-1, Crosby Road Extension
Dover, New Hampshire

LETTER OF AUTHORIZATION

As Owner and Applicant for the above referenced project, I hereby authorize Civilworks New England and McEneaney Survey Associates to represent Del Sol Dover, LLC to the State of New Hampshire, the City of Dover Planning Board and any other Dover Boards or Committees relative to the pursuit of permits for the development of the subject parcel.

Respectfully,



Charles P. Kageleiry, Manager
DEL SOL DOVER, LLC



City of Dover, New Hampshire CONDITIONAL USE PERMIT APPLICATION

[Revision Date: October 19, 2020]

Office Use Only	Project #: _____	Date Received: _____
	Amount Paid: _____	Time Received: _____

APPLICANT AND OWNER INFORMATION

Name of Applicant: Del Sol Dover, LLC Telephone # 603-749-0443

Address of Applicant: 340 Central Avenue, Suite 202 Dover, NH 03820

E-Mail Address: chad@summitlanddev.com

Name of Property Owner (if different from applicant): _____ Telephone # _____

Address of Property Owner: _____

PROPERTY INFORMATION

Assessor's Map # G Lot(s) # 2-1

Address of Property: Crosby Road (Extension)

Zoning District(s) CM Overlay District(s) None

Existing Use of Property: Vacant, Industrial Park

CONDITIONAL USE PERMIT INFORMATION

Type of Conditional Use Permit (Check All That Apply):

- | | | |
|---|---|--|
| ☐ Conservation District | ☐ RCM Use Overlay District | ☐ Gateway District |
| ☐ Groundwater Protection | ☐ Off-Street Parking and Loading | ☐ Alternative Treatment Center |
| ☒ Wetland Protection District | ☐ Central Business District | ☐ Heritage Residential District |

Describe Proposed Use or Activity That Requires Conditional Use Permit and Describe Any Impacts:

Site development including a 9,600 s.f. warehouse building with contractor laydown area

and associated parking, utility and drainage improvements, resulting in wetland buffer impacts

totalling 786.5 s.f.

List Any Associated State or Federal Permits That Have Been or Will Be Applied For and Indicate Their Status: _____

NH DES Alteration of Terrain (pending)

Name of Professional That Prepared Plans: Stephen J. Haight, PE - Civilworks New England

Address P.O. Box 1166 Dover, NH 03821 Telephone #: 603-749-0443

Professional License #: NH PE #7978 E-mail address: shaight@civilworksne.com

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. As applicant or as agent, I attest that I am duly authorized to act in this capacity.

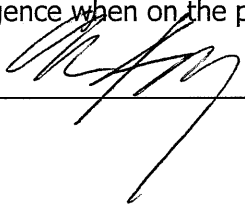
Signature of Property Owner:  Date: 8/5/24

Signature of Applicant (if different from owner): _____ Date: _____

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: 8/5/24

CITY OF DOVER CONDITIONAL USE 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
G	2-1	Del Sol Dover, LLC	340 Central Avenue, Suite 202 Dover, NH 03820

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS
Stephen J. Haight, PE	Civilworks New England	P.O. Box 1166 Dover, NH 03821
Kevin McEneaney	McEneaney Survey Associates	P.O. Box 1166 Dover, NH 03821
Bruce A. Gilday, CSS, CWS	BAG Land Consultants	43 Rockingham Street Concord, NH 03301

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS

CONDITIONAL USE NARRATIVE
§170-27.1
WETLAND PROTECTION DISTRICT
for
DEL SOL DOVER, LLC
Lot 2 Development
Tax Map G, Lot 2-1

F. Conditional use approval.

(1) Conditional use approval may be granted by the PLANNING BOARD (RSA 674:21II) after proper public notice and public hearing, for construction within the Wetland Protection District or buffer. Said construction may include but is not limited to a road or other accessway, utility right-of-way, communication lines, power lines and pipelines, STRUCTURES, and parking LOTs provided that the proposed construction complies with the following standards:

(a) Practicable Alternative: There is no practicable alternative that would have a less adverse impact on the area. **The proposed driveways, buildings, side slopes, and bio-retention basin location were chosen to avoid wetland impacts and to minimize wetland buffer impacts. The areas of impervious impact to the wetland buffer were minimized by utilizing the site characteristics including existing slope information to minimize additional side slope impacts.**

(b) Avoidance: The potential impacts have been avoided to the maximum extent practicable. The APPLICANT will demonstrate by plan and example that the proposed construction represents the least impacting alternative. **There are 786.5 sf of wetland buffer impacts associated with the grading and drainage and development of Lot 2 for the project. The design incorporates unique site characteristics including existing slope, and soil type to minimize wetland buffer impacts.**

(c) Minimization: Any unavoidable impacts have been minimized. No reasonable Alternative to the proposed construction exists which does not impact a wetland, or which has less detrimental impact on a wetland. Design, construction, and maintenance methods will be prepared by a registered engineer to minimize detrimental impacts to the wetlands and will include restoration of the site as nearly as possible to its original grade. **There are 786.5 sf of wetland buffer impacts for the development of Lot 2, with associated grading, drainage, and utilities. All impacts have been minimized to the greatest extent practicable.**

(d) Mitigation: If the APPLICANT is required by State rules to prepare a compensatory mitigation plan, the APPLICANT shall provide the Conservation Commission and PLANNING BOARD with one copy each of said plan for their review. **Mitigation is not required.**

(e) Approval for the wetlands impact has been received from the NHDES Wetlands Bureau pursuant to Section G (3), below. **A NHDES wetland permit application is not applicable.**

CHRISTOPHER G. PARKER, AICP
Deputy City Manager
c.parker@dover.nh.gov



288 Central Avenue
Dover, New Hampshire 03820-4169
(603) 516-6024
Fax: (603) 516-6049
www.dover.nh.gov

City of Dover, New Hampshire

OFFICE OF THE CITY MANAGER

April 4, 2024

Chad Kageleiry
Westfield, LLC
340 Central Ave., # 202
Dover, NH 03820

Re: Transfer of Development Rights

Dear Chad,

This letter is a follow up to our earlier discussion regarding your ongoing development of Tax Assessor's Map G lot 2, located off Littleworth Road, Crosby Road and Industrial Park Road (via an easement).

We discussed that the City Council approved an amendment to the Development Agreement the City and your entities entered into in 2022. This amendment, approved February 14th, allows the City to partner with you in applying relief from the wetlands setbacks on Map G lot 2, and any lots created via subdivision from it (hereafter collectively known as the Westfield Property).

As noted in the Development Agreement amendment, the City will provide either fee simple conveyance or agree to an easement upon Map G lots 32C or 35D. These lots total 55 acres of land in the same watershed as the Westfield Property. The City's intention is to remove the development rights from the parcels so that those rights may be transferred to your Westfield Property. In doing so, the intent is that the local 50 foot wetlands setbacks will be nullified, and you may more intensely develop the upland upon the Westfield Property. At the same time, the City will remove the right to develop its parcels and create permanent protections for the wetlands and uplands present on those parcels.

As you finalize site plans for the commercial/industrial uses upon the Westfield Property, please set up an appointment with myself and Planning staff and we can review the steps for final approval of the relief and document the deed restrictions and relief provided.

If you have any questions, please don't hesitate to contact me with any questions.

Sincerely,



Christopher G. Parker, AICP
Deputy City Manager

EC D.Benton, AICP Director of Planning and Community Development

SITE DEVELOPMENT DESIGN CRITERIA NARRATIVE

§153-14

STORMWATER MANAGEMENT

for
DEL SOL DOVER, LLC
Crosby Road Extension/ Lot 2 Development
Tax Map G, Lot 2-1

A. Stormwater management, erosion control and flood hazards.

(1) Purpose and objective. These regulations establish standards to manage the discharge of runoff to the City of Dover's municipal storm sewer system and water bodies, in a manner compliant with the requirements of state and federal law, including provisions of the federal stormwater management legislation for municipal separate storm sewer systems (MS4), as amended. These provisions and standards are implemented for the purpose of:

(a) Managing stormwater runoff to protect water quality and quantity. **The proposed roadway and commercial development have been designed in accordance with NH DES AoT permitting requirements to include the treatment and mitigation of stormwater runoff from the roadway and site. This is being managed by three (3) Bioretention basins with ISR, and swales and overland flow for conveyance.**

(b) Minimizing the contribution of a pollutant for which a water body is impaired to the maximum extent practicable (MEP). **The proposed development has been designed in accordance with NH DES AoT permitting requirements to include the treatment of stormwater runoff from all impervious areas of the roadway and site to minimize pollutant runoff.**

(c) Causing no discharge of runoff to an adjacent property in excess of runoff discharge in the existing developed or undeveloped condition. **The proposed development does not propose an increase in the peak rate of runoff from the project site.**

(d) Encouraging the use of low-impact development (LID) strategies. **The project proposes the use of bioretention basins with internal storage reservoirs for stormwater treatment.**

(2) Applicability of the stormwater standards.

(a) All projects requiring site plan or major subdivision approval shall be subject to the following set of stormwater standards according to the amount and type of disturbance. Applicability is as follows: **The project does not qualify for the redevelopment standards, as such, the stormwater standards apply.**

[1] The minimum protections and management standards shall apply to all projects. **The design incorporates these standards.**

[2] The stormwater management for new development standards shall apply to any project that results in a contiguous land disturbance of more than 20,000 square feet or creates more than 4,000 square feet of new impervious area. **The design incorporates these standards.**

[3] The stormwater management for redevelopment standards shall apply to any project that results in a contiguous land disturbance of more than 20,000 square feet or creates more than 4,000 square feet of new impervious area where the existing land use has

been previously developed as commercial, industrial, institutional, governmental, recreational, or multifamily. **The redevelopment standards are not applicable to this project.**

(b) All projects of such magnitude as to require a permit from the National Pollutant Discharge Elimination System (NPDES) Program or the New Hampshire Department of Environmental Services (NHDES) Alteration of Terrain (AoT) Program shall also comply with the standards of the Environmental Protection Agency (EPA) and/or NHDES permits and this section, whereas the stricter standards shall apply. **The project will require NH DES AoT permitting, and a NPDES CGP through the EPA. The design of the project has incorporated the associated standards of these agencies.**

(3) Design standards.

(a) Minimum protections and management standards.

[1] Where applicable, all development must comply with the EPA Phase II Stormwater Rules and the City's MS4 permit, as amended. **The project complies with the City's design and stormwater requirements.**

[2] Existing surface waters, including ponds, rivers, perennial and intermittent streams (natural or channelized), and wetlands (including vernal pools), shall be protected by the minimum buffer setback as specified in Chapter 170, Zoning, § 170-27.1. Stormwater and erosion and sediment control best management practices (BMPs) shall be located outside the specified buffer zone unless otherwise approved by the Planning Board. **The proposed project will result in wetland buffer impacts as part of the construction. A Conditional Use Permit application has been submitted as part of the application process.**

[3] Low-impact development (LID) site planning and design strategies shall be used to the MEP in order to reduce the generation of the stormwater runoff Volume for both new and redevelopment projects. An owner/applicant must document why LID strategies are not appropriate if not used to manage stormwater. **LID strategies were implemented to the maximum extent practicable. The site was evaluated for infiltration practices but the site characteristics, including soil types, topography, depth to the SHWT and depth to ledge prevent the use of infiltration practices.**

[4] All proposed stormwater practices and measures shall be installed and maintained in accordance with manufacturers' specifications and performance specifications outlined in the New Hampshire Stormwater Management Manual Volume 2 (December 2008 or current revision) a copy of which can be found on The NHDES website. **The project incorporates stormwater BMP designed in accordance with NH DES AoT permitting requirements. Details provided for construction are aligned with the NH Stormwater Manual and the engineer of design will be required to review material submittals and witness the installation of the practices. NH DES AoT will require a letter from the design engineer indicating the site stormwater BMPs were installed as designed and permitted. A Stormwater Inspection and Maintenance Manual will be provided for the site that will outline BMP maintenance; the owner will be responsible for this in perpetuity.**

[5] All storage facilities for fuel, chemicals, chemical or industrial wastes, and biodegradable raw materials shall meet the regulations of the NHDES, including but not limited to those involving underground storage tanks, aboveground storage tanks,

hazardous waste, and best management practices for groundwater protection (Part Env Wq 401). **The project does not propose the storage of the referenced materials onsite.**

[6] Salt and other deicing materials shall be stored under cover or located such that no direct discharges to receiving waters are possible. Snow storage areas shall be located such that no direct discharges to receiving waters are possible. See the NHDES guidance fact sheet on road salt and snow disposal. **The project does not propose the storage of deicing materials onsite.**

[7] The use of sodium-chloride-based materials for winter maintenance shall be the minimum necessary for safety. The use of sodium-chloride-based materials is discouraged within the groundwater protection districts. **The roadway is an extension of the existing Crosby Road and is being proposed as a city road. The city currently practices salt minimization plan as part of their winter maintenance practices. This same practice will be utilized on site.**

[8] Impervious surfaces for parking areas and roads shall be minimized to the extent possible. **The project design incorporated the minimization of impervious areas to the maximum extent possible. All aspects of the design including road width, and turning areas were evaluated.**

[9] Stormwater runoff from new impervious surfaces shall be directed to a best management practice for flow mitigation, treatment and/or infiltration. **The proposed design includes the treatment of stormwater runoff from all impervious areas of the proposed roadway and site.**

(b) Stormwater management for new development.

[1] Runoff of impervious surfaces shall be treated to provide 80% removal of total suspended solids (TSS) and 50% removal of both total nitrogen and phosphorus. Removal rates shall be determined using approved manufacturer's pollutant removal efficiency analysis or the pollutant removal efficiencies outlined in the New Hampshire Stormwater Management Manual Volume 1, Appendix E (December 2008 or current revision), a copy of which is available from the NHDES website. **The project utilizes bioretention basins with ISR for treatment of all impervious areas. This system provides 90% removal of TSS and 65% removal of both total nitrogen and phosphorous per the NH Stormwater Manual.**

[2] Rainfall amount shall be based on current extreme precipitation estimates obtained from the Northeast Regional Climate Center. **The design incorporates NRCC precipitation amounts and the associated storm distribution data. As the project will require a NH DES AoT permit, the precipitation amounts have been increased by 15% accordingly.**

[3] Measures shall be taken to control the post-development peak rate runoff so that it does not exceed predevelopment runoff for the two-, ten-, twenty-five- and fifty-year, twenty-four-hour storm events. **The proposed design mitigates post-development peak rate runoff to the pre-developed conditions.**

[4] Measures shall be taken to control the post-development surface water runoff volume so that it does not exceed predevelopment runoff for the two-, ten-, twenty-five- and fifty-year, twenty-four-hour storm events. For sites where infiltration/recharge is limited or not practicable, the owner/applicant must demonstrate that the project will not cause or

contribute to flooding or functional impairments to streets, adjacent properties, and downstream properties. **The site was evaluated for the inclusion of infiltration practices but the site characteristics, including soil types, topography, depth to the SHWT prevent the use of infiltration practices. The project proposes a slight increase in the volume of runoff from the site. The increased volume of runoff will be discharged directly to large wetland complexes associated with Knox Marsh Brook and Kelly Brook. The increase in volume will not cause flooding to adjacent or downstream properties.**

[5] Infiltration rates for designing groundwater recharge practices shall be determined in accordance with Section Env-Wq 1504.14. **The site was not feasible for infiltration practices and as such infiltration rates were not calculated.**

[6] Stormwater conveyance practices shall be sized appropriately to convey the ten-year, twenty-four-hour storm event without overtopping or causing flooding on the property. **Stormwater conveyance practices are designed to ensure they pass the 50-yr, 24-hour storm events without overtopping.**

[7] For large projects adding greater than or equal to 10 acres of impervious cover, or projects located in known areas of flooding concern, or specifically within areas with a 1% chance of being inundated by water in any given year, the owner/applicant shall submit a supplementary report that describes how the project will not increase the future flooding potential and complies with the AoT requirements pertaining to floodplain impacts as described in Section Env-Wq 1503.09, regardless of whether an AoT permit is required. **The project is located outside of the 0.2 percent annual chance floodplain. The project does not propose permanent or temporary disturbance or alteration of terrain within the flood plain.**

[8] The design of the stormwater management systems shall consider upstream and upgradient runoff that flows onto, over, or through the site to be developed or redeveloped and provide for this contribution of runoff. **The project has been designed to accommodate on-site and off-site drainage.**

[9] Seasonal high-water table elevations must be accounted for in all BMP design criteria. **Test pit information was utilized in determining the SHWT associated with the bioretention basin design.**

[10] Access for maintenance of stormwater facilities must be included as part of the design, where necessary. Access easements may be required. **Stormwater facilities are included with the roadway and will be incorporated into each of the sites as they get developed. Stormwater access easements may be required for this project.**

[11] Plantings in treatment areas shall be native grasses, shrubs and/or other native plants in sufficient numbers and density to prevent soil erosion and to achieve water-quality treatment. **N/A**

(c) Stormwater management for redevelopment. In order to determine the stormwater requirements for redevelopment projects, the percentage of the site covered by existing impervious areas must be calculated. Stormwater requirements for redevelopment will vary based upon the amount of site surface area that is covered by existing impervious surfaces. **The project does not meet redevelopment requirements and this section is Not Applicable (N/A).**

[1] For sites meeting the definition of a redevelopment project and having less than 40% existing impervious surface coverage, the stormwater management requirements will be the same as new development projects, with the important distinction that the applicant can meet those requirements either on site or at an approved off-site location (i.e., off-site mitigation). The applicant must satisfactorily demonstrate that impervious area reduction, LID strategies and BMPs have been implemented on site to the MEP. **N/A**

[2] For sites meeting the definition of a redevelopment project and having more than 40% existing impervious surface coverage, stormwater shall be managed in accordance with one or more of the following techniques, listed in order of preference: **N/A**

[a] Implement measures on site that result in mitigation and treatment of at least 30% of the existing impervious cover as well as 50% of the additional proposed impervious surfaces and pavement areas through the application of LID; or

[b] Implement other LID techniques on site to the MEP to provide mitigation and treatment for at least 50% of the entire site area.

[3] The owner/applicant may utilize off-site mitigation to meet the redevelopment requirements when the following standards have been met. **N/A**

[a] The owner/applicant shall demonstrate, to the satisfaction of the Planning Board, that on-site treatment has been implemented to the MEP.

[b] The owner/applicant shall find an approved, off-site location within the same watershed as the project site or within the drainage area of the same receiving water body.

[c] Off-site mitigation shall be equivalent to no less than the total area of pervious cover not treated on site.

[d] The owner/applicant shall submit a full design of the proposed off-site measures for review and approval.

[e] The owner/applicant must also demonstrate that there is no downstream drainage or flooding impact as a result of not providing on-site management.

(d) Erosion control standards during construction. The following standards shall be applied in project planning and shall be implemented prior to and during construction activity: **The plan set includes temporary and permanent sediment and erosion control practice notes and details in support of meeting the erosion control standards.**

[1] All proposed measures shall meet, at a minimum, the design standards for best management practices set forth in the New Hampshire Stormwater Management Manual Volume 3 (December 2008 or current revision), a copy of which is available from the NHDES website. **The sediment and erosion control details provided in the plan set are all designed in accordance with the NH Stormwater Manual.**

[2] When a project requires a stormwater permit from the EPA Construction General Permit (CGP) Program, copies of the stormwater pollution prevention plan (SWPPP) inspections shall be provided to the Community Services Department. **If required, a SWPPP will be provided prior to construction.**

[3] Stripping of vegetation shall be done in a manner that minimizes soil erosion. Whenever practical, natural vegetation shall be retained, protected, or supplemented. **The Erosion Control Notes in the provided plan set indicate that the smallest practical area shall be disturbed during construction.**

[4] The area of land disturbance shall be kept to a minimum and be limited to an area only large enough to accommodate construction activities for a particular construction phase. **The Erosion Control Notes in the provided plan set indicate that the smallest practical area shall be disturbed during construction and that in no case shall greater than 5 acres be disturbed at any time.**

[5] Off-site surface water and runoff from undisturbed areas shall be diverted away from disturbed areas where feasible, or measures to convey stormwater through the project area without causing erosion of sediment must be included. The integrity of downstream drainage systems shall be maintained. **Direction to ensure that stormwater conveyance practices shall be stabilized prior to receiving stormwater runoff is included on the Erosion Control Notes sheet provided as part of this submittal.**

[6] Appropriate erosion and sediment control measures shall be installed prior to any soil land disturbance and must be reviewed and approved by the Community Services Department. **Construction scheduling and inspections will be discussed with Community Services at the required pre-construction meeting.**

[7] Perimeter site controls shall not be placed within wetland areas, stream channels or wetland buffers. **This project will require a City of Dover Conditional Use Permit for work within wetland buffers. Sediment and erosion control will be limited within the wetland buffer as identified and approved through these permits.**

[8] Disturbed soil areas shall be either temporarily or permanently stabilized. In areas where final grading has not occurred, temporary stabilization measures should be in place within seven calendar days for exposed soil areas that are within 100 feet of a surface water body or a wetland and no more than 14 calendar days for all other areas. Permanent stabilization should be in place within three calendar days following completion of final grading of exposed soil areas. **The definitions of, and direction for, stabilization of the site is provided on the Erosion Control Notes sheet provided as part of this submittal.**

[9] All temporary erosion and sediment control measures shall be maintained in functioning condition until final site stabilization is accomplished. A proposed BMP inspection schedule shall be included in the submittal. **The erosion control inspection scheduling requirements are identified on the Erosion Control Notes sheet provided as part of this submittal.**

[10] Additional temporary stabilization for the winter season consistent with NHDES guidelines shall be in place for disturbed areas that are not permanently stabilized by October 1, or at the discretion of the Community Services Department. **The NH DES AoT winter construction notes are identified on the Erosion Control Notes sheet provided as part of this submittal.**

[11] Special stabilization details shall be provided with the submission for any land disturbance on slopes equal to or steeper than 3:1. **Slopes greater than 3:1 require erosion control matting and a detail is provided in the plan set.**

[12] All temporary erosion and sediment control measures shall be removed after final site stabilization. Trapped sediment and other disturbed soil areas resulting from the removal of temporary measures shall be permanently stabilized within 30 calendar days unless conditions dictate otherwise. **Temporary practice details identify the need to remove sediment and/or stabilize the area once the practices have been removed.**

[13] For projects proposing to disturb and expose soils in areas of 10 acres or more at one time, a temporary (or permanent) sediment basin must be provided with storage for a calculated volume of runoff from a drainage area from a two-year, twenty-four-hour storm, or equivalent control measures, where attainable, until final stabilization of the site. Alternatively, the sediment of storage per acre of drainage area until final stabilization of the site. In determining appropriate locations and number of sediment basins needed, the operators may consider such factors as erodibility of site soils, slope lengths, available area on site, construction period and other unique site considerations. **The project does not propose the disturbance of greater than 10 acres of area.**

[14] Use of temporary sediment basins should avoid any additional vegetation clearing or site land disturbance not otherwise needed for post-construction. Sediment basin locations must be reviewed by the Community Services Department prior to construction and must consider the potential for off-site impacts, including public safety, especially as it relates to sediment movement and/or sediment basin failure, and alternative sediment controls must be used where site limitations preclude a safe design. **Temporary sediment basin locations, if constructed, will be discussed with Community Services prior to the construction of the practices. These discussions will occur upon submission/review of the SWPPP, if required.**

(e) Installation and construction inspections. The owner/applicant shall be responsible for inspection requirements as follow:

[1] The Community Services Department or its designated agent shall have access to the site to complete routine inspections. **Community Services access and inspection requirements will be discussed at the pre-construction meeting.**

[2] The Community Services Department shall be notified 24 hours prior to installation of a stormwater BMP in order to schedule an inspection. These inspections shall be completed during normal working hours. **The project notes provide direction for the contractor to notify the design engineer and the Community Services Department as required.**

[3] The Planning Board or Community Services Department may require the design engineer and/or an independent third party to provide inspection and oversight of the construction of the stormwater management facilities and erosion and sediment control measures at its discretion. Such oversight may be especially important for implementing techniques such as porous pavement or subsurface stormwater infiltration systems. The owner/applicant shall be responsible for all fees associated with third-party inspections. **NH DES AoT permitting requires the design engineer to provide a letter at the completion of work that indicates the stormwater practices were installed as designed.**

[4] All SWPPP inspections must be conducted by a qualified professional such as a professional engineer (PE), a certified professional in erosion and sediment control (CPESC), a certified erosion sediment and stormwater inspector (CESSWI), or a certified professional in stormwater quality (CPSWQ). Inspection reports shall be

submitted to the Community Services Department. **The project notes provide direction for the inspector to be qualified and for all reports to be submitted to the Community Services Department.**

[5] The owner is ultimately responsible for the installation, construction, inspection, and disposition of all stormwater management and erosion control measures required by the provisions of these regulations. **The project notes identify the owner as having the responsibility for ensuring the stormwater management and erosion control measures are installed as approved.**

(f) Stormwater management plan (SWMP) submittal requirements. At the discretion of the Planning Board or Community Services Department, a technical review by an independent third party may be required of any SWMP prepared under these regulations. Such a review shall be performed by a qualified professional consultant and the expense of which shall be the full responsibility of the owner/applicant. **The SWMP is a comprehensive set of documents that include, at a minimum, a drainage report, plan set, and Stormwater I&M Manual. These documents each serve a role in presenting the necessary information to the appropriate audience. The information required in this section is provided within the SWMP documents.**

[1] For projects requiring minimum protection standards, a plan including the following information shall be submitted:

[a] Description of erosion and sediment control measures as well as sequence for final stabilization of the project site. **This information is provided within the Erosion Control Notes within the plan set.**

[b] Proposed changes in impervious cover areas and any changes in pre- and post-development drainage patterns. **This information is provided within the drainage report and the Pre/Post Development Watershed Plans.**

[c] Description of LID proposed measures. **This information is provided in the drainage report and throughout the plan set and details.**

[2] For projects requiring new development or redevelopment standards, a drainage report that contains the following items shall be submitted: **The SWMP documents include the proposed information when applicable.**

[a] Description of construction period and earth movement schedule, including anticipated project start and completion dates, sequence and duration of grading and construction activities, sequence, and timing of installation and/or application of soil erosion and sediment control measures as well as sequence for final stabilization of the project site. **The SWMP documents include the proposed information when applicable, more specifically in the erosion control note sheet.**

[b] Description of the on-site and adjacent wetlands, streams and other water resources, including methods used to identify these resources, and a description of any buffer setbacks that may apply, steep slopes, critical habitat, existing vegetation, areas with a 1% chance of being inundated by water in any given year, and whether any downstream water bodies are listed as impaired according to NHDES's most recent 303(d) list. **The SWMP documents include the proposed information when applicable, more specifically in the existing conditions plan.**

[c] Soils information for proposed disturbed areas shall be delineated by a certified soil scientist. For all other areas that contribute runoff to the project site, soil types may be identified in accordance with Natural Resources Conservation Service (NRCS) countywide soil survey. **The SWMP documents include the proposed information when applicable. BAG Land Consultants, Bruce Gilday NH Soil Scientist #12 delineated the soils.**

[d] Description of existing drainage patterns, receiving water bodies or drainage infrastructure and soil types for recharge potential. **The SWMP documents include the proposed information when applicable, more specifically in the drainage report.**

[e] Watershed area limits, including any off-site and upstream areas contributing flow to shared drainage channels and/or infrastructure. **The SWMP documents include the proposed information when applicable, more specifically in the drainage report.**

[f] Description of proposed changes in impervious cover areas and any changes in pre- and post-development drainage patterns. **The SWMP documents include the proposed information when applicable, more specifically in the drainage report.**

[g] Methods and assumptions used to calculate pre- and post-development runoff volume, peak discharge, and discharge velocity for the specified design storm events. **The SWMP documents include the proposed information when applicable, more specifically in the drainage report.**

[h] Methods and assumptions used to calculate the pollutant load removal. **The SWMP documents include the proposed information when applicable, more specifically in the drainage report.**

[i] Description of LID measures that are proposed to limit the development footprint, preserve existing vegetation and mimic existing hydrology to the extent feasible. **The SWMP documents include the proposed information when applicable.**

[j] If not used, provide rationale why LID measures are not practical for the site. **The SWMP documents include the proposed information when applicable.**

[k] Describe measures and calculations for proposed practices used to achieve no net increase in runoff volumes leaving the site. **The SWMP documents include the proposed information when applicable, more specifically in the drainage report.**

[l] Provide calculations for the infiltration or exfiltration system. **The SWMP documents include the proposed information when applicable.**

[m] If an increase in post-development runoff volume is anticipated due to limited applicability for LID measures and site constraints, provide an assessment and supporting calculations to demonstrate no adverse impacts to downstream infrastructure, adjacent properties, or aquatic habitat. **The SWMP documents include the proposed information when applicable, more specifically in the drainage report.**

[n] Descriptions, details, and design criteria and calculations for all structural, nonstructural, permanent, and temporary erosion and sedimentation control measures and BMPs. This information should include seeding mixtures and rates, types of sod, methods of seedbed preparation, expected seeding dates (or limitations on seeding time frames), type and rate of lime and fertilizer application, and type and quantity of mulching for temporary and permanent control facilities. **The SWMP documents include the proposed information when applicable, more specifically in the erosion control note sheet.**

[o] Where proposed changes are anticipated within mapped limits of the areas with a 1% chance of being inundated by water in any given year, provide hydrologic and hydraulic analysis to show no net increase in flood elevations. **The SWMP documents include the proposed information when applicable.**

[p] Proposed schedule for the inspection and maintenance of all erosion control measures on site prior to achieving final site stabilization. **The SWMP documents include the proposed information when applicable, more specifically in the erosion control note sheet.**

[q] Describe procedures for removing temporary erosion control measures and removal of accumulated sediment captured by such measures. **The SWMP documents include the proposed information when applicable, more specifically in the erosion control note sheet.**

[r] Any other specific study, calculation, or investigation as requested by the City. **Additional information is provided as requested and may include traffic studies, structural designs, septic/sewer designs, geotechnical reports, etc. These documents are provided on a case-by-case basis and as requested by the City.**

[s] Describe procedures to limit and/or optimize the use of deicing materials and minimize off-site increases in chloride levels in adjacent surface water and groundwater. **The Stormwater I&M Manual includes the implementation of a salt minimization plan.**

[t] Provide a maintenance and inspection plan for post-construction monitoring of stormwater BMPs to ensure long-term performance and functionality, including details of who will be responsible for inspections and maintenance, proposed schedule, documentation, submittal procedures and contingency plans if future maintenance is required. **A Stormwater I&M Manual is provided as part of the submission.**

[u] Provide copies of pertinent state and federal permits. **Copies of permits will be provided to the City.**

(g) Long-term operation and maintenance. The owner shall be responsible for continued inspection and maintenance requirements. **An I&M Manual that identifies the owner's responsibilities has been provided as a part of the submission.**

[1] An operation and maintenance manual shall be created with the following information:

[a] The names of the responsible qualified professionals who will implement the required reporting, inspections, and maintenance activities. **The Owner, Responsible Party, and the Management Company are identified in the I&M Manual.**

[b] An inspection checklist, identifying item or BMP, inspection frequency, and components to be inspected. The list shall clearly outline performance thresholds and triggers for maintenance. **Inspection requirements and maintenance thresholds are identified in the I&M Manual.**

[c] Snow and ice removal shall be performed by a contractor certified by the "Green SnoPro" Program, or approved equivalent, following best management practices for the application of deicing materials. **The I&M Manual requires the use of a Green SnowPro contractor.**

[d] Deicing log to track amount and type of deicing material applied. **The I&M Manual requires the implementation of a salt minimization plan that also requires the owner or operator to track salt usage onsite through a quantity usage log.**

[e] A site plan clearly identifying the locations of all stormwater practices to be inspected and maintained. **The approved Grading and Drainage Plan, where BMPs are highlighted in a BMP Location Plan, accompanies the I&M Manual.**

[f] Inspection and maintenance log to be submitted to the City of Dover Community Services Department on an annual basis. Documents shall be submitted no later than December 15 of each year. **The I&M Manual identifies this requirement.**

[2] The owner of record shall record at the Registry of Deeds documentation sufficient to provide notice to all persons 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 of the requirements for maintenance and reporting. **Not Applicable.**

WAIVER REQUEST
FOR
SITE REVIEW APPLICATION
LOT 2
Tax Map G, Lot 2-1
Crosby Road Extension/ Lot 2 Development

ARTICLE IV
Site Design and Development Criteria
§ 153-13. Site development plan.

- A. (12) A landscape plan that delineates the arrangement, species and dimensions of all existing and proposed landscaping materials. The landscape plan, in sufficient detail to indicate compliance with these regulations, shall be prepared by a professional landscape architect who is licensed by the State of New Hampshire. The licensed landscape architect shall sign the plan. The landscape plan shall be certified by the licensed landscape architect and include his/her State of New Hampshire license number.

We respectfully request relief from the requirement of a landscape plan certified by a New Hampshire Licensed Landscape Architect.

The proposed site design is located on a cul-de-sac in an industrial park that will have very little visibility to the general public. The landscape layout has been designed to the maximum extent for the proposed building and site layout to be consistent with light manufacturing or commercial use in the City of Dover.

Alternatively, the site plan will feature common landscape features suitable for an industrial park setting.

WAIVER REQUEST
FOR
SITE REVIEW APPLICATION
LOT 2
Tax Map G, Lot 2-1
Crosby Road Extension

ARTICLE IV
Site Design and Development Criteria
§ 153-13. Site development plan.

- A. (17) A colored rendering of the streetscape that will be created along the existing public right-of-way. This sheet shall include a perspective of both sides of any existing roadway, any street or sidewalk improvements, proposed plantings and structures, as prepared by a registered engineer or architect, who shall sign the plan and place his/her seal upon it, as required.

We respectfully request relief from the requirement of providing streetscape plans for this project.

The project site is located on a short cul-de-sac in an industrial park. The proposed building and site layout will be consistent with light manufacturing or commercial use, featuring a typical building design suitable for this use, in conformance with Dover regulations. Being located on a cul-de-sac, there will be very little vehicle or pedestrian traffic to make a streetscape plan beneficial.

Alternatively, a building plan will be provided which will depict the overall exterior appearance of the structure.

WAIVER REQUEST

ARTICLE IV 153-14 K. (1) (b)

Parking Location

From: Mark Beaudry

Sent: Tuesday, August 6, 2024 7:07 AM

To: Mavrogeorge, Kenneth <K.Mavrogeorge@dover.nh.gov>

Cc: Steve Haight <shaight@civilworksne.com>; Joseph Griffin <jgriffin@civilworksne.com>

Subject: CNE#24084 - Del Sol Dover, LLC - Crosby Road Extension, Dover, NH

Hello Ken: As required per the City's site review permit process, we are reaching out as part of the process to provide "will serve" letters stating that utilities are available for our proposed project. The project is located at the end of Crosby Road on one of three lots proposed at the extension of the road at Tax Map G, Lot 2-1.

It is proposed to contain one 9,600 SF building that will house four specialty contractor businesses with 30 employees (estimated total). Attached is a draft utility plan to depict the location, site layout of the building project and anticipated utility services. Each of the four businesses are anticipated to have its own water supply and sewer connection off the single water line and sewer pipe to and from the proposed extensions in the new road.

The project total design flow is estimated to be 530 GPD which is calculated as follows:

- "Unspecified" Office = $4,600 \text{ SF} \times 5 \text{ GPD} / 100 \text{ SF} = 230 \text{ GPD}$
- Warehouse = $10 \text{ GPD/ Person} \times 30 \text{ Employees} = 300 \text{ GPD}$

This design flow rate is based on NHDES Env-Wq 1008.03 Table 1008-1 *Unit Design Flow Figures*.

Please provide us with correspondence that states as required, that the City can provide water and wastewater service to this building.

If you have any questions or require more information, please do not hesitate to get back to us.

Thank you for your assistance on these projects.

Mark

Mark Beaudry, PE

Senior Associate/Sr. Project Manager

Civilworks New England

C: (413) 325-3384

O: (603) 749-0443 x113

From: Mark Beaudry
Sent: Tuesday, August 6, 2024 6:44 AM
To: Emmons, Trevor S <trevor.emmons@eversource.com>
Subject: CNE#24084 - Del Sol Dover, LLC - Crosby Road Extension, Dover, NH

Hello Trevor:

Per the City of Dover, as part of the site review permit process we are required to provide a "will serve" letter stating that electric utilities are available for our proposed project. The project is located at the end of Crosby Road on one of three lots proposed at the extension of the road in Dover at Tax Map G, Lot 2-1.

It is proposed to contain one 9,600 SF building that will house four specialty contractor businesses. Attached is a draft utility plan to depict the location, site layout of the building project and draft utility services. We have estimated the power needed for office and warehouse space to be +/- 400 Amp (total).

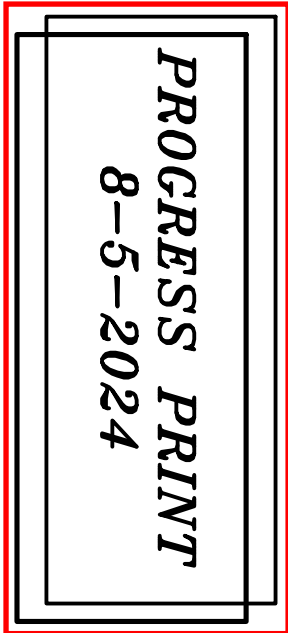
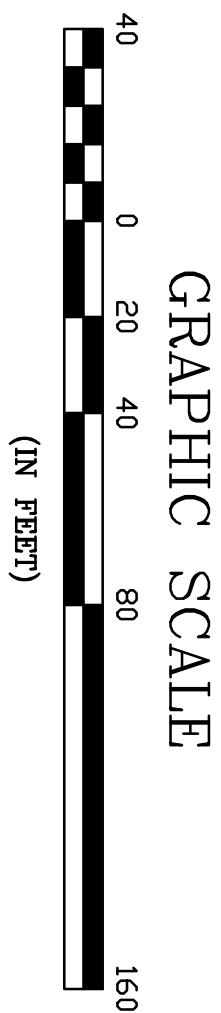
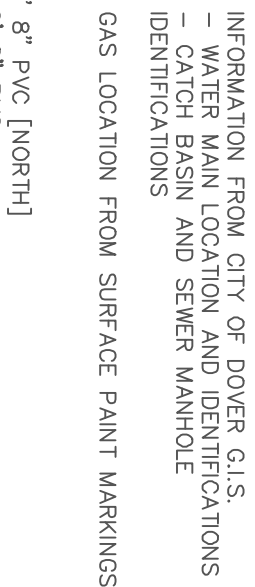
The project proponent will be in contact with you at a later date to set up a work order and provide any additional information.

If you have any questions or require more information do not hesitate to get back to me directly.

Thank you again for your assistance on these projects.

Mark Beaudry

Mark Beaudry, PE
Senior Associate/Sr. Project Manager
Civilworks New England
C: (413) 325-3384
O: (603) 749-0443 x113



UTILITY PLAN			DATE: XXX SCALE: 1"=40' DRAWN BY: SRD DESIGN BY: JPG APPROVED BY: SJH PROJECT NO: 24085 FILE: SITE.DWG				NOT FOR CONSTRUCTION FOR PERMIT USE ONLY  CIVIL & WATERFRONT ENGINEERING 181 Watson Road, P.O. Box 1166 Dover, New Hampshire 03821 603.749.0443			
X	LOT 2 DEVELOPMENT DEL SOL DOVER, LLC DOVER, NH	DEL SOL DOVER, LLC 340 CENTRAL AVENUE SUITE 202 DOVER, NH 03820								

From: Mark Beaudry
Sent: Tuesday, August 6, 2024 6:52 AM
To: Dave MacLean <davidemaclean@gmail.com>
Cc: macleand@unitil.com; oliver@unitil.com
Subject: CNE#24084 - Del Sol Dover, LLC - Crosby Road Extension, Dover, NH

Hello David: Per the City of Dover, as part of the site review permit process we are required to provide a "will serve" letter stating that utilities are available for our proposed project. The project is located at the end of Crosby Road on one of three lots proposed at the extension of the road in Dover at Tax Map G, Lot 2-1.

It is proposed to contain one 9,600 SF building that will house four specialty contractor businesses. Attached is a draft utility plan to depict the location, site layout of the building project and anticipated utility services. Each of the four businesses are anticipated to have its own natural gas meter and supply off the single natural gas service line to the building. The natural gas needed for the project should be consistent with typical business uses with an office and warehouse component.

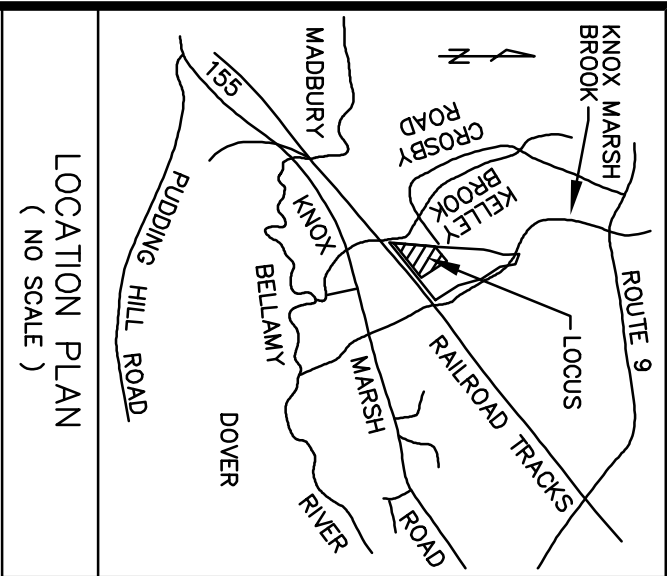
The project proponent will be in contact with you at a later date to set up a work order and provide any additional information.

If you have any questions or require more information do not hesitate to get back to us.

Thank you again for your assistance on these projects.

Mark

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INFORMATION FROM CITY OF DOVER G.I.S.
- WATER MAIN LOCATION AND IDENTIFICATIONS
- GAS MAIN LOCATION AND IDENTIFICATIONS
- GAS LOCATION FROM SURFACE PAINT MARKINGS

FORMER HANSON ROAD

PROPOSED OVERHEAD UTILITIES
UTILITY
#364A/1
1140'-22'

PROPOSED UNDERGROUND UTILITIES
UTILITY
#364A/1
1140'-22'

PROPOSED UNDERGROUND UTILITIES
UTILITY
#364A/1
1140'-22'

PROPOSED UNDERGROUND UTILITIES
UTILITY
#364A/1
1140'-22'

PROPOSED UNDERGROUND UTILITIES
UTILITY
#364A/1
1140'-22'

PROPOSED UNDERGROUND UTILITIES
UTILITY
#364A/1
1140'-22'

74
95.1'
T = 86.62' 8" PVC SMH 2875
[NORTH]

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CATCH BASIN
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#7081 RIM = 95.9'

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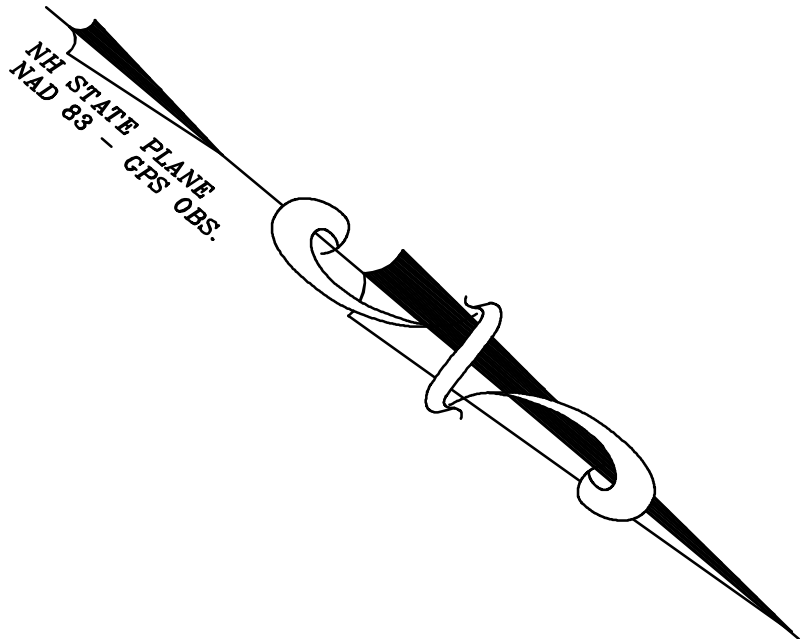
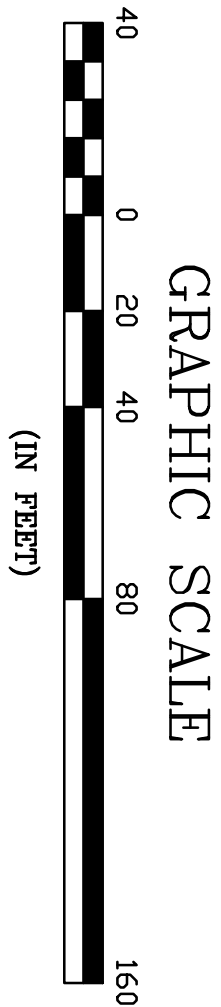
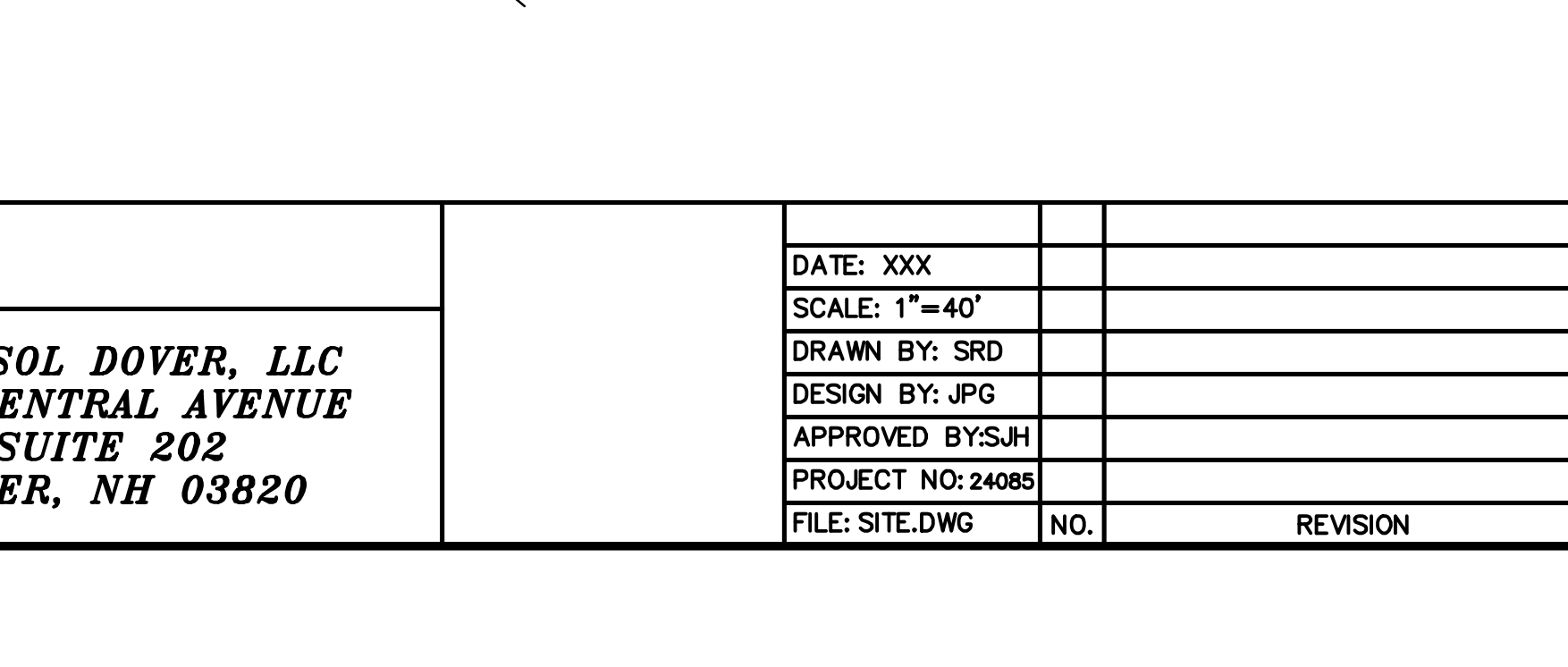
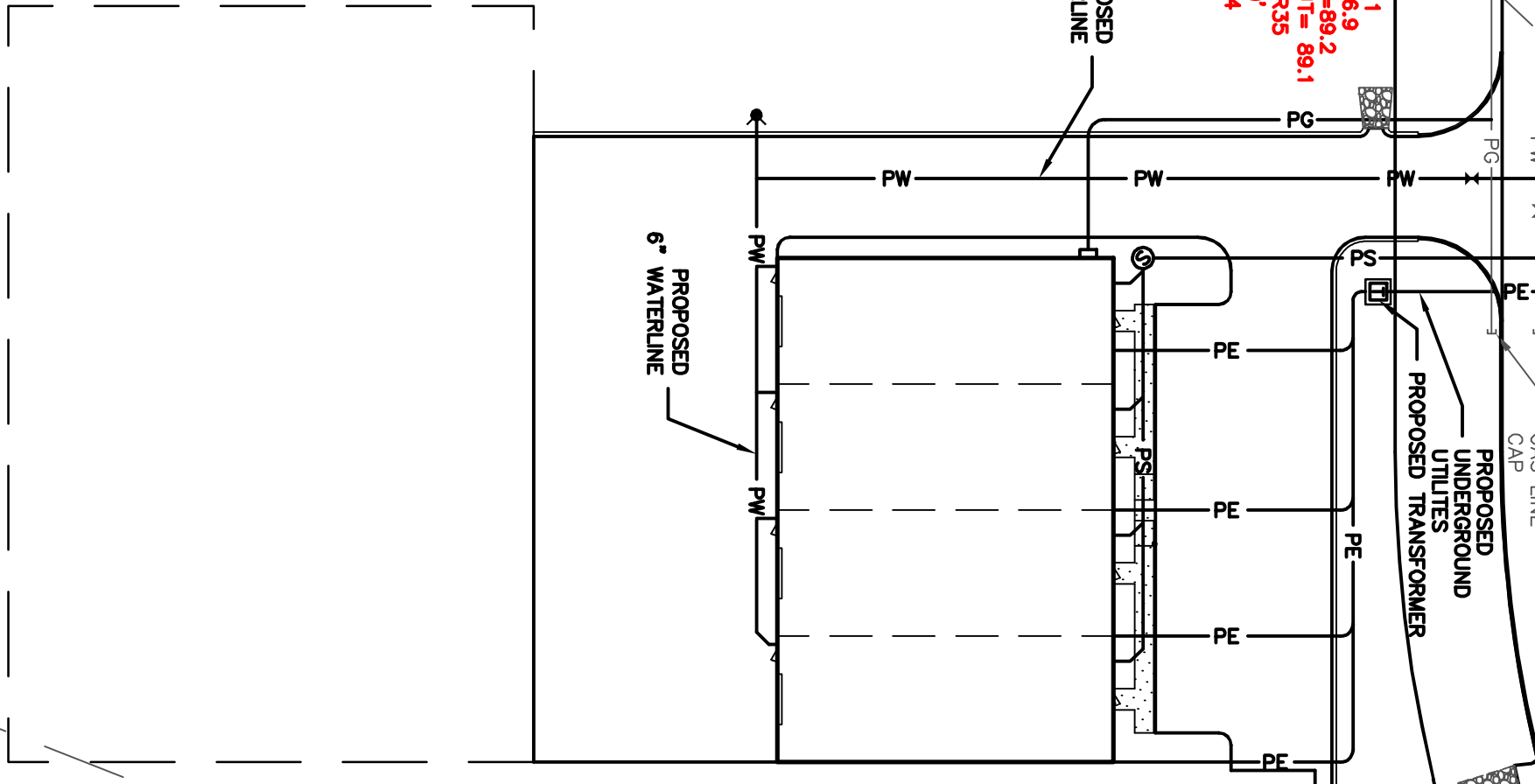
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LIMITS OF FORMER HANSON
ROAD RIGHT OF WAY



PROGRESS PRINT
8-5-2024

UTILITY PLAN

LOT 2 DEVELOPMENT
DEL SOL DOVER, LLC
DOVER, NH

DEL SOL DOVER, LLC
340 CENTRAL AVENUE
SUITE 202
DOVER, NH 03820

DATE: XXX
SCALE: 1"=40'
DRAWN BY: SRD
DESIGN BY: JPG
APPROVED BY: SJH
PROJECT NO: 24085
FILE: SITE.DWG

NO.

REVISION

APP'D

DATE

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY



CIVILWORKS NEW ENGLAND

CIVIL & WATERFRONT ENGINEERING

181 Watson Road, PO Box 1166
Dover, New Hampshire 03821
603.749.0443

JOB 24085 - DEL SOL DOVER, NH
SHEET NO. 1 OF 1
CALCULATED BY M. BEAUDRY DATE 8/5/24
CHECKED BY () DATE _____
SCALE NH PE #7101

SEWER LOADING CALCULATIONS

9,600 SF SPECIALTY TRADE
CONTRACTOR BUILDING

4,600 SF OFFICE

5,000 SF WAREHOUSE

ESTIMATED # EMPLOYEES = 30

PER NHDES ENV-WQ1008.03 TABLE 1008-1:

UNSPECIFIED OFFICE SPACE = 5 GPD/100 SF

WAREHOUSE = 10 GPD/PERSON

DESIGN FLOW

$$\text{OFFICE} = 4,600 \text{ SF} \times \frac{5 \text{ GPD}}{100 \text{ SF}} = 230 \text{ GPD}$$

$$\text{W. HOUSE} = 30 \text{ EMP'S} \times \frac{10 \text{ GPD}}{\text{EMPL.}} = 300 \text{ GPD}$$

$$\text{TOTAL} = 530 \text{ GPD}$$

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181 WATSON ROAD
P.O. BOX 1166
DOVER, NH 03821-1166
PHONE: 603.749.0443 FAX: 603.749.7348

TRAFFIC ASSESSMENT MEMORANDUM

August 6, 2024

INTRODUCTION

Civilworks New England has prepared this traffic-assessment memorandum (TAM) in regards to the proposed specialty contractor space development proposed in the City of Dover, NH on proposed Lot 2 of the proposed Crosby Road extension subdivision. Lot 2 is identified as Map G, Lot 2-1 on the subdivision plan.

This TAM includes:

- existing site description
- proposed project description
- road description
- public transit
- sight distances at the proposed driveways
- trip generation
- trip distribution/assignment
- potential traffic impacts

This TAM concludes that:

- relevant sight distances at the Crosby Road /proposed driveway intersection will be adequate
- The proposed project is not anticipated to add significant new traffic to the area

EXISTING SITE DESCRIPTION

The site (Lot 2):

- is located to the southeast of the end of the present Crosby Road
- has an area of about 6.15 acres
- is presently open, vacant land

PROPOSED PROJECT DESCRIPTION

The project will provide:

- one building with a total floor area of about 9,600 square feet (sf) that is anticipated to house multiple contractor businesses primarily involved in providing contract services to meet residential and industrial needs such as plumbing, electrical, heating and cooling, machine and mechanical repair, roofing, industrial supply, locksmith, weed and pest control, cleaning and other similar uses.
- one unsignalized driveway intersecting the south side of the planned extension of Crosby Road that will provide access to the building.

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DOVER, NH 03821-1166
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ROAD DESCRIPTION

Crosby Road:

- is under the jurisdiction of the City and the extension is proposed to be as well
- is a dead-end industrial park road
- has a 30 MPH posted speed limit
- is oriented about east-west at the end near the project location
- includes a relatively straight horizontal alignment at the end near the project location
- has minor vertical grades
- has bituminous concrete pavement; which is in overall good condition from Faraday Road west
- has one travel lane per direction, with a pavement width of about 28 ft
- has marked pavement west of Faraday Road
- includes existing utility services

PUBLIC TRANSIT

Collaborative Alliance for Seacoast Transportation (COAST) route 34 services Knox Farm Road (Route 155) to the south of the Crosby Road Industrial Park. There is presently no bus service along Littleworth Road (Route 9) to the industrial park.

SIGHT DISTANCES

Crosby Road currently services traffic from the various businesses existing on Crosby Road and Faraday Drive. The access to the site is approximately 210 feet east from both Faraday Road and the driveway for 211 Crosby Road across from Faraday. The access driveway is approximately 125 feet east of the service entrance to the Turbocam building at 5 Faraday Drive on the opposite side of the road. If the roadside area is kept clear of trees and brush, which is presently the case, sight lines well past Faraday to the west are possible.

The American Association of State Highway and Transportation Officials (AASHTO) has established authoritative policy for appropriate sight distances in terms of stopping sight distance (SSD) for vehicles on the main road reacting to existing traffic, and intersection sight distance (ISD) for left turn movements from a stop. Due to Crosby Road not being a through road, the project location being at the end of Crosby Road, the low traffic volume, and vehicles slowing to access the other businesses before reaching the project driveway, neither SSD or ISD appear to be an issue or even applicable in this case. That said, AASHTO has established the SSD for a 30 mile per hour roadway to be 200 feet.

The 210± foot distance to Faraday Road and the 211 Crosby Road driveway would appear to be suitable for a speed of approximately 31 MPH, which would not be anticipated for a turning vehicle. Service vehicles accessing the 5 Faraday driveway would not be turning east towards the

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project site so that sight distance would not appear to be relevant. Therefore, sight distance is adequate, if even applicable in this case.

CALCULATED TRIP GENERATION

The Institute of Transportation Engineers (ITE) compiles and publishes trip-generation information for a variety of land uses in *Trip Generation Manual*.¹ This authoritative guide for calculating site traffic includes vehicle trip information for Specialty Trade Contractors (Land Use Code 180) based on floor area². This Land Use Code also has estimated trips based on the number of employees in these facilities, however the number of employees cannot be identified at this time as the potential contractor businesses that will occupy the building are not yet known. Table 1 shows calculated vehicle trip ends due to the proposed development.

The total vehicle trips generated by the project are:

- Daily (weekday) = 96 total trips (48 into site and 48 out of site)
- AM peak hour (weekday) = 19 total trips (14.6 in and 4.4 out) based on the generator
- PM peak hour (weekday) = 22 total trips (8.4 in and 13.6 out) based on the generator

Table 1: Trip Generation - Specialty Trade Contractor			
Period / Condition	Vehicle Trips		
	Total	In	Out
Daily	96	48	48
AM - Peak Hour of Adjacent Street Traffic	17	12.6	4.4
PM - Peak Hour of Adjacent Street Traffic	19	6.1	12.9
AM - Peak Hour of Generator	19	14.6	4.4
PM - Peak Hour of Generator	22	8.4	13.6
* ITE, <i>Trip Generation Manual</i> , Specialty Trade Contractor - Land Use Code 180			

Building = 9,600 S.F.; Number of Employees Unknown (TBD)

Weekday Trips = No Fitted Curve Equation - Chart => Trip Ends per 1,000 S.F. GFA (50% enter, 50% exit)

AM Trips AST = No Fitted Curve Equation - Chart => Trip Ends per 1,000 S.F. GFA (74% enter, 26% exit)

PM Trips AST = No Fitted Curve Equation - Chart => Trip Ends per 1,000 S.F. GFA (32% enter, 68% exit)

AM Trips Gen. = No Fitted Curve Equation - Chart => Trip Ends per 1,000 S.F. GFA (77% enter, 23% exit)

PM Trips Gen. = No Fitted Curve Equation - Chart => Trip Ends per 1,000 S.F. GFA (38% enter, 62% exit)

¹ ITE, *Trip Generation Manual*, 11th edition (Washington DC, September 2021).

² ITE, *Trip Generation Manual*, Volume 3, General Urban/Suburban and Rural (Land Uses 000-399), pages 204 to 215.

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TRIP DISTRIBUTION/ASSIGNMENT

All project-related trips will access the site from Crosby Road which intersects with Route 9 known in this area as Franklin Pierce Highway and Littleworth Road. The calculated vehicle trip generation for the development project is so low that area traffic operations are not sensitive to trip distribution/assignment of project vehicle trips. Vehicle trips to and from the east may predominate largely due to roadway connections to Knox Marsh Road and exit 8 of the Spaulding Turnpike.

POTENTIAL TRAFFIC IMPACTS

The calculations show less than 50 peak-hour primary vehicle trips, due to the proposed project. More specifically, tabulated *peak-hour* trip generation is:

- 17 to 22 vehicle-trips
- These totals are split between vehicles entering and vehicles exiting the site

Therefore, the proposed project is not anticipated to add significant new traffic to Crosby Road or Route 9.

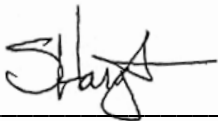
CONCLUSION

In conclusion:

- Sight distances at the Crosby Road/proposed driveway intersection will be adequate
- The proposed project is not anticipated to add significant new traffic to the area

CIVILWORKS NEW ENGLAND

Sincerely,



Stephen J. Haight, PE

Cc: Del Sol Dover, LLC

Landscape Best Management Practices Operations and Maintenance Plan

Commercial Site
Tax Map G, Lot 2-2
Crosby Road
Dover, New Hampshire 03820

Prepared for:
Del Sol Dover, LLC
340 Central Avenue
Suite 202
Dover, NH 03820

Prepared by:
Civilworks New England
181 Watson Road
P.O. Box 1166
Dover, NH 03820

CIVILWORKS NEW ENGLAND

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DOVER, NH 03821-1166
PHONE: 603.749.0443

Landscape Maintenance

Introduction:

The landscape enhancements proposed for the proposed commercial development will require modest maintenance at various times throughout the year. For the site plantings, maintenance is most important during the first 1-2 years following installation when plants are becoming established. Anyone involved in the upkeep of the facility should become familiar with the landscape and its features. Identified below are basic, at minimum, maintenance tasks:

Weekly Tasks:

1. Prune back any shrubs overhanging curbs or sidewalks.
2. Remove litter from plants bed.
3. Remove broken or fallen branches from trees.
4. Prune sucker growth from tree trunks.
5. Remove weeds larger than 2 inches high or wide from plant beds. Weeds 2 inches and larger must be removed, not just killed. **The application of herbicides such as Roundup is discouraged.**
6. Any invasive species seedlings observed should be removed and disposed of properly.
7. Replace bark mulch that may have been washed out of planting beds. Smooth mulch layer if it has been disturbed.
8. Check plants for signs of stress, pests, or disease and notify Owner for authorization to replace.
9. If a significant decline in plant health is attributed to an insect pest, **apply an organic product and/or process** to control the pest.
10. Water plants that are dry and stressed.
11. Notify Owner for authorization to replace dead plants at the appropriate time (see annual tasks, September).
12. Identify other tasks listed on the Annual and Monthly checklist of tasks.

Annual Tasks

Early Spring:

1. Prune winter damage such as broken tree branches that interfere with public safety.
2. Trim dead perennial foliage left in the fall for winter interest to within six inches of the ground.
3. Add new mulch to plant beds where the mulch depth has been reduced to less than 2 inches. Mulch depth shall not exceed two inches (top dressed). Mulch is not required where shrubs or groundcover completely hide the soil surface from view.
4. Gently prune shrubs at appropriate time of year based on species, shape and form. **Do not shear.**
5. Energize the irrigation system, repair damaged components, test the system, adjust heads, and update programing.
6. Conduct a soil test to measure at a minimum, pH, phosphorus, potassium, calcium, and magnesium. Follow the recommendations provided with the soil test results.
7. Apply fertilizer only when required. A single application of fertilizer per year before Memorial Day is encouraged.

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181 WATSON ROAD
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DOVER, NH 03821-1166
PHONE: 603.749.0443

Monthly Tasks

June:

No additional items

July:

No additional items

August:

No additional items

September:

1. Inventory all plant materials, including an exact count of all shrubs and trees.
2. Replace any dead or missing plants.
3. Aerate lawn areas.
4. Apply pelletized lime at a rate of 80 lbs/1,000 square feet or as soil test dictates.

October:

1. Winterize irrigation system.

November:

1. Remove leaves from lawn areas and planting beds.
2. Remove perennial vegetation that has died back for the season.
3. Apply "WILT-PRUF" to broadleaf evergreens, according to label instructions, to protect shrubs from winter die back.

December:

1. Prune any tree branches that interfere with public safety.
2. Prune street and parking lot trees yearly to encourage strong growth the following growing season. Trees adjacent to pedestrian sidewalks shall have branches pruned to 6-foot height.

Management Task or Activity	Time of Frequency						
	Weekly	Monthly	Spring	Summer	Fall	Winter	After Major Rain Events
Replace Dead or Dying Plants			X				
Remove Weeds	X		X	X	X		
Cut Down Grasses			X				
Remove Accumulated Leaves, Litter, and Plant Debris		X					X

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P.O. BOX 1166
DOVER, NH 03821-1166
PHONE: 603.749.0443

Stormwater Detention Facilities

Introduction:

The stormwater facilities are used to attenuate flow and treat stormwater. The stormwater treatment areas consist of large bioretention ponds and linear swales seeded with a variety of native, adaptable, and rugged perennial grasses, and sometimes additional flowering plants. There are maintenance tasks associated with stormwater facilities.

Erosion:

The soil in the facility and in areas draining to the facility shall be inspected for erosion. Eroded areas shall be filled with soil or mulch and seeded with the approved seed mix for the location.

Sediment Accumulation & Clogging:

The accumulation of sediment within the facility may reduce its infiltration capacity and impair performance. The facility shall be inspected for accumulation of sediment and excessive sediment shall be removed with the area re-mulched and replanted as appropriate and necessary.

Outlet Structure Maintenance:

The facility outlet structure requires monitoring. Periodically, the orifice on the outlet pipe may clog with debris. Any found debris should be removed and appropriately disposed of off-site.

Debris & Litter:

Debris and litter should be removed monthly to maintain aesthetic appearance and public acceptance.

Plant Maintenance:

Healthy vegetation contributes to the optimal operation of the stormwater facility. Planting area maintenance tasks include the removal of accumulated leaves, litter, and plant debris as needed. During the first 1-2 years after planting, the facility should be monitored for invasive species and weeded as needed and appropriate. Well-established facility vegetation should be mowed annually in the fall.

Snow Storage:

Snow shall not be dumped directly onto the facility.

Chlorides:

The stormwater facility is not suitable for treating chlorides. Chloride use on source surface areas tributary to the facility should be avoided if possible. In these locations, it would be prudent to eliminate or reduce application of chloride-containing deicing compounds, use alternative deicers, or apply clean sand as needed. Aggressive sweeping in these areas, along with pretreatment sumps and filter strips, will minimize the negative impact of the sand on the facility.

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181 WATSON ROAD
P.O. BOX 1166
DOVER, NH 03821-1166
PHONE: 603.749.0443

Management Task or Activity	Time of Frequency						
	Weekly	Monthly	Spring	Summer	Fall	Winter	After Major Rain Events
Inspect for erosion. Rake and redistribute/ replenish any soil, rap, or mulch that has eroded		X					X
Inspect for standing water							X
Remove Accumulated Leaves, Litter, and Plant Debris		X					X
Weed plant material		X					
Mow plant material					X		

CIVILWORKS NEW ENGLAND



Stephen J. Haight, PE
President

Stormwater Management System Inspection & Maintenance Plan

Prepared for:

**LOT 2 SITE DEVELOPMENT
Map G, Lot 2-1**

**Crosby Road
Dover, New Hampshire
Strafford County**

AUGUST 2024

Owner of Record:

DEL SOL DOVER, LLC
340 Central Avenue
Suite 202
Dover, New Hampshire 03820

Prepared By:

CIVILWORKS NEW ENGLAND
P.O. Box 1166
181 Watson Road
Dover, New Hampshire 03821

Introduction

Civilworks NE, has prepared the following Stormwater Management System Inspection & Maintenance Plan for **Del Sol Dover, LLC**. The intent of this plan is to provide a list of procedures that document the inspection and maintenance requirements of the Stormwater Management System for this site.

The inspection and maintenance requirements outlined in this document are required to be performed in perpetuity. In the event the property is sold, future owners will be responsible for implementing the responsibilities outlined in this document.

The following inspection and maintenance program is necessary in order to keep the Stormwater Management System functioning properly. These measures will also help to minimize potential environmental impacts to the areas surrounding the developed site. By following the enclosed procedures, the property owners, and maintenance personnel will be able to maintain the functional design of the Stormwater Management System and maximize its ability to remove sediment and other contaminants from site generated stormwater runoff.

This plan also requires the Owner/Operator to prepare and implement a salt minimization plan to reduce salt usage on-site and ultimately within the watershed. This plan will allow the owner/operator to monitor and modify how much salt is needed, when it should be applied, where it needs to be applied, with the ultimate goal of reducing salt-use without compromising safety. It is expected that salt-use reduction will lead to long-term cost-savings as a result of purchasing less salt and reduced impacts on vegetation (e.g., landscaping) and corrosion of infrastructure.

The salt minimization plan should include the retention of a contractor who has completed the Green SnowPro Training course and obtained NHDES Salt Application Certification.

It is anticipated that this be a living document that will be updated at regular intervals (recommend updating annually in advance of the winter season in order to facilitate adjustments).

Owner:

**Del Sol Dover, LLC
340 Central Avenue
Suite 202
Dover, NH 03820**

In the event of a change in ownership, this Inspection and Maintenance Plan shall be transferred to the new party; transfer shall be documented to NH DES in writing.

Contact / Responsible Party:

**Del Sol Dover, LLC
340 Central Avenue
Suite 202
Dover, NH 03820**

**Chad Kageleiry
Phone: (603) 749 2800
Email: chad@summitlanddev.com**

The contact information for the Contact / Responsible Party shall be kept current; transfer shall be documented to NHDES in writing.

Management Company:

**Del Sol Dover, LLC
340 Central Avenue
Suite 202
Dover, NH 03820**

The contact information for the Management Party shall be kept current.

Inspection Schedule / Record Retention

Inspection frequency should, at a minimum, be in accordance with New Hampshire Stormwater Manual, Volume 2, latest edition, as updated by NHDES. See the Inspection and Maintenance Plan for frequency requirements. Inspections shall include a photograph of each practice that is subject to the I&M requirements each time it is inspected. A copy of the completed Stormwater Management System's Inspection & Maintenance Log, inspection photographs, and Deicing Salt Quantity Use Log shall be maintained, kept on-site, and be made available to local, state, or federal regulators as applicable by law. All Inspection and Maintenance records must be provided to NHDES upon request and to the City of Dover Community Services Department annually before Dec 15th.

Stormwater Management System Components

The Stormwater Management System associated with the project is designed to mitigate both the quantity and quality of site-generated stormwater runoff. As a result, its design includes the following elements:

- Pipes/Culverts
- Outlet Structures
- Energy Dissipation Structures (Rip Rap)
- Bioretention Basin w/ Internal Storage Reservoir (ISR)
- Grassed Lined Conveyance Swale
- Stone Lined Conveyance Swale
- Pre-Treatment Structures
 - Sediment Forebay
- Pavement
- Litter / Trash Removal

Design elements are identified in the design plans, a copy of which shall be maintained with this Inspection and Maintenance Plan.

Control of Invasive Species

During maintenance activities, check for the presence of invasive plants and remove in a safe manner. Invasive plants shall be controlled to prevent them from reproducing, spreading, or re-growing. See the University of New Hampshire – Cooperative Extension's "Method for Disposing Non-Native Invasive Plants", included at the end of this manual, for guidance on the removal and disposal of invasive species.

Inspection and Maintenance Plan

By implementing the following procedures, the owners will be able to maintain the functional design of the Stormwater Management System and maximize the system's ability to remove sediment and other contaminants from site generated stormwater runoff.

PIPES/CULVERTS:

- Inspect once per year.
- Inspect for clogging and sediment accumulation.
- Remove all debris immediately and sediment accumulations ≥ 2 inches.

OUTLET STRUCTURE(S):

- Inspect once per year.
- Inspect for clogging and sediment accumulation.
- Remove all debris immediately and sediment accumulations ≥ 2 inches.

ENERGY DISSIPATION STRUCTURES (RIP RAP):

- Inspect at least once a year.
- Inspect for sediment accumulation.
- Remove all debris immediately.
- Inspect the outlet protection annually for damage and deterioration. Repair damages immediately.
- If stones become displaced from the riprap areas, they should be replaced immediately and chinked in to assure stability. Add additional riprap as needed. Vegetation growing through the riprap should be eliminated at least yearly.

BIORETENTION BASIN W/ ISR:

- Inspection, by a **qualified professional**, of the Bioretention Basin at least twice annually, and following any rainfall event exceeding 2.5 inches in a 24-hour period, with maintenance or rehabilitation conducted as warranted by such inspection. If the Bioretention Basin systems do not drain within 72-hours following a rainfall event, a **qualified professional** should assess the condition and determine measures required to restore filtration practice (as applicable).
- Inlet and outlet pipes, inlet and outlet structures, containment structures, energy dissipation structures or practices, and other structural appurtenances should be inspected by a **qualified professional**, and corrective action implemented (e.g., maintenance, repairs, or replacement) as indicated by such inspection.
- Embankments and spillways should be inspected by a **qualified professional** for settlement, erosion, seepage, animal burrows, woody vegetation, and other conditions that could degrade the embankment and reduce its stability for impounding water. Immediate corrective action should be implemented if any such conditions are found.
- Vegetation should be inspected at least annually and maintained in healthy condition, including pruning, removal and replacement of dead or diseased vegetation, and removal of invasive species.
- The bottoms, interior and exterior side slopes, and crest of earthen detention basins should be mowed at least once annually. The vegetation should be maintained in a healthy condition, as appropriate to the function of the facility and type of vegetation, to prevent the establishment of woody vegetation.

- Pretreatment measures should be inspected at least twice annually, and cleaned of accumulated sediment as warranted by inspection, but no less than once annually.
- Trash and debris should be removed from the pond and any inlet or outlet structures whenever observed.
- Accumulated sediment should be removed when it significantly affects pond capacity.

GRASS LINED CONVEYANCE SWALE:

- Inspect once per year.
- Inspect for erosion, sediment accumulation, vegetation loss, and presence of invasive species.
- Remove debris and accumulated sediment, based on inspection.
- Repair eroded areas as needed; remove invasive species and dead vegetation.
- Perform periodic mowing of swale (at least twice annually), maintain a 4" stand of vegetative growth.

STONE LINED CONVEYANCE SWALE

- Inspect once per year.
- Inspect for erosion, sediment accumulation, woody vegetation and presence of invasive species.
- Remove debris and accumulated sediment, based on inspection.
- Repair eroded areas as needed; remove invasive species and woody vegetation.
- Reset any dislodged stones.

PRE-TREATMENT STRUCTURES:

SEDIMENT FOREBAY:

- Vegetated areas shall be mowed to maintain a 4" stand of vegetative growth.
- Inspect at least once per year.
- Inspect for sediment accumulation.
- Remove all debris immediately.

PAVEMENT:

- Minimize sanding.
- Minimize application of salt for ice control.
- Clean periodically (1-2 times per year) using a sweeper or vacuum sweeper. Vacuum sweeping is the preferred method.

LITTER / TRASH REMOVAL:

- Routinely patrol site for litter pick up.

DE-ICING AGENTS:

- To address the concerns associated with the application of chlorides and other deicing materials, NHDES recommends that the Owner/Operator develop a Road Salt and Deicing Minimization Plan for the parking lots and roadways. The plan should develop the policies that the development will keep in place to minimize salt and other deicer use after the project has been completed. The plan should include tracking the use of salt and other deicers for each storm event and compiling salt use data annually. (See Deicing Salt Quantity Use Log).
- Use sand as primary agent for driveway and access way safety during ice and snow conditions.
- Minimize the use of salt during the winter.

- Use de-icing or anti-caking agents, added to enhance performance and application characteristics of sand mixtures, only as necessary and at minimum application rates.
- Recommend using a certified Winter Operator (Green SnowPro Trained) for applying de-icing agents.
- Monitor weather and apply de-icing agents based on weather conditions and temperatures.

ANTI-ICING AND SALT MINIMIZATION:

- Owner to develop a Road Salt and Deicing Minimization Plan.
- Provide a written policy that the “Development” will keep in place to minimize salt and other deicer use after the project has been completed.
- Use the attached form to track the use of salt and other deicers for each storm event and compiling salt use data annually.

Inspection & Maintenance Table

System Component / BMP	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance / Cleanout Threshold
Pipes/Culverts	Annually	- Check for clogging - Check for sediment accumulation	Remove when noticed Clean when necessary
Outlet Structure(s)	Annually	- Inspect once per year. - Inspect for clogging and sediment accumulation. - Remove all debris immediately and sediment accumulations ≥ 2 inches.	≥ 2 in. sediment Remove immediately
Energy Dissipation (ED) Structures (Rip Rap)	Annually	- Check for erosion - Check for displaced stones - Check for woody vegetation - Check for sediment accumulation	≥ 3 in. sediment Remove annually Replace/ reset Dislodged stones immediately
Bioretention Basin w/ ISR - Inlet/Outlet Piping - Pond - Sediment - Drawdown - Trash/Debris - Vegetation (Veg.) - Embankments	Bi-Annually “ “ Annually Periodically “ “ “ “	- Check for erosion, settlement, seepage, etc. - Check for sediment accum. in pond - Check drainage time - Check for and remove trash/debris - Maintain $>75\%$ veg. (pond & slopes) - Maintain healthy stand of veg.	Repair immediately ≥ 2 in sediment >72 hours Remove all trash/debris Restore veg. in-kind Mow when ≥ 6 in
Grass Lined Conveyance Swale	Annually	- Check for sediment accumulation - Check for erosion - Ensure swale is stabilized - Maintain healthy stand of veg., min 4" - Inspect for invasive species	≥ 1 in. sediment Repair immediately Restore vegetation in-kind Mow twice per year Remove/Dispose of accordingly
Stone Lined Conveyance Swale	Annually	- Check for sediment accumulation - Check for erosion - Inspect for woody/ invasive vegetation - Check for dislodged stones	≥ 1 in. sediment Repair immediately Remove/Dispose of accordingly
Pre-Treatment Structures: Sediment Forebay	Annually	- Check for sediment accumulation - Check for woody vegetation growth - Check for debris - Vegetated areas shall be mowed to maintain a 4" start of vegetation growth.	Remove/ Dispose of accordingly Mow twice per year
Pavement: - Sanding - Salt Applications - Sweep/Vacuum - Trash/Debris	Limit use As required 1 - 2 x's Year Periodically	- Minimize use to prevent tracking issues - RECORD APPLICATION RATES - Sweep or vacuum to prevent tracking issues - Check for trash/debris	Sweep to prevent issues Minimize (as required) Sweep/Vac as needed Remove when noticed
Litter / Trash Removal	Periodically	Check for litter and trash	Remove when noticed

Inspection & Maintenance Checklist/Log

The following pages contain a blank copy of the Stormwater Management System's Inspection & Maintenance Log and a Deicing Salt Quantity Use Log. These forms are provided to assist the owners with the inspection and maintenance of the aforementioned Stormwater Management System.

Stormwater Management System's Inspection & Maintenance Log

Date of Inspection/Maintenance _____ Inspector: _____

[illegible]

Deicing Salt Quantity Use Log

[illegible]

Methods for Disposing Non-Native Invasive Plants

Prepared by the Invasives Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasives Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.



Tatarian honeysuckle

Lonicera tatarica

USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 3: 282.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non-native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non-viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit www.nhinvases.org or contact your UNH Cooperative Extension office.

New Hampshire Regulations

Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr. 3802.01)

How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag “head first” at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

Burning: Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can’t be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn’t be burned as the seeds may disperse by the hot air created by the fire.

Bagging (solarization): Use this technique with softer-tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.

Tarping and Drying: Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

Chipping: Use this method for woody plants that don’t reproduce vegetatively.

Burying: This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

Drowning: Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well-rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn’t used often. Be prepared for an awful stink!

Composting: Invasive plants can take root in compost. Don’t compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.



Japanese knotweed
Polygonum cuspidatum
USDA-NRCS PLANTS Database /
Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 676.

Be diligent looking for seedlings for years in areas where removal and disposal took place.

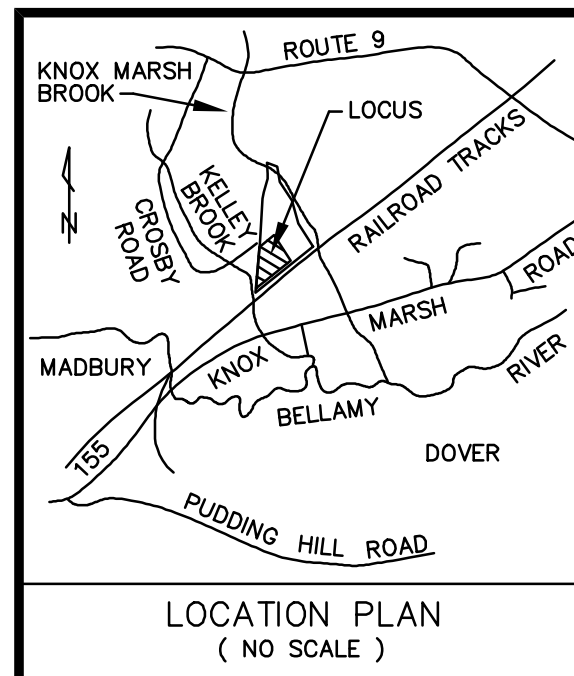
Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

Woody Plants	Method of Reproducing	Methods of Disposal
Norway maple <i>(Acer platanoides)</i> European barberry <i>(Berberis vulgaris)</i> Japanese barberry <i>(Berberis thunbergii)</i> autumn olive <i>(Elaeagnus umbellata)</i> burning bush <i>(Euonymus alatus)</i> Morrow's honeysuckle <i>(Lonicera morrowii)</i> Tatarian honeysuckle <i>(Lonicera tatarica)</i> showy bush honeysuckle <i>(Lonicera x bella)</i> common buckthorn <i>(Rhamnus cathartica)</i> glossy buckthorn <i>(Frangula alnus)</i>	Fruit and Seeds 	Prior to fruit/seed ripening Seedlings and small plants ▪ Pull or cut and leave on site with roots exposed. No special care needed. Larger plants ▪ Use as firewood. ▪ Make a brush pile. ▪ Chip. ▪ Burn.
		After fruit/seed is ripe Don't remove from site. ▪ Burn. ▪ Make a covered brush pile. ▪ Chip once all fruit has dropped from branches. ▪ Leave resulting chips on site and monitor.
oriental bittersweet <i>(Celastrus orbiculatus)</i> multiflora rose <i>(Rosa multiflora)</i>	Fruits, Seeds, Plant Fragments 	Prior to fruit/seed ripening Seedlings and small plants ▪ Pull or cut and leave on site with roots exposed. No special care needed. Larger plants ▪ Make a brush pile. ▪ Burn.
		After fruit/seed is ripe Don't remove from site. ▪ Burn. ▪ Make a covered brush pile. ▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.

Non-Woody Plants	Method of Reproducing	Methods of Disposal
garlic mustard (<i>Alliaria petiolata</i>) spotted knapweed (<i>Centaurea maculosa</i>) ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort (<i>Cynanchum nigrum</i>) ▪ May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort (<i>Cynanchum rossicum</i>) giant hogweed (<i>Heracleum mantegazzianum</i>) ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket (<i>Hesperis matronalis</i>) perennial pepperweed (<i>Lepidium latifolium</i>) purple loosestrife (<i>Lythrum salicaria</i>) Japanese stilt grass (<i>Microstegium vimineum</i>) mile-a-minute weed (<i>Polygonum perfoliatum</i>)	Fruits and Seeds 	Prior to flowering Depends on scale of infestation Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material. During and following flowering Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (<i>Phragmites australis</i>) Japanese knotweed (<i>Polygonum cuspidatum</i>) Bohemian knotweed (<i>Polygonum x bohemicum</i>)	Fruits, Seeds, Plant Fragments Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	Small infestation ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. Large infestation ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010



DRAINAGE ANALYSIS

**Del Sol Dover, LLC
CROSBY ROAD EXTENSION &
LOT 2 DEVELOPMENT
TAX MAP G, LOT 2-1
DOVER, NH**

August 2024

Prepared For:

**Del Sol Dover, LLC
340 Central Avenue
Suite 202
Dover, NH 03820**

Prepared By:

**Civilworks NE
PO Box 1166
181 Watson Road
Dover, NH 03820**

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1.0 INTRODUCTION

This is a hydrologic analysis of a portion of the subject parcel located on Crosby Road in Dover, NH. The 20.80± acre lot is identified as Tax Map G, Lot 2-1. The parcel is being subdivided into three (3) lots (Lot 2-1, 2-1A, & 2-1B) ranging in size from approximately 5.0 to 8.3 acres. This hydrologic analysis analyzes the land development associated with construction of the proposed road and the development of the newly formed (6.15+/- acre) Lot 2-1. The area of analysis is currently undeveloped and primarily consists of mowed fields with a small, graveled area for site access. The project parcel, Lot 2-1, is relatively flat and slopes to the railroad tracks located along the south easterly property line. The parcel is bound by commercial lots to the North, East, and West, and the railroad tracks to the South and Southeast.

This analysis includes the construction of an 807 foot, 24-foot-wide paved road (Crosby Road extension) and the full build out of one (Tax Map G Lot 2-1) of the three (3) commercial lots. The commercial development consists of the construction of a 9,600-sf building, site access from the newly constructed Crosby Road extension, associated parking, gravel lay down area, underground utilities, and grading and drainage improvements. The proposed drainage system incorporates grassed and stone lined swales for stormwater conveyance, sediment forebays for pre-treatment, and three (3) bioretention basins with internal storage reservoirs (ISR's) for stormwater treatment. A large portion of stormwater runoff from the proposed roadway is designed to drain into the stormwater drainage structures located on Lot 2-1 while the last 50+/- ft will be treated be treated within the proposed right-of-way and proposed Lot 2-1A. The proposed stormwater system captures, stores, and treats the stormwater runoff from the site and roadway, then redirects it to the existing discharge points. The proposed stormwater drainage structures will be maintained by the project proponent as outlined within the Stormwater Management System Inspection & Maintenance Manual (Stormwater I&M Manual) in Appendix C.

To effectively analyze the pre-development subject parcel and proposed roadway, a 12.19 ac area was analyzed and divided into three (3) watersheds, A, B, & C. The remaining 8.61 acres of the original larger lot is not being developed as part of this project. Watershed A drains to the south to an existing drainage ditch along the railroad tracks; Watershed B drains to the country drainage associated with the former Hanson Road, prior to discharge from a cross culvert under the driveway of an abutting lot; and Watershed C drains to Knox Marsh Brook. The site is located within a Great Bay Community; therefore, this analysis includes a 15% increase to the extreme precipitation data obtained from the Northeast Regional Climate Center.

The post development condition maintains the same three (3) watersheds as the pre-development condition. Watersheds A & B are further divided into subcatchments, three (3) and two (2) respectively, to account for the proposed stormwater management system. The post-development watersheds utilize the same points of discharge as the existing conditions, and they provide a direct comparison to the pre-development model. Bioretention Basins with ISR's were utilized for stormwater treatment as the site is located

within a “Class A – All Features” watershed as identified on the NHDES OneStop Data Mapper. This analysis indicates that the proposed stormwater measures, and stormwater management plan will treat and mitigate stormwater runoff in general accordance with ENV-Wq 1500 of the New Hampshire Code of Administrative Rules and the City of Dover’s Subdivision and Site Review Regulations. The proposed development of the site, in conjunction with the implementation of the Stormwater I&M Manual, will have minimal impact on the watersheds.

2.0 DRAINAGE ANALYSIS

A comprehensive hydrologic study of this site has been performed utilizing nationally recognized runoff estimating techniques developed by the USDA, Soil Conservation Services (SCS). The technique and runoff models are described in various SCS publications and references as follows:

“Stormwater Management and Erosion Sediment Control Handbook for Urban and Developing Areas in New Hampshire”

“New Hampshire Stormwater Manual Volume 2 - Post-Construction Best Management Practices Selection & Design”

“Civil Engineering Reference Manual, Fifth Edition”

“Open-Channel Hydraulics” Chow.

“Stormwater Modeling System” HydroCAD Ver. 10.10

2.1 DRAINAGE DESIGN PARAMETERS

A brief review of the procedures and parameters used in the drainage study follows:

2.1.1 Watersheds

The watershed was delineated using on site topographic and as built survey data field located by McEneaney Survey Associates of New England.

2.1.2 Soils

Soil types were determined utilizing a site specific soils map prepared by BAG Land Consultants, Bruce A. Gilday, CSS#012. The hydrologic soil drainage classifications used for this analysis are Class B and D.

Hydrologic Drainage Class B:

Map Unit Symbol	Soil Taxonomic Name	Drainage Class
313B	Deerfield	Moderately-Well Drained
915B	Deerfield Variant	Somewhat Poorly Drained

Hydrologic Drainage Class D:

Map Unit Symbol	Soil Taxonomic Name	Drainage Class
233B/P	Scantic	Poorly Drained (P)

2.1.3 Rainfall Data

Extreme precipitation estimate values from the Northeast Regional Climate Center were utilized in this analysis. The analysis has been performed for the 2-year, 10-year, 25-year, and 50-year storm events with 3.60", 5.44", 6.88", and 8.23" rainfall depths respectively. The rainfall data has been peaked by 15% in accordance with NHDES Alteration of Terrain requirements as the site is located within the Coastal Region.

2.1.4 Runoff Curve Numbers

The SCS runoff curve numbers were used and are summarized within each sub-catchment drainage summary in Appendix A.

2.2 EXISTING CONDITIONS

For the purposes of this analysis, the subject parcel was analyzed as three (3) watersheds.

2.2.1 Table A – Existing Conditions (2, 10, 25, and 50-year storm events)

Watershed	Pre-Development Volume (af)	Pre Development Peak Flows (cfs)			
Discharge Point	<u>2-yr</u>	<u>2-yr</u>	<u>10-yr</u>	<u>25-yr</u>	<u>50-yr</u>
A	0.625	2.8	6.6	9.8	12.7
B	0.080	0.4	1.2	1.8	2.5
C	0.223	1.4	3.0	4.2	5.3

2.3 DEVELOPED CONDITIONS

The post development model was analyzed utilizing the same summing points as the pre-development analysis.

2.3.1 Table B – Developed Conditions (2, 10, 25, and 50-year storm events)

Watershed	Post-Development Volume (af)	Post Development Peak Flows (cfs)			
Discharge Point	<u>2-yr</u>	<u>2-yr</u>	<u>10-yr</u>	<u>25-yr</u>	<u>50-yr</u>
A	0.915	2.5	6.3	9.7	12.7
B	0.055	0.3	0.8	1.3	1.7
C	0.261	1.4	3.0	4.2	5.3

2.4 HYDROLOGIC COMPARISON

The analysis indicates that the proposed project will have negligible impact on the developed watersheds.

2.4.1 Table C – Pre/Post Development Comparison (2, 10, 25, and 50-year storm events)

Watershed	Pre/Post-Development Volume (af)	Pre/Post Development Peak Flows (cfs)			
Discharge Point	<u>2-yr</u>	<u>2-yr</u>	<u>10-yr</u>	<u>25-yr</u>	<u>50-yr</u>
A	0.625/ 0.915	2.8/ 2.5	6.6/ 6.3	9.8/ 9.7	12.7/ 12.7
B	0.080/ 0.055	0.4/ 0.3	1.2/ 0.8	1.8/ 1.3	2.5/ 1.7
C	0.223/ 0.261	1.4/ 1.4	3.0/ 3.0	4.2/ 4.2	5.3/ 5.3

2.5 STORMWATER DESIGN

The project incorporates best management practices to mitigate runoff as well as treat and convey stormwater.

2.5.1 Stormwater Best Management Practices (BMP's)

This project incorporates three (3) bioretention basins with ISR's to mitigate flow and water quality from the proposed development. Pre-treatment for the proposed

stormwater BMP's will utilize sediment forebays. See Appendix B-1 for the BMP design calculations and supporting documentation.

2.5.2 Pollutant Removal

This project treats 1.65+/- acres of proposed impervious area. The project incorporates the following practice and associated pollutant removal efficacy as identified in the New Hampshire Stormwater Management Manual Volume 2, Appendix B:

	TSS	TN	TP
Bioretention Basin with ISR:	90%	65%	65%

The pollutant removal meets or exceeds The City of Dover's Site Review Regulations. See Appendix B-2 for the removal efficiency data as provided in Volume 1.

2.5.3 Groundwater Recharge

The site was evaluated for infiltration practices in support of groundwater recharge. The site's characteristics were not conducive for infiltration. The site limitations prevent infiltration and therefore will influence the project's ability to meet City and State requirements to attenuate volume and meet channel protection requirements respectively.

Site characteristics including soil type, topography, and depth to SHWT prevent the infiltration of stormwater. However, the project's stormwater infrastructure is designed to attenuate flow from the development of the parcel in support of meeting the spirit of the channel protection criteria to the greatest extent practicable. The discharge from the site is directed to large wetland complexes associated with Kelley and Knox Marsh Brooks and the proposed project will not contribute to flooding or functional impairments to streets, adjacent properties, or downstream properties.

2.5.4 Outlet Protection

BMP's, conveyance structures, and outlet protection have been sized to convey the 50-year, 24 hour storm event. All proposed rip-rap applications shall consist of min. d50 = 6" stone with a stone layer thickness of 12" (min) on a filter fabric layer over a 6" thick (min) gravel base. See Appendix B-3 for design calculations and supporting data, the plan set for rip-rap locations and the drainage details for additional information.

APPENDIX A

HYDROLOGIC CALCULATIONS

Extreme Precipitation in New York & New England

An Interactive Web Tool for Extreme Precipitation Analysis

About this Project

Data & Products

Daily Monitoring

Documentation

Select Product ?

Extreme Precipitation
Tables - HTML ?

Extreme Precipitation
Tables - Text/CSV ?

Partial Duration Series -
by Point ?

Partial Duration Series -
by Station ?

Distribution Curves -
Graphical ?

Distribution Curves -
Text/TBL ?

Intensity Frequency
Duration Graphs ?

Precipitation Frequency
Duration Graphs ?

GIS Data Files ?

Regional/State Maps ?

Select Location ? Double-click map to place a marker, or enter address or latitude/longitude.

Hybrid	Map	Locate by Address ?	Locate by Lat/Lon ?	Locate by State/County ?
Satellite	Terrain		43.17°N -70.91°W	



© Mapbox © OpenStreetMap © Maxar

Select Options ?

Smoothing ?

Yes ▾

Delivery ?

Popup ▾

Submit ?

Version 2.0 Copyright 2010-2022

This project is a joint collaboration between:

Northeast Regional Climate Center (NRCC)



Cornell University

Natural Resources Conservation Service (NRCS)



Contact: precip@cornell.edu

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Metadata for Point	
Smoothing	Yes
State	New Hampshire
Location	New Hampshire, United States
Latitude	43.180 degrees North
Longitude	70.911 degrees West
Elevation	20 feet
Date/Time	Mon Jun 24 2024 14:58:45 GMT-0400 (Eastern Daylight Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day		+15%
1yr	0.26	0.40	0.50	0.65	0.81	1.03	1yr	0.70	0.98	1.20	1.54	1.99	2.60	2.85	1yr	2.30	2.74	3.14	3.87	4.44	1yr	2.99
2yr	0.32	0.49	0.61	0.81	1.01	1.28	2yr	0.87	1.17	1.50	1.91	2.44	3.13	3.48	2yr	2.77	3.35	3.84	4.57	5.21	2yr	3.60
5yr	0.37	0.57	0.72	0.96	1.23	1.58	5yr	1.06	1.44	1.85	2.38	3.06	3.96	4.46	5yr	3.50	4.29	4.90	5.78	6.54	5yr	
10yr	0.40	0.63	0.80	1.09	1.41	1.84	10yr	1.22	1.69	2.17	2.82	3.65	4.73	5.38	10yr	4.19	5.17	5.90	6.90	7.77	10yr	5.44
25yr	0.46	0.74	0.94	1.29	1.72	2.26	25yr	1.48	2.09	2.69	3.51	4.59	5.98	6.90	25yr	5.30	6.64	7.54	8.73	9.76	25yr	6.88
50yr	0.51	0.82	1.06	1.48	1.99	2.66	50yr	1.72	2.45	3.17	4.17	5.47	7.16	8.33	50yr	6.33	8.01	9.08	10.43	11.61	50yr	8.23
100yr	0.58	0.93	1.20	1.70	2.31	3.11	100yr	1.99	2.88	3.73	4.94	6.51	8.56	10.07	100yr	7.57	9.68	10.94	12.47	13.81	100yr	9.84
200yr	0.64	1.04	1.35	1.94	2.69	3.65	200yr	2.32	3.39	4.41	5.87	7.77	10.24	12.17	200yr	9.06	11.70	13.18	14.91	16.44	200yr	
500yr	0.75	1.24	1.61	2.34	3.28	4.51	500yr	2.83	4.20	5.47	7.34	9.79	12.98	15.64	500yr	11.49	15.04	16.87	18.91	20.72	500yr	

Lower Confidence Limits

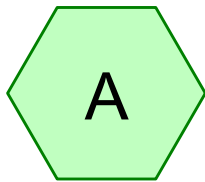
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1yr	0.24	0.37	0.45	0.60	0.74	0.90	1yr	0.64	0.88	0.91	1.25	1.55	2.04	2.48	1yr	1.81	2.38	2.92	3.35	4.05	1yr
2yr	0.31	0.49	0.60	0.81	1.00	1.18	2yr	0.86	1.16	1.36	1.83	2.36	3.04	3.38	2yr	2.69	3.25	3.73	4.45	5.06	2yr
5yr	0.35	0.54	0.67	0.91	1.16	1.40	5yr	1.00	1.37	1.61	2.15	2.78	3.70	4.11	5yr	3.27	3.96	4.58	5.40	6.10	5yr
10yr	0.38	0.59	0.73	1.02	1.32	1.60	10yr	1.14	1.57	1.82	2.45	3.14	4.26	4.78	10yr	3.77	4.59	5.31	6.24	7.01	10yr
25yr	0.44	0.67	0.83	1.18	1.55	1.91	25yr	1.34	1.87	2.11	2.85	3.67	5.04	5.79	25yr	4.46	5.57	6.48	7.56	8.43	25yr
50yr	0.48	0.73	0.91	1.31	1.77	2.19	50yr	1.53	2.14	2.36	3.21	4.12	5.78	6.69	50yr	5.11	6.44	7.53	8.74	9.68	50yr
100yr	0.54	0.81	1.02	1.47	2.02	2.51	100yr	1.74	2.46	2.64	3.59	4.61	6.61	7.73	100yr	5.85	7.43	8.76	10.09	11.08	100yr
200yr	0.60	0.90	1.14	1.65	2.30	2.88	200yr	1.99	2.81	2.93	4.02	5.16	7.57	8.93	200yr	6.70	8.58	10.19	11.67	12.72	200yr
500yr	0.70	1.04	1.34	1.94	2.77	3.47	500yr	2.39	3.39	3.40	4.67	6.01	9.01	10.78	500yr	7.97	10.37	12.44	14.15	15.20	500yr

Upper Confidence Limits

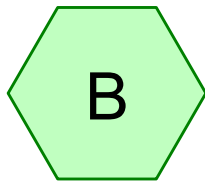
	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.53	0.71	0.87	1.08	1yr	0.75	1.05	1.23	1.74	2.21	2.83	3.05	1yr	2.50	2.93	3.37	4.17	4.76	1yr
2yr	0.33	0.51	0.62	0.84	1.04	1.24	2yr	0.90	1.22	1.48	1.95	2.50	3.25	3.59	2yr	2.87	3.45	3.96	4.72	5.39	2yr
5yr	0.39	0.60	0.75	1.03	1.31	1.58	5yr	1.13	1.54	1.85	2.49	3.19	4.22	4.80	5yr	3.73	4.61	5.23	6.17	6.94	5yr
10yr	0.46	0.70	0.87	1.21	1.57	1.92	10yr	1.35	1.87	2.23	3.04	3.84	5.19	5.98	10yr	4.59	5.75	6.55	7.58	8.46	10yr
25yr	0.55	0.84	1.05	1.49	1.96	2.47	25yr	1.69	2.41	2.87	3.95	4.92	6.93	8.02	25yr	6.13	7.71	8.73	9.96	11.02	25yr
50yr	0.64	0.97	1.21	1.74	2.34	2.98	50yr	2.02	2.91	3.48	4.80	5.97	8.55	10.03	50yr	7.57	9.64	10.87	12.25	13.47	50yr
100yr	0.74	1.12	1.40	2.03	2.78	3.59	100yr	2.40	3.51	4.21	5.87	7.24	10.55	12.55	100yr	9.34	12.07	13.52	15.08	16.47	100yr
200yr	0.86	1.29	1.63	2.37	3.30	4.35	200yr	2.85	4.26	5.12	7.18	8.78	13.06	15.72	200yr	11.56	15.11	16.83	18.54	20.18	200yr
500yr	1.05	1.56	2.00	2.91	4.13	5.59	500yr	3.57	5.46	6.61	9.39	11.34	17.35	21.17	500yr	15.36	20.36	22.49	24.42	26.41	500yr

A – 1

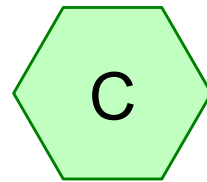
EXISTING WATERSHEDS



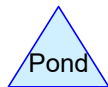
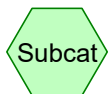
A



B



C



Routing Diagram for 24085 - Pre

Prepared by Civilworks New England

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24085 - Pre

Prepared by Civilworks New England

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
8.549	61	>75% Grass cover, Good, HSG B (A, B, C)
3.457	80	>75% Grass cover, Good, HSG D (A, C)
0.186	96	Gravel surface, HSG B (A)
12.192	67	TOTAL AREA

24085 - Pre

Prepared by Civilworks New England

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Page 3

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
8.735	HSG B	A, B, C
0.000	HSG C	
3.457	HSG D	A, C
0.000	Other	
12.192		TOTAL AREA

24085 - Pre

Prepared by Civilworks New England

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Page 4

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	8.549	0.000	3.457	0.000	12.005	>75% Grass cover, Good	A, B, C
0.000	0.186	0.000	0.000	0.000	0.186	Gravel surface	A
0.000	8.735	0.000	3.457	0.000	12.192	TOTAL AREA	

A – 1

NODE LISTING – 2-YR

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: A

Runoff Area=360,163 sf 0.00% Impervious Runoff Depth=0.91"
Flow Length=1,314' Tc=37.0 min CN=67 Runoff=2.8 cfs 0.625 af

Subcatchment B: B

Runoff Area=67,371 sf 0.00% Impervious Runoff Depth=0.62"
Flow Length=268' Tc=22.2 min CN=61 Runoff=0.4 cfs 0.080 af

Subcatchment C: C

Runoff Area=103,537 sf 0.00% Impervious Runoff Depth=1.13"
Flow Length=402' Tc=20.7 min CN=71 Runoff=1.4 cfs 0.223 af

Total Runoff Area = 12.192 ac Runoff Volume = 0.928 af Average Runoff Depth = 0.91"
100.00% Pervious = 12.192 ac 0.00% Impervious = 0.000 ac

A – 1

NODE LISTING – 10-YR

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: A

Runoff Area=360,163 sf 0.00% Impervious Runoff Depth=2.12"
Flow Length=1,314' Tc=37.0 min CN=67 Runoff=6.6 cfs 1.458 af

Subcatchment B: B

Runoff Area=67,371 sf 0.00% Impervious Runoff Depth=1.64"
Flow Length=268' Tc=22.2 min CN=61 Runoff=1.2 cfs 0.211 af

Subcatchment C: C

Runoff Area=103,537 sf 0.00% Impervious Runoff Depth=2.45"
Flow Length=402' Tc=20.7 min CN=71 Runoff=3.0 cfs 0.486 af

Total Runoff Area = 12.192 ac Runoff Volume = 2.155 af Average Runoff Depth = 2.12"
100.00% Pervious = 12.192 ac 0.00% Impervious = 0.000 ac

A – 1

10-YR STORM SUMMARY

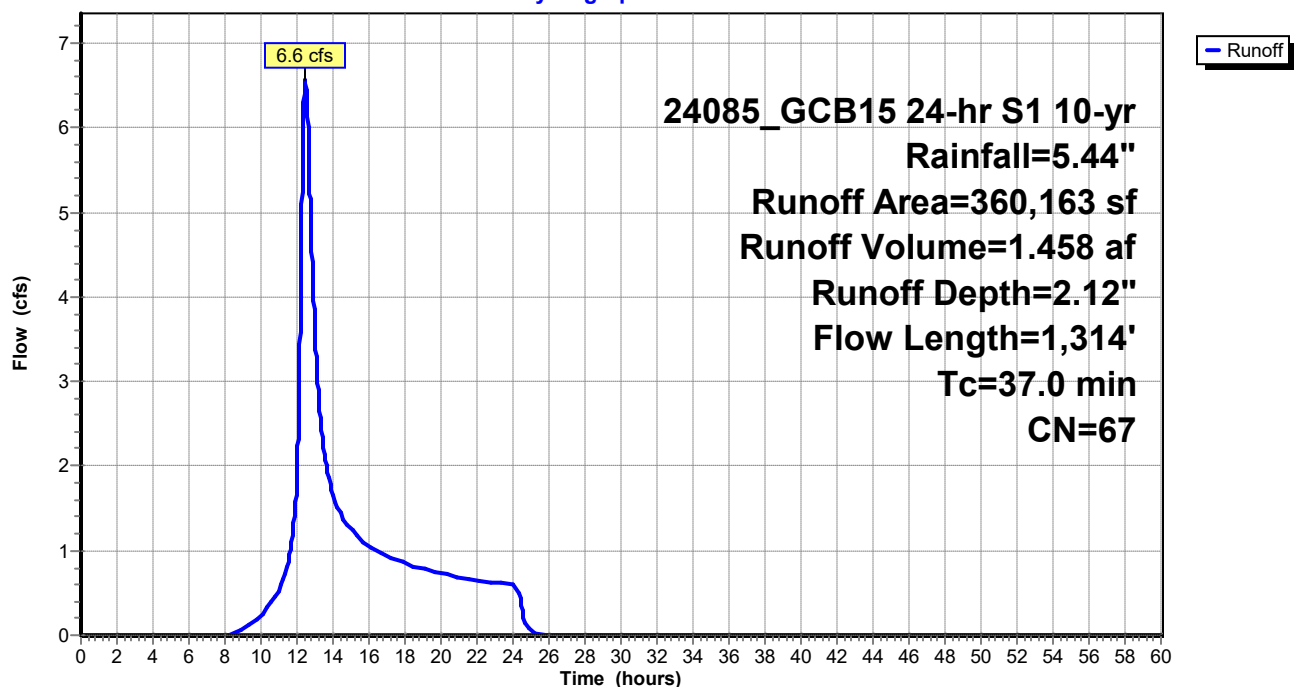
Summary for Subcatchment A: A

Runoff = 6.6 cfs @ 12.46 hrs, Volume= 1.458 af, Depth= 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 24085_GCB15 24-hr S1 10-yr Rainfall=5.44"

Area (sf)	CN	Description
253,585	61	>75% Grass cover, Good, HSG B
8,114	96	Gravel surface, HSG B
98,464	80	>75% Grass cover, Good, HSG D
360,163	67	Weighted Average
360,163		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	100	0.0100	0.09		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
16.1	479	0.0050	0.49		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.1	735	0.0050	4.00	35.96	Trap/Vee/Rect Channel Flow, Bot.W=3.00' D=1.50' Z= 2.0 '/' Top.W=9.00' n= 0.025 Earth, clean & straight
37.0	1,314	Total			

Subcatchment A: A**Hydrograph**

Summary for Subcatchment B: B

Runoff = 1.2 cfs @ 12.26 hrs, Volume= 0.211 af, Depth= 1.64"

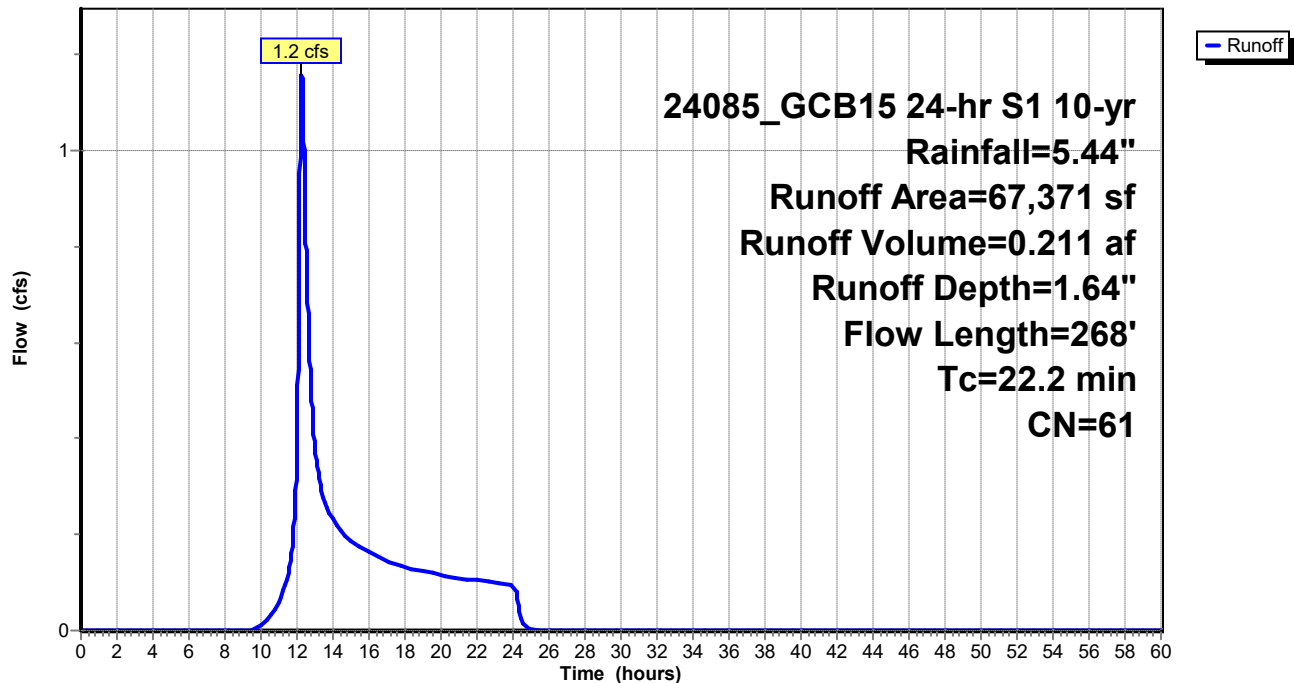
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 24085_GCB15 24-hr S1 10-yr Rainfall=5.44"

Area (sf)	CN	Description
67,371	61	>75% Grass cover, Good, HSG B
67,371		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	100	0.0120	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
5.7	168	0.0050	0.49		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
22.2	268	Total			

Subcatchment B: B

Hydrograph



Summary for Subcatchment C: C

Runoff = 3.0 cfs @ 12.24 hrs, Volume= 0.486 af, Depth= 2.45"

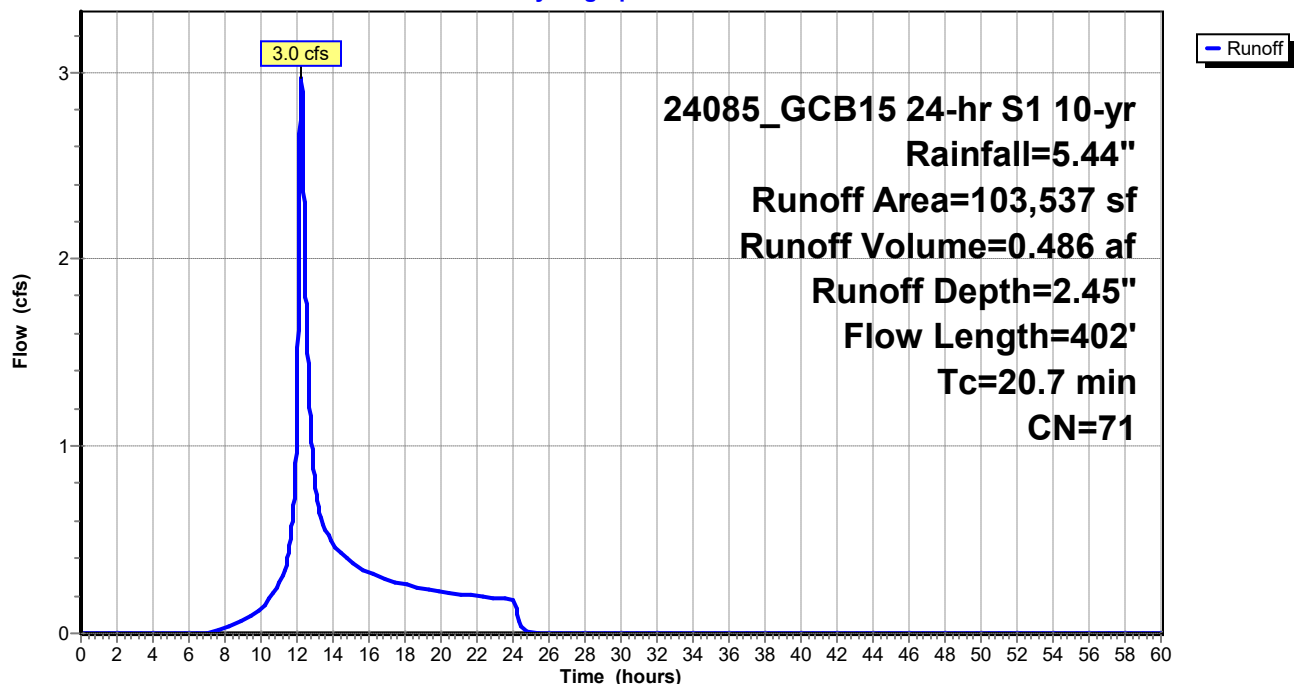
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 24085_GCB15 24-hr S1 10-yr Rainfall=5.44"

Area (sf)	CN	Description
51,429	61	>75% Grass cover, Good, HSG B
52,108	80	>75% Grass cover, Good, HSG D
103,537	71	Weighted Average
103,537		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0200	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
7.2	302	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
20.7	402	Total			

Subcatchment C: C

Hydrograph



A – 1

NODE LISTING – 25-YR

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: A

Runoff Area=360,163 sf 0.00% Impervious Runoff Depth=3.21"
Flow Length=1,314' Tc=37.0 min CN=67 Runoff=9.8 cfs 2.213 af

Subcatchment B: B

Runoff Area=67,371 sf 0.00% Impervious Runoff Depth=2.62"
Flow Length=268' Tc=22.2 min CN=61 Runoff=1.8 cfs 0.337 af

Subcatchment C: C

Runoff Area=103,537 sf 0.00% Impervious Runoff Depth=3.62"
Flow Length=402' Tc=20.7 min CN=71 Runoff=4.2 cfs 0.718 af

Total Runoff Area = 12.192 ac Runoff Volume = 3.268 af Average Runoff Depth = 3.22"
100.00% Pervious = 12.192 ac 0.00% Impervious = 0.000 ac

A – 1

NODE LISTING – 50-YR

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: A

Runoff Area=360,163 sf 0.00% Impervious Runoff Depth=4.31"
Flow Length=1,314' Tc=37.0 min CN=67 Runoff=12.7 cfs 2.972 af

Subcatchment B: B

Runoff Area=67,371 sf 0.00% Impervious Runoff Depth=3.62"
Flow Length=268' Tc=22.2 min CN=61 Runoff=2.5 cfs 0.467 af

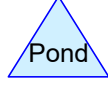
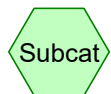
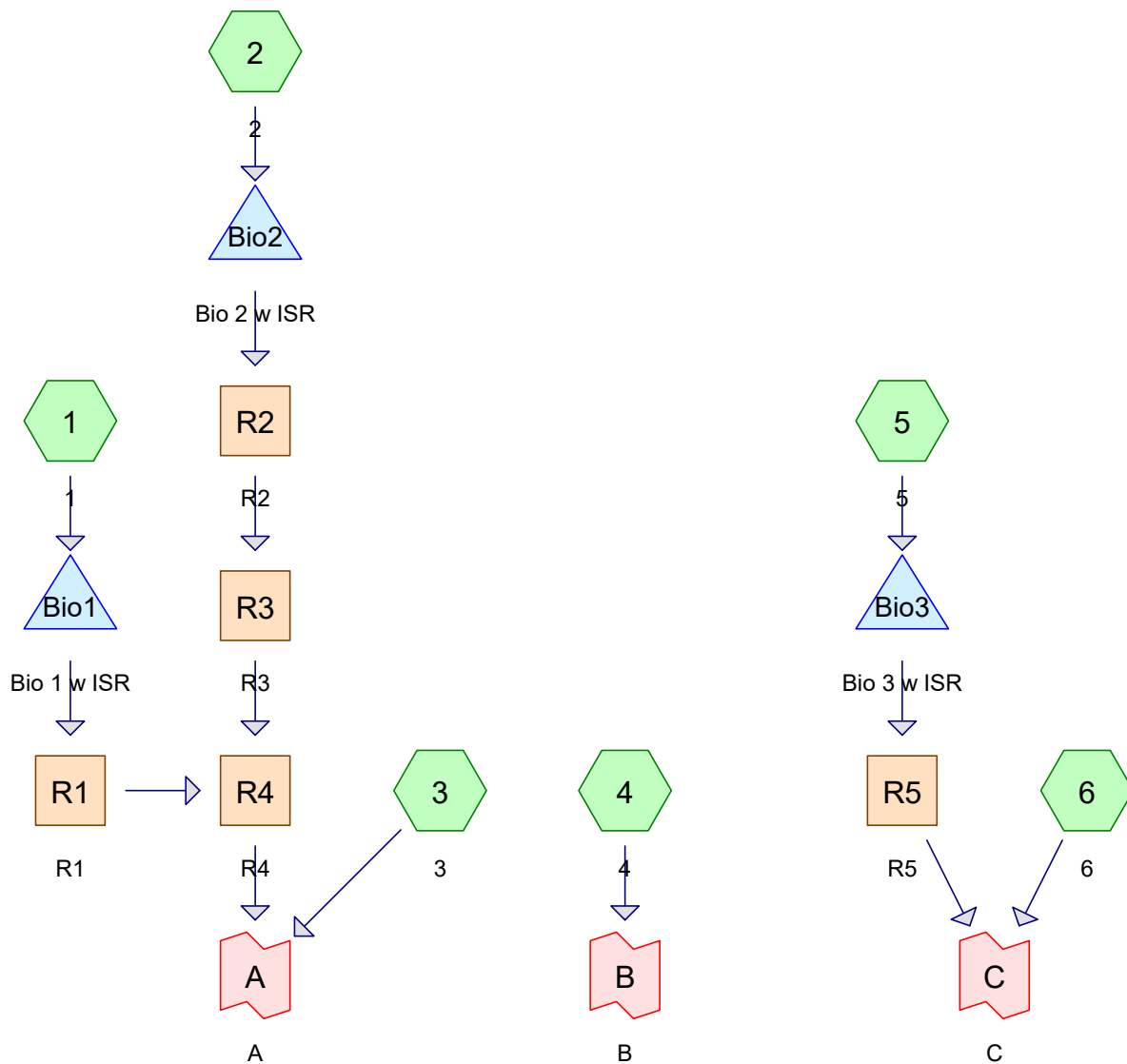
Subcatchment C: C

Runoff Area=103,537 sf 0.00% Impervious Runoff Depth=4.78"
Flow Length=402' Tc=20.7 min CN=71 Runoff=5.3 cfs 0.947 af

Total Runoff Area = 12.192 ac Runoff Volume = 4.385 af Average Runoff Depth = 4.32"
100.00% Pervious = 12.192 ac 0.00% Impervious = 0.000 ac

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DEVELOPED WATERSHEDS



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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
7.025	61	>75% Grass cover, Good, HSG B (1, 2, 3, 4, 5, 6)
3.517	80	>75% Grass cover, Good, HSG D (1, 2, 3, 5, 6)
0.576	96	Gravel surface, HSG B (2, 5)
0.017	96	Gravel surface, HSG D (5)
0.524	98	Paved parking, HSG B (2, 5)
0.008	98	Paved parking, HSG D (5)
0.305	98	Paved roads w/curbs & sewers, HSG B (1)
0.220	98	Roofs, HSG B (1, 2)
12.192	71	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
8.650	HSG B	1, 2, 3, 4, 5, 6
0.000	HSG C	
3.541	HSG D	1, 2, 3, 5, 6
0.000	Other	
12.192		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	7.025	0.000	3.517	0.000	10.542	>75% Grass cover, Good	1, 2, 3, 4, 5, 6
0.000	0.576	0.000	0.017	0.000	0.593	Gravel surface	2, 5
0.000	0.524	0.000	0.008	0.000	0.531	Paved parking	2, 5
0.000	0.305	0.000	0.000	0.000	0.305	Paved roads w/curbs & sewers	1
0.000	0.220	0.000	0.000	0.000	0.220	Roofs	1, 2
0.000	8.650	0.000	3.541	0.000	12.192	TOTAL AREA	

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NODE LISTING – 2-YR

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24085_GCB15 24-hr S1 2-yr Rainfall=3.60"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: 1	Runoff Area=23,492 sf 66.81% Impervious Runoff Depth=2.27" Flow Length=46' Slope=0.0350 '/' Tc=5.8 min CN=87 Runoff=1.2 cfs 0.102 af
Subcatchment 2: 2	Runoff Area=75,687 sf 33.25% Impervious Runoff Depth=2.02" Flow Length=468' Tc=14.5 min CN=84 Runoff=2.4 cfs 0.293 af
Subcatchment 3: 3	Runoff Area=283,339 sf 0.00% Impervious Runoff Depth=0.96" Flow Length=1,314' Tc=37.0 min CN=68 Runoff=2.3 cfs 0.520 af
Subcatchment 4: 4	Runoff Area=46,302 sf 0.00% Impervious Runoff Depth=0.62" Flow Length=268' Tc=22.2 min CN=61 Runoff=0.3 cfs 0.055 af
Subcatchment 5: 5	Runoff Area=11,195 sf 46.21% Impervious Runoff Depth=2.54" Flow Length=15' Slope=0.0600 '/' Tc=1.9 min CN=90 Runoff=0.8 cfs 0.054 af
Subcatchment 6: 6	Runoff Area=91,055 sf 0.00% Impervious Runoff Depth=1.19" Flow Length=402' Tc=20.7 min CN=72 Runoff=1.3 cfs 0.207 af
Reach R1: R1	Avg. Flow Depth=0.04' Max Vel=0.44 fps Inflow=0.0 cfs 0.102 af n=0.025 L=548.0' S=0.0036 '/' Capacity=11.6 cfs Outflow=0.0 cfs 0.102 af
Reach R2: R2	Avg. Flow Depth=0.10' Max Vel=1.28 fps Inflow=0.3 cfs 0.293 af n=0.025 L=68.0' S=0.0125 '/' Capacity=5.7 cfs Outflow=0.3 cfs 0.293 af
Reach R3: R3	Avg. Flow Depth=0.12' Max Vel=0.72 fps Inflow=0.3 cfs 0.293 af n=0.025 L=326.0' S=0.0028 '/' Capacity=26.7 cfs Outflow=0.3 cfs 0.293 af
Reach R4: R4	Avg. Flow Depth=0.16' Max Vel=0.61 fps Inflow=0.3 cfs 0.395 af n=0.025 L=170.0' S=0.0015 '/' Capacity=19.5 cfs Outflow=0.3 cfs 0.395 af
Reach R5: R5	Avg. Flow Depth=0.08' Max Vel=0.44 fps Inflow=0.1 cfs 0.054 af n=0.035 L=151.0' S=0.0056 '/' Capacity=5.1 cfs Outflow=0.1 cfs 0.054 af
Pond Bio1: Bio 1 w ISR	Peak Elev=95.52' Storage=2,961 cf Inflow=1.2 cfs 0.102 af Outflow=0.0 cfs 0.102 af
Pond Bio2: Bio 2 w ISR	Peak Elev=95.30' Storage=6,200 cf Inflow=2.4 cfs 0.293 af Outflow=0.3 cfs 0.293 af
Pond Bio3: Bio 3 w ISR	Peak Elev=95.41' Storage=1,126 cf Inflow=0.8 cfs 0.054 af Outflow=0.1 cfs 0.054 af
Link A: A	Inflow=2.5 cfs 0.915 af Primary=2.5 cfs 0.915 af
Link B: B	Inflow=0.3 cfs 0.055 af Primary=0.3 cfs 0.055 af

24085 - Post*24085_GCB15 24-hr S1 2-yr Rainfall=3.60"*

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Link C: C

Inflow=1.4 cfs 0.261 af

Primary=1.4 cfs 0.261 af

Total Runoff Area = 12.192 ac Runoff Volume = 1.231 af Average Runoff Depth = 1.21"
91.33% Pervious = 11.135 ac 8.67% Impervious = 1.057 ac

A – 2

NODE LISTING – 10-YR

24085 - Post

24085_GCB15 24-hr S1 10-yr Rainfall=5.44"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: 1	Runoff Area=23,492 sf 66.81% Impervious Runoff Depth=3.98" Flow Length=46' Slope=0.0350 '/' Tc=5.8 min CN=87 Runoff=1.8 cfs 0.179 af
Subcatchment 2: 2	Runoff Area=75,687 sf 33.25% Impervious Runoff Depth=3.68" Flow Length=468' Tc=14.5 min CN=84 Runoff=3.8 cfs 0.532 af
Subcatchment 3: 3	Runoff Area=283,339 sf 0.00% Impervious Runoff Depth=2.20" Flow Length=1,314' Tc=37.0 min CN=68 Runoff=5.4 cfs 1.192 af
Subcatchment 4: 4	Runoff Area=46,302 sf 0.00% Impervious Runoff Depth=1.64" Flow Length=268' Tc=22.2 min CN=61 Runoff=0.8 cfs 0.145 af
Subcatchment 5: 5	Runoff Area=11,195 sf 46.21% Impervious Runoff Depth=4.30" Flow Length=15' Slope=0.0600 '/' Tc=1.9 min CN=90 Runoff=1.1 cfs 0.092 af
Subcatchment 6: 6	Runoff Area=91,055 sf 0.00% Impervious Runoff Depth=2.54" Flow Length=402' Tc=20.7 min CN=72 Runoff=2.7 cfs 0.443 af
Reach R1: R1	Avg. Flow Depth=0.13' Max Vel=0.85 fps Inflow=0.3 cfs 0.179 af n=0.025 L=548.0' S=0.0036 '/' Capacity=11.6 cfs Outflow=0.3 cfs 0.179 af
Reach R2: R2	Avg. Flow Depth=0.18' Max Vel=1.85 fps Inflow=0.9 cfs 0.532 af n=0.025 L=68.0' S=0.0125 '/' Capacity=5.7 cfs Outflow=0.9 cfs 0.532 af
Reach R3: R3	Avg. Flow Depth=0.23' Max Vel=1.07 fps Inflow=0.9 cfs 0.532 af n=0.025 L=326.0' S=0.0028 '/' Capacity=26.7 cfs Outflow=0.9 cfs 0.532 af
Reach R4: R4	Avg. Flow Depth=0.33' Max Vel=0.94 fps Inflow=1.1 cfs 0.711 af n=0.025 L=170.0' S=0.0015 '/' Capacity=19.5 cfs Outflow=1.1 cfs 0.711 af
Reach R5: R5	Avg. Flow Depth=0.14' Max Vel=0.64 fps Inflow=0.3 cfs 0.092 af n=0.035 L=151.0' S=0.0056 '/' Capacity=5.1 cfs Outflow=0.3 cfs 0.092 af
Pond Bio1: Bio 1 w ISR	Peak Elev=95.68' Storage=3,572 cf Inflow=1.8 cfs 0.179 af Outflow=0.3 cfs 0.179 af
Pond Bio2: Bio 2 w ISR	Peak Elev=95.55' Storage=9,733 cf Inflow=3.8 cfs 0.532 af Outflow=0.9 cfs 0.532 af
Pond Bio3: Bio 3 w ISR	Peak Elev=95.72' Storage=1,548 cf Inflow=1.1 cfs 0.092 af Outflow=0.3 cfs 0.092 af
Link A: A	Inflow=6.3 cfs 1.903 af Primary=6.3 cfs 1.903 af
Link B: B	Inflow=0.8 cfs 0.145 af Primary=0.8 cfs 0.145 af

24085 - Post*24085_GCB15 24-hr S1 10-yr Rainfall=5.44"*

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Link C: C

Inflow=3.0 cfs 0.535 af

Primary=3.0 cfs 0.535 af

Total Runoff Area = 12.192 ac Runoff Volume = 2.583 af Average Runoff Depth = 2.54"
91.33% Pervious = 11.135 ac 8.67% Impervious = 1.057 ac

A – 2

10-YR STORM SUMMARY

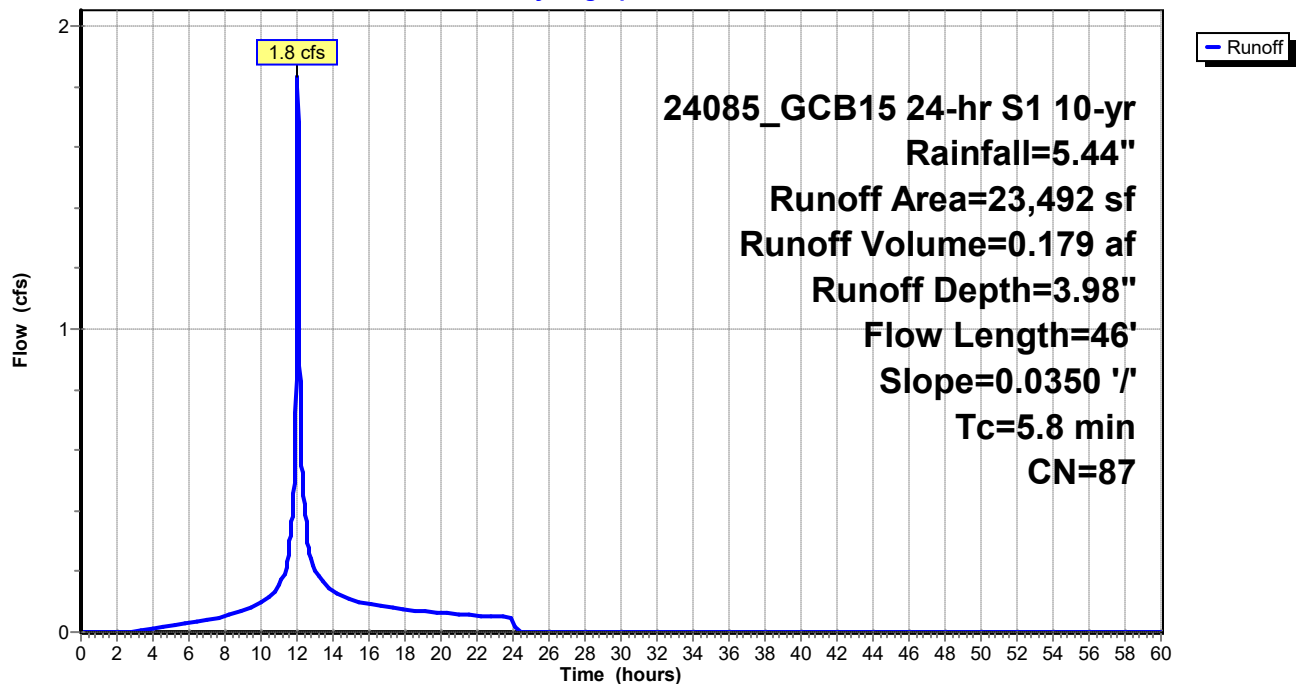
Summary for Subcatchment 1: 1

Runoff = 1.8 cfs @ 12.03 hrs, Volume= 0.179 af, Depth= 3.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 24085_GCB15 24-hr S1 10-yr Rainfall=5.44"

Area (sf)	CN	Description
6,277	61	>75% Grass cover, Good, HSG B
13,295	98	Paved roads w/curbs & sewers, HSG B
2,400	98	Roofs, HSG B
1,520	80	>75% Grass cover, Good, HSG D
23,492	87	Weighted Average
7,797		33.19% Pervious Area
15,695		66.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	46	0.0350	0.13		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"

Subcatchment 1: 1**Hydrograph**

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24085_GCB15 24-hr S1 10-yr Rainfall=5.44"

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Summary for Subcatchment 2: 2

Runoff = 3.8 cfs @ 12.15 hrs, Volume= 0.532 af, Depth= 3.68"

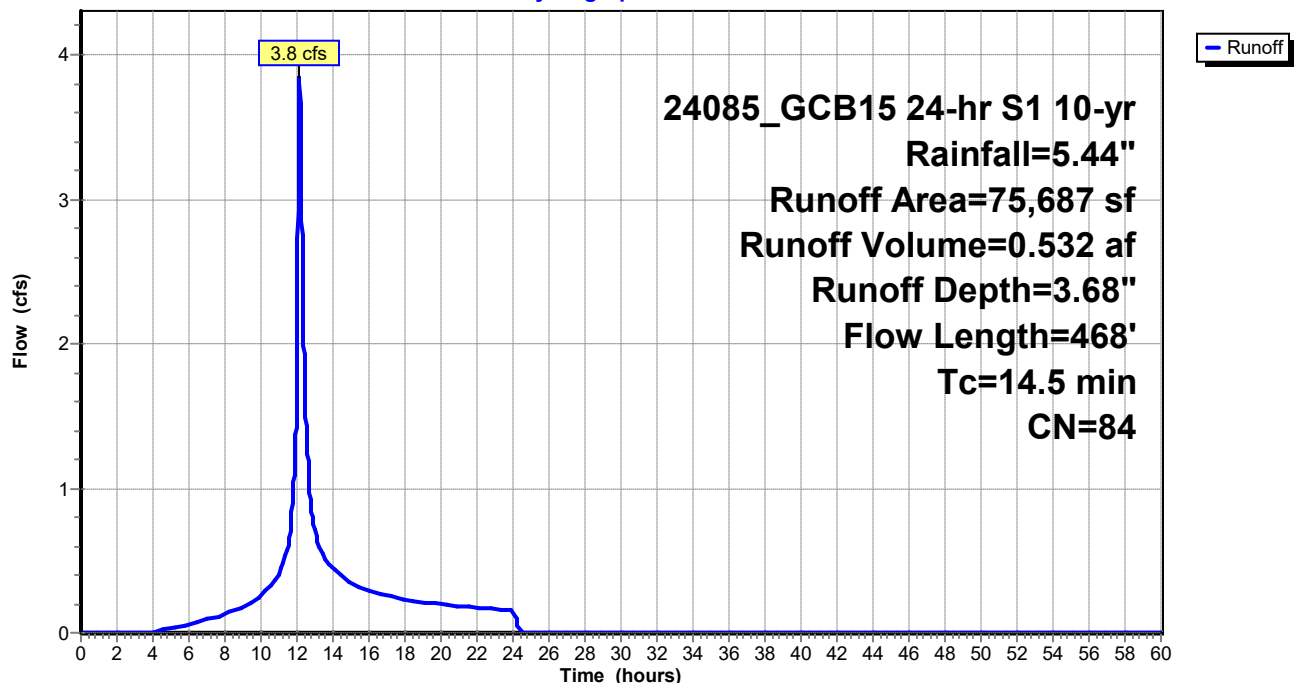
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
24085_GCB15 24-hr S1 10-yr Rainfall=5.44"

Area (sf)	CN	Description
26,404	61	>75% Grass cover, Good, HSG B
22,500	96	Gravel surface, HSG B
17,963	98	Paved parking, HSG B
7,200	98	Roofs, HSG B
1,620	80	>75% Grass cover, Good, HSG D
75,687	84	Weighted Average
50,524		66.75% Pervious Area
25,163		33.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	65	0.0110	0.09		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
2.4	403	0.0040	2.80	16.81	Trap/Vee/Rect Channel Flow, Bot.W=3.00' D=1.00' Z= 3.0 '/' Top.W=9.00' n= 0.025 Earth, clean & straight
14.5	468	Total			

Subcatchment 2: 2

Hydrograph



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24085_GCB15 24-hr S1 10-yr Rainfall=5.44"

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Summary for Subcatchment 3: 3

Runoff = 5.4 cfs @ 12.46 hrs, Volume= 1.192 af, Depth= 2.20"

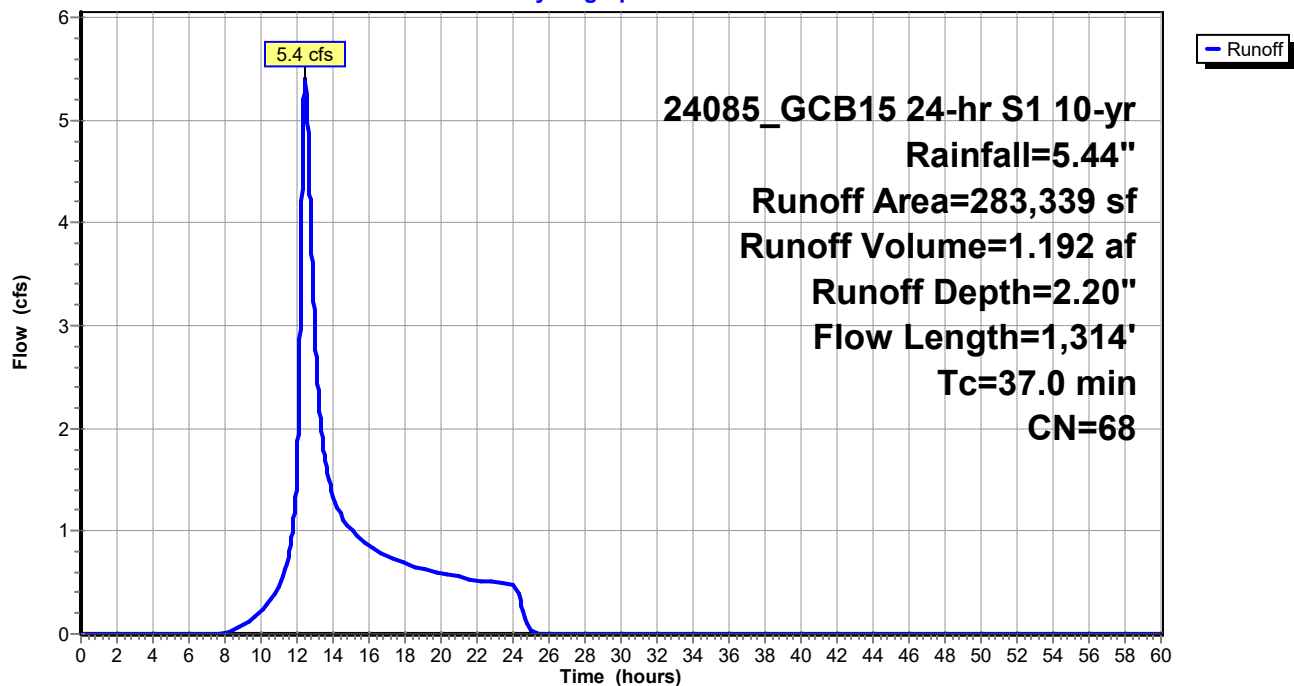
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
24085_GCB15 24-hr S1 10-yr Rainfall=5.44"

Area (sf)	CN	Description
184,875	61	>75% Grass cover, Good, HSG B
98,464	80	>75% Grass cover, Good, HSG D
283,339	68	Weighted Average
283,339		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	100	0.0100	0.09		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
16.1	479	0.0050	0.49		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.1	735	0.0050	4.00	35.96	Trap/Vee/Rect Channel Flow, Bot.W=3.00' D=1.50' Z= 2.0 '/' Top.W=9.00' n= 0.025 Earth, clean & straight
37.0	1,314	Total			

Subcatchment 3: 3

Hydrograph



24085 - Post

24085_GCB15 24-hr S1 10-yr Rainfall=5.44"

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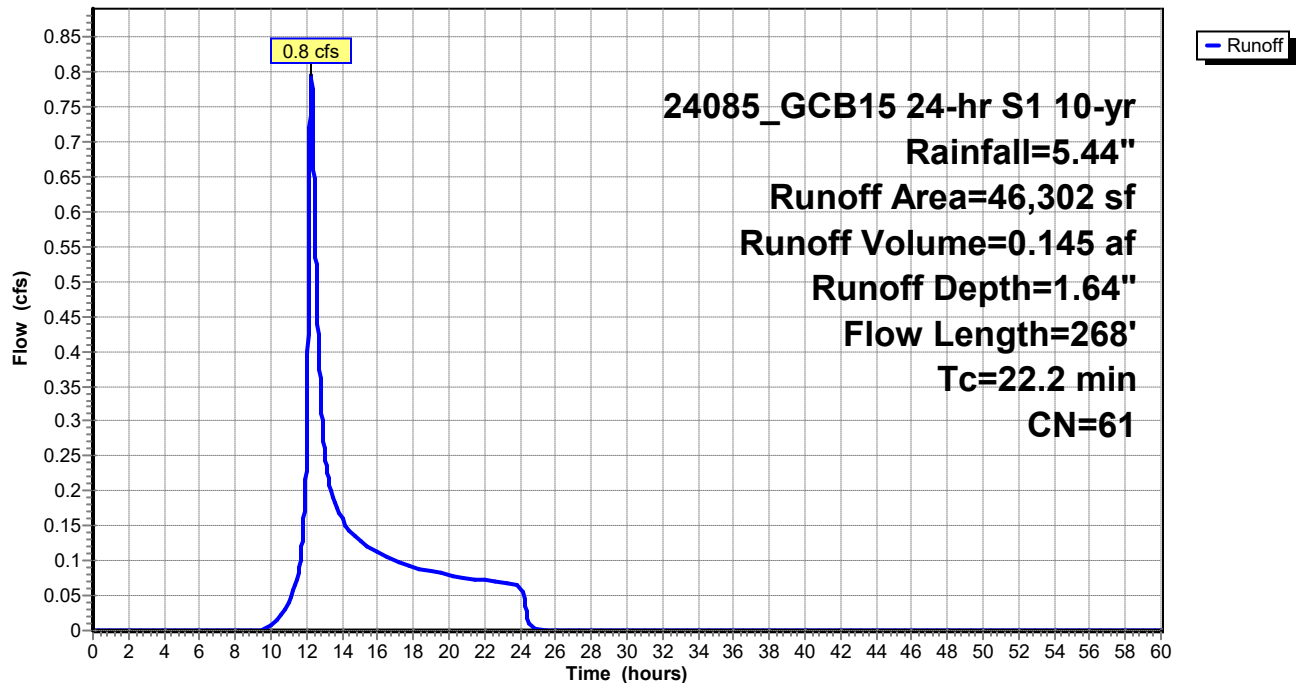
Summary for Subcatchment 4: 4

Runoff = 0.8 cfs @ 12.26 hrs, Volume= 0.145 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
24085_GCB15 24-hr S1 10-yr Rainfall=5.44"

Area (sf)	CN	Description
46,302	61	>75% Grass cover, Good, HSG B
46,302		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	100	0.0120	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
5.7	168	0.0050	0.49		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
22.2	268	Total			

Subcatchment 4: 4**Hydrograph**

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24085_GCB15 24-hr S1 10-yr Rainfall=5.44"

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Summary for Subcatchment 5: 5

Runoff = 1.1 cfs @ 12.00 hrs, Volume= 0.092 af, Depth= 4.30"

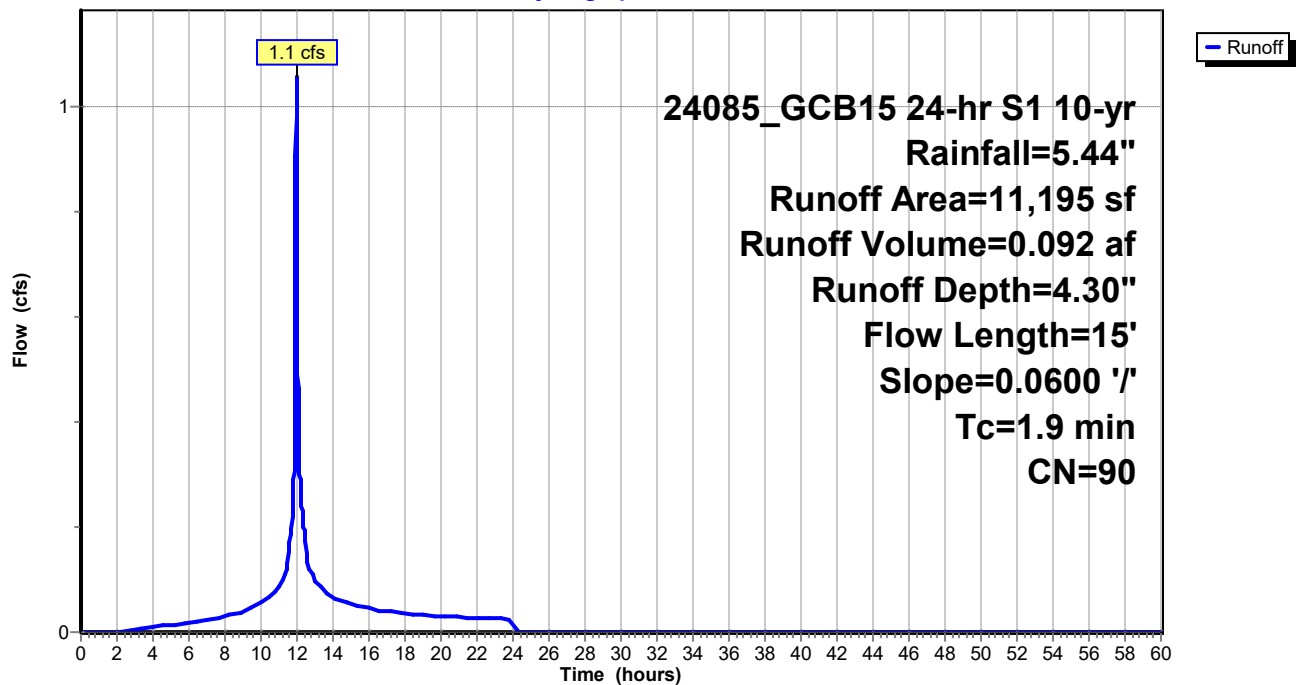
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
24085_GCB15 24-hr S1 10-yr Rainfall=5.44"

Area (sf)	CN	Description
1,995	61	>75% Grass cover, Good, HSG B
2,606	96	Gravel surface, HSG B
4,843	98	Paved parking, HSG B
678	80	>75% Grass cover, Good, HSG D
743	96	Gravel surface, HSG D
330	98	Paved parking, HSG D
11,195	90	Weighted Average
6,022		53.79% Pervious Area
5,173		46.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	15	0.0600	0.13		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"

Subcatchment 5: 5

Hydrograph



Summary for Subcatchment 6: 6

Runoff = 2.7 cfs @ 12.24 hrs, Volume= 0.443 af, Depth= 2.54"

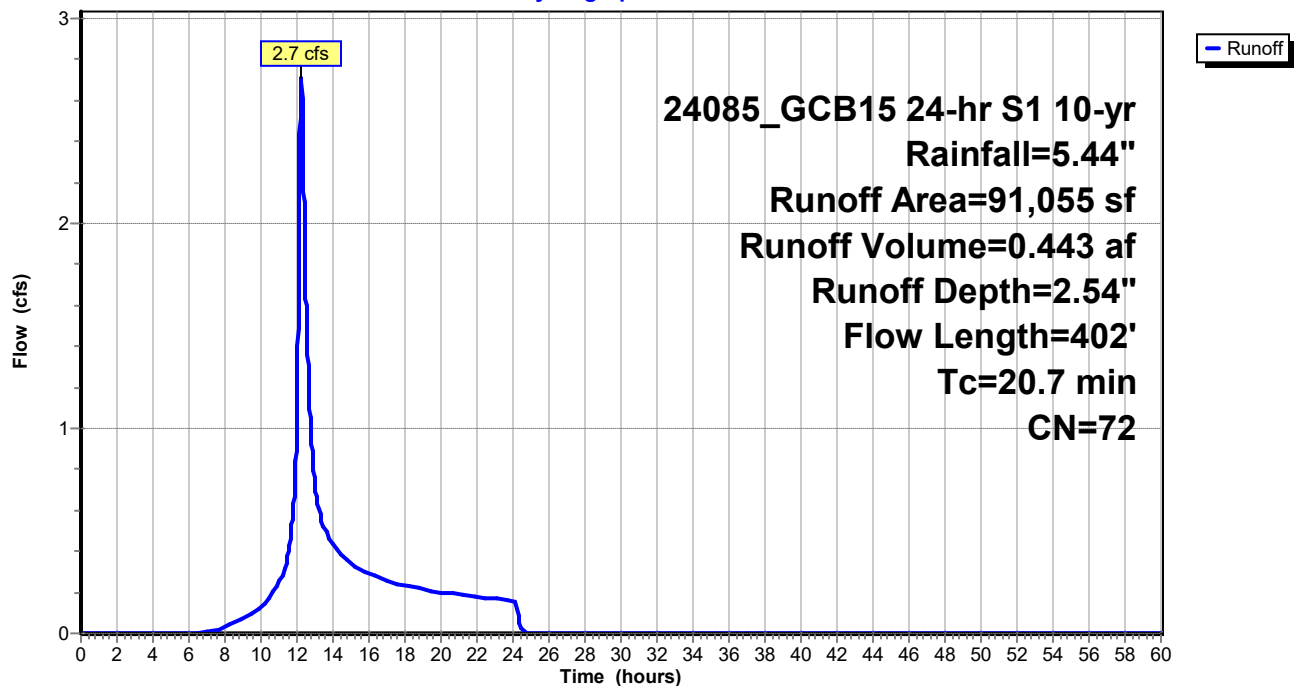
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 24085_GCB15 24-hr S1 10-yr Rainfall=5.44"

Area (sf)	CN	Description
40,145	61	>75% Grass cover, Good, HSG B
50,910	80	>75% Grass cover, Good, HSG D
91,055	72	Weighted Average
91,055		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0200	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
7.2	302	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
20.7	402	Total			

Subcatchment 6: 6

Hydrograph



Summary for Reach R1: R1

Inflow Area = 0.539 ac, 66.81% Impervious, Inflow Depth > 3.98" for 10-yr event
Inflow = 0.3 cfs @ 12.66 hrs, Volume= 0.179 af
Outflow = 0.3 cfs @ 12.84 hrs, Volume= 0.179 af, Atten= 3%, Lag= 11.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Max. Velocity= 0.85 fps, Min. Travel Time= 10.8 min

Avg. Velocity = 0.38 fps, Avg. Travel Time= 24.2 min

Peak Storage= 171 cf @ 12.84 hrs

Average Depth at Peak Storage= 0.13' , Surface Width= 2.67'

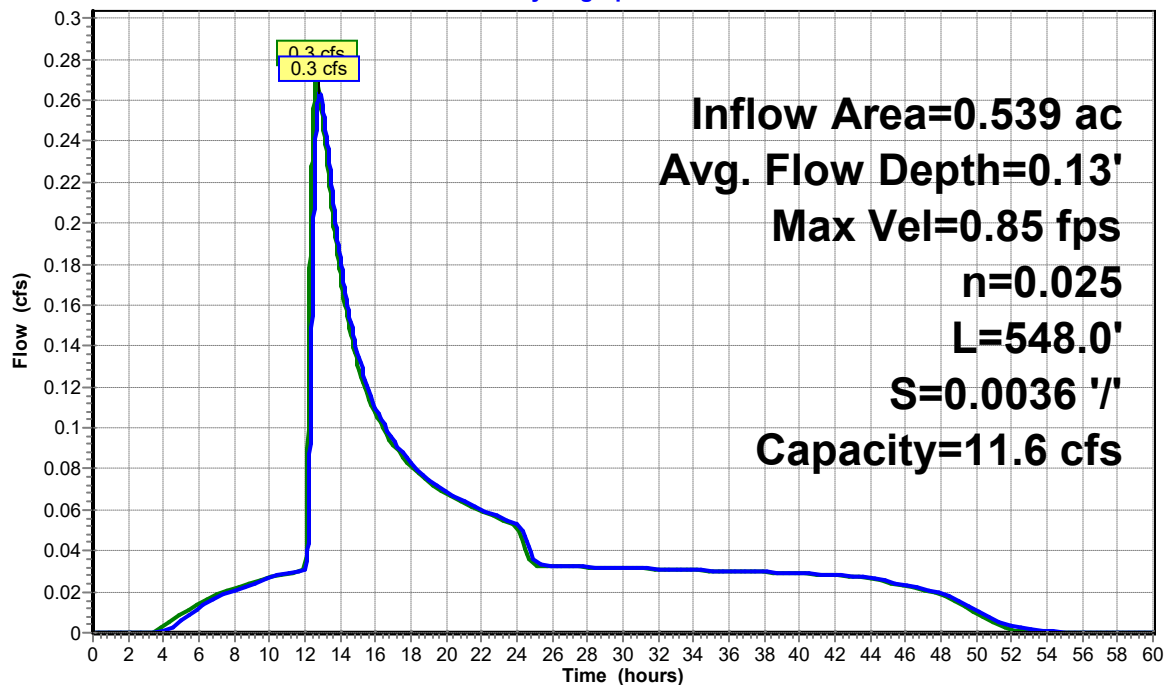
Bank-Full Depth= 1.00' Flow Area= 4.5 sf, Capacity= 11.6 cfs

2.00' x 1.00' deep channel, n= 0.025 Earth, clean & straight

Side Slope Z-value= 3.0 2.0 '/' Top Width= 7.00'

Length= 548.0' Slope= 0.0036 '/'

Inlet Invert= 93.00', Outlet Invert= 91.00'

**Reach R1: R1****Hydrograph**

Summary for Reach R2: R2

Inflow Area = 1.738 ac, 33.25% Impervious, Inflow Depth > 3.67" for 10-yr event
 Inflow = 0.9 cfs @ 12.80 hrs, Volume= 0.532 af
 Outflow = 0.9 cfs @ 12.80 hrs, Volume= 0.532 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Max. Velocity= 1.85 fps, Min. Travel Time= 0.6 min

Avg. Velocity= 0.74 fps, Avg. Travel Time= 1.5 min

Peak Storage= 32 cf @ 12.80 hrs

Average Depth at Peak Storage= 0.18' , Surface Width= 3.09'

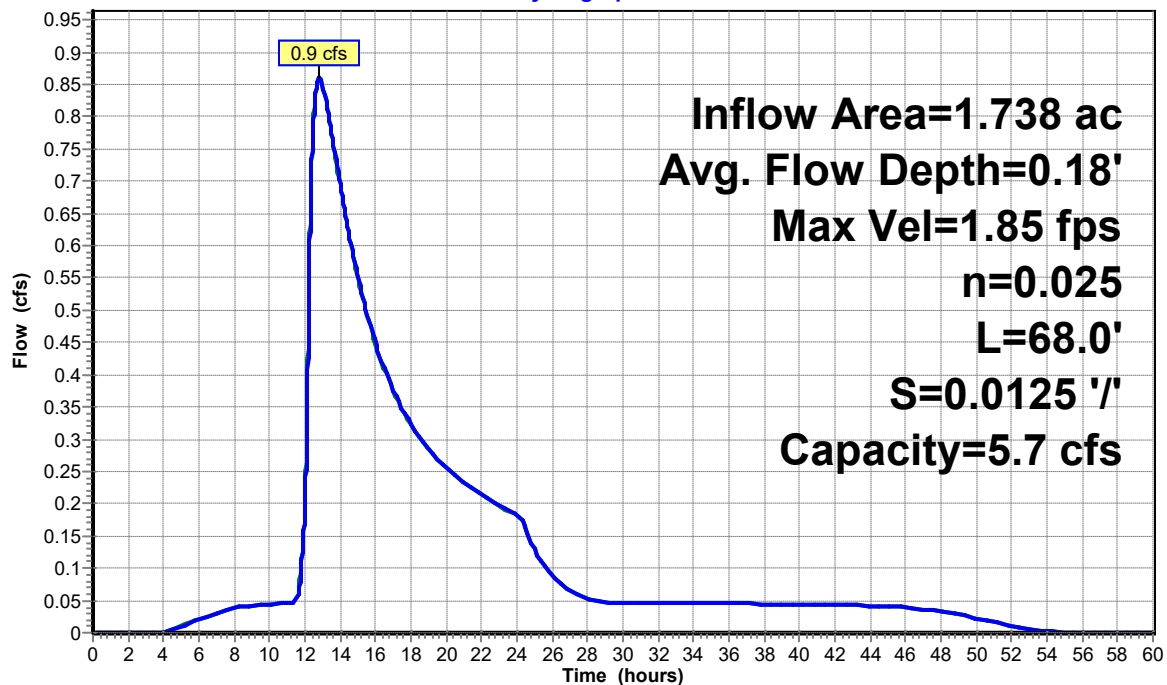
Bank-Full Depth= 0.50' Flow Area= 1.8 sf, Capacity= 5.7 cfs

2.00' x 0.50' deep channel, n= 0.025 Earth, clean & straight

Side Slope Z-value= 3.0 ' ' Top Width= 5.00'

Length= 68.0' Slope= 0.0125 ' '

Inlet Invert= 92.75', Outlet Invert= 91.90'

**Reach R2: R2****Hydrograph**

Summary for Reach R3: R3

Inflow Area = 1.738 ac, 33.25% Impervious, Inflow Depth > 3.67" for 10-yr event
Inflow = 0.9 cfs @ 12.80 hrs, Volume= 0.532 af
Outflow = 0.9 cfs @ 12.87 hrs, Volume= 0.532 af, Atten= 0%, Lag= 4.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Max. Velocity= 1.07 fps, Min. Travel Time= 5.1 min

Avg. Velocity= 0.43 fps, Avg. Travel Time= 12.8 min

Peak Storage= 263 cf @ 12.87 hrs

Average Depth at Peak Storage= 0.23' , Surface Width= 3.93'

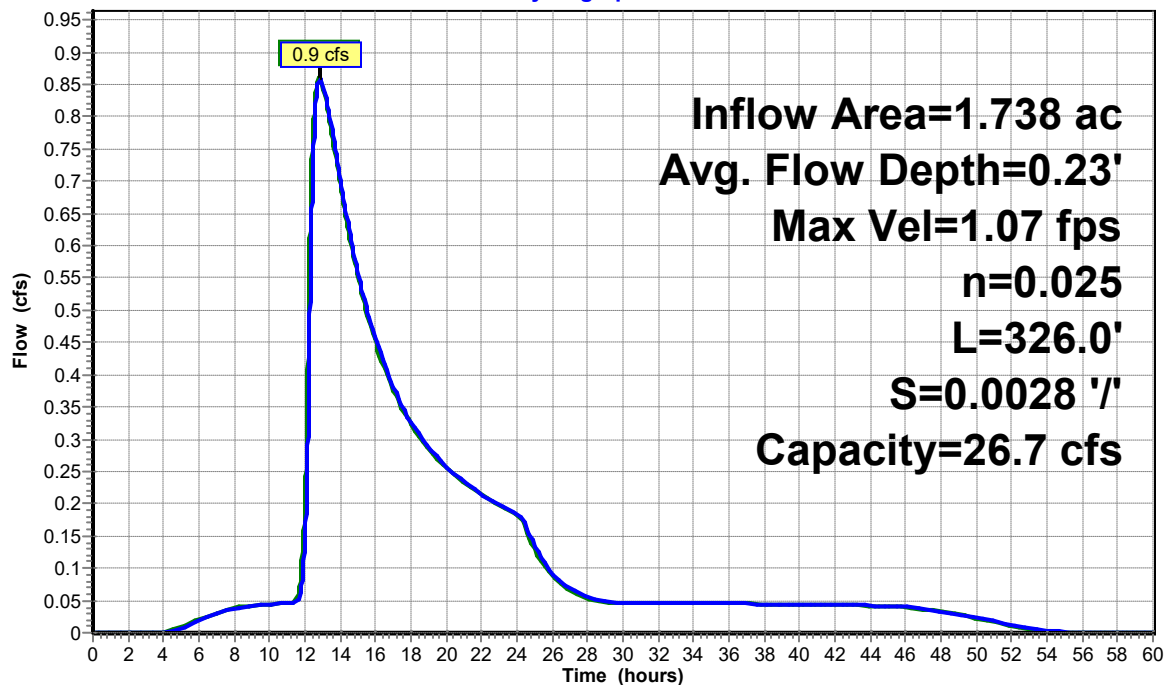
Bank-Full Depth= 1.50' Flow Area= 9.0 sf, Capacity= 26.7 cfs

3.00' x 1.50' deep channel, n= 0.025 Earth, clean & straight

Side Slope Z-value= 2.0 ' / ' Top Width= 9.00'

Length= 326.0' Slope= 0.0028 ' / '

Inlet Invert= 91.90', Outlet Invert= 91.00'

**Reach R3: R3****Hydrograph**

Summary for Reach R4: R4

Inflow Area = 2.277 ac, 41.20% Impervious, Inflow Depth > 3.75" for 10-yr event
Inflow = 1.1 cfs @ 12.86 hrs, Volume= 0.711 af
Outflow = 1.1 cfs @ 12.90 hrs, Volume= 0.711 af, Atten= 0%, Lag= 2.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Max. Velocity= 0.94 fps, Min. Travel Time= 3.0 min

Avg. Velocity = 0.39 fps, Avg. Travel Time= 7.3 min

Peak Storage= 202 cf @ 12.90 hrs

Average Depth at Peak Storage= 0.33' , Surface Width= 4.30'

Bank-Full Depth= 1.50' Flow Area= 9.0 sf, Capacity= 19.5 cfs

3.00' x 1.50' deep channel, $n = 0.025$ Earth, clean & straight

Side Slope Z-value= 2.0 ' Top Width= 9.00'

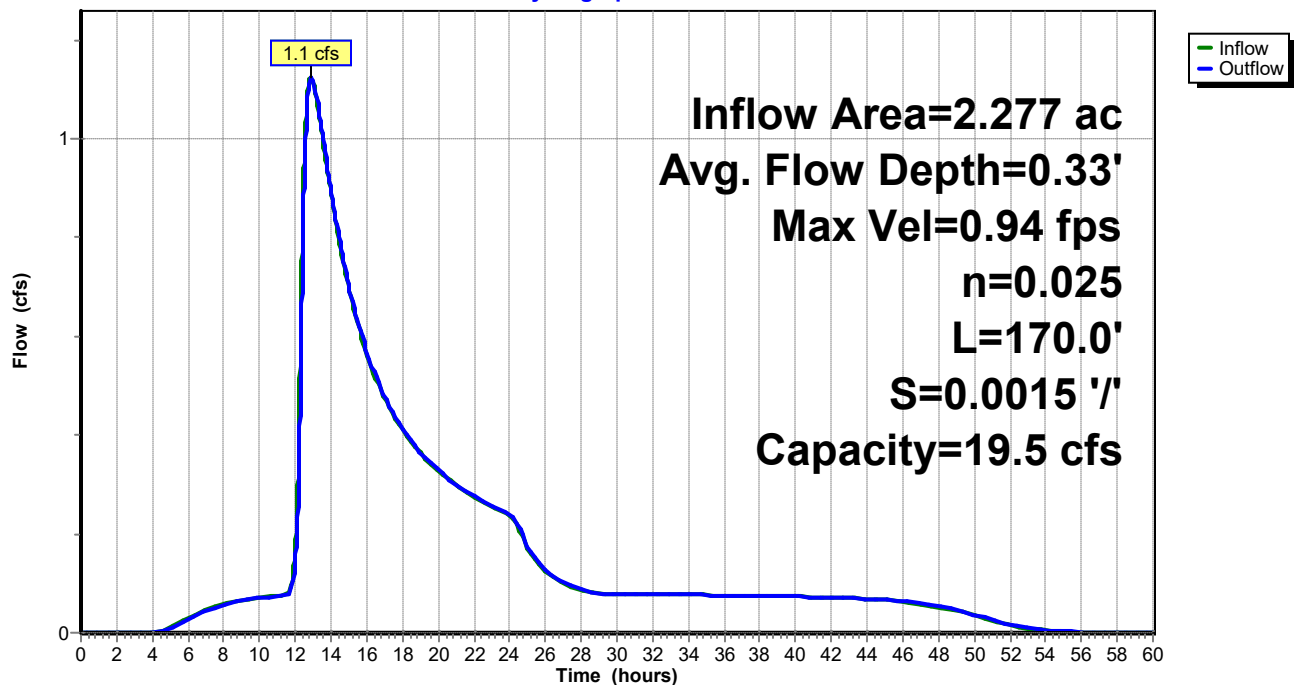
Length= 170.0' Slope= 0.0015 '/'

Inlet Invert= 91.00', Outlet Invert= 90.75'



Reach R4: R4

Hydrograph



Summary for Reach R5: R5

Inflow Area = 0.257 ac, 46.21% Impervious, Inflow Depth = 4.30" for 10-yr event
 Inflow = 0.3 cfs @ 12.14 hrs, Volume= 0.092 af
 Outflow = 0.3 cfs @ 12.23 hrs, Volume= 0.092 af, Atten= 1%, Lag= 5.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Max. Velocity= 0.64 fps, Min. Travel Time= 3.9 min

Avg. Velocity = 0.22 fps, Avg. Travel Time= 11.3 min

Peak Storage= 72 cf @ 12.23 hrs

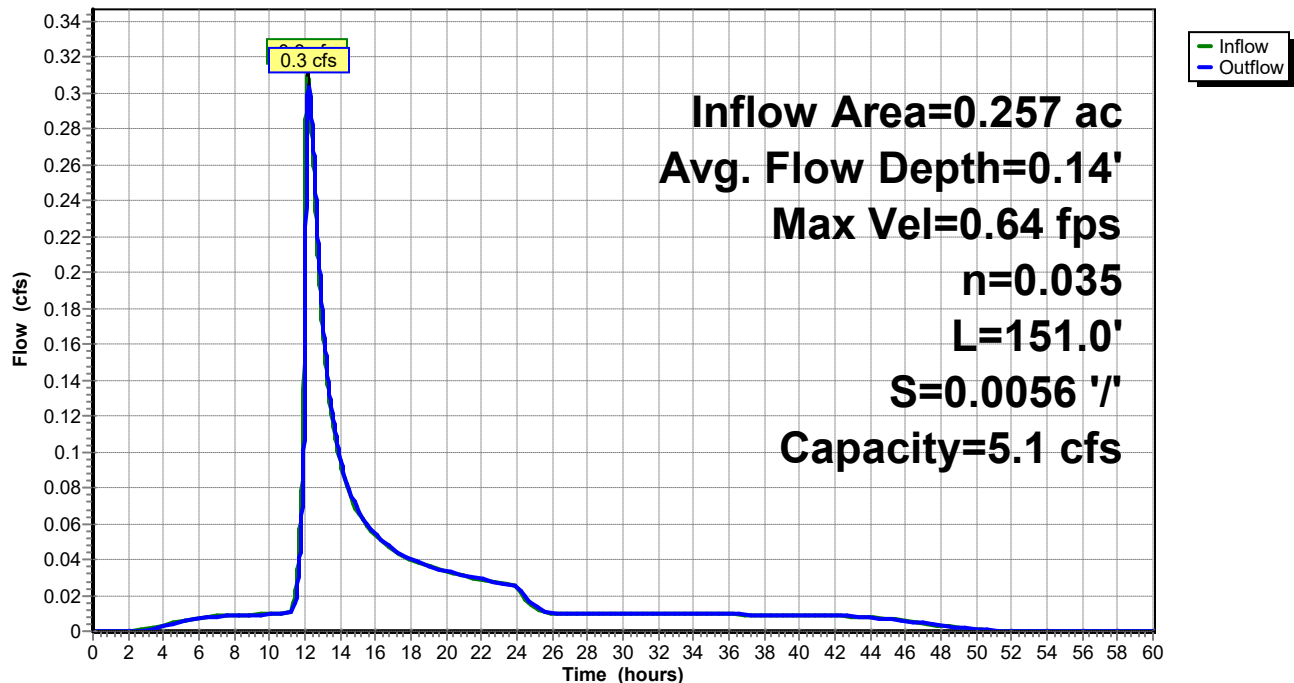
Average Depth at Peak Storage= 0.14', Surface Width= 5.22'

Bank-Full Depth= 0.50' Flow Area= 3.3 sf, Capacity= 5.1 cfs

10.00' x 0.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds

Length= 151.0' Slope= 0.0056 '/'

Inlet Invert= 92.75', Outlet Invert= 91.90'

**Reach R5: R5****Hydrograph**

Summary for Pond Bio1: Bio 1 w ISR

Inflow Area = 0.539 ac, 66.81% Impervious, Inflow Depth = 3.98" for 10-yr event
 Inflow = 1.8 cfs @ 12.03 hrs, Volume= 0.179 af
 Outflow = 0.3 cfs @ 12.66 hrs, Volume= 0.179 af, Atten= 85%, Lag= 37.3 min
 Primary = 0.3 cfs @ 12.66 hrs, Volume= 0.179 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Starting Elev= 93.10' Surf.Area= 686 sf Storage= 343 cf

Peak Elev= 95.68' @ 12.66 hrs Surf.Area= 3,982 sf Storage= 3,572 cf (3,229 cf above start)

Flood Elev= 96.25' Surf.Area= 6,799 sf Storage= 6,335 cf (5,992 cf above start)

Plug-Flow detention time= 601.0 min calculated for 0.171 af (96% of inflow)

Center-of-Mass det. time= 533.0 min (1,354.8 - 821.8)

Volume	Invert	Avail.Storage	Storage Description
#1	93.75'	1,065 cf	Sediment Forebay (Irregular) Listed below (Recalc)
#2	91.85'	5,270 cf	Bioretention Area 1 w/ ISR (Irregular) Listed below
		6,335 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.75	138	98.0	0	0	138
94.00	213	102.7	44	44	217
95.00	558	145.0	372	415	1,060
95.75	1,216	368.9	649	1,065	10,218

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.85	686	126.0	0.0	0	0	686
93.10	686	126.0	40.0	343	343	844
93.35	686	126.0	30.0	51	394	875
94.85	686	126.0	20.0	206	600	1,064
95.00	2,438	192.7	100.0	221	821	2,756
95.42	2,626	198.7	100.0	1,063	1,884	2,960
95.50	2,734	202.1	100.0	214	2,099	3,070
95.75	2,887	206.8	100.0	703	2,801	3,231
95.76	4,525	471.9	100.0	37	2,838	17,549
96.00	4,867	476.4	100.0	1,127	3,965	17,907
96.25	5,583	456.2	100.0	1,305	5,270	19,410

Device	Routing	Invert	Outlet Devices
#1	Primary	93.10'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 93.10' / 93.00' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	93.10'	0.9" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 2	92.18'	6.0" Round Culvert L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 92.18' / 92.18' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

24085 - Post

24085_GCB15 24-hr S1 10-yr Rainfall=5.44"

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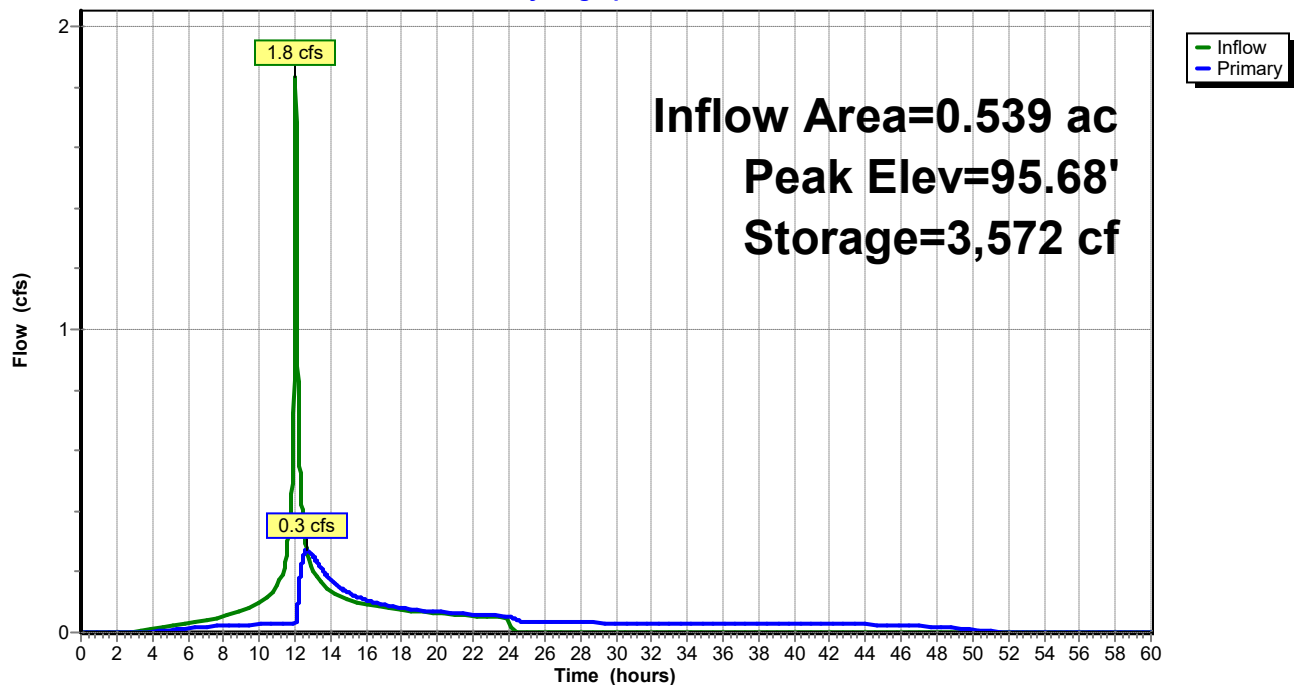
#4	Device 3	91.85'	10.000 in/hr Exfiltration over Surface area below 94.90' Phase-In= 0.01'
#5	Device 3	95.50'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Device 1	95.50'	12.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Device 1	96.00'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.3 cfs @ 12.66 hrs HW=95.68' TW=93.13' (Dynamic Tailwater)

- 1=Culvert (Passes 0.3 cfs of 5.4 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.0 cfs @ 7.67 fps)
- 3=Culvert (Passes 0.0 cfs of 1.2 cfs potential flow)
- 4=Exfiltration (Passes < 0.4 cfs potential flow)
- 5=Orifice/Grate (Passes < 0.8 cfs potential flow)
- 6=Orifice/Grate (Orifice Controls 0.2 cfs @ 1.35 fps)
- 7=Orifice/Grate (Controls 0.0 cfs)

Pond Bio1: Bio 1 w ISR

Hydrograph



Summary for Pond Bio2: Bio 2 w ISR

Inflow Area = 1.738 ac, 33.25% Impervious, Inflow Depth = 3.68" for 10-yr event
 Inflow = 3.8 cfs @ 12.15 hrs, Volume= 0.532 af
 Outflow = 0.9 cfs @ 12.80 hrs, Volume= 0.532 af, Atten= 78%, Lag= 38.8 min
 Primary = 0.9 cfs @ 12.80 hrs, Volume= 0.532 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Starting Elev= 92.85' Surf.Area= 1,140 sf Storage= 570 cf

Peak Elev= 95.55' @ 12.80 hrs Surf.Area= 14,356 sf Storage= 9,733 cf (9,163 cf above start)

Flood Elev= 96.25' Surf.Area= 17,945 sf Storage= 20,115 cf (19,545 cf above start)

Plug-Flow detention time= 394.3 min calculated for 0.519 af (98% of inflow)

Center-of-Mass det. time= 361.2 min (1,205.2 - 844.0)

Volume	Invert	Avail.Storage	Storage Description
#1	93.25'	724 cf	Sediment Forebay (Irregular) Listed below (Recalc)
#2	91.60'	19,390 cf	Bioretention Area 2 w/ ISR (Irregular) Listed below
		20,115 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.25	88	52.0	0	0	88
94.00	221	66.1	112	112	228
95.00	672	193.2	426	538	2,854
95.25	819	197.9	186	724	3,008

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.60	1,140	158.0	0.0	0	0	1,140
92.85	1,140	158.0	40.0	570	570	1,338
93.10	1,140	158.0	30.0	86	656	1,377
94.60	1,140	158.0	20.0	342	998	1,614
95.00	7,349	356.1	100.0	1,518	2,515	9,719
95.09	8,838	402.3	100.0	727	3,243	12,508
95.10	9,005	407.4	100.0	89	3,332	12,836
95.20	10,688	457.3	100.0	983	4,315	16,270
95.25	10,757	458.3	100.0	536	4,851	16,346
95.26	11,994	798.0	100.0	114	4,965	50,307
96.00	15,923	1,473.3	100.0	10,295	15,260	172,367
96.25	17,126	1,550.7	100.0	4,130	19,390	190,996

Device	Routing	Invert	Outlet Devices
#1	Primary	92.85'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 92.85' / 92.75' S= 0.0100 ' / Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	92.85'	1.1" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 2	91.93'	6.0" Round Culvert L= 16.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 91.93' / 91.93' S= 0.0000 ' / Cc= 0.900

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24085_GCB15 24-hr S1 10-yr Rainfall=5.44"

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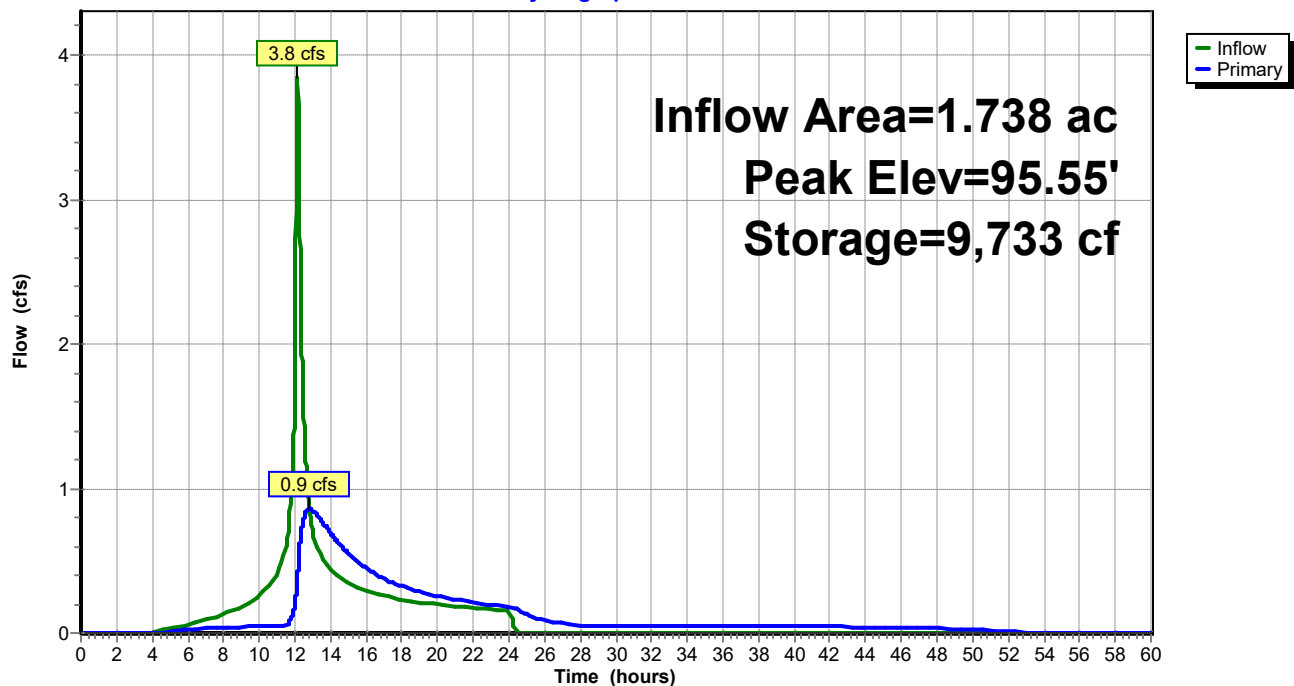
			n= 0.012, Flow Area= 0.20 sf
#4	Device 3	91.60'	10.000 in/hr Exfiltration over Surface area below 94.70' Phase-In= 0.01'
#5	Device 3	95.10'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Device 1	95.10'	10.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Device 1	96.00'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.9 cfs @ 12.80 hrs HW=95.55' TW=92.93' (Dynamic Tailwater)

- 1=Culvert (Passes 0.9 cfs of 5.6 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.1 cfs @ 7.79 fps)
- 3=Culvert (Passes 0.1 cfs of 1.2 cfs potential flow)
- 4=Exfiltration (Passes < 0.7 cfs potential flow)
- 5=Orifice/Grate (Passes < 2.5 cfs potential flow)
- 6=Orifice/Grate (Orifice Controls 0.8 cfs @ 2.15 fps)
- 7=Orifice/Grate (Controls 0.0 cfs)

Pond Bio2: Bio 2 w ISR

Hydrograph



Summary for Pond Bio3: Bio 3 w ISR

Inflow Area = 0.257 ac, 46.21% Impervious, Inflow Depth = 4.30" for 10-yr event
 Inflow = 1.1 cfs @ 12.00 hrs, Volume= 0.092 af
 Outflow = 0.3 cfs @ 12.14 hrs, Volume= 0.092 af, Atten= 71%, Lag= 8.8 min
 Primary = 0.3 cfs @ 12.14 hrs, Volume= 0.092 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Starting Elev= 92.85' Surf.Area= 280 sf Storage= 140 cf
 Peak Elev= 95.72' @ 12.14 hrs Surf.Area= 1,501 sf Storage= 1,548 cf (1,408 cf above start)
 Flood Elev= 96.25' Surf.Area= 2,545 sf Storage= 2,494 cf (2,354 cf above start)

Plug-Flow detention time= 376.5 min calculated for 0.089 af (97% of inflow)
 Center-of-Mass det. time= 328.6 min (1,131.2 - 802.6)

Volume	Invert	Avail.Storage	Storage Description
#1	93.75'	247 cf	Sediment Forebay (Irregular) Listed below (Recalc)
#2	91.60'	2,247 cf	Bioretention Area 3 w/ ISR (Irregular) Listed below
		2,494 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.75	21	22.0	0	0	21
95.75	274	61.0	247	247	292

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.60	280	76.0	0.0	0	0	280
92.85	280	76.0	40.0	140	140	375
93.10	280	76.0	30.0	21	161	394
94.60	280	76.0	20.0	84	245	508
94.85	900	120.0	100.0	140	385	1,195
95.16	1,014	125.8	100.0	296	682	1,314
95.20	1,030	126.6	100.0	41	723	1,331
95.75	1,247	137.0	100.0	625	1,348	1,561
95.76	1,563	182.5	100.0	14	1,362	2,718
96.00	1,696	187.1	100.0	391	1,753	2,860
96.25	2,271	194.9	100.0	494	2,247	3,102

Device	Routing	Invert	Outlet Devices
#1	Primary	92.85'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 92.85' / 92.75' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	92.85'	0.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 2	91.93'	6.0" Round Culvert L= 7.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 91.93' / 91.93' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#4	Device 3	91.60'	10.000 in/hr Exfiltration over Surface area below 94.70' Phase-In= 0.01'

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24085_GCB15 24-hr S1 10-yr Rainfall=5.44"

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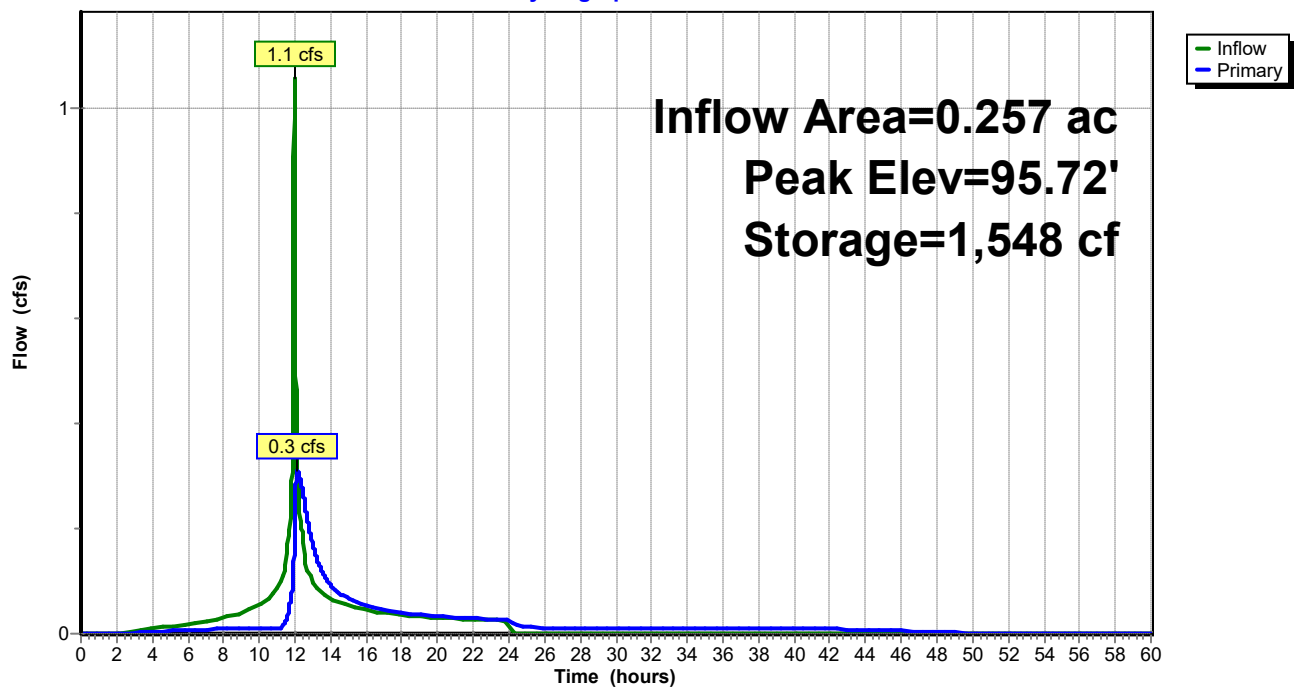
#5	Device 3	95.20'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Device 1	95.20'	3.0" W x 9.5" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Device 1	96.00'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.3 cfs @ 12.14 hrs HW=95.72' TW=92.88' (Dynamic Tailwater)

- 1=Culvert (Passes 0.3 cfs of 5.8 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.0 cfs @ 8.10 fps)
- 3=Culvert (Passes 0.0 cfs of 1.3 cfs potential flow)
- 4=Exfiltration (Passes < 0.1 cfs potential flow)
- 5=Orifice/Grate (Passes < 2.7 cfs potential flow)
- 6=Orifice/Grate (Orifice Controls 0.3 cfs @ 2.31 fps)
- 7=Orifice/Grate (Controls 0.0 cfs)

Pond Bio3: Bio 3 w ISR

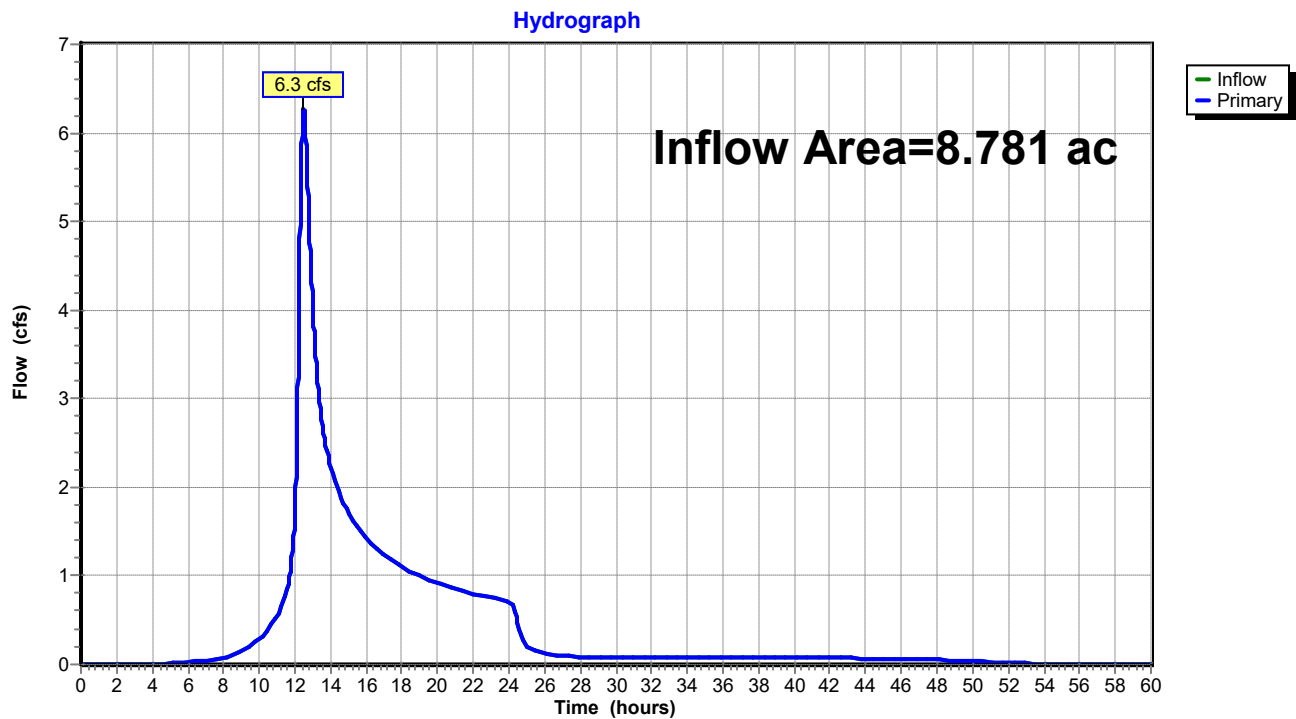
Hydrograph



Summary for Link A: A

Inflow Area = 8.781 ac, 10.68% Impervious, Inflow Depth = 2.60" for 10-yr event
Inflow = 6.3 cfs @ 12.50 hrs, Volume= 1.903 af
Primary = 6.3 cfs @ 12.50 hrs, Volume= 1.903 af, Atten= 0%, Lag= 0.0 min

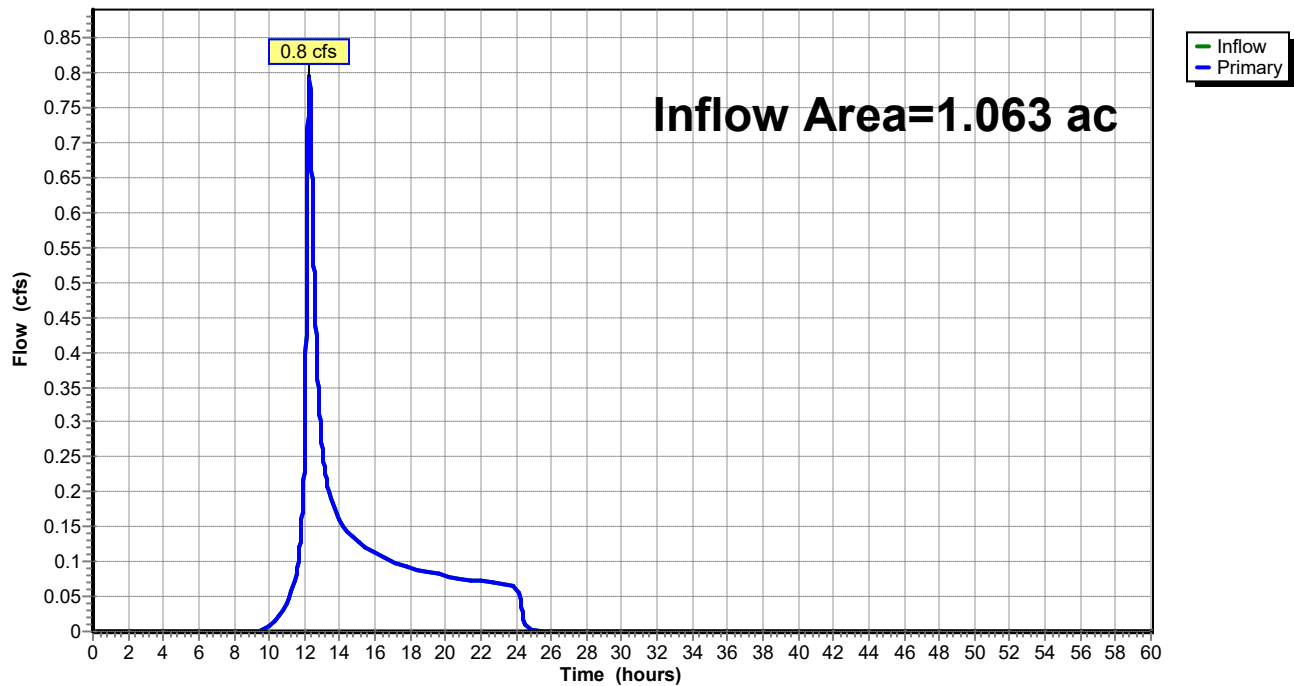
Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link A: A

Summary for Link B: B

Inflow Area = 1.063 ac, 0.00% Impervious, Inflow Depth = 1.64" for 10-yr event
Inflow = 0.8 cfs @ 12.26 hrs, Volume= 0.145 af
Primary = 0.8 cfs @ 12.26 hrs, Volume= 0.145 af, Atten= 0%, Lag= 0.0 min

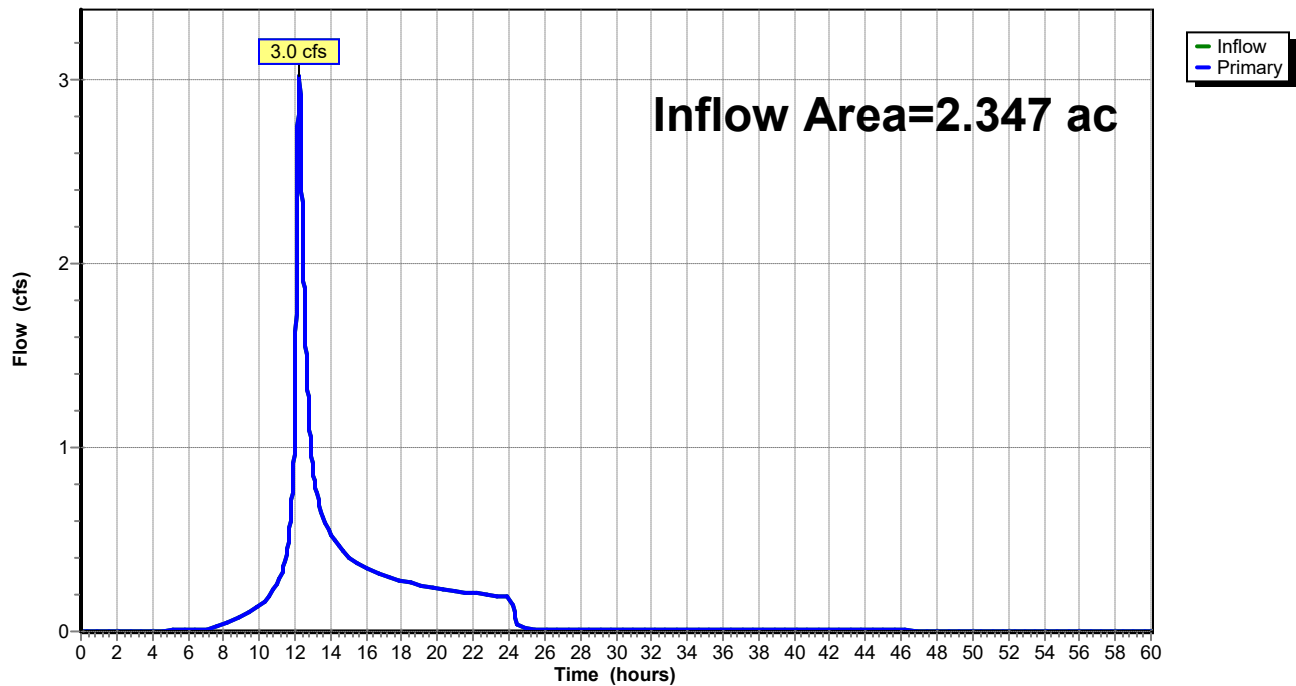
Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link B: B**Hydrograph**

Summary for Link C: C

Inflow Area = 2.347 ac, 5.06% Impervious, Inflow Depth = 2.73" for 10-yr event
Inflow = 3.0 cfs @ 12.24 hrs, Volume= 0.535 af
Primary = 3.0 cfs @ 12.24 hrs, Volume= 0.535 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link C: C**Hydrograph**

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NODE LISTING – 25-YR

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24085_GCB15 24-hr S1 25-yr Rainfall=6.88"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: 1	Runoff Area=23,492 sf 66.81% Impervious Runoff Depth=5.36" Flow Length=46' Slope=0.0350 '/' Tc=5.8 min CN=87 Runoff=2.3 cfs 0.241 af
Subcatchment 2: 2	Runoff Area=75,687 sf 33.25% Impervious Runoff Depth=5.03" Flow Length=468' Tc=14.5 min CN=84 Runoff=4.9 cfs 0.728 af
Subcatchment 3: 3	Runoff Area=283,339 sf 0.00% Impervious Runoff Depth=3.31" Flow Length=1,314' Tc=37.0 min CN=68 Runoff=7.9 cfs 1.796 af
Subcatchment 4: 4	Runoff Area=46,302 sf 0.00% Impervious Runoff Depth=2.62" Flow Length=268' Tc=22.2 min CN=61 Runoff=1.3 cfs 0.232 af
Subcatchment 5: 5	Runoff Area=11,195 sf 46.21% Impervious Runoff Depth=5.71" Flow Length=15' Slope=0.0600 '/' Tc=1.9 min CN=90 Runoff=1.3 cfs 0.122 af
Subcatchment 6: 6	Runoff Area=91,055 sf 0.00% Impervious Runoff Depth=3.73" Flow Length=402' Tc=20.7 min CN=72 Runoff=3.8 cfs 0.649 af
Reach R1: R1	Avg. Flow Depth=0.22' Max Vel=1.12 fps Inflow=0.6 cfs 0.241 af n=0.025 L=548.0' S=0.0036 '/' Capacity=11.6 cfs Outflow=0.6 cfs 0.241 af
Reach R2: R2	Avg. Flow Depth=0.23' Max Vel=2.10 fps Inflow=1.3 cfs 0.728 af n=0.025 L=68.0' S=0.0125 '/' Capacity=5.7 cfs Outflow=1.3 cfs 0.728 af
Reach R3: R3	Avg. Flow Depth=0.29' Max Vel=1.22 fps Inflow=1.3 cfs 0.728 af n=0.025 L=326.0' S=0.0028 '/' Capacity=26.7 cfs Outflow=1.3 cfs 0.728 af
Reach R4: R4	Avg. Flow Depth=0.43' Max Vel=1.11 fps Inflow=1.9 cfs 0.969 af n=0.025 L=170.0' S=0.0015 '/' Capacity=19.5 cfs Outflow=1.9 cfs 0.969 af
Reach R5: R5	Avg. Flow Depth=0.16' Max Vel=0.72 fps Inflow=0.4 cfs 0.122 af n=0.035 L=151.0' S=0.0056 '/' Capacity=5.1 cfs Outflow=0.4 cfs 0.122 af
Pond Bio1: Bio 1 w ISR	Peak Elev=95.83' Storage=4,231 cf Inflow=2.3 cfs 0.241 af Outflow=0.6 cfs 0.241 af
Pond Bio2: Bio 2 w ISR	Peak Elev=95.74' Storage=12,418 cf Inflow=4.9 cfs 0.728 af Outflow=1.3 cfs 0.728 af
Pond Bio3: Bio 3 w ISR	Peak Elev=95.86' Storage=1,770 cf Inflow=1.3 cfs 0.122 af Outflow=0.4 cfs 0.122 af
Link A: A	Inflow=9.7 cfs 2.765 af Primary=9.7 cfs 2.765 af
Link B: B	Inflow=1.3 cfs 0.232 af Primary=1.3 cfs 0.232 af

24085 - Post*24085_GCB15 24-hr S1 25-yr Rainfall=6.88"*

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Link C: C

Inflow=4.2 cfs 0.771 af

Primary=4.2 cfs 0.771 af

Total Runoff Area = 12.192 ac Runoff Volume = 3.768 af Average Runoff Depth = 3.71"
91.33% Pervious = 11.135 ac 8.67% Impervious = 1.057 ac

A – 2

NODE LISTING – 50-YR

24085 - Post

24085_GCB15 24-hr S1 50-yr Rainfall=8.23"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: 1	Runoff Area=23,492 sf 66.81% Impervious Runoff Depth=6.67" Flow Length=46' Slope=0.0350 '/' Tc=5.8 min CN=87 Runoff=2.6 cfs 0.300 af
Subcatchment 2: 2	Runoff Area=75,687 sf 33.25% Impervious Runoff Depth=6.32" Flow Length=468' Tc=14.5 min CN=84 Runoff=5.8 cfs 0.915 af
Subcatchment 3: 3	Runoff Area=283,339 sf 0.00% Impervious Runoff Depth=4.43" Flow Length=1,314' Tc=37.0 min CN=68 Runoff=10.3 cfs 2.401 af
Subcatchment 4: 4	Runoff Area=46,302 sf 0.00% Impervious Runoff Depth=3.62" Flow Length=268' Tc=22.2 min CN=61 Runoff=1.7 cfs 0.321 af
Subcatchment 5: 5	Runoff Area=11,195 sf 46.21% Impervious Runoff Depth=7.03" Flow Length=15' Slope=0.0600 '/' Tc=1.9 min CN=90 Runoff=1.5 cfs 0.151 af
Subcatchment 6: 6	Runoff Area=91,055 sf 0.00% Impervious Runoff Depth=4.90" Flow Length=402' Tc=20.7 min CN=72 Runoff=4.8 cfs 0.853 af
Reach R1: R1	Avg. Flow Depth=0.28' Max Vel=1.28 fps Inflow=1.0 cfs 0.300 af n=0.025 L=548.0' S=0.0036 '/' Capacity=11.6 cfs Outflow=1.0 cfs 0.300 af
Reach R2: R2	Avg. Flow Depth=0.25' Max Vel=2.22 fps Inflow=1.5 cfs 0.914 af n=0.025 L=68.0' S=0.0125 '/' Capacity=5.7 cfs Outflow=1.5 cfs 0.914 af
Reach R3: R3	Avg. Flow Depth=0.33' Max Vel=1.30 fps Inflow=1.5 cfs 0.914 af n=0.025 L=326.0' S=0.0028 '/' Capacity=26.7 cfs Outflow=1.5 cfs 0.914 af
Reach R4: R4	Avg. Flow Depth=0.50' Max Vel=1.20 fps Inflow=2.4 cfs 1.214 af n=0.025 L=170.0' S=0.0015 '/' Capacity=19.5 cfs Outflow=2.4 cfs 1.214 af
Reach R5: R5	Avg. Flow Depth=0.18' Max Vel=0.76 fps Inflow=0.5 cfs 0.151 af n=0.035 L=151.0' S=0.0056 '/' Capacity=5.1 cfs Outflow=0.5 cfs 0.151 af
Pond Bio1: Bio 1 w ISR	Peak Elev=95.95' Storage=4,792 cf Inflow=2.6 cfs 0.300 af Outflow=1.0 cfs 0.300 af
Pond Bio2: Bio 2 w ISR	Peak Elev=95.91' Storage=14,772 cf Inflow=5.8 cfs 0.915 af Outflow=1.5 cfs 0.914 af
Pond Bio3: Bio 3 w ISR	Peak Elev=95.95' Storage=1,917 cf Inflow=1.5 cfs 0.151 af Outflow=0.5 cfs 0.151 af
Link A: A	Inflow=12.7 cfs 3.615 af Primary=12.7 cfs 3.615 af
Link B: B	Inflow=1.7 cfs 0.321 af Primary=1.7 cfs 0.321 af

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Link C: C

Inflow=5.3 cfs 1.004 af

Primary=5.3 cfs 1.004 af

Total Runoff Area = 12.192 ac Runoff Volume = 4.940 af Average Runoff Depth = 4.86"
91.33% Pervious = 11.135 ac 8.67% Impervious = 1.057 ac

APPENDIX B

DESIGN

B – 1

**STORMWATER BEST MANAGEMENT
PRACTICES**



Enter the node name in the drainage analysis if applicable.

1. Volume stored above the wetland soil and below the high flow by-pass.

Designer's Notes: HSG "D" soils utilized in areas of lined ISR and forebay.

[illegible]

Summary for Pond Bio1: Bio 1 w ISR

Inflow Area = 0.539 ac, 66.81% Impervious, Inflow Depth = 6.67" for 50-yr event
 Inflow = 2.6 cfs @ 12.03 hrs, Volume= 0.300 af
 Outflow = 1.0 cfs @ 12.21 hrs, Volume= 0.300 af, Atten= 62%, Lag= 10.8 min
 Primary = 1.0 cfs @ 12.21 hrs, Volume= 0.300 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Starting Elev= 93.10' Surf.Area= 686 sf Storage= 343 cf

Peak Elev= 95.95' @ 12.21 hrs Surf.Area= 6,011 sf Storage= 4,792 cf (4,449 cf above start)

Flood Elev= 96.25' Surf.Area= 6,799 sf Storage= 6,335 cf (5,992 cf above start)

Plug-Flow detention time= 399.5 min calculated for 0.292 af (97% of inflow)

Center-of-Mass det. time= 361.0 min (1,163.0 - 802.0)

Volume	Invert	Avail.Storage	Storage Description
#1	93.75'	1,065 cf	Sediment Forebay (Irregular) Listed below (Recalc)
#2	91.85'	5,270 cf	Bioretention Area 1 w/ ISR (Irregular) Listed below
		6,335 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.75	138	98.0	0	0	138
94.00	213	102.7	44	44	217
95.00	558	145.0	372	415	1,060
95.75	1,216	368.9	649	1,065	10,218

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.85	686	126.0	0.0	0	0	686
93.10	686	126.0	40.0	343	343	844
93.35	686	126.0	30.0	51	394	875
94.85	686	126.0	20.0	206	600	1,064
95.00	2,438	192.7	100.0	221	821	2,756
95.42	2,626	198.7	100.0	1,063	1,884	2,960
95.50	2,734	202.1	100.0	214	2,099	3,070
95.75	2,887	206.8	100.0	703	2,801	3,231
95.76	4,525	471.9	100.0	37	2,838	17,549
96.00	4,867	476.4	100.0	1,127	3,965	17,907
96.25	5,583	456.2	100.0	1,305	5,270	19,410

Device	Routing	Invert	Outlet Devices
#1	Primary	93.10'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 93.10' / 93.00' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	93.10'	0.9" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 2	92.18'	6.0" Round Culvert L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 92.18' / 92.18' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

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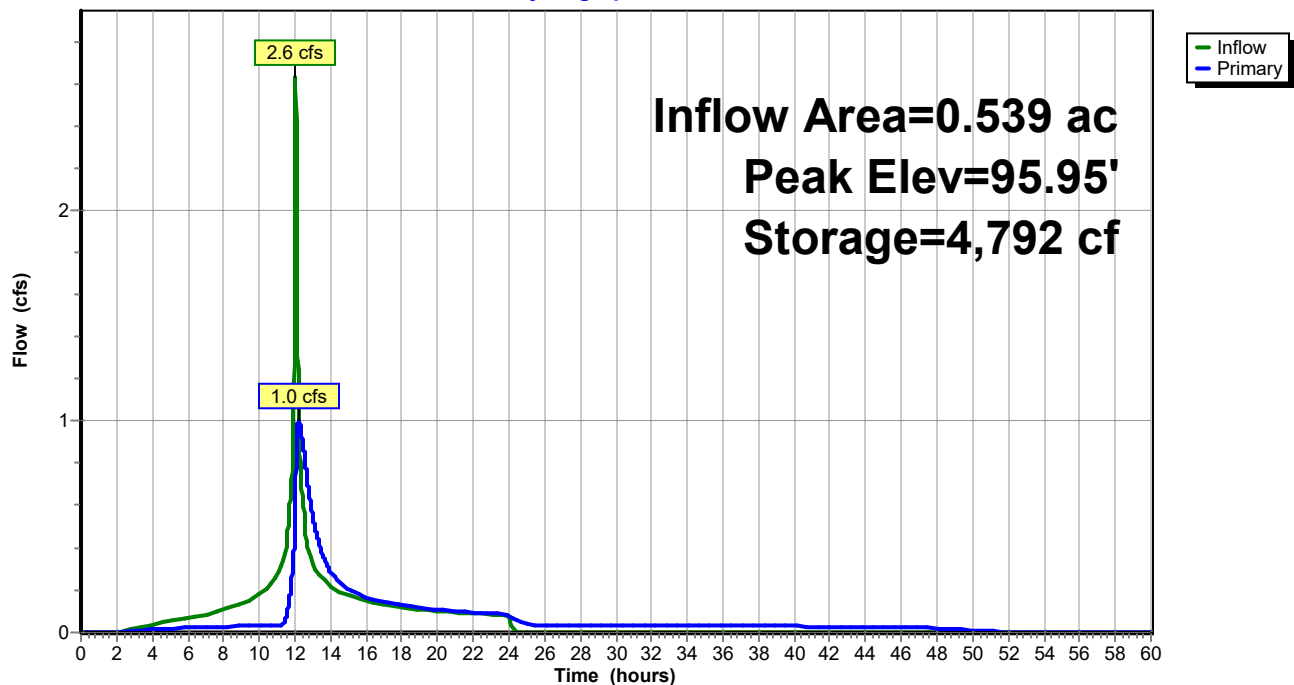
#4	Device 3	91.85'	10.000 in/hr Exfiltration over Surface area below 94.90' Phase-In= 0.01'
#5	Device 3	95.50'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Device 1	95.50'	12.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Device 1	96.00'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.0 cfs @ 12.21 hrs HW=95.95' TW=93.26' (Dynamic Tailwater)

- 1=Culvert (Passes 1.0 cfs of 5.8 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.0 cfs @ 7.89 fps)
- 3=Culvert (Passes 0.0 cfs of 1.2 cfs potential flow)
- 4=Exfiltration (Passes < 0.4 cfs potential flow)
- 5=Orifice/Grate (Passes < 2.5 cfs potential flow)
- 6=Orifice/Grate (Orifice Controls 1.0 cfs @ 2.15 fps)
- 7=Orifice/Grate (Controls 0.0 cfs)

Pond Bio1: Bio 1 w ISR

Hydrograph



Stage-Discharge for Pond Bio1: Bio 1 w ISR

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
91.85	0.0	94.45	0.0
91.90	0.0	94.50	0.0
91.95	0.0	94.55	0.0
92.00	0.0	94.60	0.0
92.05	0.0	94.65	0.0
92.10	0.0	94.70	0.0
92.15	0.0	94.75	0.0
92.20	0.0	94.80	0.0
92.25	0.0	94.85	0.0
92.30	0.0	94.90	0.0
92.35	0.0	94.95	0.0
92.40	0.0	95.00	0.0
92.45	0.0	95.05	0.0
92.50	0.0	95.10	0.0
92.55	0.0	95.15	0.0
92.60	0.0	95.20	0.0
92.65	0.0	95.25	0.0
92.70	0.0	95.30	0.0
92.75	0.0	95.35	0.0
92.80	0.0	95.40	0.0
92.85	0.0	95.45	0.0
92.90	0.0	95.50	0.0
92.95	0.0	95.55	0.1
93.00	0.0	95.60	0.1
93.05	0.0	95.65	0.2
93.10	0.0	95.70	0.3
93.15	0.0	95.75	0.4
93.20	0.0	95.80	0.6
93.25	0.0	95.85	0.7
93.30	0.0	95.90	0.8
93.35	0.0	95.95	1.0
93.40	0.0	96.00	1.2
93.45	0.0	96.05	1.9
93.50	0.0	96.10	3.1
93.55	0.0	96.15	4.6
93.60	0.0	96.20	6.1
93.65	0.0	96.25	6.2
93.70	0.0		
93.75	0.0		
93.80	0.0		
93.85	0.0		
93.90	0.0		
93.95	0.0		
94.00	0.0		
94.05	0.0		
94.10	0.0		
94.15	0.0		
94.20	0.0		
94.25	0.0		
94.30	0.0		
94.35	0.0		
94.40	0.0		

Stage-Area-Storage for Pond Bio1: Bio 1 w ISR

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
91.85	686	0	94.45	1,034	714
91.90	686	14	94.50	1,051	739
91.95	686	27	94.55	1,069	764
92.00	686	41	94.60	1,086	791
92.05	686	55	94.65	1,105	818
92.10	686	69	94.70	1,123	846
92.15	686	82	94.75	1,142	875
92.20	686	96	94.80	1,162	906
92.25	686	110	94.85	1,182	937
92.30	686	123	94.90	1,786	1,036
92.35	686	137	94.95	2,391	1,136
92.40	686	151	95.00	2,996	1,237
92.45	686	165	95.05	3,054	1,392
92.50	686	178	95.10	3,114	1,549
92.55	686	192	95.15	3,174	1,708
92.60	686	206	95.20	3,236	1,869
92.65	686	220	95.25	3,299	2,032
92.70	686	233	95.30	3,363	2,197
92.75	686	247	95.35	3,428	2,364
92.80	686	261	95.40	3,494	2,534
92.85	686	274	95.45	3,589	2,710
92.90	686	288	95.50	3,703	2,891
92.95	686	302	95.55	3,780	3,081
93.00	686	316	95.60	3,859	3,274
93.05	686	329	95.65	3,939	3,469
93.10	686	343	95.70	4,021	3,666
93.15	686	353	95.75	4,103	3,866
93.20	686	364	95.80	5,798	4,091
93.25	686	374	95.85	5,869	4,325
93.30	686	384	95.90	5,940	4,560
93.35	686	394	95.95	6,012	4,795
93.40	686	401	96.00	6,083	5,030
93.45	686	408	96.05	6,226	5,291
93.50	686	415	96.10	6,369	5,552
93.55	686	422	96.15	6,513	5,813
93.60	686	429	96.20	6,656	6,074
93.65	686	436	96.25	6,799	6,335
93.70	686	442			
93.75	824	449			
93.80	838	463			
93.85	852	478			
93.90	867	494			
93.95	883	510			
94.00	899	527			
94.05	912	545			
94.10	926	564			
94.15	940	583			
94.20	955	603			
94.25	970	623			
94.30	985	645			
94.35	1,001	667			
94.40	1,017	690			

Summary for Pond Bio2: Bio 2 w ISR

Inflow Area = 1.738 ac, 33.25% Impervious, Inflow Depth = 6.32" for 50-yr event
 Inflow = 5.8 cfs @ 12.15 hrs, Volume= 0.915 af
 Outflow = 1.5 cfs @ 12.72 hrs, Volume= 0.914 af, Atten= 73%, Lag= 34.6 min
 Primary = 1.5 cfs @ 12.72 hrs, Volume= 0.914 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Starting Elev= 92.85' Surf.Area= 1,140 sf Storage= 570 cf

Peak Elev= 95.91' @ 12.72 hrs Surf.Area= 16,279 sf Storage= 14,772 cf (14,202 cf above start)

Flood Elev= 96.25' Surf.Area= 17,945 sf Storage= 20,115 cf (19,545 cf above start)

Plug-Flow detention time= 295.4 min calculated for 0.901 af (99% of inflow)

Center-of-Mass det. time= 275.6 min (1,098.1 - 822.5)

Volume	Invert	Avail.Storage	Storage Description
#1	93.25'	724 cf	Sediment Forebay (Irregular) Listed below (Recalc)
#2	91.60'	19,390 cf	Bioretention Area 2 w/ ISR (Irregular) Listed below
		20,115 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.25	88	52.0	0	0	88
94.00	221	66.1	112	112	228
95.00	672	193.2	426	538	2,854
95.25	819	197.9	186	724	3,008

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.60	1,140	158.0	0.0	0	0	1,140
92.85	1,140	158.0	40.0	570	570	1,338
93.10	1,140	158.0	30.0	86	656	1,377
94.60	1,140	158.0	20.0	342	998	1,614
95.00	7,349	356.1	100.0	1,518	2,515	9,719
95.09	8,838	402.3	100.0	727	3,243	12,508
95.10	9,005	407.4	100.0	89	3,332	12,836
95.20	10,688	457.3	100.0	983	4,315	16,270
95.25	10,757	458.3	100.0	536	4,851	16,346
95.26	11,994	798.0	100.0	114	4,965	50,307
96.00	15,923	1,473.3	100.0	10,295	15,260	172,367
96.25	17,126	1,550.7	100.0	4,130	19,390	190,996

Device	Routing	Invert	Outlet Devices
#1	Primary	92.85'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 92.85' / 92.75' S= 0.0100 ' / Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	92.85'	1.1" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 2	91.93'	6.0" Round Culvert L= 16.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 91.93' / 91.93' S= 0.0000 ' / Cc= 0.900

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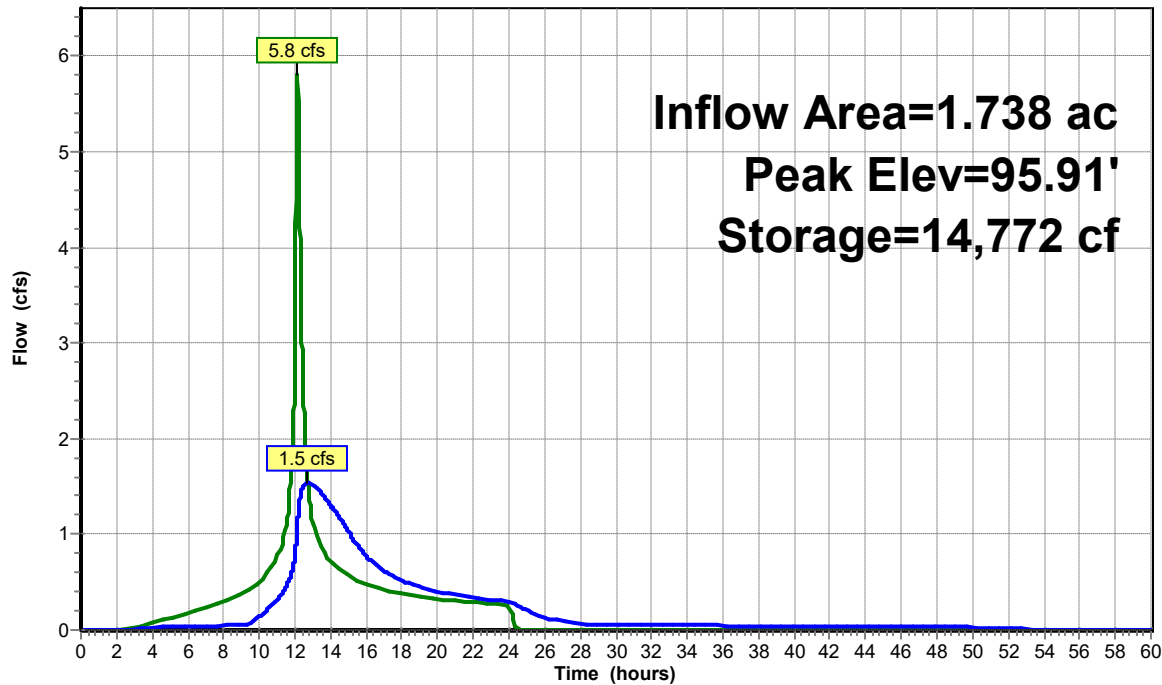
			n= 0.012, Flow Area= 0.20 sf
#4	Device 3	91.60'	10.000 in/hr Exfiltration over Surface area below 94.70' Phase-In= 0.01'
#5	Device 3	95.10'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Device 1	95.10'	10.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Device 1	96.00'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.5 cfs @ 12.72 hrs HW=95.91' TW=93.00' (Dynamic Tailwater)

- 1=Culvert (Passes 1.5 cfs of 6.1 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.1 cfs @ 8.21 fps)
- 3=Culvert (Passes 0.1 cfs of 1.3 cfs potential flow)
- 4=Exfiltration (Passes < 0.7 cfs potential flow)
- 5=Orifice/Grate (Passes < 3.4 cfs potential flow)
- 6=Orifice/Grate (Orifice Controls 1.5 cfs @ 3.58 fps)
- 7=Orifice/Grate (Controls 0.0 cfs)

Pond Bio2: Bio 2 w ISR

Hydrograph



Stage-Discharge for Pond Bio2: Bio 2 w ISR

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
91.60	0.0	94.20	0.0
91.65	0.0	94.25	0.0
91.70	0.0	94.30	0.0
91.75	0.0	94.35	0.0
91.80	0.0	94.40	0.0
91.85	0.0	94.45	0.0
91.90	0.0	94.50	0.0
91.95	0.0	94.55	0.0
92.00	0.0	94.60	0.0
92.05	0.0	94.65	0.0
92.10	0.0	94.70	0.0
92.15	0.0	94.75	0.0
92.20	0.0	94.80	0.0
92.25	0.0	94.85	0.0
92.30	0.0	94.90	0.0
92.35	0.0	94.95	0.0
92.40	0.0	95.00	0.0
92.45	0.0	95.05	0.0
92.50	0.0	95.10	0.0
92.55	0.0	95.15	0.1
92.60	0.0	95.20	0.1
92.65	0.0	95.25	0.2
92.70	0.0	95.30	0.3
92.75	0.0	95.35	0.4
92.80	0.0	95.40	0.5
92.85	0.0	95.45	0.6
92.90	0.0	95.50	0.7
92.95	0.0	95.55	0.9
93.00	0.0	95.60	1.0
93.05	0.0	95.65	1.1
93.10	0.0	95.70	1.2
93.15	0.0	95.75	1.3
93.20	0.0	95.80	1.4
93.25	0.0	95.85	1.5
93.30	0.0	95.90	1.5
93.35	0.0	95.95	1.6
93.40	0.0	96.00	1.7
93.45	0.0	96.05	2.3
93.50	0.0	96.10	3.4
93.55	0.0	96.15	4.9
93.60	0.0	96.20	6.4
93.65	0.0	96.25	6.4
93.70	0.0		
93.75	0.0		
93.80	0.0		
93.85	0.0		
93.90	0.0		
93.95	0.0		
94.00	0.0		
94.05	0.0		
94.10	0.0		
94.15	0.0		

Stage-Area-Storage for Pond Bio2: Bio 2 w ISR

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
91.60	1,140	0	94.20	1,432	1,070
91.65	1,140	23	94.25	1,451	1,096
91.70	1,140	46	94.30	1,471	1,123
91.75	1,140	68	94.35	1,491	1,152
91.80	1,140	91	94.40	1,512	1,181
91.85	1,140	114	94.45	1,534	1,212
91.90	1,140	137	94.50	1,556	1,244
91.95	1,140	160	94.55	1,579	1,276
92.00	1,140	182	94.60	1,602	1,310
92.05	1,140	205	94.65	2,402	1,524
92.10	1,140	228	94.70	3,203	1,738
92.15	1,140	251	94.75	4,005	1,954
92.20	1,140	274	94.80	4,807	2,171
92.25	1,140	296	94.85	5,609	2,390
92.30	1,140	319	94.90	6,413	2,610
92.35	1,140	342	94.95	7,217	2,831
92.40	1,140	365	95.00	8,021	3,054
92.45	1,140	388	95.05	8,876	3,492
92.50	1,140	410	95.10	9,734	3,940
92.55	1,140	433	95.15	10,605	4,469
92.60	1,140	456	95.20	11,476	4,999
92.65	1,140	479	95.25	11,576	5,576
92.70	1,140	502	95.30	13,025	6,246
92.75	1,140	524	95.35	13,291	6,942
92.80	1,140	547	95.40	13,556	7,637
92.85	1,140	570	95.45	13,822	8,333
92.90	1,140	587	95.50	14,087	9,028
92.95	1,140	604	95.55	14,353	9,724
93.00	1,140	621	95.60	14,618	10,420
93.05	1,140	638	95.65	14,884	11,115
93.10	1,140	656	95.70	15,149	11,811
93.15	1,140	667	95.75	15,415	12,506
93.20	1,140	678	95.80	15,680	13,202
93.25	1,228	690	95.85	15,946	13,898
93.30	1,235	706	95.90	16,211	14,593
93.35	1,242	722	95.95	16,477	15,289
93.40	1,250	739	96.00	16,742	15,984
93.45	1,258	756	96.05	16,983	16,811
93.50	1,266	773	96.10	17,223	17,637
93.55	1,274	791	96.15	17,464	18,463
93.60	1,283	809	96.20	17,704	19,289
93.65	1,291	828	96.25	17,945	20,115
93.70	1,301	847			
93.75	1,310	867			
93.80	1,320	887			
93.85	1,330	908			
93.90	1,340	929			
93.95	1,350	951			
94.00	1,361	973			
94.05	1,378	996			
94.10	1,395	1,019			
94.15	1,413	1,044			



Enter the node name in the drainage analysis if applicable.

1. Volume stored above the wetland soil and below the high flow by-pass.

Designer's Notes: HSG "D" soils utilized in areas of lined ISR and forebay.

[illegible]

Summary for Pond Bio3: Bio 3 w ISR

Inflow Area = 0.257 ac, 46.21% Impervious, Inflow Depth = 7.03" for 50-yr event
 Inflow = 1.5 cfs @ 12.00 hrs, Volume= 0.151 af
 Outflow = 0.5 cfs @ 12.13 hrs, Volume= 0.151 af, Atten= 64%, Lag= 7.7 min
 Primary = 0.5 cfs @ 12.13 hrs, Volume= 0.151 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Starting Elev= 92.85' Surf.Area= 280 sf Storage= 140 cf

Peak Elev= 95.95' @ 12.13 hrs Surf.Area= 1,942 sf Storage= 1,917 cf (1,777 cf above start)

Flood Elev= 96.25' Surf.Area= 2,545 sf Storage= 2,494 cf (2,354 cf above start)

Plug-Flow detention time= 266.2 min calculated for 0.147 af (98% of inflow)

Center-of-Mass det. time= 236.9 min (1,021.7 - 784.8)

Volume	Invert	Avail.Storage	Storage Description
#1	93.75'	247 cf	Sediment Forebay (Irregular) Listed below (Recalc)
#2	91.60'	2,247 cf	Bioretention Area 3 w/ ISR (Irregular) Listed below
		2,494 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.75	21	22.0	0	0	21
95.75	274	61.0	247	247	292

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.60	280	76.0	0.0	0	0	280
92.85	280	76.0	40.0	140	140	375
93.10	280	76.0	30.0	21	161	394
94.60	280	76.0	20.0	84	245	508
94.85	900	120.0	100.0	140	385	1,195
95.16	1,014	125.8	100.0	296	682	1,314
95.20	1,030	126.6	100.0	41	723	1,331
95.75	1,247	137.0	100.0	625	1,348	1,561
95.76	1,563	182.5	100.0	14	1,362	2,718
96.00	1,696	187.1	100.0	391	1,753	2,860
96.25	2,271	194.9	100.0	494	2,247	3,102

Device	Routing	Invert	Outlet Devices
#1	Primary	92.85'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 92.85' / 92.75' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	92.85'	0.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 2	91.93'	6.0" Round Culvert L= 7.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 91.93' / 91.93' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#4	Device 3	91.60'	10.000 in/hr Exfiltration over Surface area below 94.70' Phase-In= 0.01'

24085 - Post

24085_GCB15 24-hr S1 50-yr Rainfall=8.23"

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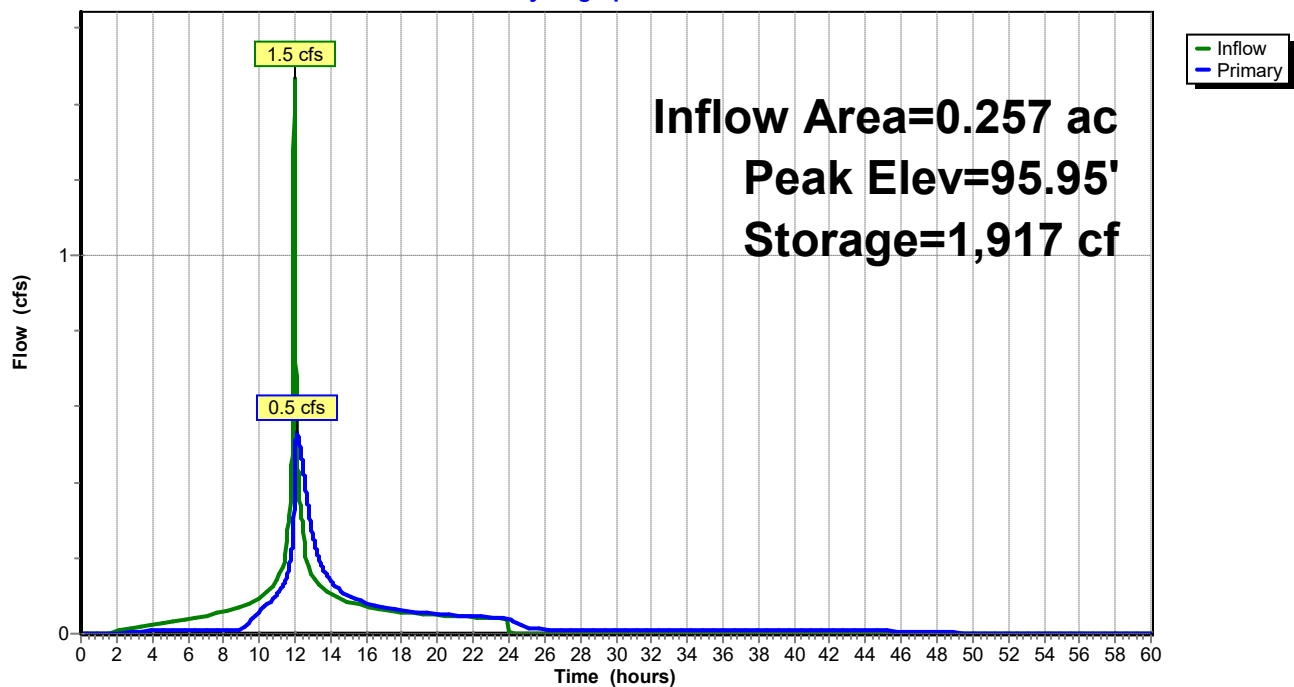
#5	Device 3	95.20'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Device 1	95.20'	3.0" W x 9.5" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Device 1	96.00'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.5 cfs @ 12.13 hrs HW=95.95' TW=92.92' (Dynamic Tailwater)

- 1=Culvert (Passes 0.5 cfs of 6.1 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.0 cfs @ 8.38 fps)
- 3=Culvert (Passes 0.0 cfs of 1.3 cfs potential flow)
- 4=Exfiltration (Passes < 0.1 cfs potential flow)
- 5=Orifice/Grate (Passes < 3.3 cfs potential flow)
- 6=Orifice/Grate (Orifice Controls 0.5 cfs @ 2.78 fps)
- 7=Orifice/Grate (Controls 0.0 cfs)

Pond Bio3: Bio 3 w ISR

Hydrograph



Stage-Discharge for Pond Bio3: Bio 3 w ISR

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
91.60	0.0	94.20	0.0
91.65	0.0	94.25	0.0
91.70	0.0	94.30	0.0
91.75	0.0	94.35	0.0
91.80	0.0	94.40	0.0
91.85	0.0	94.45	0.0
91.90	0.0	94.50	0.0
91.95	0.0	94.55	0.0
92.00	0.0	94.60	0.0
92.05	0.0	94.65	0.0
92.10	0.0	94.70	0.0
92.15	0.0	94.75	0.0
92.20	0.0	94.80	0.0
92.25	0.0	94.85	0.0
92.30	0.0	94.90	0.0
92.35	0.0	94.95	0.0
92.40	0.0	95.00	0.0
92.45	0.0	95.05	0.0
92.50	0.0	95.10	0.0
92.55	0.0	95.15	0.0
92.60	0.0	95.20	0.0
92.65	0.0	95.25	0.0
92.70	0.0	95.30	0.0
92.75	0.0	95.35	0.1
92.80	0.0	95.40	0.1
92.85	0.0	95.45	0.1
92.90	0.0	95.50	0.1
92.95	0.0	95.55	0.2
93.00	0.0	95.60	0.2
93.05	0.0	95.65	0.3
93.10	0.0	95.70	0.3
93.15	0.0	95.75	0.3
93.20	0.0	95.80	0.4
93.25	0.0	95.85	0.4
93.30	0.0	95.90	0.5
93.35	0.0	95.95	0.5
93.40	0.0	96.00	0.6
93.45	0.0	96.05	1.2
93.50	0.0	96.10	2.3
93.55	0.0	96.15	3.7
93.60	0.0	96.20	5.4
93.65	0.0	96.25	6.4
93.70	0.0		
93.75	0.0		
93.80	0.0		
93.85	0.0		
93.90	0.0		
93.95	0.0		
94.00	0.0		
94.05	0.0		
94.10	0.0		
94.15	0.0		

Stage-Area-Storage for Pond Bio3: Bio 3 w ISR

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
91.60	280	0	94.20	333	239
91.65	280	6	94.25	337	244
91.70	280	11	94.30	342	250
91.75	280	17	94.35	347	256
91.80	280	22	94.40	352	262
91.85	280	28	94.45	357	269
91.90	280	34	94.50	362	276
91.95	280	39	94.55	368	283
92.00	280	45	94.60	374	290
92.05	280	50	94.65	503	323
92.10	280	56	94.70	633	356
92.15	280	62	94.75	764	389
92.20	280	67	94.80	894	423
92.25	280	73	94.85	1,025	457
92.30	280	78	94.90	1,050	512
92.35	280	84	94.95	1,075	566
92.40	280	90	95.00	1,101	621
92.45	280	95	95.05	1,126	676
92.50	280	101	95.10	1,152	732
92.55	280	106	95.15	1,178	788
92.60	280	112	95.20	1,206	847
92.65	280	118	95.25	1,234	913
92.70	280	123	95.30	1,262	979
92.75	280	129	95.35	1,290	1,046
92.80	280	134	95.40	1,318	1,113
92.85	280	140	95.45	1,346	1,180
92.90	280	144	95.50	1,375	1,248
92.95	280	148	95.55	1,404	1,317
93.00	280	153	95.60	1,433	1,386
93.05	280	157	95.65	1,462	1,455
93.10	280	161	95.70	1,491	1,525
93.15	280	164	95.75	1,521	1,595
93.20	280	167	95.80	1,859	1,674
93.25	280	169	95.85	1,887	1,756
93.30	280	172	95.90	1,915	1,837
93.35	280	175	95.95	1,942	1,919
93.40	280	178	96.00	1,970	2,000
93.45	280	181	96.05	2,085	2,099
93.50	280	183	96.10	2,200	2,198
93.55	280	186	96.15	2,315	2,296
93.60	280	189	96.20	2,430	2,395
93.65	280	192	96.25	2,545	2,494
93.70	280	195			
93.75	301	197			
93.80	304	201			
93.85	307	205			
93.90	310	210			
93.95	313	214			
94.00	317	219			
94.05	321	223			
94.10	325	228			
94.15	329	233			

B – 2

POLLUTANT REMOVAL

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

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OUTLET PROTECTION

OUTLET PROTECTION DESIGN CALCS **DEFINED CHANNEL**

Job #: 24085
Date: 8/6/2024
Structure: Outlet from
BioPond 1

Variables:

Q= Discharge from the pipe (cfs)
D₀= Diameter of outlet pipe (ft)
D= Width of channel (ft)
z= Channel side slope (H:V ft/ft)
Tw= Tailwater depth above the invert of the pipe (ft)
La= Apron length
w₁= Apron width at pipe outlet
w₂= Apron width at downstream end of apron

Input: Outlet elev: 93
Tailwater elev: 93.26
Tw: 0.26
Q: 1
D₀: 1.00
D: 2
z: 3

Apron Dimensions

w ₁ =	8	(ft)
w ₂ =	2	(ft)
La=	9	(ft)

Apron Length:

Tw > .5D₀ Tw < .5D₀
La: 10.000 La: 8.800

Apron Width:

w₂: 2

w₁: 8

w₁= 8.00
w₂= 2.00
La= 8.8

RipRap Sizing

d ₅₀ =	0.08	(ft)
d ₅₀ =	0.92	(in)

RipRap Gradation

	Stone Size		% of Weight Smaller Than the Given Size
0.12	TO	0.15	100
0.10	TO	0.14	85
0.08	TO	0.12	50
0.02	TO	0.04	15

Minimum Depth of Rock= 0.23 (ft)

Summary for Pond Bio1: Bio 1 w ISR

Inflow Area = 0.539 ac, 66.81% Impervious, Inflow Depth = 6.67" for 50-yr event
 Inflow = 2.6 cfs @ 12.03 hrs, Volume= 0.300 af
 Outflow = 1.0 cfs @ 12.21 hrs, Volume= 0.300 af, Atten= 62%, Lag= 10.8 min
 Primary = 1.0 cfs @ 12.21 hrs, Volume= 0.300 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Starting Elev= 93.10' Surf.Area= 686 sf Storage= 343 cf

Peak Elev= 95.95' @ 12.21 hrs Surf.Area= 6,011 sf Storage= 4,792 cf (4,449 cf above start)

Flood Elev= 96.25' Surf.Area= 6,799 sf Storage= 6,335 cf (5,992 cf above start)

Plug-Flow detention time= 399.5 min calculated for 0.292 af (97% of inflow)

Center-of-Mass det. time= 361.0 min (1,163.0 - 802.0)

Volume	Invert	Avail.Storage	Storage Description
#1	93.75'	1,065 cf	Sediment Forebay (Irregular) Listed below (Recalc)
#2	91.85'	5,270 cf	Bioretention Area 1 w/ ISR (Irregular) Listed below
		6,335 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.75	138	98.0	0	0	138
94.00	213	102.7	44	44	217
95.00	558	145.0	372	415	1,060
95.75	1,216	368.9	649	1,065	10,218

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.85	686	126.0	0.0	0	0	686
93.10	686	126.0	40.0	343	343	844
93.35	686	126.0	30.0	51	394	875
94.85	686	126.0	20.0	206	600	1,064
95.00	2,438	192.7	100.0	221	821	2,756
95.42	2,626	198.7	100.0	1,063	1,884	2,960
95.50	2,734	202.1	100.0	214	2,099	3,070
95.75	2,887	206.8	100.0	703	2,801	3,231
95.76	4,525	471.9	100.0	37	2,838	17,549
96.00	4,867	476.4	100.0	1,127	3,965	17,907
96.25	5,583	456.2	100.0	1,305	5,270	19,410

Device	Routing	Invert	Outlet Devices
#1	Primary	93.10'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 93.10' / 93.00' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	93.10'	0.9" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 2	92.18'	6.0" Round Culvert L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 92.18' / 92.18' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

24085 - Post

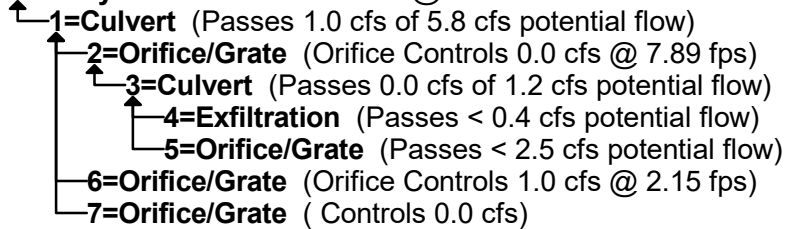
24085_GCB15 24-hr S1 50-yr Rainfall=8.23"

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#4	Device 3	91.85'	10.000 in/hr Exfiltration over Surface area below 94.90' Phase-In= 0.01'
#5	Device 3	95.50'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Device 1	95.50'	12.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Device 1	96.00'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.0 cfs @ 12.21 hrs HW=95.95' TW=93.26' (Dynamic Tailwater)

OUTLET PROTECTION DESIGN CALCS **NON DEFINED CHANNEL**

Job #: 24085
 Date: 8/6/2024
 Structure: Outlet from
 BioPond 2

Variables:

Q= Discharge from the pipe (cfs)
 D₀= Diameter of the pipe (ft)
 Tw= Tailwater depth above the invert of the pipe (ft)
 La= Apron length
 w₁= Apron width at pipe outlet
 w₂= Apron width at downstream end of apron

Input: Outlet elev: 92.75
 Tailwater elev: 93
 Tw: 0.25
 Q: 1.6
 D₀: 1

Apron Dimensions

w ₁ =	3	(ft)
w ₂ =	13	(ft)
La=	10	(ft)

Apron Length:

$\frac{Tw > .5D_0}{La: 11.800}$	$\frac{Tw < .5D_0}{La: 9.880}$
---------------------------------	--------------------------------

Apron Width:

$\frac{Tw > .5D_0}{w_2: 7.72}$	$\frac{Tw < .5D_0}{w_2: 12.88}$
--------------------------------	---------------------------------

w₁: 3

w₁= 3.00
 w₂= 12.88
 La= 9.88

RipRap Sizing

d ₅₀ =	0.15	(ft)
d ₅₀ =	1.80	(in)

RipRap Gradation

	Stone Size		% of Weight Smaller Than the Given Size
0.22	TO	0.30	100
0.19	TO	0.27	85
0.15	TO	0.22	50
0.04	TO	0.07	15

Minimum Depth of Rock= 0.45 (ft)

Summary for Pond Bio2: Bio 2 w ISR

Inflow Area = 1.738 ac, 33.25% Impervious, Inflow Depth = 6.32" for 50-yr event
 Inflow = 5.8 cfs @ 12.15 hrs, Volume= 0.915 af
 Outflow = 1.5 cfs @ 12.72 hrs, Volume= 0.914 af, Atten= 73%, Lag= 34.6 min
 Primary = 1.5 cfs @ 12.72 hrs, Volume= 0.914 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Starting Elev= 92.85' Surf.Area= 1,140 sf Storage= 570 cf

Peak Elev= 95.91' @ 12.72 hrs Surf.Area= 16,279 sf Storage= 14,772 cf (14,202 cf above start)

Flood Elev= 96.25' Surf.Area= 17,945 sf Storage= 20,115 cf (19,545 cf above start)

Plug-Flow detention time= 295.4 min calculated for 0.901 af (99% of inflow)

Center-of-Mass det. time= 275.6 min (1,098.1 - 822.5)

Volume	Invert	Avail.Storage	Storage Description
#1	93.25'	724 cf	Sediment Forebay (Irregular) Listed below (Recalc)
#2	91.60'	19,390 cf	Bioretention Area 2 w/ ISR (Irregular) Listed below
		20,115 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.25	88	52.0	0	0	88
94.00	221	66.1	112	112	228
95.00	672	193.2	426	538	2,854
95.25	819	197.9	186	724	3,008

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.60	1,140	158.0	0.0	0	0	1,140
92.85	1,140	158.0	40.0	570	570	1,338
93.10	1,140	158.0	30.0	86	656	1,377
94.60	1,140	158.0	20.0	342	998	1,614
95.00	7,349	356.1	100.0	1,518	2,515	9,719
95.09	8,838	402.3	100.0	727	3,243	12,508
95.10	9,005	407.4	100.0	89	3,332	12,836
95.20	10,688	457.3	100.0	983	4,315	16,270
95.25	10,757	458.3	100.0	536	4,851	16,346
95.26	11,994	798.0	100.0	114	4,965	50,307
96.00	15,923	1,473.3	100.0	10,295	15,260	172,367
96.25	17,126	1,550.7	100.0	4,130	19,390	190,996

Device	Routing	Invert	Outlet Devices
#1	Primary	92.85'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 92.85' / 92.75' S= 0.0100 ' / Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	92.85'	1.1" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 2	91.93'	6.0" Round Culvert L= 16.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 91.93' / 91.93' S= 0.0000 ' / Cc= 0.900

24085 - Post

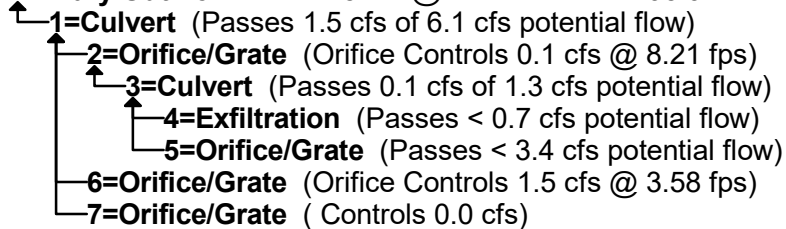
24085_GCB15 24-hr S1 50-yr Rainfall=8.23"

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			n= 0.012, Flow Area= 0.20 sf
#4	Device 3	91.60'	10.000 in/hr Exfiltration over Surface area below 94.70' Phase-In= 0.01'
#5	Device 3	95.10'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Device 1	95.10'	10.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Device 1	96.00'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.5 cfs @ 12.72 hrs HW=95.91' TW=93.00' (Dynamic Tailwater)

OUTLET PROTECTION DESIGN CALCS **NON DEFINED CHANNEL**

Job #: 24085
 Date: 8/6/2024
 Structure: Outlet from
 BioPond 3

Variables:

Q= Discharge from the pipe (cfs)
 D₀= Diameter of the pipe (ft)
 Tw= Tailwater depth above the invert of the pipe (ft)
 La= Apron length
 w₁= Apron width at pipe outlet
 w₂= Apron width at downstream end of apron

Input: Outlet elev: 92.75
 Tailwater elev: 92.92
 Tw: 0.17
 Q: 0.5
 D₀: 1

Apron Dimensions

w ₁ =	3	(ft)
w ₂ =	11	(ft)
La=	8	(ft)

Apron Length:

$\frac{Tw > .5D_0}{La: 8.500}$ $\frac{Tw < .5D_0}{La: 7.900}$

Apron Width:

$\frac{Tw > .5D_0}{w_2: 6.40}$ $\frac{Tw < .5D_0}{w_2: 10.90}$

w₁: 3

w₁= 3.00
 w₂= 10.9
 La= 7.9

RipRap Sizing

d ₅₀ =	0.05	(ft)
d ₅₀ =	0.56	(in)

RipRap Gradation

	Stone Size		% of Weight Smaller Than the Given Size
0.07	TO	0.09	100
0.06	TO	0.08	85
0.05	TO	0.07	50
0.01	TO	0.02	15

Minimum Depth of Rock= 0.14 (ft)

Summary for Pond Bio3: Bio 3 w ISR

Inflow Area = 0.257 ac, 46.21% Impervious, Inflow Depth = 7.03" for 50-yr event
 Inflow = 1.5 cfs @ 12.00 hrs, Volume= 0.151 af
 Outflow = 0.5 cfs @ 12.13 hrs, Volume= 0.151 af, Atten= 64%, Lag= 7.7 min
 Primary = 0.5 cfs @ 12.13 hrs, Volume= 0.151 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Starting Elev= 92.85' Surf.Area= 280 sf Storage= 140 cf
 Peak Elev= 95.95' @ 12.13 hrs Surf.Area= 1,942 sf Storage= 1,917 cf (1,777 cf above start)
 Flood Elev= 96.25' Surf.Area= 2,545 sf Storage= 2,494 cf (2,354 cf above start)

Plug-Flow detention time= 266.2 min calculated for 0.147 af (98% of inflow)
 Center-of-Mass det. time= 236.9 min (1,021.7 - 784.8)

Volume	Invert	Avail.Storage	Storage Description
#1	93.75'	247 cf	Sediment Forebay (Irregular) Listed below (Recalc)
#2	91.60'	2,247 cf	Bioretention Area 3 w/ ISR (Irregular) Listed below
		2,494 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.75	21	22.0	0	0	21
95.75	274	61.0	247	247	292

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.60	280	76.0	0.0	0	0	280
92.85	280	76.0	40.0	140	140	375
93.10	280	76.0	30.0	21	161	394
94.60	280	76.0	20.0	84	245	508
94.85	900	120.0	100.0	140	385	1,195
95.16	1,014	125.8	100.0	296	682	1,314
95.20	1,030	126.6	100.0	41	723	1,331
95.75	1,247	137.0	100.0	625	1,348	1,561
95.76	1,563	182.5	100.0	14	1,362	2,718
96.00	1,696	187.1	100.0	391	1,753	2,860
96.25	2,271	194.9	100.0	494	2,247	3,102

Device	Routing	Invert	Outlet Devices
#1	Primary	92.85'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 92.85' / 92.75' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	92.85'	0.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 2	91.93'	6.0" Round Culvert L= 7.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 91.93' / 91.93' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#4	Device 3	91.60'	10.000 in/hr Exfiltration over Surface area below 94.70' Phase-In= 0.01'

24085 - Post

24085_GCB15 24-hr S1 50-yr Rainfall=8.23"

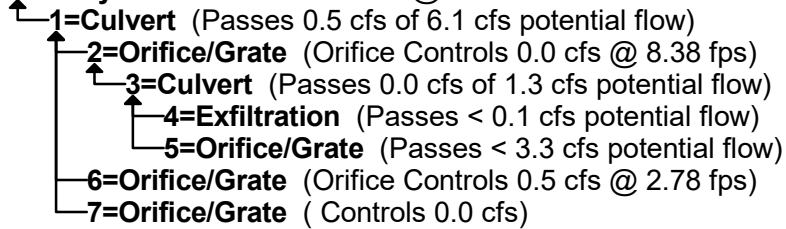
Prepared by Civilworks New England

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Page 2

#5	Device 3	95.20'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Device 1	95.20'	3.0" W x 9.5" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Device 1	96.00'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.5 cfs @ 12.13 hrs HW=95.95' TW=92.92' (Dynamic Tailwater)



APPENDIX C

INSPECTION AND MAINTENANCE

C – 1

**STORMWATER MANAGEMENT SYSTEM
INSPECTION & MAINTENANCE PLAN**

Stormwater Management System Inspection & Maintenance Plan

Prepared for:

**LOT 2 SITE DEVELOPMENT
Map G, Lot 2-1**

**Crosby Road
Dover, New Hampshire
Strafford County**

AUGUST 2024

Owner of Record:

DEL SOL DOVER, LLC
340 Central Avenue
Suite 202
Dover, New Hampshire 03820

Prepared By:

CIVILWORKS NEW ENGLAND
P.O. Box 1166
181 Watson Road
Dover, New Hampshire 03821

Introduction

Civilworks NE, has prepared the following Stormwater Management System Inspection & Maintenance Plan for **Del Sol Dover, LLC**. The intent of this plan is to provide a list of procedures that document the inspection and maintenance requirements of the Stormwater Management System for this site.

The inspection and maintenance requirements outlined in this document are required to be performed in perpetuity. In the event the property is sold, future owners will be responsible for implementing the responsibilities outlined in this document.

The following inspection and maintenance program is necessary in order to keep the Stormwater Management System functioning properly. These measures will also help to minimize potential environmental impacts to the areas surrounding the developed site. By following the enclosed procedures, the property owners, and maintenance personnel will be able to maintain the functional design of the Stormwater Management System and maximize its ability to remove sediment and other contaminants from site generated stormwater runoff.

This plan also requires the Owner/Operator to prepare and implement a salt minimization plan to reduce salt usage on-site and ultimately within the watershed. This plan will allow the owner/operator to monitor and modify how much salt is needed, when it should be applied, where it needs to be applied, with the ultimate goal of reducing salt-use without compromising safety. It is expected that salt-use reduction will lead to long-term cost-savings as a result of purchasing less salt and reduced impacts on vegetation (e.g., landscaping) and corrosion of infrastructure.

The salt minimization plan should include the retention of a contractor who has completed the Green SnowPro Training course and obtained NHDES Salt Application Certification.

It is anticipated that this be a living document that will be updated at regular intervals (recommend updating annually in advance of the winter season in order to facilitate adjustments).

Owner:

**Del Sol Dover, LLC
340 Central Avenue
Suite 202
Dover, NH 03820**

In the event of a change in ownership, this Inspection and Maintenance Plan shall be transferred to the new party; transfer shall be documented to NH DES in writing.

Contact / Responsible Party:

**Del Sol Dover, LLC
340 Central Avenue
Suite 202
Dover, NH 03820**

**Chad Kageleiry
Phone: (603) 749 2800
Email: chad@summitlanddev.com**

The contact information for the Contact / Responsible Party shall be kept current; transfer shall be documented to NHDES in writing.

Management Company:

**Del Sol Dover, LLC
340 Central Avenue
Suite 202
Dover, NH 03820**

The contact information for the Management Party shall be kept current.

Inspection Schedule / Record Retention

Inspection frequency should, at a minimum, be in accordance with New Hampshire Stormwater Manual, Volume 2, latest edition, as updated by NHDES. See the Inspection and Maintenance Plan for frequency requirements. Inspections shall include a photograph of each practice that is subject to the I&M requirements each time it is inspected. A copy of the completed Stormwater Management System's Inspection & Maintenance Log, inspection photographs, and Deicing Salt Quantity Use Log shall be maintained, kept on-site, and be made available to local, state, or federal regulators as applicable by law. All Inspection and Maintenance records must be provided to NHDES upon request and to the City of Dover Community Services Department annually before Dec 15th.

Stormwater Management System Components

The Stormwater Management System associated with the project is designed to mitigate both the quantity and quality of site-generated stormwater runoff. As a result, its design includes the following elements:

- Pipes/Culverts
- Outlet Structures
- Energy Dissipation Structures (Rip Rap)
- Bioretention Basin w/ Internal Storage Reservoir (ISR)
- Grassed Lined Conveyance Swale
- Stone Lined Conveyance Swale
- Pre-Treatment Structures
 - Sediment Forebay
- Pavement
- Litter / Trash Removal

Design elements are identified in the design plans, a copy of which shall be maintained with this Inspection and Maintenance Plan.

Control of Invasive Species

During maintenance activities, check for the presence of invasive plants and remove in a safe manner. Invasive plants shall be controlled to prevent them from reproducing, spreading, or re-growing. See the University of New Hampshire – Cooperative Extension's "Method for Disposing Non-Native Invasive Plants", included at the end of this manual, for guidance on the removal and disposal of invasive species.

Inspection and Maintenance Plan

By implementing the following procedures, the owners will be able to maintain the functional design of the Stormwater Management System and maximize the system's ability to remove sediment and other contaminants from site generated stormwater runoff.

PIPES/CULVERTS:

- Inspect once per year.
- Inspect for clogging and sediment accumulation.
- Remove all debris immediately and sediment accumulations ≥ 2 inches.

OUTLET STRUCTURE(S):

- Inspect once per year.
- Inspect for clogging and sediment accumulation.
- Remove all debris immediately and sediment accumulations ≥ 2 inches.

ENERGY DISSIPATION STRUCTURES (RIP RAP):

- Inspect at least once a year.
- Inspect for sediment accumulation.
- Remove all debris immediately.
- Inspect the outlet protection annually for damage and deterioration. Repair damages immediately.
- If stones become displaced from the riprap areas, they should be replaced immediately and chinked in to assure stability. Add additional riprap as needed. Vegetation growing through the riprap should be eliminated at least yearly.

BIORETENTION BASIN W/ ISR:

- Inspection, by a **qualified professional**, of the Bioretention Basin at least twice annually, and following any rainfall event exceeding 2.5 inches in a 24-hour period, with maintenance or rehabilitation conducted as warranted by such inspection. If the Bioretention Basin systems do not drain within 72-hours following a rainfall event, a **qualified professional** should assess the condition and determine measures required to restore filtration practice (as applicable).
- Inlet and outlet pipes, inlet and outlet structures, containment structures, energy dissipation structures or practices, and other structural appurtenances should be inspected by a **qualified professional**, and corrective action implemented (e.g., maintenance, repairs, or replacement) as indicated by such inspection.
- Embankments and spillways should be inspected by a **qualified professional** for settlement, erosion, seepage, animal burrows, woody vegetation, and other conditions that could degrade the embankment and reduce its stability for impounding water. Immediate corrective action should be implemented if any such conditions are found.
- Vegetation should be inspected at least annually and maintained in healthy condition, including pruning, removal and replacement of dead or diseased vegetation, and removal of invasive species.
- The bottoms, interior and exterior side slopes, and crest of earthen detention basins should be mowed at least once annually. The vegetation should be maintained in a healthy condition, as appropriate to the function of the facility and type of vegetation, to prevent the establishment of woody vegetation.

- Pretreatment measures should be inspected at least twice annually, and cleaned of accumulated sediment as warranted by inspection, but no less than once annually.
- Trash and debris should be removed from the pond and any inlet or outlet structures whenever observed.
- Accumulated sediment should be removed when it significantly affects pond capacity.

GRASS LINED CONVEYANCE SWALE:

- Inspect once per year.
- Inspect for erosion, sediment accumulation, vegetation loss, and presence of invasive species.
- Remove debris and accumulated sediment, based on inspection.
- Repair eroded areas as needed; remove invasive species and dead vegetation.
- Perform periodic mowing of swale (at least twice annually), maintain a 4" stand of vegetative growth.

STONE LINED CONVEYANCE SWALE

- Inspect once per year.
- Inspect for erosion, sediment accumulation, woody vegetation and presence of invasive species.
- Remove debris and accumulated sediment, based on inspection.
- Repair eroded areas as needed; remove invasive species and woody vegetation.
- Reset any dislodged stones.

PRE-TREATMENT STRUCTURES:

SEDIMENT FOREBAY:

- Vegetated areas shall be mowed to maintain a 4" stand of vegetative growth.
- Inspect at least once per year.
- Inspect for sediment accumulation.
- Remove all debris immediately.

PAVEMENT:

- Minimize sanding.
- Minimize application of salt for ice control.
- Clean periodically (1-2 times per year) using a sweeper or vacuum sweeper. Vacuum sweeping is the preferred method.

LITTER / TRASH REMOVAL:

- Routinely patrol site for litter pick up.

DE-ICING AGENTS:

- To address the concerns associated with the application of chlorides and other deicing materials, NHDES recommends that the Owner/Operator develop a Road Salt and Deicing Minimization Plan for the parking lots and roadways. The plan should develop the policies that the development will keep in place to minimize salt and other deicer use after the project has been completed. The plan should include tracking the use of salt and other deicers for each storm event and compiling salt use data annually. (See Deicing Salt Quantity Use Log).
- Use sand as primary agent for driveway and access way safety during ice and snow conditions.
- Minimize the use of salt during the winter.

- Use de-icing or anti-caking agents, added to enhance performance and application characteristics of sand mixtures, only as necessary and at minimum application rates.
- Recommend using a certified Winter Operator (Green SnowPro Trained) for applying de-icing agents.
- Monitor weather and apply de-icing agents based on weather conditions and temperatures.

ANTI-ICING AND SALT MINIMIZATION:

- Owner to develop a Road Salt and Deicing Minimization Plan.
- Provide a written policy that the “Development” will keep in place to minimize salt and other deicer use after the project has been completed.
- Use the attached form to track the use of salt and other deicers for each storm event and compiling salt use data annually.

Inspection & Maintenance Table

System Component / BMP	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance / Cleanout Threshold
Pipes/Culverts	Annually	- Check for clogging - Check for sediment accumulation	Remove when noticed Clean when necessary
Outlet Structure(s)	Annually	- Inspect once per year. - Inspect for clogging and sediment accumulation. - Remove all debris immediately and sediment accumulations ≥ 2 inches.	≥ 2 in. sediment Remove immediately
Energy Dissipation (ED) Structures (Rip Rap)	Annually	- Check for erosion - Check for displaced stones - Check for woody vegetation - Check for sediment accumulation	≥ 3 in. sediment Remove annually Replace/ reset Dislodged stones immediately
Bioretention Basin w/ ISR - Inlet/Outlet Piping - Pond - Sediment - Drawdown - Trash/Debris - Vegetation (Veg.) - Embankments	Bi-Annually “ “ Annually Periodically “ “ “ “	- Check for erosion, settlement, seepage, etc. - Check for sediment accum. in pond - Check drainage time - Check for and remove trash/debris - Maintain $>75\%$ veg. (pond & slopes) - Maintain healthy stand of veg.	Repair immediately ≥ 2 in sediment >72 hours Remove all trash/debris Restore veg. in-kind Mow when ≥ 6 in
Grass Lined Conveyance Swale	Annually	- Check for sediment accumulation - Check for erosion - Ensure swale is stabilized - Maintain healthy stand of veg., min 4" - Inspect for invasive species	≥ 1 in. sediment Repair immediately Restore vegetation in-kind Mow twice per year Remove/Dispose of accordingly
Stone Lined Conveyance Swale	Annually	- Check for sediment accumulation - Check for erosion - Inspect for woody/ invasive vegetation - Check for dislodged stones	≥ 1 in. sediment Repair immediately Remove/Dispose of accordingly
Pre-Treatment Structures: Sediment Forebay	Annually	- Check for sediment accumulation - Check for woody vegetation growth - Check for debris - Vegetated areas shall be mowed to maintain a 4" start of vegetation growth.	Remove/ Dispose of accordingly Mow twice per year
Pavement: - Sanding - Salt Applications - Sweep/Vacuum - Trash/Debris	Limit use As required 1 - 2 x's Year Periodically	- Minimize use to prevent tracking issues - RECORD APPLICATION RATES - Sweep or vacuum to prevent tracking issues - Check for trash/debris	Sweep to prevent issues Minimize (as required) Sweep/Vac as needed Remove when noticed
Litter / Trash Removal	Periodically	Check for litter and trash	Remove when noticed

Inspection & Maintenance Checklist/Log

The following pages contain a blank copy of the Stormwater Management System's Inspection & Maintenance Log and a Deicing Salt Quantity Use Log. These forms are provided to assist the owners with the inspection and maintenance of the aforementioned Stormwater Management System.

Stormwater Management System's Inspection & Maintenance Log

Date of Inspection/Maintenance _____ Inspector: _____

[illegible]

Deicing Salt Quantity Use Log

[illegible]

Methods for Disposing Non-Native Invasive Plants

Prepared by the Invasives Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasives Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.



Tatarian honeysuckle

Lonicera tatarica

USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 3: 282.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non-native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non-viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit www.nhinvasives.org or contact your UNH Cooperative Extension office.

New Hampshire Regulations

Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr. 3802.01)

How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag “head first” at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

Burning: Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can’t be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn’t be burned as the seeds may disperse by the hot air created by the fire.

Bagging (solarization): Use this technique with softer-tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.

Tarping and Drying: Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

Chipping: Use this method for woody plants that don’t reproduce vegetatively.

Burying: This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

Drowning: Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well-rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn’t used often. Be prepared for an awful stink!

Composting: Invasive plants can take root in compost. Don’t compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.



Japanese knotweed
Polygonum cuspidatum
USDA-NRCS PLANTS Database /
Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 676.

Be diligent looking for seedlings for years in areas where removal and disposal took place.

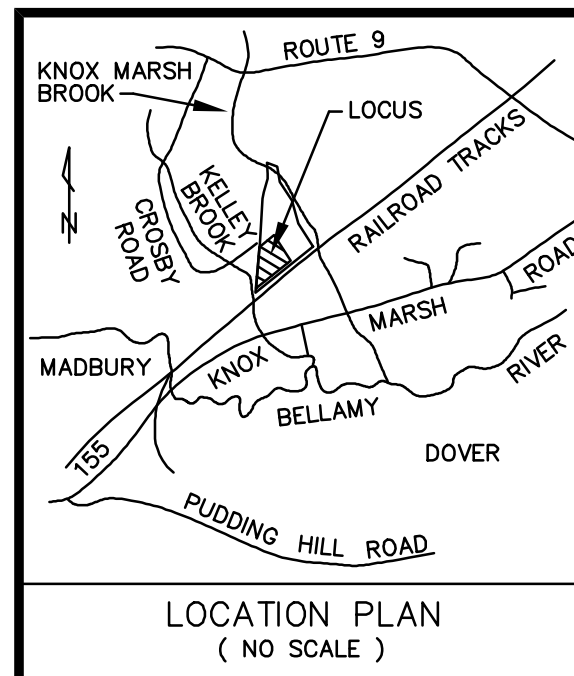
Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

Woody Plants	Method of Reproducing	Methods of Disposal
Norway maple <i>(Acer platanoides)</i> European barberry <i>(Berberis vulgaris)</i> Japanese barberry <i>(Berberis thunbergii)</i> autumn olive <i>(Elaeagnus umbellata)</i> burning bush <i>(Euonymus alatus)</i> Morrow's honeysuckle <i>(Lonicera morrowii)</i> Tatarian honeysuckle <i>(Lonicera tatarica)</i> showy bush honeysuckle <i>(Lonicera x bella)</i> common buckthorn <i>(Rhamnus cathartica)</i> glossy buckthorn <i>(Frangula alnus)</i>	Fruit and Seeds 	Prior to fruit/seed ripening Seedlings and small plants ▪ Pull or cut and leave on site with roots exposed. No special care needed. Larger plants ▪ Use as firewood. ▪ Make a brush pile. ▪ Chip. ▪ Burn.
		After fruit/seed is ripe Don't remove from site. ▪ Burn. ▪ Make a covered brush pile. ▪ Chip once all fruit has dropped from branches. ▪ Leave resulting chips on site and monitor.
oriental bittersweet <i>(Celastrus orbiculatus)</i> multiflora rose <i>(Rosa multiflora)</i>	Fruits, Seeds, Plant Fragments 	Prior to fruit/seed ripening Seedlings and small plants ▪ Pull or cut and leave on site with roots exposed. No special care needed. Larger plants ▪ Make a brush pile. ▪ Burn.
		After fruit/seed is ripe Don't remove from site. ▪ Burn. ▪ Make a covered brush pile. ▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.

Non-Woody Plants	Method of Reproducing	Methods of Disposal
garlic mustard (<i>Alliaria petiolata</i>) spotted knapweed (<i>Centaurea maculosa</i>) ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort (<i>Cynanchum nigrum</i>) ▪ May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort (<i>Cynanchum rossicum</i>) giant hogweed (<i>Heracleum mantegazzianum</i>) ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket (<i>Hesperis matronalis</i>) perennial pepperweed (<i>Lepidium latifolium</i>) purple loosestrife (<i>Lythrum salicaria</i>) Japanese stilt grass (<i>Microstegium vimineum</i>) mile-a-minute weed (<i>Polygonum perfoliatum</i>)	Fruits and Seeds 	Prior to flowering Depends on scale of infestation Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material. During and following flowering Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (<i>Phragmites australis</i>) Japanese knotweed (<i>Polygonum cuspidatum</i>) Bohemian knotweed (<i>Polygonum x bohemicum</i>)	Fruits, Seeds, Plant Fragments Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	Small infestation ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. Large infestation ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010

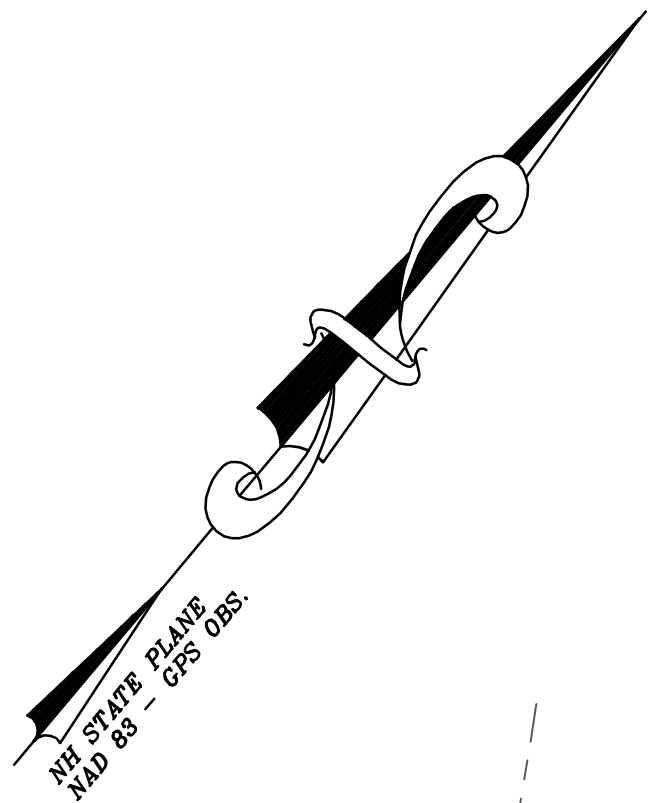
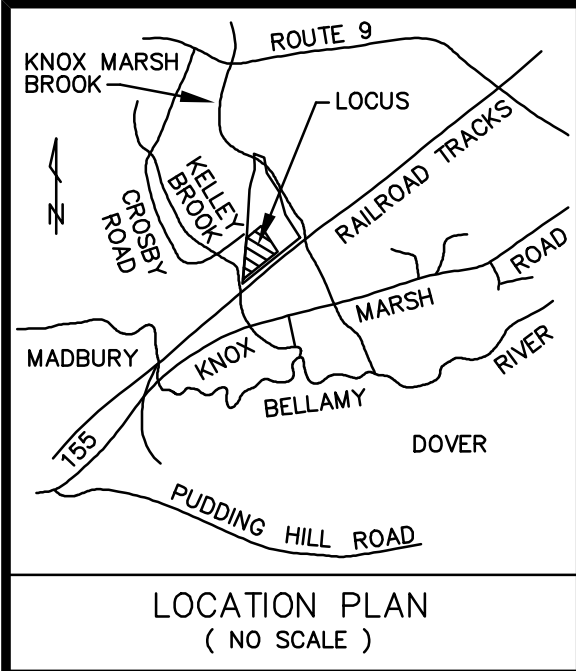


APPENDIX D

WATERSHED PLANS

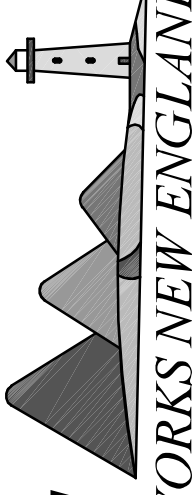
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PRE-DEVELOPMENT CONDITIONS

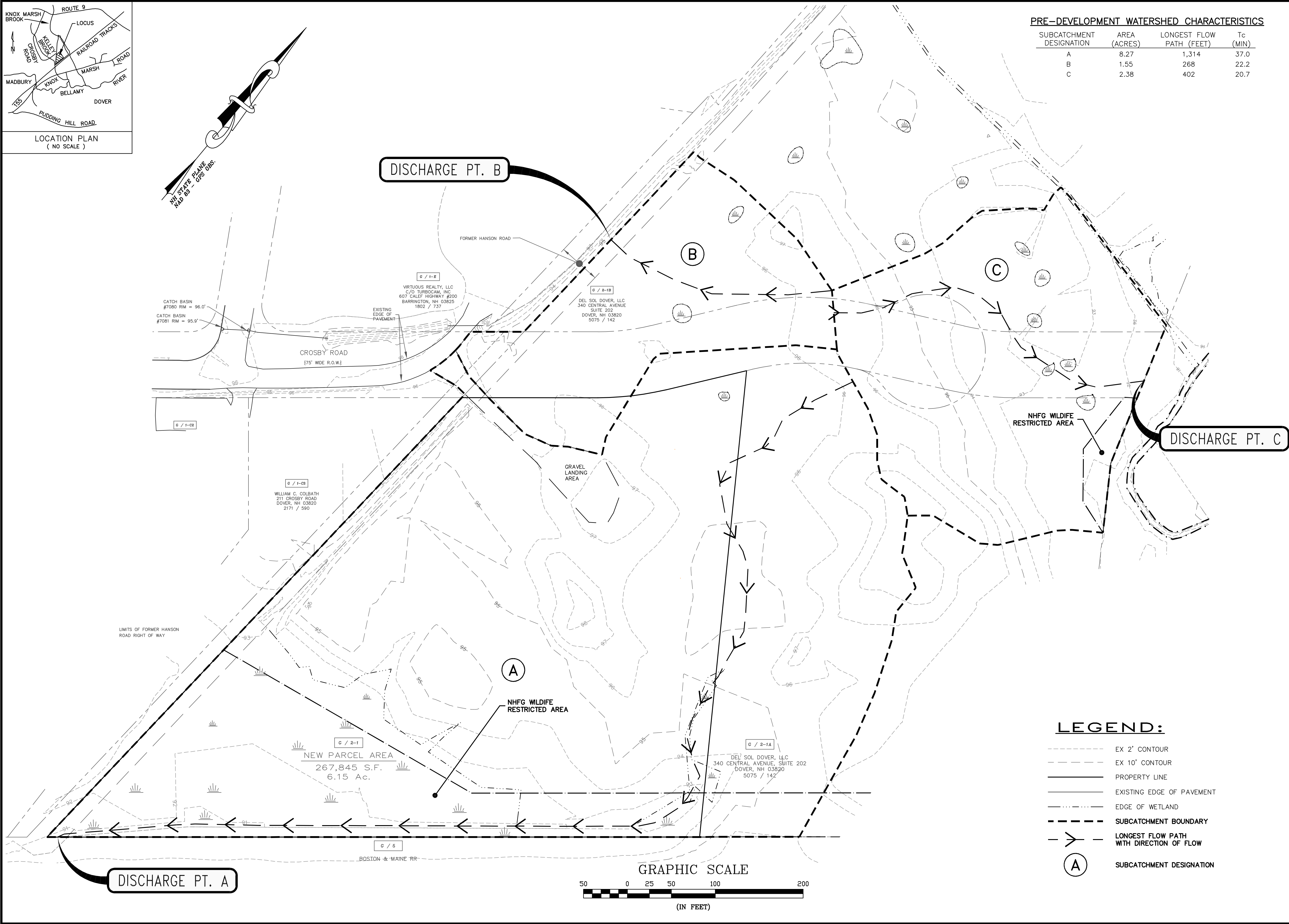


PRE-DEVELOPMENT WATERSHED CHARACTERISTICS			
SUBCATCHMENT DESIGNATION	AREA (ACRES)	LONGEST FLOW PATH (FEET)	Tc (MIN)
A	8.27	1,314	37.0
B	1.55	268	22.2
C	2.38	402	20.7

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY



CIVILWORKS NEW ENGLAND
181 Watson Road, PO Box 1166
Dover, NH 03820
603.749.0443



DATE	SCALE	DRAWN BY	DESIGN BY	APPROVED BY	PROJECT NO.	FILE	NO.	REVISION	APP'D	DATE
8-6-2024	1"=50'	SRD	JPG	BYSH	24085	DRN.DWG				

PRE-DEVELOPMENT WATERSHED PLAN

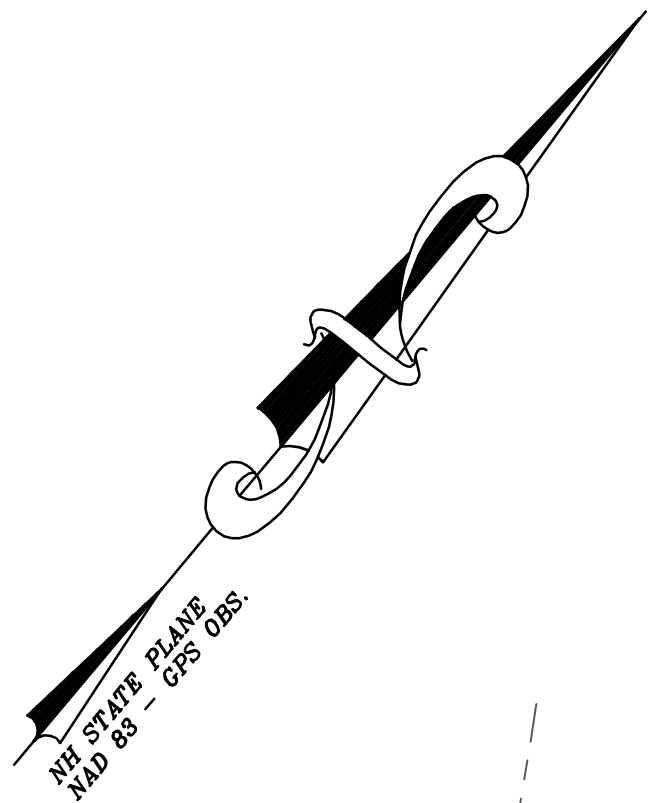
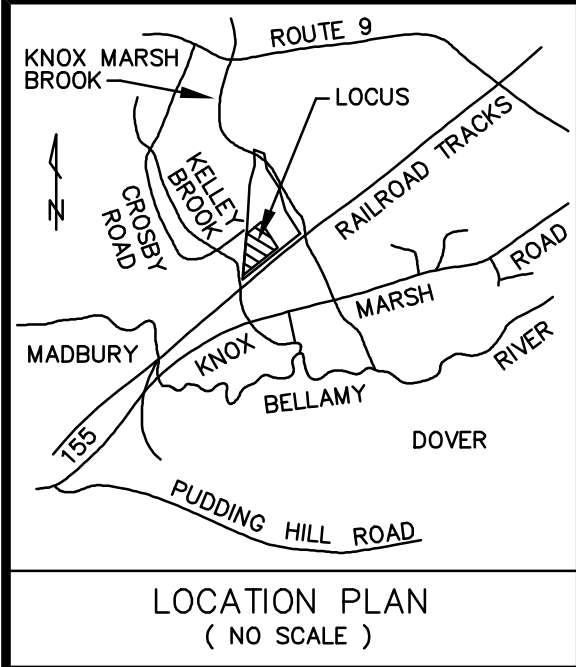
DEL SOL DOVER, LLC
340 CENTRAL AVENUE
SUITE 202
DOVER, NH 03820

LOT 2 DEVELOPMENT
DEL SOL DOVER, LLC
DOVER, NH

WS-1

D – 2

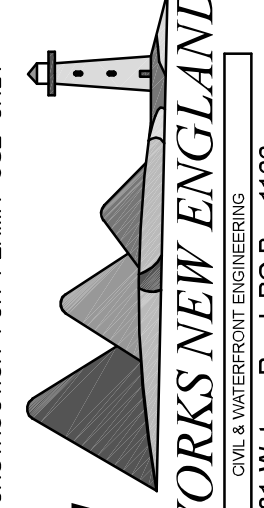
POST-DEVELOPMENT CONDITIONS



POST-DEVELOPMENT WATERSHED CHARACTERISTICS

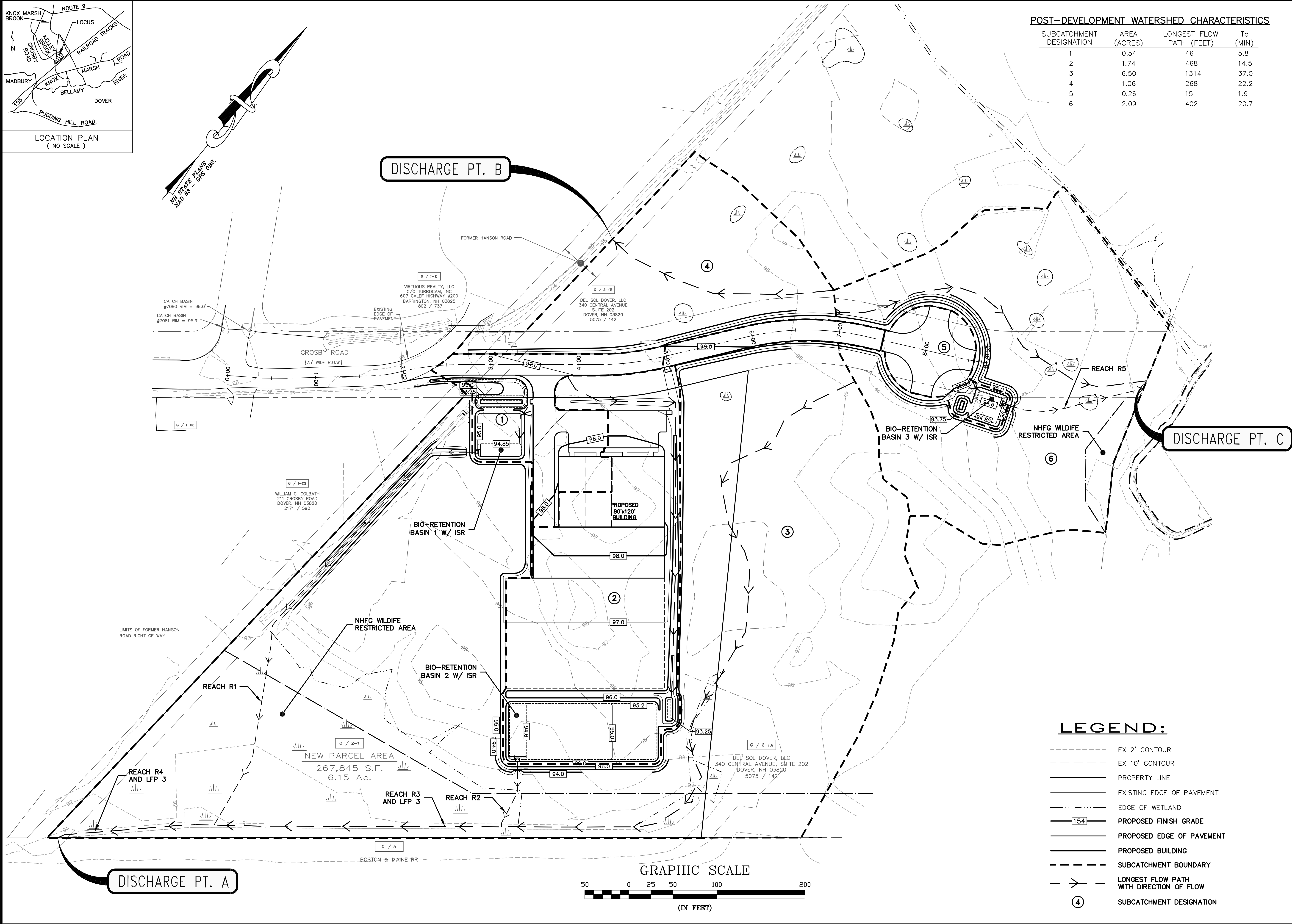
SUBCATCHMENT DESIGNATION	AREA (ACRES)	LONGEST FLOW PATH (FEET)	Tc (MIN)
1	0.54	46	5.8
2	1.74	468	14.5
3	6.50	1314	37.0
4	1.06	268	22.2
5	0.26	15	1.9
6	2.09	402	20.7

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY



CIVILWORKS NEW ENGLAND
181 Watson Road, PO Box 1166
Dover, NH 03820
603.748.0443

DATE	SCALE	DRAWN BY	DESIGN BY	APPROVED BY	PROJECT NO.	FILE/DRN/DWG	NO.	REVISION	APP'D	DATE
8-6-2024	1"=50'	SRD	JPG	BYSH	24085					



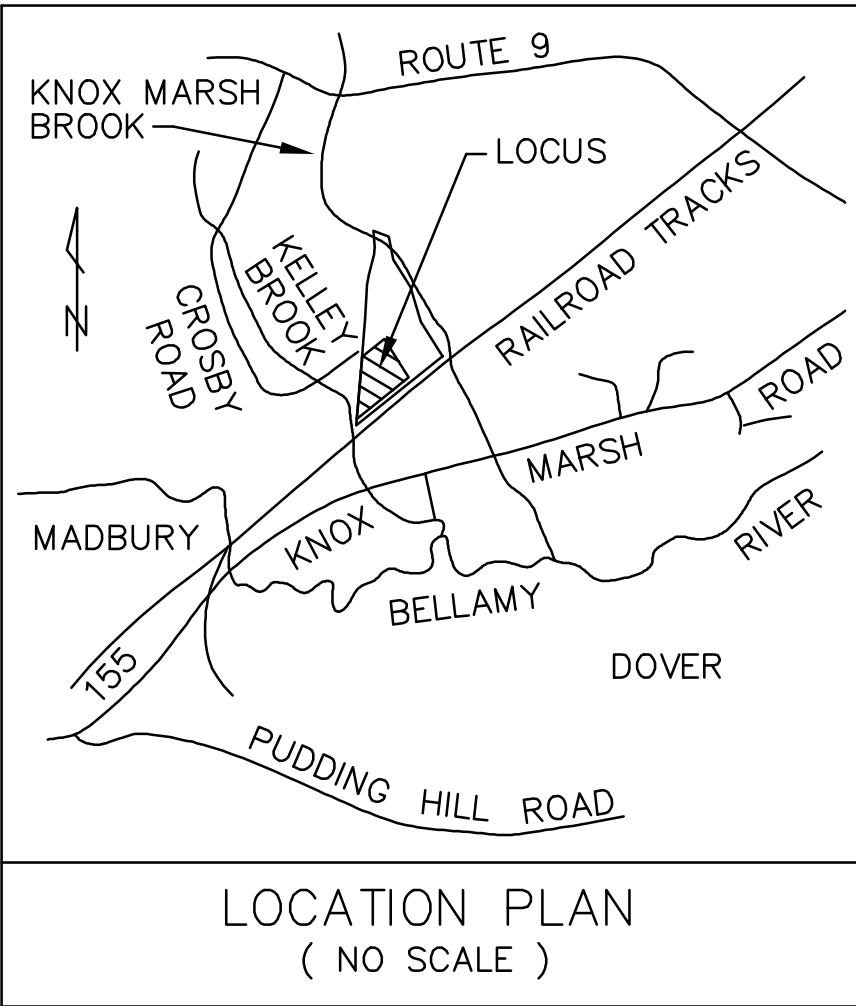
POST-DEVELOPMENT WATERSHED PLAN

DEL SOL DOVER, LLC
340 CENTRAL AVENUE
SUITE 202
DOVER, NH 03820

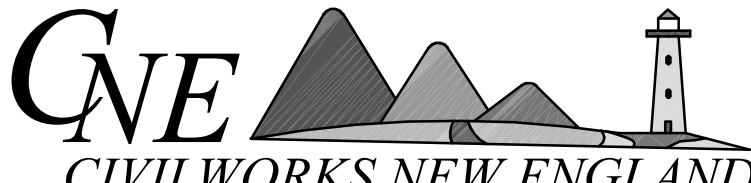
LOT 2 DEVELOPMENT
DEL SOL DOVER, LLC
DOVER, NH

WS-2

SITE PLAN - LOT 2
FOR
DEL SOL DOVER, LLC
TAX MAP G, LOT No. 2-1
CROSBY ROAD
DOVER, NH
AUGUST 2024



OWNER
DEL SOL DOVER, LLC
340 CENTRAL AVENUE
SUITE 202
DOVER, NH 03820
OWNER SIGNATURE

SITE CIVIL ENGINEER

CIVIL & WATERFRONT ENGINEERING
181 Watson Road, PO Box 1166
Dover, New Hampshire 03821
603.749.0443

LAND SURVEYOR
MCENEANEY SURVEY ASSOCIATES OF NEW ENGLAND
P.O. BOX 1166
181 WATSON ROAD
DOVER, NH 03821
(603) 742-0911

WETLAND/SOIL SCIENTIST
BRUCE A. GILDAY, CWS
BAG LAND CONSULTANTS
43 ROCKINGHAM STREET
CONCORD, NH 03301
(603) 228-5775

PERMIT SUMMARY/ WAIVER SUMMARY:
1. THE FOLLOWING FEDERAL AND STATE PERMITS HAVE BEEN ISSUED FOR THE SUBJECT PROPERTY:

NHDES ALTERATION OF TERRAIN: PENDING

2. 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.

SITE PLAN: PENDING

CONDITIONAL USE PERMIT: PENDING

3. WAIVERS REQUESTED: THE PLANNING BOARD HAS FOUND THE CRITERIA OF CHAPTER 153-21 HAVE BEEN MET AND HAVE BEEN APPROVED THE FOLLOWING WAIVERS:

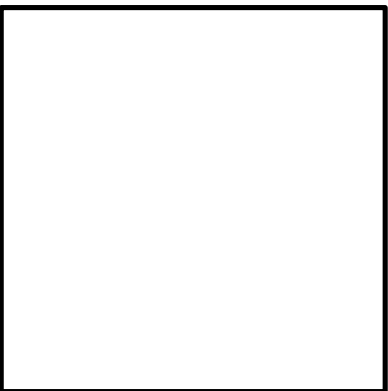
* A WAIVER REQUEST FROM 153-13A (12) TO ALLOW A LANDSCAPE PLAN NOT SIGNED BY A NH LANDSCAPE ARCHITECT.

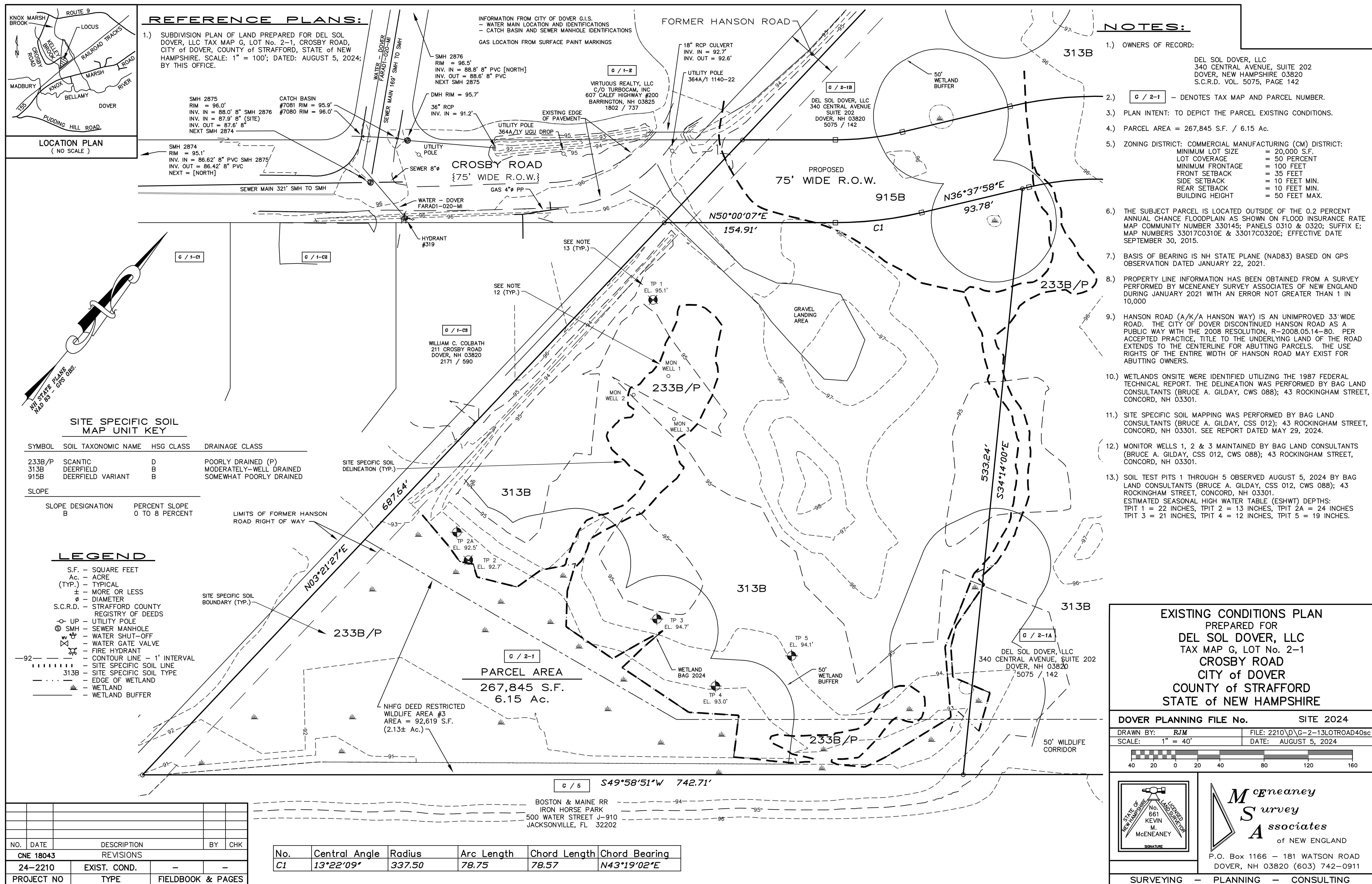
* A WAIVER REQUEST FROM 153-13K (1)(b) TO ALLOW PARKING IN FRONT OF BUILDING.

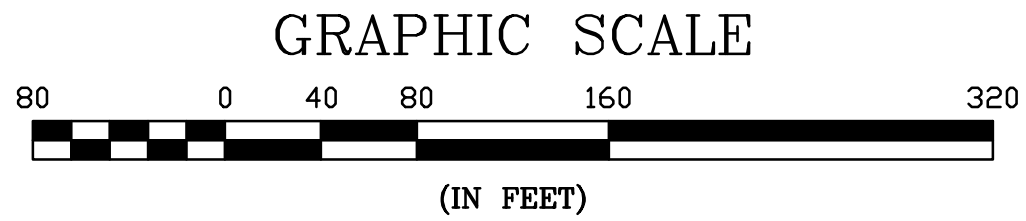
* A WAIVER REQUEST FROM 153-13A (17) TO ALLOW RELIEF FROM PROVIDING STREETSCAPE PLANS.

WILDLIFE PROTECTION NOTES:
• ALL OBSERVATIONS OF THREATENED OR ENDANGERED SPECIES SHALL BE REPORTED IMMEDIATELY TO THE NEW HAMPSHIRE FISH AND GAME DEPARTMENT NONGAME AND ENDANGERED WILDLIFE ENVIRONMENTAL REVIEW PROGRAM BY PHONE AT 603-271-2461 AND BY EMAIL AT NHFGREVIEW@WILDLIFE.NH.GOV, EMAIL SUBJECT LINE: [NHBXX-XXXX, DEL SOL DOVER LLC, WILDLIFE SPECIES OBSERVATION](#).
• PHOTOGRAPHS OF THE OBSERVED SPECIES AND NEARBY ELEMENTS OF HABITAT OR AREAS OF LAND DISTURBANCE SHALL BE PROVIDED TO NHF&G IN DIGITAL FORMAT AT THE ABOVE EMAIL ADDRESS FOR VERIFICATION AS FEASIBLE.
• IN THE EVENT A THREATENED OR ENDANGERED SPECIES IS OBSERVED ON THE PROJECT SITE DURING THE TERM OF THE PERMIT, THE SPECIES SHALL NOT BE DISTURBED, HANDLED, OR HARMED IN ANY WAY PRIOR TO CONSULTATION WITH NHF&G AND IMPLEMENTATION OF CORRECTIVE ACTIONS RECOMMENDED BY NHF&G, IF ANY, TO ASSURE THE PROJECT DOES NOT APPRECIABLY JEOPARDIZE THE CONTINUED EXISTENCE OF THREATENED AND ENDANGERED SPECIES AS DEFINED IN FIS 1002.04.
• THE NHF&G, INCLUDING ITS EMPLOYEES AND AUTHORIZED AGENTS, SHALL HAVE ACCESS TO THE PROPERTY DURING THE TERM OF THE PERMIT.

SHEET IND	SHEET
COVER SHEET	1
EXISTING CONDITIONS PLAN (BY MCENEANEY SURVEY)	2
NEIGHBORHOOD PLAN	3
NOTE SHEET	4
DEMOLITION PLAN	5
SITE PLAN	6
GRADING, DRAINAGE & EROSION CONTROL PLAN	7
UTILITY PLAN	8
LIGHTING PLAN	9
LIGHTING DETAILS	10
LANDSCAPING PLAN	11
EROSION CONTROL NOTES	12
EROSION CONTROL DETAILS	13 - 14
DETAILS	15 - 19
TRUCK MOVEMENT PLAN	20







ABUTTERS LIST (WITHIN 200 FT.)			
TAX MAP	LOT NO.	NAME & ADDRESS	
G 2-1-0	G 2-1-0	DEL SOL DOVER LLC 340 CENTRAL AVE STE 202Y DOVER, NH 03820	
G 2-0-0	G 2-0-0	WESTFIELD LLC 340 CENTRAL AVE STE 202 DOVER, NH 03820	
G 1-L-0	G 1-L-0	CHAUVIN ARNOUX INC. 15 FARADAT DRIVE DOVER, NH 03820	
G 1-E-0	G 1-E-0	VIRTOUS REALTYLLC C/O TURBOCAM INC. 607 CALEF HIGHWAY #200 BARRINGTON, NH 03825-7237	
G 1-D-0	G 1-D-0	BETTS-LEVINE DEREK S TRUSTEE R AND R REAL ESTATE TRUST FARADAY DRIVE DOVER, NH 0382	
G 1-B-0	G 1-B-0	MCQUADE REALTY INC. P.O. BOX 1409 DOVER, NH 03820	
G 1-C-1	G 1-C-1	AI SOLUTIONS INC 1735 FIFTH AVENUE MCKEESPORT, PA 15132	
G 1-C-2	G 1-C-2	AI SOLUTIONS INC 1735 FIFTH AVENUE MCKEESPORT, PA 15132	
G 1-C-3	G 1-C-3	COLBATH WILLIAM C 211 CROSBY ROAD DOVER, NH 03820	
G 5-0-0	G 5-0-0	BOSTON & MAINE RR IRON HORSE PARK 500 WATER STREET J-910 JACKSON, FL 32202	
H 38-0-0	H 38-0-0	CRAGIN PATRICK J TRUSTEE CRAGIN PATRICK J LIVING REV TRUST P.O. BOX 250 DOVER, NH 03820	
H 37-A-0	H 37-A-0	239 KNOX MARSH REALTY LLC P.O. OX 720 MIDDLETON, MA 01949	
H 36-B-1	H 36-B-1	NSA OPTIVEST ACQUISITION HOLDINGS LLC 24901 DANA PT HARBOR DRIVE #200 DANA POINT, CA 92629	

NEIGHBORHOOD PLAN

DEL SOL DOVER, LLC
340 CENTRAL AVENUE
SUITE 202
DOVER, NH 03820

LOT 2 DEVELOPMENT
DEL SOL DOVER, LLC
DOVER, NH

3

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

DATE: 8-6-24

SCALE: 1"=80'

DRAWN BY: SRD

DESIGN BY: JFG

APPROVED BY: JH

PROJECT NO: 24085

FILE SITE.DWG

NO.

REVISION

APP'D

DATE

CNE

CIVILWORKS NEW ENGLAND

CIVIL & WATERCRAFT ENGINEERING

181 Watson Road, PO Box 1166
Dover, NH 03820

1. THE OWNERS OF RECORD:
DEL SOL DOVER, LLC
340 CENTRAL AVENUE, S
DOVER, NEW HAMPSHIRE
S.C.R.D. VOL. 5075, PAG

3. PLAN INTENT: TO DEPICT THE PARCEL EXISTING CONDITIONS.

5. ZONING DISTRICT: COMMERCIAL MANUFACTURING (CM) DISTRICT:

	REQUIRED	PROPOSED
MINIMUM LOT SIZE	20,000 S.F.	267,000 S.F.

	<u>REQUIRED</u>	<u>PROPOSED</u>
MINIMUM LOT SIZE	= 20,000 S.F.	267,845
LOT COVERAGE	= 50 PERCENT	±19%
MINIMUM FRONTAGE	= 100 FEET	327 FEET
FRONT SETBACK	= 35 FEET	67 FEET
SIDE SETBACK	= 10 FEET MIN.	77 FEET
REAR SETBACK	= 10 FEET MIN.	353 FEET
BUILDING HEIGHT	= 50 FEET MAX.	24'8"

6. THE SUBJECT PARCELS IS LOCATED OUTSIDE OF THE 0.2 PERCENT ANNUAL CHANCE FLOODPLAIN AS SHOWN ON FLOOD INSURANCE RATE MAP COMMUNITY NUMBER 330145; PANELS 0310 & 0320; SUFFIX E; MAP NUMBERS 33017C0310E & 33017C0320E; EFFECTIVE DATE SEPTEMBER 30, 2015,

7. BASIS OF BEARING IS NH STATE PLANE (NAD83) BASED ON GPS OBSERVATION DATED JANUARY 22, 2021.

8. PROPERTY LINE INFORMATION HAS BEEN OBTAINED FROM A SURVEY PERFORMED BY MCENEANEY SURVEY ASSOCIATES OF NEW ENGLAND DURING JANUARY 2021 WITH AN ERROR NOT GREATER THAN 1 IN 10,000.

9. HANSON ROAD (A/K/A HANSON WAY) IS AN UNIMPROVED 33' WIDE ROAD. THE CITY OF DOVER DISCONTINUED HANSON ROAD AS A PUBLIC WAY WITH THE 2008 RESOLUTION, R-2008.05.14-80. PER ACCEPTED PRACTICE, TITLE TO THE UNDERLYING LAND OF THE ROAD EXTENDS TO THE CENTERLINE FOR ABUTTING PARCELS. THE USE RIGHTS OF THE ENTIRE WIDTH OF HANSON ROAD MAY EXIST FOR ABUTTING OWNERS.

10. WETLANDS ONSITE WERE IDENTIFIED UTILIZING THE 1987 FEDERAL TECHNICAL REPORT. THE DELINEATION WAS PERFORMED BY BAG LAND CONSULTANTS (BRUCE A. GILDAY, CWS 018); 43 ROCKINGHAM STREET, CONCORD, NH 03301. JULY 2024.

11. SITE SPECIFIC SOIL MAPPING WAS PERFORMED BY BAG LAND CONSULTANTS (BRUCE A. GILDAY, CSS 012); 43 ROCKINGHAM STREET, CONCORD, NH 03301. SEE REPORT DATED MAY 29, 2024. UPDATED JULY 2024.

12. LIST ANY VARIANCE 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. (SEE PROJECT VARIANCE/PERMIT SECTION)

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 IS SERVED BY MUNICIPAL WATER AND SEWER.

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. EROSION CONTROL NOTES 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 50 FT. OF CONSERVATION AND WETLAND DISTRICTS SHALL BE STAKED, FLAGGED AND CLEARLY IDENTIFIED PRIOR TO 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. 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. WORK PRECLUDED ON SUNDAYS AND FEDERAL HOLIDAYS.

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. THE PROPOSED USE FOR THE SITE IS LIGHT MANUFACTURING.

24. THE FOLLOWING FEDERAL AND STATE PERMITS HAVE BEEN ISSUED FOR THE SUBJECT PROPERTY: (SEE PROJECT VARIANCE/PERMIT SECTION)

19. COMMERCIAL VEHICLE ROUTE DURING CONSTRUCTION SHALL CONFORM TO DOVER CITY CODE OR BE COORDINATED WITH THE COMMUNITY SERVICES DIRECTOR.
20. ANY RETAINING WALL TALLER THAN FOUR FEET (4') REQUIRES THE ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.
21. ANY FENCE TALLER THAN SEVEN FEET (7') REQUIRES THE ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.
22. APPLICANT SHALL COMPLETE LAND USE DEVELOPMENT TRACKING FORM, MOST RECENTLY REVISED VERSION, UTILIZING THE ONLINE POLLUTION TRACKING AND ACCOUNTING PILOT PROJECT (PTAPP) PORTAL.
[HTTPS://PTAPP.UNH.EDU/](https://ptapp.unh.edu/)
23. IF APPLICABLE, 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 REPAIRING.
24. 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.
25. THE MAXIMUM PARKING SPACE CALCULATION IS 59, INCLUDING 3 ACCESSIBLE SPACES, AND 45, INCLUDING 4 ACCESSIBLE SPACES, ARE PROVIDED.
26. EXTERIOR LIGHTING SHALL BE CUT-OFF TYPE FIXTURES PER CHAPTER 153-14-E AND SHALL PROVIDE LIGHTING DIRECTED ON-SITE ONLY.
27. TOPOGRAPHIC SURVEY PERFORMED BY MCNEANEY SURVEY ASSOCIATE, OCTOBER 2022
28. ELEVATIONS DEPICTED ARE BASED ON INFORMATION OBTAINED FROM THE CITY ENGINEER'S OFFICE AND WAS DERIVED FROM COORDINATES FOR CONTROL STATIONS TR390 AND TR391A. THESE COORDINATES HAVE NOT BEEN ADJUSTED TO 1983 DATUM.
29. A SECURITY SYSTEM SHALL BE INSTALLED AS REQUIRED BY CHAPTER 45, ARTICLE I, SECTION 45-2 OF THE CODE OF THE CITY OF DOVER. (AS APPLICABLE)
30. APPROVED BACKFLOW PREVENTERS SHALL BE PROVIDED FOR BOTH FIRE AND DOMESTIC WATER LINES.
31. THE PROPOSED STRUCTURES 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.
32. 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.
33. 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.
34. 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. IBC, ANSI-117.1) AND NH RSA 155-A:5.
35. DESIGN ENGINEER SHALL PROVIDE SIGNED LETTER TO CITY ENGINEER CERTIFYING THAT THE STORMWATER MANAGEMENT SYSTEM HAS BEEN INSTALLED IN ACCORDANCE WITH T APPROVED PLANS.
36. ALL MANHOLE COVERS SHALL BE LIFTMATE R-1743-LM OR APPROVED EQUAL WITH 90 DEGREE HINGE.
37. REQUIRED BLASTING AND EXCAVATION - DOVER FIRE DEPARTMENT SHALL BE NOTIFIED PRIOR TO ANY BLASTING ACTIVITIES AND A BLASTING PERMIT FROM THE DOVER FIRE DEPARTMENT MUST BE OBTAINED.
38. THE WATER MAIN SHALL BE POLY WRAPPED IN ACCORDANCE WITH THE CITY OF DOVER STANDARDS.
39. ALL SEWER MAINS AND MANHOLES SHALL BE TESTED IN ACCORDANCE WITH NHDES ENV-WQ 700 REQUIREMENTS. COPIES OF TEST RESULTS SHALL BE PROVIDED TO THE CITY OF DOVER ENGINEERING DEPARTMENT.
40. WETLAND PLACARDS SHOULD IDENTIFY THE NO CUT WETLAND BUFFER AND SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION AND AFTER.
41. ALL FITTINGS MUST BE CLASS 140 WATER FITTINGS.
42. ALL GATE VALVES MUST BE MANUFACTURED BY MUELLER OR CLOW.

1. COORDINATE REMOVAL, RELOCATION, DISPOSAL, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
2. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
3. THE CONTRACTOR SHALL NOTIFY "DIG SAFE" PRIOR TO ANY DEMOLITION/ CONSTRUCTION ACTIVITIES. (811).
4. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, UTILITIES AND PAVEMENT ON THIS SITE TO THE LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE HIMSELF WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
6. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS NOT ALREADY OBTAINED BY THE OWNER AND ARRANGE AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS.
8. STONES FROM REMOVED STONEWALLS SHALL REMAIN ON-SITE. STONES SHALL BE REPURPOSED ON-SITE AND SHALL NOT BE USED AS FILL.
9. THE LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATION IS NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
10. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES, AND CODES.
11. LEDGE REMOVAL VOLUMES ARE ENGINEERS ESTIMATES. CONTRACTOR IS RESPONSIBLE FOR CONDUCTING ADDITIONAL SUBSURFACE INVESTIGATIONS IF NECESSARY TO DETERMINE ESTIMATED VOLUMES.

1. REVIEW DOVER NOTES FOR ALL APPLICABLE NOTES.
2. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO APPLICABLE CITY AND STATE CODES.
3. ALL CONSTRUCTION LAYOUT SHALL BE DONE BY A LICENSED SURVEYOR UNDER CONTRACT WITH THE CONTRACTOR.
4. SEE DETAILS FOR SIGN LEGENDS.
5. ALL PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", THE "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICAN WITH DISABILITIES ACT, LATEST EDITIONS.
6. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE CONSTRUCTION PROBLEMS AND SEQUENCES TO ENSURE THE SAFETY OF THE FACILITIES AND THEIR COMPONENTS DURING DEMOLITION AND CONSTRUCTION UNLESS OTHERWISE DIRECTED BY THE OWNERS REPRESENTATIVE. THIS INCLUDES THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING, GUYS OR TIE-DOWNS. SUCH MATERIALS SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AT THE COMPLETION OF THE PROJECT.
7. METHODS OF DEMOLITION, CONSTRUCTION AND ERECTION ARE THE CONTRACTOR'S RESPONSIBILITY UNLESS OTHERWISE SPECIFIED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE AND MAINTAIN ENVIRONMENTAL CONTROLS AS REQUIRED BY FEDERAL, STATE AND MUNICIPAL REGULATIONS AND PERMITS. ENVIRONMENTAL CONTROLS SHALL INCLUDE BUT SHALL NOT BE LIMITED TO DUST CONTROL AND SILT BARRIERS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE DONE TO STRUCTURES OR UTILITIES OR INJURIES TO THE PUBLIC DURING THE CONSTRUCTION PHASE CAUSED BY HIMSELF, HIS EMPLOYEES, HIS SUBCONTRACTORS OR EMPLOYEES OF SAME. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL TEMPORARY FACILITIES FOR THE PROTECTION OF THE WORK, WORKERS AND PUBLIC SAFETY.
9. THE SITE SHALL BE MAINTAINED TO PROVIDE ACCESSIBILITY IN ALL WEATHER CONDITIONS.
10. REFUSE PICKUP WILL BE BY PRIVATE CONTRACTOR AND WILL BE VIA DUMPSTER ON-SITE.
11. SNOW STORAGE WILL BE ACCORDING TO THE OPERATION AND MAINTENANCE PLAN AND WITHIN AREAS AS INDICATED. ON-SITE SNOW STORAGE SHALL OCCUR ALONG THE EDGES OF PROPOSED PAVEMENT.
12. ALL EXTERIOR DOORS ARE MANUAL AND OPENED FROM THE INTERIOR BY PANIC HARDWARE. ALL EXTERIOR DOORS SHALL COMPLY WITH ADA AND ALL LOCAL BUILDING CODE REQUIREMENTS.

1. REVIEW COVER NOTES FOR ALL APPLICABLE NOTES.
2. CONTRACTOR SHALL RETAIN A GEOTECHNICAL ENGINEERING CONSULTANT APPROVED BY THE OWNER, TO CONDUCT COMPACTION TESTING AND FILL GRADATION MONITORING.
3. SEE EROSION CONTROL NOTES & DETAIL SHEET FOR TEMPORARY AND PERMANENT EROSION CONTROL MEASURES.
4. ALL DRAINAGE PIPES SHALL BE HDPE OR APPROVED EQUAL UNLESS OTHERWISE NOTED.
5. ALL DISTURBED AREAS NOT OTHERWISE CALLED FOR SURFACE TREATMENT SHALL RECEIVE 6" OF HIGH QUALITY LOAM AND SHALL BE SEEDDED WITH GRASS.
6. ALL SITEWORK CONSTRUCTION SHALL BE ADVANCED USING "BEST MANAGEMENT PRACTICES" SANCTIONED BY THE USDA, SCS AND NHDES.
7. TEMPORARY CONSTRUCTION ENTRANCE SHALL BE INSTALLED, UTILIZED AND MAINTAINED UNTIL BASE MATERIALS ARE CONSTRUCTED.
8. CONTRACTOR SHALL PROVIDE A FINISH GRADED SURFACE FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCE AND UNDER RAISED STRUCTURES.
9. PROVIDE INLET PROTECTION BARRIERS AROUND ALL EXISTING AND PROPOSED STORM DRAINAGE INLETS WITHIN THE WORK LIMITS AND AS SHOWN ON PLAN. MAINTAIN FOR THE DURATION OF THE PROJECT UNTIL PAVEMENT HAS BEEN INSTALLED AND UPSTREAM AREAS HAVE BEEN STABILIZED.
10. INSPECT SILT BARRIERS AFTER EACH RAIN STORM OF 1/4 INCH OR GREATER. REPAIR/MODIFY PROTECTION AS NECESSARY TO MAXIMIZE EFFICIENCY OF THE FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS 1/3 THE STRUCTURE HEIGHT.
11. A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IS REQUIRED FOR THIS PROJECT. THE SWPPP MUST INCLUDE THE APPROPRIATE BEST MANAGEMENT PRACTICES (BMP'S) TO MINIMIZE THE DISCHARGE OF POLLUTANTS FROM THE SITE. PARTIES RESPONSIBLE FOR DEVELOPING THE SWPPP SHOULD REFER TO THE EPA NDES CONSTRUCTION GENERAL PERMITS NOTICE OF INTENT FOR A COMPLETE OUTLINE OF REQUIRED ELEMENTS. THESE PLANS AND THE STORMWATER MANAGEMENT SYSTEM INSPECTION & MAINTENANCE PLAN PREPARED FOR THIS PROJECT MAY BE UTILIZED IN FULFILLING THE REQUIREMENTS.
12. LIMIT TREE CLEARING TO ONLY THE EXTENT NECESSARY FOR CONSTRUCTION.
13. CONTRACTOR SHALL NOTIFY THE CITY OF DOVER AND THE DESIGN ENGINEER 48 HOURS PRIOR TO THE INSTALLATION OF PERMANENT STORMWATER BMP'S TO PROVIDE THE CITY AND THE ENGINEER THE OPPORTUNITY TO WITNESS THE CONSTRUCTION AND MATERIALS. THE DESIGN ENGINEER MUST CERTIFY THAT THE STORMWATER MANAGEMENT SYSTEM HAS BEEN INSTALLED IN ACCORDANCE WITH THE APPROVED PLANS.
14. DENSITY REQUIREMENTS:

LOCATION	<u>MINIMUM DENSITY</u>
BELOW PAVED OR CONCRETE AREAS	95%
TRENCH BEDDING MATERIAL AND	
SAND BLANKET BACKFILL	95%
BELOW LOAM AND SEED AREA	90%

*ALL PERCENTAGES SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH AASHTO STANDARD 180, METHOD C. FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH AASHTO STANDARD T-191, T-204, OR T-238 AND T-239.

- REVIEW DOWER NOTES FOR ALL APPLICABLE NOTES.
- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES, AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION.
- ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
- SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
- ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, DOUBLE CEMENT LINED DUCTILE IRON PIPE OR TYPE "K" COPPER, OR CITY APPROVED MATERIAL.
- ALL WATER MAIN INSTALLATIONS SHALL BE PRESSURE TESTED AND CHLORINATED AFTER CONSTRUCTION PRIOR TO ACTIVATING THE SYSTEM. CONTRACTOR SHALL COORDINATE CHLORINATION AND TESTING WITH THE CITY OF DOVER WATER DEPARTMENT.
- ALL GRAVITY SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE NOTED AND CONFORM TO THE REQUIREMENTS OF THE CITY OF DOVER SEWER DEPARTMENT STANDARDS.
- EXISTING UTILITIES TO BE REMOVED SHALL BE CAPPED AT THE MAIN AND MEET THE CITY OF DOVER COMMUNITY SERVICES DEPARTMENT STANDARDS FOR CAPPING OF WATER AND SEWER SERVICES.
- ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
- THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE UTILITY COMPANIES. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
- THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATES TO THE OWNER PRIOR TO THE COMPLETION OF THIS PROJECT.
- THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
- CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES. COORDINATE WITH GAS COMPANY. A 10-FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18-INCH MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER/SANITARY SEWER CROSSINGS.
- THE CONTRACTOR SHALL CONTACT "DIG-SAFE" 72 HOURS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL HAVE THE "DIG-SAFE" NUMBER ON SITE AT ALL TIMES.
- SAWCUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
- GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF DOVER.
- COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF DOVER.
- CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
- CONTRACTOR SHALL PHASE UTILITY CONSTRUCTION, PARTICULARLY WATER MAIN AND GAS MAIN CONSTRUCTION AS TO MAINTAIN CONTINUOUS SERVICE TO ABUTTING PROPERTIES. CONTRACTOR SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
- SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PREPARED BY THE PROJECT ELECTRICAL ENGINEER.
- THE PROPOSED STRUCTURE SHALL COMPLY WITH CHAPTER 81, ARTICLE IV, SECTION 81-27 AND THE STATE BUILDING CODES OF THE CODE OF THE CITY OF DOVER.
- FIRE SUPPRESSION PLANS SHALL BE PROVIDED TO THE FIRE/INSPECTION DEPARTMENT PRIOR TO INSTALLATION AS APPROPRIATE.
- COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
- SEWAGE LOADING
9,600 S.F. SPECIALTY TRADE CONTRACTOR BUILDING
4,600 S.F. OFFICE
5,000 S.F. WAREHOUSE
ESTIMATED # EMPLOYEES = 30
PER NHDES ENV-WQ1008.03 TABLE 1008-1:
UNSPECIFIED OFFICE SPACE = 5 GPD/100 S.F.
WAREHOUSE = 10 GPD/ PERSON
DESIGN FLOW
OFFICE = 4,600 S.F. x 5 GPD/100 S.F. = 230 GPD
WAREHOUSE = 30 EMP'S x 10 GPD/EMPL. = 300 GPD
TOTAL = 530 GPD
- PUMP CHAMBERS ARE UNCLASSIFIED.
- AN EASEMENT WILL BE GRANTED TO THE CITY ALONG THE WATER LINES TO ALLOW ACCESS FOR OPERATION OF THE WATER INFRASTRUCTURE TO MAINTAIN WATER QUALITY.

NATURAL GAS: — UNITIL CORPORATION
CONTACT: DAVID MACLEAN
325 WEST ROAD
PORTSMOUTH, NH 03801
TEL: (603)-294-5261
EMAIL: MACLEAND@UNITIL.COM

WATER & SEWER: - CITY OF DOVER COMMUNITY SERVICES DEPARTMENT
PUBLIC WORKS & UTILITIES
CONTACT: KEN MANDROSCOFF, PE

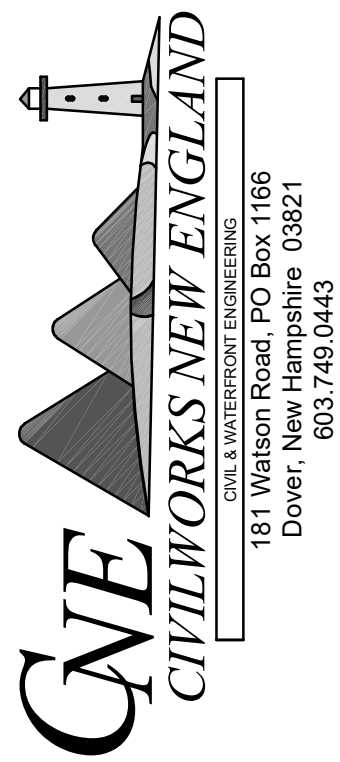
CONTACT: KEN MAVROGEORGE, PE
271 MAST ROAD
DOVER, NH 03820
TEL: (603)-516-6450
EMAIL: K.MAVROGEORGE@DOVER.NH.GOV

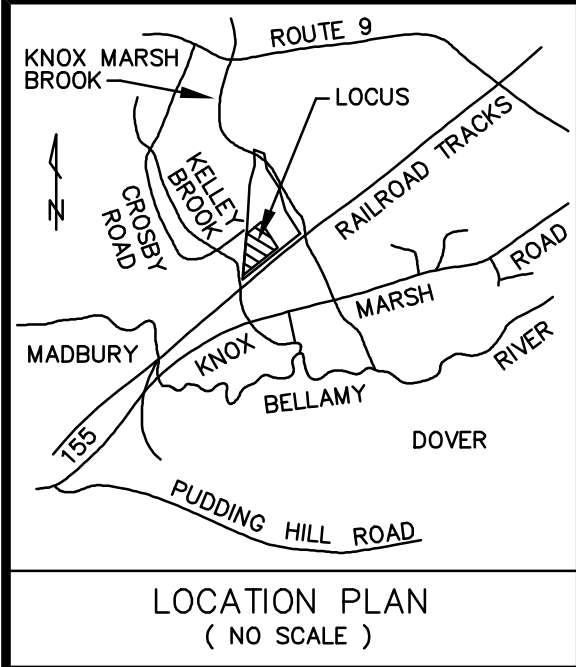
ELECTRIC: —
CONTACT: EVERSOURCE
TREVER EMMONS
4 OLD DOVER ROAD
ROCHESTER, NH 03867
TEL: (603)–332–7515
EMAIL: TREVER.EMMONS@EVERSOURCE.COM

NOTE SHEET

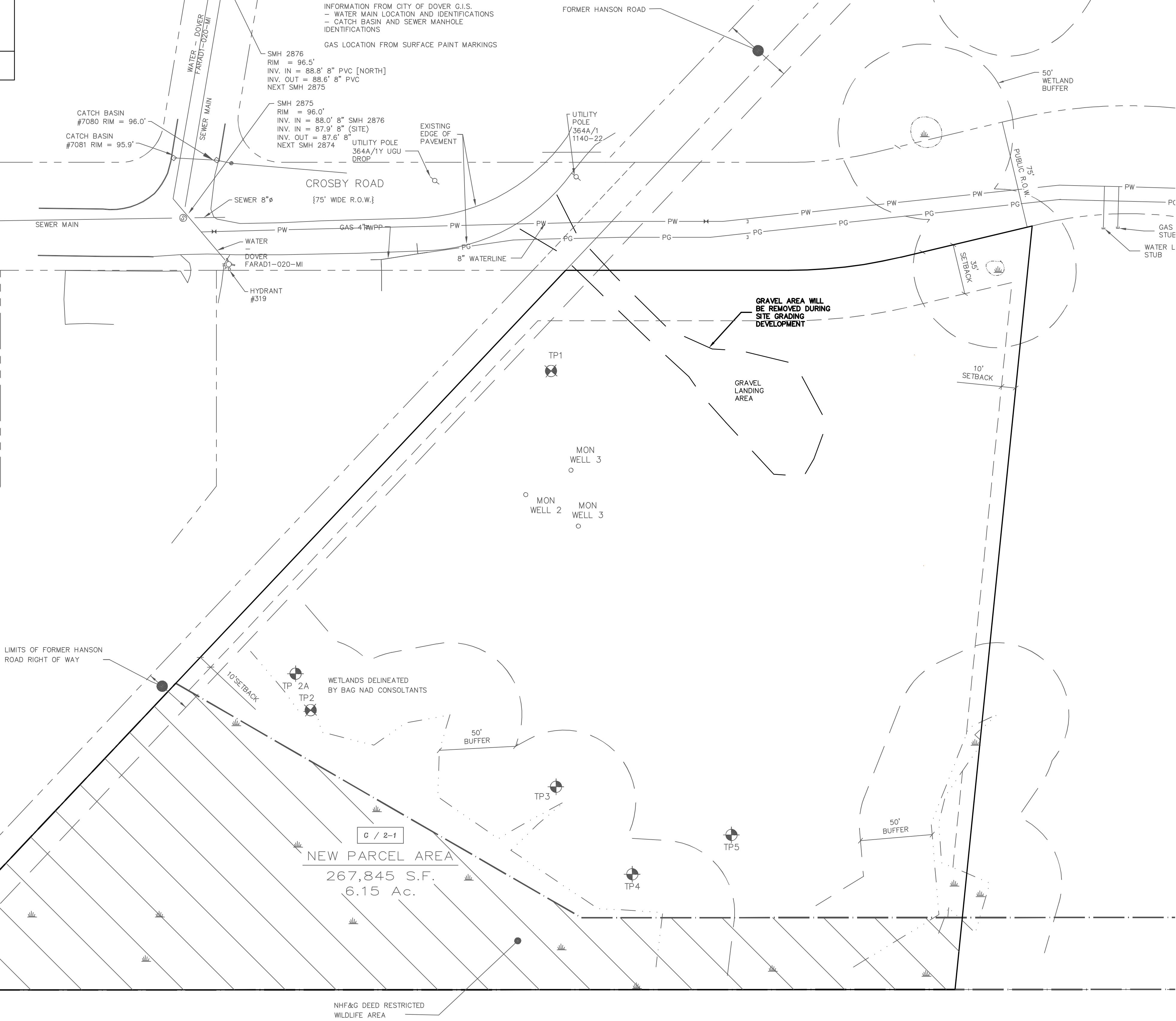
**LOT 2 DEVELOPMENT
DEL SOL DOVER, LLC
DOVER, NH**

4

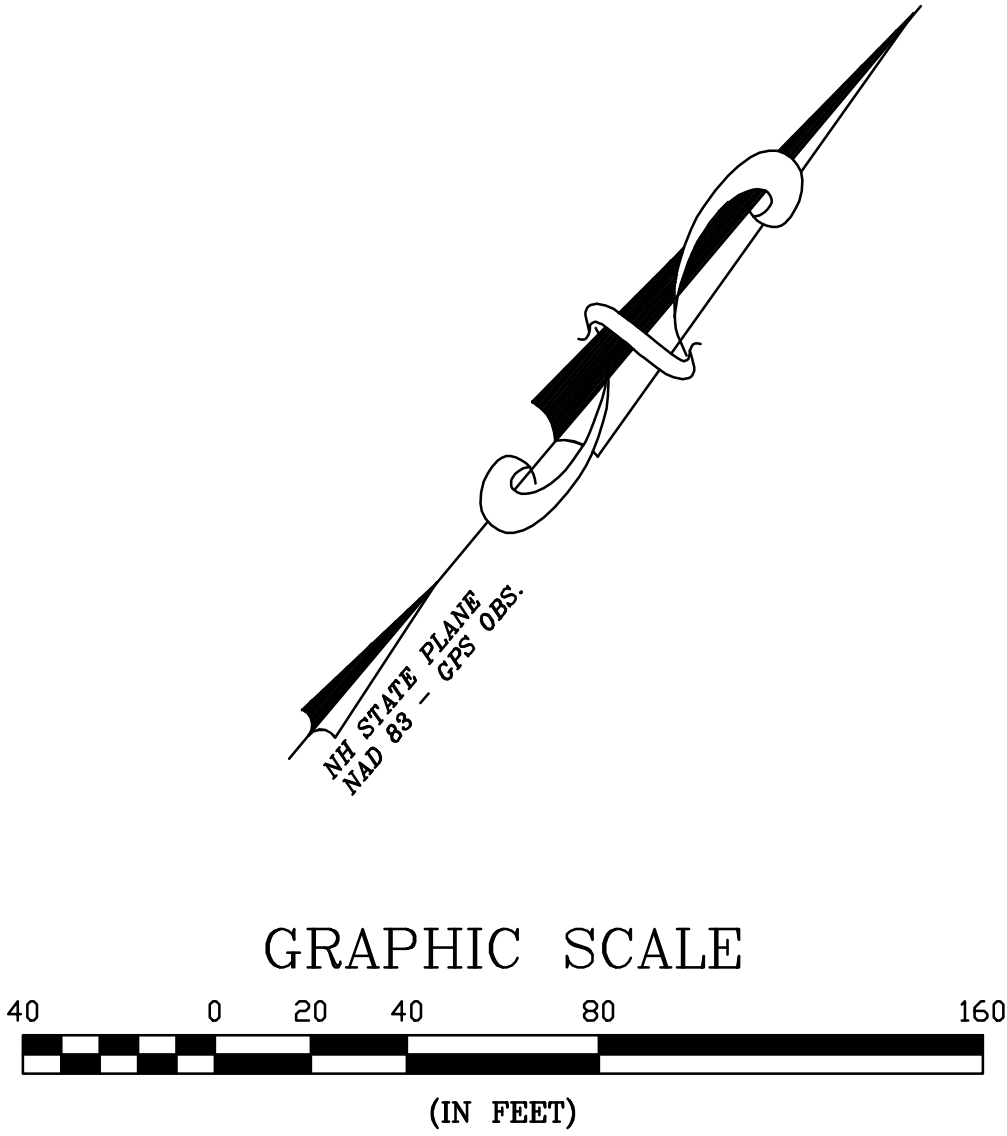


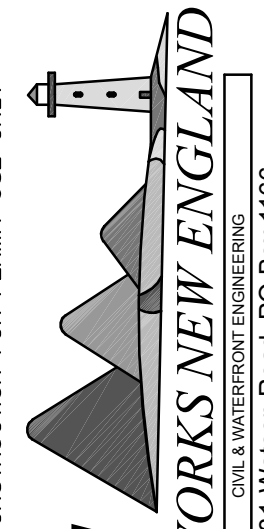


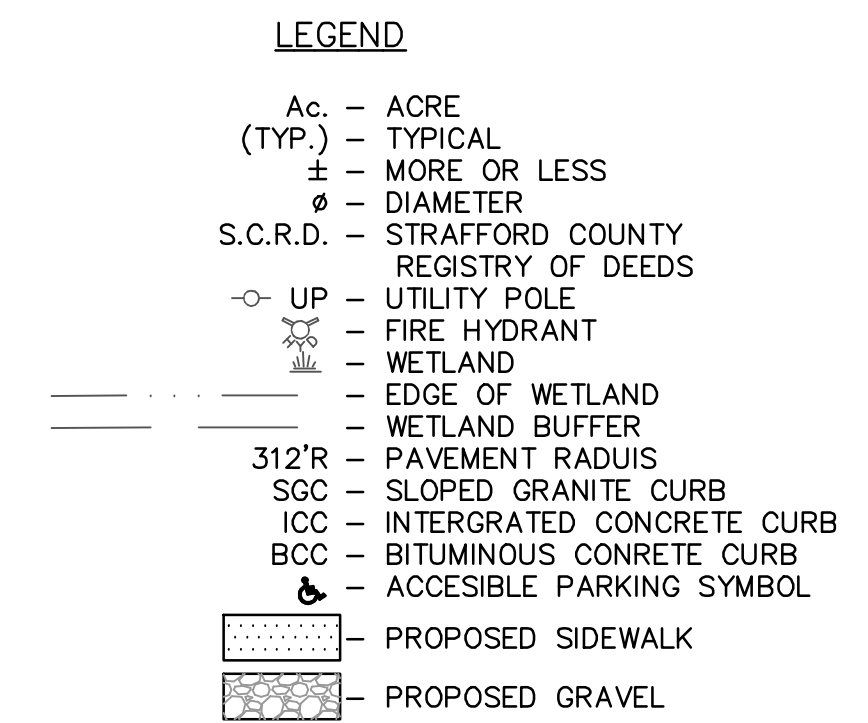
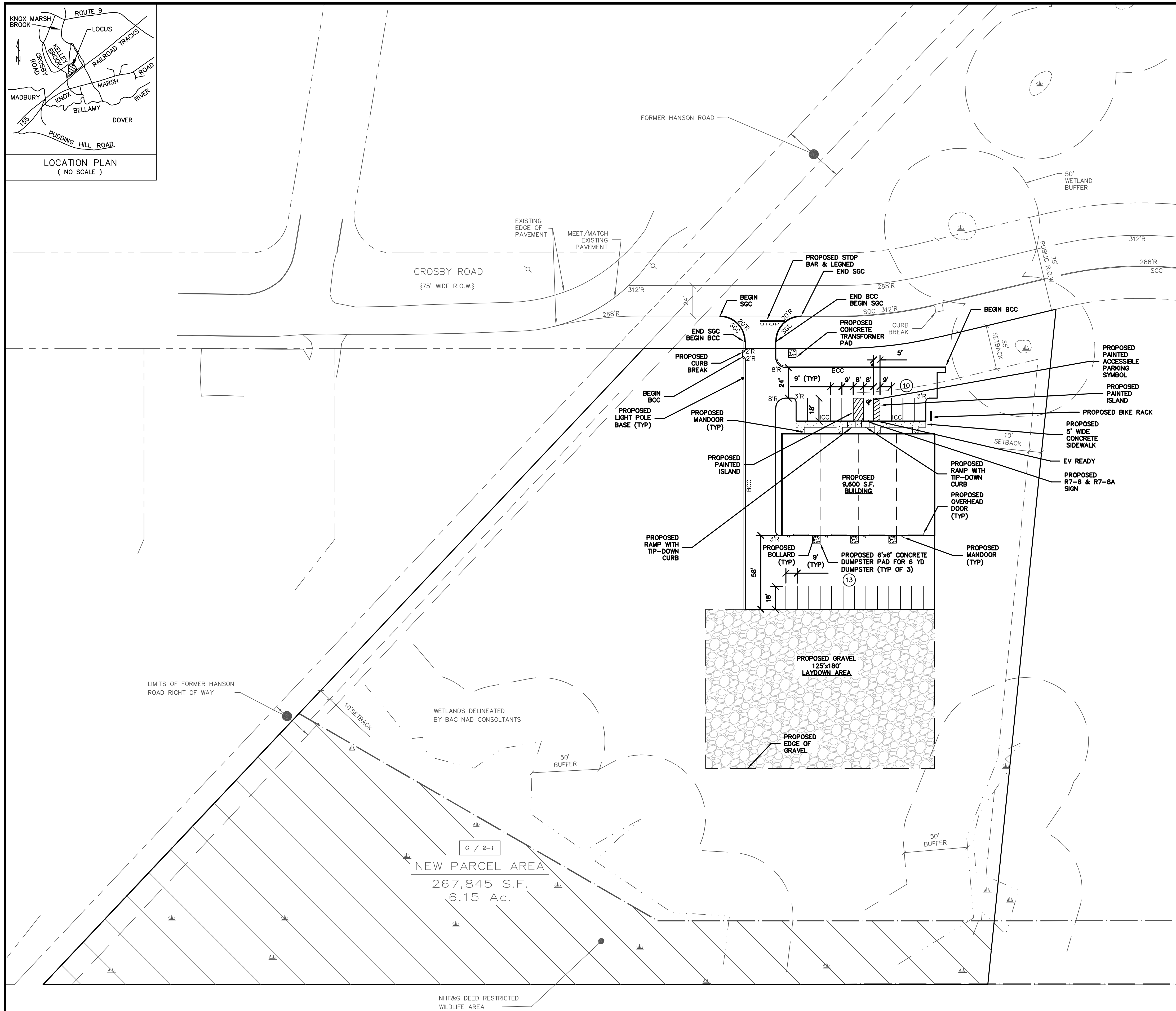
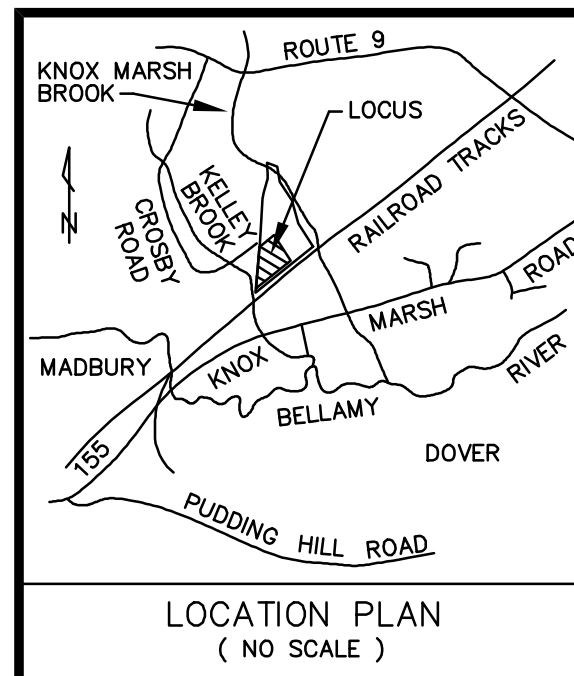
74
95.1'
= 86.62' 8" PVC SMH 2875
T = 86.42' 8" PVC
[NORTH]



- LEGEND**
- S.F. - SQUARE FEET
 - Ac. - ACRE
 - (TYP.) - TYPICAL
 - ± - MORE OR LESS
 - Ø - DIAMETER
 - S.C.R.D. - STRAFFORD COUNTY REGISTRY OF DEEDS
 - UP - UTILITY POLE
 - TBR - TO BE REMOVED
 - SMH - SEWER MANHOLE
 - W - WATER SHUT-OFF
 - WGV - WATER GATE VALVE
 - FH - FIRE HYDRANT
 - CL - CONTOUR LINE - 2' INTERVAL
 - EW - EDGE OF WETLAND
 - W - WETLAND
 - WB - WETLAND BUFFER



NOT FOR CONSTRUCTION FOR PERMIT USE ONLY		 181 Watson Road, PO Box 1166 Dover, NH 03820	
DATE: 8-6-24		NO.	
SCALE: 1" = 40'		REVISION	
DRAWN BY: SRD		APP'D	
DESIGN BY: JFG		DATE	
APPROVED BY: JH			
PROJECT NO: 24085			
FILE: SITE.DWG			
DEMOLITION PLAN		DEL SOL DOVER, LLC 340 CENTRAL AVENUE SUITE 202 DOVER, NH 03820	
LOT 2 DEVELOPMENT DEL SOL DOVER, LLC DOVER, NH		5	



PARKING CALCULATIONS

OFFICE 1 SPACE/300 S.F.

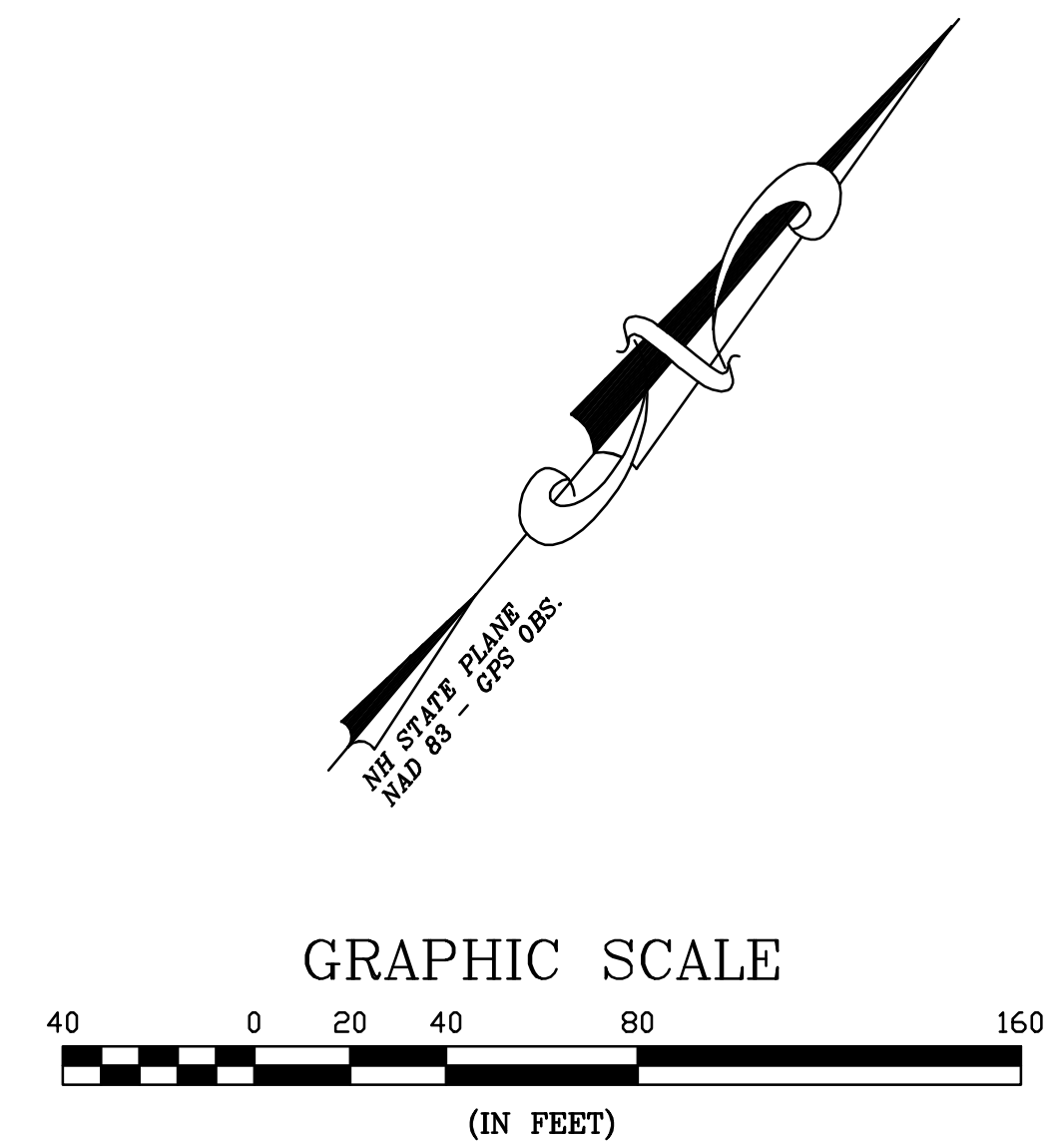
INDUSTRIAL 1 SPACE/800 S.F.

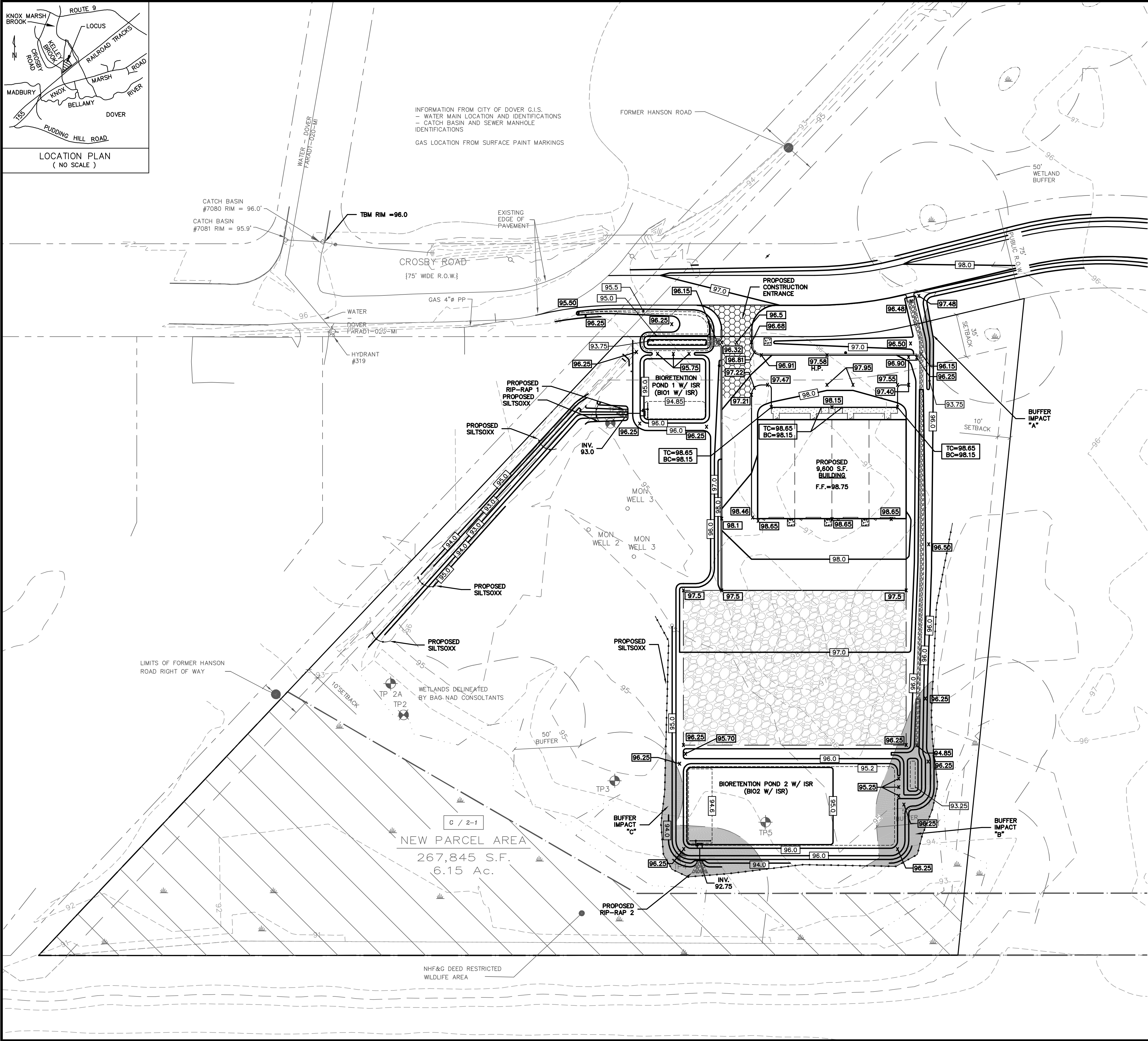
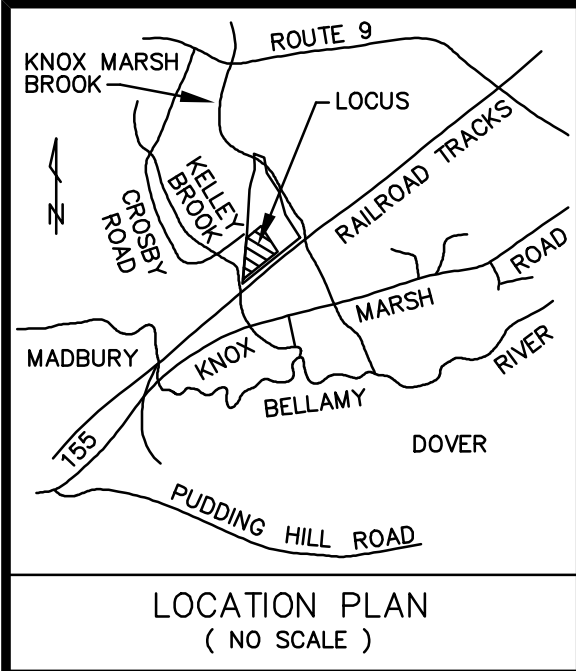
OFFICE: 4,600 S.F./300 = 16

INDUSTRIAL: 5,200 S.F./800 = 7

ALLOWED = 23

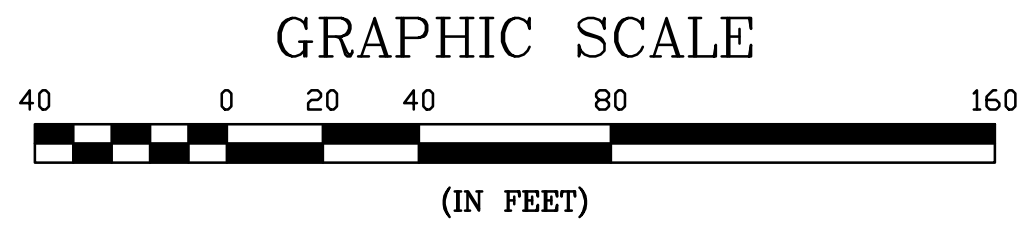
PROVIDED = 23





CONDITIONAL USE PERMIT
WETLAND BUFFER IMPACTS

IMPACT	AREA
A	104.3 S.F.
B	354.7 S.F.
C	327.5 S.F.
TOTAL	786.5 S.F.



- LEGEND
- S.F. - SQUARE FEET
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 - (TYP.) - TYPICAL
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 - S.C.R.D. - STRAFFORD COUNTY REGISTRY OF DEEDS
 - UP - UTILITY POLE
 - SMH - SEWER MANHOLE
 - WATER SHUT-OFF
 - WATER GATE VALVE
 - FIRE HYDRANT
 - CONTOUR LINE - 1' INTERVAL
 - EDGE OF WETLAND
 - WETLAND
 - WETLAND BUFFER
 - PROPOSED FINISH GRADE
 - PROPOSED SPOT ELEVATIONS
 - PROPOSED DRAIN LINE

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

CNE CIVILWORKS NEW ENGLAND
181 Watson Road, PO Box 1166
Dover, NH 03821

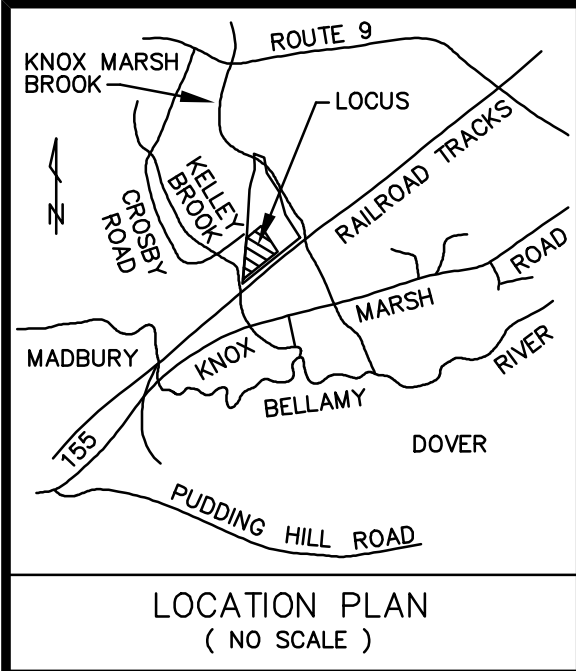
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8-6-24	1"=40'	SRD	JPG	BY:JH	24085					

GRADING, DRAINAGE & EROSION CONTROL PLAN

DEL SOL DOVER, LLC
340 CENTRAL AVENUE
SUITE 202
DOVER, NH 03820

LOT 2 DEVELOPMENT
DEL SOL DOVER, LLC
DOVER, NH

2



74
95.1'
= 86.62' 8" PVC SMH 2875
T = 86.42' 8" PVC
[NORTH]

LIMITS OF FORMER HANSON
ROAD RIGHT OF WAY

NEW PARCEL AREA
267,845 S.F.
6.15 Ac.

NHF&G DEED RESTRICTED
WILDLIFE AREA

INFORMATION FROM CITY OF DOVER G.I.S.
- WATER MAIN LOCATION AND IDENTIFICATIONS
- CATCH BASIN AND SEWER MANHOLE
IDENTIFICATIONS
GAS LOCATION FROM SURFACE PAINT MARKINGS

SMH 2876
RIM = 96.5'
INV. IN = 88.8' 8" PVC [NORTH]
INV. OUT = 88.6' 8" PVC
NEXT SMH 2875

SMH 2875
RIM = 96.0'
INV. IN = 88.0' 8" SMH 2876
INV. IN = 87.9' 8" (SITE)
INV. OUT = 87.6' 8" SMH 2874
NEXT SMH 2874

UTILITY POLE
364A/1Y UGU
DROP

EXISTING
EDGE OF
PAVEMENT

CROSBY ROAD
{75' WIDE R.O.W.}

HYDRANT
#319

FORMER HANSON ROAD

PROPOSED
OVERHEAD
UTILITIES

UTILITY
POLE
364A/1
1140-22

PROPOSED
2" TAP
WITH
SHUT-OFF

PSMH2
RIM=97.2
INV.IN=89.6
INV.OUT=89.5
8" SDR35
L=230'
S=.004

PROPOSED
UTILITY
POLE

PSMH 3
RIM=98.2
INV.IN=90.60
INV.OUT= 90.50

50' WETLAND
BUFFER

PROPOSED
UNDERGROUND
UTILITIES

PROPOSED TRANSFORMER

PROPOSED 93 LF
6" PVC
S=1%

PROPOSED
9,600 S.F.
BUILDING
F.F.=98.75

PROPOSED FUTURE
EV CHARGING
STATION ELECTRICAL
LINE

10' SETBACK

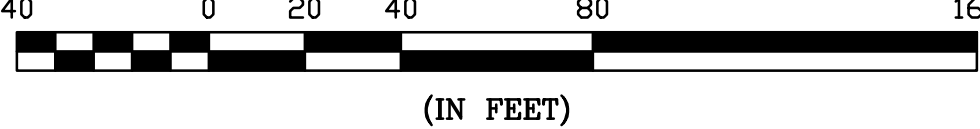
35' SETBACK

LEGEND

- S.F. = SQUARE FEET
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- (TYP.) = TYPICAL
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- Ø = DIAMETER
- S.C.R.D. = STRAFFORD COUNTY
REGISTRY OF DEEDS
- UP = UTILITY POLE
- SMH = SEWER MANHOLE
- WATER SHUT-OFF
- WATER GATE VALVE
- FIRE HYDRANT
- EDGE OF WETLAND
- WETLAND
- WETLAND BUFFER
- PROPOSED RAIN LINE
- PROPOSED WATER
- PROPOSED UTILITY LINES
- PROPOSED SEWER LINE
- PROPOSED GAS LINE

NH STATE PLANS
H&D 83 - 095 OBS.

GRAPHIC SCALE

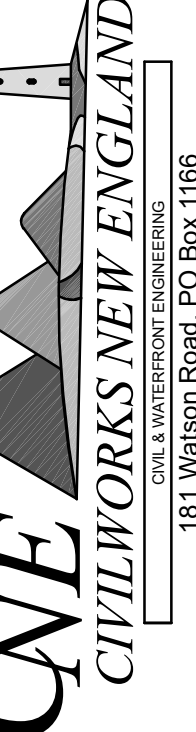


UTILITY PLAN

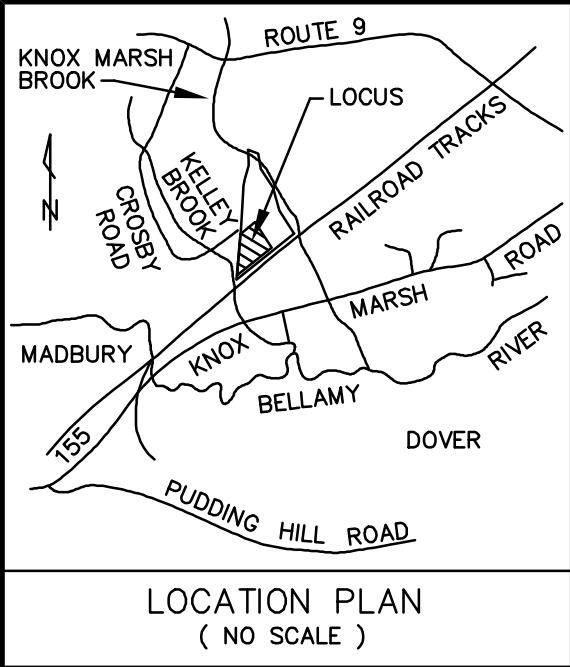
DEL SOL DOVER, LLC
340 CENTRAL AVENUE
SUITE 202
DOVER, NH 03820

LOT 2 DEVELOPMENT
DEL SOL DOVER, LLC
DOVER, NH

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY



DATE	SCALE	DRAWN BY	DESIGN BY	APPROVED BY	PROJECT NO.	FILE SITE DWG	NO.	REVISION	APP'D	DATE
8-6-24	1"=40'	SRD	JPG	BYSJH	24085					



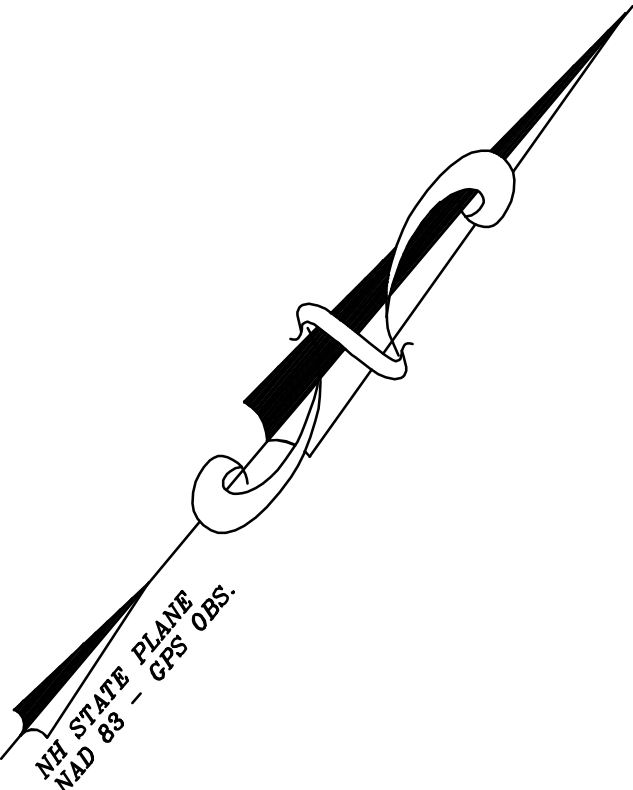
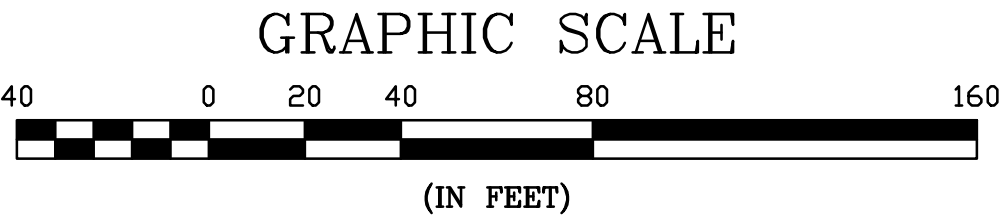
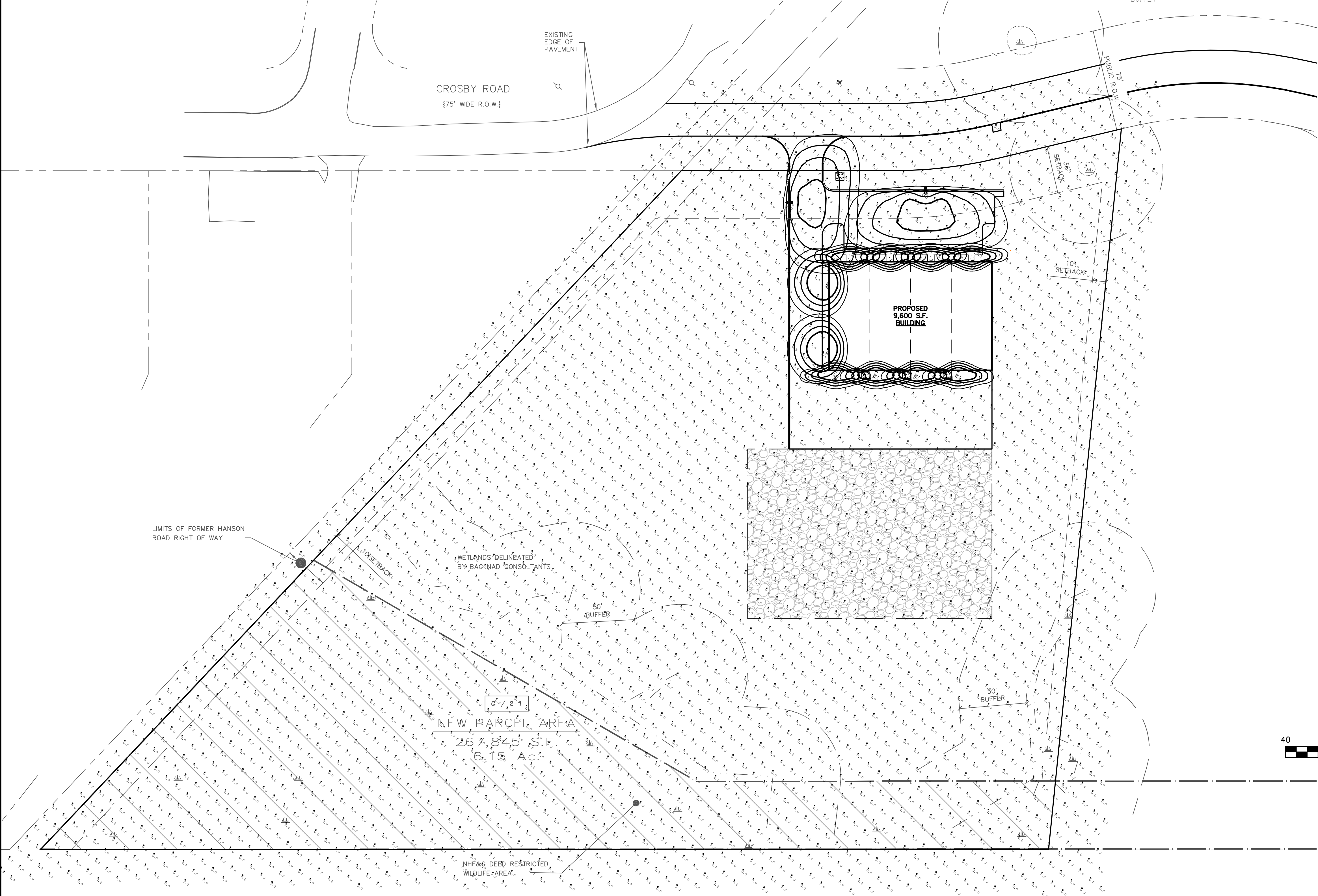
Luminaire Schedule					
Symbol	Qty	Label	Arrangement	Description	Tag
□	1	S2	Single	MRM-LED-09L-SIL-FT-UNV-DIM-30-70CRI-IL-CXX / 4SQ B3 S11G20 S AB 4BC	20' POLE
□	1	S3	Single	MRM-LED-09L-SIL-3-UNV-DIM-30-70CRI-IL-CXX / 4SQ B3 S11G20 S AB 4BC	20' POLE
□	2	W	Single	XWS-LED-03L-MTD-UNV-DIM-30-80CRI-CXX	WALL MOUNTED 12' AFG
□	8	W1	Single	EOFIMV3KCXXPSC	WALL MOUNTED 9' AFG
					{MANUFAC}
					LSI INDUSTRIES, INC.
					LSI INDUSTRIES, INC.
					LSI INDUSTRIES, INC.
					NICOR, Inc.

FRONT PARKING LOT AREA

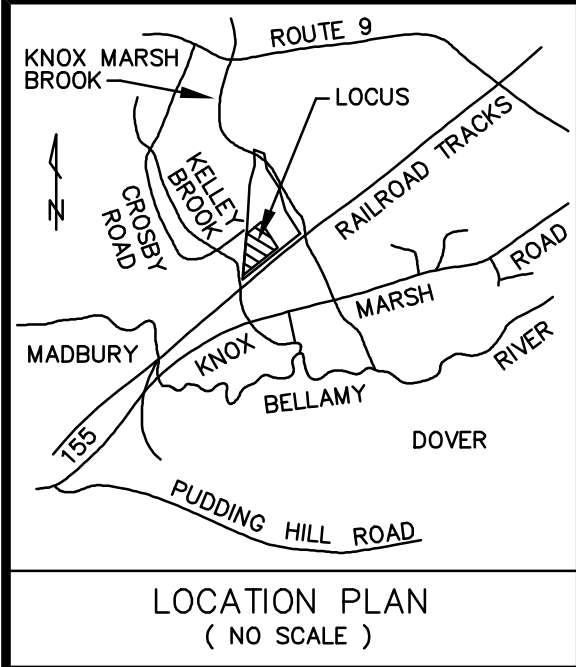
Illuminance (Fc)
Average = 1.29
Maximum = 2.8
Minimum = 0.5
Avg/Min Ratio = 2.58
Max/Min Ratio = 5.60

REAR PARKING LOT AREA

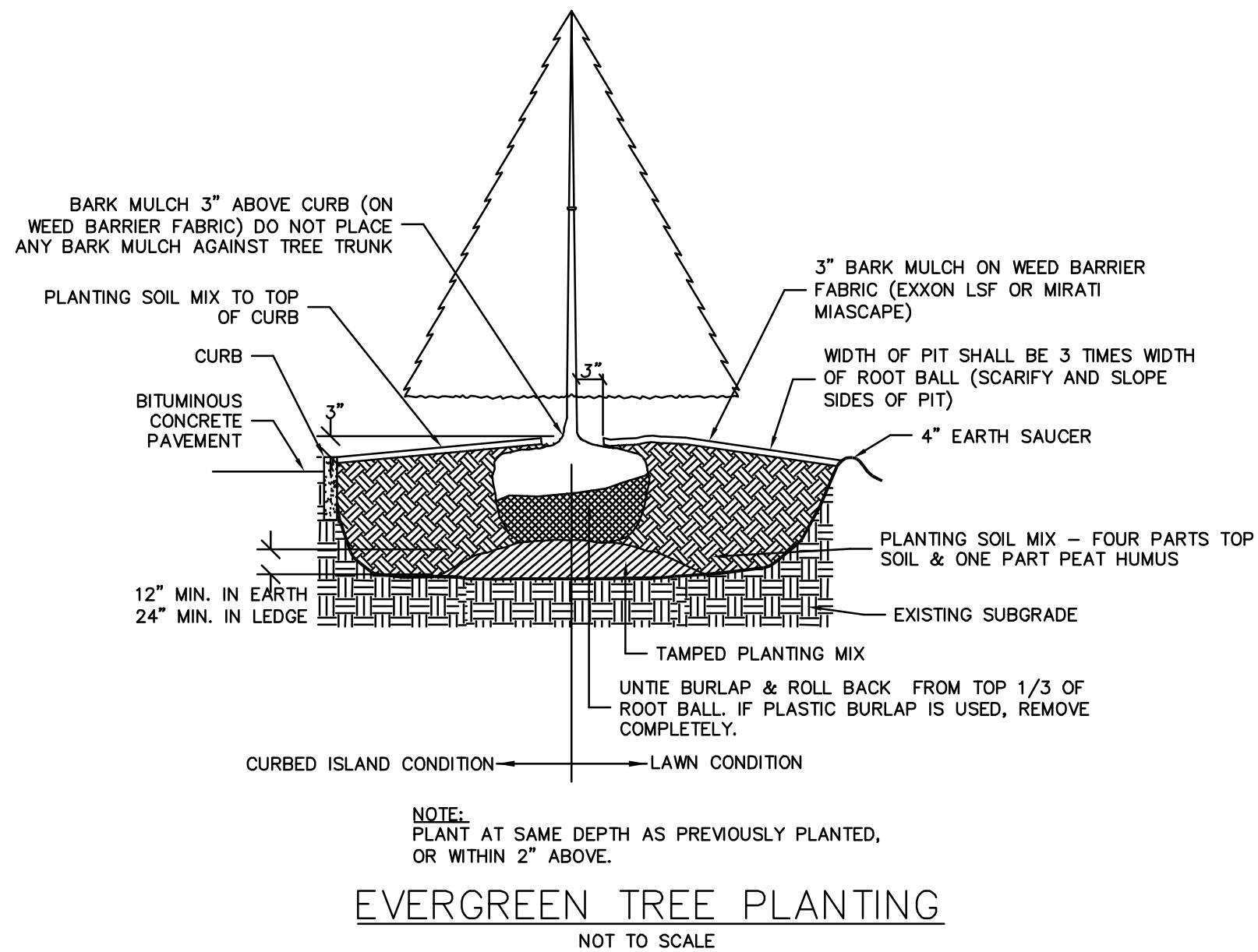
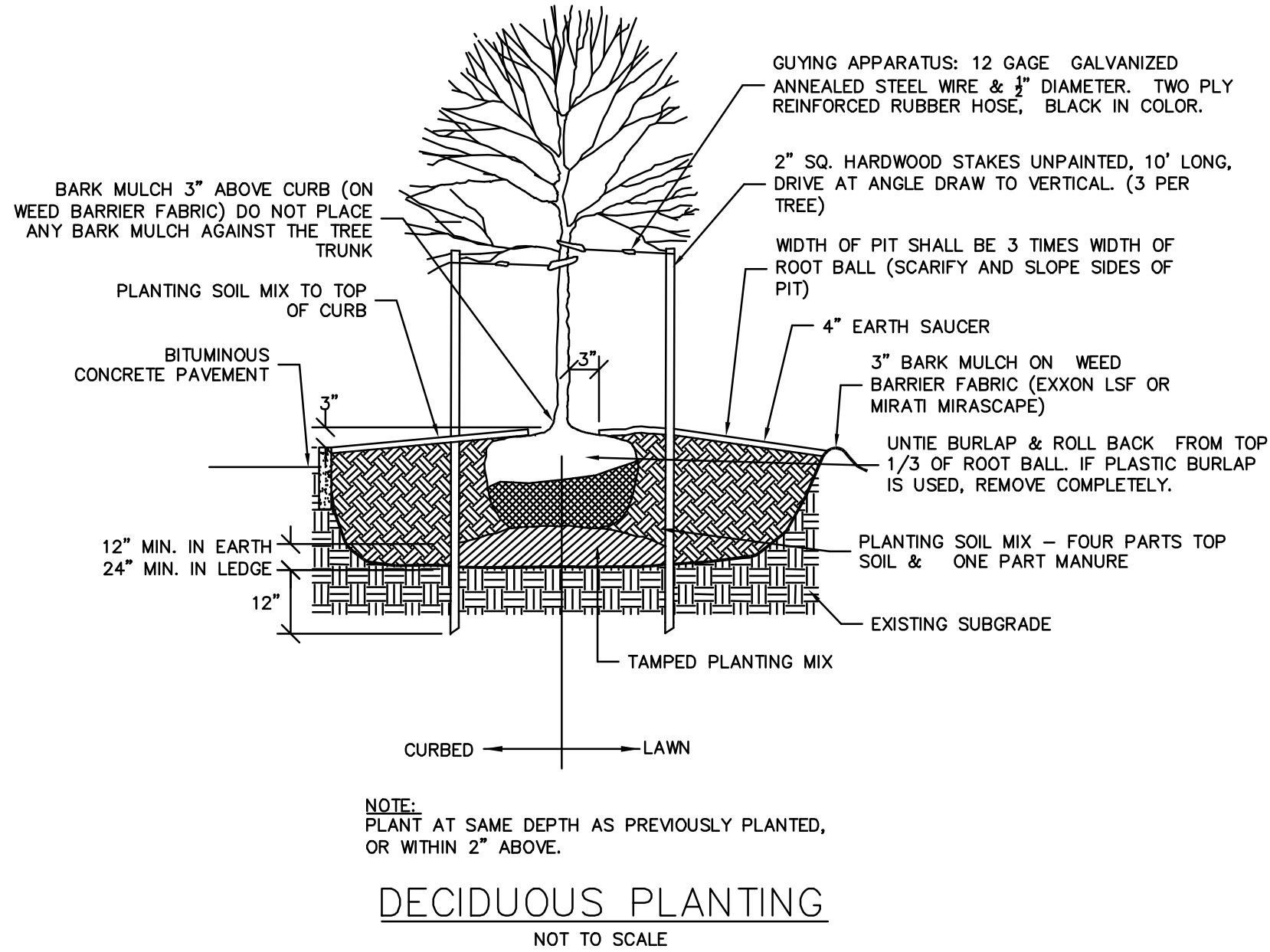
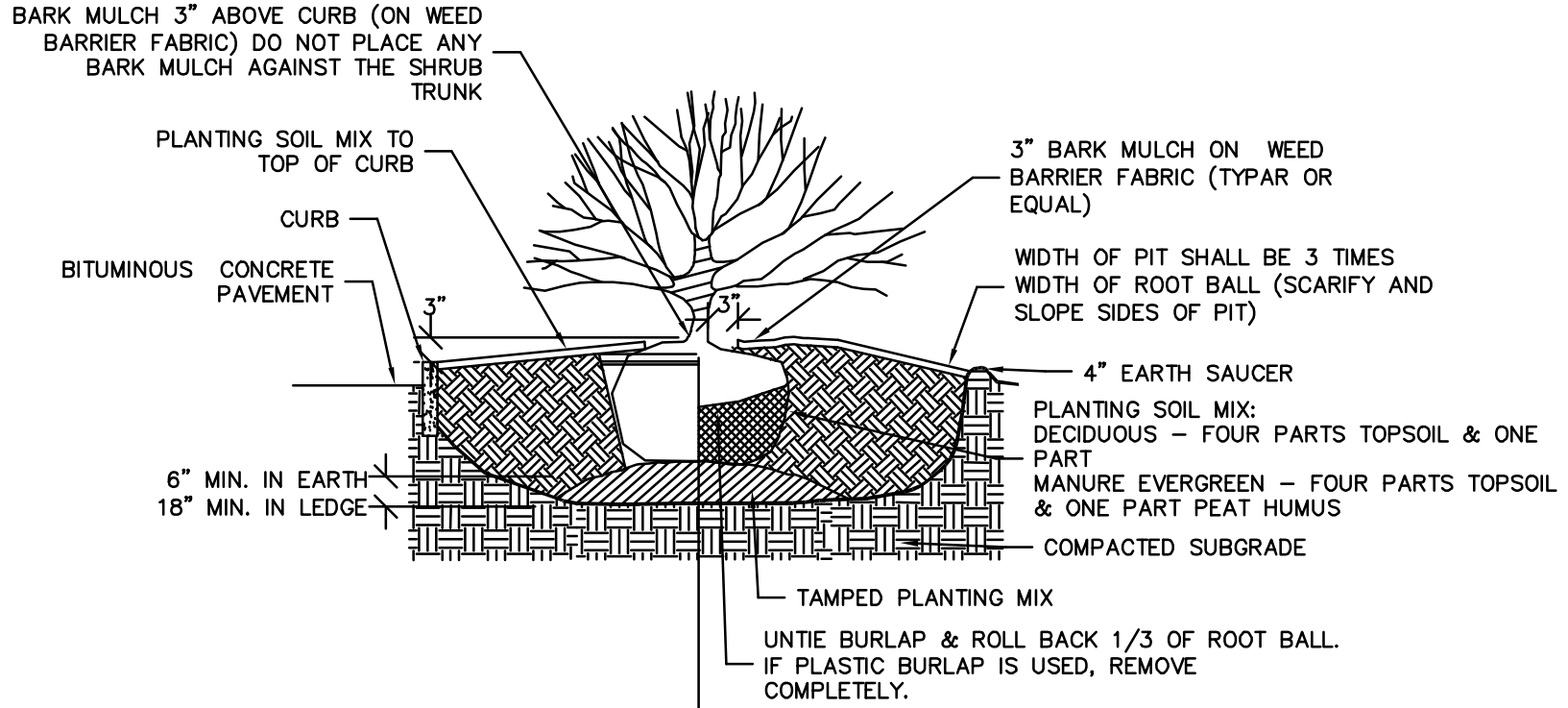
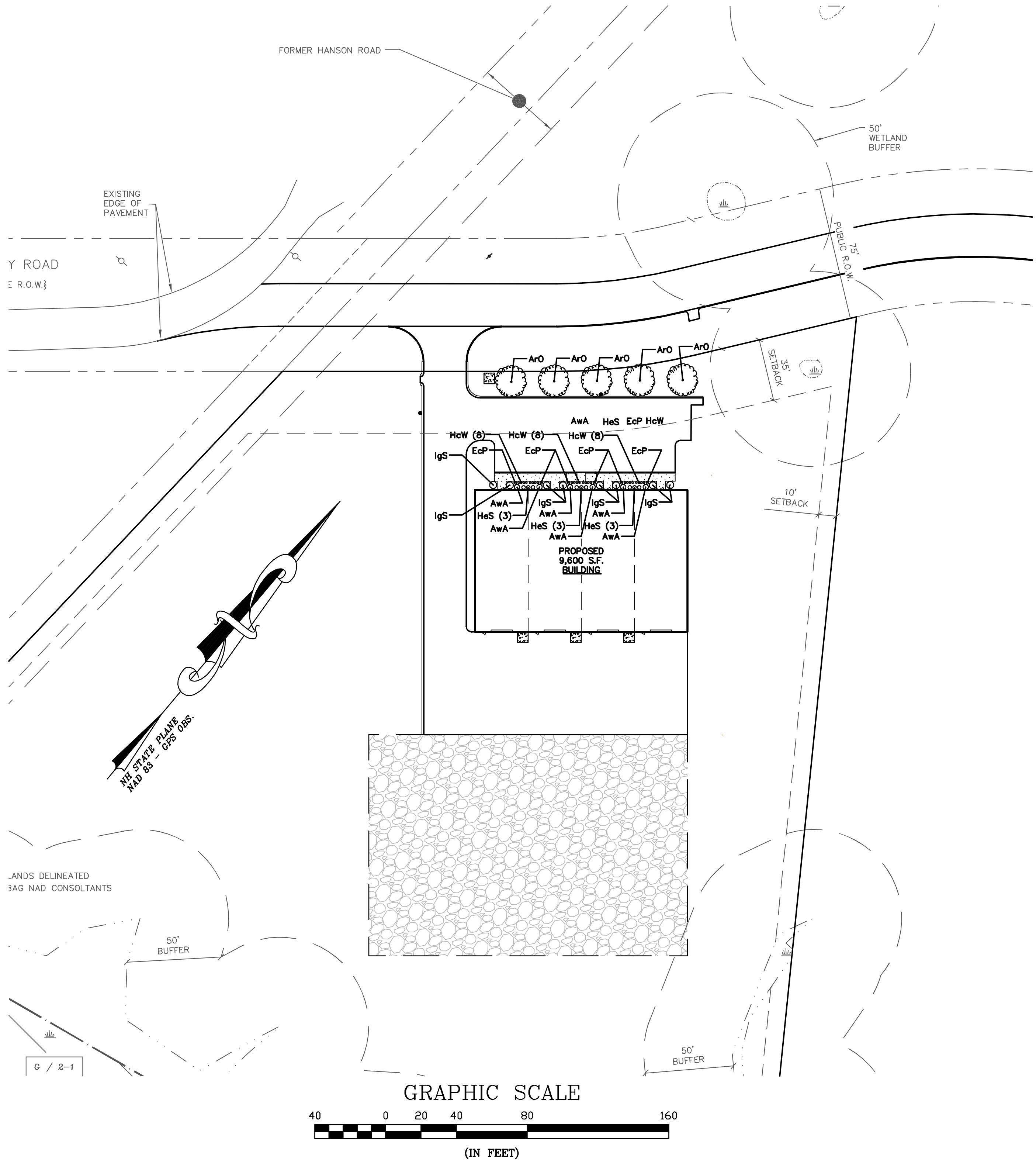
Illuminance (Fc)
Average = 0.49
Maximum = 6.1
Minimum = 0.0
Avg/Min Ratio = N.A.
Max/Min Ratio = N.A.



DATE	SCALE	DRAWN BY	DESIGN BY	APPROVED BY	PROJECT NO.	FILE SITE-DWG	NO.	REVISION	APP'D	DATE
8-6-24	1"=40'	BY: SRD	BY: JFG	BY: JH	24085					



PLANT SCHEDULE					
QTY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	
5	ARO	ACER RUBRUM 'OCTOBER GLORY'	OCTOBER GLORY RED MAPLE	3 - 3.5" C	
8	IGS	ILEX GLABRA 'SHAMROCK'	SHAMROCK HOLLY	#5	
6	AMA	ARONIA MELANOCARPA 'AUTUMN MAGIC'	AUTUMN MAGIC CHOKEBERRY	#5	
9	HES	HYDRANGEA 'ENDLESS SUMMER'	ENDLESS SUMMER HYDRANGEA	#3	
6	EcP	ECHINACEA PURPUREZ	CONEFLOWER	#1	
24	HCW	HEMEROCALLIS CATHERINE WOODBURY	CAHTERINE WOODBURY DAYLILY	#1	



NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

CNE CIVILWORKS NEW ENGLAND
181 Watson Road, PO Box 1166
Dover, NH 03820

DATE	SCALE	DRAWN BY	DESIGN BY	APPROVED BY	PROJECT NO.	FILE SITE	NO.	REVISION	APP'D	DATE
8-6-24	1"=40'	SRD	JPG	BY: SJH	24085	NO. 24085				

LANDSCAPING PLAN

DEL SOL DOVER, LLC
340 CENTRAL AVENUE
SUITE 202
DOVER, NH 03820

LOT 2 DEVELOPMENT
DEL SOL DOVER, LLC
DOVER, NH

11

DESCRIPTION

1. THE INTENT OF THIS PLAN IS TO SHOW SITE IMPROVEMENTS FOR A 9,600 S.F. COMMERCIAL BUILDING WITH THE ASSOCIATED WATER, SEWAGE, AND ELECTRIC UTILITY IMPROVEMENTS.

PROJECT NAME AND LOCATION

DEL SOL DOVER, LLC
3 LOT SUBDIVISION CROSBY RD EXTENSION DOVER, NEW HAMPSHIRE 03820

LATITUDE N43° 10' 49"

LONGITUDE W70° 54' 41"

DISTURBED AREA

±142,500 S.F.

NOTES:

1. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT IN NO CASE SHALL EXCEED 5 ACRES AT ANY TIME BEFORE DISTURBED AREAS ARE STABILIZED.
2. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.

SEQUENCE OF MAJOR ACTIVITIES

1. CONTRACTOR SHALL PREPARE THE SWPPP, FILE FOR AND OBTAIN THE NOI A MINIMUM OF 2 WEEKS PRIOR TO COMMENCEMENT OF SITE WORK.
2. PLACE TEMPORARY EROSION AND SEDIMENT CONTROL BMP'S PRIOR TO EARTH MOVING ACTIVITIES.
3. ALL EROSION CONTROL AND PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO COMMENCING EARTH MOVING OPERATIONS.
4. SELECTIVE DEMOLITION.
5. REGRADE SITE TO SUBGRADE.
6. TEMPORARY WATER DIVERSION (SWALES, BASINS) MUST BE USED AS NECESSARY UNTIL AREAS ARE STABILIZED.
7. SWALES AND PONDS (AS APPLICABLE) SHALL BE CONSTRUCTED EARLY ON IN THE CONSTRUCTION SEQUENCE AND BEFORE ROUGH GRADING OF THE SITE AND ALL DITCHES AND SWALES SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
8. INSTALL DRAINAGE STRUCTURES AND CONTROLS.
9. INSTALL FOUNDATION FOOTINGS AND WALLS.
10. INSTALL UTILITIES.
11. PLACE GRAVELS AND FINE GRADE.
12. STABILIZE ROADWAYS AND PARKING AREAS WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
13. ALL CUT AND FILL SLOPES SHALL BE LOAMED AND SEEDED (AS APPLICABLE) WITHIN 72 HOURS OF ACHIEVING FINISH GRADE.
14. ALL EROSION CONTROL MEASURES SHALL BE INSPECTED AT LEAST WEEKLY AND AFTER EVERY 1/2" OF RAINFALL.
15. IN ALL CASES THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION AND IN NO CASE SHALL EXCEED 5 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED. ALL DISTURBED AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
16. WHEN A SITE WORK IS COMPLETE AND ALL DISTURBED AREAS ARE STABILIZED REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AND FILE THE EPA – N.O.T.

DEFINITIONS

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

1. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED
2. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED
3. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP-RAP HAS BEEN INSTALLED; OR
4. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED

INSTALLATION, MAINTENANCE, AND INSPECTION PROCEDURES OF EROSION AND SEDIMENT CONTROLS

A. SILT BARRIER

1. INSTALLATION
a. USE SILT BARRIER AS PERIMETER CONTROLS, PARTICULARLY AT THE LOWER OR DOWN SLOPE EDGE OF A DISTURBED AREA.
b. LEAVE SPACE FOR MAINTENANCE BETWEEN TOE AND SLOPE OF SILT BARRIER.
c. TRENCH IN THE SILT BARRIER ON THE UPHILL SIDE (6 INCHES DEEP BY 8 INCHES WIDE)
d. INSTALL STAKES ON THE DOWNHILL SIDE OF THE SILT BARRIER.
e. CURVE THE END OF THE SILT BARRIER UP–GRADIENT TO HELP IT CONTAIN RUNOFF.
2. SEQUENCE OF INSTALLATION
a. SEDIMENT BARRIERS SHALL BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF THE CONTRIBUTING DRAINAGE AREA ABOVE THEM.
3. MAINTENANCE
a. SILT BARRIERS SHOULD BE INSPECTED AND MAINTAINED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.
b. SILT BARRIERS HAVE A USEFUL LIFE OF ONE SEASON. ON LONGER CONSTRUCTION PROJECTS, SILT BARRIERS SHOULD BE REPLACED PERIODICALLY TO MAINTAIN EFFECTIVENESS.
c. REMOVE SEDIMENT WHEN IT REACHES ONE–THIRD (1/3) THE HEIGHT OF THE SILT BARRIER.
d. REPLACE THE SILT BARRIERS WHERE THEY ARE TORN, WORN, OR OTHERWISE DAMAGED AND MONITOR PERFORMANCE TO ENSURE EFFECTIVE PERFORMANCE.
e. RETRENCH OR REPLACE ANY SILT BARRIER THAT IS NOT PROPERLY ANCHORED TO THE GROUND.
f. IF THERE IS EVIDENCE OF END FLOW ON PROPERLY INSTALLED BARRIERS, EXTEND BARRIERS UPHILL OR CONSIDER REPLACING THEM WITH OTHER MEASURES, SUCH AS TEMPORARY DIVERSIONS AND SEDIMENT TRAPS.
g. SILT BARRIERS SHOULD BE REPAIRED IMMEDIATELY IF THERE ARE ANY SIGNS OF EROSION OR SEDIMENTATION BELOW THEM. IF THERE ARE SIGNS OF UNDERCUTTING AT THE CENTER OR THE EDGES OF THE BARRIER, OR IMPOUNDING OF LARGE VOLUMES OF WATER BEHIND THEM, SILT BARRIERS SHOULD BE REPLACED WITH A TEMPORARY CHECK DAM.

B. MULCHING

1. TIMING
a. APPLY MULCH PRIOR TO ANY STORM EVENT. IT WILL BE NECESSARY TO CLOSELY MONITOR WEATHER PREDICTIONS TO HAVE ADEQUATE WARNING OF SIGNIFICANT STORMS.
b. IN OTHER AREAS, THE TIME PERIOD CAN RANGE FROM 14 TO 30 DAYS OF INACTIVITY ON A AREA. THE LENGTH OF THE VARYING WITH SITE CONDITIONS. PROFESSIONAL JUDGEMENT SHALL BE USED TO EVALUATE THE INTERACTION OF SITE CONDITIONS (SOIL ERODIBILITY, SEASON OF YEAR, EXTENT OF DISTURBANCE, PROXIMITY TO SENSITIVE RESOURCES, ETC.) AND THE POTENTIAL IMPACT OF EROSION ON ADJACENT AREAS TO CHOOSE AN APPROPRIATE TIME RESTRICTION.
c. WITHIN 100 FEET OF RIVERS, STREAMS, WETLANDS, AND IN LAKE AND POND WATERSHEDS, THE TIME PERIOD OF WHICH MULCHING SHOULD TAKE OCCUR SHOULD BE NO GREATER THAN SEVEN (7) DAYS. THIS SEVEN DAY LIMIT SHOULD BE REDUCED FURTHER DURING WET WEATHER PERIODS.
2. APPLICATION RATE
a. MULCH SHALL BE APPLIED AT A RATE OF BETWEEN 1.5 TO 2 TONS PER ACRE, OR 70 TO 90 POUNDS PER 1000 SQUARE FEET.
b. GUIDELINES FOR WINTER MULCH APPLICATION. WHEN MULCH IS APPLIED TO PROVIDE PROTECTION OVER WINTER (PAST THE GROWING SEASON) IT SHALL BE AT A RATE OF 150–200 POUNDS OF HAY OR STRAW PER ACRE WITH ABOUT 4 INCHES IN DEPTH. A TACKIFIER MAY BE ADDED TO THE MULCH.
3. MAINTENANCE
a. ALL MULCHES MUST BE INSPECTED PERIODICALLY, IN PARTICULAR AFTER RAINSTORMS. CHECK FOR SIGNS OF EROSION OR DISPLACEMENT OF THE MULCH. IF LESS THAN 90% OF THE SOIL SURFACE IS COVERED BY MULCH, ADDITIONAL MULCH SHALL BE IMMEDIATELY APPLIED.
b. NETS MUST BE INSPECTED AFTER RAIN EVENTS FOR DISLOCATION OR FAILURE AND SHOULD BE REPAIRED AS NECESSARY.
c. INSPECTIONS SHOULD TAKE PLACE UNTIL THE SITE IS ESTABLISHED.
d. EROSION CONTROL MIX MULCH USED FOR TEMPORARY STABILIZATION SHOULD BE LEFT IN PLACE. VEGETATION ADDS STABILITY AND SHOULD BE PROMOTED.

C. TEMPORARY SEEDING

1. SEEDED PREPARATION
a. STONES AND TRASH SHOULD BE REMOVED SO AS NOT TO INTERFERE WITH THE SEEDING AREA.
b. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED.
c. APPLY LIME/STONE AND FERTILIZER ACCORDING TO SOIL TEST RECOMMENDATIONS.
i) APPLY FERTILIZER AT A RATE OF 600 POUNDS PER ACRE OR 13.8 POUNDS PER 1,000 SQUARE FEET OF LOW PHOSPHATE FERTILIZER OR EQUIVALENT.
ii) APPLY LIME/STONE AT A RATE OF 3 TONS PER ACRE OR 138 POUNDS PER 1,000 SQUARE FEET.
2. SEEDING
a. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL, CULTIPACKER TYPE SEEDER OR HYDROSEEDER (SUMMARY INCLUDING SEED AND FERTILIZER) WITH A SEEDING DEPTH FROM A QUARTER (1/4) TO A HALF (1/2) INCH.
b. SEEDING RATES MUST BE INCREASED BY 10% WHEN HYDROSEEDING.
c. TEMPORARY SEEDING BETWEEN MAY 15TH AND AUGUST 15TH SHOULD BE COVERED WITH HAY OR STRAW MULCH, ACCORDING TO THE "TEMPORARY AND PERMANENT MULCHING" PRACTICE.
d. VEGETATED GROWTH COVERING 85% OF THE DISTURBED AREA SHOULD BE ACHIEVED PRIOR TO OCTOBER 15TH.
3. MAINTENANCE
a. TEMPORARY SEEDING SHALL BE INSPECTED PERIODICALLY. AT A MINIMUM, 85% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHALL BE MADE AND OTHER TEMPORARY MEASURES USED IN THE INTERIM (MULCH, FILTER FABRICS, CHECK DAMS, ETC.).

D. PERMANENT SEEDING

1. BEDDING – STONES LARGER THAN 2 INCHES, TRASH, ROOTS, AND OTHER DEBRIS INTERFERING WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA SHOULD BE REMOVED. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF 4" TO PREPARE A SEEDBED AND MIX FERTILIZER INTO THE SOIL.
2. FERTILIZER
a. LIME AND FERTILIZER SHOULD BE WORKED INTO THE SOIL TO A DEPTH OF 4 INCHES USING A DISC, SPRING TOOTH HARROW, OR OTHER SUITABLE EQUIPMENT PRIOR TO OR AT THE SAME TIME OF SEEDING.
b. FERTILIZER SHOULD BE RESTRICTED TO A LOW PHOSPHATE, SLOW RELEASE NITROGEN FERTILIZER WHEN APPLIED TO AREAS BETWEEN 25 FEET AND 250 FEET FROM A SURFACE WATER BODY. NO FERTILIZER EXCEPT LIMESTONE SHOULD BE APPLIED WITHIN 25 FEET OF THE SURFACE WATER.
c. KINDS AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:
AGRICULTURAL LIMESTONE @ 138 LBS. PER 1,000 S.F.
LOW PHOSPHATE (N–P205–K2O) FERTILIZER @ 13.8 LBS. PER 1,000 S.F.
3. SEED MIXTURE (RECOMMENDED)
RATE:
TYPE LBS. PER ACRE LBS. PER 1,000 S.F.
TALL FESCUE 20 0.45
CREEPING RED 20 0.45
FESCUE
BIRDSFOOT TREFOL 8 0.20
TOTAL 48 1.10
4. SEEDING
a. SPRING SEEDING USUALLY GIVES THE BEST RESULTS FOR ALL SEED MIXES OR WITH LEGUMES. PERMANENT SEEDING SHOULD BE COMPLETED 45 DAYS PRIOR TO THE FIRST KILLING FROST.
b. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL, CULTIPACKER TYPE SEEDER OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER) WITH A SEEDING DEPTH FROM A QUARTER (1/4) TO A HALF (1/2) INCH.
c. VEGETATED GROWTH COVERING AT LEAST 85% OF THE DISTURBED SHOULD BE ACHIEVED PRIOR TO OCTOBER 15TH. IF THIS CONDITION IS NOT ACHIEVED, IMPLEMENT TEMPORARY STABILIZATION MEASURES FOR OVERWINTER PROTECTION.
5. HYDROSEEDING
a. LIME AND FERTILIZER MAY BE APPLIED SIMULTANEOUSLY WITH THE SEED. THE USE OF STRAW MULCH ON CRITICAL AREAS IS PREFERRED SINCE IT GRANTS BETTER SLOPE PROTECTION BY USING ADHESIVE MATERIALS.
b. SLOPES MUST BE NO STEEPER THAN 2 TO 1 (2 FEET HORIZONTALLY TO 1 FOOT VERTICALLY).
c. SEEDING RATES MUST BE INCREASED BY 10% WHEN HYDROSEEDING.
6. MAINTENANCE
a. PERMANENT SEEDED AREAS SHOULD BE INSPECTED AT LEAST MONTHLY DURING THE COURSE OF CONSTRUCTION. INSPECTIONS, MAINTENANCE, AND CORRECTIVE ACTIONS SHOULD CONTINUE UNTIL THE OWNER ASSUMES PERMANENT OPERATION OF THE SITE.
b. SEEDED AREAS SHOULD BE MOWED AS REQUIRED TO MAINTAIN A HEALTHY STAND OF VEGETATION, WITH MOWING HEIGHT AND FREQUENCY DEPENDENT ON TYPE OF GRASS COVER.
c. BASED ON INSPECTION, AREAS SHOULD BE RESEEDED TO ACHIEVE FULL STABILIZATION OF EXPOSED SOILS.
d. IF EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHOULD BE MADE AND AREAS RESEEDED. WITH OTHER TEMPORARY MEASURES USED TO PROVIDE EROSION PROTECTION DURING THE PERIOD OF VEGETATION ESTABLISHMENT.
e. AT A MINIMUM, 85% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION.

E. STORM DRAIN INLET PROTECTION

1. SPECIFICATIONS
a. THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE BARRIER SHOULD BE LESS THAN ONE ACRE.
b. ANY RESULTANT PONDING OF STORMWATER MUST NOT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT AREAS OR STRUCTURES.
2. INSTALLATION
a. INSTALL INLET PROTECTION AS SOON AS STORM DRAIN INLETS ARE INSTALLED AND BEFORE LAND–DISTURBANCE ACTIVITIES BEGIN IN AREAS WITH EXISTING STORM DRAIN SYSTEMS.
b. PROTECT ALL INLETS THAT COULD RECEIVE STORMWATER FROM YOUR CONSTRUCTION PROJECT.
c. USE IN CONJUNCTION WITH OTHER EROSION PREVENTION AND SEDIMENT CONTROL BMP'S.
d. DESIGN YOUR INLET PROTECTION TO HANDLE THE VOLUME OF WATER FROM THE AREA BEING DRAINED. ENSURE THAT THE DESIGN IS SIZED APPROPRIATELY.
3. MAINTENANCE
a. INSPECT INLETS BARRIERS FREQUENTLY, BEFORE AND AFTER EACH RAINFALL EVENT AND REPAIR WHEN NECESSARY.
b. SEDIMENT SHOULD BE REMOVED AND THE STORM DRAIN SEDIMENT BARRIER RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE BARRIER.
c. REMOVED SEDIMENT SHOULD BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
d. SWEEP STREETS, SIDEWALKS, AND OTHER PAVED AREAS REGULARLY.
e. ALL CATCH BASINS AND STORM DRAIN INLETS MUST BE CLEANED AT THE END OF CONSTRUCTION AND AFTER THE SITE HAS BEEN FULLY STABILIZED

TIMING OF CONTROLS/MEASURES

AS INDICATED IN THE SEQUENCE OF MAJOR ACTIVITIES THE SILT BARRIERS SHALL BE AS INSTALLED PRIOR TO COMMENCING ANY CLEARING OR GRADING OF THE SITE. STRUCTURAL CONTROLS SHALL BE INSTALLED CONCURRENTLY WITH THE APPLICABLE ACTIVITY. AREAS WHERE CONSTRUCTION ACTIVITY TEMPORARILY CEASES FOR MORE THAN TWENTY ONE (21) DAYS WILL BE STABILIZED WITH A TEMPORARY SEED AND MULCH WITHIN FOURTEEN (14) DAYS OF THE LAST DISTURBANCE. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN AREA, SILT FENCES AND ANY EARTH/DIKES WILL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED. ALL AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISH GRADE.

WASTE DISPOSAL

- a. WASTE MATERIALS
ALL WASTE MATERIALS WILL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE WILL BE DEPOSITED IN A DUMPSTER. NO CONSTRUCTION WASTE MATERIALS WILL BE BURIED ON SITE. ALL PERSONEL WILL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL BY THE SUPERINTENDENT.
b. HAZARDOUS WASTE
ALL HAZARDOUS WASTE MATERIALS WILL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER. SITE PERSONNEL WILL BE INSTRUCTED IN THESE PRACTICES BY THE SUPERINTENDENT.
c. SANITARY WASTE
ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

MAINTENANCE OF STORMWATER MANAGEMENT FACILITIES

THE PROJECT PROPONENT IS RESPONSIBLE FOR THE MAINTENANCE OF ALL STORMWATER FACILITIES DURING CONSTRUCTION AND THE PROPERTY OWNER IS RESPONSIBLE AFTER CONSTRUCTION IS COMPLETE.

CATCH BASINS & STORMWATER TREATMENT STRUCTURES

1. CATCH BASINS & STORMWATER TREATMENT STRUCTURES SHOULD BE INSPECTED ON A MONTHLY BASIS AND/OR AFTER A MAJOR RAINFALL EVENT TO ASSURE THAT DEBRIS OR SEDIMENTS DO NOT REDUCE THE EFFECTIVENESS OF THE SYSTEM.

SPILL PREVENTION

- A. MATERIAL MANAGEMENT PRACTICES
THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT WILL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL SANITARY EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:
GOOD HOUSEKEEPING:
THE FOLLOWING GOOD HOUSEKEEPING PRACTICES THAT WILL BE FOLLOWED ON SITE DURING THE CONSTRUCTION PROJECT:
a. AN EFFORT WILL BE MADE TO STORE ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB.
b. ALL MATERIALS STORED ON SITE WILL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE.
c. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL WILL BE FOLLOWED.
d. THE SITE SUPERINTENDENT WILL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS.
e. SUBSTANCES WILL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER.
f. WHENEVER POSSIBLE ALL OF A PRODUCT WILL BE USED UP BEFORE DISPOSING OF THE CONTAINER.
2. HAZARDOUS PRODUCTS:
a. THE FOLLOWING PRODUCTS WILL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:
b. PRODUCTS WILL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE.
c. ORIGINAL LABELS AND MATERIAL SAFETY DATA WILL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION.
d. SURPLUS PRODUCT THAT MUST BE DISPOSED OF WILL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.

B. PRODUCT SPECIFICATION PRACTICES

- THE FOLLOWING PRODUCT SPECIFIC PRACTICES WILL BE FOLLOWED ON SITE:
1. PETROLEUM PRODUCTS:
a. ALL ON SITE VEHICLES WILL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTATIVE MAINTENANCE TO REDUCE LEAKAGE. PETROLEUM PRODUCTS WILL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT BASED SUBSTANCES USED ON SITE WILL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
2. FERTILIZERS:
a. FERTILIZERS USED WILL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS. ONCE APPLIED, FERTILIZER WILL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER. STORAGE WILL BE IN A COVERED SHED OR ENCLOSED TRAILERS. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER WILL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.
3. PAINTS:
a. ALL CONTAINERS WILL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE. EXCESS PAINT WILL BE DISCHARGED TO THE STORM SEWER SYSTEM BUT WILL BE DISPOSED OF PROPERLY ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.
4. CONCRETE TRUCKS:
a. CONCRETE TRUCKS WILL DISCHARGE AND WASH OUT SURPLUS CONCRETE OR DRUM WASH WATER IN A CONTAINED AREA ON SITE.

- C. SPILL CONTROL PRACTICES
IN ADDITION TO GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTION, THE FOLLOWING PRACTICES WILL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:
a. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP WILL BE CLEARLY POSTED AND SITE PERSONNEL WILL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES.
b. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP WILL BE KEPT IN THE MATERIAL STORAGE AREA ON SITE. EQUIPMENT AND MATERIALS WILL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST, AND PLASTIC OR METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE.
c. ALL SPILLS WILL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY.
d. THE SPILL AREA WILL BE KEPT WELL VENTILATED AND PERSONNEL WILL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE.
e. SPILLS OF TOXIC OR HAZARDOUS MATERIAL WILL BE REPORTED TO THE APPROPRIATE STATE OF LOCAL GOVERNMENT AGENCY, REGARDLESS OF THE SIZE.
f. THE SPILL PREVENTION PLAN WILL BE ADJUSTED TO INCLUDE MEASURES TO PREVENT THIS TYPE OF SPILL FROM RECURRING AND HOW TO CLEANUP THE SPILL IF IT OCCURS. A DESCRIPTION OF THE SPILL, ITS CAUSE, AND THE CLEANUP MEASURES WILL BE INCLUDED.
g. THE SITE SUPERINTENDENT RESPONSIBLE FOR DAY–TO–DAY SITE OPERATIONS WILL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.

THE PROJECT PROPONENT IS REQUIRED TO MANAGE CONSTRUCTION TO MEET THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO CONTROLLING INVASIVE SPECIES AND CONTROLLING FUGITIVE DUST IN ACCORDANCE WITH ENV–A 1002.

AGR 3800 PROHIBITED INVASIVE PLANT SPECIES RULES

THE RULE, AGR 3800, STATES: NO PERSON SHALL COLLECT, TRANSPORT, IMPORT, EXPORT, MOVE, BUY SELL, DISTRIBUTE, PROPAGATE OR TRANSPLANT ANY LIVING AND VIABLE PORTION OF ANY PLANT SPECIES, WHICH INCLUDED ALL OF THEIR CULTIVARS AND VARIETIES, LISTED IN TABLE 3800.1, NEW HAMPSHIRE PROHIBITED INVASIVE SPECIES LIST'. A COMPLETE COPY OF THE RULES CAN BE ACCESSED ON THE INTERNET AT [HTTP://AGRICULTURE.NH.GOV/TOPICS/PLANTS_INSECTS.HTM](http://agriculture.nh.gov/topics/plants_insects.htm).

ENV–A 1002 FUGITIVE DUST: PRECAUTIONS TO PREVENT, ABATE, AND CONTROL FUGITIVE DUST.

- a. ANY PERSON ENGAGED IN ANY ACTIVITY WITHIN THE STATE EMITS FUGITIVE DUST, OTHER THAN THOSE LISTED IN ENV–A 1002.02 (b), SHALL TAKE PRECAUTIONS THROUGHOUT THE DURATION OF THE ACTIVITY IN ORDER TO PREVENT, ABATE, AND CONTROL THE EMISSION OF FUGITIVE DUST.
b. PRECAUTIONS REQUIRED BY (g) ABOVE, SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:
i) THE USE OF WATER OR HYDROPHILIC MATERIAL ON OPERATIONS OR SURFACES, OR BOTH;
ii) THE APPLICATION OF ASPHALT, WATER, OR HYDROPHILIC MATERIAL, OR TARPS OR OTHER SUCH COVERS TO MATERIAL STOCKPILES;
iii) THE USE OF HOODS, FANS, FABRIC FILTERS, OR OTHER DEVICES TO ENCLOSE AND VENT AREAS WHERE MATERIALS PRONE TO PRODUCING FUGITIVE DUST ARE HANDLED;
iv) THE USE OF CONTAINMENT METHODS FOR SANDBLASTING OR SIMILAR OPERATIONS; AND
v) THE USE OF VACUUMS OR OTHER SUCTION DEVICES TO COLLECT AIRBORNE PARTICULATE MATTER.

WINTER CONSTRUCTION NOTES

1. ALL PROPOSED POST–DEVELOPMENT VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE. SECURED WITH ANCHORED NETTING, ELSEWHERE. THE PLACEMENT 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.
2. ALL DITCHES & SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH SHALL BE STABILIZED WITH STONE OR EROSION CONTROL BLANKETS.
3. AFTER OCTOBER 15TH, INCOMPLETE ROAD AND PARKING SURFACES SHALL BE PROTECTED WITH A MINIMUM OF 3–INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT.

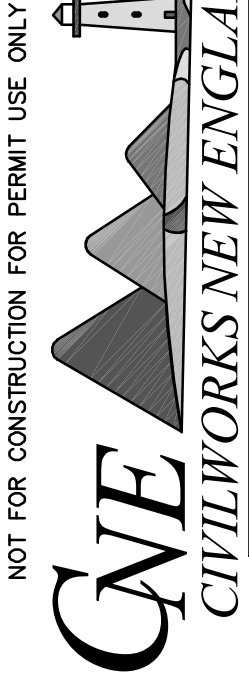
PLANNING FILE NO.: SITE–2024–

EROSION CONTROL NOTES

LOT 2 DEVELOPMENT
DEL SOL DOVER, LLC
DOVER, NH

DEL SOL DOVER, LLC
340 CENTRAL AVENUE
SUITE 202
DOVER, NH 03820

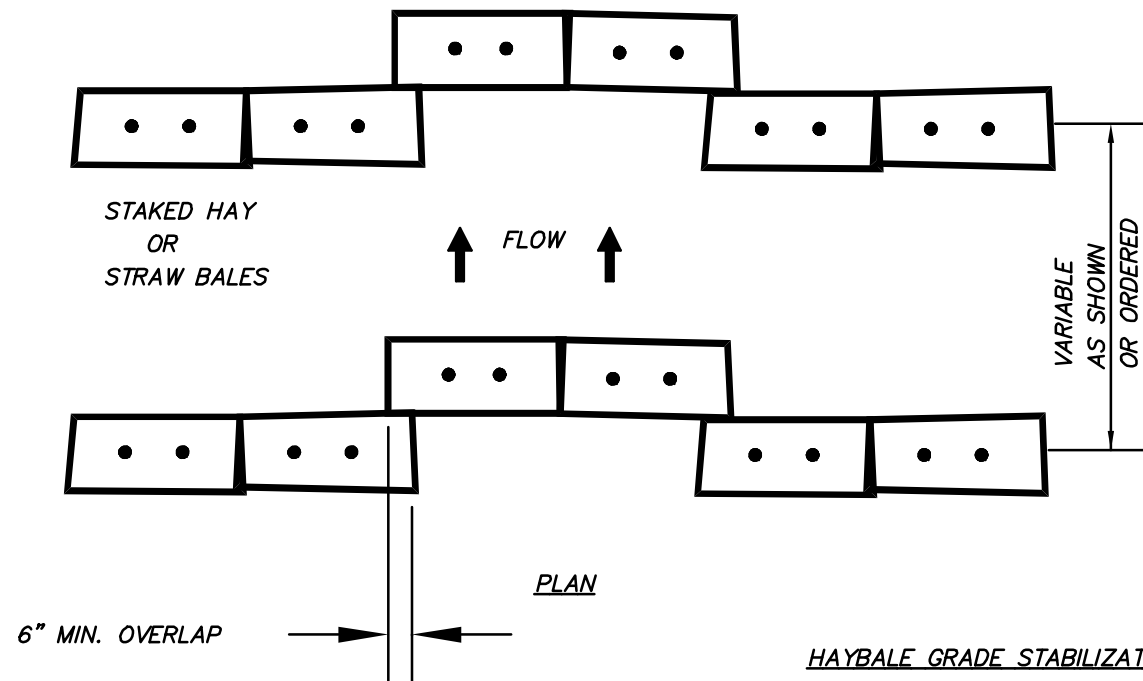
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181 Watson Road, PO Box 1166
Dover, New Hampshire 03821
603.749.0443

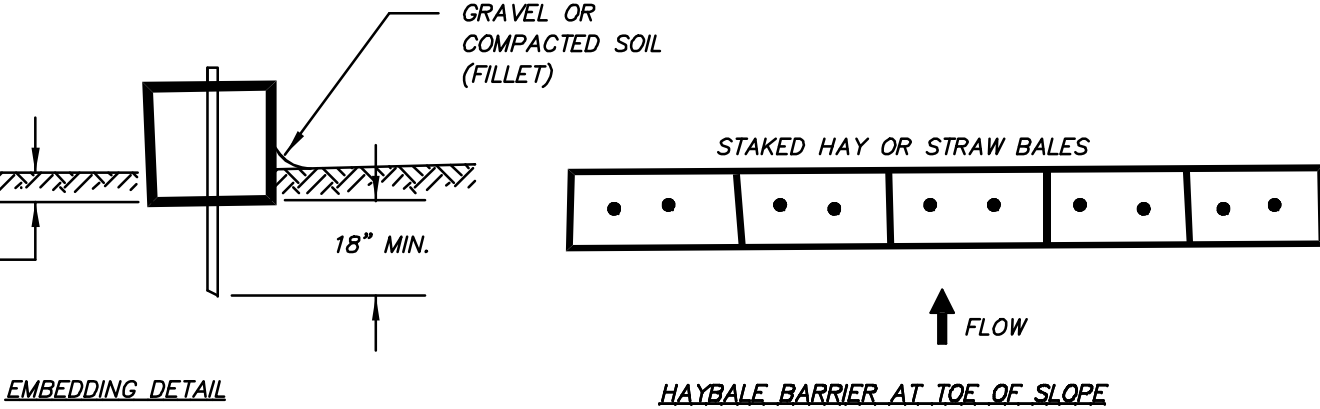
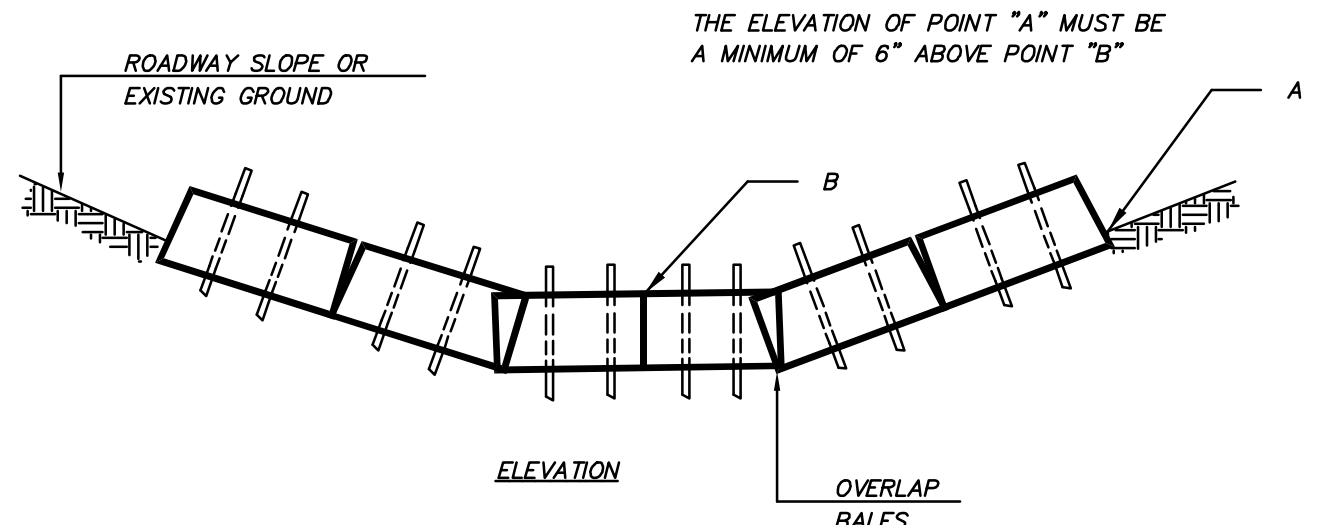
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DATE	SCALE	DRAWN BY	DESIGN BY	APPROVED BY	PROJECT NO.	FILE/SIT–DWG	NO.	REVISION	APP'D	DATE
8–6–24	AS SHOWN	SRD	JPG	BYSLH	24085					



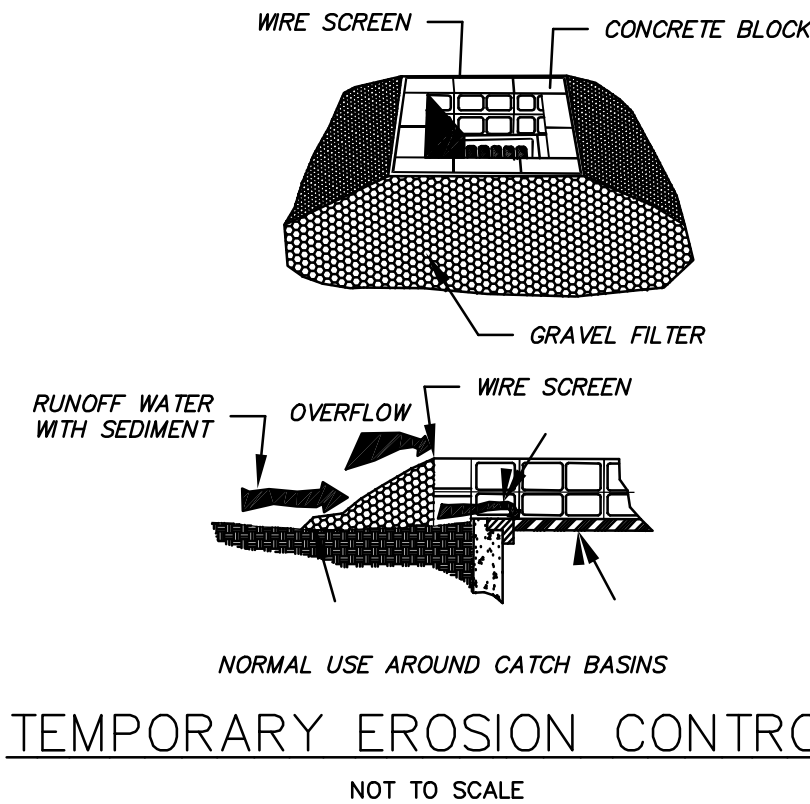
CONSTRUCTION SPECIFICATIONS

- BALES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
- EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF 4".
- BALES SHALL BE SECURELY ANCHORED IN PLACE BY 2" x 2" STAKES OR RE-BARS DRIVEN THROUGH THE BALES. THE FIRST STAKE IN EACH BALE SHALL BE ANGLED TOWARD PREVIOUSLY LAID BALE TO FORCE BALES TOGETHER.
- INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
- BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
- REMOVE AND PROPERLY DISPOSE OF ALL SEDIMENT PRIOR TO REMOVING HAYBALES.



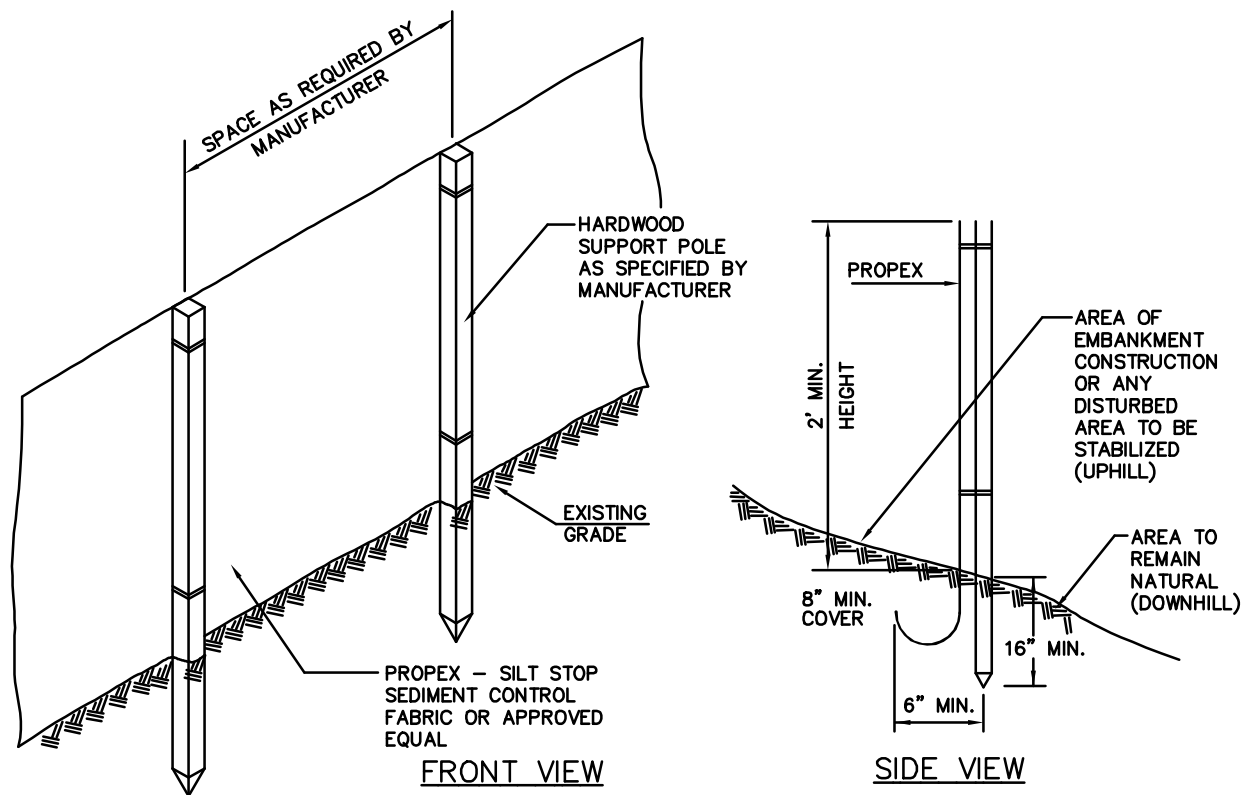
HAYBALE NOTES AND DETAILS

NOT TO SCALE



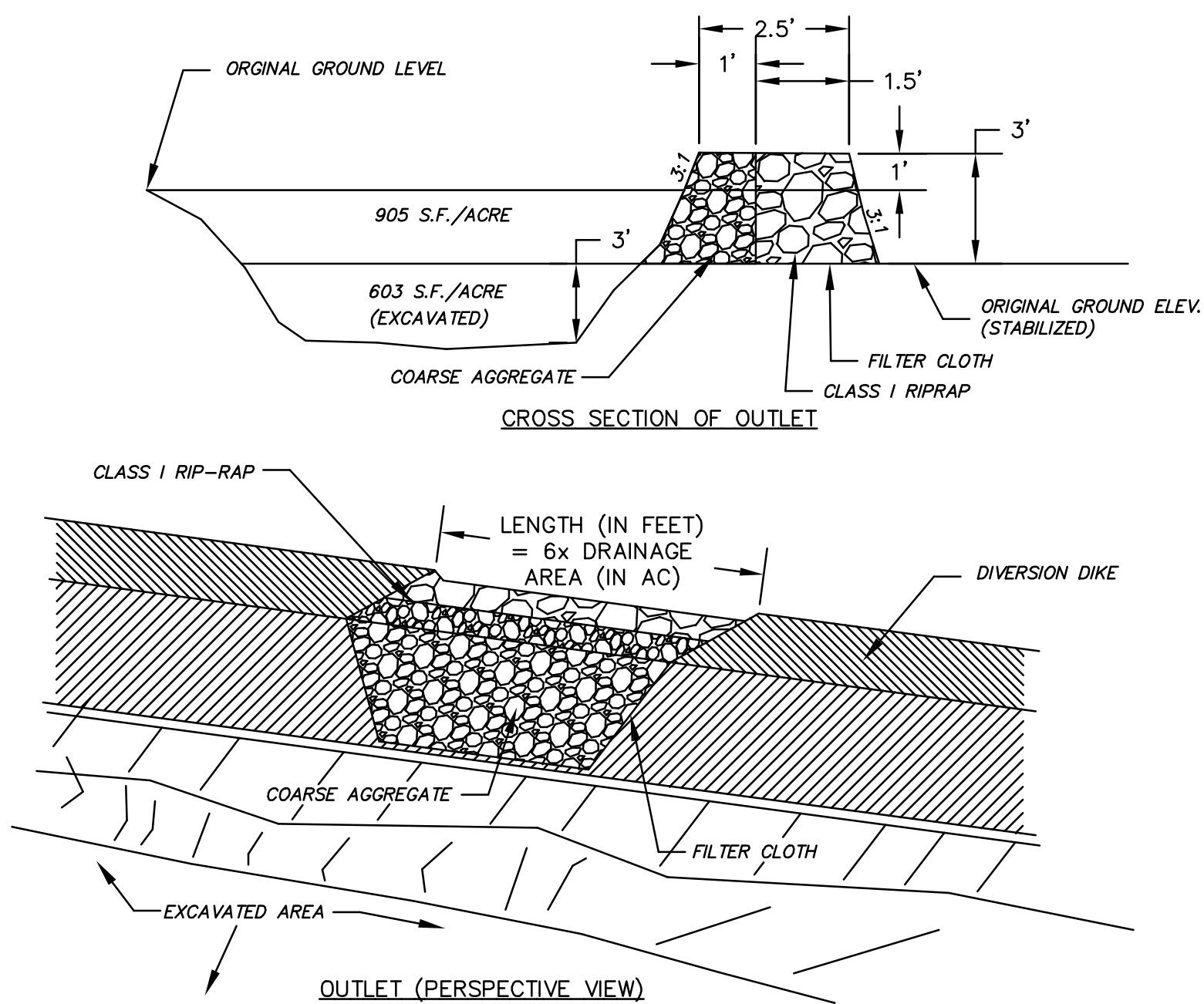
TEMPORARY EROSION CONTROL

NOT TO SCALE



SILT FENCE DETAIL

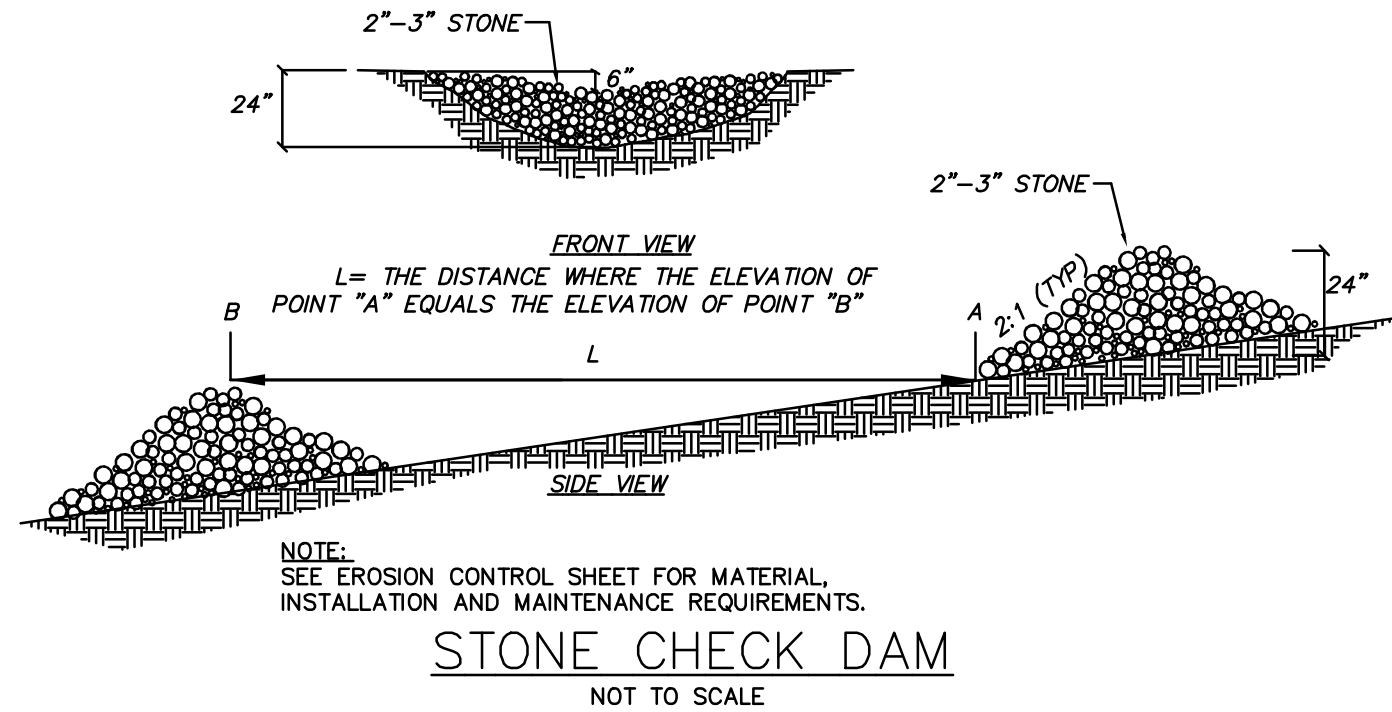
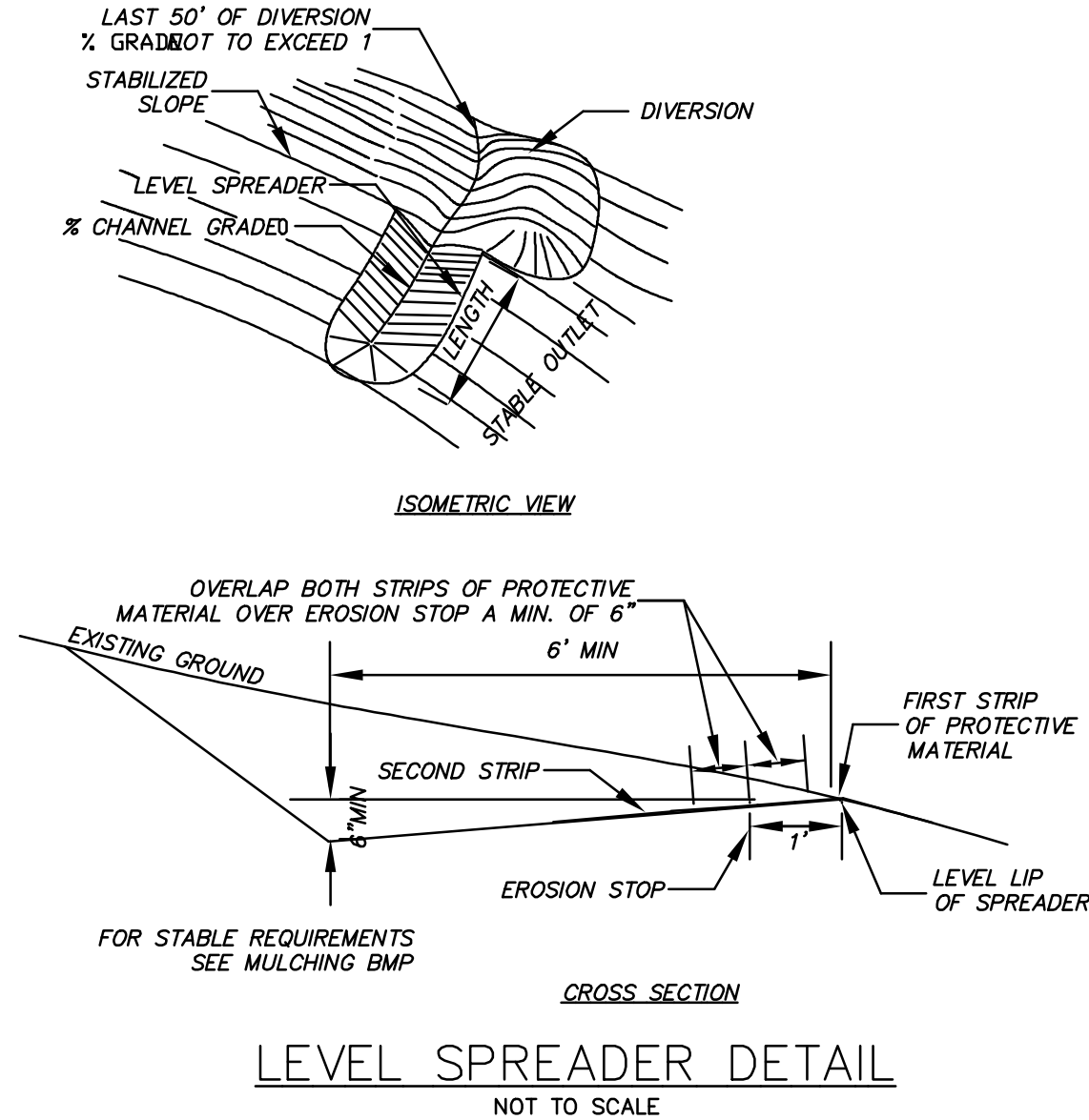
NOT TO SCALE



- NOTES:
- COARSE AGGREGATE SHALL MEET NHDOT 304.5 SPECIFICATIONS AND SHALL NOT CONTAIN MORE THAN 5% FINES PASSING THE #200 SIEVE.
 - FILTER CLOTH SHALL BE MIRAFI 700X OR APPROVED EQUAL.
 - CLASS I RIPRAP SHALL MEET NHDOT 583 SS SPECIFICATIONS.
 - THE MAXIMUM CONTRIBUTING AREA TO THE TRAP SHALL BE LESS THAN 5 AC.
 - THE TRAP SHALL BE CLEANED WHEN 50% OF THE ORIGINAL VOLUME IS FILLED.
 - MATERIALS REMOVED FROM THE TRAP SHALL BE PROPERLY DISPOSED OF AND STABILIZED.

TEMPORARY SEDIMENT TRAP

NOT TO SCALE



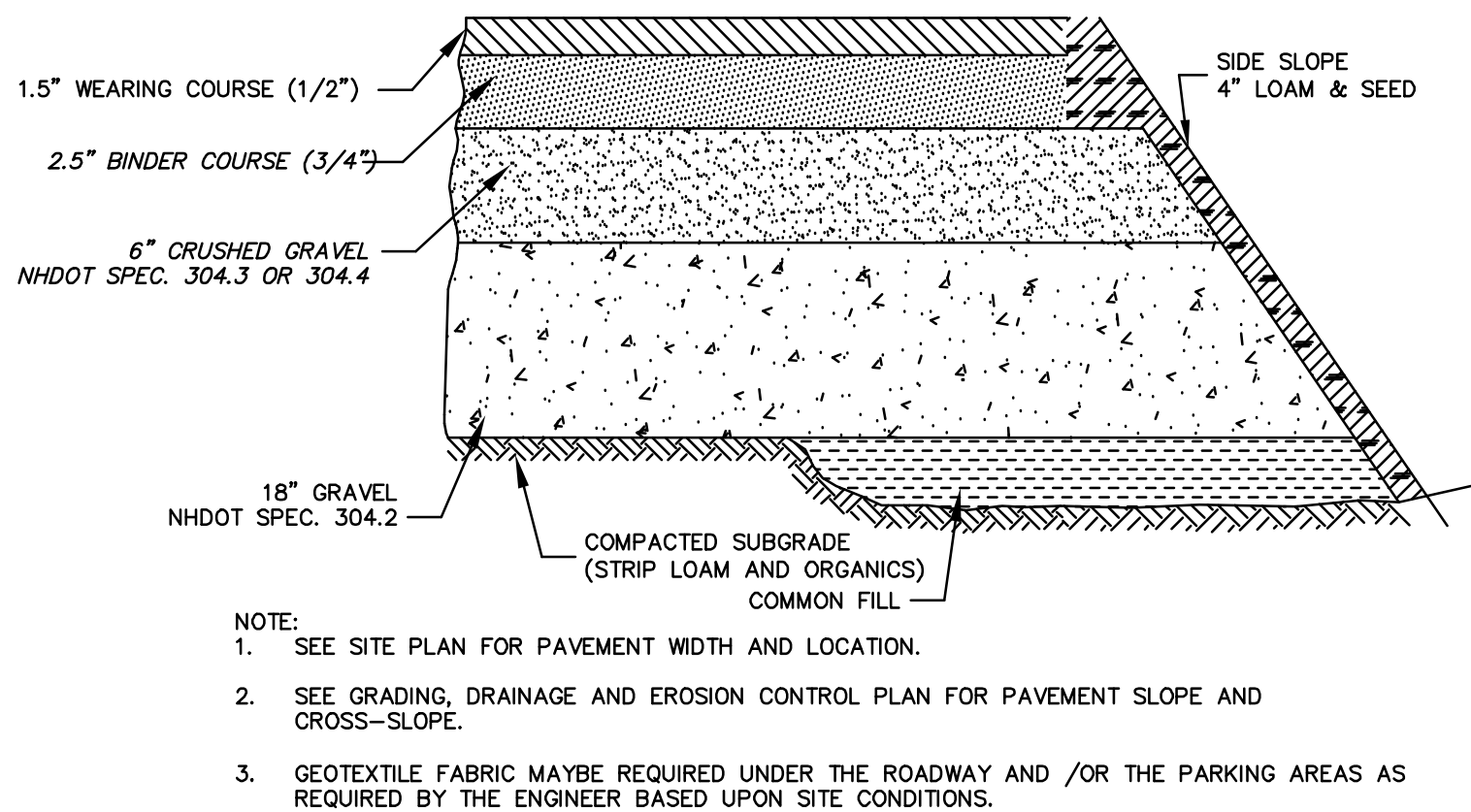
PLANNING FILE NO.: SITE-2024-

EROSION CONTROL DETAILS

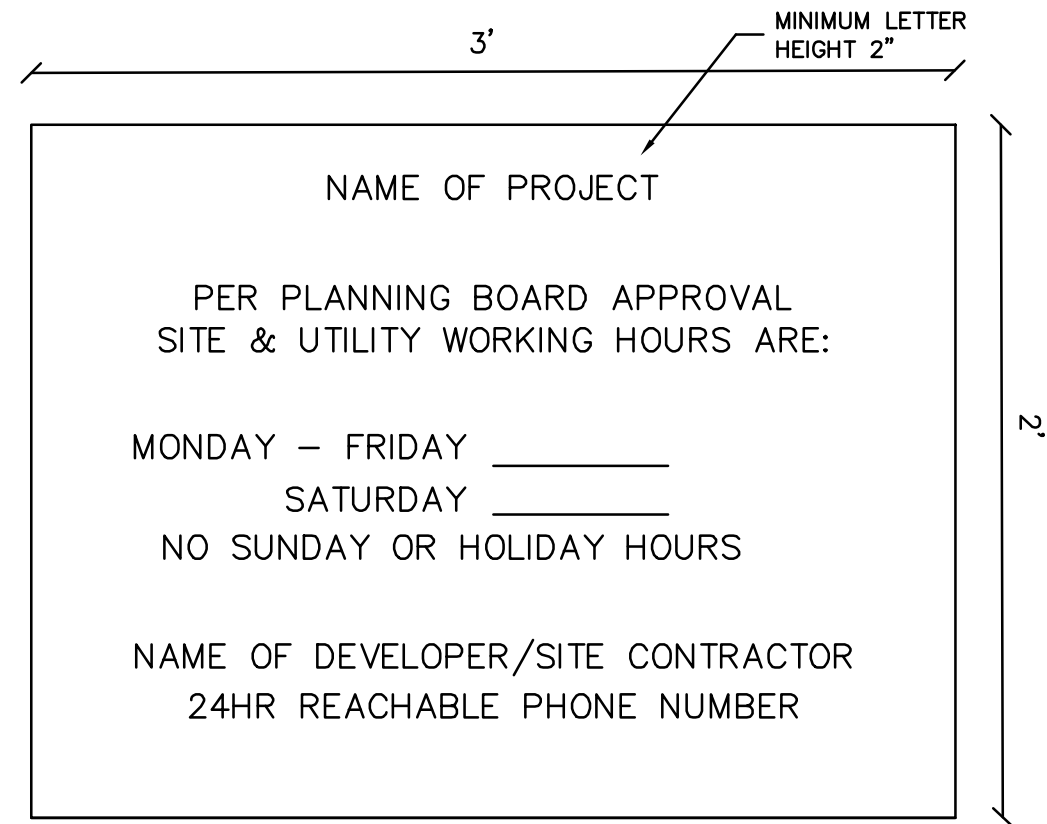
LOT 2 DEVELOPMENT
DEL SOL DOVER, LLC
DOVER, NH

DEL SOL DOVER, LLC
340 CENTRAL AVENUE
SUITE 202
DOVER, NH 03820

DATE	SCALE	DRAWN BY	DESIGN BY	APPROVED BY	PROJECT NO.	FILE SITE	DWG NO.	REVISION	APP'D	DATE
8-6-24	N.T.S.	SRD	JPG	BY:JH	24085					

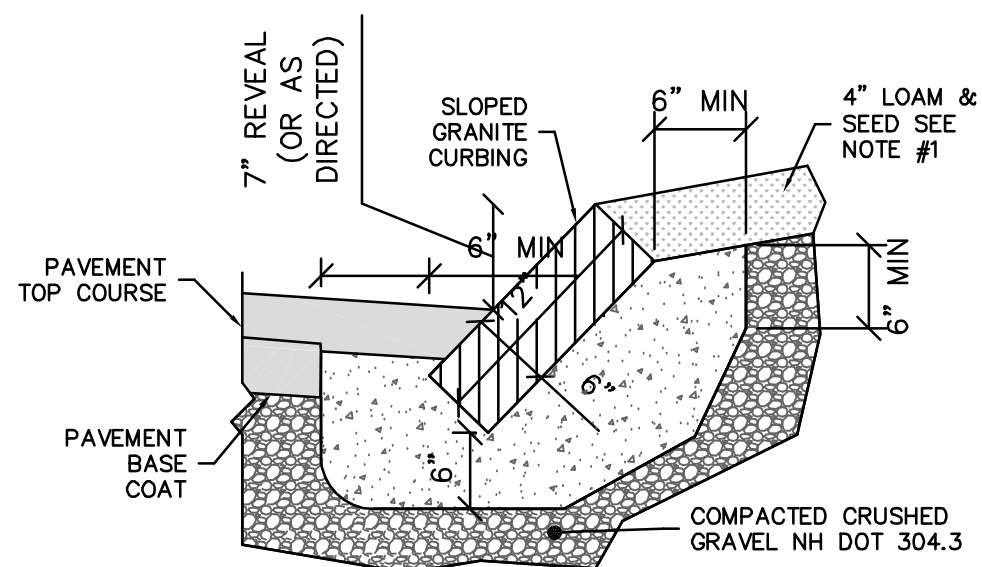


HEAVY DUTY TYPICAL PAVEMENT SECTION
NOT TO SCALE



- NOTES:
1. SIGN SHALL HAVE BLACK LETTERS ON A WHITE BACKGROUND
 2. SIGN SHALL BE WEATHER RESISTANT AND SECURED TO THE GROUND
 3. HOURS ON THE SIGN SHALL COMPLY WITH ALL PLANNING BOARD CONDITIONS OF APPROVAL.

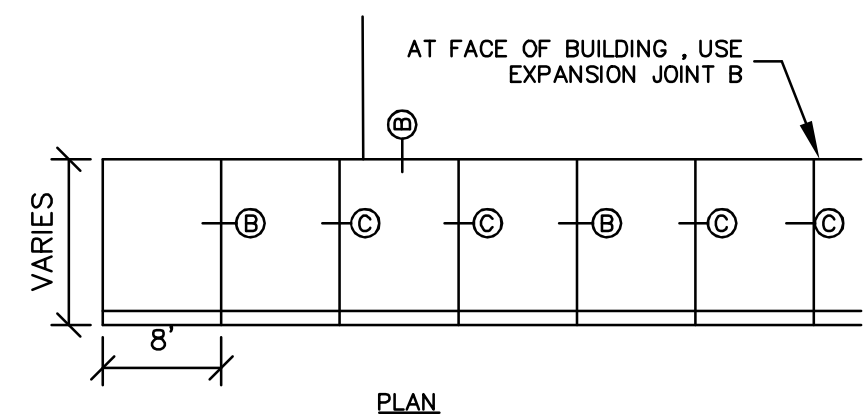
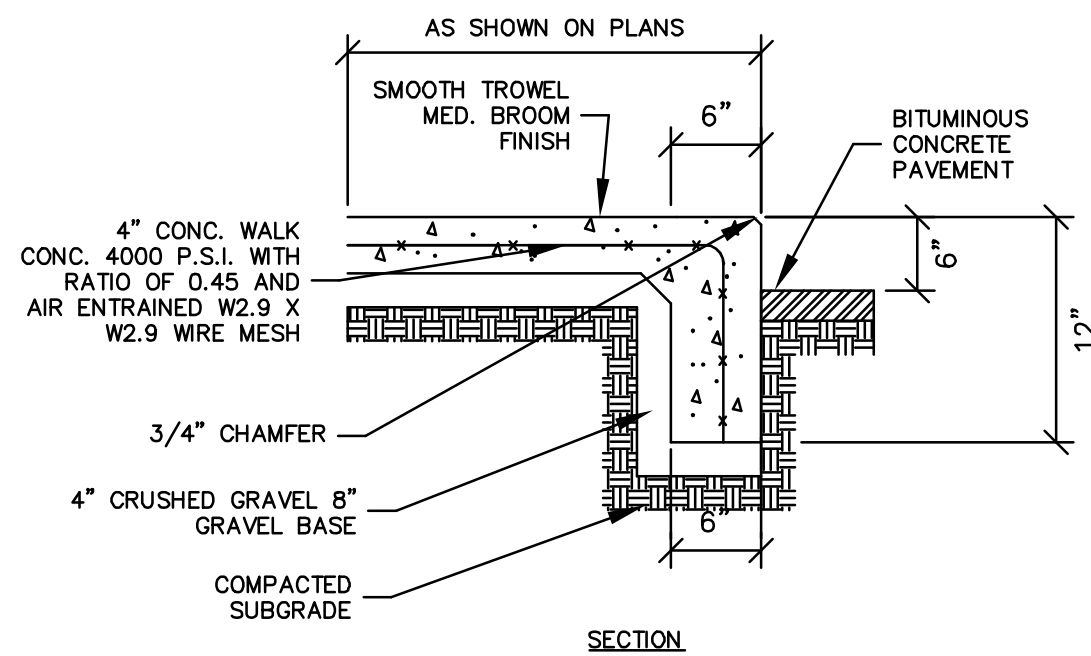
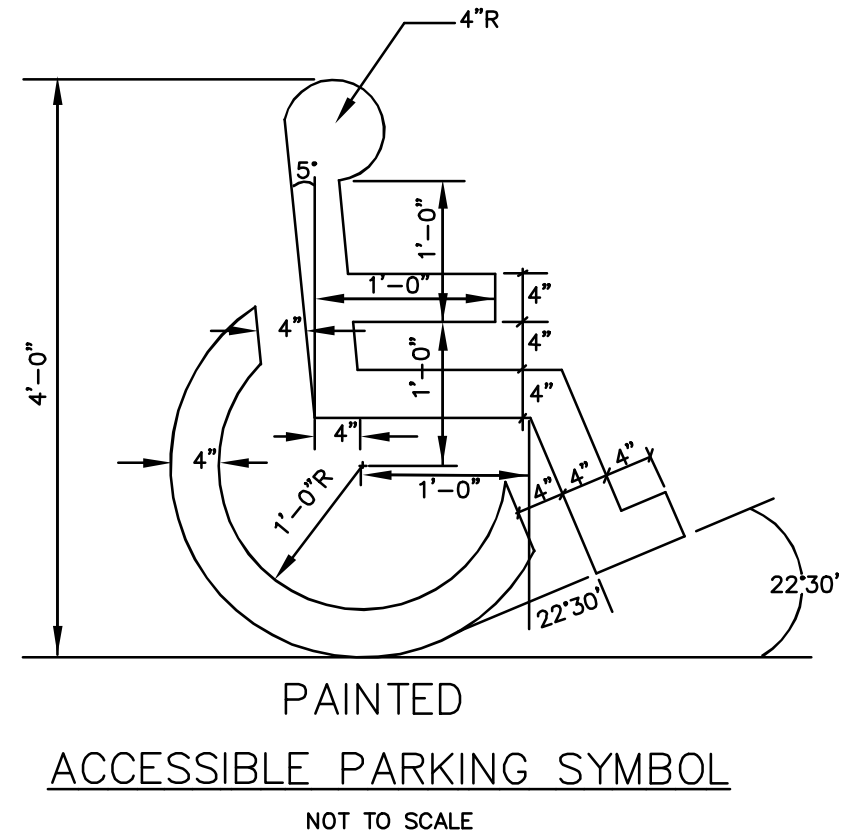
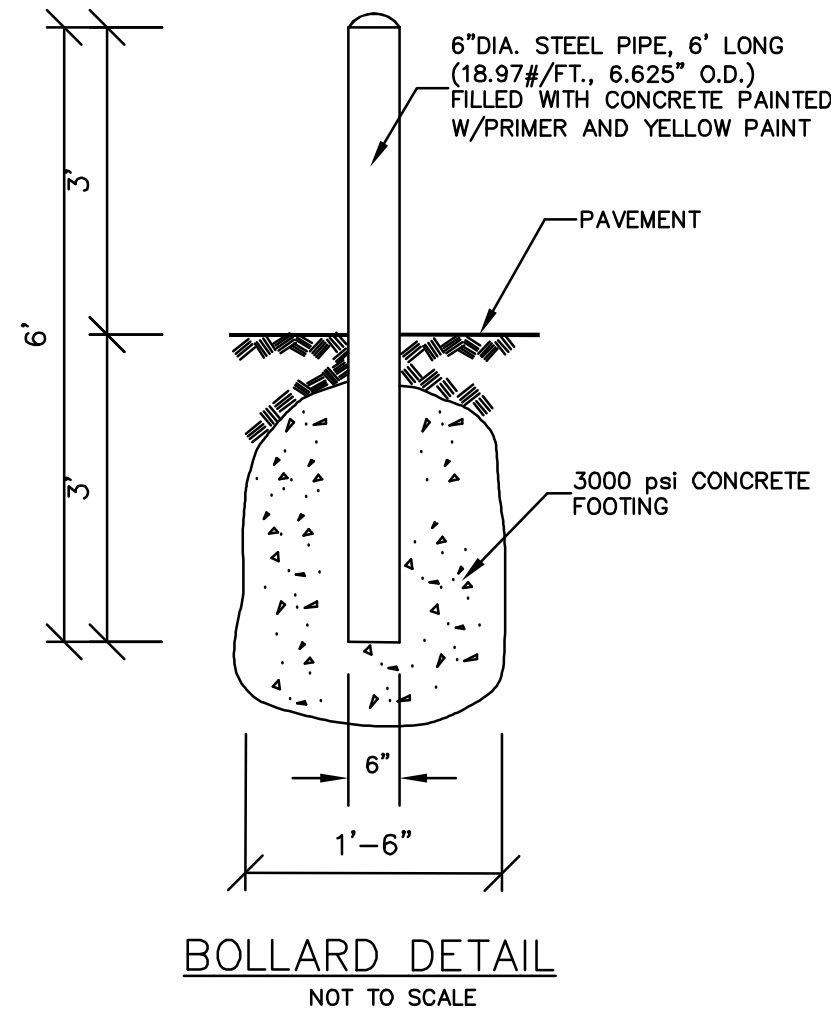
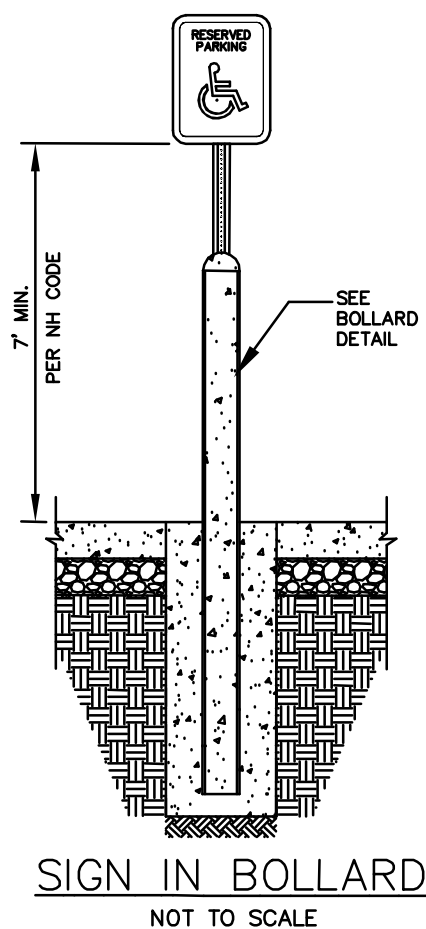
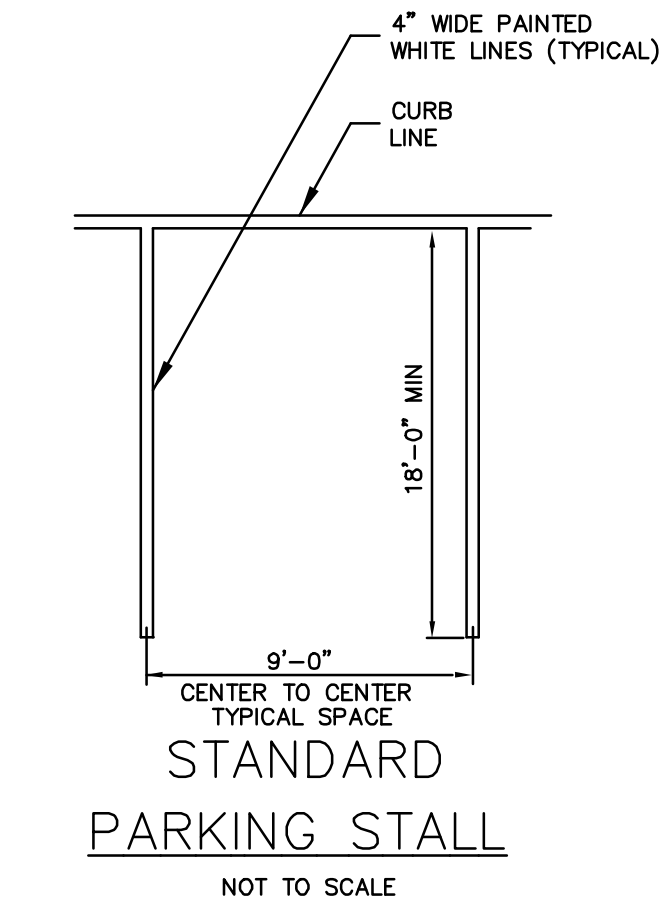
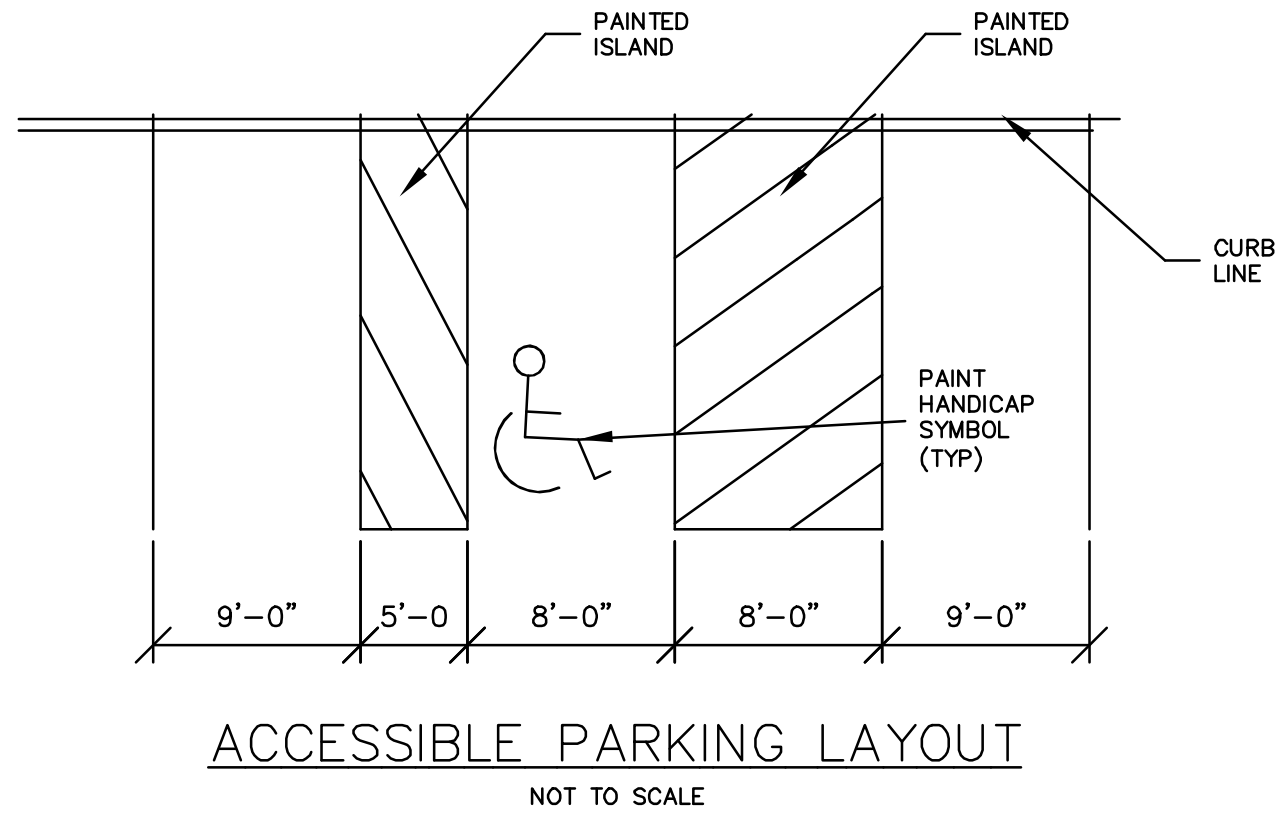
CITY OF DOVER D-2
CONSTRUCTION SIGN
NOT TO SCALE



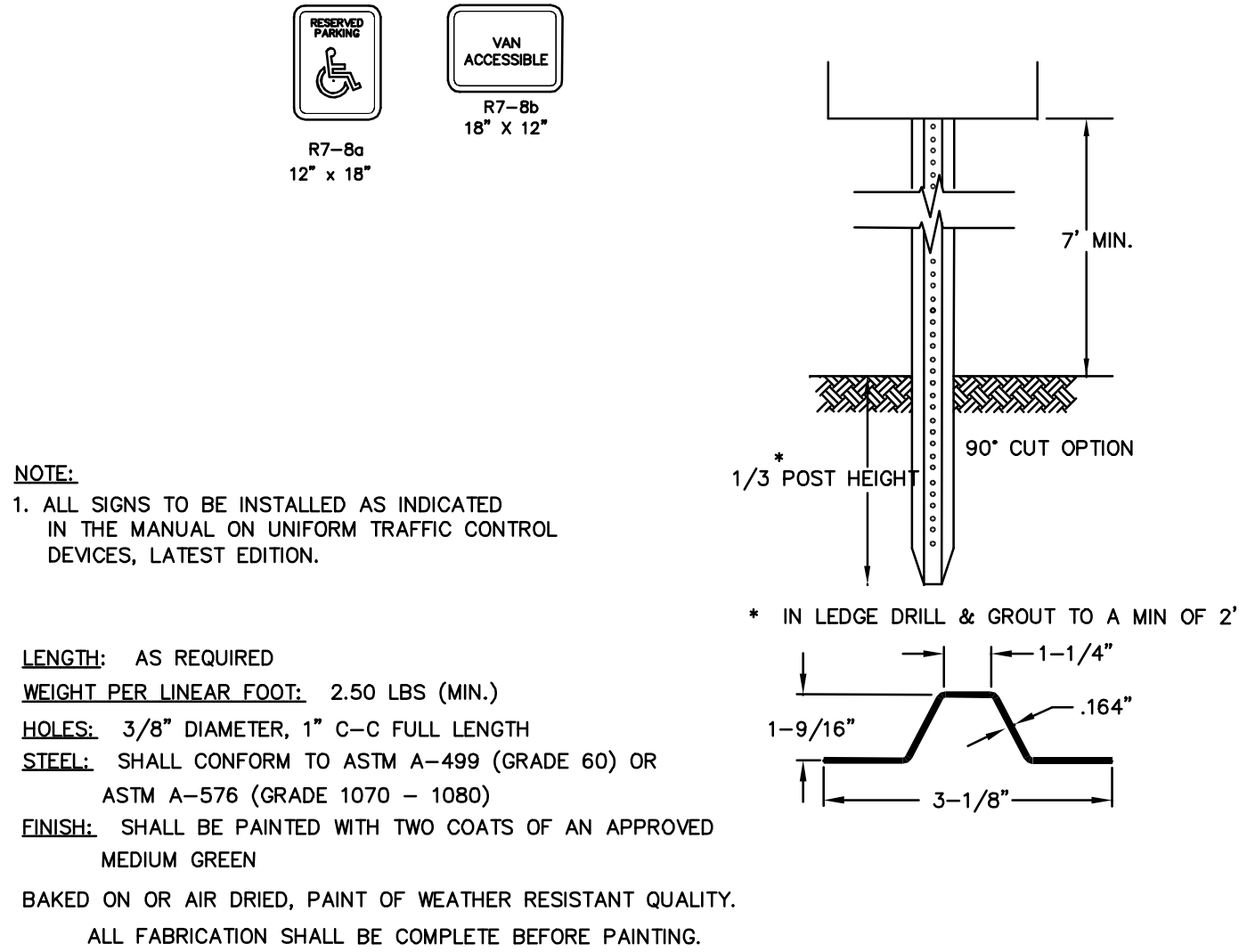
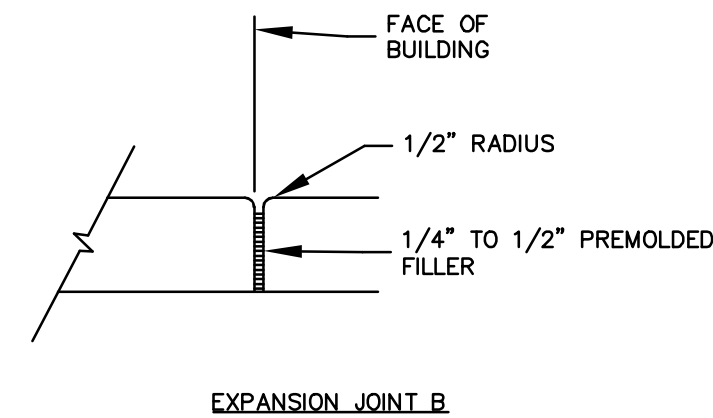
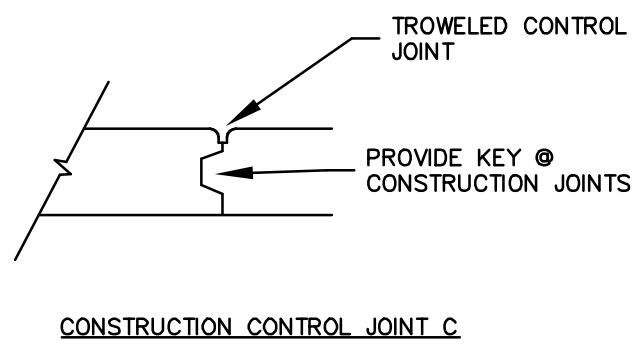
RADIUS	MAX LENGTH
< 21'	3'
21' - 28'	4'
29' - 35'	5'
36' - 42'	6'
43' - 49'	7'
50' - 56'	8'
57' - 60'	9'
OVER 60'	10'

- NOTES:
1. LOAM AND SEED SHOULD BE IN COMPLIANCE WITH NH DOT 641, 642, 643, 644 AND 645.
 2. CONCRETE CURB SUPPORT SHOULD BE SET 1/2" BELOW THE TOP OF THE PAVEMENT BASE COURSE.

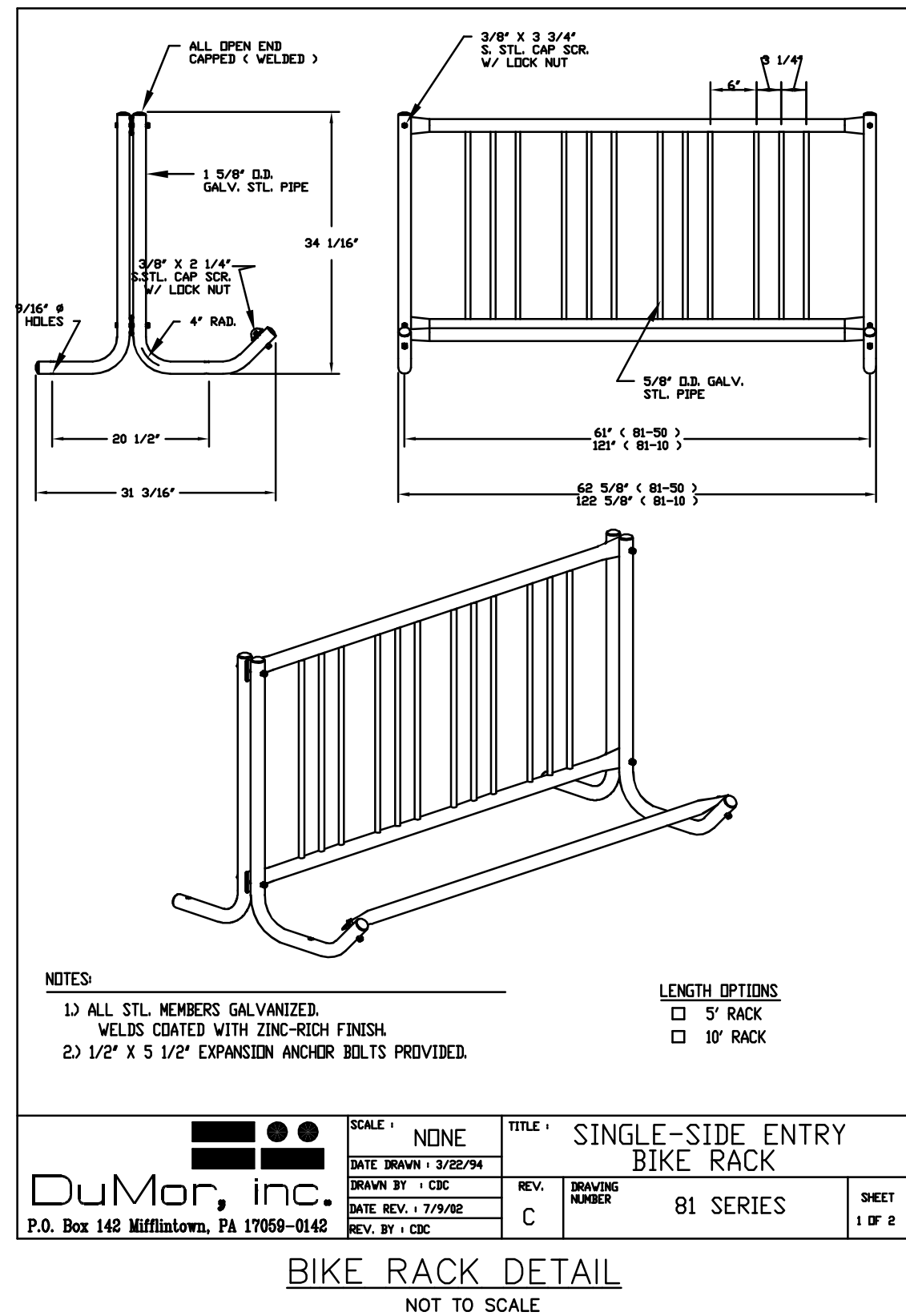
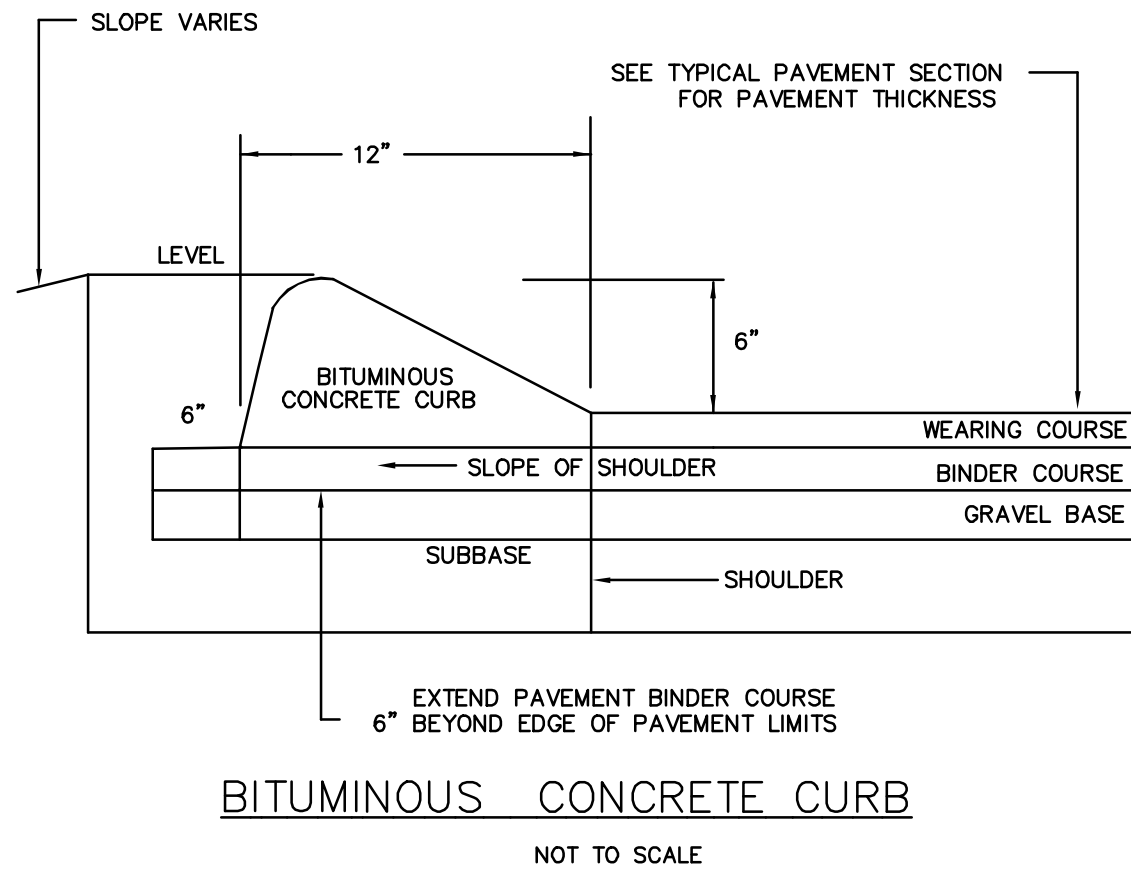
CITY OF DOVER D-8 GRANITE CURB DETAIL
NOT TO SCALE



CONCRETE WALKWAY WITH MONOLITHIC CONCRETE CURB
NOT TO SCALE



SIGN LEGEND & SIGN POST
NOT TO SCALE



- NOTES:
- 1) ALL STL. MEMBERS GALVANIZED. WELDS COATED WITH ZINC-RICH FINISH.
 - 2) 1/2" X 5 1/2" EXPANSION ANCHOR BOLTS PROVIDED.

- LENGTH OPTIONS
- 5' RACK
 - 10' RACK

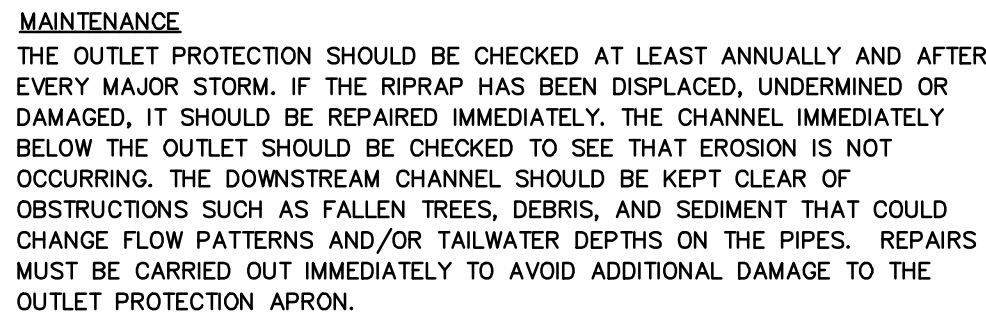
DuMor, inc. P.O. Box 142 Mifflintown, PA 17059-0142	SCALE: NONE	TITLE: SINGLE-SIDE ENTRY BIKE RACK
	DATE DRAWN: 3/10/24	REV. C
	DRAWN BY: J. CRC	DRAWING NUMBER: 81 SERIES
	DATE REV.: 7/9/02	REV. BY: J. CRC

BIKE RACK DETAIL
NOT TO SCALE

DATE	APP'D	REVISION	NO.
DATE: 8-6-24			
SCALE: N.T.S.			
DRAWN BY: SRD			
DESIGN BY: JFG			
APPROVED BY: JH			
PROJECT NO: 24085			
FILE: SITE.DWG			

DEL SOL DOVER, LLC
340 CENTRAL AVENUE
SUITE 202
DOVER, NH 03820

LOT 2 DEVELOPMENT
DEL SOL DOVER, LLC
DOVER, NH



1. THE SUBGRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIPRAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE ROCK OR GRAVEL USED FOR FILTER OR RIPRAP SHALL CONFORM TO THE SPECIFIED GRADATION.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIPRAP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY REPLACING THE ENTIREMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
4. STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

OUTLET FROM	W1<ft>	W2<ft>	L<ft>	D <ft>	D50<IN>	CHANNEL TYPE
BIO-1	8	2	20	1	6	DEFINED
BIO-2	3	13	10	1	6	UNDEFINED
BIO-3	3	11	8	1	6	UNDEFINED

A cross-sectional diagram of a sod-lined ditch. The ditch is formed by sods laid in a brickwork pattern. The layers from top to bottom are: 'EXISTING/FINISHED GRADE' (top left), '6" LOAM & SEED' (the layer immediately above the sods), 'SOD LINED BOTTOM' (the sods themselves), and 'SUBGRADE' (the base material below the sods). The ditch has a flat bottom and sloped sides. The slopes are indicated by a '3' over a '1' (3:1). A vertical dimension line on the right side of the ditch indicates a 'MIN. 6".' layer of sod. The top right of the ditch is labeled 'GRASS'. The word 'VARIES' is written above the sod layer in the center of the ditch.

MAINTENANCE

TIMELY MAINTENANCE IS IMPORTANT TO KEEP THE VEGETATION IN THE SWALE IN GOOD CONDITION. MOWING SHOULD BE DONE FREQUENTLY ENOUGH TO KEEP THE VEGETATION IN VIGOROUS CONDITION AND TO CONTROL ENCROACHMENT OF WEEDS AND UNDESIRABLE PLANTATION, HOWEVER IT SHOULD NOT BE MOWED TOO CLOSELY. MAINTAIN A MINIMUM 1" STAIN OF VEGETATION. FERTILIZE ON AN "AS NEEDED" BASIS TO KEEP THE GRASS HEALTHY. OVER FERTILIZATION CAN RESULT IN THE SWALE BECOMING A SOURCE OF POLLUTION.

THE SWALE SHOULD BE INSPECTED PERIODICALLY AND AFTER EVERY MAJOR STORM TO DETERMINE THE CONDITION OF THE SWALE. RILLS AND DAMAGED AREAS SHOULD BE PROMPTLY REPAIRED AND REVEGETATED AS NECESSARY TO PREVENT FURTHER DETERIORATION.

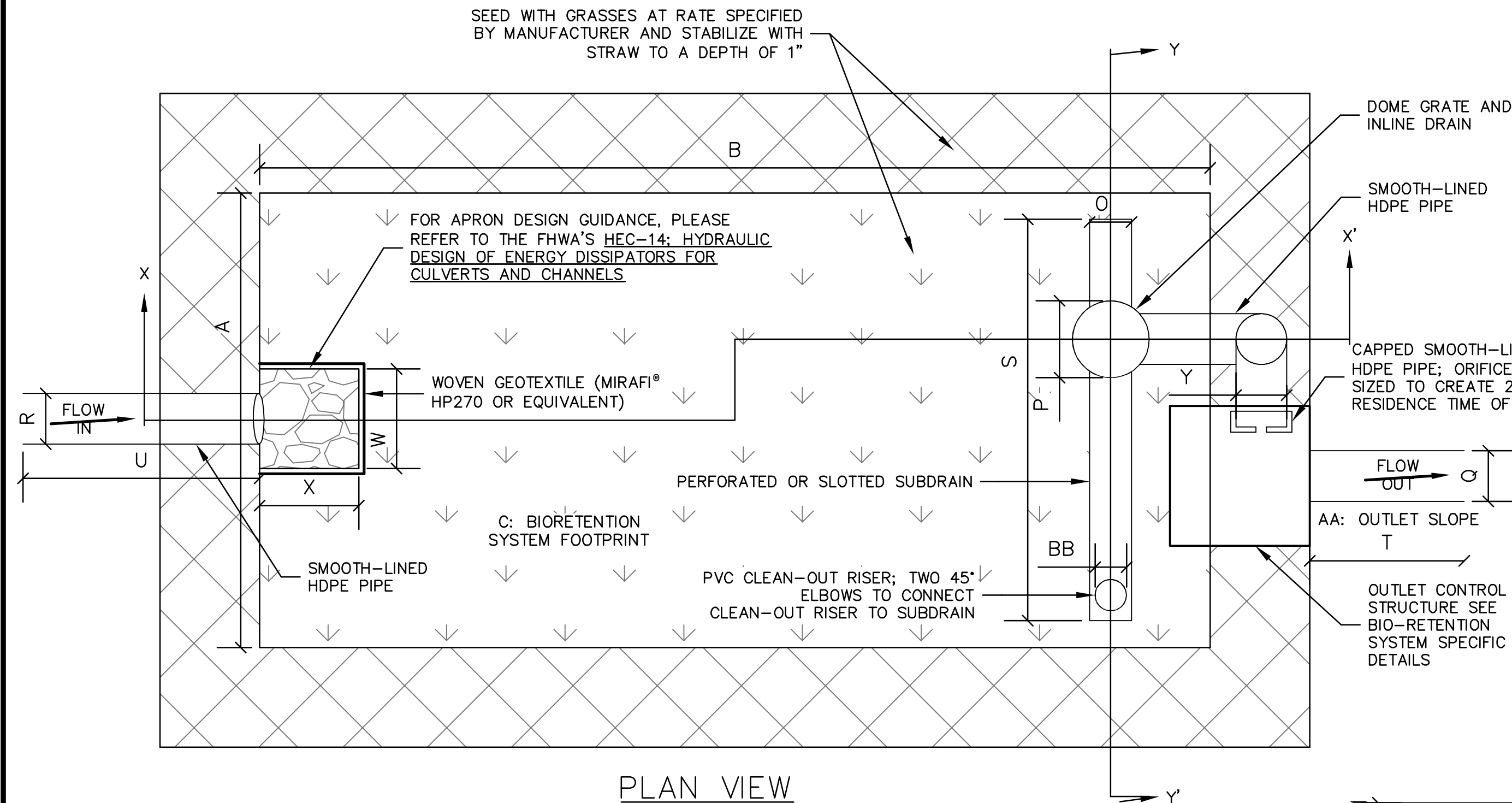
PLANNING FILE NO.: SITE-2024-

DETAILS

**LOT 2 DEVELOPMENT
DEL SOL DOVER, LLC
DOVER, NH**

**DEL SOL DOVER, LLC
340 CENTRAL AVENUE
SUITE 202
DOVER, NH 03820**

[illegible]



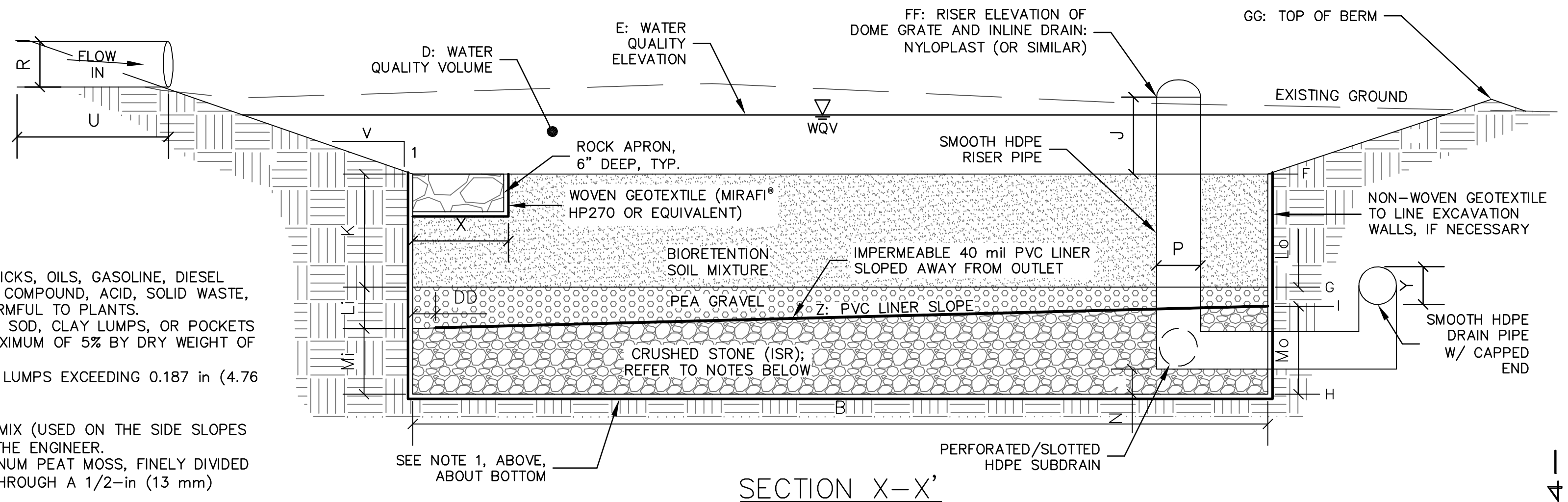
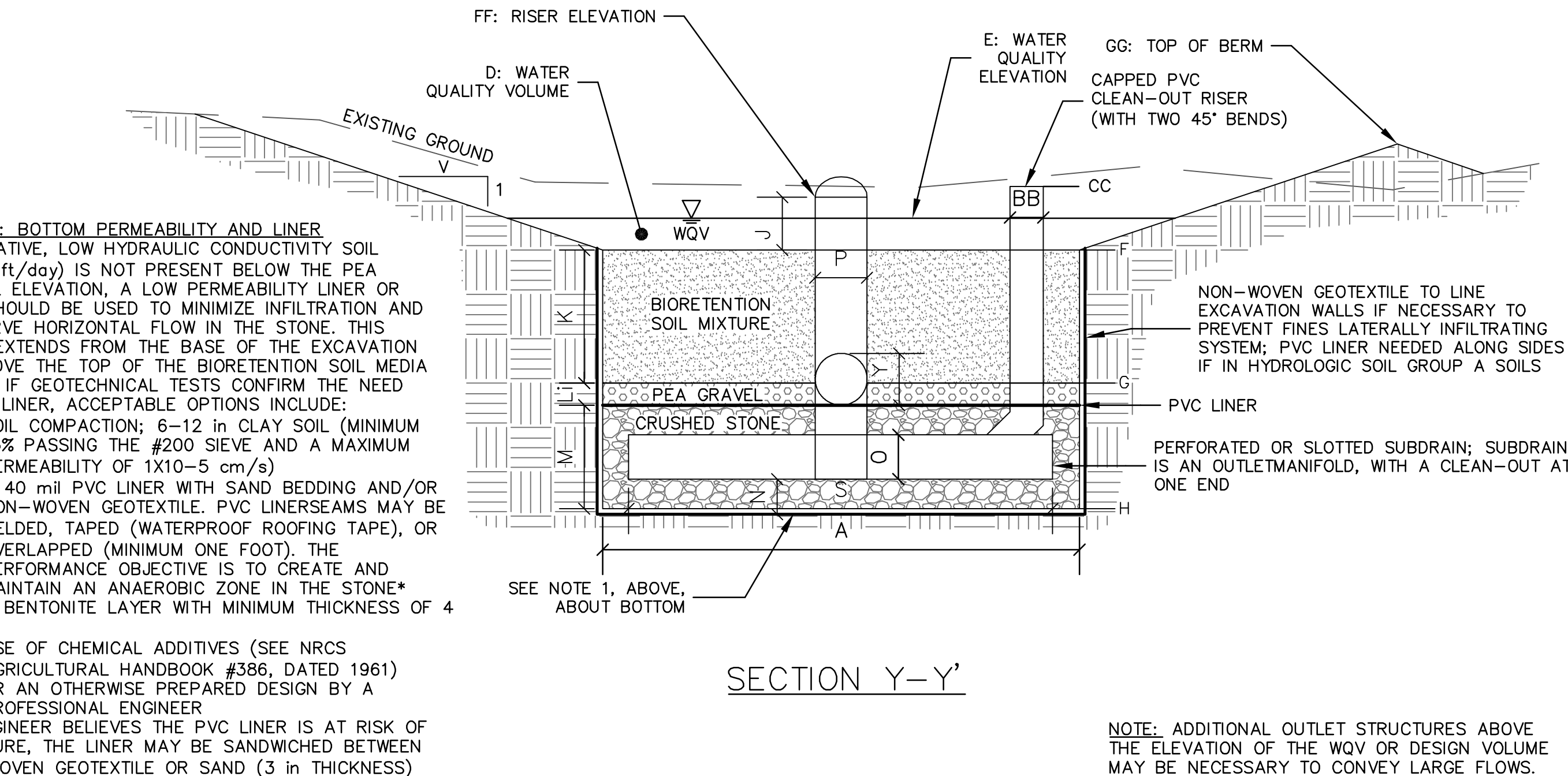
NOTE 1: BOTTOM PERMEABILITY AND LINER
IF A NATIVE, LOW HYDRAULIC CONDUCTIVITY SOIL ($k \leq 0.03 \text{ ft/day}$) IS NOT PRESENT BELOW THE PEA GRAVEL ELEVATION, A LOW PERMEABILITY LINER OR SOIL SHOULD BE USED TO MINIMIZE INFILTRATION AND PRESERVE HORIZONTAL FLOW IN THE STONE. THIS LINER EXTENDS FROM THE BASE OF THE EXCAVATION TO ABOVE THE TOP OF THE BIORETENTION SOIL MEDIA LAYER. IF GEOTECHNICAL TESTS CONFIRM THE NEED FOR A LINER, ACCEPTABLE OPTIONS INCLUDE:
a. SOIL COMPACTION; 6-12 in CLAY SOIL (MINIMUM 15% PASSING THE #200 SIEVE AND A MAXIMUM PERMEABILITY OF $1 \times 10^{-5} \text{ cm/s}$)
b. A 40 mil PVC LINER WITH SAND BEDDING AND/OR NON-WOVEN GEOTEXTILE. PVC LINER SEAMS MAY BE WELDED, TAPED (WATERPROOF ROOFING TAPE), OR OVERLAPPED (MINIMUM ONE FOOT). THE PERFORMANCE OBJECTIVE IS TO CREATE AND MAINTAIN AN ANAEROBIC ZONE IN THE STONE*
c. A BENTONITE LAYER WITH MINIMUM THICKNESS OF 4 in
d. USE OF CHEMICAL ADDITIVES (SEE NRCS AGRICULTURAL HANDBOOK #386, DATED 1961)
e. OR AN OTHERWISE PREPARED DESIGN BY A PROFESSIONAL ENGINEER
*IF ENGINEER BELIEVES THE PVC LINER IS AT RISK OF PUNCTURE, THE LINER MAY BE SANDWICHED BETWEEN NON-WOVEN GEOTEXTILE OR SAND (3 in THICKNESS)

NOTES:

- FOR FULL BIORETENTION STORMWATER SYSTEM SPECIFICATIONS, PLEASE REFER TO THE UNH STORMWATER CENTER'S BIORETENTION SPECIFICATIONS PUBLICATION, DATED FEBRUARY 2017, FOUND AT:
https://www.unh.edu/unhsc/sites/default/files/media/unhsc_bsm_spec_2-28-17_0.pdf
- SYSTEM FOOTPRINT NEED NOT BE RECTANGULAR, ANY SHAPE IS POSSIBLE. THESE DETAILS USE THE RECTANGULAR SHAPE AS AN EXAMPLE.
- THESE DETAILS ARE NOT TO SCALE; FOR DIMENSIONS AND SPECIFICATIONS, REFERENCE EACH LETTER TO THE TABLE OF METRICS.
- BIORETENTION SOIL MIX SHALL NOT BE PLACED UNTIL AFTER ENGINEERING APPROVAL AND INSPECTION OF SUBGRADE.
- BIORETENTION SYSTEM IS RECOMMENDED TO HAVE PRETREATMENT (FOREBAY, SWALE, OR OTHER APPROVED STRUCTURE). PRETREATMENT IS REQUIRED FOR PROJECTS REQUIRING ALTERATION OF TERRAIN (AOT) PERMITTING.
- PLANT THE SYSTEM AS SPECIFIED; AT A MINIMUM, SEED THE SYSTEM FLOOR AND SIDE SLOPES WITH RYE GRASS MIXTURE CONTAINING PERENNIAL AND WINTER RYES, AT A RATE SPECIFIED BY THE MANUFACTURER. STABILIZE THE SLOPES WITH STRAW TO A DEPTH OF 1".
- GENERAL CONSTRUCTION GUIDELINES:
 - VERIFY THAT NO FOREIGN OR DELETERIOUS MATERIAL OR LIQUID SUCH AS PAINT, PAINT WASHOUT, CONCRETE SLURRY, ASPHALT/CONCRETE LAYERS OR CHUNKS, CEMENT, PLASTER, OILS, GASOLINE, DIESEL FUEL, PAINT THINNER, TURPENTINE, TAR, ROOFING COMPOUND, SOLID WASTE, OR ACID HAS BEEN DEPOSITED IN PLANTING SOIL (BIORETENTION MEDIA OR LOAM ON SIDE SLOPES).
 - PROCEED WITH PLACEMENT OF ANY SUBSURFACE MATERIALS ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
 - COMPACT EACH BLENDED LIFT OF BIORETENTION SOIL MEDIA TO 75% OF MAXIMUM STANDARD PROCTOR DENSITY ACCORDING TO ASTM D698.
 - GRADE SOIL MEDIA TO A SMOOTH, UNIFORM SURFACE PLANE WITH LOOSE, UNIFORMLY FINE TEXTURE. ROLL AND RAKE, REMOVE RIDGES, AND FILL DEPRESSIONS TO MEET FINISH GRADES.
 - LIGHTLY COMPACT FINISHED FLOOR ELEVATION AND FINISHED SLOPES USING THE BUCKET OF AN EXCAVATOR, NON-MOTORIZED ROLLER, HAND TAMP, OR OTHER MEANS, THEN ROUGHEN SURFACE WITH A RAKE TO LOOSEN SOILS BEFORE SEEDING.
 - DO NOT COMPACT THE SUBGRADE AT THE BOTTOM OF EXCAVATION UNLESS PERMEABILITY EXCEEDS $1 \times 10^{-5} \text{ cm/s}$
- BIORETENTION SOIL MEDIA (BSM) MIXTURE SPECIFICATIONS:
 - STICKS AND ROOTS SHOULD BE MINIMIZED IN THE BSM MIXTURE, AND PREFERABLY LIMITED TO NOTHING LARGER THAN 4.76 mm (0.187 in).
 - DEBRIS AND OTHER FOREIGN MATERIALS SHOULD BE MINIMIZED.
 - ORGANIC MATTER SHOULD MAKE UP A MINIMUM OF 3% BY VOLUME AND A MAXIMUM 8% BY VOLUME OF THE BSM.
 - BSM MIXTURE SHOULD HAVE A SOIL REACTION pH OF 6 TO 7.
 - CATION EXCHANGE CAPACITY (CEC) OF BSM SHOULD BE A MINIMUM OF 10 meq PFR 100 ml AT A pH OF 7.0.
- IF BSM IS PURCHASED FROM A MANUFACTURER, BSM MIXTURE SHALL NOT CONTAIN THE FOLLOWING:
 - UNACCEPTABLE MATERIALS: CONCRETE SLURRY, CONCRETE LAYERS OR CHUNKS,

- CEMENT, PLASTER, BUILDING DEBRIS, ASPHALT, BRICKS, OILS, GASOLINE, DIESEL FUEL, PAINT THINNER, TURPENTINE, TAR, ROOFING COMPOUND, ACID, SOLID WASTE, OR OTHER EXTRANEOUS MATERIALS THAT ARE HARMFUL TO PLANTS.
- 9.2. UNSUITABLE MATERIALS: STONES, ROOTS, PLANTS, SOD, CLAY LUMPS, OR POCKETS OF COARSE SAND THAT EXCEEDS A COMBINED MAXIMUM OF 5% BY DRY WEIGHT OF THE MANUFACTURED SOIL.
- 9.3. LARGE MATERIALS: STONES, CLODS, ROOTS, CLAY LUMPS EXCEEDING 0.187 in (4.76 mm) IN ANY DIMENSION.
10. ORGANIC SOIL AMENDMENTS:
 - NO COMPOST SHOULD BE USED IN THE PLANTING MIX (USED ON THE SIDE SLOPES AND SURROUNDING AREA) UNLESS SPECIFIED BY THE ENGINEER.
 - SPHAGNUM PEAT: PARTIALLY DECOMPOSED SPHAGNUM PEAT MOSS, FINELY DIVIDED OR OF GRANULAR TEXTURE WITH 100% PASSING THROUGH A 1/2-in (13 mm) SIEVE, WITH A pH OF 3.4 TO 4.8.
 - WOOD DERIVATIVES: SHREDDED WOOD, WOOD CHIPS, GROUND BARK, OR WOOD WASTE; OF UNIFORM TEXTURE AND FREE OF STONES, STICKS, SOIL, OR TOXIC MATERIAL.
11. THE CRUSHED STONE LAYER SHOULD CONSIST OF AASHTO #5 STONE (3/4-in).
12. THE VOLUME OF WATER CONTAINED ABOVE THE BSM ELEVATION AND BELOW THE HIGH FLOW SPILLWAY IS STATISTICALLY DESIGNED TO HOLD A SPECIFIC RUNOFF VOLUME.
13. THE DESIGN VOLUME ABOVE THE BSM IS PREFERABLY THE WQV. THIS VOLUME MAY NOT BE ACHIEVABLE FOR RETROFIT INSTALLATIONS

BIORETENTION SYSTEM DESIGN METRICS						
ID	DESIGN PARAMETER	MIN	BIO 1	BIO 2	BIO 3	UNITS
A	SYSTEM FLOOR WIDTH		14	19	10	FT
B	SYSTEM FLOOR LENGTH		49	60	28	FT
C	BIORETENTION FOOTPRINT AREA		686	1,140	280	SF
D	WATER QUALITY VOLUME		1,274	2,203	435	CF
E	WQV ELEVATION		95.42	95.09	95.16	FT
F	SYSTEM FLOOR ELEVATION		94.85	94.60	94.60	FT
G	BOTTOM BSM ELEVATION		93.35	93.10	93.10	FT
H	BOTTOM STONE ELEVATION		91.85	91.60	91.60	FT
I	TOP STONE/OUTLET INVERT ELEVATION		93.10	92.85	92.85	FT
J	PONDING DEPTH BELOW LOWEST INV.		0.65	0.50	0.60	FT
K	BSM MEDIA DEPTH	18	18	18	18	IN
Li	INLET END PEA GRAVEL DEPTH		6	7	5	IN
Lo	OUTLET END PEA GRAVEL DEPTH	3	3	3	3	IN
Mi	INLET END CRUSHED STONE DEPTH		12	11	13	IN
Mo	OUTLET END CRUSHED STONE DEPTH	14	15	15	15	IN
N	SUBDRAIN DEPTH ABOVE BOTTOM	4	4	4	4	IN
O	PERFORATED SUBDRAIN DIAMETER	6	6	6	6	IN



ACCEPTABLE PARTICLE SIZE DISTRIBUTION OF FINAL BIORETENTION SOIL MIX				
MEDIA TYPE	SIEVE #	SIZE (in)	SIZE (mm)	% PASSING
COARSE SAND	4	0.187	4.76	100
MEDIUM SAND	10	0.079	2.00	95
FINE SAND	40	0.017	0.42	40-15
SILTS	200	0.003	0.075	10-20
CLAYS	<200	PAN	PAN	0-5

BIORETENTION SOIL MEDIA COMPONENTS: *

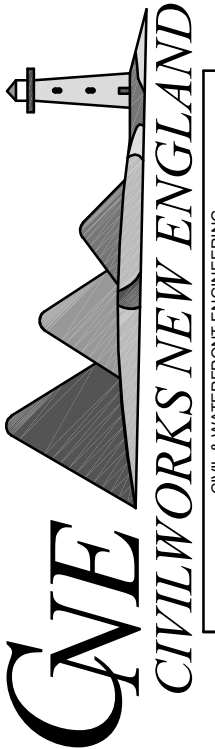
- AMOUNTS MIXED BY TOTAL VOLUME
- 60-85% - SAND (0.5 TO 2.0 mm) (SEE SPECS ABOVE)
- 15-25% - LOAM OR TOPSOIL
- 3-8% - ORGANIC MATTER
- 0-5% - WATER TREATMENT RESIDUALS OR IRON FILINGS**

*ALTERNATELY, USE MEDIA SPECIFIED IN THE ALTERATION OF TERRAIN RULES, Env-Wq 1508.07(k)
**THIS IS AN AMENDMENT USED FOR ENHANCED PHOSPHORUS ADSORPTION

INTERNAL STORAGE RESERVOIR (ISR) NOTES:

- THE HYBRID BIORETENTION SYSTEM HARBORS AN ANAEROBIC INTERNAL STORAGE RESERVOIR FOR NITROGEN REMOVAL.
- THE ISR IS SEPARATED BY AN IMPERMEABLE PVC LINER BETWEEN THE PEA GRAVEL AND CRUSHED STONE LAYERS.
- THE PVC LINER SLOPES FROM THE OUTLET TOWARDS THE INLET TO MAXIMIZE STORAGE RETENTION AND PROVIDE EXTRA TREATMENT/FILTER TIME VIA PLUG FLOW THROUGH CRUSHED STONE.
- DESIGN GUIDELINES FOR THE SUBSURFACE GRAVEL WETLAND SPECIFICATIONS (UNHSC, 2016) IDENTIFIED THAT THE WATER VOLUME IN THE ISR BE AT LEAST 0.26*WQV [WATER QUALITY VOLUME], OR 26% OF THE WQV.
- PVC LINER THICKNESS OF 40 TO 60 MIL, PREFERABLY SEAMLESS. IF SEAMS ARE UNAVOIDABLE, THE SEAMS SHOULD BE SEALED.

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY



CIVILWORKS NEW ENGLAND
181 Watson Road, PO Box 1166
Dover, NH 03820

DATE: 8-6-24	SCALE: N.T.S.	DRAWN BY: SRD	DESIGN BY: JFG	APPROVED BY: JH	PROJECT NO: 24085	FILE: SITE.DWG	NO.	REVISION	APPD	DATE
DEL SOL DOVER, LLC 340 CENTRAL AVENUE SUITE 202 DOVER, NH 03820										
LOT 2 DEVELOPMENT DEL SOL DOVER, LLC DOVER, NH										
17										

PLANNING FILE NO.: SITE-2024-DETAILS



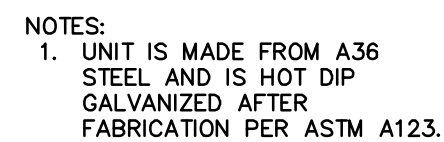
BIORETENTION POND 1 (BIO1)
OUTLET STRUCTURE DETAIL
NOT TO SCALE



BIORETENTION POND 2 (BIO2)
OUTLET STRUCTURE DETAIL
NOT TO SCALE



BIORETENTION POND 3 (BIO3)
OUTLET STRUCTURE DETAIL
NOT TO SCALE



HAALA MC56X56

56"

56"

1 1/2"

NOTES:

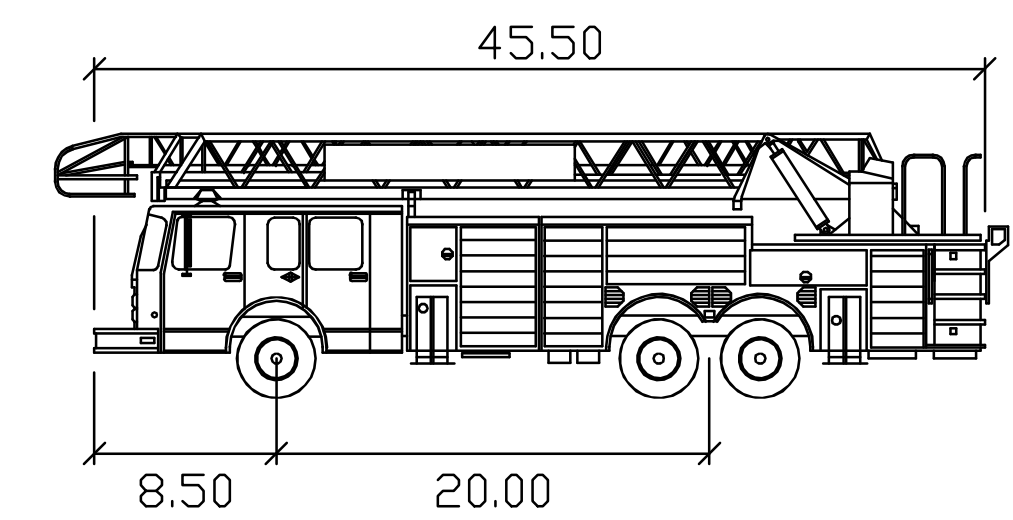
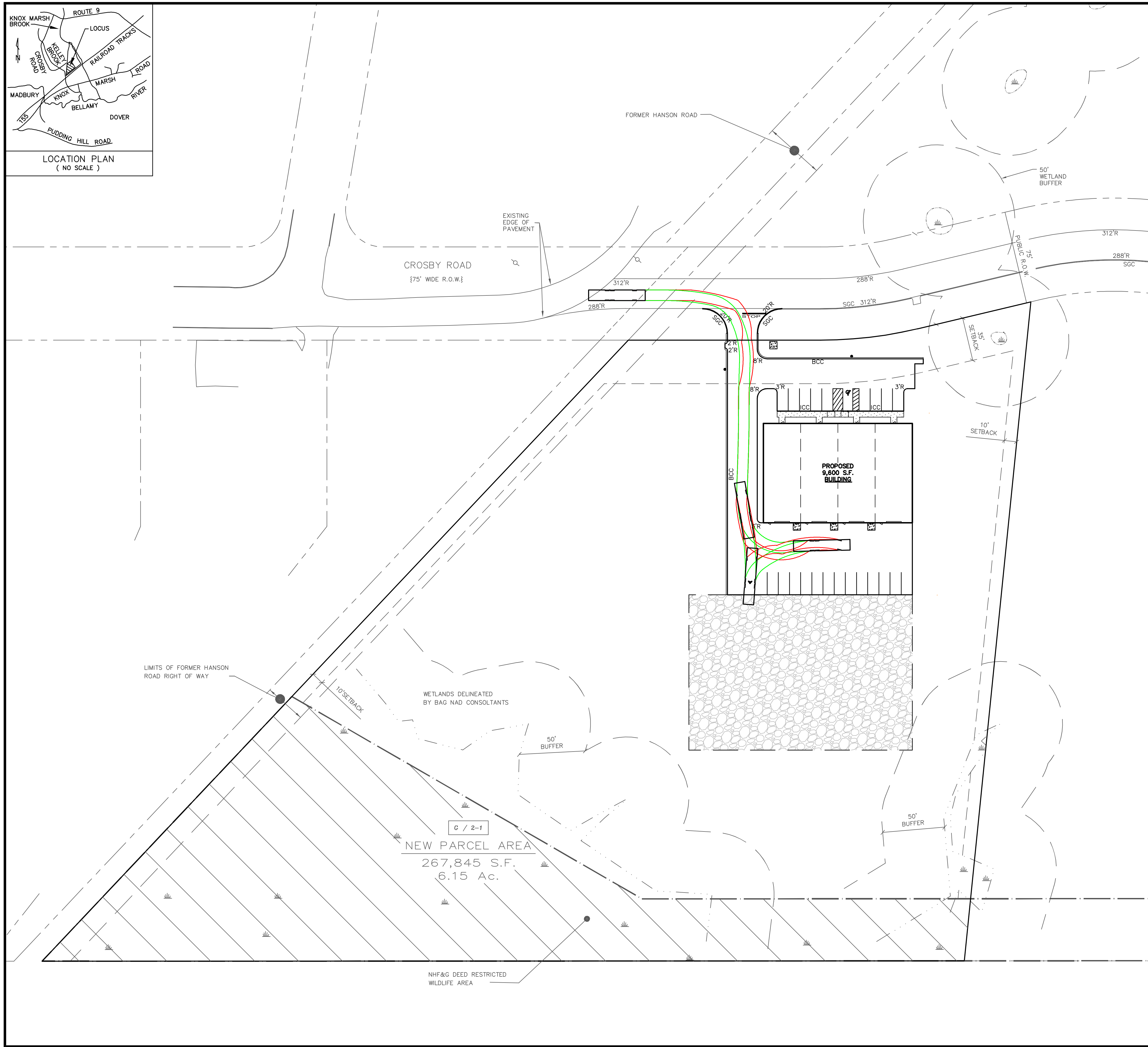
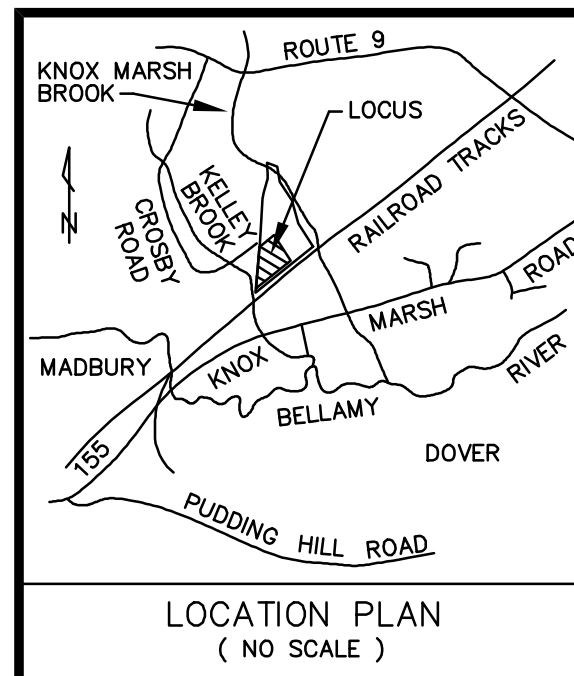
- UNIT IS MADE FROM A36 STEEL AND IS HOT DIP GALVANIZED AFTER FABRICATION PER ASTM A123.

SLOTS FOR 1/2" ANCHORS

HAALA MC56X56

NOT TO SCALE

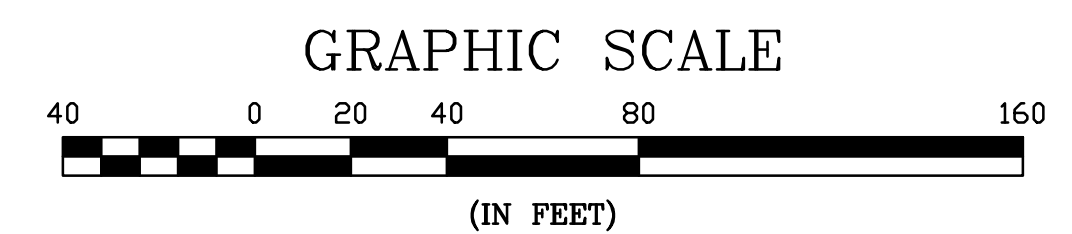
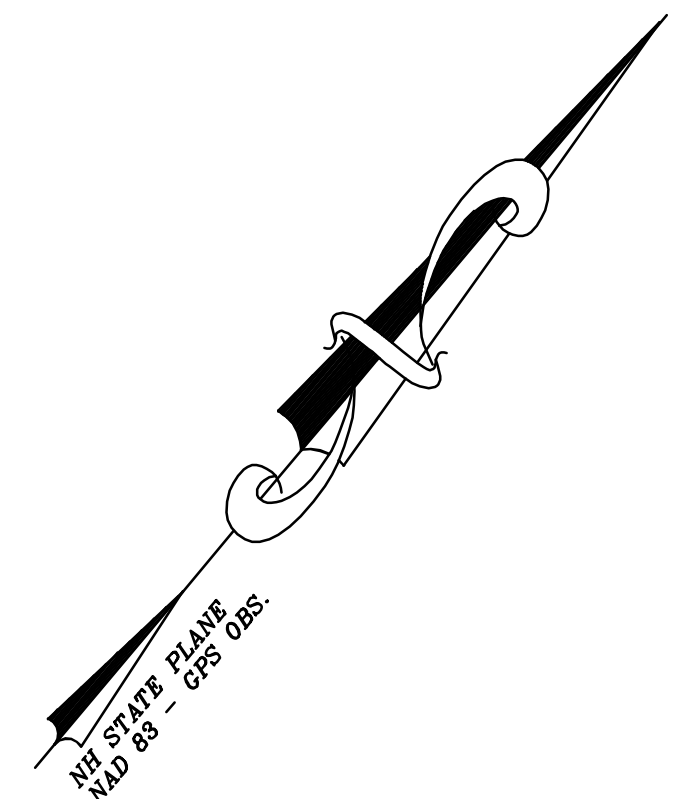
HAALA MC56X56
NOT TO SCALE

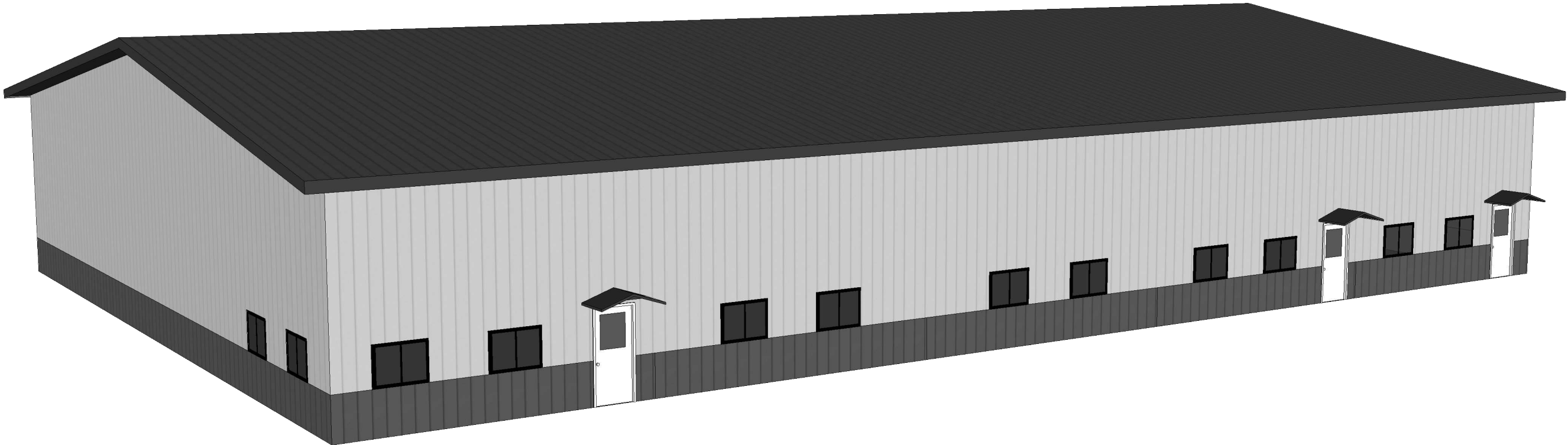


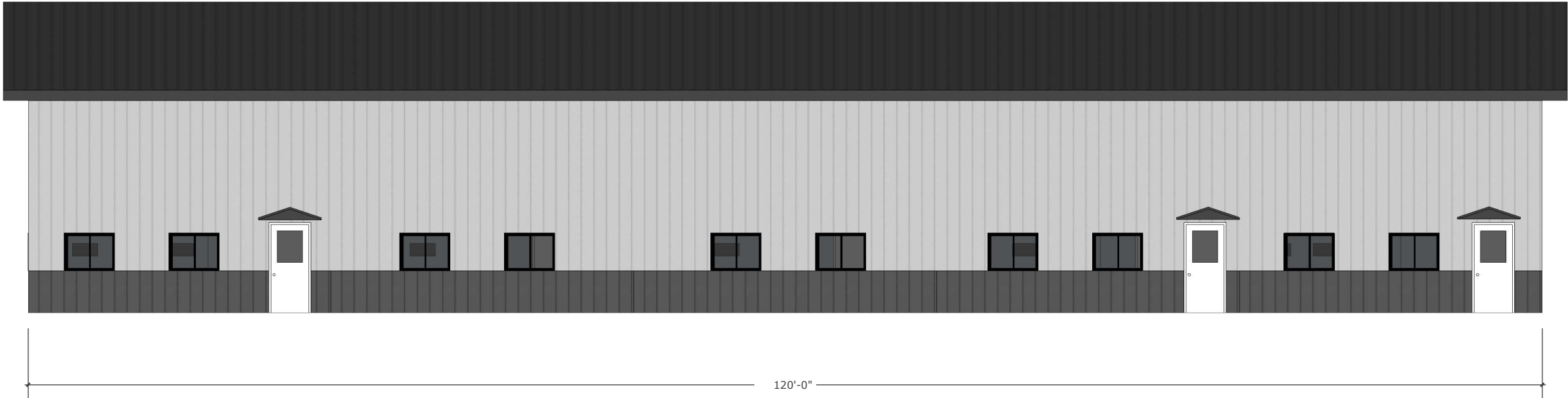
Dover ladder

feet

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Width           : 8.50
Track           : 8.50
Lock to Lock Time : 6.0
Steering Angle  : 44.0
```







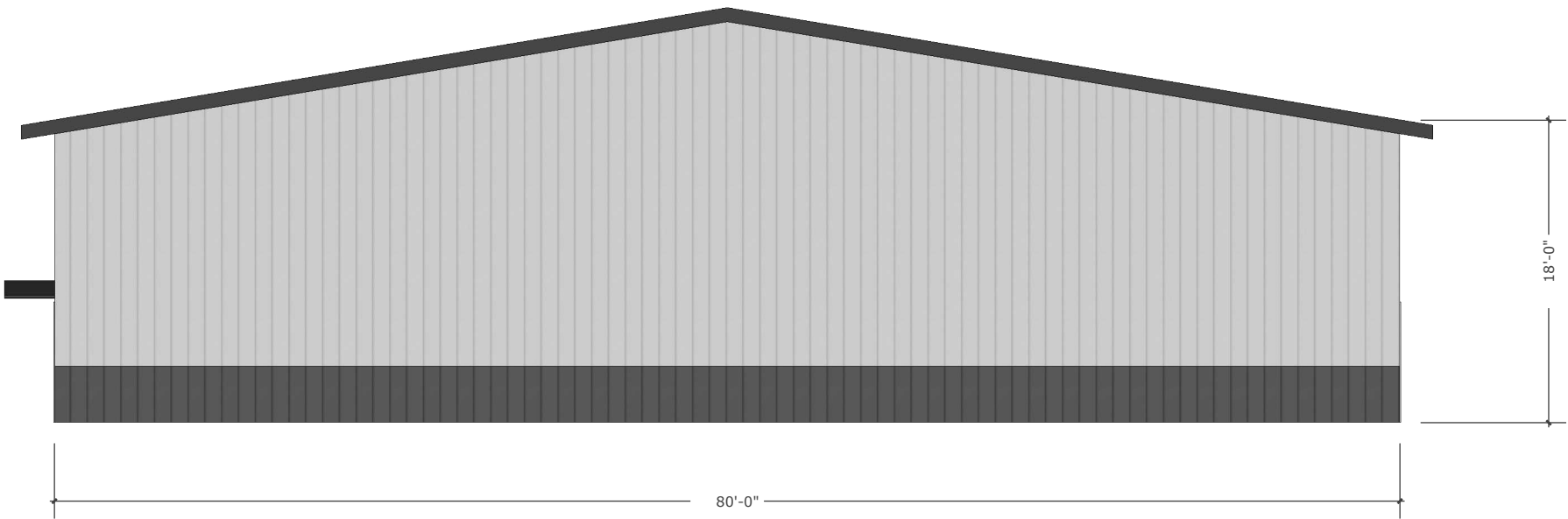
Front Side Wall Elevation

A
01



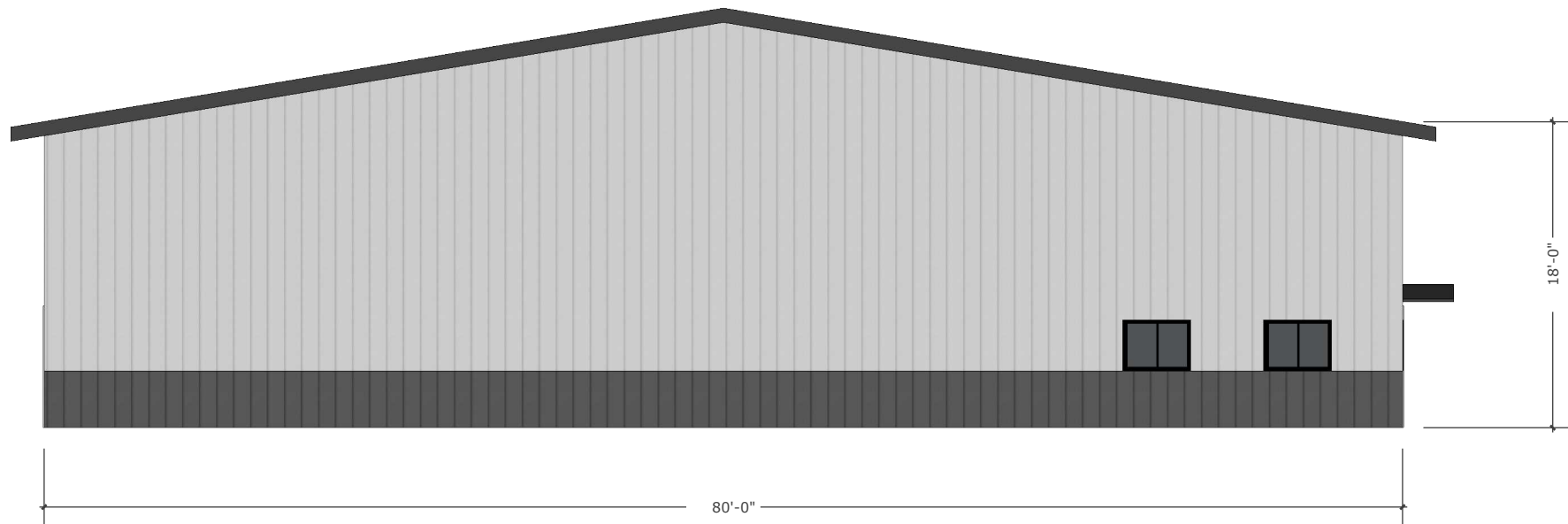
Back Sidewall Elevations

A
02



Left Endwall Elevation

A
01



Right Endwall Elevation

A
02



PLAN SNAPSHOT REPORT SITE-2024-0011 FOR CITY OF DOVER, N.H.

Plan Type: Site Plan - Major
Work Class: New Construction
Status: In Review
Valuation: \$0.00
Description: (Building is over the threshold of 1,500 sf. and will need TRC review). 2,356 sf one story storage building. Our building permit BLDG-2024-0109 has been put on hold pending a meeting with TRC.

Project:
District: None
Square Feet: 0.00
Assigned To: Blonigen, Rachel

App Date: 08/14/2024
Exp Date: 10/18/2024
Completed: NOT COMPLETED
Approval Expire Date:

Parcel: G0001-L00000	Main	Address: 15 Faraday Dr Dover, NH	Main	Zone: CM(Non-Residential - Commercial Manuf.
-----------------------------	------	--	------	---

Applicant
Chezney Aubert
15 FARADAY DRIVE
DOVER, NH 03820
Business: (603) 740-7518

Plan Custom Fields

Total	0	Total2	0	Total3	0
Total4	0	Total5	0	Total6	0
Total7	0	Total8	0	Total9	0
Street Classification Type	Municipal	Net Change in # Parking Spaces (+/-)	50	Water Service	Not Applicable
Recording Number		Sewer Service	Not Applicable	Deed Book	
Total SQFT	0	Deed Page		Deed Date	
Proposed Property Use	Material storage - no offices	Area of Parcel to be Developed (SQFT)	2000	Number of Parking Spaces Existing	50
Number of Parking Spaces Proposed	0	Type of Building to be Built	One story metal pre-fab storage building	Estimated Construction Value	247297.83
Refuse Removal	Private	Existing Conservation Easement Details		TotalImpactFeeSDTOD	0.00
TotalImpactFeeTHTOD	0.00	TotalImpactFee23FTOD	0.00	TotalImpactFeeA4TOD	0.00
TotalImpactFeeMHTOD	0.00	TotalImpactFeeADUTOD	0.00	TotalImpactFeeAONRTOD	0.00
TotalImpactFeeAR55TOD	0.00	TotalImpactFeeAR62TOD	0.00	Sub Total Residential	0.00
TotalImpactFeeRIRCTOD	0.00	TotalImpactFeeOCSTOD	0.00	TotalImpactFeeITWCTOD	0.00
TotalImpactFeeNHALTOD	0.00	TotalImpactFeeOIUTOD	0.00	TotalImpactFeeAFAOT	0.00
Sub Total Non-Residential	0.00	Total of Impact Fees to be Assessed	0.00		

Attachment File Name	Added On	Added By	Attachment Group	Notes
Signature_Chezney_Aubert_8/14/2024.jpg	08/14/2024 9:56	Aubert, Chezney		Uploaded via CSS

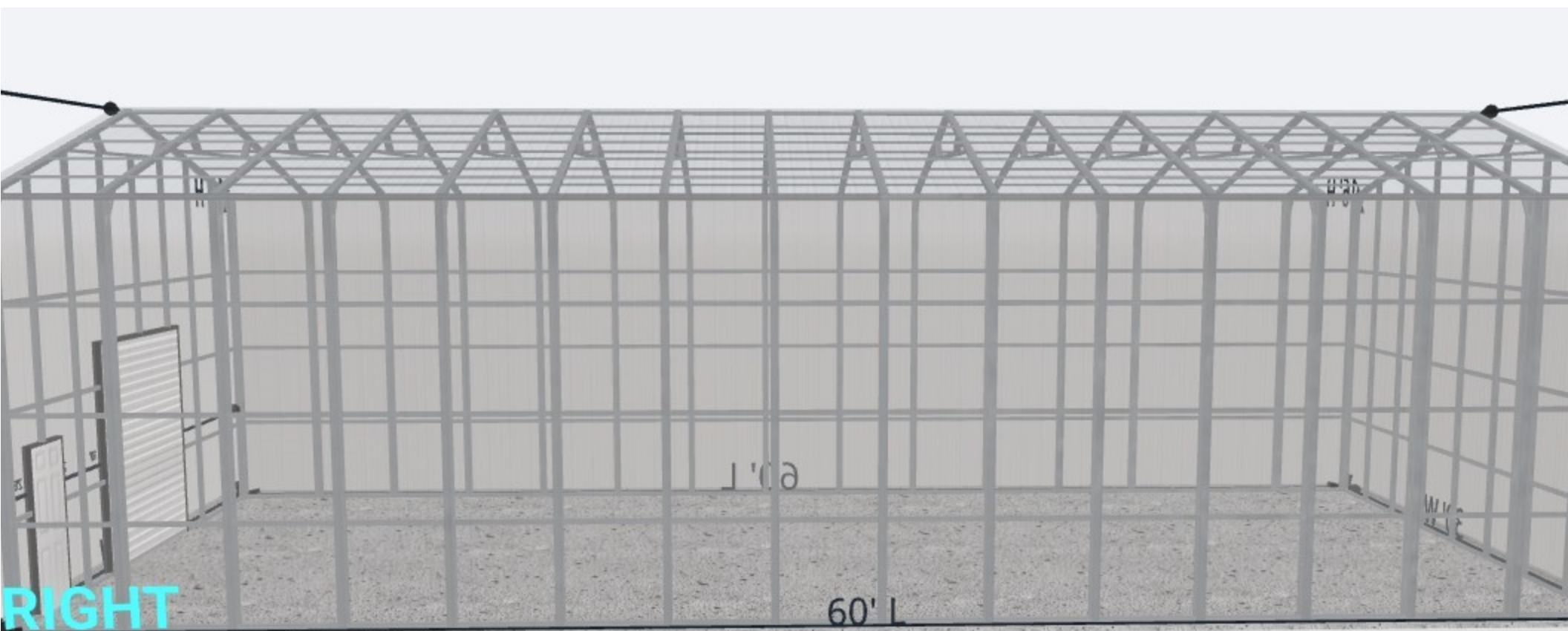
Invoice No.	Fee	Fee Amount	Amount Paid
INV-00008961	Planning General Application Fee	\$200.00	\$200.00
Total for Invoice INV-00008961		\$200.00	\$200.00
Grand Total for Plan		\$200.00	\$200.00

Workflow Step / Action Name	Action Type	Start Date	End Date
Review v.1		08/14/2024 11:30	
Confirm application complete v.1	Generic Action		08/14/2024 11:30
Technical Review Committee Meeting Agenda v.1	Task	08/14/2024 11:30	

PLAN SNAPSHOT REPORT (SITE-2024-0011)

Land Use Plan Technical Review v.1	Receive Submittal
Technical Review Committee Meeting v.1	Hold Meeting
Planning Board v.1	
Planning Board Agenda v.1	Task
Invoice for Notices v.1	Task
Send Notices v.1	Task
Planner Creates Staff Recommendations v.1	Plan Activity
Distribute Planning Board Materials v.1	Task
Planning Board Hearing v.1	Hold Hearing
Planning Board Decision v.1	Plan Activity
NOD Sent to Applicant v.1	Create Report
Final Plan v.1	
Land Use Plan Stamped and Signed v.1	Generic Action
Recording v.1	Task
Document Archival v.1	Generic Action
Internal Notification of Plan Completion v.1	Generic Action
Building Official Notifies Address v.1	Generic Action
Pre-Con Meeting v.1	Hold Meeting
Create/Link to Records v.1	
Create / Link to Permit - Building Major v.1	Create Sub Permit
Create / Link to Permit - Site Work, Construction v.1	Create Sub Permit





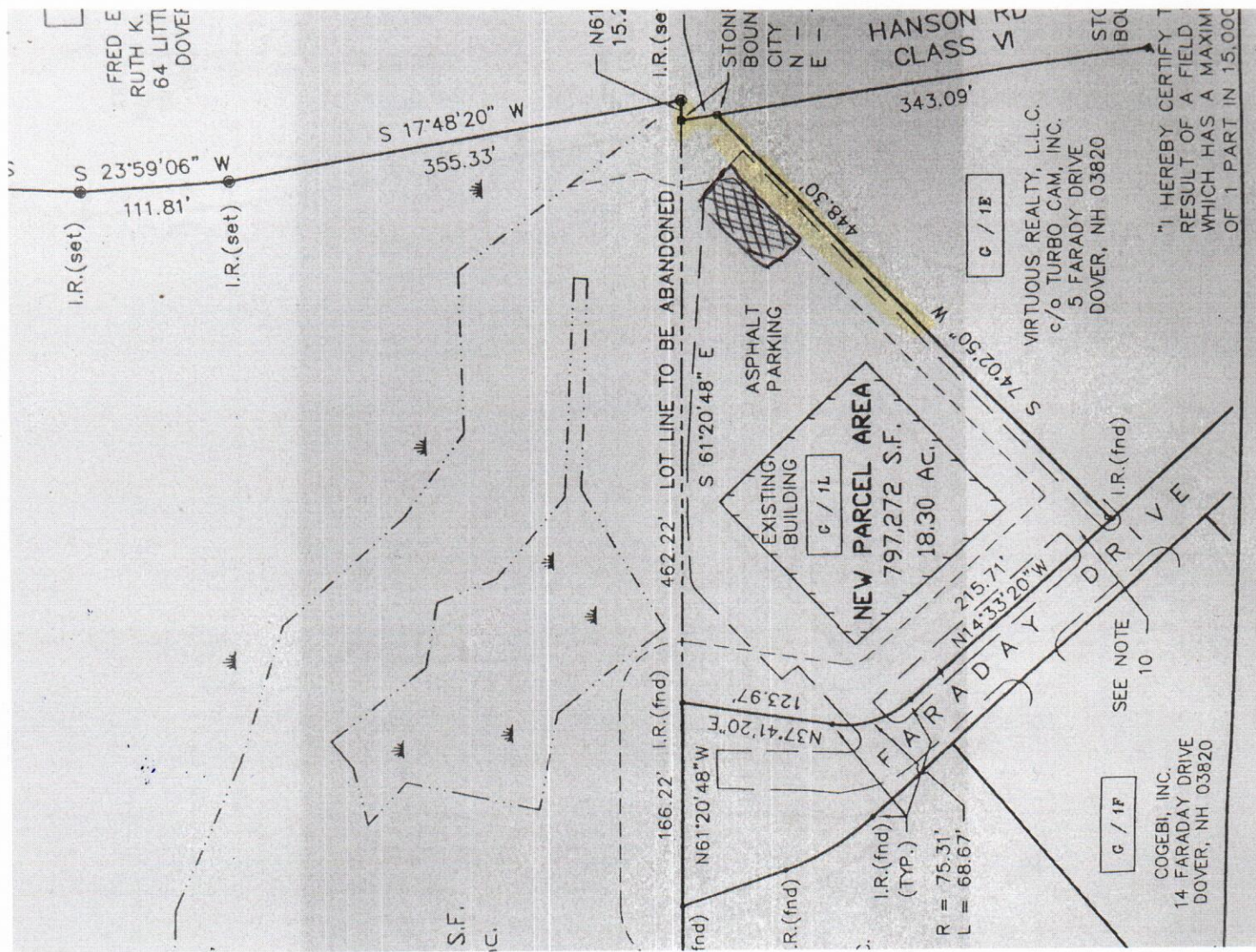


TABLE-1						
BOW/RAFTER FRAME, END POST, GROUND ANCHOR AND PANEL FASTENER SPACING SPECIFICATIONS						
WIND EXPOSURE CATEGORY	ULTIMATE WIND SPEED (MPH)	NOMINAL WIND SPEED (MPH)	MAXIMUM GROUND SNOW LOAD (PSF)	MAXIMUM POST RAFTER SPACING (FEET)	AVERAGE FASTENERS SPACING ON-CENTERS ALONG RAFTER OR PURLINS AND POST OR GIRTS (INCHES)	
B	115	91	60	4 (12 GA)	METAL PANELS	SPACING
					29 GAUGE	6
NOTES: 1. SPECIFICATIONS APPLICABLE TO 29 GAUGE METAL PANELS FASTENED DIRECTLY TO 12 OR 14 GAUGE STEEL TUBE BOW FRAMES 2. FASTENER CONSIST OF #12-14 x ¾" SELF-DRILLING SCREWS WITHOUT CONTRAL SEAL WASHER. 3. SPECIFICATIONS APPLICABLE ONLY FOR MEAN ROOF HEIGHT OF 24 FEET OR LESS AND ROOF SLOPES OF 7 TO 27 DEGREES (15/12 TO 6/12 PITCH). SPACING REQUIREMENTS FOR OTHER ROOF HEIGHTS AND/OR SLOPES MAY VARY.						

STANDARD BUILDING DETAILS 40 FT SPAN

LIGHT FRAME CONSTRUCTION

NOTE: THESE PLANS MAY BE USED FOR SPANS LESS THAN 40 FT

NOTE: ☐ USE 2 1/2" x 2 1/2" 14GA
☒ USE 2 1/4" x 2 1/4" 12GA

STEEL TUBE FOR ALL FRAME AND BASE RAIL MEMBERS UNLESS OTHERWISE SHOWN

METAL BUILDING INSTALLATION PLANS, DETAILS, FRAMING & FASTENER SPECIFICATIONS

15 FARADAY DRIVE
DOVER, NEW HAMPSHIRE
03820

THE OWNER IS RESPONSIBLE FOR OBTAINING A BUILDING PERMIT, IF NEEDED, AND FOR COMPLYING WITH ALL LOCAL BUILDING CODE REQUIREMENTS

THIS IS THAT THE CALCULATIONS AND SPECIFICATIONS HEREIN HAVE BEEN PREPARED BY THE UNDERSIGNED PROFESSIONAL ENGINEER AND ARE IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2018 INTERNATIONAL BUILDING CODE BUILDING CODE AND THE 2018 INTERNATIONAL RESIDENTIAL CODE INCLUDING

DESIGN LOADS	
MIN DEAD LOAD	3 PSF
MIN ROOF LIVE LOAD	20
MIN GROUND SNOW LOAD	0
MAX GROUND SNOW LOAD	SEE TABLE-1
MIN ULTIMATE WIND SPEED	
MAX ULTIMATE WIND SPEED	

BUILDING CODE INFORMATION	
OCCUPANCY CATEGORY	II
USE GROUP	U OR S
CONSTRUCTION TYPE	2B

IMPORTANCE FACTOR		
WIND	Iw	1.0
SNOW	Is	1.0
EARTHQUAKE	Ie	1.0

GENERAL NOTES:

THESE PLANS PERTAIN ONLY TO THE STRUCTURE, INCLUDING MAIN WIND FORCE RESISTING SYSTEM (MWFRS), COMPONENTS AND CLADDING AND BASE RAIL ANCHORAGE. OTHER DESIGN ISSUES, INCLUDING, BUT NOT LIMITED TO, PLUMBING, ELECTRICAL, INGRESS/EGRESS, PROPERTY SET BACKS, OR OTHER LOCAL ZONING REQUIREMENTS ARE THE RESPONSIBILITY OF OTHERS.

THESE STRUCTURES ARE DESIGNED AS UTILITY/STORAGE BUILDINGS CAPABLE OF SUPPORTING THE DEAD LOAD OF THE STRUCTURE AND APPLICABLE LIVE AND WIND LOADS. IMPROVEMENTS NOT SPECIFICALLY ADDRESSED HEREIN, WHICH EXERT ADDITIONAL LOADS ON THE STRUCTURE SHALL BE AT THE OWNER'S RISK. THE CARPORT SHALL NOT BE RESPONSIBLE FOR STRUCTURAL DAMAGE OR FAILURE DUE TO THE APPLICATION OF ADDITIONAL LOADS.

ALL STEEL TUBING SHALL BE 55 KSI STEEL OR BETTER. ALL METAL PANELS SHALL BE 80 KSI STEEL OR BETTER.

FASTEN METAL ROOF AND WALL PANELS TO FRAMING WITH #12x3/4" SELF DRILLING FASTENERS WITH CONTROL SEAL WASHERS AT AN AVERAGE SPACING OF 6" FOR 29 GAUGE PANELS.

ALL FIELD CONNECTIONS SHALL BE #12x3/4" SELF DRILLING FASTENERS (SDF), UNLESS NOTED OTHERWISE. BOLTED CONNECTIONS SHALL BE 1/2" H.S. BOLTS, ASTM A325 OR SAE GRADE 5, UNLESS NOTED OTHERWISE.

ALL WELDED CONNECTIONS SHALL BE SHOP WELDED UNLESS NOTED OTHERWISE.

INSTALL CONCRETE ANCHORS WITHIN 6" OF EACH VERTICAL POST ALONG SIDE AND END BASE RAILS. USE ITW RAMSET/ REDHEAD TRUBOLT OR SIMPSON STRONG-TIE STRONG BOLT-2 WEDGE ANCHORS, OR ITW REDHEAD TAPCON+ OR TITEN HD SCREW ANCHORS OR AN APPROVED EQUAL.

POST/RAFTER BRACING: BRACE ON EVERY POST/RAFTER CONNECTION, EXCEPT FOR END WALLS AND HEADERS.

PROVIDE LONGITUDINAL BRACING ON TOP OF THE BOTTOM CHORD OF THE ROOF TRUSS FOR THE FULL LENGTH OF THE BUILDING AS INDICATED.

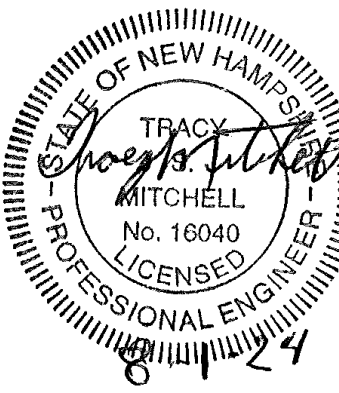
GALVANIZATION: METAL ACCESSORIES FOR USE IN EXTERIOR WALL CONSTRUCTION AND NOT DIRECTLY EXPOSED TO THE WEATHER SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 153, CLASS B-2. METAL PLATE CONNECTORS, SCREWS, BOLTS AND NAILS EXPOSED DIRECTLY TO THE WEATHER SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED.

CONCRETE FOUNDATION DESIGN RECOMMENDATIONS:

CONCRETE SHALL HAVE A MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF 1500 PSI AT 28 DAYS OR AS REQUIRED BY LOCAL BUILDING CODE. THE USE OF HIGHER STRENGTH CONCRETE IS ACCEPTABLE.

COVER OVER REINFORCING STEEL: MINIMUM CONCRETE OVER REINFORCING BARS SHALL BE 3 INCHES WHERE CONCRETE IS CAST AGAINST AND PERMANENTLY IN CONTACT WITH THE EARTH OR EXPOSED TO THE EARTH OR WEATHER AND 14# ELSEWHERE.

REINFORCING STEEL: THE REINFORCING STEEL SHALL BE MINIMUM GRADE 40. THE USE OF FIBER REINFORCED CONCRETE (FRC) OR WELDED WIRE FABRIC (WWF) IS ACCEPTABLE.



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CLIENT: 

PROJECT: CARPORT

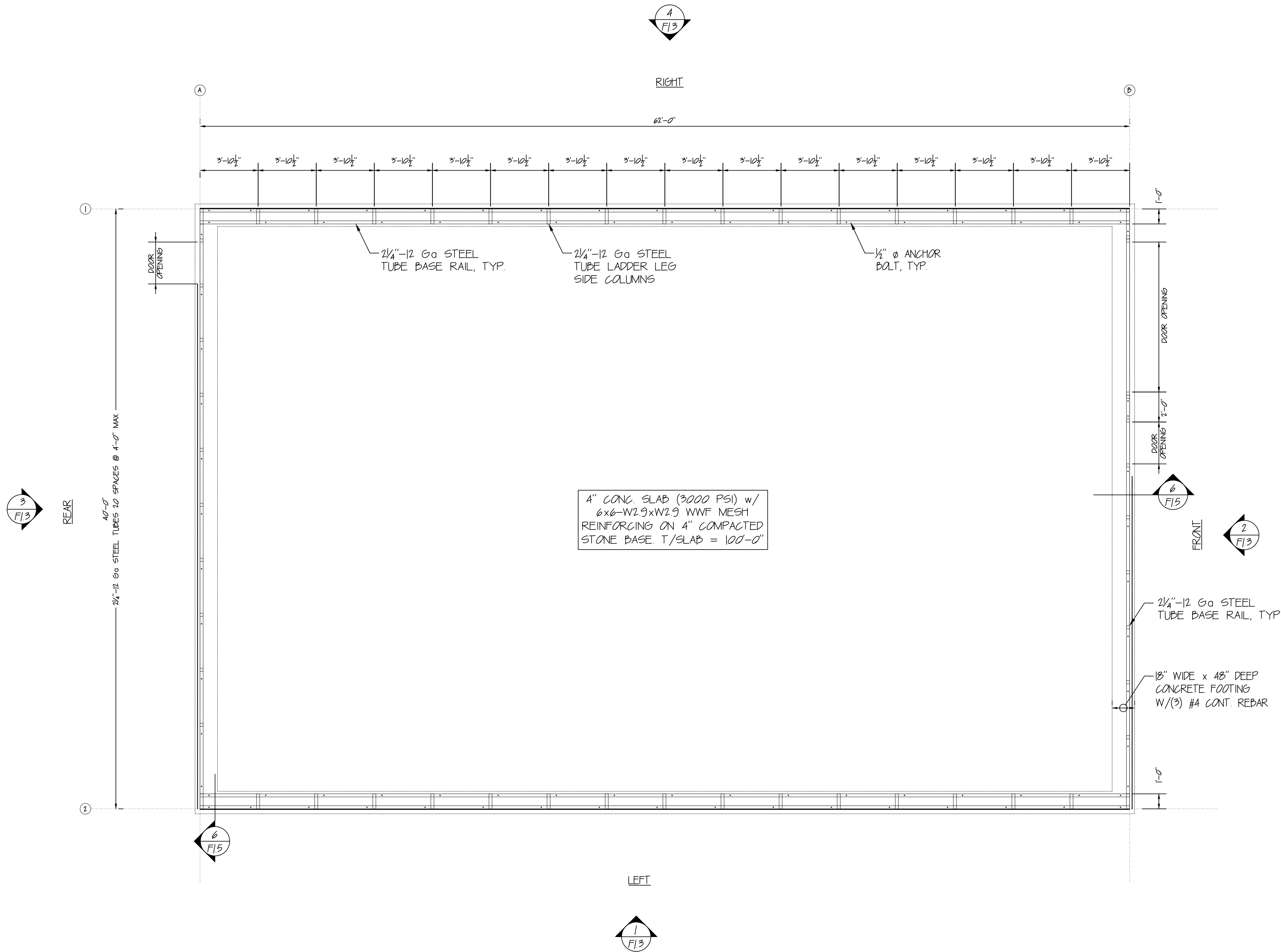
800 PIEDMONT TRIAD W
DR. MT. AIRY, NC 27030

15 FARADAY DRIVE

STRUCTURAL NOTES

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DRAWN BY:
DATE: 07.25.24
CHKD. BY:
DATE:
ASG JOB NO. 242028
DRAWING FILENAME:
DRAWING NO.:

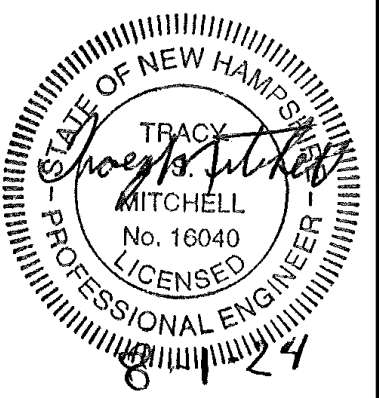
F1.0



- NOTES:
1. BOTTOM OF FOOTING TO BE LOCATED BELOW FROST LINE PER LOCAL BUILDING CODE.
 2. OWNER TO PROVIDE ALL ANCHOR BOLTS, MASONRY, CONCRETE, STEEL COLLARS, POST BASES, AND ALL LABOR AND ACCESSORIES NECESSARY TO INSTALL SAME.
 3. ALL REINFORCING STEEL TO BE ASTM A615 MATERIAL.
 4. OWNER TO PROVIDE FOUNDATION VENTS PER LOCAL CODE.
 5. OWNER TO PROVIDE ACCESS TO CRAWL SPACE PER LOCAL CODE.
 6. 61 - 1" DEEP SAWCUT CONTROL JOINT.
 7. ALL CONCRETE TO BE 3000 PSI STRENGTH AT 28 DAYS.
 8. MINIMUM SOIL BEARING PRESSURE OF 1500 PSF ASSUMED. CONTACT STRUCTURAL ENGINEER IF NOT PROVIDED. OWNER IS RESPONSIBLE TO VERIFY ACTUAL SOIL CONDITIONS.

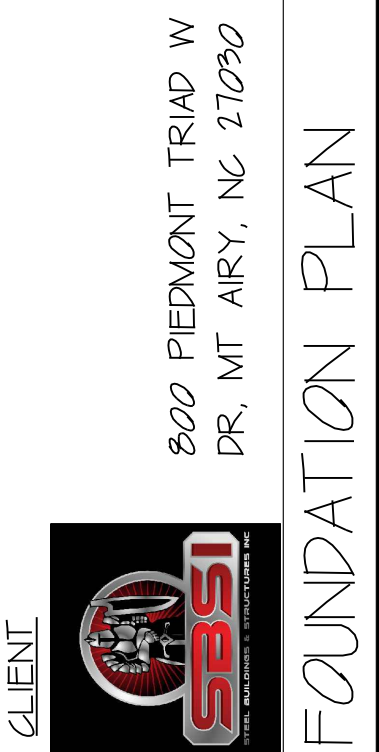
FOUNDATION PLAN

SCALE: 1/4" = 1'-0"



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PROJECT: CARPORT
15 FARADAY DRIVE
800 PIEDMONT TRIAD W
DR. MT. AIRY, NC 27030



CUSTOMER JOB NO.:
CUSTOMER:
DRAWN BY:
DATE: 07/25/24
CKD. BY:
DATE:
ASG JOB NO. 24202B
DRAWING FILENAME:
DRAWING NO.:



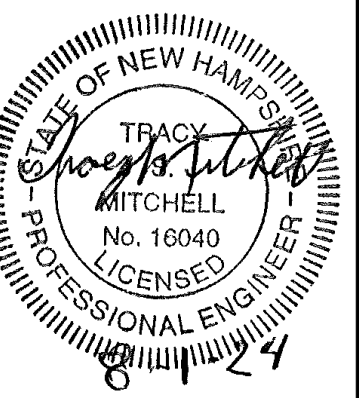
NOTES:

1. REFER TO ARCH. DRAWING FOR DIMENSIONS
2. FRAMING SUPPORTING ELEMENTS HAVE BEEN DESIGNED FOR LOADING AS GIVEN IN NOTES & SPECIFICATIONS

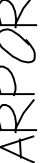
ASG LLC
AMERICAN STRUCTURAL GROUP
CONSULTING STRUCTURAL ENGINEERS

225 SOUTH MAIN STREET
MONROE, OHIO 45050
PH 513-402-7600
WWW.ASG-ENG.COM

"Value Engineering the First Time"

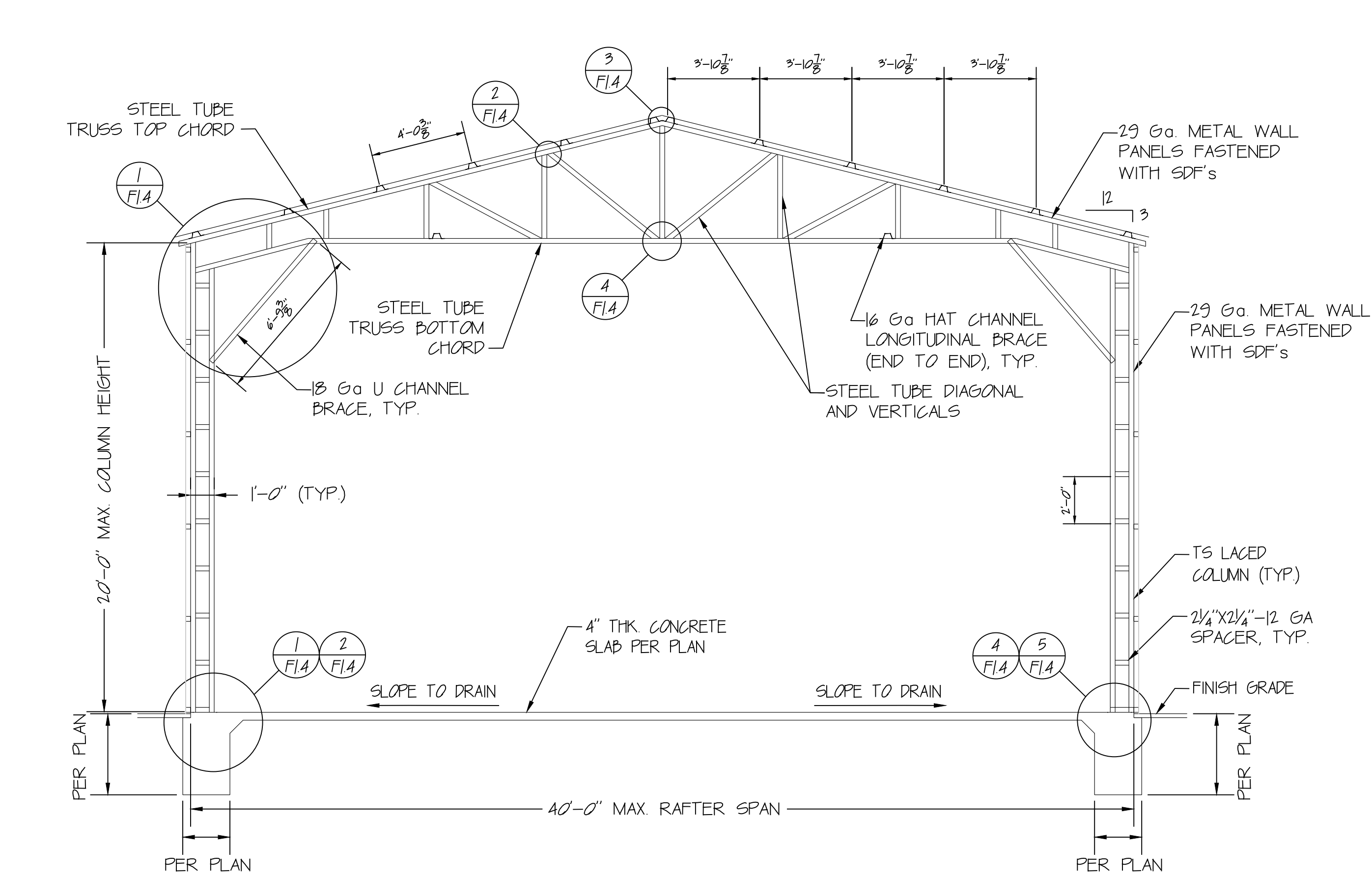


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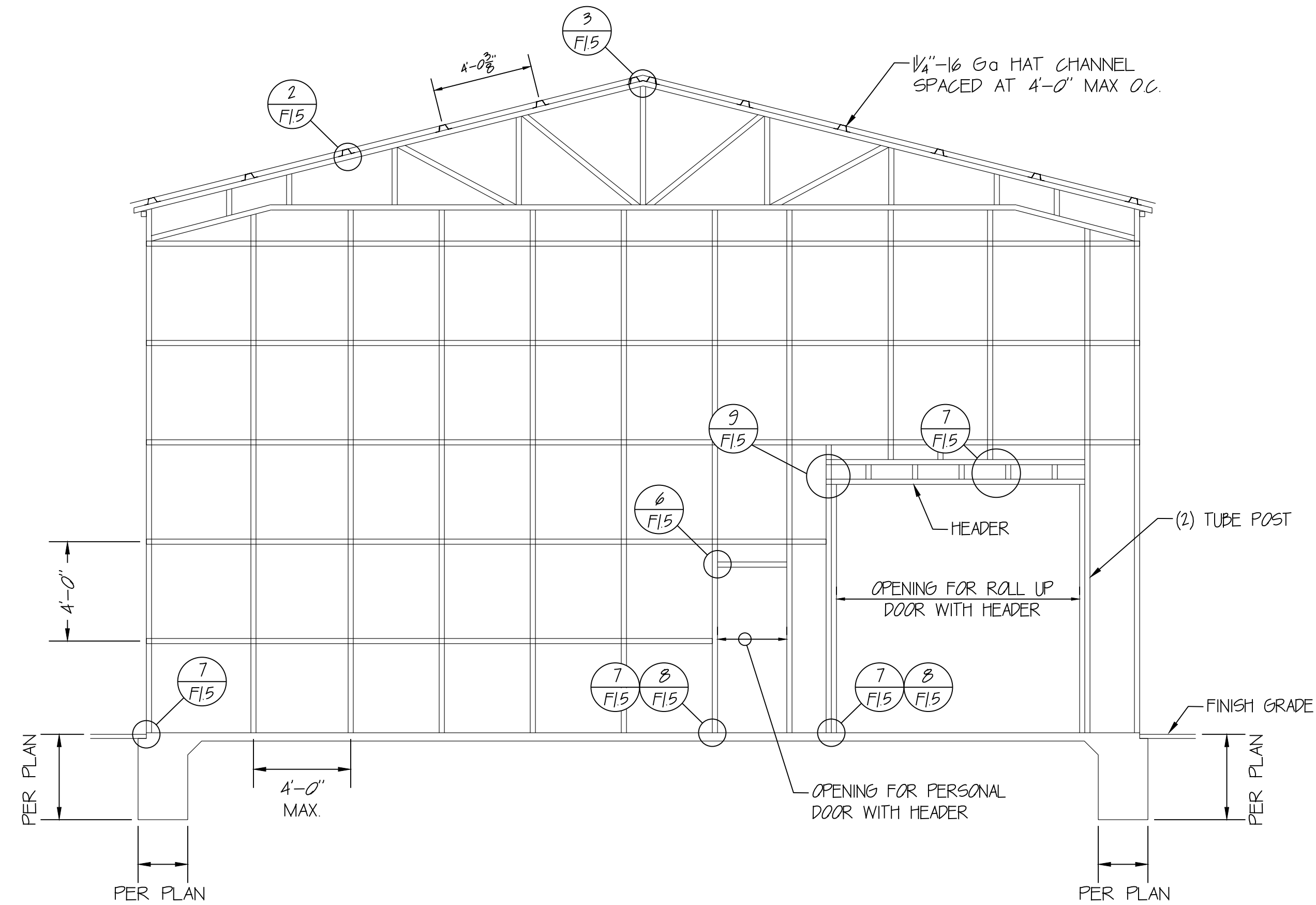
	800 PIEDMONT TRIAD W DR, MT AIRY, NC 27090	15 FARADAY DRIVE CARPORT
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RAWN BY:	
DATE:	072524
KD. BY:	
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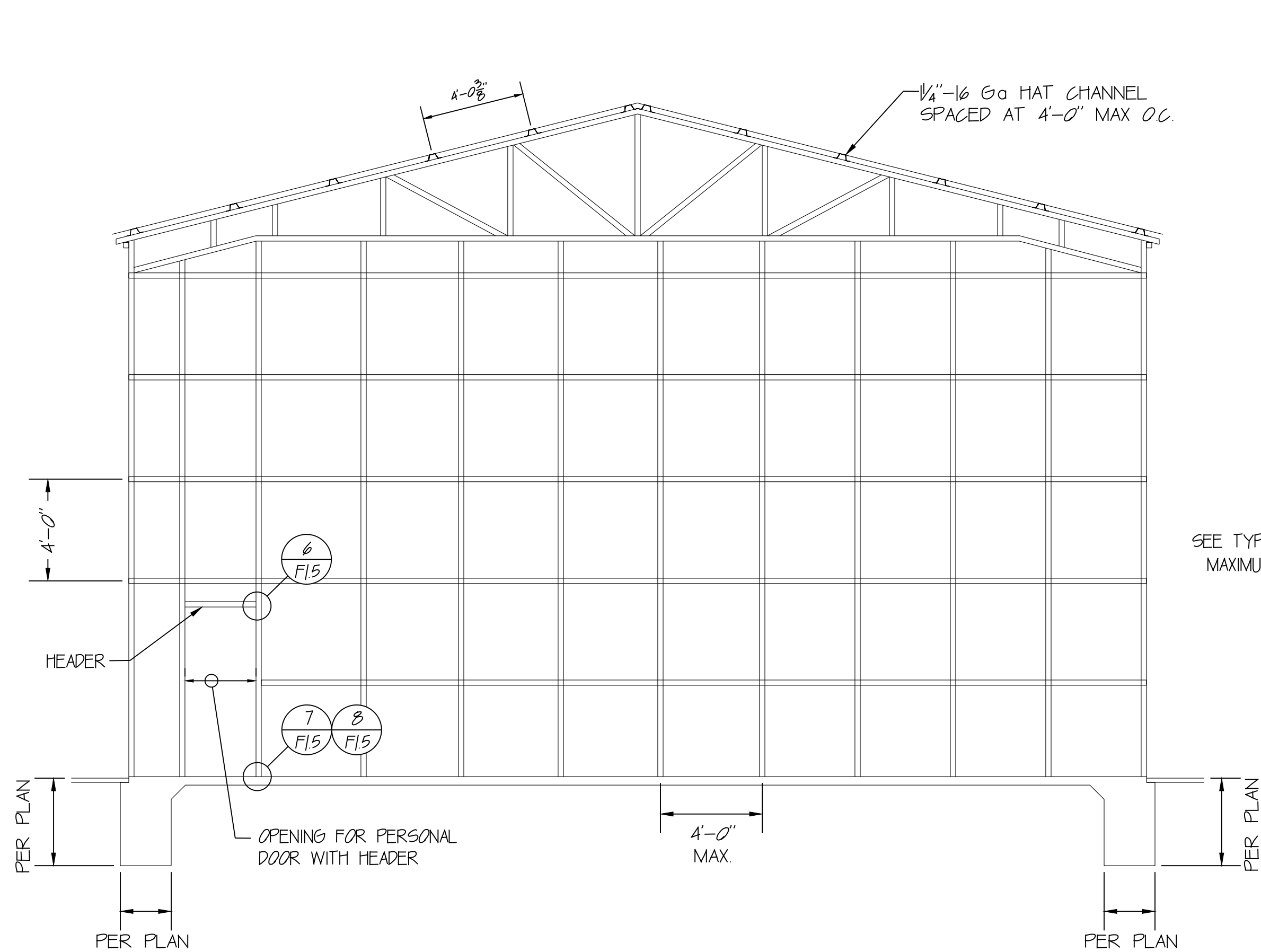
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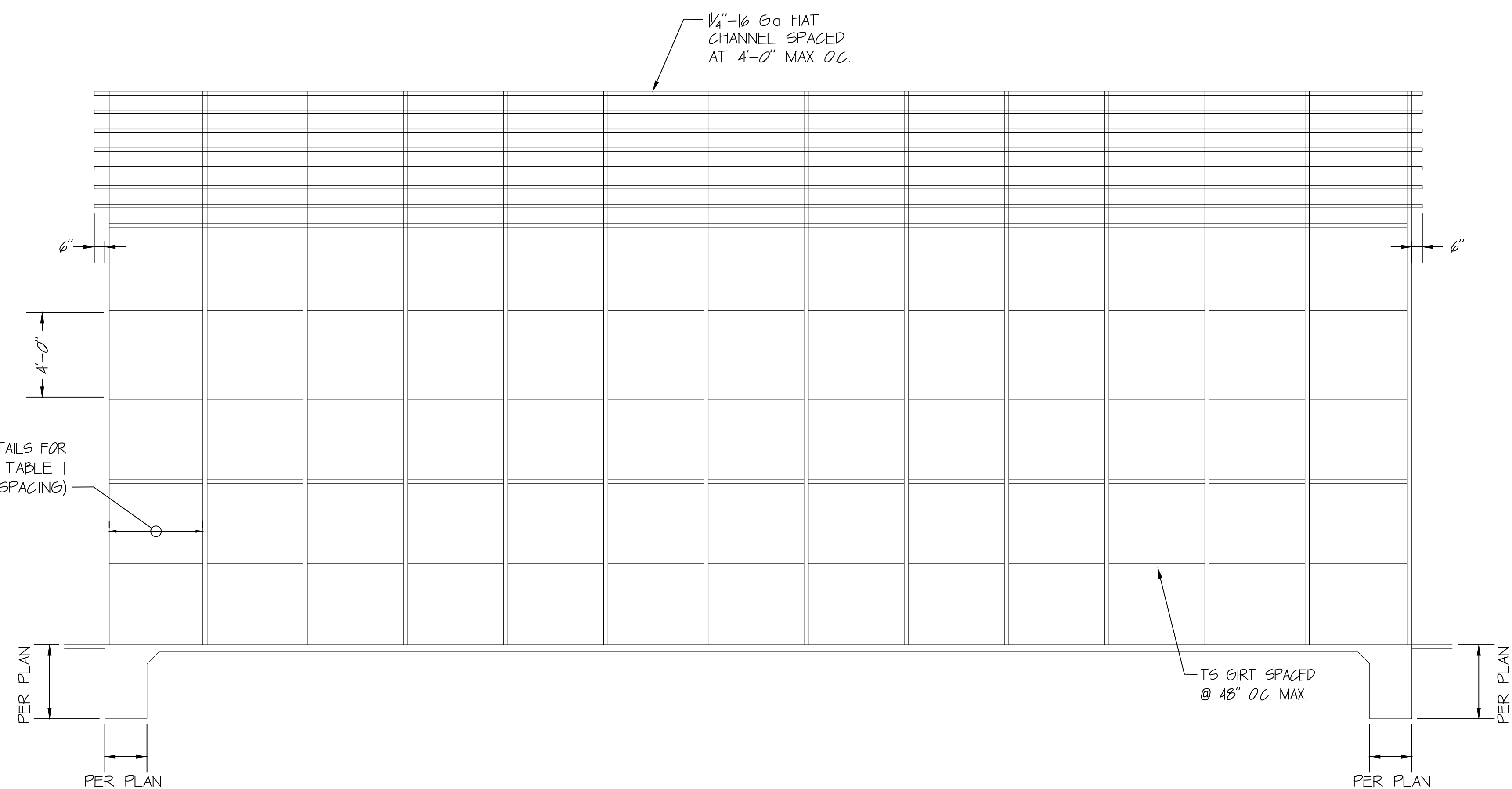
1. TYPICAL RAFTER COLUMN FRAME SECTION
SCALE: 1/4" = 1'-0"



2. FRONT SIDE ELEVATION
SCALE: 1/4" = 1'-0"



3. BACK SIDE ELEVATION
SCALE: 1/4" = 1'-0"



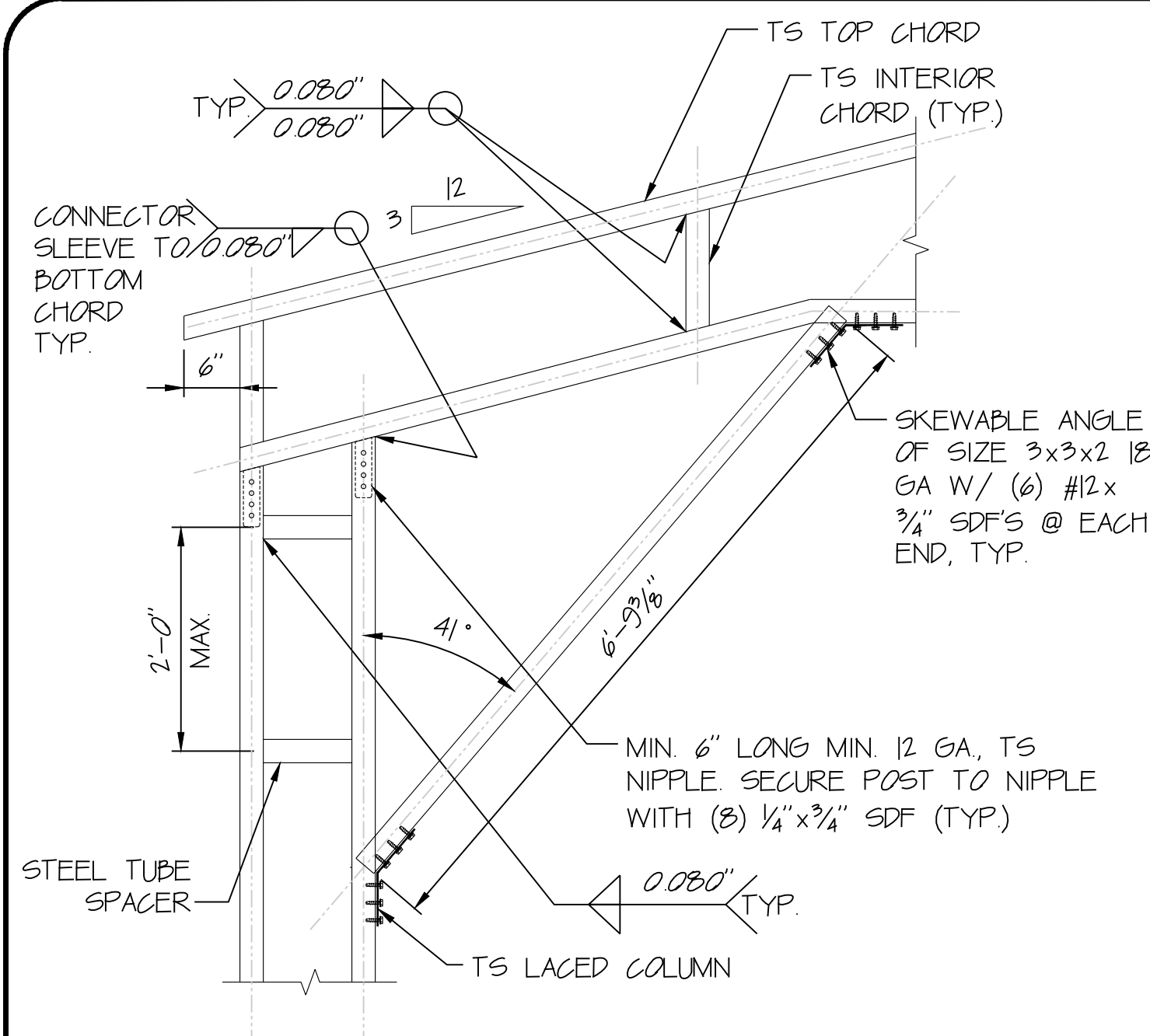
4. RIGHT & LEFT SIDE ELEVATION
SCALE: 1/4" = 1'-0"

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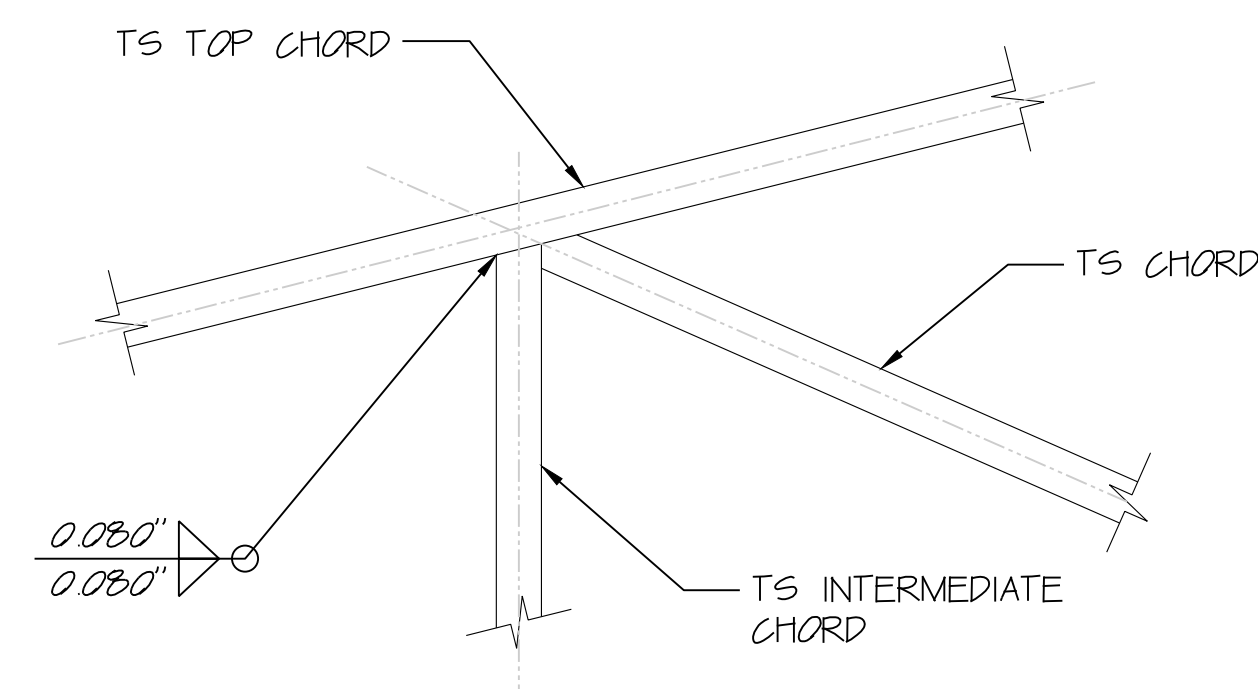
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CLIENT: 800 PIEDMONT TRIAD W
DR. MT. AVE., NC 27030
15 FARADAY DRIVE



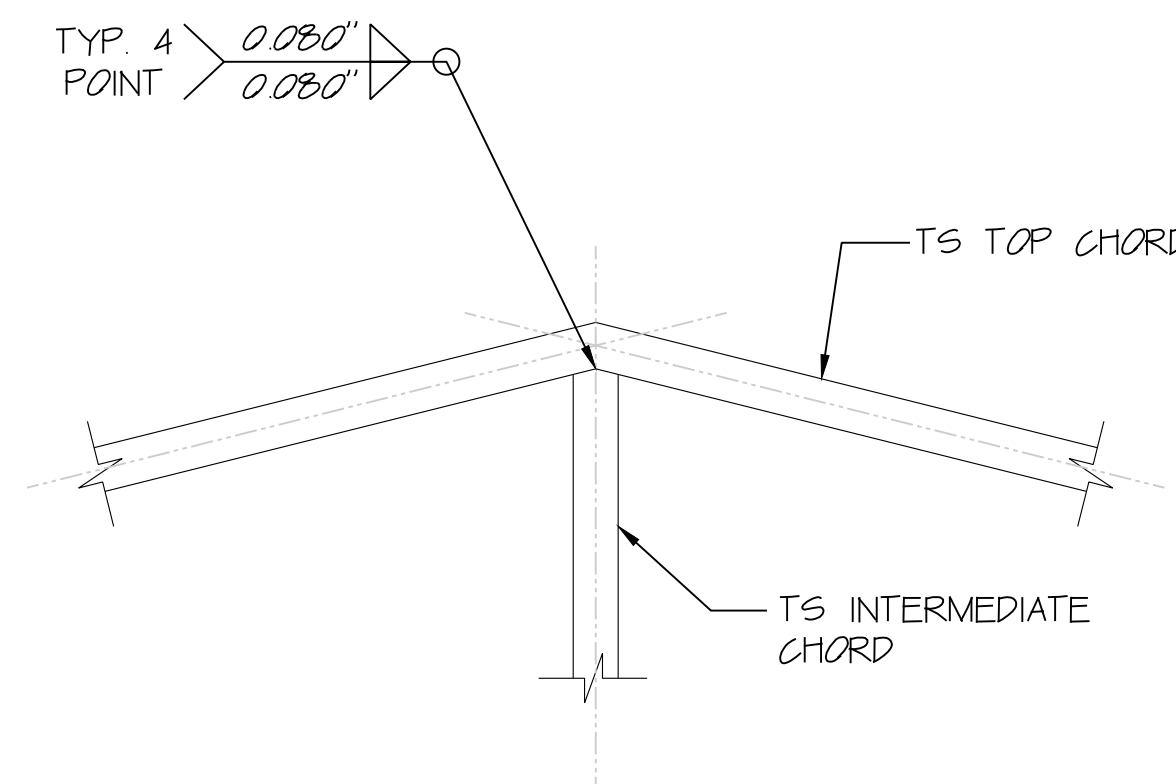
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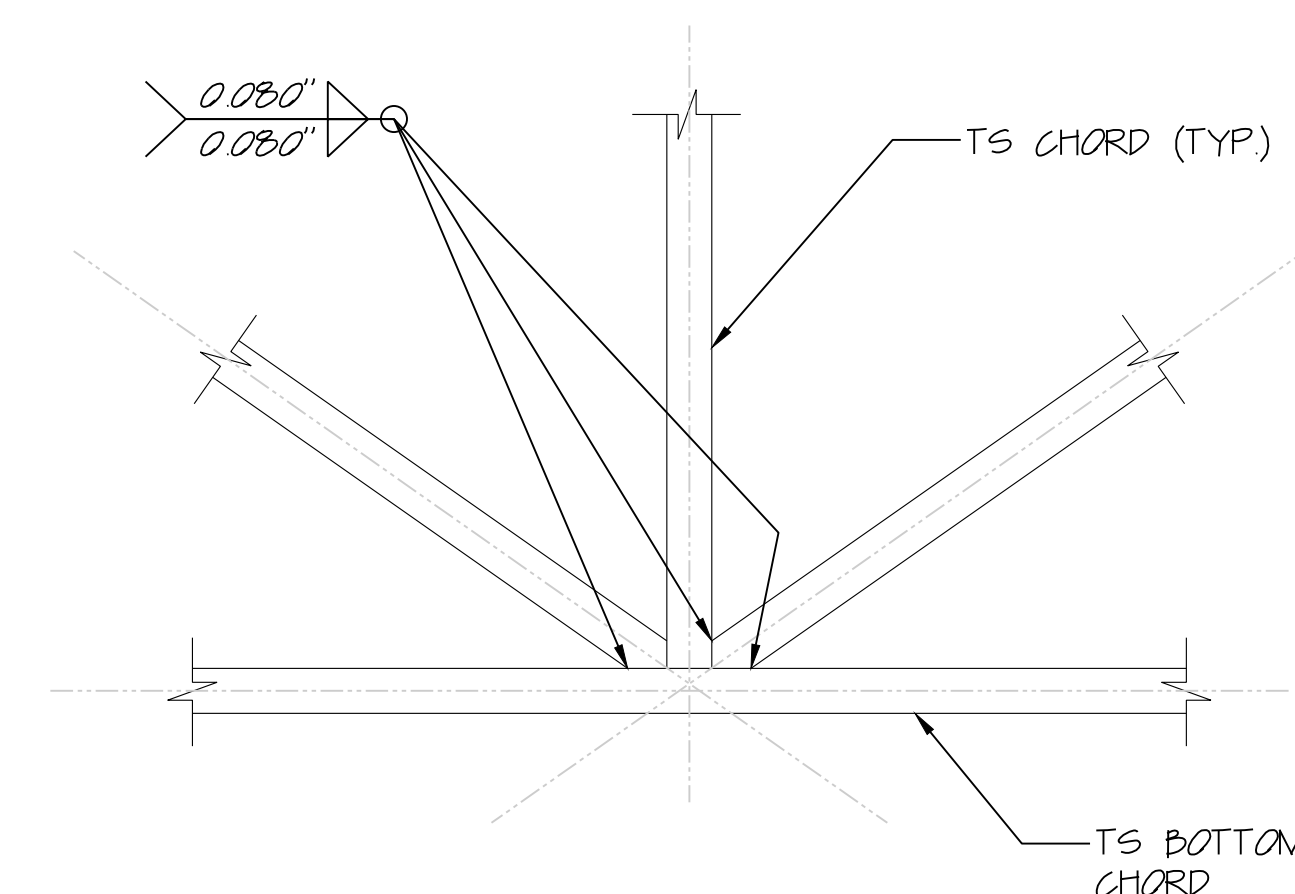
CORNER COLUMN CONNECTION DETAIL (1)
SCALE: 3/4"=1'-0" F14



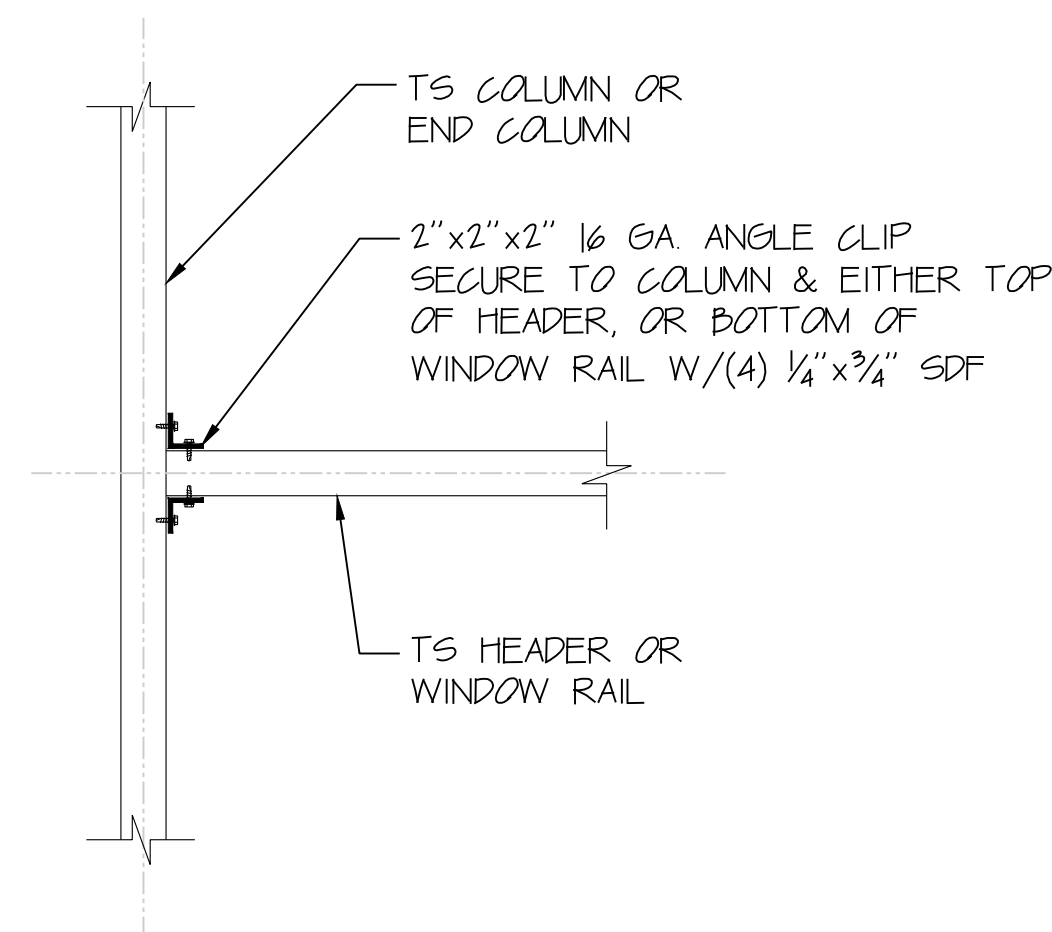
INTERMEDIATE CHORD TO TOP CHORD CONNECTION DETAIL (2)
SCALE: 3/4"=1'-0" F14



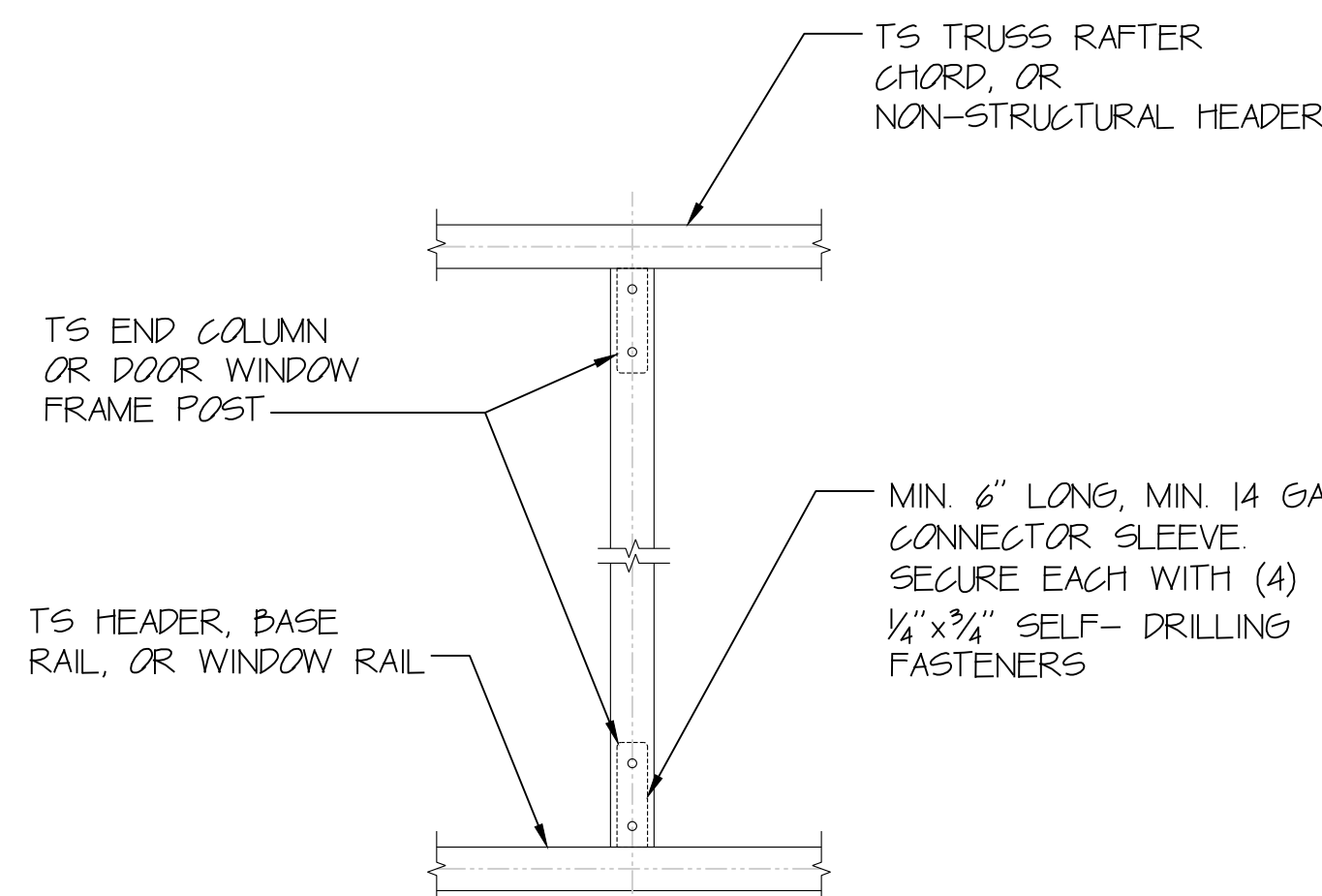
CENTER POST TO RAFTER CONNECTION DETAIL (3)
SCALE: 3/4"=1'-0" F14



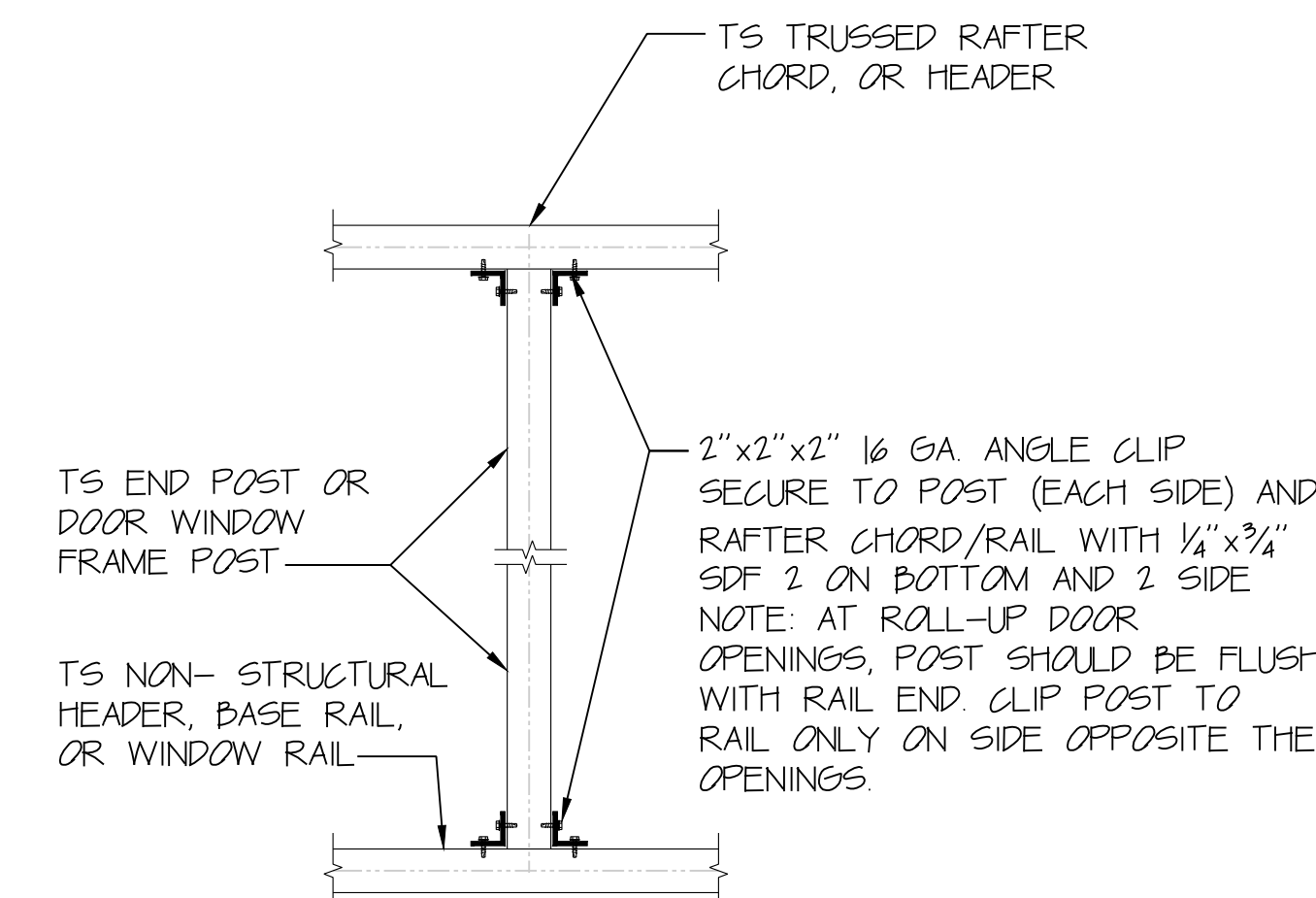
CENTER POST TO BOTTOM CHORD CONNECTION DETAIL (4)
SCALE: 3/4"=1'-0" F14



NOT USED (5)
F14

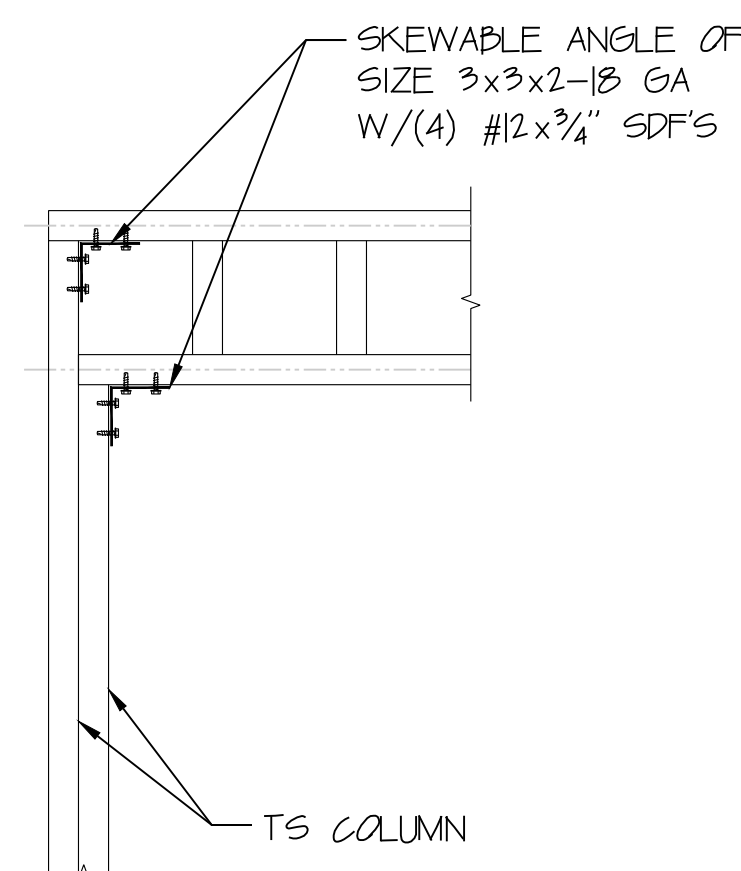


COLUMN OR WINDOW RAIL/WALL GIRT TO POST CONNECTION DETAIL (6)
SCALE: 3/4"=1'-0" F14

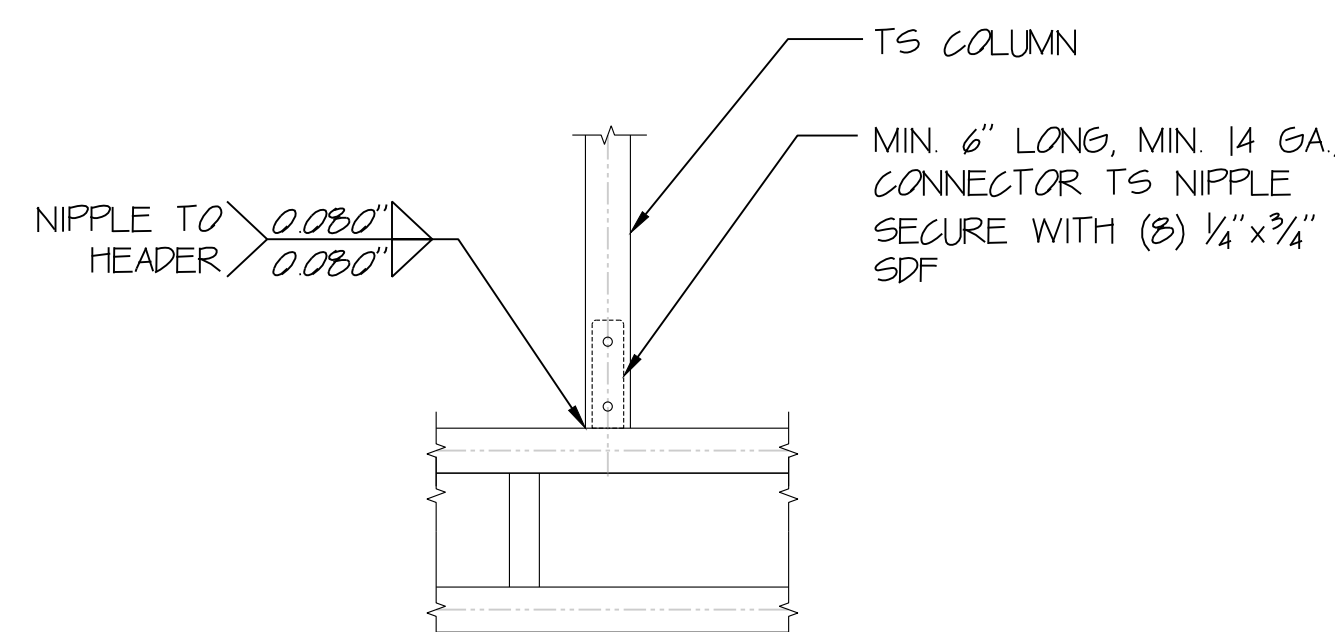


COLUMN TO HEADER OR BASE RAIL CONNECTION DETAIL (7)
SCALE: 3/4"=1'-0" F14

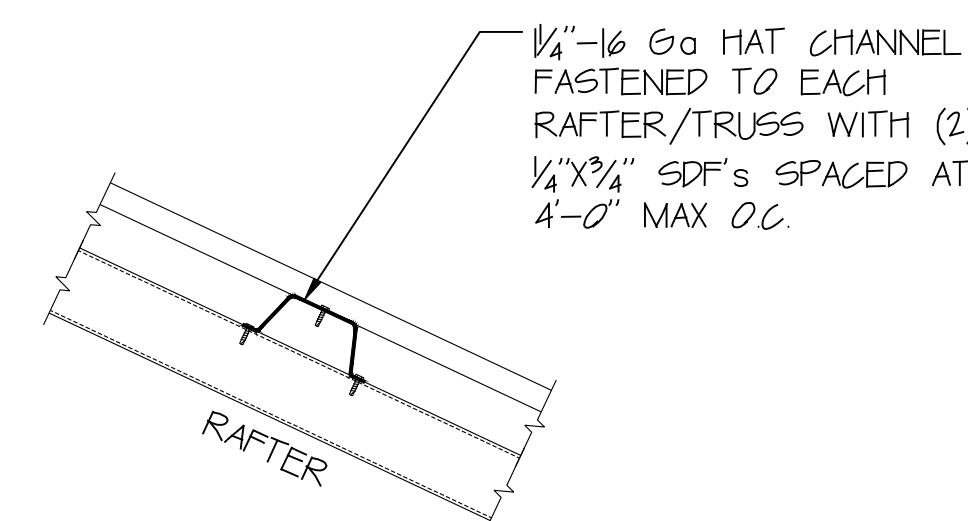
HEADER OR WINDOW RAIL TO POST CONNECTION DETAIL (8)
SCALE: 3/4"=1'-0" F14



LADDER HEADER/COLUMN CONNECTION DETAIL (9)
SCALE: 3/4"=1'-0" F14



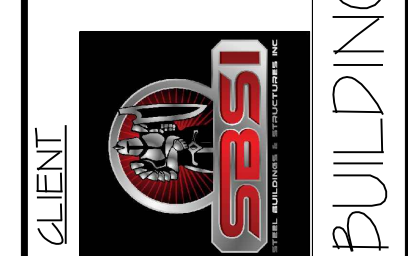
COLUMN/DOUBLE LADDER CONNECTION DETAIL (10)
SCALE: 3/4"=1'-0" F14



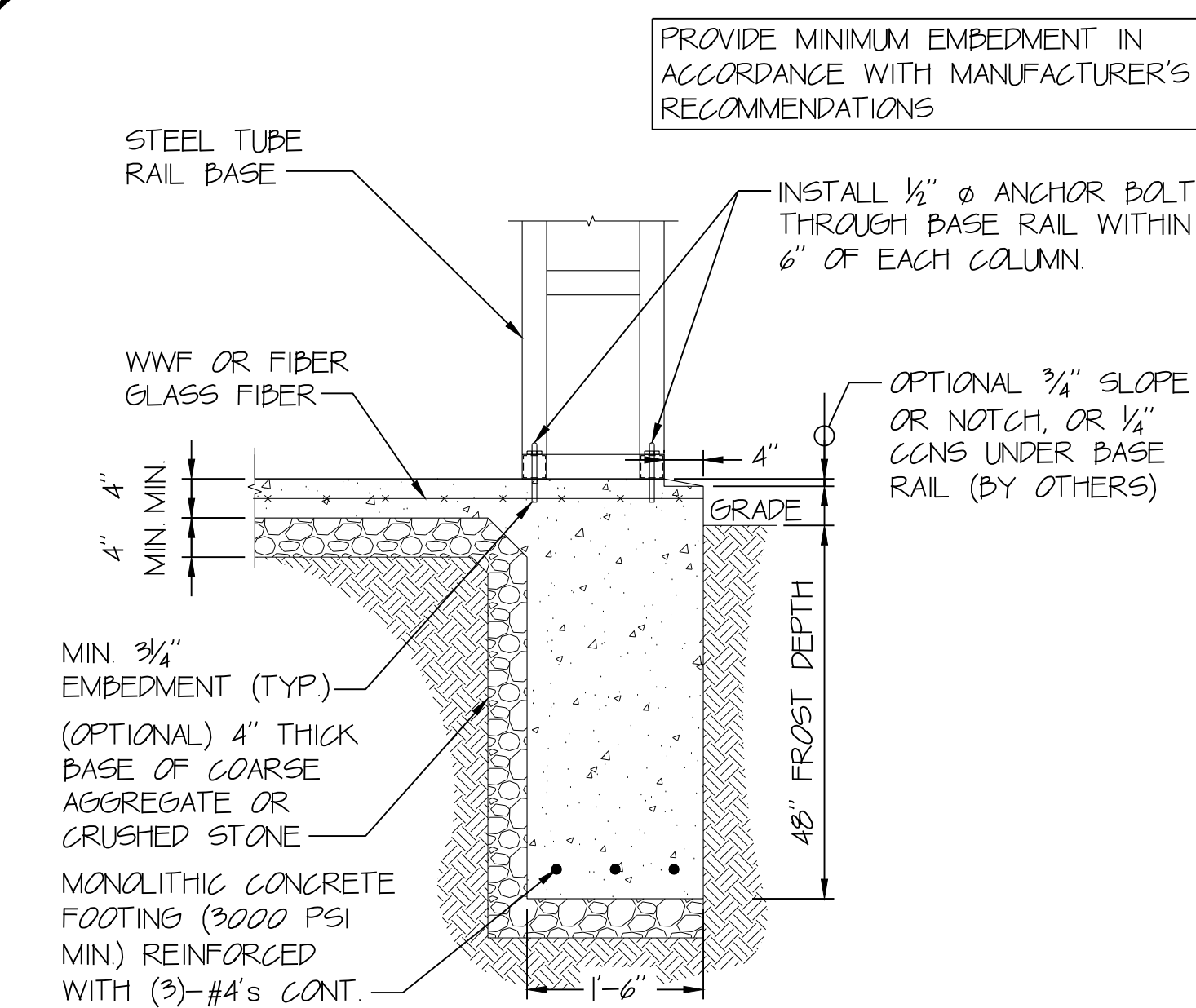
ROOF PANEL ATTACHMENT (ALTERNATE FOR VERTICAL ROOF PANELS) (11)
SCALE: 3/4"=1'-0" F14

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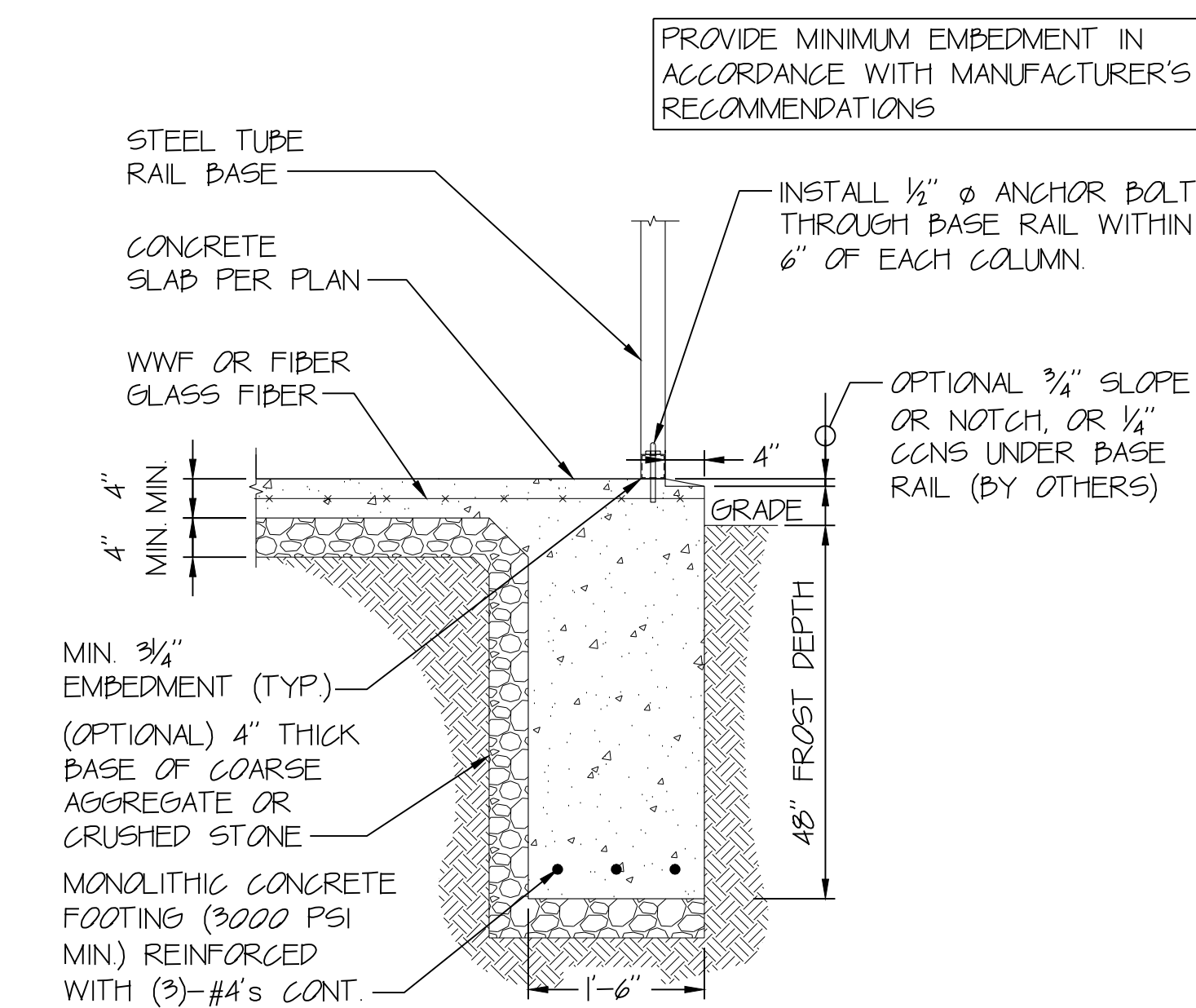
PROJECT: CARPORT
15 FARADAY DRIVE
800 PIEDMONT TRIAD W
DR. MT. AIRY, NC 27030



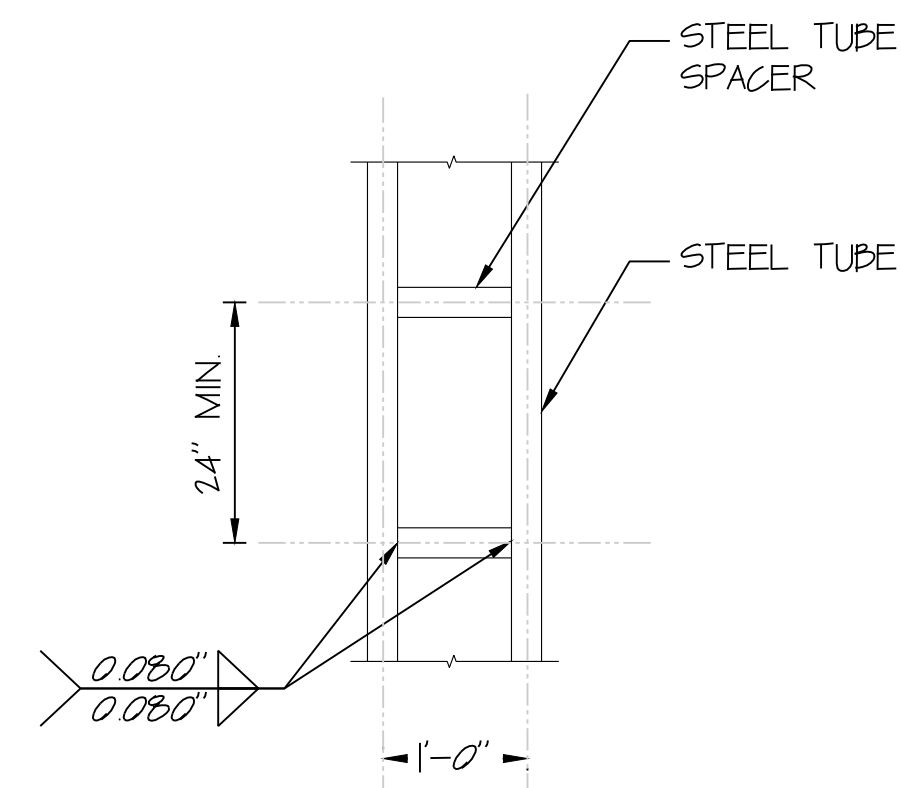
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CUSTOMER: SBSI
JOB NO.:
CUSTOMER:
DRAWN BY:
DATE: 07/25/24
CHKD. BY:
DATE:
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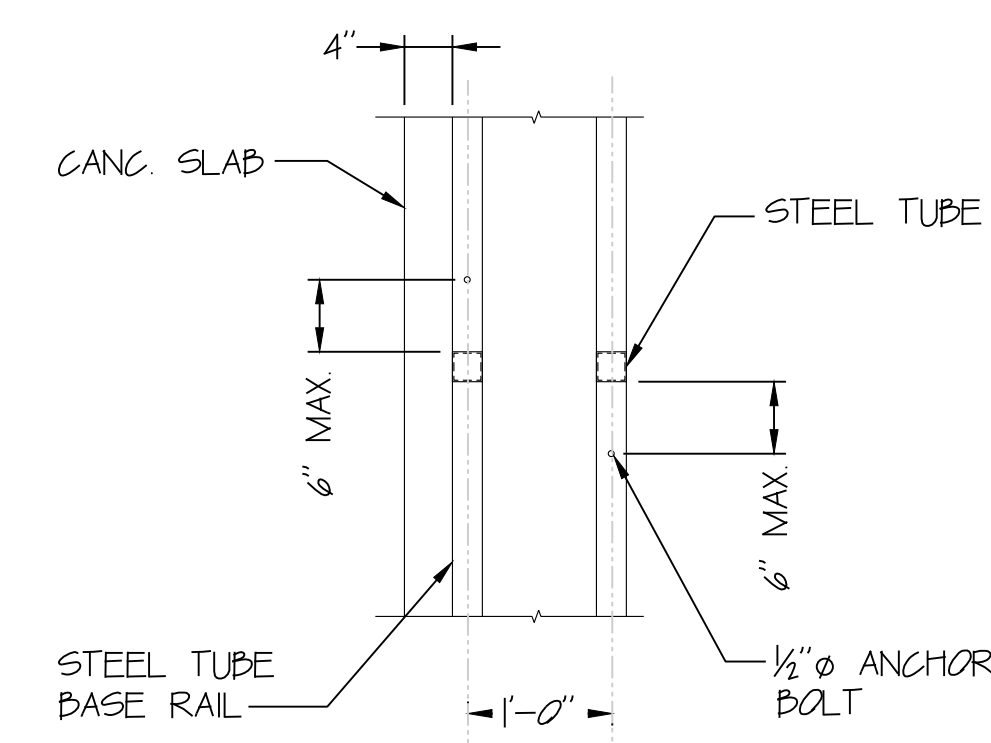
CONC. MONOLITHIC SLAB BASE RAIL LADDER LEG (1)
SCALE: 3/4" = 1'-0" (F15)



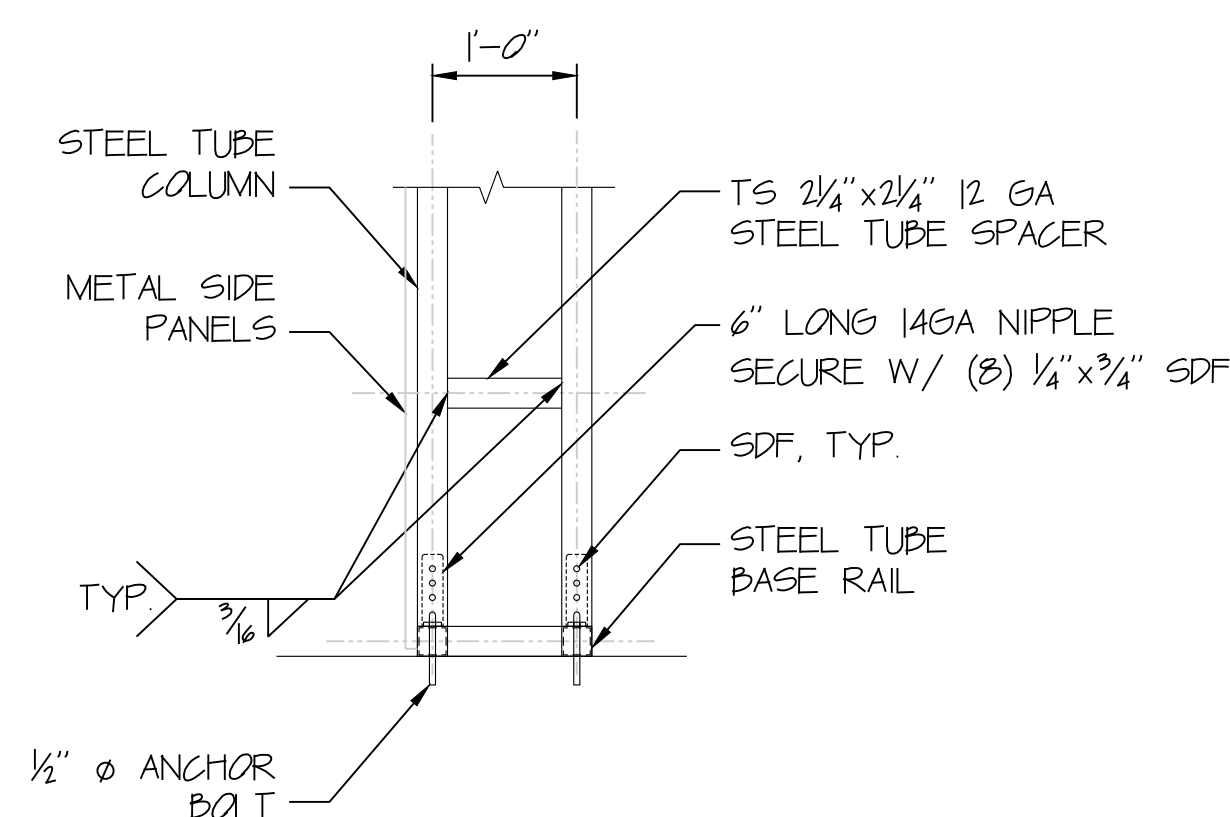
CONC. MONOLITHIC SLAB BASE RAIL SINGLE LEG (2)
SCALE: 3/4" = 1'-0" (F15)



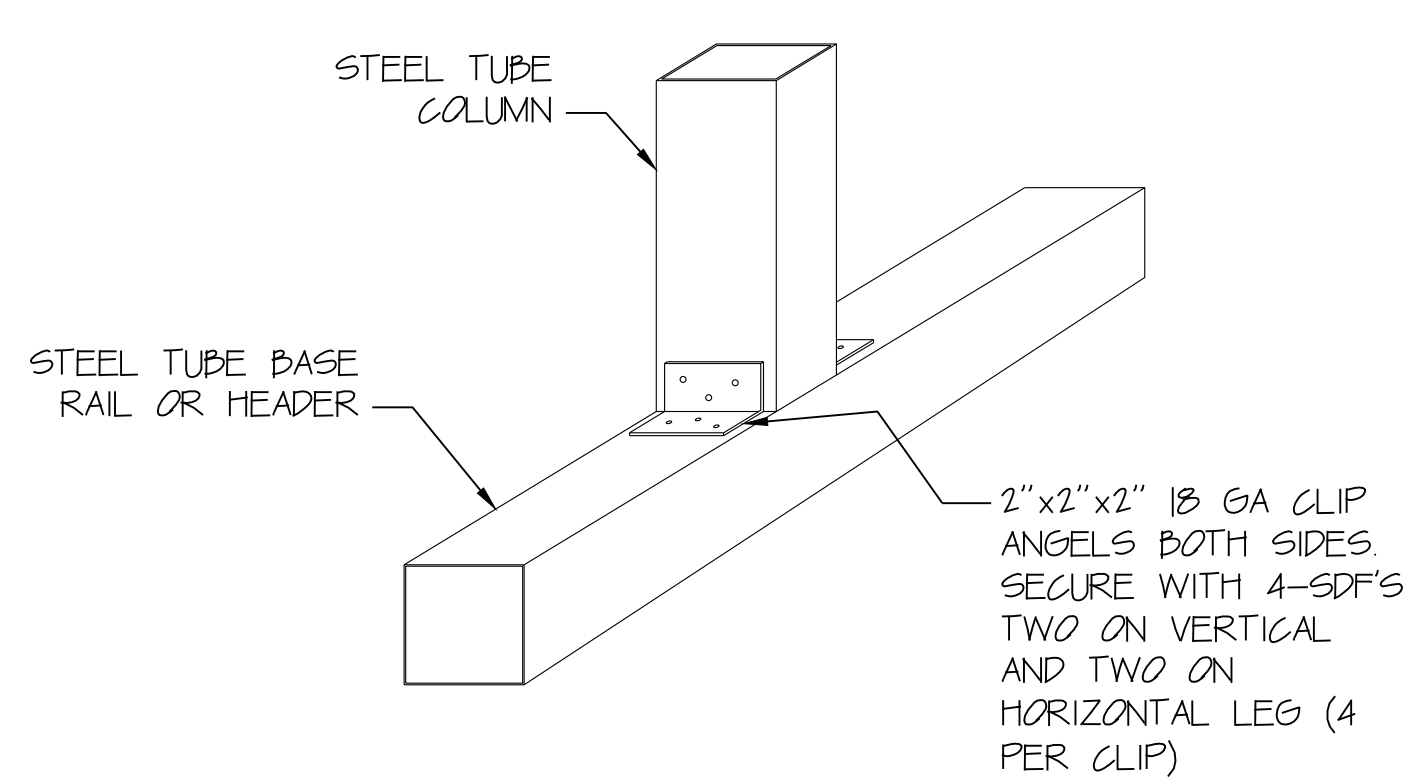
DETAIL @ LADDER LEG COLUMN (3)
SCALE: 3/4"=1'-0" (F1.5)



DETAIL @ LADDER LEG BASE RAIL CONNECTION (4)
SCALE: 3/4" = 1'-0" (F15)



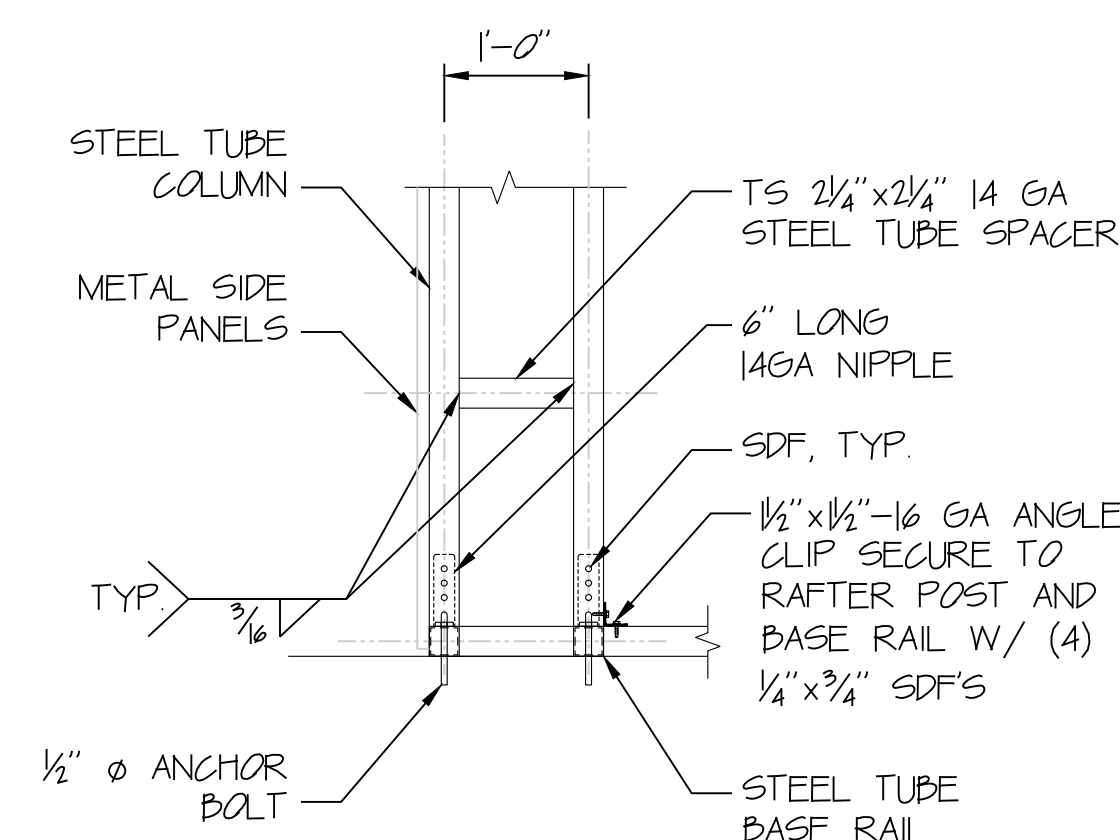
DETAIL @ LADDER LEG/BASE RAIL CONNECTION (5)
SCALE: 3/4" = 1'-0" (F15)



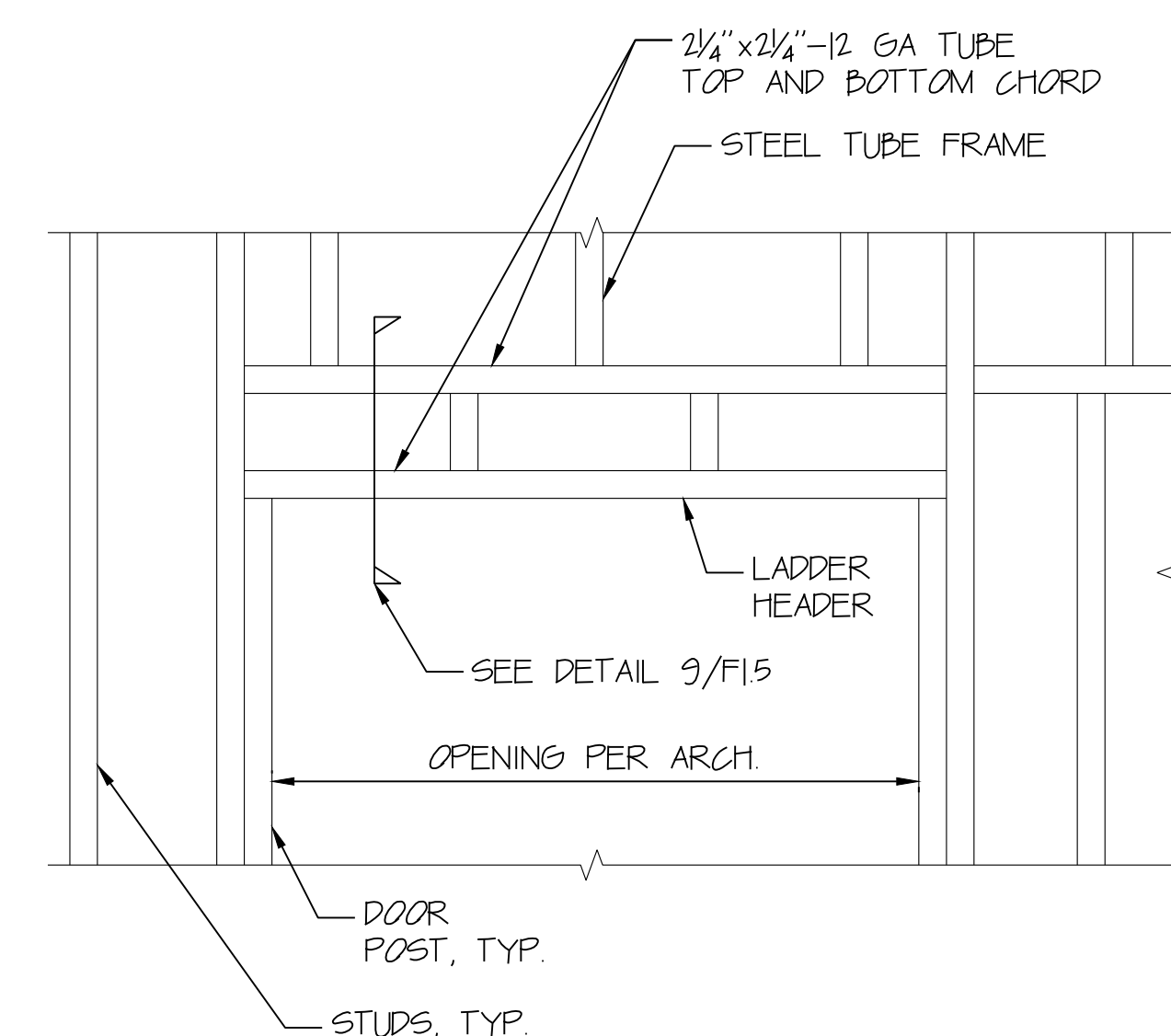
END POST/BASE RAIL CONNECTION DETAIL

SCALE: 3/4"=1'-0"

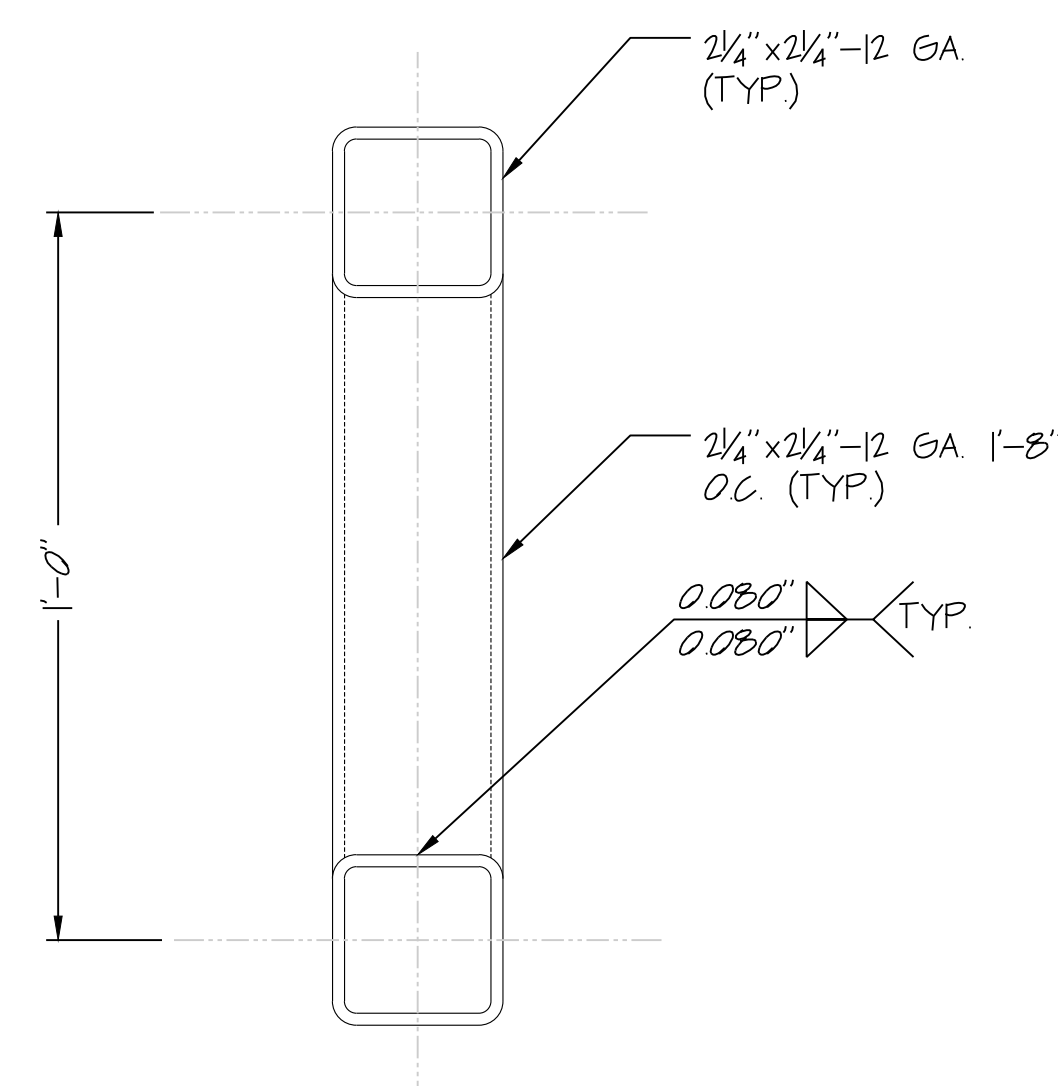
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F15



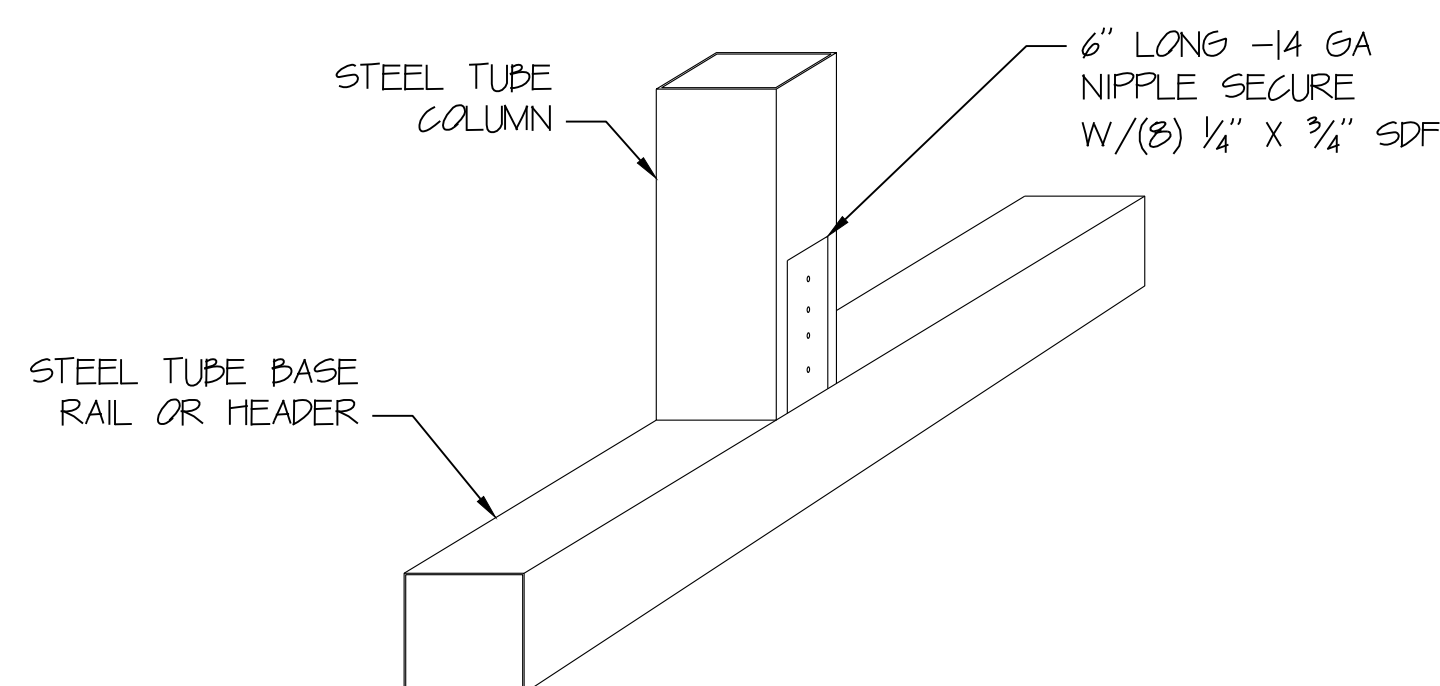
END POST/BASE RAIL CONNECTION DETAIL (7)
SCALE: 3/4"=1'-0" (F15)



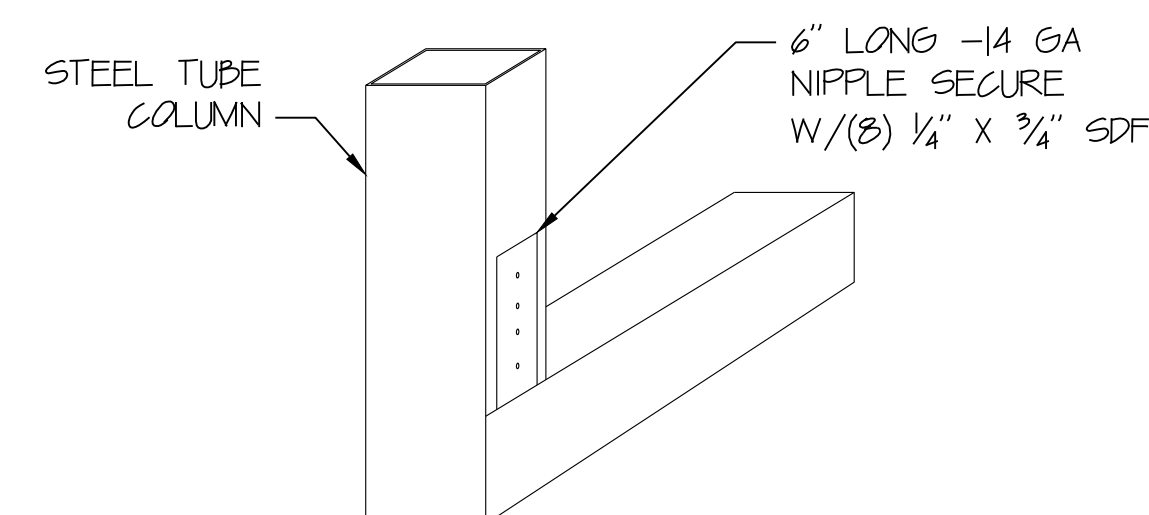
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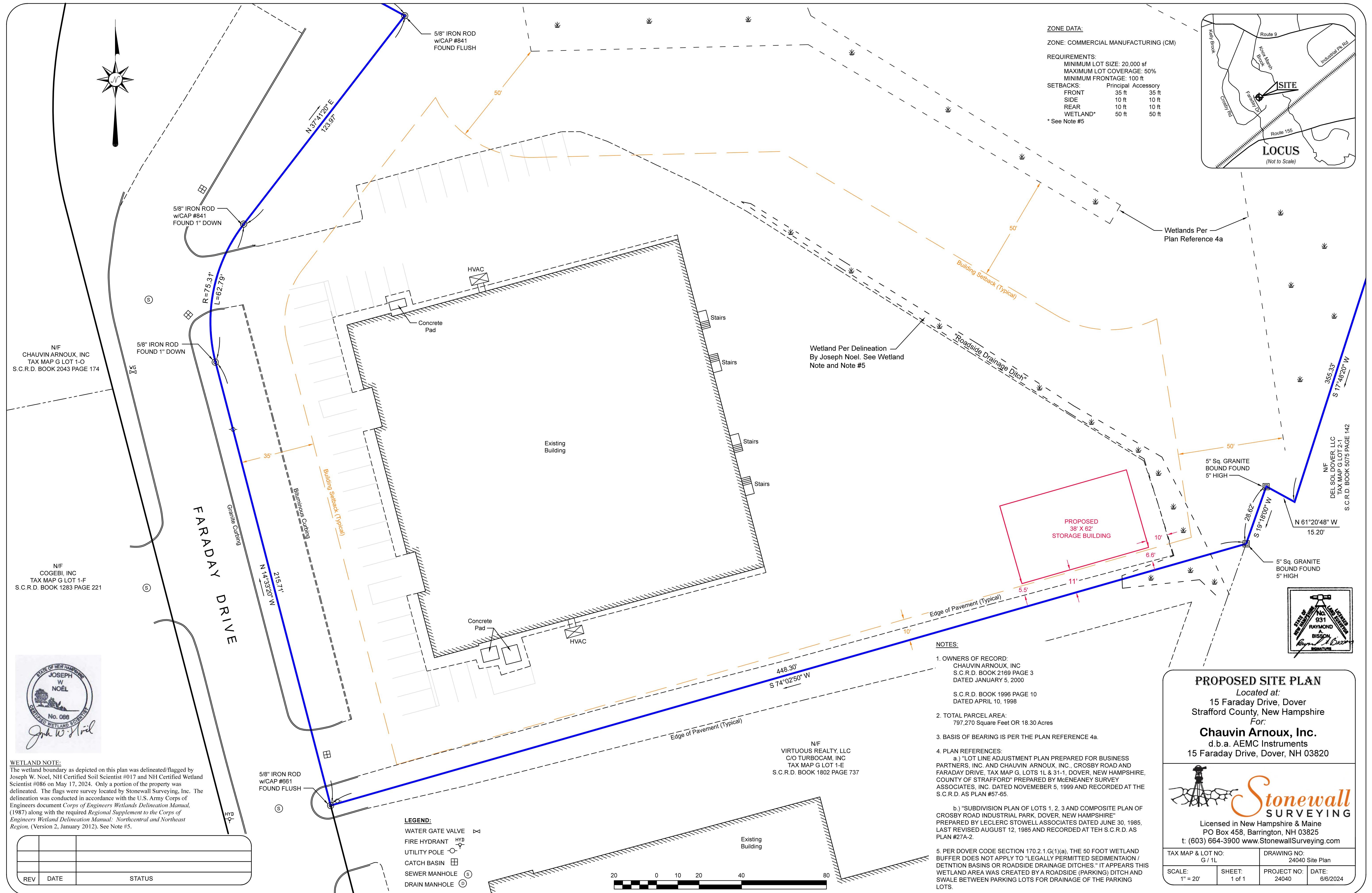
HEADER DETAIL FOR DOOR OPENINGS (9)
SCALE: 3/4"=1'-0" (F15)



POST/ BASE RAIL CONNECTION @ 10
SCALE: 3/4"=1'-0" INTERMEDIATE LOCATION F15



POST / BASE RAIL CONNECTION @ CORNER (11)
SCALE: 3/4"=1'-0" (F15)



REV	DATE	STATUS