CITY OF DOVER

PLANNING TECHNICAL REVIEW COMMITTEE –AGENDA

Meeting Type: Regular Meeting
Meeting Location: Council Conference Room – City Hall, Dover NH
Meeting Date: **Thursday, March 24, 2022**
Meeting Time: **10:30 AM**

1. 10:30 AM – 11:15 AM: Site Review for Bluebird Self-Storage, (Owner: Westfield, LLC.), Assessor's Map G, Lots 2-2, zoned CM, located 64 Littleworth Road. (Proposal is to construct a self-storage facility in two phases. Phase 1 is three stories with a building footprint of 46,100 s.f. and gross floor area of 138,300 s.f., then Phase 2 building will be also be three stories with building footprint of 31,000 s.f. and a gross floor area of 93,000 s.f.). A related CUP application will also appear before the Planning Board. (P22-18)

FUSS & O'NEILL

February 25, 2022

Ms. Donna Benton, AICP
Director of Planning and Community Development
City of Dover
288 Central Avenue
Dover, New Hampshire, 03820

Re: Bluebird Self-Storage, TRC Site Plan Application
Dover, New Hampshire
Fuss & O'Neill Reference No. 20210509.A10

Dear Ms. Benton:

On behalf of the applicant, Bluebird Self-Storage, the enclosed materials have been prepared in support of a Technical Review Committee Site Plan application for the 6.8-acre property located at 64 Littleworth Road. This property is currently owned by Westfield, LLC and will be purchased and developed by Bluebird Self-Storage.

The self-storage facility will be constructed in two phases. The Phase 1 is three stories with a building footprint of 46,100 square feet and a gross floor area of 138,300 square feet. The Phase 2 building will also be three-stories with a slightly smaller footprint of 31,000 square feet and a gross floor area of 93,000 square feet. The development includes paved driveway access, parking and walkways, landscaping, lighting, municipal and private utility connections and stormwater management and treatment.

Zoning

Tax Map G, Lot 2-2 is in the Commercial Manufacturing District (CM). A variance from the CUP criteria was granted for this project as Case Number Z22-01 on January 20, 2022. The project requested relief related to the number of stories, building height, hours of operation and building position along the road (parallel not perpendicular).

Existing Conditions

The property was previously used as a farmstead, consisting of a house, barns, fields, and driveways. The property is still mowed for hay but the house and some of the barns were recently removed.

Access

Littleworth Road is New Hampshire Route 9; therefore, the proposed driveway access requires a State of New Hampshire Department of Transportation driveway permit. The Sight Distance Plan and Profile Drawing CP-101 shows the 400-foot all season safe sight distance is provided from the proposed driveway. The NHDOT driveway permit is pending.

The Gateway Building
50 Commercial Street
Manchester, NH
03101
t 603.668.8223
800.286.2469

www.fando.com

California
Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

Site Layout, circulation and parking

The proposed building is positioned on the site such that the north elevation visually appears as a two-story building with no access doors along the Littleworth Road frontage. The remaining elevations are three stories and include canopies with sliding access doors, parking, and walkways. A fire apparatus turnaround is proposed to the west of the Phase 2 building. Trash will be internally collected and removed from the building as there are no proposed dumpsters. Snow storage is primarily located off the edge of pavement around the building.

Utilities

Most of the existing utilities are located along Littleworth Road. The proposed fire and domestic water service is proposed to be tapped off the 8-inch water main in Littleworth Road and extended to the building. The gas service will be tapped off the existing main along Littleworth Road and the electric, telephone and cable services will extend underground from the overhead along Littleworth Road. A transformer is anticipated and is proposed to be located to the west of the proposed access driveway, near the retaining wall. The sewer main will be extended to this property by the property owner, Westfield, LLC. It is our understanding that design plans for the sewer extension are under development and will be provided to the City of Dover for review and approval. Utility Plan CU-101 shows the proposed service for this building to the anticipated manhole to be provided by Westfield, LLC.

There is an existing 12-inch water main that parallels the southern property boundary. This project proposed a water easement for that municipal water main.

Stormwater Management

This project will disturb more than 100,000 square feet and therefore requires a New Hampshire Department of Environmental Services (NHDES) Alteration of Terrain (AoT) permit. Rainfall depths for this design are based on the Northeast Regional Climate Center Extreme Precipitation tables. Additionally, and in accordance with Env-Wq 1503.08(l), since the project site is located within the great bay region and will have a projected life that extends beyond 2050, the rainfall depths have been increased by 15 percent. Resulting in the following rainfall depths for each storm event. 1-year (2.99-inches), 2-year (3.6-inches), 10-year (5.44-inches), 25-year (6.88-inches) and 50-year (8.21-inches). These rainfall values exceed City of Dover requirements.

The stormwater design includes two bioretention ponds and two underground bioretention systems that collect, control, and treat stormwater flows from the development. Pretreatment of paved areas is provided by sediment forebays or Stormtech isolator rows.

Since existing soils prohibit infiltration, infiltrating practices are not proposed for this project.

Wetland Impact

There are two wetlands along the easterly portion of the property. This project proposes to dredge and fill one of the wetlands and its associated buffer. The wetland furthest to the east will remain and no impacts to its buffer are proposed. A wetland permit application will be submitted to NHDES.

Phasing

The intent is to construct the Phase 1 building, parking, and walkways, along with the fire truck turn around and all stormwater management in phase 1. Phase 2 will include the phase 2 building and the paved parking and walkways associated with the Phase 2 building.

Signage

A building and freestanding monument sign are proposed for this development. The monument sign will be located to the east of the proposed driveway with building signage on the north elevation.

Traffic

The expected traffic generation for the proposed self-storage facility will have a negligible impact on the existing adjacent traffic network. It is our opinion that the level of traffic generated can be accommodated by the existing street network adjacent to the project site.

Landscaping

Landscape design of the project site has been designed to meet the requirement of the City of Dover including required tree and shrub sizes, number of street trees and shrubs and interior landscaping.

Lighting

LED light fixtures are proposed to illuminate the proposed parking areas, along the building and at the canopies. Lumen levels are included on Lighting Plan CL-101 and details of all fixtures, pole and pole base are provided on the Lighting Details Plan CD-503.

Enclosures

The project team looks forward to working with the City of Dover on the successful completion of the TRC and site plan review process at the earliest possible date. We understand that copies of these materials will be internally distributed and reviewed, and that comments will be forwarded to our attention when available. The following information is included to complete our application:

- One (1) Executed Site Review Application and Checklist
- One (1) Executed Conditional Use Permit Application
- Mailing Notification list for Owner, Applicant and Technical professionals
- Plan Review Fees: $13,317.95
- Three (3) copy of the Stormwater Management Report (including NHDES Alteration of Terrain Application)
- Eight (8) copies of the Bluebird Self-Storage Plan set (22" x 34") (Folded)
- Eight (8) copies of the Colored Streetscape (11"x 17")
- Three (3) copies Trip Generation Memorandum

Please reach out to me via email at asanders@fando.com or telephone at 603-668-8223, extension 2141, with any questions you may have during your review.

Very truly yours,

Amy R. Sanders, PE
Project Manager

ARS:mjt

Enclosures

cc w/ enclosures via email: Bluebird Self-Storage

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: Bluebird Self-Storage Telephone # 203.988.5247

Address of Applicant: 125 Ocean Road, Greenland, NH 03840

E-Mail Address: bill.goodison@bluebirdstorage.com

Name of Property Owner (*if different from applicant*): Westfield, LLC Telephone # 603.749.2800

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

PROPERTY INFORMATION

Address of Property: 64 Littleworth Road

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

Zoning District(s) CM Overlay District(s) _____

Size of Parcel: 296,551 sq. ft. 6.81 ac. Property Deed: Book 4733 Page: 471

Existing Use of Property: Farm land/ Residential

SITE PLAN INFORMATION

Describe Proposed Use: Self-Storage

Area of Parcel to be Developed: 246,500 sq. ft.

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

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

Number of Parking Spaces: Existing 0 Proposed 27

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

Number of Employees Total: 3 In Maximum Shift: 1.5

Disposition of Parcel:

Building Footprint 77,100 sq. ft.

Total Building Area 231,300 sq. ft.

Paved Area 41,685 sq. ft.

Building Setbacks:

Front Yard 72 ft.

Rear Yard 86 ft.

Side Yard: Right 182 ft. Left 115 ft.

City Water? X Yes ___ No How far is city water from the property? At Road and rear of property

City Sewer? X Yes ___ No How far is city sewer from the property? To be extended to development by property owner via separate project.

TRANSFER OF DEVELOPMENT RIGHTS INFORMATION

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

□ Residential □ Residential (reduced size) □ Industrial | □ Purchase □ Land Preservation

Relief sought (Check All That Apply):

□ Lot Size □ Frontage □ Setback □ 30' Buffer □ Increase by _____ units

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

_____

_____

_____

BUILDING INFORMATION

Type of Building to be Built: TypeII-B Construction

Height of Building: 32.5' Finished Floor Elevation: 116.62

Number of Seats (where applicable) _____

Estimated value of construction: $11,866,000 Refuse removal: Public/Private (circle one) Private

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.) Kevin McEneaney
McEneaney Survey Associates of New England

Address PO Box 681, 24 Chestnut Street, Dover, NH 03820 Telephone #: 603.742.0911

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

ENGINEER INFORMATION

Name of Engineer and Company (Licensed in N.H.) Amy Sanders, Fuss and O'Neill

Address 50 Commercial Street, Manchester, NH 03101 Telephone #: 603.668.8223 x 2141

Professional License #: 11065 E-mail address: asanders@fando.com

ARCHITECT INFORMATION

Name of Architect and Company (Licensed in N.H.) Jeff Nawocki, JSN Associates, LLC

Address 1 Autumn Street, Portsmouth, NH 03801 Telephone #: 603.433.8639

Professional License #: 6771 E-mail address: roger@jsneng.com

LANDSCAPE ARCHITECT INFORMATION

Name of Landscape Architect and Company (Licensed in N.H.) Stephanie White, Fuss and O'Neill

Address 50 Commercial Street, Manchester, NH 03101 Telephone #: 603.668.8223

Professional License #: 00164 E-mail address: swhite@fando.com

SOIL SCIENTIST INFORMATION

Name of Soil Scientist and Company (Licensed in N.H.) Luke Hurley, Gove Environmental Services

Address 8 Continental Dr. Bldg 2, Unit H, Exeter, NH 03833-7526 Telephone #: 603.778.0644

Professional License #: 095 E-mail address: lhurley@gesinc.biz

CONSERVATION EASEMENT HOLDER

Name of Easement Holder: _____ Telephone #_____

Address Easement Holder: _____

SIGNATURES

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

Signature of Property Owner: _____ Date: 2/23/22

Signature of Applicant (*if different from owner*): _____ Date: 2/22/22

Signature of Agent: _____ Date: _____

AUTHORIZATION TO ENTER SUBJECT PROPERTY

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

Signature of Property Owner: _____ Date: 2/23/22

AUTHORIZATION TO COMPLETE THE PROJECT ON SUBJECT PROPERTY

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

Signature of Property Owner: _____ Date: 2/23/22

Signature of Applicant (*if different from owner*): _____ Date: 2/22/22

CERTIFICATION OF FEES

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

Signature of Property Owner: _____ Date: 2/23/22

Signature of Applicant (*if different from owner*): _____ Date: 2/22/22

PLANNING BOARD FEE SCHEDULE/INVOICE

(Revised July 1, 2021)

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 # 231,300 sq. ft.= $34,695 $10,200
  - 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 # 1 per Application = $ 200
- ☐ 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 = $_____

2. 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 # 41,685 sq. ft. = $ 2,917.95

SUBTOTAL PLAN REVIEW FEE (A) = $ 13,317.95

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 $8.00= $_____
- ☐ Certified letters fee: # of abutters _____ X $8.00= $_____
- ☐ 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 $100.00 x # _____ applications = $_____

SUBTOTAL NOTICE FEE (B & C) = $_____

TOTAL INVOICE AMOUNT (A, B & C) = $_____

PLAN REVIEW FEE COLLECTED/PAID = $ _____

BALANCE DUE = $ _____

The balance 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: F&O for Bluebird Self Storage File Number: _____

PROJECT TITLE: Bluebird Self Storage

PROPERTY LOCATION: 64 Littleworth Road Tax Map: G Lot: 2-2

	Where/How Provided	Reviewed
1. Completed and signed Application form	Submittal Packet	
2. Plan Review Fees are provided	Submittal Packet - Check	
3. Electronic copy of the engineered/surveyed plan layout	Submitted Via Email	
4. Electronic copy of supplementary materials and application	Submitted Via Email	
5. Traffic Impact Assessment and Analysis (Standard or Advanced)	Submitted Via Email	
6. Waiver requests to the Site Plan Review Regulations, with written justification	No waivers requested	
7. Conditional Use Permit applications	Submittal Packet	
8. A colored rendering of the streetscape that will be created along the existing public right-of-way	Submitted Packet	
9. A colored architectural plan showing all sides of buildings	Plan Set	
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:	Submittal Packet	
Location map at appropriate scale		
Proposed Project name and title and Planning File #	Plan Sheet GI-001, # Pending	
Date, north arrow and scale	All plans	
Names of all abutting property owners	Existing Conditions/Survey Plan	
Name and address of owners and/or applicants	Submittal Packet	
Signature & stamp of NH licensed land surveyor and/or engineer	All plans	
Zoning District boundaries, including any special or overlay districts	Existing Conditions/Survey Plan	
Location of Conservation District areas	NA	
Location, names and widths of existing and proposed streets, including pavement widths, grades, curbs and crosswalks	Site Layout Plan	
Location and widths of existing & proposed easements & right of ways	Existing Conditions/Survey Plan	
Location and width of existing and proposed access/egress ways	N/A	

	Explain How Provided	Reviewed
Depict pedestrian walkways and accessible access	Plan Sheet CS-101	
Existing and proposed property lines with dimensions and bearings tied into Dover's Geographic Information System coordinate system	Existing Conditions/Survey Plan	
Existing and proposed topographic information at two foot intervals	All plans	
Existing and proposed buildings and structure locations	All plans	
Minimum building setbacks or build to lines on all lots	Existing Conditions/Survey Plan & CS101	
Location and size of existing and proposed electric, telephone, gas cable and other underground utilities	Existing Conditions/Survey Plan	
Existing and proposed water lines and fire hydrants, including materials and capacity needed	Plan Sheet CU-101	
Location and materials of sanitary sewage facilities within project site and projected additional peak hour sewer load	Plan Sheet CU-101	
Existing and proposed stormwater lines and facilities	Plan Sheet CG-101	
Lighting plan depicting all existing and proposed exterior light fixtures and a lighting level analysis for parking lots	Plan Sheet CL-101	
Location of Flood Hazard Zone	Existing Conditions/Survey Plan	
Location of all bodies of water and watercourses	All plans	
Location of wetlands and buffers	CW-101	
Neighborhood plan with aerial underlay showing how project relates to abutting uses within the plan set	Plan Sheet CS-104	
Existing natural features and/or significant vegetation on property	Existing Conditions/Survey Plan	
Depict existing contours up to 100 ft. beyond project limits	Existing Conditions/Survey Plan	
Landscape plan depicting existing and proposed landscaping, prepared by a licensed Professional Landscape Architect	Plan Sheet LP-101 & LP-102	
Location of parking layout delineating spaces and arrangement; note addressing maximum required spaces	Plan Sheet CS-101 Plan Sheet CN-002	
Location, material and size of existing and proposed pavement area	Existing Conditions/Survey Plan & CS101	
Location of proposed fire lanes	Plan Sheet CS-101	
Specify finished floor elevations of buildings	Plan Sheet CG-101	
Location of solid waste disposal facilities (dumpster, pad and screening, etc.), including required screening	N/A - See Site Plan Note #18 on Plan Sheet CN-002	
Depict all service, storage, loading bays and utility areas	Plan Sheet CS-101	
All applicable Dover Common Site Plan notes	CN-001 and CN-002	
11. Additional Information if appropriate		
Stormwater Management Plan depicting the existing & proposed storm drainage system and engineered drainage analysis	Plan Sheet CG-101	
Stormwater Management System Operation and Maintenance Plan	NHDES AoT Permit	
Letter to Serve from Public and Private Utilities	Pending	
Erosion and Sedimentation Control Plan	Plan Sheet CE-101	
Landscape Operation and Maintenance Plan	Plan Sheet LP-102	
Proposed restrictive covenants or homeowners association documents	N/A	
Dates and permit numbers of all required state and federal permits	Plan Sheet GI-001	
If wetland buffer, indicate placards locations, as applicable	CW-101	
Depict test boring locations, groundwater elevations and soil profiles and/or soils types call-outs	Existing Conditions/Survey Plan Test Pits on Sheet CN-001	
Location of proposed drive-in facilities	N/A	
Provide additional exhibits/technical data determined appropriate by the Planning Board or its staff as required	Will provide upon request	

REVIEWED BY: _____ DATE_____ TRC DATE_____

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: Bluebird Self-Storage Telephone # 203.988.5247

Address of Applicant: 125 Ocean Road, Greenland, NH 03840

E-Mail Address: bill.goodison@bluebirdstorage.com

Name of Property Owner (if different from applicant): Westfield, LLC Telephone # 603.749.2800

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

PROPERTY INFORMATION

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

Address of Property: 64 Littleworth Road

Zoning District(s) CM Overlay District(s) _____

Existing Use of Property: Farm land/ Residential

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

x CM Self Service Storage Facility

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

This project requires two conditional use permits, one related to a wetland impact and the other for the self-storage use.

The project proposed to impact a 2,988 sf wetland related to the building construction and the associated parking, walkways and driveway. The other wetland area on and it's associated buffer located within the property, will not be impacted by the development.

The proposed use is for a self-storage facility. The project received a variance for CUP criteria to allow for a building with 3-stories (and subsequent height greater than 20 feet), structure that is parallel to the road, and expanded hours of operation. The proposed building height is 32.5 feet, proposed hours are noted on plan sheet CN-002, Site Plan Note #5.

List Any Associated State or Federal Permits That Have Been or Will Be Applied For and Indicate Their Status: This project requires NHDES Alteration of Terrain and Wetland permitting. Additionally, once approved and prior to construction, this project will require an NPDES Notice of Intent.

Name of Professional That Prepared Plans: Fuss and O'Neill, Amy Sanders

Address 50 Commercial Street, Manchester, NH 03101 Telephone #: 603.668.8223

Professional License #: 11065 E-mail address: asanders@fando.com

SIGNATURES

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

Signature of Property Owner: _____ Date: 2/23/22

Signature of Applicant (if different from owner): _____ Date: 2/23/22

Signature of Agent: _____ Date: _____

AUTHORIZATION TO ENTER SUBJECT PROPERTY

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

Signature of Property Owner: _____ Date: 2/23/22

Unitil
Northern Utilities, Inc.

March 10, 2022

Amy Sanders, PE
Fuss & O'Neill, Inc
The Gateway Bldg., 50 Commercial Street, Unit 2S
Manchester, NH 03101

Natural Gas to Bluebird Storage Dover, NH

Hi Amy,

Unitil/Northern Utilities Natural Gas Division has reviewed the requested site for natural gas service:

Unitil hereby confirms that natural gas is available at 64 Littleworth Rd in Dover, NH to serve the future Bluebird Storage Facility.

If you have any questions, please contact me at 603-534-2379.

Dave MacLean
Senior Business Development Rep
Unitil
T 603.294.5261 **M** 603.534.2379 **F** 603.294.5264
Email macleand@unitil.com

EVERSOURCE ENERGY

1700 Lafayette Road
Portsmouth, NH 03801

Trevor S Emmons
603-332-7515
Trevor.emmons@eversource.com

March 22, 2022

Amy R. Sanders, PE
Fuss and O'Neill
50 Commercial Street
Manchester, New Hampshire, 03101

Dear Amy:

I am responding to your request to confirm the availability of electric service for the proposed 64 Littleworth Road project being constructed for/by Bluebird Self-Storage.

The proposed project consists of a 3-story building with approximately 231,300 s/f of self-storage space. The proposed development will be constructed along Littleworth Road.

The developer will be responsible for the installation of all underground facilities and infrastructure required to service the new building. The service will be as shown on attached marked up Utility Plan CU-101. The proposed building service will be fed from utility pole 3/86 as depicted on utility plan CU-101. The developer will work with Eversource to obtain all necessary easements and licenses for the proposed overhead/underground facilities listed above.

This letter serves as confirmation that Eversource has sufficient capacity in the area to provide service to this proposed development. The cost of extending service to the aforementioned location and any associated infrastructure improvements necessary to provide service will be borne by the developer unless otherwise agreed upon.

The attached drawing titled "Bluebird Self Storage Utility Plan" dated 02/24/2022, shows transformer locations to service your proposed project.

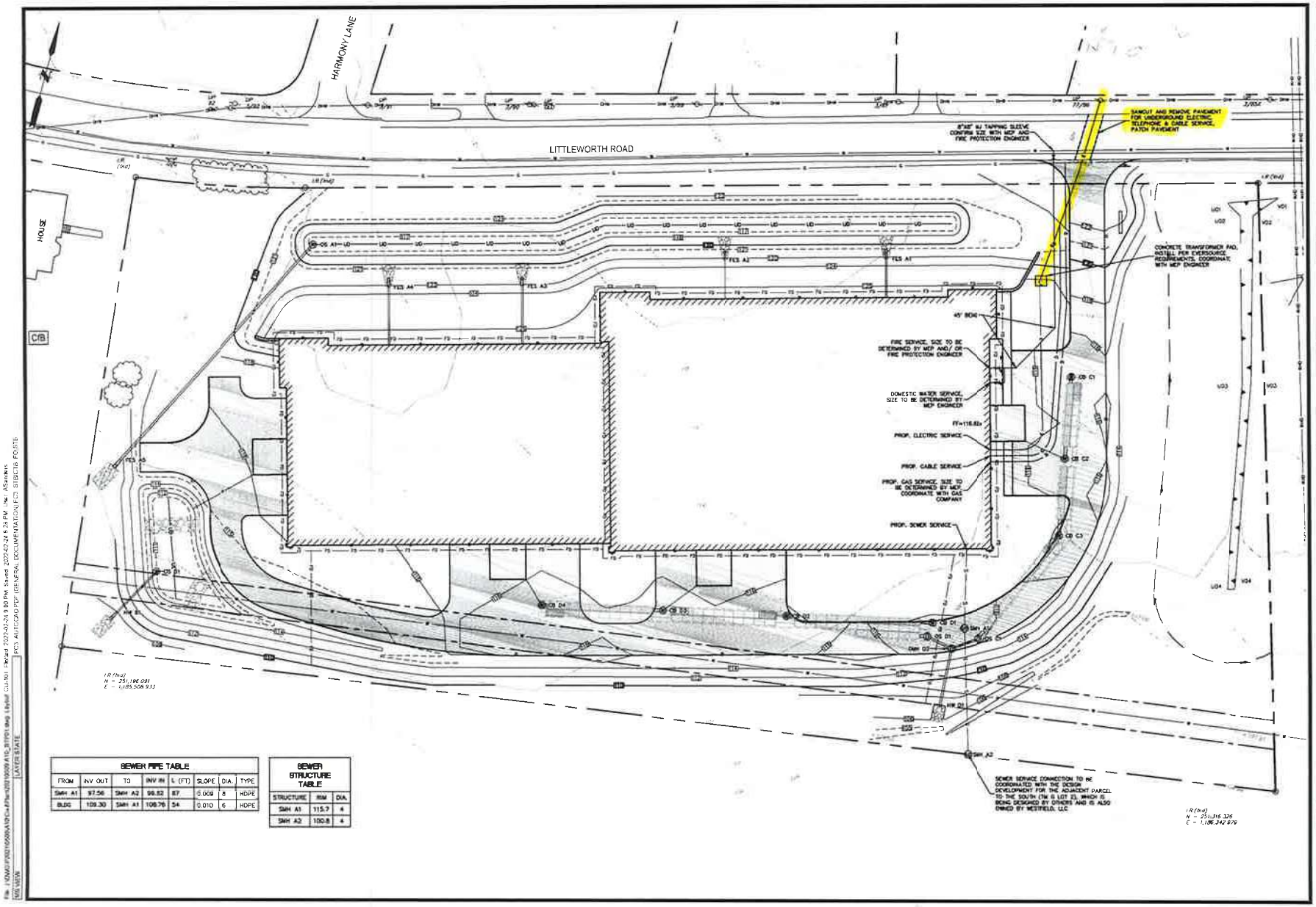
Eversource approves the locations shown; assuming the final installed locations meet all clearances, physical protection, and access requirements as outlined in Eversource's "Information & Requirements For Electric Supply" (https://www.eversource.com/content/docs/default-source/pdfs/requirements-for-electric-service-connections.pdf?sfvrsn=2).

If you require additional information or I can be of further assistance please do not hesitate to contact me at our Rochester Office, 603-332-7515

Respectfully.

Trevor Emmons
Eastern Regional Engineer, Eversource

cc: Michael J. Busby, PE, Eastern Regional Engineering and Design Manager, Eversource
Thomas Boulter, Eastern Region Operations Manager, Eversource
Nickolai Kosko, Field Supervisor, Electric Design, Eversource



SEWER PIPE TABLE

FROM	INV OUT	TO	INV IN	L (FT)	SLOPE	DIA.	TYPE
SMH A1	97.56	SMH A2	96.82	87	0.009	8	HDPE
BLDG	108.30	SMH A1	106.76	54	0.010	6	HDPE

SEWER STRUCTURE TABLE

STRUCTURE	RIM	DIA.
SMH A1	115.7	4
SMH A2	100.8	4

NO.	DESCRIPTION	DATE	DESIGNED REVIEWED

SCALE: HORZ. 30 VERT.
DATUM: HORZ. VERT.
GRAPHIC SCALE 30 15 0 30

FUSS & O'NEILL
ENGINEERS, PLANNERS & SCIENTISTS
www.fando.com

BLUEBIRD SELF STORAGE
UTILITY PLAN
TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No. 20210508.A10
DATE: 2.25.2022

CU-101

File: J:\DWG\P2021\0508\A10\Civil\Plan\20210508.A10_SITE01.dwg Layout: CU-101 Plotted: 2022-02-24 9:00 PM Saved: 2022-02-24 9:23 PM User: JSanders
PC3 AUTOCAD PDF (GENERAL DOCUMENTATION).PC3 STRETCH FONTS
NO VIEW
LAYER STATE

Mailing Notifications
Owner, Applicant and Technical Professionals

Applicant
Bill Goodison
Bluebird Self-Storage
125 Ocean Road
Greenland, NH 03840

Owner
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Westfield, LLC
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Dover, New Hampshire 03820

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Fuss and O'Neill
50 Commercial Street
Manchester, New Hampshire 03101

Landscape Architect
Stephanie White
Fuss and O'Neill
50 Commercial Street
Manchester, New Hampshire 03101

Land Surveyor
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McEneaney Survey Associates
PO Box 681
24 Chestnut Street
Dover, New Hampshire 03820

Architect
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JSN Associates, LLC
One Autumn Street
Portsmouth, New Hampshire 03801

Wetland Scientist
Bruce Gilday
BAD Land Consultants
43 Rockingham Street
Concord, New Hampshire 03301

Soil Scientist
Luke Hurley
Gove Environmental Services, Inc.
8 Continental Drive, Unit H
Exeter, New Hampshire 03833

BLUEBIRD
SELF STORAGE

TANGRAM 3DS

TANGRAM 3DS

FUSS & O'NEILL

MEMORANDUM

TO: Ms. Donna Benton, AICP
Director of Planning and Community Development

FROM: Linda Greer, PE, PTOE

DATE: February 25, 2022

RE: Traffic Generation Assessment
Proposed Self-Storage Facility Development
Tax Map G, Lot 2 – 64 Littleworth Road (NH Route 9)
Dover, NH
Fuss & O'Neill Reference No. 20210509.A10

Purpose

The purpose of this traffic memo is to provide an assessment of the potential traffic generation associated with the development of the property at 64 Littleworth Road (NH Route 9) in Dover, New Hampshire to a 231,300 sf self-storage facility. The land (Tax Map G, Lot 2) was previously occupied by a residential home and garage, which have already been demolished. Access to the site will be provided via a new driveway connected to Littleworth Road (NH Route 9) on the eastern side of the site. The self-storage facility is proposed to be developed in two phases, the first of which will construct a 138,300-sf building and the second to construct an additional 93,000 sf addition, in the future, totaling 231,300 sf once both phases are complete. This analysis will assess traffic generation associated with the completion of both phases, combined.

Study Area Description

Littleworth Road is a two-lane arterial roadway that runs east-west between Calef Highway (NH Route 125) and Knox Marsh Road (NH Route 155) in Dover, New Hampshire. It is approximately 32 feet in width with two 12-foot lanes serving traffic in each direction separated by a painted double yellow centerline. The road has marked 4-foot shoulders as well. No curbing or sidewalks are provided along the roadway within the project study area. Bike lanes or on-street parking are also not provided. According to the New Hampshire Department of Transportation Transportation Data Management System, Littleworth Road experienced an average annual daily traffic volume of 10,476 vehicles per day in 2020 and 10,646 vehicles per day in 2017approximately half a mile east of the project site. Littleworth Road is under the administrative jurisdiction of the New Hampshire Department of Transportation and has a posted speed limit of 40 mph adjacent to the site.

Estimated Traffic Generation and Distribution

Traffic generation estimates for land uses are typically calculated using the rates and equations from the Institute of Transportation Engineers (ITE) *Trip Generation,* 11th Edition publication. This publication is an industry standard resource for determining trip generation.

Traffic estimates for the proposed self-storage facility utilized the Mini-Warehouse Land Use Code (LUC 151) of 231,300 sf in size, which results in a total of 335 trips during the average weekday (167 entering, 168 exiting), 21 trips during the weekday morning peak hour (12 entering, 9 exiting) and 35 trips during the weekday evening peak hour (16 entering, 19 exiting). These estimates are summarized in the tables below.

Weekday Adjacent Street Peak Hour	Total	Enter	Exit
Mini-Warehouse (231.30 ksf)	335	167	168
Project Total	**335**	**167**	**168**

Weekday AM Adjacent Street Peak Hour	Total	Enter	Exit
Mini-Warehouse (231.30 ksf)	21	12	9
Project Total	**21**	**12**	**9**

Weekday PM Adjacent Street Peak Hour	Total	Enter	Exit
Mini-Warehouse (231.30 ksf)	35	16	19
Project Total	**35**	**16**	**19**

According to the New Hampshire Department of Transportation Data Management System count data described previously, approximately 50.1% of trips travelled through the count station in the eastbound direction and 49.9% of trips travelled through the count station in the westbound direction. It is assumed that the trips generated by the proposed self-storage facility would follow the same pattern- approximately half of the trips generated by the development would arrive from/exit to the west, while the other half of the generated trips would arrive from/exit to the east.
`

Applying this distribution, approximately 167 vehicles would arrive from/exit to the west and 168 vehicles would arrive from/exit to the east during the average weekday. Similarly, during the weekday morning peak hour, 11 trips would arrive from/exit to the west and 10 trips would arrive from/exit to

the east. Lastly, during the weekday evening peak hour, 17 trips would arrive from/exit to the west and 18 trips would arrive from/exit to the east.

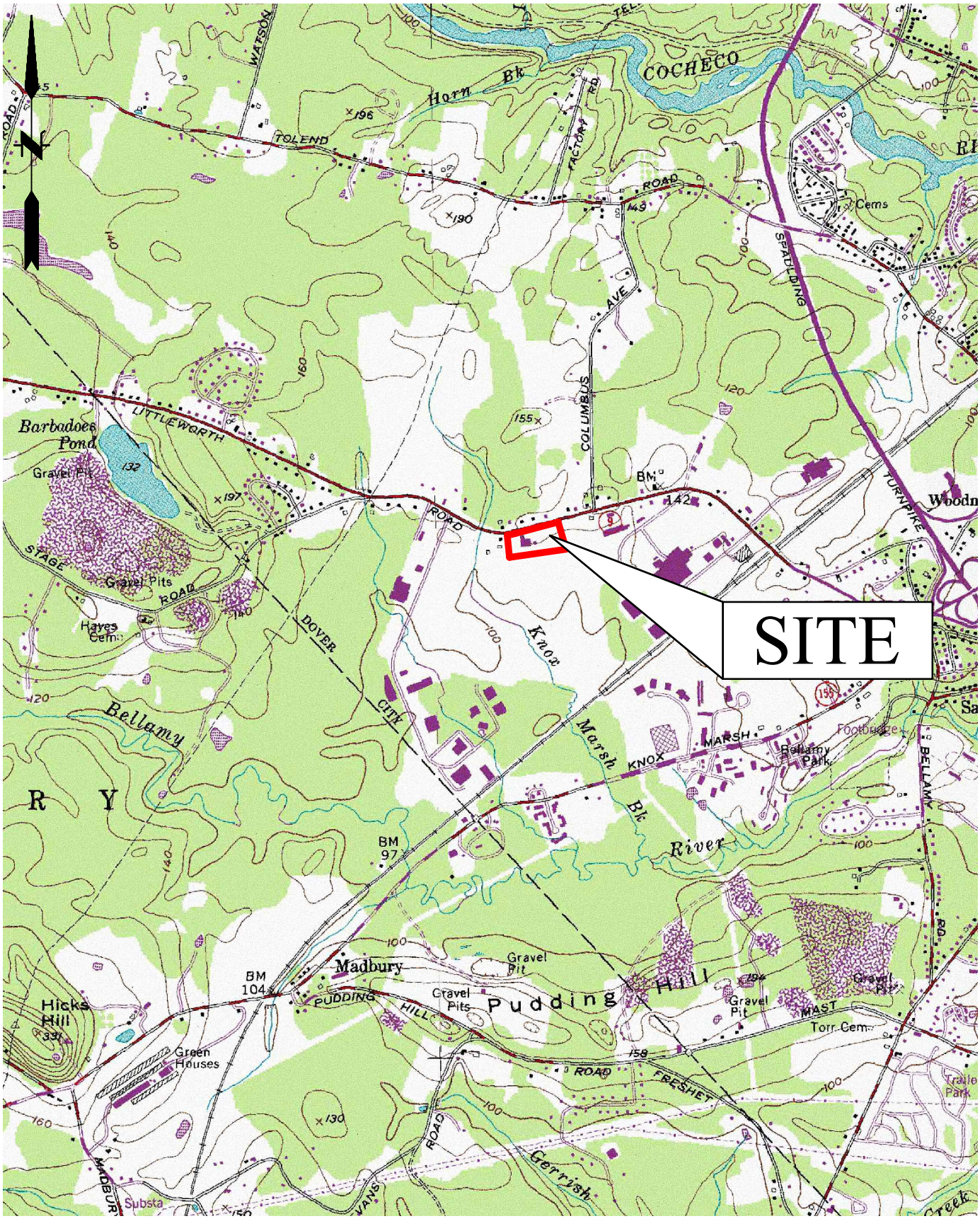
Overall, considering the relatively low amount of traffic expected to be generated by the proposed self-storage facility site, there should be minimal impacts on traffic operations on the roadway network adjacent to the site.

Conclusions and Recommendations

Based on the above evaluation, we feel that the development of the existing site at 64 Littleworth Road for a proposed self-storage facility use would have negligible impact on the existing adjacent traffic network. The expected traffic generation for the proposed self-storage facility use would be on the order of 335 trips during the average weekday, 21 trips during the weekday morning peak hour and 35 trips during the weekday evening peak hour. It is our opinion that this level of traffic generation can be accommodated by the existing street network adjacent to the project site.

LCG:mjt

Attachments -
- Site Layout plan – Proposed site development
- ITE Trip Generation – Mini-Warehouse (LUC 151) – Weekday, AM Peak, PM Peak
- NHDOT TDMS Count Data



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Plotter: DWG TO PDF.PC3 CTB File: FO.STB
LAYER STATE:
MS VIEW:

SCALE:	
HORZ.:	1" = 1000'
VERT.:	
DATUM:	
HORZ.:	
VERT.:	

0 1000 2000
GRAPHIC SCALE

FUSS & O'NEILL
50 COMMERCIAL STREET
MANCHESTER, NEW HAMPSHIRE 03101
603.668.8223
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BLUEBIRD SELF-STORAGE

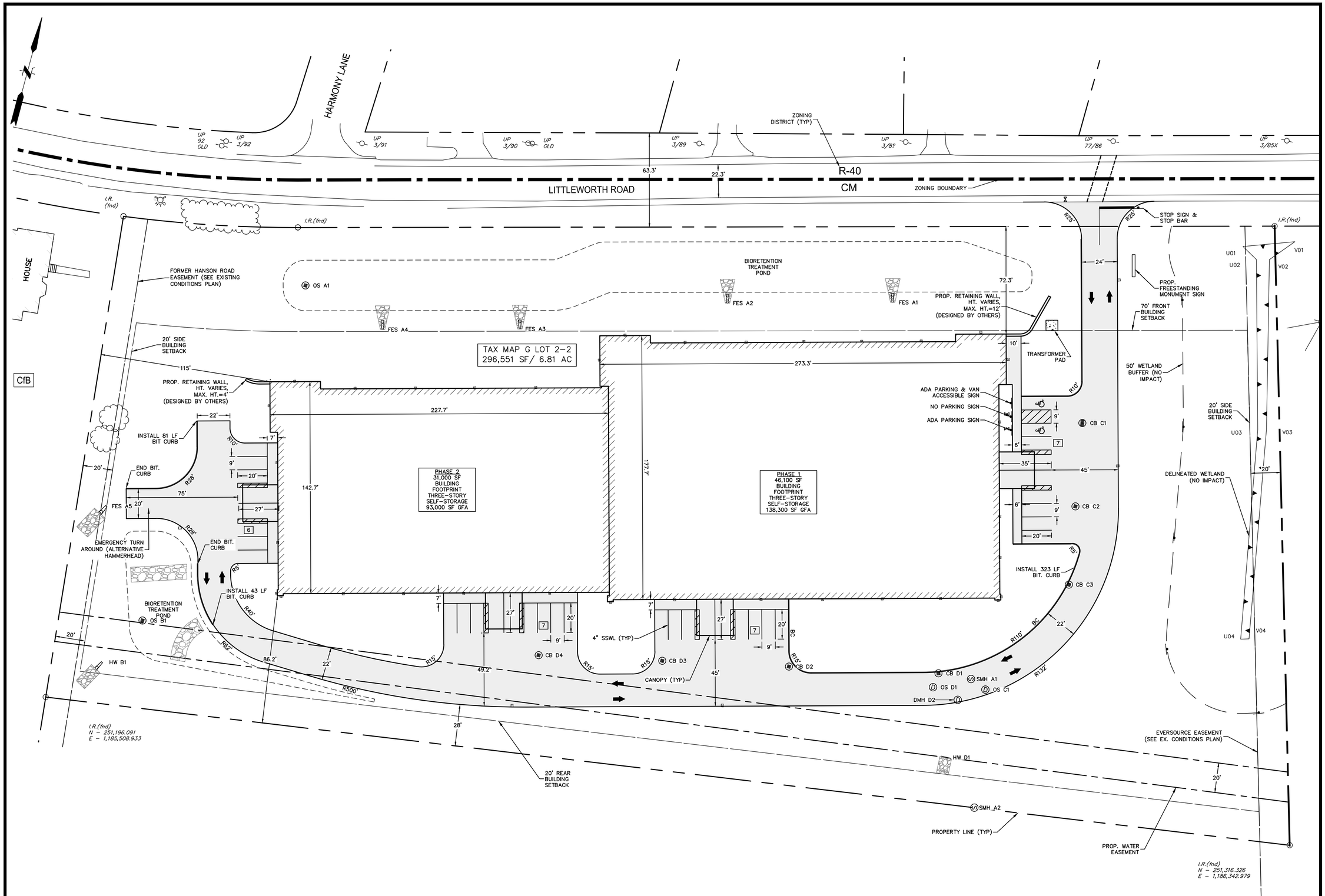
USGS MAP

TAX MAP G LOT 2-2
SELF-STORAGE FACILITY

DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

CM-101



No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE: HORZ.: 30 VERT.: DATUM: HORZ.: VERT.: 30 15 0 30 GRAPHIC SCALE

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MANCHESTER, NEW HAMPSHIRE 03101
603.668.8223
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BLUEBIRD SELF STORAGE

SITE LAYOUT PLAN

TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

CS-101

File: J:\DWG\P2021\0509\A10\Civil\Plan\20210509.A10_STP01.dwg Layout: CS-101 Plotted: 2022-02-23 1:12 PM Saved: 2022-02-23 12:25 PM User: adubois
PC3: DWG TO PDF.PC3 STB/CTB: FO.STB
MS VIEW: LAYER STATE:

Mini-Warehouse
(151)

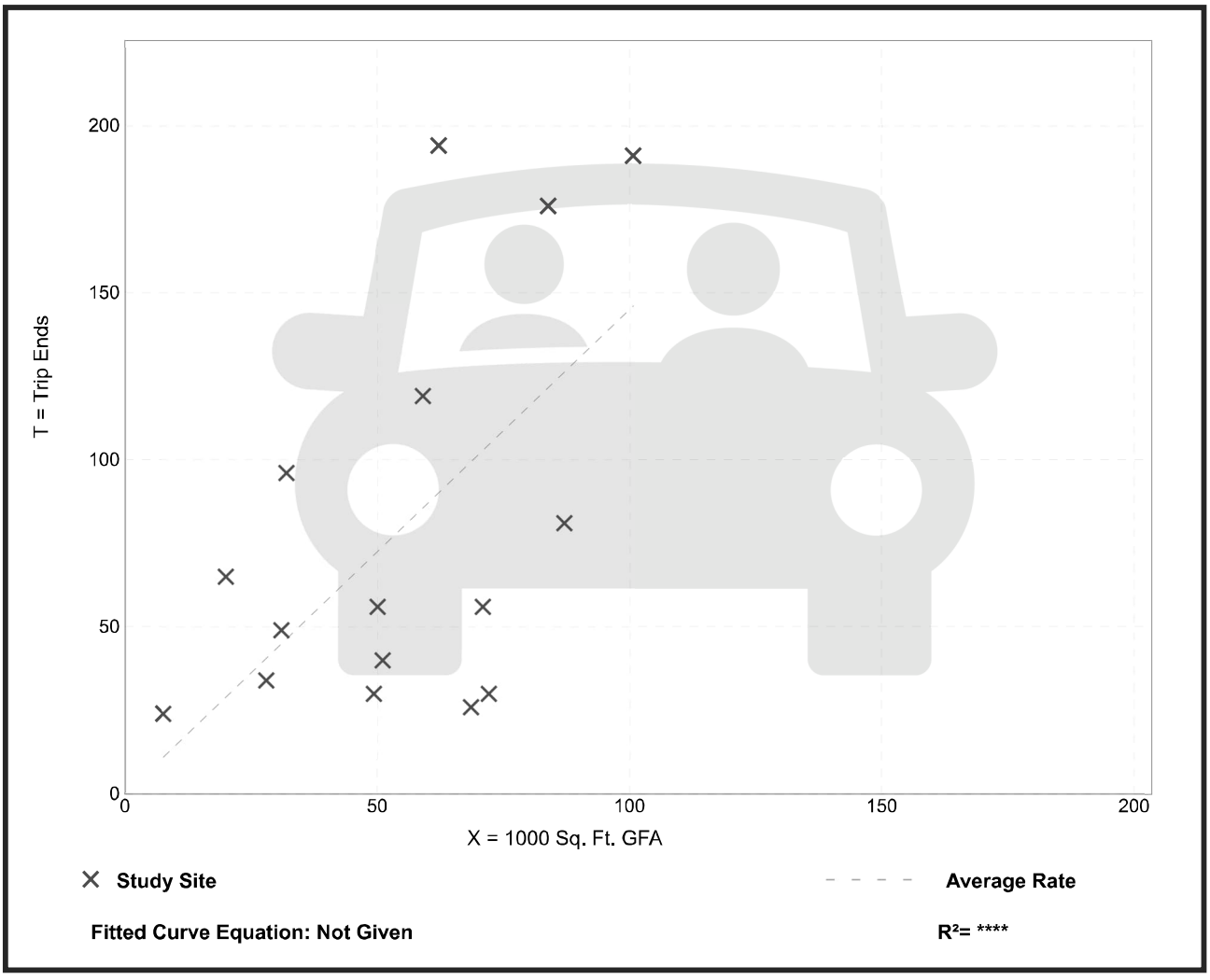
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 16
Avg. 1000 Sq. Ft. GFA: 55
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.45	0.38 - 3.25	0.92

Data Plot and Equation



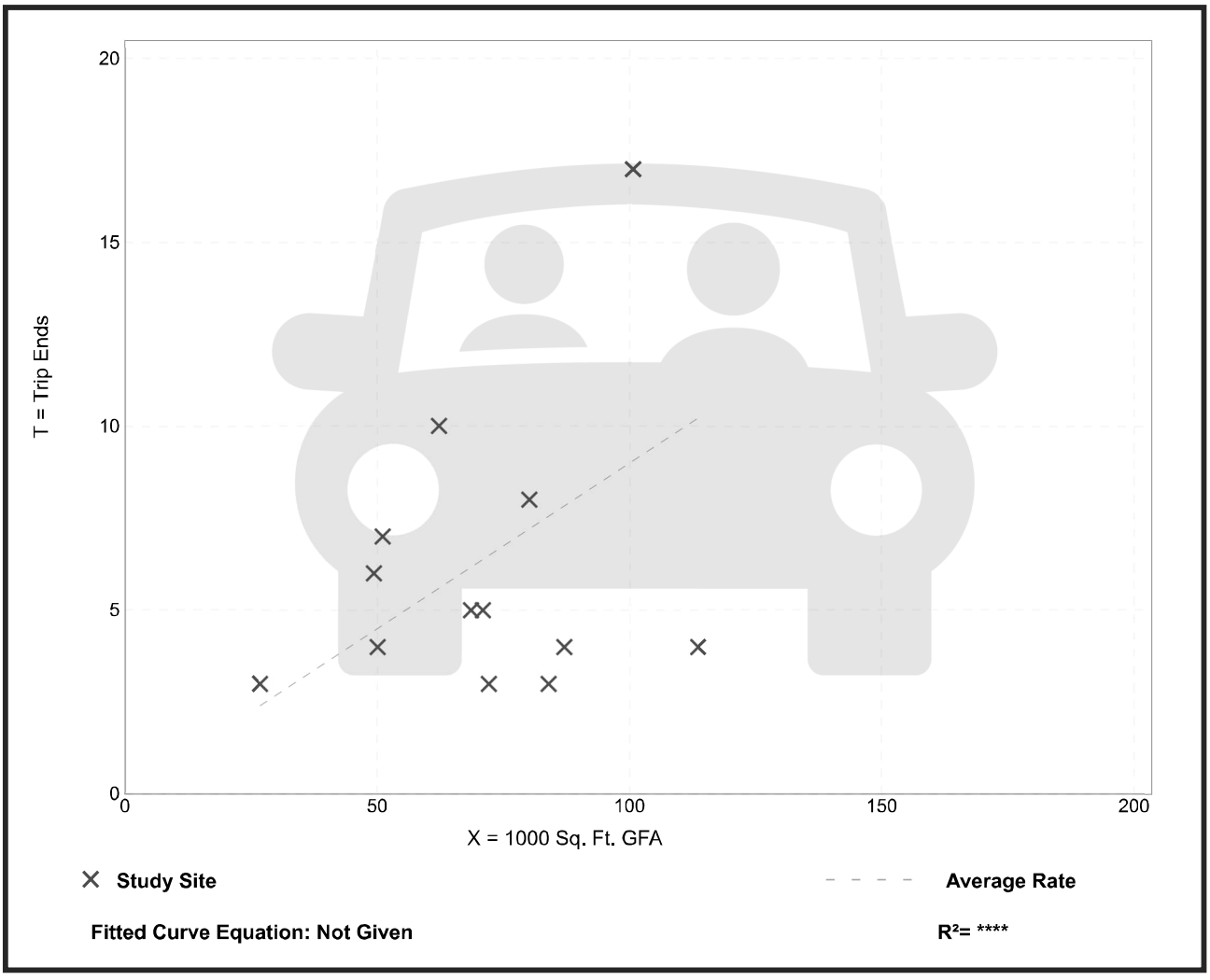
Mini-Warehouse
(151)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 13
Avg. 1000 Sq. Ft. GFA: 70
Directional Distribution: 59% entering, 41% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.09	0.04 - 0.17	0.05

Data Plot and Equation



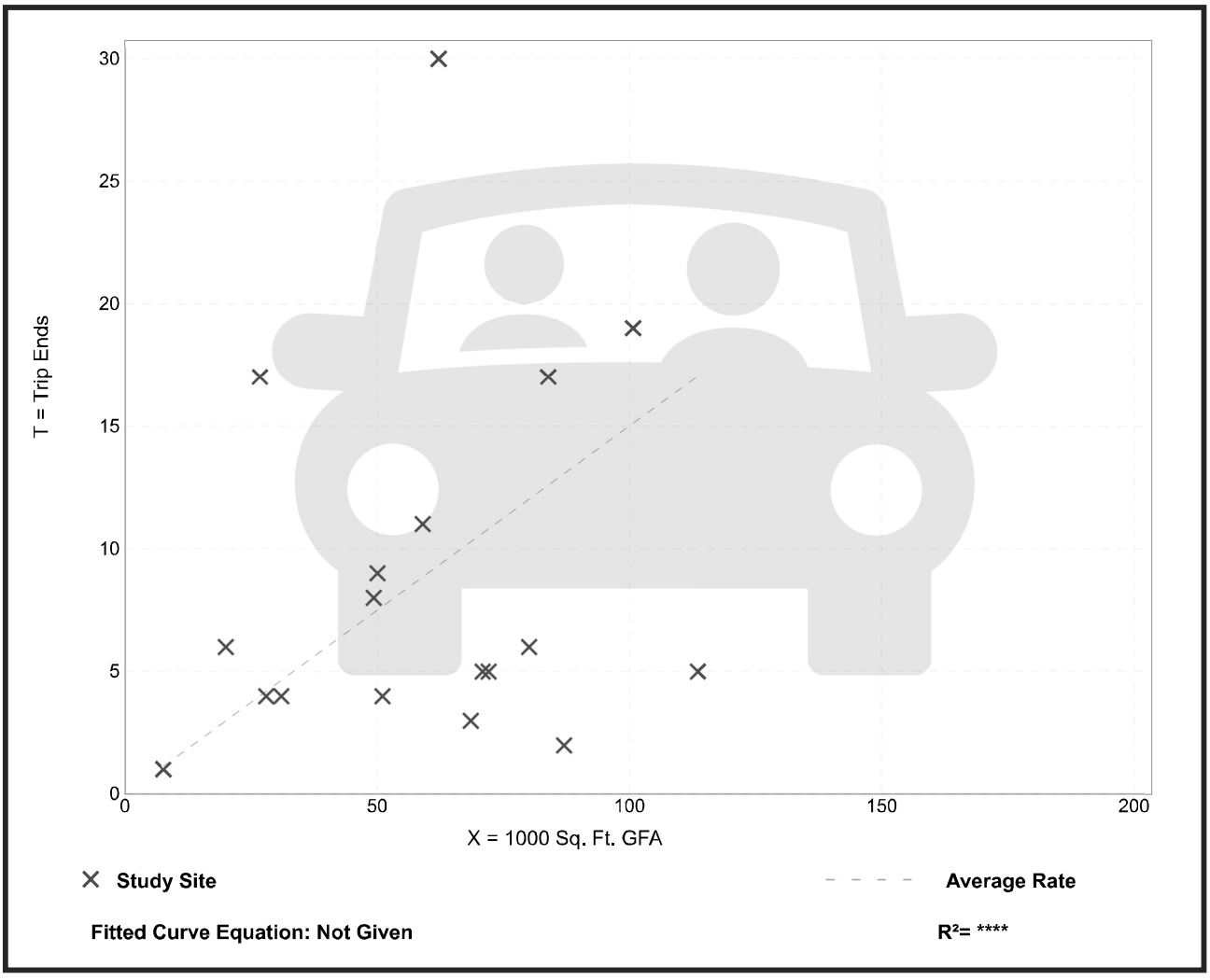
Mini-Warehouse
(151)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
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: 18
Avg. 1000 Sq. Ft. GFA: 59
Directional Distribution: 47% entering, 53% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.15	0.02 - 0.64	0.14

Data Plot and Equation



New Hampshire DOT
82125086 Weekly Volume Report - Mon 07/24/2017 - Sun 07/30/2017

Location ID:	82125086	**Type:**	SPOT
Located On:	Littleworth Rd		
Direction	2-WAY		
Community:	DOVER	**Period:**	Mon 07/24/2017 - Sun 07/30/2017
AADT:	10646		

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg
12:00 AM	34	57	65	66				56
1:00 AM	16	24	22	22				21
2:00 AM	30	32	35	46				36
3:00 AM	47	67	55	49				55
4:00 AM	114	127	156	116				128
5:00 AM	321	332	288	310				313
6:00 AM	584	679	651	640				639
7:00 AM	882	939	915	889				906
8:00 AM	884	944	933	858				905
9:00 AM	655	641	661	658				654
10:00 AM	620	635	700	634				647
11:00 AM	665	657	723	715				690
12:00 PM	718	783	828	762				773
1:00 PM	670	675	722	689				689
2:00 PM	725	804	768	788				771
3:00 PM	837	969	929	861				899
4:00 PM	796	898	910	950				889
5:00 PM	732	899	883	875				847
6:00 PM	520	600	661	655				609
7:00 PM	391	464	448	439				436
8:00 PM	263	271	339	307				295
9:00 PM	174	247	226	214				215
10:00 PM	129	145	217	165				164
11:00 PM	86	130	111	104				108
Total	**10893**	**12019**	**12246**	**11812**	**0**	**0**	**0**	
24HrTotal	10893	12019	12246	11812				11743
AM Pk Hr	8:00	8:00	8:00	7:00				
AM Peak	884	944	933	889				913
PM Pk Hr	3:00	3:00	3:00	4:00				
PM Peak	837	969	929	950				921
% Peak Hr	8.12%	8.06%	7.62%	8.04%				8.00%
% Peak Hr	8.12%	8.06%	7.62%	8.04%				7.96%

New Hampshire DOT
82125086 Weekly Volume Report - Mon 08/31/2020 - Sun 09/06/2020

Location ID:	82125086	**Type:**	SPOT
Located On:	Littleworth Rd		
Direction	2-WAY		
Community:	DOVER	**Period:**	Mon 08/31/2020 - Sun 09/06/2020
AADT:	10476		

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg
12:00 AM		30	31	38				33
1:00 AM		28	30	29				29
2:00 AM		18	23	14				18
3:00 AM		66	79	66				70
4:00 AM		105	123	102				110
5:00 AM		329	302	321				317
6:00 AM		649	617	680				649
7:00 AM		924	923	953				933
8:00 AM		910	937	952				933
9:00 AM		832	834	826				831
10:00 AM		766	686	701				718
11:00 AM		802	767	797				789
12:00 PM		881	793	873				849
1:00 PM		834	769	770				791
2:00 PM		954	840	941				912
3:00 PM		1040	1016	1125				1060
4:00 PM		1073	994	1059				1042
5:00 PM		877	804	905				862
6:00 PM		552	477	492				507
7:00 PM		347	336	374				352
8:00 PM		193	186	238				206
9:00 PM		153	144	129				142
10:00 PM		88	93	106				96
11:00 PM		57	43	60				53
Total	**0**	**12508**	**11847**	**12551**	**0**	**0**	**0**	
24HrTotal			12508	11847	12551			12302
AM Pk Hr		7:00	8:00	7:00				
AM Peak		924	937	953				938
PM Pk Hr		4:00	3:00	3:00				
PM Peak		1073	1016	1125				1071
% Peak Hr		8.58%	8.58%	8.96%				9.00%
% Peak Hr			8.58%	8.58%	8.96%			8.71%

BLUEBIRD SELF-STORAGE

TAX MAP G LOT 2-2

64 LITTLEWORTH ROAD · DOVER · NEW HAMPSHIRE

SELF-STORAGE FACILITY

FEBRUARY 25, 2022

PREPARED FOR

BLUEBIRD SELF-STORAGE
125 OCEAN ROAD, GREENLAND, NH 03840

PREPARED BY

FUSS & O'NEILL
50 COMMERCIAL STREET
MANCHESTER, NEW HAMPSHIRE 03101
603.668.8223
www.fando.com

SHEET INDEX

SHEET NO.	DWG. NO.	SHEET TITLE
1	GI-001	COVER SHEET
2	CN-001	GENERAL NOTES PLAN
3	CN-002	GENERAL NOTES PLAN
4	-	EXISTING CONDITIONS PLAN OF LAND
5	CC-101	DEMOLITION PLAN
6	CS-101	SITE LAYOUT PLAN
7	CS-102	SITE PHASING PLAN
8	CS-103	SITE CIRCULATION PLAN
9	CS-104	NEIGHBORHOOD SITE PLAN
10	CG-101	GRADING AND DRAINAGE PLAN
11	CU-101	UTILITY PLAN
12	CL-101	LIGHTING PLAN
13	CP-101	SIGHT DISTANCE PLAN AND PROFILE
14	CE-101	EROSION AND SEDIMENT CONTROL PLAN
15	CW-101	WETLAND IMPACT PLAN
16	LP-101	SITE PLANTING PLAN
17	LP-102	SITE PLANTING NOTES AND DETAILS
18	CD-501	PAVEMENT, PAVEMENT MARKING AND CURB DETAILS
19	CD-502	SIGN DETAILS
20	CD-503	LIGHTING DETAILS
21	CD-504	DRAINAGE DETAILS
22	CD-505	DRAINAGE DETAILS
23	CD-506	DRAINAGE DETAILS
24	CD-507	DRAINAGE DETAILS
25	CD-508	EROSION AND SEDIMENT CONTROL DETAILS
26	CD-509	EROSION AND SEDIMENT CONTROL DETAILS
27	CD-510	WATER AND UTILITY DETAILS
28	CD-511	SEWER DETAILS
29		COLORED BUILDING ELEVATIONS

PROJECT TEAM

APPLICANT:
BLUEBIRD SELF STORAGE
125 OCEAN ROAD
GREENLAND, NH 03840
603.436.7355

OWNER:
WESTFIELD, LLC
340 CENTRAL AVENUE, SUITE 202
DOVER, NH 03820
603.749.2800

ENGINEER & LANDSCAPE ARCHITECT:
FUSS AND O'NEILL
50 COMMERCIAL STREET
MANCHESTER, NH 03101
603.668.8223

SOIL SCIENTIST:
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EXETER, NH 03865
603.778.0644

SURVEYOR:
MCENEANEY SURVEY ASSOCIATES OF NEW ENGLAND
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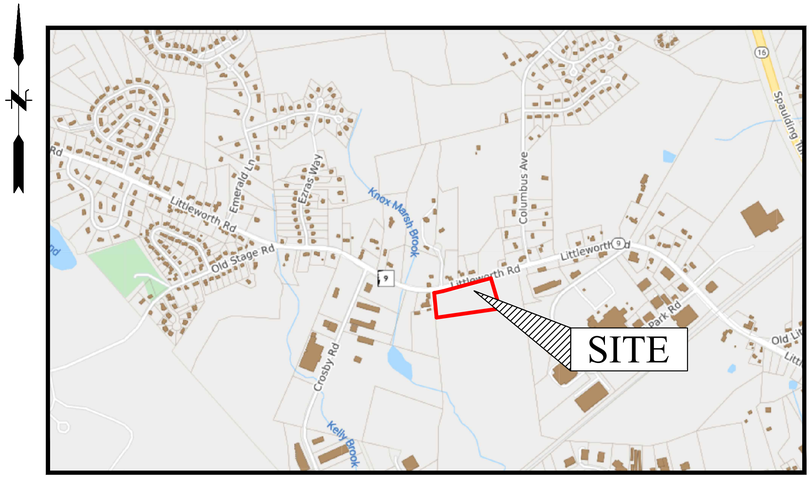
24 CHESTNUT STREET
DOVER, NH 03820
603.742.0911

WETLAND SCIENTIST:
BAG LAND CONSULTANTS
43 ROCKINGHAM STREET
CONCORD, NH 03301
603.228.5775



LOCATION MAP
SCALE: 1" = 1,000'

DIG SAFE
NE NH VT
888-DIG-SAFE
811 UTILITIES UNDER GROUND PLANT DAMAGE PREVENTION SYSTEM

CONTACT DIG SAFE 72 HOURS PRIOR TO CONSTRUCTION

THE LOCATION OF ANY UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. FUSS & O'NEILL MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UTILITIES SHOWN. 72 HOURS PRIOR TO ANY EXCAVATION ON SITE, THE CONTRACTOR SHALL CONTACT DIG-SAFE AT 1-888-DIG-SAFE.

#	DATE	DESCRIPTION	DES. BY	APPROVED
1.	2.25.2022	ISSUED FOR TRC REVIEW	ARS	BAP

STATE OF NEW HAMPSHIRE
AMY REBECCA SANDERS
No. 11065
LICENSED PROFESSIONAL ENGINEER

REQUIRED APPROVALS

	PERMIT #	DATE APPROVED	EXPIRATION DATE
PLANNING BOARD			
SITE PLAN	-	PENDING	
CONDITIONAL USE PERMIT	-	PENDING	
ZONING BOARD			
CUP CRITERIA	Z22-01	1.20.2022	-
NHDES			
ALTERATION OF TERRAIN PERMIT	-	PENDING	-
WETLANDS AND NON-SITE SPECIFIC PERMIT	-	PENDING	-
NHDOT			
DRIVEWAY PERMIT	-	PENDING	-

OWNER'S SIGNATURE _____ DATE _____

APPROVED BY THE CITY OF DOVER, NH PLANNING BOARD ON _____

CERTIFIED BY:

CHAIRMAN/ VICE CHAIRMAN _____ DATE _____

TAX MAP G LOT 2-2
BK 4733 PG 471
STRAFFORD COUNTY

OWNER
WESTFIELD, LLC
340 CENTRAL AVENUE, SUITE 202
DOVER, NH 03820

PROJ. No.: 20190293.A10
DATE: 12/11/2020

GI-001

File Path: J:\DWG\P2021\05\09A10\CivilPlan\20210509.A10_COV01.dwg, Layout: GI-001, Plotted: Thursday, February 24, 2022, User: asanders Plotter: DWG TO PDF.PC3 CTB File: FO.STB

LEGEND

EXIST	PROP	
		PROPERTY LINE/RIGHT-OF-WAY
		CENTERLINE
	LOD	LIMIT OF DISTURBANCE
		EASEMENT
		BUILDING SETBACK
		STATE HIGHWAY BASELINE
10+00	10+00	BASELINE
		ZONING LINE
		EDGE OF WATER
WET		WETLAND LINE
		BUFFER ZONE
		WETLAND SYMBOL
		GRAVEL ROAD
		EDGE OF PAVEMENT
	BC	BITUMINOUS CURB
	CC	CONCRETE CURB
	SGC	SLOPED GRANITE CURB
	VGC	VERT. GRAN. CURB
		LIMIT OF CURB TYPE
		SAW CUT
MATCH LINE	SEE SHEET XXX-XX	MATCH LINE
SWL	SWL	SOLID WHITE LINE
SYL	SYL	SOLID YELLOW LINE
BWL	BWL	BROKEN WHITE LINE
BYL	BYL	BROKEN YELLOW LINE
SWCHL	SWCHL	SOLID WHITE CHANNELIZING LINE
SYCHL	SYCHL	SOLID YELLOW CHANNELIZING LINE
DYL	DYL	DOUBLE YELLOW LINE
STOP	STOP	STOP LINE
		GUARD RAIL
		STOCKADE FENCE
		WIRE FENCE
		CHAIN LINK FENCE
		TREE LINE
		SHRUB LINE
		STONE WALL
		RETAINING WALL
4	4	MINOR CONTOUR
20	20	MAJOR CONTOUR
TS	TS	TOP of SLOPE
BS	BS	BOTTOM of SLOPE
		BUILDING
		BOLLARD
		SIGN
		DOUBLE SIGN
PM	PM	PARKING METER
10	10	PARKING COUNT
		CROSSWALK
		CONC. PAVEMENT
		HANDICAP RAMP
		HANDICAP PARKING
VAN	VAN	VAN-ACCESSIBLE HANDICAP PARKING
21.25 TC 21.25 BC	21.25 TC 21.25 BC	TOP & BOTTOM ELEVATION
21.25 x21.25	21.25 x21.25	SPOT ELEVATION w/LEADER
	x21.25	SPOT ELEVATION
		SOIL BORING
		MONITORING WELL
		TEST PIT LOCATION
		IRON PIPE
		DRILL HOLE
	IP	IRON PIN
		MONUMENT
		MAIL BOX
		CONTROL POINT
		SILT FENCE
		HAYBALES

LEGEND (CONT.)

	EXIST	PROP.
STORM DRAINAGE PIPE	D	
SANITARY SEWER PIPE	S	
OVERHEAD WIRES	OHE	II
WATER MAIN	W	W
UNDERGROUND GAS	G	G
UNDERGROUND TELEPHONE	T	T
UNDERGROUND ELECTRIC	UGE	E
FOUNDATION DRAIN	FD	FD
CABLE LINE	C	C
RIPRAP		
SANITARY MANHOLE	S	S
STORM MANHOLE	D	D
ELECTRIC MANHOLE	E	E
TELEPHONE MANHOLE	T	T
CATCH BASIN		
FLAT TOP CATCHBASIN		
DOUBLE CATCHBASIN		
WATER VALVE		
FIRE HYDRANT		
UTILITY POLE		
BOLLARD/POST		
SIGN		
GAS GATE	GG	GG
LIGHTPOLE		
FLARED END		
DECIDUOUS TREE		

ABBREVIATIONS

GENERAL

APPROX.	APPROXIMATE
BIT.	BITUMINOUS
BW	BOTTOM OF WALL
CC	CONCRETE CURB
CCB	CAPE CODE BERM
CONC.	CONCRETE
ELEV	ELEVATION
EXIST	EXISTING
GC	GRANITE CURB
MAX	MAXIMUM
MIN	MINIMUM
NTS	NOT TO SCALE
PCC	PRE CAST CONCRETE CURB
PROP	PROPOSED
REM	REMOVE
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
TOS	TOP OF SLOPE
TW	TOP OF WALL
TYP	TYPICAL
VGC	VERTICAL GRANITE CURB

UTILITY

CB	CATCH BASIN
CMP	CORRUGATED METAL PIPE
CPP	CORRUGATED POLYETHYLENE PIPE
DCB	DOUBLE CATCH BASIN
DI	DUCTILE IRON PIPE
F&G	FRAME AND GRATE
F&C	FRAME AND COVER
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HYD	HYDRANT
INV	INVERT ELEVATION
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
SMH	SEWER MANHOLE
TSV	TAPPING SLEEVE, VALVE AND BOX
UP	UTILITY POLE

TEST PIT DATA

TEST PITS LOGGED BY LUKE HURLEY OF GOVE ENVIRONMENTAL SERVICES, NOVEMBER 29, 2021.

TEST PIT #1:

0–6 INCHES, 10YR3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
6–12 INCHES, 10YR 4/4, FINE SANDY LOAM , GRANULAR, FRIABLE
12–32 INCHES, 2.5Y 4/4, FINE SANDY LOAM, MASSIVE, FIRM
32–64 INCHES, 2.5Y5/6, FINE SAND LOAM, MASSIVE, FIRM

ESHWT: N/A REFUSAL: N/A OBSERVED WATER: N/A

TEST PIT #2:
0–4 INCHES, 10YR3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
4–10 INCHES, 10YR 4/4, FINE SANDY LOAM , BLOCKY, FIRM
10–16 INCHES, 2.5Y 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE
16–36 INCHES, 2.5Y5/6, FINE SAND LOAM, GRANULAR, FRIABLE
36–56 INCHES, 2.5Y4/4, FINE SAND, MASSIVE, FIRM

ESHWT: N/A REFUSAL: SHALE 56 INCHES OBSERVED WATER: N/A

TEST PIT #2A:

0–6 INCHES, 10YR3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
6–12 INCHES, 10YR 4/4, FINE SANDY LOAM , BLOCKY, FIRM
12–20 INCHES, 2.5Y4/4, FINE SANDY LOAM, GRANULAR, FRIABLE,
20–40 INCHES, 10YR5/6, FINE SANDY LOAM, GRANULAR, FRIABLE
40–54 INCHES, 2.5Y4/4, FINE SAND, MASSIVE, FIRM, REDOX 15%

ESHWT: 54 INCHES REFUSAL: SHALE 54 INCHES OBSERVED WATER: N/A

TEST PIT #3

0–8 INCHES, 10YR3/6, FINE SANDY LOAM, GRANULAR, FRIABLE
8–30 INCHES, 10YR4/4, FINE SANDY LOAM , MASSIVE, FIRM

ESHWT: N/A INCHES REFUSAL: 30 INCHES SHALE OBSERVED WATER: N/A

TEST PIT #4

0–10 INCHES, 10YR3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
10–20 INCHES, 2.5Y 3/3, SILT/CLAY , BLOCKY, FIRM REDOX 50%

ESHWT: 10 INCHES REFUSAL: N/A OBSERVED WATER: N/A

TEST PIT #5

0–12 INCHES, 10YR3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
12–24 INCHES, 2.5Y 4/3, FINE SANDY LOAM , BLOCKY, FIRM REDOX 30%

ESHWT: 12 INCHES REFUSAL: N/A OBSERVED WATER: N/A

TEST PIT #6

0–10 INCHES, 10YR3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
10–16 INCHES, 2.5Y 5/3, FINE SANDY LOAM , BLOCKY, FIRM REDOX 30%
16–24 INCHES, 2.5Y4/3, SILT/CLAY, BLOCKY, FIRM REDOX 15%
24–36 INCHES 10YR4/4, SANDY/GRAVEL, MASSIVE, FIRM, REDOX 30%

ESHWT: 10 INCHES REFUSAL: N/A OBSERVED WATER: N/A

TEST PIT #7

0–6 INCHES, 10YR3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
6–12 INCHES, 2.5Y3/3, FINE SANDY LOAM , GRANULAR FRIABLE
12–24 INCHES, 2.5Y3/1, SILT/CLAY, BLOCKY, FIRM REDOX 15%
24–36 INCHES, 2.5Y4/2, SILT/CLAY, BLOCKY, FIRM REDOX 15%

ESHWT: 12 INCHES REFUSAL: N/A OBSERVED WATER: N/A

TEST PIT #8

0–6 INCHES, 10YR3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
6–14 INCHES, 10YR3/3, FINE SANDY, MASSIVE, FIRM
14–36 INCHES, 2.5Y4/2, SILT/CLAY, BLOCKY, FIRM, REDOX 30%

ESHWT: 14 INCHES REFUSAL: N/A OBSERVED WATER: N/A

TEST PIT #9

0–6 INCHES, 10YR3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
6–20 INCHES, 10YR4/3, FINE SANDY, GRANULAR, FRIABLE
20–40 INCHES, 2.5Y5/2, SILT/CLAY, BLOCKY, FIRM, REDOX 20%

ESHWT: 20 INCHES REFUSAL: N/A OBSERVED WATER: N/A

TEST PIT #10

0–4 INCHES, 10YR3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
4–12 INCHES, 2.5Y5/3, FINE SANDY LOAM , GRANULAR FRIABLE
12–40 INCHES, 2.5Y 5/3, SILT/CLAY, BLOCKY, FIRM, REDOX 30%

ESHWT: 12 INCHES REFUSAL: N/A OBSERVED WATER: N/A

GENERAL PLAN NOTES:

1. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SHOWN ON THE DRAWINGS TO SCALE OR TO THEIR ACTUAL DIMENSION OR LOCATION. COORDINATE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.
2. DO NOT RELY SOLELY ON ELECTRONIC VERSIONS OF DRAWINGS, SPECIFICATIONS, AND DATA FILES THAT ARE PROVIDED BY THE ENGINEER. FIELD VERIFY LOCATION OF PROJECT FEATURES.
3. SITE WORK SHALL BE CONSTRUCTED FROM A COMPLETE SET OF PLANS, NOT ALL FEATURES ARE DETAILED ON EVERY PLAN. THE ENGINEER IS TO BE NOTIFIED OF ANY CONFLICT WITHIN THIS PLAN SET. ALL PLAN SHEETS WILL BE ON FILE AT THE TOWN OF DOVER.

REFERENCE PLANS:

1. EXISTING CONDITION AND BOUNDARY INFORMATION DEPICTED THROUGHOUT THIS IS SHOWN PER THE "EXISTING CONDITIONS PLAN OF LAND, PREPARED FOR BLUEBIRD STORAGE, TAX MAP G, LOT NO. 2-2, LITTLEWORTH ROAD, CITY OF DOVER, COUNTY OF STRAFFORD, STATE OF NEW HAMPSHIRE"", PREPARED BY MCENEANEY SURVEY, DATED NOVEMBER 8, 2021 AND FOUND WITHIN THIS PLAN SET.

REGULATORY REQUIREMENTS

1. PROVIDE TRAFFIC SIGNAGE AND PAVEMENT MARKINGS IN CONFORMANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. ALL CONSTRUCTION ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST OSHA STANDARDS, STATE AND LOCAL REQUIREMENTS, AND CITY OF DOVER REQUIREMENTS, POLICIES, AND SPECIFICATIONS.
3. CONTRACTOR TO CREATE TRAFFIC CONTROL PLAN FOR REVIEW AND APPROVAL WITH THE APPROPRIATE LOCAL AND/OR STATE AGENCIES PRIOR TO START OF CONSTRUCTION.

EROSION AND SEDIMENT CONTROL

1. INSTALL EROSION CONTROL MEASURES PRIOR TO STARTING ANY WORK ON THE SITE. REFER TO THE EROSION AND SEDIMENT CONTROL DRAWINGS.
2. IMPLEMENT ALL NECESSARY MEASURES REQUIRED TO CONTROL STORMWATER RUNOFF, DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE. PERFORM CORRECTIVE ACTION AS NEEDED FOR EROSION CLEANUP AND REPAIRS TO OFF SITE AREAS, IF ANY, AT NO COST TO OWNER.
3. INSTALL EROSION CONTROL BLANKETS ON ALL SLOPES 3:1 AND STEEPER.
4. INSPECT AND MAINTAIN EROSION CONTROL MEASURES PER THE SCHEDULE IN THE APPROVED SWPPP. DISPOSE OF SEDIMENT IN AN UPLAND AREA. DO NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
5. PERFORM CONSTRUCTION SEQUENCING IN SUCH A MANNER TO CONTROL EROSION AND TO MINIMIZE THE TIME THAT EARTH MATERIALS ARE EXPOSED BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED.
6. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, REMOVE AND DISPOSE OF TEMPORARY EROSION CONTROL MEASURES. CLEAN SEDIMENT AND DEBRIS FROM TEMPORARY MEASURES AND FROM PERMANENT STORM DRAIN.
7. PRIOR TO CONSTRUCTION, A CONSTRUCTION CIRCULATION PLAN SHALL BE PREPARED BY THE SITE CONTRACTOR WHICH DIRECTS CONSTRUCTION TRAFFIC TO EXIT VIA THE PROPOSED CONSTRUCTION ENTRANCE.

DEMOLITION

1. REMOVE AND DISPOSE OF EXISTING UTILITIES, FOUNDATIONS, PAVEMENT, UNSUITABLE MATERIAL, STUMPS, AND OTHER DEMOLITION DEBRIS AS DESCRIBED IN THE PLANS AND SPECIFICATIONS UNLESS OTHERWISE NOTED.
2. REMOVE AND DISPOSE OF EXISTING DEMOLITION MATERIALS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUTES.
3. NO CHANGES ARE PROPOSED OUTSIDE OF THE VISIBLE CONTENT PRESENTED ON THIS PLAN.
4. ANY BUILDING TO BE REMOVED FROM THE SITE MUST HAVE A DEMOLITION PERMIT.
5. THE LIMITS OF CONSTRUCTION DISTURBANCE THAT ARE LOCATED WITHIN THE 50FT OF CONSERVATION AND WETLAND DISTRICTS SHALL BE STAKED, FLAGGED AND CLEARLY IDENTIFIED PRIOR TO ANY EARTH DISTURBING ACTIVITY OCCURS.

NHDES INVASIVE SPECIES NOTES

1. IF INVASIVE SPECIES ARE ENCOUNTERED ON SITE AND SHOULD BE REMOVED ACCORDING TO NHDES REQUIREMENTS.
2. THE CONTRACTOR SHALL TAKE STEPS TO PREVENT THE SPREAD OF INVASIVE PLANT, INSECT, AND FUNGAL SPECIES BY MEETING THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES. HTTP://GENCOURT.STATE.NH.US/RULES/STATE_AGENCIES/AGR3800.HTML

NHDES AOT NOTES:

1. DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL EROSION AND SEDIMENT CONTROL DEVICES AS SHOWN IN THE PLANS THROUGHOUT THE DURATION OF THE PROJECT IN ACCORDANCE WITH APPLICABLE NHDES STANDARDS.
2. IF REQUIRED BY THE ALTERATION OF TERRAIN PERMIT, IT SHALL BE THE OWNER AND/OR CONTRACTOR'S RESPONSIBILITY TO ACQUIRE NHDES APPROVED ENVIRONMENTAL MONITORING DURING CONSTRUCTION, FOR WEEKLY MONITORING AND REPORTING.
3. ENV-WQ REQUIRES THAT THE PERMIT HOLDER AND A QUALIFIED ENGINEER MUST SUBMIT A CERTIFICATION INDICATING THAT THE PROJECT WAS COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS, OR THAT DEVIATIONS WERE MADE THAT DID NOT REQUIRE AN AMENDED PERMIT OR NEW PERMIT.
4. POST CONSTRUCTION, THE PROPERTY OWNER/OPERATOR SHALL SHALL BE RESPONSIBLE FOR MAINTAINING ALL DRAINAGE AND STORMWATER PRACTICES. REFER TO THE ALTERATION OF TERRAIN/DRAINAGE CALCULATIONS FOR THE OPERATION AND MAINTENANCE MANUAL.
5. SALT SHALL BE APPLIED BY A GREEN SNOW PRO CERTIFIED CONTRACTOR. REFER TO THE INSPECTION AND MAINTENANCE MANUAL FOR THE WINTER MAINTENANCE AND SALT MINIMIZATION PLAN WITH ASSOCIATED INFORMATION.
6. REFER TO THE AOT PERMIT FOR ADDITIONAL CONDITIONS OF APPROVAL, APPROVAL NUMBER IS LISTED UPON THE COVER SHEET GI-001.

NEW HAMPSHIRE FISH AND GAME AOT PERMIT CONDITIONS RELATED TO THREATENED AND ENDANGERED SPECIES NOTES:

- EROSION CONTROL MATERIALS SUCH AS WELDED PLASTIC OR "BIODEGRADABLE PLASTIC" NETTING OR THREAD (E.G. POLYPROPYLENE) SHALL NOT BE USED. THE USE OF EROSION CONTROL BERM, WHITE FILTREXX DEGRADABLE WOVEN SILT SOCK OR WOVEN ORGANIC MATERIALS (E.G. COCO OR JUTE MATTING SUCH AS NORTH AMERICAN GREEN SC150BN) SHALL BE USED. SEE SHEET CD-507.
- ALL CONSTRUCTION AND SITE OPERATORS SHALL BE PROVIDED WITH THE FLYERS TO AID IN THE IDENTIFICATION OF RARE AND STATE-LISTED SPECIES WITHIN THE PROJECT VICINITY THAT ARE DETERMINED AS LIKELY OR MORE LIKELY TO BE ENCOUNTERED.
- ALL OBSERVATIONS OF THREATENED OR ENDANGERED SPECIES SHALL BE REPORTED IMMEDIATELY TO NHFG AT 603-271-2461 OR NHFG WILDLIFE BIOLOGIST MELISSA DOPERALSKI TEXT OR PHONE AT 603-479-1129 OR BY EMAIL AT RAARP@WILDLIFE.NH.GOV. EMAIL SUBJECT LINE: NHB19-3786, NH ROUTE 111 AND EMERSON AVE, WILDLIFE SPECIES OBSERVATION. PHOTOGRAPHS SHALL BE PROVIDED FOR VERIFICATION AS FEASIBLE.
- NHFG SHALL HAVE ACCESS TO THE PROPERTY DURING THE TERM OF THE PERMIT.

NPDES NOTES:

1. THIS PROJECT DISTURBS 246,500 ± SF (5.65 ± AC) OF LAND WHICH EXCEEDS THE NPDES THRESHOLD AMOUNT OF 43,560 SF (1 AC). THEREFORE, THE PROJECT WILL BE REQUIRED TO OBTAIN NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT COVERAGE AS ISSUED BY THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA). THE OWNER/DEVELOPER AND "OPERATOR" (GENERAL CONTRACTOR) SHALL BE REQUIRED TO PREPARE AND SUBMIT A NOTICE OF INTENT (NOI) TO THE EPA PRIOR TO THE START OF CONSTRUCTION AND SHALL BE RESPONSIBLE FOR THE PREPARATION AND IMPLEMENTATION OF A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) MEETING THE REQUIREMENTS OF THE CURRENT NPDES PERMIT.
2. A COPY OF THE NOI AND SWPPP SHALL BE PROVIDED TO THE TOWN PLANNING DEPT., ENGINEERING DEPT., OR DPW.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

AMY REBECCA SANDERS No. 11065 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

SCALE: HORZ.: VERT.: DATUM: HORZ.: VERT.: 0 GRAPHIC SCALE

FUSS&O'NEILL
50 COMMERCIAL STREET
MANCHESTER, NEW HAMPSHIRE 03101
603.668.8223
www.fuss-oneill.com

BLUEBIRD SELF STORAGE
GENERAL NOTES PLAN
TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

CN-001

File Path: J:\DWG\P20210509A10\CivilPlan\20210509.A10_GEN01.dwg Layout: CN-001 Plotted: Thu, February 24, 2022 - 8:49 PM User: asanders
Plotter: AUTOCAD PDF (GENERAL DOCUMENTATION).PC3 CTB File: FO.STB
MS VIEW: LAYER STATE:

DEMOLITION PLAN NOTES:

1. THE PURPOSE OF THE DEMOLITION PLAN IS TO DEPICT THE RECENT DEMOLITION OF THE FORMER HOUSE AND BARNS AS WELL AS THE PROPOSED DEMOLITION OF THE REMAINING STRUCTURES INCLUDING THE BARN, WELL AND WELL HOUSE. ADDITIONALLY, THIS PLAN IDENTIFIES TREES AND BRUSH TO BE REMOVED, GRAVEL DRIVEWAYS THAT WILL BE ELIMINATED AND PROJECT RELATED WETLAND IMPACT ON THE SUBJECT PROPERTY, 64 LITTLEWORTH ROAD, DOVER, NH.
2. THE SUBJECT PROPERTY IS LOCATED IN THE COMMERCIAL MANUFACTURING DISTRICT (CM) PER THE CITY OF DOVER, GIS MAP, ZONING LAYER. PROPERTIES TO THE SOUTH, WEST AND EAST ARE ALSO ZONED CM. PROPERTIES TO THE NORTH ARE ZONED R-40, RURAL RESIDENTIAL.
3. SUBJECT PARCEL IS NOT LOCATED WITHIN A FEDERALLY DESIGNATED FLOOD HAZARD AREA, COMMUNITY PANEL NUMBER 33017C0310E, DATED SEPTEMBER 30, 2015.
4. THIS PROJECT INCLUDES A 2,988 SF WETLAND IMPACT.
5. 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.
6. 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.
7. SITE CONSTRUCTION HOURS SHALL BE LIMITED TO MONDAY-FRIDAY, 7AM TO 6PM, SATURDAY AND SUNDAY 9AM -4PM. HOURS OF CONSTRUCTION MUST BE DOCUMENTED ON THE 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.
8. COMMERCIAL VEHICLE ROUTE DURING CONSTRUCTION SHALL CONFORM TO DOVER CITY CODE OR BE COORDINATED WITH THE COMMUNITY SERVICES DIRECTOR.
9. SITE WORK SHALL BE CONSTRUCTED FROM A COMPLETE SET OF PLANS, NOT ALL FEATURES ARE DETAILED ON EVERY PLAN. THE ENGINEER IS TO BE NOTIFIED OF ANY CONFLICT WITHIN THIS PLAN SET. ALL PLAN SHEETS WILL BE ON FILE AT THE CITY OF DOVER PLANNING DEPARTMENT. SEE OTHER PLAN SHEETS FOR RELATED NOTES AND ASSOCIATED INFORMATION.
10. THIS PROPERTY WILL BE SERVICED BY MUNICIPAL WATER AND SEWER AND PRIVATE ELECTRIC, TELEPHONE , CABLE AND GAS SERVICES.
11. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE SITE AND EXISTING CONDITIONS SURROUNDING IT AND THEREON.
12. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM THE LOCATION OF EXISTING FEATURES BOTH ABOVE GROUND AND BELOW, NO GUARANTEE IS MADE BY THIS OFFICE OR INDIVIDUALS AS TO THE LOCATION OF EXISTING FEATURES. UNDERGROUND UTILITIES ARE APPROXIMATE BASED ON REFERENCE PLANS AND INFORMATION PROVIDED BY THE UTILITY COMPANIES.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE AND ELEVATION OF ALL EXISTING UTILITIES SHOWN ON THESE PLANS PRIOR TO THE START OF ANY CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION BE AGREED TO BY THE ENGINEER BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT NEW HAMPSHIRE DIG SAFE, AT 1-888-DIG-SAFE, AT LEAST 72 HOURS BEFORE DIGGING.
14. IF ANY ERROR OR OMISSION IN THESE PLANS IS DISCOVERED BY THE CONTRACTOR, THE CONTRACTOR SHALL CONTACT THE ENGINEER OF RECORD IMMEDIATELY IN WRITING FOR DIRECTION ON HOW TO PROCEED. THE CONTRACTOR SHALL DISCONTINUE WORK IN THE AFFECTED PROJECT AREA UNTIL AGREEMENT HAS BEEN REACHED WITH THIS FIRM ON CORRECTIVE ACTION.
15. SEE DRAWING CN-001 FOR TEST PIT DATA.
16. THE SITE SPECIFIC SOIL SURVEY (SSSS) INFORMATION IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOIL SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, INTENDED FOR INFILTRATION REQUIREMENTS BY THE NH DES ALTERATION OF TERRAIN BUREAU. IT WAS PRODUCED BY A PROFESSIONAL SOIL SCIENTIST, AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE. THERE IS A REPORT THAT ACCOMPANIES THIS MAP. THE SSSS WAS PRODUCED NOVEMBER 29, 2021 AND WAS PREPARED BY LUKE D. HURLEY, CSS #095, OF GOVE ENVIRONMENTAL SERVICES, INC. THE SURVEY AREA IS LOCATED AT 64 LITTLEWORTH ROAD IN DOVER, NH. SOILS WERE IDENTIFIED WITH THE NEW HAMPSHIRE STATE-WIDE NUMERICAL SOILS LEGEND, USDA NRCS, DURHAM, NH. ISSUE # 10, JANUARY 2011. OFFSITE SOILS ARE FROM THE NRCS WEB SOIL SURVEY.
17. SEAL EXISTING WELL(S) IN ACCORDANCE WITH STATE OF NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES WATER WELL BOARD RULES 604.
    17.1. REMOVE PUMP, PIPING AND WIRING FROM THE WELL.
    17.2. FILL WELL AS NOTED IN WE 604.
    17.3. CUT WELL CASING OFF AT OR BELOW ELEVATION AND COVER WITH SOIL.
18. THE WELL SHALL ONLY BE SEALED BY A LICENSED NEW HAMPSHIRE WATER WELL CONTRACTOR WHO HAS BEEN ISSUED A VALID WATER WELL CONTRACTOR LICENSE UNDER RSA 482-B.

SITE SPECIFIC SOIL DATA:

SYMBOL	SOIL NAME	HYDROLOGIC SOIL GROUP
232	BUXTON	C
32	BOXFORD	C
233	SCANTIC	D

NRCS SOIL DATA FROM WEB SOIL SURVEY:

SYMBOL	SOIL NAME	HYDROLOGIC SOIL GROUP
CFB	CHARLTON	B
BZA	BUXTON	C
SCA	SCANTIC	C

SITE PLAN NOTES:

1. THE PURPOSE OF THE SITE PLAN IS TO ILLUSTRATE THE PROPOSED SITE IMPROVEMENTS ASSOCIATED WITH THE CONSTRUCTION OF A TWO PHASE SELF-STORAGE FACILITY DEVELOPMENT. THE PHASE 1 BUILDING IS THREE STORIES WITH A 46,100 SF FOOTPRINT AND A GROSS FLOOR AREA OF 138,300 SF. THE PHASE 2 BUILDING IS ALSO THREE STORIES, WITH A 31,000 SF FOOTPRINT AND A GROSS FLOOR AREA OF 93,000 SF. DRIVEWAY ACCESS IS FROM LITTLEWORTH ROAD (NH ROUTE 9) AND REQUIRES A NHDOT DRIVEWAY PERMIT.
2. THE SUBJECT PROPERTY IS ZONED CM, COMMERCIAL MANUFACTURING. THE SELF-STORAGE FACILITY REQUIRES A CONDITIONAL USE PERMIT WHICH HAS ADDITIONAL DIMENSIONAL CRITERIA.
3. A ZONING VARIANCE WAS GRANTED ON 1/20/2022 TO PERMIT A THREE STORY BUILDING (WITH INCREASED BUILDING HEIGHT) AND HOURS OF OPERATION GREATER THAN 9 AM - 9PM.
4. REQUIREMENTS FOR THE CM ZONING DISTRICT AND SUBSEQUENT CUP ARE AS FOLLOWS:

	REQUIRED	EXISTING	PROPOSED
MIN. LOT SIZE*	20,000 SF	6.81 AC	6.81 AC (TOTAL LOT SIZE)
		6.265 AC	6.265 AC (SEE NOTE BELOW)*
MIN. LOT FRONTAGE	100'	774.68'	774.68'
MIN. FRONT SETBACK	70'	23'	72.3'±
MIN. SIDE SETBACK	20'	146'	115.0'±
MIN. REAR SETBACK	20'	153'	86.1'±
MAX. IMPERVIOUS COVER	50%	5.4±% (16,025SF)	40.0±% (118,440SF)
MAX. HEIGHT	20'	N/A'	32.5' (VARIANCE GRANTED)
MAX STORIES	1	N/A	3 (VARIANCE GRANTED)

*LOT AREA HAS BEEN ADJUSTED TO OMIT WETLAND AREAS AND COUNT ONLY 40% OF THE WETLAND BUFFER AREAS.

5. THE FACILITY HAS THE FOLLOWING PROPOSED HOURS OF OPERATION.
   TENANT ACCESS: MONDAY THROUGH FRIDAY 6 AM TO 6PM, SATURDAY 6 AM TO 6PM AND SUNDAY 6AM TO 4PM.
   OFFICE HOURS: MONDAY THROUGH FRIDAY 9 AM TO 8PM, SATURDAY 9 AM TO 6PM AND SUNDAY 9AM TO 4PM.
6. PARKING CALCULATIONS:

   MAXIMUM PARKING FOR PROPOSED USE
   INDUSTRIAL: 1 SPACE/800 SF X 231,300 SF = 289 SPACES
   TOTAL SPACES PROVIDED = 27 SPACES (INCLUDES 2 ADA ACCESSIBLE SPACES)

7. ALL PLAN SHEETS WILL BE ON FILE AT THE CITY OF DOVER PLANNING DEPARTMENT.
8. SITE WORK SHALL BE CONSTRUCTED FROM A COMPLETE SET OF PLANS, NOT ALL FEATURES ARE DETAILED ON EVERY PLAN. THE ENGINEER IS TO BE NOTIFIED OF ANY CONFLICT WITHIN THIS PLAN SET.
9. IF, DURING CONSTRUCTION, IT BECOMES APPARENT THAT DEFICIENCIES EXIST IN THE APPROVED DRAWINGS, THE OWNER SHALL BE REQUIRED TO CORRECT THE DEFICIENCIES TO MEET THE REQUIREMENTS OF THE REGULATIONS AT NO EXPENSE TO THE CITY.
10. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE SITE AND EXISTING CONDITIONS SURROUNDING IT AND THEREON. THE CONTRACTOR SHALL ADVISE THE APPROPRIATE AUTHORITY OF HIS INTENTIONS AT LEAST 48 HOURS IN ADVANCE.
11. THE CONTRACTOR SHALL BID AND PERFORM THE WORK IN ACCORDANCE WILL ALL LOCAL, STATE AND NATIONAL CODES, SPECIFICATIONS, REGULATIONS, AND STANDARDS.
12. THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR CONDITIONS AT THE SITE. THESE PLANS, PREPARED BY FUSS & O'NEILL, INC. DO NOT EXTEND TO OR INCLUDE SYSTEM PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR THEIR EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF THE SURVEYOR OR ENGINEER HERE ON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEM THAT MAY NOW OR HEREAFTER BE INCORPORATED INTO THESE PLANS. THE CONSTRUCTION CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEM WHICH MAY BE REQUIRED BY THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND/OR LOCAL REGULATIONS.
13. WRITTEN DIMENSIONS HAVE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL USE CAUTION WHEN SCALING REPRODUCED PLANS, IN CASE OF CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWING AND/OR SPECIFICATION, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY FOR CLARIFICATIONS.
14. THE CONTRACTOR SHALL MAINTAIN EMERGENCY ACCESS TO ALL AREAS AFFECTED BY THEIR WORK AT ALL TIMES.
15. IF ANY ERROR OR OMISSION IN THESE PLANS IS DISCOVERED BY THE CONTRACTOR, THE CONTRACTOR SHALL CONTACT THE ENGINEER OF RECORD IMMEDIATELY IN WRITING FOR DIRECTION ON HOW TO PROCEED. THE CONTRACTOR SHALL DISCONTINUE WORK IN THE AFFECTED PROJECT AREA UNTIL AGREEMENT HAS BEEN REACHED WITH THIS FIRM ON CORRECTIVE ACTION.
16. ALL CONSTRUCTION SHALL CONFORM WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION (NHDOT) "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" AND WITH THE CITY OF DOVER COMMUNITY SERVICES REGULATIONS AND STANDARD SPECIFICATIONS FOR CONSTRUCTION. THE MORE STRINGENT SPECIFICATIONS SHALL APPLY.
17. SNOW SHALL BE STORED IN OPEN AREAS ON SITES. SNOW SHALL NOT BLOCK SIGHT DISTANCES AND SHALL BE TRANSPORTED OFFSITE OR INTO OPEN AREAS IF NEEDED. OFFSITE TRANSPORT OF SNOW SHALL BE DONE SO IN ACCORDANCE WITH NHDES REGULATIONS.
18. THE PROPERTY DOES NOT PROVIDE EXTERNAL DUMPSTERS. INTERNAL BLUEBIRD OFFICE/BUSINESS REFUSE WILL BE PRIVATELY CONTRACTED BETWEEN BLUEBIRD AND A CLEANING COMPANY TO BE DISPOSED OF APPROPRIATELY.
19. THE SITE LAYOUT IS DESIGNED IN COMPLIANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS. THE PROPOSED STRUCTURE WILL ALSO BE DESIGNED IN ACCORDANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS (I.E. IBC, ANSI-117.1) AND NH RSA 155-A:5.

SITE PHASING PLAN NOTES:

1. THE PURPOSE OF THIS PLAN IS TO IDENTIFY THE IMPROVEMENTS TO BE COMPLETED IN PHASE 1 AND THE REMAINING IMPROVEMENTS TO BE COMPLETED IN PHASE 2.
2. ALL DRAINAGE IMPROVEMENTS SHALL BE CONSTRUCTED IN PHASE 1.
3. IN PHASE 1, THE CONTRACTOR SHALL PROVIDE STUBS FOR ALL PHASE 2 CANOPY ROOF DRAINS SO THAT CONNECTIONS CAN BE MADE IN PHASE 2 WITHOUT DISTURBING PAVEMENT OR THE DRAINAGE STRUCTURES. ADDITIONALLY, PHASE 2 BUILDING ROOF DRAIN CONNECTIONS SHALL BE PROVIDED FOR CONNECTIONS TO FES A3 AND FES A4, SUCH THAT THE BIORETENTION POND WILL NOT BE DISTURBED.

SITE CIRCULATION PLAN NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW EMERGENCY VEHICLE CIRCULATION THROUGH THE PROPOSED SITE.
2. THE DRIVEWAY IS DESIGNED TO ACCOMMODATE THE TOWN OF DOVER TYPICAL EMERGENCY VEHICLE FIRE TRUCK CIRCULATION NEEDS.

NEIGHBORHOOD SITE PLAN NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW AN AERIAL VIEW OF HOW THE PROJECT RELATES TO ABUTTING PROPERTIES AND USE.

GRADING AND DRAINAGE PLAN PLAN NOTES:

1. THE PURPOSE OF THE GRADING AND DRAINAGE PLAN IS TO ILLUSTRATE THE PROPOSED GRADING, DRAINAGE AND STORMWATER MANAGEMENT, ASSOCIATED WITH THE PROPOSED SITE IMPROVEMENTS FOR THE SUBJECT PARCEL.
2. SITE WORK SHALL BE CONSTRUCTED FROM A COMPLETE SET OF PLANS, NOT ALL FEATURES ARE DETAILED ON EVERY PLAN. THE ENGINEER IS TO BE NOTIFIED OF ANY CONFLICT WITHIN THIS PLAN SET. ALL PLAN SHEETS WILL BE ON FILE AT THE CITY OF DOVER.
3. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE SITE AND EXISTING CONDITIONS SURROUNDING IT AND THEREON. THE CONTRACTOR SHALL ADVISE THE APPROPRIATE AUTHORITY OF HIS INTENTIONS AT LEAST 48 HOURS IN ADVANCE.
4. THE CONTRACTOR SHALL VERIFY TEMPORARY BENCH MARKS (TBM) IDENTIFIED ON REFERENCE PLANS PRIOR TO CONSTRUCTION AND NOTIFY THE CERTIFIED LAND SURVEYOR OF ANY DISCREPANCIES.
5. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM THE LOCATION OF EXISTING FEATURES BOTH ABOVE GROUND AND BELOW, NO GUARANTEE IS MADE BY THIS OFFICE OR INDIVIDUALS OF LOCATION OF EXISTING FEATURES. UNDERGROUND UTILITIES ARE APPROXIMATE BASED ON REFERENCES LOCATED ON THE COVER SHEET.
6. ALL DRAINAGE STRUCTURES IN PAVEMENT SHALL HAVE RIMS SET TO FINISH GRADE REGARDLESS OF ANY ELEVATIONS OTHERWISE SHOWN, AS APPLICABLE.
7. DRAINAGE PIPE LENGTHS NOTED ARE MEASURED FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE UNLESS OTHERWISE NOTED.
8. THE CONTRACTOR SHALL STABILIZE ALL DITCHES, SWALES, AND PONDS PRIOR TO DIRECTING STORM WATER RUN-OFF TO THEM.
9. ALL EXCAVATIONS SHALL BE THOROUGHLY SECURED ON A DAILY BASIS BY THE CONTRACTOR AT THE COMPLETION OF CONSTRUCTION OPERATIONS IN THE IMMEDIATE AREA.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL EROSION AND SEDIMENT CONTROL DEVICES AS SHOWN IN THE PLANS THROUGHOUT THE DURATION OF THE PROJECT IN ACCORDANCE WITH APPLICABLE NHDES STANDARDS. THE LOCATIONS SHOWN ON THE PLANS AND DETAILS ARE PROVIDED AS A GUIDE ONLY. THE CONTRACTOR SHALL PROVIDE ADDITIONAL SEDIMENT AND EROSION CONTROLS AND MAINTAIN THEM IN A FUNCTIONING ORDER, AS REQUIRED BY THE ACTUAL SITE CONDITIONS.
11. IF, DURING CONSTRUCTION, IT BECOMES APPARENT THAT ADDITIONAL EROSION CONTROL MEASURES ARE REQUIRED TO STOP ANY EROSION ON THE CONSTRUCTION SITE, THE PROPERTY OWNER SHALL BE REQUIRED TO INSTALL THE NECESSARY EROSION PROTECTION AT NO EXPENSE TO THE CITY OF DOVER.
12. ALL PROPOSED AND EXISTING CATCH BASINS, OUTLET CONTROL STRUCTURES OR INLET PIPES, THAT MAY RECEIVE STORMWATER RUNOFF FROM THE DEVELOPMENT DURING CONSTRUCTION, SHOULD BE OUTFITTED WITH INLET PROTECTION.
13. INSTALL UNDERDRAIN IN ALL CUT SECTIONS. DAYLIGHT TO STORMWATER BASIN, SWALE, OR CONNECT TO CATCH BASIN, AS REQUIRED.
14. FLUSH CLEAN AND REMOVE ALL DEBRIS OF EXISTING AND PROPOSED CULVERTS DURING AND POST CONSTRUCTION.
15. INSPECT EXISTING CONDITION OF ALL PIPES/CULVERTS/HEADWALLS DURING CONSTRUCTION, REPLACE AS NECESSARY.
16. IF LEDGE IS DISCOVERED DURING EXCAVATION, REMOVE LEDGE A MINIMUM OF TWO (2) FEET BELOW GRAVELS AND REPLACE WITH SAND.
17. REMOVE ALL UNSUITABLE MATERIALS ENCOUNTERED DURING EXCAVATIONS AND REPLACE WITH SUITABLE FILL. CONTRACTOR TO COORDINATE ADDITIONAL TEST BORINGS, TEST PITS, AND COORDINATE WITH A GEOTECHNICAL ENGINEER, IF NECESSARY.
18. ALL RETAINING WALLS OVER FOUR FEET IN HEIGHT REQUIRES ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.
19. ANY FENCE TALLER THAN SEVEN FEET REQUIRES THE ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.
20. INSTALL EROSION CONTROL BLANKETS ON ALL SLOPES STEEPER THAN 3:1, IF APPLICABLE. ALL EROSION CONTROL BLANKETS SHALL BE WILDLIFE FRIENDLY WITH NO PLASTIC OR WELDS.
21. LOAM AND SEED ALL DISTURBED AREAS NOT OTHERWISE COVERED BY LANDSCAPE MATERIAL, MULCH, RIPRAP, BUILDING OR PAVEMENT, PER DETAIL LOCATED WITHIN THIS PLAN SET.
22. SEE OTHER PLAN SHEETS FOR RELATED NOTES AND ASSOCIATED INFORMATION.
23. WETLANDS WERE DELINEATED BY BRUCE GILDAY OF BAG LAND CONSULTANTS, CERTIFIED WETLAND SCIENTIST, CERTIFICATION NUMBER 088, IN ACCORDANCE WITH CHAPTER 170-27.1 OF THE ZONING ORDINANCE, ON OCTOBER 5, 2021.
24. FIRE DEPARTMENT ACCESS SHALL BE INSTALLED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF FIRE APPARATUS IN ALL WEATHER CONDITIONS AT ALL TIMES. ALL FIRE LANES ARE NON-DEMARCATED.
25. BLUEBIRD SELF-STORAGE SHALL COMPLETE LAND USE DEVELOPMENT TRACKING FORM, MOST RECENTLY REVISED VERSION, UTILIZING THE ONLINE POLLUTION TRACKING ACCOUNTING PILOT PROJECT (PTAPP) PORTAL. HTTPS://WWW.UNH.EDU.UNHSC/PTAPP

UTILITY PLAN NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE UTILITY SERVICE CONNECTIONS PROPOSED FOR THE DEVELOPMENT.
2. UTILITY LOCATIONS AS SHOWN ON THESE PLANS HAVE BEEN OBTAINED FROM VARIOUS SOURCES AND THEIR LOCATIONS ARE ONLY APPROXIMATE. BEFORE ANY CONSTRUCTION ACTIVITY BEGINS, THE CONTRACTOR SHALL CONTACT DIG-SAFE AT 1-888-DIG-SAFE AND FIELD VERIFY ALL UTILITY LOCATIONS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE AND ELEVATION OF ALL EXISTING UTILITIES SHOWN ON THESE PLANS PRIOR TO THE START OF ANY CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING IF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION SHALL BE AGREED TO BY THE ENGINEER BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT NEW HAMPSHIRE DIG SAFE, AT 1-888-DIG-SAFE, AT LEAST 72 HOURS BEFORE DIGGING.
4. THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES OWNING UTILITIES, EITHER OVERHEAD OR UNDERGROUND, WITHIN THE CONSTRUCTION AREA. THE PROTECTION OR RELOCATION OF UTILITIES IS ULTIMATELY THE RESPONSIBILITY OF THE CONTRACTOR.
5. THE CONTRACTOR SHALL COORDINATE MATERIALS AND INSTALLATION SPECIFICATIONS WITH THE INDIVIDUAL UTILITY AGENCIES/COMPANIES, AND ARRANGE FOR ALL INSPECTIONS.
6. THE INSTALLATION OF ELECTRIC POWER, CABLE TELEVISION AND TELEPHONE LINES SHALL BE UNDERGROUND THROUGHOUT THE SITE FOR WHICH DEVELOPMENT IS PROPOSED.
7. COORDINATE WITH EVERSOURCE, UNITIL, CONSOLIDATED AND COMCAST FOR FINAL ELECTRICAL , GAS, TELEPHONE AND CABLE LAYOUTS AND INSTALLATION REQUIREMENTS.MEET CITY OF DOVER WATER DEPARTMENT REGULATIONS FOR ALL WATER CONNECTIONS, INSTALLATIONS AND MATERIALS.
8. PRIOR TO THE DATE OF APPROVAL OF THESE DESIGN PLANS; FINAL MECHANICAL, ELECTRICAL,PLUMBING (MEP), AND ARCHITECTURAL PLANS WERE NOT PROVIDED TO THE DESIGN ENGINEER. PRIOR TO CONSTRUCTION THE MEP CONTRACTORS AND ARCHITECTS ARE REQUIRED TO REVIEW, APPROVE, AND/OR AMEND ALL MEP AND ARCHITECTURAL DESIGN WITHIN THE BUILDINGS OR UPON THE SITE. INCLUDING BUT NOT LIMITED TO SIZES, MATERIALS, ELEVATIONS, AND OVERALL DESIGN. COORDINATE WITH THE MUNICIPALITY AND DESIGN ENGINEER FOR ALL PLAN REVISIONS.
9. APPROVED BACKFLOW PREVENTERS SHALL BE PROVIDED FOR BOTH FIRE AND DOMESTIC WATER LINES.
10. THE PROPOSED STRUCTURE SHALL BE SERVICED BY A SPRINKLER SYSTEM AS REQUIRED BY CHAPTER 81-30 OF THE CODE OF THE CITY OF DOVER AND THE ADOPTED STATE OF NH BUILDING AND FIRE CODES.
11. IF BUILDING CONTAINS A SECURITY SYSTEM, IT SHALL BE INSTALLED AS REQUIRED BY CHAPTER 45, ARTICLE I, SECTION 45-2 OF THE CODE OF THE CITY OF DOVER.
12. SPRINKLER CONNECTIONS MUST BE FLUSHED IN ACCORDANCE WITH NFPA 24 AND A CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR UNDERGROUND PIPING FORM MUST BE COMPLETED AND APPROVED BY INSPECTION SERVICES PRIOR TO CONNECTION OF THE BACKFLOW DEVICE.
13. FIRE DEPARTMENT CONNECTION(S) (FDC) SHALL BE LOCATED ON THE STREET SIDE OF THE BUILDING PER NFPA 13. ACCESS TO THE FDC SHALL MAINTAIN A CLEAR AND UNOBSTRUCTED PATH AT ALL TIMES.
14. COORDINATE WITH THE FIRE DEPARTMENT IF AN ANNUNCIATOR IS REQUIRED. COORDINATE WITH ARCHITECT AND MEP/PLUMBER FOR INTERNAL CONFIGURATION OF SERVICES AND METER LOCATIONS (TYP)

LIGHTING PLAN NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE LIGHTING DESIGN FOR THE PROPOSED BUILDING, PARKING AND ACCESS AISLES.
2. REFER TO DETAIL DRAWING CD-503 FOR POLE BASE DETAIL.
3. ALL PROPOSED LIGHTS ARE FULL CUT-OFF FIXTURES AND DARK SKY COMPLIANT, MEETING CHAPTER 153-14E. ALL LIGHTING IS DIRECTED ON SITE ONLY.ALL SITE LIGHTING IS TO COMPLY WITH ALL PROVISIONS OUTLINED WITHIN THE TOWN OF DOVER REGULATIONS.
4. LIGHTING DESIGN PROVIDED BY KEN SWEENEY OF CHARRON INC. 603-624-4827
5. LIGHTING CONDUIT DESIGNED BY OTHERS.
6. THE PROFESSIONAL ENGINEER ENDORSEMENT BY F&O ON THIS SHEET DOES NOT INCLUDE DESIGN ENDORSEMENT OF THIS DETAILED INFORMATION. CONTACT CHARRON INC. FOR ADDITIONAL INFORMATION.

SIGHT DISTANCE PLAN AND PROFILE NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE ALL-SEASON SIGHT DISTANCE FOR THE PROPOSED DRIVEWAY EGRESS AT LITTLEWORTH ROAD/NH ROUTE 9.
2. ALL-SEASON SIGHT DISTANCE SHALL BE DEFINED AS THE CRITICAL LINE OF SIGHT THAT ENCOUNTERS NO VISUAL OBSTRUCTION BETWEEN 2 POINTS, ALLOWING FOR A SNOW WINDROW AND/OR SEASONAL CHANGES. THE CRITICAL LINE OF SIGHT REPRESENTS THE LINE OF SIGHT BETWEEN THE OPERATOR OF A VEHICLE USING THE DRIVEWAY AND THE OPERATOR OF A VEHICLE APPROACHING FROM EITHER DIRECTION.
3. DESIGN CRITERIA IS BASED ON STANDARD ENGINEERING PRACTICE AND AN NHDOT REQUIREMENT OF 400' SIGHT DISTANCE .
4. DESIGN CRITERIA IS BASED ON "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS" 6TH EDITION, AASHTO RELEASED 2011. PER CHAPTER 9.5 INTERSECTION SIGHT DISTANCE:
   - BASE POINT IS 3' 9" ABOVE THE PAVEMENT FOR DRIVER'S EYE AND ROADWAY OBJECT (3.B OF NHDOT DRIVEWAY POLICY)
   - DECISION POINT IS 14.5' FROM THE EDGE OF TRAVEL WAY
   - SIGHT DISTANCE LEFT = 400'+
   - SIGHT DISTANCE RIGHT = 400'+
5. IT SHALL BE THE PROPERTY OWNER'S RESPONSIBILITY TO MAINTAIN ALL SEASON SIGHT DISTANCE VISIBILITY BY TRIMMING OF VEGETATION AS NEEDED/REQUIRED AND PROPER ONSITE SNOW REMOVAL/STORAGE.
6. PE STAMP ENDORSES PROPOSED CONDITIONS BASED ON PROVIDED INFORMATION FOR SIGHT DISTANCE OF SURVEYED INFORMATION AND CONDITIONS.

EROSION AND SEDIMENT CONTROL PLAN NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW EROSION AND SEDIMENT CONTROL PRACTICES FOR THE PROPOSED DEVELOPMENT.
2. SEE EROSION AND SEDIMENT CONTROL NOTES ON GENERAL NOTES PLAN SHEET CN-001.
3. SEE EROSION AND SEDIMENT CONTROL DETAILS DETAIL PLAN SHEETS CD-507 AND CD-508.

STORMWATER MAINTENANCE NOTES:

BIORETENTION AREAS & SEDIMENT FOREBAY

1. THE BOTTOM, INTERIOR AND EXTERIOR SIDE SLOPES AND CREST OF EARTHEN DETENTION PONDS SHALL BE MOWED, AND THE VEGETATION MAINTAINED IN HEALTHY CONDITION, AS APPROPRIATE TO THE FUNCTION OF THE FACILITY AND TYPE OF VEGETATION.
2. VEGETATED EMBANKMENTS THAT SERVE AS "BERMS" THAT IMPOUND WATER SHALL BE MOWED AT LEAST ONCE ANNUALLY TO PREVENT THE ESTABLISHMENT OF WOODY VEGETATION.
3. EMBANKMENTS SHALL BE INSPECTED AT LEAST ANNUALLY BY A QUALIFIED PROFESSIONAL FOR SETTLEMENT, EROSION, SEEPAGE, ANIMAL BURROWS, WOODY VEGETATION AND OTHER CONDITIONS THAT COULD DEGRADE THE EMBANKMENT AND REDUCE ITS STABILITY FOR IMPOUNDING WATER. IMMEDIATE CORRECTIVE ACTION SHOULD BE IMPLEMENTED IF ANY SUCH CONDITIONS ARE FOUND.
4. INLET AND OUTLET PIPES, INLET AND OUTLET STRUCTURES, ENERGY DISSIPATION STRUCTURES OR PRACTICES AND OTHER STRUCTURAL APPURTENANCES SHOULD BE INSPECTED AT LEAST ANNUALLY BY A QUALIFIED PROFESSIONAL AND CORRECTIVE ACTION IMPLEMENTED AS INDICATED BY SUCH INSPECTION.
5. TRASH AND DEBRIS SHALL BE REMOVED FROM THE POND AND ANY INLET OR OUTLET STRUCTURES WHENEVER OBSERVED BY INSPECTION.
6. ACCUMULATED SEDIMENT SHOULD BE REMOVED WHEN IT SIGNIFICANTLY AFFECTS SEDIMENT FOREBAY AND/OR POND CAPACITY.

PIPES AND OUTLET STRUCTURES

- AT A MINIMUM, IT IS RECOMMENDED THAT OUTLET STRUCTURES BE INSPECTED AT LEAST TWICE ANNUALLY, ONCE FOLLOWING SNOW-MELT AND ONCE FOLLOWING LEAF-DROP, AND CLEANED AS INDICATED BY INSPECTION.
- SEDIMENT SHOULD BE REMOVED WHEN IT APPROACHES HALF THE SUMP DEPTH.
- IF FLOATING HYDROCARBONS ARE OBSERVED DURING AN INSPECTION, THE MATERIAL SHOULD BE REMOVED IMMEDIATELY BY SKIMMING, ABSORBENT MATERIALS, OR OTHER METHOD AND DISPOSED IN CONFORMANCE WITH APPLICABLE STATE AND FEDERAL REGULATIONS.
- REMOVE ALL DEBRIS FROM PIPE INLETS AND OUTLETS.
- MAINTAIN, REPAIR OR REPLACE INLET CONTROLS

PAVEMENT

1. AT A MINIMUM, CONSTRUCT ACCESSIBLE ROUTES AND PARKING SPACES IN CONFORMANCE WITH THE FEDERAL AMERICANS WITH DISABILITIES ACT AND WITH STATE AND LOCAL LAWS AND REGULATIONS (WHICHEVER ARE MORE STRINGENT).

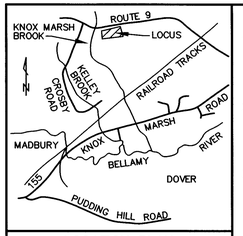
No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

AMY REBECCA SANDERS No. 11065 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE

SCALE: HORZ.: VERT.: DATUM: HORZ.: VERT.: 0 GRAPHIC SCALE

FUSS&O'NEILL
50 COMMERCIAL STREET
MANCHESTER, NEW HAMPSHIRE 03101
603.668.8223
www.fando.com

BLUEBIRD SELF STORAGE
GENERAL NOTES



LOCATION PLAN
(NO SCALE)

REFERENCE PLANS:

1.) SUBDIVISION PLAN OF LAND PREPARED FOR WESTFIELD, LLC TAX MAP G, LOT No. 2 LITTLEWORTH ROAD CITY of DOVER COUNTY of STRAFFORD STATE of NEW HAMPSHIRE. SCALE: 1" = 200'; DATED: JUNE 21, 2021; BY THIS OFFICE. RECORDED S.C.R.D. PLANS 12514, 21515 & 12516.

2.) NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION RIGHT OF WAY PLANS, PROJECT No. W.P.M.H. 54 CENTRAL ROAD, SHEETS 8 & 9; DATED: 1933. OBTAINED FROM NH D.O.T. PROJECT VIEWER WEBSITE "https://nhdotprojects.sr.unh.edu/"; "https://gis.dot.nh.gov/plan/50835.ASB.pdf".

3.) CITY OF DOVER, PUBLIC WORKS DEPT., PROPOSED DRAINAGE DITCH FROM DOVER INDUSTRIAL PARK THROUGH RILEY LAND TO BROOK. SCALE: 1" = 100'; DATED: MARCH 23, 1965; BY: CITY OF DOVER ENGINEERING, FILE No. 12-49.

No.	Central Angle	Radius	Arc Length	Chord Length	Chord Bearing
C1	07°28'41"	901.74	117.69	117.61	N78°39'33"E

THE SOIL TYPES ON THE SITE ARE:
BzA BUXTON SILT LOAM, 0 TO 3 PERCENT SLOPES
CfB CHARLTON FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
THE SOURCE FOR THE SOIL TYPE DATA IS USDA SCS SOIL SURVEY OF STRAFFORD COUNTY DATED MARCH 1973 & USDA NRCS WEB SOIL SURVEY
http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

F / 30 — GABRIEL PEARSON, 81 LITTLEWORTH ROAD, DOVER, NH 03820, 4876 / 216
F / 29 — JOANNE M. FAIRCHILD 1999 TRUST, JOANNE M. FAIRCHILD, TRUSTEE, 77 LITTLEWORTH ROAD, DOVER, NH 03820, 2186 / 28
F / 28 — BOVEE FAMILY REVOCABLE TRUST OF 2014, DAVID G. & CAROL A. BOVEE, TRUSTEES, 75 LITTLEWORTH ROAD, DOVER, NH 03820, 4259 / 817
F / 28-A — LUANNE K. SHOCKLEY, DAVID MICHAEL HARVEY, 73 LITTLEWORTH ROAD, DOVER, NH 03820, 4873 / 738
F / 26 — EVERSOURCE ENERGY, PUBLIC SERVICE COMPANY OF NH, P.O. Box 330, MANCHESTER, NH 03105, 789 / 12
G / 31 — BRUCE CASWELL, 68 LITTLEWORTH ROAD, DOVER, NH 03820, 4067 / 862
G / 2-2 — WESTFIELD, LLC, 340 CENTRAL AVENUE, SUITE 202, DOVER, NH 03820, 4733 / 471

LITTLEWORTH ROAD — NH ROUTE 9 — VARIABLE WIDTH C.A.R.O.W.
HARMONY LANE
OVERHEAD UTILITY LINES BETWEEN UTILITY POLES (TYP.)
GAS MAIN 6" PP
WATER MAIN – 8" C.I. APPROXIMATE LOCATION, NOT MARKED IN FIELD
FIRE HYDRANT #323 – 6" C.I. CONNECT
EDGE OF PAVEMENT (TYP.)
SINGLE WHITE FOG LINE (TYP.)
DRAINAGE DITCH
EDGE OF WETLAND
50' WETLAND BUFFER
WETLAND I.D. FLAG (TYP.)
WELL HOUSE
GRAVEL / FIELD DRIVE
REMAINS OF PAVED DRIVEWAY
FOOTPRINT OF HOUSE AND BARNS SINCE DEMOLISHED
FOOTPRINT OF WOOD FRAME BARN SINCE DEMOLISHED
FOOTPRINT OF CONCRETE PAD & ASPHALT PAD SINCE DEMOLISHED
GRAVEL DRIVE
FIELD DRIVE
BUILDING SETBACK LINE (TYP.)
WATERLINE EASEMENT (SEE NOTE 9) {S.C.R.D. 546/347}
EVERSOURCE EASEMENT (SEE NOTE 11) 100' WIDE
WATER MAIN – 12" ASBESTOS CLAY LOCATION BASED ON STAKES SET BY CITY OF DOVER IN FIELD.
C1 — N74°55'12"E 656.99'
N05°49'11"W 327.68'
S81°47'48"W 842.67'
S16°23'24"E 416.75'
CfB
BzA
TPIT 1 – TPIT 10
I.R.(fnd) N – 251,196.091 E – 1,185,508.933
I.R.(fnd) N – 251,316.326 E – 1,186,342.979
NH STATE PLANE NAD 83 – GPS OBS.
FORMER HANSON ROAD (SEE NOTE 12)
INVERT OUT 18" HDPE CULVERT = 102.4
INVERT IN 18" HDPE CULVERT = 102.7

PARCEL AREA
296,551 S.F.
6.81 Ac.

LEGEND

I.R.(fnd) – IRON ROD (FOUND)
C.A.R.O.W. – CONTROLLED ACCESS RIGHT OF WAY
S.F. – SQUARE FEET
Ac. – ACRE
(TYP.) – TYPICAL
± – MORE OR LESS
ø – DIAMETER
S.C.R.D. – STRAFFORD COUNTY REGISTRY OF DEEDS
-o- UP – UTILITY POLE
62 – CONTOUR (2FT INTERVAL)
SOILS LINE
BzA – SOILS TYPE
PP – PLASTIC PIPE
HDPE – HIGH DENSITY POLYETHYLENE PIPE
N – NORTHING
E – EASTING
198+00 – ROADWAY CENTERLINE STATION
PT – CURVE POINT OF TANGENCY

NOTES:

1.) OWNERS OF RECORD:
WESTFIELD, LLC
340 CENTRAL AVENUE, SUITE 202
DOVER, NEW HAMPSHIRE 03820
S.C.R.D. VOL. 4733, PAGE 471 (200002182)

2.) G / 2-2 – DENOTES TAX MAP AND PARCEL NUMBER.

3.) PLAN INTENT: TO DEPICT THE PARCEL BOUNDARIES AND EXISTING CONDITIONS AS OF THE DATE OF THIS SURVEY. LOT IS SERVED BY MUNICIPAL SEWER AND WATER SERVICE.

4.) PARCEL AREA: 296,551 S.F. / 6.81 Ac.

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

MINIMUM LOT SIZE	= 20,000 S.F.
LOT COVERAGE	= 50 PERCENT
MINIMUM FRONTAGE	= 100 FEET
FRONT SETBACK	= 35 FEET
SIDE SETBACK	= 10 FEET MIN.
REAR SETBACK	= 10 FEET MIN.
BUILDING HEIGHT	= 50 FEET MAX.

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

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

8.) VERTICAL DATUM IS NAVD88 FROM GPS OBSERVATION DATED JANUARY 22, 2021.

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

10.) THE PARCEL IS SUBJECT TO RIGHTS OF DOVER TO MAINTAIN A WATER LINE AS DESCRIBED IN S.C.R.D. VOLUME 546, PAGE 347. DESCRIBED BY CITY AS 12" ASBESTOS CLAY.

11.) THE PARCEL IS SUBJECT TO A PORTION OF A 100' WIDE EASEMENT GRANTED TO PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE DATED MARCH 12, 1958 AND DESCRIBED IN S.C.R.D. VOLUME 686, PAGE 130.

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

13.) CITY OF DOVER G.I.S. INDICATES AN EIGHT (8) INCH WATER MAIN LOCATED WITHIN LITTLEWORTH ROAD RIGHT OF WAY, NO MARKINGS WERE FOUND. LOCATION SHOWN IS GRAPHICAL ONLY.

14.) WETLANDS ONSITE WERE IDENTIFIED UTILIZING THE 1987 FEDERAL TECHNICAL REPORT. THE DELINEATION WAS PERFORMED ON OCTOBER 5, 2021 BY BAG LAND CONSULTANTS (BRUCE A. GILDAY, CWS); 43 ROCKINGHAM STREET, CONCORD, NH 03301.

NO.	DATE	DESCRIPTION	BY	CHK
		REVISIONS		
2	1/24/22	ADD WETLANDS & BUFFER, REVISE NOTE 14	RJM	KMM
1	12/3/21	ADD TEST PITS 1-10	RJM	KMM

21-2383	EXIST. COND.		
PROJECT NO	TYPE	FIELDBOOK & PAGES	

STATE OF NEW HAMPSHIRE — BRUCE A. GILDAY — No. 088 — CERTIFIED WETLAND SCIENTIST

ATTENTION:
HIGH PRESSURE GAS MAIN EXISTS WITHIN THE RIGHT OF WAY OF LITTLEWORTH ROAD; PRIOR TO ANY EARTH MOVING ACTIVITY CONTACT DIGSAFE AT 1-888-344-7233 TO VERIFY LOCATION.

"I HEREBY CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL GROUND SURVEY PERFORMED WITH A TOTAL STATION, BY ME OR THOSE UNDER MY DIRECT SUPERVISION AND THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, SAID SURVEY MEETS OR EXCEEDS THE MINIMUM PRECISION REQUIREMENTS FOR SURVEY CLASSIFICATION "U" AS SET FORTH IN TABLE 500.1 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS."

EXISTING CONDITIONS PLAN OF LAND
PREPARED FOR
BLUEBIRD STORAGE
TAX MAP G, LOT No. 2-2
LITTLEWORTH ROAD
CITY of DOVER
COUNTY of STRAFFORD
STATE of NEW HAMPSHIRE

DOVER PLANNING FILE No. P 21-__

DRAWN BY: RJM	FILE: 2210\DWGS\2210 G 2-1 EC
SCALE: 1" = 40'	DATE: NOVEMBER 8, 2021

40 20 0 20 40 80 120 160

STATE OF NEW HAMPSHIRE — No. 661 — KEVIN M. McENEANEY — LICENSED LAND SURVEYOR — SIGNATURE

McENEANEY SURVEY ASSOCIATES of NEW ENGLAND
P.O. Box 681 – 24 CHESTNUT STREET
DOVER, NH 03820 (603) 742-0911

SURVEYING – PLANNING – CONSULTING

HARMONY LANE

LITTLEWORTH ROAD

ZONING DISTRICT (TYP)

R-40

CM

ZONING BOUNDARY

EDGE OF PAVEMENT (TYP.)

SINGLE WHITE FOG LINE (TYP.)

UP 92 OHW

UP 3/92 OHW

UP 3/91 OHW

DRIVE

UP 3/90 OHW

UP OLD OHW

UP 3/89 OHW

DRIVE

UP 3/87 OHW

DRIVE

UP 77/86 OHW

UP 3/85X OHW

I.R. (fnd)

TREES & BRUSH

HOUSE

GRAVEL DRIVE

TWIN 24" BIRCH

18" APPLE

SAPLNG CLUSTER

TPIT 1 EL 119.4'

CUT & REMOVE TREES & BRUSH

REMOVE EX. FLAG POLE

TPIT 2A EL 120.2'

CUT & REMOVE TREES

REMAINS OF PAVED DRIVEWAY

TPIT 2 EL 122.2'

TPIT 3 EL 122.1'

BRUSH

CUT & REMOVE BRUSH

SITE SPECIFIC SOIL BOUNDARY

REMOVE EX. WELL HOUSE AND SEAL WELL IN ACCORDANCE WITH NHDES WE 604. SEE ALSO WATER WELL NOTES ON SHEET CG-101

TPIT 4 EL 116.1'

EX. DRAINAGE DITCH

EDGE OF DELINEATED WETLAND U01-U04 AND V01-V04, NO IMPACT

INSTALL DOUBLE ROW OF SILT FENCE ALONG 50' WETLAND BUFFER PRIOR TO ANY DEMOLITION OR LAND DISTURBANCE ON THE PROPERTY

50'

CfB

TREES TO REMAIN

CUT, CLEAR & REMOVE TREES

FOOTPRINT OF HOUSE & BARNS WHICH HAVE SINCE BEEN DEMOLISHED

TREES & BRUSH

30" MAPLE

CUT & REMOVE TREES

SITE SPECIFIC SOIL TYPE (TYP)

232B

EXISTING WELL TO BE SEALED IN ACCORDANCE WITH NHDES WE 604. SEE ALSO WATER WELL NOTES ON SHEET CG-101

12" ASH

36" TREE

TREE CLUSTER

DEMOLISH & REMOVE EX. BARN

16" TREE

CUT & REMOVE TREES

10" APPLE

TREE CLUSTER

FOOTPRINT OF CONCRETE PAD & ASPHALT PAD WHICH HAVE SINCE BEEN DEMOLISHED

CUT & REMOVE TREE

TPIT 10 EL 110.7'

TPIT 9 EL 113.4'

32B

EX. GRAVEL DRIVEWAY TO BE ELIMINATED AT SOUTHERLY PROPERTY LINE

I.R.(fnd)
N - 251,196.091
E - 1,185,508.933

FIELD DRIVE

S05 T06 S04 233B T05 T04 S03 T03 S02 T02 S01 T01

EDGE OF DELINEATED WETLAND S01-S05 AND T01-T06, PROPOSED IMPACT WETLAND IMPACT

2,988 SF WETLAND IMPACT

TPIT 8 EL 107.0'

EX. DRAINAGE DITCH

TPIT 5 EL 113.2'

TPIT 6 EL 112.4'

TPIT 7 EL 107.7'

U01 V01 U02 V02 U03 V03 U04 V04

EX. 12" WATER MAIN (TO REMAIN)

I.R.(fnd)
N - 251,316.326
E - 1,186,342.979

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

AMY REBECCA SANDERS No. 11065 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE -

SCALE: HORZ.: 30 VERT.: DATUM: HORZ.: VERT.: 30 15 0 30 GRAPHIC SCALE

FUSS&O'NEILL
50 COMMERCIAL STREET
MANCHESTER, NEW HAMPSHIRE 03101
603.668.8223
www.fando.com

BLUEBIRD SELF STORAGE

DEMOLITION PLAN

TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

CC-101

File: J:\DWG\P2021\05509\A10\Civil\Plan\20210509.A10_STP01.dwg Layout: CC-101 Plotted: 2022-02-24 8:58 PM Saved: 2022-02-24 8:28 PM User: ASanders
PC3: AUTOCAD PDF (GENERAL DOCUMENTATION).PC3 STB/CTB: FO.STB
MS VIEW: LAYER STATE:

HARMONY LANE

UP 92 OLD | UP 3/92 | UP 3/91 | UP 3/90 | UP OLD | UP 3/89 | UP 3/87 | UP 77/86 | UP 3/85X

63.3' | 22.3'

LITTLEWORTH ROAD

ZONING DISTRICT (TYP)

R-40 CM

ZONING BOUNDARY

I.R. (fnd)

I.R.(fnd)

HOUSE

FORMER HANSON ROAD EASEMENT (SEE EXISTING CONDITIONS PLAN)

OS A1

BIORETENTION TREATMENT POND

FES A2

FES A1

FES A4

FES A3

PROP. RETAINING WALL, HT. VARIES, MAX. HT.=12' (DESIGNED BY OTHERS)

72.3'

24'

R25'

STOP SIGN & STOP BAR

I.R.(fnd)

U01

U02

V01

V02

PROP. FREESTANDING MONUMENT SIGN

70' FRONT BUILDING SETBACK

TAX MAP G LOT 2-2
296,551 SF/ 6.81 AC

20' SIDE BUILDING SETBACK

115'

CfB

PROP. RETAINING WALL, HT. VARIES, MAX. HT.=4' (DESIGNED BY OTHERS)

273.3'

10'

TRANSFORMER PAD

50' WETLAND BUFFER (NO IMPACT)

ADA PARKING & VAN ACCESSIBLE SIGN

NO PARKING SIGN

ADA PARKING SIGN

R10'

22'

INSTALL 81 LF BIT CURB

7'

227.7'

9'

CB C1

20' SIDE BUILDING SETBACK

U03

V03

20'

END BIT. CURB

R28'

75'

20'

6'

7

35'

45'

DELINEATED WETLAND (NO IMPACT)

20'

PHASE 2
31,000 SF BUILDING FOOTPRINT
THREE-STORY SELF-STORAGE
93,000 SF GFA

142.7'

177.7'

PHASE 1
46,100 SF BUILDING FOOTPRINT
THREE-STORY SELF-STORAGE
138,300 SF GFA

6'

9'

CB C2

20'

FES A5 20'

27'

6

R28'

END BIT. CURB

EMERGENCY TURN AROUND (ALTERNATIVE HAMMERHEAD)

R5'

INSTALL 323 LF BIT. CURB

CB C3

INSTALL 43 LF BIT. CURB

R40'

BIORETENTION TREATMENT POND

OS B1

7'

27'

20'

7

9'

4" SSWL (TYP)

SNOW STORAGE

R15'

CB D4

CB D3

CB D2

SNOW STORAGE

R110'

BC

22'

20'

HW B1

86.2'

22'

49.2'

45'

CANOPY (TYP)

CB D1

SMH A1

OS D1

OS C1

DMH D2

R500'

R132'

I.R.(fnd)
N – 251,196.091
E – 1,185,508.933

28'

20' REAR BUILDING SETBACK

EVERSOURCE EASEMENT (SEE EX. CONDITIONS PLAN)

HW D1

20'

SMH A2

PROPERTY LINE (TYP)

PROP. WATER EASEMENT

U04

V04

I.R.(fnd)
N – 251,316.326
E – 1,186,342.979

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

STATE OF NEW HAMPSHIRE – AMY REBECCA SANDERS No. 11065 LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: 30 VERT.: | DATUM: HORZ.: VERT.: | GRAPHIC SCALE 30 0 15 30

FUSS & O'NEILL
50 COMMERCIAL STREET
MANCHESTER, NEW HAMPSHIRE 03101
603.668.8223
www.fando.com

BLUEBIRD SELF STORAGE

SITE LAYOUT PLAN

TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
NEW HAMPSHIRE
DOVER

PROJ. No.: 20210509.A10
DATE: 2.25.2022

CS-101

File: J:\DWG\P2021\0509\A10\Civil\Plan\20210509.A10_STP01.dwg Layout: CS-101 Plotted: 2022-02-25 7:07 AM Saved: 2022-02-24 9:02 PM User: ASanders
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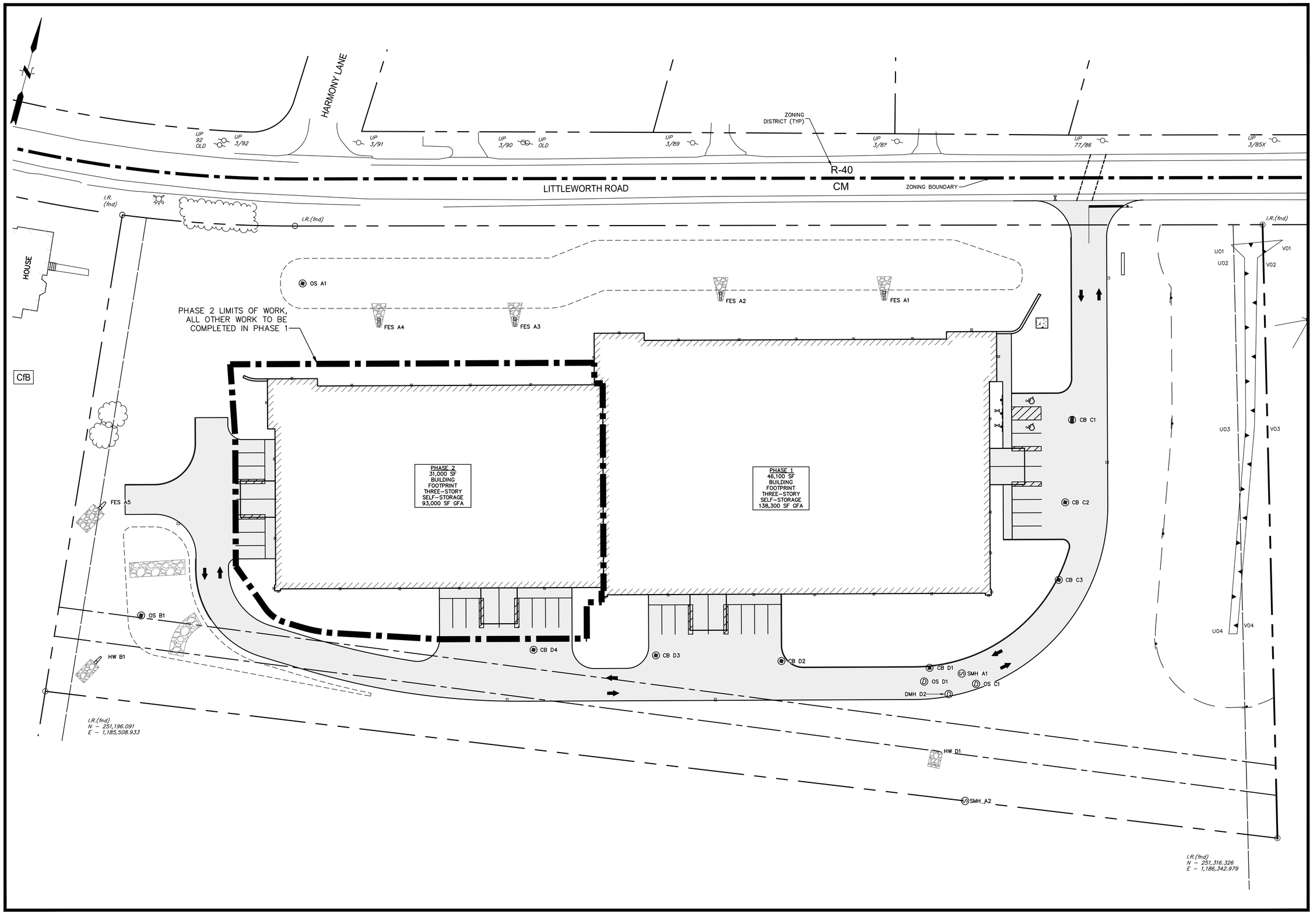

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MS VIEW:

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

AMY REBECCA SANDERS No. 11065 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE -

SCALE: HORZ.: 30 VERT.: DATUM: HORZ.: VERT.: 30 15 0 30 GRAPHIC SCALE

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603.668.8223
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BLUEBIRD SELF STORAGE

SITE PHASING PLAN

TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

CS-102

HARMONY LANE

LITTLEWORTH ROAD

UP 92 OLD

UP 3/92

UP 3/91

UP 3/90

UP OLD

UP 3/89

UP 3/87

UP 77/86

UP 3/85X

I.R. (fnd)

I.R.(fnd)

HOUSE

CfB

FIRE TRUCK TURNING MOVEMENTS (TYP)

Fire Truck Custom

Fire Truck

Fire Truck Custom

Fire Truck Custom

Fire Truck Custom

File: J:\DWG\P2021\0509\A10\Civil\Plan\20210509.A10_STP01.dwg Layout: CS-104 Plotted: 2022-02-24 8:27 PM Saved: 2022-02-24 2:41 PM User: ASanders
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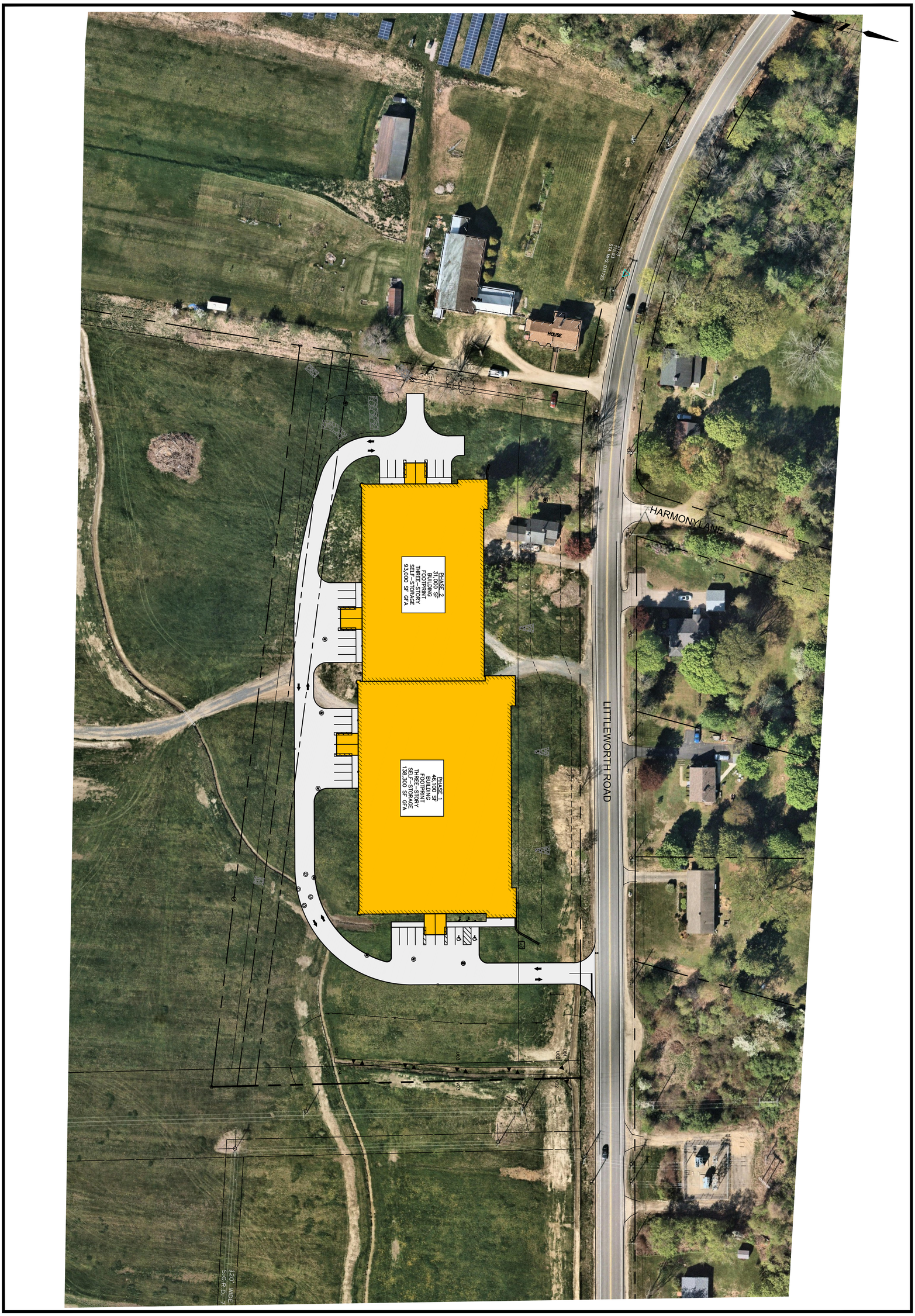

CS-104

PROJ. No.: 20210509.A10
DATE: 2-25-2022

BLUEBIRD SELF STORAGE

NEIGHBORHOOD SITE PLAN

TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

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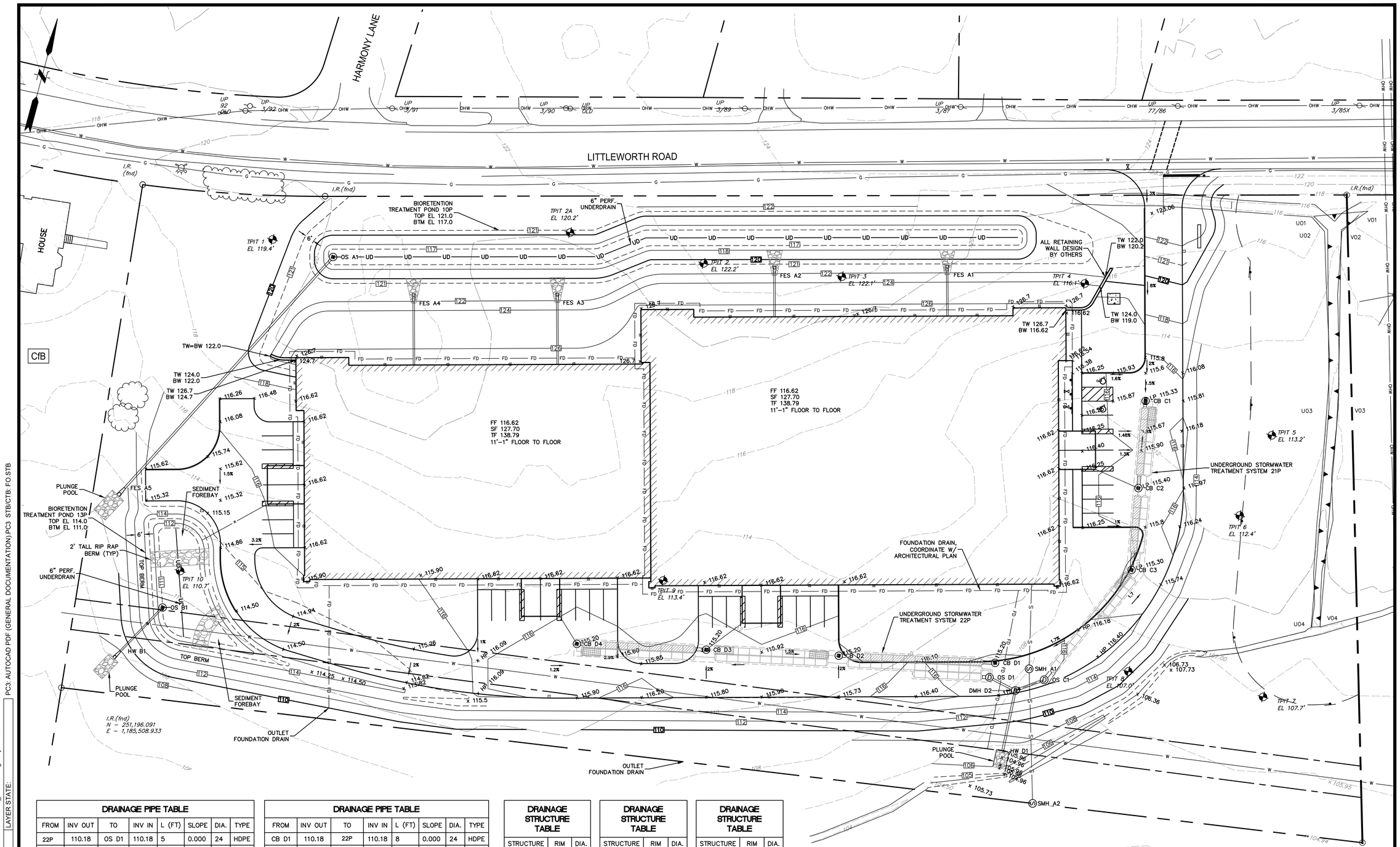
SCALE:
HORZ.: 50
VERT.:
DATUM:
HORZ.:
VERT.:
50 25 0 50
GRAPHIC SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER



DRAINAGE PIPE TABLE

FROM	INV OUT	TO	INV IN	L (FT)	SLOPE	DIA.	TYPE
22P	110.18	OS D1	110.18	5	0.000	24	HDPE
21P	110.18	OS C1	110.18	7	0.000	24	HDPE
ROOF	122.70	FES A1	122.43	27	0.010	12	HDPE
ROOF	122.70	FES A2	122.43	27	0.010	12	HDPE
ROOF	122.70	FES A3	122.30	40	0.010	12	HDPE
ROOF	122.70	FES A4	122.30	40	0.010	12	HDPE
CB C1	110.18	21P	110.18	4	0.000	24	HDPE
CB C2	110.18	21P	110.18	8	0.000	24	HDPE
CB C3	110.18	21P	110.18	11	0.000	24	HDPE

DRAINAGE PIPE TABLE

FROM	INV OUT	TO	INV IN	L (FT)	SLOPE	DIA.	TYPE
CB D1	110.18	22P	110.18	8	0.000	24	HDPE
CB D2	110.18	22P	110.18	6	0.000	24	HDPE
CB D3	110.18	22P	110.18	7	0.000	24	HDPE
CB D4	110.18	22P	110.18	3	0.000	24	HDPE
DMH D2	106.26	HW D1	105.96	40	0.007	15	HDPE
OS A1	113.50	FES A5	111.00	200	0.013	15	HDPE
OS B1	107.50	HW B1	107.11	39	0.010	12	HDPE
OS C1	106.50	DMH D2	106.35	20	0.008	15	HDPE
OS D1	106.50	DMH D2	106.36	19	0.008	15	HDPE

DRAINAGE STRUCTURE TABLE

STRUCTURE	RIM	DIA.
CB C1	115.3	5
CB C2	115.4	4
CB C3	115.3	4
CB D1	115.2	4
CB D2	115.2	4
CB D3	115.2	4
CB D4	115.2	4

DRAINAGE STRUCTURE TABLE

STRUCTURE	RIM	DIA.
DMH D2	115.7	4
FES A1	123.6	N/A
FES A2	123.6	N/A
FES A3	123.4	N/A
FES A4	123.4	N/A
FES A5	112.4	N/A
HW B1	108.2	N/A

DRAINAGE STRUCTURE TABLE

STRUCTURE	RIM	DIA.
HW D1	107.8	N/A
OS A1	119.8	4
OS B1	109.7	4
OS C1	115.9	5
OS D1	115.6	5

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

AMY REBECCA SANDERS No. 11065 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE –

SCALE: HORZ.: 30 VERT.: DATUM: HORZ.: VERT.: 30 15 0 30 GRAPHIC SCALE

FUSS&O'NEILL
50 COMMERCIAL STREET MANCHESTER, NEW HAMPSHIRE 03101 603.668.8223 www.fando.com

BLUEBIRD SELF STORAGE

GRADING AND DRAINAGE PLAN

TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

CG-101

File: J:\DWG\P2021\05\09\A10\Civil\Plan\20210509.A10_STP01.dwg Layout: CG-101 Plotted: 2022-02-24 9:00 PM Saved: 2022-02-24 8:28 PM User: ASanders
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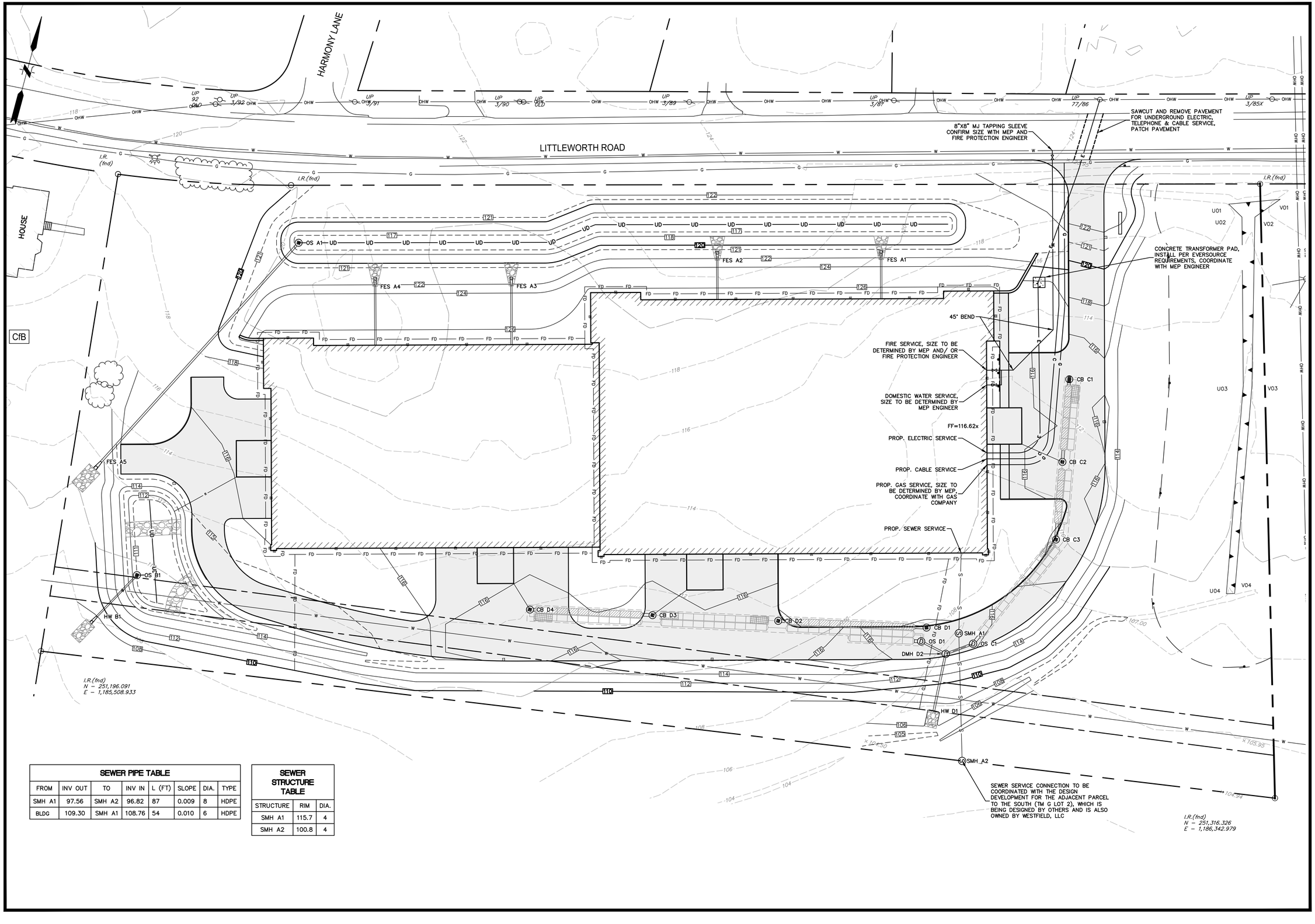

SEWER PIPE TABLE

FROM	INV OUT	TO	INV IN	L (FT)	SLOPE	DIA.	TYPE
SMH A1	97.56	SMH A2	96.82	87	0.009	8	HDPE
BLDG	109.30	SMH A1	108.76	54	0.010	6	HDPE

SEWER STRUCTURE TABLE

STRUCTURE	RIM	DIA.
SMH A1	115.7	4
SMH A2	100.8	4

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

AMY REBECCA SANDERS No. 11065 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE –

SCALE: HORZ.: 30 VERT.:
DATUM: HORZ.: VERT.:
GRAPHIC SCALE 30 0 30 15

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50 COMMERCIAL STREET
MANCHESTER, NEW HAMPSHIRE 03101
603.668.8223
www.fando.com

BLUEBIRD SELF STORAGE

UTILITY PLAN

TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

CU-101

File: J:\DWG\P20210509\A10\Civil\Plan\20210509.A10_STP01.dwg Layout: CU-101 Plotted: 2022-02-24 9:00 PM Saved: 2022-02-24 8:28 PM User: ASanders
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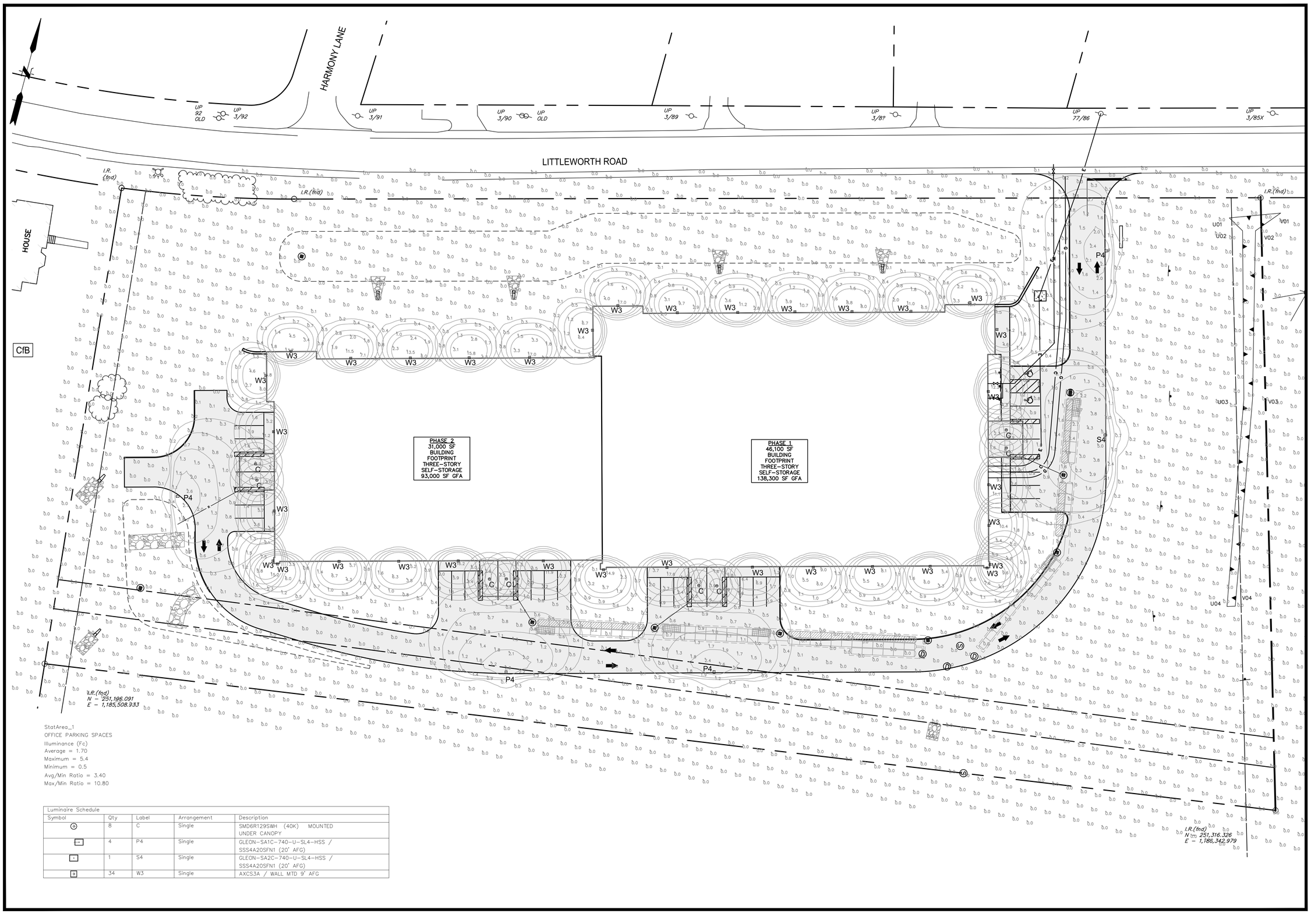

StatArea_1
OFFICE PARKING SPACES
Illuminance (Fc)
Average = 1.70
Maximum = 5.4
Minimum = 0.5
Avg/Min Ratio = 3.40
Max/Min Ratio = 10.80

Luminaire Schedule				
Symbol	Qty	Label	Arrangement	Description
⊙	8	C	Single	SMD6R129SWH (40K) MOUNTED UNDER CANOPY
↔	4	P4	Single	GLEON-SA1C-740-U-SL4-HSS / SSS4A20SFN1 (20' AFG)
▪	1	S4	Single	GLEON-SA2C-740-U-SL4-HSS / SSS4A20SFN1 (20' AFG)
✳	34	W3	Single	AXCS3A / WALL MTD 9' AFG

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

AMY REBECCA SANDERS No. 11065 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE

SCALE: HORZ.: 30 VERT.:
DATUM: HORZ.: VERT.:
GRAPHIC SCALE 30 15 0 30

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MANCHESTER, NEW HAMPSHIRE 03101
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BLUEBIRD SELF STORAGE

LIGHTING PLAN

TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

CL-101

File: J:\DWG\P2021\05\09\A10\CivilPlan\20210509.A10_STP01.dwg Layout: CL-101 Plotted: 2022-02-24 9:01 PM Saved: 2022-02-24 8:28 PM User: ASanders
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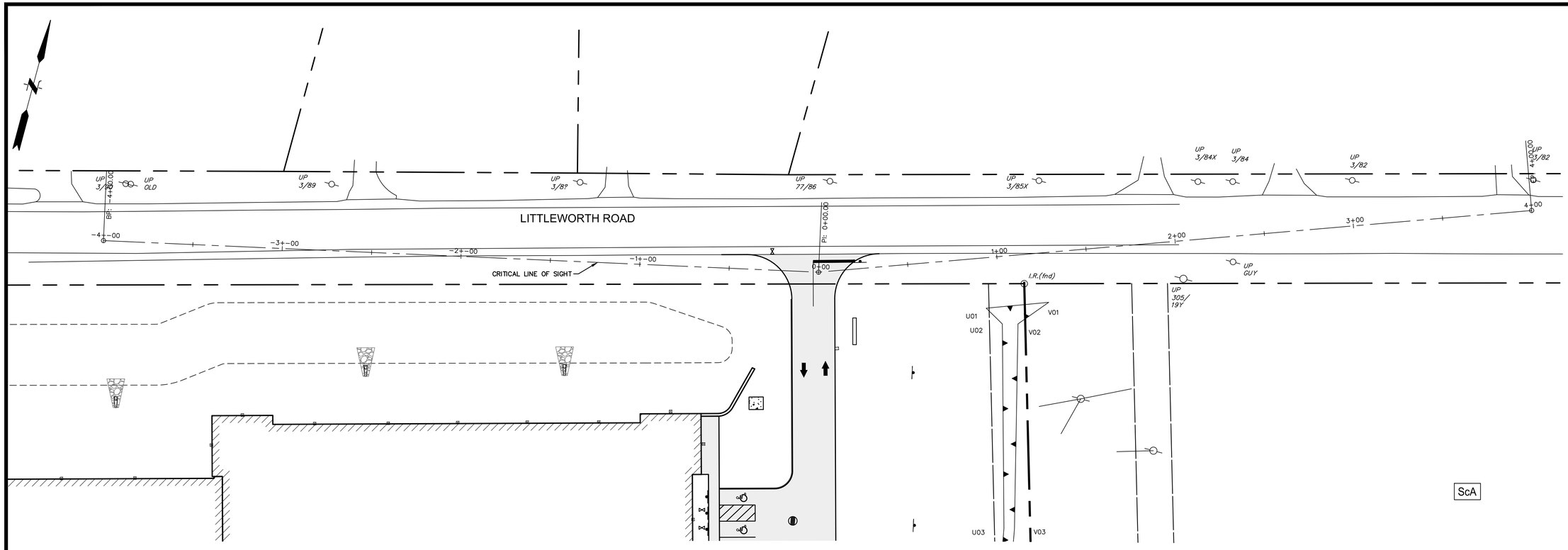

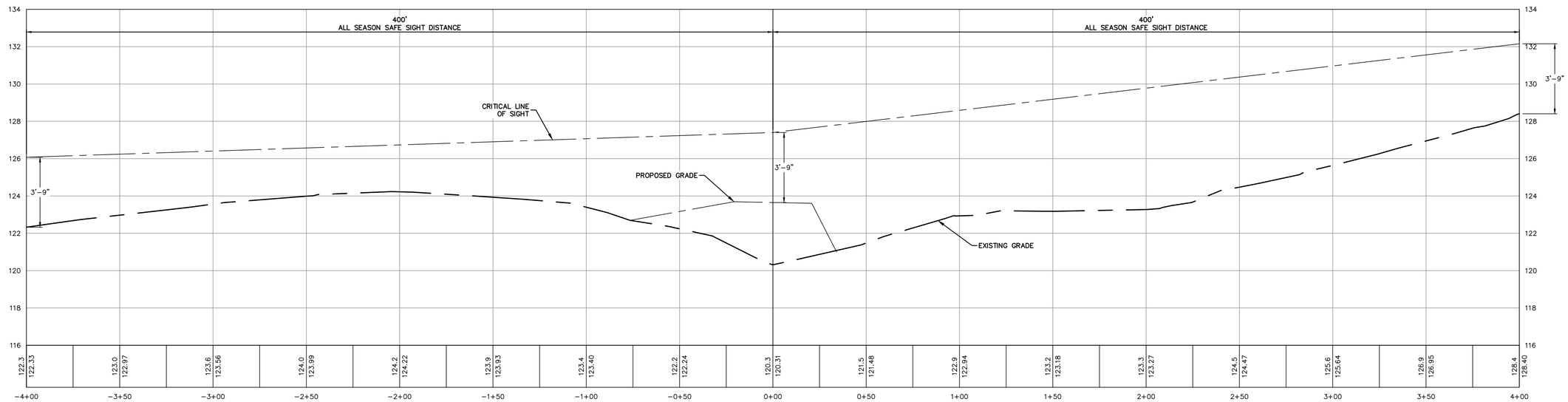

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

AMY REBECCA SANDERS No. 11065 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE –

SCALE: HORZ.: 30 VERT.: DATUM: HORZ.: VERT.: 30 15 0 30 GRAPHIC SCALE

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MANCHESTER, NEW HAMPSHIRE 03101
603.668.8223
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BLUEBIRD SELF STORAGE
SIGHT DISTANCE PLAN AND PROFILE
TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

CP-101

File: J:\DWG\P20210509\A10\CivilPlan\20210509.A10_STP01.dwg Layout: CP-101 Plotted: 2022-02-24 9:01 PM Saved: 2022-02-24 8:28 PM User: ASanders
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PC3: AUTOCAD PDF (GENERAL DOCUMENTATION).PC3 STB\CTB: FO.STB
LAYER STATE:
MS VIEW:

HARMONY LANE

LITTLEWORTH ROAD

PROP. CONSTRUCTION ENTRANCE

HOUSE

CfB

INSTALL PERIMETER EROSION CONTROLS SUCH AS SILT FENCE, FILTER SOCK, ETC. (TYP)

INSTALL INLET PROTECTION (TYP)

OS A1

FES A1

FES A2

FES A3

FES A4

FES A5

OS B1

HW B1

PLUNGE POOL W/ STONE LEVEL SPREADER

CB B1

CB C1

CB C2

CB C3

CB D1

CB D2

CB D3

CB D4

OS C1

OS D1

SMH A1

SMH A2

DMH D2

HW D1

U01

U02

U03

U04

V01

V02

V03

V04

DOUBLE ROW SILT FENCE, INSTALL PRIOR TO LAND DISTURBANCE

INSTALL CHECK DAMS (TYP)

I.R.(fnd)
N – 251,196.091
E – 1,185,508.933

I.R.(fnd)
N – 251,316.326
E – 1,186,342.979

INVERT IN 18" HDPE
SYM VERT = 102.7

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

AMY REBECCA SANDERS No. 11065 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE –

SCALE: HORZ.: 30 VERT.: DATUM: HORZ.: VERT.: 30 15 0 30 GRAPHIC SCALE

FUSS & O'NEILL
50 COMMERCIAL STREET
MANCHESTER, NEW HAMPSHIRE 03101
603.668.8223
www.fando.com

BLUEBIRD SELF STORAGE
EROSION AND SEDIMENT CONTROL PLAN
TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

CE-101

File: J:\DWG\P20210509\A10\CivilPlan\20210509.A10_STP01.dwg Layout: CW-101 Plotted: 2022-02-24 8:25 PM Saved: 2022-02-24 2:41 PM User: ASanders
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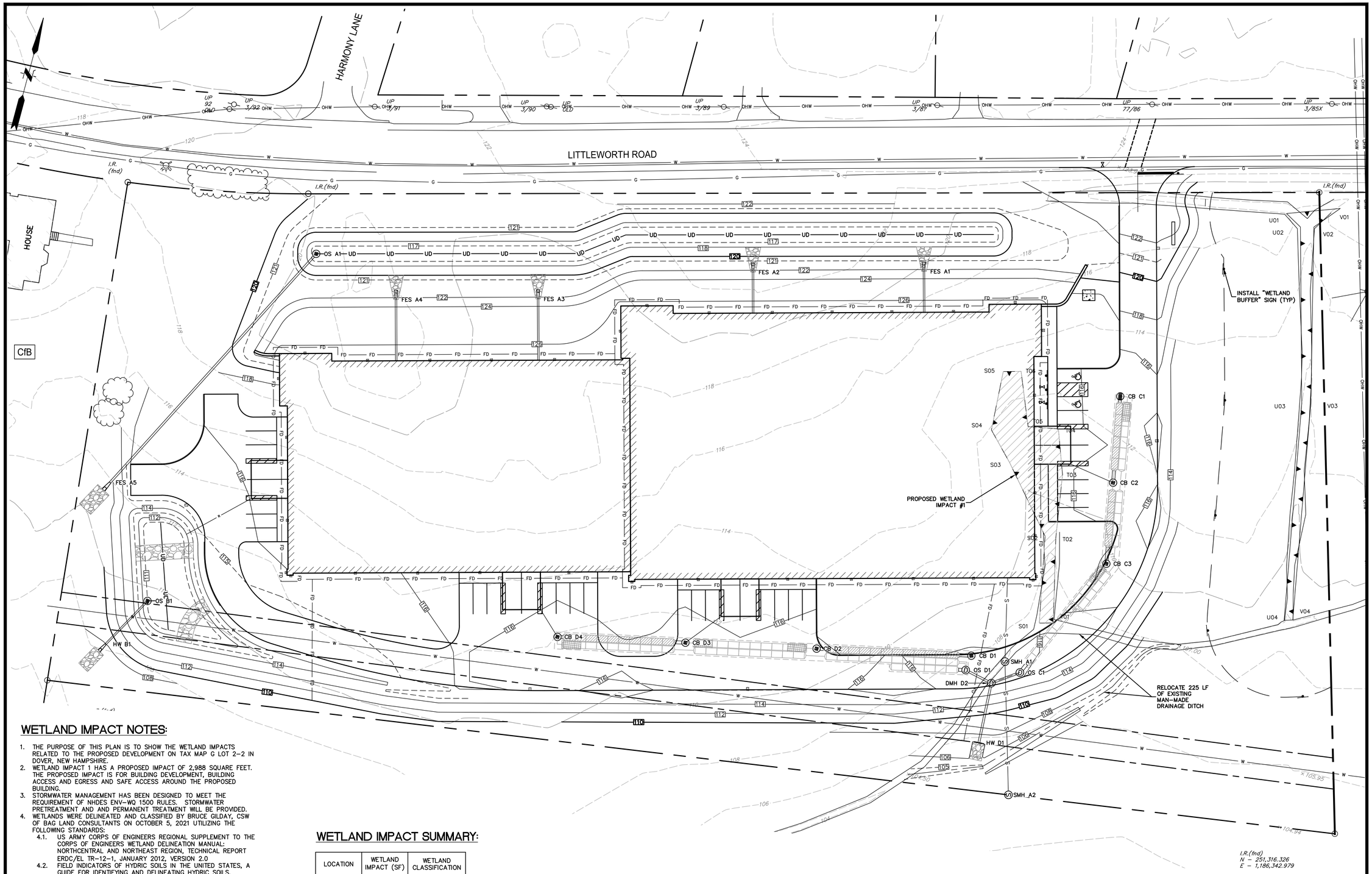


WETLAND IMPACT NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE WETLAND IMPACTS RELATED TO THE PROPOSED DEVELOPMENT ON TAX MAP G LOT 2-2 IN DOVER, NEW HAMPSHIRE.
2. WETLAND IMPACT 1 HAS A PROPOSED IMPACT OF 2,988 SQUARE FEET. THE PROPOSED IMPACT IS FOR BUILDING DEVELOPMENT, BUILDING ACCESS AND EGRESS AND SAFE ACCESS AROUND THE PROPOSED BUILDING.
3. STORMWATER MANAGEMENT HAS BEEN DESIGNED TO MEET THE REQUIREMENT OF NHDES ENV-WQ 1500 RULES. STORMWATER PRETREATMENT AND AND PERMANENT TREATMENT WILL BE PROVIDED.
4. WETLANDS WERE DELINEATED AND CLASSIFIED BY BRUCE GILDAY, CSW OF BAG LAND CONSULTANTS ON OCTOBER 5, 2021 UTILIZING THE FOLLOWING STANDARDS:
   - 4.1. US ARMY CORPS OF ENGINEERS REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, TECHNICAL REPORT ERDC/EL TR-12-1, JANUARY 2012, VERSION 2.0
   - 4.2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 7.0. UNITED STATES DEPARTMENT OF AGRICULTURE (2010).
   - 4.3. NORTH AMERICAN DIGITAL FLORA: NATIONAL WETLAND PLANT LIST, CURRENT VERSION
   - 4.4. CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES. USFW MANUAL FWS/OBS-79/31 (1979).
5. WETLAND 1 IS CLASSIFIED AS PEM1E.

WETLAND IMPACT SUMMARY:

LOCATION	WETLAND IMPACT (SF)	WETLAND CLASSIFICATION
WETLAND 1	2988	PEM1E
TOTAL	2,988	

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE: HORZ.: 30 VERT.:
DATUM: HORZ.: VERT.:
GRAPHIC SCALE 30 15 0 30

FUSS&O'NEILL
50 COMMERCIAL STREET
MANCHESTER, NEW HAMPSHIRE 03101
603.668.8223
www.fando.com

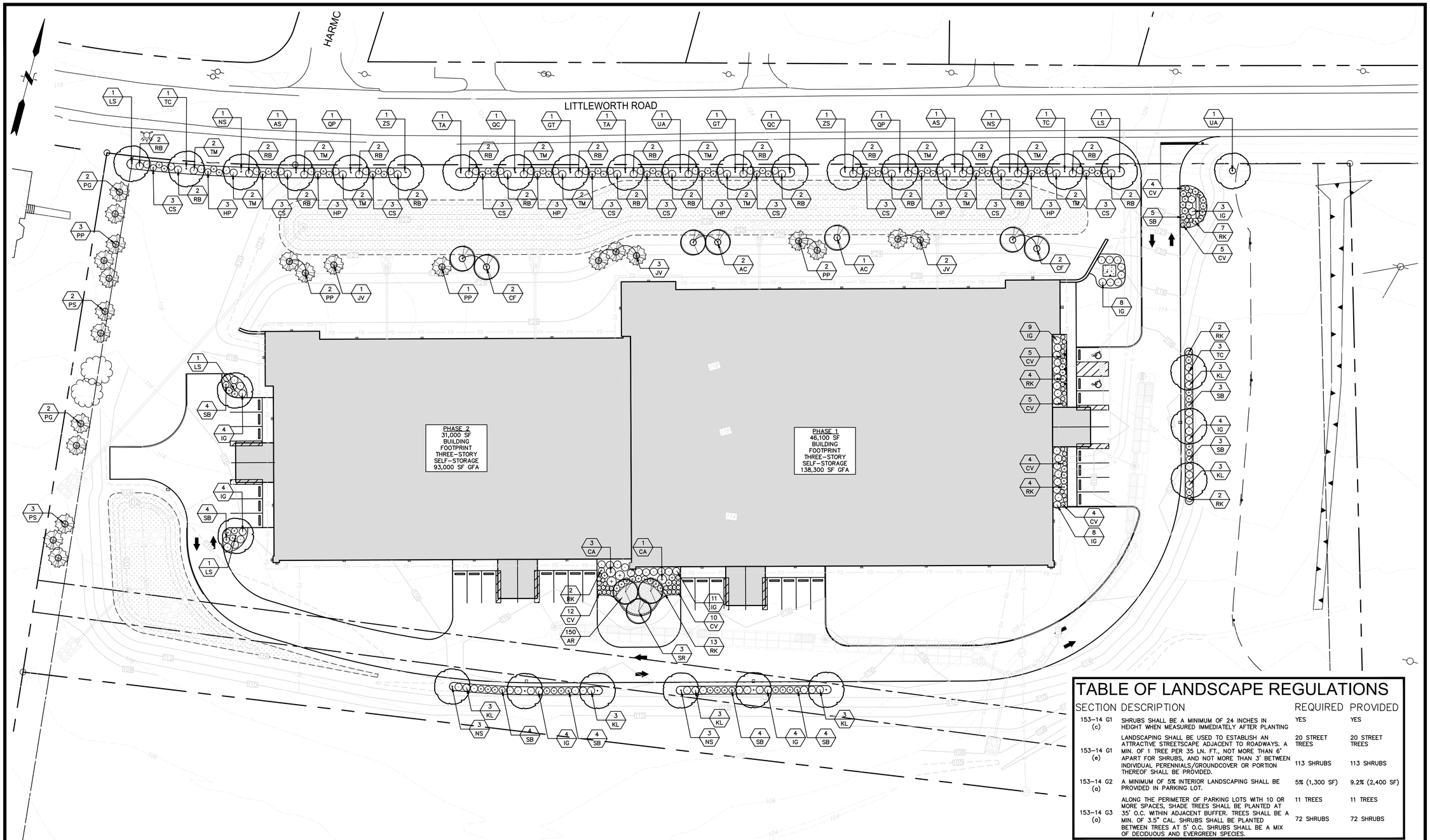
BLUEBIRD SELF STORAGE

WETLAND IMPACT PLAN

TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

CW-101



PLANT LIST

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
	TREES			
AC	AMELANCHIER 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	3	2–2.5" CAL.
AS	ACER SACCHARUM	SUGAR MAPLE	2	3–3.5" CAL.
CF	CORNUS FLORIDA 'CHEROKEE BRAVE'	CHEROKEE BRAVE DOGWOOD	4	2–2.5" CAL.
GT	GLEDITSIA TRIACANTHOS VAR. INERMIS	THORNLESS HONEYLOCUST	2	3–3.5" CAL.
JV	JUNIPERUS VIRGINIANA	EASTERN RED CEDAR	6	6–8' HT.
LS	LIQUIDAMBAR STYRACIFLUA	SWEETGUM	4	3–3.5" CAL.
NS	NYSSA SYLVATICA 'WILDFIRE'	WILDFIRE TUPELO	8	3–3.5" CAL.
PG	PICEA GLAUCA	WHITE SPRUCE	4	6–8' HT.
PP	PICEA PUNGENS 'GLAUCA'	COLORADO BLUE SPRUCE	8	6–8' HT.
PS	PINUS STROBUS	WHITE PINE	5	6–8' HT.
QC	QUERCUS COCCINEA	SCARLET OAK	2	3–3.5" CAL.
QP	QUERCUS PALUSTRIS	PIN OAK	2	3–3.5" CAL.
SR	SYRINGA RETICULATA	JAPANESE TREE LILAC	3	2–2.5" CAL.
TA	TILIA AMERICANA 'BOULEVARD'	BOULEVARD LINDEN	2	3–3.5" CAL.
TC	TILIA CORDATA	LITTLELEAF LINDEN	5	3–3.5" CAL.
UA	ULMUS AMERICANA 'PRINCETON'	PRINCETON ELM	2	3–3.5" CAL.
ZS	ZELKOVA SERRATA 'GREEN VASE'	GREEN VASE ZELKOVA	2	3–3.5" CAL.
	SHRUBS			
CA	CORNUS ALBA 'BAILHALO'	IVORY HALO DOGWOOD	4	24" HT. MIN.
CS	CORNUS STOLONIFERA 'FARROW'	ARCTIC FIRE RED TWIG DOGWOOD	30	24" HT. MIN.
HP	HYDRANGEA PANICULATA 'LITTLE QUICK FIRE'	LITTLE QUICK FIRE HYDRANGEA	18	24" HT. MIN.
IG	ILEX GLABRA 'SHAMROCK'	SHAMROCK INKBERRY	56	24" HT. MIN.
KL	KALMIA LATIFOLIA 'ELF'	ELF DWARF MOUNTAIN LAUREL	18	24" HT. MIN.
RB	RHODODENDRON 'BLAAUW'S PINK'	BLAAUW'S PINK AZALEA	40	24" HT. MIN.
RK	ROSA 'CORAL KNOCKOUT'	CORAL KNOCKOUT ROSE	27	24" HT. MIN.
SB	SPIREA X BUMALDA 'ANTHONY WATERER'	ANTHONY WATERER SPIREA	30	24" HT. MIN.
TM	TAXUS X MEDIA 'DENSIFORMIS'	DENSE SPREADING YEW	24	24" HT. MIN.
	PERENNIALS/GROUNDCOVER			
AR	AJUGA REPTANS 'BURGUNDY GLOW'	BURGUNDY GLOW CARPET BUGLE	150	2 GAL.
CV	COREOPSIS VERTICILLATA 'MOONBEAM'	MOONBEAM TICKSEED	40	2 GAL.

TABLE OF LANDSCAPE REGULATIONS

SECTION	DESCRIPTION	REQUIRED	PROVIDED
153-14 G1 (c)	SHRUBS SHALL BE A MINIMUM OF 24 INCHES IN HEIGHT WHEN MEASURED IMMEDIATELY AFTER PLANTING	YES	YES
153-14 G1 (e)	LANDSCAPING SHALL BE USED TO ESTABLISH AN ATTRACTIVE STREETSCAPE ADJACENT TO ROADWAYS. A MIN. OF 1 TREE PER 35 LN. FT., NOT MORE THAN 6' APART FOR SHRUBS, AND NOT MORE THAN 3' BETWEEN INDIVIDUAL PERENNIALS/GROUNDCOVER OR PORTION THEREOF SHALL BE PROVIDED.	20 STREET TREES 113 SHRUBS	20 STREET TREES 113 SHRUBS
153-14 G2 (a)	A MINIMUM OF 5% INTERIOR LANDSCAPING SHALL BE PROVIDED IN PARKING LOT.	5% (1,300 SF)	9.2% (2,400 SF)
153-14 G3 (a)	ALONG THE PERIMETER OF PARKING LOTS WITH 10 OR MORE SPACES, SHADE TREES SHALL BE PLANTED AT 35' O.C. WITHIN ADJACENT BUFFER. TREES SHALL BE A MIN. OF 3.5" CAL. SHRUBS SHALL BE PLANTED BETWEEN TREES AT 5' O.C. SHRUBS SHALL BE A MIX OF DECIDUOUS AND EVERGREEN SPECIES.	11 TREES 72 SHRUBS	11 TREES 72 SHRUBS

LEGEND

- DECIDUOUS TREE
- ORNAMENTAL TREE
- EVERGREEN TREE
- SHRUBS/ORNAMENTAL GRASSES
- GROUNDCOVER
- NEW ENGLAND WETMIX
- HYDROSEED LAWN

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE: HORZ.: 1" = 30'
VERT.:
DATUM: HORZ.:
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30 15 0 30
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BLUEBIRD SELF STORAGE

SITE PLANTING PLAN

TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
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PROJ. No.: 20210509.A10
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LP-101

File: J:\DWG\P2021\0509\A10\Civil\Plan\20210509.A10_LND01.dwg Layout: LP-101 Plotted: 2022-02-25 2:29 PM Saved: 2022-02-25 2:28 PM User: NMarelli
PC3: DWG TO PDF.PC3 STB\CTB: FO.STB
LAYER STATE:
MS VIEW:

PLANTING NOTES:

1. ALL PLANTING MATERIAL TO BE NURSERY GROWN STOCK SUBJECT TO A.A.N. STANDARDS.
2. THE CONTRACTOR SHALL SUPPLY ALL PLANTS IN QUANTITIES SUFFICIENT TO COMPLETE THE WORK SHOWN ON THE DRAWINGS AND LISTED IN THE PLANT LIST. IN THE EVENT OF A DISCREPANCY BETWEEN QUANTITIES SHOWN IN THE PLANT LIST AND THOSE REQUIRED BY THE DRAWINGS, THE LARGER NUMBER SHALL APPLY.
3. ALL PLANTS SHALL BE APPROVED PRIOR TO INSTALLATION AND SHALL BE LOCATED ON SITE BY THE CONTRACTOR FOR THE APPROVAL OF THE LANDSCAPE ARCHITECT. ANY INSTALLATIONS WHICH WERE NOT APPROVED BY THE LANDSCAPE ARCHITECT AND WHICH ARE SUBSEQUENTLY REQUESTED TO BE MOVED WILL BE DONE AT THE CONTRACTORS EXPENSE.
4. PRECISE LOCATION OF ITEMS NOT DIMENSIONED ON THE PLAN ARE TO BE FIELD STAKED BY THE CONTRACTOR AND SHALL BE SUBJECT TO THE REQUIREMENTS SPECIFIED IN THE PREVIOUS NOTE.
5. ALL SHRUB MASSINGS AND TREE PITS SHALL BE MULCHED TO A DEPTH OF 2" WITH SHREDDED PINE BARK MULCH.
6. TREES SHALL NOT BE STAKED UNLESS OTHERWISE NOTED.
7. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGED VEGETATION AND SHALL REPLACE OR REPAIR ANY DAMAGED MATERIAL, AT HIS OWN EXPENSE. THE CONTRACTOR SHALL CONTACT "CALL DIG SAFE" AT 888-DIG-SAFE PRIOR TO CONSTRUCTION.
8. ALL SHRUB AND GROUNDCOVER PLANTING AREAS SHALL HAVE CONTINUOUS BEDS OF TOPSOIL 12" DEEP. ALL SOD AND HYDROSEED AREAS SHALL HAVE A MINIMUM TOPSOIL BED OF 6".
9. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES IN THE FIELD. WHERE PLANT MATERIAL MAY INTERFERE WITH UTILITIES, THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT TO COORDINATE THEIR INSTALLATION.
10. FOR PLANTING SOIL MIX, SEE SPECIFICATIONS OR PLANTING DETAILS.
11. ALL EXISTING RILL, GULLY OR CHANNEL EROSION SHALL BE FILLED WITH APPROPRIATE BACKFILL MATERIAL, FINE RAKED, SCARIFIED AND STABILIZED WITH APPROPRIATE VEGETATIVE MATERIAL AND/OR APPROPRIATE SEDIMENTATION AND EROSION CONTROL MEASURES.
12. ADJUSTMENTS IN THE LOCATION OF THE PROPOSED PLANT MATERIAL AS A RESULT OF EXISTING VEGETATION TO REMAIN SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
13. CONTRACTOR TO RESEED ALL DISTURBED AREAS.

SEEDING NOTES:

1. SEED MIX TO BE PROVIDED BY NEW ENGLAND WETLAND PLANTS; 820 WEST STREET, AMHERST, MA 01002; (413)-548-8000; INFO@NEWP.COM
2. THE WETLAND SEEDS CAN BE SOWN BY HAND, WITH A HAND HELD SPREADER, OR HYDRO-SEEDED ON LARGE OR HARD TO REACH SITES. LIGHTLY RAKE TO INSURE GOOD SEED TO SOIL CONTACT. SEEDING CAN TAKE PLACE ON FROZEN SOIL, AS THE FREEZING AND THAWING WEATHER OF LATE FALL AND LATE WINTER WILL WORK THE SEED INTO THE SOIL. IF SPRING CONDITIONS ARE DRIER THAN USUAL WATERING MAY BE REQUIRED. IF SOWING DURING THE SUMMER MONTHS SUPPLEMENTAL WATERING WILL LIKELY BE REQUIRED UNTIL GERMINATION. A LIGHT MULCH OF CLEAN, WEED FREE STRAW IS RECOMMENDED.
3. SEED MIXES TO BE USED:

3.1. NEW ENGLAND WETMIX
APPLICATION RATE: 18 LBS./ACRE

SPECIES: FOX SEDGE (CAREX VULPINOIDEA), LURID SEDGE (CAREX LURIDA), BLUNT BROOM SEDGE (CAREX SCOPARIA), BLUE VERVAIN (VERBENA HASTATA), FOWL BLUEGRASS (POA PALUSTRIS), HOP SEDGE (CAREX LUPULINA), GREEN BULRUSH (SCIRPUS ATROVIRENS), CREEPING SPIKE RUSH (ELEOCHARIS PALUSTRIS), FRINGED SEDGE (CAREX CRINITA), SOFT RUSH (JUNCUS EFFUSUS), SPOTTED JOE PYE WEED (EUPATORIUM MACULATUM), RATTLESNAKE GRASS (GLYCERIA CANADENSIS), SWAMP ASTER (ASTER PUNICEUS), BLUEFLAG (IRIS VERSICOLOR), SWAMP MILKWEED (ASCLEPIAS INCARNATA), SQUARE STEMMED MONKEY FLOWER (MIMULUS RINGENS).

LANDSCAPE OPERATIONS AND MAINTENANCE REQUIREMENTS:

GENERAL

- ALL LANDSCAPED AREAS SHALL RECEIVE REGULAR MAINTENANCE AND UPKEEP. SEVERELY INJURED, DISEASED, OR DEAD PLANT MATERIAL SHALL BE REPLACED IN KIND IN PERPETUITY.
- AVOID REPLACING LANDSCAPE MATERIALS IN THE PERIOD FROM NOVEMBER TO MARCH.
- ALL PLANT MATERIAL TO RECEIVE ROUTINE PRUNING, WATERING, WEEDING, FERTILIZING, AND MULCHING.
- KEEP MOWERS AND STRING TRIMMERS AWAY FROM ALL TREE TRUNKS.

SNOW REMOVAL
- SNOW STORAGE MAY BE PERMITTED ON ANY GRASSED OR NONLIVING LANDSCAPE AREA
- SNOW AND ICE REMOVAL SHALL BE PERFORMED BY A CONTRACTOR CERTIFIED BY THE "GREEN SNOPRO"
- PROGRAM, OR APPROVED EQUIVALENT, FOLLOWING BEST MANAGEMENT PRACTICES FOR THE APPLICATION OF DEICING MATERIALS.

WATERING
- ALL NEWLY PLANTED TREES, SHRUBS AND OTHER VEGETATION SHALL HAVE A WATERING PLAN DURING THE ESTABLISHMENT PERIOD (FOR TREES, ONE YEAR PER INCH IN CALIPER AT PLANTING; SHRUBS AND OTHER VEGETATION GENERALLY ESTABLISH WITHIN ONE GROWING SEASON).
- WHEN IRRIGATION SYSTEMS ARE PROPOSED, A TEMPORARY WATERING PLAN/SCHEDULE OR LOW-VOLUME (DRIP) IRRIGATION SYSTEM SHALL BE REQUIRED. PERMANENT IRRIGATION SYSTEMS ARE PROHIBITED, EXCEPT AS NOTED BELOW. TEMPORARY IRRIGATION SYSTEMS SHALL BE DESIGNED AND INSTALLED FOR EFFICIENT AND EFFECTIVE WATER USE TO THE LANDSCAPED AREA FOR A LIMITED PERIOD OF TIME DETERMINED BY THE PLANT MATERIAL AND SITE CONDITIONS. FOR THOSE EXCEPTIONS WHEN PERMANENT IRRIGATION IS CONSIDERED NECESSARY, SUCH AS AN ATHLETIC FIELD, PERMANENT IRRIGATION SHALL UTILIZE WATER-SAVING TECHNOLOGIES, INCLUDING RAIN SENSORS, FLOW METERS, AND MANAGEMENT SYSTEMS THAT MONITOR CURRENT WEATHER CONDITIONS AND/OR SOIL MOISTURE.

MULCHING
- MULCH SHALL BE NO GREATER THAN THREE INCHES IN DEPTH AND SHALL NOT BE IN CONTACT WITH THE BARK OR STEMS OF PLANTS.
- THICK APPLICATIONS OF MULCH SUCH AS "VOLCANO MULCHING" IS PROHIBITED AND WILL ULTIMATELY KILL THE TREE.
- MULCH PROPERLY EVERY SPRING AROUND YOUNG TREES.
- IMMATURE LANDSCAPE BEDS SHALL RECEIVE TOP DRESSING OF HARDWOOD BARK MULCH EACH SPRING
- MULCH SO WATER IS SENT TO THE TREE, NOT SHED AWAY FROM IT.

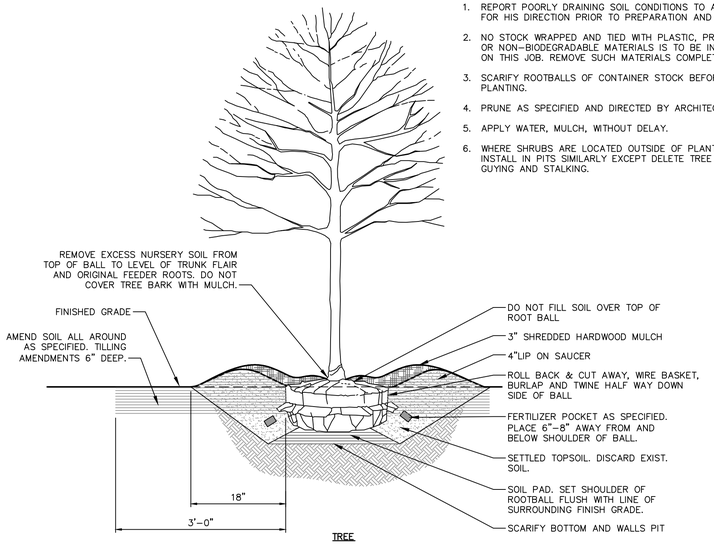
FERTILIZING
- THE USE OF LOW PHOSPHORUS AND SLOW RELEASE NITROGEN IS REQUIRED FOR FERTILIZATION OF ALL PLANT MATERIAL.

WEEDING
- INSPECT LANDSCAPE BEDS FOR SPROUTS OF WEED GROWTH AND TRASH DEBRIS. REMOVE WEEDS BETWEEN GAPS IN PLANT BEDS AND TRASH.

MOWING
- MOWING OF LAWN AREAS TO OCCUR EVERY 7-10 DAYS DURING THE ACTIVE GROWING SEASON (MAY-NOVEMBER).
- MAINTAIN GRASS HEIGHT TO 2.5"-3"
- AFTER MOWING, CLEANUP ALL CLIPPINGS AND DEBRIS BY SWEEPING OR BLOWING CLIPPINGS OFF HARDSCAPE AREAS, BUILDING WALLS, AND FENCING.
- GRASS CLIPPINGS TO BE SWEPT AWAY FROM PAVING AND RETURNED TO LAWN AREAS TO PREVENT STORMDRAIN BLOCKAGES AND NUTRIENT LOADING.

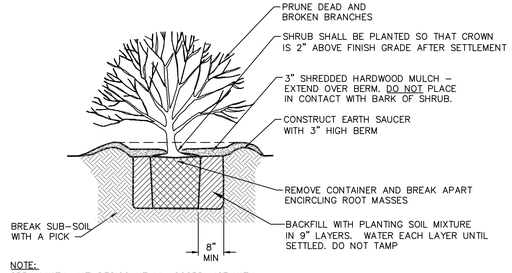
PRUNING
- INSPECT TREES AND SHRUBS. REMOVE DEAD, DECEASED OR BROKEN SHRUB BRANCHES ON AN AS NEEDED BASIS
- PRUNE TREES DURING DORMANT WINTER MONTHS AND REMOVE SUCKER GROWTH FROM BASE OF TREE.

NOTES
1. REPORT POORLY DRAINING SOIL CONDITIONS TO ARCHITECT FOR HIS DIRECTION PRIOR TO PREPARATION AND PLANTING.
2. NO STOCK WRAPPED AND TIED WITH PLASTIC, PRESERVED OR NON-BIODEGRADABLE MATERIALS IS TO BE INSTALLED ON THIS JOB. REMOVE SUCH MATERIALS COMPLETELY.
3. SCARIFY ROOTBALLS OF CONTAINER STOCK BEFORE PLANTING.
4. PRUNE AS SPECIFIED AND DIRECTED BY ARCHITECT.
5. APPLY WATER, MULCH, WITHOUT DELAY.
6. WHERE SHRUBS ARE LOCATED OUTSIDE OF PLANTS BED INSTALL IN PITS SIMILARLY EXCEPT DELETE TREE WRAP, GUYING AND STALKING.



TREE

TYPICAL TREE PIT PLANTING
NOT TO SCALE



NOTE:
SPRAY WITH ANTI DESICCANT IN ACCORDANCE WITH MFG.'S RECOMMENDATIONS IF FOLIAGE IS PRESENT.

FOR CONTAINER GROWN SHRUBS, USE FINGERS OR SMALL HAND TOOLS TO PULL THE ROOTS OUT OF THE OUTER LAYER OF POTTING SOIL; THEN CUT OR PULL APART ANY ROOTS CIRCLING THE PERIMETER OF THE CONTAINER.

INCORPORATE COMMERCIALLY PREPARED MYCORRHIZA SPORES IN THE SOIL IMMEDIATELY AROUND THE ROOT BALL AT RATES SPECIFIED BY THE MANUFACTURER.

SHRUB PLANTING DETAIL FOR CONTAINERIZED SHRUBS
NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE: HORZ.: 1" = 30'
VERT.:
DATUM: HORZ.:
VERT.:
GRAPHIC SCALE 30 15 0 30

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BLUEBIRD SELF STORAGE
SITE PLANTING NOTES AND DETAILS
TAX MAP G LOT 2-2
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PROJ. No.: 20210509.A10
DATE: 2.25.2022

LP-102

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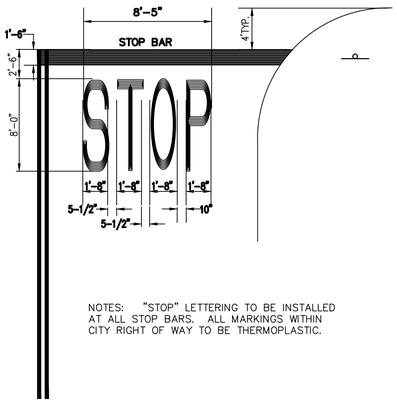
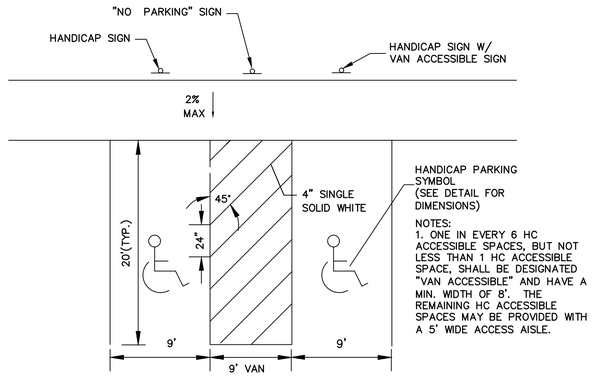


NOTES: "STOP" LETTERING TO BE INSTALLED AT ALL STOP BARS. ALL MARKINGS WITHIN CITY RIGHT OF WAY TO BE THERMOPLASTIC.

Typical Stop Bar

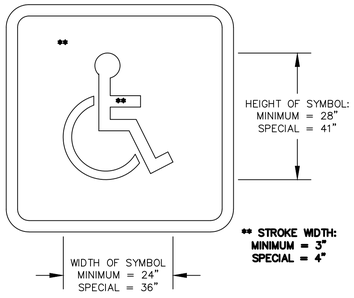
N.T.S.



NOTES:
1. ONE IN EVERY 6 HC ACCESSIBLE SPACES, BUT NOT LESS THAN 1 HC ACCESSIBLE SPACE, SHALL BE DESIGNATED "VAN ACCESSIBLE" AND HAVE A MIN. WIDTH OF 8'. THE REMAINING HC ACCESSIBLE SPACES MAY BE PROVIDED WITH A 5' WIDE ACCESS AISLE.

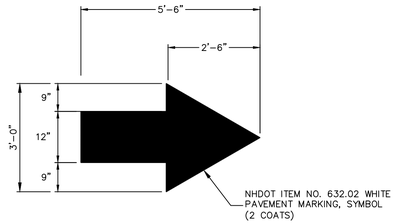
Handicap Ramp & Striping Detail (Van Accessible)

N.T.S.



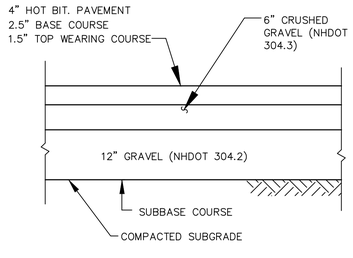
Int'l Symbol of Accessibility Marking

N.T.S.



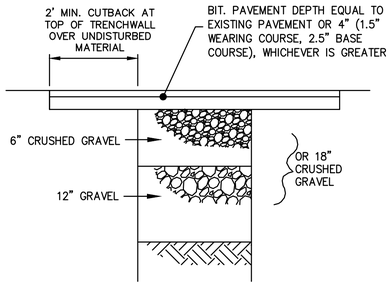
Traffic Flow Arrow

N.T.S.



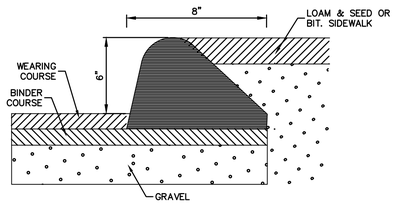
On-Site Pavement Section For Parking Lots & Driveways

N.T.S.



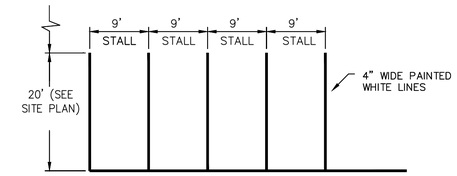
Permanent Pavement Repair

N.T.S.



Bituminous Curb

N.T.S.



Standard Striping Detail

N.T.S.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.				

AMY REBECCA SANDERS No. 11065 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE -

SCALE: HORZ.: VERT.: GRAPHIC SCALE 0

DATUM: HORZ.: VERT.:

FUSS & O'NEILL
50 COMMERCIAL STREET
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BLUEBIRD SELF-STORAGE FACILITY
PAVEMENT, PAVEMENT MARKINGS AND CURB DETAILS
TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

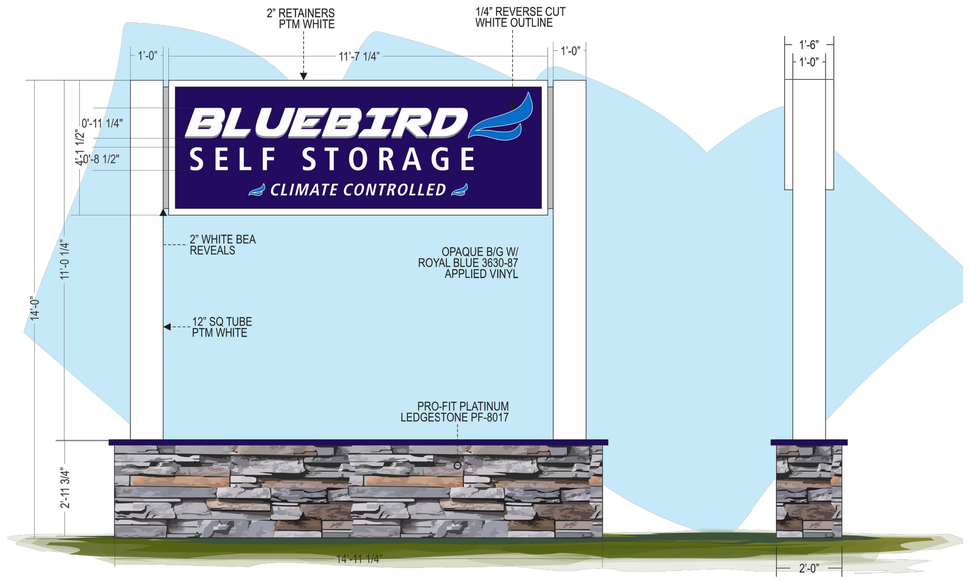
PROJ. No.: 20210509.A10
DATE: 2.25.2022

CD-501

File Path: J:\DWG\P2021\05\09.A10\Civil\Plan\20210509.A10_DET01.dwg Layout: CD-501 Plotted: Thu, February 24, 2022 - 8:53 PM User: asanders
Plotter: AUTOCAD PDF (GENERAL DOCUMENTATION).PC3 CTB File: FO.STB
MS VIEW: LAYER STATE:

ITEM A - (1) D/F ILLUMINATED MONUMENT SIGN W/ BASE

SCALE: 3/8"=1'-0"



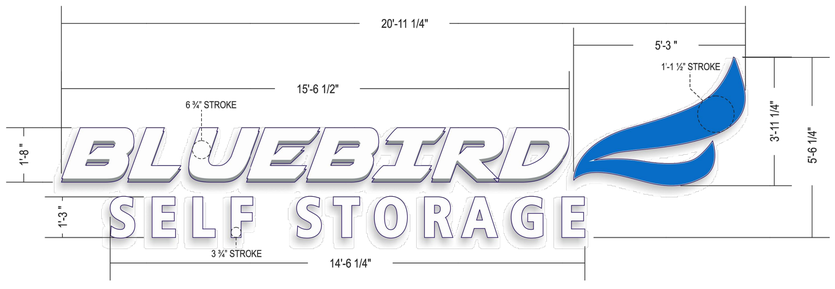
PROFILE

SCOPE OF WORK	Sign Area: 48 SQ. FT.	JOB#:

M&I (1) D/F ILLUM MONUMENT SIGN ; 14'-0" OAH W/ BASE
ILLUM CABINET: WHITE CABINET - WHITE LEXAN FACES W/ ROYAL BLUE 3630-87 OVERLAY
REVERSE CUT TO WHITE , VINYL APPLIED: SILVER 3630-51, INTENSE BLUE 3630-127

Monument Sign

N.T.S.



SCOPE OF WORK	Sign Area: 98.1 SQ. FT.

M&I (1) SET OF 20" FACE-LIT LED CHANNEL LETTERS & 15" FACE-LIT LED CHANNEL LETTER
Faces: White PLEX 7328 w SILVER GREY 3630-51 Drop Shadow
Returns: Blue BEA , TrimCap: 1" Blue

LOGO: 3'-11 1/4" Height Logo
Face: WHITE PLEX 7328 W. Applied vinyl Intense Blue 3630-127
TrimCap: 1" Blue , Returns: Blue BEA

LIGHTING: ALL WHITE LEDs

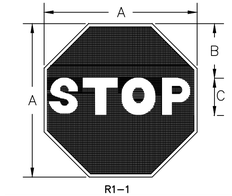
Building Sign

N.T.S.

Wetland Boundary Placard

SUBJECT TO CHANGE. COORDINATE COLOR, MATERIAL, AND MOUNTING HARDWARE WITH CITY OF DOVER

N.T.S.

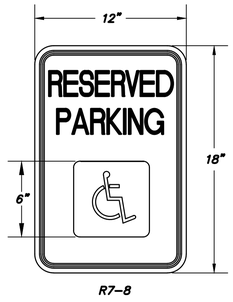


SIGN	DIMENSIONS (INCHES)
	STD
A	30
B	10
C	10

COLORS
LEGEND – WHITE (REFL)
BACKGROUND – RED (REFL)

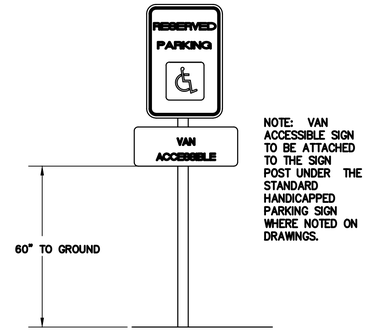
Stop Sign

N.T.S.



Reserved Parking Handicap Sign

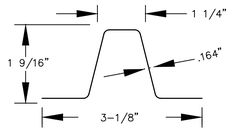
N.T.S.



Reserved Parking – Handicap & Van Accessible Sign

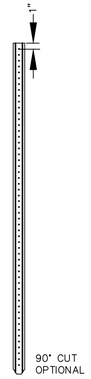
N.T.S.

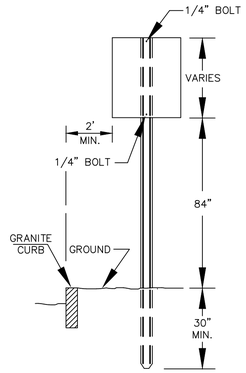
LENGTH: P–12, 12'–0"; P–14, 14'–0"; P–16, 16'–0".
WEIGHT PER LINEAR FOOT: 2.50 LBS. (MIN.)
HOLES: 3/8" DIA. 1" C–C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A–499 (GRADE 60) OR ASTM A–576 (GRADE 1070–1080).
FINISH: SHALL BE PAINTED WITH TWO COATS OF AN APPROVED MEDIUM GREEN, BAKED ON OR AIR DRIED, PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.



DIMENSIONS SHOWN ARE NOMINAL

ALTERNATE SECTIONS MUST BE APPROVED PRIOR TO USE.





NOTES
1. POSTS SHALL BE PLUMB; ANY POST BENT OR OTHERWISE DAMAGED SHALL BE REMOVED AND PROPERLY REPLACED.
2. POSTS MAY BE SET OF DRIVEN. WHEN POSTS ARE SET, HOLES SHALL BE DUG TO THE PROPER DEPTH; AFTER INSERTING POSTS, THE HOLES SHALL BE BACK FILLED WITH SUITABLE MATERIAL IN LAYERS NOT TO EXCEED A 6" DEPTH, THOROUGHLY COMPACTED.
3. CARE SHALL BE TAKEN TO PRESERVE THE ALIGNMENT OF THE POST. WHEN POSTS ARE DRIVEN, A SUITABLE DRIVING CAP SHALL BE USED AND AFTER DRIVING THE TOP OF THE POST SHALL HAVE SUBSTANTIALLY THE SAME CROSS–SECTIONAL DIMENSION AS THE BODY OF THE POST; BATTERED HEADS WILL NOT BE ACCEPTED.
4. POSTS SHALL NOT BE DRIVEN WITH THE SIGN ATTACHED TO THE POST.
5. SIGNS SHALL BE ERECTED IN CONFORMANCE WITH THE REQUIREMENTS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
6. WHEN SIGN IS IN PLACE NO PART OF POST SHALL EXTEND ABOVE THE SIGN.

Sign Post

N.T.S.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.				

STATE OF NEW HAMPSHIRE – AMY REBECCA SANDERS No. 11065 LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: VERT.: DATUM: HORZ.: VERT.: 0 GRAPHIC SCALE

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MANCHESTER, NEW HAMPSHIRE 03101
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BLUEBIRD SELF-STORAGE FACILITY
SIGN DETAILS
TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

CD-502

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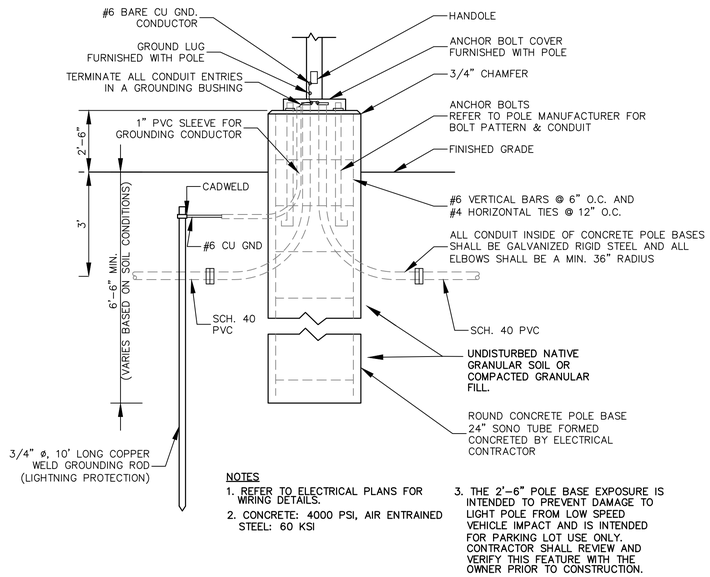


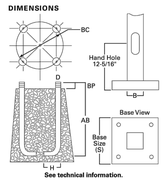
NOTES

1. REFER TO ELECTRICAL PLANS FOR WIRING DETAILS.
2. CONCRETE: 4000 PSI, AIR ENTRAINED STEEL: 60 KSI
3. THE 2'-6" POLE BASE EXPOSURE IS INTENTIONAL TO PREVENT DAMAGE TO LIGHT POLE FROM LOW SPEED VEHICLE IMPACT AND IS INTENDED FOR PARKING LOT USE ONLY. CONTRACTOR SHALL REVIEW AND VERIFY THIS FEATURE WITH THE OWNER PRIOR TO CONSTRUCTION.

Light Pole Base Detail

N.T.S.

SSS SQUARE
STRAIGHT STEEL



Eaton Square Straight Steel Pole

N.T.S.

HALO

SMD6 Series

6" Round and Square Surface Mount Downlight
SMD6R & SMD6S

Typical Applications
Residential

Interactive Menu

- Order Information page 2
- Product Specifications page 4
- Photometric Data page 5
- Product Warranty

Product Certification

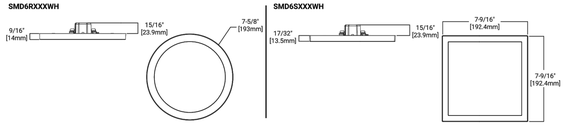
Refer to ENERGY STAR® Certified Products List.
Can be used to comply with California Title 24 High Efficacy requirements.
Certified to California Appliance Efficiency Database under JA8.

Product Features

Top Product Features

- Ultra-low profile surface luminaire with wide distribution
- Ceiling or wall mounting in compatible junction boxes
- 600 & 1200 lumen; 2700K, 3000K, 3500K, 4000K or 5000K field selectable CCT; 90 CRI
- 120V only and Universal Voltage 120V – 277V options
- Dimmable with 120V dimmers

Dimensional and Mounting Details



Halo Canopy Lighting

N.T.S.

Lumark

Axcent

Wall Mount Luminaire

Product Features

Interactive Menu

- Ordering Information page 2
- Mounting Details page 3
- Product Specifications page 4
- Energy and Performance Data page 4
- Control Options page 6

Product Certifications

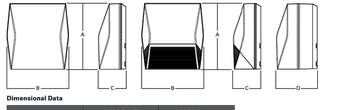
Quick Facts

- Available in 14W - 123W (1,800 - 17,000 lumens) models
- Full cutoff and refractive lens models available
- Energy and maintenance savings up to 95% compared to HID
- Energy efficient illumination results in up to 144 LPW
- Replaces 70W up to 450W HID equivalents

Connected Systems

- WaveLinx Lite
- Enlighted

Dimensional Details



Dimensional Data

	AXCS Small	AXCL Large
A	8" [202mm]	11-1/2" [292mm]
B	7-1/2" [190mm]	10-3/4" [273mm]
C	3-5/8" [94mm]	4-7/8" [124mm]
D	6-1/8" [155mm]	7-1/8" [181mm]

Lumark Axcent Wall Mount Lighting

N.T.S.

McGraw-Edison

GLEON Galleon

Area / Site Luminaire

Typical Applications
Outdoor • Parking Lots • Walkways • Roadways • Building Areas

Interactive Menu

- Ordering Information page 2
- Mounting Details page 3
- Optical Distributions page 4
- Product Specifications page 4
- Energy and Performance Data page 4
- Control Options page 9

Product Certifications

Product Features

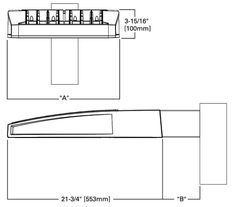
Quick Facts

- Lumen packages range from 4,200 - 80,800 (34W - 640W)
- Efficacy up to 156 lumens per watt

Connected Systems

- WaveLinx
- Enlighted

Dimensional Details



Number of Light Squares	"A" Width	"B" Standard Arm Length	"B" Extended Arm Length †	"B" Quick Mount Arm Length	"B" Quick Mount Extended Arm Length
1-4	15-1/2"	7"	10"	10-5/8"	16-9/16"
5-6	21-5/8"	7"	10"	10-5/8"	16-9/16"
7-8	27-5/8"	7"	13"	10-5/8"	--
9-10	33-3/4"	7"	16"	--	--

NOTES:
For arm selection requirements and additional line art, see Mounting Details section.

McGraw-Edison GLEON Galleon Pole Fixture

N.T.S.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.				

SCALE: HORZ.: VERT.:
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BLUEBIRD SELF-STORAGE FACILITY
LIGHTING DETAILS
TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

CD-503

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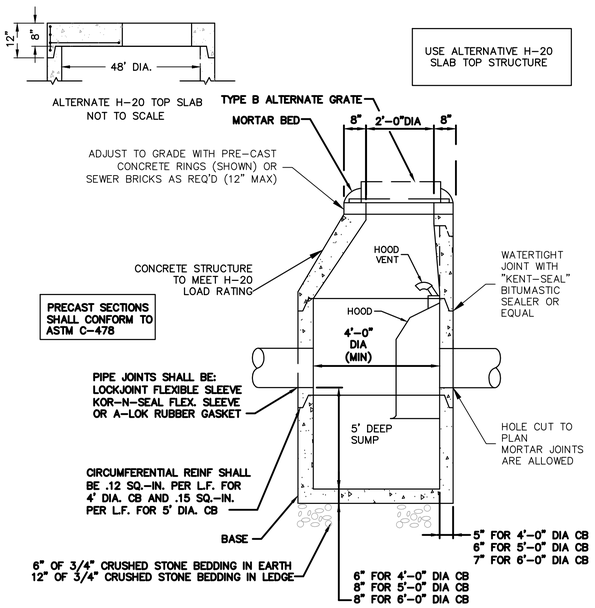
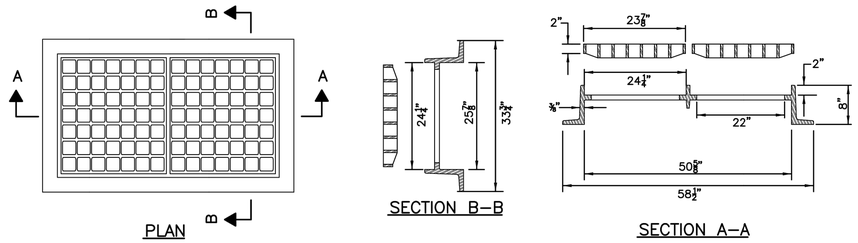


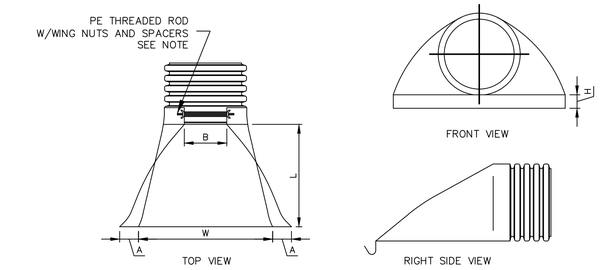
NOTES:
1. ALL SECTIONS SHALL BE CONCRETE, CLASS AA (4,000 PSI) CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ. IN. PER L.F. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
2. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER L.F.
3. RISERS OF 1'-4" MAY BE USED TO REACH THE DESIRED ELEVATION.
4. STEPS ARE NOT ALLOWED.

Precast Reinforced Catch Basin
N.T.S.



NOTES:
1. GRATE AND FRAME TO BE CAST IRON
2. WATERWAY OPENING – 434 SI
3. MANUFACTURED BY EAST JORDAN IRON WORKS OR APPROVED EQUAL

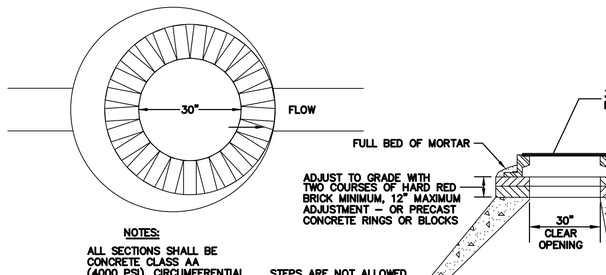
Double Frame & Grate
N.T.S.



	PIPE DIAMETER, in (mm)					
Diameter in (mm)	12 (300)	15 (375)	18 (450)	24 (600)	30 (750)	36 (900)
A in (mm)	6.5 (165)	6.5 (165)	7.5 (191)	7.5 (191)	7.5 (191)	7.5 (191)
B (max) in (mm)	10.0 (254)	10.0 (254)	15.0 (381)	18.0 (475)	22.0 (559)	25.0 (635)
H in (mm)	6.5 (165)	6.5 (165)	6.5 (165)	6.5 (165)	8.6 (218)	8.6 (218)
L in (mm)	25.0 (635)	25.0 (635)	32.0 (813)	36.0 (914)	58.0 (1473)	58.0 (1473)
W in (mm)	29.0 (737)	29.0 (737)	35.0 (889)	45.0 (1143)	63.0 (1600)	63.0 (1600)

NOTE: PE THREADED ROD W/WING NUTS PROVIDED FOR END SECTIONS 12"–24". 30" & 36" END SECTIONS REQUIRE TWO (2) THREADED RODS FOR ASSEMBLE.

ADS Flared End Section
N.T.S.

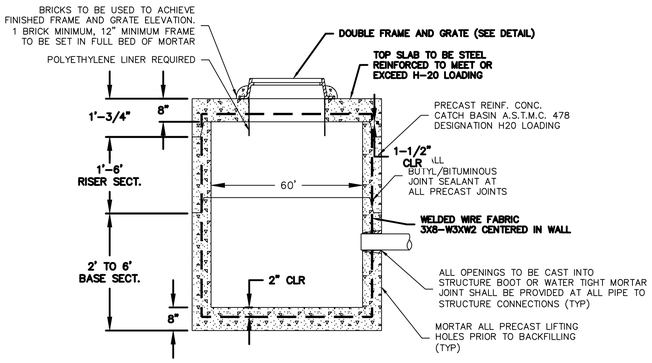


NOTES:
ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 PSI). CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ. IN. PER L.F. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER L.F.

TYPE OF PIPE	SIZE	MAX. DIST. TO FIRST JOINT
R.C.P. & C.I.	ALL	48"
C.I.P.	ALL	48"
P.V.C.	>15"	48"
V.C.P.	0–12"	18"
V.C.P.	>12"	36"

CONSTRUCTION NOTES:
1. INSTALL FIRST SECTION BELOW EXISTING PIPE.
2. CONSTRUCT BRICK SHELF AND ADD REMAINING SECTIONS
3. FORM WATER TIGHT JOINT USING "KENT–SEAL" BITUMASTIC SEAL
4. CUT PIPE IN TWO LOCATIONS, 3" FROM MANHOLE INSIDE WALL

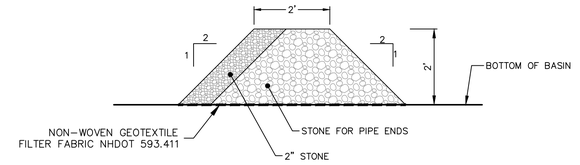
Drain Manhole Detail
N.T.S.



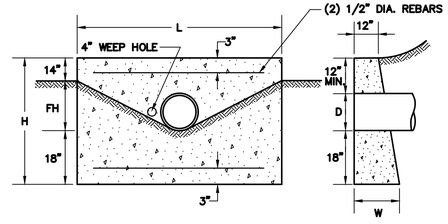
POLYETHYLENE LINER NOTES:
1. ALL CATCH BASINS SHALL BE OUTFITTED WITH A POLYETHYLENE LINER DOWNSPOUT.
2. POLYETHYLENE LINER (NHDOT ITEM 604.0007) SHALL BE FABRICATED AT THE SHOP. DOWNSPOUT SHALL BE EXTRUSION FILLET WELDED TO THE POLYETHYLENE SHEET.
3. PLACE A CONTINUOUSE BEAD OF AN APPROVED SILICONE SEALANT BETWEEN FRAME AND POLYETHYLENE SHEET.
4. PLACE CLASS AA CONCRETE TO 2" BELOW THE TOP OF GRATE ELEVATION (SUBSIDIARY TO DRAINAGE STRUCTURE)
5. TRIM POLYETHYLENE SHEET A MAXIMUM OF 4" OUTSIDE THE FLANGE ON THE FRAME FOR THE CATCH BASIN BEFORE PLACING CONCRETE (EXCEPT AS SHOWN WHEN USED WITH CURB)
6. THE CENTER OF THE GRATE AND FRAME MAY BE SHIFTED A MAXIMUM OF 3" FROM THE CENTER OF THE DOWNSPOUT IN ANY DIRECTION.

CATCH BASIN NOTES:
1. MAXIMUM DEPTH = 18 FT
2. MINIMUM PIPE DROP (INLET TO OUTLET) SHALL BE 3" UNLESS OTHERWISE APPROVED BY THE DEPARTMENT OF PUBLIC WORKS AND ENGINEERING.
3. ALL BOOTS, GASKETS AND SEALANTS SHALL BE IN ACCORDANCE WITH MANUFACTURES WRITTEN INSTRUCTIONS.

5 Foot Diameter Catch Basin
N.T.S.



Forebay Rip Rap Berm Detail
N.T.S.



D	MAS.PER STD.HDR. CU.YD.	STEEL PER STD. HDR.LB.	LENGTH OF BARS	L	H	FH	W
12	.61	9	3'-2"	3'-6"	3'-6"	0'-10"	1'-10.5"
15	.85	11	3–10	4–8	3–9	1–1	1–11.25
18	1.13	14	5–2	5–6	4–0	1–4	2–0
24	1.78	20	7–2	7–6	4–6	1–10	2–1.5
30	2.58	25	9–2	9–6	5–0	2–4	2–3
36	3.53	31	11–2	11–6	5–6	2–10	2–4.5
42	4.65	36	13–2	13–6	6–0	3–4	2–6
48	5.95	42	15–2	15–6	6–6	3–10	2–7.5

Typical Headwall
N.T.S.

No.	DESCRIPTION	DATE	DESIGNER REVIEWER
1.			

AMY REBECCA SANDERS No. 11065 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

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DRAINAGE DETAILS
TAX MAP 14-1-10-1 AND 14-1-10-2
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CD-504

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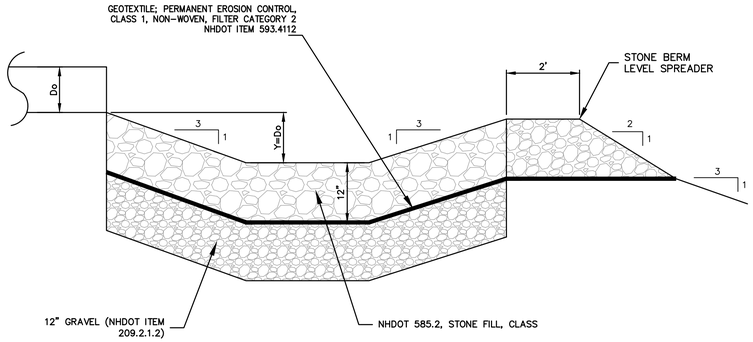
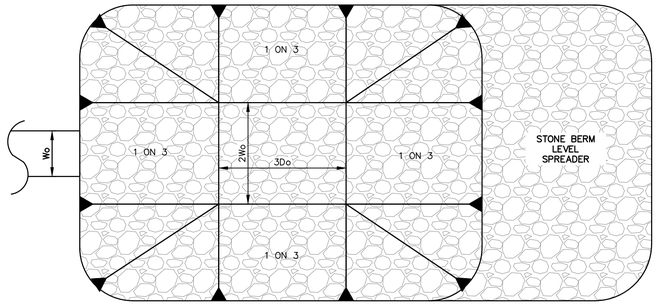
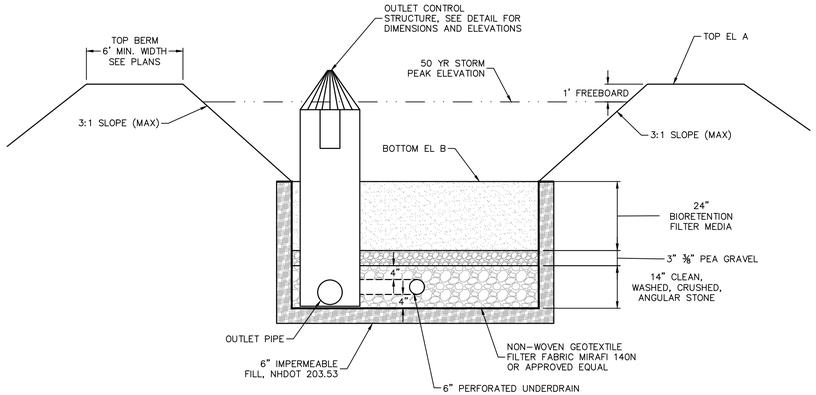




RipRap Plunge Pool Detail

N.T.S.



BIORETENTION POND ELEVATIONS		
BIORETENTION AREA	A	B
10P	121.0	117.0
13P	114.0	111.0

NOTE: CONTRACTOR SHALL NOT DIRECT STORMWATER TO BIORETENTION AREA UNTIL THE SITE IS STABILIZED. PROVIDE TEMPORARY SETTLING BASIN OR ALTERNATIVE UPSTREAM OF BIORETENTION AREA DURING CONSTRUCTION.

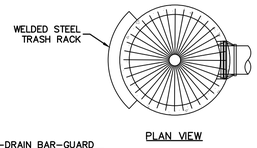
Table 4-4. Bioretention Filter Media			
Component Material	Percent of Mixture by Volume	Gradation of Material	
		Sieve No.	Percent by Weight Passing Standard Sieve
Filter Media Option A			
ASTM C-33 concrete sand	50 to 55		
Loamy sand topsoil, with fines as indicated	20 to 30	200	15 to 25
Moderately fine shredded bark or wood fiber mulch, with fines as indicated	20 to 30	200	< 5

BIORETENTION POND NOTES:

1. BIORETENTION SOIL MIX SHALL NOT BE PLACED UNTIL AFTER ENGINEERING APPROVAL AND INSPECTION OF SUBGRADE.
2. PLANT THE SYSTEM AS SPECIFIED. AT A MINIMUM, PLANT THE SYSTEM FLOOR AND SIDE SLOPES WITH RYE GRASS MIXTURE CONTAINING PERENNIAL AND WINTER RYES, AT A RATE SPECIFIED BY THE MANUFACTURER. STABILIZE THE SLOPES WITH STRAW TO A DEPTH OF 1". SEE LANDSCAPE PLAN FOR SPECIFIC SEED MIX ON BIORETENTION SOIL.
3. GENERAL CONSTRUCTION GUIDELINES:
   - 3.1. VERIFY THAT NO FOREIGN OR DELETERIOUS MATERIAL OR LIQUID SUCH AS PAINT, PAINT WASHOUT, CONCRETE SLURRY, ASPHALT/CONCRETE LAYERS OR CHUNKS, CEMENT, PLASTER, OILS, GASOLINE, DIESEL FUEL, PAINT THINNER, TURPENTINE, TAR, ROOFING COMPOUND, SOLID WASTE, OR ACID HAS BEEN DEPOSITED IN PLANTING SOIL (BIORETENION MEDIA OR LOAM ON SIDE SLOPES).
   - 3.2. PROCEED WITH PLACEMENT OF ANY SUBSURFACE MATERIALS ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
   - 3.3. COMPACT EACH BLENDED LIFT OF BIORETENTION SOIL MEDIA TO 75% OF MAXIMUM STANDARD PROCTOR DENSITY ACCORDING TO ASTM D698.
   - 3.4. GRADE SOIL MEDIA TO A SMOOTH, UNIFORM SURFACE PLANE WITH LOOSE, UNIFORMLY FINE TEXTURE, ROLL AND RAKE, REMOVE RIDGES, AND FILL DEPRESSIONS TO MEET FINISHED GRADES.
   - 3.5. LIGHTLY COMPACT FINISHED FLOOR ELEVATION AND FINISHED SLOPES USING THE BUCKET OF AN EXCAVATOR, NON-MOTORIZED ROLLER, HAND TAMP, OR OTHER MEANS, THEN ROUGHEN SURFACE WITH A RAKE TO LOOSEN SOILS BEFORE SEEDING.
   - 3.6. DO NOT COMPACT THE SUBGRADE AT THE BOTTOM OF EXCAVATION UNLESS PERMEABILITY EXCEEDS 1X10-5 CM/S.
4. BIORETENTION SOIL MEDIA (BSM) MIXTURE SPECIFICATIONS:
   - 4.1. STICKS AND ROOTS SHOULD BE MINIMIZED IN THE BXM MIXTURE AND PREFERABLY LIMITED TO NOTHING LARGER THAN 4.76 MM (0.187 IN).
   - 4.2. DEBRIS AND OTHER FOREIGHN MATERIAL SHOULD BE MINIMIZED.
   - 4.3. ORGANIC MATTER SHOULD MAKE UP A MINIMUM OF 3% BY VOLUME AND A MAXIMUM 8% BY VOLUME OF THE BSM.
   - 4.4. BSM SHALL BE MIXED PRIOR TO INSTALLATION.
5. ORGANIC SOIL AMENDMENTS;
   - 5.1. NO COMPOST SHOULD BE USED IN THE PLANTING MIX (USED ON THE SIDE SLOPES AND SURROUNDING AREA) UNLESS SPECIFIED BY THE ENGINEER.
   - 5.2. SPHAGNUM PEAT: PARTIALLY DECOMPOSED SPHAGNUM PEAT MOSS, FINELY DIVIDED OR OF GRANULAR TEXTURE WITH 100% PASSING THROUGH A 1/2-IN (13 MM) SIEVE, WITH A PH OF 3.4 TO 4.8.
   - 5.3. WOOD DERIVATIVES: SHREDDED WOOD, WOOD CHIPS, GROUND BARK, OR WOOD WASTE; OF UNIFORM TEXTURE AND FREE OF STONES, STICKS, SOIL OR TOXIC MATERIAL.
6. THE CRUSHED STONE LAYER SHOULD CONSIST OF AASHTO #5 STONE (3/4-IN). THE CRUSHED STONE SHALL BE CLEAN, WASHED AND FREE OF FINES.

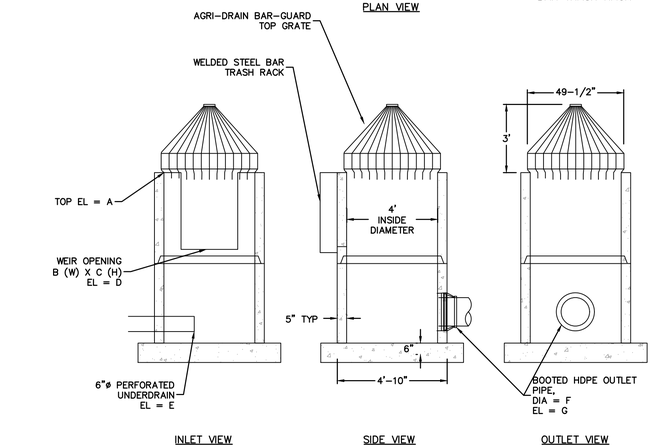
Bioretention Pond Detail

N.T.S.



PLAN VIEW

WELDED STEEL BAR TRASH RACK



INLET VIEW | SIDE VIEW | OUTLET VIEW

GENERAL NOTES:

1. STEEL REINFORCEMENT CONFORMING TO THE LATEST ASTM SPECIFICATION: ASTM A-615, GRADE 60 BLACK DEFORMED BARS, ASTM A-185 WELDED WIRE FABRIC, 0.12 SQ IN/LINEAL FT AND 0.12 SQ IN. (BOTH WAYS) BASE BOTTOM.
2. CONCRETE: fc=4,000 PSI @ 28 DAYS MINIMUM, TYPE III CEMENT.
3. BUTYL RUBBER JOINT SEALANT CONFORMING TO ASTM C-990 AND FEDERAL SPEC SS-S-210A.
4. HS-20 DESIGN LOADING TO CONFORM TO LATEST SPECIFICATIONS ASTM C478, AASHTO M199 PRECAST REINFORCED CONCRETE MANHOLE SECTIONS
5. ONE POUR MONOLITHIC BASE SECTION.

OUTLET STRUCTURE		
INLET AND OUTLET, DIMENSIONS AND ELEVATIONS		
OUTLET STRUCTURE	OS 10P	OS 13P
TOP EL A	119.80	113.00
WEIR WIDTH B	1'	1'
WEIR HEIGHT C	1.6'	1.25'
WEIR EL D	118.20	111.75
6" UNDERDRAIN EL E	113.92	107.92
OUTLET PIPE DIA. F	15"	12"
OUTLET PIPE EL G	113.50	107.50

Outlet Structure Detail

N.T.S.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.				

STATE OF NEW HAMPSHIRE - AMY REBECCA SANDERS No. 11065 LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: VERT.: DATUM: HORZ.: VERT.: 0 GRAPHIC SCALE

FUSS & O'NEILL
50 COMMERCIAL STREET
MANCHESTER, NEW HAMPSHIRE 03101
603.668.8223
www.fando.com

BLUEBIRD SELF-STORAGE FACILITY
DRAINAGE DETAILS
TAX MAP 14-1-10-1 AND 14-1-10-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

CD-505

File Path: J:\DWG\P2021\0509\A10\Civil\Plan\20210509.A10_DET01.dwg Layout: CD-505 Plotted: Thu, February 24, 2022 - 8:53 PM User: asanders
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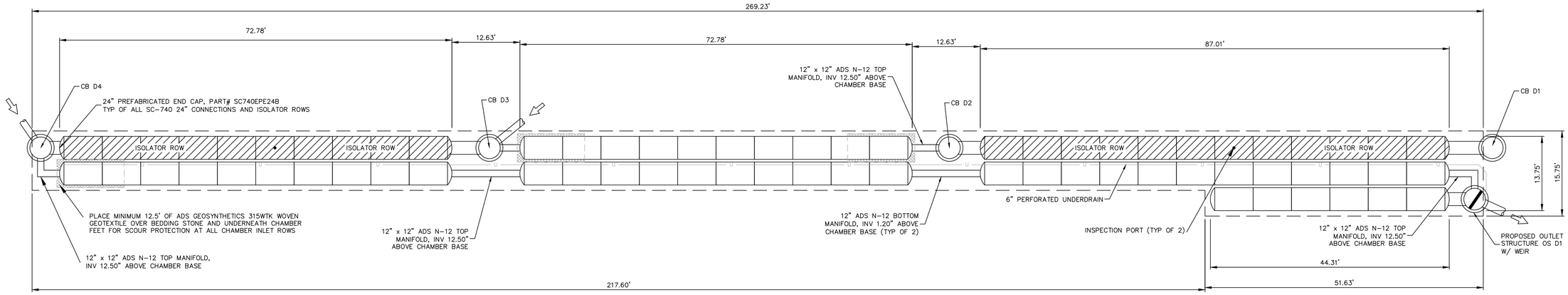
STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-740 OR APPROVED EQUAL.
2. STORMTECH CHAMBERS SHALL BE PROVIDED, STORED AND INSTALLED IN STRICT CONFORMANCE WITH THE MANUFACTURES SPECIFICATIONS AND CONSTRUCTION REQUIREMENTS.
3. SEE DRAWING CD-507 FOR ALL DETAILS AND INSTALLATION REQUIREMENTS.



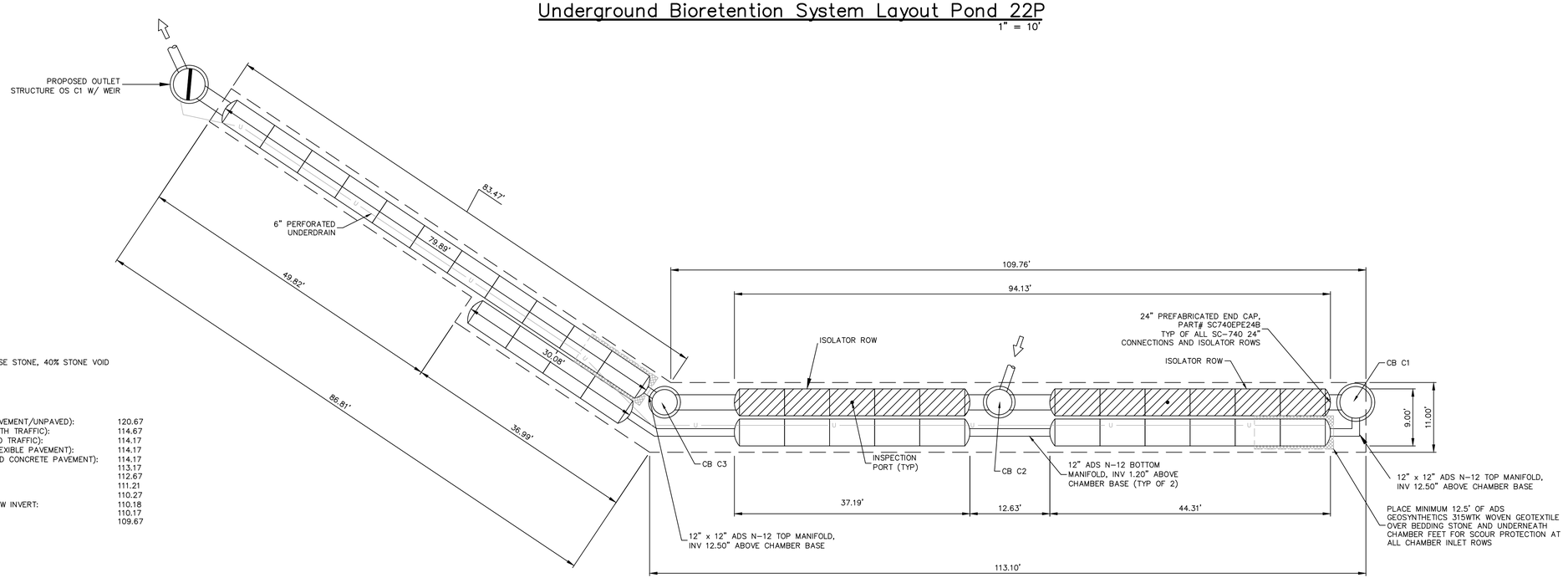
LAYOUT - SYSTEM 22P
(70) STORMTECH SC-740 CHAMBERS
(14) STORMTECH SC-740 END CAPS
INSTALLED WITH 6" COVER STONE, 6" BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME: 6420 CF
AREA OF SYSTEM: 3207 FT²
PERIMETER OF SYSTEM: 570 FT

PROPOSED ELEVATIONS - SYSTEM 22P

MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	120.67
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	114.67
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	114.17
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	114.17
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	114.17
TOP OF STONE:	113.17
TOP OF CHAMBER:	112.67
12" TOP CONNECTION INVERT:	111.21
12" BOTTOM CONNECTION INVERT:	110.27
24" BOTTOM CONNECTION / ISOLATOR ROW INVERT:	110.18
BOTTOM OF CHAMBER:	110.17
BOTTOM OF STONE:	109.67

Underground Bioretention System Layout Pond 22P

1" = 10'



LAYOUT - SYSTEM 21P
(37) STORMTECH SC-740 CHAMBERS
(12) STORMTECH SC-740 END CAPS
INSTALLED WITH 6" COVER STONE, 6" BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME: 3717 CF
AREA OF SYSTEM: 1926 FT²
PERIMETER OF SYSTEM: 415 FT

PROPOSED ELEVATIONS - SYSTEM 21P

MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	120.67
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	114.67
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	114.17
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	114.17
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	114.17
TOP OF STONE:	113.17
TOP OF CHAMBER:	112.67
12" TOP CONNECTION INVERT:	111.21
12" BOTTOM CONNECTION INVERT:	110.27
24" BOTTOM CONNECTION / ISOLATOR ROW INVERT:	110.18
BOTTOM OF CHAMBER:	110.17
BOTTOM OF STONE:	109.67

Underground Bioretention System Layout Pond 21P

1" = 10'

No.	DESCRIPTION	DATE	DESIGNER	REVIEWER
1.				

AMY REBECCA SANDERS No. 11065 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE

SCALE: HORZ.: VERT.: DATUM: HORZ.: VERT.: 0 GRAPHIC SCALE

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BLUEBIRD SELF-STORAGE FACILITY

DRAINAGE DETAILS

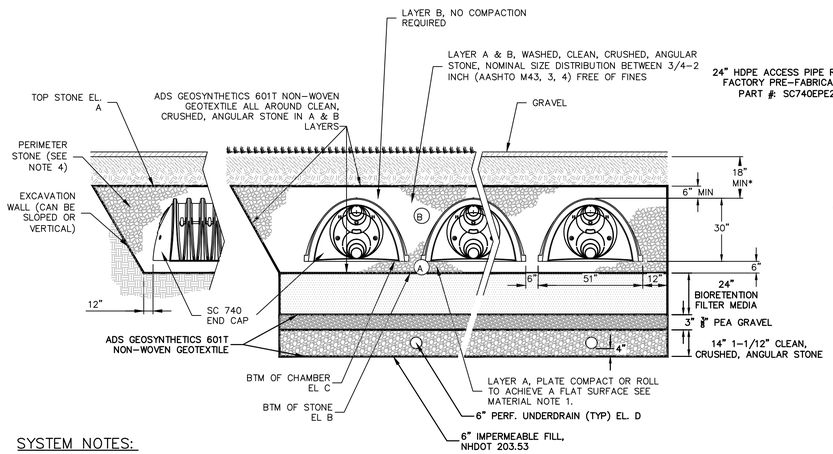
TAX MAP 14-1-10-1 AND 14-1-10-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

CD-506

File Path: J:\DWG\P2021\05\09\A10\Civil\Plan\20210509.A10_DET01.dwg Layout: CD-506 Plotted: Thu, February 24, 2022 - 8:53 PM User: asanders
MS VIEW: LAYER STATE: Plotter: AUTOCAD PDF (GENERAL DOCUMENTATION).PC3 CTB File: FO.STB

MATERIAL NOTES:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



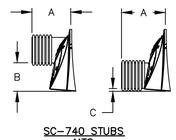
SYSTEM NOTES:

1. SC–740 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC–740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"."
3. ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. PROVIDED BANK RUN GRAVEL BETWEEN THE TOP OF STONE (LAYER B) AND THE BOTTOM OF THE "PAVEMENT SECTION FOR PARKING LOTS AND DRIVEWAYS".
6. BIORETENTION FILTER MEDIA SHALL BE CONSTRUCTED IN 6–INCH LIFTS.

Table 4-4. Bioretention Filter Media			
Component Material	Percent of Mixture by Volume	Gradation of Material	
		Sieve No.	Percent by Weight Passing Standard Sieve
Filter Media Option A			
ASTM C-33 concrete sand	50 to 55		
Loamy sand topsoil, with fines as indicated	20 to 30	200	15 to 25
Moderately fine shredded bark or wood fiber mulch, with fines as indicated	20 to 30	200	< 5

SC–740 Stormtech Chamber Underground Bioretention System

N.T.S.



SC–740 STUBS
NTS

STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART #	STUB	A	B	C
SC740EPE08T/SC740EPE08TPC	8"	12.2"	16.5"	–
SC740EPE12T/SC740EPE12TPC	12"	14.7"	12.5"	–
SC740EPE15T/SC740EPE15TPC	15"	18.4"	9.0"	–
SC740EPE24B*	24"	18.5"	–	0.1"

NOTE: ALL DIMENSIONS ARE NOMINAL

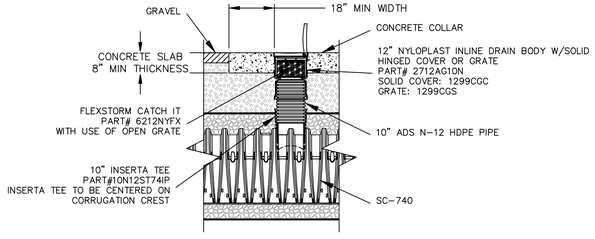
SC–740 Stubs

N.T.S.

ELEVATIONS				
SYSTEM	A	B	C	D
21P	113.16	109.67	110.17	106.59
22P	113.16	109.67	110.17	106.59

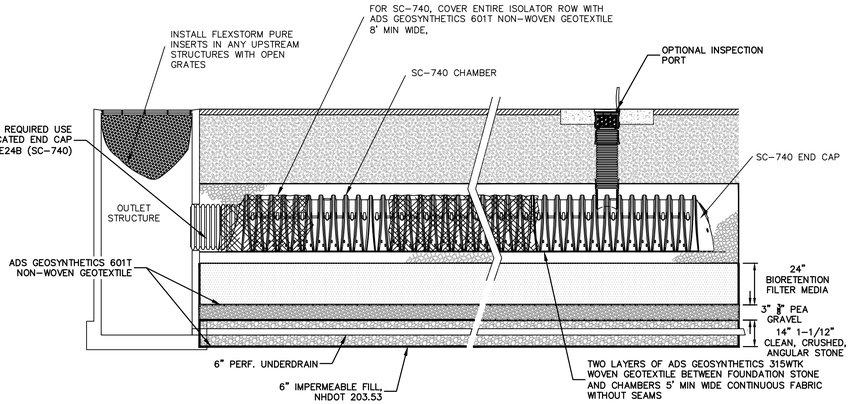
UNDERGROUND DETENTION SYSTEM NOTES:

1. DO NOT DISCHARGE SEDIMENT–LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO THE INFILTRATION SYSTEMS.
2. DO NOT PLACE UNDERGROUND DETENTION SYSTEMS INTO SERVICE UNTIL THE CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
3. IF REQUIRED BY CONDITIONS OF APPROVAL, A QUALIFIED ENGINEER MUST OBSERVE THE UNDERGROUND TREATMENT SYSTEM PRIOR TO BACKFILLING AND WRITE A LETTER TO DES AS TO WHETHER THE SYSTEM CONFORMS TO THE APPROVED PLANS AND SPECIFICATIONS. CONTRACTOR TO NOTIFY AND COORDINATE WITH THE ENGINEER.



SC–740 Inspection Port Detail

N.T.S.



SC–740 Isolator Row

N.T.S.

INSPECTION & MAINTENANCE

STEP 1 – INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON CATCH BASINS OR DRAIN MANHOLES
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3

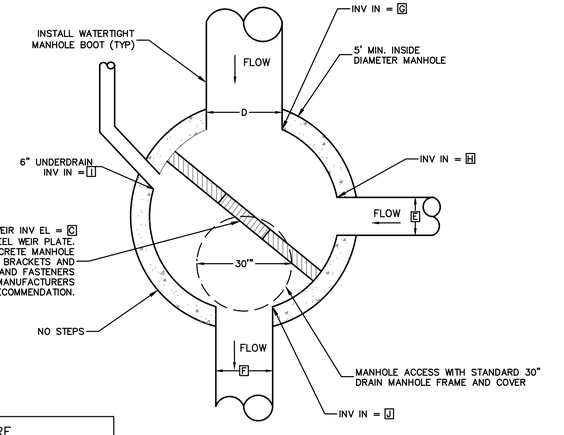
STEP 2 –CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3 – REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4 – INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

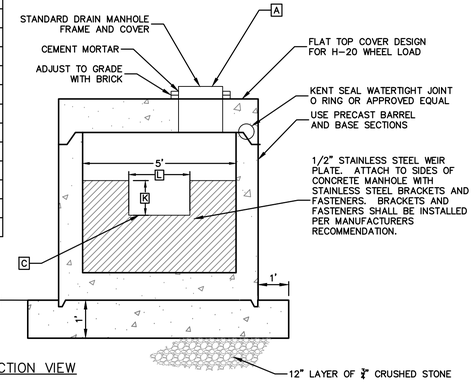
1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



OUTLET STRUCTURE			
ITEM	DESCRIPTION	OS C1 (21P)	OS D1 (22P)
		DIMENSION/ELEVATION	
A	RIM ELEVATION	115.9	115.6
B	BOTTOM OF STRUCTURE	105.5	105.5
C	WEIR INVERT	110.85	110.60
D	PIPE DIAMETER	24"	24"
E	PIPE DIAMETER	NA	12"
F	PIPE DIAMETER	15"	15"
G	INV IN	110.18	110.18
H	INV IN	NA	111.21
I	INV IN	106.59	106.59
J	INV OUT	106.50	106.50
K	WEIR HEIGHT	1.5'	1.0'
L	WEIR WIDTH	0.75'	1.0'

NOTES:
1. ALL CEMENT TO BE 4000 PSI (MIN).
2. ALL STAINLESS STEEL SHALL BE GRADE 316.
3. PRECAST REINFORCED CONCRETE STRUCTURE TO MEET ASTM C–478 & HS–10 LOADING.

PLAN VIEW



SECTION VIEW

Underground Detention Outlet Structure

N.T.S.

No.	DESCRIPTION	DATE	DESIGNER REVIEWER
1.			

AMY REBECCA SANDERS No. 11065 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE –

SCALE: HORZ.: VERT.: DATUM: HORZ.: VERT.: 0 GRAPHIC SCALE

FUSS & O'NEILL
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BLUEBIRD SELF-STORAGE FACILITY
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TAX MAP 14-1-10-1 AND 14-1-10-2
64 LITTLEWORTH ROAD
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PROJ. No.: 20210509.A10
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CD-507

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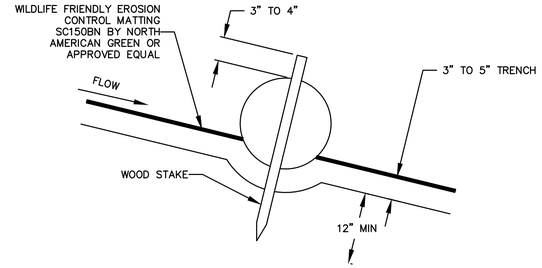
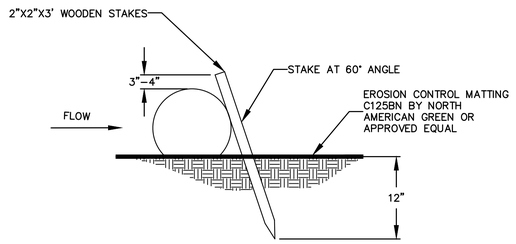


ALTERNATIVE STAKING DETAIL



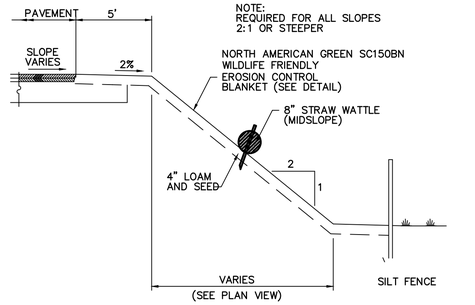
ALTERNATIVE STAKING DETAIL

COMPOST FILTER SOCK GENERAL NOTES:

1. SHALL BE WILDLIFE FRIENDLY FILTREXX BIODEGRADABLE COMPOST FILTER SOCK, OR APPROVED EQUAL AND SHALL NOT CONTAIN WELDED PLASTIC, PLASTIC, OR MULTI-FILAMENT OR MONOFILAMENT POLYPROPYLENE NETTING OR MESH.
2. FOR DITCH APPLICATIONS, MINIMUM INSTALLED HEIGHT OF SINGLE SOCK NOMINALLY. SOCKS ARE PLACED PERPENDICULAR TO FLOW OF WATER. FILTER SOCKS SHALL CONTINUE UP SIDE SLOPES TO TOP OF BANK OR MAXIMUM 3-FEET ABOVE INSTALLED HEIGHT. FILTER SOCKS SHALL REMAIN IN PLACE UNTIL ALL UPSTREAM AREAS ARE PERMANENTLY STABILIZED.
3. REMOVE SEDIMENT FROM BEHIND THE FILTER SOCK ONCE IT ACCUMULATES TO ONE-HALF OF THE ORIGINAL HEIGHT OF THE FILTER SOCK.
4. INSPECT FILETER SOCKS AFTER EACH RUNOFF EVENT. REMOVE AND REPLACE IF SIGNS OF UNDERCUTTING OR DOWNSTREAM RILLS ARE OBSERVED.
5. SOCKS SHOULD BE REMOVED FROM SLOPES AFTER STABILIZATION IS COMPLETE UNLESS DIRECTED OTHERWISE.
6. FILTER SOCKS APPLIED IN DITCHES SHALL BE COMPLETELY REMOVED ONCE VEGETATION IS ESTABLISHED.

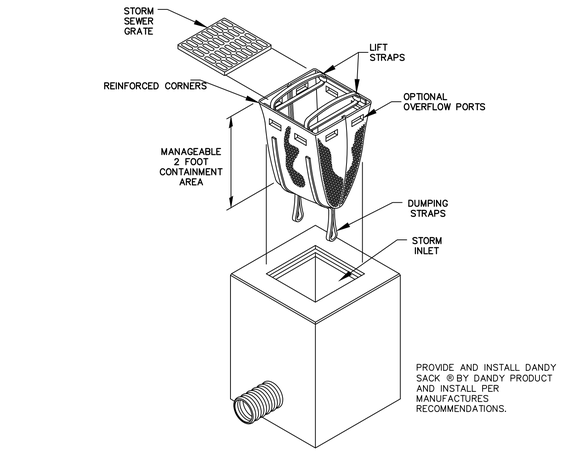
Compost Filter Sock Installation Detail

N.T.S.



Slope Stabilization

N.T.S.



Dandy Sack

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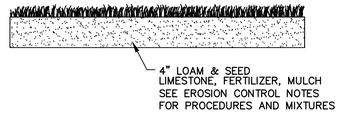
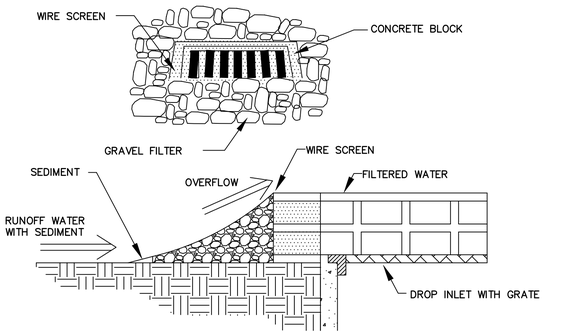


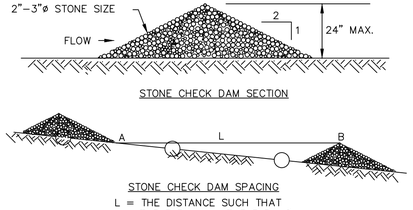
Loam & Seed Detail

N.T.S.



Block and Gravel Inlet Sediment Filter

N.T.S.



MAINTENANCE:

1. TEMPORARY GRADE STABILIZATION STRUCTURES SHOULD BE CHECKED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED STORMS. ANY NECESSARY REPAIRS SHOULD BE MADE IMMEDIATELY. PARTICULAR ATTENTION SHOULD BE GIVEN TO END RUN AND EROSION AT THE DOWNSTREAM TOE OF THE STRUCTURE. WHEN THE STRUCTURES ARE REMOVED, THE DISTURBED PORTION SHOULD BE BROUGHT TO THE EXISTING CHANNEL GRADE AND THE AREAS PREPARED, SEEDED AND MULCHED. WHILE THIS PRACTICE IS NOT INTENDED TO BE USED PRIMARILY FOR SEDIMENT TRAPPING, SOME SEDIMENT WILL ACCUMULATE BEHIND THE STRUCTURES. SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURES WHEN IT HAS ACCUMULATED TO ONE HALF OF THE ORIGINAL HEIGHT OF THE STRUCTURE.

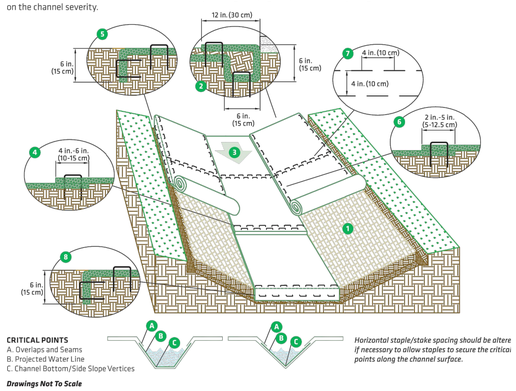
CONSTRUCTION SPECIFICATIONS:

1. DAMS SHALL BE INSTALLED AT THE LOCATIONS SHOWN ON THE PLANS.
2. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER SO THAT EROSION AND AIR AND WATER POLLUTION WILL BE MINIMIZED.
3. STRUCTURES SHALL BE REMOVED FROM THE CHANNEL WHEN THEIR USEFUL LIFE HAS BE COMPLETED.
4. STONE SHALL BE FRACTURED FACE STONE. D50 SIZE SHALL BE 2 TO 3 INCHES. NO STONE SMALLER THAN 1-1/2 INCHES OR LARGER THAN 4 INCHES SHALL BE USED.

Typical Stone Check Dam Detail

N.T.S.

The following channel guide outlines general recommendations for installing RollMax System temporary and/or permanent RECPs concentrated flow applications. Consult the staple pattern guide (Figure 1) for fastener spacing recommendations based on the channel severity.



CRITICAL POINTS
A. Overlaps and Seams
B. Projected Water Line
C. Channel Bottom/Side Slope Vertices

Horizontal staple/stake spacing should be altered if necessary to allow staples to secure the critical points along the channel surface.

Drawings Not To Scale

CHANNEL INSTALLATION STEPS

1. Prepare soil before installing RECPs, including any necessary application of lime, fertilizer and seed.
2. Begin at the top of the channel by anchoring the RECPs in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench with approximately 12 in. (30 cm) of RECPs extended beyond the upslope portion of the trench. For supplemental scour protection, use RevetMax™ System ShoreMax® Mat at the channel/culvert outlet as needed. Anchor the RECPs with a row of staples/stakes approximately 12 in. (30 cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12 in. (30 cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12 in. (30 cm) apart across the width of the RECPs.
3. Roll center RECPs in direction of water flow in bottom of channel. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.
4. Place consecutive RECPs end-over-end (shingle style) with a 4 in.-6 in. (10-15 cm) overlap. Use a double row of staples staggered 4 in. (10 cm) apart and 4 in. (10 cm) on center to secure RECPs.
5. Full-length edge of RECPs at top of side slopes must be anchored with a row of staples/stakes approximately 12 in. (30 cm) apart in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench. Backfill and compact the trench after stapling
6. Adjacent RECPs must be overlapped approximately 2 in.-5 in. (5-12.5 cm) (depending on RECP type) and stapled*
7. In high flow channel applications a staple check slot is recommended a: 30 to 40 ft (9-12 m) intervals. Use a double row of staples staggered 4 in. (10 cm) apart and 4 in. (10 cm) on center over entire width of the channel.
8. The terminal end of the RECPs must be anchored with a row of staples/stakes approximately 12 in. (30 cm) apart in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench. Backfill and compact the trench after stapling.

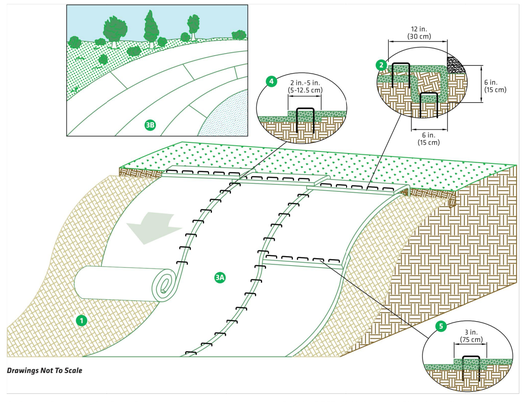
***NOTE:** In adverse soil conditions longer staples/stakes or earth anchors may be necessary to properly secure the RECPs.*

NOTE: EROSION CONTROL BLANKET SHALL BE NORTH AMERICAN GREEN SC 150 BN, OR APPROVED EQUAL. APPROVED EQUAL MUST BE ALL NATURAL MATERIAL WITH NO PHOTOBIODEGRADABLE CONTENT.

Erosion Control Channel Installation Detail

N.T.S.

The following slope guide outlines general recommendations for installing RollMax™ System temporary and/or permanent RECPs on sloping applications. Consult the staple pattern guide (Figure 1) for fastener spacing recommendations based on the slope severity.



Drawings Not To Scale

SLOPE INSTALLATION STEPS

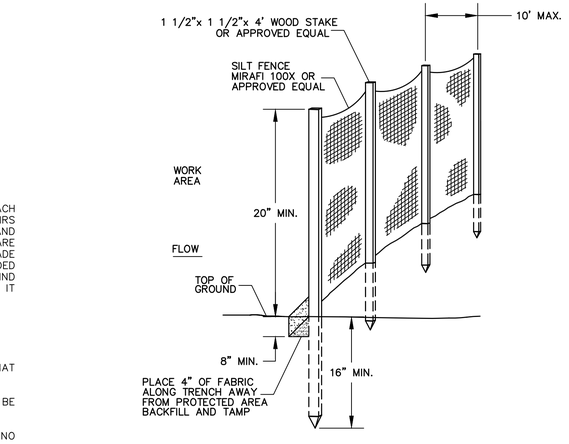
1. Prepare soil before installing RECPs, including any necessary application of lime, fertilizer and seed.
2. Begin at the top of the slope by anchoring the RECPs in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench with approximately 12 in. (30 cm) of RECPs extended beyond the upslope portion of the trench. Anchor the RECPs with a row of staples/stakes approximately 12 in. (30 cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12 in. (30 cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12 in. (30 cm) apart across the width of the RECPs.
3. Roll the RECPs (3A) down or (3B) horizontally across the slope. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.
4. The edges of parallel RECPs must be stapled with an approximately 2 in.-5 in. (5-12.5 cm) overlap depending on the RECP type.
5. Consecutive RECPs spliced down the slope must be end-over-end (shingle style) with an approximate 3 in. (7.5 cm) overlap. Staple through overlapped area, approximately 12 in. (30 cm) apart across entire RECPs width.*

***NOTE:** In adverse soil conditions longer staples/stakes or earth anchors may be necessary to properly secure the RECPs.*

NOTE: EROSION CONTROL BLANKET SHALL BE NORTH AMERICAN GREEN SC 150 BN, OR APPROVED EQUAL. APPROVED EQUAL MUST BE ALL NATURAL MATERIAL WITH NO PHOTOBIODEGRADABLE CONTENT.

Erosion Control Slope Installation Detail

N.T.S.



Silt Fence Barrier

N.T.S.

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EROSION AND SEDIMENT CONTROL DETAILS
TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

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INVASIVE SPECIES NOTE

1. THE CONTRACTOR SHALL TAKE STEPS TO PREVENT THE SPREAD OF INVASIVE PLANT, INSECT, AND FUNGAL SPECIES BY MEETING THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES. http://gencourt.state.nh.us/rules/state_agencies/agr3800.html

DUST CONTROL NOTE

1. THE CONTRACTOR SHALL, IN ACCORDANCE WITH ENV–A 1000 "...TAKE PRECAUTIONS THROUGHOUT THE DURATION OF THE ACTIVITY IN ORDER TO PREVENT, ABATE, AND CONTROL THE EMISSION OF FUGITIVE DUST INCLUDING BUT NOT LIMITED TO WETTING, COVERING, SHIELDING, OR VACUUMING."

MAINTENANCE NOTES

SILT FENCE/ FILTER SOCK

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

BIORETENTION AREAS & SEDIMENT FOREBAY

1. THE BOTTOM, INTERIOR AND EXTERIOR SIDE SLOPES AND CREST OF EARTHEN DETENTION PONDS SHALL BE MOWED, AND THE VEGETATION MAINTAINED IN HEALTHY CONDITION, AS APPROPRIATE TO THE FUNCTION OF THE FACILITY AND TYPE OF VEGETATION.
2. VEGETATED EMBANKMENTS THAT SERVE AS "BERMS" THAT IMPOUND WATER SHALL BE MOWED AT LEAST ONCE ANNUALLY TO PREVENT THE ESTABLISHMENT OF WOODY VEGETATION.
3. EMBANKMENTS SHALL BE INSPECTED AT LEAST ANNUALLY BY A QUALIFIED PROFESSIONAL FOR SETTLEMENT, EROSION, SEEPAGE, ANIMAL BURROWS, WOODY VEGETATION AND OTHER CONDITIONS THAT COULD DEGRADE THE EMBANKMENT AND REDUCE ITS STABILITY FOR IMPOUNDING WATER. IMMEDIATE CORRECTIVE ACTION SHOULD BE IMPLEMENTED IF ANY SUCH CONDITIONS ARE FOUND.
4. INLET AND OUTLET PIPES, INLET AND OUTLET STRUCTURES, ENERGY DISSIPATION STRUCTURES OR PRACTICES AND OTHER STRUCTURAL APPURTENANCES SHOULD BE INSPECTED AT LEAST ANNUALLY BY A QUALIFIED PROFESSIONAL AND CORRECTIVE ACTION IMPLEMENTED AS INDICATED BY SUCH INSPECTION.
5. TRASH AND DEBRIS SHALL BE REMOVED FROM THE POND AND ANY INLET OR OUTLET STRUCTURES WHENEVER OBSERVED BY INSPECTION.
6. ACCUMULATED SEDIMENT SHOULD BE REMOVED WHEN IT SIGNIFICANTLY AFFECTS POND CAPACITY.

TYPICAL CONSTRUCTION SEQUENCE

1. INSTALL HAY BALE BARRIERS AND SILT FENCES IN LOCATIONS SHOWN ON PLANS AS A MINIMUM. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY EARTH MOVING OPERATION. PREPARE TEMPORARY STABILIZED CONSTRUCTION ENTRANCE IN SUITABLE LOCATION.
2. INSPECT AND MAINTAIN EROSION CONTROL MEASURES ON A DAILY BASIS.
3. DAILY OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, CULVERTS, DITCHES, SILTATION FENCES, SEDIMENT TRAPS, ETC. MULCH AND SEED AS REQUIRED.
4. CUT AND CLEAR TREES, DISPOSE OF DEBRIS IN AN APPROVED OFF–SITE LOCATION.
5. THE WORK AREA SHALL BE GRADED, SHAPED AND OTHERWISE DRAINED IN SUCH A MANNER AS TO MINIMIZE SOIL EROSION, SILTATION OF DRAINAGE CHANNELS, DAMAGE TO EXISTING VEGETATION, AND DAMAGE TO PROPERTY OUTSIDE LIMITS OF THE WORK AREA. SILT FENCES, FILTER SOCK AND/OR DETENTION BASINS WILL BE NECESSARY TO ACCOMPLISH THIS.
6. TOPSOIL SHALL BE STRIPPED AND STOCKPILED DURING DRY CONDITIONS AND WITHOUT COMPACTION. TOPSOIL SHALL BE STABILIZED AGAINST EROSION.
7. GRUBBING AND STUMPING DISPOSAL IN AN APPROVED OFF–SITE LOCATION.
8. CONSTRUCT ALL DITCHES AND SWALES.
9. ALL DITCHES AND SWALES, SHALL BE STABILIZED PRIOR TO DIRECTING ANY STORM WATER INTO THEM.
10. CONSTRUCT SLOPED EMBANKMENTS.
11. ROUGH GRADE SITE OR PHASED WORK AREA. DISTURBED AREAS SHALL BE STABILIZED UPON COMPLETION OF ROUGH GRADING PER THE EROSION CONTROL NOTES.
12. INSTALL ALL UNDERGROUND UTILITIES.
13. INSTALL DRAINAGE STRUCTURES, CULVERTS, HEADWALLS, RIP RAP, AND OTHER DRAINAGE FACILITIES. PLACE CATCH BASIN RIMS IN DANDY BAGS UNTIL PARKING AREAS ARE PAVED. STORMWATER PONDS, INFILTRATION BASINS AND SWALES MUST BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
14. FINISH GRADING, LOAMING AND SEEDING. ALL DISTURBED AREAS SHALL BE STABILIZED WITHIN 72 HOURS AFTER FINAL GRADING.
15. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
16. TEMPORARY EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL ALL DISTURBED AREAS ARE STABILIZED AND HAVE A HEALTHY VEGETATIVE COVER.
17. CLEAN ALL DRAINAGE STRUCTURE SUMPS OF SEDIMENT AND DEBRIS (INCLUDES ALL STRUCTURES WITHIN THE LIMITS OF WORK).
18. DUST SHALL BE CONTROLLED DURING CONSTRUCTION BY ADEQUATE USE OF WATER.

WINTER EROSION CONTROL NOTES

1. ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS;
2. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% 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; AND
3. AFTER OCTOBER 15TH, 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.

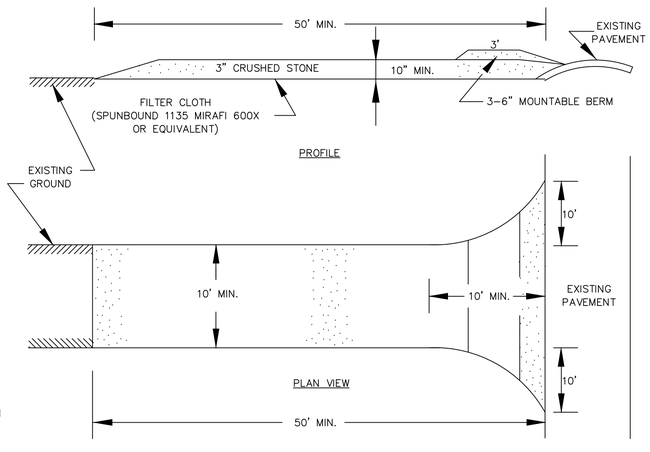
TYPICAL EROSION CONTROL NOTES

DURING CONSTRUCTION AND THEREAFTER, EROSION CONTROL MEASURES ARE TO BE IMPLEMENTED AS NOTED:

1. INSTALLATION OF PERIMETER CONTROLS (SILT FENCE OR FILTER SOCK) SHALL BE COMPLETED PRIOR TO THE START OF SITE WORK IN ANY GIVEN AREA. PREFABRICATED SILT FENCES SHALL BE INSTALLED ACCORDING TO THE MANUFACTURES' RECOMMENDATIONS.
2. PERIMETER CONTROLS SHALL BE KEPT CLEAN DURING CONSTRUCTION AND REMOVED WHEN ALL SLOPES HAVE A HEALTHY STAND OF VEGETATIVE COVER. EROSION CONTROL MEASURES SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EVERY RAINFALL.
3. EXISTING VEGETATION IS TO REMAIN UNDISTURBED WHEREVER POSSIBLE.
4. NO MORE THAN FIVE ACRES OF LAND SHALL BE LEFT DISTURBED AT ANY ONE TIME. ALL DISTURBED AREAS SHALL BE STABILIZED WITHIN 72 HOURS AFTER FINAL GRADING.
5. STABILIZATION SHALL INCLUDE THE FOLLOWING, AT A MINIMUM:
   A. INSTALLATION OF BASE COURSE GRAVELS (IN PAVED AREAS)
   B. MIN. 85% VEGETATED GROWTH
   C. INSTALLATION OF STONE OR RIP RAP MATERIAL (3" MIN. DEPTH)
   D. PROPERLY INSTALLED EROSION CONTROL BLANKETS
6. ALL DISTURBED AREAS SHALL HAVE A MINIMUM OF 4" OF LOAM INSTALLED WITH NOT LESS THAN 1.1 POUNDS OF SEED MIX PER 1,000 SQ. FT. SEED MIXTURE SHALL BE:

PERMANENT	
TALL FESCUE	0.45 LBS.
CREEPING RED FESCUE	0.45 LBS.
BIRDSFOOT TREFOIL	0.20 LBS.
TEMPORARY	
ANNUAL RYEGRASS	1.10 LBS.

7. LIME AND FERTILIZER SHALL BE INCORPORATED INTO THE SOIL PRIOR TO SEEDING. A MINIMUM OF 2 TONS PER ACRE OF AGRICULTURAL LIMESTONE AND 500 LBS. PER ACRE OF 10–20–20 FERTILIZER SHALL BE APPLIED. SEEDING PRACTICES SHALL COMPLY WITH LOCAL USDA SOIL CONSERVATION SERVICES RECOMMENDATIONS.
8. HAY MULCH OR JUTE MATTING SHALL BE USED WHERE INDICATED ON THE PLANS. A MINIMUM OF 1.5 TONS OF MULCH PER ACRE SHALL BE APPLIED. MULCH SHALL BE ANCHORED IN PLACE WHERE NECESSARY. JUTE MATTING SHALL BE LAID IN THE DIRECTION OF RUNOFF FLOW AND APPLIED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.
9. PERMANENT OR TEMPORARY COVER MUST BE IN PLACE BEFORE THE GROWING SEASON ENDS. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS BAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 15 TO SEPTEMBER 15. NO DISTURBED AREA SHALL BE LEFT EXPOSED DURING WINTER MONTHS, PLANT ANNUAL RYE GRASS PRIOR TO OCTOBER 15TH.
10. THE LAND AREA EXPOSED SHOULD BE KEPT TO THE SHORTEST PRACTICAL PERIOD OF TIME AND SHALL NOT REMAIN EXPOSED MORE THAN 45 DAYS FROM INITIAL DISTURBANCE.
11. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT IN NO CASE SHALL EXCEED 5 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED
12. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
    - BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED
    - A MINIMUM OF 85% OF VEGETATED GROWTH HAS BEEN ESTABLISHED
    - A MINIMUM OF 3" NON EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED
    - EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
13. ALL CONTRIBUTING WATERSHED AREAS MUST BE FULLY STABILIZED PRIOR TO DIRECTING STORMWATER TO THEM.
14. ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY 0.5" OR GREATER RAINFALL WITHIN A 24–HOUR PERIOD.
15. TEMPORARY WATER DIVERSION (SEDIMENT BASINS, SWALES, ETC.) MUST BE USED AS NECESSARY TO CONTAIN RUNOFF UNTIL SOILS ARE STABILIZED.
16. CUT AND FILL SLOPES MUST BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
17. STORMWATER BASINS AND SWALES MUST BE INSTALLED BEFORE ROUGH GRADING THE SITE.
18. STORMWATER BASINS AND SWALES MUST BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.



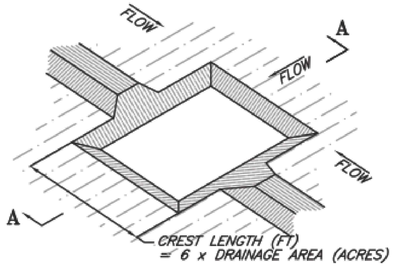
1. FILTER CLOTH WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
2. ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE.
3. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGTHS–OF–WAY MUST BE REMOVED IMMEDIATELY.
4. THE PAD SHALL BE MAINTAINED OR REPLACED WHEN MUD AND SOIL PARTICLES CLOG THE VOIDS IN THE STONE AND THAT MUD AND SOIL PARTICLES ARE TRACKED OFF–SITE.
5. WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO THE ROADWAY.

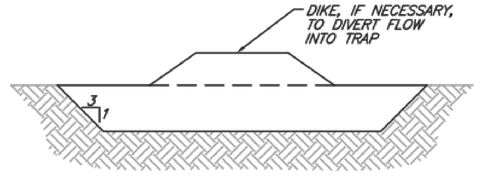
Temporary Construction Exit

N.T.S.

TEMPORARY SEDIMENT TRAP NOTES

1. TEMPORARY SEDIMENT TRAPS SHOULD MEET THE FOLLOWING REQUIREMENTS:
   - SEDIMENT TRAPS SHOULD BE LOCATED SO THAT THEY CAN BE INSTALLED PRIOR TO DISTURBING THE AREA THEY ARE TO PROTECT.
   - THE TRAP SHOULD BE INSTALLED AS CLOSE TO THE DISTURBED AREA OR SOURCE OF SEDIMENT AS POSSIBLE.
   - THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE TRAP SHOULD BE LESS THAN 5 ACRES.
   - THE MINIMUM VOLUME OF THE TRAP SHOULD BE 3,600 CUBIC FEET OF STORAGE FOR EACH ACRE OF DRAINAGE AREA.
   - THE SIDE SLOPES OF THE TRAP SHOULD BE 3:1 OR FLATTER, AND SHOULD BE STABILIZED IMMEDIATELY AFTER THEIR CONSTRUCTION.
2. EMBANKMENTS:
   - THE MAXIMUM HEIGHT OF THE SEDIMENT TRAP EMBANKMENT SHOULD BE 4 FEET WHEN MEASURED FROM THE LOWEST POINT OF NATURAL GROUND ON THE DOWNSTREAM SIDE OF THE EMBANKMENT.
   - THE MINIMUM TOP WIDTH OF THE EMBANKMENT SHOULD BE 6 FEET.
3. OUTLETS (GENERAL REQUIREMENTS):
   - THE OUTLET SHOULD BE DESIGNED, CONSTRUCTED AND MAINTAINED IN SUCH A MANNER THAT SEDIMENT DOES NOT LEAVE THE TRAP AND THAT EROSION AT OR BELOW THE OUTLET DOES NOT OCCUR.
   - OUTLETS SHOULD BE DESIGNED SO THAT THE TOP OF THE EMBANKMENT IS A MINIMUM OF 1 FOOT ABOVE THE CREST ELEVATION OF THE OUTLET.
   - THE OUTLET OF THE TRAP SHOULD BE A MINIMUM OF ONE FOOT BELOW THE CREST OF THE TRAP
   - THE OUTLET SHOULD DISCHARGE TO A STABILIZED AREA. THE OUTLETS MUST EMPTY ONTO UNDISTURBED GROUND, INTO A WATERCOURSE, STABILIZED CHANNEL OR A STORM SEWER SYSTEM.
   - OUTLETS MAY BE CONSTRUCTED AS EARTH SPILLWAYS, STONE OUTLETS, OR PIPE OUTLETS.
4. EARTH OUTLETS:
   - AN EARTH OUTLET SEDIMENT TRAP HAS A DISCHARGE POINT THAT IS EITHER OVER NATURAL GROUND OR CUT INTO NATURAL GROUND.
   - THE OUTLET WIDTH SHOULD BE EQUAL TO 6 TIMES THE DRAINAGE AREA IN ACRES.
   - THE EMBANKMENT AND OUTLET SHOULD BE VEGETATED WITHIN 3 DAYS OF CONSTRUCTION.
5. STONE OUTLETS:
   - A STONE OUTLET SEDIMENT TRAP HAS AN OUTLET CONSISTING OF A CRUSHED STONE SECTION IN THE EMBANKMENT.
   - THE STONE SECTION SHOULD BE LOCATED AT THE LOW POINT OF THE NATURAL GROUND, AS DETERMINED AT THE DOWNSTREAM SIDE OF THE EMBANKMENT.
   - THE OUTLET SHOULD BE CONSTRUCTED OF MINIMUM SIZE 1 ½" CRUSHED STONE.
6. VEGETATION:
   - ALL EMBANKMENTS, EARTH SPILLWAYS, AND DISTURBED AREAS BELOW THE STRUCTURE SHOULD BE VEGETATED WITHIN 72 HOURS OF COMPLETION OF THE CONSTRUCTION OF THE STRUCTURE.
   - IF THE STRUCTURE IS NOT PLANNED FOR MORE THAN ONE VEGETATIVE GROWING SEASON, THE STRUCTURE MAY BE VEGETATED USING THE RECOMMENDATION OF THE TEMPORARY VEGETATION BEST MANAGEMENT PRACTICE DESCRIBED IN NHDES STORMWATER MANAGEMENT MANUAL, VOL. 2.
   - BASINS THAT WILL BE CARRIED OVER THE WINTER AND INTO THE NEXT VEGETATIVE GROWING SEASON SHOULD BE VEGETATED USING THE RECOMMENDATIONS FOR PERMANENT VEGETATION BEST MANAGEMENT PRACTICE.





Earth Outlet Temporary Sediment Trap

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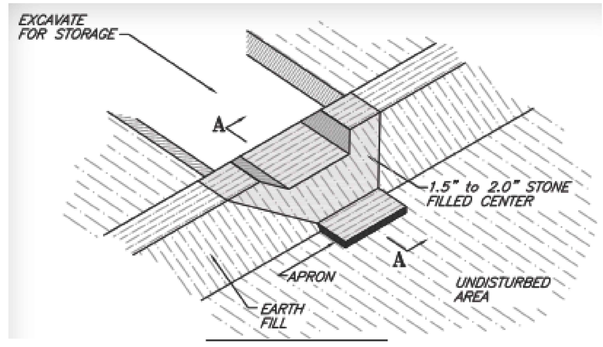

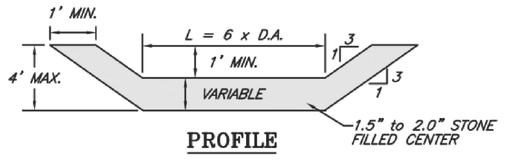

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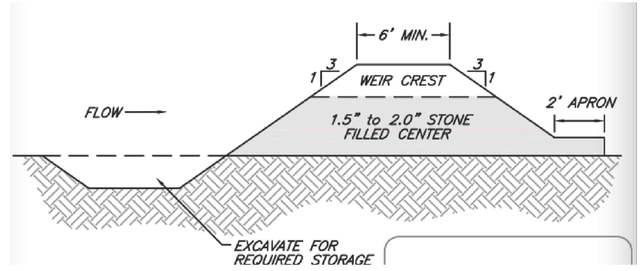

Temporary Sediment Trap

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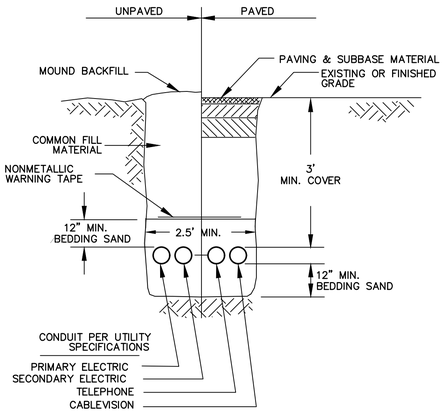
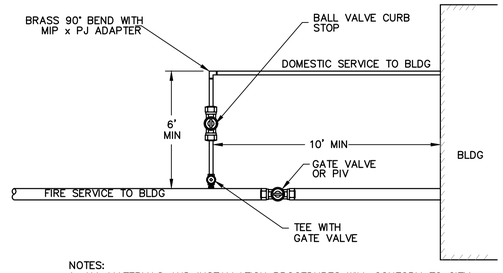


CONTRACTOR TO CONFIRM WITH UTILITY COMPANY CONDUIT NEEDS

Utility Trench

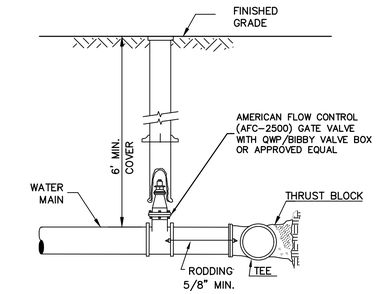
N.T.S.



NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO CITY OF DOVER TECHNICAL SPECIFICATIONS.
2. DOMESTIC WATER SERVICE AND FIRE PROTECTION SHALL BE PROVIDED FOR EACH BUILDING SERVICED. ALL WATER CONNECTIONS MUST BE PROVIDED WITH THE CONNECTION AS SHOWN ABOVE OR PER DOVER WATER DEPARTMENT SPECIFIC DETAILS.

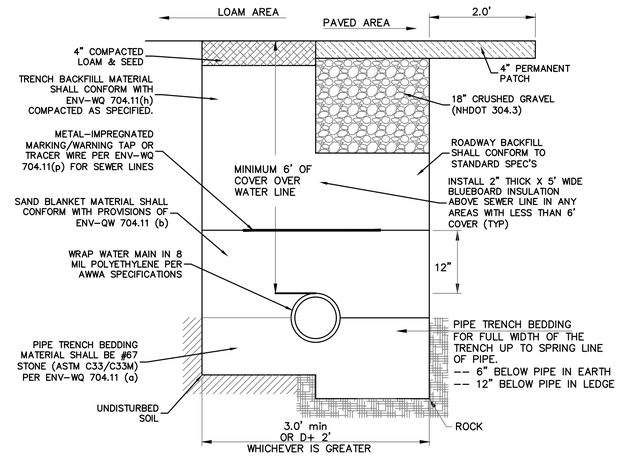
Typical Domestic Water Service
Tapped Off Fire Service

N.T.S.



Buried Gate Valve Detail

N.T.S.

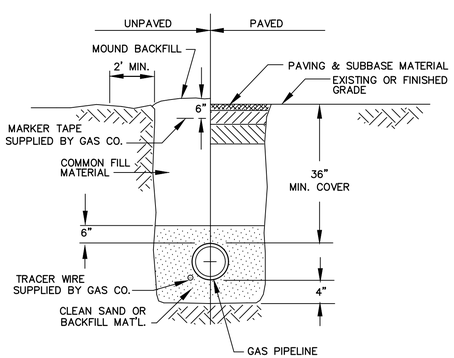


SERVICE TYPE	MINIMUM COVER
WATER	6'
SEWER	6' PAVED
	4' X-COUNTRY
STORM DRAIN	3'

NOTES:
1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS. DEPTH FOR BITUMINOUS PAVEMENT SHALL BE AS SPECIFIED IN PAVEMENT DETAIL.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM TO SUBDIVISION SPECIFICATIONS.
3. IN LIEU OF THE 12" GRAVEL COURSE AND 9" CRUSHED GRAVEL, 18" OF CRUSHED GRAVEL OR RECLAIMED STABILIZED BASE MAY BE USED AS A BASE FOR THE PAVEMENT REPAIR.
4. MATERIAL SHALL BE REPLACED IN KIND WHENEVER POSSIBLE.
5. A MINIMUM 2' CUTBACK IS REQUIRED AT THE TOP OF THE TRENCH WALL OVER UNDISTURBED MATERIAL.
6. ALL BACK FILL MATERIAL PLACED IN TRENCHES SHALL BE COMPACTED IN LAYERS NOT EXCEEDING 6" IN COMPACTED THICKNESS AT NEAR OPTIMUM MOISTURE CONTENT USING PNEUMATIC TAMPERS, VIBRATORY COMPACTORS OR OTHER APPROVED MEANS. THE MATERIAL SHALL BE COMPACTED TO NO LESS THAN 95% OF AASHTO METHOD OF TEST T99, METHOD C. WATER SHALL BE UNIFORMLY APPLIED DURING COMPACTION IN THE AMOUNT NECESSARY FOR PROPER CONSOLIDATION, BUT PUDDLING WILL NOT BE ALLOWED.
7. NEW WATER CONSTRUCTION SHALL CONFORM TO DOVER VILLAGE WATER PRECINCT REGULATIONS, SPECIFICATIONS AND POLICIES.
8. TRENCHES FOR SEWER CONSTRUCTION SHALL MEET THE REQUIREMENTS OF ENV-WQ 704.11. PIPE TRENCH BEDDING MATERIAL SHALL BE #67 STONE (ASTM C33/C33M) PER ENV-WQ 704.11(A). SAND BLANKET MATERIAL SHALL CONFORM WITH PROVISIONS OF ENV-WQ 704.11(B). TRENCH BACKFILL MATERIAL SHALL CONFORM WITH ENV-WQ 704.11(H).
9. GRAVITY SEWER CONSTRUCTION MATERIALS SHALL MEET THE REQUIREMENTS OF ENV WQ. 704.05. PVC PIPE SHALL CONFORM WITH ASTM D3034 AND ASTM D2412 AND PVC JOINTS SEALS SHALL CONFORM WITH ASTM D3212.

Typical Trench Detail

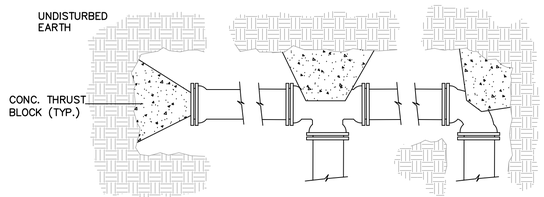
N.T.S.



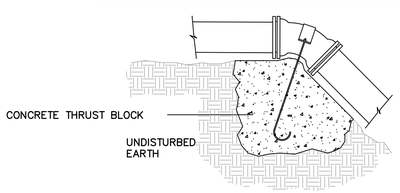
MAY VARY: COORDINATE WITH LIBERTY UTILITIES

Gas Main Trench

N.T.S.



PLAN – HORIZONTAL BENDS, TEES AND PLUGS

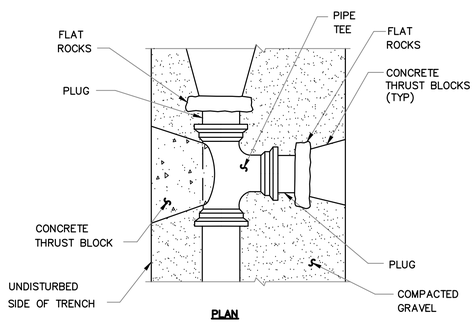


ELEVATION – VERTICAL BENDS

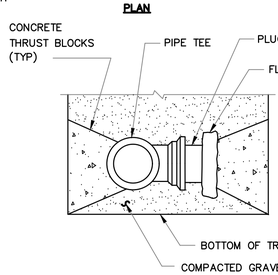
NOTES
1. THRUST BLOCK DIMENSIONS TO BE DETERMINED IN FIELD BY ENGINEER BASED ON PIPE SIZE, WATER PRESSURE AND SOIL TYPE.
2. STONE BACKING MAY BE SUBSTITUTED FOR CONCRETE THRUST BLOCKS PROVIDED THE STONE(S) ARE OF EQUAL SIZE AND BEAR ON UNDISTURBED EARTH.
3. USE OF JOINT RESTRAINT SYSTEMS SHALL NOT ELIMINATE THRUST BLOCK REQUIREMENTS (WHERE POSSIBLE).

Typical Thrust Blocks

N.T.S.



PLAN



SECTION

Typical Tees & Plugs Installation

N.T.S.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.				

AMY REBECCA SANDERS No. 11065 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE –

SCALE: HORZ.: VERT.: DATUM: HORZ.: VERT.: 0 GRAPHIC SCALE

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BLUEBIRD SELF-STORAGE FACILITY
WATER AND UTILITY DETAILS
TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

CD-510

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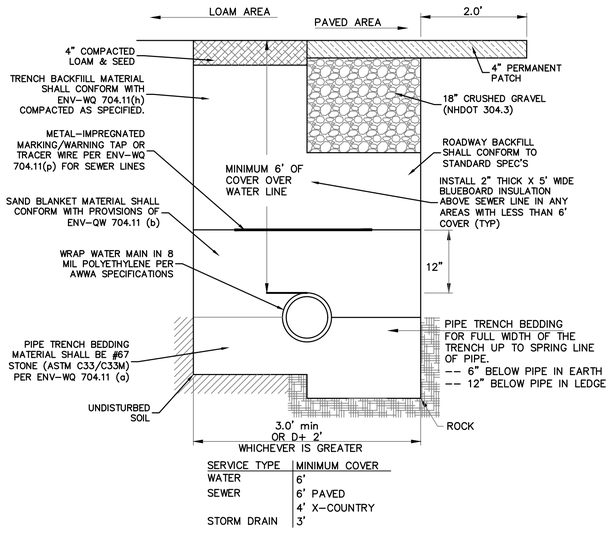
MS VIEW: LAYER STATE:

MANHOLE TESTING REQUIREMENTS.

PER ENV-WQ 704.17 MANHOLES: TESTING.

(A) MANHOLES SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST IN ACCORDANCE WITH THE ASTM C1244
STANDARD IN EFFECT WHEN THE TESTING IS PERFORMED, AVAILABLE AS NOTED IN APPENDIX D. A MANHOLE MAY BE BACKFILLED PRIOR TO PERFORMING A VACUUM TEST, BUT IF THE MANHOLE FAILS THE VACUUM TEST, BACKFILL SHALL BE REMOVED SO REPAIRS TO THE MANHOLE CAN BE MADE FROM THE OUTSIDE OF THE MANHOLE PRIOR TO RETESTING.
(B) THE MANHOLE VACUUM TEST SHALL CONFORM TO THE FOLLOWING:
(1) THE INITIAL VACUUM GAUGE TEST PRESSURE SHALL BE 10 INCHES HG; AND NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES 23 ENV-WQ 700
(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 IN DEPTH;
B. NOT LESS THAN 2.5 MINUTES FOR MANHOLES 10 TO 15 FEET DEEP; AND
C. NOT LESS THAN 3 MINUTES FOR MANHOLES MORE THAN 15 FEET DEEP;
(C) THE MANHOLE SHALL BE REPAIRED AND RETESTED IF THE TEST HOLD TIMES FAIL TO ACHIEVE THE ACCEPTANCE LIMITS SPECIFIED IN (B), ABOVE.
(D) INVERTS AND SHELVES SHALL NOT BE INSTALLED UNTIL AFTER SUCCESSFUL TESTING IS COMPLETED.
(E) IMMEDIATELY FOLLOWING COMPLETION OF THE LEAKAGE TEST, THE FRAME AND COVER SHALL BE PLACED ON THE TOP OF THE MANHOLE OR SOME OTHER MEANS USED TO PREVENT ACCIDENTAL ENTRY BY UNAUTHORIZED PERSONS, CHILDREN, OR ANIMALS, UNTIL THE CONTRACTOR IS READY TO MAKE FINAL ADJUSTMENT TO GRADE.



SERVICE TYPE	MINIMUM COVER
WATER	6'
SEWER	6' PAVED 4' X-COUNTRY
STORM DRAIN	3'

NOTES:
1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS. DEPTH FOR BITUMINOUS PAVEMENT SHALL BE AS SPECIFIED IN PAVEMENT DETAIL.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM TO SUBDIVISION SPECIFICATIONS.
3. IN LIEU OF THE 12" GRAVEL COURSE AND 9" CRUSHED GRAVEL, 18" OF CRUSHED GRAVEL OR RECLAIMED STABILIZED BASE MAY BE USED AS A BASE FOR THE PAVEMENT REPAIR.
4. MATERIAL SHALL BE REPLACED IN KIND WHENEVER POSSIBLE.
5. A MINIMUM 2' CUTBACK IS REQUIRED AT THE TOP OF THE TRENCH WALL OVER UNDISTURBED MATERIAL.
6. ALL BACK FILL MATERIAL PLACED IN TRENCHES SHALL BE COMPACTED IN LAYERS NOT EXCEEDING 6" IN COMPACTED THICKNESS AT NEAR OPTIMUM MOISTURE CONTENT USING PNEUMATIC TAMPERS, VIBRATORY COMPACTORS OR OTHER APPROVED MEANS. THE MATERIAL SHALL BE COMPACTED TO NO LESS THAN 95% OF AASHTO METHOD OF TEST T99, METHOD C. WATER SHALL BE UNIFORMLY APPLIED DURING COMPACTION IN THE AMOUNT NECESSARY FOR PROPER CONSOLIDATION, BUT PUDDLING WILL NOT BE ALLOWED.
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9. GRAVITY SEWER CONSTRUCTION MATERIALS SHALL MEET THE REQUIREMENTS OF ENV WQ. 704.05. PVC PIPE SHALL CONFORM WITH ASTM D3034 AND ASTM D2412 AND PVC JOINTS SEALS SHALL CONFORM WITH ASTM D3212.

Typical Trench Detail

N.T.S.

SEWER MANHOLE NOTES:

ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 PSI). CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ. IN. PER L.F. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER L.F..

HORIZONTAL JOINTS BETWEEN SECTIONS OF PRE-CAST CONCRETE BARRELS SHALL BE OF AN OVERLAPPING TYPE SEALED FOR WATER-TIGHTNESS USING A DOUBLE ROW OF AN ELASTOMERIC OR MASTIC-LIKE SEALANT

ALL PRECAST SECTIONS AND BASES SHALL BE COATED ON THE EXTERIOR WITH A BITUMINOUS, DAMP-PROOF COATING.

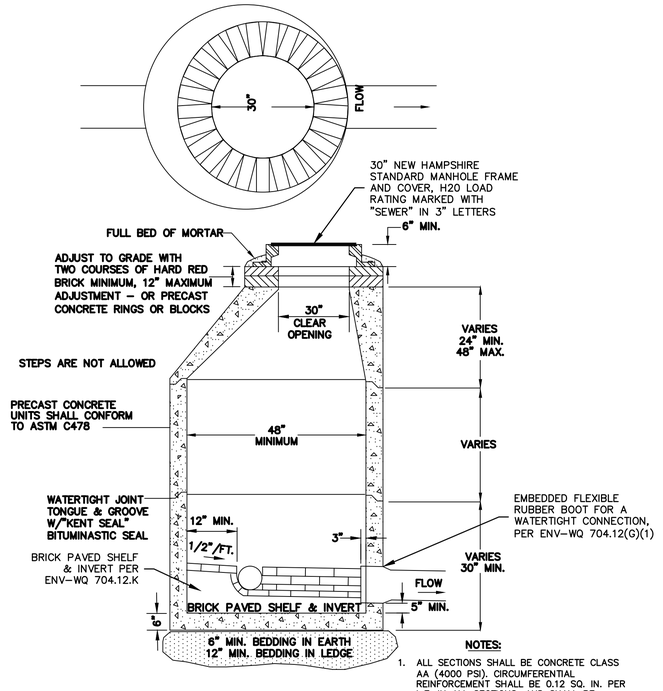
(A) MATERIALS OF CONSTRUCTION FOR MANHOLES SHALL BE AS FOLLOWS:
(1) CONCRETE FOR MANHOLES AND CONCRETE GRADE RINGS SHALL CONFORM TO THE REQUIREMENTS FOR CLASS AA CONCRETE IN THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AS AVAILABLE AT HTTP://WWW.NH.GOV/DOT/ORG/PROJECTDEVELOPMENT/HIGHWAYDESIGN/SPECIFICATIONS/INDEX.HTM
(2) REINFORCING FOR CONCRETE MANHOLES AND CONCRETE GRADE RINGS SHALL BE STEEL OR STRUCTURAL FIBERS THAT CONFORM TO THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AS AVAILABLE AT HTTP://WWW.NH.GOV/DOT/ORG/PROJECTDEVELOPMENT/HIGHWAYDESIGN/SPECIFICATIONS/INDEX.HTM
(3) PRECAST CONCRETE BARREL SECTIONS, CONES, AND BASES SHALL BE CERTIFIED BY THEIR MANUFACTURER(S) AS CONFORMING TO THE ASTM C478 STANDARD IN EFFECT AT THE TIME THE BARREL SECTIONS, CONES, AND BASES ARE MANUFACTURED;
(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 AND CERTIFIED BY THEIR MANUFACTURER AS CONFORMING TO THE ASTM A48/48M STANDARD IN EFFECT AT THE TIME THE CASTINGS WERE MANUFACTURED;
(9) BRICK MASONRY FOR SHELF, INVERT, AND GRADE ADJUSTMENT SHALL BE CERTIFIED BY ITS MANUFACTURER AS COMPLYING WITH THE ASTM C32 STANDARD IN EFFECT AT THE TIME THE BRICK IS MANUFACTURED, CLAY OR SHALE, FOR GRADE SS HARD BRICK, WITH NO MORE THAN 5 LAYERS OF BRICK FOR GRADE ADJUSTMENT;
(10) MORTAR SHALL BE COMPOSED OF PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION;
(11) PROPORTIONS IN MORTAR OF PARTS BY VOLUMES SHALL BE:
A. 4.5 PARTS SAND AND 1.5 PARTS CEMENT; OR
B. 4.5 PARTS SAND, ONE 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 ;
(15) CONCRETE FOR DROP SUPPORTS SHALL CONFORM TO THE REQUIREMENT FOR CLASS AAA CONCRETE OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AS AVAILABLE AT HTTP://WWW.NH.GOV/DOT/BUREAUS/HIGHWAYDESIGN/SPECIFICATIONS/INDEX.HTM;
(16) SUBJECT TO (17), BELOW, A FLEXIBLE PIPE JOINT SHALL BE PROVIDED WITHIN THE FOLLOWING DISTANCES FROM ANY MANHOLE CONNECTION:
A. WITHIN 48 INCHES FOR REINFORCED CONCRETE (RC) PIPE; AND
B. WITHIN 60 INCHES FOR PVC PIPE LARGER THAN 15-INCH DIAMETER;
(17) NO FLEXIBLE JOINT SHALL BE REQUIRED FOR:
A. DI PIPE; OR
B. PVC PIPE UP THROUGH 15-INCH DIAMETER; AND
(18) WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED IN LIEU OF A CONE SECTION, PROVIDED THE SLAB HAS AN ECCENTRIC ENTRANCE OPENING AND BE CAPABLE OF
SUPPORTING H-20 LOADS.

ALL WORK SHALL CONFORM TO THE CITY OF MANCHESTER STANDARD SPECIFICATIONS FOR ROAD, DRAIN AND SEWER CONSTRUCTION, CURRENT EDITION".

GRAVITY SEWER TESTING REQUIREMENTS

PER ENV-WQ 704.06 GRAVITY SEWER PIPE TESTING.

A. ALL NEW GRAVITY 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 THE FOLLOWING TESTING STANDARDS IN EFFECT AT THE TIME THE TEST IS CONDUCTED:
B.1. ASTM F1417 'STANDARD TEST METHOD FOR INSTALLATION ACCEPTANCE OF PLASTIC GRAVITY SEWER LINES USING LOW-PRESSURE AIR', AVAILABLE AS NOTED IN APPENDIX D; OR
B.2. UNI-BELL PVC PIPE ASSOCIATION UNI-B-6, 'LOW-PRESSURE AIR TESTING OF INSTALLED SEWER PIPE', AVAILABLE AS NOTED IN APPENDIX D.
C. ALL NEW GRAVITY SEWERS SHALL BE:
C.1. CLEANED AND VISUALLY INSPECTED USING A LAMP TEST AND BY INTRODUCING WATER TO DETERMINE THAT THERE IS NO STANDING WATER IN THE SEWER; AND
C.2. TRUE TO LINE AND GRADE FOLLOWING INSTALLATION AND PRIOR TO USE. NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES 15 ENV-WQ 700
D. ALL PLASTIC SEWER PIPE SHALL BE VISUALLY INSPECTED AND DEFLECTION TESTED NOT LESS THAN 30 DAYS NOR MORE THAN 90 DAYS FOLLOWING INSTALLATION.
E. THE MAXIMUM ALLOWABLE DEFLECTION OF FLEXIBLE SEWER PIPE SHALL BE 5% PERCENT OF AVERAGE INSIDE DIAMETER. A RIGID BALL OR MANDREL WITH A DIAMETER OF AT LEAST 95% OF THE AVERAGE INSIDE PIPE DIAMETER SHALL BE USED FOR TESTING PIPE DEFLECTION. THE DEFLECTION TEST SHALL BE CONDUCTED WITHOUT MECHANICAL PULLING DEVICES.



TYPE OF PIPE	SIZE	MAX. DIST. TO FIRST JOINT
R.C.P. & C.I.	ALL	48"
C.I.P.	ALL	48"
P.V.C.	>15"	48"
V.C.P.	0-12"	18"
V.C.P.	>12"	36"

NOTES:
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 PSI). CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ. IN. PER L.F. IN ALL SECTIONS, AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL
2. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER L.F.
3. BASE SECTION SHALL BE MONOLITHIC TO A POINT AT LEAST 6" ABOVE CROWN OF INCOMING PIPE, PER ENV-WQ 704.12 (E)
4. SEWER MANHOLE STEPS ARE PROHIBITED.

Sewer Manhole Detail

N.T.S.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.				

ANN REBECCA SANDERS No. 11065 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE

SCALE: HORZ.: VERT.: DATUM: HORZ.: VERT.: 0 GRAPHIC SCALE

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BLUEBIRD SELF-STORAGE FACILITY
SEWER DETAILS
TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
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CD-511

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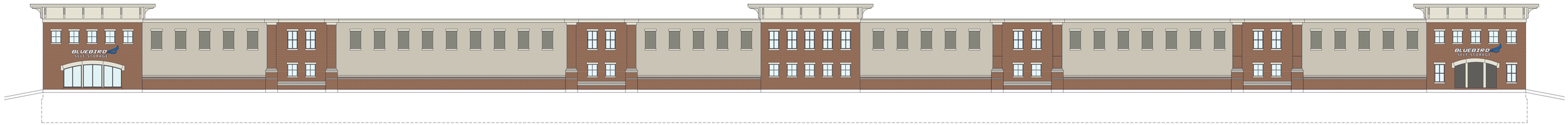


NORTH (STREET) ELEVATION

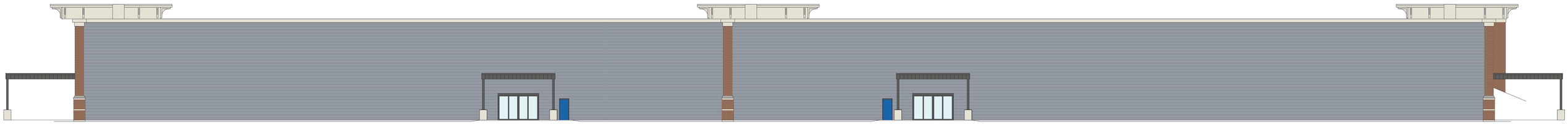
SCALE: 1/16" = 1'-0"

EAST (MAIN ENTRY) ELEVATION

SCALE: 1/16" = 1'-0"

WEST ELEVATION (SHOWING PHASE 2)

SCALE: 1/16" = 1'-0"



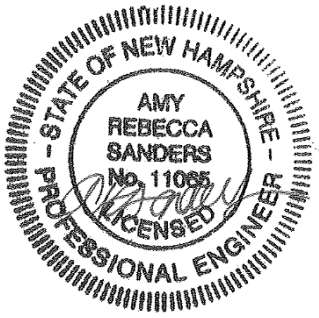
SOUTH (BACK) ELEVATION

SCALE: 1/16" = 1'-0"

Stormwater Management Report
for
Dover Bluebird Self-Storage Facility

Tax Map G Lot 2-2
64 Littleworth Road
Dover, New Hampshire

February 25, 2022



Prepared by:

FUSS & O'NEILL

50 Commercial Street
Manchester, NH 03101

Project No. 20210509.A10

Table of Contents

Stormwater Management Report
Dover Bluebird Self-Storage Facility

1 Narrative 3

2 Design Methodology 4

3 Watershed Analysis 5

4 Design Summary 7

5 Construction Sequence/Erosion Control 10

Appendices

Appendix A Supporting Correspondence

- Web GIS – "Surface Water Impairments"
- Web GIS – "AOT Screening Layers"
- NHB Data Check Results and Correspondence
- NRCS Web Soil Survey Map
- GES Site Specific Soil Survey Report and Map
- Ksat Values
- Aerial Map
- Site Photos

Appendix B Drainage Analysis

- Pre-Development 1-, 2-, 10-, 25- and 50-Year Node Listing
- Pre-Development 10 and 25-Year Full Summary and Report
- Post-Development 2-, 10-, 25- and 50-Year Node Listing
- Post-Development 10 and 25-Year Full Summary and Report
- Peak Pond Elevations 50-Year Calculations

Appendix C Additional Alteration of Terrain Permit Material

- BMP Worksheets
    - 10P Bioretention Pond
    - 10P Stage Storage Table
    - 10P Stage Discharge Table
    - 13P Bioretention Pond
    - 13P Stage Storage Table
    - 13P Stage Discharge Table
    - 21P Underground Bioretention System
    - 21P Stage Storage Table
    - 21P Stage Discharge Table
    - 22P Underground Bioretention System
    - 22P Stage Storage Table
    - 22P Stage Discharge Table
- Inspection and Maintenance Manual
- Winter Maintenance and Salt Minimization
- Extreme Precipitation Table

Appendix D Plans

- Existing Drainage Area Plan – (DA-101)
- Proposed Drainage Area Plan – (DA-102)
- Existing Color-Coded Soil Plan – (DA-201)
- Proposed Color-Coded Soil Plan – (DA-202)

1 Narrative

A. Introduction

Bluebird Self-Storage intends to purchase the 64 Littleworth Road parcel, known in the City of Dover, New Hampshire as Tax Map G Lot 2-2. The property is currently owned by Westfield, LLC and was recently subdivided to create the 6.8 acres property fronting on Littleworth Road.

The property was previously used as a farmstead, consisting of a house, barns, fields, and driveways. The property is still mowed for hay but the house and some of the barns have been removed.

This project will develop the property for a self-storage facility. The facility will be constructed in two phases. The three-story Phase 1 building footprint is 46,100 square feet with a gross floor area of 138,300 square feet. The Phase 2 building will also be three-stories with a slightly smaller footprint of 31,000 square feet and a gross floor area of 93,000 square feet. The development includes paved driveway access, parking and walkways, landscaping, lighting, municipal and private utility connections and stormwater management and treatment.

B. Site Location and Topography

The site is located at 64 Littleworth Road in Dover, New Hampshire. The property is located on the south side of Littleworth Road and to the west of Industrial Park Road. The site moderately slopes down from Littleworth Road to the southern property boundary.

C. Site Soils, Vegetative Cover and Ksat Values

Site Soils

The Site-Specific Soil Survey, prepared by Gove Environmental Services, Inc. indicates the following soil types within the project watershed.

Symbol	Soils Name	Hydrologic Soil Group
232B	Buxton	C
32B	Boxford	C
233B	Scantic	D

The NRCS Web Soils Survey, prepared by the USDA-SCS, indicates the following soil types within the project watershed:

Symbol	Soils Name	Hydrologic Soil Group
CfB	Charlton	B
ScA	Scantic	C
BzA	Buxton	C

Vegetated Cover

Aside from the structures, driveways and a few small areas of brush, most of the property has a good grass ground cover. There are also two wetland areas on the property. These areas are also mowed with grass ground cover. A wetland impact is proposed to fill the wetland area that is more centrally located within the property while the other wetland area, and its buffer, will remain unchanged.

See Appendix A for the Site-Specific Soil Survey and Web Soil Survey maps.

Ksat Values

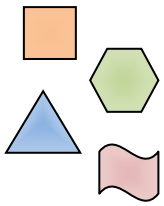
The Ksat values for each soil type were reviewed to determine if stormwater infiltration could be incorporated into the stormwater design for this project. Based on the Ksat values listed in the publication, "Ksat Values for New Hampshire Soils" dated September 2009, which indicate all site soils have a 0.00 in/hr Ksat value, and in accordance with Env-Wq 1508.06(a)(1), infiltration is prohibited since all Ksat values are less than 0.5 in/hr prior to adding a factor of safety.

2 Design Methodology

A computer-aided design software package, HydroCAD (v 10.10-4a), was used to perform an intensive series of calculations to determine peak runoff flow rate, peak runoff flow velocity, and other relevant values for the post-development watershed model. The model is based on the SCS TR-20 program and is subject to cumulative rainfall/volume dependent routing calculations. Hydrographs are prepared for each element of the watershed and routed through the dynamic storage-indication method to produce various time-based results. Drainage summaries for the 2-, 10-, 25- and 50-Year storm events are provided in Appendix B of this report.

Labeling on drainage plans and diagrams is as follows:

- Reaches/ Analysis Points – Represented by a Rectangle or Square
- Subcatchment - Represented by a Hexagon
- Ponds/Catch Basin – Represented by a Triangle
- Links– Represented by an Irregular Octagon



A. Design Criteria

Rainfall Depths: Rainfall depths for this design are based on the Northeast Regional Climate Center Extreme Precipitation tables. Additionally, and in accordance with Env-Wq 1503.08(l), since the project site is located within the great bay region and will have a projected life that extends beyond 2050, the rainfall depths have been increased by 15 percent. Resulting in the following rainfall depths for each storm event. 1-year (2.99-inches), 2-year (3.6-inches), 10-year (5.44-inches), 25-year (6.88-inches) and 50-year (8.21-inches).

Closed Drainage: A minimum 3-feet of cover is maintained over the drainage pipes under pavement. This allows for frost protection and H-20 loading. HDPE pipe has been specified for all conveyances. All drainage structures have been designed to handle flow from a 25-year storm.

Pretreatment: Onsite pretreatment is provided by sediment forebays, for the open bioretention system and isolator rows, for the underground bioretention system. The sediment forebay meets or exceeds the volume required by NHDES (25% of the WQV).

Bioretention Pond: The bioretention pond has been designed in accordance with NHDES Alteration of Terrain, Env-Wq 1508.07 requirements. This treatment practice uses a 24-inch bioretention filter media to provide stormwater treatment. The system is sized to treat the full Water Quality Volume (WQV) and the outlet structure is sized to control the flow of the 2-, 10-, 25-, and 50-year design storm. One foot of freeboard is provided from the top of berm to the peak elevation of the 50-year storm event. Per Appendix E of the New Hampshire Stormwater Manual, Volume 1, Bioretention System Filtering Practices, have the following pollutant removal efficiencies, 90% Total Suspended Solids, 65% Total Nitrogen and 65%Total Phosphorus. These efficiencies meet the City of Dover requirements of 80%, 50% and 50% respectively.

Underground Bioretention System: The underground detention system has been designed in accordance with NHDES Alteration of Terrain, Env-Wq 1508.07 requirements. This treatment practice uses a 24-inch ASTM C-33 sand filter to provide stormwater treatment. The system is sized to treat the full Water Quality Volume (WQV) and the outlet structure is sized to control the flow of the 2-, 10-, 25-, and 50-year design storm. One foot of freeboard is provided from the top of the practice to the peak elevation of the 50-year storm event. Per Appendix E of the New Hampshire Stormwater Manual, Volume 1, Bioretention System Filtering Practices, have the following pollutant removal efficiencies, 90% Total Suspended Solids, 65% Total Nitrogen and 65%Total Phosphorus. These efficiencies meet the City of Dover requirements of 80%, 50% and 50% respectively.

Erosion Control and Sediment Control: Temporary and permanent erosion control and sediment control measures are designed using Best Management Practices described by the New Hampshire Department of Environmental Services Stormwater Manual (Latest Revision). Additionally, temporary erosion control will be provided using wildlife friendly means such as mulch berms, Filtrexx Degradable woven silt socks and North American Green SC150BN filter fabric, consistent with New Hampshire Fish and Game, typical requirements.

3 Watershed Analysis

A. Pre-Development Watershed Conditions

The existing watershed extends from Littleworth Road to the southern property line and is divided into two subcatchment areas, 1S and 2S. These two areas leave the site in two general locations along the southern property boundary and are defined as Analysis Points AP1 and AP2. AP1 is the area along the southwestern property boundary while AP2 is an area along the southeastern property boundary.

Subcatchment 1S

Subcatchment 1S is generally the western portion of the property and includes most of the previous farm structures including the house, barns, and driveways. There is also a small portion of Littleworth Road that is included in this subcatchment area. This subcatchment area flows to AP1.

Subcatchment 2S

Subcatchment 2S generally consists of the eastern portion of the property, along with a small portion of Littleworth Road, the Eversource easement and additional fields to the east of the property boundary. There is a manmade ditch in this portion of the property that intercepts and diverts water to Analysis Point AP2.

B. Post-Development Watershed Conditions

The post development watershed is further divided by the proposed development into seven subcatchments areas, 10S-13S and 20S -22S. These subcatchments discharge to four proposed stormwater treatment areas Bioretention Ponds 10P and 13P and Underground Treatment Systems 21P and 22P.

Bioretention Pond 10P

Subcatchment 10S and 11S discharge to Bioretention Pond 10P. Subcatchment 10S is the area directly to the north of the proposed building and includes the bioretention pond, landscaping, and a small portion of Littleworth Road. Subcatchment 11S is the proposed roof runoff which also discharges to the bioretention pond.

Pretreatment from the small portion of road pavement within 11S is provided by a roadside buffer and the roof runoff does not require pretreatment.

The bioretention pond is designed to include a 24-inch-deep filter media as the property is located within a groundwater protection area. Also, since the estimated seasonal high-water table is high throughout most of the property, the bioretention pond includes an underdrain embedded in washed, clean, crushed angular stone all surrounded by impermeable fill to meet the one-foot separation requirement from the bottom of the filter media.

Bioretention Pond 10P includes an outlet control structure fitted with a weir opening on the side and open top. All openings include trash racks. The outlet pipe discharges to a plunge pool with stone level spreader then flows overland to Analysis Point AP1.

Bioretention Pond 13P

Subcatchment 13S discharges to Bioretention Pond 13P. Subcatchment 13S includes landscaped areas, paved access aisles, parking, and walkways, to the west and south of the Phase 2 building. A curb is proposed along the westerly side of a portion of the paved aisle to direct runoff from the pavement to pretreatment sediment forebays on each end of the bioretention pond.

Bioretention Pond 13P is designed with the same cross-section of materials and outlet structure as described above for 10P. This pond discharges to a plunge pool with stone level spreader and then flows overland to Analysis Point AP1.

Subcatchment 20S

Subcatchment 20S includes the remaining undeveloped portion of the property to the east along with portion of Littleworth Road, the Eversource easement and the additional off property fields to the east.

Since a portion of the proposed driveway and their associated embankments are located within the existing man-made ditch, the ditch has been reestablished along the toe of slope and continues to discharge at Analysis Point AP2.

Underground Bioretention Treatment System 21P

Subcatchment 21S discharges to Underground Bioretention Treatment System 21P. Subcatchment 21S includes landscaped areas as well as paved driveways, parking, walkways, and access aisles, located to the east of the Phase 1 building. Runoff is collected in catch basins and discharges to Underground Bioretention Treatment System 21P.

The underground bioretention treatment system consists of open bottom Stormtech chambers embedded in washed, clean, crushed, angular stone. Below the chambers and stone is a 24-inch-deep filter media layer. As with the bioretention ponds described above, this system also includes an underdrain and impermeable fill layer.

Each catch basin discharges to a Stormtech isolator row which provides stormwater pretreatment.

Underground Bioretention Treatment System 22P discharges to a Drain Manhole DMH D2 then to a plunge pool with level spreader then to the reestablished man-made ditch and Analysis Point AP2.

Underground Bioretention Treatment System 22P

Subcatchment 22S discharges to Underground Bioretention Treatment System 22P. Subcatchment 22S includes landscaped areas as well as, paved driveways, parking, walkways, and access aisles, located to the south of the Phase 1 and Phase 2 building. Runoff is collected in catch basins and discharges to Underground Bioretention Treatment System 22P.

The underground treatment system is designed with the same cross-section of materials as described above for 21P and discharges to the same drain manhole, DMH D2. Additionally, all catch basins discharge to a Stormtech isolator row for pretreatment.

C. Post-Development Conclusion

The proposed development has been designed to collect and convey runoff from the site effectively as well as manage, pretreat, and permanently treat stormwater runoff from the development. Additionally, post-development peak flows from all required storm events have been reduced for all storms.

4 Design Summary

Peak Flows

Tables 4.1 through 4.4 below summarize the stormwater management data found in Appendix B. These tables compare the results of the HydroCAD stormwater calculations for the 2, 10, 25 and 50-year 24-hour storm events. The overall results indicate that for each storm event there is no increase in peak flow for any of the design storms for either Analysis Point AP1 and AP2.

Stormwater pretreatment is provided by either a road buffer, sediment forebay or Stormtech isolator row. The bioretention ponds and underground treatment systems are designed to provided permanent treatment of the entire water quality volume.

TABLE 4.1 SUMMARY OF PEAK FLOWS (CFS) 2-YEAR DESIGN STORM			
Analysis Point	Pre-Development	Post-Development	Difference
AP1	4.7	2.5	-2.2
AP2	7.0	6.3	-0.7

TABLE 4.2 SUMMARY OF PEAK FLOWS (CFS) 10-YEAR DESIGN STORM			
Analysis Point	Pre-Development	Post-Development	Difference
AP1	9.5	5.3	-4.2
AP2	14.8	12.1	-2.7

TABLE 4.3 SUMMARY OF PEAK FLOWS (CFS) 25-YEAR DESIGN STORM			
Analysis Point	Pre-Development	Post-Development	Difference
AP1	13.3	8.8	-4.5
AP2	21.3	18.1	-3.2

TABLE 4.4 SUMMARY OF PEAK FLOWS (CFS) 50-YEAR DESIGN STORM			
Analysis Point	Pre-Development	Post-Development	Difference
AP1	17.0	12.5	-4.5
AP2	27.5	24.5	-3.0

Pond Freeboard Depths

Tables 4.5 below summarizes the peak elevations of each detention pond or underground detention system to demonstrate a minimum freeboard depth of 1-foot is achieved, from the peak elevation of the 50-year storm event to the top of the berm or top of the underground practice.

TABLE 4.5 PEAK POND ELEVATIONS 50-YEAR DESIGN STORM			
Detention Pond	Peak Elevation	Berm Elevation or Top of Practice	Freeboard
10P	119.8	121.0	1.2
13P	112.4	114.0	1.6
21P	111.7	113.2	1.5
22P	111.2	113.2	2.0

Channel Protection

The purpose of the channel protection requirements is to protect channels, downstream receiving waters and wetlands from erosion and associated sedimentation resulting from urbanization within a watershed. Per Env-Wq 1507.05(b) channel protection requirements are met if any of following conditions are met.

- The 2-year, 24-hour post-development peak flow rate shall be less than or equal to the 1-year, 24-hour pre-development peak flow rate **OR**
- The 2-year, 24-hour post development peak flow rate is less than the 2-year, 24-hour pre-development peak flow rate **AND** the 2-year, 24-hour post-development storm volume has not increased over the pre-development volume by more than 0.1 acre-feet

TABLE 4.6.1 CHANNEL PROTECTION Peak Flow (CFS)			
Analysis Point	1-Year Storm Pre-Development	2-Year Storm Post-Development	Difference
AP1	3.3	2.2	-1.1

Table 4.6.1 above show that for Analysis Point AP1, the 2-year post development peak flow is less than the 1-year pre-development peak flow; therefore, AP1 meets the channel protection requirements of Env-Wq 1507.05(b)(3).

TABLE 4.6.2 CHANNEL PROTECTION 2-YEAR DESIGN STORM VOLUME (AC-FT)			
Analysis Point	Pre-Development	Post-Development	Difference
AP2	0.431	0.510	0.079

Table 4.1 showed that all post-development 2-year peak flows are less than the pre-development 2-year peak flows **AND** Table 4.6.2 above, shows that the 2-year post-development storm volume for AP2 has not

increased over the 2-year pre-development storm volume by more than 0.1 acre-feet; therefore, AP2 meets the channel protection requirements of Env-Wq 1507.05(b)(1) and (a).

Given the channel protection requirements are met and given that the post-development peak flows are less than the pre-development peak flows for all the design storms, negative downstream impacts or flooding is not anticipated to occur or have detrimental impacts.

Groundwater Recharge

Since Ksat values of the existing soils prohibit infiltration, it is not practical to provide groundwater recharge. Therefore, groundwater recharge volume calculations are not provided.

Pollutant Removal

Per Appendix E of the New Hampshire Stormwater Manual, Volume 1, Bioretention System Filtering Practices, have the following pollutant removal efficiencies, 90% Total Suspended Solids, 65% Total Nitrogen and 65%Total Phosphorus. These efficiencies meet the City of Dover requirements of 80%, 50% and 50% respectively.

5 Construction Sequence | Erosion Control

Silt fence/filter socks shall be placed prior to any construction activities being undertaken on-site. Erosion control measures shall utilize wildlife friendly options, as noted in Section 2.A of this report. Site construction activities shall be limited to construction of any temporary diversions or sedimentation basins necessary to provide stormwater control during construction. All catch basins will be equipped with dandy socks prior to construction activities. All conveyances shall be seeded and stabilized prior to full-scale site construction activities and the direction of stormwater flows. Use jute matting to stabilize all ditch lines and disturbed soils receiving concentrated runoff prior to the establishment of vegetation.

All stockpile areas are to be stabilized with temporary seeding and silt fencing, as necessary, to control and prevent the erosion of these materials.

During construction and immediately following a rain event, an inspection shall be made of all erosion control measures to verify integrity and perform repairs. Repairs shall be made within 24 hours of the event.

Dewatering operations shall be controlled to avoid erosion or sedimentation of abutting properties and wetland areas by implementing temporary settling basins with gravel check dams, the proposed detention basin, or commercially available dewatering products.

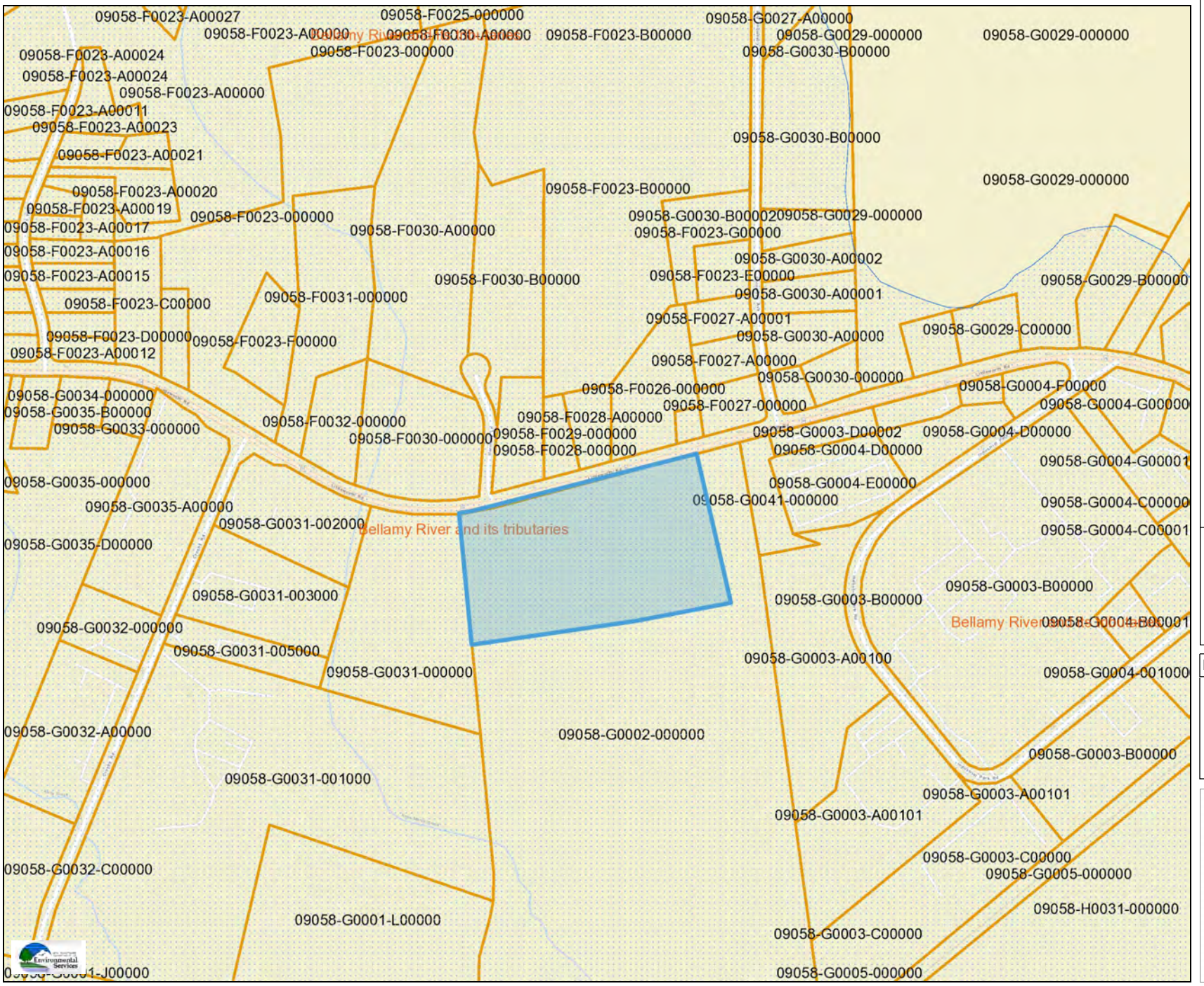
All drainage pretreatment, filtration and detention areas are to be stabilized prior to directing stormwater flows to them.

See detail plans for full Construction Sequence.

Appendix A
Supporting Correspondence

- Web GIS – "Surface Water Impairments"
- Web GIS – "AOT Screening Layers"
- NHB Data Check Results and Correspondence
- NRCS Web Soil Survey Map
- GES Site Specific Soil Survey Report and Map
- Ksat Values
- Aerial Map
- Site Photos

Surface Waters Impairment Map



Legend

- Public Water Supply Wells
- Water Supply Intake Protect Areas
- Class A Lakes with a Quarte Buffer
- Class A - All Features
- Outstanding Resource Wate Watersheds
- Surface Waters with Impairn 2016 with Quarter Mile Buffe

Parcels

- Parcel Polygons
- Attributes for Additional Lines

Map Scale

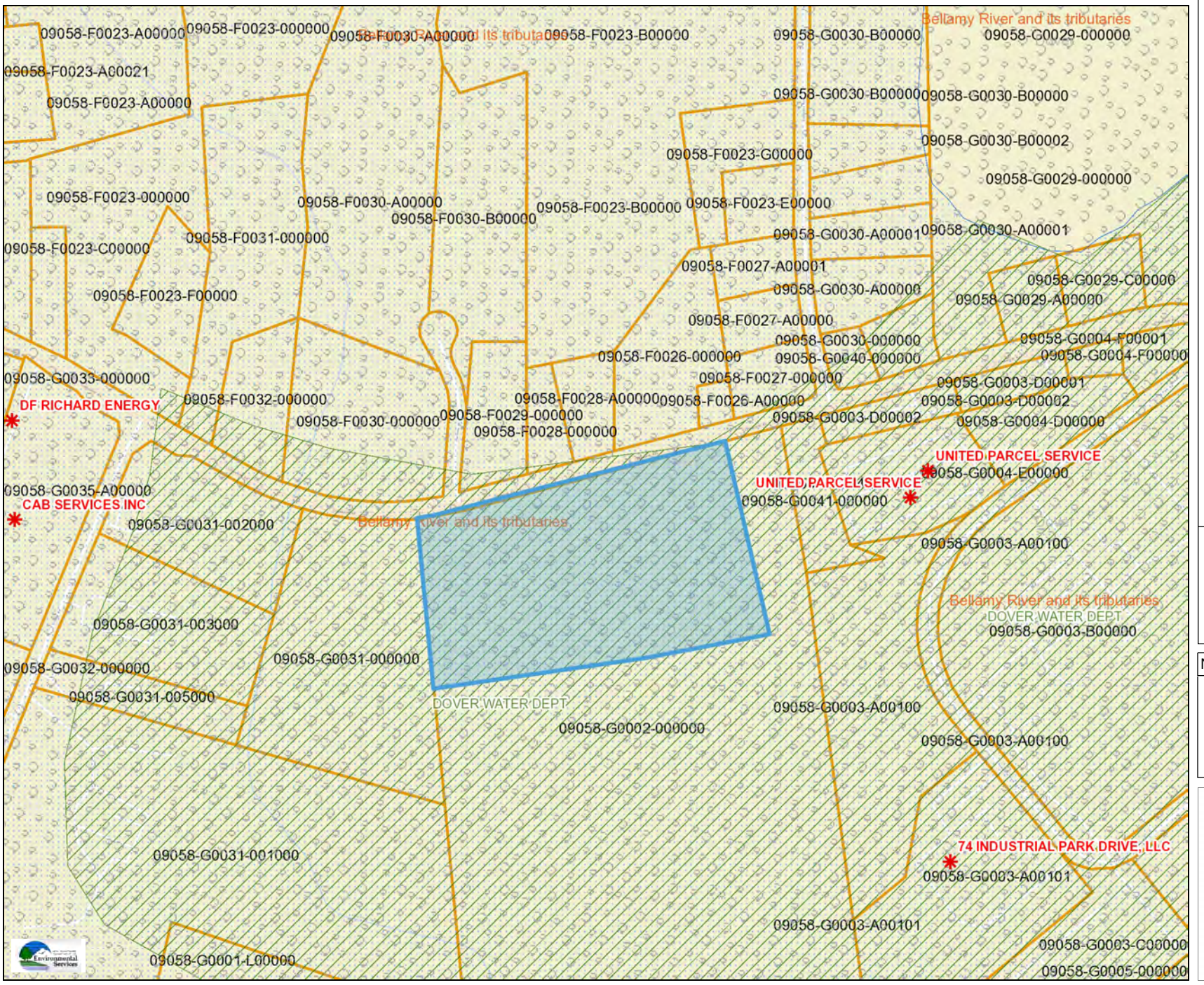
1: 6,494

© NH DES, http://des.nh.gov

Map Generated: 11/15/2021

Notes

AoT Screening Layers



Legend

- Remediation Sites
- Coastal and Great Bay Regi Communities
- Designated Rivers Quarterm Buffer
- Public Water Supply Wells
- Groundwater Classification / GA1
- Groundwater Classification / GA2
- Water Supply Intake Protect Areas
- Wellhead Protection Areas
- Class A Lakes with a Quarte Buffer
- Class A - All Features
- All Lakes, with a Quarter Mil Buffer
- Outstanding Resource Wate Watersheds
- Surface Waters with Impairn 2016 with Quarter Mile Buffe
- Watersheds with Chloride Impairments 2016

Parcels

- Parcel Polygons
- Attributes for Additional Lines

Map Scale

1: 5,000

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Map Generated: 11/15/2021

Notes

Memo

NH Natural Heritage Bureau
NHB DataCheck Results Letter

Please note: portions of this document are confidential.
Maps and NHB record pages are confidential and should be redacted from public documents.

To: AMY SANDERS, Fuss & O'Neill
50 COMMERCIAL STREET
MANCHESTER, NH 03101

From: NHB Review, NH Natural Heritage Bureau
Date: 11/23/2021 (valid until 11/23/2022)
Re: Review by NH Natural Heritage Bureau
Permits: MUNICIPAL POR - Dover - Site Plan, NHDES - Alteration of Terrain Permit, USEPA - Stormwater Pollution Prevention

NHB ID: **NHB21-3597** Town: Dover Location: 64 Littleworth Road
Description: Commercial development for a 75,000 sf (footprint), self-storage building with paved driveway access, parking and loading. Lighting, landscaping, utility extensions and stormwater management. For constructed in Spring/Summer 2022. Site recently subdivided. This is a smaller lot fronting along Littleworth Road. Site was former farmstead.

cc: Kim Tuttle

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments **NHB: Please send an aerial overlaid with the proposed limits of disturbance, representative site photos, and indicate if any wetland impacts are proposed.**
F&G: Please describe and send photos of any brushy/shrubby areas on-site. Please send an aerial overlaid with the proposed limits of disturbance and provide representative site photos. Please submit AoT-related documents for NHFG review, AoT review inquiries or wildlife biologist questions to NHFGreview@wildlife.nh.gov. If project related: Include the NHB datacheck results letter number (i.e. NHB21-3597) in the email subject line at a minimum. Not including this number will affect our response time and delays of our review. Please include the NHB number in the title of the assessment along with a date (year,month,day).

Plant species	State[1]	Federal	Notes
greater fringed-gentian (*Gentianopsis crinita*)	T	--	Vulnerable to shading by invading trees and to disturbances that destroy plants or impede their ability to reproduce (such as mowing in the mid-summer while the plants are in bloom).
Nuttall's reed grass (*Calamagrostis coarctata*)	E	--	

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

Memo

NH Natural Heritage Bureau
NHB DataCheck Results Letter

Please note: portions of this document are confidential.
Maps and NHB record pages are confidential and should be redacted from public documents.

Vertebrate species	State[1]	Federal	Notes
New England Cottontail (*Sylvilagus transitionalis*)	E	--	Contact the NH Fish & Game Dept (see below).
Northern Black Racer (*Coluber constrictor constrictor*)	T	--	Contact the NH Fish & Game Dept (see below).
Spotted Turtle (*Clemmys guttata*)	T	--	Contact the NH Fish & Game Dept (see below).

[1]Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

Contact for all animal reviews: Kim Tuttle, NH F&G, (603) 271-6544.

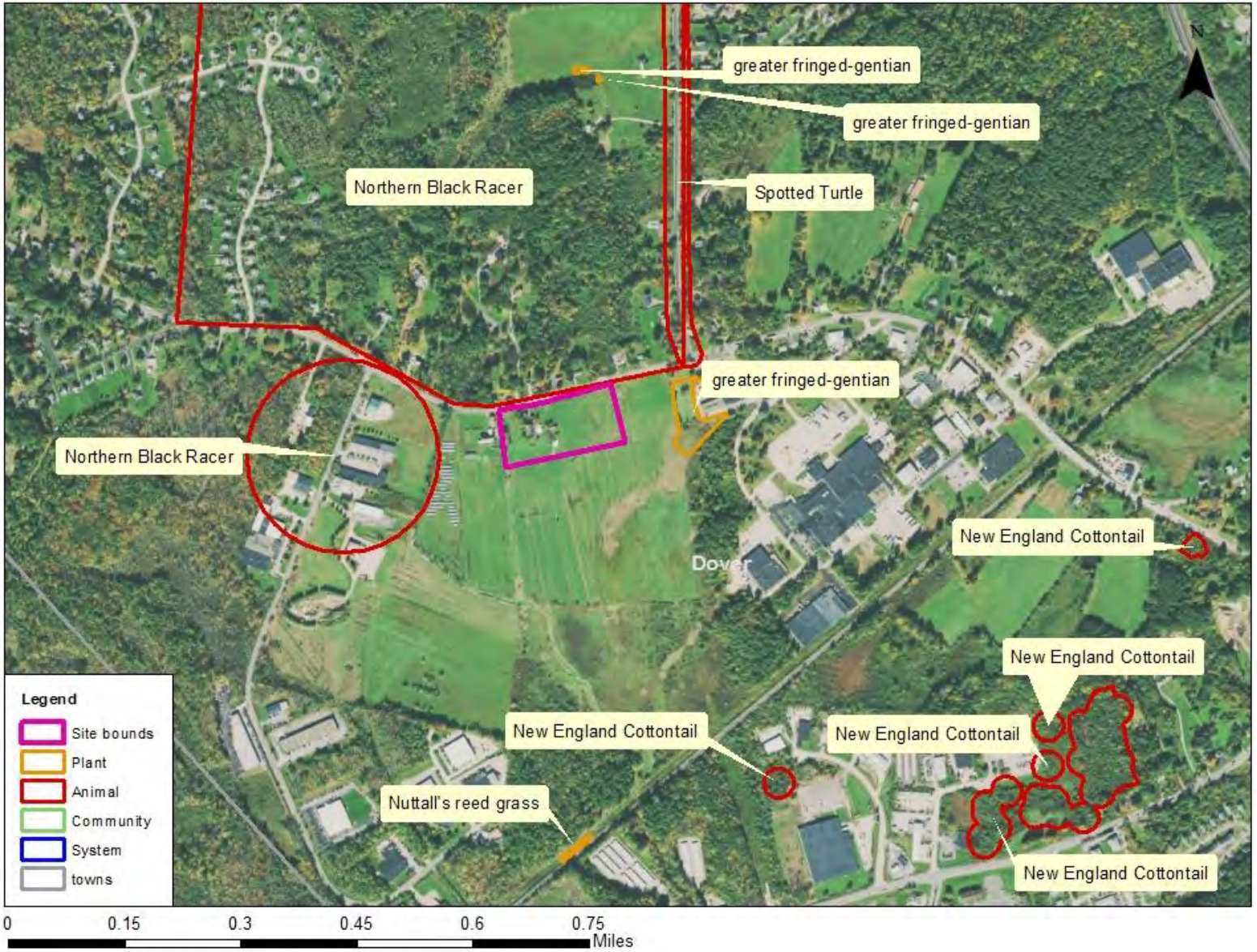
A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

CONFIDENTIAL – NH Dept. of Environmental Services review

NHB21-3597



New Hampshire Natural Heritage Bureau - Plant Record

greater fringed-gentian (*Gentianopsis crinita*)

Legal Status	Conservation Status
Federal: Not listed	Global: Demonstrably widespread, abundant, and secure
State: Listed Threatened	State: Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank:	Fair quality, condition and/or landscape context ('C' on a scale of A-D).
Comments on Rank:	Parking lot encroachment.
Detailed Description:	2020: Kay: Approximately 43 plants, 13 on the north side of the pond, 30 on the east side. Most plants were in flower. 1987: UPS: 51-100 vigorous flowering, budding and vegetative plants. Specimen in UNH.
General Area:	2020: Kay: Along edge of farm pond in agricultural fields. Associated species include asters, clover, goldenrod, and grasses. 1987: UPS: wet, open, flat meadow (cow pasture).
General Comments:	--
Management Comments:	2020: Kay: Phragmites control has been conducted on populations adjacent to the pond.

Location

Survey Site Name: Columbus Avenue, Dover
Managed By:

County: Strafford
Town(s): Dover
Size: 2.0 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2020: Kay: 131 Columbus Avenue, Dover. Drive up owner's driveway and walk along the field edge in a northerly direction to pond. Found on east and north sides of the small farm pond. 1987: Dover. UPS station. Next to UPS parking lot in cow pasture.

Dates documented

First reported: 1987 Last reported: 2020-10-05

CONFIDENTIAL – NH Dept. of Environmental Services review

New Hampshire Natural Heritage Bureau - Plant Record

Nuttall's reed grass (*Calamagrostis coarctata*)

Legal Status		Conservation Status	
Federal:	Not listed	Global:	Demonstrably widespread, abundant, and secure
State:	Listed Endangered	State:	Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank:	Not ranked
Comments on Rank:	--
Detailed Description:	2005: 9 plants (perennial clumps?), 7 with fruit, in a ca. 10x20 ft. area.
General Area:	2005: Somewhat disturbed area next to railroad tracks, next to a larger swamp. *Pinus strobus* (white pine) in wetland and adjacent upland. Shrubs include *Alnus incana* ssp. *rugosa* (speckled alder), *Vaccinium corymbosum* (highbush blueberry), and *Ilex verticillata* (winterberry). Herbaceous layer has abundant *Glyceria canadensis* (rattlesnake mannagrass), *Osmunda cinnamomea* (cinnamon fern), *Thelypteris noveboracensis* (New York fern), *Juncus effusus* (soft rush), *Scirpus* sp. (rush), *Spiraea alba* var. *latifolia* (eastern meadowsweet), *Spiraea tomentosa* (steeple bush), and *Solidago* sp. (goldenrod). Across the railroad tracks is a large swamp with *Lythrum salicaria* (purple loosestrife).
General Comments:	--
Management Comments:	2005: Railroad regularly cuts vegetation. Lots of slash next to the railroad but not much where the plants were growing.

Location

Survey Site Name:	Knox Marsh Brook
Managed By:	
County:	Strafford
Town(s):	Dover
Size:	.0 acres
Elevation:	

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2005: From Rte. 155 (Knox Marsh Road) drive to Eagle Storage. Walk behind the storage buildings and cross the railroad tracks (need permission from the railroad). Alternative approach from the other side of the tracks is via Crosby Road off Rte. 9, behind industrial buildings.

Dates documented

First reported:	2005-11-01	Last reported:	2005-11-14

CONFIDENTIAL – NH Dept. of Environmental Services review

New Hampshire Natural Heritage Bureau - Animal Record

New England Cottontail (*Sylvilagus transitionalis*)

Legal Status		Conservation Status	
Federal:	Not listed	Global:	Rare or uncommon
State:	Listed Endangered	State:	Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank:	Not ranked
Comments on Rank:	--
Detailed Description:	2014: Winter observation at 1 point. 2011: Winter observations at 22 points. 2003: Seen (Obs_id 442). Seen (Obs_id 441).
General Area:	2003: Terrestrial: Scrub / shrubland (Obs_id 442, 441).
General Comments:	2003: Results of J. Litvaitis Regional New England Cottontail Survey - 2003 (Obs_id 442). 2003: Results of J. Litvaitis Regional New England Cottontail Survey - 2003 (Obs_id 441).
Management Comments:	--

Location

Survey Site Name: Knox Marsh
Managed By:

County: Strafford
Town(s): Dover
Size: 14.2 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2003: Rte. 9, ca. 200 meters from junction with Rte. 155; old field south of road (Obs_id 442). 2003: Traveling NE on Rte. 155, old field patch on left after the Dover bus depot (Obs_id 441).

Dates documented

First reported: 2003-01-01 Last reported: 2014

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

CONFIDENTIAL – NH Dept. of Environmental Services review

New Hampshire Natural Heritage Bureau - Animal Record

Northern Black Racer (*Coluber constrictor constrictor*)

Legal Status	Conservation Status
Federal: Not listed	Global: Demonstrably widespread, abundant, and secure
State: Listed Threatened	State: Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2003: 6-foot long roadkill, about 2 weeks ago [from 9/18/03] (Obs_id 2003.0132). 1999: 5 adult or subadult snakes captured and monitored with radio telemetry.
General Area: 2003: Large hayfield (industrial park) (Obs_id 2003.0132). 1999: No details.
General Comments: 1999: Collected under plastic cover sheets and traps.
Management Comments: --

Location

Survey Site Name: Rte. 9, north of
Managed By: Ezra Greens Farm

County: Strafford
Town(s): Dover
Size: 405.5 acres
Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2003: Crosby Road, intersection Rte. 9, 150'-200' down on right (Obs_id 2003.0132). 1999: Nearly a square mile area, ca. 1 mile west of Dover. Bounded by Rte. 9 to the south, Tolend Rd. to the north, Columbus Ave. to the east, and woods (and subdivisions) to the west.

Dates documented

First reported: 1998 Last reported: 2003-09-18

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

CONFIDENTIAL – NH Dept. of Environmental Services review

New Hampshire Natural Heritage Bureau - Animal Record

Spotted Turtle (*Clemmys guttata*)

Legal Status		Conservation Status	
Federal:	Not listed	Global:	Demonstrably widespread, abundant, and secure
State:	Listed Threatened	State:	Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Fair quality, condition and/or landscape context ('C' on a scale of A-D).
Comments on Rank: --

Detailed Description: 2006: Area 11682: 1 adult female seen.
General Area: --
General Comments: --
Management Comments: --

Location

Survey Site Name: Columbus Avenue, Dover
Managed By: Goldberg Park

County: Strafford
Town(s): Dover
Size: 18.3 acres
Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2006: Area 11682: Columbus Avenue, Dover.

Dates documented

First reported: 2006-06-06 Last reported: 2006-06-06

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

CONFIDENTIAL – NH Dept. of Environmental Services review

From: Bouchard, Jessica <Jessica.R.Bouchard@dncr.nh.gov>
Sent: Thursday, February 3, 2022 2:24 PM
To: Luke Hurley
Cc: Amy Sanders
Subject: [External] RE: NHB21-3597

HI Luke,

I was expecting an email. Just found the hard copy memo (it had to go through our new internal mail process).

Following receipt of the letter, and after speaking with Susan Romano and Bruce Gilday on the phone, NHB is satisfied that the newly subdivided subject property, Map G Lot 2-2, has been reviewed for the presence of Gentianopsis crinita during the appropriate time of year and that none were found.

Additionally, NHB understands that the nearby documented Gentian occurrence last observed in 1987, located at the northeastern portion of the field adjacent to the UPS building, was surveyed during the appropriate time of year and none were found.

Finally, NHB understands that the subject property is mowed 2-3 times per year, within the summer months, between May to September. A mowing regime such as this would impact flowering and seed production on the site.

After reviewing all of the information that has been provided, NHB is satisfied that the subject property is unlikely to support Gentianopsis crinita. No additional correspondence with NHB is necessary for this project.

Thank you,

Jessica Bouchard
Environmental Reviewer / Ecological Information Specialist
New Hampshire Natural Heritage Bureau (NHB)
Division of Forests & Lands
NH Dept. of Natural & Cultural Resources
172 Pembroke Rd
Concord, NH 03301
(603) 271-2834 (office)

NHB DataCheck Tool

From: Luke Hurley <lhurley@gesinc.biz>
Sent: Thursday, February 3, 2022 8:32 AM
To: Bouchard, Jessica <Jessica.R.Bouchard@dncr.nh.gov>
Cc: Amy Sanders <ASanders@fando.com>
Subject: NHB21-3597

EXTERNAL: Do not open attachments or click on links unless you recognize and trust the sender.

Hi Jess,
I am working with Amy on this project for the wetland application and will need some sort of sign off from you on the rare plants. I Believe you have this letter from BAG Land Consultants. Please let me know if you need anything else.
Thanks,
Luke

Custom Soil Resource Report
Soil Map

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Strafford County, New Hampshire
Survey Area Data: Version 22, Aug 31, 2021

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

Date(s) aerial images were photographed: Dec 31, 2009—Sep 9, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Be	Biddeford silty clay loam	7.8	6.8%
BzA	Buxton silt loam, 0 to 3 percent slopes	23.9	21.0%
BzB	Buxton silt loam, 3 to 8 percent slopes	8.3	7.3%
CfB	Charlton fine sandy loam, 3 to 8 percent slopes	33.2	29.1%
ScA	Scantic silt loam, 0 to 3 percent slopes	39.9	35.0%
SnB	Sutton fine sandy loam, 3 to 8 percent slopes	0.8	0.7%
Totals for Area of Interest		**113.9**	**100.0%**

Map Unit Descriptions

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it

SITE-SPECIFIC SOIL SURVEY REPORT
For
Littleworth Road, Dover
By
Gove Environmental Services, Inc.

1. MAPPING STANDARDS
Site-Specific Soil Mapping Standards for New Hampshire and Vermont. SSSNNE Special Publication No. 3, current version. This map product is within the technical standards of the National Cooperative Soil Survey. It is a special product, intended for the submission to NH DES Alteration of Terrain. It was produced by a professional soil scientist and is not a product of the USDA Natural Resource Conservation Service.

OVERVIEW:
This site is located on an area of approximately 6 acres of open field. This site was part of a larger lot to be subdivided off. There was a single family home, barn and associated out buildings that have been removed. An existing gravel driveway still exists as part of the active hay operation.

This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for infiltration requirements by the NH DES Alteration of Terrain Bureau. It was produced by a professional soil scientist and is not a product of the USDA Natural Resources Conservation Service. There is a report that accompanies this map.
The site-specific soil survey (SSSS) was produced on November 29, 2021, and was prepared by Luke D. Hurley, CSS # 095, Gove Environmental Services, Inc.

The survey area is located at Little worth Road, Dover, NH.

Soils were identified with the New Hampshire State-wide Numerical Soils Legend, USDA NRCS, Durham, NH. Issue # 10, January 2011. The numeric legend was amended to identify the correct soil components of the complex.

Hydrologic Soil Group from Ksat Values for New Hampshire Soils, Society of Soil Scientists of New England, Special Publication No. 5, September 2009.

2. DATE SOIL MAP PRODUCED
Date(s) of on-site field work: November 29, 2021
Date(s) of test pits: November 29, 2021
Test pits recorded by: Luke Hurley, GES Inc.

3. GEOGRAPHIC LOCATION AND SIZE OF SITE
City or town where soil mapping was conducted: Dover
Location: Tax Map G, Lot 2-2
Size of area: approximately 6 acres
Was the map for the entire lot? Yes

8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
Ph (603) 778 0644 / *Fax* (603) 778 0654
info@gesinc.biz
www.gesinc.biz

If no, where was the mapping conducted on the parcel:

4. PURPOSE OF THE SOIL MAP
Was the map prepared to meet the requirement of Alteration of Terrain? Yes
If no, what was the purpose of the map? N/A
Who was the map prepared for? Fuss and O'Neill Engineers, Inc.

5. SOIL MAP UNIT DESCRIPTIONS – SOIL DESCRIPTIONS

SSSS SYM.	SSSS MAP NAME	HISS SYM.	HYDROLOGIC SOIL GRP.
232	Buxton	353	C
32	Boxford	353	C
233	Scantic	553	D

232 The Buxton series consists of very deep, moderately well drained soils that formed in glaciolacustrine or glaciomarine deposits on coastal lowlands and river valleys. Slope ranges from 3 to 50 percent. Permeability is moderate or moderately slow in the surface horizon, moderately slow or slow in the upper part of the subsoil, and slow or very slow in the lower part of the subsoil and in the substratum. These soils are found in the upper reaches of the site. Typical soil profile has fine sandy loam in the upper layers with massive, firm material in the C layer with some shale material.

32 The Boxford series consists of very deep, moderately well to somewhat poorly drained soils formed in clayey marine sediments. These soils are nearly level and are on terraces. Permeability is slow in the upper part of the B horizon and slow to very slow in the lower part of the B and in the C horizons. These soils are found in the lower areas of the site along the wetland edge. These soils are comprised of sandy loam material in the A layer and firm, blocky silt clay material in the B and c layer.

233 The Scantic series consists of very deep, poorly drained soils formed in glaciomarine or glaciolacustrine deposits on coastal lowlands and river valleys. Slope ranges from 0 to 8 percent. Saturated hydraulic conductivity of the surface and subsurface horizons is moderately high or high and low or moderately slow in the subsoil and substratum.

Test pits 1
0-6 10YR3/2 FSL, GR, FR
6-12 10YR4/4 FSL, GR, FR
12-32 2.5Y4/4 FSL, OM, FR Fi,
32-64 2.5Y5/6 FSL, OM, Fi
ESHWT NA"
Soil Type: Buxton

Test pit 2
0-4 10YR3/2 FSL, GR, FR
4-10 10YR4/4, FSL, GR, FR
10-16 2.5Y4/4 FSL, GR, FR
16-36 2.5Y5/6 FSL, GR, FR
36-56 2.5Y 4/4 FSL, OM, Fi
ESHWT N/A Shale @ 56”
Soil Type Buxton

Test pit 2A
0-6 10YR3/2 FSL, GR, FR
6-12 10YR4/4, FSL, GR, FR
12-20 2.5Y4/4 FSL, GR, FR
20-40 2/5Y5/6 FSL, GR, FR
40-54 2.5Y4/4 FS, OM, Fi
ESHWT 26”
Soil Type Buxton

Test pit 3
0-8 10YR3/2 FSL, GR, FR
8-30 10YR5/4, FSL, GR, FR
ESHWT N/A Refusal @30”
Soil Type Buxton

Test pit 4
0-10 10YR3/2 FSL, GR, FR
10-20 2.5Y3/2, SLCL, BLK, Fi, Redox 10YR5/6 50%
ESHWT 10”
Soil Type Boxford

Test pit 5
0-12 10YR3/2 FSL, GR, FR
12-24 2.5Y3/2, SLCL, BLK, Fi, Redox 10YR5/6 50%
ESHWT 12”
Soil Type Boxford

Test pit 6
0-10 10YR3/2 FSL, GR, FR
10-16 2.5Y5/3, FSL, GR, FR Redox 10YR5/6 15%
16-24 2.5Y4/3, SLCL, BLK, Fi, Redox 10YR5/6 15%
24-36 10YR4/4 Gr, OM, Fi, Redox 10YR5/6 30%
ESHWT 10”
Soil Type Boxford

Test pit 7
0-6 10YR3/2 FSL, GR, FR
6-12 2.5Y3/2, FSL, GR, FR Redox 10YR5/6 15%
12-24 2.5Y3/1, SLCL, BLK, Fi, Redox 10YR5/6 15%
24-36 10YR4/4 Gr, OM, Fi, Redox 10YR5/6 30%
ESHWT 12”
Soil Type Boxford

Test pit 8
0-6 10YR3/2 FSL, GR, FR
6-14 210YRY3/3, FSL, OM, Fi, Redox 10YR5/6 15%
14-36 2.5Y4/2, SLCL, BLK, Fi, Redox 10YR5/6 30%
ESHWT 14”
Soil Type Boxford

Test pit 9
0-6 10YR3/2 FSL, GR, FR
6-20 10YRY4/3, FSL, GR, FR
20-40 2.5Y4/2, SLCL, BLK, Fi, Redox 10YR5/6 25%
ESHWT 20”
Soil Type Boxford

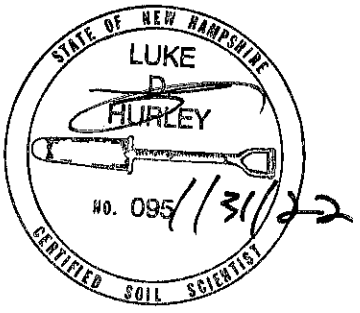
Test pit 10
0-4 10YR3/2 FSL, GR, FR
4-12 2.5Y5/3, FSL, GR, FR
12-40 2.5Y4/2, SLCL, BLK, Fi, Redox 10YR5/6 25%
ESHWT 12”
Soil Type Boxford

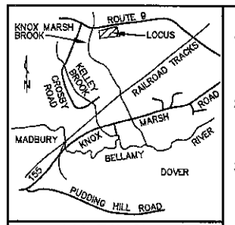
6. RESPONSIBLE SOIL SCIENTIST

Name: Luke D. Hurley
Certified Soil Scientist Number: 095

7. OTHER DISTINGUISHING FEATURES OF SITE

Is the site in a natural condition? No
If no, what is the nature of the disturbance? Some area is flat and packed gravel.





LOCATION PLAN
(NO SCALE)

REFERENCE PLANS:

1.) SUBDIVISION PLAN OF LAND PREPARED FOR WESTFIELD, LLC TAX MAP G, LOT No. 2 LITTLEWORTH ROAD CITY of DOVER COUNTY of STRAFFORD STATE of NEW HAMPSHIRE. SCALE: 1" = 200'; DATED: JUNE 21, 2021; BY THIS OFFICE. RECORDED S.C.R.D. PLANS 12514, 21515 & 12516.

2.) NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION RIGHT OF WAY PLANS, PROJECT No. W.P.M.H. 54 CENTRAL ROAD, SHEETS 8 & 9; DATED: 1933. OBTAINED FROM NH D.O.T. PROJECT VIEWER WEBSITE "https://nhdotprojects.sr.unh.edu/"; "https://gis.dot.nh.gov/plan/50835.ASB.pdf".

3.) CITY OF DOVER, PUBLIC WORKS DEPT., PROPOSED DRAINAGE DITCH FROM DOVER INDUSTRIAL PARK THROUGH RILEY LAND TO BROOK. SCALE: 1" = 100'; DATED: MARCH 23, 1965; BY: CITY OF DOVER ENGINEERING, FILE No. 12-49.

No.	Central Angle	Radius	Arc Length	Chord Length	Chord Bearing
C1	07°28'41"	901.74	117.69	117.61	N78°39'33"E

THE SOIL TYPES ON THE SITE ARE:
BzA BUXTON SILT LOAM, 0 TO 3 PERCENT SLOPES
CfB CHARLTON FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
THE SOURCE FOR THE SOIL TYPE DATA IS USDA SCS SOIL SURVEY OF STRAFFORD COUNTY DATED MARCH 1973 & USDA NRCS WEB SOIL SURVEY
http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

NOTES:

1.) OWNERS OF RECORD:

WESTFIELD, LLC
340 CENTRAL AVENUE, SUITE 202
DOVER, NEW HAMPSHIRE 03820
S.C.R.D. VOL. 4733, PAGE 471 (200002182)

2.) [0 / 2-2] – DENOTES TAX MAP AND PARCEL NUMBER.

3.) PLAN INTENT: TO DEPICT THE PARCEL BOUNDARIES AND EXISTING CONDITIONS AS OF THE DATE OF THIS SURVEY. LOT IS SERVED BY MUNICIPAL SEWER AND WATER SERVICE.

4.) PARCEL AREA: 296,551 S.F. / 6.81 Ac.

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

MINIMUM LOT SIZE	= 20,000 S.F.
LOT COVERAGE	= 50 PERCENT
MINIMUM FRONTAGE	= 100 FEET
FRONT SETBACK	= 25 FEET
SIDE SETBACK	= 10 FEET MIN.
REAR SETBACK	= 10 FEET MIN.
BUILDING HEIGHT	= 50 FEET MAX.

6.) THE SUBJECT PARCEL IS LOCATED OUTSIDE OF THE 0.2 PERCENT ANNUAL CHANCE FLOODPLAIN AS SHOWN ON FLOOD INSURANCE RATE MAP COMMUNITY NUMBER 330168, PANELS 0310 & 0320, SUFFIX E; MAP NUMBERS 33017C0310E & 33017C0320E; EFFECTIVE DATE SEPTEMBER 30, 2015.

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

8.) VERTICAL DATUM IS NAVD88 FROM GPS OBSERVATION DATED JANUARY 22, 2021.

9.) PROPERTY LINE INFORMATION WAS ENTERED AND PLOTTED BY MCENEANEY SURVEY ASSOCIATES OF NEW ENGLAND DURING JANUARY 2021 WITH AN ERROR NOT GREATER THAN 1 IN 10,000.

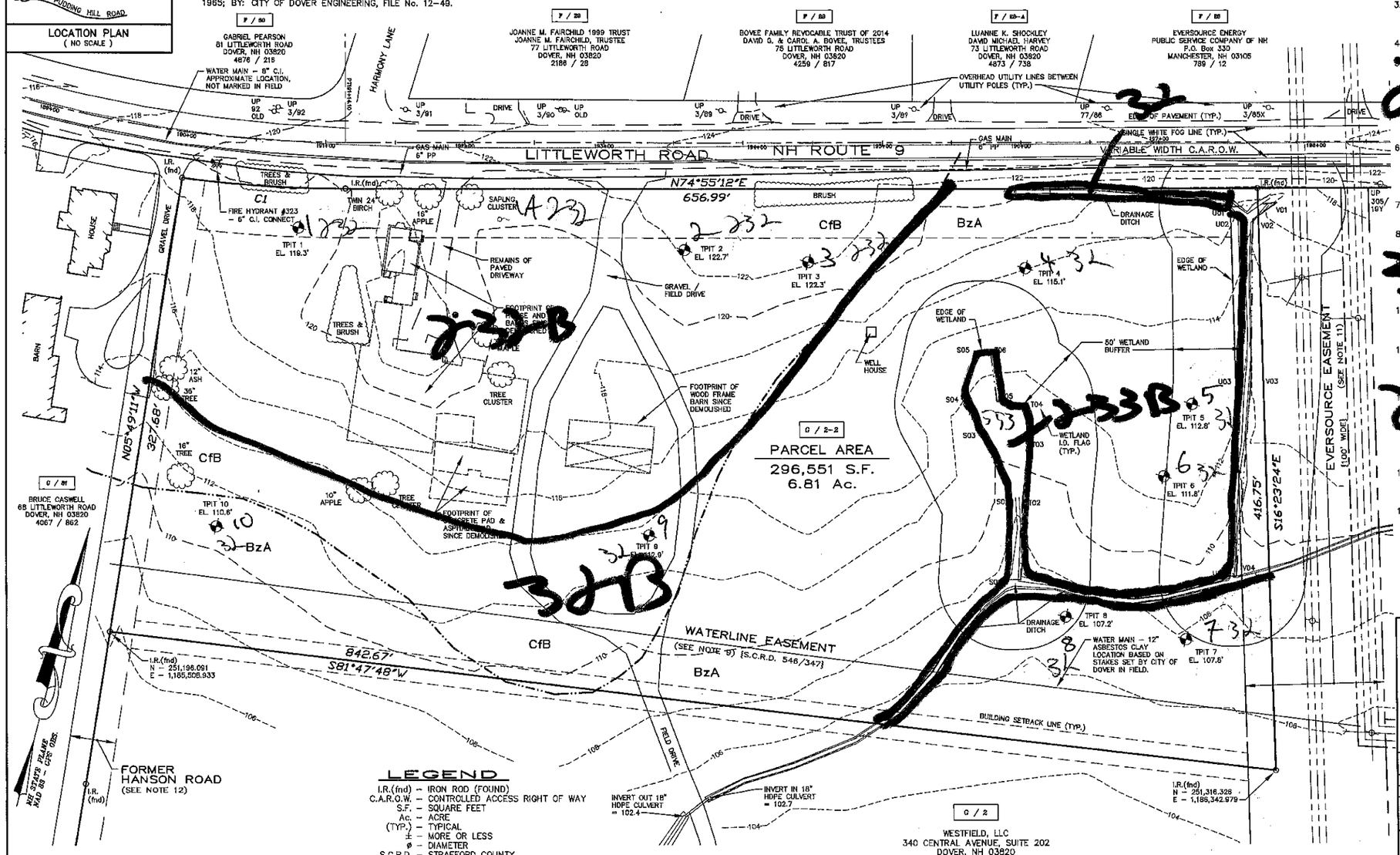
10.) THE PARCEL IS SUBJECT TO RIGHTS OF DOVER TO MAINTAIN A WATER LINE AS DESCRIBED IN S.C.R.D. VOLUME 546, PAGE 347. DESCRIBED BY CITY AS 12" DIP.

11.) THE PARCEL IS SUBJECT TO A PORTION OF A 100' WIDE EASEMENT GRANTED TO PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE DATED MARCH 12, 1958 AND DESCRIBED IN S.C.R.D. VOLUME 686, PAGE 130.

12.) HANSON ROAD (A/K/A FORMER HANSON ROAD) IS AN UNIMPROVED 33' WIDE ROAD WITHIN THE CITY OF DOVER DISCONTINUED HANSON ROAD IS PUBLIC PER WITH THE 2008 RESTATEMENT OF THE ACCEPTANCE PRACTICE, TITLE TO THE UNDERLYING LAND OF THE ROAD EXTENDS TO THE CENTERLINE FOR ABUTTING PARCELS. THE USE RIGHTS OF THE ENTIRE WIDTH OF HANSON ROAD MAY EXIST FOR ABUTTING OWNERS.

13.) CITY OF DOVER G.I.S. INDICATES AN 8" DIP WATER MAIN LOCATED WITHIN LITTLEWORTH ROAD. NO MARKINGS WERE FOUND. LOCATION SHOWN IS GRAPHIC.

14.) WETLANDS ONSITE WERE IDENTIFIED UTILIZING THE 1987 FEDERAL TECHNICAL REPORT. THE DELINEATION WAS PERFORMED ON OCTOBER 5, 2021 BY BAG LAND CONSULTANTS (BRUCE A. GILDAY, CWS); 43 ROCKINGHAM STREET, CONCORD, NH 03301.



LEGEND

I.R.(fnd) – IRON ROD (FOUND)
C.A.R.O.W. – CONTROLLED ACCESS RIGHT OF WAY
S.F. – SQUARE FEET
Ac. – ACRE
(TYP.) – TYPICAL
± – MORE OR LESS
ø – DIAMETER
S.C.R.D. – STRAFFORD COUNTY REGISTRY OF DEEDS
-o- UP – UTILITY POLE
62 – CONTOUR (2FT INTERVAL)
SOILS LINE
BzA – SOILS TYPE
PP – PLASTIC PIPE
HDPE – HIGH DENSITY POLYETHYLENE PIPE
N – NORTHING
E – EASTING
196+00 – ROADWAY CENTERLINE STATION
PT – CURVE POINT OF TANGENCY

NO.	DATE	DESCRIPTION	BY	CHK
2	1/24/22	ADD WETLANDS & BUFFER, REVISE NOTE 14	RJM	KMM
1	12/3/21	ADD TEST PITS 1–10	RJM	KMM

REVISIONS

21-2383	EXIST. COND.	
PROJECT NO	TYPE	FIELDBOOK & PAGES

STATE OF NEW HAMPSHIRE
BRUCE A. GILDAY
No. 058
CERTIFIED WETLAND SCIENTIST

ATTENTION:

HIGH PRESSURE GAS MAIN EXISTS WITHIN THE RIGHT OF WAY OF LITTLEWORTH ROAD; PRIOR TO ANY EARTH MOVING ACTIVITY CONTACT DIGSAFE AT 1-888-344-7233 TO VERIFY LOCATION.

"I HEREBY CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL GROUND SURVEY PERFORMED WITH A TOTAL STATION, BY ME OR THOSE UNDER MY DIRECT SUPERVISION AND THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, SAID SURVEY MEETS OR EXCEEDS THE MINIMUM PRECISION REQUIREMENTS FOR SURVEY CLASSIFICATION "U" AS SET FORTH IN TABLE 500.1 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS."

EXISTING CONDITIONS PLAN OF LAND
PREPARED FOR
BLUEBIRD STORAGE
TAX MAP G, LOT No. 2-2
LITTLEWORTH ROAD
CITY of DOVER
COUNTY of STRAFFORD
STATE of NEW HAMPSHIRE

DOVER PLANNING FILE No. P 21-__

DRAWN BY: RJM	FILE: 2210\DWGS\2210 G 2-1 EC
SCALE: 1" = 40'	DATE: NOVEMBER 8, 2021

40 20 0 20 40 80 120 160

STATE OF NEW HAMPSHIRE No. 661 KEVIN M. McENEANEY LICENSED LAND SURVEYOR

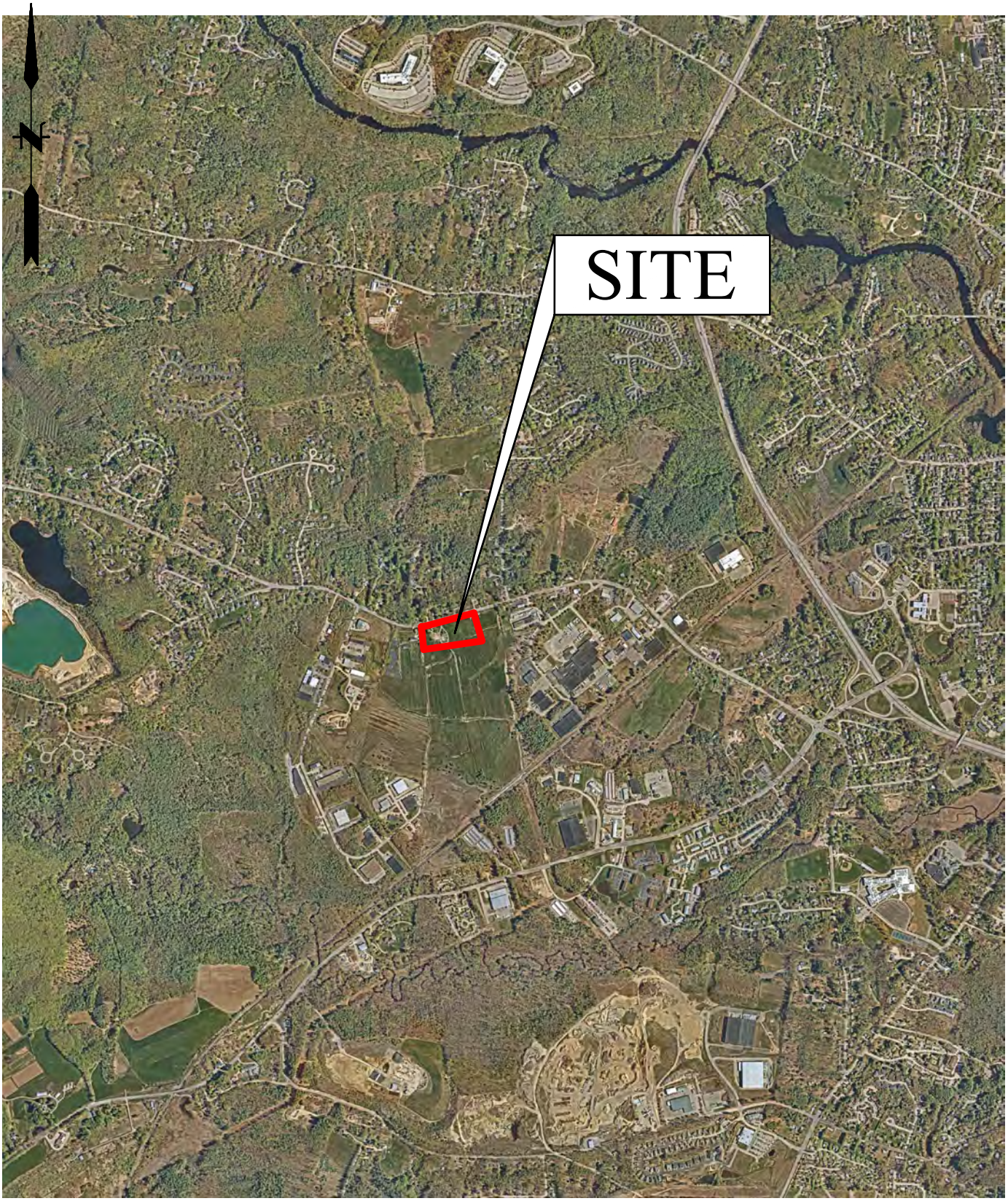
McEneaney Survey Associates of NEW ENGLAND

P.O. Box 681 – 24 CHESTNUT STREET
DOVER, NH 03820 (603) 742-0911

SURVEYING – PLANNING – CONSULTING

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Occum	1	0.6	2.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	mesic	loamy	no	loamy over loamy sand
Suncook	2	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	mesic	sandy	no	occasionally flooded
Lim	3	0.6	2.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Pootatuck	4	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	mesic	loamy	no	single grain in C
Rippowam	5	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Saco	6	0.6	2.0	6.00	20.0	D	6	Flood Plain (Bottom Land)	mesic	silty	no	strata
Hadley	8	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand
Winooski	9	0.6	6.0	0.60	6.0	B		Flood Plain (Bottom Land)	mesic	silty over loamy	no	
Merrimac	10	2.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	mesic	gravelly sand	no	loamy cap
Gloucester	11	6.0	20.0	6.00	20.0	A	1	Sandy Till	mesic	sandy-skeletal	no	loamy cap
Hinckley	12	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	
Sheepscot	14	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly coarse sand
Searsport	15	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	frigid	sandy	no	organic over sand
Saugatuck	16	0.06	0.2	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	yes	ortstein
Colton, gravelly	21	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly surface
Colton	22	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	
Masardis	23	6.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	slate, loamy cap
Agawam	24	6.0	20.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Windsor	26	6.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	mesic	sandy	no	
Groveton	27	0.6	2.0	0.60	6.0	B	2	Outwash and Stream Terraces	frigid	loamy	yes	loamy over sandy
Madawaska	28	0.6	2.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Woodbridge	29	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	mesic	loamy	no	sandy loam in Cd
Unadilla	30	0.6	2.0	2.00	20.0	B	2	Terraces and glacial lake plains	mesic	silty	no	silty over gravelly
Hartland	31	0.6	2.0	0.20	2.0	B	2	Terraces and glacial lake plains	mesic	silty	no	very fine sandy loam
Boxford	32	0.1	0.2	0.00	0.2	C	3	Silt and Clay Deposits	mesic	fine	no	silty clay loam
Scitico	33	0.0	0.2	0.00	0.2	C	5	Silt and Clay Deposits	mesic	fine	no	
Wareham	34	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	no	
Champlain	35	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	gravelly sand	no	
Adams	36	6.0	20.0	20.00	99.0	A	1	Outwash and Stream Terraces	frigid	sandy	yes	
Melrose	37	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	silty clay loam in C
Eldridge	38	6.0	20.0	0.06	0.6	C	3	Sandy/loamy over silt/clay	mesic	sandy over loamy	no	
Millis	39					C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Canton	42	2.0	6.0	6.00	20.0	B	2	Loose till, sandy textures	mesic	loamy over sandy	no	loamy over loamy sand
Montauk	44	0.6	6.0	0.06	0.6	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Henniker	46	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Madawaska, aquentic	48	0.6	2.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Whitman	49	0.0	0.2	0.00	0.2	D	6	Firm, platy, loamy till	mesic	loamy	no	mucky loam
Hermon	55	2.0	20.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	loamy cap
Becket	56	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	gravelly sandy loam in Cd
Waumbeck	58	2.0	20.0	6.00	20.0	B	3	Loose till, sandy textures	frigid	sandy-skeletal	yes	very cobbly loamy sand
Charlton	62	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	mesic	loamy	no	fine sandy loam
Paxton	66	0.6	2.0	0.00	0.2	C	3	Firm, platy, loamy till	mesic	loamy	no	
Sutton	68	0.6	6.0	0.60	6.0	B	3	Loose till, loamy textures	mesic	loamy	no	
Berkshire	72	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	fine sandy loam
Marlow	76	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Peru	78	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	
Thorndike	84	0.6	2.0	0.60	2.0	C/D	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	less than 20 in. deep
Hollis	86	0.6	6.0	0.60	6.0	C/D	4	Loose till, bedrock	mesic	loamy	no	less than 20 in. deep
Winnecook	88	0.6	2.0	0.60	2.0	C	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Chatfield	89	0.6	6.0	0.60	6.0	B	4	Loose till, bedrock	mesic	loamy	no	20 to 40 in. deep
Hogback	91	2.0	6.0	2.00	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Lyman	92	2.0	6.0	2.00	6.0	A/D	4	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Woodstock	93	2.0	6.0	2.00	6.0	C/D	4	Loose till, bedrock	frigid	loamy	no	less than 20 in. deep
Rawsonville	98	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Tunbridge	99	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Ondawa	101	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	loamy over loamy sand
Sunday	102	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	frigid	sandy	no	occasionally flooded
Winooski	103	0.6	6.0	0.60	6.0	B	3	Flood Plain (Bottom Land)	mesic	silty	no	very fine sandy loam
Podunk	104	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	frigid	loamy	no	loamy to coarse sand in C
Rumney	105	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	frigid	loamy	no	
Hadley	108	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand, occ flooded
Limerick	109	0.6	2.0	0.60	2.0	C	5	Flood Plain (Bottom Land)	mesic	silty	no	
Scarboro	115	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	mesic	sandy	no	organic over sand, non stony
Finch	116					C	3	Outwash and Stream Terraces	frigid	sandy	yes	cemented (ortstein)
Sudbury	118	2.0	6.0	2.00	20.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	loam over gravelly sand
Telos	123	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Chesuncook	126	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Allagash	127	0.6	2.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy	yes	loamy over sandy
Elliottsville	128	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	20 to 40 in. deep
Hitchcock	130	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam to silt in C
Burnham	131	0.2	6.0	0.02	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over silt
Dartmouth	132	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	thin strata silty clay loam
Monson	133	0.6	2.0	0.60	2.0	D	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	less than 20 in. deep
Maybid	134	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	mesic	fine	no	silt over clay
Shapleigh	136					C/D	4	Sandy Till	mesic	sandy	yes	less than 20 in. deep
Monadnock	142	0.6	2.0	2.00	6.0	B	2	Loose till, sandy textures	frigid	loamy over sandy, sandy-skeletal	yes	gravelly loamy sand in C
Acton	146	2.0	20.0	2.00	20.0	B	3	Loose till, sandy textures	mesic	sandy-skeletal	no	cobbly loamy sand
Vassalboro	150					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Success	154	2.0	6.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	cemented
Canterbury	166	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Sunapee	168	0.6	2.0	0.60	6.0	B	3	Loose till, loamy textures	frigid	loamy	yes	
Waskish	195					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Ondawa	201	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	occ flood, loamy over l. sand
Sunday	202	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	frigid	sandy	no	frequently flooded
Fryeburg	208	0.6	2.0	2.00	6.0	B	2	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Charles	209	0.6	100.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	silty	no	
Warwick	210	2.0	6.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	loamy-skeletal	no	loamy over slate gravel
Naumburg	214	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Boscawen	220	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	no	loamy cap
Bemis	224	0.6	0.2	0.00	0.2	C	5	Firm, platy, loamy till	cryic	loamy	no	
Bice	226	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	no	sandy loam
Lanesboro	228	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	channery silt loam in Cd
Poocham	230	0.6	2.0	0.20	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam in C
Buxton	232	0.1	0.6	0.00	0.2	C	3	Silt and Clay Deposits	frigid	fine	no	silty clay
Scantic	233	0.0	0.2	0.00	0.2	D	5	Silt and Clay Deposits	frigid	fine	no	
Biddeford	234	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	frigid	fine	no	organic over clay
Buckland	237	0.6	2.0	0.06	0.2	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Elmridge	238	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	loamy over clayey	no	
Brayton	240	0.6	2.0	0.06	0.6	C	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Lyme	246	0.6	6.0	0.60	6.0	C	5	Loose till, sandy textures	frigid	loamy	no	
Millsite	251	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	no	20 to 40 in. deep
Macomber	252	0.6	2.0	0.60	2.0	C	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Lombard	259	0.6	6.0	2.00	20.0	C/D	2	Weathered bedrock, phyllite	frigid	loamy	no	very channery
Sunapee var	269	0.6	2.0	0.60	6.0	B	3	Loose till, loamy textures	frigid	loamy	yes	frigid dystrudept
Chatfield Var.	289	0.6	6.0	0.60	6.0	B	3	Loose till, bedrock	mesic	loamy	no	mwd to swpd
Greenwood	295					A/D	6	Organic Materials - Freshwater	frigid	hemic	no	deep organic
Catden	296					A/D	6	Organic Materials - Freshwater	mesic	sapric	no	deep organic
Lovewell	307	0.6	2.0	0.60	2.0	B	3	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Quonset	310	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	shale
Deerfield	313	6.0	20.0	20.00	100.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	single grain in C



SCALE:	
HORZ.:	1" = 2,000'
VERT.:	
DATUM:	
HORZ.:	
VERT.:	

0 2000 1000

GRAPHIC SCALE

FUSS & O'NEILL
50 COMMERCIAL STREET
MANCHESTER, NEW HAMPSHIRE 03101
603.668.8223
www.fando.com

BLUEBIRD SELF STORAGE

AERIAL MAP

TAX MAP G LOT 2-2
SELF-STORAGE FACILITY

DOVER NEW HAMPSHIRE

PROJ. No.:	20210509.A10
DATE:	2.25.2022

CM-102

File Path: J:\DWG\P20210509\A10\Civil\Plan\20210509.A10_COV01.dwg Layout: CM-102 AERIAL MAP Plotted: Wed, February 16, 2022 - 2:19 PM User: asanders
Plotter: AUTOCAD PDF (GENERAL DOCUMENTATION).PC3 CTB File: FO.STB
LAYER STATE:
MS VIEW:

LITTLEWORTH ROAD

HARMONY LANE

F / 30
SANDRA CUTCHIN
81 LITTLEWORTH ROAD
DOVER, NH 03820
2109 / 8

F / 29
JOANNE M. FAIRCHILD 1999 TRUST
JOANNE M. FAIRCHILD, TRUSTEE
77 LITTLEWORTH ROAD
DOVER, NH 03820
2186 / 28

F / 28
BOVEE FAMILY REVOCABLE TRUST OF 2014
DAVID C. & CAROL A. BOVEE, TRUSTEES
75 LITTLEWORTH ROAD
DOVER, NH 03820
4259 / 817

F / 28-4
DAVID G. PELLETIER
73 LITTLEWORTH ROAD
DOVER, NH 03820
1777 / 205

F / 26
EVERSOURCE ENERGY
PUBLIC SERVICE COMPANY OF NH
P.O. Box 330
MANCHESTER, NH 03105
789 / 12

C / 31
BRUCE CASWELL
68 LITTLEWORTH ROAD
DOVER, NH 03820
4067 / 862

WATER MAIN - 8" C.I. APPROXIMATE LOCATION, NOT MARKED IN FIELD

OVERHEAD UTILITY LINES BETWEEN UTILITY POLES (TYP.)

EDGE OF PAVEMENT (TYP.)

SINGLE WHITE FOG LINE (TYP.)

GAS MAIN 6" PP

GAS MAIN 6" PP

I.R.(fnd)

I.R.(fnd)

N74°55'12"E
656.99'

TREES & BRUSH

FIRE HYDRANT #323 - 6" C.I. CONNECT

GRAVEL DRIVE

HOUSE

SHED

TWIN 24" BIRCH

16" APPLE

SAPLING CLUSTER

BRUSH

DRAINAGE DITCH

REMAINS OF PAVED DRIVEWAY

GRAVEL FIELD DRIVE

TREES & BRUSH

30" MAPLE

TREE CLUSTER

12" ASH

36" TREE

16" TREE

10" APPLE

TREE CLUSTER

N08°49'11"W
332.58'

842.67'
S81°47'48"W

I.R.(fnd)
N - 251,196.091
E - 1,185,508.933

I.R. (fnd)

FIELD DRIVE

INVERT OUT 18" HDPE CULVERT = 102.4

INVERT IN 18" HDPE CULVERT = 102.7

DRAINAGE DITCH

WATER MAIN - 12" A.C. LOCATION BASED ON STAKES SET BY CITY OF DOVER IN FIELD.

416.75'
S16°23'24"E

I.R.(fnd)
N - 251,316.326
E - 1,186,342.979

EVERSOURCE EASEMENT

1 2 3 4 5 6 7 8 9 10 11

2173
115.93
STA MHS 037+00

UP 3/94
UP 3/93
UGD ROP
UP 92 OLD
UP 3/92
UP 3/91
DRIVE
UP 3/90
UP OLD
UP 3/89
DRIVE
UP 3/87
DRIVE
UP 77/86
UP 3/85X
DRIVE
UP 3/84X
UP 3/84
UP 305/19Y
UP GUY

SCALE:
HORZ.: 1" = 80'
VERT.:
DATUM:
HORZ.:
VERT.:
0 40 80
GRAPHIC SCALE

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NEW HAMPSHIRE

BLUEBIRD SELF-STORAGE
AERIAL PHOTO
EXISTING CONDITIONS
64 LITTLEWORTH ROAD
DOVER

PROJ. No.: 20210509.A10
DATE: 1.5.2022

AM-101

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PC3: DWG TO PDF.PC3 STB/CTB: FO.STB
MS VIEW: LAYER STATE:

PHOTO 1

PHOTO 2

PHOTO 3

PHOTO 4

PHOTO 5

PHOTO 6

PHOTO 7

PHOTO 8

PHOTO 9

PHOTO 10

PHOTO 11

Appendix B
Drainage Analysis

- Pre-Development 1-, 2-, 10-, 25- and 50-Year Node Listing
- Pre-Development 10 and 25-Year Full Summary and Report
- Post-Development 2-, 10-, 25- and 50-Year Node Listing
- Post-Development 10 and 25-Year Full Summary and Report
- Peak Pond Elevations 50-Year Calculations

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-year	Type III 24-hr		Default	24.00	1	2.99	2
2	2-year	Type III 24-hr		Default	24.00	1	3.60	2
3	10-year	Type III 24-hr		Default	24.00	1	5.44	2
4	25-year	Type III 24-hr		Default	24.00	1	6.88	2
5	50-year	Type III 24-hr		Default	24.00	1	8.21	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 Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Runoff Area=168,848 sf 12.26% Impervious Runoff Depth>1.02"
Flow Length=362' Tc=19.9 min CN=78 Runoff=3.32 cfs 0.331 af

Subcatchment 2S: Runoff Area=260,178 sf 7.74% Impervious Runoff Depth>0.87"
Flow Length=411' Tc=15.0 min CN=75 Runoff=4.72 cfs 0.431 af

Reach AP1: Inflow=3.32 cfs 0.331 af
Outflow=3.32 cfs 0.331 af

Reach AP2: Inflow=4.72 cfs 0.431 af
Outflow=4.72 cfs 0.431 af

Total Runoff Area = 9.849 ac Runoff Volume = 0.762 af Average Runoff Depth = 0.93"
90.48% Pervious = 8.912 ac 9.52% Impervious = 0.937 ac

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 Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Runoff Area=168,848 sf 12.26% Impervious Runoff Depth>1.45"
Flow Length=362' Tc=19.9 min CN=78 Runoff=4.74 cfs 0.467 af

Subcatchment 2S: Runoff Area=260,178 sf 7.74% Impervious Runoff Depth>1.26"
Flow Length=411' Tc=15.0 min CN=75 Runoff=7.02 cfs 0.625 af

Reach AP1: Inflow=4.74 cfs 0.467 af
Outflow=4.74 cfs 0.467 af

Reach AP2: Inflow=7.02 cfs 0.625 af
Outflow=7.02 cfs 0.625 af

Total Runoff Area = 9.849 ac Runoff Volume = 1.092 af Average Runoff Depth = 1.33"
90.48% Pervious = 8.912 ac 9.52% Impervious = 0.937 ac

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 Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Runoff Area=168,848 sf 12.26% Impervious Runoff Depth>2.87"
Flow Length=362' Tc=19.9 min CN=78 Runoff=9.47 cfs 0.927 af

Subcatchment 2S: Runoff Area=260,178 sf 7.74% Impervious Runoff Depth>2.61"
Flow Length=411' Tc=15.0 min CN=75 Runoff=14.81 cfs 1.297 af

Reach AP1: Inflow=9.47 cfs 0.927 af
Outflow=9.47 cfs 0.927 af

Reach AP2: Inflow=14.81 cfs 1.297 af
Outflow=14.81 cfs 1.297 af

Total Runoff Area = 9.849 ac Runoff Volume = 2.224 af Average Runoff Depth = 2.71"
90.48% Pervious = 8.912 ac 9.52% Impervious = 0.937 ac

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 Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Runoff Area=168,848 sf 12.26% Impervious Runoff Depth>4.08"
Flow Length=362' Tc=19.9 min CN=78 Runoff=13.35 cfs 1.317 af

Subcatchment 2S: Runoff Area=260,178 sf 7.74% Impervious Runoff Depth>3.77"
Flow Length=411' Tc=15.0 min CN=75 Runoff=21.34 cfs 1.876 af

Reach AP1: Inflow=13.35 cfs 1.317 af
Outflow=13.35 cfs 1.317 af

Reach AP2: Inflow=21.34 cfs 1.876 af
Outflow=21.34 cfs 1.876 af

Total Runoff Area = 9.849 ac Runoff Volume = 3.193 af Average Runoff Depth = 3.89"
90.48% Pervious = 8.912 ac 9.52% Impervious = 0.937 ac

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 Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

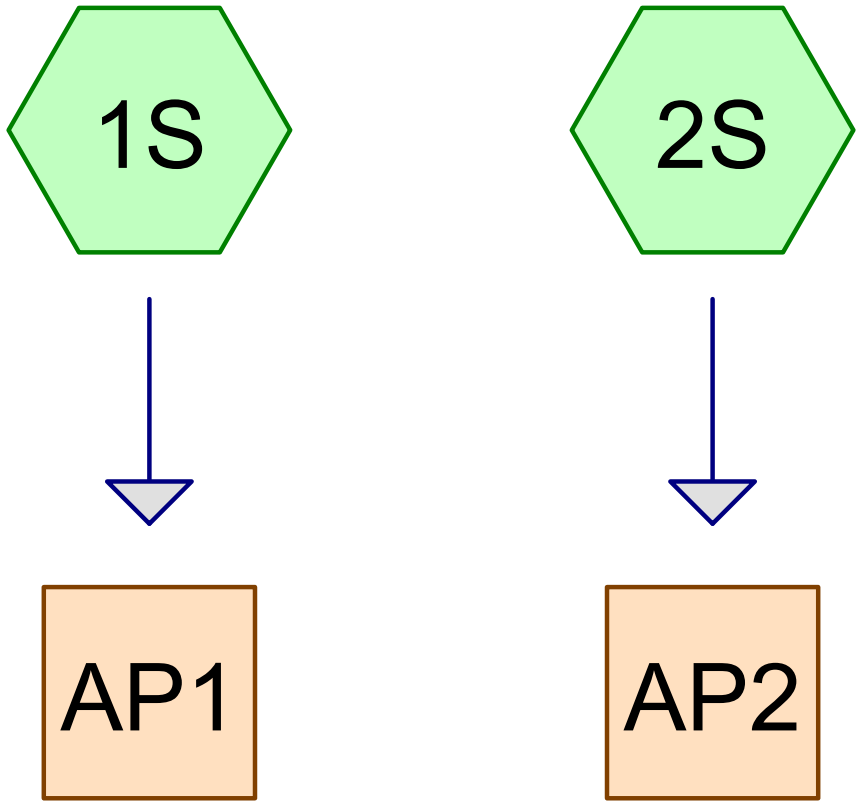
Subcatchment 1S: Runoff Area=168,848 sf 12.26% Impervious Runoff Depth>5.23"
Flow Length=362' Tc=19.9 min CN=78 Runoff=16.98 cfs 1.690 af

Subcatchment 2S: Runoff Area=260,178 sf 7.74% Impervious Runoff Depth>4.89"
Flow Length=411' Tc=15.0 min CN=75 Runoff=27.53 cfs 2.435 af

Reach AP1: Inflow=16.98 cfs 1.690 af
Outflow=16.98 cfs 1.690 af

Reach AP2: Inflow=27.53 cfs 2.435 af
Outflow=27.53 cfs 2.435 af

Total Runoff Area = 9.849 ac Runoff Volume = 4.125 af Average Runoff Depth = 5.03"
90.48% Pervious = 8.912 ac 9.52% Impervious = 0.937 ac



Subcat Reach Pond Link

Routing Diagram for Pre-Development 2022-0207
Prepared by Fuss & O'Neill, Printed 2/24/2022
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10-year	Type III 24-hr		Default	24.00	1	5.44	2
2	25-year	Type III 24-hr		Default	24.00	1	6.88	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.353	61	>75% Grass cover, Good, HSG B (2S)
7.913	74	>75% Grass cover, Good, HSG C (1S, 2S)
0.270	80	>75% Grass cover, Good, HSG D (2S)
0.126	65	Brush, Good, HSG C (1S, 2S)
0.249	96	Gravel surface, HSG C (1S)
0.937	98	Impervious (1S, 2S)
9.849	**76**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.353	HSG B	2S
8.289	HSG C	1S, 2S
0.270	HSG D	2S
0.937	Other	1S, 2S
9.849		**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
0.000	0.353	7.913	0.270	0.000	8.536	>75% Grass cover, Good	1S, 2S
0.000	0.000	0.126	0.000	0.000	0.126	Brush, Good	1S, 2S
0.000	0.000	0.249	0.000	0.000	0.249	Gravel surface	1S
0.000	0.000	0.000	0.000	0.937	0.937	Impervious	1S, 2S
0.000	**0.353**	**8.289**	**0.270**	**0.937**	**9.849**	**TOTAL AREA**	

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

Subcatchment 1S: Runoff Area=168,848 sf 12.26% Impervious Runoff Depth>2.87"
Flow Length=362' Tc=19.9 min CN=78 Runoff=9.47 cfs 0.927 af

Subcatchment 2S: Runoff Area=260,178 sf 7.74% Impervious Runoff Depth>2.61"
Flow Length=411' Tc=15.0 min CN=75 Runoff=14.81 cfs 1.297 af

Reach AP1: Inflow=9.47 cfs 0.927 af
Outflow=9.47 cfs 0.927 af

Reach AP2: Inflow=14.81 cfs 1.297 af
Outflow=14.81 cfs 1.297 af

Total Runoff Area = 9.849 ac Runoff Volume = 2.224 af Average Runoff Depth = 2.71"
90.48% Pervious = 8.912 ac 9.52% Impervious = 0.937 ac

Summary for Subcatchment 1S:

Runoff = 9.47 cfs @ 12.27 hrs, Volume= 0.927 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.44"

	Area (sf)	CN	Description
*	20,706	98	Impervious
	10,859	96	Gravel surface, HSG C
	3,910	65	Brush, Good, HSG C
	0	80	>75% Grass cover, Good, HSG D
	0	61	>75% Grass cover, Good, HSG B
	133,373	74	>75% Grass cover, Good, HSG C
	168,848	78	Weighted Average
	148,142		87.74% Pervious Area
	20,706		12.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	100	0.0110	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.60"
2.8	262	0.0492	1.55		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.9	362	Total			

Summary for Subcatchment 2S:

Runoff = 14.81 cfs @ 12.21 hrs, Volume= 1.297 af, Depth> 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.44"

	Area (sf)	CN	Description
*	20,130	98	Impervious
	0	96	Gravel surface, HSG B
	1,593	65	Brush, Good, HSG C
	11,750	80	>75% Grass cover, Good, HSG D
	15,375	61	>75% Grass cover, Good, HSG B
	211,330	74	>75% Grass cover, Good, HSG C
	260,178	75	Weighted Average
	240,048		92.26% Pervious Area
	20,130		7.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0300	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.60"
3.6	311	0.0420	1.43		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.0	411	Total			

Summary for Reach AP1:

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.876 ac, 12.26% Impervious, Inflow Depth > 2.87" for 10-year event
Inflow = 9.47 cfs @ 12.27 hrs, Volume= 0.927 af
Outflow = 9.47 cfs @ 12.27 hrs, Volume= 0.927 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach AP2:

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.973 ac, 7.74% Impervious, Inflow Depth > 2.61" for 10-year event
Inflow = 14.81 cfs @ 12.21 hrs, Volume= 1.297 af
Outflow = 14.81 cfs @ 12.21 hrs, Volume= 1.297 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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

Subcatchment 1S: Runoff Area=168,848 sf 12.26% Impervious Runoff Depth>4.08"
Flow Length=362' Tc=19.9 min CN=78 Runoff=13.35 cfs 1.317 af

Subcatchment 2S: Runoff Area=260,178 sf 7.74% Impervious Runoff Depth>3.77"
Flow Length=411' Tc=15.0 min CN=75 Runoff=21.34 cfs 1.876 af

Reach AP1: Inflow=13.35 cfs 1.317 af
Outflow=13.35 cfs 1.317 af

Reach AP2: Inflow=21.34 cfs 1.876 af
Outflow=21.34 cfs 1.876 af

Total Runoff Area = 9.849 ac Runoff Volume = 3.193 af Average Runoff Depth = 3.89"
90.48% Pervious = 8.912 ac 9.52% Impervious = 0.937 ac

Summary for Subcatchment 1S:

Runoff = 13.35 cfs @ 12.27 hrs, Volume= 1.317 af, Depth> 4.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.88"

	Area (sf)	CN	Description
*	20,706	98	Impervious
	10,859	96	Gravel surface, HSG C
	3,910	65	Brush, Good, HSG C
	0	80	>75% Grass cover, Good, HSG D
	0	61	>75% Grass cover, Good, HSG B
	133,373	74	>75% Grass cover, Good, HSG C
	168,848	78	Weighted Average
	148,142		87.74% Pervious Area
	20,706		12.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	100	0.0110	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.60"
2.8	262	0.0492	1.55		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.9	362	Total			

Summary for Subcatchment 2S:

Runoff = 21.34 cfs @ 12.21 hrs, Volume= 1.876 af, Depth> 3.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.88"

	Area (sf)	CN	Description
*	20,130	98	Impervious
	0	96	Gravel surface, HSG B
	1,593	65	Brush, Good, HSG C
	11,750	80	>75% Grass cover, Good, HSG D
	15,375	61	>75% Grass cover, Good, HSG B
	211,330	74	>75% Grass cover, Good, HSG C
	260,178	75	Weighted Average
	240,048		92.26% Pervious Area
	20,130		7.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0300	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.60"
3.6	311	0.0420	1.43		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.0	411	Total			

Summary for Reach AP1:

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.876 ac, 12.26% Impervious, Inflow Depth > 4.08" for 25-year event
Inflow = 13.35 cfs @ 12.27 hrs, Volume= 1.317 af
Outflow = 13.35 cfs @ 12.27 hrs, Volume= 1.317 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach AP2:

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.973 ac, 7.74% Impervious, Inflow Depth > 3.77" for 25-year event
Inflow = 21.34 cfs @ 12.21 hrs, Volume= 1.876 af
Outflow = 21.34 cfs @ 12.21 hrs, Volume= 1.876 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10S: Runoff Area=63,988 sf 12.26% Impervious Runoff Depth=1.51"
Tc=6.0 min CN=77 Runoff=2.51 cfs 0.184 af

Subcatchment 11S: Runoff Area=76,986 sf 100.00% Impervious Runoff Depth=3.37"
Tc=6.0 min CN=98 Runoff=6.05 cfs 0.496 af

Subcatchment 12S: Runoff Area=34,483 sf 0.00% Impervious Runoff Depth=1.31"
Flow Length=363' Tc=10.7 min CN=74 Runoff=0.99 cfs 0.086 af

Subcatchment 13S: Runoff Area=28,783 sf 39.72% Impervious Runoff Depth=2.02"
Tc=6.0 min CN=84 Runoff=1.54 cfs 0.111 af

Subcatchment 20S: Runoff Area=174,272 sf 8.42% Impervious Runoff Depth=1.37"
Flow Length=762' Tc=11.8 min CN=75 Runoff=5.13 cfs 0.458 af

Subcatchment 21S: Runoff Area=22,159 sf 67.67% Impervious Runoff Depth=2.54"
Tc=6.0 min CN=90 Runoff=1.46 cfs 0.108 af

Subcatchment 22S: Runoff Area=28,352 sf 65.32% Impervious Runoff Depth=2.54"
Tc=6.0 min CN=90 Runoff=1.87 cfs 0.138 af

Reach AP1: Inflow=2.50 cfs 0.880 af
Outflow=2.50 cfs 0.880 af

Reach AP2: Inflow=6.32 cfs 0.705 af
Outflow=6.32 cfs 0.705 af

Pond 10P: Peak Elev=118.40' Storage=8,938 cf Inflow=8.55 cfs 0.680 af
Outflow=1.32 cfs 0.681 af

Pond 13P: Peak Elev=111.38' Storage=827 cf Inflow=1.54 cfs 0.111 af
Outflow=0.47 cfs 0.112 af

Pond 21P: Peak Elev=110.47' Storage=785 cf Inflow=1.46 cfs 0.108 af
Outflow=0.45 cfs 0.108 af

Pond 22P: Peak Elev=110.19' Storage=700 cf Inflow=1.87 cfs 0.138 af
Outflow=0.74 cfs 0.139 af

Pond D D2: DMH D2 Peak Elev=106.83' Inflow=1.19 cfs 0.247 af
15.0" Round Culvert n=0.013 L=39.6' S=0.0076 '/' Outflow=1.19 cfs 0.247 af

Total Runoff Area = 9.849 ac Runoff Volume = 1.581 af Average Runoff Depth = 1.93"
66.33% Pervious = 6.533 ac 33.67% Impervious = 3.316 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10S: Runoff Area=63,988 sf 12.26% Impervious Runoff Depth=3.00"
Tc=6.0 min CN=77 Runoff=5.06 cfs 0.367 af

Subcatchment 11S: Runoff Area=76,986 sf 100.00% Impervious Runoff Depth=5.20"
Tc=6.0 min CN=98 Runoff=9.19 cfs 0.766 af

Subcatchment 12S: Runoff Area=34,483 sf 0.00% Impervious Runoff Depth=2.72"
Flow Length=363' Tc=10.7 min CN=74 Runoff=2.13 cfs 0.179 af

Subcatchment 13S: Runoff Area=28,783 sf 39.72% Impervious Runoff Depth=3.68"
Tc=6.0 min CN=84 Runoff=2.76 cfs 0.202 af

Subcatchment 20S: Runoff Area=174,272 sf 8.42% Impervious Runoff Depth=2.81"
Flow Length=762' Tc=11.8 min CN=75 Runoff=10.81 cfs 0.937 af

Subcatchment 21S: Runoff Area=22,159 sf 67.67% Impervious Runoff Depth=4.30"
Tc=6.0 min CN=90 Runoff=2.41 cfs 0.182 af

Subcatchment 22S: Runoff Area=28,352 sf 65.32% Impervious Runoff Depth=4.30"
Tc=6.0 min CN=90 Runoff=3.08 cfs 0.233 af

Reach AP1: Inflow=5.30 cfs 1.515 af
Outflow=5.30 cfs 1.515 af

Reach AP2: Inflow=12.07 cfs 1.354 af
Outflow=12.07 cfs 1.354 af

Pond 10P: Peak Elev=119.03' Storage=14,870 cf Inflow=14.24 cfs 1.133 af
Outflow=3.53 cfs 1.133 af

Pond 13P: Peak Elev=111.94' Storage=2,234 cf Inflow=2.76 cfs 0.202 af
Outflow=0.75 cfs 0.202 af

Pond 21P: Peak Elev=111.16' Storage=1,699 cf Inflow=2.41 cfs 0.182 af
Outflow=0.88 cfs 0.183 af

Pond 22P: Peak Elev=110.75' Storage=2,019 cf Inflow=3.08 cfs 0.233 af
Outflow=0.94 cfs 0.234 af

Pond D D2: DMH D2 Peak Elev=106.99' Inflow=1.80 cfs 0.417 af
15.0" Round Culvert n=0.013 L=39.6' S=0.0076 '/' Outflow=1.80 cfs 0.417 af

Total Runoff Area = 9.849 ac Runoff Volume = 2.867 af Average Runoff Depth = 3.49"
66.33% Pervious = 6.533 ac 33.67% Impervious = 3.316 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10S: Runoff Area=63,988 sf 12.26% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=77 Runoff=7.16 cfs 0.521 af

Subcatchment 11S: Runoff Area=76,986 sf 100.00% Impervious Runoff Depth=6.64"
Tc=6.0 min CN=98 Runoff=11.65 cfs 0.978 af

Subcatchment 12S: Runoff Area=34,483 sf 0.00% Impervious Runoff Depth=3.94"
Flow Length=363' Tc=10.7 min CN=74 Runoff=3.10 cfs 0.260 af

Subcatchment 13S: Runoff Area=28,783 sf 39.72% Impervious Runoff Depth=5.03"
Tc=6.0 min CN=84 Runoff=3.72 cfs 0.277 af

Subcatchment 20S: Runoff Area=174,272 sf 8.42% Impervious Runoff Depth=4.04"
Flow Length=762' Tc=11.8 min CN=75 Runoff=15.58 cfs 1.348 af

Subcatchment 21S: Runoff Area=22,159 sf 67.67% Impervious Runoff Depth=5.71"
Tc=6.0 min CN=90 Runoff=3.14 cfs 0.242 af

Subcatchment 22S: Runoff Area=28,352 sf 65.32% Impervious Runoff Depth=5.71"
Tc=6.0 min CN=90 Runoff=4.02 cfs 0.309 af

Reach AP1: Inflow=8.78 cfs 2.037 af
Outflow=8.78 cfs 2.037 af

Reach AP2: Inflow=18.12 cfs 1.900 af
Outflow=18.12 cfs 1.900 af

Pond 10P: Peak Elev=119.45' Storage=19,341 cf Inflow=18.80 cfs 1.499 af
Outflow=5.61 cfs 1.500 af

Pond 13P: Peak Elev=112.18' Storage=2,884 cf Inflow=3.72 cfs 0.277 af
Outflow=1.38 cfs 0.277 af

Pond 21P: Peak Elev=111.45' Storage=2,057 cf Inflow=3.14 cfs 0.242 af
Outflow=1.59 cfs 0.242 af

Pond 22P: Peak Elev=111.02' Storage=2,635 cf Inflow=4.02 cfs 0.309 af
Outflow=1.64 cfs 0.310 af

Pond D D2: DMH D2 Peak Elev=107.30' Inflow=3.20 cfs 0.552 af
15.0" Round Culvert n=0.013 L=39.6' S=0.0076 '/' Outflow=3.20 cfs 0.552 af

Total Runoff Area = 9.849 ac Runoff Volume = 3.935 af Average Runoff Depth = 4.79"
66.33% Pervious = 6.533 ac 33.67% Impervious = 3.316 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10S: Runoff Area=63,988 sf 12.26% Impervious Runoff Depth=5.47"
Tc=6.0 min CN=77 Runoff=9.13 cfs 0.669 af

Subcatchment 11S: Runoff Area=76,986 sf 100.00% Impervious Runoff Depth=7.97"
Tc=6.0 min CN=98 Runoff=13.91 cfs 1.174 af

Subcatchment 12S: Runoff Area=34,483 sf 0.00% Impervious Runoff Depth=5.11"
Flow Length=363' Tc=10.7 min CN=74 Runoff=4.01 cfs 0.337 af

Subcatchment 13S: Runoff Area=28,783 sf 39.72% Impervious Runoff Depth=6.30"
Tc=6.0 min CN=84 Runoff=4.61 cfs 0.347 af

Subcatchment 20S: Runoff Area=174,272 sf 8.42% Impervious Runoff Depth=5.23"
Flow Length=762' Tc=11.8 min CN=75 Runoff=20.09 cfs 1.744 af

Subcatchment 21S: Runoff Area=22,159 sf 67.67% Impervious Runoff Depth=7.01"
Tc=6.0 min CN=90 Runoff=3.81 cfs 0.297 af

Subcatchment 22S: Runoff Area=28,352 sf 65.32% Impervious Runoff Depth=7.01"
Tc=6.0 min CN=90 Runoff=4.88 cfs 0.380 af

Reach AP1: Inflow=12.48 cfs 2.528 af
Outflow=12.48 cfs 2.528 af

Reach AP2: Inflow=24.53 cfs 2.422 af
Outflow=24.53 cfs 2.422 af

Pond 10P: Peak Elev=119.80' Storage=23,549 cf Inflow=23.04 cfs 1.843 af
Outflow=7.70 cfs 1.844 af

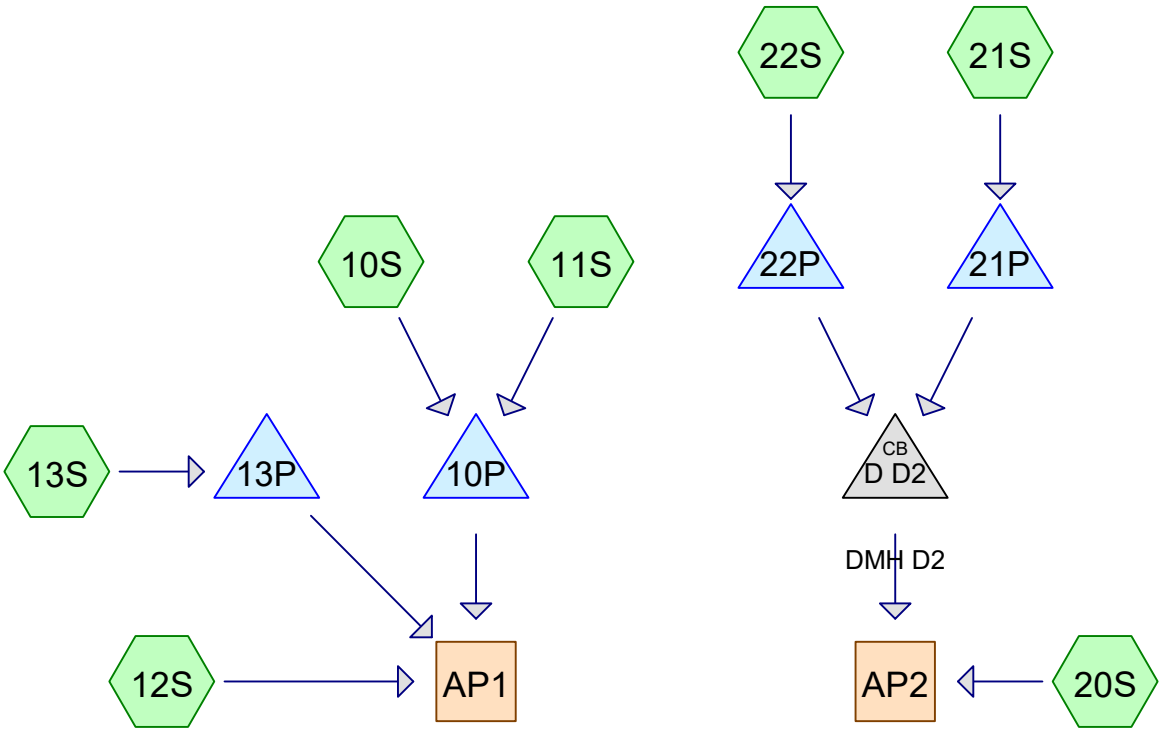
Pond 13P: Peak Elev=112.36' Storage=3,426 cf Inflow=4.61 cfs 0.347 af
Outflow=2.03 cfs 0.347 af

Pond 21P: Peak Elev=111.69' Storage=2,350 cf Inflow=3.81 cfs 0.297 af
Outflow=2.35 cfs 0.297 af

Pond 22P: Peak Elev=111.23' Storage=3,109 cf Inflow=4.88 cfs 0.380 af
Outflow=2.39 cfs 0.380 af

Pond D D2: DMH D2 Peak Elev=107.64' Inflow=4.72 cfs 0.678 af
15.0" Round Culvert n=0.013 L=39.6' S=0.0076 '/' Outflow=4.72 cfs 0.678 af

Total Runoff Area = 9.849 ac Runoff Volume = 4.949 af Average Runoff Depth = 6.03"
66.33% Pervious = 6.533 ac 33.67% Impervious = 3.316 ac



Subcat Reach Pond Link

Routing Diagram for Post-Development 2022-0219
Prepared by Fuss & O'Neill, Printed 2/24/2022
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10-year	Type III 24-hr		Default	24.00	1	5.44	2
2	25-year	Type III 24-hr		Default	24.00	1	6.88	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.353	61	>75% Grass cover, Good, HSG B (20S)
5.977	74	>75% Grass cover, Good, HSG C (10S, 12S, 13S, 20S, 21S, 22S)
0.203	80	>75% Grass cover, Good, HSG D (20S, 21S, 22S)
1.549	98	Paved parking (10S, 13S, 20S, 21S, 22S)
1.767	98	Roofs (11S)
9.849	**82**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.353	HSG B	20S
5.977	HSG C	10S, 12S, 13S, 20S, 21S, 22S
0.203	HSG D	20S, 21S, 22S
3.316	Other	10S, 11S, 13S, 20S, 21S, 22S
9.849		**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
0.000	0.353	5.977	0.203	0.000	6.533	>75% Grass cover, Good	10S, 12S, 13S, 20S, 21S, 22S
0.000	0.000	0.000	0.000	1.549	1.549	Paved parking	10S, 13S, 20S, 21S, 22S
0.000	0.000	0.000	0.000	1.767	1.767	Roofs	11S
0.000	**0.353**	**5.977**	**0.203**	**3.316**	**9.849**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	10P	113.50	111.00	200.0	0.0125	0.013	15.0	0.0	0.0
2	10P	113.92	113.92	5.0	0.0000	0.013	6.0	0.0	0.0
3	13P	107.50	107.11	39.1	0.0100	0.013	12.0	0.0	0.0
4	13P	107.92	107.92	10.0	0.0000	0.010	6.0	0.0	0.0
5	21P	106.50	106.35	19.8	0.0076	0.013	15.0	0.0	0.0
6	21P	106.59	106.59	100.0	0.0000	0.010	6.0	0.0	0.0
7	21P	110.18	110.18	6.7	0.0000	0.013	24.0	0.0	0.0
8	22P	106.50	106.36	18.7	0.0075	0.013	15.0	0.0	0.0
9	22P	106.59	106.59	100.0	0.0000	0.010	6.0	0.0	0.0
10	22P	111.21	111.21	8.0	0.0000	0.013	12.0	0.0	0.0
11	22P	110.18	110.18	4.5	0.0000	0.013	24.0	0.0	0.0
12	D D2	106.26	105.96	39.6	0.0076	0.013	15.0	0.0	0.0

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10S: Runoff Area=63,988 sf 12.26% Impervious Runoff Depth=3.00"
Tc=6.0 min CN=77 Runoff=5.06 cfs 0.367 af

Subcatchment 11S: Runoff Area=76,986 sf 100.00% Impervious Runoff Depth=5.20"
Tc=6.0 min CN=98 Runoff=9.19 cfs 0.766 af

Subcatchment 12S: Runoff Area=34,483 sf 0.00% Impervious Runoff Depth=2.72"
Flow Length=363' Tc=10.7 min CN=74 Runoff=2.13 cfs 0.179 af

Subcatchment 13S: Runoff Area=28,783 sf 39.72% Impervious Runoff Depth=3.68"
Tc=6.0 min CN=84 Runoff=2.76 cfs 0.202 af

Subcatchment 20S: Runoff Area=174,272 sf 8.42% Impervious Runoff Depth=2.81"
Flow Length=762' Tc=11.8 min CN=75 Runoff=10.81 cfs 0.937 af

Subcatchment 21S: Runoff Area=22,159 sf 67.67% Impervious Runoff Depth=4.30"
Tc=6.0 min CN=90 Runoff=2.41 cfs 0.182 af

Subcatchment 22S: Runoff Area=28,352 sf 65.32% Impervious Runoff Depth=4.30"
Tc=6.0 min CN=90 Runoff=3.08 cfs 0.233 af

Reach AP1: Inflow=5.30 cfs 1.515 af
Outflow=5.30 cfs 1.515 af

Reach AP2: Inflow=12.07 cfs 1.354 af
Outflow=12.07 cfs 1.354 af

Pond 10P: Peak Elev=119.03' Storage=14,870 cf Inflow=14.24 cfs 1.133 af
Outflow=3.53 cfs 1.133 af

Pond 13P: Peak Elev=111.94' Storage=2,234 cf Inflow=2.76 cfs 0.202 af
Outflow=0.75 cfs 0.202 af

Pond 21P: Peak Elev=111.16' Storage=1,699 cf Inflow=2.41 cfs 0.182 af
Outflow=0.88 cfs 0.183 af

Pond 22P: Peak Elev=110.75' Storage=2,019 cf Inflow=3.08 cfs 0.233 af
Outflow=0.94 cfs 0.234 af

Pond D D2: DMH D2 Peak Elev=106.99' Inflow=1.80 cfs 0.417 af
15.0" Round Culvert n=0.013 L=39.6' S=0.0076 '/' Outflow=1.80 cfs 0.417 af

Total Runoff Area = 9.849 ac Runoff Volume = 2.867 af Average Runoff Depth = 3.49"
66.33% Pervious = 6.533 ac 33.67% Impervious = 3.316 ac

Summary for Subcatchment 10S:

Runoff = 5.06 cfs @ 12.09 hrs, Volume= 0.367 af, Depth= 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.44"

	Area (sf)	CN	Description
*	7,848	98	Paved parking
	0	80	>75% Grass cover, Good, HSG D
	0	61	>75% Grass cover, Good, HSG B
	56,140	74	>75% Grass cover, Good, HSG C
	63,988	77	Weighted Average
	56,140		87.74% Pervious Area
	7,848		12.26% Impervious Area

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

Summary for Subcatchment 11S:

Runoff = 9.19 cfs @ 12.09 hrs, Volume= 0.766 af, Depth= 5.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.44"

	Area (sf)	CN	Description
*	76,986	98	Roofs
	76,986		100.00% Impervious Area

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

Summary for Subcatchment 12S:

Runoff = 2.13 cfs @ 12.15 hrs, Volume= 0.179 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.44"

	Area (sf)	CN	Description
*	0	98	Paved parking
	0	80	>75% Grass cover, Good, HSG D
	0	61	>75% Grass cover, Good, HSG B
	34,483	74	>75% Grass cover, Good, HSG C
	34,483	74	Weighted Average
	34,483		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0330	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.60"
3.1	263	0.0420	1.43		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.7	363	Total			

Summary for Subcatchment 13S:

Runoff = 2.76 cfs @ 12.09 hrs, Volume= 0.202 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.44"

	Area (sf)	CN	Description
*	11,432	98	Paved parking
	0	80	>75% Grass cover, Good, HSG D
	0	61	>75% Grass cover, Good, HSG B
	17,351	74	>75% Grass cover, Good, HSG C
	28,783	84	Weighted Average
	17,351		60.28% Pervious Area
	11,432		39.72% Impervious Area

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

Summary for Subcatchment 20S:

Runoff = 10.81 cfs @ 12.17 hrs, Volume= 0.937 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.44"

	Area (sf)	CN	Description
*	14,667	98	Paved parking
	7,838	80	>75% Grass cover, Good, HSG D
	15,375	61	>75% Grass cover, Good, HSG B
	136,392	74	>75% Grass cover, Good, HSG C
	174,272	75	Weighted Average
	159,605		91.58% Pervious Area
	14,667		8.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	100	0.0700	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.60"
2.2	204	0.0490	1.55		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.4	458	0.0100	5.28	29.03	**Channel Flow,** Area= 5.5 sf Perim= 5.0' r= 1.10' n= 0.030 Earth, grassed & winding
11.8	762	Total			

Summary for Subcatchment 21S:

Runoff = 2.41 cfs @ 12.09 hrs, Volume= 0.182 af, Depth= 4.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.44"

	Area (sf)	CN	Description
*	14,994	98	Paved parking
	6,461	74	>75% Grass cover, Good, HSG C
	704	80	>75% Grass cover, Good, HSG D
	22,159	90	Weighted Average
	7,165		32.33% Pervious Area
	14,994		67.67% Impervious Area

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

Summary for Subcatchment 22S:

Runoff = 3.08 cfs @ 12.09 hrs, Volume= 0.233 af, Depth= 4.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.44"

	Area (sf)	CN	Description
*	18,519	98	Paved parking
	9,529	74	>75% Grass cover, Good, HSG C
	304	80	>75% Grass cover, Good, HSG D
	28,352	90	Weighted Average
	9,833		34.68% Pervious Area
	18,519		65.32% Impervious Area

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

Summary for Reach AP1:

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.689 ac, 47.13% Impervious, Inflow Depth = 3.88" for 10-year event
Inflow = 5.30 cfs @ 12.37 hrs, Volume= 1.515 af
Outflow = 5.30 cfs @ 12.37 hrs, Volume= 1.515 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach AP2:

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.160 ac, 21.43% Impervious, Inflow Depth = 3.15" for 10-year event
Inflow = 12.07 cfs @ 12.17 hrs, Volume= 1.354 af
Outflow = 12.07 cfs @ 12.17 hrs, Volume= 1.354 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Pond 10P:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=56)

Inflow Area = 3.236 ac, 60.18% Impervious, Inflow Depth = 4.20" for 10-year event
Inflow = 14.24 cfs @ 12.09 hrs, Volume= 1.133 af
Outflow = 3.53 cfs @ 12.47 hrs, Volume= 1.133 af, Atten= 75%, Lag= 23.1 min
Primary = 3.53 cfs @ 12.47 hrs, Volume= 1.133 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 119.03' @ 12.47 hrs Surf.Area= 10,184 sf Storage= 14,870 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 57.2 min (829.5 - 772.3)

Volume	Invert	Avail.Storage	Storage Description
#1	117.00'	40,840 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
117.00	4,470	0	0
118.00	7,240	5,855	5,855
120.00	12,930	20,170	26,025
121.00	16,700	14,815	40,840

Device	Routing	Invert	Outlet Devices
#1	Primary	113.50'	**15.0" Round Outlet Pipe** L= 200.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 113.50' / 111.00' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	113.92'	**6.0" Round 6" Underdrain** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 113.92' / 113.92' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#3	Device 2	117.00'	**10.000 in/hr Filter Media Exfiltration over Surface area below 117.00'**
#4	Device 1	118.20'	**Weir Invert, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.60 Width (feet) 1.00 1.00
#5	Device 1	119.80'	**48.0" Horiz. Rim Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.53 cfs @ 12.47 hrs HW=119.03' TW=0.00' (Dynamic Tailwater)
- **1=Outlet Pipe** (Passes 3.53 cfs of 10.33 cfs potential flow)
  - **2=6" Underdrain** (Passes 1.03 cfs of 2.08 cfs potential flow)
    - **3=Filter Media Exfiltration** (Exfiltration Controls 1.03 cfs)
  - **4=Weir Invert** (Weir Controls 2.49 cfs @ 2.99 fps)
  - **5=Rim Grate** (Controls 0.00 cfs)

Summary for Pond 13P:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=92)

Inflow Area = 0.661 ac, 39.72% Impervious, Inflow Depth = 3.68" for 10-year event
Inflow = 2.76 cfs @ 12.09 hrs, Volume= 0.202 af
Outflow = 0.75 cfs @ 12.46 hrs, Volume= 0.202 af, Atten= 73%, Lag= 22.0 min
Primary = 0.75 cfs @ 12.46 hrs, Volume= 0.202 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 111.94' @ 12.46 hrs Surf.Area= 2,701 sf Storage= 2,234 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 24.6 min (831.8 - 807.2)

Volume	Invert	Avail.Storage	Storage Description
#1	111.00'	9,755 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
111.00	2,030	0	0
112.00	2,740	2,385	2,385
113.00	3,600	3,170	5,555
114.00	4,800	4,200	9,755

Device	Routing	Invert	Outlet Devices
#1	Primary	107.50'	**12.0" Round Culvert** L= 39.1' Ke= 0.500 Inlet / Outlet Invert= 107.50' / 107.11' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	107.92'	**6.0" Round 6" underdrain** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 107.92' / 107.92' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 2	111.00'	**10.000 in/hr Filter Media Exfiltration over Surface area below 111.00'**
#4	Device 1	111.75'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.25 Width (feet) 1.00 1.00
#5	Device 1	113.00'	**48.0" Horiz. Rim Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.75 cfs @ 12.46 hrs HW=111.94' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.75 cfs of 7.47 cfs potential flow)
  - **2=6" underdrain** (Passes 0.47 cfs of 1.84 cfs potential flow)
    - **3=Filter Media Exfiltration** (Exfiltration Controls 0.47 cfs)
  - **4=Custom Weir/Orifice** (Weir Controls 0.28 cfs @ 1.44 fps)
  - **5=Rim Grate** (Controls 0.00 cfs)

Summary for Pond 21P:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=97)

Inflow Area = 0.509 ac, 67.67% Impervious, Inflow Depth = 4.30" for 10-year event
Inflow = 2.41 cfs @ 12.09 hrs, Volume= 0.182 af
Outflow = 0.88 cfs @ 12.35 hrs, Volume= 0.183 af, Atten= 64%, Lag= 15.9 min
Primary = 0.88 cfs @ 12.35 hrs, Volume= 0.183 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 111.16' @ 12.35 hrs Surf.Area= 1,925 sf Storage= 1,699 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 17.0 min (804.8 - 787.9)

Volume	Invert	Avail.Storage	Storage Description
#1	109.67'	2,007 cf	**Stone (Prismatic)** Listed below (Recalc) 6,718 cf Overall - 1,700 cf Embedded = 5,018 cf x 40.0% Voids
#2	110.17'	551 cf	**ADS_StormTech SC-740 +Cap** x 12 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 12 Chambers in 2 Rows
#3	110.17'	459 cf	**ADS_StormTech SC-740 +Cap** x 10 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 10 Chambers in 2 Rows
#4	110.17'	505 cf	**ADS_StormTech SC-740 +Cap** x 11 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#5	110.17'	184 cf	**ADS_StormTech SC-740 +Cap** x 4 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		3,707 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.67	1,925	0	0
113.16	1,925	6,718	6,718

Device	Routing	Invert	Outlet Devices
#1	Primary	106.50'	**15.0" Round Culvert** L= 19.8' Ke= 0.500 Inlet / Outlet Invert= 106.50' / 106.35' S= 0.0076 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	106.59'	**6.0" Round Underdrain** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 106.59' / 106.59' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 2	109.67'	**10.000 in/hr Exfiltration over Surface area below 109.67'**
#4	Device 1	110.85'	**OS Weir, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.50 1.50 3.56 Width (feet) 0.75 0.75 5.00 5.00
#5	Device 4	110.18'	**24.0" Round 24"Outlet** L= 6.7' Ke= 0.500

Inlet / Outlet Invert= 110.18' / 110.18' S= 0.0000 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.88 cfs @ 12.35 hrs HW=111.16' TW=106.99' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.88 cfs of 11.87 cfs potential flow)
- **2=Underdrain** (Passes 0.45 cfs of 1.28 cfs potential flow)
  - **3=Exfiltration** (Exfiltration Controls 0.45 cfs)
- **4=OS Weir** (Weir Controls 0.43 cfs @ 1.83 fps)
  - **5=24"Outlet** (Passes 0.43 cfs of 3.29 cfs potential flow)

Summary for Pond 22P:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=102)

Inflow Area = 0.651 ac, 65.32% Impervious, Inflow Depth = 4.30" for 10-year event
Inflow = 3.08 cfs @ 12.09 hrs, Volume= 0.233 af
Outflow = 0.94 cfs @ 12.41 hrs, Volume= 0.234 af, Atten= 70%, Lag= 19.4 min
Primary = 0.94 cfs @ 12.41 hrs, Volume= 0.234 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 110.75' @ 12.41 hrs Surf.Area= 3,205 sf Storage= 2,019 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 12.8 min (800.7 - 787.9)

Volume	Invert	Avail.Storage	Storage Description
#1	109.67'	3,188 cf	**Stone (Prismatic)** Listed below (Recalc) 11,185 cf Overall - 3,216 cf Embedded = 7,970 cf x 40.0% Voids
#2	110.17'	1,838 cf	**ADS_StormTech SC-740 +Cap** x 40 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 40 Chambers in 4 Rows
#3	110.17'	1,103 cf	**ADS_StormTech SC-740 +Cap** x 24 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 24 Chambers in 2 Rows
#4	110.17'	276 cf	**ADS_StormTech SC-740 +Cap** x 6 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		6,404 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.67	3,205	0	0
113.16	3,205	11,185	11,185

Device	Routing	Invert	Outlet Devices
#1	Primary	106.50'	**15.0" Round Culvert** L= 18.7' Ke= 0.500 Inlet / Outlet Invert= 106.50' / 106.36' S= 0.0075 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	106.59'	**6.0" Round Underdrain** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 106.59' / 106.59' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 2	109.67'	**10.000 in/hr Exfiltration over Surface area below 109.67'**
#4	Device 1	110.60'	**OS Weir, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.00 1.00 4.31 Width (feet) 1.00 1.00 5.00 5.00
#5	Device 4	111.21'	**12.0" Round 12" Outlet** L= 8.0' Ke= 0.500 Inlet / Outlet Invert= 111.21' / 111.21' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#6	Device 4	110.18'	**24.0" Round 24" Outlet** L= 4.5' Ke= 0.500

Inlet / Outlet Invert= 110.18' / 110.18' S= 0.0000 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.93 cfs @ 12.41 hrs HW=110.75' TW=106.98' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.93 cfs of 11.25 cfs potential flow)
- **2=Underdrain** (Passes 0.74 cfs of 1.21 cfs potential flow)
  - **3=Exfiltration** (Exfiltration Controls 0.74 cfs)
- **4=OS Weir** (Weir Controls 0.19 cfs @ 1.27 fps)
  - **5=12" Outlet** (Controls 0.00 cfs)
  - **6=24" Outlet** (Passes 0.19 cfs of 1.17 cfs potential flow)

Summary for Pond D D2: DMH D2

[57] Hint: Peaked at 106.99' (Flood elevation advised)

Inflow Area = 1.160 ac, 66.35% Impervious, Inflow Depth = 4.31" for 10-year event
Inflow = 1.80 cfs @ 12.38 hrs, Volume= 0.417 af
Outflow = 1.80 cfs @ 12.38 hrs, Volume= 0.417 af, Atten= 0%, Lag= 0.0 min
Primary = 1.80 cfs @ 12.38 hrs, Volume= 0.417 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 106.99' @ 12.38 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	106.26'	**15.0" Round Culvert** L= 39.6' Ke= 0.500 Inlet / Outlet Invert= 106.26' / 105.96' S= 0.0076 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.80 cfs @ 12.38 hrs HW=106.99' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.80 cfs @ 3.49 fps)

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10S: Runoff Area=63,988 sf 12.26% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=77 Runoff=7.16 cfs 0.521 af

Subcatchment 11S: Runoff Area=76,986 sf 100.00% Impervious Runoff Depth=6.64"
Tc=6.0 min CN=98 Runoff=11.65 cfs 0.978 af

Subcatchment 12S: Runoff Area=34,483 sf 0.00% Impervious Runoff Depth=3.94"
Flow Length=363' Tc=10.7 min CN=74 Runoff=3.10 cfs 0.260 af

Subcatchment 13S: Runoff Area=28,783 sf 39.72% Impervious Runoff Depth=5.03"
Tc=6.0 min CN=84 Runoff=3.72 cfs 0.277 af

Subcatchment 20S: Runoff Area=174,272 sf 8.42% Impervious Runoff Depth=4.04"
Flow Length=762' Tc=11.8 min CN=75 Runoff=15.58 cfs 1.348 af

Subcatchment 21S: Runoff Area=22,159 sf 67.67% Impervious Runoff Depth=5.71"
Tc=6.0 min CN=90 Runoff=3.14 cfs 0.242 af

Subcatchment 22S: Runoff Area=28,352 sf 65.32% Impervious Runoff Depth=5.71"
Tc=6.0 min CN=90 Runoff=4.02 cfs 0.309 af

Reach AP1: Inflow=8.78 cfs 2.037 af
Outflow=8.78 cfs 2.037 af

Reach AP2: Inflow=18.12 cfs 1.900 af
Outflow=18.12 cfs 1.900 af

Pond 10P: Peak Elev=119.45' Storage=19,341 cf Inflow=18.80 cfs 1.499 af
Outflow=5.61 cfs 1.500 af

Pond 13P: Peak Elev=112.18' Storage=2,884 cf Inflow=3.72 cfs 0.277 af
Outflow=1.38 cfs 0.277 af

Pond 21P: Peak Elev=111.45' Storage=2,057 cf Inflow=3.14 cfs 0.242 af
Outflow=1.59 cfs 0.242 af

Pond 22P: Peak Elev=111.02' Storage=2,635 cf Inflow=4.02 cfs 0.309 af
Outflow=1.64 cfs 0.310 af

Pond D D2: DMH D2 Peak Elev=107.30' Inflow=3.20 cfs 0.552 af
15.0" Round Culvert n=0.013 L=39.6' S=0.0076 '/' Outflow=3.20 cfs 0.552 af

Total Runoff Area = 9.849 ac Runoff Volume = 3.935 af Average Runoff Depth = 4.79"
66.33% Pervious = 6.533 ac 33.67% Impervious = 3.316 ac

Summary for Subcatchment 10S:

Runoff = 7.16 cfs @ 12.09 hrs, Volume= 0.521 af, Depth= 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.88"

	Area (sf)	CN	Description
*	7,848	98	Paved parking
	0	80	>75% Grass cover, Good, HSG D
	0	61	>75% Grass cover, Good, HSG B
	56,140	74	>75% Grass cover, Good, HSG C
	63,988	77	Weighted Average
	56,140		87.74% Pervious Area
	7,848		12.26% Impervious Area

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

Summary for Subcatchment 11S:

Runoff = 11.65 cfs @ 12.09 hrs, Volume= 0.978 af, Depth= 6.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.88"

	Area (sf)	CN	Description
*	76,986	98	Roofs
	76,986		100.00% Impervious Area

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

Summary for Subcatchment 12S:

Runoff = 3.10 cfs @ 12.15 hrs, Volume= 0.260 af, Depth= 3.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.88"

	Area (sf)	CN	Description
*	0	98	Paved parking
	0	80	>75% Grass cover, Good, HSG D
	0	61	>75% Grass cover, Good, HSG B
	34,483	74	>75% Grass cover, Good, HSG C
	34,483	74	Weighted Average
	34,483		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0330	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.60"
3.1	263	0.0420	1.43		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.7	363	Total			

Summary for Subcatchment 13S:

Runoff = 3.72 cfs @ 12.09 hrs, Volume= 0.277 af, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.88"

	Area (sf)	CN	Description
*	11,432	98	Paved parking
	0	80	>75% Grass cover, Good, HSG D
	0	61	>75% Grass cover, Good, HSG B
	17,351	74	>75% Grass cover, Good, HSG C
	28,783	84	Weighted Average
	17,351		60.28% Pervious Area
	11,432		39.72% Impervious Area

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

Summary for Subcatchment 20S:

Runoff = 15.58 cfs @ 12.16 hrs, Volume= 1.348 af, Depth= 4.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.88"

	Area (sf)	CN	Description
*	14,667	98	Paved parking
	7,838	80	>75% Grass cover, Good, HSG D
	15,375	61	>75% Grass cover, Good, HSG B
	136,392	74	>75% Grass cover, Good, HSG C
	174,272	75	Weighted Average
	159,605		91.58% Pervious Area
	14,667		8.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	100	0.0700	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.60"
2.2	204	0.0490	1.55		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.4	458	0.0100	5.28	29.03	**Channel Flow,** Area= 5.5 sf Perim= 5.0' r= 1.10' n= 0.030 Earth, grassed & winding
11.8	762	Total			

Summary for Subcatchment 21S:

Runoff = 3.14 cfs @ 12.09 hrs, Volume= 0.242 af, Depth= 5.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.88"

	Area (sf)	CN	Description
*	14,994	98	Paved parking
	6,461	74	>75% Grass cover, Good, HSG C
	704	80	>75% Grass cover, Good, HSG D
	22,159	90	Weighted Average
	7,165		32.33% Pervious Area
	14,994		67.67% Impervious Area

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

Summary for Subcatchment 22S:

Runoff = 4.02 cfs @ 12.09 hrs, Volume= 0.309 af, Depth= 5.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.88"

	Area (sf)	CN	Description
*	18,519	98	Paved parking
	9,529	74	>75% Grass cover, Good, HSG C
	304	80	>75% Grass cover, Good, HSG D
	28,352	90	Weighted Average
	9,833		34.68% Pervious Area
	18,519		65.32% Impervious Area

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

Summary for Reach AP1:

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.689 ac, 47.13% Impervious, Inflow Depth = 5.21" for 25-year event
Inflow = 8.78 cfs @ 12.27 hrs, Volume= 2.037 af
Outflow = 8.78 cfs @ 12.27 hrs, Volume= 2.037 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach AP2:

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.160 ac, 21.43% Impervious, Inflow Depth = 4.42" for 25-year event
Inflow = 18.12 cfs @ 12.18 hrs, Volume= 1.900 af
Outflow = 18.12 cfs @ 12.18 hrs, Volume= 1.900 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Pond 10P:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=48)

Inflow Area = 3.236 ac, 60.18% Impervious, Inflow Depth = 5.56" for 25-year event
Inflow = 18.80 cfs @ 12.09 hrs, Volume= 1.499 af
Outflow = 5.61 cfs @ 12.42 hrs, Volume= 1.500 af, Atten= 70%, Lag= 19.8 min
Primary = 5.61 cfs @ 12.42 hrs, Volume= 1.500 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 119.45' @ 12.42 hrs Surf.Area= 11,365 sf Storage= 19,341 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 56.1 min (824.6 - 768.4)

Volume	Invert	Avail.Storage	Storage Description
#1	117.00'	40,840 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
117.00	4,470	0	0
118.00	7,240	5,855	5,855
120.00	12,930	20,170	26,025
121.00	16,700	14,815	40,840

Device	Routing	Invert	Outlet Devices
#1	Primary	113.50'	**15.0" Round Outlet Pipe** L= 200.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 113.50' / 111.00' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	113.92'	**6.0" Round 6" Underdrain** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 113.92' / 113.92' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#3	Device 2	117.00'	**10.000 in/hr Filter Media Exfiltration over Surface area below 117.00'**
#4	Device 1	118.20'	**Weir Invert, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.60 Width (feet) 1.00 1.00
#5	Device 1	119.80'	**48.0" Horiz. Rim Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.60 cfs @ 12.42 hrs HW=119.45' TW=0.00' (Dynamic Tailwater)
- **1=Outlet Pipe** (Passes 5.60 cfs of 10.64 cfs potential flow)
  - **2=6" Underdrain** (Passes 1.03 cfs of 2.17 cfs potential flow)
    - **3=Filter Media Exfiltration** (Exfiltration Controls 1.03 cfs)
  - **4=Weir Invert** (Weir Controls 4.57 cfs @ 3.66 fps)
  - **5=Rim Grate** (Controls 0.00 cfs)

Summary for Pond 13P:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=87)

Inflow Area = 0.661 ac, 39.72% Impervious, Inflow Depth = 5.03" for 25-year event
Inflow = 3.72 cfs @ 12.09 hrs, Volume= 0.277 af
Outflow = 1.38 cfs @ 12.35 hrs, Volume= 0.277 af, Atten= 63%, Lag= 15.7 min
Primary = 1.38 cfs @ 12.35 hrs, Volume= 0.277 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 112.18' @ 12.35 hrs Surf.Area= 2,892 sf Storage= 2,884 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 25.0 min (823.4 - 798.4)

Volume	Invert	Avail.Storage	Storage Description
#1	111.00'	9,755 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
111.00	2,030	0	0
112.00	2,740	2,385	2,385
113.00	3,600	3,170	5,555
114.00	4,800	4,200	9,755

Device	Routing	Invert	Outlet Devices
#1	Primary	107.50'	**12.0" Round Culvert** L= 39.1' Ke= 0.500 Inlet / Outlet Invert= 107.50' / 107.11' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	107.92'	**6.0" Round 6" underdrain** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 107.92' / 107.92' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 2	111.00'	**10.000 in/hr Filter Media Exfiltration over Surface area below 111.00'**
#4	Device 1	111.75'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.25 Width (feet) 1.00 1.00
#5	Device 1	113.00'	**48.0" Horiz. Rim Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.38 cfs @ 12.35 hrs HW=112.18' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.38 cfs of 7.70 cfs potential flow)
  - **2=6" underdrain** (Passes 0.47 cfs of 1.89 cfs potential flow)
    - **3=Filter Media Exfiltration** (Exfiltration Controls 0.47 cfs)
  - **4=Custom Weir/Orifice** (Weir Controls 0.91 cfs @ 2.14 fps)
  - **5=Rim Grate** (Controls 0.00 cfs)

Summary for Pond 21P:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=94)

Inflow Area = 0.509 ac, 67.67% Impervious, Inflow Depth = 5.71" for 25-year event
Inflow = 3.14 cfs @ 12.09 hrs, Volume= 0.242 af
Outflow = 1.59 cfs @ 12.24 hrs, Volume= 0.242 af, Atten= 49%, Lag= 9.3 min
Primary = 1.59 cfs @ 12.24 hrs, Volume= 0.242 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 111.45' @ 12.24 hrs Surf.Area= 1,925 sf Storage= 2,057 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 16.4 min (796.8 - 780.4)

Volume	Invert	Avail.Storage	Storage Description
#1	109.67'	2,007 cf	**Stone (Prismatic)** Listed below (Recalc) 6,718 cf Overall - 1,700 cf Embedded = 5,018 cf x 40.0% Voids
#2	110.17'	551 cf	**ADS_StormTech SC-740 +Cap** x 12 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 12 Chambers in 2 Rows
#3	110.17'	459 cf	**ADS_StormTech SC-740 +Cap** x 10 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 10 Chambers in 2 Rows
#4	110.17'	505 cf	**ADS_StormTech SC-740 +Cap** x 11 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#5	110.17'	184 cf	**ADS_StormTech SC-740 +Cap** x 4 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		3,707 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.67	1,925	0	0
113.16	1,925	6,718	6,718

Device	Routing	Invert	Outlet Devices
#1	Primary	106.50'	**15.0" Round Culvert** L= 19.8' Ke= 0.500 Inlet / Outlet Invert= 106.50' / 106.35' S= 0.0076 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	106.59'	**6.0" Round Underdrain** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 106.59' / 106.59' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 2	109.67'	**10.000 in/hr Exfiltration over Surface area below 109.67'**
#4	Device 1	110.85'	**OS Weir, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.50 1.50 3.56 Width (feet) 0.75 0.75 5.00 5.00
#5	Device 4	110.18'	**24.0" Round 24"Outlet** L= 6.7' Ke= 0.500

Inlet / Outlet Invert= 110.18' / 110.18' S= 0.0000 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=1.58 cfs @ 12.24 hrs HW=111.45' TW=107.29' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.58 cfs of 12.05 cfs potential flow)
- **2=Underdrain** (Passes 0.45 cfs of 1.29 cfs potential flow)
  - **3=Exfiltration** (Exfiltration Controls 0.45 cfs)
- **4=OS Weir** (Weir Controls 1.13 cfs @ 2.53 fps)
  - **5=24"Outlet** (Passes 1.13 cfs of 5.28 cfs potential flow)

Summary for Pond 22P:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=100)

Inflow Area = 0.651 ac, 65.32% Impervious, Inflow Depth = 5.71" for 25-year event
Inflow = 4.02 cfs @ 12.09 hrs, Volume= 0.309 af
Outflow = 1.64 cfs @ 12.31 hrs, Volume= 0.310 af, Atten= 59%, Lag= 13.3 min
Primary = 1.64 cfs @ 12.31 hrs, Volume= 0.310 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 111.02' @ 12.31 hrs Surf.Area= 3,205 sf Storage= 2,635 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 13.7 min (794.1 - 780.4)

Volume	Invert	Avail.Storage	Storage Description
#1	109.67'	3,188 cf	**Stone (Prismatic)** Listed below (Recalc) 11,185 cf Overall - 3,216 cf Embedded = 7,970 cf x 40.0% Voids
#2	110.17'	1,838 cf	**ADS_StormTech SC-740 +Cap** x 40 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 40 Chambers in 4 Rows
#3	110.17'	1,103 cf	**ADS_StormTech SC-740 +Cap** x 24 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 24 Chambers in 2 Rows
#4	110.17'	276 cf	**ADS_StormTech SC-740 +Cap** x 6 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		6,404 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.67	3,205	0	0
113.16	3,205	11,185	11,185

Device	Routing	Invert	Outlet Devices
#1	Primary	106.50'	**15.0" Round Culvert** L= 18.7' Ke= 0.500 Inlet / Outlet Invert= 106.50' / 106.36' S= 0.0075 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	106.59'	**6.0" Round Underdrain** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 106.59' / 106.59' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 2	109.67'	**10.000 in/hr Exfiltration over Surface area below 109.67'**
#4	Device 1	110.60'	**OS Weir, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.00 1.00 4.31 Width (feet) 1.00 1.00 5.00 5.00
#5	Device 4	111.21'	**12.0" Round 12" Outlet** L= 8.0' Ke= 0.500 Inlet / Outlet Invert= 111.21' / 111.21' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#6	Device 4	110.18'	**24.0" Round 24" Outlet** L= 4.5' Ke= 0.500

Inlet / Outlet Invert= 110.18' / 110.18' S= 0.0000 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=1.63 cfs @ 12.31 hrs HW=111.02' TW=107.29' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.63 cfs of 11.42 cfs potential flow)
- **2=Underdrain** (Passes 0.74 cfs of 1.22 cfs potential flow)
  - **3=Exfiltration** (Exfiltration Controls 0.74 cfs)
- **4=OS Weir** (Weir Controls 0.89 cfs @ 2.12 fps)
  - **5=12" Outlet** (Controls 0.00 cfs)
  - **6=24" Outlet** (Passes 0.89 cfs of 2.47 cfs potential flow)

Summary for Pond D D2: DMH D2

[57] Hint: Peaked at 107.30' (Flood elevation advised)

Inflow Area = 1.160 ac, 66.35% Impervious, Inflow Depth = 5.71" for 25-year event
Inflow = 3.20 cfs @ 12.27 hrs, Volume= 0.552 af
Outflow = 3.20 cfs @ 12.27 hrs, Volume= 0.552 af, Atten= 0%, Lag= 0.0 min
Primary = 3.20 cfs @ 12.27 hrs, Volume= 0.552 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 107.30' @ 12.27 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	106.26'	**15.0" Round Culvert** L= 39.6' Ke= 0.500 Inlet / Outlet Invert= 106.26' / 105.96' S= 0.0076 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.17 cfs @ 12.27 hrs HW=107.29' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.17 cfs @ 3.97 fps)

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond 10P: Peak Elev=119.80' Storage=23,549 cf Inflow=23.04 cfs 1.843 af
Outflow=7.70 cfs 1.844 af

Pond 13P: Peak Elev=112.36' Storage=3,426 cf Inflow=4.61 cfs 0.347 af
Outflow=2.03 cfs 0.347 af

Pond 21P: Peak Elev=111.69' Storage=2,350 cf Inflow=3.81 cfs 0.297 af
Outflow=2.35 cfs 0.297 af

Pond 22P: Peak Elev=111.23' Storage=3,109 cf Inflow=4.88 cfs 0.380 af
Outflow=2.39 cfs 0.380 af

Summary for Pond 10P:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=41)

Inflow Area = 3.236 ac, 60.18% Impervious, Inflow Depth = 6.83" for 50-year event
Inflow = 23.04 cfs @ 12.09 hrs, Volume= 1.843 af
Outflow = 7.70 cfs @ 12.38 hrs, Volume= 1.844 af, Atten= 67%, Lag= 17.6 min
Primary = 7.70 cfs @ 12.38 hrs, Volume= 1.844 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 119.80' @ 12.38 hrs Surf.Area= 12,373 sf Storage= 23,549 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 55.3 min (820.8 - 765.5)

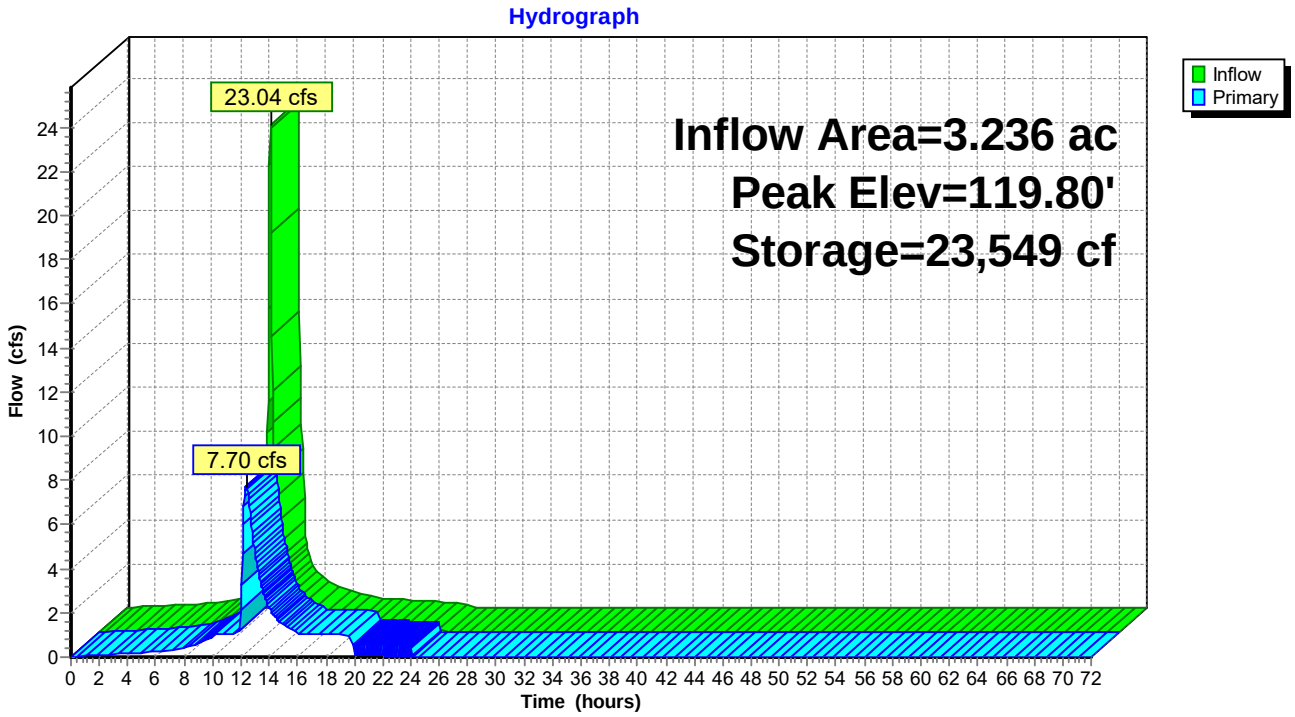
Volume	Invert	Avail.Storage	Storage Description
#1	117.00'	40,840 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
117.00	4,470	0	0
118.00	7,240	5,855	5,855
120.00	12,930	20,170	26,025
121.00	16,700	14,815	40,840

Device	Routing	Invert	Outlet Devices
#1	Primary	113.50'	**15.0" Round Outlet Pipe** L= 200.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 113.50' / 111.00' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	113.92'	**6.0" Round 6" Underdrain** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 113.92' / 113.92' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#3	Device 2	117.00'	**10.000 in/hr Filter Media Exfiltration over Surface area below 117.00'**
#4	Device 1	118.20'	**Weir Invert, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.60 Width (feet) 1.00 1.00
#5	Device 1	119.80'	**48.0" Horiz. Rim Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=7.68 cfs @ 12.38 hrs HW=119.80' TW=0.00' (Dynamic Tailwater)
- **1=Outlet Pipe** (Passes 7.68 cfs of 10.90 cfs potential flow)
  - **2=6" Underdrain** (Passes 1.03 cfs of 2.24 cfs potential flow)
    - **3=Filter Media Exfiltration** (Exfiltration Controls 1.03 cfs)
  - **4=Weir Invert** (Orifice Controls 6.64 cfs @ 4.15 fps)
  - **5=Rim Grate** (Weir Controls 0.01 cfs @ 0.16 fps)

Pond 10P:


Hydrograph
Inflow
Primary
23.04 cfs
7.70 cfs
Inflow Area=3.236 ac
Peak Elev=119.80'
Storage=23,549 cf
Flow (cfs)
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72

Summary for Pond 13P:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=83)

Inflow Area = 0.661 ac, 39.72% Impervious, Inflow Depth = 6.30" for 50-year event
Inflow = 4.61 cfs @ 12.09 hrs, Volume= 0.347 af
Outflow = 2.03 cfs @ 12.29 hrs, Volume= 0.347 af, Atten= 56%, Lag= 11.8 min
Primary = 2.03 cfs @ 12.29 hrs, Volume= 0.347 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 112.36' @ 12.29 hrs Surf.Area= 3,049 sf Storage= 3,426 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 24.5 min (816.7 - 792.2)

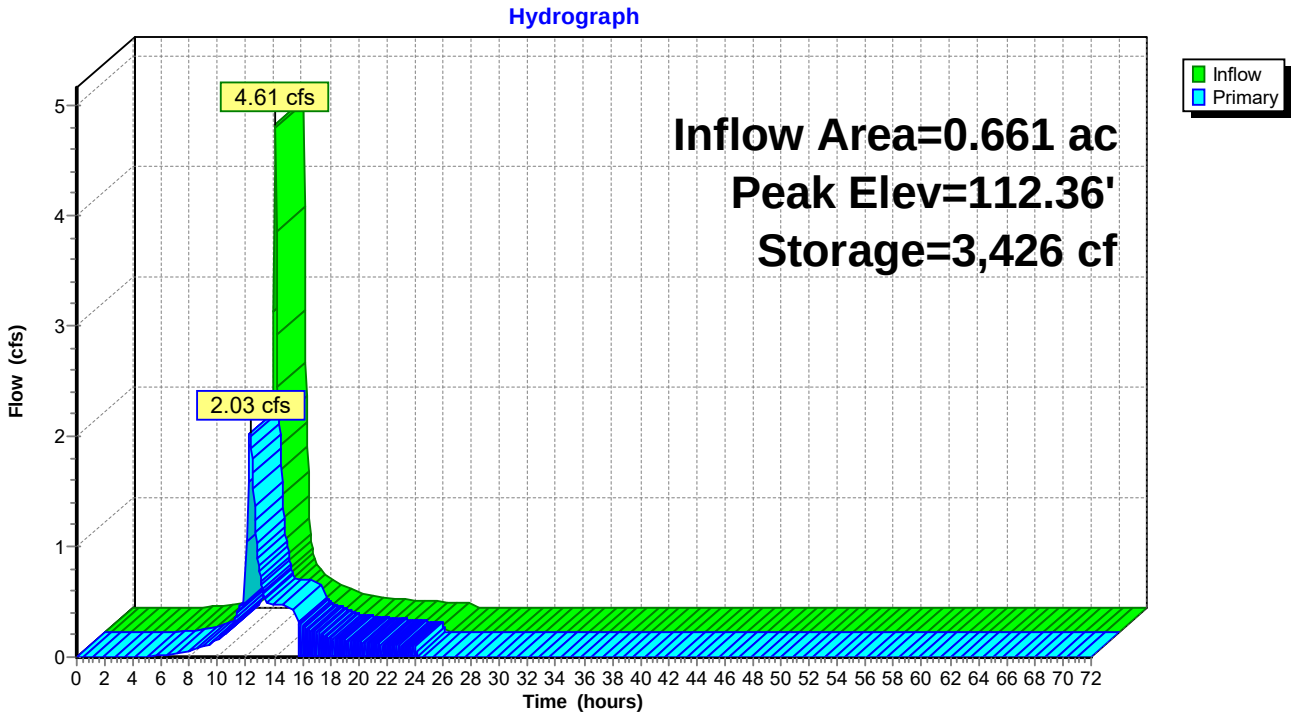
Volume	Invert	Avail.Storage	Storage Description
#1	111.00'	9,755 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
111.00	2,030	0	0
112.00	2,740	2,385	2,385
113.00	3,600	3,170	5,555
114.00	4,800	4,200	9,755

Device	Routing	Invert	Outlet Devices
#1	Primary	107.50'	**12.0" Round Culvert** L= 39.1' Ke= 0.500 Inlet / Outlet Invert= 107.50' / 107.11' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	107.92'	**6.0" Round 6" underdrain** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 107.92' / 107.92' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 2	111.00'	**10.000 in/hr Filter Media Exfiltration over Surface area below 111.00'**
#4	Device 1	111.75'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.25 Width (feet) 1.00 1.00
#5	Device 1	113.00'	**48.0" Horiz. Rim Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.02 cfs @ 12.29 hrs HW=112.36' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 2.02 cfs of 7.87 cfs potential flow)
  - **2=6" underdrain** (Passes 0.47 cfs of 1.93 cfs potential flow)
    - **3=Filter Media Exfiltration** (Exfiltration Controls 0.47 cfs)
  - **4=Custom Weir/Orifice** (Weir Controls 1.55 cfs @ 2.55 fps)
  - **5=Rim Grate** (Controls 0.00 cfs)

Pond 13P:


Hydrograph
Inflow
Primary
4.61 cfs
2.03 cfs
Inflow Area=0.661 ac
Peak Elev=112.36'
Storage=3,426 cf
Flow (cfs)
0 1 2 3 4 5
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72
Time (hours)

Summary for Pond 21P:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=58)

Inflow Area = 0.509 ac, 67.67% Impervious, Inflow Depth = 7.01" for 50-year event
Inflow = 3.81 cfs @ 12.09 hrs, Volume= 0.297 af
Outflow = 2.35 cfs @ 12.20 hrs, Volume= 0.297 af, Atten= 38%, Lag= 6.9 min
Primary = 2.35 cfs @ 12.20 hrs, Volume= 0.297 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 111.69' @ 12.20 hrs Surf.Area= 1,925 sf Storage= 2,350 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 15.5 min (790.6 - 775.2)

Volume	Invert	Avail.Storage	Storage Description
#1	109.67'	2,007 cf	**Stone (Prismatic)** Listed below (Recalc) 6,718 cf Overall - 1,700 cf Embedded = 5,018 cf x 40.0% Voids
#2	110.17'	551 cf	**ADS_StormTech SC-740 +Cap** x 12 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 12 Chambers in 2 Rows
#3	110.17'	459 cf	**ADS_StormTech SC-740 +Cap** x 10 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 10 Chambers in 2 Rows
#4	110.17'	505 cf	**ADS_StormTech SC-740 +Cap** x 11 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#5	110.17'	184 cf	**ADS_StormTech SC-740 +Cap** x 4 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		3,707 cf	Total Available Storage

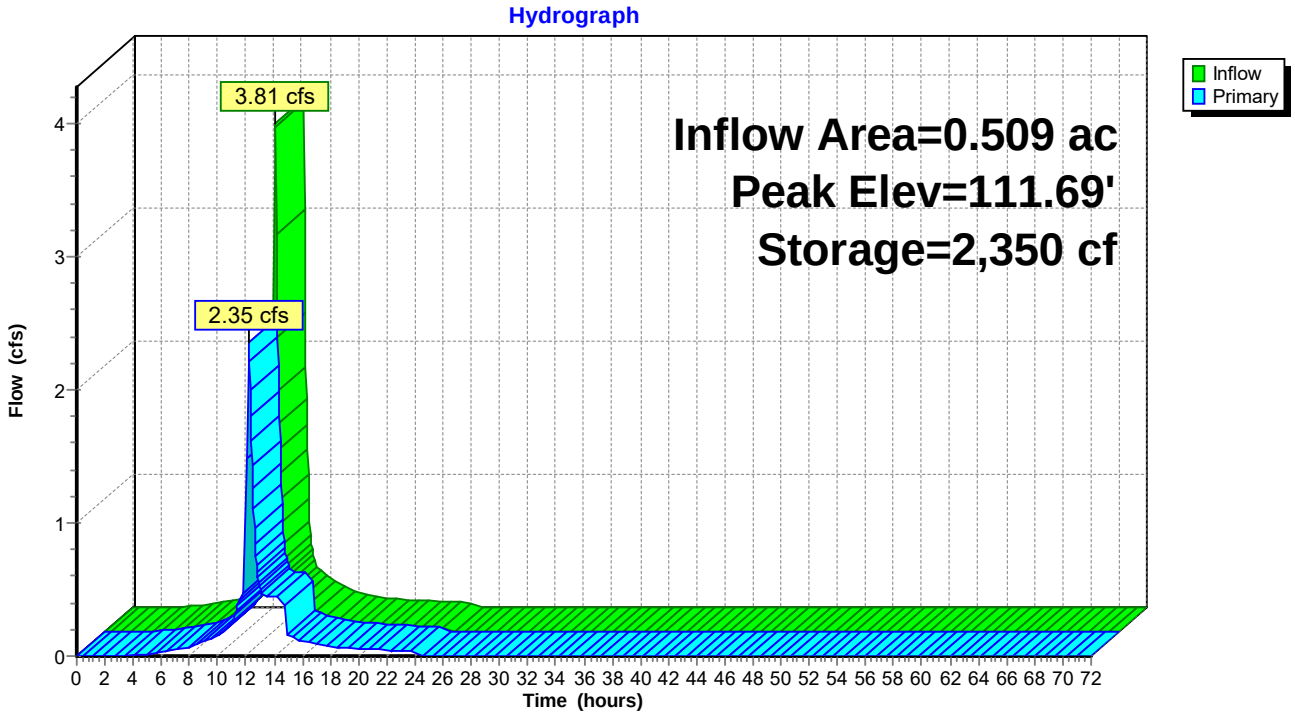
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.67	1,925	0	0
113.16	1,925	6,718	6,718

Device	Routing	Invert	Outlet Devices
#1	Primary	106.50'	**15.0" Round Culvert** L= 19.8' Ke= 0.500 Inlet / Outlet Invert= 106.50' / 106.35' S= 0.0076 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	106.59'	**6.0" Round Underdrain** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 106.59' / 106.59' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 2	109.67'	**10.000 in/hr Exfiltration over Surface area below 109.67'**
#4	Device 1	110.85'	**OS Weir, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.50 1.50 3.56 Width (feet) 0.75 0.75 5.00 5.00
#5	Device 4	110.18'	**24.0" Round 24"Outlet** L= 6.7' Ke= 0.500

Inlet / Outlet Invert= 110.18' / 110.18' S= 0.0000 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.34 cfs @ 12.20 hrs HW=111.69' TW=107.63' (Dynamic Tailwater)
- **1=Culvert** (Passes 2.34 cfs of 11.91 cfs potential flow)
  - **2=Underdrain** (Passes 0.45 cfs of 1.28 cfs potential flow)
    - **3=Exfiltration** (Exfiltration Controls 0.45 cfs)
  - **4=OS Weir** (Weir Controls 1.90 cfs @ 3.01 fps)
    - **5=24"Outlet** (Passes 1.90 cfs of 7.23 cfs potential flow)

Pond 21P:



Summary for Pond 22P:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=98)

Inflow Area = 0.651 ac, 65.32% Impervious, Inflow Depth = 7.01" for 50-year event
Inflow = 4.88 cfs @ 12.09 hrs, Volume= 0.380 af
Outflow = 2.39 cfs @ 12.25 hrs, Volume= 0.380 af, Atten= 51%, Lag= 9.7 min
Primary = 2.39 cfs @ 12.25 hrs, Volume= 0.380 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 111.23' @ 12.25 hrs Surf.Area= 3,205 sf Storage= 3,109 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 13.4 min (788.6 - 775.2)

Volume	Invert	Avail.Storage	Storage Description
#1	109.67'	3,188 cf	**Stone (Prismatic)** Listed below (Recalc) 11,185 cf Overall - 3,216 cf Embedded = 7,970 cf x 40.0% Voids
#2	110.17'	1,838 cf	**ADS_StormTech SC-740 +Cap** x 40 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 40 Chambers in 4 Rows
#3	110.17'	1,103 cf	**ADS_StormTech SC-740 +Cap** x 24 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 24 Chambers in 2 Rows
#4	110.17'	276 cf	**ADS_StormTech SC-740 +Cap** x 6 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		6,404 cf	Total Available Storage

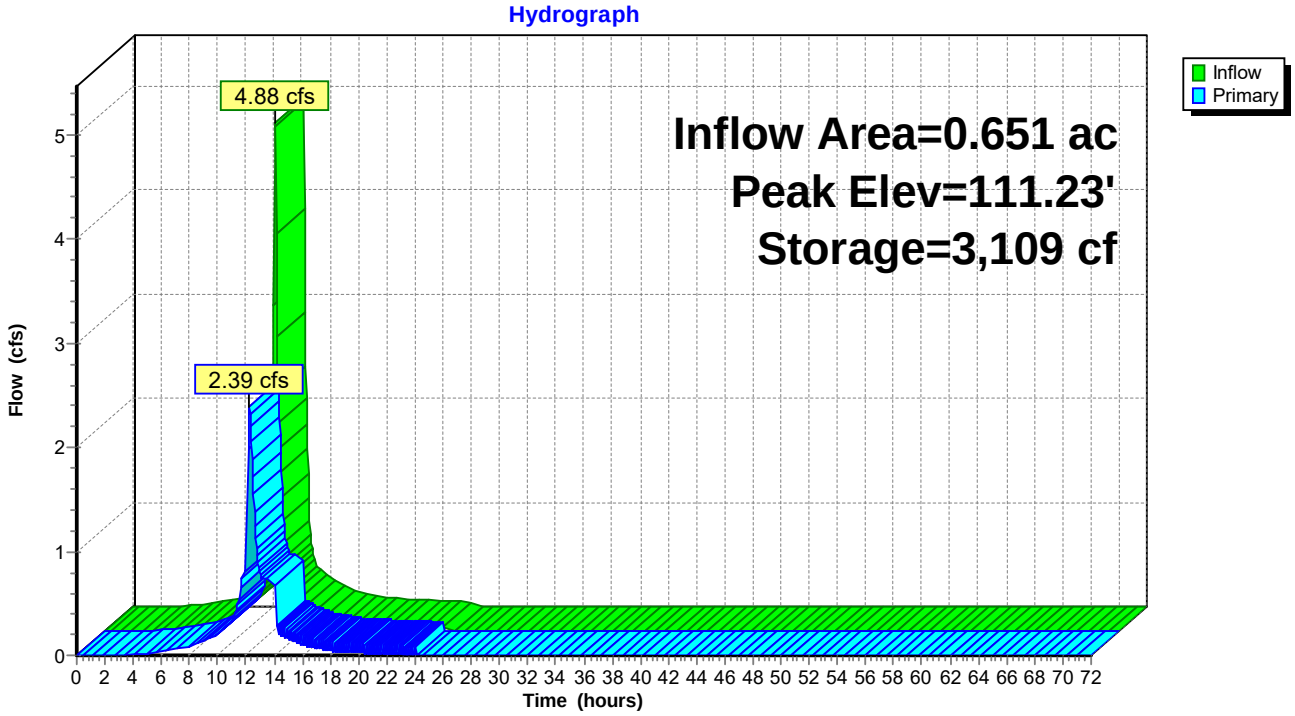
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.67	3,205	0	0
113.16	3,205	11,185	11,185

Device	Routing	Invert	Outlet Devices
#1	Primary	106.50'	**15.0" Round Culvert** L= 18.7' Ke= 0.500 Inlet / Outlet Invert= 106.50' / 106.36' S= 0.0075 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	106.59'	**6.0" Round Underdrain** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 106.59' / 106.59' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 2	109.67'	**10.000 in/hr Exfiltration over Surface area below 109.67'**
#4	Device 1	110.60'	**OS Weir, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.00 1.00 4.31 Width (feet) 1.00 1.00 5.00 5.00
#5	Device 4	111.21'	**12.0" Round 12" Outlet** L= 8.0' Ke= 0.500 Inlet / Outlet Invert= 111.21' / 111.21' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#6	Device 4	110.18'	**24.0" Round 24" Outlet** L= 4.5' Ke= 0.500

Inlet / Outlet Invert= 110.18' / 110.18' S= 0.0000 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.39 cfs @ 12.25 hrs HW=111.23' TW=107.61' (Dynamic Tailwater)
- **1=Culvert** (Passes 2.39 cfs of 11.24 cfs potential flow)
- **2=Underdrain** (Passes 0.74 cfs of 1.21 cfs potential flow)
  - **3=Exfiltration** (Exfiltration Controls 0.74 cfs)
- **4=OS Weir** (Weir Controls 1.65 cfs @ 2.61 fps)
  - **5=12" Outlet** (Passes < 0.00 cfs potential flow)
  - **6=24" Outlet** (Passes < 3.79 cfs potential flow)

Pond 22P:



Appendix C

Additional Alteration of Terrain Permit Material

- BMP Worksheets
  - 10P Bioretention Pond
  - 10P Stage Storage Table
  - 10P Stage Discharge Table
  - 13P Bioretention Pond
  - 13P Stage Storage Table
  - 13P Stage Discharge Table
  - 21P Underground Bioretention System
  - 21P Stage Storage Table
  - 21P Stage Discharge Table
  - 22P Underground Bioretention System
  - 22P Stage Storage Table
  - 22P Stage Discharge Table
- Inspection and Maintenance Manual
- Winter Maintenance and Salt Minimization
- Extreme Precipitation Table

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: 10P North Pond

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
3.24	ac	A = Area draining to the practice	
1.95	ac	A_I = Impervious area draining to the practice	
0.60	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.59	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
1.91	ac-in	WQV= 1" x Rv x A	
6,950	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
1,737	cf	25% x WQV (check calc for sediment forebay volume)	
5,212	cf	75% x WQV (check calc for surface sand filter volume)	
Roof & Road Buffer		Method of Pretreatment? (not required for clean or roof runoff)	
NA	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
118.15	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
1.03	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
3.75	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	≤ 72-hrs
115.00	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
113.92	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
119.60	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
119.60	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.08	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
(4.60)	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
(4.60)	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
119.80	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
121.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	< 10 ac
	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ 75%WQV
	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	← yes

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	← yes
7,360	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ WQV
24.0	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet	CD-505	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	≥ 3:1
Sheet	LP-101	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	≤ 5:1
	inches	D_{FC} = Filter course thickness	12", or 18" if within GPA
Sheet		Note what sheet in the plan set contains the filter course spec.	mod. 304.1 (see spec)

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes: System is lined, depth to SHWT and bedrock is irrelivant.

Stage-Discharge for Pond 10P:

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
117.00	0.00	117.54	1.03	118.08	1.03	118.62	1.93
117.01	1.03	117.55	1.03	118.09	1.03	118.63	1.96
117.02	1.03	117.56	1.03	118.10	1.03	118.64	1.99
117.03	1.03	117.57	1.03	118.11	1.03	118.65	2.02
117.04	1.03	117.58	1.03	118.12	1.03	118.66	2.06
117.05	1.03	117.59	1.03	118.13	1.03	118.67	2.09
117.06	1.03	117.60	1.03	118.14	1.03	118.68	2.12
117.07	1.03	117.61	1.03	118.15	1.03	118.69	2.16
117.08	1.03	117.62	1.03	118.16	1.03	118.70	2.19
117.09	1.03	117.63	1.03	118.17	1.03	118.71	2.23
117.10	1.03	117.64	1.03	118.18	1.03	118.72	2.26
117.11	1.03	117.65	1.03	118.19	1.03	118.73	2.30
117.12	1.03	117.66	1.03	118.20	1.03	118.74	2.33
117.13	1.03	117.67	1.03	118.21	1.04	118.75	2.37
117.14	1.03	117.68	1.03	118.22	1.04	118.76	2.41
117.15	1.03	117.69	1.03	118.23	1.05	118.77	2.44
117.16	1.03	117.70	1.03	118.24	1.06	118.78	2.48
117.17	1.03	117.71	1.03	118.25	1.07	118.79	2.52
117.18	1.03	117.72	1.03	118.26	1.08	118.80	2.56
117.19	1.03	117.73	1.03	118.27	1.10	118.81	2.60
117.20	1.03	117.74	1.03	118.28	1.11	118.82	2.63
117.21	1.03	117.75	1.03	118.29	1.12	118.83	2.67
117.22	1.03	117.76	1.03	118.30	1.14	118.84	2.71
117.23	1.03	117.77	1.03	118.31	1.15	118.85	2.75
117.24	1.03	117.78	1.03	118.32	1.17	118.86	2.79
117.25	1.03	117.79	1.03	118.33	1.19	118.87	2.83
117.26	1.03	117.80	1.03	118.34	1.21	118.88	2.87
117.27	1.03	117.81	1.03	118.35	1.22	118.89	2.91
117.28	1.03	117.82	1.03	118.36	1.24	118.90	2.95
117.29	1.03	117.83	1.03	118.37	1.26	118.91	2.99
117.30	1.03	117.84	1.03	118.38	1.28	118.92	3.04
117.31	1.03	117.85	1.03	118.39	1.31	118.93	3.08
117.32	1.03	117.86	1.03	118.40	1.33	118.94	3.12
117.33	1.03	117.87	1.03	118.41	1.35	118.95	3.16
117.34	1.03	117.88	1.03	118.42	1.37	118.96	3.20
117.35	1.03	117.89	1.03	118.43	1.40	118.97	3.25
117.36	1.03	117.90	1.03	118.44	1.42	118.98	3.29
117.37	1.03	117.91	1.03	118.45	1.44	118.99	3.33
117.38	1.03	117.92	1.03	118.46	1.47	119.00	3.38
117.39	1.03	117.93	1.03	118.47	1.49	119.01	3.42
117.40	1.03	117.94	1.03	118.48	1.52	119.02	3.47
117.41	1.03	117.95	1.03	118.49	1.55	119.03	3.51
117.42	1.03	117.96	1.03	118.50	1.57	119.04	3.56
117.43	1.03	117.97	1.03	118.51	1.60	119.05	3.60
117.44	1.03	117.98	1.03	118.52	1.63	119.06	3.65
117.45	1.03	117.99	1.03	118.53	1.66	119.07	3.69
117.46	1.03	118.00	1.03	118.54	1.68	119.08	3.74
117.47	1.03	118.01	1.03	118.55	1.71	119.09	3.78
117.48	1.03	118.02	1.03	118.56	1.74	119.10	3.83
117.49	1.03	118.03	1.03	118.57	1.77	119.11	3.88
117.50	1.03	118.04	1.03	118.58	1.80	119.12	3.92
117.51	1.03	118.05	1.03	118.59	1.83	119.13	3.97
117.52	1.03	118.06	1.03	118.60	1.86	119.14	4.02
117.53	1.03	118.07	1.03	118.61	1.89	119.15	4.07

Stage-Discharge for Pond 10P: (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
119.16	4.12	119.70	7.05	120.24	11.21	120.78	11.59
119.17	4.16	119.71	7.11	120.25	11.22	120.79	11.59
119.18	4.21	119.72	7.17	120.26	11.23	120.80	11.60
119.19	4.26	119.73	7.23	120.27	11.23	120.81	11.61
119.20	4.31	119.74	7.29	120.28	11.24	120.82	11.61
119.21	4.36	119.75	7.35	120.29	11.25	120.83	11.62
119.22	4.41	119.76	7.42	120.30	11.25	120.84	11.63
119.23	4.46	119.77	7.48	120.31	11.26	120.85	11.63
119.24	4.51	119.78	7.54	120.32	11.27	120.86	11.64
119.25	4.56	119.79	7.60	120.33	11.28	120.87	11.65
119.26	4.61	119.80	7.66	120.34	11.28	120.88	11.65
119.27	4.66	119.81	7.76	120.35	11.29	120.89	11.66
119.28	4.71	119.82	7.89	120.36	11.30	120.90	11.67
119.29	4.76	119.83	8.05	120.37	11.30	120.91	11.67
119.30	4.81	119.84	8.22	120.38	11.31	120.92	11.68
119.31	4.86	119.85	8.40	120.39	11.32	120.93	11.69
119.32	4.92	119.86	8.59	120.40	11.32	120.94	11.69
119.33	4.97	119.87	8.80	120.41	11.33	120.95	11.70
119.34	5.02	119.88	9.02	120.42	11.34	120.96	11.71
119.35	5.07	119.89	9.25	120.43	11.34	120.97	11.71
119.36	5.13	119.90	9.49	120.44	11.35	120.98	11.72
119.37	5.18	119.91	9.74	120.45	11.36	120.99	11.73
119.38	5.23	119.92	9.99	120.46	11.37	121.00	**11.73**
119.39	5.29	119.93	10.26	120.47	11.37		
119.40	5.34	119.94	10.53	120.48	11.38		
119.41	5.39	119.95	10.81	120.49	11.39		
119.42	5.45	119.96	11.01	120.50	11.39		
119.43	5.50	119.97	11.02	120.51	11.40		
119.44	5.56	119.98	11.03	120.52	11.41		
119.45	5.61	119.99	11.04	120.53	11.41		
119.46	5.67	120.00	11.04	120.54	11.42		
119.47	5.72	120.01	11.05	120.55	11.43		
119.48	5.78	120.02	11.06	120.56	11.43		
119.49	5.83	120.03	11.06	120.57	11.44		
119.50	5.89	120.04	11.07	120.58	11.45		
119.51	5.95	120.05	11.08	120.59	11.46		
119.52	6.00	120.06	11.09	120.60	11.46		
119.53	6.06	120.07	11.09	120.61	11.47		
119.54	6.11	120.08	11.10	120.62	11.48		
119.55	6.17	120.09	11.11	120.63	11.48		
119.56	6.23	120.10	11.11	120.64	11.49		
119.57	6.29	120.11	11.12	120.65	11.50		
119.58	6.34	120.12	11.13	120.66	11.50		
119.59	6.40	120.13	11.13	120.67	11.51		
119.60	6.46	120.14	11.14	120.68	11.52		
119.61	6.52	120.15	11.15	120.69	11.52		
119.62	6.58	120.16	11.16	120.70	11.53		
119.63	6.64	120.17	11.16	120.71	11.54		
119.64	6.69	120.18	11.17	120.72	11.54		
119.65	6.75	120.19	11.18	120.73	11.55		
119.66	6.81	120.20	11.18	120.74	11.56		
119.67	6.87	120.21	11.19	120.75	11.56		
119.68	6.93	120.22	11.20	120.76	11.57		
119.69	6.99	120.23	11.21	120.77	11.58		

Stage-Area-Storage for Pond 10P:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
117.00	4,470	0	117.54	5,966	2,818
117.01	4,498	45	117.55	5,993	2,877
117.02	4,525	90	117.56	6,021	2,938
117.03	4,553	135	117.57	6,049	2,998
117.04	4,581	181	117.58	6,077	3,059
117.05	4,608	227	117.59	6,104	3,119
117.06	4,636	273	117.60	6,132	3,181
117.07	4,664	320	117.61	6,160	3,242
117.08	4,692	366	117.62	6,187	3,304
117.09	4,719	414	117.63	6,215	3,366
117.10	4,747	461	117.64	6,243	3,428
117.11	4,775	508	117.65	6,271	3,491
117.12	4,802	556	117.66	6,298	3,554
117.13	4,830	605	117.67	6,326	3,617
117.14	4,858	653	117.68	6,354	3,680
117.15	4,886	702	117.69	6,381	3,744
117.16	4,913	751	117.70	6,409	3,808
117.17	4,941	800	117.71	6,437	3,872
117.18	4,969	849	117.72	6,464	3,936
117.19	4,996	899	117.73	6,492	4,001
117.20	5,024	949	117.74	6,520	4,066
117.21	5,052	1,000	117.75	6,548	4,132
117.22	5,079	1,050	117.76	6,575	4,197
117.23	5,107	1,101	117.77	6,603	4,263
117.24	5,135	1,153	117.78	6,631	4,329
117.25	5,163	1,204	117.79	6,658	4,396
117.26	5,190	1,256	117.80	6,686	4,462
117.27	5,218	1,308	117.81	6,714	4,529
117.28	5,246	1,360	117.82	6,741	4,597
117.29	5,273	1,413	117.83	6,769	4,664
117.30	5,301	1,466	117.84	6,797	4,732
117.31	5,329	1,519	117.85	6,824	4,800
117.32	5,356	1,572	117.86	6,852	4,869
117.33	5,384	1,626	117.87	6,880	4,937
117.34	5,412	1,680	117.88	6,908	5,006
117.35	5,439	1,734	117.89	6,935	5,075
117.36	5,467	1,789	117.90	6,963	5,145
117.37	5,495	1,844	117.91	6,991	5,215
117.38	5,523	1,899	117.92	7,018	5,285
117.39	5,550	1,954	117.93	7,046	5,355
117.40	5,578	2,010	117.94	7,074	5,426
117.41	5,606	2,066	117.95	7,102	5,496
117.42	5,633	2,122	117.96	7,129	5,568
117.43	5,661	2,178	117.97	7,157	5,639
117.44	5,689	2,235	117.98	7,185	5,711
117.45	5,717	2,292	117.99	7,212	5,783
117.46	5,744	2,349	118.00	7,240	5,855
117.47	5,772	2,407	118.01	7,268	5,928
117.48	5,800	2,465	118.02	7,297	6,000
117.49	5,827	2,523	118.03	7,325	6,073
117.50	5,855	2,581	118.04	7,354	6,147
117.51	5,883	2,640	118.05	7,382	6,221
117.52	5,910	2,699	118.06	7,411	6,295
117.53	5,938	2,758	118.07	7,439	6,369

Stage-Area-Storage for Pond 10P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
118.08	7,468	6,443
118.09	7,496	6,518
118.10	7,524	6,593
118.11	7,553	6,669
118.12	7,581	6,744
118.13	7,610	6,820
118.14	7,638	6,896
118.15	7,667	6,973
118.16	7,695	7,050
118.17	7,724	7,127
118.18	7,752	7,204
118.19	7,781	7,282
118.20	7,809	7,360
118.21	7,837	7,438
118.22	7,866	7,517
118.23	7,894	7,595
118.24	7,923	7,675
118.25	7,951	7,754
118.26	7,980	7,834
118.27	8,008	7,914
118.28	8,037	7,994
118.29	8,065	8,074
118.30	8,093	8,155
118.31	8,122	8,236
118.32	8,150	8,317
118.33	8,179	8,399
118.34	8,207	8,481
118.35	8,236	8,563
118.36	8,264	8,646
118.37	8,293	8,729
118.38	8,321	8,812
118.39	8,350	8,895
118.40	8,378	8,979
118.41	8,406	9,063
118.42	8,435	9,147
118.43	8,463	9,231
118.44	8,492	9,316
118.45	8,520	9,401
118.46	8,549	9,486
118.47	8,577	9,572
118.48	8,606	9,658
118.49	8,634	9,744
118.50	8,663	9,831
118.51	8,691	9,917
118.52	8,719	10,004
118.53	8,748	10,092
118.54	8,776	10,179
118.55	8,805	10,267
118.56	8,833	10,355
118.57	8,862	10,444
118.58	8,890	10,533
118.59	8,919	10,622
118.60	8,947	10,711
118.61	8,975	10,801
118.62	9,004	10,891
118.63	9,032	10,981
118.64	9,061	11,071
118.65	9,089	11,162
118.66	9,118	11,253
118.67	9,146	11,344
118.68	9,175	11,436
118.69	9,203	11,528
118.70	9,232	11,620
118.71	9,260	11,712
118.72	9,288	11,805
118.73	9,317	11,898
118.74	9,345	11,992
118.75	9,374	12,085
118.76	9,402	12,179
118.77	9,431	12,273
118.78	9,459	12,368
118.79	9,488	12,462
118.80	9,516	12,557
118.81	9,544	12,653
118.82	9,573	12,748
118.83	9,601	12,844
118.84	9,630	12,940
118.85	9,658	13,037
118.86	9,687	13,133
118.87	9,715	13,230
118.88	9,744	13,328
118.89	9,772	13,425
118.90	9,801	13,523
118.91	9,829	13,621
118.92	9,857	13,720
118.93	9,886	13,819
118.94	9,914	13,918
118.95	9,943	14,017
118.96	9,971	14,116
118.97	10,000	14,216
118.98	10,028	14,316
118.99	10,057	14,417
119.00	10,085	14,518
119.01	10,113	14,618
119.02	10,142	14,720
119.03	10,170	14,821
119.04	10,199	14,923
119.05	10,227	15,025
119.06	10,256	15,128
119.07	10,284	15,230
119.08	10,313	15,333
119.09	10,341	15,437
119.10	10,369	15,540
119.11	10,398	15,644
119.12	10,426	15,748
119.13	10,455	15,853
119.14	10,483	15,957
119.15	10,512	16,062

Stage-Area-Storage for Pond 10P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
119.16	10,540	16,168	119.70	12,077	22,274
119.17	10,569	16,273	119.71	12,105	22,395
119.18	10,597	16,379	119.72	12,133	22,516
119.19	10,626	16,485	119.73	12,162	22,638
119.20	10,654	16,591	119.74	12,190	22,759
119.21	10,682	16,698	119.75	12,219	22,881
119.22	10,711	16,805	119.76	12,247	23,004
119.23	10,739	16,912	119.77	12,276	23,126
119.24	10,768	17,020	119.78	12,304	23,249
119.25	10,796	17,128	119.79	12,333	23,372
119.26	10,825	17,236	119.80	12,361	23,496
119.27	10,853	17,344	119.81	12,389	23,620
119.28	10,882	17,453	119.82	12,418	23,744
119.29	10,910	17,562	119.83	12,446	23,868
119.30	10,938	17,671	119.84	12,475	23,993
119.31	10,967	17,781	119.85	12,503	24,118
119.32	10,995	17,890	119.86	12,532	24,243
119.33	11,024	18,000	119.87	12,560	24,368
119.34	11,052	18,111	119.88	12,589	24,494
119.35	11,081	18,222	119.89	12,617	24,620
119.36	11,109	18,332	119.90	12,646	24,746
119.37	11,138	18,444	119.91	12,674	24,873
119.38	11,166	18,555	119.92	12,702	25,000
119.39	11,195	18,667	119.93	12,731	25,127
119.40	11,223	18,779	119.94	12,759	25,254
119.41	11,251	18,891	119.95	12,788	25,382
119.42	11,280	19,004	119.96	12,816	25,510
119.43	11,308	19,117	119.97	12,845	25,638
119.44	11,337	19,230	119.98	12,873	25,767
119.45	11,365	19,344	119.99	12,902	25,896
119.46	11,394	19,458	120.00	12,930	26,025
119.47	11,422	19,572	120.01	12,968	26,154
119.48	11,451	19,686	120.02	13,005	26,284
119.49	11,479	19,801	120.03	13,043	26,415
119.50	11,508	19,916	120.04	13,081	26,545
119.51	11,536	20,031	120.05	13,118	26,676
119.52	11,564	20,146	120.06	13,156	26,808
119.53	11,593	20,262	120.07	13,194	26,939
119.54	11,621	20,378	120.08	13,232	27,071
119.55	11,650	20,495	120.09	13,269	27,204
119.56	11,678	20,611	120.10	13,307	27,337
119.57	11,707	20,728	120.11	13,345	27,470
119.58	11,735	20,845	120.12	13,382	27,604
119.59	11,764	20,963	120.13	13,420	27,738
119.60	11,792	21,081	120.14	13,458	27,872
119.61	11,820	21,199	120.15	13,496	28,007
119.62	11,849	21,317	120.16	13,533	28,142
119.63	11,877	21,436	120.17	13,571	28,278
119.64	11,906	21,555	120.18	13,609	28,413
119.65	11,934	21,674	120.19	13,646	28,550
119.66	11,963	21,793	120.20	13,684	28,686
119.67	11,991	21,913	120.21	13,722	28,823
119.68	12,020	22,033	120.22	13,759	28,961
119.69	12,048	22,153	120.23	13,797	29,099

Stage-Area-Storage for Pond 10P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
120.24	13,835	29,237
120.25	13,873	29,375
120.26	13,910	29,514
120.27	13,948	29,654
120.28	13,986	29,793
120.29	14,023	29,933
120.30	14,061	30,074
120.31	14,099	30,214
120.32	14,136	30,356
120.33	14,174	30,497
120.34	14,212	30,639
120.35	14,249	30,781
120.36	14,287	30,924
120.37	14,325	31,067
120.38	14,363	31,211
120.39	14,400	31,354
120.40	14,438	31,499
120.41	14,476	31,643
120.42	14,513	31,788
120.43	14,551	31,933
120.44	14,589	32,079
120.45	14,627	32,225
120.46	14,664	32,372
120.47	14,702	32,518
120.48	14,740	32,666
120.49	14,777	32,813
120.50	14,815	32,961
120.51	14,853	33,110
120.52	14,890	33,258
120.53	14,928	33,407
120.54	14,966	33,557
120.55	15,003	33,707
120.56	15,041	33,857
120.57	15,079	34,008
120.58	15,117	34,159
120.59	15,154	34,310
120.60	15,192	34,462
120.61	15,230	34,614
120.62	15,267	34,766
120.63	15,305	34,919
120.64	15,343	35,072
120.65	15,381	35,226
120.66	15,418	35,380
120.67	15,456	35,534
120.68	15,494	35,689
120.69	15,531	35,844
120.70	15,569	36,000
120.71	15,607	36,156
120.72	15,644	36,312
120.73	15,682	36,468
120.74	15,720	36,625
120.75	15,758	36,783
120.76	15,795	36,941
120.77	15,833	37,099
120.78	15,871	37,257
120.79	15,908	37,416
120.80	15,946	37,575
120.81	15,984	37,735
120.82	16,021	37,895
120.83	16,059	38,055
120.84	16,097	38,216
120.85	16,134	38,377
120.86	16,172	38,539
120.87	16,210	38,701
120.88	16,248	38,863
120.89	16,285	39,026
120.90	16,323	39,189
120.91	16,361	39,352
120.92	16,398	39,516
120.93	16,436	39,680
120.94	16,474	39,845
120.95	16,512	40,010
120.96	16,549	40,175
120.97	16,587	40,341
120.98	16,625	40,507
120.99	16,662	40,673
121.00	**16,700**	**40,840**

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: 13P Smaller Pond Southwest

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.66	ac	A = Area draining to the practice	
0.26	ac	A_I = Impervious area draining to the practice	
0.40	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.41	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.27	ac-in	WQV= 1" x Rv x A	
978	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
244	cf	25% x WQV (check calc for sediment forebay volume)	
733	cf	75% x WQV (check calc for surface sand filter volume)	
Forebay		Method of Pretreatment? (not required for clean or roof runoff)	
1,190	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
111.45	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.47	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
1.16	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	≤ 72-hrs
109.00	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
107.92	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
109.70	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
107.36	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.08	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
1.64	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
(0.70)	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
112.36	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
114.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	< 10 ac
	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ 75%WQV
	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	← yes

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	← yes
1,722	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ WQV
24.0	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet	CD-505	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	≥ 3:1
Sheet	LP-101	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	≤ 5:1
	inches	D_{FC} = Filter course thickness	12", or 18" if within GPA
Sheet		Note what sheet in the plan set contains the filter course spec.	mod. 304.1 (see spec)

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes: System is lined, depth to SHWT and bedrock is irrelivant.

Stage-Discharge for Pond 13P:

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
111.00	0.00	111.54	0.47	112.08	1.09	112.62	3.13
111.01	0.47	111.55	0.47	112.09	1.12	112.63	3.17
111.02	0.47	111.56	0.47	112.10	1.15	112.64	3.22
111.03	0.47	111.57	0.47	112.11	1.18	112.65	3.27
111.04	0.47	111.58	0.47	112.12	1.21	112.66	3.31
111.05	0.47	111.59	0.47	112.13	1.24	112.67	3.36
111.06	0.47	111.60	0.47	112.14	1.27	112.68	3.41
111.07	0.47	111.61	0.47	112.15	1.30	112.69	3.45
111.08	0.47	111.62	0.47	112.16	1.33	112.70	3.50
111.09	0.47	111.63	0.47	112.17	1.36	112.71	3.55
111.10	0.47	111.64	0.47	112.18	1.39	112.72	3.60
111.11	0.47	111.65	0.47	112.19	1.43	112.73	3.65
111.12	0.47	111.66	0.47	112.20	1.46	112.74	3.70
111.13	0.47	111.67	0.47	112.21	1.49	112.75	3.74
111.14	0.47	111.68	0.47	112.22	1.53	112.76	3.79
111.15	0.47	111.69	0.47	112.23	1.56	112.77	3.84
111.16	0.47	111.70	0.47	112.24	1.59	112.78	3.89
111.17	0.47	111.71	0.47	112.25	1.63	112.79	3.94
111.18	0.47	111.72	0.47	112.26	1.66	112.80	3.99
111.19	0.47	111.73	0.47	112.27	1.70	112.81	4.04
111.20	0.47	111.74	0.47	112.28	1.73	112.82	4.09
111.21	0.47	111.75	0.47	112.29	1.77	112.83	4.15
111.22	0.47	111.76	0.47	112.30	1.81	112.84	4.20
111.23	0.47	111.77	0.48	112.31	1.84	112.85	4.25
111.24	0.47	111.78	0.49	112.32	1.88	112.86	4.30
111.25	0.47	111.79	0.50	112.33	1.92	112.87	4.35
111.26	0.47	111.80	0.51	112.34	1.95	112.88	4.40
111.27	0.47	111.81	0.52	112.35	1.99	112.89	4.46
111.28	0.47	111.82	0.53	112.36	2.03	112.90	4.51
111.29	0.47	111.83	0.54	112.37	2.07	112.91	4.56
111.30	0.47	111.84	0.56	112.38	2.11	112.92	4.61
111.31	0.47	111.85	0.57	112.39	2.15	112.93	4.67
111.32	0.47	111.86	0.59	112.40	2.19	112.94	4.72
111.33	0.47	111.87	0.61	112.41	2.23	112.95	4.78
111.34	0.47	111.88	0.62	112.42	2.27	112.96	4.83
111.35	0.47	111.89	0.64	112.43	2.31	112.97	4.88
111.36	0.47	111.90	0.66	112.44	2.35	112.98	4.94
111.37	0.47	111.91	0.68	112.45	2.39	112.99	4.99
111.38	0.47	111.92	0.70	112.46	2.43	113.00	5.05
111.39	0.47	111.93	0.72	112.47	2.47	113.01	5.14
111.40	0.47	111.94	0.74	112.48	2.51	113.02	5.26
111.41	0.47	111.95	0.76	112.49	2.55	113.03	5.41
111.42	0.47	111.96	0.79	112.50	2.60	113.04	5.57
111.43	0.47	111.97	0.81	112.51	2.64	113.05	5.75
111.44	0.47	111.98	0.83	112.52	2.68	113.06	5.94
111.45	0.47	111.99	0.85	112.53	2.73	113.07	6.14
111.46	0.47	112.00	0.88	112.54	2.77	113.08	6.35
111.47	0.47	112.01	0.90	112.55	2.81	113.09	6.57
111.48	0.47	112.02	0.93	112.56	2.86	113.10	6.80
111.49	0.47	112.03	0.96	112.57	2.90	113.11	7.04
111.50	0.47	112.04	0.98	112.58	2.95	113.12	7.29
111.51	0.47	112.05	1.01	112.59	2.99	113.13	7.55
111.52	0.47	112.06	1.04	112.60	3.04	113.14	7.82
111.53	0.47	112.07	1.06	112.61	3.08	113.15	8.09

Stage-Discharge for Pond 13P: (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
113.16	8.37	113.70	9.02
113.17	8.58	113.71	9.03
113.18	8.59	113.72	9.04
113.19	8.60	113.73	9.05
113.20	8.61	113.74	9.06
113.21	8.62	113.75	9.06
113.22	8.63	113.76	9.07
113.23	8.64	113.77	9.08
113.24	8.64	113.78	9.09
113.25	8.65	113.79	9.10
113.26	8.66	113.80	9.10
113.27	8.67	113.81	9.11
113.28	8.68	113.82	9.12
113.29	8.69	113.83	9.13
113.30	8.69	113.84	9.14
113.31	8.70	113.85	9.14
113.32	8.71	113.86	9.15
113.33	8.72	113.87	9.16
113.34	8.73	113.88	9.17
113.35	8.74	113.89	9.17
113.36	8.74	113.90	9.18
113.37	8.75	113.91	9.19
113.38	8.76	113.92	9.20
113.39	8.77	113.93	9.21
113.40	8.78	113.94	9.21
113.41	8.79	113.95	9.22
113.42	8.79	113.96	9.23
113.43	8.80	113.97	9.24
113.44	8.81	113.98	9.25
113.45	8.82	113.99	9.25
113.46	8.83	114.00	**9.26**
113.47	8.84		
113.48	8.84		
113.49	8.85		
113.50	8.86		
113.51	8.87		
113.52	8.88		
113.53	8.88		
113.54	8.89		
113.55	8.90		
113.56	8.91		
113.57	8.92		
113.58	8.93		
113.59	8.93		
113.60	8.94		
113.61	8.95		
113.62	8.96		
113.63	8.97		
113.64	8.97		
113.65	8.98		
113.66	8.99		
113.67	9.00		
113.68	9.01		
113.69	9.01		

Stage-Area-Storage for Pond 13P:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
111.00	2,030	0
111.01	2,037	20
111.02	2,044	41
111.03	2,051	61
111.04	2,058	82
111.05	2,065	102
111.06	2,073	123
111.07	2,080	144
111.08	2,087	165
111.09	2,094	186
111.10	2,101	207
111.11	2,108	228
111.12	2,115	249
111.13	2,122	270
111.14	2,129	291
111.15	2,137	312
111.16	2,144	334
111.17	2,151	355
111.18	2,158	377
111.19	2,165	399
111.20	2,172	420
111.21	2,179	442
111.22	2,186	464
111.23	2,193	486
111.24	2,200	508
111.25	2,208	530
111.26	2,215	552
111.27	2,222	574
111.28	2,229	596
111.29	2,236	619
111.30	2,243	641
111.31	2,250	663
111.32	2,257	686
111.33	2,264	709
111.34	2,271	731
111.35	2,278	754
111.36	2,286	777
111.37	2,293	800
111.38	2,300	823
111.39	2,307	846
111.40	2,314	869
111.41	2,321	892
111.42	2,328	915
111.43	2,335	939
111.44	2,342	962
111.45	2,350	985
111.46	2,357	1,009
111.47	2,364	1,033
111.48	2,371	1,056
111.49	2,378	1,080
111.50	2,385	1,104
111.51	2,392	1,128
111.52	2,399	1,152
111.53	2,406	1,176
111.54	2,413	1,200
111.55	2,420	1,224
111.56	2,428	1,248
111.57	2,435	1,272
111.58	2,442	1,297
111.59	2,449	1,321
111.60	2,456	1,346
111.61	2,463	1,370
111.62	2,470	1,395
111.63	2,477	1,420
111.64	2,484	1,445
111.65	2,492	1,469
111.66	2,499	1,494
111.67	2,506	1,519
111.68	2,513	1,545
111.69	2,520	1,570
111.70	2,527	1,595
111.71	2,534	1,620
111.72	2,541	1,646
111.73	2,548	1,671
111.74	2,555	1,697
111.75	2,563	1,722
111.76	2,570	1,748
111.77	2,577	1,774
111.78	2,584	1,799
111.79	2,591	1,825
111.80	2,598	1,851
111.81	2,605	1,877
111.82	2,612	1,903
111.83	2,619	1,929
111.84	2,626	1,956
111.85	2,633	1,982
111.86	2,641	2,008
111.87	2,648	2,035
111.88	2,655	2,061
111.89	2,662	2,088
111.90	2,669	2,115
111.91	2,676	2,141
111.92	2,683	2,168
111.93	2,690	2,195
111.94	2,697	2,222
111.95	2,705	2,249
111.96	2,712	2,276
111.97	2,719	2,303
111.98	2,726	2,330
111.99	2,733	2,358
112.00	2,740	2,385
112.01	2,749	2,412
112.02	2,757	2,440
112.03	2,766	2,468
112.04	2,774	2,495
112.05	2,783	2,523
112.06	2,792	2,551
112.07	2,800	2,579

Stage-Area-Storage for Pond 13P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
112.08	2,809	2,607	112.62	3,273	4,249
112.09	2,817	2,635	112.63	3,282	4,282
112.10	2,826	2,663	112.64	3,290	4,315
112.11	2,835	2,692	112.65	3,299	4,348
112.12	2,843	2,720	112.66	3,308	4,381
112.13	2,852	2,748	112.67	3,316	4,414
112.14	2,860	2,777	112.68	3,325	4,447
112.15	2,869	2,806	112.69	3,333	4,480
112.16	2,878	2,834	112.70	3,342	4,514
112.17	2,886	2,863	112.71	3,351	4,547
112.18	2,895	2,892	112.72	3,359	4,581
112.19	2,903	2,921	112.73	3,368	4,614
112.20	2,912	2,950	112.74	3,376	4,648
112.21	2,921	2,979	112.75	3,385	4,682
112.22	2,929	3,009	112.76	3,394	4,716
112.23	2,938	3,038	112.77	3,402	4,750
112.24	2,946	3,067	112.78	3,411	4,784
112.25	2,955	3,097	112.79	3,419	4,818
112.26	2,964	3,126	112.80	3,428	4,852
112.27	2,972	3,156	112.81	3,437	4,887
112.28	2,981	3,186	112.82	3,445	4,921
112.29	2,989	3,216	112.83	3,454	4,955
112.30	2,998	3,246	112.84	3,462	4,990
112.31	3,007	3,276	112.85	3,471	5,025
112.32	3,015	3,306	112.86	3,480	5,059
112.33	3,024	3,336	112.87	3,488	5,094
112.34	3,032	3,366	112.88	3,497	5,129
112.35	3,041	3,397	112.89	3,505	5,164
112.36	3,050	3,427	112.90	3,514	5,199
112.37	3,058	3,458	112.91	3,523	5,234
112.38	3,067	3,488	112.92	3,531	5,270
112.39	3,075	3,519	112.93	3,540	5,305
112.40	3,084	3,550	112.94	3,548	5,341
112.41	3,093	3,581	112.95	3,557	5,376
112.42	3,101	3,612	112.96	3,566	5,412
112.43	3,110	3,643	112.97	3,574	5,447
112.44	3,118	3,674	112.98	3,583	5,483
112.45	3,127	3,705	112.99	3,591	5,519
112.46	3,136	3,736	113.00	3,600	5,555
112.47	3,144	3,768	113.01	3,612	5,591
112.48	3,153	3,799	113.02	3,624	5,627
112.49	3,161	3,831	113.03	3,636	5,664
112.50	3,170	3,863	113.04	3,648	5,700
112.51	3,179	3,894	113.05	3,660	5,736
112.52	3,187	3,926	113.06	3,672	5,773
112.53	3,196	3,958	113.07	3,684	5,810
112.54	3,204	3,990	113.08	3,696	5,847
112.55	3,213	4,022	113.09	3,708	5,884
112.56	3,222	4,054	113.10	3,720	5,921
112.57	3,230	4,087	113.11	3,732	5,958
112.58	3,239	4,119	113.12	3,744	5,996
112.59	3,247	4,151	113.13	3,756	6,033
112.60	3,256	4,184	113.14	3,768	6,071
112.61	3,265	4,216	113.15	3,780	6,109

Stage-Area-Storage for Pond 13P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
113.16	3,792	6,146
113.17	3,804	6,184
113.18	3,816	6,222
113.19	3,828	6,261
113.20	3,840	6,299
113.21	3,852	6,337
113.22	3,864	6,376
113.23	3,876	6,415
113.24	3,888	6,454
113.25	3,900	6,493
113.26	3,912	6,532
113.27	3,924	6,571
113.28	3,936	6,610
113.29	3,948	6,649
113.30	3,960	6,689
113.31	3,972	6,729
113.32	3,984	6,768
113.33	3,996	6,808
113.34	4,008	6,848
113.35	4,020	6,888
113.36	4,032	6,929
113.37	4,044	6,969
113.38	4,056	7,010
113.39	4,068	7,050
113.40	4,080	7,091
113.41	4,092	7,132
113.42	4,104	7,173
113.43	4,116	7,214
113.44	4,128	7,255
113.45	4,140	7,297
113.46	4,152	7,338
113.47	4,164	7,380
113.48	4,176	7,421
113.49	4,188	7,463
113.50	4,200	7,505
113.51	4,212	7,547
113.52	4,224	7,589
113.53	4,236	7,632
113.54	4,248	7,674
113.55	4,260	7,716
113.56	4,272	7,759
113.57	4,284	7,802
113.58	4,296	7,845
113.59	4,308	7,888
113.60	4,320	7,931
113.61	4,332	7,974
113.62	4,344	8,018
113.63	4,356	8,061
113.64	4,368	8,105
113.65	4,380	8,149
113.66	4,392	8,192
113.67	4,404	8,236
113.68	4,416	8,280
113.69	4,428	8,325
113.70	4,440	8,369
113.71	4,452	8,413
113.72	4,464	8,458
113.73	4,476	8,503
113.74	4,488	8,548
113.75	4,500	8,593
113.76	4,512	8,638
113.77	4,524	8,683
113.78	4,536	8,728
113.79	4,548	8,773
113.80	4,560	8,819
113.81	4,572	8,865
113.82	4,584	8,910
113.83	4,596	8,956
113.84	4,608	9,002
113.85	4,620	9,048
113.86	4,632	9,095
113.87	4,644	9,141
113.88	4,656	9,188
113.89	4,668	9,234
113.90	4,680	9,281
113.91	4,692	9,328
113.92	4,704	9,375
113.93	4,716	9,422
113.94	4,728	9,469
113.95	4,740	9,517
113.96	4,752	9,564
113.97	4,764	9,612
113.98	4,776	9,659
113.99	4,788	9,707
114.00	**4,800**	**9,755**

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: 21P Stormtech

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.51	ac	A = Area draining to the practice	
0.34	ac	A_I = Impervious area draining to the practice	
0.68	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.66	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.34	ac-in	WQV= 1" x Rv x A	
1,218	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
304	cf	25% x WQV (check calc for sediment forebay volume)	
913	cf	75% x WQV (check calc for surface sand filter volume)	
Isolator Row		Method of Pretreatment? (not required for clean or roof runoff)	
NA	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
110.80	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.45	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
1.50	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	≤ 72-hrs
107.67	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
106.59	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
111.56	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
109.40	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.08	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
(1.73)	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
(3.89)	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
111.69	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
113.16	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	< 10 ac
1,295	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ 75%WQV
24.0	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet	CD-507	Note what sheet in the plan set contains the filter course specification.	
yes	Yes/No	Access grate provided?	← yes

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	← yes
	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ WQV
	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification	
	:1	Pond side slopes	≥ 3:1
Sheet	NA	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	≤ 5:1
	inches	D_{FC} = Filter course thickness	12", or 18" if within GPA
Sheet		Note what sheet in the plan set contains the filter course spec.	mod. 304.1 (see spec)

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes: System is lined, depth to SHWT and bedrock is irrelivant.

Stage-Discharge for Pond 21P:

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
109.67	0.00	110.21	0.45	110.75	0.45	111.29	1.16
109.68	0.45	110.22	0.45	110.76	0.45	111.30	1.19
109.69	0.45	110.23	0.45	110.77	0.45	111.31	1.21
109.70	0.45	110.24	0.45	110.78	0.45	111.32	1.24
109.71	0.45	110.25	0.45	110.79	0.45	111.33	1.26
109.72	0.45	110.26	0.45	110.80	0.45	111.34	1.29
109.73	0.45	110.27	0.45	110.81	0.45	111.35	1.31
109.74	0.45	110.28	0.45	110.82	0.45	111.36	1.34
109.75	0.45	110.29	0.45	110.83	0.45	111.37	1.37
109.76	0.45	110.30	0.45	110.84	0.45	111.38	1.39
109.77	0.45	110.31	0.45	110.85	0.45	111.39	1.42
109.78	0.45	110.32	0.45	110.86	0.45	111.40	1.45
109.79	0.45	110.33	0.45	110.87	0.45	111.41	1.47
109.80	0.45	110.34	0.45	110.88	0.46	111.42	1.50
109.81	0.45	110.35	0.45	110.89	0.47	111.43	1.53
109.82	0.45	110.36	0.45	110.90	0.47	111.44	1.56
109.83	0.45	110.37	0.45	110.91	0.48	111.45	1.59
109.84	0.45	110.38	0.45	110.92	0.49	111.46	1.62
109.85	0.45	110.39	0.45	110.93	0.50	111.47	1.64
109.86	0.45	110.40	0.45	110.94	0.51	111.48	1.67
109.87	0.45	110.41	0.45	110.95	0.52	111.49	1.70
109.88	0.45	110.42	0.45	110.96	0.54	111.50	1.73
109.89	0.45	110.43	0.45	110.97	0.55	111.51	1.76
109.90	0.45	110.44	0.45	110.98	0.56	111.52	1.79
109.91	0.45	110.45	0.45	110.99	0.57	111.53	1.82
109.92	0.45	110.46	0.45	111.00	0.59	111.54	1.85
109.93	0.45	110.47	0.45	111.01	0.60	111.55	1.88
109.94	0.45	110.48	0.45	111.02	0.62	111.56	1.92
109.95	0.45	110.49	0.45	111.03	0.63	111.57	1.95
109.96	0.45	110.50	0.45	111.04	0.65	111.58	1.98
109.97	0.45	110.51	0.45	111.05	0.67	111.59	2.01
109.98	0.45	110.52	0.45	111.06	0.68	111.60	2.04
109.99	0.45	110.53	0.45	111.07	0.70	111.61	2.07
110.00	0.45	110.54	0.45	111.08	0.72	111.62	2.11
110.01	0.45	110.55	0.45	111.09	0.73	111.63	2.14
110.02	0.45	110.56	0.45	111.10	0.75	111.64	2.17
110.03	0.45	110.57	0.45	111.11	0.77	111.65	2.20
110.04	0.45	110.58	0.45	111.12	0.79	111.66	2.24
110.05	0.45	110.59	0.45	111.13	0.81	111.67	2.27
110.06	0.45	110.60	0.45	111.14	0.83	111.68	2.30
110.07	0.45	110.61	0.45	111.15	0.85	111.69	2.34
110.08	0.45	110.62	0.45	111.16	0.87	111.70	2.37
110.09	0.45	110.63	0.45	111.17	0.89	111.71	2.40
110.10	0.45	110.64	0.45	111.18	0.91	111.72	2.44
110.11	0.45	110.65	0.45	111.19	0.93	111.73	2.47
110.12	0.45	110.66	0.45	111.20	0.95	111.74	2.51
110.13	0.45	110.67	0.45	111.21	0.98	111.75	2.54
110.14	0.45	110.68	0.45	111.22	1.00	111.76	2.58
110.15	0.45	110.69	0.45	111.23	1.02	111.77	2.61
110.16	0.45	110.70	0.45	111.24	1.04	111.78	2.65
110.17	0.45	110.71	0.45	111.25	1.07	111.79	2.68
110.18	0.45	110.72	0.45	111.26	1.09	111.80	2.72
110.19	0.45	110.73	0.45	111.27	1.11	111.81	2.76
110.20	0.45	110.74	0.45	111.28	1.14	111.82	2.79

Stage-Discharge for Pond 21P: (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
111.83	2.83	112.37	5.09	112.91	13.54	113.45	14.86
111.84	2.87	112.38	5.17	112.92	13.75	113.46	14.87
111.85	2.90	112.39	5.25	112.93	13.96	113.47	14.88
111.86	2.94	112.40	5.34	112.94	14.17	113.48	14.90
111.87	2.98	112.41	5.44	112.95	14.26	113.49	14.91
111.88	3.01	112.42	5.54	112.96	14.27	113.50	14.92
111.89	3.05	112.43	5.64	112.97	14.29	113.51	14.93
111.90	3.09	112.44	5.75	112.98	14.30	113.52	14.94
111.91	3.13	112.45	5.86	112.99	14.31	113.53	14.95
111.92	3.16	112.46	5.97	113.00	14.32	113.54	14.97
111.93	3.20	112.47	6.09	113.01	14.33	113.55	14.98
111.94	3.24	112.48	6.21	113.02	14.35	113.56	14.99
111.95	3.28	112.49	6.33	113.03	14.36	113.57	15.00
111.96	3.32	112.50	6.46	113.04	14.37	113.58	15.01
111.97	3.36	112.51	6.59	113.05	14.38	113.59	15.02
111.98	3.40	112.52	6.72	113.06	14.40	113.60	15.04
111.99	3.44	112.53	6.86	113.07	14.41	113.61	15.05
112.00	3.47	112.54	6.99	113.08	14.42	113.62	15.06
112.01	3.51	112.55	7.13	113.09	14.43	113.63	15.07
112.02	3.55	112.56	7.28	113.10	14.44	113.64	15.08
112.03	3.59	112.57	7.42	113.11	14.46	113.65	15.09
112.04	3.63	112.58	7.57	113.12	14.47	113.66	15.11
112.05	3.67	112.59	7.72	113.13	14.48	113.67	15.12
112.06	3.71	112.60	7.87	113.14	14.49	113.68	15.13
112.07	3.76	112.61	8.03	113.15	14.50	113.69	15.14
112.08	3.80	112.62	8.18	113.16	14.52	113.70	15.15
112.09	3.84	112.63	8.34	113.17	14.53	113.71	15.16
112.10	3.88	112.64	8.50	113.18	14.54	113.72	15.17
112.11	3.92	112.65	8.66	113.19	14.55	113.73	15.19
112.12	3.96	112.66	8.83	113.20	14.56	113.74	15.20
112.13	4.00	112.67	9.00	113.21	14.58	113.75	15.21
112.14	4.04	112.68	9.16	113.22	14.59	113.76	15.22
112.15	4.09	112.69	9.34	113.23	14.60	113.77	15.23
112.16	4.13	112.70	9.51	113.24	14.61	113.78	15.24
112.17	4.17	112.71	9.68	113.25	14.62	113.79	15.25
112.18	4.21	112.72	9.86	113.26	14.64	113.80	15.27
112.19	4.26	112.73	10.04	113.27	14.65	113.81	15.28
112.20	4.30	112.74	10.22	113.28	14.66	113.82	15.29
112.21	4.34	112.75	10.40	113.29	14.67	113.83	15.30
112.22	4.38	112.76	10.58	113.30	14.68	113.84	15.31
112.23	4.43	112.77	10.77	113.31	14.70	113.85	15.32
112.24	4.47	112.78	10.96	113.32	14.71	113.86	15.33
112.25	4.51	112.79	11.15	113.33	14.72	113.87	15.35
112.26	4.56	112.80	11.34	113.34	14.73	113.88	15.36
112.27	4.60	112.81	11.53	113.35	14.74	113.89	15.37
112.28	4.65	112.82	11.72	113.36	14.75	113.90	15.38
112.29	4.69	112.83	11.92	113.37	14.77	113.91	15.39
112.30	4.73	112.84	12.12	113.38	14.78	113.92	15.40
112.31	4.78	112.85	12.31	113.39	14.79	113.93	15.41
112.32	4.82	112.86	12.51	113.40	14.80	113.94	15.43
112.33	4.87	112.87	12.72	113.41	14.81	113.95	15.44
112.34	4.91	112.88	12.92	113.42	14.83	113.96	15.45
112.35	4.96	112.89	13.13	113.43	14.84	113.97	15.46
112.36	5.02	112.90	13.33	113.44	14.85	113.98	15.47

Stage-Discharge for Pond 21P: (continued)

Elevation (feet)	Primary (cfs)
113.99	15.48
114.00	15.49
114.01	15.50
114.02	15.52
114.03	15.53
114.04	15.54
114.05	15.55
114.06	15.56
114.07	15.57
114.08	15.58
114.09	15.59
114.10	15.61
114.11	15.62
114.12	15.63
114.13	15.64
114.14	15.65
114.15	15.66
114.16	15.67
114.17	15.68
114.18	15.69
114.19	15.71
114.20	15.72
114.21	15.73
114.22	15.74
114.23	15.75
114.24	15.76
114.25	15.77
114.26	15.78
114.27	15.79
114.28	15.81
114.29	15.82
114.30	15.83
114.31	15.84
114.32	15.85
114.33	15.86
114.34	15.87
114.35	15.88
114.36	15.89
114.37	15.90
114.38	15.92
114.39	15.93
114.40	15.94
114.41	**15.95**

Stage-Area-Storage for Pond 21P:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
109.67	**1,925**	0	110.21	1,925	439
109.68	1,925	8	110.22	1,925	453
109.69	1,925	15	110.23	1,925	466
109.70	1,925	23	110.24	1,925	480
109.71	1,925	31	110.25	1,925	494
109.72	1,925	38	110.26	1,925	507
109.73	1,925	46	110.27	1,925	521
109.74	1,925	54	110.28	1,925	534
109.75	1,925	62	110.29	1,925	548
109.76	1,925	69	110.30	1,925	561
109.77	1,925	77	110.31	1,925	575
109.78	1,925	85	110.32	1,925	588
109.79	1,925	92	110.33	1,925	602
109.80	1,925	100	110.34	1,925	616
109.81	1,925	108	110.35	1,925	629
109.82	1,925	116	110.36	1,925	643
109.83	1,925	123	110.37	1,925	656
109.84	1,925	131	110.38	1,925	670
109.85	1,925	139	110.39	1,925	683
109.86	1,925	146	110.40	1,925	697
109.87	1,925	154	110.41	1,925	710
109.88	1,925	162	110.42	1,925	724
109.89	1,925	169	110.43	1,925	737
109.90	1,925	177	110.44	1,925	751
109.91	1,925	185	110.45	1,925	764
109.92	1,925	193	110.46	1,925	777
109.93	1,925	200	110.47	1,925	791
109.94	1,925	208	110.48	1,925	804
109.95	1,925	216	110.49	1,925	818
109.96	1,925	223	110.50	1,925	831
109.97	1,925	231	110.51	1,925	845
109.98	1,925	239	110.52	1,925	858
109.99	1,925	246	110.53	1,925	871
110.00	1,925	254	110.54	1,925	885
110.01	1,925	262	110.55	1,925	898
110.02	1,925	269	110.56	1,925	911
110.03	1,925	277	110.57	1,925	925
110.04	1,925	285	110.58	1,925	938
110.05	1,925	293	110.59	1,925	952
110.06	1,925	300	110.60	1,925	965
110.07	1,925	308	110.61	1,925	978
110.08	1,925	316	110.62	1,925	992
110.09	1,925	323	110.63	1,925	1,005
110.10	1,925	331	110.64	1,925	1,018
110.11	1,925	339	110.65	1,925	1,031
110.12	1,925	347	110.66	1,925	1,045
110.13	1,925	354	110.67	1,925	1,058
110.14	1,925	362	110.68	1,925	1,071
110.15	1,925	370	110.69	1,925	1,084
110.16	1,925	377	110.70	1,925	1,098
110.17	1,925	385	110.71	1,925	1,111
110.18	1,925	399	110.72	1,925	1,124
110.19	1,925	412	110.73	1,925	1,137
110.20	1,925	426	110.74	1,925	1,151

Stage-Area-Storage for Pond 21P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
110.75	1,925	1,164	111.29	1,925	1,859
110.76	1,925	1,177	111.30	1,925	1,872
110.77	1,925	1,190	111.31	1,925	1,884
110.78	1,925	1,203	111.32	1,925	1,896
110.79	1,925	1,216	111.33	1,925	1,909
110.80	1,925	1,230	111.34	1,925	1,921
110.81	1,925	1,243	111.35	1,925	1,934
110.82	1,925	1,256	111.36	1,925	1,946
110.83	1,925	1,269	111.37	1,925	1,959
110.84	1,925	1,282	111.38	1,925	1,971
110.85	1,925	1,295	111.39	1,925	1,983
110.86	1,925	1,308	111.40	1,925	1,996
110.87	1,925	1,321	111.41	1,925	2,008
110.88	1,925	1,334	111.42	1,925	2,020
110.89	1,925	1,347	111.43	1,925	2,033
110.90	1,925	1,360	111.44	1,925	2,045
110.91	1,925	1,373	111.45	1,925	2,057
110.92	1,925	1,386	111.46	1,925	2,069
110.93	1,925	1,399	111.47	1,925	2,082
110.94	1,925	1,412	111.48	1,925	2,094
110.95	1,925	1,425	111.49	1,925	2,106
110.96	1,925	1,438	111.50	1,925	2,118
110.97	1,925	1,451	111.51	1,925	2,130
110.98	1,925	1,464	111.52	1,925	2,142
110.99	1,925	1,477	111.53	1,925	2,155
111.00	1,925	1,490	111.54	1,925	2,167
111.01	1,925	1,503	111.55	1,925	2,179
111.02	1,925	1,516	111.56	1,925	2,191
111.03	1,925	1,529	111.57	1,925	2,203
111.04	1,925	1,542	111.58	1,925	2,215
111.05	1,925	1,554	111.59	1,925	2,227
111.06	1,925	1,567	111.60	1,925	2,239
111.07	1,925	1,580	111.61	1,925	2,251
111.08	1,925	1,593	111.62	1,925	2,263
111.09	1,925	1,606	111.63	1,925	2,275
111.10	1,925	1,619	111.64	1,925	2,287
111.11	1,925	1,631	111.65	1,925	2,298
111.12	1,925	1,644	111.66	1,925	2,310
111.13	1,925	1,657	111.67	1,925	2,322
111.14	1,925	1,670	111.68	1,925	2,334
111.15	1,925	1,682	111.69	1,925	2,346
111.16	1,925	1,695	111.70	1,925	2,358
111.17	1,925	1,708	111.71	1,925	2,369
111.18	1,925	1,720	111.72	1,925	2,381
111.19	1,925	1,733	111.73	1,925	2,393
111.20	1,925	1,746	111.74	1,925	2,404
111.21	1,925	1,758	111.75	1,925	2,416
111.22	1,925	1,771	111.76	1,925	2,428
111.23	1,925	1,784	111.77	1,925	2,439
111.24	1,925	1,796	111.78	1,925	2,451
111.25	1,925	1,809	111.79	1,925	2,463
111.26	1,925	1,821	111.80	1,925	2,474
111.27	1,925	1,834	111.81	1,925	2,486
111.28	1,925	1,846	111.82	1,925	2,497

Stage-Area-Storage for Pond 21P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
111.83	1,925	2,509	112.37	1,925	3,079
111.84	1,925	2,520	112.38	1,925	3,089
111.85	1,925	2,531	112.39	1,925	3,098
111.86	1,925	2,543	112.40	1,925	3,107
111.87	1,925	2,554	112.41	1,925	3,116
111.88	1,925	2,566	112.42	1,925	3,125
111.89	1,925	2,577	112.43	1,925	3,134
111.90	1,925	2,588	112.44	1,925	3,143
111.91	1,925	2,599	112.45	1,925	3,151
111.92	1,925	2,611	112.46	1,925	3,160
111.93	1,925	2,622	112.47	1,925	3,169
111.94	1,925	2,633	112.48	1,925	3,177
111.95	1,925	2,644	112.49	1,925	3,185
111.96	1,925	2,655	112.50	1,925	3,194
111.97	1,925	2,666	112.51	1,925	3,202
111.98	1,925	2,677	112.52	1,925	3,210
111.99	1,925	2,688	112.53	1,925	3,219
112.00	1,925	2,699	112.54	1,925	3,227
112.01	1,925	2,710	112.55	1,925	3,235
112.02	1,925	2,721	112.56	1,925	3,243
112.03	1,925	2,732	112.57	1,925	3,251
112.04	1,925	2,743	112.58	1,925	3,259
112.05	1,925	2,754	112.59	1,925	3,267
112.06	1,925	2,764	112.60	1,925	3,275
112.07	1,925	2,775	112.61	1,925	3,283
112.08	1,925	2,786	112.62	1,925	3,291
112.09	1,925	2,797	112.63	1,925	3,299
112.10	1,925	2,807	112.64	1,925	3,307
112.11	1,925	2,818	112.65	1,925	3,314
112.12	1,925	2,829	112.66	1,925	3,322
112.13	1,925	2,839	112.67	1,925	3,330
112.14	1,925	2,850	112.68	1,925	3,338
112.15	1,925	2,860	112.69	1,925	3,345
112.16	1,925	2,871	112.70	1,925	3,353
112.17	1,925	2,881	112.71	1,925	3,361
112.18	1,925	2,891	112.72	1,925	3,368
112.19	1,925	2,902	112.73	1,925	3,376
112.20	1,925	2,912	112.74	1,925	3,384
112.21	1,925	2,922	112.75	1,925	3,391
112.22	1,925	2,933	112.76	1,925	3,399
112.23	1,925	2,943	112.77	1,925	3,407
112.24	1,925	2,953	112.78	1,925	3,415
112.25	1,925	2,963	112.79	1,925	3,422
112.26	1,925	2,973	112.80	1,925	3,430
112.27	1,925	2,983	112.81	1,925	3,438
112.28	1,925	2,993	112.82	1,925	3,445
112.29	1,925	3,003	112.83	1,925	3,453
112.30	1,925	3,013	112.84	1,925	3,461
112.31	1,925	3,022	112.85	1,925	3,468
112.32	1,925	3,032	112.86	1,925	3,476
112.33	1,925	3,042	112.87	1,925	3,484
112.34	1,925	3,051	112.88	1,925	3,492
112.35	1,925	3,061	112.89	1,925	3,499
112.36	1,925	3,070	112.90	1,925	3,507

Stage-Area-Storage for Pond 21P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
112.91	1,925	3,515	113.45	1,925	3,707
112.92	1,925	3,522	113.46	1,925	3,707
112.93	1,925	3,530	113.47	1,925	3,707
112.94	1,925	3,538	113.48	1,925	3,707
112.95	1,925	3,545	113.49	1,925	3,707
112.96	1,925	3,553	113.50	1,925	3,707
112.97	1,925	3,561	113.51	1,925	3,707
112.98	1,925	3,569	113.52	1,925	3,707
112.99	1,925	3,576	113.53	1,925	3,707
113.00	1,925	3,584	113.54	1,925	3,707
113.01	1,925	3,592	113.55	1,925	3,707
113.02	1,925	3,599	113.56	1,925	3,707
113.03	1,925	3,607	113.57	1,925	3,707
113.04	1,925	3,615	113.58	1,925	3,707
113.05	1,925	3,622	113.59	1,925	3,707
113.06	1,925	3,630	113.60	1,925	3,707
113.07	1,925	3,638	113.61	1,925	3,707
113.08	1,925	3,646	113.62	1,925	3,707
113.09	1,925	3,653	113.63	1,925	3,707
113.10	1,925	3,661	113.64	1,925	3,707
113.11	1,925	3,669	113.65	1,925	3,707
113.12	1,925	3,676	113.66	1,925	3,707
113.13	1,925	3,684	113.67	1,925	3,707
113.14	1,925	3,692	113.68	1,925	3,707
113.15	1,925	3,699	113.69	1,925	3,707
113.16	1,925	**3,707**	113.70	1,925	3,707
113.17	1,925	3,707	113.71	1,925	3,707
113.18	1,925	3,707	113.72	1,925	3,707
113.19	1,925	3,707	113.73	1,925	3,707
113.20	1,925	3,707	113.74	1,925	3,707
113.21	1,925	3,707	113.75	1,925	3,707
113.22	1,925	3,707	113.76	1,925	3,707
113.23	1,925	3,707	113.77	1,925	3,707
113.24	1,925	3,707	113.78	1,925	3,707
113.25	1,925	3,707	113.79	1,925	3,707
113.26	1,925	3,707	113.80	1,925	3,707
113.27	1,925	3,707	113.81	1,925	3,707
113.28	1,925	3,707	113.82	1,925	3,707
113.29	1,925	3,707	113.83	1,925	3,707
113.30	1,925	3,707	113.84	1,925	3,707
113.31	1,925	3,707	113.85	1,925	3,707
113.32	1,925	3,707	113.86	1,925	3,707
113.33	1,925	3,707	113.87	1,925	3,707
113.34	1,925	3,707	113.88	1,925	3,707
113.35	1,925	3,707	113.89	1,925	3,707
113.36	1,925	3,707	113.90	1,925	3,707
113.37	1,925	3,707	113.91	1,925	3,707
113.38	1,925	3,707	113.92	1,925	3,707
113.39	1,925	3,707	113.93	1,925	3,707
113.40	1,925	3,707	113.94	1,925	3,707
113.41	1,925	3,707	113.95	1,925	3,707
113.42	1,925	3,707	113.96	1,925	3,707
113.43	1,925	3,707	113.97	1,925	3,707
113.44	1,925	3,707	113.98	1,925	3,707

Stage-Area-Storage for Pond 21P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
113.99	1,925	3,707
114.00	1,925	3,707
114.01	1,925	3,707
114.02	1,925	3,707
114.03	1,925	3,707
114.04	1,925	3,707
114.05	1,925	3,707
114.06	1,925	3,707
114.07	1,925	3,707
114.08	1,925	3,707
114.09	1,925	3,707
114.10	1,925	3,707
114.11	1,925	3,707
114.12	1,925	3,707
114.13	1,925	3,707
114.14	1,925	3,707
114.15	1,925	3,707
114.16	1,925	3,707
114.17	1,925	3,707
114.18	1,925	3,707
114.19	1,925	3,707
114.20	1,925	3,707
114.21	1,925	3,707
114.22	1,925	3,707
114.23	1,925	3,707
114.24	1,925	3,707
114.25	1,925	3,707
114.26	1,925	3,707
114.27	1,925	3,707
114.28	1,925	3,707
114.29	1,925	3,707
114.30	1,925	3,707
114.31	1,925	3,707
114.32	1,925	3,707
114.33	1,925	3,707
114.34	1,925	3,707
114.35	1,925	3,707
114.36	1,925	3,707
114.37	1,925	3,707
114.38	1,925	3,707
114.39	1,925	3,707
114.40	1,925	3,707
114.41	1,925	3,707

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Type/Node Name: 22P Stormtech

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.65	ac	A = Area draining to the practice	
0.43	ac	A_I = Impervious area draining to the practice	
0.65	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.64	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.42	ac-in	WQV= 1" x Rv x A	
1,507	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
377	cf	25% x WQV (check calc for sediment forebay volume)	
1,131	cf	75% x WQV (check calc for surface sand filter volume)	
Isolator Row		Method of Pretreatment? (not required for clean or roof runoff)	
NA	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
110.55	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.74	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
1.13	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	≤ 72-hrs
107.67	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
106.59	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
111.73	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
110.07	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.08	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
(2.40)	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
(4.06)	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
111.23	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
113.16	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	< 10 ac
1,639	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ 75%WQV
24.0	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet	CD-507	Note what sheet in the plan set contains the filter course specification.	
Yes	Yes/No	Access grate provided?	← yes

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	← yes
	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ WQV
	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification	
	:1	Pond side slopes	≥ 3:1
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	≤ 5:1
	inches	D_{FC} = Filter course thickness	12", or 18" if within GPA
Sheet		Note what sheet in the plan set contains the filter course spec.	mod. 304.1 (see spec)

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes: System is lined, depth to SHWT and bedrock is irrelivant.

Stage-Discharge for Pond 22P:

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
109.67	0.00	110.75	0.93	111.83	6.65	112.91	14.21
109.69	0.74	110.77	0.97	111.85	6.96	112.93	14.24
109.71	0.74	110.79	1.01	111.87	7.27	112.95	14.26
109.73	0.74	110.81	1.06	111.89	7.59	112.97	14.29
109.75	0.74	110.83	1.10	111.91	7.91	112.99	14.31
109.77	0.74	110.85	1.15	111.93	8.25	113.01	14.33
109.79	0.74	110.87	1.20	111.95	8.59	113.03	14.36
109.81	0.74	110.89	1.25	111.97	8.94	113.05	14.38
109.83	0.74	110.91	1.31	111.99	9.30	113.07	14.41
109.85	0.74	110.93	1.36	112.01	9.66	113.09	14.43
109.87	0.74	110.95	1.42	112.03	10.04	113.11	14.46
109.89	0.74	110.97	1.48	112.05	10.41	113.13	14.48
109.91	0.74	110.99	1.54	112.07	10.80	113.15	14.50
109.93	0.74	111.01	1.60	112.09	11.19	113.17	14.53
109.95	0.74	111.03	1.67	112.11	11.59	113.19	14.55
109.97	0.74	111.05	1.73	112.13	11.99	113.21	14.58
109.99	0.74	111.07	1.80	112.15	12.41	113.23	14.60
110.01	0.74	111.09	1.87	112.17	12.82	113.25	14.62
110.03	0.74	111.11	1.93	112.19	13.24	113.27	14.65
110.05	0.74	111.13	2.01	112.21	13.32	113.29	14.67
110.07	0.74	111.15	2.08	112.23	13.35	113.31	14.70
110.09	0.74	111.17	2.15	112.25	13.38	113.33	14.72
110.11	0.74	111.19	2.23	112.27	13.40	113.35	14.74
110.13	0.74	111.21	2.30	112.29	13.43	113.37	14.77
110.15	0.74	111.23	2.38	112.31	13.45	113.39	14.79
110.17	0.74	111.25	2.46	112.33	13.48	113.41	14.81
110.19	0.74	111.27	2.54	112.35	13.51	113.43	14.84
110.21	0.74	111.29	2.62	112.37	13.53	113.45	14.86
110.23	0.74	111.31	2.70	112.39	13.56	113.47	14.88
110.25	0.74	111.33	2.78	112.41	13.58	113.49	14.91
110.27	0.74	111.35	2.87	112.43	13.61	113.51	14.93
110.29	0.74	111.37	2.95	112.45	13.64	113.53	14.95
110.31	0.74	111.39	3.04	112.47	13.66	113.55	14.98
110.33	0.74	111.41	3.13	112.49	13.69	113.57	15.00
110.35	0.74	111.43	3.22	112.51	13.71	113.59	15.02
110.37	0.74	111.45	3.31	112.53	13.74	113.61	15.05
110.39	0.74	111.47	3.40	112.55	13.76	113.63	15.07
110.41	0.74	111.49	3.49	112.57	13.79	113.65	15.09
110.43	0.74	111.51	3.58	112.59	13.81	113.67	15.12
110.45	0.74	111.53	3.68	112.61	13.84	113.69	15.14
110.47	0.74	111.55	3.77	112.63	13.86	113.71	15.16
110.49	0.74	111.57	3.87	112.65	13.89	113.73	15.19
110.51	0.74	111.59	3.97	112.67	13.91	113.75	15.21
110.53	0.74	111.61	4.08	112.69	13.94	113.77	15.23
110.55	0.74	111.63	4.23	112.71	13.96	113.79	15.25
110.57	0.74	111.65	4.41	112.73	13.99	113.81	15.28
110.59	0.74	111.67	4.61	112.75	14.01	113.83	15.30
110.61	0.75	111.69	4.82	112.77	14.04	113.85	15.32
110.63	0.76	111.71	5.05	112.79	14.06	113.87	15.35
110.65	0.78	111.73	5.29	112.81	14.09	113.89	15.37
110.67	0.80	111.75	5.54	112.83	14.11	113.91	15.39
110.69	0.83	111.77	5.80	112.85	14.14	113.93	15.41
110.71	0.86	111.79	6.08	112.87	14.16	113.95	15.44
110.73	0.90	111.81	6.36	112.89	14.19	113.97	15.46

Stage-Discharge for Pond 22P: (continued)

Elevation (feet)	Primary (cfs)
113.99	15.48
114.01	15.50
114.03	15.53
114.05	15.55
114.07	15.57
114.09	15.59
114.11	15.62
114.13	15.64
114.15	15.66
114.17	15.68
114.19	15.71
114.21	15.73
114.23	15.75
114.25	15.77
114.27	15.79
114.29	15.82
114.31	15.84
114.33	15.86
114.35	15.88
114.37	15.90
114.39	15.93
114.41	15.95
114.43	15.97
114.45	15.99
114.47	16.01
114.49	16.04
114.51	16.06
114.53	16.08
114.55	16.10
114.57	16.12
114.59	16.14
114.61	16.17
114.63	16.19
114.65	16.21
114.67	16.23
114.69	16.25
114.71	16.27
114.73	16.29
114.75	16.32
114.77	16.34
114.79	16.36
114.81	16.38
114.83	16.40
114.85	16.42
114.87	16.44
114.89	16.47
114.91	**16.49**

Stage-Area-Storage for Pond 22P:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
109.67	**3,205**	0	110.75	3,205	2,013
109.69	3,205	26	110.77	3,205	2,059
109.71	3,205	51	110.79	3,205	2,106
109.73	3,205	77	110.81	3,205	2,152
109.75	3,205	103	110.83	3,205	2,198
109.77	3,205	128	110.85	3,205	2,244
109.79	3,205	154	110.87	3,205	2,290
109.81	3,205	179	110.89	3,205	2,336
109.83	3,205	205	110.91	3,205	2,382
109.85	3,205	231	110.93	3,205	2,427
109.87	3,205	256	110.95	3,205	2,473
109.89	3,205	282	110.97	3,205	2,518
109.91	3,205	308	110.99	3,205	2,564
109.93	3,205	333	111.01	3,205	2,609
109.95	3,205	359	111.03	3,205	2,654
109.97	3,205	385	111.05	3,205	2,700
109.99	3,205	410	111.07	3,205	2,745
110.01	3,205	436	111.09	3,205	2,790
110.03	3,205	462	111.11	3,205	2,835
110.05	3,205	487	111.13	3,205	2,879
110.07	3,205	513	111.15	3,205	2,924
110.09	3,205	538	111.17	3,205	2,969
110.11	3,205	564	111.19	3,205	3,013
110.13	3,205	590	111.21	3,205	3,058
110.15	3,205	615	111.23	3,205	3,102
110.17	3,205	641	111.25	3,205	3,146
110.19	3,205	689	111.27	3,205	3,190
110.21	3,205	737	111.29	3,205	3,234
110.23	3,205	785	111.31	3,205	3,278
110.25	3,205	832	111.33	3,205	3,321
110.27	3,205	880	111.35	3,205	3,365
110.29	3,205	928	111.37	3,205	3,408
110.31	3,205	976	111.39	3,205	3,452
110.33	3,205	1,024	111.41	3,205	3,495
110.35	3,205	1,071	111.43	3,205	3,538
110.37	3,205	1,119	111.45	3,205	3,581
110.39	3,205	1,167	111.47	3,205	3,623
110.41	3,205	1,214	111.49	3,205	3,666
110.43	3,205	1,262	111.51	3,205	3,709
110.45	3,205	1,309	111.53	3,205	3,751
110.47	3,205	1,356	111.55	3,205	3,793
110.49	3,205	1,404	111.57	3,205	3,835
110.51	3,205	1,451	111.59	3,205	3,877
110.53	3,205	1,498	111.61	3,205	3,919
110.55	3,205	1,545	111.63	3,205	3,961
110.57	3,205	1,592	111.65	3,205	4,002
110.59	3,205	1,639	111.67	3,205	4,044
110.61	3,205	1,686	111.69	3,205	4,085
110.63	3,205	1,733	111.71	3,205	4,126
110.65	3,205	1,780	111.73	3,205	4,167
110.67	3,205	1,827	111.75	3,205	4,208
110.69	3,205	1,873	111.77	3,205	4,248
110.71	3,205	1,920	111.79	3,205	4,288
110.73	3,205	1,967	111.81	3,205	4,329

Stage-Area-Storage for Pond 22P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
111.83	3,205	4,369	112.91	3,205	6,083
111.85	3,205	4,408	112.93	3,205	6,109
111.87	3,205	4,448	112.95	3,205	6,134
111.89	3,205	4,487	112.97	3,205	6,160
111.91	3,205	4,526	112.99	3,205	6,186
111.93	3,205	4,565	113.01	3,205	6,211
111.95	3,205	4,604	113.03	3,205	6,237
111.97	3,205	4,642	113.05	3,205	6,263
111.99	3,205	4,680	113.07	3,205	6,288
112.01	3,205	4,718	113.09	3,205	6,314
112.03	3,205	4,756	113.11	3,205	6,340
112.05	3,205	4,794	113.13	3,205	6,365
112.07	3,205	4,831	113.15	3,205	6,391
112.09	3,205	4,868	113.17	3,205	**6,404**
112.11	3,205	4,905	113.19	3,205	6,404
112.13	3,205	4,942	113.21	3,205	6,404
112.15	3,205	4,978	113.23	3,205	6,404
112.17	3,205	5,014	113.25	3,205	6,404
112.19	3,205	5,050	113.27	3,205	6,404
112.21	3,205	5,085	113.29	3,205	6,404
112.23	3,205	5,120	113.31	3,205	6,404
112.25	3,205	5,155	113.33	3,205	6,404
112.27	3,205	5,189	113.35	3,205	6,404
112.29	3,205	5,223	113.37	3,205	6,404
112.31	3,205	5,256	113.39	3,205	6,404
112.33	3,205	5,290	113.41	3,205	6,404
112.35	3,205	5,322	113.43	3,205	6,404
112.37	3,205	5,354	113.45	3,205	6,404
112.39	3,205	5,386	113.47	3,205	6,404
112.41	3,205	5,416	113.49	3,205	6,404
112.43	3,205	5,447	113.51	3,205	6,404
112.45	3,205	5,476	113.53	3,205	6,404
112.47	3,205	5,505	113.55	3,205	6,404
112.49	3,205	5,534	113.57	3,205	6,404
112.51	3,205	5,562	113.59	3,205	6,404
112.53	3,205	5,589	113.61	3,205	6,404
112.55	3,205	5,617	113.63	3,205	6,404
112.57	3,205	5,644	113.65	3,205	6,404
112.59	3,205	5,671	113.67	3,205	6,404
112.61	3,205	5,697	113.69	3,205	6,404
112.63	3,205	5,724	113.71	3,205	6,404
112.65	3,205	5,750	113.73	3,205	6,404
112.67	3,205	5,775	113.75	3,205	6,404
112.69	3,205	5,801	113.77	3,205	6,404
112.71	3,205	5,827	113.79	3,205	6,404
112.73	3,205	5,852	113.81	3,205	6,404
112.75	3,205	5,878	113.83	3,205	6,404
112.77	3,205	5,904	113.85	3,205	6,404
112.79	3,205	5,929	113.87	3,205	6,404
112.81	3,205	5,955	113.89	3,205	6,404
112.83	3,205	5,981	113.91	3,205	6,404
112.85	3,205	6,006	113.93	3,205	6,404
112.87	3,205	6,032	113.95	3,205	6,404
112.89	3,205	6,058	113.97	3,205	6,404

Stage-Area-Storage for Pond 22P: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
113.99	3,205	6,404
114.01	3,205	6,404
114.03	3,205	6,404
114.05	3,205	6,404
114.07	3,205	6,404
114.09	3,205	6,404
114.11	3,205	6,404
114.13	3,205	6,404
114.15	3,205	6,404
114.17	3,205	6,404
114.19	3,205	6,404
114.21	3,205	6,404
114.23	3,205	6,404
114.25	3,205	6,404
114.27	3,205	6,404
114.29	3,205	6,404
114.31	3,205	6,404
114.33	3,205	6,404
114.35	3,205	6,404
114.37	3,205	6,404
114.39	3,205	6,404
114.41	3,205	6,404
114.43	3,205	6,404
114.45	3,205	6,404
114.47	3,205	6,404
114.49	3,205	6,404
114.51	3,205	6,404
114.53	3,205	6,404
114.55	3,205	6,404
114.57	3,205	6,404
114.59	3,205	6,404
114.61	3,205	6,404
114.63	3,205	6,404
114.65	3,205	6,404
114.67	3,205	6,404
114.69	3,205	6,404
114.71	3,205	6,404
114.73	3,205	6,404
114.75	3,205	6,404
114.77	3,205	6,404
114.79	3,205	6,404
114.81	3,205	6,404
114.83	3,205	6,404
114.85	3,205	6,404
114.87	3,205	6,404
114.89	3,205	6,404
114.91	3,205	6,404

Inspection & Maintenance (I&M) Manual for Stormwater Best Management Practices

February 24, 2022

Bluebird Dover
64 Littleworth Road
Dover, New Hampshire

The purpose of this Inspection and Maintenance manual is to assist the responsible parties for maintaining and understanding the functions of the Stormwater Best Management Practices.

Party Responsible for Reporting, Inspection, & Maintenance during construction:

Bluebird Hooksett, LLC
125 Ocean Road
Greenland, NH 03840
603-436-7355
Bill.goodison@bluebirdselfstorage.com

Party Responsible for Reporting, Inspection, & Maintenance after construction completion:

Bluebird Hooksett, LLC
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Stormwater BMP's on Site

- Catch Basins/Drain Manholes/Outlet Structures/Pipes
- Underground Bioretention System
- Sediment Forebay/ Plunge Pool Outlet Protection
- Bioretention Treatment Pond

Recommended Maintenance for specific BMP's

Catch Basins/Drain Manholes/Outlet Structures/Pipes

- Catch basins may require frequent maintenance. Depending on location, this may require several cleanings of the sumps each year. At a minimum, it is recommended that catch basins be inspected at least twice annually, once following snow-melt and once following leaf-drop, and cleaned as indicated by inspection.
- Sediment should be removed when it approaches half the sump depth, use vacuum truck.
- If floating hydrocarbons are observed during an inspection, the material should be removed immediately by skimming, absorbent materials, or other method and disposed in conformance with applicable state and federal regulations.
- Remove all debris from pipe inlets and outlets.

Underground Bioretention System

- Inspect every 6 months during the first year of operation. Adjust the inspection interval based on previous observations of sediment accumulation and high water elevations. Inspect at least twice annually and after rainfall exceeding 2.5 inches within a 24 hour period.
- Remove trash and debris at inspection.
- At least once annually, inspect for drawdown time. If system does not drain within 72 hours following rainfall event, then a qualified professional should assess the condition to determine measures required to restore filtration function.
- Conduct Jetting and vactoring annually or when inspection shows that maintenance is necessary.
  - Step 1 - Inspect Isolator Row for sediment
    - Inspect ports
      - Remove/open lid on catch basin/ drain manhole
      - Remove and clean flexstorm filter (if installed)
      - Using a flashlight and stadia rod, measure depth of sediment and record on maintenance log
      - Lower camera into isolator row for visual inspection of sediment levels (optional)
      - If sediment is at, or above 3", proceed to step 2, if not, proceed to step 3.

        - All Isolator Rows
            - Remove cover from structure at upstream end of isolator row
            - Using a flashlight, inspect down the isolator row through outlet pipe
                - Mirrors on poles or cameras may be used to avoid a confined space entry
                - Follow OSHA regulations for confined space entry if entering manhole.
            - If sediment is at, or above, 3" proceed to step 2. If not proceed to step 3.
    - Step 2 - Clean out Isolator Row using the Jetvac Process
        - A fixed culvert cleaning nozzle with rear facing spread of 45 degrees or more preferred.
        - Apply multiple passes of Jetvac until backflush water is clean
        - Vacuum structure sump as required.
    - Step 3 – Replace all covers, grates, filters, and lids; record observations and actions
    - Step 4 – Inspect and clean basins and manholes upstream of the stormtech system

Sediment Forebay/Plunge Pool Outlet Protection

- Inspect at least twice annually, once following snow-melt and once following leaf-drop, and maintained as needed.
- Inspect annually for erosion, sediment accumulation, vegetation loss, and presence of invasive species.
- Remove trash and debris from inlet and outlet structures, if applicable
- Remove and dispose of accumulated sediment based on inspection
- Repair eroded areas, remove invasive species and dead vegetation, and reseed with applicable grass mix as warranted by inspection
- Conduct periodic mowing of embankments (generally two times per year) to control growth of woody vegetation on embankments;
- Install and maintain a staff gage or other measuring device, to indicate depth of sediment accumulation and level at which clean-out is required.
- Inspect vegetation annually and maintain in healthy condition including removal of invasive species.

Bioretention Treatment Pond

Maintenance of Bioretention systems can typically be performed as part of standard landscaping. Regular inspection and maintenance is critical to the effective operation of Bioretention systems to insure they remain clear of leaves and debris and that they remain free draining.

The most common maintenance activity is the removal of sediment and organic debris from the system and any structures. Visual inspections shall be routine and shall include looking for standing water, accumulated leaves, holes in the soil media, signs of plant distress and debris and sediment accumulation.

Vegetation coverage is integral to the performance of the system, including infiltration rate and nutrient uptake. Vegetation care is important to system productivity and health.

- Inspect at least twice annually and after rainfall exceeding 2.5 inches within a 24-hour period.
- Remove trash and debris at inspection.
- At least once annually and after every major storm in the first few months, inspect for drawdown time. IA record should be kept of the time to drain for the system completely after a storm even. The system should drain within 72 hours.
    - Check to insure the filter surface remains well draining after storm events.
    - If filter bed is clogged, draining poorly or standing water covers more than 50% of the surface 48 hours after a precipitation event, then remove top few inches of discolored material. Till or rake remaining material, as needed.
- Inspect vegetation annually or as needed and maintain in healthy condition including pruning, removal and replacement of dead or diseased vegetation and removal of invasive species.
    - Vegetation should cover greater than 75% of the system and should be cared for as needed.
- Conduct periodic mowing of embankments (generally two times per year) to control growth of woody vegetation on embankments;
- Check inlets and outlets for leaves and debris, quarterly, initially and then annually at a minimum thereafter.
    - Rake in and around the system to clear it of debris. Also clear the inlet and overflow if obstructed.
- Check for animal burrows and short circuiting in the system, quarterly initially and then annually at a minimum thereafter.
    - Soil erosion from short circuiting or animal borrows should be repaired when they occur. The holes should be filled and lightly compacted.
- Inspect inlets and outlets to ensure good condition and no evidence of deterioration. Check to see if high-flow bypass is functioning, quarterly initially and then annually at a minimum thereafter.
    - Repair or replace any damage structural parts, inlets, outlets, sidewalls, trash racks, etc.

Control of Invasive Species

During inspection of on-site stormwater best management practices, inspect for the presence of invasive plants and remove in a safe manner as described by the "University of New Hampshire Cooperative Extension Methods for Disposing of Non-Native Invasive Plants" a copy of which is

attached to this Manual and can be downloaded at
https://extension.unh.edu/resources/files/resource000988_rep1720.pdf

Required Submittals

Inspection and Maintenance Reports must be submitted to NHDES upon request to:

- NHDES Alteration of Terrain Bureau
  PO Box 95, Concord, NH 03303-0095

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Inspection Checklist

Date of Inspection: _____
(Make additional copies of this sheet for each inspection)

Catch Basins / Drain Manholes/ Outlet Structures/Pipes

☐ Check sump, remove sediment when half the sump depth, use vacuum truck

☐ Check inlets and outlets, remove debris and/or overgrown vegetation

☐ Check pipes and remove any blockages

☐ Remove floating hydrocarbons (petroleum and natural gas)

Underground Bioretention System

☐ Remove trash and debris

☐ Check drawdown time annually.

☐ Inspect Isolator Row, remove sediment as warranted.

☐ Conduct Jetting and Vactoring annually or as warranted by inspection

Sediment Forebay/Plunge Pool Outlet

☐ Remove trash and debris

☐ Remove accumulated sediment.

☐ Check for erosion, repair as needed.

☐ Inspect vegetation. Check for invasive species, remove as needed and dispose properly.

☐ Mow embankments.

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Bioretention Treatment Pond

Initial Inspection after Planting and Mulching

☐ Plants are stable, roots not exposed.

☐ Surface is at design level, no evidence of preferential flows/shoving.

☐ Inlet and outlet/bypass are functional.

Debris Cleanup (1 time/year minimum, Spring/Fall)

☐ Remove Trash and debris

☐ Litter, leaves and dead vegetation removed from the system

☐ Prune/ mow vegetation

Standing Water (1 time/year and/or after large storm events)

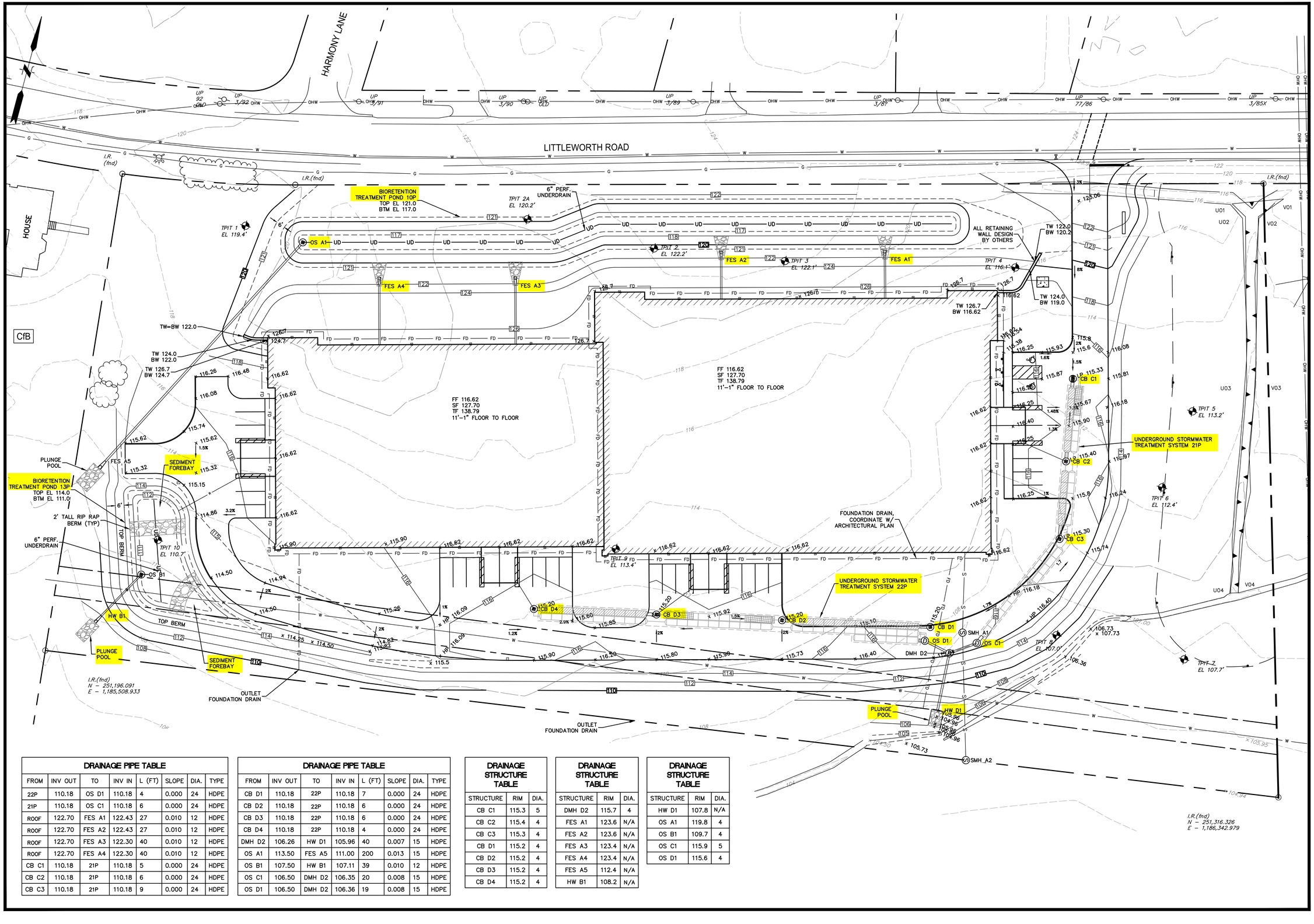
☐ Check drawdown time, no evidence of standing water after 24-48 hours since rainfall

Vegetation Condition and Coverage

☐ Vegetation condition good with good coverage (typically > 75%)

☐ Check for loss of vegetation and reseed as needed

☐ Check for the presence of invasive species and remove per UNH Cooperative Extension Methods for disposal



DRAINAGE PIPE TABLE

FROM	INV OUT	TO	INV IN	L (FT)	SLOPE	DIA.	TYPE
22P	110.18	OS D1	110.18	4	0.000	24	HDPE
21P	110.18	OS C1	110.18	6	0.000	24	HDPE
ROOF	122.70	FES A1	122.43	27	0.010	12	HDPE
ROOF	122.70	FES A2	122.43	27	0.010	12	HDPE
ROOF	122.70	FES A3	122.30	40	0.010	12	HDPE
ROOF	122.70	FES A4	122.30	40	0.010	12	HDPE
CB C1	110.18	21P	110.18	5	0.000	24	HDPE
CB C2	110.18	21P	110.18	6	0.000	24	HDPE
CB C3	110.18	21P	110.18	9	0.000	24	HDPE

DRAINAGE PIPE TABLE

FROM	INV OUT	TO	INV IN	L (FT)	SLOPE	DIA.	TYPE
CB D1	110.18	22P	110.18	7	0.000	24	HDPE
CB D2	110.18	22P	110.18	6	0.000	24	HDPE
CB D3	110.18	22P	110.18	6	0.000	24	HDPE
CB D4	110.18	22P	110.18	4	0.000	24	HDPE
DMH D2	106.26	HW D1	105.96	40	0.007	15	HDPE
OS A1	113.50	FES A5	111.00	200	0.013	15	HDPE
OS B1	107.50	HW B1	107.11	39	0.010	12	HDPE
OS C1	106.50	DMH D2	106.35	20	0.008	15	HDPE
OS D1	106.50	DMH D2	106.36	19	0.008	15	HDPE

DRAINAGE STRUCTURE TABLE

STRUCTURE	RIM	DIA.
CB C1	115.3	5
CB C2	115.4	4
CB C3	115.3	4
CB D1	115.2	4
CB D2	115.2	4
CB D3	115.2	4
CB D4	115.2	4

DRAINAGE STRUCTURE TABLE

STRUCTURE	RIM	DIA.
DMH D2	115.7	4
FES A1	123.6	N/A
FES A2	123.6	N/A
FES A3	123.4	N/A
FES A4	123.4	N/A
FES A5	112.4	N/A
HW B1	108.2	N/A

DRAINAGE STRUCTURE TABLE

STRUCTURE	RIM	DIA.
HW D1	107.8	N/A
OS A1	119.8	4
OS B1	109.7	4
OS C1	115.9	5
OS D1	115.6	4

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE: HORZ.: 30 VERT.: DATUM: HORZ.: VERT.: 30 15 0 30 GRAPHIC SCALE

FUSS&O'NEILL
50 COMMERCIAL STREET
MANCHESTER, NEW HAMPSHIRE 03101
603.668.8223
www.fussandoneill.com

BLUEBIRD SELF STORAGE

GRADING AND DRAINAGE PLAN

TAX MAP G LOT 2-2
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

CG-101

File: J:\DWG\P2021\05\09\A10\Civil\Plan\20210509.A10_STP01.dwg Layout: CG-101 Plotted: 2022-02-23 2:10 PM Saved: 2022-02-23 1:45 PM User: adubois
PC3: AUTOCAD PDF (GENERAL DOCUMENTATION).PC3 STB/CTB: FO.STB
MS VIEW: LAYER STATE:

FUSS & O'NEILL

Inspection and Maintenance Log (Make additional copies of this sheet for each inspection)		
Date of Inspection:		
BMP / Location	Inspection Notes	Maintenance Action
CB C1		
CB C2		
CB C3		
CB D1		
CB D2		

BMP / Location	Inspection Notes	Maintenance Action
CB D3		
CB D4		
DMH D2		
OS A1		
OS B1		
OS C1/ Underground Detention System 21P		

BMP / Location	Inspection Notes	Maintenance Action
OS D1/ Underground Detention System 22P		
FES A1		
FES A2		
FES A3		
FES A5		
HW B1		

BMP / Location	Inspection Notes	Maintenance Action
HW D1		

FUSS & O'NEILL

Deicing Log

Date	Amount of Deicing Salt applied

WINTER MAINTENANCE AND SALT MINIMIZATION PLAN FOR BLUEBIRD DOVER 64 LITTLEWORTH ROAD TAX MAP G LOT 2-2 DOVER, NH 03820

Prepared For:

Bluebird Hooksett, LLC
125 Ocean Road
Greenland, NH 03840
603-436-7355
Bill.goodison@bluebirdselfstorage.com

February 2022

Prepared by:

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www.fando.com

California
Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

Winter Maintenance and Salt Minimization Plan
BLUEBIRD SELF STORAGE
64 LITTLEWORTH ROAD,
TAX MAP G LOT 2-2
DOVER, NH 03820

PROJECT AREA DESCRIPTION

The lot is located on the south side of Littleworth Road, which falls within the Bellamy River and Bellamy Reservoir Watershed in Dover, NH. This project is the development of a self-storage facility located at the above referenced lot and address, consisting of approximately 6.8 acres. The proposed development will consist of an internal 1,000' driveway to access two buildings with parking, stormwater management, and associated utilities. The two buildings will be phased and constructed separately. Building footprint will total approximately 77,000sf and consist of storage units and a front office. The 6.8± acre site is proposing 2.7±acres impervious roofs and pavement, resulting in approximately 40% of the site to be imperviously cover.

The Bellamy River watershed has been identified as being within the "class A Lakes with a quarter mile buffer" and "wellhead protection" areas. Based on studies by the NHDES and US EPA the source of one of the impairments has been linked to the use of de-icing, anti-icing and pretreatment materials applied during winter maintenance of roadways and other paved surfaces.

The presence of snow and ice on drive aisles, parking lots, and walkways creates a public safety concern; hence the need for the use of salt and other de-icing measures. Salt however, and specifically chloride, can have a negative impact to plants, animals, birds and groundwater. The objective of this Winter Maintenance and Salt Minimization Plan is to reduce the amount of chloride entering the groundwater and other environmentally significant areas while still maintaining roadway and site safety.

RESPONSIBILITY

The responsible party will employ or contract grounds crews and related winter maintenance crews will be responsible for implementing and complying with the Winter Maintenance and Salt Minimization Plan, reviewing the success of the Plan and continuing to update the Plan as new requirements, practices and products are developed. A copy of this Plan shall be given to all personnel that are involved/contracted with winter maintenance of the development's winter maintenance for mandatory implementation.

CERTIFICATIONS

All Salt Applicators shall be current UNHT2 Green SnowPro Certified applicators or equivalent. In addition, a NHDES Salt Applicator Certification is recommended, but not required. Information on these certifications can be found in the links provided below:

- https://t2.unh.edu/green-snowpro-certification
- https://www.des.nh.gov/organization/divisions/water/wmb/was/salt-reduction-initiative/salt-applicator-certification.htm

WEATHER MONITORING

Winter maintenance contractors and salt applicators employed for the Pinkerton Academy Access Road shall monitor storm events using National Weather Service (http://www.noaa.gov), local TV stations and website weather information. All vehicles used for the application of road salt or brining and pre-wetting solution shall be equipped with an annually calibrated air and ground surface temperature monitor. Air and ground temperatures shall be monitored throughout the day to ensure that the operators are making informed decisions as to when and to what extent materials are applied to the drive aisles, parking lots and sidewalks.

PRETREATMENT AND TREATMENT OF PARKING LOTS AND ROADWAYS

Apply pre-wetted de-icer, salt brine or liquid de-icers to parking lots and roadways prior frost or snow accumulation to prevent icing. Pre-wetting paved areas has been shown to limit the amount of salt needed in most snow storms. Salt brine or liquid de-icers shall not be applied before a rainstorm, but can be applied before a light freezing drizzle. For more information, refer to attached Anti-Icing and Pre-wetting NH Best Management Practices sheets from the Technology Transfer Center at UNH.

If snow accumulates prior to salting the parking lots and drive aisles upon the Folsom Road Office Development, the surfaces should be plowed before applying de-icers. Salt shall not be used to "burn-off snow". Only apply salt to pavement surface or icy surfaces to prevent or reduce icing. Pavement surface temperature shall be monitored in parking lots and roadways. If pavement temperature is below 15ºF, winter maintenance contractors shall only use pre-wetted salt or brining solution. Dry salt (sodium chloride) will not melt fast enough at these temperatures.

PRETREATMENT AND TREATMENT OF SIDEWALKS

Always remove snow prior to applying deicers to pedestrian access, including but not limited to sidewalks and building entries. It is strongly recommended that a pre-wetted salt or brining solution should be applied to sidewalks. For more information, refer to attached Anti-Icing, Pre-wetting and Brine Making NH Best Management Practices sheets from the Technology Transfer Center at UNH. For salt spreaders, drop spreaders are preferred, but if using a rotary spreader, shields must be installed to restrict the spread pattern to the sidewalk only.

PLOWING

Plow operations should be timed so as to allow maximum melting by salt before snow is plowed off the access road or parking areas. Snow piles shall not be located on top of catch basins or within swales and/or ponds. Within the commercial development, snow piles should be stored within the parking lot as much as possible so that solids can be recovered after the snow melts.

EQUIPMENT & EQUIPMENT CALIBRATION

Spreaders used upon Pinkerton Academy shall be equipped with ground speed control applicators to regulate the amount of salt discharged consistently. All equipment utilized for the application of pre-wetted de-icer, liquid chemical and road salt aggregate should be calibrated each fall. Equipment should be checked after each storm and recalibrated if necessary. For more information, refer to attached Hydraulic-Run Spreader Calibration and Pony Motor-Run Spreader Calibration NH Best Management Practices sheets from the Technology Transfer Center at UNH.

DOCUMENTATION

All winter maintenance contractors shall record salt usage by vehicle for each storm and periodically compare the usage rates to confirm spreader calibrations. All winter maintenance contractors shall record storm response data, including date, air temperature, ground surface temperature, storm start and end time, snow fall total, salt usage, application rates, application times, and plow times to be compared and analyzed by the Applicators and property managers to improve the salt minimization process. The attached "checklist for snow and ice
Maintenance contractors" shall be used as a guide.

RELATED INFORMATION

Information from the State of NH Department of Environmental Services on Salt Reduction can be found in the link provided below:

- https://www.des.nh.gov/organization/divisions/water/wmb/was/salt-reduction-initiative/index.htm

ATTACHMENT B – SMART SALTING PRACTICES

A Checklist for snow and ice maintenance contractors.

Recommended Practice	Check which response applies to current practices and anticipated site maintenance activities for job site.				
	Already Do	Will Do	Might Do	Will Not Do	If "Will Not Do"; State Reason Why?
Use an application rate chart.					
Calibrate equipment each year.					
Learn about the deicer ingredients and use the appropriate one for the condition.					
Look for reasons if and why materials are leaking or spilling from vehicles and fix them (e.g. gaps, overfilling, etc.)					
Develop a comprehensive winter maintenance policy. Follow your policy.					
Measure and use pavement temperatures.					
Use anti-icing appropriately prior to the storm.					
Plow before applying deicers.					
Use wet materials (pre-wet or pre-treated)					
Don't apply sodium chloride (road salt) for pavement temperatures below 15ºF					
Don't apply deicers for pavement temps under -10ºF. It's too cold.					
Separate salt and sand. Use salt for melting, Use sand for traction.					
Apply Deicers in the center of the road or on the high side of the curve.					
Store the salt in a building or under secure cover.					
Store salt away from water flow and direct the water away from the storage area.					
Store snow away from lakes, ponds, and onsite wetlands.					
Sweep up sand, dispose of properly					
For each event, document what you did and how well it worked. Use this information to make improvements.					

Checklist is adapted from worksheet created by Fortin Consulting as a part of the Minnesota Pollution Control Agency Smart Salting Voluntary Certification Program.

How Salt Works

NH Best Management Practices

BE PROACTIVE - ANTI-ICE

Anti-icing is the proactive method of preventing snow and ice from bonding to pavement. It can be more than 50% more efficient than deicing. See the NH Anti-Icing Factsheet for more information.

PRE-WETTING FOR FASTER ACTING SALT

Adding brine to salt before you apply it to pavement jump starts the melting process which means your pavement will be clear sooner. See the Pre-wetting Fact Sheet for more information.

KNOW YOUR LIMITS

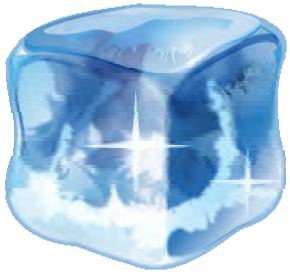
Dry salt becomes ineffective below 15°F if possible wait until the temperature rises before applying salt. At 30°F 1 lb of salt can melt 46.3 lb of ice in 5 minutes. At 15°F 1 lb of salt can melt 6.3 lb of ice in 1 hour.

PLOW FIRST

Always plow before applying any kind of chemical deicer to avoid pushing it away!

How Do We Melt Ice?

Ice can be melted by increasing the temperature, or lowering the freezing point of the water. It's not cost effective to use heat to melt ice on our roads so we use chemicals to reduce the freezing point—anything that will dissolve in water will work, including: salt, sugar, even alcohol!

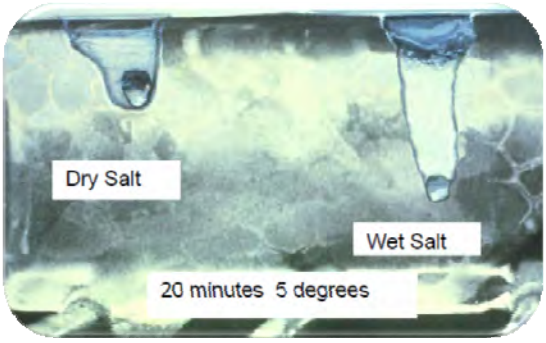


Why Use Salt?

Salt (Sodium Chloride) is the cheapest and most readily available chemical that efficiently melts ice and can be easily applied to our roadways and parking lots. However salt does corrode our cars and bridges, contaminates drinking water and pollutes our streams. Alternatives include potassium acetate, and calcium magnesium acetate (CMA), — all of which are considerably more expensive than calcium chloride, and have their own environmental concerns.

Brine Makes It Happen

The first step in melting ice is the formation of a brine. Salt crystals pull water molecules out of ice formation which creates a brine with a lower freeze point. Once the brine is formed melting is greatly accelerated. Save time and money by pre-wetting your salt with a brine before it hits the pavement to jump start melting! See the Pre-Wetting fact sheet for more information.



Source: Wisconsin DOT Transportation Bulletin #22

Save $$ and the Environment

In New Hampshire there are over 40 watersheds currently contaminated from road salt. As the pavement temperature drops more salt is required. As the pavement temperature rises less salt is required. Save money and the environment by using only what is needed to do the job. See NH application rate charts for recommended rates.

Produced in partnership with:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

New Hampshire DOT

Technology Transfer Center
New Hampshire LTAP at UNH

Anti-Icing

NH Best Management Practices

GET OUT EARLY

Typically anti-icing is most effective if applied 1-2 hours before the precipitation begins however it can be applied up to 24 hours in advance.

TRY IT FIRST

Trying anti-icing for the first time? Make a 23.3% brine solution and before a storm spray pavement on your own property using a masonry/ plant sprayer. Use this experiment to determine how best to use it with your clients.

LEAVE SOME PAVEMENT BARE

It's always best to use stream nozzles instead of fan tip to avoid creating a slippery condition. If the anti-icing liquid freezes the bare pavement will still provide a traction surface.

USE A FILTER

Having a filter in your liquid dispensing system will reduce clogs in your nozzle. Automotive in line fuel filters work quiet well. If your liquid dispenser is not functioning properly be sure to check the filter first.

A Proactive Treatment

Anti-Icing before a storm is very similar to using a non-stick spray on a pan before cooking. Just like a non-stick spray prevents food from bonding to the pan, anti-icing prevents snow and ice from bonding to the pavement so that it can be plowed away. Anti-icing can save you money as it costs 50% less than reactive deicing.

Make Your Own Salt Brine

When making brine it is important to add enough salt to produce a 23.3% solution which freezes around 0°F. Roughly 2.5lb per gallon of water will produce a 23.3% solution. You can verify using a salometer (~$20) a 23.3% solution will have a specific gravity of 1.176, or 85% salinity. Consult the Brine Making BMP sheet for more info.

How Much Should I Use and When?

You can apply brine up to 24 hours in advance of the storm. Typical application rates range from 0.5 to 0.75 gallon per 1000 sq.ft. (10' x 100' area). Other chemicals such as magnesium are also available—consult your supplier for application rates. Anti-icing is not advised prior to freezing rain events.

Getting Started

Try making your own salt brine by putting 13 lb of salt in 5 gallons of water to get a 23.3% salt brine solution. Mix the brine until all of the salt is dissolved. Using a masonry sprayer apply the liquid several hours before a storm. Start by applying about 0.25—0.5 gallons to a 10' x 50' area. Adjust the application rates based on your experience. Being careful not to over apply and cause a slippery condition.

Produced in partnership with:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

New Hampshire DOT

Technology Transfer Center
New Hampshire LTAP at UNH

Pre-wetting

NH Best Management Practices

PRE-WETTING?

Pre-wetting is the process of coating a solid de-icer with a liquid before it is spread on a roadway.

WHY PRE-WET?

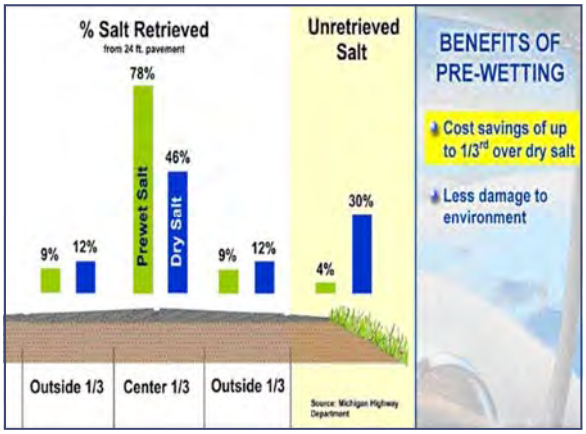
De-icing chemicals must form a brine before they can begin melting ice. Pre-wetting your chemicals accelerates the brine making process, which improves the melting action of the material. Pre-wetting also reduces bounce and scatter of material during spreading, and reduces the total amount of de-icer needed to obtain the desired results.

REDUCED RATES

If you are pre-wetting, don't forget to reduce your application rates accordingly. Reductions in the range of 15-20% are typical.

HOW MUCH LIQUID?

A good rule of thumb is to use 8-10 gallons of pre-wetting liquid for every ton of de-icer. For other chemicals, such as magnesium chloride, consult your supplier for application rates

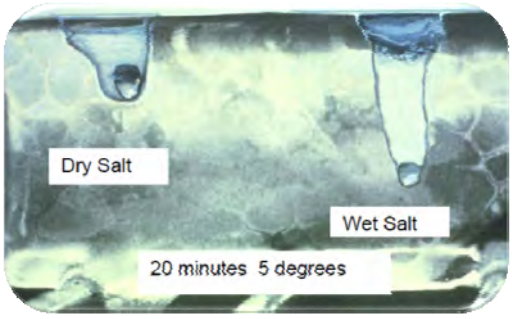


Pre-wetting Liquids

You have a few options for pre-wetting liquids. The most commonly used is a 23% sodium chloride brine solution. Calcium chloride at 32% solution is also used, as well as Magic Minus Zero™ and other patented products.

Getting Started

Wet the pile! There are two ways to pre-wet your de-icing chemicals. The easiest way to get started with pre-wetting is to spread your salt pile, spray it with pre-wetting liquid, mix it around, and re-pile it. More advanced truck mounted pre-wet systems can be installed on your trucks if you decide to make the investment.



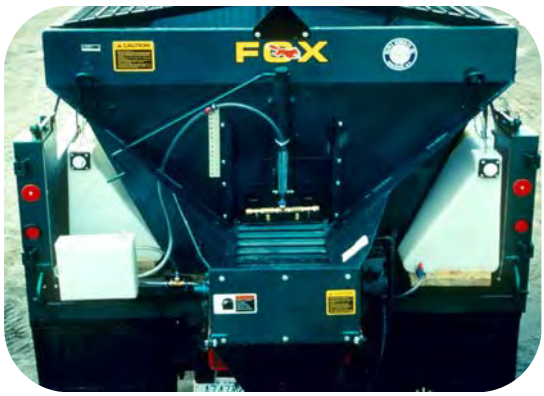
Source: Wisconsin DOT Transportation Bulletin

Spraying the Pile

This is the easiest and most cost effective way to get started in pre-wetting. The first step is to spread your salt pile on a flat, impermeable surface. Next, spray the salt while it is spread out, and mix it around to ensure adequate and consistent liquid coverage. After the salt is sufficiently covered, re-stack the salt in your storage shed for later use.

Truck Mounted Systems

These systems are mounted in the truck bed and coat the de-icer with liquid as it comes off the conveyor/auger onto the spinner. These systems have the benefit of applying liquid only to the material you use as you use it. However, these systems must be installed on every truck that will be used to spread pre-wetted material.



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New Hampshire DOT

Technology Transfer Center
New Hampshire LTAP at UNH

Brine Making

NH Best Management Practices

GET THE LOWEST FREEZE POINT

When salt brine is 23% salt (measured with a hydrometer: 1.176, or with a salimeter: 85%) it has the lowest freeze point possible (about 0°F).

BRINE STORAGE

23% brine solution may be stored outside, however if temperatures get below 0°F the brine may freeze. A circulator pump will reduce the risk of freezing. If possible store brine indoors to eliminate risk of freezing.

COST OF BRINE

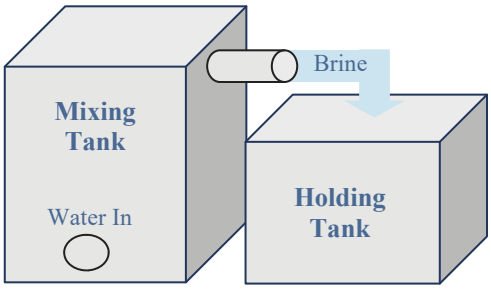
Calcium chloride brine costs about 7¢ / gallon (assuming $58/ton for salt) after you have your equipment setup.

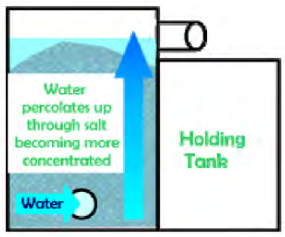
MULTIPLE USES

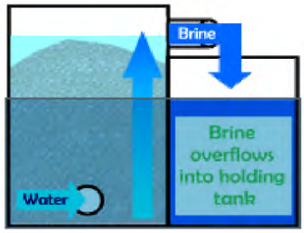
Brine can be used directly for anti-icing, for prewetting salt as it is dispensed from your truck, or to pretreat salt before it is loaded into your truck. Brine can be safely stored for up to a year, however, the concentration should be tested before use.

What Do You Need?

Brine making is a fairly simple process—the only ingredients are salt and water, and the only equipment you'll need is an open top mixing tank, a holding tank, a small pump, and a salimeter.





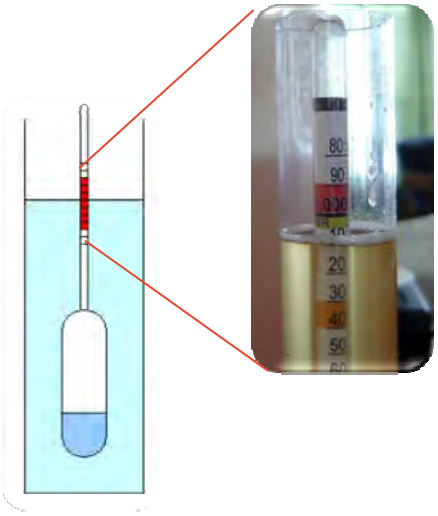


Images courtesy of Iowa DOT

Step 1: Fill Mixing Tank

Add Salt: Add about 2.5 lb of salt per gallon of water you plan to add. Make sure your mixing tank has a large opening to make adding salt easy.

Add Water: Slowly add water from the bottom of your brine mixing tank. This will allow it to percolate up through the salt and overflow into the holding tank.



Step 2: Check Concentration

Float a hydrometer or salimeter directly in your holding tank and read the value at the surface of the water. The number should be either 85% or 1.176 depending on the units of your device.

If the values are too low, pump some brine from your holding tank back into the mixing tank and allow it to overflow. If values are too high simply add some fresh water

Quality Control & Documentation

Make sure that you record the date when you create each batch of brine and document who mixed it and checked the concentration. It is also a good idea to note the final concentration. These records should be kept for at least two years to protect your group in the event of litigation.

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New Hampshire DOT

Technology Transfer Center
New Hampshire LTAP at UNH

Hydraulic-Run Spreader Calibration

NH Best Management Practices

WHY CALIBRATE?

You can't reduce your salt use if you don't know how much salt you actually use! The goal of calibrating is to know how much material you are putting down on a roadway or parking lot for every setting on your truck that you use. This is why calibrating your equipment is the first step to reducing salt use and saving money!

REMEMBER:

Each truck must be independently calibrated for each material it will be used to spread (the salt calibration chart *will* be different than the sand calibration chart).

Calibrations should be preformed annually, or after a spreader is serviced.

CALCULATIONS:

There are a few simple calculations you must perform in order to complete the calibration. Once all of the necessary data is recorded, head back inside and warm up! Refer to the reverse side of this fact sheet for calculation instructions.

Step 1: Load the Truck

Partially load the truck. Half of a full load should be more than adequate for calibration purposes.

Step 2: Set Your Controls

Gate Height: Set the gate height to its lowest practical setting (~ 2"). This should be kept constant throughout the calibration process. If you find that not enough material is dispensed with this setting, try 2.5" to 3".

Engine Speed: Warm the truck up and run the engine at the typical rate seen during spreading (approximately 2000 rpm).

Step 3: Measure Spread Width

Measure the width that the material covers during spreading. Do this for each conveyor/auger setting you are calibrating. Round your numbers to the nearest half foot and record them in column "**W**" of the calibration chart (see reverse side).

Step 4: Collect & Weigh Material

You will need either a sheet of canvas, a tarp, or a bucket to collect the material that is dispensed from the spreader, as well as a scale. Weight the object you are using to collect the material in, and record that value in the purple box above the discharge rate column. Collect material for 1 minute. Weigh the collected material and subtract the weight of the tarp/canvas/bucket. Record this value in the first purple column of the calibration chart. Do this 3 times for each conveyor/auger setting that is typically used. Average these three values together and record in the orange column in the calibration chart.

Step 5: Perform Calculations

Go inside and calculate your discharge rate using the calibration chart for each truck speed and conveyor/auger setting you normally use. Refer to the reverse side of this fact sheet for calculation instructions. The formula you will be using is shown below:

$$D = \frac{B \times C}{A}$$

Step 6: Distribute Completed Calibration Cards!

Put a copy of the calibration chart in the truck you just calibrated. Also, leave a copy of the calibration chart in the office so you have a copy incase the original is damaged.

Produced in partnership with:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

New Hampshire DOT

Technology Transfer Center
New Hampshire LTAP at UNH

Calibration Chart (Hydraulic Type)

Material: _____ Truck/Spreader ID: _____

Date: _____ Performed by: _____

Tarp/Canvas/Bucket Weight: _____

Conveyor or Auger Setting	W	A	Discharge Rate (lb/min.)			B	D					
	Spread Width (ft.)	5.28 × W	Run 1	Run 2	Run 3	Average Discharge Rate *((Run1 + Run2 + Run3)/3)*	Pounds of Material Discharged per 1000 square ft. *(D = B × C ÷ A)*					
							5 mph (C = 12)	10 mph (C = 6)	15 mph (C = 4)	20 mph (C = 3)	25 mph (C = 2.4)	30 mph (C = 2)
1												
2												
3												
4												
5												
EX	14	5.28 × 14= **73.92**	87	92	93	(87+92+93)÷3= **90.67**	12 × 90.67 ÷ 73.92= **14.72**	6 × 90.67 ÷ 73.92= **7.36**	4 × 90.67 ÷ 73.92= **4.91**	3 × 90.67 ÷ 73.92= **3.68**	2.4 × 90.67 ÷ 73.92= **2.94**	2 × 90.67 ÷ 73.92= **2.45**

Calculation Instructions: Multiply the spread width from column **W** by **5.28** and record the answer in column **A**. For each conveyor/auger setting, add **Run 1**, **Run 2**, and **Run 3** together. Divide the result by **3** and record in column **B** to get the average discharge rate. To find the pounds of material discharge per 1000 square feet, you must know the number of minutes it takes to travel one mile at every truck speed you intend to calibrate for. These numbers are designated as variable "**C**". The "**C**" value for each travel speed is shown in red under that given speed. Multiply column **B** by the "**C**" value for that speed and divide by the **A** column to find the number of pounds of material discharged per 1000 square feet for the given speed. Record these numbers in the **D** columns. The full equation is shown here:

$$D = \frac{B \times C}{A}$$

Pony Motor-Run Spreader Calibration

NH Best Management Practices

WHY CALIBRATE?

You can't reduce your salt use if you don't know how much salt you actually use! The goal of calibrating is to know how much material you are putting down on a roadway or parking lot for every setting on your truck that you use. This is why calibrating your equipment is the first step to reducing salt use and saving money!

REMEMBER:

Each truck must be independently calibrated for each material it will be used to spread (the salt calibration card *will* be different than the sand calibration card).

Calibrations should be preformed annually, or after a spreader is serviced.

CALCULATIONS:

There are a few simple calculations you must perform in order to complete the calibration. Once all of the necessary data is recorded, head back inside and warm up! Refer to the reverse side of this fact sheet for calculation instructions.

Step 1: Load the Truck

Partially load the truck. Half of a full load should be more than adequate for calibration purposes.

Step 2: Set Your Controls

Gate Height: Set the gate height to its lowest practical setting to start (approximately 1" to 1.5"). After the truck is calibrated for the lowest gate setting, calibrate for each 1/2" increment greater than the lowest setting. Continue until all gate settings you use are calibrated.

Engine Speed: Set the pony motor speed to the maximum setting, or to the setting you would normally use.

Step 3: Measure Spread Width

Measure the width that the material covers during spreading. Do this for each gate setting you are calibrating. Round your numbers to the nearest half foot and record them in column "**W**" of the calibration chart (see reverse side).

Step 4: Collect & Weigh Material

You will need either a sheet of canvas, a tarp, or a bucket to collect the material that is dispensed from the spreader, as well as a scale. Weight the object you are using to collect the material in, and record that value in the purple box above the discharge rate column. Collect material for 1 minute. Weigh the collected material and subtract the weight of the tarp/canvas/bucket. Record this value in the first purple column of the calibration chart. Do this 3 times for each gate opening that is typically used. Average these three values together and record in the orange column in the calibration chart.

Step 5: Perform Calculations

Go inside and calculate your discharge rate using the calibration chart for each truck speed and gate setting you normally use. Refer to the reverse side of this fact sheet for calculation instructions. The formula you will be using is shown below:

$$D = \frac{B \times C}{A}$$

Step 6: Distribute Completed Calibration Cards!

Put a copy of the calibration card in the truck you just calibrated. Also, leave a copy of the calibration card in the office so you have a copy incase the original is damaged.

Produced in partnership with:

NH Department of Environmental Services

New Hampshire DOT

Technology Transfer Center
New Hampshire LTAP at UNH

Calibration Chart (Pony Motor Type)

Material: _____ Truck/Spreader ID: _____

Date: _____ Performed by: _____

Tarp/Canvas/Bucket Weight: _____

Gate Opening	W	A	Discharge Rate (lb/min.)			B	D					
	Spread Width (ft.)	5.28 × W	Run 1	Run 2	Run 3	Average Discharge Rate *((Run1 + Run2 + Run3)/3)*	Pounds of Material Discharged per 1000 square ft. *(D = B × C ÷ A)*					
							5 mph (C = 12)	10 mph (C = 6)	15 mph (C = 4)	20 mph (C = 3)	25 mph (C = 2.4)	30 mph (C = 2)
1”												
1.5”												
2”												
2.5”												
3”												
EX	14	5.28 × 14= **73.92**	87	92	93	(87+92+93)÷3= **90.67**	12 × 90.67 ÷ 73.92= **14.72**	6 × 90.67 ÷ 73.92= **7.36**	4 × 90.67 ÷ 73.92= **4.91**	3 × 90.67 ÷ 73.92= **3.68**	2.4 × 90.67 ÷ 73.92= **2.94**	2 × 90.67 ÷ 73.92= **2.45**

Calculation Instructions: Multiply the spread width from column **W** by **5.28** and record the answer in column **A**. For each gate setting, add **Run 1**, **Run 2**, and **Run 3** together. Divide the result by **3** and record in column **B** to get the average discharge rate. To find the pounds of material discharge per 1000 square feet, you must know the number of minutes it takes to travel one mile at every truck speed you intend to calibrate for. These numbers are designated as variable “**C**”. The “**C**” value for each travel speed is shown in red under that given speed. Multiply column **B** by the “**C**” value for that speed and divide by the **A** column to find the number of pounds of material discharged per 1000 square feet for the given speed. Record these numbers in the **D** columns. The full equation is shown here:

$$D = \frac{B \times C}{A}$$

Example: Step #1, blank calibration form

See the References and Resources section for a full size form to copy for calibration. This is how the empty form looks. (Keep a stack of these on a clipboard when ready to begin the calibration.)

CALIBRATION CHART FOR AUGER OR CONVEYOR SYSTEMS

DATE _____ **SPREADER #** _____ **MATERIAL** _____

SETTING	POUNDS PER MINUTE	5 MPH (x12)	10 MPH (x6)	15 MPH (x4)	20 MPH (x3)
1					
2					
3					

Figure 10: Blank calibration form

Example: Step #2, calibration form filled out during calibration

Fill in the header information and column 2, the discharge weight per setting.

CALIBRATION CHART FOR AUGER OR CONVEYOR SYSTEMS

DATE 8-Aug-15 **SPREADER #** A4219 **MATERIAL** Rock Salt

SETTING	POUNDS PER MINUTE	5 MPH (x12)	10 MPH (x6)	15 MPH (x4)	20 MPH (x3)
1	10				
2	22				
3	34				

Figure 11: Example calibration form with discharge and header information filled out

Example: Step #3, calibration form ready to put in truck for road application

Back in the shop, do the calculations to fill in the rest of the blanks. Multiply the weight in column 2 with the multiplier in the top row. This provides the pounds per mile that needed to fill in the table.

CALIBRATION CHART FOR AUGER OR CONVEYOR SYSTEMS

DATE August 12, 2018 SPREADER # A4219 Rock Salt

SETTING	POUNDS PER MINUTE	5 MPH (x12)	10 MPH (x6)	15 MPH (x4)	20 MPH (x3)
1	10	*120	60	40	30
		**			
2	22	264	132	88	66
3	34	408	204	136	102

*top half of each row = lbs. /lane mile. To get this number, multiply lbs. /min by the factor shown for each speed.
**bottom half of each row = lbs. /1000 sq.ft. To find this, divide the number in the top half by 63.

Figure 12: Example calibration form with pounds per lane mile filled out

Some fish species are affected by concentrations of less than 1000 ppm NaCl, about 1 to 1.5 tablespoons of salt in 5 gallons of water.

Example: Step #4, calibration form ready to zip tie to hand spreader or put in truck for parking lot application.

Divide by 63 to convert pounds per lane mile to pounds per 1,000 square feet. This is very useful for parking lot and sidewalk applications.

CALIBRATION CHART FOR AUGER OR CONVEYOR SYSTEMS

DATE 8-Aug-15 **SPREADER #** A4219 **MATERIAL** Rock Salt

SETTING	POUNDS PER MINUTE	5 MPH (x12)	10 MPH (x6)	15 MPH (x4)	20 MPH (x3)
1	10	*120	60	40	30
		**1.9	1.0	0.6	0.5
2	22	264	132	88	66
		4.2	2.1	1.4	1.0
3	34	408	204	136	102
		6.5	3.2	2.2	1.6

* top half of each row = lbs/lane mile. To get this number, multiply lbs/min by the factor shown for each speed.

** bottom half of each row = lbs/1000 sq.ft. To find this, divide the number in the top half by 63.

Gravity Flow Equipment

This is applicable for equipment that does not have a motorized delivery system such as an auger. This type of equipment might be a pickup mounted spreader, gator mounted spreader or a hand push spreader. Gravity flow equipment is typically controlled by gate opening and speed of application.

Step 1: Calculate discharge rate

- Mark out a 10-foot stretch of pavement. (By increasing the size of the test area i.e., the longer the test area, the more accurate the results will be).
- Sweep it clean of sand or any other material.
- Using a constant speed, apply one pass of material to the test area.
- Measure the width the material is spread or bounces, in feet.
- Sweep up and weigh the material that is within the marked 10-foot stretch.
- Record the lever position/setting for the gate/chute. If there are no numbers for the positions, make permanent marks on the equipment to identify the positions.

- To improve accuracy, repeat this two more times and calculate the average weight of material applied.
- Record results in columns A, B, C, and D (Figure 14).

Step 2: Repeat step #1 for various settings.

Step 3: Fill out chart.

- Fill out columns E, F, and G (Figure 14).
- If using more than one type of material, repeat the test for each material.
- Place the completed calibration chart with the equipment.

Shortcuts:

- Put down a tarp over the application area; this makes it quicker to recover and weigh material.
- After the first pass, put a bag around spreader to catch discharge material. The first pass is needed to determine the spread width.

Calculate application rate:

- Equipment: _____Material: _____ Date: _____

A	B	C	D	E	F	G
Speed	Lever position or gate setting	Pounds spread in 10 feet*	Spread width in feet	Coverage area in square feet	Application rate in lbs./1000 ft² (1000/E x C)	Application rate in lbs./lane mile (12' width)
……..EXAMPLE……						
20 MPH	Half Closed	0.4 lbs.	13 Feet	130 Sq. Ft	3.1 lbs. per 1000 sq. ft.	196 lbs./mile

* If changing the test strip length, adjust the title in column C and the multiplier in column E.

Figure 14: Example calibration chart for gravity flow equipment

What if calibration is not a practice?

Even without calibrating the equipment, the amount of material to use can determine but will take more time to calculate. Know the material, the size of the area to be treated, and the pavement temperature, then consult the application rate chart (application rate section) and do the math. Without calibration, the way to evenly distribute the recommended amount across the maintenance area must be determined by the professional. This approach may work well for treating sidewalks using the "chicken feed" method. For example:

- 20°F degrees pavement temperature and rising
- Using dry salt
- Sidewalk is 2,000 square feet
- Table recommends 2.25 lbs. Per 1,000 square feet (for this situation)
- Measure about 4.5 lbs. Of salt
- Figure out a way to spread it evenly over the 2,000 sq. ft. surface

Sand fills in lake bottoms, accelerating the aging process of lakes. Lakes get shallower as they age, some eventually becoming wetlands.

Calibration Charts

Calibration Chart for Gravity Flow Equipment						
Vehicle or spreader number:					Date:	
Material Type:				Calibrated by:		
		A	B	C	D	E
Speed	Lever position or gate setting	Lbs. material recovered in 10 feet	Spread width in feet	Square feet covered with material (Bx10)	Application rate in lbs./1000 sq. ft. (1000/CxA)	Application rate in lbs./lane mile (12' width)(Dx63.4)

Figure 15: Blank calibration chart for gravity flow equipment

Calibration Chart for Auger or Conveyor Systems

Date _____ Spreader_____ Material_____

Setting	Pounds per Minute	Quantity / Area	5 MPH (x12)	10 MPH (x6)	15 MPH (x6)	20 MPH (x3)
1		Lbs./lane Mile				
		Lbs./1000 sq.ft.				
2		Lbs./lane Mile				
		Lbs./1000 sq.ft.				
3		Lbs./lane Mile				
		Lbs./1000 sq.ft.				
4		Lbs./lane Mile				
		Lbs./1000 sq.ft.				
5		Lbs./lane Mile				
		Lbs./1000 sq.ft.				
6		Lbs./lane Mile				
		Lbs./1000 sq.ft.				

Figure 16: Blank calibration chart for augured or conveyed manual controlled spreaders

Hiring a NH Certified Green SnowPro as your snow removal contractor will help protect you and your company from slip and fall claims arising from snow and ice conditions.

What can you do?

Look for a certified salt applicator at http://des.nh.gov/organization/divisions/water/wmb/was/salt-reduction-initiative/salt-applicator-certification.htm or ask your current contractor to take the Green SnowPro course and become certified.

How can your organization benefit from the certification?

Reduce Your Liability

Under RSA 508:22, certified applicators and those who hire them are granted liability protection from claims arising from snow and ice conditions (slip and fall claims).

Certified Green SnowPros

NH Certified Green SnowPros are leaders in the snow removal industrywho are trained in the most up to date technologies and snow management practices to ensure a high level of service and safety to their customers.

Reduce Impacts to Local Waterbodies

Once in our water supplies, there is no practical way to remove salt. Certified Green SnowPros are trained in salt reduction practices to help ensure clean water for future generations.

Why is salt reduction important?

As of 2014, 46 water bodies in New Hampshire are polluted with chloride due to road salt application. In several watersheds analyzed in the southern I-93 corridor, more than 50% of the salt load comes from private roads and parking lots. The other major sources are state and local roads and highways.

Training

For upcoming Green SnowPro Training dates go to http://t2.unh.edu/greensnowpro-training-and-certification

For more information:

Visit http://www.des.nh.gov and see “Road Salt Reduction”under the A-Z list.

Contact: *Patrick Woodbrey*
Patrick.Woodbrey@des.nh.gov
(603) 271-5329

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.910 degrees West
Latitude	43.188 degrees North
Elevation	0 feet
Date/Time	Mon, 15 Nov 2021 11:16:39 -0500

Per Env-Wq 1503.08(l), increase NRCC precipitation values by 15%, therefore use the following storm values.

2 year 24 hour = 3.60
10 year 24 hour = 5.44
25 year 24 hour = 6.88
50 year 24 hour = 8.21
100 year 24 hour = 9.82

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.81	1.03	**1yr**	0.70	0.98	1.20	1.54	1.99	2.60	2.85	**1yr**	2.30	2.74	3.14	3.87	4.44	**1yr**
2yr	0.32	0.49	0.61	0.81	1.01	1.28	**2yr**	0.87	1.17	1.50	1.91	2.44	3.13	3.48	**2yr**	2.77	3.35	3.84	4.58	5.21	**2yr**
5yr	0.37	0.57	0.72	0.96	1.23	1.58	**5yr**	1.06	1.44	1.85	2.38	3.06	3.96	4.46	**5yr**	3.50	4.29	4.91	5.78	6.54	**5yr**
10yr	0.40	0.63	0.80	1.09	1.42	1.84	**10yr**	1.22	1.69	2.18	2.82	3.65	4.73	5.38	**10yr**	4.18	5.17	5.91	6.90	7.76	**10yr**
25yr	0.46	0.74	0.94	1.29	1.72	2.26	**25yr**	1.48	2.09	2.69	3.51	4.59	5.98	6.90	**25yr**	5.29	6.64	7.55	8.72	9.75	**25yr**
50yr	0.51	0.83	1.06	1.48	1.99	2.66	**50yr**	1.72	2.45	3.17	4.17	5.47	7.14	8.33	**50yr**	6.32	8.01	9.09	10.42	11.59	**50yr**
100yr	0.58	0.93	1.20	1.70	2.31	3.11	**100yr**	2.00	2.88	3.73	4.94	6.51	8.54	10.07	**100yr**	7.56	9.68	10.95	12.46	13.79	**100yr**
200yr	0.64	1.04	1.35	1.94	2.69	3.66	**200yr**	2.32	3.39	4.41	5.87	7.76	10.22	12.17	**200yr**	9.04	11.70	13.20	14.90	16.41	**200yr**
500yr	0.75	1.24	1.61	2.34	3.28	4.51	**500yr**	2.83	4.20	5.47	7.34	9.78	12.95	15.63	**500yr**	11.46	15.03	16.90	18.88	20.67	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.24	0.37	0.45	0.60	0.74	0.90	**1yr**	0.64	0.88	0.91	1.25	1.55	2.05	2.48	**1yr**	1.81	2.38	2.93	3.36	4.06	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.18	**2yr**	0.86	1.15	1.36	1.83	2.36	3.04	3.39	**2yr**	2.69	3.26	3.73	4.45	5.06	**2yr**
5yr	0.35	0.54	0.67	0.91	1.16	1.40	**5yr**	1.00	1.37	1.61	2.15	2.78	3.70	4.11	**5yr**	3.27	3.96	4.58	5.40	6.10	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.57	1.82	2.45	3.13	4.26	4.77	**10yr**	3.77	4.59	5.31	6.23	7.00	**10yr**
25yr	0.44	0.67	0.83	1.18	1.55	1.91	**25yr**	1.34	1.87	2.11	2.85	3.66	5.05	5.79	**25yr**	4.47	5.57	6.47	7.55	8.41	**25yr**
50yr	0.48	0.73	0.91	1.31	1.77	2.19	**50yr**	1.52	2.14	2.36	3.21	4.12	5.79	6.68	**50yr**	5.12	6.43	7.53	8.71	9.65	**50yr**
100yr	0.54	0.81	1.02	1.47	2.02	2.51	**100yr**	1.74	2.46	2.64	3.59	4.60	6.63	7.71	**100yr**	5.86	7.41	8.75	10.06	11.04	**100yr**
200yr	0.60	0.90	1.14	1.65	2.30	2.88	**200yr**	1.99	2.81	2.94	4.02	5.14	7.59	8.90	**200yr**	6.71	8.56	10.17	11.62	12.67	**200yr**
500yr	0.70	1.04	1.34	1.94	2.76	3.47	**500yr**	2.38	3.39	3.41	4.67	5.99	9.03	10.74	**500yr**	7.99	10.33	12.41	14.08	15.12	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.53	0.71	0.87	1.08	**1yr**	0.75	1.05	1.23	1.74	2.21	2.83	3.05	**1yr**	2.50	2.94	3.37	4.17	4.75	**1yr**
2yr	0.33	0.51	0.62	0.84	1.04	1.24	**2yr**	0.90	1.22	1.47	1.95	2.50	3.25	3.59	**2yr**	2.87	3.46	3.97	4.72	5.39	**2yr**
5yr	0.39	0.60	0.75	1.03	1.31	1.58	**5yr**	1.13	1.54	1.85	2.49	3.19	4.22	4.80	**5yr**	3.73	4.62	5.24	6.18	6.95	**5yr**
10yr	0.46	0.70	0.87	1.21	1.57	1.91	**10yr**	1.35	1.87	2.23	3.04	3.84	5.19	5.99	**10yr**	4.59	5.76	6.57	7.58	8.46	**10yr**
25yr	0.55	0.84	1.05	1.49	1.96	2.47	**25yr**	1.70	2.41	2.87	3.95	4.93	6.91	8.03	**25yr**	6.11	7.72	8.76	9.97	11.02	**25yr**
50yr	0.64	0.97	1.21	1.74	2.34	2.98	**50yr**	2.02	2.91	3.48	4.81	5.97	8.51	10.05	**50yr**	7.54	9.66	10.91	12.26	13.47	**50yr**
100yr	0.74	1.12	1.40	2.03	2.78	3.59	**100yr**	2.40	3.51	4.21	5.88	7.25	10.50	12.57	**100yr**	9.29	12.09	13.58	15.09	16.47	**100yr**
200yr	0.86	1.29	1.64	2.37	3.31	4.35	**200yr**	2.85	4.25	5.12	7.18	8.79	12.99	15.75	**200yr**	11.50	15.15	16.91	18.56	20.18	**200yr**
500yr	1.05	1.56	2.01	2.91	4.14	5.58	**500yr**	3.58	5.46	6.61	9.39	11.36	17.24	21.22	**500yr**	15.26	20.41	22.62	24.44	26.40	**500yr**

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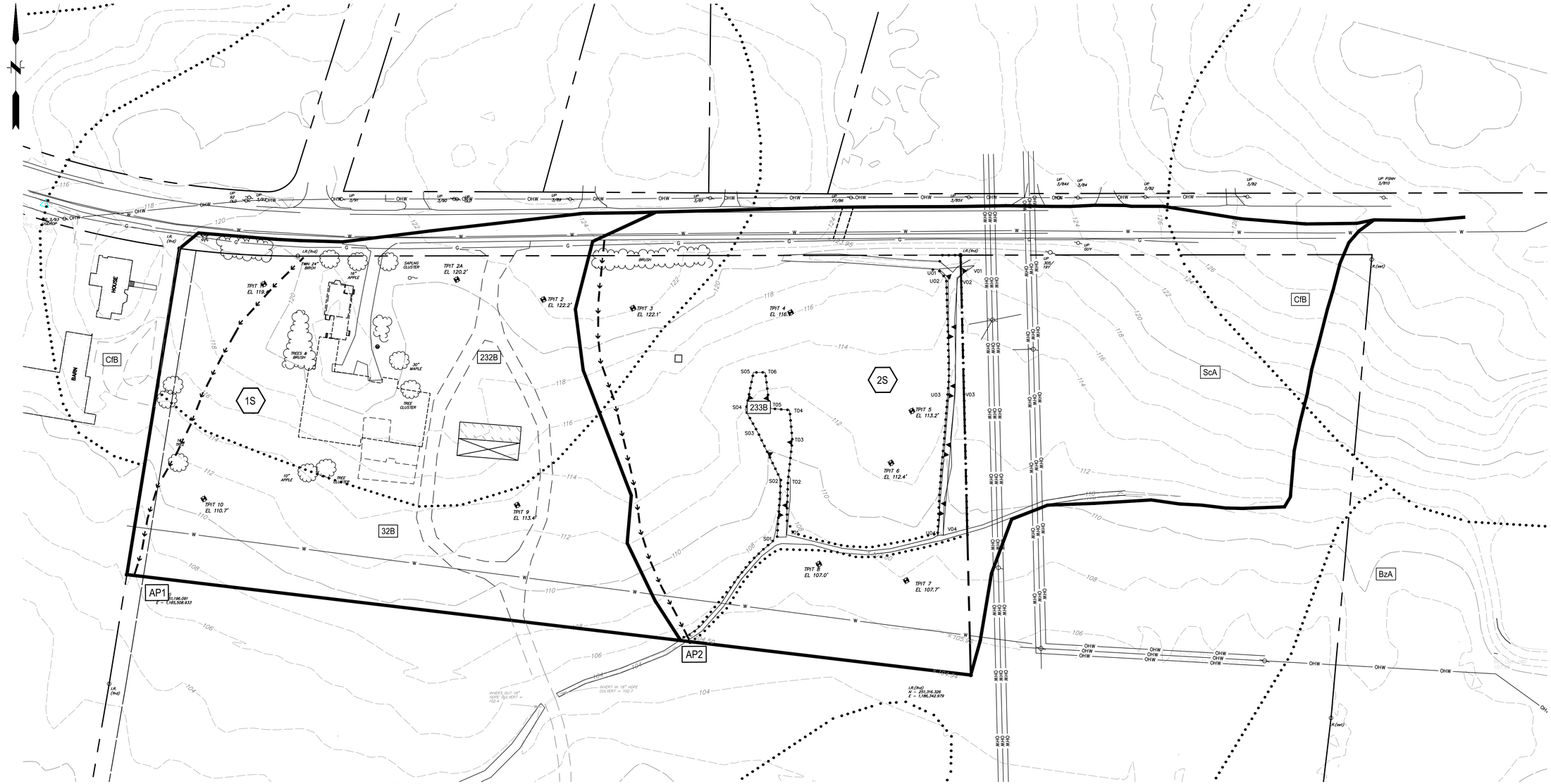
Climate Center

Appendix
D Plans

- Existing Drainage Area Plan – (DA-101)
- Proposed Drainage Area Plan – (DA-102)
- Existing Color-Coded Soil Plan – (DA-201)
- Proposed Color-Coded Soil Plan – (DA-202)



PRE-DEVELOPMENT DRAINAGE AREA PLAN NOTES

1. THIS PLAN DEPICTS THE PRE-DEVELOPMENT SITE CONDITIONS OF THE SUBJECT PROPERTY LOCATED AT 64 LITTLEWORTH ROAD, DOVER, NEW HAMPSHIRE.
2. CONTOUR INFORMATION DEPICTED ON THIS PLAN IS SHOWN PER NOAA DATA ACCESS VIEWER ALONG WITH ON THE GROUND SURVEY OF THE SUBJECT PROPERTY PERFORMED MCENEANEY SURVEY ASSOCIATES.
3. SITE SPECIFIC SOIL SURVEY MAPPING COMPLETED BY GOVE ENVIRONMENTAL SERVICES INC.
4. WETLAND DELINEATION COMPLETED BY BAG LAND CONSULTANTS.

LEGEND

SUBCATCHMENT BOUNDARY	
DRAINAGE AREA/SUBCATCHMENT ID	1S
SITE SPECIFIC SOIL SURVEY BOUNDARY	
SITE SPECIFIC SOIL TYPE	232
NRCS SOIL SURVEY BOUNDARY	
NRCS SOIL TYPE	CfB
POND/CATCH BASIN ID	C1
REACH/ANALYSIS POINT ID	AP2
Tc (TIME OF CONCENTRATION)	

SOIL MAPPING LEGEND

THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOIL SURVEY. IT WAS PRODUCED BY A PROFESSIONAL SOIL SCIENTIST, AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE. THERE IS A REPORT THAT ACCOMPANIES THIS MAP.

THE SITE SPECIFIC SOIL SURVEY (SSSS) WAS PRODUCED NOVEMBER 29, 2021, AND WAS PREPARED BY LUKE D. HURLEY, SSA OF GOVE ENVIRONMENTAL SERVICES, INC. THE SURVEY AREA IS LOCATED AT 64 LITTLEWORTH ROAD, DOVER, NH.

SOILS WERE IDENTIFIED WITH THE NEW HAMPSHIRE STATE-WIDE NUMERICAL SOILS LEGEND, USDA NRCS, DURHAM, NH. ISSUE # 10, JANUARY 2011. THE NUMERIC LEGEND WAS AMENDED TO IDENTIFY THE CORRECT SOIL COMPONENTS OF THE COMPLEX.

HYDROLOGIC SOIL GROUP FROM KSAT VALUES FOR NEW HAMPSHIRE SOILS, SOCIETY OF SOIL SCIENTISTS OF NEW ENGLAND, SPECIAL PUBLICATION NO. 5, SEPTEMBER, 2009.

SYMBOL	SOIL NAME	HYDROLOGIC SOIL GROUP
232	BUXTON	C
32	BOXFORD	C
233	SCANTIC	D

NRCS SOIL DATA FROM WEB SOIL SURVEY

SYMBOL	SOIL NAME	HYDROLOGIC SOIL GROUP
CFB	CHARLTON	B
BZA	BUXTON	C
SCA	SCANTIC	C

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE:
HORZ.: 1" = 50'
VERT.:
DATUM:
HORZ.:
VERT.:
50 25 0 50
GRAPHIC SCALE

FUSS & O'NEILL
50 COMMERCIAL STREET
MANCHESTER, NEW HAMPSHIRE 03101
603.668.8223
www.fando.com

BLUEBIRD SELF-STORAGE
PRE-DEVELOPMENT
DRAINAGE AREA PLAN
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 3/1/2022

DA-101

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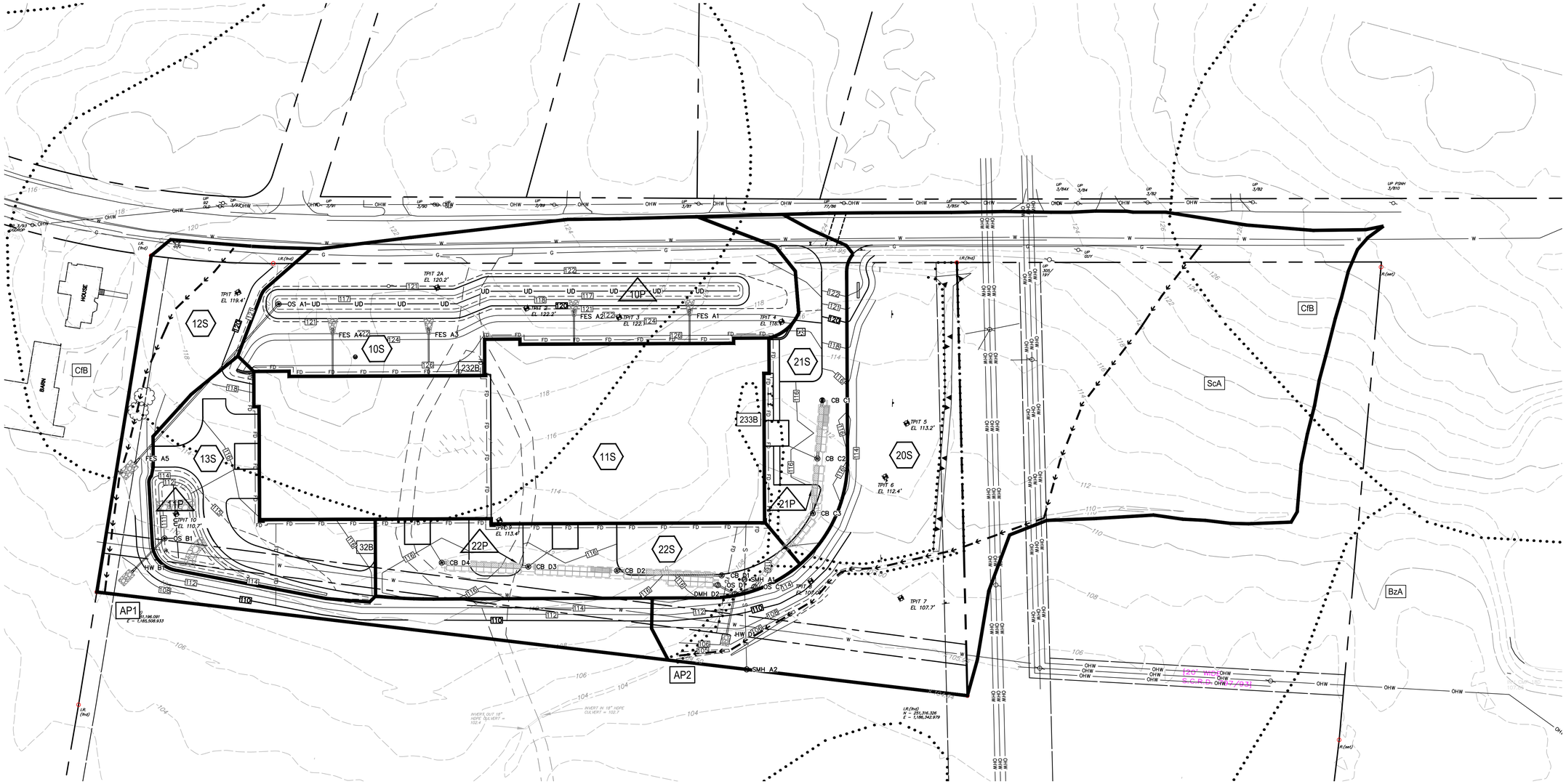

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4. WETLAND DELINEATION COMPLETED BY BAG LAND CONSULTANTS.

LEGEND

SUBCATCHMENT BOUNDARY	
DRAINAGE AREA/SUBCATCHMENT ID	1S
SITE SPECIFIC SOIL SURVEY BOUNDARY	
SITE SPECIFIC SOIL TYPE	232
NRCS SOIL SURVEY BOUNDARY	
NRCS SOIL TYPE	CfB
POND/CATCH BASIN ID	C1
REACH/ANALYSIS POINT ID	AP2
Tc (TIME OF CONCENTRATION)	

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CfB	CHARLTON	B
BZA	BUXTON	C
SCA	SCANTIC	C

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE:
HORZ.: 1" = 50'
VERT.:
DATUM:
HORZ.:
VERT.:
50 25 0 50
GRAPHIC SCALE

FUSS & O'NEILL
50 COMMERCIAL STREET
MANCHESTER, NEW HAMPSHIRE 03101
603.668.8223
www.fando.com

BLUEBIRD SELF-STORAGE
POST-DEVELOPMENT
DRAINAGE AREA PLAN
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

DA-102

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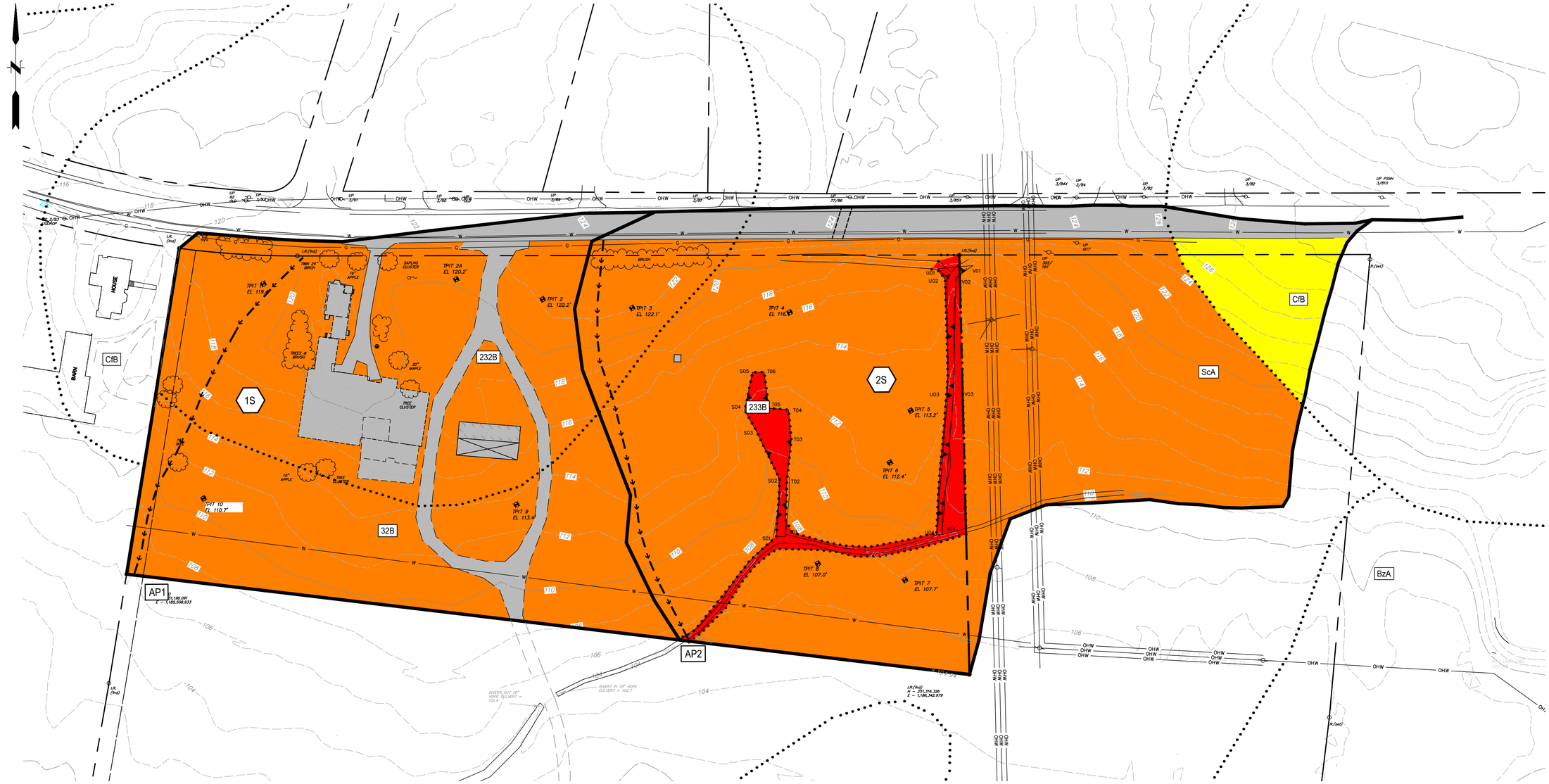

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4. WETLAND DELINEATION COMPLETED BY BAG LAND CONSULTANTS.

LEGEND

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BZA	BUXTON	C
SCA	SCANTIC	C

COLOR CODED LEGEND

SOIL GROUP A	
SOIL GROUP B	
SOIL GROUP C	
SOIL GROUP D	
IMPERVIOUS COVER	

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE:
HORZ.: 1" = 50'
VERT.:
DATUM:
HORZ.:
VERT.:
50 25 0 50
GRAPHIC SCALE

FUSS & O'NEILL
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BLUEBIRD SELF-STORAGE
PRE-DEVELOPMENT COLOR DRAINAGE AREA PLAN
64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 3/1/2022

DA-201

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POST-DEVELOPMENT DRAINAGE AREA PLAN NOTES

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LEGEND

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SITE SPECIFIC SOIL TYPE	232
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COLOR CODED LEGEND

SOIL GROUP A	
SOIL GROUP B	
SOIL GROUP C	
SOIL GROUP D	
IMPERVIOUS COVER	

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE:
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64 LITTLEWORTH ROAD
DOVER NEW HAMPSHIRE

PROJ. No.: 20210509.A10
DATE: 2.25.2022

DA-202

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