CITY OF DOVER

PLANNING TECHNICAL REVIEW COMMITTEE –AGENDA

REVISED

Meeting Type: Regular Meeting
Meeting Location: Council Conference Room, City Hall, 288 Central Ave, Dover NH 03820
Meeting Date: **Thursday, August 17, 2023**
Meeting Time: **10:30 AM**

1. 10:30 AM - 11:15 AM: Site Review for CESO (Owners: 914 Central Avenue, LLC), Assessor's Map 38, Lot 20, zoned C, located at 914 Central Avenue. (Proposal is for Hang Ten Car Wash development that will consist of a 4,400-sf building, sixteen (16) vacuum spaces, and two (2) employee parking spaces. Two (2) related Conditional Use Permit applications would also appear before the Planning Board. (SITE-2023-0008, COND-2023-0045, & COND-2023-0046)

2. 11:15 AM - 12:00 PM: Site Review for Horizons Engineering Inc. (Owners: Zeland Schwartz Trustee, The Zeland Schwartz Revocable Trust), Assessor's Map A, Lot 45-A-2, zoned R-40, located at 36 Olive Meadow Lane. (Proposal is to build 32 individual units through Transfer of Development Rights.) (SITE-2023-0005) [*This item was previously heard on July 13, 2023]*

PLAN SNAPSHOT REPORT SITE-2023-0008
FOR CITY OF DOVER, N.H.

Plan Type:	Site Plan - Major	**Project:**		**App Date:**	07/25/2023
Work Class:	New Construction	**District:**	None	**Exp Date:**	09/28/2023
Status:	In Review	**Square Feet:**	0.00	**Completed:**	NOT COMPLETED
Valuation:	$0.00	**Assigned To:**	Blonigen, Rachel	**Approval Expire Date:**	
Description:	Hang Ten car wash with parking and vacuums.				

Parcel:	38020-000000	Main	**Address:**	914 Central Av Dover, NH	Main
Zone:					

Project Manager
Jason Rice
Mobile: (330) 807-1727

Applicant
Mandy Gauss
13060 S. US Hwy 27 Suite D
Suite D
Dewitt, MI 48820
Business: (517) 212-4185
Mobile: (586) 855-8130

Owner
Steve Lukin
Mobile: (508) 944-1450

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 (+/-)	-24	Water Service	Municipal
Recording Number		Sewer Service	Municipal	Total Acres (GIS)	1.287
Deed Book		Total SQFT	56061.7	Deed Page	
Deed Date		Proposed Property Use	Hang Ten Car Wash	Area of Parcel to be Developed (SQFT)	56078
Number of Parking Spaces Existing	42	Number of Parking Spaces Proposed	18	Distance to City Water	0
Distance to City Sewer	0	Type of Building to be Built	Steel structure with infill wall material and structure	Estimated Construction Value	2500000.00
Refuse Removal	Public	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	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
TotalImpactFeeAFAOTOD	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_Mandy_Gauss_7/25/2023.jpg	07/25/2023 9:02	Gauss, Mandy		Uploaded via CSS

Invoice No.	Fee	Fee Amount	Amount Paid
INV-00004388	Planning General Application Fee	$200.00	$200.00
	Total for Invoice INV-00004388	$200.00	$200.00
	Grand Total for Plan	**$200.00**	**$200.00**

PLAN SNAPSHOT REPORT (SITE-2023-0008)

Workflow Step / Action Name	Action Type	Start Date	End Date
Review v.1			
Confirm application complete v.1	Generic Action		
Technical Review Committee Meeting Agenda v.1	Task		
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 Final Review v.1	Receive Submittal		
Land Use Plan Stamped and Signed v.1	Generic Action		
Plans uploaded to Treeno v.1	Generic Action		
Recording v.1	Task		
Property Info Group 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 Complex v.1	Create Sub Permit		
Create / Link to Permit - Site Work, Construction v.1	Create Sub Permit		

CHRISTOPHER G. PARKER, AICP
Assistant City Manager
Planning & Strategic Initiatives
c.parker@dover.nh.gov

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Dover, New Hampshire 03820-4169
(603) 516-6008
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City of Dover, New Hampshire

DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT

INSTRUCTIONS TO APPLICANTS TO THE DOVER PLANNING BOARD

IMPORTANT: PLEASE READ ALL INSTRUCTIONS CAREFULLY BEFORE FILLING OUT ATTACHED APPLICATION.
INCOMPLETE APPLICATIONS WILL NOT BE ACCEPTED FOR REVIEW.

Dear Applicant:

This will serve to briefly inform you regarding the process to have the Dover Planning Board (the Board) review a land use application. Please refer to the NH Statutes on Land Use and Regulation the Dover Code, and our Developer's Handbook for more specific information.

The Board primarily reviews 5 types of applications:

1. **Site Plans** - A site plan is a professionally rendered drawing which delineates the proposed development of a site. This plan is required for non-residential development, creation of multi-family residential structures, and for extensions of parking lots and alteration of an acre or more of land. These plans require meeting with the Technical Review Committee before Planning Board review.

2. **Subdivisions** - A subdivision is the division of the lot, tract, or parcel of land into two (2) or more lots, plats, sites or other divisions of land for the purpose, whether immediate or future, of sale, rent, lease or building development. It includes re-subdivision and, when appropriate to the context, relates to the process of subdividing or to the land or territory subdivided. Major subdivision plans (4+) require meeting with the Technical Review Committee before Planning Board review.

3. **Lot Line Adjustments** - A lot line adjustment alters the size of two (2) or more lots, but does not create a new buildable lot.

4. **Conditional Use Permits** - A conditional use permit is required for any alteration of wetlands, wetland buffers or work within the City's conservation district. Additionally, a conditional use permit could be issued as to offer relief in the Central Business District, for plans in the Residential Mixed Use Overlay District, or parking relief. Environmental Conditional Use Permits are acted on after Conservation Commission review.

5. **Excavation Permits** – NH RSA Chapter 155-E grants municipalities the authority to regulate earth excavations within their borders. This authority rests with the Planning Board.

The Board cannot and will not review applications that do not meet zoning requirements. **Please review the need to apply to the Zoning Board of Adjustment prior to applying to the Board.**

Professional agents will prepare your application; however, you may represent yourself or authorize, in writing, someone else to represent you before the Planning Board.

In most cases, 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, and a PDF, need to be provided, along with payment of plan review fees. These meetings occur on Thursday, and materials and payment must be submitted three (3) weeks prior to meeting. Meetings are scheduled, upon receipt of completed applications with the full checklist and payment.

The next step would be to provide, two weeks prior to Planning Board, the final plan sets (three (3) full size and twelve (12) half size (11x 17), folded, copies of the plan), and 15 copies, and a PDF, of all supporting materials, including response to TRC comments. Please print all materials on both sides of paper.

For projects not appearing before the Technical Review Committee, Plan Review Fees are due along with three (3) full size and twelve (12) half size (11x17), folded, copies of the plan set and 15 copies, plus a PDF, of plans and materials, 3 weeks prior to the Planning Board meeting. Please print all materials on both sides of paper.

Staff will generate an abutter list, and Abutter/Notice Fees will be invoiced. They are due 28 hours prior to Planning Board. If they are not paid, the application will not be heard.

Once an item is placed upon an agenda the following process is used:

- The Board will hold a public hearing on your application at a regularly scheduled meeting
    - Typically the second or fourth Tuesday of the Month.
- Public notice of the hearing will be posted at the City Clerk's office and the Planning Department office and printed in the newspaper.
- Certified letters will be mailed to you and to all abutters at least ten days before the date of the hearing.
- 28 hours prior to the meeting, abutter/notice fees must be paid
- At the meeting
    - Staff will introduce your project
    - You and all other parties will be invited to appear in person or by agent or counsel to present your application.
        - Your project will be pre-loaded onto a laptop for review by the Board and public
    - The Board may ask clarifying questions
    - The Board will vote to accept jurisdiction on the application
    - If accepted:
        - The Board will hold a public hearing
        - The Board may ask additional questions
        - The Board will deliberate on your application
            - Typically decisions are made the night of the presentation, but an application may be tabled
        - After deliberation, a decision will be made.
            - You will be sent a notice of the decision.

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: CESO, Inc. (Mandy Gauss) Telephone # 517-212-4185

Address of Applicant: 13060 S. US Hwy 27, Suite D; Dewitt, MI 48820

E-Mail Address: gauss@cesoinc.com

Name of Property Owner (*if different from applicant*): 914 Central Avenue, LLC Telephone #_____

Address of Property Owner: 1380 Soldiers Field Road; Boston, MA 02135

PROPERTY INFORMATION

Address of Property: 914 Central Avenue; Dover, NH 03820

Assessor's Map #09058-38020-000000 Lot(s) # _____

Zoning District(s) Commercial District (c) Overlay District(s) _____

Size of Parcel: 56,078 sq. ft. 1.287 ac. Property Deed: Book 1130 Page: 721

Existing Use of Property: Vacant Commercial Building and Parking Lot

SITE PLAN INFORMATION

Describe Proposed Use: Hang Ten Car Wash

Area of Parcel to be Developed: 35, 510 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 46 Proposed 18

Highway Access (check where applicable): x City Street ____ State Highway

Number of Employees Total: _____ In Maximum Shift: _____

Disposition of Parcel:

Building Footprint 4,400 sq. ft.

Total Building Area 4,400 sq. ft.

Paved Area 22,756 (asphalt) and 7,764 (pervious pavement) sq. ft.

Building Setbacks:

Front Yard 68 ft.

Rear Yard 100 ft.

Side Yard: Right 31 ft. Left 72 ft.

City Water? _x_ Yes ___ No How far is city water from the property? serves existing building

City Sewer? _x_ Yes ___ No How far is city sewer from the property? serves existing building

TRANSFER OF DEVELOPMENT RIGHTS INFORMATION N/A

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 structure with infill wall material and structure

Height of Building: 26.5' Finished Floor Elevation: 190

Number of Seats (where applicable) N/A

Estimated value of construction: $2.5 million Refuse removal: Public/Private (circle one)

WAIVER REQUESTS

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

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

_____

_____

_____

_____

_____

_____

_____

SURVEYOR INFORMATION

Name of Surveyor and Company (Licensed in N.H.) Holland E. Shaw - BLEW & Associates, PA

Address 3825 N. Shiloh Drive; Fayetteville, AR 72703 Telephone #: 479-443-4506

Professional License #: 632 E-mail address: survey@blewinc.com

ENGINEER INFORMATION

Name of Engineer and Company (Licensed in N.H.) Zachary Freshner - CESO, Inc.

Address 216 Centerview Drive, Suite 150; Brentwood, TN 37027 Telephone #: 614-942-3032

Professional License #: 16215 E-mail address: freshner@cesoinc.com

ARCHITECT INFORMATION

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

Address _____ Telephone #: _____

Professional License #: _____ E-mail address: _____

LANDSCAPE ARCHITECT INFORMATION

Name of Landscape Architect and Company (Licensed in N.H.) Terrence P. Parker - Terra Firm

Address 163a Court Street; Portsmouth, NH 03801 Telephone #: 603-531-9109

Professional License #: 041 E-mail address: terrence@terrafirmalandarch.com

SOIL SCIENTIST INFORMATION

Name of Soil Scientist and Company (Licensed in N.H.) _____

Address _____ Telephone #: _____

Professional License #: _____ E-mail address: _____

CONSERVATION EASEMENT HOLDER

Name of Easement Holder: _____ Telephone #_____

Address Easement Holder: _____

SIGNATURES

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

Signature of Property Owner: Stephen Lukin Date: 7/27/2023

Signature of Applicant (*if different from owner*): Mandy J. Haussy Date: 07/28/2023

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: Stephen Lukin Date: 07/27/2023

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: Stephen Lukin Date: 7/27/23

Signature of Applicant (*if different from owner*): Mandy J. Haussy Date: 07/28/2023

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: Stephen Lukin Date: 07/27/23

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
		914 Central Avenue, LLC	1380 Soldiers Field Road; Boston, MA 02135

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS
Mandy Gauss	CESO , Inc.	13060 S. US Hwy 27, ste. D; Dewitt, MI 48820

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS
Holland E. Shaw	BLEW & Associates, PA	3825 N. Shiloh Drive; Fayetteville, AR 72703
Zachary Freshner	CESO, Inc.	216 Centerview Drive, Suite 150; Brentwood, TN 37027
Terrence P. Parker	Terra Firm	163a Court Street; Portsmouth, NH 03801

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 # 4400 sq. ft.= $ 660
  - 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 # 22,756 sq. ft. = $ 1,592.92

SUBTOTAL PLAN REVIEW FEE = $ 2,252.92

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: _____ File Number: _____

PROJECT TITLE: Hang Ten Car Wash

PROPERTY LOCATION: 914 Central Avenue; Dover, NH 03820 Tax Map: ____ Lot: ____

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

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

REVIEWED BY: _____ DATE_____ TRC DATE_____

July 21, 2023

City of Dover
288 Central Ave.
Dover, NH 03820-4169

RE: Proposed Hang Ten Car Wash

CESO, Inc. is pleased to submit for Site Plan Review, Secondary Groundwater Protection District CUP, and Impervious Area over 20% CUP.

Per section 170-28.3-D(3)(e) – A car wash is allowed within the Secondary Groundwater Protection Zone only if the Planning Board approves a Conditional Use Permit for the specific use.

Per section 170-28.3-D(5) – Any development in the Secondary Groundwater Protection Zone that proposes a total impervious surface greater than twenty percent (20%) shall only be permitted if the Planning Board grants a Conditional Use Permit.

The existing 1.29-acre site is developed with a vacant 3,559-sf masonry building and asphalt parking lot. The existing site does not provide any stormwater retention areas. The existing site consists of 0.72 acres of pervious area and 0.57 acres of impervious area, which is more than the 20% impervious area permitted per code (44%).

The proposed car wash development will consist of a 4,400-sf building, sixteen (16) vacuum spaces, and two (2) employee parking spaces. The proposed site will consist of 0.58 acres of pervious area, 0.18 acres of pervious pavement, and 0.53 acres of impervious area, which will reduce the impervious area onsite to 41%.

The proposed development will also include the additional of a storm system onsite to collect storm water and direct it to a bioretention area prior to discharging to the storm system in Central Avenue.

Should you have any further questions, please do not hesitate to call me at (517) 212-4185 or email me at gauss@cesoinc.com.

Respectfully,

Mandy J. Gauss

Mandy Gauss, P.E.
Senior Project Manager

Documents provided:
- Building Elevations
- Traffic Impact Analysis
- Site Plans (Including Landscape Plan)
- Drainage Report
- Safety Data Sheets for chemicals used at car wash

CITY OF DOVER, NEW HAMPSHIRE
PLANNING APPLICATION OWNER AUTHORIZATION

OWNER AUTHORIZATION

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

Property Owner Name: 914 Central Avenue, LLC

Signature(s) of Property Owner(s): DocuSigned by: Steve Lukin 268C150F2AB9468... Date: 5/22/2023

Signature of Applicant: DocuSigned by: Mandy Lausse 0844D5CC1D3042B... Date: 5/22/2023
if different from owner

AUTHORIZATION TO ENTER SUBJECT PROPERTY

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

Property Owner Name: 914 Central Avenue, LLC

Signature(s) of Property Owner(s): DocuSigned by: Steve Lukin 268C150F2AB9468... Date: 5/22/2023

Signature of Applicant: DocuSigned by: Mandy Lausse 0844D5CC1D3042B... Date: 5/22/2023
if different from owner

IF SIGN PERMIT, SIGN PERMIT APPLICATION INFORMATION

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

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

Address of Sign Location: _____

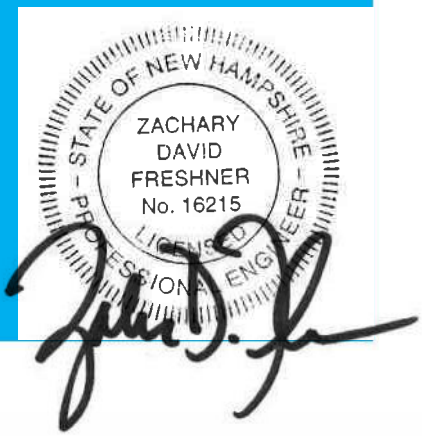
Sign Permit Application Type:
(check one)

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

05.02.2023

Traffic Impact Analysis

Proposed Car Wash Development



On behalf of:

Wash Equity Advisors
Giving Owners Options

Contact:

Mandy Gauss, PE
CESO Senior Project Manager
Office: 517.212.4185
Email: gauss@cesoinc.com

Preparation Date:

05/02/2023

1. Executive Summary

1.1. Introduction

This report is submitted on behalf of Wash Equity Advisors in connection with its application to the City of Dover, New Hampshire (NH) for site plan approval. The trip generation analysis conducted by CESO Inc. addresses the traffic impact associated with the Proposed Automated Car Wash Development; referred to herein as "Car Wash Development".

CESO, Inc. was retained by the Developer to provide a traffic impact assessment and analysis for the Proposed Car Wash Development that will be located at 914 Central Avenue, Dover, NH 03820. The following analysis has been performed in general accordance with locally accepted standards and industry practices. Based on these guidelines, the purpose of this analysis is to quantify the amount of traffic generated by the construction of the Proposed Car Wash Development and identify measures to mitigate any adverse impacts on the existing transportation system.

1.2. Site Description

The Proposed Car Wash Development is to be located on the southwest side of Central Avenue, approximately 260' southeast of the Central Avenue and Webb Place. intersection, within the City of Dover, NH. The Site is primarily surrounded by commercial development in all directions. **Attachment A** contains a site location map, **Attachment B** contains a site aerial, and **Attachment C** contains a site conceptual plan.

The subject parcel is currently occupied by one approximately 4,000 sq. ft, vacant restaurant building. The existing building will be demolished to be replaced by the Car Wash Development. The Proposed Car Wash Development will be approximately 4,500 feet in gross floor area, will include one car wash tunnel and 17 vacuum-use parking spaces.

Wash Equity Advisor's Site Plan application requests approval of the following access point:

- Right-in-right-out (RIRO) access driveway to utilize the existing curb-cut approximately 300' southeast of the Central Avenue and Webb Place/Weeks Lane intersection.

1.3. Area Roadway Characteristics

Central Avenue – Central Avenue is a four-lane, two-way roadway with a two-way left-turn lane median that runs in the northwest/southeast direction in the Site vicinity. Central Avenue is classified as a minor arterial according to the *NHDOT Roads System*. Central Avenue has a posted speed limit of 30 mph and is under the jurisdiction of the City of Dover.

1.4. Area Pedestrian/Public Transit Characteristics

Pedestrian Access – Pedestrian amenities in the Site vicinity include 5' sidewalks running parallel to the roadway alignment on both the north and south side of Central Avenue. The nearest pedestrian crosswalk is located at the intersection of Central Avenue and Weeks Lane.

Public Transit – Local public transit includes bus access approximately ¼ mile northwest of the Site. However, due to the proposed use of the Site as a car wash, it is not anticipated that public transit will be utilized.

1.5. Site Traffic Generation

In order to calculate the Proposed Car Wash Development Generated Traffic Volumes, CESO reviewed Site Plan data provided by the client to determine the quantity of potential traffic volumes generated. The full buildout of the Development includes the proposed use of the Site as a Car Wash Development that consists of the following:

- One (1) approximate 4,500 sq. ft. Automated Car Wash Development with one (1) wash tunnel.

Studies of similar developments throughout North America have shown that the amount of traffic generated will be functionally related to some unit of activity (i.e., number of fueling stations, gross floor area, service bays, etc.). In practice, site traffic fluctuates substantially on different days and hours throughout the year. Therefore, it is imperative to select an appropriate hourly volume on which to base the design of the external roadway and site access facilities. The Weekday PM and Saturday Peak Hours were selected based on the hours of operation of the proposed Development and available data from the Institute of Transportation Engineers (ITE).

For analysis purposes, the base unit utilized for trip-generation was the number of car wash tunnels. The Proposed Car Wash Development Generated Traffic Volumes were calculated by utilizing data contained in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 11th Edition,* in combination with methods outlined in the (ITE) Trip Generation Handbook. Trip Generation resources and calculations can be found in **Attachment D.** The Car Wash Development Generated Traffic Volumes are presented below in Table 1. The trip generation shown below includes PM peak hour trips generated, and Saturday peak hour trips generated.

Table 1
Site Generated Traffic Volumes

ITE Land Use Description	ITE Cat.	Size	Unit	Total Generated Trips								
				Weekday			Weekday PM Peak Hour			Saturday Peak Hour		
				Total	Total	Total	Total	In	Out	Total	In	Out
Automated Car Wash	948	1	Wash Tunnel	N/D	N/D	N/D	78	39	39	41	19	22
ITE Cat. 948 Entering (%)/Exiting (%)				N/D	N/D	N/D	*100%*	*50%*	*50%*	*100%*	*46%*	*54%*
TOTAL				--	--	--	78	39	39	41	19	22

N/D – No ITE trip generation data available

Note: ITE trip generation data was not available for the AM Peak Hour of the adjacent roadway. However, it would generally be accepted that a Car Wash Development would generate more traffic during a typical PM Peak Hour than a typical AM Peak Hour. As such, the typical PM Peak Hour trip generation would likely be a representative estimate of the worst-case scenario when forecasting future traffic demands.

The full buildout of the Car Wash Development is estimated to generate 78 new trips during a typical Weekday PM Peak Hour (39 inbound and 39 outbound) and 41 new trips during a typical Saturday Peak Hour (19 inbound and 22 outbound).

1.6. Site Traffic Distribution

The directional distribution of development-generated traffic is a function of several variables. The assumptions and methods used in estimating the direction in which traffic will approach and depart the Site varies with several location-specific conditions such as:

- Size and type of the proposed development.

- Population distribution within the defined area of influence.
- Prevailing operating conditions on the existing transportation system.

The analysis of directional distribution is based upon the observation that drivers normally choose the most convenient (not necessarily the most direct) routes to and from a given traffic generator. The anticipated directional distribution of trips generated by the proposed Car Wash Development is summarized in Table 2.

Table 2
Directional Distribution of Site Generated Traffic Volumes

Route	Distribution Approach/Departure	
	Passenger Cars	
	AM Peak Hour	PM Peak Hour
Trip Distribution – Cars		
From/To the North via Central Avenue	40%/40%	40%/40%
From/To the East via Central Avenue	40%/40%	40%/40%
From/To the West via Central Avenue	20%/20%	20%/20%
TOTAL	**100%/100%**	**100%/100%**

Based on an aerial review of the Site location, review of local population distributions, and an inventory of existing car wash developments in relation to the Site, it is likely that generated traffic will be distributed evenly between the northbound and southbound Central Avenue.

1.7. Intersection Sight Distance Analysis

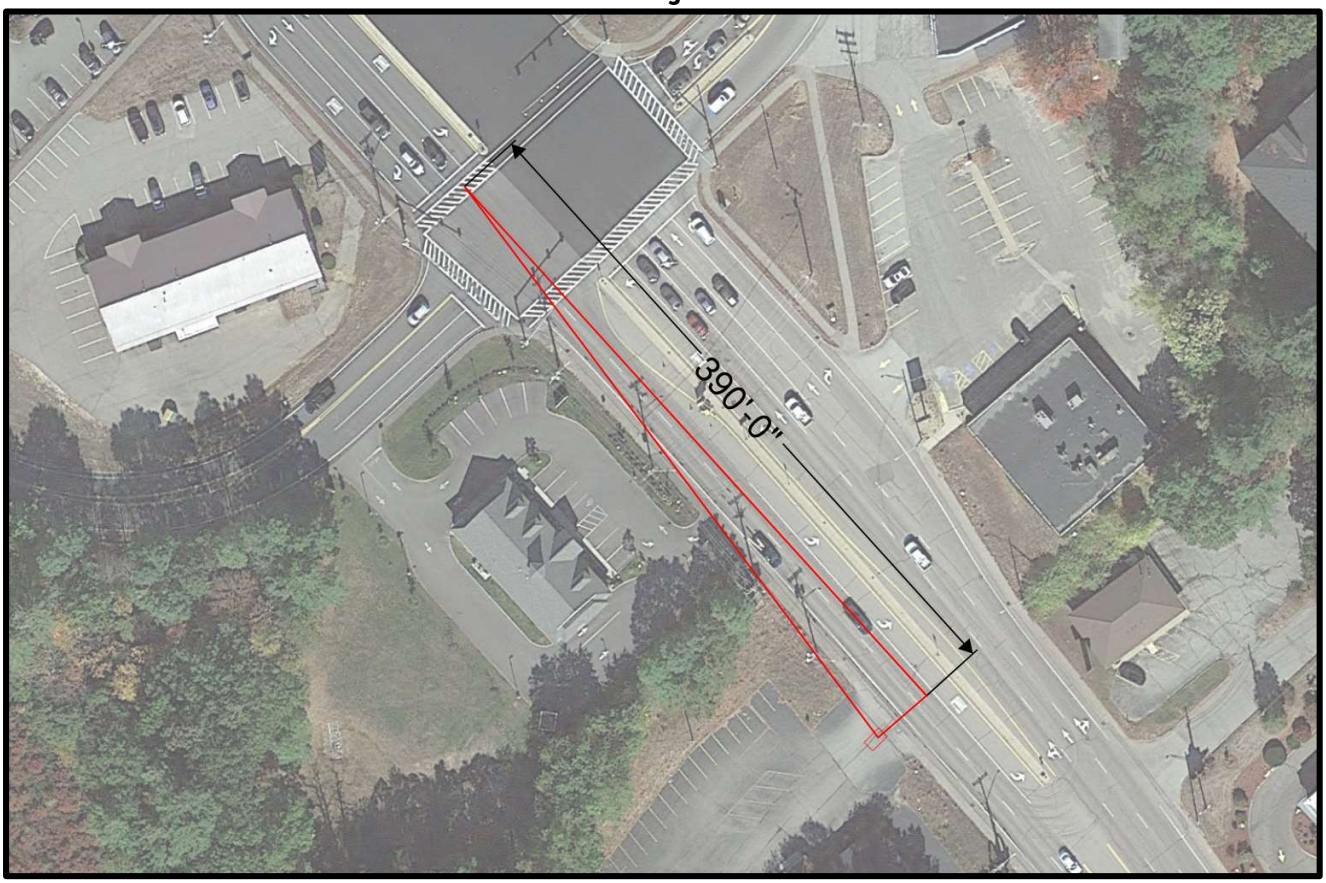
The site access driveway was reviewed for intersection sight distances were reviewed to determine if proper sight distance would be provided to vehicles exiting the Site Access Driveway per the procedures within AASHTO's *A Policy on Geometric Design of Highways and Streets 2018, 7th Edition.*

The following assumptions were made when measuring available intersection sight distance (ISD):

- 18-foot vehicle setback from the edge of travel.
- 3.5-foot visibility height for passenger cars exiting the Site Access Driveway.
- 3.5-foot object visibility height.

For a design speed of 35 MPH, the required intersection sight distance for an outbound right-turning vehicle is to be 390'. Intersection sight triangles for the site access driveway are shown on the following page.

Intersection Sight Distance



Based on the figure above, proper intersection sight distance will be provided to outbound vehicles making a right turn to exit the Car Wash Development. The following pictures show the existing sight distance at the existing driveway, provided by Google Earth imagery.

Central Avenue – Looking Northwest from Existing Site Driveway



Central Avenue – Looking Southeast from Existing Site Driveway



1.8. Summary of Recommendations

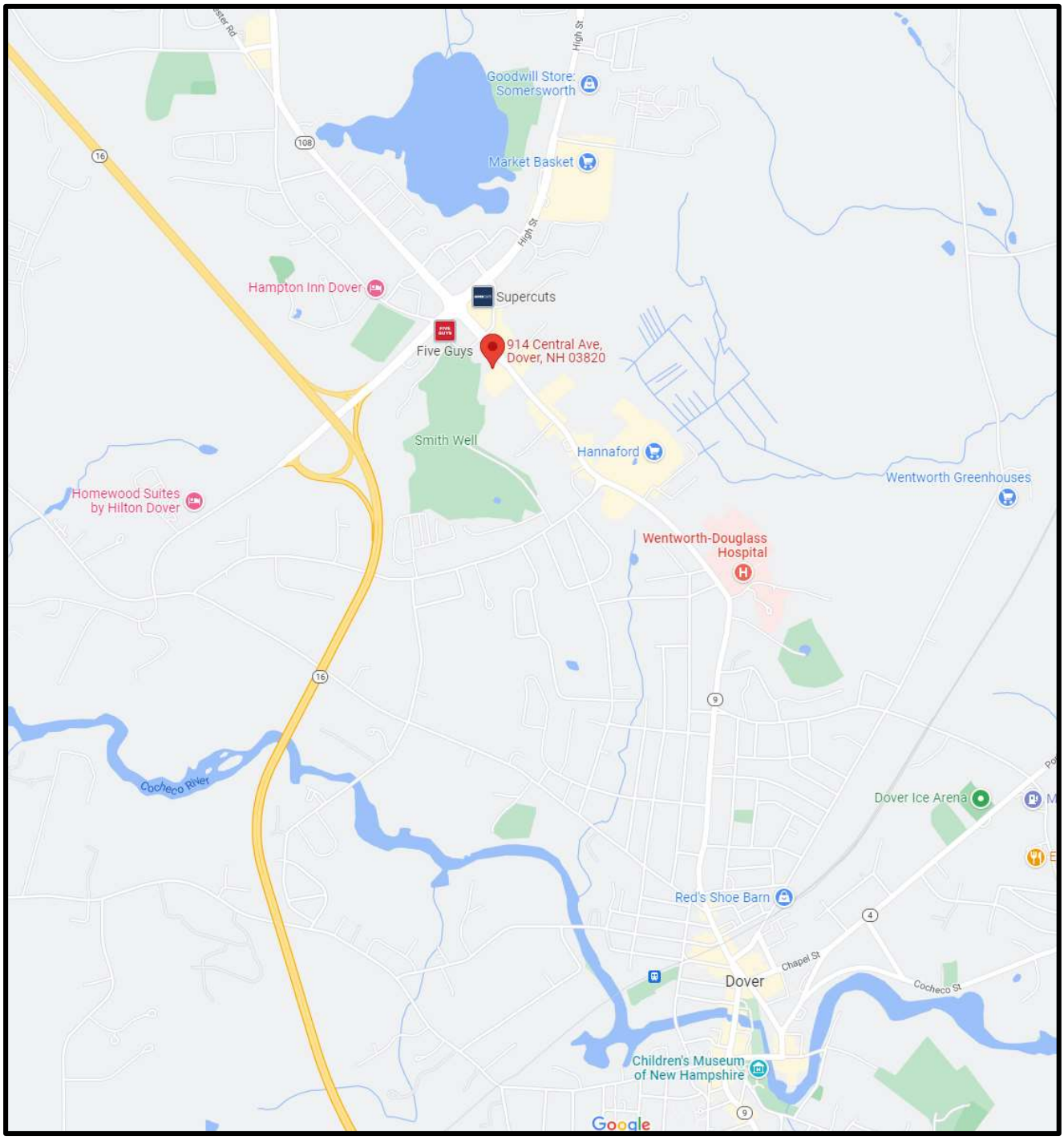
The following summary of recommendations was generated based upon the findings in the Traffic Impact Analysis.

2023 Build Traffic Scenario (Responsibility – Developer):

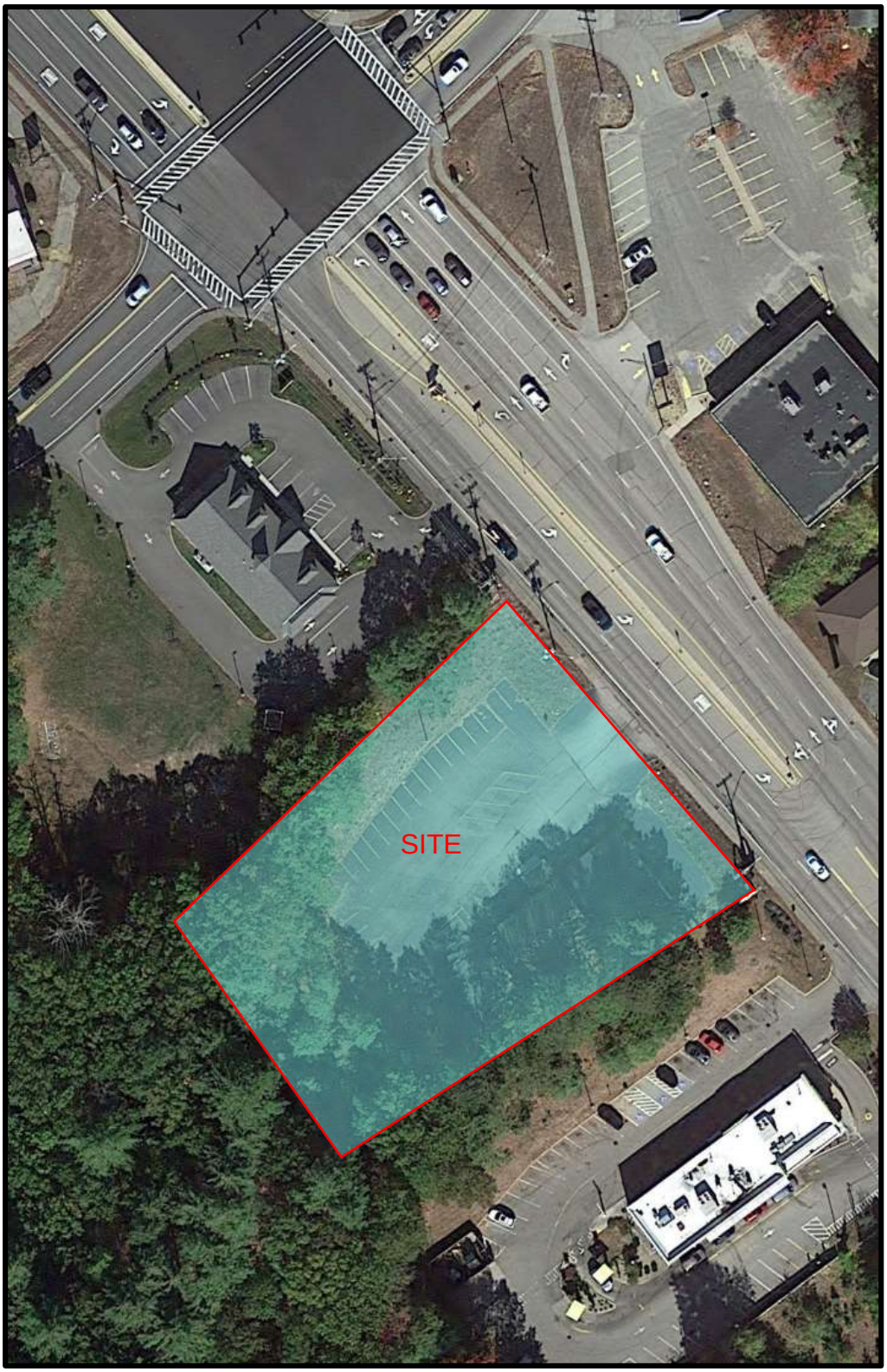
Central Avenue & Site Access Driveway:

- Improve Existing Site Access Driveway to permit right-in and right-out (RIRO) vehicle movements. Provide one (1) inbound lane and one (1) outbound right-turn lane.

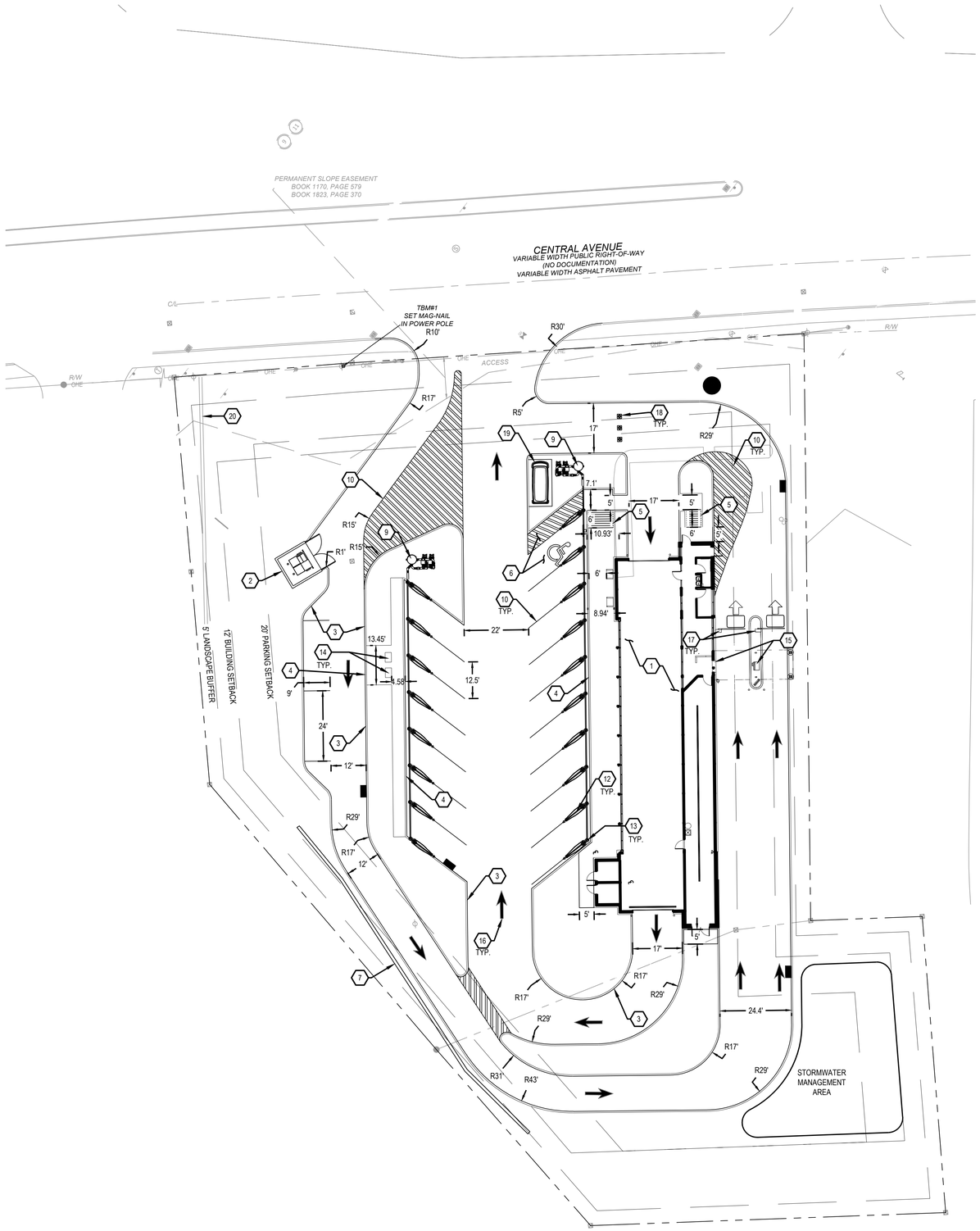
Attachment A: Site Location Map



Attachment B: Site Aerial



Attachment C: Site Plan



SITE LEGEND

EXISTING

REFER TO C1.1 FOR EXISTING FEATURES LEGEND

PROPOSED

- PROPOSED HEAVY DUTY ASPHALT PAVEMENT
- PROPOSED STANDARD DUTY ASPHALT PAVEMENT
- PROPOSED MILL & OVERLAY
- PROPOSED HEAVY DUTY CONCRETE PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- PROPOSED CONCRETE SIDEWALK
- RIGHT-OF-WAY
- PROPERTY LINE
- SETBACK
- EASEMENT
- CENTERLINE
- BUILDING
- CONCRETE CURB
- PAVEMENT/WALK
- RETAINING WALL
- PARKING SPACE COUNT
- SIGN
- DETECTABLE WARNING MAT.
- CATCH BASIN
- STORM MANHOLE
- SANITARY MANHOLE
- CURB INLET
- CLEANOUT
- YARD DRAIN
- DOWN SPOUT
- FIRE HYDRANT
- LIGHT POLE
- CONCRETE BUMPER BLOCK

GENERAL NOTES:

SEE SHEET

CODED NOTES:

1. PROPOSED 4400 SF BUILDING. REFER TO ARCHITECTURAL PLANS FOR DETAILS.
2. PROPOSED TRASH ENCLOSURE PER LOCAL REQUIREMENTS. SEE ARCHITECTURAL PLAN FOR DETAILS.
3. PROPOSED 6" STRAIGHT CURB. REFER TO CONSTRUCTION DETAILS, SHEET 6.0.
4. PROPOSED INTEGRAL CONCRETE CURB AND SIDEWALK. REFER TO CONSTRUCTION DETAILS, SHEET 6.0.
5. PROPOSED CURB RAMP, REFER TO CONSTRUCTION DETAILS, SHEET 6.0.
6. ADA ACCESSIBLE PARKING SPACE WITH SIGNAGE. REFER TO CONSTRUCTION DETAILS, SHEET 6.0.
7. PROPOSED RETAINING WALL.
8. PROPOSED 6" CONCRETE BOLLARD. REFER TO CONSTRUCTION DETAILS, SHEET C6.0.
9. PROPOSED PUMP. REFER TO MEP PLANS FOR DETAILS.
10. PROPOSED PARKING LOT PAVEMENT MARKINGS.
11. PROPOSED LIGHT POLE.
12. PROPOSED VACUUMS. REFER TO MEP PLANS FOR DETAILS.
13. PROPOSED VACUUM MOTOR/ EQUIPMENT ENCLOSURE. REFER TO MEP PLANS FOR DETAILS.
14. PROPOSED TRASH RECEPTACLE.
15. PROPOSED PAY STATION. REFER TO MEP PLANS FOR DETAILS.
16. PROPOSED DIRECTIONAL ARROW TO BE IN COMPLIANCE WITH M.U.T.C.D. STANDARDS.
17. PROPOSED BARRIER GATE. REFER TO MEP PLANS FOR DETAILS.
18. PROPOSED TRAFFIC CONE
19. PROPOSED CAR SIGNAGE
20. EXISTING RETAINING WALL

811 DigSafe MA·ME·NH·RI·VT

SEVENTY-TWO (72) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: NEW HAMPSHIRE UTILITIES PROTECTION SERVICE AT 811 OR 888-344-7233 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

N

1 0 1 2

GRAPHIC SCALE (IN FEET)
1 in. = 1 ft.

CESO
WWW.CESOINC.COM

HANG TEN CAR WASH
DOVER, NH

914 CENTRAL AVE.
DOVER, NH 03820

Revisions / Submissions

ID	Description	Date

761766
1'=20'
NTV
HGC
03/10/2023
NOT FOR CONSTRUCTION

SITE PLAN

C3.0

W:\PROJECTS\WEA\761766-01_Hang 10_Dover_NH\03-CIVIL\PLAN\PLAN\C3.0-SITE PLAN.dwg - 3/29/2023 - Taylor Viera

Attachment D: Trip Generation Resources

Automated Car Wash
(948)

Vehicle Trip Ends vs: **Car Wash Tunnels**
On a: **Saturday, Peak Hour of Generator**

Setting/Location: **General Urban/Suburban**
Number of Studies: 1
Avg. Num. of Car Wash Tunnels: 1
Directional Distribution: 46% entering, 54% exiting

Vehicle Trip Generation per Car Wash Tunnel

Average Rate	Range of Rates	Standard Deviation
41.00	41.00 - 41.00	*

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= **

Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Automated Car Wash
(948)

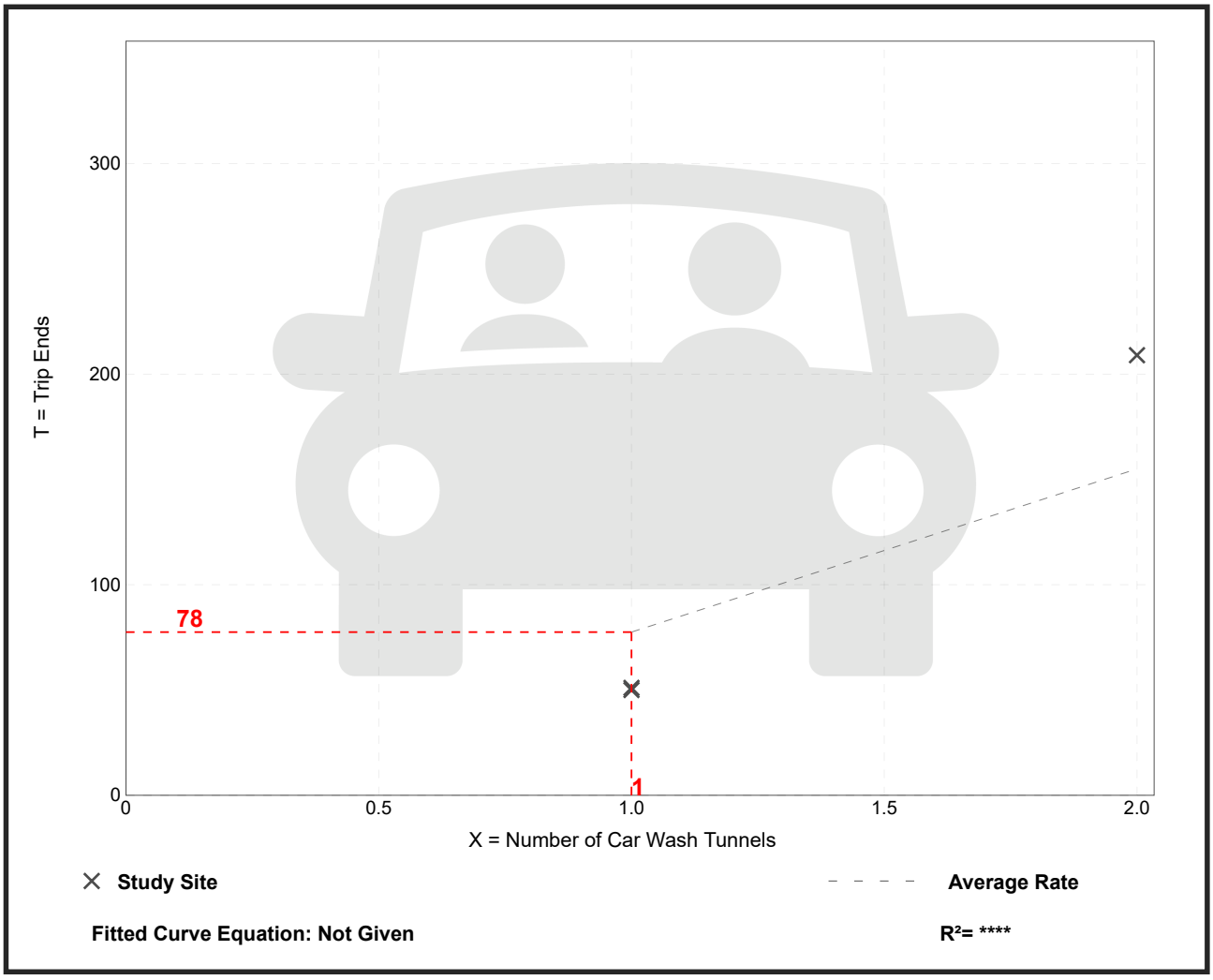
Vehicle Trip Ends vs: **Car Wash Tunnels**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 3
Avg. Num. of Car Wash Tunnels: 1
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Car Wash Tunnel

Average Rate	Range of Rates	Standard Deviation
77.50	50.00 - 104.50	33.07

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= **

Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

November 11th, 2022

Traffic Impact Study – Proposed Automobile Wash Facility

City of Dover, NH

CESO Trip Generation Calculations – 2023 Build Traffic Scenario:

ITE 948 – Automated Car Wash

For Weekday → N/D

For AM Peak Hour → N/D

For PM Peak Hour → 50% Enter/50% Exit

1 Wash Tunnel x 77.50 = 77.50 ≈ 78 Trips for Even Number

Primary Trips = 78 x 0.50 (50%) = 39 Trips Enter/39 Trips Exit

For Saturday Peak Hour → 46% Enter/54% Exit

1 Wash Tunnel x 41.00 = 41.00 ≈ 41 Trips for Even Number

Primary Trips = 41 x 0.46 (46%) and 41 x 0.54 (54%) = 19 Trips Enter/22 Trips Exit

Safety Data Sheet

Issue Date: 04-Feb-2014 **Revision Date:** 27-Jul-2020 **Version** 3

1. IDENTIFICATION

Product Identifier

Product Name BUG REMOVER AND BUG REMOVER *2X*

Other means of identification

SDS # DSI-024

Product Code BUG REMOVER PRODUCT CODES: 3232, 3235, 32315, 32330, 32355
BUG REMOVER *2X* PRODUCT CODES: D191, D192, D193, D197, D199

UN/ID No UN3267

Recommended use of the chemical and restrictions on use

Recommended Use Automotive Care Products. Bug remover.

Details of the supplier of the safety data sheet

Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number

Company Phone Number 800-843-7627
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Red liquid **Physical State** Liquid

Classification

Skin corrosion/irritation	Category 1 Sub-category B
Serious eye damage/eye irritation	Category 1
Specific target organ toxicity (single exposure)	Category 3

Signal Word
Danger

Hazard Statements
Causes severe skin burns and eye damage
May cause respiratory irritation. May cause drowsiness or dizziness



Precautionary Statements - Prevention
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection
Use only outdoors or in a well-ventilated area

Precautionary Statements - Response
Immediately call a poison center or doctor/physician
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a poison center or doctor/physician
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Immediately call a poison center or doctor/physician
IF SWALLOWED: rinse mouth. Do NOT induce vomiting
Immediately call a poison center or doctor/physician

Precautionary Statements - Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Other Hazards
Harmful to aquatic life with long lasting effects

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Monoethanolamine	141-43-5	5-20
Trisodium Nitrilotriacetate	5064-31-3	<1
Caustic Soda	1310-73-2	<1

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor/physician.

Skin Contact IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If skin irritation persists, call a physician.

Inhalation IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor/physician. Artificial respiration and/or oxygen may be necessary.

Ingestion IF SWALLOWED: call a poison control center or physician immediately. If conscious give 2 glasses of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting.

Most important symptoms and effects

Symptoms Causes severe skin burns and eye damage. Headache. Nausea. May cause respiratory irritation. May cause drowsiness or dizziness.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
Material is corrosive. The product is not expected to present any fire or explosion hazards under prescribed use conditions.

Hazardous Combustion Products None known.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. See Section 13: DISPOSAL CONSIDERATIONS.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so. Contain spilled material if possible. Absorb with materials such as: Dirt. Sand. Sawdust.

Methods for Clean-Up Transfer liquid and solid material into suitable containers in accordance with local, state and federal regulations for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practice. Use personal protection recommended in Section 8. Avoid contact with skin, eyes or clothing. Do not breathe dust/fume/gas/mist/vapors/spray. Wash face, hands, and any exposed skin thoroughly after handling. Follow all product label instructions. Use only as directed. Use only outdoors or in a well-ventilated area.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry and well-ventilated place. Store locked up. Store away from heat and incompatible materials.

Incompatible Materials Acids. Soft metals. Store away from oxidizing agents/reducing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Monoethanolamine 141-43-5	STEL: 6 ppm TWA: 3 ppm	TWA: 3 ppm TWA: 6 mg/m^3 (vacated) TWA: 3 ppm (vacated) TWA: 8 mg/m^3 (vacated) STEL: 6 ppm (vacated) STEL: 15 mg/m^3	IDLH: 30 ppm TWA: 3 ppm TWA: 8 mg/m^3 STEL: 6 ppm STEL: 15 mg/m^3
Caustic Soda 1310-73-2	Ceiling: 2 mg/m^3	TWA: 2 mg/m^3 (vacated) Ceiling: 2 mg/m^3	IDLH: 10 mg/m^3 Ceiling: 2 mg/m^3

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits. Eyewash stations. Showers.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Chemical anti-splash safety goggles.

Skin and Body Protection Protective gloves. Wear suitable protective clothing to prevent contact with skin.

Respiratory Protection Ensure adequate ventilation, especially in confined areas. In case of inadequate ventilation wear respiratory protection.

General Hygiene Considerations Wash contaminated clothing before reuse. Wash face, hands and any exposed skin thoroughly after handling. Protective clothing and equipment should be in accordance with 29 CFR 1910.132 and 1910.133.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Red liquid	**Odor**	Not determined
Color	Red	**Odor Threshold**	Not determined

Property	Values	Remarks • Method
pH	12.4-13.5	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	> 100 °C / > 212 °F	
Flash Point	Not applicable	
Evaporation Rate	Not available	
Flammability (Solid, Gas)	Liquid-not applicable	
Upper Flammability Limits	Not applicable	
Lower Flammability Limit	Not applicable	
Vapor Pressure	Not available	
Vapor Density	Not available	
Specific Gravity	1.032-1.066	@ 25 °C (77 °F) (1=Water)
Water Solubility	Completely soluble	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	Not determined	
Dynamic Viscosity	7 cSt	
Explosive Properties	Not an explosive	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to Avoid
Excessive heat.

Incompatible Materials
Acids. Soft metals. Store away from oxidizing agents/reducing agents.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Causes severe eye damage.

Skin Contact Causes severe skin burns.

Inhalation Avoid breathing vapors or mists.

Ingestion Do not taste or swallow.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Water 7732-18-5	> 90 mL/kg (Rat)	-	-
Monoethanolamine 141-43-5	= 1720 mg/kg (Rat)	= 1 mL/kg (Rabbit) = 1025 mg/kg (Rabbit)	-
Caustic Soda 1310-73-2	-	= 1350 mg/kg (Rabbit)	-
Trisodium Nitrilotriacetate 5064-31-3	= 920 mg/kg (Rat)	-	> 5 mg/L (Rat) 4 h

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen. However, the product as a whole has not been tested.

Chemical Name	ACGIH	IARC	NTP	OSHA
Trisodium Nitrilotriacetate 5064-31-3		Group 2B		X

IARC (International Agency for Research on Cancer)
Group 2B - Possibly Carcinogenic to Humans
OSHA (Occupational Safety and Health Administration of the US Department of Labor)
X - Present

STOT - single exposure May cause respiratory irritation. May cause drowsiness or dizziness.

Numerical measures of toxicity
Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity
Harmful to aquatic life with long lasting effects.

Component Information

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Monoethanolamine 141-43-5	15: 72 h Desmodesmus subspicatus mg/L EC50	227: 96 h Pimephales promelas mg/L LC50 flow-through 3684: 96 h Brachydanio rerio mg/L LC50 static 300 - 1000: 96 h Lepomis macrochirus mg/L LC50 static 114 - 196: 96 h Oncorhynchus mykiss mg/L LC50 static 200: 96 h Oncorhynchus mykiss mg/L LC50 flow-through		65: 48 h Daphnia magna mg/L EC50
Caustic Soda 1310-73-2		45.4: 96 h Oncorhynchus mykiss mg/L LC50 static		
Trisodium Nitrilotriacetate 5064-31-3	560 - 1000: 96 h Chlorella vulgaris mg/L EC50	93 - 170: 96 h Pimephales promelas mg/L LC50 flow-through 175 - 225: 96 h Lepomis macrochirus mg/L LC50 static 252: 96 h Lepomis macrochirus mg/L LC50 470: 96 h Pimephales promelas mg/L LC50 static 560 - 1000: 96 h Oryzias latipes mg/L LC50 560 - 1000: 96 h Oryzias latipes mg/L LC50 semi-static 72 - 133: 96 h Oncorhynchus mykiss mg/L LC50 static 560 - 1000: 96 h Poecilia reticulata mg/L LC50 semi-static 560 - 1000: 96 h Poecilia reticulata mg/L LC50 114: 96 h Pimephales promelas mg/L LC50		560 - 1000: 48 h Daphnia magna mg/L LC50

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility

Chemical Name	Partition Coefficient
Monoethanolamine 141-43-5	-1.91

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

California Hazardous Waste Status

Chemical Name	California Hazardous Waste Status
Caustic Soda 1310-73-2	Toxic Corrosive

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances. Based on package size, product may be eligible for limited quantity exception.

DOT
UN/ID No UN3267
Proper Shipping Name Corrosive liquid, basic, organic, n.o.s. (Monoethanolamine)
Hazard Class 8
Packing Group II

IATA
UN/ID No UN3267
Proper Shipping Name Corrosive liquid, basic, organic, n.o.s. (Monoethanolamine)
Hazard Class 8
Packing Group II

IMDG
UN/ID No UN3267
Proper Shipping Name Corrosive liquid, basic, organic, n.o.s. (Monoethanolamine)
Hazard Class 8
Packing Group II
Marine Pollutant This material may meet the definition of a marine pollutant

15. REGULATORY INFORMATION

International Inventories

TSCA	Listed

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

KECL *- Korean Existing and Evaluated Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

US Federal Regulations

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Caustic Soda 1310-73-2	1000 lb		RQ 1000 lb final RQ RQ 454 kg final RQ

SARA 313

Not determined

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Component	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Caustic Soda 1310-73-2 (<1)	1000 lb			X

US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals.

Chemical Name	California Proposition 65
Diethanolamine 111-42-2	Carcinogen

This product also contains a chemical that is at or below California Proposition 65's "safe harbor level" as determined via a risk assessment. Therefore, the chemical is not required to be listed as a Prop 65 chemical on the SDS or label.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Monoethanolamine 141-43-5	X	X	X
Caustic Soda 1310-73-2	X	X	X

Trisodium Nitrilotriacetate 5064-31-3		X	

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	2	0	0	Not determined

Issue Date: 04-Feb-2014
Revision Date: 27-Jul-2020
Revision Note: Information in Section 15

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

VELOCITY WATER WORKS
Elevating the Standard.

Carwash Effluent Estimates

When Using a Velocity Water Works Recycling System

Vehicles through normal travel will collect contaminants from the environment, as well as the contaminants found on the roadways that they travel. This will consist of environmental contaminants from the region such as soil, tree sap, bird droppings, pollens, insects, as well as hydrocarbons from the from the surface of the road. Regions that may experience sub-freezing temperatures may also experience contaminants related to ice/snow melting products that may also include sand, salt, liquid brine solutions or a modified liquid magnesium chloride. These contaminants will be wash from the vehicle and will end up in the water reclamation tanking system.

The recycling system manufactured by Velocity water works consist of four primary processes.

- The first is a series of underground storage tanks that are both sized and plumbed in a way that provides an adequate amount of dwell time for contaminants with differing weights to that of water to separate. With this, the solids with a specific gravity of greater than one (1) will sink to the bottom, while the hydrocarbons, wash chemicals and lighter products will float to the surface. Baffling along with a specific plumbing design prevents the already separated contaminants from passing to the next compartment where the next stage of separation continues. This process continues until all particles >70uM have fallen out, as well as all lighter contaminants have floated to the surface where they are either held back for later disposal or skimmed off for the final processing. (Fig. 1)

- The second step in the process involves the use of the recycling system manufactured by Velocity Water Works. This portion pumps the water from the final compartment of the underground storage tanks and then mechanical separates any remaining particles >5uM in size using Hydro-Cyclones. The cyclones spin the water within a cone shaped device with the purpose of increasing the centrifugal forces being experienced by the particles. The particles of dirt >5uM are forced to the outer surfaces where they are collected, and then discharged out through an underflow orifice. This dirt is then sent to a specific storage compartment located in the underground storage tanks for future disposal. (Fig. 2)

- The third step in the process incorporates circulation of recycled water back through the underground storage tanks in conjunction with the induction of air and/or ozone.

    - Velocity's recycling system continuously re-circulates the water while:
        - Removing suspended solids >5uM
        - Inducts air for the purpose of raising depleted oxygen levels in the tanks
        - Inducts ozone to break down the bonds associated with hydrocarbons, soaps, waxes, and dies from the process of washing the vehicle. (Fig. 3)

- The fourth, and final step of the process is to re-pressurize the water so that it can be distributed directly to the carwash equipment between 30 and 45 PSI. (Fig 4.)

Effluent Discharge

The overflow (effluent), or water not being recycled has been left to settle out the suspended solid (TSS) >70uM. Is free of "Free Oil & Grease" (FOG) as a result of its separation in the tanks, integral partitions, and a specific plumbing design that inhibits the free flow of containments with a specific gravity less then water and has been aeriated to improve the Dissolved Oxygen (DO) levels, and therefore overcome the depleting effects of Biological Oxygen Demand (BOD).

Velocity Water Works 100 East Kelso Rd, Kaukauna WI 54130
PH (920) 423-7170 / FAX (844)348-9001 / Website: www.velocitywaterworks.com

Effluent Discharge (Cont.)

TSS, FOG and BOD are typically the main concern by municipalities receiving effluent from a car wash. The recycling system manufactured by Velocity Water Works has been engineered to alleviate those concerns so that the effluent can be efficiently processed by the municipality. However, we do not claim to influence the dissolved solids (TDS), pH, emulsified/dissolved oils, or certain chemistry dissolved in the water.

Measures Effluent Levels

Total Suspended Solid (TSS): <100 ppm
Free Oil & Grease (FOG): <25ppm
Biological Oxygen Demand (BOD): <50ppm

The above effluent quality estimates are based on normal contaminant loading experienced by a vehicle wash. The estimates are not a guarantee of performance, but instead the findings from a typical vehicle wash using reclaim compatible cleaning products. The effluent may, may not, be acceptable for direct discharge to sewer or leach field per local specifications and as such local authorities/municipalities should be consulted to determine if additional treatment may be required to meet specific needs.

Please let me know if you have any additional questions related to Velocity Water Works recycling system.

Sincerely,

Jay Dayak
Vice President of Engineering
Velocity Water Works
100 E. Kelso Road, Kaukauna WI 54130
Phone: **(321) 614-1326**
Email: jay@velocitywaterworks.com

Underground Storage Tanks

Recommended Settling/Storage Capacities

Total Flow	No. of Tanks & Volume Each
100 GPM	(3) 2,000 Gallon Tanks

All tanks should have center partitions to promote the separation of heavier solids, and lighter liquids from the main body of water as it transfers from compartment to compartment.

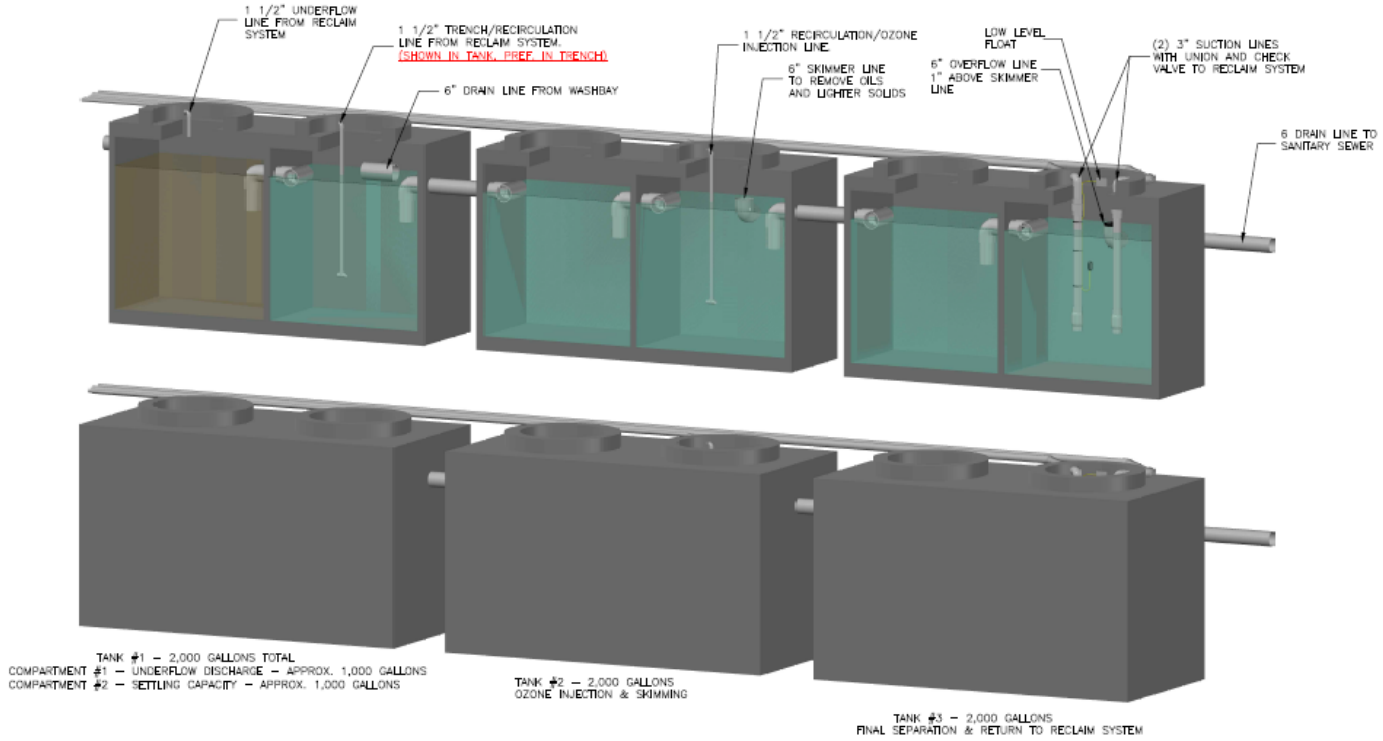


Fig. 1

Above is an example configuration for a typical 6,000 tank configuration suitable for up to 100GPM of water being discharged from the carwash. Both smaller, and larger systems are designed in a very similar way with the exception that tank volume, and quantities will very as water discharge expectations increase/decrease.

Note: The general configuration of the tanks can be perceived as an over-sized "Sand – Oil Separator". This does suffice as one in many cases, however, an addition "Sand-Oil Separator" may still be required be required by the municipality before discharging to the sewer. Please follow all local municipal guidelines when specifying the tanking configuration.

Circulation & Particle Separation by Cyclone

Water is circulated through the tanking system to prevent stagnation, and to provide a means to aeration. Dirt particles larger than 5uM are removed from then circulating water and sent back to a storage compartment via the underflow for disposal later.

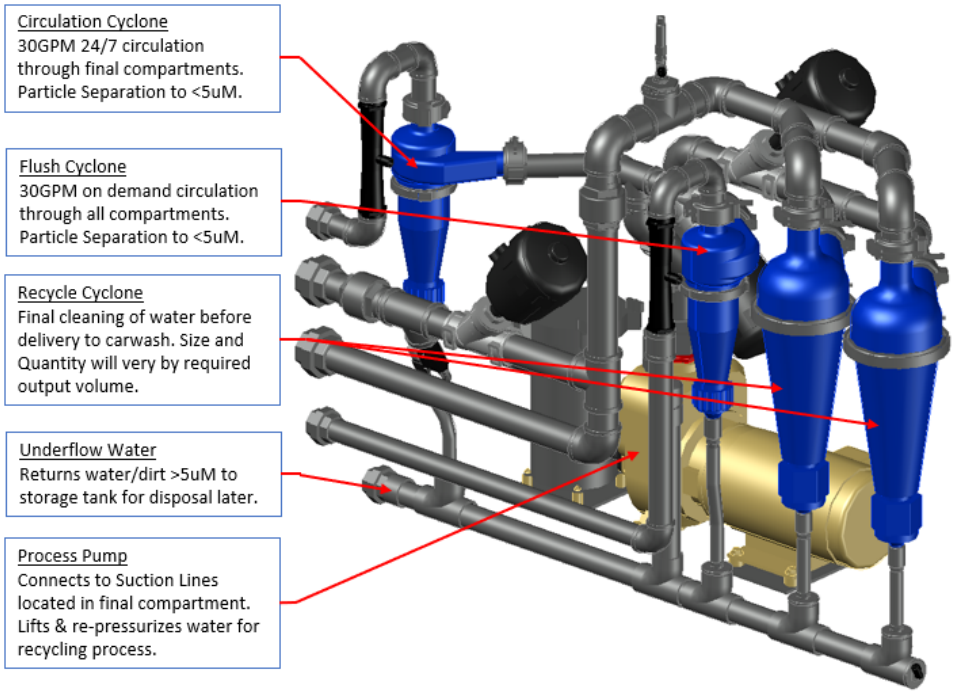


Fig. 2

Aeriation & Oxidation

Air along with Ozone is inducted into the Circulation and Flush lines to improve oxygen levels that may have been depleted, to resist the growth of odor generating Anaerobic bacteria, as well as enhance the growth of Aerobic bacteria that intern helps clarify the water.

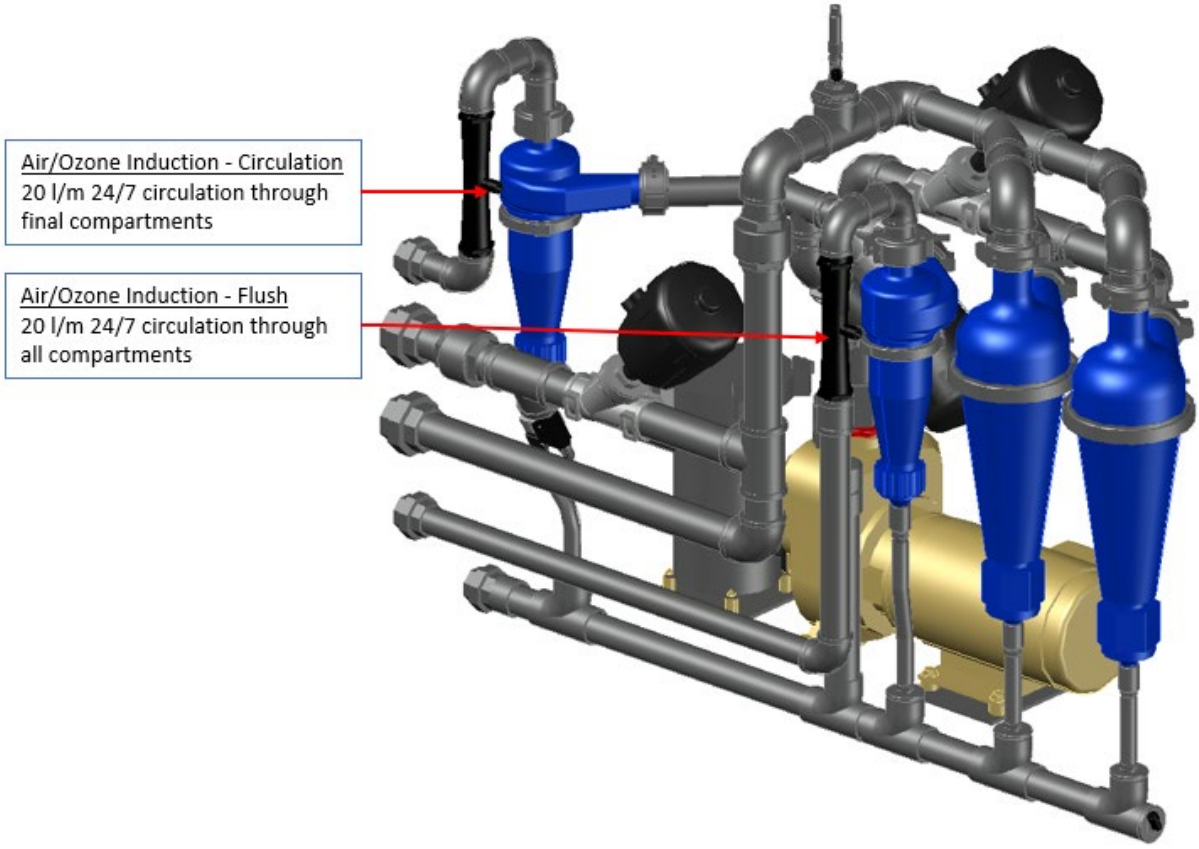


Fig. 3

Water Usage

Below is an example water distribution and usage for a tunnel carwash system.

Conveyor Carwash - Water Distribution

	Equipment/Application	Water Type	Water Flow	Fresh Water	Reclaim Water	RO Reject
1	Prep Unit	Reclaim	4	2.5	2.5	
2	Foaming Bath Arch	Fresh	2	1		
3	CTA #1	Fresh	1	0.25		
4	Bumper Prep Manifold	Reclaim	6		4	
5	CTA #2	Fresh	1	0.25		
6	Top Brush - Soap & Water	Reclaim	6		4	
7	Tire Brush - Water	Reclaim	6		6	
8	Wash Around Brush - Soap & Water	Reclaim	6		6	
9	Full Side Washer - Soap & Water	Reclaim	6		6	
10	Tire Brush - Water	Reclaim	6		6	
11	Under Carriage	Reclaim	12		12	
12	Full Sider Washer - Soap & Water	Reclaim	6		6	
13	High Pressure Rinse - Sides	Reclaim	35		25	
14	High Pressure Rinse - Top	Reclaim	15		20	
15	Triple Foam - Wax & water	Fresh	1.5	0.75		
16	Diagonal Curtain - Water	Fresh	6	4		
17	Rocker Washer - Water	Fresh	6	5		
18	Rinse Water	Fresh	4			4
19	Sealer Wax/Drying Agent	Fresh	4	2.5		
20	SpotFree Rinse	Fresh	4	4		
	TOTAL (Gallons)			20.25	97.5	4

Vehicle Washing Statistics	
Vehicles Washed - Estimated Per Hour	70
Vehicles Washed - Estimated Per Day	500

Water Statistics	
Evaporation Carry-out (Gallons/Car)	6
Fresh Water (Gallons/Car)	24.25
Reclaim Water (Gallons/Car)	97.5
Total Gallons/Car	121.75
Flow Through Settling Tanks (Gallons/Car)	115.75
Overflow Discharge to Sewer (Gallons/Car)	18.25
Reclaim Percent	80.1%
Fresh Water Percent	19.9%

Reclaim Water Settling Time	
Settling Capacity For Recycled Water (Gallons)	5000
Setting Time In Tank (Minutes)	43.20

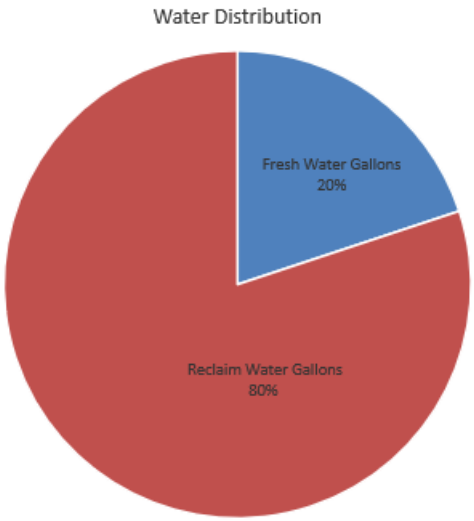


Fig. 4

Effluent Settling Capacity

The time created for solids and or oil to separate from the wash water is created through the combined volumes of water in storage before being allowed to overflow to the sanitary sewer. The combine volume in this application consists of 3,000 gallons of primary separation in the reclaim tanking, followed up by an additional 1,500 gallons of secondary storage found in the sand/oil separator. The combined volume of 4,500 gallons will create an estimated dwell time of 92 minutes in tank prior to overflow. See fig. 5 for details.

Effluent Water Settling Time		
MAIN TANKING	Settling Capacity Prior to Overflow to Sand/Oil (Gallons)	3000
	Total Flow Through Reclaim Tanking (GPM)	135.04
	Time in Tank Prior To Overflow to Sand/Oil (Minutes)	22.2
SAND/OIL SEPARATOR	Settling Capacity of Sand/Oil (Gallons)	1500
	Total Flow Through Sand/Oil Separator(GPM)	21.29
	Time in Sand Oil Separator prior to overflow to Sewer (Minutes)	70.45
	Combined Effluent Setting Time (Minutes)	92.67

Effluent Discharge	
Average Water Flow (GPM)	21.29
Average Per Day (Gallons)	9,125

Fig. 5

Safety Data Sheet

Issue Date: 27-April-2020 **Revision Date:** **Version** 1

1. IDENTIFICATION

Product identifier
Product Name Cerabond

Recommended use of the chemical and restrictions on use
Recommended Use For industrial use.

Details of the supplier of the safety data sheet
Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency telephone number
Company Phone Number 800-843-7627
Emergency Telephone INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Clear straw-colored liquid **Physical state** Liquid **Odor** No appreciable odor

Classification

Serious eye damage/eye irritation	Category 1
Specific target organ toxicity (single exposure)	Category 1

Signal Word
Danger

Hazard statements
Causes serious eye damage
Causes damage to organs



Precautionary Statements - Prevention
Wear protective gloves/protective clothing/eye protection/face protection
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product

Precautionary Statements - Response
IF exposed: Call a POISON CENTER or doctor/physician
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a poison center or doctor/physician

Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	CAS No	Weight-%
Glycol Ether EB	111-76-2	<10

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST AID MEASURES

Description of first aid measures

Eye Contact Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor/physician.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Wash skin thoroughly with mild soap and water. Wash contaminated clothing before reuse. If skin irritation persists, call a physician.

Inhalation Remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms develop and persist.

Ingestion Seek medical attention immediately. Wash out mouth with water. If conscious give 2 glasses of water to dilute. Stop if the person feels sick as vomiting may be dangerous. If spontaneous vomiting occurs, keep head below hips to prevent aspiration and monitor breathing. Never give anything by mouth to an unconscious person. Do NOT induce vomiting.

Most important symptoms and effects, both acute and delayed

Symptoms Causes mild skin irritation. Causes serious eye damage. Inhalation symptoms may include dizziness, headache, and nausea. Ingestion symptoms: causes damage to organs, optic nerve, and central nervous system. Irritating to mouth, throat, and stomach.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
Not determined.

Hazardous combustion products Carbon dioxide (CO2). Carbon monoxide. Nitrogen oxides (NOx). Hydrogen chloride. Silicon oxides.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Environmental precautions

Environmental precautions See Section 12 for additional Ecological Information.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Clean-Up Contain and collect with an inert absorbent and place into an appropriate container for disposal. Dispose of in accordance with federal, state and local regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practice. Wear protective gloves/protective clothing and eye/face protection. Do not breathe dust/fume/gas/mist/vapors/spray. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry and well-ventilated place. Store locked up.

Incompatible Materials Oxidizing agents. Reducing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Glycol Ether EB 111-76-2	TWA: 20 ppm	TWA: 50 ppm TWA: 240 mg/m^3 (vacated) TWA: 25 ppm (vacated) TWA: 120 mg/m^3 (vacated) S* S*	IDLH: 700 ppm TWA: 5 ppm TWA: 24 mg/m^3

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits.

Individual protection measures, such as personal protective equipment

Eye/Face Protection	Wear eye/face protection. Splash goggles or safety glasses. Refer to 29 CFR 1910.133 for eye and face protection regulations.
Skin and Body Protection	Wear protective gloves and protective clothing. Refer to 29 CFR 1910.138 for appropriate skin and body protection.
Respiratory Protection	Ensure adequate ventilation, especially in confined areas. Refer to 29 CFR 1910.134 for respiratory protection requirements.
General Hygiene Considerations	Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state	Liquid		
Appearance	Clear straw-colored liquid	**Odor**	No appreciable odor
Color	Straw	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	7.5-9.5	
Melting point / freezing point	Not determined	
Boiling point / boiling range	> 100 °C / 212 °F	
Flash point	Not determined	
Evaporation Rate	Not determined	
Flammability (Solid, Gas)	Liquid-Not applicable	
Flammability Limit in Air		
Upper flammability or explosive limits	Not determined	
Lower flammability or explosive limits	Not determined	
Vapor Pressure	Not determined	
Vapor Density	Not determined	
Relative Density	0.960-0.990	(Water=1)
Water Solubility	Not determined	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Autoignition temperature	Not determined	
Decomposition temperature	Not determined	
Kinematic viscosity	10-30 cst	
Dynamic Viscosity	Not determined	
Explosive Properties	Not determined	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
None under normal processing.

Hazardous Polymerization	Hazardous polymerization does not occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible materials
Oxidizing agents. Reducing agents.

Hazardous decomposition products
Carbon dioxide (CO2). Nitrogen oxides (NOx). Hydrogen chloride. Silicon oxides. Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Avoid contact with eyes. Causes serious eye damage.

Skin Contact Avoid contact with skin.

Inhalation Do not inhale.

Ingestion Do not ingest.

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Glycol Ether EB 111-76-2	= 470 mg/kg (Rat)	= 435 mg/kg (Rabbit)	= 486 ppm (Rat) 4 h = 450 ppm (Rat) 4 h
Proprietary ingredient 2	= 620 mg/kg (Rat) = 500 mg/kg (Rat)	> 10 g/kg (Rat)	-

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation May cause skin irritation.

Carcinogenicity Group 3 IARC components are "not classifiable as human carcinogens".

Chemical name	ACGIH	IARC	NTP	OSHA
Glycol Ether EB 111-76-2	A3	Group 3		

Legend
ACGIH (American Conference of Governmental Industrial Hygienists)
A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)
Group 3 IARC components are "not classifiable as human carcinogens"

STOT - single exposure Causes damage to organs. optic nerve. Central nervous system (CNS).

Numerical measures of toxicity

The following values are calculated based on chapter 3.1 of the GHS document .

Oral LD50	8,227.90 mg/kg
Dermal LD50	9,496.00 mg/kg
ATEmix (inhalation-dust/mist)	14.30 mg/L
ATEmix (inhalation-vapor)	22.45 mg/L

12. ECOLOGICAL INFORMATION

Ecotoxicity

The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Chemical name	Algae/aquatic plants	Fish	Crustacea
Glycol Ether EB 111-76-2		2950: 96 h Lepomis macrochirus mg/L LC50 1490: 96 h Lepomis macrochirus mg/L LC50 static	1000: 48 h Daphnia magna mg/L EC50 1698 - 1940: 24 h Daphnia magna mg/L EC50

Persistence/Degradability

Not determined.

Bioaccumulation

There is no data for this product.

Mobility

Chemical name	Partition coefficient
Glycol Ether EB 111-76-2	0.81

Other Adverse Effects

Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes	Disposal should be in accordance with applicable regional, national and local laws and regulations.
Contaminated Packaging	Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

IMDG Not regulated

15. REGULATORY INFORMATION

International Inventories

Chemical name	TSCA	TSCA Inventory Status	DSL/NDSL	EINECS/ELINCS	ENCS	IECSC	KECL	PICCS	AICS
Glycol Ether EB	X	ACTIVE	X	X	X	X	X	X	X
Proprietary Silicone Emulsion	X	ACTIVE	X	X	X	X	X	X	X
Proprietary ingredient 1	X	ACTIVE	X	X		X			X
Proprietary ingredient 2	X	ACTIVE	X	X		X	X	X	X
Polyoxyethylene 2-ethyl hexyl ether	X	ACTIVE	X			X		X	X

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

KECL *- Korean Existing and Evaluated Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

AICS *- Australian Inventory of Chemical Substances*

US Federal Regulations

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313

Chemical name	CAS No	Weight-%	SARA 313 - Threshold Values %
Glycol Ether EB - 111-76-2	111-76-2	<10	1.0

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Glycol Ether EB 111-76-2	X	X	X
Proprietary Silicone Emulsion			X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical hazards**	**Personal Protection**
	Not determined	Not determined	Not determined	Not determined

Issue Date: 27-April-2020
Revision Date:
Revision Note: New format

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Safety Data Sheet

Issue Date: 29-Aug-2019 **Revision Date:** 30-Aug-2019 **Version** 1

1. IDENTIFICATION

Product identifier
Product Name Ceramic X3 Drying Agent (Step 3)

Other means of identification
SDS #

Recommended use of the chemical and restrictions on use
Recommended Use For industrial use.

Details of the supplier of the safety data sheet
Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency telephone number
Company Phone Number 800-843-7627
Emergency Telephone INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Clear straw-colored liquid **Physical state** Liquid **Odor** No appreciable odor

Classification

Serious eye damage/eye irritation	Category 1
Specific target organ toxicity (single exposure)	Category 1

Signal Word
Danger

Hazard statements
Causes serious eye damage
Causes damage to organs



Precautionary Statements - Prevention
Wear protective gloves/protective clothing/eye protection/face protection
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product

Precautionary Statements - Response
IF exposed: Call a POISON CENTER or doctor/physician
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a poison center or doctor/physician

Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	CAS No	Weight-%
Glycol Ether EB	111-76-2	<10
Petroleum distillates, hydrotreated middle	64742-46-7	<5

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST AID MEASURES

Description of first aid measures

Eye Contact Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor/physician.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Wash skin thoroughly with mild soap and water. Wash contaminated clothing before reuse. If skin irritation persists, call a physician.

Inhalation Remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms develop and persist.

Ingestion Seek medical attention immediately. Wash out mouth with water. If conscious give 2 glasses of water to dilute. Stop if the person feels sick as vomiting may be dangerous. If spontaneous vomiting occurs, keep head below hips to prevent aspiration and monitor breathing. Never give anything by mouth to an unconscious person. Do NOT induce vomiting.

Most important symptoms and effects, both acute and delayed

Symptoms Causes mild skin irritation. Causes serious eye damage. Inhalation symptoms may include dizziness, headache, and nausea. Ingestion symptoms: causes damage to organs, optic nerve, and central nervous system. Irritating to mouth, throat, and stomach.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
Not determined.

Hazardous combustion products Carbon dioxide (CO2). Carbon monoxide. Nitrogen oxides (NOx). Hydrogen chloride. Silicon oxides.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Environmental precautions

Environmental precautions See Section 12 for additional Ecological Information.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Clean-Up Contain and collect with an inert absorbent and place into an appropriate container for disposal. Dispose of in accordance with federal, state and local regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practice. Wear protective gloves/protective clothing and eye/face protection. Do not breathe dust/fume/gas/mist/vapors/spray. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry and well-ventilated place. Store locked up.

Incompatible Materials Oxidizing agents. Reducing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Glycol Ether EB 111-76-2	TWA: 20 ppm	TWA: 50 ppm TWA: 240 mg/m^3 (vacated) TWA: 25 ppm (vacated) TWA: 120 mg/m^3 (vacated) S* S*	IDLH: 700 ppm TWA: 5 ppm TWA: 24 mg/m^3

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits.

Individual protection measures, such as personal protective equipment

Eye/Face Protection	Wear eye/face protection. Splash goggles or safety glasses. Refer to 29 CFR 1910.133 for eye and face protection regulations.
Skin and Body Protection	Wear protective gloves and protective clothing. Refer to 29 CFR 1910.138 for appropriate skin and body protection.
Respiratory Protection	Ensure adequate ventilation, especially in confined areas. Refer to 29 CFR 1910.134 for respiratory protection requirements.
General Hygiene Considerations	Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state	Liquid		
Appearance	Clear straw-colored liquid	**Odor**	No appreciable odor
Color	Straw	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	7.0-9.0	
Melting point / freezing point	Not determined	
Boiling point / boiling range	> 100 °C / 212 °F	
Flash point	Not determined	
Evaporation Rate	Not determined	
Flammability (Solid, Gas)	Liquid-Not applicable	
Flammability Limit in Air		
Upper flammability or explosive limits	Not determined	
Lower flammability or explosive limits	Not determined	
Vapor Pressure	Not determined	
Vapor Density	Not determined	
Relative Density	0.960-0.980	(Water=1)
Water Solubility	Not determined	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Autoignition temperature	Not determined	
Decomposition temperature	Not determined	
Kinematic viscosity	10-30 cst	
Dynamic Viscosity	Not determined	
Explosive Properties	Not determined	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible materials
Oxidizing agents. Reducing agents.

Hazardous decomposition products
Carbon dioxide (CO2). Nitrogen oxides (NOx). Hydrogen chloride. Silicon oxides. Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Avoid contact with eyes. Causes serious eye damage.

Skin Contact Avoid contact with skin.

Inhalation Do not inhale.

Ingestion Do not ingest.

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Glycol Ether EB 111-76-2	= 470 mg/kg (Rat)	= 435 mg/kg (Rabbit)	= 486 ppm (Rat) 4 h = 450 ppm (Rat) 4 h
Petroleum distillates, hydrotreated middle 64742-46-7	= 7400 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	= 4.6 mg/L (Rat) 4 h
Proprietary ingredient 2	= 620 mg/kg (Rat) = 500 mg/kg (Rat)	> 10 g/kg (Rat)	-

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation May cause skin irritation.

Carcinogenicity Group 3 IARC components are "not classifiable as human carcinogens".

Chemical name	ACGIH	IARC	NTP	OSHA
Glycol Ether EB 111-76-2	A3	Group 3		

Legend
ACGIH (American Conference of Governmental Industrial Hygienists)
A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)
Group 3 IARC components are "not classifiable as human carcinogens"

STOT - single exposure Causes damage to organs. optic nerve. Central nervous system (CNS).

Numerical measures of toxicity

The following values are calculated based on chapter 3.1 of the GHS document .

Oral LD50	8,227.90 mg/kg
Dermal LD50	9,496.00 mg/kg
ATEmix (inhalation-dust/mist)	14.30 mg/L
ATEmix (inhalation-vapor)	22.45 mg/L

12. ECOLOGICAL INFORMATION

Ecotoxicity

The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Chemical name	Algae/aquatic plants	Fish	Crustacea
Glycol Ether EB 111-76-2		2950: 96 h Lepomis macrochirus mg/L LC50 1490: 96 h Lepomis macrochirus mg/L LC50 static	1000: 48 h Daphnia magna mg/L EC50 1698 - 1940: 24 h Daphnia magna mg/L EC50
Petroleum distillates, hydrotreated middle 64742-46-7		10000: 96 h Pimephales promelas mg/L LC50 static 35: 96 h Pimephales promelas mg/L LC50 flow-through	

Persistence/Degradability

Not determined.

Bioaccumulation

There is no data for this product.

Mobility

Chemical name	Partition coefficient
Glycol Ether EB 111-76-2	0.81

Other Adverse Effects

Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

IMDG Not regulated

15. REGULATORY INFORMATION

International Inventories

Chemical name	TSCA	TSCA Inventory Status	DSL/NDSL	EINECS/ELINCS	ENCS	IECSC	KECL	PICCS	AICS
Glycol Ether EB	X	ACTIVE	X	X	X	X	X	X	X
Proprietary Silicone Emulsion	X	ACTIVE	X	X	X	X	X	X	X
Proprietary ingredient 1	X	ACTIVE	X	X		X			X
Petroleum distillates, hydrotreated middle	X	ACTIVE	X	X		X	X	X	X
Proprietary ingredient 2	X	ACTIVE	X	X		X	X	X	X
Polyoxyethylene 2-ethyl hexyl ether	X	ACTIVE	X			X		X	X

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

KECL *- Korean Existing and Evaluated Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

AICS *- Australian Inventory of Chemical Substances*

US Federal Regulations

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313

Chemical name	CAS No	Weight-%	SARA 313 - Threshold Values %
Glycol Ether EB - 111-76-2	111-76-2	<10	1.0

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Glycol Ether EB 111-76-2	X	X	X
Proprietary Silicone Emulsion			X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical hazards**	**Personal Protection**
	Not determined	Not determined	Not determined	Not determined

Issue Date: 29-Aug-2019
Revision Date: 30-Aug-2019
Revision Note: New

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Safety Data Sheet

Issue Date: 29-Aug-2019 **Revision Date:** 30-Aug-2019 **Version** 1

1. IDENTIFICATION

Product identifier
Product Name Ceramic X3 Protectant (Step 2)

Other means of identification
SDS #

Recommended use of the chemical and restrictions on use
Recommended Use For industrial use.

Details of the supplier of the safety data sheet
Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency telephone number
Company Phone Number 800-843-7627
Emergency Telephone INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Clear straw-colored liquid **Physical state** Liquid **Odor** No appreciable odor

Classification

Serious eye damage/eye irritation	Category 1
Specific target organ toxicity (single exposure)	Category 1

Signal Word
Danger

Hazard statements
Causes serious eye damage
Causes damage to organs



Precautionary Statements - Prevention
Wear protective gloves/protective clothing/eye protection/face protection
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product

Precautionary Statements - Response
IF exposed: Call a POISON CENTER or doctor/physician
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a poison center or doctor/physician

Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	CAS No	Weight-%
Glycol Ether EB	111-76-2	<10
Petroleum distillates, hydrotreated middle	64742-46-7	<5

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST AID MEASURES

Description of first aid measures

Eye Contact Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor/physician.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Wash skin thoroughly with mild soap and water. Wash contaminated clothing before reuse. If skin irritation persists, call a physician.

Inhalation Remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms develop and persist.

Ingestion Seek medical attention immediately. Wash out mouth with water. If conscious give 2 glasses of water to dilute. Stop if the person feels sick as vomiting may be dangerous. If spontaneous vomiting occurs, keep head below hips to prevent aspiration and monitor breathing. Never give anything by mouth to an unconscious person. Do NOT induce vomiting.

Most important symptoms and effects, both acute and delayed

Symptoms Causes mild skin irritation. Causes serious eye damage. Inhalation symptoms may include dizziness, headache, and nausea. Ingestion symptoms: causes damage to organs, optic nerve, and central nervous system. Irritating to mouth, throat, and stomach.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
Not determined.

Hazardous combustion products Carbon dioxide (CO2). Carbon monoxide. Nitrogen oxides (NOx). Hydrogen chloride. Silicon oxides.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Environmental precautions

Environmental precautions See Section 12 for additional Ecological Information.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Clean-Up Contain and collect with an inert absorbent and place into an appropriate container for disposal. Dispose of in accordance with federal, state and local regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practice. Wear protective gloves/protective clothing and eye/face protection. Do not breathe dust/fume/gas/mist/vapors/spray. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry and well-ventilated place. Store locked up.

Incompatible Materials Oxidizing agents. Reducing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Glycol Ether EB 111-76-2	TWA: 20 ppm	TWA: 50 ppm TWA: 240 mg/m^3 (vacated) TWA: 25 ppm (vacated) TWA: 120 mg/m^3 (vacated) S* S*	IDLH: 700 ppm TWA: 5 ppm TWA: 24 mg/m^3

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits.

Individual protection measures, such as personal protective equipment

Eye/Face Protection	Wear eye/face protection. Splash goggles or safety glasses. Refer to 29 CFR 1910.133 for eye and face protection regulations.
Skin and Body Protection	Wear protective gloves and protective clothing. Refer to 29 CFR 1910.138 for appropriate skin and body protection.
Respiratory Protection	Ensure adequate ventilation, especially in confined areas. Refer to 29 CFR 1910.134 for respiratory protection requirements.
General Hygiene Considerations	Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state	Liquid		
Appearance	Clear straw-colored liquid	**Odor**	No appreciable odor
Color	Straw	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	7.0-9.0	
Melting point / freezing point	Not determined	
Boiling point / boiling range	> 100 °C / 212 °F	
Flash point	Not determined	
Evaporation Rate	Not determined	
Flammability (Solid, Gas)	Liquid-Not applicable	
Flammability Limit in Air		
Upper flammability or explosive limits	Not determined	
Lower flammability or explosive limits	Not determined	
Vapor Pressure	Not determined	
Vapor Density	Not determined	
Relative Density	0.960-0.980	(Water=1)
Water Solubility	Not determined	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Autoignition temperature	Not determined	
Decomposition temperature	Not determined	
Kinematic viscosity	10-30 cst	
Dynamic Viscosity	Not determined	
Explosive Properties	Not determined	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible materials
Oxidizing agents. Reducing agents.

Hazardous decomposition products
Carbon dioxide (CO2). Nitrogen oxides (NOx). Hydrogen chloride. Silicon oxides. Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Avoid contact with eyes. Causes serious eye damage.

Skin Contact Avoid contact with skin.

Inhalation Do not inhale.

Ingestion Do not ingest.

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Glycol Ether EB 111-76-2	= 470 mg/kg (Rat)	= 435 mg/kg (Rabbit)	= 486 ppm (Rat) 4 h = 450 ppm (Rat) 4 h
Petroleum distillates, hydrotreated middle 64742-46-7	= 7400 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	= 4.6 mg/L (Rat) 4 h
Proprietary ingredient 2	= 620 mg/kg (Rat) = 500 mg/kg (Rat)	> 10 g/kg (Rat)	-

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation May cause skin irritation.

Carcinogenicity Group 3 IARC components are "not classifiable as human carcinogens".

Chemical name	ACGIH	IARC	NTP	OSHA
Glycol Ether EB 111-76-2	A3	Group 3		

Legend
ACGIH (American Conference of Governmental Industrial Hygienists)
A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)
Group 3 IARC components are "not classifiable as human carcinogens"

STOT - single exposure Causes damage to organs. optic nerve. Central nervous system (CNS).

Numerical measures of toxicity

The following values are calculated based on chapter 3.1 of the GHS document .

Oral LD50	8,227.90 mg/kg
Dermal LD50	9,496.00 mg/kg
ATEmix (inhalation-dust/mist)	14.30 mg/L
ATEmix (inhalation-vapor)	22.45 mg/L

12. ECOLOGICAL INFORMATION

Ecotoxicity

The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Chemical name	Algae/aquatic plants	Fish	Crustacea
Lauramine oxide 1643-20-5		134: 96 h Danio rerio mg/L LC50 semi-static	
Glycol Ether EB 111-76-2		2950: 96 h Lepomis macrochirus mg/L LC50 1490: 96 h Lepomis macrochirus mg/L LC50 static	1000: 48 h Daphnia magna mg/L EC50 1698 - 1940: 24 h Daphnia magna mg/L EC50
Petroleum distillates, hydrotreated middle 64742-46-7		10000: 96 h Pimephales promelas mg/L LC50 static 35: 96 h Pimephales promelas mg/L LC50 flow-through	

Persistence/Degradability

Not determined.

Bioaccumulation

There is no data for this product.

Mobility

Chemical name	Partition coefficient
Glycol Ether EB 111-76-2	0.81

Other Adverse Effects

Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

IMDG Not regulated

15. REGULATORY INFORMATION

International Inventories

Chemical name	TSCA	TSCA Inventory Status	DSL/NDSL	EINECS/ELINCS	ENCS	IECSC	KECL	PICCS	AICS
Lauramine oxide	X	ACTIVE	X	X	X	X	X	X	X
Glycol Ether EB	X	ACTIVE	X	X	X	X	X	X	X
Proprietary Silicone Emulsion	X	ACTIVE	X	X	X	X	X	X	X
Proprietary ingredient 1	X	ACTIVE	X	X		X			X
Petroleum distillates, hydrotreated middle	X	ACTIVE	X	X		X	X	X	X
Proprietary ingredient 2	X	ACTIVE	X	X		X	X	X	X
Polyoxyethylene 2-ethyl hexyl ether	X	ACTIVE	X			X		X	X

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

KECL *- Korean Existing and Evaluated Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

AICS *- Australian Inventory of Chemical Substances*

US Federal Regulations

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313

Chemical name	CAS No	Weight-%	SARA 313 - Threshold Values %
Glycol Ether EB - 111-76-2	111-76-2	<10	1.0

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Glycol Ether EB 111-76-2	X	X	X
Proprietary Silicone Emulsion			X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical hazards**	**Personal Protection**
	Not determined	Not determined	Not determined	Not determined

Issue Date: 29-Aug-2019
Revision Date: 30-Aug-2019
Revision Note: New

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Safety Data Sheet

Issue Date: 29-Aug-2019 **Revision Date:** 30-Aug-2019 **Version** 1

1. IDENTIFICATION

Product identifier

Product Name Ceramic X3 Wax (Step 1)

Other means of identification

SDS # DSI-119

Recommended use of the chemical and restrictions on use

Recommended Use For industrial use.

Details of the supplier of the safety data sheet

Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency telephone number

Company Phone Number 800-843-7627
Emergency Telephone INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Clear straw-colored liquid **Physical state** Liquid **Odor** No appreciable odor

Classification

Serious eye damage/eye irritation	Category 1
Specific target organ toxicity (single exposure)	Category 1

Signal Word
Danger

Hazard statements
Causes serious eye damage
Causes damage to organs



Precautionary Statements - Prevention
Wear protective gloves/protective clothing/eye protection/face protection
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product

Precautionary Statements - Response
IF exposed: Call a POISON CENTER or doctor/physician
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a poison center or doctor/physician

Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	CAS No	Weight-%
Glycol Ether EB	111-76-2	<10
Petroleum distillates, hydrotreated middle	64742-46-7	<5

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST AID MEASURES

Description of first aid measures

Eye Contact Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor/physician.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Wash skin thoroughly with mild soap and water. Wash contaminated clothing before reuse. If skin irritation persists, call a physician.

Inhalation Remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms develop and persist.

Ingestion Seek medical attention immediately. Wash out mouth with water. If conscious give 2 glasses of water to dilute. Stop if the person feels sick as vomiting may be dangerous. If spontaneous vomiting occurs, keep head below hips to prevent aspiration and monitor breathing. Never give anything by mouth to an unconscious person. Do NOT induce vomiting.

Most important symptoms and effects, both acute and delayed

Symptoms Causes mild skin irritation. Causes serious eye damage. Inhalation symptoms may include dizziness, headache, and nausea. Ingestion symptoms: causes damage to organs, optic nerve, and central nervous system. Irritating to mouth, throat, and stomach.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
Not determined.

Hazardous combustion products Carbon dioxide (CO2). Carbon monoxide. Nitrogen oxides (NOx). Hydrogen chloride. Silicon oxides.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Environmental precautions

Environmental precautions See Section 12 for additional Ecological Information.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Clean-Up Contain and collect with an inert absorbent and place into an appropriate container for disposal. Dispose of in accordance with federal, state and local regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practice. Wear protective gloves/protective clothing and eye/face protection. Do not breathe dust/fume/gas/mist/vapors/spray. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry and well-ventilated place. Store locked up.

Incompatible Materials Oxidizing agents. Reducing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Glycol Ether EB 111-76-2	TWA: 20 ppm	TWA: 50 ppm TWA: 240 mg/m^3 (vacated) TWA: 25 ppm (vacated) TWA: 120 mg/m^3 (vacated) S* S*	IDLH: 700 ppm TWA: 5 ppm TWA: 24 mg/m^3

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits.

Individual protection measures, such as personal protective equipment

Eye/Face Protection	Wear eye/face protection. Splash goggles or safety glasses. Refer to 29 CFR 1910.133 for eye and face protection regulations.
Skin and Body Protection	Wear protective gloves and protective clothing. Refer to 29 CFR 1910.138 for appropriate skin and body protection.
Respiratory Protection	Ensure adequate ventilation, especially in confined areas. Refer to 29 CFR 1910.134 for respiratory protection requirements.
General Hygiene Considerations	Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state	Liquid		
Appearance	Clear straw-colored liquid	**Odor**	No appreciable odor
Color	Straw	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	7.0-9.0	
Melting point / freezing point	Not determined	
Boiling point / boiling range	> 100 °C / 212 °F	
Flash point	Not determined	
Evaporation Rate	Not determined	
Flammability (Solid, Gas)	Liquid-Not applicable	
Flammability Limit in Air		
Upper flammability or explosive limits	Not determined	
Lower flammability or explosive limits	Not determined	
Vapor Pressure	Not determined	
Vapor Density	Not determined	
Relative Density	0.960-0.980	(Water=1)
Water Solubility	Not determined	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Autoignition temperature	Not determined	
Decomposition temperature	Not determined	
Kinematic viscosity	10-30 cst	
Dynamic Viscosity	Not determined	
Explosive Properties	Not determined	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible materials
Oxidizing agents. Reducing agents.

Hazardous decomposition products
Carbon dioxide (CO2). Nitrogen oxides (NOx). Hydrogen chloride. Silicon oxides. Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Avoid contact with eyes. Causes serious eye damage.

Skin Contact Avoid contact with skin.

Inhalation Do not inhale.

Ingestion Do not ingest.

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Glycol Ether EB 111-76-2	= 470 mg/kg (Rat)	= 435 mg/kg (Rabbit)	= 486 ppm (Rat) 4 h = 450 ppm (Rat) 4 h
Petroleum distillates, hydrotreated middle 64742-46-7	= 7400 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	= 4.6 mg/L (Rat) 4 h
Proprietary ingredient 2	= 620 mg/kg (Rat) = 500 mg/kg (Rat)	> 10 g/kg (Rat)	-

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation May cause skin irritation.

Carcinogenicity Group 3 IARC components are "not classifiable as human carcinogens".

Chemical name	ACGIH	IARC	NTP	OSHA
Glycol Ether EB 111-76-2	A3	Group 3		

Legend
ACGIH (American Conference of Governmental Industrial Hygienists)
A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)
Group 3 IARC components are "not classifiable as human carcinogens"

STOT - single exposure Causes damage to organs. optic nerve. Central nervous system (CNS).

Numerical measures of toxicity

The following values are calculated based on chapter 3.1 of the GHS document .

Oral LD50	8,227.90 mg/kg
Dermal LD50	9,496.00 mg/kg
ATEmix (inhalation-dust/mist)	14.30 mg/L
ATEmix (inhalation-vapor)	22.45 mg/L

12. ECOLOGICAL INFORMATION

Ecotoxicity

The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Chemical name	Algae/aquatic plants	Fish	Crustacea
Lauramine oxide 1643-20-5		134: 96 h Danio rerio mg/L LC50 semi-static	
Glycol Ether EB 111-76-2		2950: 96 h Lepomis macrochirus mg/L LC50 1490: 96 h Lepomis macrochirus mg/L LC50 static	1000: 48 h Daphnia magna mg/L EC50 1698 - 1940: 24 h Daphnia magna mg/L EC50
Petroleum distillates, hydrotreated middle 64742-46-7		10000: 96 h Pimephales promelas mg/L LC50 static 35: 96 h Pimephales promelas mg/L LC50 flow-through	

Persistence/Degradability

Not determined.

Bioaccumulation

There is no data for this product.

Mobility

Chemical name	Partition coefficient
Glycol Ether EB 111-76-2	0.81

Other Adverse Effects

Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

IMDG Not regulated

15. REGULATORY INFORMATION

International Inventories

Chemical name	TSCA	TSCA Inventory Status	DSL/NDSL	EINECS/ELINCS	ENCS	IECSC	KECL	PICCS	AICS
Lauramine oxide	X	ACTIVE	X	X	X	X	X	X	X
Glycol Ether EB	X	ACTIVE	X	X	X	X	X	X	X
Proprietary Silicone Emulsion	X	ACTIVE	X	X	X	X	X	X	X
Proprietary ingredient 1	X	ACTIVE	X	X		X			X
Petroleum distillates, hydrotreated middle	X	ACTIVE	X	X		X	X	X	X
Proprietary ingredient 2	X	ACTIVE	X	X		X	X	X	X
Polyoxyethylene 2-ethyl hexyl ether	X	ACTIVE	X			X		X	X

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

KECL *- Korean Existing and Evaluated Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

AICS *- Australian Inventory of Chemical Substances*

US Federal Regulations

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313

Chemical name	CAS No	Weight-%	SARA 313 - Threshold Values %
Glycol Ether EB - 111-76-2	111-76-2	<10	1.0

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Glycol Ether EB 111-76-2	X	X	X
Proprietary Silicone Emulsion			X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical hazards**	**Personal Protection**
	Not determined	Not determined	Not determined	Not determined

Issue Date: 29-Aug-2019
Revision Date: 30-Aug-2019
Revision Note: New

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Safety Data Sheet

Issue Date: 06-Sep-2017 **Revision Date:** 17-Feb-2020 **Version** 5

1. IDENTIFICATION

Product Identifier

Product Name FUSION BATH – BLUE & GREEN & PURPLE & RED & YELLOW

Other means of identification

Product Code FUSION BATH BLUE 62115, BE615
FUSION BATH GREEN 62315, BE665
FUSION BATH PURPLE 62415, BE655
FUSION BATH RED 62015, BE625
FUSION BATH YELLOW 62215, BE645

UN/ID No UN1760

Recommended use of the chemical and restrictions on use

Recommended Use Automotive care.

Details of the supplier of the safety data sheet

Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number

Company Phone Number 800-843-7627
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Blue, Green, Purple, Red or Yellow liquid **Physical State** Liquid

Classification

Skin corrosion/irritation	Category 1 Sub-category B
Serious eye damage/eye irritation	Category 1

Hazards Not Otherwise Classified (HNOC)
May be harmful if swallowed

Signal Word
Danger

Hazard Statements
Causes severe skin burns and eye damage



Precautionary Statements - Prevention
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response

Immediately call a poison center or doctor/physician
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a poison center or doctor/physician
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Immediately call a poison center or doctor/physician
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
Rinse mouth
Do not induce vomiting

Precautionary Statements - Storage

Store locked up

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

Other Hazards

Harmful to aquatic life with long lasting effects

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Dodecyl benzene sulfonic acid	27176-87-0	10-25
Phosphoric Acid	7664-38-2	5-15
Ethylene Glycol Monobutyl Ether	111-76-2	<6

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact — Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor/physician.

Skin Contact — IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If skin irritation persists, call a physician.

Inhalation — IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor/physician. Artificial respiration and/or oxygen may be necessary.

Ingestion — IF SWALLOWED: call a poison control center or physician immediately. If conscious give 2 glasses of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting.

Most important symptoms and effects

Symptoms Causes severe skin burns and eye damage. Headache. Dizziness. Nausea.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
Material is corrosive. The product is not expected to present any fire or explosion hazards under prescribed use conditions.

Hazardous Combustion Products Phosphorus oxides.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. See Section 13: DISPOSAL CONSIDERATIONS.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so. Contain spilled material if possible. Absorb with materials such as: Dirt. Sand. Sawdust.

Methods for Clean-Up Transfer liquid and solid material into suitable containers in accordance with local, state and federal regulations for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practice. Use personal protection recommended in Section 8. Avoid contact with skin, eyes or clothing. Do not breathe dust/fume/gas/mist/vapors/spray. Wash face, hands, and any exposed skin thoroughly after handling. Follow all product label instructions. Use only as directed.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry and well-ventilated place. Store locked up. Store away from heat and incompatible materials.

Incompatible Materials Store away from oxidizing agents/reducing agents. Sulfides. sulfites.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Phosphoric Acid 7664-38-2	STEL: 3 mg/m^3 TWA: 1 mg/m^3	TWA: 1 mg/m^3 (vacated) TWA: 1 mg/m^3 (vacated) STEL: 3 mg/m^3	IDLH: 1000 mg/m^3 TWA: 1 mg/m^3 STEL: 3 mg/m^3
Ethylene Glycol Monobutyl Ether 111-76-2	TWA: 20 ppm	TWA: 50 ppm TWA: 240 mg/m^3 (vacated) TWA: 25 ppm (vacated) TWA: 120 mg/m^3 (vacated) S* S*	IDLH: 700 ppm TWA: 5 ppm TWA: 24 mg/m^3

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits. Eyewash stations. Showers.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Chemical anti-splash safety goggles.

Skin and Body Protection Protective gloves. Wear suitable protective clothing to prevent contact with skin.

Respiratory Protection Ensure adequate ventilation, especially in confined areas. In case of inadequate ventilation wear respiratory protection.

General Hygiene Considerations Wash contaminated clothing before reuse. Wash face, hands and any exposed skin thoroughly after handling. Protective clothing and equipment should be in accordance with 29 CFR 1910.132 and 1910.133.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Blue, Green, Purple, Red or Yellow	**Odor**	Not determined
Color	Blue, Green, Purple, Red or Yellow	**Odor Threshold**	Not determined

Property	Values	Remarks • Method
pH	0.50-1.50	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	> 100 °C / > 212 °F	
Flash Point	Not applicable	
Evaporation Rate	Not available	
Flammability (Solid, Gas)	Liquid-not applicable	
Upper Flammability Limits	Not applicable	
Lower Flammability Limit	Not applicable	
Vapor Pressure	Not available	
Vapor Density	Not available	
Specific Gravity	1.036-1.042	@ 25 °C (77 °F) (1=Water)
Water Solubility	Completely soluble	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	Not determined	
Dynamic Viscosity	40-100 cSt	
Explosive Properties	Not an explosive	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Not expected to occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible Materials
Store away from oxidizing agents/reducing agents. Sulfides. sulfites.

Hazardous Decomposition Products
Phosphorous oxides.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Causes severe eye damage.

Skin Contact Causes severe skin burns.

Inhalation Avoid breathing vapors or mists.

Ingestion May be harmful if swallowed.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Water 7732-18-5	> 90 mL/kg (Rat)	-	-
Dodecyl benzene sulfonic acid 27176-87-0	= 500 mg/kg (Rat)	-	-
Phosphoric Acid 7664-38-2	= 1530 mg/kg (Rat)	= 2730 mg/kg (Rabbit)	> 850 mg/m^3 (Rat) 1 h
Ethylene Glycol Monobutyl Ether 111-76-2	= 470 mg/kg (Rat)	= 2270 mg/kg (Rat) = 220 mg/kg (Rabbit)	= 2.21 mg/L (Rat) 4 h = 450 ppm (Rat) 4 h

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen. However, the product as a whole has not been tested. Group 3 IARC components are "not classifiable as human carcinogens".

Chemical Name	ACGIH	IARC	NTP	OSHA
Ethylene Glycol Monobutyl Ether 111-76-2	A3	Group 3		

ACGIH (American Conference of Governmental Industrial Hygienists)
A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)
Group 3 IARC components are "not classifiable as human carcinogens"

Numerical measures of toxicity
Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity
Harmful to aquatic life with long lasting effects.

Component Information

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Dodecyl benzene sulfonic acid 27176-87-0	29: 96 h Pseudokirchneriella subcapitata mg/L EC50	10.8: 96 h Oncorhynchus mykiss mg/L LC50 static 3.5 - 10: 96 h Brachydanio rerio mg/L LC50 static		5.88: 48 h Daphnia magna mg/L EC50
Ethylene Glycol Monobutyl Ether 111-76-2		1490: 96 h Lepomis macrochirus mg/L LC50 static 2950: 96 h Lepomis macrochirus mg/L LC50		1698 - 1940: 24 h Daphnia magna mg/L EC50 1000: 48 h Daphnia magna mg/L EC50

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility

Chemical Name	Partition Coefficient
Ethylene Glycol Monobutyl Ether 111-76-2	0.81

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

California Hazardous Waste Status

Chemical Name	California Hazardous Waste Status
Phosphoric Acid 7664-38-2	Corrosive

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances. Based on package size, product may be eligible for limited quantity exception.

DOT

UN/ID No	UN1760
Proper Shipping Name	Corrosive liquid, n.o.s. (Phosphoric acid, Dodecylbenzene sulfonic acid)
Hazard Class	8
Packing Group	II

IATA

UN/ID No	UN1760
Proper Shipping Name	Corrosive liquid, n.o.s. (Phosphoric acid, Dodecylbenzene sulfonic acid)
Hazard Class	8
Packing Group	II

IMDG

UN/ID No	UN1760
Proper Shipping Name	Corrosive liquid, n.o.s. (Phosphoric acid, Dodecylbenzene sulfonic acid)
Hazard Class	8
Packing Group	II
Marine Pollutant	This material may meet the definition of a marine pollutant

15. REGULATORY INFORMATION

International Inventories

TSCA	Listed

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

KECL *- Korean Existing and Evaluated Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

US Federal Regulations

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Dodecyl benzene sulfonic acid 27176-87-0	1000 lb		RQ 1000 lb final RQ RQ 454 kg final RQ
Phosphoric Acid 7664-38-2	5000 lb		RQ 5000 lb final RQ RQ 2270 kg final RQ

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	CAS No	Weight-%	SARA 313 - Threshold Values %
Ethylene Glycol Monobutyl Ether - 111-76-2	111-76-2	<5	1.0

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Component	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Dodecyl benzene sulfonic acid 27176-87-0 (15-25)	1000 lb			X
Phosphoric Acid 7664-38-2 (5-15)	5000 lb			X

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Dodecyl benzene sulfonic acid 27176-87-0	X	X	X
Phosphoric Acid 7664-38-2	X	X	X
Ethylene Glycol Monobutyl Ether 111-76-2	X	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	2	0	0	Not determined

Issue Date: 06-Sep-2017
Revision Date: 17-Feb-2020
Revision Note: Addition of Green & Purple

Disclaimer

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End of Safety Data Sheet

Safety Data Sheet

Issue Date: 24-Jan-2014 **Revision Date:** 20-Feb-2019 **Version** 4

1. IDENTIFICATION

Product Identifier

Product Name FUSION PRIME
LO pH BOOST

Other means of identification

SDS # DSI-011

Product Code 24015, BE935
UN/ID No UN3264

Recommended use of the chemical and restrictions on use

Recommended Use Automotive care.

Details of the supplier of the safety data sheet

Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number

Company Phone Number 800-843-7627
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Blue liquid **Physical State** Liquid

Classification

Acute toxicity - Inhalation (Dusts/Mists)	Category 4
Skin corrosion/irritation	Category 1 Sub-category B
Serious eye damage/eye irritation	Category 1

Signal Word
Danger

Hazard Statements
Harmful if inhaled
Causes severe skin burns and eye damage



Precautionary Statements - Prevention
Use only outdoors or in a well-ventilated area
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response
Immediately call a poison center or doctor/physician
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a poison center or doctor/physician
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Immediately call a poison center or doctor/physician
IF SWALLOWED: rinse mouth. Do NOT induce vomiting
Immediately call a poison center or doctor/physician

Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Phosphoric Acid	7664-38-2	20-30
Sulfuric Acid	7664-93-9	<10

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor/physician.

Skin Contact IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If skin irritation persists, call a physician.

Inhalation IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor/physician. Artificial respiration and/or oxygen may be necessary.

Ingestion IF SWALLOWED: call a poison control center or physician immediately. If conscious give 2 glasses of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting.

Most important symptoms and effects

Symptoms Causes severe skin burns and eye damage. Headache. Dizziness. Nausea.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
Material is corrosive. The product is not expected to present any fire or explosion hazards under prescribed use conditions.

Hazardous Combustion Products Phosphorus oxides.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions	Use personal protective equipment as required.
Environmental Precautions	Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. See Section 13: DISPOSAL CONSIDERATIONS.

Methods and material for containment and cleaning up

Methods for Containment	Prevent further leakage or spillage if safe to do so. Contain spilled material if possible. Absorb with materials such as: Dirt. Sand. Sawdust.
Methods for Clean-Up	Transfer liquid and solid material into suitable containers in accordance with local, state and federal regulations for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling	Handle in accordance with good industrial hygiene and safety practice. Use personal protection recommended in Section 8. Avoid contact with skin, eyes or clothing. Do not breathe dust/fume/gas/mist/vapors/spray. Wash face, hands, and any exposed skin thoroughly after handling. Follow all product label instructions. Use only as directed. Use only outdoors or in a well-ventilated area.

Conditions for safe storage, including any incompatibilities

Storage Conditions	Keep container tightly closed and store in a cool, dry and well-ventilated place. Store locked up. Store away from heat and incompatible materials.
Incompatible Materials	Sulfides. sulfites. Oxidizing agents. Reducing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Phosphoric Acid 7664-38-2	STEL: 3 mg/m^3 TWA: 1 mg/m^3	TWA: 1 mg/m^3 (vacated) TWA: 1 mg/m^3 (vacated) STEL: 3 mg/m^3	IDLH: 1000 mg/m^3 TWA: 1 mg/m^3 STEL: 3 mg/m^3
Sulfuric Acid 7664-93-9	TWA: 0.2 mg/m^3 thoracic fraction	TWA: 1 mg/m^3 (vacated) TWA: 1 mg/m^3	IDLH: 15 mg/m^3 TWA: 1 mg/m^3

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits. Eyewash stations. Showers.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Chemical anti-splash safety goggles.

Skin and Body Protection Protective gloves. Wear suitable protective clothing to prevent contact with skin.

Respiratory Protection Ensure adequate ventilation, especially in confined areas. In case of inadequate ventilation wear respiratory protection.

General Hygiene Considerations Wash contaminated clothing before reuse. Wash face, hands and any exposed skin thoroughly after handling. Protective clothing and equipment should be in accordance with 29 CFR 1910.132 and 1910.133.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Blue liquid	**Odor**	Not determined
Color	Blue	**Odor Threshold**	Not determined

Property	Values	Remarks • Method
pH	0.10-1.00	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	> 100 °C / > 212 °F	
Flash Point	Not applicable	
Evaporation Rate	Not available	
Flammability (Solid, Gas)	Liquid-not applicable	
Upper Flammability Limits	Not applicable	
Lower Flammability Limit	Not applicable	
Vapor Pressure	Not available	
Vapor Density	Not available	
Specific Gravity	1.200	@ 25 °C (77 °F) (1=Water)
Water Solubility	Completely soluble	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	Not determined	
Dynamic Viscosity	Not determined	
Explosive Properties	Not an explosive	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Not expected to occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible Materials
Sulfides. sulfites. Oxidizing agents. Reducing agents.

Hazardous Decomposition Products
Phosphorous oxides.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Causes severe eye damage.

Skin Contact Causes severe skin burns.

Inhalation Harmful if inhaled.

Ingestion Do not taste or swallow.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Water 7732-18-5	> 90 mL/kg (Rat)	-	-
Phosphoric Acid 7664-38-2	= 1530 mg/kg (Rat)	= 2730 mg/kg (Rabbit)	> 850 mg/m^3 (Rat) 1 h
Sulfuric Acid 7664-93-9	= 2140 mg/kg (Rat)	-	= 510 mg/m^3 (Rat) 2 h

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen. However, the product as a whole has not been tested. Note: The agencies below have listed Strong Inorganic Acid Mists, Containing Sulfuric Acid as a known carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
Sulfuric Acid 7664-93-9	A2	Group 1	Known	X

ACGIH (American Conference of Governmental Industrial Hygienists)
A2 - Suspected Human Carcinogen
IARC (International Agency for Research on Cancer)
Group 1 - Carcinogenic to Humans
NTP (National Toxicology Program)
Known - Known Carcinogen
OSHA (Occupational Safety and Health Administration of the US Department of Labor)
X - Present

Numerical measures of toxicity
Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity
The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Sulfuric Acid 7664-93-9		500: 96 h Brachydanio rerio mg/L LC50 static		29: 24 h Daphnia magna mg/L EC50

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility
Not determined

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

California Hazardous Waste Status

Chemical Name	California Hazardous Waste Status
Phosphoric Acid 7664-38-2	Corrosive
Sulfuric Acid 7664-93-9	Toxic Corrosive

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances. Based on package size, product may be eligible for limited quantity exception.

DOT

UN/ID No	UN3264
Proper Shipping Name	Corrosive liquid, acidic, inorganic, n.o.s. (phosphoric acid, sulfuric acid)
Hazard Class	8
Packing Group	II

IATA

UN/ID No	UN3264
Proper Shipping Name	Corrosive liquid, acidic, inorganic, n.o.s. (phosphoric acid, sulfuric acid)
Hazard Class	8
Packing Group	II

IMDG

UN/ID No	UN3264
Proper Shipping Name	Corrosive liquid, acidic, inorganic, n.o.s. (phosphoric acid, sulfuric acid)
Hazard Class	8
Packing Group	II

15. REGULATORY INFORMATION

International Inventories

TSCA	Listed

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

KECL *- Korean Existing and Evaluated Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

US Federal Regulations

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Phosphoric Acid 7664-38-2	5000 lb		RQ 5000 lb final RQ RQ 2270 kg final RQ
Sulfuric Acid 7664-93-9	1000 lb	1000 lb	RQ 1000 lb final RQ RQ 454 kg final RQ

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	CAS No	Weight-%	SARA 313 - Threshold Values %
Sulfuric Acid - 7664-93-9	7664-93-9	<10	1.0

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Component	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Phosphoric Acid 7664-38-2 (20-30)	5000 lb			X
Sulfuric Acid 7664-93-9 (<10)	1000 lb			X

US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals.

Chemical Name	California Proposition 65
Sulfuric Acid - 7664-93-9	Carcinogen

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Phosphoric Acid 7664-38-2	X	X	X
Sulfuric Acid 7664-93-9	X	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	2	0	0	Not determined

Issue Date: 24-Jan-2014
Revision Date: 20-Feb-2019
Revision Note: Name change to Fusion Prime

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Safety Data Sheet

Issue Date: 06-Feb-2017 **Revision Date:** 20-Feb-2019 **Version** 2

1. IDENTIFICATION

Product Identifier

Product Name Fusion Seal Blue, Fusion Seal Red, Fusion Seal White
Sealtech Blue, Sealtech Red, Sealtech White

Other means of identification

SDS #

Product Code Fusion Seal Blue: BE455
Fusion Seal Red: BE465
Fusion Seal White: BE495

Recommended use of the chemical and restrictions on use

Recommended Use Automotive care.

Details of the supplier of the safety data sheet

Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number

Company Phone Number 800-843-7627
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance	Physical State	Odor
Fusion Seal Blue-Blue colored liquid	Fusion Seal Blue-Liquid	Fusion Seal Blue-None
Fusion Seal Red-Red colored liquid	Fusion Seal Red-Liquid	Fusion Seal Red-None
Fusion Seal White-Straw colored liquid	Fusion Seal White-Liquid	Fusion Seal White-Lemon

Classification

Acute toxicity - Inhalation (Vapors)	Category 4

Hazards Not Otherwise Classified (HNOC)

Causes mild skin irritation

Signal Word

Warning

Hazard Statements

Harmful if inhaled



Precautionary Statements - Prevention
Avoid breathing dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Petroleum distillates, hydrotreated middle	64742-46-7	< 10
Ethylene Glycol Monobutyl Ether	111-76-2	< 15

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

General Advice Provide this SDS to medical personnel for treatment.

Eye Contact Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes.

Inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing.

Ingestion Clean mouth with water and drink afterwards plenty of water.

Most important symptoms and effects

Symptoms Harmful if inhaled.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
Not determined.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Environmental Precautions See Section 12 for additional Ecological Information.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Clean-Up Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Avoid breathing dust/fume/gas/mist/vapors/spray. Use only outdoors or in a well-ventilated area.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry and well-ventilated place. Store locked up.

Incompatible Materials None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Ethylene Glycol Monobutyl Ether 111-76-2	TWA: 20 ppm	TWA: 50 ppm TWA: 240 mg/m^3 (vacated) TWA: 25 ppm (vacated) TWA: 120 mg/m^3 (vacated) S* S*	IDLH: 700 ppm TWA: 5 ppm TWA: 24 mg/m^3

Appropriate engineering controls

Engineering Controls Showers
Eyewash stations
Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Avoid contact with eyes.

Skin and Body Protection Wear suitable protective clothing.

Respiratory Protection Ensure adequate ventilation, especially in confined areas.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Fusion Seal Blue-Blue liquid Fusion Seal Red-Red liquid Fusion Seal White-White liquid	**Odor**	Fusion Seal Blue-None Fusion Seal Red-None Fusion Seal White-Lemon
Color	Not determined	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	7.0-9.0	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	Not determined	
Flash Point	Not determined	
Evaporation Rate	Not determined	
Flammability (Solid, Gas)	Not determined	
Upper Flammability Limits	Not determined	
Lower Flammability Limit	Not determined	
Vapor Pressure	Not determined	
Vapor Density	Not determined	
Specific Gravity	0.970-0.990	@25 Deg. C (77 Deg. F) (1=Water)
Water Solubility	Not determined	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	20-40 cSt	@25 Deg. C (77 Deg. F)
Dynamic Viscosity	Not determined	
Explosive Properties	Not determined	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Conditions to Avoid
Keep out of reach of children.

Incompatible Materials
None known based on information supplied.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Avoid contact with eyes.

Skin Contact Causes mild skin irritation.

Inhalation Harmful if inhaled.

Ingestion Do not ingest.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Petroleum distillates, hydrotreated middle 64742-46-7	= 7400 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	= 4.6 mg/L (Rat) 4 h
Ethylene Glycol Monobutyl Ether 111-76-2	= 470 mg/kg (Rat)	= 2270 mg/kg (Rat) = 220 mg/kg (Rabbit)	= 2.21 mg/L (Rat) 4 h = 450 ppm (Rat) 4 h

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity Group 3 IARC components are "not classifiable as human carcinogens".

Chemical Name	ACGIH	IARC	NTP	OSHA
Ethylene Glycol Monobutyl Ether 111-76-2	A3	Group 3		

Legend
ACGIH (American Conference of Governmental Industrial Hygienists)
A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)
Group 3 IARC components are "not classifiable as human carcinogens"
OSHA (Occupational Safety and Health Administration of the US Department of Labor)
X - Present

Numerical measures of toxicity
Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity
The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Petroleum distillates, hydrotreated middle 64742-46-7		35: 96 h Pimephales promelas mg/L LC50 flow-through 10000: 96 h Pimephales promelas mg/L LC50 static		
Ethylene Glycol Monobutyl Ether 111-76-2		1490: 96 h Lepomis macrochirus mg/L LC50 static 2950: 96 h Lepomis macrochirus mg/L LC50		1698 - 1940: 24 h Daphnia magna mg/L EC50 1000: 48 h Daphnia magna mg/L EC50

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility

Chemical Name	Partition Coefficient
Ethylene Glycol Monobutyl Ether 111-76-2	0.81

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

California Hazardous Waste Status

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

IMDG Not regulated

15. REGULATORY INFORMATION

International Inventories

Chemical Name	TSCA	DSL	NDSL	EINECS	ELINCS	ENCS	IECSC	KECL	PICCS	AICS
Petroleum distillates, hydrotreated middle	Present	X		Present		Present	X	Present	X	X
Ethylene Glycol Monobutyl Ether	Present	X		Present		Present	X	Present	X	X

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

KECL *- Korean Existing and Evaluated Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

AICS *- Australian Inventory of Chemical Substances*

US Federal Regulations

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	CAS No	Weight-%	SARA 313 - Threshold Values %
Ethylene Glycol Monobutyl Ether - 111-76-2	111-76-2	<15	1.0

CWA (Clean Water Act)
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Ethylene Glycol Monobutyl Ether 111-76-2	X	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	Not determined	Not determined	Not determined	Not determined

Issue Date: 06-Feb-2017
Revision Date: 20-Feb-2019
Revision Note: Name change to Fusion Seal

Disclaimer
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End of Safety Data Sheet

Safety Data Sheet

Issue Date: 20-Mar-2018 **Revision Date:** **Version** 1

1. IDENTIFICATION

Product Identifier
Product Name Fusion Wax

Other means of identification
SDS #

Product Code BE265

Recommended use of the chemical and restrictions on use
Recommended Use Automotive care.

Details of the supplier of the safety data sheet
Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number
Company Phone Number 800-843-7627
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Straw colored liquid **Physical State** Liquid **Odor** No Appreciable Odor

Classification

Hazards Not Otherwise Classified (HNOC)
Causes mild skin irritation

Unknown Acute Toxicity **1%** of the mixture consists of ingredient(s) of unknown toxicity

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Ethylene Glycol Monobutyl Ether	111-76-2	1-10

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Seek immediate medical attention/advice.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Wash skin thoroughly with mild soap and water. If skin irritation persists, call a physician.

Inhalation Remove to fresh air. If not breathing, give artificial respiration.

Ingestion Seek medical attention immediately. If conscious give 2 glasses of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting.

Most important symptoms and effects

Symptoms Inhalation symptoms may include dizziness and headache. Nausea. May cause skin and eye irritation.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
None known.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Environmental Precautions Discharge into the environment must be avoided.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Clean-Up Contain and collect with an inert absorbent and place into an appropriate container for disposal. Dispose of in accordance with federal, state and local regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practice. Use in accordance with product label instructions.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Do not store at high temperatures. Store away from incompatible materials.

Incompatible Materials Oxidizing agents. Reducing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Ethylene Glycol Monobutyl Ether 111-76-2	TWA: 20 ppm	TWA: 50 ppm TWA: 240 mg/m^3 (vacated) TWA: 25 ppm (vacated) TWA: 120 mg/m^3 (vacated) S* S*	IDLH: 700 ppm TWA: 5 ppm TWA: 24 mg/m^3

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Splash goggles or safety glasses.

Skin and Body Protection Wear protective gloves. Wear protective clothing to minimize skin contact.

Respiratory Protection Ensure adequate ventilation, especially in confined areas.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Straw colored liquid	**Odor**	No Appreciable Odor
Color	Straw	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	7.50 – 9.50	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	> 100 °C / >212 °F	
Flash Point	Not available	
Evaporation Rate	Not available	
Flammability (Solid, Gas)	n/a-liquid	
Upper Flammability Limits	Not available	
Lower Flammability Limit	Not available	
Vapor Pressure	Not available	
Vapor Density	Not available	
Specific Gravity	0.960 – 0.980	(1=Water)
Water Solubility	Completely soluble	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	20 – 40 cst	
Dynamic Viscosity	Not determined	
Explosive Properties	Not determined	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible Materials
Oxidizing agents. Reducing agents.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Avoid contact with eyes.

Skin Contact Causes mild skin irritation.

Inhalation Avoid breathing vapors or mists.

Ingestion Do not taste or swallow.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Ethylene Glycol Monobutyl Ether 111-76-2	= 470 mg/kg (Rat)	= 2270 mg/kg (Rat) = 220 mg/kg (Rabbit)	= 2.21 mg/L (Rat) 4 h = 450 ppm (Rat) 4 h

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity Not classifiable as a human carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
Ethylene Glycol Monobutyl Ether 111-76-2	A3	Group 3		

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)
A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)
Group 3 IARC components are "not classifiable as human carcinogens"

Numerical measures of toxicity
Not determined

Unknown Acute Toxicity

1% of the mixture consists of ingredient(s) of unknown toxicity.

12. ECOLOGICAL INFORMATION

Ecotoxicity
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Ethylene Glycol Monobutyl Ether 111-76-2		1490: 96 h Lepomis macrochirus mg/L LC50 static 2950: 96 h Lepomis macrochirus mg/L LC50		1698 - 1940: 24 h Daphnia magna mg/L EC50 1000: 48 h Daphnia magna mg/L EC50

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility

Chemical Name	Partition Coefficient
Ethylene Glycol Monobutyl Ether 111-76-2	0.81

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

DOT Not regulated

IATA Not regulated

IMDG Not regulated

15. REGULATORY INFORMATION

International Inventories

TSCA Listed

Legend:
TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

US Federal Regulations

SARA 313

Chemical Name	CAS No	Weight-%	SARA 313 - Threshold Values %
Ethylene Glycol Monobutyl Ether - 111-76-2	111-76-2	1-10	1.0

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Ethylene Glycol Monobutyl Ether 111-76-2	X	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	1	0	0	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	1	0	0	Not determined

Issue Date: 20-Mar-2018
Revision Date:
Revision Note: New

Disclaimer

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End of Safety Data Sheet

Safety Data Sheet

Issue Date: 22-Dec-2014 **Revision Date:** 21-Aug-2017 **Version** 2

1. IDENTIFICATION

Product Identifier

Product Name Glass Concentrate

Other means of identification

SDS # DSI-110

Product Code 4402, 4405, 44015, 44030, 44055, 4402NF, 4405NF, 44015NF, 44030NF, 44055NF

Synonyms Glass Clean Concentrate, Glass Clean Concentrate NF.

Recommended use of the chemical and restrictions on use

Recommended Use Glass cleaner.

Details of the supplier of the safety data sheet

Supplier Address

Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number

Company Phone Number 800-843-7627

Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance According to product specification **Physical State** Liquid **Odor** Various

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. COMPOSITION/INFORMATION ON INGREDIENTS

The product contains no substances which, at their given concentration, are considered to be hazardous to health.

4. FIRST-AID MEASURES

First Aid Measures

General Advice Provide this SDS to medical personnel for treatment.

Eye Contact Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes.

Inhalation Remove to fresh air.

Ingestion Clean mouth with water and drink afterwards plenty of water.

Most important symptoms and effects

Symptoms None known.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
Not determined.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Clean-Up Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place.

Incompatible Materials None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines This product, as supplied, is not known to contain any materials with established occupational exposure limits.

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Avoid contact with eyes.

Skin and Body Protection Wear suitable protective clothing.

Respiratory Protection Ensure adequate ventilation, especially in confined areas.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	According to product specification	**Odor**	Various
Color	According to product specification	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	8-10	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	Not determined	
Flash Point	Not determined	
Evaporation Rate	Not determined	
Flammability (Solid, Gas)	Not determined	
Upper Flammability Limits	Not determined	
Lower Flammability Limit	Not determined	
Vapor Pressure	Not determined	
Vapor Density	Not determined	
Specific Gravity	.97	
Water Solubility	Not determined	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	Not determined	
Dynamic Viscosity	5 cSt	
Explosive Properties	Not determined	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Conditions to Avoid
Keep out of reach of children.

Incompatible Materials
None known based on information supplied.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact	Avoid contact with eyes.
Skin Contact	Avoid contact with skin.
Inhalation	Do not inhale.
Ingestion	Do not ingest.

Component Information

Information on physical, chemical and toxicological effects

Symptoms	Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity	Based on the information provided, this product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

Numerical measures of toxicity
Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity
The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility
Not determined

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes	Disposal should be in accordance with applicable regional, national and local laws and regulations.
Contaminated Packaging	Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

IMDG Not regulated

15. REGULATORY INFORMATION

International Inventories

All ingredients are listed or exempt from listing on Chemical Substance Inventory

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

KECL *- Korean Existing and Evaluated Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

AICS *- Australian Inventory of Chemical Substances*

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

This product does not contain any substances regulated under applicable state right-to-know regulations

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	Not determined	Not determined	Not determined	Not determined

Issue Date: 22-Dec-2014
Revision Date: 21-Aug-2017
Revision Note: Information in Section 15

Disclaimer

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End of Safety Data Sheet

Safety Data Sheet

Issue Date: 11-Apr-2022 **Revision Date:** 21-Oct-2022 **Version** 2

1. IDENTIFICATION

Product Identifier
Product Name Graphene Xtreme

Other means of identification
SDS #

Product Code 30010868, 30010869, 30010870

Recommended use of the chemical and restrictions on use
Recommended Use Automotive care.

Details of the supplier of the safety data sheet
Supplier Address
Sonny's Car Wash Chemistry
9050 Tyler Blvd.
Mentor, OH 44060

Emergency Telephone Number
Company Phone Number 800-843-7627
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Black liquid **Physical State** Liquid **Odor** No Appreciable Odor

Classification

Hazards Not Otherwise Classified (HNOC)
Causes mild skin irritation

Unknown Acute Toxicity **1%** of the mixture consists of ingredient(s) of unknown toxicity

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Ethylene Glycol Monobutyl Ether	111-76-2	1-10

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Seek immediate medical attention/advice.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Wash skin thoroughly with mild soap and water. If skin irritation persists, call a physician.

Inhalation Remove to fresh air. If not breathing, give artificial respiration.

Ingestion Seek medical attention immediately. If conscious give 2 glasses of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting.

Most important symptoms and effects

Symptoms Inhalation symptoms may include dizziness and headache. Nausea. May cause skin and eye irritation.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
None known.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Environmental Precautions Discharge into the environment must be avoided.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Clean-Up Contain and collect with an inert absorbent and place into an appropriate container for disposal. Dispose of in accordance with federal, state and local regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practice. Use in accordance with product label instructions.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Do not store at high temperatures. Store away from incompatible materials.

Incompatible Materials Oxidizing agents. Reducing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Ethylene Glycol Monobutyl Ether 111-76-2	TWA: 20 ppm	TWA: 50 ppm TWA: 240 mg/m^3 (vacated) TWA: 25 ppm (vacated) TWA: 120 mg/m^3 (vacated) S* S*	IDLH: 700 ppm TWA: 5 ppm TWA: 24 mg/m^3

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Splash goggles or safety glasses.

Skin and Body Protection Wear protective gloves. Wear protective clothing to minimize skin contact.

Respiratory Protection Ensure adequate ventilation, especially in confined areas.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Black liquid	**Odor**	No Appreciable Odor
Color	Black	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	7.50 – 9.50	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	> 100 °C / >212 °F	
Flash Point	Not available	
Evaporation Rate	Not available	
Flammability (Solid, Gas)	n/a-liquid	
Upper Flammability Limits	Not available	
Lower Flammability Limit	Not available	
Vapor Pressure	Not available	
Vapor Density	Not available	
Specific Gravity	0.960 – 0.980	(1=Water)
Water Solubility	Completely soluble	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	20 – 40 cst	
Dynamic Viscosity	Not determined	
Explosive Properties	Not determined	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible Materials
Oxidizing agents. Reducing agents.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Avoid contact with eyes.

Skin Contact Causes mild skin irritation.

Inhalation Avoid breathing vapors or mists.

Ingestion Do not taste or swallow.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Ethylene Glycol Monobutyl Ether 111-76-2	= 470 mg/kg (Rat)	= 2270 mg/kg (Rat) = 220 mg/kg (Rabbit)	= 2.21 mg/L (Rat) 4 h = 450 ppm (Rat) 4 h

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity Not classifiable as a human carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
Ethylene Glycol Monobutyl Ether 111-76-2	A3	Group 3		

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)
A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)
Group 3 IARC components are "not classifiable as human carcinogens"

Numerical measures of toxicity
Not determined

Unknown Acute Toxicity

1% of the mixture consists of ingredient(s) of unknown toxicity.

12. ECOLOGICAL INFORMATION

Ecotoxicity
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Ethylene Glycol Monobutyl Ether 111-76-2		1490: 96 h Lepomis macrochirus mg/L LC50 static 2950: 96 h Lepomis macrochirus mg/L LC50		1698 - 1940: 24 h Daphnia magna mg/L EC50 1000: 48 h Daphnia magna mg/L EC50

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility

Chemical Name	Partition Coefficient
Ethylene Glycol Monobutyl Ether 111-76-2	0.81

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

DOT Not regulated

IATA Not regulated

IMDG Not regulated

15. REGULATORY INFORMATION

International Inventories

TSCA Listed

Legend:
TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

US Federal Regulations

SARA 313

Chemical Name	CAS No	Weight-%	SARA 313 - Threshold Values %
Ethylene Glycol Monobutyl Ether - 111-76-2	111-76-2	1-10	1.0

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Ethylene Glycol Monobutyl Ether 111-76-2	X	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	1	0	0	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	1	0	0	Not determined

Issue Date: 11-Apr-2022
Revision Date: 21-Oct-2022
Revision Note: Information in Section 1

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End of Safety Data Sheet

Safety Data Sheet

Issue Date: 08-Aug-2014 **Revision Date:** 25-Aug-2014 **Version** 1

1. IDENTIFICATION

Product Identifier

Product Name HI Suds

Other means of identification

SDS # DSI-100

Product Code 3052, 3055, 30515, 30530, 30555

Recommended use of the chemical and restrictions on use

Recommended Use Automotive care.

Details of the supplier of the safety data sheet

Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number

Company Phone Number 800-843-7627
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Orange liquid **Physical State** Liquid **Odor** No appreciable odor

Classification

Skin sensitization	Category 1

Hazards Not Otherwise Classified (HNOC)
Causes mild skin irritation

Signal Word
Warning

Hazard Statements
May cause an allergic skin reaction



Precautionary Statements - Prevention
Avoid breathing dust/fume/gas/mist/vapors/spray
Contaminated work clothing should not be allowed out of the workplace
Wear protective gloves

Precautionary Statements - Response

IF ON SKIN: Wash with plenty of soap and water
Wash contaminated clothing before reuse
If skin irritation or rash occurs: Get medical advice/attention

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Unknown Acute Toxicity
20% of the mixture consists of ingredient(s) of unknown toxicity

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
2-Butoxyethanol	111-76-2	1-10
Hexahydro-1,3,5-tris(2-hydroxyethyl)-S-triazine	4719-04-4	>0.1

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash affected areas thoroughly with soap and water for at least 15 minutes. If skin irritation or rash occurs: Get medical advice/attention.

Inhalation IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Artificial respiration and/or oxygen may be necessary. Get medical attention if necessary.

Ingestion IF SWALLOWED: call a poison control center or physician immediately. If conscious give 2 glasses of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting.

Most important symptoms and effects

Symptoms May cause eye, skin and respiratory tract irritation. Nausea. The product contains a small amount of sensitizing substance which may provoke an allergic reaction among sensitive individuals in contact with skin.

Indication of any immediate medical attention and special treatment needed

Notes to Physician May be irritating to skin in some sensitive individuals, especially after prolonged and/or repeated contact.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
The product is not expected to present any fire or explosion hazards under prescribed use conditions.

Hazardous Combustion Products Not determined.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. See Section 13: DISPOSAL CONSIDERATIONS. See Section 12 for additional Ecological Information.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so. Soak up and contain spill with an absorbent material.

Methods for Clean-Up Transfer liquid and solid material into suitable containers in accordance with local, state and federal regulations for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practice. Use personal protection recommended in Section 8. Avoid contact with skin, eyes or clothing. Follow all product label instructions. Use only as directed. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when handling this product. Contaminated work clothing should not be allowed out of the workplace. Avoid breathing vapors or mists.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry and well-ventilated place.

Incompatible Materials None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
2-Butoxyethanol 111-76-2	TWA: 20 ppm	TWA: 50 ppm TWA: 240 mg/m^3 (vacated) TWA: 25 ppm (vacated) TWA: 120 mg/m^3 (vacated) S* S*	IDLH: 700 ppm TWA: 5 ppm TWA: 24 mg/m^3

Appropriate engineering controls

Engineering Controls Eyewash stations. Showers. Ensure adequate ventilation, especially in confined areas.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Goggles are recommended.

Skin and Body Protection Wear suitable protective clothing to prevent contact with skin.

Respiratory Protection Ensure adequate ventilation, especially in confined areas. In case of inadequate ventilation wear respiratory protection.

General Hygiene Considerations Wash contaminated clothing before reuse. Wash face, hands and any exposed skin thoroughly after handling. Protective clothing and equipment should be in accordance with 29 CFR 1910.132 and 1910.133.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Orange liquid	**Odor**	No appreciable odor
Color	Orange	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	7.0-10.0	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	> 100 °C / > 212 °F	
Flash Point	Not applicable	
Evaporation Rate	Not available	
Flammability (Solid, Gas)	Liquid-not applicable	
Upper Flammability Limits	Not applicable	
Lower Flammability Limit	Not applicable	
Vapor Pressure	Not available	
Vapor Density	Not available	
Specific Gravity	1.035	(1=Water)
Water Solubility	Completely soluble	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	Not determined	
Dynamic Viscosity	100 cSt	
Explosive Properties	Not determined	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible Materials
None known based on information supplied.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact May cause temporary irritation on eye contact.

Skin Contact Causes mild skin irritation. May cause an allergic skin reaction.

Inhalation Avoid breathing vapors or mists.

Ingestion Do not taste or swallow.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
2-Butoxyethanol 111-76-2	= 470 mg/kg (Rat)	= 2270 mg/kg (Rat) = 220 mg/kg (Rabbit)	= 2.21 mg/L (Rat) 4 h = 450 ppm (Rat) 4 h
Hexahydro-1,3,5-tris(2-hydroxyethyl)-S-triazine 4719-04-4	= 763 mg/kg (Rat)	> 2 g/kg (Rat)	-

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization May cause an allergic skin reaction.

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen. However, the product as a whole has not been tested.

Chemical Name	ACGIH	IARC	NTP	OSHA
2-Butoxyethanol 111-76-2	A3	Group 3		

ACGIH (American Conference of Governmental Industrial Hygienists)
A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)
Group 3 IARC components are "not classifiable as human carcinogens"

Numerical measures of toxicity
Not determined

Unknown Acute Toxicity 20% of the mixture consists of ingredient(s) of unknown toxicity.

12. ECOLOGICAL INFORMATION

Ecotoxicity
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Component Information

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
2-Butoxyethanol 111-76-2		1490: 96 h Lepomis macrochirus mg/L LC50 static 2950: 96 h Lepomis macrochirus mg/L LC50		1698 - 1940: 24 h Daphnia magna mg/L EC50 1000: 48 h Daphnia magna mg/L EC50
Hexahydro-1,3,5-tris(2-hydroxyethyl)-S-triazine 4719-04-4			EC50 = 28.9 mg/L 15 min	

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility

Chemical Name	Partition Coefficient
2-Butoxyethanol 111-76-2	0.81

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

IMDG Not regulated

15. REGULATORY INFORMATION

International Inventories

TSCA Listed

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

KECL *- Korean Existing and Evaluated Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

***AICS** - Australian Inventory of Chemical Substances*

US Federal Regulations

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313

Chemical Name	CAS No	Weight-%	SARA 313 - Threshold Values %
2-Butoxyethanol - 111-76-2	111-76-2	1-10	1.0

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
2-Butoxyethanol 111-76-2	X	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	1	0	0	Not determined

Issue Date: 08-Aug-2014
Revision Date: 25-Aug-2014
Revision Note: New format

Disclaimer

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End of Safety Data Sheet

Safety Data Sheet

Issue Date: 13-Dec-2012 **Revision Date:** 15-Sep-2017 **Version** 2

1. IDENTIFICATION

Product Identifier
Product Name Hydro Flow

Other means of identification
SDS # DSI-059

Product Code 6905, 69055

Recommended use of the chemical and restrictions on use
Recommended Use Hydraulic fluid.

Details of the supplier of the safety data sheet
Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number
Company Phone Number 800-843-7627
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Red liquid **Physical State** Liquid **Odor** Amine-like

Classification

Acute toxicity - Oral	Category 4
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1
Specific target organ toxicity (repeated exposure)	Category 2

Signal Word
Danger

Hazard Statements
Harmful if swallowed
Causes skin irritation
Causes serious eye damage
May cause damage to organs through prolonged or repeated exposure



Precautionary Statements - Prevention

Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Wear protective gloves/protective clothing/eye protection/face protection
Do not breathe dust/fume/gas/mist/vapors/spray

Precautionary Statements - Response

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a poison center or doctor/physician
IF ON SKIN: Wash with plenty of soap and water
If skin irritation occurs: Get medical advice/attention
Take off contaminated clothing and wash it before reuse
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
Rinse mouth

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Diethylene glycol	111-46-6	30-60
2-(Dimethylamino) ethanol	108-01-0	1-5

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Seek immediate medical attention/advice.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Wash skin thoroughly with mild soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. Get medical attention if irritation occurs.

Inhalation Remove to fresh air. If not breathing, give artificial respiration. Call a physician if you feel unwell.

Ingestion Seek medical attention immediately. If conscious give 2 glasses of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting.

Most important symptoms and effects

Symptoms May cause skin and eye irritation. Inhalation symptoms may include dizziness and headache. Nausea.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
None known.

Hazardous Combustion Products Carbon oxides.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions	Use personal protective equipment as required.
Environmental Precautions	Discharge into the environment must be avoided.

Methods and material for containment and cleaning up

Methods for Containment	Prevent further leakage or spillage if safe to do so.
Methods for Clean-Up	Contain and collect with an inert absorbent and place into an appropriate container for disposal. Dispose of in accordance with federal, state and local regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling	Use only in well-ventilated areas. Use in accordance with product label instructions. Handle in accordance with good industrial hygiene and safety practice. Use personal protection recommended in Section 8. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Do not breathe dust/fume/gas/mist/vapors/spray.

Conditions for safe storage, including any incompatibilities

Storage Conditions	Keep containers tightly closed in a dry, cool and well-ventilated place. Do not store at high temperatures. Store away from incompatible materials.
Incompatible Materials	Strong oxidizing agents. Strong acids. Strong bases.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines No exposure limits noted for ingredient(s)

Appropriate engineering controls

Engineering Controls Ensure adequate ventilation, especially in confined areas.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Splash goggles or safety glasses.

Skin and Body Protection Wear protective gloves. Wear protective clothing to minimize skin contact.

Respiratory Protection Ensure adequate ventilation, especially in confined areas.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Red liquid	**Odor**	Amine-like
Color	Red	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	9.5	
Melting Point/Freezing Point	< -40 °C / <-40 °F	
Boiling Point/Boiling Range	Foams	
Flash Point	149 °C / 300 °F	Pensky-Martens Closed Cup (PMCC)
Evaporation Rate	Not available	
Flammability (Solid, Gas)	n/a-liquid	
Upper Flammability Limits	Not determined	
Lower Flammability Limit	Not determined	
Vapor Pressure	<0.01 mm Hg	@ 20°C (68°F)
Vapor Density	>1.0	
Specific Gravity	1.0874	(1=Water)
Water Solubility	Completely soluble	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	260 °C / 500 °F	
Decomposition Temperature	Not determined	
Kinematic Viscosity	Not determined	
Dynamic Viscosity	35 cSt	
Explosive Properties	Not determined	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to Avoid
Avoid high temperatures.

Incompatible Materials
Strong oxidizing agents. Strong acids. Strong bases.

Hazardous Decomposition Products
Carbon oxides.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Causes serious eye damage.

Skin Contact Causes skin irritation.

Inhalation Avoid breathing vapors or mists.

Ingestion Harmful if swallowed.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Diethylene glycol 111-46-6	= 12565 mg/kg (Rat)	= 11890 mg/kg (Rabbit)	-
2-(Dimethylamino) ethanol 108-01-0	= 1803 mg/kg (Rat)	= 1370 µL/kg (Rabbit)	= 6.1 mg/L (Rat) 4 h = 1641 ppm (Rat) 4 h

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

STOT - repeated exposure May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard May be fatal if swallowed and enters airways.

Numerical measures of toxicity
Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Diethylene glycol 111-46-6		75200: 96 h Pimephales promelas mg/L LC50 flow-through	EC50 = 29228 mg/L 15 min	84000: 48 h Daphnia magna mg/L EC50
2-(Dimethylamino) ethanol 108-01-0	35: 72 h Desmodesmus subspicatus mg/L EC50	81: 96 h Pimephales promelas mg/L LC50 static		98.77: 48 h Daphnia magna mg/L EC50

Persistence/Degradability

Not determined.

Bioaccumulation

Not determined.

Mobility

Chemical Name	Partition Coefficient
Diethylene glycol 111-46-6	-1.98
2-(Dimethylamino) ethanol 108-01-0	-0.55

Other Adverse Effects

Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

DOT Not regulated

IATA Not regulated

IMDG Not regulated

15. REGULATORY INFORMATION

International Inventories

TSCA	Listed

Legend:
TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

US Federal Regulations

SARA 313
Not determined

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Diethylene glycol 111-46-6			X
2-(Dimethylamino) ethanol 108-01-0	X	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	1	0	0	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	1	0	0	Not determined

Issue Date: 13-Dec-2012
Revision Date: 15-Sep-2017
Revision Note: Information in Section 15

Disclaimer
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End of Safety Data Sheet

Safety Data Sheet

Issue Date: 26-July-2019 **Revision Date:** 25-Nov-2020 **Version** 2

1. IDENTIFICATION

Product Identifier

Product Name INFUSIONS FRESH

Other means of identification

Product Code 1495, 14915

Recommended use of the chemical and restrictions on use

Recommended Use Fragrance for automotive care products.

Details of the supplier of the safety data sheet

Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number

Company Phone Number 800-843-7627
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Clear to straw colored liquid **Physical State** Liquid **Odor** Characteristic

Classification

Skin sensitization	Category 1

Signal Word
Warning

Hazard Statements
May cause an allergic skin reaction



Precautionary Statements - Prevention
Avoid breathing dust/fume/gas/mist/vapors/spray
Contaminated work clothing should not be allowed out of the workplace
Wear protective gloves

Precautionary Statements - Response

IF ON SKIN: Wash with plenty of soap and water
If skin irritation or rash occurs: Get medical advice/attention
Wash contaminated clothing before reuse

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Hexahydro-1,3,5-tris(2-hydroxyethyl)-S-triazine	4719-04-4	<1

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Skin Contact IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical advice/attention.

Inhalation IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Artificial respiration and/or oxygen may be necessary. Call a physician or poison control center immediately.

Ingestion IF SWALLOWED: call a poison control center or physician immediately. If conscious give 2 glasses of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting.

Most important symptoms and effects

Symptoms Headache. Dizziness. Nausea. Direct contact may cause skin or eye irritation.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
The product is not expected to present any fire or explosion hazards under prescribed use conditions.

Hazardous Combustion Products None known.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions	Use personal protective equipment as required.
Environmental Precautions	Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. See Section 13: DISPOSAL CONSIDERATIONS.

Methods and material for containment and cleaning up

Methods for Containment	Prevent further leakage or spillage if safe to do so. Contain spilled material if possible. Absorb with materials such as: Dirt. Sand. Sawdust.
Methods for Clean-Up	Transfer liquid and solid material into suitable containers in accordance with local, state and federal regulations for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling	Handle in accordance with good industrial hygiene and safety practice. Use personal protection recommended in Section 8. Avoid contact with skin, eyes or clothing. Do not breathe dust/fume/gas/mist/vapors/spray. Follow all product label instructions. Use only as directed. Contaminated work clothing should not be allowed out of the workplace.

Conditions for safe storage, including any incompatibilities

Storage Conditions	Keep container tightly closed and store in a cool, dry and well-ventilated place. Store locked up. Store away from heat and incompatible materials.
Incompatible Materials	None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines	This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies

Appropriate engineering controls

Engineering Controls	Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual protection measures, such as personal protective equipment

Eye/Face Protection	Chemical anti-splash safety goggles.
Skin and Body Protection	Protective gloves. Wear suitable protective clothing to prevent contact with skin.

Respiratory Protection Ensure adequate ventilation, especially in confined areas. In case of inadequate ventilation wear respiratory protection.

General Hygiene Considerations Wash contaminated clothing before reuse. Contaminated work clothing should not be allowed out of the workplace. Protective clothing and equipment should be in accordance with 29 CFR 1910.132 and 1910.133.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Clear to straw colored liquid	**Odor**	Characteristic
Color	Clear to straw	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	9.0-11.0	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	> 100 °C / > 212 °F	
Flash Point	Not applicable	
Evaporation Rate	Not available	
Flammability (Solid, Gas)	Liquid-not applicable	
Upper Flammability Limits	Not applicable	
Lower Flammability Limit	Not applicable	
Vapor Pressure	Not available	
Vapor Density	Not available	
Specific Gravity	1.017	@ 25 °C (77 °F) (1=Water)
Water Solubility	Completely soluble	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	Not determined	
Dynamic Viscosity	Not determined	
Explosive Properties	Not an explosive	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible Materials
None known based on information supplied.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Avoid contact with eyes.

Skin Contact May cause an allergic skin reaction.

Inhalation Avoid breathing vapors or mists.

Ingestion Do not taste or swallow.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Water 7732-18-5	> 90 mL/kg (Rat)	-	-
Hexahydro-1,3,5-tris(2-hydroxyethyl)-S-triazine 4719-04-4	= 763 mg/kg (Rat)	> 2 g/kg (Rat)	-

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization May cause an allergic skin reaction.

Carcinogenicity This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

Numerical measures of toxicity
Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity
The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Hexahydro-1,3,5-tris(2-hydroxyethyl)-S-triazine 4719-04-4			EC50 = 28.9 mg/L 15 min	

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility
Not determined

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

IMDG Not regulated

15. REGULATORY INFORMATION

International Inventories

TSCA Listed

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

KECL *- Korean Existing and Evaluated Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains DEP which is subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals.

Chemical Name	California Proposition 65
Ethylene Oxide (< 1ppm) 75-21-8 1,4-Dioxane (< 10ppm) 123-91-1	Cancer – Birth Defects Reproductive Harm

U.S. State Right-to-Know Regulations

This product does not contain any substances regulated under applicable state right-to-know regulations

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	0	0	0	Not determined

Issue Date: 26-July-2019
Revision Date: 25-Nov-2020
Revision Note: Information in Section 15

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End of Safety Data Sheet

Safety Data Sheet

Issue Date: 24-Jan-2014 **Revision Date:** 16-Dec-2020 **Version** 4

1. IDENTIFICATION

Product Identifier
Product Name LIME OFF

Other means of identification
SDS # DSI-010

Product Code 31115, 31135
UN/ID No UN3264

Recommended use of the chemical and restrictions on use
Recommended Use Automotive care.

Details of the supplier of the safety data sheet
Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number
Company Phone Number 800-843-7627
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Blue liquid **Physical State** Liquid

Classification

Skin corrosion/irritation	Category 1 Sub-category B
Serious eye damage/eye irritation	Category 1

Hazards Not Otherwise Classified (HNOC)
May be harmful if swallowed

Signal Word
Danger

Hazard Statements
Causes severe skin burns and eye damage



Precautionary Statements - Prevention
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response
Immediately call a poison center or doctor/physician
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a poison center or doctor/physician
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Immediately call a poison center or doctor/physician
IF SWALLOWED: rinse mouth. Do NOT induce vomiting
Immediately call a poison center or doctor/physician

Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Phosphoric Acid	7664-38-2	30-40

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor/physician.

Skin Contact IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If skin irritation persists, call a physician.

Inhalation IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor/physician. Artificial respiration and/or oxygen may be necessary.

Ingestion IF SWALLOWED: call a poison control center or physician immediately. If conscious give 2 glasses of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting.

Most important symptoms and effects

Symptoms Causes severe skin burns and eye damage. Headache. Dizziness. Nausea.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
Material is corrosive. The product is not expected to present any fire or explosion hazards under prescribed use conditions.

Hazardous Combustion Products Phosphorus oxides.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. See Section 13: DISPOSAL CONSIDERATIONS.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so. Contain spilled material if possible. Absorb with materials such as: Dirt. Sand. Sawdust.

Methods for Clean-Up Transfer liquid and solid material into suitable containers in accordance with local, state and federal regulations for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practice. Use personal protection recommended in Section 8. Avoid contact with skin, eyes or clothing. Do not breathe dust/fume/gas/mist/vapors/spray. Wash face, hands, and any exposed skin thoroughly after handling. Follow all product label instructions. Use only as directed.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry and well-ventilated place. Store locked up. Store away from heat and incompatible materials.

Incompatible Materials Strong bases. Soft metals. Oxidizing agents. Reducing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Phosphoric Acid 7664-38-2	STEL: 3 mg/m^3 TWA: 1 mg/m^3	TWA: 1 mg/m^3 (vacated) TWA: 1 mg/m^3 (vacated) STEL: 3 mg/m^3	IDLH: 1000 mg/m^3 TWA: 1 mg/m^3 STEL: 3 mg/m^3

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits. Eyewash stations. Showers.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Chemical anti-splash safety goggles.

Skin and Body Protection Protective gloves. Wear suitable protective clothing to prevent contact with skin.

Respiratory Protection Ensure adequate ventilation, especially in confined areas. In case of inadequate ventilation wear respiratory protection.

General Hygiene Considerations Wash contaminated clothing before reuse. Wash face, hands and any exposed skin thoroughly after handling. Protective clothing and equipment should be in accordance with 29 CFR 1910.132 and 1910.133.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Blue liquid	**Odor**	Not determined
Color	Blue	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	0.50-1.50	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	> 100 °C / > 212 °F	
Flash Point	Not applicable	
Evaporation Rate	Not available	
Flammability (Solid, Gas)	Liquid-not applicable	
Upper Flammability Limits	Not applicable	
Lower Flammability Limit	Not applicable	
Vapor Pressure	Not available	
Vapor Density	Not available	
Specific Gravity	1.230	@ 25 °C (77 °F) (1=Water)
Water Solubility	Completely soluble	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	Not determined	
Dynamic Viscosity	Not determined	
Explosive Properties	Not an explosive	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Not expected to occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible Materials
Strong bases. Soft metals. Oxidizing agents. Reducing agents.

Hazardous Decomposition Products
Phosphorous oxides.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Causes severe eye damage.

Skin Contact Causes severe skin burns.

Inhalation Avoid breathing vapors or mists.

Ingestion May be harmful if swallowed.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Water 7732-18-5	> 90 mL/kg (Rat)	-	-
Phosphoric Acid 7664-38-2	= 1530 mg/kg (Rat)	= 2730 mg/kg (Rabbit)	> 850 mg/m^3 (Rat) 1 h
Alcohol Ethoxylate 68439-46-3	= 1378 mg/kg (Rat)	> 2 g/kg (Rabbit)	-

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

Numerical measures of toxicity
Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity
The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility
Not determined

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

California Hazardous Waste Status

Chemical Name	California Hazardous Waste Status
Phosphoric Acid 7664-38-2	Corrosive

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances. Based on package size, product may be eligible for limited quantity exception.

DOT

UN/ID No	UN3264
Proper Shipping Name	Corrosive liquid, acidic, inorganic, n.o.s. (Phosphoric acid)
Hazard Class	8
Packing Group	II

IATA

UN/ID No	UN3264
Proper Shipping Name	Corrosive liquid, acidic, inorganic, n.o.s. (Phosphoric acid)
Hazard Class	8
Packing Group	II

IMDG

UN/ID No	UN3264
Proper Shipping Name	Corrosive liquid, acidic, inorganic, n.o.s. (Phosphoric acid)
Hazard Class	8
Packing Group	II

15. REGULATORY INFORMATION

International Inventories

TSCA Listed

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

KECL *- Korean Existing and Evaluated Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

US Federal Regulations

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Phosphoric Acid 7664-38-2	5000 lb		RQ 5000 lb final RQ RQ 2270 kg final RQ

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Component	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Phosphoric Acid 7664-38-2 (30-40)	5000 lb			X

US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals.

Chemical Name	California Proposition 65
Ethylene Oxide (< 1ppm) 75-21-8 1,4-Dioxane (< 10ppm) 123-91-1	Cancer – Birth Defects Reproductive Harm

.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Phosphoric Acid 7664-38-2	X	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	2	0	0	Not determined

Issue Date: 24-Jan-2014
Revision Date: 16-Dec-2020
Revision Note: Information in Section 15

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Safety Data Sheet

Issue Date: 28-Jul-2020 **Revision Date:** **Version** 1

1. IDENTIFICATION

Product Identifier
Product Name LO pHOAM

Other means of identification
SDS #
Product Code 35515, BE965
UN/ID No UN1760

Recommended use of the chemical and restrictions on use
Recommended Use Automotive care.

Details of the supplier of the safety data sheet
Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number
Company Phone Number 800-843-7627
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Red liquid **Physical State** Liquid

Classification

Skin corrosion/irritation	Category 1 Sub-category B
Serious eye damage/eye irritation	Category 1

Hazards Not Otherwise Classified (HNOC)
May be harmful if swallowed

Signal Word
Danger

Hazard Statements
Causes severe skin burns and eye damage



Precautionary Statements - Prevention
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response
Immediately call a poison center or doctor/physician
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a poison center or doctor/physician
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Immediately call a poison center or doctor/physician
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
Rinse mouth
Do not induce vomiting

Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Other Hazards
Harmful to aquatic life with long lasting effects

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Dodecyl benzene sulfonic acid	27176-87-0	15-25
Phosphoric Acid	7664-38-2	5-15
Ethylene Glycol Monobutyl Ether	111-76-2	<5

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor/physician.

Skin Contact IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If skin irritation persists, call a physician.

Inhalation IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor/physician. Artificial respiration and/or oxygen may be necessary.

Ingestion IF SWALLOWED: call a poison control center or physician immediately. If conscious give 2 glasses of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting.

Most important symptoms and effects

Symptoms Causes severe skin burns and eye damage. Headache. Dizziness. Nausea.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
Material is corrosive. The product is not expected to present any fire or explosion hazards under prescribed use conditions.

Hazardous Combustion Products Phosphorus oxides.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. See Section 13: DISPOSAL CONSIDERATIONS.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so. Contain spilled material if possible. Absorb with materials such as: Dirt. Sand. Sawdust.

Methods for Clean-Up Transfer liquid and solid material into suitable containers in accordance with local, state and federal regulations for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practice. Use personal protection recommended in Section 8. Avoid contact with skin, eyes or clothing. Do not breathe dust/fume/gas/mist/vapors/spray. Wash face, hands, and any exposed skin thoroughly after handling. Follow all product label instructions. Use only as directed.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry and well-ventilated place. Store locked up. Store away from heat and incompatible materials.

Incompatible Materials Store away from oxidizing agents/reducing agents. Sulfides. sulfites.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Phosphoric Acid 7664-38-2	STEL: 3 mg/m^3 TWA: 1 mg/m^3	TWA: 1 mg/m^3 (vacated) TWA: 1 mg/m^3 (vacated) STEL: 3 mg/m^3	IDLH: 1000 mg/m^3 TWA: 1 mg/m^3 STEL: 3 mg/m^3
Ethylene Glycol Monobutyl Ether 111-76-2	TWA: 20 ppm	TWA: 50 ppm TWA: 240 mg/m^3 (vacated) TWA: 25 ppm (vacated) TWA: 120 mg/m^3 (vacated) S* S*	IDLH: 700 ppm TWA: 5 ppm TWA: 24 mg/m^3

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits. Eyewash stations. Showers.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Chemical anti-splash safety goggles.

Skin and Body Protection Protective gloves. Wear suitable protective clothing to prevent contact with skin.

Respiratory Protection Ensure adequate ventilation, especially in confined areas. In case of inadequate ventilation wear respiratory protection.

General Hygiene Considerations Wash contaminated clothing before reuse. Wash face, hands and any exposed skin thoroughly after handling. Protective clothing and equipment should be in accordance with 29 CFR 1910.132 and 1910.133.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Red liquid	**Odor**	Not determined
Color	Red	**Odor Threshold**	Not determined

Property	Values	Remarks • Method
pH	0.50-1.50	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	> 100 °C / > 212 °F	
Flash Point	Not applicable	
Evaporation Rate	Not available	
Flammability (Solid, Gas)	Liquid-not applicable	
Upper Flammability Limits	Not applicable	
Lower Flammability Limit	Not applicable	
Vapor Pressure	Not available	
Vapor Density	Not available	
Specific Gravity	1.051	@ 25 °C (77 °F) (1=Water)
Water Solubility	Completely soluble	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	Not determined	
Dynamic Viscosity	85 cSt	
Explosive Properties	Not an explosive	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Not expected to occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible Materials
Store away from oxidizing agents/reducing agents. Sulfides. sulfites.

Hazardous Decomposition Products
Phosphorous oxides.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Causes severe eye damage.

Skin Contact Causes severe skin burns.

Inhalation Avoid breathing vapors or mists.

Ingestion May be harmful if swallowed.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Water 7732-18-5	> 90 mL/kg (Rat)	-	-
Dodecyl benzene sulfonic acid 27176-87-0	= 500 mg/kg (Rat)	-	-
Phosphoric Acid 7664-38-2	= 1530 mg/kg (Rat)	= 2730 mg/kg (Rabbit)	> 850 mg/m^3 (Rat) 1 h
Ethylene Glycol Monobutyl Ether 111-76-2	= 470 mg/kg (Rat)	= 2270 mg/kg (Rat) = 220 mg/kg (Rabbit)	= 2.21 mg/L (Rat) 4 h = 450 ppm (Rat) 4 h

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen. However, the product as a whole has not been tested. Group 3 IARC components are "not classifiable as human carcinogens".

Chemical Name	ACGIH	IARC	NTP	OSHA
Ethylene Glycol Monobutyl Ether 111-76-2	A3	Group 3		

ACGIH (American Conference of Governmental Industrial Hygienists)
A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)
Group 3 IARC components are "not classifiable as human carcinogens"

Numerical measures of toxicity
Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity
Harmful to aquatic life with long lasting effects.

Component Information

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Dodecyl benzene sulfonic acid 27176-87-0	29: 96 h Pseudokirchneriella subcapitata mg/L EC50	10.8: 96 h Oncorhynchus mykiss mg/L LC50 static 3.5 - 10: 96 h Brachydanio rerio mg/L LC50 static		5.88: 48 h Daphnia magna mg/L EC50
Ethylene Glycol Monobutyl Ether 111-76-2		1490: 96 h Lepomis macrochirus mg/L LC50 static 2950: 96 h Lepomis macrochirus mg/L LC50		1698 - 1940: 24 h Daphnia magna mg/L EC50 1000: 48 h Daphnia magna mg/L EC50

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility

Chemical Name	Partition Coefficient
Ethylene Glycol Monobutyl Ether 111-76-2	0.81

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

California Hazardous Waste Status

Chemical Name	California Hazardous Waste Status
Phosphoric Acid 7664-38-2	Corrosive

14. TRANSPORT INFORMATION

Note

Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances. Based on package size, product may be eligible for limited quantity exception.

DOT

UN/ID No UN1760
Proper Shipping Name Corrosive liquid, n.o.s. (Phosphoric acid, Dodecylbenzene sulfonic acid)
Hazard Class 8
Packing Group II

IATA

UN/ID No UN1760
Proper Shipping Name Corrosive liquid, n.o.s. (Phosphoric acid, Dodecylbenzene sulfonic acid)
Hazard Class 8
Packing Group II

IMDG

UN/ID No UN1760
Proper Shipping Name Corrosive liquid, n.o.s. (Phosphoric acid, Dodecylbenzene sulfonic acid)
Hazard Class 8
Packing Group II
Marine Pollutant This material may meet the definition of a marine pollutant

15. REGULATORY INFORMATION

International Inventories

TSCA Listed

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

KECL *- Korean Existing and Evaluated Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

US Federal Regulations

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Dodecyl benzene sulfonic acid 27176-87-0	1000 lb		RQ 1000 lb final RQ RQ 454 kg final RQ
Phosphoric Acid 7664-38-2	5000 lb		RQ 5000 lb final RQ RQ 2270 kg final RQ

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	CAS No	Weight-%	SARA 313 - Threshold Values %
Ethylene Glycol Monobutyl Ether - 111-76-2	111-76-2	<5	1.0

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Component	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Dodecyl benzene sulfonic acid 27176-87-0 (15-25)	1000 lb			X
Phosphoric Acid 7664-38-2 (5-15)	5000 lb			X

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Dodecyl benzene sulfonic acid 27176-87-0	X	X	X
Phosphoric Acid 7664-38-2	X	X	X
Ethylene Glycol Monobutyl Ether 111-76-2	X	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	2	0	0	Not determined

Issue Date: 28-Jul-2020
Revision Date:
Revision Note: New

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Safety Data Sheet

Issue Date: 27-Jun-2014 **Revision Date:** 28-Jul-2020 **Version** 5

1. IDENTIFICATION

Product Identifier
Product Name Presoak HWS *2X*

Other means of identification
SDS # DSI-076

Product Code D131, D132, D133, D137, D139
UN/ID No UN3266

Recommended use of the chemical and restrictions on use
Recommended Use Presoak.

Details of the supplier of the safety data sheet
Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number
Company Phone Number 800-843-7627
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Yellow liquid **Physical State** Liquid **Odor** No appreciable odor

Classification

Skin corrosion/irritation	Category 1 Sub-category C
Serious eye damage/eye irritation	Category 1

Hazards Not Otherwise Classified (HNOC)
May be harmful if swallowed

Signal Word
Danger

Hazard Statements
Causes severe skin burns and eye damage



Precautionary Statements - Prevention
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a poison center or doctor/physician
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Immediately call a poison center or doctor/physician
IF SWALLOWED: rinse mouth. Do NOT induce vomiting

Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Other Hazards
Harmful to aquatic life with long lasting effects

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Sodium hydroxide	1310-73-2	10-20
Tetrasodium EDTA	64-02-8	1-10
Monoethanolamine	141-43-5	1-5

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact Rinse thoroughly with plenty of water, also under the eyelids. Call a physician immediately.

Skin Contact Wash off immediately with plenty of water. Take off contaminated clothing. Wash contaminated clothing before reuse.

Inhalation Remove to fresh air. Call a physician or poison control center immediately.

Ingestion Rinse mouth. Do not induce vomiting.

Most important symptoms and effects

Symptoms Contact will cause irritation and redness to exposed areas.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
Non-flammable solution.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Clean-Up Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Wash thoroughly after handling. Use personal protection recommended in Section 8. Do not breathe dust/fume/gas/mist/vapors/spray.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Store locked up.

Incompatible Materials Strong acids.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Sodium hydroxide 1310-73-2	Ceiling: 2 mg/m^3	TWA: 2 mg/m^3 (vacated) Ceiling: 2 mg/m^3	IDLH: 10 mg/m^3 Ceiling: 2 mg/m^3
Monoethanolamine 141-43-5	STEL: 6 ppm TWA: 3 ppm	TWA: 3 ppm TWA: 6 mg/m^3 (vacated) TWA: 3 ppm (vacated) TWA: 8 mg/m^3 (vacated) STEL: 6 ppm (vacated) STEL: 15 mg/m^3	IDLH: 30 ppm TWA: 3 ppm TWA: 8 mg/m^3 STEL: 6 ppm STEL: 15 mg/m^3

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Wear eye/face protection.

Skin and Body Protection Wear suitable protective clothing.

Respiratory Protection Ensure adequate ventilation, especially in confined areas.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Yellow liquid	**Odor**	No appreciable odor
Color	Yellow	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	13.0-13.8	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	Not determined	
Flash Point	Not determined	
Evaporation Rate	Not determined	
Flammability (Solid, Gas)	n/a-liquid	
Upper Flammability Limits	Not determined	
Lower Flammability Limit	Not determined	
Vapor Pressure	Not determined	
Vapor Density	Not determined	
Specific Gravity	1.203	
Water Solubility	Not determined	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	Not determined	
Dynamic Viscosity	Not determined	
Explosive Properties	Not determined	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Conditions to Avoid
Keep out of reach of children.

Incompatible Materials
Strong acids.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Causes severe eye damage.

Skin Contact Causes severe skin burns.

Inhalation Avoid breathing vapors or mists.

Ingestion May be harmful if swallowed.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Sodium hydroxide 1310-73-2	-	= 1350 mg/kg (Rabbit)	-
Tetrasodium EDTA 64-02-8	= 10 g/kg (Rat)	-	-
Monoethanolamine 141-43-5	= 1720 mg/kg (Rat)	= 1 mL/kg (Rabbit) = 1025 mg/kg (Rabbit)	-

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

Numerical measures of toxicity
Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity
Harmful to aquatic life with long lasting effects.

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Sodium hydroxide 1310-73-2		45.4: 96 h Oncorhynchus mykiss mg/L LC50 static		
Tetrasodium EDTA 64-02-8	1.01: 72 h Desmodesmus subspicatus mg/L EC50	41: 96 h Lepomis macrochirus mg/L LC50 static 59.8: 96 h Pimephales promelas mg/L LC50 static		610: 24 h Daphnia magna mg/L EC50
Monoethanolamine 141-43-5	15: 72 h Desmodesmus subspicatus mg/L EC50	227: 96 h Pimephales promelas mg/L LC50 flow-through 3684: 96 h Brachydanio rerio mg/L LC50 static 300 - 1000: 96 h Lepomis macrochirus mg/L LC50 static 114 - 196: 96 h Oncorhynchus mykiss mg/L LC50 static 200: 96 h Oncorhynchus mykiss mg/L LC50 flow-through		65: 48 h Daphnia magna mg/L EC50

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility

Chemical Name	Partition Coefficient
Monoethanolamine 141-43-5	-1.91

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

California Hazardous Waste Status

Chemical Name	California Hazardous Waste Status
Sodium hydroxide 1310-73-2	Toxic Corrosive

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT
UN/ID No UN3266
Proper Shipping Name Corrosive liquid, basic, inorganic, n.o.s. (sodium hydroxide, monoethanolamine)
Hazard Class 8
Packing Group II

IATA
UN/ID No UN3266
Proper Shipping Name Corrosive liquid, basic, inorganic, n.o.s. (sodium hydroxide, monoethanolamine)
Hazard Class 8
Packing Group II

IMDG
UN/ID No UN3266
Proper Shipping Name Corrosive liquid, basic, inorganic, n.o.s. (sodium hydroxide, monoethanolamine)
Hazard Class 8
Packing Group II
Marine Pollutant This material may meet the definition of a marine pollutant

Not determined

US Federal Regulations

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sodium hydroxide 1310-73-2	1000 lb		RQ 1000 lb final RQ RQ 454 kg final RQ

SARA 313

Not determined

CWA (Clean Water Act)

Component	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sodium hydroxide 1310-73-2 (10-20)	1000 lb			X

US State Regulations

California Proposition 65 This product contains the following Proposition 65 chemicals

Chemical Name	California Proposition 65
Diethanolamine 111-42-2	Carcinogen

This product also contains a chemical that is at or below California Proposition 65's "safe harbor level" as determined via a risk assessment. Therefore, the chemical is not required to be listed as a Prop 65 chemical on the SDS or label.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Sodium hydroxide 1310-73-2	X	X	X
Monoethanolamine 141-43-5	X	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	Not determined	Not determined	Not determined	Not determined

Issue Date: 27-Jun-2014
Revision Date: 28-Jul-2020
Revision Note: Information in Section 15

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Safety Data Sheet

Issue Date: 20-Mar-2013 **Revision Date:** 08-June-2015 **Version** 2

1. IDENTIFICATION

Product Identifier
Product Name PROTECT *2X*

Other means of identification
SDS # DSI-047

Product Code PROTECT *2X*: D421, D422, D423, D427, D429, BE425
UN/ID No UN1219

Recommended use of the chemical and restrictions on use
Recommended Use Automotive Care Products.

Details of the supplier of the safety data sheet
Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number
Company Phone Number 800-843-7627
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Blue liquid **Physical State** Liquid **Odor** Vanilla

Classification

Acute toxicity - Inhalation (Vapors)	Category 4
Flammable Liquids	Category 3

Signal Word
Warning

Hazard Statements
Harmful if inhaled
Flammable liquid and vapor



Precautionary Statements - Prevention
Avoid breathing dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Keep away from heat/sparks/open flames/hot surfaces. — No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use explosion-proof equipment
Use only non-sparking tools
Take precautionary measures against static discharge
Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Call a poison center or doctor/physician if you feel unwell
IN CASE OF FIRE: Use CO2, dry chemical, or alcohol resistant foam to extinguish.

Precautionary Statements - Storage
Store in a well-ventilated place. Keep cool

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Unknown Acute Toxicity
23.4% of the mixture consists of ingredient(s) of unknown toxicity

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Petroleum distillates, hydrotreated middle	64742-46-7	10-25
Isopropyl Alcohol	67-63-0	1-10
Methyl chloride	74-87-3	<1

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Skin Contact IF ON SKIN: Wash with plenty of soap and water. Wash contaminated clothing before reuse. If skin irritation persists, call a physician.

Inhalation IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Artificial respiration and/or oxygen may be necessary. Call a poison center or doctor/physician if you feel unwell.

Ingestion IF SWALLOWED: call a poison control center or physician immediately. If conscious give 2 glasses of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting.

Most important symptoms and effects

Symptoms Headache. Dizziness. Nausea. Direct contact may cause skin or eye irritation.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Dry chemical. Sand/earth. Alcohol resistant foam.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
Flammable liquid and vapor.

Hazardous Combustion Products None known.

Sensitivity to Static Discharge Take precautionary measures against static discharge.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. See Section 13: DISPOSAL CONSIDERATIONS.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so. Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see Section 13).

Methods for Clean-Up Transfer liquid and solid material into suitable containers in accordance with local, state and federal regulations for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practice. Use personal protection recommended in Section 8. Avoid contact with skin, eyes or clothing. Follow all product label instructions. Use only as directed. Use only outdoors or in a well-ventilated area. Do not breathe dust/fume/gas/mist/vapors/spray. Keep away from heat/sparks/open flames/hot surfaces. — No smoking. Ground/bond container and receiving equipment. Use non-sparking hand tools and explosion-proof electrical equipment. Take precautionary measures against static discharges.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry and well-ventilated place. Store away from heat and incompatible materials.

Incompatible Materials Store away from oxidizing agents/reducing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Isopropyl Alcohol 67-63-0	STEL: 400 ppm TWA: 200 ppm	TWA: 400 ppm TWA: 980 mg/m^3 (vacated) TWA: 400 ppm (vacated) TWA: 980 mg/m^3 (vacated) STEL: 500 ppm (vacated) STEL: 1225 mg/m^3	IDLH: 2000 ppm TWA: 400 ppm TWA: 980 mg/m^3 STEL: 500 ppm STEL: 1225 mg/m^3
Methyl chloride 74-87-3	STEL: 100 ppm TWA: 50 ppm S*	TWA: 100 ppm (vacated) TWA: 50 ppm (vacated) TWA: 105 mg/m^3 (vacated) STEL: 100 ppm (vacated) STEL: 210 mg/m^3 Ceiling: 200 ppm	IDLH: 2000 ppm

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits. Eyewash stations. Showers.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Chemical anti-splash safety goggles.

Skin and Body Protection Protective gloves. Wear suitable protective clothing to prevent contact with skin.

Respiratory Protection Ensure adequate ventilation, especially in confined areas. In case of inadequate ventilation wear respiratory protection.

General Hygiene Considerations Wash contaminated clothing before reuse. Protective clothing and equipment should be in accordance with 29 CFR 1910.132 and 1910.133.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State Liquid
Appearance Blue liquid
Color Blue
Odor Vanilla
Odor Threshold Not determined

Property	Values	Remarks • Method
pH	5.5-7.0	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	> 100 °C / > 212 °F	
Flash Point	~ 41 °C / ~ 105 °F	
Evaporation Rate	Not available	
Flammability (Solid, Gas)	Liquid-not applicable	
Upper Flammability Limits	Not applicable	
Lower Flammability Limit	Not applicable	
Vapor Pressure	Not available	
Vapor Density	Not available	

Specific Gravity	0.915-0.960	@ 25 °C (77 °F) (1=Water)
Water Solubility	Completely soluble	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	Not determined	
Dynamic Viscosity	30-65 cSt	
Explosive Properties	Not an explosive	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible Materials
Store away from oxidizing agents/reducing agents.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Avoid contact with eyes.

Skin Contact Avoid contact with skin.

Inhalation Harmful if inhaled.

Ingestion Do not taste or swallow.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Water 7732-18-5	> 90 mL/kg (Rat)	-	-
Petroleum distillates, hydrotreated middle 64742-46-7	= 7400 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	= 4.6 mg/L (Rat) 4 h
Isopropyl Alcohol 67-63-0	= 4396 mg/kg (Rat)	= 12800 mg/kg (Rat) = 12870 mg/kg (Rabbit)	= 72.6 mg/L (Rat) 4 h
Methyl chloride 74-87-3	= 1800 mg/kg (Rat)	-	= 5.3 mg/L (Rat) 4 h

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity Not classifiable as a human carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
Isopropyl Alcohol 67-63-0		Group 3		X
Methyl chloride 74-87-3		Group 3		

IARC (International Agency for Research on Cancer)
Group 3 IARC components are "not classifiable as human carcinogens"
OSHA (Occupational Safety and Health Administration of the US Department of Labor)
X - Present

Numerical measures of toxicity
Not determined

Unknown Acute Toxicity 23.4% of the mixture consists of ingredient(s) of unknown toxicity.

12. ECOLOGICAL INFORMATION

Ecotoxicity
The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Petroleum distillates, hydrotreated middle 64742-46-7		35: 96 h Pimephales promelas mg/L LC50 flow-through 10000: 96 h Pimephales promelas mg/L LC50 static		
Isopropyl Alcohol 67-63-0	1000: 96 h Desmodesmus subspicatus mg/L EC50 1000: 72 h Desmodesmus subspicatus mg/L EC50	9640: 96 h Pimephales promelas mg/L LC50 flow-through 11130: 96 h Pimephales promelas mg/L LC50 static 1400000: 96 h Lepomis macrochirus µg/L LC50		13299: 48 h Daphnia magna mg/L EC50
Methyl chloride 74-87-3		550: 96 h Lepomis macrochirus mg/L LC50 static		

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility

Chemical Name	Partition Coefficient
Isopropyl Alcohol 67-63-0	0.05
Methyl chloride 74-87-3	0.91

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

US EPA Waste Number

Chemical Name	RCRA	RCRA - Basis for Listing	RCRA - D Series Wastes	RCRA - U Series Wastes
Methyl chloride 74-87-3	U045	Included in waste streams: F024, F025, F039, K009, K010, K149, K150, K157		U045

Chemical Name	RCRA - Halogenated Organic Compounds	RCRA - P Series Wastes	RCRA - F Series Wastes	RCRA - K Series Wastes
Methyl chloride 74-87-3	Category I - Volatiles		Toxic waste waste number F025 Waste description: Condensed light ends, spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution.	

California Hazardous Waste Status

Chemical Name	California Hazardous Waste Status
Isopropyl Alcohol 67-63-0	Toxic Ignitable
Methyl chloride 74-87-3	Toxic Ignitable

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances. Based on package size, product may be eligible for limited quantity exception. DOT Ground - "Non-bulk shipments may be non-regulated per 49CFR 173.150(f)(2)".

DOT

UN/ID No UN1219
Proper Shipping Name Isopropyl alcohol solution
Hazard Class 3
Packing Group III

IATA

UN/ID No	UN1219
Proper Shipping Name	Isopropyl alcohol solution
Hazard Class	3
Packing Group	III

IMDG

UN/ID No	UN1219
Proper Shipping Name	Isopropyl alcohol solution
Hazard Class	3
Packing Group	III
Marine Pollutant	This material may meet the definition of a marine pollutant

15. REGULATORY INFORMATION

International Inventories

TSCA	Listed

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

KECL *- Korean Existing and Evaluated Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

US Federal Regulations

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Methyl chloride 74-87-3	100 lb 1 lb		RQ 100 lb final RQ RQ 45.4 kg final RQ RQ 1 lb final RQ RQ 0.454 kg final RQ

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	CAS No	Weight-%	SARA 313 - Threshold Values %
Isopropyl Alcohol - 67-63-0	67-63-0	1-10	1.0
Methyl chloride - 74-87-3	74-87-3	<1	1.0

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Component	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Methyl chloride 74-87-3 (<1)		X	X	

US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals.

Chemical Name	California Proposition 65
Methyl chloride - 74-87-3	Developmental Male Reproductive

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Isopropyl Alcohol 67-63-0	X	X	X
Methyl chloride 74-87-3	X	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	2	2	0	Not determined

Issue Date: 20-Mar-2013
Revision Date: 08-June-2015
Revision Note: New Product Code

Disclaimer

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End of Safety Data Sheet

Safety Data Sheet

Issue Date: 13-Mar-2014 **Revision Date:** 13-Jul-2017 **Version** 3

1. IDENTIFICATION

Product Identifier

Product Name Results *2X* And Results Ultra *3X*

Other means of identification

SDS # DSI-074

Product Code Results *2X*: D151, D152, D153, D157, D159
Results Ultra *3X*: BE905

UN/ID No UN3265

Recommended use of the chemical and restrictions on use

Recommended Use Automotive care.

Details of the supplier of the safety data sheet

Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number

Company Phone Number 800-843-7627
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Red liquid **Physical State** Liquid **Odor** No appreciable odor

Classification

Skin corrosion/irritation	Category 1 Sub-category C
Serious eye damage/eye irritation	Category 1

Signal Word
Danger

Hazard Statements
Causes severe skin burns and eye damage



Precautionary Statements - Prevention
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a poison center or doctor/physician
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Immediately call a poison center or doctor/physician
IF SWALLOWED: rinse mouth. Do NOT induce vomiting

Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Unknown Acute Toxicity
20% of the mixture consists of ingredient(s) of unknown toxicity

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Urea Hydrochloride	506-89-8	10-20
Iminodisuccinic Acid Tetrasodium Salt	144538-83-0	5-15

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact — Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Seek immediate medical attention/advice.

Skin Contact — Wash off immediately with plenty of water for at least 15 minutes. Wash skin thoroughly with mild soap and water. If skin irritation persists, call a physician.

Inhalation — Remove to fresh air. If not breathing, give artificial respiration. Call a physician immediately.

Ingestion — Seek medical attention immediately. If conscious give 2 glasses of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting.

Most important symptoms and effects

Symptoms — Inhalation symptoms may include dizziness and headache. Nausea. Contact will cause irritation and redness to exposed areas.

Indication of any immediate medical attention and special treatment needed

Notes to Physician — Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
None known.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Environmental Precautions Discharge into the environment must be avoided.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Clean-Up Contain and collect with an inert absorbent and place into an appropriate container for disposal. Dispose of in accordance with federal, state and local regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practice. Use in accordance with product label instructions. Use personal protection recommended in Section 8. Do not breathe dust/fume/gas/mist/vapors/spray. Wash thoroughly after handling.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Do not store at high temperatures. Store locked up.

Incompatible Materials Strong oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines No exposure limits noted for ingredient(s)

Appropriate engineering controls

Engineering Controls Ensure adequate ventilation, especially in confined areas.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Splash goggles or safety glasses.

Skin and Body Protection Wear protective gloves. Wear protective clothing to minimize skin contact.

Respiratory Protection Ensure adequate ventilation, especially in confined areas.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Red liquid	**Odor**	No appreciable odor
Color	Red	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	1.00-1.50	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	> 100 °C / >212 °F	
Flash Point	Not available	
Evaporation Rate	Not available	
Flammability (Solid, Gas)	n/a-liquid	
Upper Flammability Limits	Not available	
Lower Flammability Limit	Not available	
Vapor Pressure	Not available	
Vapor Density	Not available	
Specific Gravity	1.088-1.135	(1=Water)
Water Solubility	Completely soluble	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	

Auto-ignition Temperature	Not determined
Decomposition Temperature	Not determined
Kinematic Viscosity	Not determined
Dynamic Viscosity	Not determined
Explosive Properties	Not determined
Oxidizing Properties	Not determined

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible Materials
Strong oxidizing agents.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Causes severe eye damage.

Skin Contact Causes severe skin burns.

Inhalation Avoid breathing vapors or mists.

Ingestion Do not taste or swallow.

Component Information

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

Numerical measures of toxicity
Not determined

Unknown Acute Toxicity 20% of the mixture consists of ingredient(s) of unknown toxicity.

12. ECOLOGICAL INFORMATION

Ecotoxicity
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility
Not determined

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT

UN/ID No	UN3265
Proper Shipping Name	Corrosive liquid, acidic, organic, n.o.s. (acid salts)
Hazard Class	8
Packing Group	III

IATA

UN/ID No	UN3265
Proper Shipping Name	Corrosive liquid, acidic, organic, n.o.s. (acid salts)

Hazard Class	8
Packing Group	III

IMDG

UN/ID No	UN3265
Proper Shipping Name	Corrosive liquid, acidic, organic, n.o.s. (acid salts)
Hazard Class	8
Packing Group	III

15. REGULATORY INFORMATION

International Inventories

TSCA	Listed

Legend:
TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

US Federal Regulations

SARA 313
Not determined

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations
Not determined

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	3	0	0	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	3	0	0	Not determined

Issue Date:	13-Mar-2014
Revision Date:	13-Jul-2017
Revision Note:	Information in Section 15

Disclaimer
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End of Safety Data Sheet

Safety Data Sheet

Issue Date: 21-Aug-2014 **Revision Date:** 08-June-2015 **Version** 2

1. IDENTIFICATION

Product Identifier

Product Name Rust Repel

Other means of identification

SDS # DSI-106

Product Code 4202, 4205, 42015, 42030, 42055, BE825

Recommended use of the chemical and restrictions on use

Recommended Use Automotive care.

Details of the supplier of the safety data sheet

Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number

Company Phone Number 800-843-7627
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Yellow liquid **Physical State** Liquid **Odor** No appreciable odor

Classification

Hazards Not Otherwise Classified (HNOC)
Causes mild skin irritation

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
2-Butoxyethanol	111-76-2	1-5

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash affected areas thoroughly with soap and water for at least 15 minutes. If skin irritation or rash occurs: Get medical advice/attention.

Inhalation IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Artificial respiration and/or oxygen may be necessary. Get medical attention if necessary.

Ingestion IF SWALLOWED: call a poison control center or physician immediately. If conscious give 2 glasses of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting.

Most important symptoms and effects

Symptoms May cause eye, skin and respiratory tract irritation.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
The product is not expected to present any fire or explosion hazards under prescribed use conditions.

Hazardous Combustion Products Not determined.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. See Section 13: DISPOSAL CONSIDERATIONS. See Section 12 for additional Ecological Information.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so. Soak up and contain spill with an absorbent material.

Methods for Clean-Up Transfer liquid and solid material into suitable containers in accordance with local, state and federal regulations for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practice. Use personal protection recommended in Section 8. Avoid contact with skin, eyes or clothing. Follow all product label instructions. Use only as directed. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when handling this product.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry and well-ventilated place.

Incompatible Materials None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines No exposure limits noted for ingredient(s) The following information is given as general guidance

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
2-Butoxyethanol 111-76-2	TWA: 20 ppm	TWA: 50 ppm TWA: 240 mg/m^3 (vacated) TWA: 25 ppm (vacated) TWA: 120 mg/m^3 (vacated) S* S*	IDLH: 700 ppm TWA: 5 ppm TWA: 24 mg/m^3

Appropriate engineering controls

Engineering Controls Eyewash stations. Showers. Ensure adequate ventilation, especially in confined areas.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Goggles are recommended.

Skin and Body Protection Gloves recommended but not required. Wear suitable protective clothing to prevent contact with skin.

Respiratory Protection Ensure adequate ventilation, especially in confined areas. In case of inadequate ventilation wear respiratory protection.

General Hygiene Considerations Wash contaminated clothing before reuse. Wash face, hands and any exposed skin thoroughly after handling. Protective clothing and equipment should be in accordance with 29 CFR 1910.132 and 1910.133.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Yellow liquid	**Odor**	No appreciable odor
Color	Yellow	**Odor Threshold**	Not determined

Property	Values	Remarks • Method
pH	5.5-6.5	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	> 100 °C / > 212 °F	
Flash Point	Not applicable	
Evaporation Rate	Not available	
Flammability (Solid, Gas)	Liquid-not applicable	
Upper Flammability Limits	Not applicable	
Lower Flammability Limit	Not applicable	
Vapor Pressure	Not available	
Vapor Density	Not available	
Specific Gravity	0.99	(1=Water)
Water Solubility	Completely soluble	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	

Auto-ignition Temperature	Not determined
Decomposition Temperature	Not determined
Kinematic Viscosity	Not determined
Dynamic Viscosity	Not determined
Explosive Properties	Not determined
Oxidizing Properties	Not determined

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible Materials
None known based on information supplied.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact May cause temporary irritation on eye contact.

Skin Contact Causes mild skin irritation.

Inhalation Avoid breathing vapors or mists.

Ingestion Do not taste or swallow.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
2-Butoxyethanol 111-76-2	= 470 mg/kg (Rat)	= 2270 mg/kg (Rat) = 220 mg/kg (Rabbit)	= 2.21 mg/L (Rat) 4 h = 450 ppm (Rat) 4 h

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen. However, the product as a whole has not been tested.

Chemical Name	ACGIH	IARC	NTP	OSHA
2-Butoxyethanol 111-76-2	A3	Group 3		

ACGIH (American Conference of Governmental Industrial Hygienists)
A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)
Group 3 IARC components are "not classifiable as human carcinogens"

Numerical measures of toxicity
Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Component Information

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
2-Butoxyethanol 111-76-2		1490: 96 h Lepomis macrochirus mg/L LC50 static 2950: 96 h Lepomis macrochirus mg/L LC50		1698 - 1940: 24 h Daphnia magna mg/L EC50 1000: 48 h Daphnia magna mg/L EC50

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility

Chemical Name	Partition Coefficient
2-Butoxyethanol 111-76-2	0.81

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

IMDG Not regulated

15. REGULATORY INFORMATION

International Inventories

TSCA Listed

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

KECL *- Korean Existing and Evaluated Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

AICS *- Australian Inventory of Chemical Substances*

US Federal Regulations

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313

Chemical Name	CAS No	Weight-%	SARA 313 - Threshold Values %
2-Butoxyethanol - 111-76-2	111-76-2	1-5	1.0

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
2-Butoxyethanol 111-76-2	X	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	1	0	0	Not determined

Issue Date: 21-Aug-2014
Revision Date: 08-june-2015
Revision Note: New Product Code

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End of Safety Data Sheet

Safety Data Sheet

Issue Date: 24-Jan-2013 **Revision Date:** 13-Jul-2017 **Version** 2

1. IDENTIFICATION

Product Identifier
Product Name Tire Shine

Other means of identification
SDS # DSI-055

Product Code 5402, 5405, 54015, 54030, 54055

Recommended use of the chemical and restrictions on use
Recommended Use Tire Dressing.

Details of the supplier of the safety data sheet
Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number
Company Phone Number 800-843-7627
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Blue liquid **Physical State** Liquid **Odor** No appreciable odor

Classification

Acute toxicity - Dermal	Category 4
Acute toxicity - Inhalation (Vapors)	Category 4
Aspiration toxicity	Category 1

Signal Word
Danger

Hazard Statements
Harmful in contact with skin
Harmful if inhaled
May be fatal if swallowed and enters airways



Precautionary Statements - Prevention
Wear protective gloves/protective clothing/eye protection/face protection
Avoid breathing dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area

Precautionary Statements - Response
IF ON SKIN: Wash with plenty of soap and water
Wash contaminated clothing before reuse
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Call a poison center or doctor/physician if you feel unwell
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
Do not induce vomiting

Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Petroleum Distillates, Hydrotreated light	64742-47-8	30-60

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Wash skin thoroughly with mild soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation persists, call a physician.

Inhalation Remove to fresh air. If not breathing, give artificial respiration. Call a physician if you feel unwell.

Ingestion Seek medical attention immediately. If conscious give 2 glasses of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting.

Most important symptoms and effects

Symptoms May cause skin and eye irritation. Inhalation symptoms may include dizziness and headache. Nausea.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
None known.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions	Use personal protective equipment as required.
Environmental Precautions	Discharge into the environment must be avoided.

Methods and material for containment and cleaning up

Methods for Containment	Prevent further leakage or spillage if safe to do so.
Methods for Clean-Up	Contain and collect with an inert absorbent and place into an appropriate container for disposal. Dispose of in accordance with federal, state and local regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling	Use personal protection recommended in Section 8. Wash thoroughly after handling. Avoid breathing vapors or mists. Use only in well-ventilated areas. Use in accordance with product label instructions.

Conditions for safe storage, including any incompatibilities

Storage Conditions	Keep containers tightly closed in a dry, cool and well-ventilated place. Store locked up. Do not store at high temperatures.
Incompatible Materials	None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines No exposure limits noted for ingredient(s)

Appropriate engineering controls

Engineering Controls Ensure adequate ventilation, especially in confined areas.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Splash goggles or safety glasses.

Skin and Body Protection Wear protective gloves. Wear protective clothing to minimize skin contact.

Respiratory Protection Ensure adequate ventilation, especially in confined areas.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Blue liquid	**Odor**	No appreciable odor
Color	Blue	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	Not applicable	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	> 100 °C / >212 °F	
Flash Point	Not determined	
Evaporation Rate	Not determined	
Flammability (Solid, Gas)	n/a-liquid	
Upper Flammability Limits	Not determined	
Lower Flammability Limit	Not determined	
Vapor Pressure	Not determined	
Vapor Density	Not determined	
Specific Gravity	0.865	(1=Water)
Water Solubility	Insoluble in water	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	Not determined	
Dynamic Viscosity	Not determined	
Explosive Properties	Not determined	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible Materials
None known based on information supplied.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Avoid contact with eyes.

Skin Contact Harmful in contact with skin.

Inhalation Harmful if inhaled.

Ingestion Do not taste or swallow.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Polydimethylsiloxane 63148-62-9	> 17 g/kg (Rat)	> 2 g/kg (Rabbit)	-
Petroleum Distillates, Hydrotreated light 64742-47-8	> 5000 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	> 5.2 mg/L (Rat) 4 h

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

Aspiration hazard May be fatal if swallowed and enters airways.

Numerical measures of toxicity
Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Petroleum Distillates, Hydrotreated light 64742-47-8		45: 96 h Pimephales promelas mg/L LC50 flow-through 2.2: 96 h Lepomis macrochirus mg/L LC50 static 2.4: 96 h Oncorhynchus mykiss mg/L LC50 static		

Persistence/Degradability

Not determined.

Bioaccumulation

Not determined.

Mobility

Not determined

Other Adverse Effects

Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

DOT Not regulated

IATA Not regulated

IMDG Not regulated

15. REGULATORY INFORMATION

International Inventories

TSCA	Listed

Legend:
TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

US Federal Regulations

SARA 313
Not determined

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations
Not determined

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	1	0	0	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	1	0	0	Not determined

Issue Date: 24-Jan-2013
Revision Date: 13-Jul-2017
Revision Note: Information in Section 15

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End of Safety Data Sheet

Safety Data Sheet

Issue Date: 30-Aug-2016 **Revision Date:** 11-Dec-2018 **Version** 3

1. IDENTIFICATION

Product Identifier

Product Name TPR 100 *2X*

Other means of identification

SDS #

Product Code D173, D177, BE175

UN/ID No UN3266

Recommended use of the chemical and restrictions on use

Recommended Use Automotive care

Details of the supplier of the safety data sheet

Supplier Address

Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number

Company Phone Number 800-843-7627

Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Bluish green liquid **Physical State** Liquid **Odor** Slight chemical

Classification

Skin corrosion/irritation	Category 1 Sub-category B
Serious eye damage/eye irritation	Category 1

Hazards Not Otherwise Classified (HNOC)

May be harmful if swallowed

Signal Word

Danger

Hazard Statements

Causes severe skin burns and eye damage



Precautionary Statements - Prevention
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response
Immediately call a poison center or doctor/physician
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a poison center or doctor/physician
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Immediately call a poison center or doctor/physician
IF SWALLOWED: rinse mouth. Do NOT induce vomiting
Immediately call a poison center or doctor/physician

Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Other Hazards
Harmful to aquatic life with long lasting effects

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Ethylene Glycol Monobutyl Ether	111-76-2	5-10
Caustic Soda	1310-73-2	<5
Tetrasodium EDTA	64-02-8	10-15

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor/physician.

Skin Contact IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If skin irritation persists, call a physician.

Inhalation IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor/physician. Artificial respiration and/or oxygen may be necessary.

Ingestion IF SWALLOWED: call a poison control center or physician immediately. If conscious give 2 glasses of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting.

Most important symptoms and effects

Symptoms Causes severe skin burns and eye damage. Headache. Dizziness. Nausea.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
Material is corrosive. The product is not expected to present any fire or explosion hazards under prescribed use conditions.

Hazardous Combustion Products None known.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. See Section 13: DISPOSAL CONSIDERATIONS.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so. Contain spilled material if possible. Absorb with materials such as: Dirt. Sand. Sawdust.

Methods for Clean-Up Transfer liquid and solid material into suitable containers in accordance with local, state and federal regulations for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practice. Use personal protection recommended in Section 8. Avoid contact with skin, eyes or clothing. Do not breathe dust/fume/gas/mist/vapors/spray. Wash face, hands, and any exposed skin thoroughly after handling. Follow all product label instructions. Use only as directed.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry and well-ventilated place. Store locked up. Store away from heat and incompatible materials.

Incompatible Materials Acids. Soft metals. Store away from oxidizing agents/reducing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Ethylene Glycol Monobutyl Ether 111-76-2	TWA: 20 ppm	TWA: 50 ppm TWA: 240 mg/m^3 (vacated) TWA: 25 ppm (vacated) TWA: 120 mg/m^3 (vacated) S* S*	IDLH: 700 ppm TWA: 5 ppm TWA: 24 mg/m^3
Caustic Soda 1310-73-2	Ceiling: 2 mg/m^3	TWA: 2 mg/m^3 (vacated) Ceiling: 2 mg/m^3	IDLH: 10 mg/m^3 Ceiling: 2 mg/m^3

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits. Eyewash stations. Showers.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Chemical anti-splash safety goggles.

Skin and Body Protection Protective gloves. Wear suitable protective clothing to prevent contact with skin.

Respiratory Protection Ensure adequate ventilation, especially in confined areas. In case of inadequate ventilation wear respiratory protection.

General Hygiene Considerations Wash contaminated clothing before reuse. Wash face, hands and any exposed skin thoroughly after handling. Protective clothing and equipment should be in accordance with 29 CFR 1910.132 and 1910.133.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Bluish green liquid	**Odor**	Slight chemical
Color	Bluish green	**Odor Threshold**	Not determined

Property	Values	Remarks • Method
pH	13.0-13.8	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	> 100 °C / > 212 °F	
Flash Point	Not applicable	
Evaporation Rate	Not available	
Flammability (Solid, Gas)	Liquid-not applicable	
Upper Flammability Limits	Not applicable	
Lower Flammability Limit	Not applicable	
Vapor Pressure	Not available	
Vapor Density	Not available	
Specific Gravity	1.148	@ 25 °C (77 °F) (1=Water)
Water Solubility	Completely soluble	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	Not determined	
Dynamic Viscosity	25 cSt	
Explosive Properties	Not an explosive	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to Avoid
Excessive heat.

Incompatible Materials
Acids. Soft metals. Store away from oxidizing agents/reducing agents.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Causes severe eye damage.

Skin Contact Causes severe skin burns.

Inhalation Avoid breathing vapors or mists.

Ingestion May be harmful if swallowed.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Water 7732-18-5	> 90 mL/kg (Rat)	-	-
Ethylene Glycol Monobutyl Ether 111-76-2	= 470 mg/kg (Rat)	= 2270 mg/kg (Rat) = 220 mg/kg (Rabbit)	= 2.21 mg/L (Rat) 4 h = 450 ppm (Rat) 4 h
Bio-terge AS-40, Sodium Olefin Sulfonate 68439-57-6	= 2310 mg/kg (Rat)	= 6300 mg/kg (Rabbit)	-
Caustic Soda 1310-73-2	-	= 1350 mg/kg (Rabbit)	-
Tetrasodium EDTA 64-02-8	= 10 g/kg (Rat)	-	-

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen. However, the product as a whole has not been tested. Group 3 IARC components are "not classifiable as human carcinogens".

Chemical Name	ACGIH	IARC	NTP	OSHA
Ethylene Glycol Monobutyl Ether 111-76-2	A3	Group 3		

ACGIH (American Conference of Governmental Industrial Hygienists)
A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)
Group 3 IARC components are "not classifiable as human carcinogens"

Numerical measures of toxicity
Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity
Harmful to aquatic life with long lasting effects.

Component Information

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Ethylene Glycol Monobutyl Ether 111-76-2		1490: 96 h Lepomis macrochirus mg/L LC50 static 2950: 96 h Lepomis macrochirus mg/L LC50		1698 - 1940: 24 h Daphnia magna mg/L EC50 1000: 48 h Daphnia magna mg/L EC50
Bio-terge AS-40, Sodium Olefin Sulfonate 68439-57-6		1.0 - 10.0: 96 h Brachydanio rerio mg/L LC50 static 12.2: 96 h Brachydanio rerio mg/L LC50 semi-static		
Caustic Soda 1310-73-2		45.4: 96 h Oncorhynchus mykiss mg/L LC50 static		
Tetrasodium EDTA 64-02-8	1.01: 72 h Desmodesmus subspicatus mg/L EC50	41: 96 h Lepomis macrochirus mg/L LC50 static 59.8: 96 h Pimephales promelas mg/L LC50 static		610: 24 h Daphnia magna mg/L EC50

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility

Chemical Name	Partition Coefficient
Ethylene Glycol Monobutyl Ether 111-76-2	0.81

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

California Hazardous Waste Status

Chemical Name	California Hazardous Waste Status
Caustic Soda 1310-73-2	Toxic Corrosive

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances. Based on package size, product may be eligible for limited quantity exception.

DOT

UN/ID No UN3266
Proper Shipping Name Corrosive liquid, basic, inorganic, n.o.s. (Sodium Hydroxide)
Hazard Class 8
Packing Group II

IATA

UN/ID No UN3266
Proper Shipping Name Corrosive liquid, basic, inorganic, n.o.s. (Sodium Hydroxide)
Hazard Class 8
Packing Group II

IMDG

UN/ID No UN3266
Proper Shipping Name Corrosive liquid, basic, inorganic, n.o.s. (Sodium Hydroxide)
Hazard Class 8
Packing Group II
Marine Pollutant This material may meet the definition of a marine pollutant

15. REGULATORY INFORMATION

International Inventories

TSCA Listed

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

KECL *- Korean Existing and Evaluated Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

US Federal Regulations

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Caustic Soda 1310-73-2	1000 lb		RQ 1000 lb final RQ RQ 454 kg final RQ

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	CAS No	Weight-%	SARA 313 - Threshold Values %
Ethylene Glycol Monobutyl Ether - 111-76-2	111-76-2	5-10	1.0

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Component	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Caustic Soda 1310-73-2 (<5)	1000 lb			X

US State Regulations

California Proposition 65

This product contains a chemical that is at or below California Proposition 65's "safe harbor level" as determined via a risk assessment. Therefore, the chemical is not required to be listed as a Prop 65 chemical on the SDS or label.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Ethylene Glycol Monobutyl Ether 111-76-2	X	X	X
Caustic Soda 1310-73-2	X	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	2	0	0	Not determined

Issue Date: 30-Aug-2016
Revision Date: 11-Dec-2018
Revision Note: Information in Section 15

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Safety Data Sheet

Issue Date: 24-Jan-2013 **Revision Date:** 17-Dec-2020 **Version** 3

1. IDENTIFICATION

Product Identifier
Product Name Ultra

Other means of identification
SDS # DSI-056

Product Code 3292, 3295, 32915, 32930, 32955

Recommended use of the chemical and restrictions on use
Recommended Use Liquid towel detergent.

Details of the supplier of the safety data sheet
Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number
Company Phone Number 800-843-7627
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Blue liquid **Physical State** Liquid **Odor** Lemon

Classification

Skin sensitization	Category 1

Hazards Not Otherwise Classified (HNOC)
May be harmful if swallowed

Signal Word
Warning

Hazard Statements
May cause an allergic skin reaction



Precautionary Statements - Prevention
Avoid breathing dust/fume/gas/mist/vapors/spray
Contaminated work clothing should not be allowed out of the workplace
Wear protective gloves

Precautionary Statements - Response
IF ON SKIN: Wash with plenty of soap and water
If skin irritation or rash occurs: Get medical advice/attention
Wash contaminated clothing before reuse

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Other Hazards
Harmful to aquatic life with long lasting effects

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Sodium dodecyl benzene sulphonate	25155-30-0	1-5
Hexahydro-1,3,5-tris(2-hydroxyethyl)-S-triazine	4719-04-4	<1

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Wash skin thoroughly with mild soap and water. If skin irritation or rash occurs: Get medical advice/attention.

Inhalation Remove to fresh air. If not breathing, give artificial respiration.

Ingestion Seek medical attention immediately. If conscious give 2 glasses of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting.

Most important symptoms and effects

Symptoms May cause skin and eye irritation. Inhalation symptoms may include dizziness and headache. Nausea.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
None known.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions	Use personal protective equipment as required.
Environmental Precautions	Discharge into the environment must be avoided.

Methods and material for containment and cleaning up

Methods for Containment	Prevent further leakage or spillage if safe to do so.
Methods for Clean-Up	Contain and collect with an inert absorbent and place into an appropriate container for disposal. Dispose of in accordance with federal, state and local regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling	Handle in accordance with good industrial hygiene and safety practice. Use in accordance with product label instructions. Avoid breathing vapors or mists. Use personal protection recommended in Section 8. Contaminated work clothing should not be allowed out of the workplace.

Conditions for safe storage, including any incompatibilities

Storage Conditions	Keep containers tightly closed in a dry, cool and well-ventilated place. Do not store at high temperatures.
Incompatible Materials	None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines No exposure limits noted for ingredient(s)

Appropriate engineering controls

Engineering Controls	Ensure adequate ventilation, especially in confined areas.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Splash goggles or safety glasses.

Skin and Body Protection Wear protective gloves. Wear protective clothing to minimize skin contact.

Respiratory Protection Ensure adequate ventilation, especially in confined areas.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Blue liquid	**Odor**	Lemon
Color	Blue	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	9.0-11.0	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	> 100 °C / >212 °F	
Flash Point	Not available	
Evaporation Rate	Not available	
Flammability (Solid, Gas)	n/a-liquid	
Upper Flammability Limits	Not available	
Lower Flammability Limit	Not available	
Vapor Pressure	Not available	
Vapor Density	Not available	
Specific Gravity	1.017	(1=Water)
Water Solubility	Completely soluble	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	Not determined	
Dynamic Viscosity	Not determined	
Explosive Properties	Not determined	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible Materials
None known based on information supplied.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Avoid contact with eyes.

Skin Contact May cause an allergic skin reaction.

Inhalation Avoid breathing vapors or mists.

Ingestion May be harmful if swallowed.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Alcohol Ethoxylate 68439-46-3	= 1378 mg/kg (Rat)	> 2 g/kg (Rabbit)	-
Sodium dodecyl benzene sulphonate 25155-30-0	= 438 mg/kg (Rat)	-	-
Hexahydro-1,3,5-tris(2-hydroxyethyl)-S-triazine 4719-04-4	= 763 mg/kg (Rat)	> 2 g/kg (Rat)	-

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

Numerical measures of toxicity
Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity
Harmful to aquatic life with long lasting effects.

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Sodium dodecyl benzene sulphonate 25155-30-0		10.8: 96 h Oncorhynchus mykiss mg/L LC50 static		
Hexahydro-1,3,5-tris(2-hydroxyethyl)-S-triazine 4719-04-4			EC50 = 28.9 mg/L 15 min	

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility
Not determined

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

IMDG

Marine Pollutant This material may meet the definition of a marine pollutant

15. REGULATORY INFORMATION

International Inventories

TSCA	Listed

Legend:
***TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory*

US Federal Regulations

CERCLA

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sodium dodecyl benzene sulphonate 25155-30-0	1000 lb		RQ 1000 lb final RQ RQ 454 kg final RQ

SARA 313
Not determined

CWA (Clean Water Act)

Component	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sodium dodecyl benzene sulphonate 25155-30-0 (1-5)	1000 lb			X

US State Regulations

California Proposition 65
This product contains the following Proposition 65 chemicals.

Chemical Name	California Proposition 65
Ethylene Oxide (< 1ppm) 75-21-8 1,4-Dioxane (< 10ppm) 123-91-1	Cancer – Birth Defects Reproductive Harm

. **U.S. State Right-to-Know Regulations**

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Sodium dodecyl benzene sulphonate 25155-30-0	X	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	0	0	0	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	0	0	0	Not determined

Issue Date: 24-Jan-2013
Revision Date: 17-Dec-2020
Revision Note: Information in Section 15

15. REGULATORY INFORMATION

Disclaimer

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End of Safety Data Sheet

Safety Data Sheet

Issue Date: 23-Jan-2013 **Revision Date:** 29-Jan-2019 **Version** 4

1. IDENTIFICATION

Product Identifier
Product Name X55

Other means of identification
SDS # DSI-058

Product Code 2705, 27015, 27030, 27055

Recommended use of the chemical and restrictions on use
Recommended Use Drying agent.

Details of the supplier of the safety data sheet
Supplier Address
Diamond Shine, Inc
1340 E. 289th St
Wickliffe, OH 44092

Emergency Telephone Number
Company Phone Number 800-843-7627
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Green liquid **Physical State** Liquid **Odor** No appreciable odor

Classification

Acute toxicity - Inhalation (Vapors)	Category 4

Hazards Not Otherwise Classified (HNOC)
May be harmful in contact with skin
Causes mild skin irritation

Signal Word
Warning

Hazard Statements
Harmful if inhaled



Precautionary Statements - Prevention
Avoid breathing dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area

Precautionary Statements - Response
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Call a poison center or doctor/physician if you feel unwell

Other Hazards
Harmful to aquatic life with long lasting effects

Unknown Acute Toxicity
12.8% of the mixture consists of ingredient(s) of unknown toxicity

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Petroleum distillates, hydrotreated middle	64742-46-7	15-25
Ethylene Glycol Monobutyl Ether	111-76-2	1-10
Isopropyl alcohol	67-63-0	<5

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

First Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Wash skin thoroughly with mild soap and water. If skin irritation persists, call a physician.

Inhalation Remove to fresh air. If not breathing, give artificial respiration. Call a physician if you feel unwell.

Ingestion Seek medical attention immediately. If conscious give 2 glasses of water to dilute. Never give anything by mouth to an unconscious person. Do not induce vomiting.

Most important symptoms and effects

Symptoms May cause skin and eye irritation. Inhalation symptoms may include dizziness and headache. Nausea.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Dry chemical. Sand/earth.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
None known.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Environmental Precautions Discharge into the environment must be avoided.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Clean-Up Contain and collect with an inert absorbent and place into an appropriate container for disposal. Dispose of in accordance with federal, state and local regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Avoid breathing vapors or mists. Use only in well-ventilated areas. Use in accordance with product label instructions. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Do not store at high temperatures.

Incompatible Materials Strong oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Ethylene Glycol Monobutyl Ether 111-76-2	TWA: 20 ppm	TWA: 50 ppm TWA: 240 mg/m^3 (vacated) TWA: 25 ppm (vacated) TWA: 120 mg/m^3 (vacated) S* S*	IDLH: 700 ppm TWA: 5 ppm TWA: 24 mg/m^3
Isopropyl alcohol 67-63-0	STEL: 400 ppm TWA: 200 ppm	TWA: 400 ppm TWA: 980 mg/m^3 (vacated) TWA: 400 ppm (vacated) TWA: 980 mg/m^3 (vacated) STEL: 500 ppm (vacated) STEL: 1225 mg/m^3	IDLH: 2000 ppm TWA: 400 ppm TWA: 980 mg/m^3 STEL: 500 ppm STEL: 1225 mg/m^3

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Splash goggles or safety glasses.

Skin and Body Protection Wear protective gloves. Wear protective clothing to minimize skin contact.

Respiratory Protection Ensure adequate ventilation, especially in confined areas.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Green liquid	**Odor**	No appreciable odor
Color	Green	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	4.50-7.50	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	> 100 °C / >212 °F	
Flash Point	Not determined	
Evaporation Rate	Not available	
Flammability (Solid, Gas)	n/a-liquid	
Upper Flammability Limits	Not determined	
Lower Flammability Limit	Not determined	
Vapor Pressure	Not available	
Vapor Density	Not available	
Specific Gravity	0.930	(1=Water)
Water Solubility	Completely soluble	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	Not determined	
Dynamic Viscosity	35 cSt	
Explosive Properties	Not determined	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible Materials
Strong oxidizing agents.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Avoid contact with eyes.

Skin Contact May be harmful in contact with skin. Causes mild skin irritation.

Inhalation Harmful if inhaled.

Ingestion Do not taste or swallow.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Petroleum distillates, hydrotreated middle 64742-46-7	= 7400 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	= 4.6 mg/L (Rat) 4 h
Ethylene Glycol Monobutyl Ether 111-76-2	= 470 mg/kg (Rat)	= 2270 mg/kg (Rat) = 220 mg/kg (Rabbit)	= 2.21 mg/L (Rat) 4 h = 450 ppm (Rat) 4 h
Isopropyl alcohol 67-63-0	= 4396 mg/kg (Rat)	= 12800 mg/kg (Rat) = 12870 mg/kg (Rabbit)	= 72.6 mg/L (Rat) 4 h

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity Not classifiable as a human carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
Ethylene Glycol Monobutyl Ether 111-76-2	A3	Group 3		
Isopropyl alcohol 67-63-0		Group 3		X

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)
A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)
Group 3 IARC components are "not classifiable as human carcinogens"
OSHA (Occupational Safety and Health Administration of the US Department of Labor)
X - Present

Aspiration hazard May be fatal if swallowed and enters airways.

Numerical measures of toxicity
Not determined

Unknown Acute Toxicity 12.8% of the mixture consists of ingredient(s) of unknown toxicity.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Harmful to aquatic life with long lasting effects.

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Petroleum distillates, hydrotreated middle 64742-46-7		35: 96 h Pimephales promelas mg/L LC50 flow-through 10000: 96 h Pimephales promelas mg/L LC50 static		
Ethylene Glycol Monobutyl Ether 111-76-2		1490: 96 h Lepomis macrochirus mg/L LC50 static 2950: 96 h Lepomis macrochirus mg/L LC50		1698 - 1940: 24 h Daphnia magna mg/L EC50 1000: 48 h Daphnia magna mg/L EC50
Isopropyl alcohol 67-63-0	1000: 96 h Desmodesmus subspicatus mg/L EC50 1000: 72 h Desmodesmus subspicatus mg/L EC50	9640: 96 h Pimephales promelas mg/L LC50 flow-through 11130: 96 h Pimephales promelas mg/L LC50 static 1400000: 96 h Lepomis macrochirus µg/L LC50		13299: 48 h Daphnia magna mg/L EC50

Persistence/Degradability

Not determined.

Bioaccumulation

Not determined.

Mobility

Chemical Name	Partition Coefficient
Ethylene Glycol Monobutyl Ether 111-76-2	0.81
Isopropyl alcohol 67-63-0	0.05

Other Adverse Effects

Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

California Hazardous Waste Status

Chemical Name	California Hazardous Waste Status
Isopropyl alcohol 67-63-0	Toxic Ignitable

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

IMDG

Marine Pollutant This material may meet the definition of a marine pollutant

15. REGULATORY INFORMATION

International Inventories

TSCA Listed

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

US Federal Regulations

SARA 313

Chemical Name	CAS No	Weight-%	SARA 313 - Threshold Values %
Ethylene Glycol Monobutyl Ether - 111-76-2	111-76-2	1-10	1.0
Isopropyl alcohol - 67-63-0	67-63-0	<5	1.0

US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals.

Chemical Name	California Proposition 65
Methyl chloride - 74-87-3	Developmental Male Reproductive

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Ethylene Glycol Monobutyl Ether 111-76-2	X	X	X
Isopropyl alcohol 67-63-0	X	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	1	1	0	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	1	1	0	Not determined

Issue Date: 23-Jan-2013
Revision Date: 29-Jan-2019
Revision Note: See Section 3 & Section 15

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Stormwater Management Report

Hang Ten Car Wash

914 Central Ave

Dover, NH 03820

Date Prepared: 05/24/2023

Revised: 07/21/2023

On behalf of:

Contact:
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CESO
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Engineer of Record:
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STATE OF NEW HAMPSHIRE
ZACHARY DAVID FRESHNER
No. 16215
LICENSED PROFESSIONAL ENGINEER

07/24/2023

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Introduction

This report covers the methodology and calculations used in the design of the stormwater management system for the proposed development anticipated for 914 Central Ave, Dover, NH 03820.

The stormwater management system is designed in accordance with Dover, NH Site Plan Regulations (SPR) Section 153-14 C.2 and New Hampshire Stormwater Manual Volume 2. The stormwater criteria for Dover, NH have requirements for stormwater mitigation and treatment found in the SPR 153-14 A.3.c.2.a. The site qualifies for redevelopment under the SPR with the existing impervious coverage of the site being calculated as greater than 40% (44%, see pre-developed conditions exhibit, Appendix D1). Based on direction from the City, the impervious area shall not be increased.

- For sites qualifying for redevelopment, stormwater shall be managed in accordance with one or more of the following techniques:
    - 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
    - Implement other LID techniques on site to the Maximum Extent Practicable (MEP) to provide mitigation and treatment for at least 50% of the entire site area

The proposed design incorporates the former bullet point – mitigation and treatment of at least 30% of the existing impervious cover (0.17 acres) as well as 50% of the additional proposed impervious area (0 acres) for a total of 0.17 acres. A total of 0.18 acres of pervious pavers were included to mitigate the post-developed impervious area below the pre-developed impervious area.

The stormwater quality requirements are found in SPR Section 153-14 B: runoff of impervious surfaces shall be treated to provide 80% of removal of total suspended solids (TSS) and 50% removal of both total nitrogen and phosphorus.

Storm routings for this project were performed using HydroCAD. Time of Concentration was determined by using the TR-55 method, within HydroCAD.

The onsite soils were obtained from USDA NRCS Web Soil Survey and can be found in **Appendix C.**

The storm pipe network was designed using Hydraflow Stormsewers Extension for Autodesk Civil 3D. City of Dover site development design criteria requires that the pipes be sized appropriately to convey the 10-year, 24-hour storm. Refer to **Appendix B** for the Storm Pipe Calculations and **Appendix D3** for the associated Tributary Drainage area Map.

Existing Conditions

The existing site is a 1.29 acre developed site with an existing restaurant and parking lot on site. The 1.29 acre ± developed parcel with an existing restaurant and parking lot that has frontage along Central Ave (NH #9). Central Ave borders the site to the northeast. McDonalds borders the site to the southeast. A financial institution borders the site to the northwest. A commercial use borders the site to the west. An undeveloped wooden tract borders the site to the southwest.

The Soil Survey indicates this site to have Hinckley Loamy Sand (Hydrologic Soil Group A). For hydrologic soil group A soils, we assumed CN values of 98 for impervious areas, and 39 for grassed areas in good condition.

The Existing Conditions Drainage Area Map can be found in **Appendix D1**.

Proposed Conditions

The proposed development of the site will consist of the construction of a 4,400 SF building, a paved parking area, paved drive aisles, associated site improvements and a stormwater management system. The stormwater management system consists of a bioretention area, a hydrodynamic separator, an outlet control structure, and an emergency spillway. There is a natural emergency spillway on the south edge of the bioretention basin. The bioretention area in conjunction with the outlet control structure have been designed to address the water quality and water quantity requirements. A hydrodynamic separator shall be utilized as a pretreatment device for the bioretention area. There shall be another hydrodynamic separator installed at the outlet of the site for the stormwater that was not routed through the bioretention area. The stormwater shall then be routed into the existing stormwater system along Central Ave.

The proposed improvements will create a bioretention area, with the amount of stormwater managed as defined by the redevelopment criteria.

- B-1 – Proposed stormwater management basin, which discharges into the existing storm sewer system with Main St.

For hydrologic soil group A soils, we assumed CN values of 98 for impervious areas, and 39 for grassed areas in good condition.

Stormwater Quality

To satisfy the water quality requirements, a bioretention system was chosen for stormwater mitigation and treatment. The bioretention system is designed to mitigate and treat the area defined by the redevelopment criteria in the Dover, NH Code which results in 0.17 acres of impervious area. The area draining to the pond is 0.86 acres, greater than the 0.17 areas required by the redevelopment criteria. A hydrodynamic separator shall be used as pretreatment for the bioretention area. According to the New Hampshire Stormwater Manual, Volumes 1 & 2, bioretention systems provide 90% TSS removal, 60% nitrogen removal and 65% phosphorus removal.

The impervious areas to the southeast of the site do not drain to the bioretention system, the areas drain to the second hydrodynamic separator. This second hydrodynamic separator is installed the manage the water quality to the MEP, as the required area to treat and mitigate is being handled by the bioretention system.

Stormwater Quantity

The stormwater quantity that is being managed is 0.17 acres, the amount totaled from the redevelopment section 153-14 C.2, mentioned above.

The discharge characteristics for the proposed stormwater management basin are listed in the following table:

Basin B-1		
Storm	Peak Discharge	Water surface Elevation
2-year	0.41 CFS	186.10 FT
10-year	0.62 CFS	186.22 FT
25-year	0.78 CFS	186.32 FT
50-year	0.93 CFS	186.42 FT

Refer to **Appendix A** for the Stormwater Quantity Calculations. The Proposed Conditions Drainage Area Map can be found in **Appendix D2**.

Summary

The proposed stormwater management system has been successfully designed to manage the increased runoff from associated improvements of the project. The stormwater management system has been designed in accordance with the appropriate regulations, as demonstrated in the previous tables and accompanying calculations.

APPENDIX A:
PROPOSED CONDITIONS CALCULATIONS

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	NRCC 24-hr	D	Default	24.00	1	3.15	2
2	10-Year	NRCC 24-hr	D	Default	24.00	1	4.74	2
3	25-Year	NRCC 24-hr	D	Default	24.00	1	5.98	2
4	50-Year	NRCC 24-hr	D	Default	24.00	1	7.14	2

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

Subcatchment1S: Post-Developed Runoff Area=0.170 ac 100.00% Impervious Runoff Depth>2.60"
Tc=10.0 min CN=98 Runoff=0.41 cfs 0.037 af

Pond 2P: Pond Peak Elev=186.10' Storage=601 cf Inflow=0.41 cfs 0.037 af
Outflow=0.30 cfs 0.028 af

Total Runoff Area = 0.170 ac Runoff Volume = 0.037 af Average Runoff Depth = 2.60"
0.00% Pervious = 0.000 ac 100.00% Impervious = 0.170 ac

Summary for Subcatchment 1S: Post-Developed Conditions

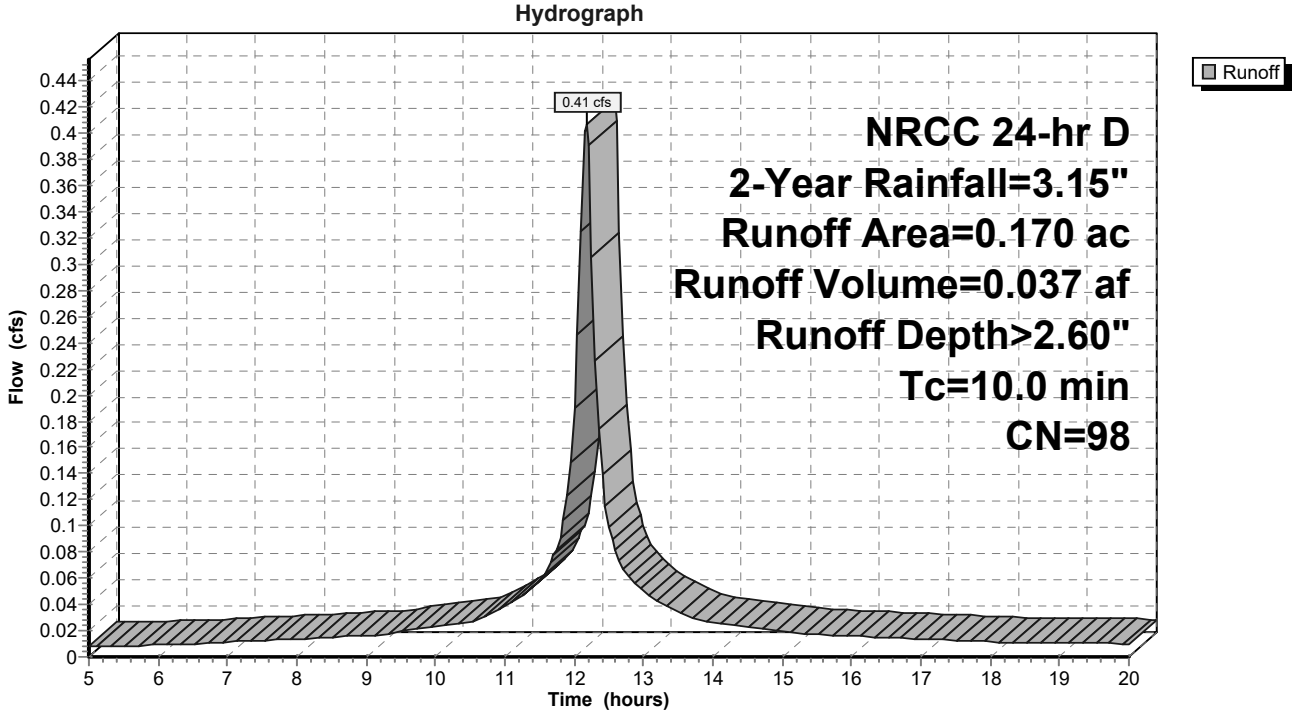
Runoff = 0.41 cfs @ 12.17 hrs, Volume= 0.037 af, Depth> 2.60"
Routed to Pond 2P : Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.15"

	Area (ac)	CN	Description
*	0.170	98	
	0.170		100.00% Impervious Area

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

Subcatchment 1S: Post-Developed Conditions



Summary for Pond 2P: Pond

Inflow Area = 0.170 ac,100.00% Impervious, Inflow Depth > 2.60" for 2-Year event
Inflow = 0.41 cfs @ 12.17 hrs, Volume= 0.037 af
Outflow = 0.30 cfs @ 12.26 hrs, Volume= 0.028 af, Atten= 27%, Lag= 5.4 min
Primary = 0.30 cfs @ 12.26 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 186.10' @ 12.26 hrs Surf.Area= 1,941 sf Storage= 601 cf

Plug-Flow detention time= 149.6 min calculated for 0.027 af (75% of inflow)
Center-of-Mass det. time= 78.0 min (820.5 - 742.5)

Volume	Invert	Avail.Storage	Storage Description
#1	185.75'	2,772 cf	**Ponding (Prismatic)** Listed below (Recalc)
#2	183.50'	186 cf	**Filter Media Voids (Prismatic)** Listed below (Recalc) 620 cf Overall x 30.0% Voids
#3	182.50'	165 cf	**Coarse Gravel Voids (Prismatic)** Listed below (Recalc) 413 cf Overall x 40.0% Voids
#4	182.25'	26 cf	**3/8" Stone Voids (Prismatic)** Listed below (Recalc) 103 cf Overall x 25.0% Voids
		3,149 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
185.75	572	0	0
186.25	757	332	332
187.25	1,200	979	1,311
188.25	1,722	1,461	2,772

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
183.50	413	0	0
185.00	413	620	620

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
182.50	413	0	0
183.50	413	413	413

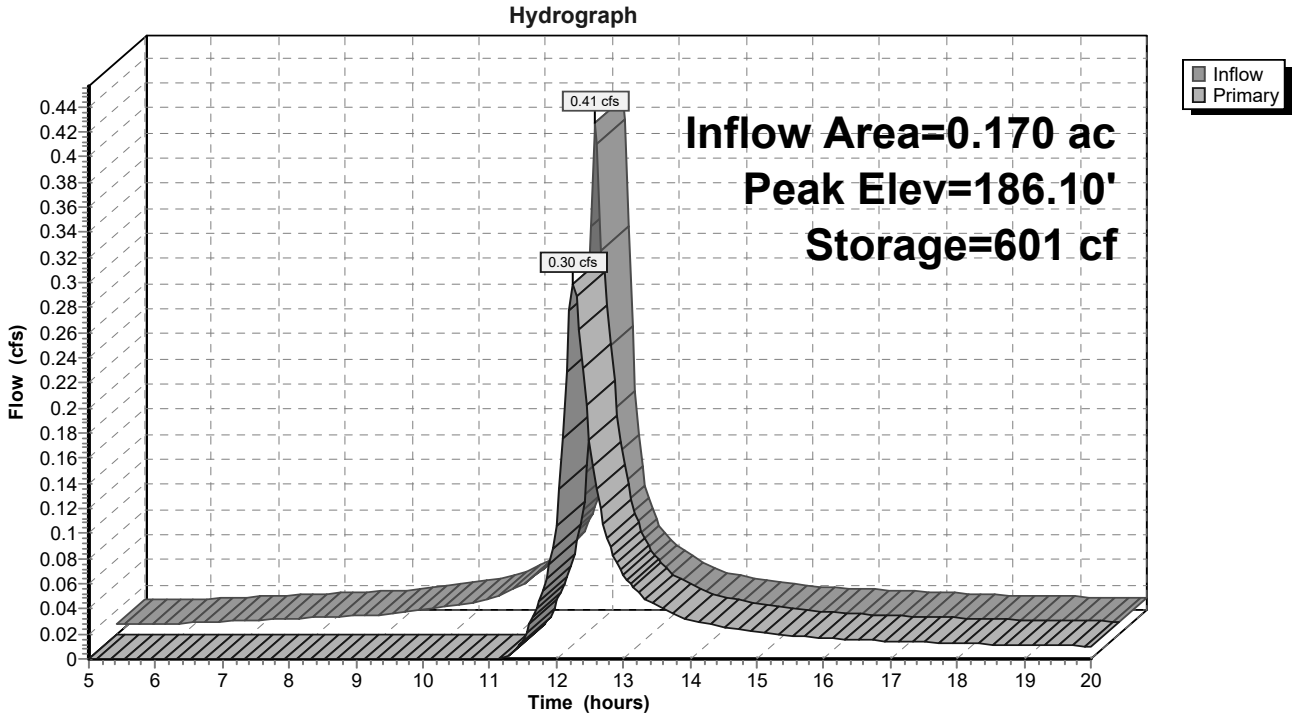
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
182.25	413	0	0
182.50	413	103	103

Device	Routing	Invert	Outlet Devices
#1	Primary	184.80'	**12.0" Round Culvert** L= 20.5' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 184.80' / 183.70' S= 0.0537 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Device 1	185.75'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

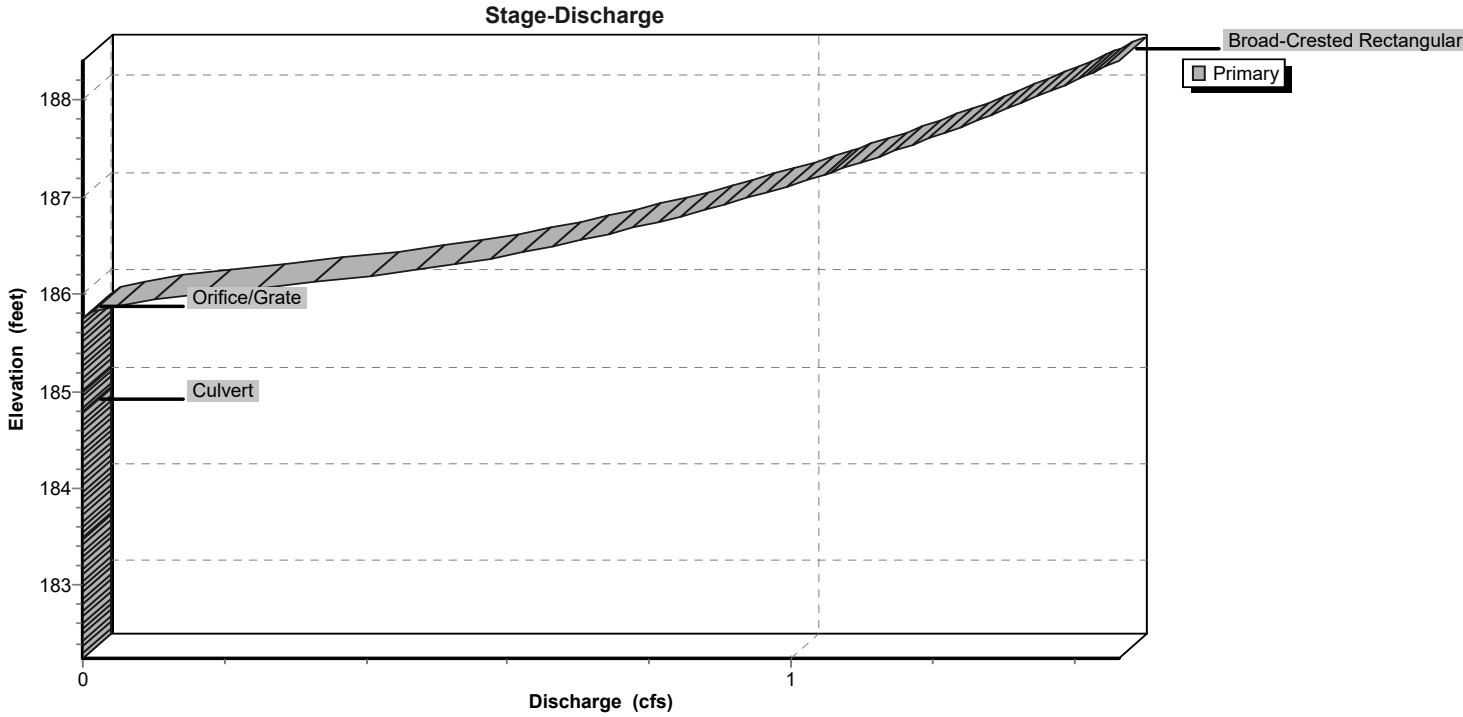
#3 Primary 188.40' **30.0' long Broad-Crested Rectangular Weir**
Head (feet) 189.00
Coef. (English) 4.00

Primary OutFlow Max=0.30 cfs @ 12.26 hrs HW=186.10' (Free Discharge)
└**1=Culvert** (Passes 0.30 cfs of 3.38 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.30 cfs @ 2.02 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

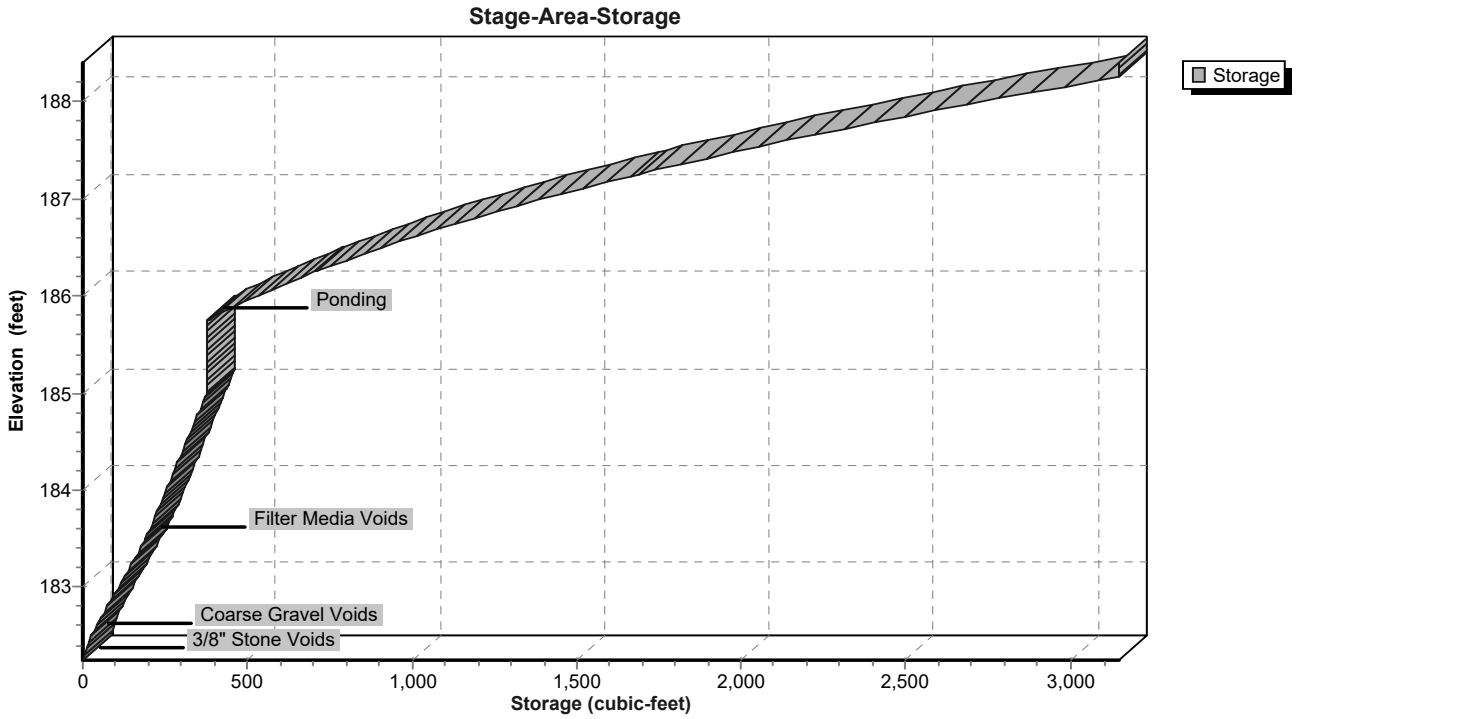
Pond 2P: Pond



Pond 2P: Pond



Pond 2P: Pond



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

Subcatchment1S: Post-Developed Runoff Area=0.170 ac 100.00% Impervious Runoff Depth>3.98"
Tc=10.0 min CN=98 Runoff=0.62 cfs 0.056 af

Pond 2P: Pond Peak Elev=186.22' Storage=690 cf Inflow=0.62 cfs 0.056 af
Outflow=0.45 cfs 0.047 af

Total Runoff Area = 0.170 ac Runoff Volume = 0.056 af Average Runoff Depth = 3.98"
0.00% Pervious = 0.000 ac 100.00% Impervious = 0.170 ac

Summary for Subcatchment 1S: Post-Developed Conditions

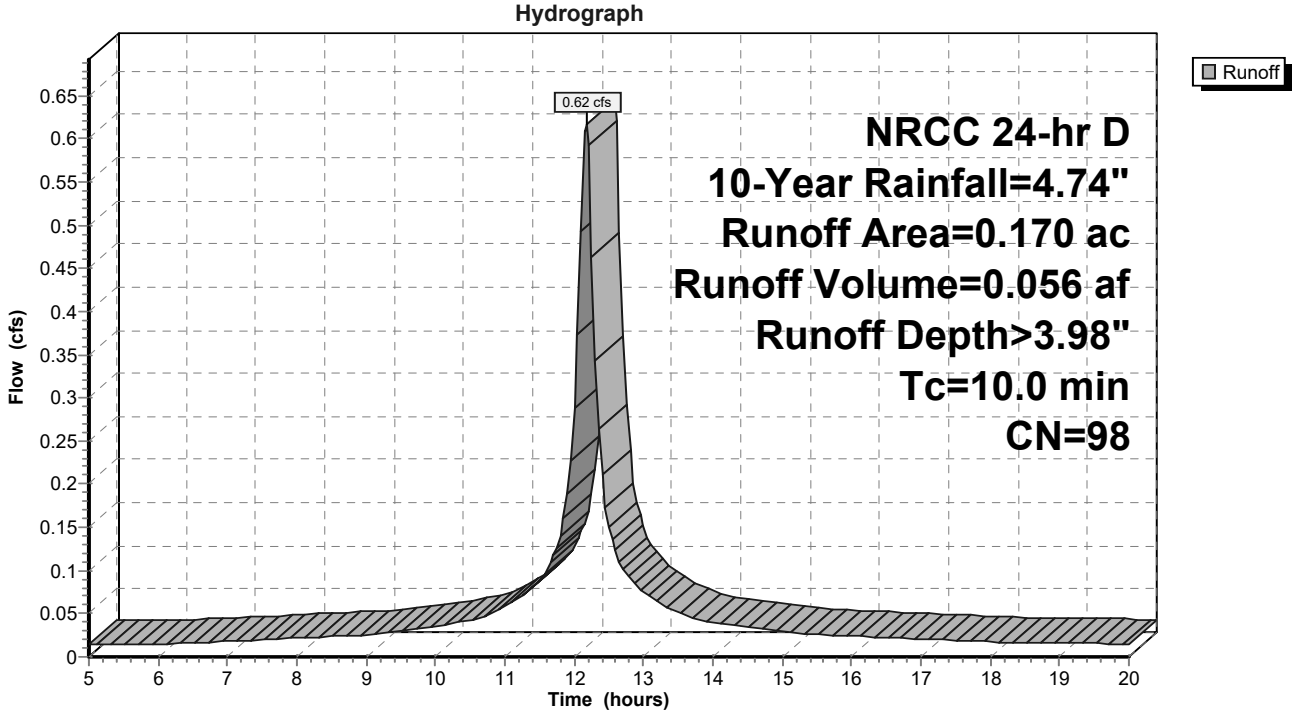
Runoff = 0.62 cfs @ 12.17 hrs, Volume= 0.056 af, Depth> 3.98"
Routed to Pond 2P : Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.74"

	Area (ac)	CN	Description
*	0.170	98	
	0.170		100.00% Impervious Area

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

Subcatchment 1S: Post-Developed Conditions



Summary for Pond 2P: Pond

Inflow Area = 0.170 ac,100.00% Impervious, Inflow Depth > 3.98" for 10-Year event
Inflow = 0.62 cfs @ 12.17 hrs, Volume= 0.056 af
Outflow = 0.45 cfs @ 12.26 hrs, Volume= 0.047 af, Atten= 28%, Lag= 5.5 min
Primary = 0.45 cfs @ 12.26 hrs, Volume= 0.047 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 186.22' @ 12.26 hrs Surf.Area= 1,986 sf Storage= 690 cf

Plug-Flow detention time= 116.8 min calculated for 0.047 af (83% of inflow)
Center-of-Mass det. time= 61.6 min (801.2 - 739.6)

Volume	Invert	Avail.Storage	Storage Description
#1	185.75'	2,772 cf	**Ponding (Prismatic)** Listed below (Recalc)
#2	183.50'	186 cf	**Filter Media Voids (Prismatic)** Listed below (Recalc) 620 cf Overall x 30.0% Voids
#3	182.50'	165 cf	**Coarse Gravel Voids (Prismatic)** Listed below (Recalc) 413 cf Overall x 40.0% Voids
#4	182.25'	26 cf	**3/8" Stone Voids (Prismatic)** Listed below (Recalc) 103 cf Overall x 25.0% Voids
		3,149 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
185.75	572	0	0
186.25	757	332	332
187.25	1,200	979	1,311
188.25	1,722	1,461	2,772

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
183.50	413	0	0
185.00	413	620	620

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
182.50	413	0	0
183.50	413	413	413

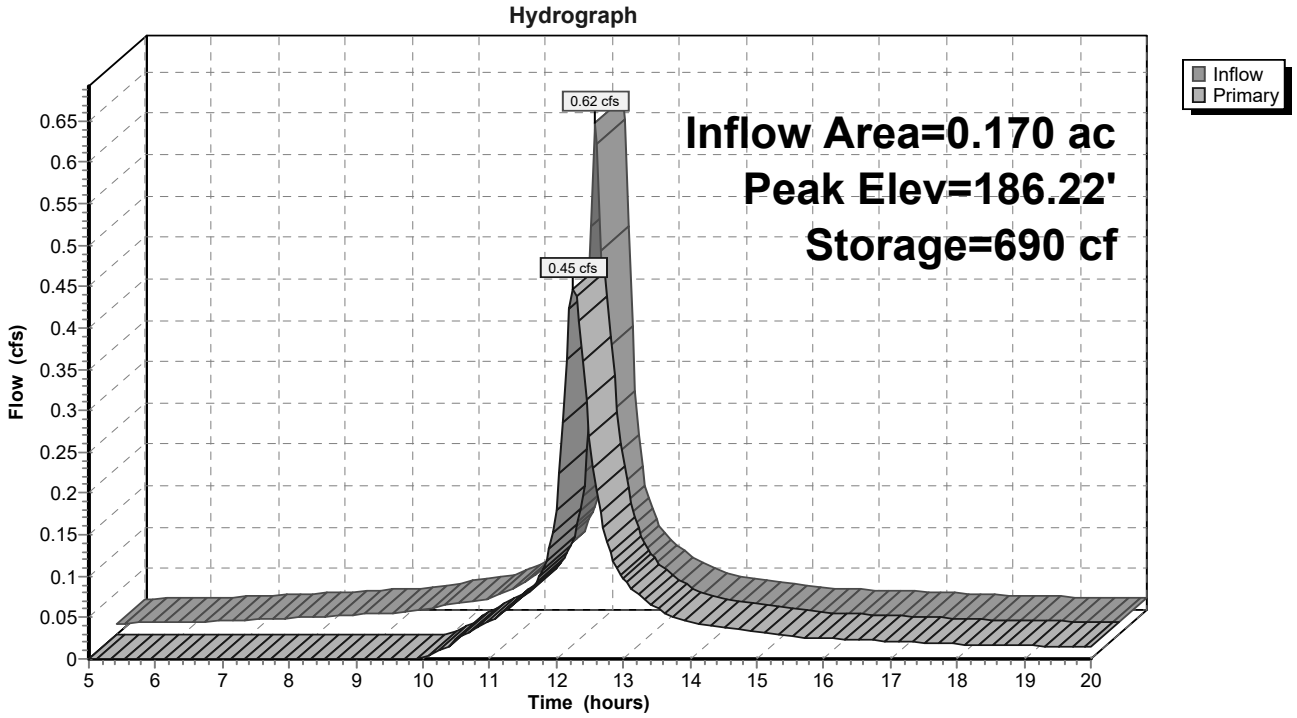
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
182.25	413	0	0
182.50	413	103	103

Device	Routing	Invert	Outlet Devices
#1	Primary	184.80'	**12.0" Round Culvert** L= 20.5' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 184.80' / 183.70' S= 0.0537 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Device 1	185.75'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

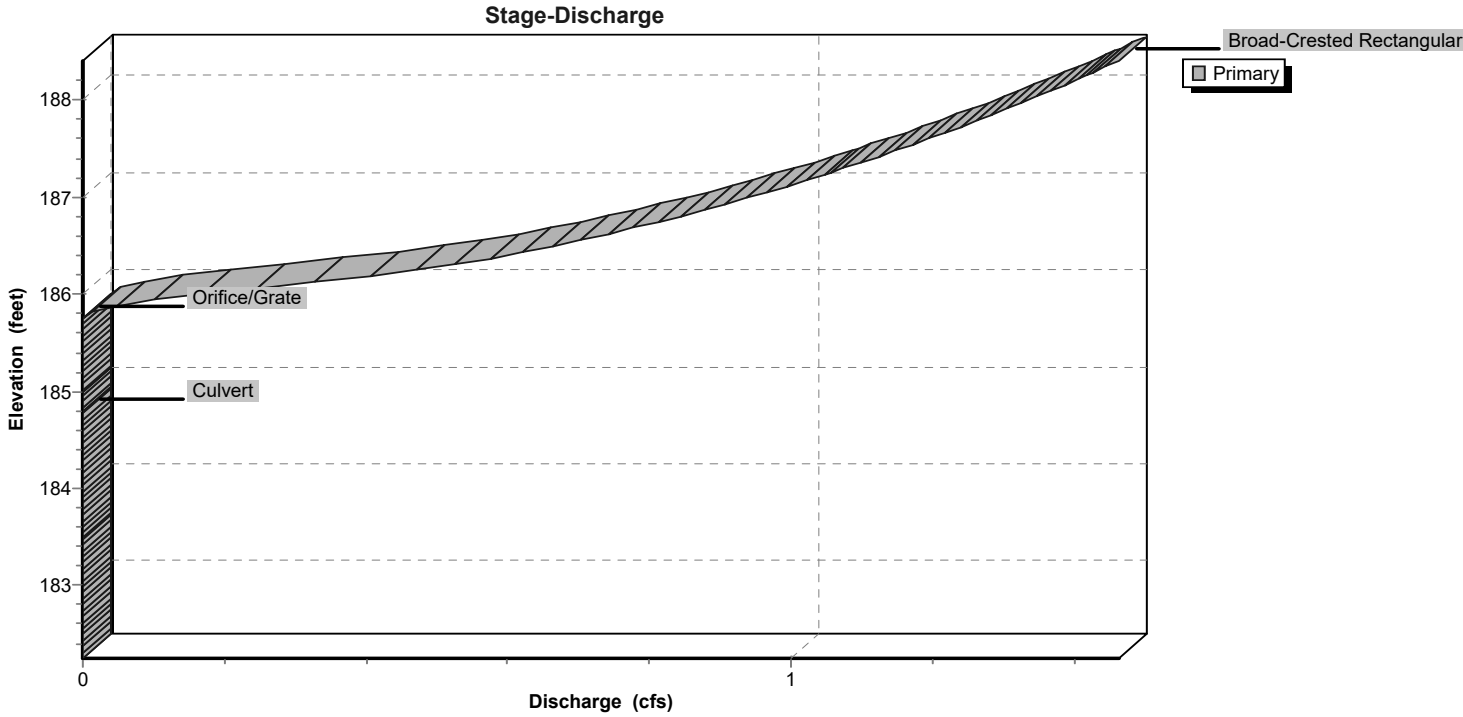
#3 Primary 188.40' **30.0' long Broad-Crested Rectangular Weir**
Head (feet) 189.00
Coef. (English) 4.00

Primary OutFlow Max=0.45 cfs @ 12.26 hrs HW=186.22' (Free Discharge)
└**1=Culvert** (Passes 0.45 cfs of 3.63 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.45 cfs @ 2.34 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

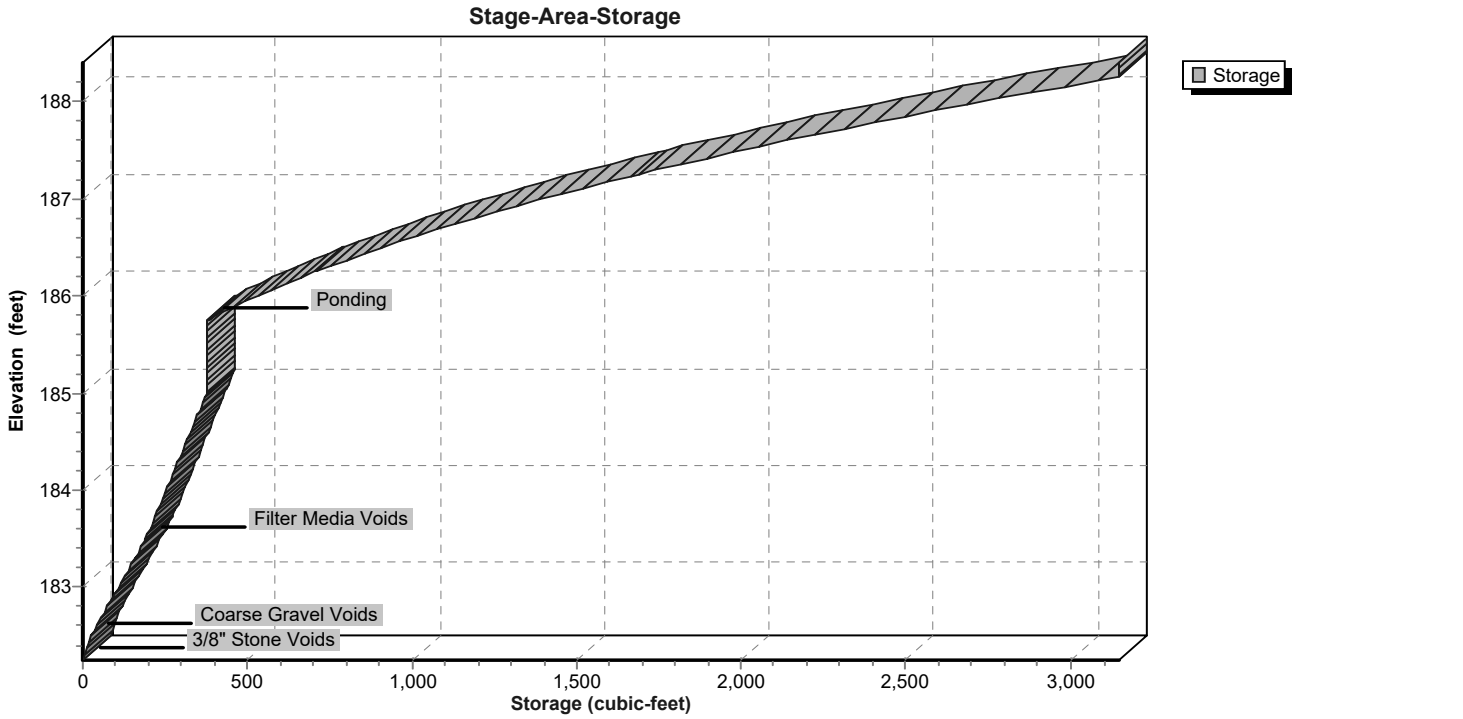
Pond 2P: Pond



Pond 2P: Pond



Pond 2P: Pond



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

Subcatchment1S: Post-Developed Runoff Area=0.170 ac 100.00% Impervious Runoff Depth>5.05"
Tc=10.0 min CN=98 Runoff=0.78 cfs 0.071 af

Pond 2P: Pond Peak Elev=186.33' Storage=767 cf Inflow=0.78 cfs 0.071 af
Outflow=0.54 cfs 0.062 af

Total Runoff Area = 0.170 ac Runoff Volume = 0.071 af Average Runoff Depth = 5.05"
0.00% Pervious = 0.000 ac 100.00% Impervious = 0.170 ac

Summary for Subcatchment 1S: Post-Developed Conditions

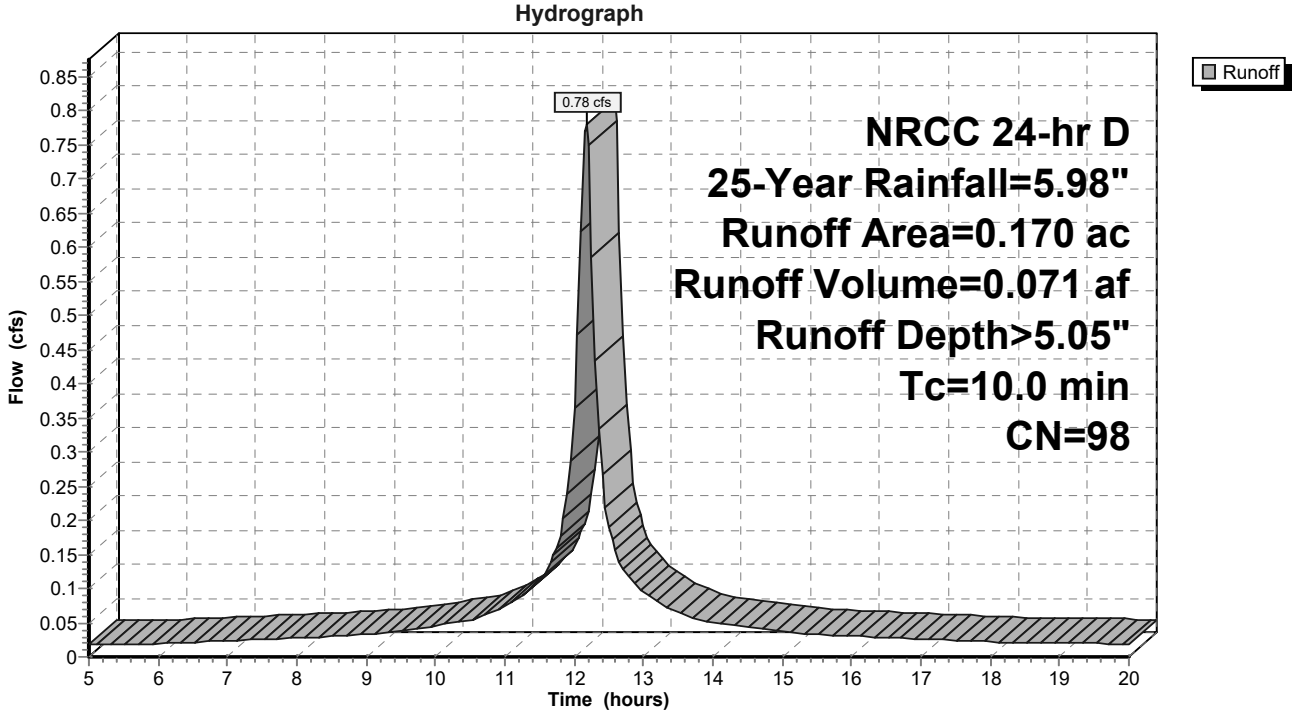
Runoff = 0.78 cfs @ 12.17 hrs, Volume= 0.071 af, Depth> 5.05"
Routed to Pond 2P : Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.98"

	Area (ac)	CN	Description
*	0.170	98	
	0.170		100.00% Impervious Area

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

Subcatchment 1S: Post-Developed Conditions



Summary for Pond 2P: Pond

Inflow Area = 0.170 ac,100.00% Impervious, Inflow Depth > 5.05" for 25-Year event
Inflow = 0.78 cfs @ 12.17 hrs, Volume= 0.071 af
Outflow = 0.54 cfs @ 12.27 hrs, Volume= 0.062 af, Atten= 31%, Lag= 6.0 min
Primary = 0.54 cfs @ 12.27 hrs, Volume= 0.062 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 186.33' @ 12.27 hrs Surf.Area= 2,029 sf Storage= 767 cf

Plug-Flow detention time= 101.6 min calculated for 0.062 af (86% of inflow)
Center-of-Mass det. time= 53.8 min (792.4 - 738.6)

Volume	Invert	Avail.Storage	Storage Description
#1	185.75'	2,772 cf	**Ponding (Prismatic)** Listed below (Recalc)
#2	183.50'	186 cf	**Filter Media Voids (Prismatic)** Listed below (Recalc) 620 cf Overall x 30.0% Voids
#3	182.50'	165 cf	**Coarse Gravel Voids (Prismatic)** Listed below (Recalc) 413 cf Overall x 40.0% Voids
#4	182.25'	26 cf	**3/8" Stone Voids (Prismatic)** Listed below (Recalc) 103 cf Overall x 25.0% Voids
		3,149 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
185.75	572	0	0
186.25	757	332	332
187.25	1,200	979	1,311
188.25	1,722	1,461	2,772

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
183.50	413	0	0
185.00	413	620	620

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
182.50	413	0	0
183.50	413	413	413

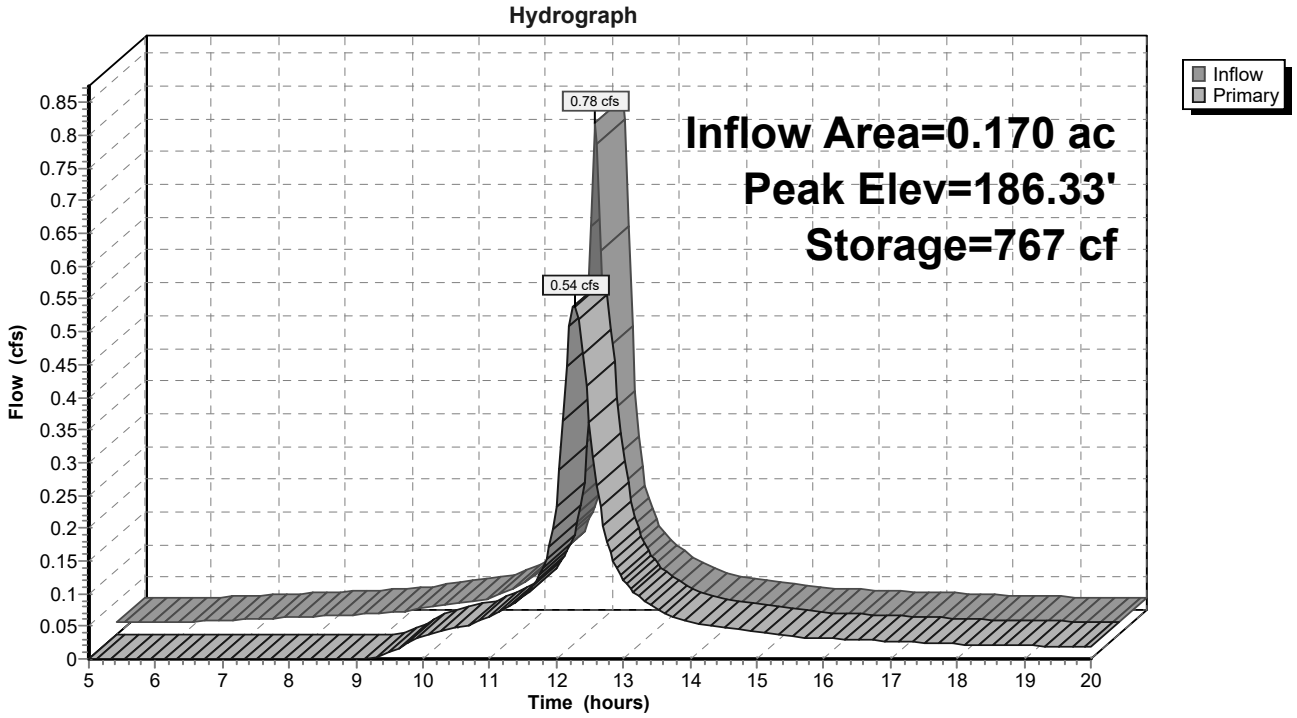
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
182.25	413	0	0
182.50	413	103	103

Device	Routing	Invert	Outlet Devices
#1	Primary	184.80'	**12.0" Round Culvert** L= 20.5' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 184.80' / 183.70' S= 0.0537 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Device 1	185.75'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

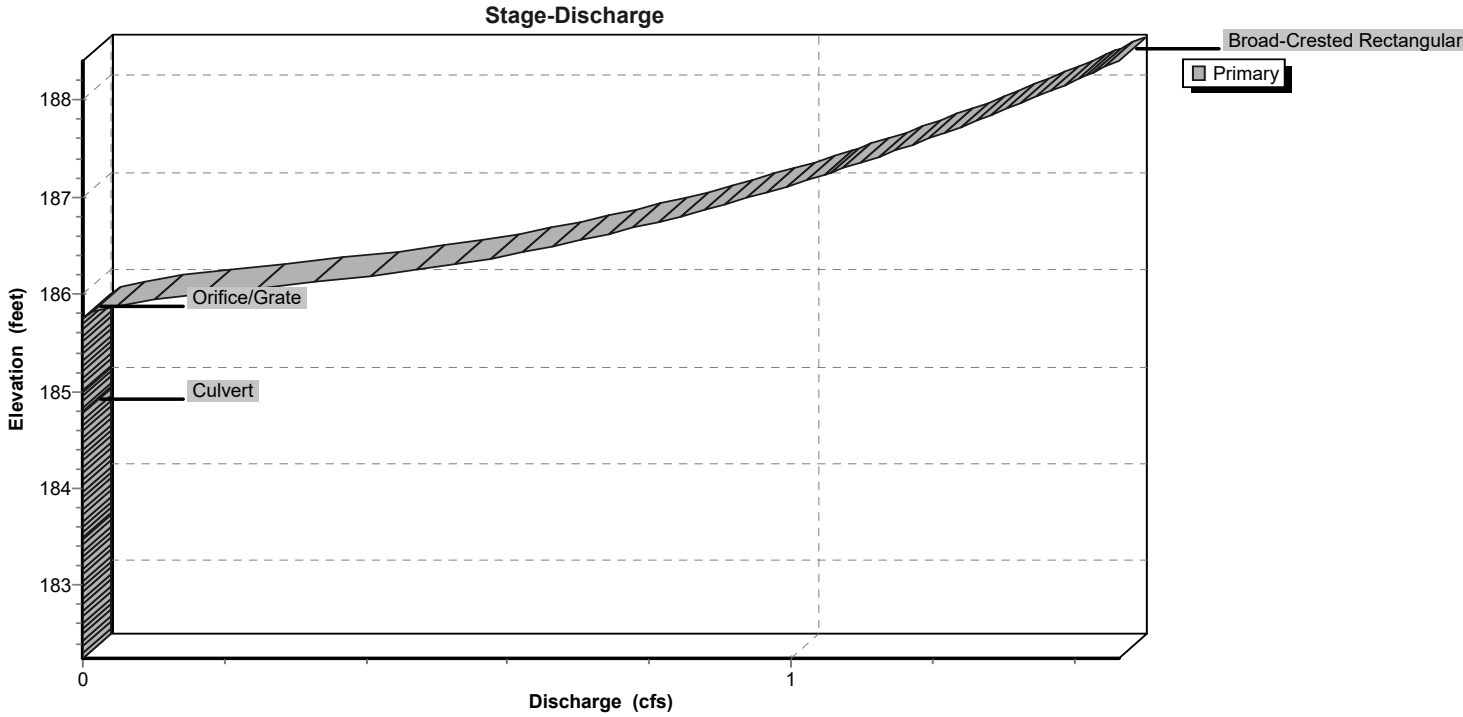
#3 Primary 188.40' **30.0' long Broad-Crested Rectangular Weir**
Head (feet) 189.00
Coef. (English) 4.00

Primary OutFlow Max=0.54 cfs @ 12.27 hrs HW=186.32' (Free Discharge)
└**1=Culvert** (Passes 0.54 cfs of 3.82 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.54 cfs @ 2.73 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

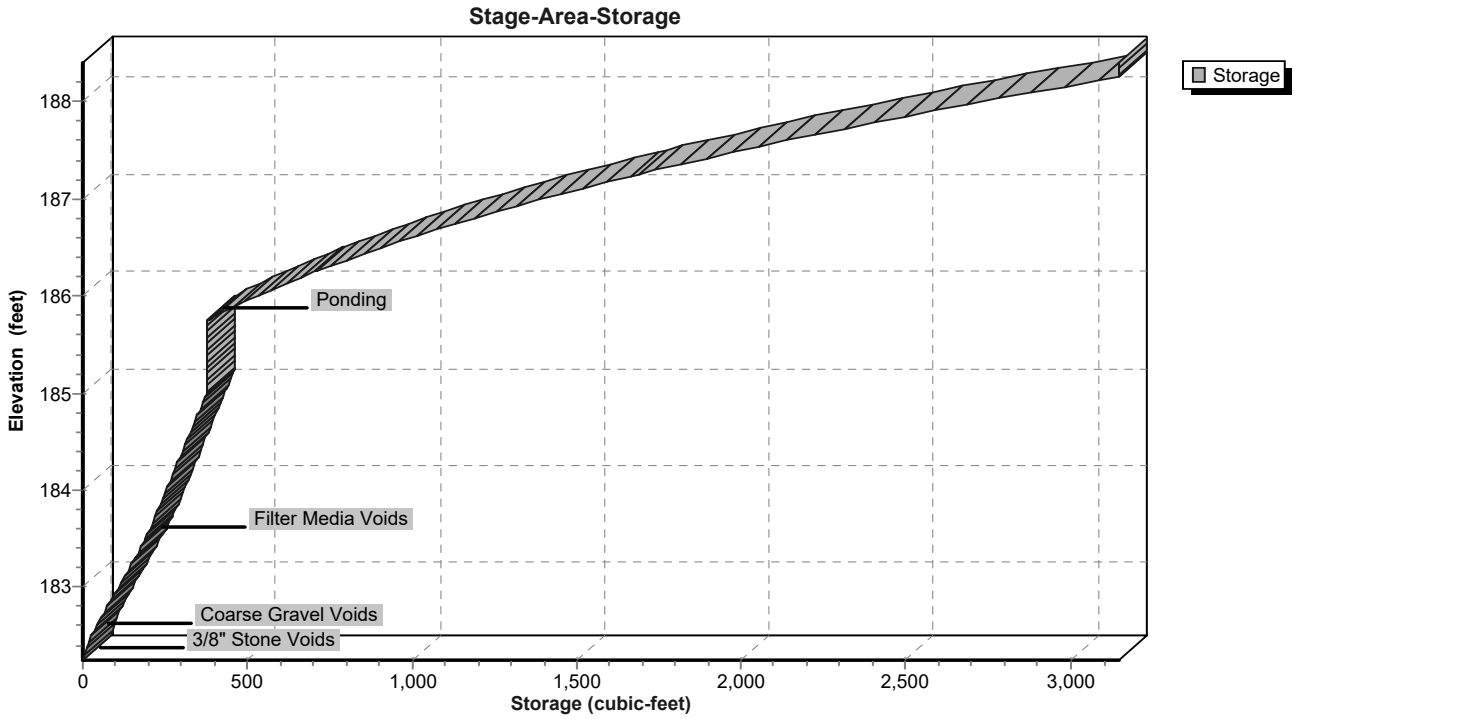
Pond 2P: Pond



Pond 2P: Pond



Pond 2P: Pond



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

Subcatchment1S: Post-Developed Runoff Area=0.170 ac 100.00% Impervious Runoff Depth>6.04"
Tc=10.0 min CN=98 Runoff=0.93 cfs 0.086 af

Pond 2P: Pond Peak Elev=186.42' Storage=847 cf Inflow=0.93 cfs 0.086 af
Outflow=0.61 cfs 0.076 af

Total Runoff Area = 0.170 ac Runoff Volume = 0.086 af Average Runoff Depth = 6.04"
0.00% Pervious = 0.000 ac 100.00% Impervious = 0.170 ac

Summary for Subcatchment 1S: Post-Developed Conditions

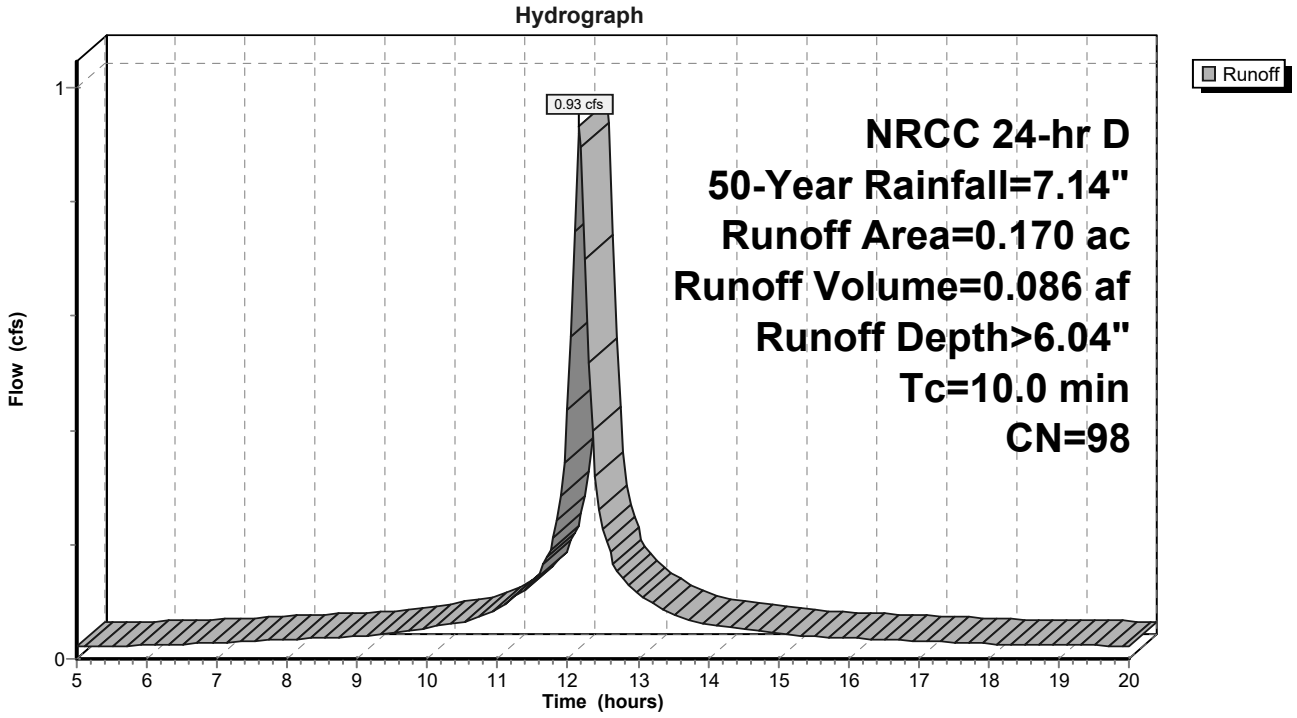
Runoff = 0.93 cfs @ 12.17 hrs, Volume= 0.086 af, Depth> 6.04"
Routed to Pond 2P : Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 50-Year Rainfall=7.14"

	Area (ac)	CN	Description
*	0.170	98	
	0.170		100.00% Impervious Area

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

Subcatchment 1S: Post-Developed Conditions



Summary for Pond 2P: Pond

Inflow Area = 0.170 ac,100.00% Impervious, Inflow Depth > 6.04" for 50-Year event
Inflow = 0.93 cfs @ 12.17 hrs, Volume= 0.086 af
Outflow = 0.61 cfs @ 12.27 hrs, Volume= 0.076 af, Atten= 34%, Lag= 6.4 min
Primary = 0.61 cfs @ 12.27 hrs, Volume= 0.076 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 186.42' @ 12.27 hrs Surf.Area= 2,073 sf Storage= 847 cf

Plug-Flow detention time= 90.5 min calculated for 0.076 af (89% of inflow)
Center-of-Mass det. time= 48.4 min (786.4 - 738.0)

Volume	Invert	Avail.Storage	Storage Description
#1	185.75'	2,772 cf	**Ponding (Prismatic)** Listed below (Recalc)
#2	183.50'	186 cf	**Filter Media Voids (Prismatic)** Listed below (Recalc) 620 cf Overall x 30.0% Voids
#3	182.50'	165 cf	**Coarse Gravel Voids (Prismatic)** Listed below (Recalc) 413 cf Overall x 40.0% Voids
#4	182.25'	26 cf	**3/8" Stone Voids (Prismatic)** Listed below (Recalc) 103 cf Overall x 25.0% Voids
		3,149 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
185.75	572	0	0
186.25	757	332	332
187.25	1,200	979	1,311
188.25	1,722	1,461	2,772

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
183.50	413	0	0
185.00	413	620	620

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
182.50	413	0	0
183.50	413	413	413

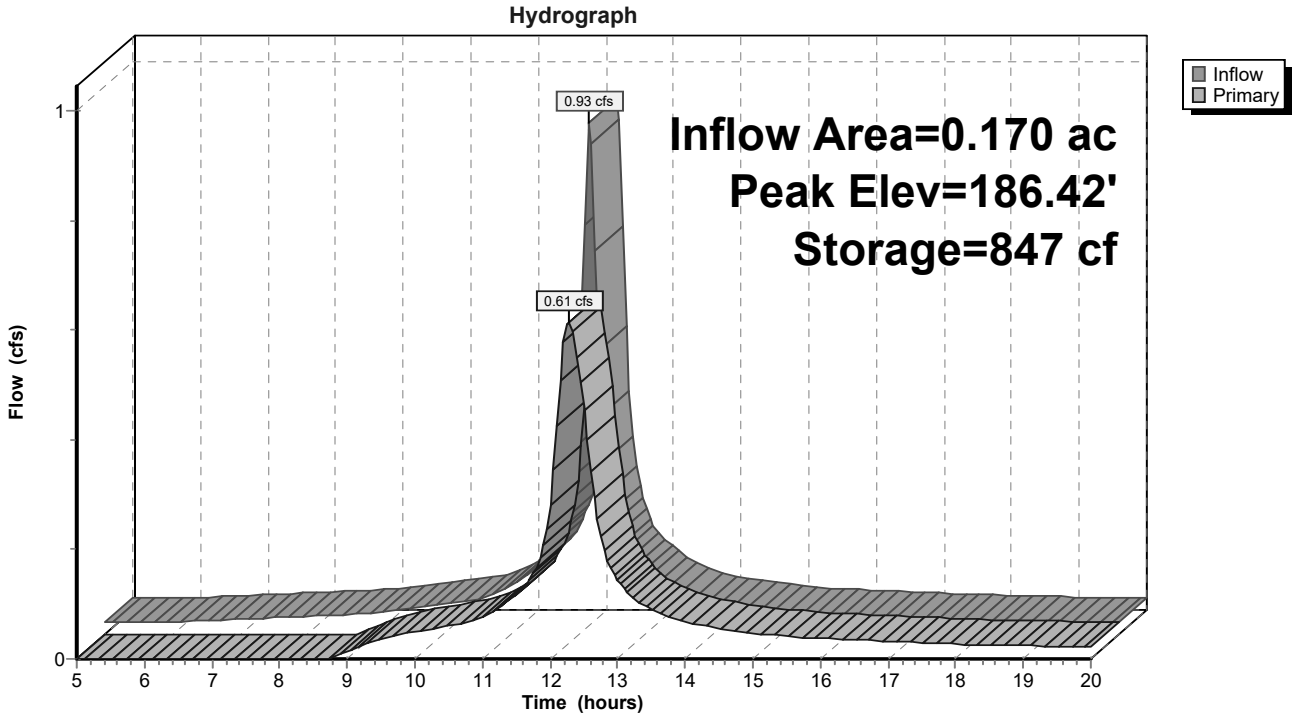
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
182.25	413	0	0
182.50	413	103	103

Device	Routing	Invert	Outlet Devices
#1	Primary	184.80'	**12.0" Round Culvert** L= 20.5' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 184.80' / 183.70' S= 0.0537 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Device 1	185.75'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

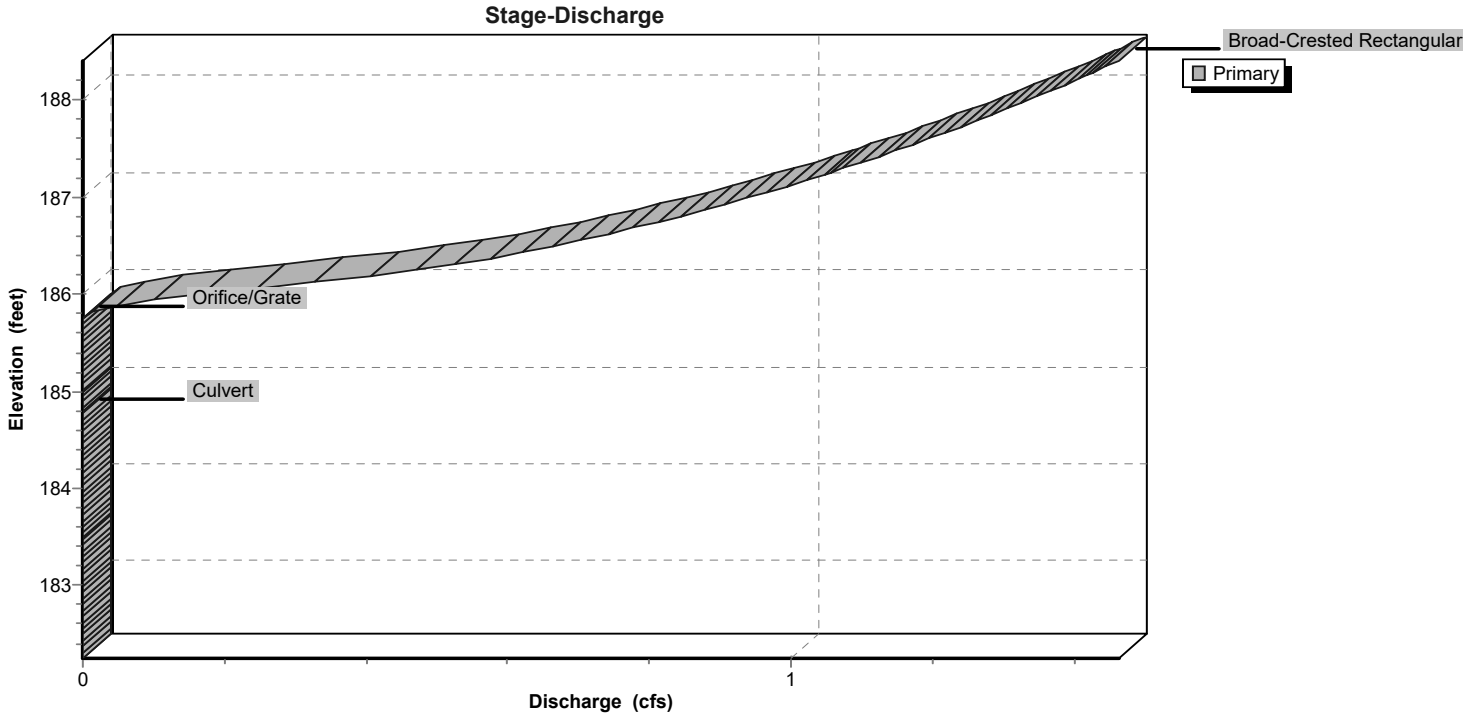
#3 Primary 188.40' **30.0' long Broad-Crested Rectangular Weir**
Head (feet) 189.00
Coef. (English) 4.00

Primary OutFlow Max=0.61 cfs @ 12.27 hrs HW=186.42' (Free Discharge)
└**1=Culvert** (Passes 0.61 cfs of 4.00 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.61 cfs @ 3.11 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

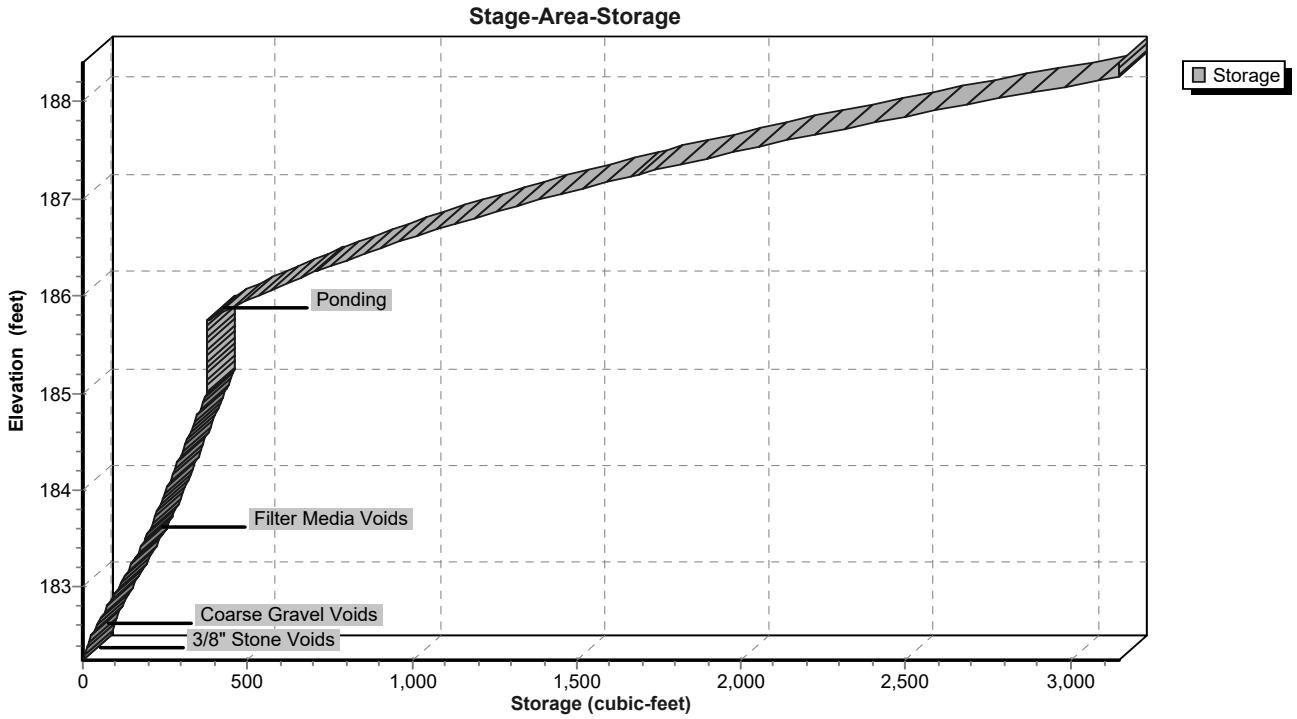
Pond 2P: Pond



Pond 2P: Pond



Pond 2P: Pond



Events for Subcatchment 1S: Post-Developed Conditions

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-Year	3.15	0.41	0.037	2.60
10-Year	4.74	0.62	0.056	3.98
25-Year	5.98	0.78	0.071	5.05
50-Year	**7.14**	**0.93**	**0.086**	**6.04**

Events for Pond 2P: Pond

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-Year	0.41	0.30	186.10	601
10-Year	0.62	0.45	186.22	690
25-Year	0.78	0.54	186.33	767
50-Year	**0.93**	**0.61**	**186.42**	**847**

APPENDIX B:
STORMWATER PIPE CALCULATIONS

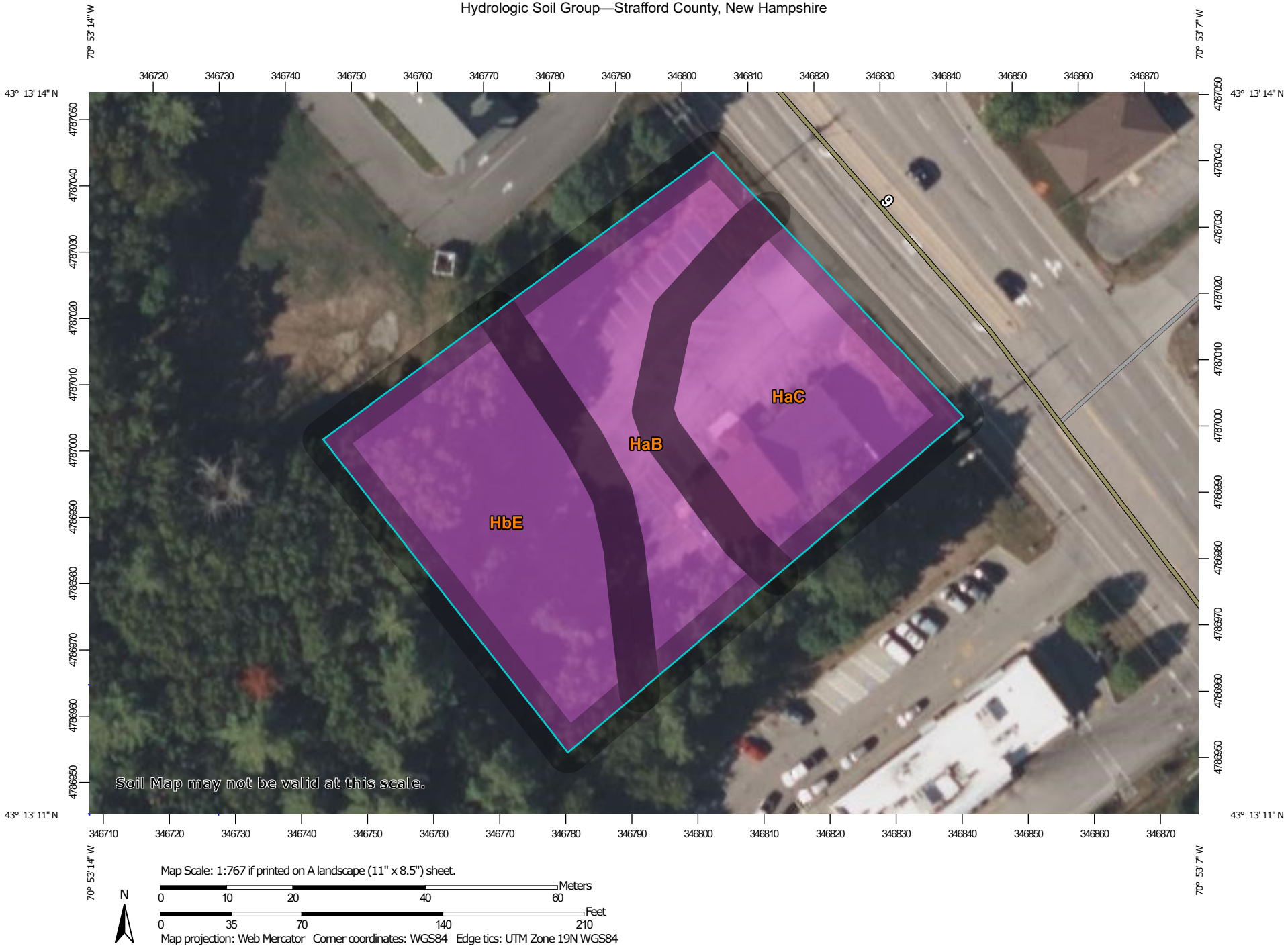
MyReport

Line No.	Line ID	Line Length (ft)	Line Size (in)	Line Slope (%)	Drng Area (ac)	Total Area (ac)	Flow Rate (cfs)	Capac Full (cfs)	Invert Dn (ft)	Invert Up (ft)	HGL Dn (ft)	Gnd/Rim El Dn (ft)	HGL Up (ft)	Gnd/Rim El Up (ft)	Junct Type	Inlet Depth (ft)	Vel Ave (ft/s)	Cover Up (ft)	Tc (min)	n-val Pipe
1	B2-B1	147.594	18	0.17	0.42	0.86	3.08	4.32	185.25	185.50	185.92	187.26	186.55	188.54	MH	....	3.18	1.54	10.3	0.013
2	B3-B2	37.846	12	2.54	0.44	0.44	1.82	5.67	185.50	186.46	186.57	188.54	187.03 j	188.96	MH	....	3.11	1.50	10.0	0.013
3	A1-EX	50.440	12	1.51	0.00	0.34	1.93	4.37	180.46	181.22	180.96	186.41	181.81	188.33	MH	....	4.45	6.11	11.5	0.013
4	A2-A1	165.609	12	1.50	0.34	0.34	2.00	4.36	181.22	183.70	181.81	188.33	184.30	189.10	MH	....	4.09	4.40	10.5	0.013
5	A3-A2	20.506	12	5.36	0.00	0.00	0.58	8.94	183.70	184.80	184.30	189.10	185.12 j	187.75	MH	....	1.95	1.95	10.0	0.012

Project File: storm.stm | Number of lines: 5 | Date: 5/24/2023

NOTES: ** Critical depth

APPENDIX C:
USDA NRCS Web Soil Survey


70° 53' 14" W
70° 53' 7" W
43° 13' 14" N
43° 13' 11" N
346720
346730
346740
346750
346760
346770
346780
346790
346800
346810
346820
346830
346840
346850
346860
346870
4787050
4787040
4787030
4787020
4787010
4787000
4786990
4786980
4786970
4786960
4786950
HaC
HaB
HbE
9
Soil Map may not be valid at this scale.
346710
Map Scale: 1:767 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0
10
20
40
60
Feet
0
35
70
140
210
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

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

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

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

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
HaB	Hinckley loamy sand, 3 to 8 percent slopes	A	0.3	30.7%
HaC	Hinckley loamy sand, 8 to 15 percent slopes	A	0.3	32.3%
HbE	Hinckley loamy sand, 15 to 60 percent slopes	A	0.4	37.0%
Totals for Area of Interest			**1.1**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

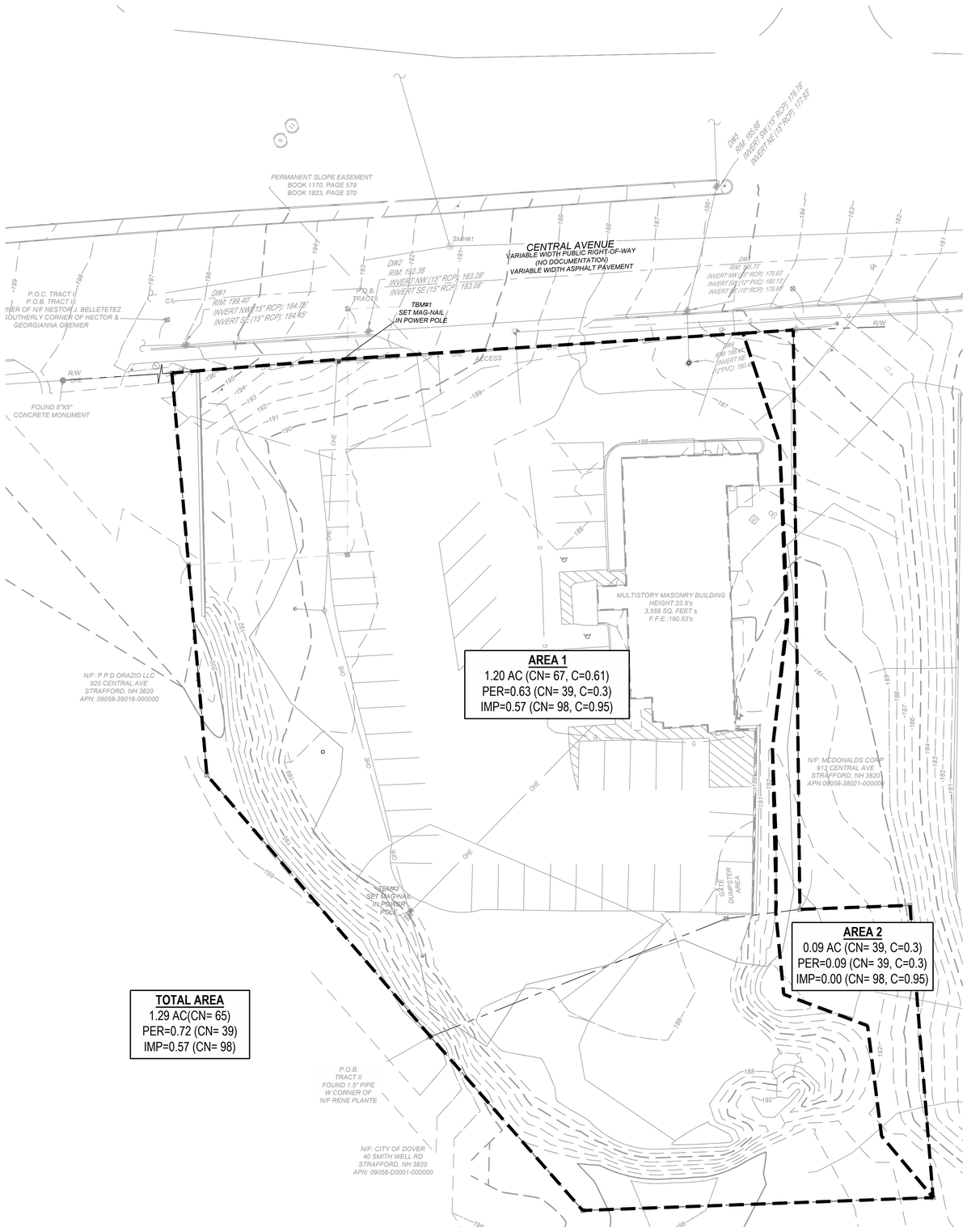
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX D:
DRAINAGE AREA MAPS

APPENDIX D1:
EXISTING CONDITIONS DRAINAGE AREA MAP



811 DigSafe MA-ME-NH-RI-VT

SEVENTY-TWO (72) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: NEW HAMPSHIRE UTILITIES PROTECTION SERVICE AT 811 OR 888-344-7233 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

N

20 0 20 40

GRAPHIC SCALE (IN FEET)
1 in. = 20 ft.

CESO
WWW.CESOINC.COM
3601 Rigby Rd., Suite 300
Miamisburg, OH 45342
Phone: 937.435.8584 Fax: 888.208.4826

HANG TEN CAR WASH

DOVER, NH

914 CENTRAL AVE.
DOVER, NH 03820

Revisions / Submissions

ID	Description	Date

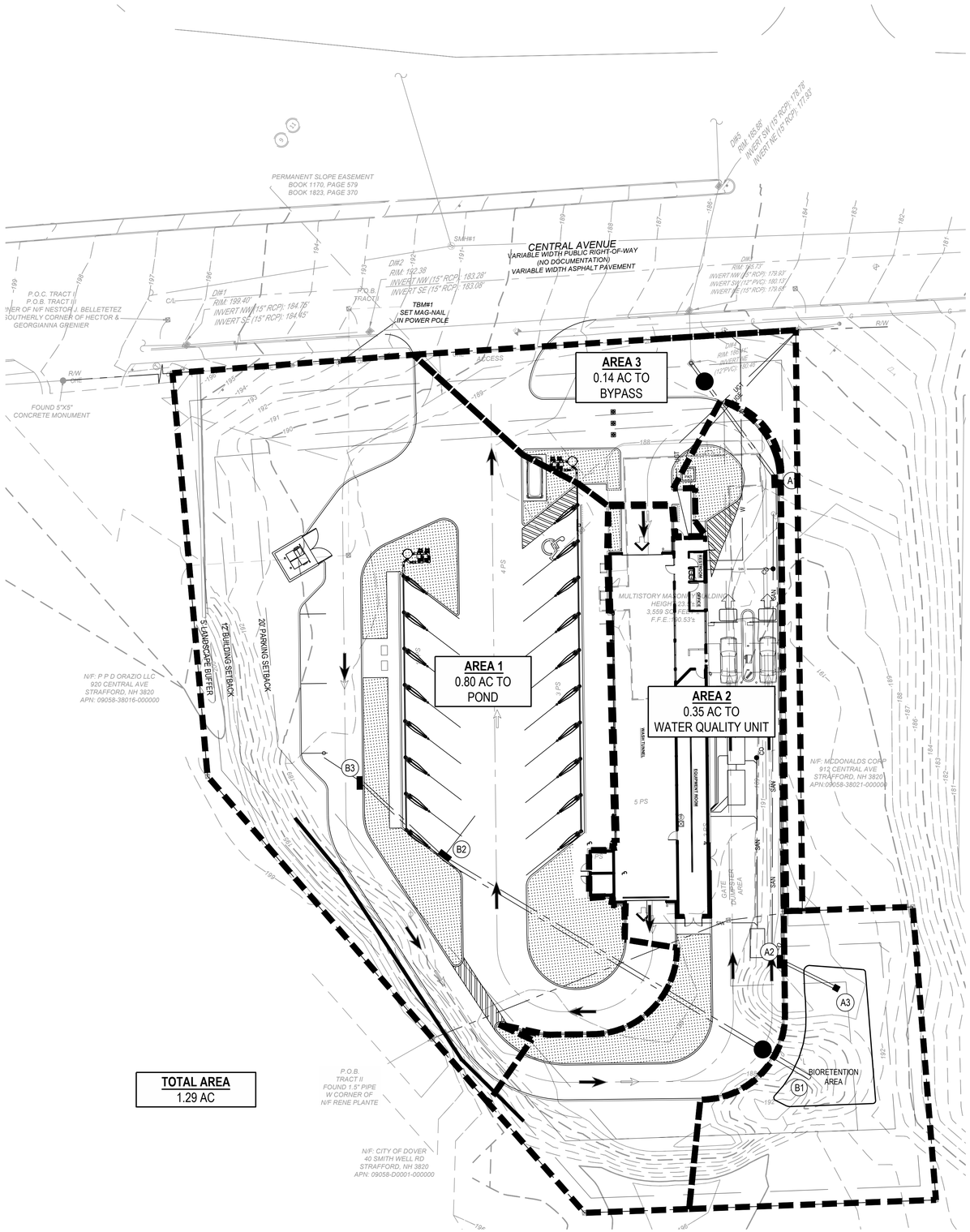
Project Number:	761168
Scale:	1'=20'
Drawn By:	NTV
Checked By:	HGC
Date:	06/22/2023
Issue:	PERMIT

Drawing Title:
PRE-DRAINAGE EXHIBIT

EX1.0

W:\PROJECTS\WEA\761766-01_Hang 10_Dover_NH\03-CIVIL\PLANS\EXHIBITS\DRAINAGE EXHIBIT.dwg - 7/21/2023 - Hosea Cunningham

APPENDIX D2:
PROPOSED CONDITIONS DRAINAGE AREA MAP



SEVENTY-TWO (72) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: NEW HAMPSHIRE UTILITIES PROTECTION SERVICE AT 811 OR 888-344-7233 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

20 0 20 40

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Revisions / Submissions

ID	Description	Date

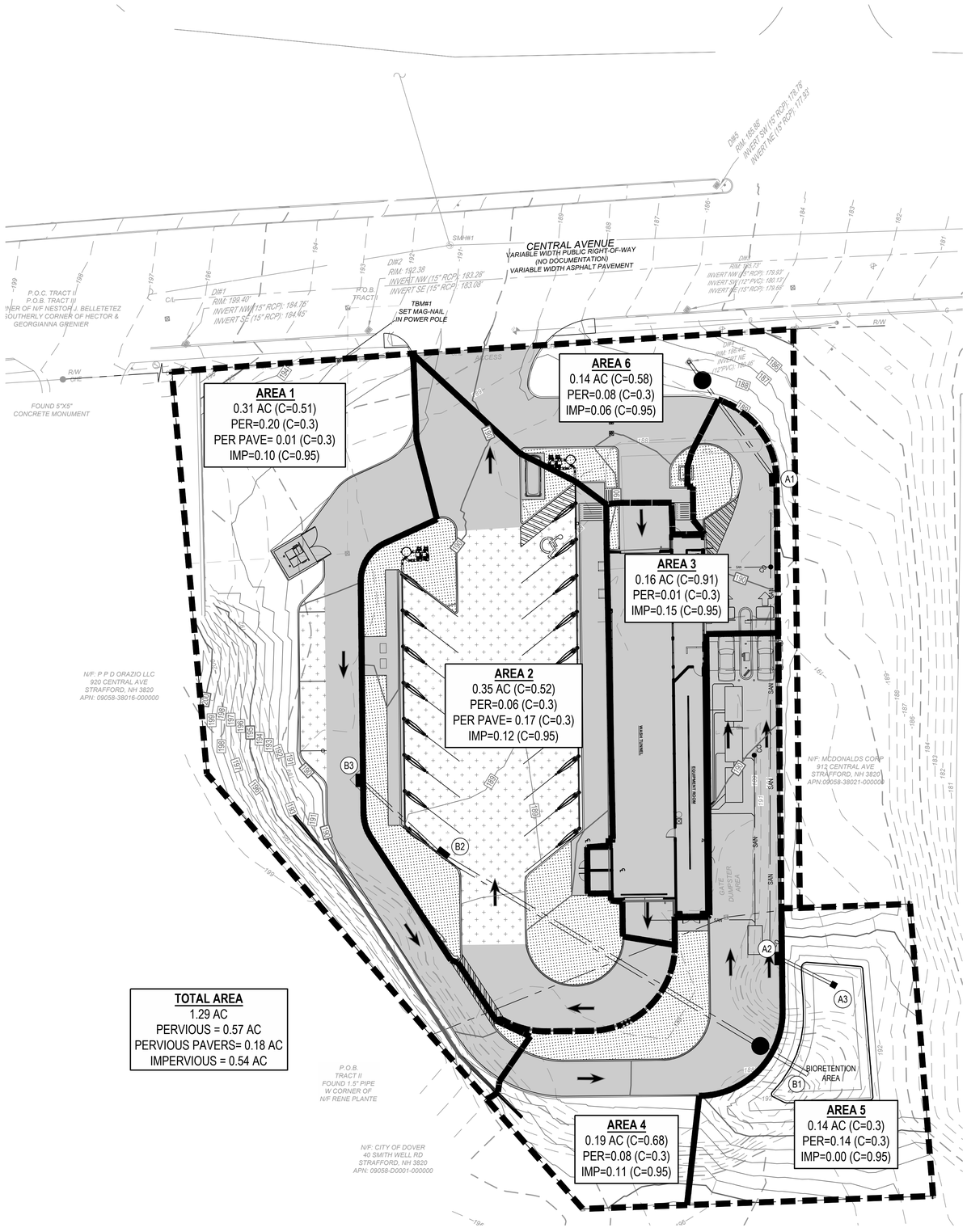
Project Number:	761168
Scale:	1'=20'
Drawn By:	NTV
Checked By:	HGC
Date:	06/22/2023
Issue:	PERMIT

Drawing Title:
POST-DRAINAGE EXHIBIT

EX1.2

W:\PROJECTS\WEA\761768-01_Hang 10_Dover_NH\03-CIVIL\PLAN\EXHIBITS\DRAINAGE EXHIBIT.dwg - 7/21/2023 - Hosea Cunningham

APPENDIX D3:
TRIBUTARY DRAINAGE AREA MAP



TOTAL AREA
1.29 AC
PERVIOUS = 0.57 AC
PERVIOUS PAVERS= 0.18 AC
IMPERVIOUS = 0.54 AC

SITE LEGEND

EXISTING

REFER TO C1.0 FOR EXISTING FEATURES LEGEND

PROPOSED

PROPOSED IMPERVIOUS PAVEMENT

PROPOSED PERVIOUS PAVEMENT

PROPOSED PERVIOUS AREA

PIPE DATA						
PIPE	SLOPE (%)	n	DIAMETER (IN)	VELOCITY (FT/S)	CAPACITY (CFS)	10-YR FLOW (CFS)
A1-EX	1.51	0.012	12.00	6.00	4.72	4.34
A2-A1	1.50	0.012	12.00	6.00	4.71	3.38
A3-A2	5.36	0.012	12.00	11.30	8.89	2.53
B2-B1	0.17	0.013	18.00	2.20	2.65	2.25
B3-B2	2.54	0.013	12.00	7.20	5.65	1.05

PEAK DISCHARGE				
DRAINAGE AREA	C	I (IN/HR)	A (AC)	10-YR FLOW (CFS)
AREA 1	0.51	6.61	0.31	1.05
AREA 2	0.52	6.61	0.35	1.20
AREA 3	0.91	6.61	0.16	0.96
AREA 4	0.68	6.61	0.19	0.85
AREA 5	0.30	6.61	0.14	0.28
AREA 6	0.58	6.61	0.14	0.54

811 DigSafe MA-ME-NH-RI-VT

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1 in. = 20 ft.

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HANG TEN CAR WASH

DOVER, NH

914 CENTRAL AVE.
DOVER, NH 03820

Revisions / Submissions

ID	Description	Date

Project Number:	761766
Scale:	1'=20'
Drawn By:	NTV
Checked By:	HGC
Date:	06/23/2023
Issue:	PERMIT

Drawing Title:
POST-DRAINAGE EXHIBIT

EX1.1

W:\PROJECTS\WEA\761766-01_Hang 10_Dover_NH\03-CIV\LPLAN\EXHIBITS\DRAINAGE EXHIBIT.dwg - 7/21/2023 - Hosea Cunningham

ALTA/NSPS LAND TITLE SURVEY

914 CENTRAL AVE

DOVER, STRAFFORD, NEW HAMPSHIRE 03820

TITLE COMMITMENT INFORMATION

THE PROPERTY HEREON DESCRIBED IS THE SAME AS THE PERTINENT PROPERTY AS DESCRIBED IN CONNECTICUT ATTORNEYS TITLE INSURANCE COMPANY (C.A.T.I.C.), AGENT NO.: 004402, WITH A COMMITMENT DATE OF 9/19/2022.

SCHEDULE A DESCRIPTION

RE: 914 CENTRAL AVENUE, DOVER, NH 03820

THREE CERTAIN PARCELS OF LAND WITH ANY BUILDINGS THEREON, LOCATED ON THE WESTERLY SIDE OF CENTRAL AVENUE, DOVER, COUNTY OF STRAFFORD AND STATE OF NEW HAMPSHIRE, BEING MORE PARTICULARLY DESCRIBED ON PLAN ENTITLED, "PLAN OF LAND NESTOR J. BELLETETE - DOVER, NEW HAMPSHIRE, DATED NOVEMBER 1955 AND DRAWN BY G.L. DAVIS & ASSOCIATES, ENGINEERS - 44 ELM STREET, DOVER, N.H.", RECORDED AT THE STRAFFORD COUNTY REGISTRY OF DEEDS AS PLAN #28A, POCKET #2, FOLDER #21, BOUNDED AND DESCRIBED AS FOLLOWS:

TRACT I:

BEGINNING AT AN IRON STAKE DRIVEN IN THE GROUND SITUATE ON THE WESTERLY SIDE OF SAID HIGHWAY SIXTY-TWO AND FIFTY HUNDREDTHS (62.50) FEET SOUTHERLY FROM THE NORTHEASTERLY CORNER OF LAND NOW OR FORMERLY OF NESTOR J. BELLETETE; THENCE RUNNING SOUTH 25° 00' EAST TO AN IRON STAKE AND OTHER LAND NOW OR FORMERLY OF SAID BELLETETE ONE HUNDRED FIFTY-FOUR (154) FEET; THENCE TURNING AND RUNNING SOUTH 66° 58' WEST TO AN IRON PIN AND LAND NOW OR FORMERLY OF ONE HYMAN L. PINDRUS, TWO HUNDRED FOURTEEN AND FIVE TENTHS (214.5) FEET; THENCE TURNING AND RUNNING NORTH 29° 30' WEST BY AND ALONG SAID PINDRUS LAND TO A PINE STUMP TWENTY-FIVE AND SEVEN TENTHS (25.7) FEET; THENCE RUNNING NORTH 44° 10' WEST BY AND ALONG SAID PINDRUS LAND ONE HUNDRED TEN (110) FEET TO AN IRON PIN; THENCE TURNING AND RUNNING NORTH 27° 05' EAST BY AND ALONG LAND OF ONE VICTOR GRENIER ONE HUNDRED NINETEEN (119) FEET TO AN IRON STAKE; THENCE TURNING AND RUNNING N 62° 39' EAST BY AND ALONG SAID GRENIER LAND SEVENTY-TWO AND NINE TENTHS (72.9) FEET TO A STAKE IN THE GROUND AND OTHER LAND NOW OR FORMERLY OF SAID BELLETETE; THENCE TURNING AND RUNNING SOUTH 26° 04' EAST BY AND ALONG LAND OWNED BY SAID BELLETETE FIFTY-FIVE (55) FEET TO AN IRON STAKE; THENCE TURNING AND RUNNING NORTH 67° 42' EAST EIGHTY-FIVE (85) FEET TO THE POINT OF BEGINNING.

EXCEPTING A CERTAIN PARCEL OF LAND LOCATED ON CENTRAL AVENUE IN THE CITY OF DOVER, NEW HAMPSHIRE. SAID PARCEL BEING LOCATED WESTERLY OF CENTRAL AVENUE, AS NOW TRAVELED, AND DESIGNATED AS PARCEL #28 AND 28-A AS SHOWN AND DESCRIBED ON A RIGHT-OF-WAY MAP PREPARED BY KIMBALL CHASE COMPANY, INC., ENTITLED "CENTRAL AVENUE RECONSTRUCTION PROJECT #83-398" SHEET 6 AND 7 OF 7. REGISTERED AT THE STRAFFORD COUNTY REGISTRY OF DEEDS, MARCH 30, 1984, AS 24A-12 AND 13 AND CONSISTING OF .03 ACRES AND 88 SQUARE FEET, MORE OR LESS, AND MORE PARTICULARLY BOUNDED AND DESCRIBED BY REFERENCE TO ABOVE-MENTIONED MAP IN DEED OF TCD REALTY, INC, TO CITY OF DOVER DATED APRIL 18, 1984 AND RECORDED AT STRAFFORD COUNTY REGISTRY OF DEEDS AT BOOK 1130, PAGE 721.

TRACT II:

RE: 914 CENTRAL AVENUE, DOVER, NH 03820

BEGINNING AT AN IRON PIPE AT THE NORTHERLY CORNER OF THE HEREIN DESCRIBED PARCEL OF LAND WHICH POINT IS ALSO THE WESTERLY CORNER OF LAND NOW OR FORMERLY OF RENE PLANTE AND RUNNING THENCE SOUTH 44° 10' EAST BY OTHER LAND NOW OR FORMERLY OF RENE PLANTE A DISTANCE OF ONE HUNDRED TEN (110) FEET TO A POINT; THENCE CONTINUING SOUTH 29° 30' EAST BY SAID OTHER LAND OF PLANTE A DISTANCE OF TWENTY-FIVE AND SEVEN TENTHS (25.7) FEET TO AN IRON PIPE AT LAND NOW OR FORMERLY OF DOVER MCCOY CO., INC., THENCE CONTINUING BY SAID LAND NOW OR FORMERLY OF DOVER MCCOY CO., INC., SOUTH 24° 29' EAST A DISTANCE OF THIRTY-EIGHT (38) FEET TO A POINT, THENCE TURNING AND RUNNING BY OTHER LAND NOW OR FORMERLY OF DOVER MCCOY CO., INC, SOUTH 63° 05' 30" WEST A DISTANCE OF ONE HUNDRED ONE AND FOUR TENTHS (101.4) FEET TO LAND NOW OR FORMERLY OF RUTH PINDRUS; THENCE TURNING AND RUNNING BY SAID LAND NOW OR FORMERLY OF RUTH PINDRUS NORTH 24° 29' WEST A DISTANCE OF ONE HUNDRED TWENTY-ONE AND TWO TENTHS (121.2) FEET TO LAND OF THE CITY OF DOVER, THENCE TURNING AND RUNNING BY SAID LAND OF THE CITY OF DOVER NORTH 26° 25' EAST A DISTANCE OF SEVENTY-NINE AND EIGHT TENTHS (79.8) FEET TO THE POINT OF BEGINNING.

TRACT III:

BEGINNING AT AN IRON STAKE SITUATE AT THE NORTHEASTERLY CORNER OF THE PREMISES HEREIN CONVEYED AND AT THE SOUTHERLY CORNER OF PROPERTY NOW OR FORMERLY OF HECTOR AND GEORGIANNA GRENIER; THENCE RUNNING SOUTH 25° 54' EAST SIXTY-TWO AND FIFTY HUNDREDTHS (62.50) FEET TO AN IRON STAKE AND LAND FORMERLY OF OLIVIA PLANTE, ET AL; THENCE TURNING AND RUNNING SOUTH 67° 42' WEST BY AND ALONG SAID PLANTE'S LAND EIGHTY-FIVE (85) FEET TO AN IRON STAKE AND OTHER LAND OF SAID PLANTE; THENCE TURNING AND RUNNING NORTH 26° 04' WEST FIFTY-FIVE AND NO HUNDREDTHS (55.00) FEET BY AND ALONG SAID PLANTE'S LAND TO AN IRON STAKE AND LAND OF SAID GRENIER; THENCE TURNING AND RUNNING NORTH 62° 39' EAST BY AND ALONG SAID GRENIER'S LAND EIGHTY-FIVE AND NO HUNDREDTHS (85.00) FEET TO THE POINT OF BEGINNING.

SAID TRACT III ALSO BEING CONVEYED TOGETHER WITH THE RIGHT AND EASEMENT RELATING TO LAND NOW OR FORMERLY OF ANITA DOHERTY RECORDED IN THE STRAFFORD COUNTY REGISTRY OF DEEDS.

EXCEPTING FROM SAID TRACT III, THE PARCEL CONVEYED BY RENE PLANTE TO ANITA M. DOHERTY RECORDED IN THE STRAFFORD COUNTY REGISTRY OF DEEDS.

RE: 914 CENTRAL AVENUE, DOVER, NH 03820

BEING THE SAME PROPERTY CONVEYED TO KITTY HO LAM, TRUSTEE OF THE HO FAMILY REVOCABLE TRUST OF 2003, BY DEED RECORDED JANUARY 8, 2021 IN BOOK 4855 PAGE 727.

PROPERTY ADDRESS:

(FOR REFERENCE ONLY)

914 CENTRAL AVENUE

DOVER, NH

THE PROPERTY SHOWN AND DEPICTED HEREON IS THE SAME AS THE PERTINENT PROPERTY AS DESCRIBED IN CONNECTICUT ATTORNEYS TITLE INSURANCE COMPANY (C.A.T.I.C.), AGENT NO.: 004402, WITH A COMMITMENT DATE OF 9/19/2022.

NOTES CORRESPONDING TO SCHEDULE B

6 — *6. TERMS AND CONDITIONS AS SHOWN ON PLAN REFERENCED IN THE PROPERTY DESCRIPTION HEREIN. (AFFECTS, CONTAINS NO PLOTTABLE EASEMENT ITEMS)*

7 — *7. RIGHT OF WAY AS SHOWN ON PLAN IN BOOK 24A-12 & 24A-13. (AFFECTS, CONTAINS NO PLOTTABLE EASEMENT ITEMS)*

8 — *8. EASEMENT RECORDED IN BOOK 1512 PAGE 471. (AFFECTS, CONTAINS NO PLOTTABLE EASEMENT ITEMS)*

9 — *9. NOTICE OF CONDEMNATION RECORDED IN BOOK 1770 PAGE 579. (AFFECTS, PLOTTED AS SHOWN)*

10 — *10. ORDER RECORDED IN BOOK 1823 PAGE 369. (AFFECTS, CONTAINS NO PLOTTABLE EASEMENT ITEMS)*

11 — *11. AMENDED DECLARATION OF TAKING RECORDED IN BOOK 1823 PAGE 370. (AFFECTS, PLOTTED AS SHOWN)*

12 — *12. RIGHT OF WAY SHOWN IN PLAN BOOK 56-69 & 56-82. (UNABLE TO PLOT, BOOK 56-69 AND 56-82 NOT PROVIDED)*

ZONING INFORMATION

PROPERTY IS CURRENTLY ZONED: AWAITING ZONING REPORT

ITEM	REQUIRED	OBSERVED
PERMITTED USE		RESTURANT
MIN. LOT AREA		56,078 SQ. FEET±
MIN. LOT FRONTAGE		215.31'
MAX. BLDG COVERAGE		06%±
MIN. SETBACKS FRONT		40.1'
MIN. SETBACKS SIDE		12.4'
MIN. SETBACKS REAR		163.4'
MAX. BUILDING HEIGHT		23.5±
PARKING REGULAR		44
PARKING HANDICAP		2
PARKING TOTAL		46

PARKING INFORMATION:

NOTES: BECAUSE THERE MAY BE A NEED FOR INTERPRETATION OF THE APPLICABLE ZONING CODES, WE REFER YOU TO STRAFFORD COUNTY FOR ZONING LAWS AND APPLICABLE CODES.

INVERT INFORMATION

SMH#1
RIM ELEVATION: 191.24'
INVERT NW (12" CLAY): 183.44'
INVERT NE (12" CLAY): 183.64'
INVERT SE (12" CLAY): 183.29'

DI#1
RIM ELEVATION: 199.40'
INVERT NW (15" RCP): 184.75'
INVERT SE (15" RCP): 184.45'

DI#2
RIM ELEVATION: 192.38'
INVERT NW (15" RCP): 183.28'
INVERT SE (15" RCP): 183.08'

DI#3
RIM ELEVATION: 185.73'
INVERT NW (15" RCP): 179.93'
INVERT SW (12" PVC): 180.13'
INVERT NE (15" RCP): 179.68'

DI#4
RIM ELEVATION: 186.41'
INVERT NE (12" PVC): 180.46'

DI#5
RIM ELEVATION: 185.88'
INVERT SW (15" RCP): 178.78'
INVERT NE (15" RCP): 177.93'

PARKING INFORMATION

REGULAR= 44
HANDICAP= 2
TOTAL= 46

FLOOD ZONE INFORMATION

BY GRAPHIC PLOTTING ONLY, THIS PROPERTY IS IN ZONE "X" OF THE FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO.33017C0310E, WHICH BEARS AN EFFECTIVE DATE OF 09/30/2015 AND IS NOT IN A SPECIAL FLOOD HAZARD AREA

ZONE "X" - AREA OF MINIMAL FLOOD HAZARD, USUALLY DEPICTED ON FIRMS AS ABOVE THE 500-YEAR FLOOD LEVEL. ZONE "X" IS THE AREA DETERMINED TO BE OUTSIDE THE 500-YEAR FLOOD AND PROTECTED BY LEVEE FROM 100-YEAR FLOOD.

BASIS OF BEARINGS

THE BASIS OF BEARINGS OF THIS SURVEY IS GRID NORTH BASED ON THE WEST LINE OF THE SUBJECT PROPERTY. THE BEARING IS DENOTED AS S51°20'52"W PER GPS COORDINATE OBSERVATIONS NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM, NAD83.
LATITUDE = 43°13'13.6708"
LONGITUDE = -70°53'10.1389"
CONVERGENCE ANGLE = 00°32'04.2776"

SIGNIFICANT OBSERVATIONS

NONE OBSERVED AT THE TIME OF THE ALTA/NSPS SURVEY.

UTILITY INFORMATION

THE UTILITIES SHOWN ON THIS DRAWING HEREON HAVE BEEN LOCATED BY FIELD MEASUREMENTS, UTILITY MAP DRAWINGS, AND ONE-CALL UTILITY LOCATE REQUEST. BLEW & ASSOCIATES MAKES NO WARRANTY TO THE EXACT LOCATION OF ANY UNDERGROUND UTILITIES SHOWN OR NOT SHOWN ON THIS DRAWING. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ANY AND ALL UTILITIES PRIOR TO CONSTRUCTION. CALL NEW HAMPSHIRE ONE-CALL AT 888-344-7233 FOR FIELD LOCATIONS (REQUEST FOR GROUND MARKINGS) OF UNDERGROUND UTILITY LINES BEFORE DIGGING.
TICKET NUMBER: 20224215321

COMPANY:	CONTACT:
DOVER, CITY OF	603-516-6450
CONSOLIDATED COMMUNICATIONS	800-778-9140
UNITIL - NORTHN UTILITIES - NH - GAS	603-294-5177
EVERSOURCE - ELECTRIC	207-852-8315
COMCAST - NH	800-778-9140
UNITIL - UNIVERSITY OF NH GAS SYSTEM	603-294-5177

LEGEND & SYMBOLS

- FOUND MONUMENT AS-NOTED
- COMPUTED POINT
- TELEPHONE MANHOLE
- HANDICAP PARKING
- FIRE HYDRANT
- GAS VALVE
- SANITARY MANHOLE
- FLAG POLE
- POWER POLE
- ELECTRIC METER
- SIGN
- GUY ANCHOR
- AIR CONDITIONER
- WATER VALVE
- DRAIN GRATE
- CLEANOUT
- NG — NATURAL GROUND
- BB — BOTTOM OF BANK
- TB — TOP OF BANK
- TA — TOP OF ASPHALT
- BOC — BACK OF CURB
- FL — FLOW LINE
- EC — EDGE OF CONCRETE
- (M) — MEASURED/CALCULATED DIMENSION
- (R) — RECORD DIMENSION
- N/F — NOW OR FORMERLY
- B.H.L. — BUILDING HEIGHT LOCATION
- F.F.E. — FINISHED FLOOR ELEVATION
- P.O.C. — POINT OF COMMENCEMENT
- P.O.B. — POINT OF BEGINNING
- PVC — POLYVINYL CHLORIDE PIPE
- RCP — REINFORCED CONCRETE PIPE
- SMH — SANITARY MANHOLE
- DMH — STORM MANHOLE
- DI — DRAINAGE INLET
- BOUNDARY LINE
- SS — UNDERGROUND SANITARY SEWER LINE
- R/W — RIGHT-OF-WAY LINE
- C/L — CENTERLINE
- FENCE LINE
- SS — UNDERGROUND SANITARY SEWER LINE
- OHP — OVERHEAD POWER LINE
- SD — UNDERGROUND STORM DRAIN LINE
- GAS — UNDERGROUND GAS LINE
- TREE LINE
- FOP — UNDERGROUND FIBER OPTIC LINE
- UGE — UNDERGROUND ELECTRIC LINE

TEMPORARY BENCHMARK INFORMATION

TBM#1
SET MAG-NAIL IN SOUTHEAST SIDE OF POWER POLE
NORTHING: 263586.58
EASTING: 1192294.13
ELEVATION: 194.23'

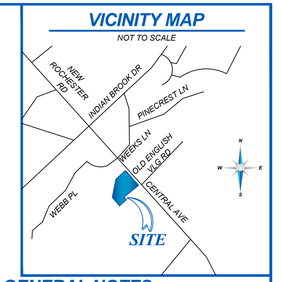
TBM#2
SET MAG-NAIL IN EAST SIDE OF POWER POLE
NORTHING: 263450.25
EASTING: 1192159.97
ELEVATION: 189.64'

LINE TABLE

LINE	BEARING	DISTANCE
L1(M)	N 47°01'30" E	18.43'
L2(M)	N 52°04'42" E	17.31'
L3(M)	S 51°20'52" W	14.29'
L4(M)	N 45°07'18" W	25.70'
L4(R)	N 29°30'00" W	25.70'
L4(R)	S 29°30'00" E	25.70'

VICINITY MAP

NOT TO SCALE



GENERAL NOTES

1. *SOME FEATURES SHOWN ON THIS PLAT MAY BE SHOWN OUT OF SCALE FOR CLARITY.*
2. *DIMENSIONS ON THIS PLAT ARE EXPRESSED IN FEET AND DECIMAL PARTS THEREOF UNLESS OTHERWISE NOTED. MONUMENTS WERE FOUND AT POINTS WHERE INDICATED.*
3. *IN REGARD TO TABLE A ITEM 16, THERE WAS NO OBSERVABLE EVIDENCE OF RECENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR ADDITIONS EXCEPT AS SHOWN HEREON.*
4. *IN REGARD TO TABLE A ITEM 17, THERE WERE NO KNOWN PROPOSED CHANGES IN RIGHT OF WAY LINES, RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS EXCEPT AS SHOWN HEREON.*
5. *AT THE TIME OF THE ALTA SURVEY, THERE WAS NO OBSERVABLE EVIDENCE OF SITE USE AS A SOLID WASTE DUMP, SUMP, OR SANITARY LANDFILL.*
6. *AT THE TIME OF THE ALTA SURVEY, THERE WAS NO OBSERVABLE EVIDENCE OF SITE USE AS A CEMETERY, ISOLATED GRAVE SITE OR BURIAL GROUNDS.*
7. *COMPLETED FIELD WORK WAS NOVEMBER 7, 2022.*
8. *THE DISTANCES SHOWN HEREON ARE UNITS OF GROUND MEASUREMENTS.*
9. *THE NEAREST INTERSECTING STREET IS THE INTERSECTION OF WEBB PLACE AND CENTRAL AVENUE, WHICH IS APPROXIMATELY 200' FROM THE NORTHWEST CORNER OF THE SUBJECT PROPERTY.*
10. *THE SUBJECT PROPERTY HAS DIRECT PHYSICAL ACCESS TO CENTRAL AVENUE, BEING A PUBLICLY DEDICATED RIGHT-OF-WAY.*
11. *EXCEPT AS SPECIFICALLY STATED OR SHOWN ON THIS PLAT, THIS SURVEY DOES NOT PURPORT TO REFLECT ANY OF THE FOLLOWING WHICH MAY BE APPLICABLE TO THE SUBJECT PROPERTY: EASEMENTS, OTHER THAN POSSIBLE EASEMENTS WHICH WERE VISIBLE AT THE TIME OF SURVEY; RESTRICTIVE COVENANTS; SUBDIVISION RESTRICTIONS OR OTHER LAND USE REGULATIONS; AND ANY OTHER FACTS WHICH AN ACCURATE TITLE SEARCH MAY DISCLOSE.*
12. *NO SURVEYOR OR ANY OTHER PERSON OTHER THAN A LICENSED NEW HAMPSHIRE ATTORNEY MAY PROVIDE LEGAL ADVICE CONCERNING THE STATUS OF TITLE TO THE PROPERTY DESCRIBED IN THIS SURVEY ("THE SUBJECT PROPERTY"). THE PURPOSE OF THIS SURVEY, AND THE COMMENTS RELATED TO THE SCHEDULE B-II EXCEPTIONS, IS ONLY TO SHOW THE LOCATION OF BOUNDARIES AND PHYSICAL OBJECTIONS IN RELATION THERETO, TO THE EXTENT THAT THE SURVEY INDICATES THAT THE LEGAL INSTRUMENT "AFFECTS" THE SUBJECT PROPERTY, SUCH STATEMENT IS ONLY INTENDED TO INDICATE THAT PROPERTY BOUNDARIES INCLUDED IN SUCH INSTRUMENT INCLUDE SOME OR ALL OF THE SUBJECT PROPERTY. THE SURVEYOR DOES NOT PURPORT TO DESCRIBE HOW SUCH INSTRUMENT AFFECTS THE SUBJECT PROPERTY OR THE ENFORCEABILITY OR LEGAL CONSEQUENCES OF SUCH INSTRUMENT.*
13. *NAMES AND ADDRESSES OF ADJOINING PROPERTY OWNERS WERE TAKEN FROM STRAFFORD COUNTY GIS.*
14. *IN REGARD TO TABLE A ITEM 10, NO VISIBLE DIVISION OR PARTY WALLS WITH RESPECT TO ADJOINING PROPERTIES WERE OBSERVED AT THE TIME THE FIELD SURVEY WAS PERFORMED, NOR WERE ANY DESIGNATED BY THE CLIENT.*
15. *ELEVATIONS ESTABLISHED WITH GPS STATIC OBSERVATIONS UTILIZING ONLINE POSITIONING USER SERVICE (OPUS) FOR POST PROCESSING, VERTICAL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM (NAVD88) IN US SURVEY FEET. CONTOURS SHOWN ARE AT ONE FOOT INTERVALS.*

LAND AREA

TRACT I:
52,191 ± SQUARE FEET
1.198 ± ACRES

TRACT II:
13,408 ± SQUARE FEET
0.308 ± ACRES

TRACT III:
3,887 ± SQUARE FEET
0.089 ± ACRES

TOTAL AREA:
56,078 ± SQUARE FEET
1.287 ± ACRES

SURVEYOR'S CERTIFICATE

TO: CONNECTICUT ATTORNEYS TITLE INSURANCE COMPANY (C.A.T.I.C.):

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2021 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 2, 3, 4, 5, 6A, 6B, 7B1, 7C, 8, 9, 10, 13, 14, 16, 17, AND 19 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON 11/07/2022.

DATE OF PLAT OR MAP: 11/30/2022

PRELIMINARY

HOLLAND E. SHAW
PROFESSIONAL LAND SURVEYOR NO. 632
STATE OF NEW HAMPSHIRE
NEW HAMPSHIRE C.O.A. 00545

BLEW & ASSOCIATES, P.A.
Surveying
Engineering
Mapping
3825 N. SHILOH DRIVE - FAYETTEVILLE, AR 72703
EMAIL:SURVEY@BLEWINC.COM
OFFICE: 479.443.4506 FAX: 479.582.1883
EMAIL: SURVEY@BLEWINC.COM-WWW.BLEWINC.COM

DATE	REVISION HISTORY	BY
12/07/2022	CLIENT COMMENTS	PJZ

SURVEYOR JOB NUMBER: 22-10520	**SURVEY DRAWN BY:** PJZ - 11/30/2022
SURVEY REVIEWED BY: S.T.M.	**SHEET:** 1 OF 1

CITY OF DOVER, STRAFFORD COUNTY, NEW HAMPSHIRE

SITE PLANS

FOR

HANG TEN CAR WASH

914 CENTRAL AVENUE
DOVER, NH 03820

OWNER/DEVELOPER:
HANG TEN CAR WASH
1380 SOLDIERS FIELD ROAD
BOSTON, MA 02135
CONTACT: STEVE LUKIN

ENGINEER:
CESO, INC.
216 CENTERVIEW DRIVE, SUITE 150
BRENTWOOD, TN 37027
PHONE: (615) 932-5187
CONTACT: HOSEA CUNNINGHAM

GOVERNING AGENCIES AND UTILITY COMPANIES:

ZONING:
CITY OF DOVER
288 CENTER AVE.
DOVER, NH 03820
PHONE: (603) 516-6008

GAS SERVICE:
UNITIL NORTHERN UTILITIES, INC.
325 WEST RD.
PORTSMOUTH, NH 03801
PHONE: (603) 534-2379

WATER & SEWER:
CITY OF DOVER PUBLIC WORKS
271 MAST RD.
DOVER, NH 03820
PHONE: (603) 516-6450

ELECTRIC:
EVERSOURCE SERVICE SUPPORT
BRAMBER II
ROCHESTER, NH 03867
PHONE: (800) 362-7764

STORMWATER:
CITY OF DOVER
271 MAST RD.
DOVER, NH 03820
PHONE: (603) 516-6450

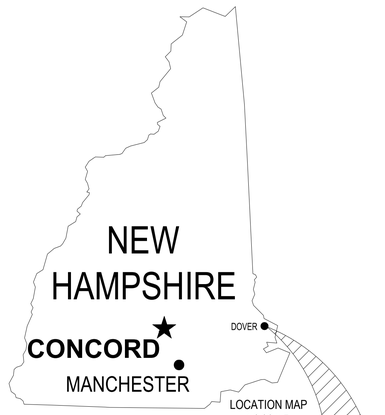
PROPERTY DATA:

PARCEL ID:	#38020-000000	
ADDRESS:	914 CENTRAL AVE. DOVER, NH 03820	
PROPERTY AREA:	1.287 AC.	
ZONING:	COMMERCIAL DISTRICT (C)	
PROPOSED USE:	CAR WASH	
	REQUIRED	PROPOSED
BUILDING SETBACKS		
FRONTAGE ALONG STREET:	30'	68.09
SIDE:	12'	31.91
REAR:	15'	100.26
BUILDING AREA:	4,400 SF	
PARKING:		
TOTAL PARKING SPACES:	19	18
ADA PARKING SPACES:	1	1

FLOODPLAIN DESIGNATION: PARCEL IS LOCATED WITHIN "ZONE X" AS INDICATED BY THE FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY PANEL NUMBER 33017C0310E, EFFECTIVE DATE: 09/30/2015; PUBLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.

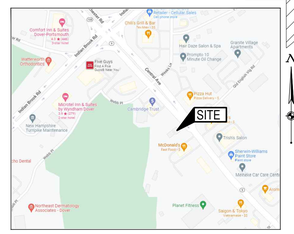
Sheet List Table

Sheet Number	Sheet Title
C0.0	COVER SHEET
C0.1	GENERAL NOTES
C1.0	EXISITING COND. & DEMO PLAN
C2.0	SWPPP NOTES
C2.1	SWPPP PHASE 1 PLAN
C2.2	SWPPP PHASE 2 PLAN
C2.3	SWPPP DETAILS
C3.0	SITE PLAN
C4.0	GRADING & DRAINAGE PLAN
C5.0	UTILITY PLAN
C5.1	UTILITY DETAILS
C6.0	CONSTRUCTION DETAILS
C6.1	NHDOT DETAILS
C6.2	NHDOT DETAILS
C6.3	NHDOT DETAILS
1 OF 2	LANDSCAPE PLAN
2 OF 2	LANDSCAPE DETAILS



LOCATION MAP
NO SCALE

PARCEL IS LOCATED WITHIN "ZONE X" AS INDICATED BY THE FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY PANEL NUMBER 33017C0310E, EFFECTIVE DATE: 09/30/2015; PUBLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.



VICINITY MAP
NO SCALE

SURVEY PROVIDED BY:
BLEW & ASSOCIATES
3825 N. SHILOH DRIVE
FAYETTEVILLE, AR 72703
PHONE: 479.443.4506
DATED: 11/30/2022

CESO PROVIDES NO GUARANTEE TO THE ACCURACY OF THE SURVEY PROVIDED BY BLEW AND ASSOCIATES. CONTRACTOR TO VERIFY EXISTING CONDITIONS PRIOR TO BID AND CONSTRUCTION.

BENCHMARK

	ELEVATION*	NORTHING**	EASTING**	DESCRIPTION
TBM#1	194.2300	263586.5800	1192294.1300	SET MAG NAIL IN POWER POLE
TBM#2	189.6400	263450.2500	1192159.9700	SET MAG NAIL IN POWER POLE

* VERTICAL DATUM: NAVD88
** HORIZONTAL DATUM: NAD83

811 DigSafe MA-ME-NH-RI-VT

SEVENTY-TWO (72) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: NEW HAMPSHIRE UTILITIES PROTECTION SERVICE AT 811 OR 888-344-7233 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

CESO
WWW.CESOINC.COM
3601 Rigby Rd., Suite 300
Miamisburg, OH 45342
Phone: 937.435.8584 Fax: 888.208.4826

STATE OF NEW HAMPSHIRE
ZACHARY DAVID FRESHNER
No. 16215
LICENSED PROFESSIONAL ENGINEER
07/24/2023

HANG TEN CAR WASH
DOVER, NH
914 CENTRAL AVE.
DOVER, NH 03820

Revisions / Submissions

ID	Description	Date

Project Number:	761766
Scale:	1'=20'
Drawn By:	NTV
Checked By:	HGC
Date:	06/28/2023
Issue:	PERMIT

Drawing Title:
COVER SHEET

C0.0

W:\PROJECTS\WEA\761766-01_Hang 10_Dover_NH\03-CIVIL\PLAN\PLANC0.0-COVER.dwg - 7/24/2023 - Hosea Cunningham

GENERAL NOTES

DEMOLITION NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR DEMOLITION AND DISPOSAL. THE DEMOLITION, REMOVAL, AND DISPOSAL IS TO BE APPROVED BY ALL GOVERNING AUTHORITIES, OF ALL FACILITIES SUCH AS: STRUCTURES, PADS, WALLS, FLUMES, FOUNDATIONS, PARKING, DRIVES, DRAINAGE, STRUCTURES, UTILITIES, WELLS, ETC., SUCH THAT THE IMPROVEMENTS SHOWN ON THE REMAINING PLANS CAN BE CONSTRUCTED. ALL FACILITIES TO BE REMOVED SHALL BE UNDERCUT TO SUITABLE MATERIAL AND BROUGHT TO GRADE WITH SUITABLE COMPACTED FILL MATERIAL AS SPECIFIED BY A QUALIFIED PROFESSIONAL GEOTECHNICAL ENGINEER. IF UNDOCUMENTED FACILITIES ARE FOUND ON SITE, CONTRACTOR SHALL CONTACT THE OWNER AND UTILITY COMPANY PRIOR TO REMOVAL. ALL FACILITIES SHALL BE PLUGGED, ABANDONED, OR REMOVED PER STATE AND LOCAL REQUIREMENTS.
2. FEDERAL, STATE AND LOCAL CODE REQUIREMENTS SHALL GOVERN THE DISPOSAL OF DEBRIS INCLUDING ANY POTENTIALLY HAZARDOUS AND TOXIC MATERIALS. ALL MATERIALS AND STRUCTURES DESIGNATED AS "TO BE REMOVED" SHALL BE DISPOSED OF OFF SITE AND AT THE COST OF THE CONTRACTOR.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING JOB SITE SAFETY PER OSHA REQUIREMENTS AT ALL TIMES.
4. PRIOR TO DEMOLITION, IT IS THE CONTRACTOR'S RESPONSIBILITY TO CALL THE STATE 811 AND NOTIFY ALL UTILITY COMPANIES TO SCHEDULE UTILITY SERVICE REMOVAL AND/OR ABANDONMENT. ALL UTILITIES SHALL BE REMOVED/RELOCATED PER THE SPECIFICATIONS OF THE UTILITY COMPANIES. THE CONTRACTOR IS RESPONSIBLE TO PAY ALL FEES AND CHARGES ASSOCIATED WITH THIS WORK
5. CONTRACTOR SHALL MAINTAIN ALL UTILITY SERVICES TO INHABITED BUILDINGS ON SITE AND ADJACENT PROPERTIES AT ALL TIMES. INTERRUPTIONS SHALL BE APPROVED BY THE OWNERS OF THE BUILDINGS/PROPERTIES.
6. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THIS PLAN HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THEIR ACCURACY. PRIOR TO THE START OF ANY DEMOLITION ACTIVITY, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES FOR ONSITE LOCATIONS OF EXISTING UTILITIES. IF THE LOCATION OR ELEVATION OF THE EXISTING UTILITIES ARE FOUND TO BE DIFFERENT FROM THE PLANS, CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY.
7. CONTRACTOR SHALL PROTECT EXISTING SITE FEATURES TO REMAIN INSIDE AND OUTSIDE CONSTRUCTION LIMITS. CONTRACTOR IS RESPONSIBLE TO DOCUMENT ALL EXISTING DAMAGES AND NOTIFY THE CITY/COUNTY PRIOR TO CONSTRUCTION START. ANY EXISTING SITE FEATURE TO REMAIN THAT IS DAMAGED DURING CONSTRUCTION, SUCH AS, BUT NOT LIMITED TO, DRAINAGE, UTILITIES, PAVEMENT, CURB, ETC. SHALL BE REPAIRED TO A CONDITION THAT IS EQUAL TO, OR BETTER THAN, THE EXISTING CONDITIONS. PRIOR TO BEING DAMAGED, THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST.
8. CONTINUOUS ACCESS SHALL BE MAINTAINED TO THE SURROUNDING PROPERTIES AT ALL TIMES DURING DEMOLITION OF THE EXISTING FACILITIES.
9. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TRAFFIC CONTROL. ALL TRAFFIC CONTROL MEASURES SHALL BE IN ACCORDANCE WITH STATE DEPARTMENT OF TRANSPORTATION REGULATIONS AND LOCAL REGULATIONS.
10. THE CONTRACTOR IS RESPONSIBLE FOR PLACING AND MAINTAINING CONSTRUCTION FENCE, SIGNS, ETC. TO WARN AND KEEP UNAUTHORIZED PEOPLE OFF SITE FOR THE DURATION OF THE PROJECT.
11. PRIOR TO DEMOLITION, ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED PER THE GOVERNING AGENCIES GUIDELINES AND STANDARDS. DUST CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
12. SAWCUT LINE PROVIDED IS FOR REFERENCE ONLY. CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING THE EXTENT OF THE SAWCUT THAT WILL BE REQUIRED AS WELL AS PAVEMENT REPAIRS TO INSTALL UTILITY TRENCHING. IF ANY DAMAGE OCCURS ON ANY OF THE SURROUNDING PAVEMENT, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ITS REMOVAL AND REPAIR. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING THAT WHICH IS NECESSARY TO COMPLETE THE INTENT OF THE PROPOSED IMPROVEMENTS. SAWCUT EXISTING PAVEMENT TO FULL DEPTH, USING CARE TO CUT NEAT, STRAIGHT LINES. CUT AT EXISTING JOINTS WHERE POSSIBLE.
13. THE CONTRACTOR SHALL MAINTAIN A WELL-DRAINED SITE, FREE OF STANDING WATER DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY DRAINAGE MEASURES DURING CONSTRUCTION.
14. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO STUDY THE PLANS AND VISIT THE SITE TO DETERMINE THE ITEMS THAT MUST BE REMOVED TO COMPLY WITH THE SITE DEVELOPMENT PLANS. NO EXTRA FEE WILL BE PAID FOR THE REMOVAL OF ANY ITEM NOT LISTED THAT IS VISIBLE UPON A SITE VISIT. THE DEMOLITION PLAN IS INTENDED TO PRESENT THE SCOPE OF THE DEMOLITION, AND DOES NOT GUARANTEE THAT ALL ITEMS ARE ADDRESSED.
15. THE CONTRACTOR SHALL OBTAIN ALL PERMITS FOR ALL SITE DEVELOPMENT WORK, PAY ALL FEES FOR PERMITS AND CHECK ALL GOVERNING AUTHORITIES' SPECIFICATIONS FOR BUT NOT LIMITED TO, GUTTERS, SIDEWALKS, POLES, AND OTHER STRUCTURES, INCLUDING THE REMOVAL OR RELOCATION OF EXISTING UTILITIES OR OTHER PHYSICAL OBJECTS SHOWN ON PLANS OR NOTED OTHERWISE.
16. THE CONTRACTOR SHALL CREATE AND IMPLEMENT AN EROSION AND SEDIMENTATION CONTROL PLAN FOR ALL SITE CONSTRUCTION ACTIVITIES ASSOCIATED WITH THE PROJECT. THE PLAN MUST CONFORM TO THE EROSION AND SEDIMENTATION REQUIREMENTS OF THE CONSTRUCTION GENERAL PERMIT OR LOCAL STANDARDS AND CODES, WHICHEVER IS MORE STRINGENT.
17. ALL COSTS FOR INSPECTIONS AND/OR TESTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR UNLESS NOTED OTHERWISE.

SITE NOTES

1. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL CITY/COUNTY REGULATIONS AND CODES AND O.S.H.A. STANDARDS.
2. ALL MATERIAL NOTED ON DRAWINGS WILL BE SUPPLIED BY THE CONTRACTOR UNLESS OTHERWISE NOTED.
3. CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS TO COORDINATE ACCESS POINTS AND ELEVATIONS. REFER TO ARCHITECTURAL PLANS. FOR EXACT LOCATIONS AND DIMENSIONS OF DOORS, ENTRY RAMP, AND CANOPY.
4. THE CONTRACTOR SHALL OBTAIN ALL PERMITS FOR ALL SITE DEVELOPMENT WORK, PAY ALL FEES FOR PERMITS AND CHECK ALL GOVERNING AUTHORITIES' SPECIFICATIONS FOR BUT NOT LIMITED TO, GUTTERS, SIDEWALKS, POLES, AND OTHER STRUCTURES, INCLUDING THE REMOVAL OR RELOCATION OF EXISTING UTILITIES OR OTHER PHYSICAL OBJECTS SHOWN ON PLANS OR NOTED OTHERWISE.
5. THE CONTRACTOR SHALL CREATE AND IMPLEMENT AN EROSION AND SEDIMENTATION CONTROL PLAN FOR ALL SITE CONSTRUCTION ACTIVITIES ASSOCIATED WITH THE PROJECT. THE PLAN MUST CONFORM TO THE EROSION AND SEDIMENTATION REQUIREMENTS OF THE CONSTRUCTION GENERAL PERMIT OR LOCAL STANDARDS AND CODES, WHICHEVER IS MORE STRINGENT.
6. ALL COSTS FOR INSPECTIONS AND/OR TESTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR UNLESS NOTED OTHERWISE.
7. ACCESSIBILITY STANDARDS SHALL BE IN ACCORDANCE WITH FEDERAL AND LOCAL REQUIREMENTS FOR HANDICAP ACCESSIBILITY, INCLUDING BUT NOT LIMITED TO THE AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES. ADA PARKING STALLS SHALL MEET ADA GRADE GUIDELINES. CONTRACTOR SHALL FIELD VERIFY EXISTING GRADES AT ACCESS POINTS, ACCESSIBLE ROUTES, AND EXISTING PARKING TO REMAIN TO DETERMINE COMPLIANCE WITH STANDARDS.
8. ALL DISTURBED AREAS ARE TO RECEIVE 6" OF TOPSOIL, SEED, MULCH AND WATER UNTIL A HEALTHY STAND OF GRASS IS ESTABLISHED.
9. ALL DIMENSIONS AND RADII ARE TO THE FACE OF THE CURB OR EDGE OF PAVEMENT, AS APPLICABLE, UNLESS OTHERWISE NOTED.
10. ALL CURB RADII ARE 5 FEET UNLESS OTHERWISE NOTED.
11. PROVIDE SIGNAGE AND STRIPING AS SHOWN. ALL SIGNAGE AND PAVEMENT MARKINGS SHALL COMPLY WITH THE GOVERNING MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.). PAVEMENT MARKINGS ON ASPHALT SHALL BE WHITE. PAVEMENT MARKINGS ON CONCRETE SHALL BE YELLOW.
12. REFER TO ARCHITECTURAL PLANS FOR PROPOSED BUILDING SIGNAGE.
13. REFER TO MECHANICAL PLANS FOR EQUIPMENT LAYOUT.
14. REFER TO ELECTRICAL PLANS FOR ELECTRICAL WORK.
15. REFER TO GEOTECHNICAL ENGINEERING REPORT FOR SITE WORK PREPARATION/RECOMMENDATIONS AND PAVEMENT SECTIONS.
16. REFER TO ORIGINAL SURVEY PROVIDED BY BLEW & ASSOCIATES DATED NOVEMBER 30, 2022; REVISED DECEMBER 07, 2022.
17. ALL LIGHT POLES TO BE LOCATED 3' FROM THE BACK OF CURB, AS MEASURED FROM THE FACE OF POLE FOUNDATION, UNLESS OTHERWISE DENOTED ON PLANS.

GRADING NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
2. THE TOPOGRAPHIC SURVEY WAS PERFORMED BY A REGISTERED LAND SURVEYOR. IF CONTRACTOR DOES NOT ACCEPT EXISTING TOPOGRAPHY AS SHOWN ON THE PLANS, WITHOUT EXCEPTION, HE SHALL HAVE MADE, AT HIS EXPENSE, A TOPOGRAPHIC SURVEY BY A REGISTERED LAND SURVEYOR AND SUBMIT IT TO THE OWNER FOR REVIEW.
3. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.
4. THE CONTRACTOR SHALL ADHERE TO ALL TERMS & CONDITIONS AS OUTLINED IN THE EPA OR APPLICABLE STATE GENERAL N.P.D.E.S. PERMIT FOR STORM WATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITIES.
5. EXISTING AND PROPOSED GRADE CONTOUR INTERVALS ARE SHOWN AT 1 FOOT INTERVALS.
6. ALL SPOT ELEVATIONS REFER TO FINISHED PAVEMENT ELEVATIONS UNLESS OTHERWISE NOTED.
7. ALL ADA ACCESSIBLE PARKING SPACES AND LOADING AREAS SHALL BE GRADED WITH A 2.0% MAXIMUM SLOPE IN ALL DIRECTIONS. ALL ADA ACCESSIBLE ROUTES SHALL BE GRADED WITH A 2.0% MAXIMUM CROSS SLOPE AND 5.0% MAXIMUM RUNNING SLOPE.
8. MAINTAIN EXISTING DRAINAGE PATTERN THROUGHOUT THE SITE, EXCEPT WITHIN THE LIMITS OF DISTURBANCE (LOD).
9. COORDINATE GRADES AT BUILDING ENTRIES WITH ARCHITECTURAL PLANS.
10. EXISTING DRAINAGE STRUCTURES SHALL BE INSPECTED AND REPAIRED AS NEEDED, AND EXISTING PIPES ARE TO BE CLEANED TO REMOVE ALL SILT AND DEBRIS AFTER CONSTRUCTION IS COMPLETE.
11. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO A CONDITION EQUAL TO OR BETTER THAN IT'S CONDITION PRIOR TO DAMAGE.
12. CONTRACTOR SHALL ASSURE POSITIVE DRAINAGE AWAY FROM BUILDING AND WITHIN PAVED AREAS.
13. ALL TOPSOIL MUST BE REMOVED BEFORE FILL MATERIAL IS PLACED.
14. ALL WET, OR OTHERWISE UNSUITABLE SOILS MUST BE STABILIZED. THIS MAY BE ACCOMPLISHED BY DRYING, REMOVAL & REPLACEMENT, REMOVAL & DRYING & RECOMPACTION, OR SOIL TREATMENT (LIME/CEMENT) UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL GEOTECHNICAL ENGINEER.
15. ALL UNSURFACED AREAS, DISTURBED BY GRADING, OPERATION SHALL RECEIVE 6" OF TOPSOIL. CONTRACTOR SHALL APPLY STABILIZATION FABRIC TO ALL SLOPES 3H:1V OR STEEPER AND SEED WITH LOW MAINTENANCE GRASS SEED MIX. CONTRACTOR SHALL SEED DISTURBED AREAS IN ACCORDANCE WITH SPECIFICATIONS UNTIL A HEALTHY STAND OF GRASS IS OBTAINED. ALL EXPOSED SURFACE AREAS SHALL BE STABILIZED PER THE SWPPP AND LANDSCAPE REQUIREMENTS AS PART OF THIS PLAN SET.
16. ALL STORM PIPE ENTERING STRUCTURES SHALL BE GROUTED TO ASSURE CONNECTION AT STRUCTURE IS SOIL TIGHT.
17. ALL STORM STRUCTURES SHALL HAVE A SMOOTH UNIFORM POURED MORTAR INVERT FROM INVERT IN TO INVERT OUT.
18. STORM PIPE SHALL BE AS FOLLOWS UNLESS OTHERWISE NOTED:

MATERIAL	TYPE	PIPE SPEC	JOINT SPEC	INSTALLATION	ACCEPTABLE AREAS OF USE
REINFORCED CONCRETE PIPE (RCP)	CLASS III, IV, V	ASTM C-76	ASTM C443	ASTM C1479	WITHIN R/W, COVER VARIES WITH PIPE CLASS
HIGH DENSITY POLY-ETHYLENE (HDPE)	SMOOTH-WALLED CORRUGATED ADS-N12 OR EQUAL	AASHTO M294 (TYPE S)	ASTM F477	ASTM D2321	ON SITE, 12" TO 60" DIA.
POLY VINYL CHLORIDE (PVC)	SDR 35	ASTM D3034	ASTM D3212	ASTM D2321	ON SITE, 4" TO 10"

19. ALL STORM SEWER STRUCTURE GRATES AND FRAMES WITHIN PAVEMENT SHALL BE HEAVY DUTY.
20. ALL STORM DRAINAGE SHALL BE PERFORMED IN ACCORDANCE WITH ALL LOCAL COUNTY AND DOT STANDARDS.
21. ALL DOWNSPOUT DRAIN LINES OR ROOF LEADERS SHALL HAVE A 1.0% MINIMUM SLOPE, UNLESS OTHERWISE NOTED. CONNECT ALL DOWNSPOUTS AND ROOF LEADERS TO THE STORM SEWER SYSTEM. REFER TO ARCHITECTURAL PLANS FOR DOWNSPOUT AND ROOF LEADER LOCATIONS. PROVIDE POSITIVE DRAINAGE AND PAVEMENT REPAIR AS NEEDED.
22. ROOF DRAINS, FOUNDATION DRAINS, AND OTHER CLEAN WATER CONNECTIONS TO THE SANITARY SEWER SYSTEM ARE PROHIBITED.
23. THE STORM SEWER GRADE WILL BE SUCH THAT A MINIMUM COVER IS MAINTAINED TO WITHSTAND AASHTO HS-25 LOADING ON THE PIPE. PROVIDE MINIMUM 2.0 FEET OF COVER FOR ALL STORM SEWERS UNLESS OTHERWISE NOTED.
24. WHEN A SANITARY SEWER MAIN LIES ABOVE A STORM SEWER, OR WITHIN 18 INCHES BELOW, THE SANITARY SEWER WILL HAVE AN IMPERVIOUS ENCASEMENT OR BE CONSTRUCTED OF STRUCTURAL SEWER PIPE FOR A MINIMUM OF 10 FEET ON EACH SIDE OF WHERE THE STORM SEWER CROSSES.
25. IF EXISTING FIELD TILES ARE ENCOUNTERED DURING CONSTRUCTION THEY SHALL BE REPAIRED AND/OR TIED INTO A STORM SEWER SYSTEM AS NEEDED TO MAINTAIN POSITIVE DRAINAGE.

UTILITY NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE.
2. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
3. CONTRACTOR SHALL COMPLY TO THE FULLEST EXTENT WITH THE LATEST STANDARDS OF O.S.H.A. DIRECTIVES OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR SHALL USE SUPPORT SYSTEMS, SLOPING, BENCHING, AND OTHER MEANS OF PROTECTION. THIS TO INCLUDE BUT NOT LIMITED FOR ACCESS AND EGRESS FROM ALL EXCAVATION AND TRENCHING. CONTRACTOR IS RESPONSIBLE TO COMPLY WITH PERFORMANCE CRITERIA FOR O.S.H.A.
4. CONTRACTOR IS RESPONSIBLE FOR REPAIRS OF DAMAGE TO ANY EXISTING UTILITY DURING CONSTRUCTION AT NO COST TO THE OWNER.
5. ALL FILL MATERIAL IS TO BE IN PLACE AND COMPACTED BEFORE INSTALLATION OF PROPOSED UTILITIES.
6. CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES FOR INSTALLATION REQUIREMENTS AND SPECIFICATIONS. THE CONTRACTOR SHALL CONDUCT ALL REQUIRED TESTS TO THE SATISFACTION OF THE RESPECTIVE UTILITY REGULATIONS AND THE OWNER'S INSPECTION AUTHORITIES.
7. CONTRACTOR SHALL NOTIFY THE UTILITY AUTHORITY'S INSPECTORS 72 HOURS BEFORE CONNECTING TO ANY EXISTING LINE.
8. WATER AND SANITARY UTILITIES SHALL HAVE TEN (10') FEET OF HORIZONTAL CLEARANCE WHEN PARALLEL OR 18" VERTICAL CLEARANCE WHEN CROSSING. ALL CLEARANCE DISTANCES SHALL BE MEASURE FROM OUTSIDE EDGE OF PIPE TO OUTSIDE EDGE OF PIPE. THE CROSSING SHALL BE ARRANGED SO THAT THE SANITARY SEWER JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER LINE JOINTS.
9. IF A WATER LINE PASSES UNDER THE SANITARY SEWER LINE, THE SEWER LINE SHOULD BE CONSTRUCTED OF A WATERTIGHT MATERIAL APPROVED BY THE REGULATORY AGENCY FOR USE IN WATER MAIN CONSTRUCTION AND SHALL EXTEND TEN (10') FEET ON BOTH SIDES OF THE CROSSING, AS MEASURED PERPENDICULAR TO THE WATER LINES. ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER TO MAINTAIN LINE AND GRADE.
10. UNDERGROUND LINES SHALL BE INSTALLED, INSPECTED AND APPROVED BEFORE BACKFILLING.
11. CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES FOR INSTALLATION REQUIREMENTS AND SPECIFICATIONS. THE CONTRACTOR SHALL CONDUCT ALL REQUIRED TESTS TO THE SATISFACTION OF THE RESPECTIVE UTILITY REGULATIONS AND THE OWNER'S INSPECTION AUTHORITIES.
12. UTILITY TRENCHES WITHIN PAVED AREAS TO BE BACKFILLED PER UTILITY TRENCH DETAIL PROVIDED WITHIN THE CONSTRUCTION DETAILS SHEET.
13. ALL WATER LINE WORK SHALL BE PERFORMED IN ACCORDANCE WITH CITY OF DOVER PUBLIC WORKS CONSTRUCTION STANDARDS AND STATE REGULATIONS.
14. INSTALL ALL WATER LINES WITH A MINIMUM COVER PER THE CITY OF DOVER PUBLIC WORKS.
15. ON-SITE WATER LINE MATERIAL SHALL BE AS FOLLOWS:

MATERIAL	PRESSURE RATING	PIPE SPEC	FITTINGS	INSTALLATION	ACCEPTABLE AREAS OF USE
HIGH-DENSITY POLY-ETHYLENE (HPDE TUBING)	SDR 9 P.C. = 250 PSI	ASTM D2239 AWWA C901 ASTM F714	ASTM D3350 ASTM D3261	ASTM D2774	ON SITE, < 3" DIA.
COPPER 1"-3"	TYPE "K"	ASTM B88	AWWA C800	AWWA C800	DOMESTIC WATERLINES 1"-3"
PE 4710 POLY-ETHYLENE PLASTIC (IPS)	SDR 11 P.C. = 200 PSI	ASTM D3035 AWWA C901	ASTM D3350 ASTM D3261	ASTM D2774	ON SITE, 2" TO 3" DIA.
P.V.C. POLY VINYL CHLORIDE 4"- 8" C900	C900	AWWA C901 (RATED DR 14)	ASTM F-477 ASTM D3139	AWWA C900 C651	ON SITE, 4"-8" WATER LINES & FIRE LINES INSTALL W/ TRACER & TAPE #12 COPPER
DUCTILE IRON PIPE 4"-12"	CLASS 52 P.C. = 350PSI	AWWA C104, C110, C151, C500	AWWA C111	AWWA C600, C651	6" FIRE HYDRANT LEADS
PE 4710 POLY-ETHYLENE PLASTIC (DIPS)	SDR 9 P.C. = 250 PSI	ASTM D2239 ASTM F714 AWWA C906	ASTM D3350 ASTM D3261	ASTM D2774	ON SITE, 4" DIA. AND LARGER

16. ON-SITE SANITARY SEWER LINE MATERIAL SHALL BE AS FOLLOWS:

MATERIAL	PRESSURE RATING	PIPE SPEC	FITTINGS	INSTALLATION	ACCEPTABLE AREAS OF USE
POLY VINYL CHLORIDE (PVC)	SDR 35	ASTM D3034	ASTM D3212	ASTM D2321 WITH TYPE 1 BEDDING	ON SITE, 6" TO 8" DIA., LESS THAN 8.5' OF COVER
POLY VINYL CHLORIDE (PVC)	SDR 26	ASTM 3034	ASTM D3212	ASTM 2321 WITH TYPE 1 BEDDING	ON SITE, 6" TO 8" DIA., GREATER THAN OR EQUAL TO 8.5' OF COVER

17. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT BUILDING UTILITY CONNECTION LOCATIONS, SERVICE SIZES TO BE DETERMINED BY ARCHITECT.
18. CLEAN OUTS AND CURB BOXES WITHIN THE PAVED AREAS MUST HAVE TRAFFIC LOADING FRAMES AND COVERS.

EXISTING FEATURES LEGEND

APPLIES TO ALL CIVIL SHEETS

- RIGHT OF WAY
- PARCEL LINE
- PROPERTY BOUNDARY
- EASEMENT
- CURB
- EDGE OF PAVEMENT
- EDGE OF WALK
- PAVEMENT MARKINGS
- G — GAS LINE
- W — WATER LINE
- UGE — UNDERGROUND ELECTRIC
- UGT — UNDERGROUND TELE
- OHL — OVERHEAD LIGHTING
- STM — STORM SEWER
- SAN — SANITARY SEWER
- 102 — MAJOR CONTOURS
- 102 — MINOR CONTOURS

- WATER METER
- WATER VALVE
- POWER/TELE POLE
- POWER POLE
- AIR CONDITIONER
- ELECTRIC BOX
- LIGHT POLE
- GAS VALVE
- GAS METER
- STORM CATCH BASIN
- STORM INLET BASIN
- STORM MANHOLE
- STORM CLEANOUT
- SANITARY MANHOLE
- SANITARY CLEANOUT
- TRAFFIC MANHOLE
- SIGN
- TELEPHONE POLE

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STATE OF NEW HAMPSHIRE
ZACHARY DAVID FRESHNER
No. 16215
LICENSED PROFESSIONAL ENGINEER
07/24/2023

HANG TEN CAR WASH
DOVER, NH
914 CENTRAL AVE.
DOVER, NH 03820

Revisions / Submissions

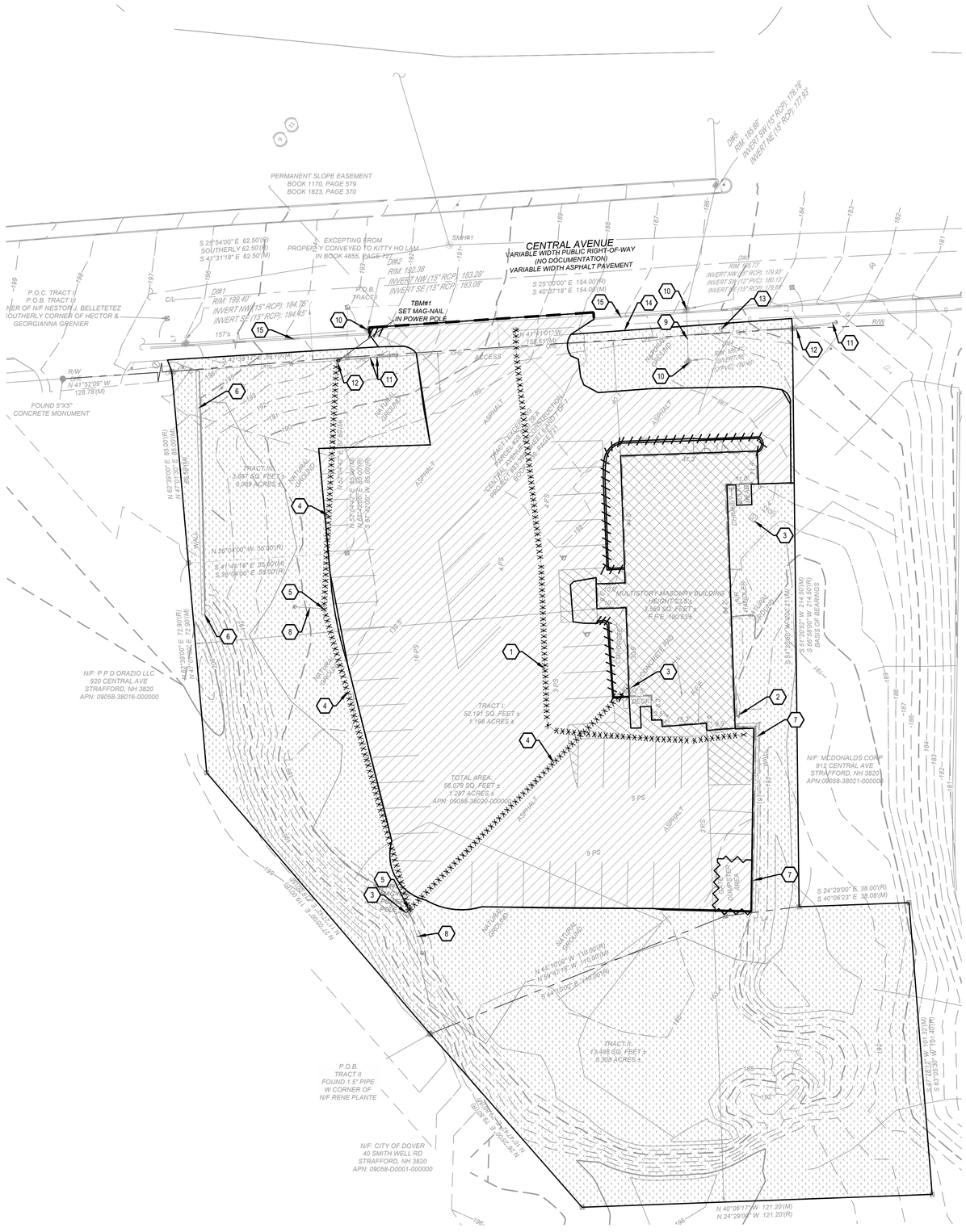
ID	Description	Date

Project Number:	761766
Scale:	1'=20'
Drawn By:	NTV
Checked By:	HGC
Date:	06/28/2023
Issue:	PERMIT

Drawing Title:
GENERAL NOTES

C0.1

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DEMOLITION LEGEND

EXISTING

REFER TO C0.1 FOR EXISTING FEATURES LEGEND

PROPOSED

- SITE CLEARING LIMITS
- REMOVE EXISTING BUILDING
- REMOVE EXISTING GRAVEL PAVEMENT
- REMOVE EXISTING ASPHALT PAVEMENT (OR AS NOTED ON THE PLANS)
- SAWCUT LINE
- UTILITY LINE TO BE REMOVED / RELOCATED
- REMOVE EXISTING CURB & GUTTER
- REMOVE EXISTING FENCE

GENERAL NOTES:

SEE SHEET C0.1

CODED NOTES:

1. EXISTING GAS LINE TO BE REMOVED.
2. EXISTING GAS STRUCTURE TO BE REMOVED.
3. EXISTING ELECTRIC STRUCTURE TO BE REMOVED.
4. EXISTING OVERHEAD ELECTRIC LINE TO BE REMOVED.
5. EXISTING UTILITY POLE TO BE REMOVED.
6. EXISTING RETAINING WALL TO REMAIN AND TO BE PROTECTED DURING DEMOLITION AND CONSTRUCTION.
7. EXISTING RETAINING WALL TO BE REMOVED.
8. EXISTING GUY WIRE AND ANCHOR TO BE REMOVED.
9. EXISTING STORM LINE TO REMAIN AND TO BE PROTECTED DURING DEMOLITION AND CONSTRUCTION.
10. EXISTING STORM STRUCTURE TO REMAIN AND TO BE PROTECTED DURING DEMOLITION AND CONSTRUCTION.
11. EXISTING GUY WIRES TO REMAIN TO BE PROTECTED DURING DEMOLITION AND CONSTRUCTION.
12. EXISTING UTILITY POLE TO REMAIN AND TO BE PROTECTED DURING DEMOLITION AND CONSTRUCTION.
13. EXISTING WATER METER TO REMAIN AND BE PROTECTED DURING DEMOLITION AND CONSTRUCTION.
14. EXISTING GAS LINE TO REMAIN AND TO BE PROTECTED DURING DEMOLITION AND CONSTRUCTION.
15. EXISTING CURB AND SIDEWALK TO REMAIN AND TO BE PROTECTED DURING DEMOLITION AND CONSTRUCTION.

SEVENTY-TWO (72) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: NEW HAMPSHIRE UTILITIES PROTECTION SERVICE AT 811 OR 888-344-7233 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

20 0 20 40
GRAPHIC SCALE (IN FEET)
1 in. = 20 ft.

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STATE OF NEW HAMPSHIRE
ZACHARY DAVID FRESHNER
No. 16215
PROFESSIONAL ENGINEER
07/24/2023

HANG TEN CAR WASH

DOVER, NH

914 CENTRAL AVE.
DOVER, NH 03820

Revisions / Submissions

ID	Description	Date

761766
1"=20'
NTV
HGC
06/28/2023
PERMIT

EXISITING COND. & DEMO PLAN

C1.0

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SWPPP GENERAL NOTES

1. ALL EROSION AND SEDIMENTATION CONTROL SHALL BE PERFORMED ACCORDING TO: SWPPP AND DETAIL PLANS; ACCORDING TO THE LATEST EPA AUTHORIZATION FOR CONSTRUCTION ACTIVITY UNDER THE "NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM" (NPDES); ANY AND ALL REQUIRED PERMITS, REPORTS, AND RELATED DOCUMENTS. ALL CONTRACTORS AND SUBCONTRACTORS MUST BECOME FAMILIAR WITH ALL OF THE ABOVE.

2. CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES (BMPS) AS REQUIRED BY THE SWPPP. ADDITIONAL BEST MANAGEMENT PRACTICES SHALL BE IMPLEMENTED AS DICTATED BY CONDITIONS AND GRADE CHANGES TO THE SITE AT NO ADDITIONAL COST TO OWNER THROUGHOUT ALL PHASES OF CONSTRUCTION.

3. CONTRACTOR SHALL MINIMIZE CLEARING AND DISTURBANCE TO THE ENVIRONMENT TO THE MAXIMUM EXTENT POSSIBLE OR AS REQUIRED BY THE GENERAL PERMIT.

4. SEDIMENT STRUCTURES AND PERIMETER SEDIMENT BARRIERS SHALL BE IMPLEMENTED AS THE FIRST STEP OF GRADING WITHIN SEVEN (7) DAYS FROM THE START OF CLEARING AND GRUBBING, AND SHALL CONTINUE TO FUNCTION UNTIL THE DEVELOPMENT AREA IS STABILIZED.

5. PERMANENT SOIL STABILIZATION OF DISTURBED AREAS BY MEANS OF VEGETATION, LANDSCAPE TYPE MULCHING, MATTING, SOD, RIP RAP, AND OTHER APPROVED LANDSCAPING TECHNIQUES TO BE APPLIED AS FOLLOWS:
   - WITHIN SEVEN (7) DAYS OF ANY AREA THAT WILL BE DORMANT FOR ONE (1) YEAR OR MORE.
   - WITHIN TWO (2) DAYS OF ANY AREA WITHIN 50 FEET OF A STREAM AT FINAL GRADE.
   - WITHIN SEVEN (7) DAYS FOR ANY OTHER AREA AT FINAL GRADE.

6. TEMPORARY SOIL STABILIZATION OF DISTURBED AREAS BY MEANS OF TEMPORARY VEGETATION, MULCHING, GEOTEXTILES, SOD, PRESERVATION OF EXISTING VEGETATION, AND OTHER APPROVED TECHNIQUES TO BE APPLIED AS FOLLOWS:
   - WITHIN TWO (2) DAYS OF ANY AREA WITHIN 50 FEET OF A STREAM NOT AT FINAL GRADE.
   - WITHIN SEVEN (7) DAYS OF ANY AREA THAT WILL BE DORMANT FOR MORE THAN TWENTY ONE (21) DAYS, BUT LESS THAN ONE (1) YEAR.
   - PRIOR TO THE ONSET OF WINTER WEATHER FOR AREAS THAT WILL BE IDLE OVER WINTER.

7. TEMPORARY SEEDING, MULCHING, AND FERTILIZER SPECIFICATIONS:

   SEEDING: ANNUAL RYEGRASS AT 2.02 POUNDS PER 1,000 S.F.

   MULCHING: STRAW MATERIAL SHALL BE UNROTTED SMALL GRAIN STRAW APPLIED AT A RATE OF TWO (2) TON/ACRE, OR 80-100 POUNDS PER 1,000 S.F. MULCH MATERIALS SHALL BE RELATIVELY FREE OF ALL KINDS OF WEEDS AND SHALL BE FREE OF PROHIBITIVE NOXIOUS WEEDS. MULCH SHALL BE SPREAD UNIFORMLY BY HAND OR MECHANICAL MEANS. FROM NOVEMBER 01 THRU MARCH 15 INCREASE THE RATE OF STRAW MULCH TO THREE (3) TON/ACRE.

   FERTILIZER: APPLY FERTILIZER AT HALF THE RATE OF PERMANENT APPLICATION AND AS PER SPECIFICATIONS. IF PROJECT CONDITIONS PREVENT FERTILIZING THE SOIL, THEN THIS ITEM MAY BE WAIVED.

8. SLOPES SHALL BE LEFT IN A ROUGHENED CONDITION DURING THE GRADING PHASE TO REDUCE RUNOFF VELOCITIES AND EROSION. ALL SLOPES 3:1 OR GREATER THAN 3:1 SHALL BE FERTILIZED, SEEDED, AND CURLEX BLANKETS BY AMERICAN EXCELSIOR COMPANY, NORTH AMERICAN GREEN, INC. OR AN APPROVED EQUAL AS SPECIFIED IN THE PLANS SHALL BE INSTALLED ON THE SLOPES.

9. NO SOLID (OTHER THAN SEDIMENT) OR LIQUID WASTE, INCLUDING BUILDING MATERIALS, SHALL BE DISCHARGED IN STORM WATER RUNOFF. ALL NON-SEDIMENT POLLUTANTS MUST BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL GUIDELINES. WASH OUT OF CEMENT TRUCKS SHOULD OCCUR IN DESIGNATED PIT OR DIKED AREAS, WHERE WASHINGS CAN BE REMOVED AND PROPERLY DISPOSED OFF-SITE WHEN THEY HARDEN. STORAGE TANKS SHOULD ALSO BE LOCATED IN PIT OR DIKED AREAS. IN ADDITION, SUFFICIENT OIL AND GREASE ABSORBING MATERIALS AND FLOTATION BOOMS TO CLEAN AND CONTAIN FUEL AND CHEMICAL SPILLS MUST BE KEPT ON SITE.

10. IF THE ACTION OF VEHICLES TRAVELING OVER THE STABILIZED CONSTRUCTION EXIT DOES NOT SUFFICIENTLY REMOVE MOST OF THE DIRT AND MUD, THEN THE TIRES MUST BE WASHED BEFORE VEHICLES ENTER A PUBLIC ROAD. PROVISIONS MUST BE MADE TO INTERCEPT THE WATER AND TRAP THE SEDIMENT BEFORE IT IS CARRIED OFF THE SITE.

11. RUBBISH, TRASH, GARBAGE, LITTER, OR OTHER SUCH MATERIALS SHALL BE DISPOSED INTO SEALED CONTAINERS. MATERIALS SHALL BE PREVENTED FROM LEAVING THE SITE THROUGH THE ACTION OF WIND OR STORM WATER DISCHARGE INTO DRAINAGE DITCHES OR WATERS OF THE STATE.

12. DUST CONTROL USING APPROVED MATERIALS MUST BE PERFORMED AT ALL TIMES. THE USE OF MOTOR OILS AND OTHER PETROLEUM BASED OR TOXIC LIQUIDS FOR DUST SUPPRESSION IS PROHIBITED.

13. ON-SITE AND OFF-SITE STOCKPILE AND BORROW AREAS SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION BY THE USE OF BEST MANAGEMENT PRACTICES. THESE AREAS MUST BE SHOWN IN THE SITE MAP AND PERMITTED IN ACCORDANCE WITH GENERAL PERMIT REQUIREMENTS. AT A MINIMUM SILT FENCE TO BE PLACED AT PERIMETER OF STOCKPILE AREA TO PREVENT SOIL FROM LEAVING THE STOCKPILE AREA.

14. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED ONTO THE ROADWAYS OR INTO THE STORM SEWERS MUST BE REMOVED IMMEDIATELY.

15. ALL CONSTRUCTION SHALL BE STABILIZED AT THE END OF EACH DAY; THIS INCLUDES BACKFILLING OF TRENCHES FOR UTILITY CONSTRUCTION AND PLACEMENT OF GRAVEL OR ASPHALT FOR ROAD CONSTRUCTION.

16. THE LAST LAYER OF SOIL, INCLUDING TOP SOIL SHOULD BE COMPACTED TO 80% - 85% OF THE MAXIMUM STANDARD PROCTOR DENSITY, IN AREAS OUTSIDE THE PARKING LOT THAT WILL RECEIVE VEGETATION. THIS IS PARTICULARLY IMPORTANT IN CUT SLOPE AND EMBANKMENT AREAS. IN PAVEMENT AND ISLAND AREAS, IT IS RECOMMENDED THAT THE SOIL BE COMPACTED TO 98% AND 95% OF THE MAXIMUM STANDARD PROCTOR DENSITY RESPECTIVELY; THE LAST COMPACTED LAYER MAY BE SCARIFIED TO IMPROVE THE SOIL GROWTH CHARACTERISTICS.

17. ALL DEWATERING ACTIVITIES SUCH AS PUMPING DOWN OF FLOODED FOUNDATION AND UTILITY TRENCHES MUST PASS THROUGH THE RETROFITTED DETENTION BASIN OR A SEDIMENT CONTROL PRACTICE PRIOR TO WATER LEAVING THE SITE.

18. SILT FENCE AND OTHER PERIMETER EROSION CONTROL MEASURES SHOWN OFF LIMITS OF DISTURBANCE FOR CLARITY PURPOSES ONLY. CONTRACTOR TO ENSURE PERIMETER EROSION CONTROL MEASURES ARE PLACED AT THE LIMITS OF DISTURBANCE. ANY DISCREPANCIES SHOULD BE BROUGHT TO THE ENGINEER PRIOR TO PLACEMENT OF ANY EROSION CONTROL MEASURES.

SWPPP MAINTENANCE NOTES

1. ALL CONTROL MEASURES STATED IN THE SWPPP SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION UNTIL TEMPORARY OR PERMANENT STABILIZATION OF THE SITE IS ACHIEVED. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED BY A QUALIFIED PERSON IN ACCORDANCE TO THE CONTRACT DOCUMENTS OR THE APPLICABLE PERMIT, WHICHEVER IS MORE STRINGENT, AND REPAIRED ACCORDING TO THE FOLLOWING:

2. INLET PROTECTION DEVICES AND CONTROLS SHALL BE REPAIRED OR REPLACED WHEN THEY SHOW SIGNS OF UNDERMINING AND OR DETERIORATION. INLET PROTECTION DEVICES SHOULD BE ROUTINELY CLEANED AND MAINTAINED.

3. ALL SEEDED AREAS SHALL BE CHECKED REGULARLY TO ENSURE THAT A GOOD STANDING OF GRASS IS MAINTAINED. AREAS SHOULD BE FERTILIZED, WATERED, AND RESEEDED AS NEEDED.

4. MINIMIZE OFF-SITE SEDIMENT TRACKING OF VEHICLES BY THE USE OF STONE MATERIAL IN ALL CONSTRUCTION ENTRANCES, ALONG WITH REGULARLY SCHEDULED SWEEPING/GOOD HOUSEKEEPING. STABILIZED CONSTRUCTION ENTRANCES TO BE PROPERLY MAINTAINED BY GENERAL CONTRACTOR AND IN GOOD WORKING ORDER AT ALL TIMES; THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE STONE AS CONDITIONS DEMAND.

5. THE TEMPORARY PARKING AND STORAGE AREA SHALL BE KEPT IN GOOD CONDITION (SUITABLE FOR PARKING AND STORAGE) BY GENERAL CONTRACTOR. THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE TEMPORARY PARKING AS CONDITIONS DEMAND.

6. CONTRACTORS AND SUBCONTRACTORS WILL BE RESPONSIBLE FOR REMOVING ALL SEDIMENT FROM THE SITE, AND STORM SEWER SYSTEMS. SEDIMENT DEPOSITION DURING SITE STABILIZATION MUST ALSO BE REMOVED.

7. STONE CONSTRUCTION EXIT TO BE MAINTAINED BY GENERAL CONTRACTOR UNTIL SITE HAS BEEN PAVED OR IS NO LONGER REQUIRED.

8. ALL CATCH BASIN GRATES ARE TO BE PROTECTED WITH INLET BAGS AFTER THEY ARE INSTALLED. THEY SHOULD BE ROUTINELY CLEANED AND MAINTAINED.

9. CONTAINERS SHALL BE AVAILABLE FOR DISPOSAL OF DEBRIS, TRASH, HAZARDOUS OR PETROLEUM WASTES. ALL CONTAINERS MUST BE COVERED AND LEAK-PROOF. ALL WASTE MATERIAL SHALL BE DISPOSED OF AT FACILITIES APPROVED FOR THE PERTINENT MATERIAL

10. BRICKS, HARDENING CONCRETE AND SOIL WASTE SHALL BE FREE FROM CONTAMINATION WHICH MAY LEACH CONSTITUENTS TO WATERS OF THE STATE.

11. CLEAN CONSTRUCTION WASTES THAT WILL BE DISPOSED INTO THE PROPERTY SHALL BE SUBJECT TO ANY LOCAL PROHIBITIONS FROM THIS TYPE OF DISPOSAL.

12. ALL CONSTRUCTION AND DEMOLITION DEBRIS (C&DD) WASTE SHALL BE DISPOSED OF IN A STATE APPROVED C&DD LANDFILL. CONSTRUCTION DEBRIS MAY BE DISPOSED OF ON-SITE, BUT DEMOLITION DEBRIS MUST BE DISPOSED IN A STATE APPROVED LANDFILL. ALSO, MATERIALS WHICH CONTAIN ASBESTOS MUST COMPLY WITH ALL LOCAL AND STATE REGULATIONS.

13. AREA SHALL BE DESIGNATED BY CONTRACTOR AND SHOWN ON SWPPP MAP FOR MIXING OR STORAGE OF COMPOUNDS SUCH AS FERTILIZERS, LIME ASPHALT, OR CONCRETE. THESE DESIGNATED AREAS SHALL BE LOCATED AWAY FROM WATERCOURSES, DRAINAGE DITCHES, FIELD DRAINS, OR OTHER STORMWATER DRAINAGE AREA.

14. EQUIPMENT FUELING & MAINTENANCE SHALL BE IN DESIGNATED AREAS ONLY.

15. A SPILL PREVENTION CONTROL AND COUNTERMEASURE (SPCC) PLAN MUST BE DEVELOPED FOR SITES WITH ONE ABOVE-GROUND STORAGE TANK OF 660 GALLONS OR MORE, TOTAL ABOVE-GROUND STORAGE OF 1,330 GALLONS OR BELOW-GROUND STORAGE OF 4,200 GALLONS OF FUEL.

16. ALL DESIGNATED CONCRETE WASHOUT AREAS SHALL BE LOCATED AWAY FROM WATERCOURSES, DRAINAGE DITCHES, FIELD DRAINS OR OTHER STORMWATER DRAINAGE AREAS.

17. ALL CONTAMINATED SOIL MUST BE TREATED AND/OR DISPOSED IN AN EPA APPROVED SOLID WASTE MANAGEMENT FACILITY OR HAZARDOUS WASTE TREATMENT, STORAGE OR DISPOSAL FACILITIES.

18. THE CONTRACTOR SHALL CONTACT THE STATE EPA, THE LOCAL FIRE DEPARTMENT AND THE LOCAL EMERGENCY PLANNING COMMITTEE IN THE EVENT OF A PETROLEUM SPILL (>25 GALLONS) OR THE PRESENCE OF SHEEN.

19. OPEN BURNING IS NOT PERMITTED ON THE SITE.

20. CONTRACTOR TO ENSURE STREETS SHALL BE CLEARED OF DEBRIS FROM SITE AND SWEPT CLEAN ON AN AS NEEDED BASIS.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PROJECT NARRATIVE:

PLAN ENGINEERS: CESO, INC.
2800 CORPORATE EXCHANGE DRIVE
COLUMBUS, OH 43231
PHONE: (614) 942-7631
CONTACT: ZACH FRESHNER

DEVELOPER: HANG TEN CAR WASH
1380 SOLDIERS FIELD ROAD
BOSTON, MA 02135
CONCTACT: STEVE LUKIN

THE PROPOSED PROJECT IS THE CONSTRUCTION OF A CAR WASH AND PARKING. THE SUBJECT PARCEL IS 1.29 ACRES. THE TOTAL DISTURBED AREA IS 1.29 ACRES.

THE SITE DRAINS TO AN EXISTING YARD DRAIN IN THE NORTH WEST CORNER OF THE PROPERTY.

ON-SITE SOILS: HAB 27.1%
HAC 26.1%
HBE 46.8%
HYDROLOGIC SOIL GROUP = A

SEQUENCE OF CONSTRUCTION

1. NOTIFY CITY/COUNTY ENGINEER BEFORE WORK IS TO BEGIN.
2. INSTALL ALL TEMPORARY EROSION CONTROL MEASURES INCLUDING SILT FENCE, CONSTRUCTION EXIT, FILTER SACKS, CONCRETE WASHOUT.
3. SITE DEMOLITION AND CLEARING.
4. ROUGH GRADING. PROVIDE TEMPORARY SEEDING OF DISTURBED AREAS WHICH ARE INACTIVE.
5. STORM SEWER AND UNDERGROUND UTILITY CONSTRUCTION.
6. BUILDING PAD.
7. CURB CONSTRUCTION.
8. FINE GRADING AND PAVEMENT SUBGRADE PREPARATION
9. ASPHALT PAVING AND REMAINING CONCRETE FLATWORK.
10. FINAL SEEDING.

* CONTRACTOR SHALL MODIFY THE SEQUENCE OF CONSTRUCTION BASED ON SITE CONDITIONS. CONTRACTOR TO NOTIFY PROJECT MANAGER PRIOR TO CHANGING SEQUENCE OF CONSTRUCTION.

CESO
WWW.CESOINC.COM
3601 Rigby Rd., Suite 300
Miamisburg, OH 45342
Phone: 937.435.8584 Fax: 888.208.4826

STATE OF NEW HAMPSHIRE
ZACHARY DAVID FRESHNER
No. 16215
LICENSED PROFESSIONAL ENGINEER
07/24/2023

HANG TEN CAR WASH
DOVER, NH
914 CENTRAL AVE.
DOVER, NH 03820

Revisions / Submissions

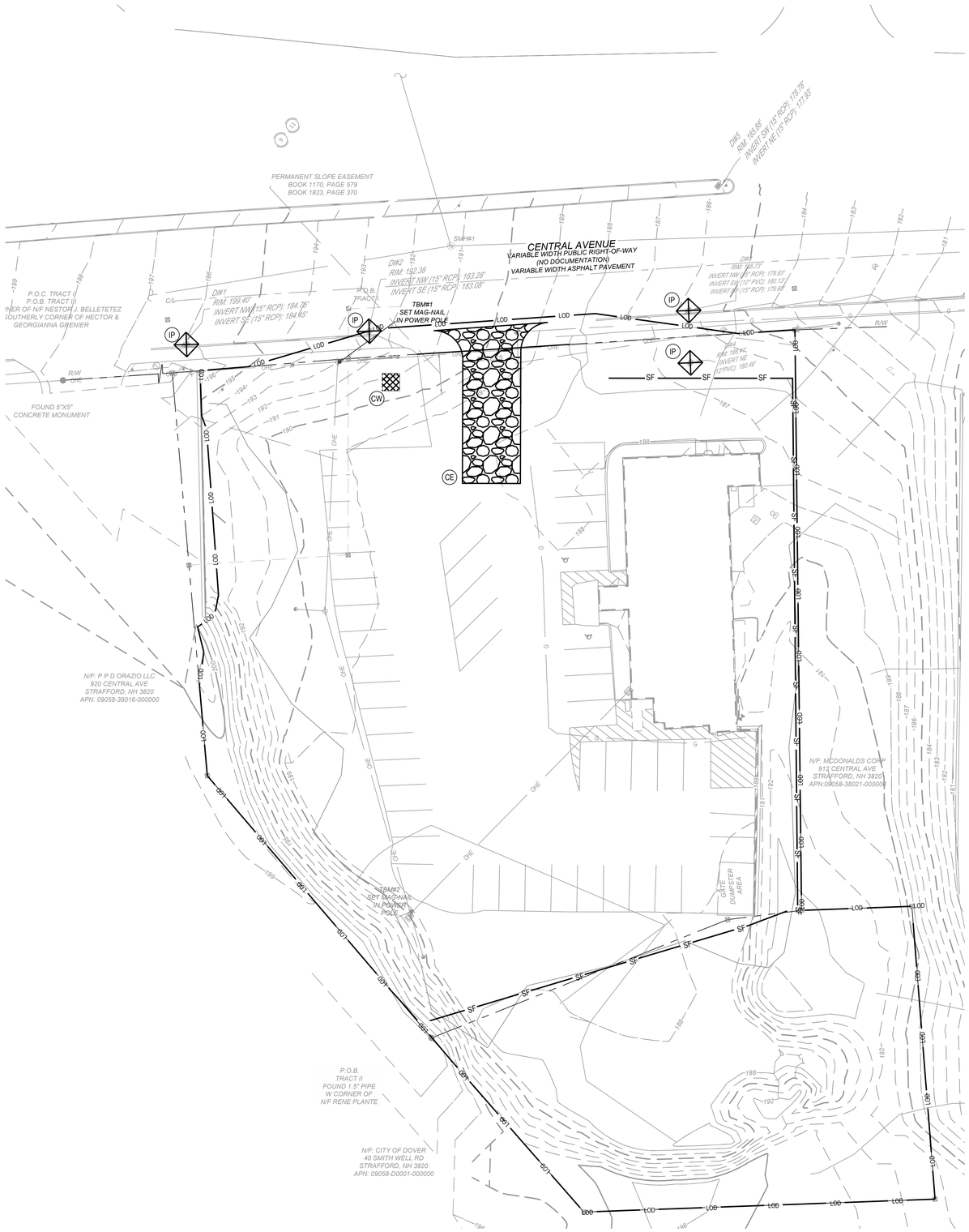
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Scale:	1'=20'
Drawn By:	NTV
Checked By:	HGC
Date:	06/28/2023
Issue:	PERMIT

Drawing Title:
SWPPP NOTES

C2.0

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SWPPP LEGEND

EXISTING

REFER TO C1.1 FOR EXISTING FEATURES LEGEND

PROPOSED

- MAJOR CONTOUR
- MINOR CONTOUR
- PAVEMENT/WALK
- STORM SEWER
- SILT FENCE
- LIMIT OF DISTURBANCE
- STABILIZED CONSTRUCTION ENTRANCE
- CONCRETE WASHOUT
- BASIN SEDIMENT FILTER
- STORM MANHOLE
- CATCH BASIN
- CURB INLET
- STABILIZED CONSTRUCTION ENTRANCE
- CONCRETE WASHOUT AREA
- INLET PROTECTION

811 DigSafe MA-ME-NH-RI-VT

SEVENTY-TWO (72) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: NEW HAMPSHIRE UTILITIES PROTECTION SERVICE AT 811 OR 888-344-7233 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

20 0 20 40

GRAPHIC SCALE (IN FEET)
1 in. = 20 ft.

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Revisions / Submissions

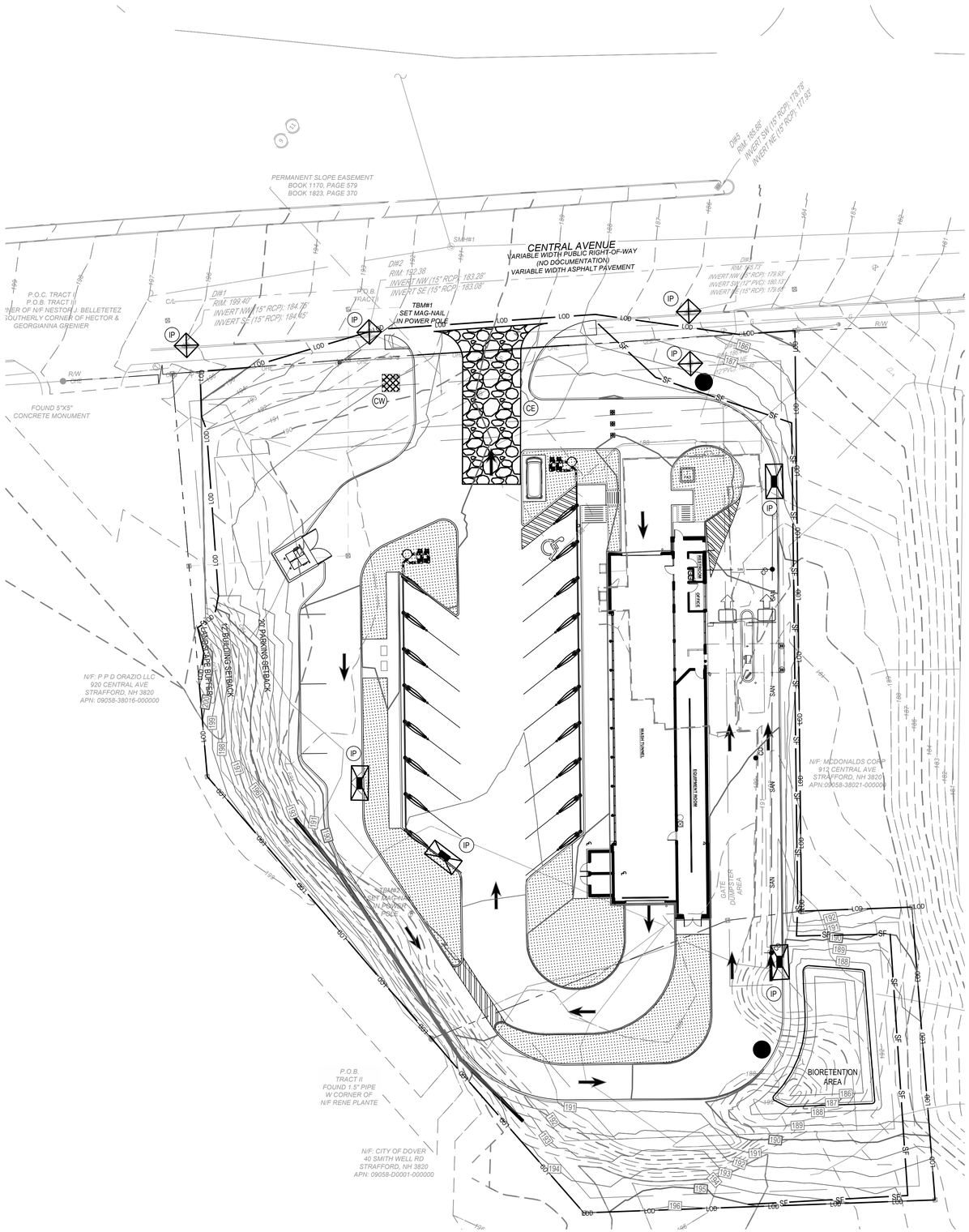
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Drawn By:	NTV
Checked By:	HGC
Date:	06/28/2023
Issue:	PERMIT

Drawing Title:
SWPPP PHASE 1 PLAN

C2.1

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SWPPP LEGEND

EXISTING

REFER TO C1.1 FOR EXISTING FEATURES LEGEND

PROPOSED

- SC1 — MAJOR CONTOUR
- SC2 — MINOR CONTOUR
- PAVEMENT/WALK
- STORM SEWER
- SF — SILT FENCE
- LOD — LIMIT OF DISTURBANCE
- STABILIZED CONSTRUCTION ENTRANCE
- CONCRETE WASHOUT
- BASIN SEDIMENT FILTER
- (D) — STORM MANHOLE
- CATCH BASIN
- CURB INLET
- (CE) — STABILIZED CONSTRUCTION ENTRANCE
- (CW) — CONCRETE WASHOUT AREA
- (IP) — INLET PROTECTION

SEVENTY-TWO (72) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: NEW HAMPSHIRE UTILITIES PROTECTION SERVICE AT 811 OR 888-344-7233 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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GRAPHIC SCALE (IN FEET)
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STATE OF NEW HAMPSHIRE
ZACHARY DAVID FRESHNER
No. 16215
LICENSED PROFESSIONAL ENGINEER
07/24/2023

HANG TEN CAR WASH

DOVER, NH

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Revisions / Submissions

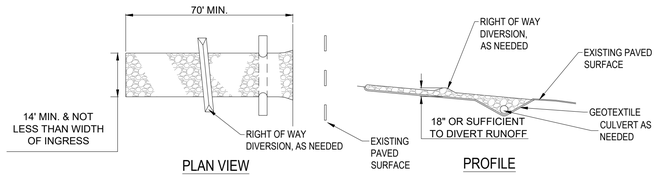
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Checked By:	HGC
Date:	06/28/2023
Issue:	PERMIT

Drawing Title:
SWPPP PHASE 2 PLAN

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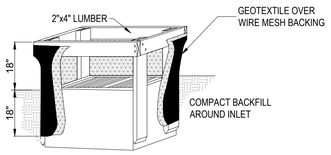
GEOTEXTILE SPECIFICATION FOR CONSTRUCTION ENTRANCE	
MINIMUM TENSILE STRENGTH	200 lbs.
MINIMUM PUNCTURE STRENGTH	80 psi.
MINIMUM TEAR STRENGTH	50 lbs.
MINIMUM BURST STRENGTH	320 psi.
MINIMUM ELONGATION	20%
EQUIVALENT OPENING SIZE	EOS < 0.6 mm.
PERMITTIVITY	1x10-3 cm/sec.

NOTES:

1. STONE SIZE - (1.5-2.5 INCH) STONE SHALL BE USED, OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - THE CONSTRUCTION ENTRANCE SHALL BE AS LONG AS REQUIRED TO STABILIZE HIGH TRAFFIC AREAS BUT NOT LESS THAN 70 FT. (EXCEPTION: APPLY 30 FT. MINIMUM TO SINGLE RESIDENCE LOTS.
3. THICKNESS - THE STONE LAYER SHALL BE AT LEAST 6 INCHES THICK FOR LIGHT DUTY ENTRANCES OR AT LEAST 10 INCHES FOR HEAVY DUTY USE.
4. WIDTH - THE ENTRANCE SHALL E AT LEAST 14 FEET WIDE, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. GEOTEXTILE - A GEOTEXTILE SHALL BE LAID OVER THE ENTIRE AREA PRIOR TO PLACING STONE, IT SHALL BE COMPOSED OF STRONG ROT-PROOF POLYMERIC FIBERS AND MEET THE FOLLOWING SPECIFICATIONS:
6. TIMING - THE CONSTRUCTION ENTRANCE SHALL BE INSTALLED AS SOON AS IS PRACTICAL BEFORE MAJOR GRADING ACTIVITIES.
7. CULVERT - A PIPE OR CULVERT SHALL BE CONSTRUCTED UNDER THE ENTRANCE IF NEEDED TO PREVENT SURFACE WATER FROM FLOWING ACROSS THE ENTRANCE OR TO PREVENT RUNOFF FROM BEING DIRECTED OUT ONTO PAVED SURFACES.
8. WATER BAR - A WATER BAR SHALL BE CONSTRUCTED AS PART OF THE CONSTRUCTION ENTRANCE IF NEEDED TO PREVENT SURFACE RUNOFF FROM FLOWING THE LENGTH OF THE CONSTRUCTION ENTRANCE AND OUT ONTO PAVED SURFACES.
9. MAINTENANCE - TOP DRESSING OF ADDITIONAL STONE SHALL BE APPLIED AS CONDITIONS DEMAND. MUD SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADS, ORA ANY SURFACE WHERE RUNOFF IS NOT CHECKED BY SEDIMENT CONTROLS, SHALL BE REMOVED IMMEDIATELY, REMOVAL SHALL BE ACCOMPLISHED BY SCRAPING OR SWEEPING.
10. CONSTRUCTION ENTRANCES SHALL NOT BE RELIED UPON TO REMOVE MUD FROM VEHICLES AND PREVENT OFF-SITE TRACKING. VEHICLES THAT ENTER AND LEAVE THE CONSTRUCTION-SITE SHALL BE RESTRICTED FROM MUDDY AREAS.
11. REMOVAL - THE ENTRANCE SHALL REMAIN IN PLACE UNTIL THE DISTURBED AREA IS STABILIZED OR REPLACED WITH A PERMANENT ROADWAY OR ENTRANCE.

STABILIZED CONSTRUCTION ENTRANCE

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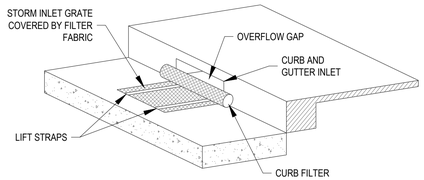
SECTION

NOTES:

1. INLET PROTECTION SHALL BE CONSTRUCTED EITHER BEFORE UPSLOPE LAND DISTURBANCE BEGINS OR BEFORE THE INLET BECOMES FUNCTIONAL.
2. THE EARTH AROUND THE INLET SHALL BE EXCAVATED COMPLETELY TO A DEPTH AT LEAST 18 INCHES.
3. THE WOODEN FRAME SHALL BE CONSTRUCTED OF 2-INCH BY 4-INCH CONSTRUCTION GRADE LUMBER. THE 2-INCH BY 4-INCH POSTS SHALL BE DRIVEN 18" INTO THE GROUND AT FOUR CORNERS OF THE INLET AND THE TOP PORTION OF 2-INCH BY 4-INCH FRAME ASSEMBLED USING THE OVERLAP JOINT SHOWN. THE TOP OF THE FRAME SHALL BE AT LEAST 6 INCHES BELOW ADJACENT ROADS IF PONDED WATER WILL POSE A SAFETY HAZARD TO TRAFFIC.
4. WIRE MESH SHALL BE OF SUFFICIENT STRENGTH TO SUPPORT FABRIC WITH WATER FULLY IMPOUNDED AGAINST IT. IT SHALL BE STRETCHED TIGHTLY AROUND THE FRAME AND FASTENED SECURELY TO THE FRAME.
5. GEOTEXTILE MATERIAL SHALL HAVE AN EQUIVALENT OPENING SIZE OF 20-40 SIEVE AND BE RESISTANT TO SUNLIGHT. IT SHALL BE STRETCHED TIGHTLY AROUND THE FRAME AND FASTENED SECURELY. IT SHALL EXTEND FROM THE TOP OF THE FRAME TO 18 INCHES BELOW THE INLET NOTCH ELEVATION. THE GEOTEXTILE SHALL OVERLAP ACROSS ONE SIDE OF THE INLET SO THE ENDS OF THE CLOTH ARE NOT FASTENED TO THE SAME POST.
6. BACKFILL SHALL BE PLACED AROUND THE INLET IN COMPACTED 6 INCH LAYERS UNTIL THE EARTH IS EVEN WITH NOTCH ELEVATION ON ENDS AND TOP ELEVATION ON SIDES.
7. A COMPACTED EARTH DIKE OR CHECK DAM SHALL BE CONSTRUCTED IN THE DITCH LINE BELOW THE INLET IF THE INLET IS NOT IN A DEPRESSION. THE TOP OF THE DIKE SHALL BE AT LEAST 6 INCHES HIGHER THAN THE TOP OF THE FRAME.

AREA INLET PROTECTION

NTS

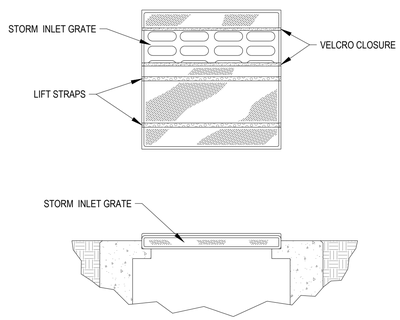


NOTE:

INLET PROTECTION SHALL BE DANDY CURB BAG OR APPROVED OTHER.

CURB INLET PROTECTION

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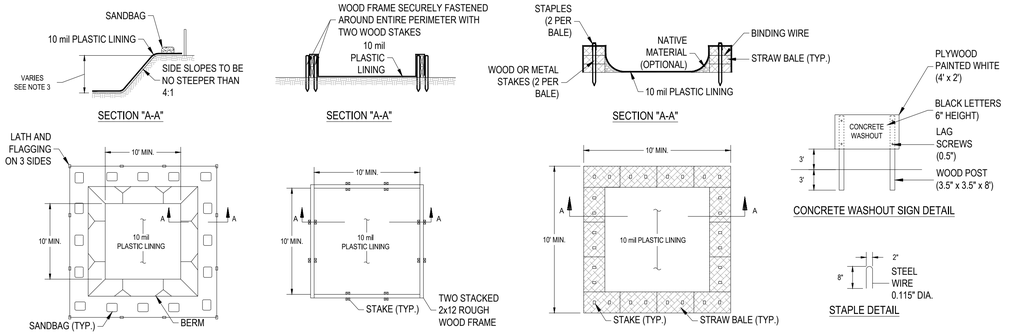


NOTE:

INLET PROTECTION SHALL BE DANDY BAG OR APPROVED OTHER.

INLET PROTECTION

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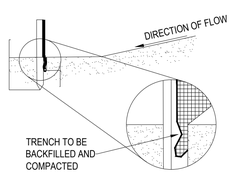


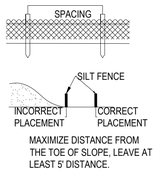
NOTES:

1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30' OF THE TEMPORARY CONCRETE WASHOUT FACILITY.
3. THE WASHOUT MUST HAVE SUFFICIENT VOLUME TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS INCLUDING BUT NOT LIMITED TO OPERATIONS ASSOCIATED WITH GROUT AND MORTAR.

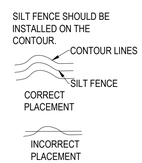
CONCRETE WASHOUT

NTS





MAXIMIZE DISTANCE FROM THE TOE OF SLOPE, LEAVE AT LEAST 5' DISTANCE.



SPECIFICATIONS FOR SILT FENCE

FABRIC PROPERTIES	VALUES	TEST METHODS
GRAB TENSILE STRENGTH	90 LB. MINIMUM	ASTM D-1682
MULEN BURST STRENGTH	190 PSI MINIMUM	ASTM D-3786
SLURRY FLOW RATE	0.3 GAL/MIN/FT. MAX.	
EQUIVALENT OPENING SIZE	40-80	US STD. SIEVE CW 02215
ULTRAVIOLET RADIATION STABILITY	90% MINIMUM	ASTM - G 26

NOTES:

1. SILT FENCE SHALL BE CONSTRUCTED BEFORE UPSLOPE LAND DISTURBANCE BEGINS.
2. ALL SILT FENCE SHALL BE PLACED AS CLOSE TO THE CONTOUR AS POSSIBLE SO THAT WATER WILL NOT CONCENTRATE AT LOW POINTS IN THE FENCE AND SO THAT SMALL SWALES OR DEPRESSIONS WHICH MAY CARRY SMALL CONCENTRATED FLOWS TO THE SILT FENCE ARE DISSIPATED ALONG ITS LENGTH.
3. TO PREVENT WATER PONDED BY THE SILT FENCE FROM FLOWING AROUND THE ENDS, EACH END SHALL BE CONSTRUCTED UPSLOPE SO THAT THE ENDS ARE AT A HIGHER ELEVATION.
4. WHERE POSSIBLE, SILT FENCE SHALL BE PLACED ON THE FLATTEST AREA AVAILABLE.
5. WHERE POSSIBLE, VEGETATION SHALL BE PRESERVED FOR 5 FT. (OR AS MUCH AS POSSIBLE) UPSLOPE FROM THE SILT FENCE. IF VEGETATION IS REMOVED, IT SHALL BE ESTABLISHED WITHIN 7 DAYS FROM THE INSTALLATION OF THE SILT FENCE.
6. THE HEIGHT OF THE SILT FENCE SHALL BE A MINIMUM OF 16 IN. ABOVE THE ORIGINAL GROUND SURFACE.
7. THE SILT FENCE SHALL BE PLACED IN A TRENCH CUT A MINIMUM F 6 IN. DEEP. THE TRENCH SHALL BE CUT WITH A TRENCHER, CABLE LAYING MACHINE, OR OTHER SUITABLE DEVICES WHICH WILL ENSURE ADEQUATE UNIFORM TRENCH DEPTH.
8. THE SILT FENCE SHALL BE PLACED WITH THE STAKES ON THE DOWNSLOPE SIDE OF THE GEOTEXTILE AND SO THAT THE 8 INCHES OF CLOTH ARE BELOW THE GROUND SURFACE. EXCESS MATERIAL SHALL LAY ON THE BOTTOM OF THE 6 IN. DEEP TRENCH. THE TRENCH SHALL BE BACKFILLED AND COMPACTED.
9. SEAMS BETWEEN SECTIONS OF SILT FENCE SHALL BE OVERLAPPED WITH THE END STAKES OF EACH SECTION WRAPPED TOGETHER BEFORE DRIVING INTO THE GROUND.
10. MAINTENANCE - SILT FENCE SHALL ALLOW RUNOFF TO PASS ONLY AS DIFFUSE FLOW THROUGH THE GEOTEXTILE. IF RUNOFF OVERTOPS SILT FENCE, FLOWS UNDER OR AROUND THE ENDS, OR IN ANY OTHER WAY BECOMES A CONCENTRATED FLOW, ONLY OF THE FOLLOWING SHALL BE PERFORMED, AS APPROPRIATE:
    1) THE LAYOUT OF THE SILT FENCE SHALL BE CHANGED,
    2) ACCUMULATED SEDIMENT SHALL BE REMOVED, OR
    3) OTHER PRACTICES SHALL BE INSTALLED.

CRITERIA FOR SILT FENCE MATERIALS

1. FENCE POSTS - THE LENGTH SHALL BE A MINIMUM OF 32 INCHES LONG. WOOD POSTS WILL BE 2 IN. X 2 IN. HARDWOOD OF SOUND QUALITY. THE MAXIMUM SPACING BETWEEN POSTS SHALL BE 10 FT.
2. SILT FENCE FABRIC (SEE CHART BELOW)

SILT FENCE

NTS

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WWW.CESOINC.COM
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Miamisburg, OH 45342
Phone: 937.435.8584 Fax: 888.208.4826

STATE OF NEW HAMPSHIRE
ZACHARY DAVID FRESHNER
No. 16215
LICENSED PROFESSIONAL ENGINEER
07/24/2023

HANG TEN CAR WASH

DOVER, NH

914 CENTRAL AVE.
DOVER, NH 03820

Revisions / Submissions

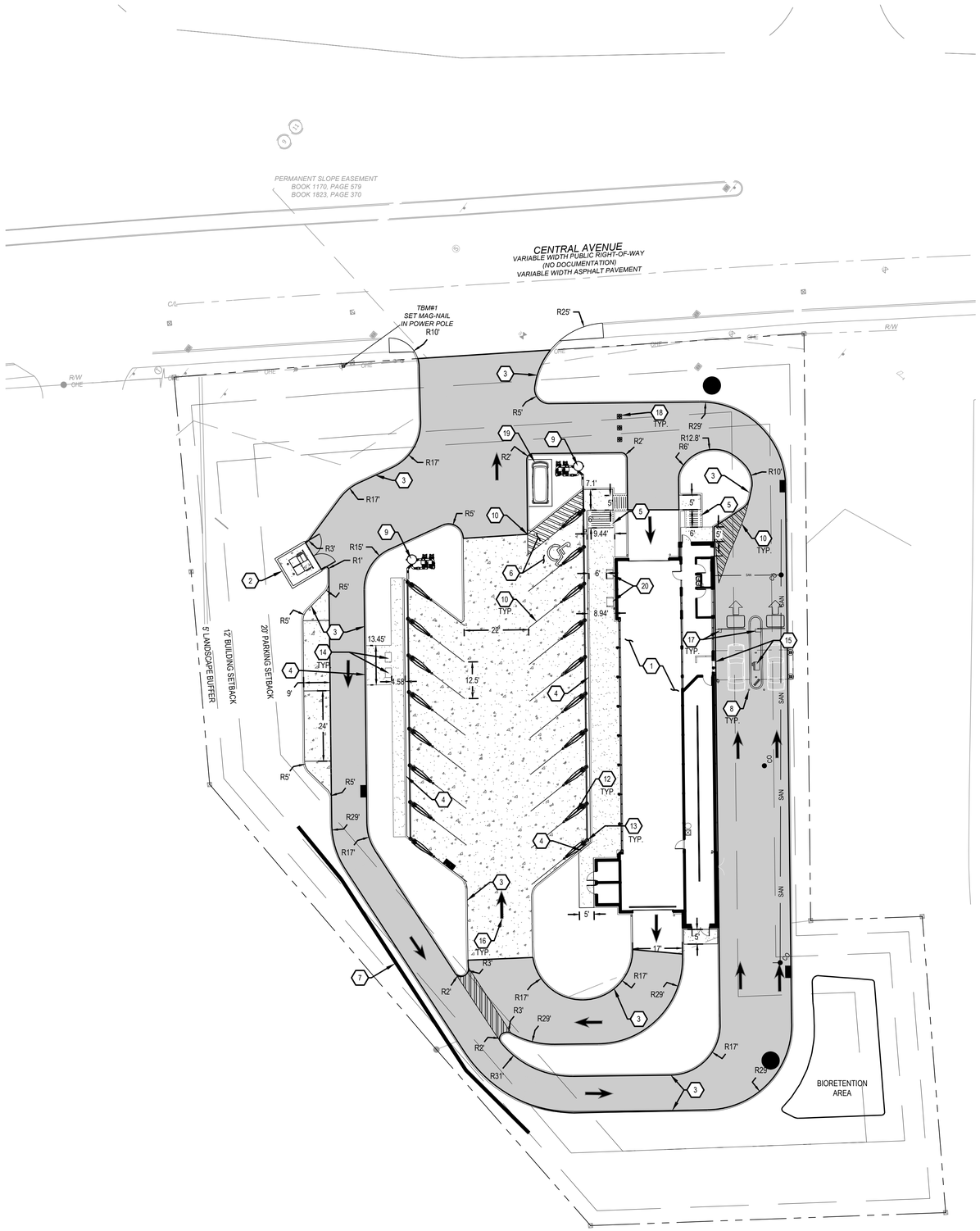
ID	Description	Date

Project Number:	761766
Scale:	1'=20'
Drawn By:	NTV
Checked By:	HGC
Date:	06/28/2023
Issue:	PERMIT

Drawing Title:
SWPPP DETAILS

C2.3

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SITE LEGEND

EXISTING

REFER TO C0.1 FOR EXISTING FEATURES LEGEND

PROPOSED

- PROPOSED STANDARD DUTY ASPHALT PAVEMENT
- PROPOSED PERVIOUS PAVERS (SEE DETAIL ON SHEET C600)
- PROPOSED CONCRETE PAVEMENT
- RIGHT-OF-WAY
- PROPERTY LINE
- SETBACK
- EASEMENT
- CENTERLINE
- BUILDING
- CONCRETE CURB
- PAVEMENT/WALK
- RETAINING WALL
- PARKING SPACE COUNT
- SIGN
- DETECTABLE WARNING MAT.
- CATCH BASIN
- STORM MANHOLE
- SANITARY MANHOLE
- CURB INLET
- CLEANOUT
- YARD DRAIN
- DOWN SPOUT
- FIRE HYDRANT
- LIGHT POLE
- CONCRETE BUMPER BLOCK

GENERAL NOTES:

SEE SHEET C0.1

CODED NOTES:

1. PROPOSED 4400 SF BUILDING. REFER TO ARCHITECTURAL PLANS FOR DETAILS.
2. PROPOSED TRASH ENCLOSURE PER LOCAL REQUIREMENTS. SEE ARCHITECTURAL PLAN FOR DETAILS.
3. PROPOSED 6" CONCRETE CURB. REFER TO CONSTRUCTION DETAILS, SHEET 6.0.
4. PROPOSED CONCRETE CURB WITH SIDEWALK. REFER TO CONSTRUCTION DETAILS, SHEET 6.0.
5. PROPOSED CURB RAMP, REFER TO CONSTRUCTION DETAILS, SHEET 6.0.
6. ADA ACCESSIBLE PARKING SPACE WITH SIGNAGE. REFER TO CONSTRUCTION DETAILS, SHEET 6.0.
7. PROPOSED RETAINING WALL SHALL BE DESIGNED BY OTHERS.
8. PROPOSED 6" CONCRETE BOLLARD. REFER TO CONSTRUCTION DETAILS, SHEET C6.0.
9. PROPOSED PUMP. REFER TO MEP PLANS FOR DETAILS.
10. PROPOSED PARKING LOT PAVEMENT MARKINGS.
11. PROPOSED LIGHT POLE.
12. PROPOSED VACUUMS. REFER TO MEP PLANS FOR DETAILS.
13. PROPOSED VACUUM MOTOR/ EQUIPMENT ENCLOSURE. REFER TO MEP PLANS FOR DETAILS.
14. PROPOSED TRASH RECEPTACLE.
15. PROPOSED PAY STATION. REFER TO MEP PLANS FOR DETAILS.
16. PROPOSED DIRECTIONAL ARROW TO BE IN COMPLIANCE WITH M.U.T.C.D. STANDARDS.
17. PROPOSED BARRIER GATE. REFER TO MEP PLANS FOR DETAILS.
18. PROPOSED TRAFFIC CONE.
19. PROPOSED CAR SIGNAGE.
20. PROPOSED FLOOR MAT CLEANER.

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SEVENTY-TWO (72) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: NEW HAMPSHIRE UTILITIES PROTECTION SERVICE AT 811 OR 888-344-7233 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

20 0 20 40

GRAPHIC SCALE (IN FEET)
1 in. = 20 ft.

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STATE OF NEW HAMPSHIRE
ZACHARY DAVID FREISHNER
No. 16215
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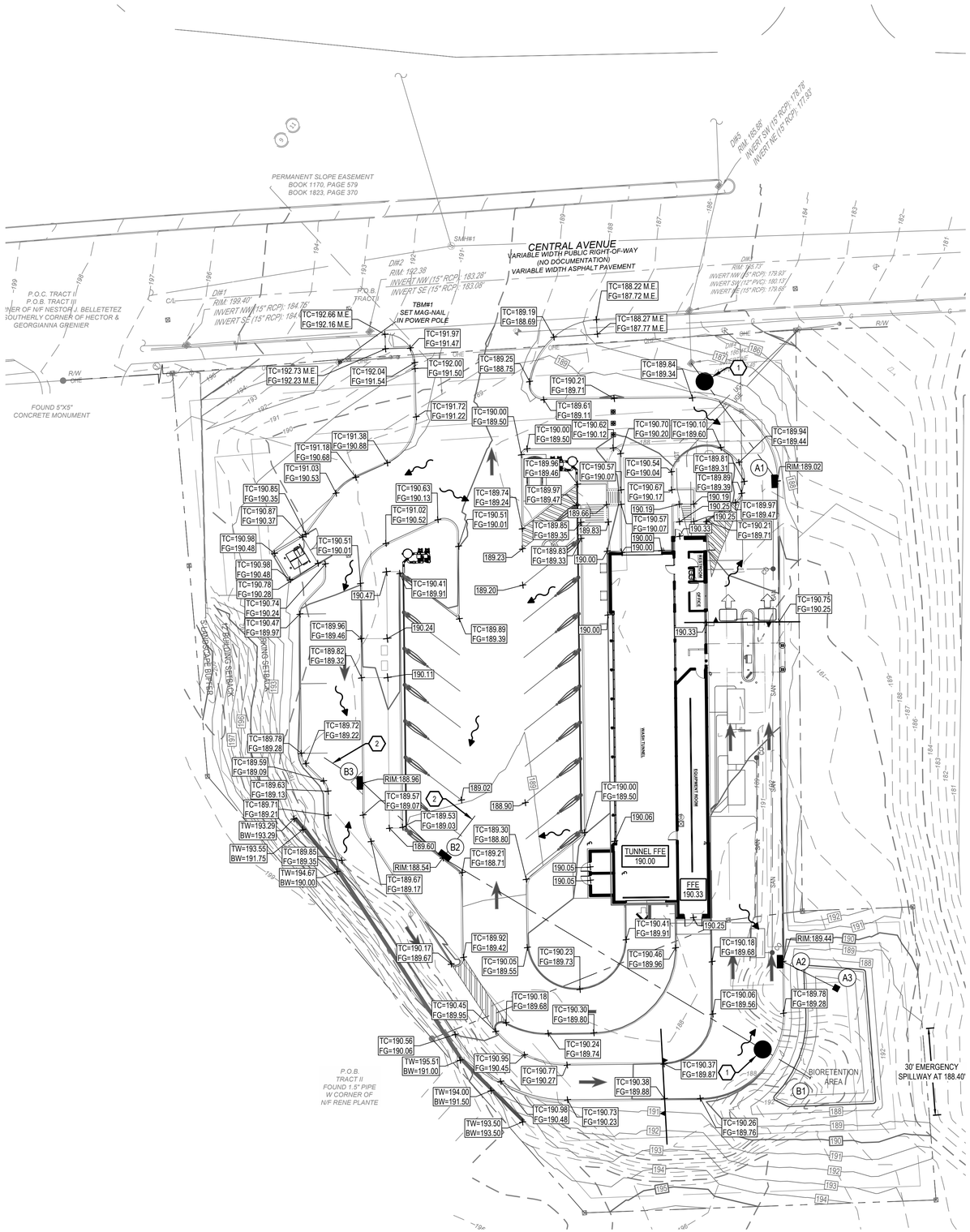
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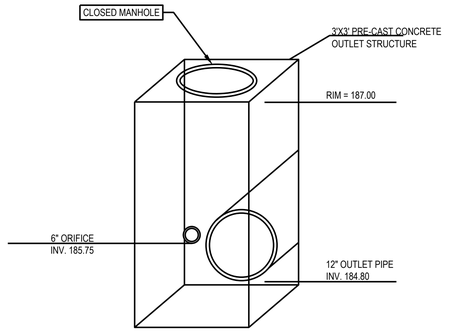
761766
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NTV
HGC
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PERMIT

SITE PLAN

C3.0

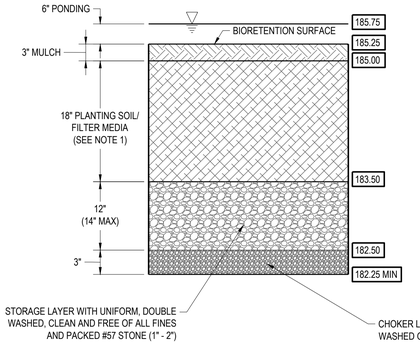
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OUTLET STRUCTURE (A3)

NTS

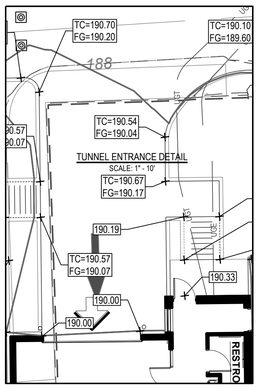


BIORETENTION NOTES:

1. FILTER MEDIA SHALL BE EITHER (PER THE NEW HAMPSHIRE STORMWATER MANUAL VOLUME 2, BIORETENTION SYSTEM):
   - A. FILTER MEDIA OPTION A
     - 50 TO 55% - ASTM C-33 CONCRETE SAND
     - 20 TO 30% - LOAMY SAND TOPSOIL, WITH FINES AS INDICATED (15 TO 25% PERCENT BY WEIGHT PASSING STANDARD #200 SIEVE)
     - 20 TO 30% - MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH, WITH FINES AS INDICATED (<5% PERCENT BY WEIGHT PASSING STANDARD #200 SIEVE)
   - B. FILTER MEDIA OPTION B
     - 20 TO 30% - MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH, WITH FINES AS INDICATED (<5% PERCENT BY WEIGHT PASSING STANDARD #200 SIEVE)
     - 70 TO 80% - LOAMY COARSE SAND
       - 85 TO 100% PERCENT BY WEIGHT PASSING STANDARD #10 SIEVE
       - 70 TO 100% PERCENT BY WEIGHT PASSING STANDARD #20 SIEVE
       - 15 TO 40% PERCENT BY WEIGHT PASSING STANDARD #60 SIEVE
       - 8 TO 15% BY WEIGHT PASSING STANDARD #200 SIEVE

BIORETENTION SECTION

NTS



GRADING LEGEND

EXISTING

REFER TO C1.1 FOR EXISTING FEATURES LEGEND

PROPOSED

- RIGHT-OF-WAY
- PROPERTY LINE
- SETBACK
- EASEMENT
- BUILDING
- 960 — MAJOR CONTOUR
- 962 — MINOR CONTOUR
- GRADE BREAK
- FLOW LINE
- (1) — STRUCTURE NUMBER
- (D) — STORM MANHOLE
- CURB INLET
- CO — CLEANOUT
- DS — DOWNSPOUT
- XXX.XX — FINISHED GRADE ELEVATION
- RIM=XXX.XX — RIM ELEVATION
- BC=XXX.XX — BACK OF CURB ELEVATION
- TC=XXX.XX / FG=XXX.XX — TOP OF CURB ELEVATION / FINISHED GRADE ELEVATION
- TP=XXX.XX / FTG=XXX.XX — TOP OF PAVEMENT ELEVATION / TOP OF FOOTING ELEVATION
- M.E. — MATCH EXISTING ELEVATION

GENERAL NOTES:

SEE SHEET C0.1

CODED NOTES:

1. PROPOSED HYDRODYNAMIC SEPARATOR. CONTRACTOR SHALL USE STORMTRAP STORMSETTLER OR APPROVED EQUAL.
2. PROPOSED 4" SUBDRAIN UNDER PERVIOUS PAVEMENT. SEE DETAIL ON SHEET C600.

STORM SEWER STRUCTURE SCHEDULE

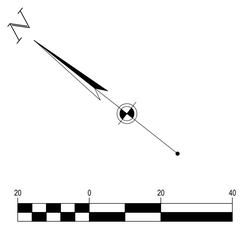
NO.	STRUCTURE	GRATE	INVERT
A1	CURB INLET	189.02	181.22 (12") SW 181.22 (12") N
A2	CURB INLET	189.44	183.70 (12") NE 184.80 (12") S
A3	OUTLET CONTROL STRUCTURE	185.25	183.70 (12") N
B1	HEADWALL	-	185.25 (18") N
B2	CURB INLET	188.54	185.50 (12") N 185.50 (18") S
B3	CURB INLET	188.96	186.46 (12") S
EX1	EXISTING INLET	187.52	180.46 (12") S

STORM SEWER PIPE TABLE

PIPE NAME	DIAMETER	LENGTH	SLOPE
A1-EX	12"	50'	1.51%
A2-A1	12"	166'	1.50%
A3-A2	12"	21'	5.36%
B2-B1	18"	148'	0.17%
B3-B2	12"	38'	2.54%

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GRAPHIC SCALE (IN FEET)
1 in. = 20 ft.

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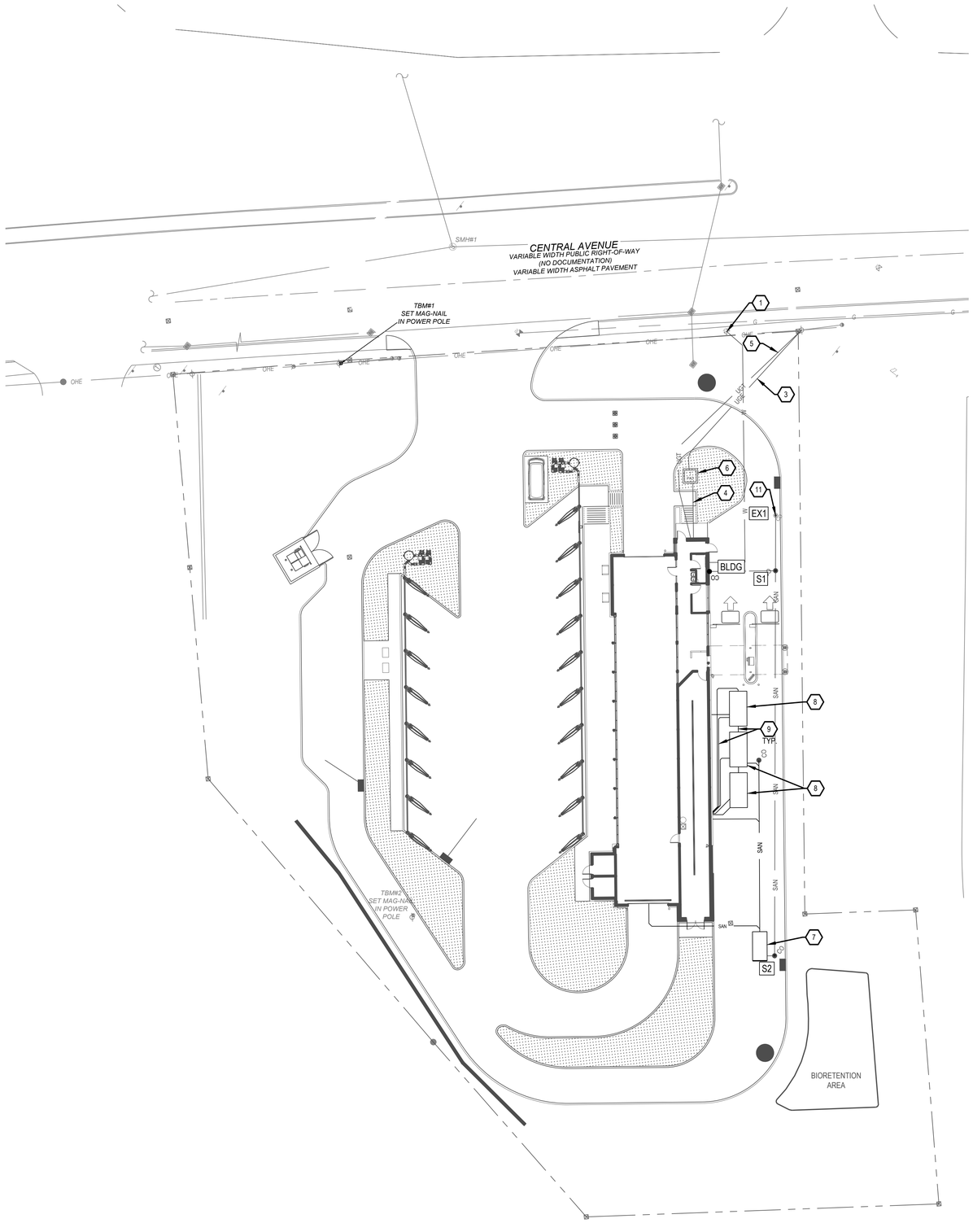
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761766
1"=20'
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GRADING & DRAINAGE PLAN

C4.0

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SANITARY SEWER STRUCTURE SCHEDULE

NO.	STRUCTURE	RIM	INVERT
BLDG	BLDG CONNECTION	190.08	187.10 (6") SE
EX1	CLEANOUT	188.82	186.91 (6") SW
S1	CLEANOUT	189.59	187.10 (6") SW 187.10 (6") NE 187.33 (6") NW
S2	CLEANOUT	189.50	188.42 (6") NE

SANITARY SEWER PIPE TABLE

PIPE NAME	DIAMETER	LENGTH	SLOPE
S1-S2	6"	132'	1.00%
EX1-S1	6"	19'	1.00%
S1-BLDG	6"	23'	1.00%

UTILITY LEGEND

EXISTING

REFER TO GXX FOR EXISTING FEATURES LEGEND

PROPOSED

- BUILDING
- CONCRETE CURB
- PAVEMENT/WALK
- STM — STORM SEWER LINE
- SAN — SANITARY SEWER LINE
- W — DOMESTIC WATER SERVICE LINE
- G — GAS SERVICE LINE
- OHE — OVERHEAD ELECTRIC LINE
- UGE — UNDERGROUND ELECTRIC LINE
- FM — FORCEMAIN
- UGT — UNDERGROUND TELEPHONE LINE
- OHT — OVERHEAD TELEPHONE LINE
- CATCH BASIN
- STORM SEWER
- SANITARY SEWER
- CURB INLET
- CO — CLEANOUT
- YD — YARD DRAIN
- DS — DOWNSPOUT
- T PAD — ELECTRICAL TRANSFORMER PAD
- FIRE HYDRANT
- WATER VALVE
- HEADWALL WITH RIP-RAP

GENERAL NOTES:

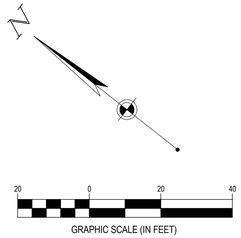
SEE SHEET C1.1

CODED NOTES:

1. PROPOSED 2" WATER SERVICE LINE CONNECTED TO EXISTING WATER METER. CONTRACTOR SHALL VERIFY WITH UTILITY COMPANY CURRENT SIZE OF WATER METER.
2. PROPOSED GAS SERVICE LINE. CONTRACTOR TO COORDINATE SERVICE WITH PROVIDER FOR CONNECTION. SEE MECHANICAL SHEETS FOR SIZE, MATERIALS, AND BUILDING CONNECTION DETAILS.
3. PROPOSED UNDERGROUND PRIMARY ELECTRIC SERVICE LINE. CONTRACTOR SHALL COORDINATE WITH SERVICE PROVIDER.
4. PROPOSED UNDERGROUND SECONDARY ELECTRIC SERVICE LINE. CONTRACTOR SHALL COORDINATE WITH SERVICE PROVIDER AND MEP PLANS FOR CONNECTION.
5. PROPOSED UNDERGROUND TELEPHONE SERVICE LINE. CONTRACTOR SHALL COORDINATE WITH SERVICE PROVIDER FOR CONNECTION.
6. PROPOSED TRANSFORMER PAD. CONTRACTOR SHALL COORDINATE WITH SERVICE PROVIDER FOR CONNECTION.
7. PROPOSED OIL/WATER SEPARATOR. SEE MECHANICAL SHEETS FOR ADDITIONAL INFORMATION.
8. PROPOSED 2000 GAL. RECLAIM TANK. SEE MECHANICAL SHEETS FOR ADDITIONAL INFORMATION.
9. PROPOSED RECLAIM TANK SERVICE LINE. SEE MECHANICAL SHEETS FOR ADDITIONAL INFORMATION.
10. PROPOSED ELECTRIC AND COMMUNICATIONS LINES. REFER TO MEP PLANS FOR ADDITIONAL INFORMATION.
11. SANITARY SEWER TO BE TIED INTO EXISTING CLEANOUT. CONTRACTOR SHALL TELEVISE SANITARY SEWER BETWEEN CLEAN OUT AND SANITARY MAIN TO DETERMINE IF SANITARY SEWER NEEDS TO BE REPLACED. CONTRACTOR TO VERIFY 1% SLOPE. NOTIFY ENGINEER OF ANY DISCREPANCIES. CONTRACTOR SHALL VERIFY THAT THE EXISTING SANITARY SERVICE IS 6".

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UTILITY PLAN

C5.0

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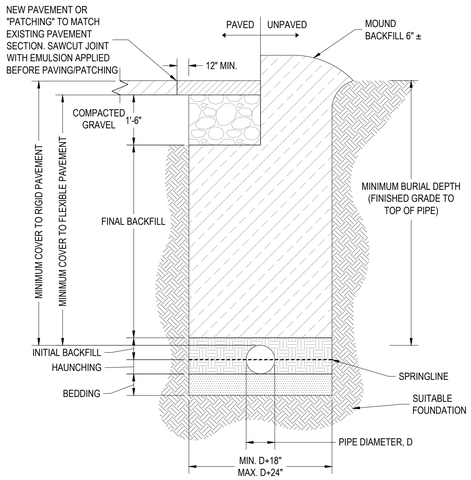


TABLE 1: BACKFILL AND EMBEDMENT MATERIALS

SOIL CLASSIFICATIONS (AS DEFINED IN ASTM D2487 AND D2321)	
CLASS I	CRUSHED ROCK ANGULAR (CLEAN).
CLASS II	GRAVEL AND/OR SANDS, WITH LITTLE OR NO FINES.
CLASS III	SAND/SILT AND SAND/CLAY MIXTURES.
CLASS IV	INORGANIC CLAYS
CLASS V	ORGANIC SILTS, CLAYS, AND PEATS.
SOIL CLASSIFICATIONS (AS DEFINED IN ASCE 15-98)	
CATEGORY I	GRAVELLY SAND
CATEGORY II	SANDY SILT
CATEGORY III	SILTY CLAY

NOTES:

1. IN THE CASE OF TRENCH BOTTOM BEING UNSTABLE, THE CONTRACTOR SHALL REPLACE FOUNDATION WITH SUITABLE MATERIAL AS SPECIFIED BY GEOTECHNICAL ENGINEER.
2. COMPACTION PERCENTAGES SPECIFIED REFER TO STANDARD PROCTOR PERCENT COMPACTION.
3. CONTRACTOR TO MANDATE DEWATERING IN TRENCHES DURING CONSTRUCTION.
4. TRENCHING OPERATIONS SHALL CONFORM TO ALL OSHA REQUIREMENTS.
5. FOR HDPE AND PVC WATERLINES AND LONG SEWER LATERALS, INSTALL METALLIC LOCATOR TAPE 12" (MIN) AND 18" (MAX) BELOW FINISHED SUBGRADE ELEVATION. INSTALL TRACER WIRE LOCATED AT THE TOP OF THE PIPE WITHIN THE INITIAL BACKFILL.

PVC PIPE	
ZONE	DEPTH / SOIL MATERIAL
FINAL BACKFILL	CLASS I-V*
INITIAL BACKFILL	MINIMUM DEPTH = D/2 (12" COMMON)** CLASS I, II, AND III*
HAUNCHING	DEPTH = D/2** CLASS I, II, AND III COMPACTED*
BEDDING	DEPTH = 4-6" CLASS I, II, AND III COMPACTED*

NOTE: HAUNCHING ZONE MUST BE COMPACTED PRIOR TO PLACEMENT AND COMPACTION OF INITIAL AND FINAL BACKFILLS TO PREVENT PIPE DEFLECTION.

HDPE PIPE	
ZONE	DEPTH / SOIL MATERIAL
FINAL BACKFILL	MINIMUM COVER UNPAVED AREAS = 12" MINIMUM COVER PAVED AREAS (D <=48") = 12"***,*** MINIMUM COVER PAVED AREAS (D>48") = 24"***,*** CLASS I AND II (COMPACTED 90% SPD) AND CLASS III (COMPACTED 95% SPD)*
INITIAL BACKFILL	MINIMUM DEPTH = D/2 (CAN EXTEND TO THE CROWN OF THE PIPE)** CLASS I, II, AND III (TYPE IV CAN BE USED WITH THE APPROVAL OF GEOTECHNICAL ENGINEER)*
HAUNCHING	DEPTH = D/2** CLASS I, II, AND III (TYPE IV CAN BE USED WITH THE APPROVAL OF GEOTECHNICAL ENGINEER)*
BEDDING	DEPTH (D <= 24") = 4*** DEPTH (D > 24") = 6*** CLASS I, II, AND III (TYPE IV CAN BE USED WITH THE APPROVAL OF GEOTECHNICAL ENGINEER)*

NOTE: THE MIDDLE $\frac{1}{3}$ BENEATH THE PIPE INVERT IN THE BEDDING ZONE SHALL BE LOOSELY PLACED

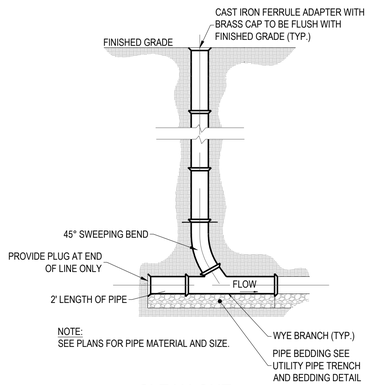
RC PIPE	
ZONE	DEPTH / SOIL MATERIAL
FINAL BACKFILL	CATEGORY I, II, III*
INITIAL BACKFILL	DEPTH = D/2** CATEGORY I (85-95% COMPACTION), CATEGORY II (90-95% COMPACTION), OR CATEGORY III (85-95% COMPACTION)*
HAUNCHING	DEPTH = D/2** CATEGORY I (85-95% COMPACTION), CATEGORY II (90-95% COMPACTION), OR CATEGORY III (85-95% COMPACTION)*
BEDDING	MINIMUM DEPTH = D/24 (NOT LESS THAN 3")** IF ROCK FOUNDATION, MINIMUM DEPTH = D/12 (NOT LESS THAN 6")** CATEGORY I (85-95% COMPACTION), CATEGORY II (90-95% COMPACTION), OR CATEGORY III (85-95% COMPACTION)*

NOTE: FOR ELLIPTICAL AND ARCH PIPE, D SHALL REPRESENT HORIZONTAL SPAN OF PIPE.

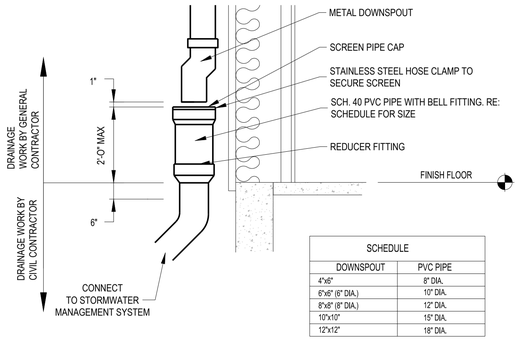
DI PIPE	
ZONE	DEPTH / SOIL MATERIAL
FINAL BACKFILL	CLASS I-V*
INITIAL BACKFILL	DEPTH = D/2** CLASS I, II, AND III (APPROX. 90% STANDARD PROCTOR PER AASHTO T-99)*
HAUNCHING	DEPTH = D/2** CLASS I, II, AND III*
BEDDING	MINIMUM DEPTH = 4" CLASS I, II, AND III*

*SEE TABLE 1 FOR SPECIFICATIONS ON SOIL MATERIALS
** D = PIPE DIAMETER
*** MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

UTILITY PIPE TRENCH AND BEDDING
NTS

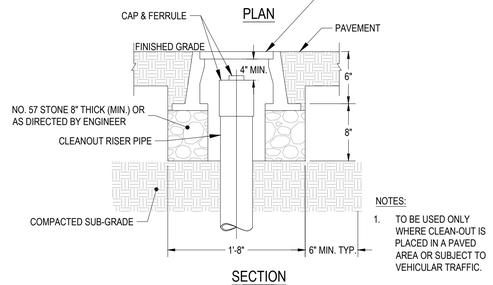


CLEAN OUT
NTS



SCHEDULE	
DOWNSPOUT	PVC PIPE
4"x6"	8" DIA.
6"x6" (6" DIA.)	10" DIA.
8"x8" (8" DIA.)	12" DIA.
10"x10"	15" DIA.
12"x12"	18" DIA.

DOWNSPOUT COLLECTOR DETAIL
NTS



CLEANOUT PROTECTION BOX
NTS

CESO
WWW.CESOINC.COM

STATE OF NEW HAMPSHIRE
ZACHARY DAVID FRESHNER
No. 16215
PROFESSIONAL ENGINEER
07/24/2023

HANG TEN CAR WASH

DOVER, NH
914 CENTRAL AVE.
DOVER, NH 03820

Revisions / Submissions

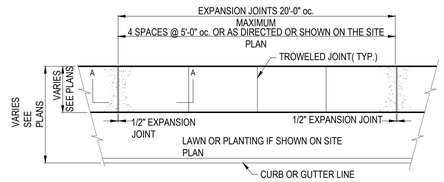
ID	Description	Date

761766
1"=20'
NTV
HGC
06/28/2023
PERMIT

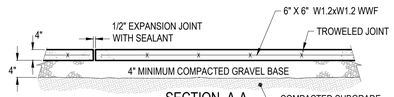
UTILITY DETAILS

C5.1

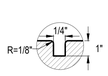
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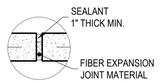
PLAN VIEW



SECTION A-A



TROWELED JOINT



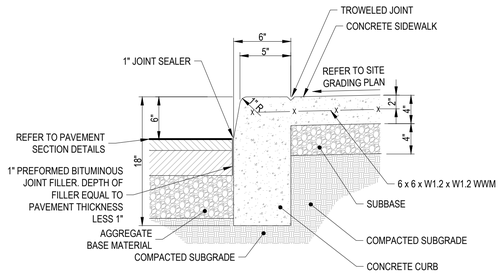
EXPANSION JOINT

NOTES:

1. ALL CONCRETE CURBS AND SIDEWALKS TO BE 4000 P.S.I. CONCRETE.
2. SIDEWALK TO BE SLOPED 2% MAX. AWAY FROM BUILDING.
3. ALL SIDEWALKS SHALL BE BROOM FINISHED.

CONCRETE SIDEWALK

NTS

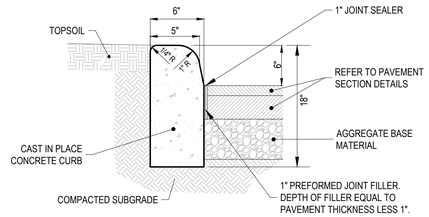


NOTES:

1. ALL CONCRETE CURBS AND SIDEWALK TO BE 4,000 P.S.I. CONCRETE AT 28 DAYS.
2. TRANSVERSE EXPANSION JOINTS, 1/2" WIDE, SHALL BE INSTALLED IN THE CURB 20'-0" APART MAXIMUM. SPACING SHALL MATCH SIDEWALK.
3. EXPANSION JOINTS SHALL BE FILLED WITH 1/2" PREFORMED JOINT FILLER, RECESSED 1/4" FROM TOP AND FACE OF CURB.
4. MAXIMUM HEIGHT OF CURB TO PAVING IS 6".

CONCRETE SIDEWALK W/ CURB

NTS

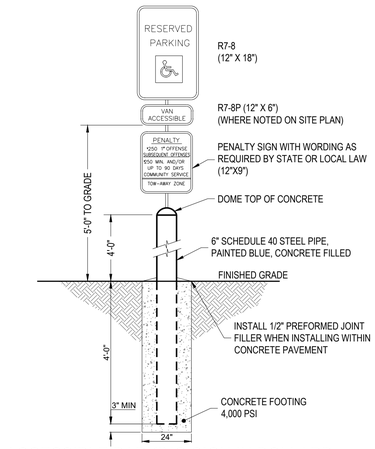


NOTES:

1. ALL CONCRETE CURBS TO BE 4,000 P.S.I. CONCRETE AT 28 DAYS.
2. TRANSVERSE EXPANSION JOINTS, 1/2" WIDE, SHALL BE INSTALLED IN THE CURB 20'-0" APART MAXIMUM.
3. EXPANSION JOINTS SHALL BE FILLED WITH 1/2" PREFORMED JOINT FILLER, RECESSED 1/4" FROM TOP AND FACE OF CURB.
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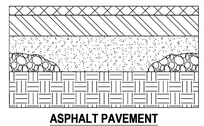
CONCRETE CURB

NTS



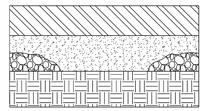
ACCESSIBLE PARKING SIGN IN BOLLARD

NTS



A. ASPHALT PAVEMENT SURFACE COURSE
B. ASPHALT PAVEMENT BINDER COURSE
C. AGGREGATE BASE MATERIAL
D. SUBGRADE-COMPACT PER FES GROUP LLC GEOTECHNICAL REPORT SECTION 4.5.1

ASPHALT PAVEMENT



A. PORTLAND CEMENT CONCRETE PAVEMENT, 4000 P.S.I.
B. AGGREGATE BASE MATERIAL
C. SUBGRADE-COMPACT PER FES GROUP LLCGEOTECHNICAL REPORT SECTION 4.5.1

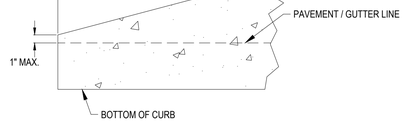
CONCRETE PAVEMENT

PAVEMENT LAYER DEPTHS

	ASPHALT			CONCRETE	
	A	B	C	A	B
STANDARD DUTY	1.5"	2.5"	8"	5"	8"
HEAVY DUTY	2"	2.5"	10"	6"	8"

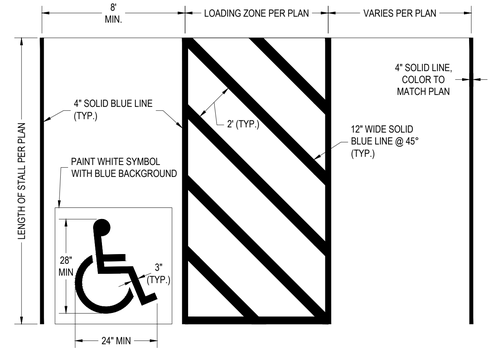
PAVEMENT SECTIONS

NTS



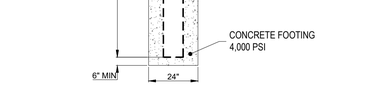
CURB TAPER

NTS



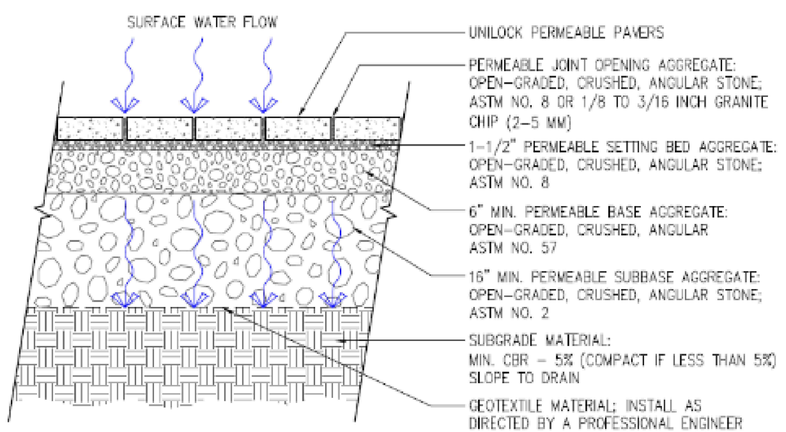
ACCESSIBLE PARKING SPACE STRIPING

NTS



BOLLARD

NTS



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STATE OF NEW HAMPSHIRE
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No. 16215
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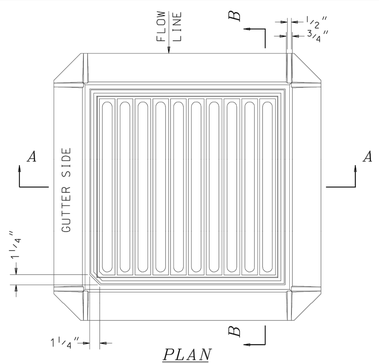
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761766
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06/28/2023
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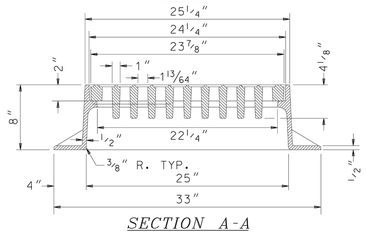
CONSTRUCTION DETAILS

C6.0

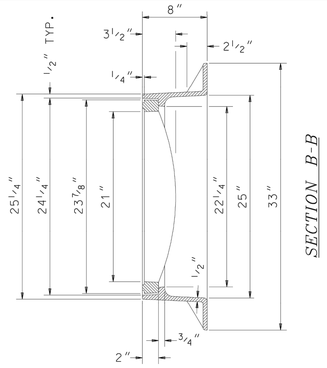
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PLAN



SECTION A-A

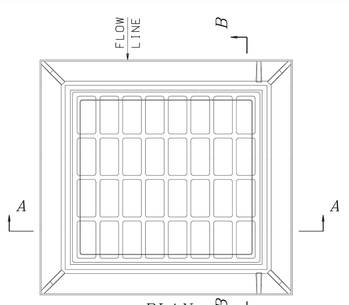


SECTION B-B

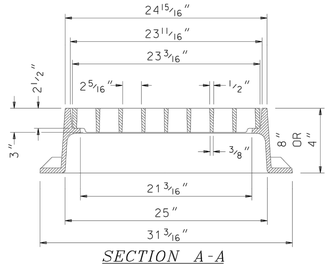
GENERAL NOTES

1. ALL DIMENSIONS ARE NOMINAL.
2. FREE OPEN AREA = 1.73 S.F.
3. NOT TO BE USED WHEN BICYCLE TRAFFIC IS ANTICIPATED.
4. USE 3-FLANGE FRAME IF INSTALLED ADJACENT TO GRANITE CURB.

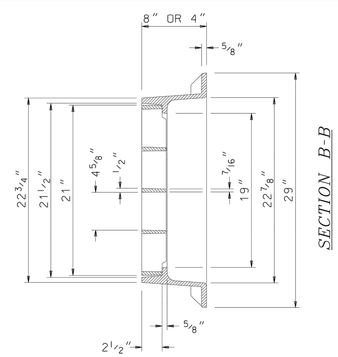
NHDOT STANDARD PLANS	REV. DATE		PLATE
TYPE "A" GRATE & FRAME	06-16-2010		1
			STANDARD DR-1



PLAN



SECTION A-A

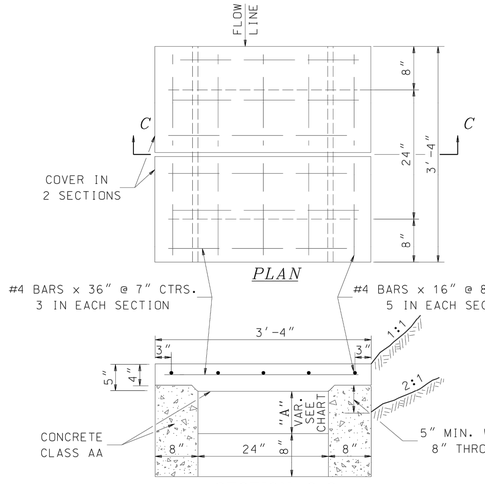


SECTION B-B

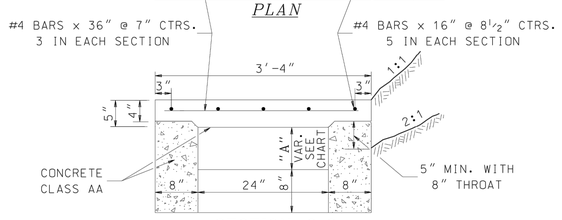
GENERAL NOTES

1. ALL DIMENSIONS ARE NOMINAL.
2. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS THE EXISTING FRAMES ALLOW, WITHOUT SHIMS OR OTHER MODIFICATIONS OR ACCOMMODATIONS.
   C. ALL OTHER PERTINENT REQUIREMENTS OF THE SPECIFICATIONS ARE MET.
3. FRAME AVAILABLE IN 4" OR 8" HEIGHTS.
4. FREE OPEN AREA = 2.55 S.F.
5. USE 3-FLANGE FRAME IF INSTALLED ADJACENT TO GRANITE CURB.

NHDOT STANDARD PLANS	REV. DATE		PLATE
TYPE "B" GRATE & FRAME	06-16-2010		2
	08-14-2015		STANDARD DR-1



PLAN



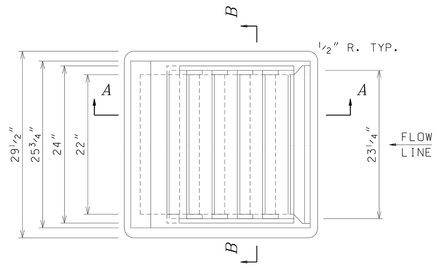
SECTION C-C

TO BE USED IN BERM DITCHES AND AT LOCATIONS INACCESSIBLE TO VEHICULAR TRAFFIC

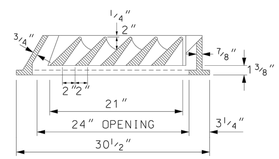
PIPE DIAMETER INCHES	THROAT DEPTH "A" INCHES	
	ONE THROAT	TWO THROAT
12"	8"	8"
15"	8"	8"
18"	16"	8"
24"	18"	16"

IN A SERIES OF CONNECTING C.B.'S OR D.I.'S, THE OUTLET PIPES MAY INCREASE IN DIAMETER, BUT THE SURFACE THROAT OPENINGS ARE NOT AFFECTED.

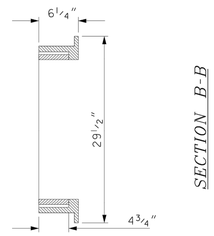
NHDOT STANDARD PLANS	REV. DATE		PLATE
TYPE "C" GRATE & FRAME	06-16-2010		3
			STANDARD DR-1



PLAN



SECTION A-A



SECTION B-B

GENERAL NOTES

1. ALL DIMENSIONS ARE NOMINAL.
2. NOT TO BE USED WHEN BICYCLE TRAFFIC IS ANTICIPATED.
3. USE 3-FLANGE FRAME IF INSTALLED ADJACENT TO GRANITE CURB.
4. FREE OPEN AREA = 1.80 S.F.

NHDOT STANDARD PLANS	REV. DATE		PLATE
TYPE "E" GRATE	06-16-2010		4
			STANDARD DR-1

STANDARD NO. DR-1

REVISION DATE
07-13-2001
06-16-2010
08-14-2015

*.DGN FILE NAME
DR-1

STANDARD PLANS

New Hampshire DOT Department of Transportation

STANDARD NO. DR-1

CESO
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STATE OF NEW HAMPSHIRE
ZACHARY DAVID FRESHNER
No. 16215
LICENSED PROFESSIONAL ENGINEER
07/24/2023

HANG TEN CAR WASH

DOVER, NH

914 CENTRAL AVE.
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Revisions / Submissions

ID	Description	Date

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1"=20'
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HGC
06/28/2023
PERMIT

NHDOT DETAILS

C6.1

W:\PROJECTS\WEA\761269-01_Hang 10_Warwick_RI\03-CIVIL\PLAN\761269_CONSTRUCTION DETAILS.dwg - 7/24/2023 - Hosea Cunningham

GENERAL NOTES:

1. THESE SHEETS ARE IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA), AND THE REQUIREMENTS OF THE 2011 PROPOSED ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT OF WAY (PROWAG).

2. NOT ALL FACILITIES CAN BE CONSTRUCTED TO MEET THE DESIGN STANDARDS. FACILITIES THAT CANNOT BE CONSTRUCTED TO MEET THE DESIGN STANDARDS SHALL BE CONSTRUCTED TO MEET THE STANDARDS TO THE GREATEST EXTENT PRACTICABLE. NONSTANDARD FEATURES SHALL BE DOCUMENTED ON TECHNICAL INFEASIBILITY FORM AND SUBMITTED TO NHDOT ADA COORDINATOR FOR APPROVAL.

3. TO CHECK FIELD LAYOUT ALL SLOPES AND GRADES SHALL BE MEASURED WITH A DIGITAL LEVEL USING AT LEAST TWO READINGS. WHERE THE READINGS VARY, THE MEASUREMENTS SHALL BE AVERAGED. GRADE (RUNNING SLOPE) SHALL BE MEASURED ALONG THE CENTERLINE AND OFFSET 1.00' TO 1.50' FROM THE CENTERLINE. CROSS SLOPES SHALL BE MEASURED PERPENDICULAR TO CENTERLINE AT 5.00' TO 10.00' INTERVALS.

4. GRADES (RUNNING SLOPES) ARE MEASURED IN THE DIRECTION OF PEDESTRIAN TRAVEL. CROSS SLOPES ARE MEASURED PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.

5. JOINTS BETWEEN SIDEWALKS, CURB RAMPS, TURNING SPACES AND ROADWAYS SHALL BE FLUSH AND FREE FROM ABRUPT VERTICAL CHANGES GREATER THAN 1/4". VERTICAL SURFACE DISCONTINUITIES BETWEEN 1/4" AND 1/2" SHALL BE BEVELED WITH A SLOPE NOT STEEPER THAN 2:1. THE BEVEL SHALL BE APPLIED ACROSS THE ENTIRE JOINT. SEE DETAIL ON SHEET 9 OF 9.

6. SIDEWALKS ARE CONNECTED TO ROADWAYS BY EITHER BLENDED TRANSITIONS OR CURB RAMPS. BLENDED TRANSITIONS ARE CONNECTIONS BETWEEN THE SIDEWALK LEVEL AND THE ROADWAY LEVEL THAT HAVE A MAXIMUM GRADE (RUNNING SLOPE) OF 5%, AND TRANSITIONS GREATER THAN 5% ARE CONSIDERED CURB RAMPS.

7. CURB RAMPS AND BLENDED TRANSITIONS MAY REQUIRE THE INSTALLATION OF DETECTABLE WARNINGS. SEE ADDITIONAL "DETECTABLE WARNING DEVICE NOTES" ON THIS SHEET, AND DETAILS ON SHEET 6 OF 10 FOR DIMENSIONS, ORIENTATION AND INSTALLATION.

8. VERTICAL ALIGMENT SHALL BE GENERALLY PLANAR. GRADE BREAKS WITHIN THE PEDESTRIAN ACCESS ROUTE SHALL BE PERPENDICULAR TO THE DIRECTION OF TRAVEL AND SHALL NOT BE ROUNDED.

9. THE CROSS SLOPE OF PEDESTRIAN ACCESS ROUTES (PAR) SHALL BE 2% MAXIMUM. THE FOLLOWING EXCEPTIONS ARE ALLOWED:

   A. WHERE PEDESTRIAN CROSSINGS ARE PROVIDED AT INTERSECTIONS WITHOUT YIELD OR STOP CONTROL OR WHERE THERE IS ANY TRAFFIC SIGNAL, THE CROSS SLOPE OF A PEDESTRIAN ACCESS ROUTE CONTAINED WITHIN A CROSSING SHALL BE 5% MAXIMUM.

   B. WHERE MIDBLOCK PEDESTRIAN CROSSINGS ARE PROVIDED, THE CROSS SLOPE OF A PEDESTRIAN ACCESS ROUTE CONTAINED WITHIN A MIDBLOCK CROSSING SHALL BE PERMITTED TO EQUAL THE STREET OR HIGHWAY GRADE.

10. THE MINIMUM CLEAR WIDTH FOR PEDESTRIAN ACCESS ROUTES IS 4.00', EXCLUSIVE OF THE CURB. WHEN WALKWAY WIDTHS ARE LESS THAN 5.00', 5.00' x 5.00' PASSING SPACES, OR A FEATURE OF EQUAL OR GREATER DIMENSIONS (E.G., DRIVEWAYS) THAT MEET THE SLOPE CRITERIA, SHALL BE PROVIDED AT A MAXIMUM INTERVAL OF 200'. EXISTING DRIVEWAYS AND STREET CROSSING MAY ALSO SERVE AS PASSING SPACES.

11. THE BUFFER ZONE IS A PHYSICAL DISTANCE SEPARATING THE PEDESTRIAN ACCESS ROUTE FROM THE VEHICLE TRAVELED WAY. THE BUFFER ZONE MAY BE PLANTED OR PAVED.

12. WHEN CROSSING DRIVEWAYS, THE WORK SHALL BE IN CONFORMANCE WITH NHDOT DRIVEWAY DETAILS SHEET. THE CROSS SLOPE ACROSS DRIVEWAYS SHALL BE 2% MAXIMUM.

13. FOR ACCESSIBLE PEDESTRIAN SIGNAL PUSH BUTTONS, SEE DETAILS ON SHEET 8 OF 9.

14. FOR RAMP COUNTER SLOPE REQUIREMENTS, SEE DETAILS ON SHEET 9 OF 9.

CURB RAMP NOTES:

15. THE MINIMUM WIDTH OF A CURB RAMP SHALL BE 4.00'.

16. THE FULL WIDTH OF THE RAMP OR LANDING SHALL BE CONTAINED WITHIN THE PAVEMENT MARKINGS AT MARKED CROSSWALKS.

17. CURB RAMPS ARE NOT REQUIRED IN LOCATIONS WHERE THERE IS NO ACCESSIBLE PEDESTRIAN ACCESS ROUTE. UNLESS IT IS SERVING AS A LANDING FOR A PEDESTRIAN SIGNAL.

18. THE GRADE (RUNNING SLOPE) OF A CURB RAMP SHALL BE A MAXIMUM OF 8.3%.

19. WHERE EXISTING CONDITIONS DO NOT ALLOW THE CONSTRUCTION OF A CURB RAMP WITH A GRADE (RUNNING SLOPE) OF 8.3% OR LESS, THE RAMP LENGTH SHALL NOT BE REQUIRED TO EXCEED 15.00'.

20. THE CROSS SLOPE OF THE CURB RAMP SHALL BE AS FLAT AS POSSIBLE AND STILL PROVIDE POSITIVE DRAINAGE. THE CROSS SLOPE OF A CURB RAMP 2% MAXIMUM. SEE NOTE 9 FOR EXCEPTIONS. WHERE THE EXISTING ROADWAY GRADE EXCEEDS 2%, THE CURB RAMP MAY BE WARPED ACCORDING TO THE DETAIL ON SHEET 9 OF 9 TO TIE INTO THE ROADWAY GRADE.

21. RAMP SIDE TREATMENT OPTIONS ARE DETAILED ON SHEET 7 OF 9 FOR USE WITHIN THE BUFFER ZONE. WHERE A PEDESTRIAN CIRCULATION PATH CROSSES THE CURB RAMP, FLARED SIDES SHALL BE INSTALLED WITH A SLOPE OF 10% MAXIMUM. THE SLOPE OF FLARED SIDES IS MEASURED PARALLEL TO THE CURB LINE. (ALSO SEE CURB RAMP CONFIGURATION TYPE 7 ON SHEET 3 OF 9.)

22. THE BACKSIDE OF A PARALLEL RAMP SHOULD BE GRADED TO MATCH EXISTING TERRAIN, UNLESS OTHERWISE SHOWN IN THE CONTRACT DOCUMENTS. WHERE GRADING IS NOT FEASIBLE DUE TO LIMITED ROW OR PHYSICAL CONSTRAINTS, A BACK CURB MAY BE INSTALLED. SEE DETAILS ON SHEET 7 OF 9.

TURNING SPACE AND CLEAR SPACE NOTES:

23. WHERE A CHANGE IN DIRECTION IS REQUIRED TO UTILIZE A CURB RAMP, A TURNING SPACE SHALL BE PROVIDED AT THE BASE AND/OR THE TOP OF CURB RAMP AS APPLICABLE. TURNING SPACES SHALL BE PERMITTED TO OVERLAP CLEAR SPACES.

24. WHERE THERE ARE NO VERTICAL CONSTRAINTS AT THE BACK OF SIDEWALK, (E.G., VERTICAL CURB, BUILDINGS, FENCES) THE TURNING SPACE DIMENSIONS SHALL BE 4.00' x 4.00' MINIMUM. WHERE THE TURNING SPACE IS CONSTRAINED AT THE BACK OF SIDEWALK, THE TURNING SPACE SHALL BE 4.00' X 5.00' MINIMUM. THE 5.00' DIMENSION SHALL BE PROVIDED PERPENDICULAR TO THE CONSTRAINT.

25. TURNING SPACE MAXIMUM CROSS SLOPE IS 2% IN ANY DIRECTION.

26. BEYOND THE BOTTOM GRADE BREAK, A CLEAR SPACE OF 4.00' x 4.00' MINIMUM SHALL BE PROVIDED WITHIN THE WIDTH OF THE PEDESTRIAN CROSSWALK, AND OUTSIDE THE PARALLEL VEHICLE TRAVEL LANE. THE CLEAR SPACE MAY OVERLAP TURNING SPACES, DETECTABLE WARNING SURFACES, AND DROP CURBS.

DETECTABLE WARNING DEVICE NOTES:

27. DETECTABLE WARNING DEVICES (DWD) SHALL BE PROVIDED AT THE FOLLOWING LOCATIONS ON PEDESTRIAN ACCESS ROUTES:

   A. CURB RAMPS AT PEDESTRIAN CROSSINGS.

   B. PEDESTRIAN REFUGE ISLANDS (WHERE THE LENGTH OF THE PEDESTRIAN ACCESS ROUTE ACROSS THE REFUGE ISLAND IS GREATER THAN OR EQUAL TO 6.00'). SEE SHEET 8 OF 9.

   C. PEDESTRIAN AT-GRADE RAIL CROSSINGS NOT LOCATED WITHIN A STREET OR HIGHWAY.

   D. DRIVEWAY CROSSINGS WITH NHDOT APPROVED AND MAINTAINED SIGNALS, YIELD OR STOP CONTROL. DETECTABLE WARNING DEVICES SHALL NOT BE PROVIDED AT CROSSINGS OF UNCONTROLLED DRIVEWAY APRONS.

28. SOME DETECTABLE WARNING PRODUCTS REQUIRE A CONCRETE BORDER FOR PROPER INSTALLATION. IF REQUIRED, THE BORDER SHALL NOT EXCEED 2" IN WIDTH OR 6" ALONG ROADWAY EDGE/CURB. THE BORDER DIMENSION SHALL BE MEASURED FROM THE INSIDE EDGE OF THE RADIUS.

29. THE DETAILS PROVIDED ARE NOT DRAWN TO SCALE. THE QUANTITY OF DOMES DEPICTED ON THE DETECTABLE WARNING DEVICE DETAIL IS FOR ILLUSTRATION ONLY. THE SIZE OF THE DETECTABLE WARNING FIELD SHALL BE 2.00' MINIMUM IN THE DIRECTION OF TRAVEL AND SHALL EXTEND THE FULL WIDTH OF THE CURB RAMP OR FLUSH SURFACE, EXCLUDING ANY FLARED SIDES. THE WIDTH OF THE DETECTABLE WARNING FIELD INCLUDES A CONCRETE BORDER, IF PROVIDED. PLACEMENT AND ORIENTATION SHALL BE IN COMPLIANCE WITH THE DETAILS.

30. ON SLOPES OF 5% OR GREATER, THE ROWS OF DOMES SHALL BE ALIGNED TO BE PERPENDICULAR OR RADIAL TO THE LOWER GRADE BREAK ON THE RAMP RUN. WHERE DOMES ARE ARRAYED RADIALLY THEY MAY DIFFER IN DOME DIAMETER AND CENTER-TO-CENTER SPACING WITHIN THE RANGES SPECIFIED ON SHEET 9. ON SLOPES LESS THAN 5%, DOME ORIENTATION IS LESS CRITICAL AND MAY DIFFER FROM PERPENDICULAR OR RADIAL ALIGNMENT TO THE GRADE BREAK.

31. THE DETECTABLE WARNING SURFACES SHALL CONTRAST VISUALLY WITH ADJACENT GUTTER, STREET OR HIGHWAY, OR PEDESTRIAN ACCESS ROUTE SURFACE.

32. DETECTABLE WARNING PANELS SHALL BE CAST IRON WITH NO SURFACE COATING AND SHALL BE ALLOWED TO TRANSITION TO THEIR NATURAL PATINA.

DEFINITION OF TERMS:

LANDING: A 4.00' X 4.00' CLEAR SPACE WITH A 2% SLOPE OR LESS IN ALL DIRECTIONS.

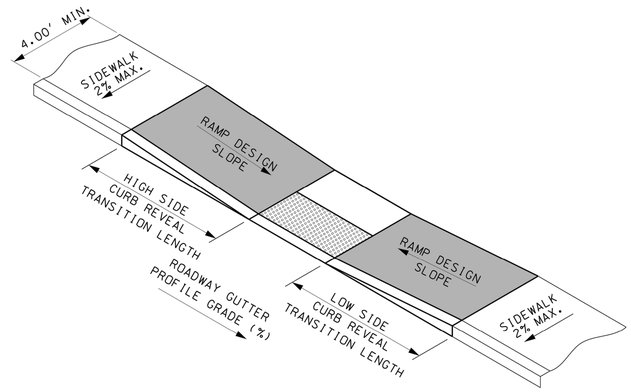
MAXIMUM EXTENT FEASIBLE: ALL CHANGES THAT ARE POSSIBLE ARE MADE TO COMPLY WITH ACCESSIBILITY STANDARDS.

PEDESTRIAN ACCESS ROUTE (PAR): A CONTINUOUS AND UNOBSTRUCTED PATH OF TRAVEL PROVIDED FOR PEDESTRIANS WITH DISABLITIES WITHIN OR COINICIDING WITH A PEDESTRIAN CIRCULATION PATH. PAR SHALL BE 4'W MIN.(EXCLUDING CURBING), 2% MAX. CROSS SLOPE AND 1/4" OR LESS VERTICAL DISCONTINUITY.

TECHNICAL INFEASIBILITY: EXISTING PHYSICAL OR SITE CONSTRAINTS THAT PROHIBIT MODIFICATIONS OR ADDITIONS OF ELEMENTS, SPACES OR FEATURES TO COMPLY WITH MINIMUM ACCESSIBILITY REQUIREMENTS.

INDEX OF SHEETS

1 OF 9	INDEX OF SHEETS AND GENERAL NOTES
2 OF 9	CURB RAMP CONFIGURATIONS TYPE 1 - 5
3 OF 9	CURB RAMP CONFIGURATIONS TYPE 6 - 7
4 OF 9	CURB RAMP CONFIGURATIONS TYPE 8 - 11
5 OF 9	SLIP RAMP, SIDEWALK TO SHOULDER TRANSISTION, ACCESS ISLAND
6 OF 9	DETECTABLE WARNING DEVICE PLACEMENT OPTIONS
7 OF 9	RAMP SIDE CONFIGURATIONS AND BACK TREATMENTS
8 OF 9	RR X-INGS, ROUNDABOUTS, PEDESTRIAN BUTTONS
9 OF 9	DETECTABLE WARNING DEVICE, TRUNCATED DOMES, MISCELLANEOUS DETAILS



TYPICAL CURB TRANSITION LENGTH TABLE

CURB REVEAL (INCHES)		7	6	5	4	3	2	1
	ROADWAY PROFILE GRADE (%)	Minimum Transition Length Required (FT)						
Low Side Transition Length	-10%	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	-9%	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	-8%	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	-7%	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	-6%	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	-5%	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	-4%	5.1	5.0	5.0	5.0	5.0	5.0	5.0
	-3%	5.6	5.0	5.0	5.0	5.0	5.0	5.0
	-2%	6.1	5.3	5.0	5.0	5.0	5.0	5.0
	-1%	6.9	5.9	5.0	5.0	5.0	5.0	5.0
	0%	7.8	6.7	5.6	5.0	5.0	5.0	5.0
High Side Transition Length	1%	9.0	7.7	6.4	5.1	5.0	5.0	5.0
	2%	10.6	9.1	7.6	6.1	5.0	5.0	5.0
	3%	13.0	11.1	9.3	7.4	5.6	5.0	5.0
	4%	15.0	14.3	11.9	9.5	7.1	5.0	5.0
	5%	15.0	15.0	15.0	13.3	10.0	6.8	5.0
	6%	15.0	15.0	15.0	15.0	15.0	11.3	5.3
	7%	15.0	15.0	15.0	15.0	15.0	15.0	15.0
	8%	15.0	15.0	15.0	15.0	15.0	15.0	15.0
	9%	15.0	15.0	15.0	15.0	15.0	15.0	15.0
	10%	15.0	15.0	15.0	15.0	15.0	15.0	15.0

THIS TABLE REPRESENTS THE MINIMUM LENGTH OF CURB RAMP TRANSITION BASED ON THE EXISTING ROADWAY PROFILE GRADE AND THE CURB REVEAL AT FULL HEIGHT ALONG THE SIDEWALK. THE MINIMUM TRANSITION LENGTH REQUIRED IS BASED ON 7.5% SLOPE AND INDICATED CURB REVEAL.

TREATMENT KEY LEGEND

(RESURFACING STYLE PROJECTS)

#-#-$-$

- RAMP BACK TREATMENT OPTION - SEE SHEET 7
- RAMP SIDE CONFIGURATION - SEE SHEET 7
- DETECTABLE WARNING DEVICE PLACEMENT - SEE SHEET 6
- RAMP CONFIGURATION TYPE - SEE SHEETS 2-5

(X = OMIT THIS OPTION)

STATE OF NEW HAMPSHIRE
SPECIAL DETAILS
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

SIDEWALK CURB RAMP DETAILS (SHEET 1 OF 9)

REVISION DATE	MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
6-18-18	Curb-Ramp-1	crb_ramp_1-9	-	1	9

CESO
WWW.CESOINC.COM

STATE OF NEW HAMPSHIRE
ZACHARY DAVID FRESHNER
No. 16215
PROFESSIONAL ENGINEER
07/24/2023

HANG TEN CAR WASH
DOVER, NH
914 CENTRAL AVE.
DOVER, NH 03820

Revisions / Submissions

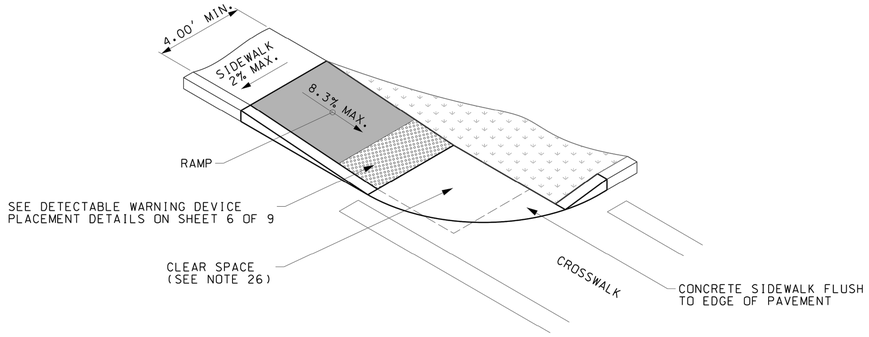
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	NTV
	HGC
	06/28/2023
	PERMIT

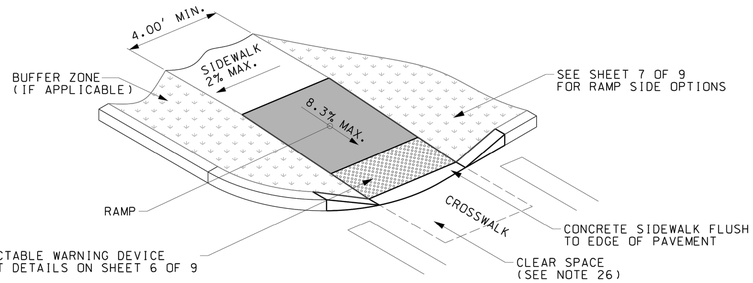
NHDOT DETAILS

C6.2

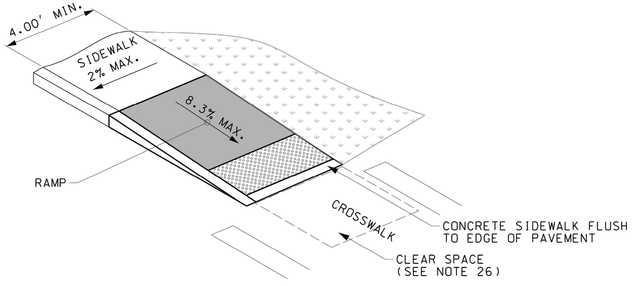
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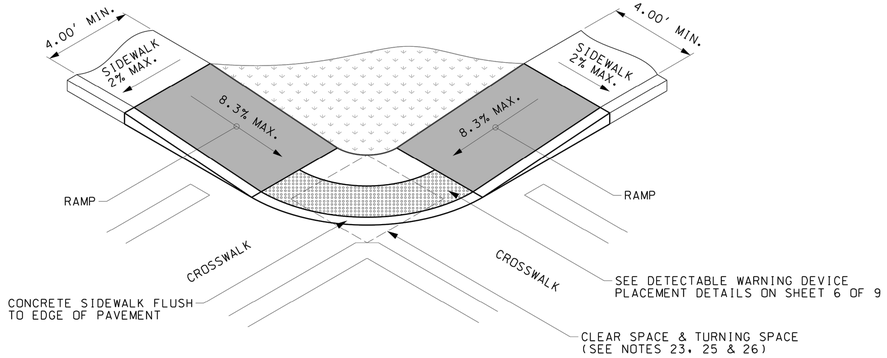
TYPE 1



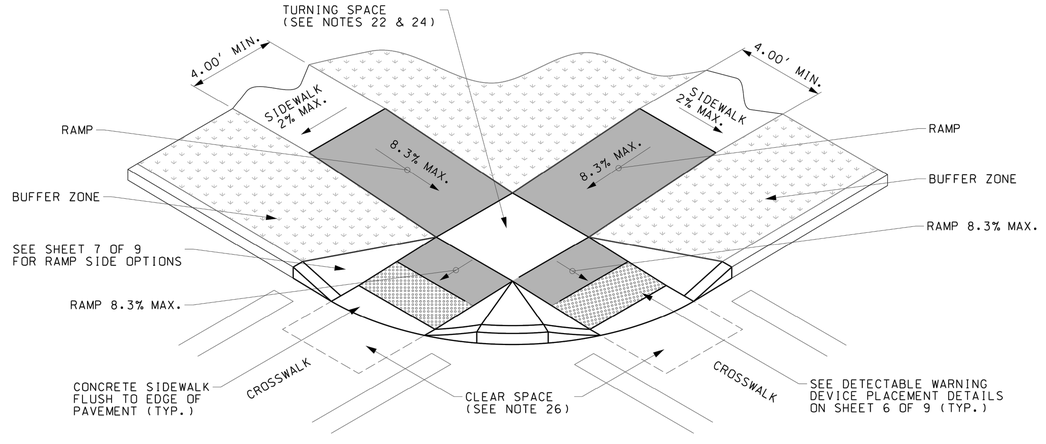
TYPE 2



TYPE 3



TYPE 4
NOT FOR NEW DESIGNS - RETROFITS ONLY



TYPE 5

CURB RAMP CONFIGURATIONS

NOTE:

ALL NOTES REFERENCED ON THIS SHEET CAN BE FOUND ON SIDEWALK CURB RAMP DETAILS, SHEET 1 OF 9.

STATE OF NEW HAMPSHIRE
SPECIAL DETAILS
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

SIDEWALK CURB RAMP DETAILS (SHEET 2 OF 9)

REVISION DATE	MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
7-2-18	Curb-Ramp-2	crb_ramp_1-9	_	2	9

CESO
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STATE OF NEW HAMPSHIRE
ZACHARY DAVID FRESHNER
No. 16215
LICENSED PROFESSIONAL ENGINEER
07/24/2023

HANG TEN CAR WASH

DOVER, NH
914 CENTRAL AVE.
DOVER, NH 03820

Revisions / Submissions

ID	Description	Date

761766
1'=20'
NTV
HGC
06/28/2023
PERMIT

NHDOT DETAILS

C6.3

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Plant List - Trees and Shrubs

ID	Qty	Botanical Name	Common Name	Scheduled Size
ASF	3	Amelanchier laevis 'Spring Flurry'	Spring Flurry Serviceberry	3" Cal.
ASV	6	Acer rubrum 'Sun Valley'	Sun Valley Maple	3" Cal.
CBF	4	Carpinus betulus 'Fastigiata'	Fastigiata Hornbeam	3" Cal.
CCF	3	Cercis canadensis 'Forest Pansy'	Forest Pansy Redbud	3" Cal.
COP	71	Comptonia peregrina	Sweetfern	24" HT.
CSA	43	Cornus sericea 'Arctic Fire'	Arctic Fire Dogwood	3" Cal.
FG	26	Fothergilla gardenii	Dwarf Fothergilla	24" HT
GBP	5	Ginkgo biloba 'Princeton Sentry'	Maidenhair Tree	3" Cal.
HHid	34	Hypericum x 'Hidcote'	Hidcote St. John's Wort	24" Ht.
ICH	4	Ilex crenata 'Hetzii'	Japanese Holly	24" HT.
ICM	3	Ilex crenata 'Hoogendorn'	Hoogendorn Japanese Holly (Male)	24" HT.
JBD	3	Juniperus communis depressa 'AmiDak'	Blueberry Delight Juniper	5 Gal.
JES	17	Juniperus virginiana 'Emerald Sentinel'	Emerald Sentinel Red Cedar	3" Cal.
MG	38	Myrica gale	Sweetgale	24" Ht.
NS	2	Nyssa sylvetica	Black Tupelo	3" Cal.
PG	7	Picea glauca 'Densata'	White Spruce	3" Cal.
RGL	149	Rhus aromatica 'Grow Low'	Grow Low Sumac	2 GAL.
SAW	8	Spiraea x bumalda 'Anthony Waterer'	Anthony Waterer Spirea	24" HT

Plant List - Perennials

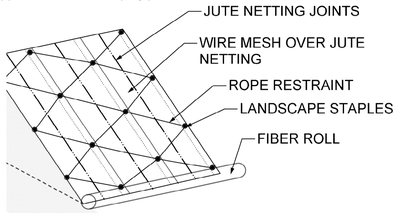
ID	Qty	Botanical Name	Common Name	Scheduled Size
AOS	6	Aster oblongifolius 'October Skies'	Aromatic Aster	2 QT
DES	26	Deschampsia cespitosa	Tussock Grass	2 QT
PVS	37	Panicum virgatum 'Shenandoah'	Shenandoah Switch Grass	2 Gal.
RBK	5	Rudbeckia fulgida 'Goldsturm'	Black-Eyed Susan	2 QT
SH	24	Sporobolus heterolepsis	Prairie Dropseed	1 Gal.
SS	71	Schizachyrium scoparium	Little Buestem	2 QT

LANDSCAPE NOTES:

1. THE CONTRACTOR SHALL LOCATE AND VERIFY THE EXISTENCE OF ALL UTILITIES PRIOR TO STARTING WORK.
2. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTINGS SHOWN ON THE DRAWINGS.
3. ALL MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE CURRENT AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
4. ALL PLANT SUBSTITUTIONS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT.
5. ALL PLANT MATERIALS SHALL BE EXACTLY AS SPECIFIED BY THE LANDSCAPE ARCHITECT. IF PLANT SPECIES CULTIVARS ARE FOUND TO VARY FROM THAT SPECIFIED AT ANY TIME DURING THE GUARANTEE PERIOD, THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO HAVE THE CONTRACTOR REPLACE THAT PLANT MATERIAL. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY PLANT DELIVERED TO THE SITE FOR AESTHETIC REASONS BEFORE PLANTING. THE LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR THE QUALITY FOR ALL THE PLANTS.
6. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, UPON DELIVERY OR AT THE JOB SITE WHILE WORK IS ON-GOING TO CONFORMITY TO SPECIFIED QUALITY, SIZE AND VARIETY.
7. PLANTS FURNISHED IN CONTAINERS SHALL HAVE THE ROOTS WELL ESTABLISHED IN THE SOIL MASS AND SHALL HAVE AT LEAST ONE (1) GROWING SEASON. ROOT-BOUND PLANTS OR INADEQUATELY SIZED CONTAINERS TO SUPPORT THE PLANT MAY BE DEEMED UNACCEPTABLE.
8. NO PLANT SHALL BE PUT IN THE GROUND BEFORE GRADING HAS BEEN FINISHED AND APPROVED BY THE LANDSCAPE ARCHITECT.
9. ALL PLANTS SHALL BE INSTALLED AND DETAILED PER PROJECT SPECIFICATIONS.
10. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24-HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL BE WATERED WEEKLY, OR MORE OFTEN IF NECESSARY, DURING THE FIRST GROWING SEASON, WITH TREES BEING WATERED FOR 1 YEAR PER INCH OF CALIPER AT TIME OF PLANTING. IF TEMPORARY IRRIGATION SYSTEMS ARE TO BE USED, THEY SHALL BE DESIGNED AND INSTALLED FOR EFFICIENT AND EFFECTIVE WATER USE TO LANDSCAPED AREAS FOR A LIMITED PERIOD OF TIME DETERMINED BY THE PLANT MATERIAL AND SITE CONDITIONS.
11. ALL PLANTS SHALL BE GUARANTEED BY THE CONTRACTOR FOR NOT LESS THAN ONE FULL YEAR FROM THE TIME OF PROVISIONAL ACCEPTANCE. DURING THIS TIME, THE OWNER SHALL MAINTAIN ALL PLANT MATERIALS IN THE ABOVE MANNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT THE PLANTS TO ENSURE PROPER CARE. IF THE CONTRACTOR IS DISSATISFIED WITH THE CARE GIVEN, HE SHALL IMMEDIATELY, AND IN SUFFICIENT TIME TO PERMIT THE CONDITION TO BE RECTIFIED, NOTIFY THE LANDSCAPE ARCHITECT IN WRITING OR OTHERWISE FORFEIT HIS CLAIM. LANDSCAPE CONTRACTOR SHALL PRUNE PLANTINGS OF DEAD LIMBS OR TWIGS DURING THE FIRST YEAR OF GROWTH.
12. FINAL ACCEPTANCE BY THE LANDSCAPE ARCHITECT WILL BE MADE UPON THE CONTRACTOR'S REQUEST AFTER ALL CORRECTIVE WORK HAS BEEN COMPLETED.
13. LANDSCAPE CONTRACTOR SHOULD REPLACE DEAD PLANTINGS IMMEDIATELY UPON OWNER DIRECTION WITHIN THE WARRANTY PERIOD AND AGAIN AT THE END OF THE GUARANTEE PERIOD, THE CONTRACTOR SHALL HAVE REPLACED ANY PLANT MATERIAL THAT IS MISSING, NOT TRUE TO SIZE AS SPECIFIED, THAT HAVE DIED, THAT HAVE LOST THEIR NATURAL SHAPE DUE TO DEAD BRANCHES, EXCESSIVE PRUNING OR INADEQUATE OR IMPROPER CARE, OR THAT ARE, IN THE OPINION OF THE LANDSCAPE ARCHITECT, IN UNHEALTHY OR UNSIGHTLY CONDITION.
14. ALL LANDSCAPE AREAS TO BE GRASS COMMON TO REGION EXCEPT FOR INTERIOR LANDSCAPED ISLANDS OR WHERE OTHER PLANT MATERIAL IS CALLED FOR.
15. ALL TREES AND SHRUBS TO BE PLANTED IN MULCH BEDS WITH DEFINED AND CUT EDGES TO SEPARATE TURF GRASS AREAS.
16. FOR ANY LANDSCAPE AREA SO DESIGNATED TO REMAIN, WHETHER ON OR OFF-SITE, REMOVE WEEDS, ROCKS, CONSTRUCTION ITEMS, ETC., THEN APPLY GRASS SEED OR PINE BARK MULCH AS DEPICTED ON PLANS.
17. LANDSCAPE CONTRACTOR SHALL FEED AND PRUNE EX. TREES, ON OR JUST OFF SITE, THAT HAVE EXPERIENCED ROOT BASE INTRUSION OR DAMAGE DURING CONSTRUCTION IMMEDIATELY AND FOR THE DURATION OF THE WARRANTY PERIOD AT THE DIRECTION OF THE LANDSCAPE ARCHITECT.
18. EXISTING TREES TO REMAIN SHALL BE PROTECTED WITH TEMPORARY SNOW FENCING AT THE EDGE OF THE EX. TREE CANOPY THE CONTRACTOR SHALL NOT STORE VEHICLES OR MATERIALS WITHIN THE LANDSCAPED AREAS. ANY DAMAGE TO EXISTING TREES, SHRUBS OR LAWN SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
19. ALL MULCH AREAS SHALL RECEIVE A 3" LAYER OF SHREDDED PINE BARK MULCH, AND MULCH SHALL NOT BE IN CONTACT WITH STEMS OR TRUNKS OF SHRUBS AND TREES.
20. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.

Maintenance Plan

Installation of all new plants or replacement plants shall be planted during the growing season from April to October.
Plants shall be planted in accordance with the Landscape Notes on the planting plan.
All plants shall be watered 2x per week during the first growing season. Watering shall saturate the soil around the root ball. The proper use and regular refilling of 'Gator' bags is acceptable. Trees shall be watered for a period of one year per inch of caliper at planting. if temporary irrigation systems are to be used, they shall be designed and installed for efficient and effective water use to landscaped area for a limited period of time determined by the plant material and site conditions.
Aged and organic compost mulch shall be used to a 3" depth shall be maintained around root ball, but kept away from stems and trunks. Do not stack mulch in mounds deeper than 3".
Planting beds shall be kept free of weeds on a biweekly schedule.
Bed edges shall be maintained to keep lawn mowers from damaging trees and shrubs.
Lawn areas shall be mowed on a weekly schedule.
Broken or dead limbs of all plant materials shall be removed close to trunk, but not damaging trunk of plant with clean sharp shears.
Severely injured, diseased, or dead plant material shall be replaced in kind in perpetuity.
Aged organic compost mulch is preferred, but an owner may use a low phosphorous and slow release nitrogen organic fertilizer as needed.
The owner shall be responsible for continued inspection and maintenance requirements as cited by the City of Dover requirements of § 153-14G.
Snow Storage to occur on grassed and/or non-living landscape.
If ownership of a site is conveyed to a new property owner, the new owner shall be responsible for maintaining all landscaping in accordance with the approved final landscaping plan.



1 / L-1 JUTE NETTING DETAIL
SCALE: NTS



2 / L-1 TONGUE + GROOVE FENCE DETAIL
SCALE: NTS

Chillmark Fence by Walpole Woodworkers or Approved Equal
"V" groove board with ship-lap joinery is 5 5/8". Rails are square edge. Mortise and Tenon installation.
767 East Street, Rt 27
Walpole, MA 02081
508 668-2800



terra firma
landscape architecture
163.a court street portsmouth, nh 03801
office 603.430.3388 | terrence@terrafirmalandarch.com



No.	Date	By	Revision Notes

No.	Date	Issue Notes

Design Firm
terra firma landscape architecture
163.a Court Street
Portsmouth, NH

Consultant

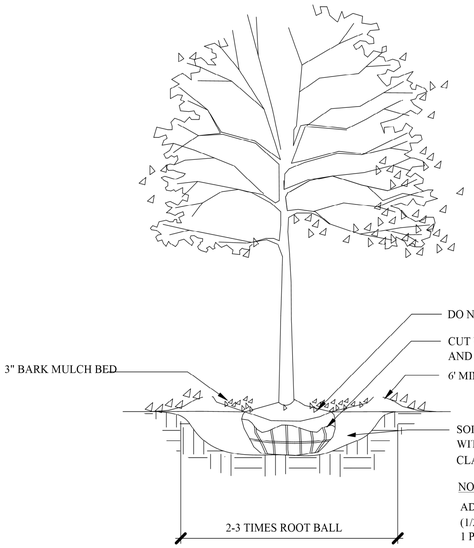
Project Title
Hang Ten Car Wash

Sheet Title
Landscape Plan

Project Manager	Project ID: Hang Ten
Drawn By: TC	Scale: 1:240
Reviewed By: TP	Sheet No.: L-1 of 2
Date: 6/28/2023	
CAD File Name: hangten51623.vwx	

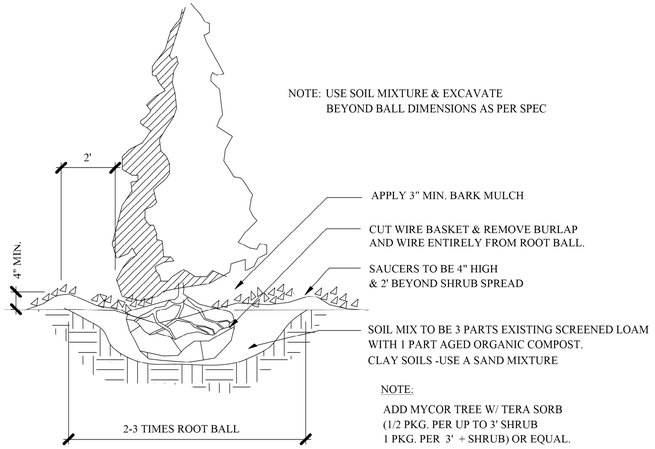
LICENSED LANDSCAPE ARCHITECT · TERRENCE P. PARKER · 041 · STATE OF NEW HAMPSHIRE

PLEASE NOTE: THIS SHEET IS SCALED FOR 22 BY 34 PAPER, DO NOT REDUCE OR ENLARGE.



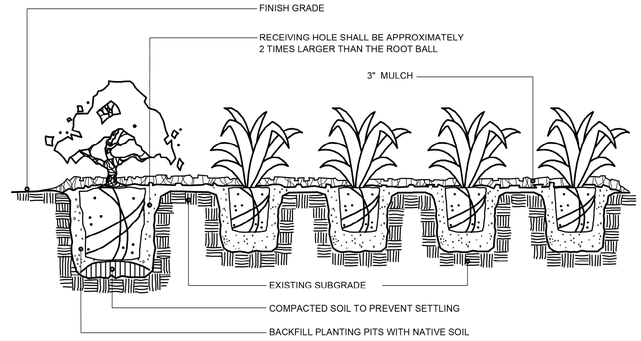
1 L-2

TREE PLANTING - 2"+ CAL.
SCALE: NTS



2 L-2

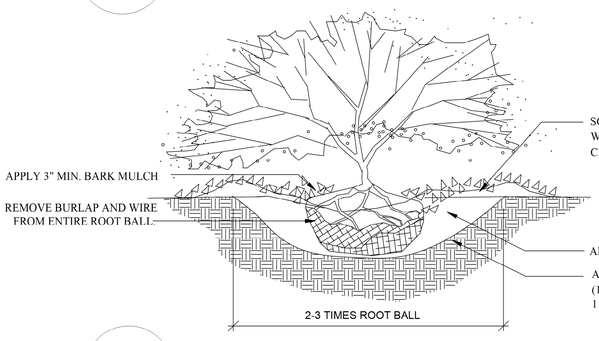
PYRAMIDAL EVERGREEN TREE PLANTING
SCALE: NTS



NOTE: SHRUBS SHALL BE PLANTED A MINIMUM OF 1" & NO MORE THAN 2" ABOVE FINISH GRADE, DEPENDING UPON SITE CONDITIONS.

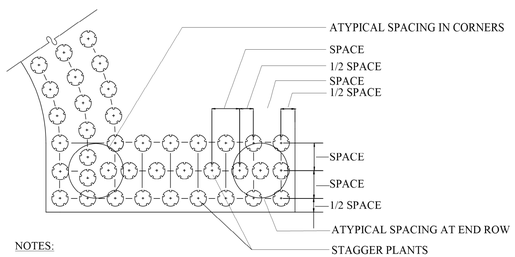
3 L-2

SHRUB/GROUND COVER PLANTING DETAIL
SCALE: NTS



4 L-2

B&B SHRUB PLANTING
SCALE: NTS



NOTES:

1. PLACE PLANTS IN BED AS SHOWN, SPACING AS SPECIFIED IN PLANT SCHEDULE.
2. GROUNDCOVER SHALL BE TRIANGULAR SPACED IN ROWS PARALLEL TO STRAIGHT EDGES AND SHALL BE EVENLY SPACED IN ROWS PARALLEL TO CURVE EDGES.

5 L-2

GROUND COVER SPACING DETAIL
SCALE: NTS

Ernst Conservation Seeds
8884 Mercer Pike
Meadville, PA 16335
(800) 873-3321 Fax (814) 336-5191
www.ernstseed.com

Rain Garden Grass Mix - ERNMX-180-1

	Botanical Name	Common Name
40.40 %	*Schizachyrium scoparium, Fort Indiantown Gap-PA Ecotype*	Little Bluestem, Fort Indiantown Gap-PA Ecotype
20.00 %	*Carex vulpinoidea, PA Ecotype*	Fox Sedge, PA Ecotype
20.00 %	*Elymus virginicus, Madison-NY Ecotype*	Virginia Wildrye, Madison-NY Ecotype
9.00 %	*Panicum clandestinum, Tioga*	Deertongue, Tioga
5.50 %	*Panicum rigidulum, PA Ecotype*	Redtop Panicgrass, PA Ecotype
4.00 %	*Chasmanthium latifolium, WV Ecotype*	River Oats, WV Ecotype
0.50 %	*Carex scoparia, PA Ecotype*	Blunt Broom Sedge, PA Ecotype
0.30 %	*Juncus effusus*	Soft Rush
0.30 %	*Juncus tenuis, PA Ecotype*	Path Rush, PA Ecotype

100.00 %

Seeding Rate: 15 lb per acre with a cover crop of grain rye at 30 lb per acre

Grasses & Grass-like Species - Herbaceous Perennial; Stormwater Management

Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

Ernst Conservation Seeds
8884 Mercer Pike
Meadville, PA 16335
(800) 873-3321 Fax (814) 336-5191
www.ernstseed.com

5311 Conservation Mix - ERNMX-114

	Botanical Name	Common Name
30.00 %	*Festuca rubra*	Creeping Red Fescue
25.00 %	*Poa pratensis, 'Baron'*	Kentucky Bluegrass, 'Baron'
25.00 %	*Poa pratensis, 'Kelly'*	Kentucky Bluegrass, 'Kelly'
10.00 %	*Lolium multiflorum*	Annual Ryegrass
10.00 %	*Lolium perenne, 'Confetti III'*	Perennial Ryegrass, 'Confetti III' (turf type)

100.00 %

Seeding Rate: 100-200 lb per acre, or 3-5 lb per 1,000 sq ft

Grasses & Grass-like Species - Herbaceous Perennial; Lawn & Turfgrass Sites

Our best and most popular mix designed for full sun. While this mix tolerates partial shade, it will need at least 3 hours of sunlight a day. The bluegrasses go dormant during a drought. Mowing too close can cause browning. The ryegrasses and red fescue blend well with the bluegrasses to create a full lawn. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

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Northeast Solar Pollinator Buffer Mix - ERNMX-610

	Botanical Name	Common Name
37.00 %	*Schizachyrium scoparium, 'Camper'*	Little Bluestem, 'Camper'
36.30 %	*Bouteloua curtipendula, Butte*	Sideoats Grama, Butte
4.00 %	*Chamaecrista fasciculata, PA Ecotype*	Partridge Pea, PA Ecotype
4.00 %	*Coreopsis lanceolata*	Lanceleaf Coreopsis
4.00 %	*Echinacea purpurea*	Purple Coneflower
3.30 %	*Rudbeckia hirta*	Blackeyed Susan
2.30 %	*Heliopsis helianthoides, PA Ecotype*	Oxeye Sunflower, PA Ecotype
1.60 %	*Penstemon digitalis*	Tall White Beardtongue
1.50 %	*Asclepias tuberosa*	Butterfly Milkweed
0.80 %	*Liatris spicata*	Marsh Blazing Star
0.70 %	*Senna hebecarpa, VA & WV Ecotype*	Wild Senna, VA & WV Ecotype
0.60 %	*Zizia aurea*	Golden Alexanders
0.50 %	*Asclepias incarnata, PA Ecotype*	Swamp Milkweed, PA Ecotype
0.50 %	*Goum canadense, PA Ecotype*	White Avens, PA Ecotype
0.50 %	*Monarda fistulosa, Fort Indiantown Gap-PA Ecotype*	Wild Bergamot, Fort Indiantown Gap-PA Ecotype
0.50 %	*Pycnanthemum tenuifolium*	Narrowleaf Mountainmint
0.40 %	*Aster laevis, NY Ecotype*	Smooth Blue Aster, NY Ecotype
0.40 %	*Aster novae-angliae, PA Ecotype*	New England Aster, PA Ecotype
0.30 %	*Baptisia australis, Southern WV Ecotype*	Blue False Indigo, Southern WV Ecotype
0.30 %	*Sisyrinchium angustifolium*	Narrowleaf Blue Eyed Grass
0.20 %	*Oenothera fruticosa var. fruticosa*	Sundrops
0.20 %	*Solidago nemoralis, PA Ecotype*	Gray Goldenrod, PA Ecotype
0.10 %	*Aster prenanthoides, PA Ecotype*	Zigzag Aster, PA Ecotype

100.00 %

Seeding Rate: Seed at 15 lbs/acre with 30 lbs/acre of a cover crop. For a cover crop use either grain oats (1 Jan to 31 Jul) or grain rye (1 Aug to 31 Dec).

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Native Steep Slope Mix w/Annual Ryegrass - ERNMX-181

	Botanical Name	Common Name
31.10 %	*Sorghastrum nutans, NY4 Ecotype*	Indiangrass, NY4 Ecotype
20.00 %	*Lolium multiflorum*	Annual Ryegrass
14.00 %	*Andropogon gerardii, 'Southlow'-MI Ecotype*	Big Bluestem, 'Southlow'-MI Ecotype
10.00 %	*Elymus canadensis*	Canada Wildrye
7.00 %	*Elymus virginicus, Madison-NY Ecotype*	Virginia Wildrye, Madison-NY Ecotype
4.00 %	*Agrostis perennans, Albany Pine Bush-NY Ecotype*	Autumn Bentgrass, Albany Pine Bush-NY Ecotype
4.00 %	*Panicum virgatum, 'Shawnee'*	Switchgrass, 'Shawnee'
3.00 %	*Panicum clandestinum, Tioga*	Deertongue, Tioga
1.50 %	*Echinacea purpurea*	Purple Coneflower
1.30 %	*Chamaecrista fasciculata, PA Ecotype*	Partridge Pea, PA Ecotype
1.20 %	*Heliopsis helianthoides, PA Ecotype*	Oxeye Sunflower, PA Ecotype
1.00 %	*Coreopsis lanceolata*	Lanceleaf Coreopsis
1.00 %	*Rudbeckia hirta*	Blackeyed Susan
0.30 %	*Monarda fistulosa, Fort Indiantown Gap-PA Ecotype*	Wild Bergamot, Fort Indiantown Gap-PA Ecotype
0.20 %	*Asclepias syriaca*	Common Milkweed
0.20 %	*Solidago rugosa, PA Ecotype*	Wrinkleleaf Goldenrod, PA Ecotype
0.10 %	*Aster novae-angliae, PA Ecotype*	New England Aster, PA Ecotype
0.10 %	*Aster pilosus, PA Ecotype*	Heath Aster, PA Ecotype

100.00 %

Seeding Rate: 60 lb per acre, or 1.5 lb per 1,000 sq ft

Erosion Control & Revegetation; Grasses & Grass-like Species - Herbaceous Perennial; Herbaceous Flowering Species - Herbaceous Perennial

The native grass and forb species tolerate poor soils typically found on steep slopes in the eastern United States. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

Ernst Conservation Seeds
8884 Mercer Pike
Meadville, PA 16335
(800) 873-3321 Fax (814) 336-5191
www.ernstseed.com

Partially Shaded Area Roadside Mix - ERNMX-140

	Botanical Name	Common Name
46.90 %	*Schizachyrium scoparium, Fort Indiantown Gap-PA Ecotype*	Little Bluestem, Fort Indiantown Gap-PA Ecotype
18.30 %	*Elymus virginicus, PA Ecotype*	Virginia Wildrye, PA Ecotype
9.50 %	*Echinacea purpurea*	Purple Coneflower
6.80 %	*Elymus hystrix, PA Ecotype*	Bottlebrush Grass, PA Ecotype
3.00 %	*Chamaecrista fasciculata, PA Ecotype*	Partridge Pea, PA Ecotype
3.00 %	*Rudbeckia hirta*	Blackeyed Susan
1.80 %	*Heliopsis helianthoides, PA Ecotype*	Oxeye Sunflower, PA Ecotype
1.10 %	*Geum canadense, PA Ecotype*	White Avens, PA Ecotype
1.00 %	*Liatris spicata*	Marsh Blazing Star
1.00 %	*Penstemon digitalis, PA Ecotype*	Tall White Beardtongue, PA Ecotype
1.00 %	*Zizia aurea, PA Ecotype*	Golden Alexanders, PA Ecotype
0.60 %	*Baptisia australis, Southern WV Ecotype*	Blue False Indigo, Southern WV Ecotype
0.50 %	*Anemone virginiana, PA Ecotype*	Thimbleweed, PA Ecotype
0.50 %	*Gaura biennis, PA Ecotype*	Biennial Beeblossom, PA Ecotype
0.50 %	*Rudbeckia triloba, WV Ecotype*	Browneyed Susan, WV Ecotype
0.40 %	*Asclepias tuberosa, PA Ecotype*	Butterfly Milkweed, PA Ecotype
0.40 %	*Aster macrophyllus, PA Ecotype*	Bigleaf Aster, PA Ecotype
0.40 %	*Aster pilosus, PA Ecotype*	Heath Aster, PA Ecotype
0.40 %	*Pycnanthemum incanum, MD Ecotype*	Hoary Mountainmint, MD Ecotype
0.40 %	*Pycnanthemum tenuifolium*	Narrowleaf Mountainmint
0.30 %	*Asclepias syriaca, PA Ecotype*	Common Milkweed, PA Ecotype
0.30 %	*Monarda fistulosa, Fort Indiantown Gap-PA Ecotype*	Wild Bergamot, Fort Indiantown Gap-PA Ecotype
0.30 %	*Solidago bicolor, PA Ecotype*	White Goldenrod, PA Ecotype
0.20 %	*Aquilegia canadensis*	Eastern Columbine
0.20 %	*Aster novae-angliae, PA Ecotype*	New England Aster, PA Ecotype
0.20 %	*Aster prenanthoides, PA Ecotype*	Zigzag Aster, PA Ecotype
0.20 %	*Penstemon laevigatus, PA Ecotype*	Appalachian Beardtongue, PA Ecotype
0.20 %	*Solidago nemoralis, PA Ecotype*	Gray Goldenrod, PA Ecotype
0.20 %	*Tradescantia ohiensis, PA Ecotype*	Ohio Spiderwort, PA Ecotype
0.10 %	*Oenothera fruticosa var. fruticosa*	Sundrops
0.10 %	*Penstemon hirsutus*	Hairy Beardtongue
0.10 %	*Solidago juncea, PA Ecotype*	Early Goldenrod, PA Ecotype
0.10 %	*Solidago odora, PA Ecotype*	Licorice Scented Goldenrod, PA Ecotype

100.00 %

Seeding Rate: 20 lbs/acre with 30 lbs/acre of a cover crop. For a cover crop use either grain oats (1 Jan to 31 Jul) or grain rye (1 Aug to 31 Dec).

Grasses & Grass-like Species - Herbaceous Perennial; Herbaceous Flowering Species - Herbaceous Perennial; Pollinator Favorites; Woodland Openings

The native grasses and forbs are ideal for roadside areas and woodland margins. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

PLEASE NOTE: THIS SHEET IS SCALED FOR 22 BY 34 PAPER, DO NOT REDUCE OR ENLARGE.

terra firma
landscape architecture
163.a court street portsmouth, nh 03801
office 603.430.3388 | terrence@terrafirmalandarch.com



No.	Date	By	Revision Notes

No.	Date	Issue Notes

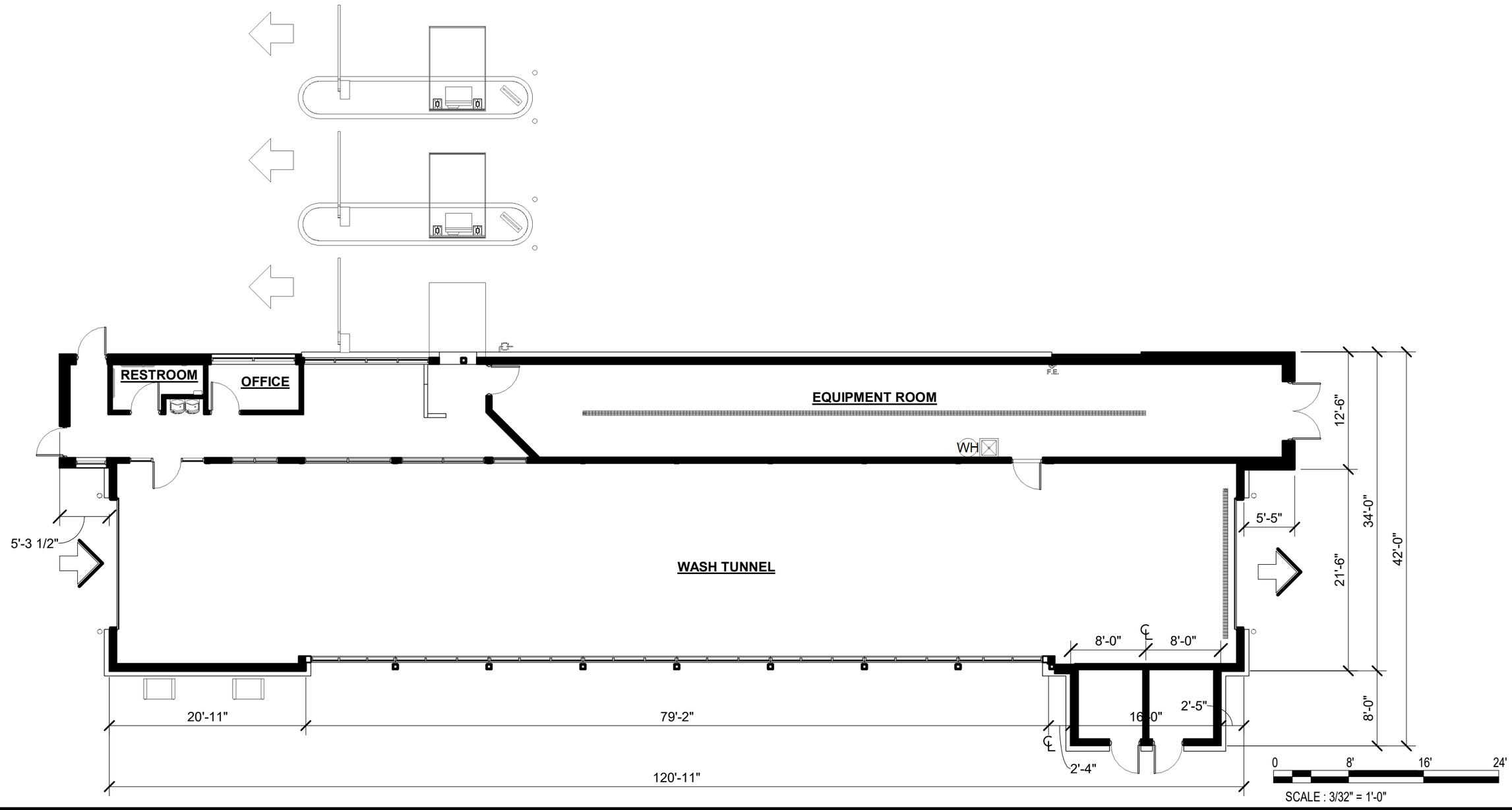
Design Firm
terra firma landscape architecture
163.a Court Street
Portsmouth, NH

Consultant

Project Title
Hang Ten Car Wash

Sheet Title
Landscape Details

Project Manager	Project ID: Hang Ten
Drawn By: TC	Scale: SEE DETAILS
Reviewed By: TP	Sheet No.: L-2 of 2
Date: 6/28/2023	
CAD File Name: hangten51623.vwx	



SCALE : 3/32" = 1'-0"

HANG 10

CONCEPTUAL FLOOR PLAN

PROJECT NO.:	PDP22.CWB.003
DATE:	01/03/2023
DRAWN BY:	MMK
CHECKED BY:	JTK

Car Wash BUILDINGS

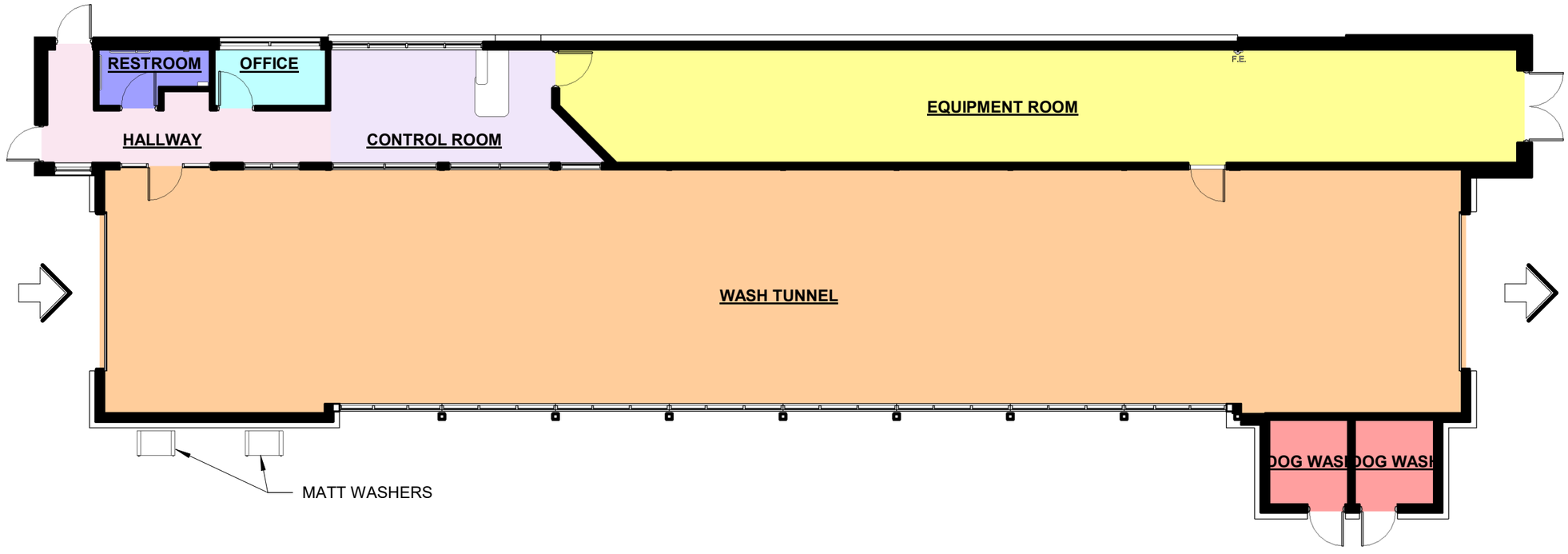
HOVER ARCHITECTURE

DISCLAIMER

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COLOR LEGEND

CONTROL ROOM | DOG WASH | EQUIPMENT ROOM | HALLWAY | OFFICE | RESTROOM | WASH TUNNEL



0 8' 16' 24'

SCALE : 3/32" = 1'-0"

HANG 10

FLOOR PLAN

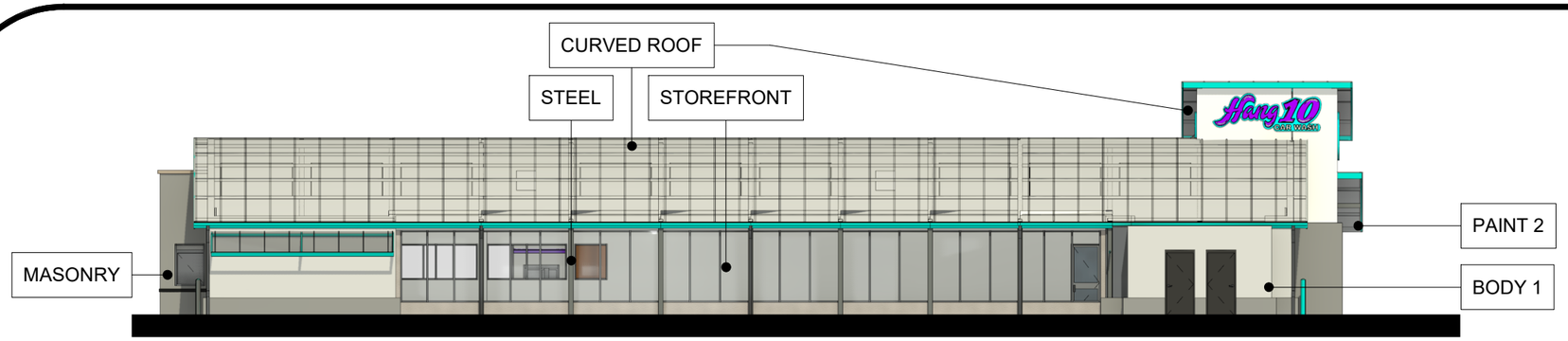
PROJECT NO.:	PDP22.CWB.003
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Car Wash BUILDINGS

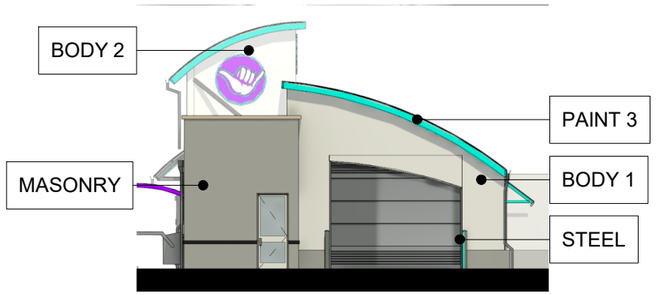
HOVER ARCHITECTURE

DISCLAIMER

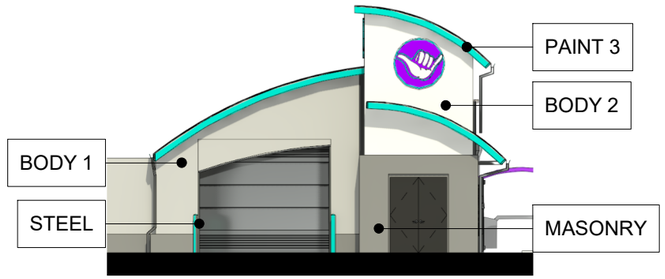
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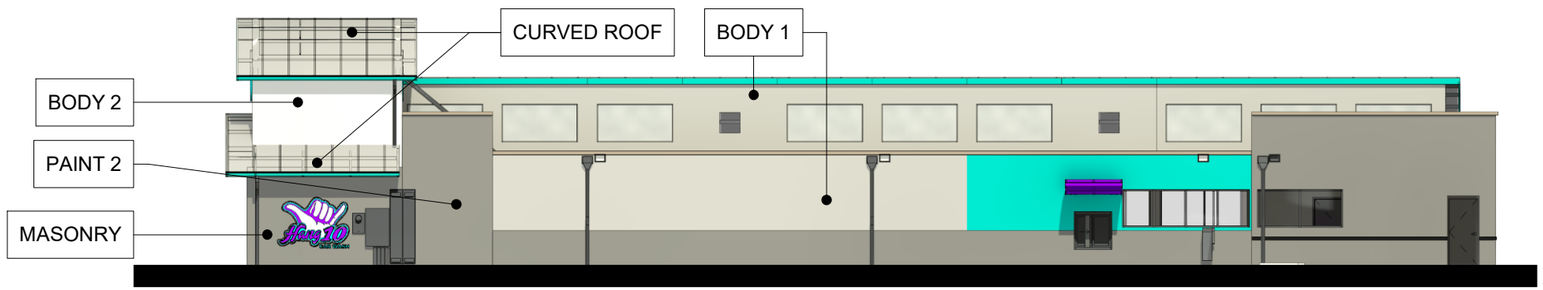
FRONT ELEVATION



LEFT ELEVATION



RIGHT ELEVATION



BACK ELEVATION

CURVED ROOF

EXPOSED STEEL

POLYCARBONATE ROOF

BODY 1

METAL PANEL

BODY 2

METAL PANEL

MASONRY

BLOCK

PAINT

WALL TRIM PAINT 1

DOORS & FRAMES PAINT 2

AWNING PAINT 3

STOREFRONT

STOREFRONT

0 8' 16' 32'

SCALE : 1/16" = 1'-0"

HANG 10

BUILDING ELEVATIONS

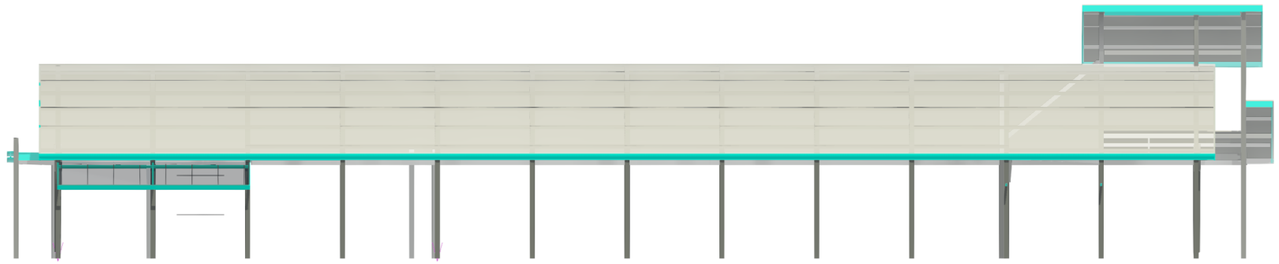
PROJECT NO.:	PDP22.CWB.003
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CHECKED BY:	JTK

Car Wash BUILDINGS

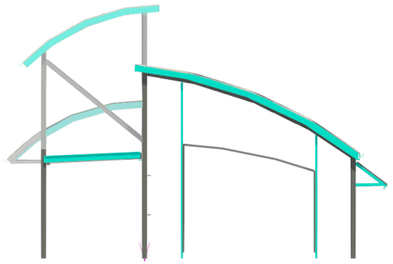
HOVER ARCHITECTURE

DISCLAIMER

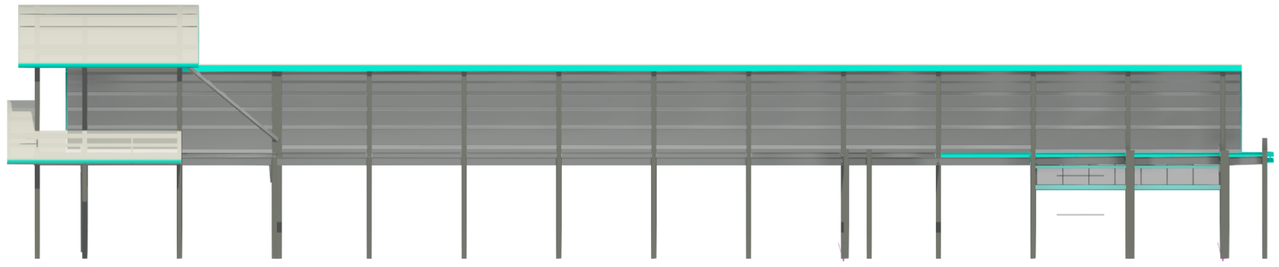
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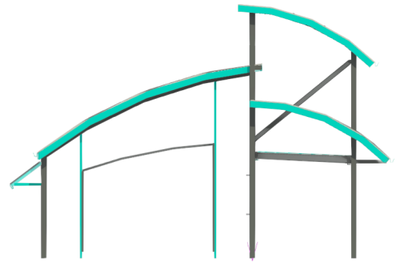
FRONT ELEVATION



LEFT ELEVATION



BACK ELEVATION



RIGHT ELEVATION

0 8' 16' 32'

SCALE : 1/16" = 1'-0"

HANG 10

STEEL ELEVATIONS

PROJECT NO.:	PDP22.CWB.003
DATE:	01/03/2023
DRAWN BY:	MMK
CHECKED BY:	JTK

Car Wash BUILDINGS

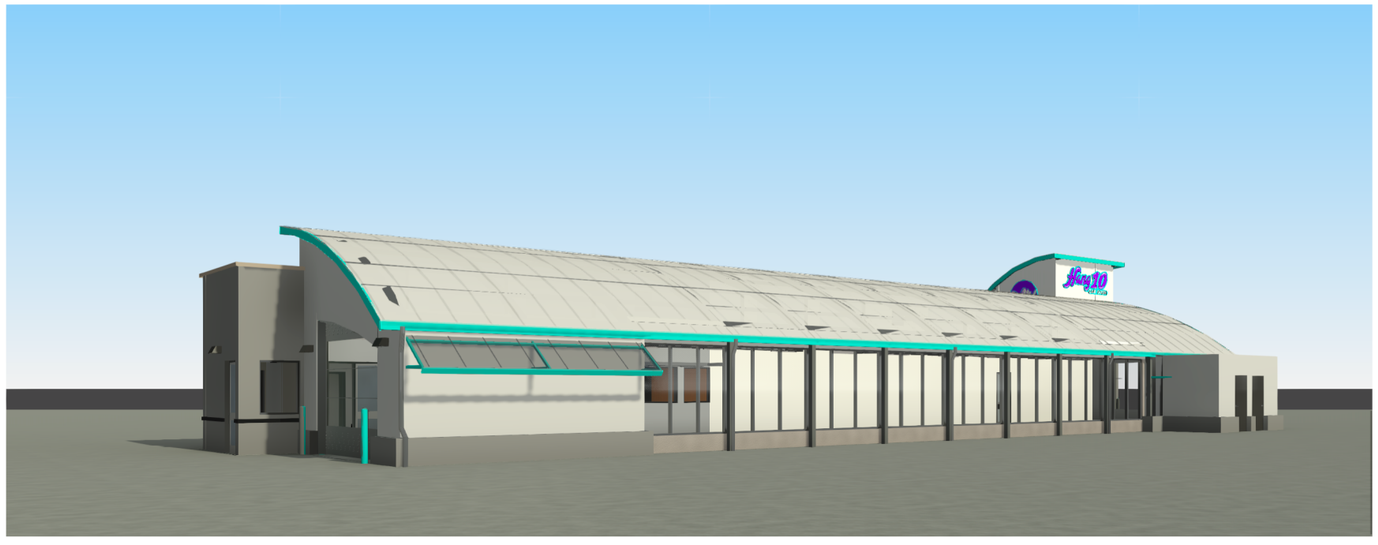
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HANG 10

PERSPECTIVES

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Car Wash BUILDINGS

HOVER ARCHITECTURE

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Plant List - Trees and Shrubs

ID	Qty	Botanical Name	Common Name	Scheduled Size
ASF	3	Amelanchier laevis 'Spring Flurry'	Spring Flurry Serviceberry	3" Cal.
ASV	6	Acer rubrum 'Sun Valley'	Sun Valley Maple	3" Cal.
CBF	4	Carpinus betulus 'Fastigiata'	Fastigiata Hornbeam	3" Cal.
CCF	3	Cercis canadensis 'Forest Pansy'	Forest Pansy Redbud	3" Cal.
COP	71	Comptonia peregrina	Sweetfern	24" HT.
CSA	43	Cornus sericea 'Arctic Fire'	Arctic Fire Dogwood	3" Cal.
FG	26	Fothergilla gardenii	Dwarf Fothergilla	24" HT
GBP	5	Ginkgo biloba 'Princeton Sentry'	Maidenhair Tree	3" Cal.
HHid	34	Hypericum x 'Hidcote'	Hidcote St. John's Wort	24" Ht.
ICH	4	Ilex crenata 'Hetzii'	Japanese Holly	24" HT.
ICM	3	Ilex crenata 'Hoogendorn'	Hoogendorn Japanese Holly (Male)	24" HT.
JBD	3	Juniperus communis depressa 'AmiDak'	Blueberry Delight Juniper	5 Gal.
JES	17	Juniperus virginiana 'Emerald Sentinel'	Emerald Sentinel Red Cedar	3" Cal.
MG	38	Myrica gale	Sweetgale	24" Ht.
NS	2	Nyssa sylvetica	Black Tupelo	3" Cal.
PG	7	Picea glauca 'Densata'	White Spruce	3" Cal.
RGL	149	Rhus aromatica 'Grow Low'	Grow Low Sumac	2 GAL.
SAW	8	Spiraea x bumalda 'Anthony Waterer'	Anthony Waterer Spirea	24" HT

Plant List - Perennials

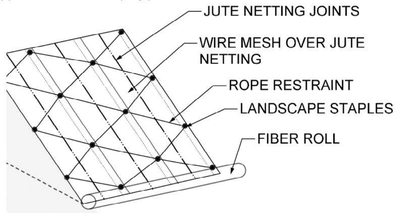
ID	Qty	Botanical Name	Common Name	Scheduled Size
AOS	6	Aster oblongifolius 'October Skies'	Aromatic Aster	2 QT
DES	26	Deschampsia cespitosa	Tussock Grass	2 QT
PVS	37	Panicum virgatum 'Shenandoah'	Shenandoah Switch Grass	2 Gal.
RBK	5	Rudbeckia fulgida 'Goldsturm'	Black-Eyed Susan	2 QT
SH	24	Sporobolus heterolepsis	Prairie Dropseed	1 Gal.
SS	71	Schizachyrium scoparium	Little Buestem	2 QT

LANDSCAPE NOTES:

1. THE CONTRACTOR SHALL LOCATE AND VERIFY THE EXISTENCE OF ALL UTILITIES PRIOR TO STARTING WORK.
2. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTINGS SHOWN ON THE DRAWINGS.
3. ALL MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE CURRENT AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
4. ALL PLANT SUBSTITUTIONS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT.
5. ALL PLANT MATERIALS SHALL BE EXACTLY AS SPECIFIED BY THE LANDSCAPE ARCHITECT. IF PLANT SPECIES CULTIVARS ARE FOUND TO VARY FROM THAT SPECIFIED AT ANY TIME DURING THE GUARANTEE PERIOD, THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO HAVE THE CONTRACTOR REPLACE THAT PLANT MATERIAL. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY PLANT DELIVERED TO THE SITE FOR AESTHETIC REASONS BEFORE PLANTING. THE LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR THE QUALITY FOR ALL THE PLANTS.
6. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, UPON DELIVERY OR AT THE JOB SITE WHILE WORK IS ON-GOING TO CONFORMITY TO SPECIFIED QUALITY, SIZE AND VARIETY.
7. PLANTS FURNISHED IN CONTAINERS SHALL HAVE THE ROOTS WELL ESTABLISHED IN THE SOIL MASS AND SHALL HAVE AT LEAST ONE (1) GROWING SEASON. ROOT-BOUND PLANTS OR INADEQUATELY SIZED CONTAINERS TO SUPPORT THE PLANT MAY BE DEEMED UNACCEPTABLE.
8. NO PLANT SHALL BE PUT IN THE GROUND BEFORE GRADING HAS BEEN FINISHED AND APPROVED BY THE LANDSCAPE ARCHITECT.
9. ALL PLANTS SHALL BE INSTALLED AND DETAILED PER PROJECT SPECIFICATIONS.
10. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24-HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL BE WATERED WEEKLY, OR MORE OFTEN IF NECESSARY, DURING THE FIRST GROWING SEASON, WITH TREES BEING WATERED FOR 1 YEAR PER INCH OF CALIPER AT TIME OF PLANTING. IF TEMPORARY IRRIGATION SYSTEMS ARE TO BE USED, THEY SHALL BE DESIGNED AND INSTALLED FOR EFFICIENT AND EFFECTIVE WATER USE TO LANDSCAPED AREAS FOR A LIMITED PERIOD OF TIME DETERMINED BY THE PLANT MATERIAL AND SITE CONDITIONS.
11. ALL PLANTS SHALL BE GUARANTEED BY THE CONTRACTOR FOR NOT LESS THAN ONE FULL YEAR FROM THE TIME OF PROVISIONAL ACCEPTANCE. DURING THIS TIME, THE OWNER SHALL MAINTAIN ALL PLANT MATERIALS IN THE ABOVE MANNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT THE PLANTS TO ENSURE PROPER CARE. IF THE CONTRACTOR IS DISSATISFIED WITH THE CARE GIVEN, HE SHALL IMMEDIATELY, AND IN SUFFICIENT TIME TO PERMIT THE CONDITION TO BE RECTIFIED, NOTIFY THE LANDSCAPE ARCHITECT IN WRITING OR OTHERWISE FORFEIT HIS CLAIM. LANDSCAPE CONTRACTOR SHALL PRUNE PLANTINGS OF DEAD LIMBS OR TWIGS DURING THE FIRST YEAR OF GROWTH.
12. FINAL ACCEPTANCE BY THE LANDSCAPE ARCHITECT WILL BE MADE UPON THE CONTRACTOR'S REQUEST AFTER ALL CORRECTIVE WORK HAS BEEN COMPLETED.
13. LANDSCAPE CONTRACTOR SHOULD REPLACE DEAD PLANTINGS IMMEDIATELY UPON OWNER DIRECTION WITHIN THE WARRANTY PERIOD AND AGAIN AT THE END OF THE GUARANTEE PERIOD, THE CONTRACTOR SHALL HAVE REPLACED ANY PLANT MATERIAL THAT IS MISSING, NOT TRUE TO SIZE AS SPECIFIED, THAT HAVE DIED, THAT HAVE LOST THEIR NATURAL SHAPE DUE TO DEAD BRANCHES, EXCESSIVE PRUNING OR INADEQUATE OR IMPROPER CARE, OR THAT ARE, IN THE OPINION OF THE LANDSCAPE ARCHITECT, IN UNHEALTHY OR UNSIGHTLY CONDITION.
14. ALL LANDSCAPE AREAS TO BE GRASS COMMON TO REGION EXCEPT FOR INTERIOR LANDSCAPED ISLANDS OR WHERE OTHER PLANT MATERIAL IS CALLED FOR.
15. ALL TREES AND SHRUBS TO BE PLANTED IN MULCH BEDS WITH DEFINED AND CUT EDGES TO SEPARATE TURF GRASS AREAS.
16. FOR ANY LANDSCAPE AREA SO DESIGNATED TO REMAIN, WHETHER ON OR OFF-SITE, REMOVE WEEDS, ROCKS, CONSTRUCTION ITEMS, ETC., THEN APPLY GRASS SEED OR PINE BARK MULCH AS DEPICTED ON PLANS.
17. LANDSCAPE CONTRACTOR SHALL FEED AND PRUNE EX. TREES, ON OR JUST OFF SITE, THAT HAVE EXPERIENCED ROOT BASE INTRUSION OR DAMAGE DURING CONSTRUCTION IMMEDIATELY AND FOR THE DURATION OF THE WARRANTY PERIOD AT THE DIRECTION OF THE LANDSCAPE ARCHITECT.
18. EXISTING TREES TO REMAIN SHALL BE PROTECTED WITH TEMPORARY SNOW FENCING AT THE EDGE OF THE EX. TREE CANOPY THE CONTRACTOR SHALL NOT STORE VEHICLES OR MATERIALS WITHIN THE LANDSCAPED AREAS. ANY DAMAGE TO EXISTING TREES, SHRUBS OR LAWN SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
19. ALL MULCH AREAS SHALL RECEIVE A 3" LAYER OF SHREDDED PINE BARK MULCH, AND MULCH SHALL NOT BE IN CONTACT WITH STEMS OR TRUNKS OF SHRUBS AND TREES.
20. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.

Maintenance Plan

Installation of all new plants or replacement plants shall be planted during the growing season from April to October.
Plants shall be planted in accordance with the Landscape Notes on the planting plan.
All plants shall be watered 2x per week during the first growing season. Watering shall saturate the soil around the root ball. The proper use and regular refilling of 'Gator' bags is acceptable. Trees shall be watered for a period of one year per inch of caliper at planting. if temporary irrigation systems are to be used, they shall be designed and installed for efficient and effective water use to landscaped area for a limited period of time determined by the plant material and site conditions.
Aged and organic compost mulch shall be used to a 3" depth shall be maintained around root ball, but kept away from stems and trunks. Do not stack mulch in mounds deeper than 3".
Planting beds shall be kept free of weeds on a biweekly schedule.
Bed edges shall be maintained to keep lawn mowers from damaging trees and shrubs.
Lawn areas shall be mowed on a weekly schedule.
Broken or dead limbs of all plant materials shall be removed close to trunk, but not damaging trunk of plant with clean sharp shears.
Severely injured, diseased, or dead plant material shall be replaced in kind in perpetuity.
Aged organic compost mulch is preferred, but an owner may use a low phosphorous and slow release nitrogen organic fertilizer as needed.
The owner shall be responsible for continued inspection and maintenance requirements as cited by the City of Dover requirements of § 153-14G.
Snow Storage to occur on grassed and/or non-living landscape.
If ownership of a site is conveyed to a new property owner, the new owner shall be responsible for maintaining all landscaping in accordance with the approved final landscaping plan.



1 / L-1 JUTE NETTING DETAIL
SCALE: NTS



2 / L-1 TONGUE + GROOVE FENCE DETAIL
SCALE: NTS

Chillmark Fence by Walpole Woodworkers or Approved Equal
"V" groove board with ship-lap joinery is 5 5/8". Rails are square edge. Mortise and Tenon installation.
767 East Street, Rt 27
Walpole, MA 02081
508 668-2800



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terra firma
landscape architecture
163.a court street portsmouth, nh 03801
office 603.430.3388 | terrence@terrafirmalandarch.com

No.	Date	By	Revision Notes

No.	Date	Issue Notes

Design Firm
terra firma landscape architecture
163.a Court Street
Portsmouth, NH

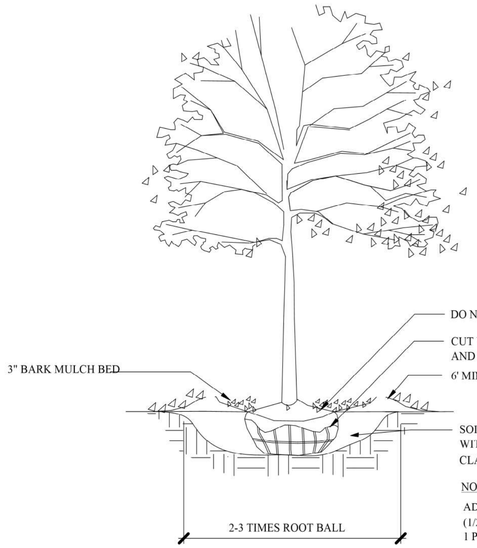
Consultant

Project Title
Hang Ten Car Wash

Sheet Title
Landscape Plan

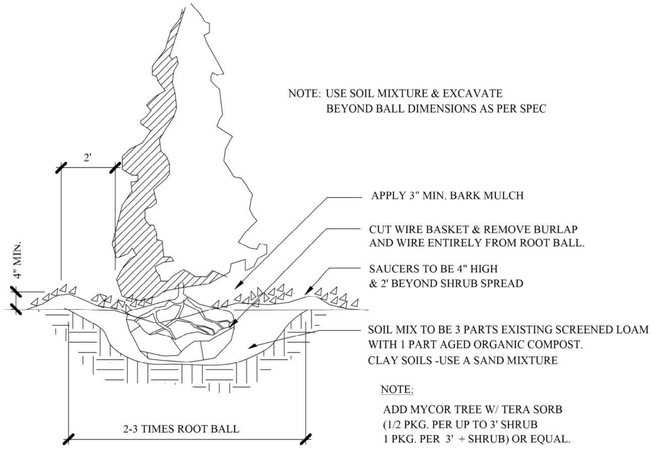
Project Manager: TC	Project ID: Hang Ten
Drawn By: TC	Scale: 1:240
Reviewed By: TP	Sheet No.: L-1 of 2
Date: 6/28/2023	
CAD File Name: hangten51623.vwx	

LICENSED LANDSCAPE ARCHITECT · TERRENCE P. PARKER · 041 · STATE OF NEW HAMPSHIRE



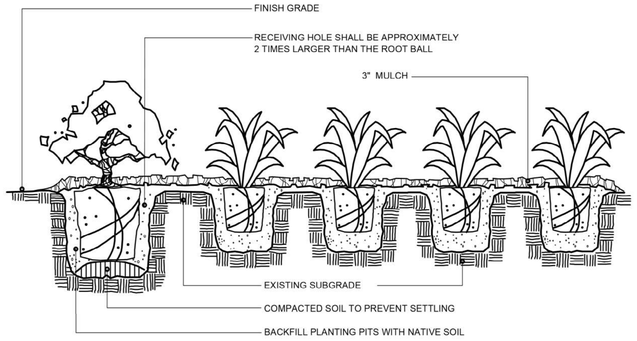
1 L-2

TREE PLANTING - 2"+ CAL.
SCALE: NTS



2 L-2

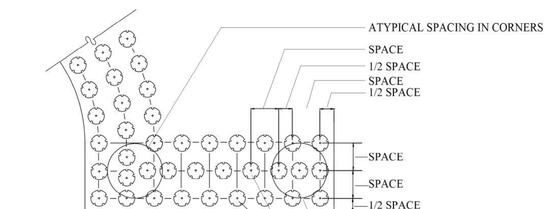
PYRAMIDAL EVERGREEN TREE PLANTING
SCALE: NTS



NOTE: SHRUBS SHALL BE PLANTED A MINIMUM OF 1" & NO MORE THAN 2" ABOVE FINISH GRADE, DEPENDING UPON SITE CONDITIONS.

3 L-2

SHRUB/GROUND COVER PLANTING DETAIL
SCALE: NTS



4 L-2

B&B SHRUB PLANTING
SCALE: NTS

NOTES:

1. PLACE PLANTS IN BED AS SHOWN, SPACING AS SPECIFIED IN PLANT SCHEDULE.
2. GROUNDCOVER SHALL BE TRIANGULAR SPACED IN ROWS PARALLEL TO STRAIGHT EDGES AND SHALL BE EVENLY SPACED IN ROWS PARALLEL TO CURVE EDGES.

5 L-2

GROUND COVER SPACING DETAIL
SCALE: NTS

Ernst Conservation Seeds
8884 Mercer Pike
Meadville, PA 16335
(800) 873-3321 Fax (814) 336-5191
www.ernstseed.com

Rain Garden Grass Mix - ERNMX-180-1

	Botanical Name	Common Name
40.40 %	*Schizachyrium scoparium, Fort Indiantown Gap-PA Ecotype*	Little Bluestem, Fort Indiantown Gap-PA Ecotype
20.00 %	*Carex vulpinoidea, PA Ecotype*	Fox Sedge, PA Ecotype
20.00 %	*Elymus virginicus, Madison-NY Ecotype*	Virginia Wildrye, Madison-NY Ecotype
9.00 %	*Panicum clandestinum, Tioga*	Deertongue, Tioga
5.50 %	*Panicum rigidulum, PA Ecotype*	Redtop Panicgrass, PA Ecotype
4.00 %	*Chasmanthium latifolium, WV Ecotype*	River Oats, WV Ecotype
0.50 %	*Carex scoparia, PA Ecotype*	Blunt Broom Sedge, PA Ecotype
0.30 %	*Juncus effusus*	Soft Rush
0.30 %	*Juncus tenuis, PA Ecotype*	Path Rush, PA Ecotype

100.00 %

Seeding Rate: 15 lb per acre with a cover crop of grain rye at 30 lb per acre

Grasses & Grass-like Species - Herbaceous Perennial; Stormwater Management

Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

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Meadville, PA 16335
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5311 Conservation Mix - ERNMX-114

	Botanical Name	Common Name
30.00 %	*Festuca rubra*	Creeping Red Fescue
25.00 %	*Poa pratensis, 'Baron'*	Kentucky Bluegrass, 'Baron'
25.00 %	*Poa pratensis, 'Kelly'*	Kentucky Bluegrass, 'Kelly'
10.00 %	*Lolium multiflorum*	Annual Ryegrass
10.00 %	*Lolium perenne, 'Confetti III'*	Perennial Ryegrass, 'Confetti III' (turf type)

100.00 %

Seeding Rate: 100-200 lb per acre, or 3-5 lb per 1,000 sq ft

Grasses & Grass-like Species - Herbaceous Perennial; Lawn & Turfgrass Sites

Our best and most popular mix designed for full sun. While this mix tolerates partial shade, it will need at least 3 hours of sunlight a day. The bluegrasses go dormant during a drought. Mowing too close can cause browning. The ryegrasses and red fescue blend well with the bluegrasses to create a full lawn. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

Ernst Conservation Seeds
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Meadville, PA 16335
(800) 873-3321 Fax (814) 336-5191
www.ernstseed.com

Northeast Solar Pollinator Buffer Mix - ERNMX-610

	Botanical Name	Common Name
37.00 %	*Schizachyrium scoparium, 'Camper'*	Little Bluestem, 'Camper'
36.30 %	*Bouteloua curtipendula, Butte*	Sideoats Grama, Butte
4.00 %	*Chamaecrista fasciculata, PA Ecotype*	Partridge Pea, PA Ecotype
4.00 %	*Coreopsis lanceolata*	Lanceleaf Coreopsis
4.00 %	*Echinacea purpurea*	Purple Coneflower
3.30 %	*Rudbeckia hirta*	Blackeyed Susan
2.30 %	*Heliopsis helianthoides, PA Ecotype*	Oxeye Sunflower, PA Ecotype
1.60 %	*Penstemon digitalis*	Tall White Beardtongue
1.50 %	*Asclepias tuberosa*	Butterfly Milkweed
0.80 %	*Liatris spicata*	Marsh Blazing Star
0.70 %	*Senna hebecarpa, VA & WV Ecotype*	Wild Senna, VA & WV Ecotype
0.60 %	*Zizia aurea*	Golden Alexanders
0.50 %	*Asclepias incarnata, PA Ecotype*	Swamp Milkweed, PA Ecotype
0.50 %	*Geum canadense, PA Ecotype*	White Avens, PA Ecotype
0.50 %	*Monarda fistulosa, Fort Indiantown Gap-PA Ecotype*	Wild Bergamot, Fort Indiantown Gap-PA Ecotype
0.50 %	*Pycnanthemum tenuifolium*	Narrowleaf Mountainmint
0.40 %	*Aster laevis, NY Ecotype*	Smooth Blue Aster, NY Ecotype
0.40 %	*Aster novae-angliae, PA Ecotype*	New England Aster, PA Ecotype
0.30 %	*Baptisia australis, Southern WV Ecotype*	Blue False Indigo, Southern WV Ecotype
0.30 %	*Sisyrinchium angustifolium*	Narrowleaf Blue Eyed Grass
0.20 %	*Oenothera fruticosa var. fruticosa*	Sundrops
0.20 %	*Solidago nemoralis, PA Ecotype*	Gray Goldenrod, PA Ecotype
0.10 %	*Aster prenanthoides, PA Ecotype*	Zigzag Aster, PA Ecotype

100.00 %

Seeding Rate: Seed at 15 lbs/acre with 30 lbs/acre of a cover crop. For a cover crop use either grain oats (1 Jan to 31 Jul) or grain rye (1 Aug to 31 Dec).

Ernst Conservation Seeds
8884 Mercer Pike
Meadville, PA 16335
(800) 873-3321 Fax (814) 336-5191
www.ernstseed.com

Native Steep Slope Mix w/Annual Ryegrass - ERNMX-181

	Botanical Name	Common Name
31.10 %	*Sorghastrum nutans, NY4 Ecotype*	Indiangrass, NY4 Ecotype
20.00 %	*Lolium multiflorum*	Annual Ryegrass
14.00 %	*Andropogon gerardii, 'Southlow'-MI Ecotype*	Big Bluestem, 'Southlow'-MI Ecotype
10.00 %	*Elymus canadensis*	Canada Wildrye
7.00 %	*Elymus virginicus, Madison-NY Ecotype*	Virginia Wildrye, Madison-NY Ecotype
4.00 %	*Agrostis perennans, Albany Pine Bush-NY Ecotype*	Autumn Bentgrass, Albany Pine Bush-NY Ecotype
4.00 %	*Panicum virgatum, 'Shawnee'*	Switchgrass, 'Shawnee'
3.00 %	*Panicum clandestinum, Tioga*	Deertongue, Tioga
1.50 %	*Echinacea purpurea*	Purple Coneflower
1.30 %	*Chamaecrista fasciculata, PA Ecotype*	Partridge Pea, PA Ecotype
1.20 %	*Heliopsis helianthoides, PA Ecotype*	Oxeye Sunflower, PA Ecotype
1.00 %	*Coreopsis lanceolata*	Lanceleaf Coreopsis
1.00 %	*Rudbeckia hirta*	Blackeyed Susan
0.30 %	*Monarda fistulosa, Fort Indiantown Gap-PA Ecotype*	Wild Bergamot, Fort Indiantown Gap-PA Ecotype
0.20 %	*Asclepias syriaca*	Common Milkweed
0.20 %	*Solidago rugosa, PA Ecotype*	Wrinkleleaf Goldenrod, PA Ecotype
0.10 %	*Aster novae-angliae, PA Ecotype*	New England Aster, PA Ecotype
0.10 %	*Aster pilosus, PA Ecotype*	Heath Aster, PA Ecotype

100.00 %

Seeding Rate: 60 lb per acre, or 1.5 lb per 1,000 sq ft

Erosion Control & Revegetation; Grasses & Grass-like Species - Herbaceous Perennial; Herbaceous Flowering Species - Herbaceous Perennial

The native grass and forb species tolerate poor soils typically found on steep slopes in the eastern United States. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

Ernst Conservation Seeds
8884 Mercer Pike
Meadville, PA 16335
(800) 873-3321 Fax (814) 336-5191
www.ernstseed.com

Partially Shaded Area Roadside Mix - ERNMX-140

	Botanical Name	Common Name
46.90 %	*Schizachyrium scoparium, Fort Indiantown Gap-PA Ecotype*	Little Bluestem, Fort Indiantown Gap-PA Ecotype
18.30 %	*Elymus virginicus, PA Ecotype*	Virginia Wildrye, PA Ecotype
9.50 %	*Echinacea purpurea*	Purple Coneflower
6.80 %	*Elymus hystrix, PA Ecotype*	Bottlebrush Grass, PA Ecotype
3.00 %	*Chamaecrista fasciculata, PA Ecotype*	Partridge Pea, PA Ecotype
3.00 %	*Rudbeckia hirta*	Blackeyed Susan
1.80 %	*Heliopsis helianthoides, PA Ecotype*	Oxeye Sunflower, PA Ecotype
1.10 %	*Geum canadense, PA Ecotype*	White Avens, PA Ecotype
1.00 %	*Liatris spicata*	Marsh Blazing Star
1.00 %	*Penstemon digitalis, PA Ecotype*	Tall White Beardtongue, PA Ecotype
1.00 %	*Zizia aurea, PA Ecotype*	Golden Alexanders, PA Ecotype
0.60 %	*Baptisia australis, Southern WV Ecotype*	Blue False Indigo, Southern WV Ecotype
0.50 %	*Anemone virginiana, PA Ecotype*	Thimbleweed, PA Ecotype
0.50 %	*Gaura biennis, PA Ecotype*	Biennial Beeblossom, PA Ecotype
0.50 %	*Rudbeckia triloba, WV Ecotype*	Browneyed Susan, WV Ecotype
0.40 %	*Asclepias tuberosa, PA Ecotype*	Butterfly Milkweed, PA Ecotype
0.40 %	*Aster macrophyllus, PA Ecotype*	Bigleaf Aster, PA Ecotype
0.40 %	*Aster pilosus, PA Ecotype*	Heath Aster, PA Ecotype
0.40 %	*Pycnanthemum incanum, MD Ecotype*	Hoary Mountainmint, MD Ecotype
0.40 %	*Pycnanthemum tenuifolium*	Narrowleaf Mountainmint
0.30 %	*Asclepias syriaca, PA Ecotype*	Common Milkweed, PA Ecotype
0.30 %	*Monarda fistulosa, Fort Indiantown Gap-PA Ecotype*	Wild Bergamot, Fort Indiantown Gap-PA Ecotype
0.30 %	*Solidago bicolor, PA Ecotype*	White Goldenrod, PA Ecotype
0.20 %	*Aquilegia canadensis*	Eastern Columbine
0.20 %	*Aster novae-angliae, PA Ecotype*	New England Aster, PA Ecotype
0.20 %	*Aster prenanthoides, PA Ecotype*	Zigzag Aster, PA Ecotype
0.20 %	*Penstemon laevigatus, PA Ecotype*	Appalachian Beardtongue, PA Ecotype
0.20 %	*Solidago nemoralis, PA Ecotype*	Gray Goldenrod, PA Ecotype
0.20 %	*Tradescantia ohiensis, PA Ecotype*	Ohio Spiderwort, PA Ecotype
0.10 %	*Oenothera fruticosa var. fruticosa*	Sundrops
0.10 %	*Penstemon hirsutus*	Hairy Beardtongue
0.10 %	*Solidago juncea, PA Ecotype*	Early Goldenrod, PA Ecotype
0.10 %	*Solidago odora, PA Ecotype*	Licorice Scented Goldenrod, PA Ecotype

100.00 %

Seeding Rate: 20 lbs/acre with 30 lbs/acre of a cover crop. For a cover crop use either grain oats (1 Jan to 31 Jul) or grain rye (1 Aug to 31 Dec).

Grasses & Grass-like Species - Herbaceous Perennial; Herbaceous Flowering Species - Herbaceous Perennial; Pollinator Favorites; Woodland Openings

The native grasses and forbs are ideal for roadside areas and woodland margins. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

PLEASE NOTE: THIS SHEET IS SCALED FOR 22 BY 34 PAPER, DO NOT REDUCE OR ENLARGE.

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landscape architecture
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office 603.430.3388 | terrence@terrafirmalandarch.com



No.	Date	By	Revision Notes

No.	Date	Issue Notes

Design Firm
terra firma landscape architecture
163.a Court Street
Portsmouth, NH

Consultant

Project Title
Hang Ten Car Wash

Sheet Title
Landscape Details

Project Manager	Project ID: Hang Ten
Drawn By: TC	Scale: SEE DETAILS
Reviewed By: TP	Sheet No.: L-2 of 2
Date: 6/28/2023	
CAD File Name: hangten51623.vwx	

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Permit Number	Project	Address	Permit Type	Status	State
COND-2023-0046		914 CENTRAL AV Dover, NH	Environmental Conditional Use	Submitted - Onli...	Attention, Recent, Pending (Unpaid Fees)
COND-2023-0045		914 CENTRAL AV Dover, NH	Environmental Conditional Use	Submitted - Onli...	Attention, Recent, Pending (Unpaid Fees)

Showing 2 records.

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: CESO, Inc. (Mandy Gauss) Telephone # 517-212-4185

Address of Applicant: 13060 S. US Hwy 27, Suite D; Dewitt, MI 48820

E-Mail Address: gauss@cesoinc.com

Name of Property Owner (if different from applicant): 914 Central Avenue, LLC Telephone #

Address of Property Owner: 1380 Soldiers Field Road; Boston, MA 02135

PROPERTY INFORMATION

Assessor's Map # 09058-38020-000000 Lot(s) #

Address of Property: 914 Central Avenue; Dover, NH 03820

Zoning District(s) Commercial District (c) Overlay District(s)

Existing Use of Property: Vacant Commercial Building and Parking Lot

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:

Per section 170-28.3-D(3)(e) – A car wash is allowed within the Secondary Groundwater Protection Zone only if the Planning Board approves a CUP for the specific use.

Per section 170-28.3-D(5) – Any development in the Secondary Groundwater Protection Zone that proposes a total impervious surface greater than twenty percent (20%) shall only be permitted if the Planning Board grants a Conditional Use Permit.

The existing 1.29-acre site is developed with a vacant 3,559-sf masonry building and asphalt parking lot. The existing site does not provide any stormwater retention areas. The existing site consists of 0.72 acres of pervious area and 0.57 acres of impervious area, which is more than the 20% impervious area permitted per code (44%).

The proposed car wash development will consist of a 4,400-sf building, sixteen (16) vacuum spaces, and two (2) employee parking spaces. The proposed site will consist of 0.58 acres of pervious area, 0.18 acres of pervious pavement, and 0.53 acres of impervious area, which will reduce the impervious area onsite to 41%.

The proposed development will also include the addition of a storm system onsite to collect storm water and direct it to a bioretention area prior to discharging to the storm system in Central Avenue.

Overall the proposed development will improve the storm water impact from the existing conditions onsite.

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

_____

Name of Professional That Prepared Plans: Zachary Freshner - CESO, Inc.

Address 216 Centerview Drive, Suite 150; Brentwood, TN 37027 Telephone #: 614-942-3032

Professional License #: 16215 E-mail address: freshner@cesoinc.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: Stephen Lukin Date: 07/27/23

Signature of Applicant (if different from owner): Mandy J. Gauss Date: 07/23/2023

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: Stephen Lukin s.g.l. Date: 07/27/23

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
		914 Central Avenue, LLC	1380 Soldiers Field Road; Boston, MA 02135

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS
Mandy Gauss	CESO , Inc.	13060 S. US Hwy 27, ste. D; Dewitt, MI 48820

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS
Holland E. Shaw	BLEW & Associates, PA	3825 N. Shiloh Drive; Fayetteville, AR 72703
Zachary Freshner	CESO, Inc.	216 Centerview Drive, Suite 150; Brentwood, TN 37027
Terrence P. Parker	Terra Firm	163a Court Street; Portsmouth, NH 03801

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 # _____ sq. ft.= $_____
  - 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 # 2 per Application = $ 400
- ☐ 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 # _____ sq. ft. = $_____

SUBTOTAL PLAN REVIEW FEE = $ 400

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.

PLAN SNAPSHOT REPORT SITE-2023-0005
FOR CITY OF DOVER, N.H.

Plan Type:	Site Plan - Major	**Project:**		**App Date:**	06/22/2023
Work Class:	New Construction	**District:**	None	**Exp Date:**	08/28/2023
Status:	Fees Due	**Square Feet:**	0.00	**Completed:**	NOT COMPLETED
Valuation:	$0.00	**Assigned To:**	Blonigen, Rachel	**Approval Expire Date:**	
Description:	32 individual unit affordable housing development				

Parcel:	A0045-A00002	Main	**Address:**	36 Olive Meadow Ln Dover, NH	Main	**Zone:**

Project Manager
Travis Letellier
Business: (207) 204-9979
Mobile: (603) 380-8411

Project Manager
Michael Sievert
Business: (603) 659-4979
Mobile: (603) 828-6655

Applicant
Janice Bell
5 Railroad Street
Newmarket, NH 03857
Home: (603) 200-4015
Business: (603) 659-4979
Mobile: (603) 892-5973

Plan Custom Fields

Total	0	Total2	0	Total3	59940
Total4	0	Total5	37520	Total6	32
Total7	0	Total8	19600	Total9	19600
Street Classification Type	Private	Net Change in # Parking Spaces (+/-)	41	Water Service	Municipal
Recording Number		Sewer Service	Municipal	Total Acres (GIS)	25.1
Deed Book	4961	Total SQFT	1.09336e+006	Deed Page	475
Deed Date		Proposed Property Use	32 individual unit affordable housing development	Area of Parcel to be Developed (SQFT)	174240
Number of Parking Spaces Existing	51	Number of Parking Spaces Proposed	92	Number of Employees Total	8
Number of Employees in Max Shift	8	Distance to City Water	0	Distance to City Sewer	0
Type of Building to be Built	32 single family units, one 26'x36' community building, and one 24'x36' maintenance building	Estimated Construction Value	0.00	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	TotalImpactFeeAFAOTOD	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_Janice_Bell_6/22/2023.jpg	06/22/2023 10:41	Bell, Janice		Uploaded via CSS
2023.07.13_PlanningTechnicalReviewCommittee_SITE-2023-0005.pdf	07/21/2023 12:43	Blonigen, Rachel		Approved TRC MInutes

PLAN SNAPSHOT REPORT (SITE-2023-0005)

Invoice No.	Fee		Fee Amount	Amount Paid
INV-00003899	Planning General Application Fee		$200.00	$200.00
		Total for Invoice INV-00003899	$200.00	$200.00
INV-00003933	Planning Residential Fee		$3,200.00	$3,200.00
		Total for Invoice INV-00003933	$3,200.00	$3,200.00
INV-00003934	Planning Impervious Paved Area Fee		$4,195.80	$0.00
		Total for Invoice INV-00003934	$4,195.80	$0.00
		Grand Total for Plan	**$7,595.80**	**$3,400.00**

Meeting Type	Location	Scheduled Date	Subject
Technical Review Committee Meeting v.1	City Hall, Second Floor Conference Room	07/13/2023	Technical Review Committee Meeting

Comments: 32 units affordable housing

Submittal Name	Status	Received Date	Due Date	Complete Date	Resubmit	Completed
Land Use Plan Technical Review v.1	Requires Re-submit	08/02/2023	08/30/2023	08/03/2023	Yes	Yes

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Business Development	Business Development	Burdin, James	Requires Re-submit	08/02/2023	08/30/2023	08/02/2023
City Engineer	Community Services - Engineering	Mavrogeorge, Kenneth	Requires Re-submit	08/02/2023	08/30/2023	08/02/2023
IS Building Official	Fire / Inspection Services	Maxfield, Jim	Requires Re-submit	08/02/2023	08/30/2023	08/02/2023
Planning	Planning	Benton, Donna	Requires Re-submit	08/02/2023	08/30/2023	08/02/2023
Zoning Administrator	Planning	Kypfer, Natasha	Requires Re-submit	08/02/2023	08/30/2023	08/02/2023
Traffic Bureau	Police	Speidel, Marn	Requires Re-submit	08/02/2023	08/30/2023	08/02/2023

Workflow Step / Action Name	Action Type	Start Date	End Date
Review v.1		08/02/2023 16:39	
Confirm application complete v.1	Generic Action		08/02/2023 16:39
Technical Review Committee Meeting Agenda v.1	Task	08/02/2023 16:40	08/02/2023 16:40
Land Use Plan Technical Review v.1	Receive Submittal	08/02/2023 0:00	08/03/2023 15:36
Land Use Plan Technical Review v.2	Receive Submittal	08/03/2023 0:00	
Technical Review Committee Meeting v.1	Hold Meeting	08/02/2023 16:44	
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		

PLAN SNAPSHOT REPORT (SITE-2023-0005)

Final Plan v.1	
Land Use Plan Final Review v.1	Receive Submittal
Land Use Plan Stamped and Signed v.1	Generic Action
Plans uploaded to Treeno v.1	Generic Action
Recording v.1	Task
Property Info Group 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 Complex v.1	Create Sub Permit
Create / Link to Permit - Site Work, Construction v.1	Create Sub Permit

CITY OF DOVER

TECHNICAL REVIEW COMMITTEE MINUTES – SITE-2023-0005

Application Type:	Site Review
Applicant(s):	Horizons Engineering Inc.
Owner(s):	Zeland Schwartz Trustee, The Zeland Schwartz Revocable Trust
Location:	36 Olive Meadow Lane (Assessor's Map A, Lot 45-A-2)
Date:	July 13, 2023

INTENT: Proposal is to build 32 individual units through Transfer of Development Rights (TDR).

UNITS PROPOSED: 32 units

AGENDA ITEM #: 1

ACREAGE: 25.1± ac.

ZONING DISTRICT: R-40, Wetland Overlay District, Conservation District

EXISTING LAND USE: Child Daycare

PROPOSED LAND USE: Residential, Affordable/Workforce Housing Development (HUD FMR-rated)

SURROUNDING LAND USE: Residential

ZBA ACTION: None

PERMITS REQUIRED: TBD

RELIEF/WAIVERS REQUESTED: TBD

ATTENDANCE:
Members:
Donna Benton, Planning
Natasha Kypfer, Zoning
Marn Speidel, Police
Ken Mavrogeorge, Engineering
James Burdin, Business Development
Other:
Christopher Parker, Deputy City Manager
Maggie Randolph, GSD Communities
John Randolph, GSD Communities
Ryan Crosby, Dover Housing Authority
Mike Seivert, Horizons Engineering
Travis Letellier, Horizons Engineering

Approval of minutes from July 6, 2023:
M. Speidel moved to approve the July 6, 2023 minutes. Seconded by J. Burdin. Vote: U/A.

PLAN REVIEW:
Planning:

- Reminder: Impact fees, Water/Sewer Investment fees if applicable
- TDR approval and fees as applicable
- Traffic Impact Study; labeled preliminary and lacking signature & stamp by PE and use 85th percentile rather than speed limit for site distance
- Will ADA parking be provided?, they should be convenient to building entries
- Photometric report is missing, §153-14E(1)(b)[2] (provide a lighting plan that meets the regulations)
- Discuss pump station improvements
- Discuss pedestrian connectivity especially with Community Center
- Toters? Discuss trash removal?
- Confirm all items on the checklist are provided before next TRC
- Provide a TDR narrative about how you meet the criteria
- Double check HOA documents
- DA or more detail on upgrading forcemain
- Revise plans to add:
    - Owner's signatures on the final plans
    - PE, LLS, LLA signature & stamp on the plans
    - Add File # SITE-2023-0005
    - TDR noted on plan
    - Confirm all common notes are added
    - Add bike racks
    - EV readiness?
    - Revise typos, wrong titles and names, etc.
    - Landscape O&M Plan
    - Revise fencing around daycare
    - Provide a neighborhood plan with aerial underlay
    - Landscape plan to meet regulations
    - Floor plans for community building
    - Add conservation easement from OSS more clearly

Engineering:

- General Comment: Applicant and Contractor shall review the Dover Construction Guidelines prior to scheduling a Preconstruction meeting with City staff. The guidelines can be found on the City of Dover Website on the Engineering page. https://www.dover.nh.gov/Assets/government/city-operations/1form/community-services/engineering/engineering-documents/Construction%20Guidelines.pdf

CITY OF DOVER

TECHNICAL REVIEW COMMITTEE MINUTES – SITE-2023-0005

Application Type:	Site Review
Applicant(s):	Horizons Engineering Inc.
Owner(s):	Zeland Schwartz Trustee, The Zeland Schwartz Revocable Trust
Location:	36 Olive Meadow Lane (Assessor's Map A, Lot 45-A-2)
Date:	July 13, 2023

- General Comment: A more comprehensive narrative should be provided. It is strongly recommended Applicant's presentation to the TRC should mimic the presentation to the Planning Board including a brief introduction of the history of the site and the proposed changes given the time between the applications.
- General Comment: Traffic Impact Study is marked preliminary. It should be stamped by the PE who prepared the document once a final version is prepared.
- Drainage Report: Applicant shall review the section 153-14 of the Dover Code and clarify how the design meets the City's requirements.
- Sheet 1 of 1 (Survey): There appears to be a typo on note 8. Is the intent to read "not" instead of "lot".
- Sheet 1 of 1 (Survey): Identify limits of force main versus gravity sewer with different linetype. In addition, show the location of the air release valve in Olive Meadow.
- General Comment: Multiple plans note that the lot would be served by Municipal Water and Sewer. Note that the sewer force main infrastructure within Olive Meadow is private.
- General Comment: Add note that Design Engineer shall provide signed letter to City Engineer certifying that the stormwater management system has been installed in accordance with approved plans.
- C100.1: There is pavement proposed within the existing conservation easement. Applicant should speak to how the easement would be modified.
- C101: Width of mini roads, both labelled "Mini Road B" are only 14 feet wide. Increase width to meet minimums in Section 153.14.C.2 of the Dover Code and comply with fire access requirements.
- C101: Recommend eliminating notes 39-41 and including that information in a narrative rather than a construction plan set.
- C101: Note 46 references Red Barn Drive which is not near this project. Revise or remove note.
- C101: Recommend adding stop bars in conjunction with STOP signs.
- C101: Provide sidewalk, crosswalk, or other means to encourage pedestrians to safely access the Community Building.
- C101: Provide ADA parking spaces near community building and other public buildings. None are shown on the subject property.
- C102 (Grading): Grades at the back of the development appear to exceed 12% or more. Can the lower lot be raised to reduce slopes to comply with Dover Code.
- C102 (Grading): It is unclear what method of pretreatment is proposed for the underground infiltration system.
- C102 (Grading): Number of catch basins provided appears insufficient for the amount of impervious. Provide calculations showing basins do not overtop and pipes are appropriately sized.
- C102 (Grading): Some pipe slopes exceed 5%. Recommend providing drop structures to reduce slopes and trench dams.
- C102 (Utility): Renumber the utility plan as it conflicts with the Grading plan.
- C102 (Utility): The City recommends that the applicant source out ductile iron piping, which is the City required material, in advance commencing construction in lieu of HDPE pipe. Provide additional details on water main construction including valves or thrust blocks locations on the plans.
- C102 (Utility): Increase the size of the water main within the proposed Loop Road to 8 inch minimum.
- C102 (Utility): Provide gate valves at water main intersections and tapping sleeve for tie in.
- C102 (Utility): Applicant should bring 8" gravity sewer into Olive Meadow from 6th Street and show the limits of proposed force main from project site to the gravity tie in.
- General Comment: A 3" Force main is proposed on the plan but the detail calls for a 4 inch force main. The design was not supported with flow calculations for the additional flows.
- General Comment: Cleanouts for sewer infrastructure outside of the building are not permitted.
- C102 (Utility): Proposed sewer appears to have less than the minimum required cover per NHDES requirements around multiple sewer structures.
- C102 (Utility): A minimum 8 inch gravity sewer should be provided for building connections. 4 inch services can be provided for individual buildings.
- C102 (Utility): Recommend providing one pump station in lieu of two.

- C102 (Utility): Pump Stations will need to have either back up generators or 6 hrs worth of storage with a generator hook up.
- C102 (Utility): Community Building and Garage do not have utility services. Provide additional detail.
- C102 (Utility): Number of transformers seems insufficient for the number of buildings. Provide additional detail on the electric design including locations of transformers, pull boxes, and communication trenches.
- C102 (Utility): Recommend sewer infrastructure be located in accessible areas and not between or behind buildings.
- General Comment: Recommend providing 1 sf of snow storage per 10 sf of pavement to be cleared. Verify snow storage meets or exceeds this recommendation or provide note to remove excess snow when storage areas are filled.
- General Comment: The City would request a 30 foot wide utility easement along the northern property line for a future sewer and water infrastructure project.
- General Comment: Applicant shall provide an easement to the City along the private drives within the property to allow for access and operation of the water infrastructure (hydrants and shut offs) to maintain water quality.
- General Comment: Engineering requests a letter certifying the tie in locations or discharge points for all sump pumps and roof leaders for existing and proposed structures on the property will not connect to the sewer.
- General Comment: All valves and hydrants shall open left (counterclockwise)
- C502: Pipe Outlet Protection Detail mentions four rip rap aprons while only one is proposed. Be sure that the outlet protection is shown correctly on the plan.
- C503: ADA space detail is provided but not shown on the plan.
- C503: Vertical Curb detail shows 4 inches of loam and seed on what looks like a sidewalk detail. Please clarify also the material of the curb.
- General Comment: Sewer manhole covers shall be Liftmate R-1743-LM or approved equal with 90 deg hinge.
- C505: Recommend providing concrete around curbing.
- C507: Storm Drain Utility Trench Section – crushed stone shall extend 12" above top of pipe.
- General Comment: Water Service Connection: curb box shall be Erie-style
- General Comment: Water Service Connection: tapping sleeve shall be stainless steel.
- General Comment: Water shall have a minimum of 5 feet of cover over the top of pipe.
- General Comment: Remove 90 degree bends from water main, use 45 degree bends or less
- General Comment: The report states that the stormwater design complies with Dover standards. Applicant shall review the section 153-14 of the Dover Code and clarify how the design meets the City's requirements.
- General Comment: Revised Stabilized Construction Entrance to match NHDES standard detail (include note about alternate berm for entrances less than 75 feet).
- General Comment: How will trash be handled?
- General Comment: Please provide truck turning plans with a fire truck and dumpster truck.
- General Comment: Recommend individual water shut offs be located outside of paved surfaces and in grass.
- General Comment: It is strongly recommended that the Applicant submit a detailed breakdown of proposed HOA costs for annual maintenance and replacement of private infrastructure including backup as to how the fees are estimated.
- General Comment: Recommend that the amendment approval from the NHDES AoT be a condition of approval at PB. Applicant shall also comment on how the proposed design is in accordance with Dover Code 153-14. Revised Stormwater report shall be provided once approved by AoT.
- General Comment: If a retaining wall is proposed to reduce slopes, provide detail for retaining wall that notes that the design of the wall must be prepared by a professional engineer licensed in the state of NH.
- General Comment: Label existing SMH in accordance with City of Dover numbering (Coordinate with Community Services).
- General Comment: Proposed grading appears close to wetland but no flags are provided. Applicant to provide updated wetland

flagging and clarify if a NHDES Standard Dredge and Fill Permit is required.
- General Comment: Emergency contacts shall be provided for pump system after construction is complete.
- General Comment: Applicant shall provide an operation and maintenance plan for the pump station and emergency storage.
- General Comment: Photometrics Plan should be provided.

Fire/Inspection Services:
- Provide proposed street names for proposed roads for addressing
- Submission does not appear to include architectural or elevation plans for the proposed dwelling units or community building.
- Provide bicycle racks at community center
- Indicate location of accessible parking spaces throughout.
- Plans to indicate design and construction conformance to applicable accessibility regulations and NH RSA 155-A:5.
- Sheet C101 Clarify pedestrian travel throughout the site (i.e. access 8 parking spaces across from units 1 & 2).
- The hydrant near unit 15 appears to be too far from units 27-32. Indicate an additional hydrant near units 27-32 or note location of an additional hydrant on Olive Meadow.
- Plans set to include design compliance with NFPA 820 for waste water disposal system.
- Sheet C 505 Plan set detail to include the hazardous location classification and applicable boundaries (i.e. Class I div. I)

Police:
- Vehicle Sight Distance analysis (Traffic Impact Study, p. 6) uses 30 mph posted limit. This analysis should use the 85th percentile speed of Sixth Street, not the posted limit. Police historical data indicates the 85th percentile speed on this section of Sixth Street is 43 mph NB, 44 mph SB.
- In light of the increased traffic volumes coupled with future increases at the child care center, provide measures to mitigate speeding concerns on the public section of Olive Meadow Lane. A small solar-assisted speed monitoring device is suggested. Alternatively, consider providing a speed monitoring sign/post on Sixth Street northbound similar to the one on the Sixth Street southbound approach.

Business Development:
- The proposed residential use, including the use of TDR at this location, appears generally consistent with the residential zoning and character of the area – existing properties along Olive Meadow Lane are undersized for the R-40 zone, existing vegetation on the subject and abutting parcels would likely screen abutters from impacts of increased density, and any such impacts are unlikely to exceed those of the Spaulding Turnpike or uses in the IT zone.
- Business development supports the proposal to retain the existing child care center as part of this development. We encourage the applicants to approach site buildout in a way that minimizes and/or proactively communicates potential impacts to the operators.
- The extension of Olive Meadow Lane appears to reduce the garden/playground area adjacent to the child care center. Sheet C101 further divides this area into envelopes for a relocated playground and separate rec area –will one or both be enclosed and/or reserved for use by the child care center? If there will be a reduction in area reserved for the business, please quantify.

Planning Board: N/A

Next Steps: Revise plans, resubmit with TRC response letter on the portal, and come back for another TRC.

Adjournment:
K. Mavrogeorge moved to adjourn the meeting at 11:04 am. Seconded by M. Speidel. Vote: U/A

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

August 3, 2023

City of Dover
Planning Department
288 Central Ave.
Dover, NH 03820-4169

Re: TRC #2 – Resubmission for review

Dear Ms. Benton,

Please find attached the following information:

1. Revised plan set dated 8-3-23.
2. Revised traffic report.
3. Revised drainage report and Stormwater Inspection and Maintenance plan.
4. Architectural drawings for the Community building.
5. Revised letter of intent.
6. Sewer pump station calculations.
7. TRC response document.
8. Updates to application.

We have provided our responses in "red" on the original Planning technical review committee review document. All items have been addressed and the response includes the location on the plan sheets as appropriate. The letter of intent has been revised to meet the requests within the TRC review document. All other supporting documents provide information as requested on the TRC review document.

If you need additional information, please do not hesitate to contact me.

Sincerely,

Michael J. Sievert PE
VP President Structural

CITY OF DOVER

TECHNICAL REVIEW COMMITTEE MINUTES – SITE-2023-0005

Application Type:	Site Review
Applicant(s):	Horizons Engineering Inc.
Owner(s):	Zeland Schwartz Trustee, The Zeland Schwartz Revocable Trust
Location:	36 Olive Meadow Lane (Assessor's Map A, Lot 45-A-2)
Date:	July 13, 2023

INTENT: Proposal is to build 32 individual units through Transfer of Development Rights (TDR).

UNITS PROPOSED: 32 units

AGENDA ITEM #: 1

ACREAGE: 25.1± ac.

ZONING DISTRICT: R-40, Wetland Overlay District, Conservation District

EXISTING LAND USE: Child Daycare

PROPOSED LAND USE: Residential, Affordable/Workforce Housing Development (HUD FMR-rated)

SURROUNDING LAND USE: Residential

ZBA ACTION: None

PERMITS REQUIRED: TBD

RELIEF/WAIVERS REQUESTED: TBD

ATTENDANCE:
Members:
Donna Benton, Planning
Natasha Kypfer, Zoning
Marn Speidel, Police
Ken Mavrogeorge, Engineering
James Burdin, Business Development
Other:
Christopher Parker, Deputy City Manager
Maggie Randolph, GSD Communities
John Randolph, GSD Communities
Ryan Crosby, Dover Housing Authority
Mike Seivert, Horizons Engineering
Travis Letellier, Horizons Engineering

Approval of minutes from July 6, 2023:
M. Speidel moved to approve the July 6, 2023 minutes. Seconded by J. Burdin. Vote: U/A.

PLAN REVIEW:
Planning:

- Reminder: Impact fees, Water/Sewer Investment fees if applicable
- TDR approval and fees as applicable
- Traffic Impact Study; labeled preliminary and lacking signature & stamp by PE and use 85th percentile rather than speed limit for site distance
  A new fnal traffic impact study is provided with PE stamps and revisions as requested.
- Will ADA parking be provided?, they should be convenient to building entries
  Three ADA spaces have been added to the plan (Sheet C101)
- Photometric report is missing, §153-14E(1)(b)[2] (provide a lighting plan that meets the regulations)
  A new lighting and photometric plan is being prepared by our lighting consultant and will be provided prior to the TRC meeting.
- Discuss pump station improvements
  Addressed in revised LOI.
- Discuss pedestrian connectivity especially with Community Center
  The sidewalks and cross walks have been added to provide connection from the development to the community center.
- Toters? Discuss trash removal?
  The plan has been revised to show a larger fenced area for trash/recycling and removal will be provided by a private company also noted in the LOI.
- Confirm all items on the checklist are provided before next TRC
  Checklist included with notes.
- Provide a TDR narrative about how you meet the criteria
  This has been provided in the LOI
- Double check HOA documents
  We have consulted with the owners attorney and the design does not violate the documents to our knowledge.
- DA or more detail on upgrading forcemain
  This have been provided in both the plans and LOI.
- Revise plans to add:
  - Owner's signatures on the final plans
    Owners signature will be on the final plans.
  - PE, LLS, LLA signature & stamp on the plans
    Added
  - Add File # SITE-2023-0005

DRAFT

File number has been added to all sheets, lower right hand corner.

- TDR noted on plan
  Added to sheet C102 note #49.
- Confirm all common notes are addedtrc
  The common notes have been added.
- Add bike racks
  bike racks have been added.
- EV readiness?
  Conduit for a potential ev charging station is proposed.
- Revise typos, wrong titles and names, etc.
  Completed as noted.
- Landscape O&M Plan
  This plan is being prepared as part of the landscape architects scope.
- Revise fencing around daycare
  This have been updated as required.
- Provide a neighborhood plan with aerial underlay
  A neighbourhood plan has been added.
- Landscape plan to meet regulations
  As stated above, Woodburn and Associates is working on the landscape plan and we will submit as soon as we have it.
- Floor plans for community building
  Floor plans for the community building are included.
- Add conservation easement from OSS more clearly
  The area has been shaded on the existing conditions plan.

Engineering:

- General Comment: Applicant and Contractor shall review the Dover Construction Guidelines prior to scheduling a Preconstruction meeting with City staff. The guidelines can be found on the City of Dover Website on the Engineering page. https://www.dover.nh.gov/Assets/government/city-operations/1form/community-services/engineering/engineering-documents/Construction%20Guidelines.pdf
- General Comment: A more comprehensive narrative should be provided. It is strongly recommended Applicant's presentation to the TRC should mimic the presentation to the Planning Board including a brief introduction of the history of the site and the proposed changes given the time between the applications.
  The narrative in the letter of intent LOI has been enhanced.
- General Comment: Traffic Impact Study is marked preliminary. It should be stamped by the PE who prepared the document once a final version is prepared.
  An updated TIS has been prepared for this submission.
- Drainage Report: Applicant shall review the section 153-14 of the Dover Code and clarify how the design meets the City's requirements.
  The drainage report has been updated to provide additional information on how the design meets the requirements.
- Sheet 1 of 1 (Survey): There appears to be a typo on note 8. Is the intent to read "not" instead of "lot".
  This have been updated.
- Sheet 1 of 1 (Survey): Identify limits of force main versus gravity sewer with different linetype. In addition, show the location of the air release valve in Olive Meadow.
  The line types and labels have been updated on the EC plan.
- General Comment: Multiple plans note that the lot would be served by Municipal Water and Sewer. Note that the sewer force main infrastructure within Olive Meadow is private.
  Noted, but the property is services by Municipal water and sewer within 6th Street. We intend to keep the sewer system on the lot and within Olive Meadow private with the design upgrades.
- General Comment: Add note that Design Engineer shall provide signed letter to City Engineer certifying that the stormwater management system has been installed in accordance with approved plans.

DRAFT

Note 46 on the site plan has been added in acroadance with this comment. (Sheet C101)

- C100.1: There is pavement proposed within the existing conservation easement. Applicant should speak to how the easement would be modified.
  The easement boundary will be modified to exclude the paved area and as additional area will be added. This is further addresses in the LOI

- C101: Width of mini roads, both labelled "Mini Road B" are only 14 feet wide. Increase width to meet minimums in Section 153.14.C.2 of the Dover Code and comply with fire access requirements.
  The width of the "mini" roads have been increased to 16 feet wide (sheet C506) and have also been designated for one way traffic. (sheet C101)

- C101: Recommend eliminating notes 39-41 and including that information in a narrative rather than a construction plan set.
  These notes have been eliminated (sheet C101)

- C101: Note 46 references Red Barn Drive which is not near this project. Revise or remove note.
  This note does no apply and has been removed (sheet C101)

- C101: Recommend adding stop bars in conjunction with STOP signs.
  A stop bar has been added to the plan (Sheet C101)

- C101: Provide sidewalk, crosswalk, or other means to encourage pedestrians to safely access the Community Building.
  A crosswalk and reconfigured sidewalk has been added to safely connect the parking lot to the community building for pedestrians.

- C101: Provide ADA parking spaces near community building and other public buildings. None are shown on the subject property.
  One ADA parking space has been added next to the community building, and two ADA parking spaces have been added to the parking area near station 9+00 (Sheet C101)

- C102 (Grading): Grades at the back of the development appear to exceed 12% or more. Can the lower lot be raised to reduce slopes to comply with Dover Code.
  The road has been realigned and pushed up the slope from the original design from station 7+00 to 11+00, The result of this eliminates and slopes greater than 8% within the entirety of the loop road design. (sheet C102, C104, C105)

- C102 (Grading): It is unclear what method of pretreatment is proposed for the underground infiltration system.
  Pre-treatemnt is provided with deep sump catch basins which have been taken off line with the new design, each CB now drains to a drain manhole eliminating flow through

- C102 (Grading): Number of catch basins provided appears insufficient for the amount of impervious. Provide calculations showing basins do not overtop and pipes are appropriately sized.
  An analysis of the closed drainage system is included in the drainage report appendix E, and the plans have been amended accordingly.

- C102 (Grading): Some pipe slopes exceed 5%. Recommend providing drop structures to reduce slopes and trench dams.
  As a result of the road re-alignment a couple pipes a slightly above a 5% grade, revising to 5% of less would result in lowering upgradient structurs to maintain cover rather than adding a drop on the down gradient structures. We feel the pipe slopes proposed will not cause any harm.

- C102 (Utility): Renumber the utility plan as it conflicts with the Grading plan.
  Utility plan has been updated to sheet C103.

- C102 (Utility): The City recommends that the applicant source out ductile iron piping, which is the City required material, in advance commencing construction in lieu of HDPE pipe. Provide additional details on water main construction including valves or thrust blocks locations on the plans.

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DI pipe is now called out on the plans. The water line has been slightly re-aligned with a main trunk line of 8" DI with a smaller 6" DI loop within the development. A 8" stub at the edge of the development has been provided to allow for a future connection to the municipal system. (Sheet C103)

- C102 (Utility): Increase the size of the water main within the proposed Loop Road to 8 inch minimum.
  See response above.

- C102 (Utility): Provide gate valves at water main intersections and tapping sleeve for tie in.
  6x8 tapping sleeved with thrust block is proposed at the tie in location in Olive Meadow. (Sheet C103)

- C102 (Utility): Applicant should bring 8" gravity sewer into Olive Meadow from 6th Street and show the limits of proposed force main from project site to the gravity tie in.
  We concur with this assessment and a new gravity line and new manholes extending into Olive Meadow has been included in the design. The new 4 inch force main will empty into the new gravity line, simarly, the exisint forcem main will be directed to this new gravity line as well, by others. (Sheet C103.1)

- General Comment: A 3" Force main is proposed on the plan but the detail calls for a 4 inch force main. The design was not supported with flow calculations for the additional flows.
  Additional design information has been provided and the proposal is for a 4" FM (Sheet C505)

- General Comment: Cleanouts for sewer infrastructure outside of the building are not permitted.
  Cleanouts have been removed from the design.

- C102 (Utility): Proposed sewer appears to have less than the minimum required cover per NHDES requirements around multiple sewer structures.
  6 feet of cover has been provided for the site with the exception of a short sectin of pipe leaving SMH-11. The pipe has 5 feet of cover directly leaving the SMH, but quickly has grater than 6' cover heading towards SMH-10. In addition, there is a section in the extension up Olive Meadow with less than 6' of cover, but insulation has been shown on the pipe. (Sheet C103.1 C103, C105)

- C102 (Utility): A minimum 8 inch gravity sewer should be provided for building connections. 4 inch services can be provided for individual buildings.
  8" sewer lines are proposed throughout the development. (Sheet 103)

- C102 (Utility): Recommend providing one pump station in lieu of two.
  Agree, the sewer design now includes only one sewer pump station located at station 8+43.6. (Sheet C103, C105)

- C102 (Utility): Pump Stations will need to have either back up generators or 6 hrs worth of storage with a generator hook up.
  A backup generator is proposed for this pump station. (Sheet C103)

- C102 (Utility): Community Building and Garage do not have utility services. Provide additional detail.
  Both buildings will be served by all new underground utilities, now shown on the Sheet C103)

- C102 (Utility): Number of transformers seems insufficient for the number of buildings. Provide additional detail on the electric design including locations of transformers, pull boxes, and communication trenches.
  A couple additional transformers have been added to the plan. The final locations and number of transformers, pull boxes etc., will be determined by the utility company at a later date. We have contacted the utility company. The transformwers shown are a placeholder until then and show

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possible locations that are out of the way of other utilities and landscaping features. (Sheet C103)

- C102 (Utility): Recommend sewer infrastructure be located in accessible areas and not between or behind buildings.
  Other than one segment of sewer line between SMH-08 and SMH-09 all of the proposed system is located in an accessible areas. In this particular location the grade is level and access is available. (Sheet C103)

- General Comment: Recommend providing 1 sf of snow storage per 10 sf of pavement to be cleared. Verify snow storage meets or exceeds this recommendation or provide note to remove excess snow when storage areas are filled.
  The new road and driveways consist of nearly 58,000 square feet of pavement. The total snow storage area identified on the plans is about 26,000 square feet, nearly 5x the requirement. (Sheet C101, note 45)

- General Comment: The City would request a 30 foot wide utility easement along the northern property line for a future sewer and water infrastructure project.
  A proposed 30 foot easement is shown along the northly peoperty line (Sheet C100.1)

- General Comment: Applicant shall provide an easement to the City along the private drives within the property to allow for access and operation of the water infrastructure (hydrants and shut offs) to maintain water quality.
  Note 47 has been added to the site plan to indicate an easement benefitting the City to all for operations of the proposed waterline. (Sheet C101)

- General Comment: Engineering requests a letter certifying the tie in locations or discharge points for all sump pumps and roof leaders for existing and proposed structures on the property will not connect to the sewer.
  Note 48 on the site plan was added to address this concern. (sheet C101)

- General Comment: All valves and hydrants shall open left (counterclockwise)
  Noted.

- C502: Pipe Outlet Protection Detail mentions four rip rap aprons while only one is proposed. Be sure that the outlet protection is shown correctly on the plan.
  There are three outlets proposed and are noted on the grading plan. The detail has been updated to include dimension for each. Sheet C502

- C503: ADA space detail is provided but not shown on the plan.
  Three (3) ADA spaces are now shown on the plan. (Sheet C101)

- C503: Vertical Curb detail shows 4 inches of loam and seed on what looks like a sidewalk detail. Please clarify also the material of the curb.
  This detail has been updated to show the paved sidewalk in the specific location. (sheet C503)

- General Comment: Sewer manhole covers shall be Liftmate R-1743-LM or approved equal with 90 deg hinge.
  Cover has been specified as noted in this comment (Sheet C504)

- C505: Recommend providing concrete around curbing.
  Straight granite curb is being changed to sloped granite curb around the outside of the loop road, and the detail has been revised with concrete. (Sheet C505)

- C507: Storm Drain Utility Trench Section – crushed stone shall extend 12" above top of pipe.
  The standard drainage pipe trench detail has been updated to include crushed stone 12 inches above top of pipe. (Sheet C507)

- General Comment: Water Service Connection: curb box shall be Erie-style

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"Erie style" has been added t othe detail. (Sheet C507)

- General Comment: Water Service Connection: tapping sleeve shall be stainless steel.
  Details have been updated to show stainless rather than brass. (Sheet C507)

- General Comment: Water shall have a minimum of 5 feet of cover over the top of pipe.
  Noted, detail on sheet C507 and profile both indicate a minimum of 5'-6" of cover.

- General Comment: Remove 90 degree bends from water main, use 45 degree bends or less.
  Bends have been added to the plan, no 90 degree bends are proposed. (Sheet C103)

- General Comment: The report states that the stormwater design complies with Dover standards. Applicant shall review the section 153-14 of the Dover Code and clarify how the design meets the City's requirements.
  This has been addressed in the revised drainage report.

- General Comment: Revised Stabilized Construction Entrance to match NHDES standard detail (include note about alternate berm for entrances less than 75 feet).
  The detail has been revised with added notes Sheet C502.

- General Comment: How will trash be handled?
  A new screened trash and recycling area has been shown adjacent to the existing one which will be removed. The trash/recycling removal from the site will be by a private contractor.

- General Comment: Please provide truck turning plans with a fire truck and dumpster truck.
  We have created a new plan, "Turnining Diagram Plan" that shows a fire truck driving around the internal mini roads and around the loop road, in addition shows a garbage truck driving to the proposed dumperster pad (Sheet C202)

- General Comment: Recommend individual water shut offs be located outside of paved surfaces and in grass.
  All shutoffs are shown in the grassed areas. (Sheet C103)

- General Comment: It is strongly recommended that the Applicant submit a detailed breakdown of proposed HOA costs for annual maintenance and replacement of private infrastructure including backup as to how the fees are estimated.
  There is no HOA for this development. The owner/operator will be the Dover Housing Authority and the sewer system is private and only for this development. The existing sewer system in Olive Meadwo Lane can be reconfigured and tied into the gravity system proposed by this development, but this new development nor the childcare facility will be tied into this system.

- General Comment: Recommend that the amendment approval from the NHDES AoT be a condition of approval at PB. Applicant shall also comment on how the proposed design is in accordance with Dover Code 153-14. Revised Stormwater report shall be provided once approved by AoT.
  Agreed.

- General Comment: If a retaining wall is proposed to reduce slopes, provide detail for retaining wall that notes that the design of the wall must be prepared by a professional engineer licensed in the state of NH.
  Noted.

- General Comment: Label existing SMH in accordance with City of Dover numbering (Coordinate with Community Services).
  Pending response

- General Comment: Proposed grading appears close to wetland but no flags are provided. Applicant to provide updated wetland flagging and clarify if a NHDES Standard Dredge and Fill Permit is required.
  All grading is a minimum of 50 feet from delineated wetlands. No wetland permit is required.

- General Comment: Emergency contacts shall be provided for pump system after construction is complete.

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Noted.

- General Comment: Applicant shall provide an operation and maintenance plan for the pump station and emergency storage.
  A backup generator is proposed to keep the pump station in operation during a power outage.

- General Comment: Photometrics Plan should be provided.
  As stated earlier, a photometric plan is being prepared now.

Fire/Inspection Services:

- Provide proposed street names for proposed roads for addressing
- Submission does not appear to include architectural or elevation plans for the proposed dwelling units or community building.
  Proposed street names have been added to the plan.
- Provide bicycle racks at community center
  A bicycle rack has been added.
- Indicate location of accessible parking spaces throughout.
  This has been added to the plans Sheet C101
- Plans to indicate design and construction conformance to applicable accessibility regulations and NH RSA 155-A:5.
  Note 50 has been added to the site plan sheet C101 and to the architectural plans for the community building.

- Sheet C101 Clarify pedestrian travel throughout the site (i.e. access 8 parking spaces across from units 1 & 2).
  This has been addressed with added walkways and cross walk.
- The hydrant near unit 15 appears to be too far from units 27-32. Indicate an additional hydrant near units 27-32 or note location of an additional hydrant on Olive Meadow.
  An additional hydrant has been added sheet C103.
- Plans set to include design compliance with NFPA 820 for waste water disposal system.
  Agreed
- Sheet C 505 Plan set detail to include the hazardous location classification and applicable boundaries (i.e. Class I div. I)
  This is noted in the detail notes on Sheet C505

Police:

- Vehicle Sight Distance analysis (Traffic Impact Study, p. 6) uses 30 mph posted limit. This analysis should use the 85th percentile speed of Sixth Street, not the posted limit. Police historical data indicates the 85th percentile speed on this section of Sixth Street is 43 mph NB, 44 mph SB.
  This have been revised in the traffic study.

- In light of the increased traffic volumes coupled with future increases at the child care center, provide measures to mitigate speeding concerns on the public section of Olive Meadow Lane. A small solar-assisted speed monitoring device is suggested. Alternatively, consider providing a speed monitoring sign/post on Sixth Street northbound similar to the one on the Sixth Street southbound approach.
  The owner is in agreement and is willing to provide the speed monitoring device, agree to alternatives.

Business Development:

- The proposed residential use, including the use of TDR at this location, appears generally consistent with the residential zoning and character of the area – existing properties along Olive Meadow Lane are undersized for the R-40 zone, existing vegetation on the subject and abutting parcels would likely screen abutters from impacts of increased density, and any such impacts are unlikely to exceed those of the Spaulding Turnpike or uses in the IT zone.
- Business development supports the proposal to retain the existing child care center as part of this development. We encourage the applicants to approach site buildout in a way that minimizes and/or proactively communicates potential impacts to the operators.
  Noted

- The extension of Olive Meadow Lane appears to reduce the garden/playground area adjacent to the child care center. Sheet C101 further divides this area into envelopes for a relocated

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playground and separate rec area –will one or both be enclosed and/or reserved for use by the child care center? If there will be a reduction in area reserved for the business, please quantify.
The design has been revised to minimize the impacts and show new fencing. Additional screening will be provided on the northeasterly side of the childcare facility to better separate and screen the two uses.

Planning Board: N/A

Next Steps: Revise plans, resubmit with TRC response letter on the portal, and come back for another TRC.

Adjournment:
K. Mavrogeorge moved to adjourn the meeting at 11:04 am. Seconded by M. Speidel. Vote: U/A

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

Letter of Intent – Site Plan Review and TDR Application
For
GSD Communities, LLC
Workforce Housing Development
Tax Map A45 Lot A2
Rev.1

August 2, 2023

The Subject Property

The subject parcel is located at 36 Olive Meadow Lane within the R-40 zoning district. The 25.1-acre parcel is bordered on all sides by residential property. The access to the subject parcel is via Olive Meadow Lane and the parcel has frontage on the cul-de-sac. There are 12 single family residential lots which front on Olive Meadow Lane. The subject parcel at 36 Olive Meadow Lane is serviced by municipal water, underground utilities, and natural gas. The existing building has a sewer system that is connected to the municipal sewer system in 6th Street via a 3" PVC force main.

The parcel was originally developed in or around 2004, with a 10,000-sf single story building currently used as a child daycare. However, the original site plan approved in 2003 was for the Temple Israel building. There is an access road from the cul-de-sac to the existing building, and there are 51 parking spaces on site, with an internal loop road for pickup and drop off. The area currently developed with the daycare building is approximately 2.6 acres. As mentioned above, the building is services with underground utilities including municipal water via a 6" ductile iron pipe. The original sewer system approved during the site plan approval and verified on the site, includes a 1000-gallon grease trap, a 2500-gallon septic tank and a 5' diameter duplex pump station. The duplex pump station has effluent pumps. Therefore, this system is only pumping effluent into the municipal sewer system and the solids are retained in the septic tank. The owner is currently responsible for the pumping and maintenance of this system. This building will be retained and continue to be operated as a childcare facility.

There are 12 single family homes on Olive Meadow Lane. 11 of the lots were developed between 2004 and approximately 2018, with the last amended plan and covenants updated in or around 2012. Each residential lot is serviced by underground utilities, municipal water and connected to the private sewer force main. It is currently common knowledge that there are issues with the operation of the private sewer force main that connects to the municipal gravity sewer system in 6th Street.

The remainder of the subject parcel is wooded and undeveloped. 14.1 acres is upland, and 11.0 acres is wetland. The parcel does not have steep slopes in the area proposed for development. There is a small area on the northerly corner of the parcel that meets the requirements for steep slopes, but this area is outside of the proposed development. The parcel is also subject to the Wetland Overlay District and Conservation District.

GSD Communities, LLC Affordable/Workforce Housing Cottage Development Proposal

The proposal by GSD Communities, LLC is to develop the existing property at 36 Olive Meadow Lane, into an affordable/workforce housing development. The style of the development will be small single family detached "Cottages". There are two sections, one at the entrance to the site with six homes and a community center, and the second area divided into three clusters and surrounded by an exterior loop road. Two of the housing clusters front on one way connector roads with individual driveways for parking. The "fronts" of the cottages will face green space connected by internal walkways. The third and lager cluster will have a central green space where the units front with onsite remote parking lots along the main access road. A loop road has been provided for circulation and emergency vehicle access. The small one-way connector roads divide the clusters and provide alternate access throughout the development, especially in the event of an emergency. The proposed developed area encompasses approximately 4.0 acres of the upland area on the subject parcel excluding the existing 2.6 acres currently developed, the remaining 18.5 acres will be added to the current open space on the parcel. The units are less than 1200 sf, total with kitchen/living area, 2-4 bedrooms and 2 baths. There is a small front porch.

The developer is proposing to reconstruct the existing private sewer system that connects to the municipal system. The proposal includes constructing a new gravity sewer system to collect waste from the proposed residential buildings and two commercial buildings. In addition, the existing childcare facility will be disconnected from the existing force main and tied into the gravity collection sewer system on site. This gravity system will flow to a new duplex sewer pump station which will pump sewage from the entire new development, and the existing childcare building via a new force main to the gravity sewer system in 6th Street. In addition, the gravity sewer system in 6th Street will be extended approximately 300' into Olive Meadow Lane where the new force main will connect. We believe that this new sewer system design will alleviate the current issues within the existing force main and provide an opportunity for the Olive Meadow residences to connect their force main system into the same new sewer manhole. With the extension of the gravity sewer system into Olive Meadow, there may be an

opportunity for the first few houses along Olive Meadow to connect via gravity to the system and eliminate their pumps completely. The connection of the existing sewer force main and any gravity sewer connections from the residences will be at the individual homeowner's expense and is not part of the proposed development.

Trash and recycling will be handled internally at the site and will be removed by a private waste contractor from a central trash and recycling area. This area is shown relocated in the southwesterly corner of the parcel adjacent to the existing location for the childcare facility. The area will be relocated, enlarged and fenced to meet the site plan requirements.

The development is in accordance with the City of Dover Zoning Ordinance Section 170-27.2 Transfer of Development Rights. This project specifically falls under section G(3)(a). The chart below shows the calculations of a Yield plan based on section G(3)(a)i 1-4.

TDR DEVELOPABLE AREA CALCULATIONS - SINGLE FAMILY DETACHED METHOD	
TOTAL LOT AREA	25.1 ACRES
EASEMENT AREA	4.83 ACRES
WETLAND AREA	10.7 ACRES
UPLAND AREA OUTSIDE WETLANDS AND EASEMENT AREAS	12.2 ACRES
NET AREA	10.37 ACRES
DEVELOPABLE AREA	7.26 ACRES
YIELD	7 LOTS

The developable area yields 7 lots meeting the minimum requirements for development in the R-40 District and establishes the base number of units. The TDR meets the requirements of section ii.2 because of the size of the units. These units will be rental units and will meet the HUD Fair Market Rental rates for Dover, NH.

The design of this project also meets the TDR requirements in other ways such as maintaining a wooded buffer surrounding the entire development, retaining an existing commercial use by incorporating the childcare facility into the design, providing an additional 10+/- acres to the current open space easement and improving the sewer system for the both the existing residential houses on Olive Meadow Lane and the new development. All of this is consistent with the Dover Master Plan because it provides a diversity of living opportunities, open space for protection of sensitive wetland areas and low impact recreation space. This proposed development fits into the neighborhood because it is surrounded by single family neighborhoods.

In regard to the above-mentioned open space, it is the developer's intent to add approximately 10+/- acres to the existing open space. The boundary of the existing open space will be reconfigured such that the proposed pavement is outside of the all easement areas.

In accordance with the City of Dover Zoning Ordinance Section 170-15, it appears the required usable recreation space for this development would be 9700 SF. Incorporated into the proposed site plan are three active recreation areas that total approximately 7200 SF. Within these three areas a minimum of 4850 Sf will be set up for children with swings, etc. The other green space surrounding the units with walkways is intended to be space for recreation including walking, outdoor grilling, and sitting areas for adults. In addition to this area, there will ultimately be approximately 15 acres of open space, that will be restricted from future development. Some of these areas may have future walking trails.

A. *Request for Technical Review Committee and Site Plan Approval*

In accordance with the Dover Code chapter 149, Site Review Regulations, this revised submission includes the plans and supporting documentation:

1. Cover Sheet
2. Existing Conditions Plan
3. Site Context Plan
4. Neighborhood Plan
5. Site Plan
6. Grading, Drainage, & Erosion Control Plan
7. Two Utility Plans
8. Two Road Plan and Profile Sheets
9. Construction Details
10. Proposed Building Plans for Community Building
11. Revised partial Drainage Report
12. Stormwater Inspection and Maintenance Plan
13. Final Traffic Report

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

Sincerely,



Michael J. Sievert PE
VP President Structural

City of Dover, New Hampshire
SITE PLAN REVIEW SUBMISSION CHECKLIST

[Revision Date: June 4, 2019]

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

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

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

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

APPLICANT: __GSD Communities_____ File Number: _SITE-2023-0005

PROJECT TITLE: _Cottages at Olive Meadow Lane_____

PROPERTY LOCATION: ___36 Olive Meadow Lane_____ Tax Map: _A45_ Lot: _A2_

	Where/How Provided	Reviewed
1. Completed and signed Application form	PDF	
2. Plan Review Fees are provided	$3,500 Paid	
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	N/A	
7. Conditional Use Permit applications	N/A	
8. A colored rendering of the streetscape that will be created along the existing public right-of-way	N/A No Change	
9. A colored architectural plan showing all sides of buildings	Arch Plans Submitted	
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	Cover Sheet	
Proposed Project name and title and Planning File #	Cover Sheet	
Date, north arrow and scale	All Sheets	
Names of all abutting property owners	Exist Cond Plan	
Name and address of owners and/or applicants	C101 Site Plan	
Signature & stamp of NH licensed land surveyor and/or engineer	All Plans	
Zoning District boundaries, including any special or overlay districts	C101 Site Plan	
Location of Conservation District areas	C101 Site Plan	
Location, names and widths of existing and proposed streets, including pavement widths, grades, curbs and crosswalks	C101 Site Plan	
Location and widths of existing & proposed easements & right of ways	Exist Cond & Site Plan	
Location and width of existing and proposed access/egress ways	C101 Site Plan	

	Explain How Provided	Reviewed
Depict pedestrian walkways and accessible access	C101 Site Plan	
Existing and proposed property lines with dimensions and bearings tied into Dover's Geographic Information System coordinate system	Existing Conditions Plan	
Existing and proposed topographic information at two foot intervals	C102	
Existing and proposed buildings and structure locations	C101	
Minimum building setbacks or build to lines on all lots	C101	
Location and size of existing and proposed electric, telephone, gas cable and other underground utilities	C103	
Existing and proposed water lines and fire hydrants, including materials and capacity needed	C103 & Details	
Location and materials of sanitary sewage facilities within project site and projected additional peak hour sewer load	C103, C104, C105 & Details	
Existing and proposed stormwater lines and facilities	C102	
Lighting plan depicting all existing and proposed exterior light fixtures and a lighting level analysis for parking lots	Pending	
Location of Flood Hazard Zone	C101	
Location of all bodies of water and watercourses	C101 & Existing Cond Plan	
Location of wetlands and buffers	C101 & Existing Cond Plan	
Neighborhood plan with aerial underlay showing how project relates to abutting uses within the plan set	C100.2	
Existing natural features and/or significant vegetation on property	Existing Conditions Plan	
Depict existing contours up to 100 ft. beyond project limits	C102	
Landscape plan depicting existing and proposed landscaping, prepared by a licensed Professional Landscape Architect	Pending	
Location of parking layout delineating spaces and arrangement; note addressing maximum required spaces	C101	
Location, material and size of existing and proposed pavement area	C101	
Location of proposed fire lanes	C101	
Specify finished floor elevations of buildings	N/A	
Location of solid waste disposal facilities (dumpster, pad and screening, etc.), including required screening	C101	
Depict all service, storage, loading bays and utility areas	C101	
All applicable Dover Common Site Plan notes	C101	
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	Pending	
Erosion and Sedimentation Control Plan	X	
Landscape Operation and Maintenance Plan	Pending Final	
Proposed restrictive covenants or homeowners association documents	N/A	
Dates and permit numbers of all required state and federal permits	Pending	
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	In Process	
Location of proposed drive-in facilities	N/A	
Provide additional exhibits/technical data determined appropriate by the Planning Board or its staff as required	Included in Submittal	

REVIEWED BY: _____ DATE_____ TRC DATE_____

TRAFFIC IMPACT STUDY

FOR PROPOSED

36 OLIVE MEADOW LANE

DOVER, NEW HAMPSHIRE

Prepared For: John Randolph

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

July 18, 2023

Introduction

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

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

Image 1 Proposed Development Site



Existing Traffic Conditions

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

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

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

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

Future Traffic Growth

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

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

Site Trip Generation

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

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

Table 1.1 ITE Trip Generation Calculations						
Land Use	**Affordable Housing-Income Limits - LUC 223**					
Time Period	**Dwelling Units**	**Trip Generation Rate Trips/Dwelling Units**	**Trips Generated**	**Distribution Entering / Exiting**	**Enter**	**Exit**
Weekday	32	4.81	154	50% / 50%	77	77
AM Weekday Peak Hour (Street)	32	0.36	12	26% / 74%	3	9
PM Weekday Peak Hour (Street)	32	0.46	15	59% / 41%	9	6
AM Weekday Peak Hour (Generator)	32	0.36	12	26% / 74%	3	9
PM Weekday Peak Hour (Generator)	32	0.50	16	58% / 42%	9	7

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

Site Trip Assignment

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

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

2025 Pre-Development Traffic

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

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

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

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

2025 Post-Development Traffic

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

Left-Turn Lane Warrant Analysis

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

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

Table 2.1
NCHRP Report 457 Analysis - Left Turn Lane Warrant

Time Period	Advancing Volume (Va)	Opposing Volume (Vo)	Percent Left-Turns	Warrant Met (Yes/No)
Weekday AM Peak Hour	335	141	11%	No
Weekday PM Peak Hour	134	339	15%	No

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

Capacity Analysis

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

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

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

Level of Service Criteria for Unsignalized Intersections

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

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

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

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

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

Vehicle Sight Distance

Barton and Loguidice measured intersection sight distance from the Olive Meadow Lane approach at 6th Street based upon 85th percentile speed data provided by the City of Dover Police Department. Police historical speed data for the section of 6th Street near Olive Meadow Lane is 43mph Northbound and 44 mph Southbound. We consulted the latest edition of the AASHTO Greenbook (A policy on Geometric Design of Highways and Streets), and the Institute of Transportation Engineers handbook for intersection sight distance. Specifically, we referenced a stop-controlled condition on the Olive Meadow Lane approach with free-flowing traffic on both approaches of 6th Street. Following NHDOT guidelines, we utilized both an eye height and object height of 3'-9 inches for passenger cars and measured from a point 10-feet away from the edge of travel way.

The AASHTO requirements for passenger vehicles are based upon a vehicle gap of 6.5 seconds for right-turns and 7.5 seconds for left-turns. This corresponds to a required sight distance of 423 feet for right-turn and 488 feet for left-turn movements from the Olive Meadow Lane approach.

Our field measurements, in accordance with AASHTO standards, looking both left and right from Olive Meadow Lane directionally onto 6th Street indicate existing sight distances are in excess of the requirements based upon the 85th percentile speed of 44mph. Looking left from Olive Meadow Lane we measured a sight distance in excess of 500-feet and a similar measurement of 500-feet was recorded to the right.

Summary

1. The proposed 32-unit affordable housing project located on the dead-end section of Olive Meadow Lane is projected to generate approximately 12 trips in the morning peak hour and an additional 15 trips during the PM peak hour.

2. Manual vehicle traffic data was gathered at the 6th Street/Olive Meadow Lane intersection during the morning and evening commuter hours to establish existing peak traffic volumes at the study intersection. Summaries of the traffic data for both time periods show the peak volumes of traffic circulating to/from 6th Street from Olive Meadow Lane. In the morning peak hour, a total of 63 vehicles, about one vehicle per minute, either entered or exited the Olive Meadow Lane approach. Twenty-nine (29) of the vehicles entered and 34 exited. Trends observed in the evening peak hour were similar, with a total of 65 vehicles; again, roughly one vehicle trip every minute during the busiest time period of a typical weekday. Thirty-three of the vehicle trips entered Olive Meadow Lane and 32 trips were observed leaving Olive Meadow Lane.

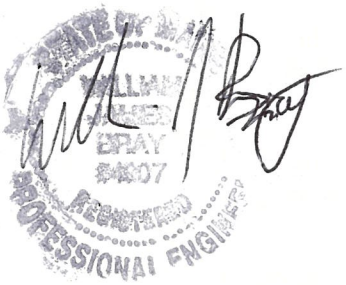
3. The existing Daycare facility located within the general area of the proposed affordable housing development based upon recorded traffic data collected on May 18, 2023, with a total of 49 students in attendance, generates about 50 of the total observed trips entering/exiting Olive Meadow Lane to/from 6th Street.

4. The existing daycare facility maintains City of Dover approval for a total capacity of 166 students. The operators of the daycare are estimating that an additional 50 students, potentially, could be added at the facility over the next five to 10 years. This traffic report provides an analytical process whereby trip generation for the added 50-students is estimated. Traffic data collected at the driveway entrance estimates an additional peak hour trip is generated for each additional daycare student. To present a very conservative approach, all the added daycare trips are assumed to be students from outside of Olive Meadow Lane. When, in fact, it is highly likely that several students residing within the proposed affordable housing development will attend the existing daycare. A mathematical process is not available to precisely estimate the number of students that attend the daycare from the proposed development. The projected increase in vehicle trips generated by the added 50 students during both peak hours were assigned through the study intersection, based upon existing directional patterns. Figure 4 in the Appendix illustratively presents the added trips that can be expected from the increased number of students attending the daycare facility.

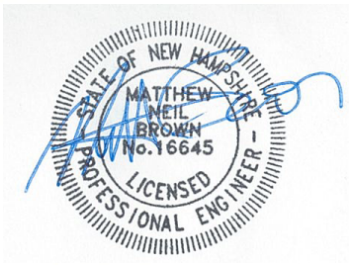
5. A capacity analysis was performed for the unsignalized study intersection at 6th Street and Olive Meadow Lane based upon 2025 Pre and Post-Development trave conditions. The analysis shows that the proposed 32-unit affordable housing development has no measurable impact on traffic operations on at the study intersection. Overall, the study intersection operates at level of Service A under both pre- and post-development travel conditions.

6. A left-turn lane warrant analysis was performed for the southbound approach of 6th Street at Olive Meadow Lane to determine if predicted peak hour traffic conditions meet the warrants for construction of a dedicated left-turn on the southbound approach of 6th Street for motorists turning left onto Olive Meadow Lane. The analyses were conducted using the National Cooperative Highway Research program (NCHRP) 457 Report process. The results of the analyses conclude a dedicated left-turn lane is not required.

7. Vehicle sight distance was measured for both directions of travel from the Olive Meadow Lane approach at the 6th Street intersection. Field measurements confirm that both sightlines from the side-street approach meet and exceed the minimum sight distance standard for a travel speed of 44mph, which represents the existing 85th percentile speed of traffic on 6th Street. Sight distance measurements in excess of 500-feet were recorded for both directions of travel from Olive Meadow Lane. Acceptable sight distance is met on both approaches of Olive Meadow Lane.



William J. Bray, P.E.
Date: 7-19-2023



Matthew N. Brown, P.E.
N.H. PE #16645
Date: 7-19-2023

APPENDIX

Traffic Count Summaries

Traffic Figures

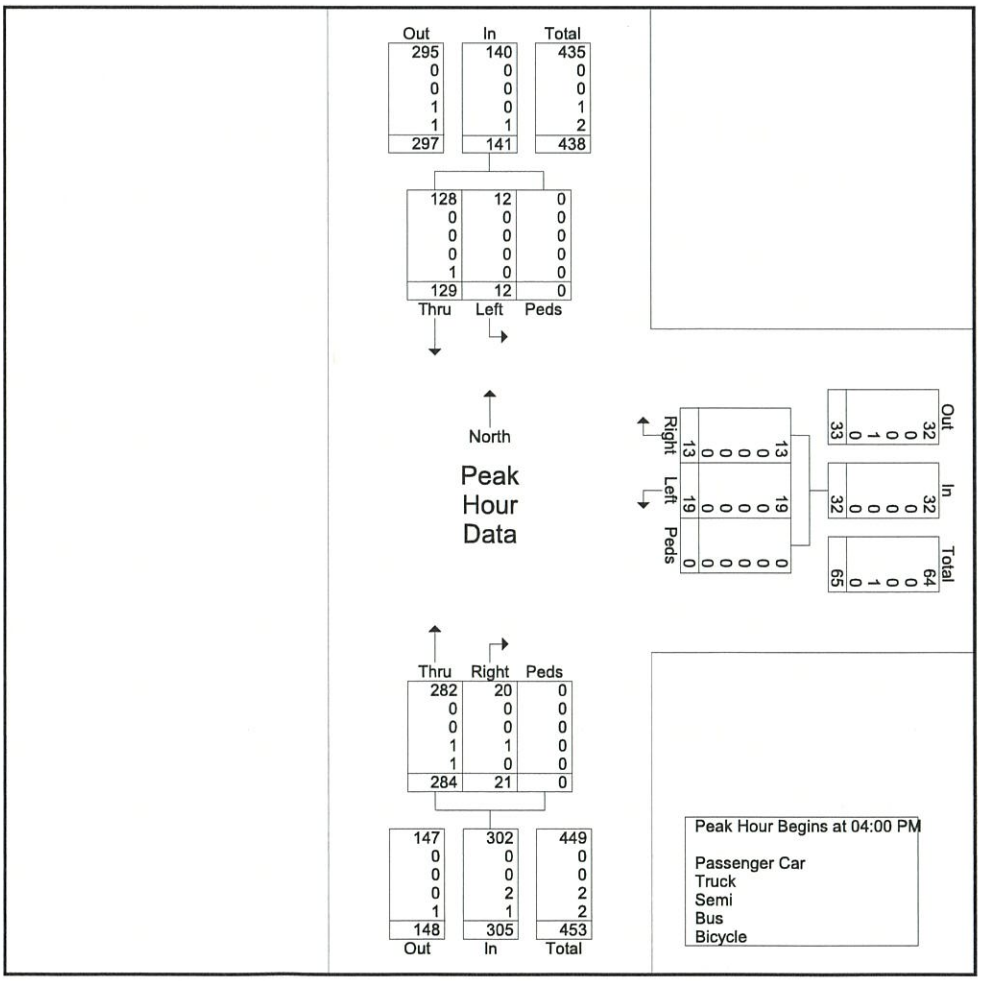
Left-Turn Warrant Analysis – Summary Charts

Intersection Capacity Analysis Summary Reports

Traffic Solutions
17 Mount View Dr
Gorham, ME 04038

File Name : Dover Six St & Olive Meadow Lane 05-18-2023 PM
Site Code : 00000000
Start Date : 5/18/2023
Page No : 4

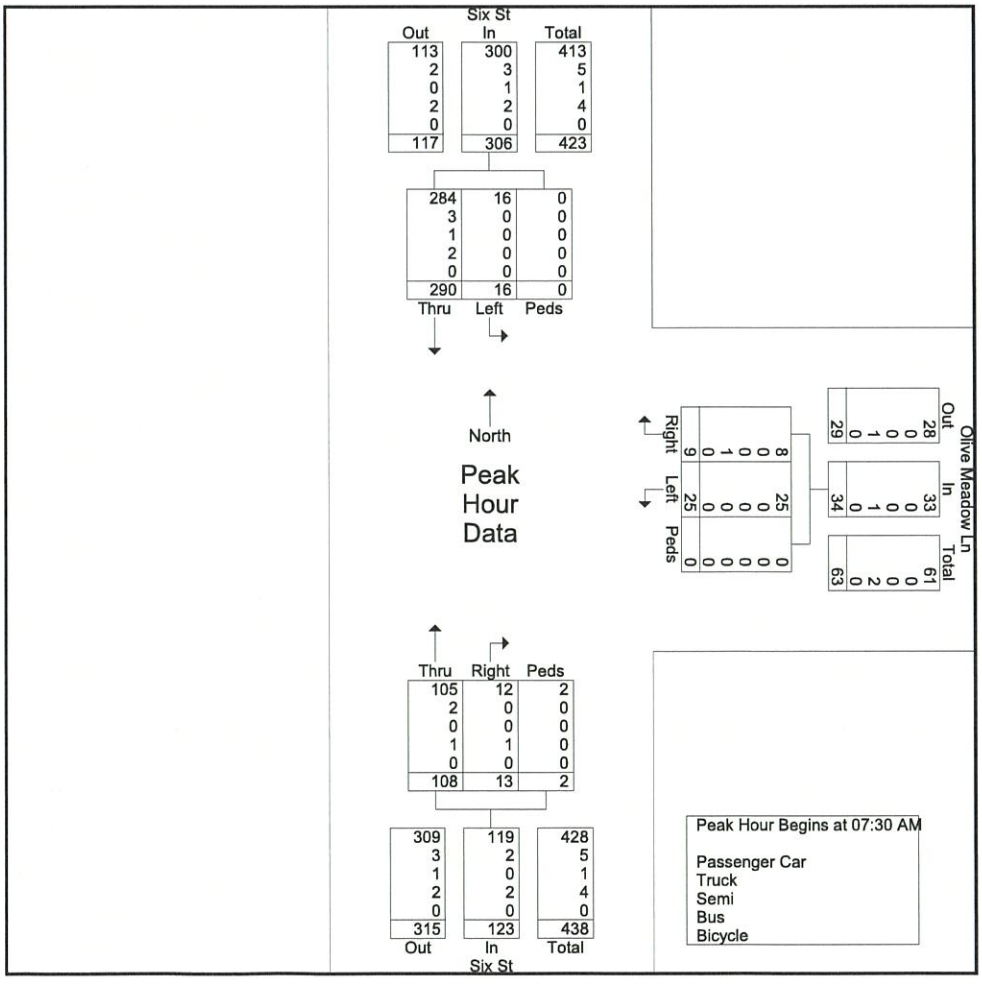
	From North				From East				From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 04:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	36	3	0	39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



Traffic Solutions
17 Mount View Dr
Gorham, ME 04038

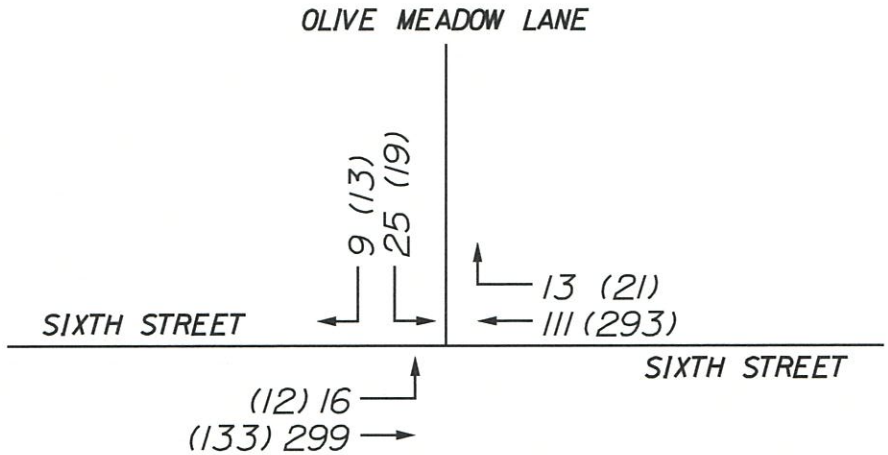
File Name : Dover Six St & Olive Meadow Lane 05-18-2023 AM
Site Code : 05182301
Start Date : 5/18/2023
Page No : 4

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



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

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



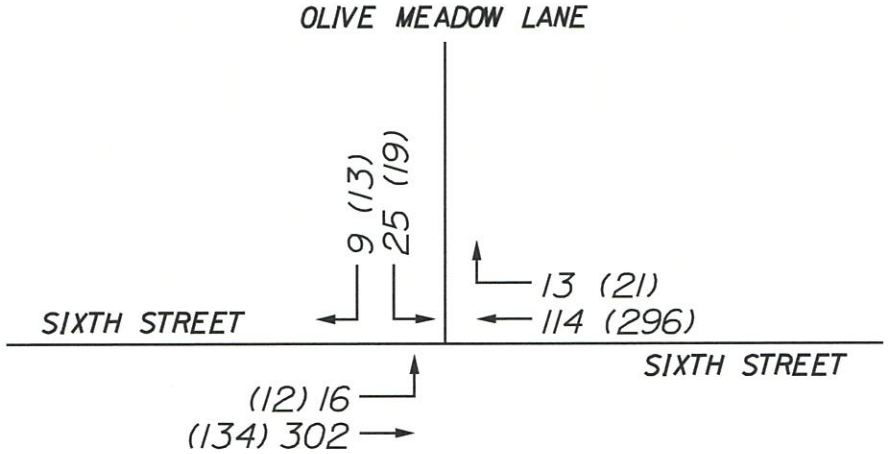
2023 DESIGN HOUR TRAFFIC

FIGURE 1

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

36 OLIVE MEADOW LANE
AFFORDABLE HOUSING
DOVER, NEW HAMPSHIRE
DATE: JUNE 2023

Barton & Loguidice



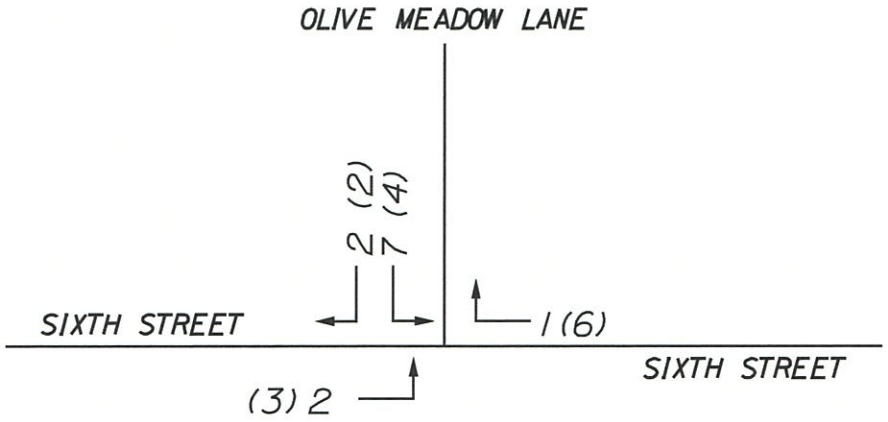
2025 DESIGN HOUR TRAFFIC

FIGURE 2

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

36 OLIVE MEADOW LANE
AFFORDABLE HOUSING
DOVER, NEW HAMPSHIRE
DATE: JUNE 2023

Barton & Loguidice



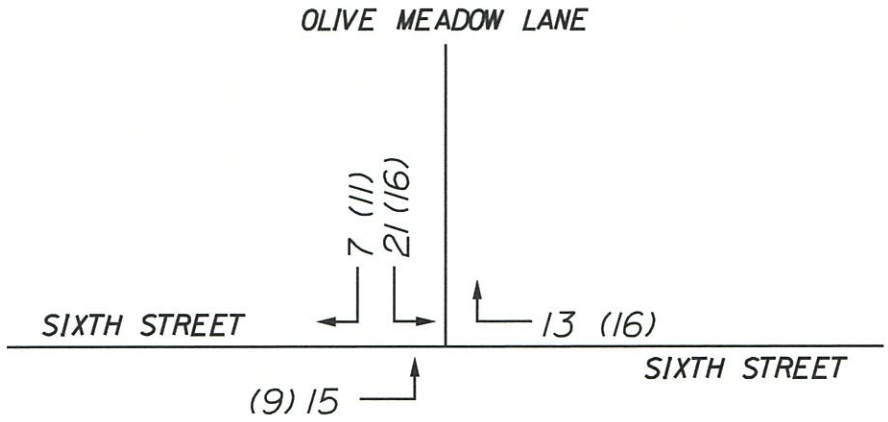
SITE TRIP ASSIGNMENT

FIGURE 3

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

36 OLIVE MEADOW LANE
AFFORDABLE HOUSING
DOVER, NEW HAMPSHIRE
DATE: JUNE 2023

Barton & Loguidice



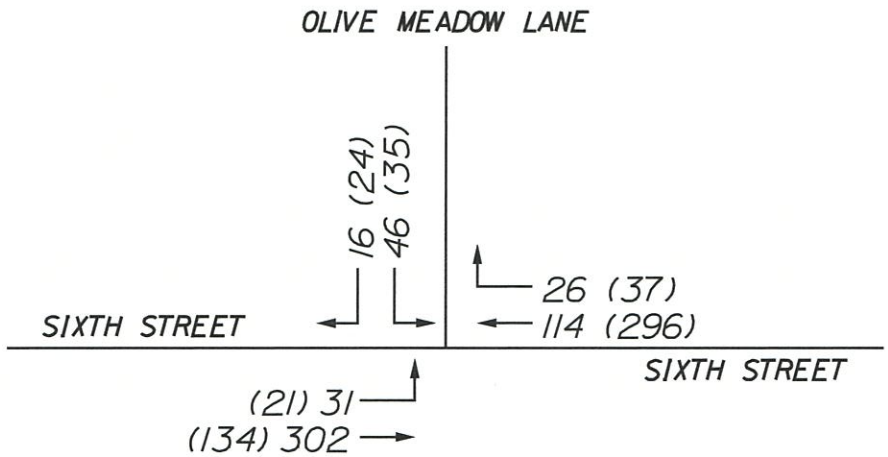
OTHER DEVELOPMENT TRAFFIC

FIGURE 4

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

36 OLIVE MEADOW LANE
AFFORDABLE HOUSING
DOVER, NEW HAMPSHIRE
DATE: JUNE 2023

Barton & Loguidice



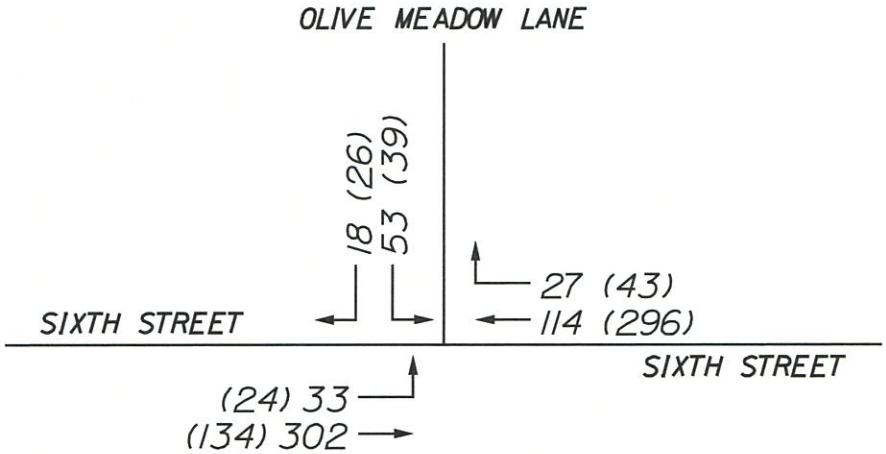
2025 PRE-DEVELOPMENT TRAFFIC

FIGURE 5

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

36 OLIVE MEADOW LANE
AFFORDABLE HOUSING
DOVER, NEW HAMPSHIRE
DATE: JUNE 2023

Barton & Loguidice



2025 POST-DEVELOPMENT TRAFFIC

FIGURE 6

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

36 OLIVE MEADOW LANE
AFFORDABLE HOUSING
DOVER, NEW HAMPSHIRE
DATE: JUNE 2023

Barton & Loguidice

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

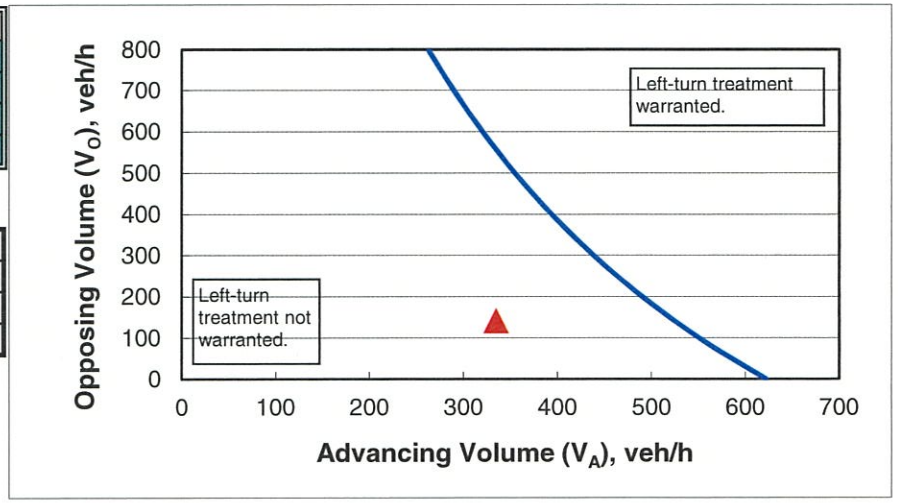
2-lane roadway (English)

INPUT

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

OUTPUT

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



CALIBRATION CONSTANTS

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

AM Peak Hour Summary

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

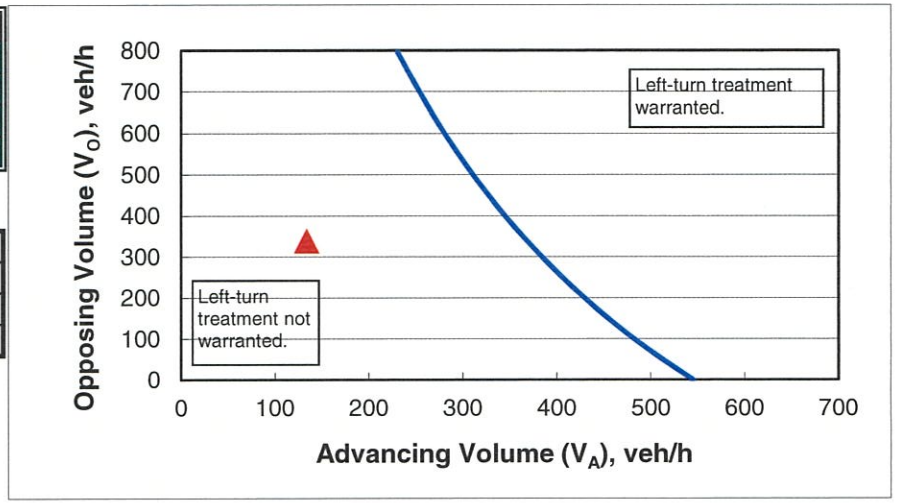
2-lane roadway (English)

INPUT

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

OUTPUT

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



CALIBRATION CONSTANTS

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

PM Peak Hour Summary

Summary of All Intervals

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

Interval #0 Information Seeding

Start Time	6:55
End Time	7:00
Total Time (min)	5

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

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

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

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

Total Network Performance

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

Intersection: 3: 6th Street & Olive Meadow Lane

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

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

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

Interval #0 Information Seeding

Start Time	6:55
End Time	7:00
Total Time (min)	5

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

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

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

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

Total Network Performance

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

Intersection: 3: 6th Street & Olive Meadow Lane

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

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

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

Interval #0 Information Seeding

Start Time	3:55
End Time	4:00
Total Time (min)	5

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	4:00
End Time	5:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

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

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

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

Total Network Performance

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

Intersection: 3: 6th Street & Olive Meadow Lane

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

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

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

Interval #0 Information Seeding

Start Time	3:55
End Time	4:00
Total Time (min)	5

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:00
End Time	5:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

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

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

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

Total Network Performance

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

Intersection: 3: 6th Street & Olive Meadow Lane

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

Network Summary

Network wide Queuing Penalty: 0

horizons Engineering

DRAINAGE REPORT

Prepared for:

John Randolph
Tax Map A45, Lot A2

PROJECT #230277
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5. Post-Development Conditions 1
6. Erosion & Sediment Control 3
7. Conclusion 3

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A	Drainage Plans
B	Pre-Development Drainage Analysis
C	Post-Development Drainage Analysis
D	Soils Report
E	Catch Basin Summary



1. Project Background / Purpose

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

2. Methodology

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

3. Soils

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

Soil Types

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

4. Pre-Development Conditions

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

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

5. Post-Development Conditions

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

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

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

Comparison of Pre- and Post-Development Conditions

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

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

Storm	Pre-Development (cfs)	Post-Development (cfs)	Difference
2-Year	2.3	2.5	+0.2
10-Year	6.7	6.1	(0.6)
25-Year	10.9	9.3	(1.6)

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

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

Table 3: Total Runoff Volume Summary Table

Storm	Volume (ac-ft)	Volume (ac-ft)	Difference
2-Year	0.99	1.02	+0.03
10-Year	2.29	2.13	(0.11)
25-Year	3.39	3.21	(0.18)

As shown in Tables 1 and 2, the overall peak runoff from the property is decreased for the 2-, 10- and 25-year storms in the post-development drainage in all but the 2-year event at point of analysis #1. In combination. The 2-year event is lower overall when combining both points of analysis. Both points of interest combine in the adjacent stream shortly after leaving the property therefore an analysis of the points in aggregate is appropriate.

City requirements: Section 153-14.A(3)(b) Stormwater Management for new development.

The underground infiltration system in conjunction with the pre-treatment deep sump catch basins will remove greater than 90% of TSS and greater than 60% of total nitrogen and total phosphorous.

The underground infiltration system has been sized to handle the water quality volume along with additional storage/treatment to control peak flows from the development. As shown in table 1 and 2 above, peak flows have been mitigated to levels below pre-development in all but the 2-year event at point of interest number 1, which is insignificant in nature.

As shown in table 3 above, the total volume of stormwater decreases in the larger modeled storms and is essentially unchanged in the 2-year storm event. This, in combination with lower peak flow rates off the site will result in a better downstream condition than in the pre-development condition.

The water quality volume (WQV) required for this development is 6,600 cubic feet and the total volume of water being detained and infiltrated/treated is 15,500 cubic feet, more than doubling the requirement based on NHDES calculations.

The groundwater recharge volume provided in a 25-year storm event is almost an acre-foot of stormwater. Nearly 90 percent of the runoff will be captured and infiltrated within the proposed underground infiltration system and the entirety of a 2-year, and 10-year storm event will be captured and infiltrated on site.

Access to the underground infiltration system will be provide via drain manholes, at each end of perforated pipe, that will allow inspection and maintenance to occur.

6. Erosion & Sediment Control

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

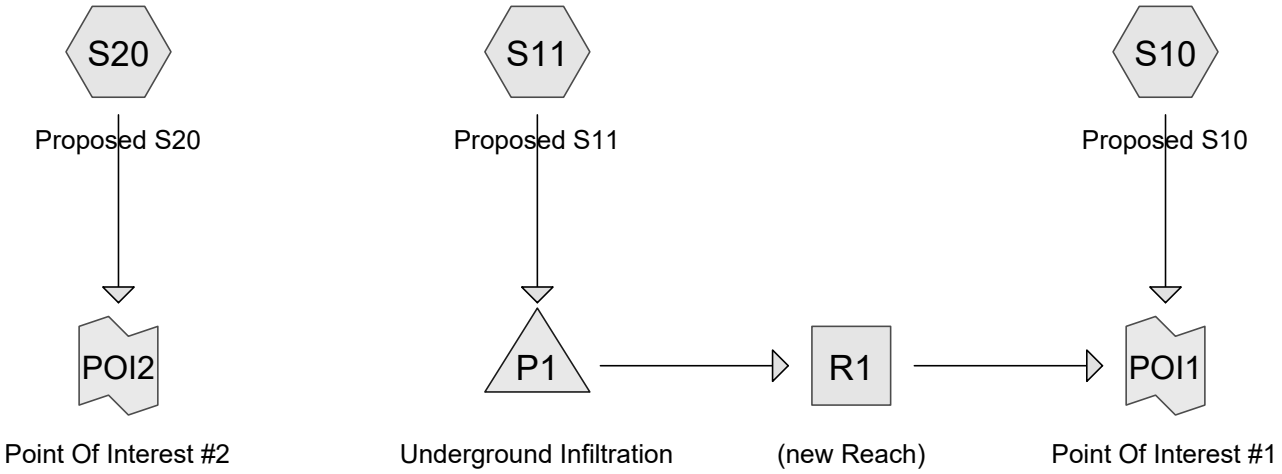
7. Conclusion

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

APPENDIX A

APPENDIX B

APPENDIX C



Subcat Reach Pond Link

Routing Diagram for 230277_POST
Prepared by Horizons Engineering, Printed 8/1/2023
HydroCAD® 10.20-2g s/n 01179 © 2022 HydroCAD Software Solutions LLC

Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 6516 NH Merrimack East
Rainfall events imported from "NRCS-Rain.txt" for 6520 NH Strafford

Rainfall Events Listing (selected events)

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

Area Listing (all nodes)

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

Soil Listing (all nodes)

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

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.943	0.000	0.000	2.518	0.000	3.462	>75% Grass cover, Good	S10, S11, S20
0.000	0.000	0.000	2.191	0.000	2.191	Paved roads w/curbs & sewers	S10, S11, S20
0.000	0.000	0.000	0.461	0.000	0.461	Roofs	S10, S11
0.000	0.000	0.000	0.145	0.000	0.145	Unconnected roofs	S20
0.951	0.000	0.000	8.158	0.000	9.109	Woods, Good	S10, S20
1.894	**0.000**	**0.000**	**13.474**	**0.000**	**15.368**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	P1	161.00	160.00	20.0	0.0500	0.012	0.0	12.0	0.0

Time span=5.00-60.00 hrs, dt=0.05 hrs, 1101 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S10: Proposed S10 Runoff Area=360,244 sf 2.82% Impervious Runoff Depth=0.84"
Flow Length=961' Tc=56.5 min CN=72 Runoff=2.50 cfs 0.578 af

Subcatchment S11: Proposed S11 Runoff Area=147,446 sf 53.50% Impervious Runoff Depth=1.29"
Tc=6.0 min CN=80 Runoff=4.68 cfs 0.363 af

Subcatchment S20: Proposed S20 Runoff Area=161,744 sf 20.28% Impervious Runoff Depth=1.42"
Flow Length=466' Tc=27.9 min CN=82 Runoff=3.11 cfs 0.439 af

Reach R1: (new Reach) Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.250 L=300.0' S=0.0067 '/' Capacity=12.34 cfs Outflow=0.00 cfs 0.000 af

Pond P1: Underground Infiltration Peak Elev=158.08' Storage=4,301 cf Inflow=4.68 cfs 0.363 af
Discarded=0.56 cfs 0.363 af Primary=0.00 cfs 0.000 af Outflow=0.56 cfs 0.363 af

Link POI1: Point Of Interest #1 Inflow=2.50 cfs 0.578 af
Primary=2.50 cfs 0.578 af

Link POI2: Point Of Interest #2 Inflow=3.11 cfs 0.439 af
Primary=3.11 cfs 0.439 af

Total Runoff Area = 15.368 ac Runoff Volume = 1.380 af Average Runoff Depth = 1.08"
81.80% Pervious = 12.571 ac 18.20% Impervious = 2.797 ac

Summary for Subcatchment S10: Proposed S10

Runoff = 2.50 cfs @ 12.83 hrs, Volume= 0.578 af, Depth= 0.84"
Routed to Link POI1 : Point Of Interest #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.05"

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

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

Summary for Subcatchment S11: Proposed S11

Runoff = 4.68 cfs @ 12.13 hrs, Volume= 0.363 af, Depth= 1.29"
Routed to Pond P1 : Underground Infiltration

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.05"

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

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

Summary for Subcatchment S20: Proposed S20

Runoff = 3.11 cfs @ 12.40 hrs, Volume= 0.439 af, Depth= 1.42"
Routed to Link POI2 : Point Of Interest #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.05"

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

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

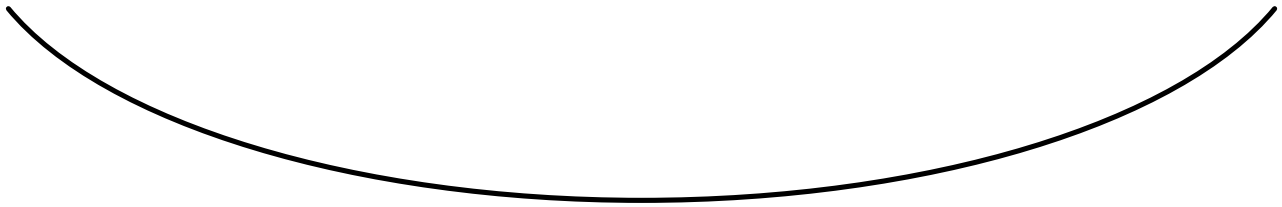
Summary for Reach R1: (new Reach)

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

Routing by Stor-Ind+Trans method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

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

50.00' x 1.00' deep Parabolic Channel, n= 0.250
Length= 300.0' Slope= 0.0067 '/'
Inlet Invert= 142.00', Outlet Invert= 140.00'



‡

Summary for Pond P1: Underground Infiltration

Inflow Area = 3.385 ac, 53.50% Impervious, Inflow Depth = 1.29" for 2-Year event
Inflow = 4.68 cfs @ 12.13 hrs, Volume= 0.363 af
Outflow = 0.56 cfs @ 11.80 hrs, Volume= 0.363 af, Atten= 88%, Lag= 0.0 min
Discarded = 0.56 cfs @ 11.80 hrs, Volume= 0.363 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach R1 : (new Reach)

Routing by Stor-Ind method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 158.08' @ 13.06 hrs Surf.Area= 5,420 sf Storage= 4,301 cf

Plug-Flow detention time= 55.7 min calculated for 0.363 af (100% of inflow)
Center-of-Mass det. time= 55.7 min (929.4 - 873.7)

Volume	Invert	Avail.Storage	Storage Description
#1	156.40'	9,138 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 32,520 cf Overall - 9,676 cf Embedded = 22,844 cf x 40.0% Voids
#2	157.40'	9,676 cf	**48.0" Round Pipe Storage** x 10 Inside #1 L= 77.0'
		18,814 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
156.40	5,420	0	0
162.40	5,420	32,520	32,520

Device	Routing	Invert	Outlet Devices
#1	Primary	161.00'	**12.0" Round Culvert X 3.00** L= 20.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 161.00' / 160.00' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Discarded	156.40'	**4.500 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.56 cfs @ 11.80 hrs HW=156.47' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.56 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=156.40' (Free Discharge)
↑—**1=Culvert** (Controls 0.00 cfs)

Summary for Link POI1: Point Of Interest #1

Inflow Area = 11.655 ac, 17.54% Impervious, Inflow Depth = 0.59" for 2-Year event
Inflow = 2.50 cfs @ 12.83 hrs, Volume= 0.578 af
Primary = 2.50 cfs @ 12.83 hrs, Volume= 0.578 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs

Summary for Link POI2: Point Of Interest #2

Inflow Area = 3.713 ac, 20.28% Impervious, Inflow Depth = 1.42" for 2-Year event
Inflow = 3.11 cfs @ 12.40 hrs, Volume= 0.439 af
Primary = 3.11 cfs @ 12.40 hrs, Volume= 0.439 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs

Time span=5.00-60.00 hrs, dt=0.05 hrs, 1101 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S10: Proposed S10 Runoff Area=360,244 sf 2.82% Impervious Runoff Depth=1.87"
Flow Length=961' Tc=56.5 min CN=72 Runoff=6.06 cfs 1.290 af

Subcatchment S11: Proposed S11 Runoff Area=147,446 sf 53.50% Impervious Runoff Depth=2.52"
Tc=6.0 min CN=80 Runoff=9.17 cfs 0.711 af

Subcatchment S20: Proposed S20 Runoff Area=161,744 sf 20.28% Impervious Runoff Depth=2.70"
Flow Length=466' Tc=27.9 min CN=82 Runoff=5.96 cfs 0.835 af

Reach R1: (new Reach) Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.250 L=300.0' S=0.0067 '/' Capacity=12.34 cfs Outflow=0.00 cfs 0.000 af

Pond P1: Underground Infiltration Peak Elev=160.10' Storage=12,208 cf Inflow=9.17 cfs 0.711 af
Discarded=0.56 cfs 0.711 af Primary=0.00 cfs 0.000 af Outflow=0.56 cfs 0.711 af

Link POI1: Point Of Interest #1 Inflow=6.06 cfs 1.290 af
Primary=6.06 cfs 1.290 af

Link POI2: Point Of Interest #2 Inflow=5.96 cfs 0.835 af
Primary=5.96 cfs 0.835 af

Total Runoff Area = 15.368 ac Runoff Volume = 2.836 af Average Runoff Depth = 2.21"
81.80% Pervious = 12.571 ac 18.20% Impervious = 2.797 ac

Summary for Subcatchment S10: Proposed S10

Runoff = 6.06 cfs @ 12.78 hrs, Volume= 1.290 af, Depth= 1.87"
Routed to Link POI1 : Point Of Interest #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.57"

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

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

Summary for Subcatchment S11: Proposed S11

Runoff = 9.17 cfs @ 12.13 hrs, Volume= 0.711 af, Depth= 2.52"
Routed to Pond P1 : Underground Infiltration

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.57"

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

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

Summary for Subcatchment S20: Proposed S20

Runoff = 5.96 cfs @ 12.39 hrs, Volume= 0.835 af, Depth= 2.70"
Routed to Link POI2 : Point Of Interest #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.57"

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

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

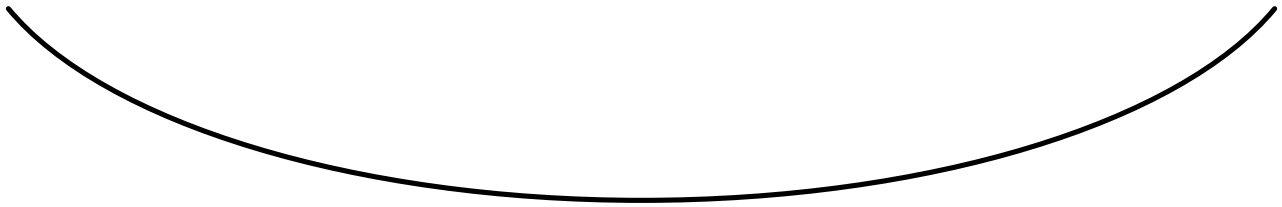
Summary for Reach R1: (new Reach)

Inflow Area = 3.385 ac, 53.50% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Routed to Link POI1 : Point Of Interest #1

Routing by Stor-Ind+Trans method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

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

50.00' x 1.00' deep Parabolic Channel, n= 0.250
Length= 300.0' Slope= 0.0067 '/'
Inlet Invert= 142.00', Outlet Invert= 140.00'



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Summary for Pond P1: Underground Infiltration

Inflow Area = 3.385 ac, 53.50% Impervious, Inflow Depth = 2.52" for 10-Year event
Inflow = 9.17 cfs @ 12.13 hrs, Volume= 0.711 af
Outflow = 0.56 cfs @ 11.20 hrs, Volume= 0.711 af, Atten= 94%, Lag= 0.0 min
Discarded = 0.56 cfs @ 11.20 hrs, Volume= 0.711 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach R1 : (new Reach)

Routing by Stor-Ind method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 160.10' @ 14.27 hrs Surf.Area= 5,420 sf Storage= 12,208 cf

Plug-Flow detention time= 204.9 min calculated for 0.711 af (100% of inflow)
Center-of-Mass det. time= 204.9 min (1,053.6 - 848.7)

Volume	Invert	Avail.Storage	Storage Description
#1	156.40'	9,138 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 32,520 cf Overall - 9,676 cf Embedded = 22,844 cf x 40.0% Voids
#2	157.40'	9,676 cf	**48.0" Round Pipe Storage** x 10 Inside #1 L= 77.0'
		18,814 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
156.40	5,420	0	0
162.40	5,420	32,520	32,520

Device	Routing	Invert	Outlet Devices
#1	Primary	161.00'	**12.0" Round Culvert X 3.00** L= 20.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 161.00' / 160.00' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Discarded	156.40'	**4.500 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.56 cfs @ 11.20 hrs HW=156.46' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.56 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=156.40' (Free Discharge)
↑**1=Culvert** (Controls 0.00 cfs)

Summary for Link POI1: Point Of Interest #1

Inflow Area = 11.655 ac, 17.54% Impervious, Inflow Depth = 1.33" for 10-Year event
Inflow = 6.06 cfs @ 12.78 hrs, Volume= 1.290 af
Primary = 6.06 cfs @ 12.78 hrs, Volume= 1.290 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs

Summary for Link POI2: Point Of Interest #2

Inflow Area = 3.713 ac, 20.28% Impervious, Inflow Depth = 2.70" for 10-Year event
Inflow = 5.96 cfs @ 12.39 hrs, Volume= 0.835 af
Primary = 5.96 cfs @ 12.39 hrs, Volume= 0.835 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs

Time span=5.00-60.00 hrs, dt=0.05 hrs, 1101 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S10: Proposed S10 Runoff Area=360,244 sf 2.82% Impervious Runoff Depth=2.81"
Flow Length=961' Tc=56.5 min CN=72 Runoff=9.26 cfs 1.934 af

Subcatchment S11: Proposed S11 Runoff Area=147,446 sf 53.50% Impervious Runoff Depth=3.57"
Tc=6.0 min CN=80 Runoff=12.89 cfs 1.008 af

Subcatchment S20: Proposed S20 Runoff Area=161,744 sf 20.28% Impervious Runoff Depth>3.78"
Flow Length=466' Tc=27.9 min CN=82 Runoff=8.30 cfs 1.168 af

Reach R1: (new Reach) Avg. Flow Depth=0.27' Max Vel=0.16 fps Inflow=1.15 cfs 0.107 af
n=0.250 L=300.0' S=0.0067 '/' Capacity=12.34 cfs Outflow=0.73 cfs 0.107 af

Pond P1: Underground Infiltration Peak Elev=161.31' Storage=16,405 cf Inflow=12.89 cfs 1.008 af
Discarded=0.56 cfs 0.901 af Primary=1.15 cfs 0.107 af Outflow=1.72 cfs 1.008 af

Link POI1: Point Of Interest #1 Inflow=9.26 cfs 2.041 af
Primary=9.26 cfs 2.041 af

Link POI2: Point Of Interest #2 Inflow=8.30 cfs 1.168 af
Primary=8.30 cfs 1.168 af

Total Runoff Area = 15.368 ac Runoff Volume = 4.111 af Average Runoff Depth = 3.21"
81.80% Pervious = 12.571 ac 18.20% Impervious = 2.797 ac

Summary for Subcatchment S10: Proposed S10

Runoff = 9.26 cfs @ 12.77 hrs, Volume= 1.934 af, Depth= 2.81"
Routed to Link POI1 : Point Of Interest #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.77"

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

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

Summary for Subcatchment S11: Proposed S11

Runoff = 12.89 cfs @ 12.13 hrs, Volume= 1.008 af, Depth= 3.57"
Routed to Pond P1 : Underground Infiltration

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.77"

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

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

Summary for Subcatchment S20: Proposed S20

Runoff = 8.30 cfs @ 12.39 hrs, Volume= 1.168 af, Depth> 3.78"
Routed to Link POI2 : Point Of Interest #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.77"

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

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

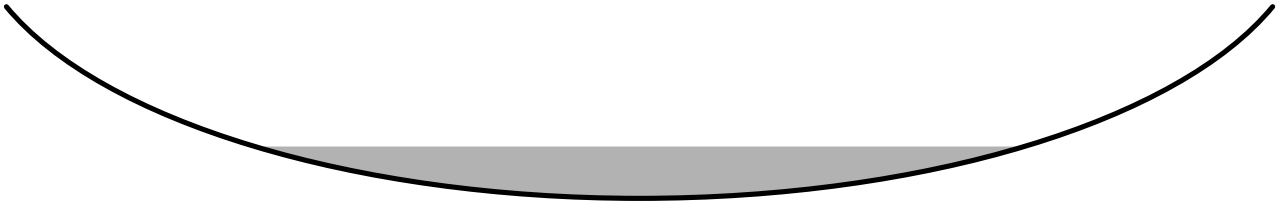
Summary for Reach R1: (new Reach)

Inflow Area = 3.385 ac, 53.50% Impervious, Inflow Depth = 0.38" for 25-Year event
Inflow = 1.15 cfs @ 12.80 hrs, Volume= 0.107 af
Outflow = 0.73 cfs @ 13.83 hrs, Volume= 0.107 af, Atten= 37%, Lag= 61.6 min
Routed to Link POI1 : Point Of Interest #1

Routing by Stor-Ind+Trans method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.16 fps, Min. Travel Time= 32.2 min
Avg. Velocity = 0.03 fps, Avg. Travel Time= 170.4 min

Peak Storage= 1,411 cf @ 13.29 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 26.03'
Bank-Full Depth= 1.00' Flow Area= 33.3 sf, Capacity= 12.34 cfs

50.00' x 1.00' deep Parabolic Channel, n= 0.250
Length= 300.0' Slope= 0.0067 '/'
Inlet Invert= 142.00', Outlet Invert= 140.00'



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Summary for Pond P1: Underground Infiltration

Inflow Area = 3.385 ac, 53.50% Impervious, Inflow Depth = 3.57" for 25-Year event
Inflow = 12.89 cfs @ 12.13 hrs, Volume= 1.008 af
Outflow = 1.72 cfs @ 12.80 hrs, Volume= 1.008 af, Atten= 87%, Lag= 40.3 min
Discarded = 0.56 cfs @ 10.75 hrs, Volume= 0.901 af
Primary = 1.15 cfs @ 12.80 hrs, Volume= 0.107 af
Routed to Reach R1 : (new Reach)

Routing by Stor-Ind method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 161.31' @ 12.80 hrs Surf.Area= 5,420 sf Storage= 16,405 cf

Plug-Flow detention time= 252.4 min calculated for 1.007 af (100% of inflow)
Center-of-Mass det. time= 252.4 min (1,088.2 - 835.7)

Volume	Invert	Avail.Storage	Storage Description
#1	156.40'	9,138 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 32,520 cf Overall - 9,676 cf Embedded = 22,844 cf x 40.0% Voids
#2	157.40'	9,676 cf	**48.0" Round Pipe Storage** x 10 Inside #1 L= 77.0'
		18,814 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
156.40	5,420	0	0
162.40	5,420	32,520	32,520

Device	Routing	Invert	Outlet Devices
#1	Primary	161.00'	**12.0" Round Culvert X 3.00** L= 20.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 161.00' / 160.00' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Discarded	156.40'	**4.500 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.56 cfs @ 10.75 hrs HW=156.46' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.56 cfs)

Primary OutFlow Max=1.15 cfs @ 12.80 hrs HW=161.31' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.15 cfs @ 1.88 fps)

Summary for Link POI1: Point Of Interest #1

Inflow Area = 11.655 ac, 17.54% Impervious, Inflow Depth = 2.10" for 25-Year event
Inflow = 9.26 cfs @ 12.77 hrs, Volume= 2.041 af
Primary = 9.26 cfs @ 12.77 hrs, Volume= 2.041 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs

Summary for Link POI2: Point Of Interest #2

Inflow Area = 3.713 ac, 20.28% Impervious, Inflow Depth > 3.78" for 25-Year event
Inflow = 8.30 cfs @ 12.39 hrs, Volume= 1.168 af
Primary = 8.30 cfs @ 12.39 hrs, Volume= 1.168 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs

APPENDIX D

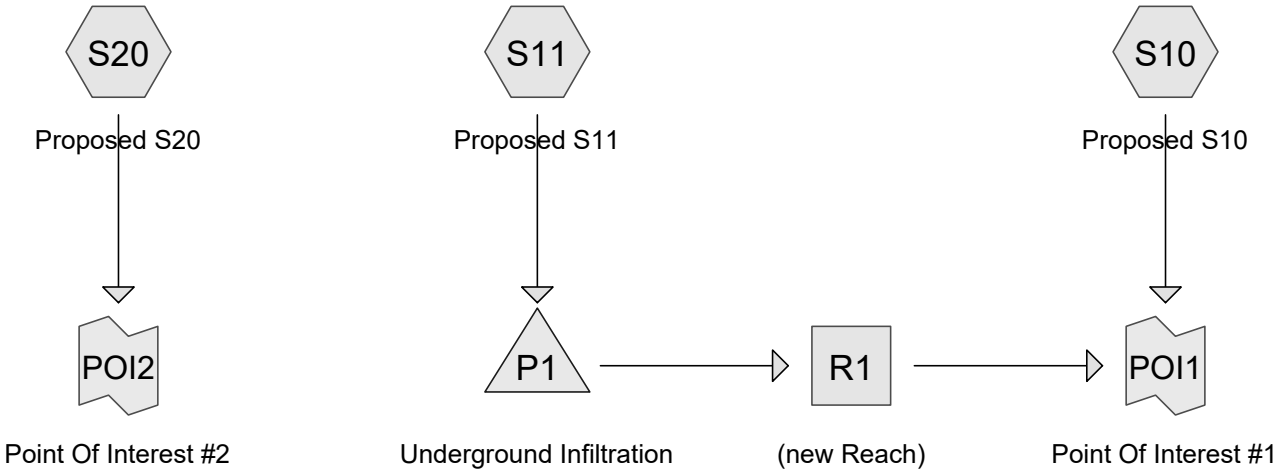
APPENDIX E

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

Deep Sump Catch Basin Impervious Area Summary Table

CB	Pavement Area (SF)	Roof Area (SF)	Total Area (SF/ac)	Rim/Flood Elevation	Peak Elevation (25-year storm)
CB-01	5,900	0	5,900/0.14	177.40	173.88
CB-02	8,400	0	8,400/0.19	168.40	164.98
CB-03	2,300	0	2,300/0.05	169.10	165.39
CB-04	2,100	1,680	3,780/0.09	164.80	161.17
CB-05	6,500	3,360	9,860/0.23	**	**
CB-06	3,400	3,360	6,760/0.16	**	**
CB-07	3,600	0	3,600/0.08	167.30	163.42
CB-08	7,500	1,680	9,180/0.21	175.20	171.82
CB-09	7,500	4,480	11,980/0.28	168.40	165.11

**** CB-05 and CB-06 are integrated into the underground infiltration system and do not overtop per the full HydroCAD analysis as shown in Appendix C**



Subcat Reach Pond Link

Routing Diagram for 230277_POST
Prepared by Horizons Engineering, Printed 8/1/2023
HydroCAD® 10.20-2g s/n 01179 © 2022 HydroCAD Software Solutions LLC

Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 6516 NH Merrimack East
Rainfall events imported from "NRCS-Rain.txt" for 6520 NH Strafford

Rainfall Events Listing (selected events)

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

Area Listing (all nodes)

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

Soil Listing (all nodes)

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

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.943	0.000	0.000	2.518	0.000	3.462	>75% Grass cover, Good	S10, S11, S20
0.000	0.000	0.000	2.191	0.000	2.191	Paved roads w/curbs & sewers	S10, S11, S20
0.000	0.000	0.000	0.461	0.000	0.461	Roofs	S10, S11
0.000	0.000	0.000	0.145	0.000	0.145	Unconnected roofs	S20
0.951	0.000	0.000	8.158	0.000	9.109	Woods, Good	S10, S20
1.894	**0.000**	**0.000**	**13.474**	**0.000**	**15.368**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	P1	161.00	160.00	20.0	0.0500	0.012	0.0	12.0	0.0

Time span=5.00-60.00 hrs, dt=0.05 hrs, 1101 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S10: Proposed S10 Runoff Area=360,244 sf 2.82% Impervious Runoff Depth=0.84"
Flow Length=961' Tc=56.5 min CN=72 Runoff=2.50 cfs 0.578 af

Subcatchment S11: Proposed S11 Runoff Area=147,446 sf 53.50% Impervious Runoff Depth=1.29"
Tc=6.0 min CN=80 Runoff=4.68 cfs 0.363 af

Subcatchment S20: Proposed S20 Runoff Area=161,744 sf 20.28% Impervious Runoff Depth=1.42"
Flow Length=466' Tc=27.9 min CN=82 Runoff=3.11 cfs 0.439 af

Reach R1: (new Reach) Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.250 L=300.0' S=0.0067 '/' Capacity=12.34 cfs Outflow=0.00 cfs 0.000 af

Pond P1: Underground Infiltration Peak Elev=158.08' Storage=4,301 cf Inflow=4.68 cfs 0.363 af
Discarded=0.56 cfs 0.363 af Primary=0.00 cfs 0.000 af Outflow=0.56 cfs 0.363 af

Link POI1: Point Of Interest #1 Inflow=2.50 cfs 0.578 af
Primary=2.50 cfs 0.578 af

Link POI2: Point Of Interest #2 Inflow=3.11 cfs 0.439 af
Primary=3.11 cfs 0.439 af

Total Runoff Area = 15.368 ac Runoff Volume = 1.380 af Average Runoff Depth = 1.08"
81.80% Pervious = 12.571 ac 18.20% Impervious = 2.797 ac

Summary for Subcatchment S10: Proposed S10

Runoff = 2.50 cfs @ 12.83 hrs, Volume= 0.578 af, Depth= 0.84"
Routed to Link POI1 : Point Of Interest #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.05"

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

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

Summary for Subcatchment S11: Proposed S11

Runoff = 4.68 cfs @ 12.13 hrs, Volume= 0.363 af, Depth= 1.29"
Routed to Pond P1 : Underground Infiltration

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.05"

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

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

Summary for Subcatchment S20: Proposed S20

Runoff = 3.11 cfs @ 12.40 hrs, Volume= 0.439 af, Depth= 1.42"
Routed to Link POI2 : Point Of Interest #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.05"

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

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

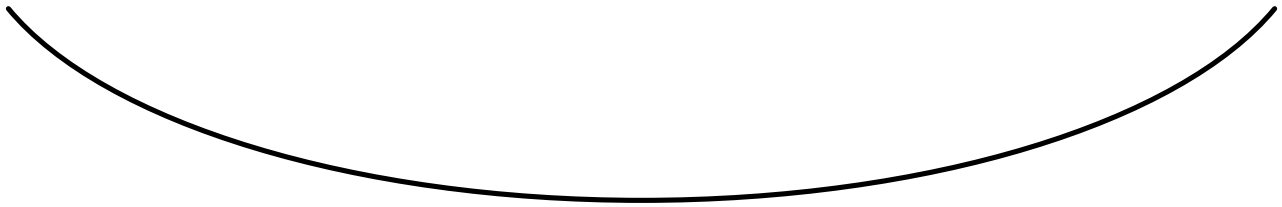
Summary for Reach R1: (new Reach)

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

Routing by Stor-Ind+Trans method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

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

50.00' x 1.00' deep Parabolic Channel, n= 0.250
Length= 300.0' Slope= 0.0067 '/'
Inlet Invert= 142.00', Outlet Invert= 140.00'



‡

Summary for Pond P1: Underground Infiltration

Inflow Area = 3.385 ac, 53.50% Impervious, Inflow Depth = 1.29" for 2-Year event
Inflow = 4.68 cfs @ 12.13 hrs, Volume= 0.363 af
Outflow = 0.56 cfs @ 11.80 hrs, Volume= 0.363 af, Atten= 88%, Lag= 0.0 min
Discarded = 0.56 cfs @ 11.80 hrs, Volume= 0.363 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach R1 : (new Reach)

Routing by Stor-Ind method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 158.08' @ 13.06 hrs Surf.Area= 5,420 sf Storage= 4,301 cf

Plug-Flow detention time= 55.7 min calculated for 0.363 af (100% of inflow)
Center-of-Mass det. time= 55.7 min (929.4 - 873.7)

Volume	Invert	Avail.Storage	Storage Description
#1	156.40'	9,138 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 32,520 cf Overall - 9,676 cf Embedded = 22,844 cf x 40.0% Voids
#2	157.40'	9,676 cf	**48.0" Round Pipe Storage** x 10 Inside #1 L= 77.0'
		18,814 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
156.40	5,420	0	0
162.40	5,420	32,520	32,520

Device	Routing	Invert	Outlet Devices
#1	Primary	161.00'	**12.0" Round Culvert X 3.00** L= 20.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 161.00' / 160.00' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Discarded	156.40'	**4.500 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.56 cfs @ 11.80 hrs HW=156.47' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.56 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=156.40' (Free Discharge)
↑—**1=Culvert** (Controls 0.00 cfs)

Summary for Link POI1: Point Of Interest #1

Inflow Area = 11.655 ac, 17.54% Impervious, Inflow Depth = 0.59" for 2-Year event
Inflow = 2.50 cfs @ 12.83 hrs, Volume= 0.578 af
Primary = 2.50 cfs @ 12.83 hrs, Volume= 0.578 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs

Summary for Link POI2: Point Of Interest #2

Inflow Area = 3.713 ac, 20.28% Impervious, Inflow Depth = 1.42" for 2-Year event
Inflow = 3.11 cfs @ 12.40 hrs, Volume= 0.439 af
Primary = 3.11 cfs @ 12.40 hrs, Volume= 0.439 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs

Time span=5.00-60.00 hrs, dt=0.05 hrs, 1101 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S10: Proposed S10 Runoff Area=360,244 sf 2.82% Impervious Runoff Depth=1.87"
Flow Length=961' Tc=56.5 min CN=72 Runoff=6.06 cfs 1.290 af

Subcatchment S11: Proposed S11 Runoff Area=147,446 sf 53.50% Impervious Runoff Depth=2.52"
Tc=6.0 min CN=80 Runoff=9.17 cfs 0.711 af

Subcatchment S20: Proposed S20 Runoff Area=161,744 sf 20.28% Impervious Runoff Depth=2.70"
Flow Length=466' Tc=27.9 min CN=82 Runoff=5.96 cfs 0.835 af

Reach R1: (new Reach) Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.250 L=300.0' S=0.0067 '/' Capacity=12.34 cfs Outflow=0.00 cfs 0.000 af

Pond P1: Underground Infiltration Peak Elev=160.10' Storage=12,208 cf Inflow=9.17 cfs 0.711 af
Discarded=0.56 cfs 0.711 af Primary=0.00 cfs 0.000 af Outflow=0.56 cfs 0.711 af

Link POI1: Point Of Interest #1 Inflow=6.06 cfs 1.290 af
Primary=6.06 cfs 1.290 af

Link POI2: Point Of Interest #2 Inflow=5.96 cfs 0.835 af
Primary=5.96 cfs 0.835 af

Total Runoff Area = 15.368 ac Runoff Volume = 2.836 af Average Runoff Depth = 2.21"
81.80% Pervious = 12.571 ac 18.20% Impervious = 2.797 ac

Summary for Subcatchment S10: Proposed S10

Runoff = 6.06 cfs @ 12.78 hrs, Volume= 1.290 af, Depth= 1.87"
Routed to Link POI1 : Point Of Interest #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.57"

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

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

Summary for Subcatchment S11: Proposed S11

Runoff = 9.17 cfs @ 12.13 hrs, Volume= 0.711 af, Depth= 2.52"
Routed to Pond P1 : Underground Infiltration

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.57"

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

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

Summary for Subcatchment S20: Proposed S20

Runoff = 5.96 cfs @ 12.39 hrs, Volume= 0.835 af, Depth= 2.70"
Routed to Link POI2 : Point Of Interest #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.57"

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

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

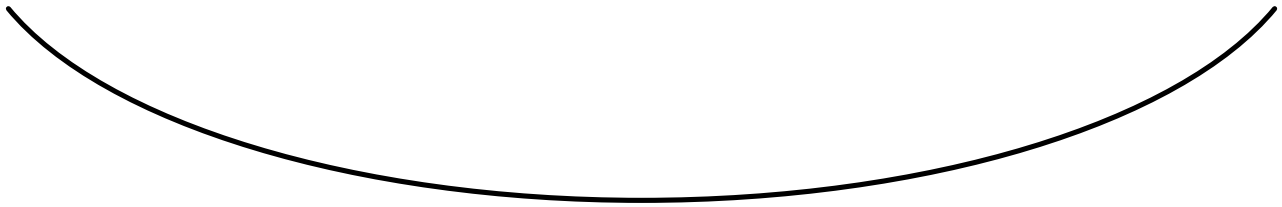
Summary for Reach R1: (new Reach)

Inflow Area = 3.385 ac, 53.50% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Routed to Link POI1 : Point Of Interest #1

Routing by Stor-Ind+Trans method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

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

50.00' x 1.00' deep Parabolic Channel, n= 0.250
Length= 300.0' Slope= 0.0067 '/'
Inlet Invert= 142.00', Outlet Invert= 140.00'



‡

Summary for Pond P1: Underground Infiltration

Inflow Area = 3.385 ac, 53.50% Impervious, Inflow Depth = 2.52" for 10-Year event
Inflow = 9.17 cfs @ 12.13 hrs, Volume= 0.711 af
Outflow = 0.56 cfs @ 11.20 hrs, Volume= 0.711 af, Atten= 94%, Lag= 0.0 min
Discarded = 0.56 cfs @ 11.20 hrs, Volume= 0.711 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach R1 : (new Reach)

Routing by Stor-Ind method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 160.10' @ 14.27 hrs Surf.Area= 5,420 sf Storage= 12,208 cf

Plug-Flow detention time= 204.9 min calculated for 0.711 af (100% of inflow)
Center-of-Mass det. time= 204.9 min (1,053.6 - 848.7)

Volume	Invert	Avail.Storage	Storage Description
#1	156.40'	9,138 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 32,520 cf Overall - 9,676 cf Embedded = 22,844 cf x 40.0% Voids
#2	157.40'	9,676 cf	**48.0" Round Pipe Storage** x 10 Inside #1 L= 77.0'
		18,814 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
156.40	5,420	0	0
162.40	5,420	32,520	32,520

Device	Routing	Invert	Outlet Devices
#1	Primary	161.00'	**12.0" Round Culvert X 3.00** L= 20.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 161.00' / 160.00' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Discarded	156.40'	**4.500 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.56 cfs @ 11.20 hrs HW=156.46' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.56 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=156.40' (Free Discharge)
↑**1=Culvert** (Controls 0.00 cfs)

Summary for Link POI1: Point Of Interest #1

Inflow Area = 11.655 ac, 17.54% Impervious, Inflow Depth = 1.33" for 10-Year event
Inflow = 6.06 cfs @ 12.78 hrs, Volume= 1.290 af
Primary = 6.06 cfs @ 12.78 hrs, Volume= 1.290 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs

Summary for Link POI2: Point Of Interest #2

Inflow Area = 3.713 ac, 20.28% Impervious, Inflow Depth = 2.70" for 10-Year event
Inflow = 5.96 cfs @ 12.39 hrs, Volume= 0.835 af
Primary = 5.96 cfs @ 12.39 hrs, Volume= 0.835 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs

Time span=5.00-60.00 hrs, dt=0.05 hrs, 1101 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S10: Proposed S10 Runoff Area=360,244 sf 2.82% Impervious Runoff Depth=2.81"
Flow Length=961' Tc=56.5 min CN=72 Runoff=9.26 cfs 1.934 af

Subcatchment S11: Proposed S11 Runoff Area=147,446 sf 53.50% Impervious Runoff Depth=3.57"
Tc=6.0 min CN=80 Runoff=12.89 cfs 1.008 af

Subcatchment S20: Proposed S20 Runoff Area=161,744 sf 20.28% Impervious Runoff Depth>3.78"
Flow Length=466' Tc=27.9 min CN=82 Runoff=8.30 cfs 1.168 af

Reach R1: (new Reach) Avg. Flow Depth=0.27' Max Vel=0.16 fps Inflow=1.15 cfs 0.107 af
n=0.250 L=300.0' S=0.0067 '/' Capacity=12.34 cfs Outflow=0.73 cfs 0.107 af

Pond P1: Underground Infiltration Peak Elev=161.31' Storage=16,405 cf Inflow=12.89 cfs 1.008 af
Discarded=0.56 cfs 0.901 af Primary=1.15 cfs 0.107 af Outflow=1.72 cfs 1.008 af

Link POI1: Point Of Interest #1 Inflow=9.26 cfs 2.041 af
Primary=9.26 cfs 2.041 af

Link POI2: Point Of Interest #2 Inflow=8.30 cfs 1.168 af
Primary=8.30 cfs 1.168 af

Total Runoff Area = 15.368 ac Runoff Volume = 4.111 af Average Runoff Depth = 3.21"
81.80% Pervious = 12.571 ac 18.20% Impervious = 2.797 ac

Summary for Subcatchment S10: Proposed S10

Runoff = 9.26 cfs @ 12.77 hrs, Volume= 1.934 af, Depth= 2.81"
Routed to Link POI1 : Point Of Interest #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.77"

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

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

Summary for Subcatchment S11: Proposed S11

Runoff = 12.89 cfs @ 12.13 hrs, Volume= 1.008 af, Depth= 3.57"
Routed to Pond P1 : Underground Infiltration

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.77"

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

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

Summary for Subcatchment S20: Proposed S20

Runoff = 8.30 cfs @ 12.39 hrs, Volume= 1.168 af, Depth> 3.78"
Routed to Link POI2 : Point Of Interest #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.77"

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

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

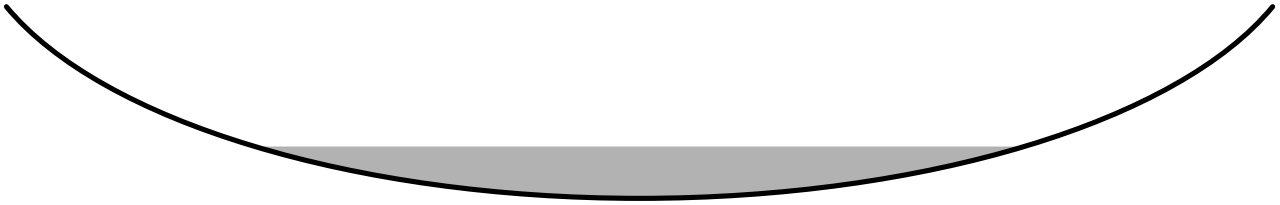
Summary for Reach R1: (new Reach)

Inflow Area = 3.385 ac, 53.50% Impervious, Inflow Depth = 0.38" for 25-Year event
Inflow = 1.15 cfs @ 12.80 hrs, Volume= 0.107 af
Outflow = 0.73 cfs @ 13.83 hrs, Volume= 0.107 af, Atten= 37%, Lag= 61.6 min
Routed to Link POI1 : Point Of Interest #1

Routing by Stor-Ind+Trans method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.16 fps, Min. Travel Time= 32.2 min
Avg. Velocity = 0.03 fps, Avg. Travel Time= 170.4 min

Peak Storage= 1,411 cf @ 13.29 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 26.03'
Bank-Full Depth= 1.00' Flow Area= 33.3 sf, Capacity= 12.34 cfs

50.00' x 1.00' deep Parabolic Channel, n= 0.250
Length= 300.0' Slope= 0.0067 '/'
Inlet Invert= 142.00', Outlet Invert= 140.00'



‡

Summary for Pond P1: Underground Infiltration

Inflow Area = 3.385 ac, 53.50% Impervious, Inflow Depth = 3.57" for 25-Year event
Inflow = 12.89 cfs @ 12.13 hrs, Volume= 1.008 af
Outflow = 1.72 cfs @ 12.80 hrs, Volume= 1.008 af, Atten= 87%, Lag= 40.3 min
Discarded = 0.56 cfs @ 10.75 hrs, Volume= 0.901 af
Primary = 1.15 cfs @ 12.80 hrs, Volume= 0.107 af
Routed to Reach R1 : (new Reach)

Routing by Stor-Ind method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 161.31' @ 12.80 hrs Surf.Area= 5,420 sf Storage= 16,405 cf

Plug-Flow detention time= 252.4 min calculated for 1.007 af (100% of inflow)
Center-of-Mass det. time= 252.4 min (1,088.2 - 835.7)

Volume	Invert	Avail.Storage	Storage Description
#1	156.40'	9,138 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 32,520 cf Overall - 9,676 cf Embedded = 22,844 cf x 40.0% Voids
#2	157.40'	9,676 cf	**48.0" Round Pipe Storage** x 10 Inside #1 L= 77.0'
		18,814 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
156.40	5,420	0	0
162.40	5,420	32,520	32,520

Device	Routing	Invert	Outlet Devices
#1	Primary	161.00'	**12.0" Round Culvert X 3.00** L= 20.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 161.00' / 160.00' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Discarded	156.40'	**4.500 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.56 cfs @ 10.75 hrs HW=156.46' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.56 cfs)

Primary OutFlow Max=1.15 cfs @ 12.80 hrs HW=161.31' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.15 cfs @ 1.88 fps)

Summary for Link POI1: Point Of Interest #1

Inflow Area = 11.655 ac, 17.54% Impervious, Inflow Depth = 2.10" for 25-Year event
Inflow = 9.26 cfs @ 12.77 hrs, Volume= 2.041 af
Primary = 9.26 cfs @ 12.77 hrs, Volume= 2.041 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs

Summary for Link POI2: Point Of Interest #2

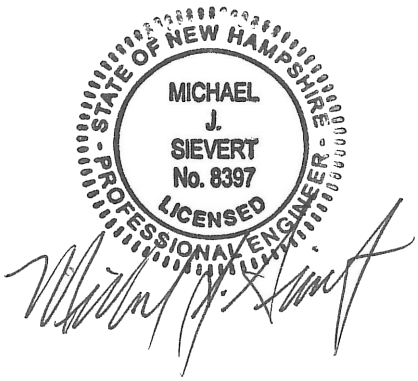
Inflow Area = 3.713 ac, 20.28% Impervious, Inflow Depth > 3.78" for 25-Year event
Inflow = 8.30 cfs @ 12.39 hrs, Volume= 1.168 af
Primary = 8.30 cfs @ 12.39 hrs, Volume= 1.168 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs

Sanitary Sewer Flow Estimation

Project address:	36 Olive Meadow Lane, Dover, NH
Client:	GSD Communities
Design by:	MJS
Approved by:	MJS
Date:	2023-08-02

Domestic wastewater			
Parameter	**Value**	**Unit**	**Comments**
Household size	4	capita/home	Average based on 2-4-bedroom house size
Daily Flow rate per capita	240	ℓ/capita/d	value taken from Metcalf & Eddy 5e figure 3-2
No. of households	32	homes	based on proposed site plan
Daily mean flow rate	30720	ℓ/d	
	8115	gal/d	
Peak hourly flow rate	33.8	gpm	peak factor = 6, Env-Wq 700
Infiltration to collection system			
Parameter	**Value**	**Unit**	**Comments**
sewer pipe lengths			
4" pipe	700	ft	
6" pipe	0	ft	
8" pipe	1254	ft	
inch-miles of sewer			
4" pipe	0.53	in·mi	4" · length of 4" pipe to be installed in miles
6" pipe	0.00	in·mi	6" · length of 6" pipe to be installed in miles
8" pipe	1.90	in·mi	8" · length of 8" pipe to be installed in miles
sum	2.43	in·mi	
flow rate			
Daily mean flow rate (high)	24303	gal/d	assuming 10,000 USgal/d/in/mi (Metcalf & Eddy 5e)
	16.88	gpm	
Daily mean flow rate (mid)	729	gal/d	assuming 300 USgal/d/in/mi (Metcalf & Eddy 5e)
	0.51	gpm	
Daily mean flow rate (low)	243	gal/d	assuming 100 USgal/d/in/mi (Metcalf & Eddy 5e)
	0.17	gpm	
Combined (domestic+infiltration) flows			
Parameter	**Value**	**Unit**	**Comments**
Daily mean flow rate (high)	32418	gal/d	mean domestic flow + mean infiltration flow
Peak hourly flow rate (high)	50.69	gpm	peak domestic flow + mean infiltration flow
Daily mean flow rate (mid)	8844	gal/d	mean domestic flow + mean infiltration flow
Peak hourly flow rate (mid)	34.32	gpm	peak domestic flow + mean infiltration flow
Daily mean flow rate (low)	8358	gal/d	mean domestic flow + mean infiltration flow
Peak hourly flow rate (low)	33.98	gpm	peak domestic flow + mean infiltration flow



Horizons Engineering
P.O. Box 359
Newmarket, NH 03857

Job No.: 230277

Prepared for:
36 Olive Meadow Lane
Dover, NH

Septic System Pump Design:

Septic Tank: Shea Conc 8' Dia duplex pump station w/valve pit

Pump Chamber = **376** Gal./ft

inv in. = 158.33

SMH: Prop SMH 11 Olive Meadow .

inv in. = 183.33

Design Flow: 8848 **GPD**

Pipe: SDR 21 3 in. dia.

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length = 1740.00 LF

Joint Pipe Head = 143.00 LF

Total Pipe Length = 1883.00 LF

Static Head Calc's:

6 H.I. inv. in --> bottom of tank
- 1.00 1' always in Pump Chamber
5.00 ft.

158.33 inv. in
- 5.00 ft.
153.33 effluent elev.

Static Head = inv. in smh - Low water elev.

Static Head = 30.00 ft.

Pump Chamber:

dia= 8.00 ft

Volume/ft. of depth = 376.00 gal/ft

Pipe Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	1	24	24
Gate Valve =	1	3	3
90deg. Elbows =	3	12	36
bends	10	6	60
Tee =	1	20	20
		Total Joint = Pipe Head	143.00

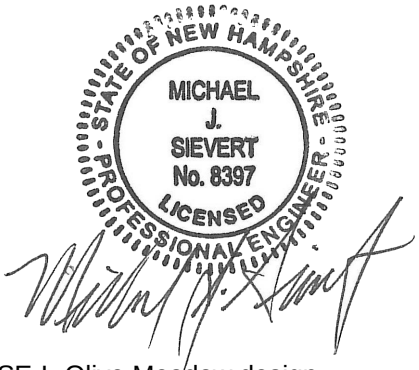
Dosing Calculations:

Pump Chamber Volume/ft. of depth =	376.00	gal./ft.
No. of desired doses =	6	
Daily flow =	8848	GPD

Volume of each dose = 1474.67 gal/dse

Dose Height in Pump Chamber:
(= Volume of each dose / (Volume / ft. of depth))

Dose Height in Pump Chamber = 3.92 ft.



Horizons Engineering
P.O. Box 359
Newmarket, NH 03857

Job No.: 230277

Prepared for:
36 Olive Meadow Lane
Dover, NH

System Curve:

GPM	Static Head	Tot. Pipe Length	Pipe Size	Friction Loss/100'	Friction Loss (ft.)	Tot. Dynamic Head
100	30.00	1883.00	4	0.73	13.75	43.75
150	30.00	1883.00	4	1.22	22.97	52.97
200	30.00	1883.00	4	1.77	33.33	63.33

Pump Selection:

Capacity =	150.00	GPM
Tot. Dynamic Head =	54	ft.
Velocity =	2.6	ft./sec.
Pump Make/Model:	Barnes 4SE-L 4.5HP	
Pipe Length =	1740.00	ft.
Pipe Type:	SDR 21	

Run Time:

(= gal./dose / pump gpm)

Pump GPM = 150.00

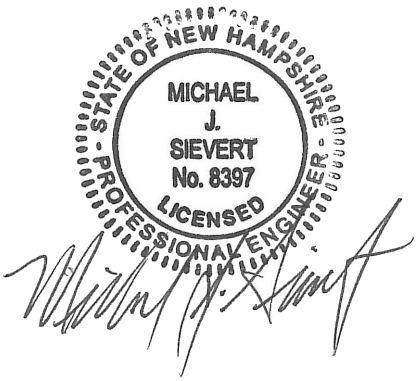
*Pump GPM either selected from above or taken from Pump Curve at intersection.

Run Time = 9.83 minute

*Run Time shall be greater than 2 min.

Pump Chamber Data:

Design Flow =	8848	GPD
Doses Per Day =	6	ft.
Gallons Per Dose =	1474.667	gal.
Pump Chmbr Dims =	8' dia	
Pump Chamber =	376.00	Gal./ft.
Pump On Elev. =	155.92	ft.
Pump Off Elev. =	152.00	ft.
Pump Alarm Elev. =	156.42	ft.



Series 4SE -L

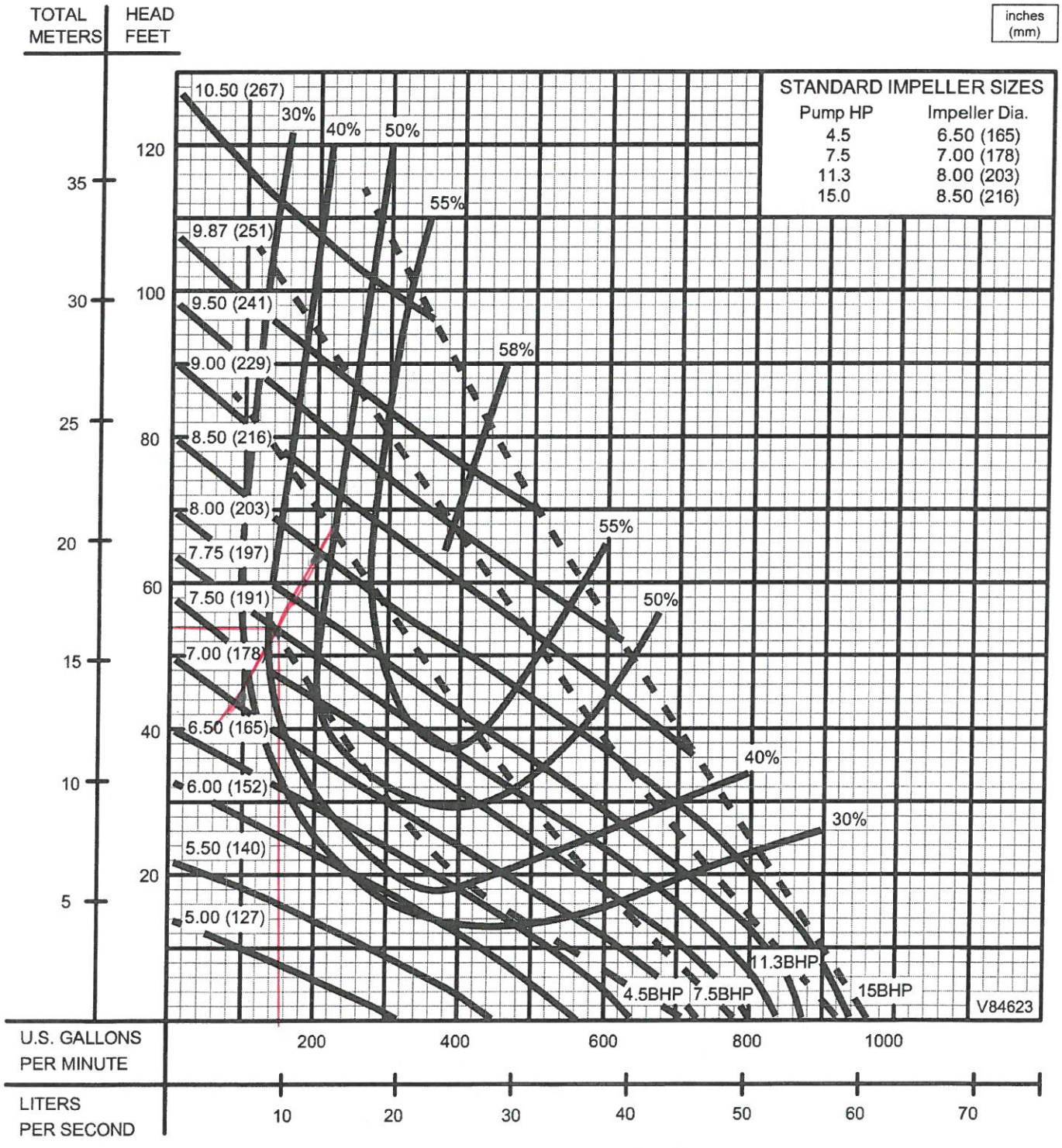
Performance Curve

4.5, 7.5, 11.3 & 15HP, 1750RPM, 60Hz

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4" Horizontal Discharge - Submersible Non-Clog Pumps



Testing is performed with water, specific gravity 1.0 @ 68° F @ (20°C), other fluids may vary performance

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STORMWATER SYSTEMS INSPECTION & MAINTENANCE MANUAL

Prepared for:

John Randolph

GSD Communities

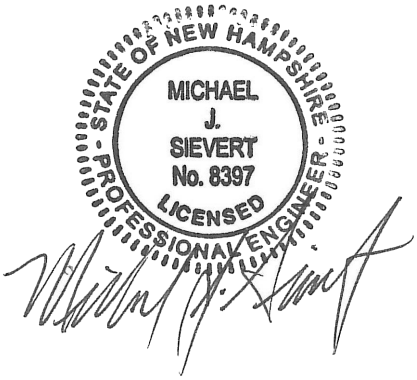
36 Olive Meadow Lane

Dover, NH

Prepared on:

July 2023

Prepared by:



horizons Engineering

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2.0 EXECUTIVE SUMMARY

The Stormwater Systems Inspection and Maintenance Manual (SSIMM) provides a complete reference guide for use by the property owner and their chosen maintenance subcontractor for the inspection and maintenance of the storm water best management practices (BMPs) associated with the proposed commercial development. The SSIMM describes each BMP and identifies necessary inspection activities, schedules and record keeping requirements. Compliance with the recommendations in the SSIMM will ensure expected operation, performance, and life cycle of the BMPs which have a common purpose of collecting and treating storm water runoff in an effort to protect the quality of public waters.

3.0 CONTACT INFORMATION

The individual responsible for the required reporting, inspection, and maintenance activities specified in this manual is;

Name: __John Randolph___

Phone: ___603-834-2317___

4.0 PERMANENT BEST MANAGEMENT PRACTICES

This section identifies the BMPs employed on this development and provides a brief summary to establish their purpose in the collection and treatment within the storm water system. See the included Storm Water Systems Overview Plan for the location(s) of each of the BMPs.

4.1 UNDERGROUND INFILTRATION SYSTEM

Subsurface infiltration basins may comprise a subsurface manifold system with associated crushed stone storage bed, drainage pipes or specially-designed chambers (with or without perforations) bedded in or above crushed stone.

4.2 CATCH BASINS/SUMPS

The catch basins collect surface water and the sumps store settleable solids prior to discharge. The sumps can help reduce the discharge of sediments into the treatment system and surface water.

4.3 PRE-TREATMENT SWALE

Pre-treatment swales are shallow, vegetated earthen channels design to convey flows while capturing a limited amount of sediment and associated pollutants..

4.4 LEVEL SPREADER

A level spreader is used to collect concentrated flow and convert it to sheet flow. The conversion of concentrated flow to shallow, sheet flow allows runoff to be discharged at non-erosive velocities onto the natural ground.

4.5 GENERAL SITE CLEANUP

In the fall, the site shall be cleaned from leaf and yard waste. In the spring, the parking area should be cleaned of winter maintenance debris. The general site area shall be inspected at least twice a year and should be cleaned of leaf and yard waste debris.

5.0 LONG TERM MAINTENANCE OF PERMANENT BMPS

This section will be useful to the property owner and their maintenance subcontractor to establish a systematic approach for the inspection and maintenance of the on-site storm water system components. Included in Appendix B is an Inspection Matrix which summarizes the inspection needs described below. An Inspection Report is provided in Appendix C. Completion of the Inspection Report and Matrix is required, and a record shall be kept on site of each inspection.

5.1 UNDERGROUND INFILTRATION SYSTEM

Inspect drain manhole at inlet twice annually:

- Removal of debris from inlet and outlet structures
- Removal of accumulated sediment
- Inspection and repair of inlet and outlet structures
- Inspection of infiltration components at least twice annually, and following any rainfall event exceeding 2.5 inches in a 24 hour period, with maintenance or rehabilitation conducted as warranted by such inspection.
- Inspection of pretreatment measures at least twice annually, and removal of accumulated sediment as warranted by inspection, but no less than once annually.
- If an infiltration system does not drain within 72-hours following a rainfall event, then a qualified professional should assess the condition of the facility to determine measures required to restore infiltration function, including but not limited to removal of accumulated sediments or reconstruction of the infiltration system.

5.2 CATCH BASINS/SUMPS

Inspect annually for sediment accumulation, and damage. Remove sediment and debris, and repair, as necessary.

5.3 PRE-TREATMENT SWALE

Inspect annually for sediment accumulation erosion, vegetation loss and presence of invasive species. Mow periodically to a minimum of 4". Remove sediment and debris, and repair, as necessary.

5.4 LEVEL SPREADER

- Inspect annually for sediment accumulation, and, and debris and signs of erosion within the approach channel, spreader channel or down-slope of the spreader.
- Remove debris when observed, and sediment when accumulation exceeds 25% of spreader channel depth.
- At a minimum mow annually to control woody vegetation within spreader
- Repair any erosion and regrade or replace stone berm material, as necessary.
- Reconstruct the spreader of the down-slope channelization indicates that the spreader is not level or if discharge has become concentrated.

5.5 GENERAL SITE CLEANUP

During maintenance activities, remove accumulation debris, and pick up trash. In the spring, the parking lot shall be swept to remove sand and other debris.

6.0 REFERENCES

The Storm Water Systems Management Plan incorporates many standard and accepted practices. Specifically, the following references were utilized:

The New Hampshire Stormwater Manual, December 2008, Revision 1.0.

Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in New Hampshire. Rockingham County Conservation District, August 1992, or latest edition.

APPENDIX A:
MAINTENANCE MATRIX

LONG TERM BMP INSPECTION / MAINTENANCE MATRIX

		Inspection / Maintenance Interval				
BMP	**Major Inspection / Maintenance Criterion [1]**	**Spring [2]**	**Summer**	**Fall [3]**	**Winter**	**Other / Notes**
Underground Infiltration System	I - check for sediment buildup M - remove debris including accumulated leaves I - check infiltration components	I - RQ M - RQ	I - O	I - R M - R	I - O	inspect infiltration componets following any rainfall exceeding 2.5 inhes in a 24 hour period, with maintnenance conducted as warranted
Catch basin deep sumps	M - remove debris and leaves M - vacumm once a year	I - RQ M - RQ	I - O	I - R M - R	I - O	inspect catch basins following any rainfall exceeding 2.5 inhes in a 24 hour period, with maintnenance conducted as warranted
Pre-treatment swale	I - check for sediment buildup, vegetation loss, invasive species M - remove debris including accumulated sediment M - mow periodically M - repair eroded area, remove invasives	I -RQ M - RQ	I - O	I - R M - R	I - O	inspect swale following any rainfall exceeding 2.5 inhes in a 24 hour period, with maintnenance conducted as warranted
Level Spreader	I - check for sediment buildup M - remove debris including accumulated sediment M - mow periodically M - repair eroded area reconstruct if erosion down slope	I -RQ M - RQ	I - O	I - R M - R	I - O	inspect spreader following any rainfall exceeding 2.5 inhes in a 24 hour period, with maintnenance conducted as warranted

Notes

(1) The BMP should be inspected as recommended and maintenance shall be performed as needed. Maintenance may be needed at shorter or longer intervals depending on weather conditions, and use of the property and contributing watershed

(2) Early Spring as vegetation begins to blossom or earlier

(3) Late Fall after majority of leaf fall, but prior to snow fall

Abbreviations

I - Inspection
M - Maintenance
O - Optional
R - Recommended
RQ - Required

APPENDIX B:
MAINTENANCE REPORTS

BMP Maintenance Report

Site Name:	GSD Communities Dover
Site Location:	36 Olive Meadow Lane
Installation Date:	Pending

Owner:	GSD Communities/Dover Housing Authority	Contractor:	TBD
Contact Name:	John Randolph	Contact Name:	
Company Name:	GSD Construction	Company Name:	
Telephone:	603-834-2317	Telephone:	
Fax:		Fax:	
Address:	Exeter, NH	Address:	

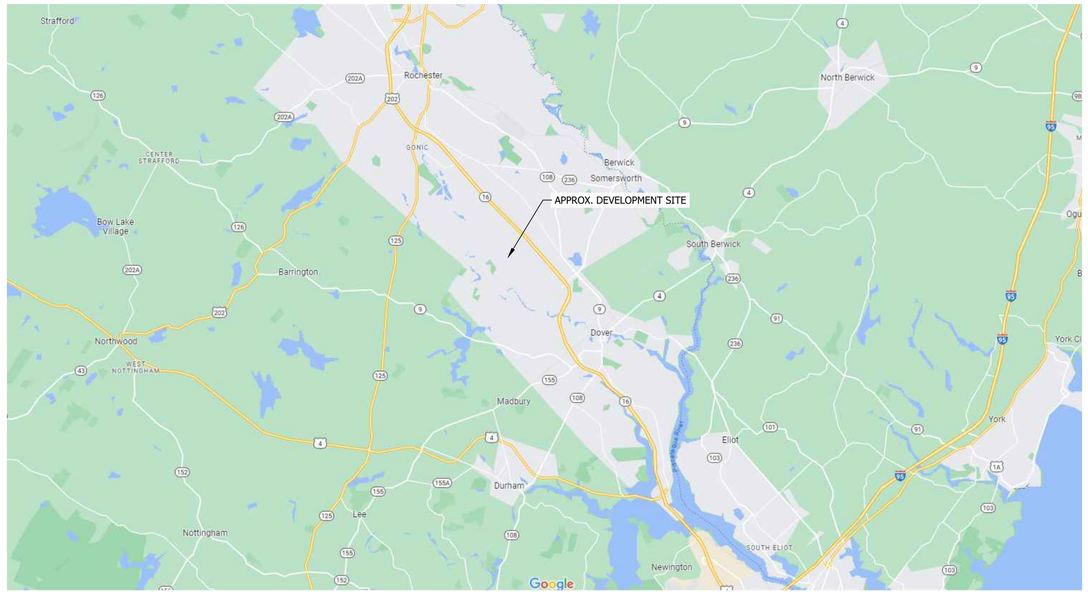
Maintenance Log

Items Inspected	Checked		Maintenance Needed		Comments
	Yes	No	Yes	No	
Underground Pipe Infiltration System					
Catchbasins/Sumps					
Pre-Treatment Swale					
Level spreader					
General Site Cleanup					

OLIVE MEADOW LANE POCKET COMMUNITY

DOVER, NEW HAMPSHIRE

AUGUST 2023



LOCUS MAP
SCALE: 1"=10,000'

SHEET INDEX

C100	EXISTING CONDITIONS PLAN
C100.1	SITE CONTEXT PLAN
C100.2	NEIGHBORHOOD PLAN
C101	SITE & UTILITY PLAN
C102	GRADING AND EROSION CONTROL PLAN
C103-C103.1	UTILITY PLAN
C104-C105	PLAN & PROFILE SHEETS
C200	TURNING DIAGRAM PLAN
C501-C508	CONSTRUCTION DETAILS

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JOHN RANDOLPH

36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

COVER & INDEX PLAN

NO.	DATE	REVISION DESCRIPTION	ENG	DWG
1	7.24.23	REVISED PER TRC COMMENTS	TAL	TAL

STATE OF NEW HAMPSHIRE
MICHAEL J. SEVERY
No. 8307
LICENSED PROFESSIONAL ENGINEER

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

COVER



GENERAL NOTES

1. OWNER OF RECORD:
   ZELAND SCHWARTZ, TRUSTEE OF THE ZELAND SCHWARTZ REVOCABLE TRUST DATED JULY 9, 2019
   14 HUCKINS ROAD
   MADBURY, NH 03832

2. REFERENCE DEED:

   A. WARRANTY DEED FROM PARACOSM, LLC TO ZELAND SCHWARTZ, TRUSTEE OF THE ZELAND SCHWARTZ REVOCABLE TRUST DATED JULY 9, 2019, RECORDED IN THE STRAFFORD COUNTY REGISTRY OF DEEDS AS BOOK 4961, PAGE 475.

3. REFERENCE PLANS:

   A. "AMENDED OPEN SPACE SUBDIVISION PLAN OF OLIVE MEADOW OLIVE MEADOW LANE DOVER, NEW HAMPSHIRE" PREPARED BY TRITECH ENGINEERING, DATED JANUARY OF 2012 AND RECORDED IN THE STRAFFORD COUNTY REGISTRY OF DEEDS AS PLAN BOOK 103, PAGE 81-82.

4. THIS PLAN IS BASED ON A FIELD SURVEY COMPLETED BY HORIZONS ENGINEERING, INC. IN MAY, 2023 USING A CARLSON BRX-7 GNSS & LEICA TS13 ROBOTIC TOTAL STATION.

5. THE BEARINGS SHOWN HEREON REFER TO GRID NORTH AND ARE BASED ON THE NEW HAMPSHIRE COORDINATE SYSTEM NAD83. CONTOURS SHOWN HEREON ARE A COMBINATION OF A TOPOGRAPHIC SURVEY AND FROM PUBLICLY AVAILABLE LIDAR ELEVATION DATA (LIDAR IN WETLANDS AND FAR EAST SIDE OF LOT).

6. PROPERTY IS ZONED RURAL RESIDENTIAL (R-40)

7. THE WETLANDS SHOWN HEREON WERE DELINEATED IN APRIL, 2023 BY MARK WEST OF WEST ENVIRONMENTAL, INC. AND LOCATED DURING THE FIELD SURVEY.

8. THE PREMISES ARE NOT LOCATED WITHIN A DEFINED FLOOD HAZARD ZONE.

9. UNDERGROUND UTILITIES AS SHOWN HEREON ARE BASED ON SURFACE STRUCTURES AND RECORD PLANS PROVIDED BY THE CITY OF DOVER, AND SHOULD BE CONSIDERED APPROXIMATE.

LEGEND

- IRON PIPE OR ROD FOUND (DIMENSIONS LABELED ON PLAN)
- CALCULATED CORNER
- DRILL HOLE FOUND
- STONE MONUMENT FOUND
- LIGHT POLE
- GATE VALVE
- WATER HYDRANT
- SEWER MANHOLE
- ELECTRIC METER
- MAILBOX

- DECIDUOUS TREE
- TREE LINE
- ABUTTER PROPERTY LINE
- PROPERTY LINE
- EASEMENT OR RIGHT OF WAY
- EDGE OF WATER/WETLAND
- STONE WALL
- PAVED ROAD
- FENCING
- BARBED WIRE
- EX. WATER
- EX. SEWER/FORCEMAIN
- EX. UG GAS
- EX. UG ELEC/CABLE

0 50 100 200 400

SCALE IN FEET

SCALE: 1" = 100'

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EXISTING CONDITIONS SURVEY PREPARED FOR

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

LOCATED AT
36 OLIVE MEADOW LANE
DOVER, STRAFFORD COUNTY, NEW HAMPSHIRE

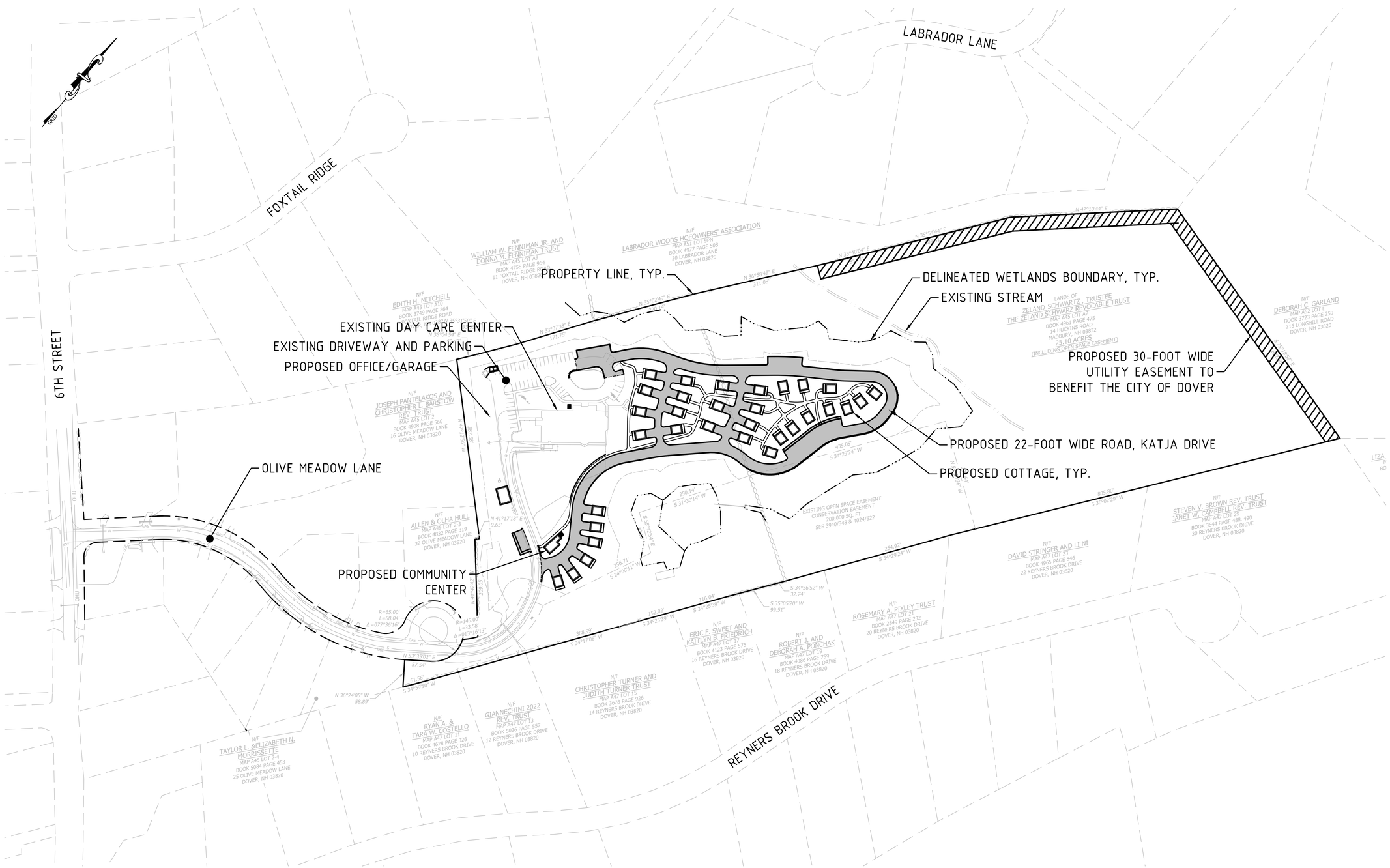
DOVER TAX MAP A45 LOT A2
DEED BOOK 4961 PAGE 475

NO.	DATE	REVISION DESCRIPTION	ENG	DWG
1	7.24.23	REVISED PER TRC COMMENTS	TAL	TAL

DATE: 6/20/2023	PROJECT #: 230277
SURV'D BY: NFN	DRAWN BY: NFN
CHECK'D BY: AJN	ARCHIVE #: H-___

C100

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36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

SITE CONTEXT PLAN

NO.	DATE	REVISION DESCRIPTION	ENG	DWG
1	7.24.23	REVISED PER TRC COMMENTS	TAL	TAL

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

C100.1

FILE # SITE-2023-0005



0 50 100 200 400

SCALE IN FEET

FILE # SITE-2023-0005

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36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

NEIGHTBORHOOD PLAN

NO.	DATE	REVISION DESCRIPTION	ENG	DWG
1	7.24.23	REVISED PER TRC COMMENTS	TAL	TAL

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

C100.2

NOTES:

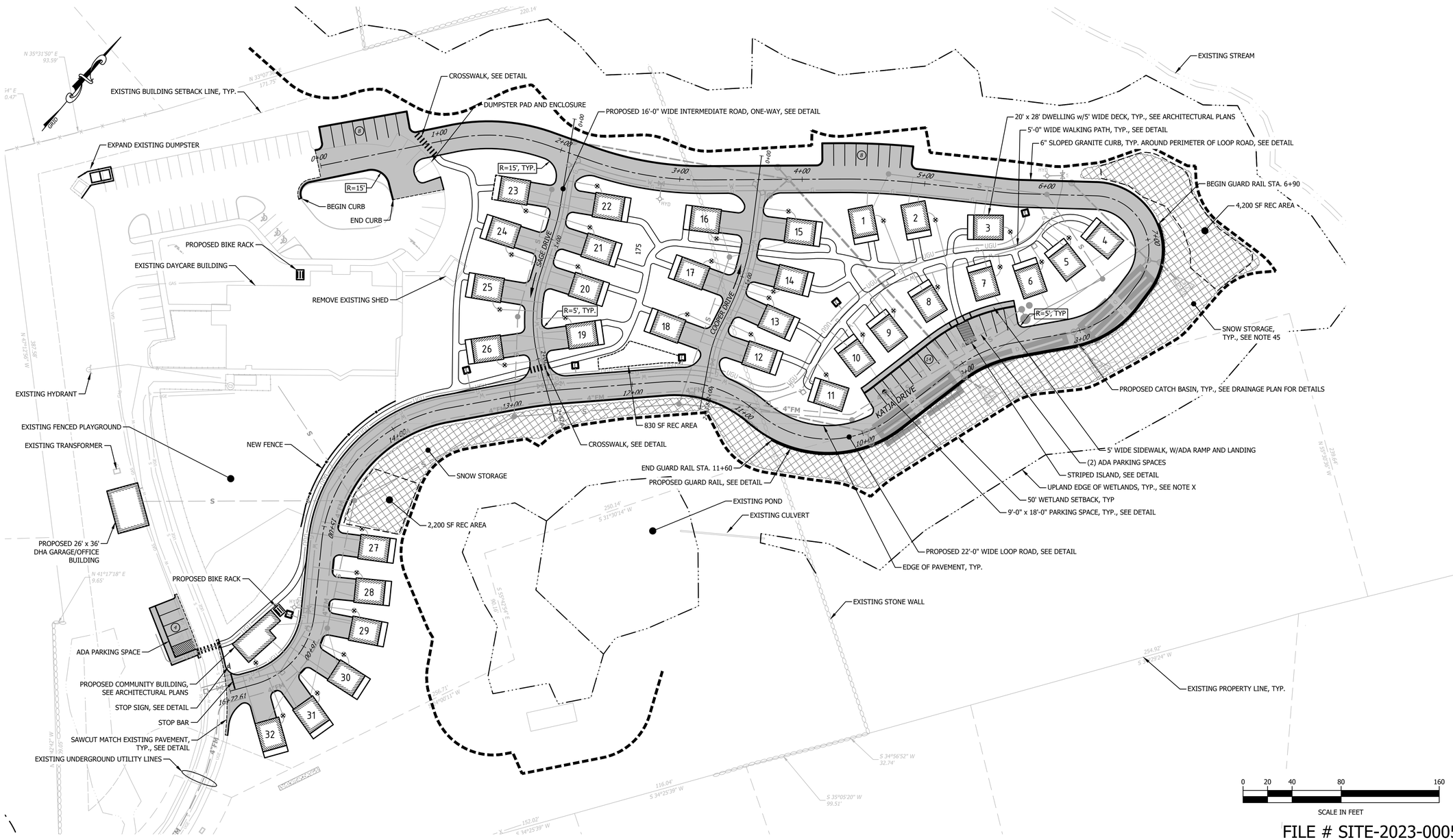
1. THE INTENT OF THIS PLAN IS TO DEVELOP THE EXISTING PROPERTY INTO AN AFFORDABLE/WORKFORCE HOUSING COMMUNITY.
2. CURRENT OWNER OF RECORD: SCHWARTZ ZEELAND TRUSTEE
   14 HUCKINS ROAD
   MADBURRY, NH 03832 OWNER SIGNATURE: _____
3. SUBJECT PARCEL IS LOCATED IN THE CITY OF DOVER, COUNTY OF STRAFFORD AND THE STATE OF NEW HAMPSHIRE.
4. TOTAL LOT AREA: 1,093,356 SQ. FT - 25.1 ACRES
5. TAX MAP 445, LOT A2 OF THE CITY OF DOVER TAX ASSESSOR'S MAPS.
6. PROJECT DEED REFERENCE: STRAFFORD COUNTY REGISTRY OF DEEDS BOOK NO. 4961, PAGE NO. 475
7. ZONING: R-40

MIN. LOT SIZE:	40,000 SQ. FT
MIN. FRONTAGE:	150 FT
MIN. SETBACKS:	
FRONT:	40 FT
SIDE:	25 FT
REAR:	30 FT
MAX. BUILDING HEIGHT:	35 FT
MAX. LOT COVERAGE:	10%

8. THIS PROPERTY FALLS WITHIN THE FOLLOWING ZONING OVERLAY DISTRICTS: WETLANDS, CONSERVATION.
9. IN THE MONTH OF APRIL, 2023 MARK WEST OF WEST ENVIRONMENTAL, STATE OF NEW HAMPSHIRE CERTIFIED SOIL SCIENTIST, NH CERTIFIED WETLAND SCIENTIST, CONDUCTED AN ON-SITE WETLANDS DELINEATION OF THE SUBJECT PARCEL. WETLANDS WERE IDENTIFIED BASED ON THE CITY OF DOVER ZONING ORDINANCE (170-27.1) AND ON STATE AND FEDERAL CRITERIA OUTLINES IN THE "CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL" (DEPT. OF THE ARMY 1987) ON THIS SITE. WETLANDS BASED ON LOCAL CRITERIA SHARE THE SAME BOUNDARIES WITH THOSE BASED ON STATE AND FEDERAL CRITERIA. NO VERY POORLY DRAINED SOILS WERE FOUND.
10. IN JUNE AND JULY OF 2023 JOSEPH W. NOEL, CERTIFIED SOIL SCIENTIST COMPLETED A SITE SPECIFIC SOIL MAP IN ACCORDANCE WITH "SITE SPECIFIC SOIL MAPPING STANDARDS FOR NEW HAMPSHIRE AND VERMONT" (SOCIETY OF SOIL SCIENTISTS OF NORTHERN NEW ENGLAND, VERSION 5.0, DECEMBER 2017). [NOTE TO BE UPDATED WITH CURRENT INFORMATION WHEN COMPLETED]
11. A PORTION OF THE SUBJECT PARCEL IS WITHIN A FEDERALLY DESIGNATED SPECIAL FLOOD HAZARD ZONE (FLOOD ZONE A - PANEL 0340E. MAP NO. 33017C0340E, DATE 9-30-2015)
12. LOTS ARE SERVICED BY CITY WATER AND MUNICIPAL SEWER.
13. AS-BUILT PLANS OF THE SUBDIVISION SHALL BE SUBMITTED ON PAPER AND IN DIGITAL FORMAT AUTOCAD DWG, AUTOCAD DXF OR 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 THE ELECTRICAL POWER, CABLE TELEVISION AND TELEPHONE LINES SHALL BE UNDERGROUND THROUGHOUT THE SITE FOR WHICH DEVELOPMENT IS PROPOSED.
15. ALL CONSTRUCTION SHALL CONFORM WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION (NHDOT) "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" AND WITH THE CITY OF DOVER COMMUNITY SERVICES REGULATIONS AND STANDARD SPECIFICATION FOR CONSTRUCTION. THE MORE STRINGENT SPECIFICATION SHALL APPLY.
16. THE LIMITS OF CONSTRUCTION DISTURBANCE THAT ARE LOCATED IN OR WITHIN THE 50 FT OF CONSERVATION AND WETLAND DISTRICTS SHALL BE STAKED, FLAGGED AND CLEARLY IDENTIFIED PRIOR TO ANY EARTH DISTURBING ACTIVITY OCCURS.
17. ALL TREATMENT SWALES TO BE CONSTRUCTED SHALL HAVE SOD BOTTOMS.
18. A LETTER OF CREDIT FOR THE COST OF REVEGETATING ALL DISTURBED AREAS ON THE SITE SHALL BE SUBMITTED, AND THE APPROVED CONSTRUCTION SIGN INSTALLED PRIOR TO ANY EARTH DISTURBING ACTIVITY.
19. A PRE-CONSTRUCTION CONFERENCE WITH THE DEVELOPER, THE DESIGN ENGINEER, THE EARTHWORK CONTRACTOR AND THE CITY ENGINEER SHALL OCCUR PRIOR TO ANY EARTH DISTURBING ACTIVITY.
20. SITE CONSTRUCTION HOURS SHALL BE LIMITED TO MONDAY-FRIDAY 7 AM-6 PM. HOURS OF CONSTRUCTION MUST BE 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 ASSISTANT CITY MANAGER.
21. BUILDING ADDRESSES (INCLUDING APT/UNIT NUMBERS IF APPLICABLE) SHALL BE ASSIGNED BY THE BUILDING OFFICIAL AT THE TIME OF ISSUANCE OF A BUILDING PERMIT.
22. THE PROPOSED USE FOR THE SITE IS SINGLE FAMILY COTTAGES FOR WORK FORCE HOUSING. 32 TOTAL, 2, 3 AND 4 BEDROOM UNITS.
23. THE FOLLOWING FEDERAL AND STATE PERMITS HAVE BEEN ISSUED FOR THE SUBJECT PROPERTY:
    A. ALTERATION OF TERRAIN (PENDING)
    B. NHDES SEWER DISCHARGE (PENDING)
26. COMMERCIAL VEHICLE ROUTE DURING CONSTRUCTION SHALL CONFORM TO DOVER CITY CODE OR BE COORDINATED WITH THE COMMUNITY SERVICES DIRECTOR.
27. ANY RETAINING WALL OVER FOUR FEET (4') REQUIRES THE ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.
28. AND FENCE TALLER THAN SEVEN FEET (7') REQUIRES THE ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.
29. 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 SUFFICIENT TO PROVIDE NOTICE TO ALL PROSPECTIVE PURCHASERS TO THE REQUIREMENTS FOR MAINTENANCE AND REPORTING.
30. FIRE DEPARTMENT ACCESS ROADS SHALL BE INSTALLED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF FIRE APPARATUS IN ALL WEATHER CONDITIONS AT ALL TIMES.
31. MAXIMUM ALLOWED PARKING SPACE CALCULATION:

USE	UNITS	STANDARD	ALLOWED	PROVIDED
RESIDENTIAL	32	1.4 SPACES/ UNIT + 0.5 GUEST SPACES/UNIT	61	55

32. EXTERIOR LIGHTING SHALL BE CUT-OFF TYPE FIXTURES PER CHAPTER 153-14-E AND SHALL PROVIDE LIGHTING DIRECTED ON-SITE ONLY.
33. TOPOGRAPHIC SURVEY PERFORMED BY HORIZONS ENGINEERING IN MAY, 2023.
34. ELEVATIONS ARE BASED ON NEW HAMPSHIRE STATE PLANE COORDINATES SPC (2800 NH). (VERTICAL DATUM: NAVD88). (DOVER GIS)
35. APPROVED BACKFLOW PREVENTERS SHALL BE PROVIDED FOR BOTH FIRE AND DOMESTIC WATER.
36. A LETTER OF CREDIT FOR THE COST OF REVEGETATING ALL DISTURBED AREAS ON THE SITE SHALL BE SUBMITTED, AND THE APPROVED CONSTRUCTION SIGN INSTALLED PRIOR TO ANY EARTH DISTURBING ACTIVITY OCCURS.
37. EXISTING DAYCARE BUILDING SHALL REMAIN IN SERVICE ON SITE.
38. PROPOSED COTTAGES HAVE A MINIMUM 14' OF SPACE BETWEEN THEM.
39. IT IS ANTICIPATED THAT APPROXIMATELY 10% OF RESIDENTS WOULD WORK FROM HOME.
40. ANY MODIFICATION TO OWNERSHIP RIGHTS, SUCH AS THE CREATION OF CONDOMINIUMS, WOULD REQUIRE PLANNING BOARD APPROVAL.
41. ANY INTERIOR STONE WALLS WILL BE REUSED ON SITE.
42. APPLICANT SHALL COMPLETE LAND USE DEVELOPMENT TRACKING FORM, MOST RECENTLY REVISED VERSION, UTILIZING THE ONLINE POLLUTION TRACKING AND ACCOUNTING PILOT PROJECT (PTAPP) PORTAL. HTTPS://WWW.UNH.EDU/UNHSC/PTAPP.
43. THE SITE LAYOUT IS DESIGNED IN COMPLIANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS. THE PROPOSED STRUCTURE WILL BE ALSO BE DESIGNED IN ACCORDANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS. (I.E. IBC, ANSI-117.1) AND NH RSA 155-A:5.
44. NO SUSTAINED STEEP SLOPES (+20%) WITH AN AREA OF 2,000 SQUARE FEET OR MORE EXIST WITHIN THE PROPOSED DEVELOPMENT AREA.
45. APPROXIMATELY 26,000 SQUARE FEET OF SNOW STORAGE BETWEEN THE ROAD AND THE 50-FOOT WETLAND BUFFER
46. AFTER CONSTRUCTION DESIGN ENGINEER SHALL PROVIDE CITY ENGINEER A CERTIFIED LETTER STATING THE STORMWATER MANAGEMENT SYSTEM HAS BEEN INSTALLED PER THE APPROVED PLANS.
47. AN EASEMENT TO BENEFIT THE CITY OF DOVER SHALL BE PLACED OVER THE NEW ROADS WITHIN THE DEVELOPMENT TO ALLOW ACCESS TO WATER UTILITIES ON SITE.
48. NO FOUNDATION DRAINS OR SUMP PUMPS ARE ALLOWED TO CONNECT INTO THE NEW SEWER SYSTEM.
49. THIS PROJECT IS REQUESTING A TRANSFER OF DEVELOPMENT RIGHT APPROVAL: THE REQUEST IS FRO AN INCREASE IN RESIDENTIAL UNITS: THE UNITS WILL BE AFFORDABLE AND WILL MEET THE HUD FAIR MARKET RENTAL RATE.
50. THE SITE DESIGN AND CONSTRUCTION WILL MEET THE APPLICABLE ACCESSIBILITY REGULATIONS FOR PARKING AND ACCESS TO PUBILC BUILDINGS.



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JOHN RANDOLPH

36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

SITE PLAN

NO.	DATE	REVISION DESCRIPTION	ENG	DWG
1	7.24.23	REVISED PER TRC COMMENTS	TAL	TAL

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

C101

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

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

CATCH BASIN CB-01
RIM=177.40'
INV.(DMH-01)=173.40'
SUMP=170.40'

CATCH BASIN CB-02
RIM=168.40'
INV.(DMH-01)=164.40'
SUMP=160.40'

CATCH BASIN CB-09
RIM=168.85'
INV.(DMH-01)=164.40'
SUMP=160.40'

DRAIN MANHOLE, DMH-01
RIM=169.10'
INV.(CB-01)=164.20'
INV.(CB-02)=164.20'
INV.(CB-09)=164.20'
INV.(DMH-04)=164.10'
SUMP=163.10'

STORM DRAIN SD-01, 12" HDPE
L=173, S=0.053

STORM DRAIN SD-02, 18" HDPE
L=201, S=0.020

HIGH POINT, STA 5+08.6,
ELEVATION 172.60'

CATCH BASIN CB-03
RIM=169.10'
INV.(DMH-02)=165.10'
SUMP=161.10'

STORM DRAIN SD-03, 12" HDPE
L=84.5', S=0.058

DRAIN MANHOLE, DMH-02
RIM=166.00'
INV.(CB-03)=160.20'
INV.(CB-04)=160.20'
INV.(O)=160.10'
SUMP=159.10'

CATCH BASIN CB-04
RIM=164.80'
INV.(DMH-02)=160.80'
INV.(OF)=162.0'
SUMP=156.80'

OVERFLOW PIPE, TYP., 12" HDPE
L=20', S=0.050

RIPRAP OUTLET PROTECTION
#1, INV=160.0, SEE DETAIL

SAGE DRIVE

CROCKER DRIVE

KATJA DRIVE

HIGH POINT, STA 14+47, ELEVATION 180.40'

DRAIN MANHOLE, DMH-03
RIM=163.62'
INV.(CB-05)=159.20'
INV.(O)=159.10'
SUMP=158.10'

CATCH BASIN CB-05
RIM=163.40'
INV.(DMH-03)=159.40'
INV.(OF)=162.0'
SUMP=155.40'

CATCH BASIN CB-06
RIM=164.95'
INV.(DMH-04)=160.95'
INV.(OF)=162.0'
SUMP=156.95'

UNDERGROUND INFILTRATION SYSTEM, 4'-0" PERFORATED
PLASTIC PIPE EMBEDDED IN CRUSHED STONE, TYP., SEE DETAIL

DRAIN MANHOLE, DMH-04
RIM=165.17'
INV.(CB-06)=160.75'
INV.(DMH-01)=160.10'
INV.(O)=160.00'
SUMP=159.00'

CATCH BASIN CB-08
RIM=175.20'
INV.=171.20'
SUMP=167.20'

STORM DRAIN SD-06 12" HDPE
L=143', S=0.064

PROPOSED EROSION CONTROLS, TYPICAL (SEE
DETAILS); CONTRACTOR MAY USE SEDIMENT FENCE,
PERVIOUS MULCH BERM, FILTREXX SOXX, OR A
COMBINATION OF ONE OR MORE OF THOSE THREE.

CATCH BASIN SEDIMENT TRAP, TYP. OF ALL INSTALLED
CATCH BASINS UNTIL 100% UPGRADIENT DISTURBED
AREA IS STABILIZED, SEE DETAIL

CATCH BASIN, CB-07
RIM=167.05'
INV.(DMH-05)=163.05'
SUMP=159.05'

DRAIN MANHOLE, DMH-05
RIM=167.30'
INV.(CB-07)=162.85'
INV.(CB-08)=162.00'
INV.(UIS)=160.00'
SUMP=159.00'

2:1 PROPOSED SLOPE, TYP., TURF REINFORCEMENT, SEE
DETAIL

STABILIZED CONSTRUCTION
ENTRANCE, TYP., SEE DETAIL

LOW POINT STA 16+60, ELEVATION 168.50'

STORMWATER PRE-TREATMENT SWALE, SEE DETAIL

STONE LIP LEVEL SPREADER, SEE DETAIL
BOTTOM=164.5'
OVERFLOW=165.5'

N/F
ROSEMARY A. PIXLEY TRI
MAP A47 LOT 21

0 20 40 80 160
SCALE IN FEET

FILE # SITE-2023-0005

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JOHN RANDOLPH

36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

GRADING, DRAINAGE & EROSION CONTROL PLAN

NO.	DATE	REVISION DESCRIPTION	ENG	DWG
1	7.24.23	REVISED PER TRC COMMENTS	TAL	TAL

DATE: 2023.06.02	PROJECT #: 230277
ENGIN'D BY: TAL	DRAWN BY: TAL
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C102

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

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

N/F
ROSEMARY A. PIXLEY TRI
MAP A47 LOT 21

SEWER MANHOLE, SMH-01
RIM=178.67'
INV(o)=172.00'

4" SEWER SERVICE, TYP., SEE DETAIL

3/4" CTS HDPE WATER SERVICE
w/SHUTOFF, TYP., SEE DETAIL

PROPOSED GAS SERVICE LINE, TYP.
ALL DWELLINGS, SEE DETAIL

PROPOSED GAS LINE,
TYP.

INTERNAL WATER
LINE LOOP, 6" DI

SEWER MANHOLE, SMH-04
RIM=172.00'
INV(SMH-05)=165.33'

45 DEGREE BEND w/THRUST BLOCK,
TYP., SEE DETAIL

SEWER MANHOLE, SMH-07
RIM=171.75'
INV(SMH-08)=165.08'

PROPOSED LIGHTING, TYP.,
SEE LIGHTING PLAN

SEWER MANHOLE, SMH-08
RIM=170.10'
INV.(SMH-07)=163.34'
INV.(SMH-09)=163.24'

PROPOSED 8" DI WATERLINE STUB

8" PVC, L=78.5', S=0.037

8" PVC, L=126.2', S=0.014

SEWER MANHOLE, SMH-02
RIM=178.80'
INV.(SMH-01)=170.95'
INV.(SMH-03)=170.85'

ELECTRIC TRANSFORMER, TYP.

CENTRAL WATER
LINE, 8" DI

6" SEWER INV=181.47

NEW 4" GRAVITY CONNECTION FROM EXISTING
BUILDING TO NEW SEWER SYSTEM

UNDERGROUND ELECTRIC LINE

PROPOSED HYDRANT, TYP.

CONDUIT FOR POTENTIAL
EV CHARGING STATION

CONNECT TO EXISTING GAS SERVICE

CONNECT TO EX. WATER SERVICE, 6"x8"
TAPPING SLEEVE w/THRUST BLOCK

EXTEND NEW 4" SEWER FORCE MAIN,
1,740 FEET TO NEW GRAVITY LINE
INSTALLED WITHIN OLIVE MEADOW

SEWER MANHOLE, SMH-10
RIM=176.0'
INV.(SMH-11)=164.10'
INV.(SMH-03)=164.00'

SEWER MANHOLE, SMH-03
RIM=176.00'
INV.(SMH-02)=169.30'
INV(SMH-10)=163.28'
INV(SMH-05)=163.18'

SEWER MANHOLE, SMH-11
RIM=176.30'
INV.(SMH-10)=164.63'

SEWER MANHOLE, SMH-05
RIM=174.00'
INV(SMH-03)=162.52'
INV(I)(B)=164.13'
INV(SMH-06)=162.42'

8"x6" DI TEE w/THRUST BLOCK, TYP.

SEWER MANHOLE, SMH-06
RIM=168.20'
INV(SMH-05)=160.53'
INV(PS)=160.40'

SEWER MANHOLE, SMH-09
RIM=167.0'
INV.(SMH-08)=160.33'
INV.(PS)=160.23'

BACKUP GENERATOR

SEWER PUMP STATION & VALVE PIT, SEE DETAIL
RIM=165.00'
INV(SMH-06)=158.33'
INV(SMH-09)=158.33'
SUMP=152.00'

4" SEWER FORCE MAIN

EXISTING OPEN SPACE EASEMENT
CONSERVATION EASEMENT
200,000 SQ. FT.
SEE 3940/348 & 4024/622

0 20 40 80 160
SCALE IN FEET

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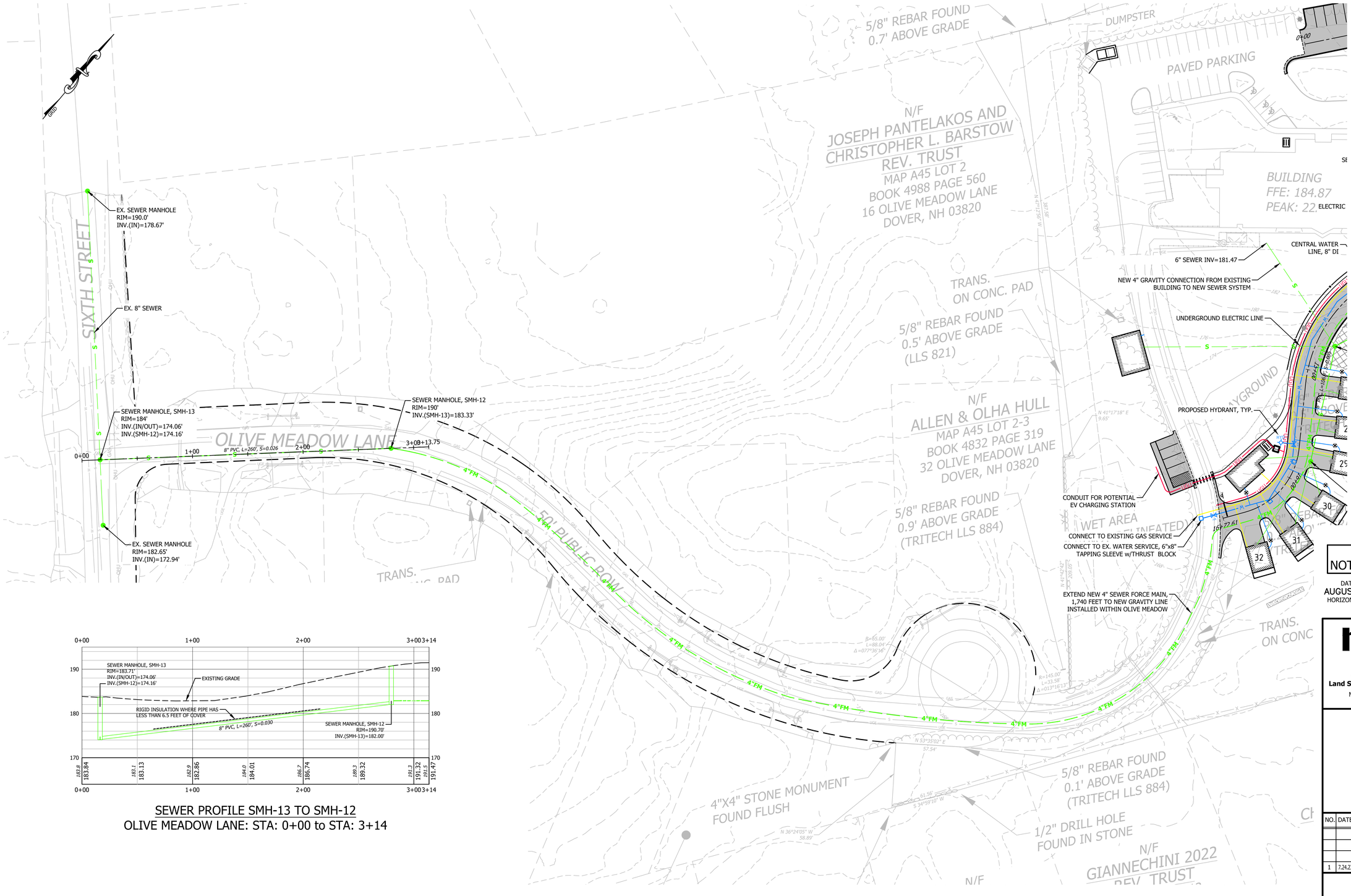
36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

UTILITY PLAN

NO.	DATE	REVISION DESCRIPTION	ENG	DWG
1	7.24.23	REVISED PER TRC COMMENTS	TAL	TAL

DATE: 2023.06.02	PROJECT #: 230277
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C103



SEWER PROFILE SMH-13 TO SMH-12
OLIVE MEADOW LANE: STA: 0+00 to STA: 3+14

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UTILITY PLAN

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C103.1

FILE # SITE-2023-0005

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

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

N/F
ROSEMARY A. PIXLEY TRI
MAP A47 LOT 21

SEWER MANHOLE, SMH-01
RIM=178.67'
INV(o)=172.00'

4" SEWER SERVICE, TYP., SEE DETAIL

3/4" CTS HDPE WATER SERVICE
w/SHUTOFF, TYP., SEE DETAIL

PROPOSED GAS SERVICE LINE, TYP.
ALL DWELLINGS, SEE DETAIL

PROPOSED GAS LINE,
TYP.

INTERNAL WATER
LINE LOOP, 6" DI

SEWER MANHOLE, SMH-04
RIM=172.00'
INV(SMH-05)=165.33'

45 DEGREE BEND w/THRUST BLOCK,
TYP., SEE DETAIL

SEWER MANHOLE, SMH-07
RIM=171.75'
INV(SMH-08)=165.08'

PROPOSED LIGHTING, TYP.,
SEE LIGHTING PLAN

SEWER MANHOLE, SMH-08
RIM=170.10'
INV.(SMH-07)=163.34'
INV.(SMH-09)=163.24'

PROPOSED 8" DI WATERLINE STUB

8" PVC, L=78.5', S=0.037

8" PVC, L=126.2', S=0.014

SEWER MANHOLE, SMH-02
RIM=178.80'
INV.(SMH-01)=170.95'
INV.(SMH-03)=170.85'

ELECTRIC TRANSFORMER, TYP.

CENTRAL WATER
LINE, 8" DI

6" SEWER INV=181.47

NEW 4" GRAVITY CONNECTION FROM EXISTING
BUILDING TO NEW SEWER SYSTEM

UNDERGROUND ELECTRIC LINE

PROPOSED HYDRANT, TYP.

CONDUIT FOR POTENTIAL
EV CHARGING STATION

CONNECT TO EXISTING GAS SERVICE

CONNECT TO EX. WATER SERVICE, 6"x8"
TAPPING SLEEVE w/THRUST BLOCK

EXTEND NEW 4" SEWER FORCE MAIN,
1,740 FEET TO NEW GRAVITY LINE
INSTALLED WITHIN OLIVE MEADOW

SEWER MANHOLE, SMH-10
RIM=176.0'
INV.(SMH-11)=164.10'
INV.(SMH-03)=164.00'

SEWER MANHOLE, SMH-03
RIM=176.00'
INV.(SMH-02)=169.30'
INV(SMH-10)=163.28'
INV(SMH-05)=163.18'

SEWER MANHOLE, SMH-11
RIM=176.30'
INV.(SMH-10)=164.63'

SEWER MANHOLE, SMH-05
RIM=174.00'
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INV(I)(B)=164.13'
INV(SMH-06)=162.42'

8"x6" DI TEE w/THRUST BLOCK, TYP.

SEWER MANHOLE, SMH-06
RIM=168.20'
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INV(PS)=160.40'

SEWER MANHOLE, SMH-09
RIM=167.0'
INV.(SMH-08)=160.33'
INV.(PS)=160.23'

BACKUP GENERATOR

SEWER PUMP STATION & VALVE PIT, SEE DETAIL
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INV(SMH-06)=158.33'
INV(SMH-09)=158.33'
SUMP=152.00'

4" SEWER FORCE MAIN

EXISTING OPEN SPACE EASEMENT
CONSERVATION EASEMENT
200,000 SQ. FT.
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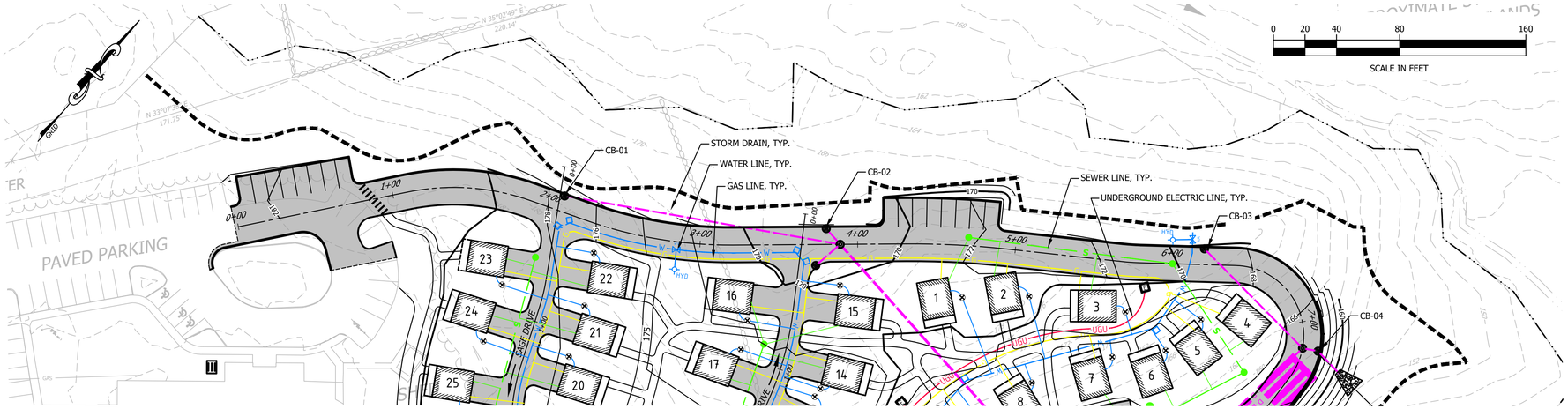
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DOVER, NEW HAMPSHIRE

UTILITY PLAN

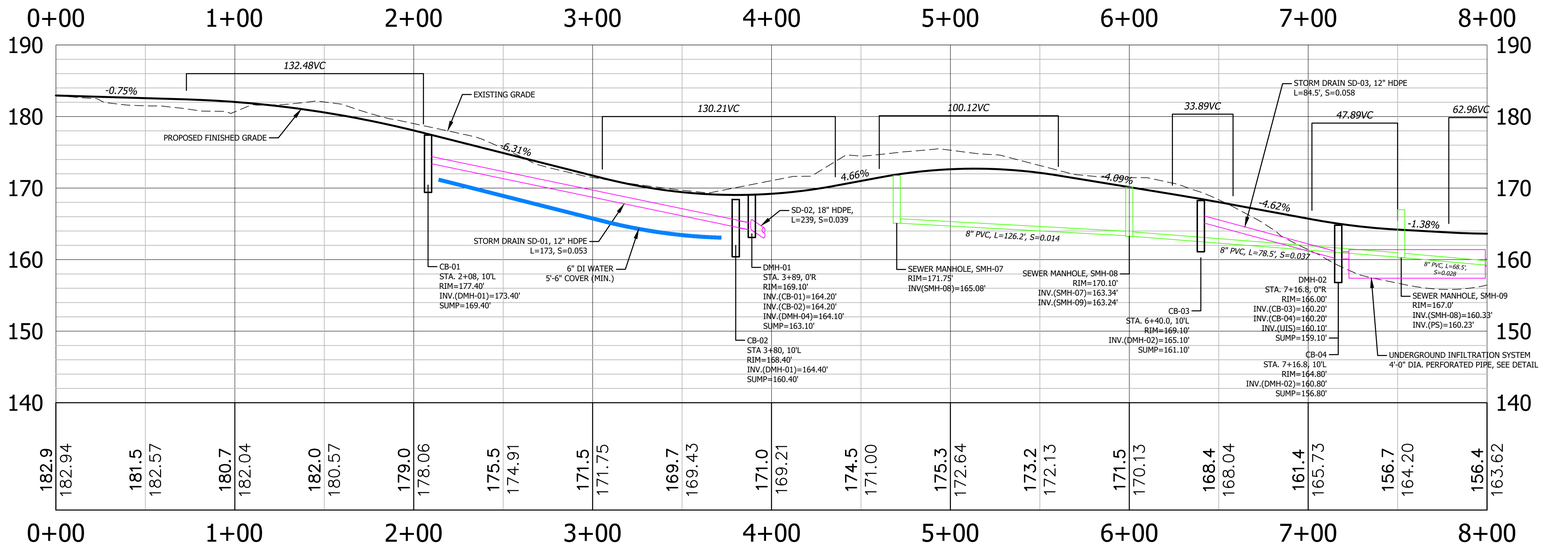
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C103



KATJA DRIVE PLAN VIEW
STA: 0+00 to STA: 8+00
SCALE: 1"=40'



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

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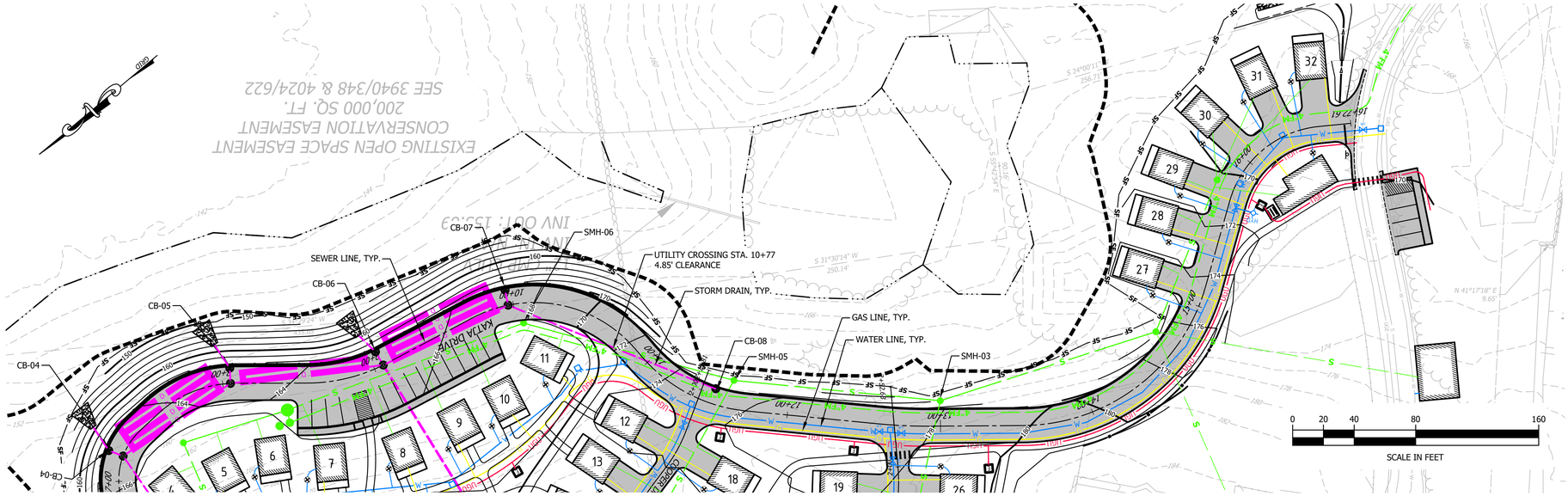
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PLAN & PROFILE SHEET 1 OF 2

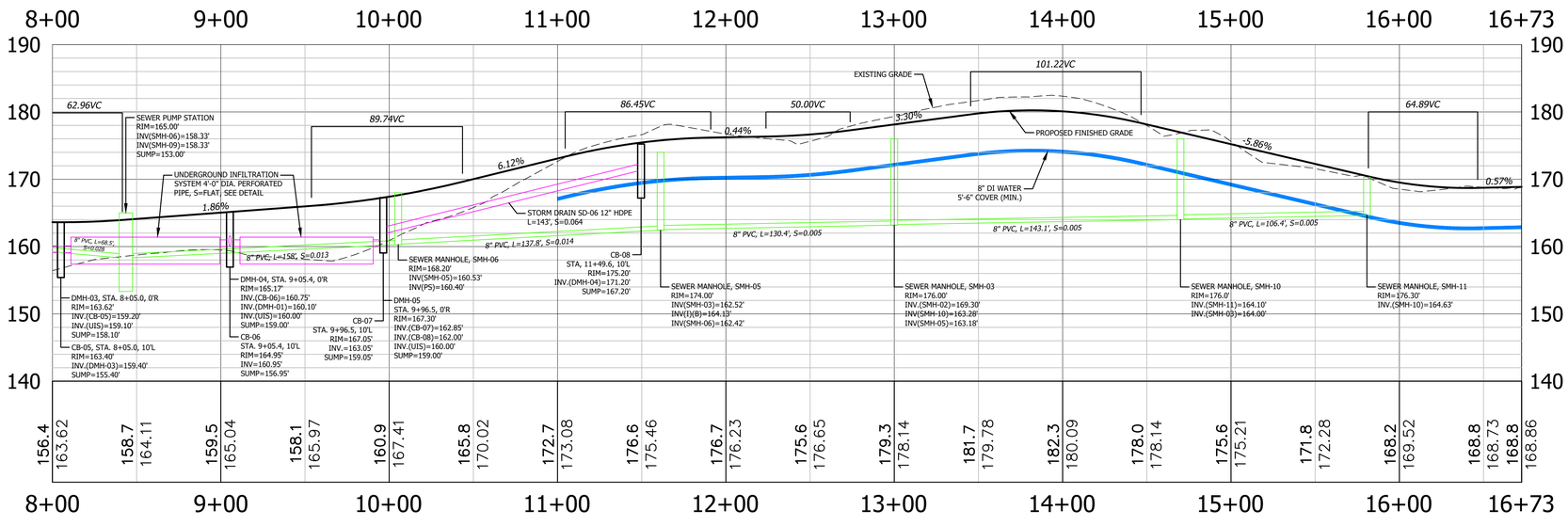
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C104



KATJA DRIVE PLAN VIEW
STA: 8+00 to STA: 16+73
SCALE: 1"=40'



KATJA DRIVE PROFILE
STA: 8+00 to STA: 16+73
SCALE(H): 1"=40'
SCALE(V): 1"=10'

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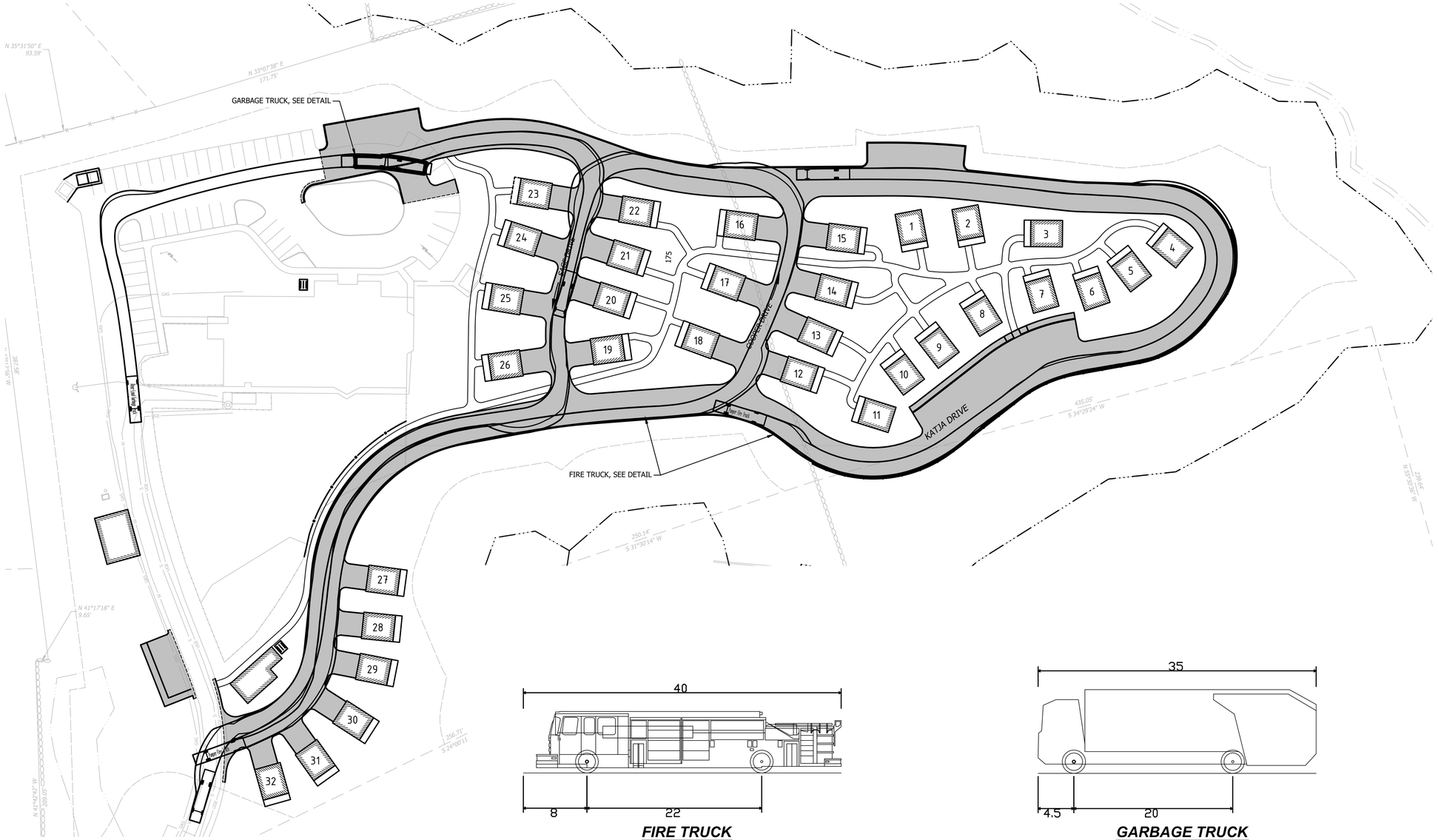
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PLAN & PROFILE SHEET 2 OF 2

NO.	DATE	REVISION DESCRIPTION	ENG	DWG
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C105	



FIRE TRUCK

Pumper Fire Truck	
Overall Length	40.000ft
Overall Width	8.167ft
Overall Body Height	7.745ft
Min Body Ground Clearance	0.656ft
Track Width	8.167ft
Lock-to-lock time	5.00s
Max Wheel Angle	45.00°

GARBAGE TRUCK

Rear-Load Garbage Truck	
Overall Length	35.000ft
Overall Width	8.375ft
Overall Body Height	10.546ft
Min Body Ground Clearance	1.000ft
Track Width	8.375ft
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	29.300ft

0 20 40 80 160

SCALE IN FEET

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TURNING DIAGRAM PLAN

NO.	DATE	REVISION DESCRIPTION	ENG	DWG
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C200

CONSTRUCTION SEQUENCING AND EROSION CONTROL NOTES:

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

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

PROTECTED SHORELAND REQUIREMENTS

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

COLD WEATHER SITE STABILIZATION

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

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

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

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

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

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

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

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

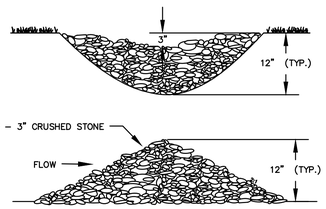
DUST CONTROL
A. DUST SHALL BE CONTROLLED ON SITE DURING CONSTRUCTION BY IMPLEMENTING THE FOLLOWING DUST CONTROL MEASURES
1. MULCHING AND VEGETATIVE COVER TO REDUCE DUST.
2. MECHANICAL SWEEPERS AND FINE WATER SPRAYS.
3. COVER SURFACES WITH CRUSHED STONE OR COARSE GRAVEL.

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



L = THE DISTANCE SUCH THAT POINTS A AND B ARE OF EQUAL ELEVATION.

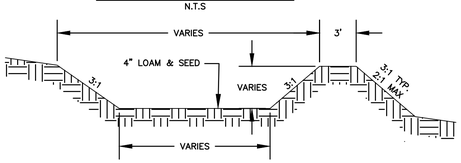
STONE CHECK DAM PROFILE VIEW
N.T.S



CONSTRUCTION SPECIFICATIONS:
1. STRUCTURES SHALL BE INSTALLED ACCORDING TO THE DIMENSIONS SHOWN ON THE PLANS AT THE APPROPRIATE SPACING.
2. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER SO THAT EROSION, AIR AND WATER POLLUTION WILL BE MINIMIZED.
5. STRUCTURES SHALL BE REMOVED FROM THE CHANNEL WHEN THEIR USEFUL LIFE HAS BEEN COMPLETED.

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

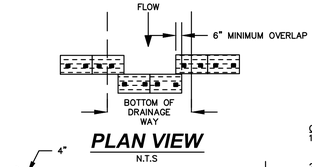
STONE CHECK DAM
N.T.S



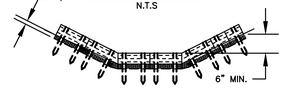
CONVEYANCE SWALE DETAIL
N.T.S

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

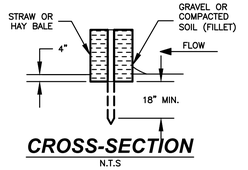
MAINTENANCE NOTES:
1. INSPECT ANNUALLY FOR EROSION, SEDIMENT ACCUMULATION, VEGETATION LOSS, AND PRESENCE OF INVASIVE SPECIES.
2. PERFORM PERIODIC MOWING. DO NOT MOW GRASS SHORTER THAN 4 INCHES.
3. REMOVE DEBRIS AND ACCUMULATED SEDIMENT BASED ON INSPECTION.
4. REPAIR ERODED AREAS, REMOVE INVASIVE SPECIES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



PLAN VIEW
N.T.S



DRAINAGE WAY CROSS-SECTION
N.T.S

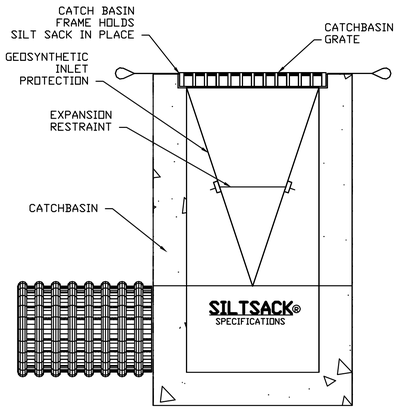


CROSS-SECTION
N.T.S

CONSTRUCTION SPECIFICATIONS:
1. STRUCTURES SHALL BE INSTALLED ACCORDING TO THE DIMENSIONS SHOWN ON THE PLANS AT THE APPROPRIATE SPACING.
2. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER SO THAT EROSION, AIR AND WATER POLLUTION WILL BE MINIMIZED.
3. HAY BALES SHALL BE PLACED IN ROWS WITH ENDS TIGHTLY ABUTTING. WHEN PLACED IN CHANNELS BALES SHALL BE STAGGERED AND OVERLAPPED AS SHOWN IN THE DETAIL.
4. HAY BALES SHALL BE EMBEDDED ONTO THE SOIL AT LEAST 4 INCHES.
5. HAY BALES SHALL BE ANCHORED INTO THE SOIL USING 2" X 2" STAKES DRIVEN THROUGH THE BALES AT LEAST 18" INTO THE SOIL.
6. STRUCTURES SHALL BE REMOVED FROM THE CHANNEL WHEN THEIR USEFUL LIFE HAS BEEN COMPLETED.

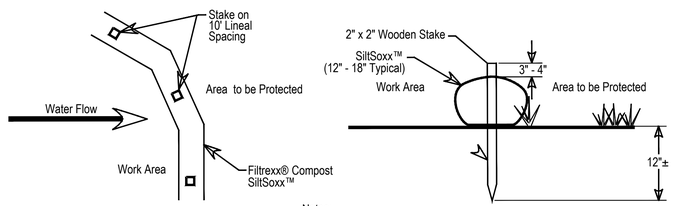
MAINTENANCE NOTES:
1. TEMPORARY GRADE STABILIZATION STRUCTURES SHOULD BE INSPECTED AFTER EACH STORM AND DAILY DURING PROLONGED STORM EVENTS. ANY DAMAGE TO THE STRUCTURES SHALL BE REPAIRED IMMEDIATELY.
2. PARTICULAR ATTENTION SHOULD BE GIVEN TO END RUN AND EROSION AT THE DOWNSTREAM TOE OF THE STRUCTURE.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

HAY BALE INLET PROTECTION DETAIL
N.T.S



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

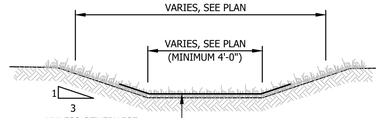
CATCH BASIN GEOSYNTHETIC SEDIMENT TRAP
N.T.S.



®SiltSoxx™ Plan View

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

SILTSOXX DETAIL



PRE-TREATMENT SWALE DETAIL
NOT TO SCALE

FOR REVIEW
NOT FOR CONSTRUCTION

DATE OF PRINT
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horizons Engineering
Civil and Structural Engineering
Land Surveying and Environmental Consulting
MAINE • NEW HAMPSHIRE • VERMONT
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JOHN RANDOLPH

36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

CONSTRUCTION DETAILS

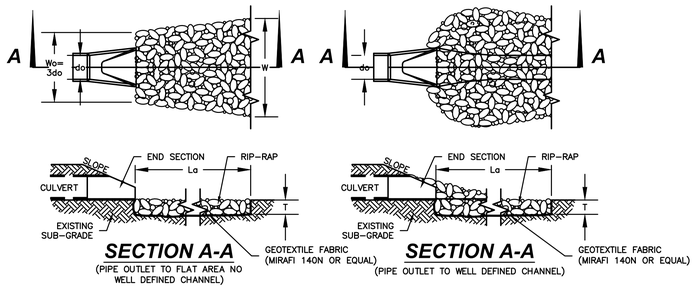
NO.	DATE	REVISION DESCRIPTION	ENG	DWG
1	7.24.23	REVISED PER TRC COMMENTS	TAL	TAL

DATE: 2023.06.02	PROJECT #: 230277
ENGIN'D BY: TAL	DRAWN BY: TAL
CHECK'D BY: MJS	ARCHIVE #: H-___
C501	

FILE # SITE-2023-0005

SEED MIXTURE SELECTION BASED ON SOIL TYPE				
	SOIL DRAINAGE			
USE	SEEDING MIXTURE	DROUGHTY	WELL DRAINED	MODERATELY WELL DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A B C D	FAIR POOR POOR FAIR	GOOD GOOD GOOD EXCELLENT	GOOD FAIR EXCELLENT EXCELLENT
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A C	GOOD GOOD	GOOD EXCELLENT	GOOD EXCELLENT
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES.	A B C	GOOD GOOD GOOD	GOOD GOOD EXCELLENT	GOOD FAIR EXCELLENT
PLAY AREAS AND ATHLETIC FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.)	E F	FAIR FAIR	EXCELLENT EXCELLENT	EXCELLENT EXCELLENT
NOTE: POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREAS AND ATHLETIC FIELDS.				

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



RIP-RAP GRADATION

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

d50 = 9"	% OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE (INCHES)		
	100	12	TO	16
	85	10.4	TO	14.4
	50	8	TO	12
	15	2.4	TO	4

RIP RAP DIMENSION TABLE

LOCATION	Wo	W	La	T	d50
RIP RAP OUTLET #1 – 18" HDPE OUTLET PIPE	4.5'	13.5'	15'	24"	12"
RIP RAP OUTLET #2 – 18" HDPE OUTLET PIPE	4.5'	13.5'	15'	24"	12"
RIP RAP OUTLET #3 – 18" HDPE OUTLET PIPE	4.5'	13.5'	15'	24"	12"

CONSTRUCTION SPECIFICATIONS:
1. PREPARE THE SUB-GRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIP-RAP TO THE GRADES SHOWN ON THE PLANS.
2. MINIMUM 6" SAND/GRAVEL BEDDING OR GEOTEXTILE FABRIC (MIRAFI 140N OR EQUAL) REQUIRED UNDER ALL ROCK RIP-RAP.
3. THE ROCK OR GRAVEL USED FOR FILTER OR RIP-RAP SHALL CONFORM TO THE SPECIFIED GRADATION.
4. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF ROCK RIP-RAP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO (2) PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
5. STONE FOR THE RIP-RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

MAINTENANCE NOTES:
1. OUTLETS SHALL BE INSPECTED AND CLEANED ANNUALLY AND AFTER ANY MAJOR STORM EVENT. ANY EROSION OR DAMAGE TO THE RIP-RAP SHALL BE REPAIRED IMMEDIATELY.
2. THE CHANNEL IMMEDIATELY DOWNSTREAM FROM THE OUTLET SHOULD BE CHECKED TO SEE THAT NO EROSION IS OCCURRING.
3. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO THE OUTLET PROTECTION APRON.

PIPE OUTLET PROTECTION DETAIL

NOT TO SCALE

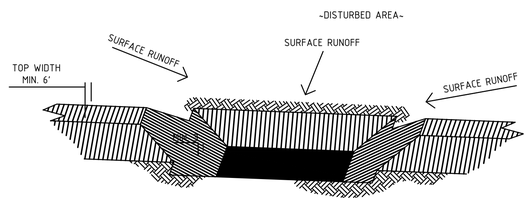
CONSTRUCTION SEQUENCING:

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

1. SCHEDULE A PRE-CONSTRUCTION MEETING WITH CITY OFFICIALS, OWNER, AND CONTRACTORS IF REQUIRED BY THE CONDITIONS OF APPROVAL PRIOR TO BEGINNING CONSTRUCTION.
2. CONTACT DIG-SAFE, INDIVIDUAL UTILITIES, AND CITY DEPARTMENTS TO GET ALL UTILITIES MARKED PRIOR TO START OF CONSTRUCTION.
3. THE OWNER OR SITE GENERAL CONTRACTOR SHALL FILE A NOTICE OF INTENT (NOI) FOR COVERAGE UNDER THE EPA'S CONSTRUCTION GENERAL PERMIT (CGP). A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) SHALL BE AVAILABLE ON SITE.
4. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCES IN ACCORDANCE WITH THE STABILIZED CONSTRUCTION ENTRANCE DETAIL. A CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED AT THE BACK ROAD AND MCKONE LANE ACCESS POINTS.
5. CONSTRUCT AND STABILIZE ALL TEMPORARY AND PERMANENT SEDIMENT AND EROSION CONTROLS INCLUDING SWALES AND SEDIMENT TRAPS.
   5.1. SEDIMENT AND EROSION PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH MOVING OPERATIONS AND SHALL FULLY ENCOMPASS ALL WORK COMPLETED DURING EACH PHASE.
   5.2. INSTALL SWALES AND TEMPORARY SEDIMENT TRAPS PRIOR TO ROUGH GRADING. THE LOCATION OF THE SEDIMENT TRAPS ARE SHOWN ON THE GRADING PLANS. A SEDIMENT TRAP DETAIL, INCLUDING SIZING INFORMATION, IS SHOWN ON SHEET D2.
   5.3. CONSTRUCTION OF THE STORMWATER PONDS AND TREATMENT SWALES SHALL BEGIN AFTER ALL CONTRIBUTING DISTURBED AREAS HAVE BEEN STABILIZED.
6. THIS PROJECT SHALL BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 450:53 AND CHAPTER Agr 3800 RELATIVE TO INVASIVE SPECIES.
7. INSTALL TEMPORARY CONSTRUCTION GATE AT NEW ENTRANCE ROAD FOR SAFETY PURPOSES.
8. CLEAR AND GRUB THE ROADWAY AND PARKING AREAS, AND THE HOUSING AREA TO THE SOUTHWEST. REMOVE ORGANICS ONLY FROM THOSE AREAS THAT CAN BE WORKED AND STABILIZED WITHIN 45 DAYS OF REMOVAL. LOAM STOCKPILES SHALL BE STORED ON THE EXISTING CLEARED AREA TO THE SOUTHEAST OF THE ROADWAY. STOCKPILES SHALL BE TEMPORARILY STABILIZED WITH MULCH. STUMPS MAY BE DISPOSED OF ON OR OFFSITE IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS.
9. MINIMIZE DISTURBANCE OF PREVIOUSLY STABILIZED SOILS ON SITE, THAT ARE OUTSIDE OF THE ROADWAY AND STORMWATER CONTROL AREAS.
10. TOTAL SITE DISTURBANCE DEPICTED ON THESE PLANS IS APPROXIMATELY 178,100 SF (~4.1 AC.).
    10.1. REFER TO VEGETATION AND EROSION CONTROL NOTES ON THIS PLAN DURING CONSTRUCTION.
    10.2. THE ROAD CONSTRUCTION FOR THIS PROJECT WILL BE CONSTRUCTED IN ONE PHASE.
    10.3. ALL CONSTRUCTION SHALL FOLLOW EROSION CONTROL REQUIREMENTS AND CONSTRUCTION SEQUENCE AND SHALL BE STABILIZED WITHIN 45 DAYS OF COMPLETION.

11. ROAD CONSTRUCTION
    11.1 PROCEED WITH ROAD CONSTRUCTION IN THE LOCATION AND TO GRADES AS SHOWN ON THE PLANS. EXCAVATE ROADWAY TO SUBGRADE.
    11.2 PLACE SELECT FILLS IN LOCATIONS AND TO THE GRADES SHOWN ON PLANS PER THE APPLICABLE DETAILS AND THE FOLLOWING:
    11.2.1. PLACE FILL MATERIAL MEETING THE SPECIFICATION OF NHDOT 304.1 IN MAXIMUM 12" LIFTS AND COMPACT TO 95% MAXIMUM DRY DENSITY.
    11.2.2. ALL MATERIAL SHALL BE FREE OF DELETERIOUS MATERIALS SUCH AS LOAM, STUMPS, BRUSH, AND ROCKS LARGER THAN 3/4 THE DEPTH OF THE LIFT BEING PLACED.
    11.2.3 LOAM AND SEED SLOPES WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
    11.3 BASE MATERIALS:
    11.3.1. BANK RUN AND CRUSHED GRAVEL SHALL BE PLACED IN 6" LIFTS AND COMPACTED TO 95% MAXIMUM DRY DENSITY TO THE DEPTHS SPECIFIED IN THE ROAD CROSS-SECTION DETAILS.
    11.4 PAVEMENT:
    11.4.1. PLACE AS SOON AS POSSIBLE AFTER THE SELECT MATERIALS ARE INSTALLED AND ACCEPTED TO ELIMINATE SOIL EROSION.
    11.4.2. STABILIZE ALL ROADWAYS WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
    11.4.3. DRIVEWAY APRONS SHALL BE INCLUDED IF BASE GRAVELS HAVE BEEN PLACED.
12. UNDERGROUND UTILITIES SHALL BE INSTALLED WITH THE PROGRESS OF THE ROAD CONSTRUCTION. ELECTRICAL AND COMMUNICATION CONDUITS SHALL BE INSTALLED BY LICENSED PROFESSIONALS AND IN ACCORDANCE WITH THE SPECIFIC STANDARDS. THE SEWER FORCEMAIN AND WATER LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS HEREIN.
13. INSPECT, MAINTAIN, AND IF NECESSARY REPAIR ALL EROSION AND SEDIMENT CONTROL MEASURES AS STATED IN THE EROSION CONTROL NOTES ON THIS SHEET. PROVIDE AN EROSION CONTROL LOG INDICATING THE DATE INSPECTED, WHO INSPECTED, WHAT WAS FOUND, AND WHAT WAS DONE (IF ANYTHING).
14. REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AFTER SITE IS STABILIZED AND RESEED ANY AREAS DISTURBED BY REMOVAL. THE APPROXIMATE DATE FOR REMOVAL OF EROSION CONTROLS IS AUGUST 2018.
15. IF NECESSARY, ALL DRAINAGE STRUCTURES AND PIPES SHALL BE FLUSHED/PUMPED FREE OF SEDIMENT AFTER STABILIZATION IS COMPLETE.
16. LOT DISTURBANCE, OTHER THAN THAT SHOWN ON THE APPROVED PLANS, SHALL NOT COMMENCE UNTIL AFTER THE ROADWAY HAS THE BASE COURSE TO DESIGN ELEVATION AND THE ASSOCIATED DRAINAGE IS COMPLETE AND STABLE.

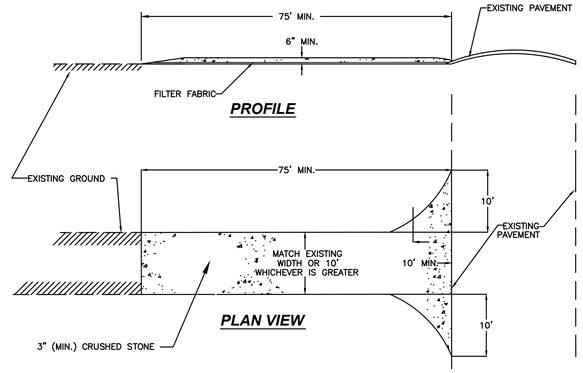
17. UNIT CONSTRUCTION
    17.1 UNITS WILL BE CONSTRUCTED IN GROUPS OF 10-15.
    17.2 CONSTRUCTION OF UNITS WILL BEGIN ON THE GROUP ON THE EAST SIDE AND PROCEED TO THE WEST SIDE, FROM SOUTH TO NORTH.
    17.3 UTILITY CONNECTIONS SHALL BE COORDINATED WITH FOUNDATION CONSTRUCTION



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

TEMPORARY SEDIMENT TRAP DETAIL

N.T.S

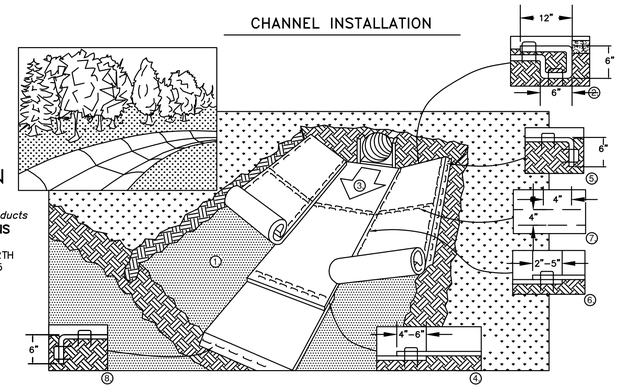


STABILIZED CONSTRUCTION ENTRANCE DETAIL

N.T.S

STABILIZED CONSTRUCTION ENTRANCE NOTES:
1. GRADE AND COMPACT ACCESS ROAD ENTRANCE AS NECESSARY. PLACE FILTER FABRIC (MIRAFI OR EQUAL) AND PLACE 6" OF 3" CRUSHED STONE TO MATCH SLOPE OF EXISTING ROAD.
2. PROVIDE NECESSARY SWALES OR DIVERSIONS TO MINIMIZE DIRECT FLOW OF WATER ONTO STONE AREA.
3. CONSTRUCTION ENTRANCE SHALL BE MAINTAINED AS NECESSARY TO REMOVE SILT FROM TIRES PRIOR TO ENTERING PUBLIC ROADS. A SMALL SWALE SHALL BE CONSTRUCTED ON THE DOWN GRADIENT SIDE TO TRAP ANY SILT WASHED FROM THE STONE ENTRANCE.
4. THE MINIMUM LENGTH OF THE PAS SHOULD BE 75 FEET, EXCEPT THAT THE MINIMUM LENGTH MAY BE REDUCED TO 50 FEET IF A 3 INCH TO 6 INCH HIGH PERM IS INSTALLED AT THE ENTRANCE OF THE PROJECT SITE.
5. THE PAD SHOULD SLOPE AWAY FROM THE EXISTING ROADWAY.

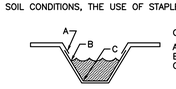
CHANNEL INSTALLATION



NORTH AMERICAN GREEN
EROSION CONTROL *Products Guaranteed* SOLUTIONS
14649 HIGHWAY 41 NORTH
EVANSVILLE, IN 47725
800-772-2040
www.nagreen.com

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

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



CRITICAL POINTS
A. OVERLAPS AND SEAMS
B. PROJECTED WATER LINE
C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

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

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

TYPICAL TURF REINFORCEMENT MATTING DETAIL

N.T.S

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

FOR REVIEW
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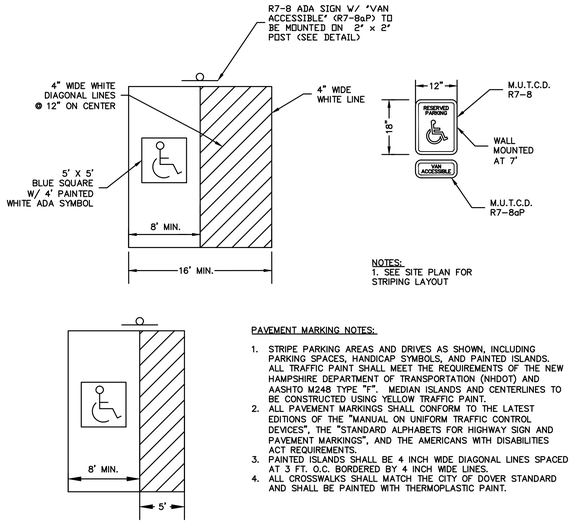
CONSTRUCTION DETAILS

NO.	DATE	REVISION DESCRIPTION	ENG	DWG
1	7.24.23	REVISED PER TRC COMMENTS	TAL	TAL

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

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FILE # SITE-2023-0005



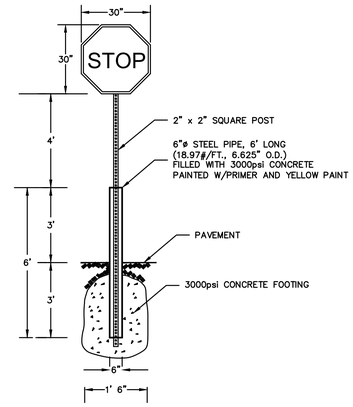
NOTES:
1. SEE SITE PLAN FOR STRIPING LAYOUT

PAVEMENT MARKING NOTES:

1. STRIPE PARKING AREAS AND DRIVES AS SHOWN, INCLUDING PARKING SPACES, HANDICAP SYMBOLS, AND PAINTED ISLANDS. ALL TRAFFIC PAINT SHALL MEET THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION (NHDOT) AND AASHTO M248 TYPE "F". MEDIAN ISLANDS AND CENTERLINES TO BE CONSTRUCTED USING YELLOW TRAFFIC PAINT.
2. ALL PAVEMENT MARKINGS SHALL CONFORM TO THE LATEST EDITIONS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", THE "STANDARD ALPHABETS FOR HIGHWAY SIGN AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS.
3. PAINTED ISLANDS SHALL BE 4 INCH WIDE DIAGONAL LINES SPACED AT 3 FT. O.C. BORDERED BY 4 INCH WIDE LINES.
4. ALL CROSSWALKS SHALL MATCH THE CITY OF DOVER STANDARD AND SHALL BE PAINTED WITH THERMOPLASTIC PAINT.

ADA STRIPING AND SIGN DETAIL

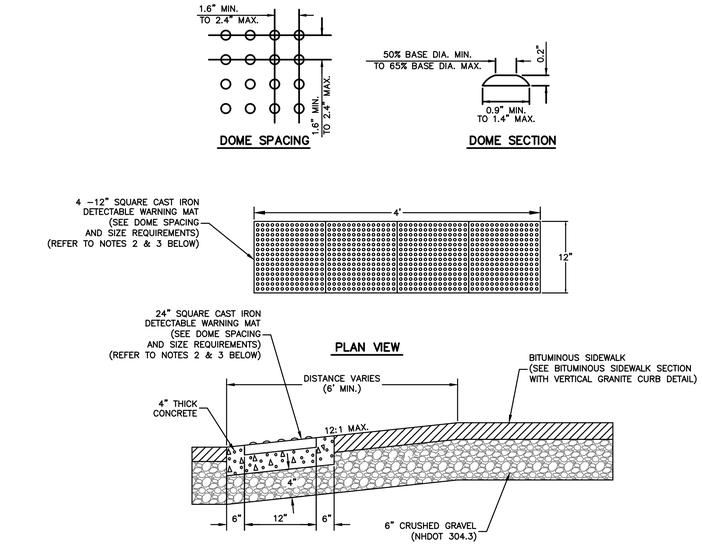
N.T.S



TYPICAL SIGN DETAIL

N.T.S.

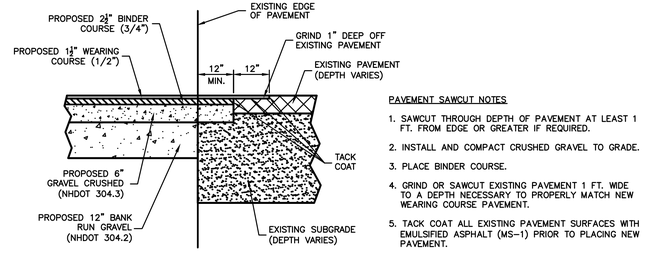
NOTES:
1. SEE PLANS FOR SIGN PLACEMENT.



DETECTABLE WARNING MAT DETAIL

N.T.S

NOTES:
1. MAXIMUM CROSS SLOPE OF SIDEWALK TO BE 2%.
2. CONCRETE TO BE 4,000 PSF.
3. REFER TO MANUFACTURER'S SPECIFICATIONS FOR INSTALLATION OF DETECTABLE WARNING MATS.

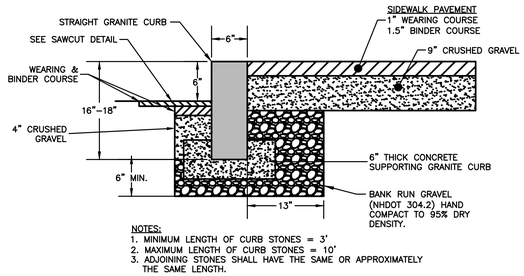


PAVEMENT SAWCUT NOTES

1. SAWCUT THROUGH DEPTH OF PAVEMENT AT LEAST 1 FT. FROM EDGE OR GREATER IF REQUIRED.
2. INSTALL AND COMPACT CRUSHED GRAVEL TO GRADE.
3. PLACE BINDER COURSE.
4. GRIND OR SAWCUT EXISTING PAVEMENT 1 FT. WIDE TO A DEPTH NECESSARY TO PROPERLY MATCH NEW WEARING COURSE PAVEMENT.
5. TACK COAT ALL EXISTING PAVEMENT SURFACES WITH EMULSIFIED ASPHALT (MS-1) PRIOR TO PLACING NEW PAVEMENT.

TYPICAL PAVEMENT SAWCUT DETAIL

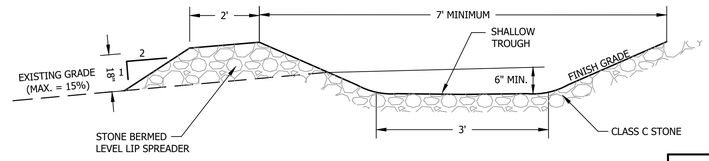
SCALE: N.T.S.



NOTES:
1. MINIMUM LENGTH OF CURB STONES = 3'
2. MAXIMUM LENGTH OF CURB STONES = 10'
3. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.

TYPICAL VERTICAL CURB DETAIL

N.T.S



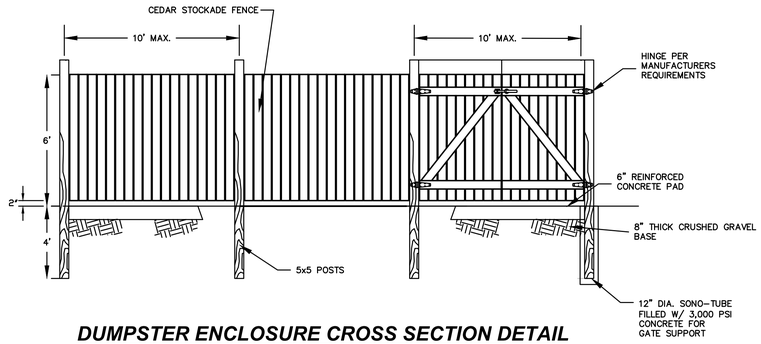
SECTION VIEW

LEVEL SPREADER INSTALLATION NOTES

1. CONSTRUCT THE LEVEL SPREADER LIP ON A ZERO PERCENT GRADE TO ENSURE UNIFORM SPREADING OF RUNOFF.
2. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL AND NOT ON FILL NOR ON EXISTING GRADES IN EXCESS OF 15%.
3. STONE BERMED LEVEL SPREADERS SHALL NOT BE INSTALLED IN WETLANDS SOILS OR IN HYDROLIC SOILS GROUP D.
4. THE ENTIRE LEVEL LIP AREA SHALL BE PROTECTED BY PLACING A 3 FOOT WIDE BY 6" DEEP TRAPEZOIDAL TROUGH AND A 2 FOOT WIDE BY 18" HIGH STONE BERM FOR A MINIMUM OF 20 FEET.
5. THE FLOW FROM THE LEVEL SPREADER SHALL OUTLET ONTO STABILIZED AREAS. WATER SHOULD NOT RE-CONCENTRATE IMMEDIATELY BELOW THE SPREADER.
6. INSPECT ANNUALLY FOR ACCUMULATION OF SEDIMENT AND DEBRIS AND FOR SIGNS OF EROSION WITHIN APPROACH CHANNEL, SPREADER CHANNEL, OR DOWN SLOPE OF THE SPREADER.
7. REMOVE DEBRIS OBSERVED DURING INSPECTION.
8. REMOVE SEDIMENT WHEN ACCUMULATION EXCEEDS 25% OF SPREADER DEPTH.
9. MOW ANNUALLY TO CONTROL WOODY VEGETATION WITHIN THE SPREADER.
10. SNOW SHOULD NOT BE STORED WITHIN OR DOWNSLOPE OF THE LEVEL SPREADER OR IT'S APPROACH CHANNEL.
11. REPAIR EROSION AND REPLACE STONE BERM MATERIAL, AS WARRANTED BY INSPECTION.
12. RECONSTRUCT THE SPREADER IF DOWN-SLOPE CHANELIZATION INDICATES THAT THE SPREADER IS NOT LEVEL OR THAT DISCHARGE HAS BECOME CONCENTRATED, AND CORRECTIONS CANNOT BE MADE THROUGH MINOR RE-GRADING.

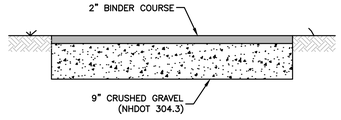
STONE LIP LEVEL SPREADER DETAIL

NOT TO SCALE



DUMPSTER ENCLOSURE CROSS SECTION DETAIL

N.T.S



TYPICAL WALKING PATH DETAIL

N.T.S

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DOVER, NEW HAMPSHIRE

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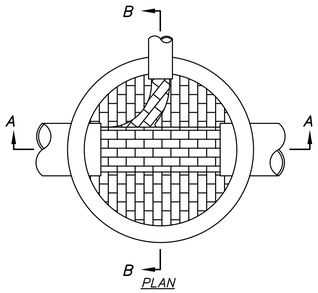
FILE # SITE-2023-0005

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

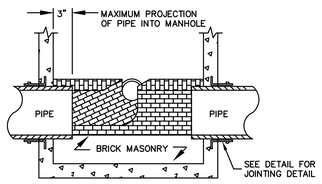
(A) ALL COMPONENT PARTS OF MANHOLE STRUCTURES SHALL HAVE THE STRENGTH, LEAK RESISTANCE, AND SPACE NECESSARY FOR THE INTENDED SERVICE.
(B) MANHOLE STRUCTURES SHALL HAVE A LIFE EXPECTANCY IN EXCESS OF 25 YEARS.
(C) MANHOLE STRUCTURES SHALL BE DESIGNED TO WITHSTAND H-20 LOADING AND SHALL NOT LEAK IN EXCESS OF 1 GPD PER VERTICAL FOOT OF MANHOLE FOR THE LIFE OF THE STRUCTURE.
(D) BARRELS AND CONE SECTIONS SHALL BE CONSTRUCTED OF PRECAST REINFORCED CONCRETE.
(E) BASE SECTIONS SHALL BE MONOLITHIC CONSTRUCTION TO A POINT AT LEAST SIX INCHES ABOVE THE CROWN OF THE INCOMING PIPE.
(F) HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF AN OVERLAPPING TYPE, SEALED FOR WATER TIGHTNESS USING A DOUBLE ROW OF AN ELASTOMERIC OR MASTIC-LIKE SEALANT.
(G) PIPE TO MANHOLE JOINTS SHALL BE AS FOLLOWS:
  (1) ELASTOMERIC, RUBBER SLEEVE WITH WATER TIGHT JOINTS AT THE MANHOLE OPENING AND PIPE SURFACES;
  (2) CAST INTO THE WALL OR SECURED WITH STAINLESS STEEL CLAMPS;
  (3) ELASTOMERIC SEALING RING CAST IN THE MANHOLE OPENING WITH SEAL FORMED ON THE SURFACE OF THE PIPE BY COMPRESSION OF THE RING; AND
  (4) NON-SHRINK GROUTED JOINTS WHERE WATERTIGHT BONDING TO THE MANHOLE AND PIPE CAN BE OBTAINED.
(H) MANHOLE CONE SECTIONS SHALL BE ECCENTRIC IN SHAPE.
(I) ALL PRECAST SECTIONS AND BASES SHALL HAVE THE DATE OF MANUFACTURE AND THE NAME OF THE TRADEMARK OF THE MANUFACTURER IMPRESSED OR INDELIBLY MARKED ON THE INSIDE OF THE WALL.
(J) MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF THE PIPE AND FLOW. AT CHANGES IN DIRECTIONS, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL.
  UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY. INVERTS AND SHELVES SHALL BE PLACED AFTER TESTING.
(K) MATERIALS FOR CONSTRUCTION FOR MANHOLES SHALL BE AS FOLLOWS:
  (1) CONCRETE FOR CAST-IN-PLACE OR COMPLETE MANHOLES SHALL CONFORM TO THE REQUIREMENTS FOR CLASS AA CONCRETE IN THE NH DOT'S "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION."
  (2) REINFORCING FOR CAST-IN-PLACE CONCRETE SHALL BE STEEL OR STRUCTURAL FIBERS THAT CONFORM TO THE REQUIREMENTS OF THE NH DOT'S "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION."
  (3) PRECAST CONCRETE BARREL SECTIONS, CONES, AND BASES SHALL CONFORM TO ASTM C478-06;
  (4) THE MANHOLE FRAME AND COVER SHALL PROVIDE A 30-INCH DIAMETER CLEAR OPENING;
  (5) THE MANHOLE COVER SHALL HAVE THE WORD "SEWER" IN 3-INCH LETTERS CAST INTO THE TOP SURFACE;
  (6) THE CASTINGS SHALL BE OF EVEN-GRAINED CAST IRON, SMOOTH, AND FREE FROM SCALE, LUMPS, BLISTERS, SAND HOLES AND DEFECTS;
  (7) CONTACT SURFACES OF COVERS AND FRAMES SHALL BE MACHINED AT THE FOUNDRY TO PREVENT ROCKING OF COVERS IN ANY ORIENTATION;
  (8) CASTINGS SHALL BE EQUAL TO CLASS 30, CONFORMING TO ASTM A48/48M-03;
  (9) BRICK MASONRY FOR SHELF, INVERT AND GRADE ADJUSTMENT SHALL COMPLY WITH ASTM C32-05, CLAY OR SHALE, FOR GRADE SS HARD BRICK;
  (10) MORTAR SHALL BE COMPOSED OF PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION;
  (11) PROPORTIONS IN MORTAR OF PARTS BY VOLUME SHALL BE:
    (a) 4.5 PARTS SAND AND 1.5 PARTS CEMENT; OR
    (b) 4.5 PARTS SAND, 1.0 PART CEMENT AND 0.5 PART HYDRATED LIME;
  (12) CEMENT SHALL BE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C150-05;
  (13) HYDRATED LIME SHALL BE TYPE S CONFORMING TO THE ASTM C207-06 "STANDARD SPECIFICATIONS FOR HYDRATED LIME FOR MASONRY PURPOSES";
  (14) SAND SHALL CONSIST OF INERT NATURAL SAND CONFORMING TO THE ASTM C33-03 "STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES";
(N) THE MINIMUM INTERNAL DIAMETER OF MANHOLE SHALL BE 48 INCHES.
(S) IN THE FLOW CHANNEL A DROP OF AT LEAST 0.1 FEET SHALL BE PROVIDED BETWEEN THE INGOING AND OUTGOING SEWERS ON ALL MANHOLES.

MANHOLE TESTING REQUIREMENTS (Env-Wq 704.10)

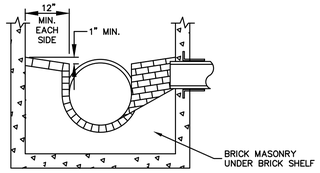
(X) MANHOLES SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST.*
(Y) THE MANHOLE VACUUM TEST SHALL CONFORM TO THE FOLLOWING:
  (1) THE INITIAL VACUUM GAUGE TEST PRESSURE SHALL BE 10 INCHES Hg: AND
  (2) THE MINIMUM ACCEPTABLE TEST HOLD TIME FOR A 1-INCH Hg PRESSURE DROP TO 9 INCHES Hg SHALL BE:
    (A)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



PLAN



SECTION A-A

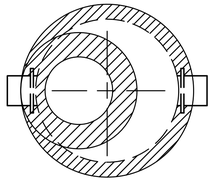


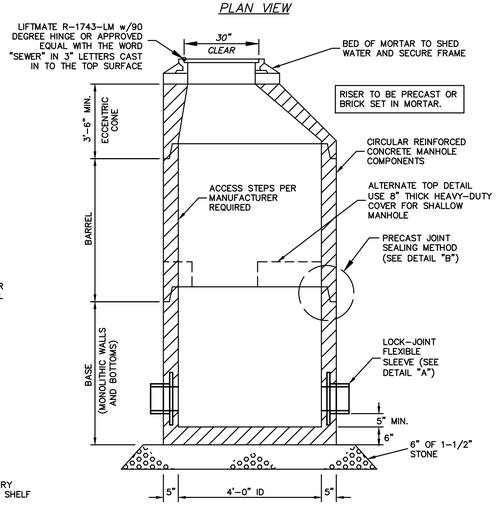
SECTION B-B

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

TYPICAL SEWER MANHOLE INVERT

N.T.S.


PLAN VIEW

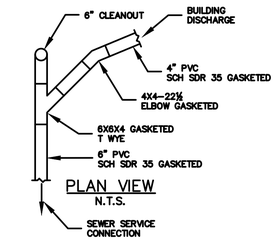


SECTION VIEW

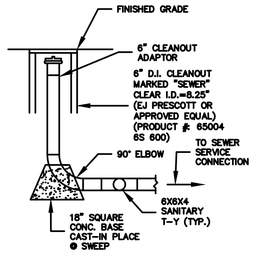
NOTES:
1. SMH #1 IS A STANDARD MANHOLE WITH ECCENTRIC CONE TOP.
2. THERE SHALL BE NO STEPS INSTALLED WITHIN THE MANHOLE.

STANDARD MANHOLE

N.T.S.

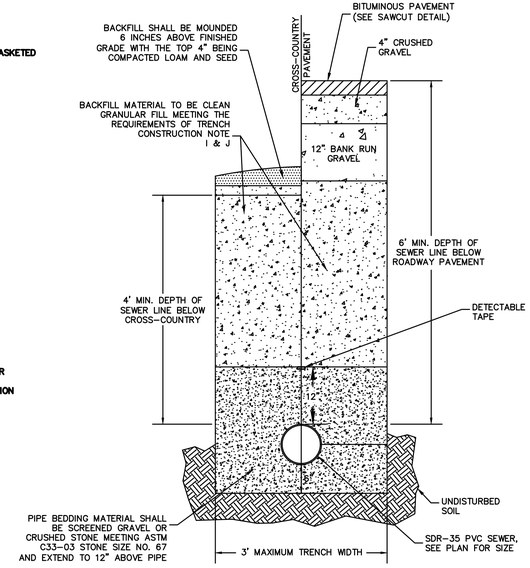


PLAN VIEW
N.T.S.

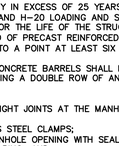


ELEVATION VIEW
N.T.S.

CLEANOUT DETAIL



STANDARD SEWER PIPE TRENCH

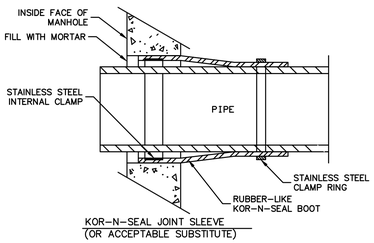


LOCK-JOINT FLEXIBLE MANHOLE SLEEVE
(OR ACCEPTABLE SUBSTITUTE)



ELASTOMERIC SEALANT

NOTE:
ALL GASKETS AND SEALANTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS

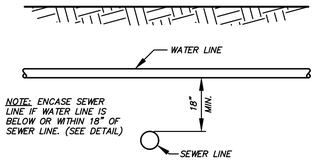


DETAIL "A" - PIPE TO MANHOLE JOINTS

N.T.S

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

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



NOTE: ENCASE SEWER LINE IF WATER LINE IS BELOW OR WITHIN 18" OF SEWER LINE. (SEE DETAIL)

WATER/SEWER CROSSING

N.T.S.

SEWER NOTES:

PER THE REQUIREMENTS OF "STANDARDS OF DESIGN AND CONSTRUCTION FOR SEWERAGE AND WASTEWATER TREATMENT FACILITIES."

GRAVITY SEWER CONSTRUCTION MATERIALS (Env-Wq 704.05)

(A) PLASTIC GRAVITY SEWER PIPE AND FITTINGS SHALL BE 8 INCH PVC SDR 35 SEWER PIPE (EXCEPT SEWER SERVICE SHALL BE 6" SRD 35 PVC) AND SHALL COMPLY WITH ASTM D3034-04a.
(B) PLASTIC SEWER PIPE SHALL HAVE A PIPE STIFFNESS RATING OF AT LEAST 46 PSI AT 5 PERCENT PIPE DIAMETER DEFLECTION, AS MEASURED IN ACCORDANCE WITH ASTM D2412-02 DURING MANUFACTURE.
(C) JOINT SEALS FOR PVC PIPE SHALL BE OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL CONFORMING TO ASTM D3212-96(a)(2003)e1 AND SHALL BE PUSH-ON, BELL AND SPIGOT TYPE.

GRAVITY SEWER PIPE TESTING REQUIREMENTS (Env-Wq 704.07)

(A) ALL NEW SEWERS SHALL BE TESTED FOR WATER TIGHTNESS BY THE USE OF LOW-PRESSURE AIR TESTS.
(B) LOW-PRESSURE AIR TESTING SHALL BE IN CONFORMANCE WITH:
  (1) ASTM F1417-92(2005) "STANDARD TEST METHOD FOR INSTALLATION ACCEPTANCE OF PLASTIC GRAVITY SEWER LINES USING LOW-PRESSURE AIR"; OR
  (2) UNI-BELL PVC PIPE ASSOCIATION UNI-B-6, "LOW-PRESSURE AIR TESTING OF INSTALLED SEWER PIPE" (1998).
(C) ALL NEW GRAVITY SEWERS SHALL BE CLEANED AND VISUALLY INSPECTED AND SHALL BE TRUE TO LINE AND GRADE FOLLOWING INSTALLATION AND PRIOR TO USE.
(D) ALL PLASTIC SEWER PIPE SHALL BE DEFLECTION TESTED NOT LESS THAN 30 DAYS FOLLOWING INSTALLATION.
(E) THE MAXIMUM ALLOWABLE DEFLECTION OF FLEXIBLE SEWER PIPE SHALL BE 7½ PERCENT OF AVERAGE INSIDE DIAMETER.

PROTECTION OF WATER SUPPLIES (Env-Wq 704.12)

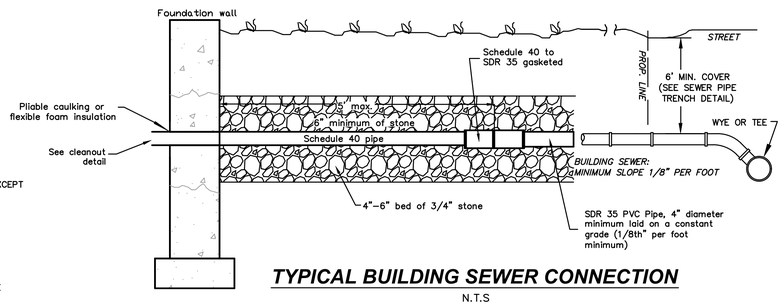
(A) SEWERS SHALL BE LOCATED AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED WATER MAIN.
(B) A DEVIATION FROM THE SEPARATION REQUIREMENTS OF (A) ABOVE SHALL BE ALLOWED WHERE NECESSARY TO AVOID CONFLICT WITH SUBSURFACE STRUCTURES, UTILITY CHAMBERS, AND BUILDING FOUNDATIONS, PROVIDED THAT THE SEWER IS CONSTRUCTED IN ACCORDANCE WITH THE FORCE MAIN CONSTRUCTION REQUIREMENTS SPECIFIED IN Env-Wq 704.06.
(C) WHENEVER SEWERS MUST CROSS WATER MAINS, THE SEWER SHALL BE CONSTRUCTED AS FOLLOWS:
  (1) VERTICAL SEPARATION OF THE SEWER AND WATER MAIN SHALL BE NOT LESS THAN 18 INCHES, WITH WATER ABOVE SEWER; AND
  (2) SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATER MAIN.

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

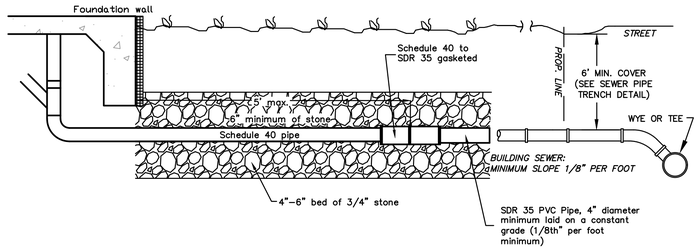
THIS SECTION REQUIRED TO MEET REQUIREMENTS OF Env-Wq 704.12 (d):
(A) FORCE MAINS SHALL BE CONSTRUCTED OF SDR 21 PVC MATERIAL.
(B) FORCE MAINS SHALL BE TREATED AS GRAVITY SEWERS FOR PURPOSES OF FOUNDATION BEDDING AND BACKFILL REQUIREMENTS.
(C) PVC PIPE USED FOR FORCE MAINS SHALL CONFORM TO ASTM D2241-05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

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

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



TYPICAL BUILDING SEWER CONNECTION
N.T.S



TYPICAL BUILDING SEWER CONNECTION
N.T.S

FOR REVIEW
NOT FOR CONSTRUCTION

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Civil and Structural Engineering
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JOHN RANDOLPH

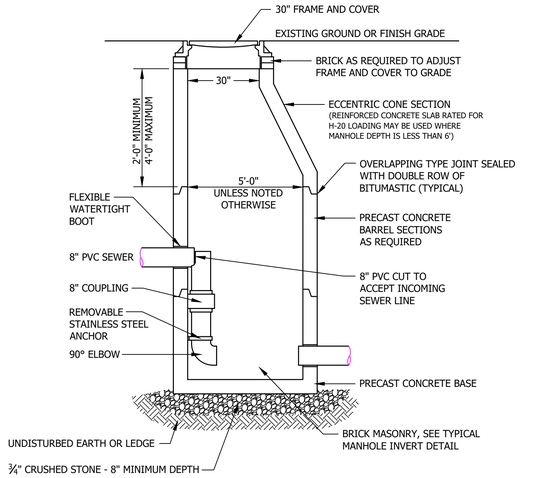
36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

CONSTRUCTION DETAILS

NO.	DATE	REVISION DESCRIPTION	ENG	DWG
1	7.24.23	REVISED PER TRC COMMENTS	TAL	TAL

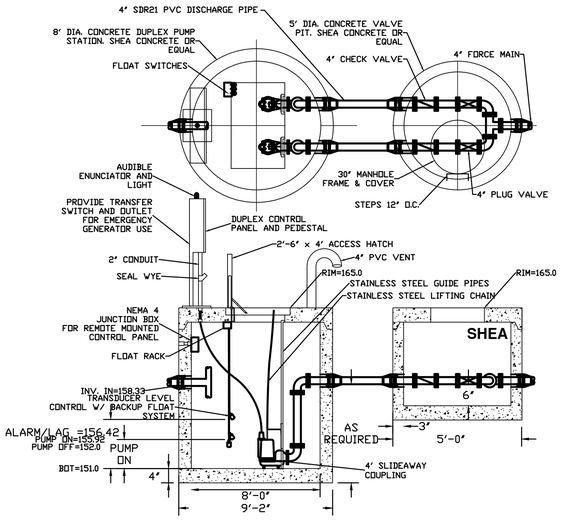
DATE: 2023.06.02	PROJECT #: 230277
ENGIN'D BY: TAL	DRAWN BY: TAL
CHECK'D BY: MJS	ARCHIVE #: H-___
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FILE # SITE-2023-0005



INSIDE DROP MANHOLE DETAIL

NOT TO SCALE

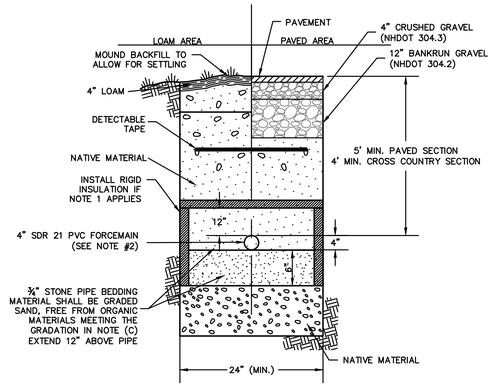


PROPOSED PUMP STATION & VALVE PIT DETAIL

NOT TO SCALE

NOTES:

1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. REINFORCED STEEL CONFORMS TO LATEST ASTM A185
3. BUTYL RESIN SECTION JOINT CONFORMS TO LATEST ASTM C990 SPEC
4. PUMP MODEL – BARNES 4SE–L, 4.5HP 3" SOLIDS HANDLING PUMP OR APPROVED EQUAL, 7.75" IMPELLER CLASS 1, DIV. 1
6. OWNER SHALL SECURE A MAINTENANCE AGREEMENT FOR THE PUMP STATION. THE ALARM SHALL BE TRANSMITTED DIRECTLY OR VIA AN ANSWERING SERVICE TO THE MAINTENANCE COMPANY.
7. STATION SHALL HAVE A RUNNING METER.
8. PROVISIONS SHALL BE MADE TO SILENCE THE AUDIBLE ALARM MANUALLY, BUT THE LIGHT SHALL CONTINUE UNTIL THE CONDITION HAS BEEN RECTIFIED.
9. SUBMERSIBLE PU,PS FOR SEWAGE PUMPING STATIONS SHALL CONFORM TO THE NEC REQUIREMENTS ADOPTED BY REFERENCE IN THE STATE BUILDING CODE PURSUANT TO RSA 155–A:1, IV, FOR INSTALLATION IN AREAS CLASSIFIED BY THE NEC AS CLASS I, DIVISION 1.
10. ELECTRICAL SYSTEMS AND COMPONENTS, INCLUDING MOTORS, LIGHTS, CABLE, CONDUITS, SWITCH BOXES, AND CONTROL CIRCUITS SHALL BE PROTECTED FROM FLOODING IN ACCORDANCE WITH ENV–WQ 705.01.
11. ELECTRICAL SYSTEMS AND COMPONENTS INCLUDING, MOTORS, LIGHTS, CABLE, CONDUITS, SWITCH BOXES, AND CONTROL CIRCUITS IN ENCLOSED OR PARTIALLY ENCLOSED SPACES WHERE FLAMMABLE MIXTURES OCCASIONALLY MAY BE PRESENT, INCLUDING RAW SEWAGE WET WELLS, SHALL BE CERTIFIED BY THEIR MANUFACTURER AS:
    A. COMPLYING WITH THE NEC REQUIREMENTS ADOPTED BY REFERENCE IN THE STATE BUILDING CODE PURSUANT TO RSA 155–A:1, IV, FOR CLASS I, DIVISION 1 LOCATIONS; OR
    B. BEING RATED FOR CLASS I DIVISION 2 REQUIREMENTS WHERE MECHANICAL VENTILATION IS PROVIDED IN ACCORDANCE WITH THE NFPA AS ADOPTED BY REFERENCE IN THE STATE FIRE CODE IN SAF–C 6000.
11. ALL ELECTRICAL EQUIPMENT AND WORK SHALL COMPLY WITH THE REQUIREMENTS OF NEC AS APOTED BY REFERENCE IN THE STATE BUILDING CODE PURSUANT TO RSA 155–A:1, IV, AND NFPA AS ADOPTED BY REFERENCE IN THE STATE FIRE CODE IN SAF–C 6000 IN EFFECT AT THE TIME OF INSTALLATION



SEWER FORCEMAIN TRENCH

N.T.S

NOTES

1. USE RIGID INSULATION AS SHOWN IF PIPE COVER IS LESS THAN 4' UNDER PAVED SECTION OR 5' UNDER CROSS COUNTRY SECTION.
2. THERE SHALL BE NO GLUE JOINTS ON THE FORCEMAIN.

TRENCH CONSTRUCTION (PER Env–Wq 704.09 NUMERATION)

(A) TRENCH DIMENSIONS SHALL BE AS FOLLOWS:
  (1) FOR SEWER PIPE LESS THAN 15" IN DIAMETER, THE ALLOWABLE TRENCH WIDTH AT A PLANE 12 INCHES ABOVE THE PIPE SHALL BE NO MORE THAN 36".
(B) PIPE TRENCH BEDDING MATERIAL AND FILL MATERIAL FOR EXCAVATION BELOW GRADE SHALL BE SCREENED GRAVEL OR CRUSHED STONE TO ASTM C33–03 STONE SIZE NO. 67.
(C) THE PIPE SAND BLANKET MATERIAL SHALL BE GRADED SAND, FREE FROM ORGANIC MATERIALS, GRADED SUCH THAT 100% PASSES THROUGH A 1/2 INCH SIEVE AND A MAXIMUM OF 15% PASSES THROUGH A #200 SIEVE.
(E) PIPE BEDDING MATERIAL SHALL EXTEND FROM A HORIZONTAL PLANE THROUGH THE PIPE AXIS TO 6 INCHES BELOW THE BOTTOM OF THE OUTSIDE SURFACE OF THE PIPE.
(F) PIPE SAND MATERIAL SHALL COVER THE PIPE A MINIMUM OF 12 INCHES ABOVE THE CROWN OF THE OUTSIDE SURFACE.
(G) COMPACTION SHALL BE IN 12 INCH LAYERS FOR BEDDING AND BLANKET MATERIALS.
(H) BACKFILL MATERIALS SHALL BE COMPACTED IN 3–FOOT LAYERS TO THE GROUND SURFACE EXCEPT FOR ROAD CONSTRUCTION (OR OTHER PAVED AREAS) WHERE THE FINAL 3 FEET SHALL BE COMPACTED IN 12–INCH LAYERS TO THE ROAD BASE SURFACE.
(I) TRENCH BACKFILL MATERIAL IN ROADWAY LOCATIONS SHALL BE NATURAL MATERIALS EXCAVATED FROM THE TRENCH DURING CONSTRUCTION, EXCLUDING: DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT OR CLAY, ALL EXCAVATED LEDGE MATERIAL, AND ALL ROCKS OVER SIX INCHES IN LARGEST DIMENSION, OR ANY MATERIAL WHICH AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.
(J) TRENCH BACKFILL AT CROSS–COUNTRY LOCATIONS SHALL BE AS DESCRIBED IN (I) ABOVE, EXCEPT THAT TOP SOIL, LOAM, MUCK OR PEAT, MAY BE USED PROVIDED THE COMPLETED CONSTRUCTION WILL BE STABLE, AND PROVIDED THAT ACCESS TO THE SEWER FOR MAINTENANCE AND RECONSTRUCTION IS PRESERVED.
(K) BACKFILL SHALL BE MOUNDED 6 INCHES ABOVE ORIGINAL GROUND AT CROSS–COUNTRY LOCATIONS.
(L) BASE COURSE FOR TRENCH REPAIR SHALL MEET THE REQUIREMENTS OF DIVISION 300 OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" OF THE NH DOT.
(O) PRECAUTIONS SHALL BE TAKEN TO AVOID GROUNDWATER POOLING AT THE SURFACE BY PROVIDING DRAINAGE TO A SUITABLE OUTLET AT CATCH BASINS OR RUNOFF SWALES.

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

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

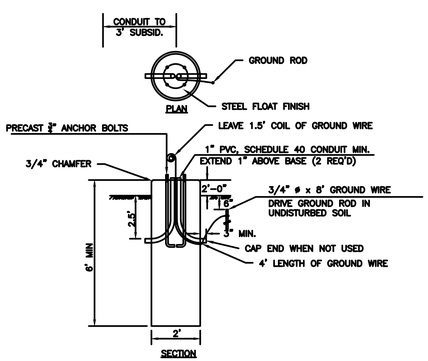
FORCE MAIN AND LOW PRESSURE SEWER TESTING (PER Env–Wq 704.08 NUMERATION)

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

NOTES:
1. REMOVE LOAM TO A MINIMUM DEPTH OF 8" BELOW SELECT MATERIALS.
2. COMPACT BASE, SUBBASE, AND SUBGRADE TO 95% OF STANDARD PROCTOR.
3. SEE PLAN FOR LOCATION

TYPICAL SLOPED GRANITE CURB

NTS



CONCRETE LIGHT POLE BASE

N.T.S

POLE MOUNTED LIGHTING SPECIFICATIONS:

1. ALL SITE WORK SHALL CONFORM TO TOWN OF DURHAM STANDARDS AND LOCAL AUTHORITIES HAVING JURISDICTION.
2. ALL MATERIAL WORKMANSHIP SHALL CONFORM TO THE LATEST EDITIONS OF THE FOLLOWING STANDARDS, NEW HAMPSHIRE ELECTRIC CODE, FIRE PROTECTION ASSOCIATION, NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION.
3. ALL EXTERIOR CONDUITS FOR LIGHTING SHALL BE 1" MIN. DIAMETER PVC SCHEDULE 40. ALL ELBOWS SHALL BE SCHEDULE 40. ALL CONDUITS UNDER ROADWAYS AND PARKING AREAS SHALL HAVE MINIMUM COVER OF THREE (3) FEET.
4. ALL UNDERGROUND CONDUITS WILL HAVE NYLON PULL ROPE TO FACILITATE PULLING IN CABLES.
5. ALL EQUIPMENT TO BE LITHONIA LIGHTING – MR2–LED SERIES.
6. LUMINARIES SHALL BE LITHONIA LIGHTING – MR2–LED SERIES,
7. ALL EXTERIOR CONDUITS SHALL BE PROVIDED WITH 6" WIDE, METALIZED CONTINUOUS WARNING TAPE.
8. POLES SHALL BE LITHONIA LIGHTIN OR EQUAL.
9. PROVIDE FUSING ON ALL LUMINARIES. FUSES TO BE LOCATED AT POLE HANDHOLE. ALL LUMINARIES 277 VOLT.
10. GROUND ALL POLES. PROVIDE 3/4" X 8'–0" GROUND ROD AT EACH POLE WITH #6 AWG COPPER GROUND CONNECTION.
11. PROVIDE SHIMS AS REQUIRED AND SET ALL POLES PLUMB. PROVIDE FULL ANCHOR BOLT COVERS.
12. ALL NO. 6 WIRE AND LARGER SHALL BE TYPE THHN COPPER. NO. 8 WIRE AND SMALLER SHALL BE THWN COPPER.
13. MOUNTING HEIGHT SHALL BE 17'±.
14. USE MR2 LED 60C LEDS, WITH DRIVE CURRENT OF 700 mA DISTANCE TYPE T3M.

GENERAL LIGHTING NOTES:

1. LIGHTING SUPPLIER: VISIBLE LIGHT, INC. (603) 926–6049.
2. OWNER MAY ELECT TO USE ALTERNATIVE LIGHT FIXTURES IF FIRST APPROVED BY DESIGNER AND TOWN.
3. SITE LIGHTING WILL BE LOCATED AS SHOWN ON THE SITE PLAN.
4. ALL NON–ESSENTIAL LIGHTING WILL BE REQUIRED TO BE TURNED OFF AFTER BUSINESS HOURS, LEAVING ONLY THE NECESSARY LIGHTING FOR SECURITY.
5. ALL LIGHTING FOR SECURITY OR AESTHETICS WILL BE FULL CUT–OFF OR A SHIELDED TYPE, NOT ALLOWING ANY UPWARD DISTRIBUTION OF LIGHT.
6. PRECAST CONCRETE POLE BASE SHEA CONCRETE OR EQUAL.
7. LIGHT FIXTURE SHALL BE MOUNTED AT 16'–0" HIGH.
8. LIGHT POLE IS 12'–0".

FOR REVIEW
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DATE OF PRINT
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HORIZONS ENGINEERING

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36 OLIVE MEADOW LANE
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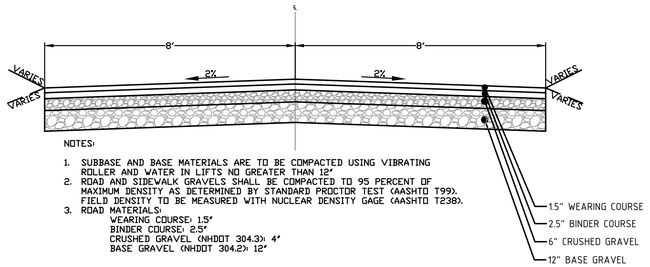
CONSTRUCTION DETAILS

NO.	DATE	REVISION DESCRIPTION	ENG	DWG
1	7.24.23	REVISED PER TRC COMMENTS	TAL	TAL

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

C505

FILE # SITE-2023-0005

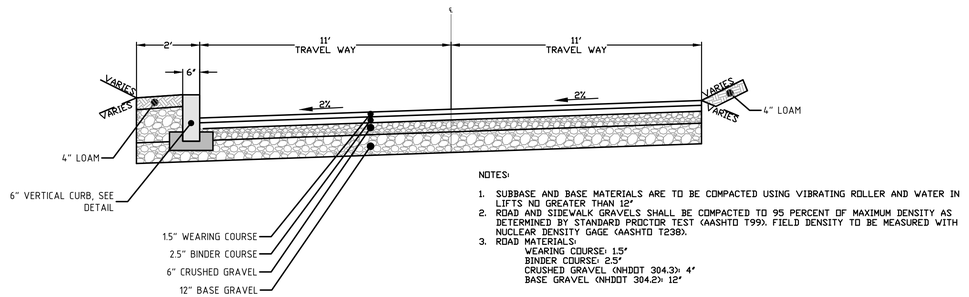


NOTES:

1. SUBBASE AND BASE MATERIALS ARE TO BE COMPACTED USING VIBRATING ROLLER AND WATER IN LIFTS NO GREATER THAN 12"
2. ROAD AND SIDEWALK GRAVELS SHALL BE COMPACTED TO 95 PERCENT OF MAXIMUM DENSITY AS DETERMINED BY STANDARD PROCTOR TEST (AASHTO T99). FIELD DENSITY TO BE MEASURED WITH NUCLEAR DENSITY GAGE (AASHTO T238).
3. ROAD MATERIALS:
   WEARING COURSE: 1.5"
   BINDER COURSE: 2.5"
   CRUSHED GRAVEL (NHDOT 304.3): 4"
   BASE GRAVEL (NHDOT 304.2): 12"

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

NTS

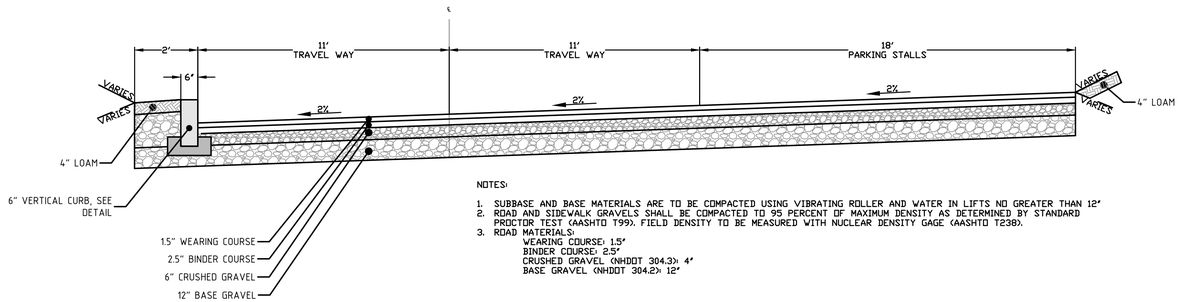


NOTES:

1. SUBBASE AND BASE MATERIALS ARE TO BE COMPACTED USING VIBRATING ROLLER AND WATER IN LIFTS NO GREATER THAN 12"
2. ROAD AND SIDEWALK GRAVELS SHALL BE COMPACTED TO 95 PERCENT OF MAXIMUM DENSITY AS DETERMINED BY STANDARD PROCTOR TEST (AASHTO T99). FIELD DENSITY TO BE MEASURED WITH NUCLEAR DENSITY GAGE (AASHTO T238).
3. ROAD MATERIALS:
   WEARING COURSE: 1.5"
   BINDER COURSE: 2.5"
   CRUSHED GRAVEL (NHDOT 304.3): 4"
   BASE GRAVEL (NHDOT 304.2): 12"

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

NTS

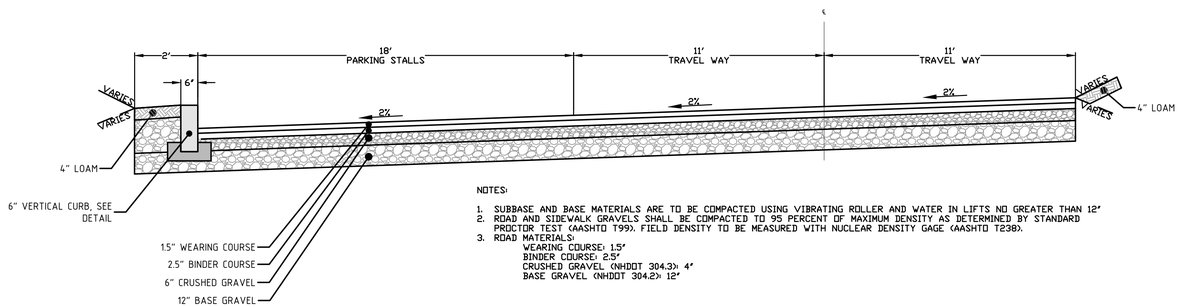


NOTES:

1. SUBBASE AND BASE MATERIALS ARE TO BE COMPACTED USING VIBRATING ROLLER AND WATER IN LIFTS NO GREATER THAN 12"
2. ROAD AND SIDEWALK GRAVELS SHALL BE COMPACTED TO 95 PERCENT OF MAXIMUM DENSITY AS DETERMINED BY STANDARD PROCTOR TEST (AASHTO T99). FIELD DENSITY TO BE MEASURED WITH NUCLEAR DENSITY GAGE (AASHTO T238).
3. ROAD MATERIALS:
   WEARING COURSE: 1.5"
   BINDER COURSE: 2.5"
   CRUSHED GRAVEL (NHDOT 304.3): 4"
   BASE GRAVEL (NHDOT 304.2): 12"

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

NTS

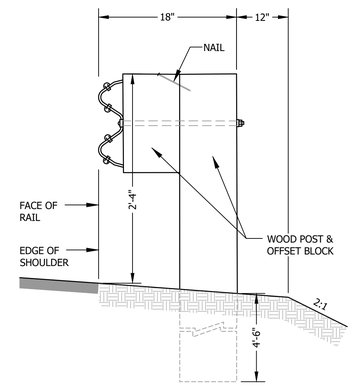


NOTES:

1. SUBBASE AND BASE MATERIALS ARE TO BE COMPACTED USING VIBRATING ROLLER AND WATER IN LIFTS NO GREATER THAN 12"
2. ROAD AND SIDEWALK GRAVELS SHALL BE COMPACTED TO 95 PERCENT OF MAXIMUM DENSITY AS DETERMINED BY STANDARD PROCTOR TEST (AASHTO T99). FIELD DENSITY TO BE MEASURED WITH NUCLEAR DENSITY GAGE (AASHTO T238).
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   WEARING COURSE: 1.5"
   BINDER COURSE: 2.5"
   CRUSHED GRAVEL (NHDOT 304.3): 4"
   BASE GRAVEL (NHDOT 304.2): 12"

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

NTS



BEAM GUARDRAIL / WOOD POSTS

PER NHDOT SPECIFICATIONS
ITEM NO. 606.140

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36 OLIVE MEADOW LANE
POCKET NEIGHBORHOOD
DOVER, NEW HAMPSHIRE

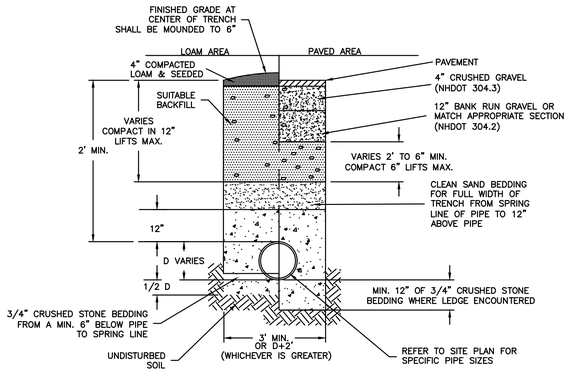
CONSTRUCTION DETAILS

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DATE: 2023.06.02	PROJECT #: 230277
ENGIN'D BY: TAL	DRAWN BY: TAL
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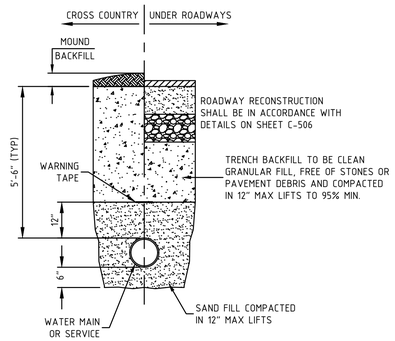
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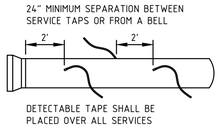
FILE # SITE-2023-0005



STANDARD DRAINAGE PIPE TRENCH

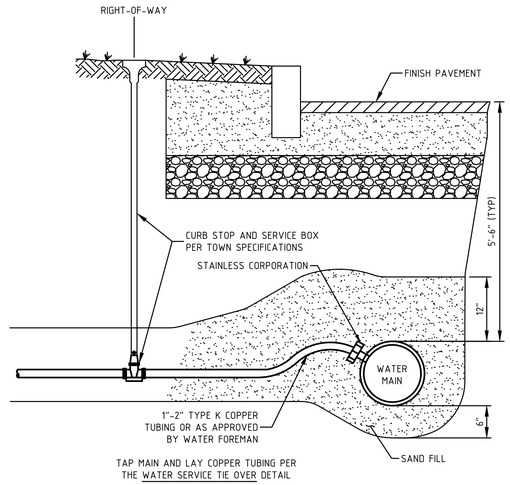
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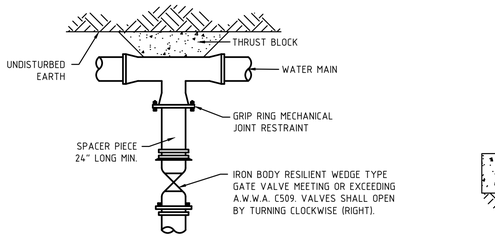
WATER MAIN TRENCH DETAIL

N.T.S.

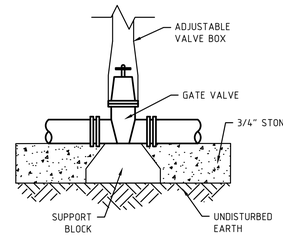


WATER SERVICE INSTALLATION

N.T.S.



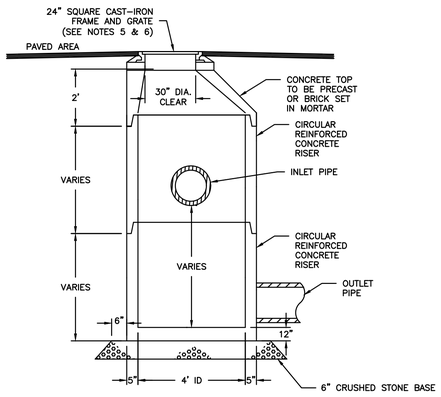
PLAN VIEW



ELEVATION VIEW

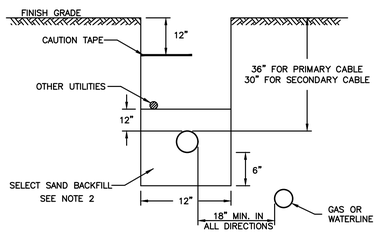
TYPICAL VALVE CONNECTION

N.T.S



TYPICAL DRAIN MANHOLE

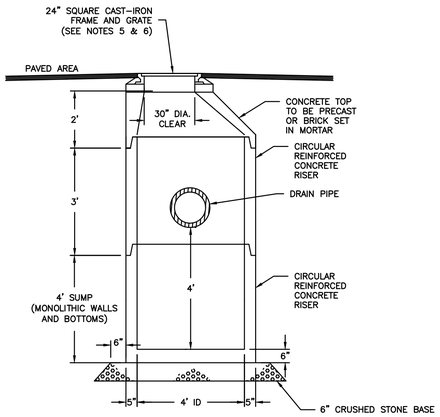
N.T.S



TELEPHONE & ELECTRIC TRENCH

N.T.S

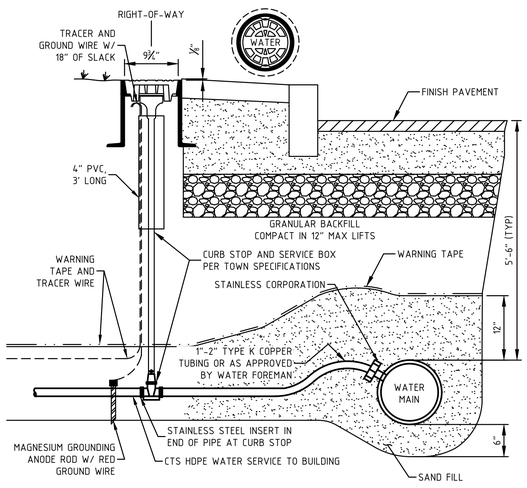
NOTES:
1. CONSTRUCTION TO BE IN ACCORDANCE WITH PSNH CONSTRUCTION STANDARDS FOR NEW ELECTRICAL SERVICE WORK BY CONTRACTORS, MOST RECENT EDITION.
2. SELECT SAND BACKFILL SHALL CONSIST OF A FINE GRANULAR MATERIAL OF WHICH 100% SHALL PASS THROUGH A 1/4" SIEVE. EXCEPT NATURALLY OCCURING SMOOTH ROUND PEBBLES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



TYPICAL DEEP SUMP CATCH BASIN DETAIL

N.T.S

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



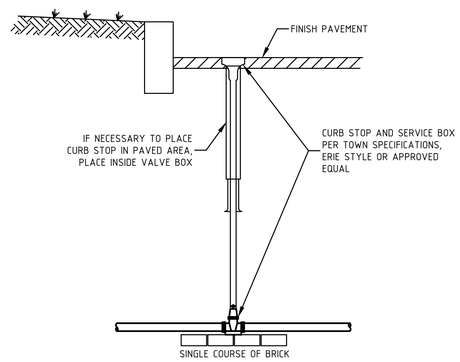
WATER SERVICE TRACER WIRE INSTALLATION

N.T.S.

NOTES:
LOCATOR BOX:
1. LOCATOR BOX AND COVER SHALL BE CAST IRON.
2. LOCATOR BOXES SHALL BE SET AT 500' INTERVALS AND AT BENDS.
3. PROVIDE 18" WIRE LOOP INSIDE THE LOCATOR BOX.
4. LOCATOR BOXES SHALL BE SET AT GRADE IN CROSS COUNTRY LOCATIONS AND ½" BELOW PAVEMENT, TAPERED OVER 2'.

TRACER WIRE:
1. CONTINUOUS, DIRECT BURIAL RATED.
2. 12 AWG HIGH STRENGTH SOLID CORE COPPER CLAD STEEL.
3. COATING COLOR SHALL CONFORM TO THE APWA UNIFORM COLOR CODE.

REPAIRS:
1. SPLICES SHALL BE MADE WITH CORROSION PROOF, LOCKABLE WIRE CONNECTORS.



CURB STOP IN PAVEMENT

N.T.S.

FILE # SITE-2023-0005

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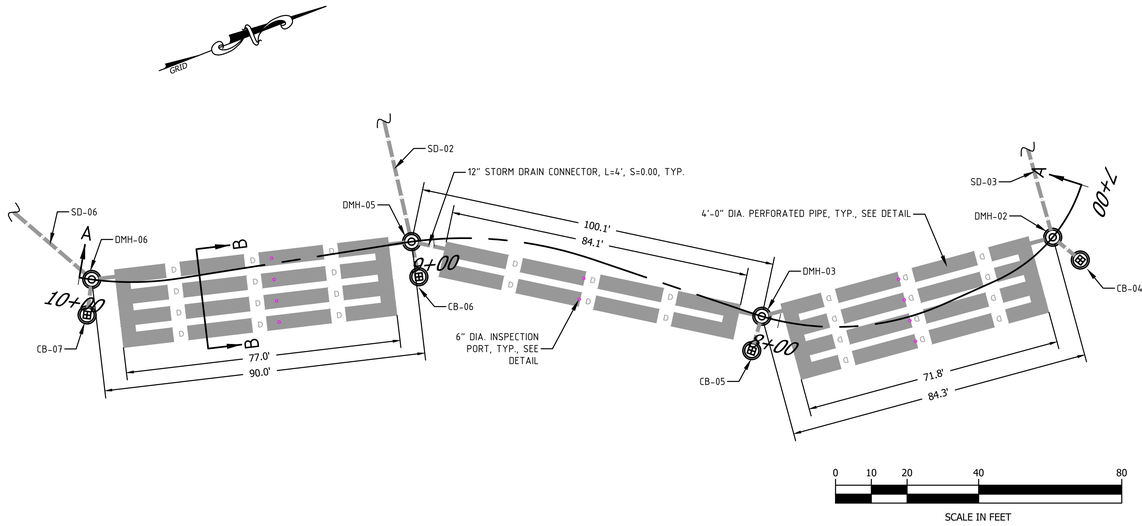
36 OLIVE MEADOW LANE
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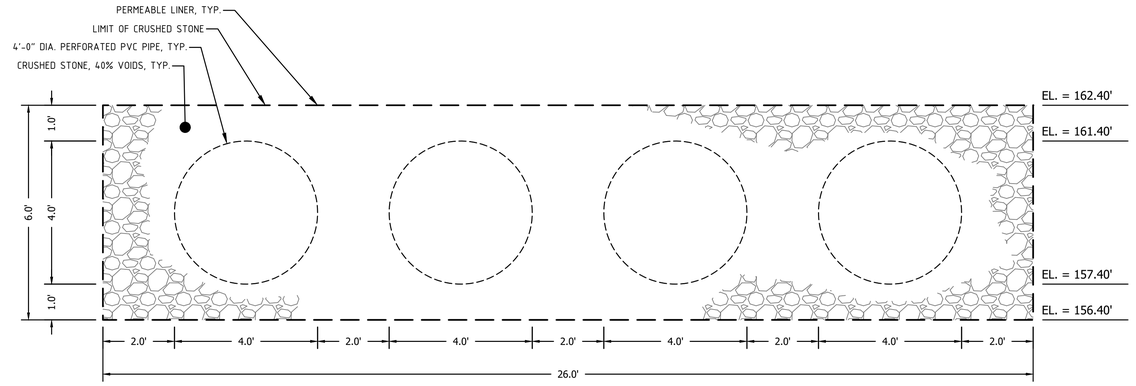
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ENGIN'D BY: TAL	DRAWN BY: TAL
CHECK'D BY: MJS	ARCHIVE #: H-___

C507



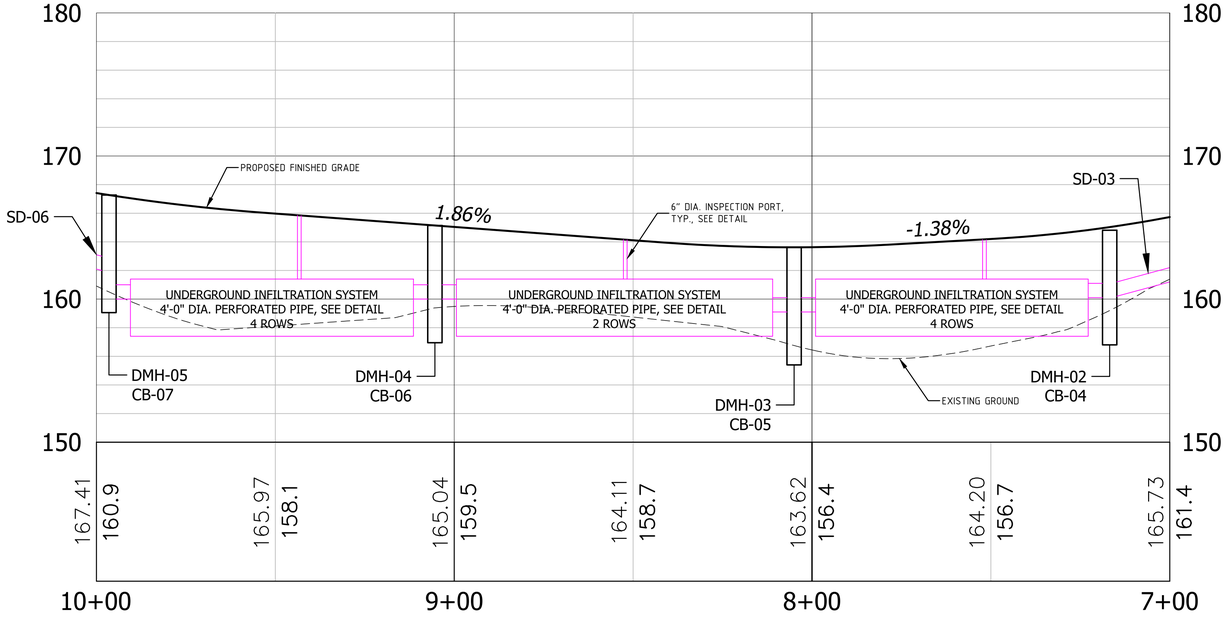
UNDERGROUND DETENTION AND INFILTRATION SYSTEM PLAN VIEW

SCALE: 1"=20'



UNDERGROUND DETENTION AND INFILTRATION SYSTEM CROSS SECTION B-B

SCALE: 1"=2'

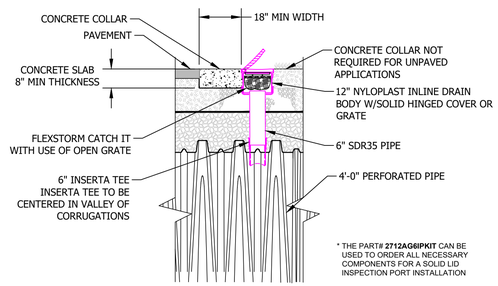


UNDERGROUND DETENTION AND INFILTRATION SYSTEM CROSS SECTION A-A

STA: 7+00 to STA: 10+00

SCALE(H): 1"=20'

SCALE(V): 1"=5'



6" INSPECTION PORT DETAIL

NOT TO SCALE

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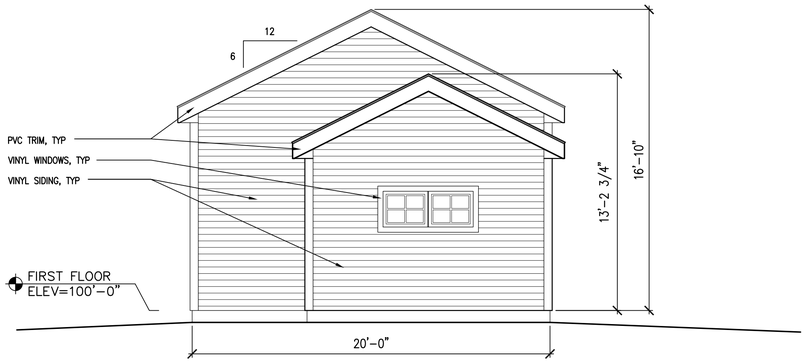
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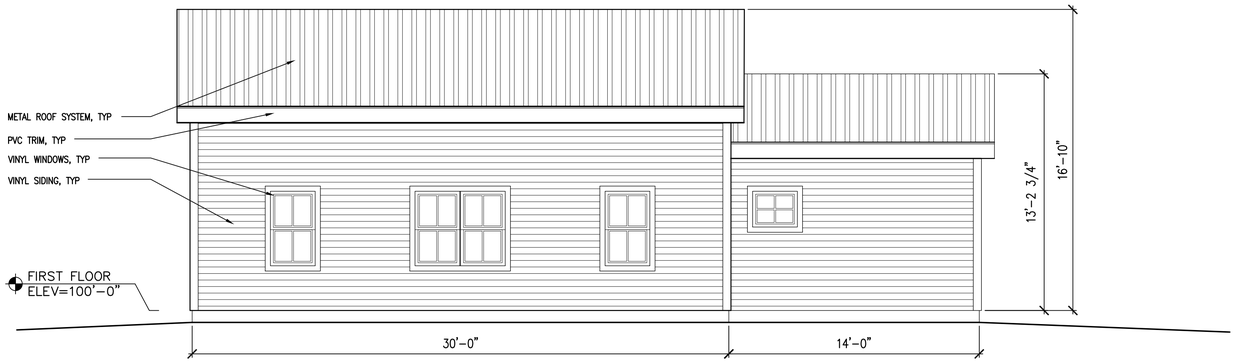
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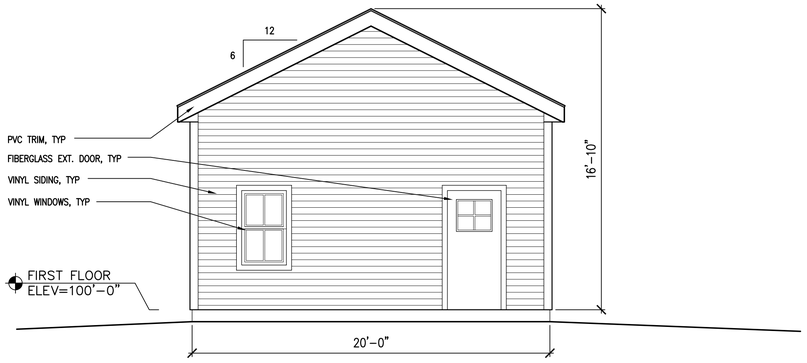
FILE # SITE-2023-0005



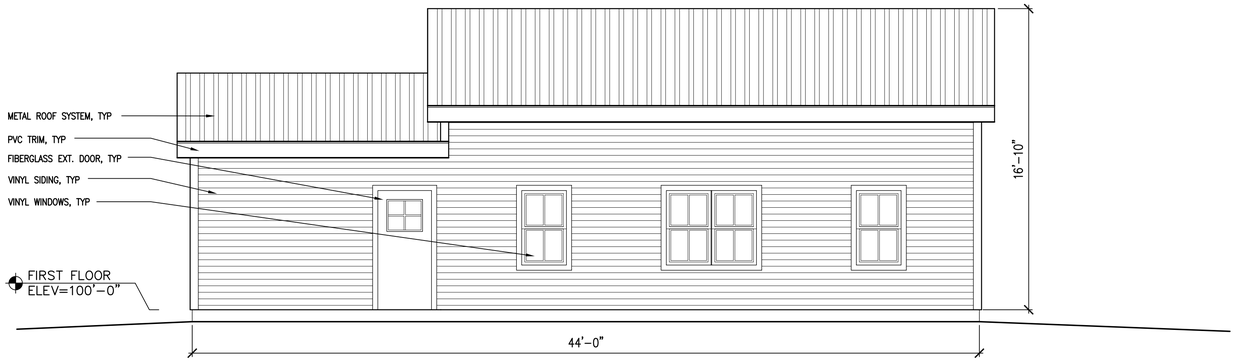
NORTH ELEVATION
SCALE: 1/4"=1'-0" — 1



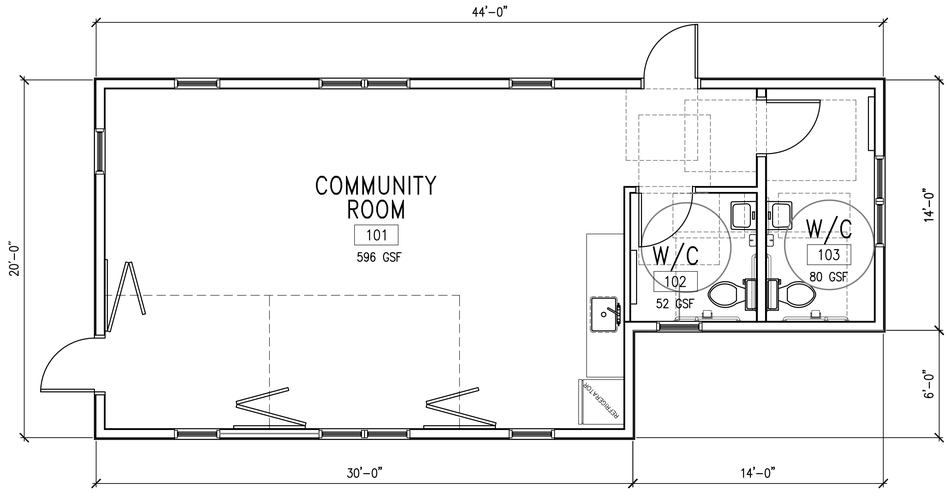
EAST ELEVATION
SCALE: 1/4"=1'-0" — 2



SOUTH ELEVATION
SCALE: 1/4"=1'-0" — 3



WEST ELEVATION
SCALE: 1/4"=1'-0" — 4



FLOOR PLAN
SCALE: 1/4"=1'-0" — 5

PLAN NORTH

COMMUNITY BUILDING - NOTES

- COMMUNITY SPACE
  - OPEN ROOM WITH MOVEABLE PARTITIONS
- 796 GSF TOTAL
- ADA ACCESSIBLE; COMPLIANT WITH NH RSA 155-A:5

GRAPHIC SCALE

1/4" = 1' — 4 2 0 4 8 12 (scale / feet)

CHECK GRAPHIC SCALE BEFORE USING

NO.	DESCRIPTION	DATE
1	CONCEPT PLANS	07/12/2023

REVISIONS

NOT FOR CONSTRUCTION

SEAL

We GSD Studios
ARCHITECTURE | PLANNING
22 Jady Hill Ave
Exeter, NH 03833

DESIGNED BY: MWR
DRAWN BY: MWR

PROJECT: 230401.01

THE COTTAGES AT OLIVE MEADOW
36 OLIVE MEADOW LANE, DOVER, NH

COMMUNITY BUILDING
FLOOR PLAN & ELEVATIONS

SCALE: AS NOTED
DATE: 07.12.2023
DRAWING NO.:

A1.7

SHEET 7 OF 8