CITY OF DOVER

PLANNING TECHNICAL REVIEW COMMITTEE –AGENDA

REVISED

Meeting Type: Regular Meeting
Meeting Location: Council Conference Room, City Hall, 288 Central Ave, Dover NH 03820
Meeting Date: **Thursday, May 18, 2023**
Meeting Time: **10:30 AM**

1. 10:30 AM - 11:00 AM: Open Space Subdivision for Stonearch Development Corp. & Eugene A. and Donna L Sgrignuoli, Assessor's Map E, Lot 65-1 & 65-A, zoned R-20, located between 53 & 65 Tolend Road and 22 Sun Hawk Lane. (Proposal is for a 27 lot subdivision with 2 open space areas) (SUBD-2023-0005).

   (This property had previous Technical Review Committee meetings with different proposals)

City of Dover, New Hampshire
SUBDIVISION APPLICATION

[Revision Date: July 1, 2021]

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

APPLICANT AND OWNER INFORMATION

Name of Applicant: Stonearch Development Corp. Telephone # 1-978-375-3153

Address of Applicant: 42J Dover Point Road, Dover, NH 03820

Name of Property Owner (*if different from applicant*): 59 Tolend RD LLC Telephone #

Address of Property Owner: Same
Sgrignuoli, Eugene A. & Donna L., 22 Sun Hawk Lane, Dover, NH
E-Mail Address: oneillfamilydevelopment@gmail.com

PROPERTY INFORMATION

Address of Property: Between 53 & 65 Tolend Road, and 22 Sun Hawk Lane

Assessor's Map # E Lot(s) # 65-1 & 65-A

Zoning District(s) R20 Overlay District(s) Wetlands and Conservation
Combined Area 5044-744
Size of Parcel: 44.42 Property Deed: Book Page: 1571-86

Existing Use of Property: Vacant Lane and Single Family Home

SUBDIVISION INFORMATION

Subdivision Type: Conventional: _____ Open Space: X TDR: _____

Existing Number of Lots: 2 Proposed Number of Lots: 27 Limited Common Areas
2 Open Space Areas + Ex lot 65-A

TDR Relief sought (Check All That Apply): □ Lot Size □ Frontage □ Setback □ 30' Buffer □ Purchase ____ units

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

N/A

Circle one for each category:
Water: City/Well (circle one) How far is city water from the property? At the site

Sewer: City/Septic (circle one) How far is city sewer from the property? 1/4 mile +

Highway Access: City Street/State Highway (circle one) | Roadway Public or Private Road (circle one)

Refuse removal: Public/Private (circle one) | Estimated Length of Proposed Road: 2,335 feet

Estimated value of construction: 18M New impervious area (in s.f.): 144,393

WAIVER REQUESTS

Subdivision Regulations section(s) to be waived: 157-21F(4) (one location), 157-32G (three locations)

Justification for waiver request(s) (*attach additional sheets as needed*): Please find attached narrative.

SURVEYOR INFORMATION

Name of Surveyor and Company (Licensed in N.H.) Kenneth A. Berry
Berry Surveying & Engineering

Address 335 Second Crown Point Road, Barrington, NH 03825 Telephone #: 603-332-2863

Professional License #: 805 E-mail address: Crberry@metrocast.net

ENGINEER INFORMATION

Name of Engineer and Company (Licensed in N.H.) Kenneth A. Berry
Berry Surveying & Engineering

Address 335 Second Crown Point Road Barrington, NH 03825 Telephone #: 603-332-2863

Professional License #: 14243 E-mail address: Crberry@metrocast.net

LANDSCAPE ARCHITECT INFORMATION

Name of Landscape Architect and Company (Licensed in N.H.) Terrain Planning & Design LLC
Eric Buck

Address 311 Kast Hill Road, Hopkinton, NH 03229 Telephone #: 603-491-2322

Professional License #: 79 E-mail address: _____

SOIL SCIENTIST INFORMATION

Name of Soil Scientist and Company (Licensed in N.H.) John P. Hayes III

Address 7 Limestone Way, North Hampton, NH 03862 Telephone #: 603-776-5825

Professional License #: CWS 18 E-mail address: johnphayes@comcast.net

CONSERVATION EASEMENT HOLDER

Name of Easement Holder: _____ Telephone #_____

Address Easement Holder: _____

SIGNATURES

I/We hereby submit this application to the City of Dover Planning Board and attest that to the best of my knowledge all of the information on this application form and in the accompanying application materials and documentation is true and accurate. Furthermore, I/We submit that the existing conditions sheet of the plan represents the lot in question, and that no alteration of the site shall take

place during Planning Board review up to and including the pre-construction meeting. As applicant or as agent, I attest that I am duly authorized to act in this capacity.

Signature of Property Owner: _____ Date: 4-27-23

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

Signature of Agent: _____ Date: 4-27-23

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: 4-27-23

AUTHORIZATION TO COMPLETE THE PROJECT ON SUBJECT PROPERTY

I, and my successors, hereby authorize the City of Dover and 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: 4-27-23

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

CERTIFICATION OF FEES

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

Signature of Property Owner: _____ Date: 4-27-23

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

CERTIFICATION OF PUBLIC ROADWAY ACCEPTANCE

I, and my successors, hereby certify that I understand that the acceptance of a roadway as a public road is an action of the City Council in its sole and complete discretion. In order for the City Council to consider accepting a road as public, it must be free of encumbrances. No roadway with private utility easements shall be accepted as a public road by the City unless the easements are expunged prior to the transfer of land to the City. License agreements for any and all private utilities within the right of way may be granted by the City upon acceptance of the unencumbered roadway consistent with applicable state law.

Signature of Property Owner: _____ Date: 4-27-23

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

City of Dover, New Hampshire
SUBDIVISION SUBMISSION CHECKLIST

[Revision Date: May 18, 2019]

This review checklist is intended to assist the applicant in the planning process of preparing a Subdivision 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 subdivision requirements. Please refer to the Subdivision Regulations for full details.

APPLICANT: StoneArch Development Corp. File Number: _____

PROJECT TITLE: Rolling Hill Estates

PROPERTY LOCATION: Between 53 - 65 Tolend Road Tax Map: E Lot: 65-1 & 65-A

	Where/How Provided	Reviewed
1. Completed and signed Application form	X	
2. Plan Review Fees are provided	X	
3. Electronic copy of the surveyed plat layout	X	
4. Electronic copy of supplementary materials and application	X	
5. Traffic Impact Assessment and Analysis (Standard or Advanced)	X	
6. Waiver requests to the Subdivision Regulations, with written justification	X	
7. Conditional Use Permit applications	X	
8. Narrative describing yield plan and cost analysis	X	
9. Folded copies of subdivision plan w/scale of not less than 1"=50' or 1"=100' for larger subdivisions. Plans shall contain the following items as appropriate:	X	
Location map at appropriate scale	X	
Proposed subdivision name and title and Planning File #	X	
Date, north arrow and scale	X	
Names of all abutting property owners	X	
Name and address of owners and/or applicants	X	
Signature & stamp of NH licensed land surveyor and/or engineer	X	
Zoning District boundaries, including any special or overlay districts	X	
Location of Conservation District areas	X	
Location, names and widths of existing and proposed streets, including pavement widths, grades, curbs and crosswalks	X	
Location and widths of existing & proposed easements & right of ways	X	
Location and widths of existing and proposed sidewalks	X	
Existing and proposed property lines with dimensions and bearings tied into Dover's Geographic Information System coordinate system	X	
Existing and proposed lot areas in square feet	X	
Existing and proposed topographic information at two foot intervals	X	
Minimum building setbacks or build to lines on all lots	X	

	Explain How Provided	Reviewed
Existing and proposed buildings and structure locations	X	
Location and size of existing and proposed electric, telephone, gas cable and other underground utilities	X	
Existing and proposed water lines and fire hydrants, including materials and capacity needed	X	
Location and materials of sanitary sewage facilities within project site and projected additional peak hour sewer load	X	
Existing and proposed septic system, including test pit locations and results and NHDES subdivision permit number	X	
Existing and proposed stormwater lines and facilities	X	
Existing and proposed streetlights	X	
Location of Flood Hazard Zone	X	
Location of all bodies of water and watercourses	X	
Location of wetlands and buffers	X	
Neighborhood plan with aerial underlay showing how project relates to abutting uses	X	
Existing natural features and/or significant vegetation on property	X	
Depict existing contours up to 100 ft. beyond project limits	X	
Soil types	X	
Map and lot numbers for existing and proposed lots as assigned by Tax Assessor	X	
Location of all land offered for dedication for public use or land to be held in common by property owners of the subdivision	X	
Location of all land offered for dedication for public use or land to be held in common by property owners of the subdivision	X	
Location, material and size of existing and proposed permanent monuments	X	
Existing railroad lines	n/a	
Note regarding solid waste disposal	X	
All applicable Dover Common Subdivision notes	X	
10. Construction Detail Sheets shall contain the following:		
Profiles showing existing & proposed elevations along the center lines of proposed streets & within 100' of intersections with existing streets	X	
Profiles showing the locations & a typical cross-section detail of streets	X	
Location of street trees, street lighting poles and street signs	X	
Location, size and invert elevations of existing and proposed sanitary sewers, stormwater drains and fire hydrants	X	
Location and size of all water, gas and other underground utilities	X	
11. Additional Information if appropriate		
Stormwater Management Plan depicting the existing and proposed storm drainage system and engineered drainage analysis	X	
Stormwater Management System Operation and Maintenance Plan	X	
Letter to Serve from Public and Private Utilities	X	
Erosion and Sedimentation Control Plan	X	
Perimeter Landscaping Plan	X	
Proposed restrictive covenants or homeowners association documents	Will upon request	
Dates and permit numbers of all required state and federal permits	X	
If wetland buffer, indicate placards locations, as applicable	X	
Hydrogeologic study if located in Groundwater Protection Zone	n/a	
Provide additional exhibits/technical data determined appropriate by the Planning Board or its staff as required	Will upon request	

REVIEWED BY: _____ DATE_____ TRC DATE_____

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: StoneArch Developement Corp Telephone # 1-978-375-3153

Address of Applicant: 42J Dover Point Road, Dover, NH 03820

E-Mail Address: oneillfamilydevelopment@gmail.com

Name of Property Owner (*if different from applicant*): 59 Tolend RD LLC Telephone #

Address of Property Owner: Sgrignuoli, Eugene A. & Donna L., 22 Sun Hawk Lane, Dover, NH

PROPERTY INFORMATION

Address of Property: Between 53 & 65 Tolend Road, and 22 Sun Hawk Lane

Assessor's Map # E Lot(s) # 65-1 & 65-A

Zoning District(s) R20 Combined Area Overlay District(s) Wetlands and Conservation

Size of Parcel: 44.42 sq. ft. _____ ac. Property Deed: Book 5044-744 Page: 1571-86

Existing Use of Property: Vacant Land and Single Family Home

SITE PLAN INFORMATION

Describe Proposed Use: 27 Single-family detached units & 1 duplex

Area of Parcel to be Developed: 14.65Ac of 44.42Ac total land sq. ft.

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

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

Number of Parking Spaces: Existing _____ Proposed 5 spaces along, 2 in each garage 2 in each driveway

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

Number of Employees Total: _____ In Maximum Shift: _____

Disposition of Parcel:

Building Footprint 62,910 coverage sq. ft.

Total Building Area _____ sq. ft.

Paved Area 81,483 sq. ft.

Building Setbacks:

Front Yard 100' oss ft.

Rear Yard 40' oss ft.

Side Yard: Right 40' oss ft. Left ____ ft.

City Water? _x_ Yes ___ No How far is city water from the property? At the site

City Sewer? ___Yes _x_ No How far is city sewer from the property? 1/4 mi +

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: Single family detached structures

Height of Building: See architectural Plans Finished Floor Elevation: See Grading Plans

Number of Seats (where applicable) _____

Estimated value of construction: 18M Refuse removal: Public/Private (circle one)

WAIVER REQUESTS

Site Review Regulations section(s) to be waived: No Site Review, see Subdivision Reg waiver requests

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

_____

_____

_____

_____

_____

_____

_____

SURVEYOR INFORMATION

Name of Surveyor and Company (Licensed in N.H.) Kenneth A. Berry
Berry Surveying & Engineering

Address 335 Second Crown Point Road
Barrington, NH 03825 Telephone #: 603-332-2863

Professional License #: 805 E-mail address: Crberry@metrocast.net

ENGINEER INFORMATION

Name of Engineer and Company (Licensed in N.H.) Kenneth A. Berry
Berry Surveying & Engineering

Address 335 Second Crown Point Road
Barrington, NH 03825 Telephone #: 603-332-2863

Professional License #: 14243 E-mail address: Crberry@metrocast.net

ARCHITECT INFORMATION

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

Address _____ Telephone #: _____

Professional License #: _____ E-mail address: _____

LANDSCAPE ARCHITECT INFORMATION

Name of Landscape Architect and Company (Licensed in N.H.) Terrain Planning & Design LLC
Eric Buck

Address 311 Kast Hill Road, Hopkinton, NH 03229 Telephone #: 603-491-2322

Professional License #: 79 E-mail address: _____

SOIL SCIENTIST INFORMATION

Name of Soil Scientist and Company (Licensed in N.H.) John P. Hayes III

Address 7 Limestone Way, North Hampton, NH 03862 Telephone #: 603-776-5825

Professional License #: 87 E-mail address: johnphayes@comcast.net

CONSERVATION EASEMENT HOLDER

Name of Easement Holder: _____ Telephone #_____

Address Easement Holder: _____

SIGNATURES

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

Signature of Property Owner: _____ Date: 4-27-23

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

Signature of Agent: _____ Date: 4-27-23

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: 4-27-23

AUTHORIZATION TO COMPLETE THE PROJECT ON SUBJECT PROPERTY

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

Signature of Property Owner: _____ Date: 4-27-23

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

CERTIFICATION OF FEES

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

Signature of Property Owner: _____ Date: 4-27-23

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

CITY OF DOVER SITE REVIEW
LIST OF ABUTTERS

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

Owner:

TAX MAP	LOT #	PROPERTY OWNER	MAILING ADDRESS

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS

City of Dover, New Hampshire
SITE PLAN REVIEW SUBMISSION CHECKLIST

[Revision Date: June 4, 2019]

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

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

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

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

APPLICANT: StoneArch Development Corp. File Number: _____

PROJECT TITLE: Riverside Estates

PROPERTY LOCATION: Between 53 - 65 Tolend Road Tax Map: E Lot: 65-1 & 65-A

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

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

REVIEWED BY: _____ DATE_____ TRC DATE_____

BERRY SURVEYING & ENGINEERING
335 Second Crown Point Road
Barrington, NH 03825
Phone: (603) 332-2863
Fax: (603) 335-4623
www.BerrySurveying.Com

April 27, 2023

City of Dover
Attention: Mrs. Donna Benton Director of Planning and Community Development 288 Central Ave
Dover, NH 03820

Re: Proposed Lot Line Revision & Open Space Subdivision
Project Narrative
StoneArch Development Corp.
Tolend Road & Sun Hawk Lane, Dover,
NH Tax Map E, Lot 65-1 & 65-A

Dear Mrs. Benton,

On behalf of our client, StoneArch Development Corp, Berry Surveying & Engineering (BS&E) is submitting a proposed Lot Line Revision and Open Space Subdivision application off of Tolend Road and Sun Hawk Lane.

Background and General Narrative

The subject parcels are known as Tax Map E, Lot 65-1 and 65-A, containing 31.87+/- Ac. and 12.55+/-Ac. of land, respectively. Certain managing members of StoneArch Development Corp. (applicant) are managing members of 59 Tolend Rd LLC, the owner of Lot 65-1. Having purchased this lot from previous owners in the Spring of 2022, StoneArch Development Corp. is under agreement to purchase a portion of Lot 65-A from the Sgrignouli family. This will require a Lot Line Revision prior to the proposed Open Space Subdivision. At the time of the application, a Variance has been requested and approved for a lot with zero frontage (Lot 65-A). Lot 65-1 is located between 53-65 Tolend Road and Lot 65-A is located at 22 Sun Hawk Lane with Sun Hawk Lane being owned by NHDOT. Both lots contain land along the Cochecho River and are within the NHDES Shoreland Protection Zone. Lot 65-A is bordered by NH Route 16 to the east.

BS&E has conducted a full boundary survey of both parcels of land which included a topographic survey and wetlands survey. John P. Hayes, CWS, CSS conducted an on the ground wetlands analysis of both parcels and has provided a site-specific soils map. The site generally slopes from Tolend Road to the Cochecho River. There are slopes that exceed 20% for contiguous areas of over 2,000 SF (square feet) and intermingling wetlands areas. There are no vernal pools on the

project site.

The Proposal

Density:

The subject parcels are located within the R-20 Zone, and contain land within the wetlands overlay district and the following conservation overlay districts: steep slopes (greater than 20% for 2,000 SF contiguous area) and within 100 feet of the Cochecho River. The project proposes to construct twenty-seven (27) single family homes (Units #1-27) that will be sold by StoneArch Development Corp., and a duplex on Lot 65-A owned by the Sgrignouli's (Units #28 & #29), for a total of twenty-nine (29 units).

The base density of twenty-eight (28) duplex lots (fifty-six (56) units) is determined using the Open Space Subdivision (OSS) (cluster method) where the applicant conducts a yield plan to determine the base density of the parcel using the underlying zoning dimensions. It is of note that the applicant chose to demonstrate a duplex lot Yield Plan, while proposing single family homes. The R-20 Zone permits duplex units to be constructed on lots that contain 30,000 SF of upland and 18,000 SF outside of the wetlands buffer. Single family lots require 20,000 SF of upland and 12,000 SF outside of the wetlands buffer. Each lot shown within the Yield Plan is compliant with these requirements.

Using the base density of a conventional dimension R-20 subdivision, the applicant is proposing twenty-seven single family homes in a cluster format with Limited Common Areas (LCA). The LCAs range from 5,990 Sq. Ft. to 11,690 Sq. Ft., with LCA frontage obtained via one of three proposed private roads. Theodore Drive, Amelia Drive, and Liam Drive, each providing direct access to nine single family homes. Proposed structures are shown no closer than twenty-five feet in distance and approximately twenty feet to the edge of pavement/back of sidewalk to the front of the home. Foundation drain trunk lines that are shown on the Grading & Drainage Plan will be further evaluated for necessity before the next TRC submission.

This provides a large, un-interrupted area of Open Space around the perimeter of the subdivision, in addition to the forty-foot required R-20 Zone Open Space Buffer. There is an existing trail adjacent to the river and generally within the 100' setback from the river to provide an opportunity for recreation. A trail connection is proposed to the open space, with five independent parking spots proposed with sidewalk access to the trailhead off Amelia Drive. A total project disturbance of 10.19 Ac. is proposed for the total 44.42 Ac. +/- site (Lot 65-1 & Lot 65-E). These spaces are located away from the Amelia trail head due

to accessible parking requirements. There are no locations near the trail head that provide a 2% or flatter cross slope for parking and loading.

Post Lot Line Revision with Lot 65-A, Lot 65-1 becomes 41.53 Ac. +/-. Of this 41.53Ac. +/- revised lot area, 34.94 Ac. +/- is proposed to be Open Space or undeveloped area, including 27.91 Ac. in upland area. Within this open space are three subsurface gravel wetlands for stormwater treatment and detention (1.25 Ac.) and three community effluent disposal areas (EDAs) (0.60 Ac.) along with general grading for stormwater and other features.

Roads:

Theodore Drive is proposed to be the major access into the subdivision, entering and exiting to and from Tolend Road. Liam Drive and Amelia Drive are proposed residential roads terminating in cul-de-sacs, both less than 1,000 feet to the neck. A total of 2,335 LF of twenty-four feet wide paved roadway is proposed to support the subdivision. The existing home on 65-A is proposed to be removed and will be rebuilt as duplex in a new location, still accessed from Sun Hawk Lane. Sun Hawk Lane is proposed to be extended to Theodore Drive for emergency circulation. The proposal includes the widening and reconstruction to a 20- foot-wide gravel driveway, including a gate with knox box, with only a small section off of Theodore Drive being paved. It will be the responsibility of the applicants to keep the fire access road open and clear to Sun Hawk Lane during all seasons.

Street trees are provided throughout the roadways in addition to shrubs and perennials for screening of transformers and junction boxes. In addition, a series of white spruce trees are provided between the LCAs and the proposed duplex for screening purposes. A fenced in recreation area near the intersection of Theodore Drive and Liam Drive will include benches with trash barrels and picnic tables with fire pits as amenities. Additional benches with trash barrels and bike racks are distributed around the subdivision.

Parking:

Parking for the single-family homes is provided within the twenty foot long, twenty-two-foot-wide driveway (two vehicle) and the provided two car garage. With twenty-four-foot-wide paved streets, parking will be allowed along the roadway during non-snow conditions. To meet the 5% EV parking requirement, one garage along each of the three roadways is proposed to contain wiring for EV charging. Three bike rack locations are also provided throughout the subdivision. Five general parking spaces are provided at the recreation area located at the intersection of Theodore Drive & Liam Drive. There is a sidewalk connection provided to the trail head location off of Amelia Drive from these spaces.

Sewer/Septic:

Sewage/effluent disposal will be addressed on site utilizing a series of three community Geomatrix GST 6224 effluent disposal areas (EDA). The effluent flows are distributed evenly across the subdivision with each EDA servicing nine, three-bedroom houses, each at 4,050 GPD (12,150 GPD project demand). Each single-family home will be serviced by a 1,250 gallon septic tank, with effluent flowing via gravity to a collection line in the street to a one of three effluent pump stations for the leachfields. A nitrate easement is proposed from Lot 65-A in favor of Lot 65-1 to accommodate the nitrate setbacks of EDA #2 & #3. All nitrate setbacks are a minimum of 230 feet from the Cochecho River. The duplex unit will be serviced by a 2,500 gallon septic tank and gravity to an Advanced Enviro System on Lot 65-A.

Water:

Domestic water services proposed includes a 1" domestic water service to each single-family home and the proposed duplex. An 8" concrete lined ductile iron (CLDI) watermain is proposed to be looped from Tolend Road, down Theodore Drive and down Sun Hawk Lane to Atina Way. The waterline branches down Amelia Drive and Liam Drive terminate in fire hydrants. Fire hydrants are provided in intervals no further than 500 feet drivable distance from any structure. Power and cable utility is proposed to be underground throughout with the potential need for a drop pole at the intersection of Tolend Rd & Theodore Dr. The plans have been submitted to Eversource for a final design and a letter to serve. Free standing lamps shown on site are proposed to be solar powered. Each structure will have be serviced by an underground liquid propane tank. Electric meters meter locations are shown near the front of all structures.

Stormwater:

The stormwater from the proposal flows to various catch basins and is discharged to three subsurface gravel wetlands for attenuation and treatment. The peak rate of runoff and volume of stormwater are reduced at all analyzed events and analysis points. Taking into consideration the comments of Dover Engineering on the prior project designs, subsurface gravel wetlands are the proposed stormwater best management practices (BMP) utilized on site. These BMPs provide excellent removal efficiency of nitrogen and phosphorous in addition to total suspended solids and turbidity. Notably, the implementation of these BMPs will help to mitigate the additional nitrogen and phosphorous created from the impervious surfaces within the subdivision. The Cochecho River has suffered algae blooms caused from phosphorous impairments in previous years and these BMPs will help support Dover's compliance with the NPDES Total Nitrogen General Permit.

None of the catch basins within the project are equipped with deep sumps or hoods due to wild life concerns (NH Fish & Game requirement), and therefore water quality inlets and forebays are proposed on each pond device. Any structure sump required from pre-casting will be filled with stone. Other considerations for wildlife include:

- Where basins are proposed with grass lined areas (limited) a bee hive grate is proposed to reduce the likelihood of entrapment.
- Outlet structures within the ponds have sumps filled with stone, and the rim of the structure is held 9" minimum above the surrounding grade, to prevent climbing.
- The culvert is oversized within the wetland crossing with a 6" bury depth. Culverts within crossings are proposed to be reinforced concrete pipes, which is the preferred method of NH Fish and Game.
- Stabilization matting is proposed to be Bio-Net which is a natural product with no plastic components.
- Siltation controls are proposed to be mulch berm and silt sock which have no plastic components.
- Low lighting is proposed on the structures and roadway systems to prevent spill into buffers and wetlands areas.
- Known state wide species of concern are included in the plan set with a small piece of educational instruction to aid the contractor in the event of contact.

Conditional Use Permit Areas:

The project does propose conditional use permits for 1,983 SF of temporary (1 location) and 2,156 SF of permanent (1 location) wetland disturbance, 8,071 SF of temporary (5 locations) and 20,850 SF of permanent (5 locations) wetland buffer disturbance. The design made an effort to balance the size of a primary impact versus what the secondary impacts would be. The permanent wetland buffer impact is located in three areas: Theodore Drive wetland crossing, Subsurface Gravel Wetland #102 outlet level spreader, and the reconstruction/upgrade of Sun Hawk Lane (which has been requested by Dover from the prior submissions). Temporary wetland buffer impact occurs from double perimeter control and construction fence setting within the wetland buffers. Perimeter control and construction fence require six feet offset from toe of slope for proper and effective setup. Areas of temporary wetland buffer impact are restored at the end of construction. The wetlands buffer disturbance has been minimized using 2:1 rip-rap lined slopes and 2:1 slopes lined with erosion blanket, retaining wall features and several locations, and general avoidance and minimization methods. Find CUP Plans for color areas of disturbance.

The project does propose conditional use permits for 2,472 SF of disturbance of areas greater than 20% slope for 2,000 SF (2 locations): Theodore Drive Wetland crossing #1 and Gravel Wetland #103 outlet pipe. It is important to note that in these two locations, the wetland buffer was considered the more valuable resource to protect, therefore more disturbance within these particular steep slope conservation districts was chosen. This strategy was chosen to be used across the project. Find CUP Plans for color areas of disturbance.

The project requests waivers to articles of two separate sections. Waiver to Chapter 157-21F(4) requests a reduction of the 40' OSS buffer in one location to minimize wetland and wetland buffer disturbance. Waiver to Chapter 157-32G requests 4% road grade within 75 feet of an intersection where 3% is required in three locations due to topographic conditions. A stop-controlled intersection grade of 4% is the NHDOT standard for a minor leg. Please find waiver requests for narrative and criteria.

The project requires the following local approvals:

- Lot Line Revision approval.
- Subdivision approval.
- Site Review approval.
- Waiver Request approval for the intersection grade and 40' OSS buffer reduction in one location.
- Conditional Use Permits for disturbance within the conservation overlay district (wetland buffer & disturbance of areas of greater than 20% slope for 2,000SF of contiguous area).

The project requires the following State and Federal Approvals:

- NHDES Wetlands Permit
- Army Corps. Permit under the CGP
- NHDES Alteration of Terrain (AoT) Permit
- NHDES Subdivision Approval
- NHDES Shoreland Permit
- NHDES Drinkwater & Groundwater Bureau (DWGB) Permit
- EPA Notice of Intent and Stormwater Pollution & Prevention Plan
- Natural Heritage Bureau (NHB)
- Department of Historical Resources (DHR)

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

Christopher R. Berry, SIT Project Manager
Principal, President

Kenneth A. Berry, PE, LLS,
CPSWQ, CPESC, CESSWI
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April 27, 2023

City of Dover Planning Board
Attention: Mrs. Donna Benton, Director of Planning and Community Development
288 Central Ave
Dover, NH 03820

Re: StoneArch Development Corp.
Riverside Estates
Off Tolend Road
Waiver Requests

Chairperson & Members of the Dover Planning Board:

In accordance with to the subdivision standards Article 157-30, the following waiver is hereby requested:

1. Identification of Waiver Request: Maximum road grade of 3% within 75' of an intersection per Dover Subdivision Regulation 157-32.G.

- Road grade of -4% within 75' of the intersection; Theodore Dr./Tolend Rd. int
- Road grade of -4% within 75' of the intersection; Theodore Dr./Amelia Dr. int
- Road grade of -4% within 75' of the intersection; Amelia Dr./Theodore Dr. int

2. Explanation:

The applicant is proposing to construct a 24' wide roadway off Tolend Road known as Theodore Drive (Pvt.). Theodore Drive is to provide the primary access an and out of the subdivision known as Riverside Estates. The subdivision regulations require a maximum grade of 3% within 75' of the intersection of Tolend Road and the applicant is proposing 4% within 75' of the intersection. Due to the existing slope off Tolend Road into the subject property, a 4% slope aids in the reduction of fill required within the wetlands and buffer crossing. A 4% grade is the standard NHDOT platform slope, which allows for proper drainage off the road shoulder and provides a navigable platform. The intersection legs of Theodore Drive and Amelia Drive at 4% are both stop-controlled with adequate sight distance being provided. The increased road grade helps to reduce environmental impact and fill required at the end of Ameila Drive, near the river.

3. Waiver Justification:
a. Granting the waiver will properly carry out the purpose and intent of the regulations.

The intent of requiring a maximum road grade of 3% within 75' of an intersection is to ensure vehicular safety for all turning movements, including sight distance. In this case the 4% proposed within 75' is the NHDOT standard, and therefore will carry out the purpose and intent

the regulations in these three locations.

b. Strict conformity to the regulations would pose an unnecessary hardship to the applicant.

Requiring the applicant meet the grading requirement would increase the disturbance and filling required at the wetland crossings and within the wetland buffers.

Identification of Waiver Request: Reduction of required 40' OSS buffer that fronts per Dover Subdivision 157-21F.

- Proposed grading within the front 40' perimeter buffer as required in the OSS in one location.

2. Explanation:

The applicant is proposing to construct a roadway into the subject property to gain access to productive upland areas, on the back side of a small wetlands area which will need to be crossed. Given the need to demonstrate minimization and avoidance within the disturbance area of not only the wetlands, but also the wetlands buffers, the narrowest crossing was chosen which also has the best topographic advantage.

The design is careful to balance the required 40' perimeter needs with the environmental impacts. The proposed roadway (pavement) was set to 40' from the closest corner point of the abutting land owner on Tax Map E, Lot 65-B, so that the area of impact within the 40' is only side slope grading. It is important to point out that the existing abutting structure is 178' away from the impact area to the buffer and is 8' higher in elevation, with a large platform between the two. With the provided buffer and these existing topographic attributes, the impact area will not be viewed by the abutting land owner. The remainder of the 40' buffer along the western edge of Lot 65-B is respected.

3. Waiver Justification:

a. Granting the waiver will properly carry out the purpose and intent of the regulations.

The purpose of the 40' buffer is to reduce the impact on the most abutting land owners. In this case, granting the waiver with the mitigation proposed will carry out the purpose and intent of the regulation.

b. Strict conformity to the regulations would pose an unnecessary hardship to the applicant.

Requiring the applicant to not disturb the 40' buffer would increase to the environmental impact of the project without increasing the benefit of the 40' buffer given the mitigation proposed along with the topographic relief between the existing structure on Lot 65-B and the proposed impact area.

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

Christopher R. Berry, SIT Project Manager
Principal, President

Kevin R. Poulin, EIT
Project Engineer

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Fiscal Analysis of Yield Plan

For

Rolling Hill Estates
Tax Map E, Lots 65-1 & 65-A
Tolend Road

StoneArch Development Corp.
42J Dover Point Road
Dover, NH 03820

Prepared By

Berry Surveying & Engineering
335 Second Crown Point Road
Barrington, NH 03825
603-332-2863

File Number
DB2023-031
April 27, 2023

The yield plan provides for 28 total duplex lots. The proposed road for the yield plan is 4,200 linear feet to the back side of each cul-de-sac and includes the connection to Sun Hawk with a fire access road. This roadway would have cuts and fills, as the does the development plan, curbing, sidewalk, and water utility. Septic systems would be placed on their own lots without the need to gravity sewer lines.

We have conducted an engineer's estimate on a roadway of this nature recently using the NHDOT weighted standard construction numbers and have found that a roadway and was confirmed by contractor bid and construction. The road contained the same utilities and cross sections which would be required to build the enclosed yield plan. Water utilities and onsite effluent disposal systems. The proposed yield plan would require sidewalk and curbing which would add to the price of the road comparison above. The cost per foot is assumed to be $950.00 a linear foot.

Acquisition Cost: $900,000
3,857 feet of Road with full utilities @ $950.00 a linear foot: $3,664,150 Engineering: $180,000.00

Total Approximate cost to build the Yield Plan = $3,844,150
Total number of Lots/Units = 28
Total cost per unit = $137,291

The retail price in Dover at the moment for lots is approximately $175,000.00 with no price adjustment for the available duplex units assumed. It is important to point out that the developers of this project are also the builders of the proposed homes.

Respectfully submitted,
Berry Surveying & Engineering

Christopher R. Berry
Principal, President

# 3br Units	2
# Bedrooms	6
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
3.75	
Flow Received from Infiltration (gpm)	
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day	
0.019	
Cumulative Infiltration (gpm)	
0.019	
Total Flow Received (BR Flow + INF) (gpm)	
3.77	
Prop. SMH #1	
Rim Elev	120.34
Inv In (Unit #1)	110.92
Inv In (Unit #9)	110.92
Inv Out (SMH #2)	110.59
Station	20+96.00
Offset	Rt. 6.00'
Depth SMH	9.75

Full Velocity (Manning Equation)	
V=(1.486/n)*(R^2/3)*(S^1/2)	
n	0.011
R	0.167
Pipe Dia (in)	8
Area (ft^2)	0.349
8" SDR 35	
Inv In (SMH #1)	110.59
Inv Out (SMH #2)	110.36
Length (ft)	60.00
Slope	0.004
Full Velocity (ft/s)	2.53
Discharge Rate (gpm)	396.66

# 3br Units	4
# Bedrooms	12
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
7.50	
Flow Received from Infiltration (gpm)	
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day	
0.013	
Cumulative Infiltration (gpm)	
0.032	
Total Flow Received (BR Flow + INF) (gpm)	
7.53	
Prop. SMH #2	
Rim Elev	118.51
Inv In (SMH #1)	110.36
Inv Out (SMH #3)	110.26
Station	21+60.00
Offset	Rt. 6.00'
Depth SMH	8.25

Full Velocity (Manning Equation)	
V=(1.486/n)*(R^2/3)*(S^1/2)	
n	0.011
R	0.167
Pipe Dia (in)	8
Area (ft^2)	0.349
8" SDR 35	
Inv In (SMH #1)	110.26
Inv Out (SMH #3)	108.48
Length (ft)	42.50
Slope	0.042
Full Velocity (ft/s)	8.37
Discharge Rate (gpm)	1311.12

# 3br Units	6
# Bedrooms	18
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
11.25	
Flow Received from Infiltration (gpm)	
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day	
0.038	
Cumulative Infiltration (gpm)	
0.071	
Total Flow Received (BR Flow + INF) (gpm)	
11.32	
Prop. SMH #3	
Rim Elev	115.48
Inv In (SMH #2)	108.48
Inv Out (SMH #4)	106.48
Station	22+06.90
Offset	Rt. 5.60'
Depth SMH	9.00

Full Velocity (Manning Equation)	
V=(1.486/n)*(R^2/3)*(S^1/2)	
n	0.011
R	0.167
Pipe Dia (in)	8
Area (ft^2)	0.349
8" SDR 35	
Inv In (Prop. SMH #13)	106.48
Inv Out (Pump Sta. #4)	99.20
Length (ft)	121.25
Slope	0.060
Full Velocity (ft/s)	10.02
Discharge Rate (gpm)	1569.83

# 3br Units	8
# Bedrooms	24
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
15.00	
Flow Received from Infiltration (gpm)	
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day	
0.021	
Cumulative Infiltration (gpm)	
0.092	
Total Flow Received (BR Flow + INF) (gpm)	
15.09	
Prop. SMH #4	
Rim Elev	108.10
Inv In (Unit #5)	99.43
Inv In (Unit #6)	99.43
Inv In (SMH #3)	99.20
Inv Out (SMH #12)	99.10
Station	23+32.60
Offset	Rt. 6.60'
Depth SMH	9.00

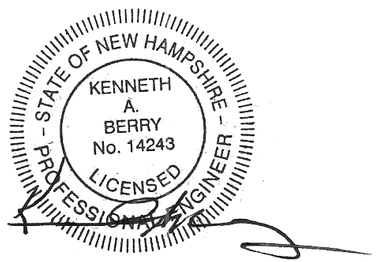
Full Velocity (Manning Equation)	
V=(1.486/n)*(R^2/3)*(S^1/2)	
n	0.011
R	0.167
Pipe Dia (in)	8
Area (ft^2)	0.349
8" SDR 35	
Inv In (SMH #4)	99.10
Inv Out (Pump Sta #1)	98.00
Length (ft)	68.00
Slope	0.016
Full Velocity (ft/s)	5.20
Discharge Rate (gpm)	814.83

# 3br Units	1
# Bedrooms	3
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
1.88	
Flow Received from Infiltration (gpm)	
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day	
0.027	
Cumulative Infiltration (gpm)	
0.027	
Total Flow Received (BR Flow + INF) (gpm)	
1.90	
Prop. SMH #5	
Rim Elev	105.42
Inv In (Unit #4)	98.75
Inv Out (Pump Sta #1)	98.42
Station	24+42.25
Offset	Rt. 7.00'
Depth SMH	7.00

Full Velocity (Manning Equation)	
V=(1.486/n)*(R^2/3)*(S^1/2)	
n	0.011
R	0.167
Pipe Dia (in)	8
Area (ft^2)	0.349
8" SDR 35	
Inv In (SMH #16)	98.42
Inv Out (SMH #17)	98.00
Length (ft)	85.25
Slope	0.005
Full Velocity (ft/s)	2.87
Discharge Rate (gpm)	449.68

# 3br Units	9
# Bedrooms	27
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
16.88	
Cumulative Infiltration (gpm)	
0.119	
Total Flow Received (BR Flow + INF) (gpm)	
16.99	
Proposed EDA Pump Chamber #1	
Top Tank	106.50
Inv In (SMH #4)	98.00
Inv In (SMH #5)	98.00

23-031 Sewer Calculations Summary Flow to Pump Station #1		
Peaking Factor		6
Flow/Bedroom (gpd)		150
Units are Three (3) bedrooms		
Total 8" SDR 35 Length (Ft) To Pump Station #1	Total Rate (Design Flow)(GPD):	Total Rate (Design Flow)(GPM):
	4,050	16.88
377.00	Total Rate (Infiltration)(GPD):	Total Rate (Infiltration)(GPM):
	171	0.12
	Total Flow Received (GPD):	Total Flow Received (GPM):
	4,221	16.99



# 3br Units	8
# Bedrooms	24
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
15.00	
Flow Received from Infiltration (gpm)	
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day	
0.095	
Cumulative Infiltration (gpm)	
0.095	
Total Flow Received (BR Flow + INF) (gpm)	
15.09	
Prop. SMH #6	
Rim Elev	118.59
Inv In (Unit #27)	110.92
Inv Out (SMH #7)	110.59
Station	5+82.25
Offset	Rt. 6.00'
Depth SMH	8.00

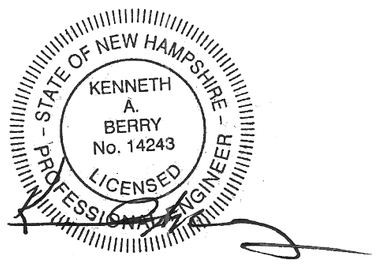
Full Velocity (Manning Equation)	
V=(1.486/n)*(R^2/3)*(S^1/2)	
n	0.011
R	0.167
Pipe Dia (in)	8
Area (ft^2)	0.349
8" SDR 35	
Inv In (SMH #6)	110.59
Inv Out (SMH #7)	96.62
Length (ft)	300.00
Slope	0.047
Full Velocity (ft/s)	8.83
Discharge Rate (gpm)	1382.50

# 3br Units	9
# Bedrooms	27
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
16.88	
Flow Received from Infiltration (gpm)	
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day	
0.010	
Cumulative Infiltration (gpm)	
0.105	
Total Flow Received (BR Flow + INF) (gpm)	
16.98	
Prop. SMH #7	
Rim Elev	105.52
Inv In (SMH #6)	96.62
Inv Out (Pump Sta #2)	96.52
Station	30+18.25
Offset	Rt. 7.75'
Depth SMH	9.00

Full Velocity (Manning Equation)	
V=(1.486/n)*(R^2/3)*(S^1/2)	
n	0.011
R	0.167
Pipe Dia (in)	8
Area (ft^2)	0.349
8" SDR 35	
Inv In (SMH #7)	96.52
Inv Out (Pump Sta #2)	96.25
Length (ft)	31.25
Slope	0.009
Full Velocity (ft/s)	3.80
Discharge Rate (gpm)	595.50

# 3br Units	9
# Bedrooms	27
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
16.88	
Cumulative Infiltration (gpm)	
0.105	
Total Flow Received (BR Flow + INF) (gpm)	
16.98	
Proposed Pump Chamber #2	
Top Tank	105.50
Inv In (SMH #7)	96.25

23-031 Sewer Calculations Summary Flow to Pump Station #2		
Peaking Factor		6
Flow/Bedroom (gpd)		150
Units are Three (3) bedrooms		
Total 8" SDR 35 Length (Ft) To Pump Station #2	Total Rate (Design Flow)(GPD):	Total Rate (Design Flow)(GPM):
	4,050	16.98
331.25	Total Rate (Infiltration)(GPD):	Total Rate (Infiltration)(GPM):
	151	0.10
	Total Flow Received (GPD):	Total Flow Received (GPM):
	4,201	17.08



# 3br Units	3
# Bedrooms	9
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
5.63	
Flow Received from Infiltration (gpm)	
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day	
0.049	
Cumulative Infiltration (gpm)	
0.049	
Total Flow Received (BR Flow + INF) (gpm)	
5.67	
Prop. SMH #8	
Rim Elev	100.91
Inv In (Unit #21)	94.24
Inv Out (SMH #9)	93.91
Station	11+38.65
Offset	Rt. 6.00'
Depth SMH	7.00

Full Velocity (Manning Equation)	
V=(1.486/n)*(R^2/3)*(S^1/2)	
n	0.011
R	0.167
Pipe Dia (in)	8
Area (ft^2)	0.349
8" SDR 35	
Inv In (SMH #8)	93.91
Inv Out (SMH #9)	83.53
Length (ft)	154.00
Slope	0.067
Full Velocity (ft/s)	10.62
Discharge Rate (gpm)	1663.28

# 3br Units	3
# Bedrooms	9
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
5.63	
Flow Received from Infiltration (gpm)	
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day	
0.018	
Cumulative Infiltration (gpm)	
0.066	
Total Flow Received (BR Flow + INF) (gpm)	
5.69	
Prop. SMH #9	
Rim Elev	90.93
Inv In (SMH #8)	83.53
Inv Out (SMH #10)	83.43
Station	12+97.15
Offset	Rt. 5.15'
Depth SMH	7.50

Full Velocity (Manning Equation)	
V=(1.486/n)*(R^2/3)*(S^1/2)	
n	0.011
R	0.167
Pipe Dia (in)	8
Area (ft^2)	0.349
8" SDR 35	
Inv In (SMH #9)	83.43
Inv Out (SMH #10)	80.64
Length (ft)	56.25
Slope	0.050
Full Velocity (ft/s)	9.11
Discharge Rate (gpm)	1426.82

# 3br Units	8
# Bedrooms	24
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
15.00	
Flow Received from Infiltration (gpm)	
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day	
0.008	
Cumulative Infiltration (gpm)	
0.074	
Total Flow Received (BR Flow + INF) (gpm)	
15.07	
Prop. SMH #10	
Rim Elev	87.64
Inv In (Unit #13)	76.97
Inv In (SMH #9)	80.64
Inv In (SMH #11)	76.74
Inv Out (Pump Station #3)	76.64
Station	13+59.50
Offset	Rt. 2.75'
Depth SMH	11.00

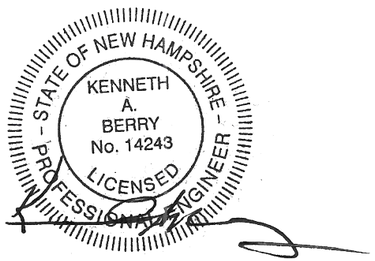
Full Velocity (Manning Equation)	
V=(1.486/n)*(R^2/3)*(S^1/2)	
n	0.011
R	0.167
Pipe Dia (in)	8
Area (ft^2)	0.349
8" SDR 35	
Inv In (Prop. SMH #13)	76.64
Inv Out (Pump Sta. #4)	76.50
Length (ft)	25.25
Slope	0.006
Full Velocity (ft/s)	3.05
Discharge Rate (gpm)	477.05

# 3br Units	4
# Bedrooms	12
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
7.50	
Flow Received from Infiltration (gpm)	
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day	
0.030	
Cumulative Infiltration (gpm)	
0.030	
Total Flow Received (BR Flow + INF) (gpm)	
7.53	
Prop. SMH #11	
Rim Elev	84.47
Inv In (Unit #16)	77.55
Inv Out (SMH #10)	77.22
Station	15+39.95
Offset	Rt. 8.50'
Depth SMH	7.25

Full Velocity (Manning Equation)	
V=(1.486/n)*(R^2/3)*(S^1/2)	
n	0.011
R	0.167
Pipe Dia (in)	8
Area (ft^2)	0.349
8" SDR 35	
Inv In (SMH #11)	77.22
Inv Out (SMH #10)	76.74
Length (ft)	95.00
Slope	0.005
Full Velocity (ft/s)	2.91
Discharge Rate (gpm)	455.39

# 3br Units	9
# Bedrooms	27
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
16.88	
Cumulative Infiltration (gpm)	
0.104	
Total Flow Received (BR Flow + INF) (gpm)	
16.98	
Proposed EDA Pump Chamber #3	
Top Tank	87.50
Inv In (Unit #18)	77.75
Inv In (SMH #10)	76.50

23-031 Sewer Calculations Summary Flow to Pump Station #3		
Peaking Factor		6
Flow/Bedroom (gpd)		150
Units are Three (3) bedrooms		
Total 8" SDR 35 Length (Ft) To Pump Station #1	Total Rate (Design Flow)(GPD):	Total Rate (Design Flow)(GPM):
	4,050	16.88
330.50	Total Rate (Infiltration)(GPD):	Total Rate (Infiltration)(GPM):
	150	0.10
	Total Flow Received (GPD):	Total Flow Received (GPM):
	4,200	16.98

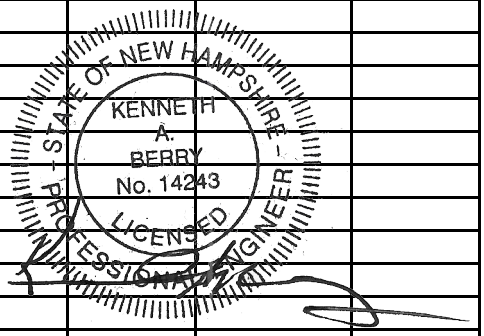


Pump Design

23-031 Riverside Estates Pump Station #1

Liam Drive - Dover, N.H.

Design Parameters:								
						Gravity Line In /		
						Force Main Inv. Out =		115.85
Force Main:		2.00	- Inch SDR 11 HDPE					
Force Main Length:		61.0	- Feet	On-Site				
Min. Cycle Volume Main:		3.1416 x R^2 x 7.48 Gal / C.F.			0.163	Gal / L.F.		
Force Main Volume Main:		61.0	0.163	Gal / L.F.	9.95	Gal		
			Total Volume		9.95			
			Use:	163		Gal		
		Pump Immersion Depth (Pump Off)						
	+	Minimum Cycle Volume (Pump On)						
	+	1091	Gal Excess Volume (Power Off / Pump Failure)					
		Pump Off - Bottom of Wet Well			1.067	12.8" w/ legs		
		d=	72	- Inches	6.00	- Feet		
		r=	36	- Inches	3.00	- Feet		
		h=	84	- Inches	7.00	- Feet		
					28	_ CF / VF		
					211	- Gal / VF		
Wet Well Capacity =			1254					
Elevations:								
Pump Chamber:		98.00	Invert IN					
Chamber Bottom:		91.00						
Pump Off Elev.		92.07						
Pump On Elev.		92.84						
Alarm On Elev.		92.94						
Pump Details:								
Total Equivalent Length of Pipe								
		Equiv. Length (ft)		Sum				

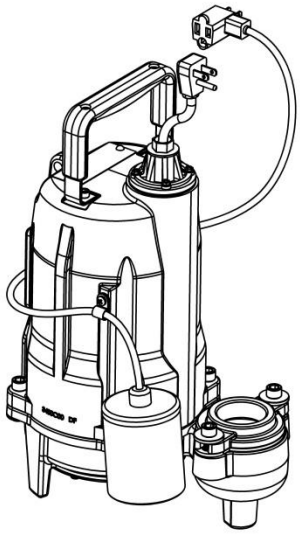


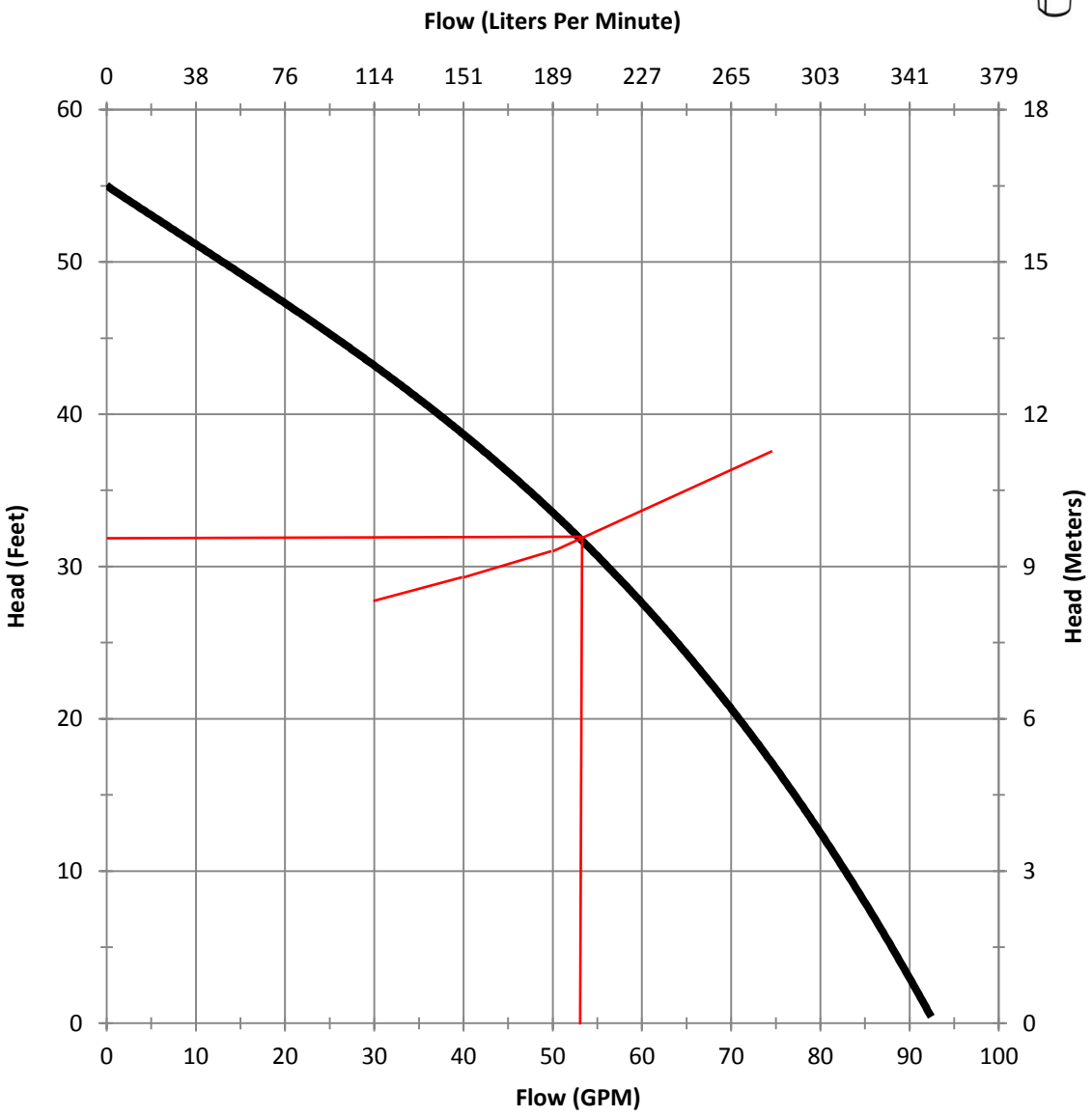
2.0" F M Line		61.0						
2 Check Valve		20' per		40				
1 Gate Valve		1.4' per 2" line		1.4				
4 90 Degree Elbows		5.2' per 2" line		20.8				
				123.2	Equivalent Length (Feet)			
Gallons per Min. Est.			**30**	**40**	**50**	**75**		
Static Head			24.85	24.85	24.85	24.85		
Equiv. Pipe Length (2")			123.2	123.2	123.2	123.2		
Pipe Size			2.00	2.00	2.00	2.00		
Friction Loss/100'			2.25	3.84	5.81	12.31		
Loss in Feet			2.77	4.73	7.16	15.17		
Total Head			**27.62**	**29.58**	**32.01**	**40.02**		
Pump Selection:								
Cap. Reqd. In GPM								
Pipe Size		2.00" SDR 11 HDPE Main						
Main Velocity		5.89						
Pump Model		Liberty FL50 Effluent Pump						
Pumping Style		Dual Alternating						
Pump Cap. In GPM/ Pump		53						
Total Head		32						
Bedrooms		27						
Gallons/Day		4050						
Gallons/Day+Inf		4221						
Gallons/Cycle		163	- Gallons					
Pump Cycles/Day/Pump		12.42						
Pump Run-Time:		3.08	- Minutes					
Pressure Check:		80	PSI					

Peak Conditions			
23-031 Riverside Estates Pump Station #1			
Liam Drive - Dover, N.H.			
FM Diameter (in)	2.00		SDR 11
Length	61.0		LF
Daily Flow Flow Received (GPD)	4050		
Upstream 8" SDR Length (Ft)	377.00		
Infiltration Rate (GPD)	300	GPD/In. DIA / MI / Day	
Infiltration Rate = 300 GPD * IN * LF / 5280 LF			
Infiltration Rate Main (GPD)	171.4		
Total Daily Flow (GPD)	4221		
Peak Flow			
Peaking Factor	6	(ADF < 100,000)	
Peak Flow (GPM)	17.6		
Emergency Operations/Storage Capacity			
Wet Storage (Gal)	1091		
6 Hours of storage at Average Daily Flow (Gal)			1013
Storage Capacity Check (Gal)	1091	>	1013
Required Pump Capacity (GPM)	17.6		
Provided Pump Capacity (GPM)	53.0		
Req. Pump Capacity Check	53.0	>	17.6
>6 Hours storage provided			
Generator with 500 gallon propane tank provided			
Wet Well & Pump Operation Notes			
Wet Well Inverts			
Invert In:	98.00		
High Water Alarm:	92.94		
Pump On:	92.84		
Dose Depth:	0.77		
Pump Off:	92.07		
Depth of Pump Submersion:	1.07		
Chamber Bottom:	91.00		
Pump Head Calculations			
Static Head (Ft):	24.85		
Total Dynamic Head (Ft):	32.00		
Pump Information:	Liberty FL50 Effluent Pump		
Pumping Style	Dual Alternating		
Run Time:	3.08		Min/Cycle

Pump Specifications

FL50 Series 1/2 hp Submersible Effluent Pump





23-031 EDA #1
TDH = 32'
GPM = 53

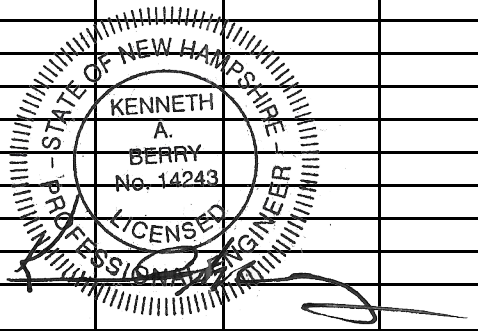
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Pump Design

23-031 Riverside Estates Pump Station #2

Sun Hawk Lane - Dover, N.H.

Design Parameters:								
						Gravity Line In /		
						Force Main Inv. Out =		91.54
Force Main:		2.00	- Inch SDR 11 HDPE					
Force Main Length:		177.0	- Feet	On-Site				
Min. Cycle Volume Main:		3.1416 x R^2 x 7.48 Gal / C.F.			0.163	Gal / L.F.		
Force Main Volume Main:		177.0	0.163	Gal / L.F.	28.88	Gal		
			Total Volume		28.88			
			Use:	294		Gal		
		Pump Immersion Depth (Pump Off)						
	+	Minimum Cycle Volume (Pump On)						
	+	1184	Gal Excess Volume (Power Off / Pump Failure)					
		Pump Off - Bottom of Wet Well			1.067	12.8" w/ legs		
		d=	72	- Inches	6.00	- Feet		
		r=	48	- Inches	4.00	- Feet		
		h=	60	- Inches	5.00	- Feet		
					50	_ CF / VF		
					376	- Gal / VF		
Wet Well Capacity =			1478					
Elevations:								
Pump Chamber:		96.25	Invert IN					
Chamber Bottom:		91.25						
Pump Off Elev.		92.32						
Pump On Elev.		93.10						
Alarm On Elev.		93.20						
Pump Details:								
Total Equivalent Length of Pipe								
		Equiv. Length (ft)		Sum				

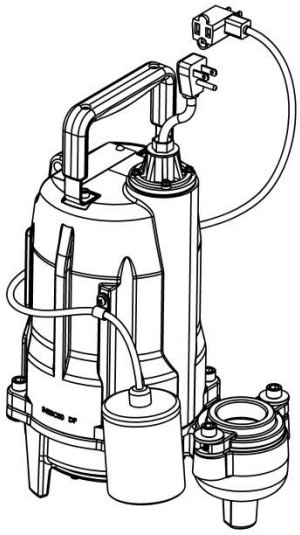


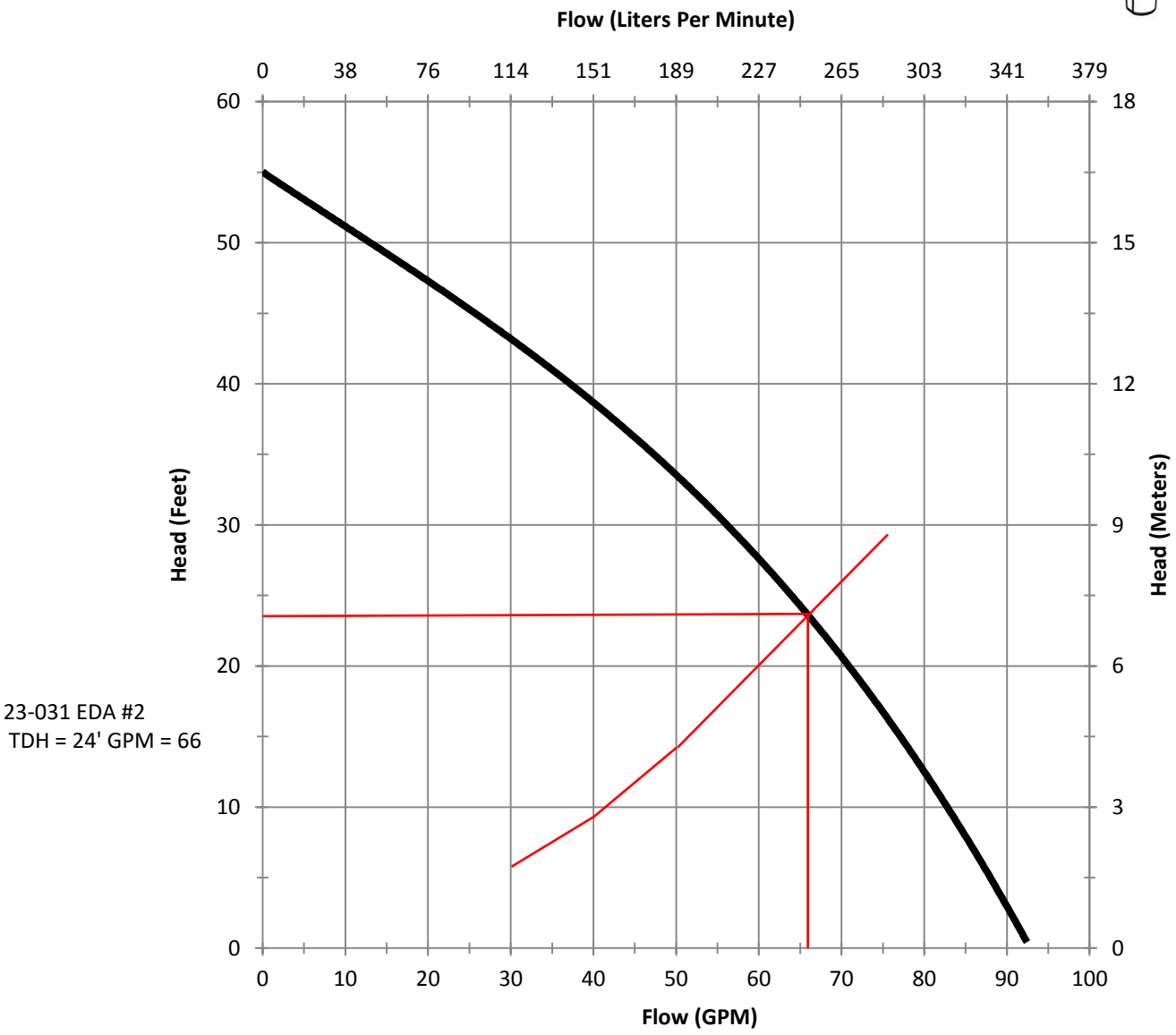
2.0" F M Line		177.0						
2 Check Valve		20' per		40				
1 Gate Valve		1.4' per 2" line		1.4				
4 90 Degree Elbows		5.2' per 2" line		20.8				
				239.2	Equivalent Length (Feet)			
Gallons per Min. Est.			**30**	**40**	**50**	**75**		
Static Head			0.29	0.29	0.29	0.29		
Equiv. Pipe Length (2")			239.2	239.2	239.2	239.2		
Pipe Size			2.00	2.00	2.00	2.00		
Friction Loss/100'			2.25	3.84	5.81	12.31		
Loss in Feet			5.38	9.19	13.90	29.45		
Total Head			**5.67**	**9.48**	**14.19**	**29.74**		
Pump Selection:								
Cap. Reqd. In GPM								
Pipe Size		2.00" SDR 11 HDPE Main						
Main Velocity		7.34						
Pump Model		Liberty FL50 Effluent Pump						
Pumping Style		Dual Alternating						
Pump Cap. In GPM/ Pump		66						
Total Head		24						
Bedrooms		27						
Gallons/Day		4050						
Gallons/Day+Inf		4221						
Gallons/Cycle		294	- Gallons					
Pump Cycles/Day/Pump		6.89						
Pump Run-Time:		4.45	- Minutes					
Pressure Check:		60	PSI					

Peak Conditions			
23-031 Riverside Estates Pump Station #2			
Sun Hawk Lane - Dover, N.H.			
FM Diameter (in)	2.00		SDR 11
Length	177.0		LF
Daily Flow Flow Received (GPD)	4050		
Upstream 8" SDR Length (Ft)	331.25		
Infiltration Rate (GPD)	300	GPD/In. DIA / MI / Day	
Infiltration Rate = 300 GPD * IN * LF / 5280 LF			
Infiltration Rate Main (GPD)	150.6		
Total Daily Flow (GPD)	4201		
Peak Flow			
Peaking Factor	6	(ADF < 100,000)	
Peak Flow (GPM)	17.5		
Emergency Operations/Storage Capacity			
Wet Storage (Gal)	1184		
6 Hours of storage at Average Daily Flow (Gal)			1013
Storage Capacity Check (Gal)	1184	>	1013
Required Pump Capacity (GPM)	17.5		
Provided Pump Capacity (GPM)	66.0		
Req. Pump Capacity Check	66.0	>	17.5
>6 Hours storage provided			
Generator with 500 gallon propane tank provided			
Wet Well & Pump Operation Notes			
Wet Well Inverts			
Invert In:	96.25		
High Water Alarm:	93.20		
Pump On:	93.10		
Dose Depth:	0.78		
Pump Off:	92.32		
Depth of Pump Submersion:	1.07		
Chamber Bottom:	91.25		
Pump Head Calculations			
Static Head (Ft):	0.29		
Total Dynamic Head (Ft):	24.00		
Pump Information:	Liberty FL50 Effluent Pump		
Pumping Style	Dual Alternating		
Run Time:	4.45		Min/Cycle

Pump Specifications

FL50 Series 1/2 hp Submersible Effluent Pump





23-031 EDA #2
TDH = 24' GPM = 66

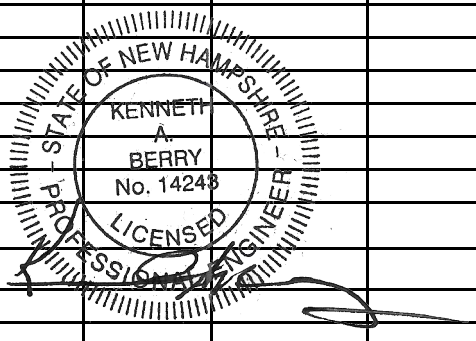
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Pump Design

23-031 Riverside Estates Pump Station #3

Amelia Drive - Dover, N.H.

Design Parameters:								
						Gravity Line In /		
						Force Main Inv. Out =		87.54
Force Main:		2.00	- Inch SDR 11 HDPE					
Force Main Length:		196.5	- Feet	On-Site				
Min. Cycle Volume Main:		3.1416 x R^2 x 7.48 Gal / C.F.			0.163	Gal / L.F.		
Force Main Volume Main:		196.5	0.163	Gal / L.F.	32.07	Gal		
			Total Volume		32.07			
			Use:	294		Gal		
		Pump Immersion Depth (Pump Off)						
	+	Minimum Cycle Volume (Pump On)						
	+	1184	Gal Excess Volume (Power Off / Pump Failure)					
		Pump Off - Bottom of Wet Well			1.067	12.8" w/ legs		
		d=	72	- Inches	6.00	- Feet		
		r=	48	- Inches	4.00	- Feet		
		h=	60	- Inches	5.00	- Feet		
					50	_ CF / VF		
					376	- Gal / VF		
Wet Well Capacity =			1478					
Elevations:								
Pump Chamber:		76.50	Invert IN					
Chamber Bottom:		71.50						
Pump Off Elev.		72.57						
Pump On Elev.		73.35						
Alarm On Elev.		73.45						
Pump Details:								
Total Equivalent Length of Pipe								
		Equiv. Length (ft)		Sum				
2.0" F M Line		196.5						
2 Check Valve		20' per		40				

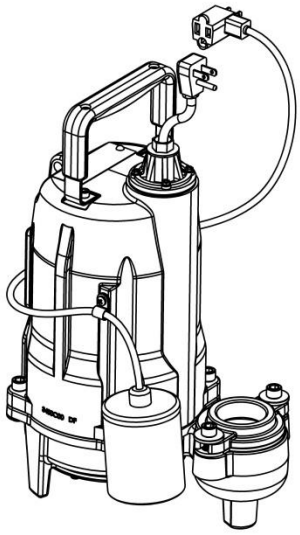


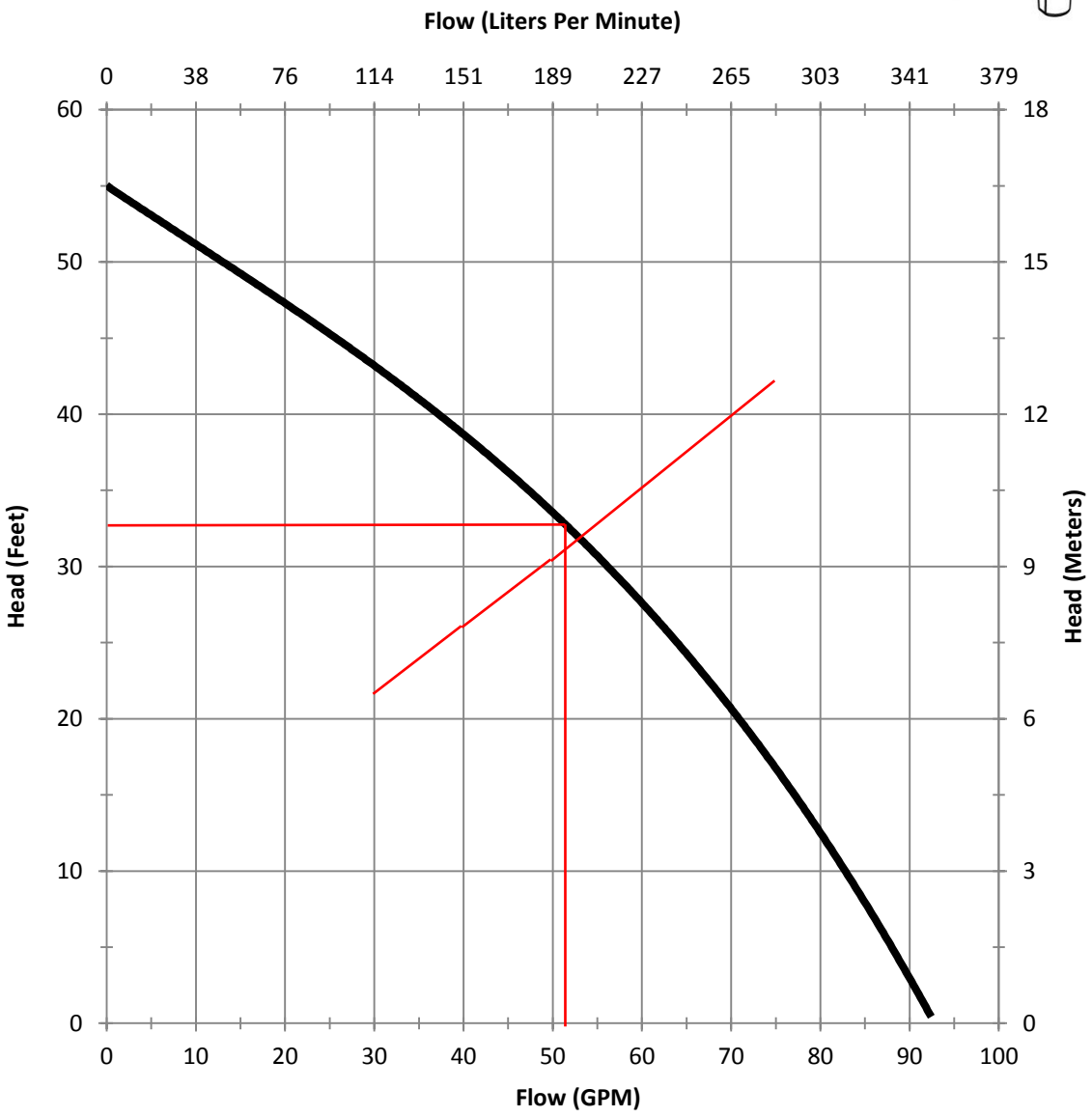
1 Gate Valve		1.4' per 2" line		1.4				
4 90 Degree Elbows		5.2' per 2" line		20.8				
				258.7	Equivalent Length (Feet)			
Gallons per Min. Est.			**30**	**40**	**50**	**75**		
Static Head			16.04	16.04	16.04	16.04		
Equiv. Pipe Length (2")			258.7	258.7	258.7	258.7		
Pipe Size			2.00	2.00	2.00	2.00		
Friction Loss/100'			2.25	3.84	5.81	12.31		
Loss in Feet			5.82	9.93	15.03	26.49		
Total Head			**21.86**	**25.97**	**31.07**	**42.53**		
Pump Selection:								
Cap. Reqd. In GPM								
Pipe Size		2.00" SDR 11 HDPE Main						
Main Velocity		5.67						
Pump Model		Liberty FL50 Effluent Pump						
Pumping Style		Dual Alternating						
Pump Cap. In GPM/ Pump		51						
Total Head		33.5						
Bedrooms		27						
Gallons/Day		4050						
Gallons/Day+Inf		4221						
Gallons/Cycle		294	- Gallons					
Pump Cycles/Day/Pump		6.89						
Pump Run-Time:		5.76	- Minutes					
Pressure Check:		83.75	PSI					

Peak Conditions			
23-031 Riverside Estates Pump Station #3			
Amelia Drive - Dover, N.H.			
FM Diameter (in)	2.00		SDR 11
Length	196.5		LF
Daily Flow Flow Received (GPD)	4050		
Upstream 8" SDR Length (Ft)	330.50		
Infiltration Rate (GPD)	300	GPD/In. DIA / MI / Day	
Infiltration Rate = 300 GPD * IN * LF / 5280 LF			
Infiltration Rate Main (GPD)	150.2		
Total Daily Flow (GPD)	4200		
Peak Flow			
Peaking Factor	6	(ADF < 100,000)	
Peak Flow (GPM)	17.5		
Emergency Operations/Storage Capacity			
Wet Storage (Gal)	1184		
6 Hours of storage at Average Daily Flow (Gal)			1013
Storage Capacity Check (Gal)	1184	>	1013
Required Pump Capacity (GPM)	17.5		
Provided Pump Capacity (GPM)	51.0		
Req. Pump Capacity Check	51.0	>	17.5
>6 Hours storage provided			
Generator with 500 gallon propane tank provided			
Wet Well & Pump Operation Notes			
Wet Well Inverts			
Invert In:	76.50		
High Water Alarm:	73.45		
Pump On:	73.35		
Dose Depth:	0.78		
Pump Off:	72.57		
Depth of Pump Submersion:	1.07		
Chamber Bottom:	71.50		
Pump Head Calculations			
Static Head (Ft):	16.04		
Total Dynamic Head (Ft):	33.50		
Pump Information:	Liberty FL50 Effluent Pump		
Pumping Style	Dual Alternating		
Run Time:	5.76		Min/Cycle

Pump Specifications

FL50 Series 1/2 hp Submersible Effluent Pump





23-031 EDA #3
TDH = 33.5'
GPM = 51

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DRAINAGE ANALYSIS
&
EROSION & SEDIMENT CONTROL PLAN

Prepared for:
StoneArch Development Corp.
42 Dover Point Road, Suite J
Dover, NH 03820

Land of:

Tax Map E, Lot 65-1
59 Tolend Road, LLC.

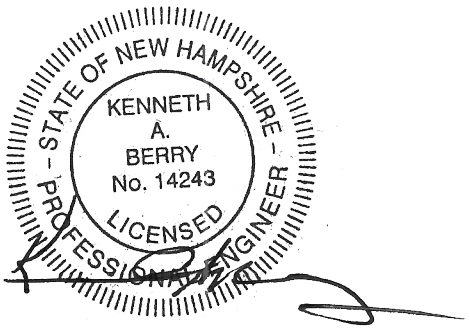
Tax Map E, Lot 65-A
Eugene A. & Donna L. Sgrignuoli

Tolend Road
Dover, NH 03820

LOCATION:
Rolling Hill Estates
Tax Map E, Lot 65-1
Tax Map E, Lot 65-A

Prepared by:

Berry Surveying & Engineering
335 Second Crown Point Road
Barrington, NH 03825



Project Number:
DB 2023-031
April 27, 2023

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USGS Quadrangle Location Map

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2.0 Proposed Conditions Analysis Page 5

3.0 Full Comparative Analysis Page 10

4.0 Erosion and Sediment Control, BMP's Page 11

5.0 Demonstration of Compliance with Dover Chapter 153-14 Page 15

6.0 Conclusion Page 30

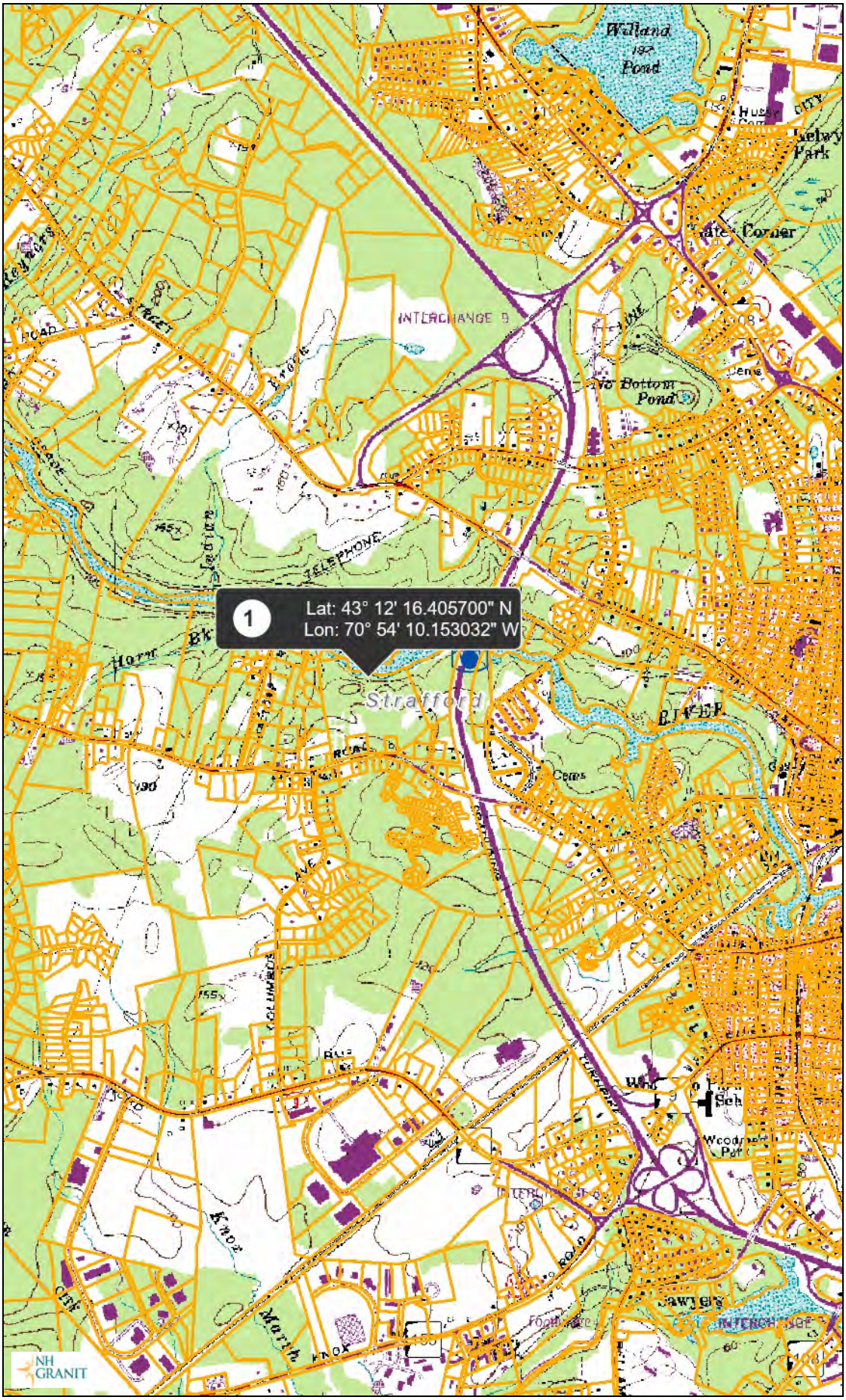
Appendix I - Existing Conditions Analysis
2 Yr- 24 Hr Node Listing
10 Yr -24 Hr. Node Listing
25 Yr-24 Hr. Node Listing
50 Yr-24 Hr. Node Listing
100 Yr-24 Hr. Node Listing
25 Yr-24 Hr. Full Summary

Appendix II - Proposed Conditions Analysis
2 Yr-24 Hr. Node Listing
10 Yr-24 Hr. Node Listing
25 Yr-24 HR. Node Listing
50 Yr-24 Hr. Node Listing
100 Yr-24 Hr. Node Listing
25 Yr-24 Hr. Full Summary

Appendix III - Calculations, Charts, & Graphs
Extreme Precipitation Tables
Rip Rap Calculations
AoT Stormwater Treatment Spreadsheets
NCRS USDA Web-soil Map
Site Specific Soil Map & Report
Stormwater System Management: Inspection & Maintenance Manual & Plan
Watershed Report Card, 303(d) List, & ORW List

Enclosed: W-1 Sheet Existing Conditions Watershed Plan Sheets 1-5
W-2 Sheet Post Construction Watershed Plan Sheets 6-10
Erosion & Sediment Control Plan

Map by NH GRANIT



Legend

- Polygons
- State
- County
- City/Town

Map Scale

1: 24,000

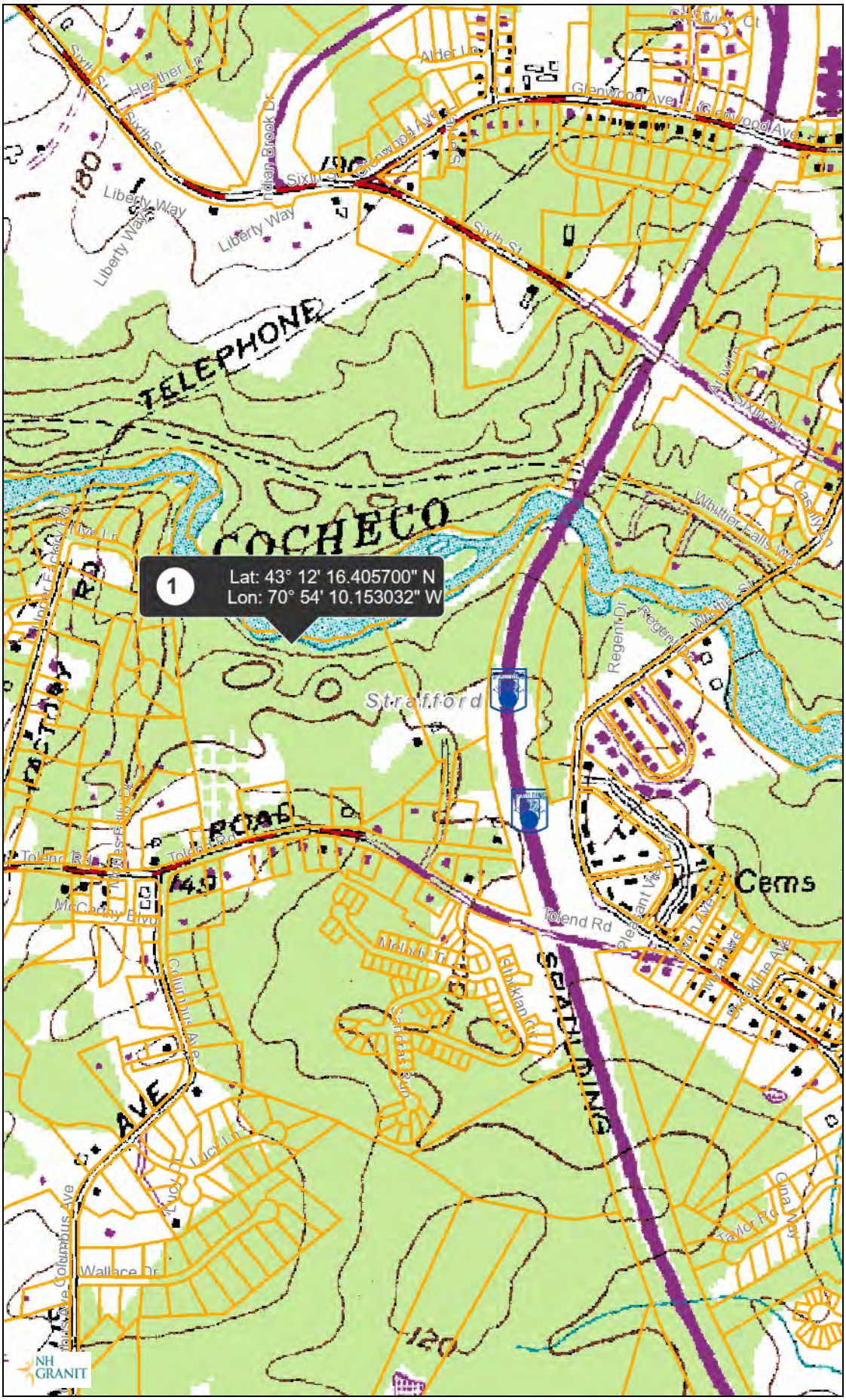
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Map Generated: 8/25/2020

Notes



Map by NH GRANIT



Legend

- Polygons
- State
- County
- City/Town

Map Scale

1: 10,000

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Map Generated: 8/25/2020

Notes



DESIGN METHOD OBJECTIVES

The owners of Tax Map E, Lot 65-1, 59 Tolend Road, LLC., and Tax Map E, Lot 65-A, Eugene A. & Donna L. Sgrignuoli, are proposing to develop the property on Tolend Road. Lot 65-1 is currently vacant land while Lot 65-A includes a single family home.

An Existing and Proposed Conditions analysis was conducted for the purpose of estimating the peak rate of stormwater run-off and to subsequently design adequate mitigation of drainage. There are four existing drainage discharge points which were identified in the existing analysis and duplicated in the proposed conditions analysis. Designing two watershed models we have compared the differences in these rates of peak run-off and surface water volume. Sheet W1, Existing Conditions Watershed Plan, outlines the characteristics of the site in its existing or pre-construction conditions. The second analysis displays the proposed (post-construction) conditions (See Sheet W2). The analysis was conducted using data for; 2 Yr-24 Hr (3.61”), 10 Yr-24 Hr (5.44”), 25 Yr-24 Hr (6.87”), 50 Yr-24 Hr (8.21”), and 100 YR-24 Hr (9.81”) storm events. Storm event analysis was accomplished using the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment. Rainfall quantities are based on the Extreme Precipitation Table for this location from the Northeast Regional Climate Center / Cornell University (http://precip.eas.cornell.edu). Dover is considered a part of the Coastal Region, and therefore a 15% escalation of rain fall depths has been applied to this application, reflected in the totals above.

1.0 Existing Conditions Analysis:

Reference: Sheet W1 - Existing Conditions Watershed Plan (Enclosed)
Existing Conditions Plan

The existing parcels currently consist of mostly vacant land with a single family home and accessory structures, the soils within the development area are made up of multiple soil types, containing Hydrologic Soil Group (HSG) A, B, C & D including Hollis-Charlton complex soil consisting of a mix of HSG B & D. See the provided Site Specific Soils Map and Report for more information. The land cover types involved are grass land, woods, roofs, and road pavement.

The land area analyzed consists of 56.65 acres, of which 44.42 acres of land make up the two parcels of ownership. The parcel has been divided into 14 subcatchments. Ten of which drain to nine separate analysis points along the Cochecho River, also known as, Cocheco River, NHDES. The other four subcatchments flow to three different offsite final analysis reaches which flow away from the Cochecho River initially.

The Cocheco River (NHRIV600030608-05) watershed will receive all of the runoff from the site either directly or indirectly. The impairment of the watershed are as follows:

> **Mercury, NE Regional Mercury TMDL, December 20, 2008, TMDL #33883**
> **Escherichia coli, Bacteria, NH Statewide Bacteria, 9-21-2010, TMDL #39272**
> **pH, Low Priority, Non-ORW.**

Reaches #100-#800 are successive segments of the Cocheco River as it flows west to east with this analysis culminating at a single cumulative point analyzed as **Final Reach #900**

Reach #100

Subcatchment #1, is land area in the southwest corner of the property and extends up the western property line to the Cochecho River. Runoff in this subcatchment drains through a delineated wetland to a point on the Cochecho River being analyzed as Analysis **Reach #100**.

Subcatchments #16-#19 make up a portion of Tolend Road abutting the locus parcel. Runoff is collected in a series of offsite catch basins (**Ponds #1E-#4E**) and directed onto the property, eventually flowing to **Final Reach #100** through a series of overland reaches (**Reaches #1a & #1b**).

Reach #200

Subcatchment #2, consists of a small portion of land adjacent to the Cochecho River and is being analyzed at Analysis **Reach #200**.

Reach #300

Subcatchment #3 consists of a small portion of land also adjacent to the Cochecho River. Runoff flows to a small channel and into the river and is being analyzed as **Reach #300**.

Reach #400

Subcatchment #4 consists of a portion of land adjacent to the Cochecho River toward the middle of the northern edge of the parcel. Runoff flows to the river and is being analyzed at **Reach #400**.

Reach #500

Subcatchment #5 consists of an area of land in the eastern portion of the parcel extending the north-south length of the property. Runoff flows north to the Cochecho River and is being analyzed at **Reach #500**.

Reach #600

Subcatchment #6 consists of a portion of land adjacent to the Cochecho River toward the middle of the parcel extending a majority of the way to the south side of the parcel. Runoff flows to the river, mostly through a wetland, and is being analyzed at **Reach #600**.

Reach #700

Subcatchment #7 consists of a portion of land adjacent to the Cochecho River toward the eastern side of the northern edge of the parcel. Runoff flows to the river and is being analyzed at **Reach #700**.

Reach #800

Subcatchment #8 consists of a small portion of land adjacent to the Cochecho River near the northeastern corner of the parcel. Runoff flows to the river and is being analyzed at **Reach #800**.

Final Reach #900

The Final Reach being analyzed is representative of the properties impact to the Cochecho River, however the river itself is not being analyzed. **Final Reach #900** is the successive sum of the hydrographs from **Reaches #100-#800** where the cumulative runoff combines with the runoff from **Subcatchment #9**.

Subcatchment #9 consists of the majority of the northeastern corner of the parcel extending from just over the eastern property line to the Cochecho River. Runoff flows mostly through a small wetland directed toward the river where it combines with runoff from **Reaches #100-#800** and is analyzed as **Final Reach #900**.

Final Reach #1100

Subcatchment #10 consists of a portion of offsite land along both Tolend Road and Atina Way including the entrance of Sun Hawk Lane. Runoff is collected in a small wetland and directed through a culvert under Sun Hawk Lane (**Pond #10**). Exiting the culvert, runoff flows through **Subcatchment #11** by way of an overland reach (**Reach #10**) flowing to **Final Reach #1100**, a point where runoff crosses into the Spaulding Turnpike right of way and the associated drainage measures.

Subcatchment #11 consists of a portion of the southeastern edge of the parcel as well as a portion of offsite land. Runoff flows offsite to a nonpoint area and is being analyzed as **Final Reach #1100**.

Subcatchment #15 consists of the southeastern corner of the parcel as well as a portion of offsite land between the parcel and Tolend Road. Runoff is collected in a small inlet pond and directed through a culvert under Sun Hawk Lane (**Pond #15**). Exiting the culvert, runoff flows through **Subcatchment #11** by way of an overland reach (**Reach #15**) flowing to **Final Reach #1100**.

Final Reach #1200

Subcatchment #12 consists of a majority of the land along the eastern edge of the parcel as well as a portion of offsite land. Runoff flows offsite to a culvert under NH Route 16 which is being analyzed as **Final Reach #1200**, the delineated limit of a wetland adjacent to the Spaulding Turnpike.

Final Reach #1300

Subcatchment #13 consists of a small portion of land along the eastern edge of the parcel as well as a portion of offsite land. Runoff flows offsite to a nonpoint area and is being analyzed as **Final Reach #1300**, which is the limit of the Spaulding Turnpike right of way.

2.0 Proposed Conditions Analysis:

Reference: Sheet W2 - Proposed Conditions Watershed Plan (Enclosed)
Proposed Grading & Drainage Plan

The client is proposing to develop 27 single family-detached homes. The homes are located off of the entrance road (Theodore Drive) and 2 cul-de-sac roads consisting of a total of 2,355 feet of roadway. The developer is also proposing to replace the existing single family house on Lot 65-A with a duplex and add a 200-foot paved extension to Sun Hawk Drive to meet the intersection of Theodore Drive and Amelia Drive and upgrade the entire resulting 790 foot length to a minimum of 20 feet wide. The proposal is supported by five subsurface gravel wetlands as well as a closed drainage system including 25 catch basins, 10 drain manholes, and 2 water quality inlets. Prior to discharge from the subsurface gravel wetlands to surface waters of the state, runoff is treated and released through level spreaders, overland, through undeveloped area.

Reach #100

Subcatchment #1 is somewhat increased in size by the proposed construction and grading of Theodore Drive as well as a portion of the related buildings. Runoff still drains to **Reach #100**.

Subcatchments #16-#19 are offsite subcatchments flowing to city managed catch basins and therefore remain unchanged.

Reach #200

Subcatchment #2 remains unchanged. Runoff still flows to **Reach #200**.

Reach #300

Subcatchment #3 remains unchanged. Runoff continues to flow to **Reach #300**.

Reach #400

Subcatchment #4 remains unchanged. Runoff continues to flow to the river and is being analyzed at **Reach #400**.

Reach #500

Subcatchment #5 is reduced in size as a result of the proposed construction of multiple residential buildings, Theodore Drive, Liam Drive, and **Subsurface Gravel Wetland #103**. Runoff still flows to the river and is being analyzed at **Reach #500**.

Reach #600

Subcatchment #6 considerably decreased in size as a result of the proposed construction of Theodore Drive, Liam Drive, Amelia Drive, and a number of the proposed buildings as well as one of the proposed subsurface gravel wetlands (**Pond #103**). Runoff continues to flow to the river, mostly through a wetland, and is being analyzed as **Reach #600**.

Subsurface Gravel Wetland #103 (**Pond #103**) receives runoff from the surrounding land area (**Subcatchment #73**) as well as a series of catch basins (**Ponds #C01-#C10**) and their respective subcatchments along the beginning portion of Theodore Drive (**Subcatchments #21-#24**) and the entirety of Liam Drive (**Subcatchments #25-#30**). These subcatchments are made up of portions of roadway pavement as well as multiple residential units and the related lawns and parking areas. The Drainage system contributing to **Pond #103** also includes drain manholes (**Ponds #D01-#D03**) and a water quality inlet (**Pond #W01**). Runoff is then discharged through a drain manhole (**Pond #D04**) and a level spreader directed toward **Reach #600** through an overland reach (**Reach #73**).

Reach #700

Subcatchment #7 decreased in size due to the proposed construction of the cul-de-sac of Amelia Drive, a number of the related buildings, and one of the gravel wetlands (**Pond #102**). Runoff still flows to the river and is being analyzed at **Reach #700**.

Subsurface Gravel Wetland #102 (**Pond #102**) receives runoff from the surrounding land area (**Subcatchment #72**) as well as a series of catch basins (**Ponds #C17-#C23**) and their respective subcatchments along the northeastern portion of Amelia Drive (**Subcatchments #37-#43**). These subcatchments are made up of portions of Amelia Drive as well as multiple residential units and the related lawns and parking areas. The Drainage system contributing to **Pond #102** also includes drain manholes (**Ponds #D08 & #D09**) and a water quality inlet (**Pond #W02**). Runoff is then discharged through a primary outlet system (OS A&B in HydroCAD Outlet listing) and level spreader as well as a tertiary emergency spillway directed toward **Reach #700** through a pair of overland reach series (**Reaches #72a-#72c & #72e-#72f**). Some runoff utilizes an alternate outlet system (OS C&D in HydroCAD Outlet listing) and level spreader through an overland reach (**Reach #73d**) which is directed to **Final Reach #1200**.

Reach #800

Subcatchment #8 remains unchanged. Runoff continues to flow to **Reach #800**.

Final Reach #900

Subcatchment #9 remains unchanged. Runoff still flows mostly through a small wetland directed toward the river where it combines with runoff from **Reaches #100-#800** and is analyzed as **Final Reach #900**.

Final Reach #1100

Subcatchment #10 is decreased in size marginally due to the widening and crowning of Sun Hawk Lane, otherwise it remains unchanged.

Subcatchment #11 increased in size as a result of the proposed construction of the emergency access road connecting Theodore Drive to Sun Hawk Lane. Runoff still flows offsite to a nonpoint area analyzed as **Final Reach #1100**.

Subcatchment #15 is reduced in size due to the construction of Theodore Drive, a portion of the related buildings, and one of the gravel wetlands (**Pond #101**). Runoff is still directed through a culvert under Sun Hawk Lane (**Pond #15**) and through **Subcatchment #11** by way of **Reach #15** to **Final Reach #1100**.

Subsurface Gravel Wetland #101 (**Pond #101**) receives runoff from the surrounding land area (**Subcatchment #71**) as well as a series of catch basins (**Ponds**

#C11-#C15) and their respective subcatchments along a portion of Theodore Drive (**Subcatchments #31-#35**). These subcatchments are made up of portions of Theodore Drive and the emergency connector as well as multiple residential units and the related lawns and parking areas. Runoff is then discharged through a drain manhole (**Pond #D07**) and subsequently a catch basin (**Pond #C16**) at the end of the existing portion of Sun Hawk Lane which discharges into **Pond #15** via a level spreader and eventually to **Final Reach #1100**. Excess runoff is released from **Pond #101** through an emergency spillway flowing to **Pond #15** via a series of overland reaches (**Reaches #71a & b**).

Final Reach #1200

Subcatchment #12 moderately decreased in size due to the proposed construction of Amelia Drive and a portion of the related buildings as well as the emergency access connector to Sun Hawk Lane. Runoff continues to flow offsite to a culvert which is being analyzed as **Final Reach #1200**.

Subsurface Gravel Wetland #102 (**Pond #102**) (See description under **Reach #700**)

Final Reach #1300

Subcatchment #13 remains unchanged.

Stormwater Treatment:

Treatment takes place within the subsurface gravel wetlands designed to support the development on site. Pre-treatment will be provided in the sediment forebay's and water quality inlets for the subsurface gravel wetlands. The stormwater quality volume capability is treated within provided treatment area of the practices. Subsurface gravel wetlands were selected as treatment practices after considering the anaerobic conditions and the effects on nitrogen and phosphorous levels.

3.0 FULL COMPARATIVE ANALYSIS

ANALYSIS COMPONENT: PEAK RATE DISCHARGE (Cubic Feet / Second)

		2 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Final Reach #900	Existing	21.45	50.85	76.69	102.10	133.32
	Proposed	21.01	50.25	75.57	100.52	133.16
Final Reach #1100	Existing	10.35	22.16	31.29	39.88	50.15
	Proposed	9.94	21.67	30.75	39.30	49.51
Final Reach #1200	Existing	4.35	9.94	14.78	19.50	25.26
	Proposed	3.74	8.31	12.24	16.29	21.13
Final Reach #1300	Existing	0.66	1.52	2.26	2.98	3.86
	Proposed	0.66	1.52	2.26	2.98	3.86

ANALYSIS COMPONENT: VOLUME (Acre Feet)

		2 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Final Reach #900	Existing	3.222	7.138	10.617	14.080	18.389
	Proposed	3.190	7.100	10.570	14.007	18.261
Final Reach #1100	Existing	1.256	2.750	4.068	5.376	7.212
	Proposed	1.237	2.651	4.001	5.372	7.080
Final Reach #1200	Existing	0.466	1.008	1.485	1.957	2.542
	Proposed	0.443	0.906	1.394	1.878	2.490
Final Reach #1300	Existing	0.072	0.157	0.231	0.304	0.395
	Proposed	0.072	0.157	0.231	0.304	0.395

4.0 EROSION and SEDIMENT CONTROL PLAN & BEST MANAGEMENT PRACTICES (BMP's)

Reference: Proposed Site Plan and Grading Plan
Erosion & Sediment Control Plan
Erosion & Sediment Control Details

The proposed site development is protected from erosion and the abutting properties are protected from sediment by the use of Best Management Practices as outlined in the New Hampshire Stormwater Manual, Volume 2, Post-Construction Best Management Practices Selection & Design (December 2008, NHDES & US EPA). Any area disturbed by construction will be re-stabilized within 14 days and abutting properties will not be adversely affected by this development. All swales and drainage structures will be constructed and stabilized prior to having run-off directed to them. Reference is also made to the Stormwater System Management: Inspection & Maintenance Manual which has been written specifically for this project and available to the owner.

Perimeter Control (Silt Fence / SiltSoxx / Erosion Control Mix Berm)

The plan set demonstrates the location of perimeter sediment control. The Erosion and Sediment Control Details, Sheet E-101, has the specifications for installation and maintenance of the silt fence, Filtrexx mulch filled SiltSoxx (or approved equal), and Erosion Control Mix Berm. There are locations on the site, for example bio-media rain garden protection, where SiltSoxx protection is specified

Subsurface Gravel Wetland

Description: A Gravel Wetland (NHDES SWM 4-3 Treatment Practice 2D) or Subsurface Gravel Wetland consists of a forebay and multiple flow-through treatment cells. During smaller rain events, the surface water runoff is intended to pass from the forebay, into the gravel media through perforated pipes and structures where it passes through an anaerobic environment where the Water Quality Volume will have 24-72 hours of contact time. The forebay is required to contain 10% of the WQV and each of the two cells must contain 45% of the WQV. During larger storm events, the system works as a detention pond. The design of a Subsurface Gravel Wetland will be constructed in accordance with the most current version of the Design Specifications provided by the UNH Stormwater Center.
Maintenance Considerations: The outlet configuration of the anaerobic subsurface gravel consists of a small discharge orifice that is located in a threaded cap. This goose-neck feature is designed to be disassembled to allow cleaning. This outlet orifice is located within a concrete outlet structure that also contains a control stack used to control and detain runoff in the system. Although this is designed to be "clean water" after the filtering process, the outlet structure in general is going to require periodic maintenance to ensure that it is discharging runoff properly. If the Subsurface Gravel Wetland retains runoff on the surface for more than 72 hours the performance is not correct and maintenance is required.

Debris will need to be removed from the inlet and outlet structures as well as any buildup of sediment. The surface of the ponded area is intended to have wetland plants which may require periodic replanting, depending on the sediment loading. Sediment buildup in the forebay must be removed to maintain the minimum required volume. See also 9 and 10 of the attached UNHSC Subsurface Gravel Wetland Design Specifications 2009, and / or UNHSC Subsurface Gravel Wetland Design Specifications 2016 with Maintenance Guidelines and Checklist.

Water Quality Inlet

Description: A water quality inlet is an underground storage structure with multiple chambers designed to capture coarse sediments, floating debris, and some hydrocarbons from stormwater runoff. Such inlet devices are typically used for pretreatment of runoff prior to discharge to another treatment practice. The devices use baffles with weirs or orifices to control flow and help capture sediment, and inverted baffles or hooded outlets to help capture floating materials. Depending on the design of the unit and the magnitude of peak flow events, the captured sediments may be subject to re-suspension and flushing from the device. Floating hydrocarbons captured in the unit can be removed for disposal during maintenance operations or by use of sorbent materials. Note, however, that hydrocarbons carried by stormwater frequently are dispersed in suspension or adsorbed to fine-grained sediment particles or organic materials, and may not necessarily be captured in the unit. To limit potential for re-suspension of captured materials, the device is usually designed as an “off-line” unit sized for the Water Quality Flow. Larger storm events would then bypass the unit.

Maintenance Requirements: Inspect the Water Quality Inlet quarterly. Remove and legally dispose of floating debris at each inspection. Remove sediment when inspection indicates depth is approaching half the depth to the lowest orifice or other outlet in the first chamber baffle. However, it is recommended that the unit be cleaned at least once per year. Remove floating hydrocarbons immediately whenever detected by inspection. Dispose of sediments and other wastes in conformance with applicable local, state, and federal regulations.

Vegetated Stabilization

All areas that are disturbed during construction will be stabilized with vegetated material within 30 days of breaking ground. Construction will be managed in such a manner that erosion is prevented and that no abutter’s property will be subjected to any siltation, unless otherwise permitted. All areas to be planted with grass for long-term cover will follow the specification and on Sheet E-102 using seeding mixture C, as follows:

Mixture	Pounds per Acre	Pounds per 1,000 Sq. Ft.
Tall Fescue	24	0.55
Creeping Red Fescue	24	0.55
Total	48	1.10

Conservation Mix

Tall Fescue	15	0.35
Creeping Red Fescue	15	0.35
Annual Ryegrass	5	0.12
Perennial Ryegrass	5	0.12
Kentucky Bluegrass	15	0.35
White Clover	7	0.16
Total	**62**	**1.45**

Conservation Mix will used to stabilize all 2:1 slopes and all land area disturbed within the wetland buffer. (If applicable).

Gravel Wetland Mix: The grass that is planted within a subsurface gravel wetland will be a mix designed for both inundation and dry conditions such as Ernst Seeds, Retention Basin Floor Mix ERNMX-126.

Stabilized Construction Entrance

A temporary gravel construction entrance provides an area where mud can be dislodged from tires before the vehicle leaves the construction site to reduce the amount of mud and sediment transported onto paved municipal and state roads. The stone size for the pad should be 3" coarse aggregate, and the pad itself constructed to a minimum length of 75' for the full width of the access road. The aggregate should be placed at least six inches thick. A plan view and profile are shown on Sheet E-101- Erosion & Sediment Control Detail Plan. (If applicable).

Environmental Dust Control

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

Vegetated Filter Strips / Buffers

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

Drainage Swales / Stormwater Conveyance Channels

Drainage swales will be stabilized with vegetation for long term cover as outlined below, and on Sheet E-102 using seed mixture C. As a general rule, velocities in the swale should not exceed 3.0 feet per second for a vegetated swale although velocities as high as 4.5 FPS are allowed under certain soil conditions (If applicable).

Construction Sequence

1. Cut and remove trees in construction area only as required.

2. Construct and/or install temporary and permanent sediment erosion and detention control facilities as required.

3. Erosion, sediment and detention control facility shall be installed & stabilized prior to any earth moving operation & or directing runoff to them.

4. Clear, cut and dispose of debris in approved facility.

5. Construct temporary culverts as required, or directed.

6. Construct roadways for access to desired construction areas. All roads shall be stabilized immediately.

7. Install pipe and construction associated appurtenances as required or directed. Install rain gardens. All disturbed areas shall stabilized immediately after grading.

8. Begin permanent and temporary seeding and mulching. All cut and fill slopes and disturbed areas shall be seeded or mulched as required, or directed. No area is allowed to be disturbed for a length of time that exceeds 60 days before being stabilized. Daily, or as required. All roadways and parking areas shall be stabilized within 72 hours of

achieving finished grades. All cut and fill slopes shall be stabilized within 72 hours of achieving finished grades.

9. Construct temporary berms, drains ditches, silt fences, sediment traps, etc. mulch and seed as required.

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

11. Complete permanent seeding and landscaping.

12. Remove temporary erosion control measures after seeding areas have established themselves and site improvements are complete.

13. Smooth and revegetate all disturbed areas.

14. Finish paving all roadways.

Temporary Erosion Control Measures

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

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

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

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

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

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

Inspection and Maintenance Schedule

Fencing (if used) will be inspected during and after storm events to ensure that the fence still has integrity and is not allowing sediment to pass. Depending on SWPPP criteria, all controls will be inspected either once every 7 days and after storm events. Inspection reports must be submitted to City of Dover Engineering Department. See also Stormwater System Management: Inspection & Maintenance Manual published separately also by Berry Surveying & Engineering. See also Storm Water Pollution Prevention Plan (SWPPP) developed in accordance with EPA NPDES requirements & the City of Dover Stormwater regulations. In accordance with the City of Dover Site Plan Review Ordinance and US EPA 2022 Construction General Permit, Inspections will be conducted by a qualified person. This requirement includes Erosion and Sediment Control Education and Professional Certification.

Corrective Action measures will be made in accordance with SWPPP requirements and records maintained on site by the Contractor.

5.0 Demonstration of Compliance with Dover Chapter 153-14

The following list of standards from chapter 153-14 are shown to demonstrate compliance with Dover stormwater regulations, starting with section 3: Design Standards. Our demonstration of compliance is *italicized* after each standard:

(3) Design standards.

(a) Minimum protections and management standards.

[1] Where applicable, all development must comply with the EPA Phase II Stormwater Rules and the City's MS4 permit, as amended.

Acknowledgement of project compliance with the EPA Phase II stormwater rules is shown in project specific notes, sheet #2, note #78.

[2] Existing surface waters, including ponds, rivers, perennial and intermittent streams (natural or channelized), and wetlands (including vernal pools), shall be protected by the minimum buffer setback as specified in Chapter **170**, Zoning, § 170-27.1. Stormwater and erosion and sediment control best management practices (BMPs) shall be located outside the specified buffer zone unless otherwise approved by the Planning Board.

Please find Grading & Drainage/Watershed Plans showing stormwater BMPs located outside buffer zones. A Conditional Use Permit has been filed for the level spreader of gravel wetland #101 & #102, and outlet pipe of Gravel Wetland #103.

[3] Low-impact development (LID) site planning and design strategies shall be used to the most extent practicable (MEP) in order to reduce the generation of the stormwater runoff volume for both new and redevelopment projects. An owner/applicant must document why LID strategies are not appropriate if not used to manage stormwater.

Please find subsurface gravel wetland designs, sheets #45-50. Subsurface gravel wetlands treat stormwater as a resource and specifically addresses nitrogen and phosphates from the proposed development. Reference is made to the US EPA Low Impact Development (LID) and green infrastructure resources.

[4] All proposed stormwater practices and measures shall be installed and maintained in accordance with manufacturers' specifications and performance specifications outlined in the New Hampshire Stormwater Management Manual Volume 2 (December 2008 or current revision) a copy of which can be found on the NHDES website.

Please find Inspection & Maintenance Manual included in the drainage binder.

[5] All storage facilities for fuel, chemicals, chemical or industrial wastes, and biodegradable raw materials shall meet the regulations of the NHDES, including but not limited to those involving underground storage tanks, aboveground storage tanks, hazardous waste and best management practices for groundwater protection (Part Env-Wq 401).

Please find Inspection & Maintenance Manual included in the drainage binder. Prior to construction, a stormwater pollution prevention plan will be developed in accordance with US EPA CGP 2022.

[6] Salt and other deicing materials shall be stored under cover or located such that no direct discharges to receiving waters are possible. Snow storage areas shall be located such that no direct discharges to receiving waters are possible. See the NHDES guidance fact sheet on road salt and snow disposal.

Please find Inspection & Maintenance Manual included in the drainage binder.

[7] The use of sodium-chloride-based materials for winter maintenance shall be the minimum necessary for safety. The use of sodium-chloride-based materials is discouraged within the groundwater protection districts.

Please find Inspection & Maintenance Manual included in the drainage binder.

[8] Impervious surfaces for parking areas and roads shall be minimized to the extent possible.

Impervious surfaces for parking surfaces and roads are provided as the required 24' width roadway and 22' width driveways. There are no unnecessary impervious surfaces to be construction.

[9] Stormwater runoff from new impervious surfaces shall be directed to a best management practice for flow mitigation, treatment and/or infiltration.

Stormwater runoff is conveyed to one of three subsurface gravel wetlands for detention and treatment. A waiver has been required to Ground Water Recharge (GRV) requirements due to site soil conditions. Find waiver request included in the drainage binder.

(b) Stormwater management for new development.

[1] Runoff of impervious surfaces shall be treated to provide 80% removal of total suspended solids (TSS) and 50% removal of both total nitrogen and phosphorus. Removal rates shall be determined using approved manufacturer's pollutant removal efficiency analysis or the pollutant removal efficiencies outlined in the New Hampshire Stormwater Management Manual Volume 1, Appendix E (December 2008 or current revision), a copy of which is available from the NHDES website.

Utilizing this standard and guidance from the Pollutant Removal Efficiencies for the NH Stormwater Manual, Volume 2, the design can expect to see the following annual performance standards for a ***Subsurface Gravel Wetland****:*

- *Total Suspended Solids (TSS) reduction of 95%*
- *Total Nitrogen (TN) reduction of 85%*
- *Total Phosphorous (TP) reduction of 64%*

Given that the first outlet by-pass elevation is set above the water quality elevation, the efficiencies seen in the design ponds may exceed the those stated in the standard design practices. The project also utilizes water quality inlets and oversized sediment forebays.

[2] Rainfall amount shall be based on current extreme precipitation estimates obtained from the Northeast Regional Climate Center.

Extreme Precipitation Tables are included in the drainage binder and have been used for analysis.

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

Please find comparative analysis for this demonstration at all final reach.

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

Please find comparative analysis for this demonstration at all final reach.

[5] Infiltration rates for designing groundwater recharge practices shall be determined in accordance with Section Env-Wq 1504.14.

A waiver has been required to Ground Water Recharge (GRV) requirements due to site soil conditions. Find waiver request included in the drainage binder.

[6] Stormwater conveyance practices shall be sized appropriately to convey the ten-year, twenty-four-hour storm event without overtopping or causing flooding on the property.

All Practices have been sized within these parameters.

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

This standard is not applicable for this project.

[8] The design of the stormwater management systems shall take into account upstream and upgradient runoff that flows onto, over, or through the site to be developed or redeveloped and provide for this contribution of runoff.

Off-site stormwater flow has been accounted for in the project design. Please find watershed sheets within the drainage binder.

[9] Seasonal high-water table elevations must be accounted for in all BMP design criteria.

The seasonal high-water table elevations are shown in the subsurface gravel wetland plans, sheets #45-50.

[10] Access for maintenance of stormwater facilities must be included as part of the design, where necessary. Access easements may be required.

All practices have been designed to be maintained and located in the open space areas with access trails provided.

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

See section 4.0 of this narrative for BMP plantings and stabilization seeding descriptions. The applicant is following USDA NRCS seeding recommendations.

(c) Stormwater management for redevelopment. In order to determine the stormwater requirements for redevelopment projects, the percentage of the site covered by existing impervious areas must be calculated. Stormwater requirements for redevelopment will vary based upon the amount of site surface area that is covered by existing impervious surfaces.

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

This standard is not applicable for this project.

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

This standard is not applicable for this project.

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

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

This standard is not applicable for this project.

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

This standard is not applicable for this project.

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

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

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

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

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

(d) Erosion control standards during construction. The following standards shall be applied in project planning and shall be implemented prior to and during construction activity:

[1] All proposed measures shall meet, at a minimum, the design standards for best management practices set forth in the New Hampshire Stormwater Management Manual Volume 3 (December 2008 or current revision), a copy of which is available from the NHDES website.

See Inspection & Maintenance Manual and Erosion & Sediment Control Plans, sheets #51-52.

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

Copies will be provided when developed and published prior to NOI submittal and construction.

[3] Stripping of vegetation shall be done in a manner that minimizes soil erosion. Whenever practical, natural vegetation shall be retained, protected, or supplemented.

There is to be no disturbance outside of the limit of construction. Erosion & sediment control measures are to be in place prior to the start of land grubbing. See Erosion & Sediment Control Plans, sheets #51-52.

[4] The area of land disturbance shall be kept to a minimum and be limited to an area only large enough to accommodate construction activities for a particular construction phase.

This project has been broken into two phases to aid in minimization of disturbance. The limit of disturbance is to be staked prior to the beginning of construction. An area of open space and applicable buffers are preserved.

[5] Off-site surface water and runoff from undisturbed areas shall be diverted away from disturbed areas where feasible, or measures to convey stormwater through the project area without causing erosion of sediment must be included. Integrity of downstream drainage systems shall be maintained.

Please find Erosion & Sediment Control Plans, sheets #51-52.

[6] Appropriate erosion and sediment control measures shall be installed prior to any soil land disturbance and must be reviewed and approved by the Community Services Department.

Please find Erosion & Sediment Control Plans, sheets #51-52.

[7] Perimeter site controls shall not be placed within wetland areas, stream channels or wetland buffers.

Please find Erosion & Sediment Control Plans, sheets #51-52.

[8] Disturbed soil areas shall be either temporarily or permanently stabilized. In areas where final grading has not occurred, temporary stabilization measures should be in place within seven calendar days for exposed soil areas that are within 100 feet of a surface water body or a wetland and no more than 14 calendar days for all other areas. Permanent stabilization should be in place within three calendar days following completion of final grading of exposed soil areas.

Please find Erosion & Sediment Control Plans (sheet #51-52), Inspection & Maintenance Manual, and Construction Detail Sheets E-101 & E-102.

[9] All temporary erosion and sediment control measures shall be maintained in functioning condition until final site stabilization is accomplished. A proposed BMP inspection schedule shall be included in the submittal.

Please find Erosion & Sediment Control Plans (sheet #51-52), Inspection & Maintenance Manual.

[10] Additional temporary stabilization for the winter season consistent with NHDES guidelines shall be in place for disturbed areas that are not permanently stabilized by October 1, or at the discretion of the Community Services Department.

Please find winter stabilization note E22, sheet E-102.

[11] Special stabilization details shall be provided with the submission for any land disturbance on slopes equal to or steeper than 3:1.

Please find Rolled Erosion Control Blanket (RECB) Slope Stabilization Detail E21, sheet E-102.

[12] All temporary erosion and sediment control measures shall be removed after final site stabilization. Trapped sediment and other disturbed soil areas resulting from the removal of temporary measures shall be permanently stabilized within 30 calendar days unless conditions dictate otherwise.

Please find Inspection & Maintenance Manual containing this statement.

[13] For projects proposing to disturb and expose soils in areas of 10 acres or more at one time, a temporary (or permanent) sediment basin must be provided with storage for a calculated volume of runoff from a drainage area from a two-year, twenty-four-hour storm, or equivalent control measures, where attainable, until final stabilization of the site. Alternatively, the sediment basin can be sized to provide 3,600 cubic feet of storage per acre of drainage area until final stabilization of the site. In determining appropriate locations and number of sediment basins needed, the operators may consider such factors as erodibility of site soils, slope lengths, available area on site, construction period and other unique site considerations.

This standard is not applicable for this project.

[14] Use of temporary sediment basins should avoid any additional vegetation clearing or site land disturbance not otherwise needed for post-construction. Sediment basin locations must be reviewed by the Community Services Department prior to construction and must consider the potential for off-site impacts, including public safety, especially as it relates to sediment

movement and/or sediment basin failure, and alternative sediment controls must be used where site limitations preclude a safe design.

The limit of construction is not to be expanded beyond the staked phase limits.

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

[1] The Community Services Department or its designated agent shall have access to the site to complete routine inspections.

The applicant acknowledges this standard.

[2] The Community Services Department shall be notified 24 hours prior to installation of a stormwater BMP in order to schedule an inspection. These inspections shall be completed during normal working hours.

The applicant acknowledges this standard.

[3] The Planning Board or Community Services Department may require the design engineer and/or an independent third party to provide inspection and oversight of the construction of the stormwater management facilities and erosion and sediment control measures at its discretion. Such oversight may be especially important for implementing techniques such as porous pavement or subsurface stormwater infiltration systems. The owner/applicant shall be responsible for all fees associated with third-party inspections.

The applicant acknowledges this standard.

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

The applicant acknowledges this standard.

[5] The owner is ultimately responsible for the installation, construction, inspection, and disposition of all stormwater management and erosion control measures required by the provisions of these regulations.

The applicant acknowledges this standard.

(f) Stormwater management plan (SWMP) submittal requirements. At the discretion of the Planning Board or Community Services Department, a technical review

by an independent third party may be required of any SWMP prepared under these regulations. Such a review shall be performed by a qualified professional consultant and the expense of which shall be the full responsibility of the owner/applicant.

The applicant acknowledges this standard.

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

[a] Description of erosion and sediment control measures as well as sequence for final stabilization of the project site.

Please find Erosion & Sediment Control Plans, sheets #51-52.

[b] Proposed changes in impervious cover areas and any changes in pre- and post-development drainage patterns.

Please find W1 Existing watershed and W2 Proposed watershed plans within the drainage binder.

[c] Description of LID proposed measures.

Please see section 4.0 of this drainage narrative. Low impact development measures include the implementation of three subsurface gravel wetlands for treatment, with oversized sediment forebays and water quality inlets for pre-treatment.

[2] For projects requiring new development or redevelopment standards, a drainage report that contains the following items shall be submitted:

[a] Description of construction period and earth movement schedule, including anticipated project start and completion dates, sequence and duration of grading and construction activities, sequence and timing of installation and/or application of soil erosion and sediment control measures as well as sequence for final stabilization of the project site.

Please find section 4.0 in this drainage narrative containing the construction sequence.

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

Please find Existing Conditions Plans, sheets #5-9 delineating natural resources and applicable buffers.

[c] Soils information for proposed disturbed areas shall be delineated by a certified soil scientist. For all other areas that contribute runoff to the project site, soil types may be identified in accordance with Natural Resources Conservation Service (NRCS) countywide soil survey.

Please find Site Specific Soils Survey (sheets #10-16) and W-1 Existing Watershed Plans.

[d] Description of existing drainage patterns, receiving water bodies or drainage infrastructure and soil types for recharge potential.

Please find W-1 Existing Watershed Plan, Site Specific Soils Survey (sheets #10-16).

[e] Watershed area limits, including any off-site and upstream areas contributing flow to shared drainage channels and/or infrastructure.

Please find W-1 Existing Watershed Plan & W-2 Proposed Watershed Plan within the drainage binder.

[f] Description of proposed changes in impervious cover areas and any changes in pre- and post-development drainage patterns.

Please find sections 1.0 and 2.0 of this narrative as well as W-1 Existing Watershed Plan, Existing Drainage Analysis, W-2 Proposed Watershed Plan & Proposed Drainage Analysis.

[g] Methods and assumptions used to calculate pre- and post-development runoff volume, peak discharge, and discharge velocity for the specified design storm events.

Please find Section 1.0 & 2.0 of this drainage narrative discussing the existing and proposed development conditions.

[h] Methods and assumptions used to calculate the pollutant load removal.

Utilizing this standard and guidance from the Pollutant Removal Efficiencies for the NH Stormwater Manual, Volume 2, the design can expect to see the following annual performance standards for a ***Subsurface Gravel Wetland****:*

- *Total Suspended Solids (TSS) reduction of 95%*
- *Total Nitrogen (TN) reduction of 85%*
- *Total Phosphorous (TP) reduction of 64%*

Given that the first outlet by-pass elevation is set above the water quality elevation, the efficiencies seen in the design ponds may exceed the those stated in the standard design practices. The project also utilizes water quality inlets and oversized sediment forebays.

[i] Description of LID measures that are proposed to limit the development footprint, preserve existing vegetation and mimic existing hydrology to the extent feasible.

Please find section 4.0 of this drainage narrative describing stormwater BMPs used for the design. Low impact development measures include the implementation of three subsurface gravel wetlands for treatment, with oversized sediment forebays and water quality inlets for pre-treatment.

[j] If not used, provide rationale why LID measures are not practical for the site.

Subsurface Gravel Wetlands are proposed on site and qualify as l ow impact development.

[k] Describe measures and calculations for proposed practices used to achieve no net increase in runoff volumes leaving the site.

Please find comparative analysis demonstrating compliance with the 2-100YR 24Hr storm events.

[l] Provide calculations for the infiltration or exfiltration system.

A waiver to ground water recharge volume has been requested due to site soil conditions. Please find waiver request within drainage binder. A reduction in volume though extended detention of the subsurface gravel wetlands.

[m] If an increase in post-development runoff volume is anticipated due to limited applicability for LID measures and site constraints, provide an assessment and supporting calculations to demonstrate no adverse impacts to downstream infrastructure, adjacent properties or aquatic habitat.

There is no increase in post-development runoff volume due to the extended detention capabilities of the proposed subsurface gravel wetlands.

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

Please find section 4.0 of this narrative, the Inspection & Maintenance Manual and Plan, as well as the Erosion & Sediment Control Plan. Type and rate of lime and fertilizer will be determined on site by testing the topsoil for requirements.

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

There is no disturbance proposed within any flood zones.

[p] Proposed schedule for the inspection and maintenance of all erosion control measures on site prior to achieving final site stabilization.

Please find Inspection & Maintenance Manual. EPA and NHDES will require an inspection every 7 days and after a storm event greater than 0.25".

[q] Describe procedures for removing temporary erosion control measures and removal of accumulated sediment captured by such measures.

Please find Inspection & Maintenance Manual.

[r] Any other specific study, calculation, or investigation as requested by the City.

No additional studies or investigations have been requested at this time.

[s] Describe procedures to limit and/or optimize the use of deicing materials and minimize off-site increases in chloride levels in adjacent surface water and groundwater.

Please find Inspection & Maintenance Manual.

[t] Provide a maintenance and inspection plan for post-construction monitoring of stormwater BMPs to ensure long-term performance and functionality, including details of who will be responsible for inspections and maintenance, proposed schedule, documentation, submittal procedures and contingency plans if future maintenance is required.

Please find Inspection & Maintenance Manual and plans.

[u] Provide copies of pertinent state and federal permits.

Copies of all state and federal permits will be provided when received.

(g) Long-term operation and maintenance. The owner shall be responsible for continued inspection and maintenance requirements.

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

[a] The names of the responsible qualified professionals who will implement the required reporting, inspections, and maintenance activities.

Please find Inspection & Maintenance Manual.

[b] An inspection checklist, identifying item or BMP, inspection frequency, and components to be inspected. The list shall clearly outline performance thresholds and triggers for maintenance.

Please find Inspection & Maintenance Manual.

[c] Snow and ice removal shall be performed by a contractor certified by the "Green SnoPro" Program, or approved equivalent, following best management practices for the application of deicing materials.

Please find Inspection & Maintenance Manual.

[d] Deicing log to track amount and type of deicing material applied.

Please find Inspection & Maintenance Manual.

[e] A site plan clearly identifying the locations of all stormwater practices to be inspected and maintained.

Please find Inspection & Maintenance Plans within the drainage binder.

[f] Inspection and maintenance log to be submitted to the City of Dover Community Services Department on an annual basis. Documents shall be submitted no later than December 15 of each year.

Please find Inspection & Maintenance Manual.

[2] The owner of record shall record at the Registry of Deeds documentation sufficient to provide notice to all persons that may acquire any property subject to the requirements and responsibilities described in the approved stormwater management plan. The notice shall comply with the applicable requirements for recording contained in RSA 477 and 478. The notice need not set forth the requirements at length, so long as it is sufficient to provide notice to prospective purchasers of the requirements for maintenance and reporting.

Please find note #29 of project specific notes, sheet #2.

6.0 CONCLUSION

Peak rates of runoff and volume are modeled to be equal or reduced in the post-construction analysis / condition, as compared to the pre-construction peak rates of runoff and volume during all storm events due to the installation of the low impact development stormwater devices.

A Site Specific, Terrain Alteration Permit (RSA 485: A-17) is required for this site plan due to the area of disturbance being greater than 100,000 SF. The impact is approximately 443,945 square feet over two phases, so that an EPA Notice of Intent will be required to be filed prior to construction and a Stormwater Pollution Prevention Plan prepared. A waiver has been requested to Groundwater recharge Volume in accordance with Env-Wq 1509.02-1509.04. As required in accordance with Env-Wq 1505.03(f), an environmental monitor is required during all project phases due to disturbance of soils with erodibility factors of 0.4 or greater (all phases) and disturbance of slopes greater than 25%. See Erosion & Sediment Control Plan for more information.

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

Christopher R. Berry, SIT 567
Principal, President

Kenneth A. Berry PE, LLS,
CPSWQ, CPESC, CESSWI
Principal, VP - Technical Operations

Kevin R. Poulin, EIT
Design Engineer / Project Manager

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www.BerrySurveying.Com

April 27, 2023

Alteration of Terrain Bureau
NHDES
PO Box 95
Concord, NH 03302

RE: Alteration of Terrain Permit Application
"Rolling Hill Estates"
Tax Map E, Lot 65-1 & 65-A
Tolend Rd & Sun Hawk Ln
Dover, NH

Dear Reviewer:

The following waivers are hereby requested:

Identification of Waivers Requested:

1. Waiver requested to not satisfy Ground Water Recharge (GRV) requirement as put forth by Env-Wq 1507.04(b).

1) Explanation:

This waiver request is being submitted to allow for the Ground Water Recharge requirements put forth by Env-Wq 1507.04(b) due to soil conditions on site as shown in the Site Specific Soils Map (SSSM).

1) Waiver Justification:

a. Granting the request will not result in an adverse impact on the environment, public health, public safety, or abutting properties that is more significant than the impact that would result from complying with the rule as written.

Granting this request will not result in adverse impact on the environment, public health, public safety, or abutting properties that is more significant than the impact of complying with the rules as written. This is due to site conditions not allowing for compliance in the vast majority of the development area. On-Site soils that are being replaced with impervious surfaces are Buxton, Suffield, Scantic (poorly drained), Hollis-Charlton complex (very rocky), as determined by John P. Hayes III, CWS, CSS. KSat Values for New Hampshire Soils (Ksat NH Manual) for these soils are as follows:

Buxton consists of restrictive “B” and “C” horizons of 0.1-0.6 in/hr and 0.0-0.2 in/hr, respectively. Suffield consists of “B” and “C” horizons of 0.6-2.0 in/hr and 0.0-0.2 in/hr, respectively. Scantic consists of restrictive “B” and “C” horizons as well, with 0.0-0.2 in/hr and 0.0-0.2 in/hr, respectively. With restrictive “B” and “C” horizons across the subject parcel, compliance with Env-Wq 1507.04(b) is not possible.

The complex soil, Hollis-Charlton (very rocky), is located within the development area, determined to be 70% Hollis, 30% Charlton. Hollis consists of “B” and “C” horizons of 0.6-6.0 in/hr and 0.6-6.0 in/hr, respectively. Charlton consists of “B” and “C” horizons of 0.6-6.0 in/hr and 0.6-6.0 in/hr. While infiltration could occur over this Hollis-Charlton complex soil, the majority of this soil is in a location where ledge was found within four feet of the surface making infiltration not reasonably possible.

b. Granting the request is consistent with the intent and purposes of the rule being waived.

Utilizing the justification put forth in part a, granting this waiver request is consistent with the intent and purposes of the rule being waived. There is no practical location of the subject parcel that is able to provide the minimum Ksat requirement of 0.5 in/hr in order to satisfy the GRV requirements of Env-Wq 1507.04(b). Subsurface Gravel Wetlands are proposed on-site partially due to the restrictive soil conditions.

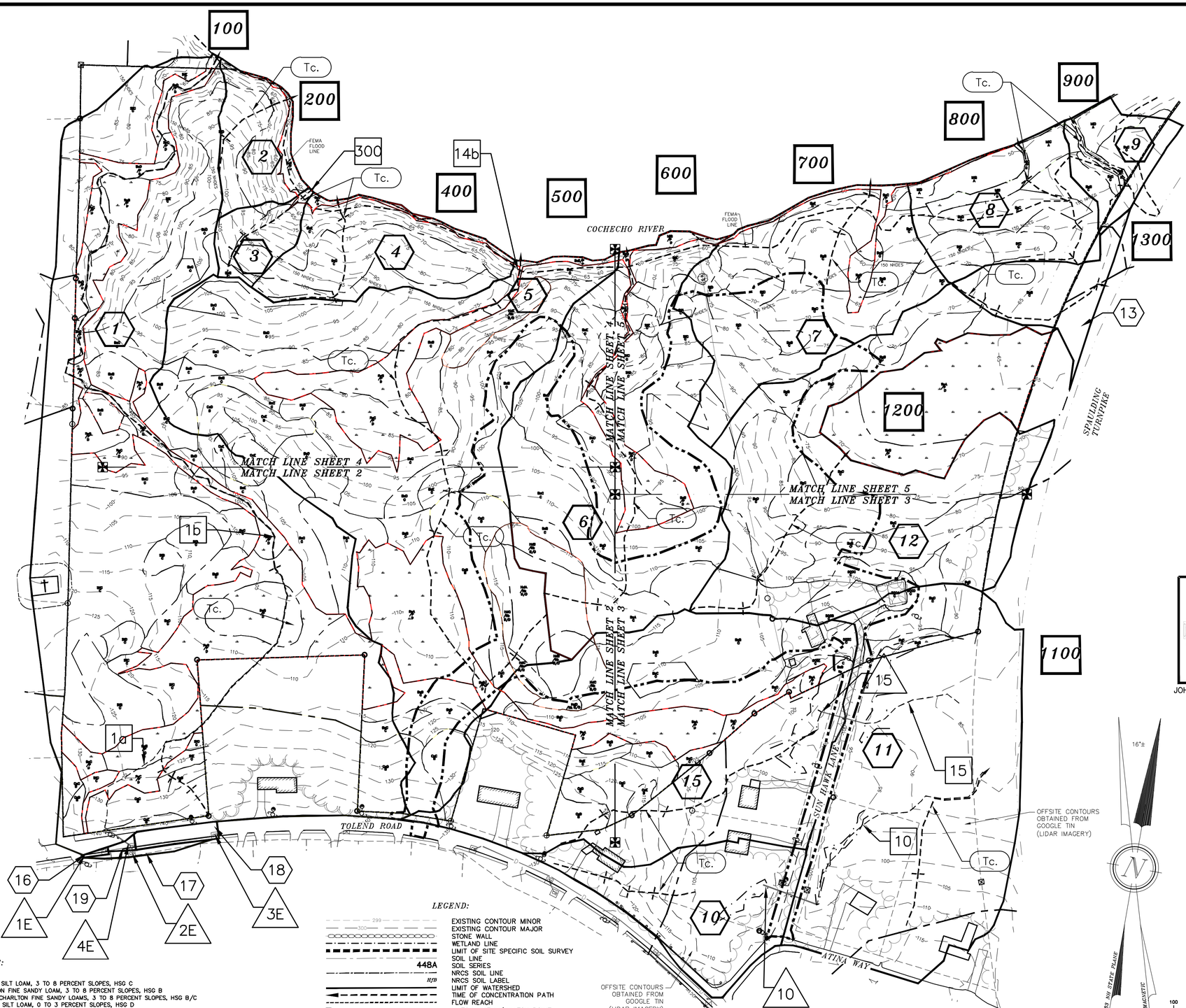
Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

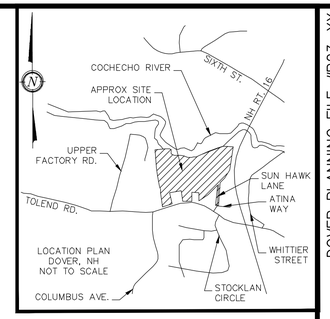
Kevin R. Poulin, EIT
Project Engineer
k.poulin@berrysurveying.com

Kenneth A. Berry, PE, LLS
CPSWQ, CPESC, CESSWI
VP – Technical Operations
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Appendix I - Existing Conditions Analysis

2 Yr - 24 Hr. Node Listing
10 Yr -24 Hr. Node Listing
25 Yr -24 Hr. Node Listing
50 Yr -24 Hr. Node Listing
100 Yr - 24 Hr. Node Listing
25 Yr - 24 Hr. Full Summary





NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) LOT AREA LOT 65–1: 1,388,401 Sq. Ft., 31.87 Ac. +/–
LOT AREA LOT 65–A: 546,549 Sq. Ft., 12.55 Ac. +/–

4.) S.C.R.D. BOOK 5044, PAGE 158
S.C.R.D. BOOK 1571, PAGE 86

5.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, A PORTION OF THIS PARCEL DOES FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015 AS SHOWN.

6.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

7.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING WATERSHED CONDITIONS ON TAX MAP E, LOT 65–1 AS OF THE DATE OF THE SURVEY (WINTER, 2021).

8.) SEE EXISTING CONDITIONS PLANS FOR EXPLANATION OF JURISDICTIONAL WETLANDS SHEETS #5–9. SEE SITE SPECIFIC SOIL SURVEY FOR SOILS EXPLANATION. SOILS LEGEND ALSO LOCATED ON SHEETS #11–15.

NRCS SOILS:

BzB – BUXTON SILT LOAM, 3 TO 8 PERCENT SLOPES, HSG C
CfB – CHARLTON FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES, HSG B
HcB – HOLLIS–CHARLTON FINE SANDY LOAMS, 3 TO 8 PERCENT SLOPES, HSG B/C
ScA – SCANTIC SILT LOAM, 0 TO 3 PERCENT SLOPES, HSG D
ScB – SCANTIC SILT LOAM, 3 TO 8 PERCENT SLOPES, HSG D
SfC – SUFFIELD SILT LOAM, 8 TO 15 PERCENT SLOPES, HSG C
SfE – SUFFIELD SILT LOAM, 15 TO 35 PERCENT SLOPES, HSG C

SEE WEBSOIL USDA–NRCS

LEGEND:

EXISTING CONTOUR MINOR
EXISTING CONTOUR MAJOR
STONE WALL
WETLAND LINE
LIMIT OF SITE SPECIFIC SOIL SURVEY
SOIL LINE
448A SOIL SERIES
NRCS SOIL LINE
HfB NRCS SOIL LABEL
LIMIT OF WATERSHED
TIME OF CONCENTRATION PATH
FLOW REACH
MATCH LINE W/ MATCH POINT
S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. TYPICAL
FND FOUND
TBR TO BE REMOVED

JOHN P. HAYES III, CWS #18

JOHN P. HAYES III, CSS #87

WETLAND NOTES:

WETLANDS WERE DELINEATED BY JOHN P. HAYES SPRING 2021 & OCTOBER OF 2022.
1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.0. UNITED STATES DEPARTMENT OF AGRICULTURE (2016).
3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

SYMBOLS LEGEND:

SUBCATCHMENT AREA SYMBOL
FLOW REACH SYMBOL
POND DEVICE SYMBOL
TIME OF CONCENTRATION SEGMENT

GRAPHIC SCALE

100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

W–1 EXISTING WATERSHED OVERVIEW
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

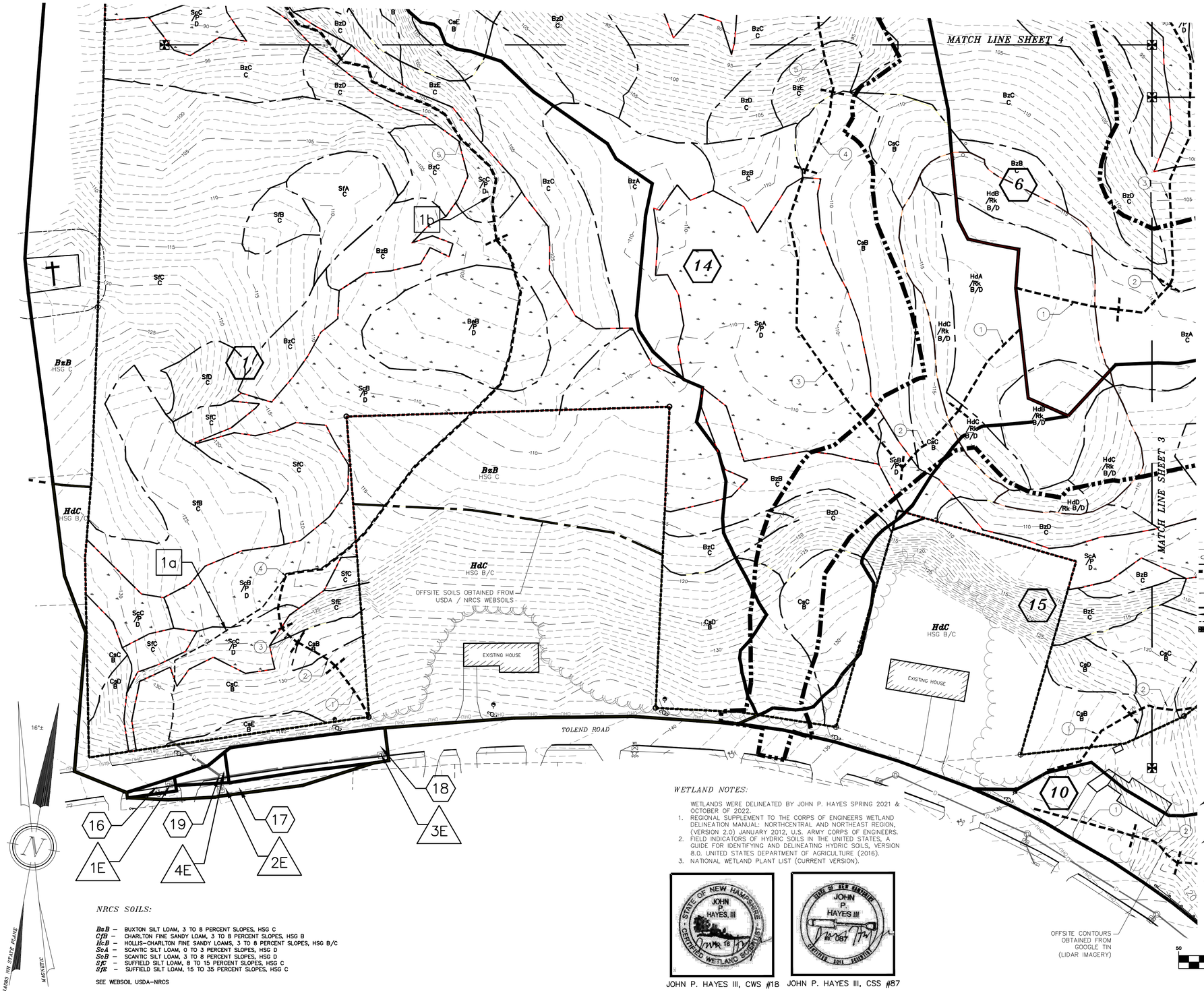
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

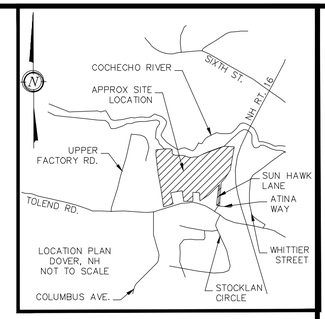
SCALE : 1 IN. EQUALS 100 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

SHEET 1 OF 10

NOT FOR CONSTRUCTION





NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) LOT AREA LOT 65–1: 1,388,401 Sq. Ft., 31.87 Ac. +/–
LOT AREA LOT 65–A: 546,549 Sq. Ft., 12.55 Ac. +/–

4.) S.C.R.D. BOOK 5044, PAGE 158
S.C.R.D. BOOK 1571, PAGE 86

5.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, A PORTION OF THIS PARCEL DOES FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015 AS SHOWN.

6.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

7.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING WATERSHED CONDITIONS ON TAX MAP E, LOT 65–1 AS OF THE DATE OF THE SURVEY (WINTER, 2021).

8.) SEE EXISTING CONDITIONS PLANS FOR EXPLANATION OF JURISDICTIONAL WETLANDS SHEETS #5–9. SEE SITE SPECIFIC SOIL SURVEY FOR SOILS EXPLANATION. SOILS LEGEND ALSO LOCATED ON SHEETS #11–15.

LEGEND:

299	EXISTING CONTOUR MINOR
100	EXISTING CONTOUR MAJOR
	STONE WALL
	WETLAND LINE
	LIMIT OF SITE SPECIFIC SOIL SURVEY
448A	SOIL LINE
	SOIL SERIES
	NRCS SOIL LINE
#/#	NRCS SOIL LABEL
	LIMIT OF WATERSHED
	TIME OF CONCENTRATION PATH
	FLOW REACH
	MATCH LINE W/ MATCH POINT
S.C.R.D.	STRAFFORD COUNTY REGISTRY OF DEEDS
TYP.	TYPICAL
FND	FOUND
TBR	TO BE REMOVED

NRCS SOILS:

BzB – BUXTON SILT LOAM, 3 TO 8 PERCENT SLOPES, HSG C
CfB – CHARLTON FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES, HSG B
HcB – HOLLIS–CHARLTON FINE SANDY LOAMS, 3 TO 8 PERCENT SLOPES, HSG B/C
ScA – SCANTIC SILT LOAM, 0 TO 3 PERCENT SLOPES, HSG D
ScB – SCANTIC SILT LOAM, 3 TO 8 PERCENT SLOPES, HSG D
SfC – SUFFIELD SILT LOAM, 8 TO 15 PERCENT SLOPES, HSG C
SfE – SUFFIELD SILT LOAM, 15 TO 35 PERCENT SLOPES, HSG C

SEE WEBSOIL USDA–NRCS

WETLAND NOTES:

WETLANDS WERE DELINEATED BY JOHN P. HAYES SPRING 2021 & OCTOBER OF 2022.
1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
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3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

STATE OF NEW HAMPSHIRE JOHN P. HAYES, III CERTIFIED WETLAND SCIENTIST
JOHN P. HAYES III, CWS #18

STATE OF NEW HAMPSHIRE JOHN P. HAYES III 087 CERTIFIED SOIL SCIENTIST
JOHN P. HAYES III, CSS #87

SYMBOLS LEGEND:

#	SUBCATCHMENT AREA SYMBOL
#	FLOW REACH SYMBOL
#	POND DEVICE SYMBOL
Tc.	TIME OF CONCENTRATION SEGMENT

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

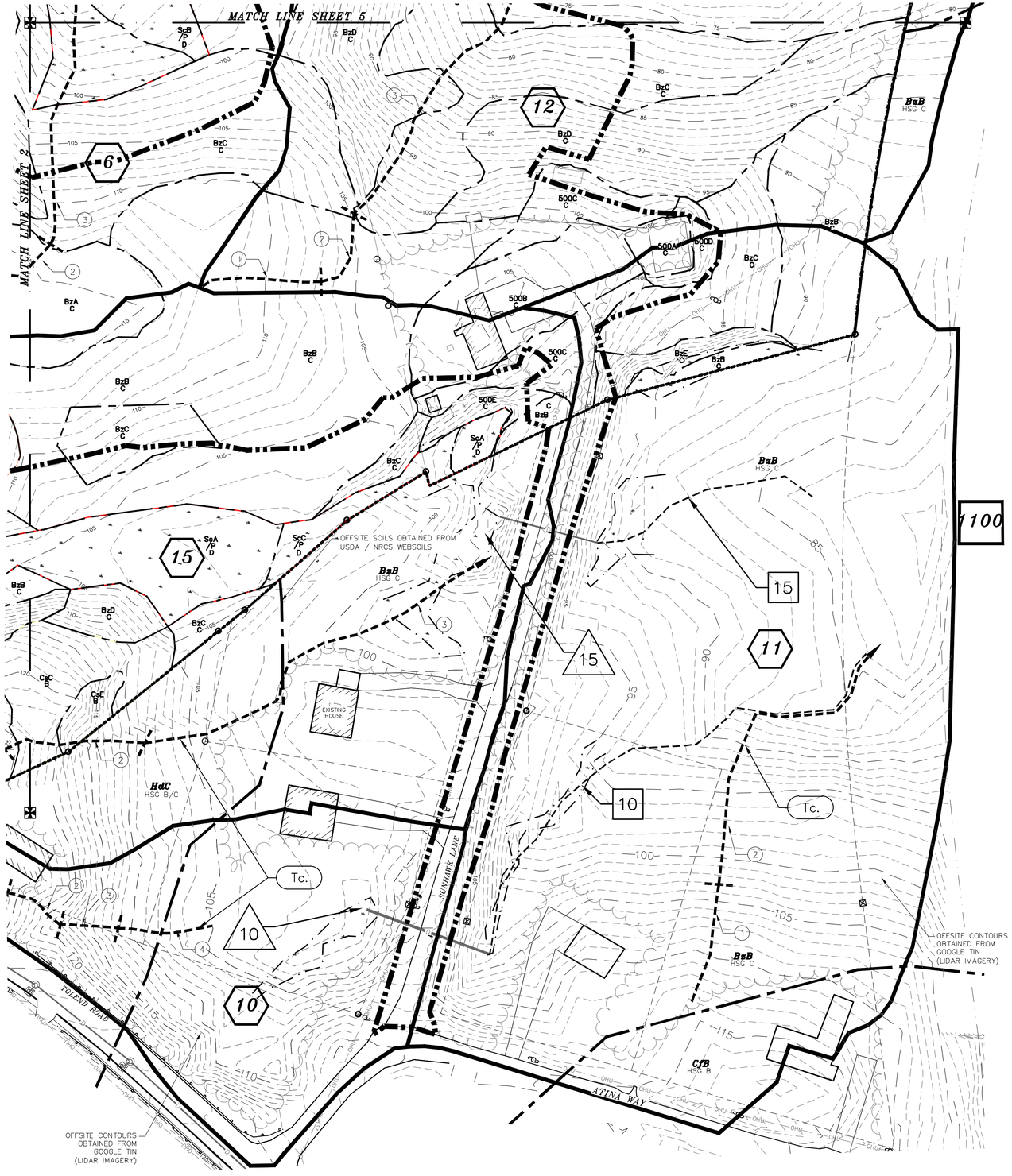
W–1 EXISTING WATERSHED DETAIL – SOUTHWEST
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE KENNETH A. BERRY No. 14243 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



SITE SPECIFIC SOILS LEGEND

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
BeB	BIDDEFORD	D
BzA	BUXTON	C
BzB	BUXTON	C
BzC	BUXTON	C
BzD	BUXTON	C
BzE	BUXTON	C
CsB	CHARLTON (VERY STONY)	B
CsC	CHARLTON (VERY STONY)	B
CsD	CHARLTON (VERY STONY)	B
CsE	CHARLTON (VERY STONY)	B
HdA/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B/D
HdB/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B/D
HdC/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B/D
HdD/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B/D
HdE/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B/D
MIB/P	MIXED ALLUVIAL LAND (POORLY DRAINED)	C/D
MIC/P	MIXED ALLUVIAL LAND (POORLY DRAINED)	C/D

SLOPE: A = 0–3% B = 3–8% C = 8–15% D = 15–25% E = 25–50% F = 50%+

DENOMINATOR: /Rk = ROCKY /VPD = VERY POORLY DRAINED /PD = POORLY DRAINED /SWPD = SOMEWHAT POORLY DRAINED /MWD = MODERATELY WELL DRAINED

SITE SPECIFIC SOILS LEGEND (CONT'D)

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
MIB	MIXED ALLUVIAL LAND	A
MIC	MIXED ALLUVIAL LAND	A
MID	MIXED ALLUVIAL LAND	A
MIE	MIXED ALLUVIAL LAND	A
ScA/P	SCANTIC	D
ScB/P	SCANTIC	D
ScC/P	SCANTIC	D
ScD/P	SCANTIC	D
ScE/P	SCANTIC	D
SfA	SUFFIELD	C
SfB	SUFFIELD	C
SfC	SUFFIELD	C
SfD	SUFFIELD	C
SfE	SUFFIELD	C
500B	UDORTHENTS	C
500C	UDORTHENTS	C
500D	UDORTHENTS	C
500E	UDORTHENTS	C

SLOPE: A = 0–3% B = 3–8% C = 8–15% D = 15–25% E = 25–50% F = 50%+

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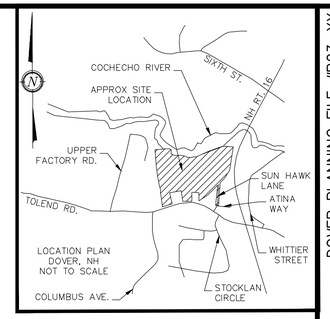
LEGEND:

- EXISTING CONTOUR MINOR
- EXISTING CONTOUR MAJOR
- STONE WALL
- WETLAND LINE
- LIMIT OF SITE SPECIFIC SOIL SURVEY
- SOIL LINE
- 448A — SOIL SERIES
- NRCS SOIL LINE
- H/P — NRCS SOIL LABEL
- LIMIT OF WATERSHED
- TIME OF CONCENTRATION PATH
- FLOW REACH
- MATCH LINE W/ MATCH POINT
- S.C.R.D. — STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. — TYPICAL
- FND — FOUND
- TBR — TO BE REMOVED

NRCS SOILS:

- *BzB* – BUXTON SILT LOAM, 3 TO 8 PERCENT SLOPES, HSG C
- *CfB* – CHARLTON FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES, HSG B
- *HdB* – HOLLIS–CHARLTON FINE SANDY LOAMS, 3 TO 8 PERCENT SLOPES, HSG B/C
- *ScA* – SCANTIC SILT LOAM, 0 TO 3 PERCENT SLOPES, HSG D
- *ScB* – SCANTIC SILT LOAM, 3 TO 8 PERCENT SLOPES, HSG D
- *SfC* – SUFFIELD SILT LOAM, 8 TO 15 PERCENT SLOPES, HSG C
- *SfE* – SUFFIELD SILT LOAM, 15 TO 35 PERCENT SLOPES, HSG C

SEE WEBSOIL USDA–NRCS



NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) LOT AREA LOT 65–1: 1,388,401 Sq. Ft., 31.87 Ac. +/–
LOT AREA LOT 65–A: 546,549 Sq. Ft., 12.55 Ac. +/–

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8.) SEE EXISTING CONDITIONS PLANS FOR EXPLANATION OF JURISDICTIONAL WETLANDS SHEETS #5–9. SEE SITE SPECIFIC SOIL SURVEY FOR SOILS EXPLANATION. SOILS LEGEND ALSO LOCATED ON SHEETS #11–15.



JOHN P. HAYES III, CWS #18



JOHN P. HAYES III, CSS #87

WETLAND NOTES:

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SYMBOLS LEGEND:

- # — SUBCATCHMENT AREA SYMBOL
- # — FLOW REACH SYMBOL
- # — POND DEVICE SYMBOL
- Tc. / # — TIME OF CONCENTRATION SEGMENT

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

W–1 EXISTING WATERSHED DETAIL – SOUTHEAST
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

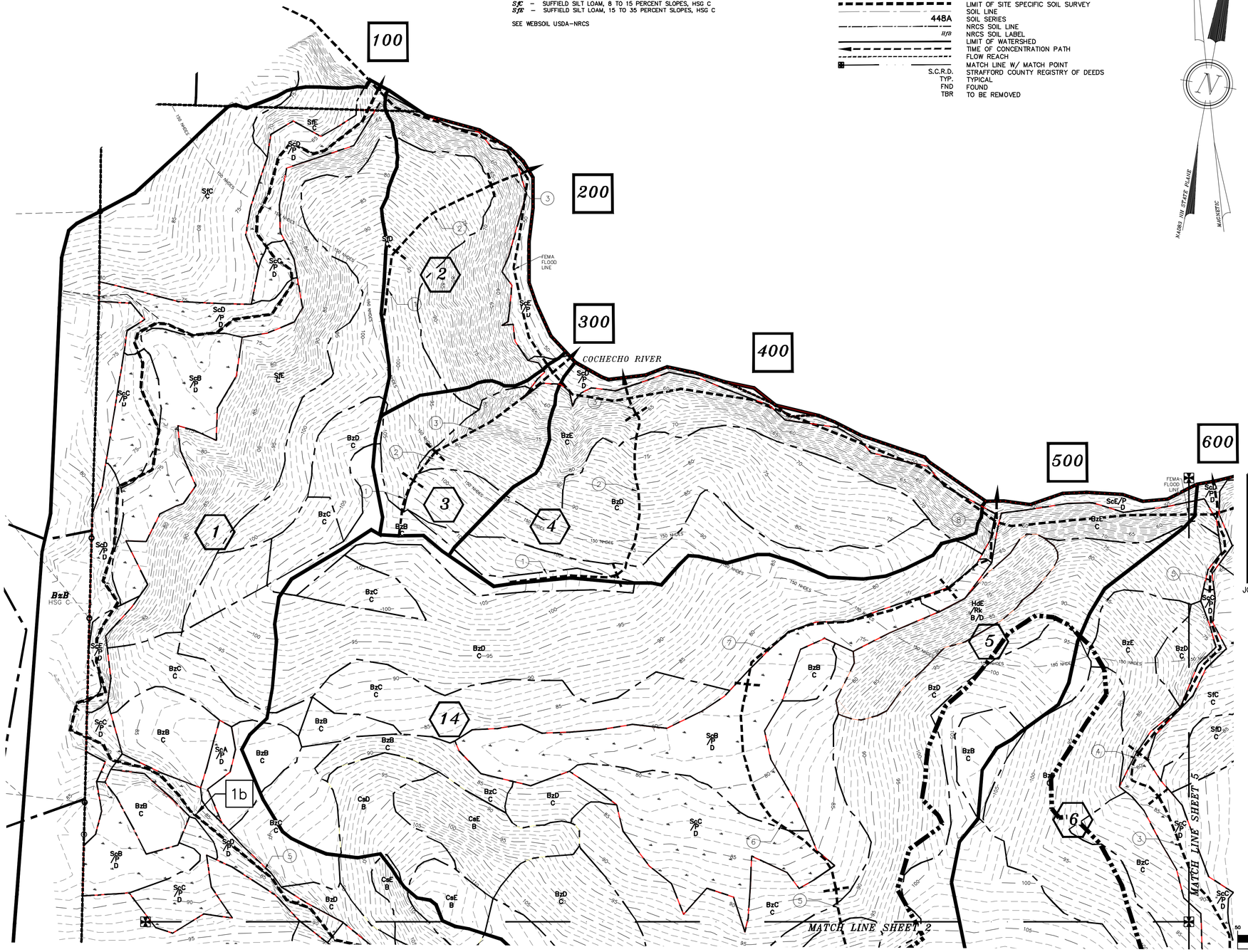
NRCS SOILS:

BzB – BUXTON SILT LOAM, 3 TO 8 PERCENT SLOPES, HSG C
CfB – CHARLTON FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES, HSG B
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SEE WEBSOIL USDA–NRCS

LEGEND:

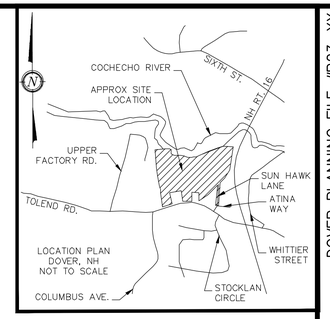
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	WETLAND LINE
	LIMIT OF SITE SPECIFIC SOIL SURVEY
448A	SOIL LINE
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HYD	NRCS SOIL LABEL
	LIMIT OF WATERSHED
	TIME OF CONCENTRATION PATH
	FLOW REACH
	MATCH LINE W/ MATCH POINT
S.C.R.D.	STRAFFORD COUNTY REGISTRY OF DEEDS
TYP.	TYPICAL
FND	FOUND
TBR	TO BE REMOVED



16°±

NAD83 NH STATE PLANE

MAGNETIC



NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

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STATE OF NEW HAMPSHIRE – JOHN P. HAYES, III – CERTIFIED WETLAND SCIENTIST – JWR 18

JOHN P. HAYES III, CWS #18

STATE OF NEW HAMPSHIRE – JOHN P. HAYES III – SURVEYOR

JOHN P. HAYES III, CSS #87

WETLAND NOTES:

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SYMBOLS LEGEND:

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FLOW REACH SYMBOL
POND DEVICE SYMBOL
TIME OF CONCENTRATION SEGMENT

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

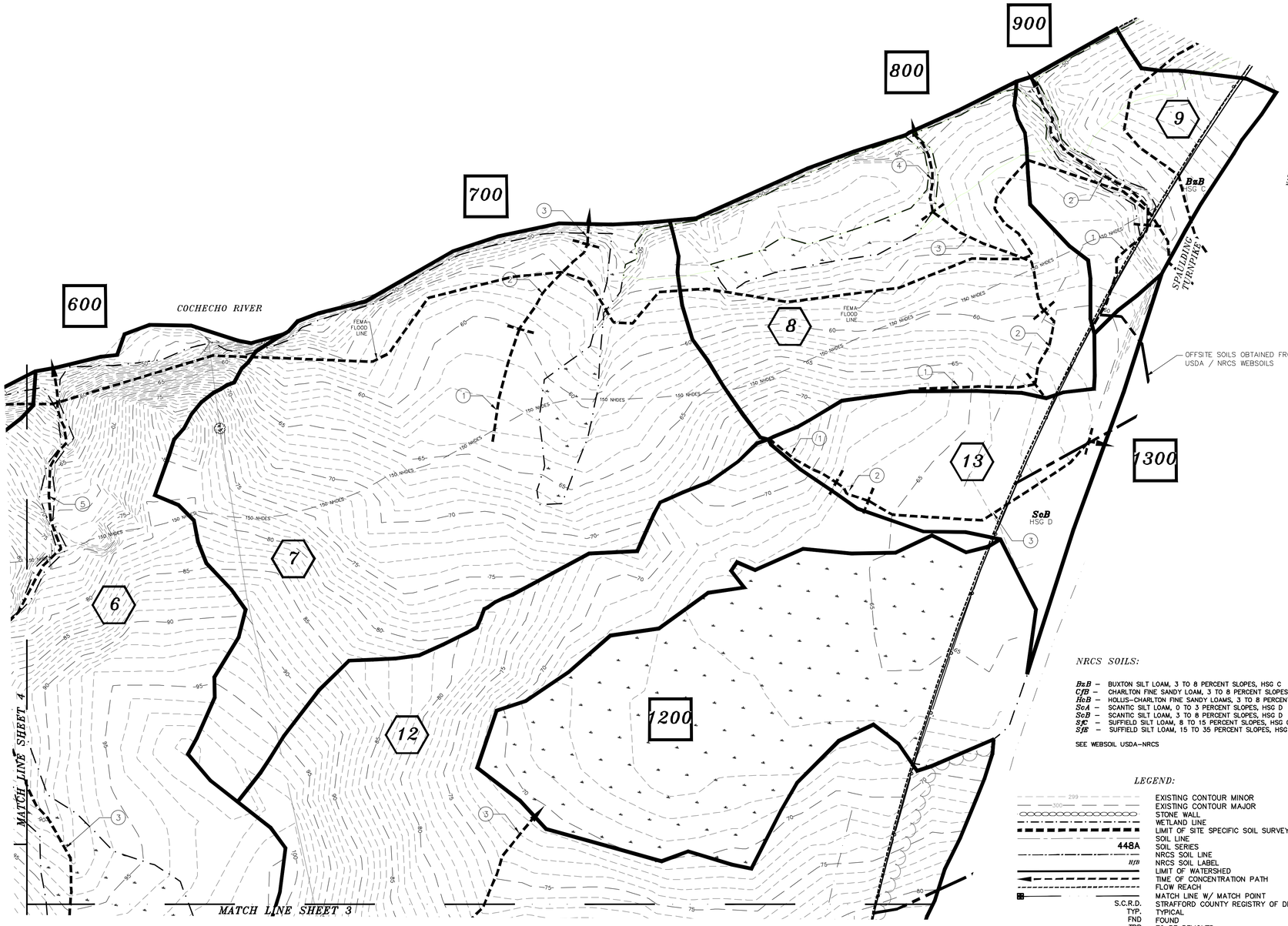
W–1 EXISTING WATERSHED DETAIL – NORTHWEST
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK ROAD
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

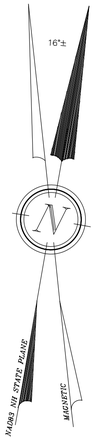
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

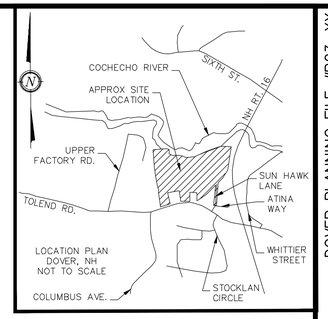
SCALE : 1 IN. EQUALS 50 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE – KENNETH A. BERRY No. 14263 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION







NOTES:

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42J DOVER POINT ROAD
DOVER, NH 03820

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DOVER, NH 03820

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NRCS SOILS:

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ChB	–	CHARLTON FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES, HSG B
HoB	–	HOLLIS–CHARLTON FINE SANDY LOAMS, 3 TO 8 PERCENT SLOPES, HSG B/C
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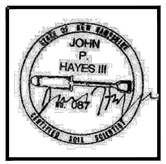
SEE WEBSOIL USDA–NRCS

LEGEND:

299 / 300	EXISTING CONTOUR MINOR / EXISTING CONTOUR MAJOR
	STONE WALL
	WETLAND LINE
	LIMIT OF SITE SPECIFIC SOIL SURVEY
448A	SOIL LINE / SOIL SERIES
H/B	NRCS SOIL LINE / NRCS SOIL LABEL
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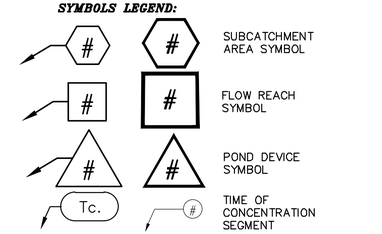


JOHN P. HAYES III, CSS #87

WETLAND NOTES:

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SYMBOLS LEGEND:



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

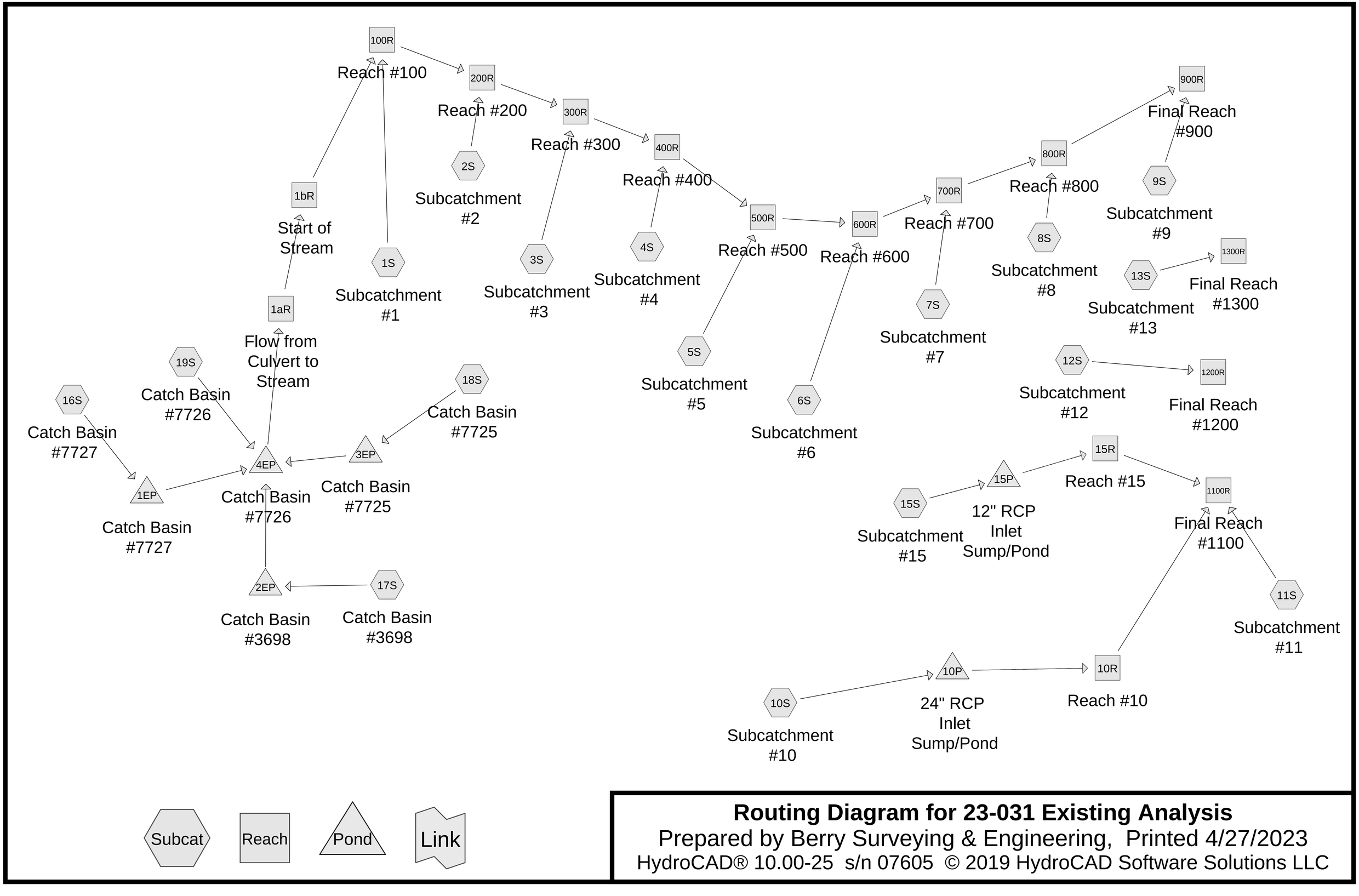
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TAX MAP E, LOT 65–1 & 65–A

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335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

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STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



Routing Diagram for 23-031 Existing Analysis

Prepared by Berry Surveying & Engineering, Printed 4/27/2023

HydroCAD® 10.00-25 s/n 07605 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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: Subcatchment #1 Runoff Area=616,631 sf 0.96% Impervious Runoff Depth>1.07"
Flow Length=2,050' Tc=25.3 min CN=70 Runoff=10.08 cfs 1.262 af

Subcatchment 2S: Subcatchment #2 Runoff Area=33,802 sf 0.00% Impervious Runoff Depth>1.13"
Flow Length=215' Tc=8.3 min CN=71 Runoff=0.87 cfs 0.073 af

Subcatchment 3S: Subcatchment #3 Runoff Area=19,435 sf 0.00% Impervious Runoff Depth>1.08"
Flow Length=240' Tc=7.0 min CN=70 Runoff=0.50 cfs 0.040 af

Subcatchment 4S: Subcatchment #4 Runoff Area=64,929 sf 0.00% Impervious Runoff Depth>1.07"
Flow Length=293' Tc=14.1 min CN=70 Runoff=1.34 cfs 0.133 af

Subcatchment 5S: Subcatchment #5 Runoff Area=406,239 sf 0.00% Impervious Runoff Depth>1.01"
Flow Length=1,214' Tc=48.2 min CN=69 Runoff=4.55 cfs 0.782 af

Subcatchment 6S: Subcatchment #6 Runoff Area=232,739 sf 0.00% Impervious Runoff Depth>1.13"
Flow Length=881' Tc=29.5 min CN=71 Runoff=3.79 cfs 0.501 af

Subcatchment 7S: Subcatchment #7 Runoff Area=133,394 sf 0.00% Impervious Runoff Depth>1.07"
Flow Length=210' Tc=17.4 min CN=70 Runoff=2.54 cfs 0.274 af

Subcatchment 8S: Subcatchment #8 Runoff Area=69,837 sf 0.00% Impervious Runoff Depth>0.62"
Flow Length=381' Tc=18.1 min CN=61 Runoff=0.61 cfs 0.083 af

Subcatchment 9S: Subcatchment #9 Runoff Area=30,235 sf 0.00% Impervious Runoff Depth>0.62"
Flow Length=273' Tc=13.9 min CN=61 Runoff=0.29 cfs 0.036 af

Subcatchment 10S: Subcatchment #10 Runoff Area=76,002 sf 10.02% Impervious Runoff Depth>1.25"
Flow Length=280' Tc=9.4 min CN=73 Runoff=2.16 cfs 0.182 af

Subcatchment 11S: Subcatchment #11 Runoff Area=246,553 sf 3.13% Impervious Runoff Depth>1.13"
Flow Length=368' Tc=13.6 min CN=71 Runoff=5.49 cfs 0.533 af

Subcatchment 12S: Subcatchment #12 Runoff Area=215,562 sf 0.67% Impervious Runoff Depth>1.13"
Flow Length=462' Tc=17.7 min CN=71 Runoff=4.35 cfs 0.466 af

Subcatchment 13S: Subcatchment #13 Runoff Area=33,510 sf 0.00% Impervious Runoff Depth>1.13"
Flow Length=329' Tc=18.6 min CN=71 Runoff=0.66 cfs 0.072 af

Subcatchment 15S: Subcatchment #15 Runoff Area=279,874 sf 3.55% Impervious Runoff Depth>1.01"
Flow Length=553' Tc=23.7 min CN=69 Runoff=4.40 cfs 0.543 af

Subcatchment 16S: Catch Basin #7727 Runoff Area=459 sf 45.75% Impervious Runoff Depth>1.80"
Tc=6.0 min CN=81 Runoff=0.02 cfs 0.002 af

Subcatchment 17S: Catch Basin #3698 Runoff Area=2,300 sf 9.70% Impervious Runoff Depth>1.08"
Tc=6.0 min CN=70 Runoff=0.06 cfs 0.005 af

Subcatchment 18S: Catch Basin #7725 Runoff Area=5,195 sf 84.79% Impervious Runoff Depth>2.84"
Tc=6.0 min CN=93 Runoff=0.37 cfs 0.028 af

Subcatchment 19S: Catch Basin #7726 Runoff Area=880 sf 88.86% Impervious Runoff Depth>3.05"
Tc=6.0 min CN=95 Runoff=0.07 cfs 0.005 af

Reach 1aR: Flow from Culvert to Stream Avg. Flow Depth=0.08' Max Vel=1.32 fps Inflow=0.52 cfs 0.040 af
n=0.035 L=655.5' S=0.0506 '/' Capacity=22.92 cfs Outflow=0.40 cfs 0.039 af

Reach 1bR: Start of Stream Avg. Flow Depth=0.07' Max Vel=1.32 fps Inflow=0.40 cfs 0.039 af
n=0.035 L=1,438.0' S=0.0351 '/' Capacity=6.96 cfs Outflow=0.28 cfs 0.039 af

Reach 10R: Reach #10 Avg. Flow Depth=0.18' Max Vel=1.87 fps Inflow=2.16 cfs 0.182 af
n=0.035 L=453.0' S=0.0336 '/' Capacity=18.68 cfs Outflow=1.98 cfs 0.181 af

Reach 15R: Reach #15 Avg. Flow Depth=0.25' Max Vel=2.39 fps Inflow=4.25 cfs 0.543 af
n=0.035 L=198.0' S=0.0344 '/' Capacity=18.90 cfs Outflow=4.24 cfs 0.542 af

Reach 100R: Reach #100 Inflow=10.35 cfs 1.300 af
Outflow=10.35 cfs 1.300 af

Reach 200R: Reach #200 Inflow=10.80 cfs 1.373 af
Outflow=10.80 cfs 1.373 af

Reach 300R: Reach #300 Inflow=11.03 cfs 1.413 af
Outflow=11.03 cfs 1.413 af

Reach 400R: Reach #400 Inflow=12.05 cfs 1.547 af
Outflow=12.05 cfs 1.547 af

Reach 500R: Reach #500 Inflow=14.81 cfs 2.329 af
Outflow=14.81 cfs 2.329 af

Reach 600R: Reach #600 Inflow=18.59 cfs 2.830 af
Outflow=18.59 cfs 2.830 af

Reach 700R: Reach #700 Inflow=20.63 cfs 3.103 af
Outflow=20.63 cfs 3.103 af

Reach 800R: Reach #800 Inflow=21.21 cfs 3.186 af
Outflow=21.21 cfs 3.186 af

Reach 900R: Final Reach #900 Inflow=21.45 cfs 3.222 af
Outflow=21.45 cfs 3.222 af

Reach 1100R: Final Reach #1100 Inflow=10.35 cfs 1.256 af
Outflow=10.35 cfs 1.256 af

Reach 1200R: Final Reach #1200 Inflow=4.35 cfs 0.466 af
Outflow=4.35 cfs 0.466 af

Reach 1300R: Final Reach #1300 Inflow=0.66 cfs 0.072 af
Outflow=0.66 cfs 0.072 af

Pond 1EP: Catch Basin #7727 Peak Elev=138.03' Storage=1 cf Inflow=0.02 cfs 0.002 af
12.0" Round Culvert n=0.012 L=48.0' S=0.0050 '/' Outflow=0.02 cfs 0.002 af

Pond 2EP: Catch Basin #3698 Peak Elev=137.88' Storage=2 cf Inflow=0.06 cfs 0.005 af
12.0" Round Culvert n=0.012 L=8.3' S=0.0048 '/' Outflow=0.06 cfs 0.005 af

Pond 3EP: Catch Basin #7725 Peak Elev=138.81' Storage=4 cf Inflow=0.37 cfs 0.028 af
12.0" Round Culvert n=0.012 L=153.7' S=0.0050 '/' Outflow=0.37 cfs 0.028 af

Pond 4EP: Catch Basin #7726 Peak Elev=137.03' Storage=4 cf Inflow=0.52 cfs 0.040 af
24.0" Round Culvert n=0.012 L=61.5' S=0.0050 '/' Outflow=0.52 cfs 0.040 af

Pond 10P: 24" RCP Inlet Sump/Pond Peak Elev=100.48' Storage=85 cf Inflow=2.16 cfs 0.182 af
24.0" Round Culvert n=0.012 L=108.8' S=0.0104 '/' Outflow=2.16 cfs 0.182 af

Pond 15P: 12" RCP Inlet Sump/Pond Peak Elev=94.67' Storage=322 cf Inflow=4.40 cfs 0.543 af
Primary=4.25 cfs 0.543 af Secondary=0.00 cfs 0.000 af Outflow=4.25 cfs 0.543 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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: Subcatchment #1 Runoff Area=616,631 sf 0.96% Impervious Runoff Depth>2.35"
Flow Length=2,050' Tc=25.3 min CN=70 Runoff=23.61 cfs 2.778 af

Subcatchment 2S: Subcatchment #2 Runoff Area=33,802 sf 0.00% Impervious Runoff Depth>2.45"
Flow Length=215' Tc=8.3 min CN=71 Runoff=2.02 cfs 0.158 af

Subcatchment 3S: Subcatchment #3 Runoff Area=19,435 sf 0.00% Impervious Runoff Depth>2.37"
Flow Length=240' Tc=7.0 min CN=70 Runoff=1.17 cfs 0.088 af

Subcatchment 4S: Subcatchment #4 Runoff Area=64,929 sf 0.00% Impervious Runoff Depth>2.36"
Flow Length=293' Tc=14.1 min CN=70 Runoff=3.14 cfs 0.293 af

Subcatchment 5S: Subcatchment #5 Runoff Area=406,239 sf 0.00% Impervious Runoff Depth>2.26"
Flow Length=1,214' Tc=48.2 min CN=69 Runoff=10.92 cfs 1.754 af

Subcatchment 6S: Subcatchment #6 Runoff Area=232,739 sf 0.00% Impervious Runoff Depth>2.44"
Flow Length=881' Tc=29.5 min CN=71 Runoff=8.65 cfs 1.086 af

Subcatchment 7S: Subcatchment #7 Runoff Area=133,394 sf 0.00% Impervious Runoff Depth>2.36"
Flow Length=210' Tc=17.4 min CN=70 Runoff=5.96 cfs 0.602 af

Subcatchment 8S: Subcatchment #8 Runoff Area=69,837 sf 0.00% Impervious Runoff Depth>1.63"
Flow Length=381' Tc=18.1 min CN=61 Runoff=2.00 cfs 0.218 af

Subcatchment 9S: Subcatchment #9 Runoff Area=30,235 sf 0.00% Impervious Runoff Depth>1.63"
Flow Length=273' Tc=13.9 min CN=61 Runoff=0.96 cfs 0.095 af

Subcatchment 10S: Subcatchment #10 Runoff Area=76,002 sf 10.02% Impervious Runoff Depth>2.63"
Flow Length=280' Tc=9.4 min CN=73 Runoff=4.70 cfs 0.382 af

Subcatchment 11S: Subcatchment #11 Runoff Area=246,553 sf 3.13% Impervious Runoff Depth>2.45"
Flow Length=368' Tc=13.6 min CN=71 Runoff=12.56 cfs 1.155 af

Subcatchment 12S: Subcatchment #12 Runoff Area=215,562 sf 0.67% Impervious Runoff Depth>2.45"
Flow Length=462' Tc=17.7 min CN=71 Runoff=9.94 cfs 1.008 af

Subcatchment 13S: Subcatchment #13 Runoff Area=33,510 sf 0.00% Impervious Runoff Depth>2.44"
Flow Length=329' Tc=18.6 min CN=71 Runoff=1.52 cfs 0.157 af

Subcatchment 15S: Subcatchment #15 Runoff Area=279,874 sf 3.55% Impervious Runoff Depth>2.27"
Flow Length=553' Tc=23.7 min CN=69 Runoff=10.57 cfs 1.216 af

Subcatchment 16S: Catch Basin #7727 Runoff Area=459 sf 45.75% Impervious Runoff Depth>3.37"
Tc=6.0 min CN=81 Runoff=0.04 cfs 0.003 af

Subcatchment 17S: Catch Basin #3698 Runoff Area=2,300 sf 9.70% Impervious Runoff Depth>2.37"
Tc=6.0 min CN=70 Runoff=0.14 cfs 0.010 af

Subcatchment 18S: Catch Basin #7725 Runoff Area=5,195 sf 84.79% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=93 Runoff=0.59 cfs 0.046 af

Subcatchment 19S: Catch Basin #7726 Runoff Area=880 sf 88.86% Impervious Runoff Depth>4.85"
Tc=6.0 min CN=95 Runoff=0.10 cfs 0.008 af

Reach 1aR: Flow from Culvert to Stream Avg. Flow Depth=0.10' Max Vel=1.58 fps Inflow=0.88 cfs 0.067 af
n=0.035 L=655.5' S=0.0506 '/' Capacity=22.92 cfs Outflow=0.71 cfs 0.067 af

Reach 1bR: Start of Stream Avg. Flow Depth=0.10' Max Vel=1.68 fps Inflow=0.71 cfs 0.067 af
n=0.035 L=1,438.0' S=0.0351 '/' Capacity=6.96 cfs Outflow=0.53 cfs 0.066 af

Reach 10R: Reach #10 Avg. Flow Depth=0.26' Max Vel=2.40 fps Inflow=4.69 cfs 0.382 af
n=0.035 L=453.0' S=0.0336 '/' Capacity=18.68 cfs Outflow=4.42 cfs 0.381 af

Reach 15R: Reach #15 Avg. Flow Depth=0.32' Max Vel=2.79 fps Inflow=7.03 cfs 1.215 af
n=0.035 L=198.0' S=0.0344 '/' Capacity=18.90 cfs Outflow=7.03 cfs 1.214 af

Reach 100R: Reach #100 Inflow=24.11 cfs 2.844 af
Outflow=24.11 cfs 2.844 af

Reach 200R: Reach #200 Inflow=25.08 cfs 3.003 af
Outflow=25.08 cfs 3.003 af

Reach 300R: Reach #300 Inflow=25.60 cfs 3.091 af
Outflow=25.60 cfs 3.091 af

Reach 400R: Reach #400 Inflow=27.94 cfs 3.384 af
Outflow=27.94 cfs 3.384 af

Reach 500R: Reach #500 Inflow=34.94 cfs 5.138 af
Outflow=34.94 cfs 5.138 af

Reach 600R: Reach #600 Inflow=43.56 cfs 6.223 af
Outflow=43.56 cfs 6.223 af

Reach 700R: Reach #700 Inflow=48.32 cfs 6.825 af
Outflow=48.32 cfs 6.825 af

Reach 800R: Reach #800 Inflow=50.10 cfs 7.043 af
Outflow=50.10 cfs 7.043 af

Reach 900R: Final Reach #900 Inflow=50.85 cfs 7.138 af
Outflow=50.85 cfs 7.138 af

Reach 1100R: Final Reach #1100 Inflow=22.16 cfs 2.749 af
Outflow=22.16 cfs 2.749 af

Reach 1200R: Final Reach #1200 Inflow=9.94 cfs 1.008 af
Outflow=9.94 cfs 1.008 af

Reach 1300R: Final Reach #1300 Inflow=1.52 cfs 0.157 af
Outflow=1.52 cfs 0.157 af

Pond 1EP: Catch Basin #7727 Peak Elev=138.05' Storage=1 cf Inflow=0.04 cfs 0.003 af
12.0" Round Culvert n=0.012 L=48.0' S=0.0050 '/' Outflow=0.04 cfs 0.003 af

Pond 2EP: Catch Basin #3698 Peak Elev=137.96' Storage=3 cf Inflow=0.14 cfs 0.010 af
12.0" Round Culvert n=0.012 L=8.3' S=0.0048 '/' Outflow=0.14 cfs 0.010 af

Pond 3EP: Catch Basin #7725 Peak Elev=138.90' Storage=5 cf Inflow=0.59 cfs 0.046 af
12.0" Round Culvert n=0.012 L=153.7' S=0.0050 '/' Outflow=0.59 cfs 0.046 af

Pond 4EP: Catch Basin #7726 Peak Elev=137.13' Storage=5 cf Inflow=0.88 cfs 0.068 af
24.0" Round Culvert n=0.012 L=61.5' S=0.0050 '/' Outflow=0.88 cfs 0.067 af

Pond 10P: 24" RCP Inlet Sump/Pond Peak Elev=100.80' Storage=191 cf Inflow=4.70 cfs 0.382 af
24.0" Round Culvert n=0.012 L=108.8' S=0.0104 '/' Outflow=4.69 cfs 0.382 af

Pond 15P: 12" RCP Inlet Sump/Pond Peak Elev=96.87' Storage=5,097 cf Inflow=10.57 cfs 1.216 af
Primary=7.03 cfs 1.215 af Secondary=0.00 cfs 0.000 af Outflow=7.03 cfs 1.215 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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: Subcatchment #1 Runoff Area=616,631 sf 0.96% Impervious Runoff Depth>3.49"
Flow Length=2,050' Tc=25.3 min CN=70 Runoff=35.41 cfs 4.120 af

Subcatchment 2S: Subcatchment #2 Runoff Area=33,802 sf 0.00% Impervious Runoff Depth>3.61"
Flow Length=215' Tc=8.3 min CN=71 Runoff=2.99 cfs 0.233 af

Subcatchment 3S: Subcatchment #3 Runoff Area=19,435 sf 0.00% Impervious Runoff Depth>3.51"
Flow Length=240' Tc=7.0 min CN=70 Runoff=1.75 cfs 0.130 af

Subcatchment 4S: Subcatchment #4 Runoff Area=64,929 sf 0.00% Impervious Runoff Depth>3.50"
Flow Length=293' Tc=14.1 min CN=70 Runoff=4.71 cfs 0.435 af

Subcatchment 5S: Subcatchment #5 Runoff Area=406,239 sf 0.00% Impervious Runoff Depth>3.37"
Flow Length=1,214' Tc=48.2 min CN=69 Runoff=16.54 cfs 2.620 af

Subcatchment 6S: Subcatchment #6 Runoff Area=232,739 sf 0.00% Impervious Runoff Depth>3.59"
Flow Length=881' Tc=29.5 min CN=71 Runoff=12.86 cfs 1.600 af

Subcatchment 7S: Subcatchment #7 Runoff Area=133,394 sf 0.00% Impervious Runoff Depth>3.50"
Flow Length=210' Tc=17.4 min CN=70 Runoff=8.93 cfs 0.893 af

Subcatchment 8S: Subcatchment #8 Runoff Area=69,837 sf 0.00% Impervious Runoff Depth>2.60"
Flow Length=381' Tc=18.1 min CN=61 Runoff=3.33 cfs 0.347 af

Subcatchment 9S: Subcatchment #9 Runoff Area=30,235 sf 0.00% Impervious Runoff Depth>2.60"
Flow Length=273' Tc=13.9 min CN=61 Runoff=1.59 cfs 0.150 af

Subcatchment 10S: Subcatchment #10 Runoff Area=76,002 sf 10.02% Impervious Runoff Depth>3.82"
Flow Length=280' Tc=9.4 min CN=73 Runoff=6.86 cfs 0.555 af

Subcatchment 11S: Subcatchment #11 Runoff Area=246,553 sf 3.13% Impervious Runoff Depth>3.61"
Flow Length=368' Tc=13.6 min CN=71 Runoff=18.67 cfs 1.700 af

Subcatchment 12S: Subcatchment #12 Runoff Area=215,562 sf 0.67% Impervious Runoff Depth>3.60"
Flow Length=462' Tc=17.7 min CN=71 Runoff=14.78 cfs 1.485 af

Subcatchment 13S: Subcatchment #13 Runoff Area=33,510 sf 0.00% Impervious Runoff Depth>3.60"
Flow Length=329' Tc=18.6 min CN=71 Runoff=2.26 cfs 0.231 af

Subcatchment 15S: Subcatchment #15 Runoff Area=279,874 sf 3.55% Impervious Runoff Depth>3.39"
Flow Length=553' Tc=23.7 min CN=69 Runoff=15.99 cfs 1.816 af

Subcatchment 16S: Catch Basin #7727 Runoff Area=459 sf 45.75% Impervious Runoff Depth>4.68"
Tc=6.0 min CN=81 Runoff=0.06 cfs 0.004 af

Subcatchment 17S: Catch Basin #3698 Runoff Area=2,300 sf 9.70% Impervious Runoff Depth>3.51"
Tc=6.0 min CN=70 Runoff=0.21 cfs 0.015 af

Subcatchment 18S: Catch Basin #7725 Runoff Area=5,195 sf 84.79% Impervious Runoff Depth>6.04"
Tc=6.0 min CN=93 Runoff=0.76 cfs 0.060 af

Subcatchment 19S: Catch Basin #7726 Runoff Area=880 sf 88.86% Impervious Runoff Depth>6.27"
Tc=6.0 min CN=95 Runoff=0.13 cfs 0.011 af

Reach 1aR: Flow from Culvert to Stream Avg. Flow Depth=0.12' Max Vel=1.73 fps Inflow=1.16 cfs 0.090 af
n=0.035 L=655.5' S=0.0506 '/' Capacity=22.92 cfs Outflow=0.96 cfs 0.090 af

Reach 1bR: Start of Stream Avg. Flow Depth=0.13' Max Vel=1.91 fps Inflow=0.96 cfs 0.090 af
n=0.035 L=1,438.0' S=0.0351 '/' Capacity=6.96 cfs Outflow=0.74 cfs 0.089 af

Reach 10R: Reach #10 Avg. Flow Depth=0.31' Max Vel=2.70 fps Inflow=6.82 cfs 0.555 af
n=0.035 L=453.0' S=0.0336 '/' Capacity=18.68 cfs Outflow=6.50 cfs 0.554 af

Reach 15R: Reach #15 Avg. Flow Depth=0.34' Max Vel=2.93 fps Inflow=8.20 cfs 1.815 af
n=0.035 L=198.0' S=0.0344 '/' Capacity=18.90 cfs Outflow=8.20 cfs 1.814 af

Reach 100R: Reach #100 Inflow=36.09 cfs 4.208 af
Outflow=36.09 cfs 4.208 af

Reach 200R: Reach #200 Inflow=37.51 cfs 4.442 af
Outflow=37.51 cfs 4.442 af

Reach 300R: Reach #300 Inflow=38.27 cfs 4.572 af
Outflow=38.27 cfs 4.572 af

Reach 400R: Reach #400 Inflow=41.78 cfs 5.007 af
Outflow=41.78 cfs 5.007 af

Reach 500R: Reach #500 Inflow=52.56 cfs 7.627 af
Outflow=52.56 cfs 7.627 af

Reach 600R: Reach #600 Inflow=65.36 cfs 9.227 af
Outflow=65.36 cfs 9.227 af

Reach 700R: Reach #700 Inflow=72.58 cfs 10.120 af
Outflow=72.58 cfs 10.120 af

Reach 800R: Reach #800 Inflow=75.52 cfs 10.467 af
Outflow=75.52 cfs 10.467 af

Reach 900R: Final Reach #900 Inflow=76.69 cfs 10.617 af
Outflow=76.69 cfs 10.617 af

Reach 1100R: Final Reach #1100 Inflow=31.29 cfs 4.068 af
Outflow=31.29 cfs 4.068 af

Reach 1200R: Final Reach #1200 Inflow=14.78 cfs 1.485 af
Outflow=14.78 cfs 1.485 af

Reach 1300R: Final Reach #1300 Inflow=2.26 cfs 0.231 af
Outflow=2.26 cfs 0.231 af

Pond 1EP: Catch Basin #7727 Peak Elev=138.07' Storage=2 cf Inflow=0.06 cfs 0.004 af
12.0" Round Culvert n=0.012 L=48.0' S=0.0050 '/' Outflow=0.06 cfs 0.004 af

Pond 2EP: Catch Basin #3698 Peak Elev=138.01' Storage=3 cf Inflow=0.21 cfs 0.015 af
12.0" Round Culvert n=0.012 L=8.3' S=0.0048 '/' Outflow=0.21 cfs 0.015 af

Pond 3EP: Catch Basin #7725 Peak Elev=138.96' Storage=6 cf Inflow=0.76 cfs 0.060 af
12.0" Round Culvert n=0.012 L=153.7' S=0.0050 '/' Outflow=0.76 cfs 0.060 af

Pond 4EP: Catch Basin #7726 Peak Elev=137.20' Storage=6 cf Inflow=1.16 cfs 0.090 af
24.0" Round Culvert n=0.012 L=61.5' S=0.0050 '/' Outflow=1.16 cfs 0.090 af

Pond 10P: 24" RCP Inlet Sump/Pond Peak Elev=101.02' Storage=299 cf Inflow=6.86 cfs 0.555 af
24.0" Round Culvert n=0.012 L=108.8' S=0.0104 '/' Outflow=6.82 cfs 0.555 af

Pond 15P: 12" RCP Inlet Sump/Pond Peak Elev=98.12' Storage=12,599 cf Inflow=15.99 cfs 1.816 af
Primary=8.20 cfs 1.815 af Secondary=0.00 cfs 0.000 af Outflow=8.20 cfs 1.815 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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: Subcatchment #1 Runoff Area=616,631 sf 0.96% Impervious Runoff Depth>4.62"
Flow Length=2,050' Tc=25.3 min CN=70 Runoff=46.98 cfs 5.453 af

Subcatchment 2S: Subcatchment #2 Runoff Area=33,802 sf 0.00% Impervious Runoff Depth>4.76"
Flow Length=215' Tc=8.3 min CN=71 Runoff=3.95 cfs 0.308 af

Subcatchment 3S: Subcatchment #3 Runoff Area=19,435 sf 0.00% Impervious Runoff Depth>4.64"
Flow Length=240' Tc=7.0 min CN=70 Runoff=2.32 cfs 0.173 af

Subcatchment 4S: Subcatchment #4 Runoff Area=64,929 sf 0.00% Impervious Runoff Depth>4.63"
Flow Length=293' Tc=14.1 min CN=70 Runoff=6.25 cfs 0.576 af

Subcatchment 5S: Subcatchment #5 Runoff Area=406,239 sf 0.00% Impervious Runoff Depth>4.48"
Flow Length=1,214' Tc=48.2 min CN=69 Runoff=22.05 cfs 3.484 af

Subcatchment 6S: Subcatchment #6 Runoff Area=232,739 sf 0.00% Impervious Runoff Depth>4.73"
Flow Length=881' Tc=29.5 min CN=71 Runoff=16.97 cfs 2.108 af

Subcatchment 7S: Subcatchment #7 Runoff Area=133,394 sf 0.00% Impervious Runoff Depth>4.63"
Flow Length=210' Tc=17.4 min CN=70 Runoff=11.85 cfs 1.182 af

Subcatchment 8S: Subcatchment #8 Runoff Area=69,837 sf 0.00% Impervious Runoff Depth>3.59"
Flow Length=381' Tc=18.1 min CN=61 Runoff=4.68 cfs 0.480 af

Subcatchment 9S: Subcatchment #9 Runoff Area=30,235 sf 0.00% Impervious Runoff Depth>3.60"
Flow Length=273' Tc=13.9 min CN=61 Runoff=2.24 cfs 0.208 af

Subcatchment 10S: Subcatchment #10 Runoff Area=76,002 sf 10.02% Impervious Runoff Depth>4.99"
Flow Length=280' Tc=9.4 min CN=73 Runoff=8.94 cfs 0.725 af

Subcatchment 11S: Subcatchment #11 Runoff Area=246,553 sf 3.13% Impervious Runoff Depth>4.75"
Flow Length=368' Tc=13.6 min CN=71 Runoff=24.62 cfs 2.241 af

Subcatchment 12S: Subcatchment #12 Runoff Area=215,562 sf 0.67% Impervious Runoff Depth>4.75"
Flow Length=462' Tc=17.7 min CN=71 Runoff=19.50 cfs 1.957 af

Subcatchment 13S: Subcatchment #13 Runoff Area=33,510 sf 0.00% Impervious Runoff Depth>4.75"
Flow Length=329' Tc=18.6 min CN=71 Runoff=2.98 cfs 0.304 af

Subcatchment 15S: Subcatchment #15 Runoff Area=279,874 sf 3.55% Impervious Runoff Depth>4.51"
Flow Length=553' Tc=23.7 min CN=69 Runoff=21.34 cfs 2.414 af

Subcatchment 16S: Catch Basin #7727 Runoff Area=459 sf 45.75% Impervious Runoff Depth>5.94"
Tc=6.0 min CN=81 Runoff=0.07 cfs 0.005 af

Subcatchment 17S: Catch Basin #3698 Runoff Area=2,300 sf 9.70% Impervious Runoff Depth>4.64"
Tc=6.0 min CN=70 Runoff=0.28 cfs 0.020 af

Subcatchment 18S: Catch Basin #7725 Runoff Area=5,195 sf 84.79% Impervious Runoff Depth>7.37"
Tc=6.0 min CN=93 Runoff=0.92 cfs 0.073 af

Subcatchment 19S: Catch Basin #7726 Runoff Area=880 sf 88.86% Impervious Runoff Depth>7.61"
Tc=6.0 min CN=95 Runoff=0.16 cfs 0.013 af

Reach 1aR: Flow from Culvert to Stream Avg. Flow Depth=0.13' Max Vel=1.85 fps Inflow=1.43 cfs 0.112 af
n=0.035 L=655.5' S=0.0506 '/' Capacity=22.92 cfs Outflow=1.20 cfs 0.111 af

Reach 1bR: Start of Stream Avg. Flow Depth=0.15' Max Vel=2.09 fps Inflow=1.20 cfs 0.111 af
n=0.035 L=1,438.0' S=0.0351 '/' Capacity=6.96 cfs Outflow=0.94 cfs 0.110 af

Reach 10R: Reach #10 Avg. Flow Depth=0.35' Max Vel=2.93 fps Inflow=8.84 cfs 0.725 af
n=0.035 L=453.0' S=0.0336 '/' Capacity=18.68 cfs Outflow=8.50 cfs 0.724 af

Reach 15R: Reach #15 Avg. Flow Depth=0.36' Max Vel=3.01 fps Inflow=9.01 cfs 2.413 af
n=0.035 L=198.0' S=0.0344 '/' Capacity=18.90 cfs Outflow=9.01 cfs 2.411 af

Reach 100R: Reach #100 Inflow=47.82 cfs 5.563 af
Outflow=47.82 cfs 5.563 af

Reach 200R: Reach #200 Inflow=49.68 cfs 5.871 af
Outflow=49.68 cfs 5.871 af

Reach 300R: Reach #300 Inflow=50.67 cfs 6.043 af
Outflow=50.67 cfs 6.043 af

Reach 400R: Reach #400 Inflow=55.33 cfs 6.619 af
Outflow=55.33 cfs 6.619 af

Reach 500R: Reach #500 Inflow=69.87 cfs 10.103 af
Outflow=69.87 cfs 10.103 af

Reach 600R: Reach #600 Inflow=86.75 cfs 12.211 af
Outflow=86.75 cfs 12.211 af

Reach 700R: Reach #700 Inflow=96.35 cfs 13.393 af
Outflow=96.35 cfs 13.393 af

Reach 800R: Reach #800 Inflow=100.48 cfs 13.872 af
Outflow=100.48 cfs 13.872 af

Reach 900R: Final Reach #900 Inflow=102.10 cfs 14.080 af
Outflow=102.10 cfs 14.080 af

Reach 1100R: Final Reach #1100 Inflow=39.88 cfs 5.376 af
Outflow=39.88 cfs 5.376 af

Reach 1200R: Final Reach #1200 Inflow=19.50 cfs 1.957 af
Outflow=19.50 cfs 1.957 af

Reach 1300R: Final Reach #1300 Inflow=2.98 cfs 0.304 af
Outflow=2.98 cfs 0.304 af

Pond 1EP: Catch Basin #7727 Peak Elev=138.09' Storage=2 cf Inflow=0.07 cfs 0.005 af
12.0" Round Culvert n=0.012 L=48.0' S=0.0050 '/' Outflow=0.07 cfs 0.005 af

Pond 2EP: Catch Basin #3698 Peak Elev=138.06' Storage=4 cf Inflow=0.28 cfs 0.020 af
12.0" Round Culvert n=0.012 L=8.3' S=0.0048 '/' Outflow=0.28 cfs 0.020 af

Pond 3EP: Catch Basin #7725 Peak Elev=139.02' Storage=7 cf Inflow=0.92 cfs 0.073 af
12.0" Round Culvert n=0.012 L=153.7' S=0.0050 '/' Outflow=0.92 cfs 0.073 af

Pond 4EP: Catch Basin #7726 Peak Elev=137.25' Storage=7 cf Inflow=1.43 cfs 0.112 af
24.0" Round Culvert n=0.012 L=61.5' S=0.0050 '/' Outflow=1.43 cfs 0.112 af

Pond 10P: 24" RCP Inlet Sump/Pond Peak Elev=101.21' Storage=424 cf Inflow=8.94 cfs 0.725 af
24.0" Round Culvert n=0.012 L=108.8' S=0.0104 '/' Outflow=8.84 cfs 0.725 af

Pond 15P: 12" RCP Inlet Sump/Pond Peak Elev=99.09' Storage=21,457 cf Inflow=21.34 cfs 2.414 af
Primary=9.01 cfs 2.413 af Secondary=0.00 cfs 0.000 af Outflow=9.01 cfs 2.413 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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

Subcatchment1S: Subcatchment#1 Runoff Area=616,631 sf 0.96% Impervious Runoff Depth>6.03"
Flow Length=2,050' Tc=25.3 min CN=70 Runoff=61.14 cfs 7.109 af

Subcatchment2S: Subcatchment#2 Runoff Area=33,802 sf 0.00% Impervious Runoff Depth>6.18"
Flow Length=215' Tc=8.3 min CN=71 Runoff=5.11 cfs 0.399 af

Subcatchment3S: Subcatchment#3 Runoff Area=19,435 sf 0.00% Impervious Runoff Depth>6.05"
Flow Length=240' Tc=7.0 min CN=70 Runoff=3.01 cfs 0.225 af

Subcatchment4S: Subcatchment#4 Runoff Area=64,929 sf 0.00% Impervious Runoff Depth>6.04"
Flow Length=293' Tc=14.1 min CN=70 Runoff=8.13 cfs 0.750 af

Subcatchment5S: Subcatchment#5 Runoff Area=406,239 sf 0.00% Impervious Runoff Depth>5.87"
Flow Length=1,214' Tc=48.2 min CN=69 Runoff=28.85 cfs 4.561 af

Subcatchment6S: Subcatchment#6 Runoff Area=232,739 sf 0.00% Impervious Runoff Depth>6.15"
Flow Length=881' Tc=29.5 min CN=71 Runoff=21.98 cfs 2.739 af

Subcatchment7S: Subcatchment#7 Runoff Area=133,394 sf 0.00% Impervious Runoff Depth>6.04"
Flow Length=210' Tc=17.4 min CN=70 Runoff=15.42 cfs 1.540 af

Subcatchment8S: Subcatchment#8 Runoff Area=69,837 sf 0.00% Impervious Runoff Depth>4.86"
Flow Length=381' Tc=18.1 min CN=61 Runoff=6.39 cfs 0.649 af

Subcatchment9S: Subcatchment#9 Runoff Area=30,235 sf 0.00% Impervious Runoff Depth>4.86"
Flow Length=273' Tc=13.9 min CN=61 Runoff=3.06 cfs 0.281 af

Subcatchment10S: Subcatchment#10 Runoff Area=76,002 sf 10.02% Impervious Runoff Depth>6.43"
Flow Length=280' Tc=9.4 min CN=73 Runoff=11.47 cfs 0.935 af

Subcatchment11S: Subcatchment#11 Runoff Area=246,553 sf 3.13% Impervious Runoff Depth>6.17"
Flow Length=368' Tc=13.6 min CN=71 Runoff=31.88 cfs 2.910 af

Subcatchment12S: Subcatchment#12 Runoff Area=215,562 sf 0.67% Impervious Runoff Depth>6.17"
Flow Length=462' Tc=17.7 min CN=71 Runoff=25.26 cfs 2.542 af

Subcatchment13S: Subcatchment#13 Runoff Area=33,510 sf 0.00% Impervious Runoff Depth>6.16"
Flow Length=329' Tc=18.6 min CN=71 Runoff=3.86 cfs 0.395 af

Subcatchment15S: Subcatchment#15 Runoff Area=279,874 sf 3.55% Impervious Runoff Depth>5.90"
Flow Length=553' Tc=23.7 min CN=69 Runoff=27.91 cfs 3.158 af

Subcatchment16S: Catch Basin #7727 Runoff Area=459 sf 45.75% Impervious Runoff Depth>7.46"
Tc=6.0 min CN=81 Runoff=0.09 cfs 0.007 af

Subcatchment17S: Catch Basin #3698 Runoff Area=2,300 sf 9.70% Impervious Runoff Depth>6.05"
Tc=6.0 min CN=70 Runoff=0.37 cfs 0.027 af

Subcatchment 18S: Catch Basin #7725 Runoff Area=5,195 sf 84.79% Impervious Runoff Depth>8.96"
Tc=6.0 min CN=93 Runoff=1.10 cfs 0.089 af

Subcatchment 19S: Catch Basin #7726 Runoff Area=880 sf 88.86% Impervious Runoff Depth>9.20"
Tc=6.0 min CN=95 Runoff=0.19 cfs 0.015 af

Reach 1aR: Flow from Culvert to Stream Avg. Flow Depth=0.14' Max Vel=1.98 fps Inflow=1.75 cfs 0.138 af
n=0.035 L=655.5' S=0.0506 '/' Capacity=22.92 cfs Outflow=1.49 cfs 0.137 af

Reach 1bR: Start of Stream Avg. Flow Depth=0.17' Max Vel=2.28 fps Inflow=1.49 cfs 0.137 af
n=0.035 L=1,438.0' S=0.0351 '/' Capacity=6.96 cfs Outflow=1.18 cfs 0.136 af

Reach 10R: Reach #10 Avg. Flow Depth=0.39' Max Vel=3.16 fps Inflow=11.24 cfs 0.935 af
n=0.035 L=453.0' S=0.0336 '/' Capacity=18.68 cfs Outflow=10.90 cfs 0.933 af

Reach 15R: Reach #15 Avg. Flow Depth=0.37' Max Vel=3.07 fps Inflow=9.57 cfs 3.158 af
n=0.035 L=198.0' S=0.0344 '/' Capacity=18.90 cfs Outflow=9.57 cfs 3.156 af

Reach 100R: Reach #100 Inflow=62.18 cfs 7.245 af
Outflow=62.18 cfs 7.245 af

Reach 200R: Reach #200 Inflow=64.56 cfs 7.644 af
Outflow=64.56 cfs 7.644 af

Reach 300R: Reach #300 Inflow=65.84 cfs 7.869 af
Outflow=65.84 cfs 7.869 af

Reach 400R: Reach #400 Inflow=71.97 cfs 8.619 af
Outflow=71.97 cfs 8.619 af

Reach 500R: Reach #500 Inflow=91.15 cfs 13.180 af
Outflow=91.15 cfs 13.180 af

Reach 600R: Reach #600 Inflow=112.96 cfs 15.918 af
Outflow=112.96 cfs 15.918 af

Reach 700R: Reach #700 Inflow=125.49 cfs 17.459 af
Outflow=125.49 cfs 17.459 af

Reach 800R: Reach #800 Inflow=131.12 cfs 18.108 af
Outflow=131.12 cfs 18.108 af

Reach 900R: Final Reach #900 Inflow=133.32 cfs 18.389 af
Outflow=133.32 cfs 18.389 af

Reach 1100R: Final Reach #1100 Inflow=50.15 cfs 7.000 af
Outflow=50.15 cfs 7.000 af

Reach 1200R: Final Reach #1200 Inflow=25.26 cfs 2.542 af
Outflow=25.26 cfs 2.542 af

Reach 1300R: Final Reach #1300 Inflow=3.86 cfs 0.395 af
Outflow=3.86 cfs 0.395 af

Pond 1EP: Catch Basin #7727 Peak Elev=138.11' Storage=2 cf Inflow=0.09 cfs 0.007 af
12.0" Round Culvert n=0.012 L=48.0' S=0.0050 '/' Outflow=0.09 cfs 0.007 af

Pond 2EP: Catch Basin #3698 Peak Elev=138.10' Storage=5 cf Inflow=0.37 cfs 0.027 af
12.0" Round Culvert n=0.012 L=8.3' S=0.0048 '/' Outflow=0.37 cfs 0.027 af

Pond 3EP: Catch Basin #7725 Peak Elev=139.08' Storage=8 cf Inflow=1.10 cfs 0.089 af
12.0" Round Culvert n=0.012 L=153.7' S=0.0050 '/' Outflow=1.10 cfs 0.089 af

Pond 4EP: Catch Basin #7726 Peak Elev=137.32' Storage=8 cf Inflow=1.75 cfs 0.138 af
24.0" Round Culvert n=0.012 L=61.5' S=0.0050 '/' Outflow=1.75 cfs 0.138 af

Pond 10P: 24" RCP Inlet Sump/Pond Peak Elev=101.44' Storage=611 cf Inflow=11.47 cfs 0.935 af
24.0" Round Culvert n=0.012 L=108.8' S=0.0104 '/' Outflow=11.24 cfs 0.935 af

Pond 15P: 12" RCP Inlet Sump/Pond Peak Elev=99.97' Storage=33,847 cf Inflow=27.91 cfs 3.158 af
Primary=9.57 cfs 3.158 af Secondary=0.00 cfs 0.000 af Outflow=9.57 cfs 3.158 af

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.951	61	>75% Grass cover, Good, HSG B (1S, 5S, 10S, 11S, 15S, 16S, 17S, 18S, 19S)
2.395	74	>75% Grass cover, Good, HSG C (1S, 10S, 11S, 12S, 15S, 16S, 17S, 18S, 19S)
0.136	80	>75% Grass cover, Good, HSG D (12S)
0.205	96	Gravel surface, HSG C (10S, 11S, 15S)
0.125	98	Paved parking, HSG B (10S, 11S, 15S, 16S, 17S, 18S, 19S)
0.374	98	Paved parking, HSG C (10S, 11S, 12S, 15S, 16S, 17S, 18S, 19S)
0.082	98	Roofs, HSG B (10S, 11S, 15S)
0.154	98	Roofs, HSG C (10S, 11S, 15S)
0.046	98	Unconnected pavement, HSG B (1S)
0.046	98	Unconnected pavement, HSG C (1S)
0.021	98	Unconnected roofs, HSG B (1S)
0.029	98	Unconnected roofs, HSG C (1S, 12S)
0.579	30	Woods, Good, HSG A (7S, 8S, 9S)
4.674	55	Woods, Good, HSG B (1S, 5S, 6S, 10S, 11S, 15S)
39.021	70	Woods, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 15S)
7.809	77	Woods, Good, HSG D (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 12S, 13S, 15S)
56.648	**70**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.579	HSG A	7S, 8S, 9S
5.900	HSG B	1S, 5S, 6S, 10S, 11S, 15S, 16S, 17S, 18S, 19S
42.224	HSG C	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 15S, 16S, 17S, 18S, 19S
7.945	HSG D	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 12S, 13S, 15S
0.000	Other	
56.648		**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	0.951	2.395	0.136	0.000	3.483	>75% Grass cover, Good	1S, 5S, 10S, 11S, 12S, 15S, 16S, 17S, 18S, 19S
0.000	0.000	0.205	0.000	0.000	0.205	Gravel surface	10S, 11S, 15S
0.000	0.125	0.374	0.000	0.000	0.499	Paved parking	10S, 11S, 12S, 15S, 16S, 17S, 18S, 19S
0.000	0.082	0.154	0.000	0.000	0.236	Roofs	10S, 11S, 15S
0.000	0.046	0.046	0.000	0.000	0.092	Unconnected pavement	1S
0.000	0.021	0.029	0.000	0.000	0.050	Unconnected roofs	1S, 12S
0.579	4.674	39.021	7.809	0.000	52.082	Woods, Good	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 15S
0.579	**5.900**	**42.224**	**7.945**	**0.000**	**56.648**	**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	1EP	137.94	137.70	48.0	0.0050	0.012	12.0	0.0	0.0
2	2EP	137.74	137.70	8.3	0.0048	0.012	12.0	0.0	0.0
3	3EP	138.47	137.70	153.7	0.0050	0.012	12.0	0.0	0.0
4	4EP	136.70	136.39	61.5	0.0050	0.012	24.0	0.0	0.0
5	10P	99.87	98.74	108.8	0.0104	0.012	24.0	0.0	0.0
6	15P	92.91	90.32	84.3	0.0307	0.012	12.0	0.0	0.0

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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

Subcatchment1S: Subcatchment#1 Runoff Area=616,631 sf 0.96% Impervious Runoff Depth>3.49"
Flow Length=2,050' Tc=25.3 min CN=70 Runoff=35.41 cfs 4.120 af

Subcatchment2S: Subcatchment#2 Runoff Area=33,802 sf 0.00% Impervious Runoff Depth>3.61"
Flow Length=215' Tc=8.3 min CN=71 Runoff=2.99 cfs 0.233 af

Subcatchment3S: Subcatchment#3 Runoff Area=19,435 sf 0.00% Impervious Runoff Depth>3.51"
Flow Length=240' Tc=7.0 min CN=70 Runoff=1.75 cfs 0.130 af

Subcatchment4S: Subcatchment#4 Runoff Area=64,929 sf 0.00% Impervious Runoff Depth>3.50"
Flow Length=293' Tc=14.1 min CN=70 Runoff=4.71 cfs 0.435 af

Subcatchment5S: Subcatchment#5 Runoff Area=406,239 sf 0.00% Impervious Runoff Depth>3.37"
Flow Length=1,214' Tc=48.2 min CN=69 Runoff=16.54 cfs 2.620 af

Subcatchment6S: Subcatchment#6 Runoff Area=232,739 sf 0.00% Impervious Runoff Depth>3.59"
Flow Length=881' Tc=29.5 min CN=71 Runoff=12.86 cfs 1.600 af

Subcatchment7S: Subcatchment#7 Runoff Area=133,394 sf 0.00% Impervious Runoff Depth>3.50"
Flow Length=210' Tc=17.4 min CN=70 Runoff=8.93 cfs 0.893 af

Subcatchment8S: Subcatchment#8 Runoff Area=69,837 sf 0.00% Impervious Runoff Depth>2.60"
Flow Length=381' Tc=18.1 min CN=61 Runoff=3.33 cfs 0.347 af

Subcatchment9S: Subcatchment#9 Runoff Area=30,235 sf 0.00% Impervious Runoff Depth>2.60"
Flow Length=273' Tc=13.9 min CN=61 Runoff=1.59 cfs 0.150 af

Subcatchment10S: Subcatchment#10 Runoff Area=76,002 sf 10.02% Impervious Runoff Depth>3.82"
Flow Length=280' Tc=9.4 min CN=73 Runoff=6.86 cfs 0.555 af

Subcatchment11S: Subcatchment#11 Runoff Area=246,553 sf 3.13% Impervious Runoff Depth>3.61"
Flow Length=368' Tc=13.6 min CN=71 Runoff=18.67 cfs 1.700 af

Subcatchment12S: Subcatchment#12 Runoff Area=215,562 sf 0.67% Impervious Runoff Depth>3.60"
Flow Length=462' Tc=17.7 min CN=71 Runoff=14.78 cfs 1.485 af

Subcatchment13S: Subcatchment#13 Runoff Area=33,510 sf 0.00% Impervious Runoff Depth>3.60"
Flow Length=329' Tc=18.6 min CN=71 Runoff=2.26 cfs 0.231 af

Subcatchment15S: Subcatchment#15 Runoff Area=279,874 sf 3.55% Impervious Runoff Depth>3.39"
Flow Length=553' Tc=23.7 min CN=69 Runoff=15.99 cfs 1.816 af

Subcatchment16S: Catch Basin #7727 Runoff Area=459 sf 45.75% Impervious Runoff Depth>4.68"
Tc=6.0 min CN=81 Runoff=0.06 cfs 0.004 af

Subcatchment17S: Catch Basin #3698 Runoff Area=2,300 sf 9.70% Impervious Runoff Depth>3.51"
Tc=6.0 min CN=70 Runoff=0.21 cfs 0.015 af

Subcatchment 18S: Catch Basin #7725 Runoff Area=5,195 sf 84.79% Impervious Runoff Depth>6.04"
Tc=6.0 min CN=93 Runoff=0.76 cfs 0.060 af

Subcatchment 19S: Catch Basin #7726 Runoff Area=880 sf 88.86% Impervious Runoff Depth>6.27"
Tc=6.0 min CN=95 Runoff=0.13 cfs 0.011 af

Reach 1aR: Flow from Culvert to Stream Avg. Flow Depth=0.12' Max Vel=1.73 fps Inflow=1.16 cfs 0.090 af
n=0.035 L=655.5' S=0.0506 '/' Capacity=22.92 cfs Outflow=0.96 cfs 0.090 af

Reach 1bR: Start of Stream Avg. Flow Depth=0.13' Max Vel=1.91 fps Inflow=0.96 cfs 0.090 af
n=0.035 L=1,438.0' S=0.0351 '/' Capacity=6.96 cfs Outflow=0.74 cfs 0.089 af

Reach 10R: Reach #10 Avg. Flow Depth=0.31' Max Vel=2.70 fps Inflow=6.82 cfs 0.555 af
n=0.035 L=453.0' S=0.0336 '/' Capacity=18.68 cfs Outflow=6.50 cfs 0.554 af

Reach 15R: Reach #15 Avg. Flow Depth=0.34' Max Vel=2.93 fps Inflow=8.20 cfs 1.815 af
n=0.035 L=198.0' S=0.0344 '/' Capacity=18.90 cfs Outflow=8.20 cfs 1.814 af

Reach 100R: Reach #100 Inflow=36.09 cfs 4.208 af
Outflow=36.09 cfs 4.208 af

Reach 200R: Reach #200 Inflow=37.51 cfs 4.442 af
Outflow=37.51 cfs 4.442 af

Reach 300R: Reach #300 Inflow=38.27 cfs 4.572 af
Outflow=38.27 cfs 4.572 af

Reach 400R: Reach #400 Inflow=41.78 cfs 5.007 af
Outflow=41.78 cfs 5.007 af

Reach 500R: Reach #500 Inflow=52.56 cfs 7.627 af
Outflow=52.56 cfs 7.627 af

Reach 600R: Reach #600 Inflow=65.36 cfs 9.227 af
Outflow=65.36 cfs 9.227 af

Reach 700R: Reach #700 Inflow=72.58 cfs 10.120 af
Outflow=72.58 cfs 10.120 af

Reach 800R: Reach #800 Inflow=75.52 cfs 10.467 af
Outflow=75.52 cfs 10.467 af

Reach 900R: Final Reach #900 Inflow=76.69 cfs 10.617 af
Outflow=76.69 cfs 10.617 af

Reach 1100R: Final Reach #1100 Inflow=31.29 cfs 4.068 af
Outflow=31.29 cfs 4.068 af

Reach 1200R: Final Reach #1200 Inflow=14.78 cfs 1.485 af
Outflow=14.78 cfs 1.485 af

Reach 1300R: Final Reach #1300 Inflow=2.26 cfs 0.231 af
Outflow=2.26 cfs 0.231 af

Pond 1EP: Catch Basin #7727 Peak Elev=138.07' Storage=2 cf Inflow=0.06 cfs 0.004 af
12.0" Round Culvert n=0.012 L=48.0' S=0.0050 '/' Outflow=0.06 cfs 0.004 af

Pond 2EP: Catch Basin #3698 Peak Elev=138.01' Storage=3 cf Inflow=0.21 cfs 0.015 af
12.0" Round Culvert n=0.012 L=8.3' S=0.0048 '/' Outflow=0.21 cfs 0.015 af

Pond 3EP: Catch Basin #7725 Peak Elev=138.96' Storage=6 cf Inflow=0.76 cfs 0.060 af
12.0" Round Culvert n=0.012 L=153.7' S=0.0050 '/' Outflow=0.76 cfs 0.060 af

Pond 4EP: Catch Basin #7726 Peak Elev=137.20' Storage=6 cf Inflow=1.16 cfs 0.090 af
24.0" Round Culvert n=0.012 L=61.5' S=0.0050 '/' Outflow=1.16 cfs 0.090 af

Pond 10P: 24" RCP Inlet Sump/Pond Peak Elev=101.02' Storage=299 cf Inflow=6.86 cfs 0.555 af
24.0" Round Culvert n=0.012 L=108.8' S=0.0104 '/' Outflow=6.82 cfs 0.555 af

Pond 15P: 12" RCP Inlet Sump/Pond Peak Elev=98.12' Storage=12,599 cf Inflow=15.99 cfs 1.816 af
Primary=8.20 cfs 1.815 af Secondary=0.00 cfs 0.000 af Outflow=8.20 cfs 1.815 af

Total Runoff Area = 56.648 ac Runoff Volume = 16.406 af Average Runoff Depth = 3.48"
98.45% Pervious = 55.770 ac 1.55% Impervious = 0.878 ac

Summary for Subcatchment 1S: Subcatchment #1

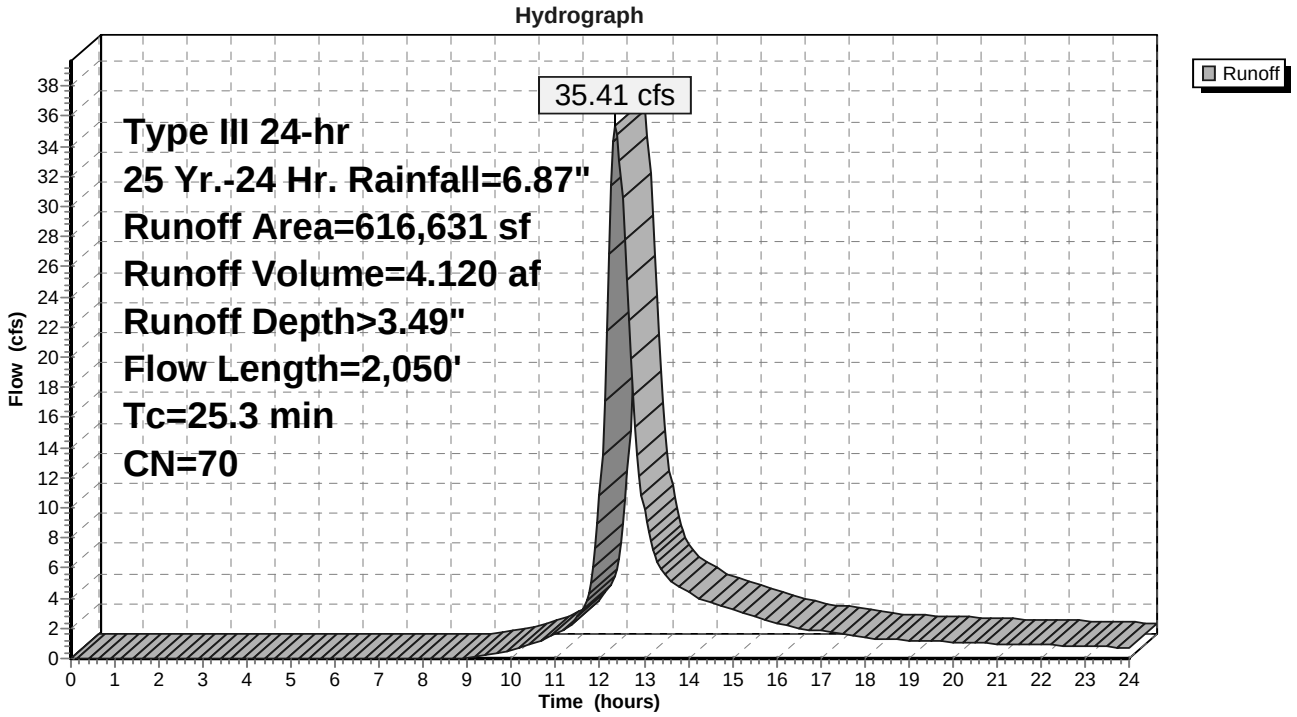
Runoff = 35.41 cfs @ 12.36 hrs, Volume= 4.120 af, Depth> 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
8,381	74	>75% Grass cover, Good, HSG C
8,381	61	>75% Grass cover, Good, HSG B
2,012	98	Unconnected pavement, HSG C
2,012	98	Unconnected pavement, HSG B
936	98	Unconnected roofs, HSG C
936	98	Unconnected roofs, HSG B
65,876	55	Woods, Good, HSG B
396,739	70	Woods, Good, HSG C
131,358	77	Woods, Good, HSG D
616,631	70	Weighted Average
610,735		99.04% Pervious Area
5,896		0.96% Impervious Area
5,896		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	60	0.1500	0.17		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
5.7	40	0.0750	0.12		**Sheet Flow, Segment #2** Woods: Light underbrush n= 0.400 P2= 3.61"
0.1	20	0.2500	2.50		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
7.9	492	0.0427	1.03		**Shallow Concentrated Flow, Segment #4** Woodland Kv= 5.0 fps
5.6	1,438	0.0351	4.28	6.95	**Trap/Vee/Rect Channel Flow, Segment #5** Bot.W=3.00' D=0.50' Z= 0.5 '/' Top.W=3.50' n= 0.035 Earth, dense weeds
25.3	2,050	Total			

Subcatchment 1S: Subcatchment #1



Summary for Subcatchment 2S: Subcatchment #2

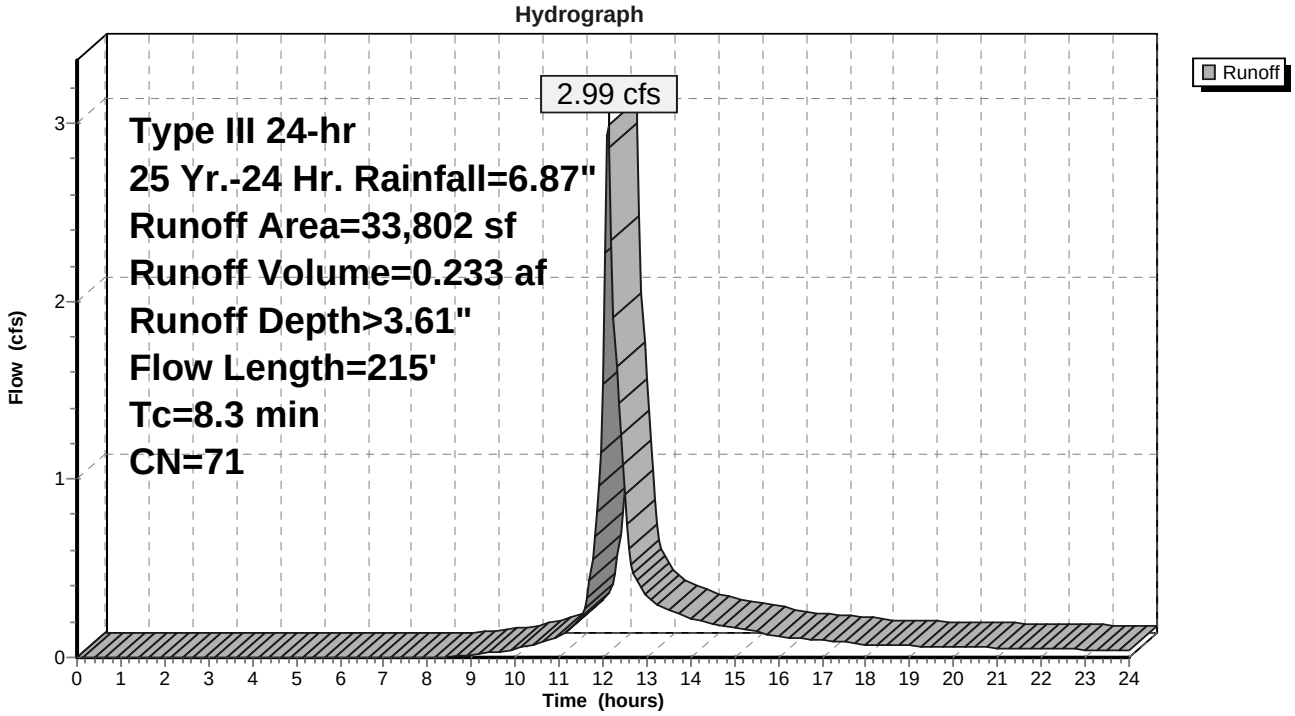
Runoff = 2.99 cfs @ 12.12 hrs, Volume= 0.233 af, Depth> 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
29,699	70	Woods, Good, HSG C
4,103	77	Woods, Good, HSG D
33,802	71	Weighted Average
33,802		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	69	0.1159	0.15		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
0.7	109	0.2477	2.49		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
0.2	37	0.4852	3.48		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
8.3	215	Total			

Subcatchment 2S: Subcatchment #2



Summary for Subcatchment 3S: Subcatchment #3

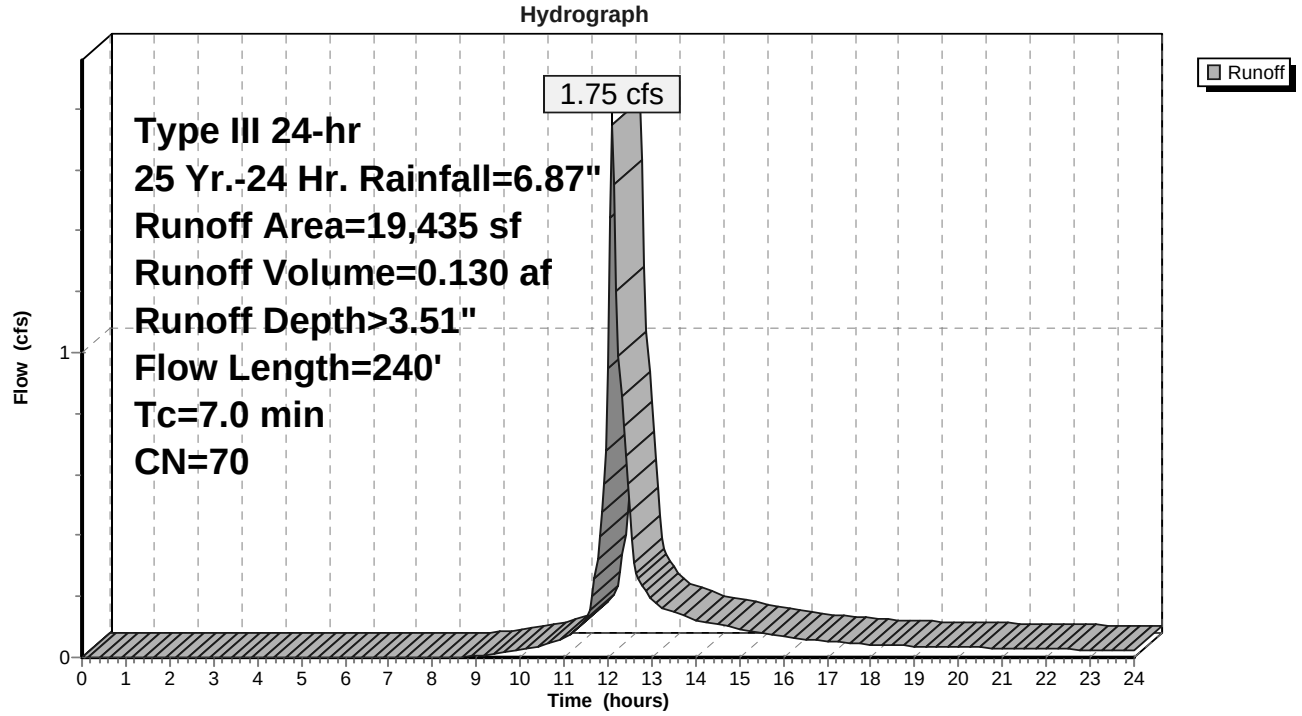
Runoff = 1.75 cfs @ 12.11 hrs, Volume= 0.130 af, Depth> 3.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
18,831	70	Woods, Good, HSG C
604	77	Woods, Good, HSG D
19,435	70	Weighted Average
19,435		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	53	0.1226	0.15		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
0.2	33	0.2406	2.45		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
0.9	154	0.3052	2.76		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
7.0	240	Total			

Subcatchment 3S: Subcatchment #3



Summary for Subcatchment 4S: Subcatchment #4

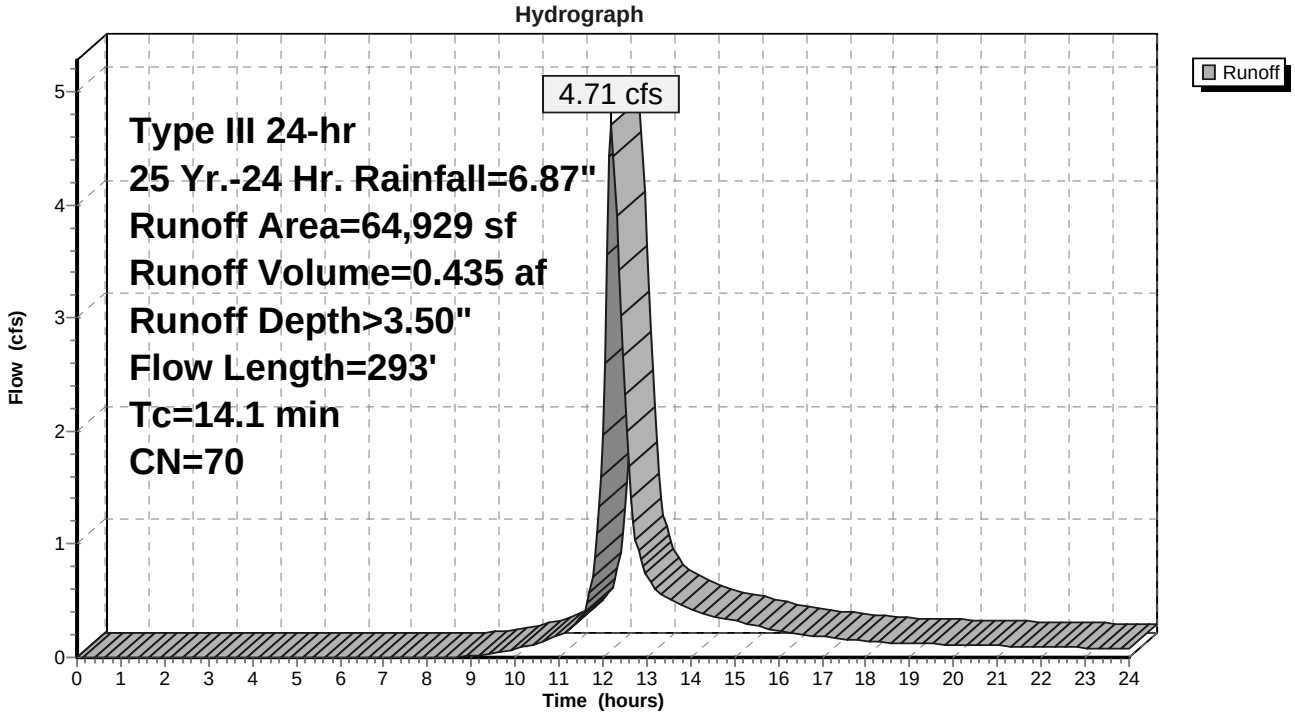
Runoff = 4.71 cfs @ 12.20 hrs, Volume= 0.435 af, Depth> 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
61,644	70	Woods, Good, HSG C
3,285	77	Woods, Good, HSG D
64,929	70	Weighted Average
64,929		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	100	0.0625	0.13		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
1.1	157	0.2299	2.40		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
0.2	36	0.4049	3.18		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
14.1	293	Total			

Subcatchment 4S: Subcatchment #4



Summary for Subcatchment 5S: Subcatchment #5

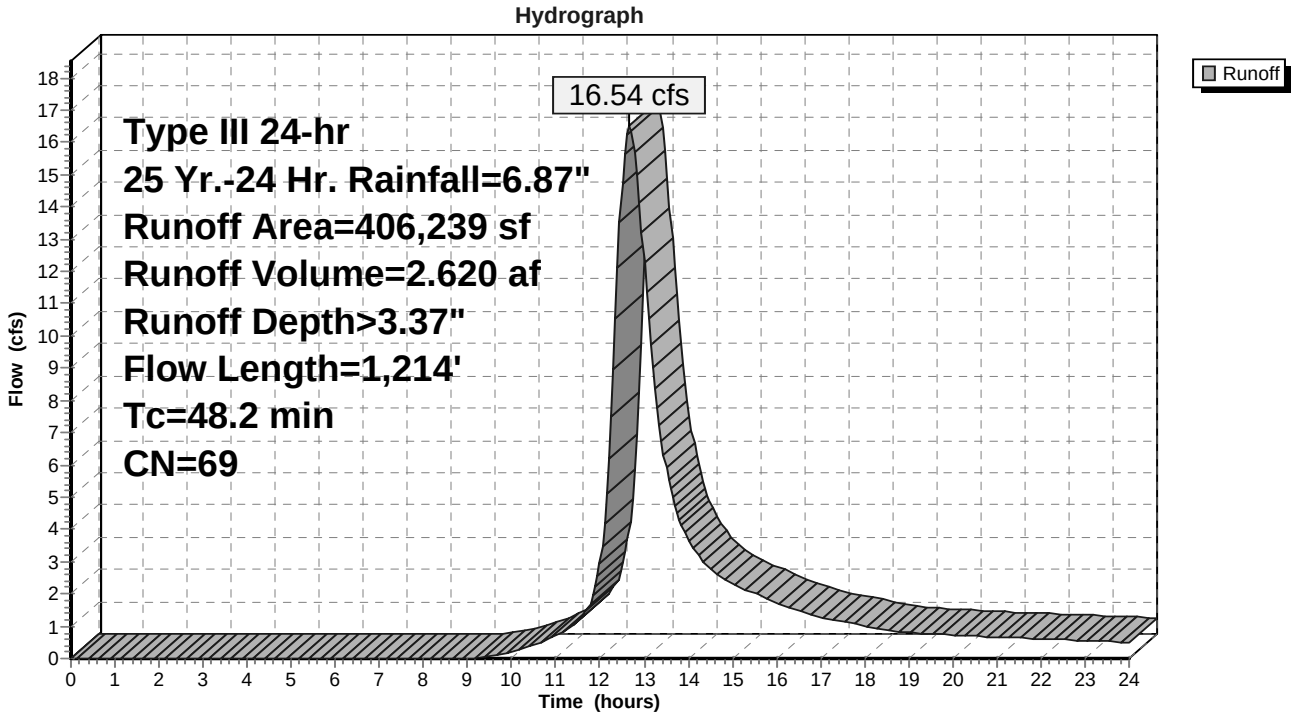
Runoff = 16.54 cfs @ 12.68 hrs, Volume= 2.620 af, Depth> 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
73,493	55	Woods, Good, HSG B
226,426	70	Woods, Good, HSG C
106,036	77	Woods, Good, HSG D
284	61	>75% Grass cover, Good, HSG B
406,239	69	Weighted Average
406,239		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.7	100	0.0150	0.07		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
1.1	80	0.0625	1.25		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
14.2	330	0.0060	0.39		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
1.4	81	0.0370	0.96		**Shallow Concentrated Flow, Segment #4** Woodland Kv= 5.0 fps
0.6	78	0.2175	2.33		**Shallow Concentrated Flow, Segment #5** Woodland Kv= 5.0 fps
3.3	223	0.0516	1.14		**Shallow Concentrated Flow, Segment #6** Woodland Kv= 5.0 fps
4.2	219	0.0296	0.86		**Shallow Concentrated Flow, Segment #7** Woodland Kv= 5.0 fps
0.7	103	0.2195	2.34		**Shallow Concentrated Flow, Segment #8** Woodland Kv= 5.0 fps
48.2	1,214	Total			

Subcatchment 5S: Subcatchment #5



Summary for Subcatchment 6S: Subcatchment #6

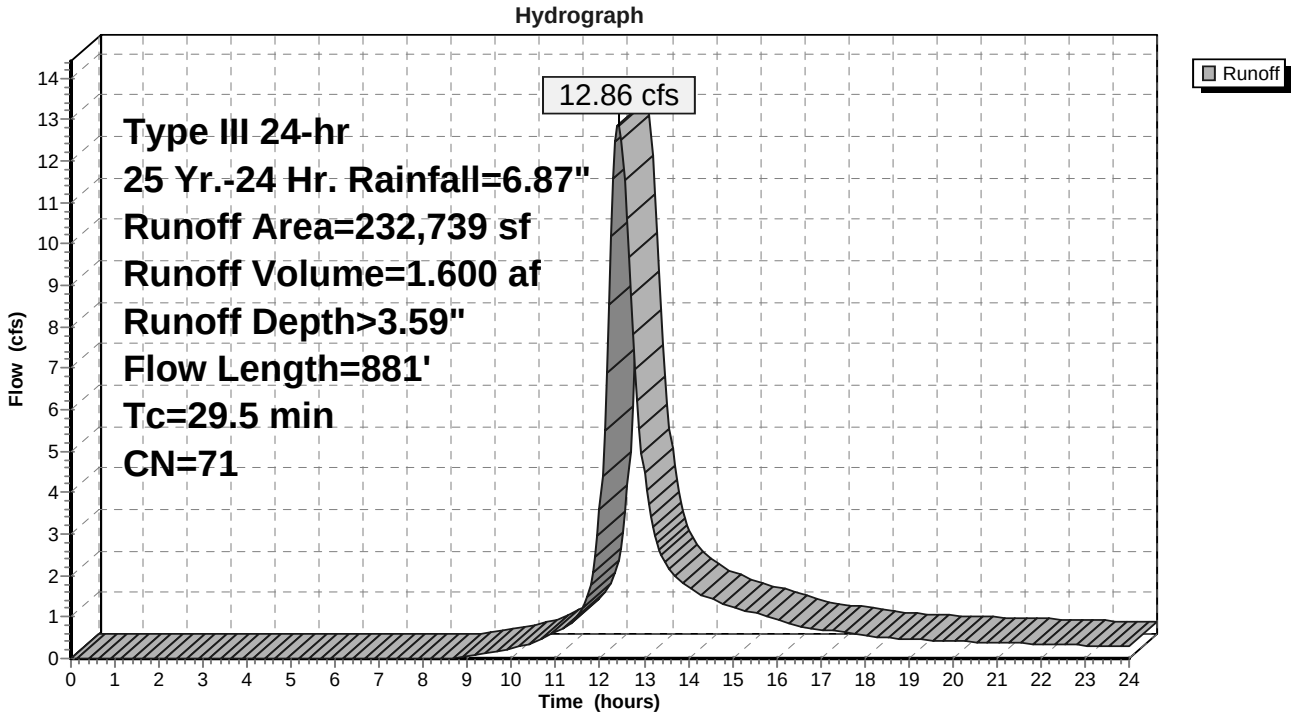
Runoff = 12.86 cfs @ 12.42 hrs, Volume= 1.600 af, Depth> 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
5,898	55	Woods, Good, HSG B
191,340	70	Woods, Good, HSG C
35,501	77	Woods, Good, HSG D
232,739	71	Weighted Average
232,739		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.2	100	0.0200	0.08		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
1.4	64	0.0230	0.76		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
4.4	374	0.0803	1.42		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
0.6	56	0.0887	1.49		**Shallow Concentrated Flow, Segment #4** Woodland Kv= 5.0 fps
2.9	287	0.1125	1.68		**Shallow Concentrated Flow, Segment #5** Woodland Kv= 5.0 fps
29.5	881	Total			

Subcatchment 6S: Subcatchment #6



Summary for Subcatchment 7S: Subcatchment #7

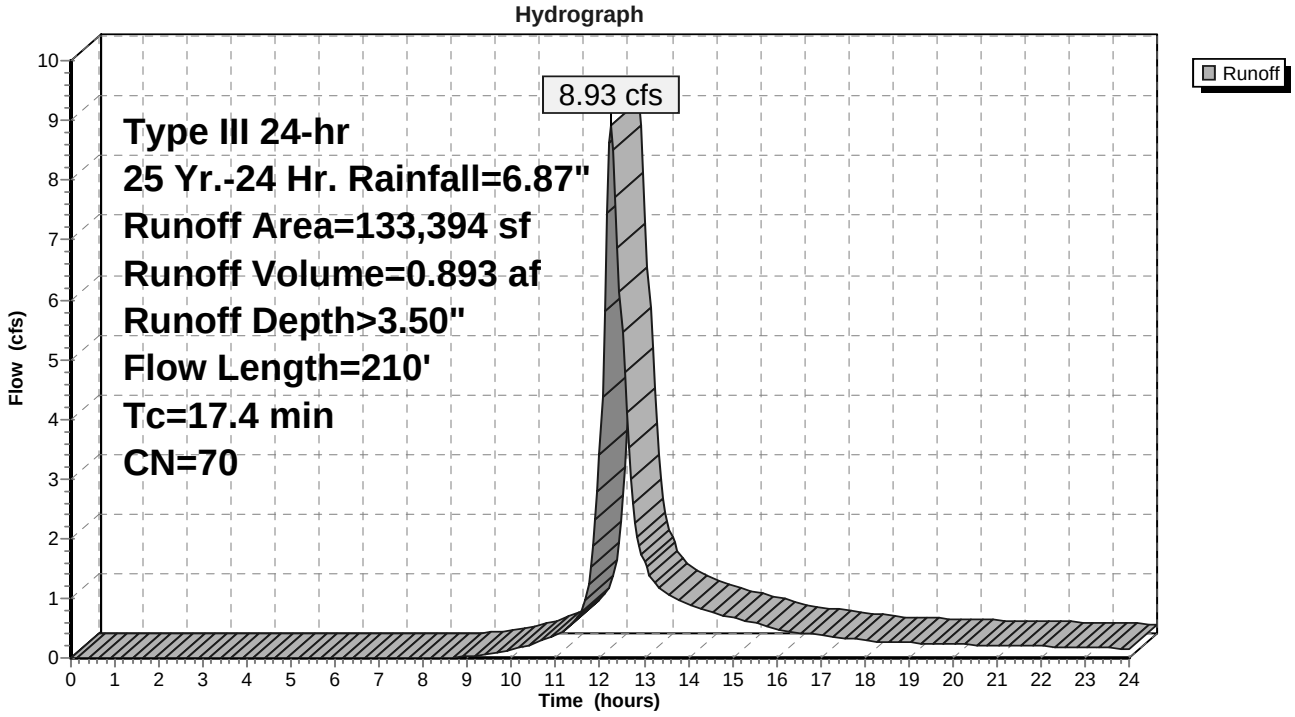
Runoff = 8.93 cfs @ 12.25 hrs, Volume= 0.893 af, Depth> 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
1,591	30	Woods, Good, HSG A
123,735	70	Woods, Good, HSG C
8,068	77	Woods, Good, HSG D
133,394	70	Weighted Average
133,394		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	100	0.0350	0.10		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
1.1	94	0.0850	1.46		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
0.1	16	0.4000	3.16		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
17.4	210	Total			

Subcatchment 7S: Subcatchment #7



Summary for Subcatchment 8S: Subcatchment #8

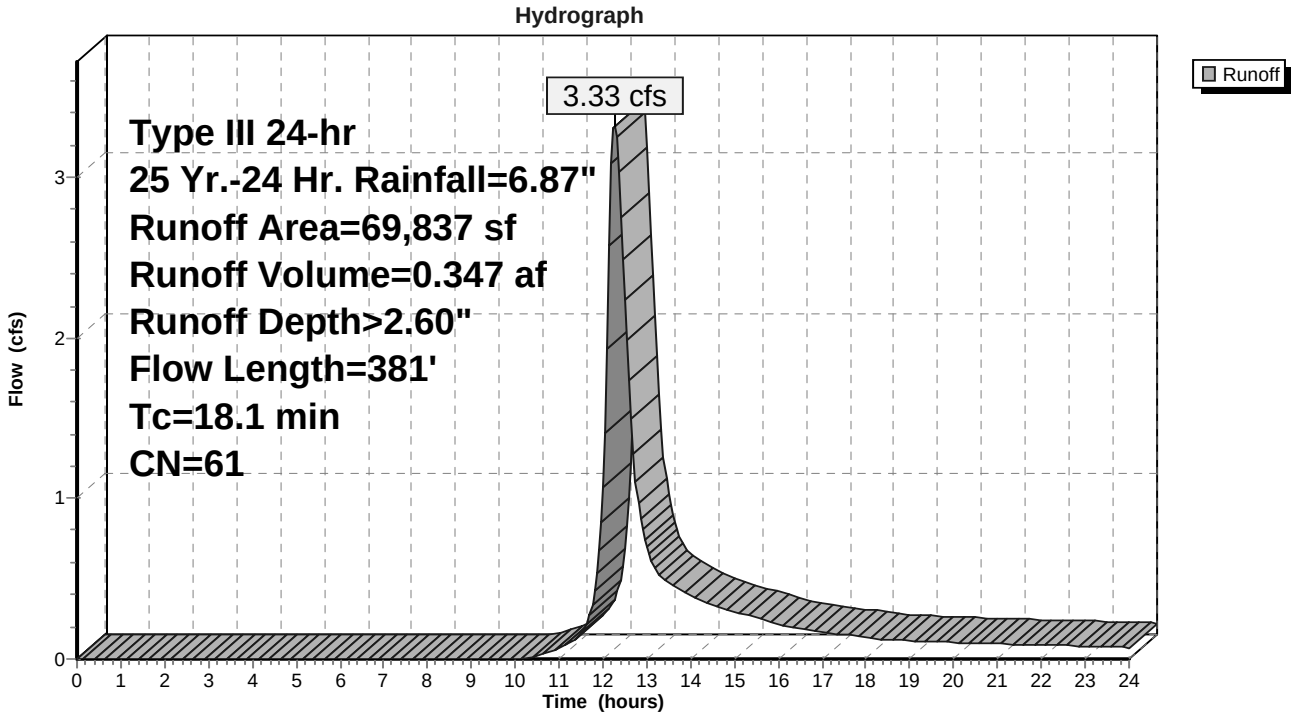
Runoff = 3.33 cfs @ 12.27 hrs, Volume= 0.347 af, Depth> 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
16,548	30	Woods, Good, HSG A
47,189	70	Woods, Good, HSG C
6,100	77	Woods, Good, HSG D
69,837	61	Weighted Average
69,837		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	100	0.0475	0.12		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
1.1	70	0.0429	1.04		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
1.9	139	0.0612	1.24		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
0.8	72	0.0900	1.50		**Shallow Concentrated Flow, Segment #4** Woodland Kv= 5.0 fps
18.1	381	Total			

Subcatchment 8S: Subcatchment #8



Summary for Subcatchment 9S: Subcatchment #9

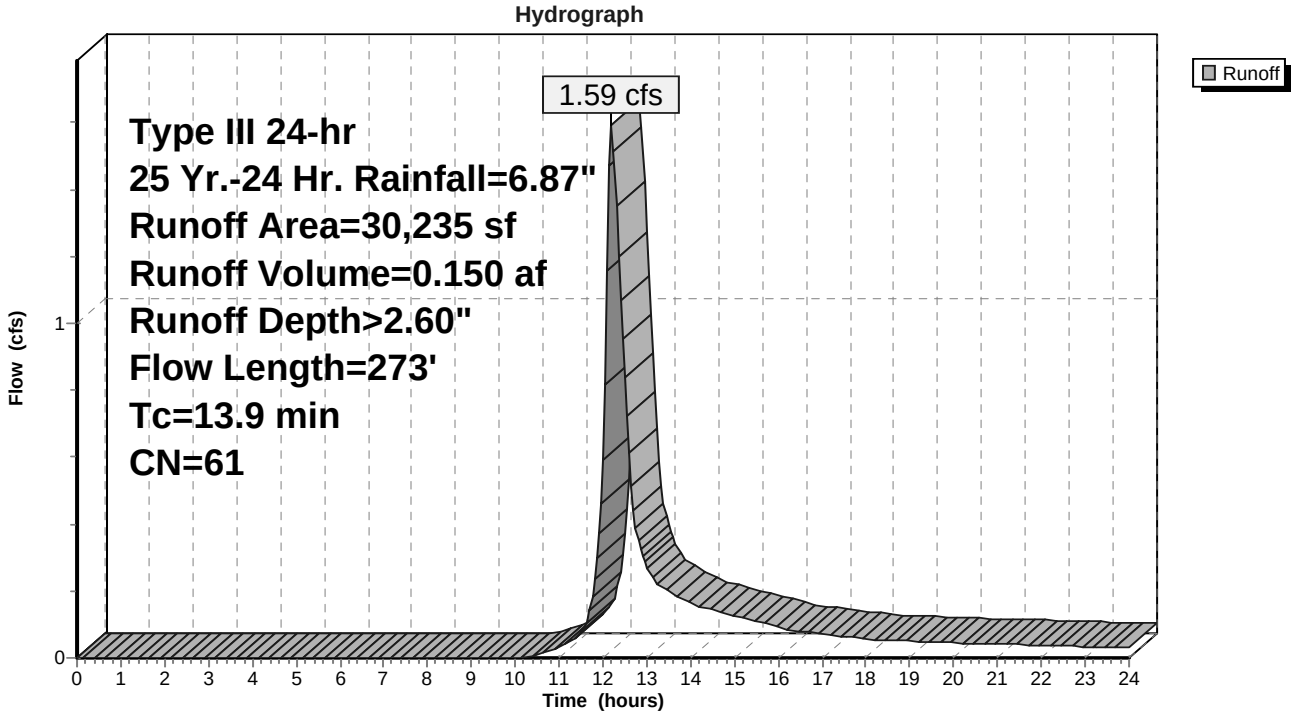
Runoff = 1.59 cfs @ 12.20 hrs, Volume= 0.150 af, Depth> 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
7,072	30	Woods, Good, HSG A
20,587	70	Woods, Good, HSG C
2,576	77	Woods, Good, HSG D
30,235	61	Weighted Average
30,235		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	100	0.0925	0.15		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
2.9	173	0.0404	1.00		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
13.9	273	Total			

Subcatchment 9S: Subcatchment #9



Summary for Subcatchment 10S: Subcatchment #10

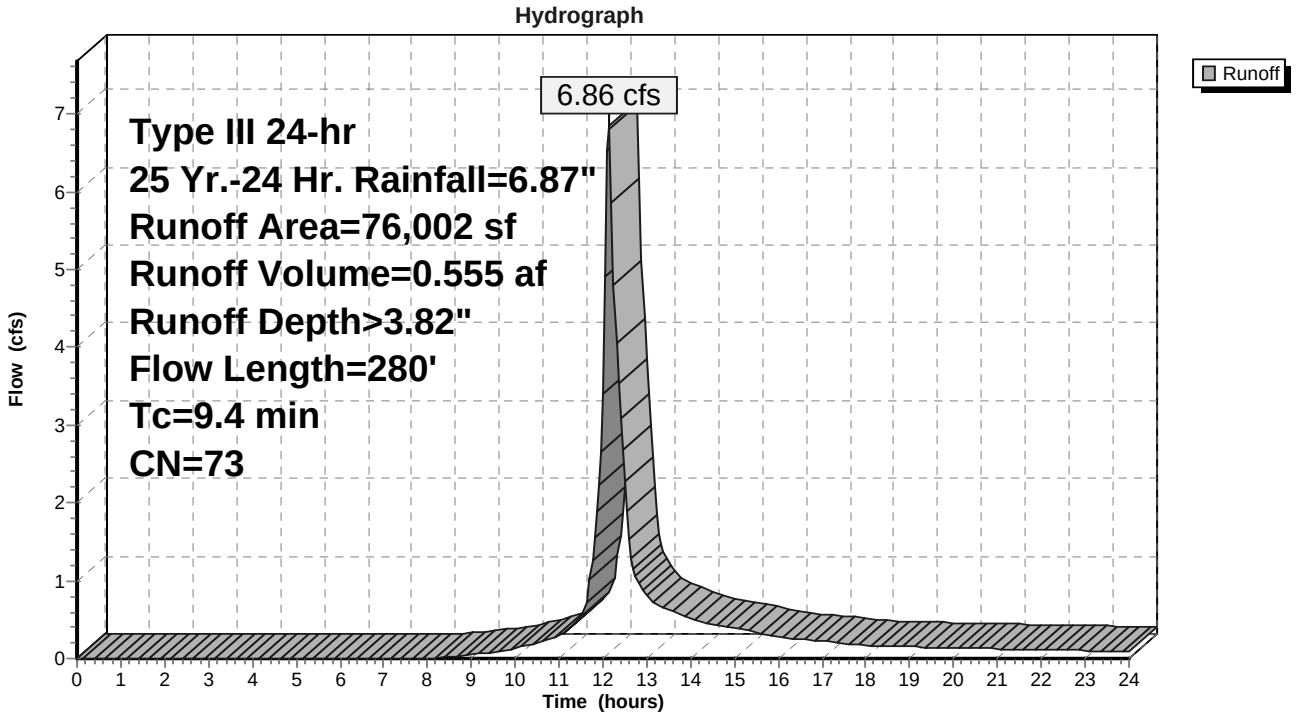
Runoff = 6.86 cfs @ 12.14 hrs, Volume= 0.555 af, Depth> 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
3,711	61	>75% Grass cover, Good, HSG B
18,577	74	>75% Grass cover, Good, HSG C
380	98	Paved parking, HSG B
5,183	98	Paved parking, HSG C
506	98	Roofs, HSG B
1,544	98	Roofs, HSG C
6,534	55	Woods, Good, HSG B
37,829	70	Woods, Good, HSG C
1,738	96	Gravel surface, HSG C
76,002	73	Weighted Average
68,389		89.98% Pervious Area
7,613		10.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0330	0.22		**Sheet Flow, Segment #1** Grass: Short n= 0.150 P2= 3.61"
0.5	53	0.1500	1.94		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
0.4	49	0.1420	1.88		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
0.9	78	0.0770	1.39		**Shallow Concentrated Flow, Segment #4** Woodland Kv= 5.0 fps
9.4	280	Total			

Subcatchment 10S: Subcatchment #10



Summary for Subcatchment 11S: Subcatchment #11

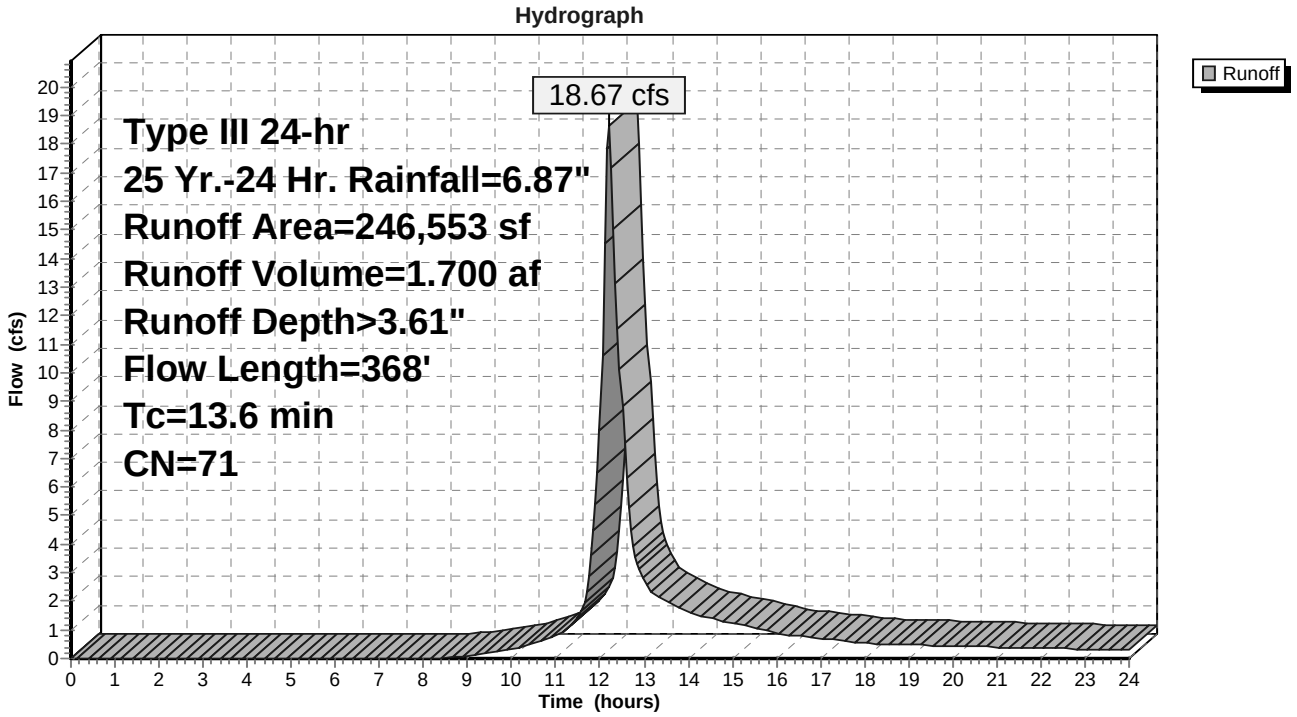
Runoff = 18.67 cfs @ 12.19 hrs, Volume= 1.700 af, Depth> 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
13,485	61	>75% Grass cover, Good, HSG B
16,120	74	>75% Grass cover, Good, HSG C
1,288	98	Paved parking, HSG B
3,713	98	Paved parking, HSG C
1,573	98	Roofs, HSG B
1,151	98	Roofs, HSG C
4,467	96	Gravel surface, HSG C
1,554	55	Woods, Good, HSG B
203,202	70	Woods, Good, HSG C
246,553	71	Weighted Average
238,828		96.87% Pervious Area
7,725		3.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.1100	0.16		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
3.4	268	0.0700	1.32		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
13.6	368	Total			

Subcatchment 11S: Subcatchment #11



Summary for Subcatchment 12S: Subcatchment #12

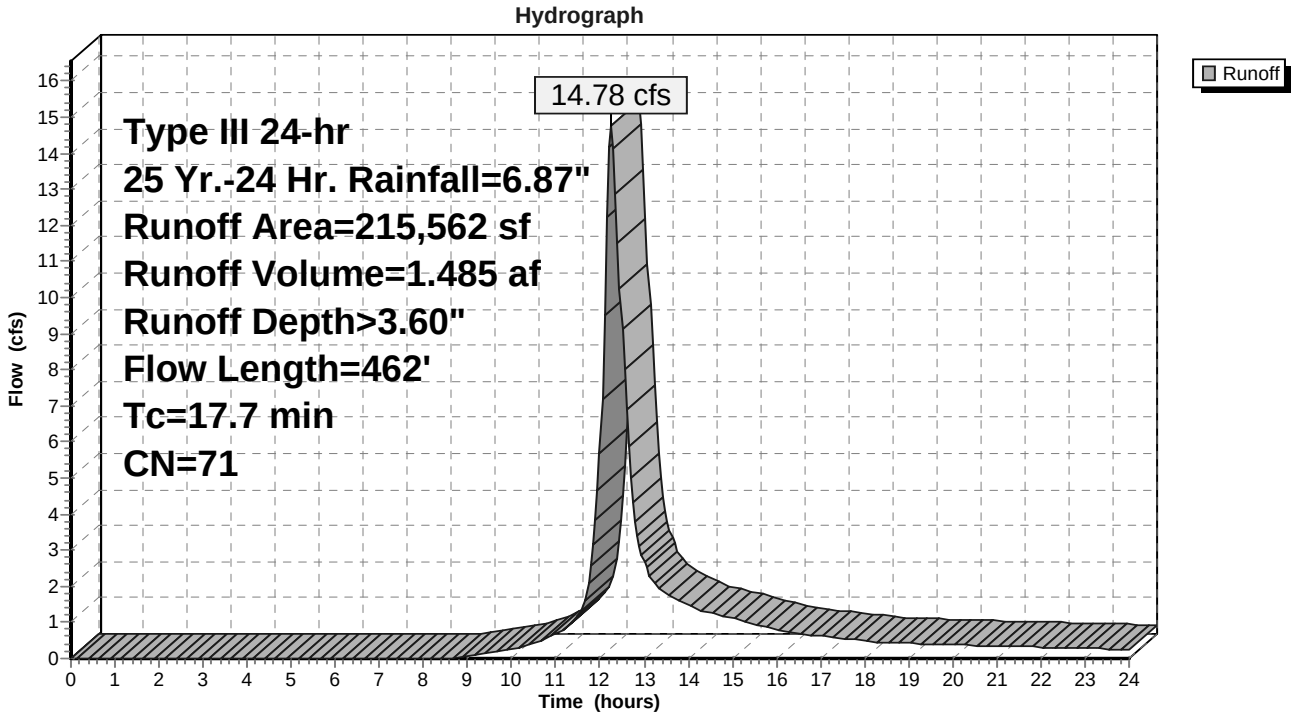
Runoff = 14.78 cfs @ 12.25 hrs, Volume= 1.485 af, Depth> 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
319	98	Unconnected roofs, HSG C
24,044	74	>75% Grass cover, Good, HSG C
1,116	98	Paved parking, HSG C
182,591	70	Woods, Good, HSG C
5,915	80	>75% Grass cover, Good, HSG D
1,577	77	Woods, Good, HSG D
215,562	71	Weighted Average
214,127		99.33% Pervious Area
1,435		0.67% Impervious Area
319		22.23% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0550	0.12		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
1.4	71	0.0281	0.84		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
2.8	291	0.1170	1.71		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
17.7	462	Total			

Subcatchment 12S: Subcatchment #12



Summary for Subcatchment 13S: Subcatchment #13

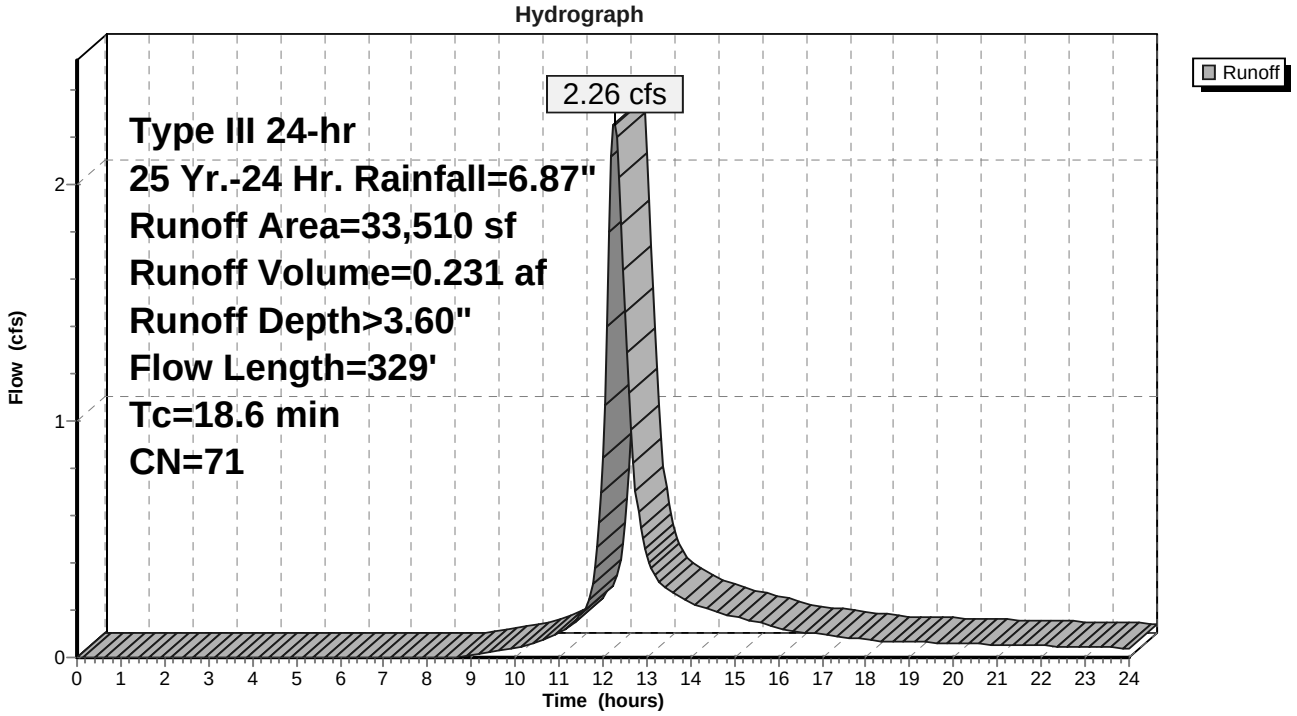
Runoff = 2.26 cfs @ 12.26 hrs, Volume= 0.231 af, Depth> 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
26,508	70	Woods, Good, HSG C
7,002	77	Woods, Good, HSG D
33,510	71	Weighted Average
33,510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	67	0.1084	0.15		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
6.0	33	0.0453	0.09		**Sheet Flow, Segment #2** Woods: Light underbrush n= 0.400 P2= 3.61"
5.0	215	0.0209	0.72		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
0.1	14	0.1817	2.13		**Shallow Concentrated Flow, Segment #4** Woodland Kv= 5.0 fps
18.6	329	Total			

Subcatchment 13S: Subcatchment #13



Summary for Subcatchment 15S: Subcatchment #15

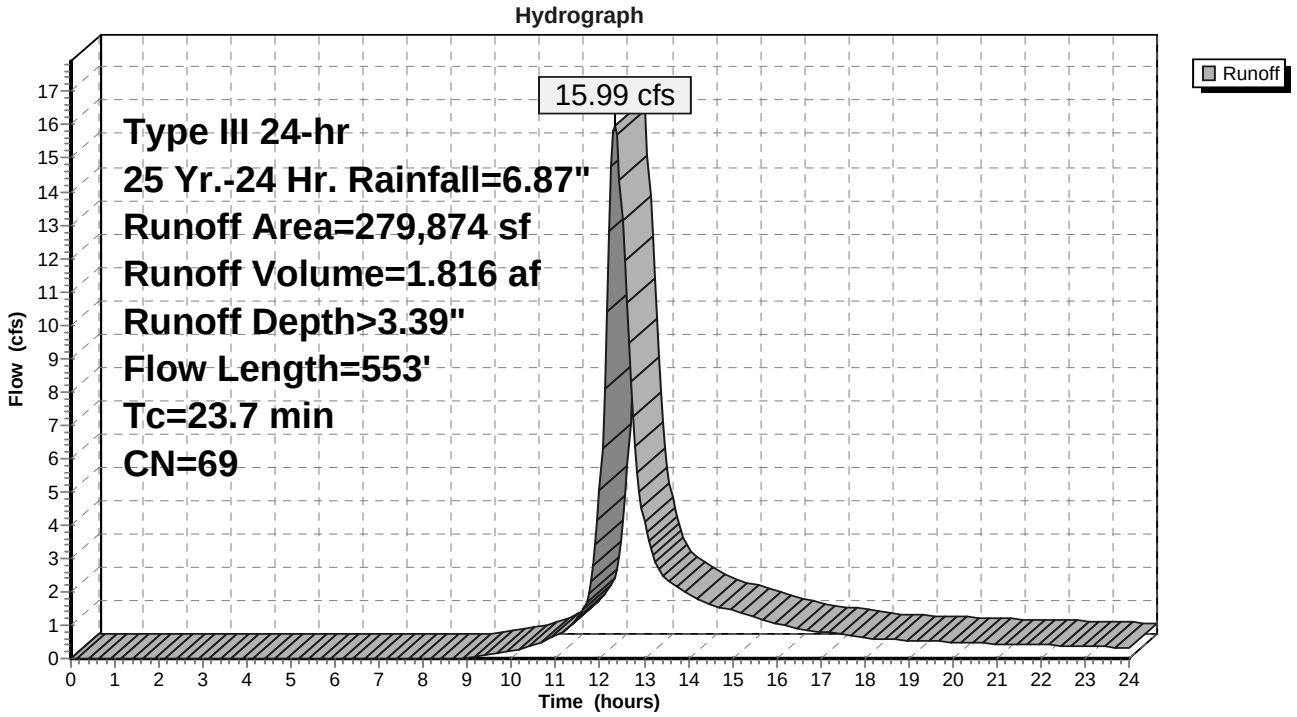
Runoff = 15.99 cfs @ 12.34 hrs, Volume= 1.816 af, Depth> 3.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
13,970	61	>75% Grass cover, Good, HSG B
35,618	74	>75% Grass cover, Good, HSG C
3,452	98	Paved parking, HSG C
963	98	Paved parking, HSG B
4,027	98	Roofs, HSG C
1,498	98	Roofs, HSG B
50,246	55	Woods, Good, HSG B
133,416	70	Woods, Good, HSG C
33,955	77	Woods, Good, HSG D
2,729	96	Gravel surface, HSG C
279,874	69	Weighted Average
269,934		96.45% Pervious Area
9,940		3.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	100	0.0300	0.10		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
1.1	119	0.1426	1.89		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
5.4	334	0.0420	1.02		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
23.7	553	Total			

Subcatchment 15S: Subcatchment #15



Summary for Subcatchment 16S: Catch Basin #7727

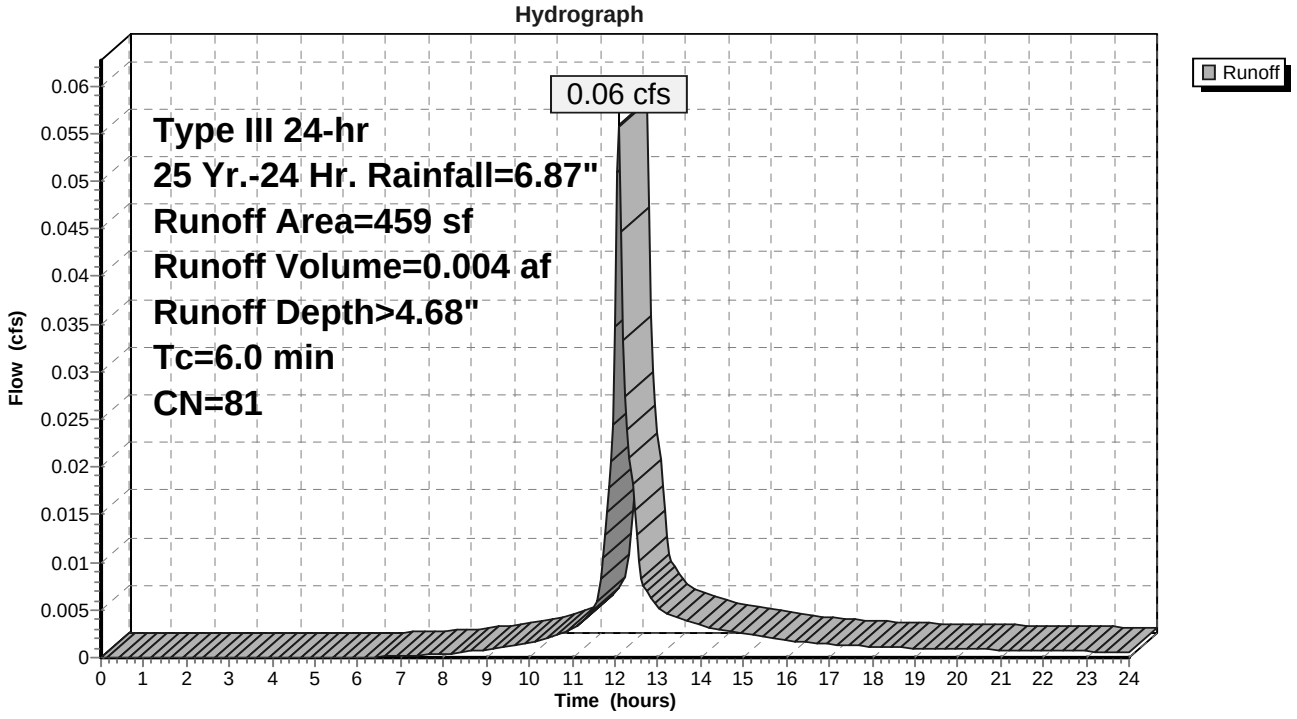
Runoff = 0.06 cfs @ 12.09 hrs, Volume= 0.004 af, Depth> 4.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
124	61	>75% Grass cover, Good, HSG B
125	74	>75% Grass cover, Good, HSG C
105	98	Paved parking, HSG B
105	98	Paved parking, HSG C
459	81	Weighted Average
249		54.25% Pervious Area
210		45.75% Impervious Area

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

Subcatchment 16S: Catch Basin #7727



Summary for Subcatchment 17S: Catch Basin #3698

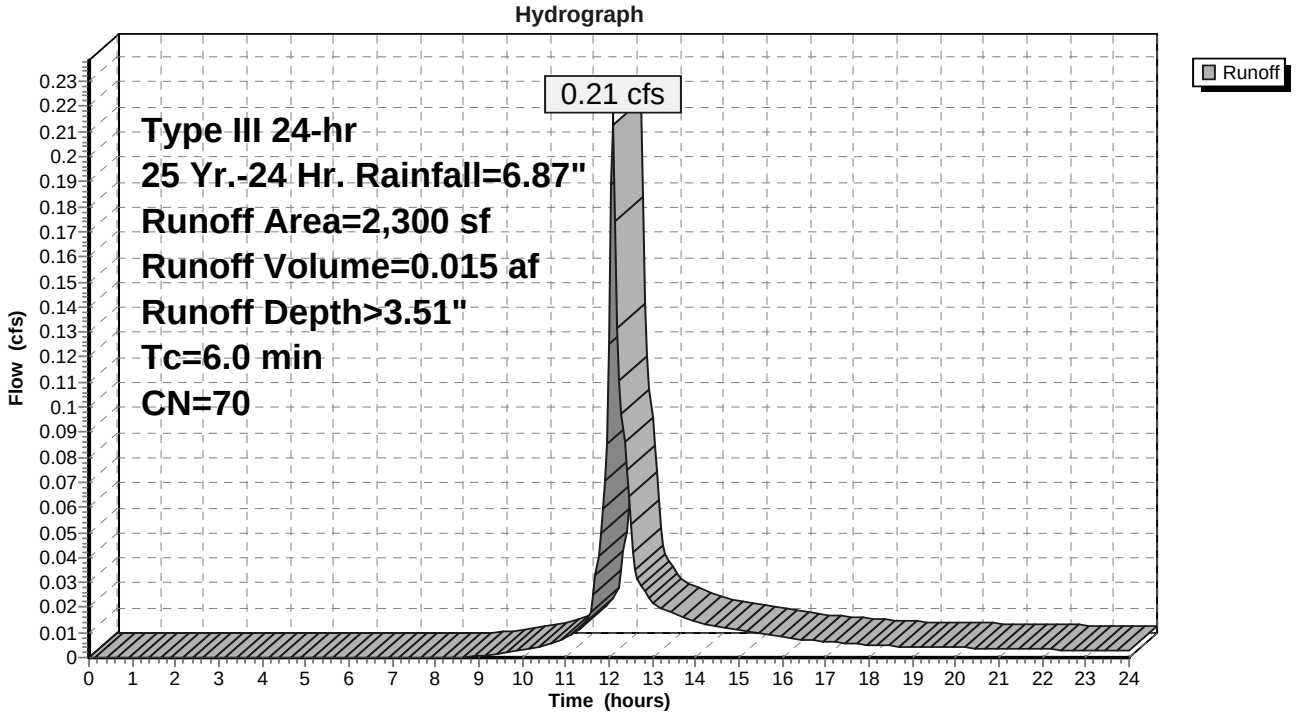
Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.015 af, Depth> 3.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
1,038	74	>75% Grass cover, Good, HSG C
1,039	61	>75% Grass cover, Good, HSG B
112	98	Paved parking, HSG C
111	98	Paved parking, HSG B
2,300	70	Weighted Average
2,077		90.30% Pervious Area
223		9.70% Impervious Area

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

Subcatchment 17S: Catch Basin #3698



Summary for Subcatchment 18S: Catch Basin #7725

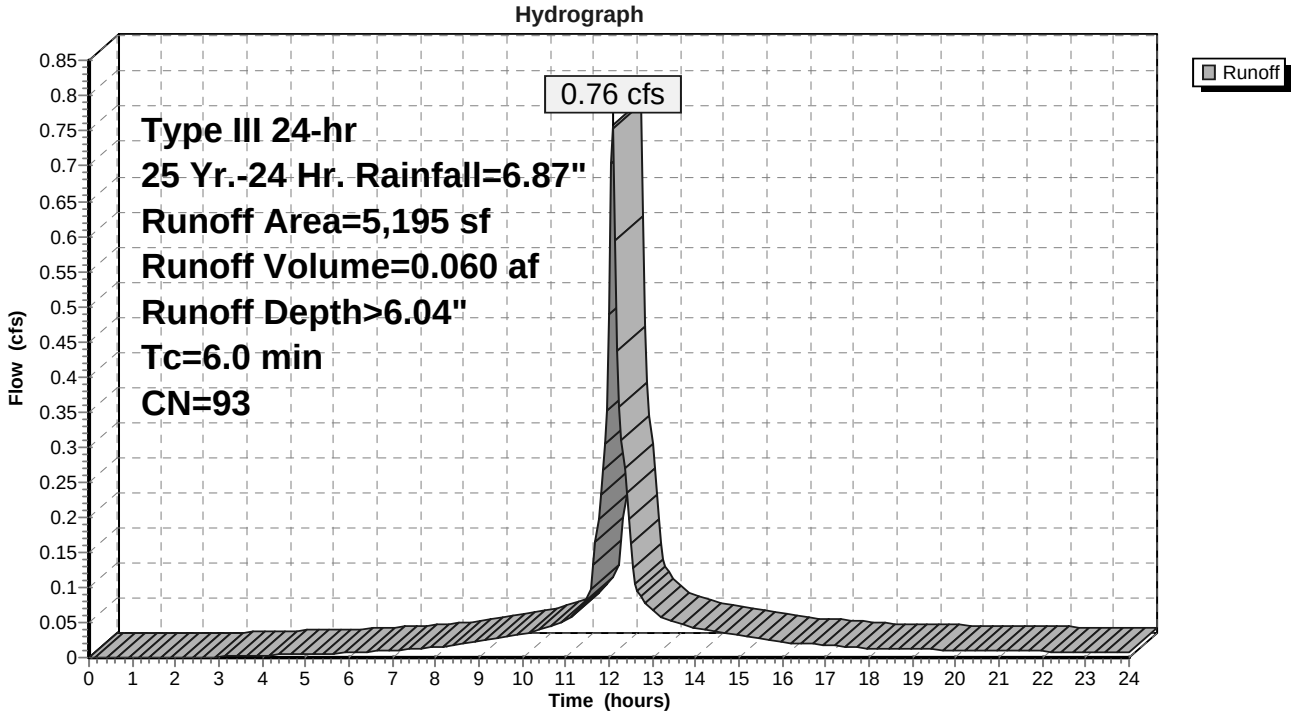
Runoff = 0.76 cfs @ 12.09 hrs, Volume= 0.060 af, Depth> 6.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
395	61	>75% Grass cover, Good, HSG B
395	74	>75% Grass cover, Good, HSG C
2,203	98	Paved parking, HSG B
2,202	98	Paved parking, HSG C
5,195	93	Weighted Average
790		15.21% Pervious Area
4,405		84.79% Impervious Area

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

Subcatchment 18S: Catch Basin #7725



Summary for Subcatchment 19S: Catch Basin #7726

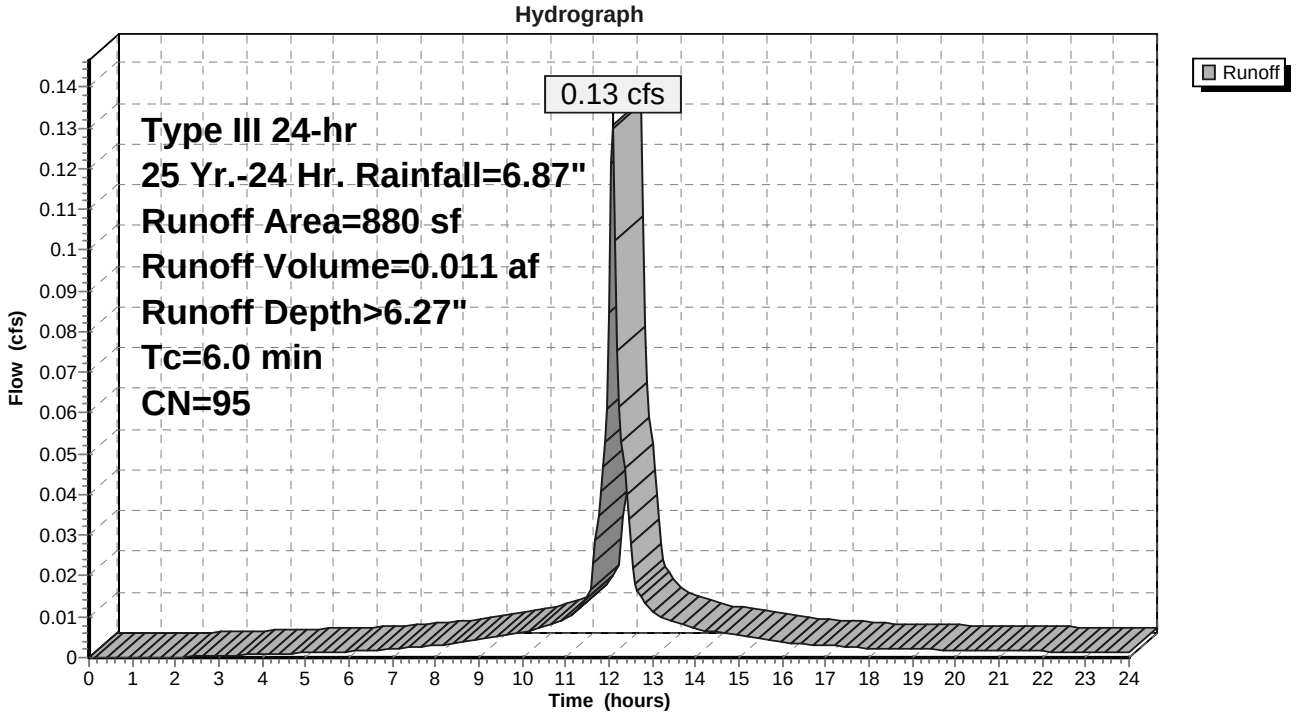
Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth> 6.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
49	61	>75% Grass cover, Good, HSG B
49	74	>75% Grass cover, Good, HSG C
391	98	Paved parking, HSG B
391	98	Paved parking, HSG C
880	95	Weighted Average
98		11.14% Pervious Area
782		88.86% Impervious Area

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

Subcatchment 19S: Catch Basin #7726



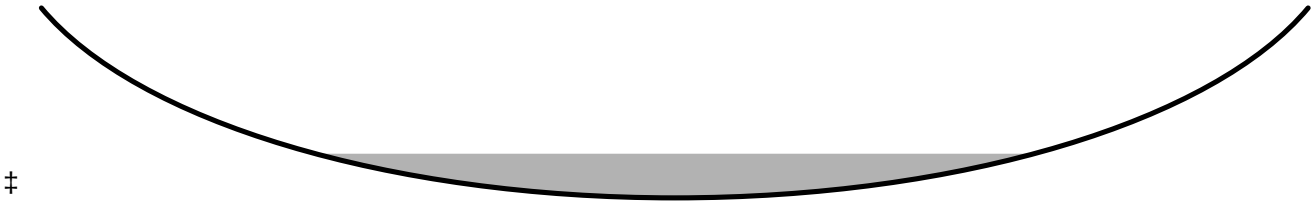
Summary for Reach 1aR: Flow from Culvert to Stream

Inflow Area = 0.203 ac, 63.62% Impervious, Inflow Depth > 5.33" for 25 Yr.-24 Hr. event
Inflow = 1.16 cfs @ 12.09 hrs, Volume= 0.090 af
Outflow = 0.96 cfs @ 12.15 hrs, Volume= 0.090 af, Atten= 17%, Lag= 3.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.73 fps, Min. Travel Time= 6.3 min
Avg. Velocity = 0.57 fps, Avg. Travel Time= 19.1 min

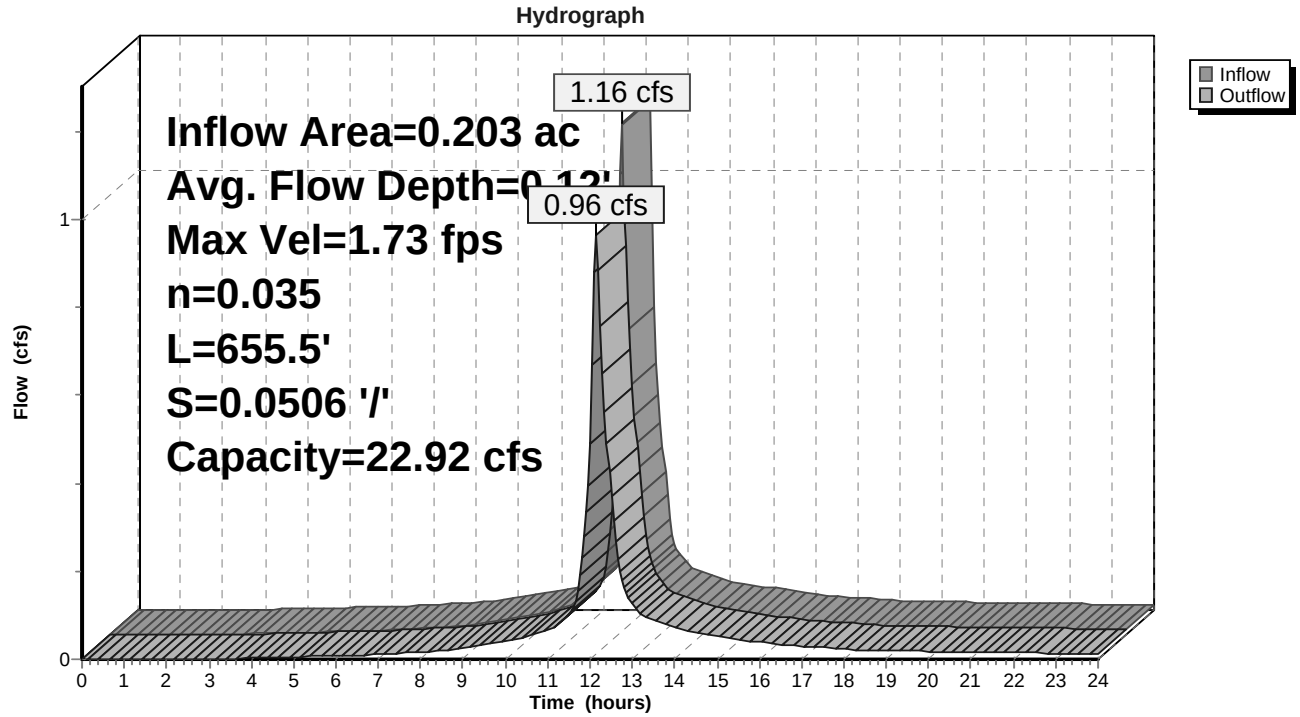
Peak Storage= 364 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 0.50' Flow Area= 5.0 sf, Capacity= 22.92 cfs

15.00' x 0.50' deep Parabolic Channel, n= 0.035
Length= 655.5' Slope= 0.0506 '/'
Inlet Invert= 136.39', Outlet Invert= 103.20'



‡

Reach 1aR: Flow from Culvert to Stream



Summary for Reach 1bR: Start of Stream

[62] Hint: Exceeded Reach 1aR OUTLET depth by 0.03' @ 12.40 hrs

Inflow Area = 0.203 ac, 63.62% Impervious, Inflow Depth > 5.31" for 25 Yr.-24 Hr. event
Inflow = 0.96 cfs @ 12.15 hrs, Volume= 0.090 af
Outflow = 0.74 cfs @ 12.26 hrs, Volume= 0.089 af, Atten= 23%, Lag= 6.8 min

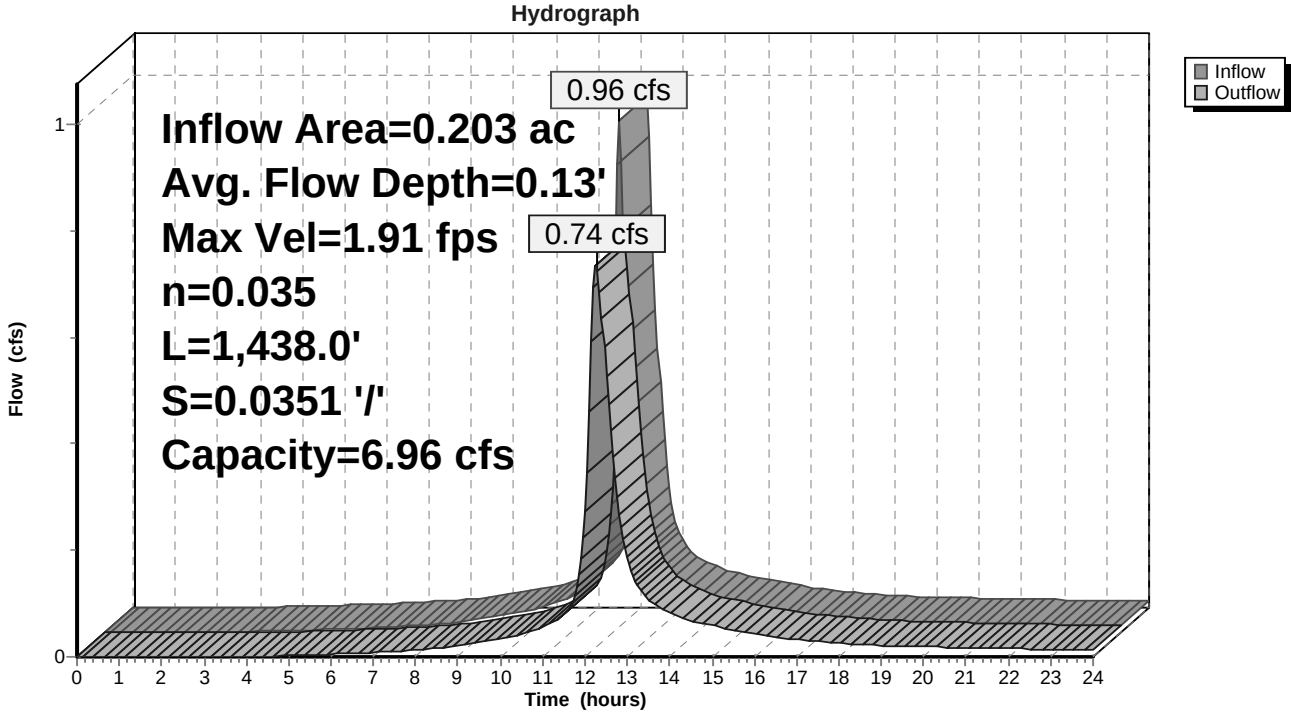
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.91 fps, Min. Travel Time= 12.6 min
Avg. Velocity = 0.55 fps, Avg. Travel Time= 43.9 min

Peak Storage= 555 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.50' Flow Area= 1.6 sf, Capacity= 6.96 cfs

3.00' x 0.50' deep channel, n= 0.035
Side Slope Z-value= 0.5 '/' Top Width= 3.50'
Length= 1,438.0' Slope= 0.0351 '/'
Inlet Invert= 103.20', Outlet Invert= 52.70'



Reach 1bR: Start of Stream



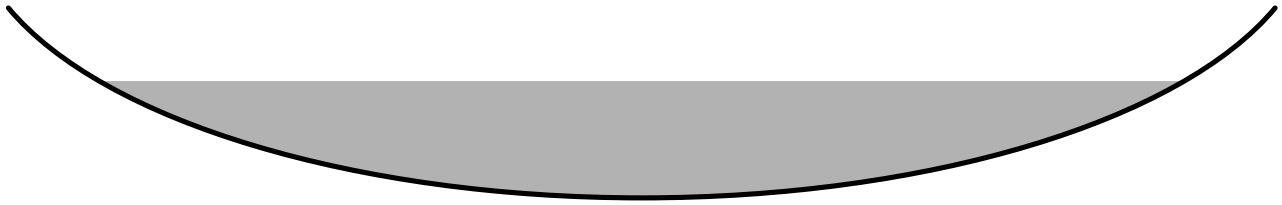
Summary for Reach 10R: Reach #10

Inflow Area = 1.745 ac, 10.02% Impervious, Inflow Depth > 3.82" for 25 Yr.-24 Hr. event
Inflow = 6.82 cfs @ 12.15 hrs, Volume= 0.555 af
Outflow = 6.50 cfs @ 12.19 hrs, Volume= 0.554 af, Atten= 5%, Lag= 2.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.70 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.98 fps, Avg. Travel Time= 7.7 min

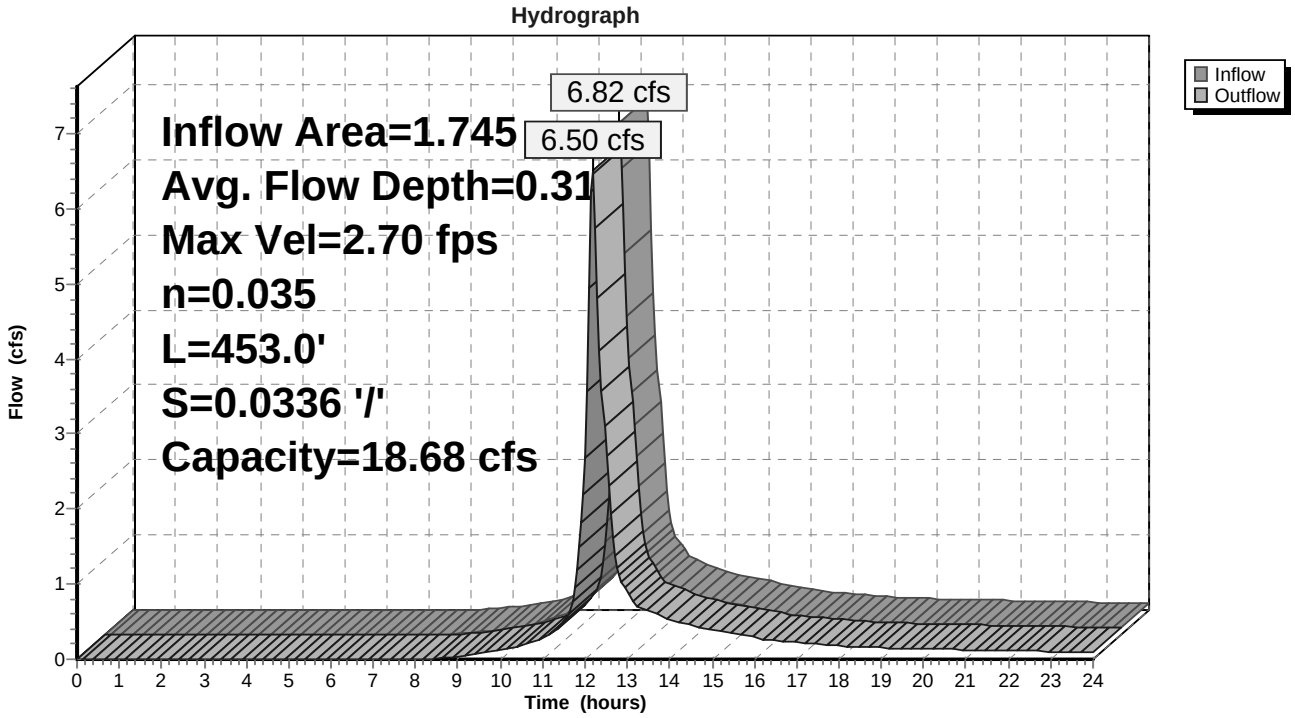
Peak Storage= 1,090 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 0.50' Flow Area= 5.0 sf, Capacity= 18.68 cfs

15.00' x 0.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 453.0' Slope= 0.0336 '/'
Inlet Invert= 98.74', Outlet Invert= 83.50'



‡

Reach 10R: Reach #10



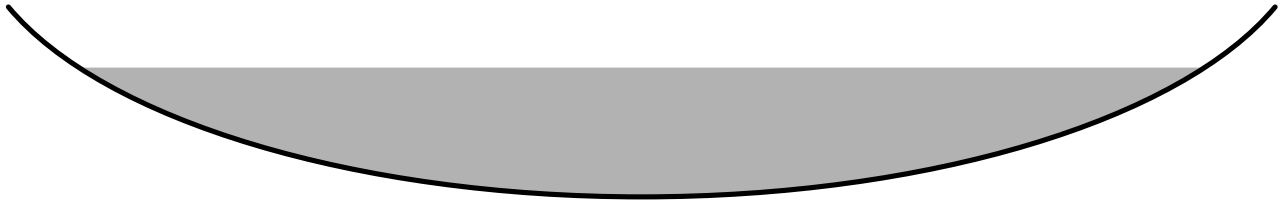
Summary for Reach 15R: Reach #15

Inflow Area = 6.425 ac, 3.55% Impervious, Inflow Depth > 3.39" for 25 Yr.-24 Hr. event
Inflow = 8.20 cfs @ 12.71 hrs, Volume= 1.815 af
Outflow = 8.20 cfs @ 12.72 hrs, Volume= 1.814 af, Atten= 0%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.93 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 2.3 min

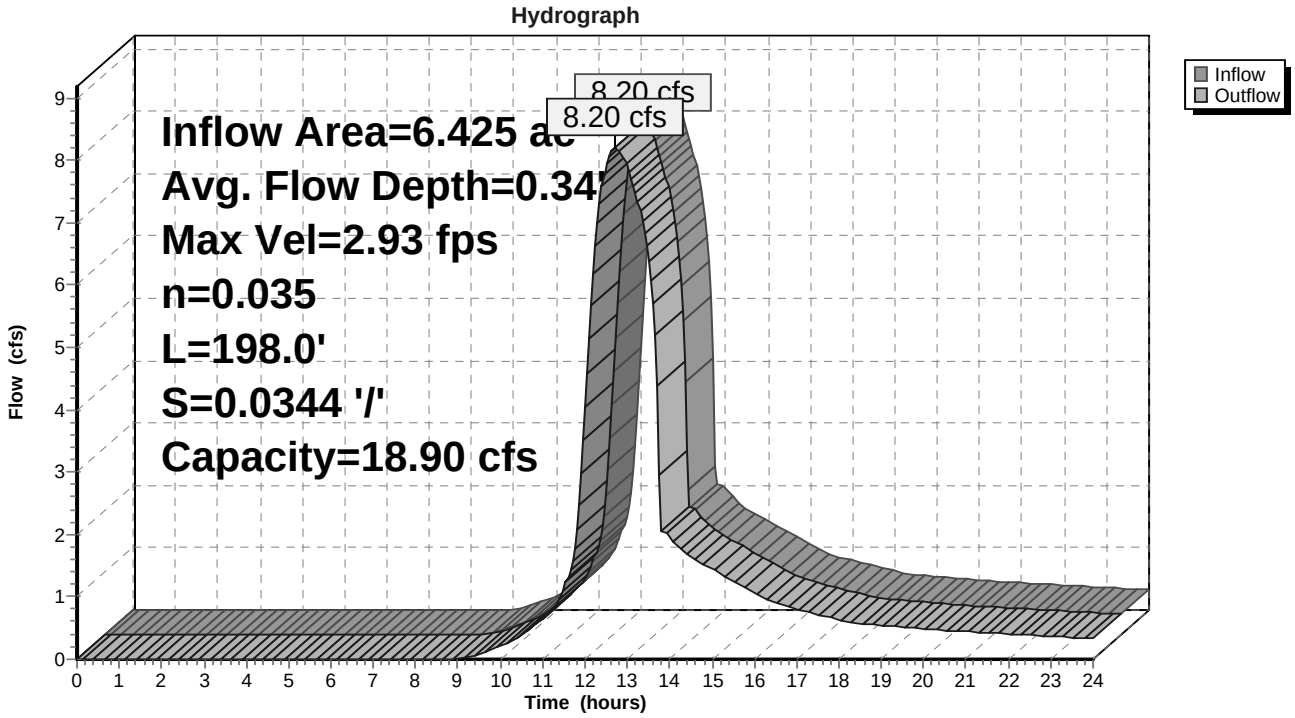
Peak Storage= 555 cf @ 12.72 hrs
Average Depth at Peak Storage= 0.34'
Bank-Full Depth= 0.50' Flow Area= 5.0 sf, Capacity= 18.90 cfs

15.00' x 0.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 198.0' Slope= 0.0344 '/'
Inlet Invert= 90.32', Outlet Invert= 83.50'



‡

Reach 15R: Reach #15



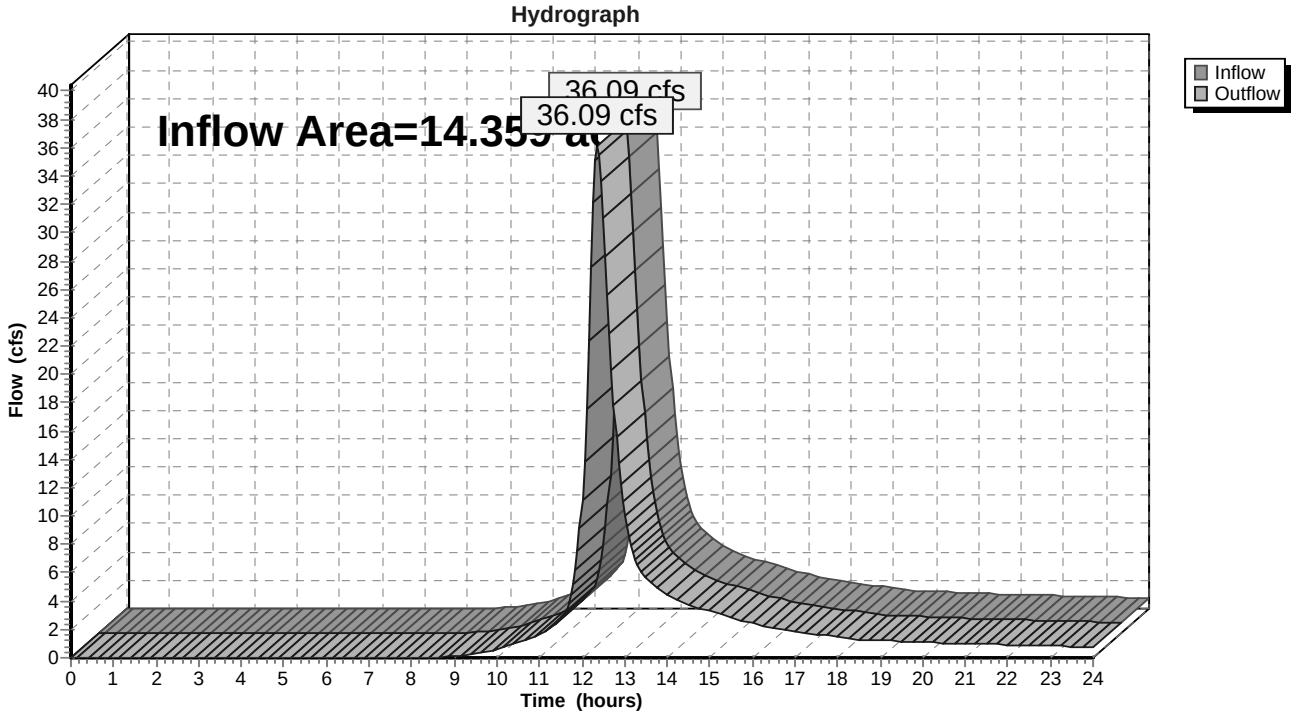
Summary for Reach 100R: Reach #100

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

Inflow Area = 14.359 ac, 1.84% Impervious, Inflow Depth > 3.52" for 25 Yr.-24 Hr. event
Inflow = 36.09 cfs @ 12.36 hrs, Volume= 4.208 af
Outflow = 36.09 cfs @ 12.36 hrs, Volume= 4.208 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 100R: Reach #100



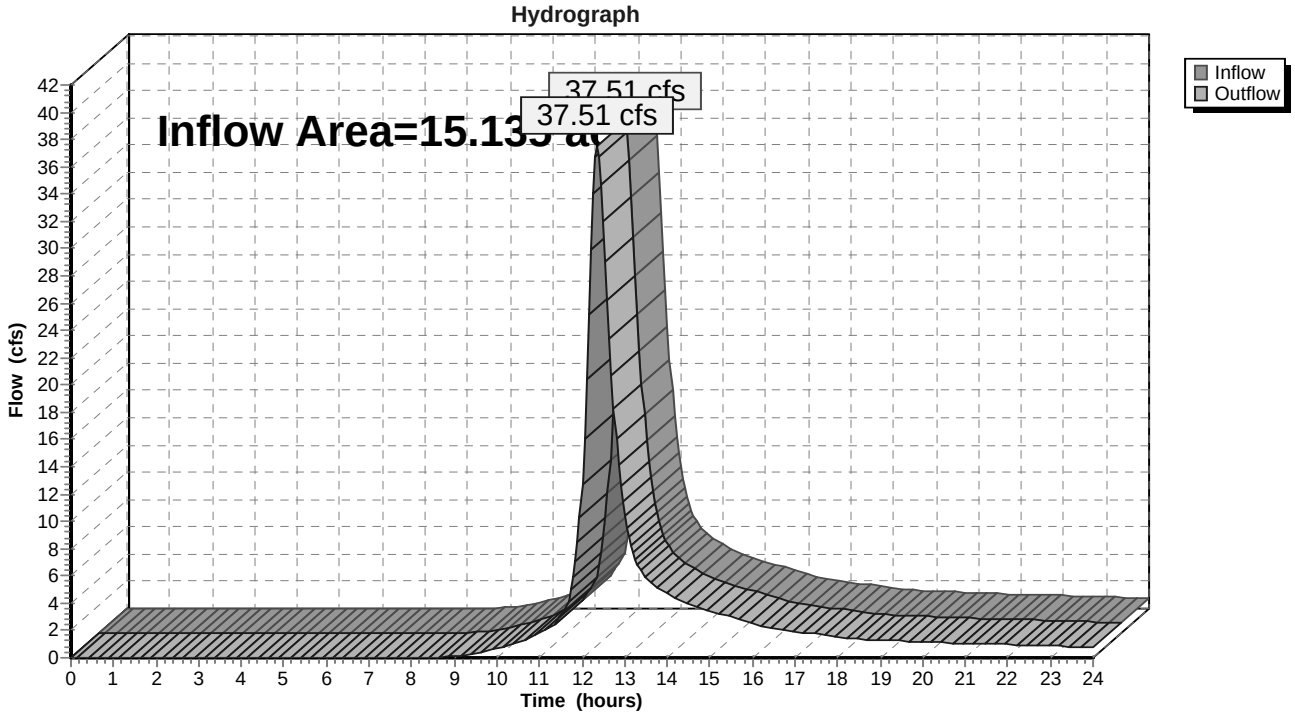
Summary for Reach 200R: Reach #200

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

Inflow Area = 15.135 ac, 1.75% Impervious, Inflow Depth > 3.52" for 25 Yr.-24 Hr. event
Inflow = 37.51 cfs @ 12.35 hrs, Volume= 4.442 af
Outflow = 37.51 cfs @ 12.35 hrs, Volume= 4.442 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 200R: Reach #200



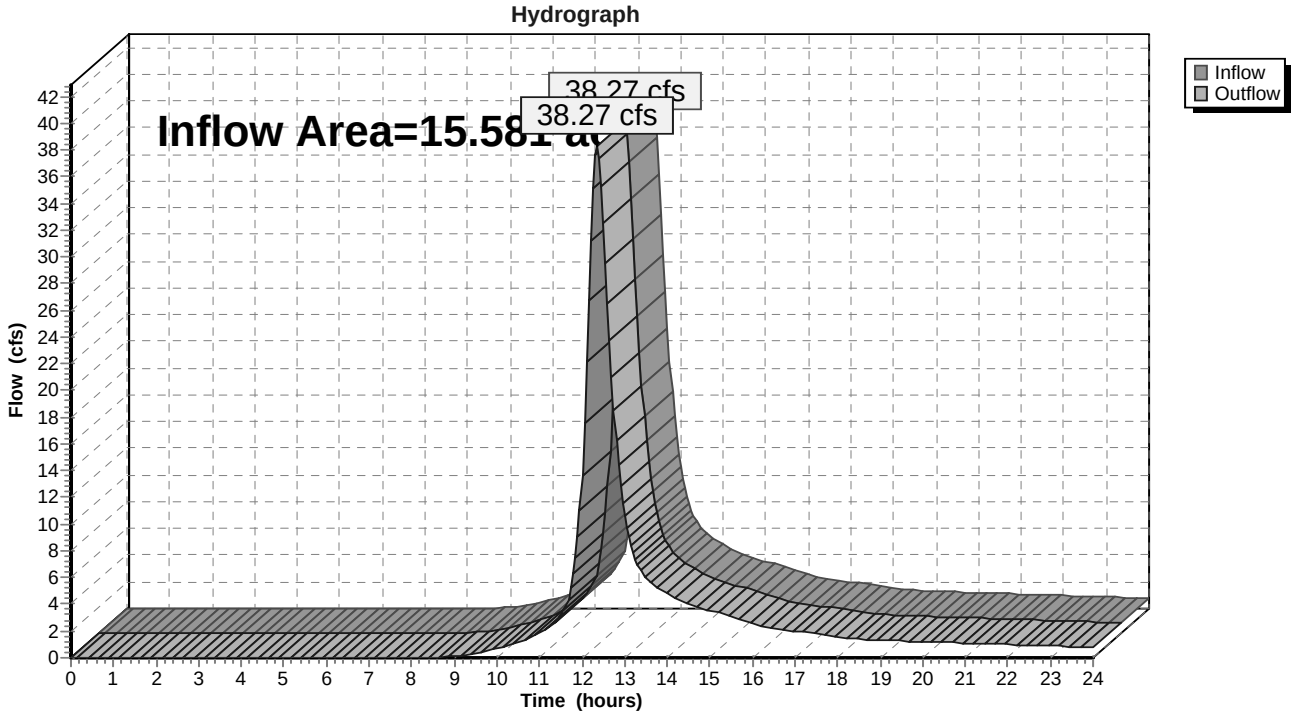
Summary for Reach 300R: Reach #300

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

Inflow Area = 15.581 ac, 1.70% Impervious, Inflow Depth > 3.52" for 25 Yr.-24 Hr. event
Inflow = 38.27 cfs @ 12.35 hrs, Volume= 4.572 af
Outflow = 38.27 cfs @ 12.35 hrs, Volume= 4.572 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 300R: Reach #300



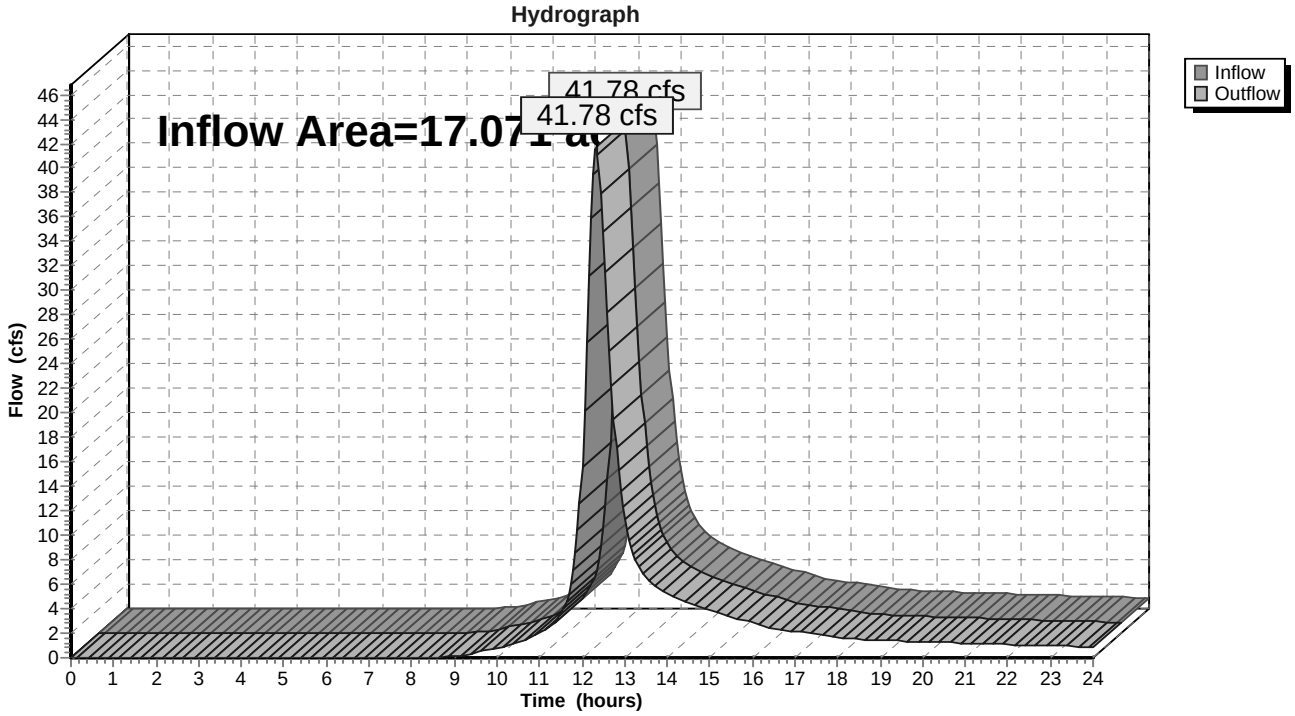
Summary for Reach 400R: Reach #400

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

Inflow Area = 17.071 ac, 1.55% Impervious, Inflow Depth > 3.52" for 25 Yr.-24 Hr. event
Inflow = 41.78 cfs @ 12.33 hrs, Volume= 5.007 af
Outflow = 41.78 cfs @ 12.33 hrs, Volume= 5.007 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 400R: Reach #400



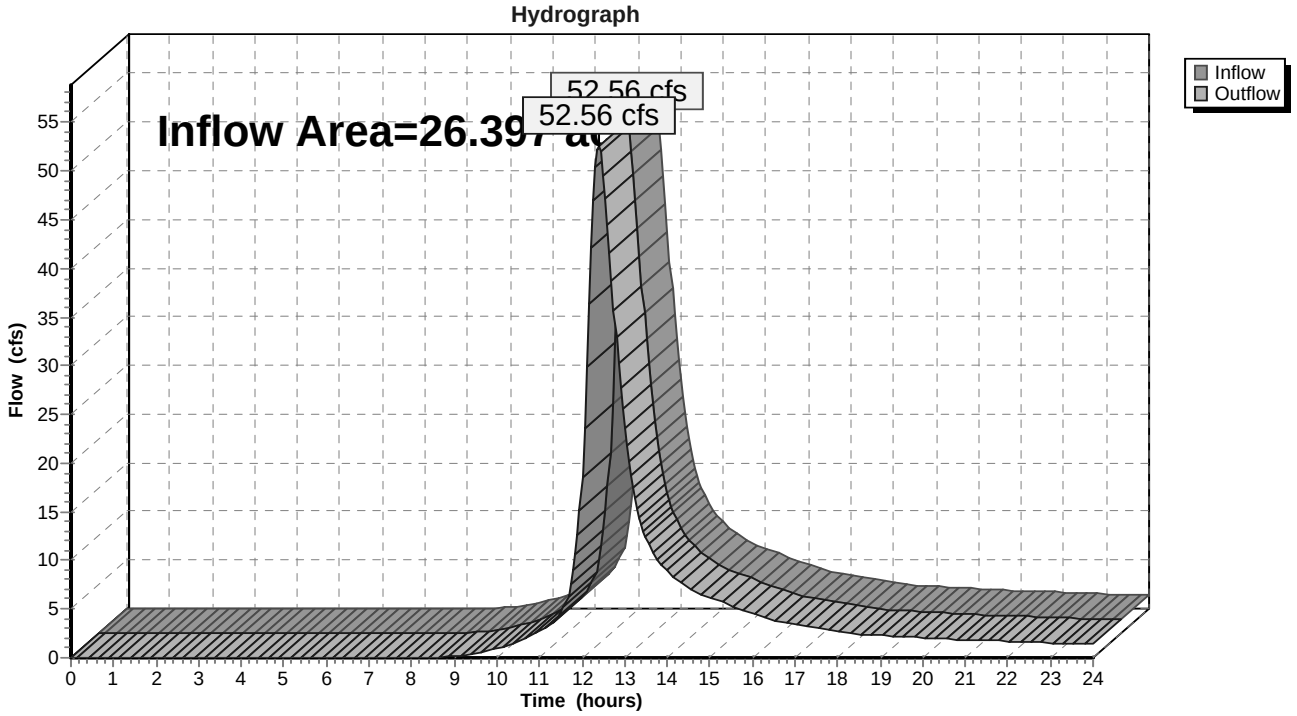
Summary for Reach 500R: Reach #500

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

Inflow Area = 26.397 ac, 1.00% Impervious, Inflow Depth > 3.47" for 25 Yr.-24 Hr. event
Inflow = 52.56 cfs @ 12.39 hrs, Volume= 7.627 af
Outflow = 52.56 cfs @ 12.39 hrs, Volume= 7.627 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 500R: Reach #500



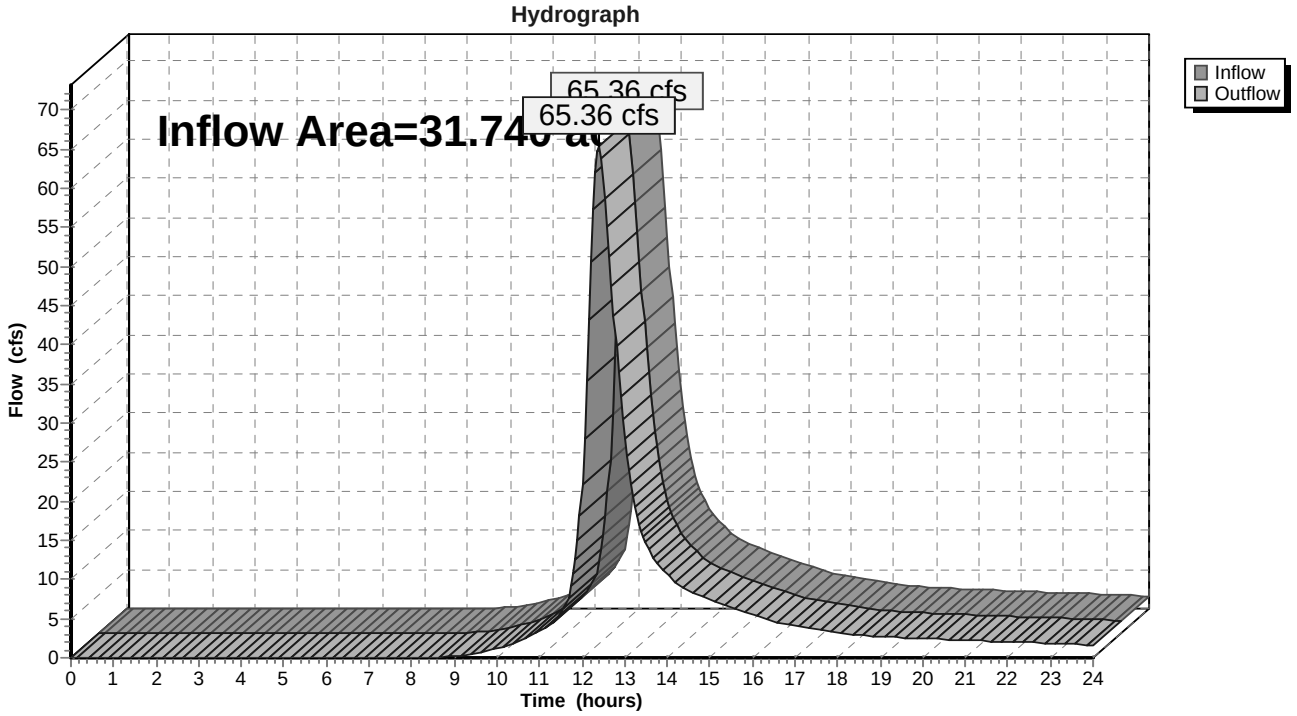
Summary for Reach 600R: Reach #600

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

Inflow Area = 31.740 ac, 0.83% Impervious, Inflow Depth > 3.49" for 25 Yr.-24 Hr. event
Inflow = 65.36 cfs @ 12.39 hrs, Volume= 9.227 af
Outflow = 65.36 cfs @ 12.39 hrs, Volume= 9.227 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 600R: Reach #600



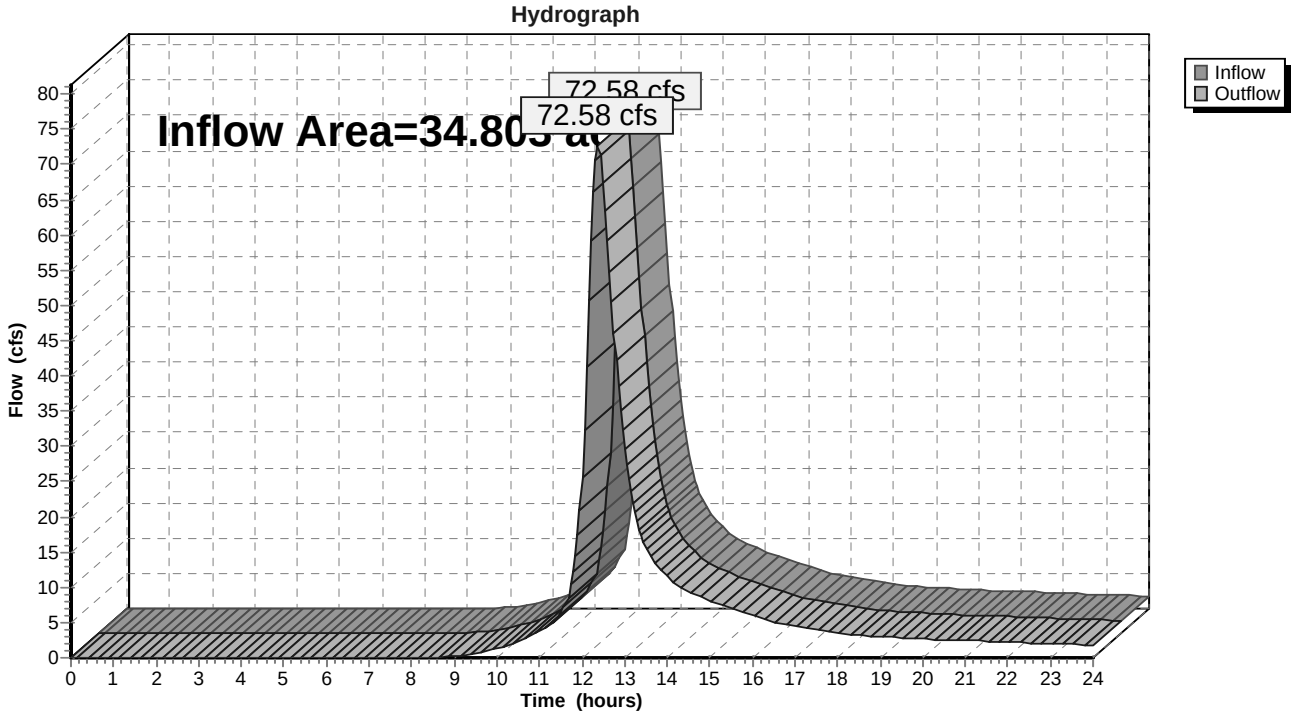
Summary for Reach 700R: Reach #700

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

Inflow Area = 34.803 ac, 0.76% Impervious, Inflow Depth > 3.49" for 25 Yr.-24 Hr. event
Inflow = 72.58 cfs @ 12.37 hrs, Volume= 10.120 af
Outflow = 72.58 cfs @ 12.37 hrs, Volume= 10.120 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 700R: Reach #700



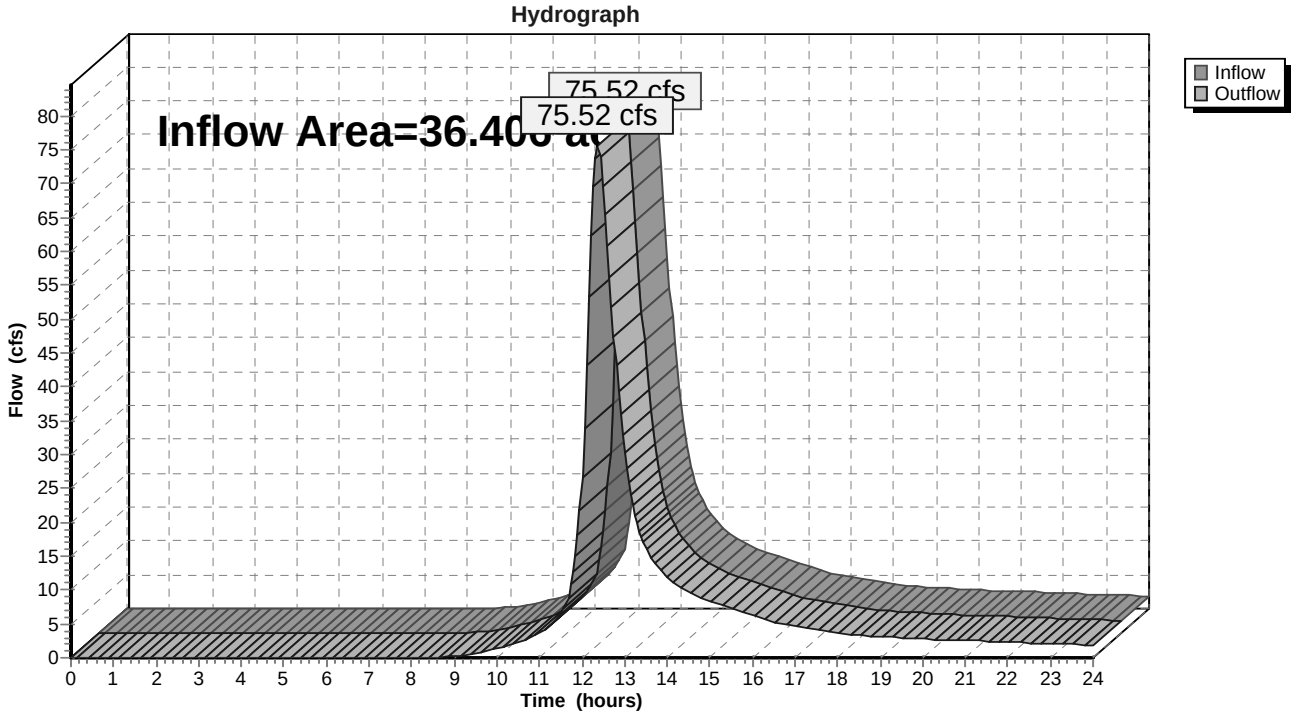
Summary for Reach 800R: Reach #800

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

Inflow Area = 36.406 ac, 0.73% Impervious, Inflow Depth > 3.45" for 25 Yr.-24 Hr. event
Inflow = 75.52 cfs @ 12.36 hrs, Volume= 10.467 af
Outflow = 75.52 cfs @ 12.36 hrs, Volume= 10.467 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 800R: Reach #800



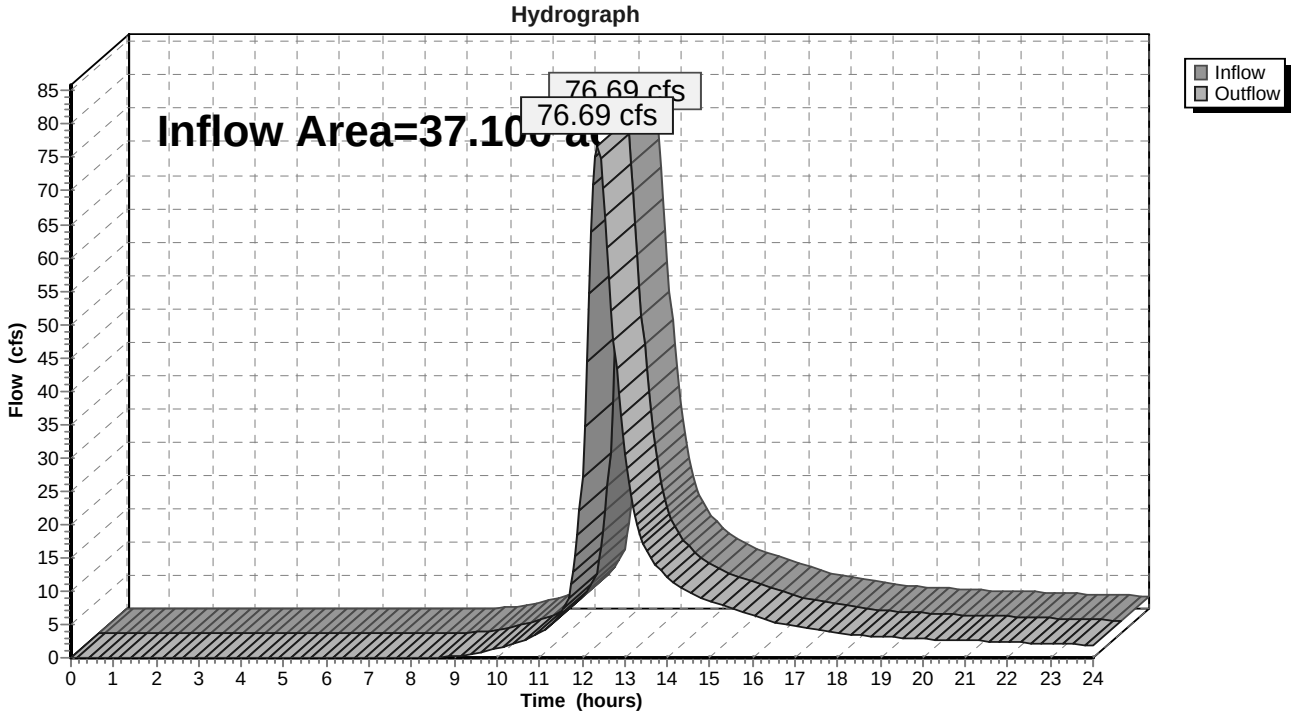
Summary for Reach 900R: Final Reach #900

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

Inflow Area = 37.100 ac, 0.71% Impervious, Inflow Depth > 3.43" for 25 Yr.-24 Hr. event
Inflow = 76.69 cfs @ 12.36 hrs, Volume= 10.617 af
Outflow = 76.69 cfs @ 12.36 hrs, Volume= 10.617 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 900R: Final Reach #900



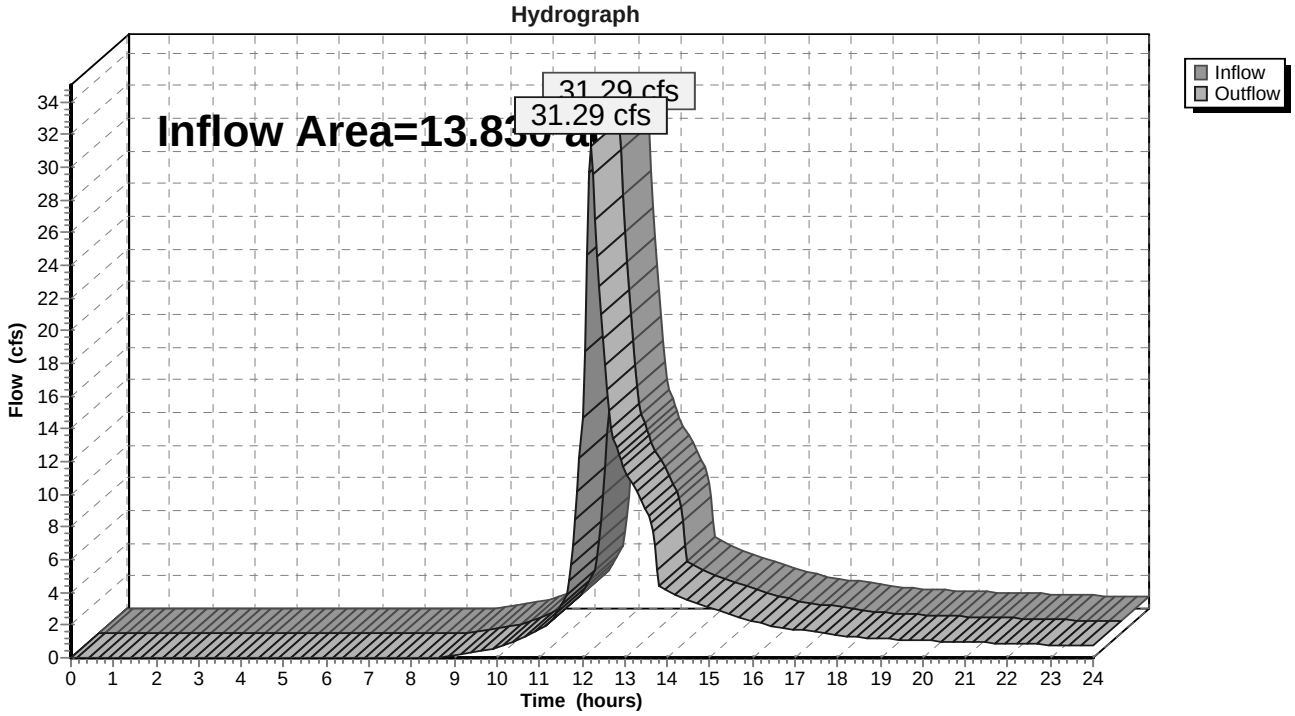
Summary for Reach 1100R: Final Reach #1100

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

Inflow Area = 13.830 ac, 4.20% Impervious, Inflow Depth > 3.53" for 25 Yr.-24 Hr. event
Inflow = 31.29 cfs @ 12.20 hrs, Volume= 4.068 af
Outflow = 31.29 cfs @ 12.20 hrs, Volume= 4.068 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1100R: Final Reach #1100



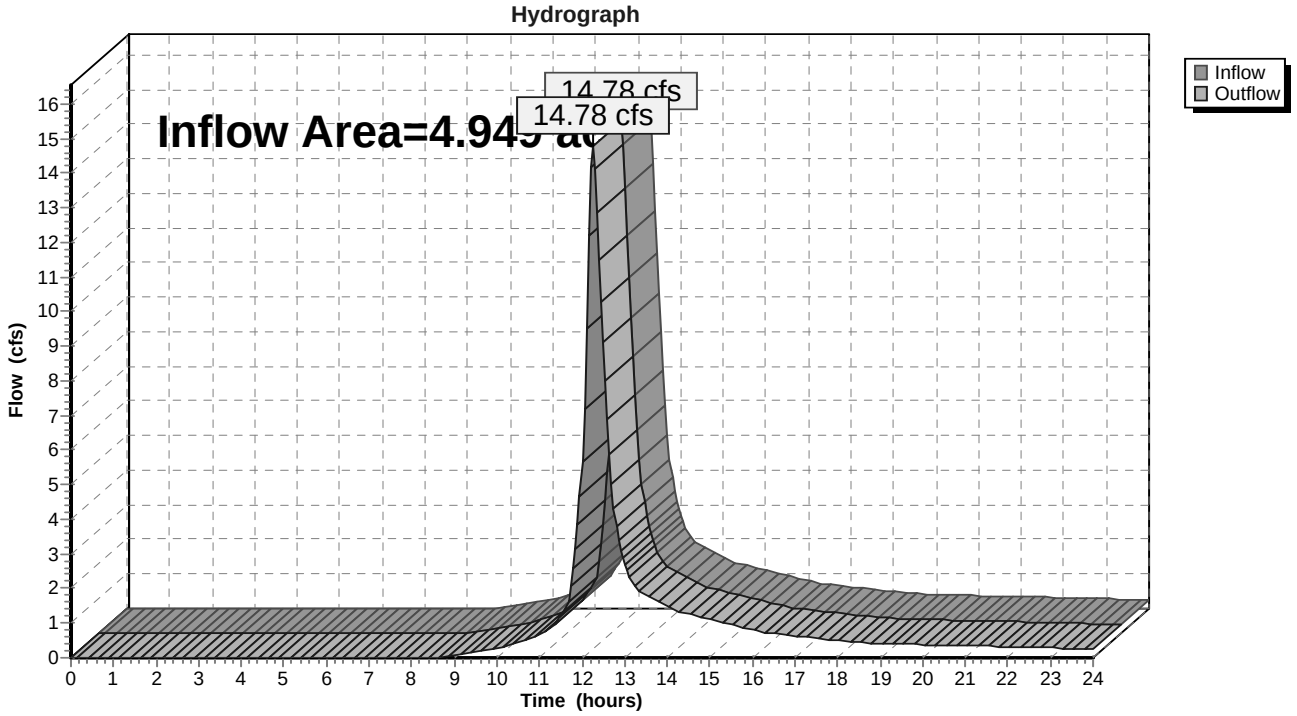
Summary for Reach 1200R: Final Reach #1200

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

Inflow Area = 4.949 ac, 0.67% Impervious, Inflow Depth > 3.60" for 25 Yr.-24 Hr. event
Inflow = 14.78 cfs @ 12.25 hrs, Volume= 1.485 af
Outflow = 14.78 cfs @ 12.25 hrs, Volume= 1.485 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1200R: Final Reach #1200



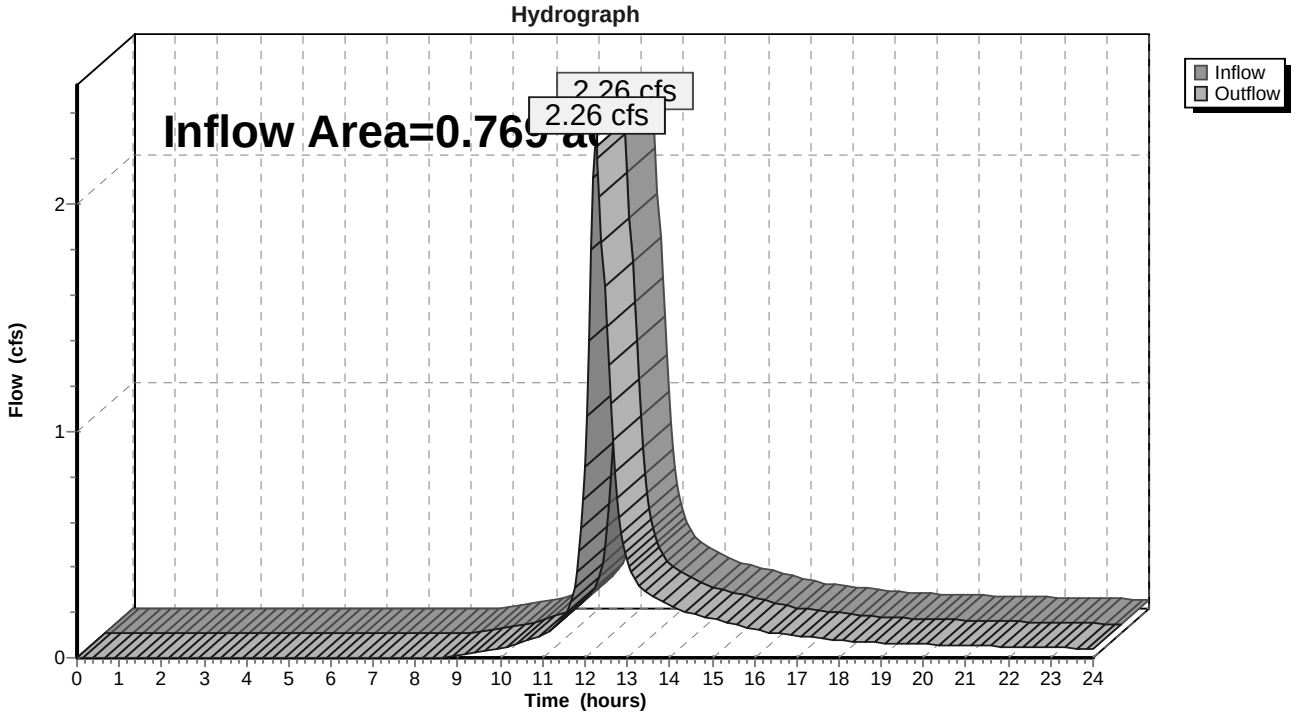
Summary for Reach 1300R: Final Reach #1300

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

Inflow Area = 0.769 ac, 0.00% Impervious, Inflow Depth > 3.60" for 25 Yr.-24 Hr. event
Inflow = 2.26 cfs @ 12.26 hrs, Volume= 0.231 af
Outflow = 2.26 cfs @ 12.26 hrs, Volume= 0.231 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1300R: Final Reach #1300



Summary for Pond 1EP: Catch Basin #7727

Inflow Area = 0.011 ac, 45.75% Impervious, Inflow Depth > 4.68" for 25 Yr.-24 Hr. event
Inflow = 0.06 cfs @ 12.09 hrs, Volume= 0.004 af
Outflow = 0.06 cfs @ 12.09 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.3 min
Primary = 0.06 cfs @ 12.09 hrs, Volume= 0.004 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 138.07' @ 12.09 hrs Surf.Area= 13 sf Storage= 2 cf

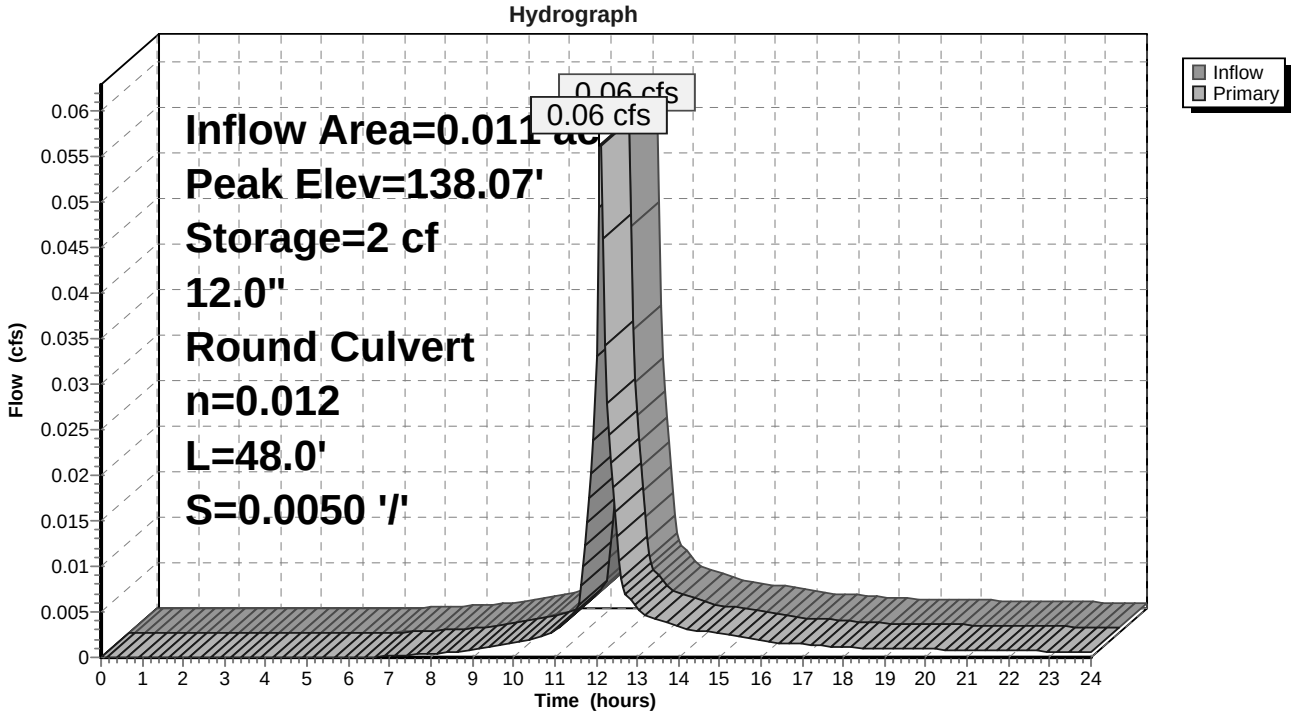
Plug-Flow detention time= 1.9 min calculated for 0.004 af (100% of inflow)
Center-of-Mass det. time= 1.3 min (807.0 - 805.7)

Volume	Invert	Avail.Storage	Storage Description
#1	137.94'	57 cf	**4.00'D x 4.50'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	137.94'	**12.0" Round 12" HDPE** L= 48.0' Ke= 0.500 Inlet / Outlet Invert= 137.94' / 137.70' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.06 cfs @ 12.09 hrs HW=138.07' TW=137.19' (Dynamic Tailwater)
1=12" HDPE (Barrel Controls 0.06 cfs @ 1.36 fps)

Pond 1EP: Catch Basin #7727



Summary for Pond 2EP: Catch Basin #3698

Inflow Area = 0.053 ac, 9.70% Impervious, Inflow Depth > 3.51" for 25 Yr.-24 Hr. event
Inflow = 0.21 cfs @ 12.09 hrs, Volume= 0.015 af
Outflow = 0.21 cfs @ 12.10 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.2 min
Primary = 0.21 cfs @ 12.10 hrs, Volume= 0.015 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 138.01' @ 12.10 hrs Surf.Area= 13 sf Storage= 3 cf

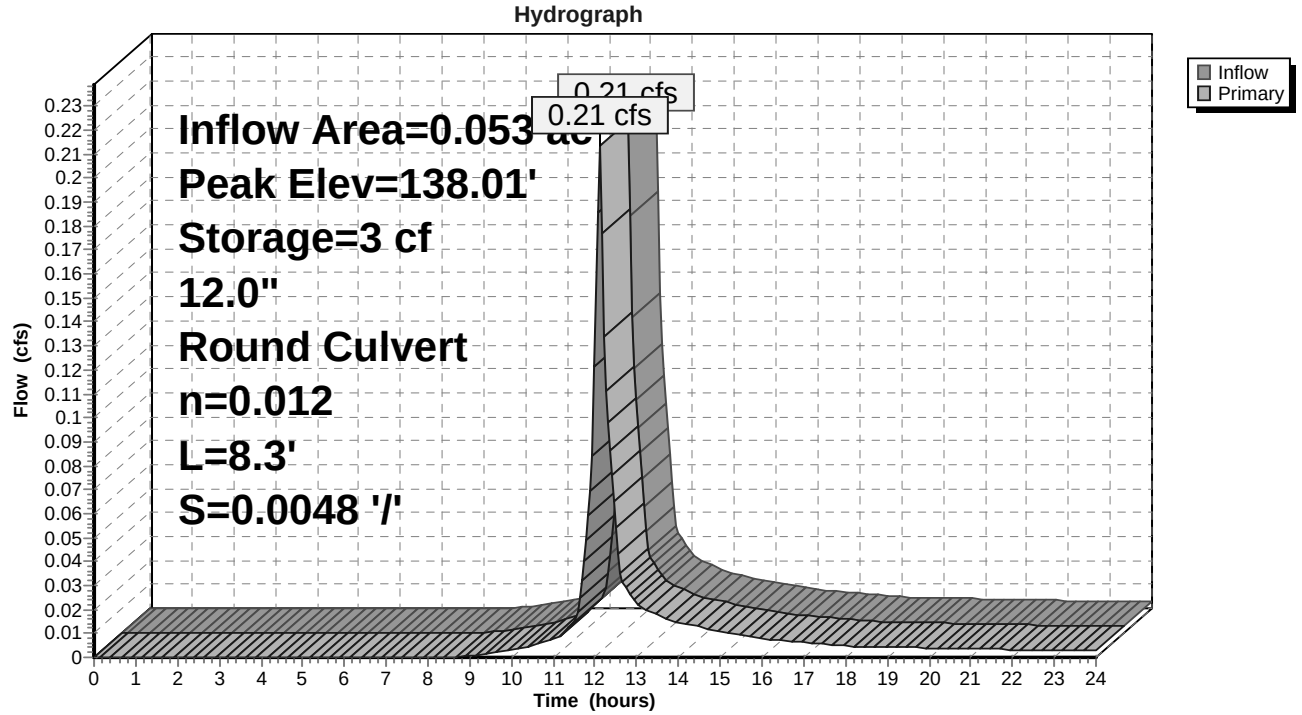
Plug-Flow detention time= 0.9 min calculated for 0.015 af (100% of inflow)
Center-of-Mass det. time= 0.6 min (831.7 - 831.2)

Volume	Invert	Avail.Storage	Storage Description
#1	137.74'	43 cf	**4.00'D x 3.40'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	137.74'	**12.0" Round 12" HDPE** L= 8.3' Ke= 0.500 Inlet / Outlet Invert= 137.74' / 137.70' S= 0.0048 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.21 cfs @ 12.10 hrs HW=138.01' TW=137.19' (Dynamic Tailwater)
↑—**1=12" HDPE** (Barrel Controls 0.21 cfs @ 1.83 fps)

Pond 2EP: Catch Basin #3698



Summary for Pond 3EP: Catch Basin #7725

Inflow Area = 0.119 ac, 84.79% Impervious, Inflow Depth > 6.04" for 25 Yr.-24 Hr. event
Inflow = 0.76 cfs @ 12.09 hrs, Volume= 0.060 af
Outflow = 0.76 cfs @ 12.09 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.1 min
Primary = 0.76 cfs @ 12.09 hrs, Volume= 0.060 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 138.96' @ 12.09 hrs Surf.Area= 13 sf Storage= 6 cf

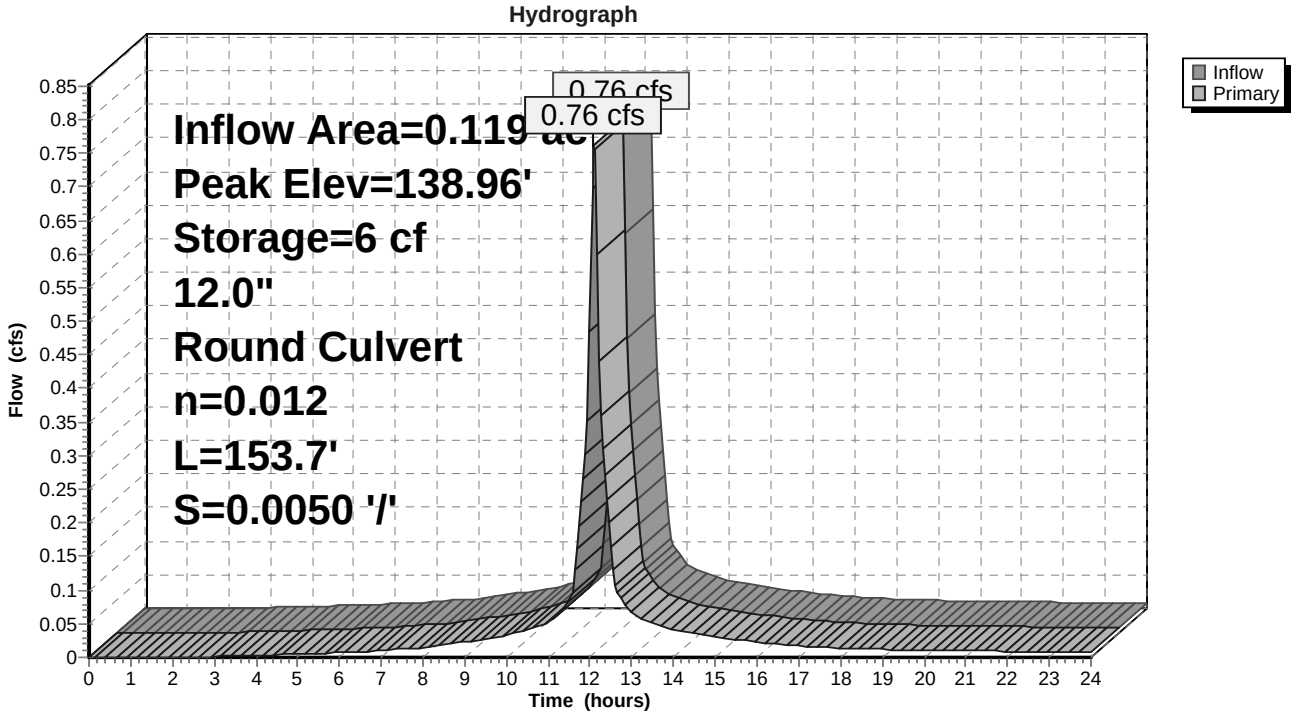
Plug-Flow detention time= 0.5 min calculated for 0.060 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (769.2 - 768.9)

Volume	Invert	Avail.Storage	Storage Description
#1	138.47'	41 cf	**4.00'D x 3.23'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	138.47'	**12.0" Round 12" HDPE** L= 153.7' Ke= 0.500 Inlet / Outlet Invert= 138.47' / 137.70' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.74 cfs @ 12.09 hrs HW=138.96' TW=137.19' (Dynamic Tailwater)
↑**1=12" HDPE** (Barrel Controls 0.74 cfs @ 2.86 fps)

Pond 3EP: Catch Basin #7725



Summary for Pond 4EP: Catch Basin #7726

Inflow Area = 0.203 ac, 63.62% Impervious, Inflow Depth > 5.33" for 25 Yr.-24 Hr. event
Inflow = 1.16 cfs @ 12.09 hrs, Volume= 0.090 af
Outflow = 1.16 cfs @ 12.09 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.1 min
Primary = 1.16 cfs @ 12.09 hrs, Volume= 0.090 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 137.20' @ 12.09 hrs Surf.Area= 13 sf Storage= 6 cf

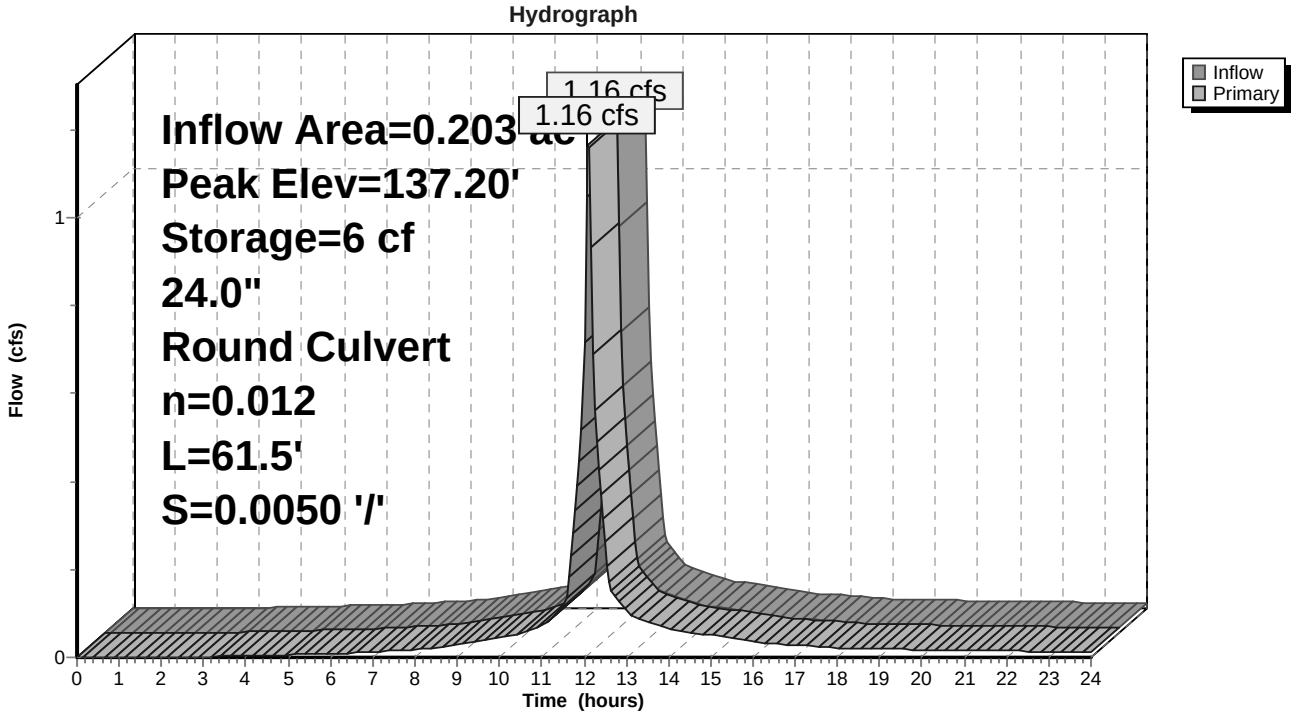
Plug-Flow detention time= 0.3 min calculated for 0.090 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (780.8 - 780.6)

Volume	Invert	Avail.Storage	Storage Description
#1	136.70'	69 cf	**4.00'D x 5.48'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	136.70'	**24.0" Round 24 " HDPE** L= 61.5' Ke= 0.500 Inlet / Outlet Invert= 136.70' / 136.39' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=1.14 cfs @ 12.09 hrs HW=137.19' TW=136.50' (Dynamic Tailwater)
1=24 " HDPE (Barrel Controls 1.14 cfs @ 2.86 fps)

Pond 4EP: Catch Basin #7726



Summary for Pond 10P: 24" RCP Inlet Sump/Pond

Inflow Area = 1.745 ac, 10.02% Impervious, Inflow Depth > 3.82" for 25 Yr.-24 Hr. event
Inflow = 6.86 cfs @ 12.14 hrs, Volume= 0.555 af
Outflow = 6.82 cfs @ 12.15 hrs, Volume= 0.555 af, Atten= 1%, Lag= 1.0 min
Primary = 6.82 cfs @ 12.15 hrs, Volume= 0.555 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 101.02' @ 12.15 hrs Surf.Area= 565 sf Storage= 299 cf
Flood Elev= 105.00' Surf.Area= 15,552 sf Storage= 25,913 cf

Plug-Flow detention time= 0.8 min calculated for 0.554 af (100% of inflow)
Center-of-Mass det. time= 0.6 min (827.8 - 827.2)

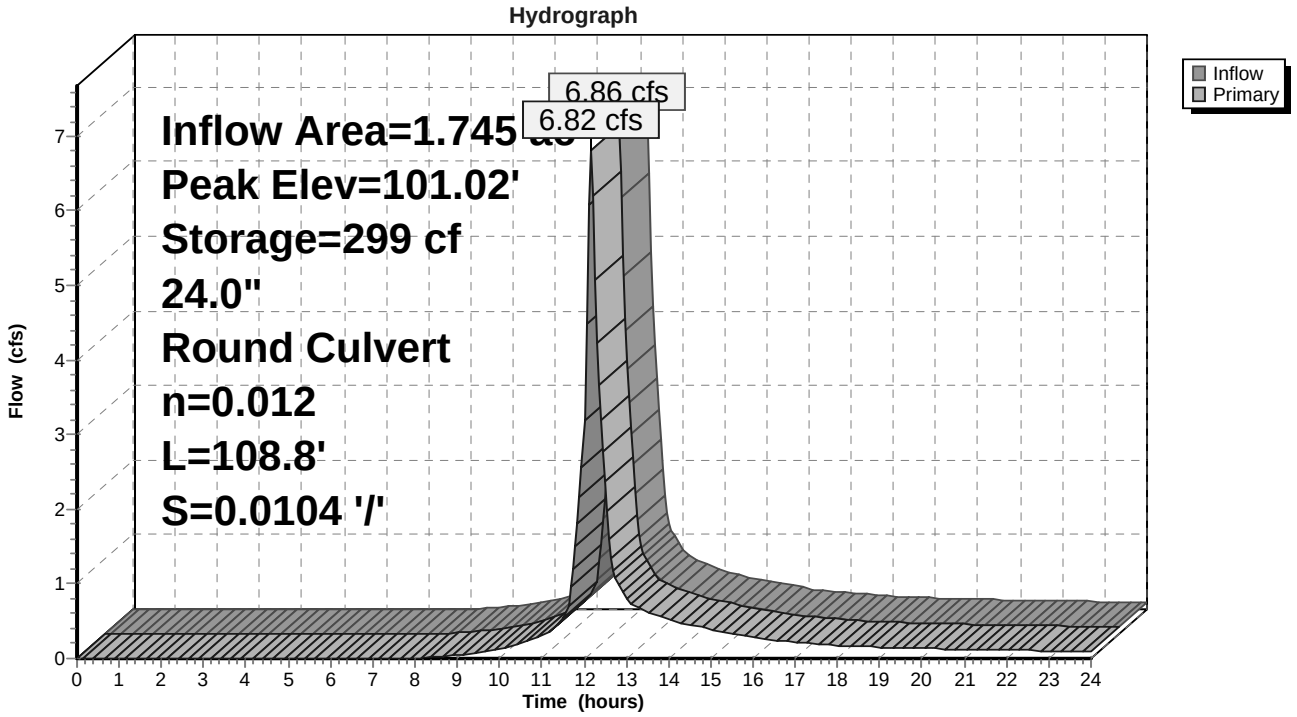
Volume	Invert	Avail.Storage	Storage Description
#1	99.87'	25,913 cf	**Open Water Storage (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.87	50	25.0	0	0	50
101.00	550	113.5	288	288	1,029
102.00	1,622	235.2	1,039	1,327	4,410
103.00	5,674	319.0	3,443	4,771	8,116
104.00	10,737	417.2	8,072	12,843	13,881
105.00	15,552	506.0	13,070	25,913	20,421

Device	Routing	Invert	Outlet Devices
#1	Primary	99.87'	**24.0" Round 24" RCP** L= 108.8' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 99.87' / 98.74' S= 0.0104 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=6.79 cfs @ 12.15 hrs HW=101.02' TW=99.04' (Dynamic Tailwater)
↑—**1=24" RCP** (Inlet Controls 6.79 cfs @ 3.64 fps)

Pond 10P: 24" RCP Inlet Sump/Pond



Summary for Pond 15P: 12" RCP Inlet Sump/Pond

Inflow Area = 6.425 ac, 3.55% Impervious, Inflow Depth > 3.39" for 25 Yr.-24 Hr. event
Inflow = 15.99 cfs @ 12.34 hrs, Volume= 1.816 af
Outflow = 8.20 cfs @ 12.71 hrs, Volume= 1.815 af, Atten= 49%, Lag= 22.2 min
Primary = 8.20 cfs @ 12.71 hrs, Volume= 1.815 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 98.12' @ 12.71 hrs Surf.Area= 7,480 sf Storage= 12,599 cf
Flood Elev= 100.50' Surf.Area= 20,281 sf Storage= 43,715 cf

Plug-Flow detention time= 9.2 min calculated for 1.811 af (100% of inflow)
Center-of-Mass det. time= 9.0 min (856.4 - 847.4)

Volume	Invert	Avail.Storage	Storage Description
#1	92.91'	43,715 cf	**Open Water Storage (Irregular)** Listed below (Recalc)

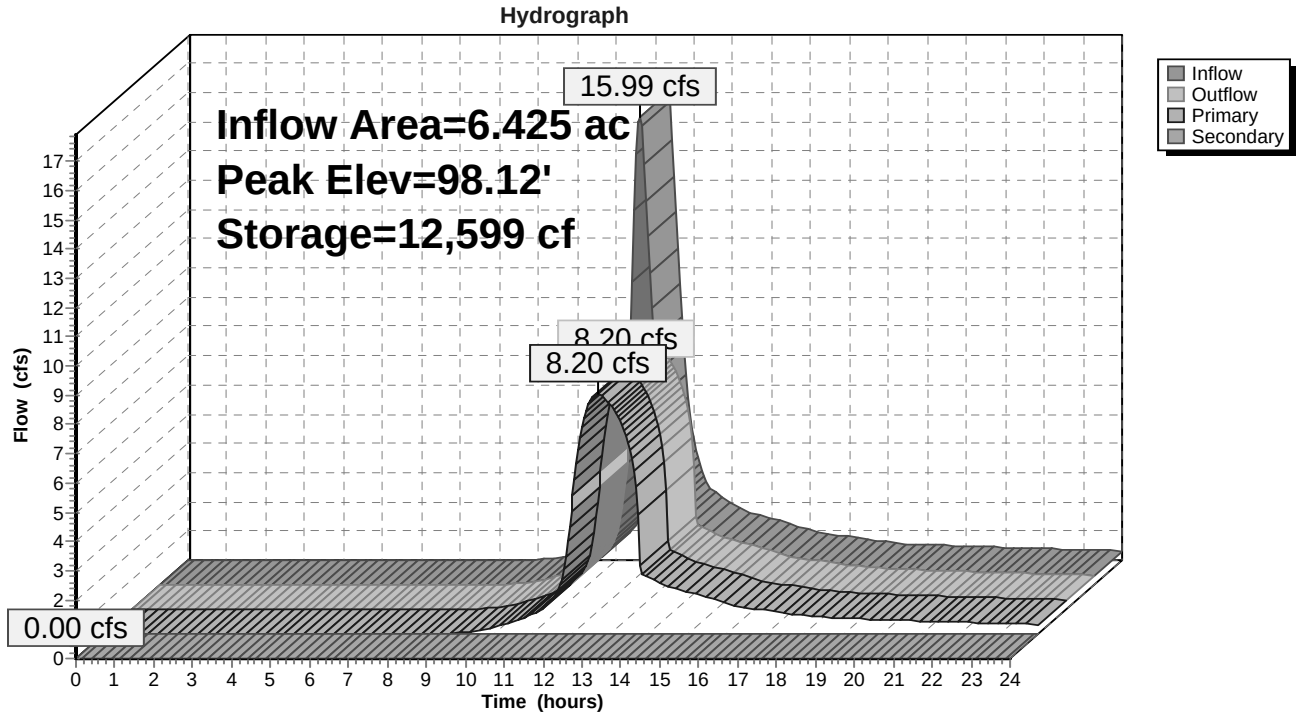
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.91	4	8.0	0	0	4
93.00	76	32.8	3	3	85
94.00	145	50.2	109	112	207
95.00	785	142.0	422	534	1,614
96.00	2,440	333.7	1,536	2,070	8,875
97.00	5,015	384.4	3,651	5,721	11,794
98.00	7,121	421.5	6,037	11,759	14,207
99.00	10,534	551.3	8,772	20,531	24,267
100.00	17,329	664.7	13,791	34,322	35,257
100.50	20,281	657.0	9,393	43,715	36,132

Device	Routing	Invert	Outlet Devices
#1	Primary	92.91'	**12.0" Round 12" RCP** L= 84.3' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 92.91' / 90.32' S= 0.0307 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Secondary	100.25'	**50.0' long x 15.0' breadth Flow Over Road** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=8.20 cfs @ 12.71 hrs HW=98.11' TW=90.66' (Dynamic Tailwater)
↑—**1=12" RCP** (Inlet Controls 8.20 cfs @ 10.44 fps)

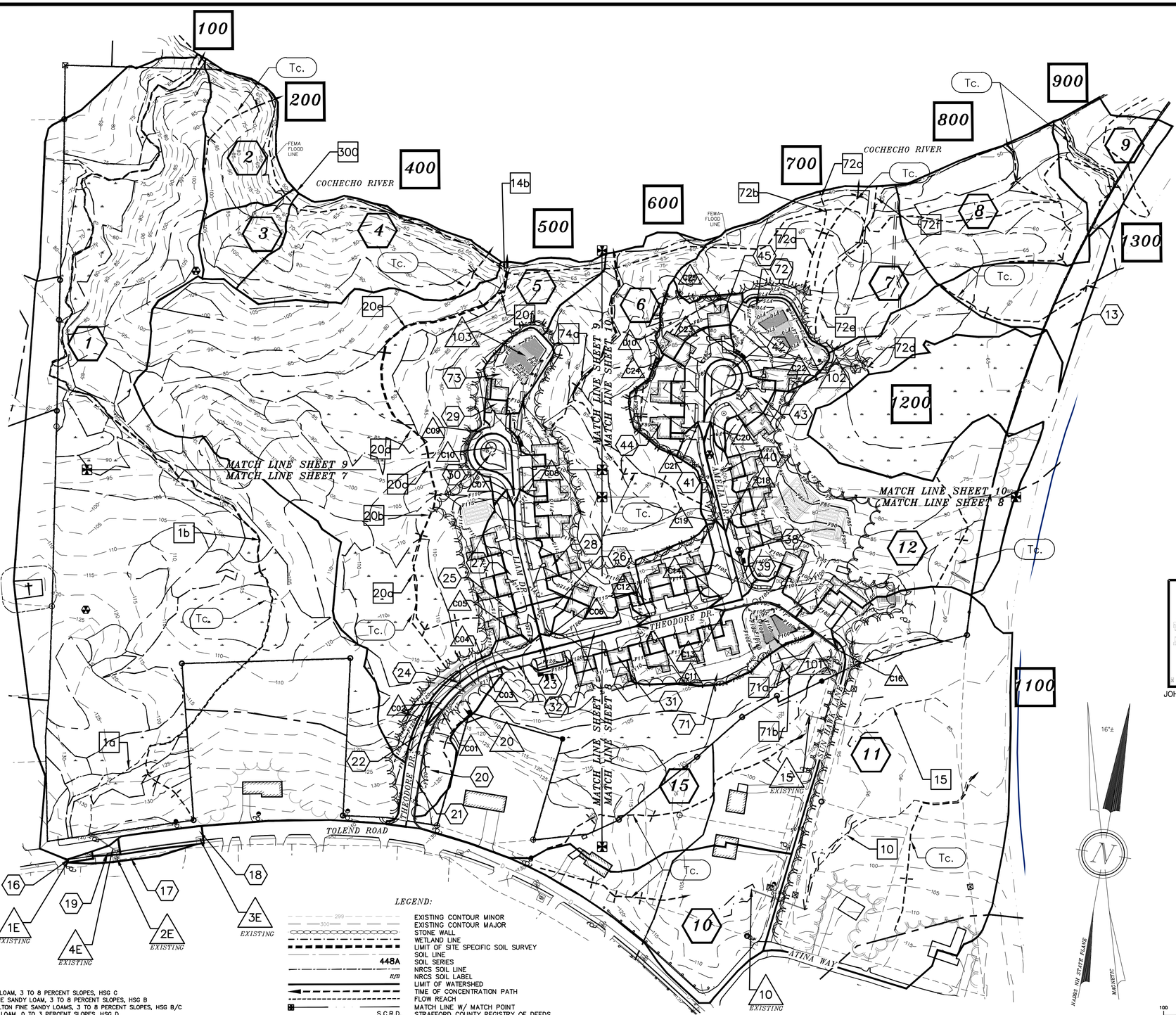
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=92.91' TW=90.32' (Dynamic Tailwater)
↑—**2=Flow Over Road** (Controls 0.00 cfs)

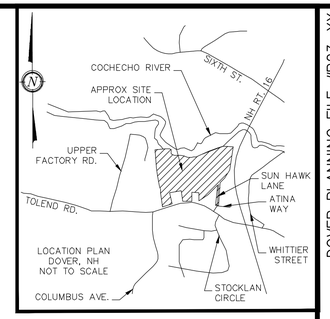
Pond 15P: 12" RCP Inlet Sump/Pond



Appendix II - Proposed Conditions Analysis

2 Yr - 24 Hr. Node Listing
10 Yr -24 Hr. Node Listing
25 Yr -24 Hr. Node Listing
50 Yr -24 Hr. Node Listing
100 Yr - 24 Hr. Node Listing
25 Yr - 24 Hr. Full Summary





NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) LOT AREA LOT 65–1: 1,388,401 Sq. Ft., 31.87 Ac. +/–
LOT AREA LOT 65–A: 546,549 Sq. Ft., 12.55 Ac. +/–

4.) S.C.R.D. BOOK 5044, PAGE 158
S.C.R.D. BOOK 1571, PAGE 86

5.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, A PORTION OF THIS PARCEL DOES FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015 AS SHOWN.

6.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

7.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED WATERSHED CONDITIONS ON TAX MAP E, LOT 65–1 AS PROPOSED PER SITE PLAN AND GRADING & DRAINAGE PLAN.

8.) SEE EXISTING CONDITIONS PLANS FOR EXPLANATION OF JURISDICTIONAL WETLANDS SHEETS #5–9. SEE SITE SPECIFIC SOIL SURVEY FOR SOILS EXPLANATION. SOILS LEGEND ALSO LOCATED ON SHEETS #11–15.



JOHN P. HAYES III, CWS #18



JOHN P. HAYES III, CSS #87

WETLAND NOTES:

WETLANDS WERE DELINEATED BY JOHN P. HAYES SPRING 2021 & OCTOBER OF 2022.
1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.0. UNITED STATES DEPARTMENT OF AGRICULTURE (2016).
3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

SYMBOLS LEGEND:

SUBCATCHMENT AREA SYMBOL
FLOW REACH SYMBOL
POND DEVICE SYMBOL
TIME OF CONCENTRATION SEGMENT

GRAPHIC SCALE

100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

16°±
MAGNETIC
NADB3 NH STATE PLANE

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

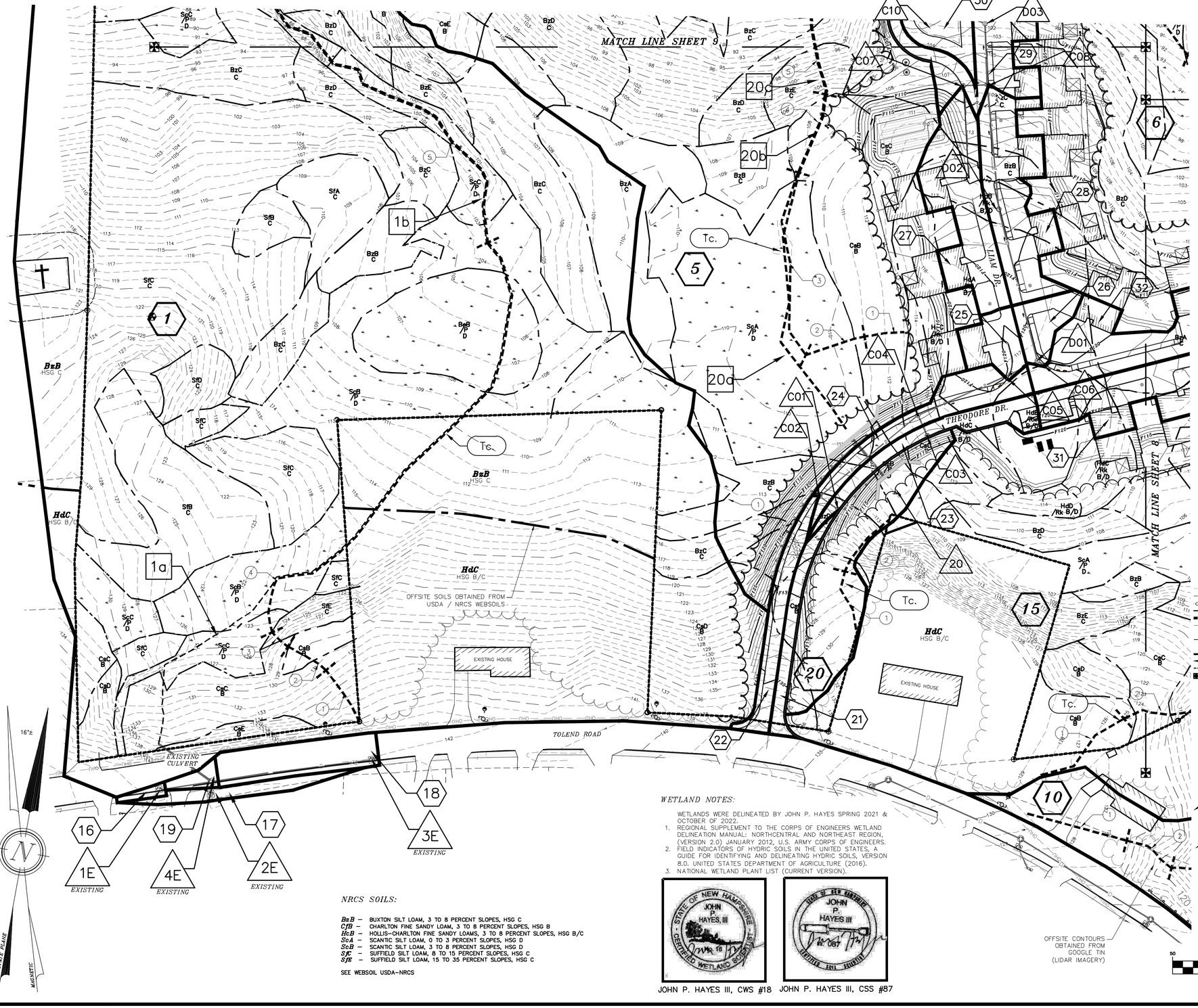
W–2 PROPOSED WATERSHED OVERVIEW
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

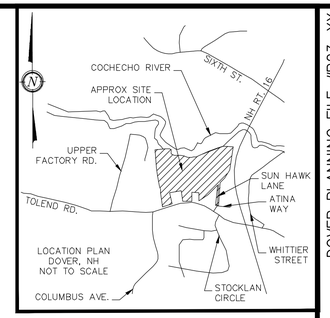
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 100 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

KENNETH A. BERRY No. 14143 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE

NOT FOR CONSTRUCTION





NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

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4.) S.C.R.D. BOOK 5044, PAGE 158
S.C.R.D. BOOK 1571, PAGE 86

5.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, A PORTION OF THIS PARCEL DOES FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015 AS SHOWN.

6.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

7.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED WATERSHED CONDITIONS ON TAX MAP E, LOT 65–1 AS PROPOSED PER SITE PLAN AND GRADING & DRAINAGE PLAN.

8.) SEE EXISTING CONDITIONS PLANS FOR EXPLANATION OF JURISDICTIONAL WETLANDS SHEETS #5–9. SEE SITE SPECIFIC SOIL SURVEY FOR SOILS EXPLANATION. SOILS LEGEND ALSO LOCATED ON SHEETS #11–15.

LEGEND:

- EXISTING CONTOUR MINOR
- EXISTING CONTOUR MAJOR
- STONE WALL
- WETLAND LINE
- LIMIT OF SITE SPECIFIC SOIL SURVEY
- 448A — SOIL SERIES
- SOIL LINE
- NRCS SOIL LINE
- HfB — NRCS SOIL LABEL
- LIMIT OF WATERSHED
- TIME OF CONCENTRATION PATH
- FLOW REACH
- MATCH LINE W/ MATCH POINT
- S.C.R.D. — STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. — TYPICAL
- FND — FOUND
- TBR — TO BE REMOVED

SYMBOLS LEGEND:

- # — SUBCATCHMENT AREA SYMBOL
- # — FLOW REACH SYMBOL
- # — POND DEVICE SYMBOL
- Tc. / # — TIME OF CONCENTRATION SEGMENT

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

NRCS SOILS:

BxB – BUXTON SILT LOAM, 3 TO 8 PERCENT SLOPES, HSG C
CfB – CHARLTON FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES, HSG B
HcB – HOLLIS–CHARLTON FINE SANDY LOAMS, 3 TO 8 PERCENT SLOPES, HSG B/C
ScA – SCANTIC SILT LOAM, 0 TO 3 PERCENT SLOPES, HSG D
ScB – SCANTIC SILT LOAM, 3 TO 8 PERCENT SLOPES, HSG D
SfC – SUFFIELD SILT LOAM, 8 TO 15 PERCENT SLOPES, HSG C
SfE – SUFFIELD SILT LOAM, 15 TO 35 PERCENT SLOPES, HSG C

SEE WEBSOIL USDA–NRCS

WETLAND NOTES:

WETLANDS WERE DELINEATED BY JOHN P. HAYES SPRING 2021 & OCTOBER OF 2022.
1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
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3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

STATE OF NEW HAMPSHIRE — JOHN P. HAYES, III — CERTIFIED WETLAND SCIENTIST — OWR 18
JOHN P. HAYES III, CWS #18

STATE OF NEW HAMPSHIRE — JOHN P. HAYES III — 087 — SURVEYOR
JOHN P. HAYES III, CSS #87

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

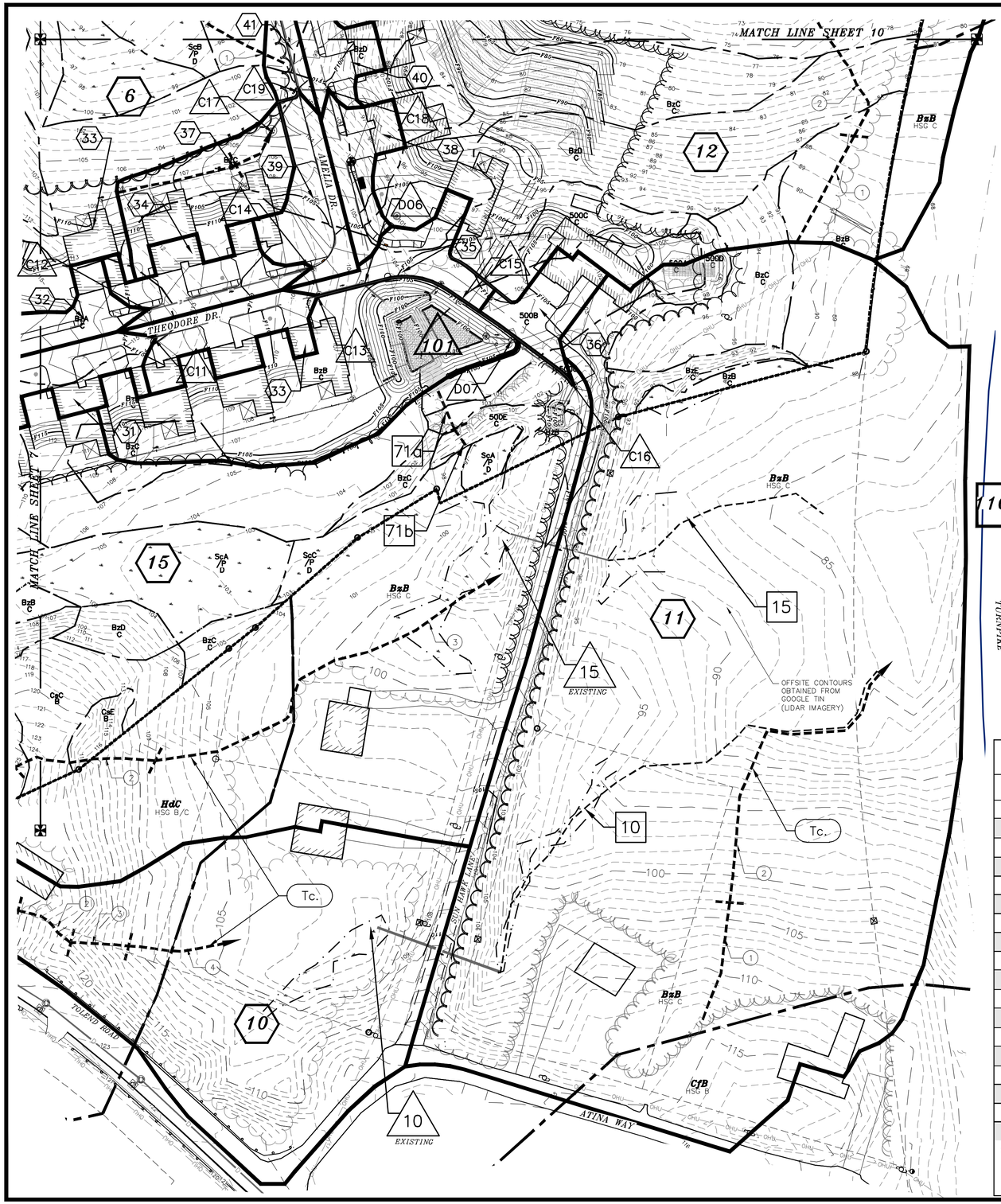
W–2 PROPOSED WATERSHED DETAIL – SOUTHWEST
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE — KENNETH A. BERRY — 10743 — LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



SITE SPECIFIC SOILS LEGEND

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
BeB	BIDDEFORD	D
BzA	BUXTON	C
BzB	BUXTON	C
BzC	BUXTON	C
BzD	BUXTON	C
BzE	BUXTON	C
CsB	CHARLTON (VERY STONY)	B
CsC	CHARLTON (VERY STONY)	B
CsD	CHARLTON (VERY STONY)	B
CsE	CHARLTON (VERY STONY)	B
HdA/Rk	HOLLIS-CHARLTON COMPLEX (VERY ROCKY)	B/D
HdB/Rk	HOLLIS-CHARLTON COMPLEX (VERY ROCKY)	B/D
HdC/Rk	HOLLIS-CHARLTON COMPLEX (VERY ROCKY)	B/D
HdD/Rk	HOLLIS-CHARLTON COMPLEX (VERY ROCKY)	B/D
HdE/Rk	HOLLIS-CHARLTON COMPLEX (VERY ROCKY)	B/D
MIB/P	MIXED ALLUVIAL LAND (POORLY DRAINED)	C/D
MIC/P	MIXED ALLUVIAL LAND (POORLY DRAINED)	C/D

SLOPE: A = 0-3% B = 3-8% C = 8-15% D = 15-25% E = 25-50% F = 50%+

DENOMINATOR: /Rk = ROCKY /VPD = VERY POORLY DRAINED /PD = POORLY DRAINED /SWPD = SOMEWHAT POORLY DRAINED /MWD = MODERATELY WELL DRAINED

LEGEND:

- EXISTING CONTOUR MINOR
- EXISTING CONTOUR MAJOR
- STONE WALL
- WETLAND LINE
- LIMIT OF SITE SPECIFIC SOIL SURVEY
- SOIL LINE
- 448A — SOIL SERIES
- nrb — NRCS SOIL LINE
- NRCS SOIL LABEL
- LIMIT OF WATERSHED
- TIME OF CONCENTRATION PATH
- FLOW REACH
- MATCH LINE W/ MATCH POINT
- S.C.R.D. — STRAFFORD COUNTY REGISTRY OF DEEDS
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- FND — FOUND
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NRCS SOILS:

BzB – BUXTON SILT LOAM, 3 TO 8 PERCENT SLOPES, HSG C
CfB – CHARLTON FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES, HSG B
HcB – HOLLIS-CHARLTON FINE SANDY LOAMS, 3 TO 8 PERCENT SLOPES, HSG B/C
ScA – SCANTIC SILT LOAM, 0 TO 3 PERCENT SLOPES, HSG D
ScB – SCANTIC SILT LOAM, 3 TO 8 PERCENT SLOPES, HSG D
SfC – SUFFIELD SILT LOAM, 8 TO 15 PERCENT SLOPES, HSG C
SfE – SUFFIELD SILT LOAM, 15 TO 35 PERCENT SLOPES, HSG C

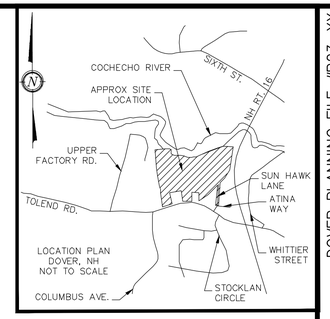
SEE WEBSOIL USDA-NRCS

SITE SPECIFIC SOILS LEGEND (CONT'D)

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
MIB	MIXED ALLUVIAL LAND	A
MIC	MIXED ALLUVIAL LAND	A
MID	MIXED ALLUVIAL LAND	A
MIE	MIXED ALLUVIAL LAND	A
ScA/P	SCANTIC	D
ScB/P	SCANTIC	D
ScC/P	SCANTIC	D
ScD/P	SCANTIC	D
ScE/P	SCANTIC	D
SfA	SUFFIELD	C
SfB	SUFFIELD	C
SfC	SUFFIELD	C
SfD	SUFFIELD	C
SfE	SUFFIELD	C
500B	UDORTHENTS	C
500C	UDORTHENTS	C
500D	UDORTHENTS	C
500E	UDORTHENTS	C

SLOPE: A = 0-3% B = 3-8% C = 8-15% D = 15-25% E = 25-50% F = 50%+

DENOMINATOR: /Rk = ROCKY /VPD = VERY POORLY DRAINED /PD = POORLY DRAINED /SWPD = SOMEWHAT POORLY DRAINED /MWD = MODERATELY WELL DRAINED



NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,388,401 Sq. Ft., 31.87 Ac. +/-
LOT AREA LOT 65-A: 546,549 Sq. Ft., 12.55 Ac. +/-

4.) S.C.R.D. BOOK 5044, PAGE 158
S.C.R.D. BOOK 1571, PAGE 86

5.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, A PORTION OF THIS PARCEL DOES FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015 AS SHOWN.

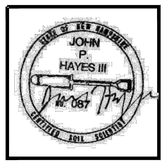
6.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

7.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED WATERSHED CONDITIONS ON TAX MAP E, LOT 65-1 AS PROPOSED PER SITE PLAN AND GRADING & DRAINAGE PLAN.

8.) SEE EXISTING CONDITIONS PLANS FOR EXPLANATION OF JURISDICTIONAL WETLANDS SHEETS #5-9. SEE SITE SPECIFIC SOIL SURVEY FOR SOILS EXPLANATION. SOILS LEGEND ALSO LOCATED ON SHEETS #11-15.



JOHN P. HAYES III, CWS #18



JOHN P. HAYES III, CSS #87

WETLAND NOTES:

WETLANDS WERE DELINEATED BY JOHN P. HAYES SPRING 2021 & OCTOBER OF 2022.
1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
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3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

SYMBOLS LEGEND:

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- # — FLOW REACH SYMBOL
- # — POND DEVICE SYMBOL
- Tc. — # — TIME OF CONCENTRATION SEGMENT

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

W-2 PROPOSED WATERSHED DETAIL - SOUTHEAST
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
NO. 14143
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

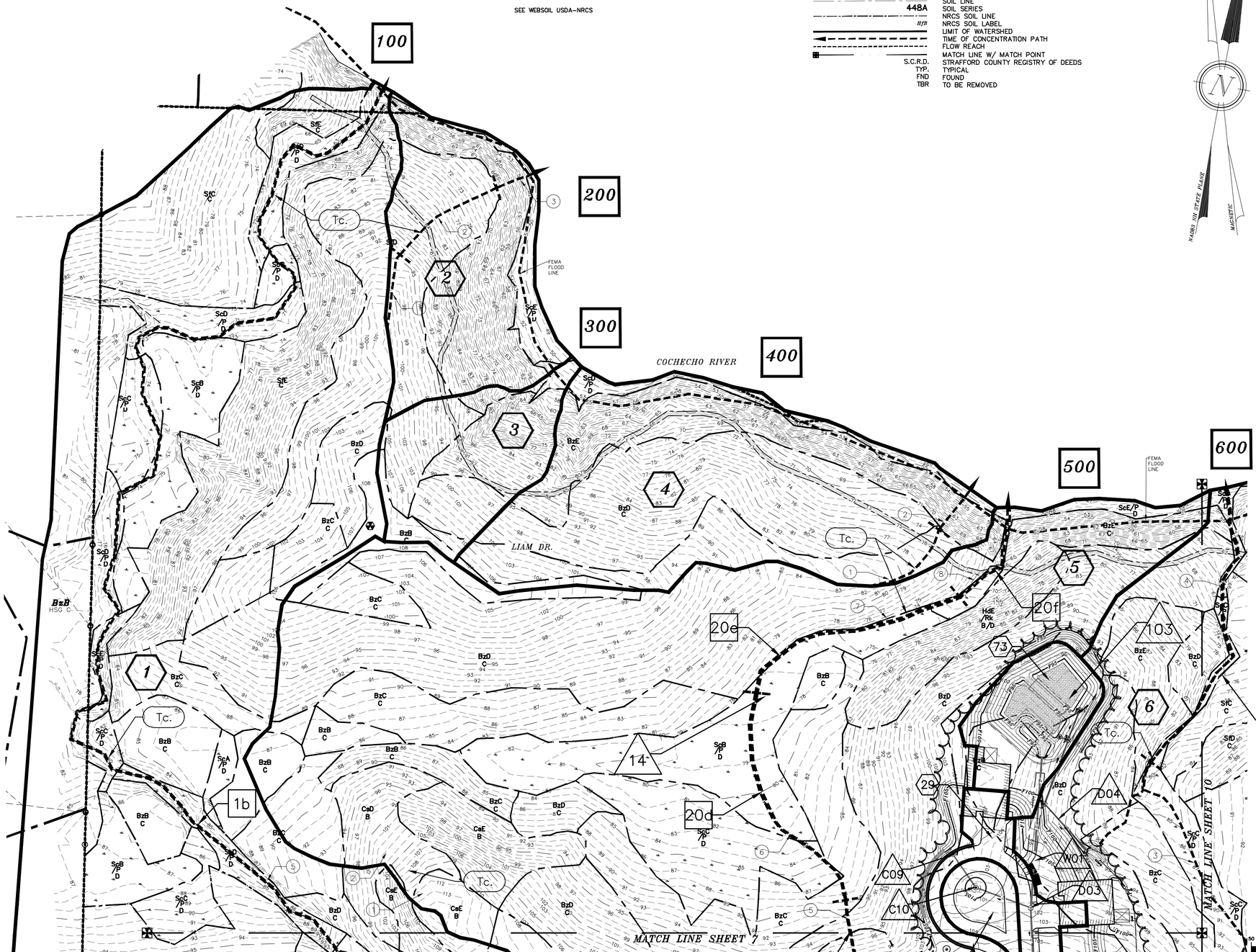
NRCS SOILS:

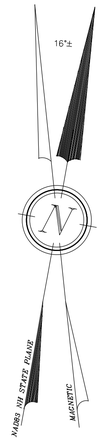
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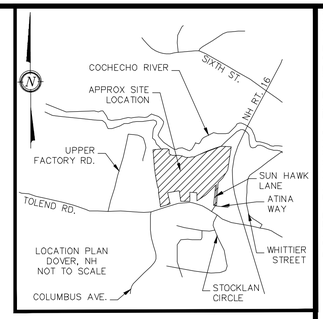
SEE WEBSOIL USDA–NRCS

LEGEND:

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- EXISTING CONTOUR MAJOR
- STONE WALL
- WETLAND LINE
- LIMIT OF SITE SPECIFIC SOIL SURVEY
- SOIL LINE
- 448A — SOIL SERIES
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- *HfB* — NRCS SOIL LABEL
- LIMIT OF WATERSHED
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- MATCH LINE W/ MATCH POINT
- S.C.R.D. — STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. — TYPICAL
- FND — FOUND
- TBR — TO BE REMOVED







NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) LOT AREA LOT 65–1: 1,388,401 Sq. Ft., 31.87 Ac. +/–
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4.) S.C.R.D. BOOK 5044, PAGE 158
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JOHN P. HAYES III, CWS #18

JOHN P. HAYES III, CSS #87

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SYMBOLS LEGEND:

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GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

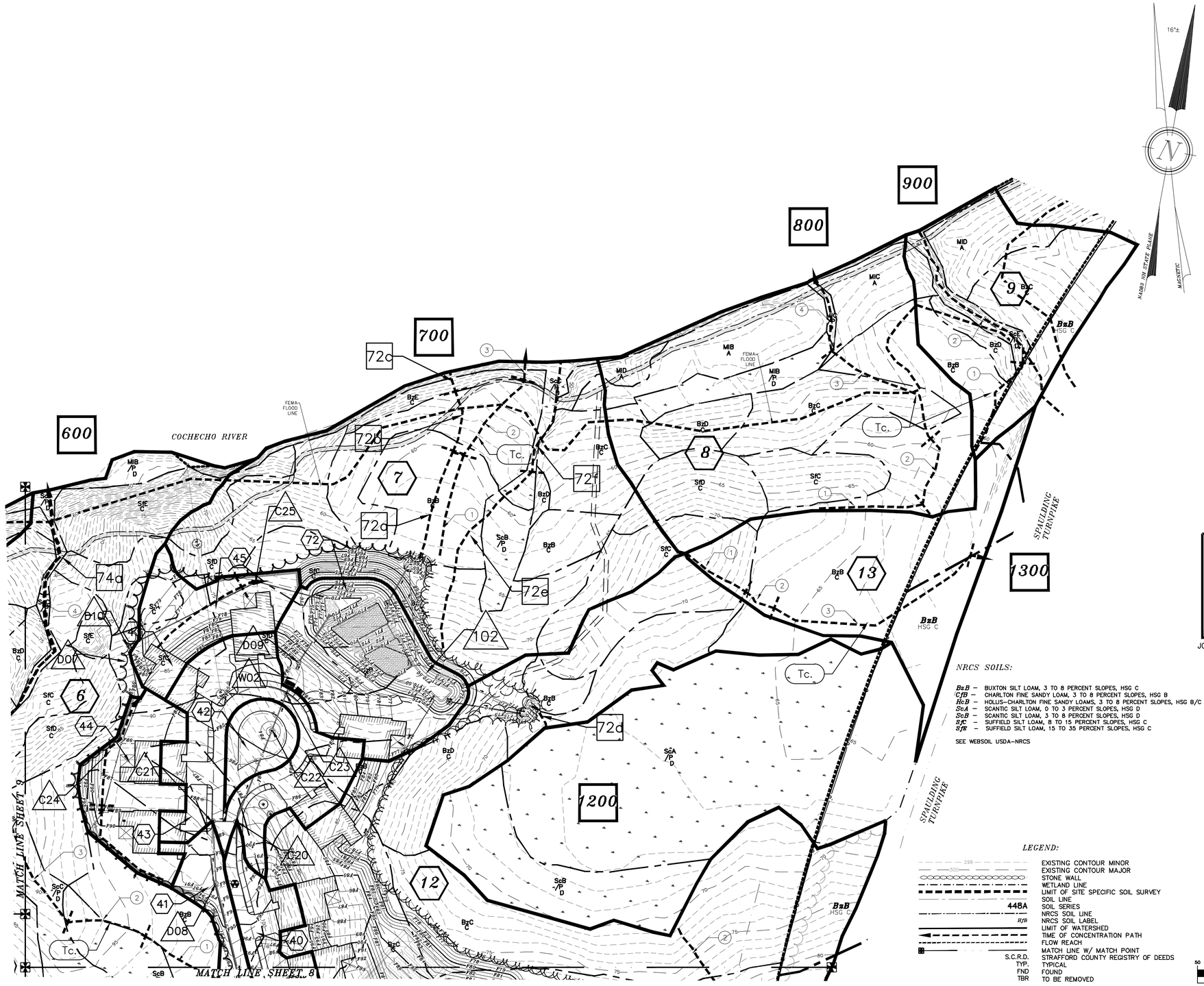
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EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

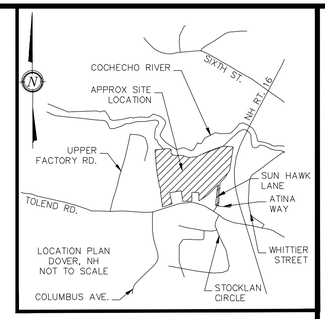
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION





NOTES:

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DOVER, NH 03820

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JOHN P. HAYES III, CWS #18

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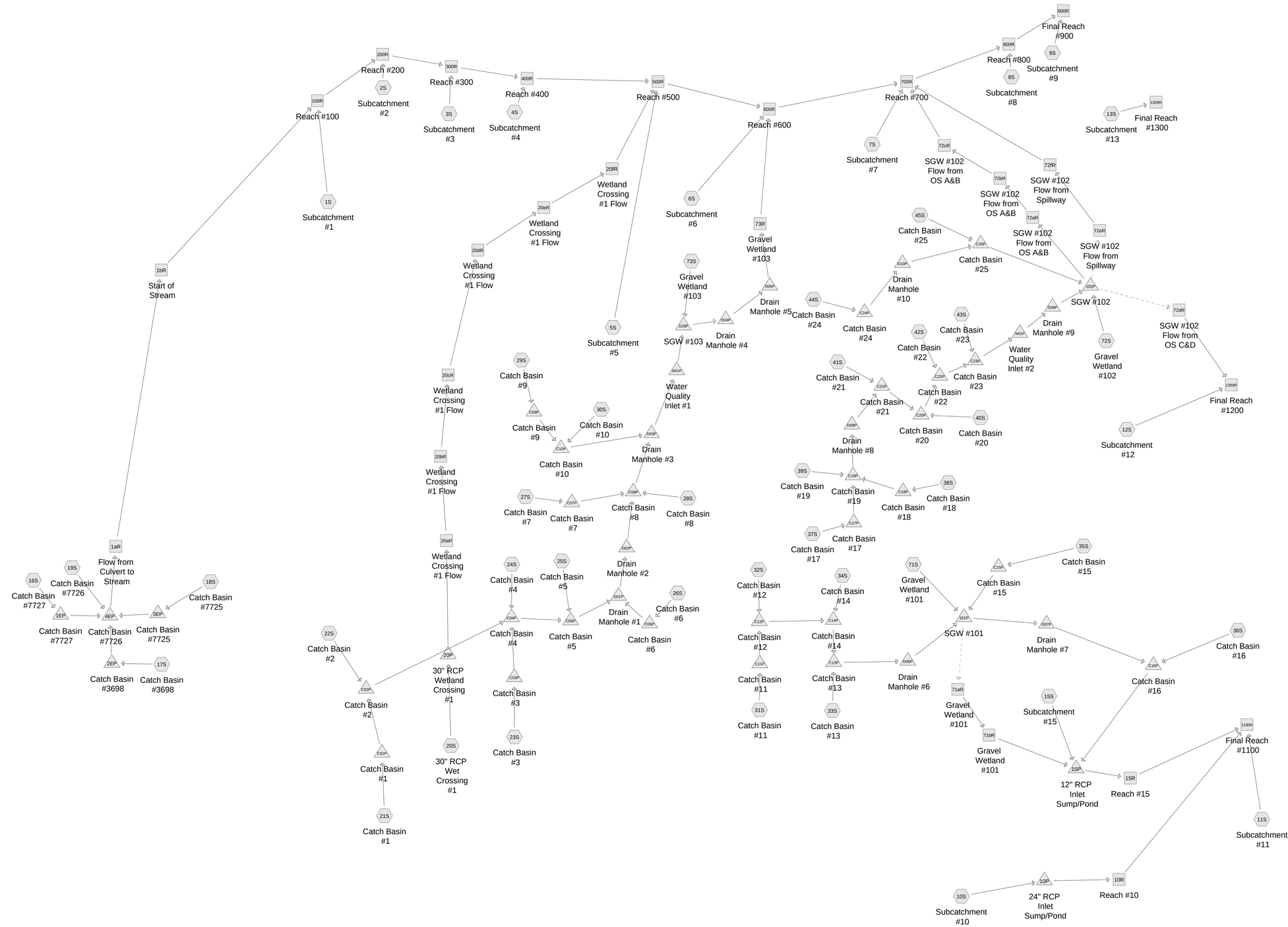
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STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



Subcat Reach Pond Link

Routing Diagram for 23-031 Proposed Analysis

Prepared by Berry Surveying & Engineering, Printed 4/27/2023

HydroCAD® 10.00-25 s/n 07605 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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

Subcatchment1S: Subcatchment#1 Runoff Area=618,885 sf 0.95% Impervious Runoff Depth>1.07"
Flow Length=2,050' Tc=25.3 min CN=70 Runoff=10.11 cfs 1.266 af

Subcatchment2S: Subcatchment#2 Runoff Area=33,802 sf 0.00% Impervious Runoff Depth>1.13"
Flow Length=215' Tc=8.3 min CN=71 Runoff=0.87 cfs 0.073 af

Subcatchment3S: Subcatchment#3 Runoff Area=19,435 sf 0.00% Impervious Runoff Depth>1.08"
Flow Length=240' Tc=7.0 min CN=70 Runoff=0.50 cfs 0.040 af

Subcatchment4S: Subcatchment#4 Runoff Area=64,929 sf 0.00% Impervious Runoff Depth>1.07"
Flow Length=293' Tc=14.1 min CN=70 Runoff=1.34 cfs 0.133 af

Subcatchment5S: Subcatchment#5 Runoff Area=355,305 sf 1.21% Impervious Runoff Depth>1.06"
Flow Length=991' Tc=40.0 min UI Adjusted CN=70 Runoff=4.70 cfs 0.724 af

Subcatchment6S: Subcatchment#6 Runoff Area=148,453 sf 5.90% Impervious Runoff Depth>1.25"
Flow Length=927' Tc=27.5 min UI Adjusted CN=73 Runoff=2.81 cfs 0.354 af

Subcatchment7S: Subcatchment#7 Runoff Area=87,203 sf 0.00% Impervious Runoff Depth>1.07"
Flow Length=210' Tc=17.4 min CN=70 Runoff=1.66 cfs 0.179 af

Subcatchment8S: Subcatchment#8 Runoff Area=69,837 sf 0.00% Impervious Runoff Depth>0.62"
Flow Length=381' Tc=18.1 min CN=61 Runoff=0.61 cfs 0.083 af

Subcatchment9S: Subcatchment#9 Runoff Area=30,235 sf 0.00% Impervious Runoff Depth>0.62"
Flow Length=273' Tc=13.9 min CN=61 Runoff=0.29 cfs 0.036 af

Subcatchment10S: Subcatchment#10 Runoff Area=74,498 sf 10.49% Impervious Runoff Depth>1.13"
Flow Length=280' Tc=9.4 min UI Adjusted CN=71 Runoff=1.88 cfs 0.161 af

Subcatchment11S: Subcatchment#11 Runoff Area=247,933 sf 3.57% Impervious Runoff Depth>1.13"
Flow Length=368' Tc=13.6 min CN=71 Runoff=5.52 cfs 0.536 af

Subcatchment12S: Subcatchment#12 Runoff Area=172,549 sf 5.34% Impervious Runoff Depth>1.19"
Flow Length=462' Tc=17.7 min UI Adjusted CN=72 Runoff=3.70 cfs 0.392 af

Subcatchment13S: Subcatchment#13 Runoff Area=33,510 sf 0.00% Impervious Runoff Depth>1.13"
Flow Length=329' Tc=18.6 min CN=71 Runoff=0.66 cfs 0.072 af

Subcatchment15S: Subcatchment#15 Runoff Area=238,038 sf 5.11% Impervious Runoff Depth>1.01"
Flow Length=553' Tc=23.7 min UI Adjusted CN=69 Runoff=3.74 cfs 0.462 af

Subcatchment16S: Catch Basin #7727 Runoff Area=459 sf 45.75% Impervious Runoff Depth>1.80"
Tc=6.0 min CN=81 Runoff=0.02 cfs 0.002 af

Subcatchment17S: Catch Basin #3698 Runoff Area=2,300 sf 9.70% Impervious Runoff Depth>1.08"
Tc=6.0 min CN=70 Runoff=0.06 cfs 0.005 af

Subcatchment 18S: Catch Basin #7725 Runoff Area=5,195 sf 84.79% Impervious Runoff Depth>2.84"
Tc=6.0 min CN=93 Runoff=0.37 cfs 0.028 af

Subcatchment 19S: Catch Basin #7726 Runoff Area=880 sf 88.86% Impervious Runoff Depth>3.05"
Tc=6.0 min CN=95 Runoff=0.07 cfs 0.005 af

Subcatchment 20S: 30" RCP Wet Crossing Runoff Area=14,031 sf 0.00% Impervious Runoff Depth>0.71"
Flow Length=138' Tc=8.8 min CN=63 Runoff=0.19 cfs 0.019 af

Subcatchment 21S: Catch Basin #1 Runoff Area=2,746 sf 100.00% Impervious Runoff Depth>3.37"
Tc=6.0 min CN=98 Runoff=0.22 cfs 0.018 af

Subcatchment 22S: Catch Basin #2 Runoff Area=4,125 sf 100.00% Impervious Runoff Depth>3.37"
Tc=6.0 min CN=98 Runoff=0.32 cfs 0.027 af

Subcatchment 23S: Catch Basin #3 Runoff Area=4,117 sf 96.04% Impervious Runoff Depth>3.26"
Tc=6.0 min CN=97 Runoff=0.32 cfs 0.026 af

Subcatchment 24S: Catch Basin #4 Runoff Area=5,883 sf 77.78% Impervious Runoff Depth>2.84"
Tc=6.0 min CN=93 Runoff=0.42 cfs 0.032 af

Subcatchment 25S: Catch Basin #5 Runoff Area=3,045 sf 75.40% Impervious Runoff Depth>2.74"
Tc=6.0 min CN=92 Runoff=0.21 cfs 0.016 af

Subcatchment 26S: Catch Basin #6 Runoff Area=2,819 sf 66.69% Impervious Runoff Depth>2.55"
Tc=6.0 min CN=90 Runoff=0.19 cfs 0.014 af

Subcatchment 27S: Catch Basin #7 Runoff Area=10,139 sf 53.49% Impervious Runoff Depth>2.11"
Tc=6.0 min CN=85 Runoff=0.56 cfs 0.041 af

Subcatchment 28S: Catch Basin #8 Runoff Area=10,376 sf 71.82% Impervious Runoff Depth>2.64"
Tc=6.0 min CN=91 Runoff=0.71 cfs 0.052 af

Subcatchment 29S: Catch Basin #9 Runoff Area=10,795 sf 77.32% Impervious Runoff Depth>2.84"
Tc=6.0 min CN=93 Runoff=0.78 cfs 0.059 af

Subcatchment 30S: Catch Basin #10 Runoff Area=4,592 sf 58.78% Impervious Runoff Depth>2.55"
Tc=6.0 min CN=90 Runoff=0.30 cfs 0.022 af

Subcatchment 31S: Catch Basin #11 Runoff Area=8,885 sf 77.12% Impervious Runoff Depth>2.84"
Tc=6.0 min CN=93 Runoff=0.64 cfs 0.048 af

Subcatchment 32S: Catch Basin #12 Runoff Area=9,067 sf 63.57% Impervious Runoff Depth>2.46"
Tc=6.0 min CN=89 Runoff=0.58 cfs 0.043 af

Subcatchment 33S: Catch Basin #13 Runoff Area=6,803 sf 72.53% Impervious Runoff Depth>2.64"
Tc=6.0 min CN=91 Runoff=0.46 cfs 0.034 af

Subcatchment 34S: Catch Basin #14 Runoff Area=7,027 sf 75.00% Impervious Runoff Depth>2.74"
Tc=6.0 min CN=92 Runoff=0.49 cfs 0.037 af

Subcatchment 35S: Catch Basin #15 Runoff Area=5,408 sf 92.07% Impervious Runoff Depth>3.15"
Tc=6.0 min CN=96 Runoff=0.41 cfs 0.033 af

Subcatchment 36S: Catch Basin #16 Runoff Area=4,733 sf 81.07% Impervious Runoff Depth>2.84"
Tc=6.0 min CN=93 Runoff=0.34 cfs 0.026 af

Subcatchment 37S: Catch Basin #17 Runoff Area=10,736 sf 26.53% Impervious Runoff Depth>1.51"
Flow Length=139' Tc=7.4 min UI Adjusted CN=77 Runoff=0.40 cfs 0.031 af

Subcatchment 38S: Catch Basin #18 Runoff Area=5,166 sf 74.68% Impervious Runoff Depth>2.74"
Tc=6.0 min CN=92 Runoff=0.36 cfs 0.027 af

Subcatchment 39S: Catch Basin #19 Runoff Area=7,033 sf 41.63% Impervious Runoff Depth>2.03"
Tc=6.0 min CN=84 Runoff=0.38 cfs 0.027 af

Subcatchment 40S: Catch Basin #20 Runoff Area=8,226 sf 73.85% Impervious Runoff Depth>2.74"
Tc=6.0 min CN=92 Runoff=0.58 cfs 0.043 af

Subcatchment 41S: Catch Basin #21 Runoff Area=6,361 sf 48.18% Impervious Runoff Depth>2.11"
Tc=6.0 min CN=85 Runoff=0.35 cfs 0.026 af

Subcatchment 42S: Catch Basin #22 Runoff Area=4,592 sf 58.78% Impervious Runoff Depth>2.55"
Tc=6.0 min CN=90 Runoff=0.30 cfs 0.022 af

Subcatchment 43S: Catch Basin #23 Runoff Area=21,628 sf 64.81% Impervious Runoff Depth>2.55"
Tc=6.0 min CN=90 Runoff=1.43 cfs 0.105 af

Subcatchment 44S: Catch Basin #24 Runoff Area=11,921 sf 24.23% Impervious Runoff Depth>1.51"
Flow Length=213' Tc=10.9 min UI Adjusted CN=77 Runoff=0.40 cfs 0.034 af

Subcatchment 45S: Catch Basin #25 Runoff Area=11,430 sf 24.30% Impervious Runoff Depth>1.51"
Flow Length=112' Slope=0.0050 '/' Tc=16.5 min UI Adjusted CN=77 Runoff=0.33 cfs 0.033 af

Subcatchment 71S: Gravel Wetland #101 Runoff Area=28,837 sf 17.32% Impervious Runoff Depth>1.58"
Tc=6.0 min CN=78 Runoff=1.19 cfs 0.087 af

Subcatchment 72S: Gravel Wetland #102 Runoff Area=21,302 sf 9.37% Impervious Runoff Depth>1.44"
Tc=6.0 min CN=76 Runoff=0.80 cfs 0.059 af

Subcatchment 73S: Gravel Wetland #103 Runoff Area=12,324 sf 9.02% Impervious Runoff Depth>1.44"
Tc=6.0 min CN=76 Runoff=0.46 cfs 0.034 af

Reach 1aR: Flow from Culvert to Stream Avg. Flow Depth=0.08' Max Vel=1.32 fps Inflow=0.52 cfs 0.040 af
n=0.035 L=655.5' S=0.0506 '/' Capacity=22.92 cfs Outflow=0.40 cfs 0.039 af

Reach 1bR: Start of Stream Avg. Flow Depth=0.07' Max Vel=1.32 fps Inflow=0.40 cfs 0.039 af
n=0.035 L=1,438.0' S=0.0351 '/' Capacity=6.96 cfs Outflow=0.28 cfs 0.039 af

Reach 10R: Reach #10 Avg. Flow Depth=0.17' Max Vel=1.79 fps Inflow=1.87 cfs 0.161 af
n=0.035 L=453.0' S=0.0336 '/' Capacity=18.68 cfs Outflow=1.71 cfs 0.160 af

Reach 15R: Reach #15 Avg. Flow Depth=0.24' Max Vel=2.31 fps Inflow=3.83 cfs 0.541 af
n=0.035 L=198.0' S=0.0344 '/' Capacity=18.90 cfs Outflow=3.82 cfs 0.540 af

Reach 20aR: Wetland Crossing #1 Flow Avg. Flow Depth=0.06' Max Vel=0.37 fps Inflow=0.18 cfs 0.019 af
n=0.035 L=274.0' S=0.0055 '/' Capacity=12.58 cfs Outflow=0.13 cfs 0.019 af

Reach 20bR: Wetland Crossing #1 Flow Avg. Flow Depth=0.05' Max Vel=0.83 fps Inflow=0.13 cfs 0.019 af
n=0.035 L=81.0' S=0.0370 '/' Capacity=19.60 cfs Outflow=0.13 cfs 0.019 af

Reach 20cR: Wetland Crossing #1 Flow Avg. Flow Depth=0.03' Max Vel=1.54 fps Inflow=0.13 cfs 0.019 af
n=0.035 L=78.0' S=0.2179 '/' Capacity=47.55 cfs Outflow=0.13 cfs 0.019 af

Reach 20dR: Wetland Crossing #1 Flow Avg. Flow Depth=0.04' Max Vel=0.93 fps Inflow=0.13 cfs 0.019 af
n=0.035 L=222.5' S=0.0517 '/' Capacity=23.16 cfs Outflow=0.13 cfs 0.019 af

Reach 20eR: Wetland Crossing #1 Flow Avg. Flow Depth=0.07' Max Vel=0.97 fps Inflow=0.13 cfs 0.019 af
n=0.035 L=217.0' S=0.0300 '/' Capacity=36.75 cfs Outflow=0.12 cfs 0.019 af

Reach 20fR: Wetland Crossing #1 Flow Avg. Flow Depth=0.05' Max Vel=1.92 fps Inflow=0.12 cfs 0.019 af
n=0.035 L=105.0' S=0.2143 '/' Capacity=98.29 cfs Outflow=0.12 cfs 0.019 af

Reach 71aR: Gravel Wetland #101 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=34.0' S=0.0588 '/' Capacity=39.30 cfs Outflow=0.00 cfs 0.000 af

Reach 71bR: Gravel Wetland #101 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=16.0' S=0.2500 '/' Capacity=50.93 cfs Outflow=0.00 cfs 0.000 af

Reach 72aR: SGW #102 Flow from OS Avg. Flow Depth=0.03' Max Vel=0.65 fps Inflow=0.07 cfs 0.073 af
n=0.035 L=109.0' S=0.0367 '/' Capacity=103.16 cfs Outflow=0.07 cfs 0.073 af

Reach 72bR: SGW #102 Flow from OS Avg. Flow Depth=0.03' Max Vel=0.93 fps Inflow=0.07 cfs 0.073 af
n=0.035 L=60.0' S=0.1000 '/' Capacity=170.29 cfs Outflow=0.07 cfs 0.073 af

Reach 72cR: SGW #102 Flow from OS Avg. Flow Depth=0.02' Max Vel=1.34 fps Inflow=0.07 cfs 0.073 af
n=0.035 L=20.0' S=0.3000 '/' Capacity=294.94 cfs Outflow=0.07 cfs 0.073 af

Reach 72dR: SGW #102 Flow from OS Avg. Flow Depth=0.03' Max Vel=0.64 fps Inflow=0.05 cfs 0.051 af
n=0.035 L=26.5' S=0.0472 '/' Capacity=116.95 cfs Outflow=0.05 cfs 0.051 af

Reach 72eR: SGW #102 Flow from Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=201.0' S=0.0871 '/' Capacity=158.89 cfs Outflow=0.00 cfs 0.000 af

Reach 72fR: SGW #102 Flow from Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=117.5' S=0.0936 '/' Capacity=64.97 cfs Outflow=0.00 cfs 0.000 af

Reach 73R: Gravel Wetland #103 Avg. Flow Depth=0.08' Max Vel=1.97 fps Inflow=0.28 cfs 0.172 af
n=0.035 L=380.0' S=0.1145 '/' Capacity=71.84 cfs Outflow=0.28 cfs 0.172 af

Reach 100R: Reach #100 Inflow=10.39 cfs 1.305 af
Outflow=10.39 cfs 1.305 af

Reach 200R: Reach #200 Inflow=10.83 cfs 1.378 af
Outflow=10.83 cfs 1.378 af

Reach 300R: Reach #300 Inflow=11.07 cfs 1.418 af
Outflow=11.07 cfs 1.418 af

Reach 400R: Reach #400 Inflow=12.09 cfs 1.551 af
Outflow=12.09 cfs 1.551 af

Reach 500R: Reach #500 Inflow=15.87 cfs 2.294 af
Outflow=15.87 cfs 2.294 af

Reach 600R: Reach #600 Inflow=18.78 cfs 2.819 af
Outflow=18.78 cfs 2.819 af

Reach 700R: Reach #700 Inflow=20.19 cfs 3.071 af
Outflow=20.19 cfs 3.071 af

Reach 800R: Reach #800 Inflow=20.76 cfs 3.153 af
Outflow=20.76 cfs 3.153 af

Reach 900R: Final Reach #900 Inflow=21.00 cfs 3.189 af
Outflow=21.00 cfs 3.189 af

Reach 1100R: Final Reach #1100 Inflow=9.93 cfs 1.237 af
Outflow=9.93 cfs 1.237 af

Reach 1200R: Final Reach #1200 Inflow=3.74 cfs 0.443 af
Outflow=3.74 cfs 0.443 af

Reach 1300R: Final Reach #1300 Inflow=0.66 cfs 0.072 af
Outflow=0.66 cfs 0.072 af

Pond 1EP: Catch Basin #7727 Peak Elev=138.03' Storage=1 cf Inflow=0.02 cfs 0.002 af
12.0" Round Culvert n=0.012 L=48.0' S=0.0050 '/' Outflow=0.02 cfs 0.002 af

Pond 2EP: Catch Basin #3698 Peak Elev=137.88' Storage=2 cf Inflow=0.06 cfs 0.005 af
12.0" Round Culvert n=0.012 L=8.3' S=0.0048 '/' Outflow=0.06 cfs 0.005 af

Pond 3EP: Catch Basin #7725 Peak Elev=138.81' Storage=4 cf Inflow=0.37 cfs 0.028 af
12.0" Round Culvert n=0.012 L=153.7' S=0.0050 '/' Outflow=0.37 cfs 0.028 af

Pond 4EP: Catch Basin #7726 Peak Elev=137.03' Storage=4 cf Inflow=0.52 cfs 0.040 af
24.0" Round Culvert n=0.012 L=61.5' S=0.0050 '/' Outflow=0.52 cfs 0.040 af

Pond 10P: 24" RCP Inlet Sump/Pond Peak Elev=100.54' Storage=99 cf Inflow=1.88 cfs 0.161 af
24.0" Round Culvert n=0.012 L=108.8' S=0.0113 '/' Outflow=1.87 cfs 0.161 af

Pond 15P: 12" RCP Inlet Sump/Pond Peak Elev=94.44' Storage=218 cf Inflow=3.90 cfs 0.541 af
Primary=3.83 cfs 0.541 af Secondary=0.00 cfs 0.000 af Outflow=3.83 cfs 0.541 af

Pond 20P: 30" RCP Wetland Crossing #1 Peak Elev=111.11' Storage=35 cf Inflow=0.19 cfs 0.019 af
30.0" Round Culvert w/ 6.0" inside fill n=0.024 L=52.0' S=0.0096 '/' Outflow=0.18 cfs 0.019 af

Pond 101P: SGW #101 Peak Elev=102.51' Storage=9,907 cf Inflow=3.77 cfs 0.281 af
Primary=0.05 cfs 0.054 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.054 af

Pond 102P: SGW #102 Peak Elev=72.77' Storage=12,777 cf Inflow=5.14 cfs 0.407 af
Primary=0.07 cfs 0.073 af Secondary=0.05 cfs 0.051 af Tertiary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.124 af

Pond 103P: SGW #103 Peak Elev=96.51' Storage=8,805 cf Inflow=4.50 cfs 0.340 af
Primary=0.10 cfs 0.115 af Secondary=0.18 cfs 0.057 af Tertiary=0.00 cfs 0.000 af Outflow=0.28 cfs 0.172 af

Pond C01P: Catch Basin #1 Peak Elev=117.77' Storage=0.000 af Inflow=0.22 cfs 0.018 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=0.22 cfs 0.018 af

Pond C02P: Catch Basin #2 Peak Elev=117.63' Storage=0.000 af Inflow=0.54 cfs 0.044 af
12.0" Round Culvert n=0.012 L=120.5' S=0.0228 '/' Outflow=0.54 cfs 0.044 af

Pond C03P: Catch Basin #3 Peak Elev=115.11' Storage=0.000 af Inflow=0.32 cfs 0.026 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=0.32 cfs 0.026 af

Pond C04P: Catch Basin #4 Peak Elev=115.07' Storage=0.000 af Inflow=1.28 cfs 0.102 af
12.0" Round Culvert n=0.012 L=95.5' S=0.0065 '/' Outflow=1.28 cfs 0.102 af

Pond C05P: Catch Basin #5 Peak Elev=114.43' Storage=0.000 af Inflow=1.49 cfs 0.118 af
12.0" Round Culvert n=0.012 L=25.5' S=0.0075 '/' Outflow=1.49 cfs 0.118 af

Pond C06P: Catch Basin #6 Peak Elev=115.18' Storage=0.000 af Inflow=0.19 cfs 0.014 af
12.0" Round Culvert n=0.012 L=4.5' S=0.0489 '/' Outflow=0.19 cfs 0.014 af

Pond C07P: Catch Basin #7 Peak Elev=105.08' Storage=0.000 af Inflow=0.56 cfs 0.041 af
12.0" Round Culvert n=0.012 L=19.9' S=0.0050 '/' Outflow=0.57 cfs 0.041 af

Pond C08P: Catch Basin #8 Peak Elev=104.84' Storage=0.000 af Inflow=2.95 cfs 0.225 af
18.0" Round Culvert n=0.012 L=55.7' S=0.0418 '/' Outflow=2.95 cfs 0.225 af

Pond C09P: Catch Basin #9 Peak Elev=101.52' Storage=0.000 af Inflow=0.78 cfs 0.059 af
12.0" Round Culvert n=0.012 L=33.2' S=0.0217 '/' Outflow=0.78 cfs 0.059 af

Pond C10P: Catch Basin #10 Peak Elev=100.87' Storage=0.000 af Inflow=1.08 cfs 0.081 af
12.0" Round Culvert n=0.012 L=50.0' S=0.0050 '/' Outflow=1.08 cfs 0.081 af

Pond C11P: Catch Basin #11 Peak Elev=109.92' Storage=0.000 af Inflow=0.64 cfs 0.048 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=0.64 cfs 0.048 af

Pond C12P: Catch Basin #12 Peak Elev=109.76' Storage=0.000 af Inflow=1.22 cfs 0.091 af
12.0" Round Culvert n=0.012 L=136.0' S=0.0422 '/' Outflow=1.22 cfs 0.091 af

Pond C13P: Catch Basin #13 Peak Elev=103.57' Storage=0.000 af Inflow=2.17 cfs 0.162 af
15.0" Round Culvert n=0.012 L=33.0' S=0.0527 '/' Outflow=2.17 cfs 0.162 af

Pond C14P: Catch Basin #14 Peak Elev=104.08' Storage=0.000 af Inflow=1.71 cfs 0.128 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0139 '/' Outflow=1.71 cfs 0.128 af

Pond C15P: Catch Basin #15 Peak Elev=102.50' Storage=0.001 af Inflow=0.41 cfs 0.033 af
12.0" Round Culvert n=0.012 L=12.0' S=0.0167 '/' Outflow=0.40 cfs 0.032 af

Pond C16P: Catch Basin #16 Peak Elev=99.08' Storage=0.000 af Inflow=0.37 cfs 0.079 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=0.37 cfs 0.079 af

Pond C17P: Catch Basin #17 Peak Elev=97.97' Storage=0.000 af Inflow=0.40 cfs 0.031 af
12.0" Round Culvert n=0.012 L=37.2' S=0.0478 '/' Outflow=0.40 cfs 0.031 af

Pond C18P: Catch Basin #18 Peak Elev=96.37' Storage=0.000 af Inflow=0.36 cfs 0.027 af
12.0" Round Culvert n=0.012 L=19.0' S=0.0100 '/' Outflow=0.36 cfs 0.027 af

Pond C19P: Catch Basin #19 Peak Elev=96.13' Storage=0.000 af Inflow=1.14 cfs 0.085 af
12.0" Round Culvert n=0.012 L=122.5' S=0.0651 '/' Outflow=1.14 cfs 0.085 af

Pond C20P: Catch Basin #20 Peak Elev=84.18' Storage=0.000 af Inflow=2.06 cfs 0.154 af
15.0" Round Culvert n=0.012 L=90.0' S=0.0486 '/' Outflow=2.07 cfs 0.154 af

Pond C21P: Catch Basin #21 Peak Elev=84.65' Storage=0.000 af Inflow=1.49 cfs 0.111 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0139 '/' Outflow=1.49 cfs 0.111 af

Pond C22P: Catch Basin #22 Peak Elev=79.92' Storage=0.000 af Inflow=2.37 cfs 0.177 af
18.0" Round Culvert n=0.012 L=34.5' S=0.0055 '/' Outflow=2.36 cfs 0.176 af

Pond C23P: Catch Basin #23 Peak Elev=79.68' Storage=0.000 af Inflow=3.78 cfs 0.282 af
18.0" Round Culvert n=0.012 L=6.5' S=0.0092 '/' Outflow=3.79 cfs 0.282 af

Pond C24P: Catch Basin #24 Peak Elev=78.81' Storage=0.000 af Inflow=0.40 cfs 0.034 af
12.0" Round Culvert n=0.012 L=49.2' S=0.0437 '/' Outflow=0.40 cfs 0.034 af

Pond C25P: Catch Basin #25 Peak Elev=72.78' Storage=0.001 af Inflow=0.70 cfs 0.067 af
15.0" Round Culvert n=0.012 L=60.0' S=0.0083 '/' Outflow=0.70 cfs 0.066 af

Pond D01P: Drain Manhole #1 Peak Elev=113.93' Storage=0.000 af Inflow=1.68 cfs 0.132 af
15.0" Round Culvert n=0.012 L=148.5' S=0.0055 '/' Outflow=1.68 cfs 0.132 af

Pond D02P: Drain Manhole #2 Peak Elev=112.96' Storage=0.000 af Inflow=1.68 cfs 0.132 af
15.0" Round Culvert n=0.012 L=118.0' S=0.0682 '/' Outflow=1.68 cfs 0.132 af

Pond D03P: Drain Manhole #3 Peak Elev=100.09' Storage=0.000 af Inflow=4.03 cfs 0.306 af
18.0" Round Culvert n=0.012 L=33.5' S=0.0075 '/' Outflow=4.04 cfs 0.306 af

Pond D04P: Drain Manhole #4 Peak Elev=93.49' Storage=0.000 af Inflow=0.28 cfs 0.172 af
15.0" Round Culvert n=0.012 L=58.5' S=0.0282 '/' Outflow=0.28 cfs 0.172 af

Pond D05P: Drain Manhole #5 Peak Elev=91.74' Storage=0.000 af Inflow=0.28 cfs 0.172 af
15.0" Round Culvert n=0.012 L=56.7' S=0.0265 '/' Outflow=0.28 cfs 0.172 af

Pond D06P: Drain Manhole #6 Peak Elev=102.51' Storage=0.000 af Inflow=2.17 cfs 0.162 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0180 '/' Outflow=2.18 cfs 0.162 af

Pond D07P: Drain Manhole #7 Peak Elev=99.27' Storage=0.000 af Inflow=0.05 cfs 0.054 af
12.0" Round Culvert n=0.012 L=60.0' S=0.0050 '/' Outflow=0.05 cfs 0.054 af

Pond D08P: Drain Manhole #8 Peak Elev=88.06' Storage=0.000 af Inflow=1.14 cfs 0.085 af
12.0" Round Culvert n=0.012 L=56.0' S=0.0613 '/' Outflow=1.14 cfs 0.085 af

Pond D09P: Drain Manhole #9 Peak Elev=75.68' Storage=0.000 af Inflow=3.78 cfs 0.282 af
18.0" Round Culvert n=0.012 L=50.0' S=0.0700 '/' Outflow=3.78 cfs 0.282 af

Pond D10P: Drain Manhole #10 Peak Elev=72.77' Storage=0.000 af Inflow=0.40 cfs 0.034 af
12.0" Round Culvert n=0.012 L=134.0' S=0.0056 '/' Outflow=0.40 cfs 0.034 af

Pond W01P: Water Quality Inlet #1 Peak Elev=99.47' Storage=0.004 af Inflow=4.04 cfs 0.306 af
18.0" Round Culvert n=0.012 L=75.0' S=0.0600 '/' Outflow=4.04 cfs 0.306 af

Pond W02P: Water Quality Inlet #2 Peak Elev=79.38' Storage=0.004 af Inflow=3.79 cfs 0.282 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=3.78 cfs 0.282 af

Total Runoff Area = 56.648 ac Runoff Volume = 5.626 af Average Runoff Depth = 1.19"
92.42% Pervious = 52.355 ac 7.58% Impervious = 4.293 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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

Subcatchment1S: Subcatchment#1 Runoff Area=618,885 sf 0.95% Impervious Runoff Depth>2.35"
Flow Length=2,050' Tc=25.3 min CN=70 Runoff=23.70 cfs 2.788 af

Subcatchment2S: Subcatchment#2 Runoff Area=33,802 sf 0.00% Impervious Runoff Depth>2.45"
Flow Length=215' Tc=8.3 min CN=71 Runoff=2.02 cfs 0.158 af

Subcatchment3S: Subcatchment#3 Runoff Area=19,435 sf 0.00% Impervious Runoff Depth>2.37"
Flow Length=240' Tc=7.0 min CN=70 Runoff=1.17 cfs 0.088 af

Subcatchment4S: Subcatchment#4 Runoff Area=64,929 sf 0.00% Impervious Runoff Depth>2.36"
Flow Length=293' Tc=14.1 min CN=70 Runoff=3.14 cfs 0.293 af

Subcatchment5S: Subcatchment#5 Runoff Area=355,305 sf 1.21% Impervious Runoff Depth>2.35"
Flow Length=991' Tc=40.0 min UI Adjusted CN=70 Runoff=10.99 cfs 1.595 af

Subcatchment6S: Subcatchment#6 Runoff Area=148,453 sf 5.90% Impervious Runoff Depth>2.62"
Flow Length=927' Tc=27.5 min UI Adjusted CN=73 Runoff=6.14 cfs 0.743 af

Subcatchment7S: Subcatchment#7 Runoff Area=87,203 sf 0.00% Impervious Runoff Depth>2.36"
Flow Length=210' Tc=17.4 min CN=70 Runoff=3.89 cfs 0.394 af

Subcatchment8S: Subcatchment#8 Runoff Area=69,837 sf 0.00% Impervious Runoff Depth>1.63"
Flow Length=381' Tc=18.1 min CN=61 Runoff=2.00 cfs 0.218 af

Subcatchment9S: Subcatchment#9 Runoff Area=30,235 sf 0.00% Impervious Runoff Depth>1.63"
Flow Length=273' Tc=13.9 min CN=61 Runoff=0.96 cfs 0.095 af

Subcatchment10S: Subcatchment#10 Runoff Area=74,498 sf 10.49% Impervious Runoff Depth>2.45"
Flow Length=280' Tc=9.4 min UI Adjusted CN=71 Runoff=4.28 cfs 0.349 af

Subcatchment11S: Subcatchment#11 Runoff Area=247,933 sf 3.57% Impervious Runoff Depth>2.45"
Flow Length=368' Tc=13.6 min CN=71 Runoff=12.63 cfs 1.161 af

Subcatchment12S: Subcatchment#12 Runoff Area=172,549 sf 5.34% Impervious Runoff Depth>2.53"
Flow Length=462' Tc=17.7 min UI Adjusted CN=72 Runoff=8.27 cfs 0.836 af

Subcatchment13S: Subcatchment#13 Runoff Area=33,510 sf 0.00% Impervious Runoff Depth>2.44"
Flow Length=329' Tc=18.6 min CN=71 Runoff=1.52 cfs 0.157 af

Subcatchment15S: Subcatchment#15 Runoff Area=238,038 sf 5.11% Impervious Runoff Depth>2.27"
Flow Length=553' Tc=23.7 min UI Adjusted CN=69 Runoff=8.99 cfs 1.034 af

Subcatchment16S: Catch Basin #7727 Runoff Area=459 sf 45.75% Impervious Runoff Depth>3.37"
Tc=6.0 min CN=81 Runoff=0.04 cfs 0.003 af

Subcatchment17S: Catch Basin #3698 Runoff Area=2,300 sf 9.70% Impervious Runoff Depth>2.37"
Tc=6.0 min CN=70 Runoff=0.14 cfs 0.010 af

Subcatchment 18S: Catch Basin #7725 Runoff Area=5,195 sf 84.79% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=93 Runoff=0.59 cfs 0.046 af

Subcatchment 19S: Catch Basin #7726 Runoff Area=880 sf 88.86% Impervious Runoff Depth>4.85"
Tc=6.0 min CN=95 Runoff=0.10 cfs 0.008 af

Subcatchment 20S: 30" RCP Wet Crossing Runoff Area=14,031 sf 0.00% Impervious Runoff Depth>1.79"
Flow Length=138' Tc=8.8 min CN=63 Runoff=0.57 cfs 0.048 af

Subcatchment 21S: Catch Basin #1 Runoff Area=2,746 sf 100.00% Impervious Runoff Depth>5.20"
Tc=6.0 min CN=98 Runoff=0.33 cfs 0.027 af

Subcatchment 22S: Catch Basin #2 Runoff Area=4,125 sf 100.00% Impervious Runoff Depth>5.20"
Tc=6.0 min CN=98 Runoff=0.49 cfs 0.041 af

Subcatchment 23S: Catch Basin #3 Runoff Area=4,117 sf 96.04% Impervious Runoff Depth>5.08"
Tc=6.0 min CN=97 Runoff=0.49 cfs 0.040 af

Subcatchment 24S: Catch Basin #4 Runoff Area=5,883 sf 77.78% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=93 Runoff=0.67 cfs 0.052 af

Subcatchment 25S: Catch Basin #5 Runoff Area=3,045 sf 75.40% Impervious Runoff Depth>4.52"
Tc=6.0 min CN=92 Runoff=0.34 cfs 0.026 af

Subcatchment 26S: Catch Basin #6 Runoff Area=2,819 sf 66.69% Impervious Runoff Depth>4.30"
Tc=6.0 min CN=90 Runoff=0.31 cfs 0.023 af

Subcatchment 27S: Catch Basin #7 Runoff Area=10,139 sf 53.49% Impervious Runoff Depth>3.77"
Tc=6.0 min CN=85 Runoff=0.99 cfs 0.073 af

Subcatchment 28S: Catch Basin #8 Runoff Area=10,376 sf 71.82% Impervious Runoff Depth>4.41"
Tc=6.0 min CN=91 Runoff=1.15 cfs 0.087 af

Subcatchment 29S: Catch Basin #9 Runoff Area=10,795 sf 77.32% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=93 Runoff=1.23 cfs 0.096 af

Subcatchment 30S: Catch Basin #10 Runoff Area=4,592 sf 58.78% Impervious Runoff Depth>4.30"
Tc=6.0 min CN=90 Runoff=0.50 cfs 0.038 af

Subcatchment 31S: Catch Basin #11 Runoff Area=8,885 sf 77.12% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=93 Runoff=1.01 cfs 0.079 af

Subcatchment 32S: Catch Basin #12 Runoff Area=9,067 sf 63.57% Impervious Runoff Depth>4.19"
Tc=6.0 min CN=89 Runoff=0.97 cfs 0.073 af

Subcatchment 33S: Catch Basin #13 Runoff Area=6,803 sf 72.53% Impervious Runoff Depth>4.41"
Tc=6.0 min CN=91 Runoff=0.75 cfs 0.057 af

Subcatchment 34S: Catch Basin #14 Runoff Area=7,027 sf 75.00% Impervious Runoff Depth>4.52"
Tc=6.0 min CN=92 Runoff=0.79 cfs 0.061 af

Subcatchment 35S: Catch Basin #15 Runoff Area=5,408 sf 92.07% Impervious Runoff Depth>4.97"
Tc=6.0 min CN=96 Runoff=0.64 cfs 0.051 af

Subcatchment 36S: Catch Basin #16 Runoff Area=4,733 sf 81.07% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=93 Runoff=0.54 cfs 0.042 af

Subcatchment 37S: Catch Basin #17 Runoff Area=10,736 sf 26.53% Impervious Runoff Depth>2.99"
Flow Length=139' Tc=7.4 min UI Adjusted CN=77 Runoff=0.81 cfs 0.061 af

Subcatchment 38S: Catch Basin #18 Runoff Area=5,166 sf 74.68% Impervious Runoff Depth>4.52"
Tc=6.0 min CN=92 Runoff=0.58 cfs 0.045 af

Subcatchment 39S: Catch Basin #19 Runoff Area=7,033 sf 41.63% Impervious Runoff Depth>3.67"
Tc=6.0 min CN=84 Runoff=0.67 cfs 0.049 af

Subcatchment 40S: Catch Basin #20 Runoff Area=8,226 sf 73.85% Impervious Runoff Depth>4.52"
Tc=6.0 min CN=92 Runoff=0.92 cfs 0.071 af

Subcatchment 41S: Catch Basin #21 Runoff Area=6,361 sf 48.18% Impervious Runoff Depth>3.77"
Tc=6.0 min CN=85 Runoff=0.62 cfs 0.046 af

Subcatchment 42S: Catch Basin #22 Runoff Area=4,592 sf 58.78% Impervious Runoff Depth>4.30"
Tc=6.0 min CN=90 Runoff=0.50 cfs 0.038 af

Subcatchment 43S: Catch Basin #23 Runoff Area=21,628 sf 64.81% Impervious Runoff Depth>4.30"
Tc=6.0 min CN=90 Runoff=2.35 cfs 0.178 af

Subcatchment 44S: Catch Basin #24 Runoff Area=11,921 sf 24.23% Impervious Runoff Depth>2.99"
Flow Length=213' Tc=10.9 min UI Adjusted CN=77 Runoff=0.81 cfs 0.068 af

Subcatchment 45S: Catch Basin #25 Runoff Area=11,430 sf 24.30% Impervious Runoff Depth>2.99"
Flow Length=112' Slope=0.0050 '/' Tc=16.5 min UI Adjusted CN=77 Runoff=0.67 cfs 0.065 af

Subcatchment 71S: Gravel Wetland #101 Runoff Area=28,837 sf 17.32% Impervious Runoff Depth>3.09"
Tc=6.0 min CN=78 Runoff=2.35 cfs 0.170 af

Subcatchment 72S: Gravel Wetland #102 Runoff Area=21,302 sf 9.37% Impervious Runoff Depth>2.90"
Tc=6.0 min CN=76 Runoff=1.63 cfs 0.118 af

Subcatchment 73S: Gravel Wetland #103 Runoff Area=12,324 sf 9.02% Impervious Runoff Depth>2.90"
Tc=6.0 min CN=76 Runoff=0.94 cfs 0.068 af

Reach 1aR: Flow from Culvert to Stream Avg. Flow Depth=0.10' Max Vel=1.58 fps Inflow=0.88 cfs 0.067 af
n=0.035 L=655.5' S=0.0506 '/' Capacity=22.92 cfs Outflow=0.71 cfs 0.067 af

Reach 1bR: Start of Stream Avg. Flow Depth=0.10' Max Vel=1.68 fps Inflow=0.71 cfs 0.067 af
n=0.035 L=1,438.0' S=0.0351 '/' Capacity=6.96 cfs Outflow=0.53 cfs 0.066 af

Reach 10R: Reach #10 Avg. Flow Depth=0.25' Max Vel=2.33 fps Inflow=4.26 cfs 0.349 af
n=0.035 L=453.0' S=0.0336 '/' Capacity=18.68 cfs Outflow=4.01 cfs 0.348 af

Reach 15R: Reach #15 Avg. Flow Depth=0.31' Max Vel=2.74 fps Inflow=6.67 cfs 1.142 af
n=0.035 L=198.0' S=0.0344 '/' Capacity=18.90 cfs Outflow=6.67 cfs 1.141 af

Reach 20aR: Wetland Crossing #1 Flow Avg. Flow Depth=0.11' Max Vel=0.54 fps Inflow=0.56 cfs 0.048 af
n=0.035 L=274.0' S=0.0055 '/' Capacity=12.58 cfs Outflow=0.45 cfs 0.048 af

Reach 20bR: Wetland Crossing #1 Flow Avg. Flow Depth=0.09' Max Vel=1.22 fps Inflow=0.45 cfs 0.048 af
n=0.035 L=81.0' S=0.0370 '/' Capacity=19.60 cfs Outflow=0.45 cfs 0.047 af

Reach 20cR: Wetland Crossing #1 Flow Avg. Flow Depth=0.06' Max Vel=2.26 fps Inflow=0.45 cfs 0.047 af
n=0.035 L=78.0' S=0.2179 '/' Capacity=47.55 cfs Outflow=0.44 cfs 0.047 af

Reach 20dR: Wetland Crossing #1 Flow Avg. Flow Depth=0.08' Max Vel=1.36 fps Inflow=0.44 cfs 0.047 af
n=0.035 L=222.5' S=0.0517 '/' Capacity=23.16 cfs Outflow=0.44 cfs 0.047 af

Reach 20eR: Wetland Crossing #1 Flow Avg. Flow Depth=0.13' Max Vel=1.42 fps Inflow=0.44 cfs 0.047 af
n=0.035 L=217.0' S=0.0300 '/' Capacity=36.75 cfs Outflow=0.43 cfs 0.047 af

Reach 20fR: Wetland Crossing #1 Flow Avg. Flow Depth=0.08' Max Vel=2.80 fps Inflow=0.43 cfs 0.047 af
n=0.035 L=105.0' S=0.2143 '/' Capacity=98.29 cfs Outflow=0.43 cfs 0.047 af

Reach 71aR: Gravel Wetland #101 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=34.0' S=0.0588 '/' Capacity=39.30 cfs Outflow=0.00 cfs 0.000 af

Reach 71bR: Gravel Wetland #101 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=16.0' S=0.2500 '/' Capacity=50.93 cfs Outflow=0.00 cfs 0.000 af

Reach 72aR: SGW #102 Flow from OS Avg. Flow Depth=0.06' Max Vel=1.00 fps Inflow=0.27 cfs 0.220 af
n=0.035 L=109.0' S=0.0367 '/' Capacity=103.16 cfs Outflow=0.27 cfs 0.220 af

Reach 72bR: SGW #102 Flow from OS Avg. Flow Depth=0.05' Max Vel=1.41 fps Inflow=0.27 cfs 0.220 af
n=0.035 L=60.0' S=0.1000 '/' Capacity=170.29 cfs Outflow=0.27 cfs 0.219 af

Reach 72cR: SGW #102 Flow from OS Avg. Flow Depth=0.04' Max Vel=2.06 fps Inflow=0.27 cfs 0.219 af
n=0.035 L=20.0' S=0.3000 '/' Capacity=294.94 cfs Outflow=0.27 cfs 0.219 af

Reach 72dR: SGW #102 Flow from OS Avg. Flow Depth=0.03' Max Vel=0.76 fps Inflow=0.08 cfs 0.069 af
n=0.035 L=26.5' S=0.0472 '/' Capacity=116.95 cfs Outflow=0.08 cfs 0.069 af

Reach 72eR: SGW #102 Flow from Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=201.0' S=0.0871 '/' Capacity=158.89 cfs Outflow=0.00 cfs 0.000 af

Reach 72fR: SGW #102 Flow from Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=117.5' S=0.0936 '/' Capacity=64.97 cfs Outflow=0.00 cfs 0.000 af

Reach 73R: Gravel Wetland #103 Avg. Flow Depth=0.15' Max Vel=3.12 fps Inflow=1.24 cfs 0.393 af
n=0.035 L=380.0' S=0.1145 '/' Capacity=71.84 cfs Outflow=1.24 cfs 0.393 af

Reach 100R: Reach #100 Inflow=24.20 cfs 2.854 af
Outflow=24.20 cfs 2.854 af

Reach 200R: Reach #200 Inflow=25.17 cfs 3.013 af
Outflow=25.17 cfs 3.013 af

Reach 300R: Reach #300 Inflow=25.69 cfs 3.101 af
Outflow=25.69 cfs 3.101 af

Reach 400R: Reach #400 Inflow=28.03 cfs 3.394 af
Outflow=28.03 cfs 3.394 af

Reach 500R: Reach #500 Inflow=37.19 cfs 5.036 af
Outflow=37.19 cfs 5.036 af

Reach 600R: Reach #600 Inflow=44.48 cfs 6.171 af
Outflow=44.48 cfs 6.171 af

Reach 700R: Reach #700 Inflow=47.71 cfs 6.784 af
Outflow=47.71 cfs 6.784 af

Reach 800R: Reach #800 Inflow=49.53 cfs 7.003 af
Outflow=49.53 cfs 7.003 af

Reach 900R: Final Reach #900 Inflow=50.24 cfs 7.097 af
Outflow=50.24 cfs 7.097 af

Reach 1100R: Final Reach #1100 Inflow=21.67 cfs 2.650 af
Outflow=21.67 cfs 2.650 af

Reach 1200R: Final Reach #1200 Inflow=8.31 cfs 0.905 af
Outflow=8.31 cfs 0.905 af

Reach 1300R: Final Reach #1300 Inflow=1.52 cfs 0.157 af
Outflow=1.52 cfs 0.157 af

Pond 1EP: Catch Basin #7727 Peak Elev=138.05' Storage=1 cf Inflow=0.04 cfs 0.003 af
12.0" Round Culvert n=0.012 L=48.0' S=0.0050 '/' Outflow=0.04 cfs 0.003 af

Pond 2EP: Catch Basin #3698 Peak Elev=137.96' Storage=3 cf Inflow=0.14 cfs 0.010 af
12.0" Round Culvert n=0.012 L=8.3' S=0.0048 '/' Outflow=0.14 cfs 0.010 af

Pond 3EP: Catch Basin #7725 Peak Elev=138.90' Storage=5 cf Inflow=0.59 cfs 0.046 af
12.0" Round Culvert n=0.012 L=153.7' S=0.0050 '/' Outflow=0.59 cfs 0.046 af

Pond 4EP: Catch Basin #7726 Peak Elev=137.13' Storage=5 cf Inflow=0.88 cfs 0.068 af
24.0" Round Culvert n=0.012 L=61.5' S=0.0050 '/' Outflow=0.88 cfs 0.067 af

Pond 10P: 24" RCP Inlet Sump/Pond Peak Elev=100.85' Storage=214 cf Inflow=4.28 cfs 0.349 af
24.0" Round Culvert n=0.012 L=108.8' S=0.0113 '/' Outflow=4.26 cfs 0.349 af

Pond 15P: 12" RCP Inlet Sump/Pond Peak Elev=96.52' Storage=3,644 cf Inflow=9.23 cfs 1.142 af
Primary=6.67 cfs 1.142 af Secondary=0.00 cfs 0.000 af Outflow=6.67 cfs 1.142 af

Pond 20P: 30" RCP Wetland Crossing #1 Peak Elev=111.22' Storage=72 cf Inflow=0.57 cfs 0.048 af
30.0" Round Culvert w/ 6.0" inside fill n=0.024 L=52.0' S=0.0096 '/' Outflow=0.56 cfs 0.048 af

Pond 101P: SGW #101 Peak Elev=103.86' Storage=18,398 cf Inflow=6.49 cfs 0.489 af
Primary=0.06 cfs 0.066 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.066 af

Pond 102P: SGW #102 Peak Elev=74.11' Storage=22,283 cf Inflow=9.19 cfs 0.737 af
Primary=0.27 cfs 0.220 af Secondary=0.08 cfs 0.069 af Tertiary=0.00 cfs 0.000 af Outflow=0.35 cfs 0.289 af

Pond 103P: SGW #103 Peak Elev=97.24' Storage=12,669 cf Inflow=7.42 cfs 0.572 af
Primary=0.11 cfs 0.128 af Secondary=0.81 cfs 0.216 af Tertiary=0.32 cfs 0.050 af Outflow=1.24 cfs 0.393 af

Pond C01P: Catch Basin #1 Peak Elev=117.86' Storage=0.000 af Inflow=0.33 cfs 0.027 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=0.33 cfs 0.027 af

Pond C02P: Catch Basin #2 Peak Elev=117.72' Storage=0.000 af Inflow=0.82 cfs 0.068 af
12.0" Round Culvert n=0.012 L=120.5' S=0.0228 '/' Outflow=0.82 cfs 0.068 af

Pond C03P: Catch Basin #3 Peak Elev=115.33' Storage=0.000 af Inflow=0.49 cfs 0.040 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=0.48 cfs 0.040 af

Pond C04P: Catch Basin #4 Peak Elev=115.30' Storage=0.000 af Inflow=1.97 cfs 0.160 af
12.0" Round Culvert n=0.012 L=95.5' S=0.0065 '/' Outflow=1.96 cfs 0.160 af

Pond C05P: Catch Basin #5 Peak Elev=114.67' Storage=0.000 af Inflow=2.31 cfs 0.187 af
12.0" Round Culvert n=0.012 L=25.5' S=0.0075 '/' Outflow=2.31 cfs 0.187 af

Pond C06P: Catch Basin #6 Peak Elev=115.24' Storage=0.000 af Inflow=0.31 cfs 0.023 af
12.0" Round Culvert n=0.012 L=4.5' S=0.0489 '/' Outflow=0.31 cfs 0.023 af

Pond C07P: Catch Basin #7 Peak Elev=105.27' Storage=0.000 af Inflow=0.99 cfs 0.073 af
12.0" Round Culvert n=0.012 L=19.9' S=0.0050 '/' Outflow=0.99 cfs 0.073 af

Pond C08P: Catch Basin #8 Peak Elev=105.10' Storage=0.000 af Inflow=4.76 cfs 0.370 af
18.0" Round Culvert n=0.012 L=55.7' S=0.0418 '/' Outflow=4.76 cfs 0.370 af

Pond C09P: Catch Basin #9 Peak Elev=101.65' Storage=0.000 af Inflow=1.23 cfs 0.096 af
12.0" Round Culvert n=0.012 L=33.2' S=0.0217 '/' Outflow=1.23 cfs 0.096 af

Pond C10P: Catch Basin #10 Peak Elev=101.08' Storage=0.000 af Inflow=1.73 cfs 0.133 af
12.0" Round Culvert n=0.012 L=50.0' S=0.0050 '/' Outflow=1.73 cfs 0.133 af

Pond C11P: Catch Basin #11 Peak Elev=110.11' Storage=0.000 af Inflow=1.01 cfs 0.079 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=1.01 cfs 0.079 af

Pond C12P: Catch Basin #12 Peak Elev=109.96' Storage=0.000 af Inflow=1.97 cfs 0.151 af
12.0" Round Culvert n=0.012 L=136.0' S=0.0422 '/' Outflow=1.97 cfs 0.151 af

Pond C13P: Catch Basin #13 Peak Elev=103.86' Storage=0.000 af Inflow=3.52 cfs 0.269 af
15.0" Round Culvert n=0.012 L=33.0' S=0.0527 '/' Outflow=3.52 cfs 0.269 af

Pond C14P: Catch Basin #14 Peak Elev=104.38' Storage=0.000 af Inflow=2.76 cfs 0.212 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0139 '/' Outflow=2.76 cfs 0.212 af

Pond C15P: Catch Basin #15 Peak Elev=103.86' Storage=0.001 af Inflow=0.64 cfs 0.051 af
12.0" Round Culvert n=0.012 L=12.0' S=0.0167 '/' Outflow=0.62 cfs 0.050 af

Pond C16P: Catch Basin #16 Peak Elev=99.17' Storage=0.000 af Inflow=0.58 cfs 0.108 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=0.58 cfs 0.108 af

Pond C17P: Catch Basin #17 Peak Elev=98.11' Storage=0.000 af Inflow=0.81 cfs 0.061 af
12.0" Round Culvert n=0.012 L=37.2' S=0.0478 '/' Outflow=0.81 cfs 0.061 af

Pond C18P: Catch Basin #18 Peak Elev=96.52' Storage=0.000 af Inflow=0.58 cfs 0.045 af
12.0" Round Culvert n=0.012 L=19.0' S=0.0100 '/' Outflow=0.57 cfs 0.045 af

Pond C19P: Catch Basin #19 Peak Elev=96.37' Storage=0.000 af Inflow=2.05 cfs 0.155 af
12.0" Round Culvert n=0.012 L=122.5' S=0.0651 '/' Outflow=2.05 cfs 0.155 af

Pond C20P: Catch Basin #20 Peak Elev=84.47' Storage=0.000 af Inflow=3.60 cfs 0.272 af
15.0" Round Culvert n=0.012 L=90.0' S=0.0486 '/' Outflow=3.60 cfs 0.272 af

Pond C21P: Catch Basin #21 Peak Elev=84.99' Storage=0.000 af Inflow=2.67 cfs 0.201 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0139 '/' Outflow=2.68 cfs 0.201 af

Pond C22P: Catch Basin #22 Peak Elev=80.42' Storage=0.000 af Inflow=4.09 cfs 0.310 af
18.0" Round Culvert n=0.012 L=34.5' S=0.0055 '/' Outflow=4.08 cfs 0.310 af

Pond C23P: Catch Basin #23 Peak Elev=80.24' Storage=0.000 af Inflow=6.42 cfs 0.488 af
18.0" Round Culvert n=0.012 L=6.5' S=0.0092 '/' Outflow=6.42 cfs 0.488 af

Pond C24P: Catch Basin #24 Peak Elev=78.96' Storage=0.000 af Inflow=0.81 cfs 0.068 af
12.0" Round Culvert n=0.012 L=49.2' S=0.0437 '/' Outflow=0.81 cfs 0.068 af

Pond C25P: Catch Basin #25 Peak Elev=74.11' Storage=0.001 af Inflow=1.42 cfs 0.133 af
15.0" Round Culvert n=0.012 L=60.0' S=0.0083 '/' Outflow=1.40 cfs 0.132 af

Pond D01P: Drain Manhole #1 Peak Elev=114.14' Storage=0.000 af Inflow=2.62 cfs 0.210 af
15.0" Round Culvert n=0.012 L=148.5' S=0.0055 '/' Outflow=2.62 cfs 0.210 af

Pond D02P: Drain Manhole #2 Peak Elev=113.15' Storage=0.000 af Inflow=2.62 cfs 0.210 af
15.0" Round Culvert n=0.012 L=118.0' S=0.0682 '/' Outflow=2.62 cfs 0.210 af

Pond D03P: Drain Manhole #3 Peak Elev=100.49' Storage=0.000 af Inflow=6.49 cfs 0.504 af
18.0" Round Culvert n=0.012 L=33.5' S=0.0075 '/' Outflow=6.49 cfs 0.504 af

Pond D04P: Drain Manhole #4 Peak Elev=93.78' Storage=0.000 af Inflow=1.24 cfs 0.393 af
15.0" Round Culvert n=0.012 L=58.5' S=0.0282 '/' Outflow=1.24 cfs 0.393 af

Pond D05P: Drain Manhole #5 Peak Elev=92.03' Storage=0.000 af Inflow=1.24 cfs 0.393 af
15.0" Round Culvert n=0.012 L=56.7' S=0.0265 '/' Outflow=1.24 cfs 0.393 af

Pond D06P: Drain Manhole #6 Peak Elev=103.86' Storage=0.001 af Inflow=3.52 cfs 0.269 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0180 '/' Outflow=3.52 cfs 0.268 af

Pond D07P: Drain Manhole #7 Peak Elev=99.30' Storage=0.000 af Inflow=0.06 cfs 0.066 af
12.0" Round Culvert n=0.012 L=60.0' S=0.0050 '/' Outflow=0.06 cfs 0.066 af

Pond D08P: Drain Manhole #8 Peak Elev=88.30' Storage=0.000 af Inflow=2.05 cfs 0.155 af
12.0" Round Culvert n=0.012 L=56.0' S=0.0613 '/' Outflow=2.05 cfs 0.155 af

Pond D09P: Drain Manhole #9 Peak Elev=76.06' Storage=0.000 af Inflow=6.40 cfs 0.487 af
18.0" Round Culvert n=0.012 L=50.0' S=0.0700 '/' Outflow=6.40 cfs 0.487 af

Pond D10P: Drain Manhole #10 Peak Elev=74.11' Storage=0.001 af Inflow=0.81 cfs 0.068 af
12.0" Round Culvert n=0.012 L=134.0' S=0.0056 '/' Outflow=0.81 cfs 0.068 af

Pond W01P: Water Quality Inlet #1 Peak Elev=99.83' Storage=0.005 af Inflow=6.49 cfs 0.504 af
18.0" Round Culvert n=0.012 L=75.0' S=0.0600 '/' Outflow=6.48 cfs 0.503 af

Pond W02P: Water Quality Inlet #2 Peak Elev=79.83' Storage=0.006 af Inflow=6.42 cfs 0.488 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=6.40 cfs 0.487 af

Total Runoff Area = 56.648 ac Runoff Volume = 11.869 af Average Runoff Depth = 2.51"
92.42% Pervious = 52.355 ac 7.58% Impervious = 4.293 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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

Subcatchment1S: Subcatchment#1 Runoff Area=618,885 sf 0.95% Impervious Runoff Depth>3.49"
Flow Length=2,050' Tc=25.3 min CN=70 Runoff=35.54 cfs 4.135 af

Subcatchment2S: Subcatchment#2 Runoff Area=33,802 sf 0.00% Impervious Runoff Depth>3.61"
Flow Length=215' Tc=8.3 min CN=71 Runoff=2.99 cfs 0.233 af

Subcatchment3S: Subcatchment#3 Runoff Area=19,435 sf 0.00% Impervious Runoff Depth>3.51"
Flow Length=240' Tc=7.0 min CN=70 Runoff=1.75 cfs 0.130 af

Subcatchment4S: Subcatchment#4 Runoff Area=64,929 sf 0.00% Impervious Runoff Depth>3.50"
Flow Length=293' Tc=14.1 min CN=70 Runoff=4.71 cfs 0.435 af

Subcatchment5S: Subcatchment#5 Runoff Area=355,305 sf 1.21% Impervious Runoff Depth>3.48"
Flow Length=991' Tc=40.0 min UI Adjusted CN=70 Runoff=16.47 cfs 2.366 af

Subcatchment6S: Subcatchment#6 Runoff Area=148,453 sf 5.90% Impervious Runoff Depth>3.80"
Flow Length=927' Tc=27.5 min UI Adjusted CN=73 Runoff=8.97 cfs 1.080 af

Subcatchment7S: Subcatchment#7 Runoff Area=87,203 sf 0.00% Impervious Runoff Depth>3.50"
Flow Length=210' Tc=17.4 min CN=70 Runoff=5.84 cfs 0.584 af

Subcatchment8S: Subcatchment#8 Runoff Area=69,837 sf 0.00% Impervious Runoff Depth>2.60"
Flow Length=381' Tc=18.1 min CN=61 Runoff=3.33 cfs 0.347 af

Subcatchment9S: Subcatchment#9 Runoff Area=30,235 sf 0.00% Impervious Runoff Depth>2.60"
Flow Length=273' Tc=13.9 min CN=61 Runoff=1.59 cfs 0.150 af

Subcatchment10S: Subcatchment#10 Runoff Area=74,498 sf 10.49% Impervious Runoff Depth>3.61"
Flow Length=280' Tc=9.4 min UI Adjusted CN=71 Runoff=6.35 cfs 0.514 af

Subcatchment11S: Subcatchment#11 Runoff Area=247,933 sf 3.57% Impervious Runoff Depth>3.61"
Flow Length=368' Tc=13.6 min CN=71 Runoff=18.77 cfs 1.710 af

Subcatchment12S: Subcatchment#12 Runoff Area=172,549 sf 5.34% Impervious Runoff Depth>3.71"
Flow Length=462' Tc=17.7 min UI Adjusted CN=72 Runoff=12.18 cfs 1.223 af

Subcatchment13S: Subcatchment#13 Runoff Area=33,510 sf 0.00% Impervious Runoff Depth>3.60"
Flow Length=329' Tc=18.6 min CN=71 Runoff=2.26 cfs 0.231 af

Subcatchment15S: Subcatchment#15 Runoff Area=238,038 sf 5.11% Impervious Runoff Depth>3.39"
Flow Length=553' Tc=23.7 min UI Adjusted CN=69 Runoff=13.60 cfs 1.544 af

Subcatchment16S: Catch Basin #7727 Runoff Area=459 sf 45.75% Impervious Runoff Depth>4.68"
Tc=6.0 min CN=81 Runoff=0.06 cfs 0.004 af

Subcatchment17S: Catch Basin #3698 Runoff Area=2,300 sf 9.70% Impervious Runoff Depth>3.51"
Tc=6.0 min CN=70 Runoff=0.21 cfs 0.015 af

Subcatchment 18S: Catch Basin #7725 Runoff Area=5,195 sf 84.79% Impervious Runoff Depth>6.04"
Tc=6.0 min CN=93 Runoff=0.76 cfs 0.060 af

Subcatchment 19S: Catch Basin #7726 Runoff Area=880 sf 88.86% Impervious Runoff Depth>6.27"
Tc=6.0 min CN=95 Runoff=0.13 cfs 0.011 af

Subcatchment 20S: 30" RCP Wet Crossing Runoff Area=14,031 sf 0.00% Impervious Runoff Depth>2.80"
Flow Length=138' Tc=8.8 min CN=63 Runoff=0.92 cfs 0.075 af

Subcatchment 21S: Catch Basin #1 Runoff Area=2,746 sf 100.00% Impervious Runoff Depth>6.63"
Tc=6.0 min CN=98 Runoff=0.41 cfs 0.035 af

Subcatchment 22S: Catch Basin #2 Runoff Area=4,125 sf 100.00% Impervious Runoff Depth>6.63"
Tc=6.0 min CN=98 Runoff=0.62 cfs 0.052 af

Subcatchment 23S: Catch Basin #3 Runoff Area=4,117 sf 96.04% Impervious Runoff Depth>6.51"
Tc=6.0 min CN=97 Runoff=0.62 cfs 0.051 af

Subcatchment 24S: Catch Basin #4 Runoff Area=5,883 sf 77.78% Impervious Runoff Depth>6.04"
Tc=6.0 min CN=93 Runoff=0.86 cfs 0.068 af

Subcatchment 25S: Catch Basin #5 Runoff Area=3,045 sf 75.40% Impervious Runoff Depth>5.92"
Tc=6.0 min CN=92 Runoff=0.44 cfs 0.035 af

Subcatchment 26S: Catch Basin #6 Runoff Area=2,819 sf 66.69% Impervious Runoff Depth>5.69"
Tc=6.0 min CN=90 Runoff=0.40 cfs 0.031 af

Subcatchment 27S: Catch Basin #7 Runoff Area=10,139 sf 53.49% Impervious Runoff Depth>5.12"
Tc=6.0 min CN=85 Runoff=1.33 cfs 0.099 af

Subcatchment 28S: Catch Basin #8 Runoff Area=10,376 sf 71.82% Impervious Runoff Depth>5.81"
Tc=6.0 min CN=91 Runoff=1.49 cfs 0.115 af

Subcatchment 29S: Catch Basin #9 Runoff Area=10,795 sf 77.32% Impervious Runoff Depth>6.04"
Tc=6.0 min CN=93 Runoff=1.58 cfs 0.125 af

Subcatchment 30S: Catch Basin #10 Runoff Area=4,592 sf 58.78% Impervious Runoff Depth>5.69"
Tc=6.0 min CN=90 Runoff=0.65 cfs 0.050 af

Subcatchment 31S: Catch Basin #11 Runoff Area=8,885 sf 77.12% Impervious Runoff Depth>6.04"
Tc=6.0 min CN=93 Runoff=1.30 cfs 0.103 af

Subcatchment 32S: Catch Basin #12 Runoff Area=9,067 sf 63.57% Impervious Runoff Depth>5.58"
Tc=6.0 min CN=89 Runoff=1.27 cfs 0.097 af

Subcatchment 33S: Catch Basin #13 Runoff Area=6,803 sf 72.53% Impervious Runoff Depth>5.81"
Tc=6.0 min CN=91 Runoff=0.97 cfs 0.076 af

Subcatchment 34S: Catch Basin #14 Runoff Area=7,027 sf 75.00% Impervious Runoff Depth>5.92"
Tc=6.0 min CN=92 Runoff=1.02 cfs 0.080 af

Subcatchment 35S: Catch Basin #15 Runoff Area=5,408 sf 92.07% Impervious Runoff Depth>6.39"
Tc=6.0 min CN=96 Runoff=0.81 cfs 0.066 af

Subcatchment 36S: Catch Basin #16 Runoff Area=4,733 sf 81.07% Impervious Runoff Depth>6.04"
Tc=6.0 min CN=93 Runoff=0.69 cfs 0.055 af

Subcatchment 37S: Catch Basin #17 Runoff Area=10,736 sf 26.53% Impervious Runoff Depth>4.24"
Flow Length=139' Tc=7.4 min UI Adjusted CN=77 Runoff=1.15 cfs 0.087 af

Subcatchment 38S: Catch Basin #18 Runoff Area=5,166 sf 74.68% Impervious Runoff Depth>5.92"
Tc=6.0 min CN=92 Runoff=0.75 cfs 0.059 af

Subcatchment 39S: Catch Basin #19 Runoff Area=7,033 sf 41.63% Impervious Runoff Depth>5.01"
Tc=6.0 min CN=84 Runoff=0.91 cfs 0.067 af

Subcatchment 40S: Catch Basin #20 Runoff Area=8,226 sf 73.85% Impervious Runoff Depth>5.92"
Tc=6.0 min CN=92 Runoff=1.19 cfs 0.093 af

Subcatchment 41S: Catch Basin #21 Runoff Area=6,361 sf 48.18% Impervious Runoff Depth>5.12"
Tc=6.0 min CN=85 Runoff=0.84 cfs 0.062 af

Subcatchment 42S: Catch Basin #22 Runoff Area=4,592 sf 58.78% Impervious Runoff Depth>5.69"
Tc=6.0 min CN=90 Runoff=0.65 cfs 0.050 af

Subcatchment 43S: Catch Basin #23 Runoff Area=21,628 sf 64.81% Impervious Runoff Depth>5.69"
Tc=6.0 min CN=90 Runoff=3.06 cfs 0.236 af

Subcatchment 44S: Catch Basin #24 Runoff Area=11,921 sf 24.23% Impervious Runoff Depth>4.24"
Flow Length=213' Tc=10.9 min UI Adjusted CN=77 Runoff=1.15 cfs 0.097 af

Subcatchment 45S: Catch Basin #25 Runoff Area=11,430 sf 24.30% Impervious Runoff Depth>4.24"
Flow Length=112' Slope=0.0050 '/' Tc=16.5 min UI Adjusted CN=77 Runoff=0.95 cfs 0.093 af

Subcatchment 71S: Gravel Wetland #101 Runoff Area=28,837 sf 17.32% Impervious Runoff Depth>4.35"
Tc=6.0 min CN=78 Runoff=3.30 cfs 0.240 af

Subcatchment 72S: Gravel Wetland #102 Runoff Area=21,302 sf 9.37% Impervious Runoff Depth>4.14"
Tc=6.0 min CN=76 Runoff=2.32 cfs 0.169 af

Subcatchment 73S: Gravel Wetland #103 Runoff Area=12,324 sf 9.02% Impervious Runoff Depth>4.14"
Tc=6.0 min CN=76 Runoff=1.34 cfs 0.098 af

Reach 1aR: Flow from Culvert to Stream Avg. Flow Depth=0.12' Max Vel=1.73 fps Inflow=1.16 cfs 0.090 af
n=0.035 L=655.5' S=0.0506 '/' Capacity=22.92 cfs Outflow=0.96 cfs 0.090 af

Reach 1bR: Start of Stream Avg. Flow Depth=0.13' Max Vel=1.91 fps Inflow=0.96 cfs 0.090 af
n=0.035 L=1,438.0' S=0.0351 '/' Capacity=6.96 cfs Outflow=0.74 cfs 0.089 af

Reach 10R: Reach #10 Avg. Flow Depth=0.30' Max Vel=2.63 fps Inflow=6.30 cfs 0.514 af
n=0.035 L=453.0' S=0.0336 '/' Capacity=18.68 cfs Outflow=6.01 cfs 0.513 af

Reach 15R: Reach #15 Avg. Flow Depth=0.33' Max Vel=2.88 fps Inflow=7.82 cfs 1.782 af
n=0.035 L=198.0' S=0.0344 '/' Capacity=18.90 cfs Outflow=7.82 cfs 1.780 af

Reach 20aR: Wetland Crossing #1 Flow Avg. Flow Depth=0.14' Max Vel=0.63 fps Inflow=0.91 cfs 0.075 af
n=0.035 L=274.0' S=0.0055 '/' Capacity=12.58 cfs Outflow=0.75 cfs 0.074 af

Reach 20bR: Wetland Crossing #1 Flow Avg. Flow Depth=0.11' Max Vel=1.44 fps Inflow=0.75 cfs 0.074 af
n=0.035 L=81.0' S=0.0370 '/' Capacity=19.60 cfs Outflow=0.75 cfs 0.074 af

Reach 20cR: Wetland Crossing #1 Flow Avg. Flow Depth=0.07' Max Vel=2.66 fps Inflow=0.75 cfs 0.074 af
n=0.035 L=78.0' S=0.2179 '/' Capacity=47.55 cfs Outflow=0.76 cfs 0.074 af

Reach 20dR: Wetland Crossing #1 Flow Avg. Flow Depth=0.10' Max Vel=1.61 fps Inflow=0.76 cfs 0.074 af
n=0.035 L=222.5' S=0.0517 '/' Capacity=23.16 cfs Outflow=0.74 cfs 0.074 af

Reach 20eR: Wetland Crossing #1 Flow Avg. Flow Depth=0.16' Max Vel=1.67 fps Inflow=0.74 cfs 0.074 af
n=0.035 L=217.0' S=0.0300 '/' Capacity=36.75 cfs Outflow=0.73 cfs 0.074 af

Reach 20fR: Wetland Crossing #1 Flow Avg. Flow Depth=0.10' Max Vel=3.30 fps Inflow=0.73 cfs 0.074 af
n=0.035 L=105.0' S=0.2143 '/' Capacity=98.29 cfs Outflow=0.74 cfs 0.074 af

Reach 71aR: Gravel Wetland #101 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=34.0' S=0.0588 '/' Capacity=39.30 cfs Outflow=0.00 cfs 0.000 af

Reach 71bR: Gravel Wetland #101 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=16.0' S=0.2500 '/' Capacity=50.93 cfs Outflow=0.00 cfs 0.000 af

Reach 72aR: SGW #102 Flow from OS Avg. Flow Depth=0.09' Max Vel=1.27 fps Inflow=0.60 cfs 0.371 af
n=0.035 L=109.0' S=0.0367 '/' Capacity=103.16 cfs Outflow=0.60 cfs 0.370 af

Reach 72bR: SGW #102 Flow from OS Avg. Flow Depth=0.07' Max Vel=1.80 fps Inflow=0.60 cfs 0.370 af
n=0.035 L=60.0' S=0.1000 '/' Capacity=170.29 cfs Outflow=0.60 cfs 0.370 af

Reach 72cR: SGW #102 Flow from OS Avg. Flow Depth=0.06' Max Vel=2.64 fps Inflow=0.60 cfs 0.370 af
n=0.035 L=20.0' S=0.3000 '/' Capacity=294.94 cfs Outflow=0.60 cfs 0.370 af

Reach 72dR: SGW #102 Flow from OS Avg. Flow Depth=0.07' Max Vel=1.16 fps Inflow=0.34 cfs 0.169 af
n=0.035 L=26.5' S=0.0472 '/' Capacity=116.95 cfs Outflow=0.34 cfs 0.168 af

Reach 72eR: SGW #102 Flow from Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=201.0' S=0.0871 '/' Capacity=158.89 cfs Outflow=0.00 cfs 0.000 af

Reach 72fR: SGW #102 Flow from Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=117.5' S=0.0936 '/' Capacity=64.97 cfs Outflow=0.00 cfs 0.000 af

Reach 73R: Gravel Wetland #103 Avg. Flow Depth=0.18' Max Vel=3.45 fps Inflow=1.72 cfs 0.575 af
n=0.035 L=380.0' S=0.1145 '/' Capacity=71.84 cfs Outflow=1.72 cfs 0.574 af

Reach 100R: Reach #100 Inflow=36.22 cfs 4.224 af
Outflow=36.22 cfs 4.224 af

Reach 200R: Reach #200 Inflow=37.64 cfs 4.457 af
Outflow=37.64 cfs 4.457 af

Reach 300R: Reach #300 Inflow=38.40 cfs 4.587 af
Outflow=38.40 cfs 4.587 af

Reach 400R: Reach #400 Inflow=41.91 cfs 5.022 af
Outflow=41.91 cfs 5.022 af

Reach 500R: Reach #500 Inflow=55.77 cfs 7.462 af
Outflow=55.77 cfs 7.462 af

Reach 600R: Reach #600 Inflow=66.39 cfs 9.116 af
Outflow=66.39 cfs 9.116 af

Reach 700R: Reach #700 Inflow=71.44 cfs 10.070 af
Outflow=71.44 cfs 10.070 af

Reach 800R: Reach #800 Inflow=74.38 cfs 10.417 af
Outflow=74.38 cfs 10.417 af

Reach 900R: Final Reach #900 Inflow=75.55 cfs 10.567 af
Outflow=75.55 cfs 10.567 af

Reach 1100R: Final Reach #1100 Inflow=30.75 cfs 4.003 af
Outflow=30.75 cfs 4.003 af

Reach 1200R: Final Reach #1200 Inflow=12.24 cfs 1.392 af
Outflow=12.24 cfs 1.392 af

Reach 1300R: Final Reach #1300 Inflow=2.26 cfs 0.231 af
Outflow=2.26 cfs 0.231 af

Pond 1EP: Catch Basin #7727 Peak Elev=138.07' Storage=2 cf Inflow=0.06 cfs 0.004 af
12.0" Round Culvert n=0.012 L=48.0' S=0.0050 '/' Outflow=0.06 cfs 0.004 af

Pond 2EP: Catch Basin #3698 Peak Elev=138.01' Storage=3 cf Inflow=0.21 cfs 0.015 af
12.0" Round Culvert n=0.012 L=8.3' S=0.0048 '/' Outflow=0.21 cfs 0.015 af

Pond 3EP: Catch Basin #7725 Peak Elev=138.96' Storage=6 cf Inflow=0.76 cfs 0.060 af
12.0" Round Culvert n=0.012 L=153.7' S=0.0050 '/' Outflow=0.76 cfs 0.060 af

Pond 4EP: Catch Basin #7726 Peak Elev=137.20' Storage=6 cf Inflow=1.16 cfs 0.090 af
24.0" Round Culvert n=0.012 L=61.5' S=0.0050 '/' Outflow=1.16 cfs 0.090 af

Pond 10P: 24" RCP Inlet Sump/Pond Peak Elev=101.07' Storage=328 cf Inflow=6.35 cfs 0.514 af
24.0" Round Culvert n=0.012 L=108.8' S=0.0113 '/' Outflow=6.30 cfs 0.514 af

Pond 15P: 12" RCP Inlet Sump/Pond Peak Elev=97.69' Storage=9,643 cf Inflow=13.91 cfs 1.782 af
Primary=7.82 cfs 1.782 af Secondary=0.00 cfs 0.000 af Outflow=7.82 cfs 1.782 af

Pond 20P: 30" RCP Wetland Crossing #1 Peak Elev=111.29' Storage=99 cf Inflow=0.92 cfs 0.075 af
30.0" Round Culvert w/ 6.0" inside fill n=0.024 L=52.0' S=0.0096 '/' Outflow=0.91 cfs 0.075 af

Pond 101P: SGW #101 Peak Elev=104.34' Storage=22,067 cf Inflow=8.61 cfs 0.658 af
Primary=0.06 cfs 0.073 af Secondary=0.14 cfs 0.111 af Tertiary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.184 af

Pond 102P: SGW #102 Peak Elev=74.61' Storage=26,286 cf Inflow=12.30 cfs 1.010 af
Primary=0.60 cfs 0.371 af Secondary=0.34 cfs 0.169 af Tertiary=0.00 cfs 0.000 af Outflow=0.93 cfs 0.540 af

Pond 103P: SGW #103 Peak Elev=97.92' Storage=16,672 cf Inflow=9.62 cfs 0.758 af
Primary=0.12 cfs 0.136 af Secondary=1.13 cfs 0.338 af Tertiary=0.47 cfs 0.101 af Outflow=1.72 cfs 0.575 af

Pond C01P: Catch Basin #1 Peak Elev=117.91' Storage=0.000 af Inflow=0.41 cfs 0.035 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=0.41 cfs 0.035 af

Pond C02P: Catch Basin #2 Peak Elev=117.79' Storage=0.000 af Inflow=1.04 cfs 0.087 af
12.0" Round Culvert n=0.012 L=120.5' S=0.0228 '/' Outflow=1.04 cfs 0.087 af

Pond C03P: Catch Basin #3 Peak Elev=115.52' Storage=0.000 af Inflow=0.62 cfs 0.051 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=0.61 cfs 0.051 af

Pond C04P: Catch Basin #4 Peak Elev=115.50' Storage=0.000 af Inflow=2.50 cfs 0.206 af
12.0" Round Culvert n=0.012 L=95.5' S=0.0065 '/' Outflow=2.50 cfs 0.206 af

Pond C05P: Catch Basin #5 Peak Elev=114.89' Storage=0.000 af Inflow=2.94 cfs 0.241 af
12.0" Round Culvert n=0.012 L=25.5' S=0.0075 '/' Outflow=2.94 cfs 0.241 af

Pond C06P: Catch Basin #6 Peak Elev=115.28' Storage=0.000 af Inflow=0.40 cfs 0.031 af
12.0" Round Culvert n=0.012 L=4.5' S=0.0489 '/' Outflow=0.40 cfs 0.031 af

Pond C07P: Catch Basin #7 Peak Elev=105.46' Storage=0.000 af Inflow=1.33 cfs 0.099 af
12.0" Round Culvert n=0.012 L=19.9' S=0.0050 '/' Outflow=1.32 cfs 0.099 af

Pond C08P: Catch Basin #8 Peak Elev=105.30' Storage=0.000 af Inflow=6.15 cfs 0.486 af
18.0" Round Culvert n=0.012 L=55.7' S=0.0418 '/' Outflow=6.15 cfs 0.486 af

Pond C09P: Catch Basin #9 Peak Elev=101.75' Storage=0.000 af Inflow=1.58 cfs 0.125 af
12.0" Round Culvert n=0.012 L=33.2' S=0.0217 '/' Outflow=1.58 cfs 0.125 af

Pond C10P: Catch Basin #10 Peak Elev=101.24' Storage=0.000 af Inflow=2.23 cfs 0.175 af
12.0" Round Culvert n=0.012 L=50.0' S=0.0050 '/' Outflow=2.23 cfs 0.175 af

Pond C11P: Catch Basin #11 Peak Elev=110.27' Storage=0.000 af Inflow=1.30 cfs 0.103 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=1.29 cfs 0.103 af

Pond C12P: Catch Basin #12 Peak Elev=110.13' Storage=0.000 af Inflow=2.56 cfs 0.199 af
12.0" Round Culvert n=0.012 L=136.0' S=0.0422 '/' Outflow=2.56 cfs 0.199 af

Pond C13P: Catch Basin #13 Peak Elev=104.34' Storage=0.000 af Inflow=4.54 cfs 0.354 af
15.0" Round Culvert n=0.012 L=33.0' S=0.0527 '/' Outflow=4.54 cfs 0.354 af

Pond C14P: Catch Basin #14 Peak Elev=104.83' Storage=0.000 af Inflow=3.58 cfs 0.279 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0139 '/' Outflow=3.56 cfs 0.279 af

Pond C15P: Catch Basin #15 Peak Elev=104.34' Storage=0.001 af Inflow=0.81 cfs 0.066 af
12.0" Round Culvert n=0.012 L=12.0' S=0.0167 '/' Outflow=0.79 cfs 0.065 af

Pond C16P: Catch Basin #16 Peak Elev=99.24' Storage=0.000 af Inflow=0.74 cfs 0.238 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=0.74 cfs 0.238 af

Pond C17P: Catch Basin #17 Peak Elev=98.21' Storage=0.000 af Inflow=1.15 cfs 0.087 af
12.0" Round Culvert n=0.012 L=37.2' S=0.0478 '/' Outflow=1.15 cfs 0.087 af

Pond C18P: Catch Basin #18 Peak Elev=96.70' Storage=0.000 af Inflow=0.75 cfs 0.059 af
12.0" Round Culvert n=0.012 L=19.0' S=0.0100 '/' Outflow=0.74 cfs 0.059 af

Pond C19P: Catch Basin #19 Peak Elev=96.61' Storage=0.000 af Inflow=2.79 cfs 0.213 af
12.0" Round Culvert n=0.012 L=122.5' S=0.0651 '/' Outflow=2.78 cfs 0.213 af

Pond C20P: Catch Basin #20 Peak Elev=84.75' Storage=0.000 af Inflow=4.78 cfs 0.369 af
15.0" Round Culvert n=0.012 L=90.0' S=0.0486 '/' Outflow=4.77 cfs 0.369 af

Pond C21P: Catch Basin #21 Peak Elev=85.52' Storage=0.000 af Inflow=3.61 cfs 0.275 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0139 '/' Outflow=3.59 cfs 0.275 af

Pond C22P: Catch Basin #22 Peak Elev=81.23' Storage=0.001 af Inflow=5.42 cfs 0.419 af
18.0" Round Culvert n=0.012 L=34.5' S=0.0055 '/' Outflow=5.39 cfs 0.419 af

Pond C23P: Catch Basin #23 Peak Elev=80.99' Storage=0.001 af Inflow=8.44 cfs 0.654 af
18.0" Round Culvert n=0.012 L=6.5' S=0.0092 '/' Outflow=8.40 cfs 0.654 af

Pond C24P: Catch Basin #24 Peak Elev=79.06' Storage=0.000 af Inflow=1.15 cfs 0.097 af
12.0" Round Culvert n=0.012 L=49.2' S=0.0437 '/' Outflow=1.15 cfs 0.097 af

Pond C25P: Catch Basin #25 Peak Elev=74.61' Storage=0.001 af Inflow=1.99 cfs 0.189 af
15.0" Round Culvert n=0.012 L=60.0' S=0.0083 '/' Outflow=1.97 cfs 0.188 af

Pond D01P: Drain Manhole #1 Peak Elev=114.29' Storage=0.000 af Inflow=3.34 cfs 0.271 af
15.0" Round Culvert n=0.012 L=148.5' S=0.0055 '/' Outflow=3.34 cfs 0.271 af

Pond D02P: Drain Manhole #2 Peak Elev=113.28' Storage=0.000 af Inflow=3.34 cfs 0.271 af
15.0" Round Culvert n=0.012 L=118.0' S=0.0682 '/' Outflow=3.34 cfs 0.271 af

Pond D03P: Drain Manhole #3 Peak Elev=100.92' Storage=0.001 af Inflow=8.39 cfs 0.661 af
18.0" Round Culvert n=0.012 L=33.5' S=0.0075 '/' Outflow=8.38 cfs 0.661 af

Pond D04P: Drain Manhole #4 Peak Elev=93.89' Storage=0.000 af Inflow=1.72 cfs 0.575 af
15.0" Round Culvert n=0.012 L=58.5' S=0.0282 '/' Outflow=1.72 cfs 0.575 af

Pond D05P: Drain Manhole #5 Peak Elev=92.14' Storage=0.000 af Inflow=1.72 cfs 0.575 af
15.0" Round Culvert n=0.012 L=56.7' S=0.0265 '/' Outflow=1.72 cfs 0.575 af

Pond D06P: Drain Manhole #6 Peak Elev=104.34' Storage=0.001 af Inflow=4.54 cfs 0.354 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0180 '/' Outflow=4.52 cfs 0.353 af

Pond D07P: Drain Manhole #7 Peak Elev=99.40' Storage=0.000 af Inflow=0.20 cfs 0.184 af
12.0" Round Culvert n=0.012 L=60.0' S=0.0050 '/' Outflow=0.20 cfs 0.184 af

Pond D08P: Drain Manhole #8 Peak Elev=88.54' Storage=0.000 af Inflow=2.78 cfs 0.213 af
12.0" Round Culvert n=0.012 L=56.0' S=0.0613 '/' Outflow=2.78 cfs 0.213 af

Pond D09P: Drain Manhole #9 Peak Elev=76.45' Storage=0.000 af Inflow=8.32 cfs 0.653 af
18.0" Round Culvert n=0.012 L=50.0' S=0.0700 '/' Outflow=8.31 cfs 0.653 af

Pond D10P: Drain Manhole #10 Peak Elev=74.61' Storage=0.001 af Inflow=1.15 cfs 0.097 af
12.0" Round Culvert n=0.012 L=134.0' S=0.0056 '/' Outflow=1.13 cfs 0.096 af

Pond W01P: Water Quality Inlet #1 Peak Elev=100.20' Storage=0.007 af Inflow=8.38 cfs 0.661 af
18.0" Round Culvert n=0.012 L=75.0' S=0.0600 '/' Outflow=8.28 cfs 0.660 af

Pond W02P: Water Quality Inlet #2 Peak Elev=80.22' Storage=0.008 af Inflow=8.40 cfs 0.654 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=8.32 cfs 0.653 af

Total Runoff Area = 56.648 ac Runoff Volume = 17.335 af Average Runoff Depth = 3.67"
92.42% Pervious = 52.355 ac 7.58% Impervious = 4.293 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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

Subcatchment1S: Subcatchment#1 Runoff Area=618,885 sf 0.95% Impervious Runoff Depth>4.62"
Flow Length=2,050' Tc=25.3 min CN=70 Runoff=47.15 cfs 5.473 af

Subcatchment2S: Subcatchment#2 Runoff Area=33,802 sf 0.00% Impervious Runoff Depth>4.76"
Flow Length=215' Tc=8.3 min CN=71 Runoff=3.95 cfs 0.308 af

Subcatchment3S: Subcatchment#3 Runoff Area=19,435 sf 0.00% Impervious Runoff Depth>4.64"
Flow Length=240' Tc=7.0 min CN=70 Runoff=2.32 cfs 0.173 af

Subcatchment4S: Subcatchment#4 Runoff Area=64,929 sf 0.00% Impervious Runoff Depth>4.63"
Flow Length=293' Tc=14.1 min CN=70 Runoff=6.25 cfs 0.576 af

Subcatchment5S: Subcatchment#5 Runoff Area=355,305 sf 1.21% Impervious Runoff Depth>4.61"
Flow Length=991' Tc=40.0 min UI Adjusted CN=70 Runoff=21.85 cfs 3.132 af

Subcatchment6S: Subcatchment#6 Runoff Area=148,453 sf 5.90% Impervious Runoff Depth>4.97"
Flow Length=927' Tc=27.5 min UI Adjusted CN=73 Runoff=11.71 cfs 1.412 af

Subcatchment7S: Subcatchment#7 Runoff Area=87,203 sf 0.00% Impervious Runoff Depth>4.63"
Flow Length=210' Tc=17.4 min CN=70 Runoff=7.75 cfs 0.772 af

Subcatchment8S: Subcatchment#8 Runoff Area=69,837 sf 0.00% Impervious Runoff Depth>3.59"
Flow Length=381' Tc=18.1 min CN=61 Runoff=4.68 cfs 0.480 af

Subcatchment9S: Subcatchment#9 Runoff Area=30,235 sf 0.00% Impervious Runoff Depth>3.60"
Flow Length=273' Tc=13.9 min CN=61 Runoff=2.24 cfs 0.208 af

Subcatchment10S: Subcatchment#10 Runoff Area=74,498 sf 10.49% Impervious Runoff Depth>4.75"
Flow Length=280' Tc=9.4 min UI Adjusted CN=71 Runoff=8.37 cfs 0.678 af

Subcatchment11S: Subcatchment#11 Runoff Area=247,933 sf 3.57% Impervious Runoff Depth>4.75"
Flow Length=368' Tc=13.6 min CN=71 Runoff=24.76 cfs 2.253 af

Subcatchment12S: Subcatchment#12 Runoff Area=172,549 sf 5.34% Impervious Runoff Depth>4.86"
Flow Length=462' Tc=17.7 min UI Adjusted CN=72 Runoff=15.99 cfs 1.605 af

Subcatchment13S: Subcatchment#13 Runoff Area=33,510 sf 0.00% Impervious Runoff Depth>4.75"
Flow Length=329' Tc=18.6 min CN=71 Runoff=2.98 cfs 0.304 af

Subcatchment15S: Subcatchment#15 Runoff Area=238,038 sf 5.11% Impervious Runoff Depth>4.51"
Flow Length=553' Tc=23.7 min UI Adjusted CN=69 Runoff=18.15 cfs 2.053 af

Subcatchment16S: Catch Basin #7727 Runoff Area=459 sf 45.75% Impervious Runoff Depth>5.94"
Tc=6.0 min CN=81 Runoff=0.07 cfs 0.005 af

Subcatchment17S: Catch Basin #3698 Runoff Area=2,300 sf 9.70% Impervious Runoff Depth>4.64"
Tc=6.0 min CN=70 Runoff=0.28 cfs 0.020 af

Subcatchment 18S: Catch Basin #7725 Runoff Area=5,195 sf 84.79% Impervious Runoff Depth>7.37"
Tc=6.0 min CN=93 Runoff=0.92 cfs 0.073 af

Subcatchment 19S: Catch Basin #7726 Runoff Area=880 sf 88.86% Impervious Runoff Depth>7.61"
Tc=6.0 min CN=95 Runoff=0.16 cfs 0.013 af

Subcatchment 20S: 30" RCP Wet Crossing Runoff Area=14,031 sf 0.00% Impervious Runoff Depth>3.83"
Flow Length=138' Tc=8.8 min CN=63 Runoff=1.28 cfs 0.103 af

Subcatchment 21S: Catch Basin #1 Runoff Area=2,746 sf 100.00% Impervious Runoff Depth>7.97"
Tc=6.0 min CN=98 Runoff=0.50 cfs 0.042 af

Subcatchment 22S: Catch Basin #2 Runoff Area=4,125 sf 100.00% Impervious Runoff Depth>7.97"
Tc=6.0 min CN=98 Runoff=0.75 cfs 0.063 af

Subcatchment 23S: Catch Basin #3 Runoff Area=4,117 sf 96.04% Impervious Runoff Depth>7.85"
Tc=6.0 min CN=97 Runoff=0.74 cfs 0.062 af

Subcatchment 24S: Catch Basin #4 Runoff Area=5,883 sf 77.78% Impervious Runoff Depth>7.37"
Tc=6.0 min CN=93 Runoff=1.04 cfs 0.083 af

Subcatchment 25S: Catch Basin #5 Runoff Area=3,045 sf 75.40% Impervious Runoff Depth>7.25"
Tc=6.0 min CN=92 Runoff=0.53 cfs 0.042 af

Subcatchment 26S: Catch Basin #6 Runoff Area=2,819 sf 66.69% Impervious Runoff Depth>7.01"
Tc=6.0 min CN=90 Runoff=0.49 cfs 0.038 af

Subcatchment 27S: Catch Basin #7 Runoff Area=10,139 sf 53.49% Impervious Runoff Depth>6.41"
Tc=6.0 min CN=85 Runoff=1.65 cfs 0.124 af

Subcatchment 28S: Catch Basin #8 Runoff Area=10,376 sf 71.82% Impervious Runoff Depth>7.13"
Tc=6.0 min CN=91 Runoff=1.80 cfs 0.141 af

Subcatchment 29S: Catch Basin #9 Runoff Area=10,795 sf 77.32% Impervious Runoff Depth>7.37"
Tc=6.0 min CN=93 Runoff=1.90 cfs 0.152 af

Subcatchment 30S: Catch Basin #10 Runoff Area=4,592 sf 58.78% Impervious Runoff Depth>7.01"
Tc=6.0 min CN=90 Runoff=0.79 cfs 0.062 af

Subcatchment 31S: Catch Basin #11 Runoff Area=8,885 sf 77.12% Impervious Runoff Depth>7.37"
Tc=6.0 min CN=93 Runoff=1.57 cfs 0.125 af

Subcatchment 32S: Catch Basin #12 Runoff Area=9,067 sf 63.57% Impervious Runoff Depth>6.89"
Tc=6.0 min CN=89 Runoff=1.54 cfs 0.119 af

Subcatchment 33S: Catch Basin #13 Runoff Area=6,803 sf 72.53% Impervious Runoff Depth>7.13"
Tc=6.0 min CN=91 Runoff=1.18 cfs 0.093 af

Subcatchment 34S: Catch Basin #14 Runoff Area=7,027 sf 75.00% Impervious Runoff Depth>7.25"
Tc=6.0 min CN=92 Runoff=1.23 cfs 0.097 af

Subcatchment 35S: Catch Basin #15 Runoff Area=5,408 sf 92.07% Impervious Runoff Depth>7.73"
Tc=6.0 min CN=96 Runoff=0.97 cfs 0.080 af

Subcatchment 36S: Catch Basin #16 Runoff Area=4,733 sf 81.07% Impervious Runoff Depth>7.37"
Tc=6.0 min CN=93 Runoff=0.84 cfs 0.067 af

Subcatchment 37S: Catch Basin #17 Runoff Area=10,736 sf 26.53% Impervious Runoff Depth>5.46"
Flow Length=139' Tc=7.4 min UI Adjusted CN=77 Runoff=1.47 cfs 0.112 af

Subcatchment 38S: Catch Basin #18 Runoff Area=5,166 sf 74.68% Impervious Runoff Depth>7.25"
Tc=6.0 min CN=92 Runoff=0.90 cfs 0.072 af

Subcatchment 39S: Catch Basin #19 Runoff Area=7,033 sf 41.63% Impervious Runoff Depth>6.29"
Tc=6.0 min CN=84 Runoff=1.13 cfs 0.085 af

Subcatchment 40S: Catch Basin #20 Runoff Area=8,226 sf 73.85% Impervious Runoff Depth>7.25"
Tc=6.0 min CN=92 Runoff=1.44 cfs 0.114 af

Subcatchment 41S: Catch Basin #21 Runoff Area=6,361 sf 48.18% Impervious Runoff Depth>6.41"
Tc=6.0 min CN=85 Runoff=1.03 cfs 0.078 af

Subcatchment 42S: Catch Basin #22 Runoff Area=4,592 sf 58.78% Impervious Runoff Depth>7.01"
Tc=6.0 min CN=90 Runoff=0.79 cfs 0.062 af

Subcatchment 43S: Catch Basin #23 Runoff Area=21,628 sf 64.81% Impervious Runoff Depth>7.01"
Tc=6.0 min CN=90 Runoff=3.72 cfs 0.290 af

Subcatchment 44S: Catch Basin #24 Runoff Area=11,921 sf 24.23% Impervious Runoff Depth>5.46"
Flow Length=213' Tc=10.9 min UI Adjusted CN=77 Runoff=1.47 cfs 0.124 af

Subcatchment 45S: Catch Basin #25 Runoff Area=11,430 sf 24.30% Impervious Runoff Depth>5.45"
Flow Length=112' Slope=0.0050 '/' Tc=16.5 min UI Adjusted CN=77 Runoff=1.22 cfs 0.119 af

Subcatchment 71S: Gravel Wetland #101 Runoff Area=28,837 sf 17.32% Impervious Runoff Depth>5.58"
Tc=6.0 min CN=78 Runoff=4.19 cfs 0.308 af

Subcatchment 72S: Gravel Wetland #102 Runoff Area=21,302 sf 9.37% Impervious Runoff Depth>5.35"
Tc=6.0 min CN=76 Runoff=2.98 cfs 0.218 af

Subcatchment 73S: Gravel Wetland #103 Runoff Area=12,324 sf 9.02% Impervious Runoff Depth>5.35"
Tc=6.0 min CN=76 Runoff=1.73 cfs 0.126 af

Reach 1aR: Flow from Culvert to Stream Avg. Flow Depth=0.13' Max Vel=1.85 fps Inflow=1.43 cfs 0.112 af
n=0.035 L=655.5' S=0.0506 '/' Capacity=22.92 cfs Outflow=1.20 cfs 0.111 af

Reach 1bR: Start of Stream Avg. Flow Depth=0.15' Max Vel=2.09 fps Inflow=1.20 cfs 0.111 af
n=0.035 L=1,438.0' S=0.0351 '/' Capacity=6.96 cfs Outflow=0.94 cfs 0.110 af

Reach 10R: Reach #10 Avg. Flow Depth=0.34' Max Vel=2.87 fps Inflow=8.26 cfs 0.677 af
n=0.035 L=453.0' S=0.0336 '/' Capacity=18.68 cfs Outflow=7.94 cfs 0.676 af

Reach 15R: Reach #15 Avg. Flow Depth=0.35' Max Vel=2.97 fps Inflow=8.65 cfs 2.448 af
n=0.035 L=198.0' S=0.0344 '/' Capacity=18.90 cfs Outflow=8.65 cfs 2.446 af

Reach 20aR: Wetland Crossing #1 Flow Avg. Flow Depth=0.16' Max Vel=0.71 fps Inflow=1.27 cfs 0.103 af
n=0.035 L=274.0' S=0.0055 '/' Capacity=12.58 cfs Outflow=1.08 cfs 0.102 af

Reach 20bR: Wetland Crossing #1 Flow Avg. Flow Depth=0.13' Max Vel=1.60 fps Inflow=1.08 cfs 0.102 af
n=0.035 L=81.0' S=0.0370 '/' Capacity=19.60 cfs Outflow=1.07 cfs 0.102 af

Reach 20cR: Wetland Crossing #1 Flow Avg. Flow Depth=0.09' Max Vel=2.97 fps Inflow=1.07 cfs 0.102 af
n=0.035 L=78.0' S=0.2179 '/' Capacity=47.55 cfs Outflow=1.07 cfs 0.102 af

Reach 20dR: Wetland Crossing #1 Flow Avg. Flow Depth=0.12' Max Vel=1.79 fps Inflow=1.07 cfs 0.102 af
n=0.035 L=222.5' S=0.0517 '/' Capacity=23.16 cfs Outflow=1.06 cfs 0.102 af

Reach 20eR: Wetland Crossing #1 Flow Avg. Flow Depth=0.19' Max Vel=1.86 fps Inflow=1.06 cfs 0.102 af
n=0.035 L=217.0' S=0.0300 '/' Capacity=36.75 cfs Outflow=1.05 cfs 0.101 af

Reach 20fR: Wetland Crossing #1 Flow Avg. Flow Depth=0.12' Max Vel=3.69 fps Inflow=1.05 cfs 0.101 af
n=0.035 L=105.0' S=0.2143 '/' Capacity=98.29 cfs Outflow=1.05 cfs 0.101 af

Reach 71aR: Gravel Wetland #101 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=34.0' S=0.0588 '/' Capacity=39.30 cfs Outflow=0.00 cfs 0.000 af

Reach 71bR: Gravel Wetland #101 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=16.0' S=0.2500 '/' Capacity=50.93 cfs Outflow=0.00 cfs 0.000 af

Reach 72aR: SGW #102 Flow from OS Avg. Flow Depth=0.11' Max Vel=1.41 fps Inflow=0.84 cfs 0.514 af
n=0.035 L=109.0' S=0.0367 '/' Capacity=103.16 cfs Outflow=0.84 cfs 0.514 af

Reach 72bR: SGW #102 Flow from OS Avg. Flow Depth=0.09' Max Vel=2.00 fps Inflow=0.84 cfs 0.514 af
n=0.035 L=60.0' S=0.1000 '/' Capacity=170.29 cfs Outflow=0.84 cfs 0.514 af

Reach 72cR: SGW #102 Flow from OS Avg. Flow Depth=0.07' Max Vel=2.93 fps Inflow=0.84 cfs 0.514 af
n=0.035 L=20.0' S=0.3000 '/' Capacity=294.94 cfs Outflow=0.84 cfs 0.514 af

Reach 72dR: SGW #102 Flow from OS Avg. Flow Depth=0.08' Max Vel=1.32 fps Inflow=0.51 cfs 0.270 af
n=0.035 L=26.5' S=0.0472 '/' Capacity=116.95 cfs Outflow=0.51 cfs 0.270 af

Reach 72eR: SGW #102 Flow from Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=201.0' S=0.0871 '/' Capacity=158.89 cfs Outflow=0.00 cfs 0.000 af

Reach 72fR: SGW #102 Flow from Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=117.5' S=0.0936 '/' Capacity=64.97 cfs Outflow=0.00 cfs 0.000 af

Reach 73R: Gravel Wetland #103 Avg. Flow Depth=0.19' Max Vel=3.64 fps Inflow=2.05 cfs 0.748 af
n=0.035 L=380.0' S=0.1145 '/' Capacity=71.84 cfs Outflow=2.05 cfs 0.747 af

Reach 100R: Reach #100 Inflow=48.00 cfs 5.583 af
Outflow=48.00 cfs 5.583 af

Reach 200R: Reach #200 Inflow=49.85 cfs 5.890 af
Outflow=49.85 cfs 5.890 af

Reach 300R: Reach #300 Inflow=50.84 cfs 6.063 af
Outflow=50.84 cfs 6.063 af

Reach 400R: Reach #400 Inflow=55.50 cfs 6.639 af
Outflow=55.50 cfs 6.639 af

Reach 500R: Reach #500 Inflow=74.03 cfs 9.872 af
Outflow=74.03 cfs 9.872 af

Reach 600R: Reach #600 Inflow=87.72 cfs 12.031 af
Outflow=87.72 cfs 12.031 af

Reach 700R: Reach #700 Inflow=94.73 cfs 13.317 af
Outflow=94.73 cfs 13.317 af

Reach 800R: Reach #800 Inflow=98.87 cfs 13.796 af
Outflow=98.87 cfs 13.796 af

Reach 900R: Final Reach #900 Inflow=100.50 cfs 14.004 af
Outflow=100.50 cfs 14.004 af

Reach 1100R: Final Reach #1100 Inflow=39.29 cfs 5.375 af
Outflow=39.29 cfs 5.375 af

Reach 1200R: Final Reach #1200 Inflow=16.28 cfs 1.876 af
Outflow=16.28 cfs 1.876 af

Reach 1300R: Final Reach #1300 Inflow=2.98 cfs 0.304 af
Outflow=2.98 cfs 0.304 af

Pond 1EP: Catch Basin #7727 Peak Elev=138.09' Storage=2 cf Inflow=0.07 cfs 0.005 af
12.0" Round Culvert n=0.012 L=48.0' S=0.0050 '/' Outflow=0.07 cfs 0.005 af

Pond 2EP: Catch Basin #3698 Peak Elev=138.06' Storage=4 cf Inflow=0.28 cfs 0.020 af
12.0" Round Culvert n=0.012 L=8.3' S=0.0048 '/' Outflow=0.28 cfs 0.020 af

Pond 3EP: Catch Basin #7725 Peak Elev=139.02' Storage=7 cf Inflow=0.92 cfs 0.073 af
12.0" Round Culvert n=0.012 L=153.7' S=0.0050 '/' Outflow=0.92 cfs 0.073 af

Pond 4EP: Catch Basin #7726 Peak Elev=137.25' Storage=7 cf Inflow=1.43 cfs 0.112 af
24.0" Round Culvert n=0.012 L=61.5' S=0.0050 '/' Outflow=1.43 cfs 0.112 af

Pond 10P: 24" RCP Inlet Sump/Pond Peak Elev=101.26' Storage=458 cf Inflow=8.37 cfs 0.678 af
24.0" Round Culvert n=0.012 L=108.8' S=0.0113 '/' Outflow=8.26 cfs 0.677 af

Pond 15P: 12" RCP Inlet Sump/Pond Peak Elev=98.65' Storage=17,048 cf Inflow=18.56 cfs 2.448 af
Primary=8.65 cfs 2.448 af Secondary=0.00 cfs 0.000 af Outflow=8.65 cfs 2.448 af

Pond 20P: 30" RCP Wetland Crossing #1 Peak Elev=111.36' Storage=124 cf Inflow=1.28 cfs 0.103 af
30.0" Round Culvert w/ 6.0" inside fill n=0.024 L=52.0' S=0.0096 '/' Outflow=1.27 cfs 0.103 af

Pond 101P: SGW #101 Peak Elev=104.46' Storage=23,071 cf Inflow=10.62 cfs 0.820 af
Primary=0.06 cfs 0.075 af Secondary=0.81 cfs 0.253 af Tertiary=0.00 cfs 0.000 af Outflow=0.86 cfs 0.329 af

Pond 102P: SGW #102 Peak Elev=75.29' Storage=32,199 cf Inflow=15.46 cfs 1.271 af
Primary=0.84 cfs 0.514 af Secondary=0.51 cfs 0.270 af Tertiary=0.00 cfs 0.000 af Outflow=1.35 cfs 0.785 af

Pond 103P: SGW #103 Peak Elev=98.53' Storage=20,549 cf Inflow=11.68 cfs 0.934 af
Primary=0.13 cfs 0.144 af Secondary=1.35 cfs 0.454 af Tertiary=0.57 cfs 0.150 af Outflow=2.05 cfs 0.748 af

Pond C01P: Catch Basin #1 Peak Elev=117.97' Storage=0.000 af Inflow=0.50 cfs 0.042 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=0.49 cfs 0.042 af

Pond C02P: Catch Basin #2 Peak Elev=117.84' Storage=0.000 af Inflow=1.24 cfs 0.105 af
12.0" Round Culvert n=0.012 L=120.5' S=0.0228 '/' Outflow=1.24 cfs 0.105 af

Pond C03P: Catch Basin #3 Peak Elev=115.98' Storage=0.000 af Inflow=0.74 cfs 0.062 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=0.73 cfs 0.062 af

Pond C04P: Catch Basin #4 Peak Elev=115.96' Storage=0.000 af Inflow=3.00 cfs 0.249 af
12.0" Round Culvert n=0.012 L=95.5' S=0.0065 '/' Outflow=2.96 cfs 0.249 af

Pond C05P: Catch Basin #5 Peak Elev=115.20' Storage=0.000 af Inflow=3.49 cfs 0.292 af
12.0" Round Culvert n=0.012 L=25.5' S=0.0075 '/' Outflow=3.50 cfs 0.292 af

Pond C06P: Catch Basin #6 Peak Elev=115.32' Storage=0.000 af Inflow=0.49 cfs 0.038 af
12.0" Round Culvert n=0.012 L=4.5' S=0.0489 '/' Outflow=0.49 cfs 0.038 af

Pond C07P: Catch Basin #7 Peak Elev=105.67' Storage=0.000 af Inflow=1.65 cfs 0.124 af
12.0" Round Culvert n=0.012 L=19.9' S=0.0050 '/' Outflow=1.63 cfs 0.124 af

Pond C08P: Catch Basin #8 Peak Elev=105.54' Storage=0.000 af Inflow=7.42 cfs 0.595 af
18.0" Round Culvert n=0.012 L=55.7' S=0.0418 '/' Outflow=7.42 cfs 0.595 af

Pond C09P: Catch Basin #9 Peak Elev=102.06' Storage=0.000 af Inflow=1.90 cfs 0.152 af
12.0" Round Culvert n=0.012 L=33.2' S=0.0217 '/' Outflow=1.90 cfs 0.152 af

Pond C10P: Catch Basin #10 Peak Elev=101.95' Storage=0.000 af Inflow=2.69 cfs 0.214 af
12.0" Round Culvert n=0.012 L=50.0' S=0.0050 '/' Outflow=2.67 cfs 0.214 af

Pond C11P: Catch Basin #11 Peak Elev=110.47' Storage=0.000 af Inflow=1.57 cfs 0.125 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=1.55 cfs 0.125 af

Pond C12P: Catch Basin #12 Peak Elev=110.35' Storage=0.000 af Inflow=3.10 cfs 0.245 af
12.0" Round Culvert n=0.012 L=136.0' S=0.0422 '/' Outflow=3.10 cfs 0.245 af

Pond C13P: Catch Basin #13 Peak Elev=104.47' Storage=0.000 af Inflow=5.48 cfs 0.435 af
15.0" Round Culvert n=0.012 L=33.0' S=0.0527 '/' Outflow=5.48 cfs 0.434 af

Pond C14P: Catch Basin #14 Peak Elev=105.47' Storage=0.001 af Inflow=4.33 cfs 0.342 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0139 '/' Outflow=4.30 cfs 0.342 af

Pond C15P: Catch Basin #15 Peak Elev=104.46' Storage=0.001 af Inflow=0.97 cfs 0.080 af
12.0" Round Culvert n=0.012 L=12.0' S=0.0167 '/' Outflow=0.95 cfs 0.079 af

Pond C16P: Catch Basin #16 Peak Elev=99.31' Storage=0.000 af Inflow=0.93 cfs 0.396 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=0.93 cfs 0.396 af

Pond C17P: Catch Basin #17 Peak Elev=98.30' Storage=0.000 af Inflow=1.47 cfs 0.112 af
12.0" Round Culvert n=0.012 L=37.2' S=0.0478 '/' Outflow=1.47 cfs 0.112 af

Pond C18P: Catch Basin #18 Peak Elev=96.96' Storage=0.000 af Inflow=0.90 cfs 0.072 af
12.0" Round Culvert n=0.012 L=19.0' S=0.0100 '/' Outflow=0.89 cfs 0.072 af

Pond C19P: Catch Basin #19 Peak Elev=96.91' Storage=0.000 af Inflow=3.47 cfs 0.268 af
12.0" Round Culvert n=0.012 L=122.5' S=0.0651 '/' Outflow=3.47 cfs 0.268 af

Pond C20P: Catch Basin #20 Peak Elev=85.09' Storage=0.000 af Inflow=5.88 cfs 0.460 af
15.0" Round Culvert n=0.012 L=90.0' S=0.0486 '/' Outflow=5.89 cfs 0.460 af

Pond C21P: Catch Basin #21 Peak Elev=86.31' Storage=0.001 af Inflow=4.50 cfs 0.346 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0139 '/' Outflow=4.45 cfs 0.346 af

Pond C22P: Catch Basin #22 Peak Elev=82.18' Storage=0.001 af Inflow=6.67 cfs 0.522 af
18.0" Round Culvert n=0.012 L=34.5' S=0.0055 '/' Outflow=6.58 cfs 0.522 af

Pond C23P: Catch Basin #23 Peak Elev=81.78' Storage=0.001 af Inflow=10.29 cfs 0.812 af
18.0" Round Culvert n=0.012 L=6.5' S=0.0092 '/' Outflow=10.25 cfs 0.812 af

Pond C24P: Catch Basin #24 Peak Elev=79.15' Storage=0.000 af Inflow=1.47 cfs 0.124 af
12.0" Round Culvert n=0.012 L=49.2' S=0.0437 '/' Outflow=1.47 cfs 0.124 af

Pond C25P: Catch Basin #25 Peak Elev=75.29' Storage=0.001 af Inflow=2.55 cfs 0.243 af
15.0" Round Culvert n=0.012 L=60.0' S=0.0083 '/' Outflow=2.53 cfs 0.242 af

Pond D01P: Drain Manhole #1 Peak Elev=114.43' Storage=0.000 af Inflow=3.99 cfs 0.329 af
15.0" Round Culvert n=0.012 L=148.5' S=0.0055 '/' Outflow=3.99 cfs 0.329 af

Pond D02P: Drain Manhole #2 Peak Elev=113.41' Storage=0.000 af Inflow=3.99 cfs 0.329 af
15.0" Round Culvert n=0.012 L=118.0' S=0.0682 '/' Outflow=3.99 cfs 0.329 af

Pond D03P: Drain Manhole #3 Peak Elev=101.68' Storage=0.001 af Inflow=10.10 cfs 0.809 af
18.0" Round Culvert n=0.012 L=33.5' S=0.0075 '/' Outflow=10.07 cfs 0.809 af

Pond D04P: Drain Manhole #4 Peak Elev=93.96' Storage=0.000 af Inflow=2.05 cfs 0.748 af
15.0" Round Culvert n=0.012 L=58.5' S=0.0282 '/' Outflow=2.05 cfs 0.748 af

Pond D05P: Drain Manhole #5 Peak Elev=92.21' Storage=0.000 af Inflow=2.05 cfs 0.748 af
15.0" Round Culvert n=0.012 L=56.7' S=0.0265 '/' Outflow=2.05 cfs 0.748 af

Pond D06P: Drain Manhole #6 Peak Elev=104.47' Storage=0.001 af Inflow=5.48 cfs 0.434 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0180 '/' Outflow=5.48 cfs 0.433 af

Pond D07P: Drain Manhole #7 Peak Elev=99.71' Storage=0.000 af Inflow=0.86 cfs 0.329 af
12.0" Round Culvert n=0.012 L=60.0' S=0.0050 '/' Outflow=0.86 cfs 0.329 af

Pond D08P: Drain Manhole #8 Peak Elev=88.84' Storage=0.000 af Inflow=3.47 cfs 0.268 af
12.0" Round Culvert n=0.012 L=56.0' S=0.0613 '/' Outflow=3.47 cfs 0.268 af

Pond D09P: Drain Manhole #9 Peak Elev=76.98' Storage=0.001 af Inflow=10.36 cfs 0.811 af
18.0" Round Culvert n=0.012 L=50.0' S=0.0700 '/' Outflow=10.34 cfs 0.811 af

Pond D10P: Drain Manhole #10 Peak Elev=75.29' Storage=0.001 af Inflow=1.47 cfs 0.124 af
12.0" Round Culvert n=0.012 L=134.0' S=0.0056 '/' Outflow=1.43 cfs 0.124 af

Pond W01P: Water Quality Inlet #1 Peak Elev=100.62' Storage=0.008 af Inflow=10.07 cfs 0.809 af
18.0" Round Culvert n=0.012 L=75.0' S=0.0600 '/' Outflow=9.96 cfs 0.808 af

Pond W02P: Water Quality Inlet #2 Peak Elev=80.54' Storage=0.009 af Inflow=10.25 cfs 0.812 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=10.36 cfs 0.811 af

Total Runoff Area = 56.648 ac Runoff Volume = 22.738 af Average Runoff Depth = 4.82"
92.42% Pervious = 52.355 ac 7.58% Impervious = 4.293 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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

Subcatchment1S: Subcatchment#1 Runoff Area=618,885 sf 0.95% Impervious Runoff Depth>6.03"
Flow Length=2,050' Tc=25.3 min CN=70 Runoff=61.37 cfs 7.135 af

Subcatchment2S: Subcatchment#2 Runoff Area=33,802 sf 0.00% Impervious Runoff Depth>6.18"
Flow Length=215' Tc=8.3 min CN=71 Runoff=5.11 cfs 0.399 af

Subcatchment3S: Subcatchment#3 Runoff Area=19,435 sf 0.00% Impervious Runoff Depth>6.05"
Flow Length=240' Tc=7.0 min CN=70 Runoff=3.01 cfs 0.225 af

Subcatchment4S: Subcatchment#4 Runoff Area=64,929 sf 0.00% Impervious Runoff Depth>6.04"
Flow Length=293' Tc=14.1 min CN=70 Runoff=8.13 cfs 0.750 af

Subcatchment5S: Subcatchment#5 Runoff Area=355,305 sf 1.21% Impervious Runoff Depth>6.01"
Flow Length=991' Tc=40.0 min UI Adjusted CN=70 Runoff=28.45 cfs 4.084 af

Subcatchment6S: Subcatchment#6 Runoff Area=148,453 sf 5.90% Impervious Runoff Depth>6.41"
Flow Length=927' Tc=27.5 min UI Adjusted CN=73 Runoff=15.04 cfs 1.821 af

Subcatchment7S: Subcatchment#7 Runoff Area=87,203 sf 0.00% Impervious Runoff Depth>6.04"
Flow Length=210' Tc=17.4 min CN=70 Runoff=10.08 cfs 1.007 af

Subcatchment8S: Subcatchment#8 Runoff Area=69,837 sf 0.00% Impervious Runoff Depth>4.86"
Flow Length=381' Tc=18.1 min CN=61 Runoff=6.39 cfs 0.649 af

Subcatchment9S: Subcatchment#9 Runoff Area=30,235 sf 0.00% Impervious Runoff Depth>4.86"
Flow Length=273' Tc=13.9 min CN=61 Runoff=3.06 cfs 0.281 af

Subcatchment10S: Subcatchment#10 Runoff Area=74,498 sf 10.49% Impervious Runoff Depth>6.18"
Flow Length=280' Tc=9.4 min UI Adjusted CN=71 Runoff=10.82 cfs 0.880 af

Subcatchment11S: Subcatchment#11 Runoff Area=247,933 sf 3.57% Impervious Runoff Depth>6.17"
Flow Length=368' Tc=13.6 min CN=71 Runoff=32.06 cfs 2.927 af

Subcatchment12S: Subcatchment#12 Runoff Area=172,549 sf 5.34% Impervious Runoff Depth>6.29"
Flow Length=462' Tc=17.7 min UI Adjusted CN=72 Runoff=20.62 cfs 2.078 af

Subcatchment13S: Subcatchment#13 Runoff Area=33,510 sf 0.00% Impervious Runoff Depth>6.16"
Flow Length=329' Tc=18.6 min CN=71 Runoff=3.86 cfs 0.395 af

Subcatchment15S: Subcatchment#15 Runoff Area=238,038 sf 5.11% Impervious Runoff Depth>5.90"
Flow Length=553' Tc=23.7 min UI Adjusted CN=69 Runoff=23.73 cfs 2.686 af

Subcatchment16S: Catch Basin #7727 Runoff Area=459 sf 45.75% Impervious Runoff Depth>7.46"
Tc=6.0 min CN=81 Runoff=0.09 cfs 0.007 af

Subcatchment17S: Catch Basin #3698 Runoff Area=2,300 sf 9.70% Impervious Runoff Depth>6.05"
Tc=6.0 min CN=70 Runoff=0.37 cfs 0.027 af

Subcatchment 18S: Catch Basin #7725 Runoff Area=5,195 sf 84.79% Impervious Runoff Depth>8.96"
Tc=6.0 min CN=93 Runoff=1.10 cfs 0.089 af

Subcatchment 19S: Catch Basin #7726 Runoff Area=880 sf 88.86% Impervious Runoff Depth>9.20"
Tc=6.0 min CN=95 Runoff=0.19 cfs 0.015 af

Subcatchment 20S: 30" RCP Wet Crossing Runoff Area=14,031 sf 0.00% Impervious Runoff Depth>5.13"
Flow Length=138' Tc=8.8 min CN=63 Runoff=1.72 cfs 0.138 af

Subcatchment 21S: Catch Basin #1 Runoff Area=2,746 sf 100.00% Impervious Runoff Depth>9.56"
Tc=6.0 min CN=98 Runoff=0.59 cfs 0.050 af

Subcatchment 22S: Catch Basin #2 Runoff Area=4,125 sf 100.00% Impervious Runoff Depth>9.56"
Tc=6.0 min CN=98 Runoff=0.89 cfs 0.075 af

Subcatchment 23S: Catch Basin #3 Runoff Area=4,117 sf 96.04% Impervious Runoff Depth>9.44"
Tc=6.0 min CN=97 Runoff=0.89 cfs 0.074 af

Subcatchment 24S: Catch Basin #4 Runoff Area=5,883 sf 77.78% Impervious Runoff Depth>8.96"
Tc=6.0 min CN=93 Runoff=1.25 cfs 0.101 af

Subcatchment 25S: Catch Basin #5 Runoff Area=3,045 sf 75.40% Impervious Runoff Depth>8.83"
Tc=6.0 min CN=92 Runoff=0.64 cfs 0.051 af

Subcatchment 26S: Catch Basin #6 Runoff Area=2,819 sf 66.69% Impervious Runoff Depth>8.59"
Tc=6.0 min CN=90 Runoff=0.59 cfs 0.046 af

Subcatchment 27S: Catch Basin #7 Runoff Area=10,139 sf 53.49% Impervious Runoff Depth>7.96"
Tc=6.0 min CN=85 Runoff=2.02 cfs 0.154 af

Subcatchment 28S: Catch Basin #8 Runoff Area=10,376 sf 71.82% Impervious Runoff Depth>8.71"
Tc=6.0 min CN=91 Runoff=2.18 cfs 0.173 af

Subcatchment 29S: Catch Basin #9 Runoff Area=10,795 sf 77.32% Impervious Runoff Depth>8.96"
Tc=6.0 min CN=93 Runoff=2.29 cfs 0.185 af

Subcatchment 30S: Catch Basin #10 Runoff Area=4,592 sf 58.78% Impervious Runoff Depth>8.59"
Tc=6.0 min CN=90 Runoff=0.96 cfs 0.075 af

Subcatchment 31S: Catch Basin #11 Runoff Area=8,885 sf 77.12% Impervious Runoff Depth>8.96"
Tc=6.0 min CN=93 Runoff=1.89 cfs 0.152 af

Subcatchment 32S: Catch Basin #12 Runoff Area=9,067 sf 63.57% Impervious Runoff Depth>8.46"
Tc=6.0 min CN=89 Runoff=1.88 cfs 0.147 af

Subcatchment 33S: Catch Basin #13 Runoff Area=6,803 sf 72.53% Impervious Runoff Depth>8.71"
Tc=6.0 min CN=91 Runoff=1.43 cfs 0.113 af

Subcatchment 34S: Catch Basin #14 Runoff Area=7,027 sf 75.00% Impervious Runoff Depth>8.83"
Tc=6.0 min CN=92 Runoff=1.48 cfs 0.119 af

Subcatchment 35S: Catch Basin #15 Runoff Area=5,408 sf 92.07% Impervious Runoff Depth>9.32"
Tc=6.0 min CN=96 Runoff=1.16 cfs 0.096 af

Subcatchment 36S: Catch Basin #16 Runoff Area=4,733 sf 81.07% Impervious Runoff Depth>8.96"
Tc=6.0 min CN=93 Runoff=1.00 cfs 0.081 af

Subcatchment 37S: Catch Basin #17 Runoff Area=10,736 sf 26.53% Impervious Runoff Depth>6.95"
Flow Length=139' Tc=7.4 min UI Adjusted CN=77 Runoff=1.86 cfs 0.143 af

Subcatchment 38S: Catch Basin #18 Runoff Area=5,166 sf 74.68% Impervious Runoff Depth>8.83"
Tc=6.0 min CN=92 Runoff=1.09 cfs 0.087 af

Subcatchment 39S: Catch Basin #19 Runoff Area=7,033 sf 41.63% Impervious Runoff Depth>7.84"
Tc=6.0 min CN=84 Runoff=1.39 cfs 0.105 af

Subcatchment 40S: Catch Basin #20 Runoff Area=8,226 sf 73.85% Impervious Runoff Depth>8.83"
Tc=6.0 min CN=92 Runoff=1.74 cfs 0.139 af

Subcatchment 41S: Catch Basin #21 Runoff Area=6,361 sf 48.18% Impervious Runoff Depth>7.96"
Tc=6.0 min CN=85 Runoff=1.27 cfs 0.097 af

Subcatchment 42S: Catch Basin #22 Runoff Area=4,592 sf 58.78% Impervious Runoff Depth>8.59"
Tc=6.0 min CN=90 Runoff=0.96 cfs 0.075 af

Subcatchment 43S: Catch Basin #23 Runoff Area=21,628 sf 64.81% Impervious Runoff Depth>8.59"
Tc=6.0 min CN=90 Runoff=4.51 cfs 0.355 af

Subcatchment 44S: Catch Basin #24 Runoff Area=11,921 sf 24.23% Impervious Runoff Depth>6.95"
Flow Length=213' Tc=10.9 min UI Adjusted CN=77 Runoff=1.85 cfs 0.158 af

Subcatchment 45S: Catch Basin #25 Runoff Area=11,430 sf 24.30% Impervious Runoff Depth>6.94"
Flow Length=112' Slope=0.0050 '/' Tc=16.5 min UI Adjusted CN=77 Runoff=1.54 cfs 0.152 af

Subcatchment 71S: Gravel Wetland #101 Runoff Area=28,837 sf 17.32% Impervious Runoff Depth>7.08"
Tc=6.0 min CN=78 Runoff=5.27 cfs 0.391 af

Subcatchment 72S: Gravel Wetland #102 Runoff Area=21,302 sf 9.37% Impervious Runoff Depth>6.82"
Tc=6.0 min CN=76 Runoff=3.78 cfs 0.278 af

Subcatchment 73S: Gravel Wetland #103 Runoff Area=12,324 sf 9.02% Impervious Runoff Depth>6.82"
Tc=6.0 min CN=76 Runoff=2.18 cfs 0.161 af

Reach 1aR: Flow from Culvert to Stream Avg. Flow Depth=0.14' Max Vel=1.98 fps Inflow=1.75 cfs 0.138 af
n=0.035 L=655.5' S=0.0506 '/' Capacity=22.92 cfs Outflow=1.49 cfs 0.137 af

Reach 1bR: Start of Stream Avg. Flow Depth=0.17' Max Vel=2.28 fps Inflow=1.49 cfs 0.137 af
n=0.035 L=1,438.0' S=0.0351 '/' Capacity=6.96 cfs Outflow=1.18 cfs 0.136 af

Reach 10R: Reach #10 Avg. Flow Depth=0.38' Max Vel=3.11 fps Inflow=10.60 cfs 0.880 af
n=0.035 L=453.0' S=0.0336 '/' Capacity=18.68 cfs Outflow=10.26 cfs 0.878 af

Reach 15R: Reach #15 Avg. Flow Depth=0.36' Max Vel=3.06 fps Inflow=9.51 cfs 3.280 af
n=0.035 L=198.0' S=0.0344 '/' Capacity=18.90 cfs Outflow=9.51 cfs 3.278 af

Reach 20aR: Wetland Crossing #1 Flow Avg. Flow Depth=0.19' Max Vel=0.78 fps Inflow=1.71 cfs 0.138 af
n=0.035 L=274.0' S=0.0055 '/' Capacity=12.58 cfs Outflow=1.49 cfs 0.137 af

Reach 20bR: Wetland Crossing #1 Flow Avg. Flow Depth=0.15' Max Vel=1.77 fps Inflow=1.49 cfs 0.137 af
n=0.035 L=81.0' S=0.0370 '/' Capacity=19.60 cfs Outflow=1.49 cfs 0.137 af

Reach 20cR: Wetland Crossing #1 Flow Avg. Flow Depth=0.10' Max Vel=3.26 fps Inflow=1.49 cfs 0.137 af
n=0.035 L=78.0' S=0.2179 '/' Capacity=47.55 cfs Outflow=1.48 cfs 0.137 af

Reach 20dR: Wetland Crossing #1 Flow Avg. Flow Depth=0.14' Max Vel=1.98 fps Inflow=1.48 cfs 0.137 af
n=0.035 L=222.5' S=0.0517 '/' Capacity=23.16 cfs Outflow=1.47 cfs 0.136 af

Reach 20eR: Wetland Crossing #1 Flow Avg. Flow Depth=0.22' Max Vel=2.05 fps Inflow=1.47 cfs 0.136 af
n=0.035 L=217.0' S=0.0300 '/' Capacity=36.75 cfs Outflow=1.44 cfs 0.136 af

Reach 20fR: Wetland Crossing #1 Flow Avg. Flow Depth=0.14' Max Vel=4.06 fps Inflow=1.44 cfs 0.136 af
n=0.035 L=105.0' S=0.2143 '/' Capacity=98.29 cfs Outflow=1.44 cfs 0.136 af

Reach 71aR: Gravel Wetland #101 Avg. Flow Depth=0.08' Max Vel=2.41 fps Inflow=0.84 cfs 0.016 af
n=0.022 L=34.0' S=0.0588 '/' Capacity=39.30 cfs Outflow=0.85 cfs 0.016 af

Reach 71bR: Gravel Wetland #101 Avg. Flow Depth=0.08' Max Vel=2.89 fps Inflow=0.85 cfs 0.016 af
n=0.035 L=16.0' S=0.2500 '/' Capacity=50.93 cfs Outflow=0.85 cfs 0.016 af

Reach 72aR: SGW #102 Flow from OS Avg. Flow Depth=0.22' Max Vel=2.24 fps Inflow=3.73 cfs 0.675 af
n=0.035 L=109.0' S=0.0367 '/' Capacity=103.16 cfs Outflow=3.85 cfs 0.674 af

Reach 72bR: SGW #102 Flow from OS Avg. Flow Depth=0.17' Max Vel=3.18 fps Inflow=3.85 cfs 0.674 af
n=0.035 L=60.0' S=0.1000 '/' Capacity=170.29 cfs Outflow=3.88 cfs 0.674 af

Reach 72cR: SGW #102 Flow from OS Avg. Flow Depth=0.14' Max Vel=4.65 fps Inflow=3.88 cfs 0.674 af
n=0.035 L=20.0' S=0.3000 '/' Capacity=294.94 cfs Outflow=3.88 cfs 0.674 af

Reach 72dR: SGW #102 Flow from OS Avg. Flow Depth=0.20' Max Vel=2.37 fps Inflow=3.37 cfs 0.410 af
n=0.035 L=26.5' S=0.0472 '/' Capacity=116.95 cfs Outflow=3.43 cfs 0.410 af

Reach 72eR: SGW #102 Flow from Avg. Flow Depth=0.06' Max Vel=1.51 fps Inflow=0.44 cfs 0.006 af
n=0.035 L=201.0' S=0.0871 '/' Capacity=158.89 cfs Outflow=0.39 cfs 0.006 af

Reach 72fR: SGW #102 Flow from Avg. Flow Depth=0.10' Max Vel=2.06 fps Inflow=0.39 cfs 0.006 af
n=0.035 L=117.5' S=0.0936 '/' Capacity=64.97 cfs Outflow=0.40 cfs 0.006 af

Reach 73R: Gravel Wetland #103 Avg. Flow Depth=0.26' Max Vel=4.46 fps Inflow=4.04 cfs 0.956 af
n=0.035 L=380.0' S=0.1145 '/' Capacity=71.84 cfs Outflow=4.03 cfs 0.956 af

Reach 100R: Reach #100 Inflow=62.41 cfs 7.271 af
Outflow=62.41 cfs 7.271 af

Reach 200R: Reach #200 Inflow=64.79 cfs 7.670 af
Outflow=64.79 cfs 7.670 af

Reach 300R: Reach #300 Inflow=66.07 cfs 7.895 af
Outflow=66.07 cfs 7.895 af

Reach 400R: Reach #400 Inflow=72.20 cfs 8.645 af
Outflow=72.20 cfs 8.645 af

Reach 500R: Reach #500 Inflow=96.34 cfs 12.865 af
Outflow=96.34 cfs 12.865 af

Reach 600R: Reach #600 Inflow=114.08 cfs 15.642 af
Outflow=114.08 cfs 15.642 af

Reach 700R: Reach #700 Inflow=125.65 cfs 17.329 af
Outflow=125.65 cfs 17.329 af

Reach 800R: Reach #800 Inflow=130.97 cfs 17.978 af
Outflow=130.97 cfs 17.978 af

Reach 900R: Final Reach #900 Inflow=132.86 cfs 18.259 af
Outflow=132.86 cfs 18.259 af

Reach 1100R: Final Reach #1100 Inflow=49.51 cfs 7.082 af
Outflow=49.51 cfs 7.082 af

Reach 1200R: Final Reach #1200 Inflow=21.11 cfs 2.487 af
Outflow=21.11 cfs 2.487 af

Reach 1300R: Final Reach #1300 Inflow=3.86 cfs 0.395 af
Outflow=3.86 cfs 0.395 af

Pond 1EP: Catch Basin #7727 Peak Elev=138.11' Storage=2 cf Inflow=0.09 cfs 0.007 af
12.0" Round Culvert n=0.012 L=48.0' S=0.0050 '/' Outflow=0.09 cfs 0.007 af

Pond 2EP: Catch Basin #3698 Peak Elev=138.10' Storage=5 cf Inflow=0.37 cfs 0.027 af
12.0" Round Culvert n=0.012 L=8.3' S=0.0048 '/' Outflow=0.37 cfs 0.027 af

Pond 3EP: Catch Basin #7725 Peak Elev=139.08' Storage=8 cf Inflow=1.10 cfs 0.089 af
12.0" Round Culvert n=0.012 L=153.7' S=0.0050 '/' Outflow=1.10 cfs 0.089 af

Pond 4EP: Catch Basin #7726 Peak Elev=137.32' Storage=8 cf Inflow=1.75 cfs 0.138 af
24.0" Round Culvert n=0.012 L=61.5' S=0.0050 '/' Outflow=1.75 cfs 0.138 af

Pond 10P: 24" RCP Inlet Sump/Pond Peak Elev=101.48' Storage=649 cf Inflow=10.82 cfs 0.880 af
24.0" Round Culvert n=0.012 L=108.8' S=0.0113 '/' Outflow=10.60 cfs 0.880 af

Pond 15P: 12" RCP Inlet Sump/Pond Peak Elev=99.88' Storage=32,260 cf Inflow=27.89 cfs 3.281 af
Primary=9.51 cfs 3.280 af Secondary=0.00 cfs 0.000 af Outflow=9.51 cfs 3.280 af

Pond 20P: 30" RCP Wetland Crossing #1 Peak Elev=111.43' Storage=153 cf Inflow=1.72 cfs 0.138 af
30.0" Round Culvert w/ 6.0" inside fill n=0.024 L=52.0' S=0.0096 '/' Outflow=1.71 cfs 0.138 af

Pond 101P: SGW #101 Peak Elev=104.58' Storage=24,070 cf Inflow=12.92 cfs 1.015 af
Primary=0.06 cfs 0.077 af Secondary=3.34 cfs 0.420 af Tertiary=0.84 cfs 0.016 af Outflow=4.23 cfs 0.514 af

Pond 102P: SGW #102 Peak Elev=75.57' Storage=34,732 cf Inflow=18.73 cfs 1.588 af
Primary=3.73 cfs 0.675 af Secondary=3.37 cfs 0.410 af Tertiary=0.44 cfs 0.006 af Outflow=7.54 cfs 1.090 af

Pond 103P: SGW #103 Peak Elev=99.08' Storage=24,356 cf Inflow=14.01 cfs 1.146 af
Primary=0.13 cfs 0.152 af Secondary=2.37 cfs 0.591 af Tertiary=1.51 cfs 0.214 af Outflow=4.01 cfs 0.956 af

Pond C01P: Catch Basin #1 Peak Elev=118.03' Storage=0.000 af Inflow=0.59 cfs 0.050 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=0.59 cfs 0.050 af

Pond C02P: Catch Basin #2 Peak Elev=117.91' Storage=0.000 af Inflow=1.48 cfs 0.126 af
12.0" Round Culvert n=0.012 L=120.5' S=0.0228 '/' Outflow=1.48 cfs 0.126 af

Pond C03P: Catch Basin #3 Peak Elev=116.65' Storage=0.001 af Inflow=0.89 cfs 0.074 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=0.84 cfs 0.074 af

Pond C04P: Catch Basin #4 Peak Elev=116.62' Storage=0.001 af Inflow=3.57 cfs 0.301 af
12.0" Round Culvert n=0.012 L=95.5' S=0.0065 '/' Outflow=3.52 cfs 0.301 af

Pond C05P: Catch Basin #5 Peak Elev=115.70' Storage=0.001 af Inflow=4.17 cfs 0.352 af
12.0" Round Culvert n=0.012 L=25.5' S=0.0075 '/' Outflow=4.15 cfs 0.352 af

Pond C06P: Catch Basin #6 Peak Elev=115.35' Storage=0.000 af Inflow=0.59 cfs 0.046 af
12.0" Round Culvert n=0.012 L=4.5' S=0.0489 '/' Outflow=0.59 cfs 0.046 af

Pond C07P: Catch Basin #7 Peak Elev=106.08' Storage=0.000 af Inflow=2.02 cfs 0.154 af
12.0" Round Culvert n=0.012 L=19.9' S=0.0050 '/' Outflow=1.98 cfs 0.154 af

Pond C08P: Catch Basin #8 Peak Elev=105.87' Storage=0.001 af Inflow=8.89 cfs 0.726 af
18.0" Round Culvert n=0.012 L=55.7' S=0.0418 '/' Outflow=8.90 cfs 0.726 af

Pond C09P: Catch Basin #9 Peak Elev=103.20' Storage=0.001 af Inflow=2.29 cfs 0.185 af
12.0" Round Culvert n=0.012 L=33.2' S=0.0217 '/' Outflow=2.28 cfs 0.185 af

Pond C10P: Catch Basin #10 Peak Elev=103.09' Storage=0.001 af Inflow=3.24 cfs 0.260 af
12.0" Round Culvert n=0.012 L=50.0' S=0.0050 '/' Outflow=3.18 cfs 0.260 af

Pond C11P: Catch Basin #11 Peak Elev=110.83' Storage=0.000 af Inflow=1.89 cfs 0.152 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=1.85 cfs 0.152 af

Pond C12P: Catch Basin #12 Peak Elev=110.65' Storage=0.000 af Inflow=3.72 cfs 0.299 af
12.0" Round Culvert n=0.012 L=136.0' S=0.0422 '/' Outflow=3.73 cfs 0.299 af

Pond C13P: Catch Basin #13 Peak Elev=105.54' Storage=0.001 af Inflow=6.60 cfs 0.531 af
15.0" Round Culvert n=0.012 L=33.0' S=0.0527 '/' Outflow=6.52 cfs 0.530 af

Pond C14P: Catch Basin #14 Peak Elev=106.63' Storage=0.001 af Inflow=5.22 cfs 0.418 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0139 '/' Outflow=5.17 cfs 0.417 af

Pond C15P: Catch Basin #15 Peak Elev=104.59' Storage=0.001 af Inflow=1.16 cfs 0.096 af
12.0" Round Culvert n=0.012 L=12.0' S=0.0167 '/' Outflow=1.14 cfs 0.095 af

Pond C16P: Catch Basin #16 Peak Elev=100.27' Storage=0.000 af Inflow=3.66 cfs 0.578 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=3.66 cfs 0.578 af

Pond C17P: Catch Basin #17 Peak Elev=98.40' Storage=0.000 af Inflow=1.86 cfs 0.143 af
12.0" Round Culvert n=0.012 L=37.2' S=0.0478 '/' Outflow=1.86 cfs 0.143 af

Pond C18P: Catch Basin #18 Peak Elev=97.40' Storage=0.000 af Inflow=1.09 cfs 0.087 af
12.0" Round Culvert n=0.012 L=19.0' S=0.0100 '/' Outflow=1.05 cfs 0.087 af

Pond C19P: Catch Basin #19 Peak Elev=97.35' Storage=0.001 af Inflow=4.28 cfs 0.335 af
12.0" Round Culvert n=0.012 L=122.5' S=0.0651 '/' Outflow=4.28 cfs 0.335 af

Pond C20P: Catch Basin #20 Peak Elev=85.59' Storage=0.001 af Inflow=7.21 cfs 0.571 af
15.0" Round Culvert n=0.012 L=90.0' S=0.0486 '/' Outflow=7.22 cfs 0.571 af

Pond C21P: Catch Basin #21 Peak Elev=87.43' Storage=0.001 af Inflow=5.55 cfs 0.432 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0139 '/' Outflow=5.49 cfs 0.432 af

Pond C22P: Catch Basin #22 Peak Elev=83.41' Storage=0.001 af Inflow=8.17 cfs 0.647 af
18.0" Round Culvert n=0.012 L=34.5' S=0.0055 '/' Outflow=8.07 cfs 0.647 af

Pond C23P: Catch Basin #23 Peak Elev=82.81' Storage=0.001 af Inflow=12.56 cfs 1.002 af
18.0" Round Culvert n=0.012 L=6.5' S=0.0092 '/' Outflow=12.51 cfs 1.002 af

Pond C24P: Catch Basin #24 Peak Elev=79.25' Storage=0.000 af Inflow=1.85 cfs 0.158 af
12.0" Round Culvert n=0.012 L=49.2' S=0.0437 '/' Outflow=1.85 cfs 0.158 af

Pond C25P: Catch Basin #25 Peak Elev=75.66' Storage=0.001 af Inflow=3.23 cfs 0.310 af
15.0" Round Culvert n=0.012 L=60.0' S=0.0083 '/' Outflow=3.20 cfs 0.309 af

Pond D01P: Drain Manhole #1 Peak Elev=114.61' Storage=0.000 af Inflow=4.74 cfs 0.399 af
15.0" Round Culvert n=0.012 L=148.5' S=0.0055 '/' Outflow=4.74 cfs 0.398 af

Pond D02P: Drain Manhole #2 Peak Elev=113.60' Storage=0.000 af Inflow=4.74 cfs 0.398 af
15.0" Round Culvert n=0.012 L=118.0' S=0.0682 '/' Outflow=4.74 cfs 0.398 af

Pond D03P: Drain Manhole #3 Peak Elev=102.72' Storage=0.001 af Inflow=12.07 cfs 0.986 af
18.0" Round Culvert n=0.012 L=33.5' S=0.0075 '/' Outflow=12.01 cfs 0.986 af

Pond D04P: Drain Manhole #4 Peak Elev=94.34' Storage=0.000 af Inflow=4.01 cfs 0.956 af
15.0" Round Culvert n=0.012 L=58.5' S=0.0282 '/' Outflow=4.02 cfs 0.956 af

Pond D05P: Drain Manhole #5 Peak Elev=92.59' Storage=0.000 af Inflow=4.02 cfs 0.956 af
15.0" Round Culvert n=0.012 L=56.7' S=0.0265 '/' Outflow=4.04 cfs 0.956 af

Pond D06P: Drain Manhole #6 Peak Elev=104.70' Storage=0.001 af Inflow=6.52 cfs 0.530 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0180 '/' Outflow=6.51 cfs 0.530 af

Pond D07P: Drain Manhole #7 Peak Elev=101.16' Storage=0.001 af Inflow=3.39 cfs 0.497 af
12.0" Round Culvert n=0.012 L=60.0' S=0.0050 '/' Outflow=3.35 cfs 0.497 af

Pond D08P: Drain Manhole #8 Peak Elev=89.28' Storage=0.001 af Inflow=4.28 cfs 0.335 af
12.0" Round Culvert n=0.012 L=56.0' S=0.0613 '/' Outflow=4.28 cfs 0.335 af

Pond D09P: Drain Manhole #9 Peak Elev=77.57' Storage=0.001 af Inflow=12.23 cfs 1.001 af
18.0" Round Culvert n=0.012 L=50.0' S=0.0700 '/' Outflow=12.23 cfs 1.001 af

Pond D10P: Drain Manhole #10 Peak Elev=75.73' Storage=0.001 af Inflow=1.85 cfs 0.158 af
12.0" Round Culvert n=0.012 L=134.0' S=0.0056 '/' Outflow=1.82 cfs 0.158 af

Pond W01P: Water Quality Inlet #1 Peak Elev=101.19' Storage=0.010 af Inflow=12.01 cfs 0.986 af
18.0" Round Culvert n=0.012 L=75.0' S=0.0600 '/' Outflow=11.85 cfs 0.985 af

Pond W02P: Water Quality Inlet #2 Peak Elev=81.06' Storage=0.011 af Inflow=12.51 cfs 1.002 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=12.23 cfs 1.001 af

Total Runoff Area = 56.648 ac Runoff Volume = 29.430 af Average Runoff Depth = 6.23"
92.42% Pervious = 52.355 ac 7.58% Impervious = 4.293 ac

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.567	61	>75% Grass cover, Good, HSG B (1S, 5S, 6S, 10S, 11S, 15S, 16S, 17S, 18S, 19S, 20S, 24S, 25S, 26S, 27S, 28S, 32S)
7.480	74	>75% Grass cover, Good, HSG C (1S, 5S, 6S, 7S, 10S, 11S, 12S, 15S, 16S, 17S, 18S, 19S, 20S, 27S, 28S, 29S, 30S, 31S, 32S, 33S, 34S, 35S, 36S, 37S, 38S, 39S, 40S, 41S, 42S, 43S, 44S, 45S, 71S, 72S, 73S)
0.463	80	>75% Grass cover, Good, HSG D (5S, 6S, 15S, 20S, 23S, 24S, 25S, 26S, 27S, 28S, 31S, 32S)
0.258	96	Gravel surface, HSG C (11S, 15S, 30S, 42S)
0.327	98	Paved parking, HSG B (16S, 17S, 18S, 19S, 21S, 22S, 23S, 24S, 25S, 26S, 27S, 28S, 31S, 32S)
1.404	98	Paved parking, HSG C (16S, 17S, 18S, 19S, 21S, 22S, 23S, 24S, 27S, 28S, 29S, 30S, 31S, 32S, 33S, 34S, 35S, 36S, 37S, 38S, 39S, 40S, 41S, 42S, 43S, 44S, 71S, 72S, 73S)
0.283	98	Paved parking, HSG D (23S, 24S, 25S, 26S, 27S, 28S, 31S, 32S)
0.034	98	Roofs, HSG B (25S, 27S, 28S, 31S, 32S)
0.665	98	Roofs, HSG C (28S, 29S, 31S, 32S, 33S, 34S, 35S, 36S, 38S, 39S, 40S, 41S, 43S, 71S, 72S, 73S)
0.079	98	Roofs, HSG D (25S, 27S, 28S, 31S, 32S)
0.107	98	Unconnected pavement, HSG B (1S, 5S, 6S, 10S, 11S, 15S)
0.349	98	Unconnected pavement, HSG C (1S, 6S, 10S, 11S, 15S)
0.003	98	Unconnected pavement, HSG D (5S, 6S, 15S)
0.159	98	Unconnected roofs, HSG B (1S, 5S, 6S, 10S, 11S, 15S)
0.800	98	Unconnected roofs, HSG C (1S, 6S, 10S, 11S, 12S, 15S, 37S, 44S, 45S)
0.081	98	Unconnected roofs, HSG D (5S, 6S, 15S)
0.579	30	Woods, Good, HSG A (7S, 8S, 9S)
3.706	55	Woods, Good, HSG B (1S, 5S, 10S, 11S, 15S, 20S)
31.267	70	Woods, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 15S, 20S, 41S, 45S)
7.036	77	Woods, Good, HSG D (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 13S, 15S, 20S)
56.648	**72**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.579	HSG A	7S, 8S, 9S
5.900	HSG B	1S, 5S, 6S, 10S, 11S, 15S, 16S, 17S, 18S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 26S, 27S, 28S, 31S, 32S
42.224	HSG C	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 15S, 16S, 17S, 18S, 19S, 20S, 21S, 22S, 23S, 24S, 27S, 28S, 29S, 30S, 31S, 32S, 33S, 34S, 35S, 36S, 37S, 38S, 39S, 40S, 41S, 42S, 43S, 44S, 45S, 71S, 72S, 73S
7.945	HSG D	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 13S, 15S, 20S, 23S, 24S, 25S, 26S, 27S, 28S, 31S, 32S
0.000	Other	
56.648		**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	1.567	7.480	0.463	0.000	9.510	>75% Grass cover, Good	1S, 5S, 6S, 7S, 10S, 11S, 12S, 15S, 16S, 17S, 18S, 19S, 20S, 23S, 24S, 25S, 26S, 27S, 28S, 29S, 30S, 31S, 32S, 33S, 34S, 35S, 36S, 37S, 38S, 39S, 40S, 41S, 42S, 43S, 44S, 45S, 71S, 72S, 73S
0.000	0.000	0.258	0.000	0.000	0.258	Gravel surface	11S, 15S, 30S, 42S
0.000	0.327	1.404	0.283	0.000	2.015	Paved parking	16S, 17S, 18S, 19S, 21S, 22S, 23S,

Ground Covers (all nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.034	0.665	0.079	0.000	0.779	Roofs	25S, 27S, 28S, 29S, 31S, 32S, 33S, 34S, 35S, 36S, 38S, 39S, 40S, 41S, 43S, 71S, 72S, 73S
0.000	0.107	0.349	0.003	0.000	0.459	Unconnected pavement	1S, 5S, 6S, 10S, 11S, 15S
0.000	0.159	0.800	0.081	0.000	1.041	Unconnected roofs	1S, 5S, 6S, 10S, 11S, 12S, 15S, 37S, 44S, 45S
0.579	3.706	31.267	7.036	0.000	42.588	Woods, Good	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 15S, 20S, 41S, 45S
0.579	**5.900**	**42.224**	**7.945**	**0.000**	**56.648**	**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	1EP	137.94	137.70	48.0	0.0050	0.012	12.0	0.0	0.0
2	2EP	137.74	137.70	8.3	0.0048	0.012	12.0	0.0	0.0
3	3EP	138.47	137.70	153.7	0.0050	0.012	12.0	0.0	0.0
4	4EP	136.70	136.39	61.5	0.0050	0.012	24.0	0.0	0.0
5	10P	99.97	98.74	108.8	0.0113	0.012	24.0	0.0	0.0
6	15P	92.91	90.32	84.3	0.0307	0.012	12.0	0.0	0.0
7	20P	110.50	110.00	52.0	0.0096	0.024	30.0	0.0	6.0
8	101P	99.42	99.25	11.0	0.0155	0.012	6.0	0.0	0.0
9	101P	99.42	99.25	17.0	0.0100	0.012	12.0	0.0	0.0
10	102P	69.67	65.00	85.0	0.0549	0.012	6.0	0.0	0.0
11	102P	69.67	69.00	107.0	0.0063	0.012	6.0	0.0	0.0
12	102P	67.50	65.00	35.0	0.0714	0.012	15.0	0.0	0.0
13	102P	69.67	69.00	67.0	0.0100	0.012	15.0	0.0	0.0
14	103P	93.67	93.35	45.3	0.0071	0.012	6.0	0.0	0.0
15	103P	93.67	93.35	25.5	0.0125	0.012	15.0	0.0	0.0
16	103P	93.67	93.35	5.0	0.0640	0.012	15.0	0.0	0.0
17	C01P	117.51	117.36	18.0	0.0083	0.012	12.0	0.0	0.0
18	C02P	117.26	114.51	120.5	0.0228	0.012	12.0	0.0	0.0
19	C03P	114.66	114.51	18.0	0.0083	0.012	12.0	0.0	0.0
20	C04P	114.41	113.79	95.5	0.0065	0.012	12.0	0.0	0.0
21	C05P	113.69	113.50	25.5	0.0075	0.012	12.0	0.0	0.0
22	C06P	114.97	114.75	4.5	0.0489	0.012	12.0	0.0	0.0
23	C07P	104.63	104.53	19.9	0.0050	0.012	12.0	0.0	0.0
24	C08P	104.03	101.70	55.7	0.0418	0.012	18.0	0.0	0.0
25	C09P	101.07	100.35	33.2	0.0217	0.012	12.0	0.0	0.0
26	C10P	100.25	100.00	50.0	0.0050	0.012	12.0	0.0	0.0
27	C11P	109.43	109.28	18.0	0.0083	0.012	12.0	0.0	0.0
28	C12P	109.18	103.44	136.0	0.0422	0.012	12.0	0.0	0.0
29	C13P	102.84	101.10	33.0	0.0527	0.012	15.0	0.0	0.0
30	C14P	103.34	103.09	18.0	0.0139	0.012	12.0	0.0	0.0
31	C15P	100.20	100.00	12.0	0.0167	0.012	12.0	0.0	0.0
32	C16P	98.75	98.60	18.0	0.0083	0.012	12.0	0.0	0.0
33	C17P	97.65	95.87	37.2	0.0478	0.012	12.0	0.0	0.0
34	C18P	96.06	95.87	19.0	0.0100	0.012	12.0	0.0	0.0
35	C19P	95.57	87.60	122.5	0.0651	0.012	12.0	0.0	0.0
36	C20P	83.47	79.10	90.0	0.0486	0.012	15.0	0.0	0.0
37	C21P	83.97	83.72	18.0	0.0139	0.012	12.0	0.0	0.0
38	C22P	79.00	78.81	34.5	0.0055	0.012	18.0	0.0	0.0
39	C23P	78.56	78.50	6.5	0.0092	0.012	18.0	0.0	0.0
40	C24P	78.50	76.35	49.2	0.0437	0.012	12.0	0.0	0.0
41	C25P	71.00	70.50	60.0	0.0083	0.012	15.0	0.0	0.0
42	D01P	113.25	112.43	148.5	0.0055	0.012	15.0	0.0	0.0

Pipe Listing (all nodes) (continued)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
43	D02P	112.33	104.28	118.0	0.0682	0.012	15.0	0.0	0.0
44	D03P	99.00	98.75	33.5	0.0075	0.012	18.0	0.0	0.0
45	D04P	93.25	91.60	58.5	0.0282	0.012	15.0	0.0	0.0
46	D05P	91.50	90.00	56.7	0.0265	0.012	15.0	0.0	0.0
47	D06P	101.61	101.25	20.0	0.0180	0.012	15.0	0.0	0.0
48	D07P	99.15	98.85	60.0	0.0050	0.012	12.0	0.0	0.0
49	D08P	87.50	84.07	56.0	0.0613	0.012	12.0	0.0	0.0
50	D09P	74.75	71.25	50.0	0.0700	0.012	18.0	0.0	0.0
51	D10P	72.00	71.25	134.0	0.0056	0.012	12.0	0.0	0.0
52	W01P	98.50	94.00	75.0	0.0600	0.012	18.0	0.0	0.0
53	W02P	78.25	78.20	5.0	0.0100	0.012	18.0	0.0	0.0

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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

Subcatchment1S: Subcatchment#1 Runoff Area=618,885 sf 0.95% Impervious Runoff Depth>3.49"
Flow Length=2,050' Tc=25.3 min CN=70 Runoff=35.54 cfs 4.135 af

Subcatchment2S: Subcatchment#2 Runoff Area=33,802 sf 0.00% Impervious Runoff Depth>3.61"
Flow Length=215' Tc=8.3 min CN=71 Runoff=2.99 cfs 0.233 af

Subcatchment3S: Subcatchment#3 Runoff Area=19,435 sf 0.00% Impervious Runoff Depth>3.51"
Flow Length=240' Tc=7.0 min CN=70 Runoff=1.75 cfs 0.130 af

Subcatchment4S: Subcatchment#4 Runoff Area=64,929 sf 0.00% Impervious Runoff Depth>3.50"
Flow Length=293' Tc=14.1 min CN=70 Runoff=4.71 cfs 0.435 af

Subcatchment5S: Subcatchment#5 Runoff Area=355,305 sf 1.21% Impervious Runoff Depth>3.48"
Flow Length=991' Tc=40.0 min UI Adjusted CN=70 Runoff=16.47 cfs 2.366 af

Subcatchment6S: Subcatchment#6 Runoff Area=148,453 sf 5.90% Impervious Runoff Depth>3.80"
Flow Length=927' Tc=27.5 min UI Adjusted CN=73 Runoff=8.97 cfs 1.080 af

Subcatchment7S: Subcatchment#7 Runoff Area=87,203 sf 0.00% Impervious Runoff Depth>3.50"
Flow Length=210' Tc=17.4 min CN=70 Runoff=5.84 cfs 0.584 af

Subcatchment8S: Subcatchment#8 Runoff Area=69,837 sf 0.00% Impervious Runoff Depth>2.60"
Flow Length=381' Tc=18.1 min CN=61 Runoff=3.33 cfs 0.347 af

Subcatchment9S: Subcatchment#9 Runoff Area=30,235 sf 0.00% Impervious Runoff Depth>2.60"
Flow Length=273' Tc=13.9 min CN=61 Runoff=1.59 cfs 0.150 af

Subcatchment10S: Subcatchment#10 Runoff Area=74,498 sf 10.49% Impervious Runoff Depth>3.61"
Flow Length=280' Tc=9.4 min UI Adjusted CN=71 Runoff=6.35 cfs 0.514 af

Subcatchment11S: Subcatchment#11 Runoff Area=247,933 sf 3.57% Impervious Runoff Depth>3.61"
Flow Length=368' Tc=13.6 min CN=71 Runoff=18.77 cfs 1.710 af

Subcatchment12S: Subcatchment#12 Runoff Area=172,549 sf 5.34% Impervious Runoff Depth>3.71"
Flow Length=462' Tc=17.7 min UI Adjusted CN=72 Runoff=12.18 cfs 1.223 af

Subcatchment13S: Subcatchment#13 Runoff Area=33,510 sf 0.00% Impervious Runoff Depth>3.60"
Flow Length=329' Tc=18.6 min CN=71 Runoff=2.26 cfs 0.231 af

Subcatchment15S: Subcatchment#15 Runoff Area=238,038 sf 5.11% Impervious Runoff Depth>3.39"
Flow Length=553' Tc=23.7 min UI Adjusted CN=69 Runoff=13.60 cfs 1.544 af

Subcatchment16S: Catch Basin #7727 Runoff Area=459 sf 45.75% Impervious Runoff Depth>4.68"
Tc=6.0 min CN=81 Runoff=0.06 cfs 0.004 af

Subcatchment17S: Catch Basin #3698 Runoff Area=2,300 sf 9.70% Impervious Runoff Depth>3.51"
Tc=6.0 min CN=70 Runoff=0.21 cfs 0.015 af

Subcatchment 18S: Catch Basin #7725 Runoff Area=5,195 sf 84.79% Impervious Runoff Depth>6.04"
Tc=6.0 min CN=93 Runoff=0.76 cfs 0.060 af

Subcatchment 19S: Catch Basin #7726 Runoff Area=880 sf 88.86% Impervious Runoff Depth>6.27"
Tc=6.0 min CN=95 Runoff=0.13 cfs 0.011 af

Subcatchment 20S: 30" RCP Wet Crossing Runoff Area=14,031 sf 0.00% Impervious Runoff Depth>2.80"
Flow Length=138' Tc=8.8 min CN=63 Runoff=0.92 cfs 0.075 af

Subcatchment 21S: Catch Basin #1 Runoff Area=2,746 sf 100.00% Impervious Runoff Depth>6.63"
Tc=6.0 min CN=98 Runoff=0.41 cfs 0.035 af

Subcatchment 22S: Catch Basin #2 Runoff Area=4,125 sf 100.00% Impervious Runoff Depth>6.63"
Tc=6.0 min CN=98 Runoff=0.62 cfs 0.052 af

Subcatchment 23S: Catch Basin #3 Runoff Area=4,117 sf 96.04% Impervious Runoff Depth>6.51"
Tc=6.0 min CN=97 Runoff=0.62 cfs 0.051 af

Subcatchment 24S: Catch Basin #4 Runoff Area=5,883 sf 77.78% Impervious Runoff Depth>6.04"
Tc=6.0 min CN=93 Runoff=0.86 cfs 0.068 af

Subcatchment 25S: Catch Basin #5 Runoff Area=3,045 sf 75.40% Impervious Runoff Depth>5.92"
Tc=6.0 min CN=92 Runoff=0.44 cfs 0.035 af

Subcatchment 26S: Catch Basin #6 Runoff Area=2,819 sf 66.69% Impervious Runoff Depth>5.69"
Tc=6.0 min CN=90 Runoff=0.40 cfs 0.031 af

Subcatchment 27S: Catch Basin #7 Runoff Area=10,139 sf 53.49% Impervious Runoff Depth>5.12"
Tc=6.0 min CN=85 Runoff=1.33 cfs 0.099 af

Subcatchment 28S: Catch Basin #8 Runoff Area=10,376 sf 71.82% Impervious Runoff Depth>5.81"
Tc=6.0 min CN=91 Runoff=1.49 cfs 0.115 af

Subcatchment 29S: Catch Basin #9 Runoff Area=10,795 sf 77.32% Impervious Runoff Depth>6.04"
Tc=6.0 min CN=93 Runoff=1.58 cfs 0.125 af

Subcatchment 30S: Catch Basin #10 Runoff Area=4,592 sf 58.78% Impervious Runoff Depth>5.69"
Tc=6.0 min CN=90 Runoff=0.65 cfs 0.050 af

Subcatchment 31S: Catch Basin #11 Runoff Area=8,885 sf 77.12% Impervious Runoff Depth>6.04"
Tc=6.0 min CN=93 Runoff=1.30 cfs 0.103 af

Subcatchment 32S: Catch Basin #12 Runoff Area=9,067 sf 63.57% Impervious Runoff Depth>5.58"
Tc=6.0 min CN=89 Runoff=1.27 cfs 0.097 af

Subcatchment 33S: Catch Basin #13 Runoff Area=6,803 sf 72.53% Impervious Runoff Depth>5.81"
Tc=6.0 min CN=91 Runoff=0.97 cfs 0.076 af

Subcatchment 34S: Catch Basin #14 Runoff Area=7,027 sf 75.00% Impervious Runoff Depth>5.92"
Tc=6.0 min CN=92 Runoff=1.02 cfs 0.080 af

Subcatchment 35S: Catch Basin #15 Runoff Area=5,408 sf 92.07% Impervious Runoff Depth>6.39"
Tc=6.0 min CN=96 Runoff=0.81 cfs 0.066 af

Subcatchment 36S: Catch Basin #16 Runoff Area=4,733 sf 81.07% Impervious Runoff Depth>6.04"
Tc=6.0 min CN=93 Runoff=0.69 cfs 0.055 af

Subcatchment 37S: Catch Basin #17 Runoff Area=10,736 sf 26.53% Impervious Runoff Depth>4.24"
Flow Length=139' Tc=7.4 min UI Adjusted CN=77 Runoff=1.15 cfs 0.087 af

Subcatchment 38S: Catch Basin #18 Runoff Area=5,166 sf 74.68% Impervious Runoff Depth>5.92"
Tc=6.0 min CN=92 Runoff=0.75 cfs 0.059 af

Subcatchment 39S: Catch Basin #19 Runoff Area=7,033 sf 41.63% Impervious Runoff Depth>5.01"
Tc=6.0 min CN=84 Runoff=0.91 cfs 0.067 af

Subcatchment 40S: Catch Basin #20 Runoff Area=8,226 sf 73.85% Impervious Runoff Depth>5.92"
Tc=6.0 min CN=92 Runoff=1.19 cfs 0.093 af

Subcatchment 41S: Catch Basin #21 Runoff Area=6,361 sf 48.18% Impervious Runoff Depth>5.12"
Tc=6.0 min CN=85 Runoff=0.84 cfs 0.062 af

Subcatchment 42S: Catch Basin #22 Runoff Area=4,592 sf 58.78% Impervious Runoff Depth>5.69"
Tc=6.0 min CN=90 Runoff=0.65 cfs 0.050 af

Subcatchment 43S: Catch Basin #23 Runoff Area=21,628 sf 64.81% Impervious Runoff Depth>5.69"
Tc=6.0 min CN=90 Runoff=3.06 cfs 0.236 af

Subcatchment 44S: Catch Basin #24 Runoff Area=11,921 sf 24.23% Impervious Runoff Depth>4.24"
Flow Length=213' Tc=10.9 min UI Adjusted CN=77 Runoff=1.15 cfs 0.097 af

Subcatchment 45S: Catch Basin #25 Runoff Area=11,430 sf 24.30% Impervious Runoff Depth>4.24"
Flow Length=112' Slope=0.0050 '/' Tc=16.5 min UI Adjusted CN=77 Runoff=0.95 cfs 0.093 af

Subcatchment 71S: Gravel Wetland #101 Runoff Area=28,837 sf 17.32% Impervious Runoff Depth>4.35"
Tc=6.0 min CN=78 Runoff=3.30 cfs 0.240 af

Subcatchment 72S: Gravel Wetland #102 Runoff Area=21,302 sf 9.37% Impervious Runoff Depth>4.14"
Tc=6.0 min CN=76 Runoff=2.32 cfs 0.169 af

Subcatchment 73S: Gravel Wetland #103 Runoff Area=12,324 sf 9.02% Impervious Runoff Depth>4.14"
Tc=6.0 min CN=76 Runoff=1.34 cfs 0.098 af

Reach 1aR: Flow from Culvert to Stream Avg. Flow Depth=0.12' Max Vel=1.73 fps Inflow=1.16 cfs 0.090 af
n=0.035 L=655.5' S=0.0506 '/' Capacity=22.92 cfs Outflow=0.96 cfs 0.090 af

Reach 1bR: Start of Stream Avg. Flow Depth=0.13' Max Vel=1.91 fps Inflow=0.96 cfs 0.090 af
n=0.035 L=1,438.0' S=0.0351 '/' Capacity=6.96 cfs Outflow=0.74 cfs 0.089 af

Reach 10R: Reach #10 Avg. Flow Depth=0.30' Max Vel=2.63 fps Inflow=6.30 cfs 0.514 af
n=0.035 L=453.0' S=0.0336 '/' Capacity=18.68 cfs Outflow=6.01 cfs 0.513 af

Reach 15R: Reach #15 Avg. Flow Depth=0.33' Max Vel=2.88 fps Inflow=7.82 cfs 1.782 af
n=0.035 L=198.0' S=0.0344 '/' Capacity=18.90 cfs Outflow=7.82 cfs 1.780 af

Reach 20aR: Wetland Crossing #1 Flow Avg. Flow Depth=0.14' Max Vel=0.63 fps Inflow=0.91 cfs 0.075 af
n=0.035 L=274.0' S=0.0055 '/' Capacity=12.58 cfs Outflow=0.75 cfs 0.074 af

Reach 20bR: Wetland Crossing #1 Flow Avg. Flow Depth=0.11' Max Vel=1.44 fps Inflow=0.75 cfs 0.074 af
n=0.035 L=81.0' S=0.0370 '/' Capacity=19.60 cfs Outflow=0.75 cfs 0.074 af

Reach 20cR: Wetland Crossing #1 Flow Avg. Flow Depth=0.07' Max Vel=2.66 fps Inflow=0.75 cfs 0.074 af
n=0.035 L=78.0' S=0.2179 '/' Capacity=47.55 cfs Outflow=0.76 cfs 0.074 af

Reach 20dR: Wetland Crossing #1 Flow Avg. Flow Depth=0.10' Max Vel=1.61 fps Inflow=0.76 cfs 0.074 af
n=0.035 L=222.5' S=0.0517 '/' Capacity=23.16 cfs Outflow=0.74 cfs 0.074 af

Reach 20eR: Wetland Crossing #1 Flow Avg. Flow Depth=0.16' Max Vel=1.67 fps Inflow=0.74 cfs 0.074 af
n=0.035 L=217.0' S=0.0300 '/' Capacity=36.75 cfs Outflow=0.73 cfs 0.074 af

Reach 20fR: Wetland Crossing #1 Flow Avg. Flow Depth=0.10' Max Vel=3.30 fps Inflow=0.73 cfs 0.074 af
n=0.035 L=105.0' S=0.2143 '/' Capacity=98.29 cfs Outflow=0.74 cfs 0.074 af

Reach 71aR: Gravel Wetland #101 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=34.0' S=0.0588 '/' Capacity=39.30 cfs Outflow=0.00 cfs 0.000 af

Reach 71bR: Gravel Wetland #101 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=16.0' S=0.2500 '/' Capacity=50.93 cfs Outflow=0.00 cfs 0.000 af

Reach 72aR: SGW #102 Flow from OS Avg. Flow Depth=0.09' Max Vel=1.27 fps Inflow=0.60 cfs 0.371 af
n=0.035 L=109.0' S=0.0367 '/' Capacity=103.16 cfs Outflow=0.60 cfs 0.370 af

Reach 72bR: SGW #102 Flow from OS Avg. Flow Depth=0.07' Max Vel=1.80 fps Inflow=0.60 cfs 0.370 af
n=0.035 L=60.0' S=0.1000 '/' Capacity=170.29 cfs Outflow=0.60 cfs 0.370 af

Reach 72cR: SGW #102 Flow from OS Avg. Flow Depth=0.06' Max Vel=2.64 fps Inflow=0.60 cfs 0.370 af
n=0.035 L=20.0' S=0.3000 '/' Capacity=294.94 cfs Outflow=0.60 cfs 0.370 af

Reach 72dR: SGW #102 Flow from OS Avg. Flow Depth=0.07' Max Vel=1.16 fps Inflow=0.34 cfs 0.169 af
n=0.035 L=26.5' S=0.0472 '/' Capacity=116.95 cfs Outflow=0.34 cfs 0.168 af

Reach 72eR: SGW #102 Flow from Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=201.0' S=0.0871 '/' Capacity=158.89 cfs Outflow=0.00 cfs 0.000 af

Reach 72fR: SGW #102 Flow from Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=117.5' S=0.0936 '/' Capacity=64.97 cfs Outflow=0.00 cfs 0.000 af

Reach 73R: Gravel Wetland #103 Avg. Flow Depth=0.18' Max Vel=3.45 fps Inflow=1.72 cfs 0.575 af
n=0.035 L=380.0' S=0.1145 '/' Capacity=71.84 cfs Outflow=1.72 cfs 0.574 af

Reach 100R: Reach #100 Inflow=36.22 cfs 4.224 af
Outflow=36.22 cfs 4.224 af

Reach 200R: Reach #200 Inflow=37.64 cfs 4.457 af
Outflow=37.64 cfs 4.457 af

Reach 300R: Reach #300 Inflow=38.40 cfs 4.587 af
Outflow=38.40 cfs 4.587 af

Reach 400R: Reach #400 Inflow=41.91 cfs 5.022 af
Outflow=41.91 cfs 5.022 af

Reach 500R: Reach #500 Inflow=55.77 cfs 7.462 af
Outflow=55.77 cfs 7.462 af

Reach 600R: Reach #600 Inflow=66.39 cfs 9.116 af
Outflow=66.39 cfs 9.116 af

Reach 700R: Reach #700 Inflow=71.44 cfs 10.070 af
Outflow=71.44 cfs 10.070 af

Reach 800R: Reach #800 Inflow=74.38 cfs 10.417 af
Outflow=74.38 cfs 10.417 af

Reach 900R: Final Reach #900 Inflow=75.55 cfs 10.567 af
Outflow=75.55 cfs 10.567 af

Reach 1100R: Final Reach #1100 Inflow=30.75 cfs 4.003 af
Outflow=30.75 cfs 4.003 af

Reach 1200R: Final Reach #1200 Inflow=12.24 cfs 1.392 af
Outflow=12.24 cfs 1.392 af

Reach 1300R: Final Reach #1300 Inflow=2.26 cfs 0.231 af
Outflow=2.26 cfs 0.231 af

Pond 1EP: Catch Basin #7727 Peak Elev=138.07' Storage=2 cf Inflow=0.06 cfs 0.004 af
12.0" Round Culvert n=0.012 L=48.0' S=0.0050 '/' Outflow=0.06 cfs 0.004 af

Pond 2EP: Catch Basin #3698 Peak Elev=138.01' Storage=3 cf Inflow=0.21 cfs 0.015 af
12.0" Round Culvert n=0.012 L=8.3' S=0.0048 '/' Outflow=0.21 cfs 0.015 af

Pond 3EP: Catch Basin #7725 Peak Elev=138.96' Storage=6 cf Inflow=0.76 cfs 0.060 af
12.0" Round Culvert n=0.012 L=153.7' S=0.0050 '/' Outflow=0.76 cfs 0.060 af

Pond 4EP: Catch Basin #7726 Peak Elev=137.20' Storage=6 cf Inflow=1.16 cfs 0.090 af
24.0" Round Culvert n=0.012 L=61.5' S=0.0050 '/' Outflow=1.16 cfs 0.090 af

Pond 10P: 24" RCP Inlet Sump/Pond Peak Elev=101.07' Storage=328 cf Inflow=6.35 cfs 0.514 af
24.0" Round Culvert n=0.012 L=108.8' S=0.0113 '/' Outflow=6.30 cfs 0.514 af

Pond 15P: 12" RCP Inlet Sump/Pond Peak Elev=97.69' Storage=9,643 cf Inflow=13.91 cfs 1.782 af
Primary=7.82 cfs 1.782 af Secondary=0.00 cfs 0.000 af Outflow=7.82 cfs 1.782 af

Pond 20P: 30" RCP Wetland Crossing #1 Peak Elev=111.29' Storage=99 cf Inflow=0.92 cfs 0.075 af
30.0" Round Culvert w/ 6.0" inside fill n=0.024 L=52.0' S=0.0096 '/' Outflow=0.91 cfs 0.075 af

Pond 101P: SGW #101 Peak Elev=104.34' Storage=22,067 cf Inflow=8.61 cfs 0.658 af
Primary=0.06 cfs 0.073 af Secondary=0.14 cfs 0.111 af Tertiary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.184 af

Pond 102P: SGW #102 Peak Elev=74.61' Storage=26,286 cf Inflow=12.30 cfs 1.010 af
Primary=0.60 cfs 0.371 af Secondary=0.34 cfs 0.169 af Tertiary=0.00 cfs 0.000 af Outflow=0.93 cfs 0.540 af

Pond 103P: SGW #103 Peak Elev=97.92' Storage=16,672 cf Inflow=9.62 cfs 0.758 af
Primary=0.12 cfs 0.136 af Secondary=1.13 cfs 0.338 af Tertiary=0.47 cfs 0.101 af Outflow=1.72 cfs 0.575 af

Pond C01P: Catch Basin #1 Peak Elev=117.91' Storage=0.000 af Inflow=0.41 cfs 0.035 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=0.41 cfs 0.035 af

Pond C02P: Catch Basin #2 Peak Elev=117.79' Storage=0.000 af Inflow=1.04 cfs 0.087 af
12.0" Round Culvert n=0.012 L=120.5' S=0.0228 '/' Outflow=1.04 cfs 0.087 af

Pond C03P: Catch Basin #3 Peak Elev=115.52' Storage=0.000 af Inflow=0.62 cfs 0.051 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=0.61 cfs 0.051 af

Pond C04P: Catch Basin #4 Peak Elev=115.50' Storage=0.000 af Inflow=2.50 cfs 0.206 af
12.0" Round Culvert n=0.012 L=95.5' S=0.0065 '/' Outflow=2.50 cfs 0.206 af

Pond C05P: Catch Basin #5 Peak Elev=114.89' Storage=0.000 af Inflow=2.94 cfs 0.241 af
12.0" Round Culvert n=0.012 L=25.5' S=0.0075 '/' Outflow=2.94 cfs 0.241 af

Pond C06P: Catch Basin #6 Peak Elev=115.28' Storage=0.000 af Inflow=0.40 cfs 0.031 af
12.0" Round Culvert n=0.012 L=4.5' S=0.0489 '/' Outflow=0.40 cfs 0.031 af

Pond C07P: Catch Basin #7 Peak Elev=105.46' Storage=0.000 af Inflow=1.33 cfs 0.099 af
12.0" Round Culvert n=0.012 L=19.9' S=0.0050 '/' Outflow=1.32 cfs 0.099 af

Pond C08P: Catch Basin #8 Peak Elev=105.30' Storage=0.000 af Inflow=6.15 cfs 0.486 af
18.0" Round Culvert n=0.012 L=55.7' S=0.0418 '/' Outflow=6.15 cfs 0.486 af

Pond C09P: Catch Basin #9 Peak Elev=101.75' Storage=0.000 af Inflow=1.58 cfs 0.125 af
12.0" Round Culvert n=0.012 L=33.2' S=0.0217 '/' Outflow=1.58 cfs 0.125 af

Pond C10P: Catch Basin #10 Peak Elev=101.24' Storage=0.000 af Inflow=2.23 cfs 0.175 af
12.0" Round Culvert n=0.012 L=50.0' S=0.0050 '/' Outflow=2.23 cfs 0.175 af

Pond C11P: Catch Basin #11 Peak Elev=110.27' Storage=0.000 af Inflow=1.30 cfs 0.103 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=1.29 cfs 0.103 af

Pond C12P: Catch Basin #12 Peak Elev=110.13' Storage=0.000 af Inflow=2.56 cfs 0.199 af
12.0" Round Culvert n=0.012 L=136.0' S=0.0422 '/' Outflow=2.56 cfs 0.199 af

Pond C13P: Catch Basin #13 Peak Elev=104.34' Storage=0.000 af Inflow=4.54 cfs 0.354 af
15.0" Round Culvert n=0.012 L=33.0' S=0.0527 '/' Outflow=4.54 cfs 0.354 af

Pond C14P: Catch Basin #14 Peak Elev=104.83' Storage=0.000 af Inflow=3.58 cfs 0.279 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0139 '/' Outflow=3.56 cfs 0.279 af

Pond C15P: Catch Basin #15 Peak Elev=104.34' Storage=0.001 af Inflow=0.81 cfs 0.066 af
12.0" Round Culvert n=0.012 L=12.0' S=0.0167 '/' Outflow=0.79 cfs 0.065 af

Pond C16P: Catch Basin #16 Peak Elev=99.24' Storage=0.000 af Inflow=0.74 cfs 0.238 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0083 '/' Outflow=0.74 cfs 0.238 af

Pond C17P: Catch Basin #17 Peak Elev=98.21' Storage=0.000 af Inflow=1.15 cfs 0.087 af
12.0" Round Culvert n=0.012 L=37.2' S=0.0478 '/' Outflow=1.15 cfs 0.087 af

Pond C18P: Catch Basin #18 Peak Elev=96.70' Storage=0.000 af Inflow=0.75 cfs 0.059 af
12.0" Round Culvert n=0.012 L=19.0' S=0.0100 '/' Outflow=0.74 cfs 0.059 af

Pond C19P: Catch Basin #19 Peak Elev=96.61' Storage=0.000 af Inflow=2.79 cfs 0.213 af
12.0" Round Culvert n=0.012 L=122.5' S=0.0651 '/' Outflow=2.78 cfs 0.213 af

Pond C20P: Catch Basin #20 Peak Elev=84.75' Storage=0.000 af Inflow=4.78 cfs 0.369 af
15.0" Round Culvert n=0.012 L=90.0' S=0.0486 '/' Outflow=4.77 cfs 0.369 af

Pond C21P: Catch Basin #21 Peak Elev=85.52' Storage=0.000 af Inflow=3.61 cfs 0.275 af
12.0" Round Culvert n=0.012 L=18.0' S=0.0139 '/' Outflow=3.59 cfs 0.275 af

Pond C22P: Catch Basin #22 Peak Elev=81.23' Storage=0.001 af Inflow=5.42 cfs 0.419 af
18.0" Round Culvert n=0.012 L=34.5' S=0.0055 '/' Outflow=5.39 cfs 0.419 af

Pond C23P: Catch Basin #23 Peak Elev=80.99' Storage=0.001 af Inflow=8.44 cfs 0.654 af
18.0" Round Culvert n=0.012 L=6.5' S=0.0092 '/' Outflow=8.40 cfs 0.654 af

Pond C24P: Catch Basin #24 Peak Elev=79.06' Storage=0.000 af Inflow=1.15 cfs 0.097 af
12.0" Round Culvert n=0.012 L=49.2' S=0.0437 '/' Outflow=1.15 cfs 0.097 af

Pond C25P: Catch Basin #25 Peak Elev=74.61' Storage=0.001 af Inflow=1.99 cfs 0.189 af
15.0" Round Culvert n=0.012 L=60.0' S=0.0083 '/' Outflow=1.97 cfs 0.188 af

Pond D01P: Drain Manhole #1 Peak Elev=114.29' Storage=0.000 af Inflow=3.34 cfs 0.271 af
15.0" Round Culvert n=0.012 L=148.5' S=0.0055 '/' Outflow=3.34 cfs 0.271 af

Pond D02P: Drain Manhole #2 Peak Elev=113.28' Storage=0.000 af Inflow=3.34 cfs 0.271 af
15.0" Round Culvert n=0.012 L=118.0' S=0.0682 '/' Outflow=3.34 cfs 0.271 af

Pond D03P: Drain Manhole #3 Peak Elev=100.92' Storage=0.001 af Inflow=8.39 cfs 0.661 af
18.0" Round Culvert n=0.012 L=33.5' S=0.0075 '/' Outflow=8.38 cfs 0.661 af

Pond D04P: Drain Manhole #4 Peak Elev=93.89' Storage=0.000 af Inflow=1.72 cfs 0.575 af
15.0" Round Culvert n=0.012 L=58.5' S=0.0282 '/' Outflow=1.72 cfs 0.575 af

Pond D05P: Drain Manhole #5 Peak Elev=92.14' Storage=0.000 af Inflow=1.72 cfs 0.575 af
15.0" Round Culvert n=0.012 L=56.7' S=0.0265 '/' Outflow=1.72 cfs 0.575 af

Pond D06P: Drain Manhole #6 Peak Elev=104.34' Storage=0.001 af Inflow=4.54 cfs 0.354 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0180 '/' Outflow=4.52 cfs 0.353 af

Pond D07P: Drain Manhole #7 Peak Elev=99.40' Storage=0.000 af Inflow=0.20 cfs 0.184 af
12.0" Round Culvert n=0.012 L=60.0' S=0.0050 '/' Outflow=0.20 cfs 0.184 af

Pond D08P: Drain Manhole #8 Peak Elev=88.54' Storage=0.000 af Inflow=2.78 cfs 0.213 af
12.0" Round Culvert n=0.012 L=56.0' S=0.0613 '/' Outflow=2.78 cfs 0.213 af

Pond D09P: Drain Manhole #9 Peak Elev=76.45' Storage=0.000 af Inflow=8.32 cfs 0.653 af
18.0" Round Culvert n=0.012 L=50.0' S=0.0700 '/' Outflow=8.31 cfs 0.653 af

Pond D10P: Drain Manhole #10 Peak Elev=74.61' Storage=0.001 af Inflow=1.15 cfs 0.097 af
12.0" Round Culvert n=0.012 L=134.0' S=0.0056 '/' Outflow=1.13 cfs 0.096 af

Pond W01P: Water Quality Inlet #1 Peak Elev=100.20' Storage=0.007 af Inflow=8.38 cfs 0.661 af
18.0" Round Culvert n=0.012 L=75.0' S=0.0600 '/' Outflow=8.28 cfs 0.660 af

Pond W02P: Water Quality Inlet #2 Peak Elev=80.22' Storage=0.008 af Inflow=8.40 cfs 0.654 af
18.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=8.32 cfs 0.653 af

Total Runoff Area = 56.648 ac Runoff Volume = 17.335 af Average Runoff Depth = 3.67"
92.42% Pervious = 52.355 ac 7.58% Impervious = 4.293 ac

Summary for Subcatchment 1S: Subcatchment #1

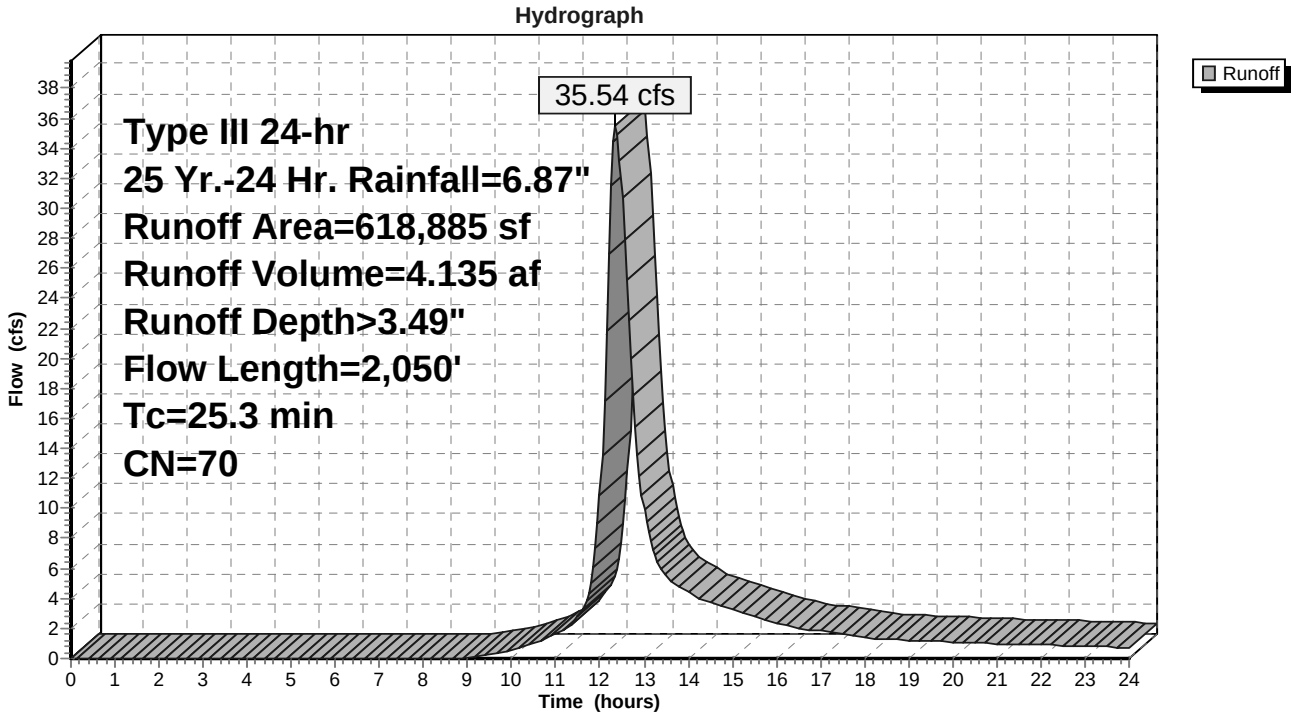
Runoff = 35.54 cfs @ 12.36 hrs, Volume= 4.135 af, Depth> 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
8,381	74	>75% Grass cover, Good, HSG C
13,523	61	>75% Grass cover, Good, HSG B
2,012	98	Unconnected pavement, HSG C
2,012	98	Unconnected pavement, HSG B
936	98	Unconnected roofs, HSG C
936	98	Unconnected roofs, HSG B
62,988	55	Woods, Good, HSG B
396,739	70	Woods, Good, HSG C
131,358	77	Woods, Good, HSG D
618,885	70	Weighted Average
612,989		99.05% Pervious Area
5,896		0.95% Impervious Area
5,896		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	60	0.1500	0.17		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
5.7	40	0.0750	0.12		**Sheet Flow, Segment #2** Woods: Light underbrush n= 0.400 P2= 3.61"
0.1	20	0.2500	2.50		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
7.9	492	0.0427	1.03		**Shallow Concentrated Flow, Segment #4** Woodland Kv= 5.0 fps
5.6	1,438	0.0351	4.28	6.95	**Trap/Vee/Rect Channel Flow, Segment #5** Bot.W=3.00' D=0.50' Z= 0.5 '/' Top.W=3.50' n= 0.035 Earth, dense weeds
25.3	2,050	Total			

Subcatchment 1S: Subcatchment #1



Summary for Subcatchment 2S: Subcatchment #2

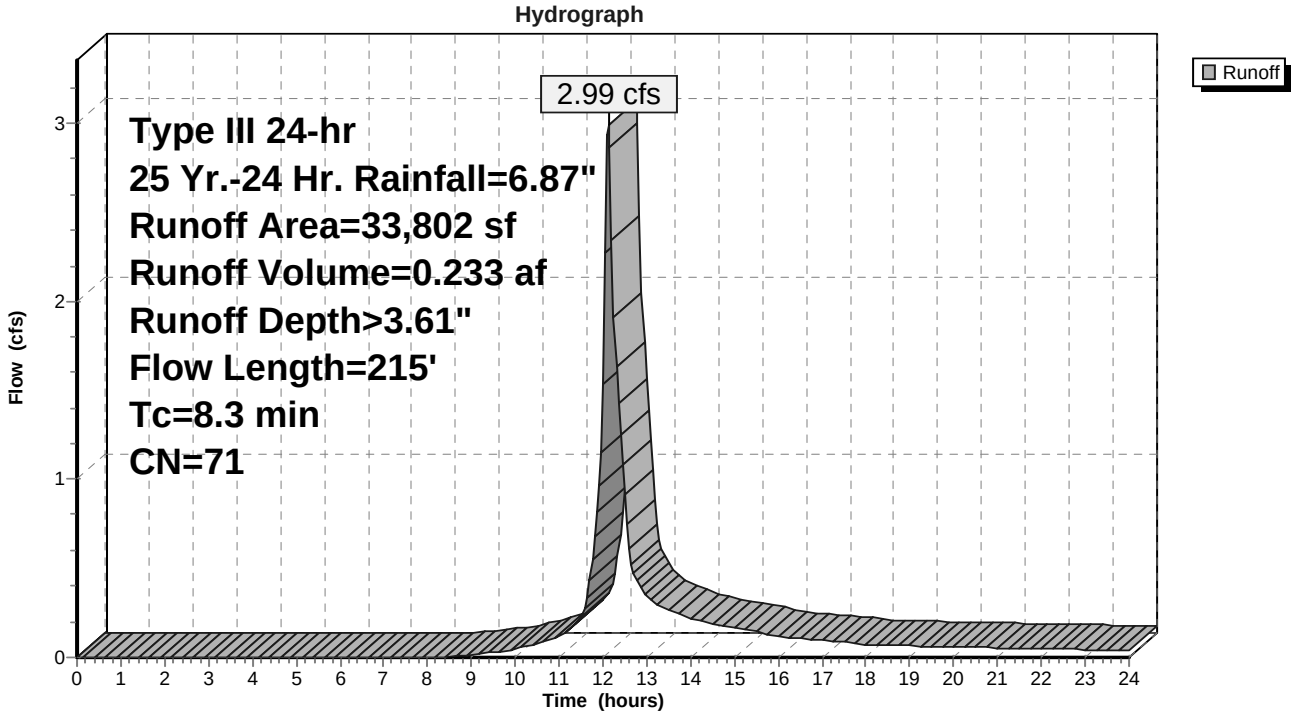
Runoff = 2.99 cfs @ 12.12 hrs, Volume= 0.233 af, Depth> 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
29,699	70	Woods, Good, HSG C
4,103	77	Woods, Good, HSG D
33,802	71	Weighted Average
33,802		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	69	0.1159	0.15		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
0.7	109	0.2477	2.49		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
0.2	37	0.4852	3.48		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
8.3	215	Total			

Subcatchment 2S: Subcatchment #2



Summary for Subcatchment 3S: Subcatchment #3

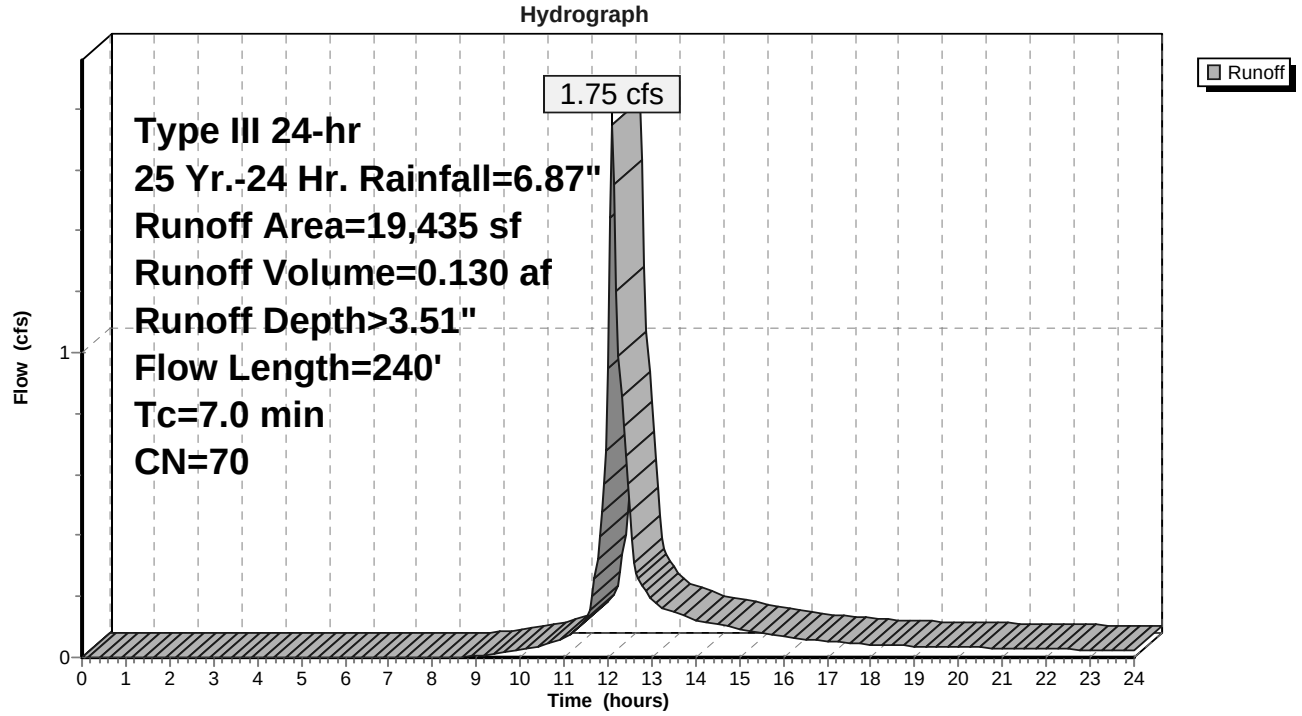
Runoff = 1.75 cfs @ 12.11 hrs, Volume= 0.130 af, Depth> 3.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
18,831	70	Woods, Good, HSG C
604	77	Woods, Good, HSG D
19,435	70	Weighted Average
19,435		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	53	0.1226	0.15		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
0.2	33	0.2406	2.45		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
0.9	154	0.3052	2.76		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
7.0	240	Total			

Subcatchment 3S: Subcatchment #3



Summary for Subcatchment 4S: Subcatchment #4

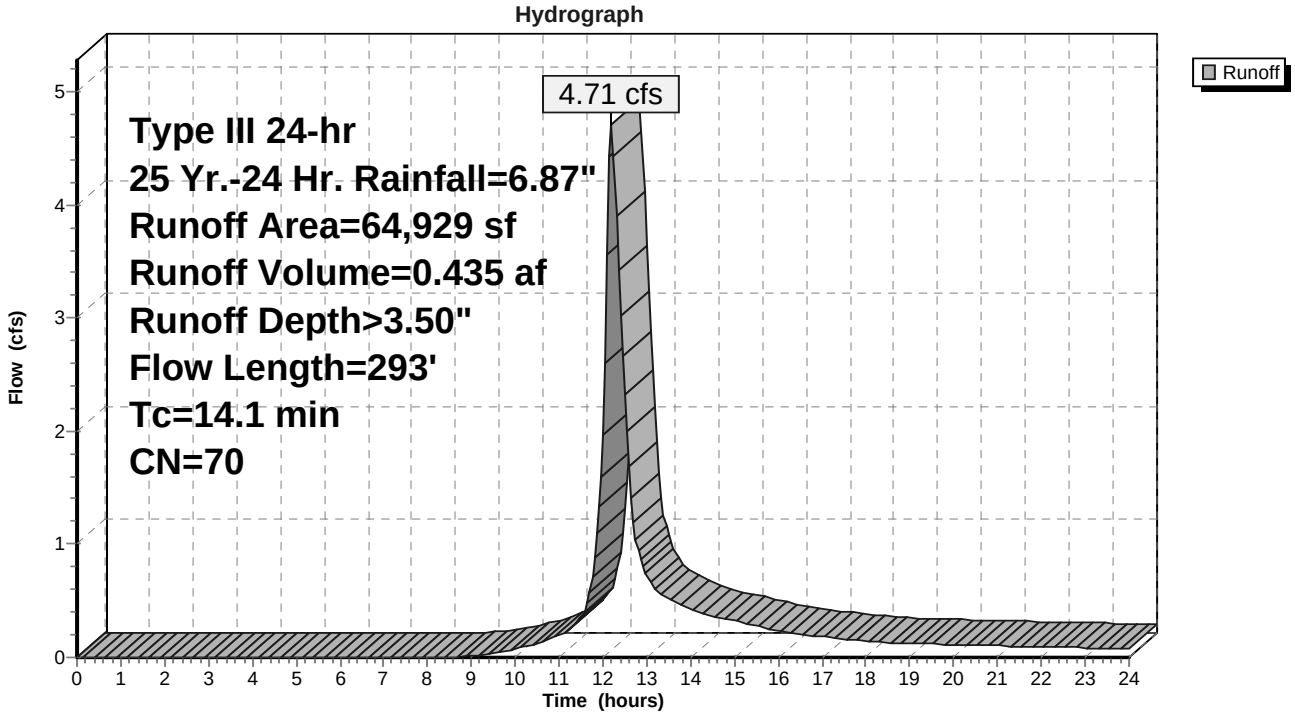
Runoff = 4.71 cfs @ 12.20 hrs, Volume= 0.435 af, Depth> 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
61,644	70	Woods, Good, HSG C
3,285	77	Woods, Good, HSG D
64,929	70	Weighted Average
64,929		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	100	0.0625	0.13		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
1.1	157	0.2299	2.40		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
0.2	36	0.4049	3.18		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
14.1	293	Total			

Subcatchment 4S: Subcatchment #4



Summary for Subcatchment 5S: Subcatchment #5

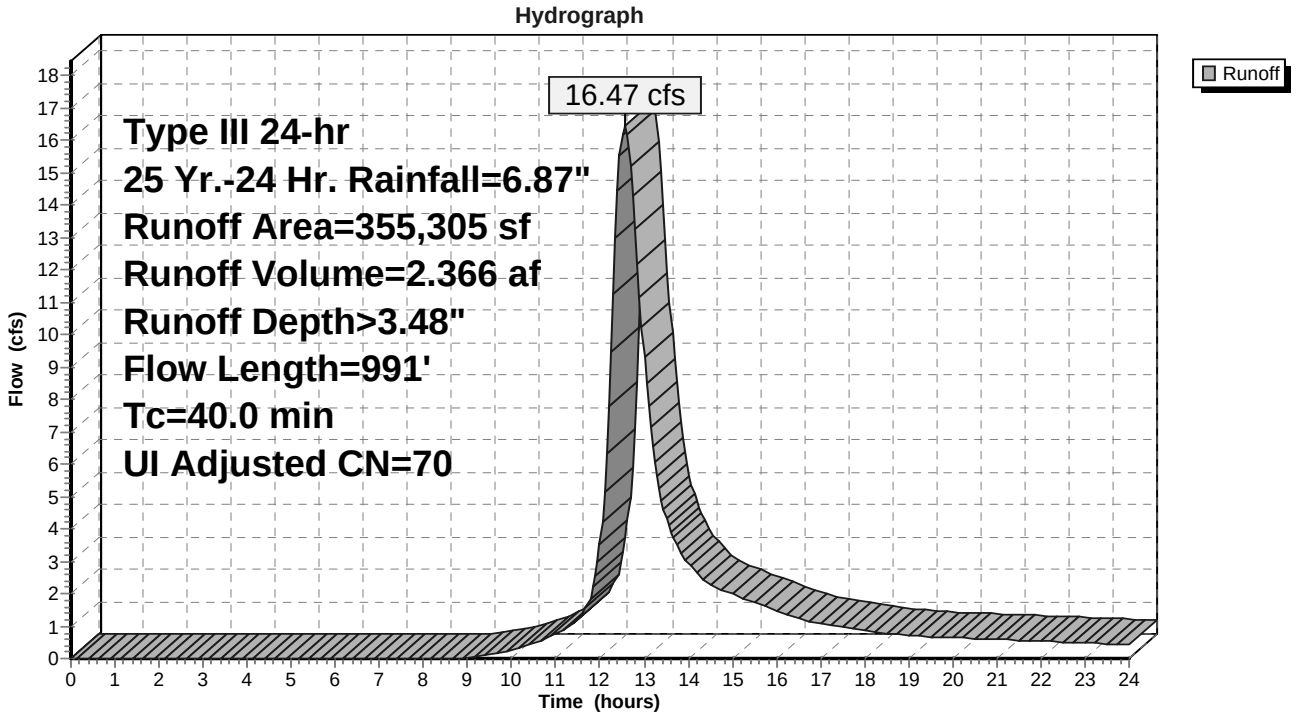
Runoff = 16.47 cfs @ 12.56 hrs, Volume= 2.366 af, Depth> 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Adj	Description
37,354	55		Woods, Good, HSG B
187,844	70		Woods, Good, HSG C
93,930	77		Woods, Good, HSG D
13,219	61		>75% Grass cover, Good, HSG B
13,233	74		>75% Grass cover, Good, HSG C
5,440	80		>75% Grass cover, Good, HSG D
32	98		Unconnected pavement, HSG B
76	98		Unconnected pavement, HSG D
1,865	98		Unconnected roofs, HSG B
2,312	98		Unconnected roofs, HSG D
355,305	71	70	Weighted Average, UI Adjusted
351,020			98.79% Pervious Area
4,285			1.21% Impervious Area
4,285			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	40	0.0500	0.10		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
13.2	60	0.0208	0.08		**Sheet Flow, Segment #2** Woods: Light underbrush n= 0.400 P2= 3.61"
9.9	187	0.0040	0.32		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
1.4	81	0.0370	0.96		**Shallow Concentrated Flow, Segment #4** Woodland Kv= 5.0 fps
0.6	78	0.2179	2.33		**Shallow Concentrated Flow, Segment #5** Woodland Kv= 5.0 fps
3.3	224	0.0515	1.13		**Shallow Concentrated Flow, Segment #6** Woodland Kv= 5.0 fps
4.2	219	0.0296	0.86		**Shallow Concentrated Flow, Segment #7** Woodland Kv= 5.0 fps
0.7	102	0.2200	2.35		**Shallow Concentrated Flow, Segment #8** Woodland Kv= 5.0 fps
40.0	991	Total			

Subcatchment 5S: Subcatchment #5



Summary for Subcatchment 6S: Subcatchment #6

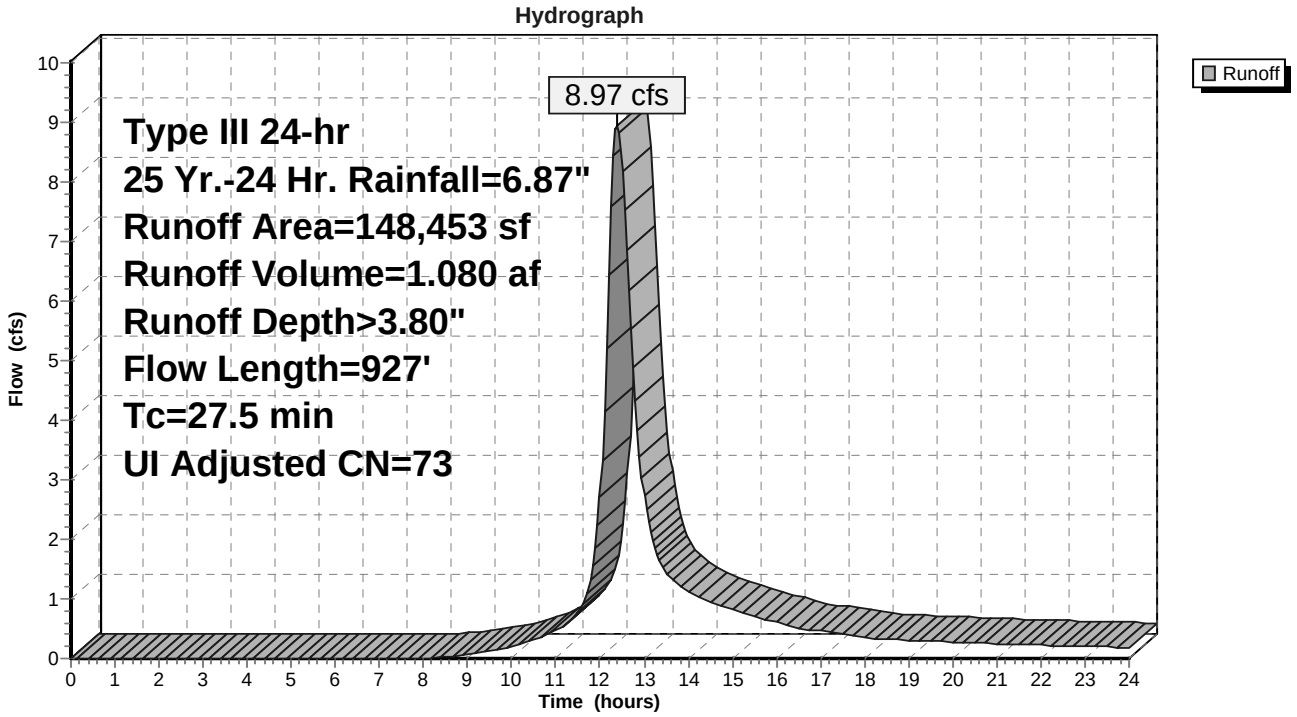
Runoff = 8.97 cfs @ 12.38 hrs, Volume= 1.080 af, Depth> 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Adj	Description
86,286	70		Woods, Good, HSG C
22,616	77		Woods, Good, HSG D
527	61		>75% Grass cover, Good, HSG B
29,038	74		>75% Grass cover, Good, HSG C
1,230	80		>75% Grass cover, Good, HSG D
11	98		Unconnected pavement, HSG B
130	98		Unconnected pavement, HSG C
25	98		Unconnected pavement, HSG D
203	98		Unconnected roofs, HSG B
7,935	98		Unconnected roofs, HSG C
452	98		Unconnected roofs, HSG D
148,453	74	73	Weighted Average, UI Adjusted
139,697			94.10% Pervious Area
8,756			5.90% Impervious Area
8,756			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	100	0.0300	0.10		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
2.4	110	0.0228	0.75		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
4.4	374	0.0803	1.42		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
0.6	56	0.0887	1.49		**Shallow Concentrated Flow, Segment #4** Woodland Kv= 5.0 fps
2.9	287	0.1125	1.68		**Shallow Concentrated Flow, Segment #5** Woodland Kv= 5.0 fps
27.5	927	Total			

Subcatchment 6S: Subcatchment #6



Summary for Subcatchment 7S: Subcatchment #7

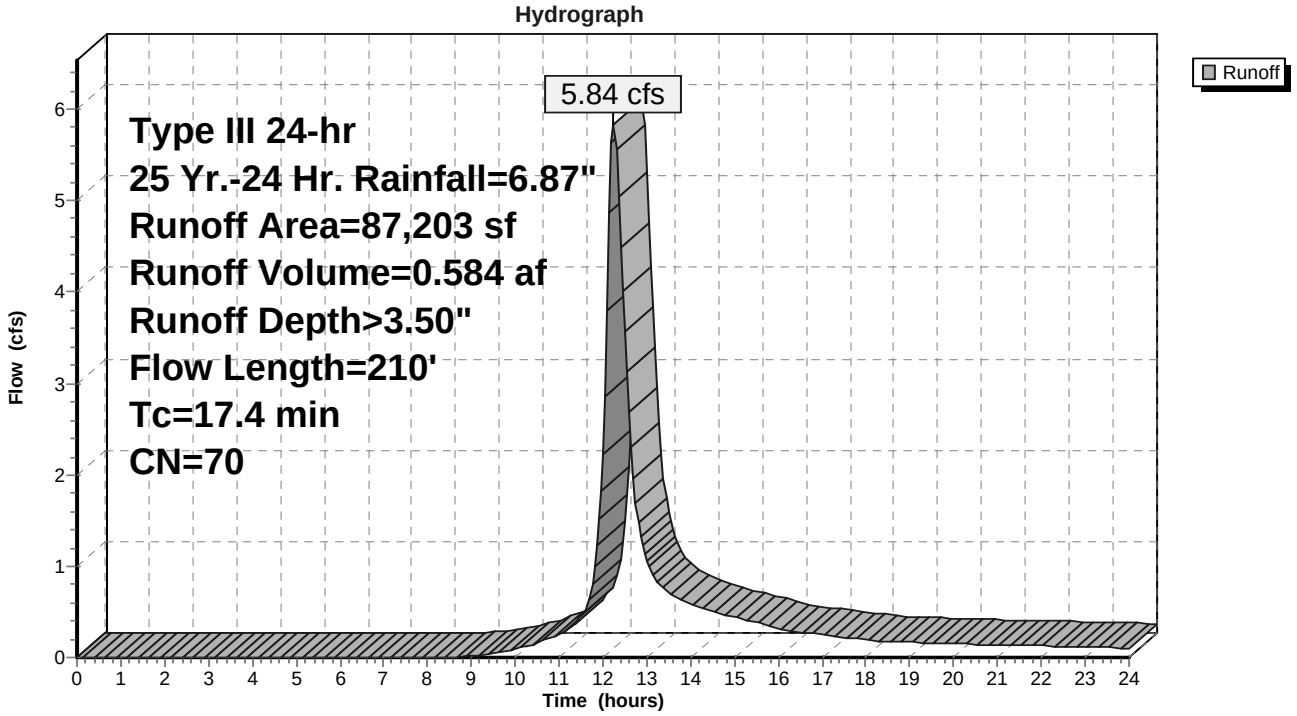
Runoff = 5.84 cfs @ 12.25 hrs, Volume= 0.584 af, Depth> 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
1,591	30	Woods, Good, HSG A
70,026	70	Woods, Good, HSG C
8,068	77	Woods, Good, HSG D
7,518	74	>75% Grass cover, Good, HSG C
87,203	70	Weighted Average
87,203		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	100	0.0350	0.10		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
1.1	94	0.0850	1.46		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
0.1	16	0.4000	3.16		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
17.4	210	Total			

Subcatchment 7S: Subcatchment #7



Summary for Subcatchment 8S: Subcatchment #8

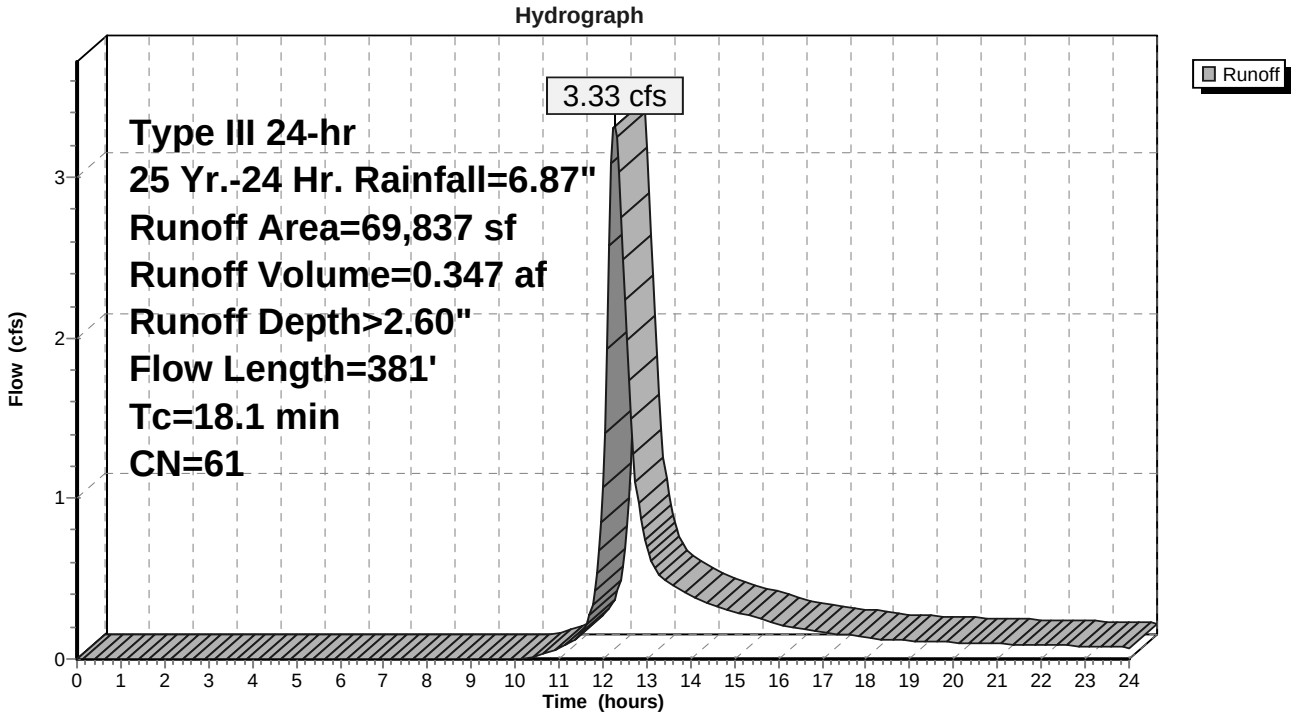
Runoff = 3.33 cfs @ 12.27 hrs, Volume= 0.347 af, Depth> 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
16,548	30	Woods, Good, HSG A
47,189	70	Woods, Good, HSG C
6,100	77	Woods, Good, HSG D
69,837	61	Weighted Average
69,837		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	100	0.0475	0.12		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
1.1	70	0.0429	1.04		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
1.9	139	0.0612	1.24		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
0.8	72	0.0900	1.50		**Shallow Concentrated Flow, Segment #4** Woodland Kv= 5.0 fps
18.1	381	Total			

Subcatchment 8S: Subcatchment #8



Summary for Subcatchment 9S: Subcatchment #9

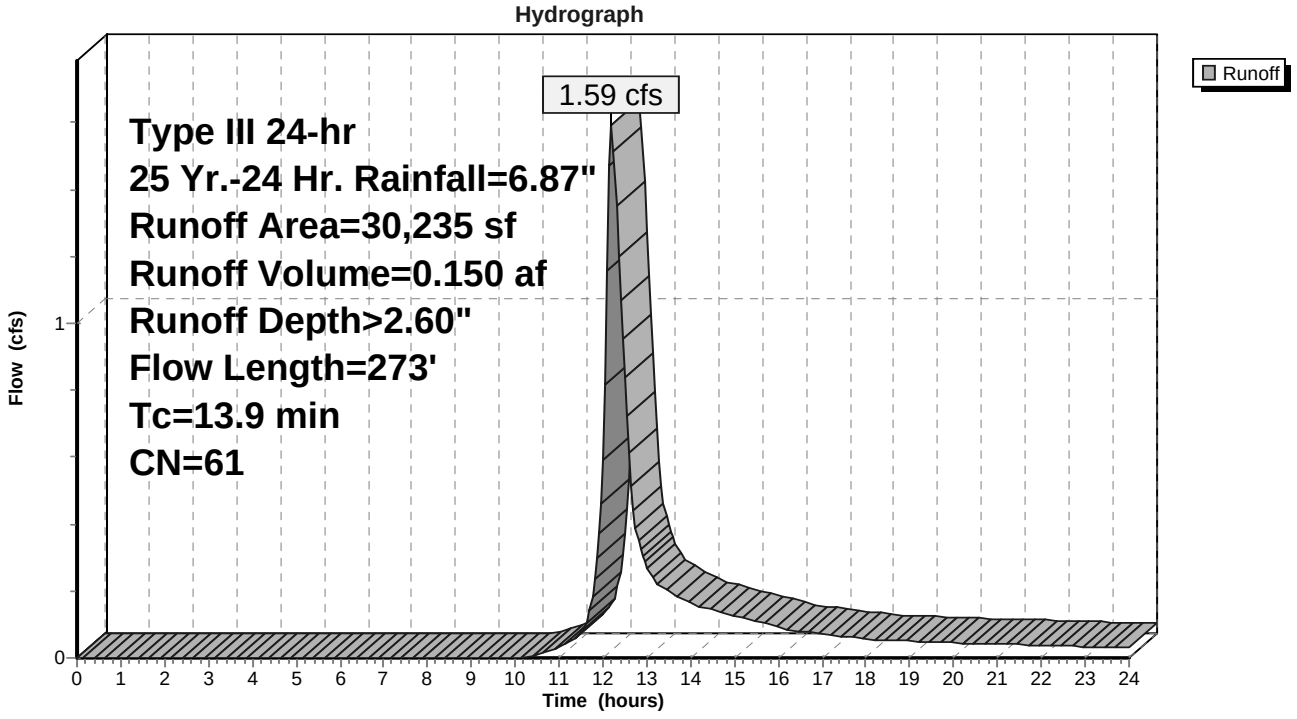
Runoff = 1.59 cfs @ 12.20 hrs, Volume= 0.150 af, Depth> 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
7,072	30	Woods, Good, HSG A
20,587	70	Woods, Good, HSG C
2,576	77	Woods, Good, HSG D
30,235	61	Weighted Average
30,235		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	100	0.0925	0.15		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
2.9	173	0.0404	1.00		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
13.9	273	Total			

Subcatchment 9S: Subcatchment #9



Summary for Subcatchment 10S: Subcatchment #10

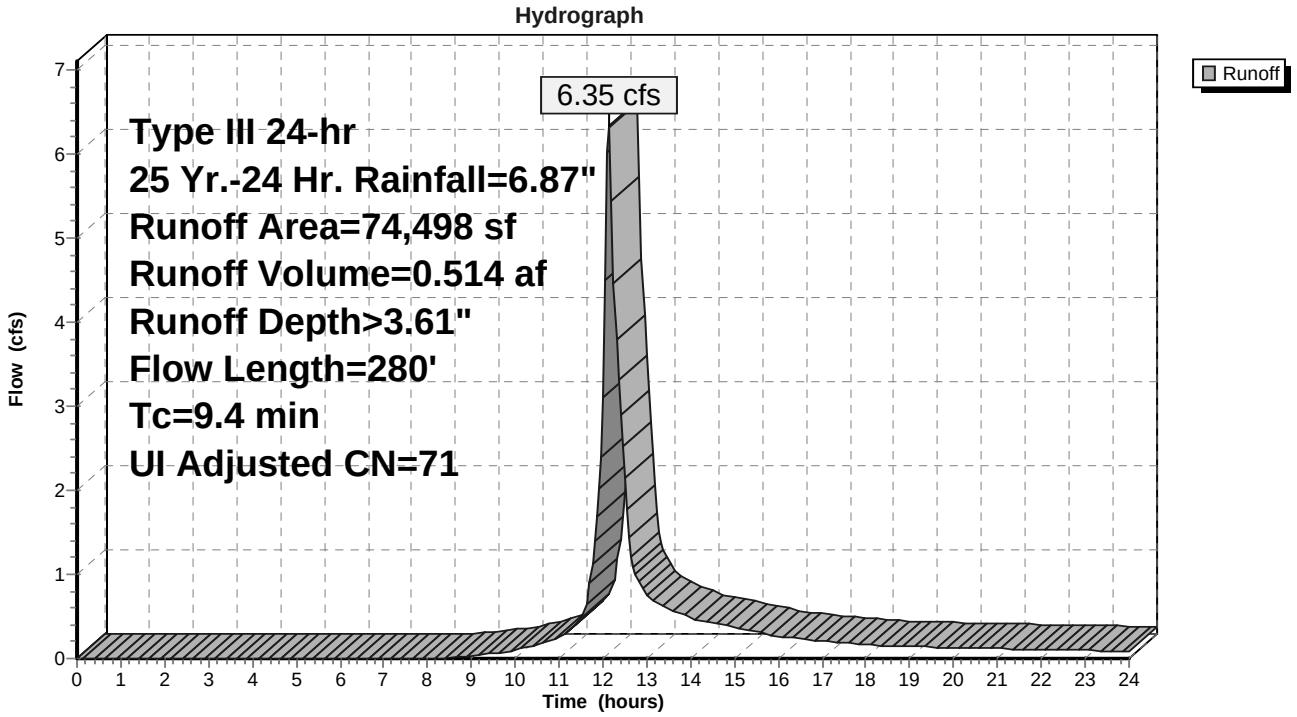
Runoff = 6.35 cfs @ 12.14 hrs, Volume= 0.514 af, Depth> 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Adj	Description
3,711	61		>75% Grass cover, Good, HSG B
18,609	74		>75% Grass cover, Good, HSG C
380	98		Unconnected pavement, HSG B
5,385	98		Unconnected pavement, HSG C
506	98		Unconnected roofs, HSG B
1,544	98		Unconnected roofs, HSG C
6,534	55		Woods, Good, HSG B
37,829	70		Woods, Good, HSG C
74,498	72	71	Weighted Average, UI Adjusted
66,683			89.51% Pervious Area
7,815			10.49% Impervious Area
7,815			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0330	0.22		**Sheet Flow, Segment #1** Grass: Short n= 0.150 P2= 3.61"
0.5	53	0.1500	1.94		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
0.4	49	0.1420	1.88		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
0.9	78	0.0770	1.39		**Shallow Concentrated Flow, Segment #4** Woodland Kv= 5.0 fps
9.4	280	Total			

Subcatchment 10S: Subcatchment #10



Summary for Subcatchment 11S: Subcatchment #11

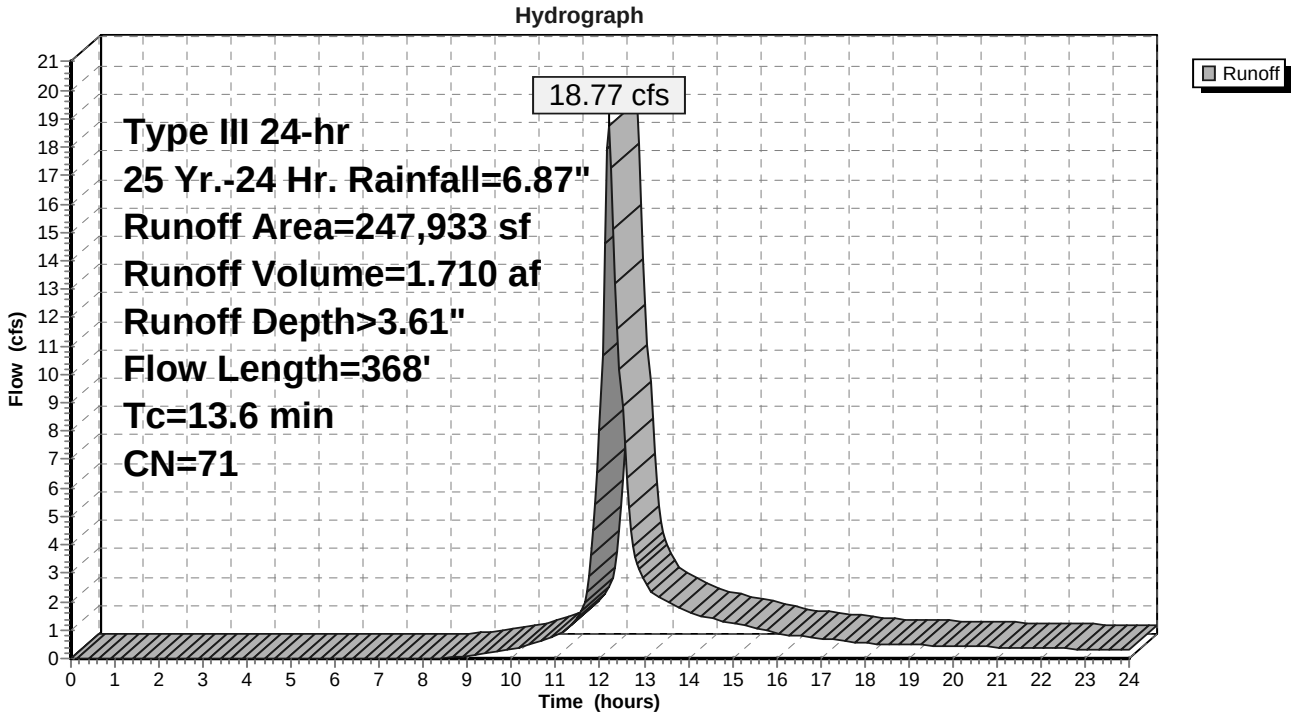
Runoff = 18.77 cfs @ 12.19 hrs, Volume= 1.710 af, Depth> 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
13,485	61	>75% Grass cover, Good, HSG B
19,882	74	>75% Grass cover, Good, HSG C
1,288	98	Unconnected pavement, HSG B
4,227	98	Unconnected pavement, HSG C
1,573	98	Unconnected roofs, HSG B
1,762	98	Unconnected roofs, HSG C
5,848	96	Gravel surface, HSG C
1,554	55	Woods, Good, HSG B
198,314	70	Woods, Good, HSG C
247,933	71	Weighted Average
239,083		96.43% Pervious Area
8,850		3.57% Impervious Area
8,850		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.1100	0.16		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
3.4	268	0.0700	1.32		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
13.6	368	Total			

Subcatchment 11S: Subcatchment #11



Summary for Subcatchment 12S: Subcatchment #12

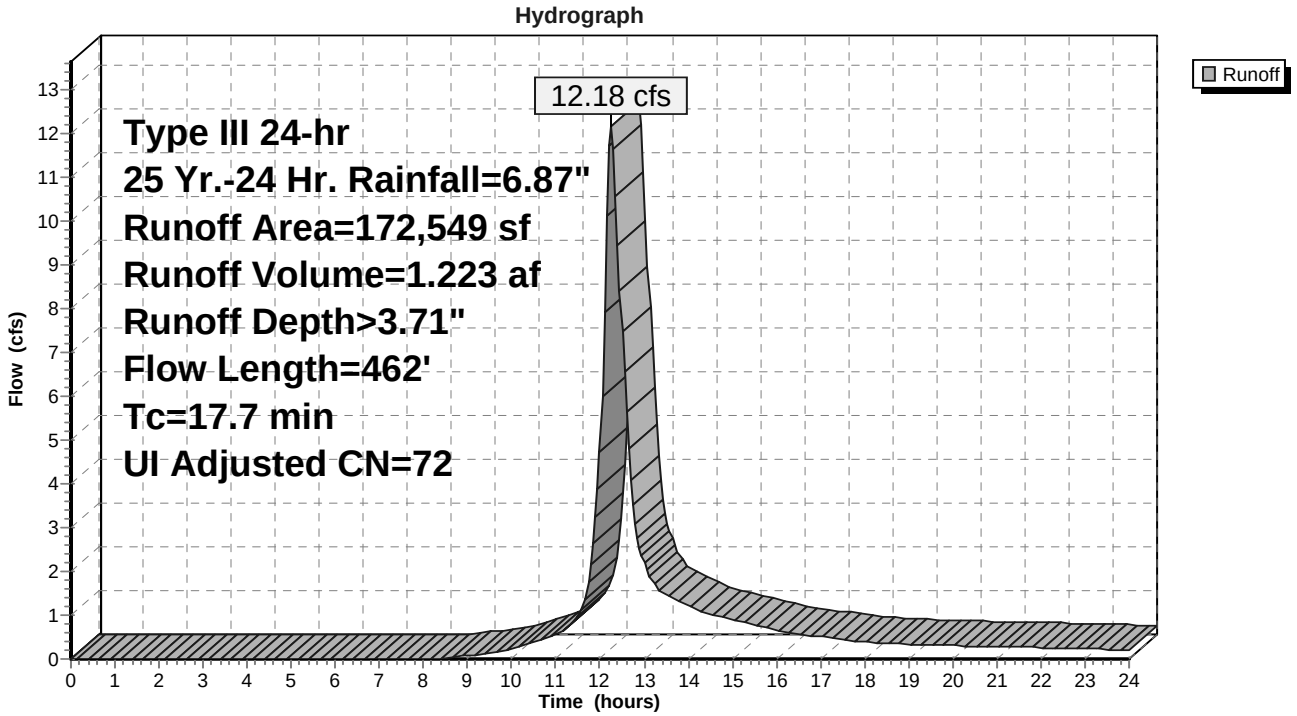
Runoff = 12.18 cfs @ 12.25 hrs, Volume= 1.223 af, Depth> 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Adj	Description
72,966	74		>75% Grass cover, Good, HSG C
9,211	98		Unconnected roofs, HSG C
90,372	70		Woods, Good, HSG C
172,549	73	72	Weighted Average, UI Adjusted
163,338			94.66% Pervious Area
9,211			5.34% Impervious Area
9,211			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	100	0.0550	0.12		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
1.4	71	0.0281	0.84		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
2.8	291	0.1170	1.71		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
17.7	462	Total			

Subcatchment 12S: Subcatchment #12



Summary for Subcatchment 13S: Subcatchment #13

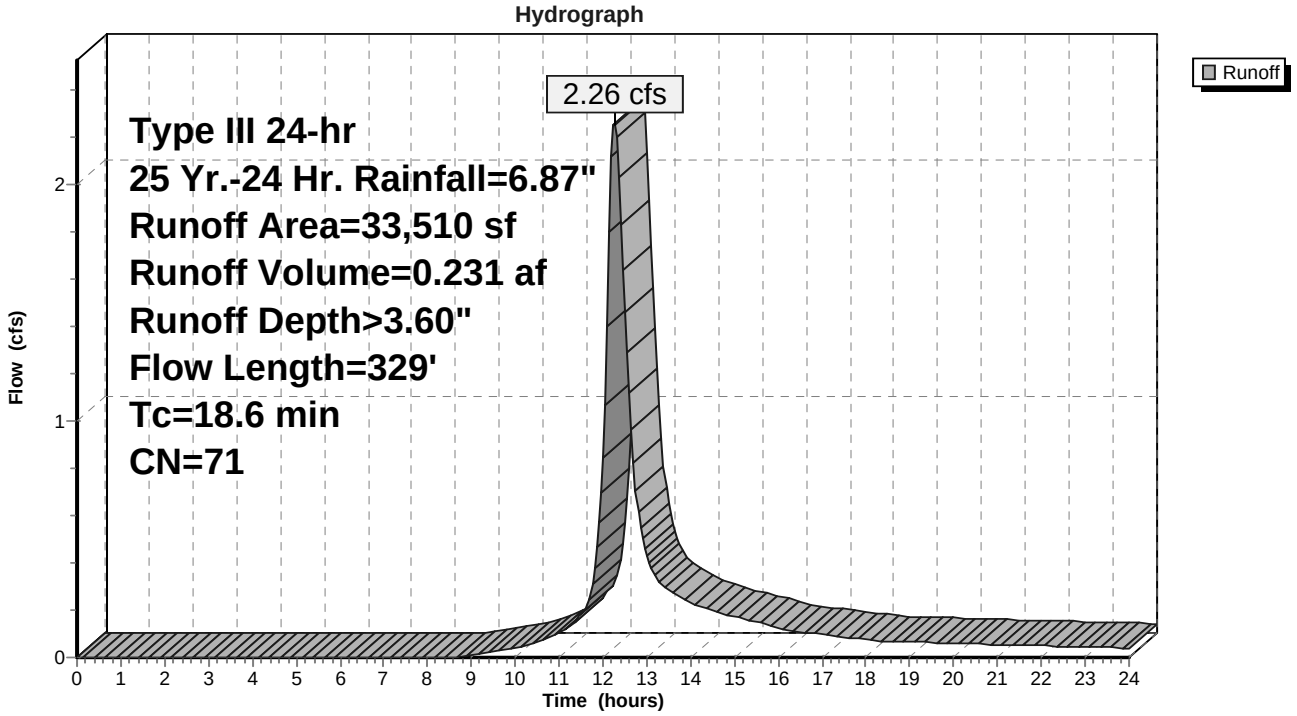
Runoff = 2.26 cfs @ 12.26 hrs, Volume= 0.231 af, Depth> 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
26,508	70	Woods, Good, HSG C
7,002	77	Woods, Good, HSG D
33,510	71	Weighted Average
33,510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	67	0.1084	0.15		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
6.0	33	0.0453	0.09		**Sheet Flow, Segment #2** Woods: Light underbrush n= 0.400 P2= 3.61"
5.0	215	0.0209	0.72		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
0.1	14	0.1817	2.13		**Shallow Concentrated Flow, Segment #4** Woodland Kv= 5.0 fps
18.6	329	Total			

Subcatchment 13S: Subcatchment #13



Summary for Subcatchment 15S: Subcatchment #15

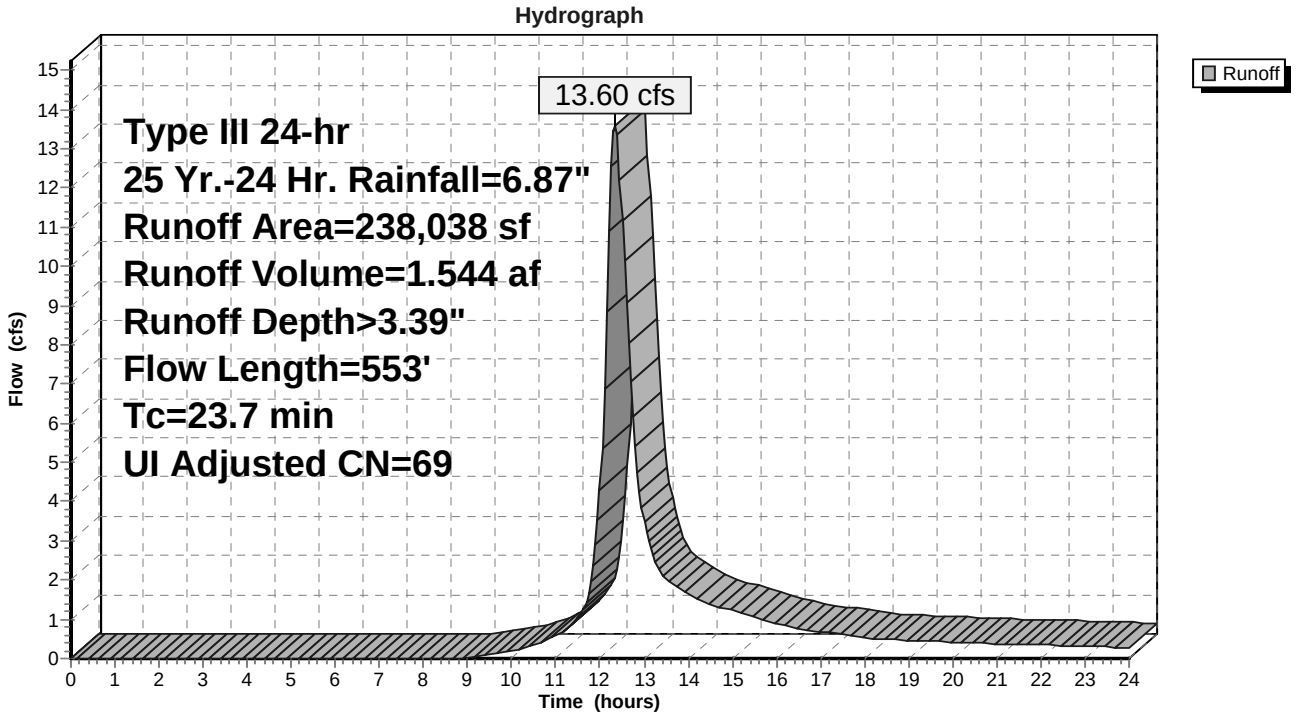
Runoff = 13.60 cfs @ 12.34 hrs, Volume= 1.544 af, Depth> 3.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Adj	Description
15,305	61		>75% Grass cover, Good, HSG B
39,330	74		>75% Grass cover, Good, HSG C
5,979	80		>75% Grass cover, Good, HSG D
942	98		Unconnected pavement, HSG B
3,434	98		Unconnected pavement, HSG C
24	98		Unconnected pavement, HSG D
1,834	98		Unconnected roofs, HSG B
5,144	98		Unconnected roofs, HSG C
785	98		Unconnected roofs, HSG D
4,440	96		Gravel surface, HSG C
47,256	55		Woods, Good, HSG B
87,474	70		Woods, Good, HSG C
26,091	77		Woods, Good, HSG D
238,038	70	69	Weighted Average, UI Adjusted
225,875			94.89% Pervious Area
12,163			5.11% Impervious Area
12,163			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	100	0.0300	0.10		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
1.1	119	0.1426	1.89		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
5.4	334	0.0420	1.02		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
23.7	553	Total			

Subcatchment 15S: Subcatchment #15



Summary for Subcatchment 16S: Catch Basin #7727

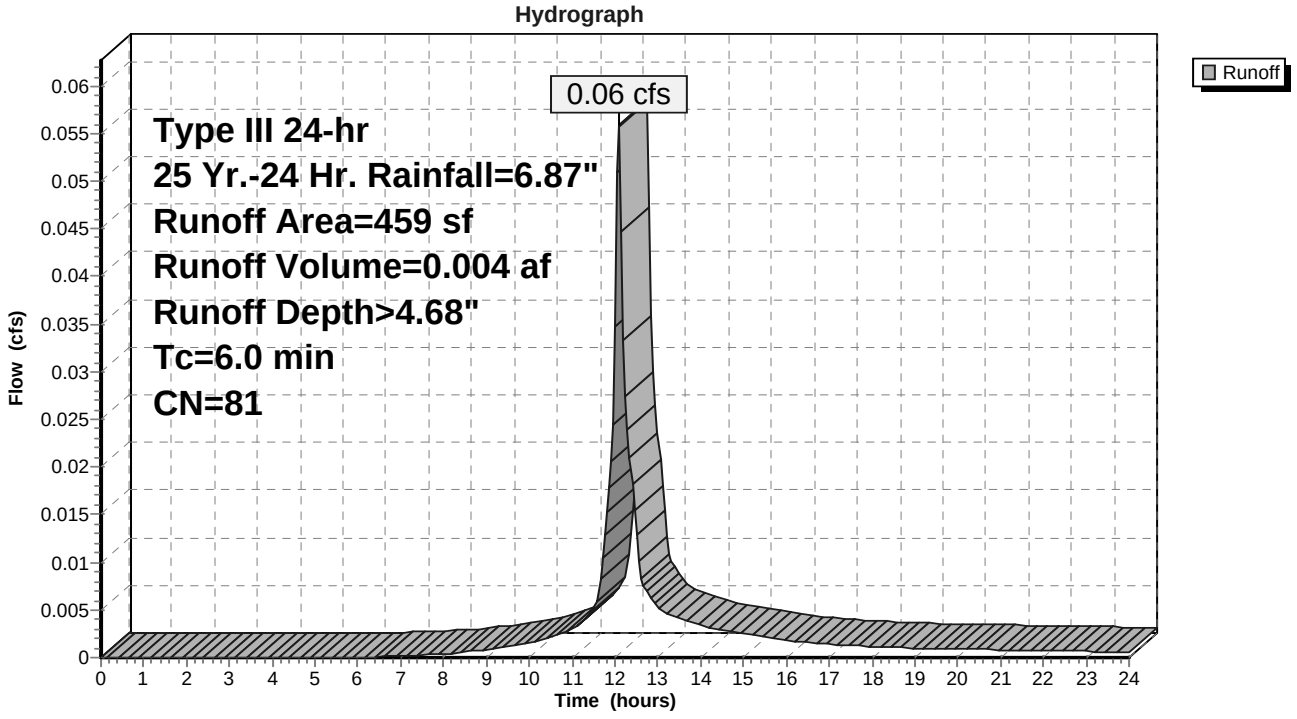
Runoff = 0.06 cfs @ 12.09 hrs, Volume= 0.004 af, Depth> 4.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
124	61	>75% Grass cover, Good, HSG B
125	74	>75% Grass cover, Good, HSG C
105	98	Paved parking, HSG B
105	98	Paved parking, HSG C
459	81	Weighted Average
249		54.25% Pervious Area
210		45.75% Impervious Area

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

Subcatchment 16S: Catch Basin #7727



Summary for Subcatchment 17S: Catch Basin #3698

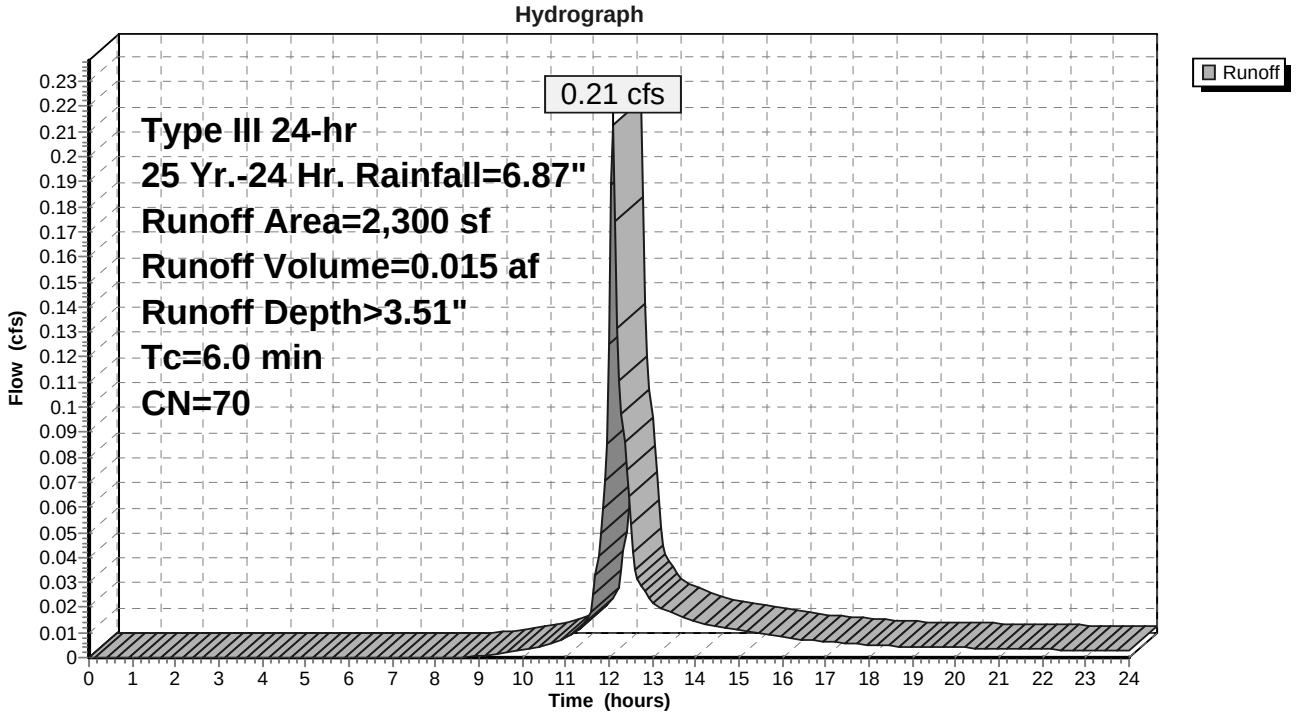
Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.015 af, Depth> 3.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
1,038	74	>75% Grass cover, Good, HSG C
1,039	61	>75% Grass cover, Good, HSG B
112	98	Paved parking, HSG C
111	98	Paved parking, HSG B
2,300	70	Weighted Average
2,077		90.30% Pervious Area
223		9.70% Impervious Area

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

Subcatchment 17S: Catch Basin #3698



Summary for Subcatchment 18S: Catch Basin #7725

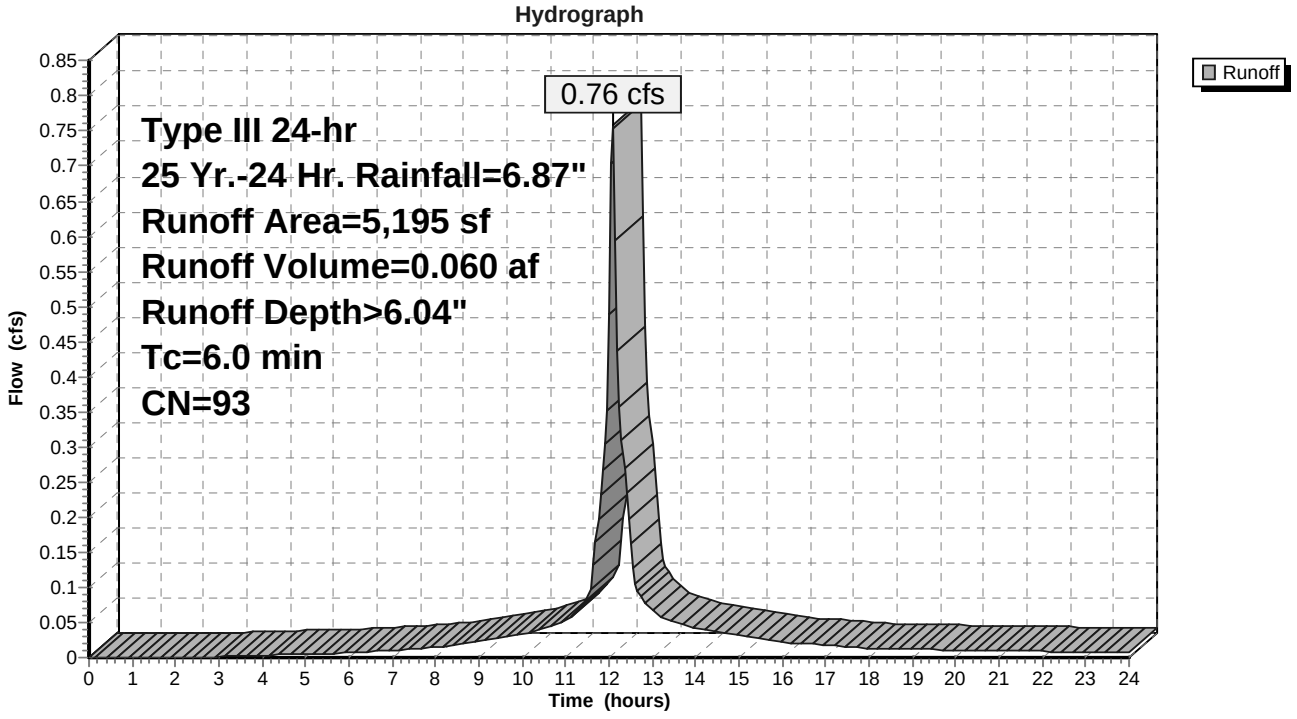
Runoff = 0.76 cfs @ 12.09 hrs, Volume= 0.060 af, Depth> 6.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
395	61	>75% Grass cover, Good, HSG B
395	74	>75% Grass cover, Good, HSG C
2,203	98	Paved parking, HSG B
2,202	98	Paved parking, HSG C
5,195	93	Weighted Average
790		15.21% Pervious Area
4,405		84.79% Impervious Area

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

Subcatchment 18S: Catch Basin #7725



Summary for Subcatchment 19S: Catch Basin #7726

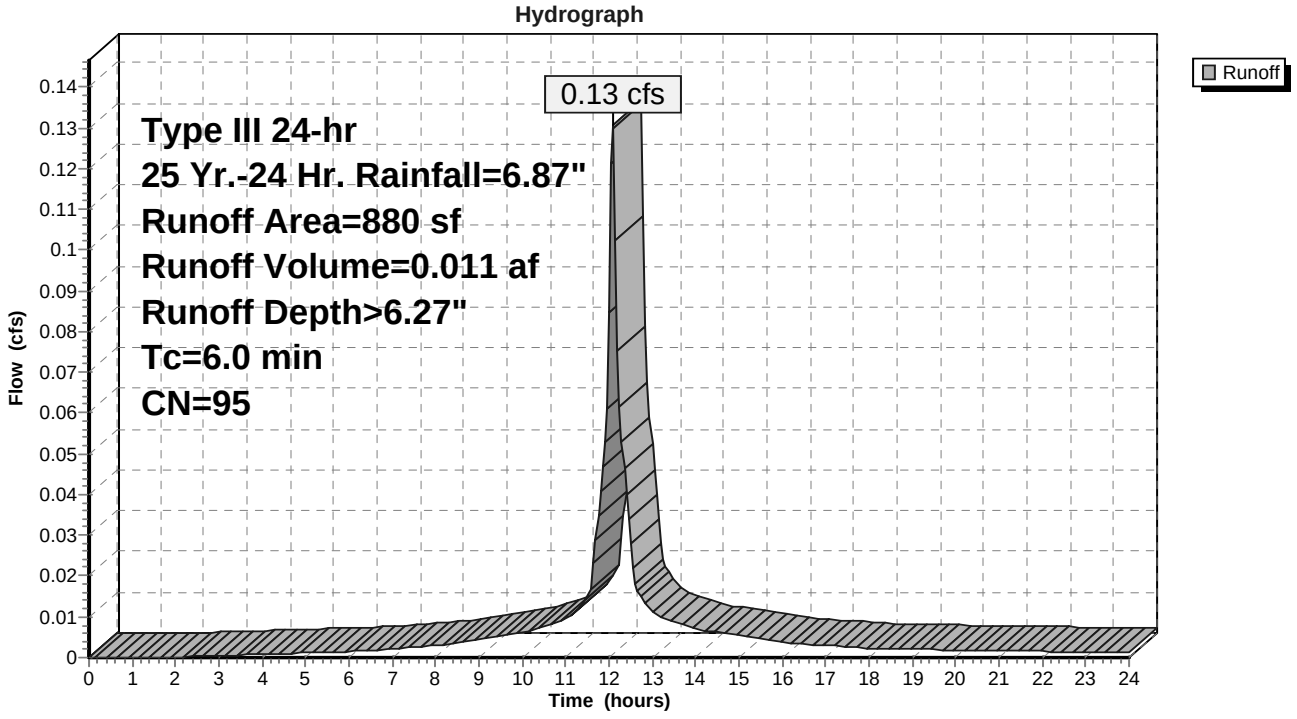
Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth> 6.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
49	61	>75% Grass cover, Good, HSG B
49	74	>75% Grass cover, Good, HSG C
391	98	Paved parking, HSG B
391	98	Paved parking, HSG C
880	95	Weighted Average
98		11.14% Pervious Area
782		88.86% Impervious Area

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

Subcatchment 19S: Catch Basin #7726



Summary for Subcatchment 20S: 30" RCP Wet Crossing #1

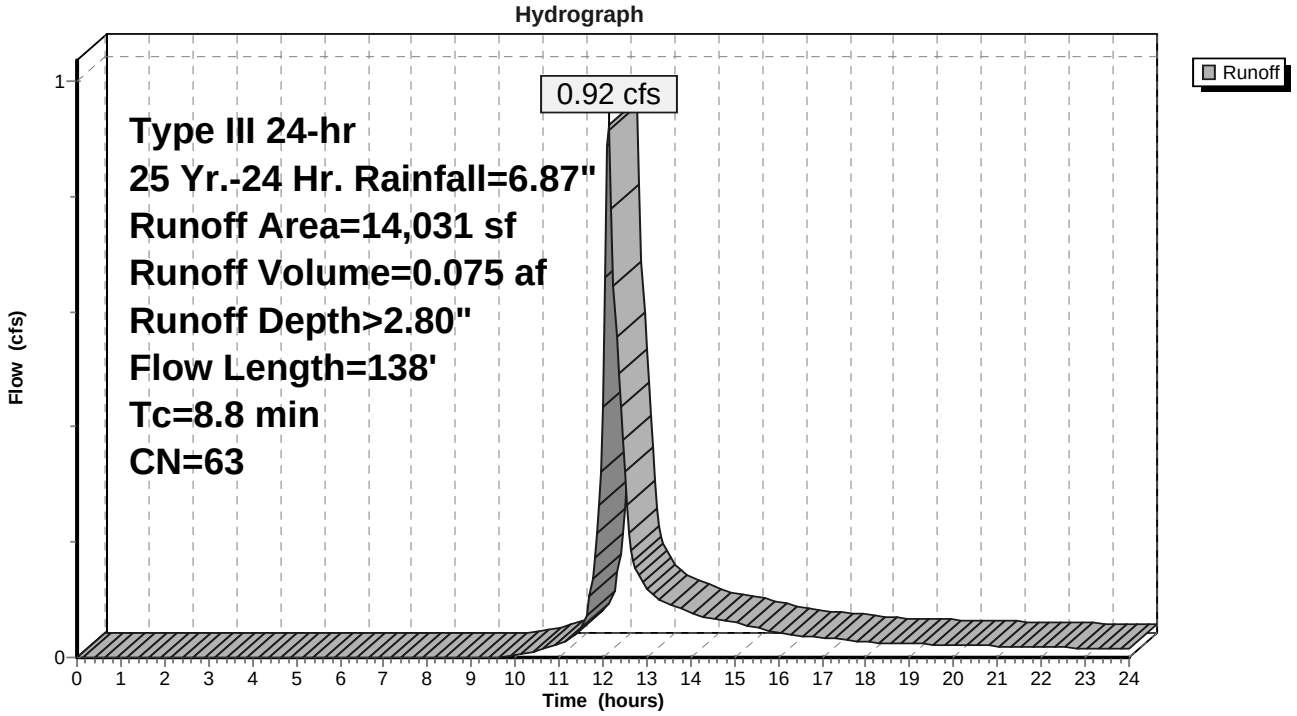
Runoff = 0.92 cfs @ 12.13 hrs, Volume= 0.075 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
3,055	61	>75% Grass cover, Good, HSG B
1,858	74	>75% Grass cover, Good, HSG C
857	80	>75% Grass cover, Good, HSG D
5,751	55	Woods, Good, HSG B
1,760	70	Woods, Good, HSG C
750	77	Woods, Good, HSG D
14,031	63	Weighted Average
14,031		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	69	0.0870	0.14		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
0.5	69	0.2029	2.25		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
8.8	138	Total			

Subcatchment 20S: 30" RCP Wet Crossing #1



Summary for Subcatchment 21S: Catch Basin #1

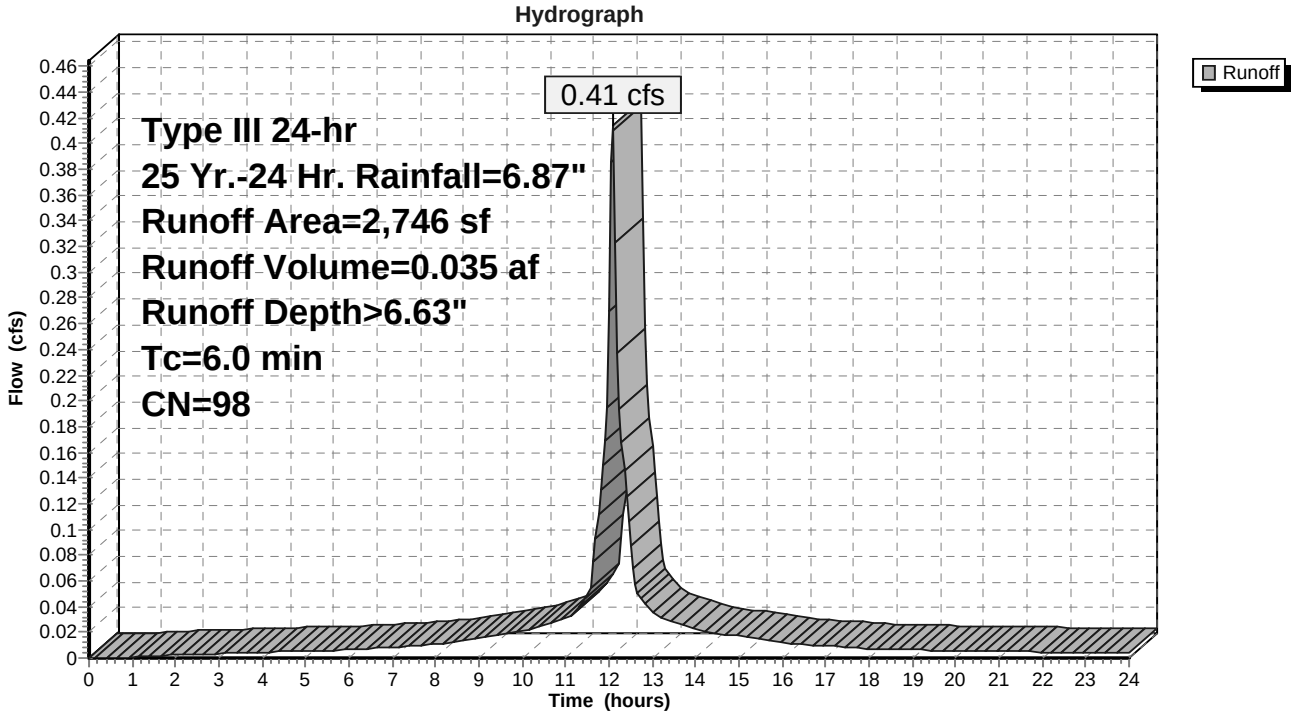
Runoff = 0.41 cfs @ 12.09 hrs, Volume= 0.035 af, Depth> 6.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
611	98	Paved parking, HSG C
2,135	98	Paved parking, HSG B
2,746	98	Weighted Average
2,746		100.00% Impervious Area

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

Subcatchment 21S: Catch Basin #1



Summary for Subcatchment 22S: Catch Basin #2

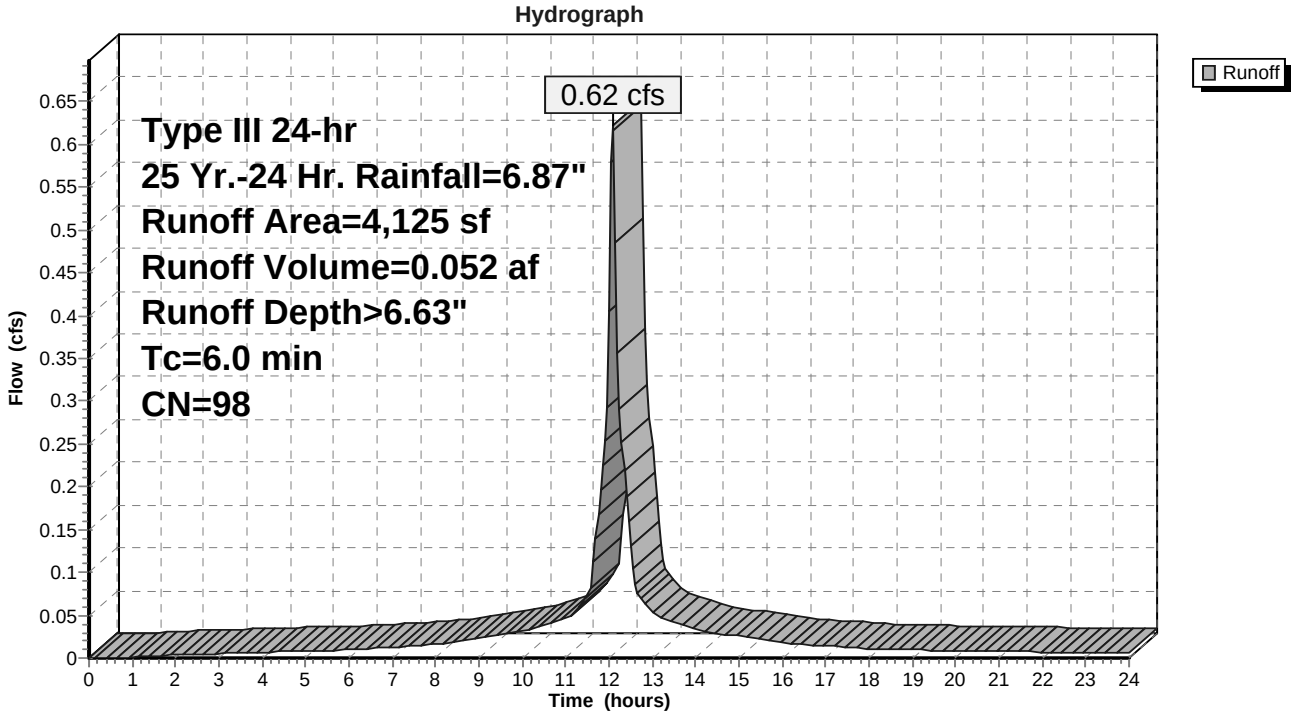
Runoff = 0.62 cfs @ 12.09 hrs, Volume= 0.052 af, Depth> 6.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
1,671	98	Paved parking, HSG C
2,454	98	Paved parking, HSG B
4,125	98	Weighted Average
4,125		100.00% Impervious Area

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

Subcatchment 22S: Catch Basin #2



Summary for Subcatchment 23S: Catch Basin #3

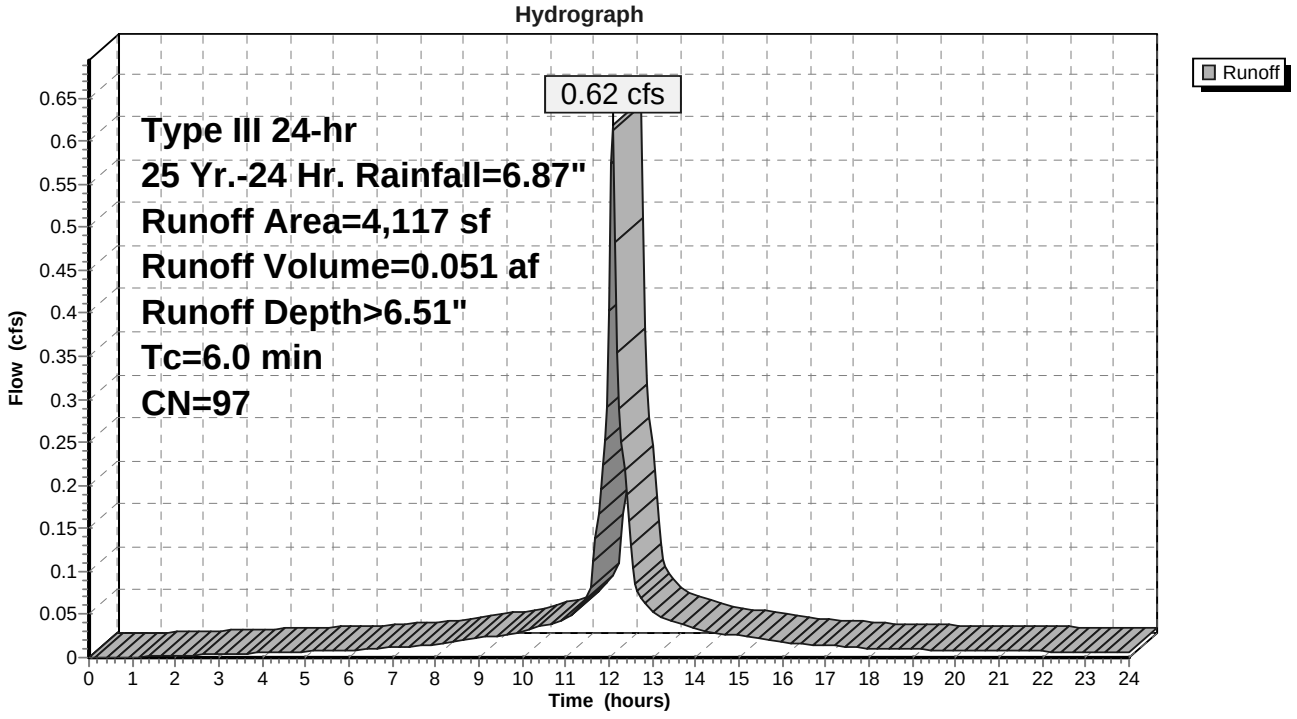
Runoff = 0.62 cfs @ 12.09 hrs, Volume= 0.051 af, Depth> 6.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
163	80	>75% Grass cover, Good, HSG D
1,387	98	Paved parking, HSG B
921	98	Paved parking, HSG C
1,646	98	Paved parking, HSG D
4,117	97	Weighted Average
163		3.96% Pervious Area
3,954		96.04% Impervious Area

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

Subcatchment 23S: Catch Basin #3



Summary for Subcatchment 24S: Catch Basin #4

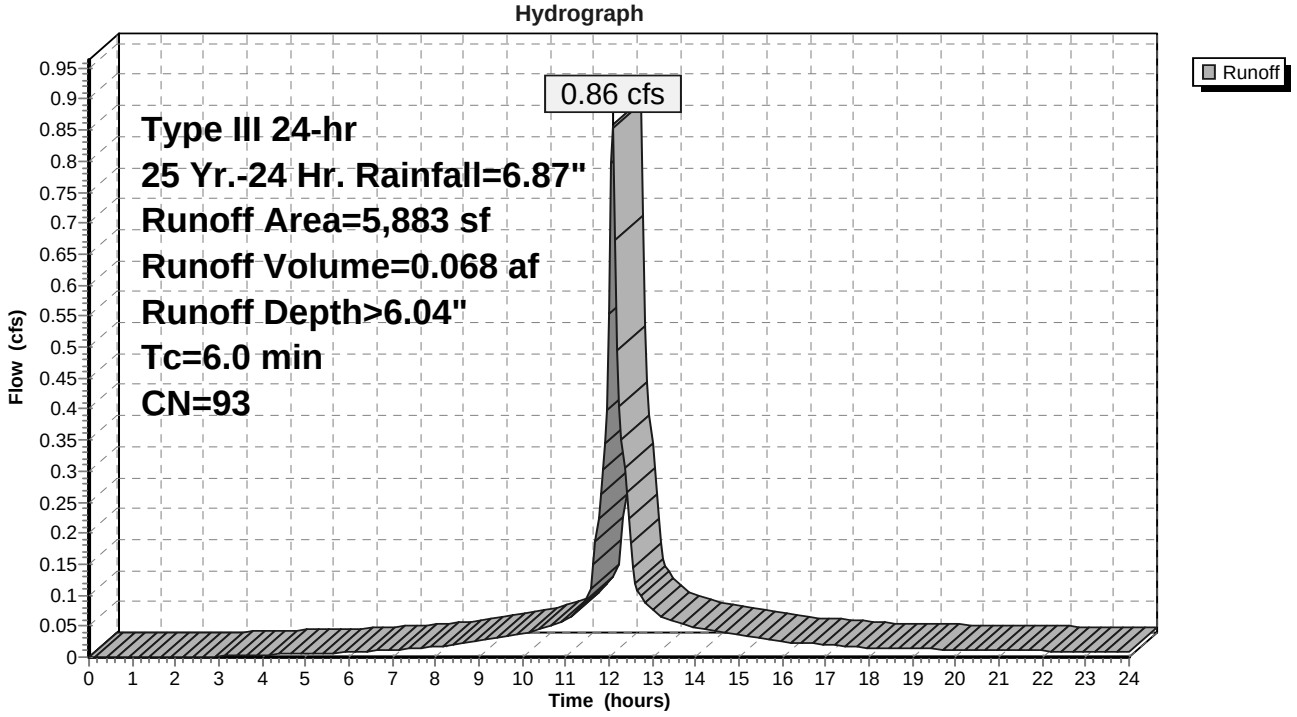
Runoff = 0.86 cfs @ 12.09 hrs, Volume= 0.068 af, Depth> 6.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
392	61	>75% Grass cover, Good, HSG B
915	80	>75% Grass cover, Good, HSG D
1,527	98	Paved parking, HSG B
1,028	98	Paved parking, HSG C
2,021	98	Paved parking, HSG D
5,883	93	Weighted Average
1,307		22.22% Pervious Area
4,576		77.78% Impervious Area

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

Subcatchment 24S: Catch Basin #4



Summary for Subcatchment 25S: Catch Basin #5

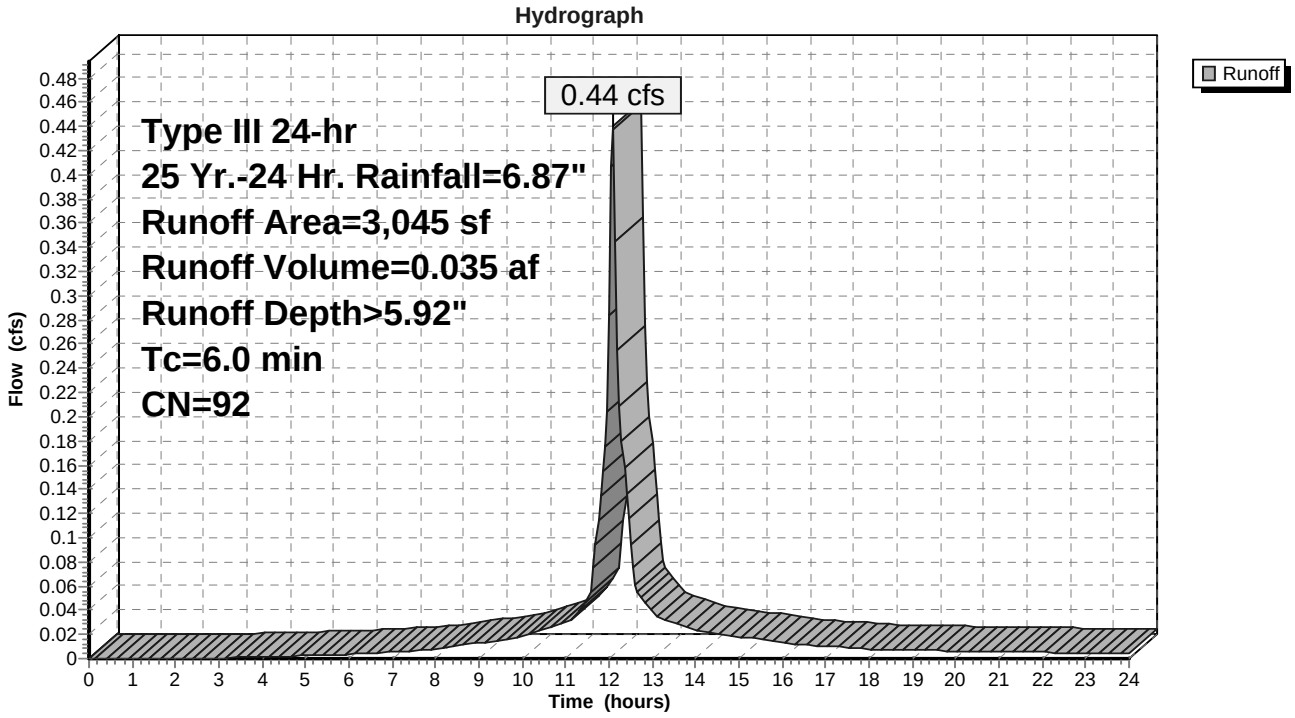
Runoff = 0.44 cfs @ 12.09 hrs, Volume= 0.035 af, Depth> 5.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
225	61	>75% Grass cover, Good, HSG B
524	80	>75% Grass cover, Good, HSG D
392	98	Paved parking, HSG B
912	98	Paved parking, HSG D
298	98	Roofs, HSG B
694	98	Roofs, HSG D
3,045	92	Weighted Average
749		24.60% Pervious Area
2,296		75.40% Impervious Area

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

Subcatchment 25S: Catch Basin #5



Summary for Subcatchment 26S: Catch Basin #6

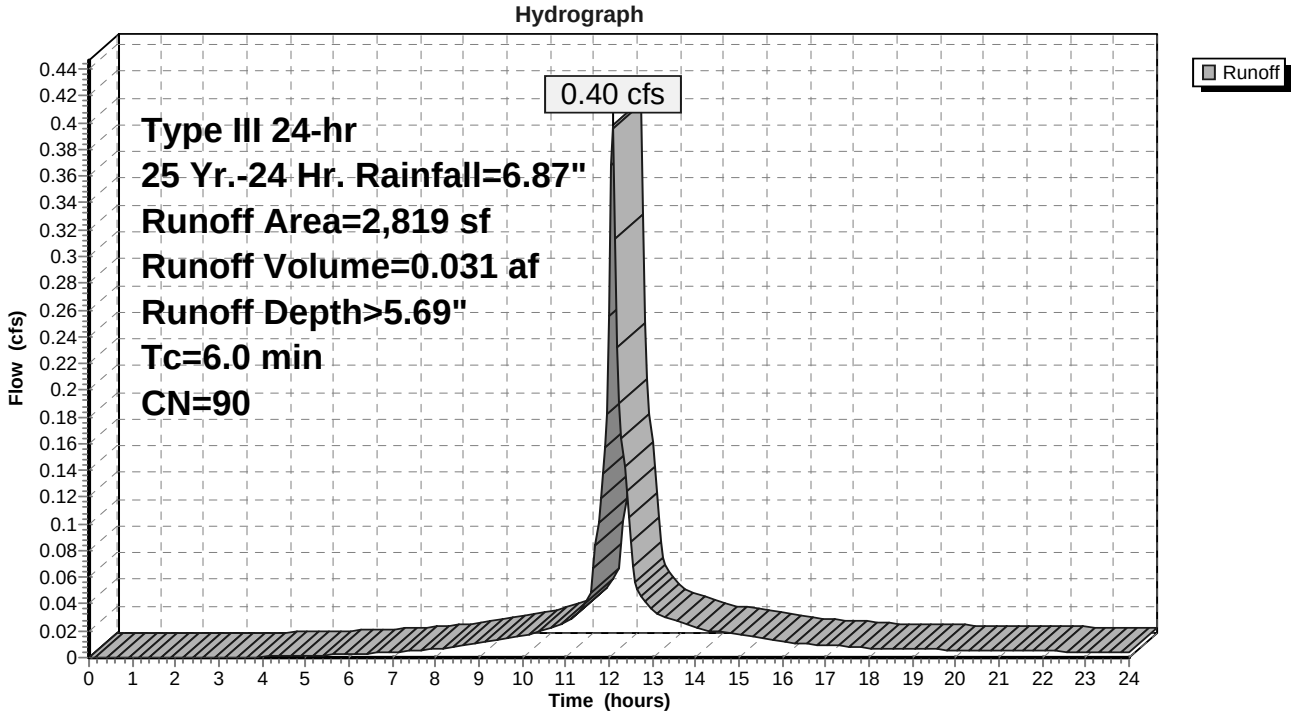
Runoff = 0.40 cfs @ 12.09 hrs, Volume= 0.031 af, Depth> 5.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
282	61	>75% Grass cover, Good, HSG B
657	80	>75% Grass cover, Good, HSG D
564	98	Paved parking, HSG B
1,316	98	Paved parking, HSG D
2,819	90	Weighted Average
939		33.31% Pervious Area
1,880		66.69% Impervious Area

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

Subcatchment 26S: Catch Basin #6



Summary for Subcatchment 27S: Catch Basin #7

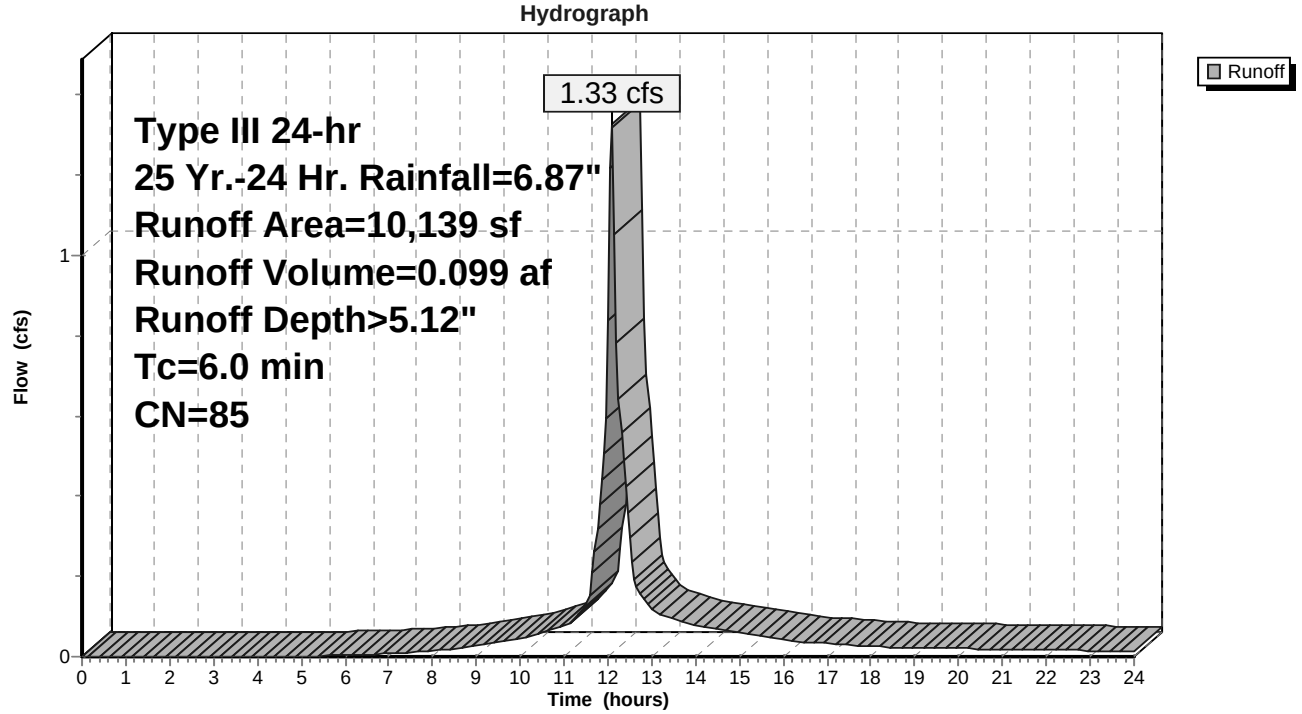
Runoff = 1.33 cfs @ 12.09 hrs, Volume= 0.099 af, Depth> 5.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
1,916	61	>75% Grass cover, Good, HSG B
999	74	>75% Grass cover, Good, HSG C
1,801	80	>75% Grass cover, Good, HSG D
826	98	Paved parking, HSG B
684	98	Paved parking, HSG C
1,928	98	Paved parking, HSG D
596	98	Roofs, HSG B
1,389	98	Roofs, HSG D
10,139	85	Weighted Average
4,716		46.51% Pervious Area
5,423		53.49% Impervious Area

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

Subcatchment 27S: Catch Basin #7



Summary for Subcatchment 28S: Catch Basin #8

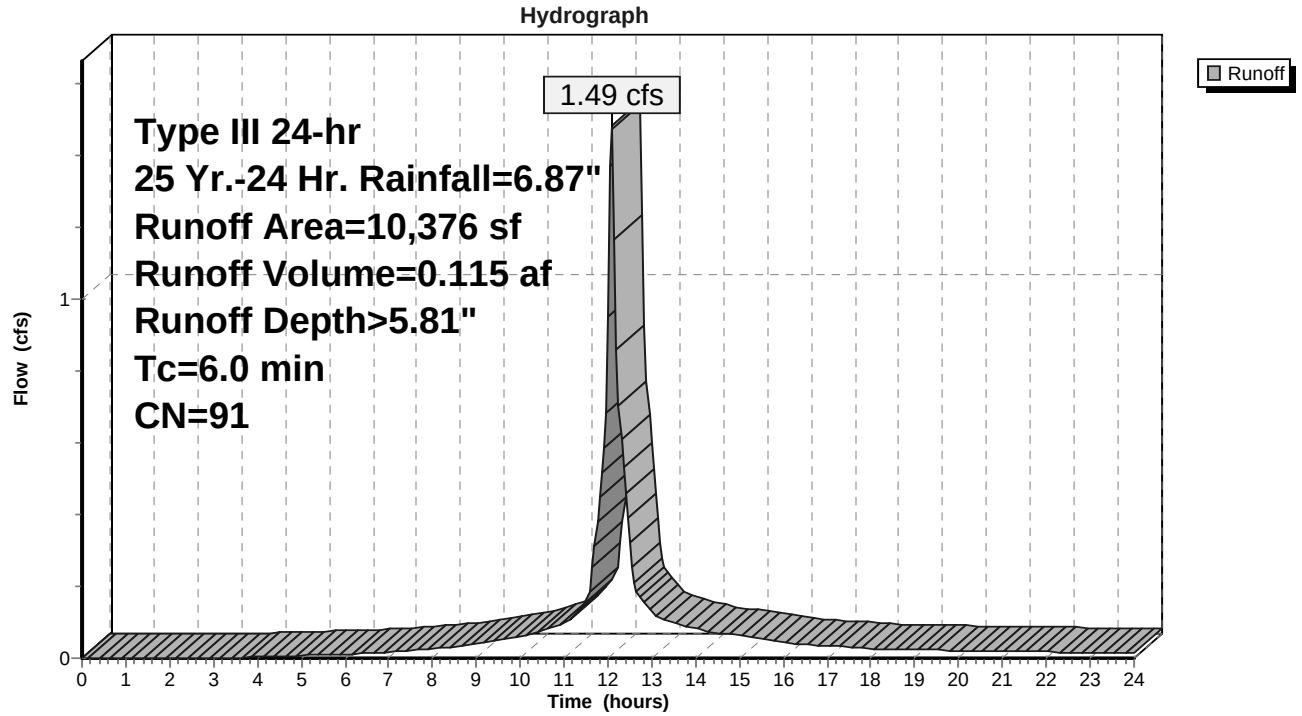
Runoff = 1.49 cfs @ 12.09 hrs, Volume= 0.115 af, Depth> 5.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
522	61	>75% Grass cover, Good, HSG B
1,184	74	>75% Grass cover, Good, HSG C
1,218	80	>75% Grass cover, Good, HSG D
897	98	Paved parking, HSG B
2,204	98	Paved parking, HSG C
2,092	98	Paved parking, HSG D
297	98	Roofs, HSG B
1,268	98	Roofs, HSG C
694	98	Roofs, HSG D
10,376	91	Weighted Average
2,924		28.18% Pervious Area
7,452		71.82% Impervious Area

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

Subcatchment 28S: Catch Basin #8



Summary for Subcatchment 29S: Catch Basin #9

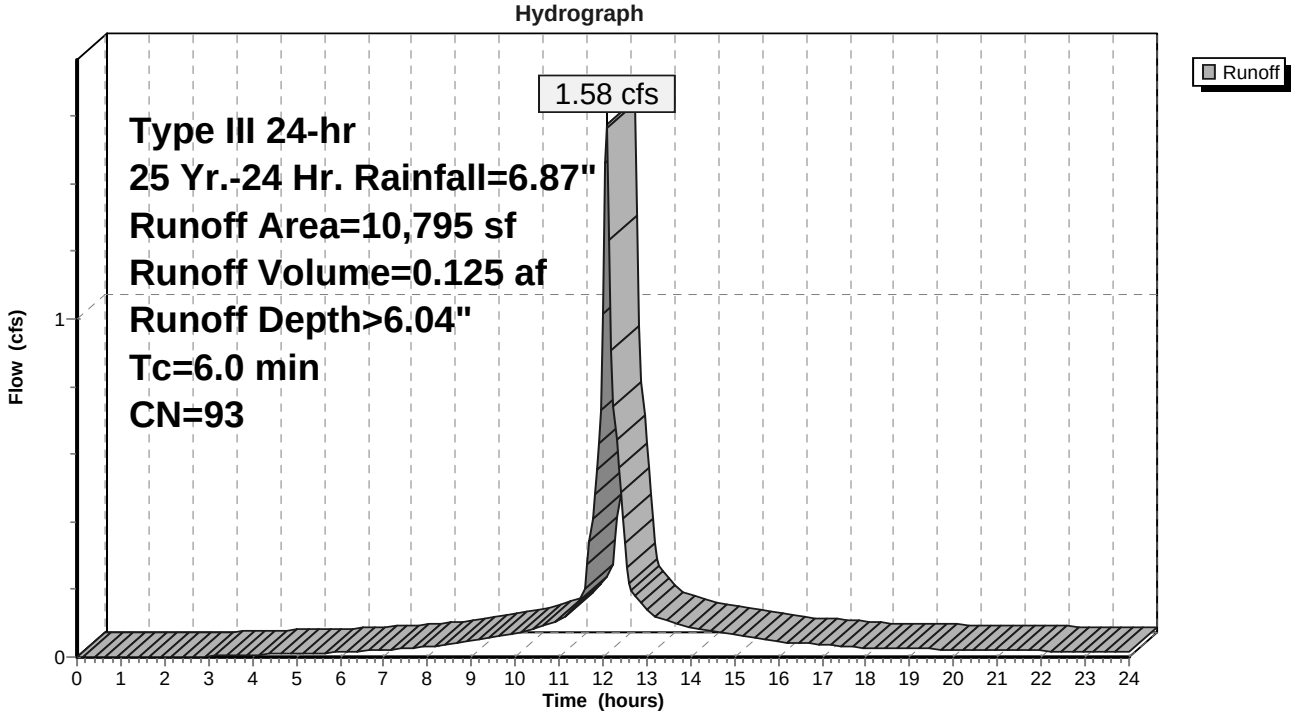
Runoff = 1.58 cfs @ 12.09 hrs, Volume= 0.125 af, Depth> 6.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
2,448	74	>75% Grass cover, Good, HSG C
6,087	98	Paved parking, HSG C
2,260	98	Roofs, HSG C
10,795	93	Weighted Average
2,448		22.68% Pervious Area
8,347		77.32% Impervious Area

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

Subcatchment 29S: Catch Basin #9



Summary for Subcatchment 30S: Catch Basin #10

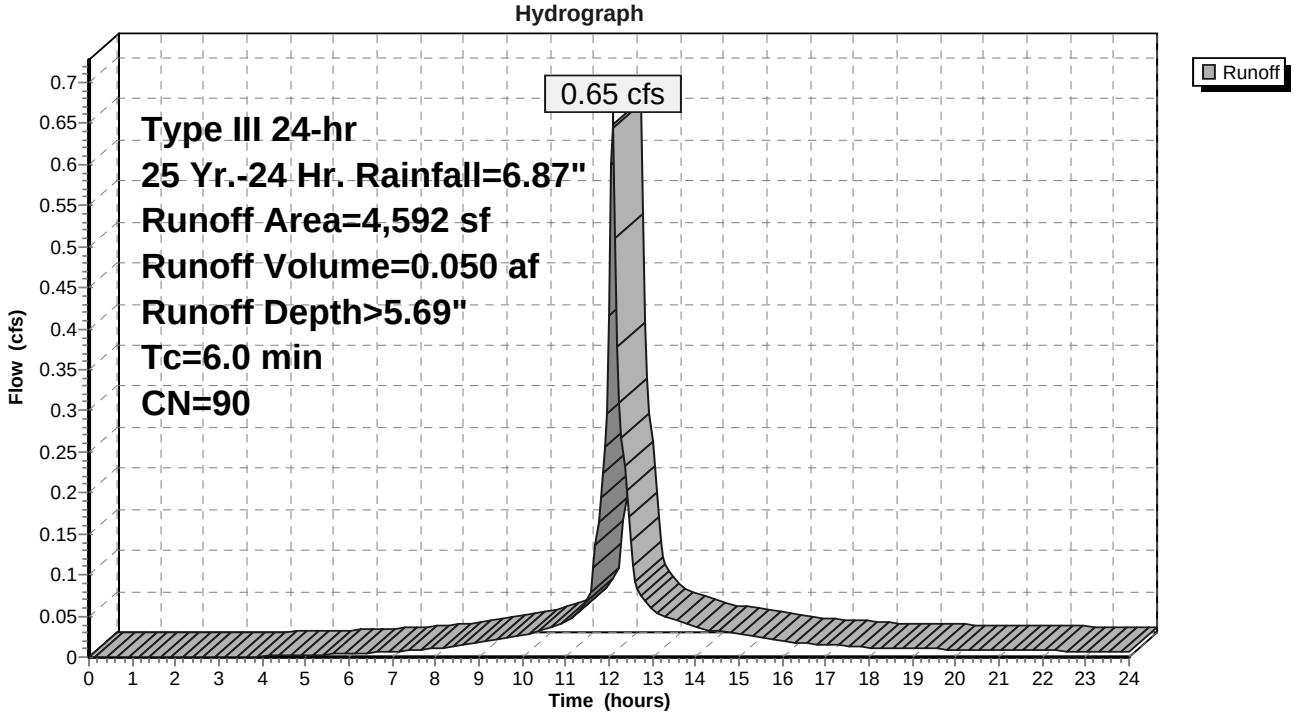
Runoff = 0.65 cfs @ 12.09 hrs, Volume= 0.050 af, Depth> 5.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
1,423	74	>75% Grass cover, Good, HSG C
2,699	98	Paved parking, HSG C
470	96	Gravel surface, HSG C
4,592	90	Weighted Average
1,893		41.22% Pervious Area
2,699		58.78% Impervious Area

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

Subcatchment 30S: Catch Basin #10



Summary for Subcatchment 31S: Catch Basin #11

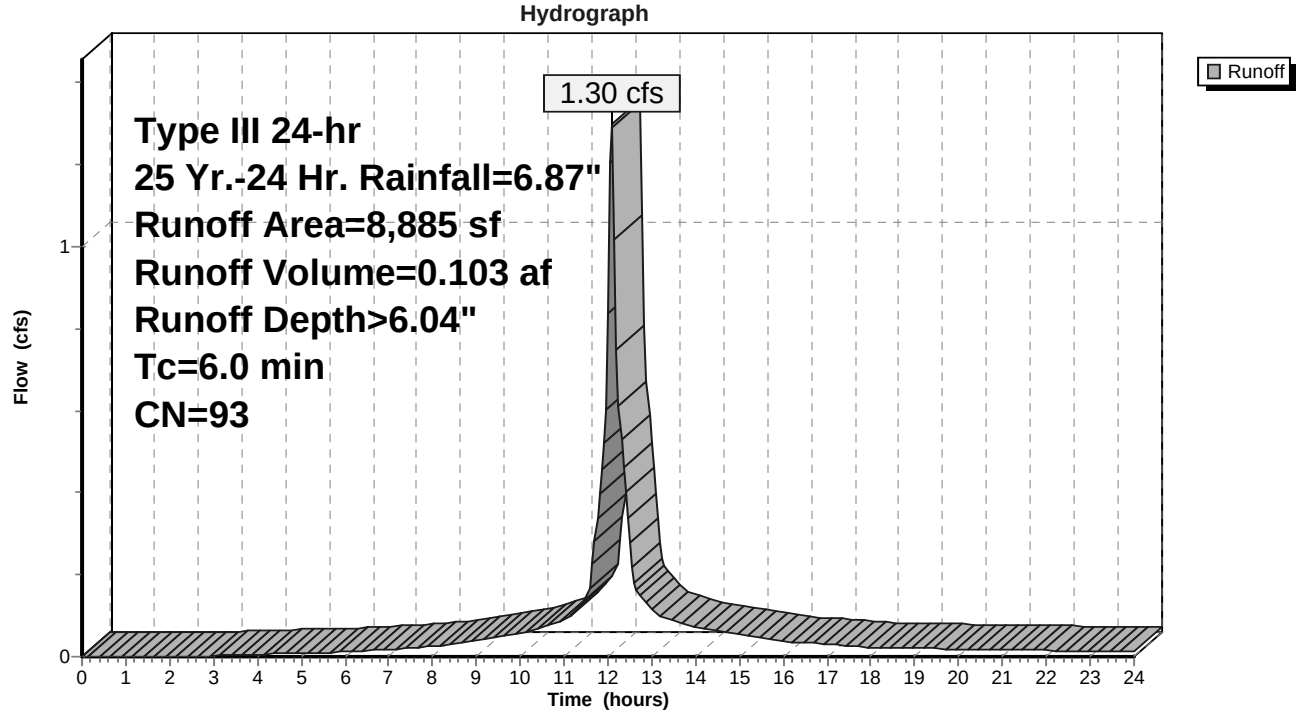
Runoff = 1.30 cfs @ 12.09 hrs, Volume= 0.103 af, Depth> 6.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
1,733	74	>75% Grass cover, Good, HSG C
300	80	>75% Grass cover, Good, HSG D
831	98	Paved parking, HSG B
2,380	98	Paved parking, HSG C
1,381	98	Paved parking, HSG D
212	98	Roofs, HSG B
1,554	98	Roofs, HSG C
494	98	Roofs, HSG D
8,885	93	Weighted Average
2,033		22.88% Pervious Area
6,852		77.12% Impervious Area

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

Subcatchment 31S: Catch Basin #11



Summary for Subcatchment 32S: Catch Basin #12

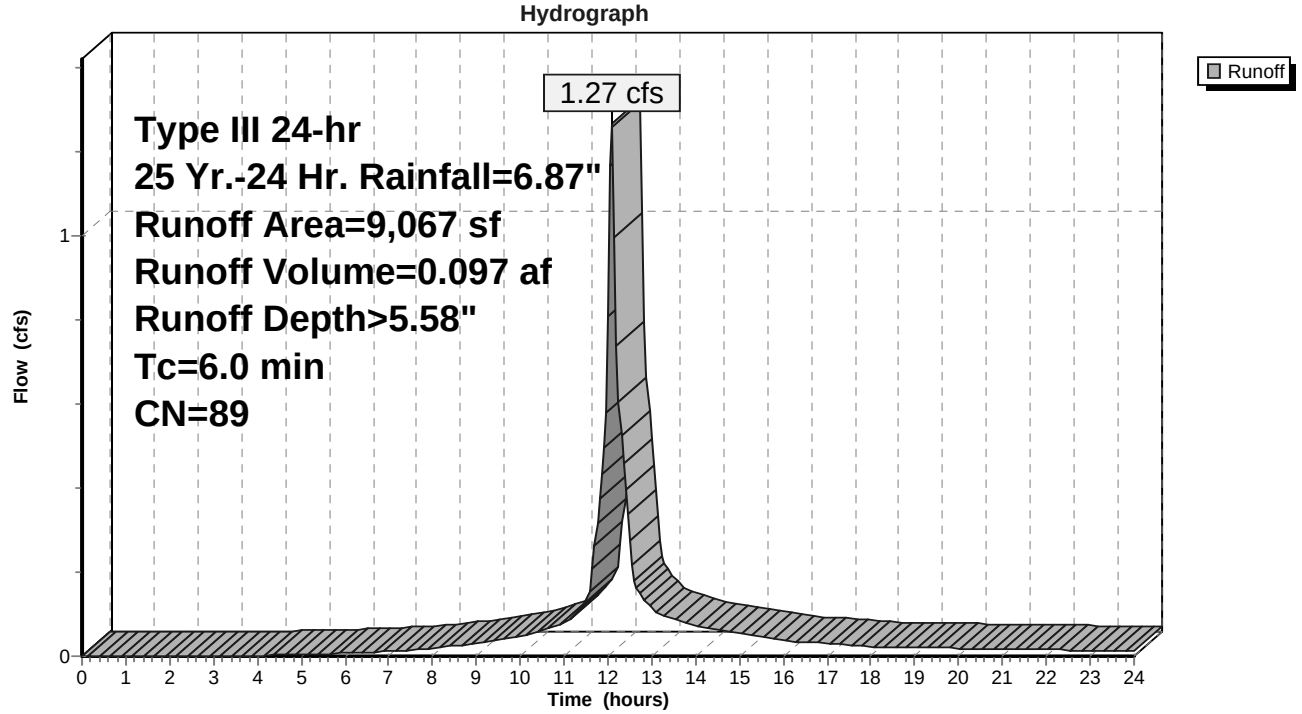
Runoff = 1.27 cfs @ 12.09 hrs, Volume= 0.097 af, Depth> 5.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
468	61	>75% Grass cover, Good, HSG B
1,743	74	>75% Grass cover, Good, HSG C
1,092	80	>75% Grass cover, Good, HSG D
438	98	Paved parking, HSG B
2,662	98	Paved parking, HSG C
1,022	98	Paved parking, HSG D
79	98	Roofs, HSG B
1,380	98	Roofs, HSG C
183	98	Roofs, HSG D
9,067	89	Weighted Average
3,303		36.43% Pervious Area
5,764		63.57% Impervious Area

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

Subcatchment 32S: Catch Basin #12



Summary for Subcatchment 33S: Catch Basin #13

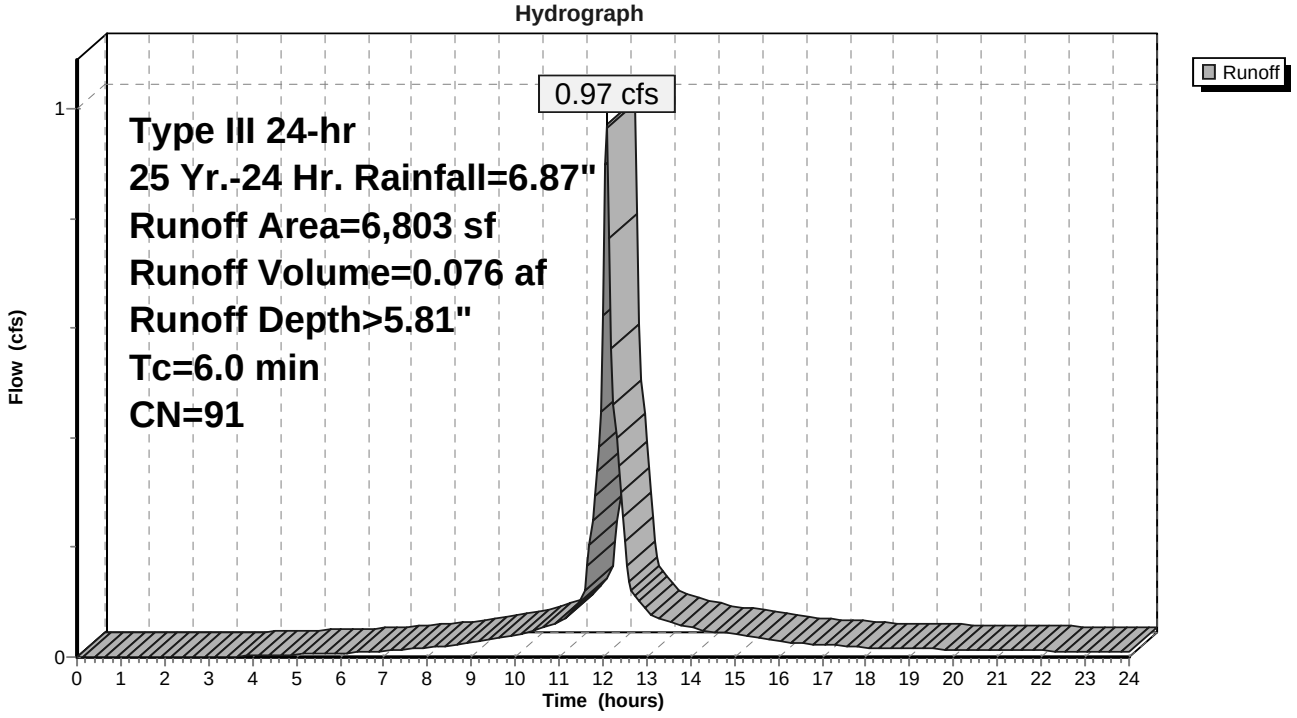
Runoff = 0.97 cfs @ 12.09 hrs, Volume= 0.076 af, Depth> 5.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
1,869	74	>75% Grass cover, Good, HSG C
2,734	98	Paved parking, HSG C
2,200	98	Roofs, HSG C
6,803	91	Weighted Average
1,869		27.47% Pervious Area
4,934		72.53% Impervious Area

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

Subcatchment 33S: Catch Basin #13



Summary for Subcatchment 34S: Catch Basin #14

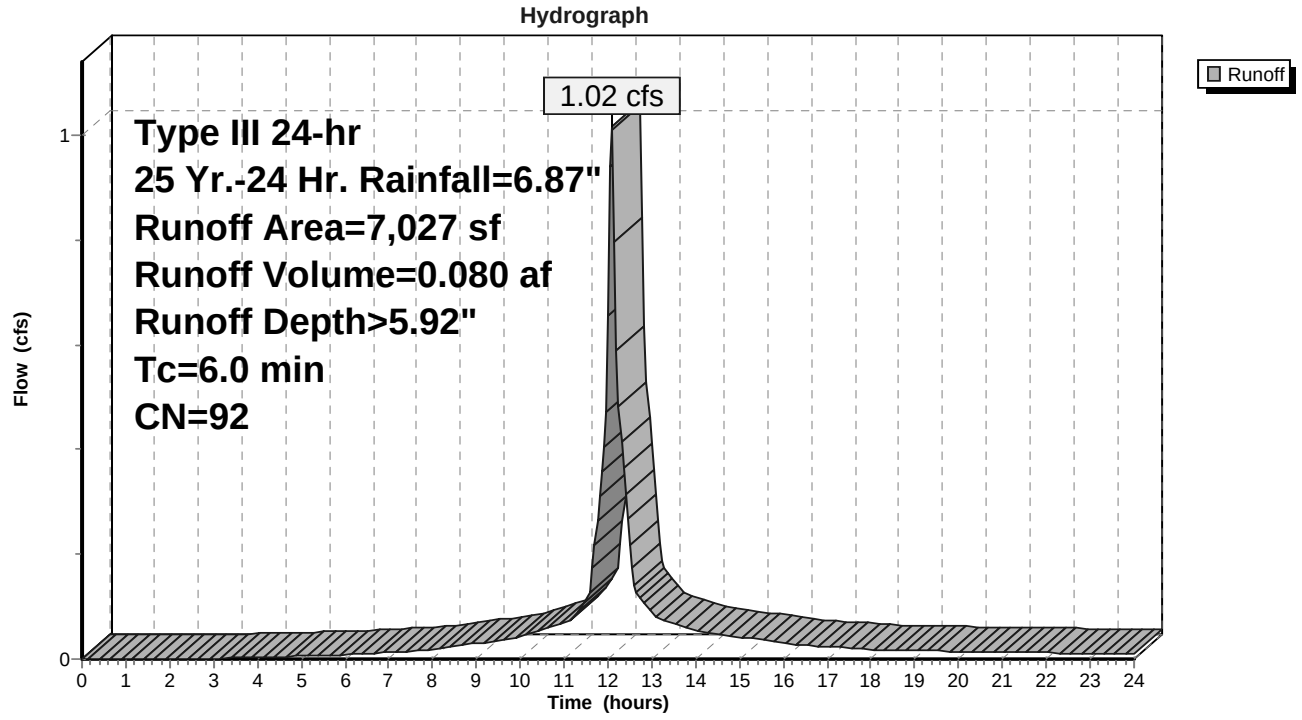
Runoff = 1.02 cfs @ 12.09 hrs, Volume= 0.080 af, Depth> 5.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
1,757	74	>75% Grass cover, Good, HSG C
3,385	98	Paved parking, HSG C
1,885	98	Roofs, HSG C
7,027	92	Weighted Average
1,757		25.00% Pervious Area
5,270		75.00% Impervious Area

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

Subcatchment 34S: Catch Basin #14



Summary for Subcatchment 35S: Catch Basin #15

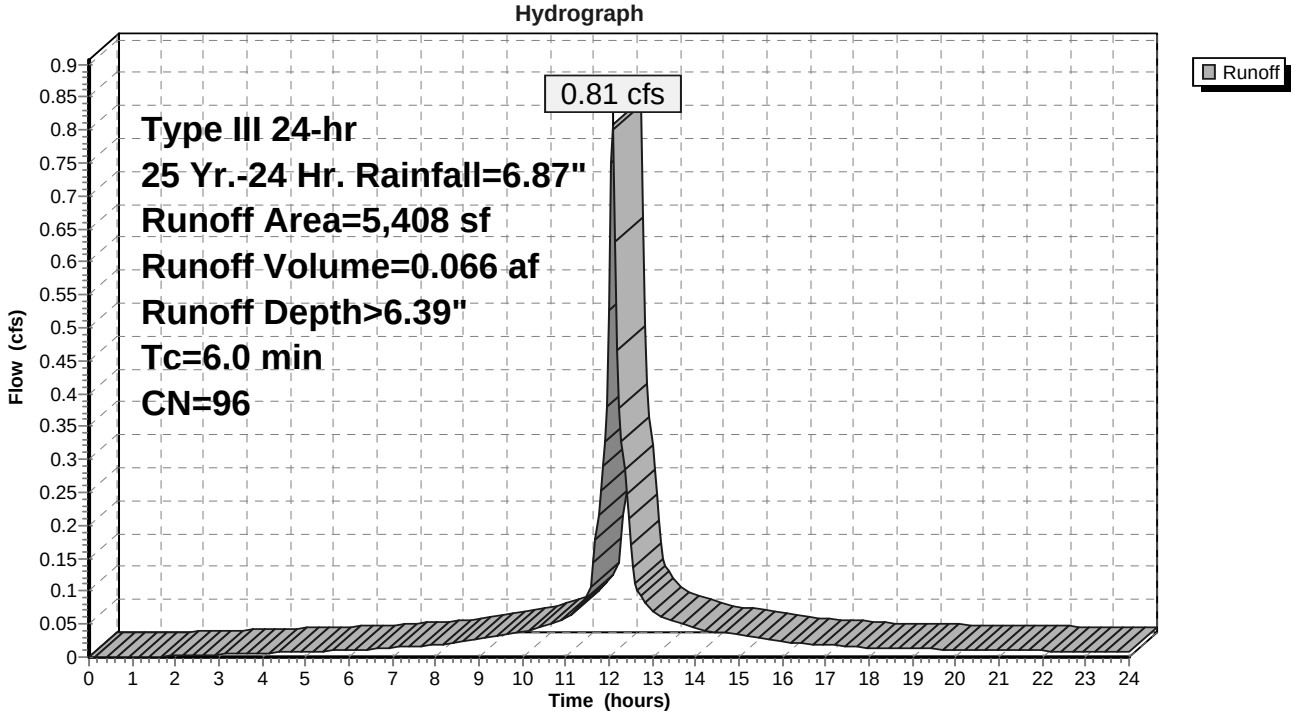
Runoff = 0.81 cfs @ 12.09 hrs, Volume= 0.066 af, Depth> 6.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
429	74	>75% Grass cover, Good, HSG C
4,429	98	Paved parking, HSG C
550	98	Roofs, HSG C
5,408	96	Weighted Average
429		7.93% Pervious Area
4,979		92.07% Impervious Area

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

Subcatchment 35S: Catch Basin #15



Summary for Subcatchment 36S: Catch Basin #16

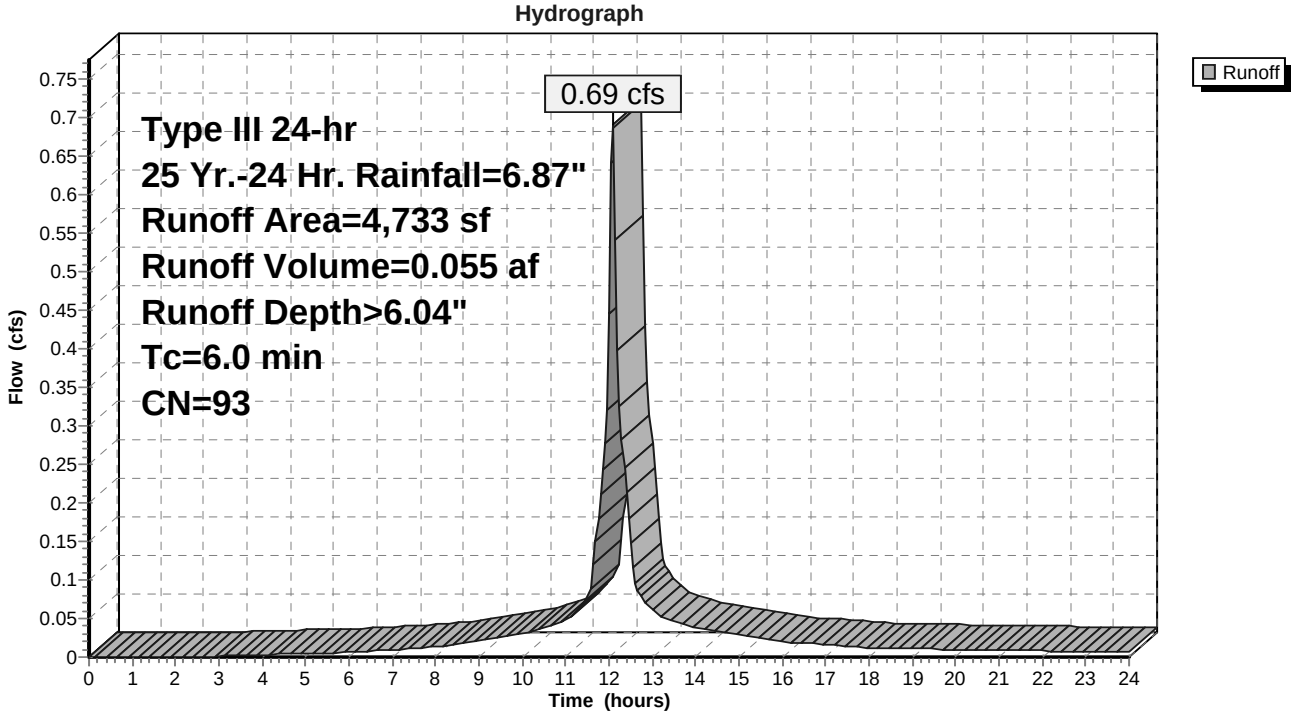
Runoff = 0.69 cfs @ 12.09 hrs, Volume= 0.055 af, Depth> 6.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
2,768	98	Paved parking, HSG C
896	74	>75% Grass cover, Good, HSG C
1,069	98	Roofs, HSG C
4,733	93	Weighted Average
896		18.93% Pervious Area
3,837		81.07% Impervious Area

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

Subcatchment 36S: Catch Basin #16



Summary for Subcatchment 37S: Catch Basin #17

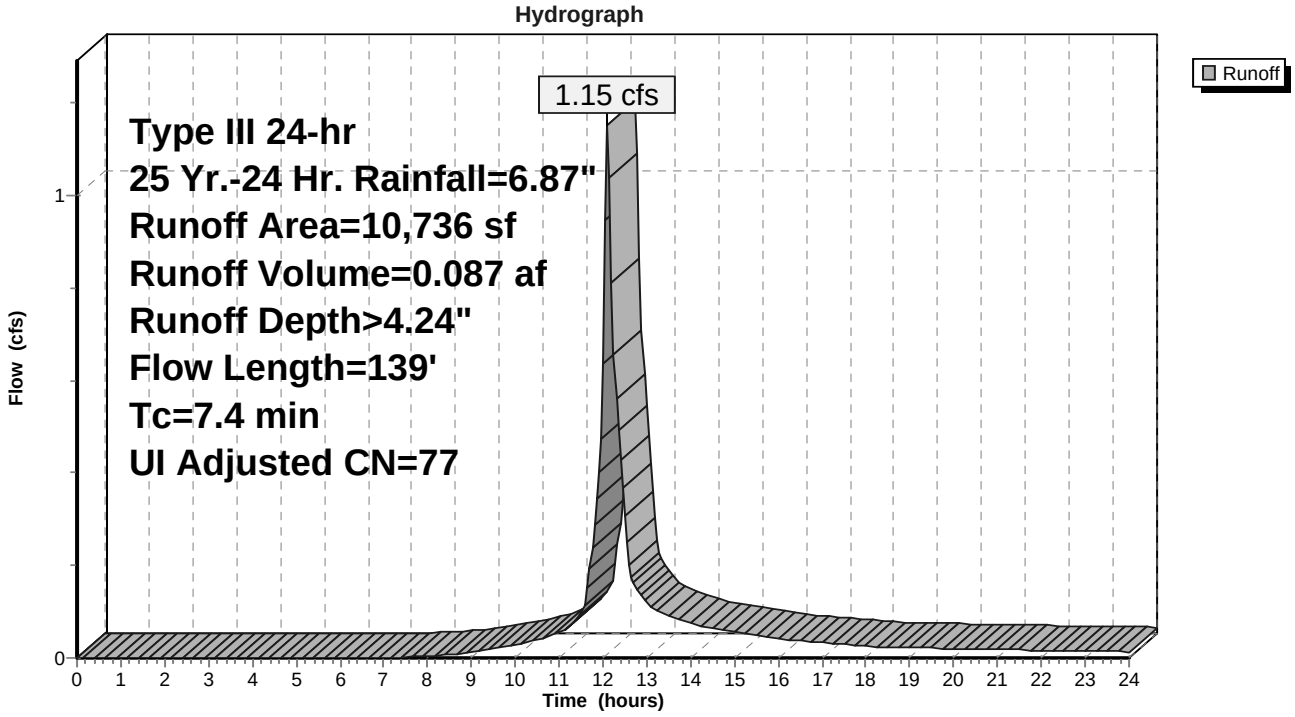
Runoff = 1.15 cfs @ 12.11 hrs, Volume= 0.087 af, Depth> 4.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Adj	Description
7,888	74		>75% Grass cover, Good, HSG C
2,778	98		Unconnected roofs, HSG C
70	98		Paved parking, HSG C
10,736	80	77	Weighted Average, UI Adjusted
7,888			73.47% Pervious Area
2,848			26.53% Impervious Area
2,778			97.54% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.0425	0.24		**Sheet Flow, Segment #1** Grass: Short n= 0.150 P2= 3.61"
0.6	39	0.0280	1.17		**Shallow Concentrated Flow, Segment #2** Short Grass Pasture Kv= 7.0 fps
7.4	139	Total			

Subcatchment 37S: Catch Basin #17



Summary for Subcatchment 38S: Catch Basin #18

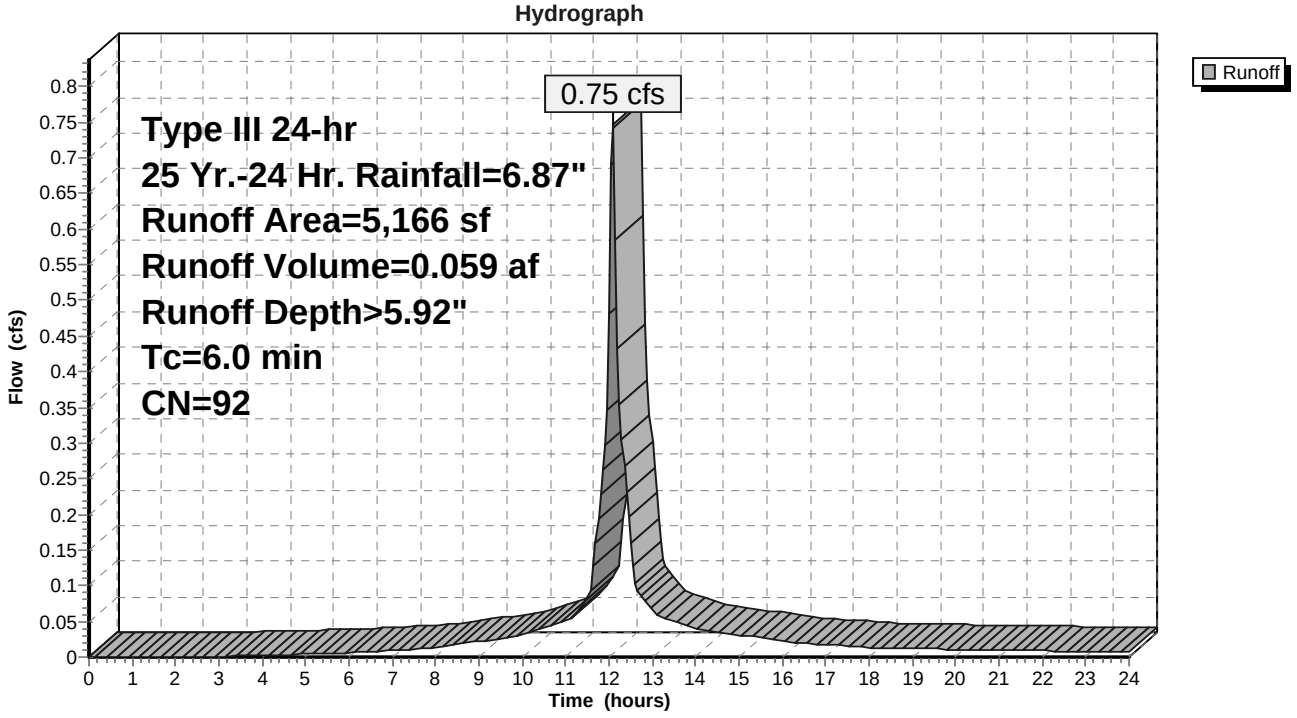
Runoff = 0.75 cfs @ 12.09 hrs, Volume= 0.059 af, Depth> 5.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
1,308	74	>75% Grass cover, Good, HSG C
2,866	98	Paved parking, HSG C
992	98	Roofs, HSG C
5,166	92	Weighted Average
1,308		25.32% Pervious Area
3,858		74.68% Impervious Area

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

Subcatchment 38S: Catch Basin #18



Summary for Subcatchment 39S: Catch Basin #19

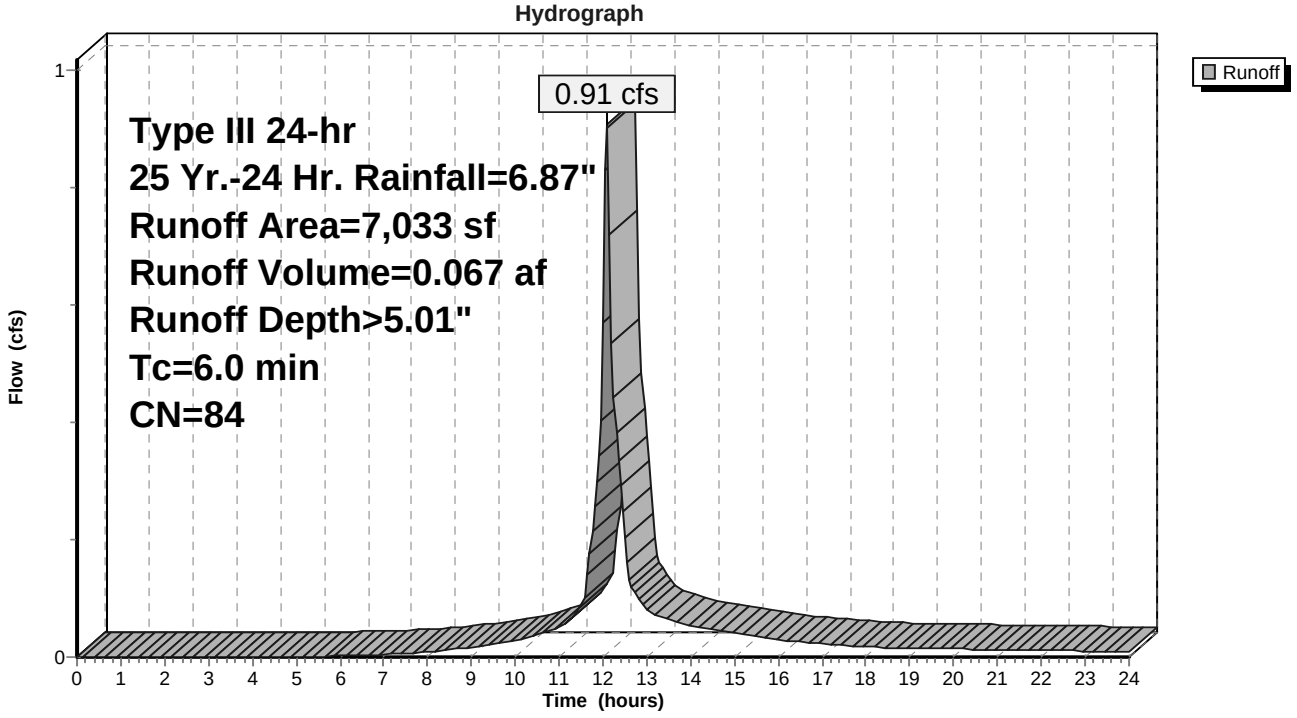
Runoff = 0.91 cfs @ 12.09 hrs, Volume= 0.067 af, Depth> 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
4,105	74	>75% Grass cover, Good, HSG C
2,486	98	Paved parking, HSG C
442	98	Roofs, HSG C
7,033	84	Weighted Average
4,105		58.37% Pervious Area
2,928		41.63% Impervious Area

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

Subcatchment 39S: Catch Basin #19



Summary for Subcatchment 40S: Catch Basin #20

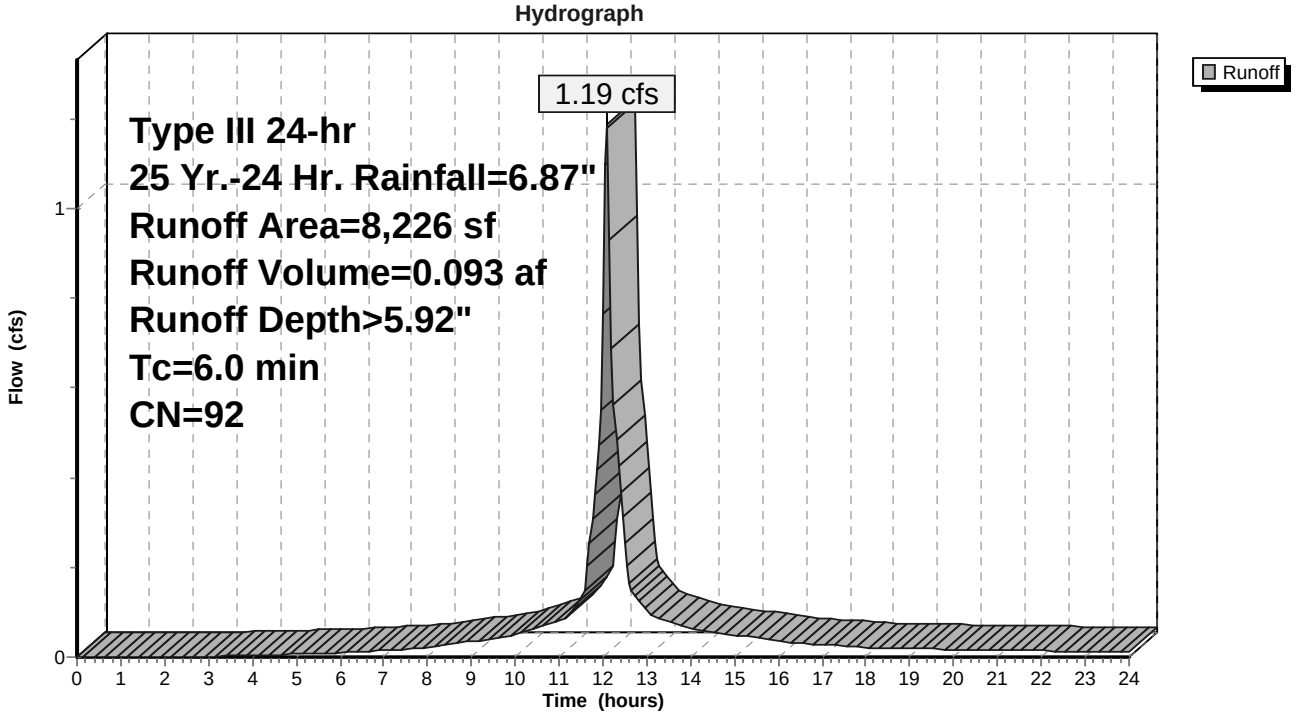
Runoff = 1.19 cfs @ 12.09 hrs, Volume= 0.093 af, Depth> 5.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
2,151	74	>75% Grass cover, Good, HSG C
4,091	98	Paved parking, HSG C
1,984	98	Roofs, HSG C
8,226	92	Weighted Average
2,151		26.15% Pervious Area
6,075		73.85% Impervious Area

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

Subcatchment 40S: Catch Basin #20



Summary for Subcatchment 41S: Catch Basin #21

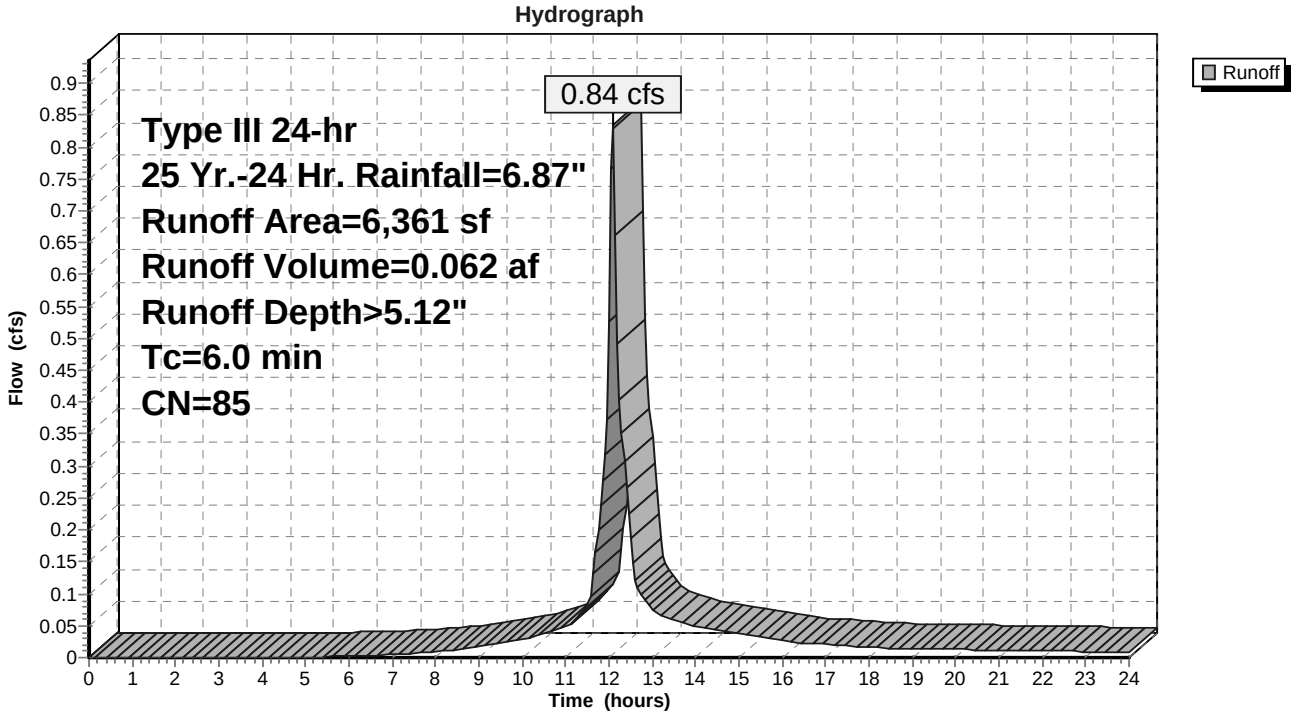
Runoff = 0.84 cfs @ 12.09 hrs, Volume= 0.062 af, Depth> 5.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
2,718	74	>75% Grass cover, Good, HSG C
2,790	98	Paved parking, HSG C
275	98	Roofs, HSG C
578	70	Woods, Good, HSG C
6,361	85	Weighted Average
3,296		51.82% Pervious Area
3,065		48.18% Impervious Area

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

Subcatchment 41S: Catch Basin #21



Summary for Subcatchment 42S: Catch Basin #22

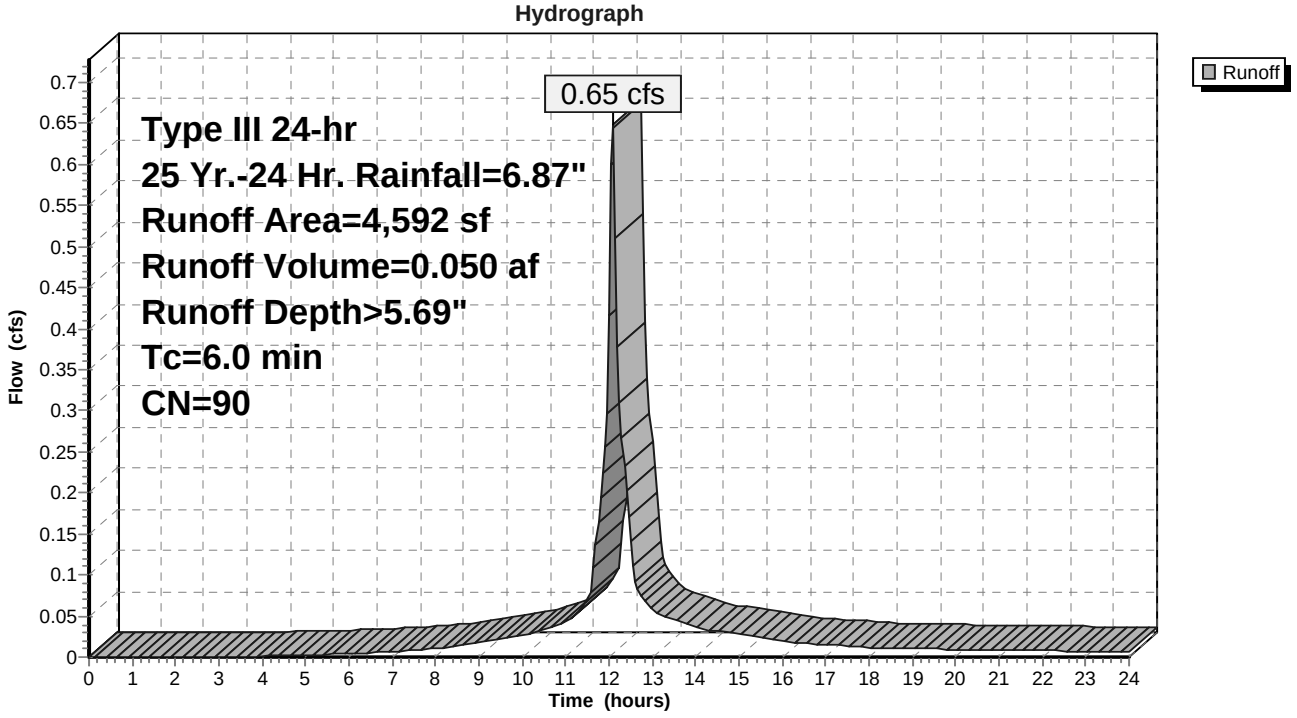
Runoff = 0.65 cfs @ 12.09 hrs, Volume= 0.050 af, Depth> 5.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
1,423	74	>75% Grass cover, Good, HSG C
2,699	98	Paved parking, HSG C
470	96	Gravel surface, HSG C
4,592	90	Weighted Average
1,893		41.22% Pervious Area
2,699		58.78% Impervious Area

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

Subcatchment 42S: Catch Basin #22



Summary for Subcatchment 43S: Catch Basin #23

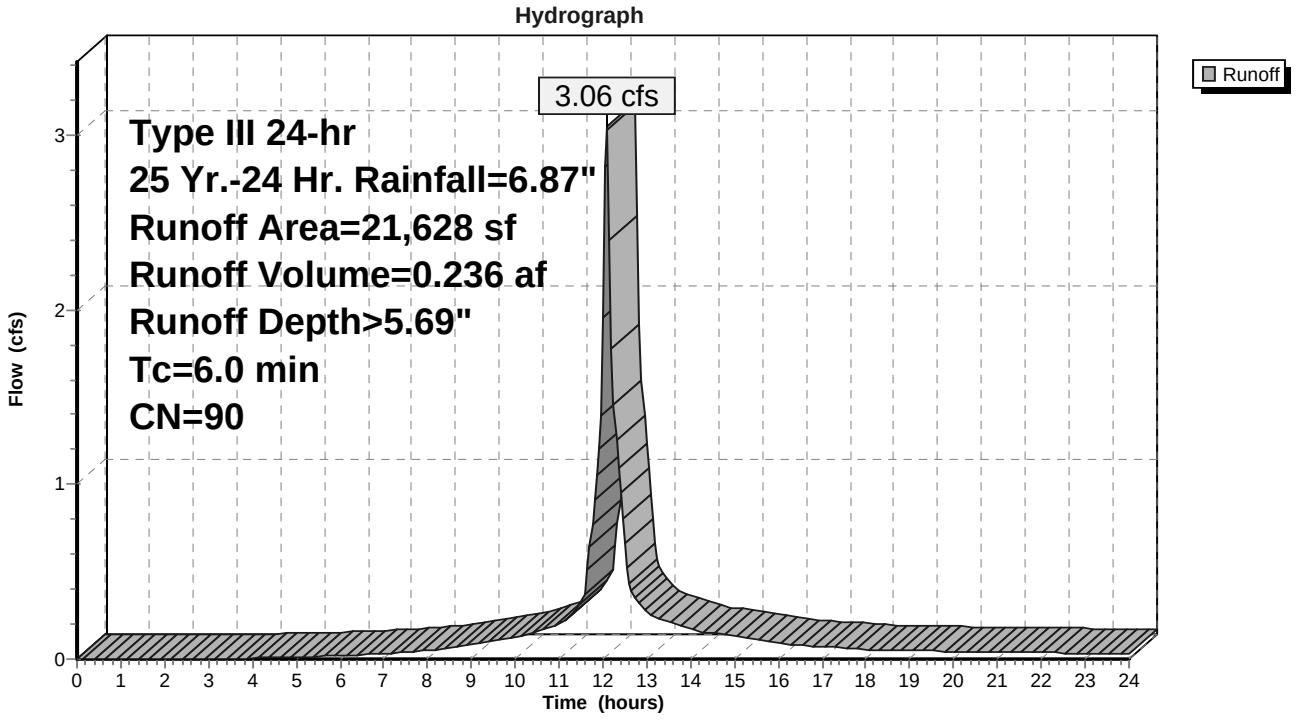
Runoff = 3.06 cfs @ 12.09 hrs, Volume= 0.236 af, Depth> 5.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
7,610	74	>75% Grass cover, Good, HSG C
8,889	98	Paved parking, HSG C
5,129	98	Roofs, HSG C
21,628	90	Weighted Average
7,610		35.19% Pervious Area
14,018		64.81% Impervious Area

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

Subcatchment 43S: Catch Basin #23



Summary for Subcatchment 44S: Catch Basin #24

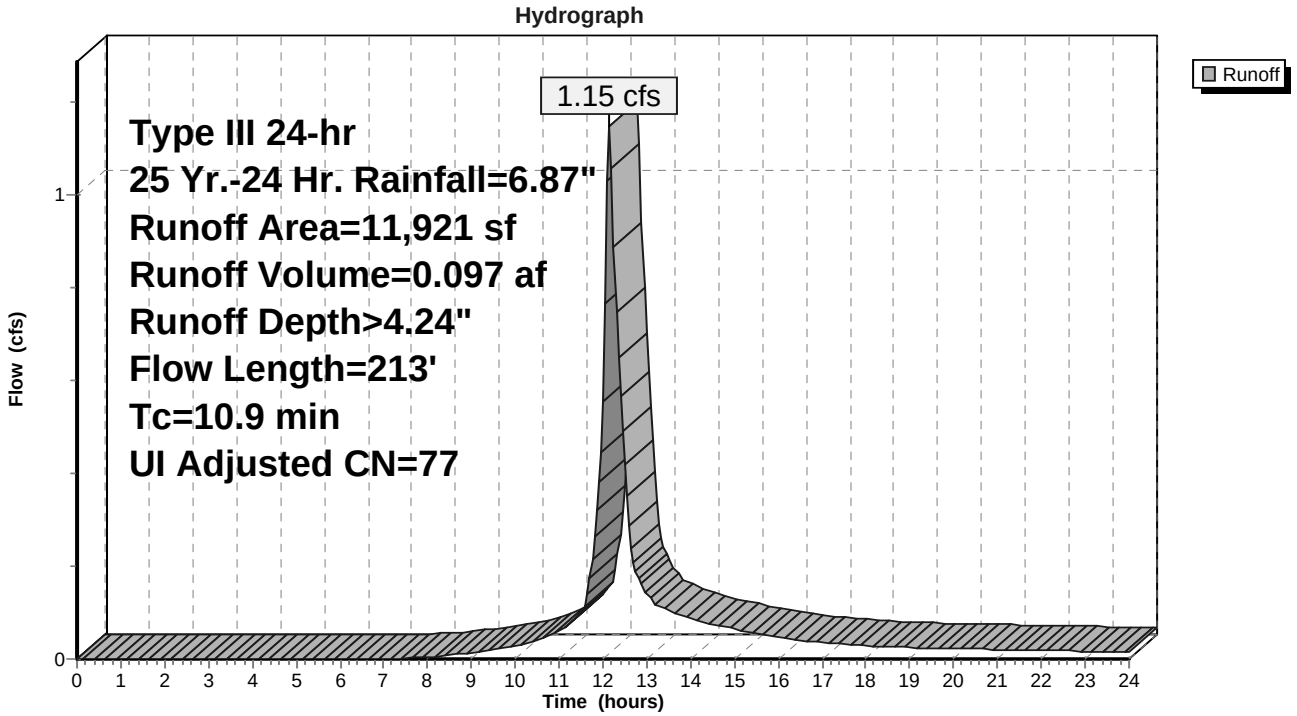
Runoff = 1.15 cfs @ 12.15 hrs, Volume= 0.097 af, Depth> 4.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Adj	Description
9,033	74		>75% Grass cover, Good, HSG C
110	98		Paved parking, HSG C
2,778	98		Unconnected roofs, HSG C
11,921	80	77	Weighted Average, UI Adjusted
9,033			75.77% Pervious Area
2,888			24.23% Impervious Area
2,778			96.19% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0200	0.18		**Sheet Flow, Segment #1** Grass: Short n= 0.150 P2= 3.61"
0.0	3	0.3300	4.02		**Shallow Concentrated Flow, Segment #2** Short Grass Pasture Kv= 7.0 fps
1.7	110	0.0230	1.06		**Shallow Concentrated Flow, Segment #3** Short Grass Pasture Kv= 7.0 fps
10.9	213	Total			

Subcatchment 44S: Catch Basin #24



Summary for Subcatchment 45S: Catch Basin #25

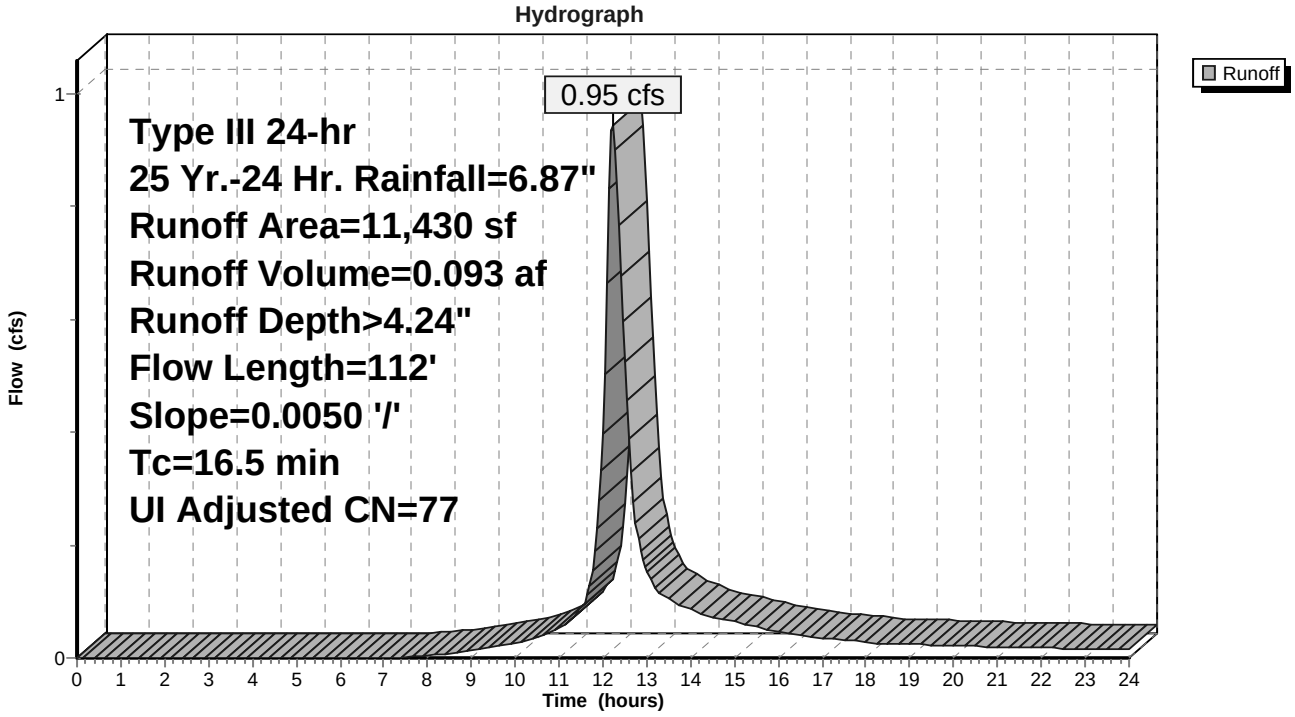
Runoff = 0.95 cfs @ 12.23 hrs, Volume= 0.093 af, Depth> 4.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Adj	Description
8,344	74		>75% Grass cover, Good, HSG C
2,778	98		Unconnected roofs, HSG C
308	70		Woods, Good, HSG C
11,430	80	77	Weighted Average, UI Adjusted
8,652			75.70% Pervious Area
2,778			24.30% Impervious Area
2,778			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	100	0.0050	0.10		**Sheet Flow, Segment #1** Grass: Short n= 0.150 P2= 3.61"
0.4	12	0.0050	0.49		**Shallow Concentrated Flow, Segment #2** Short Grass Pasture Kv= 7.0 fps
16.5	112	Total			

Subcatchment 45S: Catch Basin #25



Summary for Subcatchment 71S: Gravel Wetland #101

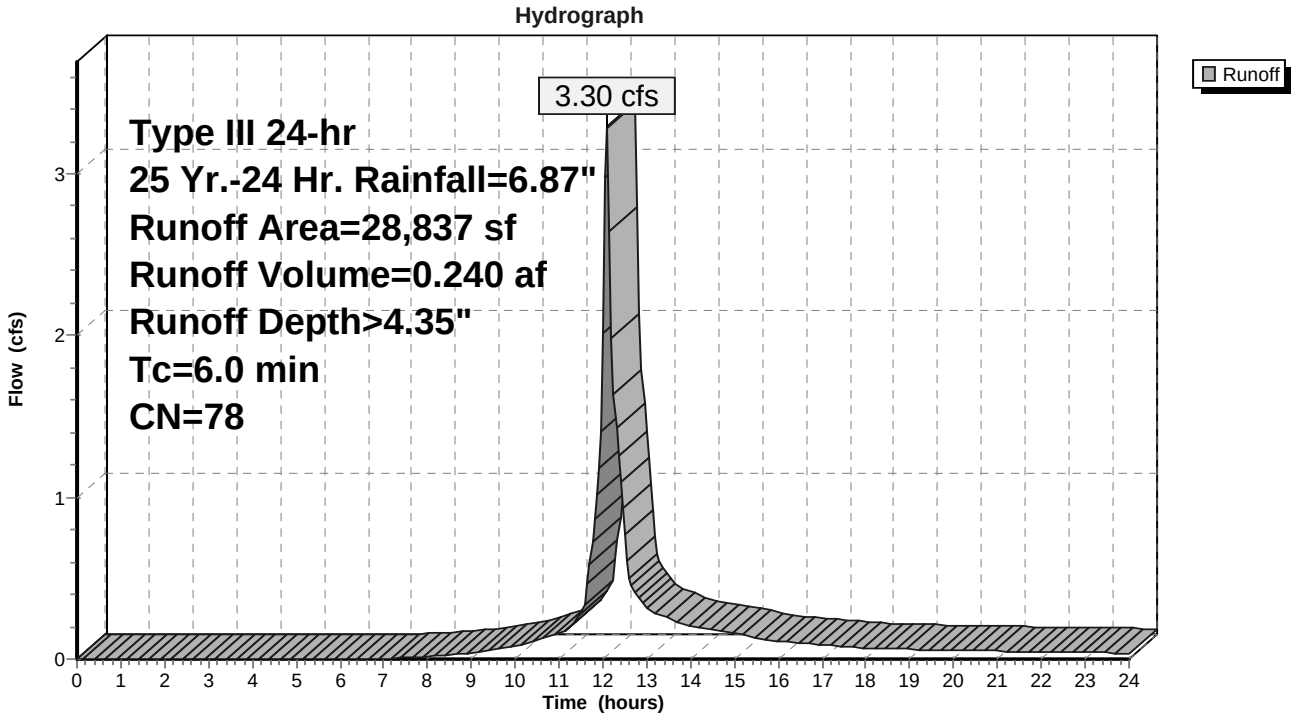
Runoff = 3.30 cfs @ 12.09 hrs, Volume= 0.240 af, Depth> 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
23,842	74	>75% Grass cover, Good, HSG C
14	98	Paved parking, HSG C
4,981	98	Roofs, HSG C
28,837	78	Weighted Average
23,842		82.68% Pervious Area
4,995		17.32% Impervious Area

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

Subcatchment 71S: Gravel Wetland #101



Summary for Subcatchment 72S: Gravel Wetland #102

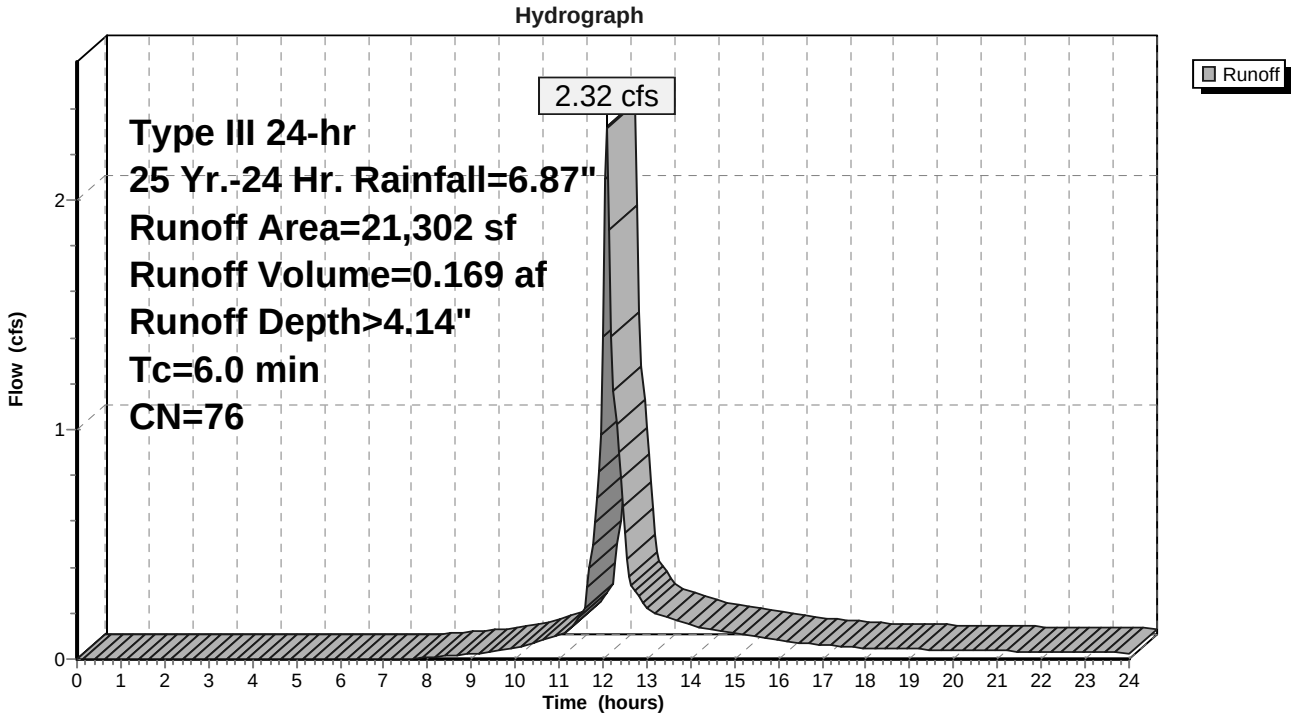
Runoff = 2.32 cfs @ 12.09 hrs, Volume= 0.169 af, Depth> 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
19,305	74	>75% Grass cover, Good, HSG C
57	98	Paved parking, HSG C
1,940	98	Roofs, HSG C
21,302	76	Weighted Average
19,305		90.63% Pervious Area
1,997		9.37% Impervious Area

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

Subcatchment 72S: Gravel Wetland #102



Summary for Subcatchment 73S: Gravel Wetland #103

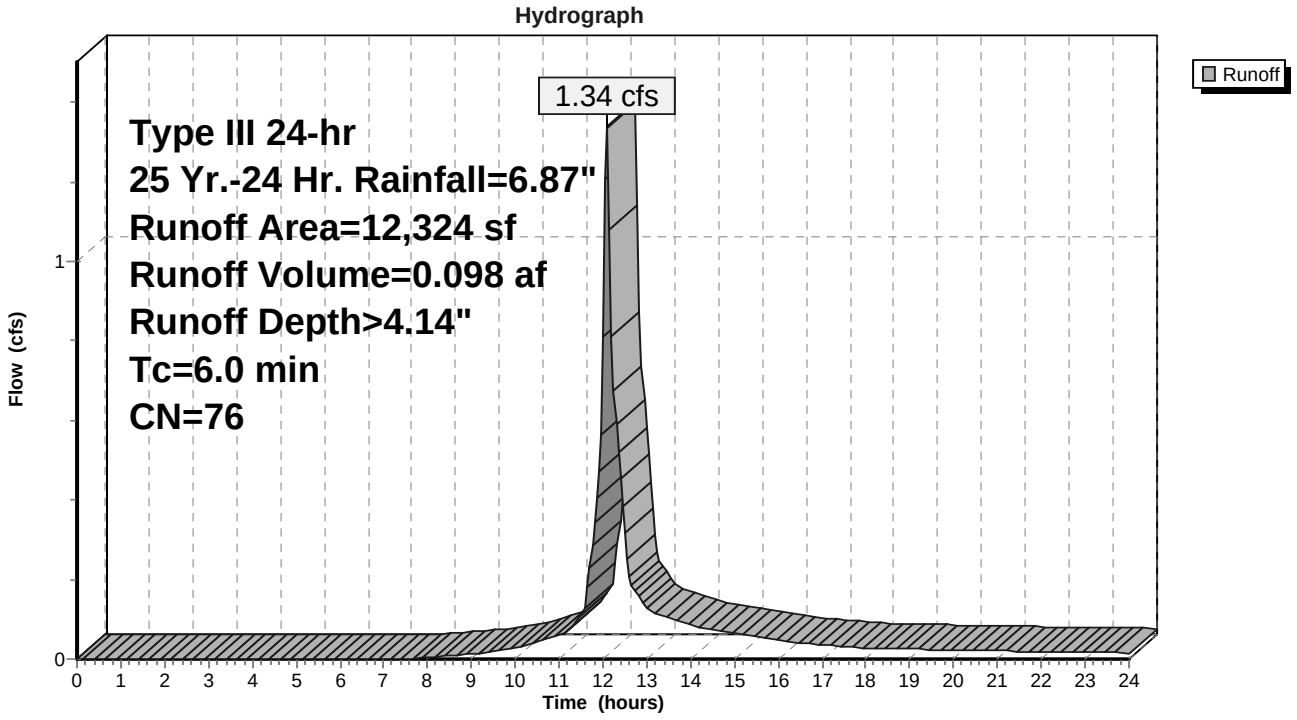
Runoff = 1.34 cfs @ 12.09 hrs, Volume= 0.098 af, Depth> 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
11,212	74	>75% Grass cover, Good, HSG C
33	98	Paved parking, HSG C
1,079	98	Roofs, HSG C
12,324	76	Weighted Average
11,212		90.98% Pervious Area
1,112		9.02% Impervious Area

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

Subcatchment 73S: Gravel Wetland #103



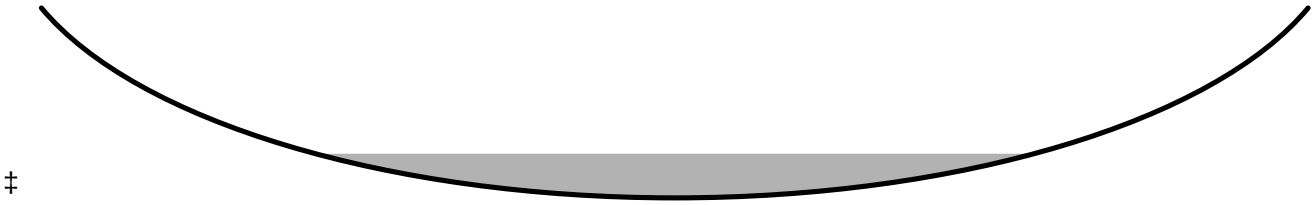
Summary for Reach 1aR: Flow from Culvert to Stream

Inflow Area = 0.203 ac, 63.62% Impervious, Inflow Depth > 5.33" for 25 Yr.-24 Hr. event
Inflow = 1.16 cfs @ 12.09 hrs, Volume= 0.090 af
Outflow = 0.96 cfs @ 12.15 hrs, Volume= 0.090 af, Atten= 17%, Lag= 3.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.73 fps, Min. Travel Time= 6.3 min
Avg. Velocity = 0.57 fps, Avg. Travel Time= 19.1 min

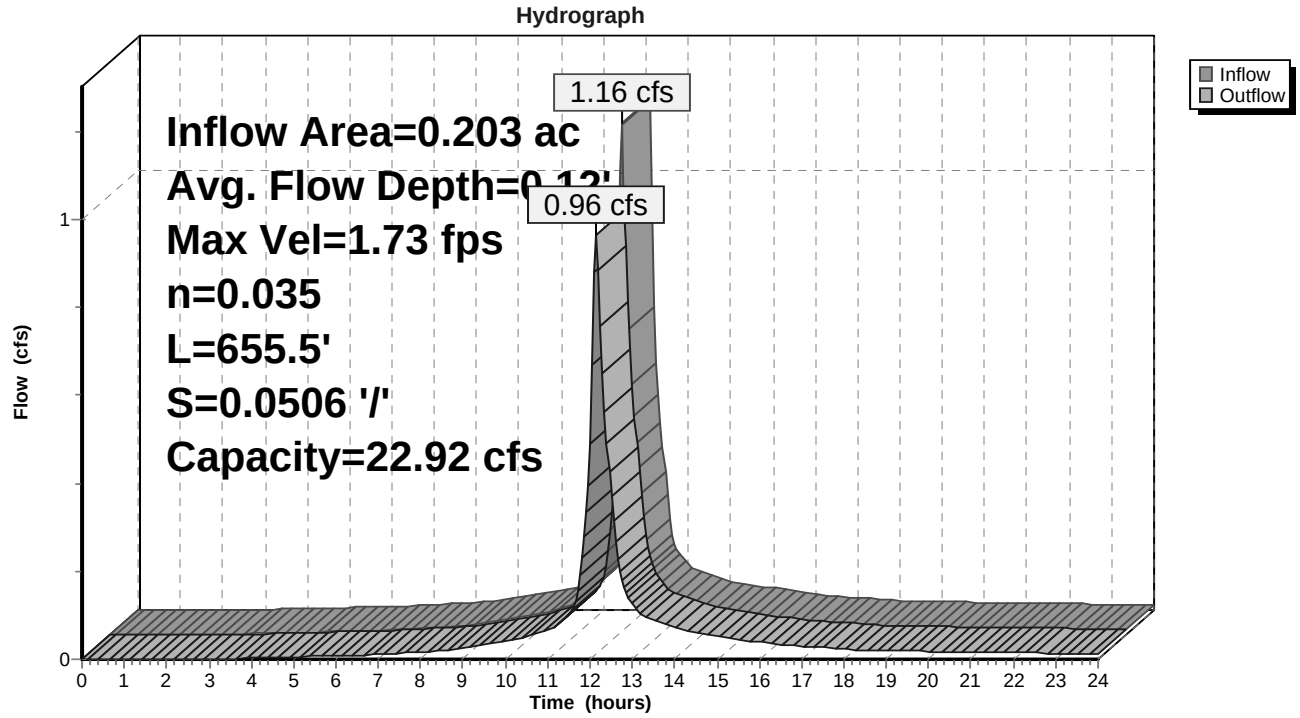
Peak Storage= 364 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 0.50' Flow Area= 5.0 sf, Capacity= 22.92 cfs

15.00' x 0.50' deep Parabolic Channel, n= 0.035
Length= 655.5' Slope= 0.0506 '/'
Inlet Invert= 136.39', Outlet Invert= 103.20'



‡

Reach 1aR: Flow from Culvert to Stream



Summary for Reach 1bR: Start of Stream

[62] Hint: Exceeded Reach 1aR OUTLET depth by 0.03' @ 12.40 hrs

Inflow Area = 0.203 ac, 63.62% Impervious, Inflow Depth > 5.31" for 25 Yr.-24 Hr. event
Inflow = 0.96 cfs @ 12.15 hrs, Volume= 0.090 af
Outflow = 0.74 cfs @ 12.26 hrs, Volume= 0.089 af, Atten= 23%, Lag= 6.8 min

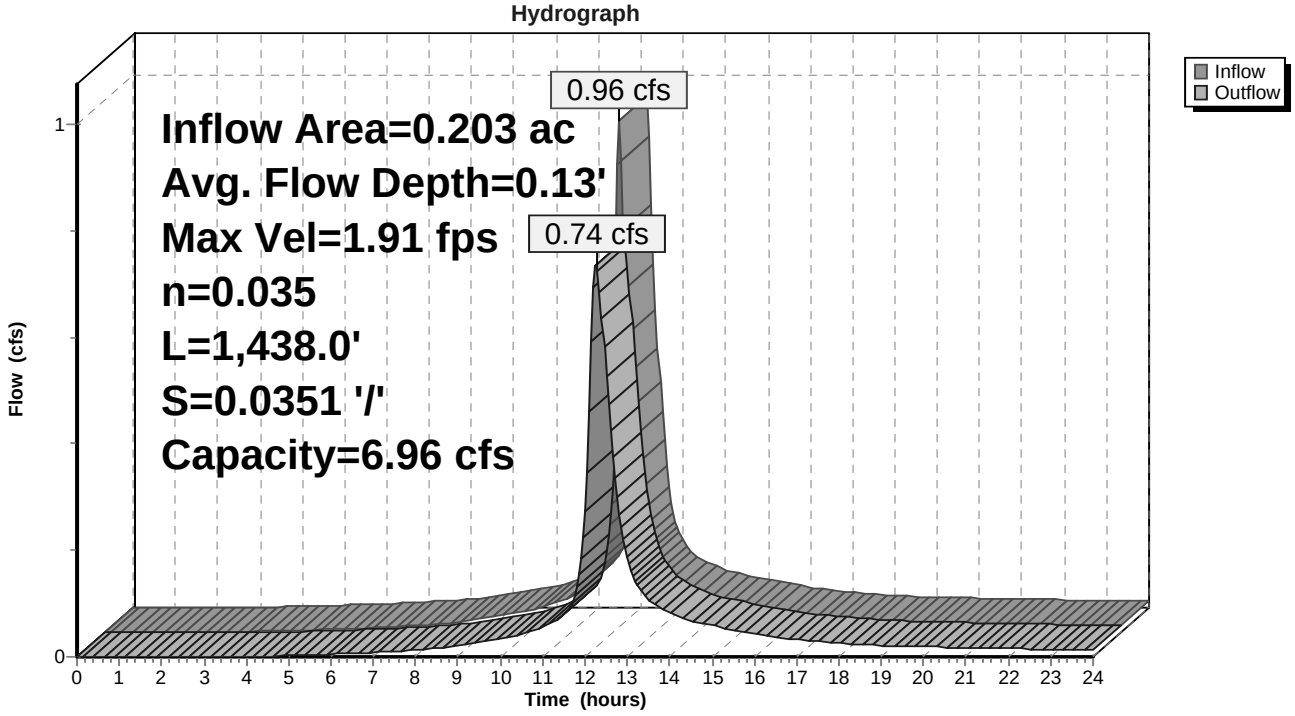
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.91 fps, Min. Travel Time= 12.6 min
Avg. Velocity = 0.55 fps, Avg. Travel Time= 43.9 min

Peak Storage= 555 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.50' Flow Area= 1.6 sf, Capacity= 6.96 cfs

3.00' x 0.50' deep channel, n= 0.035
Side Slope Z-value= 0.5 '/' Top Width= 3.50'
Length= 1,438.0' Slope= 0.0351 '/'
Inlet Invert= 103.20', Outlet Invert= 52.70'



Reach 1bR: Start of Stream



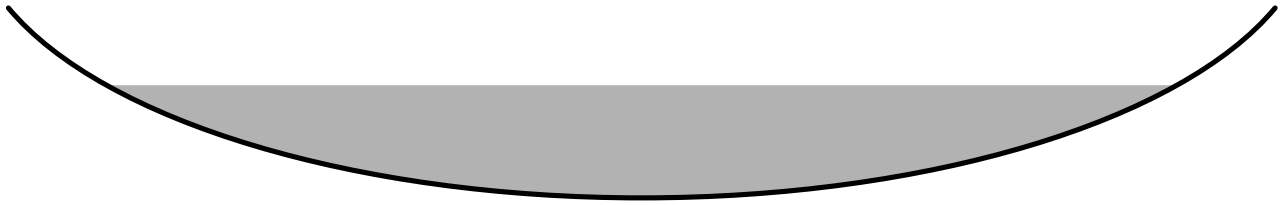
Summary for Reach 10R: Reach #10

Inflow Area = 1.710 ac, 10.49% Impervious, Inflow Depth > 3.61" for 25 Yr.-24 Hr. event
Inflow = 6.30 cfs @ 12.15 hrs, Volume= 0.514 af
Outflow = 6.01 cfs @ 12.19 hrs, Volume= 0.513 af, Atten= 5%, Lag= 2.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.63 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.98 fps, Avg. Travel Time= 7.7 min

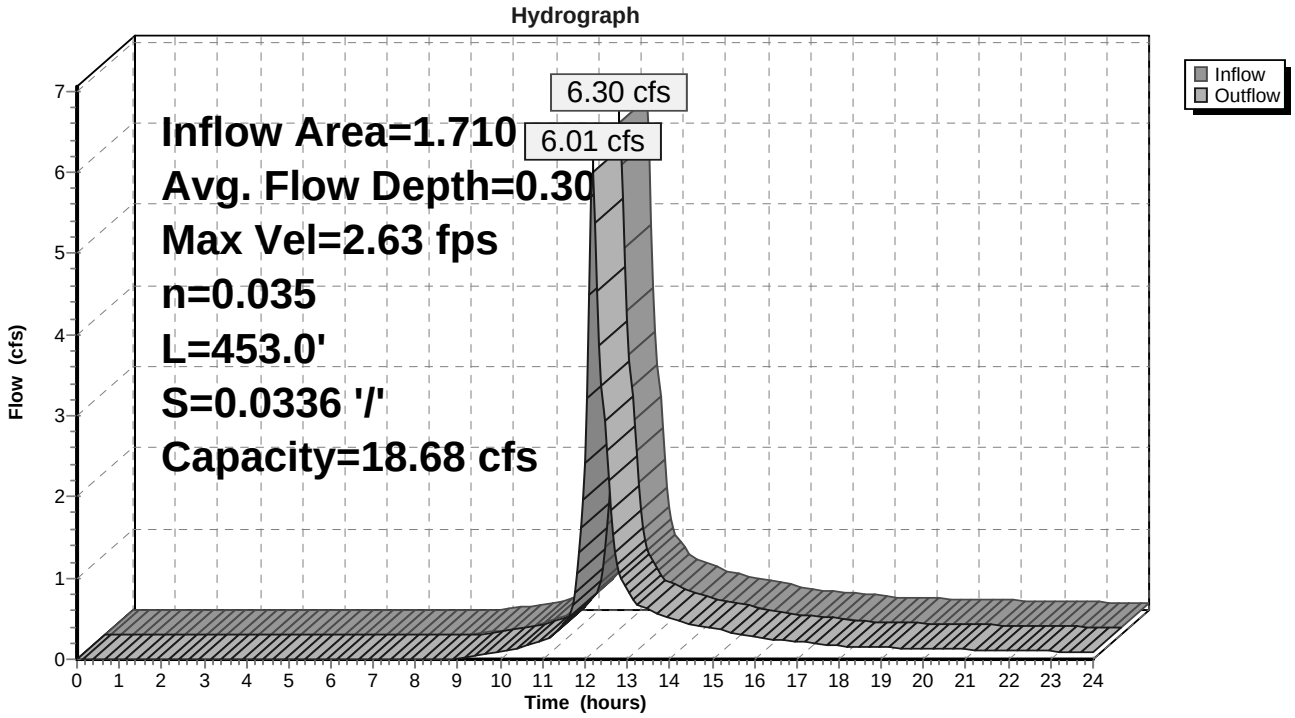
Peak Storage= 1,032 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 0.50' Flow Area= 5.0 sf, Capacity= 18.68 cfs

15.00' x 0.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 453.0' Slope= 0.0336 '/'
Inlet Invert= 98.74', Outlet Invert= 83.50'



‡

Reach 10R: Reach #10



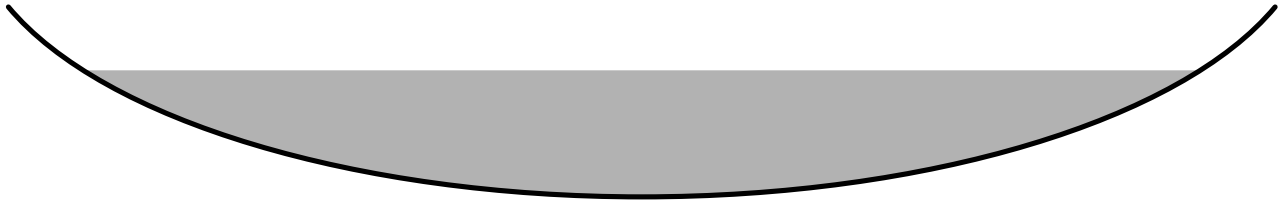
Summary for Reach 15R: Reach #15

Inflow Area = 7.089 ac, 15.80% Impervious, Inflow Depth > 3.02" for 25 Yr.-24 Hr. event
Inflow = 7.82 cfs @ 12.67 hrs, Volume= 1.782 af
Outflow = 7.82 cfs @ 12.68 hrs, Volume= 1.780 af, Atten= 0%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.88 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.17 fps, Avg. Travel Time= 2.8 min

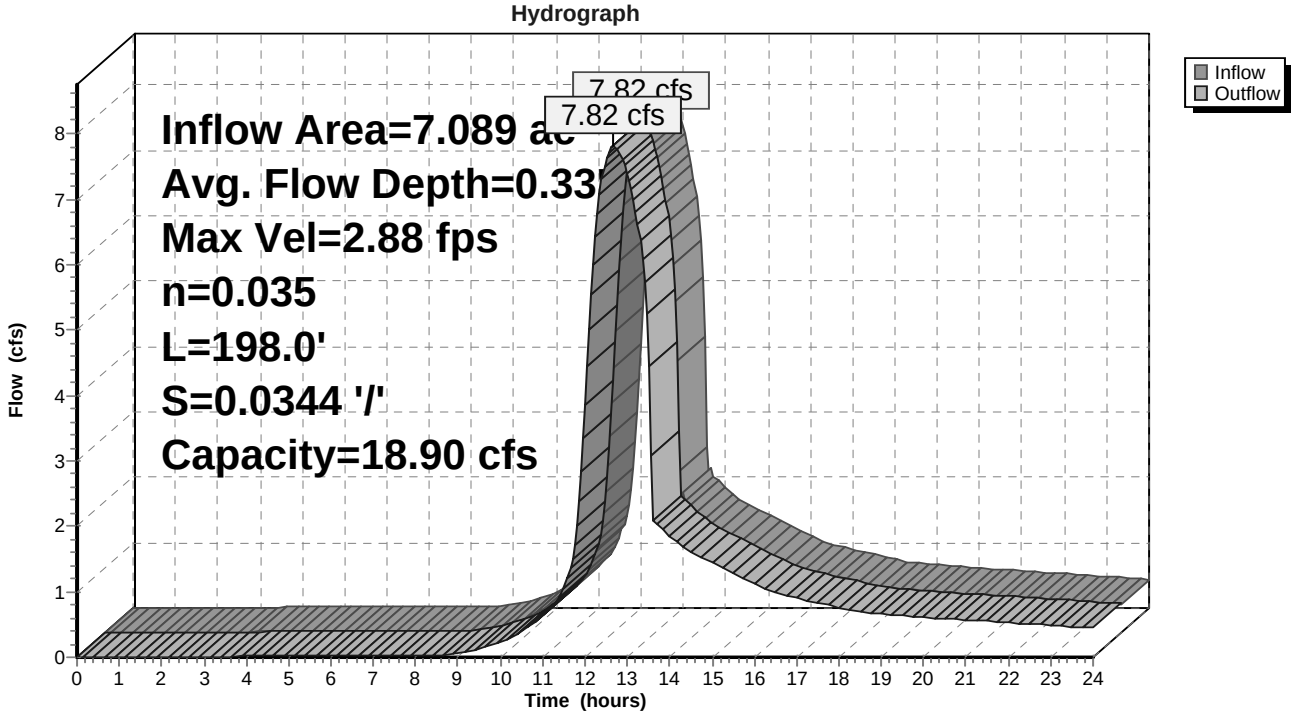
Peak Storage= 537 cf @ 12.68 hrs
Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 0.50' Flow Area= 5.0 sf, Capacity= 18.90 cfs

15.00' x 0.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 198.0' Slope= 0.0344 '/'
Inlet Invert= 90.32', Outlet Invert= 83.50'



‡

Reach 15R: Reach #15



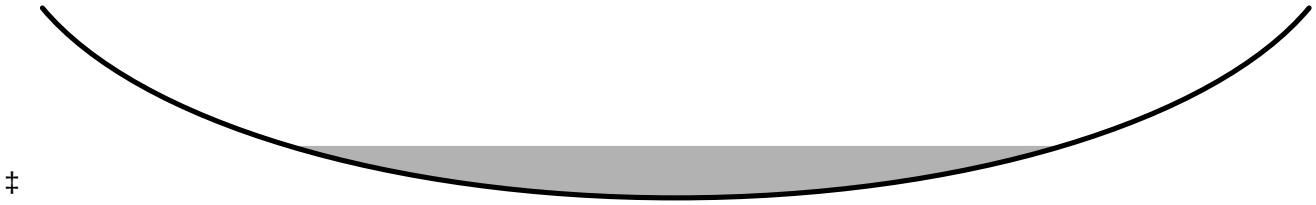
Summary for Reach 20aR: Wetland Crossing #1 Flow

Inflow Area = 0.322 ac, 0.00% Impervious, Inflow Depth > 2.79" for 25 Yr.-24 Hr. event
Inflow = 0.91 cfs @ 12.16 hrs, Volume= 0.075 af
Outflow = 0.75 cfs @ 12.24 hrs, Volume= 0.074 af, Atten= 18%, Lag= 4.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.63 fps, Min. Travel Time= 7.2 min
Avg. Velocity = 0.26 fps, Avg. Travel Time= 17.9 min

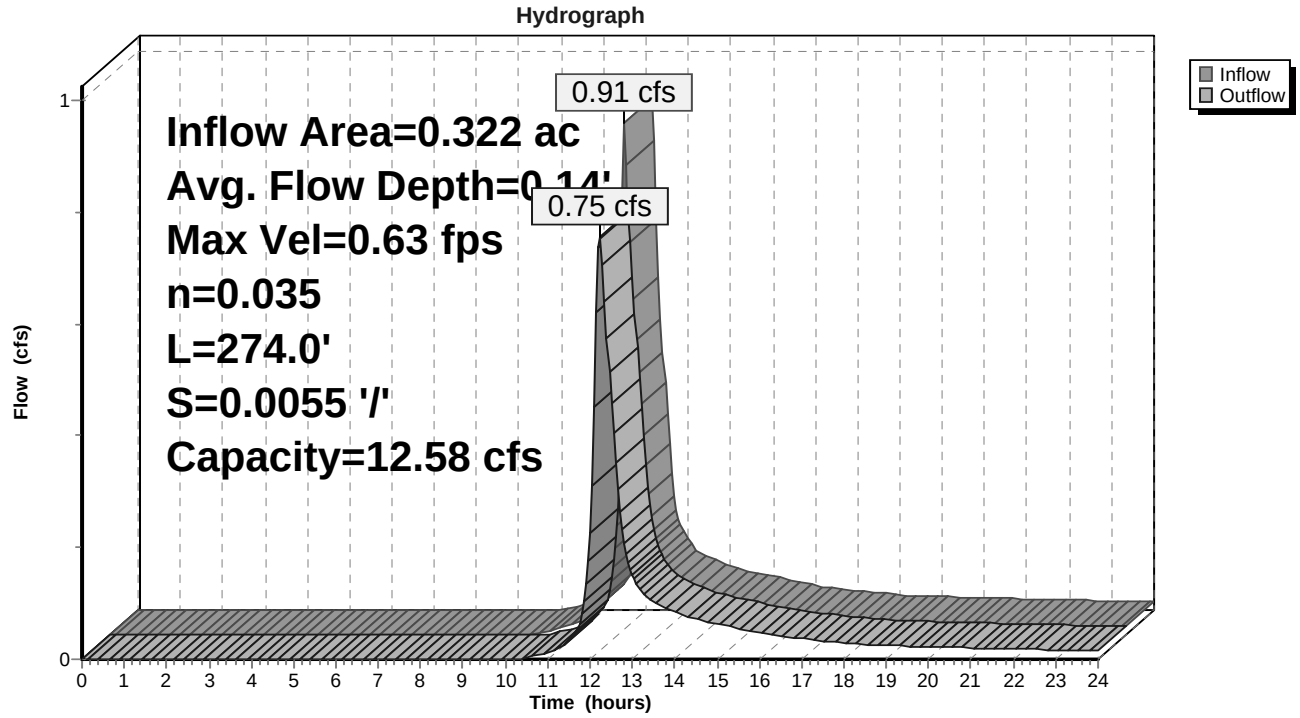
Peak Storage= 325 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 0.50' Flow Area= 8.3 sf, Capacity= 12.58 cfs

25.00' x 0.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 274.0' Slope= 0.0055 '/'
Inlet Invert= 110.50', Outlet Invert= 109.00'



‡

Reach 20aR: Wetland Crossing #1 Flow



Summary for Reach 20bR: Wetland Crossing #1 Flow

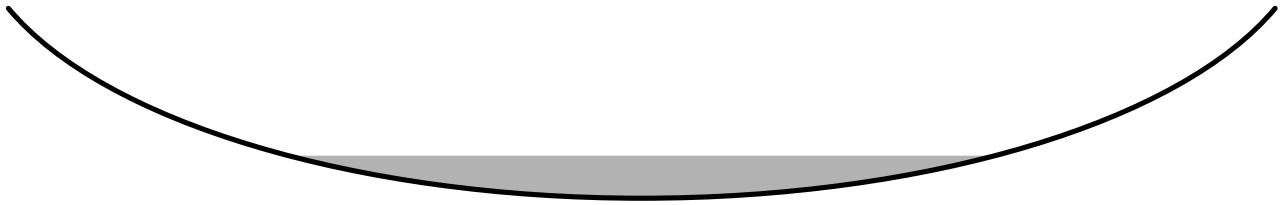
[61] Hint: Exceeded Reach 20aR outlet invert by 0.11' @ 12.25 hrs

Inflow Area = 0.322 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25 Yr.-24 Hr. event
Inflow = 0.75 cfs @ 12.24 hrs, Volume= 0.074 af
Outflow = 0.75 cfs @ 12.25 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.44 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 0.58 fps, Avg. Travel Time= 2.3 min

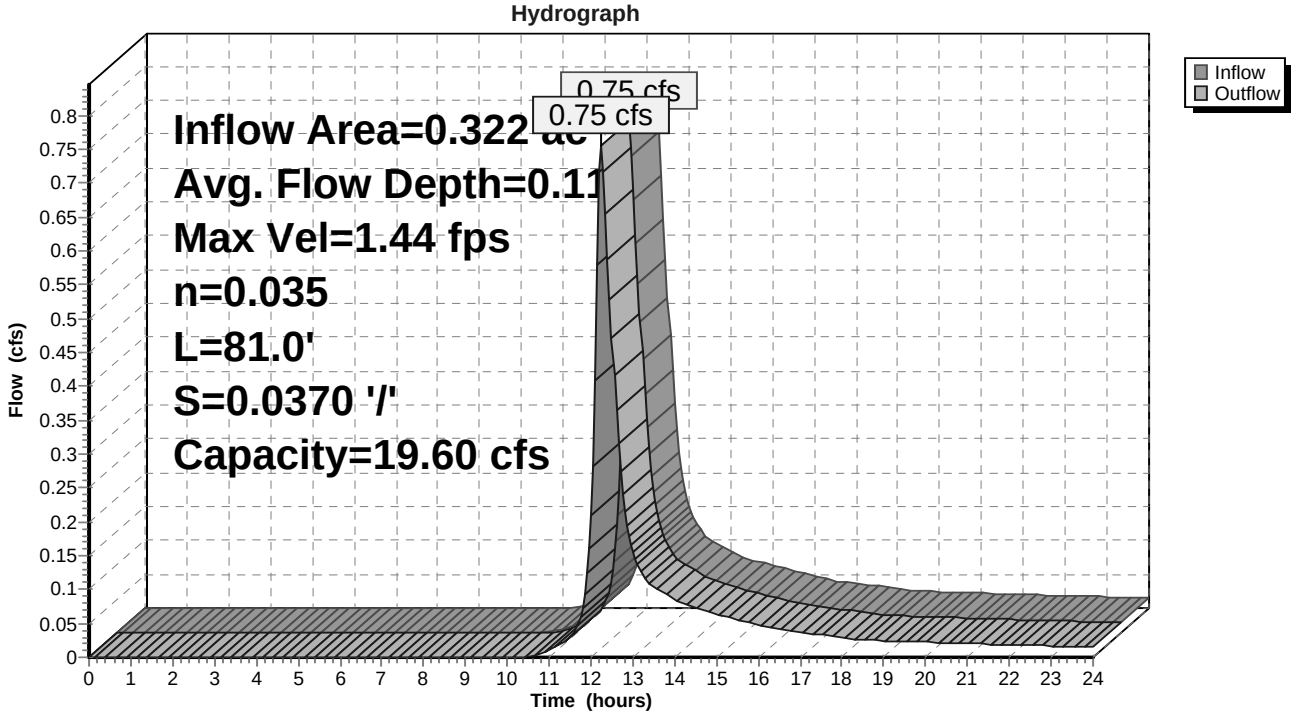
Peak Storage= 42 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 0.50' Flow Area= 5.0 sf, Capacity= 19.60 cfs

15.00' x 0.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 81.0' Slope= 0.0370 '/'
Inlet Invert= 109.00', Outlet Invert= 106.00'



‡

Reach 20bR: Wetland Crossing #1 Flow



Summary for Reach 20cR: Wetland Crossing #1 Flow

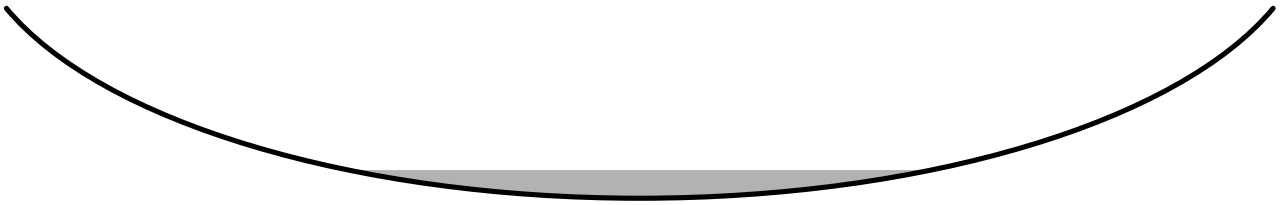
[61] Hint: Exceeded Reach 20bR outlet invert by 0.07' @ 12.25 hrs

Inflow Area = 0.322 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25 Yr.-24 Hr. event
Inflow = 0.75 cfs @ 12.25 hrs, Volume= 0.074 af
Outflow = 0.76 cfs @ 12.26 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.66 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.09 fps, Avg. Travel Time= 1.2 min

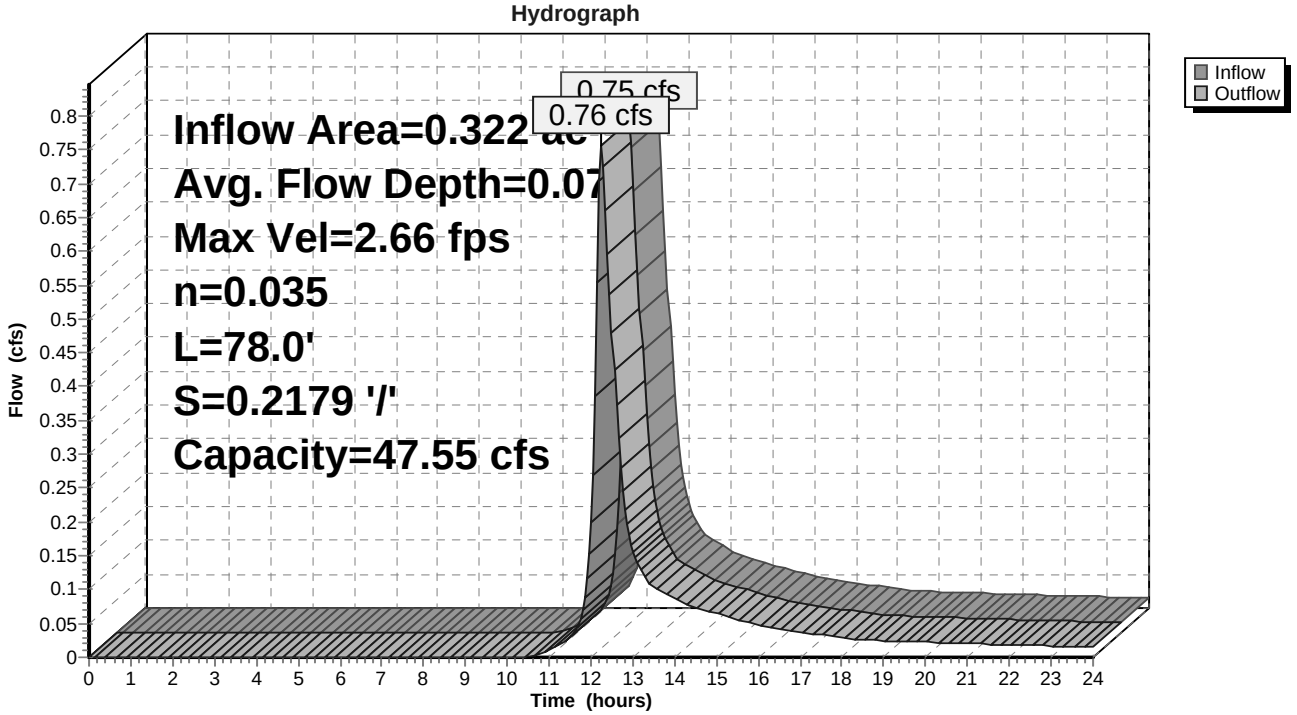
Peak Storage= 22 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 0.50' Flow Area= 5.0 sf, Capacity= 47.55 cfs

15.00' x 0.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 78.0' Slope= 0.2179 '/'
Inlet Invert= 106.00', Outlet Invert= 89.00'



‡

Reach 20cR: Wetland Crossing #1 Flow



Summary for Reach 20dR: Wetland Crossing #1 Flow

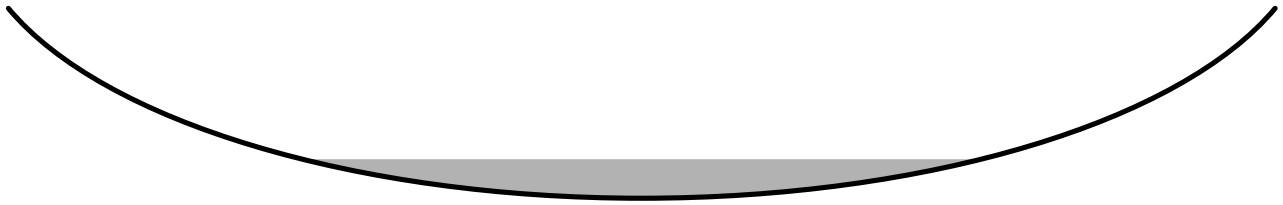
[62] Hint: Exceeded Reach 20cR OUTLET depth by 0.03' @ 12.35 hrs

Inflow Area = 0.322 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25 Yr.-24 Hr. event
Inflow = 0.76 cfs @ 12.26 hrs, Volume= 0.074 af
Outflow = 0.74 cfs @ 12.29 hrs, Volume= 0.074 af, Atten= 2%, Lag= 1.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.61 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 0.66 fps, Avg. Travel Time= 5.7 min

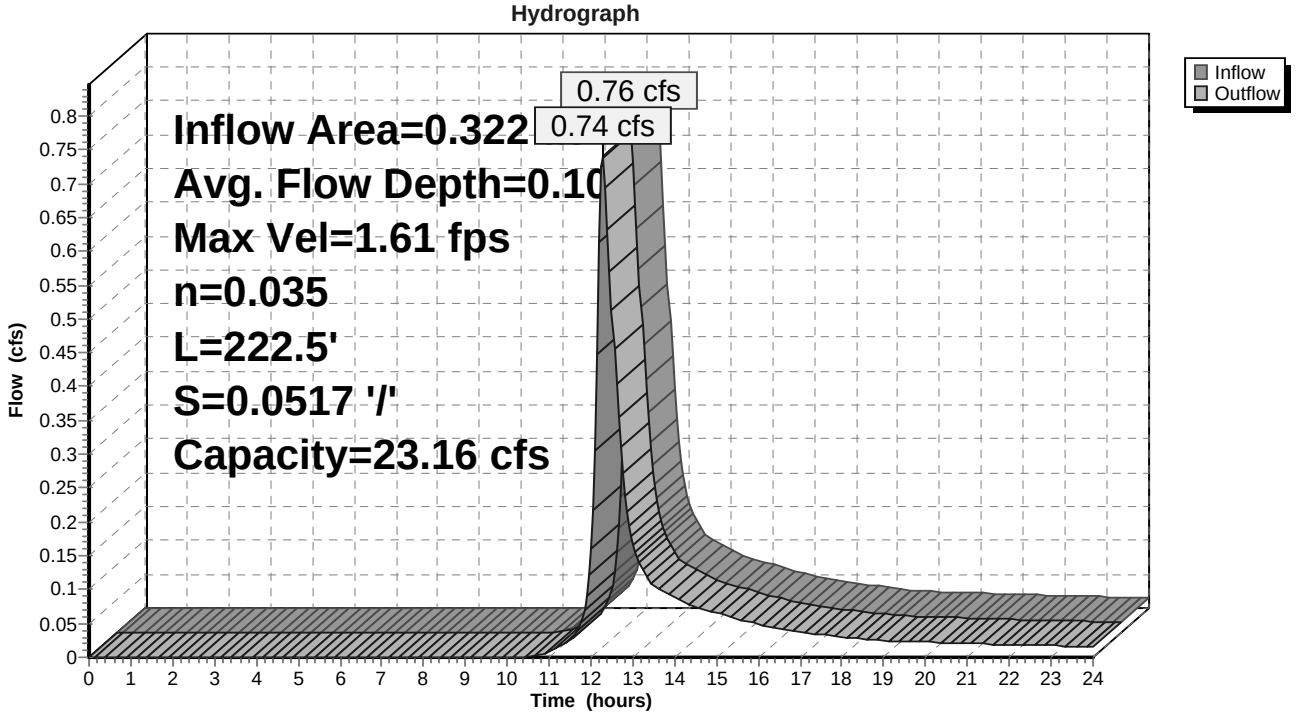
Peak Storage= 103 cf @ 12.29 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 0.50' Flow Area= 5.0 sf, Capacity= 23.16 cfs

15.00' x 0.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 222.5' Slope= 0.0517 '/'
Inlet Invert= 89.00', Outlet Invert= 77.50'



‡

Reach 20dR: Wetland Crossing #1 Flow



Summary for Reach 20eR: Wetland Crossing #1 Flow

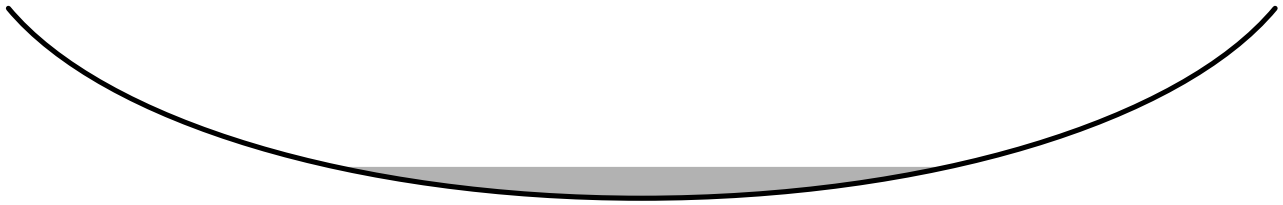
[62] Hint: Exceeded Reach 20dR OUTLET depth by 0.06' @ 12.35 hrs

Inflow Area = 0.322 ac, 0.00% Impervious, Inflow Depth > 2.76" for 25 Yr.-24 Hr. event
Inflow = 0.74 cfs @ 12.29 hrs, Volume= 0.074 af
Outflow = 0.73 cfs @ 12.32 hrs, Volume= 0.074 af, Atten= 1%, Lag= 1.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.67 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 0.69 fps, Avg. Travel Time= 5.2 min

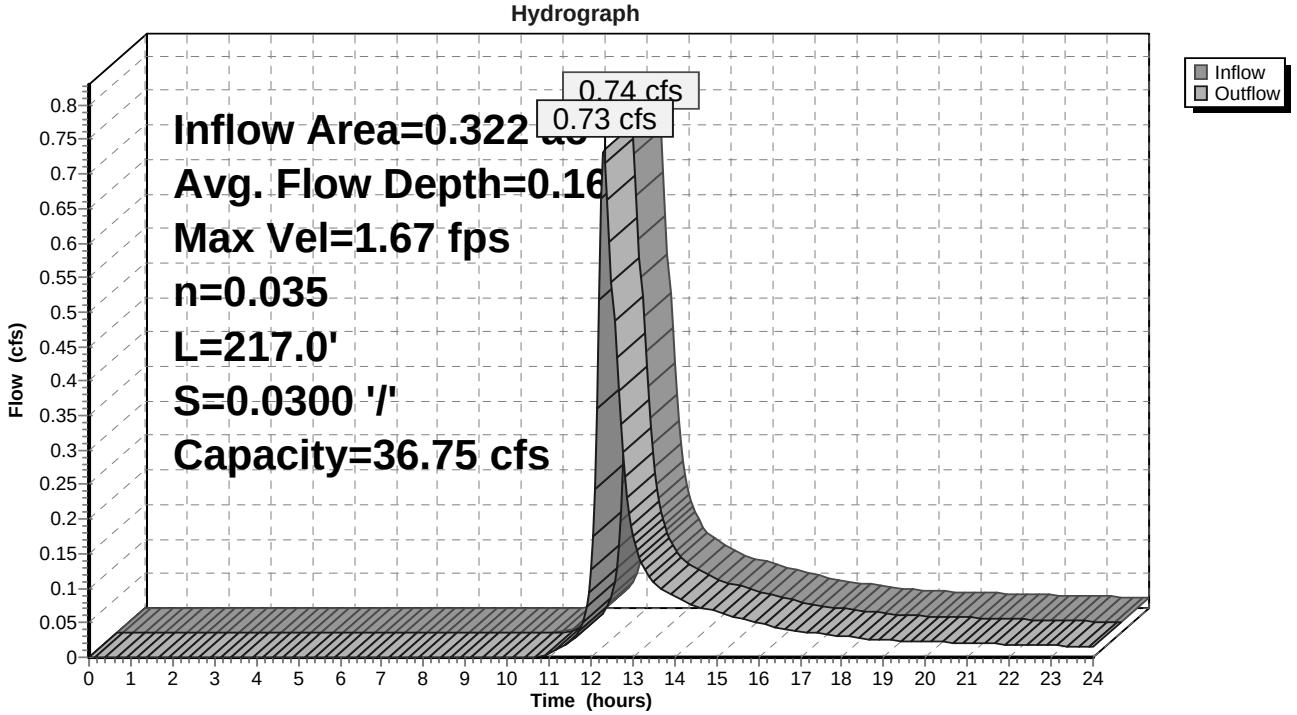
Peak Storage= 95 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 1.00' Flow Area= 6.7 sf, Capacity= 36.75 cfs

10.00' x 1.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 217.0' Slope= 0.0300 '/'
Inlet Invert= 77.50', Outlet Invert= 71.00'



‡

Reach 20eR: Wetland Crossing #1 Flow



Summary for Reach 20fR: Wetland Crossing #1 Flow

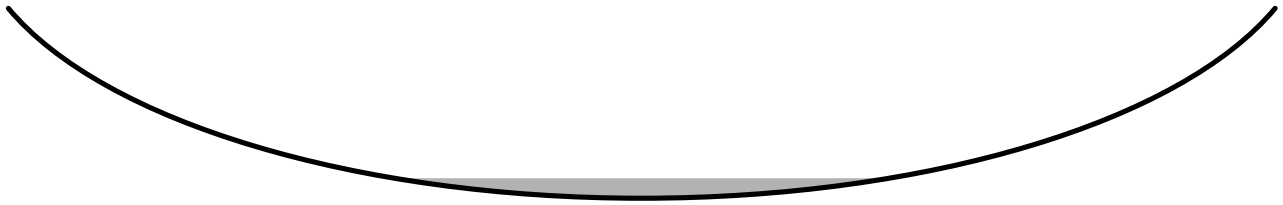
[61] Hint: Exceeded Reach 20eR outlet invert by 0.10' @ 12.30 hrs

Inflow Area = 0.322 ac, 0.00% Impervious, Inflow Depth > 2.76" for 25 Yr.-24 Hr. event
Inflow = 0.73 cfs @ 12.32 hrs, Volume= 0.074 af
Outflow = 0.74 cfs @ 12.32 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.30 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.38 fps, Avg. Travel Time= 1.3 min

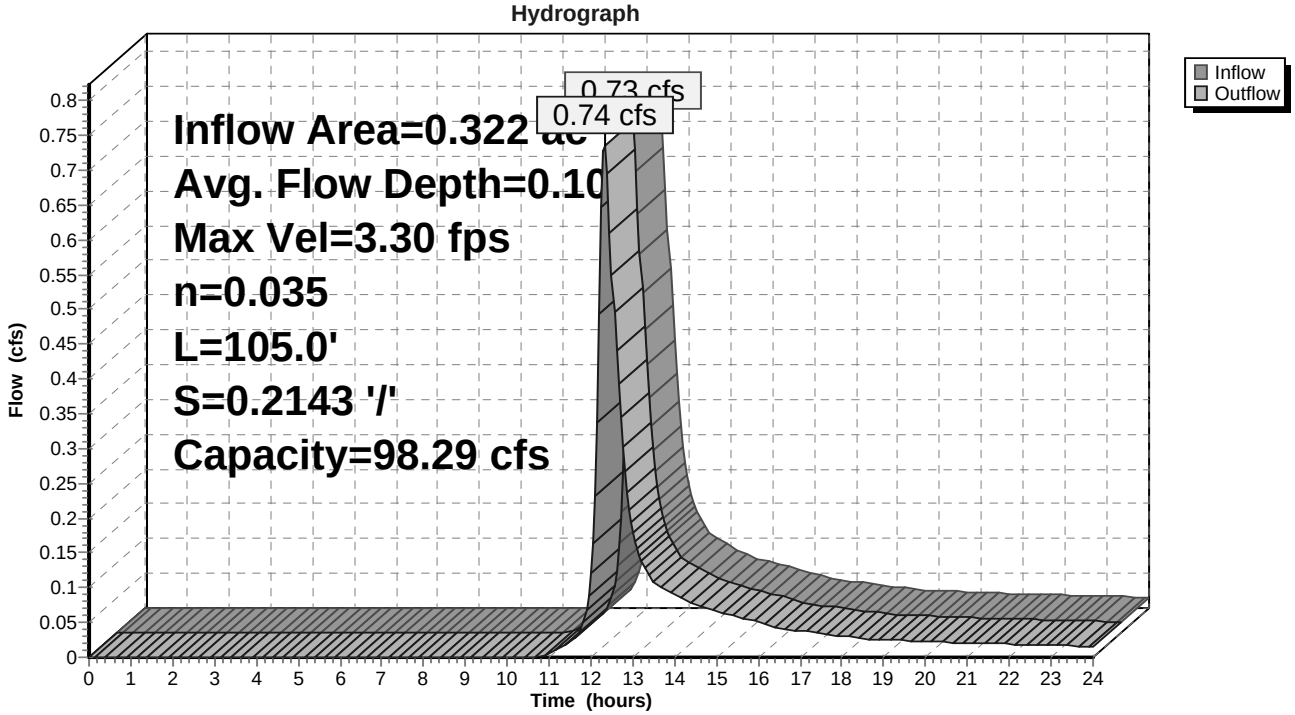
Peak Storage= 23 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 1.00' Flow Area= 6.7 sf, Capacity= 98.29 cfs

10.00' x 1.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 105.0' Slope= 0.2143 '/'
Inlet Invert= 71.00', Outlet Invert= 48.50'



‡

Reach 20fR: Wetland Crossing #1 Flow



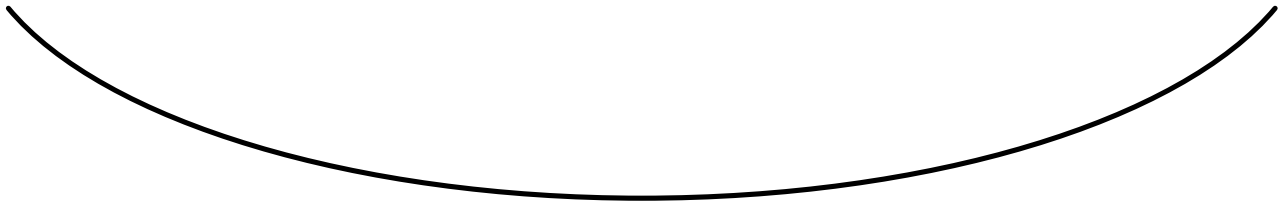
Summary for Reach 71aR: Gravel Wetland #101

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

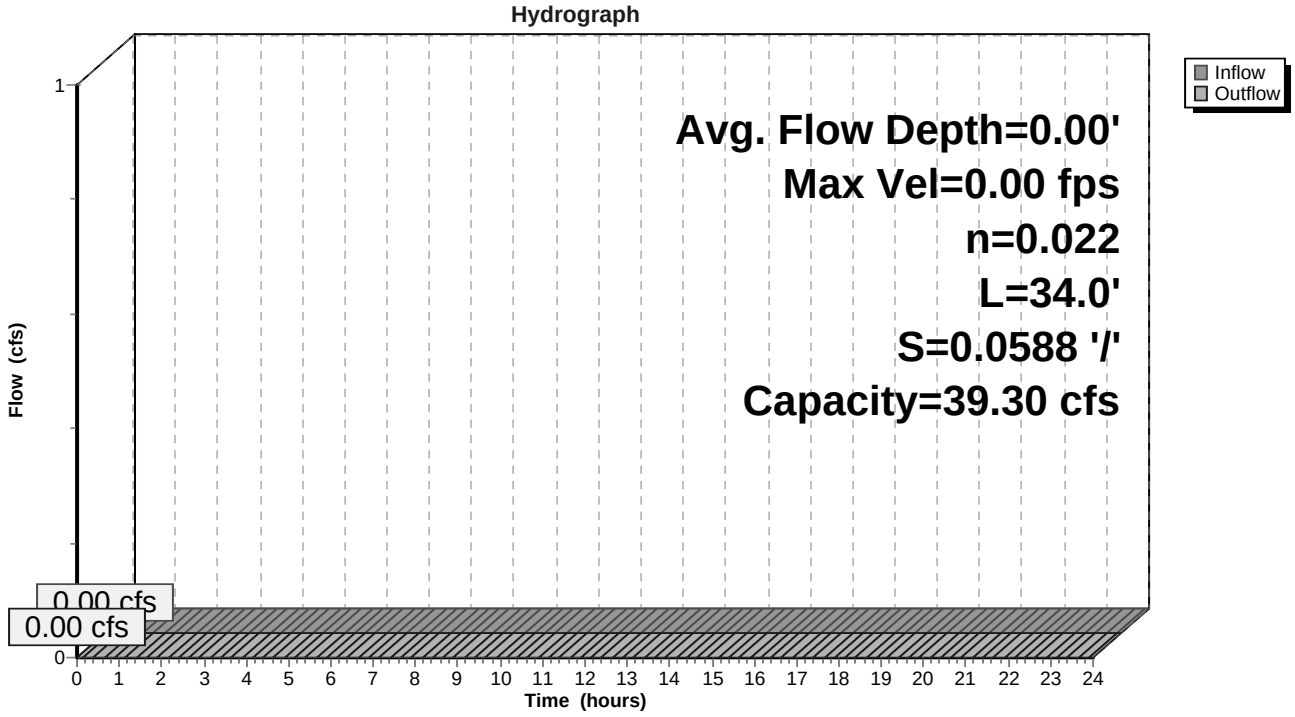
Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 5.0 sf, Capacity= 39.30 cfs

15.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 34.0' Slope= 0.0588 '/'
Inlet Invert= 104.00', Outlet Invert= 102.00'



‡

Reach 71aR: Gravel Wetland #101



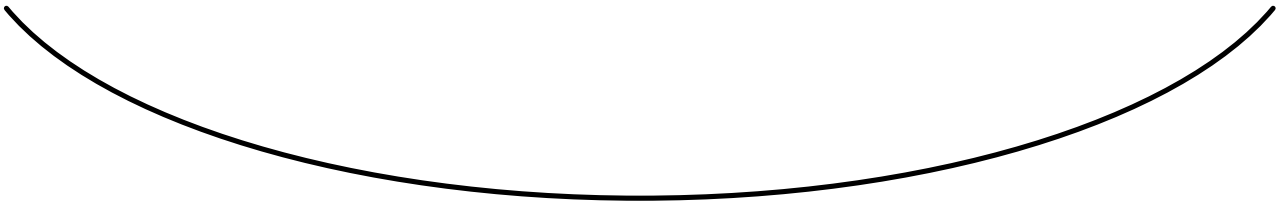
Summary for Reach 71bR: Gravel Wetland #101

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

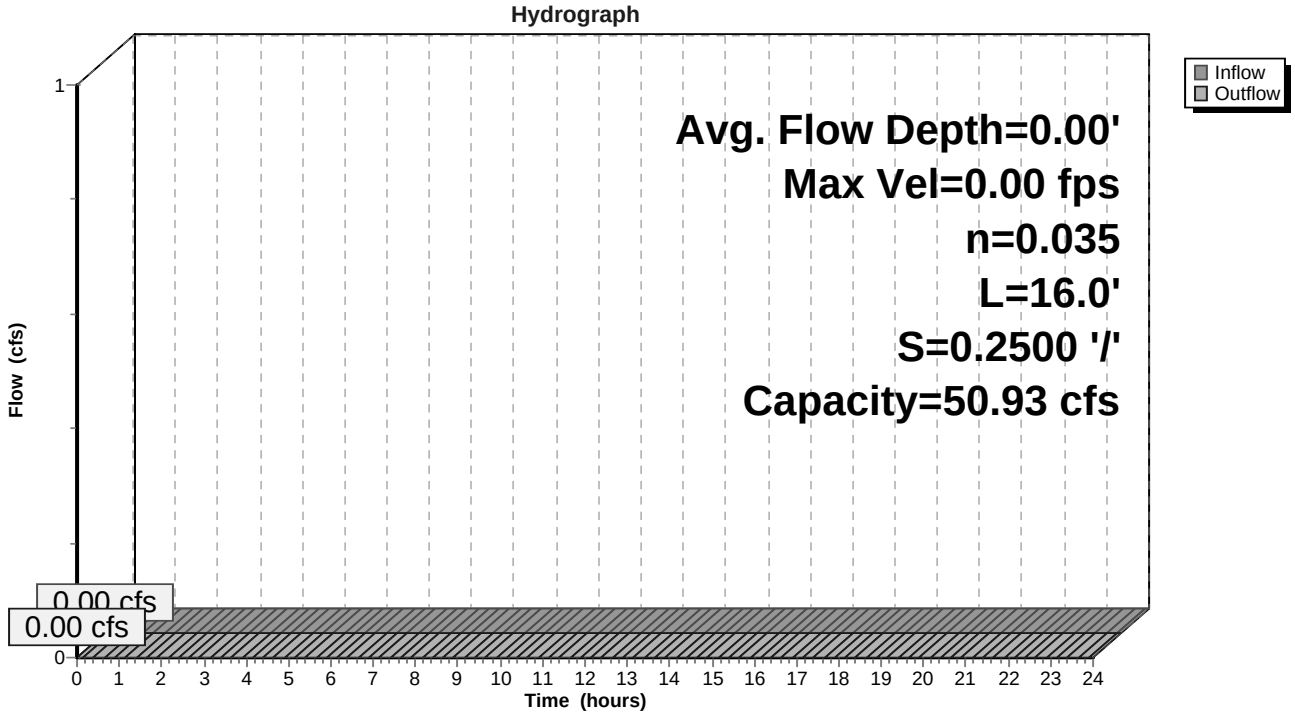
Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 5.0 sf, Capacity= 50.93 cfs

15.00' x 0.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 16.0' Slope= 0.2500 '/'
Inlet Invert= 102.00', Outlet Invert= 98.00'



‡

Reach 71bR: Gravel Wetland #101



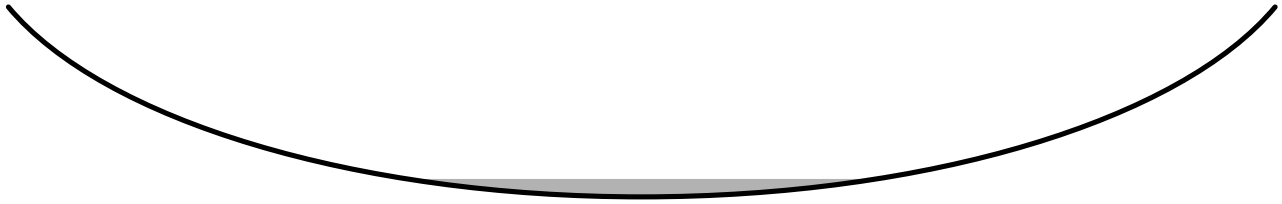
Summary for Reach 72aR: SGW #102 Flow from OS A&B

Inflow Area = 2.488 ac, 39.81% Impervious, Inflow Depth > 1.79" for 25 Yr.-24 Hr. event
Inflow = 0.60 cfs @ 13.68 hrs, Volume= 0.371 af
Outflow = 0.60 cfs @ 13.70 hrs, Volume= 0.370 af, Atten= 0%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.27 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 0.82 fps, Avg. Travel Time= 2.2 min

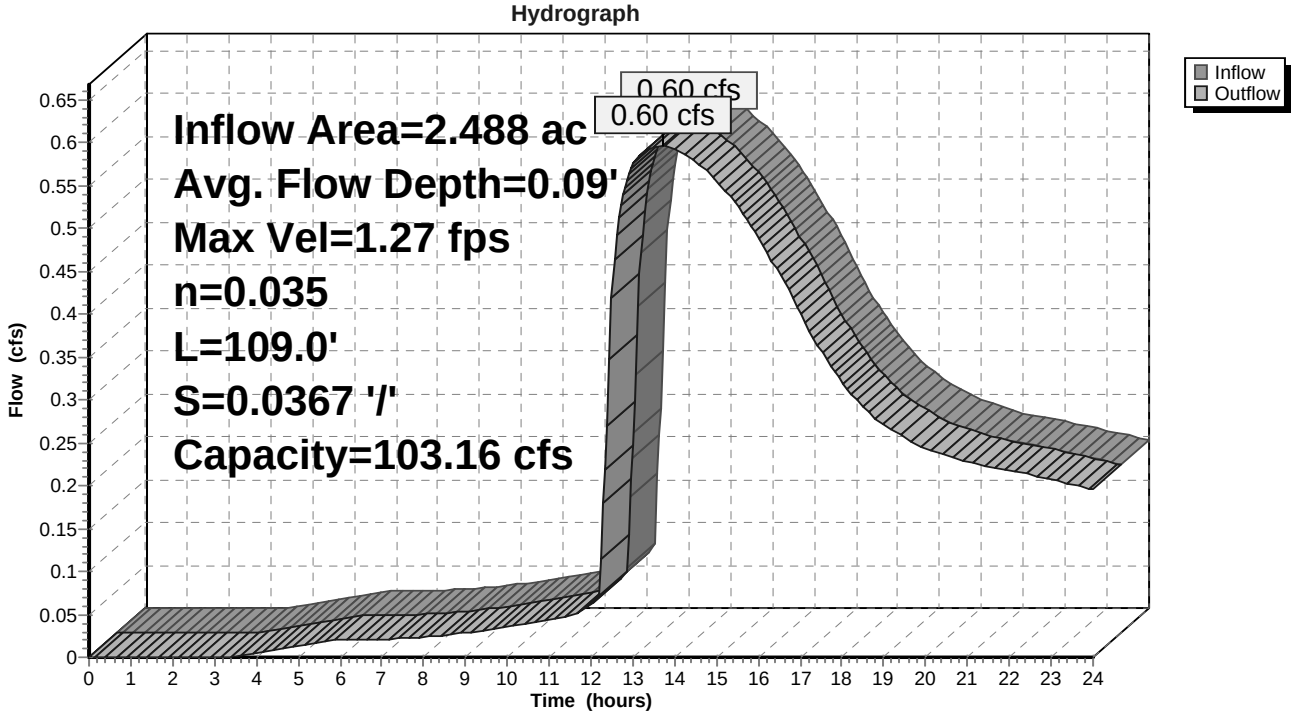
Peak Storage= 51 cf @ 13.70 hrs
Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 1.00' Flow Area= 16.7 sf, Capacity= 103.16 cfs

25.00' x 1.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 109.0' Slope= 0.0367 '/'
Inlet Invert= 64.00', Outlet Invert= 60.00'



‡

Reach 72aR: SGW #102 Flow from OS A&B



Summary for Reach 72bR: SGW #102 Flow from OS A&B

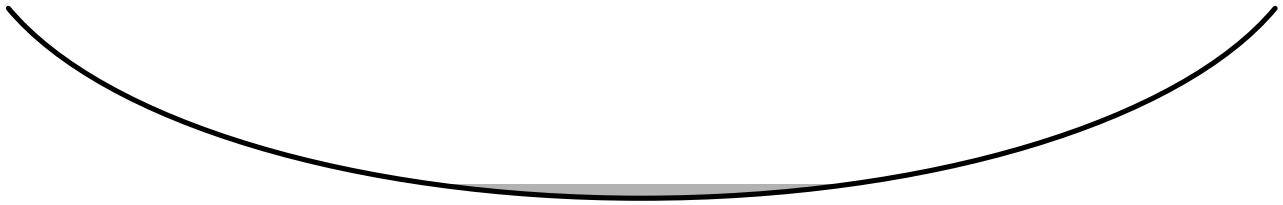
[61] Hint: Exceeded Reach 72aR outlet invert by 0.07' @ 13.70 hrs

Inflow Area = 2.488 ac, 39.81% Impervious, Inflow Depth > 1.79" for 25 Yr.-24 Hr. event
Inflow = 0.60 cfs @ 13.70 hrs, Volume= 0.370 af
Outflow = 0.60 cfs @ 13.70 hrs, Volume= 0.370 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.80 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 0.9 min

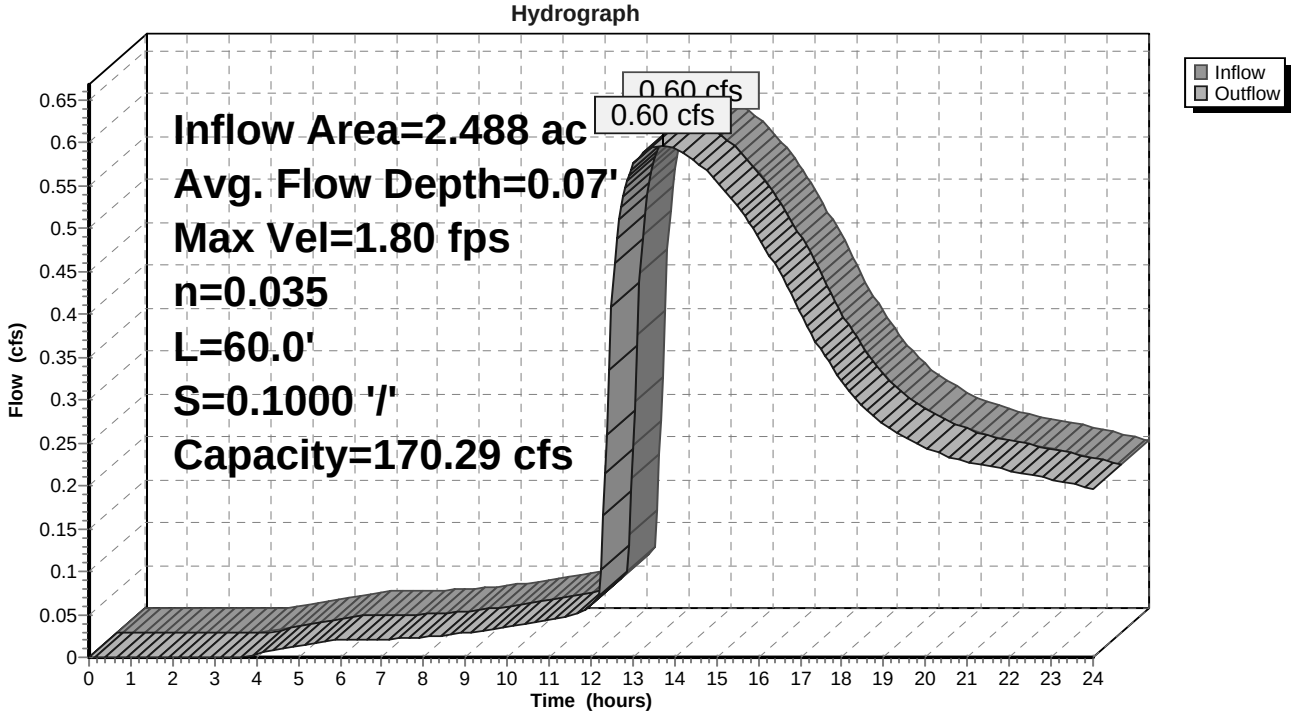
Peak Storage= 20 cf @ 13.70 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 1.00' Flow Area= 16.7 sf, Capacity= 170.29 cfs

25.00' x 1.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 60.0' Slope= 0.1000 '/'
Inlet Invert= 60.00', Outlet Invert= 54.00'



‡

Reach 72bR: SGW #102 Flow from OS A&B



Summary for Reach 72cR: SGW #102 Flow from OS A&B

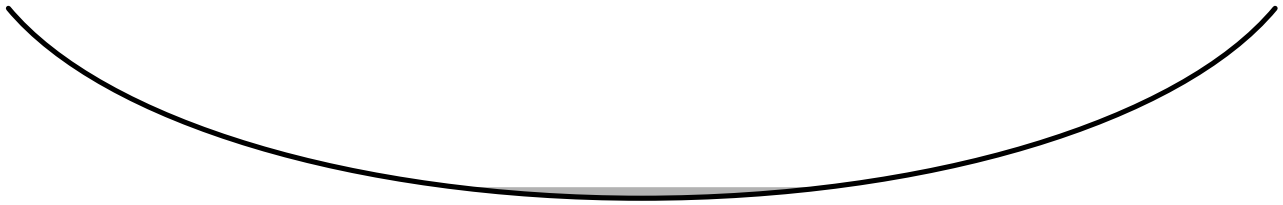
[61] Hint: Exceeded Reach 72bR outlet invert by 0.06' @ 13.70 hrs

Inflow Area = 2.488 ac, 39.81% Impervious, Inflow Depth > 1.79" for 25 Yr.-24 Hr. event
Inflow = 0.60 cfs @ 13.70 hrs, Volume= 0.370 af
Outflow = 0.60 cfs @ 13.70 hrs, Volume= 0.370 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.64 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.72 fps, Avg. Travel Time= 0.2 min

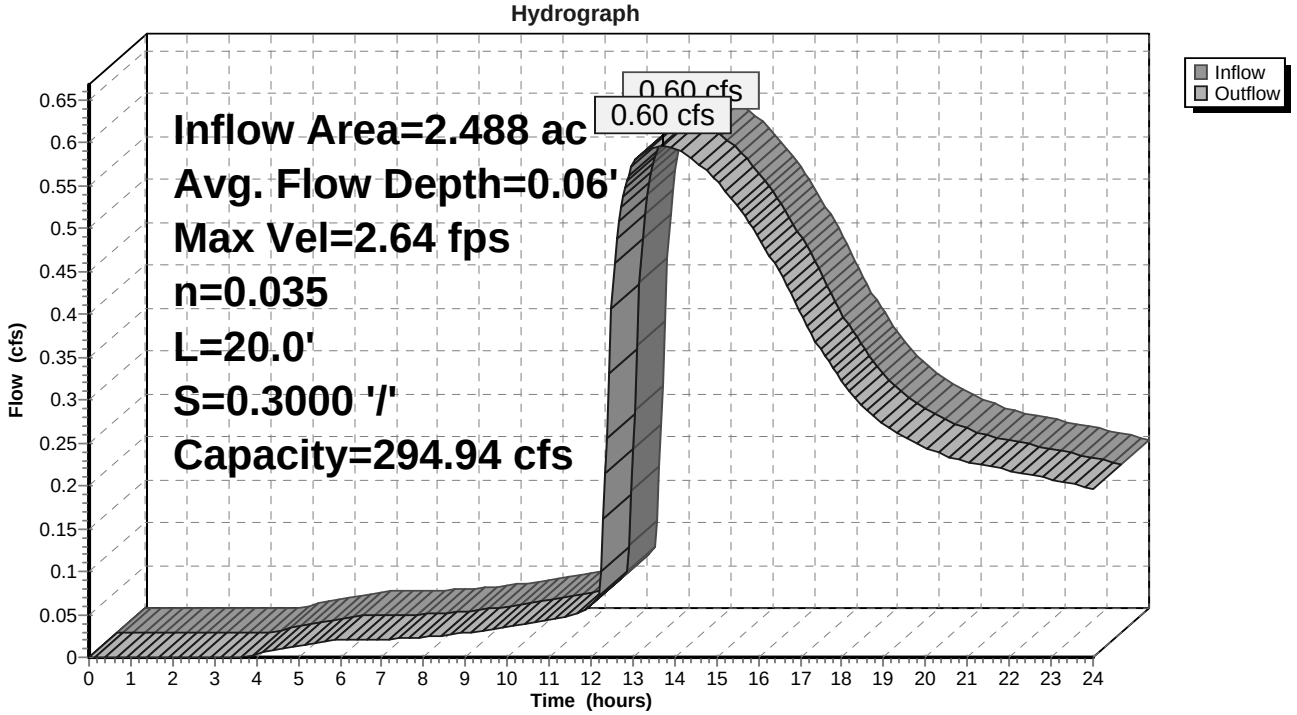
Peak Storage= 5 cf @ 13.70 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 1.00' Flow Area= 16.7 sf, Capacity= 294.94 cfs

25.00' x 1.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 20.0' Slope= 0.3000 '/'
Inlet Invert= 54.00', Outlet Invert= 48.00'



‡

Reach 72cR: SGW #102 Flow from OS A&B



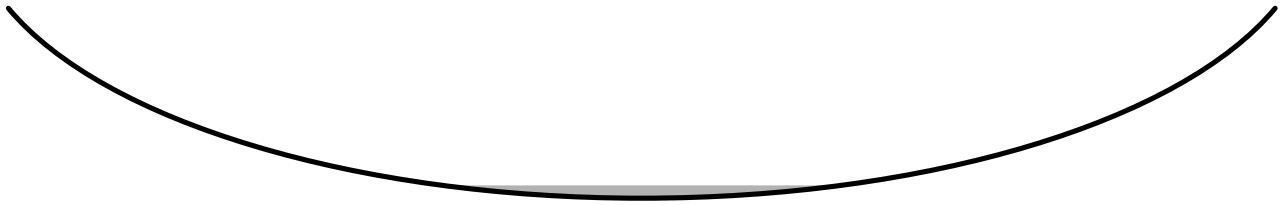
Summary for Reach 72dR: SGW #102 Flow from OS C&D

Inflow = 0.34 cfs @ 13.68 hrs, Volume= 0.169 af
Outflow = 0.34 cfs @ 13.69 hrs, Volume= 0.168 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.16 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.71 fps, Avg. Travel Time= 0.6 min

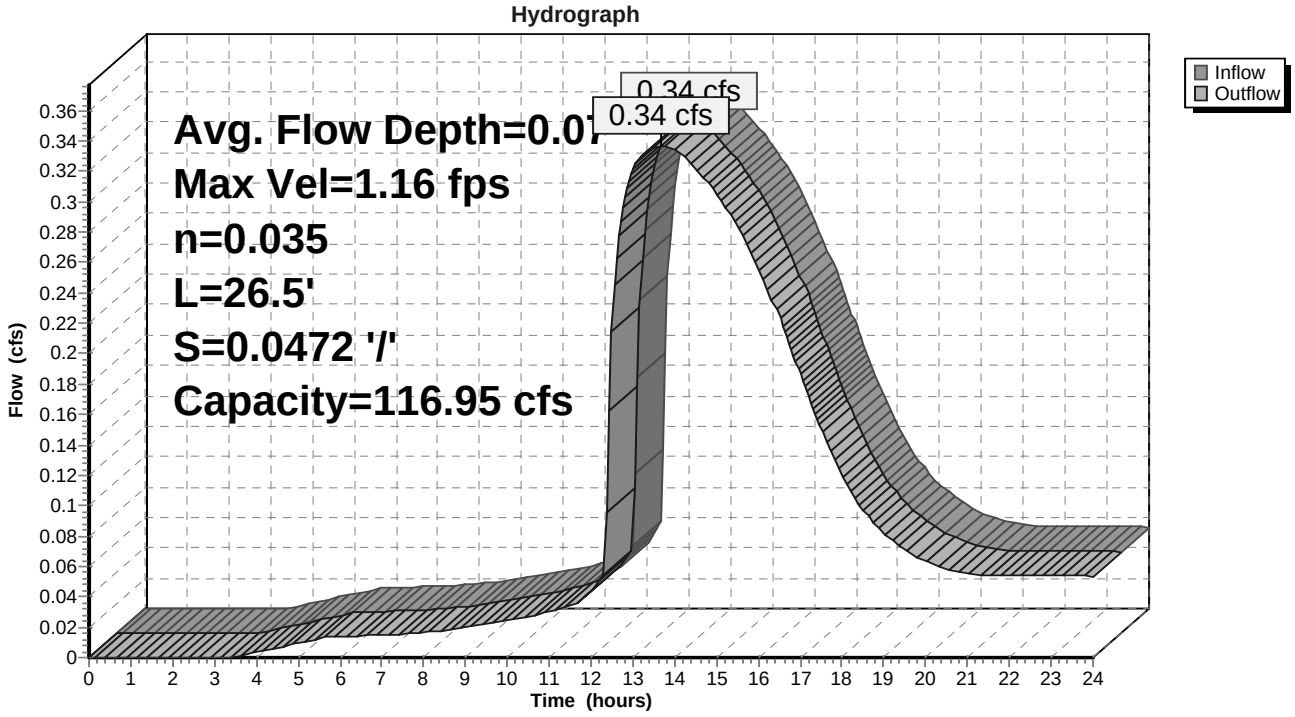
Peak Storage= 8 cf @ 13.69 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 1.00' Flow Area= 16.7 sf, Capacity= 116.95 cfs

25.00' x 1.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 26.5' Slope= 0.0472 '/'
Inlet Invert= 69.00', Outlet Invert= 67.75'



‡

Reach 72dR: SGW #102 Flow from OS C&D



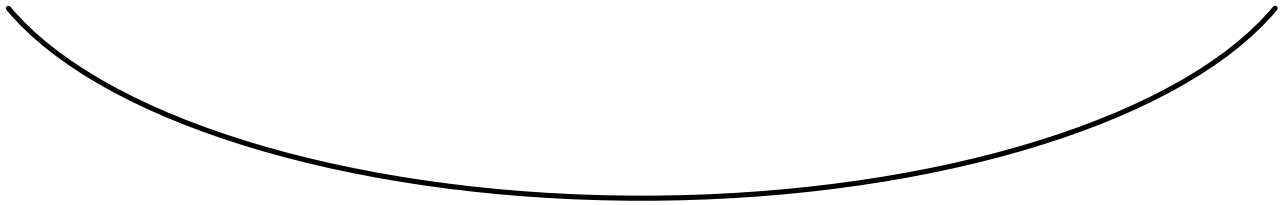
Summary for Reach 72eR: SGW #102 Flow from Spillway

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

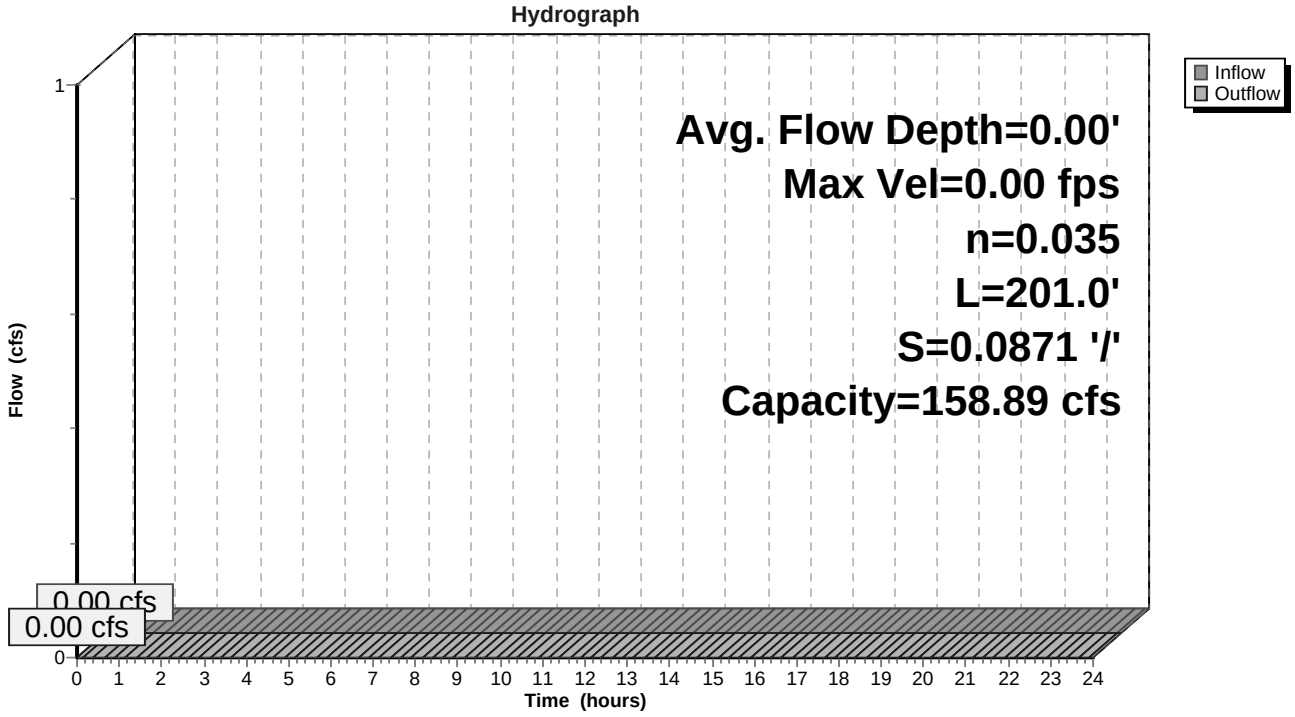
Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 16.7 sf, Capacity= 158.89 cfs

25.00' x 1.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 201.0' Slope= 0.0871 '/'
Inlet Invert= 73.50', Outlet Invert= 56.00'



‡

Reach 72eR: SGW #102 Flow from Spillway



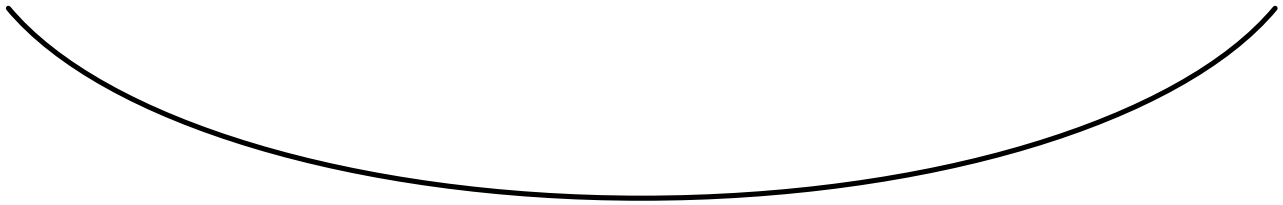
Summary for Reach 72fR: SGW #102 Flow from Spillway

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

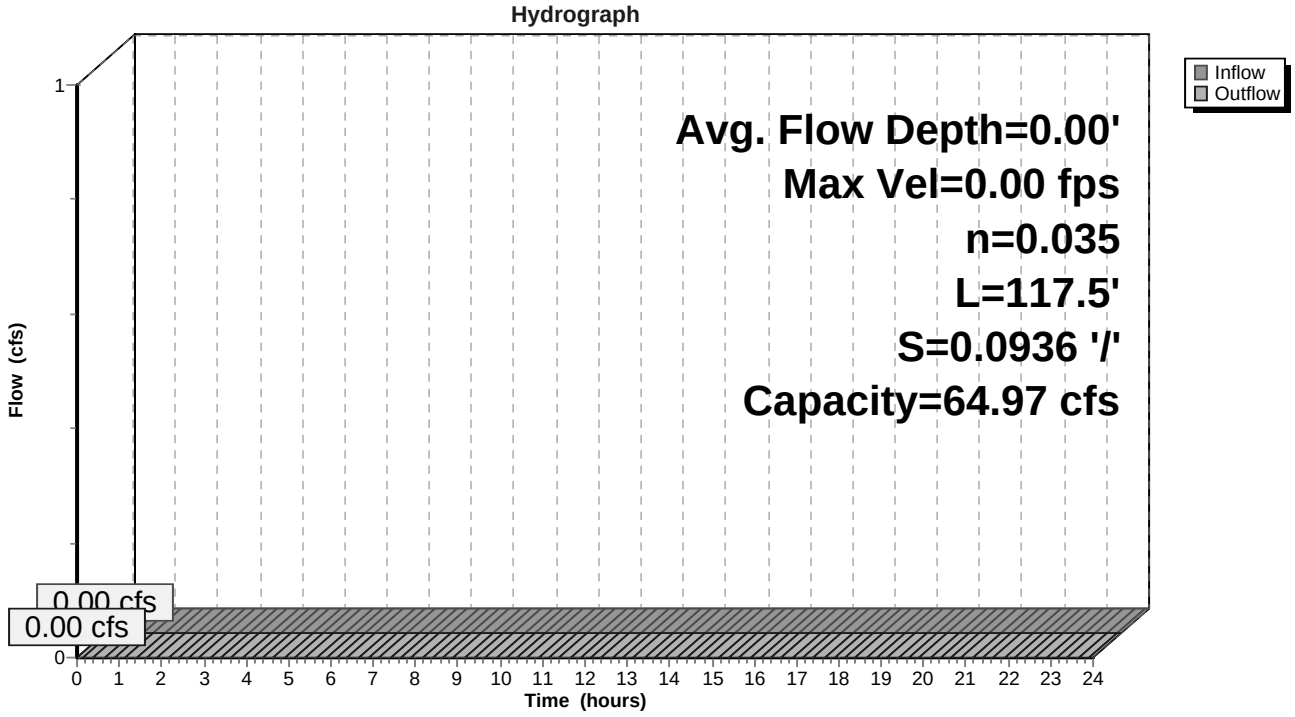
Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 6.7 sf, Capacity= 64.97 cfs

10.00' x 1.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 117.5' Slope= 0.0936 '/'
Inlet Invert= 56.00', Outlet Invert= 45.00'



‡

Reach 72fR: SGW #102 Flow from Spillway



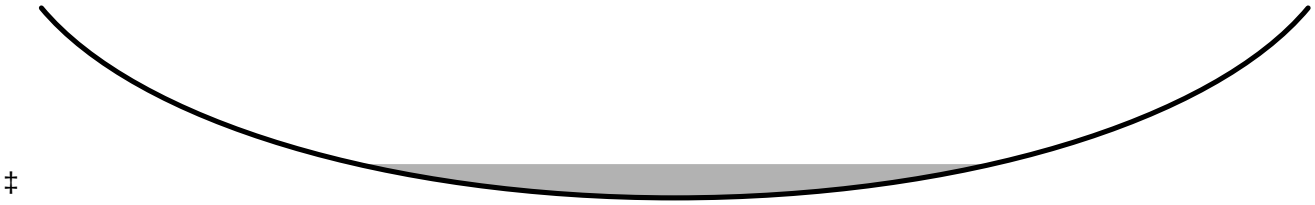
Summary for Reach 73R: Gravel Wetland #103

Inflow Area = 1.629 ac, 62.87% Impervious, Inflow Depth > 4.23" for 25 Yr.-24 Hr. event
Inflow = 1.72 cfs @ 12.59 hrs, Volume= 0.575 af
Outflow = 1.72 cfs @ 12.59 hrs, Volume= 0.574 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.45 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.67 fps, Avg. Travel Time= 3.8 min

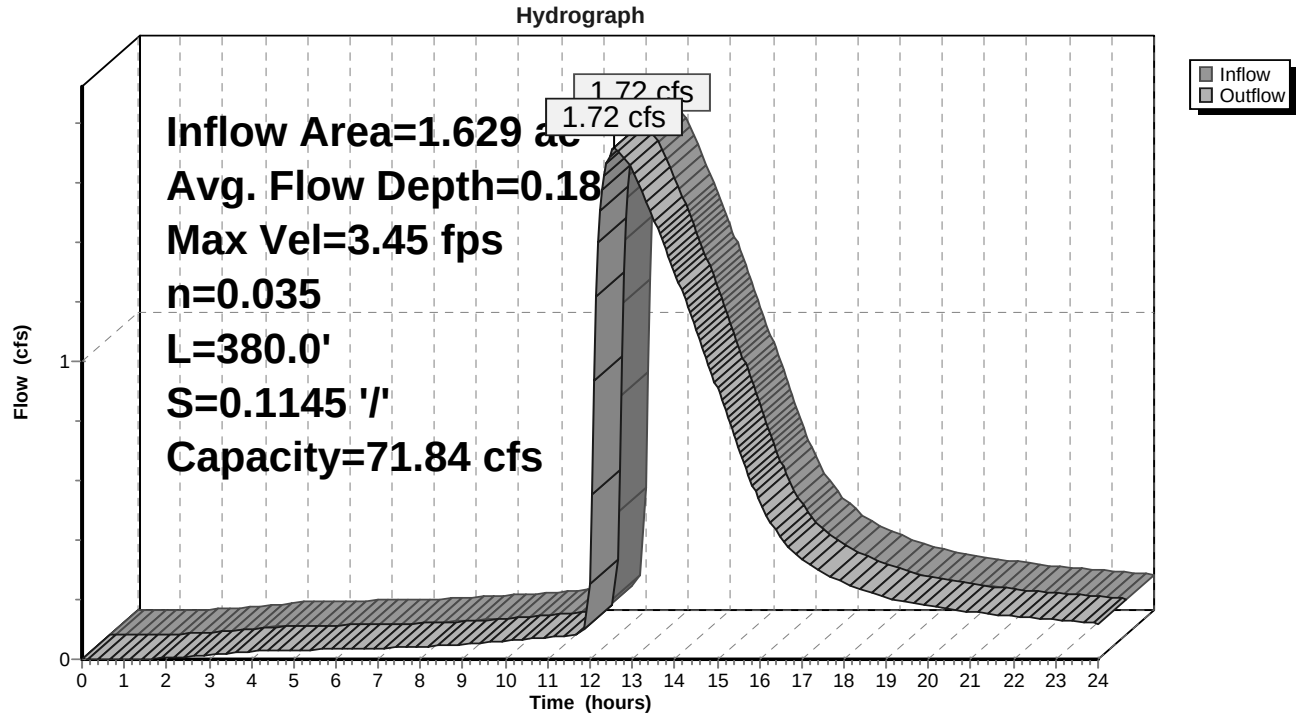
Peak Storage= 189 cf @ 12.59 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 1.00' Flow Area= 6.7 sf, Capacity= 71.84 cfs

10.00' x 1.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 380.0' Slope= 0.1145 '/'
Inlet Invert= 90.00', Outlet Invert= 46.50'



‡

Reach 73R: Gravel Wetland #103



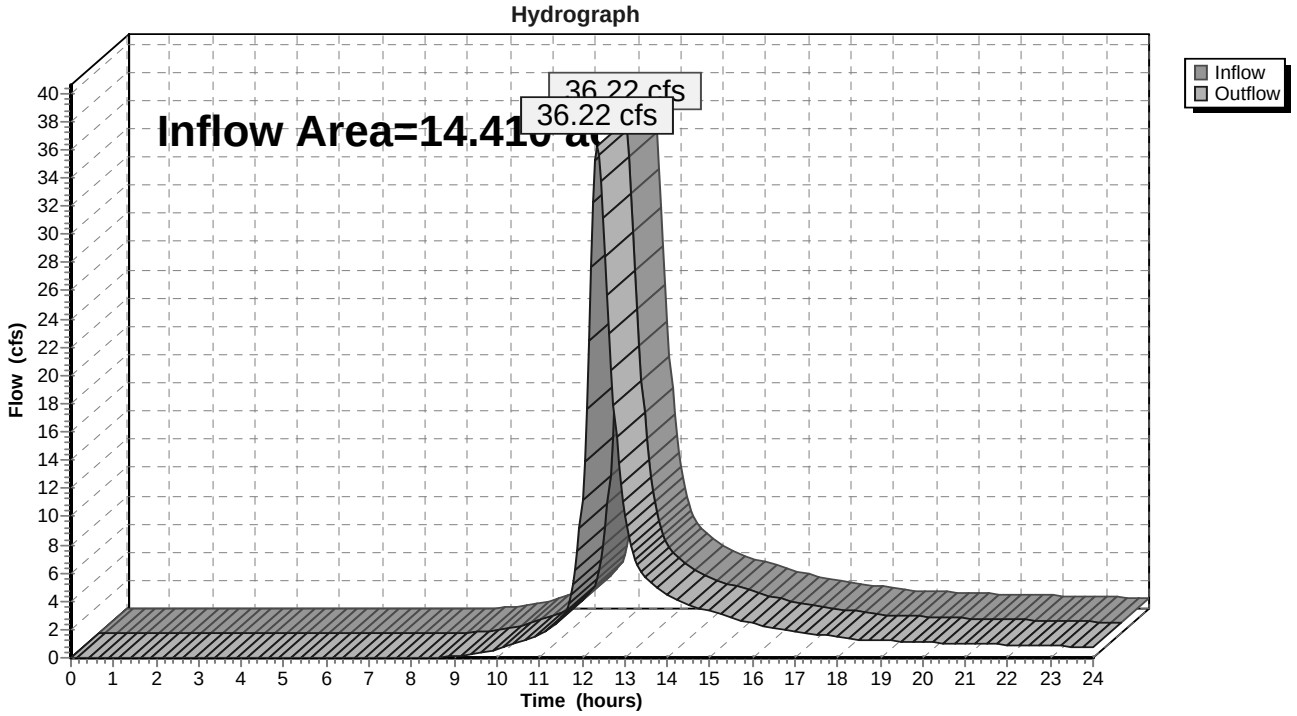
Summary for Reach 100R: Reach #100

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

Inflow Area = 14.410 ac, 1.83% Impervious, Inflow Depth > 3.52" for 25 Yr.-24 Hr. event
Inflow = 36.22 cfs @ 12.36 hrs, Volume= 4.224 af
Outflow = 36.22 cfs @ 12.36 hrs, Volume= 4.224 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 100R: Reach #100



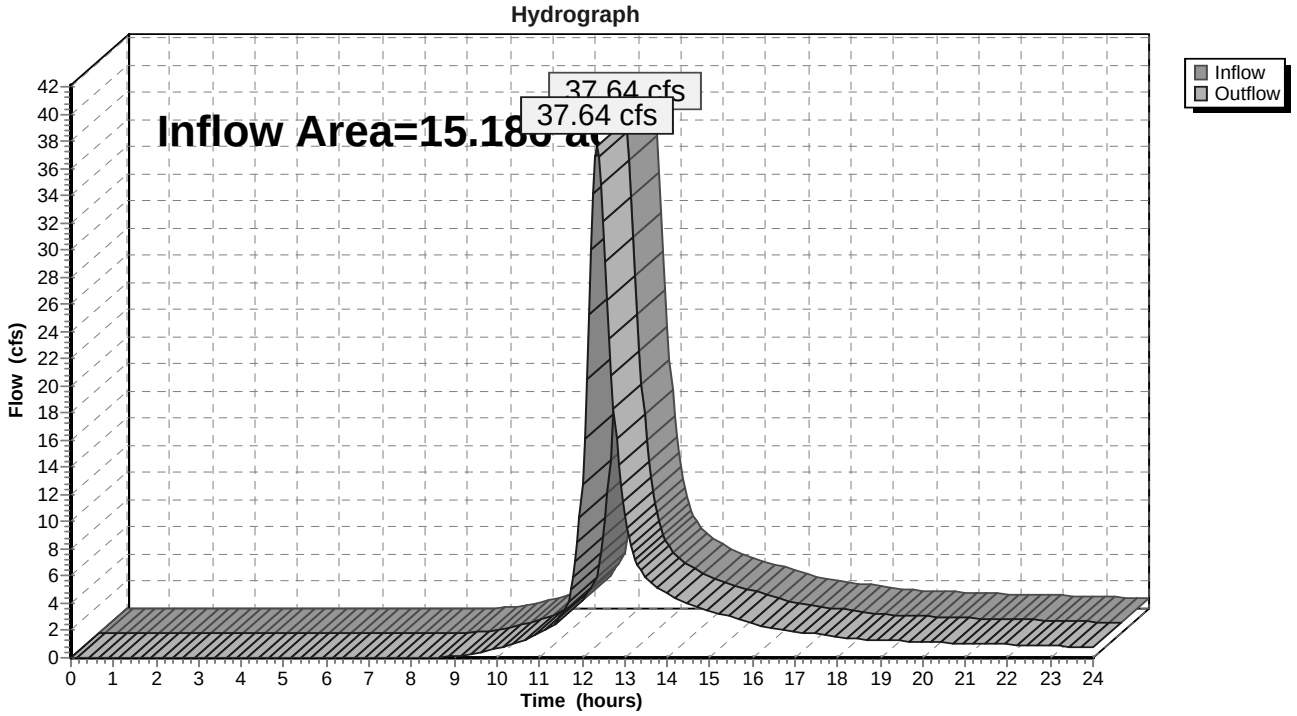
Summary for Reach 200R: Reach #200

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

Inflow Area = 15.186 ac, 1.74% Impervious, Inflow Depth > 3.52" for 25 Yr.-24 Hr. event
Inflow = 37.64 cfs @ 12.35 hrs, Volume= 4.457 af
Outflow = 37.64 cfs @ 12.35 hrs, Volume= 4.457 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 200R: Reach #200



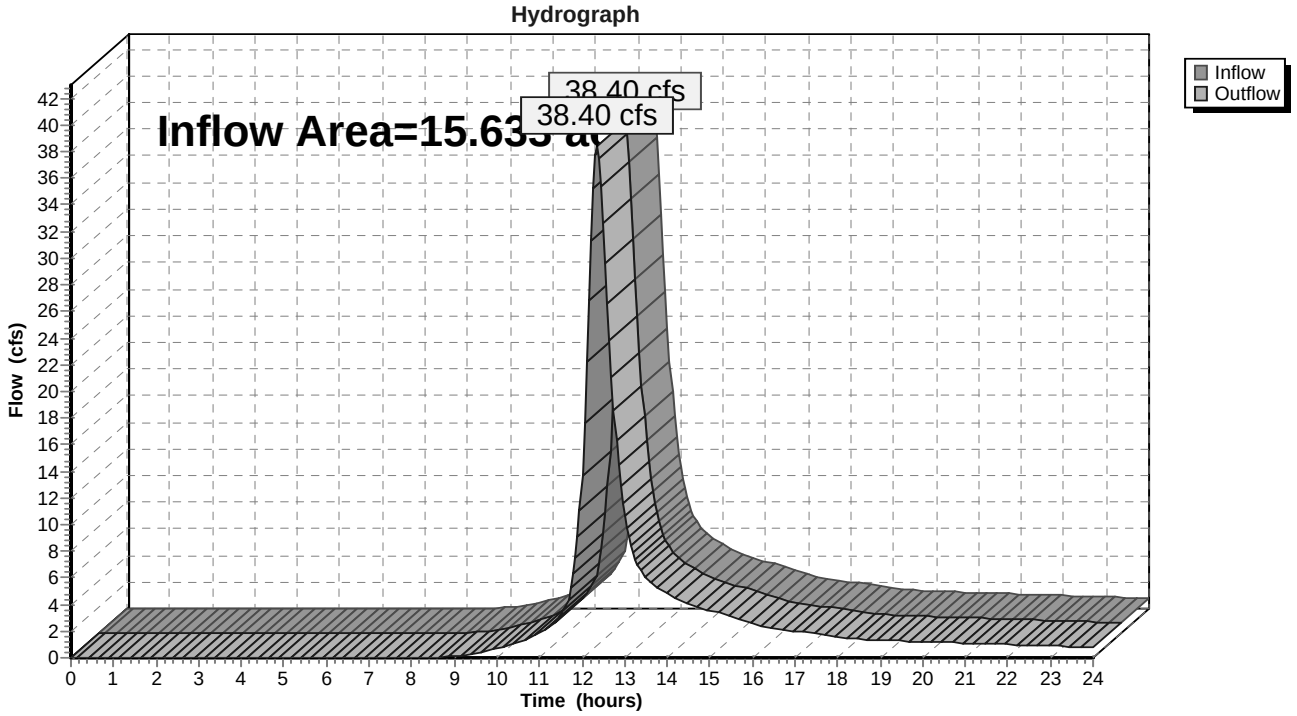
Summary for Reach 300R: Reach #300

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

Inflow Area = 15.633 ac, 1.69% Impervious, Inflow Depth > 3.52" for 25 Yr.-24 Hr. event
Inflow = 38.40 cfs @ 12.35 hrs, Volume= 4.587 af
Outflow = 38.40 cfs @ 12.35 hrs, Volume= 4.587 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 300R: Reach #300



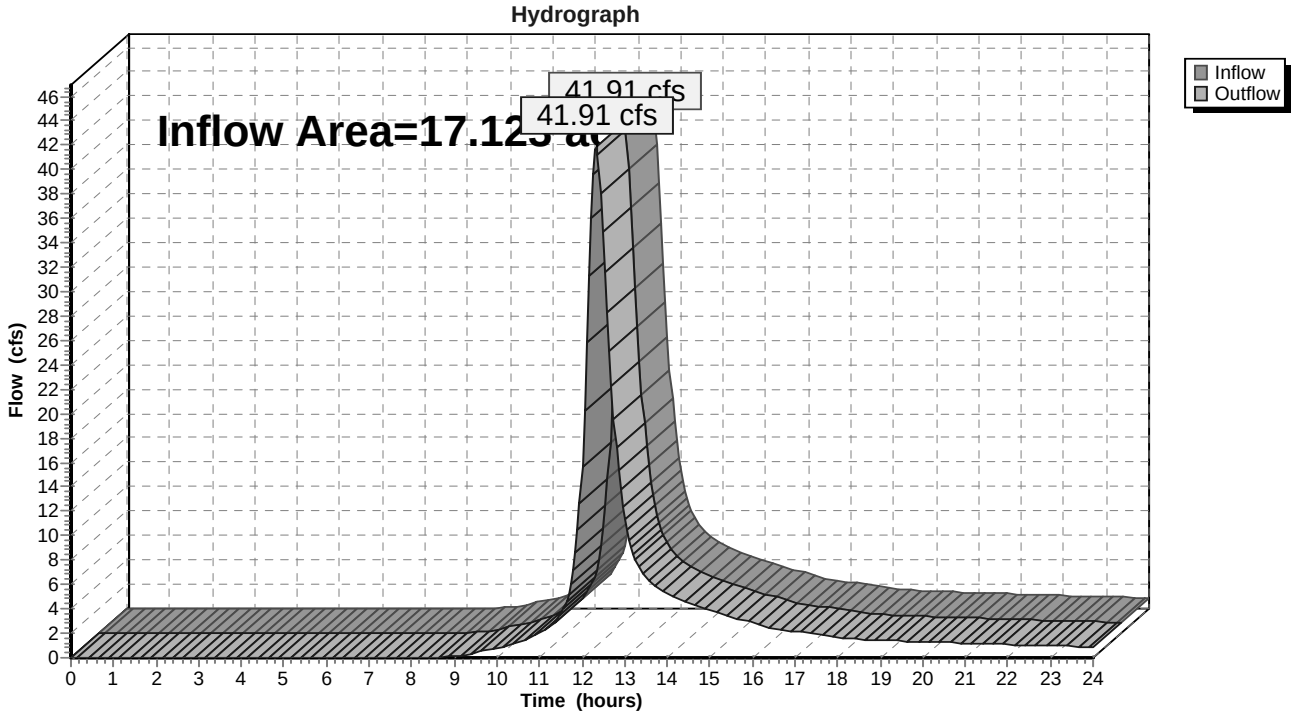
Summary for Reach 400R: Reach #400

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

Inflow Area = 17.123 ac, 1.54% Impervious, Inflow Depth > 3.52" for 25 Yr.-24 Hr. event
Inflow = 41.91 cfs @ 12.33 hrs, Volume= 5.022 af
Outflow = 41.91 cfs @ 12.33 hrs, Volume= 5.022 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 400R: Reach #400



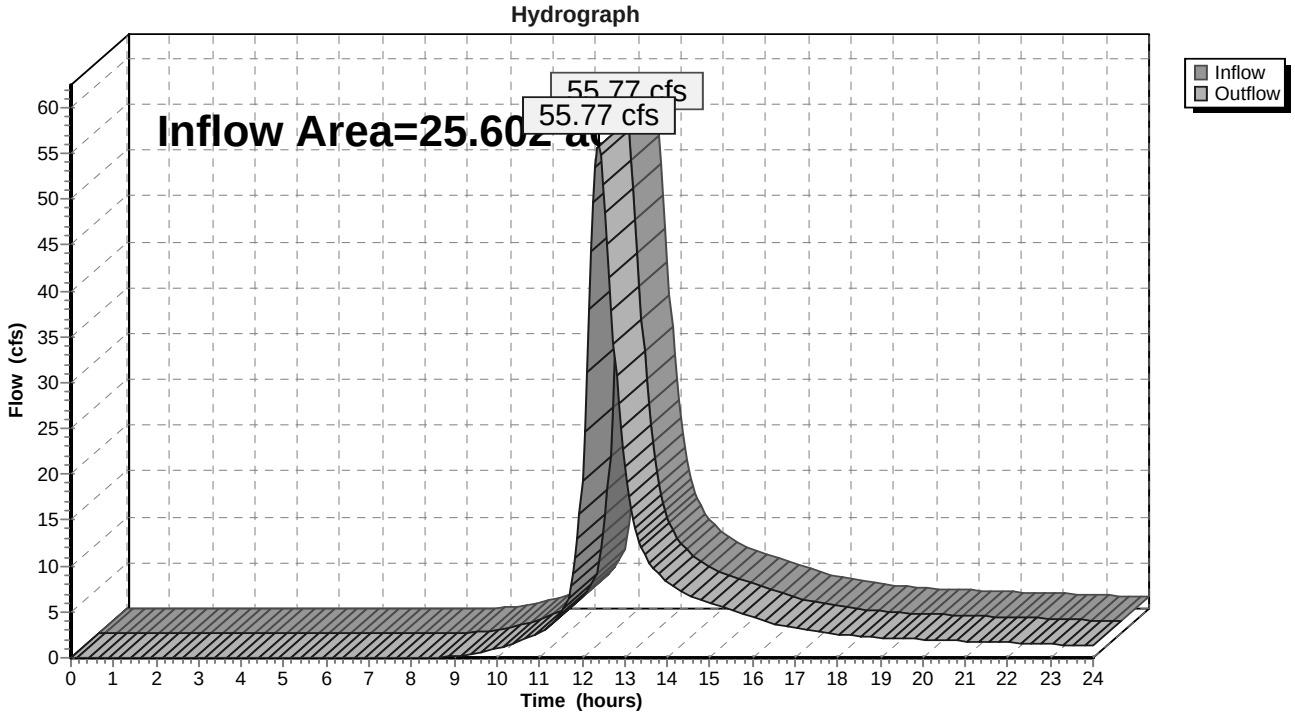
Summary for Reach 500R: Reach #500

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

Inflow Area = 25.602 ac, 1.42% Impervious, Inflow Depth > 3.50" for 25 Yr.-24 Hr. event
Inflow = 55.77 cfs @ 12.38 hrs, Volume= 7.462 af
Outflow = 55.77 cfs @ 12.38 hrs, Volume= 7.462 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 500R: Reach #500



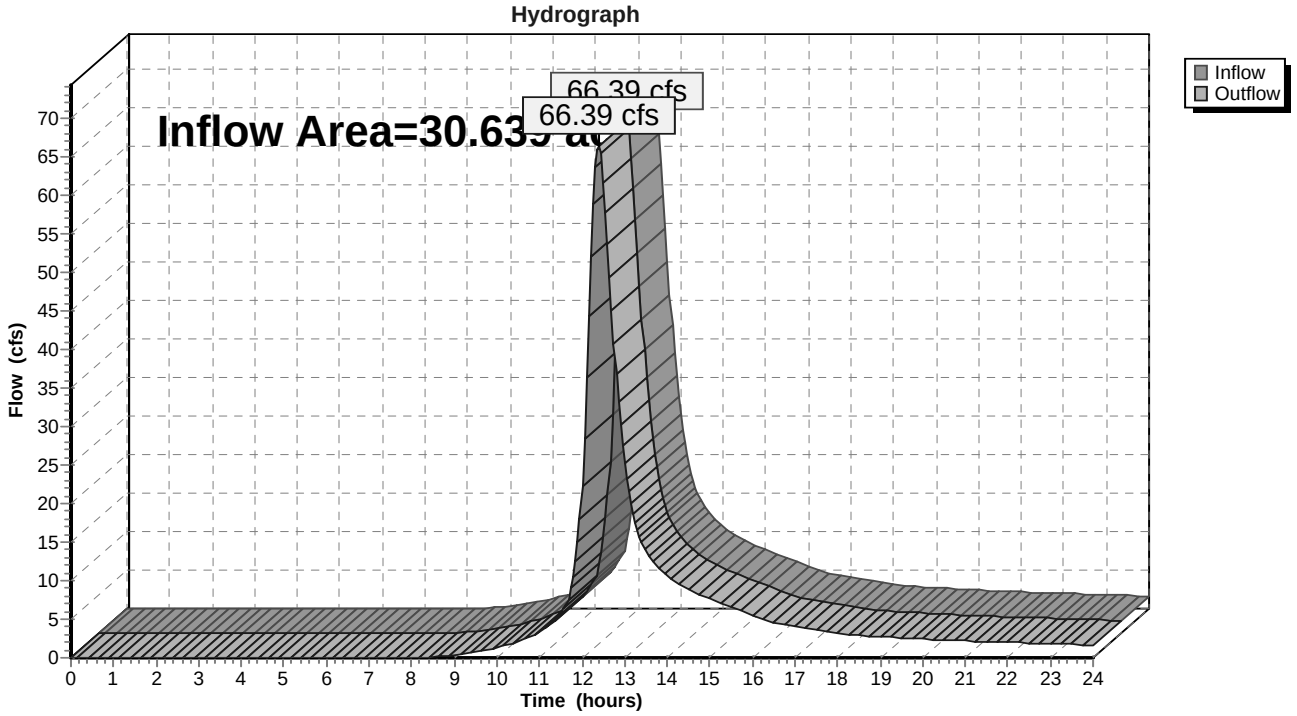
Summary for Reach 600R: Reach #600

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

Inflow Area = 30.639 ac, 5.18% Impervious, Inflow Depth > 3.57" for 25 Yr.-24 Hr. event
Inflow = 66.39 cfs @ 12.38 hrs, Volume= 9.116 af
Outflow = 66.39 cfs @ 12.38 hrs, Volume= 9.116 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 600R: Reach #600



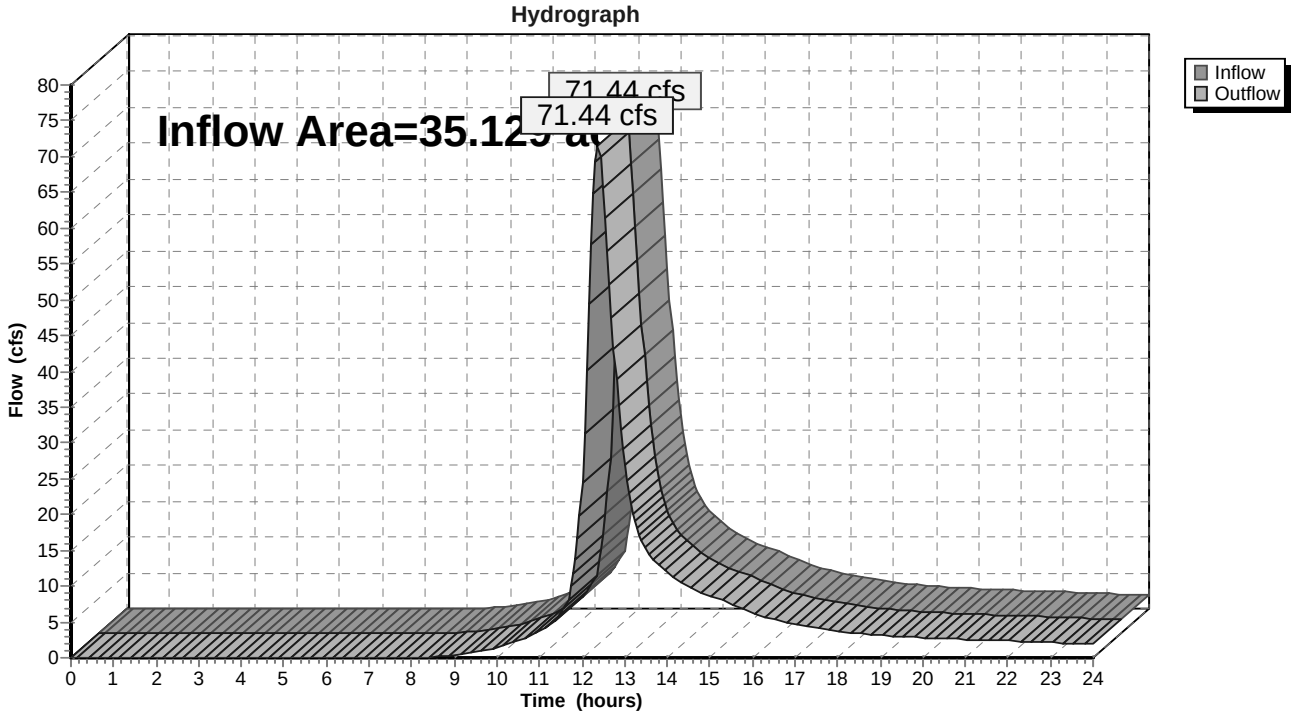
Summary for Reach 700R: Reach #700

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

Inflow Area = 35.129 ac, 7.34% Impervious, Inflow Depth > 3.44" for 25 Yr.-24 Hr. event
Inflow = 71.44 cfs @ 12.37 hrs, Volume= 10.070 af
Outflow = 71.44 cfs @ 12.37 hrs, Volume= 10.070 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 700R: Reach #700



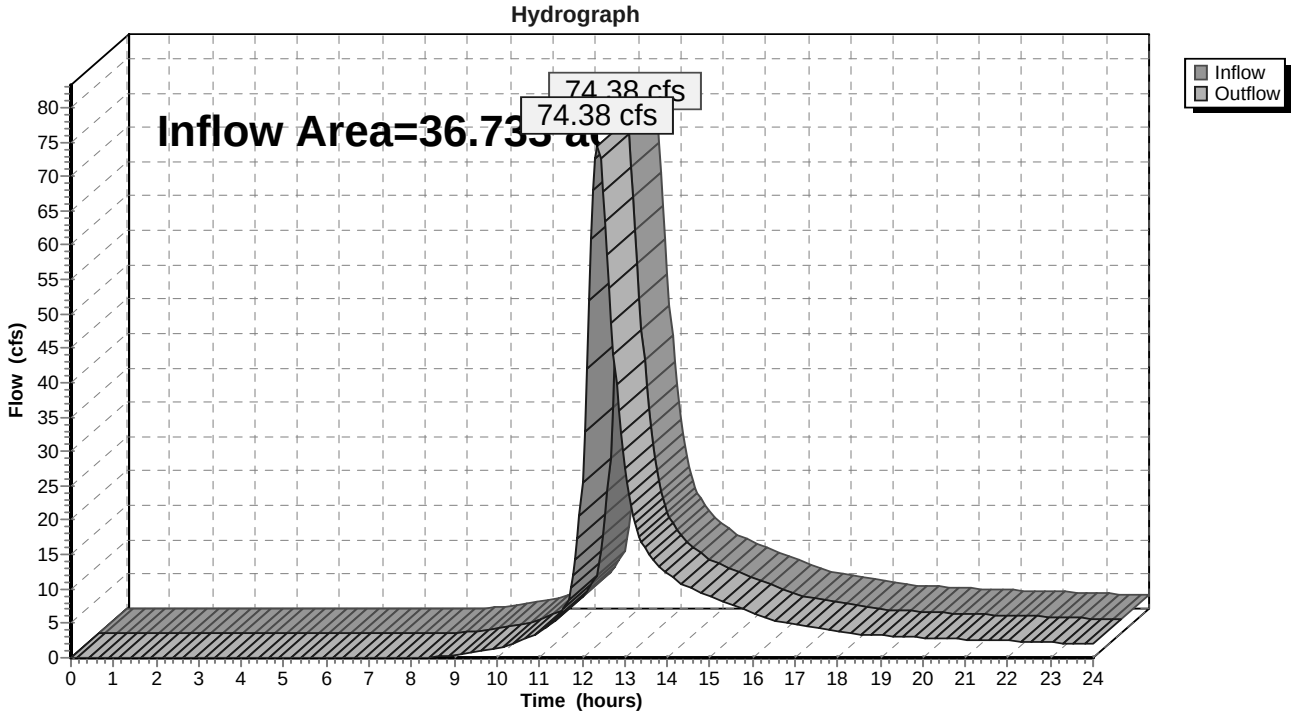
Summary for Reach 800R: Reach #800

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

Inflow Area = 36.733 ac, 7.02% Impervious, Inflow Depth > 3.40" for 25 Yr.-24 Hr. event
Inflow = 74.38 cfs @ 12.36 hrs, Volume= 10.417 af
Outflow = 74.38 cfs @ 12.36 hrs, Volume= 10.417 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 800R: Reach #800



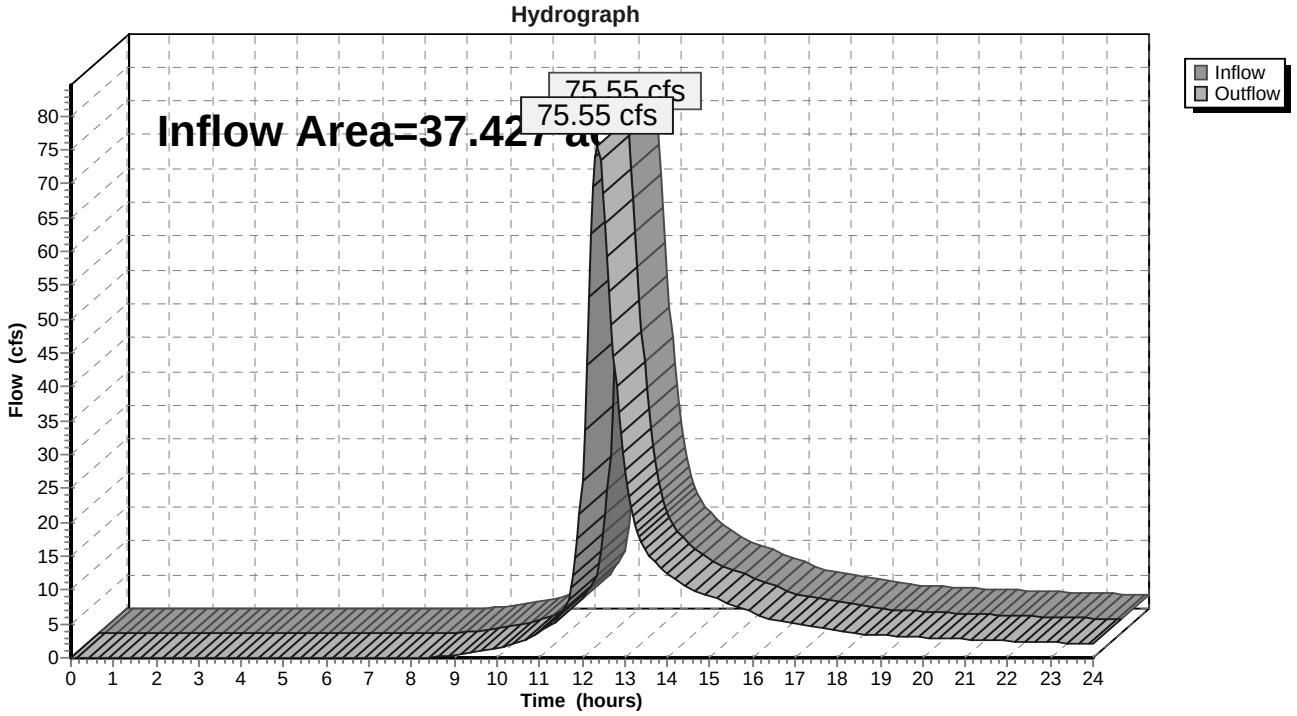
Summary for Reach 900R: Final Reach #900

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

Inflow Area = 37.427 ac, 6.89% Impervious, Inflow Depth > 3.39" for 25 Yr.-24 Hr. event
Inflow = 75.55 cfs @ 12.36 hrs, Volume= 10.567 af
Outflow = 75.55 cfs @ 12.36 hrs, Volume= 10.567 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 900R: Final Reach #900



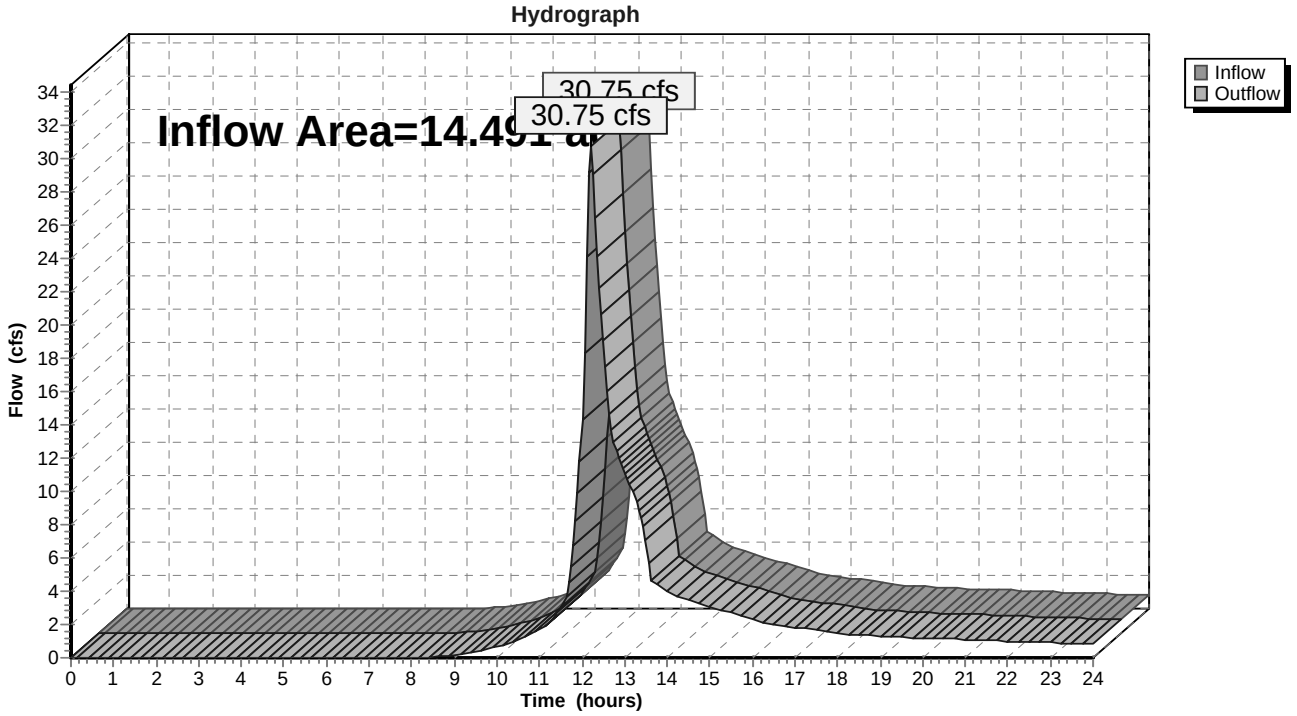
Summary for Reach 1100R: Final Reach #1100

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

Inflow Area = 14.491 ac, 10.37% Impervious, Inflow Depth > 3.31" for 25 Yr.-24 Hr. event
Inflow = 30.75 cfs @ 12.20 hrs, Volume= 4.003 af
Outflow = 30.75 cfs @ 12.20 hrs, Volume= 4.003 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1100R: Final Reach #1100



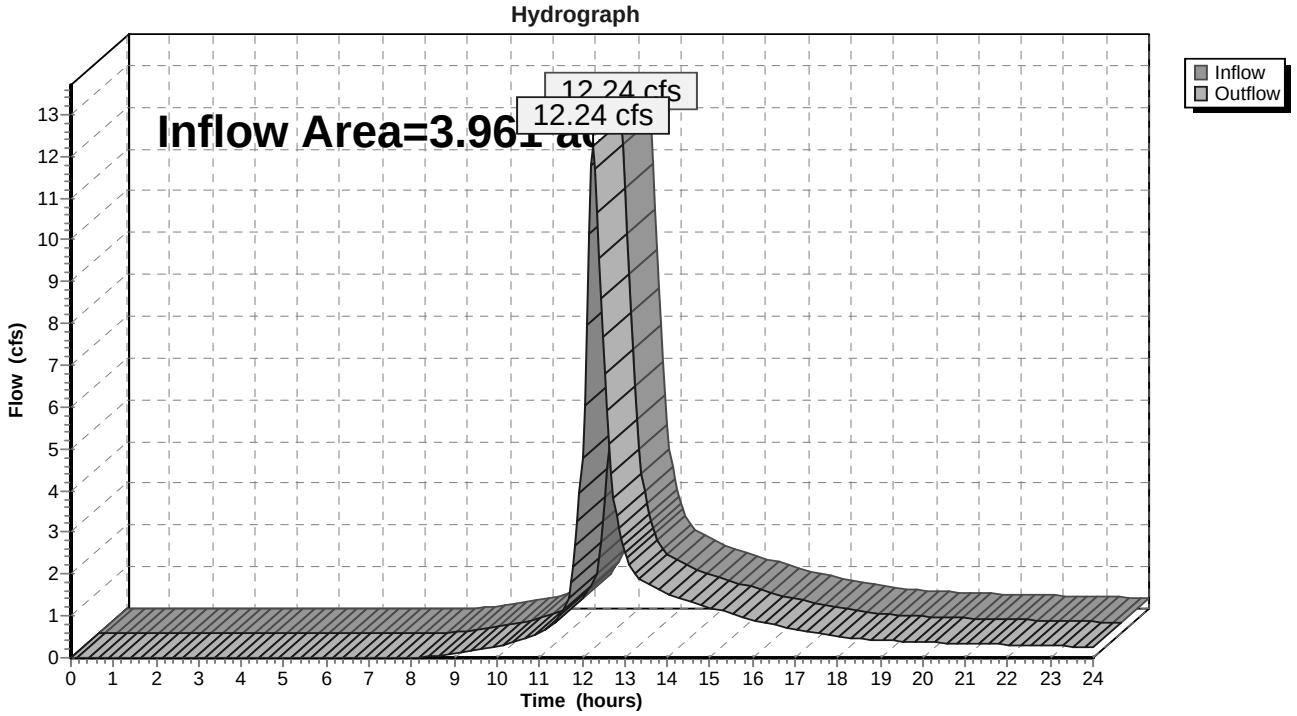
Summary for Reach 1200R: Final Reach #1200

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

Inflow Area = 3.961 ac, 5.34% Impervious, Inflow Depth > 4.22" for 25 Yr.-24 Hr. event
Inflow = 12.24 cfs @ 12.25 hrs, Volume= 1.392 af
Outflow = 12.24 cfs @ 12.25 hrs, Volume= 1.392 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1200R: Final Reach #1200



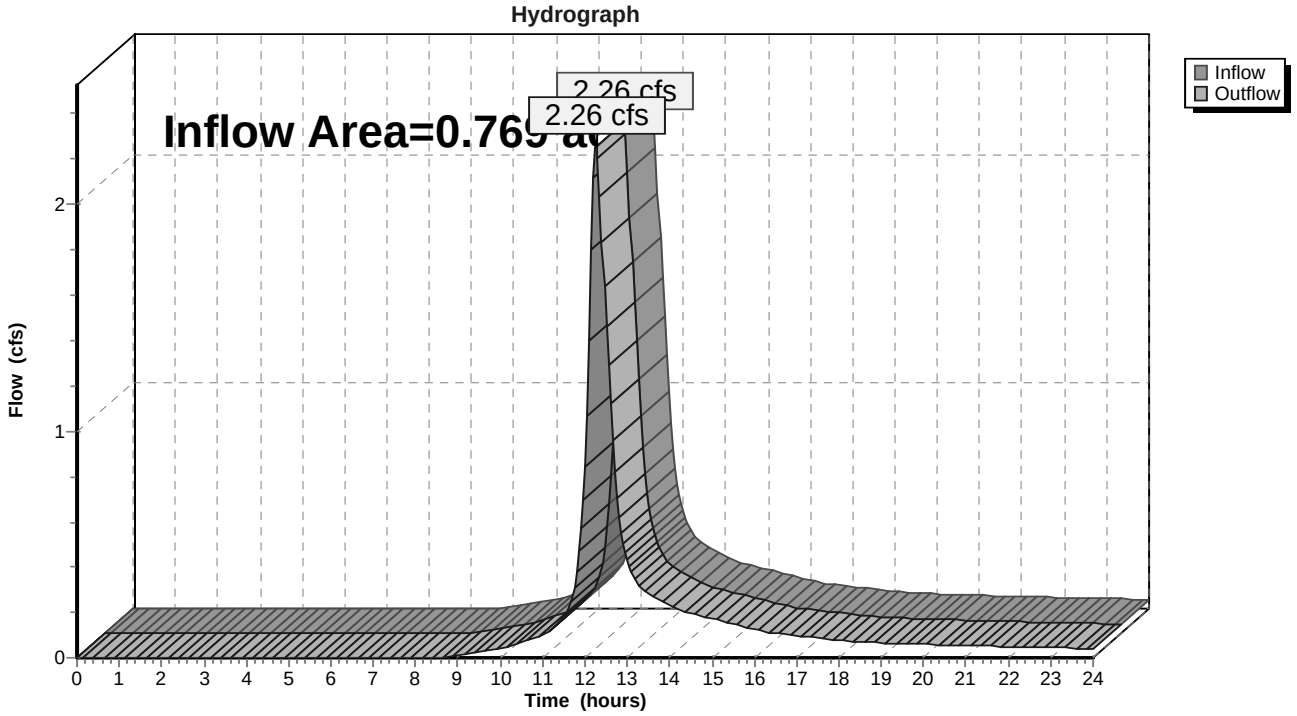
Summary for Reach 1300R: Final Reach #1300

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

Inflow Area = 0.769 ac, 0.00% Impervious, Inflow Depth > 3.60" for 25 Yr.-24 Hr. event
Inflow = 2.26 cfs @ 12.26 hrs, Volume= 0.231 af
Outflow = 2.26 cfs @ 12.26 hrs, Volume= 0.231 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1300R: Final Reach #1300



Summary for Pond 1EP: Catch Basin #7727

Inflow Area = 0.011 ac, 45.75% Impervious, Inflow Depth > 4.68" for 25 Yr.-24 Hr. event
Inflow = 0.06 cfs @ 12.09 hrs, Volume= 0.004 af
Outflow = 0.06 cfs @ 12.09 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.3 min
Primary = 0.06 cfs @ 12.09 hrs, Volume= 0.004 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 138.07' @ 12.09 hrs Surf.Area= 13 sf Storage= 2 cf

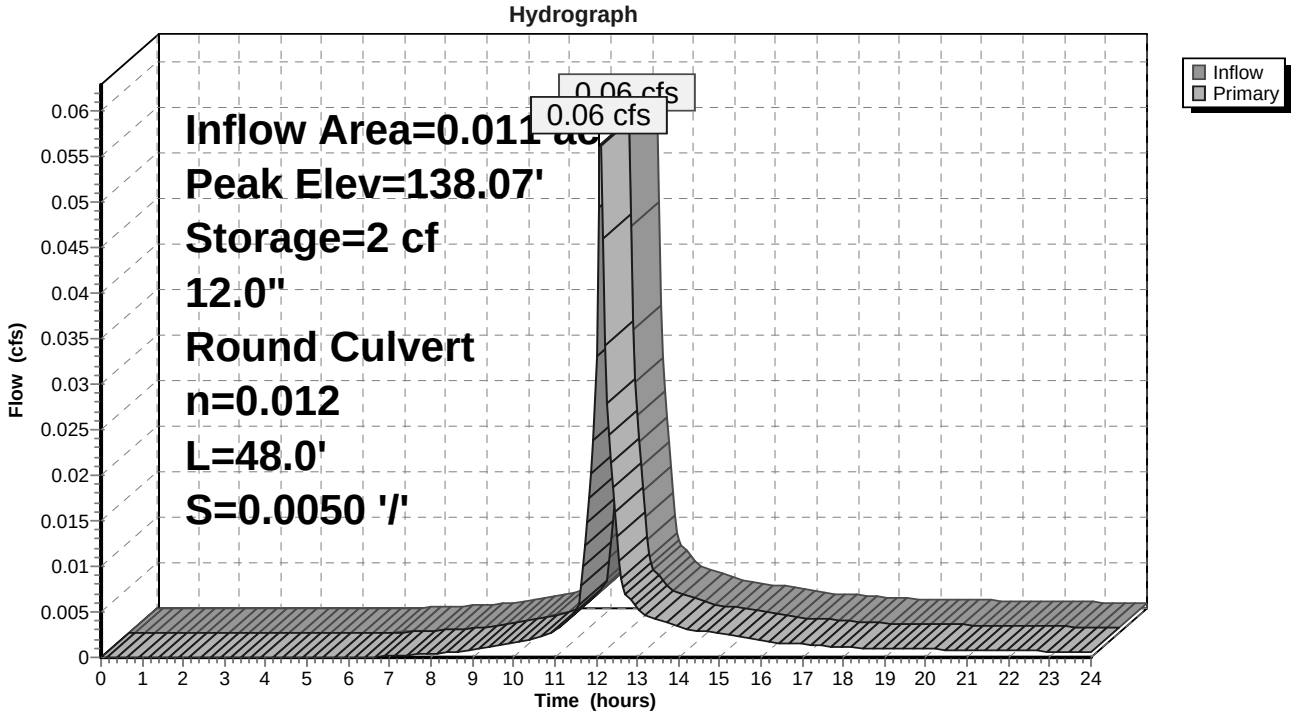
Plug-Flow detention time= 1.9 min calculated for 0.004 af (100% of inflow)
Center-of-Mass det. time= 1.3 min (807.0 - 805.7)

Volume	Invert	Avail.Storage	Storage Description
#1	137.94'	57 cf	**4.00'D x 4.50'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	137.94'	**12.0" Round 12" HDPE** L= 48.0' Ke= 0.500 Inlet / Outlet Invert= 137.94' / 137.70' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.06 cfs @ 12.09 hrs HW=138.07' TW=137.19' (Dynamic Tailwater)
1=12" HDPE (Barrel Controls 0.06 cfs @ 1.36 fps)

Pond 1EP: Catch Basin #7727



Summary for Pond 2EP: Catch Basin #3698

Inflow Area = 0.053 ac, 9.70% Impervious, Inflow Depth > 3.51" for 25 Yr.-24 Hr. event
Inflow = 0.21 cfs @ 12.09 hrs, Volume= 0.015 af
Outflow = 0.21 cfs @ 12.10 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.2 min
Primary = 0.21 cfs @ 12.10 hrs, Volume= 0.015 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 138.01' @ 12.10 hrs Surf.Area= 13 sf Storage= 3 cf

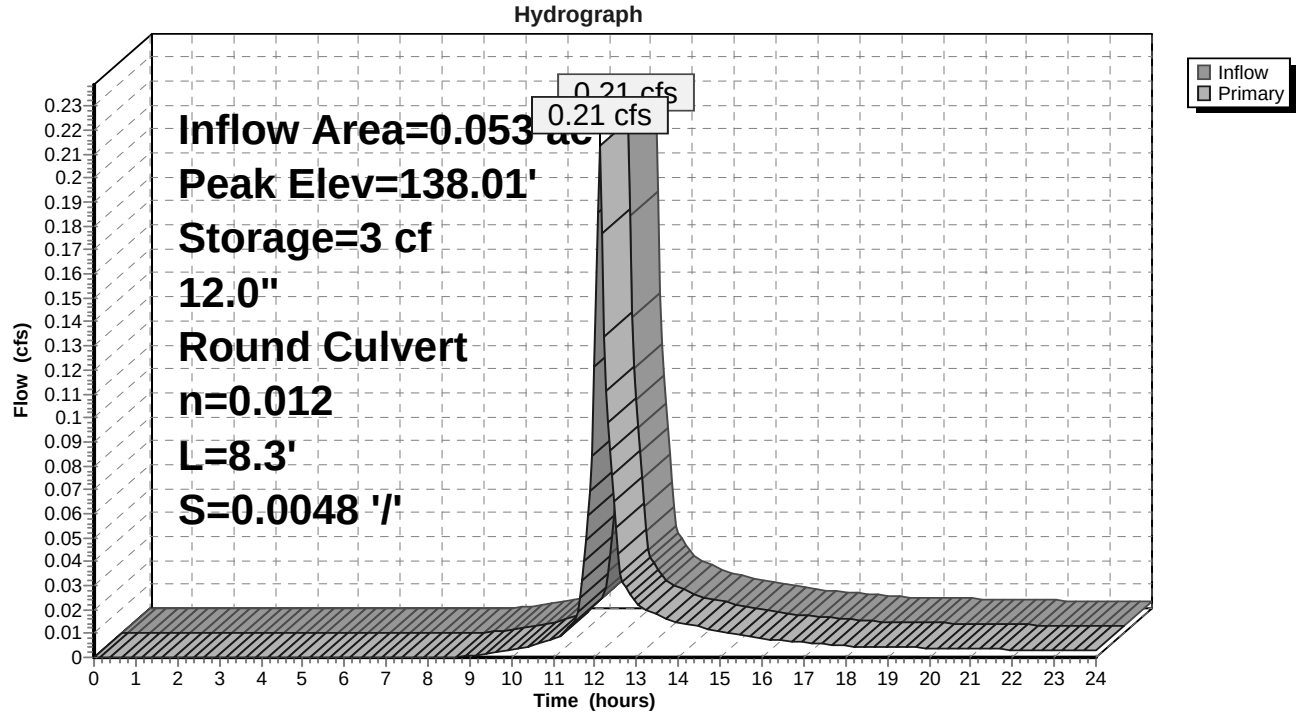
Plug-Flow detention time= 0.9 min calculated for 0.015 af (100% of inflow)
Center-of-Mass det. time= 0.6 min (831.7 - 831.2)

Volume	Invert	Avail.Storage	Storage Description
#1	137.74'	43 cf	**4.00'D x 3.40'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	137.74'	**12.0" Round 12" HDPE** L= 8.3' Ke= 0.500 Inlet / Outlet Invert= 137.74' / 137.70' S= 0.0048 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.21 cfs @ 12.10 hrs HW=138.01' TW=137.19' (Dynamic Tailwater)
1=12" HDPE (Barrel Controls 0.21 cfs @ 1.83 fps)

Pond 2EP: Catch Basin #3698



Summary for Pond 3EP: Catch Basin #7725

Inflow Area = 0.119 ac, 84.79% Impervious, Inflow Depth > 6.04" for 25 Yr.-24 Hr. event
Inflow = 0.76 cfs @ 12.09 hrs, Volume= 0.060 af
Outflow = 0.76 cfs @ 12.09 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.1 min
Primary = 0.76 cfs @ 12.09 hrs, Volume= 0.060 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 138.96' @ 12.09 hrs Surf.Area= 13 sf Storage= 6 cf

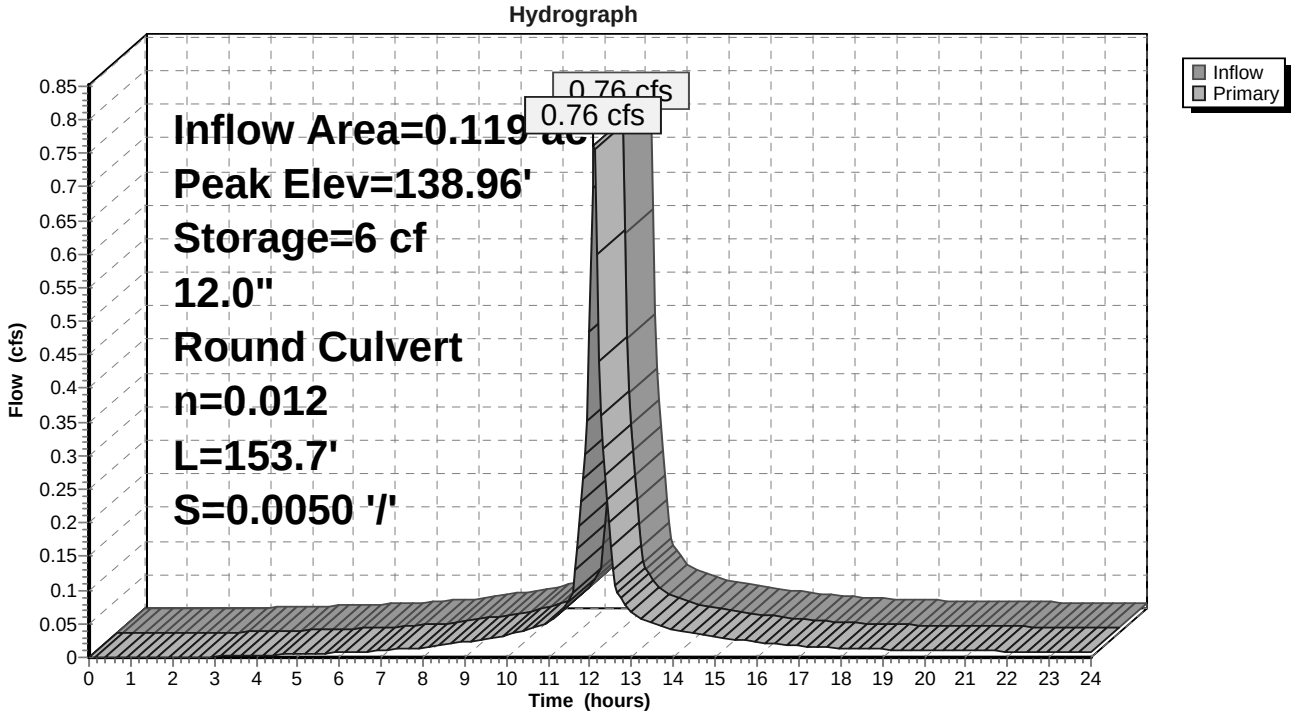
Plug-Flow detention time= 0.5 min calculated for 0.060 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (769.2 - 768.9)

Volume	Invert	Avail.Storage	Storage Description
#1	138.47'	41 cf	**4.00'D x 3.23'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	138.47'	**12.0" Round 12" HDPE** L= 153.7' Ke= 0.500 Inlet / Outlet Invert= 138.47' / 137.70' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.74 cfs @ 12.09 hrs HW=138.96' TW=137.19' (Dynamic Tailwater)
↑—**1=12" HDPE** (Barrel Controls 0.74 cfs @ 2.86 fps)

Pond 3EP: Catch Basin #7725



Summary for Pond 4EP: Catch Basin #7726

Inflow Area = 0.203 ac, 63.62% Impervious, Inflow Depth > 5.33" for 25 Yr.-24 Hr. event
Inflow = 1.16 cfs @ 12.09 hrs, Volume= 0.090 af
Outflow = 1.16 cfs @ 12.09 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.1 min
Primary = 1.16 cfs @ 12.09 hrs, Volume= 0.090 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 137.20' @ 12.09 hrs Surf.Area= 13 sf Storage= 6 cf

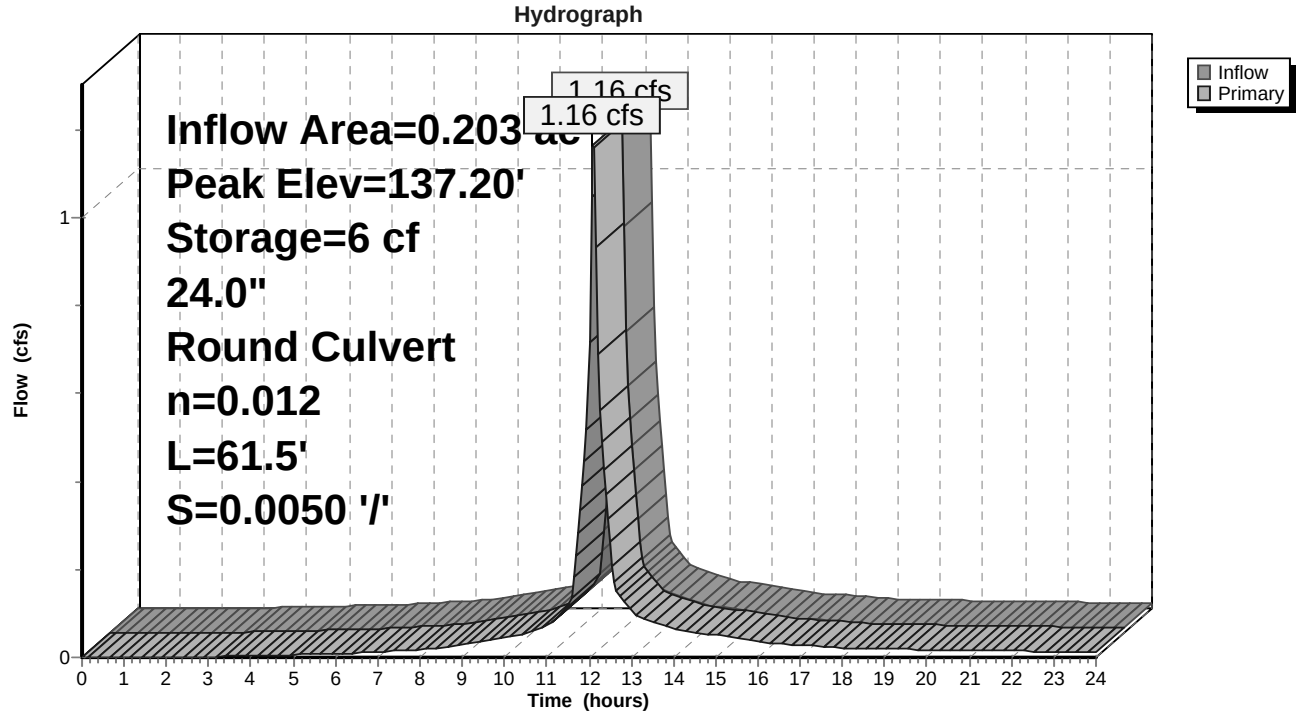
Plug-Flow detention time= 0.3 min calculated for 0.090 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (780.8 - 780.6)

Volume	Invert	Avail.Storage	Storage Description
#1	136.70'	69 cf	**4.00'D x 5.48'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	136.70'	**24.0" Round 24 " HDPE** L= 61.5' Ke= 0.500 Inlet / Outlet Invert= 136.70' / 136.39' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=1.14 cfs @ 12.09 hrs HW=137.19' TW=136.50' (Dynamic Tailwater)
1=24 " HDPE (Barrel Controls 1.14 cfs @ 2.86 fps)

Pond 4EP: Catch Basin #7726



Summary for Pond 10P: 24" RCP Inlet Sump/Pond

Inflow Area = 1.710 ac, 10.49% Impervious, Inflow Depth > 3.61" for 25 Yr.-24 Hr. event
Inflow = 6.35 cfs @ 12.14 hrs, Volume= 0.514 af
Outflow = 6.30 cfs @ 12.15 hrs, Volume= 0.514 af, Atten= 1%, Lag= 1.0 min
Primary = 6.30 cfs @ 12.15 hrs, Volume= 0.514 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 101.07' @ 12.15 hrs Surf.Area= 605 sf Storage= 328 cf
Flood Elev= 105.00' Surf.Area= 15,552 sf Storage= 25,913 cf

Plug-Flow detention time= 1.3 min calculated for 0.514 af (100% of inflow)
Center-of-Mass det. time= 0.9 min (832.5 - 831.6)

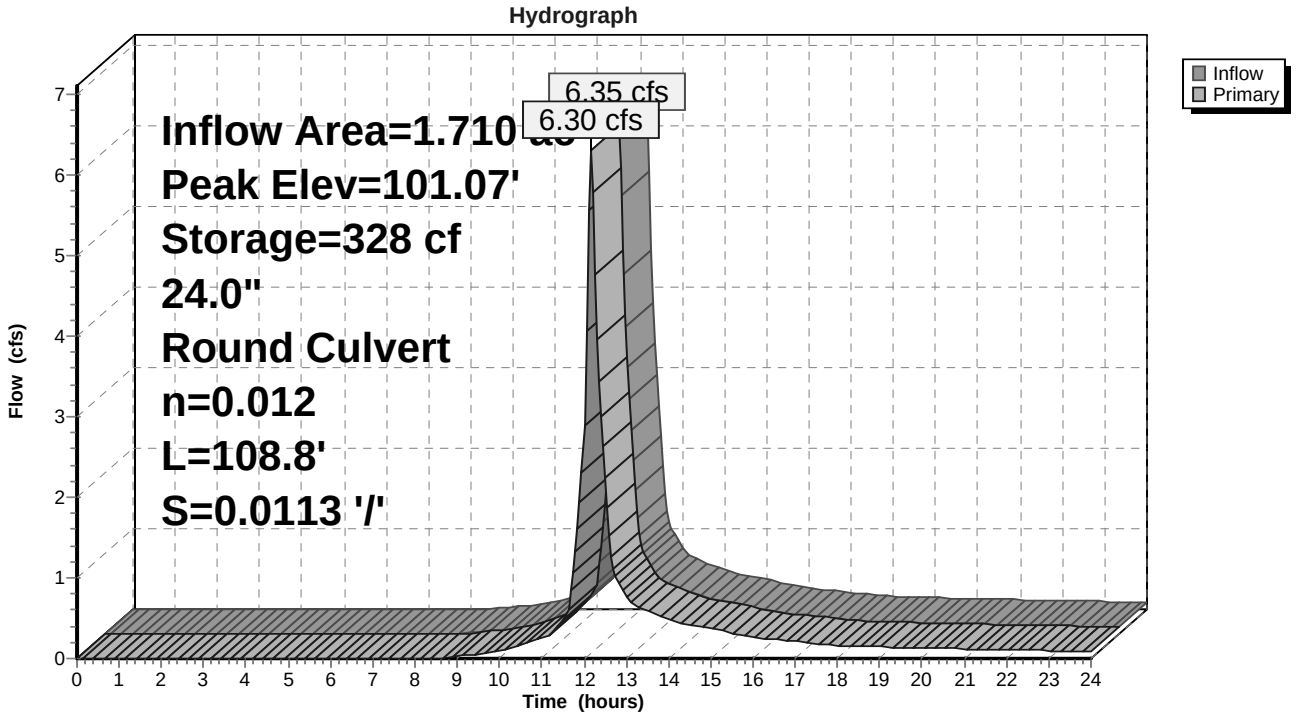
Volume	Invert	Avail.Storage	Storage Description
#1	99.87'	25,913 cf	**Open Water Storage (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.87	50	25.0	0	0	50
101.00	550	113.5	288	288	1,029
102.00	1,622	235.2	1,039	1,327	4,410
103.00	5,674	319.0	3,443	4,771	8,116
104.00	10,737	417.2	8,072	12,843	13,881
105.00	15,552	506.0	13,070	25,913	20,421

Device	Routing	Invert	Outlet Devices
#1	Primary	99.97'	**24.0" Round 24" RCP** L= 108.8' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 99.97' / 98.74' S= 0.0113 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=6.25 cfs @ 12.15 hrs HW=101.06' TW=99.03' (Dynamic Tailwater)
↑—**1=24" RCP** (Inlet Controls 6.25 cfs @ 3.56 fps)

Pond 10P: 24" RCP Inlet Sump/Pond



Summary for Pond 15P: 12" RCP Inlet Sump/Pond

Inflow Area = 7.089 ac, 15.80% Impervious, Inflow Depth > 3.02" for 25 Yr.-24 Hr. event
Inflow = 13.91 cfs @ 12.33 hrs, Volume= 1.782 af
Outflow = 7.82 cfs @ 12.67 hrs, Volume= 1.782 af, Atten= 44%, Lag= 20.2 min
Primary = 7.82 cfs @ 12.67 hrs, Volume= 1.782 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 97.69' @ 12.67 hrs Surf.Area= 6,423 sf Storage= 9,643 cf
Flood Elev= 100.50' Surf.Area= 20,281 sf Storage= 43,715 cf

Plug-Flow detention time= 6.5 min calculated for 1.782 af (100% of inflow)
Center-of-Mass det. time= 6.4 min (872.8 - 866.4)

Volume	Invert	Avail.Storage	Storage Description
#1	92.91'	43,715 cf	**Open Water Storage (Irregular)** Listed below (Recalc)

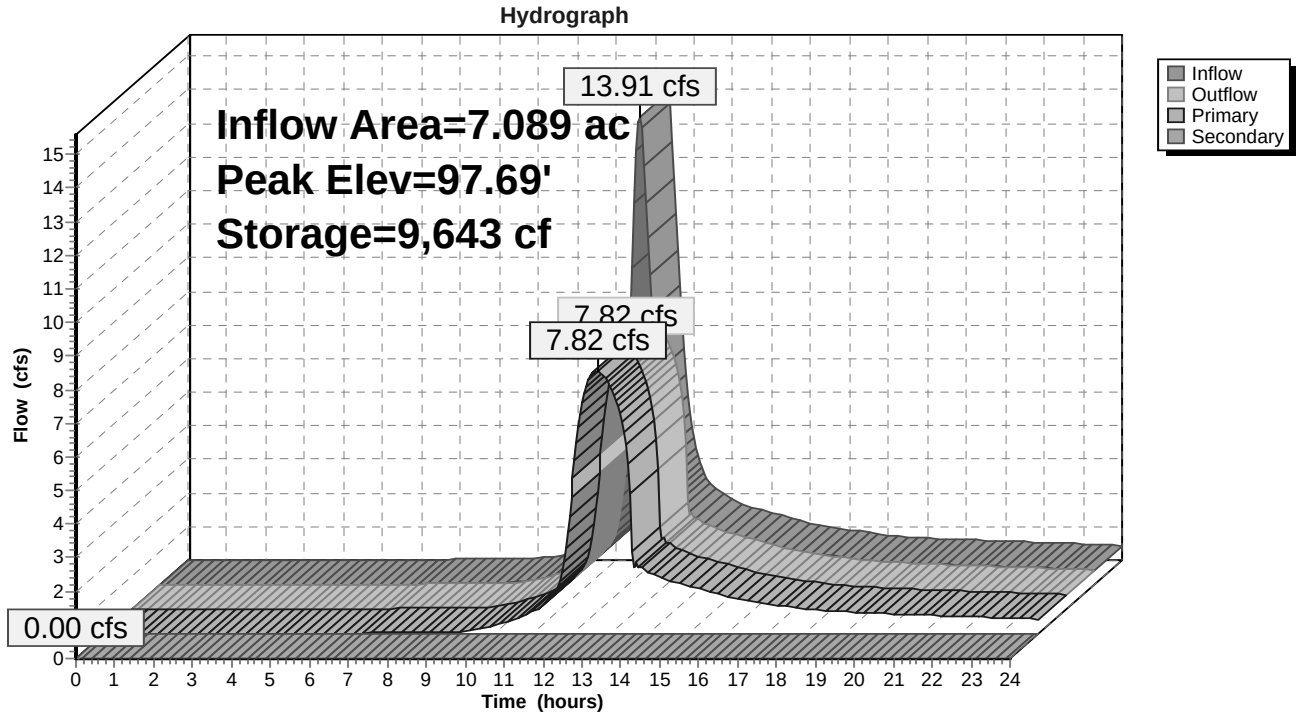
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.91	4	8.0	0	0	4
93.00	76	32.8	3	3	85
94.00	145	50.2	109	112	207
95.00	785	142.0	422	534	1,614
96.00	2,440	333.7	1,536	2,070	8,875
97.00	5,015	384.4	3,651	5,721	11,794
98.00	7,121	421.5	6,037	11,759	14,207
99.00	10,534	551.3	8,772	20,531	24,267
100.00	17,329	664.7	13,791	34,322	35,257
100.50	20,281	657.0	9,393	43,715	36,132

Device	Routing	Invert	Outlet Devices
#1	Primary	92.91'	**12.0" Round 12" RCP** L= 84.3' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 92.91' / 90.32' S= 0.0307 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Secondary	100.25'	**50.0' long x 15.0' breadth Flow Over Road** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=7.82 cfs @ 12.67 hrs HW=97.68' TW=90.65' (Dynamic Tailwater)
↑—**1=12" RCP** (Inlet Controls 7.82 cfs @ 9.95 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=92.91' TW=90.32' (Dynamic Tailwater)
↑—**2=Flow Over Road** (Controls 0.00 cfs)

Pond 15P: 12" RCP Inlet Sump/Pond



Summary for Pond 20P: 30" RCP Wetland Crossing #1

Inflow Area = 0.322 ac, 0.00% Impervious, Inflow Depth > 2.80" for 25 Yr.-24 Hr. event
Inflow = 0.92 cfs @ 12.13 hrs, Volume= 0.075 af
Outflow = 0.91 cfs @ 12.16 hrs, Volume= 0.075 af, Atten= 1%, Lag= 1.4 min
Primary = 0.91 cfs @ 12.16 hrs, Volume= 0.075 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 111.29' @ 12.16 hrs Surf.Area= 365 sf Storage= 99 cf
Flood Elev= 115.00' Surf.Area= 500 sf Storage= 904 cf

Plug-Flow detention time= 4.0 min calculated for 0.075 af (100% of inflow)
Center-of-Mass det. time= 2.7 min (851.8 - 849.1)

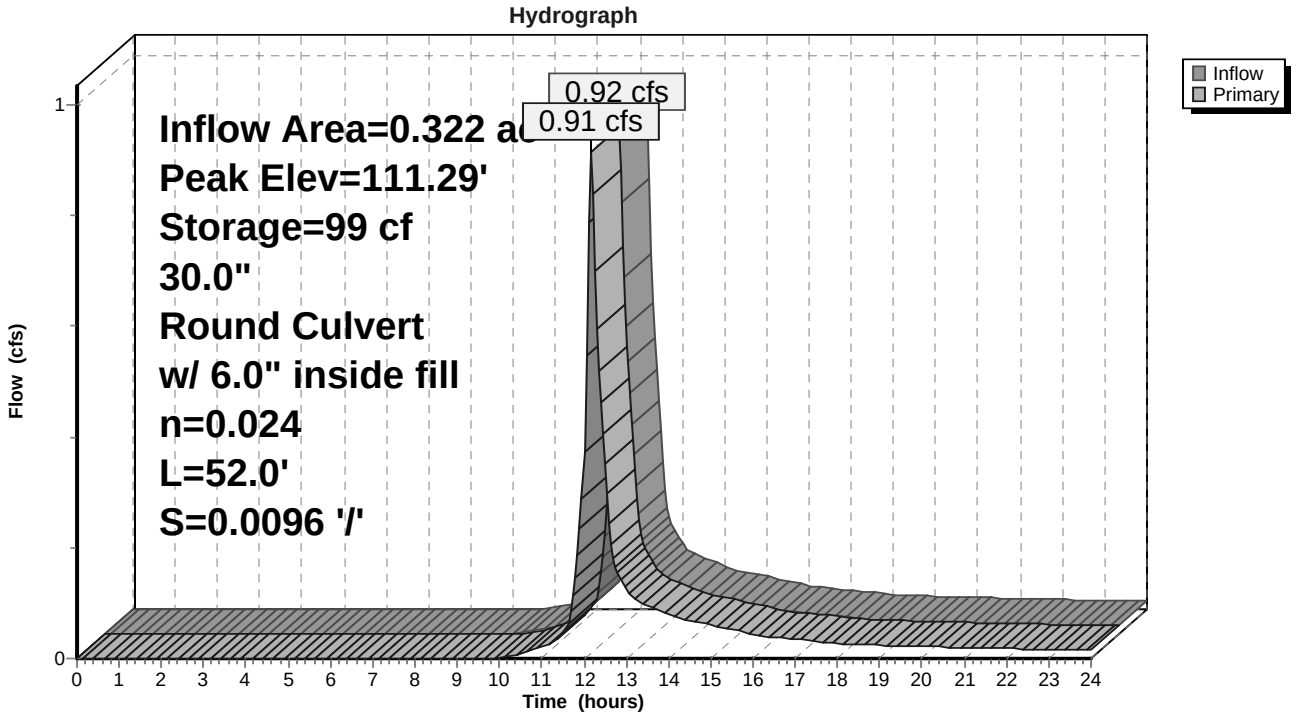
Volume	Invert	Avail.Storage	Storage Description
#1	111.00'	904 cf	**Ponding Area (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
111.00	316	76.3	0	0	316
112.00	500	100.0	404	404	660
113.00	500	100.0	500	904	760

Device	Routing	Invert	Outlet Devices
#1	Primary	111.00'	**30.0" Round 30" RCP w/ 6" Bury w/ 6.0" inside fill** L= 52.0' Ke= 0.500 Inlet / Outlet Invert= 110.50' / 110.00' S= 0.0096 '/' Cc= 0.900 n= 0.024, Flow Area= 4.21 sf

Primary OutFlow Max=0.90 cfs @ 12.16 hrs HW=111.29' TW=110.63' (Dynamic Tailwater)
↑—**1=30" RCP w/ 6" Bury** (Barrel Controls 0.90 cfs @ 1.94 fps)

Pond 20P: 30" RCP Wetland Crossing #1



Summary for Pond 101P: SGW #101

[80] Warning: Exceeded Pond C15P by 0.22' @ 12.10 hrs (1.78 cfs 0.311 af)
[80] Warning: Exceeded Pond D06P by 0.03' @ 12.50 hrs (0.97 cfs 0.161 af)

Inflow Area =	1.516 ac,	49.67% Impervious,	Inflow Depth >	5.21" for 25 Yr.-24 Hr. event
Inflow =	8.61 cfs @	12.09 hrs,	Volume=	0.658 af
Outflow =	0.20 cfs @	17.24 hrs,	Volume=	0.184 af, Atten= 98%, Lag= 308.7 min
Primary =	0.06 cfs @	17.24 hrs,	Volume=	0.073 af
Secondary =	0.14 cfs @	17.24 hrs,	Volume=	0.111 af
Tertiary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 104.34' @ 17.24 hrs Surf.Area= 12,849 sf Storage= 22,067 cf
Flood Elev= 105.00' Surf.Area= 14,163 sf Storage= 27,836 cf

Plug-Flow detention time= 426.2 min calculated for 0.183 af (28% of inflow)
Center-of-Mass det. time= 267.5 min (1,054.9 - 787.5)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	2,102 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	99.75'	2,249 cf	**Cell #1 (Irregular)** Listed below (Recalc)
#3	99.75'	2,869 cf	**Cell #2 (Irregular)** Listed below (Recalc)
#4	102.00'	20,553 cf	**Open Water Storage (Irregular)** Listed below (Recalc)
#5	99.42'	63 cf	**4.00'D x 4.98'H 4' Outlet Structure B**
		27,836 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
100.00	522	208.5	0	0	522
101.00	1,055	227.7	773	773	1,223
102.00	1,624	237.8	1,329	2,102	1,664

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.75	674	112.5	0	0	674
100.00	750	117.4	178	178	768
101.00	1,029	134.1	886	1,064	1,125
102.00	1,348	151.6	1,185	2,249	1,548

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.75	834	129.0	0	0	834
100.00	925	135.5	220	220	975
101.00	1,314	155.9	1,114	1,334	1,470
102.00	1,769	179.3	1,536	2,869	2,116

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.00	5,013	293.5	0	0	5,013
103.00	5,926	314.1	5,463	5,463	6,054
104.00	7,456	594.6	6,676	12,140	26,343
105.00	9,409	665.0	8,414	20,553	33,428

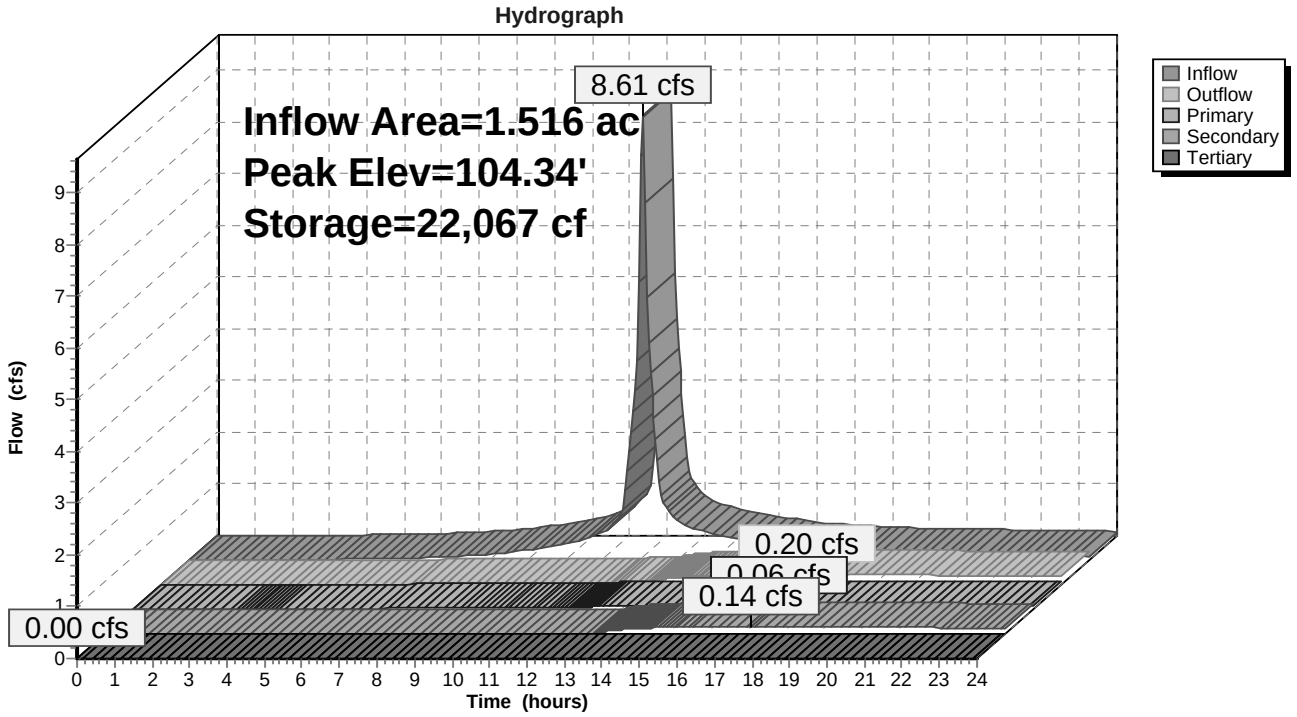
Device	Routing	Invert	Outlet Devices
#1	Primary	99.42'	**6.0" Round 6" HDPE N-12** L= 11.0' Ke= 0.500 Inlet / Outlet Invert= 99.42' / 99.25' S= 0.0155 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Secondary	99.42'	**12.0" Round 12" HDPE N-12** L= 17.0' Ke= 0.500 Inlet / Outlet Invert= 99.42' / 99.25' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#3	Tertiary	104.50'	**15.0' long x 8.0' breadth 15' Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#4	Device 1	99.42'	**1.0" Vert. 1" Orifice** C= 0.600
#5	Device 2	103.85'	**3.0" Vert. 3" Orifice** C= 0.600
#6	Device 2	104.40'	**48.0" Horiz. 48" Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.06 cfs @ 17.24 hrs HW=104.34' TW=99.40' (Dynamic Tailwater)
└─**1=6" HDPE N-12** (Passes 0.06 cfs of 2.04 cfs potential flow)
└─**4=1" Orifice** (Orifice Controls 0.06 cfs @ 10.64 fps)

Secondary OutFlow Max=0.14 cfs @ 17.24 hrs HW=104.34' TW=99.40' (Dynamic Tailwater)
└─**2=12" HDPE N-12** (Passes 0.14 cfs of 7.95 cfs potential flow)
└─**5=3" Orifice** (Orifice Controls 0.14 cfs @ 2.91 fps)
└─**6=48" Grate** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=99.42' TW=104.00' (Dynamic Tailwater)
└─**3=15' Emergency Spillway** (Controls 0.00 cfs)

Pond 101P: SGW #101



Summary for Pond 102P: SGW #102

[80] Warning: Exceeded Pond C25P by 0.23' @ 12.10 hrs (2.84 cfs 0.170 af)

Inflow Area = 2.488 ac, 39.81% Impervious, Inflow Depth > 4.87" for 25 Yr.-24 Hr. event
Inflow = 12.30 cfs @ 12.11 hrs, Volume= 1.010 af
Outflow = 0.93 cfs @ 13.68 hrs, Volume= 0.540 af, Atten= 92%, Lag= 94.4 min
Primary = 0.60 cfs @ 13.68 hrs, Volume= 0.371 af
Secondary = 0.34 cfs @ 13.68 hrs, Volume= 0.169 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 74.61' @ 13.68 hrs Surf.Area= 13,682 sf Storage= 26,286 cf
Flood Elev= 76.00' Surf.Area= 15,149 sf Storage= 38,843 cf

Plug-Flow detention time= 282.8 min calculated for 0.540 af (53% of inflow)
Center-of-Mass det. time= 171.7 min (971.3 - 799.7)

Volume	Invert	Avail.Storage	Storage Description
#1	69.67'	72 cf	**4.00'D x 5.73'H 4' Outlet Structure B**
#2	69.67'	72 cf	**4.00'D x 5.73'H 4' Outlet Structure D**
#3	70.00'	1,286 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#4	70.00'	2,901 cf	**Cell #1 (Irregular)** Listed below (Recalc)
#5	70.00'	3,799 cf	**Cell #2 (Irregular)** Listed below (Recalc)
#6	72.00'	30,713 cf	**Open Water Storage (Irregular)** Listed below (Recalc)
		38,843 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
70.00	377	91.8	0	0	377
71.00	632	116.4	499	499	798
72.00	953	142.2	787	1,286	1,344

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
70.00	1,068	138.0	0	0	1,068
71.00	1,443	158.3	1,251	1,251	1,569
72.00	1,867	178.1	1,650	2,901	2,125

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
70.00	944	120.9	0	0	944
70.50	1,667	220.3	644	644	3,644
71.00	1,946	228.3	902	1,547	3,951
72.00	2,573	248.8	2,252	3,799	4,765

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
72.00	5,734	368.0	0	0	5,734
73.00	6,675	384.0	6,199	6,199	6,763
74.00	7,654	399.7	7,159	13,357	7,817
75.00	8,673	415.4	8,158	21,516	8,914
76.00	9,731	431.1	9,197	30,713	10,053

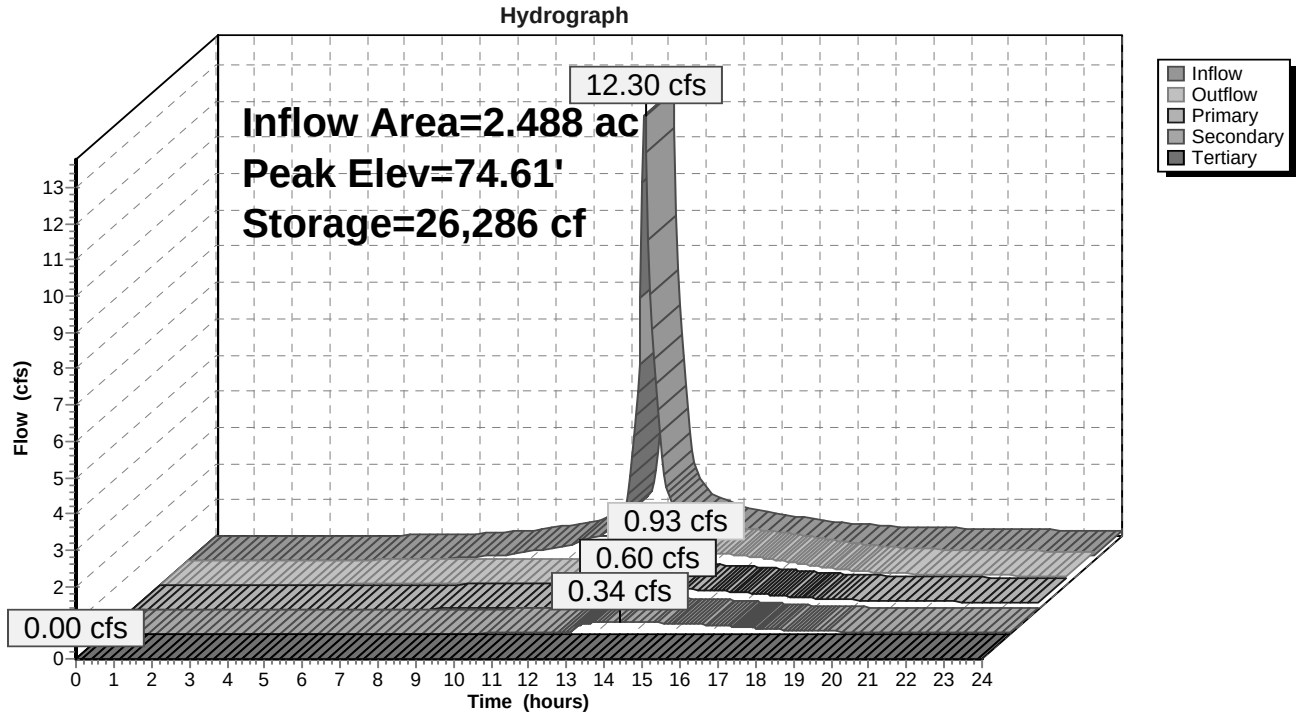
Device	Routing	Invert	Outlet Devices
#1	Primary	69.67'	**6.0" Round 6" HDPE N-12 (OS A)** L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.67' / 65.00' S= 0.0549 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Secondary	69.67'	**6.0" Round 6" HDPE N-12 (OS C)** L= 107.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.67' / 69.00' S= 0.0063 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#3	Primary	67.50'	**15.0" Round 15" HDPE N-12 (OS B)** L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 67.50' / 65.00' S= 0.0714 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#4	Secondary	69.67'	**15.0" Round 15" HDPE N-12 (OS D)** L= 67.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.67' / 69.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#5	Device 1	69.67'	**1.2" Vert. 1.25" Orifice (OS A)** C= 0.600
#6	Device 2	69.67'	**1.0" Vert. 1.0" Orifice (OS C)** C= 0.600
#7	Device 3	73.50'	**3.0" Vert. 3" Orifice (OS B)** C= 0.600
#8	Device 3	74.00'	**4.0" Vert. 4" Orifice (OS B)** C= 0.600
#9	Device 4	74.00'	**4.0" Vert. 4" Orifice (OS D)** C= 0.600
#10	Device 3	75.40'	**48.0" Horiz. 48" Grate (OS B)** C= 0.600 Limited to weir flow at low heads
#11	Device 4	75.40'	**48.0" Horiz. 48" Grate (OS D)** C= 0.600 Limited to weir flow at low heads
#12	Tertiary	75.50'	**10.0' long x 11.0' breadth 10' Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.53 2.59 2.70 2.68 2.67 2.68 2.66 2.64

Primary OutFlow Max=0.60 cfs @ 13.68 hrs HW=74.61' TW=64.09' (Dynamic Tailwater)
- **1=6" HDPE N-12 (OS A)** (Passes 0.08 cfs of 1.77 cfs potential flow)
  - **5=1.25" Orifice (OS A)** (Orifice Controls 0.08 cfs @ 10.64 fps)
- **3=15" HDPE N-12 (OS B)** (Passes 0.51 cfs of 15.04 cfs potential flow)
  - **7=3" Orifice (OS B)** (Orifice Controls 0.23 cfs @ 4.77 fps)
  - **8=4" Orifice (OS B)** (Orifice Controls 0.28 cfs @ 3.19 fps)
  - **10=48" Grate (OS B)** (Controls 0.00 cfs)

Secondary OutFlow Max=0.34 cfs @ 13.68 hrs HW=74.61' TW=69.07' (Dynamic Tailwater)
- **2=6" HDPE N-12 (OS C)** (Passes 0.06 cfs of 1.21 cfs potential flow)
  - **6=1.0" Orifice (OS C)** (Orifice Controls 0.06 cfs @ 10.65 fps)
- **4=15" HDPE N-12 (OS D)** (Passes 0.28 cfs of 12.21 cfs potential flow)
  - **9=4" Orifice (OS D)** (Orifice Controls 0.28 cfs @ 3.19 fps)
  - **11=48" Grate (OS D)** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.67' TW=73.50' (Dynamic Tailwater)
- **12=10' Emergency Spillway** (Controls 0.00 cfs)

Pond 102P: SGW #102



Summary for Pond 103P: SGW #103

Inflow Area = 1.629 ac, 62.87% Impervious, Inflow Depth > 5.58" for 25 Yr.-24 Hr. event
Inflow = 9.62 cfs @ 12.10 hrs, Volume= 0.758 af
Outflow = 1.72 cfs @ 12.56 hrs, Volume= 0.575 af, Atten= 82%, Lag= 27.8 min
Primary = 0.12 cfs @ 12.56 hrs, Volume= 0.136 af
Secondary = 1.13 cfs @ 12.56 hrs, Volume= 0.338 af
Tertiary = 0.47 cfs @ 12.56 hrs, Volume= 0.101 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 97.92' @ 12.56 hrs Surf.Area= 10,367 sf Storage= 16,672 cf
Flood Elev= 99.50' Surf.Area= 11,809 sf Storage= 27,483 cf

Plug-Flow detention time= 186.7 min calculated for 0.575 af (76% of inflow)
Center-of-Mass det. time= 102.7 min (881.2 - 778.4)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	772 cf	**Sediment Forebay (Irregular)**Listed below (Recalc)
#2	94.00'	3,004 cf	**Cell #1 (Irregular)**Listed below (Recalc)
#3	94.00'	2,528 cf	**Cell #2 (Irregular)**Listed below (Recalc)
#4	96.00'	21,046 cf	**Open Water Storage (Irregular)**Listed below (Recalc)
#5	93.67'	67 cf	**4.00'D x 5.33'H 4' Outlet Structure B**
#6	93.67'	67 cf	**4.00'D x 5.33'H 4' Outlet Structure C**
		27,483 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
94.00	199	78.4	0	0	199
95.00	382	89.0	286	286	363
96.00	599	102.1	486	772	584

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
94.00	1,087	154.4	0	0	1,087
95.00	1,494	176.4	1,285	1,285	1,689
96.00	1,953	196.7	1,718	3,004	2,320

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
94.00	897	120.0	0	0	897
95.00	1,256	142.3	1,071	1,071	1,381
96.00	1,667	161.7	1,457	2,528	1,874

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
96.00	4,578	263.5	0	0	4,578
97.00	5,362	279.3	4,965	4,965	5,312
98.00	6,189	296.3	5,771	10,735	6,143
99.00	7,107	314.6	6,643	17,378	7,083
99.50	7,565	323.1	3,667	21,046	7,543

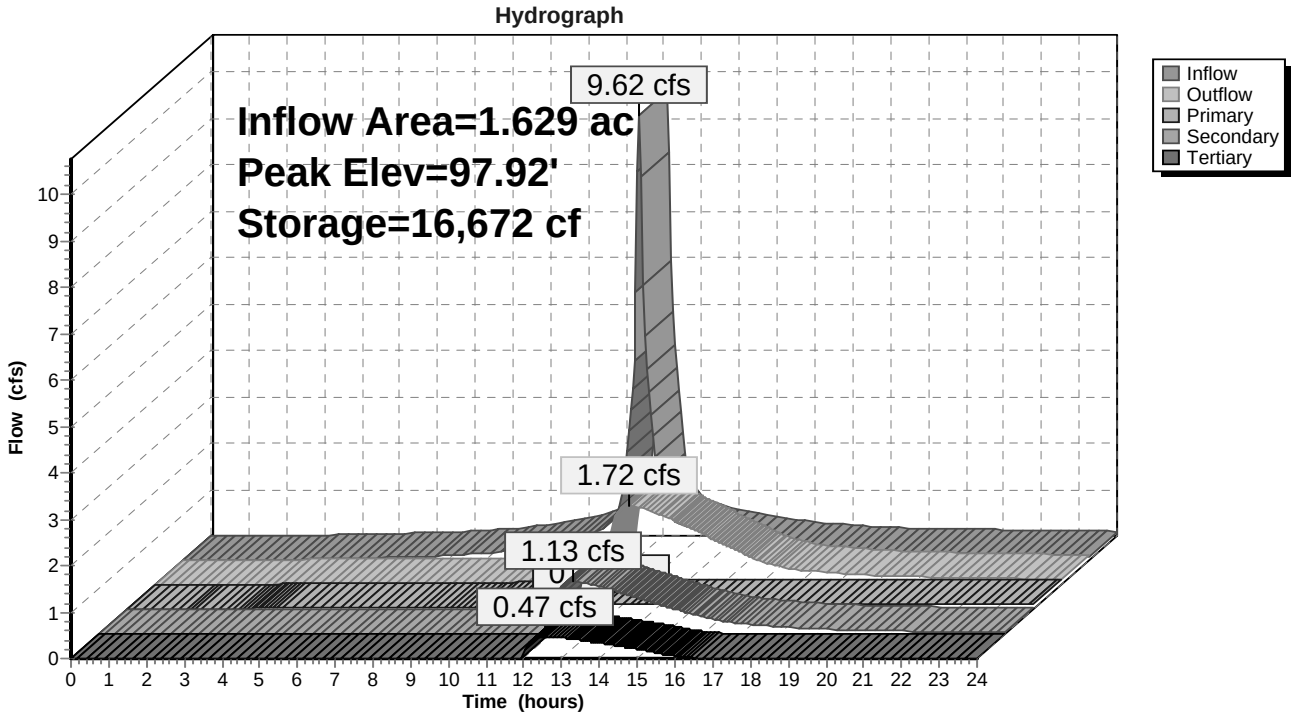
Device	Routing	Invert	Outlet Devices
#1	Primary	93.67'	**6.0" Round 6" HDPE N-12 (OS A)** L= 45.3' Ke= 0.500 Inlet / Outlet Invert= 93.67' / 93.35' S= 0.0071 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Secondary	93.67'	**15.0" Round 15" HDPE N-12 (OS B)** L= 25.5' Ke= 0.500 Inlet / Outlet Invert= 93.67' / 93.35' S= 0.0125 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#3	Tertiary	93.67'	**15.0" Round 15" HDPE N-12 (OS C)** L= 5.0' Ke= 0.500 Inlet / Outlet Invert= 93.67' / 93.35' S= 0.0640 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#4	Device 1	93.67'	**1.5" Vert. 1.5" Orifice (OS A)** C= 0.600
#5	Device 2	96.25'	**6.0" Vert. 6" Orifice (OS B)** C= 0.600
#6	Device 3	96.50'	**4.0" Vert. 4" Orifice (OS C)** C= 0.600
#7	Device 2	99.00'	**48.0" Horiz. 48" Grate B** C= 0.600 Limited to weir flow at low heads
#8	Device 3	99.00'	**48.0" Horiz. 48" Grate C** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.12 cfs @ 12.56 hrs HW=97.92' TW=93.89' (Dynamic Tailwater)
└─**1=6" HDPE N-12 (OS A)** (Passes 0.12 cfs of 1.48 cfs potential flow)
  └─**4=1.5" Orifice (OS A)** (Orifice Controls 0.12 cfs @ 9.67 fps)

Secondary OutFlow Max=1.13 cfs @ 12.56 hrs HW=97.92' TW=93.89' (Dynamic Tailwater)
└─**2=15" HDPE N-12 (OS B)** (Passes 1.13 cfs of 11.25 cfs potential flow)
  ├─**5=6" Orifice (OS B)** (Orifice Controls 1.13 cfs @ 5.74 fps)
  └─**7=48" Grate B** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.47 cfs @ 12.56 hrs HW=97.92' TW=93.89' (Dynamic Tailwater)
└─**3=15" HDPE N-12 (OS C)** (Passes 0.47 cfs of 11.25 cfs potential flow)
  ├─**6=4" Orifice (OS C)** (Orifice Controls 0.47 cfs @ 5.39 fps)
  └─**8=48" Grate C** (Controls 0.00 cfs)

Pond 103P: SGW #103



Summary for Pond C01P: Catch Basin #1

Inflow Area = 0.063 ac,100.00% Impervious, Inflow Depth > 6.63" for 25 Yr.-24 Hr. event
Inflow = 0.41 cfs @ 12.09 hrs, Volume= 0.035 af
Outflow = 0.41 cfs @ 12.09 hrs, Volume= 0.035 af, Atten= 1%, Lag= 0.1 min
Primary = 0.41 cfs @ 12.09 hrs, Volume= 0.035 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 117.91' @ 12.11 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 122.51' Surf.Area= 0.000 ac Storage= 0.001 af

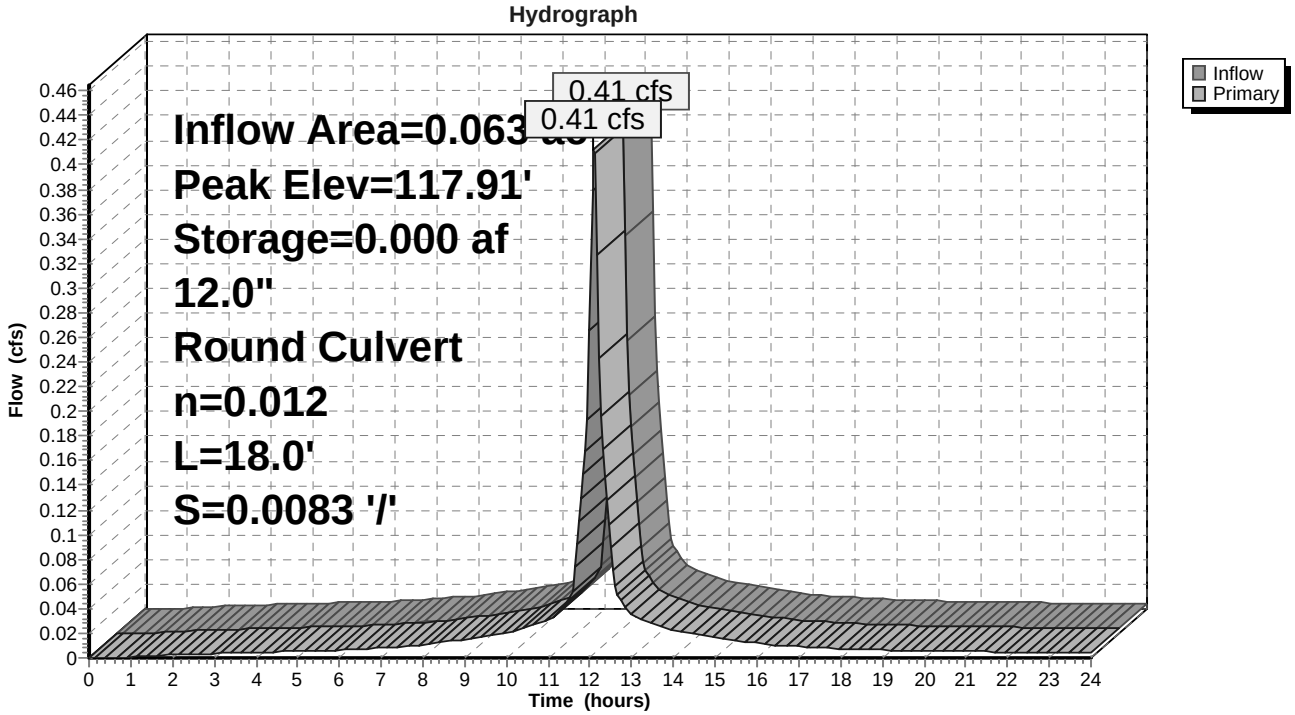
Plug-Flow detention time= 0.7 min calculated for 0.035 af (100% of inflow)
Center-of-Mass det. time= 0.5 min (743.3 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1	117.51'	0.001 af	**4.00'D x 5.00'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	117.51'	**12.0" Round 12" HDPE N-12** L= 18.0' Ke= 0.500 Inlet / Outlet Invert= 117.51' / 117.36' S= 0.0083 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.35 cfs @ 12.09 hrs HW=117.90' TW=117.78' (Dynamic Tailwater)
↑—**1=12" HDPE N-12** (Outlet Controls 0.35 cfs @ 1.84 fps)

Pond C01P: Catch Basin #1



Summary for Pond C02P: Catch Basin #2

Inflow Area = 0.158 ac,100.00% Impervious, Inflow Depth > 6.63" for 25 Yr.-24 Hr. event
Inflow = 1.04 cfs @ 12.09 hrs, Volume= 0.087 af
Outflow = 1.04 cfs @ 12.09 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.1 min
Primary = 1.04 cfs @ 12.09 hrs, Volume= 0.087 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 117.79' @ 12.09 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 122.51' Surf.Area= 0.000 ac Storage= 0.002 af

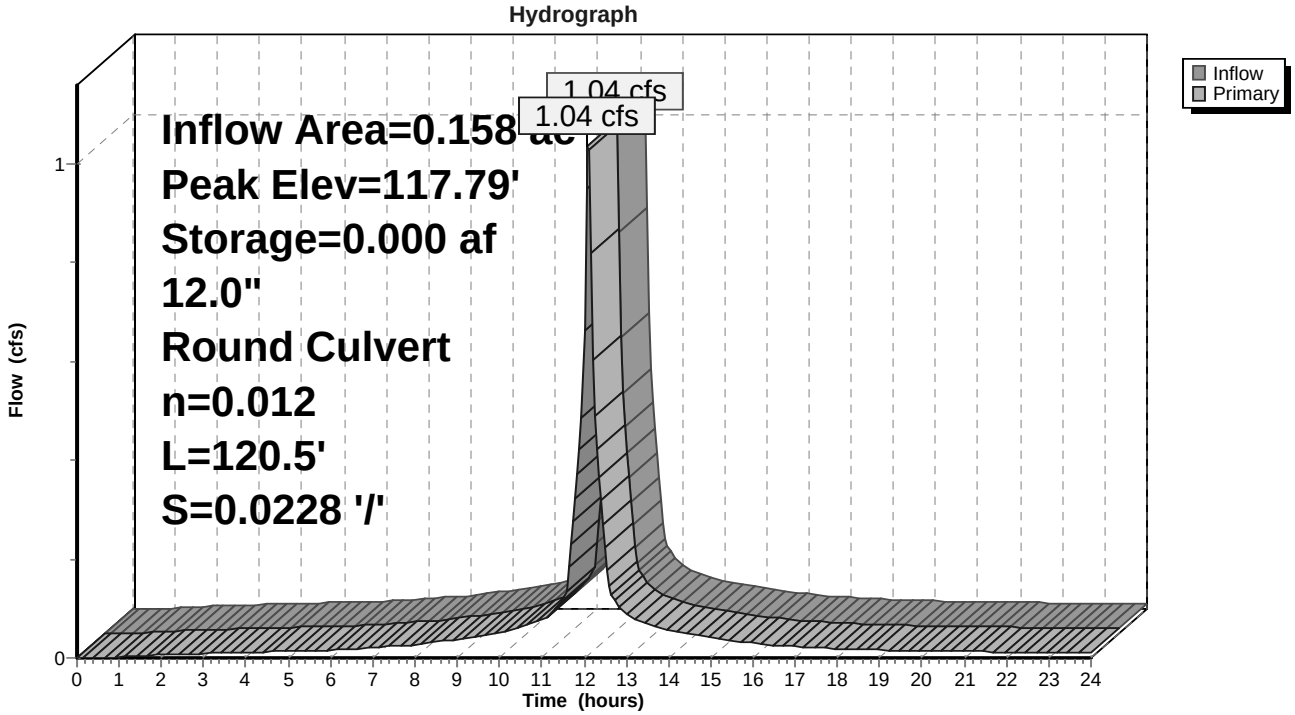
Plug-Flow detention time= 0.4 min calculated for 0.087 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (743.3 - 743.0)

Volume	Invert	Avail.Storage	Storage Description
#1	117.26'	0.002 af	**4.00'D x 5.25'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	117.26'	**12.0" Round 12" HDPE N-12** L= 120.5' Ke= 0.500 Inlet / Outlet Invert= 117.26' / 114.51' S= 0.0228 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.01 cfs @ 12.09 hrs HW=117.78' TW=115.46' (Dynamic Tailwater)
1=12" HDPE N-12 (Inlet Controls 1.01 cfs @ 2.45 fps)

Pond C02P: Catch Basin #2



Summary for Pond C03P: Catch Basin #3

Inflow Area = 0.095 ac, 96.04% Impervious, Inflow Depth > 6.51" for 25 Yr.-24 Hr. event
Inflow = 0.62 cfs @ 12.09 hrs, Volume= 0.051 af
Outflow = 0.61 cfs @ 12.09 hrs, Volume= 0.051 af, Atten= 2%, Lag= 0.0 min
Primary = 0.61 cfs @ 12.09 hrs, Volume= 0.051 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 115.52' @ 12.15 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 118.91' Surf.Area= 0.000 ac Storage= 0.001 af

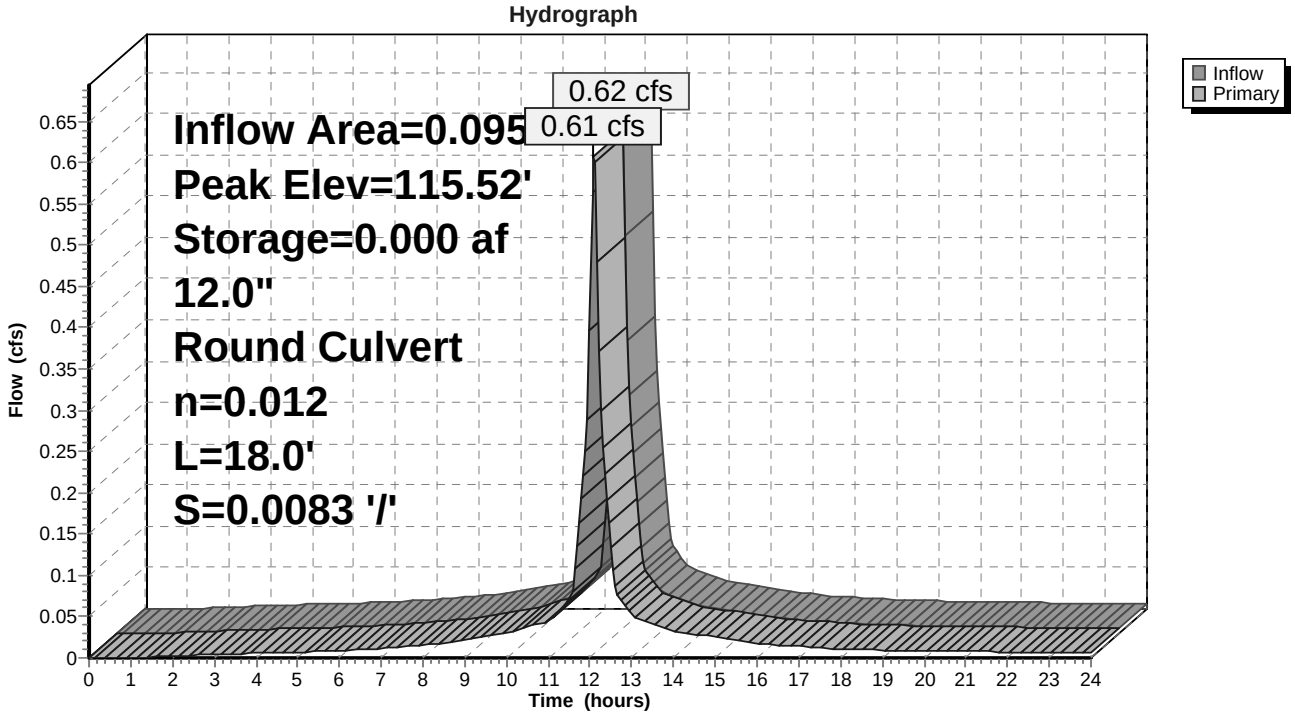
Plug-Flow detention time= 0.6 min calculated for 0.051 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (749.7 - 749.3)

Volume	Invert	Avail.Storage	Storage Description
#1	114.66'	0.001 af	**4.00'D x 4.25'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	114.66'	**12.0" Round 12" HDPE N-12** L= 18.0' Ke= 0.500 Inlet / Outlet Invert= 114.66' / 114.51' S= 0.0083 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=115.36' TW=115.46' (Dynamic Tailwater)
1=12" HDPE N-12 (Controls 0.00 cfs)

Pond C03P: Catch Basin #3



Summary for Pond C04P: Catch Basin #4

[80] Warning: Exceeded Pond C03P by 0.11' @ 12.05 hrs (0.79 cfs 0.008 af)

Inflow Area = 0.387 ac, 91.29% Impervious, Inflow Depth > 6.39" for 25 Yr.-24 Hr. event
Inflow = 2.50 cfs @ 12.09 hrs, Volume= 0.206 af
Outflow = 2.50 cfs @ 12.09 hrs, Volume= 0.206 af, Atten= 0%, Lag= 0.1 min
Primary = 2.50 cfs @ 12.09 hrs, Volume= 0.206 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 115.50' @ 12.11 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 118.91' Surf.Area= 0.000 ac Storage= 0.001 af

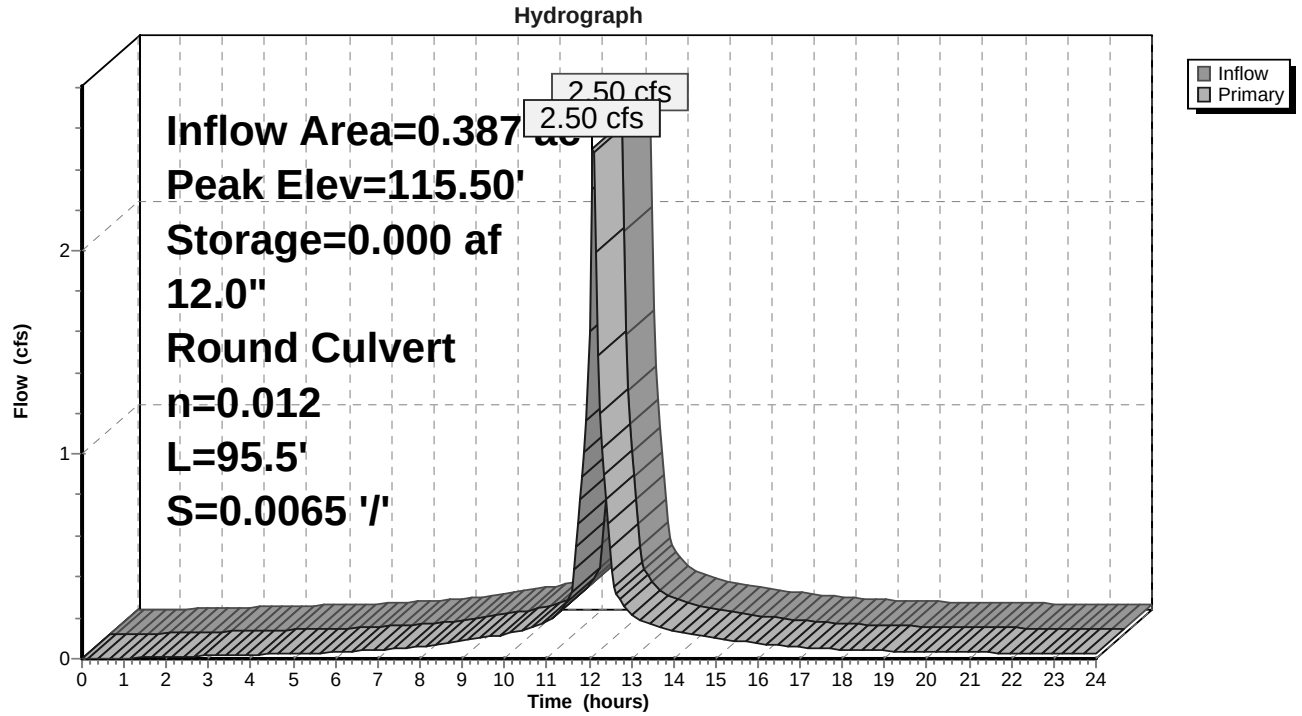
Plug-Flow detention time= 0.3 min calculated for 0.206 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (753.5 - 753.3)

Volume	Invert	Avail.Storage	Storage Description
#1	114.41'	0.001 af	**4.00'D x 4.50'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	114.41'	**12.0" Round 12" HDPE N-12** L= 95.5' Ke= 0.500 Inlet / Outlet Invert= 114.41' / 113.79' S= 0.0065 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.22 cfs @ 12.09 hrs HW=115.47' TW=114.87' (Dynamic Tailwater)
1=12" HDPE N-12 (Outlet Controls 2.22 cfs @ 3.34 fps)

Pond C04P: Catch Basin #4



Summary for Pond C05P: Catch Basin #5

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 0.457 ac, 88.86% Impervious, Inflow Depth > 6.32" for 25 Yr.-24 Hr. event
Inflow = 2.94 cfs @ 12.09 hrs, Volume= 0.241 af
Outflow = 2.94 cfs @ 12.09 hrs, Volume= 0.241 af, Atten= 0%, Lag= 0.1 min
Primary = 2.94 cfs @ 12.09 hrs, Volume= 0.241 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 114.89' @ 12.09 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 119.44' Surf.Area= 0.000 ac Storage= 0.002 af

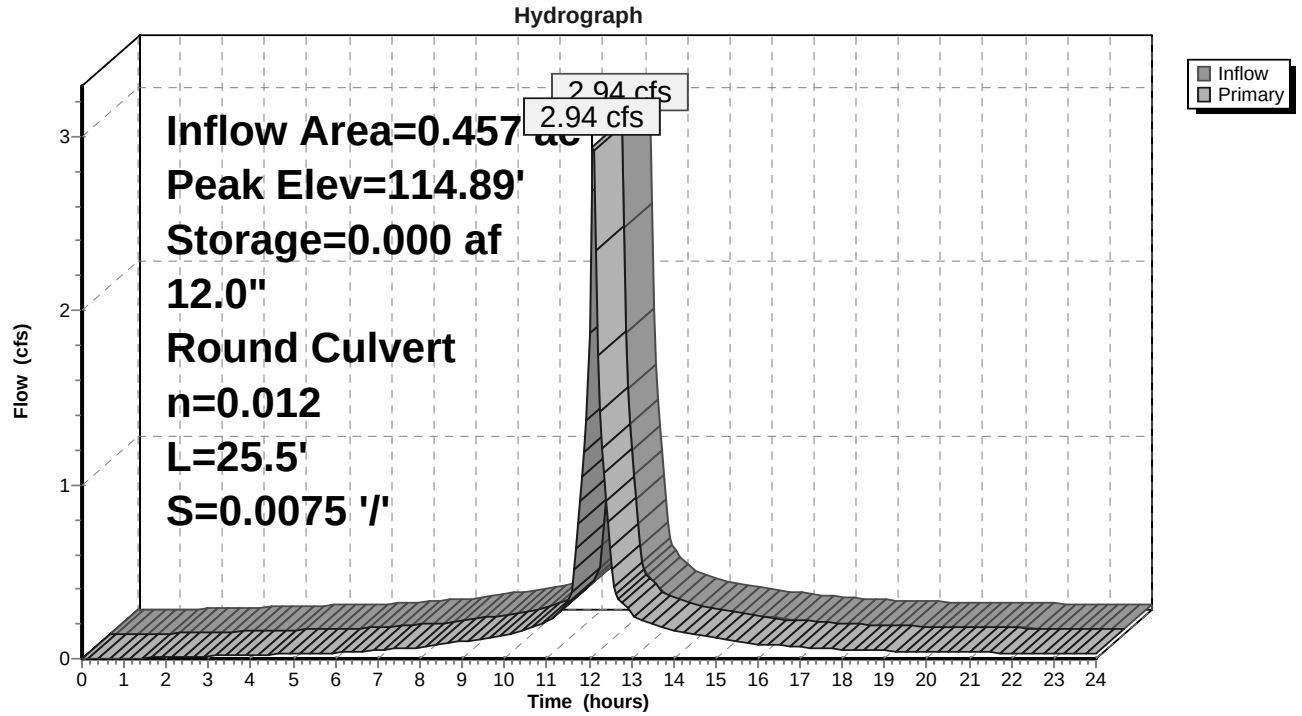
Plug-Flow detention time= 0.3 min calculated for 0.240 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (756.4 - 756.3)

Volume	Invert	Avail.Storage	Storage Description
#1	113.69'	0.002 af	**4.00'D x 5.75'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	113.69'	**12.0" Round 12" HDPE N-12** L= 25.5' Ke= 0.500 Inlet / Outlet Invert= 113.69' / 113.50' S= 0.0075 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.88 cfs @ 12.09 hrs HW=114.87' TW=114.27' (Dynamic Tailwater)
↑—**1=12" HDPE N-12** (Barrel Controls 2.88 cfs @ 3.92 fps)

Pond C05P: Catch Basin #5



Summary for Pond C06P: Catch Basin #6

Inflow Area = 0.065 ac, 66.69% Impervious, Inflow Depth > 5.69" for 25 Yr.-24 Hr. event
Inflow = 0.40 cfs @ 12.09 hrs, Volume= 0.031 af
Outflow = 0.40 cfs @ 12.09 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.1 min
Primary = 0.40 cfs @ 12.09 hrs, Volume= 0.031 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 115.28' @ 12.09 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 119.22' Surf.Area= 0.000 ac Storage= 0.001 af

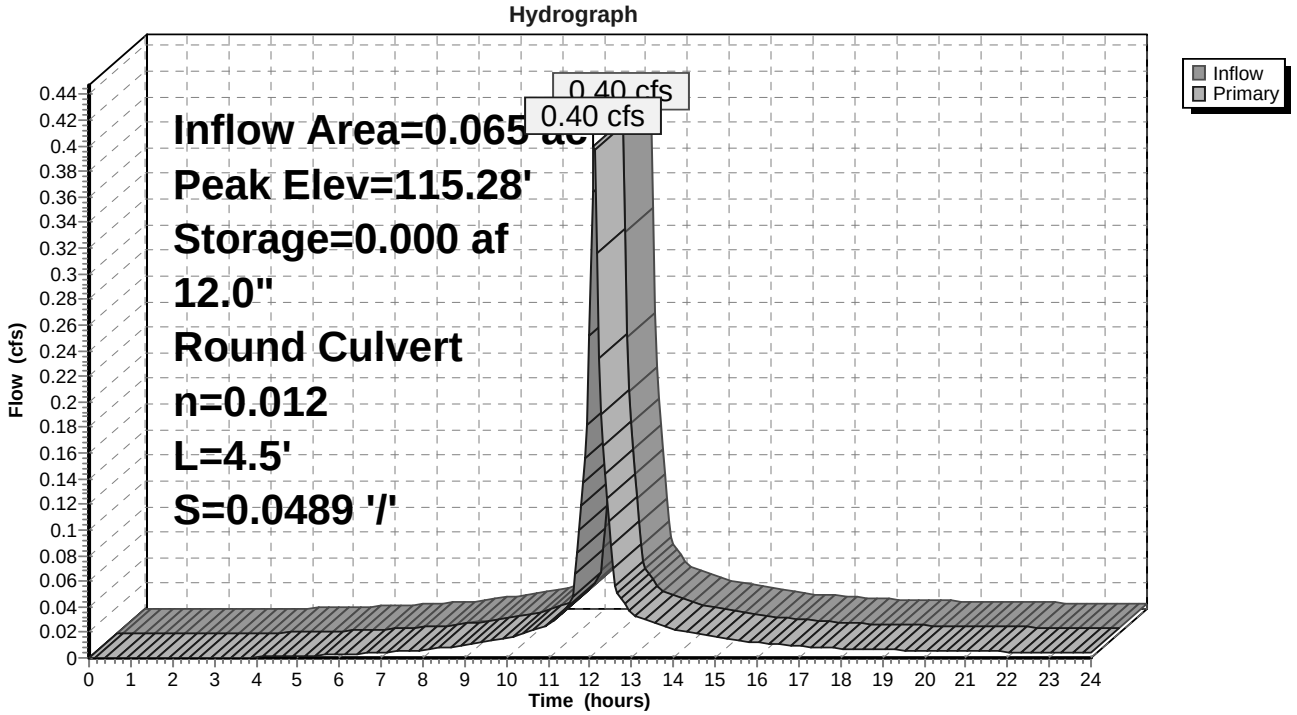
Plug-Flow detention time= 0.6 min calculated for 0.031 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (780.4 - 780.0)

Volume	Invert	Avail.Storage	Storage Description
#1	114.97'	0.001 af	**4.00'D x 4.25'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	114.97'	**12.0" Round 12" HDPE N-12** L= 4.5' Ke= 0.500 Inlet / Outlet Invert= 114.97' / 114.75' S= 0.0489 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.39 cfs @ 12.09 hrs HW=115.28' TW=114.27' (Dynamic Tailwater)
1=12" HDPE N-12 (Inlet Controls 0.39 cfs @ 1.89 fps)

Pond C06P: Catch Basin #6



Summary for Pond C07P: Catch Basin #7

Inflow Area = 0.233 ac, 53.49% Impervious, Inflow Depth > 5.12" for 25 Yr.-24 Hr. event
Inflow = 1.33 cfs @ 12.09 hrs, Volume= 0.099 af
Outflow = 1.32 cfs @ 12.09 hrs, Volume= 0.099 af, Atten= 1%, Lag= 0.0 min
Primary = 1.32 cfs @ 12.09 hrs, Volume= 0.099 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 105.46' @ 12.13 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 108.88' Surf.Area= 0.000 ac Storage= 0.001 af

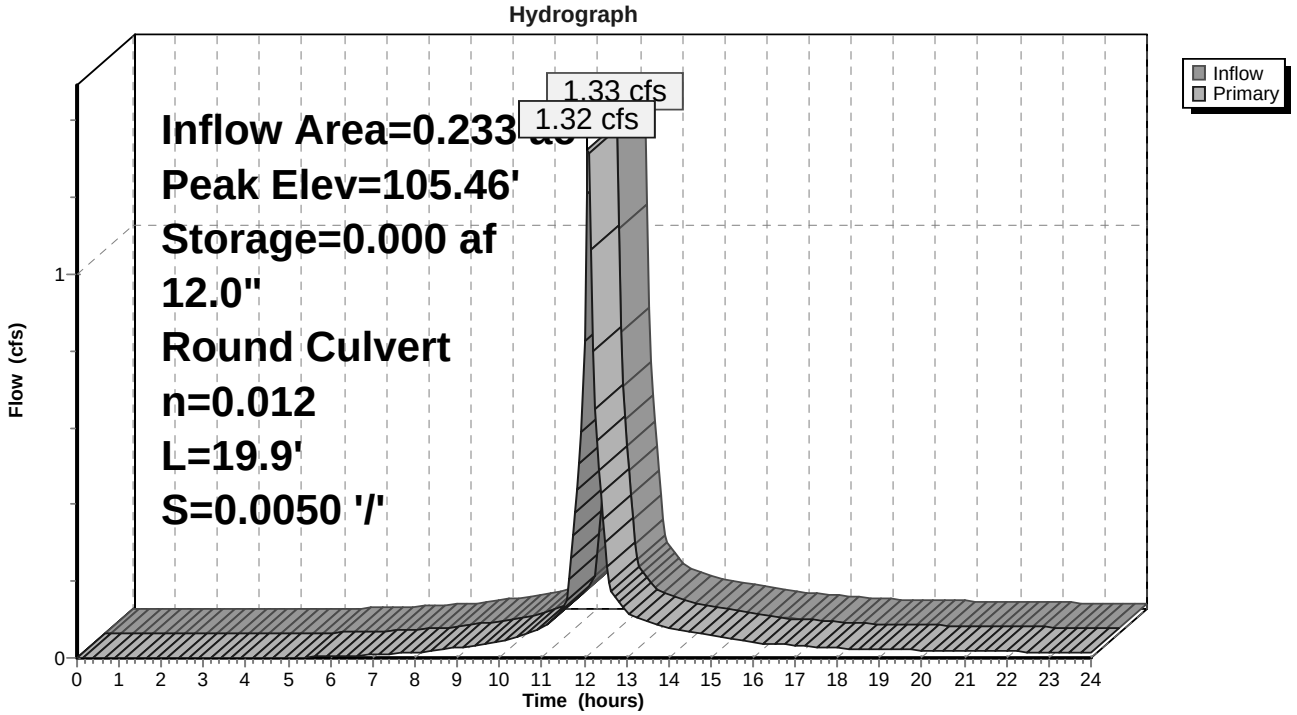
Plug-Flow detention time= 0.4 min calculated for 0.099 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (795.5 - 795.3)

Volume	Invert	Avail.Storage	Storage Description
#1	104.63'	0.001 af	**4.00'D x 4.25'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	104.63'	**12.0" Round 12" HDPE N-12** L= 19.9' Ke= 0.500 Inlet / Outlet Invert= 104.63' / 104.53' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.98 cfs @ 12.09 hrs HW=105.41' TW=105.28' (Dynamic Tailwater)
└**1=12" HDPE N-12** (Outlet Controls 0.98 cfs @ 2.04 fps)

Pond C07P: Catch Basin #7



Summary for Pond C08P: Catch Basin #8

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 0.993 ac, 75.03% Impervious, Inflow Depth > 5.87" for 25 Yr.-24 Hr. event
Inflow = 6.15 cfs @ 12.09 hrs, Volume= 0.486 af
Outflow = 6.15 cfs @ 12.09 hrs, Volume= 0.486 af, Atten= 0%, Lag= 0.0 min
Primary = 6.15 cfs @ 12.09 hrs, Volume= 0.486 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 105.30' @ 12.09 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 109.03' Surf.Area= 0.000 ac Storage= 0.001 af

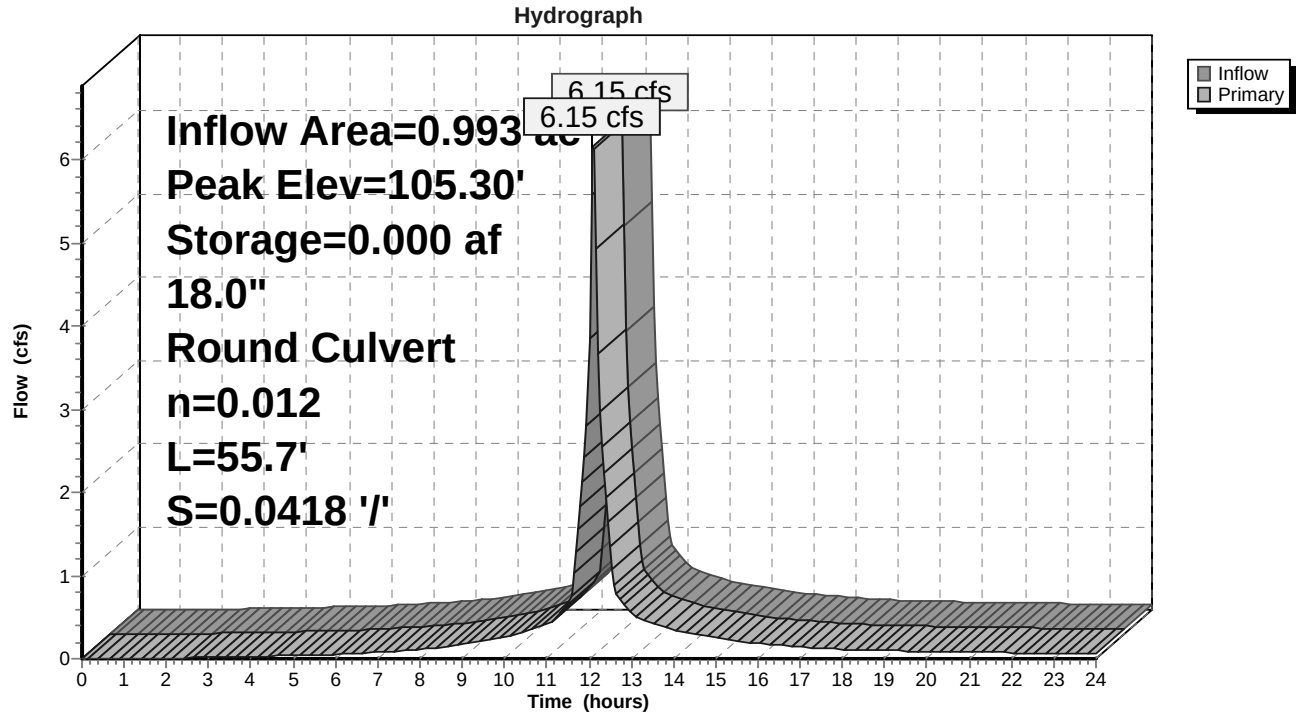
Plug-Flow detention time= 0.1 min calculated for 0.486 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (771.0 - 770.9)

Volume	Invert	Avail.Storage	Storage Description
#1	104.03'	0.001 af	**4.00'D x 5.00'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	104.03'	**18.0" Round 18" HDPE N-12** L= 55.7' Ke= 0.500 Inlet / Outlet Invert= 104.03' / 101.70' S= 0.0418 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=6.02 cfs @ 12.09 hrs HW=105.29' TW=100.87' (Dynamic Tailwater)
1=18" HDPE N-12 (Inlet Controls 6.02 cfs @ 3.81 fps)

Pond C08P: Catch Basin #8



Summary for Pond C09P: Catch Basin #9

Inflow Area = 0.248 ac, 77.32% Impervious, Inflow Depth > 6.04" for 25 Yr.-24 Hr. event
Inflow = 1.58 cfs @ 12.09 hrs, Volume= 0.125 af
Outflow = 1.58 cfs @ 12.09 hrs, Volume= 0.125 af, Atten= 0%, Lag= 0.1 min
Primary = 1.58 cfs @ 12.09 hrs, Volume= 0.125 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 101.75' @ 12.09 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 105.32' Surf.Area= 0.000 ac Storage= 0.001 af

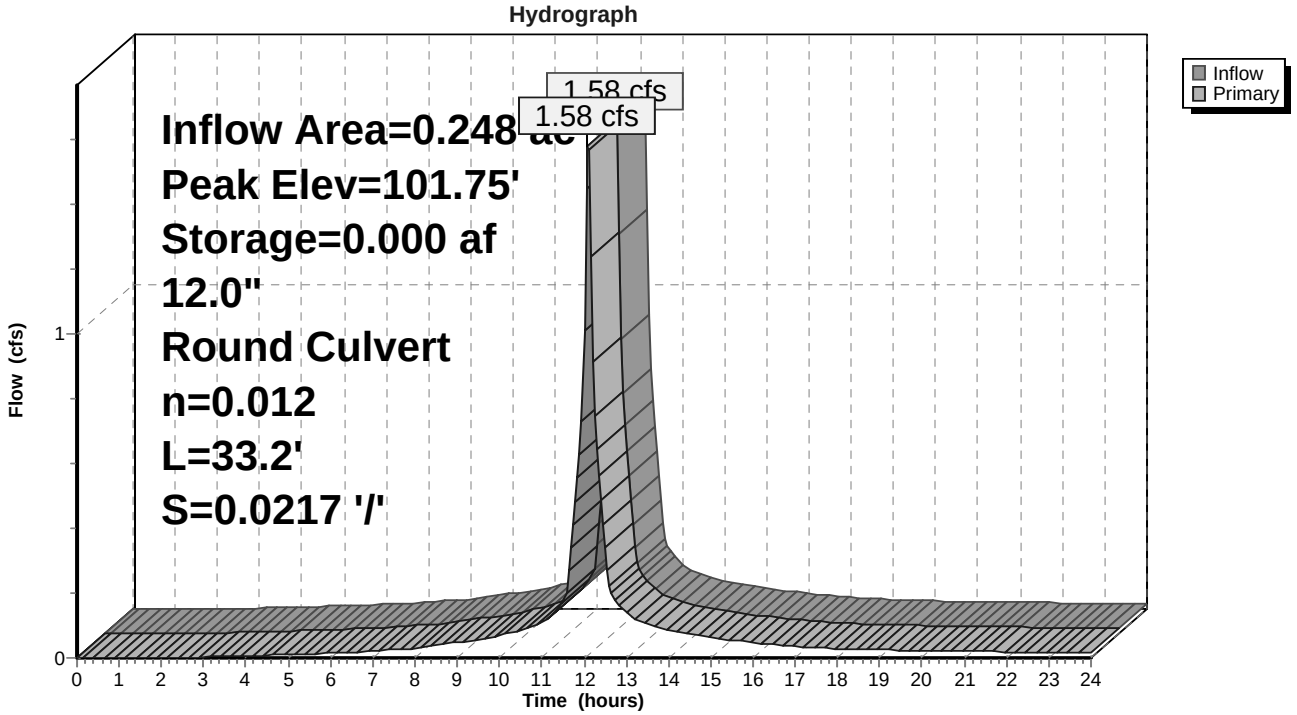
Plug-Flow detention time= 0.3 min calculated for 0.125 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (769.1 - 768.9)

Volume	Invert	Avail.Storage	Storage Description
#1	101.07'	0.001 af	**4.00'D x 4.25'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	101.07'	**12.0" Round 12" HDPE N-12** L= 33.2' Ke= 0.500 Inlet / Outlet Invert= 101.07' / 100.35' S= 0.0217 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.47 cfs @ 12.09 hrs HW=101.74' TW=101.23' (Dynamic Tailwater)
└**1=12" HDPE N-12** (Outlet Controls 1.47 cfs @ 3.72 fps)

Pond C09P: Catch Basin #9



Summary for Pond C10P: Catch Basin #10

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 0.353 ac, 71.79% Impervious, Inflow Depth > 5.93" for 25 Yr.-24 Hr. event
Inflow = 2.23 cfs @ 12.09 hrs, Volume= 0.175 af
Outflow = 2.23 cfs @ 12.09 hrs, Volume= 0.175 af, Atten= 0%, Lag= 0.1 min
Primary = 2.23 cfs @ 12.09 hrs, Volume= 0.175 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 101.24' @ 12.12 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 104.50' Surf.Area= 0.000 ac Storage= 0.001 af

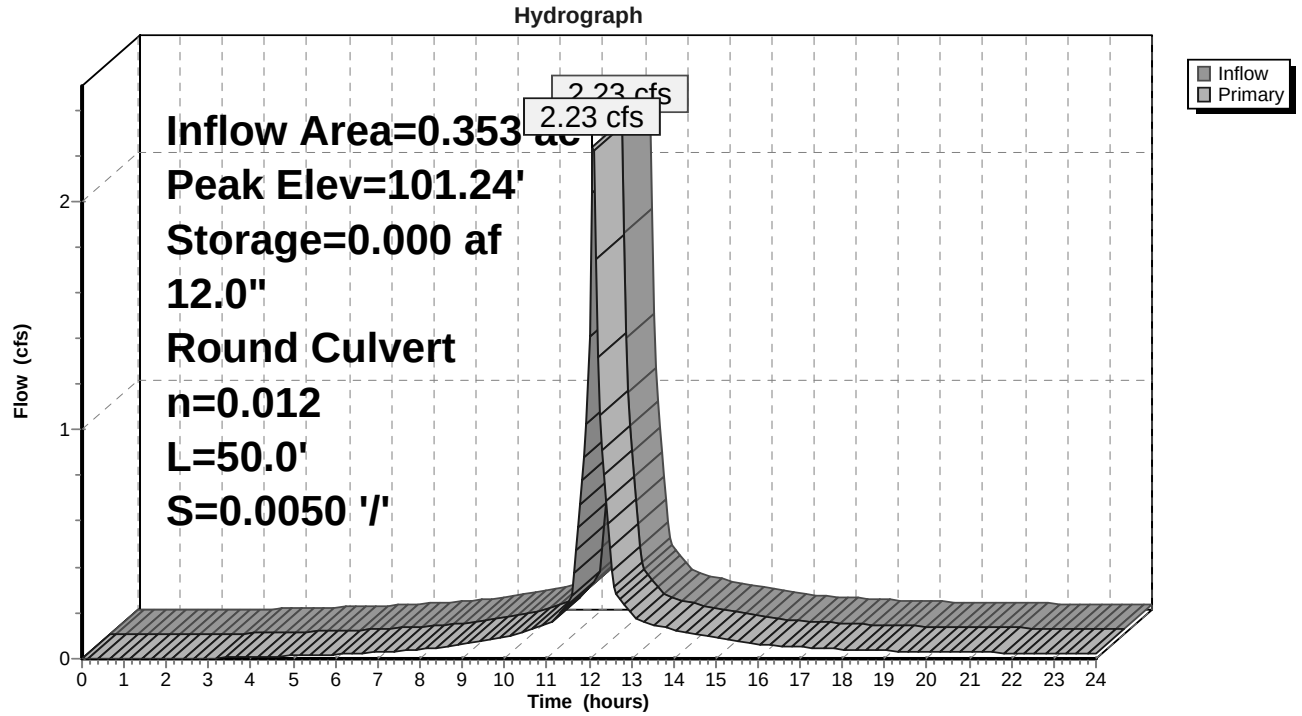
Plug-Flow detention time= 0.3 min calculated for 0.174 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (772.4 - 772.2)

Volume	Invert	Avail.Storage	Storage Description
#1	100.25'	0.001 af	**4.00'D x 4.25'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	100.25'	**12.0" Round 12" HDPE N-12** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 100.25' / 100.00' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.87 cfs @ 12.09 hrs HW=101.23' TW=100.86' (Dynamic Tailwater)
↑—**1=12" HDPE N-12** (Outlet Controls 1.87 cfs @ 3.03 fps)

Pond C10P: Catch Basin #10



Summary for Pond C11P: Catch Basin #11

Inflow Area = 0.204 ac, 77.12% Impervious, Inflow Depth > 6.04" for 25 Yr.-24 Hr. event
Inflow = 1.30 cfs @ 12.09 hrs, Volume= 0.103 af
Outflow = 1.29 cfs @ 12.09 hrs, Volume= 0.103 af, Atten= 1%, Lag= 0.1 min
Primary = 1.29 cfs @ 12.09 hrs, Volume= 0.103 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 110.27' @ 12.12 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 113.68' Surf.Area= 0.000 ac Storage= 0.001 af

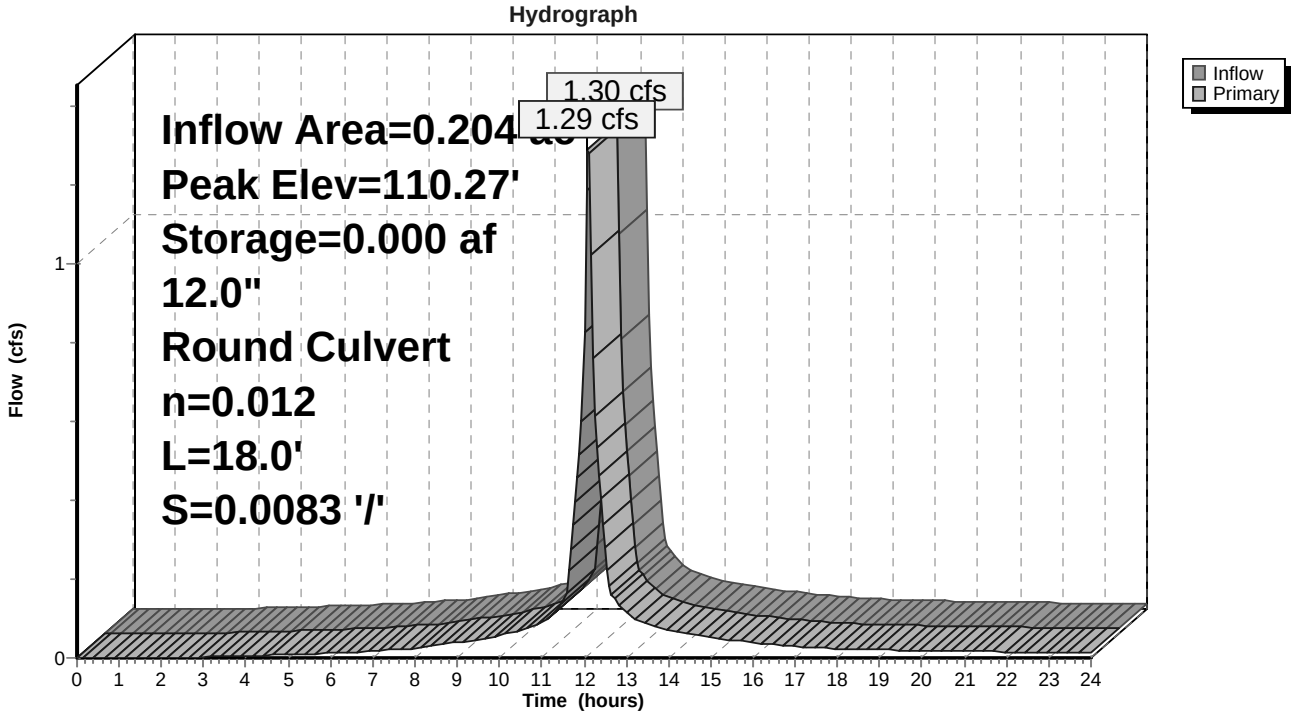
Plug-Flow detention time= 0.4 min calculated for 0.103 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (769.1 - 768.9)

Volume	Invert	Avail.Storage	Storage Description
#1	109.43'	0.001 af	**4.00'D x 4.25'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	109.43'	**12.0" Round 12" HDPE N-12** L= 18.0' Ke= 0.500 Inlet / Outlet Invert= 109.43' / 109.28' S= 0.0083 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.93 cfs @ 12.09 hrs HW=110.22' TW=110.11' (Dynamic Tailwater)
└**1=12" HDPE N-12** (Outlet Controls 0.93 cfs @ 1.92 fps)

Pond C11P: Catch Basin #11



Summary for Pond C12P: Catch Basin #12

Inflow Area = 0.412 ac, 70.28% Impervious, Inflow Depth > 5.81" for 25 Yr.-24 Hr. event
Inflow = 2.56 cfs @ 12.09 hrs, Volume= 0.199 af
Outflow = 2.56 cfs @ 12.09 hrs, Volume= 0.199 af, Atten= 0%, Lag= 0.1 min
Primary = 2.56 cfs @ 12.09 hrs, Volume= 0.199 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 110.13' @ 12.09 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 113.68' Surf.Area= 0.000 ac Storage= 0.001 af

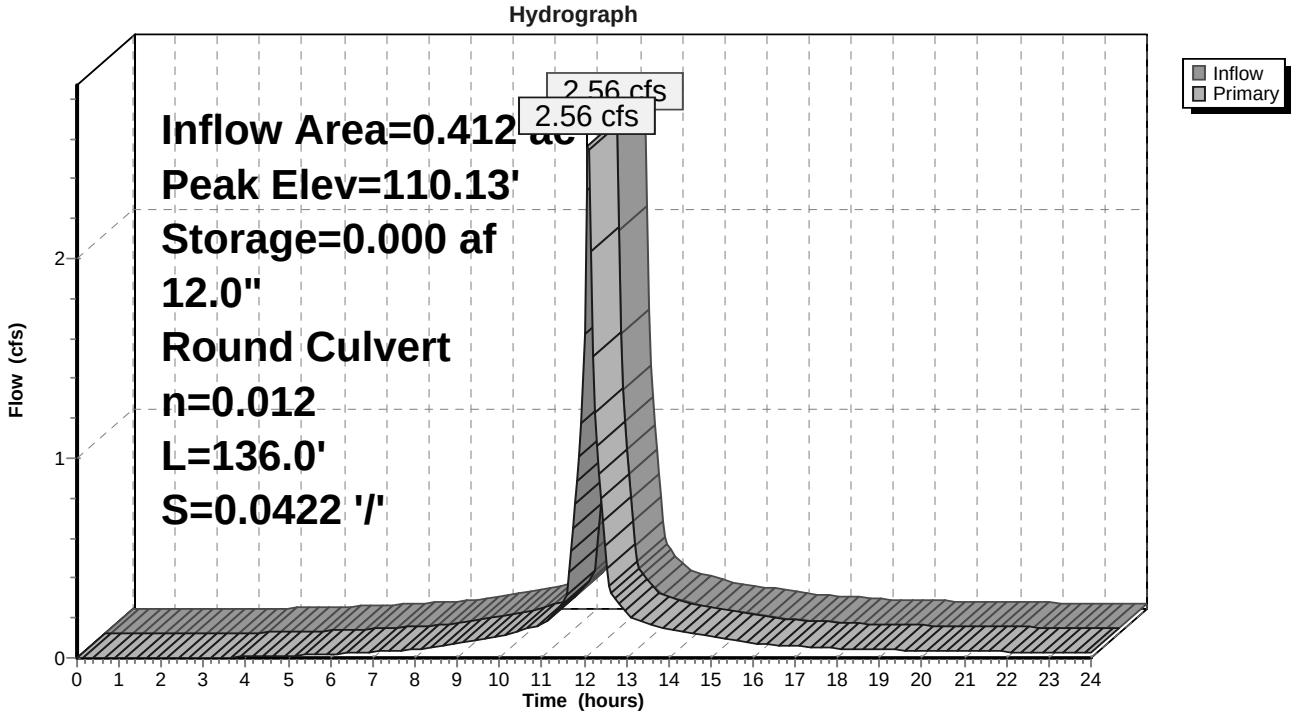
Plug-Flow detention time= 0.2 min calculated for 0.199 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (776.2 - 776.0)

Volume	Invert	Avail.Storage	Storage Description
#1	109.18'	0.001 af	**4.00'D x 4.50'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	109.18'	**12.0" Round 12" HDPE N-12** L= 136.0' Ke= 0.500 Inlet / Outlet Invert= 109.18' / 103.44' S= 0.0422 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.50 cfs @ 12.09 hrs HW=110.11' TW=104.77' (Dynamic Tailwater)
1=12" HDPE N-12 (Inlet Controls 2.50 cfs @ 3.28 fps)

Pond C12P: Catch Basin #12



Summary for Pond C13P: Catch Basin #13

Inflow Area = 0.730 ac, 71.80% Impervious, Inflow Depth > 5.83" for 25 Yr.-24 Hr. event
Inflow = 4.54 cfs @ 12.09 hrs, Volume= 0.354 af
Outflow = 4.54 cfs @ 12.09 hrs, Volume= 0.354 af, Atten= 0%, Lag= 0.1 min
Primary = 4.54 cfs @ 12.09 hrs, Volume= 0.354 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 104.34' @ 17.31 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 107.59' Surf.Area= 0.000 ac Storage= 0.001 af

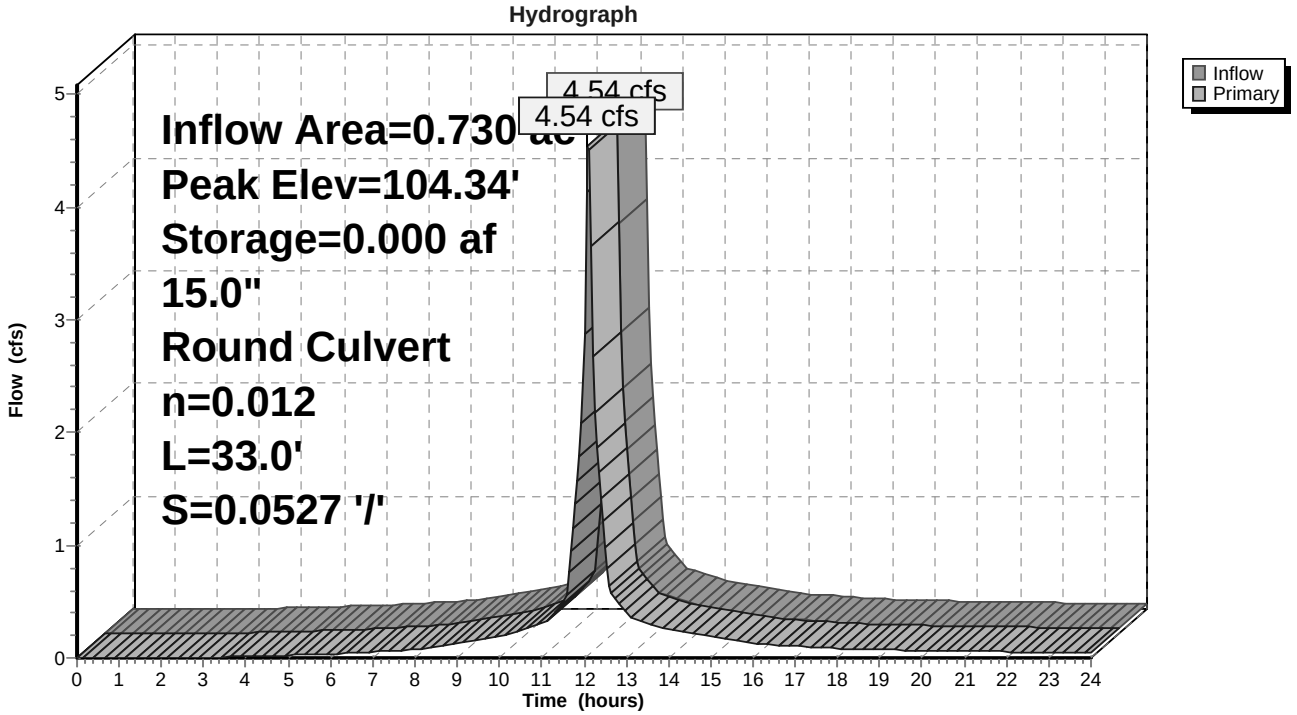
Plug-Flow detention time= 0.9 min calculated for 0.354 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (775.8 - 775.6)

Volume	Invert	Avail.Storage	Storage Description
#1	102.84'	0.001 af	**4.00'D x 4.75'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	102.84'	**15.0" Round 15" HDPE N-12** L= 33.0' Ke= 0.500 Inlet / Outlet Invert= 102.84' / 101.10' S= 0.0527 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=4.45 cfs @ 12.09 hrs HW=104.02' TW=102.96' (Dynamic Tailwater)
└**1=15" HDPE N-12** (Inlet Controls 4.45 cfs @ 3.70 fps)

Pond C13P: Catch Basin #13



Summary for Pond C14P: Catch Basin #14

Inflow Area = 0.573 ac, 71.60% Impervious, Inflow Depth > 5.84" for 25 Yr.-24 Hr. event
Inflow = 3.58 cfs @ 12.09 hrs, Volume= 0.279 af
Outflow = 3.56 cfs @ 12.09 hrs, Volume= 0.279 af, Atten= 0%, Lag= 0.1 min
Primary = 3.56 cfs @ 12.09 hrs, Volume= 0.279 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 104.83' @ 12.10 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 107.59' Surf.Area= 0.000 ac Storage= 0.001 af

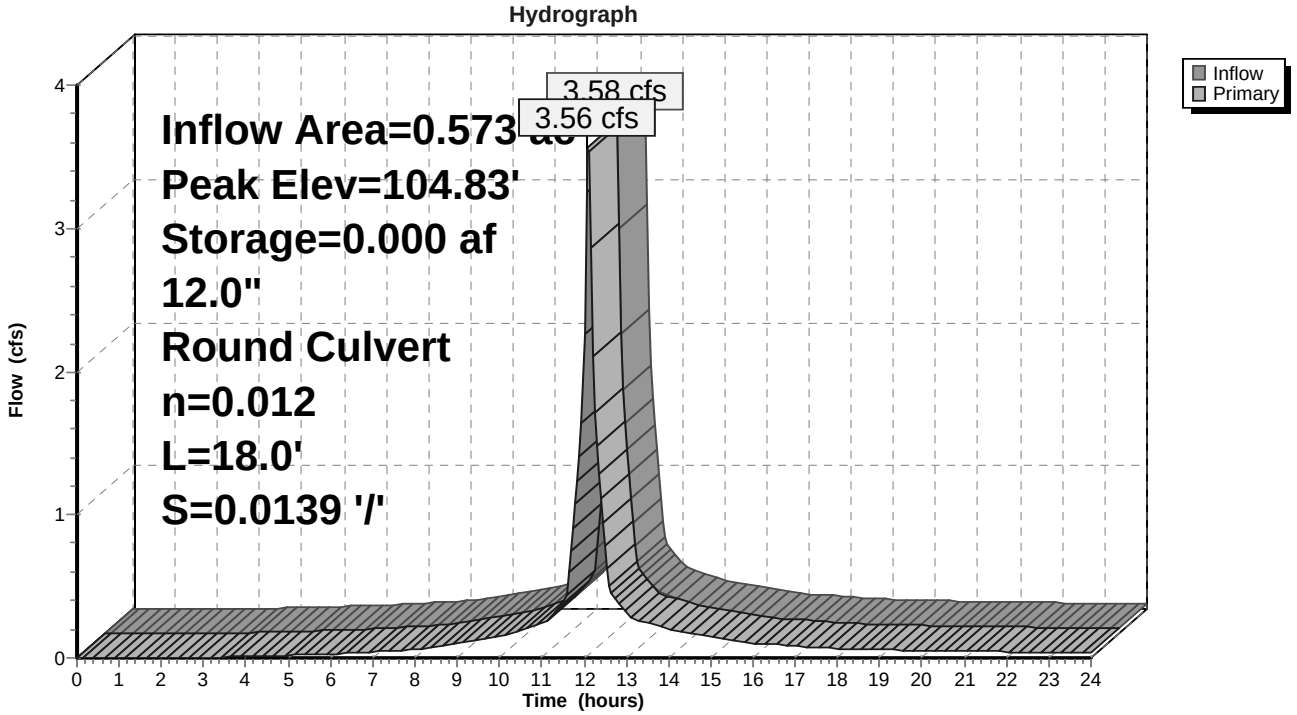
Plug-Flow detention time= 0.7 min calculated for 0.279 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (775.4 - 775.2)

Volume	Invert	Avail.Storage	Storage Description
#1	103.34'	0.001 af	**4.00'D x 4.50'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	103.34'	**12.0" Round 12" HDPE N-12** L= 18.0' Ke= 0.500 Inlet / Outlet Invert= 103.34' / 103.09' S= 0.0139 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=3.29 cfs @ 12.09 hrs HW=104.78' TW=104.02' (Dynamic Tailwater)
└**1=12" HDPE N-12** (Inlet Controls 3.29 cfs @ 4.19 fps)

Pond C14P: Catch Basin #14



Summary for Pond C15P: Catch Basin #15

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=24)

Inflow Area = 0.124 ac, 92.07% Impervious, Inflow Depth > 6.39" for 25 Yr.-24 Hr. event
Inflow = 0.81 cfs @ 12.09 hrs, Volume= 0.066 af
Outflow = 0.79 cfs @ 12.09 hrs, Volume= 0.065 af, Atten= 2%, Lag= 0.0 min
Primary = 0.79 cfs @ 12.09 hrs, Volume= 0.065 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 104.34' @ 17.28 hrs Surf.Area= 0.000 ac Storage= 0.001 af
Flood Elev= 104.43' Surf.Area= 0.000 ac Storage= 0.001 af

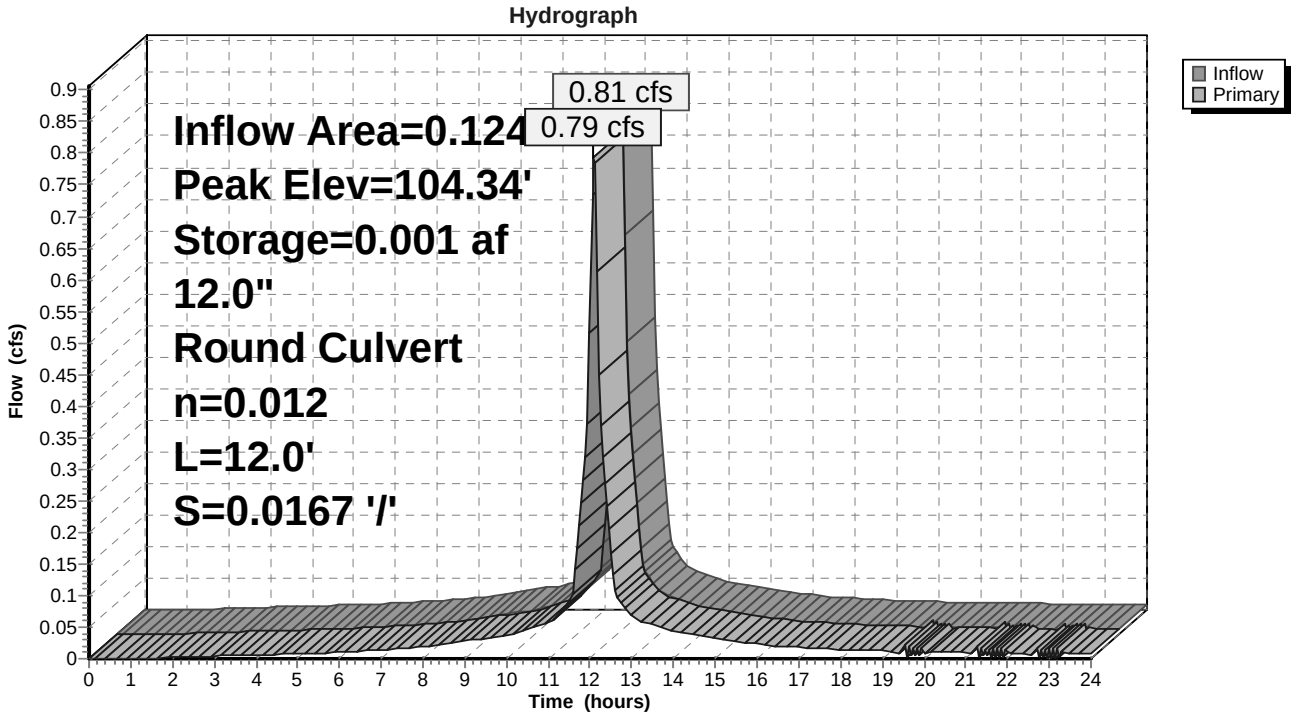
Plug-Flow detention time= 12.3 min calculated for 0.065 af (98% of inflow)
Center-of-Mass det. time= 0.7 min (755.6 - 754.9)

Volume	Invert	Avail.Storage	Storage Description
#1	100.20'	0.001 af	**4.00'D x 4.25'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	100.20'	**12.0" Round 12" HDPE N-12** L= 12.0' Ke= 0.500 Inlet / Outlet Invert= 100.20' / 100.00' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=102.40' TW=102.62' (Dynamic Tailwater)
1=12" HDPE N-12 (Controls 0.00 cfs)

Pond C15P: Catch Basin #15



Summary for Pond C16P: Catch Basin #16

Inflow Area = 1.624 ac, 51.77% Impervious, Inflow Depth > 1.76" for 25 Yr.-24 Hr. event
Inflow = 0.74 cfs @ 12.09 hrs, Volume= 0.238 af
Outflow = 0.74 cfs @ 12.09 hrs, Volume= 0.238 af, Atten= 0%, Lag= 0.1 min
Primary = 0.74 cfs @ 12.09 hrs, Volume= 0.238 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 99.24' @ 12.09 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 102.15' Surf.Area= 0.000 ac Storage= 0.001 af

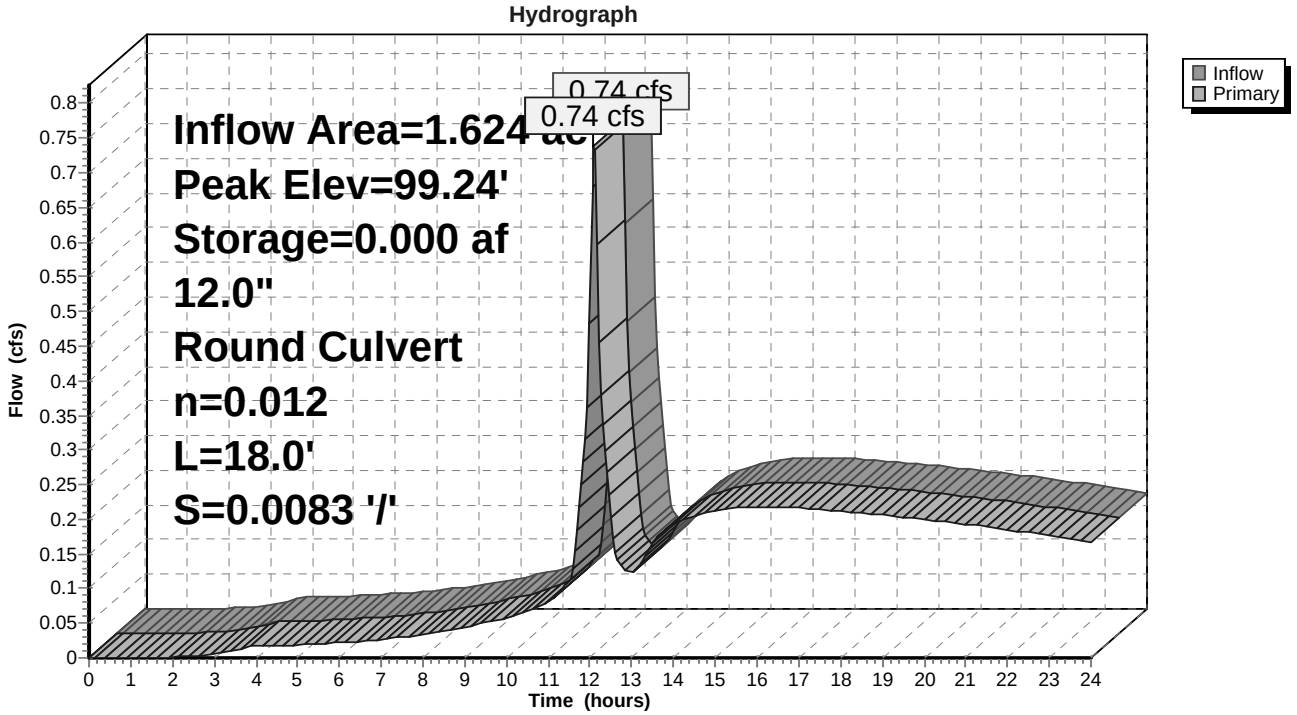
Plug-Flow detention time= 0.3 min calculated for 0.238 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (989.6 - 989.4)

Volume	Invert	Avail.Storage	Storage Description
#1	98.75'	0.001 af	**4.00'D x 3.40'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	98.75'	**12.0" Round 12" HDPE N-12** L= 18.0' Ke= 0.500 Inlet / Outlet Invert= 98.75' / 98.60' S= 0.0083 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.72 cfs @ 12.09 hrs HW=99.23' TW=95.20' (Dynamic Tailwater)
1=12" HDPE N-12 (Barrel Controls 0.72 cfs @ 2.84 fps)

Pond C16P: Catch Basin #16



Summary for Pond C17P: Catch Basin #17

Inflow Area = 0.246 ac, 26.53% Impervious, Inflow Depth > 4.24" for 25 Yr.-24 Hr. event
Inflow = 1.15 cfs @ 12.11 hrs, Volume= 0.087 af
Outflow = 1.15 cfs @ 12.11 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.1 min
Primary = 1.15 cfs @ 12.11 hrs, Volume= 0.087 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 98.21' @ 12.11 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 101.90' Surf.Area= 0.000 ac Storage= 0.001 af

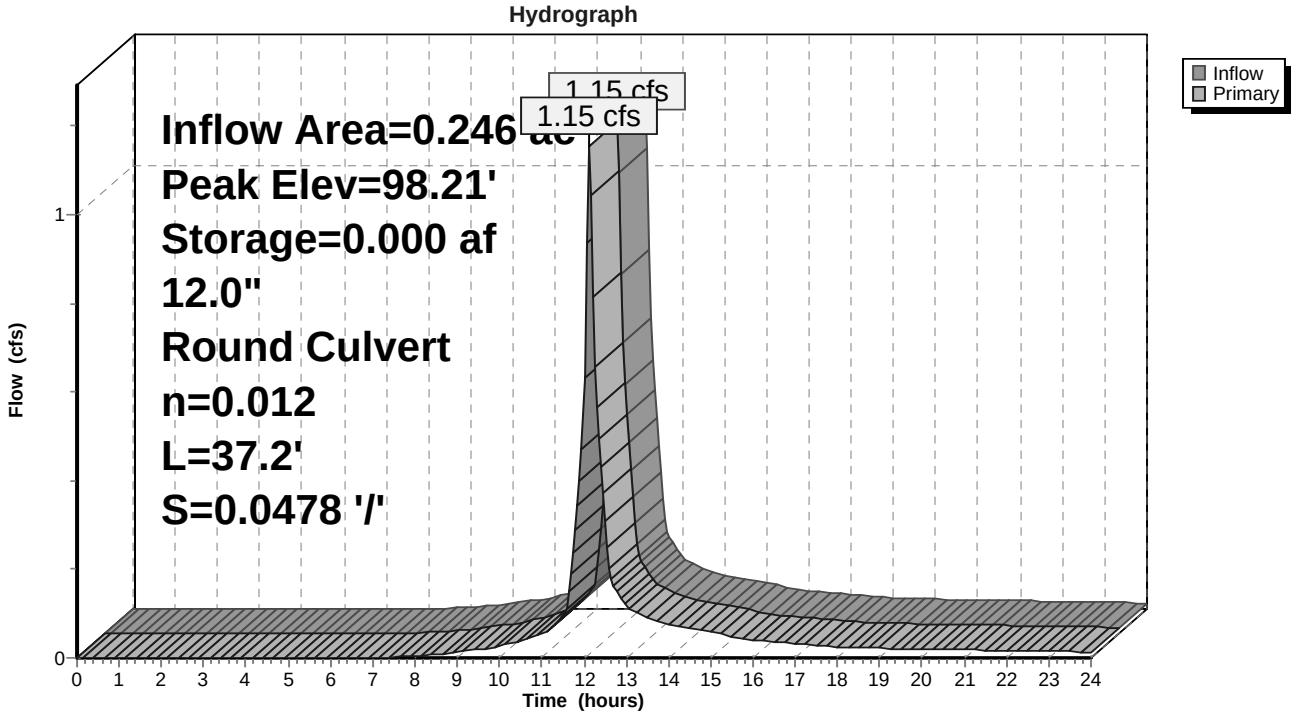
Plug-Flow detention time= 0.3 min calculated for 0.087 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (816.7 - 816.5)

Volume	Invert	Avail.Storage	Storage Description
#1	97.65'	0.001 af	**4.00'D x 4.25'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	97.65'	**12.0" Round 12" HDPE N-12** L= 37.2' Ke= 0.500 Inlet / Outlet Invert= 97.65' / 95.87' S= 0.0478 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.13 cfs @ 12.11 hrs HW=98.20' TW=96.59' (Dynamic Tailwater)
└**1=12" HDPE N-12** (Inlet Controls 1.13 cfs @ 2.53 fps)

Pond C17P: Catch Basin #17



Summary for Pond C18P: Catch Basin #18

Inflow Area = 0.119 ac, 74.68% Impervious, Inflow Depth > 5.92" for 25 Yr.-24 Hr. event
Inflow = 0.75 cfs @ 12.09 hrs, Volume= 0.059 af
Outflow = 0.74 cfs @ 12.09 hrs, Volume= 0.059 af, Atten= 1%, Lag= 0.0 min
Primary = 0.74 cfs @ 12.09 hrs, Volume= 0.059 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 96.70' @ 12.14 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 100.31' Surf.Area= 0.000 ac Storage= 0.001 af

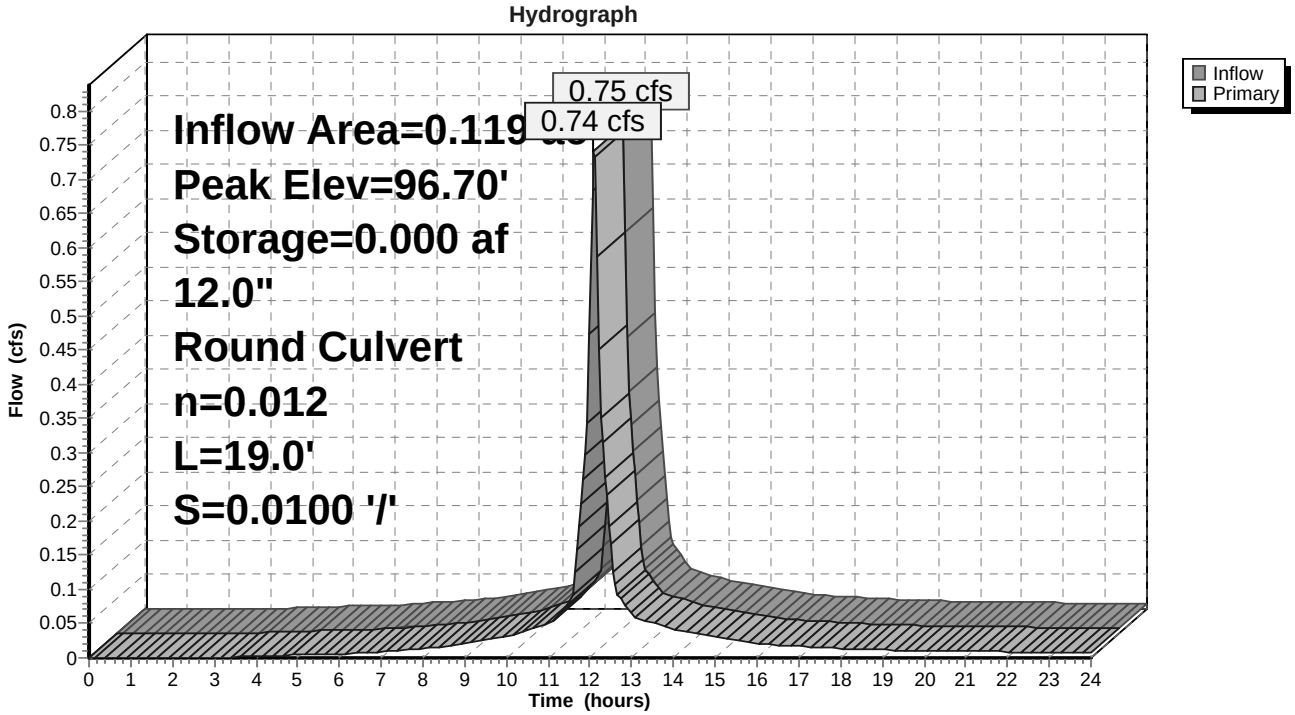
Plug-Flow detention time= 0.5 min calculated for 0.059 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (773.1 - 772.8)

Volume	Invert	Avail.Storage	Storage Description
#1	96.06'	0.001 af	**4.00'D x 4.25'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	96.06'	**12.0" Round 12" HDPE N-12** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 96.06' / 95.87' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.31 cfs @ 12.09 hrs HW=96.61' TW=96.58' (Dynamic Tailwater)
1=12" HDPE N-12 (Outlet Controls 0.31 cfs @ 1.02 fps)

Pond C18P: Catch Basin #18



Summary for Pond C19P: Catch Basin #19

Inflow Area = 0.527 ac, 42.01% Impervious, Inflow Depth > 4.86" for 25 Yr.-24 Hr. event
Inflow = 2.79 cfs @ 12.10 hrs, Volume= 0.213 af
Outflow = 2.78 cfs @ 12.10 hrs, Volume= 0.213 af, Atten= 0%, Lag= 0.1 min
Primary = 2.78 cfs @ 12.10 hrs, Volume= 0.213 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 96.61' @ 12.10 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 100.07' Surf.Area= 0.000 ac Storage= 0.001 af

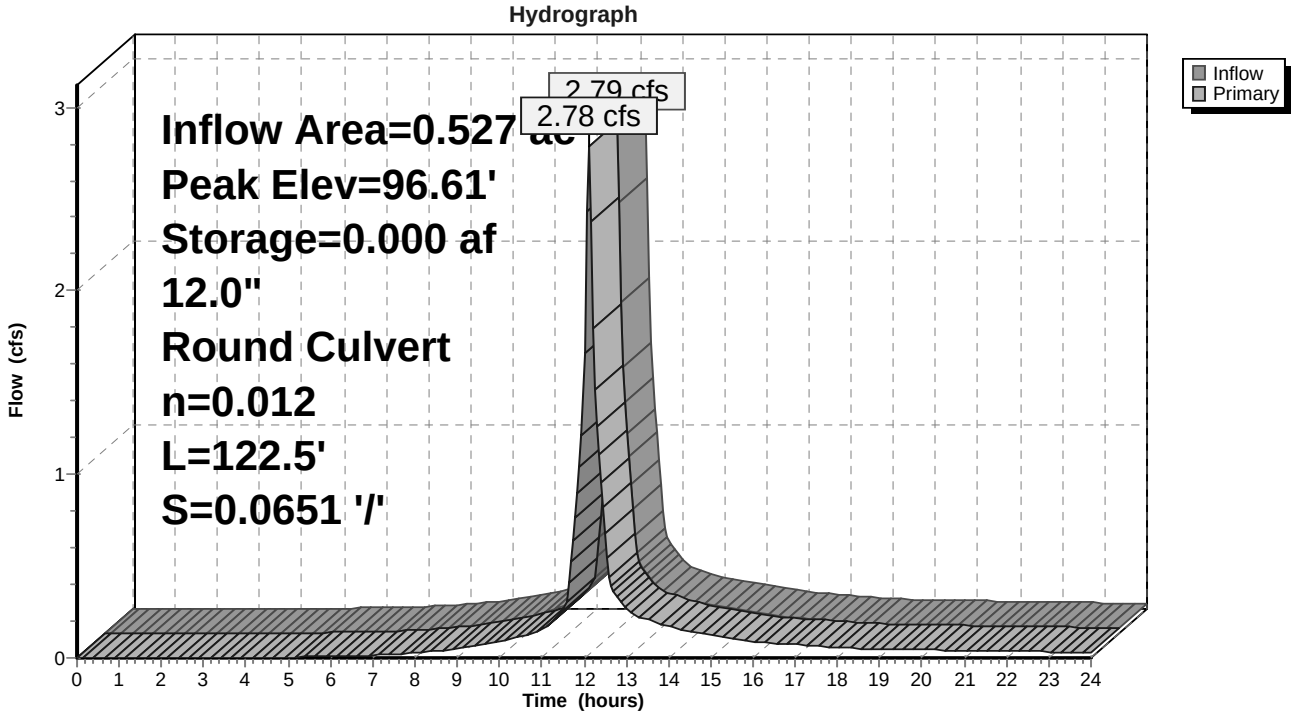
Plug-Flow detention time= 0.2 min calculated for 0.213 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (799.0 - 798.8)

Volume	Invert	Avail.Storage	Storage Description
#1	95.57'	0.001 af	**4.00'D x 4.50'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	95.57'	**12.0" Round 12" HDPE N-12** L= 122.5' Ke= 0.500 Inlet / Outlet Invert= 95.57' / 87.60' S= 0.0651 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.77 cfs @ 12.10 hrs HW=96.61' TW=88.53' (Dynamic Tailwater)
└**1=12" HDPE N-12** (Inlet Controls 2.77 cfs @ 3.53 fps)

Pond C19P: Catch Basin #19



Summary for Pond C20P: Catch Basin #20

Inflow Area = 0.861 ac, 50.03% Impervious, Inflow Depth > 5.14" for 25 Yr.-24 Hr. event
Inflow = 4.78 cfs @ 12.10 hrs, Volume= 0.369 af
Outflow = 4.77 cfs @ 12.10 hrs, Volume= 0.369 af, Atten= 0%, Lag= 0.1 min
Primary = 4.77 cfs @ 12.10 hrs, Volume= 0.369 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 84.75' @ 12.10 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 88.22' Surf.Area= 0.000 ac Storage= 0.001 af

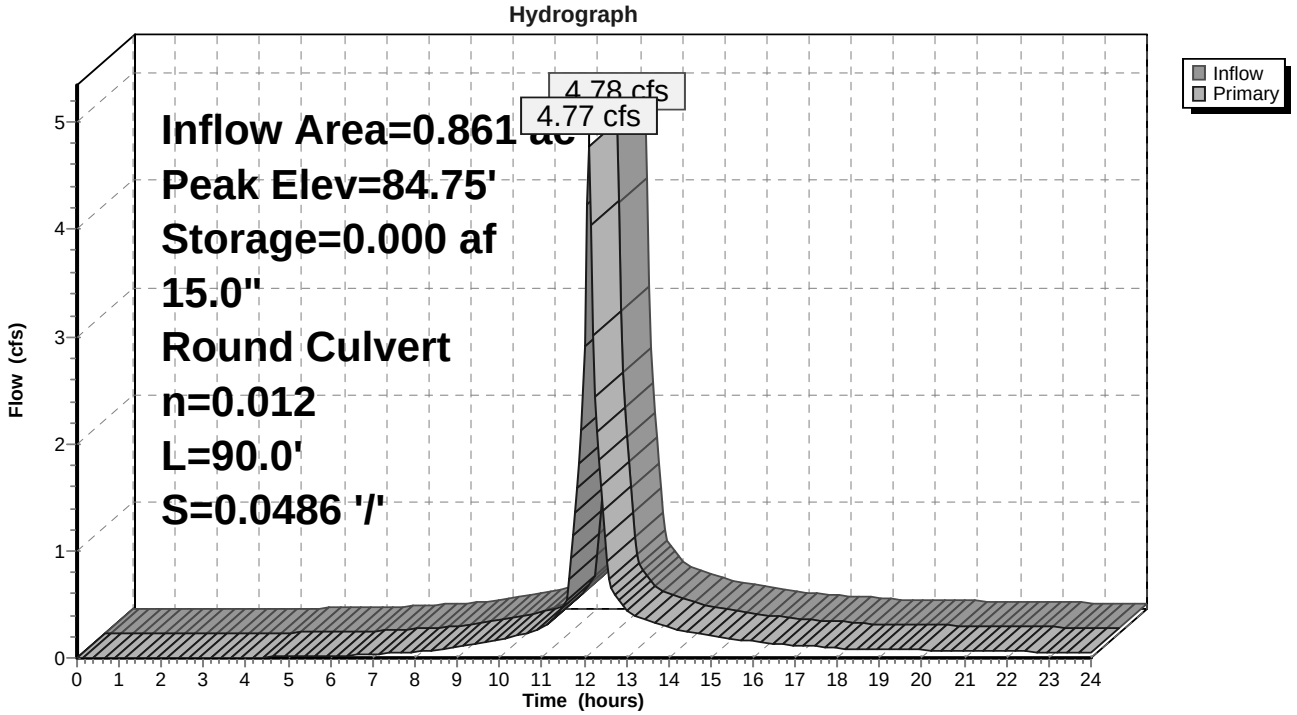
Plug-Flow detention time= 0.2 min calculated for 0.368 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (792.0 - 791.9)

Volume	Invert	Avail.Storage	Storage Description
#1	83.47'	0.001 af	**4.00'D x 4.75'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	83.47'	**15.0" Round 15" HDPE N-12** L= 90.0' Ke= 0.500 Inlet / Outlet Invert= 83.47' / 79.10' S= 0.0486 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=4.73 cfs @ 12.10 hrs HW=84.74' TW=80.74' (Dynamic Tailwater)
1=15" HDPE N-12 (Inlet Controls 4.73 cfs @ 3.86 fps)

Pond C20P: Catch Basin #20



Summary for Pond C21P: Catch Basin #21

Inflow Area = 0.673 ac, 43.35% Impervious, Inflow Depth > 4.91" for 25 Yr.-24 Hr. event
Inflow = 3.61 cfs @ 12.10 hrs, Volume= 0.275 af
Outflow = 3.59 cfs @ 12.10 hrs, Volume= 0.275 af, Atten= 1%, Lag= 0.1 min
Primary = 3.59 cfs @ 12.10 hrs, Volume= 0.275 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 85.52' @ 12.11 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 88.22' Surf.Area= 0.000 ac Storage= 0.001 af

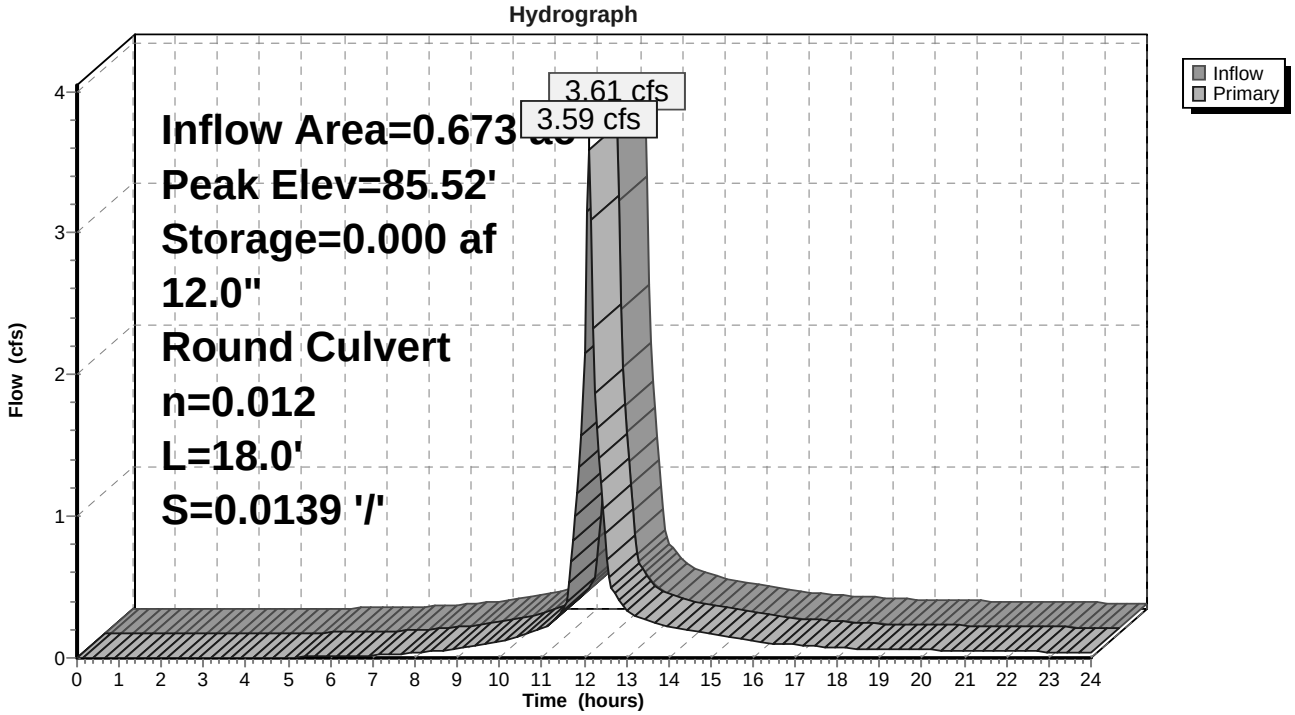
Plug-Flow detention time= 0.2 min calculated for 0.275 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (798.4 - 798.3)

Volume	Invert	Avail.Storage	Storage Description
#1	83.97'	0.001 af	**4.00'D x 4.25'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	83.97'	**12.0" Round 12" HDPE N-12** L= 18.0' Ke= 0.500 Inlet / Outlet Invert= 83.97' / 83.72' S= 0.0139 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=3.27 cfs @ 12.10 hrs HW=85.49' TW=84.74' (Dynamic Tailwater)
└**1=12" HDPE N-12** (Inlet Controls 3.27 cfs @ 4.17 fps)

Pond C21P: Catch Basin #21



Summary for Pond C22P: Catch Basin #22

Inflow Area = 0.967 ac, 50.99% Impervious, Inflow Depth > 5.20" for 25 Yr.-24 Hr. event
Inflow = 5.42 cfs @ 12.10 hrs, Volume= 0.419 af
Outflow = 5.39 cfs @ 12.10 hrs, Volume= 0.419 af, Atten= 1%, Lag= 0.0 min
Primary = 5.39 cfs @ 12.10 hrs, Volume= 0.419 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 81.23' @ 12.16 hrs Surf.Area= 0.000 ac Storage= 0.001 af
Flood Elev= 83.75' Surf.Area= 0.000 ac Storage= 0.001 af

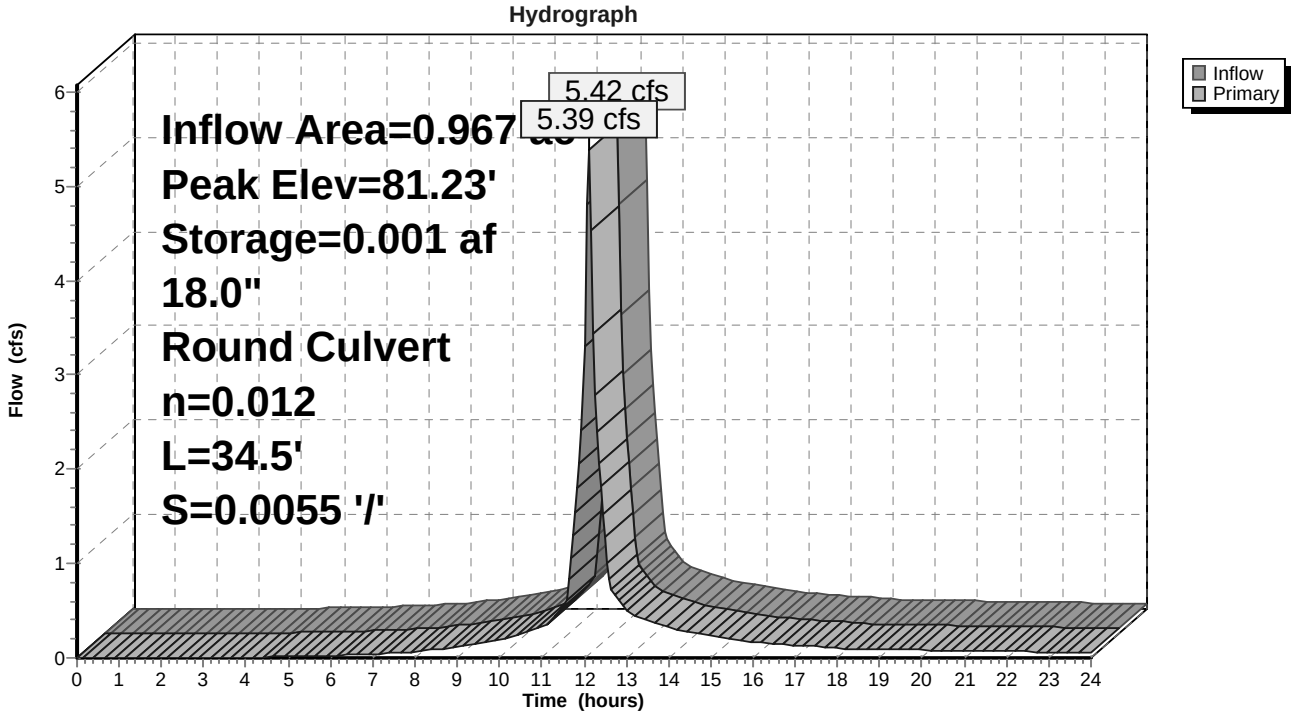
Plug-Flow detention time= 0.2 min calculated for 0.418 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (790.7 - 790.6)

Volume	Invert	Avail.Storage	Storage Description
#1	79.00'	0.001 af	**4.00'D x 4.75'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	79.00'	**18.0" Round 18" HDPE N-12** L= 34.5' Ke= 0.500 Inlet / Outlet Invert= 79.00' / 78.81' S= 0.0055 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.00 cfs @ 12.10 hrs HW=80.73' TW=80.88' (Dynamic Tailwater)
└**1=18" HDPE N-12** (Controls 0.00 cfs)

Pond C22P: Catch Basin #22



Summary for Pond C23P: Catch Basin #23

[80] Warning: Exceeded Pond C22P by 0.16' @ 12.10 hrs (3.40 cfs 0.018 af)

Inflow Area =	1.463 ac,	55.68% Impervious,	Inflow Depth >	5.36" for 25 Yr.-24 Hr. event
Inflow =	8.44 cfs @	12.09 hrs,	Volume=	0.654 af
Outflow =	8.40 cfs @	12.09 hrs,	Volume=	0.654 af, Atten= 1%, Lag= 0.0 min
Primary =	8.40 cfs @	12.09 hrs,	Volume=	0.654 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 80.99' @ 12.12 hrs Surf.Area= 0.000 ac Storage= 0.001 af
Flood Elev= 84.06' Surf.Area= 0.000 ac Storage= 0.002 af

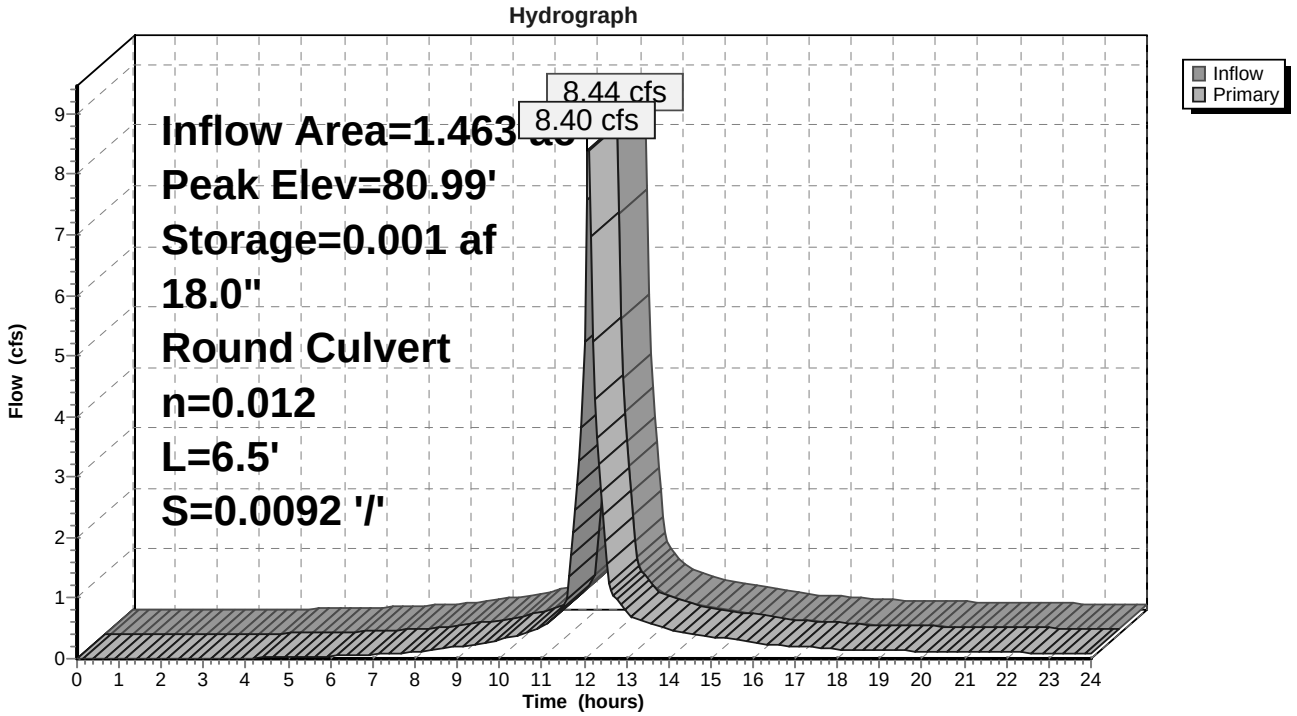
Plug-Flow detention time= 0.1 min calculated for 0.654 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (787.0 - 786.9)

Volume	Invert	Avail.Storage	Storage Description
#1	78.56'	0.002 af	**4.00'D x 5.50'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	78.56'	**18.0" Round 18" HDPE N-12** L= 6.5' Ke= 0.500 Inlet / Outlet Invert= 78.56' / 78.50' S= 0.0092 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=6.96 cfs @ 12.09 hrs HW=80.85' TW=80.19' (Dynamic Tailwater)
↑**1=18" HDPE N-12** (Inlet Controls 6.96 cfs @ 3.94 fps)

Pond C23P: Catch Basin #23



Summary for Pond C24P: Catch Basin #24

Inflow Area = 0.274 ac, 24.23% Impervious, Inflow Depth > 4.24" for 25 Yr.-24 Hr. event
Inflow = 1.15 cfs @ 12.15 hrs, Volume= 0.097 af
Outflow = 1.15 cfs @ 12.15 hrs, Volume= 0.097 af, Atten= 0%, Lag= 0.1 min
Primary = 1.15 cfs @ 12.15 hrs, Volume= 0.097 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 79.06' @ 12.15 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 85.50' Surf.Area= 0.000 ac Storage= 0.002 af

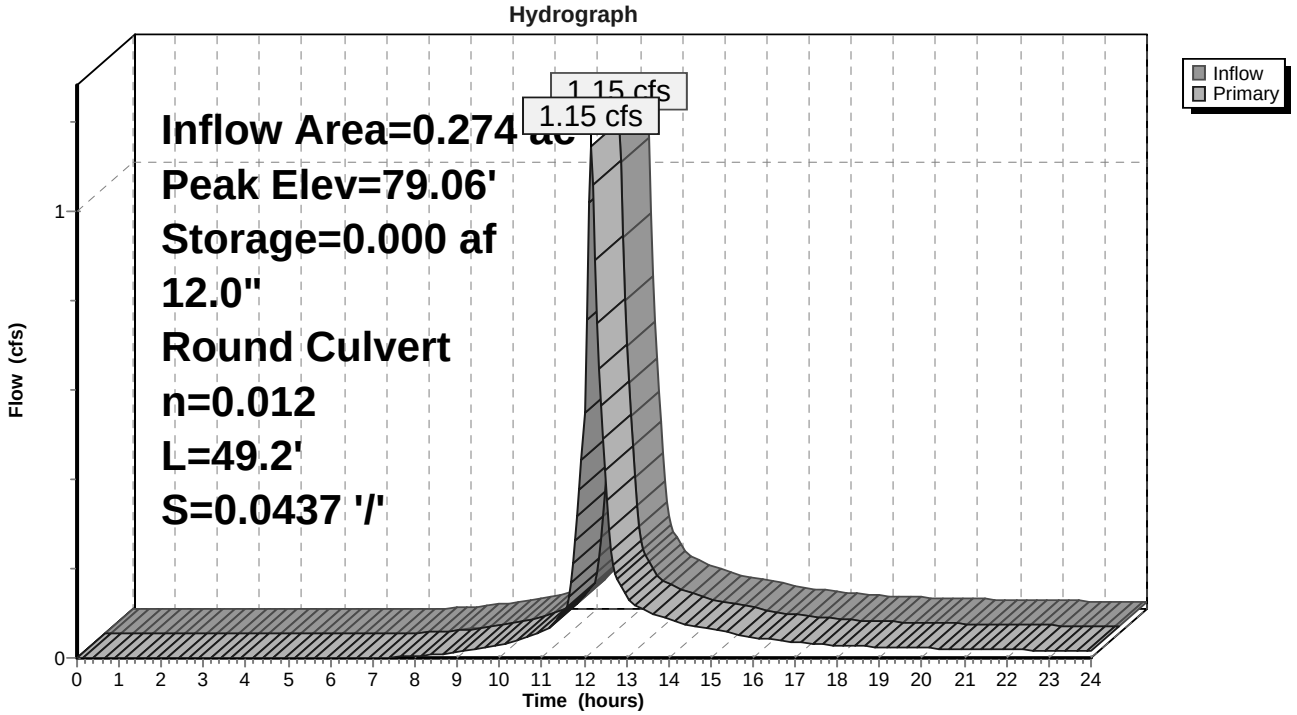
Plug-Flow detention time= 0.3 min calculated for 0.097 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (819.5 - 819.3)

Volume	Invert	Avail.Storage	Storage Description
#1	78.50'	0.002 af	**4.00'D x 7.00'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	78.50'	**12.0" Round 12" HDPE N-12** L= 49.2' Ke= 0.500 Inlet / Outlet Invert= 78.50' / 76.35' S= 0.0437 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.14 cfs @ 12.15 hrs HW=79.06' TW=73.00' (Dynamic Tailwater)
1=12" HDPE N-12 (Inlet Controls 1.14 cfs @ 2.54 fps)

Pond C24P: Catch Basin #24



Summary for Pond C25P: Catch Basin #25

[80] Warning: Exceeded Pond D10P by 0.18' @ 12.20 hrs (1.18 cfs 0.066 af)

Inflow Area = 0.536 ac, 24.26% Impervious, Inflow Depth > 4.23" for 25 Yr.-24 Hr. event
Inflow = 1.99 cfs @ 12.18 hrs, Volume= 0.189 af
Outflow = 1.97 cfs @ 12.18 hrs, Volume= 0.188 af, Atten= 1%, Lag= 0.1 min
Primary = 1.97 cfs @ 12.18 hrs, Volume= 0.188 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 74.61' @ 13.72 hrs Surf.Area= 0.000 ac Storage= 0.001 af
Flood Elev= 76.25' Surf.Area= 0.000 ac Storage= 0.002 af

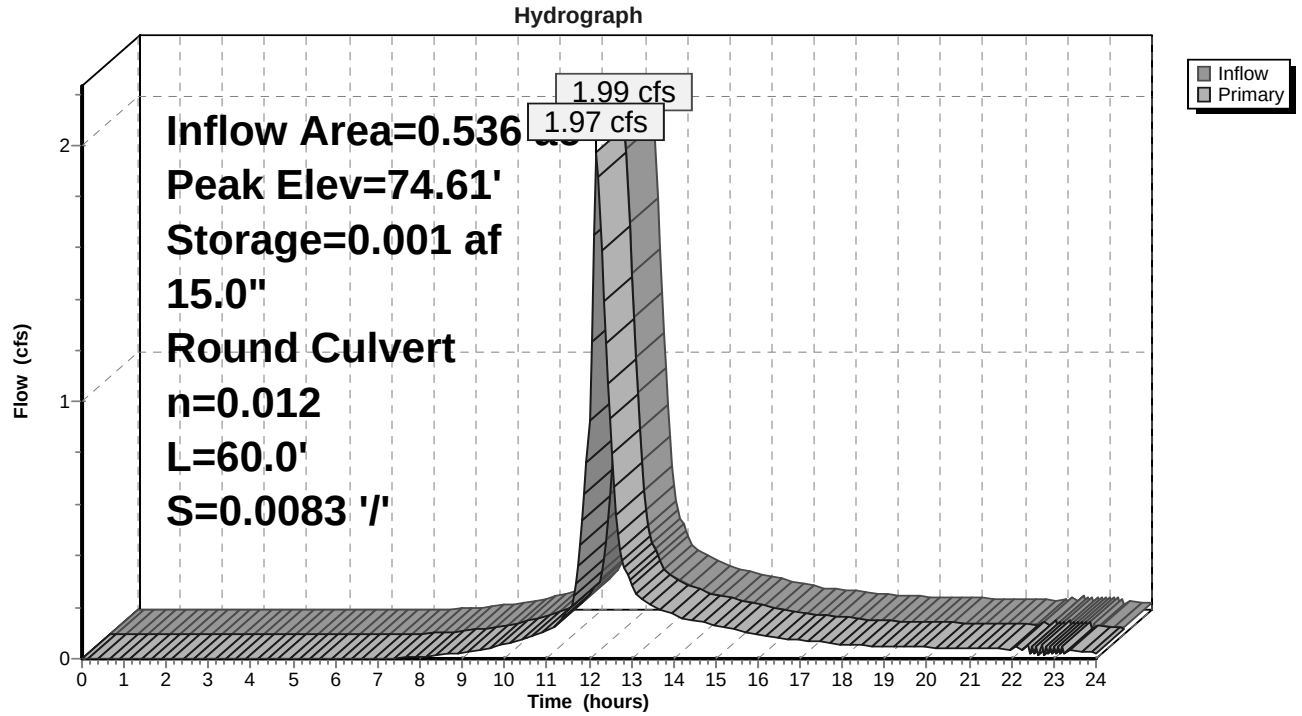
Plug-Flow detention time= 3.6 min calculated for 0.188 af (100% of inflow)
Center-of-Mass det. time= 0.7 min (822.9 - 822.1)

Volume	Invert	Avail.Storage	Storage Description
#1	71.00'	0.002 af	**4.00'D x 5.25'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	71.00'	**15.0" Round 15" HDPE N-12** L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0083 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 12.18 hrs HW=73.28' TW=73.44' (Dynamic Tailwater)
↑**1=15" HDPE N-12** (Controls 0.00 cfs)

Pond C25P: Catch Basin #25



Summary for Pond D01P: Drain Manhole #1

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 0.522 ac, 86.11% Impervious, Inflow Depth > 6.24" for 25 Yr.-24 Hr. event
Inflow = 3.34 cfs @ 12.09 hrs, Volume= 0.271 af
Outflow = 3.34 cfs @ 12.09 hrs, Volume= 0.271 af, Atten= 0%, Lag= 0.0 min
Primary = 3.34 cfs @ 12.09 hrs, Volume= 0.271 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 114.29' @ 12.10 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 119.40' Surf.Area= 0.000 ac Storage= 0.002 af

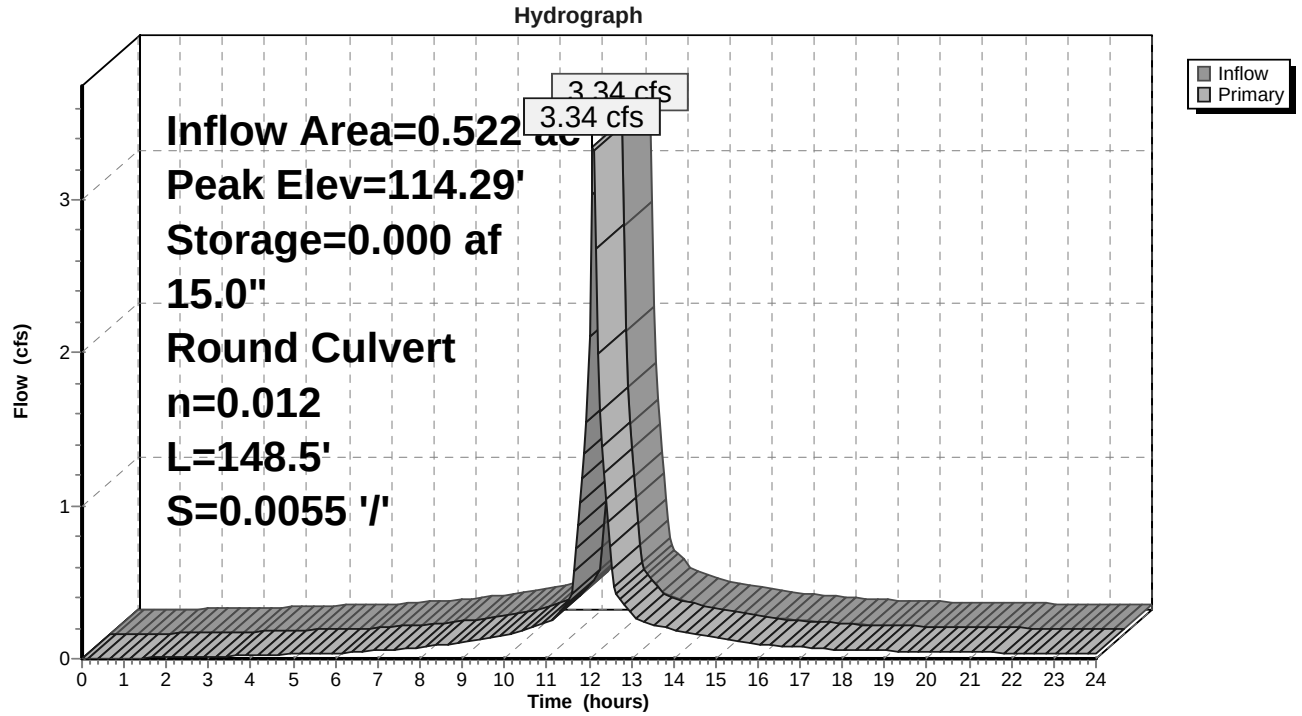
Plug-Flow detention time= 0.2 min calculated for 0.271 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (759.3 - 759.2)

Volume	Invert	Avail.Storage	Storage Description
#1	113.25'	0.002 af	**4.00'D x 6.15'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	113.25'	**15.0" Round 15" HDPE N-12** L= 148.5' Ke= 0.500 Inlet / Outlet Invert= 113.25' / 112.43' S= 0.0055 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.18 cfs @ 12.09 hrs HW=114.28' TW=113.27' (Dynamic Tailwater)
1=15" HDPE N-12 (Outlet Controls 3.18 cfs @ 4.01 fps)

Pond D01P: Drain Manhole #1



Summary for Pond D02P: Drain Manhole #2

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 0.522 ac, 86.11% Impervious, Inflow Depth > 6.24" for 25 Yr.-24 Hr. event
Inflow = 3.34 cfs @ 12.09 hrs, Volume= 0.271 af
Outflow = 3.34 cfs @ 12.09 hrs, Volume= 0.271 af, Atten= 0%, Lag= 0.0 min
Primary = 3.34 cfs @ 12.09 hrs, Volume= 0.271 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 113.28' @ 12.09 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 114.91' Surf.Area= 0.000 ac Storage= 0.001 af

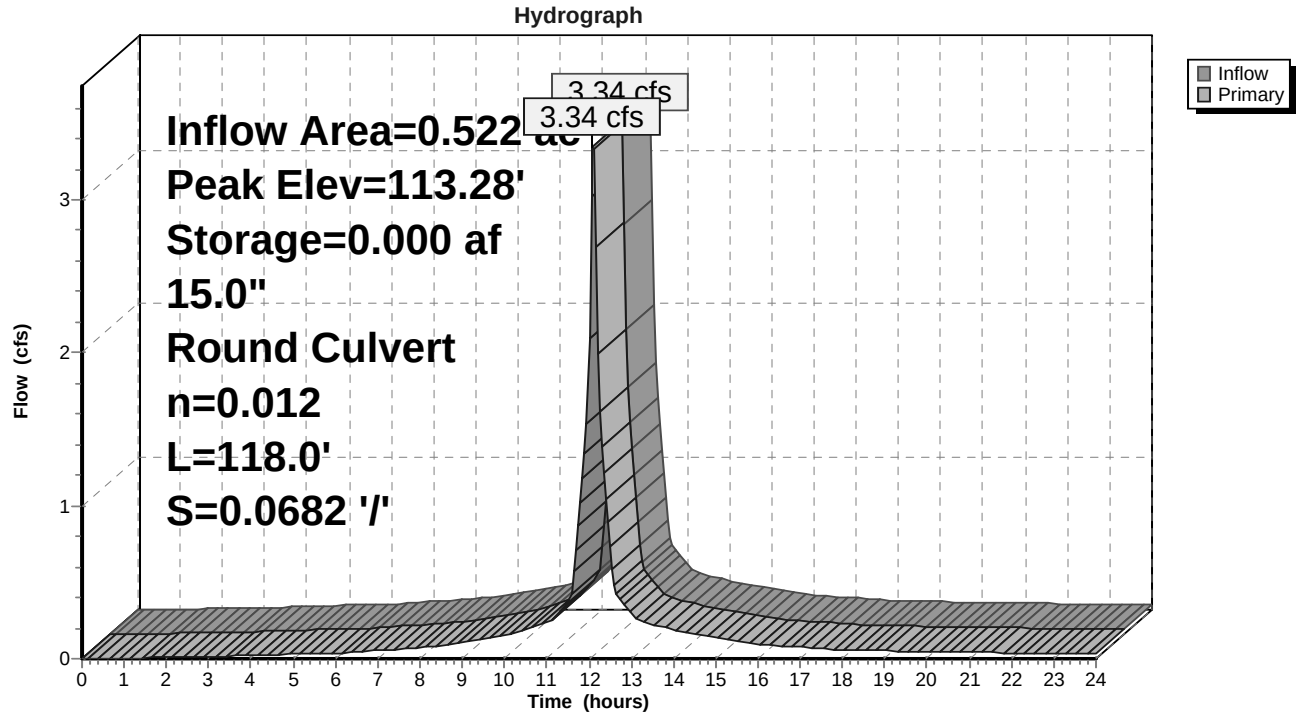
Plug-Flow detention time= 0.2 min calculated for 0.271 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (759.5 - 759.3)

Volume	Invert	Avail.Storage	Storage Description
#1	112.33'	0.001 af	**4.00'D x 4.75'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	112.33'	**15.0" Round 15" HDPE N-12** L= 118.0' Ke= 0.500 Inlet / Outlet Invert= 112.33' / 104.28' S= 0.0682 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.27 cfs @ 12.09 hrs HW=113.27' TW=105.29' (Dynamic Tailwater)
1=15" HDPE N-12 (Inlet Controls 3.27 cfs @ 3.30 fps)

Pond D02P: Drain Manhole #2



Summary for Pond D03P: Drain Manhole #3

Inflow Area = 1.346 ac, 74.18% Impervious, Inflow Depth > 5.89" for 25 Yr.-24 Hr. event
Inflow = 8.39 cfs @ 12.09 hrs, Volume= 0.661 af
Outflow = 8.38 cfs @ 12.09 hrs, Volume= 0.661 af, Atten= 0%, Lag= 0.0 min
Primary = 8.38 cfs @ 12.09 hrs, Volume= 0.661 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 100.92' @ 12.11 hrs Surf.Area= 0.000 ac Storage= 0.001 af
Flood Elev= 106.70' Surf.Area= 0.000 ac Storage= 0.002 af

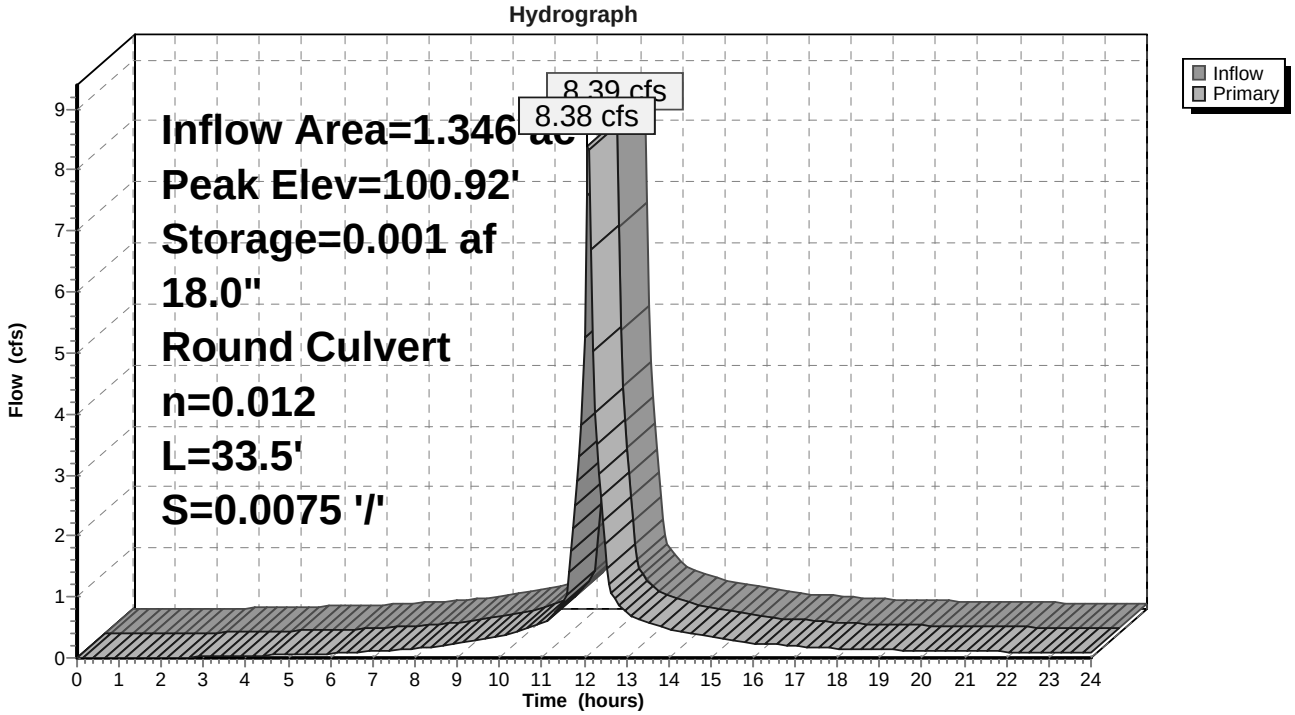
Plug-Flow detention time= 0.1 min calculated for 0.661 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (771.5 - 771.4)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	0.002 af	**4.00'D x 7.70'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	99.00'	**18.0" Round 18" HDPE N-12** L= 33.5' Ke= 0.500 Inlet / Outlet Invert= 99.00' / 98.75' S= 0.0075 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=7.22 cfs @ 12.09 hrs HW=100.87' TW=100.15' (Dynamic Tailwater)
└**1=18" HDPE N-12** (Inlet Controls 7.22 cfs @ 4.09 fps)

Pond D03P: Drain Manhole #3



Summary for Pond D04P: Drain Manhole #4

Inflow Area = 1.629 ac, 62.87% Impervious, Inflow Depth > 4.23" for 25 Yr.-24 Hr. event
Inflow = 1.72 cfs @ 12.56 hrs, Volume= 0.575 af
Outflow = 1.72 cfs @ 12.58 hrs, Volume= 0.575 af, Atten= 0%, Lag= 1.2 min
Primary = 1.72 cfs @ 12.58 hrs, Volume= 0.575 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 93.89' @ 12.58 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 99.50' Surf.Area= 0.000 ac Storage= 0.002 af

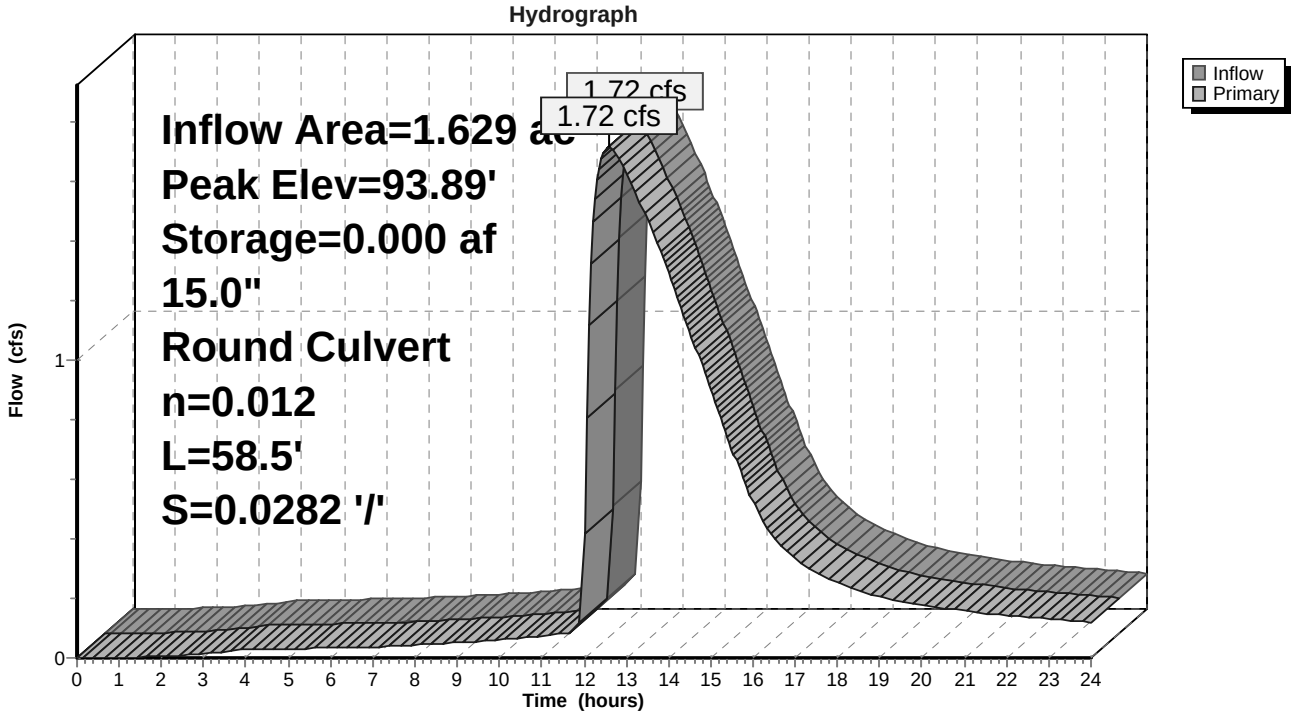
Plug-Flow detention time= 0.1 min calculated for 0.574 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (881.3 - 881.2)

Volume	Invert	Avail.Storage	Storage Description
#1	93.25'	0.002 af	**4.00'D x 6.25'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	93.25'	**15.0" Round 15" HDPE N-12** L= 58.5' Ke= 0.500 Inlet / Outlet Invert= 93.25' / 91.60' S= 0.0282 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.72 cfs @ 12.58 hrs HW=93.89' TW=92.14' (Dynamic Tailwater)
↳**1=15" HDPE N-12** (Inlet Controls 1.72 cfs @ 2.72 fps)

Pond D04P: Drain Manhole #4



Summary for Pond D05P: Drain Manhole #5

Inflow Area = 1.629 ac, 62.87% Impervious, Inflow Depth > 4.23" for 25 Yr.-24 Hr. event
Inflow = 1.72 cfs @ 12.58 hrs, Volume= 0.575 af
Outflow = 1.72 cfs @ 12.59 hrs, Volume= 0.575 af, Atten= 0%, Lag= 0.1 min
Primary = 1.72 cfs @ 12.59 hrs, Volume= 0.575 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 92.14' @ 12.59 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 100.00' Surf.Area= 0.000 ac Storage= 0.002 af

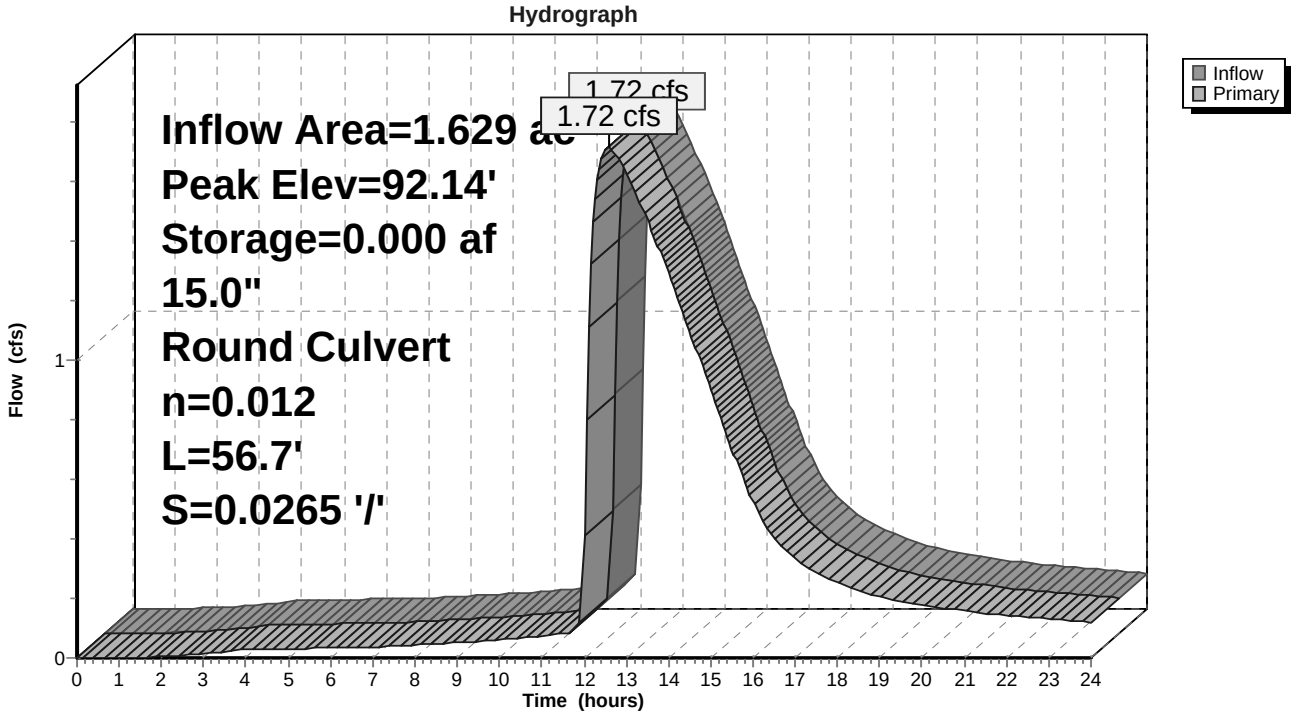
Plug-Flow detention time= 0.1 min calculated for 0.575 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (881.4 - 881.3)

Volume	Invert	Avail.Storage	Storage Description
#1	91.50'	0.002 af	**4.00'D x 8.50'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	91.50'	**15.0" Round 15" HDPE N-12** L= 56.7' Ke= 0.500 Inlet / Outlet Invert= 91.50' / 90.00' S= 0.0265 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.72 cfs @ 12.59 hrs HW=92.14' TW=90.18' (Dynamic Tailwater)
└**1=15" HDPE N-12** (Inlet Controls 1.72 cfs @ 2.72 fps)

Pond D05P: Drain Manhole #5



Summary for Pond D06P: Drain Manhole #6

[80] Warning: Exceeded Pond C13P by 0.01' @ 13.05 hrs (0.50 cfs 0.122 af)

Inflow Area = 0.730 ac, 71.80% Impervious, Inflow Depth > 5.82" for 25 Yr.-24 Hr. event
Inflow = 4.54 cfs @ 12.09 hrs, Volume= 0.354 af
Outflow = 4.52 cfs @ 12.09 hrs, Volume= 0.353 af, Atten= 0%, Lag= 0.0 min
Primary = 4.52 cfs @ 12.09 hrs, Volume= 0.353 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 104.34' @ 17.26 hrs Surf.Area= 0.000 ac Storage= 0.001 af
Flood Elev= 106.11' Surf.Area= 0.000 ac Storage= 0.001 af

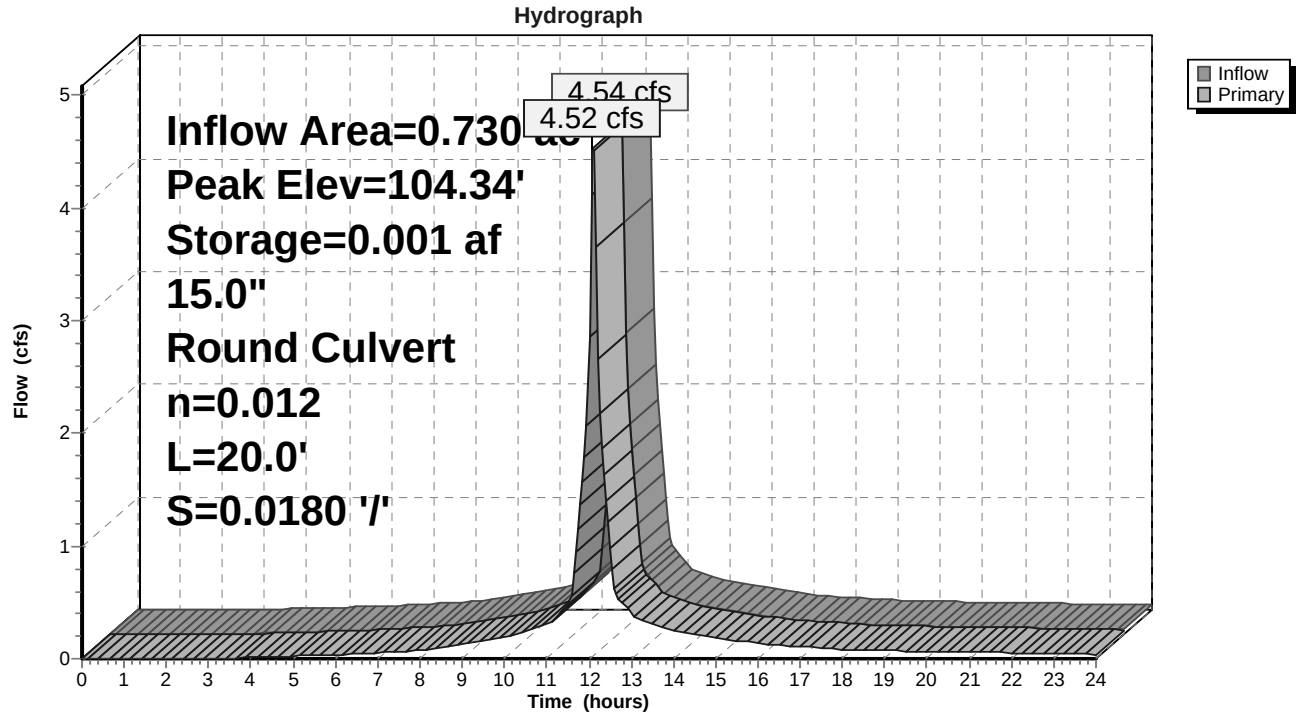
Plug-Flow detention time= 1.5 min calculated for 0.352 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (776.0 - 775.8)

Volume	Invert	Avail.Storage	Storage Description
#1	101.61'	0.001 af	**4.00'D x 4.50'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	101.61'	**15.0" Round 15" HDPE N-12** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 101.61' / 101.25' S= 0.0180 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.35 cfs @ 12.09 hrs HW=102.96' TW=102.64' (Dynamic Tailwater)
1=15" HDPE N-12 (Inlet Controls 3.35 cfs @ 2.73 fps)

Pond D06P: Drain Manhole #6



Summary for Pond D07P: Drain Manhole #7

Inflow Area = 1.516 ac, 49.67% Impervious, Inflow Depth > 1.45" for 25 Yr.-24 Hr. event
Inflow = 0.20 cfs @ 17.24 hrs, Volume= 0.184 af
Outflow = 0.20 cfs @ 17.24 hrs, Volume= 0.184 af, Atten= 0%, Lag= 0.1 min
Primary = 0.20 cfs @ 17.24 hrs, Volume= 0.184 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 99.40' @ 17.24 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 104.40' Surf.Area= 0.000 ac Storage= 0.002 af

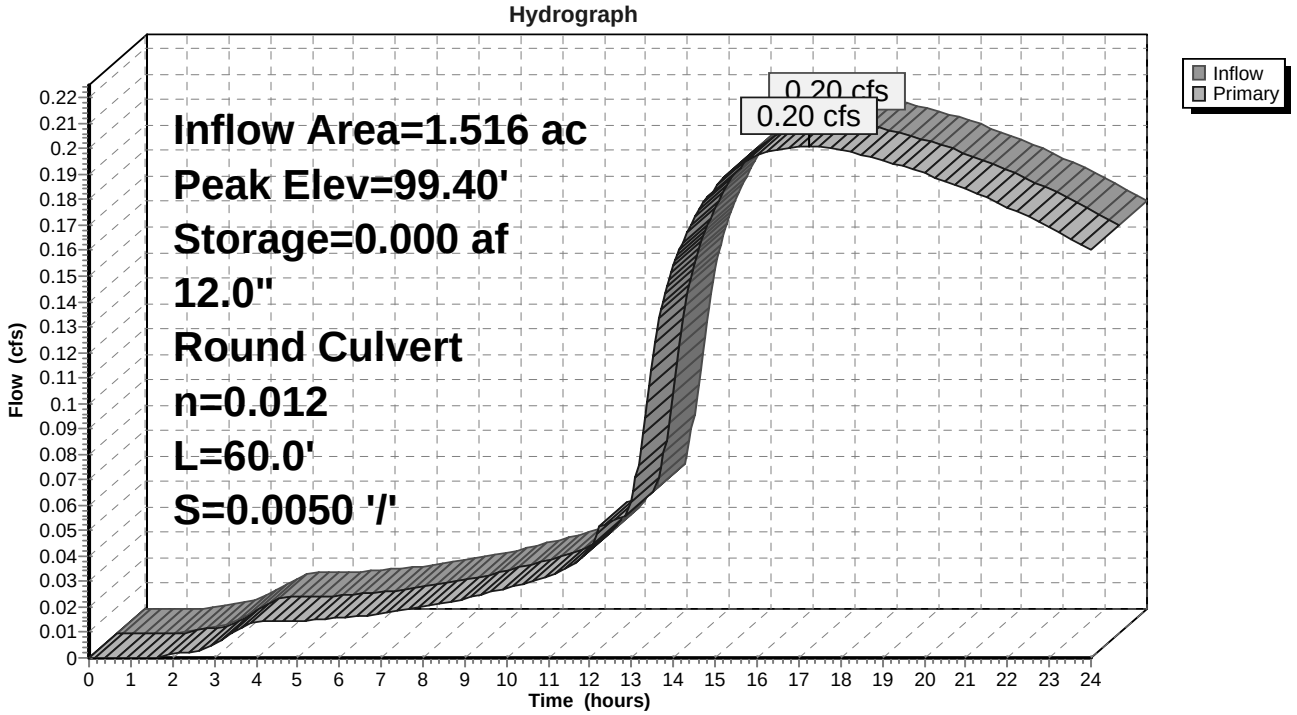
Plug-Flow detention time= 0.3 min calculated for 0.183 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (1,055.1 - 1,054.9)

Volume	Invert	Avail.Storage	Storage Description
#1	99.15'	0.002 af	**4.00'D x 5.75'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	99.15'	**12.0" Round 12" HDPE N-12** L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 99.15' / 98.85' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.20 cfs @ 17.24 hrs HW=99.40' TW=99.00' (Dynamic Tailwater)
1=12" HDPE N-12 (Barrel Controls 0.20 cfs @ 1.96 fps)

Pond D07P: Drain Manhole #7



Summary for Pond D08P: Drain Manhole #8

Inflow Area = 0.527 ac, 42.01% Impervious, Inflow Depth > 4.86" for 25 Yr.-24 Hr. event
Inflow = 2.78 cfs @ 12.10 hrs, Volume= 0.213 af
Outflow = 2.78 cfs @ 12.10 hrs, Volume= 0.213 af, Atten= 0%, Lag= 0.1 min
Primary = 2.78 cfs @ 12.10 hrs, Volume= 0.213 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 88.54' @ 12.10 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 91.75' Surf.Area= 0.000 ac Storage= 0.001 af

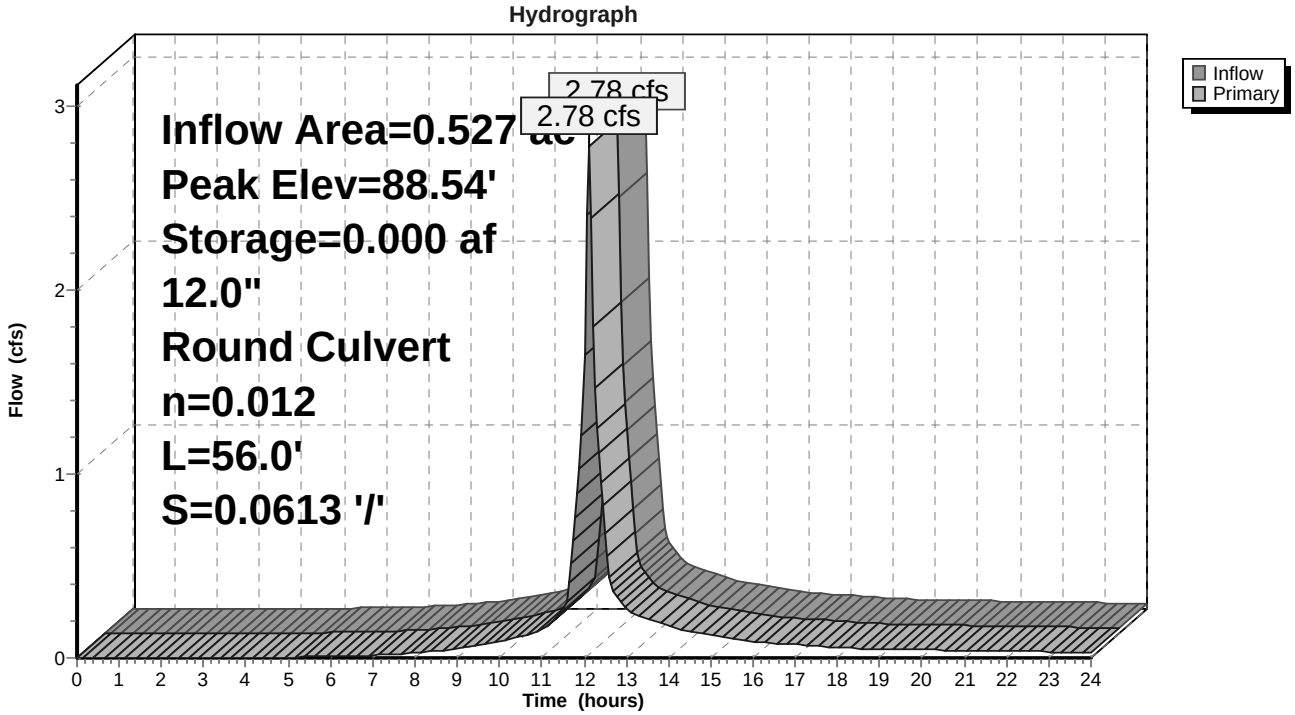
Plug-Flow detention time= 0.2 min calculated for 0.213 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (799.1 - 799.0)

Volume	Invert	Avail.Storage	Storage Description
#1	87.50'	0.001 af	**4.00'D x 4.25'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	87.50'	**12.0" Round 12" HDPE N-12** L= 56.0' Ke= 0.500 Inlet / Outlet Invert= 87.50' / 84.07' S= 0.0613 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.77 cfs @ 12.10 hrs HW=88.54' TW=85.50' (Dynamic Tailwater)
└**1=12" HDPE N-12** (Inlet Controls 2.77 cfs @ 3.53 fps)

Pond D08P: Drain Manhole #8



Summary for Pond D09P: Drain Manhole #9

Inflow Area = 1.463 ac, 55.68% Impervious, Inflow Depth > 5.36" for 25 Yr.-24 Hr. event
Inflow = 8.32 cfs @ 12.10 hrs, Volume= 0.653 af
Outflow = 8.31 cfs @ 12.10 hrs, Volume= 0.653 af, Atten= 0%, Lag= 0.0 min
Primary = 8.31 cfs @ 12.10 hrs, Volume= 0.653 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 76.45' @ 12.10 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 84.00' Surf.Area= 0.000 ac Storage= 0.003 af

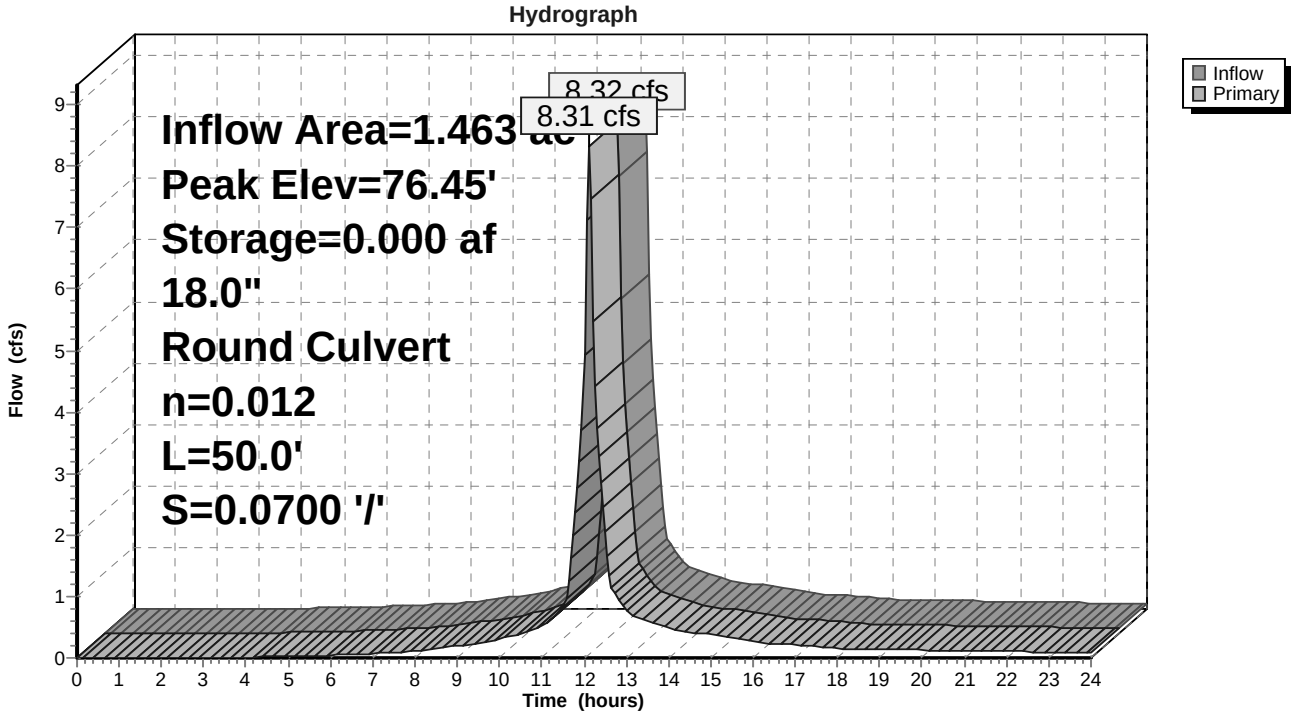
Plug-Flow detention time= 0.1 min calculated for 0.652 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (788.4 - 788.3)

Volume	Invert	Avail.Storage	Storage Description
#1	74.75'	0.003 af	**4.00'D x 8.75'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	74.75'	**18.0" Round 18" HDPE N-12** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 74.75' / 71.25' S= 0.0700 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=8.24 cfs @ 12.10 hrs HW=76.44' TW=73.02' (Dynamic Tailwater)
└**1=18" HDPE N-12** (Inlet Controls 8.24 cfs @ 4.66 fps)

Pond D09P: Drain Manhole #9



Summary for Pond D10P: Drain Manhole #10

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=18)

Inflow Area = 0.274 ac, 24.23% Impervious, Inflow Depth > 4.24" for 25 Yr.-24 Hr. event
Inflow = 1.15 cfs @ 12.15 hrs, Volume= 0.097 af
Outflow = 1.13 cfs @ 12.15 hrs, Volume= 0.096 af, Atten= 1%, Lag= 0.0 min
Primary = 1.13 cfs @ 12.15 hrs, Volume= 0.096 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 74.61' @ 13.78 hrs Surf.Area= 0.000 ac Storage= 0.001 af
Flood Elev= 80.00' Surf.Area= 0.000 ac Storage= 0.002 af

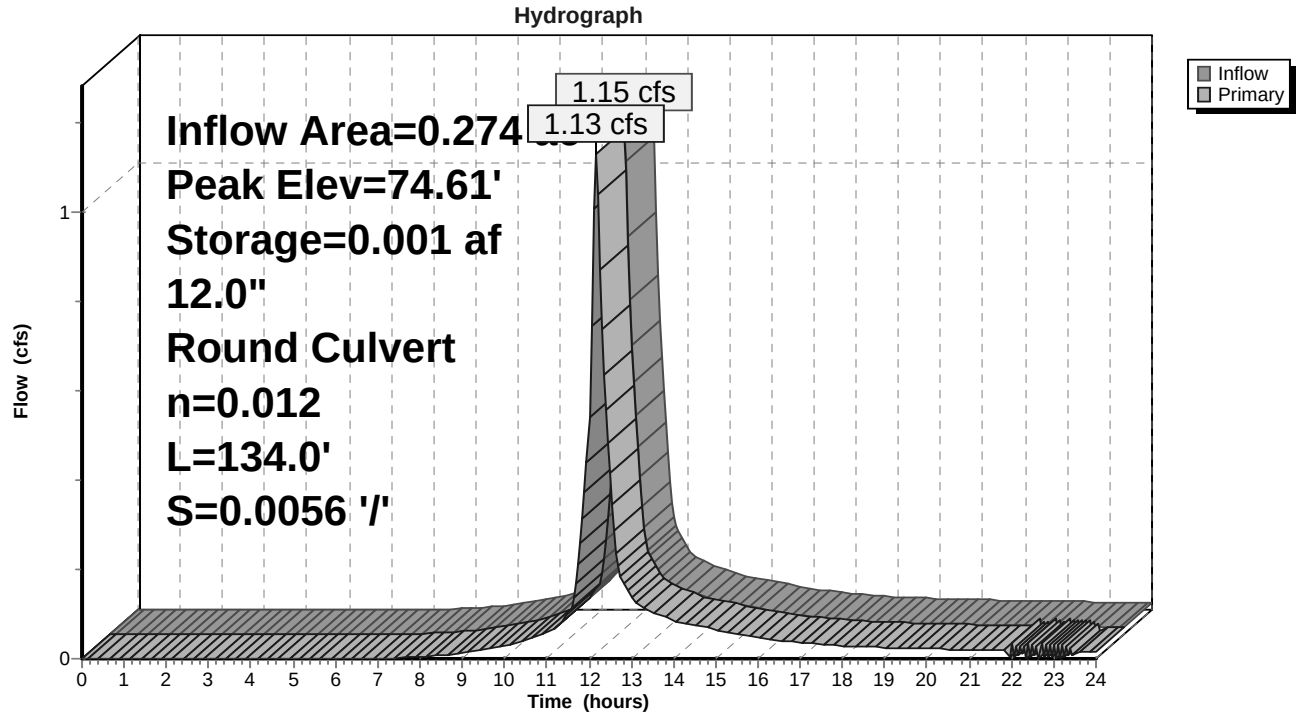
Plug-Flow detention time= 4.8 min calculated for 0.096 af (99% of inflow)
Center-of-Mass det. time= 1.0 min (820.5 - 819.5)

Volume	Invert	Avail.Storage	Storage Description
#1	72.00'	0.002 af	**4.00'D x 8.00'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	72.00'	**12.0" Round 12" HDPE N-12** L= 134.0' Ke= 0.500 Inlet / Outlet Invert= 72.00' / 71.25' S= 0.0056 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.15 hrs HW=73.00' TW=73.12' (Dynamic Tailwater)
↑**1=12" HDPE N-12** (Controls 0.00 cfs)

Pond D10P: Drain Manhole #10



Summary for Pond W01P: Water Quality Inlet #1

Inflow Area = 1.346 ac, 74.18% Impervious, Inflow Depth > 5.89" for 25 Yr.-24 Hr. event
Inflow = 8.38 cfs @ 12.09 hrs, Volume= 0.661 af
Outflow = 8.28 cfs @ 12.10 hrs, Volume= 0.660 af, Atten= 1%, Lag= 0.6 min
Primary = 8.28 cfs @ 12.10 hrs, Volume= 0.660 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 100.20' @ 12.10 hrs Surf.Area= 0.004 ac Storage= 0.007 af
Flood Elev= 102.50' Surf.Area= 0.004 ac Storage= 0.016 af

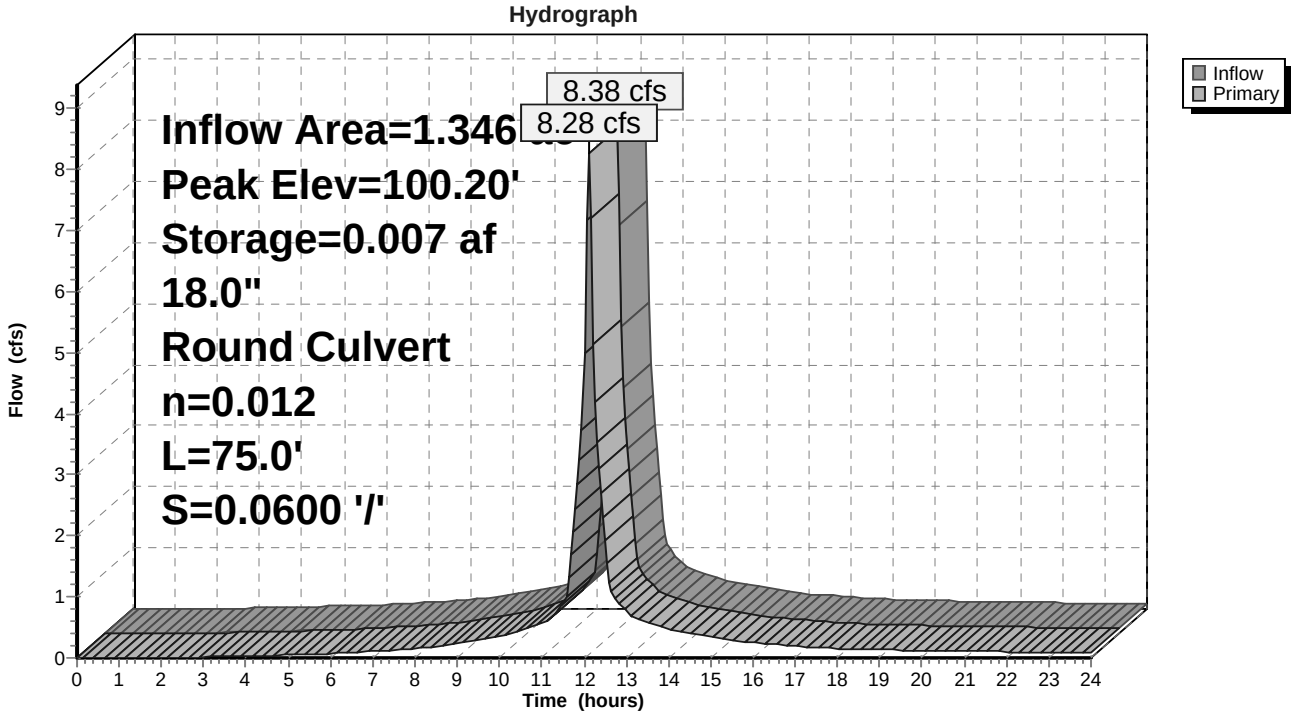
Plug-Flow detention time= 1.6 min calculated for 0.659 af (100% of inflow)
Center-of-Mass det. time= 1.2 min (772.6 - 771.5)

Volume	Invert	Avail.Storage	Storage Description
#1	98.50'	0.016 af	**10.00'W x 17.00'L x 4.00'H Storage Chamber**

Device	Routing	Invert	Outlet Devices
#1	Primary	98.50'	**18.0" Round 18" HDPE N-12** L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 98.50' / 94.00' S= 0.0600 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=8.28 cfs @ 12.10 hrs HW=100.20' TW=97.10' (Dynamic Tailwater)
└**1=18" HDPE N-12** (Inlet Controls 8.28 cfs @ 4.68 fps)

Pond W01P: Water Quality Inlet #1



Summary for Pond W02P: Water Quality Inlet #2

Inflow Area = 1.463 ac, 55.68% Impervious, Inflow Depth > 5.36" for 25 Yr.-24 Hr. event
Inflow = 8.40 cfs @ 12.09 hrs, Volume= 0.654 af
Outflow = 8.32 cfs @ 12.10 hrs, Volume= 0.653 af, Atten= 1%, Lag= 0.6 min
Primary = 8.32 cfs @ 12.10 hrs, Volume= 0.653 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 80.22' @ 12.10 hrs Surf.Area= 0.004 ac Storage= 0.008 af
Flood Elev= 91.25' Surf.Area= 0.004 ac Storage= 0.016 af

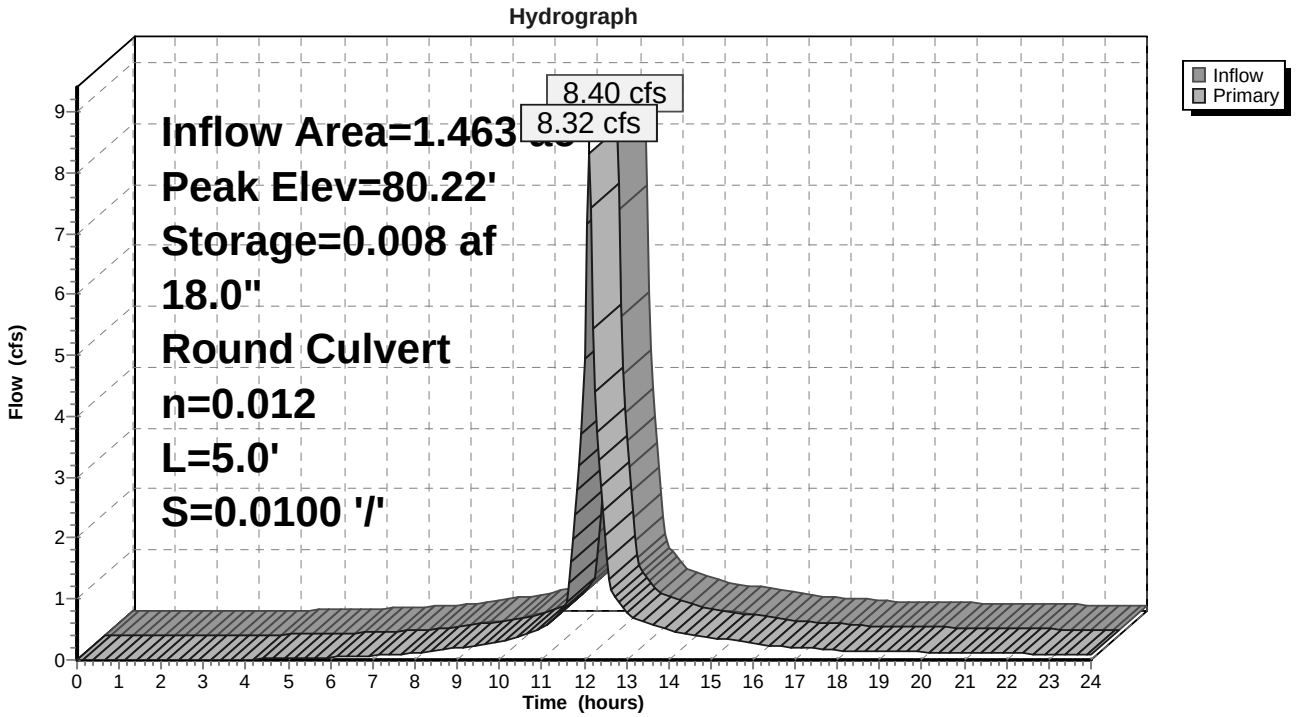
Plug-Flow detention time= 1.8 min calculated for 0.652 af (100% of inflow)
Center-of-Mass det. time= 1.3 min (788.3 - 787.0)

Volume	Invert	Avail.Storage	Storage Description
#1	78.25'	0.016 af	**10.00'W x 17.00'L x 4.00'H Storage Chamber**

Device	Routing	Invert	Outlet Devices
#1	Primary	78.25'	**18.0" Round 18" HDPE N-12** L= 5.0' Ke= 0.500 Inlet / Outlet Invert= 78.25' / 78.20' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=8.27 cfs @ 12.10 hrs HW=80.21' TW=76.44' (Dynamic Tailwater)
└**1=18" HDPE N-12** (Barrel Controls 8.27 cfs @ 4.71 fps)

Pond W02P: Water Quality Inlet #2



Appendix III - Calculations, Charts, & Graphs

Extreme Precipitation Tables
Rip Rap Calculations
AoT Stormwater Treatment Spreadsheets
NCRS USDA Web-soil Map
Site Specific Soil Map & Report
Stormwater System Management: Inspection & Maintenance Manual & Plan
Watershed Report Card, 303(d) List, & ORW List

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	70.902 degrees West
Latitude	43.203 degrees North
Elevation	0 feet
Date/Time	Mon, 08 Mar 2021 10:00:02 -0500

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	2.59	2.86	**1yr**	2.30	2.75	3.15	3.88	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	3.14	3.49	**2yr**	2.78	3.36	3.85	4.59	5.22	**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	4.47	**5yr**	3.51	4.30	4.92	5.79	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	5.40	**10yr**	4.18	5.19	5.93	6.91	7.77	**10yr**
25yr	0.46	0.74	0.94	1.29	1.72	2.27	**25yr**	1.48	2.09	2.69	3.52	4.59	5.97	6.92	**25yr**	5.29	6.65	7.58	8.73	9.75	**25yr**
50yr	0.52	0.83	1.06	1.48	2.00	2.66	**50yr**	1.72	2.45	3.18	4.17	5.47	7.14	8.35	**50yr**	6.32	8.03	9.14	10.42	11.58	**50yr**
100yr	0.58	0.94	1.21	1.71	2.32	3.12	**100yr**	2.00	2.88	3.74	4.94	6.50	8.53	10.09	**100yr**	7.55	9.70	11.01	12.45	13.77	**100yr**
200yr	0.64	1.05	1.36	1.95	2.70	3.67	**200yr**	2.33	3.39	4.42	5.87	7.75	10.19	12.19	**200yr**	9.02	11.72	13.28	14.89	16.37	**200yr**
500yr	0.75	1.24	1.62	2.35	3.30	4.53	**500yr**	2.85	4.21	5.48	7.35	9.77	12.91	15.66	**500yr**	11.43	15.06	17.02	18.86	20.60	**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	2.07	2.46	**1yr**	1.83	2.37	2.92	3.39	4.07	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.18	**2yr**	0.86	1.15	1.36	1.83	2.35	3.05	3.39	**2yr**	2.70	3.26	3.74	4.46	5.07	**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	4.12	**5yr**	3.27	3.96	4.59	5.40	6.10	**5yr**
10yr	0.38	0.59	0.73	1.02	1.31	1.60	**10yr**	1.13	1.56	1.81	2.44	3.13	4.25	4.77	**10yr**	3.76	4.59	5.31	6.22	6.99	**10yr**
25yr	0.44	0.66	0.83	1.18	1.55	1.91	**25yr**	1.34	1.87	2.11	2.84	3.65	5.04	5.78	**25yr**	4.46	5.55	6.47	7.52	8.38	**25yr**
50yr	0.48	0.73	0.91	1.31	1.76	2.19	**50yr**	1.52	2.14	2.36	3.20	4.10	5.77	6.66	**50yr**	5.11	6.40	7.52	8.67	9.60	**50yr**
100yr	0.54	0.81	1.02	1.47	2.02	2.51	**100yr**	1.74	2.45	2.64	3.59	4.57	6.60	7.67	**100yr**	5.85	7.38	8.74	10.00	10.98	**100yr**
200yr	0.60	0.90	1.14	1.65	2.30	2.87	**200yr**	1.98	2.81	2.94	4.02	5.11	7.55	8.84	**200yr**	6.69	8.50	10.14	11.53	12.57	**200yr**
500yr	0.70	1.04	1.33	1.94	2.75	3.46	**500yr**	2.38	3.39	3.42	4.66	5.93	8.99	10.65	**500yr**	7.95	10.24	12.35	13.94	14.98	**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	3.07	**1yr**	2.51	2.95	3.39	4.18	4.76	**1yr**
2yr	0.33	0.51	0.62	0.84	1.04	1.24	**2yr**	0.90	1.22	1.47	1.95	2.51	3.25	3.61	**2yr**	2.88	3.47	3.98	4.73	5.40	**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	4.83	**5yr**	3.74	4.64	5.26	6.20	6.97	**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	6.02	**10yr**	4.59	5.79	6.62	7.61	8.48	**10yr**
25yr	0.55	0.84	1.05	1.50	1.97	2.47	**25yr**	1.70	2.41	2.87	3.95	4.94	6.90	8.08	**25yr**	6.11	7.77	8.85	10.01	11.05	**25yr**
50yr	0.64	0.97	1.21	1.74	2.35	2.98	**50yr**	2.02	2.91	3.48	4.81	5.99	8.50	10.12	**50yr**	7.52	9.73	11.04	12.31	13.50	**50yr**
100yr	0.74	1.13	1.41	2.04	2.79	3.59	**100yr**	2.41	3.51	4.22	5.88	7.28	10.47	12.68	**100yr**	9.27	12.19	13.77	15.16	16.52	**100yr**
200yr	0.86	1.30	1.65	2.38	3.32	4.35	**200yr**	2.87	4.26	5.13	7.19	8.83	12.95	15.89	**200yr**	11.46	15.28	17.19	18.65	20.23	**200yr**
500yr	1.05	1.57	2.02	2.93	4.17	5.58	**500yr**	3.60	5.46	6.62	9.40	11.43	17.16	21.44	**500yr**	15.19	20.62	23.07	24.58	26.47	**500yr**

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: Kenneth Berry
Berry Surveying & Engineering
335 Second Crown Point Road
Barrington, NH 03825

From: NHB Review, NH Natural Heritage Bureau
Date: 2/18/2022 (valid until 02/18/2023)
Re: Review by NH Natural Heritage Bureau
Permits: NHDES - Alteration of Terrain Permit, NHDES - Shoreland Standard Permit

NHB ID: **NHB22-0388** Town: Dover Location: Tolend Road
Description: Construction of thirty duplex units with 3,800 LF of road and associated stormwater and septic systems.
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: Are wetlands present on the property?
F&G: Are wetlands present on the property? Vernal pool surveys are recommended to be conducted between April 1 and the end of May to give a more accurate evaluation of amphibian reproduction.

As of February 3, 2022, New Hampshire Fish and Game requirements for environmental review consultation have changed. To review the new rules, please go to https://www.wildlife.state.nh.us/legislative/proposed-rules.html. All requests for consultation and submittals should be sent via email to NHFGreview@wildlife.nh.gov or can be sent by mail. The NHB datacheck results letter number needs to be included in the email subject line.

The requirements for consultation (Fis 1004) shall not apply to the following: statutory permit by notification, permit by rule, permit by notification, routine roadway registration, docking structure registration, or conditional authorization by rule. Consultation requests for these projects can be sent directly to kim.tuttle@wildlife.nh.gov.

Plant species	State[1]	Federal	Notes
northern tubercled bog-orchid (*Platanthera flava var. herbiola*)	T	--	This species occurs in forested swamps, low floodplain forest, riparian thickets, bogs, fens, seeps, and wet meadows. Threats to the plants include direct destruction of the

Memo

NH Natural Heritage Bureau
NHB DataCheck Results Letter

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plants, e.g., by ATV traffic, destruction (draining) of its habitat, and excessive shade when succession leads to dense shrub or tree growth.

Vertebrate species	State[1]	Federal	Notes
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

NHB22-0388



New Hampshire Natural Heritage Bureau - Plant Record

northern tubercled bog-orchid (*Platanthera flava var. herbiola*)

Legal Status	Conservation Status
Federal: Not listed	Global: Apparently secure but with cause for concern
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:	2007: 19 plants counted in scattered clumps (with 3-4 plants in a clump). 12 stems had flowered. 2003: 46 plants total: 16 counted, 30 estimated. 70% in flower (7/15). Clumped in a 100-1000 sq. m area. More found in July than in June. 1987: 51-100 plants, some in flower, in a 10-100 square yard area.
General Area:	2007: Wet meadow with much shrub and young sapling growth. Associates include: *Spiraea tomentosa* (steeple bush), *Spiraea alba* var. *latifolia* (eastern meadowsweet), *Vaccinium corymbosum* (highbush blueberry), *Frangula alnus* (alder-buckthorn), *Betula populifolia* (gray birch), *Carex stipata* (awl sedge), and *Onoclea sensibilis* (sensitive fern). 2003: Wet meadow with blueberry. Associated plant species include *Iris* species and ferns. Dominant/characteristic species include *Iris* spp., ferns, and grasses. 1987: Wet, open swale on lower slope.
General Comments:	2007: Road work and a new development surround this site, but wetlands permit requires management plan to help protect this species and its habitat. 2003: Plants were in bud in June, in full bloom in July. All plants were in wet meadow interspersed with ferns and Iris. 1987: Site proposed for new church.
Management Comments:	2009: Jean Stefanik (phone call 5/5) reports talking to the Dover Planning Commission at the request of a Conservation Commission member. They are now addressing the management plan written by [Leonard Lord of Carex Ecosystems(?)], looking for and very interested in following up on details that will help to protect the plants. Jean provided input: she had found plants in 2003 outside the area where Melissa and Leonard found & flagged them in 2007, so hand trimming planned for the vicinity of the plants should be used in that area also. And timing of mowing is important (not till fall) to allow seeds to ripen. 2007: DES wetlands permit 2007-191 list management plan for the protection of this species in the permit conditions. 2003: Definite risk of loss by development.

Location

Survey Site Name: Sixth Street Connector
Managed By:

County: Strafford
Town(s): Dover
Size: 2.8 acres Elevation:

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

Directions: Take Spaulding Turnpike to Sixth Street Connector. In wet meadow northwest of junction of Sixth Street Connector with upper Sixth St.

Dates documented

First reported: 1987-07-10 Last reported: 2007-07-20

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.

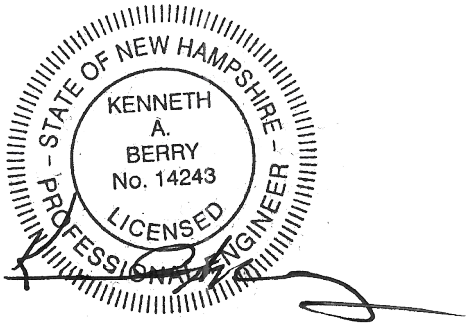
Directions: 2006: Area 11682: Columbus Avenue, Dover.

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



RIP RAP CALCULATIONS

23-031 Tolend Road
Rolling Hill Estates
Dover, NH

Berry Surveying & Engineering
335 Second Crown Point Road
Barrington, NH

31-Mar-23

Rip Rap equations were obtained from the *Stormwater Management and Erosion Control Handbook for Urban and Developing Areas in New Hampshire*. Rip Rap was sized for the 25 year storm event. (Some d50 sizes and T values have been modified)

TAILWATER < HALF THE Do

La = (1.8 x Q) / Do 3/2 + (7 x Do) Q = Peak Flow & Do is Pipe Diameter

W = La + 3*Do or defined channel width

d50 = (0.02 x Q4/3) / (Tw x Do) Tw = Tailwater Depth

T = Largest Stone Size x 1.5

Culvert or Catch Basin	Tailwater (Feet) Tw	Discharge (C.F.S.) Q	Diameter of Pipe Do	Length of Rip Rap La (feet)	Width of Rip Rap W (feet)	d50-Stone Rip Rap d50(ft.)	Actual Size	Thickness
12" HDPE (Pond #C15P)	0.20	0.79	1.00	8.4	11.4	0.07	0.50	1.20
12" HDPE (Pond #C16P)	0.20	0.74	1.00	8.3	11.3	0.07	0.50	1.20
15" HDPE (Pond #C25P)	0.25	1.99	1.25	11.3	15.1	0.16	0.50	1.20
15" HDPE (Pond #D05P)	0.25	1.71	1.25	11.0	14.7	0.13	0.50	1.20
15" HDPE (Pond #D06P)	0.25	4.47	1.25	14.5	18.3	0.47	0.50	1.20
18" HDPE (Pond #D09P)	0.30	8.35	1.50	18.7	23.2	0.75	0.67	1.75
18" HDPE (Pond #W01P)	0.30	8.26	1.50	18.6	23.1	0.74	0.67	1.75
15" HDPE (Pond #102bP)	0.25	0.60	1.25	9.5	13.3	0.03	0.50	1.20
15" HDPE (Pond #102dP)	0.25	0.34	1.25	9.2	12.9	0.02	0.50	1.20

Please note that the designer chose to use the 25 Year Event for the dimensional calculations.

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d50 Size =	0.5	Feet	6	Inches
% of Weight Smaller Than the Given d50 Size	Size of Stone (Inches) From		To	
100%	9		12	
85%	8		11	
50%	6		9	
15%	2		3	

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d50 Size =	0.67	Feet	8	Inches

% of Weight Smaller Than the Given d50 Size	Size of Stone (Inches) From	To
100%	12	16
85%	10	14
50%	8	12
15%	2	4

GRAVEL WETLAND DESIGN CRITERIA
(Env-Wq 1508.05)

Type/Node Name: **Gravel Wetland #101 (Pond 101P)**

Enter the node name in the drainage analysis if applicable.

1.51	ac	A = Area draining to the practice	
0.73	ac	A_I = Impervious area draining to the practice	
0.48	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.49	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.74	ac-in	WQV= 1" x Rv x A	
2,669	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
267	cf	10% x WQV (check calc for sediment forebay)	
1,201	cf	45% x WQV (check calc for gravel wetland treatment bay volume)	
2,102	cf	V_{SED} = Sediment forebay volume	**≥ 10%WQV**
2,249	cf	V_{TB1} = Volume of treatment bay 1 [1]	**≥ 45%WQV**
2,869	cf	V_{TB2} = Volume of treatment bay 2 [1]	**≥ 45%WQV**
0.06	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec) [2]	
100.85	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.03	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{avg}$**
49.43	hours	T_{ED} = Drawdown time of extended detention = 2WQV/Q_{WQV}	**≥ 24-hrs**
3.00	:1	Pond side slopes	**≥ 3:1**
101.67	ft	Elevation of SHWT	
99.67	ft	SHWT - 2 feet	
103.85	ft	Epp = Elevation of the permanent pool (elevation of lowest orifice) [3]	**≤ E_{SHWT} - 2 ft**
15.7, 15.4	ft	Length of the flow path between the inlet and outlet in each cell	**≥ 15 ft**
Angle Grate		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of ≤6")?	
104.46	ft	Peak elevation of the 50-year storm event (E_{50})	
105.00	ft	Berm elevation of the pond	
YES		E_{50} ≤ the berm elevation?	**← yes**

Qualified professional that developed the planting plan
Name, Profession: KAB/KRP

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

2. To ensure orifice is sized so that WQV is released at a relatively stable rate.

3. 4" to 8" below the wetland soil. If lowest orifice is higher than (SHWT - 2 feet), and saturated hydraulic conductivity (Ksat) is greater than 0.015 in/hr, the system must be lined.

Designer's Notes:

Buxton Ksat = 0 as shown in Ksat NH

Stage-Area-Storage for Pond 101P: SGW #101

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
99.42	0	101.50	5,054	103.58	16,421
99.46	1	101.54	5,217	103.62	16,695
99.50	1	101.58	5,382	103.66	16,971
99.54	2	101.62	5,550	103.70	17,249
99.58	2	101.66	5,720	103.74	17,530
99.62	3	101.70	5,891	103.78	17,813
99.66	3	101.74	6,066	103.82	18,099
99.70	4	101.78	6,242	103.86	18,388
99.74	4	101.82	6,421	103.90	18,679
99.78	50	101.86	6,602	103.94	18,972
99.82	112	101.90	6,785	103.98	19,269
99.86	175	101.94	6,970	104.02	19,567
99.90	240	101.98	7,158	104.06	19,869
99.94	305	102.02	7,354	104.10	20,174
99.98	371	102.06	7,556	104.14	20,481
100.02	449	102.10	7,760	104.18	20,792
100.06	539	102.14	7,965	104.22	21,106
100.10	631	102.18	8,172	104.26	21,422
100.14	725	102.22	8,380	104.30	21,742
100.18	820	102.26	8,589	104.34	22,065
100.22	917	102.30	8,800	104.38	22,390
100.26	1,016	102.34	9,013	104.42	22,719
100.30	1,117	102.38	9,226	104.46	23,051
100.34	1,219	102.42	9,442	104.50	23,385
100.38	1,323	102.46	9,658	104.54	23,723
100.42	1,429	102.50	9,877	104.58	24,064
100.46	1,538	102.54	10,096	104.62	24,408
100.50	1,647	102.58	10,317	104.66	24,755
100.54	1,759	102.62	10,540	104.70	25,105
100.58	1,873	102.66	10,764	104.74	25,459
100.62	1,989	102.70	10,989	104.78	25,816
100.66	2,107	102.74	11,217	104.82	26,176
100.70	2,226	102.78	11,445	104.86	26,539
100.74	2,348	102.82	11,675	104.90	26,906
100.78	2,472	102.86	11,906	104.94	27,275
WQV Elev.: 100.85	100.82 2,598	102.90	12,139	104.98	**27,648**
100.86	2,726	102.94	12,374		
100.90	2,856	102.98	12,610	WQV = 2,669	
100.94	2,988	103.02	12,848	100.85 = 2,694	
100.98	3,122	103.06	13,088		
101.02	3,259	103.10	13,330		
101.06	3,397	103.14	13,574		
101.10	3,537	103.18	13,821		
101.14	3,680	103.22	14,070		
101.18	3,824	103.26	14,322		
101.22	3,971	103.30	14,576		
101.26	4,119	103.34	14,832		
101.30	4,270	103.38	15,091		
101.34	4,422	103.42	15,352		
101.38	4,577	103.46	15,616		
101.42	4,734	103.50	15,882		
101.46	4,893	103.54	16,150		

Stage-Discharge for Pond 101P: SGW #101

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Tertiary (cfs)	
99.42	0.00	0.00	0.00	0.00	
99.62	0.01	0.01	0.00	0.00	
99.82	0.02	0.02	0.00	0.00	
100.02	0.02	0.02	0.00	0.00	
100.22	0.02	0.02	0.00	0.00	
100.42	0.03	0.03	0.00	0.00	
100.62	0.03	0.03	0.00	0.00	
100.82	0.03	0.03	0.00	0.00	100.85 + 0.03
101.02	0.03	0.03	0.00	0.00	
101.22	0.03	0.03	0.00	0.00	
101.42	0.04	0.04	0.00	0.00	
101.62	0.04	0.04	0.00	0.00	
101.82	0.04	0.04	0.00	0.00	
102.02	0.04	0.04	0.00	0.00	
102.22	0.04	0.04	0.00	0.00	
102.42	0.05	0.05	0.00	0.00	
102.62	0.05	0.05	0.00	0.00	
102.82	0.05	0.05	0.00	0.00	
103.02	0.05	0.05	0.00	0.00	
103.22	0.05	0.05	0.00	0.00	
103.42	0.05	0.05	0.00	0.00	
103.62	0.05	0.05	0.00	0.00	
103.82	0.05	0.05	0.00	0.00	
104.02	0.11	0.06	0.05	0.00	
104.22	0.17	0.06	0.12	0.00	
104.42	0.33	0.06	0.27	0.00	
104.62	6.00	0.06	4.43	1.52	
104.82	**15.21**	**0.06**	**8.37**	**6.78**	

Summary for Pond 101P: SGW #101

[80] Warning: Exceeded Pond C15P by 0.24' @ 12.10 hrs (1.84 cfs 0.249 af)
[80] Warning: Exceeded Pond D06P by 0.02' @ 12.55 hrs (0.80 cfs 0.032 af)

Inflow Area = 1.513 ac, 48.43% Impervious, Inflow Depth > 6.44" for 50 Yr.-24 Hr. event
Inflow = 10.56 cfs @ 12.09 hrs, Volume= 0.812 af
Outflow = 0.81 cfs @ 13.27 hrs, Volume= 0.322 af, Atten= 92%, Lag= 70.8 min
Primary = 0.06 cfs @ 12.89 hrs, Volume= 0.075 af
Secondary = 0.75 cfs @ 13.27 hrs, Volume= 0.247 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 104.46' @ 13.27 hrs Surf.Area= 13,078 sf Storage= 23,043 cf
Flood Elev= 105.00' Surf.Area= 14,163 sf Storage= 27,836 cf

Plug-Flow detention time= 328.8 min calculated for 0.322 af (40% of inflow)
Center-of-Mass det. time= 196.1 min (980.1 - 784.0)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	2,102 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	99.75'	2,249 cf	**Cell #1 (Irregular)** Listed below (Recalc)
#3	99.75'	2,869 cf	**Cell #2 (Irregular)** Listed below (Recalc)
#4	102.00'	20,553 cf	**Open Water Storage (Irregular)** Listed below (Recalc)
#5	99.42'	63 cf	**4.00'D x 4.98'H 4' Outlet Structure B**
		27,836 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
100.00	522	208.5	0	0	522
101.00	1,055	227.7	773	773	1,223
102.00	1,624	237.8	1,329	2,102	1,664

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.75	674	112.5	0	0	674
100.00	750	117.4	178	178	768
101.00	1,029	134.1	886	1,064	1,125
102.00	1,348	151.6	1,185	2,249	1,548

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.75	834	129.0	0	0	834
100.00	925	135.5	220	220	975
101.00	1,314	155.9	1,114	1,334	1,470
102.00	1,769	179.3	1,536	2,869	2,116

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.00	5,013	293.5	0	0	5,013
103.00	5,926	314.1	5,463	5,463	6,054
104.00	7,456	594.6	6,676	12,140	26,343
105.00	9,409	665.0	8,414	20,553	33,428

Device	Routing	Invert	Outlet Devices
#1	Primary	99.42'	**6.0" Round 6" HDPE N-12** L= 25.0' Ke= 0.500 Inlet / Outlet Invert= 99.42' / 99.25' S= 0.0068 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Secondary	99.42'	**12.0" Round 12" HDPE N-12** L= 17.0' Ke= 0.500 Inlet / Outlet Invert= 99.42' / 99.25' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#3	Tertiary	104.50'	**15.0' long x 8.0' breadth 15' Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#4	Device 1	99.42'	**1.0" Vert. 1" Orifice** C= 0.600
#5	Device 2	103.85'	**3.0" Vert. 3" Orifice** C= 0.600
#6	Device 2	104.40'	**48.0" Horiz. 48" Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.06 cfs @ 12.89 hrs HW=104.42' TW=99.49' (Dynamic Tailwater)
↑—**1=6" HDPE N-12** (Passes 0.06 cfs of 1.91 cfs potential flow)
  ↑—**4=1" Orifice** (Orifice Controls 0.06 cfs @ 10.69 fps)

Secondary OutFlow Max=0.75 cfs @ 13.27 hrs HW=104.46' TW=99.69' (Dynamic Tailwater)
↑—**2=12" HDPE N-12** (Passes 0.75 cfs of 8.06 cfs potential flow)
  ↑—**5=3" Orifice** (Orifice Controls 0.16 cfs @ 3.35 fps)
  —**6=48" Grate** (Weir Controls 0.59 cfs @ 0.79 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=99.42' TW=104.00' (Dynamic Tailwater)
↑—**3=15' Emergency Spillway** (Controls 0.00 cfs)

GRAVEL WETLAND DESIGN CRITERIA
(Env-Wq 1508.05)

Type/Node Name: **Gravel Wetland #102 (Pond 102P)**

Enter the node name in the drainage analysis if applicable.

2.49	ac	A = Area draining to the practice	
1.01	ac	A_I = Impervious area draining to the practice	
0.41	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.42	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
1.04	ac-in	WQV= 1" x Rv x A	
3,761	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
376	cf	10% x WQV (check calc for sediment forebay)	
1,692	cf	45% x WQV (check calc for gravel wetland treatment bay volume)	
1,286	cf	V_{SED} = Sediment forebay volume	**≥ 10%WQV**
2,901	cf	V_{TB1} = Volume of treatment bay 1 [1]	**≥ 45%WQV**
3,799	cf	V_{TB2} = Volume of treatment bay 2 [1]	**≥ 45%WQV**
0.09	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec) [2]	
71.11	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.08	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{avg}$**
26.12	hours	T_{ED} = Drawdown time of extended detention = 2WQV/Q_{WQV}	**≥ 24-hrs**
2.50	:1	Pond side slopes	**≥ 3:1**
68.00	ft	Elevation of SHWT	
66.00	ft	SHWT - 2 feet	
73.50	ft	Epp = Elevation of the permanent pool (elevation of lowest orifice) [3]	**≤ E_{SHWT} - 2 ft**
21.5, 30.7	ft	Length of the flow path between the inlet and outlet in each cell	**≥ 15 ft**
Angle	Grate	What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of ≤6")?	
75.31	ft	Peak elevation of the 50-year storm event (E_{50})	
76.00	ft	Berm elevation of the pond	
YES		E_{50} ≤ the berm elevation?	**← yes**

Qualified professional that developed the planting plan
Name, Profession:

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

2. To ensure orifice is sized so that WQV is released at a relatively stable rate.

3. 4" to 8" below the wetland soil. If lowest orifice is higher than (SHWT - 2 feet), and saturated hydraulic conductivity (Ksat) is greater than 0.015 in/hr, the system must be lined.

Designer's Notes:

Ksat Buxton = 0

Stage-Area-Storage for Pond 102P: SGW #102

Elevation (feet)	Storage (cubic-feet)
69.67	0
69.77	3
69.87	5
69.97	8
70.07	182
70.17	446
70.27	729
70.37	1,033
70.47	1,359
70.57	1,705
70.67	2,063
70.77	2,432
70.87	2,815
70.97	3,209
71.07	3,616
71.17	4,036
71.27	4,469
71.37	4,915
71.47	5,375
71.57	5,849
71.67	6,336
71.77	6,837
71.87	7,353
71.97	7,883
72.07	8,450
72.17	9,037
72.27	9,633
72.37	10,238
72.47	10,853
72.57	11,477
72.67	12,110
72.77	12,753
72.87	13,406
72.97	14,068
73.07	14,740
73.17	15,421
73.27	16,112
73.37	16,813
73.47	17,523
73.57	18,243
73.67	18,973
73.77	19,713
73.87	20,463
73.97	21,223
74.07	21,992
74.17	22,772
74.27	23,562
74.37	24,362
74.47	25,172
74.57	25,992
74.67	26,822
74.77	27,663
74.87	28,514
74.97	29,375
75.07	30,247
75.17	31,129
75.27	32,022
75.37	32,925
75.47	33,837
75.57	34,758
75.67	35,690
75.77	36,633
75.87	37,587
75.97	**38,551**

WQV Elev.: 71.11

WQV = 3,761
71.11 = 3,783

Stage-Discharge for Pond 102P: SGW #102

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Tertiary (cfs)	
69.67	0.00	0.00	0.00	0.00	
69.87	0.03	0.01	0.01	0.00	
70.07	0.04	0.02	0.02	0.00	
70.27	0.05	0.03	0.02	0.00	
70.47	0.06	0.03	0.02	0.00	
70.67	0.06	0.04	0.03	0.00	
70.87	0.07	0.04	0.03	0.00	
71.07	0.07	0.04	0.03	0.00	71.11 = 0.08
71.27	0.08	0.05	0.03	0.00	
71.47	0.08	0.05	0.03	0.00	
71.67	0.09	0.05	0.04	0.00	
71.87	0.09	0.06	0.04	0.00	
72.07	0.10	0.06	0.04	0.00	
72.27	0.10	0.06	0.04	0.00	
72.47	0.11	0.06	0.04	0.00	
72.67	0.11	0.06	0.05	0.00	
72.87	0.11	0.07	0.05	0.00	
73.07	0.12	0.07	0.05	0.00	
73.27	0.12	0.07	0.05	0.00	
73.47	0.12	0.07	0.05	0.00	
73.67	0.18	0.13	0.05	0.00	
73.87	0.25	0.19	0.05	0.00	
74.07	0.32	0.25	0.07	0.00	
74.27	0.59	0.40	0.19	0.00	
74.47	0.82	0.53	0.29	0.00	
74.67	0.98	0.62	0.36	0.00	
74.87	1.11	0.70	0.41	0.00	
75.07	1.23	0.77	0.46	0.00	
75.27	1.34	0.83	0.50	0.00	
75.47	2.96	1.65	1.30	0.00	
75.67	14.83	6.71	6.34	1.77	
75.87	**33.90**	**14.24**	**13.85**	**5.81**	

Summary for Pond 102P: SGW #102

[80] Warning: Exceeded Pond C25P by 0.22' @ 12.10 hrs (2.76 cfs 0.101 af)

Inflow Area = 2.488 ac, 40.73% Impervious, Inflow Depth > 6.16" for 50 Yr.-24 Hr. event
Inflow = 15.51 cfs @ 12.11 hrs, Volume= 1.277 af
Outflow = 1.36 cfs @ 13.23 hrs, Volume= 0.790 af, Atten= 91%, Lag= 67.3 min
Primary = 0.84 cfs @ 13.23 hrs, Volume= 0.518 af
Secondary = 0.51 cfs @ 13.23 hrs, Volume= 0.273 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 75.31' @ 13.23 hrs Surf.Area= 14,409 sf Storage= 32,348 cf
Flood Elev= 76.00' Surf.Area= 15,149 sf Storage= 38,843 cf

Plug-Flow detention time= 268.1 min calculated for 0.788 af (62% of inflow)
Center-of-Mass det. time= 166.5 min (959.9 - 793.3)

Volume	Invert	Avail.Storage	Storage Description
#1	69.67'	72 cf	**4.00'D x 5.73'H 4' Outlet Structure B**
#2	69.67'	72 cf	**4.00'D x 5.73'H 4' Outlet Structure D**
#3	70.00'	1,286 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#4	70.00'	2,901 cf	**Cell #1 (Irregular)** Listed below (Recalc)
#5	70.00'	3,799 cf	**Cell #2 (Irregular)** Listed below (Recalc)
#6	72.00'	30,713 cf	**Open Water Storage (Irregular)** Listed below (Recalc)
		38,843 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
70.00	377	91.8	0	0	377
71.00	632	116.4	499	499	798
72.00	953	142.2	787	1,286	1,344

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
70.00	1,068	138.0	0	0	1,068
71.00	1,443	158.3	1,251	1,251	1,569
72.00	1,867	178.1	1,650	2,901	2,125

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
70.00	944	120.9	0	0	944
70.50	1,667	220.3	644	644	3,644
71.00	1,946	228.3	902	1,547	3,951
72.00	2,573	248.8	2,252	3,799	4,765

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
72.00	5,734	368.0	0	0	5,734
73.00	6,675	384.0	6,199	6,199	6,763
74.00	7,654	399.7	7,159	13,357	7,817
75.00	8,673	415.4	8,158	21,516	8,914
76.00	9,731	431.1	9,197	30,713	10,053

Device	Routing	Invert	Outlet Devices
#1	Primary	69.67'	**6.0" Round 6" HDPE N-12 (OS A)** L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.67' / 65.00' S= 0.0549 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Secondary	69.67'	**6.0" Round 6" HDPE N-12 (OS C)** L= 107.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.67' / 69.00' S= 0.0063 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#3	Primary	67.50'	**15.0" Round 15" HDPE N-12 (OS B)** L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 67.50' / 65.00' S= 0.0714 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#4	Secondary	69.67'	**15.0" Round 15" HDPE N-12 (OS D)** L= 67.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.67' / 69.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#5	Device 1	69.67'	**1.2" Vert. 1.25" Orifice (OS A)** C= 0.600
#6	Device 2	69.67'	**1.0" Vert. 1.0" Orifice (OS C)** C= 0.600
#7	Device 3	73.50'	**3.0" Vert. 3" Orifice (OS B)** C= 0.600
#8	Device 3	74.00'	**4.0" Vert. 4" Orifice (OS B)** C= 0.600
#9	Device 4	74.00'	**4.0" Vert. 4" Orifice (OS D)** C= 0.600
#10	Device 3	75.40'	**48.0" Horiz. 48" Grate (OS B)** C= 0.600 Limited to weir flow at low heads
#11	Device 4	75.40'	**48.0" Horiz. 48" Grate (OS D)** C= 0.600 Limited to weir flow at low heads
#12	Tertiary	75.50'	**10.0' long x 11.0' breadth 10' Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.53 2.59 2.70 2.68 2.67 2.68 2.66 2.64

Primary OutFlow Max=0.84 cfs @ 13.23 hrs HW=75.31' TW=64.11' (Dynamic Tailwater)
- **1=6" HDPE N-12 (OS A)** (Passes 0.09 cfs of 1.84 cfs potential flow)
  - **5=1.25" Orifice (OS A)** (Orifice Controls 0.09 cfs @ 11.38 fps)
- **3=15" HDPE N-12 (OS B)** (Passes 0.76 cfs of 15.83 cfs potential flow)
  - **7=3" Orifice (OS B)** (Orifice Controls 0.31 cfs @ 6.24 fps)
  - **8=4" Orifice (OS B)** (Orifice Controls 0.45 cfs @ 5.14 fps)
  - **10=48" Grate (OS B)** (Controls 0.00 cfs)

Secondary OutFlow Max=0.51 cfs @ 13.23 hrs HW=75.31' TW=69.08' (Dynamic Tailwater)
- **2=6" HDPE N-12 (OS C)** (Passes 0.06 cfs of 1.29 cfs potential flow)
  - **6=1.0" Orifice (OS C)** (Orifice Controls 0.06 cfs @ 11.39 fps)
- **4=15" HDPE N-12 (OS D)** (Passes 0.45 cfs of 13.16 cfs potential flow)
  - **9=4" Orifice (OS D)** (Orifice Controls 0.45 cfs @ 5.14 fps)
  - **11=48" Grate (OS D)** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=69.67' TW=73.50' (Dynamic Tailwater)
- **12=10' Emergency Spillway** (Controls 0.00 cfs)

GRAVEL WETLAND DESIGN CRITERIA
(Env-Wq 1508.05)

Type/Node Name: **Gravel Wetland #103 (Pond 103P)**

Enter the node name in the drainage analysis if applicable.

1.62	ac	A = Area draining to the practice	
1.01	ac	A_I = Impervious area draining to the practice	
0.62	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.61	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.99	ac-in	WQV= 1" x Rv x A	
3,607	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
361	cf	10% x WQV (check calc for sediment forebay)	
1,623	cf	45% x WQV (check calc for gravel wetland treatment bay volume)	
772	cf	V_{SED} = Sediment forebay volume	**≥ 10%WQV**
3,004	cf	V_{TB1} = Volume of treatment bay 1 [1]	**≥ 45%WQV**
2,528	cf	V_{TB2} = Volume of treatment bay 2 [1]	**≥ 45%WQV**
0.08	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec) [2]	
95.29	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.07	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{avg}$**
28.63	hours	T_{ED} = Drawdown time of extended detention = 2WQV/Q_{WQV}	**≥ 24-hrs**
3.00	:1	Pond side slopes	**≥ 3:1**
95.25	ft	Elevation of SHWT	
93.25	ft	SHWT - 2 feet	
96.25	ft	Epp = Elevation of the permanent pool (elevation of lowest orifice) [3]	**≤ E_{SHWT} - 2 ft**
15, 22.2	ft	Length of the flow path between the inlet and outlet in each cell	**≥ 15 ft**
Angle	Grate	What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of ≤6")?	
98.52	ft	Peak elevation of the 50-year storm event (E_{50})	
99.50	ft	Berm elevation of the pond	
YES		E_{50} ≤ the berm elevation?	**← yes**

Qualified professional that developed the planting plan
Name, Profession:

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

2. To ensure orifice is sized so that WQV is released at a relatively stable rate.

3. 4" to 8" below the wetland soil. If lowest orifice is higher than (SHWT - 2 feet), and saturated hydraulic conductivity (Ksat) is greater than 0.015 in/hr, the system must be lined.

Designer's Notes:

K Sat Buxton = 0

Stage-Area-Storage for Pond 103P: SGW #103

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
93.67	0	95.75	5,337	97.83	16,104
93.71	1	95.79	5,497	97.87	16,347
93.75	2	95.83	5,657	97.91	16,592
93.79	3	95.87	5,820	97.95	16,838
93.83	4	95.91	5,985	97.99	17,086
93.87	5	95.95	6,151	98.03	17,335
93.91	6	95.99	6,320	98.07	17,585
93.95	7	96.03	6,501	98.11	17,837
93.99	8	96.07	6,686	98.15	18,090
94.03	75	96.11	6,873	98.19	18,345
94.07	165	96.15	7,061	98.23	18,601
94.11	256	96.19	7,250	98.27	18,858
94.15	349	96.23	7,441	98.31	19,117
94.19	444	96.27	7,633	98.35	19,378
94.23	539	96.31	7,826	98.39	19,639
94.27	636	96.35	8,020	98.43	19,903
94.31	735	96.39	8,215	98.47	20,168
94.35	835	96.43	8,412	98.51	20,434
94.39	936	96.47	8,610	98.55	20,701
94.43	1,039	96.51	8,809	98.59	20,971
94.47	1,144	96.55	9,010	98.63	21,241
94.51	1,250	96.59	9,211	98.67	21,513
94.55	1,357	96.63	9,414	98.71	21,787
94.59	1,467	96.67	9,618	98.75	22,062
94.63	1,577	96.71	9,824	98.79	22,339
94.67	1,689	96.75	10,031	98.83	22,617
94.71	1,803	96.79	10,239	98.87	22,897
94.75	1,918	96.83	10,448	98.91	23,178
94.79	2,035	96.87	10,659	98.95	23,460
94.83	2,154	96.91	10,871	98.99	23,744
94.87	2,274	96.95	11,084	99.03	24,029
94.91	2,396	96.99	11,298	99.07	24,315
94.95	2,519	97.03	11,514	99.11	24,603
94.99	2,644	97.07	11,731	99.15	24,892
95.03	2,771	97.11	11,950	99.19	25,182
95.07	2,899	97.15	12,169	99.23	25,474
95.11	3,029	97.19	12,390	99.27	25,768
95.15	3,161	97.23	12,612	99.31	26,063
95.19	3,294	97.27	12,836	99.35	26,359
95.23	3,429	97.31	13,061	99.39	26,657
95.27	3,565	97.35	13,287	99.43	26,956
95.31	3,703	97.39	13,514	99.47	**27,257**
95.35	3,843	97.43	13,743		
95.39	3,985	97.47	13,973		
95.43	4,128	97.51	14,205		
95.47	4,273	97.55	14,437		
95.51	4,420	97.59	14,671		
95.55	4,568	97.63	14,907		
95.59	4,719	97.67	15,144		
95.63	4,871	97.71	15,382		
95.67	5,024	97.75	15,621		
95.71	5,180	97.79	15,862		

WQV Elev.: 95.29

WQV = 3,607
95.29 = 3,634

Stage-Discharge for Pond 103P: SGW #103

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Tertiary (cfs)	
93.67	0.00	0.00	0.00	0.00	
93.87	0.02	0.02	0.00	0.00	
94.07	0.03	0.03	0.00	0.00	
94.27	0.04	0.04	0.00	0.00	
94.47	0.05	0.05	0.00	0.00	
94.67	0.06	0.06	0.00	0.00	
94.87	0.06	0.06	0.00	0.00	
95.07	0.07	0.07	0.00	0.00	
95.27	0.07	0.07	0.00	0.00	95.29 = 0.07
95.47	0.08	0.08	0.00	0.00	
95.67	0.08	0.08	0.00	0.00	
95.87	0.09	0.09	0.00	0.00	
96.07	0.09	0.09	0.00	0.00	
96.27	0.10	0.09	0.00	0.00	
96.47	0.23	0.10	0.13	0.00	
96.67	0.55	0.10	0.39	0.06	
96.87	0.87	0.10	0.58	0.19	
97.07	1.09	0.11	0.71	0.27	
97.27	1.27	0.11	0.83	0.33	
97.47	1.42	0.11	0.93	0.38	
97.67	1.56	0.12	1.02	0.42	
97.87	1.69	0.12	1.11	0.46	
98.07	1.81	0.12	1.18	0.50	
98.27	1.92	0.13	1.26	0.53	
98.47	2.02	0.13	1.33	0.56	
98.67	2.12	0.13	1.39	0.59	
98.87	2.21	0.13	1.46	0.62	
99.07	3.83	0.14	2.28	1.41	
99.27	13.92	0.14	7.34	6.44	
99.47	**27.03**	**0.14**	**13.44**	**13.44**	

Summary for Pond 103P: SGW #103

Inflow Area = 1.623 ac, 62.50% Impervious, Inflow Depth > 6.88" for 50 Yr.-24 Hr. event
Inflow = 11.65 cfs @ 12.10 hrs, Volume= 0.931 af
Outflow = 2.04 cfs @ 12.56 hrs, Volume= 0.745 af, Atten= 82%, Lag= 27.9 min
Primary = 0.13 cfs @ 12.56 hrs, Volume= 0.143 af
Secondary = 1.34 cfs @ 12.56 hrs, Volume= 0.452 af
Tertiary = 0.57 cfs @ 12.56 hrs, Volume= 0.149 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 98.52' @ 12.56 hrs Surf.Area= 10,902 sf Storage= 20,494 cf
Flood Elev= 99.50' Surf.Area= 11,809 sf Storage= 27,483 cf

Plug-Flow detention time= 183.3 min calculated for 0.745 af (80% of inflow)
Center-of-Mass det. time= 107.5 min (881.6 - 774.2)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	772 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#2	94.00'	3,004 cf	**Cell #1 (Irregular)** Listed below (Recalc)
#3	94.00'	2,528 cf	**Cell #2 (Irregular)** Listed below (Recalc)
#4	96.00'	21,046 cf	**Open Water Storage (Irregular)** Listed below (Recalc)
#5	93.67'	67 cf	**4.00'D x 5.33'H 4' Outlet Structure B**
#6	93.67'	67 cf	**4.00'D x 5.33'H 4' Outlet Structure C**
		27,483 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
94.00	199	78.4	0	0	199
95.00	382	89.0	286	286	363
96.00	599	102.1	486	772	584

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
94.00	1,087	154.4	0	0	1,087
95.00	1,494	176.4	1,285	1,285	1,689
96.00	1,953	196.7	1,718	3,004	2,320

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
94.00	897	120.0	0	0	897
95.00	1,256	142.3	1,071	1,071	1,381
96.00	1,667	161.7	1,457	2,528	1,874

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
96.00	4,578	263.5	0	0	4,578
97.00	5,362	279.3	4,965	4,965	5,312
98.00	6,189	296.3	5,771	10,735	6,143
99.00	7,107	314.6	6,643	17,378	7,083
99.50	7,565	323.1	3,667	21,046	7,543

Device	Routing	Invert	Outlet Devices
#1	Primary	93.67'	**6.0" Round 6" HDPE N-12 (OS A)** L= 45.3' Ke= 0.500 Inlet / Outlet Invert= 93.67' / 93.35' S= 0.0071 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Secondary	93.67'	**15.0" Round 15" HDPE N-12 (OS B)** L= 25.5' Ke= 0.500 Inlet / Outlet Invert= 93.67' / 93.35' S= 0.0125 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#3	Tertiary	93.67'	**15.0" Round 15" HDPE N-12 (OS C)** L= 5.0' Ke= 0.500 Inlet / Outlet Invert= 93.67' / 93.35' S= 0.0640 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#4	Device 1	93.67'	**1.5" Vert. 1.5" Orifice (OS A)** C= 0.600
#5	Device 2	96.25'	**6.0" Vert. 6" Orifice (OS B)** C= 0.600
#6	Device 3	96.50'	**4.0" Vert. 4" Orifice (OS C)** C= 0.600
#7	Device 2	99.00'	**48.0" Horiz. 48" Grate B** C= 0.600 Limited to weir flow at low heads
#8	Device 3	99.00'	**48.0" Horiz. 48" Grate C** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.13 cfs @ 12.56 hrs HW=98.52' TW=93.96' (Dynamic Tailwater)
└─**1=6" HDPE N-12 (OS A)** (Passes 0.13 cfs of 1.58 cfs potential flow)
  └─**4=1.5" Orifice (OS A)** (Orifice Controls 0.13 cfs @ 10.28 fps)

Secondary OutFlow Max=1.34 cfs @ 12.56 hrs HW=98.52' TW=93.96' (Dynamic Tailwater)
└─**2=15" HDPE N-12 (OS B)** (Passes 1.34 cfs of 12.14 cfs potential flow)
  ├─**5=6" Orifice (OS B)** (Orifice Controls 1.34 cfs @ 6.84 fps)
  └─**7=48" Grate B** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.57 cfs @ 12.56 hrs HW=98.52' TW=93.96' (Dynamic Tailwater)
└─**3=15" HDPE N-12 (OS C)** (Passes 0.57 cfs of 12.14 cfs potential flow)
  ├─**6=4" Orifice (OS C)** (Orifice Controls 0.57 cfs @ 6.55 fps)
  └─**8=48" Grate C** (Controls 0.00 cfs)

GROUNDWATER RECHARGE VOLULME (GRV) CALCULATION (Env-Wq 1507.04)

-	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
0.34	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
2.69	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
0.43	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.10	inches	Rd = Weighted groundwater recharge depth	
0.3536	ac-in	GRV = AI * Rd	
1,284	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	

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

Waiver to Groundwater Recharge Volume requested in accordance with Env-Wq 1500 Standards



Map Scale: 1:8,730 if printed on A landscape (11" x 8.5") sheet.

N

0 100 200 400 600 Meters

0 400 800 1600 2400 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil 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 20, May 29, 2020

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
AdC	Acton very stony fine sandy loam, 8 to 15 percent slopes	6.4	2.0%
Be	Biddeford silty clay loam	1.2	0.4%
BzB	Buxton silt loam, 3 to 8 percent slopes	111.5	34.3%
CfB	Charlton fine sandy loam, 3 to 8 percent slopes	23.7	7.3%
HcB	Hollis-Charlton fine sandy loams, 3 to 8 percent slopes	65.7	20.2%
HcC	Hollis-Charlton fine sandy loams, 8 to 15 percent slopes	3.9	1.2%
HdC	Hollis-Charlton very rocky fine sandy loams, 8 to 15 percent slopes	1.2	0.4%
Ml	Mixed alluvial land, wet	6.6	2.0%
Sb	Saugatuck loamy sand	3.6	1.1%
ScA	Scantic silt loam, 0 to 3 percent slopes	12.0	3.7%
ScB	Scantic silt loam, 3 to 8 percent slopes	7.4	2.3%
SfC	Suffield silt loam, 8 to 15 percent slopes	33.1	10.2%
SfE	Suffield silt loam, 15 to 35 percent slopes	18.3	5.6%
SnB	Sutton fine sandy loam, 3 to 8 percent slopes	0.3	0.1%
W	Water	23.3	7.2%
WdB	Windsor loamy sand, 3 to 8 percent slopes	4.8	1.5%
WfB	Windsor loamy fine sand, clay subsoil variant, 0 to 8 percent slopes	1.8	0.5%
Totals for Area of Interest		**324.6**	**100.0%**

John P. Hayes III CSS, CWS,
7 Limestone Way
North Hampton, NH 03862
603-205-4396
johnphayes@comcast.net

4/4/21

Christopher Berry
Berry Surveying and Engineering
335 Second Crown Point Road
Barrington NH 03825

Job # 20-029

3/30/21 - 4/1/21
Site Specific Soil Survey
Map E Lot 65-1 & 65-A
Tolend Road Dover NH

Dear Chris,

This letter report presents the findings of a Site Specific Soil Survey conducted on the referenced properties by John P. Hayes III on March 30 to April 3, 2021. The soil survey was conducted in accordance with the New Hampshire Supplement of the Site-Specific Soil Mapping Standard For New Hampshire and Vermont, Version 5.0, December 2017, Special Publication # 3, published by the Society of Soil Scientist of Northern New England.

The properties that are subject of the soil survey is located north of Tolend road, and East of Route 16, in Dover NH. The mapped area of the pacels is approximately 31.7 and 12.7 acres in size. The plans used for these soil maps are a 50 scale plan, where 1 inch equals 50 feet, with one foot contours.

The purpose of the soil survey is to provide the client with soils information for urban and suburban or rural land planning. Soil characteristics on the property were evaluated through observation of numerous test pits, and hand auger probes conducted throughout the property. Slope phases were determined with the use of the topography provided on the plan. The Site-specific Soil Map Units identified are taken from the New Hampshire State-Wide Numerical Soils Legend, Issue #10 January 2011, and are briefly described below. Official Series Descriptions (OSD) for each of these soil series are enclosed with this report. The soil map units comply with the Range In Characteristics described in the OSD. Any limiting enclusions on the site, do not exceed 15 percent of any of the soil map units. Dissimilar inclusions, if any, are noted above. Limits of the Site Specific mapping units are highlighted on the plan. The Hydrological Soil Groups for each of the soil series was determined using SSSNNE Publication No. 5 Ksat Values for New Hampshire Soils September 2009. Limits of the Site Specific mapping units are highlighted on the plan.

Portions of the soil map with the map unit denominator P and VP, contain poorly, and very poorly drained soils respectively. Portions of the soil map with the map unit and denominator Hd/Rk, identify the Hollis-Charlton soil complex. They are soils that have the potential to have areas of a bedrock substratum within 40 inches of the soil surface. Portions of the soil map with the map unit 500, contain disturbed soils that have been excavated and/or regraded, that are loamy in texture, underlain with a layer gravelly, loamy sand. A Disturbed Soil Mapping Unit Supplement for New Hampshire DES AoT Site Specific Soil Maps, is also included. This supplement explains the additional information given about each of the disturbed soil map units that are present on the site.

MAP UNIT #	SOIL TAXANOMIC NAME	SLOPES	HYDROLOGIC SOIL GROUP	DESCRIPTION
Be VP (State No. 234)	**Biddeford**	**B**	**D**	The Biddeford series consists of very deep, very poorly drained soils formed in glaciolacustrine or glaciomarine deposits. These soils were found in a wetland area on the southwest portion of the mapped area of the parcel. These soils are deep to bedrock. The saturated hydralic conductivity is high to moderately high in the organic layer and moderately low to low in the substratum. Estimated seasonal high water tables is at the surface of the soilBZ
Bz (State No. 32)	**Buxton**	**A B C D E**	**C**	The Buxton series consists of very deep, moderately well to somewhat poorly drained soils formed in clayey marine sediments. These soils are found throught the site in the low areas as well as on the slopes and tops of the hills. These soils are deep to bedrock. The saturated hydralic conductivity is moderately high in the upper portion of the soil profile, and moderately low in the firm substratum. Some inclusions of well drained Suffield soil may be present, but are less than 10 percent of the mapped areas. Estimated seasonal high water tables in these soils range from 15 to 30 inches.
Cs (State No. 63)	**Charlton (very stony)**	**B C D E**	**B**	The Charlton series consists of very deep, well drained soils formed in loamy melt-out till. These soils are found on the southern portion of the parcel. These soils are deep to bedrock. Saturated hydraulic conductivity is moderately high or high. Some inclusions of Hollis and Buxton soils may be present but are less than 10 percent of the mapped areas. Estimated seasonal high water tables in these soils range from 36 to 50 inches.

MAP UNIT #	SOIL TAXANOMIC NAME	SLOPES	HYDROLOGIC SOIL GROUP	DESCRIPTION
Hd (State No. 175)	**Hollis-Charlton Complex (very rocky)**	**A B C D E**	**B /D**	The Hollis Charlton Soil Complex consists of Charlton soils which are very deep, well drained soils formed in loamy melt-out till, And Hollis soils which are well drained and somewhat excessively drained soils formed in a thin mantle of till, and have bedrock within 20 inches of the soil surface. This soil comples is fount in the center portion of the parcel on both the north and south ends of the lot. Saturated hydraulic conductivity is moderately high or high. The approximate percentages of each soil series in this complex are Hollis 70% and Charlton 30%. Estimated seasonal high water tables range from none in the Hollis component of the complex, to 35 to 50 inches in the Charlton component.
Ml	**Mixed Alluvial Land (loamy sandy, moderately well drained)**	**B C D E**	**A**	Mixed Alluvial Land Wet coinsists of varioius kinds of soil materials on the bottom land of streams and rivers. The soil textures are loamy or sandy.These soils are located on the northeast portion of the property ot the slopes near the river. This land type is moderately well drained and it is frequently flooded. Estimated seasonal high water tables in these soils range from 15 to 35 inches.
MI P	**Mixed Alluvial Land (poorly drained)**	**B C**	**C/D**	Mixed Alluvial Land Wet coinsists of varioius kinds of soil materials on the bottom land of streams and rivers. The soil textures are loamy or sandy. The soil textures are loamy or sandy. These soils are located on the northeast portion of the property, at the toe of the slopes, near the river.These soils are poorly drained and frequently flooded. Estimated seasonal high water tables in these soils is less than 10 inches.
Sc P (State No. 233)	**Scantic**	**A B C D E**	**D**	The Scantic series consists of very deep, poorly drained soils formed in glaciomarine or glaciolacustrine deposits. These soils are found in the wetland areas throughout the parcel. They are are deep to bedrock. Saturated hydraulic conductivity is moderately high or high in the upper portion of the profile, and low or moderately slow in the substratum. Estimated seasonal high water tables in these soils is less than 10 inches.

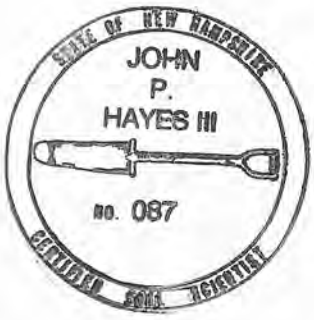
MAP UNIT #	SOIL TAXANOMIC NAME	SLOPES	HYDROLOGIC SOIL GROUP	DESCRIPTION
Sf (State No. 536)	**Suffield**	**A B C D E**	**C**	The Suffield series consists of very deep, well drained soils formed in lacustrine or marine sediments. These soils are located throughout the parcel mostly on the areas with steep slopes. They are are deep to bedrock. Permeability is moderate in the upper portions of the profile, and and slow to very slow in the substratum. Some inclusions of Buxton soils may be present, but are less than 10 percent of the mapped areas. These soils are firm in consistency, with estimated seasonal high water tables ranging from 30 to 50 inches.
500 (dccdb/c)	**Udorthents loamy**	**B/C**	**B/C**	Udorthents are disturbed soils that have been excavated and/or regraded and are loamy in texture. These disturbed soils are located on the southeast portion of the mapped area. These disturbed soils are mostly derrived from the Buxton soil series, and are moderately well drained to somewhat poorly drained. The soils are deep to bedrock. The saturated hydralic conductivity is moderately high in the upper portion of the soil profile, and moderately low in the firm substratum. Estimated seasonal high water tables in these soils range from 15 to 30 inches.

Slope Phases

Alpha Slope Symbol	Range
A	0 – 3%
B	3 – 8%
C	8 – 15%
D	15 – 25%
E	25 – 50%
F	> 50%

I trust that this Soil Survey and report meet your current planning needs. Please do not hesitate to contact me if you have any questions.

Sincerely:



John P. Hayes III CSS, CWS

SITE SPECIFIC SOILS LEGEND

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
BeB	BIDDEFORD	D
BzA	BUXTON	C
BzB	BUXTON	C
BzC	BUXTON	C
BzD	BUXTON	C
BzE	BUXTON	C
CsB	CHARLTON (VERY STONY)	B
CsC	CHARLTON (VERY STONY)	B
CsD	CHARLTON (VERY STONY)	B
CsE	CHARLTON (VERY STONY)	B
HdA/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B/D
HdB/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B/D
HdC/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B/D
HdD/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B/D
HdE/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B/D
MlB/P	MIXED ALLUVIAL LAND (POORLY DRAINED)	C/D
MlC/P	MIXED ALLUVIAL LAND (POORLY DRAINED)	C/D

SLOPE: A = 0–3% B = 3–8% C = 8–15% D = 15–25% E = 25–50% F = 50%+

DENOMINATOR: /Rk = ROCKY /VPD = VERY POORLY DRAINED /PD = POORLY DRAINED /SWPD = SOMEWHAT POORLY DRAINED /MWD = MODERATELY WELL DRAINED

SITE SPECIFIC SOILS LEGEND (CONT'D)

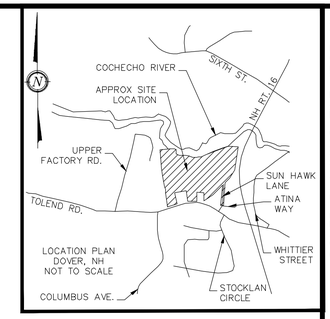
SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
MlB	MIXED ALLUVIAL LAND	A
MlC	MIXED ALLUVIAL LAND	A
MlD	MIXED ALLUVIAL LAND	A
MlE	MIXED ALLUVIAL LAND	A
ScA/P	SCANTIC	D
ScB/P	SCANTIC	D
ScC/P	SCANTIC	D
ScD/P	SCANTIC	D
ScE/P	SCANTIC	D
SfA	SUFFIELD	C
SfB	SUFFIELD	C
SfC	SUFFIELD	C
SfD	SUFFIELD	C
SfE	SUFFIELD	C
500B	UDORTHENTS	C
500C	UDORTHENTS	C
500D	UDORTHENTS	C
500E	UDORTHENTS	C

SLOPE: A = 0–3% B = 3–8% C = 8–15% D = 15–25% E = 25–50% F = 50%+

DENOMINATOR: /Rk = ROCKY /VPD = VERY POORLY DRAINED /PD = POORLY DRAINED /SWPD = SOMEWHAT POORLY DRAINED /MWD = MODERATELY WELL DRAINED

LEGEND:

- IRON BOUND (TBS)
- IRON BOUND (FND)
- DRILL HOLE (FND)
- UTILITY POLE/GUY WIRE
- TEST HOLE
- BENCHMARK
- WETLAND LINE
- 276 EXISTING CONTOUR MINOR
- 275 EXISTING CONTOUR MAJOR
- SOIL LINE
- LIMIT OF SOIL SURVEY
- 448A SOIL SERIES
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. TYPICAL
- FND FOUND



NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) LOT AREA LOT 65–1: 1,388,308 Sq. Ft., 31.87 Ac. +/–
LOT AREA LOT 65–A: 546,643 Sq. Ft., 12.55 Ac. +/–

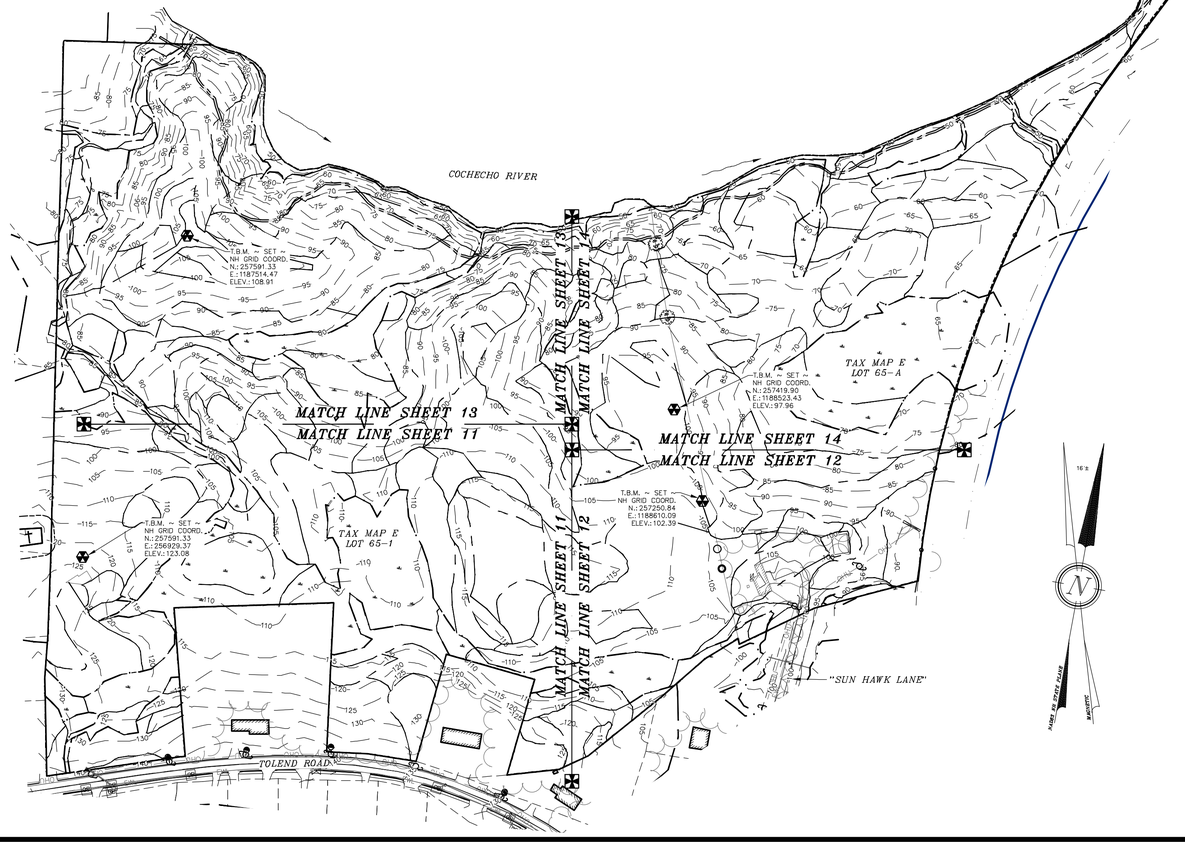
4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

5.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, A PORTION OF THIS PARCEL DOES FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015.

6.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

7.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN WINTER OF 2021, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

8.) THE INTENT OF THIS PLAN IS TO SHOW THE SITE SPECIFIC SOIL SURVEY OF TAX MAP E, LOT 65–1 AND LOT 65–A AS OF THE DATE OF THE SURVEY (WINTER 2021).



WETLAND NOTES:

WETLANDS WERE DELINEATED BY JOHN P. HAYES SPRING 2021 & OCTOBER OF 2022

1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.0. UNITED STATES DEPARTMENT OF AGRICULTURE (2016).
3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).



JOHN P. HAYES III, CWS #18



JOHN P. HAYES III, CSS #87

GRAPHIC SCALE

150 0 78 150 300 600

(IN FEET)
1 inch = 150 ft.

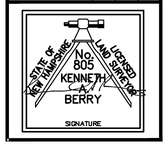
DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

OVERVIEW SITE SPECIFIC SOILS MAP
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

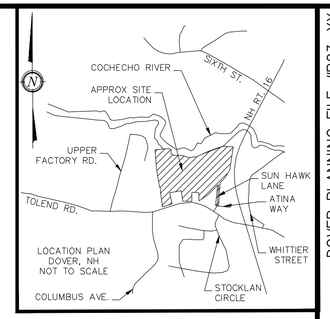
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 150 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031



NOT FOR CONSTRUCTION





NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) LOT AREA LOT 65–1: 1,388,308 Sq. Ft., 31.87 Ac. +/–
LOT AREA LOT 65–A: 546,643 Sq. Ft., 12.55 Ac. +/–

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

5.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, A PORTION OF THIS PARCEL DOES FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015.

6.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

7.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN WINTER OF 2021, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

8.) THE INTENT OF THIS PLAN IS TO SHOW THE SITE SPECIFIC SOIL SURVEY OF TAX MAP E, LOT 65–1 AND LOT 65–A AS OF THE DATE OF THE SURVEY (WINTER 2021).

LEGEND:

- IRON BOUND (TBS)
- IRON BOUND (FND)
- DRILL HOLE (FND)
- UTILITY POLE/GUY WIRE
- TEST HOLE
- BENCHMARK
- WETLAND LINE
- 276 EXISTING CONTOUR MINOR
- 277 EXISTING CONTOUR MAJOR
- SOIL LINE
- LIMIT OF SOIL SURVEY
- LIMIT OF PROJECT DISTURBANCE
- 448A SOIL SERIES
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. TYPICAL
- FND FOUND

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

JOHN P. HAYES III, CWS #18

JOHN P. HAYES III, CSS #87

WETLAND NOTES:

WETLANDS WERE DELINEATED BY JOHN P. HAYES SPRING 2021 & OCTOBER OF 2022.

1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. army CORPS OF ENGINEERS.
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.0. UNITED STATES DEPARTMENT OF AGRICULTURE (2016).
3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

SITE SPECIFIC SOILS MAP – SOUTHWEST
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

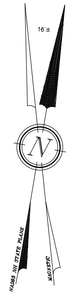
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE No. 805 KENNETH BERRY LICENSED LAND SURVEYOR SIGNATURE

NOT FOR CONSTRUCTION

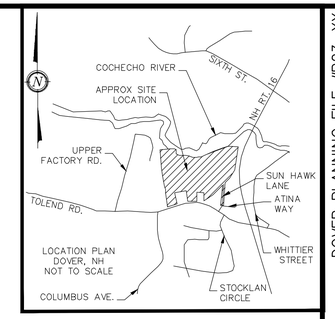




LEGEND:

- IRON BOUND (TBS)
- IRON BOUND (FND)
- DRILL HOLE (FND)
- GRANITE BOUND (TBS)
- UTILITY POLE/GUY WIRE
- TEST HOLE
- BENCHMARK

- WETLAND LINE
- 276 EXISTING CONTOUR MINOR
- 275 EXISTING CONTOUR MAJOR
- SOIL LINE
- LIMIT OF SOIL SURVEY
- LIMIT OF PROJECT DISTURBANCE
- 448A SOIL SERIES
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. TYPICAL
- FND FOUND



NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,388,308 Sq. Ft., 31.87 Ac. +/-
LOT AREA LOT 65-A: 546,643 Sq. Ft., 12.55 Ac. +/-

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3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).



JOHN P. HAYES III, CWS #18



JOHN P. HAYES III, CSS #87

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

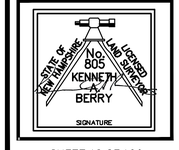
DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

SITE SPECIFIC SOILS MAP - SOUTHEAST
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

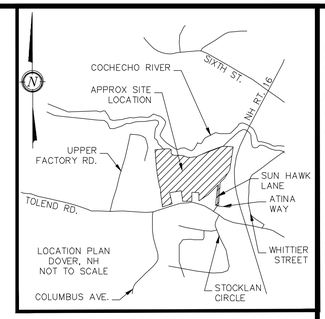
SCALE : 1 IN. EQUALS 50 FT.
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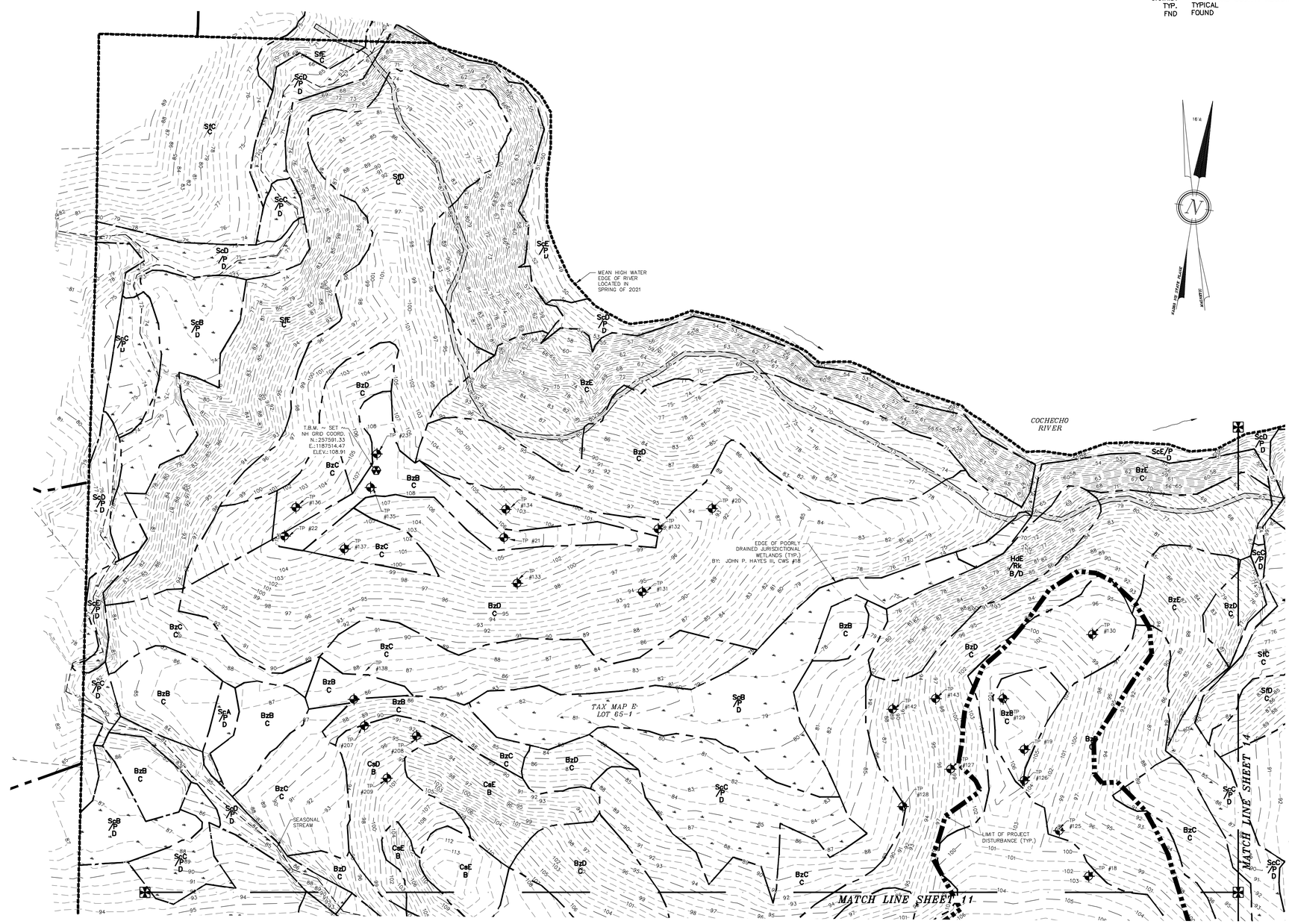


NOT FOR CONSTRUCTION

LEGEND:

●	IRON BOUND (TBS)
○	IRON BOUND (FND)
◉	DRILL HOLE (FND)
⊶	UTILITY POLE/GUY WIRE
⊕	TEST HOLE
♣	BENCHMARK
	WETLAND LINE
276	EXISTING CONTOUR MINOR
275	EXISTING CONTOUR MAJOR
	SOIL LINE
	LIMIT OF SOIL SURVEY
	LIMIT OF PROJECT DISTURBANCE
448A	SOIL SERIES
S.C.R.D.	STRAFFORD COUNTY REGISTRY OF DEEDS
TYP.	TYPICAL
FND	FOUND





NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,388,308 Sq. Ft., 31.87 Ac. +/-
LOT AREA LOT 65-A: 546,643 Sq. Ft., 12.55 Ac. +/-

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3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

STATE OF NEW HAMPSHIRE — JOHN P. HAYES, III — CERTIFIED WETLAND SCIENTIST — WWR 16

JOHN P. HAYES III, CWS #18

STATE OF NEW HAMPSHIRE — JOHN P. HAYES III — 087 — LICENSED LAND SURVEYOR

JOHN P. HAYES III, CSS #87

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

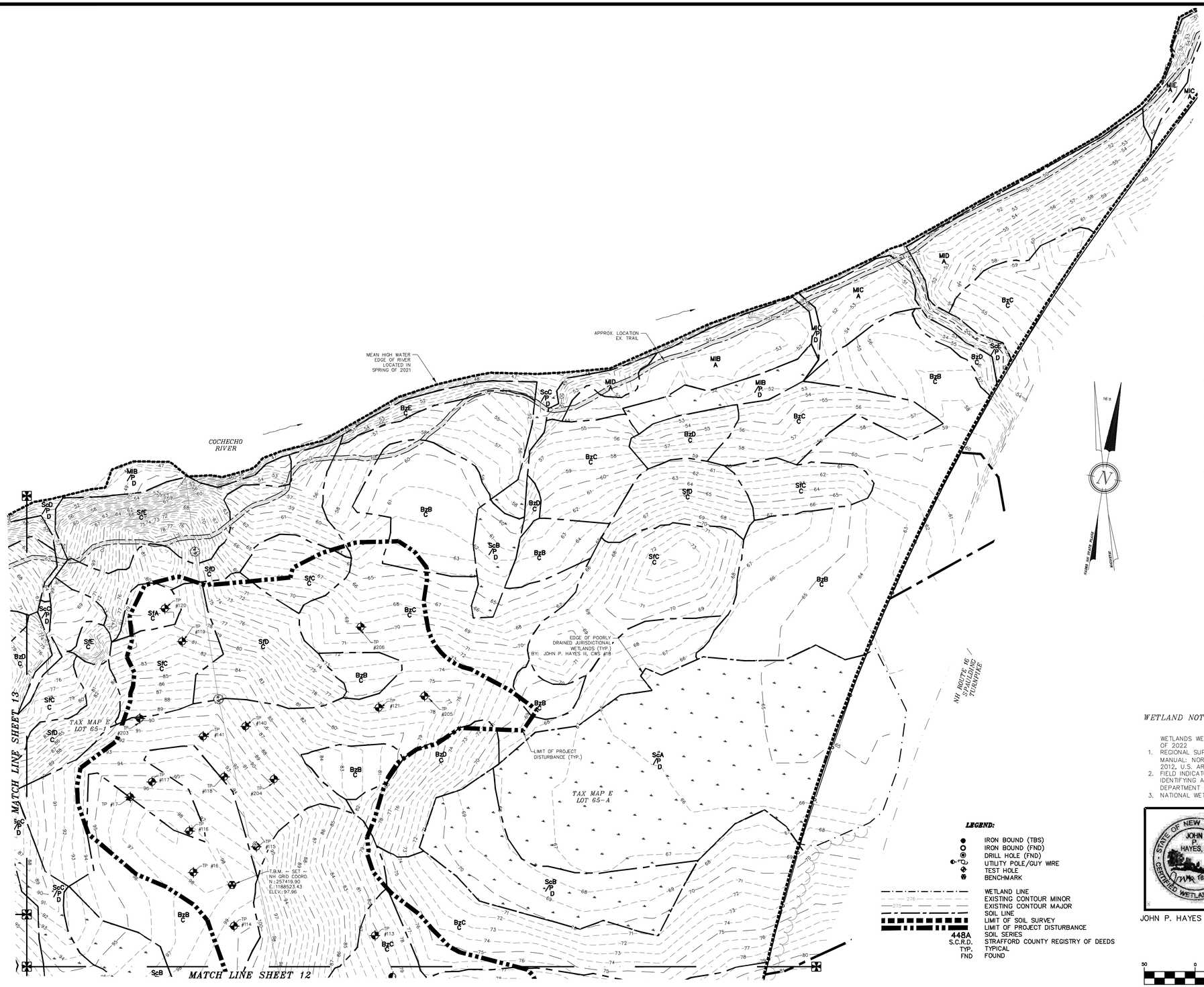
SITE SPECIFIC SOILS MAP - NORTHWEST
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

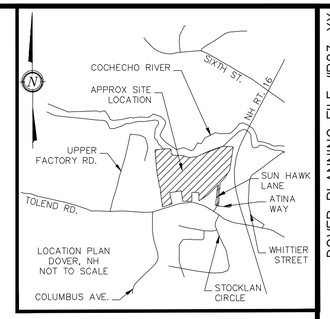
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE — NO. 805 — KENNETH A. BERRY — LICENSED LAND SURVEYOR — SIGNATURE

NOT FOR CONSTRUCTION





NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,388,401 Sq. Ft., 31.87 Ac. +/-
LOT AREA LOT 65-A: 546,549 Sq. Ft., 12.55 Ac. +/-

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

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LEGEND:

- IRON BOUND (TBS)
- IRON BOUND (FND)
- DRILL HOLE (FND)
- UTILITY POLE/GUY WIRE
- TEST HOLE
- BENCHMARK
- WETLAND LINE
- EXISTING CONTOUR MINOR
- EXISTING CONTOUR MAJOR
- SOIL LINE
- LIMIT OF SOIL SURVEY
- LIMIT OF PROJECT DISTURBANCE
- 448A SOIL SERIES
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. TYPICAL
- FND FOUND

JOHN P. HAYES III, CWS #18

JOHN P. HAYES III, CSS #87

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

SITE SPECIFIC SOILS MAP - NORTHEAST
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE No. 805 KENNETH A. BERRY LICENSED LAND SURVEYOR
SIGNATURE

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) THE INTENT OF THIS PLAN IS TO DEMONSTRATE THE DRAINAGE INFRASTRUCTURE THAT REQUIRES PERIODIC INSPECTION AND MAINTENANCE. IT IS TO ACCOMPANY A DOCUMENT ENTITLED "STORMWATER SYSTEM MANAGEMENT: INSPECTION AND MAINTENANCE MANUAL" PUBLISHED BY BERRY SURVEYING & ENGINEERING ON THE SAME DATE.

4.) 11x17" PLANS ARE TWICE THE PUBLISHED SCALE.

MARK IN STATE PLANE

SOUTHING

DRAIN MANHOLE (TYP.)

CATCH BASIN (TYP.)

F. DRAIN CLEANOUT (TYP.)

OUTLET STRUCTURE

OUTLET PROTECTION

F. DRAIN OUTLET

EMERGENCY SPILLWAY

GRAVEL WETLAND #101

OUTLET PROTECTION & LEVEL SPREADER

LIAM DRIVE (PVT.)

AMELIA DRIVE (PVT.)

THEODORE DRIVE (PVT.)

SUN HAWK LANE

TOLEND ROAD

EDGE OF POORLY DRAINED JURISDICTIONAL WETLANDS (TYP.)
BY: JOHN P. HAYES III, CWS #18

WETLAND CROSSING #1

430' RCP (POND 20P)

INSERT A

LEGEND:

- PROPOSED DRAIN MANHOLE W/ STRUCTURE
- PROPOSED CATCH BASIN W/ STRUCTURE
- PROPOSED STORMWATER BMP OUTLET STRUCTURE
- POORLY DRAINED JURISDICTIONAL WETLAND
- 50' WETLAND BUFFER
- CONTOUR MAJOR, EXISTING
- CONTOUR MAJOR, PROPOSED
- EXISTING DRAINAGE LINE
- PROPOSED DRAINAGE LINE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

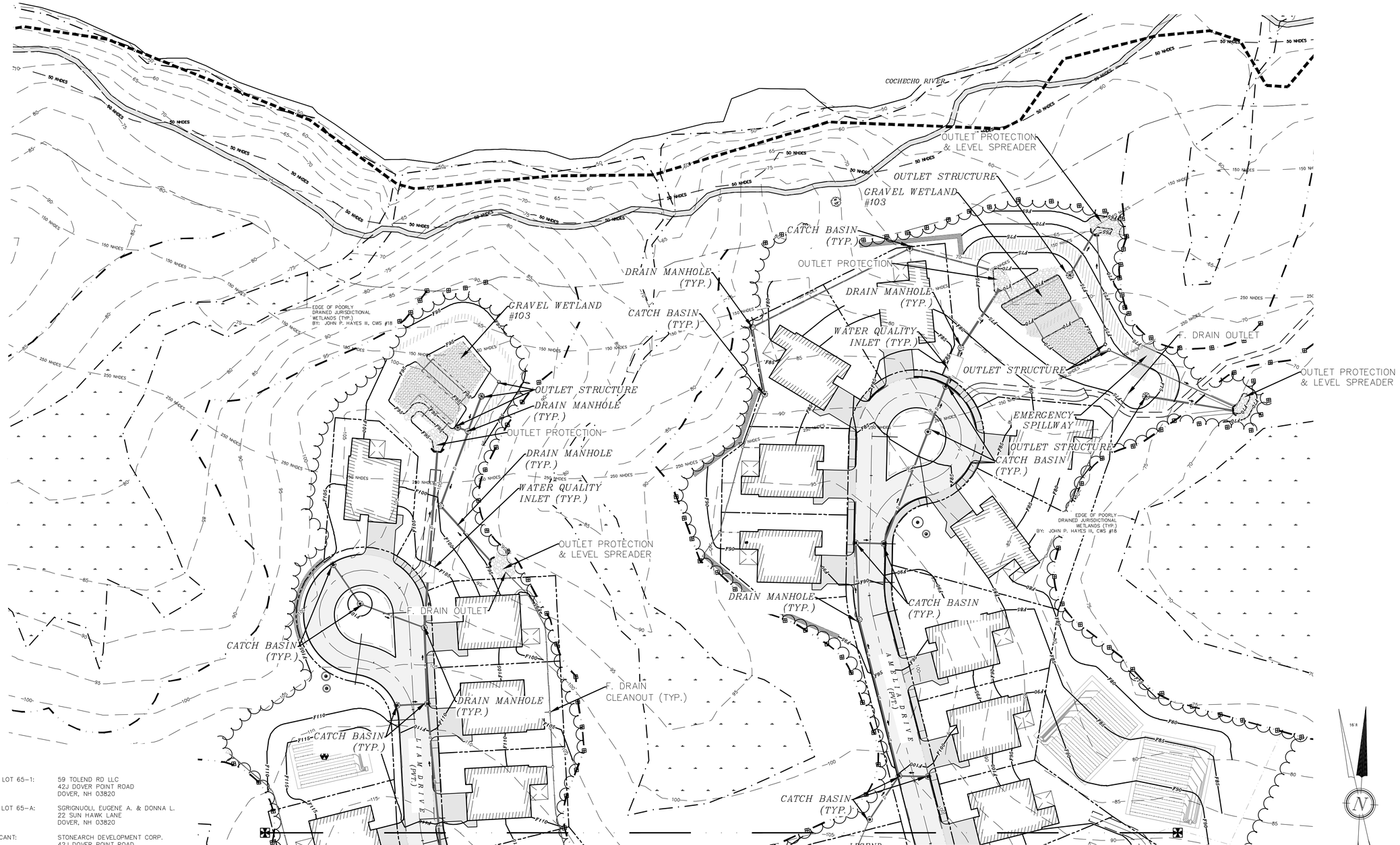
INSPECTION & MAINTENANCE PLAN
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 40 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

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LEGEND:

- PROPOSED DRAIN MANHOLE W/ STRUCTURE
- PROPOSED CATCH BASIN W/ STRUCTURE
- PROPOSED STORMWATER BMP OUTLET STRUCTURE
- POORLY DRAINED JURISDICTIONAL WETLAND
- 50' WETLAND BUFFER
- CONTOUR MAJOR, EXISTING
- CONTOUR MAJOR, PROPOSED
- EXISTING DRAINAGE LINE
- PROPOSED DRAINAGE LINE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM

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LAND OF
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TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
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SCALE : 1 IN. EQUALS 40 FT.
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STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

BERRY SURVEYING & ENGINEERING
335 Second Crown Point Road
Barrington, NH 03825
Phone: (603) 332-2863
Fax: (603) 335-4623
www.BerrySurveying.Com

Stormwater System Management:

Inspection and Maintenance Manual

Prepared for:

StoneArch Development Corp.
42 Dover Point Road, Suite J
Dover, NH 03820

Land of

Tax Map E, Lot 65-1
59 Tolend Road, LLC.

Tax Map E, Lot 65-A
Eugene A. & Donna L. Sgrignuoli

LOCATION:

Rolling Hill Estates
Tax Map E, Lot 65-1
Tax Map E, Lot 65-A
Prepared By

Berry Surveying & Engineering
335 Second Crown Point Road
Barrington, NH 03825
603-332-2863

File Number
DB2023-031

April 27, 2023

Stormwater System Management:

Inspection and Maintenance Manual

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Control of Invasive Species .....Page 9

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Deicing Log Sheet .....Page 15

Owner Certification .....Page 16

Operation & Maintenance Plans	Attached – 1 Page
Control of Invasive Plants, NH Department of Agriculture	Attached – 4 Pages
NHDES Green SnoPro Utilization Chart	Attached – 1 Page
UNHSC Checklist for Inspection of Gravel Wetlands	Attached – 43 Pages

Introduction

The Best Management Practices (BMP) described in this manual are specified in more detail within the plan set giving design details and specifications. The New Hampshire Stormwater Manual, Volume 2, Post-Construction Best Management Practices Selection & Design (December 2008, NHDES & US EPA) is included by reference to this manual. Additional details, construction specifications, and example drawings are provided within this reference. (http://des.nh.gov/organization/divisions/water/stormwater/)

The BMP's are covered below in the general order in which the storm water flows. Each BMP has a description and maintenance consideration listed. A Check List table is proved after the narrative to summarize the maintenance responsibilities and schedule. A Log Form is also provided for the owners use.

For details regarding the design of the Storm Water System see also Drainage Analysis & Erosion and Sediment Control Plan, **April 27, 2023**, as revised. See also plan set completed for **StoneArch Development Corp.**, originally dated **April 27, 2023**, as revised.

Rolling Hill Estates Homeowners' Association (Managing Member) is responsible for the Operation, Inspection, and Maintenance of the Stormwater Management System since the development will consist of 27 single family units. A significant step in this responsibility is the Inspection and Maintenance of each component of the system. Ongoing, semi-annual, and annual inspection and maintenance requirements are documented below and must be followed diligently. Failure of any component of the system can result in surface water run-off ponding and/or freezing in the roadway and parking lots, leaving the developed site untreated, and/or causing violations to issued permits. The owner / developer will be responsible for the drainage infrastructure. The owners will be responsible for the Inspection and Maintenance Plan. (Reduced copies attached.) The responsible party will conduct the inspections, complete the required maintenance, and will maintain the Inspection & Maintenance Check Lists and Logs, and will provide copies with the Annual Report to the Town of Dover, Land Use Department and provided a copy to NHDES AoT by December 15th of each year.

The applicants for Tax Map E, Lots 65-1 & 65-A, StoneArch Development Corp., are proposing a residential development consisting of 27 single family houses and a duplex with 29 units total, and 2,340 linear feet of roadway divided between Theodore Drive, Liam Drive, Amelia Drive, and an emergency access extension of Sun Hawk Lane. The proposed duplex unit (units 28 & 29) is not considered to be a part of the Rolling Hill Estates development or HOA.

The following practices and drainage features will all require periodic inspections and maintenance based on this manual and drainage layout:

Proposed Construction

Culvert Inlet Sumps

Catch Basins & Drainage Pipes

Drain Manholes

Water Quality Inlets

Sediment Forebays for all Treatment Practices

Subsurface Gravel Wetland #101 with Outlet Structure and Spillway

Subsurface Gravel Wetland #102 with Outlet Structure and Spillway

Subsurface Gravel Wetland #103 with Outlet Structure and Spillway

Rip Rap Outlet Protection & Level Spreaders

Catch Basin, and Drain Manholes

Description: Catch Basins are used throughout the site to capture and, along with culvert pipes and manhole, route surface water runoff to stormwater treatment and detention infrastructure. During construction the catch basins will be protected by inlet protection per the approved construction plans. The practice of street sweeping on a bi-annual basis will help reduce maintenance of these catch basins and culvert pipes.

Note: Deep sump catch basins are not allowed to be used on this proposed development due to wildlife concerns and any manufacturer sump resulting in a catch basin must be filled with washed crushed stone. Sediment should be trapped in the sediment forebays but is also a concern in earlier structures.

Maintenance Considerations: Sediment must be removed from Catch Basins and Manholes on a regular basis, at least twice a year and more often if post-winter maintenance and street sweeping is not conducted. Inspections should be conducted periodically. At a minimum they should be cleaned after snow-melt and after leaf-drop. Disposal of all material, sediment, and debris must be done in accordance with state and federal regulations. Culvert pipes will be inspected to ensure that surface water runoff is capable of leaving the structures.

Treatment & Conveyance Swales

Description: "Swales are stabilized channels designed to convey runoff at non-erosive velocities." (NHDES SWM) They will be trapezoidal or parabolic in section view. A conveyance swale is intended to move surface water runoff from one point to another where as a treatment swale will slow the velocity to a point where sediment will settle out of the stormwater flow. A treatment swale will be constructed to a width of between four and eight feet and have a minimum length of 100 feet. The flow characteristics will also meet design criteria. See SWM Volume 2, 4.3 Treatment Practices, 5. Treatment Swales, page 123.

Project Intent: The swales are individually designed in the drainage analysis and specified on the design plans. The designed swales must have greater than 85% vegetated growth prior to receiving runoff.

Maintenance Considerations: Grassed swales will be inspected twice annually, removing accumulated sediment and gross solids. Grass will be mowed periodically but to a depth of not less than 4 inches. Any damage to the vegetation will be repaired and woody vegetation and invasive vegetation will be removed.

Culvert Pipes, Flared End Sections / Headwalls

Description: Culvert pipes are placed to route surface water runoff from catch basins to drain manholes, and drain manholes to a discharge point conveying the runoff in such a manner that erosion does not take place. Culvert pipes are often terminated with flared end sections or headwalls.

Maintenance Considerations: The entrance and exit of the culvert pipe should be cleaned of any trash and sediment build-up. The culvert should be clear to let runoff pass through the culvert unobstructed. Flared end sections and headwalls should be inspected for erosion and destabilization, with repairs made as required.

Sediment Forebay

Description: A sediment forebay is designed to reduce the velocity of incoming surface water runoff allowing sediment to fall out of suspension initially pre-treating the runoff before it is sent to a treatment structure. This earthen basin will have vegetated side-slopes and a check dam to further reduce and pretreat the runoff. At the point of incoming runoff, the basin will be protected by rip rap outlet protection construction and the outgoing edge will be protected with rip rap. The check dam will be constructed from one side of the basin to the other and cause runoff to either go through or over. The volume of the forebay is at least 10% the volume of the Water Quality Volume (WQV) for gravel wetlands. A dewatering drain is designed into the two-foot berm of the forebay. Construction specifications are included in the plan set and New Hampshire Stormwater Manual, Volume 2, 4-4 Pretreatment Practices 1, Sediment Forebays.

If it determined that too much sediment is by-passing the sediment forebay into the stormwater practice, semi-permanent sediment barriers may be warranted in the form of check dams by using a filtering media such as Filtrexx Silt Soxx. All sediment forebays have an embedded 12” Silt Soxx in the stone berm

Maintenance Considerations: The basin and slopes will be periodically mowed, at least twice per year ensuring that woody material does not get an opportunity to grow. Sediment accumulated in the basin will be removed and properly disposed of when it reaches half the height of the check dam. Erosion or other damage to the basin will be repaired and revegetated. (See Outlet Protection) Inspect and clean the dewatering drain to ensure runoff is not trapped for more than 72 hours in the forebay. A sediment gauge is proposed in each sediment forebay as a cleaning indicator.

Rip Rap Outlet Protection, Level Spreaders, & Emergency Spillways

Description: Outlet Protection consists of a riprap apron or preformed scour hole that is designed to provide velocity reduction of the surface water run-off that is leaving a culvert. The design is dependent on the culvert size, soil conditions, velocity, and quantity of the run-off. There are to be no bend or curves at the intersection of the conduit and apron. Level spreaders are intended to provide a level lip where surface water runoff is allowed to continue downhill closer to sheet flow. The level lip is to be constructed as level as possible for the entire length. Emergency Spillways are rip rap reinforced outlets near the top of the berm that allow runoff to leave a practice during periods of very high flow. Ref.: NHDES SWM Volume 2, Section 4-6 Conveyance Practices, 6. Outlet Protection and 1. Detention Ponds, Note 3, Page 158.

Maintenance Considerations: The riprap outlet protection will be inspected annually for damage, which must be corrected immediately. Any sediment buildup will be removed and disposed of correctly. Sediment and subsequent vegetation will build up in the Level Spreader. This material will be cleaned out along with any gross solids and disposed of properly. (See invasive species below) Any rip rap that has been displaced from the original construction will be repaired, especially recreating the level lip.

Subsurface Gravel Wetland

Description: A Gravel Wetland (NHDES SWM 4-3 Treatment Practice 2D) or Subsurface Gravel Wetland consists of a forebay and multiple flow-through treatment cells. During smaller rain events, the surface water runoff is intended to pass from the forebay, into the gravel media through perforated pipes and structures where it passes through an anaerobic environment where the Water Quality Volume will have 24-72 hours of contact time. The forebay is required to contain 10% of the WQV and each of the two cells must contain 45% of the WQV. During larger storm events, the system works as a detention pond. The design of a Subsurface Gravel Wetland will be constructed in accordance with the most current version of the Design Specifications provided by the UNH Stormwater Center.

Maintenance Considerations: The outlet configuration of the anaerobic subsurface gravel consists of a small discharge orifice that is located in a threaded cap. This goose-neck feature is designed to be disassembled to allow cleaning. This outlet orifice is located within a concrete outlet structure that also contains a control stack used to control and detain runoff in the system. Although this is designed to be “clean water” after the filtering process, the outlet structure in general is going to require periodic maintenance to ensure that it is discharging runoff properly. If the Subsurface Gravel Wetland retains runoff on the surface for more than 72 hours the performance is not correct and maintenance is required.

Debris will need to be removed from the inlet and outlet structures as well as any buildup of sediment. The surface of the ponded area is intended to have wetland plants which may require periodic replanting, depending on the sediment loading. Sediment buildup in the forebay must be removed to maintain the minimum required volume. See also 9 and 10 of the attached UNHSC Subsurface Gravel Wetland Design Specifications 2009, and / or UNHSC Subsurface Gravel Wetland Design Specifications 2016 with Maintenance Guidelines and Checklist.

Water Quality Inlet

Description: A water quality inlet is an underground storage structure with multiple chambers designed to capture coarse sediments, floating debris, and some hydrocarbons from stormwater runoff. Such inlet devices are typically used for pretreatment of runoff prior to discharge to another treatment practice. The devices use baffles with weirs or orifices to control flow and help capture sediment, and inverted baffles or hooded outlets to help capture floating materials. Depending on the design of the unit and the magnitude of peak flow events, the captured sediments may be subject to re-suspension and flushing from the device. Floating hydrocarbons captured in the unit can be removed for disposal during maintenance operations or by use of sorbent materials. Note, however, that hydrocarbons carried by stormwater frequently are dispersed in suspension or adsorbed to fine-grained sediment particles or organic materials, and may not necessarily be captured in the unit. To limit potential for re-suspension of captured materials, the device is usually designed as an “off-line” unit sized for the Water Quality Flow. Larger storm events would then bypass the unit.

Maintenance Requirements: Inspect the Water Quality Inlet quarterly. Remove and legally dispose of floating debris at each inspection. Remove sediment when inspection indicates depth is approaching half the depth to the lowest orifice or other outlet in the first chamber baffle. However, it is recommended that the unit be cleaned at least once per year. Remove floating hydrocarbons immediately whenever detected by inspection. Dispose of sediments and other wastes in conformance with applicable local, state, and federal regulations

Stabilization for Long Term Cover

Vegetated Stabilization – Original Planting

All areas that are disturbed during construction will be stabilized with vegetated material within 30 days of breaking ground. Construction will be managed in such a manner that erosion is prevented and that no abutter’s property will be subjected to any siltation, unless otherwise permitted. All areas to be planted with grass for long-term cover will follow the specification and on Sheet E-102 using seeding mixture C, as follows:

Mixture	Pounds per Acre	Pounds per 1,000 Sq. Ft.
Tall Fescue	24	0.55
Creeping Red Fescue	24	0.55
Total	48	1.10

Conservation Mix

Mixture	Pounds per Acre	Pounds per 1,000 Sq. Ft.
Tall Fescue	15	0.35
Creeping Red Fescue	15	0.35
Annual Ryegrass	5	0.12
Perennial Ryegrass	5	0.12
Kentucky Bluegrass	15	0.35
White Clover	7	0.16
Total	**62**	**1.45**

Conservation Mix will used to stabilize all 2:1 slopes and all land area disturbed within the wetland buffer. As the site is to be stabilized with erosion control mix as a mulch, the vegetation should be established with a high percentage of white clover for growth to be established.

Gravel Wetland Mix:

The grass that is planted within a subsurface gravel wetland will be a mix designed for both inundation and dry conditions such as Ernst Seeds, Retention Basin Floor Mix ERNMX-126.

Maintenance Considerations: Permanent seeded areas for long-term cover will be inspected on a periodic basis looking for signs of growth loss or erosion. Any areas found to be damaged will be repaired and replanted to reestablish the growth. The grass should be mowed at least twice per year and any dead material removed. Any woody growth that becomes established will need to be cut and removed.

Long-term maintenance of the land cover is critical and must be maintained at least 85% grass / vegetation coverage, must be inspected for concentrated flow, rills, and channels; and must be repaired as necessary to prevent erosion.

CONTROL OF INVASIVE PLANTS

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described on the following pages. They should be controlled as described on the following pages.

Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:

- becoming weedy and overgrown;
- killing established shade trees;
- obstructing pipes and drainage systems;
- forming dense beds in water;
- lowering water levels in lakes, streams, and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.

Annual Report

Description: The owner is responsible to keep an **I & M Activity Log** that documents inspection, maintenance and repairs to the storm water management system, and a **Deicing Log** to track the amount and type of deicing material applied to the site. The original owner is responsible to ensure that any subsequent owner (s) have copies of the Stormwater System Management Inspection & Maintenance Manual, copies of past logs and check lists. This includes any owner association that might become involved with the property. The Annual Report will be prepared and submitted to the City of Dover, Community Services, Engineering Department with copies of both logs and check lists no later than December 15th of each year and provided to NHDES Alteration of Terrain on that same date. Upon an ownership change, the Annual Report will include the Transfer of Ownership Responsibility Forms duplicated from the form found below.

The plans that accompany this manual includes two sheets, “Drainage Operation, Inspection, & Maintenance Plan”. The owners and municipality will also maintain a complete set of the approved original design plans.

Respectfully
BERRY SURVEYING & ENGINEERING

Kevin R. Poulin, EIT
Project Engineer / Manager

Kenneth A. Berry, PE, LLS
CPSWQ, CPESC, CESSWI
Principal, VP – Technical Operations

STORMWATER SYSTEM: INSPECTION AND MAINTENANCE MANUAL

Inspection & Maintenance Manual Checklist

Rolling Hill Estates

Tax Map E, Lot 65-1
StoneArch Development Corp.
42 Dover Point Road, Suite J,
Dover, NH 03820

☑	Date	BMP / System	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance / Cleanout Threshold
		Pavement Sweeping	3 times per year	N/A	N/A
		Litter/Trash Removal	Routinely	Inspect dumpsters, outdoor waste receptacles area, and yard areas.	Parcel will be free of litter/trash.
		Deicing Agents	N/A	N/A	Use salt as the primary agent for roadway safety during winter.
		Invasive Species	2 times per year	Inspect for Invasive Species	Remove and dispose invasive species.
		Closed Drainage System:			
		Drainage Pipes & Inlet Sumps	2 times per year	Check for sediment accumulation & clogging.	Less than 2" sediment depth
		Catch Basins	2 times per year	Check for sediment accumulation & clogging.	Sediment accumulated to a depth of 2 inches.

☑	Date	BMP / System	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance / Cleanout Threshold
		Water Quality Inlets	Quarterly	Check for sediment and debris accumulation buildup.	Remove sediment & debris at least once yearly or when sediment depth approaches half the depth to the lowest orifice.
		Riprap Outlet Protection	Annually	Check for sediment buildup and structure damage.	Remove excess sediment and repair damage.
		Winter Maintenance	Ongoing	Remove snow as directed.	Ongoing
		Post Winter Maintenance	Annually	Remove excess sand, gross solids, and repair vegetation and plantings	Parcel will be free of excess sand, litter/trash. Vegetation per approved plans.
		Annual Report	Annually	Submit Annual Report to Dover Community Services, Engineering Department and provided to NHDES AoT	Report to be submitted on or before December 15th each year. Copies submitted to NHDES by that date.

Inspection Check List:

The following practices and drainage features will all require periodic inspections and maintenance based on this manual and drainage layout:

Culvert Inlet Sumps

Catch Basins & Drainage Pipes

Drain Manholes

Water Quality Inlets

Sediment Forebays for all Treatment Practices

Subsurface Gravel Wetland #101 with Outlet Structure and Spillway

Subsurface Gravel Wetland #102 with Outlet Structure and Spillway

Subsurface Gravel Wetland #103 with Outlet Structure and Spillway

Rip Rap Outlet Protection & Level Spreaders

Reference is also made to the UNHSC / NHDOT Design and Maintenance of Subsurface Gravel Wetlands, (attached) which includes specific Inspection and Maintenance Guidance in Attachment B, Page 23-26, dated February 4, 2015.

STORMWATER SYSTEM INSPECTION AND MAINTENANCE PLAN

Inspection & Maintenance Manual Log Form

Rolling Hill Estates

Tax Map E, Lot 65-1
StoneArch Development Corp.
42 Dover Point Road, Suite J,
Dover, NH 03820

BMP / System	Date Inspected	Inspector	Cleaning/Repair (List Items & Comments)	Repair Date	Performed By:

STORMWATER SYSTEM INSPECTION AND MAINTENANCE PLAN

Deicing Log Form

Rolling Hill Estates

Tax Map E, Lot 65-1
StoneArch Development Corp.
42 Dover Point Road, Suite J,
Dover, NH 03820

Date	Amount Applied	Performed By:	Date	Amount Applied	Performed By:

STORMWATER SYSTEM OPERATION & MAINTENANCE PLAN CERTIFICATION

Owner	Responsibility
Name: Scott O'Neill, Managing Member StoneArch Development Corp. Address: 42 Dover Point Road, Suite J, Dover, NH 03820 Telephone: (978)-375-3390 (Mobile)	The owner is responsible for the conduct of all construction activities, and ultimate compliance with all the provisions of the Stormwater System Operation & Maintenance Plan and the implementation of the Inspection and Maintenance Manual.

OWNER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: _____ Date: _____

Printed Name:

Representing:
Tax Map E, Lot 65-1
StoneArch Development Corp.
42 Dover Point Road, Suite J
Dover, NH 03820

SWPPP Cut Sheet:

Filtrexx® Sediment Control

Sediment & Perimeter Control Technology

PURPOSE & DESCRIPTION

Filtrexx® Sediment control is a three-dimensional tubular sediment control and storm water runoff filtration device typically used for **perimeter control** of sediment and other soluble pollutants (such as phosphorus and petroleum hydrocarbons), on and around construction activities.

APPLICATION

Filtrexx® Sediment control is to be installed down slope of any disturbed area requiring erosion and sediment control and filtration of soluble pollutants from runoff. Sediment control is effective when installed perpendicular to sheet or low concentrated flow. Acceptable applications include:

- Site perimeters
- Above and below disturbed areas subject to sheet runoff, interrill and rill erosion
- Above and below exposed and erodable slopes
- Around area drains or inlets located in a 'sump'
- On compacted soils where trenching of silt fence is difficult or impossible
- Around sensitive trees where trenching of silt fence is not beneficial for tree survival or may unnecessarily disturb established vegetation.
- On frozen ground where trenching of silt fence is impossible.
- On paved surfaces where trenching of silt fence is impossible.

INSTALLATION

1. Sediment control used for perimeter control of sediment and soluble pollutants in storm runoff shall meet Filtrexx® Soxx™ Material Specifications and use Certified Filtrexx® FilterMedia™.
2. Contractor is required to be Filtrexx® Certified™, or use pre-filled Filtrexx® Sediment control products manufactured by a Filtrexx® Certified Manufacturer™ as determined by Filtrexx® International, LLC (440-926-2607 or visit www.filtrexx.com). Certification shall be considered current if appropriate identification is shown during time of bid or at time of application. Look for the Filtrexx® Certified™ Seal.
3. Sediment control will be placed at locations indicated on plans as directed by the Engineer.
4. Sediment control should be installed parallel to the base of the slope or other disturbed area. In extreme conditions (i.e., 2:1 slopes), a second Sediment control shall be constructed at the top of the slope.
5. Effective Soxx™ height in the field should be as follows: 8" Diameter Sediment control = 6.5" high, 12" Diameter Sediment control = 9.5" high, 18" Diameter SiltSoxx™ = 14.5" high, 24" Diameter Sediment control = 19" high.
6. Stakes shall be installed through the middle of the Sediment control on 10 ft (3m) centers, using 2 in (50mm) by 2 in (50mm) by 3 ft (1m) hard wood stakes. In the event staking is not possible, i.e., when Sediment control is used on pavement, heavy concrete blocks shall be used behind the Sediment control to help stabilize during rainfall/runoff events.
7. Staking depth for sand and silt loam soils shall be 12 in (300mm), and 8 in (200mm) for clay soils.
8. Loose compost may be backfilled along the upslope side of the Sediment control, filling the seam between the soil surface and the device, improving filtration and sediment retention.
9. If the Sediment control is to be left as a permanent filter or part of the natural landscape, it may be seeded at time of installation for

establishment of permanent vegetation. The Engineer will specify seed requirements.

10. Filtrexx® Sediment control is not to be used in perennial, ephemeral, or intermittent streams.

See design drawing schematic for correct Filtrexx® Sediment control installation (Figure 1.1).

INSPECTION AND MAINTENANCE

Routine inspection should be conducted within 24 hrs of a runoff event or as designated by the regulating authority. Sediment control should be regularly inspected to make sure they maintain their shape and are producing adequate hydraulic flow-through. If ponding becomes excessive, additional Sediment control may be required to reduce effective slope length or sediment removal may be necessary. Sediment control shall be inspected until area above has been permanently stabilized and construction activity has ceased

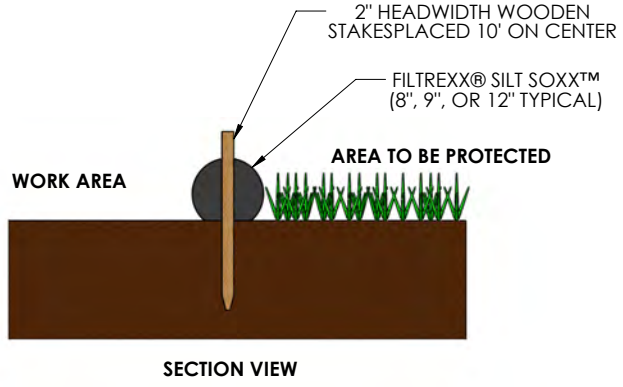
1. The Contractor shall maintain the Sediment control in a functional condition at all times and it shall be routinely inspected.
2. If the Sediment control has been damaged, it shall be repaired, or replaced if beyond repair.
3. The Contractor shall remove sediment at the base of the upslope side of the Sediment control when accumulation has reached 1/2 of the effective height of the Sediment control, or as directed by the Engineer. Alternatively, a new Sediment control can be placed on top of and slightly behind the original one creating more sediment storage capacity without soil disturbance.
4. Sediment control shall be maintained until disturbed area above the device has been permanently stabilized and construction activity has ceased.
5. The FilterMedia™ will be dispersed on site once disturbed area has been permanently stabilized, construction activity has ceased, or as determined by the Engineer.
6. For long-term sediment and pollution control applications, Sediment control can be seeded at the time of installation to create a vegetative filtering system for prolonged and increased filtration of sediment and soluble pollutants (contained vegetative filter strip). The appropriate seed mix shall be determined by the Engineer.

Slope Percent	Maximum Slope Length Above Sediment Control in Feet (meters)*				
	8 in (200 mm) Sediment control	12 in (300 mm) Sediment control	18 in (450 mm) Sediment control	24 in (600mm) Sediment control	32 in (800mm) Sediment control
	6.5 in (160 mm)**	9.5 in (240 mm) **	14.5 in (360 mm) **	19 in (480 mm) **	26 in (650 mm) **
2 (or less)	600 (180)	750 (225)	1000 (300)	1300 (400)	1650 (500)
5	400 (120)	500 (150)	550 (165)	650 (200)	750 (225)
10	200 (60)	250 (75)	300 (90)	400 (120)	500 (150)
15	140 (40)	170 (50)	200 (60)	325 (100)	450 (140)
20	100 (30)	125 (38)	140 (42)	260 (80)	400 (120)
25	80 (24)	100 (30)	110 (33)	200 (60)	275 (85)
30	60 (18)	75 (23)	90 (27)	130 (40)	200 (60)
35	60 (18)	75 (23)	80 (24)	115 (35)	150 (45)
40	60 (18)	75 (23)	80 (24)	100 (30)	125 (38)
45	40 (12)	50 (15)	60 (18)	80 (24)	100 (30)
50	40 (12)	50 (15)	55 (17)	65 (20)	75 (23)

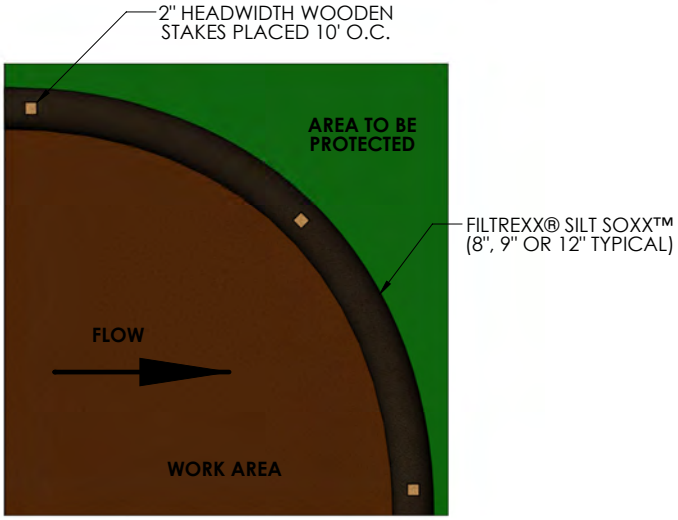
* Based on a failure point of 36 in (0.9 m) super silt fence (wire reinforced) at 1000 ft (303 m) of slope, watershed width equivalent to receiving length of sediment control device, 1 in/ 24 hr (25 mm/24 hr) rain event.

** Effective height of Sediment control after installation and with constant head from runoff as determined by Ohio State University.

FILTREXX® SILT SOXX™

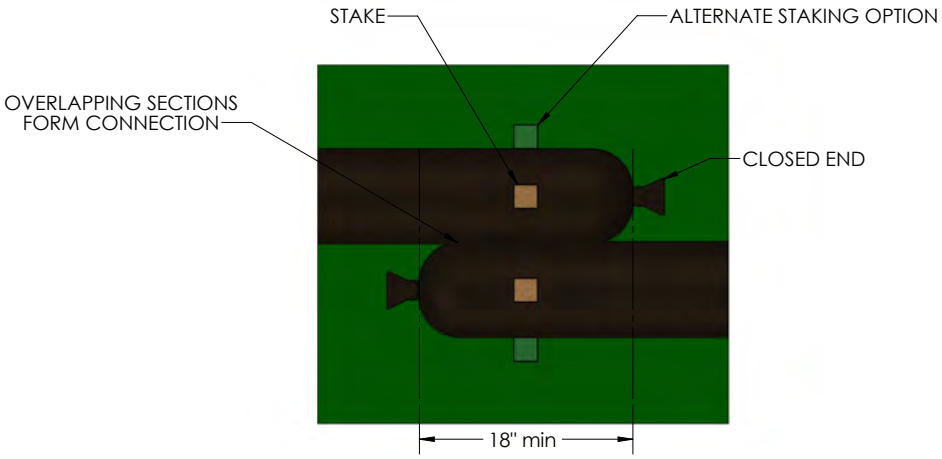


SECTION VIEW

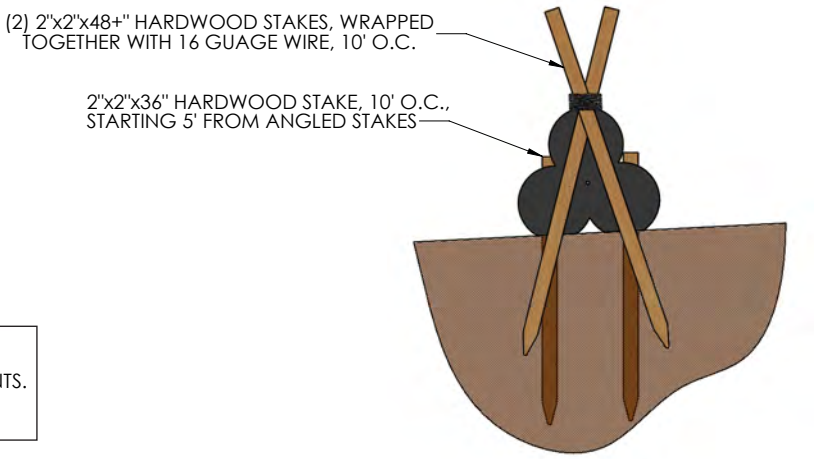


TOP VIEW

COMPOST SOCK CONNECTION/ATTACHMENT DETAIL



FILTREXX® PYRAMID STAKING DETAIL



NOTES:
1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. SILT SOXX™ FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

SWPPP Cut Sheet:

Filtrexx® Inlet Protection

Sediment & Perimeter Control Technology

PURPOSE & DESCRIPTION

Filtrexx® Inlet protection is a three-dimensional tubular sediment control and storm water runoff filtration device typically used for storm drain **inlet protection** of sediment and soluble pollutants (such as phosphorus and petroleum hydrocarbons) on and around construction activities.

APPLICATION

Drain inlets are located in areas that receive runoff from surrounding lands, often exposed and disturbed soils, and are located at a low point, or in a sump. Inlet protection used around drain inlets (or *Drain* Inlet protection) should completely enclose the circumference of the drain and where possible should not be placed on a grade or slope. Inlet protection used around drain inlets should never be the only form of site sediment control and should be accompanied by erosion control/slope stabilization practices, such as Slope protection or rolled erosion control blankets (RECB). Inlet protection should never be placed where they divert runoff flow from the drain inlet, or on top of the inlet, which can cause flooding. Under high runoff and sediment loading conditions placement of 1-2 in (25-50 mm) diameter rock (AASHTO #2) may be placed around the outer circumference of the Inlet protection up to ½ the height of the Inlet protection. This will slow runoff velocity as it contacts the Inlet protection and will reduce sediment build-up and clogging of the Inlet protection.

Curb inlets are generally located on paved surfaces and are designed to rapidly drain storm runoff from roadways to prevent flooding that poses a hazard to vehicular traffic. Inlet protection devices should be placed in a manner which intercepts runoff prior to entering the inlet, but does not block or divert runoff from the inlet. To prevent diversion of runoff, Inlet protection used around curbs (or *Curb* Inlet protection) should be used in low points, or sumps, and minor slopes or grades. Inlet protection should never be placed in or on the curb inlet drain, or placed in a manner than obstructs vehicular traffic. Inlet protection height should be at least 1 in (25 mm) lower than top of curb inlet to allow for overflow into the drain and not over the curb. Maximum sediment removal efficiency occurs when minor ponding exists behind Inlet protection but should never lead to flooding.

Curb sediment containment systems are used to reduce the sediment and pollutant load flowing to a curb inlet. They are generally placed on paved surfaces perpendicular to runoff flow and should be lower than the height of the curb. Curb sediment containment systems should never cause flooding or placed where they are a hazard to vehicular traffic. Inlet protection used for curb sediment containment (or *Curb Sediment Containment* Inlet protection) can be placed on a grade but should never be placed directly upslope from curb inlet where it may inadvertently divert runoff from entering curb inlet.

INSTALLATION

1. Inlet protection used for inlet protection to reduce sediment and soluble pollutants entering storm drains shall meet Filtrexx® FilterSoxx™ Material Specifications and use Certified Filtrexx® FilterMedia™.
2. Contractor is required to be a Filtrexx® Certified™ Installer as determined by Filtrexx® International, LLC (440-926-2607 or visit web site at Filtrexx.com). Certification shall be considered current if appropriate identification is shown during time of bid or at time of application (current list of installers can be found at www.filtrexx.com). Look for the Filtrexx® Certified™ Installer Seal.

3. Filtrexx® Inlet protection shall be placed at locations indicated on plans as directed by the Engineer. Inlet protection should be installed in a pattern that allows complete protection of the inlet area.
4. Installation of curb Inlet protection will ensure a minimal overlap of at least 1 ft (300mm) on either side of the opening being protected. The Inlet protection will be anchored to the soil behind the curb using staples, stakes or other devices capable of holding the Inlet protection in place.
5. Standard Inlet protection for curb inlet protection and curb sediment containment will use 8 in (200mm) diameter Inlet protection, and drain inlets on soil will use 12 in (300mm) or 18 in (450mm) diameter Inlet protection. In severe flow situations, larger Inlet protection may be specified by the Engineer. During curb installation, Inlet protection shall be compacted to be slightly shorter than curb height.
6. If Inlet protection becomes clogged with debris and sediment, they shall be maintained so as to assure proper drainage and water flow into the storm drain. In severe storm events, overflow of the Inlet protection may be acceptable in order to keep the area from flooding.
7. Curb and drain Inlet protection shall be positioned so as to provide a permeable physical barrier to the drain itself, allowing sediment to collect on the outside of the Inlet protection.
8. For drains and inlets that have only curb cuts, without street grates, a spacer is required in order to keep the Inlet protection away from the drain opening. This spacer should be a hog wire screen bent to overlap the grate opening and keep the sock from falling into the opening. Use at least one spacer for every 4 ft (1.2m) of curb drain opening. The wire grid also prevents other floatable waste from passing over the Inlet protection.
9. Stakes shall be installed through the middle of the drain Inlet protection on 5 ft (1.5m) centers, using 2 in (50mm) x 2 in (50mm) x 3 ft (1m) wood stakes.
10. Staking depth for sand and silt loam soils shall be 12 in (300mm), and 8 in (200mm) for clay soils.

INSPECTION AND MAINTENANCE

Routine inspection should be conducted within 24 hrs of a runoff event or as designated by the regulating authority. Inlet protection should be regularly inspected to make sure they maintain their shape and are producing adequate hydraulic flow-through. If ponding becomes excessive, additional Inlet protection may be required or sediment removal may be necessary. Inlet protection shall be inspected until contributing drainage area has been permanently stabilized and construction activity has ceased

1. The Contractor shall maintain the Inlet protection in a functional condition at all times and it shall be routinely inspected.
2. If the Inlet protection has been damaged, it shall be repaired, or replaced if beyond repair.
3. The Contractor shall remove sediment at the base of the upslope side of the Inlet protection when accumulation has reached 1/2 of the effective height of the Inlet protection, or as directed by the Engineer. Alternatively, for drain Inlet protection a new Soxx™ may be placed on top of the original increasing the sediment storage capacity without soil disturbance.
4. Inlet protection shall be maintained until disturbed area above or around the device has been permanently stabilized and construction activity has ceased.
5. Regular maintenance includes lifting the Inlet protection and cleaning around and under them as sediment collects.
6. The FilterMedia™ will be removed from paved areas or dispersed on site soil or behind curb once disturbed area has been permanently stabilized, construction activity has ceased, or as determined by the Engineer.

Table 2.4 Spacing for Curb Sediment Containment Systems.

Grade (%)	Spacing (ft)	Spacing (mm)
0.5	100	30
1.0	50	15
2.0	25	8
3.0	16	5
4.0	13	4
5.0	10	3

Source: Fifield, 2001.

Figure 2.1. Engineering Design Drawing for Curb and Drain Inlet Protection

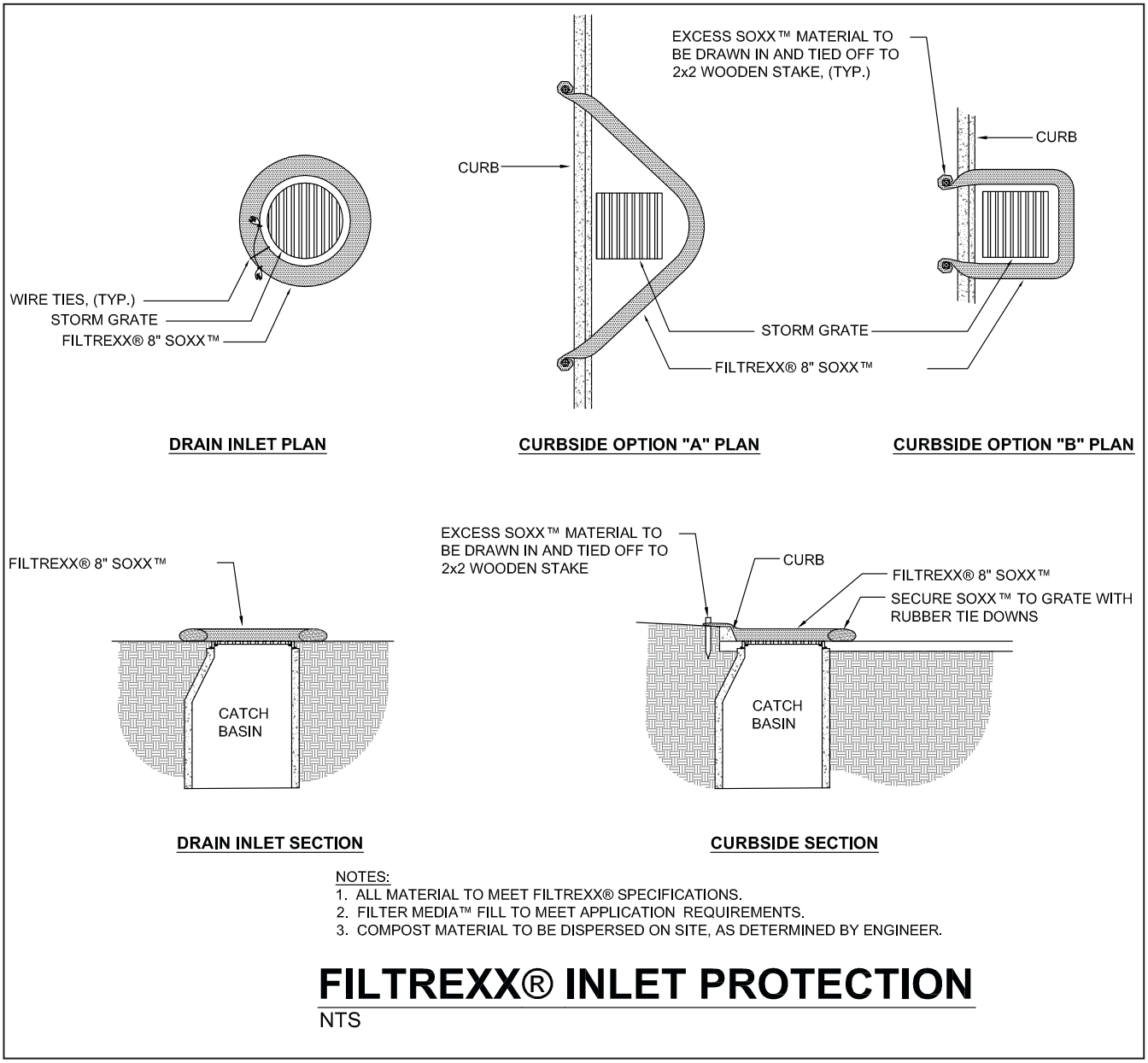
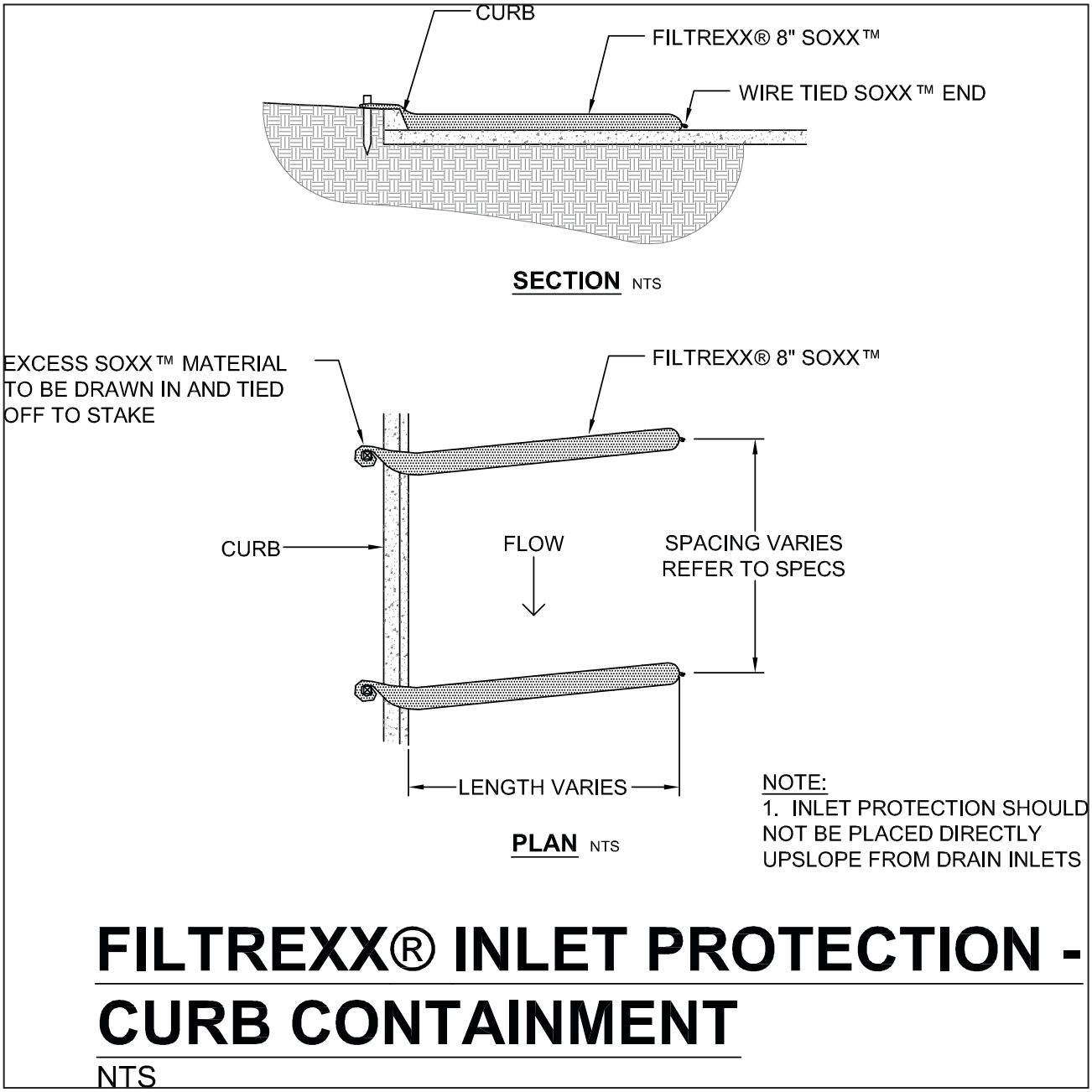


Figure 2.2. Engineering Design Drawing for Curb Sediment Containment Inlet Protection



Control of Invasive Plants

New Hampshire
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Markets & Food
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This guide lists garden plants and weeds which are already causing significant changes to natural areas in the Mid-Atlantic. **Measures for controlling each species are indicated by number, e.g., (3), in the text with a full explanation at the end of this article.** Click on the word Control: to jump to that section. Then click your "back" button to return to the text. Following each section suggested alternative plants are given. These alternatives are native plants, well adapted and needing little care, attractive to birds and butterflies, and an important part of the food web for our indigenous species.

INVASIVE TREES

NORWAY MAPLE (*Acer platanoides*) has large leaves similar to sugar maple. To easily confirm that the plant is Norway maple, break off a leaf and if it's truly Norway maple it will exude milky white sap. Fall foliage is yellow. (Exception: cultivars such as 'Crimson King,' which have red leaves in spring or summer, may have red autumn leaves.) The leaves turn color late, usually in late October after native trees have dropped their foliage. This tree suppresses growth of grass, garden plants, and forest understory beneath it, at least as far as the drip-line. Its wind-borne seeds can germinate and grow in deep shade. The presence of young Norway maples in our woodlands is increasing.
Control: (1); (7), (8), (9), or (10); (11) in mid-October to early November, before the leaves turn color.

TREE OF HEAVEN (*Ailanthus altissima*), is incredibly tough and can grow in the poorest conditions. It produces huge quantities of wind-borne seeds, grows rapidly, and secretes a toxin that kills other plants. Its long compound leaves, with 11-25 lance-shaped leaflets, smell like peanut butter or burnt coffee when crushed. Once established, this tree cannot be removed by mechanical means alone.
Control: (1) - seedlings only. Herbicide - use Garlon 3a (9) with no more than a 1" gap between cuts, or (10); plus (11) on re-growth. Or paint bottom 12" of bark with Garlon 4 Ultra (in February or March to protect surrounding plants). USE MAXIMUM STRENGTH SPECIFIED ON LABEL for all herbicide applications on Ailanthus. Glyphosate is not effective against Ailanthus.

INVASIVE SHRUBS

AUTUMN OLIVE (*Eleagnus umbellata*): Formerly recommended for erosion control and wildlife value, these have proved highly invasive and diminish the overall quality of wildlife habitat.
Control: (1) - up to 4" diameter trunks; (7) or (10) or bury stump. Do not mow.
MULTIFLORA ROSE (*Rosa multiflora*), formerly recommended for erosion control, hedges, and wildlife habitat, becomes a huge shrub that chokes out all other vegetation and is too dense for many species of birds to nest in, though a few favor it. In shade, it grows up trees like a vine. It is covered with white flowers in June. (Our native roses have fewer flowers, mostly pink.) Distinguish multiflora by its size, and by the presence of very hard, curved thorns, and a fringed edge to the leaf stalk.
Control: (1) - pull seedlings, dig out larger plants at least 6" from the crown and 6" down; (4) on extensive infestations; (10) or (11). It may remain green in winter, so herbicide may *applied when other plants are dormant. For foliar application, mix Rodeo with extra sticker-spreader, or use Roundup Sure Shot Foam on small plants.*

BUSH HONEYSUCKLES (*Lonicera spp.*), including Belle, Amur, Morrow's, and Tatarian honeysuckle. (In our region, assume that any honeysuckle is exotic unless it is a scarlet-flowered vine). Bush honeysuckles create denser shade than native shrubs, reducing plant diversity and eliminating nest sites for many forest interior species.
Control: (2) on ornamentals; (1); on shady sites only, brush cut in early spring and again in early fall (3); (4) during the growing season; (7); or (10) late in the growing season.

BLUNT-LEAVED PRIVET (*Ligustrum* obtusifolium). *Control:* (1); (7) or (10); or trim off all flowers. Do not cut back or mow.

BURNING BUSH, WINGED EUONYMUS (*Euonymus alatus*), identified by wide, corky wings on the branches.
Control: (1); (7) or (10); or trim off all flowers.

JAPANESE BARBERRY (*Berberis thunbergii*), and all cultivars and varieties.
Control: (1); (7) or (10); or trim off all flowers.

INVASIVE WOODY VINES

All of these vines shade out the shrubs and young trees of the forest understory, eventually killing them, and changing the open structure of the forest into a dense tangle. DO NOT PLANT NEXT TO OPEN SPACE.

JAPANESE HONEYSUCKLE (*Lonicera japonica*), including Hall's honeysuckle, has gold-and-white flowers with a heavenly scent and sweet nectar in June. This is probably the familiar honeysuckle of your childhood. It is a rampant grower that spirals around trees, often strangling them.
Control: (1); (3); (10); (11) in fall or early spring when native vegetation is dormant. Plan to re-treat repeatedly.

ORIENTAL BITTERSWEET (*Celastrus orbiculatus*) has almost completely displaced American bittersweet (*C. scandens*). The Asian plant has its flowers and bright orange seed capsules in clusters all along the stem, while the native species bears them only at the branch tips.
Control: (1); keep ornamental plants cut back, remove all fruits as soon as they open, and bag or burn fruits; to eradicate use Garlon 3a (10).

JAPANESE KNOTWEED, MEXICAN BAMBOO (*Polygonum cuspidatum*) can grow in shade. The stems have knotty joints, reminiscent of bamboo. It grows 6-10' tall and has large pointed oval or triangular leaves.
Control: Cut at least 3 times each growing season and/or treat with Rodeo (10) or (11). In gardens, heavy mulch or dense shade may kill it.

INVASIVE HERBACEOUS PLANTS

GARLIC MUSTARD (*Alliaria petiolata*, *A. officinalis*), a white-flowered biennial with rough, scalloped leaves (kidney-, heart- or arrow-shaped), recognizable by the smell of garlic and taste of mustard when its leaves are crushed. (The odor fades by fall.)
Control: Pull before it flowers in spring (1), removing crown and roots. Tamp down soil afterwards. Once it has flowered, cut (2), being careful not to scatter seed, then bag and burn or send to the landfill. (11) may be appropriate in some settings.

JAPANESE STILT GRASS (*Microstegium vimineum*) can be identified by its lime-green color and a line of silvery hairs down the middle of the 2-3" long blade. It tolerates sun or dense shade and quickly invades areas left bare or disturbed by tilling or flooding. An annual grass, it builds up a large seed bank in the soil.

Control: Easily pulled in early to mid-summer (1) - be sure to pull before it goes to seed. If seeds have formed, bag and burn or send to landfill. Mowing weekly or when it has just begun to flower may prevent it from setting seed (3). Use glyphosate (11) or herbicidal soap (less effective) on large infestations. Follow up with (5) in spring.

MILE-A-MINUTE VINE, DEVIL'S TAIL TEARTHUMB (*Polygonum perfoliatum*), a rapidly growing annual vine with triangular leaves, barbed stems, and turquoise berries in August which are spread by birds. It quickly covers and shades out herbaceous plants.
Control: same as for stilt grass.

SPOTTED KNAPWEED (*Centaurea maculosa*), a biennial with thistle-like flowers.
Control: Do NOT pull (1) unless the plant is young and the ground is very soft - the tap root will break off and produce several new plants. Wear sturdy gloves. (2); (6); (10) or (11).

CONTROL MEASURES

(1) PULL seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs.
(2) DEADHEAD to prevent spread of seeds of invasive plants. Cut off seeds or fruits before they ripen. Bag, and burn or send to a landfill.
(3) MOW or CUTTING at least 4 times a season to deplete plants' store of nutrients and carbohydrates, reduce seed formation, and kill or minimize spread of plants. If necessary, repeat each year.
(4) CONTROLLED BURNING during the spring, repeated over several years, allows native vegetation to compete more effectively with the invasive species. This requires a permit. Spot treatment with glyphosate in late fall can be used to make this method more effective.
(5) Use a CORN-BASED PRE-EMERGENCE HERBICIDE on annual weeds. This product is also an organic fertilizer, i.e., it can stimulate growth of existing plants, including weeds, so it is appropriate for lawns and gardens but may not be appropriate in woodlands.
(6) In lawns, SPOT TREAT with BROAD-LEAF WEEDKILLER. Good lawn-care practices (test soil; use lime and fertilizer only when soil test shows a need; mow high and frequently; leave clippings on lawn) reduce weed infestations.
(7) CUT DOWN the tree. Grind out the stump, or clip off re-growth.
(8) GIRDLE tree: cut through the bark and growing layer (cambium) all around the trunk, about 6" above the ground. Girdling is most effective in spring when the sap is rising, and from middle to late summer when the tree is sending down food to the roots. Clip off sucker sprouts.
(9) FRILL: Using a machete, hatchet or similar device, hack scars (several holes in larger trees) downward into the cambium layer, and squirt in glyphosate (or triclopyr if recommended in text above). Follow label directions for Injection and Frill Applications. This is most effective from middle to late summer. Clip off any sucker sprouts or treat with glyphosate.
(10) CUT STEM / CUT STUMP WITH GLYPHOSATE (or triclopyr if specified above). Follow label directions for Cut Stump Application. Clip off sucker sprouts or paint with glyphosate. See Note on Herbicides.
(11) FOLIAR SPRAY WITH GLYPHOSATE herbicide (see Note on Herbicides). Use a backpack or garden sprayer or mist blower, following label directions. Avoid overspray and/or dripping onto non-target plants, because glyphosate kills most plants except moss. If it rolls off waxy or grass-like foliage, use additional sticker-spreader. Deciduous trees, shrubs, and perennials move nutrients down to the roots in late summer. Glyphosate is particularly effective at this time and when plants have just gone out of flowering. Several invasive species retain their foliage after native plants have lost theirs, and resume growth earlier in spring than most natives. This allows you to treat them without harming the natives. However, the plant must be actively growing for the herbicide to work. Retreatments may be necessary the following year if suckering occurs or the plant hasn't been entirely killed.

NOTE ON HERBICIDES: It is highly recommended that small populations try to be controlled using non-chemical methods wherever feasible. However, for large infestations, and for a few plants specified above, herbicide use is essential. Apply herbicides carefully to avoid non-target plants, glyphosate is the least environmentally damaging herbicide in most cases. Add food coloring for visibility, and a soap-based sticker such as Cide-Kick. Glyphosate is ineffective on some

plants; for these, triclopyr (Garlon) may be indicated. When using herbicides, read the entire label and observe all precautions listed, including proper disposal. If in doubt, call your local Cooperative Extension Service.



Design and Maintenance of Subsurface Gravel Wetlands

February 4, 2015

The University of New Hampshire Stormwater Center conducted a design and maintenance review of subsurface gravel wetland systems for the New Hampshire Department of Transportation. The UNHSC utilized various NHDOT site and construction plans, construction photo documentation, cost and material specification sheets, and the NHDOT subsurface gravel wetland (SGW) design specification dated December 20, 2013. The UNHSC also conducted inspections of subsurface gravel wetland systems that were designed and installed by the NHDOT or its contractors in order to determine maintenance needs. The UNHSC prepared this report as a resource for SGW designers and installers to assist in the design, cost and material specification, and maintenance requirements to ensure a properly functioning SGW system.

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1.0 Introduction

The UNHSC appreciates the opportunity to provide Design and Maintenance Review services for the New Hampshire Department of Transportation. We have completed our review and site visits of NHDOT SGW installations and offer the following summary.

Information Reviewed:

- Various Site Plans prepared by NHDOT and various assisting engineering firms
- Construction Management photos provided by NHDOT
- Costs and material specifications compiled by NHDOT
- NHDOT Subsurface Gravel Wetland Design, dated December 20, 2013

2.0 Background

The subsurface gravel wetland (SGW) stormwater management system has been around for almost 20 years. It approximates the look and function of a natural wetland, effectively removing sediments and other pollutants commonly found in runoff while enhancing the visual appeal of the landscape by adding buffers or greenscape to urban areas. The SGW specification used by NHDOT represents the original specification developed by the University of New Hampshire Stormwater Center (UNHSC) and documented in the UNHSC SGW Design Specifications published in June of 2009. These specifications reflect findings from five years of study of the SGW originally designed and evaluated at UNHSC. The SGW is a horizontal-flow filtration system and should not be confused with stormwater wetlands that function more like ponds. Instead, the SGW includes a dense root mat in a wetland soil that forms a cover over crushed stone. The subsurface crushed stone is the primary flow path for stormwater and is an anaerobic microbe-rich environment for improving water quality. Like other filtration systems, it demonstrates a tremendous capacity to reduce runoff peak flows and improve water quality.

3.0 Implementation

Subsurface gravel wetlands can be used in many regions, with the exception of those that are too arid to support a wetland system. SGW systems have demonstrated exceptional stormwater quality treatment, in particular for nutrients, for a range of land uses including linear transportation environments. It should be noted that as implementation has progressed and coupled with an additional five years of research at the UNHSC, additional findings and design modifications have arisen. The initial design of the UNHSC SGW was to handle runoff from a commuter parking area, best represented by a high density commercial use. In such applications SGW systems are space intensive; however for linear transportation environments some flexibility is expected. Recommendations and comments provided herein reflect additional learning and research findings gathered since the original publication of the UNHSC 2009 SGW specification.

1.) The purpose of the NHDOT underdrain systems is to intercept and provide drainage for seasonal high ground water levels where deemed to be within 0.5' of the wetland soil surface elevation. The rationale is not well defined and requires justification. For systems that are installed within proximity to seasonal high groundwater (SHGW) it is unclear how the benefits of the flushing basins justify overall costs (average cost savings: $1,069 per system). The SGW low flow orifice not only controls the stormwater flow through the system, by this hydraulic control will also ultimately control SHGW elevation in the vicinity of the SGW in the same manner. An SGW may have a portion of the system built below the SHGW. The original SGW at the UNHSC site in Durham, NH is a case in point. A caution is noted in that groundwater flows should not be significant compared to the stormwater flows. Significant groundwater inflows could prevent the formation of the anaerobic zone in the crushed stone.

2.) Overall system sizing for NHDOT systems appears to be based on the UNHSC 2009 SGW drainage design guidance with respect to overall length to width (L:W) ratio. In some locations L:W ratio dominates design orientation. UNHSC researchers recommend that this design criterion not be considered the most critical design element. The critical design element with respect to configuration is to size the system to treat the desired design rainfall depth from the contributing drainage area (1" Water Quality Volume). Linear systems are fine (higher L:W), provided the minimum WQV: Internal Storage Reservoir (ISR) capacity ratio is 4:1 or 25% (WQV:ISR) and the minimum flow path in the crushed stone in each cell is 15 feet.

3.) Most inspected forebays appear to function as wet basins rather than the more desirable dry basin. Dry forebays promote aerobic transformations of nitrogen which is an important first step prior to the anaerobic zone. It is recommended that if forebays cannot be economically installed to operate dry then concrete inlet structures such as off-line deep sump catch basins be used for pre-treatment as opposed to a forebay structure. A deep sump catch basin or other precast inlet structure may also be easier to maintain. A very important function of any SGW forebay is that it be aerobic in order to convert most forms of nitrogen to nitrate or nitrite.

4.) Most forebay outlets lack low flow conveyance which causes them to function as wet basins as opposed to dry basins. It is important that regardless of the configuration of the pretreatment structure that the SGW system forebay contain an outlet with an invert at the same level as the wetland surface to eliminate ponding behind the forebay berm such that obligate wetland plant colonization (cattails) and the potential for anaerobic conditions do not occur. Other options are to design the forebays to convey low flows that draw the fore bay water level down between storm events.

5.) Hydraulic inlets (leaching chambers) appear to be oversized. There are many hydraulic inlet design configurations that may be able to replace existing designs with better function and maintenance capacity and diminished costs. NHDOT SGW systems observed in this study, small and large, seem to use similar hydraulic inlet configurations

with the same number of structures regardless of watershed area size or design treatment volume. UNHSC research indicates the hydraulic inlet configuration can be flexible provided it has a greater hydraulic capacity/efficiency than the primary outlet orifice control. Recent experience in UNHSC designs have used slotted hydraulic inlet pipes as a backup inlet with a primary inlet composed of woven geotextile laid on the subsurface pea stone and covered in 6”-8“ diameter stone around the outfall of the inlet pipe (see figures 1 and 2). This configuration protects the stone filter in the subsurface of the wetland system while also providing a more accessible and maintainable surface hydraulic inlet feature that will inevitably be easier and less costly to construct.

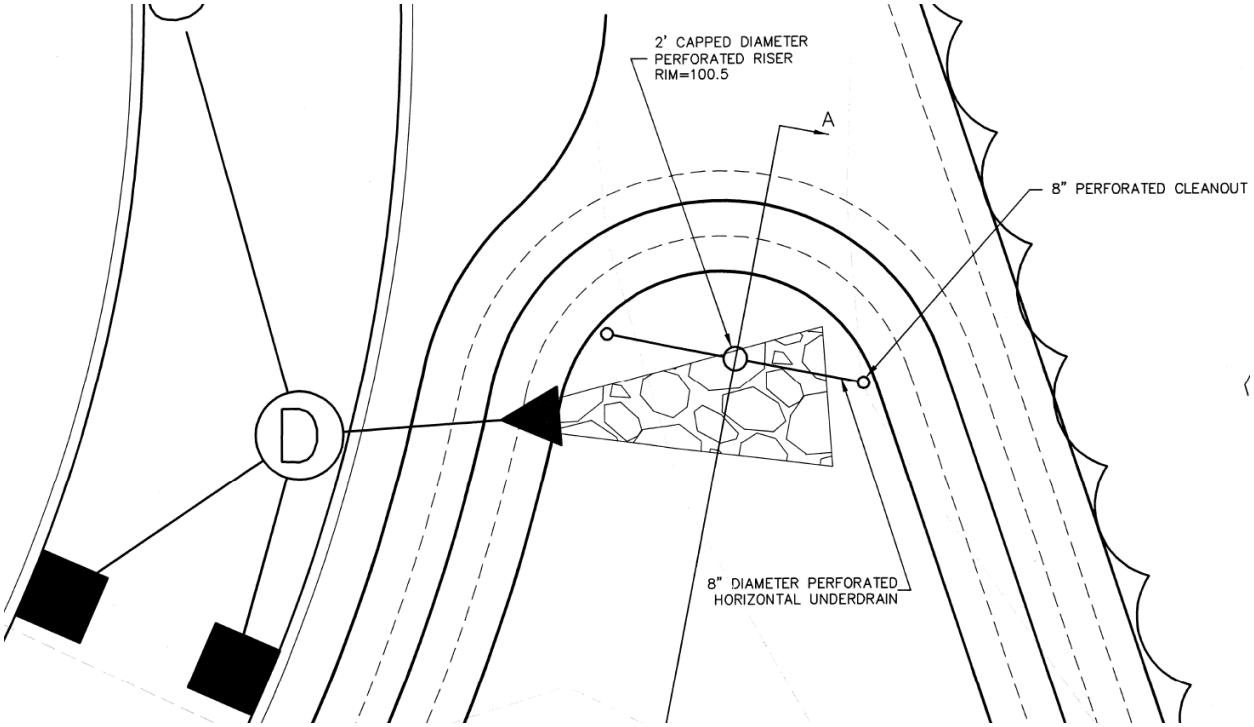


Figure 1: Typical plan view of multi-inlet configuration of a SGW system

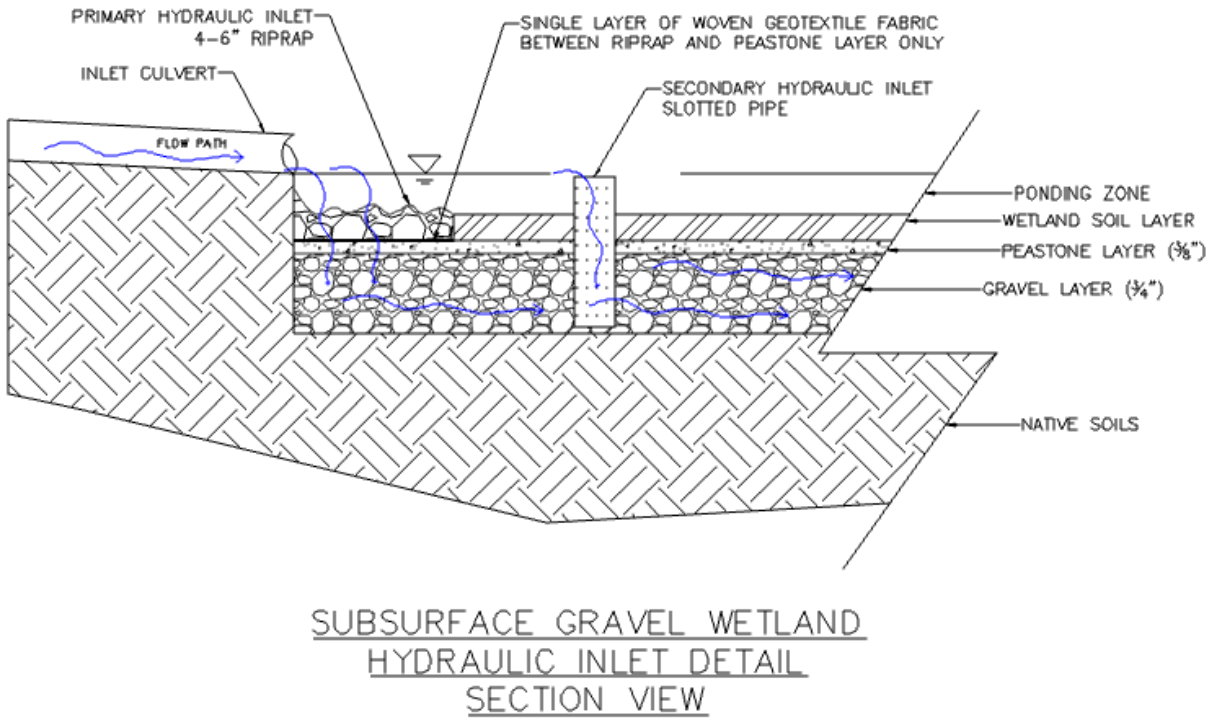


Figure 2: Typical profile view of multi-inlet configuration of a SGW system.

6.) Cleanout structures (leaching chambers) need not be as large since their primary function is for emergency access to the subsurface header pipe that directs flow either to the second wetland chamber or the outlet structure. Cleanout structures can be capped or be installed at the wetland surface grade with a manhole cover to ensure that the cleanouts are accessible, water tight, and does not short circuit system hydraulics.

7.) Some of the outlet control structures have slotted inlets (4" high by 12" wide) to allow for drainage of high flows. These slots need to be protected by covering them with 6-8" stone or some type of trash screen. This will prevent trash, leaves, or other debris from clogging the outlet orifice.

4.0 Costs

For this project NHDOT produced itemized costs associated with the bid prices for the materials and installation of thirteen SGW systems. In meetings with NHDOT personnel several items were determined to be irrelevant to this project and were thus eliminated from the spreadsheet. These items are itemized in the list below:

- 206.1 (Common Structure Excavation) and 206.2 (Rock Structure Excavation) were determined to be unique and not standard items and eliminated

- 209.1 (Granular Backfill) was determined to reflect typical stabilization for bedding material and were eliminated
- 593.331 (Geotextile, Stabilization, Class 3, Non-woven) was determined to be no longer used, and was replaced with Item 585.7 (Stone Fill, Class G) and thus eliminated
- 593.411 (Geotextile, Permeability Control, Class 1, Non-woven), 593.421 (Geotextile, Permeability Control, Class 2, Non-woven), 593.431 (Geotextile, Permeability Control, Class 3, Non-woven) were determined to be erosion control items and were eliminated
- 603.83206 (6" Plastic Pipe, Smooth Interior), 605.906 (6" Pipe Underdrain, Contractors' Option) were determined to be irrelevant to the SGW construction costs and were thus eliminated.

To compare costs, all original capital construction costs were converted to 2014 dollars using consumer price index inflation rates (USDOL, 2014). Average SGW materials and installation costs from the range of assessed projects (see attachment A for the raw costs) was $32,462 per impervious acre treated ($0.75/sf) with a maximum cost of $68,893 per impervious acre treated ($1.47/sf) and a minimum cost of $12,210 per impervious acre treated ($0.28/sf). As a comparison, for the SGW studied at the UNH field facility, costs were calculated at $28,079 per impervious acre treated ($0.64/sf). Cost details are illustrated in Table 1.

Table 1: Comparison of unit costs from all reviewed NHDOT SGW materials cost data and reference information documented by UNHSC. Note all costs are in 2014 dollars

Total Price Statistics	Contributing Impervious Area (A)	Construction Cost per Impervious Area ($/A)	Construction Cost per Impervious Area ($/sf)	UNHSC Costs ($/A)	UNHSC Costs ($/sf)
Minimum	1.90	$ 12,210	$ 0.28	-	-
Average	4.56	$ 32,462	$ 0.75	$28,079	$ 0.64
Maximum	8.40	$ 63,893	$ 1.47	-	-

Results of the cost assessment indicate room for potential savings with respect to design. In light of the detailed recommendations outlined in the Implementation section of this report, cost adjustments and justifications include:

Eliminate items 605.79 and 605.82251-24 (perimeter dewatering controls) for use if SHGW is within 0.5' of SGW surface. There is no data or clear rationale for any threat from SHGW in SGW systems. SHGW levels are often intermittent and would ultimately be controlled by the outlet orifice which is typically 0.5 to 0.67' below SGW surface. Therefore this item is redundant and further justification is necessary to validate the additional expense. Cost savings is estimated at 3.3% or $1,069 per system.

Reduce the number of item numbers 604.921 and 604.922 (alt: 604.193, 604.393, and 604.912) leaching chambers. Hydraulic inlet controls could be reduced if not eliminated in the future as linear routing through the system is adapted in future designs. Other hydraulic inlet controls such as suggested in the Implementation section of this report may be less expensive and offer

greater maintainability. There is no clear rationale for these structures at the end of each wetland cell as their only function is to provide access to the perforated header pipe in the subsurface as a potential clean out. At the end of the wetland cell these can simply be solid risers capped at the wetland surface. At the upstream end of each wetland cell, hydraulic inlets should be reduced to two if not eliminated and replaced with alternative inlet structures. Hydraulic inlet capacity need only exceed that of the outlet orifice. Cost savings is estimated at 10% or $3,201 per system.

Items 647.1 (Humus) and 647.29 (Wetland Humus) incurred high variability with respect to cost and in some systems had some of the largest percent costs (>12%) than any additional line items. There is no specification for the wetland humus in the NHDOT SGW design guidelines dated December 20, 2013 and the wetland soil specification in the UNHSC 2009 guidance is weak without sufficient detail to allow for accurate and cost effective bidding. Subsequent to this report UNHSC has worked to develop a particle size distribution for use in specifying wetland humus in future SGW systems. The proposed PSD for wetland humus is provided in Table 2 and reflects a poorly drained soil with a d50 of 0.15 mm and is a clay or silt loam in the soil textural triangle. We feel that this will allow for more cost effective bidding of appropriate soil types with the potential to even employ appropriate onsite excavated materials into select humus mixes thereby further reducing costs. We believe with these additional specifications it is not unrealistic to assume a future price of $15/CY, which represents the 25% quartile cost of the original line item. Cost savings is estimated at 0.5% or $164 per system.

Table 2: Particle size distribution and testing tolerances for wetland humus for the subsurface gravel wetland system

US Standard Sieve Size in/mm	Percent Passing	Percent Passing Testing Tolerances
0.5/12.5	100	± 10.0
#10/2.00	90 - 75	± 5.0
#100/0.15	40-50	± 5.0
#200/0.75	25-50	± 5.0

Relative cost savings are summarized in table 3.

Table 3: Comparison of unit costs from all reviewed SGW materials cost data with projected cost savings from recommended itemized design modifications. Note all costs are amortized to reflect 2014 dollars.

Total Price Statistics	Contributing Impervious Area (A)	Construction Cost per Impervious Area ($/A)	Construction Cost per Impervious Area ($/sf)	UNHSC Costs ($/A)	UNHSC Costs ($/sf)
Minimum	1.90	$ 7,895	$ 0.18	-	-
Average	4.56	$ 27,320	$ 0.63	$28,079	$0.64
Maximum	8.40	$ 53,780	$ 1.23	-	-

5.0 Maintenance

Inspection and maintenance is a critical component of the long term function and effectiveness of any stormwater control measure. Overall the UNHSC inspections of the facilities proved that the SGW systems were largely functioning properly and were well designed and constructed. The UNHSC has produced operation and maintenance guidelines as well as an inspection checklist which have been provided in attachment A of this report. Inspection is critical to assess as built functionality in addition to identifying unique maintenance tasks that may be less general in nature and more site specific. Overall the inspections conducted and provided as an attachment to this report (attachment B) indicates that routine biannual inspection (annual as a minimum) should be initiated at these facilities as a standard of practice. Post construction inspections are critical just after newly constructed SGW system is placed online. While some long-term maintenance items are due to system aging and processing of polluted runoff, some operation issues are a result of construction and installation practices not fully aligned with design specifications. These items are often quickly identifiable. In our assessment of eight NHDOT SGW systems two main issues were identified associated with installation or construction. First numerous pre-treatment forebays in observed systems held ponding water. This impacts the overall chemical function and processing of dissolved inorganic nitrogen species as these ponded forebay areas often turn into anaerobic areas of obligate wetland plants. Second on one particular system (NHDOT # 14633F BMP 19) three to five inches of standing water was observed within the entire system. The final water elevation was being controlled by an outlet pipe invert that was installed above the overall wetland soil elevation. This has resulted in sparse vegetation and likely was not part of the original design.

Beyond construction and installation issues the primary maintenance need identified through these inspections is simple maintenance of the established wetland vegetation. Numerous facilities are in need of this type of maintenance which involves cutting the existing plants down to the base and removing it from the system to prevent breakdown and rerelease of nitrogen.

Attachment A: Raw Item Costs

SUBSURFACE GRAVEL WETLANDS (13933C/ DB 920)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	16,603	$4.75	$78,864.25
Item 203.6 - Embankment-in-Place (CY)	245	$8.95	$2,192.75
Item 203. 52 - Impervious Material (CY)	500	$14.00	$7,000.00
Item 585.3- Stone Fill, Class C (CY)	83	$18.00	$1,494.00
Item 585.5 - Stone Fill, Class E (CY)	900	$18.00	$16,200.00
Item 585.7 - Stone Fill, Class G (CY)	120	$24.00	$2,880.00
Item 593.411 - Geotextile, Perm. Control, Cl. 1, Non-woven (SY)	215	$2.10	$451.50
Item 603.83212 - 12" Plastic Pipe (Smooth Interior) (LF)	283	$33.00	$9,339.00
Item 604.91X - Outlet Control Structure (U)	2	$5,800.00	$11,600.00
Item 604.193 - Special Catch Basin (3' Dia) (U)	8	$3,300.00	$26,400.00
Item 604.393 - Specia Drain Manhole 3'x 3' (U)	3	$2,600.00	$7,800.00
Item 605.508 - 8" Perf. Corr. Poly. Pipe Underdrain (LF)	592	$22.00	$13,024.00
Item 605.79 - Underdrain Flushing Basins (EA)	10	$660.00	$6,600.00
Item 605.906 - 6" Pipe Underdrain (Contractor's Option)	506	$16.00	$8,096.00
Item 646.3 - Turf Establishment w/ Mulch & Tackifiers (A)	0.48	$1,650.00	$792.00
Item 647.1 - Humus (CY)	1,900	$15.00	$28,500.00
Item 647.29 - Wetland Humus (CY)	330	$15.00	$4,950.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$225.00	$225.00
Total			**$226,408.50**

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SUBSURFACE GRAVEL WETLANDS (13455A/ GW)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	5,776	$9.75	$56,316.00
Item 203.2 - Rock Excavation (CY)	2,241	$29.00	$64,989.00
Item 203.6 - Embankment-in-Place (CY)	317	$6.25	$1,981.25
Item 203. 53 - Low Permeability Fill (CY)	255	$8.80	$2,244.00
Item 520.1 - Concrete Class A (CY)	6	$375.00	$2,250.00
Item 585.3- Stone Fill, Class C (CY)	131	$34.50	$4,519.50
Item 585.5 - Stone Fill, Class E (CY)	370	$31.00	$11,470.00
Item 585.7 - Stone Fill, Class G (CY)	62	$34.25	$2,123.50
Item 593.421 - Geotextile, Perm. Control, Cl. 2, Non-woven (SY)	502	$2.00	$1,004.00
Item 603.80012 - 12" Plastic Pipe (LF)	31	$40.00	$1,240.00
Item 604.91X - Outlet Control Structure (U)	1	$4,850.00	$4,850.00
Item 604.921 - Leaching Chamber, Type 1 (U)	6	$1,700.00	$10,200.00
Item 604.922 - Leaching Chamber, Type 2 (U)	5	$1,850.00	$9,250.00
Item 605.506 - 6" Perf. Corr. Poly. Pipe Underdrain (LF)	204	$19.50	$3,978.00
Item 647.1 - Humus (CY)	244	$14.00	$3,416.00
Item 647.29 - Wetland Humus (CY)	123	$16.00	$1,968.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$250.00	$250.00
Total			**$182,049.25**

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SUBSURFACE GRAVEL WETLANDS (10620L/ GW)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203. 52 - Impervious Material (CY)	1,919	$18.05	$34,637.95
Item 585.2 - Stone Fill, Class B (CY)	56	$19.15	$1,072.40
Item 585.3- Stone Fill, Class C (CY)	278	$40.25	$11,189.50
Item 585.5 - Stone Fill, Class E (CY)	46	$45.90	$2,111.40
Item 593.431 - Geotextile, Perm. Control, Cl. 3, Non-woven (SY)	200	$6.00	$1,200.00
Item 603.83212 - 12" Plastic Pipe (Smooth Interior) (LF)	50	$32.15	$1,607.50
Item 604.91X - Outlet Control Structure (U)	1	$2,045.00	$2,045.00
Item 604.921 - Leaching Chamber, Type 1 (U)	4	$3,080.00	$12,320.00
Item 604.922 - Leaching Chamber, Type 2 (U)	4	$2,950.00	$11,800.00
Item 605.512 - 12" Perf. Corr. Poly. Pipe Underdrain (LF)	187	$15.75	$2,945.25
Item 647.29 - Wetland Humus (CY)	93	$35.00	$3,255.00
Total			**$84,184.00**

There was no earthwork specifcally attributable to the gravel wetland. It is essentially constructed on top of the existing ground between the Rte. 16 NB slope work and the Exit 15 on ramp slope work.

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SUBSURFACE GRAVEL WETLANDS (10418G/ GW)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	5,978	$8.00	$47,824.00
Item 203.6 - Embankment-in-Place (CY)	8	$5.00	$40.00
Item 203. 52 - Impervious Material (CY)	1,415	$18.00	$25,470.00
Item 206.1 - Common Structure Excavation (CY)	1,225	$16.00	$19,600.00
Item 585.3- Stone Fill, Class C (CY)	21	$30.00	$630.00
Item 585.5 - Stone Fill, Class E (CY)	1,141	$30.00	$34,230.00
Item 593.331 - Geotextile, Stabilization, Cl. 3, Non-woven (SY)	1,711	$3.00	$5,133.00
Item 603.83206 - 6" Plastic Pipe (Smooth Interior) (LF)	55	$24.00	$1,320.00
Item 604.91X - Outlet Control Structure (U)	1	$2,400.00	$2,400.00
Item 604.921 - Leaching Chamber, Type 1 (U)	4	$3,000.00	$12,000.00
Item 604.922 - Leaching Chamber, Type 2 (U)	2	$3,000.00	$6,000.00
Item 605.906 - 6" Pipe Underdrain (Contractors Option) (LF)	602	$16.00	$9,632.00
Item 605.79 - Underdrain Flushing Basins (EA)	8	$600.00	$4,800.00
Item 647.29 - Wetland Humus (CY)	380	$25.00	$9,500.00
Total			**$178,579.00**

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SUBSURFACE GRAVEL WETLANDS (11238L/ BMP 1590)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	3,933	$4.00	$15,732.00
Item 203.6 - Embankment-in-Place (CY)	184	$2.00	$368.00
Item 203. 52 - Impervious Material (CY)	1,530	$15.00	$22,950.00
Item 206.2- Rock Structure Excavation (CY)	27	$30.00	$810.00
Item 520.1 - Concrete Class A (CY)	5	$500.00	$2,700.00
Item 585.3- Stone Fill, Class C (CY)	90	$30.00	$2,700.00
Item 585.5 - Stone Fill, Class E (CY)	182	$28.00	$5,096.00
Item 585.7 - Stone Fill, Class G (CY)	30	$40.00	$1,200.00
Item 593.411 - Geotextile, Perm. Control, Cl. 1, Non-woven (SY)	192	$2.25	$432.00
Item 603.83212 - 12" Plastic Pipe (Smooth Interior) (LF)	20	$32.00	$640.00
Item 604.91X - Outlet Control Structure (U)	1	$3,000.00	$3,000.00
Item 604.921 - Leaching Chamber, Type 1 (U)	6	$1,250.00	$7,500.00
Item 604.922 - Leaching Chamber, Type 2 (U)	5	$1,250.00	$6,250.00
Item 605.512 - 12" Perf. Corr. Poly. Pipe Underdrain (LF)	125	$25.00	$3,125.00
Item 646.31 - Turf Establishment w/ Mulch & Tackifiers (SY)	1,482	$0.35	$518.70
Item 647.1 - Humus (CY)	78	$20.00	$1,560.00
Item 647.29 - Wetland Humus (CY)	103	$35.00	$3,605.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$500.00	$500.00
Total			**$78,686.70**

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SUBSURFACE GRAVEL WETLANDS (11238L/ BMP 922)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	3,822	$4.00	$15,288.00
Item 203.6 - Embankment-in-Place (CY)	467	$2.00	$934.00
Item 206.1 - Common Structure Excavation (CY)	5	$30.00	$150.00
Item 520.1 - Concrete Class A (CY)	4	$500.00	$2,000.00
Item 585.3- Stone Fill, Class C (CY)	22	$30.00	$660.00
Item 585.5 - Stone Fill, Class E (CY)	420	$28.00	$11,760.00
Item 585.7 - Stone Fill, Class G (CY)	69	$40.00	$2,760.00
Item 593.411 - Geotextile, Perm. Control, Cl. 1, Non-woven (SY)	96	$2.25	$216.00
Item 603.83212 - 12" Plastic Pipe (Smooth Interior) (LF)	41	$32.00	$1,312.00
Item 604.91X - Outlet Control Structure (U)	1	$3,000.00	$3,000.00
Item 604.921 - Leaching Chamber, Type 1 (U)	6	$1,250.00	$7,500.00
Item 604.922 - Leaching Chamber, Type 2 (U)	6	$1,250.00	$7,500.00
Item 605.512 - 12" Perf. Corr. Poly. Pipe Underdrain (LF)	306	$25.00	$7,650.00
Item 605.79 - Underdrain Flushing Basins (EA)	2	$500.00	$1,000.00
Item 605.82251 - 24" Agg. Und. Type 2 w/ 6" Perf. Corr. PE Pipe (LF)	565	$25.00	$14,125.00
Item 646.31 - Turf Establishment w/ Mulch & Tackifiers (SY)	3,262	$0.35	$1,141.70
Item 647.1 - Humus (CY)	89	$20.00	$1,780.00
Item 647.29 - Wetland Humus (CY)	304	$35.00	$10,640.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$500.00	$500.00
Total			**$89,916.70**

SUBSURFACE GRAVEL WETLANDS (14633F/ BMP 19)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	2,396	$4.00	$9,584.00
Item 203.6 - Embankment-in-Place (CY)	468	$3.15	$1,474.20
Item 203. 52 - Impervious Material (CY)	582	$15.00	$8,730.00
Item 520.1 - Concrete Class A (CY)	10	$180.00	$1,800.00
Item 585.3- Stone Fill, Class C (CY)	108	$26.00	$2,808.00
Item 585.5 - Stone Fill, Class E (CY)	267	$25.00	$6,675.00
Item 585.7 - Stone Fill, Class G (CY)	44	$35.00	$1,540.00
Item 593.431 - Geotextile, Perm. Control, Cl. 3, Non-woven (SY)	281	$3.00	$843.00
Item 603.83212 - 12" Plastic Pipe (Smooth Interior) (LF)	50	$21.00	$1,050.00
Item 604.91X - Outlet Control Structure (U)	1	$4,000.00	$4,000.00
Item 604.921 - Leaching Chamber, Type 1 (U)	6	$980.00	$5,880.00
Item 604.922 - Leaching Chamber, Type 2 (U)	5	$960.00	$4,800.00
Item 605.506 - 6" Perf. Corr. Poly. Pipe Underdrain (LF)	192	$15.00	$2,880.00
Item 605.79 - Underdrain Flushing Basins (EA)	2	$300.00	$600.00
Item 605.82251 - 24" Agg. Und. Type 2 w/ 6" Perf. Corr. PE Pipe (LF)	429	$20.00	$8,580.00
Item 647.1 - Humus (CY)	233	$20.00	$4,660.00
Item 647.29 - Wetland Humus (CY)	292	$12.50	$3,650.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$110.00	$110.00
Total			**$69,664.20**

SUBSURFACE GRAVEL WETLANDS (14633E/ BMP 17)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	7,638	$3.75	$28,642.50
Item 203.2 - Rock Excavation (CY)	1,923	$10.75	$20,672.25
Item 203.6 - Embankment-in-Place (CY)	4,211	$4.90	$20,633.90
Item 203. 52 - Impervious Material (CY)	1,746	$12.00	$20,952.00
Item 520.1 - Concrete Class A (CY)	23	$525.00	$12,075.00
Item 585.3- Stone Fill, Class C (CY)	194	$25.00	$4,850.00
Item 585.5 - Stone Fill, Class E (CY)	317	$30.00	$9,510.00
Item 585.7 - Stone Fill, Class G (CY)	52	$40.00	$2,080.00
Item 593.431 - Geotextile, Perm. Control, Cl. 3, Non-woven (SY)	580	$2.00	$1,160.00
Item 603.83212 - 12" Plastic Pipe (Smooth Interior) (LF)	38	$24.00	$912.00
Item 604.91X - Outlet Control Structure (U)	1	$2,900.00	$2,900.00
Item 604.921 - Leaching Chamber, Type 1 (U)	6	$1,115.00	$6,690.00
Item 604.922 - Leaching Chamber, Type 2 (U)	5	$1,070.00	$5,350.00
Item 605.506 - 6" Perf. Corr. Poly. Pipe Underdrain (LF)	369	$10.50	$3,874.50
Item 605.79 - Underdrain Flushing Basins (EA)	6	$240.00	$1,440.00
Item 605.82251 - 24" Agg. Und. Type 2 w/ 6" Perf. Corr. PE Pipe (LF)	718	$21.00	$15,078.00
Item 647.29 - Wetland Humus (CY)	289	$20.00	$5,780.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$500.00	$500.00
Total			**$163,100.15**

SUBSURFACE GRAVEL WETLANDS (14633F/ BMP 16)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	3,498	$4.00	$13,992.00
Item 203.2 - Rock Excavation (CY)	3,532	$9.00	$31,788.00
Item 203.6 - Embankment-in-Place (CY)	25	$3.15	$78.75
Item 203. 52 - Impervious Material (CY)	3,435	$15.00	$51,525.00
Item 206.2- Rock Structure Excavation (CY)	39	$17.00	$663.00
Item 209.1 - Granular Backfill (CY)	7	$28.00	$196.00
Item 520.1 - Concrete Class A (CY)	7	$180.00	$1,260.00
Item 585.2 - Stone Fill, Class B (CY)	202	$20.00	$4,040.00
Item 585.3- Stone Fill, Class C (CY)	106	$26.00	$2,756.00
Item 585.5 - Stone Fill, Class E (CY)	667	$25.00	$16,675.00
Item 585.7 - Stone Fill, Class G (CY)	111	$35.00	$3,885.00
Item 593.411 - Geotextile, Perm. Control, Cl. 1, Non-woven (SY)	222	$3.00	$666.00
Item 593.431 - Geotextile, Perm. Control, Cl. 3, Non-woven (SY)	273	$3.00	$819.00
Item 603.83212 - 12" Plastic Pipe (Smooth Interior) (LF)	72	$21.00	$1,512.00
Item 604.91X - Outlet Control Structure (U)	2	$4,000.00	$8,000.00
Item 604.921 - Leaching Chamber, Type 1 (U)	6	$980.00	$5,880.00
Item 604.922 - Leaching Chamber, Type 2 (U)	5	$960.00	$4,800.00
Item 605.506 - 6" Perf. Corr. Poly. Pipe Underdrain (LF)	360	$15.00	$5,400.00
Item 605.79 - Underdrain Flushing Basins (EA)	6	$300.00	$1,800.00
Item 605.82251 - 24" Agg. Und. Type 2 w/ 6" Perf. Corr. PE Pipe (LF)	1,016	$20.00	$20,320.00
Item 647.1 - Humus (CY)	434	$20.00	$8,680.00
Item 647.29 - Wetland Humus (CY)	314	$12.50	$3,925.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$110.00	$110.00
Total			**$188,770.75**

SUBSURFACE GRAVEL WETLANDS (14633E/ BMP 14)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	4,570	$3.75	$17,137.50
Item 203.2 - Rock Excavation (CY)	572	$10.75	$6,149.00
Item 203.6 - Embankment-in-Place (CY)	23	$4.90	$112.70
Item 203. 52 - Impervious Material (CY)	1,049	$12.00	$12,588.00
Item 520.1 - Concrete Class A (CY)	16	$525.00	$8,400.00
Item 585.3- Stone Fill, Class C (CY)	183	$25.00	$4,575.00
Item 585.5 - Stone Fill, Class E (CY)	210	$30.00	$6,300.00
Item 585.7 - Stone Fill, Class G (CY)	35	$40.00	$1,400.00
Item 593.431 - Geotextile, Perm. Control, Cl. 3, Non-woven (SY)	550	$2.00	$1,100.00
Item 603.83212 - 12" Plastic Pipe (Smooth Interior) (LF)	34	$24.00	$816.00
Item 604.91X - Outlet Control Structure (U)	1	$2,900.00	$2,900.00
Item 604.921 - Leaching Chamber, Type 1 (U)	6	$1,115.00	$6,690.00
Item 604.922 - Leaching Chamber, Type 2 (U)	5	$1,070.00	$5,350.00
Item 605.506 - 6" Perf. Corr. Poly. Pipe Underdrain (LF)	296	$10.50	$3,108.00
Item 605.79 - Underdrain Flushing Basins (EA)	2	$240.00	$480.00
Item 605.82251 - 24" Agg. Und. Type 2 w/ 6" Perf. Corr. PE Pipe (LF)	256	$21.00	$5,376.00
Item 647.29 - Wetland Humus (CY)	106	$20.00	$2,120.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$500.00	$500.00
Total			**$85,102.20**

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SUBSURFACE GRAVEL WETLANDS (14633F/ BMP 13)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	8,865	$4.00	$35,460.00
Item 203.2 - Rock Excavation (CY)	1,679	$9.00	$15,111.00
Item 203.6 - Embankment-in-Place (CY)	568	$3.15	$1,789.20
Item 203. 52 - Impervious Material (CY)	4,102	$15.00	$61,530.00
Item 206.2- Rock Structure Excavation (CY)	64	$17.00	$1,088.00
Item 209.1 - Granular Backfill (CY)	9	$28.00	$252.00
Item 520.1 - Concrete Class A (CY)	8	$180.00	$1,440.00
Item 585.3- Stone Fill, Class C (CY)	159	$26.00	$4,134.00
Item 585.5 - Stone Fill, Class E (CY)	922	$25.00	$23,050.00
Item 585.7 - Stone Fill, Class G (CY)	165	$35.00	$5,775.00
Item 593.431 - Geotextile, Perm. Control, Cl. 3, Non-woven (SY)	447	$3.00	$1,341.00
Item 603.83212 - 12" Plastic Pipe (Smooth Interior) (LF)	72	$21.00	$1,512.00
Item 604.91X - Outlet Control Structure (U)	2	$4,000.00	$8,000.00
Item 604.921 - Leaching Chamber, Type 1 (U)	6	$980.00	$5,880.00
Item 604.922 - Leaching Chamber, Type 2 (U)	5	$960.00	$4,800.00
Item 605.506 - 6" Perf. Corr. Poly. Pipe Underdrain (LF)	384	$15.00	$5,760.00
Item 605.79 - Underdrain Flushing Basins (EA)	5	$300.00	$1,500.00
Item 605.82251 - 24" Agg. Und. Type 2 w/ 6" Perf. Corr. PE Pipe (LF)	994	$20.00	$19,880.00
Item 647.1 - Humus (CY)	640	$20.00	$12,800.00
Item 647.29 - Wetland Humus (CY)	467	$12.50	$5,837.50
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$110.00	$110.00
Total			**$217,049.70**

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SUBSURFACE GRAVEL WETLANDS (13742B/ GW #2)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	2,172	$5.00	$10,860.00
Item 203.6 - Embankment-in-Place (CY)	51	$5.00	$255.00
Item 203. 52 - Impervious Material (CY)	462	$14.00	$6,468.00
Item 585.3- Stone Fill, Class C (CY)	93	$27.00	$2,511.00
Item 585.5 - Stone Fill, Class E (CY)	82	$34.00	$2,788.00
Item 585.7 - Stone Fill, Class G (CY)	14	$51.00	$714.00
Item 593.421 - Geotextile, Perm. Control, Cl. 2, Non-woven (SY)	314	$2.50	$785.00
Item 603.80012 - 12" Plastic Pipe (LF)	36	$27.00	$972.00
Item 604.91X - Outlet Control Structure (U)	1	$4,000.00	$4,000.00
Item 604.921 - Leaching Chamber Type 1 (U)	6	$1,350.00	$8,100.00
Item 604.912 - Leaching Chamber Type 2 (U)	5	$1,350.00	$6,750.00
Item 605.506 - 6" Perf. Corr. Poly. Pipe Underdrain (LF)	109	$15.50	$1,689.50
Item 646.3 - Turf Establishment w/ Mulch & Tackifiers (A)	0.50	$1,775.00	$887.50
Item 647.29 - Wetland Humus (CY)	256	$19.00	$4,864.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$170.00	$170.00
Total			**$51,814.00**

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SUBSURFACE GRAVEL WETLANDS (13742B/ GW #1)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	1,150	$5.00	$5,750.00
Item 203.6 - Embankment-in-Place (CY)	831	$5.00	$4,155.00
Item 203. 52 - Impervious Material (CY)	924	$14.00	$12,936.00
Item 585.3- Stone Fill, Class C (CY)	98	$27.00	$2,646.00
Item 585.5 - Stone Fill, Class E (CY)	178	$34.00	$6,052.00
Item 585.7 - Stone Fill, Class G (CY)	30	$51.00	$1,530.00
Item 593.421 - Geotextile, Perm. Control, Cl. 2, Non-woven (SY)	333	$2.50	$832.50
Item 603.80012 - 12" Plastic Pipe (LF)	28	$27.00	$756.00
Item 604.91X - Outlet Control Structure (U)	1	$4,000.00	$4,000.00
Item 604.921 - Leaching Chamber Type 1 (U)	6	$1,350.00	$8,100.00
Item 604.912 - Leaching Chamber Type 2 (U)	5	$1,350.00	$6,750.00
Item 605.506 - 6" Perf. Corr. Poly. Pipe Underdrain (LF)	188	$15.50	$2,914.00
Item 646.3 - Turf Establishment w/ Mulch & Tackifiers (A)	0.40	$1,775.00	$710.00
Item 647.1 - Humus (CY)	330	$18.00	$5,940.00
Item 647.29 - Wetland Humus (CY)	60	$19.00	$1,140.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$170.00	$170.00
Total			**$64,381.50**

Attachment B: Subsurface Gravel Wetland Inspection and Maintenance Guidance

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device

Regular inspection and maintenance is critical to the effective operation of Gravel Wetland systems. It is the responsibility of the owner to maintain the Gravel Wetland in accordance with the minimum design standards. This page provides guidance on maintenance activities that are typically required for these systems, along with the suggested frequency for each activity. Individual systems may have more, or less, frequent maintenance needs, depending on a variety of factors including the occurrence of large storm events, overly wet or dry (I.E., drought), regional hydrologic conditions, and any changes or redevelopment in the upstream land use.

ACTIVITIES

Visual inspections are routine for system maintenance. This includes looking for standing water, accumulated leaves, holes in the soil media, signs of plant distress, and debris and sediment accumulation in the system. Vegetation coverage is integral to the performance of the system and vegetation care is important to system productivity and health. A gravel wetland is a subsurface horizontal filtration system and does not rely upon the surface soils for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of inlet standpipes. It is important to ensure these inlets are performing properly.

1ST YEAR POST-CONSTRUCTION ACTIVITY	FREQUENCY
1. Check that plants have adequate water, are well established and healthy. **Remedy:** Water plants as necessary, remove or treat diseased vegetation as necessary and re-vegetate poorly established plants as necessary	After every major storm in the first few months, then biannually.
2. Check for erosion in the system and short circuiting (holes) in the surface wetland soils. **Remedy:** Soil piping, erosion, and holes should be filled, lightly compacted, and reseeded.	
POST-CONSTRUCTION ACTIVITY	**FREQUENCY**
3. Check inlets outlets and stand pipes for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet, outlets and standpipes if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
4. Check for animal burrows and short circuiting in the system. **Remedy:** Soil erosion from short circuiting or animal boroughs should be repaired when they occur. The holes should be filled and lightly compacted	
5. Check that the depth of accumulated sediment in the sedimentation chamber is less than 12 inches or 10 percent of the pretreatment volume. **Remedy:** The sedimentation chamber, forebay, and treatment cells outlet devices should be cleaned when drawdown times exceed 36 hours. Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.	
6. Inspect inlets and outlets to ensure good condition and no evidence of deterioration. Check to see if high-flow bypass is functioning. **Remedy:** Repair or replace any damaged structural parts, inlets and outlets.	Annually
7. Check for robust vegetation coverage throughout the system. **Remedy:** If at least 50 % vegetation coverage is not established after 2 years, reinforcement planting should be performed.	
8. Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

CHECKLIST FOR INSPECTION OF GRAVEL WETLAND

Location: Inspector:

Date: Time: Site Conditions:

Date Since Last Rain Event:

Inspection Items	Satisfactory (S) or Unsatisfactory (U)		Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)			
Plants are stable, roots not exposed	**S**	**U**	
Vegetation is established and thriving	**S**	**U**	
No evidence of holes in the wetland soil causing short-circuiting	**S**	**U**	
No evidence of erosion at inlet and outlet structures	**S**	**U**	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)			
1. Standing Water			
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	**S**	**U**	
2. Short Circuiting & Erosion			
No evidence of animal burrows or other holes	**S**	**U**	
No evidence of erosion	**S**	**U**	
3. Drought Conditions (As needed)			
Water plants as needed	**S**	**U**	
Dead or dying plants	**S**	**U**	
4. Sedimentation Chamber or Forebay Inlet Inspection			
No evidence of sediment accumulation, trash, and debris.	**S**	**U**	
Good condition, no need for repair	**S**	**U**	
5. Vegetation Coverage			
50 % coverage established throughout system by first year	**S**	**U**	
Robust coverage by year 2 or later	**S**	**U**	
6. Inlet and Outlet Controls			
Flow is unobstructed in openings (grates, orifices, etc)	**S**	**U**	
Structures are operational with no evidence of deterioration	**S**	**U**	
7. Vegetation removal (once every 3 years)			
Prune dead, diseased, or decaying plants	**S**	**U**	

Corrective Action Needed	Due Date
1.	
2.	
3.	

Attachment C: Results of Subsurface Gravel Wetland Inspections

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device

Regular inspection and maintenance is critical to the effective operation of Gravel Wetland systems. It is the responsibility of the owner to maintain the Gravel Wetland in accordance with the minimum design standards. This page provides guidance on maintenance activities that are typically required for these systems, along with the suggested frequency for each activity. Individual systems may have more, or less, frequent maintenance needs, depending on a variety of factors including the occurrence of large storm events, overly wet or dry (I.E., drought), regional hydrologic conditions, and any changes or redevelopment in the upstream land use.

ACTIVITIES

Visual inspections are routine for system maintenance. This includes looking for standing water, accumulated leaves, holes in the soil media, signs of plant distress, and debris and sediment accumulation in the system. Vegetation coverage is integral to the performance of the system and vegetation care is important to system productivity and health. A gravel wetland is a subsurface horizontal filtration system and does not rely upon the surface soils for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of inlet standpipes. It is important to ensure these inlets are performing properly.

1ST YEAR POST-CONSTRUCTION ACTIVITY	FREQUENCY
1. Check that plants have adequate water, are well established and healthy. **Remedy:** Water plants as necessary, remove or treat diseased vegetation as necessary and re-vegetate poorly established plants as necessary	After every major storm in the first few months, then biannually.
2. Check for erosion in the system and short circuiting (holes) in the surface wetland soils. **Remedy:** Soil piping, erosion, and holes should be filled, lightly compacted, and reseeded.	
POST-CONSTRUCTION ACTIVITY	**FREQUENCY**
3. Check inlets outlets and stand pipes for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet, outlets and standpipes if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
4. Check for animal burrows and short circuiting in the system. **Remedy:** Soil erosion from short circuiting or animal boroughs should be repaired when they occur. The holes should be filled and lightly compacted	
5. Check that the depth of accumulated sediment in the sedimentation chamber is less than 12 inches or 10 percent of the pretreatment volume. **Remedy:** The sedimentation chamber, forebay, and treatment cells outlet devices should be cleaned when drawdown times exceed 36 hours. Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.	
6. Inspect inlets and outlets to ensure good condition and no evidence of deterioration. Check to see if high-flow bypass is functioning. **Remedy:** Repair or replace any damaged structural parts, inlets and outlets.	Annually
7. Check for robust vegetation coverage throughout the system. **Remedy:** If at least 50 % vegetation coverage is not established after 2 years, reinforcement planting should be performed.	
8. Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

CHECKLIST FOR INSPECTION OF GRAVEL WETLAND

Location: I93 NB & SB Exit 5 Area DOT#: 14633F BMP 19 Inspector: Tim Puls
Date: 7/18/14 Time: 1:00PM Site Conditions: Poor
Date of Last Rain Event: 7/16/14

Inspection Items	Satisfactory (S) or Unsatisfactory (U)		Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)			
Plants are stable, roots not exposed	**S**	U	Constructed 2013-2014
Vegetation is established and thriving	**S**	U	
No evidence of holes in the wetland soil causing short-circuiting	**S**	U	
No evidence of erosion at inlet and outlet structures	**S**	U	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)			
1. Standing Water			
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	S	**U**	Standing water in fore bay & both cells, approx. 3-5”
2. Short Circuiting & Erosion			
No evidence of animal burrows or other holes	**S**	U	
No evidence of erosion	**S**	U	
3. Drought Conditions (As needed)			Too much water. Plants are thin in areas where water has been pooling.
Water plants as needed	S	**U**	
Dead or dying plants	S	**U**	
4. Sedimentation Chamber or Forebay Inlet Inspection			
No evidence of sediment accumulation, trash, and debris.	**S**	U	
Good condition, no need for repair	**S**	U	
5. Vegetation Coverage			
50 % coverage established throughout system by first year	**S**	U	NA
Robust coverage by year 2 or later	S	U	
6. Inlet and Outlet Controls:			
Flow is unobstructed in openings (grates, orifices, etc)	**S**	U	
Structures are operational with no evidence of deterioration	**S**	U	
7. Vegetation removal (once every 3 years)			
Prune dead, diseased, or decaying plants	S	U	NA

Corrective Action Needed	Due Date
1. Outlet pipe invert is above the wetland soil elevation which keeps the system flooded. Could bring the soil up another 6-8”.	ASAP
COMMENT: Area of system is smaller than other BMPs but has the same number of structures.	

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device

Regular inspection and maintenance is critical to the effective operation of Gravel Wetland systems. It is the responsibility of the owner to maintain the Gravel Wetland in accordance with the minimum design standards. This page provides guidance on maintenance activities that are typically required for these systems, along with the suggested frequency for each activity. Individual systems may have more, or less, frequent maintenance needs, depending on a variety of factors including the occurrence of large storm events, overly wet or dry (I.E., drought), regional hydrologic conditions, and any changes or redevelopment in the upstream land use.

ACTIVITIES

Visual inspections are routine for system maintenance. This includes looking for standing water, accumulated leaves, holes in the soil media, signs of plant distress, and debris and sediment accumulation in the system. Vegetation coverage is integral to the performance of the system and vegetation care is important to system productivity and health. A gravel wetland is a subsurface horizontal filtration system and does not rely upon the surface soils for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of inlet standpipes. It is important to ensure these inlets are performing properly.

1ST YEAR POST-CONSTRUCTION ACTIVITY	FREQUENCY
1. Check that plants have adequate water, are well established and healthy. **Remedy:** Water plants as necessary, remove or treat diseased vegetation as necessary and re-vegetate poorly established plants as necessary	After every major storm in the first few months, then biannually.
2. Check for erosion in the system and short circuiting (holes) in the surface wetland soils. **Remedy:** Soil piping, erosion, and holes should be filled, lightly compacted, and reseeded.	
POST-CONSTRUCTION ACTIVITY	**FREQUENCY**
3. Check inlets outlets and stand pipes for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet, outlets and standpipes if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
4. Check for animal burrows and short circuiting in the system. **Remedy:** Soil erosion from short circuiting or animal boroughs should be repaired when they occur. The holes should be filled and lightly compacted	
5. Check that the depth of accumulated sediment in the sedimentation chamber is less than 12 inches or 10 percent of the pretreatment volume. **Remedy:** The sedimentation chamber, forebay, and treatment cells outlet devices should be cleaned when drawdown times exceed 36 hours. Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.	
6. Inspect inlets and outlets to ensure good condition and no evidence of deterioration. Check to see if high-flow bypass is functioning. **Remedy:** Repair or replace any damaged structural parts, inlets and outlets.	Annually
7. Check for robust vegetation coverage throughout the system. **Remedy:** If at least 50 % vegetation coverage is not established after 2 years, reinforcement planting should be performed.	
8. Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

CHECKLIST FOR INSPECTION OF GRAVEL WETLAND

Location: I93 NB, East side DOT#: 14633F BMP 18 Inspector: Tim Puls
Date: 7/18/14 Time: 1:45PM Site Conditions: Fair, Draining
Date of Last Rain Event: 7/16/14

Inspection Items	Satisfactory (S) or Unsatisfactory (U)	Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)		
Plants are stable, roots not exposed	**S** U	Constructed 2013-2014
Vegetation is established and thriving	**S** U	
No evidence of holes in the wetland soil causing short-circuiting	**S** U	
No evidence of erosion at inlet and outlet structures	**S** U	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)		
1. Standing Water		
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	S **U**	Standing water in fore bay & both cells, approx. 3-5”
2. Short Circuiting & Erosion		
No evidence of animal burrows or other holes	**S** U	
No evidence of erosion	**S** U	
3. Drought Conditions (As needed)		Too much water. Plants are thin in areas where water has been pooling.
Water plants as needed	S **U**	
Dead or dying plants	S **U**	
4. Sedimentation Chamber or Forebay Inlet Inspection		
No evidence of sediment accumulation, trash, and debris.	**S** U	
Good condition, no need for repair	**S** U	
5. Vegetation Coverage		
50 % coverage established throughout system by first year	S **U**	NA
Robust coverage by year 2 or later	S U	
6. Inlet and Outlet Controls:		A piece of trash was blocking outlet orifice. Blockage cleared and system began to drain.
Flow is unobstructed in openings (grates, orifices, etc)	S **U**	
Structures are operational with no evidence of deterioration	**S** U	
7. Vegetation removal (once every 3 years)		
Prune dead, diseased, or decaying plants	S U	NA

Corrective Action Needed	Due Date
1. Outlet control structure has slotted inlets (4” x 12”) that are unprotected. Bring rip rap up over the inlet slots to keep trash out of structure.	ASAP
COMMENT: Area of system is smaller than other BMPs but has the same number of structures.	

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device

Regular inspection and maintenance is critical to the effective operation of Gravel Wetland systems. It is the responsibility of the owner to maintain the Gravel Wetland in accordance with the minimum design standards. This page provides guidance on maintenance activities that are typically required for these systems, along with the suggested frequency for each activity. Individual systems may have more, or less, frequent maintenance needs, depending on a variety of factors including the occurrence of large storm events, overly wet or dry (I.E., drought), regional hydrologic conditions, and any changes or redevelopment in the upstream land use.

ACTIVITIES

Visual inspections are routine for system maintenance. This includes looking for standing water, accumulated leaves, holes in the soil media, signs of plant distress, and debris and sediment accumulation in the system. Vegetation coverage is integral to the performance of the system and vegetation care is important to system productivity and health. A gravel wetland is a subsurface horizontal filtration system and does not rely upon the surface soils for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of inlet standpipes. It is important to ensure these inlets are performing properly.

1ST YEAR POST-CONSTRUCTION ACTIVITY	FREQUENCY
1. Check that plants have adequate water, are well established and healthy. **Remedy:** Water plants as necessary, remove or treat diseased vegetation as necessary and re-vegetate poorly established plants as necessary	After every major storm in the first few months, then biannually.
2. Check for erosion in the system and short circuiting (holes) in the surface wetland soils. **Remedy:** Soil piping, erosion, and holes should be filled, lightly compacted, and reseeded.	
POST-CONSTRUCTION ACTIVITY	**FREQUENCY**
3. Check inlets outlets and stand pipes for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet, outlets and standpipes if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
4. Check for animal burrows and short circuiting in the system. **Remedy:** Soil erosion from short circuiting or animal boroughs should be repaired when they occur. The holes should be filled and lightly compacted	
5. Check that the depth of accumulated sediment in the sedimentation chamber is less than 12 inches or 10 percent of the pretreatment volume. **Remedy:** The sedimentation chamber, forebay, and treatment cells outlet devices should be cleaned when drawdown times exceed 36 hours. Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.	
6. Inspect inlets and outlets to ensure good condition and no evidence of deterioration. Check to see if high-flow bypass is functioning. **Remedy:** Repair or replace any damaged structural parts, inlets and outlets.	Annually
7. Check for robust vegetation coverage throughout the system. **Remedy:** If at least 50 % vegetation coverage is not established after 2 years, reinforcement planting should be performed.	
8. Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

CHECKLIST FOR INSPECTION OF GRAVEL WETLAND

Location: I93 Exit 5 NB Off Ramp Area DOT#: 14633F — Inspector: Tim Puls

Date: 7/18/14 — Time: 12:30AM — Site Conditions: Very Good

Date of Last Rain Event: 7/16/14 — Two systems – BMP 13, BMP 16

Inspection Items	Satisfactory (S) or Unsatisfactory (U)	Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)		
Plants are stable, roots not exposed	S U	New systems – BMP 13 approx. 1.5 years old and BMP 16 is approx. 6 months. GC is Severino Construction
Vegetation is established and thriving	S U	
No evidence of holes in the wetland soil causing short-circuiting	S U	
No evidence of erosion at inlet and outlet structures	S U	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)		
1. Standing Water		
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	S U	None
2. Short Circuiting & Erosion		
No evidence of animal burrows or other holes	S U	
No evidence of erosion	S U	
3. Drought Conditions (As needed)		
Water plants as needed	S U	
Dead or dying plants	S U	
4. Sedimentation Chamber or Forebay Inlet Inspection		
No evidence of sediment accumulation, trash, and debris.	S U	
Good condition, no need for repair	S U	
5. Vegetation Coverage		
50 % coverage established throughout system by first year	S U	
Robust coverage by year 2 or later	S U	
6. Inlet and Outlet Controls:		
Flow is unobstructed in openings (grates, orifices, etc)	S U	
Structures are operational with no evidence of deterioration	S U	
7. Vegetation removal (once every 3 years)		
Prune dead, diseased, or decaying plants	S U	

Corrective Action Needed	Due Date
COMMENT: Both BMPs drain to a central 48" line. Could reduce number of hydraulic inlets and cleanout structures.	

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device

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ACTIVITIES

Visual inspections are routine for system maintenance. This includes looking for standing water, accumulated leaves, holes in the soil media, signs of plant distress, and debris and sediment accumulation in the system. Vegetation coverage is integral to the performance of the system and vegetation care is important to system productivity and health. A gravel wetland is a subsurface horizontal filtration system and does not rely upon the surface soils for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of inlet standpipes. It is important to ensure these inlets are performing properly.

1ST YEAR POST-CONSTRUCTION ACTIVITY	FREQUENCY
1. Check that plants have adequate water, are well established and healthy. **Remedy:** Water plants as necessary, remove or treat diseased vegetation as necessary and re-vegetate poorly established plants as necessary	After every major storm in the first few months, then biannually.
2. Check for erosion in the system and short circuiting (holes) in the surface wetland soils. **Remedy:** Soil piping, erosion, and holes should be filled, lightly compacted, and reseeded.	
POST-CONSTRUCTION ACTIVITY	**FREQUENCY**
3. Check inlets outlets and stand pipes for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet, outlets and standpipes if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
4. Check for animal burrows and short circuiting in the system. **Remedy:** Soil erosion from short circuiting or animal boroughs should be repaired when they occur. The holes should be filled and lightly compacted	
5. Check that the depth of accumulated sediment in the sedimentation chamber is less than 12 inches or 10 percent of the pretreatment volume. **Remedy:** The sedimentation chamber, forebay, and treatment cells outlet devices should be cleaned when drawdown times exceed 36 hours. Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.	
6. Inspect inlets and outlets to ensure good condition and no evidence of deterioration. Check to see if high-flow bypass is functioning. **Remedy:** Repair or replace any damaged structural parts, inlets and outlets.	Annually
7. Check for robust vegetation coverage throughout the system. **Remedy:** If at least 50 % vegetation coverage is not established after 2 years, reinforcement planting should be performed.	
8. Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

CHECKLIST FOR INSPECTION OF GRAVEL WETLAND

Location: I93 Exit 5 NB On Ramp DOT#: 14633E BMP 17 Inspector: Tim Puls
Date: 7/18/14 Time: 1:30PM Site Conditions: Good
Date of Last Rain Event: 7/16/14

Inspection Items	Satisfactory (S) or Unsatisfactory (U)		Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)			
Plants are stable, roots not exposed	**S**	**U**	NA System constructed in 2008-2009
Vegetation is established and thriving	**S**	**U**	
No evidence of holes in the wetland soil causing short-circuiting	**S**	**U**	
No evidence of erosion at inlet and outlet structures	**S**	**U**	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)			
1. Standing Water			
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	**S**	**U** (circled)	Fore bay has pooled water. Full of cattails.
2. Short Circuiting & Erosion			
No evidence of animal burrows or other holes	**S** (circled)	**U**	
No evidence of erosion	**S** (circled)	**U**	
3. Drought Conditions (As needed)			
Water plants as needed	**S** (circled)	**U**	
Dead or dying plants	**S** (circled)	**U**	
4. Sedimentation Chamber or Forebay Inlet Inspection			
No evidence of sediment accumulation, trash, and debris.	**S** (circled)	**U**	
Good condition, no need for repair	**S** (circled)	**U**	
5. Vegetation Coverage			
50 % coverage established throughout system by first year	**S** (circled)	**U**	
Robust coverage by year 2 or later	**S** (circled)	**U**	
6. Inlet and Outlet Controls:			
Flow is unobstructed in openings (grates, orifices, etc)	**S** (circled)	**U**	
Structures are operational with no evidence of deterioration	**S** (circled)	**U**	
7. Vegetation removal (once every 3 years)			No maintenance has been done to date.
Prune dead, diseased, or decaying plants	**S**	**U** (circled)	

Corrective Action Needed	Due Date
1. Cut vegetation down to base and remove from system.	ASAP
COMMENT: Area of system is larger than other BMPs but has the same number of structures. 6 hydraulic inlets, 5 leach basins, 1 outlet	

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device

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ACTIVITIES

Visual inspections are routine for system maintenance. This includes looking for standing water, accumulated leaves, holes in the soil media, signs of plant distress, and debris and sediment accumulation in the system. Vegetation coverage is integral to the performance of the system and vegetation care is important to system productivity and health. A gravel wetland is a subsurface horizontal filtration system and does not rely upon the surface soils for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of inlet standpipes. It is important to ensure these inlets are performing properly.

1ST YEAR POST-CONSTRUCTION ACTIVITY	FREQUENCY
1. Check that plants have adequate water, are well established and healthy. **Remedy:** Water plants as necessary, remove or treat diseased vegetation as necessary and re-vegetate poorly established plants as necessary	After every major storm in the first few months, then biannually.
2. Check for erosion in the system and short circuiting (holes) in the surface wetland soils. **Remedy:** Soil piping, erosion, and holes should be filled, lightly compacted, and reseeded.	
POST-CONSTRUCTION ACTIVITY	**FREQUENCY**
3. Check inlets outlets and stand pipes for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet, outlets and standpipes if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
4. Check for animal burrows and short circuiting in the system. **Remedy:** Soil erosion from short circuiting or animal boroughs should be repaired when they occur. The holes should be filled and lightly compacted	
5. Check that the depth of accumulated sediment in the sedimentation chamber is less than 12 inches or 10 percent of the pretreatment volume. **Remedy:** The sedimentation chamber, forebay, and treatment cells outlet devices should be cleaned when drawdown times exceed 36 hours. Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.	
6. Inspect inlets and outlets to ensure good condition and no evidence of deterioration. Check to see if high-flow bypass is functioning. **Remedy:** Repair or replace any damaged structural parts, inlets and outlets.	Annually
7. Check for robust vegetation coverage throughout the system. **Remedy:** If at least 50 % vegetation coverage is not established after 2 years, reinforcement planting should be performed.	
8. Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

CHECKLIST FOR INSPECTION OF GRAVEL WETLAND

Location: I93 Exit 5 SB On Ramp DOT#: 14633E BMP 14 Inspector: Tim Puls

Date: 7/18/14 Time: 1:20PM Site Conditions: Good

Date of Last Rain Event: 7/16/14

Inspection Items	Satisfactory (S) or Unsatisfactory (U)		Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)			
Plants are stable, roots not exposed	**S**	**U**	NA System constructed in 2008-2009
Vegetation is established and thriving	**S**	**U**	
No evidence of holes in the wetland soil causing short-circuiting	**S**	**U**	
No evidence of erosion at inlet and outlet structures	**S**	**U**	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)			
1. Standing Water			
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	**S**	**U**	Fore bay is dry
2. Short Circuiting & Erosion			
No evidence of animal burrows or other holes	**S**	**U**	
No evidence of erosion	**S**	**U**	
3. Drought Conditions (As needed)			
Water plants as needed	**S**	**U**	
Dead or dying plants	**S**	**U**	
4. Sedimentation Chamber or Forebay Inlet Inspection			
No evidence of sediment accumulation, trash, and debris.	**S**	**U**	
Good condition, no need for repair	**S**	**U**	
5. Vegetation Coverage			
50 % coverage established throughout system by first year	**S**	**U**	
Robust coverage by year 2 or later	**S**	**U**	
6. Inlet and Outlet Controls:			
Flow is unobstructed in openings (grates, orifices, etc)	**S**	**U**	
Structures are operational with no evidence of deterioration	**S**	**U**	
7. Vegetation removal (once every 3 years)			No maintenance has been done to date.
Prune dead, diseased, or decaying plants	**S**	**U**	

Corrective Action Needed	Due Date
1. Cut vegetation down to base and remove from system.	ASAP
COMMENT: Area of system is smaller than other BMPs but has the same number of structures. 6 hydraulic inlets, 5 leach basins, 1 outlet	

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device

Regular inspection and maintenance is critical to the effective operation of Gravel Wetland systems. It is the responsibility of the owner to maintain the Gravel Wetland in accordance with the minimum design standards. This page provides guidance on maintenance activities that are typically required for these systems, along with the suggested frequency for each activity. Individual systems may have more, or less, frequent maintenance needs, depending on a variety of factors including the occurrence of large storm events, overly wet or dry (I.E., drought), regional hydrologic conditions, and any changes or redevelopment in the upstream land use.

ACTIVITIES

Visual inspections are routine for system maintenance. This includes looking for standing water, accumulated leaves, holes in the soil media, signs of plant distress, and debris and sediment accumulation in the system. Vegetation coverage is integral to the performance of the system and vegetation care is important to system productivity and health. A gravel wetland is a subsurface horizontal filtration system and does not rely upon the surface soils for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of inlet standpipes. It is important to ensure these inlets are performing properly.

1ST YEAR POST-CONSTRUCTION ACTIVITY	FREQUENCY
1. Check that plants have adequate water, are well established and healthy. **Remedy:** Water plants as necessary, remove or treat diseased vegetation as necessary and re-vegetate poorly established plants as necessary	After every major storm in the first few months, then biannually.
2. Check for erosion in the system and short circuiting (holes) in the surface wetland soils. **Remedy:** Soil piping, erosion, and holes should be filled, lightly compacted, and reseeded.	
POST-CONSTRUCTION ACTIVITY	**FREQUENCY**
3. Check inlets outlets and stand pipes for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet, outlets and standpipes if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
4. Check for animal burrows and short circuiting in the system. **Remedy:** Soil erosion from short circuiting or animal boroughs should be repaired when they occur. The holes should be filled and lightly compacted	
5. Check that the depth of accumulated sediment in the sedimentation chamber is less than 12 inches or 10 percent of the pretreatment volume. **Remedy:** The sedimentation chamber, forebay, and treatment cells outlet devices should be cleaned when drawdown times exceed 36 hours. Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.	
6. Inspect inlets and outlets to ensure good condition and no evidence of deterioration. Check to see if high-flow bypass is functioning. **Remedy:** Repair or replace any damaged structural parts, inlets and outlets.	Annually
7. Check for robust vegetation coverage throughout the system. **Remedy:** If at least 50 % vegetation coverage is not established after 2 years, reinforcement planting should be performed.	
8. Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

CHECKLIST FOR INSPECTION OF GRAVEL WETLAND

Location: I93 Exit 1 NB Off Ramp DOT#: 13933C | Inspector: Tim Puls

Date: 7/18/14 | Time: 11:00AM | Site Conditions: Very Good

Date of Last Rain Event: 7/16/14

Inspection Items	Satisfactory (S) or Unsatisfactory (U)	Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)		
Plants are stable, roots not exposed	S U	NA – This system was constructed in 2007
Vegetation is established and thriving	S U	
No evidence of holes in the wetland soil causing short-circuiting	S U	
No evidence of erosion at inlet and outlet structures	S U	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)		
1. Standing Water		
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	(S) U	None
2. Short Circuiting & Erosion		
No evidence of animal burrows or other holes	(S) U	
No evidence of erosion	(S) U	
3. Drought Conditions (As needed)		
Water plants as needed	(S) U	
Dead or dying plants	(S) U	
4. Sedimentation Chamber or Forebay Inlet Inspection		Some trash has accumulated
No evidence of sediment accumulation, trash, and debris.	(S) U	
Good condition, no need for repair	(S) U	
5. Vegetation Coverage		Plants are in good condition. Treatment cells are densely vegetated.
50 % coverage established throughout system by first year	(S) U	
Robust coverage by year 2 or later	(S) U	
6. Inlet and Outlet Controls:		Concrete outlet structure 8' x 10'
Flow is unobstructed in openings (grates, orifices, etc)	(S) U	
Structures are operational with no evidence of deterioration	(S) U	
7. Vegetation removal (once every 3 years)		No maintenance has been done to date.
Prune dead, diseased, or decaying plants	S (U)	

Corrective Action Needed	Due Date
1. Maintain vegetation = cut down to base of plant and remove vegetation from system	
COMMENT: This is an extremely large system. RRoseen advised them to replace "E Stone" with 3/8" pea stone during construction.	

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device

Regular inspection and maintenance is critical to the effective operation of Gravel Wetland systems. It is the responsibility of the owner to maintain the Gravel Wetland in accordance with the minimum design standards. This page provides guidance on maintenance activities that are typically required for these systems, along with the suggested frequency for each activity. Individual systems may have more, or less, frequent maintenance needs, depending on a variety of factors including the occurrence of large storm events, overly wet or dry (I.E., drought), regional hydrologic conditions, and any changes or redevelopment in the upstream land use.

ACTIVITIES

Visual inspections are routine for system maintenance. This includes looking for standing water, accumulated leaves, holes in the soil media, signs of plant distress, and debris and sediment accumulation in the system. Vegetation coverage is integral to the performance of the system and vegetation care is important to system productivity and health. A gravel wetland is a subsurface horizontal filtration system and does not rely upon the surface soils for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of inlet standpipes. It is important to ensure these inlets are performing properly.

1ST YEAR POST-CONSTRUCTION ACTIVITY	FREQUENCY
1. Check that plants have adequate water, are well established and healthy. **Remedy:** Water plants as necessary, remove or treat diseased vegetation as necessary and re-vegetate poorly established plants as necessary	After every major storm in the first few months, then biannually.
2. Check for erosion in the system and short circuiting (holes) in the surface wetland soils. **Remedy:** Soil piping, erosion, and holes should be filled, lightly compacted, and reseeded.	
POST-CONSTRUCTION ACTIVITY	**FREQUENCY**
3. Check inlets outlets and stand pipes for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet, outlets and standpipes if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
4. Check for animal burrows and short circuiting in the system. **Remedy:** Soil erosion from short circuiting or animal boroughs should be repaired when they occur. The holes should be filled and lightly compacted	
5. Check that the depth of accumulated sediment in the sedimentation chamber is less than 12 inches or 10 percent of the pretreatment volume. **Remedy:** The sedimentation chamber, forebay, and treatment cells outlet devices should be cleaned when drawdown times exceed 36 hours. Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.	
6. Inspect inlets and outlets to ensure good condition and no evidence of deterioration. Check to see if high-flow bypass is functioning. **Remedy:** Repair or replace any damaged structural parts, inlets and outlets.	Annually
7. Check for robust vegetation coverage throughout the system. **Remedy:** If at least 50 % vegetation coverage is not established after 2 years, reinforcement planting should be performed.	
8. Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

CHECKLIST FOR INSPECTION OF GRAVEL WETLAND

Location: Rt. 16 NB Exit 5 Inspector: Jamie Houle, Tim Puls

Date: 6/20/14 Time: 10:00AM Site Conditions: Good

Date of Last Rain Event: 6/13/14 (0.75")

Inspection Items	Satisfactory (S) or Unsatisfactory (U)		Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)			
Plants are stable, roots not exposed	S	U	NA System constructed in 2010-2011
Vegetation is established and thriving	S	U	
No evidence of holes in the wetland soil causing short-circuiting	S	U	
No evidence of erosion at inlet and outlet structures	S	U	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)			
1. Standing Water			
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	(S)	U	Fore bay has pooled water. Some cattails.
2. Short Circuiting & Erosion			
No evidence of animal burrows or other holes	(S)	U	
No evidence of erosion	(S)	U	
3. Drought Conditions (As needed)			
Water plants as needed	(S)	U	
Dead or dying plants	(S)	U	
4. Sedimentation Chamber or Forebay Inlet Inspection			Wet fore bay w/ evidence of anaerobic conditions, i.e. standing water, cattails, and algae.
No evidence of sediment accumulation, trash, and debris.	S	(U)	
Good condition, no need for repair	S	(U)	
5. Vegetation Coverage			
50 % coverage established throughout system by first year	(S)	U	
Robust coverage by year 2 or later	(S)	U	
6. Inlet and Outlet Controls:			Inlet is obstructed due to high elevation of fore bay control. Need low flow outlet from fore bay.
Flow is unobstructed in openings (grates, orifices, etc)	(S)	U	
Structures are operational with no evidence of deterioration	(S)	U	
7. Vegetation removal (once every 3 years)			
Prune dead, diseased, or decaying plants	(S)	U	

Corrective Action Needed	Due Date
1. Fore bay needs to be drained. 2.2ft of standing water.	ASAP
COMMENT:	

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device

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ACTIVITIES

Visual inspections are routine for system maintenance. This includes looking for standing water, accumulated leaves, holes in the soil media, signs of plant distress, and debris and sediment accumulation in the system. Vegetation coverage is integral to the performance of the system and vegetation care is important to system productivity and health. A gravel wetland is a subsurface horizontal filtration system and does not rely upon the surface soils for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of inlet standpipes. It is important to ensure these inlets are performing properly.

1ST YEAR POST-CONSTRUCTION ACTIVITY	FREQUENCY
1. Check that plants have adequate water, are well established and healthy. **Remedy:** Water plants as necessary, remove or treat diseased vegetation as necessary and re-vegetate poorly established plants as necessary	After every major storm in the first few months, then biannually.
2. Check for erosion in the system and short circuiting (holes) in the surface wetland soils. **Remedy:** Soil piping, erosion, and holes should be filled, lightly compacted, and reseeded.	
POST-CONSTRUCTION ACTIVITY	**FREQUENCY**
3. Check inlets outlets and stand pipes for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet, outlets and standpipes if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
4. Check for animal burrows and short circuiting in the system. **Remedy:** Soil erosion from short circuiting or animal boroughs should be repaired when they occur. The holes should be filled and lightly compacted	
5. Check that the depth of accumulated sediment in the sedimentation chamber is less than 12 inches or 10 percent of the pretreatment volume. **Remedy:** The sedimentation chamber, forebay, and treatment cells outlet devices should be cleaned when drawdown times exceed 36 hours. Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.	
6. Inspect inlets and outlets to ensure good condition and no evidence of deterioration. Check to see if high-flow bypass is functioning. **Remedy:** Repair or replace any damaged structural parts, inlets and outlets.	Annually
7. Check for robust vegetation coverage throughout the system. **Remedy:** If at least 50 % vegetation coverage is not established after 2 years, reinforcement planting should be performed.	
8. Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

CHECKLIST FOR INSPECTION OF GRAVEL WETLAND

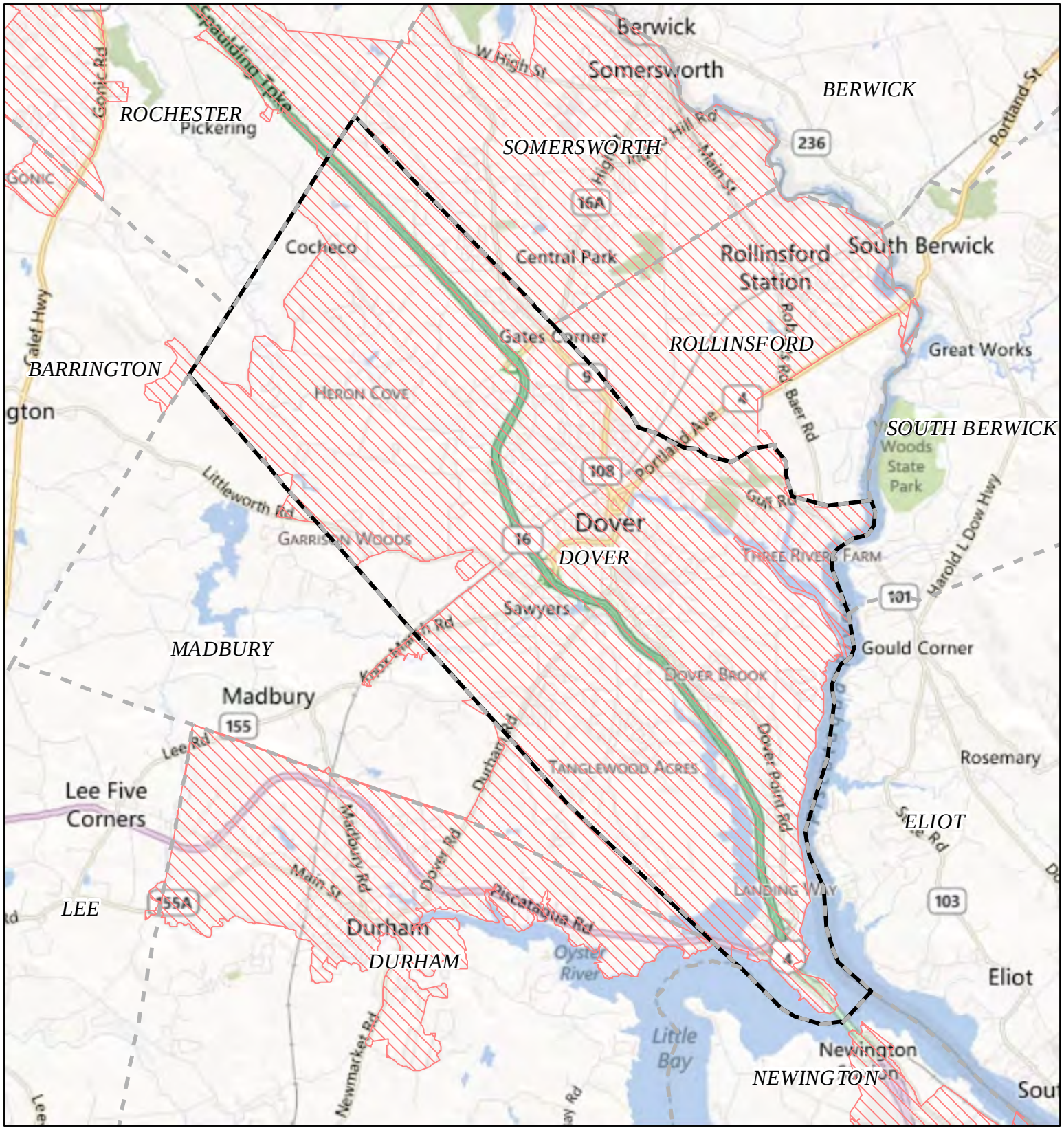
Location: I93 Exit 2 Park & Ride. DOT#: 10418G | Inspector: Tim Puls

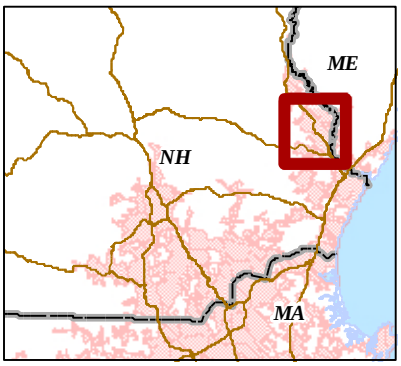
Date: 7/18/14 | Time: 10:30AM | Site Conditions: Very Good

Date of Last Rain Event: 7/16/14

Inspection Items	Satisfactory (S) or Unsatisfactory (U)	Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)		
Plants are stable, roots not exposed	S U	NA – This system was constructed in 2007
Vegetation is established and thriving	S U	
No evidence of holes in the wetland soil causing short-circuiting	S U	
No evidence of erosion at inlet and outlet structures	S U	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)		
1. Standing Water		
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	(S) U	Plunge pools around the 3 inlet locations
2. Short Circuiting & Erosion		
No evidence of animal burrows or other holes	(S) U	
No evidence of erosion	(S) U	
3. Drought Conditions (As needed)		
Water plants as needed	(S) U	
Dead or dying plants	(S) U	
4. Sedimentation Chamber or Forebay Inlet Inspection		Some trash has accumulated
No evidence of sediment accumulation, trash, and debris.	(S) U	
Good condition, no need for repair	(S) U	
5. Vegetation Coverage		Plants are in good condition. Forebay is >95% cattails. Treatment cells are densely vegetated.
50 % coverage established throughout system by first year	(S) U	
Robust coverage by year 2 or later	(S) U	
6. Inlet and Outlet Controls		
Flow is unobstructed in openings (grates, orifices, etc)	(S) U	
Structures are operational with no evidence of deterioration	(S) U	
7. Vegetation removal (once every 3 years)		No maintenance has been done to date.
Prune dead, diseased, or decaying plants	S (U)	

Corrective Action Needed	Due Date
1. Maintain vegetation = cut down to base of plant and remove vegetation from system	
COMMENT: Perimeter ground water drainage is a 6" PUD in 2'x3' stone trench. Flow is directed to inlets.	





NPDES Phase II Stormwater Program
Automatically Designated MS4 Areas

Dover NH

Regulated Area (2000 + 2010 Urbanized Area)

0 1 2 3 4 5 6 Kilometers

0 1 2 3 4 5 Miles

Town Population: 29987

Regulated Population: 29869

(Populations estimated from 2010 Census)

Urbanized Areas, Town Boundaries:
US Census (2000, 2010)

Base map © 2010 Microsoft Corporation
and its data suppliers

US EPA Region 1 GIS Center Map #8824, 11/19/2012

Welcome to New Hampshire's Watershed Report Cards built from the 2018, 305(b)/303(d)

Each Watershed Report Card covers a single 12 digit Hydrologic Unit Code (HUC12), on average a 34 square mile area. Each Watershed Report Card has three components;

1. REPORT CARD - A one page card that summarizes the overall use support for Aquatic Life Integrity, Primary Contact (i.e. Swimming), and Secondary Contact (i.e. Boating) Designated Uses on every Assessment Unit ID (AUID) within the HUC12.
2. HUC 12 MAP - A map of the watershed with abbreviated labels for each AUID within the HUC12.
3. ASSESSMENT DETAILS - Anywhere from one to forty pages with the detailed assessment information for each and every AUID in the Report Card and Map.

How are the Surface Water Quality Assessment determinations made?

All readily available data with reliable Quality Assurance/Quality Control is used in the biennial surface water quality assessments. For a full understanding of how the Surface Water Quality Standards (Env-Wq 1700) are translated into surface water quality assessments we urge the reader to review the 2018 Consolidated Assessment and Listing Methodology (CALM) at https://www.des.nh.gov/organization/divisions/water/wmb/swqa/2018/documents/r-wd-19-04.pdf.

Where can I find more advanced mapping resources?

GIS files are available by assessment cycle at ftp://pubftp.nh.gov/DES/wmb/WaterQuality/SWQA/2018/GIS

I'd like to see the more raw water quality data?

The web mapping tool allows you to download the data used in the assessment of the primary contact and aquatic life designated uses by clicking on the "Data Access Waterbody Data (Aquatic Life and Swimming Uses)" link for any assessment unit. (https://www.des.nh.gov/organization/divisions/water/wmb/swqa/assessment-viewers.htm)

How are assessments coded in the report card?

Assessment outcomes are displayed on a color scale as well as an alpha numeric scale that provides additional distinctions for the designated use and parameter level assessments as outlined in the table below.

		Severe Not Supporting, Severe	**Poor** Not Supporting, Marginal	**Likely Bad** Insufficient Information – Potentially Not Supporting	**No Data** No Data	**Likely Good** Insufficient Information – Potentially Full Supporting	**Marginal** Full Support, Marginal	**Good** Full Support, Good
CATEGORY	**Description**							
Category 2	Meets standards						2-M or 2-OBS	2-G
Category 3	Insufficient Information			3-PNS	3-ND	3-PAS		
Category 4	Does not Meet Standards;							
4A	TMDL* Completed	4A-P	4A-M or 4A-T					
4B	Other enforceable measure will correct the issue.	4B-P	4B-M or 4B-T					
4C	Non-pollutant (i.e. exotic weeds)	4C-P	4C-M					
Category 5	TMDL^ Needed	5-P	5-M or 5-T					

* TMDL stands for Total Maximum Daily Load studies (http://des.nh.gov/organization/divisions/water/wmb/tmdl/index.htm)

WATERSHED 305(b) ASSESSMENT SUMMARY REPORT:

HUC 12 010600030608

HUC 12 NAME LOWER COCHECO RIVER

(Locator map on next page only applies to this HUC12)

Assessment Cycle 2018

Good		Full Support Good
Marginal		Full Support Marginal
Likely Good		Insufficient Information – Potentially Full Support
No Data		No Data
Likely Bad		Insufficient Information – Potentially Not Support
Poor		Not Support Marginal
Severe		Not Support Severe



ASSESSMENT UNIT ID	MAP LABEL	ASSESSMENT UNIT NAME	AQUATIC LIFE	SWIMMING	BOATING	FISH CONSUMP.
NHEST600030608-01	E*01	COCHECO RIVER	5-P	5-P	4A-M	5-M
NHIMP600030607-02	I*0607-02	COCHECO RIVER - GONIC DAM POND	5-M	4A-P	2-G	4A-M
NHIMP600030607-03	I*0607-03	COCHECO RIVER - MILL POND DAM	3-PAS	3-ND	3-ND	4A-M
NHIMP600030608-02	I*02	COCHECO RIVER - WATSON WALDRON DAM	5-M	2-G	2-G	4A-M
NHIMP600030608-04	I*04	COCHECO RIVER - CENTRAL AVE DAM	5-M	2-G	2-G	4A-M
NHIMP600030608-05	I*05	CONSERVATION POND DAM	3-ND	3-ND	3-ND	4A-M
NHIMP600030608-06	I*06	FRESH CREEK - FARM POND	3-ND	3-ND	3-ND	4A-M
NHLAK600030608-01	L*01	FRESH CREEK POND	5-M	4A-P	2-G	4A-M
NHLAK600030608-02	L*02	UNNAMED POND	3-ND	3-PAS	3-PAS	4A-M
NHRIV600030607-12	R*0607-12	UNNAMED TRIBUTARY - TO COCHECO RIVER	3-ND	3-ND	3-ND	4A-M
NHRIV600030607-13	R*0607-13	UNNAMED BROOK - TO COCHECO RIVER	3-ND	3-ND	3-ND	4A-M
NHRIV600030607-14	R*0607-14	COCHECO RIVER	3-ND	3-ND	3-ND	4A-M
NHRIV600030607-15	R*0607-15	COCHECO RIVER	5-M	2-G	2-G	4A-M
NHRIV600030608-02	R*02	BLACKWATER BROOK-CLARK BROOK	3-ND	4A-P	3-ND	4A-M
NHRIV600030608-03	R*03	COCHECO RIVER - UNNAMED BROOK	5-M	4A-M	2-G	4A-M
NHRIV600030608-04	R*04	REYNERS BROOK	3-ND	4A-P	3-ND	4A-M
NHRIV600030608-05	R*05	COCHECO RIVER	5-M	4A-M	2-G	4A-M
NHRIV600030608-06	R*06	INDIAN BROOK	5-P	4A-P	3-ND	4A-M
NHRIV600030608-07	R*07	EMERSON BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-08	R*08	FRESH CREEK - TWOMBLY BROOK	5-P	4A-M	3-ND	4A-M
NHRIV600030608-09	R*09	UNNAMED BROOK - ROLLINS BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-10	R*10	ROLLINS BROOK	5-P	4A-P	3-ND	4A-M
NHRIV600030608-11	R*11	FRESH CREEK	3-PNS	4A-P	4A-M	4A-M
NHRIV600030608-12	R*12	UNNAMED TRIBUTARY - TO COCHECO RIVER (DOVER (DOWNSTREAM OF PORTLAND AVE))	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-13	R*13	UNNAMED TRIBUTARY - TO COCHECO RIVER - (DOVER (UPSTREAM OF ATLANTIC AVE))	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-14	R*14	UNNAMED TRIB. TO COCHECO RIVER, DOVER (FROM LANDFILL)	5-M	3-ND	3-ND	4A-M
NHRIV600030608-15	R*15	BERRY BROOK	5-M	4A-P	2-G	4A-M

WATERSHED 305(b) ASSESSMENT SUMMARY REPORT:

HUC 12 010600030608

HUC 12 NAME LOWER COCHECO RIVER

(Locator map on next page only applies to this HUC12)

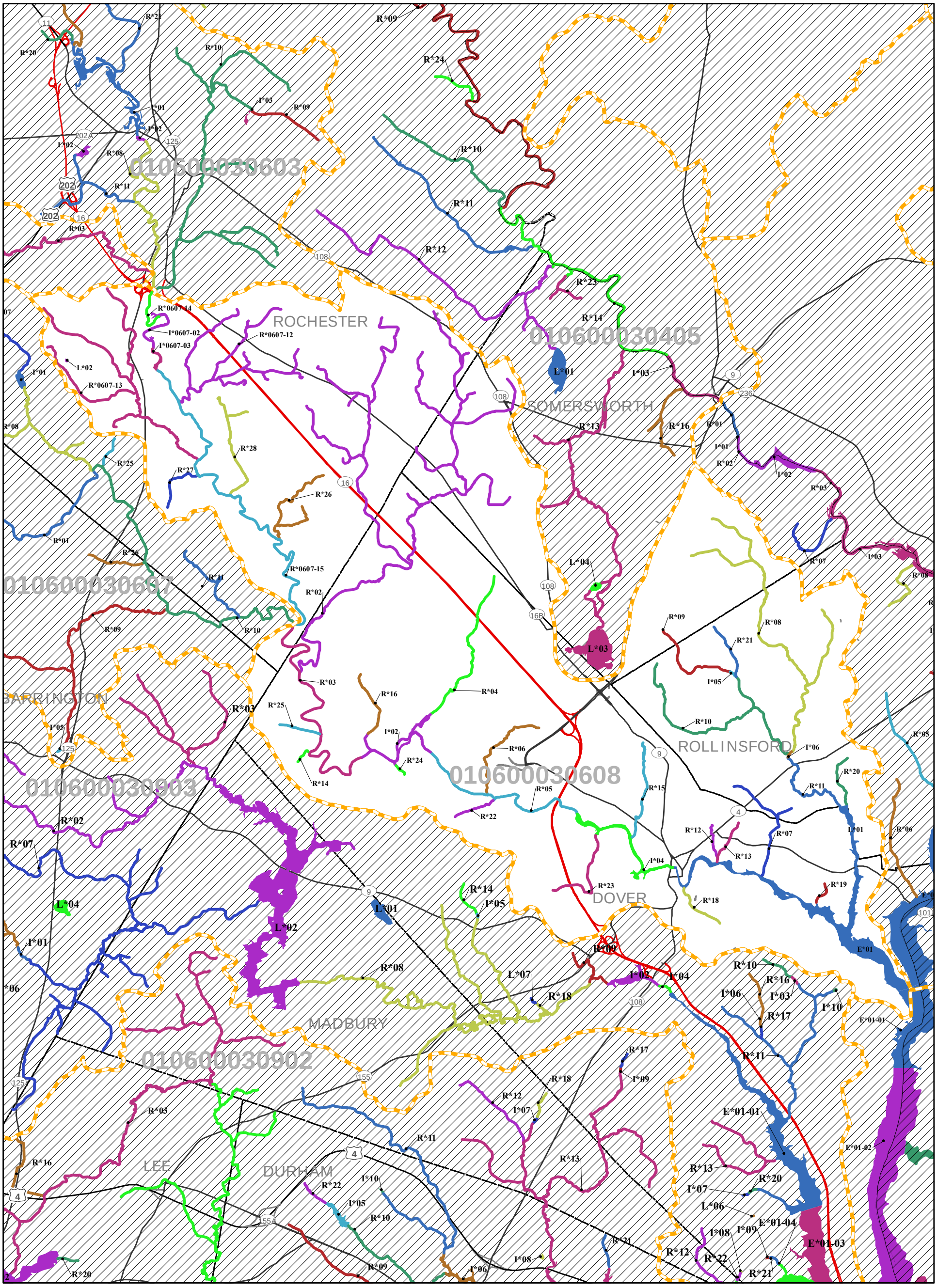
Assessment Cycle 2018

Good		Full Support Good
Marginal		Full Support Marginal
Likely Good		Insufficient Information – Potentially Full Support
No Data		No Data
Likely Bad		Insufficient Information – Potentially Not Support
Poor		Not Support Marginal
Severe		Not Support Severe



ASSESSMENT UNIT ID	MAP LABEL	ASSESSMENT UNIT NAME	AQUATIC LIFE	SWIMMING	BOATING	FISH CONSUMP.
NHRIV600030608-16	R*16	JACKSON BROOK	3-ND	4A-P	3-ND	4A-M
NHRIV600030608-18	R*18	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-19	R*19	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-20	R*20	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-21	R*21	UNNAMED BROOK - TO ROLLINS BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-22	R*22	HORN BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-23	R*23	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-24	R*24	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-25	R*25	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-26	R*26	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-27	R*27	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-28	R*28	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M

AUIDs For HUC12: 010600030608 - Lower Cocheco River



HUC12 Boundaries
Town Boundaries
Major Roads
Interstate Highway
US Highway
State Highway

Assessment Unit Coloring
AUs Ending with:
0 =
1 =
2 =
3 =
4 =
5 =
6 =
7 =
8 =
9 =

N
W E
S

Abbrv. Label	HUC 12
L* 03	010 700060201

AUID = NH L AK 700060201 - 03

Assessment Unit IDs are derived from the HUC12 they reside within. The labels have been shortened on this map for presentation purposes.
Example: the Label "L*03" in HUC12 = 010700060201 represents AUID = "NHLAK700060201-03"
In rare cases where an AUID extends beyond the boundary of a single HUC12, additional portions of the end of the HUC 12 number have also been replaced.

0 0.6 1.2 1.8 2.4 Miles

Scale:1:59,820

S:\WD-Watershed\WQ_Planning\305b_303d\2018\AUIDs\HUC12Maps

Assessment Unit ID NHRIV600030608-05
Assessment Unit Name COCHECO RIVER
Primary Town DOVER

Size 2.0600 MILES
Beach N
Assessment Unit Category*~ 5-M

2018, 305(b)/303(d) - All Reviewed Parameters by Assessment Unit

Designated Use Description	*Desig. Use Category	Parameter Name	Parameter Threatened (Y/N)	Last Sample	Last Exceed	Parameter Category*	TMDL Priority
Aquatic Life Integrity	5-M	ALUMINUM	N	1999	1999	3-ND	
		AMMONIA (TOTAL)	N	2005	N/A	3-ND	
		ARSENIC	N	2004	N/A	3-ND	
		CADMIUM	N	1999	1999	3-ND	
		CHLORIDE	N	2013	N/A	3-PAS	
		COPPER	N	1999	N/A	3-ND	
		DISSOLVED OXYGEN SATURATION	N	2013	N/A	3-PAS	
		IRON	N	2004	N/A	3-ND	
		LEAD	N	1999	1999	3-ND	
		OXYGEN, DISSOLVED	N	2013	N/A	3-PAS	
		PHOSPHORUS (TOTAL)	N	2013	NLV	3-PNS	
		TURBIDITY	N	2013	N/A	3-PAS	
		ZINC	N	1999	N/A	3-ND	
		pH	N	2013	2009	5-M	LOW
Fish Consumption	4A-M	ARSENIC	N	2004	2004	3-ND	
		COPPER	N	1999	N/A	3-ND	
		Mercury	N			4A-M	
		ZINC	N	1999	N/A	3-ND	
Potential Drinking Water Supply	2-G	ARSENIC	N	2004	2004	3-ND	
		COPPER	N	1999	N/A	3-ND	
		ESCHERICHIA COLI	N	2013	2013	3-PNS	
		IRON	N	2004	2004	3-ND	
		ZINC	N	1999	N/A	3-ND	
Primary Contact Recreation	4A-M	Escherichia coli	N	2013	2013	4A-M	
Secondary Contact Recreation	2-G	ESCHERICHIA COLI	N	2013	N/A	2-G	
Wildlife	3-ND						

Severe	Poor	Likely Bad	No Data	Likely Good	Marginal	Good
Not Supporting, Severe	Not Supporting, Marginal	Insufficient Information – Potentially Full Supporting	No Data	Insufficient Information – Potentially Full Supporting	Full Support, Marginal	Full Support, Good

*DES Categories; 2-G = Supports Parameter well above criteria, 2-M = Supports Parameter marginally above criteria, 2-OBS = Exceeds WQ criteria but natural therefore not a WQ exceedence, 3-ND = Insufficient Information/No data, 3-PAS= Insufficient Information/Potentially Attaining Standard, 3-PNS= Insufficient Information/Potentially Not Attaining Standard, (4A=Impaired/TMDL Completed, 4B=Impaired/Other Measure will rectify Impairment, 4C=Impaired/Non-Pollutant, 5=Impaired/TMDL needed) M=Marginal Impairment, P=Severe Impairment, T=Threatened (http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm)

Cycle	Assessment Unit ID (AUID)	Assessment Unit Name	Town(s) Primary Town is Listed First	Water Size	Size Unit	Designated Use Description	Parameter Name	NHDES Category	Threatened	TMDL Priority
2018	NHRIV600030607-01	ISINGLASS RIVER	BARRINGTON, ROCHESTER	7.336	MILES	Aquatic Life Integrity	pH	5-P	N	LOW
2018	NHRIV600030607-03	AYERS POND BROOK	BARRINGTON	0.128	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-M	N	LOW
2018	NHRIV600030607-03	AYERS POND BROOK	BARRINGTON	0.128	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030607-04	AYERS POND BROOK	BARRINGTON	1.691	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-M	N	LOW
2018	NHRIV600030607-04	AYERS POND BROOK	BARRINGTON	1.691	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030607-08	HANSON BROOK	ROCHESTER, BARRINGTON	2.411	MILES	Aquatic Life Integrity	pH	5-M		LOW
2018	NHRIV600030607-09	GREEN HILL BROOK	BARRINGTON	3.224	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030607-10	ISINGLASS RIVER	ROCHESTER, BARRINGTON	3.796	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030607-15	COCHECO RIVER	ROCHESTER	4.414	MILES	Aquatic Life Integrity	Iron	5-M	N	LOW
2018	NHRIV600030607-15	COCHECO RIVER	ROCHESTER	4.414	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030607-16	SCRUTON POND OUTLET BROOK	BARRINGTON	0.071	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P	N	LOW
2018	NHRIV600030607-16	SCRUTON POND OUTLET BROOK	BARRINGTON	0.071	MILES	Aquatic Life Integrity	pH	5-P	N	LOW
2018	NHRIV600030608-03	COCHECO RIVER - UNNAMED BROOK	DOVER, ROCHESTER	3.267	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030608-05	COCHECO RIVER	DOVER	2.060	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030608-06	INDIAN BROOK	DOVER	1.106	MILES	Aquatic Life Integrity	Chloride	5-P	N	LOW
2018	NHRIV600030608-08	FRESH CREEK - TWOMBLY BROOK	ROLLINSFORD, SOMERSWORTH	4.983	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P	N	LOW
2018	NHRIV600030608-08	FRESH CREEK - TWOMBLY BROOK	ROLLINSFORD, SOMERSWORTH	4.983	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030608-10	ROLLINS BROOK	ROLLINSFORD	2.856	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P	N	LOW
2018	NHRIV600030608-10	ROLLINS BROOK	ROLLINSFORD	2.856	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030608-14	UNNAMED TRIB. TO COCHECO RIVER,	DOVER	0.169	MILES	Aquatic Life Integrity	Iron	5-M	N	LOW
2018	NHRIV600030608-15	BERRY BROOK	DOVER	1.106	MILES	Aquatic Life Integrity	Benthic-Macroinvertebrate Bioassessments	5-M	N	LOW
2018	NHRIV600030608-15	BERRY BROOK	DOVER	1.106	MILES	Aquatic Life Integrity	Chloride	5-M	N	LOW
2018	NHRIV600030701-01	LAMPREY RIVER - AND HEADWATER	NORTHWOOD, DEERFIELD	13.652	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P	N	LOW
2018	NHRIV600030701-01	LAMPREY RIVER - AND HEADWATER	NORTHWOOD, DEERFIELD	13.652	MILES	Aquatic Life Integrity	pH	5-P	N	LOW
2018	NHRIV600030701-08	HARTFORD BROOK	DEERFIELD	10.734	MILES	Aquatic Life Integrity	Aluminum	5-M	N	LOW
2018	NHRIV600030701-08	HARTFORD BROOK	DEERFIELD	10.734	MILES	Aquatic Life Integrity	Benthic-Macroinvertebrate Bioassessments	5-P	N	LOW
2018	NHRIV600030701-08	HARTFORD BROOK	DEERFIELD	10.734	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030701-09	LAMPREY RIVER	DEERFIELD	7.767	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P	N	LOW
2018	NHRIV600030701-09	LAMPREY RIVER	DEERFIELD	7.767	MILES	Aquatic Life Integrity	pH	5-P	N	LOW
2018	NHRIV600030701-13	LAMPREY RIVER	DEERFIELD	0.041	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030702-06	NORTH BRANCH RIVER - UNNAMED	DEERFIELD, CANDIA	5.185	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P	N	LOW
2018	NHRIV600030702-06	NORTH BRANCH RIVER - UNNAMED	DEERFIELD, CANDIA	5.185	MILES	Aquatic Life Integrity	pH	5-P	N	LOW
2018	NHRIV600030702-07	NORTH BRANCH RIVER - UNNAMED	CANDIA, DEERFIELD	10.013	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P	N	LOW
2018	NHRIV600030702-07	NORTH BRANCH RIVER - UNNAMED	CANDIA, DEERFIELD	10.013	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-01	UNNAMED BROOK - TO ONWAY LAKE	RAYMOND, CANDIA	5.450	MILES	Aquatic Life Integrity	Benthic-Macroinvertebrate Bioassessments	5-P	N	LOW
2018	NHRIV600030703-01	UNNAMED BROOK - TO ONWAY LAKE	RAYMOND, CANDIA	5.450	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-04	DUDLEY BROOK - UNNAMED BROOK	RAYMOND, DEERFIELD,	4.340	MILES	Aquatic Life Integrity	Lead	5-M	N	LOW
2018	NHRIV600030703-04	DUDLEY BROOK - UNNAMED BROOK	RAYMOND, DEERFIELD,	4.340	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P	N	LOW
2018	NHRIV600030703-04	DUDLEY BROOK - UNNAMED BROOK	RAYMOND, DEERFIELD,	4.340	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-05	LAMPREY RIVER	RAYMOND	2.647	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-09	LAMPREY RIVER	RAYMOND	2.295	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-10	LAMPREY RIVER	RAYMOND	0.558	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-11	LAMPREY RIVER	EPPING, RAYMOND	3.270	MILES	Aquatic Life Integrity	Aluminum	5-M	N	LOW
2018	NHRIV600030703-11	LAMPREY RIVER	EPPING, RAYMOND	3.270	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-14	PAWTUCKAWAY RIVER - UNNAMED	NOTTINGHAM, EPPING,	6.751	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P	N	LOW
2018	NHRIV600030703-14	PAWTUCKAWAY RIVER - UNNAMED	NOTTINGHAM, EPPING,	6.751	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-15	LAMPREY RIVER	EPPING	4.692	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-M	N	LOW
2018	NHRIV600030703-15	LAMPREY RIVER	EPPING	4.692	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-17	UNNAMED BROOK - TO LAMPREY RIVER	EPPING	3.280	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-18	LAMPREY RIVER	EPPING	3.247	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-20	RUM BROOK	EPPING	4.791	MILES	Aquatic Life Integrity	pH	5-M	N	LOW

2018	NHRIV600030607-16	SCRUTON POND OUTLET B	BARRINGTON	0.071	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P			Non-ORW
2018	NHRIV600030607-16	SCRUTON POND OUTLET B	BARRINGTON	0.071	MILES	Aquatic Life Integrity	pH	5-P			Non-ORW
2018	NHRIV600030608-02	BLACKWATER BROOK-CLAI	ROCHESTER, D	15.228	MILES	Primary Contact Recreation	Escherichia coli	4A-P	9/21/2010	NEW HAMPSHIRE STATEWIDE BACTERIA	39272 Non-ORW
2018	NHRIV600030608-03	COCHECO RIVER - UNNAM	DOVER, ROCHI	3.267	MILES	Aquatic Life Integrity	Dissolved oxygen saturation	5-M			Non-ORW
2018	NHRIV600030608-03	COCHECO RIVER - UNNAM	DOVER, ROCHI	3.267	MILES	Aquatic Life Integrity	pH	5-M			Non-ORW
2018	NHRIV600030608-03	COCHECO RIVER - UNNAM	DOVER, ROCHI	3.267	MILES	Primary Contact Recreation	Escherichia coli	4A-M	9/21/2010	NEW HAMPSHIRE STATEWIDE BACTERIA	39272 Non-ORW
2018	NHRIV600030608-04	REYNERS BROOK	DOVER	1.77	MILES	Primary Contact Recreation	Escherichia coli	4A-P	9/21/2010	NEW HAMPSHIRE STATEWIDE BACTERIA	39272 Non-ORW
2018	NHRIV600030608-05	COCHECO RIVER	DOVER	2.06	MILES	Aquatic Life Integrity	pH	5-M			Non-ORW
2018	NHRIV600030608-05	COCHECO RIVER	DOVER	2.06	MILES	Primary Contact Recreation	Escherichia coli	4A-M	9/21/2010	NEW HAMPSHIRE STATEWIDE BACTERIA	39272 Non-ORW
2018	NHRIV600030608-06	INDIAN BROOK	DOVER	1.106	MILES	Aquatic Life Integrity	Chloride	5-P			Non-ORW
2018	NHRIV600030608-06	INDIAN BROOK	DOVER	1.106	MILES	Primary Contact Recreation	Escherichia coli	4A-P	9/21/2010	NEW HAMPSHIRE STATEWIDE BACTERIA	39272 Non-ORW
2018	NHRIV600030608-08	FRESH CREEK - TWOMBLY	ROLLINSFORD,	4.983	MILES	Aquatic Life Integrity	Dissolved oxygen saturation	5-M			Non-ORW
2018	NHRIV600030608-08	FRESH CREEK - TWOMBLY	ROLLINSFORD,	4.983	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P			Non-ORW
2018	NHRIV600030608-08	FRESH CREEK - TWOMBLY	ROLLINSFORD,	4.983	MILES	Aquatic Life Integrity	pH	5-M			Non-ORW
2018	NHRIV600030608-08	FRESH CREEK - TWOMBLY	ROLLINSFORD,	4.983	MILES	Primary Contact Recreation	Escherichia coli	4A-M	9/21/2010	NEW HAMPSHIRE STATEWIDE BACTERIA	39272 Non-ORW
2018	NHRIV600030608-10	ROLLINS BROOK	ROLLINSFORD	2.856	MILES	Aquatic Life Integrity	Dissolved oxygen saturation	5-M			Non-ORW
2018	NHRIV600030608-10	ROLLINS BROOK	ROLLINSFORD	2.856	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P			Non-ORW
2018	NHRIV600030608-10	ROLLINS BROOK	ROLLINSFORD	2.856	MILES	Aquatic Life Integrity	pH	5-M			Non-ORW
2018	NHRIV600030608-10	ROLLINS BROOK	ROLLINSFORD	2.856	MILES	Primary Contact Recreation	Escherichia coli	4A-P	9/21/2010	NEW HAMPSHIRE STATEWIDE BACTERIA	39272 Non-ORW
2018	NHRIV600030608-11	FRESH CREEK	ROLLINSFORD,	1.126	MILES	Primary Contact Recreation	Escherichia coli	4A-P	9/21/2010	NEW HAMPSHIRE STATEWIDE BACTERIA	39272 Non-ORW
2018	NHRIV600030608-14	UNNAMED TRIB. TO COCH	DOVER	0.169	MILES	Aquatic Life Integrity	Iron	5-M			Non-ORW
2018	NHRIV600030608-15	BERRY BROOK	DOVER	1.106	MILES	Aquatic Life Integrity	Benthic-Macroinvertebrate Bioassessmer	5-M			Non-ORW
2018	NHRIV600030608-15	BERRY BROOK	DOVER	1.106	MILES	Aquatic Life Integrity	Chloride	5-M			Non-ORW
2018	NHRIV600030608-15	BERRY BROOK	DOVER	1.106	MILES	Primary Contact Recreation	Escherichia coli	4A-P	9/21/2010	NEW HAMPSHIRE STATEWIDE BACTERIA	39272 Non-ORW
2018	NHRIV600030608-16	JACKSON BROOK	DOVER	0.724	MILES	Primary Contact Recreation	Escherichia coli	4A-P	9/21/2010	NEW HAMPSHIRE STATEWIDE BACTERIA	39272 Non-ORW
2018	NHRIV600030701-01	LAMPREY RIVER - AND HE/	NORTHWOOD,	13.652	MILES	Aquatic Life Integrity	Dissolved oxygen saturation	5-M			Non-ORW
2018	NHRIV600030701-01	LAMPREY RIVER - AND HE/	NORTHWOOD,	13.652	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P			Non-ORW
2018	NHRIV600030701-01	LAMPREY RIVER - AND HE/	NORTHWOOD,	13.652	MILES	Aquatic Life Integrity	pH	5-P			Non-ORW
2018	NHRIV600030701-08	HARTFORD BROOK	DEERFIELD	10.734	MILES	Aquatic Life Integrity	Aluminum	5-M			Non-ORW
2018	NHRIV600030701-08	HARTFORD BROOK	DEERFIELD	10.734	MILES	Aquatic Life Integrity	Benthic-Macroinvertebrate Bioassessmer	5-P			Non-ORW
2018	NHRIV600030701-08	HARTFORD BROOK	DEERFIELD	10.734	MILES	Aquatic Life Integrity	pH	5-M			Non-ORW
2018	NHRIV600030701-09	LAMPREY RIVER	DEERFIELD	7.767	MILES	Aquatic Life Integrity	Dissolved oxygen saturation	5-M			Non-ORW
2018	NHRIV600030701-09	LAMPREY RIVER	DEERFIELD	7.767	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P			Non-ORW
2018	NHRIV600030701-09	LAMPREY RIVER	DEERFIELD	7.767	MILES	Aquatic Life Integrity	pH	5-P			Non-ORW
2018	NHRIV600030701-13	LAMPREY RIVER	DEERFIELD	0.041	MILES	Aquatic Life Integrity	Dissolved oxygen saturation	5-M			Non-ORW
2018	NHRIV600030701-13	LAMPREY RIVER	DEERFIELD	0.041	MILES	Aquatic Life Integrity	pH	5-M			Non-ORW
2018	NHRIV600030701-14	LAMPREY RIVER	RAYMOND, DE	6.776	MILES						Review OneStop GIS
2018	NHRIV600030702-01	TR NORTH BRANCH RIVER	CANDIA	8.629	MILES						ORW
2018	NHRIV600030702-02	UNNAMED BROOKS - TO N	CANDIA	3.68	MILES						ORW
2018	NHRIV600030702-03	UNNAMED BROOK - FROM	DEERFIELD	0.131	MILES						ORW
2018	NHRIV600030702-05	NORTH BRANCH RIVER - U	DEERFIELD, CA	3.563	MILES						ORW
2018	NHRIV600030702-06	NORTH BRANCH RIVER - U	DEERFIELD, CA	5.185	MILES						ORW
2018	NHRIV600030702-07	NORTH BRANCH RIVER - U	CANDIA, DEERI	10.013	MILES						ORW
2018	NHRIV600030702-08	UNNAMED BROOK - TO NC	CANDIA, RAYM	1.171	MILES						ORW
2018	NHRIV600030702-09	NORTH BRANCH RIVER	RAYMOND, CA	0.974	MILES						Review OneStop GIS
2018	NHRIV600030702-10	UNNAMED BROOK	CANDIA	1.071	MILES						ORW
2018	NHRIV600030702-11	UNNAMED BROOK	CANDIA	0.839	MILES						ORW
2018	NHRIV600030702-12	UNNAMED BROOK	DEERFIELD	0.59	MILES						ORW
2018	NHRIV600030703-01	UNNAMED BROOK - TO OI	RAYMOND, CA	5.45	MILES	Aquatic Life Integrity	Benthic-Macroinvertebrate Bioassessmer	5-P			Non-ORW
2018	NHRIV600030703-01	UNNAMED BROOK - TO OI	RAYMOND, CA	5.45	MILES	Aquatic Life Integrity	Habitat Assessment (Streams)	4C-M			Non-ORW
2018	NHRIV600030703-01	UNNAMED BROOK - TO OI	RAYMOND, CA	5.45	MILES	Aquatic Life Integrity	pH	5-M			Non-ORW
2018	NHRIV600030703-04	DUDLEY BROOK - UNNAMI	RAYMOND, DE	4.34	MILES	Aquatic Life Integrity	Dissolved oxygen saturation	5-M			Non-ORW
2018	NHRIV600030703-04	DUDLEY BROOK - UNNAMI	RAYMOND, DE	4.34	MILES	Aquatic Life Integrity	Lead	5-M			Non-ORW
2018	NHRIV600030703-04	DUDLEY BROOK - UNNAMI	RAYMOND, DE	4.34	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P			Non-ORW
2018	NHRIV600030703-04	DUDLEY BROOK - UNNAMI	RAYMOND, DE	4.34	MILES	Aquatic Life Integrity	pH	5-M			Non-ORW
2018	NHRIV600030703-05	LAMPREY RIVER	RAYMOND	2.647	MILES	Aquatic Life Integrity	pH	5-M			Non-ORW
2018	NHRIV600030703-07-02	LAMPREY RIVER - CARROLI	RAYMOND	0.02	MILES	Primary Contact Recreation	Escherichia coli	4A-P	9/21/2010	NEW HAMPSHIRE STATEWIDE BACTERIA	39276 Non-ORW
2018	NHRIV600030703-09	LAMPREY RIVER	RAYMOND	2.295	MILES	Aquatic Life Integrity	pH	5-M			Non-ORW
2018	NHRIV600030703-10	LAMPREY RIVER	RAYMOND	0.558	MILES	Aquatic Life Integrity	pH	5-M			Non-ORW
2018	NHRIV600030703-11	LAMPREY RIVER	EPPING, RAYM	3.27	MILES	Aquatic Life Integrity	Aluminum	5-M			Non-ORW
2018	NHRIV600030703-11	LAMPREY RIVER	EPPING, RAYM	3.27	MILES	Aquatic Life Integrity	pH	5-M			Non-ORW
2018	NHRIV600030703-14	PAWTUCKAWAY RIVER - U	NOTTINGHAM,	6.751	MILES	Aquatic Life Integrity	Dissolved oxygen saturation	5-M			Non-ORW
2018	NHRIV600030703-14	PAWTUCKAWAY RIVER - U	NOTTINGHAM,	6.751	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P			Non-ORW
2018	NHRIV600030703-14	PAWTUCKAWAY RIVER - U	NOTTINGHAM,	6.751	MILES	Aquatic Life Integrity	pH	5-M			Non-ORW
2018	NHRIV600030703-15	LAMPREY RIVER	EPPING	4.692	MILES	Aquatic Life Integrity	Dissolved oxygen saturation	5-M			Non-ORW

NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

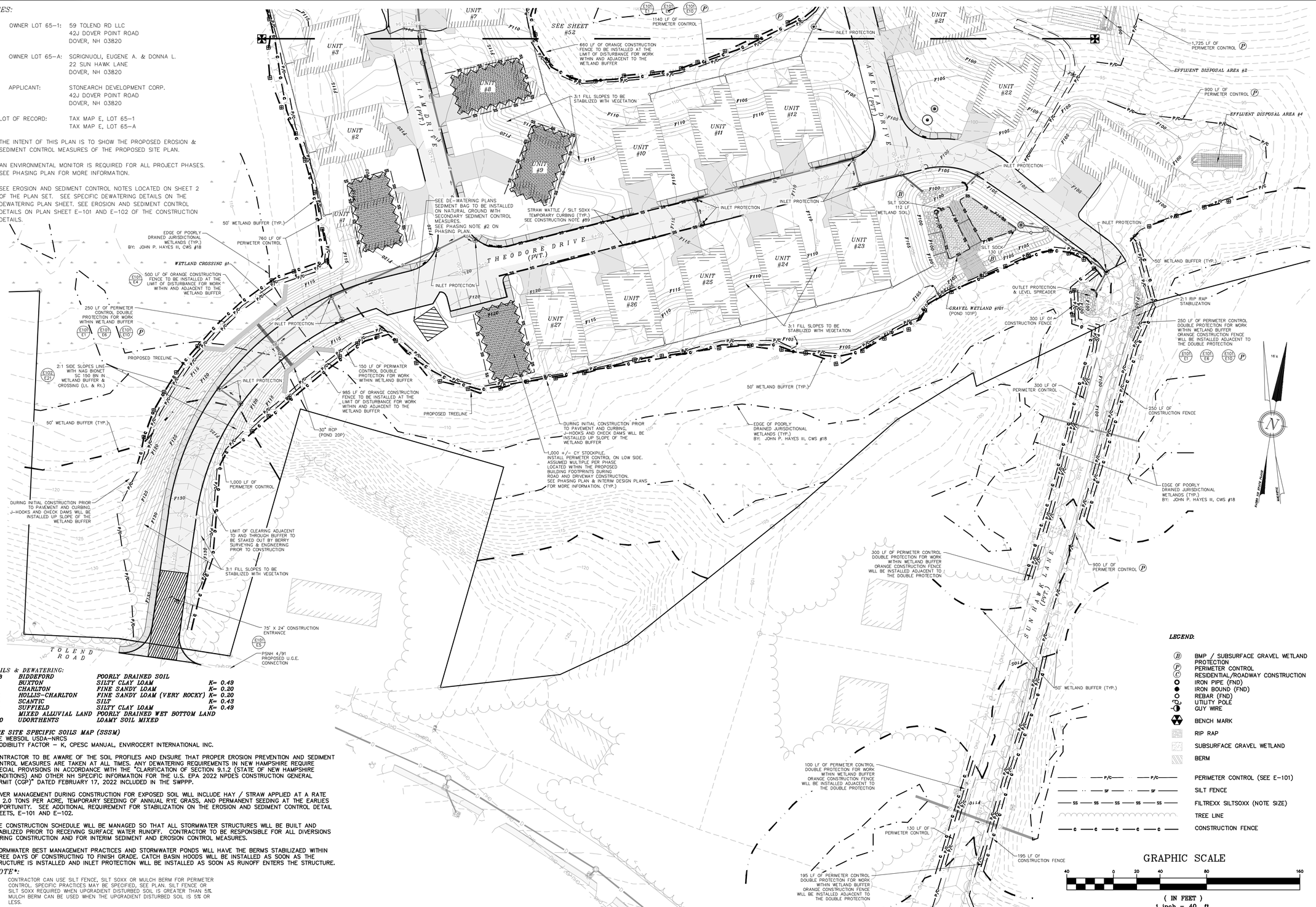
1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED EROSION & SEDIMENT CONTROL MEASURES OF THE PROPOSED SITE PLAN.

4.) AN ENVIRONMENTAL MONITOR IS REQUIRED FOR ALL PROJECT PHASES. SEE PHASING PLAN FOR MORE INFORMATION.

5.) SEE EROSION AND SEDIMENT CONTROL NOTES LOCATED ON SHEET 2 OF THE PLAN SET. SEE SPECIFIC DEWATERING DETAILS ON THE DEWATERING PLAN SHEET. SEE EROSION AND SEDIMENT CONTROL DETAILS ON PLAN SHEET E–101 AND E–102 OF THE CONSTRUCTION DETAILS.



SOILS & DEWATERING:

BmB	*BIDDEFORD*	*POORLY DRAINED SOIL*	
Bx	*BUXTON*	*SILTY CLAY LOAM*	*K= 0.49*
Ch	*CHARLTON*	*FINE SANDY LOAM*	*K= 0.20*
HkE	*HOLLIS–CHARLTON*	*FINE SANDY LOAM (VERY ROCKY)*	*K= 0.20*
Sc	*SCANTIC*	*SILT*	*K= 0.43*
Sf	*SUFFIELD*	*SILTY CLAY LOAM*	*K= 0.49*
Mt	*MIXED ALLUVIAL LAND*	*POORLY DRAINED WET BOTTOM LAND*	
SOO	*UDORTHENTS*	*LOAMY SOIL MIXED*	

SEE SITE SPECIFIC SOILS MAP (SSSM)
SEE WEBSOIL USDA–NRCS
ERODIBILITY FACTOR – K, CPESC MANUAL, ENVIROCERT INTERNATIONAL INC.

CONTRACTOR TO BE AWARE OF THE SOIL PROFILES AND ENSURE THAT PROPER EROSION PREVENTION AND SEDIMENT CONTROL MEASURES ARE TAKEN AT ALL TIMES. ANY DEWATERING REQUIREMENTS IN NEW HAMPSHIRE REQUIRE SPECIAL PROVISIONS IN ACCORDANCE WITH THE "CLARIFICATION OF SECTION 9.1.2 (STATE OF NEW HAMPSHIRE CONDITIONS) AND OTHER NH SPECIFIC INFORMATION FOR THE U.S. EPA 2022 NPDES CONSTRUCTION GENERAL PERMIT (CGP)" DATED FEBRUARY 17, 2022 INCLUDED IN THE SWPPP.

COVER MANAGEMENT DURING CONSTRUCTION FOR EXPOSED SOIL WILL INCLUDE HAY / STRAW APPLIED AT A RATE OF 2.0 TONS PER ACRE, TEMPORARY SEEDING OF ANNUAL RYE GRASS, AND PERMANENT SEEDING AT THE EARLIES OPPORTUNITY. SEE ADDITIONAL REQUIREMENT FOR STABILIZATION ON THE EROSION AND SEDIMENT CONTROL DETAIL SHEETS, E–101 AND E–102.

THE CONSTRUCTION SCHEDULE WILL BE MANAGED SO THAT ALL STORMWATER STRUCTURES WILL BE BUILT AND STABILIZED PRIOR TO RECEIVING SURFACE WATER RUNOFF. CONTRACTOR TO BE RESPONSIBLE FOR ALL DIVERSIONS DURING CONSTRUCTION AND FOR INTERIM SEDIMENT AND EROSION CONTROL MEASURES.

STORMWATER BEST MANAGEMENT PRACTICES AND STORMWATER PONDS WILL HAVE THE BERMS STABILIZED WITHIN THREE DAYS OF CONSTRUCTING TO FINISH GRADE. CATCH BASIN HOODS WILL BE INSTALLED AS SOON AS THE STRUCTURE IS INSTALLED AND INLET PROTECTION WILL BE INSTALLED AS SOON AS RUNOFF ENTERS THE STRUCTURE.

**NOTE*:*

1.) CONTRACTOR CAN USE SILT FENCE, SILT SOXX OR MULCH BERM FOR PERIMETER CONTROL. SPECIFIC PRACTICES MAY BE SPECIFIED, SEE PLAN. SILT FENCE OR SILT SOXX REQUIRED WHEN UPGRADIENT DISTURBED SOIL IS GREATER THAN 5%. MULCH BERM CAN BE USED WHEN THE UPGRADIENT DISTURBED SOIL IS 5% OR LESS.

2.) INTERIM SLOPE CONTROL MAY BE NEEDEDDURING RESIDENTIAL CONSTRUCTION.

LEGEND:

- (B) BMP / SUBSURFACE GRAVEL WETLAND PROTECTION
- (P) PERIMETER CONTROL
- (C) RESIDENTIAL/ROADWAY CONSTRUCTION
- IRON PIPE (FND)
- IRON BOUND (FND)
- REBAR (FND)
- UTILITY POLE
- GUY WIRE
- BENCH MARK
- RIP RAP
- SUBSURFACE GRAVEL WETLAND
- BERM
- P/C — P/C — PERIMETER CONTROL (SEE E–101)
- SF — SF — SILT FENCE
- SS — SS — SS — SS — SS — FILTREXX SILTSOXX (NOTE SIZE)
- TREE LINE
- C — C — C — C — C — CONSTRUCTION FENCE

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

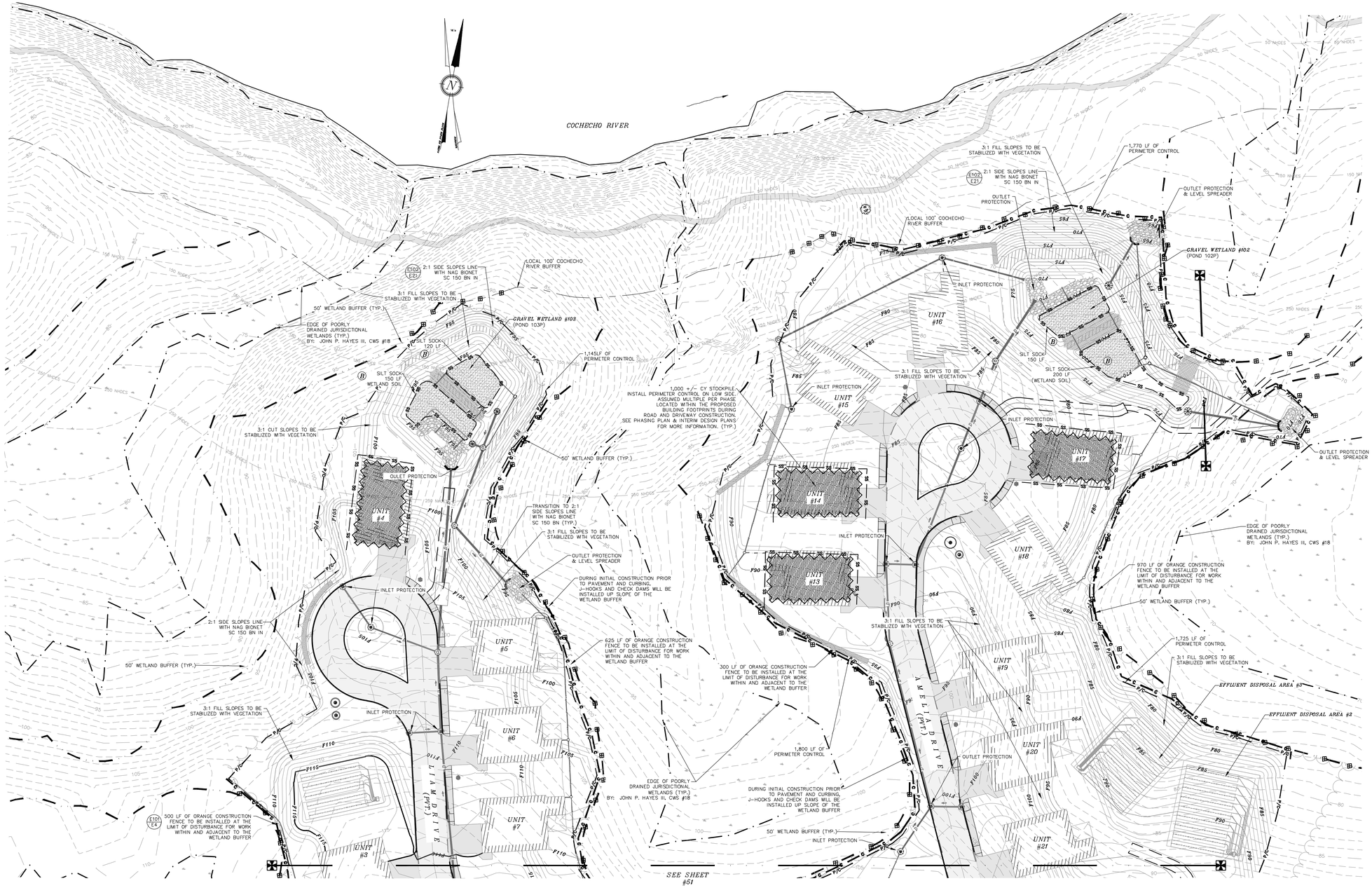
EROSION AND SEDIMENT CONTROL PLAN
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 40 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 7324 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

NOTES:

3.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED EROSION & SEDIMENT CONTROL MEASURES OF THE PROPOSED SITE PLAN.

4.) AN ENVIRONMENTAL MONITOR IS REQUIRED FOR ALL PROJECT PHASES. SEE PHASING PLAN FOR MORE INFORMATION.

5.) SEE EROSION AND SEDIMENT CONTROL NOTES LOCATED ON SHEET 2 OF THE PLAN SET. SEE SPECIFIC DEWATERING DETAILS ON THE DEWATERING PLAN SHEET. SEE EROSION AND SEDIMENT CONTROL DETAILS ON PLAN SHEET E–101 AND E–102 OF THE CONSTRUCTION DETAILS.

**NOTE*:*

1.) CONTRACTOR CAN USE SILT FENCE, SILT SOXX OR MULCH BERM FOR PERIMETER CONTROL. SPECIFIC PRACTICES MAY BE SPECIFIED, SEE PLAN. SILT FENCE OR SILT SOXX REQUIRED WHEN UPGRADIENT DISTURBED SOIL IS GREATER THAN 5% MULCH BERM CAN BE USED WHEN THE UPGRADIENT DISTURBED SOIL IS 5% OR LESS.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

EROSION AND SEDIMENT CONTROL PLAN
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 40 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 13246
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



FRONT ELEVATION

SCALE: 1/4" = 1'-0"



RIGHT ELEVATION

SCALE: 1/4" = 1'-0"

SQUARE FOOTAGE TABLE

TOTALS EXCLUDE GARAGE, OPEN AREAS, & UNFINISHED STORAGE AREAS

PLAN	SQ. FTG.
FIRST FLOOR	1,750
SECOND FLOOR	764
TOTAL:	2,514
BONUS ROOM	301

NOTE:
SQUARE FOOTAGE INCLUDES ALL WALL STRUCTURE, LIVING SPACE, CLOSETS, & STAIRS, HOWEVER, DOES NOT INCLUDE GARAGE SPACE, DECKS, OR PATIO'S.

TAKE NOTE THAT BUILDER'S SQUARE FOOTAGE CALCULATIONS MAY VARY FROM DRAFTER'S.



REAR ELEVATION

SCALE: 1/4" = 1'-0"



LEFT ELEVATION

SCALE: 1/4" = 1'-0"

StoneArch Development

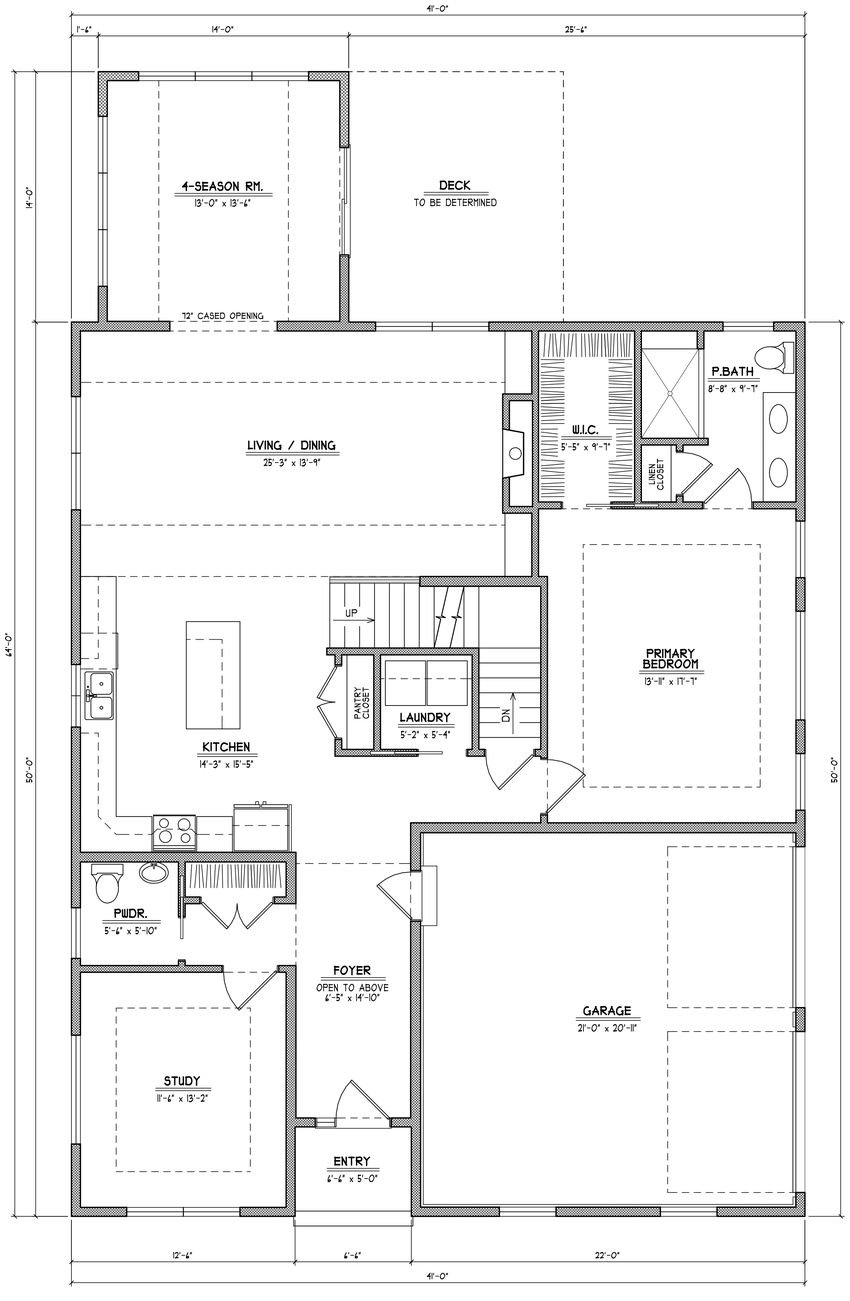
REVISIONS

NO.	DATE	REVISION
1	6/3/22	DEVELOP MARKETING PLANS.

ELEVATIONS

LISA JOANNA - SIDE LOAD
TOLEND RD. DOVER, NH

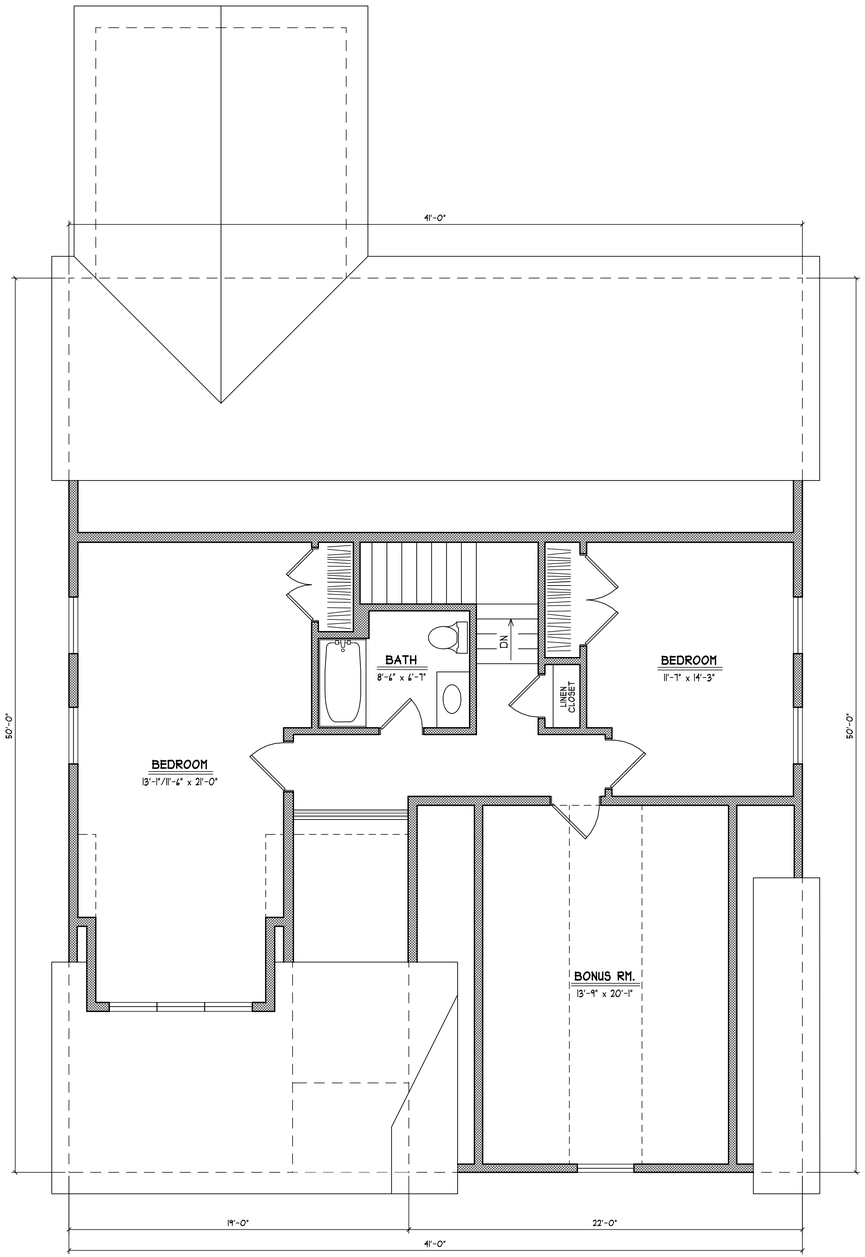
A-1



FIRST FLOOR PLAN

APPROX. 1150 SQ. FT.

SCALE: 1/4" = 1'-0"



SECOND FLOOR PLAN

APPROX. 744 SQ. FT.

SCALE: 1/4" = 1'-0"

StoneArch Development

REVISIONS

NO.	DATE	REVISION
1	6/3/22	DEVELOP MARKETING PLANS.

FLOOR PLANS

LISA JOANNA - SIDE LOAD
TOLEND RD. DOVER, NH

A-2



FRONT ELEVATION

SCALE: 1/4" = 1'-0"



RIGHT ELEVATION

SCALE: 1/4" = 1'-0"

SQUARE FOOTAGE TABLE

TOTALS EXCLUDE GARAGE, OPEN AREAS, & UNFINISHED STORAGE AREAS

PLAN	SQ. FTG.
FIRST FLOOR	1,150
SECOND FLOOR	888
TOTAL:	2,438
BONUS ROOM	258

NOTE:
SQUARE FOOTAGE INCLUDES ALL WALL STRUCTURE, LIVING SPACE, CLOSETS, & STAIRS, HOWEVER, DOES NOT INCLUDE GARAGE SPACE, DECKS, OR PATIO'S.

TAKE NOTE THAT BUILDER'S SQUARE FOOTAGE CALCULATIONS MAY VARY FROM DRAFTER'S.



REAR ELEVATION

SCALE: 1/4" = 1'-0"



LEFT ELEVATION

SCALE: 1/4" = 1'-0"

StoneArch Development

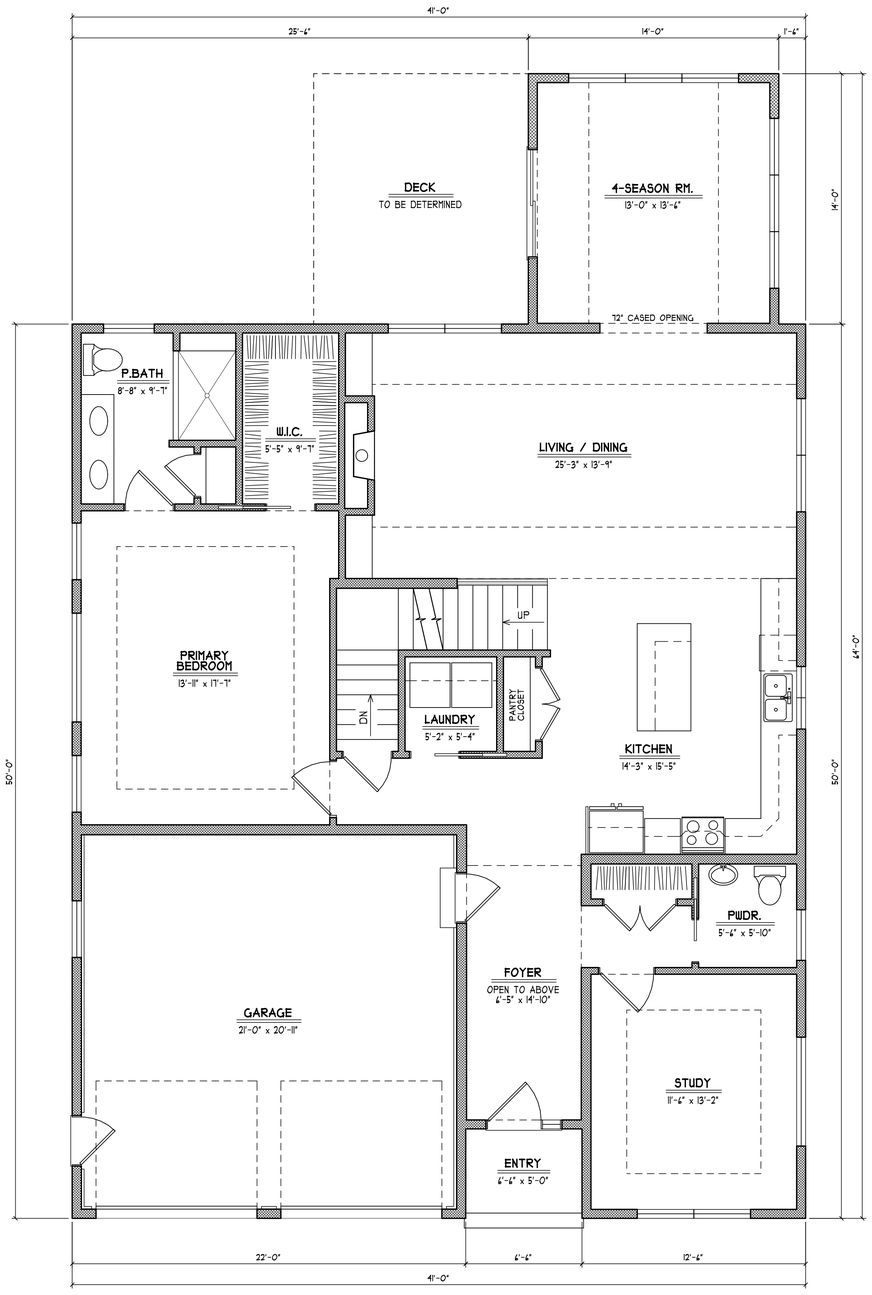
REVISIONS

NO.	DATE	REVISION
1	6/3/22	DEVELOP MARKETING PLANS.

ELEVATIONS

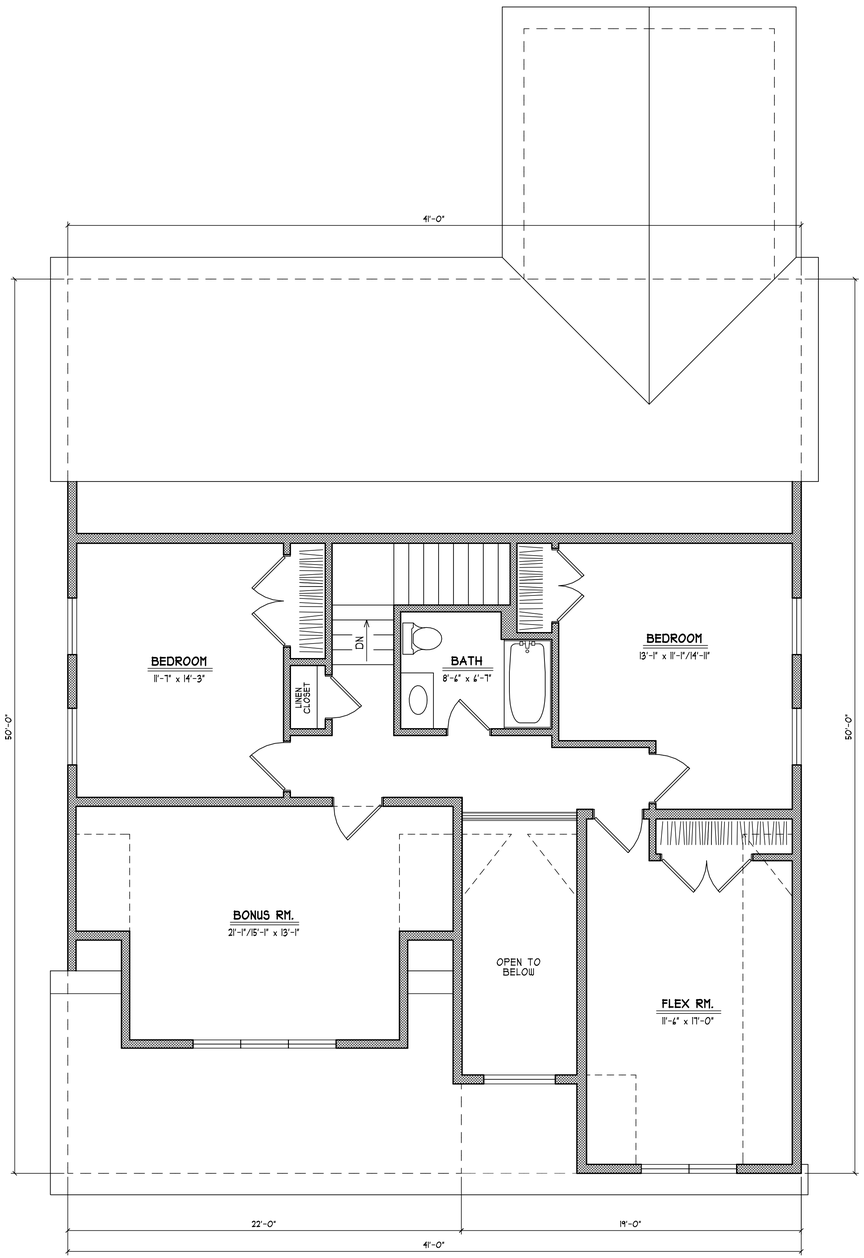
MADELYN ROSE - 2 CAR GARAGE
TOLEND RD. DOVER, NH

A-1



FIRST FLOOR PLAN — APPROX. 1150 SQ. FT.

SCALE: 1/4" = 1'-0"



SECOND FLOOR PLAN — APPROX. 888 SQ. FT.

SCALE: 1/4" = 1'-0"

StoneArch Development

REVISIONS

NO.	DATE	REVISION
1	6/3/22	DEVELOP MARKETING PLANS.

FLOOR PLANS

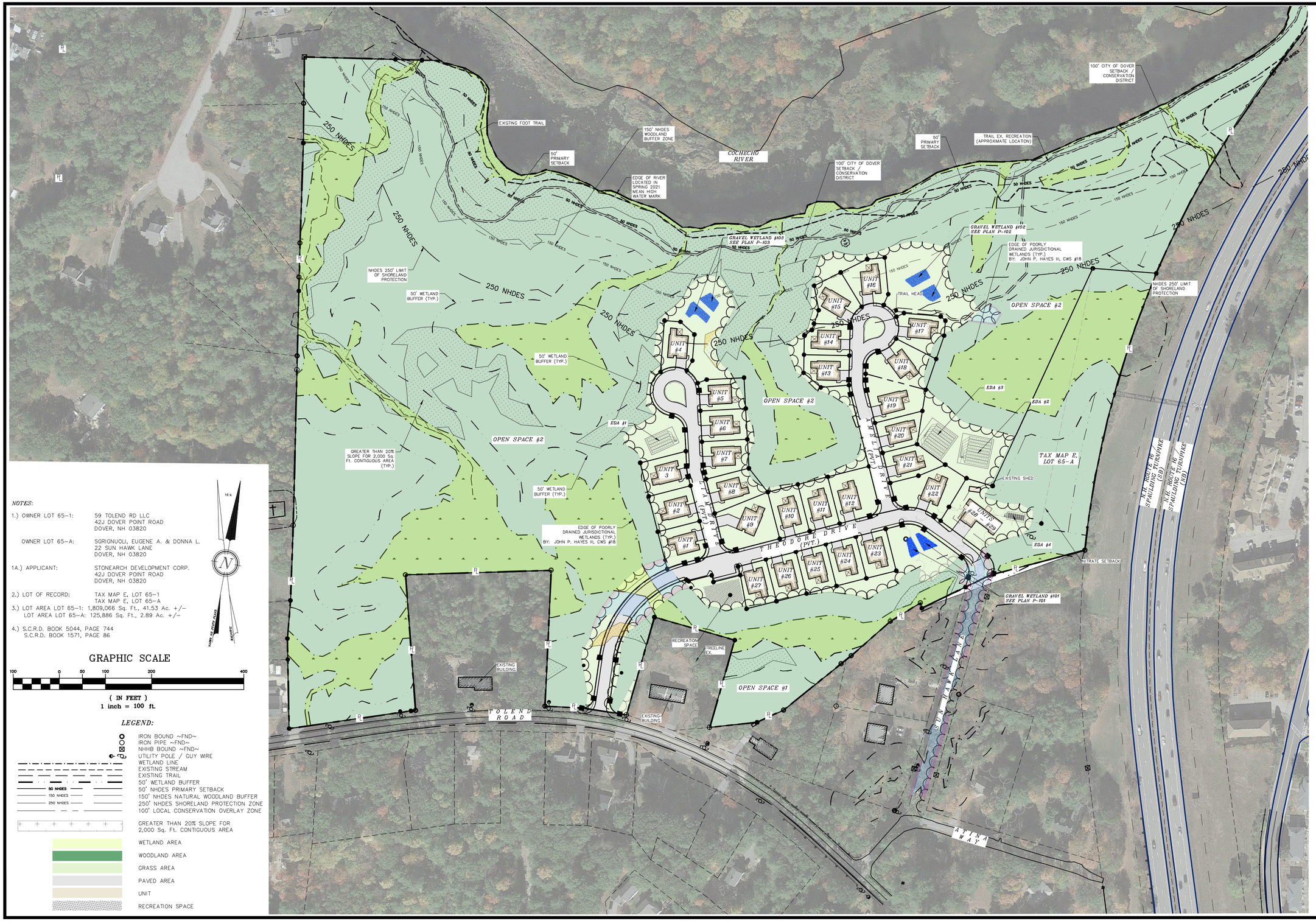
MADELYN ROSE - 2 CAR GARAGE
TOLEND RD. DOVER, NH

A-2









NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) LOT AREA LOT 65–1: 1,809,066 Sq. Ft., 41.53 Ac. +/–
LOT AREA LOT 65–A: 125,886 Sq. Ft., 2.89 Ac. +/–

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

16's

NORTH

MAGNETIC

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- NHHB BOUND ~FND~
- UTILITY POLE / GUY WIRE
- WETLAND LINE
- EXISTING STREAM
- EXISTING TRAIL
- 50' WETLAND BUFFER
- 50 NHDES — 50' NHDES PRIMARY SETBACK
- 150 NHDES — 150' NHDES NATURAL WOODLAND BUFFER
- 250 NHDES — 250' NHDES SHORELAND PROTECTION ZONE
- 100' LOCAL CONSERVATION OVERLAY ZONE
- GREATER THAN 20% SLOPE FOR 2,000 Sq. Ft. CONTIGUOUS AREA
- WETLAND AREA
- WOODLAND AREA
- GRASS AREA
- PAVED AREA
- UNIT
- RECREATION SPACE

DOVER PLANNING FILE #P23–XX

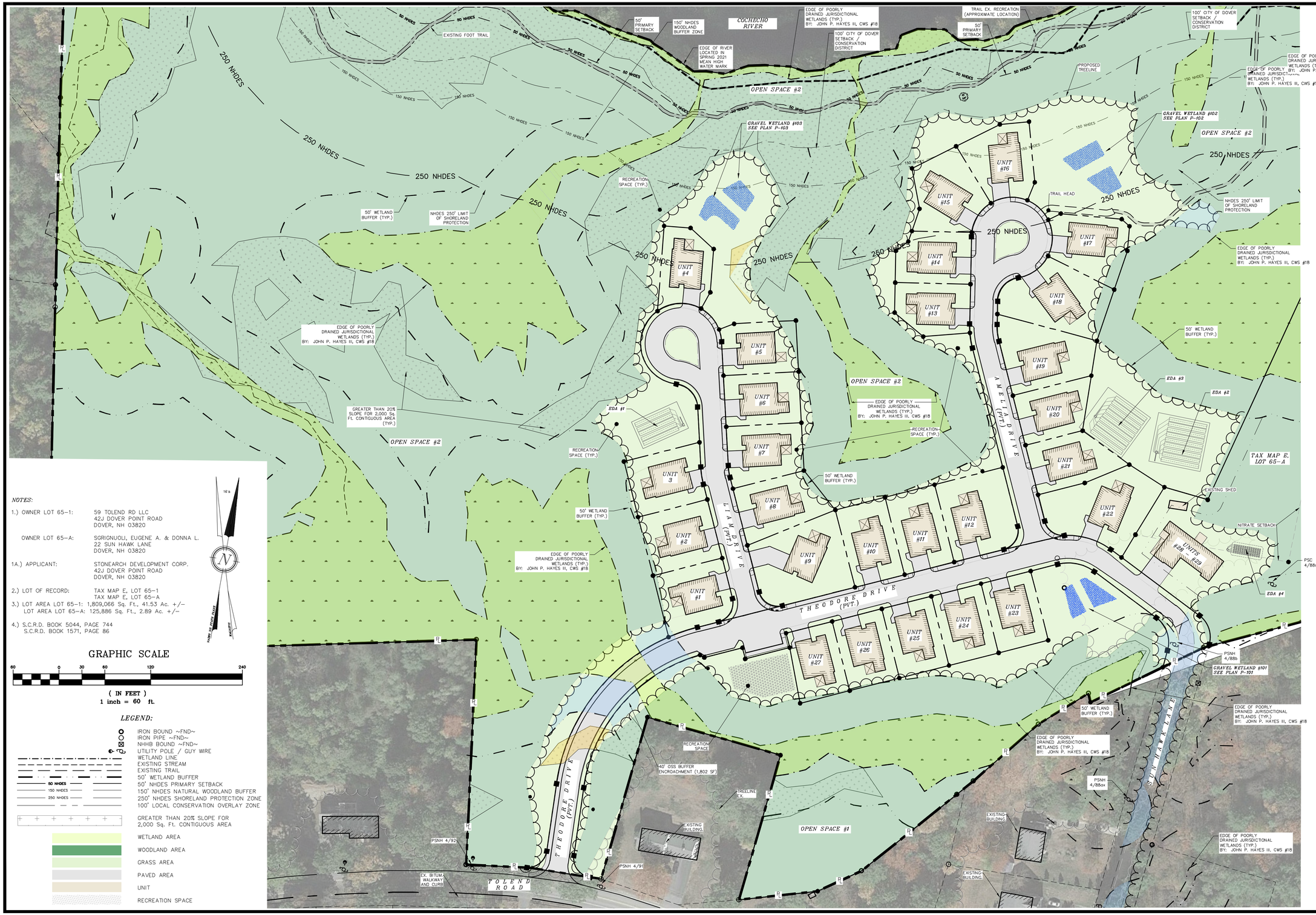
REVISION	DATE	DESCRIPTION

RESIDENTIAL DEVELOPED AREA COLOR RENDERING
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 100 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

NOT FOR CONSTRUCTION



NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) LOT AREA LOT 65–1: 1,809,066 Sq. Ft., 41.53 Ac. +/–
LOT AREA LOT 65–A: 125,886 Sq. Ft., 2.89 Ac. +/–

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

NORTH (GRID) BEARINGS ARE BASED ON NAD 83 STATE PLANE COORDINATES

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- NHHB BOUND ~FND~
- UTILITY POLE / GUY WIRE
- WETLAND LINE
- EXISTING STREAM
- EXISTING TRAIL
- 50' WETLAND BUFFER
- 50' NHDES PRIMARY SETBACK
- 150' NHDES NATURAL WOODLAND BUFFER
- 250' NHDES SHORELAND PROTECTION ZONE
- 100' LOCAL CONSERVATION OVERLAY ZONE
- GREATER THAN 20% SLOPE FOR 2,000 Sq. Ft. CONTIGUOUS AREA
- WETLAND AREA
- WOODLAND AREA
- GRASS AREA
- PAVED AREA
- UNIT
- RECREATION SPACE

DOVER PLANNING #P23–XX

REVISION	DATE	DESCRIPTION

RESIDENTIAL DEVELOPED AREA COLOR RENDERING
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 60 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

NOT FOR CONSTRUCTION

ROLLING HILL ESTATES
LOT LINE REVISION & OPEN SPACE SUBDIVISION
FOR
STONEARCH DEVELOPMENT CORP.
TOLEND ROAD & SUN HAWK LANE
DOVER, N.H.
TAX MAP E, LOTS 65-1 & 65-A

TABLE OF CONTENTS:

SHEET 1	~	NEIGHBORHOOD & SIGNAGE PLAN
SHEET 2	~	PROJECT SPECIFIC NOTE PLAN
SHEET 3	~	LEGEND PLAN & DENSITY CALCULATIONS
SHEET 4	~	BOUNDARY PLAN
SHEETS 5-9	~	EXISTING CONDITIONS PLANS
SHEETS 10-16	~	SITE SPECIFIC SOILS MAPS & TEST PIT DATA
SHEET 17	~	YIELD PLAN
SHEET 18	~	LOT LINE REVISION PLAN
SHEET 19-24	~	SUBDIVISION PLANS
SHEET 25	~	PHASING PLAN
SHEETS 26-31	~	SITE PLANS
SHEETS 32-44	~	GRADING & DRAINAGE PLANS
SHEETS 45-50	~	STORMWATER BMP PLANS
SHEETS 51-52	~	EROSION & SEDIMENT CONTROL PLANS
SHEETS 53-62	~	UTILITY PLANS
SHEETS 63-67	~	SEPTIC DESIGN PLANS
SHEETS 68-72	~	LANDSCAPING PLANS
SHEETS 73-74	~	LIGHTING PLANS
SHEETS 75-78	~	CROSS SECTIONS
SHEETS 79-80	~	ROADWAY ACCESS / SIGHT DISTANCE PLANS
SHEETS 81-85	~	TRUCK TURNING PLANS
SHEET 86	~	DEWATERING PLAN
SHEETS 87-88	~	EROSION & SEDIMENT CONTROL DETAILS (E-101 - E-102)
SHEETS 89-92	~	CONSTRUCTION DETAILS (C-101 - C-104)
SHEETS 93-94	~	DRAINAGE DETAILS (D-101 - D-102)
SHEETS 95-98	~	UTILITY DETAILS (U-101 - U-104)
SHEET 99	~	LANDSCAPING DETAILS (L-101)
SHEET 100	~	WILDLIFE IDENTIFICATION PLAN (W-101)

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

1.) ALL OBSERVATIONS OF THREATENED OR ENDANGERED SPECIES SHALL BE REPORTED IMMEDIATELY TO THE NEW HAMPSHIRE FISH AND GAME DEPARTMENT NONGAME AND ENDANGERED WILDLIFE ENVIRONMENTAL REVIEW PROGRAM BY PHONE AT 603-271-2461 AND BY EMAIL AT NHFGREVIEW@WILDLIFE.NH.GOV. EMAIL SUBJECT LINE: NHB23-1272, ROLLING HILL ESTATES, WILDLIFE SPECIES OBSERVATION.

2.) PHOTOGRAPHS OF THE OBSERVED SPECIES AND NEARBY ELEMENTS OF HABITAT OR AREAS OF LAND DISTURBANCE SHALL BE PROVIDED TO NHF&G IN DIGITAL FORMAT AT THE ABOVE EMAIL ADDRESS FOR VERIFICATION AS FEASIBLE.

3.) IN THE EVENT A THREATENED OR ENDANGERED SPECIES IS OBSERVED ON THE PROJECT SITE DURING THE TERM OF THE PERMIT, THE SPECIES SHALL NOT BE DISTURBED, HANDLED, OR HARMED IN ANY WAY PRIOR TO CONSULTATION WITH NHF&G AND IMPLEMENTATION OF CORRECTIVE ACTIONS RECOMMENDED BY NHF&G, IF ANY, TO ASSURE THE PROJECT DOES NOT APPRECIABLY JEOPARDIZE THE CONTINUED EXISTENCE OF THREATENED AND ENDANGERED SPECIES AS DEFINED IN FIS 1002.04

4.) THE NHF&G, INCLUDING ITS EMPLOYEES AND AUTHORIZED AGENTS, SHALL HAVE ACCESS TO THE PROPERTY DURING THE TERM OF THE PERMIT.

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

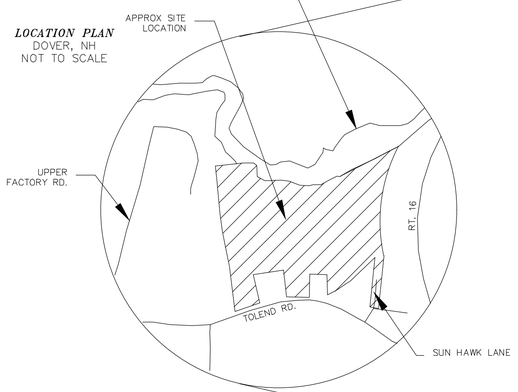
OWNER'S SIGNATURE DATE

2.) OWNER LOT 65-A: EUGENE A. & DONNA L., SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

OWNER'S SIGNATURE DATE

APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

LOCATION PLAN
DOVER, NH
NOT TO SCALE



SURVEYOR OF RECORD: KENNETH A. BERRY, PE, LLS
CPSWQ, CPESC, CESSWI
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825
(603) 332-2863

ENGINEER OF RECORD: KENNETH A. BERRY, PE, LLS
CPSWQ, CPESC, CESSWI
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825
(603) 332-2863

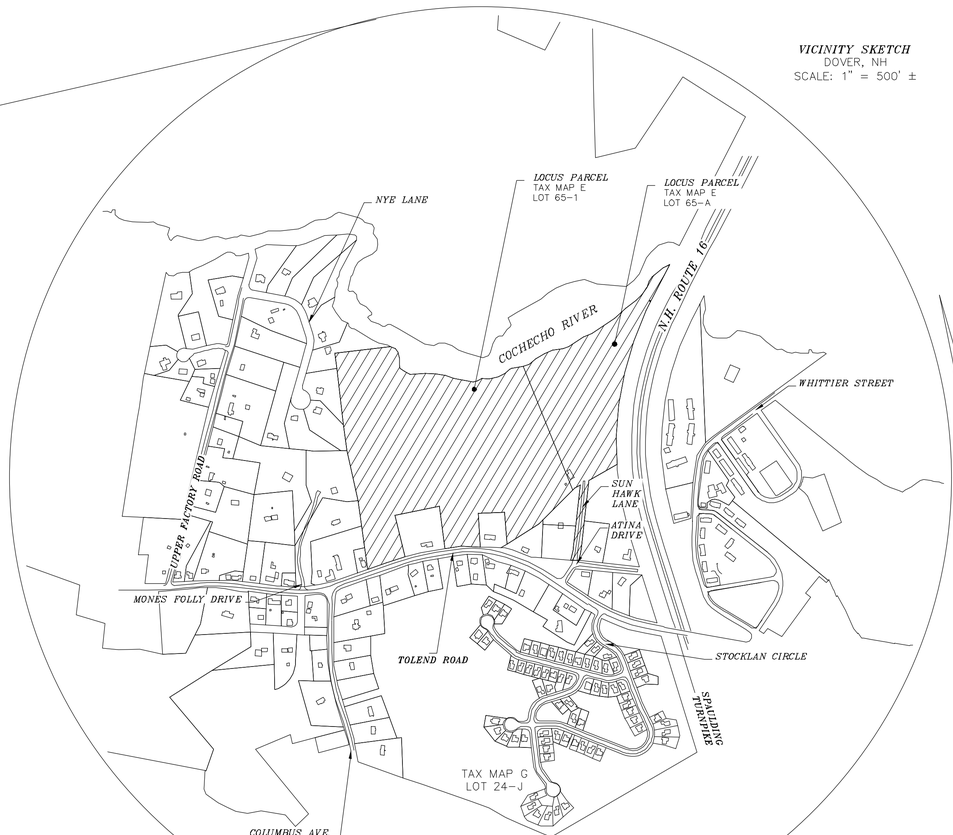
WETLAND SCIENTIST: JOHN P. HAYES III, CWS, CSS
7 LIMESTONE WAY
NORTH HAMPTON, NH 03862
(603) 776-5825

SOIL SCIENTIST: JOHN P. HAYES III, CWS, CSS
7 LIMESTONE WAY
NORTH HAMPTON, NH 03862
(603) 776-5825

WILDLIFE CONSULTANT: FRAGGLE ROCK ENVIRONMENTAL
DAMON BURT, CWS
38 GARLAND ROAD
STRAFFORD, NH 03884
603-969-5574

ARCHAEOLOGICAL CONSULTANT: MONADNOCK ARCHAEOLOGICAL CONSULTING LLC.
ROBERT G. GOODBY, Ph.D
144 GREENWOOD ROAD
DUBLIN, NH 03444

VICINITY SKETCH
DOVER, NH
SCALE: 1" = 500' ±



NOTE:

BERRY SURVEYING & ENGINEERING HAS PREPARED AN INSPECTION & MAINTENANCE MANUAL AS PART OF THIS PROJECTS DOCUMENTATION. ALL USERS ARE BOUND TO THIS DOCUMENT AS PART OF THE APPROVAL OF THE PLANNING BOARD. COPIES OF THE YEARLY INSPECTIONS ARE TO BE DELIVERED TO THE CITY OF DOVER COMMUNITY SERVICES DEPARTMENT.

WHETHER OR NOT OTHERWISE EXPRESSLY RECITED ON THIS SITE PLAN, THE SITE PLAN APPROVAL GRANTED IS CONDITIONED ON FAITHFUL AND DILIGENT ADHERENCE BY THE OWNER/SUBDIVIDER/DEVELOPER OF ALL TERMS, CONDITIONS, PROVISIONS AND SPECIFICATIONS OF THE CITY OF DOVER LAND SITE PLAN REGULATIONS AS AMENDED OR AS MAY LATER BE AMENDED, IN EFFECT ON THE DATE OF APPROVAL, UNLESS OR EXCEPT INSOFAR AS EXPRESSLY WAIVED, IN ANY PARTICULAR, BELOW. NON - ADHERENCE MAY RESULT IN A REVOCATION OF APPROVAL. ANY VARIATION FROM THE APPROVED PLAN WILL REQUIRE A RESUBMISSION FOR SITE PLAN APPROVAL.

REQUIRED PERMITS:

~ NHDES SHORELAND IMPACT PERMIT	(NOT YET SUBMITTED)
~ NHDES ALTERATION OF TERRAIN PERMIT	(NOT YET SUBMITTED)
~ NHDES DWGB PERMIT	(NOT YET SUBMITTED)
~ NHDES WETLAND IMPACT PERMIT	(NOT YET SUBMITTED)
~ NHDES SUBDIVISION APPROVAL	(NOT YET SUBMITTED)
~ NATURAL HERITAGE BUREAU	(NHB23-1272)
~ NH DIVISION OF HISTORICAL RESOURCES	(PENDING)
~ NOTICE OF INTENT	(NOT YET SUBMITTED)
~ EVERSOURCE WORK NUMBER	7773758
~ CONDITIONAL USE PERMIT (WETLAND BUFFER)	(NOT YET SUBMITTED)
~ CONDITIONAL USE PERMIT (SLOPES)	(NOT YET SUBMITTED)

GENERAL PLAN SET NOTES:

1.) 11x17" PLANS ARE TWICE THE PUBLISHED SCALE.

2.) ALL PLANS ARE CONSIDERED TO BE NOT FOR CONSTRUCTION UNLESS THEY CONTAIN THE APPROVAL STAMP OF THE CITY OF DOVER.

APPROVED DOVER

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR
No. 805
KENNETH A. BERRY
SIGNATURE

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

ROLLING HILL ESTATES
LOT LINE REVISION & OPEN SPACE SUBDIVISION
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS SHOWN
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14246
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

SIGN ID NUMBER	SIGN SIZE (WIDTH x HEIGHT)	SIGN	TEXT DIMENSIONS	NO. OF SIGNS	BACKGROUND	LEGEND	BORDER	POST SIZE & QUANTITY
R1-1	30"x30"	STOP	SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT – FHWA	5	RED	WHITE	WHITE	U-CHANNEL (4)
R2-1	24"x30"	SPEED LIMIT 25	SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT – FHWA	4	WHITE	GREEN	GREEN	U-CHANNEL (2)
R6-1R	36"x12"	ONE WAY	SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT – FHWA	2	BLACK W/ WHITE ARROW	BLACK	WHITE	U-CHANNEL (2)
W14-2	30"x30"	NO OUTLET	SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT – FHWA	3	YELLOW	BLACK	BLACK	U-CHANNEL (3)
R5-1	30"x30"	DO NOT ENTER	SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT – FHWA	2	RED	WHITE	WHITE	U-CHANNEL (2)
W3-1	30"x30"		SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT – FHWA	1	YELLOW	BLACK W/RED SYMBOL	BLACK	U-CHANNEL (1)
W1-2L	30"x30"		SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT – FHWA	1	YELLOW	BLACK	BLACK	U-CHANNEL (1)
W1-2R	30"x30"		SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT – FHWA	1	YELLOW	BLACK	BLACK	U-CHANNEL (1)
R7-8	12"x18"	RESERVED PARKING	SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT – FHWA	1	WHITE	GREEN W/ WHITE SYMBOL ON BLUE	RED	SQUARE (1)
R7-8a	12"x6"	VAN ACCESSIBLE	SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT – FHWA	1	WHITE	GREEN	GREEN	SQUARE (0)
W1-10L	30"x30"		SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT – FHWA	1	YELLOW	BLACK	BLACK	U-CHANNEL (1)
W1-10R	30"x30"		SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT – FHWA	1	YELLOW	BLACK	BLACK	U-CHANNEL (1)
	24"x12"	THEODORE DRIVE (PVT)		1	GREEN	WHITE	GREEN	U-CHANNEL (1)
	24"x12"	LIAM DRIVE (PVT)		1	GREEN	WHITE	GREEN	U-CHANNEL (1)
	24"x12"	AMELIA DRIVE (PVT)		1	GREEN	WHITE	GREEN	U-CHANNEL (1)
	24"x12"	SUN HAWK LANE		1	GREEN	WHITE	GREEN	U-CHANNEL (1)
	4"x4"	CITY OF DOVER WETLAND BUFFER		TBD IN FIELD	GREEN	WHITE	WHITE	U-CHANNEL OR TREE
	4"x4"	GRAVEL WETLAND SYSTEM		3	GREEN	WHITE	WHITE	U-CHANNEL (3)
RL-100	12"x12"			2	BROWN	WHITE	WHITE	U-CHANNEL (2)

16±

N

MAGNETIC

NADB3 NH STATE PLANE

GIS SKETCH
DOVER, NH
SCALE: 1" = 300' ±



ABUTTERS WITHIN 200':

1. N/F SICARD, RHONDA J. & BASTINELLI, GREGORY, 14 ATINA WAY, DOVER, NH 03820, *TAX MAP E, LOT 74*, S.C.R.D. BOOK 4505, PAGE 898
2. N/F SUNDSTROM, SCOTT A. & AIMEE E., 8 ATINA WAY, DOVER, NH 03820, *TAX MAP E, LOT 74-1*, S.C.R.D. BOOK 3061, PAGE 364
3. N/F POMEROY, CAROLINE S., 56 DURHAM ROAD UNIT 48, DOVER, NH 03820, *TAX MAP E, LOT 74-B*, S.C.R.D. BOOK 4805, PAGE 138
4. N/F FINN, CAROL ANNE, 10 SUNHAWK LANE, DOVER, NH 03820, *TAX MAP E, LOT 74-C*, S.C.R.D. BOOK 1598, PAGE 215
5. N/F CLOUGH, VERNON L. & OLGA, 43 TOLEND ROAD, DOVER, NH 03820, *TAX MAP E, LOT 74-D*, S.C.R.D. BOOK 2703, PAGE 371
6. N/F BSTANDIG, MARTHA A. REV. TRUST, BSTANDIG, MARTHA A. TRUSTEE, 53 TOLEND ROAD, DOVER, NH 03820, *TAX MAP E, LOT 65-B*, S.C.R.D. BOOK 4639, PAGE 921
7. N/F GEORGE, DOUGLAS A., 65 TOLEND ROAD, DOVER, NH 03820, *TAX MAP E, LOT 65*, S.C.R.D. BOOK 3953, PAGE 464
8. N/F FORBES, DONALD W. & LINDA R., 181 OLD FIELDS ROAD, SOUTH BERWICK, ME 03908, *TAX MAP E, LOT 64*, S.C.R.D. BOOK 1906, PAGE 249
9. N/F MAXON FAMILY TRUST, MAXON, THOMAS & PATRICIA, TRUSTEES, 40 BALDPATE ROAD, GEORGETOWN, MA 01833, *TAX MAP E, LOT 57-G*, S.C.R.D. BOOK 4018, PAGE 118
10. N/F MONE, FLORENCE & KEVIN, 1 MONES FOLLY DRIVE, DOVER, NH 03820, *TAX MAP E, LOT 57-C-1*, S.C.R.D. BOOK 4833, PAGE 841
11. N/F MARTEL, PAUL J., P.O. BOX 182, DOVER, NH 03821, *TAX MAP E, LOT 57-3*, S.C.R.D. BOOK 1433, PAGE 200
12. N/F THIBAULT, DANIEL JACOB, 40 NYE LANE, DOVER, NH 03820, *TAX MAP E, LOT 49-9*, S.C.R.D. BOOK 4631, PAGE 150
13. N/F BERGSTROM, EVA K. & EDDINS, KURT, 38 NYE LANE, DOVER, NH 03820, *TAX MAP E, LOT 49-8*, S.C.R.D. BOOK 4499, PAGE 734
14. N/F CHAKRAVARTY, DILIP & MITALI, 11411 RUNNING BEAR COURT, BELTSVILLE, MD 20705, *TAX MAP E, LOT 49-7*, S.C.R.D. BOOK 3988, PAGE 795

ABUTTERS WITHIN 200':

15. N/F BRODERICK, BRIDGET, 26 NYE LANE, DOVER, NH 03820, *TAX MAP E, LOT 49-6*, S.C.R.D. BOOK, 4034, PAGE 254
16. N/F RICHBURG, NORMAN R. & BETSY J., 22 NYE LANE, DOVER, NH 03820, *TAX MAP E, LOT 49-5*, S.C.R.D. BOOK 3999, PAGE 266
17. N/F ROBIDAS, ZACKERY, 71 UPPER FACTORY ROAD, DOVER, NH 03820, *TAX MAP E, LOT 57-1*, S.C.R.D. BOOK 4449, PAGE 106
18. N/F CHAGNON, MICHAEL C. & KRISTINE E., 69 UPPER FACTORY ROAD, DOVER, NH 03908, *TAX MAP E, LOT 57*, S.C.R.D. BOOK 2203, PAGE 519
19. N/F MILLER, JASON S. & CHRISTINE S., 94 TOLEND ROAD, DOVER, NH 03820, *TAX MAP G, LOT 24-A*, S.C.R.D. BOOK, 3077, PAGE 1
20. N/F THAYER SMITH FAMILY REV. TRUST, SMITH, TRAVIS K. & THAYER, MEGAN, TRUSTEES, 88 TOLEND ROAD, DOVER, NH 03820, *TAX MAP G, LOT 24-C*, S.C.R.D. BOOK, 4347, PAGE 303

ABUTTERS WITHIN 200':

21. N/F GERVAIS, ANDREW TODD, 80 TOLEND ROAD, DOVER, NH 03820, *TAX MAP G, LOT 24-M*, S.C.R.D. BOOK 4250, PAGE 900
22. N/F ROBERTSON, JAMES M. & LINDA S., 78 TOLEND ROAD, DOVER, NH 03820, *TAX MAP G, LOT 24-L*, S.C.R.D. BOOK 2611, PAGE 738
23. N/F ROBERTS, MEREDITH, 74 TOLEND ROAD, DOVER, NH 03820, *TAX MAP G, LOT 24-F*, S.C.R.D. BOOK 4542, PAGE 440
24. N/F WYNDBROOK AT DOVER HOMEOWNERS ASSOCIATION, P.O. BOX 1685, DOVER, NH 03821, *TAX MAP G, LOT 24-J*, S.C.R.D. BOOK 4359, PAGE 116
25. N/F DAMON, TIMOTHY JAMES & CATHERINE E., 64 TOLEND ROAD, DOVER, NH 03820, *TAX MAP G, LOT 24-C*, S.C.R.D. BOOK 4228, PAGE 316

ABUTTERS WITHIN 200':

26. N/F WILLIAMS, THOMAS R. & CAROLYN E., 60 TOLEND ROAD, DOVER, NH 03820, *TAX MAP G, LOT 24-B*, S.C.R.D. BOOK 2073, PAGE 290
27. N/F KEEFE, PATRICIA, 54 TOLEND ROAD, DOVER, NH 03820, *TAX MAP G, LOT 24-H*, S.C.R.D. BOOK 1484, PAGE 700
28. N/F BEAN, BONNIE E, & CITAK, TERESA, 48 TOLEND ROAD, DOVER, NH 03820, *TAX MAP G, LOT 24-E*, S.C.R.D. BOOK 4438, PAGE 210
29. N/F KEEFE, VERNA S. & RICHARD E., 3 ATINA WAY, DOVER, NH 03820, *TAX MAP G, LOT 24*, S.C.R.D. BOOK 1112, PAGE 441
30. N/F JOHNSTON, JEFFERY A, 15 TOLEND ROAD, DOVER, NH 03820, *TAX MAP G, LOT 24-I*, S.C.R.D. BOOK 4567, PAGE 361

ABUTTERS WITHIN 200':

31. N/F NORASING, VETHANA & REVERN, 17 ATINA WAY, DOVER, NH 03820, *TAX MAP G, LOT 24-Q*, S.C.R.D. BOOK 4238, PAGE 373
32. WHITTIER FALLS INC., 62 WHITTIER STREET, DOVER, NH 03820, *TAX MAP E, LOT 65-C*, S.C.R.D. BOOK 4224, PAGE 554
33. WHITTIER FALLS INC., 62 WHITTIER STREET, DOVER, NH 03820, *TAX MAP E, LOT 74-A*, S.C.R.D. BOOK 4224, PAGE 554
34. LIBERTY MUTUAL INSURANCE CO. ATTN: TYLER MUNGER, 175 BERKELEY STREET, BOSTON, MA 02116, *TAX MAP E, LOT 24*, S.C.R.D. BOOK 1364, PAGE 453

STATE OF NEW HAMPSHIRE — No. 805 — LICENSED LAND SURVEYOR — KENNETH A. BERRY — SIGNATURE

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

NEIGHBORHOOD & SIGNAGE PLAN
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS SHOWN
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE — KENNETH A. BERRY No. 14243 — LICENSED PROFESSIONAL ENGINEER

SHEET 1 OF 100

NOT FOR CONSTRUCTION

SITE PLAN NOTES:

1.) OWNER LOT 65-1: 59 TOLEND ROAD, LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L., SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,388,309 Sq. Ft., 31.87 Ac. +/- AREA FROM PROPOSED LOT LINE REVISION: 1,809,066 Sq. Ft., 41.53 Ac. +/-
LOT AREA LOT 65-A: 546,643 Sq. Ft., 12.55 Ac. +/- AREA FROM PROPOSED LOT LINE REVISION: 125,886 Sq. Ft., 2.89 Ac. +/-

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

5.) ZONING: (R-20) LOW DENSITY:

MIN. FRONTAGE ~ 125'	177.85' & 266.94' (LOT 65-1), 65.86' EX. 0' PROP. (SEE VARIANCE REQUEST (LOT 65-A))
MIN. LOT SIZE ~ 20,000 Sq. Ft. SINGLE FAMILY	N/A
MIN. LOT SIZE ~ 30,000 Sq.Ft., TWO FAMILY	SINGLE-FAMILY PROPOSED AS AN OSS CLUSTER
FRONT BUILD-TO ~ 20' - 35'	SEE OSS BELOW
REAR SETBACK ~ 30'	SEE OSS BELOW
SIDE SETBACK ~ 20'	SEE OSS BELOW
WETLANDS BUFFER ~ 50.0'	50.0'
MAX. BUILDING HEIGHT: 35'	35'
MAX. LOT COVERAGE: 30%	59,582 SF (3.3%) LOT 65-1, 3,472 SF (2.8%) LOT 65-A (FUNCTION OF LLR)

OPEN SPACE SUBDIVISION (OSS)

15 Ac. MINIMUM	41.51 Ac
MIN. LOT SIZE ~ 12,000 Sq. Ft.,	CLUSTER PROVIDED WITH LIMITED COMMON AREA LINES
MIN. FRONTAGE ~ 30'	MIN' 30' FRONTAGE PROVIDED IN CLUSTER FORMAT
MIN. BUFFER ALONG FRONTAGE ~ 100'	100' (CURB CUT EXCEPTED)
STREET SIDE ~ 15'	20' MIN
BETWEEN UNITS ~ 25'	25' MIN.
MIN. DISTANCE TO ABUTTING STRUCTURES ~ 75'	243' TO THE CLOSEST ABUTTING STRUCTURE TO A PROPOSED STRUCTURE
	89' FROM CLOSEST ABUTTING STRUCTURE TO PROPOSED THEODORE DRIVE.
MIN. BUFFER TO EXTERNAL BOUNDARIES ~ 40'	18' AT THE CLOSEST FOR ROAD CONSTRUCTION. WAIVER REQUESTED

CONSERVATION OVERLAY DISTRICT:

COCHECHO RIVER ~ 100'	100' MIN.
STEEP SLOPES LARGER THEN 2,000 Sq.Ft., IN SIZE	SEE CUP REQUEST
WETLANDS OVERLAY DISTRICT	SEE CUP REQUEST

6.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, A PORTION OF THIS PARCEL DOES FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015.

7.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL DATUM BASED ON NAD83 STATE PLANE. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

8.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN SPRING OF 2021, WITH NO SNOW CONDITIONS, WITH AN ERROR OF CLOSURE BETTER THAN 1 PART IN 10,000.

9.) TOPOGRAPHY WAS CONDUCTED USING ON THE GROUND SURVEY WITH NO SNOW CONDITIONS IN SPRING 2021 AND IS PROVIDED AT 1' CONTOUR INTERVALS ON EXISTING CONDITIONS PLANS AND ON GRADING AND DRAINAGE PLANS.

10.) LIST ANY VARIANCES OR SPECIAL EXCEPTIONS GRANTED BY THE ZONING BOARD OF ADJUSTMENT OR CONDITIONAL USE PERMITS GRANTED BY THE PLANNING BOARD FOR THE PROPOSED USE OR STRUCTURE:
REDUCTION IN LOT FRONTAGE TO 0' (LOT 65-A) (TABLE 170-12): PENDING

11.) WETLANDS WERE DELINEATED BY JOHN P. HAYES, III, CERTIFIED WETLANDS SCIENTIST, IN ACCORDANCE WITH CHAPTER 170-27.1 OF THE ZONING ORDINANCE, IN SPRING 2021. AND OCTOBER 2022.

12.) AS-BUILT PLANS OF THE SITE PLAN SHALL BE SUBMITTED ON PAPER AND IN DIGITAL FORMAT AUTOCAD DWG, AUTOCAD DXF OR ESRI FORMAT TO THE CITY OF DOVER ENGINEER'S OFFICE UPON COMPLETION OF PROJECT IF A STREET IS PROPOSED FOR CITY ACCEPTANCE. AS-BUILT PLANS SHALL BE PREPARED AND CERTIFIED CORRECT BY A L.L.S. OR P.E. DIGITAL FILES SHALL BE GEO-REFERENCED TO NEW HAMPSHIRE STATE PLANE COORDINATES NAD83 AND SHALL BE EXPRESSED IN FEET.

13.) THE INSTALLATION OF ELECTRIC POWER, CABLE TELEVISION AND TELEPHONE LINES SHALL BE UNDERGROUND THROUGHOUT THE SITE FOR WHICH DEVELOPMENT IS PROPOSED. ONE DROP POLE MAY BE REQUIRED. COORDINATION WITH EVERSOURCE IS REQUIRED. SEE COVER SHEET FOR WORK ORDER NUMBER.

14.) THE SUBJECT PARCEL IS SERVED BY MUNICIPAL WATER AND PROPOSED TO BE SERVICED BY ON SITE LEACHFIELDS.

15.) ALL CONSTRUCTION SHALL CONFORM WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION (NHDOT) "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", DATED 2016 AND WITH THE CITY OF DOVER COMMUNITY SERVICES REGULATIONS AND STANDARD SPECIFICATION FOR CONSTRUCTION. THE MORE STRINGENT SPECIFICATION SHALL APPLY.

16.) ALL EROSION CONTROL NOTES SHALL INCLUDE PROVISIONS FOR CONSTRUCTION SEQUENCING, TEMPORARY EROSION CONTROL MEASURES, AND PERMANENT STANDARDS SUCH AS LOAM SPREAD RATE FOR DISTURBED AREAS, RATES OF LIME, TYPE AND RATES FOR FERTILIZER, AND SEED AND MULCH MIXTURE WITH RATES OF APPLICATION.

17.) THE LIMITS OF CONSTRUCTION DISTURBANCE THAT ARE LOCATED IN OR WITHIN THE 50 FT. OF CONSERVATION AND WETLAND DISTRICTS SHALL BE STAKED WITH 4' GRADE STAKES, FLAGGED AND CLEARLY IDENTIFIED PRIOR ANY EARTH DISTURBING ACTIVITY OCCURS. WETLAND FLAGS ARE TO BE REFRESHED IN THE FIELD PRIOR TO THE START OF CONSTRUCTION. WETLAND PLACARDS ARE REQUIRED TO BE INSTALLED IN AREAS WHERE DEVELOPMENT HAS THE POTENTIAL TO CREEP INTO THE BUFFER ZONES. SEE THE SITE PLANS FOR REQUIRED LOCATIONS. PLACARDS SHOULD BE INSTALLED AFTER CONSTRUCTION AND PRIOR TO CERTIFICATE OF OCCUPANCY OF THE FIRST BUILDING IN THE FIRST PHASE.

18.) ALL TREATMENT SWALES TO BE CONSTRUCTED SHALL HAVE SOD BOTTOMS. (NOT APPLICABLE)

19.) A LETTER OF CREDIT FOR THE COST OF RE-VEGETATING ALL DISTURBED AREAS ON THE SITE SHALL BE SUBMITTED, AND THE APPROVED CONSTRUCTION SIGN INSTALLED PRIOR TO ANY EARTH DISTURBING ACTIVITY OCCURS. THE PROPOSED PROJECT WILL CONSIST OF TWO PHASES AND WILL DISTURB 443,945 Sq.Ft. 10.19 Ac.

20.) 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.

21.) SITE CONSTRUCTION HOURS SHALL BE LIMITED TO MONDAY-FRIDAY 7 AM-6 PM, SATURDAY 8 AM - 4 PM NO SUNDAY HOURS. NO FEDERAL HOLIDAYS. HOURS OF CONSTRUCTION MUST BE DOCUMENTED ON A SITE CONSTRUCTION SIGN ALONG WITH THE CONTACT INFORMATION FOR THE GENERAL CONTRACTOR. SAID SIGNAGE MUST BE LOCATED AND APPROVED BY THE CITY ENGINEER OR DIRECTOR OF PLANNING. TWO LOCATIONS ARE SHOWN ON THE SITE PLAN.

22.) BUILDING ADDRESSES SHALL BE ASSIGNED BY THE BUILDING OFFICIAL AT THE TIME OF ISSUANCE OF A BUILDING PERMIT.

23.) THE PROPOSED USE IS FOR 27 SINGLE FAMILY HOMES (3 BR UNITS) AND ONE EXISTING HOUSE, TO BE CONVERTED TO A DUPLEX (2 BR UNITS) FOR A TOTAL OF 29 UNITS.

24.) THE FOLLOWING FEDERAL AND STATE PERMITS HAVE BEEN ISSUED FOR THE SUBJECT PROPERTY:

NHDES SHORELAND IMPACT PERMIT	(NOT YET SUBMITTED)
NHDES ALTERATION OF TERRAIN PERMIT	(NOT YET SUBMITTED)
NHDES SUBDIVISION APPROVAL	(NOT YET SUBMITTED)
NHDES DWGB PERMIT	(NOT YET SUBMITTED)
NHDES WETLAND IMPACT PERMIT	(NOT YET SUBMITTED)
NATURAL HERITAGE BUREAU	(NHB23-1272)
NH DIVISION OF HISTORICAL RESOURCES	(PENDING)
NOTICE OF INTENT	(NOT YET SUBMITTED)
EVERSOURCE WORK NUMBER	7773758
CONDITIONAL USE PERMIT (WETLAND BUFFER)	(NOT YET SUBMITTED)
CONDITIONAL USE PERMIT (SLOPES)	(NOT YET SUBMITTED)

25.) COMMERCIAL VEHICLE ROUTE DURING CONSTRUCTION SHALL CONFORM TO DOVER CITY CODE OR BE COORDINATED WITH THE COMMUNITY SERVICES DIRECTOR.

26.) ANY RETAINING WALL TALLER THAN FOUR FEET (4') REQUIRES ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES AND IS TO BE PROVIDED DESIGNS BY THE MANUFACTURER AND STAMPED BY A STRUCTURAL ENGINEER. TO BE SUBMITTED TO DOVER ENGINEERING THREE WEEKS PRIOR TO CONSTRUCTION.

27.) ANY FENCE TALLER THAN SEVEN FEET (7') REQUIRES THE ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.

28.) APPLICANT SHALL COMPLETE LAND USE DEVELOPMENT TRACKING FORM, MOST RECENTLY REVISED VERSION, UTILIZING THE ONLINE POLLUTION TRACKING AND ACCOUNTING PILOT PROJECT (PTAPP) PORTAL.

29.) THE OWNER OF RECORD SHALL RECORD AT THE REGISTRY OF DEEDS DOCUMENTATION SUFFICIENT TO PROVIDE NOTICE TO ALL PERSONS/ENTITIES THAT MAY ACQUIRE ANY PROPERTY SUBJECT TO THE REQUIREMENTS AND RESPONSIBILITIES DESCRIBED IN THE APPROVED STORMWATER MANAGEMENT PLAN. THE NOTICE SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS FOR RECORDING CONTAINED IN RSA 477 AND 478. THE NOTICE NEED NOT SET FORTH THE REQUIREMENTS AT LENGTH, SO LONG AS IT IS SUFFICIENT TO PROVIDE NOTICE TO PROSPECTIVE PURCHASERS TO THE REQUIREMENTS FOR MAINTENANCE AND REPORTING.

SITE PLAN NOTES CONTINUED:

30.) FIRE DEPARTMENT ACCESS ROAD SHALL BE INSTALLED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF FIRE APPARATUS IN ALL WEATHER CONDITIONS AT ALL TIMES. THE SECONDARY ACCESS PROVIDED TO SUN HAWK LANE WILL BE CONSTRUCTED AS PART OF PHASE 1A AND WILL BE COMPLETED TO A PASSABLE STATUS PRIOR TO THE ISSUANCE OF THE WOOD PORTION OF A BUILDING PERMIT IN THE FIRST PHASE. A GATE WITH A KNOX BOX WILL BE CONSTRUCTED ALONG SUN HAWK LANE. SPRINKLERS ARE NOT REQUIRED FOR ANY UNITS IN THE PROJECT. FIRE HYDRANTS ARE PROVIDEDWITHIN 500' DRIVING DISTANCE FROM ANY PROPOSED STRUCTURE

31.) EXTERIOR LIGHTING SHALL BE CUT-OFF TYPE FIXTURES PER CHAPTER 153-14-E AND SHALL PROVIDE LIGHTING DIRECTED ON-SITE ONLY.

32.) A SECURITY SYSTEM SHALL BE INSTALLED AS REQUIRED BY CHAPTER 45, ARTICLE I, SECTION 45-2 OF THE CODE OF THE CITY OF DOVER. (NOT APPLICABLE)

33.) APPROVED BACKFLOW PREVENTERS SHALL BE PROVIDED FOR THE DOMESTIC WATER LINES.

34.) THE PROPOSED STRUCTURES SHALL BE SERVED BY A SPRINKLER SYSTEM AS REQUIRED BY CHAPTER 81- 30 OF THE CODE OF THE CITY OF DOVER AND THE ADOPTED STATE OF NH BUILDING AND FIRE CODES. (NOT APPLICABLE)

35.) LAMP BASES ARE TO BE A MINIMUM OF 3' OFF THE EDGE OF PAVEMENT AND PAINTED A NEUTRAL COLOR.

36.) FIRE DEPARTMENT CONNECTION(S) SHALL BE LOCATED ON THE STREET SIDE OF THE BUILDING PER NFPA 13. ACCESS TO THE FDC SHALL MAINTAIN A CLEAR AND UNOBSTRUCTED PATH AT ALL TIMES. (NOT APPLICABLE)

37.) THE SITE LAYOUT IS DESIGNED IN COMPLIANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS. THE PROPOSED STRUCTURE WILL BE ALSO BE DESIGNED IN ACCORDANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS IN THE IRC AND NH RSA 155-A:5.

38.) THE EXISTING SINGLE-FAMILY STRUCTURE ON TAX MAP E, LOT 65-A WILL BE REMOVED AND REBUILT AS A DUPLEX STRUCTURE. CONTRACTOR TO BE PREPARED TO MAKE PROVISIONS FOR THE TEMPORARY RELOCATION OF THE EXISTING FORCEMAIN TO LEACHFIELD IF DETERMINED NEEDED IN THE FIELD.

39.) PRIVATE TRASH PICKUP WILL BE USED THROUGH THE USE OF TOTERS STORED IN GARAGES.

40.) WRITTEN DIMENSION ON THIS PLAN TAKE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL USE CAUTION WHEN SCALING REPRODUCED PLANS. IN THE EVENT OF A CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWINGS AND/OR SPECIFICATIONS, THE ENGINEER SHALL BE NOTIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CONTRACTOR IS TO CONFIRM ALL ELEVATIONS. CONFLICTS WILL BE REPORTED TO THE DESIGN ENGINEER PRIOR TO CONSTRUCTION.

41.) THERE IS CLEAR SITE DISTANCE IN BOTH THE EAST AND WEST DIRECTIONS AT THE EXISTING ENTRANCE OF THEODORE DRIVE ONTO TOLEND ROAD.

42.) ONE HOUSE PER ROAD (THEODORE DRIVE, AMELIA DRIVE, LIAM DRIVE) SHALL HAVE WIRING FOR ELECTRIC VEHICLE CHARGING IN THE GARAGE.

GRADING NOTES:

43.) CONTRACTOR SHALL TAKE SPECIAL CARE IN NOT DISTURBING EXISTING MONUMENTS BOUNDS, AND OR BENCHMARKS WITHOUT FIRST MAKING PROVISIONS FOR RELOCATION.

44.) THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO LOCATE EXACTLY AND TO PRESERVE ANY AND ALL UNDERGROUND UTILITIES CALL "DIG-SAFE" 1-888-DIGSAFE (344-7233) AT LEAST 72 HOURS BEFORE COMMENCING CONSTRUCTION

45.) WHERE AN EXISTING UNDERGROUND UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.

46.) THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.

47.) AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE. LIMIT OF GRADING SHOULD NOT BE EXPANDED WITHOUT CONSULTING THE DESIGN ENGINEER. SEE ALSO E&SC PLAN.

48.) THE TERM "PROPOSED" (PROP.) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS, OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE & RESET" (R & R).

49.) ALL SYMBOLS, WORDS, TRANSVERSE MARKINGS (STOP BARS, CROSSWALK LINES, AND RAILROAD SYMBOLS), LANE LINES, AND ALL OTHER MARKINGS NOTED WITH [T] SHALL BE THERMOPLASTIC.

50.) ALL DISTURBED AREAS NOT DESIGNATED TO BE PAVED SHALL HAVE LOAM PLACED AND SEEDED. THE LOAM SHALL HAVE A MINIMUM DEPTH OF 4 INCHES AND SHALL BE PLACED FLUSH WITH THE TOP OF THE ADJACENT CURB, EDGING, BERM OR PAVEMENT SURFACE.

51.) ALL ELEVATIONS TO BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. THE DESIGN ENGINEER IS TO BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCY. TEMPORARY BENCHMARKS (T.B.M.) ARE TO BE PROVIDED BY THE DESIGN ENGINEER.

52.) UPON FINAL COMPLETION AND 85% STABILIZATION THE DRAINAGE SYSTEM IS TO BE CLEANED OF ALL DEBRIS TO INCLUDE THE PUMPING OF THE BASINS. SEE SHEET E102, DETAIL E18 FOR DEFINITION OF STABLE. ALSO TO BE DONE ONCE A YEAR DURING THE CONSTRUCTION PROCESS.

53.) ALL DRAINAGE PIPE IS TO BE HDPE N-12. INDIVIDUAL PIPE SIZES ARE SPECIFIED, RECYCLED PIPE IS APPROVED FOR PROJECT SITE. RECYCLED HDPE PIPE "GREEN PIPE" IS ACCEPTABLE FOR THIS PROJECT SITE.

54.) ALL BASINS AND DRAINS ARE PROPOSED WITH NO SUMPS OR HOODS. BASINS WITHIN ANY GRASS LINED AREAS OUTSIDE THE ROADWAY WILL HAVE "BEE HIVE" GRATES TO NOT ALLOW FOR ENTRAPMENT OF ANIMALS IN THE STRUCTURE. OUTLET CONTROL STRUCTURES WILL NOT HAVE SUMPS. IF REQUIRED TO BE INSTALLED DURING THE PRE-CASTING PROCESS THEY ARE TO BE FILLED WITH STONE ON SITE. BASINS ARE TO HAVE NH STANDARD FRAMES AND GRATES MADE IN NORTH AMERICA. PLEASE NOTE SOME GRATES ARE SPECIALIZED FOR THE LOCATION AND USE AND ARE CALLED OUT ON THE GRADING PLANS. GRATES ARE TO BE INSTALLED BINDER FLUSH PRIOR TO BASE PAVE. UPON PROJECT COMPLETION FRAMES AND GRATES ARE TO BE CUT AND RIM RAISED TO FINAL PAVEMENT SURFACE. THIS IS TO ENSURE STORWATER ENTERS THE SYSTEM AS DESIGNED DURING THE INTERIM CONSTRUCTION PERIOD.

55.) SEE DETAILS CONCERNING SITE LAYOUT, DRAINAGE, UTILITY, AND SEDIMENT AND EROSION CONTROLS.

UTILITY NOTES:

56.) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVE AND BELOW GROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. ANY UTILITY CONFLICTS SHOULD BE REPORTED IMMEDIATELY TO THE DESIGN ENGINEER.

57.) PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DE-WATERED SUBGRADES, TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAGFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL MEETING THE ENGINEERS SPECIFIC RECOMMENDED CRITERIA.

58.) IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER (NOT ALLOWED IN CITY R.O.W.), EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATION. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.

59.) PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION. VOIDS BETWEEN STONES AND CLUMPS OF MATERIAL SHALL BE FILLED WITH FINE MATERIALS.

60.) FINAL UTILITY LOCATIONS TO BE COORDINATED BETWEEN THE CONTRACTOR, ALL APPROPRIATE UTILITY COMPANIES AND THE DOVER DPW.

61.) CONTRACTOR TO CONTACT DOVER DPW A MINIMUM OF TWO WEEKS PRIOR TO ANY CONSTRUCTION TO COORDINATE ALL WORK CONCERNING INSTALLATION OF ANY PROPOSED WATER LINE IMPROVEMENTS.

62.) ALL WATER MAIN AND SERVICE INSTALLATIONS SHALL CONFORM TO CITY OF DOVER STANDARDS. ALL HIGHWAY CONSTRUCTION WILL MEET THE CITY OF DOVER STANDARDS.

63.) CONTRACTOR SHALL COORDINATE ALL ELECTRICAL INSTALLATIONS WITH EVERSOURCE AT (800) 662-7764. ALL ELECTRIC CONDUIT INSTALLATION SHALL BE INSPECTED BY EVERSOURCE PRIOR TO BACKFILL. A 48-HOUR MINIMUM NOTICE IS REQUIRED.

64.) CONTRACTOR SHALL COORDINATE ALL TELECOMMUNICATIONS INSTALLATIONS WITH FAIRPOINT COMMUNICATIONS AT (603) 427-5525.

65.) THE APPLICANT IS ABLE TO MAKE LIKE CHANGES TO PRODUCTS SO LONG AS THE DESIGN ENGINEER APPROVES THAT THEY MEET THE DESIGN INTENT. THE DESIGN ENGINEER IS TO NOTE THE PROPOSED PRODUCT CHANGE AND SEND REQUEST FOR REVIEW TO THE CITY ENGINEER AND OR PLANNING DEPARTMENT AS MY BE APPLICABLE.

66.) CONTRACTOR SHALL COORDINATE ALL CABLE INSTALLATIONS WITH COMCAST.

67.) NATURAL GAS UTILITY TO BE PROVIDED VIA UNDERGROUND TANK LOCATED NO CLOSER THAN 10' TO EACH STRUCTURE.

68.) ALL SEWERMAN HOLE RIMS & COVERS ARE TO BE LIFTMATE R-1743-LM AND MADE IN NORTH AMERICA.

69.) ALL WATER SERVICES ARE TO BE WITNESSED WITH A 2"X4" PAINTED BLUE. ALL SEWER SERVICES ARE TO BE WITNESSED WITH A 2"X4" PAINTED YELLOW, IS STUBBED PRIOR TO BUILDING CONSTRUCTION.

70.) CURB BOXES SHOULD BE PLACED IN THE LAWN AREA, OR IF PLACED IN PAVEMENT, A ROAD BOX IS REQUIRED.

71.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL DATUM BASED ON NAD83 STATE PLANE COORDINATES GATHERED USING CARLSON BRX7 SURVEY GRADE GPS.

72.) MINIMUM SLOPE FOR ALL SEWER SERVICE CONNECTIONS IS TO BE NO LESS THAN 0.0208'/, FOR 4" SDR 35/SCHD. 40.

73.) ALL SEWER INSTALLATIONS SHALL CONFORM TO THE REQUIREMENTS OF NHDES & DOVER DPW SEWER DIVISION STANDARDS. ALL PVC SEWER PIPE IS TO CONFORM WITH ENV-WQ 704.05 (c)-(e) FOR SDR 35 GRAVITY SEWER PIPE, CONFORM WITH ENV-WQ 704.08 FOR SDR 11 FORCE MAIN PRESSURE PIPE, AND CONFORM WITH ASTM D3034. PVC JOINT SEALS SHALL CONFORM WITH ASTM D3121. THE FORCE MAIN SHALL BE TESTED IN ACCORDANCE WITH ENV-WQ 704.09.

74.) CONTRACTOR TO TRANSFER TEMPORARY BENCHMARK TO A SUITABLE BENCHMARK TO CONTROL CONSTRUCTION. ANY ELEVATION DISCREPANCIES ARE TO BE REPORTED TO THE THE DESIGN ENGINEER IMMEDIATELY.

75.) ALL SEWER AND WATER CROSSINGS ARE TO MAINTAIN A 1.5' OF SEPARATION.

76.) SEE U-103 & U-104 FOR DUPLEX EFFLUENT PUMP STATION DESIGN INFORMATION. NO PUMP SUBSTITUTIONS ARE ALLOWED WITHOUT DESIGN ENGINEER APPROVAL AND WITHOUT DESIGN REAPPROVAL BY CITY OF DOVER. THREE SEPERATE DUPLEX EFFLUENT PUMP STATIONS ARE PROPOSED TO SUPPORT THE SITE PLAN.

SITE PLAN NOTES CONTINUED:

77.) THE EXISTING 2" WATERLINE IN SUN HAWK LANE IS TO REMAIN IN SERVICE IN SUN HAWK LANE UNTIL THE 8" WATER LINE CONNECTION THROUGH SUN HAWK LANE IS IN SERVICE.

EROSION CONTROL AND SEDIMENTATION NOTES:

78.) NOTE THAT THE PROJECT IS SUBJECT TO THE EPA NPDES PHASE II. THE NOTICE OF INTENT (NOI) MUST BE FILED ALONG WITH A STORMWATER POLLUTION PREVENTION PLAN (SWPPP). EROSION AND SEDIMENT CONTROL INSPECTIONS TO BE CONDUCTED ONCE PER EVERY SEVEN DAYS AND AT AN INCREASED FREQUENCY INCLUDING WITHIN 24-HOURS OF A 0.25 INCH RAIN EVENT. INSPECTIONS TO BE CONDUCTED BY A "QUALIFIED PERSON" AS DEFINED BY EPA CGP 4.1.1 AND INSPECTION REPORTS SUBMITTED TO THE CITY OF DOVER, NH, ENGINEERING DEPARTMENT WITHIN 24 HOURS IN ACCORDANCE WITH CGP 4.1.7 AND MAINTAINED BY THE OWNER FOR A PERIOD OF THREE YEARS AFTER THE PROJECT IS COMPLETED. SEE ALSO CITY OF DOVER ADDITIONAL INSPECTION REQUIREMENTS BELOW.

79.) CONTRACTOR CAN USE SILT FENCE, SILT SOXX OR MULCH BERM FOR PERIMETER CONTROL. SPECIFIC PRACTICES MAY BE SPECIFIED, SEE PLAN. SILT FENCE OR SILT SOXX REQUIRED WHEN UPGRADIENT DISTURBED SOIL IS GREATER THAN 5% MULCH BERM CAN BE USED WHEN THE UPGRADIENT DISTURBED SOIL IS 5% OR LESS.

80.) CITY OF DOVER: IN ACCORDANCE WITH SITE PLAN REVIEW REGULATIONS (153-14) THE FOLLOWING STORMWATER MEASURES ARE REQUIRED.

A.) ALL PROPOSED BMPs WILL CONFORM TO THE NH STORMWATER MANUAL VOLUME 3.
B.) EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY SOIL LAND DISTURBANCE AND MUST BE REVIEWED AND APPROVED BY COMMUNITY SERVICE.
C.) TEMPORARY STABILIZATION MEASURES SHOULD BE IN PLACE WITHIN SEVEN CALENDAR DAYS FOR EXPOSED SOILS AREAS THAT ARE WITHIN ONE HUNDRED FEET OF A SURFACE WATER BODY OR A WETLAND AND NO MORE THAN 14 CALENDAR DAYS FOR ALL OTHER AREAS. PERMANENT STABILIZATION SHOULD BE IN PLACE WITHIN THREE CALENDAR DAYS FOLLOWING COMPLETION OF FINAL GRADING OF EXPOSED SOKL AREAS.
D.) ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED IN FUNCTIONING CONDITION UNTIL FINAL STABILIZATION IS ACCOMPLISHED.
E.) COMMUNITY SERVICES DEPARTMENT OR THEIR DESIGNATED AGENT SHALL HAVE ACCESS TO THE SITE TO COMPLETE ROUTINE INSPECTIONS AND SHALL BE NOTIFIED 24-HOURS PRIOR TO INSTALLATION OF A STORMWATER BMP IN ORDER TO SCHEDULE AN INSPECTION, DURING NORMAL WORKING HOURS.
F.) THE PLANNING BOARD OR COMMUNITY SERVICES MAY REQUIRE THE DESIGN ENGINEER AND/OR AN INDEPENDENT, THIRD-PARTY INSPECTION AND OVERSIGHT OF THE CONSTRUCTION OF STORMWATER MANAGEMENT FACILITIES AND EROSION AND SEDIMENT CONTROL AT THEIR DISCRETION. THE OWNER / APPLICANT IS RESPONSIBLE FOR ALL FEES ASSOCIATED WITH INSPECTIONS.
G.) ALL SWPPP INSPECTIONS MUST BE CONDUCTED BY A QUALIFIED PROFESSIONAL SUCH AS A PROFESSIONAL ENGINEER (PE), A CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC), A CERTIFIED EROSION SEDIMENT AND STORMWATER INSPECTOR (CESSW), OR A CERTIFIED PROFESSIONAL IN STORMWATER QUALITY (CPSWQ). INSPECTION REPORTS WILL BE SUBMITTED TO THE COMMUNITY SERVICES DEPARTMENT.

81.) PER EPA CGP 2.1.2.2 (INSTALL PERIMETER CONTROL), "YOU MUST INSTALL SEDIMENT CONTROLS ALONG THOSE PERIMETER AREAS OF YOUR SITE THAT WILL RECEIVE STORMWATER FROM EARTH DISTURBING ACTIVITIES." AS A RESULT OF SWPPP INSPECTIONS, THE CONTRACTOR MAY HAVE TO EXPAND PERIMETER CONTROLS TO MEET THIS REQUIREMENT. THE E&SC PLAN IS INITIAL GUIDANCE AS TO THE ANTICIPATED REQUIREMENTS AND IT THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT STORMWATER VIOLATION DO NOT OCCUR.

82.) THE ENVIRONMENTAL MONITOR SHALL: (1) INSPECT THE PROJECT SITE AT LEAST ONCE EACH WEEK FROM THE START OF TERRAIN ALTERATION ACTIVITIES UNTIL ALL TERRAIN ALTERATION ACTIVITIES ARE COMPLETED AND THE SITE IS STABILIZED; (2) IN ADDITION TO REGULAR WEEKLY INSPECTIONS, INSPECT THE PROJECT SITE DURING ANY RAIN EVENT IN WHICH 0.5 INCH OF PRECIPITATION OR MORE FALLS WITHIN A 24 HOUR PERIOD, PROVIDED THAT IF THE ENVIRONMENTAL MONITOR IS UNABLE TO BE PRESENT DURING SUCH A STORM, THE MONITOR SHALL INSPECT THE SITE WITHIN 24 HOURS OF THE RAIN EVENT; (3) SUBMIT A WRITTEN REPORT, STAMPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST, TO THE DEPARTMENT WITHIN 24 HOURS OF EACH INSPECTION THAT: A. DESCRIBES THE PROGRESS OF THE PROJECT, INCLUDING WHETHER ALL CONDITIONS OF THE PERMIT ARE BEING MET AND, IF NOT, WHICH REQUIREMENTS ARE NOT BEING MET; B. IF ANY REQUIREMENTS ARE NOT BEING MET, AN EXPLANATION OF THE CORRECTIVE ACTION(

ABBREVIATION LEGEND:

E.O.P.	EDGE OF PAVEMENT
S.G.C.	SLOPED GRANITE CURB
V.G.C.	VERTICAL GRANITE CURB
B.C.C.	BITUMINOUS CONCRETE CURB
A.C.P.	ASBESTOS CLAY PIPE
BITUM.	BITUMINOUS
E.S.H.W.T	ESTIMATE SEASONAL HIGH WATER TABLE
TYP.	TYPICAL
E.D.A.	EFFLUENT DISPOSAL AREA
U.G.E	UNDERGROUND ELECTRIC / UTILITY
CLDI	CONCRETE LINED DUCTILE IRON
DI	DUCTILE IRON
U.D.	UNDER DRAIN
C.O.	CLEAN OUT
CMP	CORRUGATED METAL PIPE
INV.	INVERT
ELEV.	ELEVATION
F.E.S.	FLARED END SECTION
HDPE	HIGH DENSITY POLYETHYLENE
RCP	REINFORCED CONCRETE PIPE
RECB	ROLLED EROSION CONTROL BLANKET
F.G.	FINISHED GRADE
E.G.	EXISTING GRADE
E.T.W.	EDGE OF TRAVELED WAY
T.B.R.	TO BE REMOVED
PL	PROPERTY LINE
EL	EASEMENT LINE
CL	CENTER LINE
CF	CUBIC FEET
P.C.	POINT OF CURVATURE
P.T.	POINT OF TANGENCY
P.V.P.	POINT OF VERTICAL CURVE
P.V.I.	POINT OF VERTICAL INTERSECTION
P.V.T.	POINT OF VERTICAL TANGENCY
EX.	EXISTING
PROP.	PROPOSED
STA.	STATION
BMP	BEST MANAGEMENT PRACTICE
'/,	FEET / FEET
TP	TEST PIT
PT	PERC TEST
NHHB	NEW HAMPSHIRE HIGHWAY BOUND

{ } SSL ( ) ~ {SIZE} SINGLE SOLID LINE (COLOR W=WHITE, Y=YELLOW)
{ } DSL ( ) ~ {SIZE} DOUBLE SOLID LINE (COLOR W=WHITE, Y=YELLOW)
{ } SSB ( ) ~ {SIZE} SINGLE SOLID W/ BROKEN LINE (COLOR W=WHITE, Y=YELLOW)
{ } SBL ( ) ~ {SIZE} SINGLE BROKEN LINE (COLOR W=WHITE, Y=YELLOW)
{ } DBL ( ) ~ {SIZE} DOUBLE BROKEN LINE (COLOR W=WHITE, Y=YELLOW)

EXISTING LEGEND:

- DRILL HOLE ~FND~
- IRON PIPE ~FND~
- IRON BOUND ~FND~
- STEEL STAKE ~FND~
- NHHB/GRANITE BOUND ~FND~
- UTILITY POLE/GUY WIRE
- SEWER MANHOLE W/ STRUCTURE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCUTE
- TEST PIT
- PERC TEST
- TEMPORARY BENCHMARK (T.B.M.)
- BLAZED/PAINTED/BARBED WIRE TREE
- POORLY DRAINED JURISDICTIONAL WETLAND LINE
- BUILDING SETBACK LINE
- EASEMENT LINE
- WETLAND SETBACK 50' TO POORLY DRAINED
- STONE WALL
- STONE WALL REMAINS
- NRCS SOIL DELINEATION LINE
- SITE SPECIFIC SOIL LINE
- LIMIT OF SOIL SURVEY
- OVERHEAD UTILITIES LINE
- CONTOUR MINOR, EXISTING
- CONTOUR MAJOR, EXISTING
- EXISTING STREAM
- EXISTING TRAIL
- FEMA FLOOD ZONE
- 50' NHDES WOODLAND BUFFER
- 150' NHDES NATURAL WOODLAND BUFFER
- 250' NHDES SHORELAND PROTECTION ZONE
- 100' LOCAL CONSERVATION OVERLAY ZONE
- GREATER THAN 20% SLOPE FOR 2,000 Sq. Ft. CONTIGUOUS AREA
- SOIL SERIES
- NRCS SOIL LABEL
- STRAFFORD COUNTY REGISTRY OF DEEDS
- TYPICAL
- FOUND
- ABUTTER REFERENCE
- EXISTING WATER MAIN LINE
- EXISTING GRAVITY SEWER LINE
- EXISTING SPOT GRADE

PROPOSED LEGEND:

- 4"X4" GRANITE BOUND ~TBS~
- 3/4" REBAR W/ ID CAP ~TBS~
- 1/2" EASEMENT REBAR W/ ID CAP ~TBS~
- PROPOSED LIMITED COMMON AREA (LCA) LINE
- PROPOSED EASEMENT LINE
- UTILITY POLE
- LIGHT TYPE "A" MOUNTED LIGHT POLE
- LIGHT TYPE "B" MOUNTED ON BUILDING
- SEWER MANHOLE W/ STRUCTURE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCUTE
- OUTLET CONTROL STRUCTURE
- SIGNAGE
- CHECK DAM-MATERIAL AS SPECIFIED
- FLOW ARROW
- TEMPORARY BENCHMARK (T.B.M.)
- DETAIL SHEET / DETAIL
- MATCH POINT
- MATCH LINE
- CONTOUR MINOR, PROPOSED
- CONTOUR MAJOR, PROPOSED
- DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- SHOULDER
- CENTER LINE
- BUILDING SETBACK LINE
- NHDES PROTECTIVE WELL RADIUS
- TRANSFORMER / J-BOX
- UNDERGROUND UTILITY
- UNDER DRAIN
- SILT FENCE / EROSION MIX BERM
- FILTREXX 8" - 12" SILT SOXX AS SPECIFIED
- ORANGE CONSTRUCTION PERIMETER FENCE
- PERIMETER CONTROL
- NRCS SOIL DELINEATION
- SOIL TYPE
- RIP RAP
- SUBSURFACE GRAVEL WETLAND
- BERM
- SNOW STORAGE AREA
- RECREATION SPACE
- GATE VALVE
- CURB STOP
- FIRE HYDRANT OR POST HYDRANT
- THRUST BLOCKS
- PROPOSED SPOT ELEVATION
- PROPOSED WATER MAIN LINE
- PROPOSED WATER SERVICE
- PROPOSED GRAVITY SEWER LINE
- PROPOSED SEWER FORCEMAIN
- PROPOSED GRAVITY SEWER SERVICE
- PROPOSED GAS LINE / UG LP TANK
- PROPOSED TREE LINE
- PROPOSED GUARD RAIL
- PROPOSED GRAVEL SHOULDER
- CLEAR ZONE
- SAW CUT AND MILL
- EFFLUENT PUMP STATION
- EFFLUENT DISPOSAL AREA
- PERMANENT WETLAND IMPACT AREA
- TEMPORARY WETLAND IMPACT AREA
- PERMANENT WETLAND BUFFER IMPACT AREA
- TEMPORARY WETLAND BUFFER IMPACT AREA
- GREATER THAN 20% SLOPE FOR 2,000 Sq. Ft. CONTIGUOUS AREA DISTURBED

OPEN SPACE CALCULATIONS:
28 PROPOSED LOTS ON YIELD PLAN REQUIRING 30,000 Sq.Ft. / PER UNIT = 840,000 Sq.Ft.
OPEN SPACE REQUIRED = 420,000 Sq.Ft. UPLAND REQUIREMENT FOR OPEN SPACE = 210,000 Sq.Ft.,
OPEN SPACE #1 PROVIDED = 126,619 Sq.Ft, UPLAND IN OPEN SPACE #1 PROVIDED = 101,227 Sq.Ft. OPEN SPACE #2 PROVIDED = 1,395,308 +/- Sq.Ft, UPLAND IN OPEN SPACE #2 PROVIDED = 1,114,875 Sq.Ft.
TOTAL OPEN SPACE PROVIDED = 1,521,927 Sq.Ft. TOTAL UPLAND IN OPEN SPACE PROVIDED = 1,216,102 Sq.Ft
TOTAL AREA LOT 65-A = 125,886 Sq.Ft. TOTAL UPLAND AREA: 91,446 Sq.Ft.

CONDITIONAL USE PERMITS:
TOTAL 50' WETLAND BUFFER OF IMPACT: 28,921 Sq.Ft. PERMANENT 50' BUFFER IMPACT: 20,850 Sq.Ft. TEMPORARY 50' BUFFER IMPACT: 8,071 Sq.Ft.
TOTAL WETLANDS AREA OF IMPACT: 4,140 Sq.Ft. PERMANENT WETLANDS IMPACT: 2,156 Sq.Ft. TEMPORARY WETLANDS IMPACT: 1,983 Sq.Ft.
GREATER THAN 20% SLOPE FOR 2,000 SQ.FT. OF CONTIGUOUS AREA DISTURBED: 2,472 Sq.Ft.
SEE APPLICATION AND NARRATIVE FOR EXPLANATIONS & JUSTIFICATIONS

WAIVER REQUESTS:
MINIMUM PERIMETER BUFFER TO PERMIT OSS BUFFER LESS THAN 40' IN ONE LOCATION 157-21F(4)
4% INTERSECTION GRADE WITHIN 75' WHERE 3% MAX ALLOWED (157-32G)

PARKING REQUIREMENTS:

CHAPTER 153-14D PARKING TABLE

- RESIDENTIAL
  - RESIDENTIAL (NON CBD-G) 1.4 SPACES PER UNIT:
    - VISITOR 0.5 SPACES PER UNIT:
    - EACH UNIT HAS A TWO CAR GARAGE AND DRIVEWAY PARKING
    - 29 UNITS * 1.9 SPACES PER UNIT = 56 SPACES REQ

5% BICYCLE RACK STORAGE = 3 SPACES REQ. 20+ PROVIDED (3 LOCATIONS)
5% EV SPACE REQ. = 3 SPACES REQ., 3 GARAGES PROVIDED.
SEE SITE PLAN NOTE #42.

SNOW STORAGE:

- STORAGE CALCULATION (6:1 RATIO USED)
  - PAVED AREA = 55,583 Sq.Ft. / 6 = 9,264 Sq. Ft.
  - >13,236 Sq. Ft. PROVIDED
  - THIS CALCULATION BASED ON PRIMARY ROADS ONLY

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

LEGEND PLAN & DENSITY CALCULATIONS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS SHOWN
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14245
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

LEGEND:

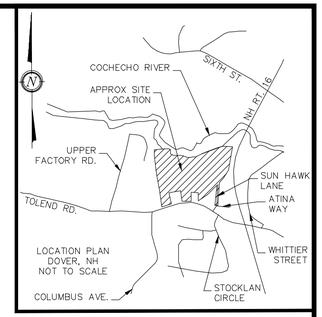
- ● 3/4" REBAR W/ ID CAP ~TBS~
- ⊕ STEEL STAKE ~FND~
- ○ IRON PIPE ~FND~
- ⊙ IRON BOUND/REBAR/IRON ROD ~FND~
- ⊠ NHHB/GRANITE BOUND
- UTILITY POLE
- APPROX. ABUTTING LOT LINE
- PERIMETER BOUNDARY LINE
- SURVEY TIE LINE
- HIGHWAY FENCE

FND FOUND
TBS TO BE SET
S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS

DETAIL "A"
SCALE: 1" = 5'

DETAIL "B"
SCALE: 1" = 5'

DETAIL "C"
SCALE: 1" = 5'



LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER LOT 65–1: 59 TOLEND ROAD, LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) LOT AREA LOT 65–1: 1,388,309 Sq. Ft.±, 31.87 Ac.±
LOT AREA LOT 65–A: 546,643 Sq. Ft.±, 12.55 Ac.±

4.) S.C.R.D. BOOK 5044, PAGE 744, LOT 65–1
S.C.R.D. BOOK 1571, PAGE 86, LOT 65–A

5.) THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES OF TAX MAP E, LOT 65–1 & 65–A IN ACCORDANCE WITH AND IN RELATION TO THE CURRENT AND ORIGINAL LEGAL DESCRIPTIONS, AND IS NOT AN ATTEMPT TO DEFINE UNWRITTEN RIGHTS, DETERMINE THE EXTENT OF OWNERSHIP, OR DEFINE THE LIMITS OF TITLE.

6.) NH STANDARD PROPERTY SURVEY WITH A CLOSURE BETTER THAN 1:10,000.

PLAN REFERENCES:

1.) STANDARD PROPERTY SURVEY AND SUBDIVISION OF LAND OF THE EDWARD J. GEORGE FAMILY TRUST
BY: CIVIL CONSULTANTS
DATED: APRIL 2, 2011
S.C.R.D.: PLAN #102–24

2.) PLAN OF LAND PREPARED FOR FAIRVIEW PARNERS, LLC
TAX MAP E, LOT NO. 74B 35 TOLEND ROAD CITY OF DOVER COUNTY OF STRAFFORD STATE OF NEW HAMPSHIRE
BY: MCENEANEY SURVEY ASSOCIATES INC.
DATED: MARCH 4, 2016

3.) SUBDIVISION OF LAND FOR KAREN & JAMES BECKINGHAM & MARY & SCOTT MCEWAN IN DOVER, N.H.
BY: BRUCE L. POHOPEK
DATED: FEBRUARY 19, 1986
S.C.R.D.: PLAN #29–67

4.) SUBDIVISION OF LAND FOR PAUL MARTEL IN DOVER, N.H.
BY: BRUCE L. POHOPEK
DATED: OCTOBER 4, 1978
S.C.R.D.: PLAN #19A–47

5.) PLAN OF LOT ERNEST BSTANDIG DOVER NEW HAMPSHIRE
BY: G.L. DAVIS & ASSOCIATES
DATED: MAY, 1969
S.C.R.D.: BOOK 858, PAGE 159

PLAN REFERENCES:

6.) PLAN OF LAND, HAROLD A. & YVONNE M. CLEWLEY & LINDA J. NOURY, NORTH SIDE OF TOLEND ROAD, DOVER, NH
BY: R.W. MCCRONE
DATED: MARCH 1986
S.C.R.D. PLAN #28A–04

7.) BOUNDARY LINE ADJUSTMENT, THE HEIRS OF KENNETH & IRENE M. NYE AND PAUL & KATHERINE MARTEL, UPPER FACTORY ROAD, DOVER, NH
BY: TRITECH ENGINEERING CORPORATION
DATED: OCTOBER 25, 2004
S.C.R.D. PLAN #77–87

8.) SUBDIVISION OF LAND FOR ANTONIO BASTIANELLI IN DOVER, N.H.
BY: BRUCE L. POHOPEK, LAND SURVEYOR
DATED: JULY 31, 1989, AS REVISED 5/28/90
S.C.R.D. PLAN #32–149

9.) STATE OF NEW HAMPSHIRE, DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS, PLAN OF PROPOSED LS1824(1), SPAULDING TURNPIKE
DATED: OCTOBER 19, 1955
S.C.R.D. PLAN #32, POCKET 15, FOLDER 3 &
S.C.R.D. PLAN #36, POCKET 15, FOLDER 3 &
ON FILE AT NH DOT RIGHTS–OF–WAY, CONCORD, NH

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

REVISION	DATE	DESCRIPTION

BOUNDARY SURVEY
LAND OF
59 TOLEND ROAD, LLC AND
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

KENNETH A. BERRY L.L.S. 805 DATE

STATE OF NEW HAMPSHIRE — No. 805 — LICENSED LAND SURVEYOR
KENNETH A. BERRY
SIGNATURE

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT RD.
BARRINGTON, N.H. (603)332–2863

SCALE : 1 IN. EQUALS 100 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023–031

DOVER PLANNING FILE #P23–XX

NOT FOR CONSTRUCTION

ABUTTERS WITHIN 200':

(1) N/F SICARD, RHONDA J. & BASTINELLI, GREGORY
14 ATINA WAY
DOVER, NH 03820
TAX MAP E, LOT 74
S.C.R.D. BOOK 4505, PAGE 898

(2) N/F SUNDSTROM, SCOTT A. & AIMEE E.
8 ATINA WAY
DOVER, NH 03820
TAX MAP E, LOT 74-1
S.C.R.D. BOOK 3061, PAGE 364

(3) N/F POMEROY, CAROLINE S.
56 DURHAM ROAD UNIT 48
DOVER, NH 03820
TAX MAP E, LOT 74-B
S.C.R.D. BOOK 4805, PAGE 138

(4) N/F FINN, CAROL ANNE
10 SUNHAWK LANE
DOVER, NH 03820
TAX MAP E, LOT 74-C
S.C.R.D. BOOK 1598, PAGE 215

(5) N/F CLOUGH, VERNON L. & OLGA
43 TOLEND ROAD
DOVER, NH 03820
TAX MAP E, LOT 74-D
S.C.R.D. BOOK 2703, PAGE 371

(6) N/F BSTANDIG, MARTHA A. REV. TRUST
BSTANDIG, MARTHA A. TRUSTEE
53 TOLEND ROAD
DOVER, NH 03820
TAX MAP E, LOT 65-B
S.C.R.D. BOOK 4639, PAGE 921

(7) N/F GEORGE, DOUGLAS A.
65 TOLEND ROAD
DOVER, NH 03820
TAX MAP E, LOT 65
S.C.R.D. BOOK 3953, PAGE 464

(8) N/F FORBES, DONALD W. & LINDA R.
181 OLD FIELDS ROAD
SOUTH BERWICK, ME 03908
TAX MAP E, LOT 64
S.C.R.D. BOOK 1906, PAGE 249

(9) N/F MAXON FAMILY TRUST
MAXON, THOMAS & PATRICIA, TRUSTEES
40 BALDPATE ROAD
GEORGETOWN, MA 01833
TAX MAP E, LOT 57-G
S.C.R.D. BOOK 4018, PAGE 118

(10) N/F MONE, FLORENCE & KEVIN
1 MONES FOLLY DRIVE
DOVER, NH 03820
TAX MAP E, LOT 57-G-1
S.C.R.D. BOOK 4833, PAGE 841

(11) N/F MARTEL, PAUL J.
P.O. BOX 182
DOVER, NH 03821
TAX MAP E, LOT 57-3
S.C.R.D. BOOK 1433, PAGE 200

(12) N/F THIBAULT, DANIEL JACOB
40 NYE LANE
DOVER, NH 03820
TAX MAP E, LOT 49-9
S.C.R.D. BOOK 4631, PAGE 150

(13) N/F BERGSTROM, EVA K. & EDDINS, KURT
38 NYE LANE
DOVER, NH 03820
TAX MAP E, LOT 49-B
S.C.R.D. BOOK 4499, PAGE 734

ABUTTERS WITHIN 200':

(14) N/F CHAKRAVARTY, DILIP & MITALI
11411 RUNNING BEAR COURT
BELTSVILLE, MD 20705
TAX MAP E, LOT 49-7
S.C.R.D. BOOK 3988, PAGE 795

(15) N/F BRODERICK, BRIDGET
26 NYE LANE
DOVER, NH 03820
TAX MAP E, LOT 49-6
S.C.R.D. BOOK, 4034, PAGE 254

(16) N/F RICHBURG, NORMAN R. & BETSY J.
22 NYE LANE
DOVER, NH 03820
TAX MAP E, LOT 49-5
S.C.R.D. BOOK 3999, PAGE 266

(17) N/F ROBIDAS, ZACKERY
71 UPPER FACTORY ROAD
DOVER, NH 03820
TAX MAP E, LOT 57-1
S.C.R.D. BOOK 4449, PAGE 106

(18) N/F CHAGNON, MICHAEL C. & KRISTINE E.
69 UPPER FACTORY ROAD
DOVER, NH 03908
TAX MAP E, LOT 57
S.C.R.D. BOOK 2203, PAGE 519

(19) N/F MILLER, JASON S. & CHRISTINE S.
94 TOLEND ROAD
DOVER, NH 03820
TAX MAP C, LOT 24-A
S.C.R.D. BOOK, 3077, PAGE 1

(20) N/F THAYER SMITH FAMILY REV. TRUST
SMITH, TRAVIS K. & THAYER, MEGAN TRUSTEES
88 TOLEND ROAD
DOVER, NH 03820
TAX MAP C, LOT 24-C
S.C.R.D. BOOK, 4347, PAGE 303

(21) N/F GERVAIS, ANDREW TODD
80 TOLEND ROAD
DOVER, NH 03820
TAX MAP C, LOT 24-M
S.C.R.D. BOOK 4250, PAGE 900

(22) N/F ROBERTSON, JAMES M. & LINDA S.
78 TOLEND ROAD
DOVER, NH 03820
TAX MAP C, LOT 24-L
S.C.R.D. BOOK 2611, PAGE 738

(23) N/F ROBERTS, MEREDITH
74 TOLEND ROAD
DOVER, NH 03820
TAX MAP C, LOT 24-F
S.C.R.D. BOOK 4542, PAGE 440

(24) N/F WYNDBROOK AT DOVER HOMEOWNERS ASSOCIATION
P.O. BOX 1685
DOVER, NH 03821
TAX MAP C, LOT 24-J
S.C.R.D. BOOK 4359, PAGE 116

(25) N/F DAMON, TIMOTHY JAMES & CATHERINE E.
64 TOLEND ROAD
DOVER, NH 03820
TAX MAP C, LOT 24-G
S.C.R.D. BOOK 4228, PAGE 316

(26) N/F WILLIAMS, THOMAS R. & CAROLYN E.
60 TOLEND ROAD
DOVER, NH 03820
TAX MAP C, LOT 24-B
S.C.R.D. BOOK 2073, PAGE 290

ABUTTERS WITHIN 200':

(27) N/F KEEFE, PATRICIA
54 TOLEND ROAD
DOVER, NH 03820
TAX MAP C, LOT 24-H
S.C.R.D. BOOK 1484, PAGE 700

(28) N/F BEAN, BONNIE E. & CITAK, TERESA
48 TOLEND ROAD
DOVER, NH 03820
TAX MAP C, LOT 24-E
S.C.R.D. BOOK 4438, PAGE 210

(29) N/F KEEFE, VERNA S. & RICHARD E.
3 ATINA WAY
DOVER, NH 03820
TAX MAP C, LOT 24
S.C.R.D. BOOK 1112, PAGE 441

(30) N/F JOHNSTON, JEFFERY A,
15 TOLEND ROAD
DOVER, NH 03820
TAX MAP C, LOT 24-I
S.C.R.D. BOOK 4567, PAGE 361

ABUTTERS WITHIN 200':

(31) N/F NORASING, VETHANA & REVERN,
17 ATINA WAY
DOVER, NH 03820
TAX MAP C, LOT 24-Q
S.C.R.D. BOOK 4238, PAGE 373

(32) WHITTIER FALLS INC.
62 WHITTIER STREET
DOVER, NH 03820
TAX MAP E, LOT 65-C
S.C.R.D. BOOK 4224, PAGE 554

(33) WHITTIER FALLS INC.
62 WHITTIER STREET
DOVER, NH 03820
TAX MAP E, LOT 74-A
S.C.R.D. BOOK 4224, PAGE 554

(34) LIBERTY MUTUAL INSURANCE CO.
ATTN: TYLER MUNGER
175 BERKELEY STREET
BOSTON, MA 02116
TAX MAP E, LOT 24
S.C.R.D. BOOK 1364, PAGE 453

PLAN REFERENCES:

1.) STANDARD PROPERTY SURVEY AND SUBDIVISION OF LAND OF THE EDWARD J. GEORGE FAMILY TRUST
BY: CIVIL CONSULTANTS
DATED: APRIL 2, 2011
S.C.R.D.: PLAN #102-24

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BY: MCENEANEY SURVEY ASSOCIATES INC.
DATED: MARCH 4, 2016

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BY: BRUCE L. POHOPEK
DATED: OCTOBER 4, 1978
S.C.R.D.: PLAN #19A-47

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BY: G.L. DAVIS & ASSOCIATES
DATED: MAY, 1969
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DATED: OCTOBER 19, 1955
S.C.R.D. PLAN #32, POCKET 15, FOLDER 3 &
S.C.R.D. PLAN #36, POCKET 15, FOLDER 3 &
ON FILE AT NH DOT RIGHTS-OF-WAY, CONCORD, NH

WETLAND NOTES:

WETLANDS WERE DELINEATED BY JOHN P. HAYES SPRING 2021 & OCTOBER OF 2022

1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.0. UNITED STATES DEPARTMENT OF AGRICULTURE (2016).
3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

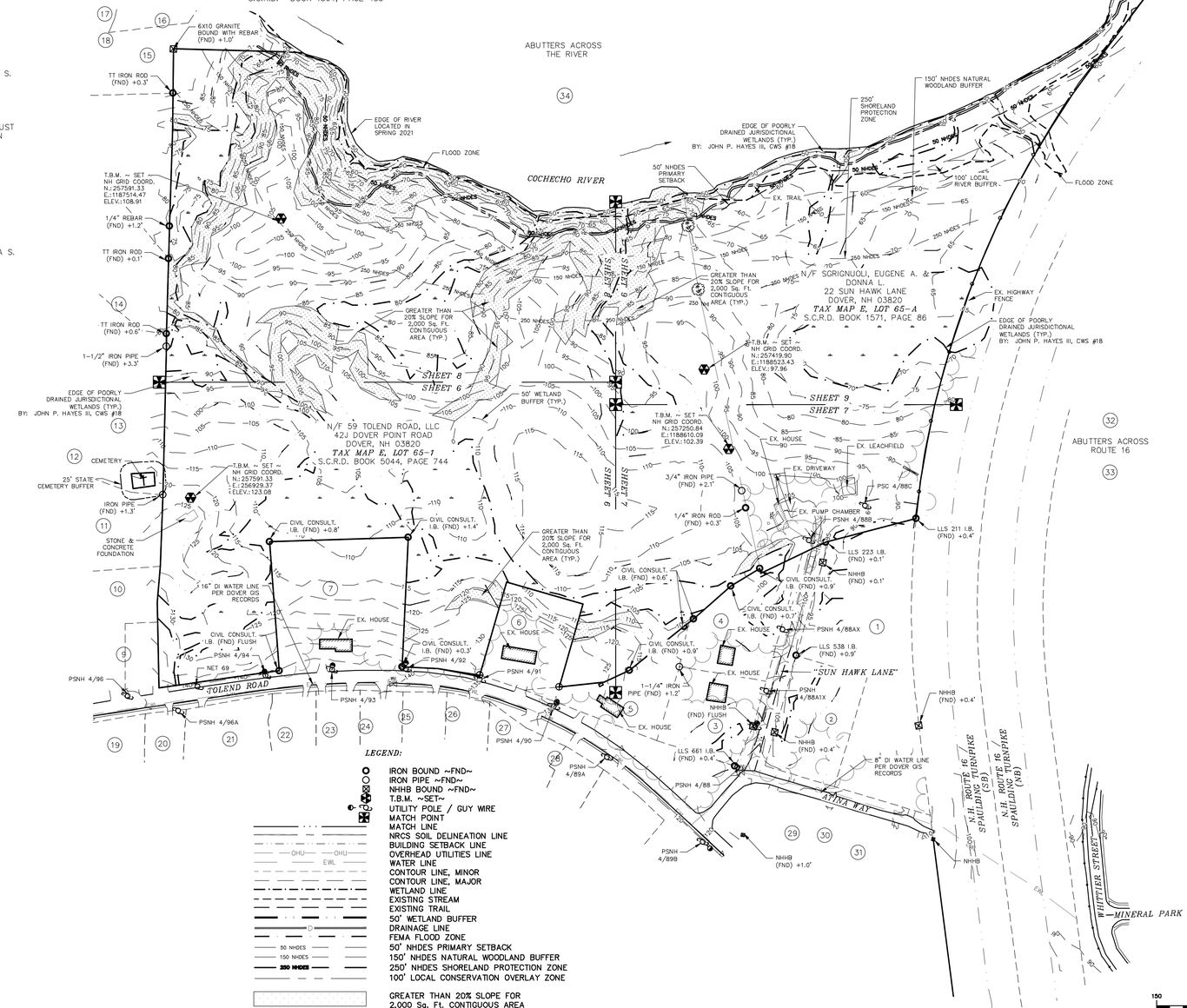
STATE OF NEW HAMPSHIRE — JOHN P. HAYES, III — No. 043 — CERTIFIED WETLAND SCIENTIST

JOHN P. HAYES III, CWS #18

NRCS SOILS:

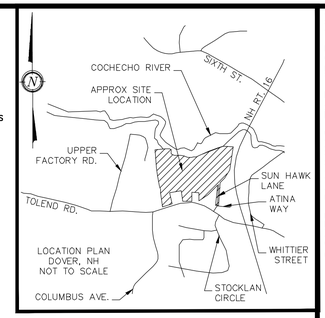
BzB – BUXTON SILT LOAM, 3 TO 8 PERCENT SLOPES
CfB – CHARLTON FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
HrB – HOLLIS-CHARLTON FINE SANDY LOAMS, 3 TO 8 PERCENT SLOPES
ScA – SCANTIC SILT LOAM, 0 TO 3 PERCENT SLOPES
ScB – SCANTIC SILT LOAM, 3 TO 8 PERCENT SLOPES
SfC – SUFFIELD SILT LOAM, 8 TO 15 PERCENT SLOPES
SfD – SUFFIELD SILT LOAM, 15 TO 35 PERCENT SLOPES

SEE WEBSOIL USDA-NRCS



LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- NHHB BOUND ~FND~
- T.B.M. ~SET~
- UTILITY POLE / GUY WIRE
- MATCH POINT
- MATCH LINE
- NRCS SOIL DELINEATION LINE
- BUILDING SETBACK LINE
- OVERHEAD UTILITIES LINE
- WATER LINE
- CONTOUR LINE, MINOR
- CONTOUR LINE, MAJOR
- WETLAND LINE
- EXISTING STREAM
- EXISTING TRAIL
- 50' WETLAND BUFFER
- DRAINAGE LINE
- FEMA FLOOD ZONE
- 50' NHDES PRIMARY SETBACK
- 150' NHDES NATURAL WOODLAND BUFFER
- 250' NHDES SHORELAND PROTECTION ZONE
- 100' LOCAL CONSERVATION OVERLAY ZONE
- GREATER THAN 20% SLOPE FOR 2,000 Sq. Ft. CONTIGUOUS AREA
- CfB — NRCS SOIL LABEL
- S.C.R.D. — STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. — TYPICAL
- FND — FOUND
- (1) — ABUTTER REFERENCE



NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,388,309 Sq. Ft., 31.87 Ac. +/-
LOT AREA LOT 65-A: 546,643 Sq. Ft., 12.55 Ac. +/-

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

5.) ZONING: (R-20) LOW DENSITY
MINIMUM FRONTAGE ~ 125'
MINIMUM LOT SIZE ~ 20,000 Sq. Ft.
FRONT SETBACK ~ 20'
REAR SETBACK ~ 30'
SIDE SETBACK ~ 20'
WETLANDS BUFFER ~ 50.0'
MAX. BUILDING HEIGHT: 35'
MAX. LOT COVERAGE: 30%

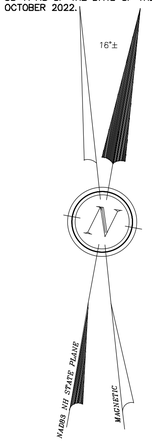
CONSERVATION OVERLAY DISTRICT:
COCHECO RIVER ~ 100'
STEEP SLOPES LARGER THAN 2,000 Sq. Ft., IN SIZE
WETLANDS OVERLAY DISTRICT

6.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, A PORTION OF THIS PARCEL DOES FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD, REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015.

7.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

8.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN WINTER OF 2021, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

9.) THE INTENT OF THIS PLAN IS TO SHOW THE OVERVIEW EXISTING CONDITIONS ON TAX MAP E, LOT 65-1 AND LOT 65-A AS OF THE DATE OF THE FIELD WORK: MARCH 2021 & OCTOBER 2022.



GRAPHIC SCALE

150 0 75 150 300 600

(IN FEET)
1 inch = 150 ft.

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

EXISTING CONDITIONS PLAN OVERVIEW
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 150 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE — No. 805 — LICENSED LAND SURVEYOR — KENNETH J. BERRY — SIGNATURE

NOT FOR CONSTRUCTION

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1.) STANDARD PROPERTY SURVEY AND SUBDIVISION OF LAND OF THE EDWARD J. GEORGE FAMILY TRUST
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S.C.R.D. PLAN #36, POCKET 15, FOLDER 3 &
ON FILE AT NH DOT RIGHTS–OF–WAY, CONCORD, NH

STATE OF NEW HAMPSHIRE · JOHN P. HAYES, III · CERTIFIED WETLAND SCIENTIST · WWR 16

JOHN P. HAYES III, CWS #18

WETLAND NOTES:

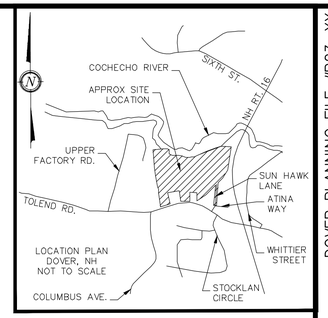
WETLANDS WERE DELINEATED BY JOHN P. HAYES SPRING 2021 & OCTOBER OF 2022

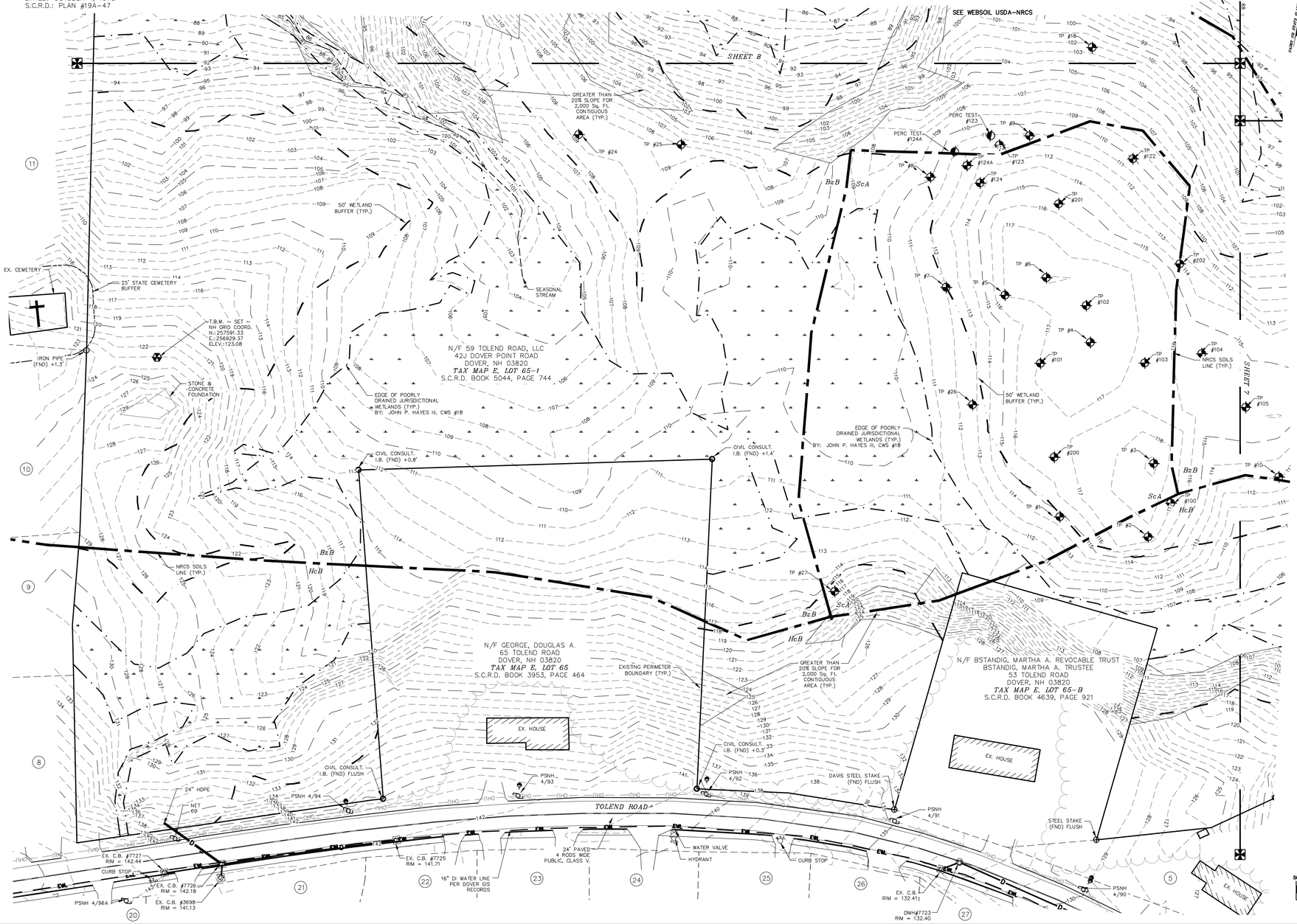
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3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

NRCS SOILS:

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CfB – CHARLTON FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
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SfC – SUFFIELD SILT LOAM, 8 TO 15 PERCENT SLOPES
SfE – SUFFIELD SILT LOAM, 15 TO 35 PERCENT SLOPES







NOTES:

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42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) LOT AREA LOT 65–1: 1,388,309 Sq. Ft., 31.87 Ac. +/–
LOT AREA LOT 65–A: 546,643 Sq. Ft., 12.55 Ac. +/–

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

5.) ZONING: (R–20) LOW DENSITY
MINIMUM FRONTAGE ~ 125'
MINIMUM LOT SIZE ~ 20,000 Sq. Ft.
FRONT SETBACK ~ 20'
REAR SETBACK ~ 30'
SIDE SETBACK ~ 20'
WETLANDS BUFFER ~ 50.0'
MAX. BUILDING HEIGHT: 35'
MAX. LOT COVERAGE: 30%

CONSERVATION OVERLAY DISTRICT:
COCHECO RIVER ~ 100'
STEEP SLOPES LARGER THAN 2,000 Sq. Ft., IN SIZE
WETLANDS OVERLAY DISTRICT

6.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, A PORTION OF THIS PARCEL DOES FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015.

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9.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS ON TAX MAP E, LOT 65–1 AND LOT 65–A AS OF THE DATE OF THE FIELD WORK: MARCH 2021 & OCTOBER 2022.

10.) SEE OVERVIEW EXISTING CONDITIONS PLAN FOR ABUTTERS LIST.

LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- NHHB BOUND ~FND~
- T.B.M. ~SET~
- UTILITY POLE / GUY WIRE
- MATCH POINT
- MATCH LINE
- NRCS SOIL DELINEATION LINE
- BUILDING SETBACK LINE
- OVERHEAD UTILITIES LINE
- WATER LINE
- CONTOUR LINE, MINOR
- CONTOUR LINE, MAJOR
- WETLAND LINE
- EXISTING STREAM
- EXISTING TRAIL
- 50' WETLAND BUFFER
- DRAINAGE LINE
- FEMA FLOOD ZONE
- 50' NHDES PRIMARY SETBACK
- 150' NHDES NATURAL WOODLAND BUFFER
- 250' NHDES SHORELAND PROTECTION ZONE
- 100' LOCAL CONSERVATION OVERLAY ZONE

GREATER THAN 20% SLOPE FOR 2,000 Sq. Ft. CONTIGUOUS AREA
CfB – NRCS SOIL LABEL
S.C.R.D. – STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. – TYPICAL
FND – FOUND
(1) – ABUTTER REFERENCE

GRAPHIC SCALE

50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

EXISTING CONDITIONS PLAN SOUTHWEST
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

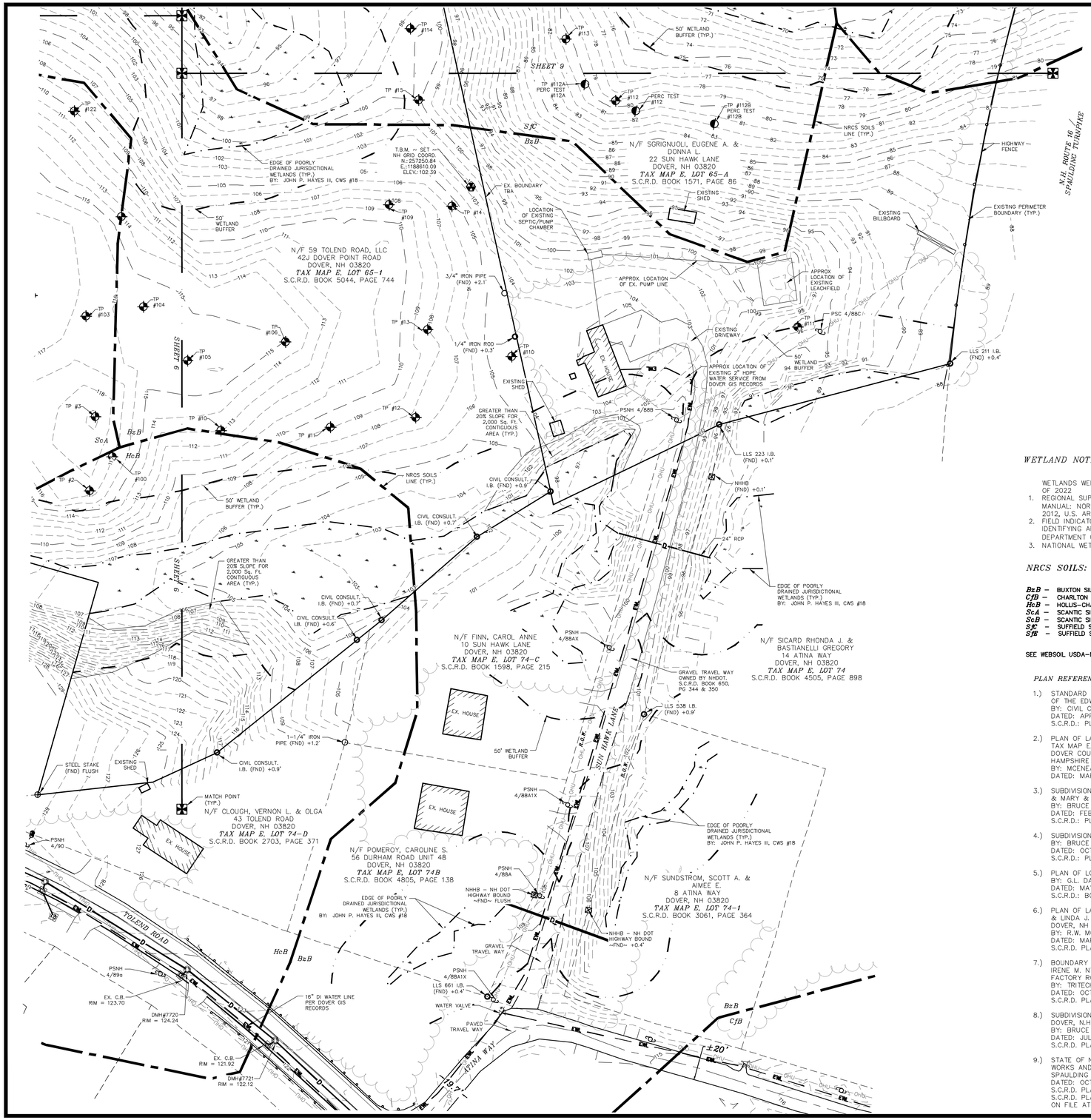
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

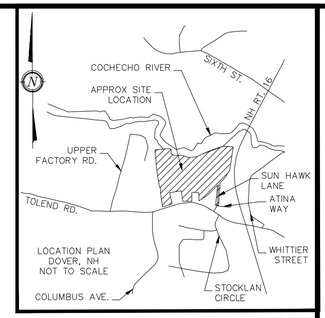
STATE OF NEW HAMPSHIRE · LICENSED LAND SURVEYOR · NO. 805 · KENNETH A. BERRY · SIGNATURE

SHEET 6 OF 100

NOT FOR CONSTRUCTION









JOHN P. HAYES III, CWS #18

WETLAND NOTES:

WETLANDS WERE DELINEATED BY JOHN P. HAYES SPRING 2021 & OCTOBER OF 2022

1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.0. UNITED STATES DEPARTMENT OF AGRICULTURE (2016).
3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

NRCS SOILS:

BzB – BUXTON SILT LOAM, 3 TO 8 PERCENT SLOPES
CfB – CHARLTON FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
HcB – HOLLIS–CHARLTON FINE SANDY LOAMS, 3 TO 8 PERCENT SLOPES
ScA – SCANTIC SILT LOAM, 0 TO 3 PERCENT SLOPES
ScB – SCANTIC SILT LOAM, 3 TO 8 PERCENT SLOPES
SfC – SUFFIELD SILT LOAM, 8 TO 15 PERCENT SLOPES
SfE – SUFFIELD SILT LOAM, 15 TO 35 PERCENT SLOPES

SEE WEBSOIL USDA–NRCS

PLAN REFERENCES:

1.) STANDARD PROPERTY SURVEY AND SUBDIVISION OF LAND OF THE EDWARD J. GEORGE FAMILY TRUST
BY: CIVIL CONSULTANTS
DATED: APRIL 2, 2011
S.C.R.D.: PLAN #102–24

2.) PLAN OF LAND PREPARED FOR FAIRVIEW PARNERS, LLC TAX MAP E, LOT NO. 74B 35 TOLEND ROAD CITY OF DOVER COUNTY OF STRAFFORD STATE OF NEW HAMPSHIRE
BY: MCENEANEY SURVEY ASSOCIATES INC.
DATED: MARCH 4, 2016

3.) SUBDIVISION OF LAND FOR KAREN & JAMES BECKINGHAM & MARY & SCOTT MCEWAN IN DOVER, N.H.
BY: BRUCE L. POHOPEK
DATED: FEBRUARY 19, 1986
S.C.R.D.: PLAN #29–67

4.) SUBDIVISION OF LAND FOR PAUL MARTEL IN DOVER, N.H.
BY: BRUCE L. POHOPEK
DATED: OCTOBER 4, 1978
S.C.R.D.: PLAN #19A–47

5.) PLAN OF LOT ERNEST BSTANDIG DOVER NEW HAMPSHIRE
BY: G.L. DAVIS & ASSOCIATES
DATED: MAY, 1969
S.C.R.D.: BOOK 858, PAGE 159

6.) PLAN OF LAND, HAROLD A. & YVONNE M. CLEWLEY & LINDA J. NOURY, NORTH SIDE OF TOLEND ROAD, DOVER, NH
BY: R.W. MCCRONE
DATED: MARCH 1986
S.C.R.D. PLAN #28A–04

7.) BOUNDARY LINE ADJUSTMENT, THE HEIRS OF KENNETH & IRENE M. NYE AND PAUL & KATHERINE MARTEL, UPPER FACTORY ROAD, DOVER, NH
BY: TRITECH ENGINEERING CORPORATION
DATED: OCTOBER 25, 2004
S.C.R.D. PLAN #77–87

8.) SUBDIVISION OF LAND FOR ANTONIO BASTIANELLI IN DOVER, N.H.
BY: BRUCE L. POHOPEK, LAND SURVEYOR
DATED: JULY 31, 1989, AS REVISED 5/28/90
S.C.R.D. PLAN #32–149

9.) STATE OF NEW HAMPSHIRE, DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS, PLAN OF PROPOSED LS1824(1), SPAULDING TURNPIKE
DATED: OCTOBER 19, 1955
S.C.R.D. PLAN #32, POCKET 15, FOLDER 3 &
S.C.R.D. PLAN #36, POCKET 15, FOLDER 3 &
ON FILE AT NH DOT RIGHTS–OF–WAY, CONCORD, NH

NOTES:

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42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

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MINIMUM LOT SIZE ~ 20,000 Sq. Ft.
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REAR SETBACK ~ 30'
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MAX. BUILDING HEIGHT: 35'
MAX. LOT COVERAGE: 30%

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STEEP SLOPES LARGER THAN 2,000 Sq. Ft., IN SIZE
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- UTILITY POLE / GUY WIRE
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S.C.R.D. – STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. – TYPICAL
FND – FOUND
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GRAPHIC SCALE

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(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

EXISTING CONDITIONS PLAN SOUTHEAST
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE No. 805 KENNETH A. BERRY LICENSED LAND SURVEYOR
SIGNATURE

NOT FOR CONSTRUCTION

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STATE OF NEW HAMPSHIRE
JOHN P. HAYES, III
CERTIFIED WETLAND SCIENTIST
No. 18

JOHN P. HAYES III, CWS #18

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PLAN REFERENCES CONTINUED:

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BY: BRUCE L. POHOPEK, LAND SURVEYOR
DATED: JULY 31, 1989, AS REVISED 5/28/90
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DATED: OCTOBER 19, 1955
S.C.R.D. PLAN #32, POCKET 15, FOLDER 3 &
S.C.R.D. PLAN #36, POCKET 15, FOLDER 3 &
ON FILE AT NH DOT RIGHTS–OF–WAY, CONCORD, NH

ABUTTERS WITHIN 200':

(11) N/F MARTEL, PAUL J.
P.O. BOX 182
DOVER, NH 03821
TAX MAP E, LOT 57–3
S.C.R.D. BOOK 1433, PAGE 200

(12) N/F THIBAULT, DANIEL JACOB
40 NYE LANE
DOVER, NH 03820
TAX MAP E, LOT 49–9
S.C.R.D. BOOK 4631, PAGE 150

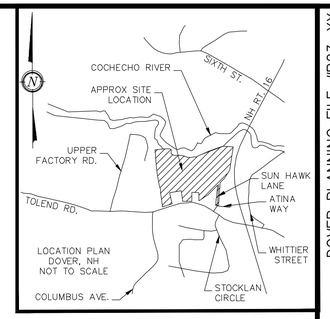
(13) N/F BERGSTROM, EVA K. & EDDINS, KURT
38 NYE LANE
DOVER, NH 03820
TAX MAP E, LOT 49–8
S.C.R.D. BOOK 4499, PAGE 734

(14) N/F CHAKRAVARTY, DILIP & MITALI
11411 RUNNING BEAR COURT
BELTSVILLE, MD 20705
TAX MAP E, LOT 49–7
S.C.R.D. BOOK 3988, PAGE 795

(15) N/F BRODERICK, BRIDGET
26 NYE LANE
DOVER, NH 03820
TAX MAP E, LOT 49–6
S.C.R.D. BOOK, 4034, PAGE 254

(34) LIBERTY MUTUAL INSURANCE CO.
ATTN: TYLER MUNGER
175 BERKELEY STREET
BOSTON, MA 02116
TAX MAP E, LOT 24
S.C.R.D. BOOK 1364, PAGE 453

16°±
MAGNETIC
MAR 08 1/2° STATE PLANE



NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) LOT AREA LOT 65–1: 1,388,309 Sq. Ft., 31.87 Ac. +/–
LOT AREA LOT 65–A: 546,643 Sq. Ft., 12.55 Ac. +/–

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5.) ZONING: (R–20) LOW DENSITY
MINIMUM FRONTAGE ~ 125'
MINIMUM LOT SIZE ~ 20,000 Sq. Ft.
FRONT SETBACK ~ 20'
REAR SETBACK ~ 30'
SIDE SETBACK ~ 20'
WETLANDS BUFFER ~ 50.0'
MAX. BUILDING HEIGHT: 35'
MAX. LOT COVERAGE: 30%

CONSERVATION OVERLAY DISTRICT:
COCHECO RIVER ~ 100'
STEEP SLOPES LARGER THAN 2,000 Sq. Ft., IN SIZE
WETLANDS OVERLAY DISTRICT

6.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, A PORTION OF THIS PARCEL DOES FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015.

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LEGEND:

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- NHHB BOUND ~FND~
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- MATCH LINE
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- EXISTING STREAM
- EXISTING TRAIL
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- TYP. — TYPICAL
- FND — FOUND
- (1) — ABUTTER REFERENCE

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

6X10 GRANITE BOUND WITH REBAR (FND) +1.0'
TT IRON ROD (FND) +0.3'
TT IRON ROD (FND) +0.1'
TT IRON ROD (FND) +0.6'
1/4" REBAR (FND) +1.2'
1–1/2" IRON PIPE (FND) +3.3'
T.B.M. ~ SET ~ NH GRID COORD. N:2575913.33 E:1187514.47 ELEV:108.91
EX. TRAIL
EDGE OF POORLY DRAINED JURISDICTIONAL WETLANDS (TYP.) BY: JOHN P. HAYES III, CWS #18
MEAN HIGH WATER EDGE OF RIVER LOCATED IN SPRING OF 2021
50' NHDES PRIMARY SETBACK
FLOOD ZONE
COCHECHO RIVER
GREATER THAN 20% SLOPE FOR 2,000 Sq. Ft. CONTIGUOUS AREA (TYP.)
150' NHDES NATURAL WOODLAND BUFFER
100' LOCAL RIVER BUFFER
NRCS SOILS LINE (TYP.)
50' WETLAND BUFFER (TYP.)
250' SHORELAND PROTECTION ZONE
N/F 59 TOLEND ROAD, LLC
42J DOVER POINT ROAD
DOVER, NH 03820
TAX MAP E, LOT 65–1
S.C.R.D. BOOK 5044, PAGE 744
SEASONAL STREAM
SHEET 6
BzB
SfB
ScB

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

EXISTING CONDITIONS PLAN NORTHWEST
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
No. 805
KENNETH A. BERRY
LICENSED LAND SURVEYOR
SIGNATURE

NOT FOR CONSTRUCTION

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ON FILE AT NH DOT RIGHTS–OF–WAY, CONCORD, NH

WETLAND NOTES:

WETLANDS WERE DELINEATED BY JOHN P. HAYES SPRING 2021 & OCTOBER 2022

1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.0. UNITED STATES DEPARTMENT OF AGRICULTURE (2016).
3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

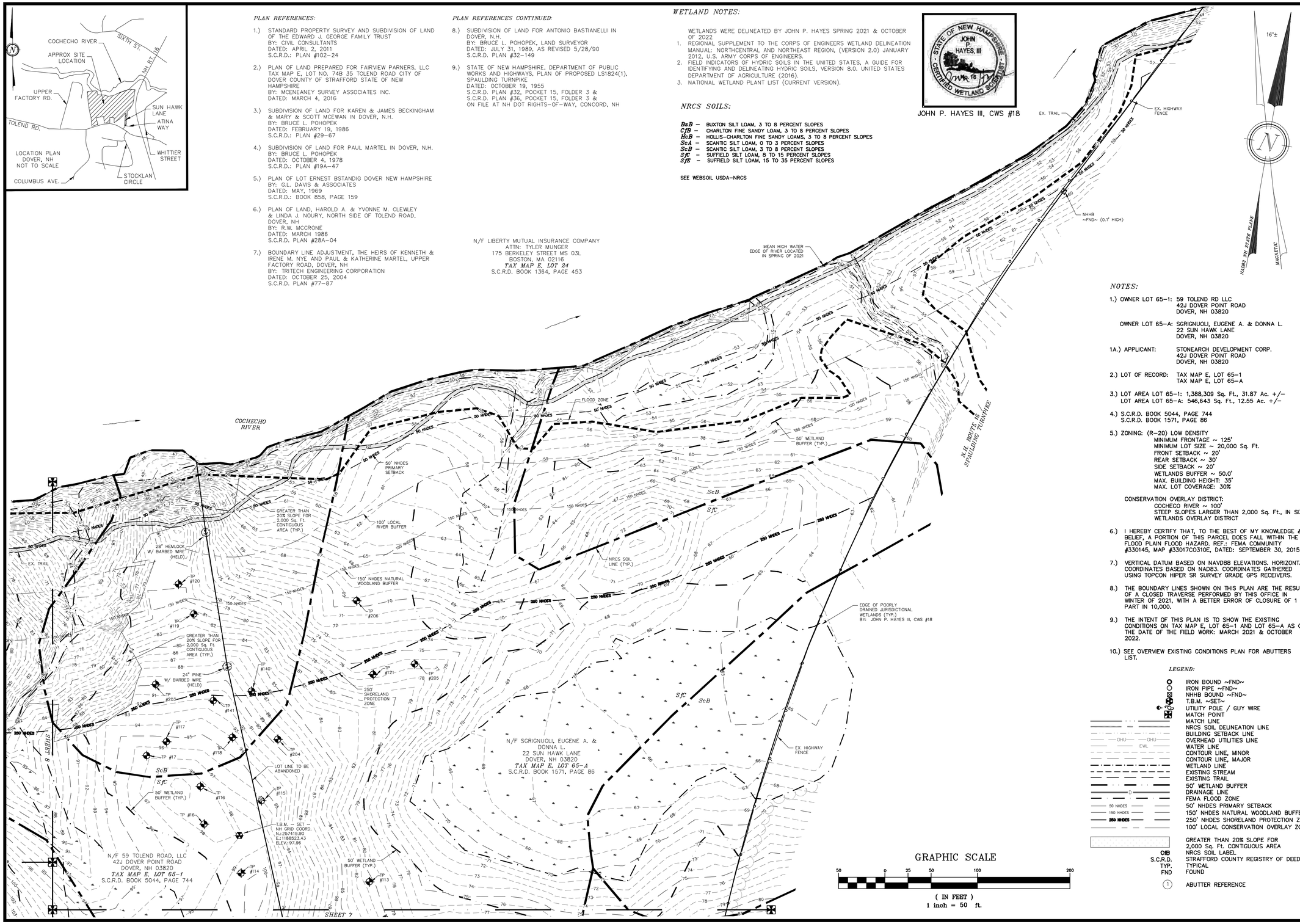
NRCS SOILS:

BsB – BUXTON SILT LOAM, 3 TO 8 PERCENT SLOPES
CfB – CHARLTON FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
HcB – HOLLIS–CHARLTON FINE SANDY LOAMS, 3 TO 8 PERCENT SLOPES
ScA – SCANTIC SILT LOAM, 0 TO 3 PERCENT SLOPES
ScB – SCANTIC SILT LOAM, 3 TO 8 PERCENT SLOPES
SfC – SUFFIELD SILT LOAM, 8 TO 15 PERCENT SLOPES
SfE – SUFFIELD SILT LOAM, 15 TO 35 PERCENT SLOPES

SEE WEBSOIL USDA–NRCS

JOHN P. HAYES III, CWS #18

N/F LIBERTY MUTUAL INSURANCE COMPANY
ATTN: TYLER MUNGER
175 BERKELEY STREET MS 03L
BOSTON, MA 02116
TAX MAP E, LOT 24
S.C.R.D. BOOK 1364, PAGE 453



GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) LOT AREA LOT 65–1: 1,388,309 Sq. Ft., 31.87 Ac. +/–
LOT AREA LOT 65–A: 546,643 Sq. Ft., 12.55 Ac. +/–

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

5.) ZONING: (R–20) LOW DENSITY
MINIMUM FRONTAGE ~ 125'
MINIMUM LOT SIZE ~ 20,000 Sq. Ft.
FRONT SETBACK ~ 20'
REAR SETBACK ~ 30'
SIDE SETBACK ~ 20'
WETLANDS BUFFER ~ 50.0'
MAX. BUILDING HEIGHT: 35'
MAX. LOT COVERAGE: 30%

CONSERVATION OVERLAY DISTRICT:
COCHECO RIVER ~ 100'
STEEP SLOPES LARGER THAN 2,000 Sq. Ft., IN SIZE
WETLANDS OVERLAY DISTRICT

6.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, A PORTION OF THIS PARCEL DOES FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015.

7.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

8.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN WINTER OF 2021, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

9.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS ON TAX MAP E, LOT 65–1 AND LOT 65–A AS OF THE DATE OF THE FIELD WORK: MARCH 2021 & OCTOBER 2022.

10.) SEE OVERVIEW EXISTING CONDITIONS PLAN FOR ABUTTERS LIST.

LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- NHHB BOUND ~FND~
- T.B.M. ~SET~
- UTILITY POLE / GUY WIRE
- MATCH POINT
- MATCH LINE
- NRCS SOIL DELINEATION LINE
- BUILDING SETBACK LINE
- OVERHEAD UTILITIES LINE
- WATER LINE
- CONTOUR LINE, MINOR
- CONTOUR LINE, MAJOR
- WETLAND LINE
- EXISTING STREAM
- EXISTING TRAIL
- 50' WETLAND BUFFER
- DRAINAGE LINE
- FEMA FLOOD ZONE
- 50' NHDES PRIMARY SETBACK
- 150' NHDES NATURAL WOODLAND BUFFER
- 250' NHDES SHORELAND PROTECTION ZONE
- 100' LOCAL CONSERVATION OVERLAY ZONE
- GREATER THAN 20% SLOPE FOR 2,000 Sq. Ft. CONTIGUOUS AREA
- CfB — NRCS SOIL LABEL
- S.C.R.D. — STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. — TYPICAL
- FND — FOUND
- (1) — ABUTTER REFERENCE

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

EXISTING CONDITIONS PLAN NORTHEAST
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE — No. 805 — LICENSED LAND SURVEYOR — KENNETH A. BERRY — SIGNATURE

SHEET 9 OF 100

NOT FOR CONSTRUCTION

SITE SPECIFIC SOILS LEGEND

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
BeB	BIDDEFORD	D
BzA	BUXTON	C
BzB	BUXTON	C
BzC	BUXTON	C
BzD	BUXTON	C
BzE	BUXTON	C
CsB	CHARLTON (VERY STONY)	B
CsC	CHARLTON (VERY STONY)	B
CsD	CHARLTON (VERY STONY)	B
CsE	CHARLTON (VERY STONY)	B
HdA/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B/D
HdB/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B/D
HdC/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B/D
HdD/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B/D
HdE/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B/D
MlB/P	MIXED ALLUVIAL LAND (POORLY DRAINED)	C/D
MlC/P	MIXED ALLUVIAL LAND (POORLY DRAINED)	C/D

SLOPE: A = 0–3% B = 3–8% C = 8–15% D = 15–25% E = 25–50% F = 50%+

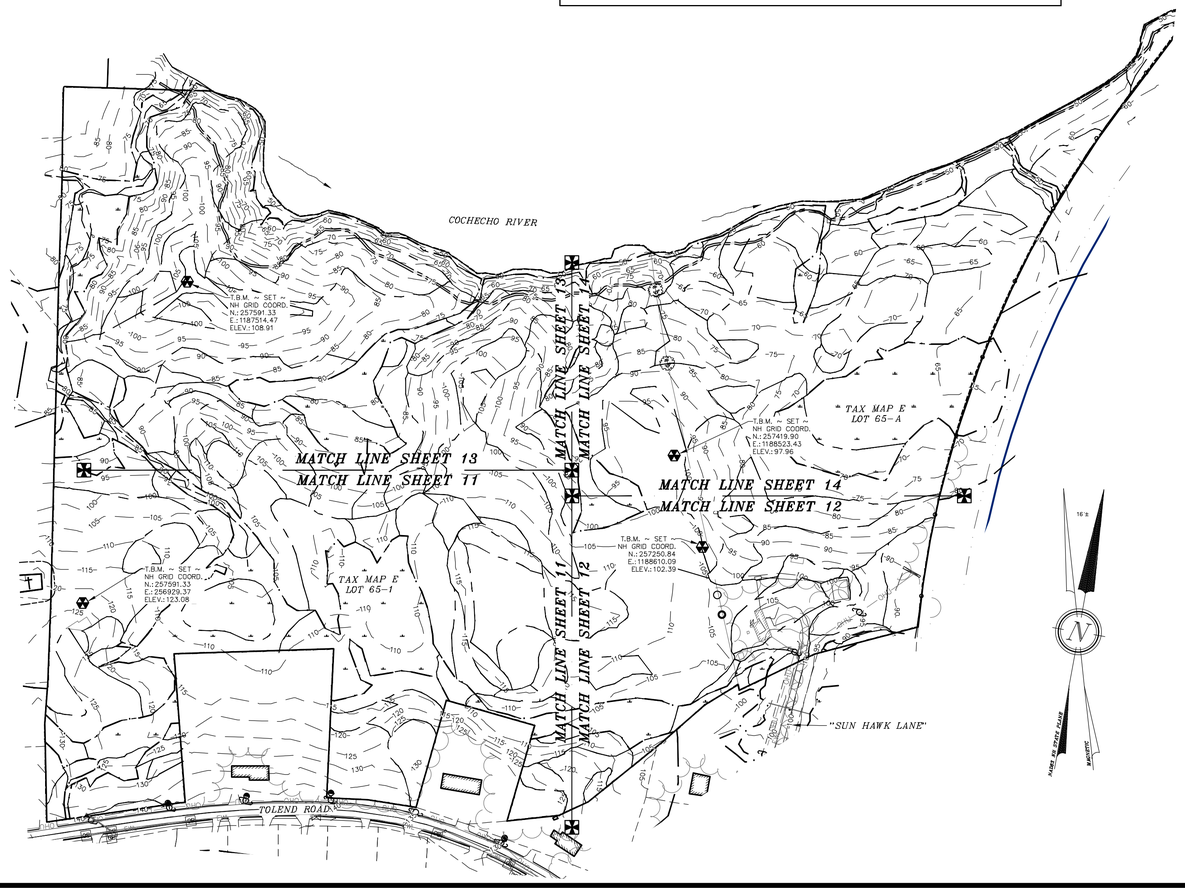
DENOMINATOR: /Rk = ROCKY /VPD = VERY POORLY DRAINED /PD = POORLY DRAINED /SWPD = SOMEWHAT POORLY DRAINED /MWD = MODERATELY WELL DRAINED

SITE SPECIFIC SOILS LEGEND (CONT'D)

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
MlB	MIXED ALLUVIAL LAND	A
MlC	MIXED ALLUVIAL LAND	A
MlD	MIXED ALLUVIAL LAND	A
MlE	MIXED ALLUVIAL LAND	A
ScA/P	SCANTIC	D
ScB/P	SCANTIC	D
ScC/P	SCANTIC	D
ScD/P	SCANTIC	D
ScE/P	SCANTIC	D
SfA	SUFFIELD	C
SfB	SUFFIELD	C
SfC	SUFFIELD	C
SfD	SUFFIELD	C
SfE	SUFFIELD	C
500B	UDORTHENTS	C
500C	UDORTHENTS	C
500D	UDORTHENTS	C
500E	UDORTHENTS	C

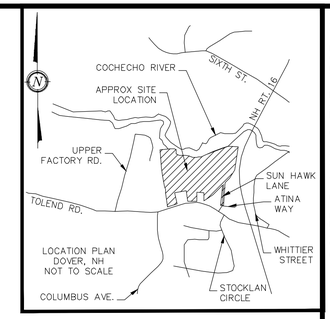
SLOPE: A = 0–3% B = 3–8% C = 8–15% D = 15–25% E = 25–50% F = 50%+

DENOMINATOR: /Rk = ROCKY /VPD = VERY POORLY DRAINED /PD = POORLY DRAINED /SWPD = SOMEWHAT POORLY DRAINED /MWD = MODERATELY WELL DRAINED



LEGEND:

- IRON BOUND (TBS)
- IRON BOUND (FND)
- DRILL HOLE (FND)
- UTILITY POLE/GUY WIRE
- TEST HOLE
- BENCHMARK
- WETLAND LINE
- 276 EXISTING CONTOUR MINOR
- 275 EXISTING CONTOUR MAJOR
- SOIL LINE
- LIMIT OF SOIL SURVEY
- 448A SOIL SERIES
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. TYPICAL
- FND FOUND



NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) LOT AREA LOT 65–1: 1,388,308 Sq. Ft., 31.87 Ac. +/–
LOT AREA LOT 65–A: 546,643 Sq. Ft., 12.55 Ac. +/–

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

5.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, A PORTION OF THIS PARCEL DOES FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015.

6.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

7.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN WINTER OF 2021, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

8.) THE INTENT OF THIS PLAN IS TO SHOW THE SITE SPECIFIC SOIL SURVEY OF TAX MAP E, LOT 65–1 AND LOT 65–A AS OF THE DATE OF THE SURVEY (WINTER 2021).

WETLAND NOTES:

WETLANDS WERE DELINEATED BY JOHN P. HAYES SPRING 2021 & OCTOBER OF 2022

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3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

JOHN P. HAYES III, CWS #18

JOHN P. HAYES III, CSS #87

GRAPHIC SCALE

150 0 78 150 300 600

(IN FEET)
1 inch = 150 ft.

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

OVERVIEW SITE SPECIFIC SOILS MAP
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

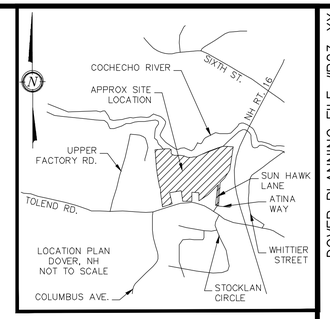
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 150 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE No. 805 KENNETH A. BERRY LICENSED LAND SURVEYOR
SIGNATURE

NOT FOR CONSTRUCTION





NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

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LEGEND:

- IRON BOUND (TBS)
- IRON BOUND (FND)
- DRILL HOLE (FND)
- UTILITY POLE/GUY WIRE
- TEST HOLE
- BENCHMARK
- WETLAND LINE
- 276 EXISTING CONTOUR MINOR
- 277 EXISTING CONTOUR MAJOR
- SOIL LINE
- LIMIT OF SOIL SURVEY
- LIMIT OF PROJECT DISTURBANCE
- 448A SOIL SERIES
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. TYPICAL
- FND FOUND

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.



JOHN P. HAYES III, CWS #18



JOHN P. HAYES III, CSS #87

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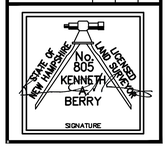
DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

SITE SPECIFIC SOILS MAP – SOUTHWEST
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

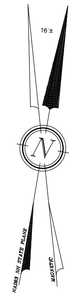
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031



NOT FOR CONSTRUCTION

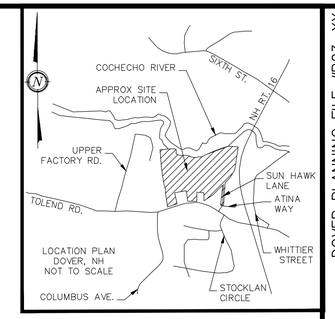




LEGEND:

- IRON BOUND (TBS)
- IRON BOUND (FND)
- DRILL HOLE (FND)
- GRANITE BOUND (TBS)
- UTILITY POLE/GUY WIRE
- TEST HOLE
- BENCHMARK

- WETLAND LINE
- 276 EXISTING CONTOUR MINOR
- 275 EXISTING CONTOUR MAJOR
- SOIL LINE
- LIMIT OF SOIL SURVEY
- LIMIT OF PROJECT DISTURBANCE
- 448A SOIL SERIES
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. TYPICAL
- FND FOUND



NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

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DOVER, NH 03820

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TAX MAP E, LOT 65–A

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3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).



JOHN P. HAYES III, CWS #18



JOHN P. HAYES III, CSS #87

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

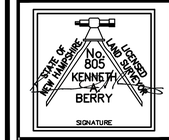
DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

SITE SPECIFIC SOILS MAP – SOUTHEAST
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

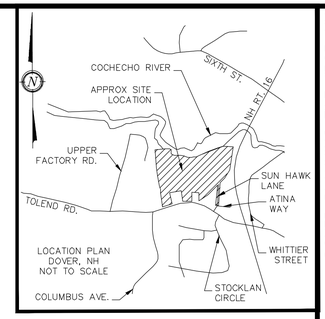
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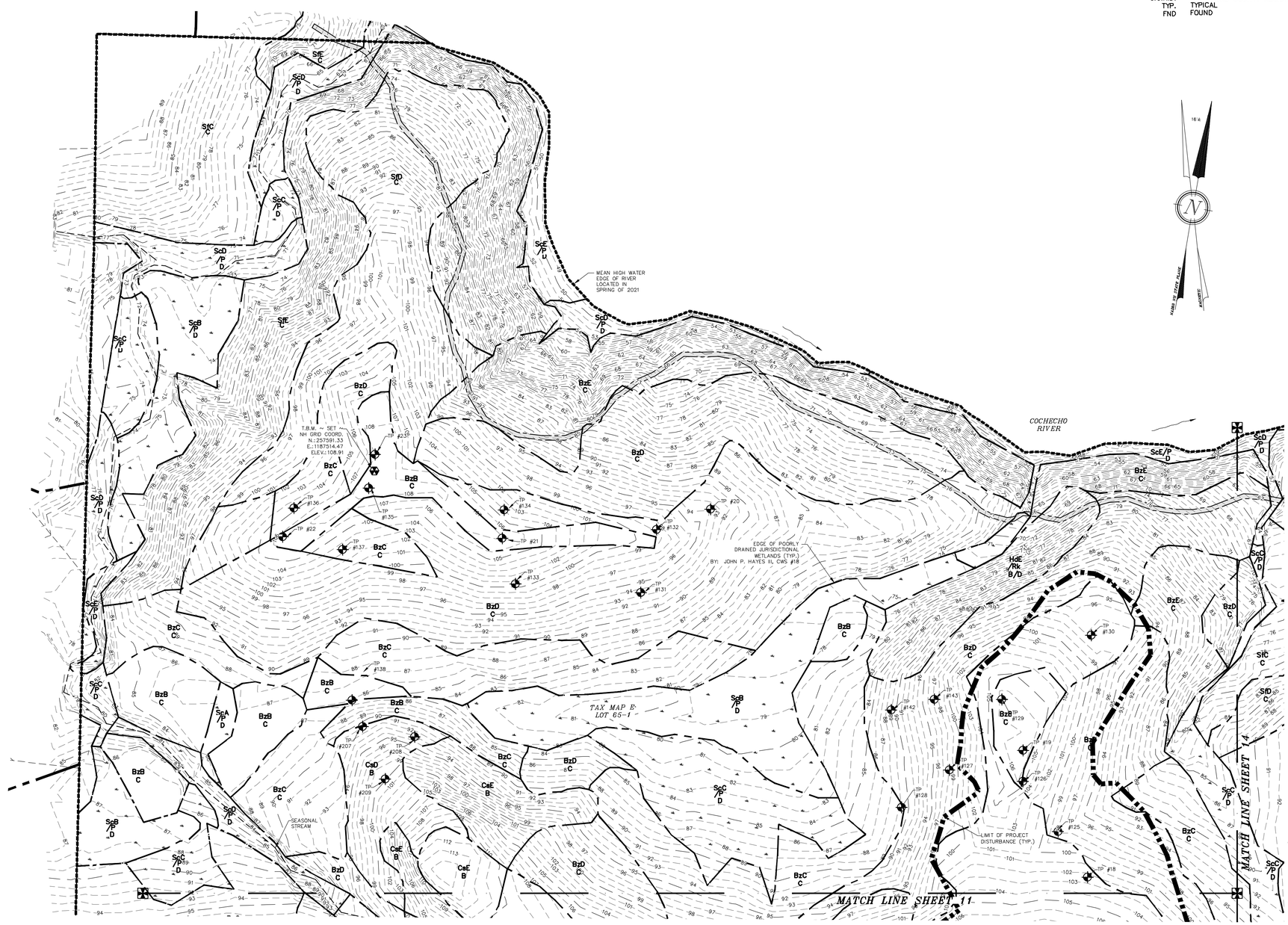


NOT FOR CONSTRUCTION

LEGEND:

●	IRON BOUND (TBS)
○	IRON BOUND (FND)
◉	DRILL HOLE (FND)
⊶	UTILITY POLE/GUY WIRE
⊕	TEST HOLE
♣	BENCHMARK
———	WETLAND LINE
276	EXISTING CONTOUR MINOR
275	EXISTING CONTOUR MAJOR
———	SOIL LINE
———	LIMIT OF SOIL SURVEY
———	LIMIT OF PROJECT DISTURBANCE
448A	SOIL SERIES
S.C.R.D.	STRAFFORD COUNTY REGISTRY OF DEEDS
TYP.	TYPICAL
FND	FOUND





NOTES:

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42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

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42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,388,308 Sq. Ft., 31.87 Ac. +/-
LOT AREA LOT 65-A: 546,643 Sq. Ft., 12.55 Ac. +/-

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

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1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.0. UNITED STATES DEPARTMENT OF AGRICULTURE (2016).
3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

STATE OF NEW HAMPSHIRE — JOHN P. HAYES, III — CERTIFIED WETLAND SCIENTIST — WR# 16

JOHN P. HAYES III, CWS #18

STATE OF NEW HAMPSHIRE — JOHN P. HAYES III — WETLAND SCIENTIST — WR# 087

JOHN P. HAYES III, CSS #87

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

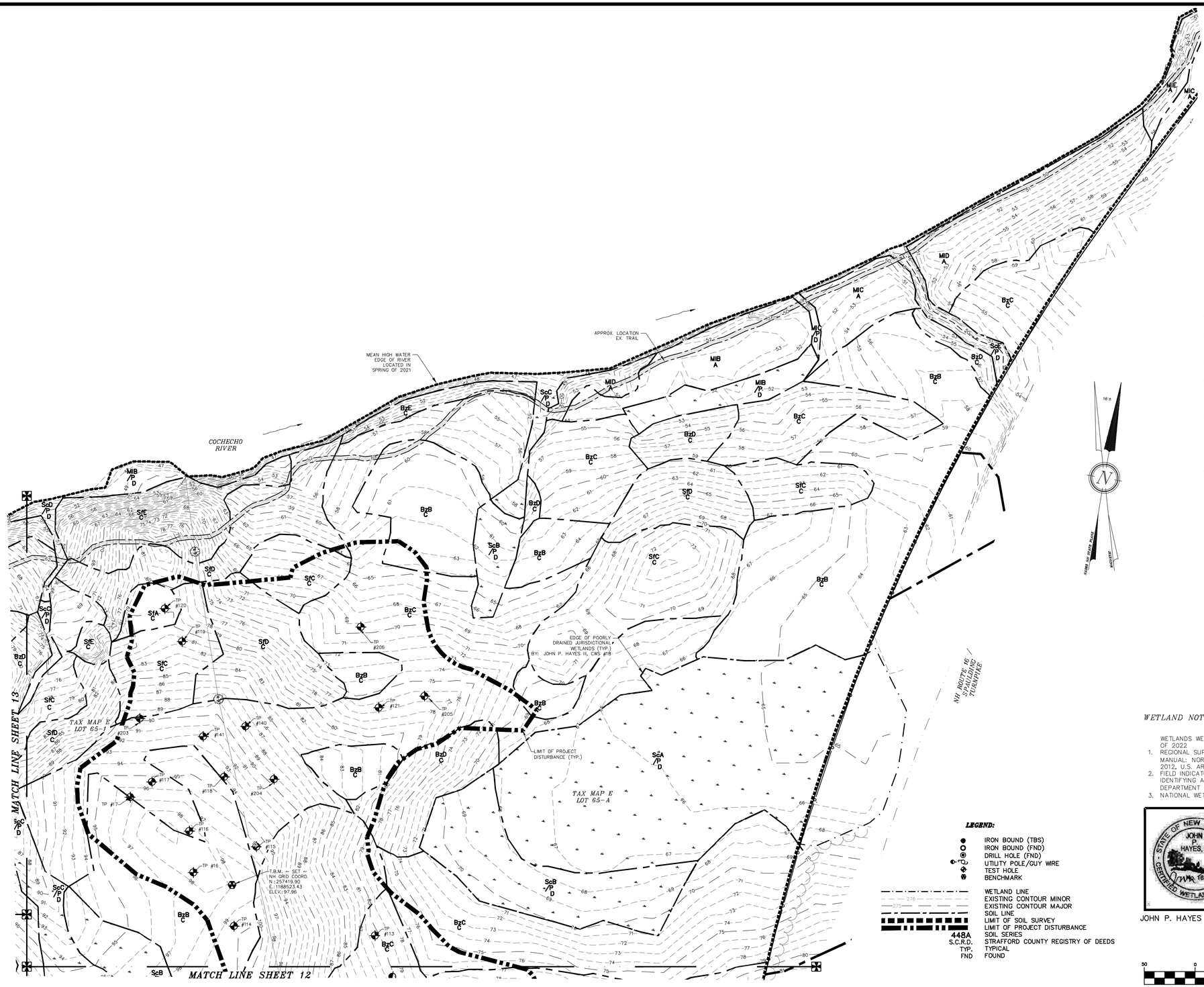
SITE SPECIFIC SOILS MAP - NORTHWEST
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

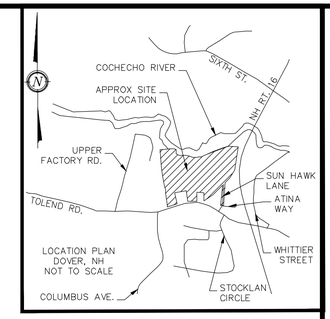
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

NO. 805 — STATE OF NEW HAMPSHIRE — LICENSED LAND SURVEYOR — KENNETH A. BERRY — SIGNATURE

NOT FOR CONSTRUCTION





NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,388,401 Sq. Ft., 31.87 Ac. +/-
LOT AREA LOT 65-A: 546,549 Sq. Ft., 12.55 Ac. +/-

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

5.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, A PORTION OF THIS PARCEL DOES FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015.

6.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

7.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN WINTER OF 2021, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

8.) THE INTENT OF THIS PLAN IS TO SHOW THE SITE SPECIFIC SOIL SURVEY OF TAX MAP E, LOT 65-1 AND LOT 65-A AS OF THE DATE OF THE SURVEY (WINTER 2021).

WETLAND NOTES:

WETLANDS WERE DELINEATED BY JOHN P. HAYES SPRING 2021 & OCTOBER OF 2022

1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
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3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

LEGEND:

- IRON BOUND (TBS)
- IRON BOUND (FND)
- DRILL HOLE (FND)
- UTILITY POLE/GUY WIRE
- TEST HOLE
- BENCHMARK
- WETLAND LINE
- EXISTING CONTOUR MINOR
- EXISTING CONTOUR MAJOR
- SOIL LINE
- LIMIT OF SOIL SURVEY
- LIMIT OF PROJECT DISTURBANCE
- 448A SOIL SERIES
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. TYPICAL
- FND FOUND

JOHN P. HAYES III, CWS #18

JOHN P. HAYES III, CSS #87

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

SITE SPECIFIC SOILS MAP - NORTHEAST
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE No. 805 LICENSED LAND SURVEYOR KENNETH A. BERRY SIGNATURE

NOT FOR CONSTRUCTION

TEST PIT DATA:

TEST PIT #1
0–7 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
7–14 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
14–20 2.5Y 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, GRANULAR, FRIABLE
20–42 2.5Y 5/2 GRAYISH BROWN, GRAVELLY FINE SANDY LOAM WITH REDOX. FEAT. PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 20"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 42"
REFUSAL @ 42"

TEST PIT #2
0–7 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
7–18 10YR 4/4 DARK YELLOWISH BROWN, GRAVELLY FINE SANDY LOAM, GRANULAR, FRIABLE
18–24 10YR 4/6 DARK YELLOWISH BROWN, GRAVELLY FINE SANDY LOAM, MASSIVE, FRIABLE
E.S.H.W.T. @ N/A
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 24"
REFUSAL @ 24"

TEST PIT #3
0–7 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
7–18 10YR 4/4 DARK YELLOWISH BROWN, GRAVELLY FINE SANDY LOAM, GRANULAR, FRIABLE
18–24 10YR 4/6 DARK YELLOWISH BROWN, GRAVELLY FINE SANDY LOAM, MASSIVE, FRIABLE
E.S.H.W.T. @ N/A
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 24"
REFUSAL @ 24"

TEST PIT #4
0–4 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
4–14 10YR 5/6 YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
14–30 2.5Y 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, GRANULAR, FRIABLE
30–62 2.5Y 5/2 GRAYISH BROWN, GRAVELLY FINE SANDY LOAM WITH REDOX. FEAT. PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 30"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 62"
REFUSAL @ N/A

TEST PIT #5
E.S.H.W.T. @ N/A
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED < 20"
REFUSAL < 20"

TEST PIT #6
E.S.H.W.T. @ N/A
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED < 20"
REFUSAL < 20"

TEST PIT #7
0–9 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
9–18 10YR 5/6 YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
18–28 2.5Y 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, GRANULAR, FRIABLE
28–38 2.5Y 5/2 GRAYISH BROWN, GRAVELLY FINE SANDY LOAM WITH REDOX. FEAT. PRESENT, MASSIVE, FRIABLE
38–64 2.5Y 5/2 GRAYISH BROWN, LOAMY SAND WITH REDOX. FEAT. PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 28"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 64"
REFUSAL @ N/A

TEST PIT #8
0–4 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
4–18 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
18–26 2.5Y 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, GRANULAR, FRIABLE
26–60 2.5Y 5/2 GRAYISH BROWN, GRAVELLY FINE SANDY LOAM WITH REDOX. FEAT. PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 26"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ N/A

TEST PIT #9
0–8 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–22 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
22–38 5Y 5/3 OLIVE, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
38–60 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 22"
RESTRICTIVE LAYER @ 22"
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ N/A

TEST PIT #10
0–8 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–20 10YR 5/6 YELLOWISH BROWN, GRAVELLY FINE SANDY LOAM, GRANULAR, FRIABLE
20–34 10YR 4/6 DARK YELLOWISH BROWN, GRAVELLY FINE SANDY LOAM, MASSIVE, FRIABLE
34–65 2.5Y 5/2 GRAYISH BROWN, GRAVELLY FINE SANDY LOAM WITH REDOX. FEAT. PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 34"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 65"
REFUSAL @ N/A

TEST PIT #11
0–8 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–16 10YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
16–24 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
24–60 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 24"
RESTRICTIVE LAYER @ 24"
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ N/A

TEST PIT #12
0–8 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–14 10YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
14–18 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
18–60 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ N/A

TEST PIT DATA:

TEST PIT #13
0–8 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–14 10YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
14–24 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
24–38 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
38–60 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 24"
RESTRICTIVE LAYER @ 24"
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ N/A

TEST PIT #14
0–8 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–16 10YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
16–24 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
24–36 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
36–64 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 24"
RESTRICTIVE LAYER @ 24"
GROUND WATER @ N/A
TERMINATED @ 64"
REFUSAL @ N/A

TEST PIT #15
0–8 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–16 2.5Y 5/4 LIGHT OLIVE BROWN, SILT LOAM, GRANULAR, FRIABLE
16–28 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
28–60 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 16"
RESTRICTIVE LAYER @ 16"
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ N/A

TEST PIT #16
0–8 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–16 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
16–24 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
24–64 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 16"
RESTRICTIVE LAYER @ 16"
GROUND WATER @ N/A
TERMINATED @ 64"
REFUSAL @ N/A

TEST PIT #17
0–8 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–16 2.5Y 5/4 LIGHT OLIVE BROWN, SILT LOAM, GRANULAR, FRIABLE
16–26 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
26–60 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 16"
RESTRICTIVE LAYER @ 16"
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ N/A

TEST PIT #18
0–8 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–16 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
16–24 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
24–64 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 16"
RESTRICTIVE LAYER @ 16"
GROUND WATER @ N/A
TERMINATED @ 64"
REFUSAL @ N/A

TEST PIT #19
0–6 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–12 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12–18 2.5Y 5/4 LIGHT OLIVE BROWN, SILT LOAM, GRANULAR, FRIABLE
18–30 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
30–62 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 62"
REFUSAL @ N/A

TEST PIT #20
0–8 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–20 2.5Y 5/4 LIGHT OLIVE BROWN, SILT LOAM, GRANULAR, FRIABLE
20–28 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
28–60 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 20"
RESTRICTIVE LAYER @ 16"
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ N/A

TEST PIT #21
0–8 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–18 2.5Y 5/4 LIGHT OLIVE BROWN, SILT LOAM, GRANULAR, FRIABLE
18–28 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
28–62 5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 62"
REFUSAL @ N/A

TEST PIT #22
0–8 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–18 2.5Y 5/4 LIGHT OLIVE BROWN, SILT LOAM, GRANULAR, FRIABLE
18–28 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
28–60 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ N/A

TEST PIT #23
0–8 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–18 2.5Y 5/4 LIGHT OLIVE BROWN, SILT LOAM, GRANULAR, FRIABLE
18–28 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
28–62 5Y 4/2 OLIVE GRAY, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 62"
REFUSAL @ N/A

TEST PIT DATA:

TEST PIT #24
0–8 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–14 10YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
14–18 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
18–60 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ N/A

TEST PIT #25
0–8 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–18 2.5Y 5/4 LIGHT OLIVE BROWN, SILT LOAM, GRANULAR, FRIABLE
18–28 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
28–64 5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 64"
REFUSAL @ N/A

TEST PIT #26
0–6 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–18 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
18–24 2.5Y 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, GRANULAR, FRIABLE
24–64 2.5Y 5/2 GRAYISH BROWN, LOAMY FINE SAND WITH REDOX. FEAT. PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 24"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 64"
REFUSAL @ N/A

TEST PIT #27
0–8 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–24 10YR 4/6 LIGHT OLIVE BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
24–32 2.5Y 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, GRANULAR, FRIABLE
32–64 5Y 5/3 OLIVE, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ 32"
GROUND WATER @ N/A
TERMINATED @ 64"
REFUSAL @ N/A



JOHN P. HAYES III, CSS #87

TEST PIT DATA:

TEST PIT #200
0–6 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–18 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
18–34 2.5YR 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, MASSIVE, FRIABLE
34–68 2.5YR 5/2 GRAYISH BROWN, GRAVELLY FINE SANDY LOAM WITH REDOXIMORPHIC FEATURES PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 34"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 68"
REFUSAL @ N/A

TEST PIT #201
0–3 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
3–16 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
16–32 2.5Y 5/4 LIGHT OLIVE BROWN, VERY FINE SANDY LOAM, MASSIVE, FRIABLE
32–64 2.5Y 5/2 GRAYISH BROWN, GRAVELLY FINE SANDY LOAM WITH REDOXIMORPHIC FEATURES PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A"
GROUND WATER @ N/A
TERMINATED @ 64"
REFUSAL @ N/A

TEST PIT #202
0–6 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–20 10 YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, BLOCKY, FRIABLE
20–48 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOXIMORPHIC FEATURES PRESENT, BLOCKY, FIRM
48–62 5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOXIMORPHIC FEATURES PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 20"
RESTRICTIVE LAYER @ 20"
GROUND WATER @ N/A
TERMINATED @ 62"
REFUSAL @ N/A

TEST PIT #203
0–6 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–20 10 YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
20–48 2.5YR 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOXIMORPHIC FEATURES PRESENT, BLOCKY, FIRM
48–65 5YR 4/2 OLIVE GRAY, SILTY CLAY WITH REDOXIMORPHIC FEATURES PRESENT, BLOCKY, FIRM
65–80 2.5YR 6/3 LIGHT YELLOWISH BROWN, SAND WITH REDOXIMORPHIC FEATURES PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 20"
RESTRICTIVE LAYER @ 20"
GROUND WATER @ N/A
TERMINATED @ 80"
REFUSAL @ N/A

TEST PIT #204
0–6 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–18 10 YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
18–50 2.5YR 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOXIMORPHIC FEATURES PRESENT, BLOCKY, FIRM
50–78 5YR 4/2 OLIVE GRAY, SILTY CLAY WITH REDOXIMORPHIC FEATURES PRESENT, BLOCKY, FIRM
78–90 2.5Y6/3 LIGHT YELLOWISH BROWN, SAND WITH REDOXIMORPHIC FEATURES PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 90"
REFUSAL @ N/A

TEST PIT #205
0–6 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–20 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
20–48 5YR 5/3 OLIVE, SILTY CLAY WITH REDOXIMORPHIC FEATURES PRESENT, BLOCKY, FIRM
48–80 5YR 4/2 OLIVE GRAY, SILTY CLAY WITH REDOXIMORPHIC FEATURES PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 20"
RESTRICTIVE LAYER @ 20"
GROUND WATER @ N/A
TERMINATED @ 80"
REFUSAL @ N/A

TEST PIT #206
0–6 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–20 10YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
20–42 2.5YR 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOXIMORPHIC FEATURES PRESENT, BLOCKY, FIRM
42–58 5YR 4/2 OLIVE GRAY, SILTY CLAY WITH REDOXIMORPHIC FEATURES PRESENT, BLOCKY, FIRM
58–72 2.5YR 6/3 LIGHT YELLOWISH BROWN, SAND WITH REDOXIMORPHIC FEATURES PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 72"
REFUSAL @ N/A

TEST PIT #207
0–6 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–22 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
20–40 2.5YR 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, MASSIVE, FRIABLE
40–84 2.5YR 5/2 GRAYISH BROWN, GRAVELLY LOAMY SAND WITH REDOXIMORPHIC FEATURES PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 40"
RESTRICTIVE LAYER @ N/A"
GROUND WATER @ N/A
TERMINATED @ 84"
REFUSAL @ N/A

TEST PIT #208
0–6 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–22 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
22–40 2.5YR 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, MASSIVE, FRIABLE
40–64 2.5YR 5/2 GRAYISH BROWN, GRAVELLY LOAMY SAND WITH REDOXIMORPHIC FEATURES PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 40"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 64"
REFUSAL @ N/A

TEST PIT #209
0–6 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–20 10 YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
20–40 2.5YR 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, MASSIVE, FRIABLE
40–64 2.5YR 5/2 GRAYISH BROWN, GRAVELLY LOAMY SAND WITH REDOXIMORPHIC FEATURES PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 40"
RESTRICTIVE LAYER @ N/A"
GROUND WATER @ N/A
TERMINATED @ 64"
REFUSAL @ N/A

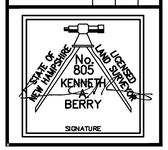
DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

TEST PITS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031



NOT FOR CONSTRUCTION

TEST PIT DATA:

TEST PIT #100
0–8 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–14 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
14–34 2.5Y 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, GRANULAR, FRIABLE
E.S.H.W.T. @ N/A
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 34"
REFUSAL @ 34"

TEST PIT #101
0–3 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
3–14 10YR 4/4 DARK YELLOWISH BROWN, GRAVELLY FINE SANDY LOAM, GRANULAR, FRIABLE
14–30 2.5Y 5/4 LIGHT OLIVE BROWN, SILT LOAM, BLOCKY, FRIABLE
30–60 2.5Y 5/2 GRAYISH BROWN, GRAVELLY FINE SANDY LOAM WITH REDOX. FEAT. PRESENT, GRANULAR, FRIABLE
E.S.H.W.T. @ 30"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ 60"

TEST PIT #102
0–6 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–18 10YR 4/4 DARK YELLOWISH BROWN, GRAVELLY FINE SANDY LOAM, GRANULAR, FRIABLE
18–30 2.5Y 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, MASSIVE, FRIABLE
30–48 2.5Y 5/2 GRAYISH BROWN, GRAVELLY FINE SANDY LOAM WITH REDOX. FEAT. PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ N/A
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 48"
REFUSAL @ 48"

TEST PIT #103
0–3 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
3–16 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
16–30 2.5Y 5/4 LIGHT OLIVE BROWN, VERY FINE SANDY LOAM, MASSIVE, FRIABLE
30–58 2.5Y 5/2 GRAYISH BROWN, GRAVELLY FINE SANDY LOAM WITH REDOX. FEAT. PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 30"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 58"
REFUSAL @ N/A

TEST PIT #104
0–7 10YR 3/2 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
7–18 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
18–58 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ 50"
TERMINATED 58"
REFUSAL @ N/A

TEST PIT #105
0–7 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
7–16 10YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
16–32 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, BLOCKY, FRIABLE
32–72 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ 32"
GROUND WATER @ N/A
TERMINATED @ 72"
REFUSAL @ 72"

TEST PIT #106
0–7 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
7–18 10YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
18–50 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
50–96 5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 96"
REFUSAL @ N/A

TEST PIT #108
0–6 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–18 10 YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, BLOCKY, FRIABLE
18–48 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
48–60 5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ 32"
TERMINATED @ 60"
REFUSAL @ N/A

TEST PIT #109
0–5 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
5–24 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, BLOCKY, FRIABLE
24–45 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
45–60 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 24"
RESTRICTIVE LAYER @ 24"
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ N/A

TEST PIT #110
0–8 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–22 10YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
22–44 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
44–60 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 22"
RESTRICTIVE LAYER @ 22"
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ N/A

TEST PIT #111
0–12 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12–18 10YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
18–24 2.5Y 5/4 LIGHT OLIVE BROWN, SILT LOAM, BLOCKY, FRIABLE
24–60 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 24"
RESTRICTIVE LAYER @ 24"
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ N/A

STATE OF NEW HAMPSHIRE
JOHN P. HAYES III
LICENSED LAND SURVEYOR

JOHN P. HAYES III, CSS #87

TEST PIT DATA:

TEST PIT #112
0–9 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
9–16 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, BLOCKY, FRIABLE
16–45 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
44–60 5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 16"
RESTRICTIVE LAYER @ 16"
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ N/A

TEST PIT #112A
0–6 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–21 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, BLOCKY, FRIABLE
E.S.H.W.T. @ 21"
GROUND WATER @ N/A
TERMINATED @ 21"
REFUSAL @ N/A

TEST PIT #112B
0–6 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–18 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, BLOCKY, FRIABLE
E.S.H.W.T. @ 18"
GROUND WATER @ N/A
TERMINATED @ 18"
REFUSAL @ N/A

TEST PIT #113
0–8 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–18 10YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
18–24 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, BLOCKY, FRIABLE
24–45 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
45–62 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 24"
RESTRICTIVE LAYER @ 24"
GROUND WATER @ N/A
TERMINATED @ 62"
REFUSAL @ N/A

TEST PIT #114
0–8 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–18 10YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
18–24 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, BLOCKY, FRIABLE
24–48 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
48–85 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 24"
RESTRICTIVE LAYER @ 24"
GROUND WATER @ N/A
TERMINATED @ 85"
REFUSAL @ N/A

TEST PIT #115
0–10 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
10–22 10YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, BLOCKY, FRIABLE
22–52 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
52–84 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 22"
RESTRICTIVE LAYER @ 22"
GROUND WATER @ N/A
TERMINATED @ 84"
REFUSAL @ N/A

TEST PIT #116
0–8 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–18 10YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
18–50 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
50–64 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
64–96 2.5Y 6/3 LIGHT YELLOWISH BROWN, SAND WITH REDOX. FEAT. PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 96"
REFUSAL @ N/A

TEST PIT #117
0–6 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–24 10YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
24–52 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
52–72 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
72–90 2.5Y 6/3 LIGHT YELLOWISH BROWN, SAND WITH REDOX. FEAT. PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 24"
RESTRICTIVE LAYER @ 24"
GROUND WATER @ N/A
TERMINATED @ 90"
REFUSAL @ N/A

TEST PIT #118
0–8 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–18 10YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
18–46 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
46–68 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
68–85 2.5Y 6/3 LIGHT YELLOWISH BROWN, SAND WITH REDOX. FEAT. PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 85"
REFUSAL @ N/A

TEST PIT #119
0–9 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
9–18 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, BLOCKY, FRIABLE
18–45 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
44–62 5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 62"
REFUSAL @ N/A

TEST PIT #120
0–9 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
9–24 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, BLOCKY, FRIABLE
24–42 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
42–64 5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 24"
RESTRICTIVE LAYER @ 24"
GROUND WATER @ N/A
TERMINATED @ 64"
REFUSAL @ N/A

TEST PIT DATA:

TEST PIT #121
0–6 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–18 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
18–44 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
44–64 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 64"
REFUSAL @ N/A

TEST PIT #122
0–6 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–16 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
16–22 2.5Y 5/4 LIGHT OLIVE BROWN, SILT LOAM, BLOCKY, FRIABLE
22–32 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
32–64 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 22"
RESTRICTIVE LAYER @ 22"
GROUND WATER @ N/A
TERMINATED @ 64"
REFUSAL @ N/A

TEST PIT #123
0–6 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–18 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
18–30 2.5Y 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, MASSIVE, FRIABLE
30–40 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
40–68 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 30"
RESTRICTIVE LAYER @ 30"
GROUND WATER @ N/A
TERMINATED @ 68"
REFUSAL @ N/A

TEST PIT #124
E.S.H.W.T. @ N/A
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 24"
REFUSAL @ 24"

TEST PIT #124A
0–6 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–18 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
18–28 2.5Y 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, MASSIVE, FRIABLE
28–68 2.5Y 5/2 GRAYISH BROWN, GRAVELLY FINE SANDY LOAM WITH REDOX. FEAT. PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 28"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 68"
REFUSAL @ N/A

TEST PIT #125
0–6 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–16 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
16–22 2.5Y 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, MASSIVE, FRIABLE
22–38 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
38–90 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 22"
RESTRICTIVE LAYER @ 22"
GROUND WATER @ N/A
TERMINATED @ 90"
REFUSAL @ N/A

TEST PIT #126
0–6 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–18 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
18–22 2.5Y 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, MASSIVE, FRIABLE
22–30 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
30–90 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 22"
RESTRICTIVE LAYER @ 22"
GROUND WATER @ N/A
TERMINATED @ 90"
REFUSAL @ N/A

TEST PIT #127
0–6 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–14 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
14–18 2.5Y 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, GRANULAR, FRIABLE
18–34 5Y 5/3 OLIVE, SILT LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
34–50 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
50–82 2.5Y 5/3 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM WITH REDOX. FEAT. PRESENT, GRANULAR, FRIABLE
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 82"
REFUSAL @ 82"

TEST PIT #128
0–6 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–16 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
16–24 2.5Y 5/4 LIGHT OLIVE BROWN, SILT LOAM, BLOCKY, FRIABLE
24–40 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
40–82 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 24"
RESTRICTIVE LAYER @ 24"
GROUND WATER @ 40"
TERMINATED @ 82"
REFUSAL @ N/A

TEST PIT #129
0–6 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–12 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12–18 2.5 Y 5/4 LIGHT OLIVE BROWN, SILT LOAM, BLOCKY, FRIABLE
18–30 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
30–92 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 92"
REFUSAL @ N/A

TEST PIT #130
0–6 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–24 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
24–30 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
30–60 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 24"
RESTRICTIVE LAYER @ 24"
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ N/A

TEST PIT DATA:

TEST PIT #131
0–6 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–20 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
20–48 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
48–84 5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 20"
RESTRICTIVE LAYER @ 20"
GROUND WATER @ N/A
TERMINATED @ 84"
REFUSAL @ N/A

TEST PIT #132
0–6 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6– 18 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
18–30 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
30–84 5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 84"
REFUSAL @ N/A

TEST PIT #133
0–6 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–18 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
18–36 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
36–90 5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 90"
REFUSAL @ N/A

TEST PIT #134
0–6 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6– 18 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
18–48 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
48–96 2.5Y 5/3 LIGHT OLIVE BROWN, STRATIFIED GRAVELLY LOAMY SAND AND SILT LOAM WITH REDOX. FEAT. PRESENT, MASSIVE, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 96"
REFUSAL @ N/A

TEST PIT #135
0–6 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–18 10YR 4/6 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
18–53 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
53–84 2.5Y 5/3 LIGHT OLIVE BROWN, STRATIFIED GRAVELLY LOAMY SAND AND SILT LOAM WITH REDOX. FEAT. PRESENT, MASSIVE, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 84"
REFUSAL @ N/A

TEST PIT #136
0–6 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6– 20 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
20–50 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
50–85 2.5Y 5/3 LIGHT OLIVE BROWN, STRATIFIED GRAVELLY LOAMY SAND AND SILT LOAM WITH REDOX. FEAT. PRESENT, MASSIVE, FIRM
E.S.H.W.T. @ 20"
RESTRICTIVE LAYER @ 20"
GROUND WATER @ N/A
TERMINATED @ 85"
REFUSAL @ N/A

TEST PIT #137
0–6 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6–18 10YR 4/6 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
18–53 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
53–85 2.5Y 5/3 LIGHT OLIVE BROWN, STRATIFIED GRAVELLY LOAMY SAND AND SILT LOAM WITH REDOX. FEAT. PRESENT, MASSIVE, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 85"
REFUSAL @ N/A

TEST PIT #138
0–8 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–16 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
16–22 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
22–70 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 22"
RESTRICTIVE LAYER @ 22"
GROUND WATER @ N/A
TERMINATED @ 70"
REFUSAL @ N/A

TEST PIT #139
0–8 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–18 10YR 4/6 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
18–58 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
58–80 2.5Y 5/3 LIGHT OLIVE BROWN, STRATIFIED GRAVELLY LOAMY SAND AND SILT LOAM WITH REDOX. FEAT. PRESENT, MASSIVE, FIRM
E.S.H.W.T. @ 18"
RESTRICTIVE LAYER @ 18"
GROUND WATER @ N/A
TERMINATED @ 80"
REFUSAL @ N/A

TEST PIT #140
0–8 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–20 10YR 4/6 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
20–70 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
70–84 2.5Y 5/3 LIGHT OLIVE BROWN, STRATIFIED GRAVELLY LOAMY SAND AND SILT LOAM WITH REDOX. FEAT. PRESENT, MASSIVE, FIRM
E.S.H.W.T. @ 20"
RESTRICTIVE LAYER @ 20"
GROUND WATER @ N/A
TERMINATED @ 84"
REFUSAL @ N/A

TEST PIT #141
0–8 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–22 10YR 4/6 DARK YELLOWISH BROWN, SILT LOAM, GRANULAR, FRIABLE
22–62 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
62–82 2.5Y 5/3 LIGHT OLIVE BROWN, STRATIFIED GRAVELLY LOAMY SAND AND SILT LOAM WITH REDOX. FEAT. PRESENT, MASSIVE, FIRM
E.S.H.W.T. @ 22"
RESTRICTIVE LAYER @ 22"
GROUND WATER @ N/A
TERMINATED @ 82"
REFUSAL @ N/A

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

TEST PITS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
NO. 805
LICENSED LAND SURVEYOR
KENNETH A. BERRY
SIGNATURE

NOT FOR CONSTRUCTION

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

EXISTING LEGEND:

- DRILL HOLE ~FND~
- IRON PIPE ~FND~
- IRON BOUND ~FND~
- ANGLE IRON ~FND~
- NHHB GRANITE BOUND ~FND~
- UTILITY POLE/GUY WIRE
- POORLY DRAINED JURISDICTIONAL WETLAND LINE
- BUILDING SETBACK LINE
- EASEMENT LINE
- WETLAND SETBACK 50' TO POORLY DRAINED
- STONE WALL
- STONE WALL REMAINS
- EXISTING STREAM
- EXISTING TRAIL
- FEMA FLOOD ZONE
- 50' NHDES PRIMARY SETBACK
- 150' NHDES NATURAL WOODLAND BUFFER
- 250' NHDES SHORELAND PROTECTION ZONE
- 100' LOCAL CONSERVATION OVERLAY ZONE
- GREATER THAN 20% SLOPE FOR 2,000 Sq. Ft. CONTIGUOUS AREA
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. TYPICAL
- FND FOUND
- (##) ABUTTER REFERENCE

ADDITIONAL ABUTTERS:

(12) N/F CHAKRAVARTY, DILIP & MITALI
N/F THIBAULT, DANIEL JACOB
40 NYE LANE
DOVER, NH 03820
TAX MAP E, LOT 49-9
S.C.R.D. BOOK 4631, PAGE 150

(20) N/F THAYER SMITH FAMILY REV. TRUST
SMITH, TRAVIS K. & THAYER, MEGAN TRUSTEES
88 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-C
S.C.R.D. BOOK, 4347, PAGE 303

(21) N/F GERVAIS, ANDREW TODD
80 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-M
S.C.R.D. BOOK 4250, PAGE 900

(22) N/F ROBERTSON, JAMES M. & LINDA S.
78 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-L
S.C.R.D. BOOK 2611, PAGE 738

ADDITIONAL ABUTTERS:

(23) N/F ROBERTS, MEREDITH
74 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-F
S.C.R.D. BOOK 4542, PAGE 440

(24) N/F WYNDBROOK AT DOVER HOMEOWNERS ASSOCIATION
P.O. BOX 1685
DOVER, NH 03821
TAX MAP G, LOT 24-J
S.C.R.D. BOOK 4359, PAGE 116

(25) N/F DAMON, TIMOTHY JAMES & CATHERINE E.
64 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-G
S.C.R.D. BOOK 4228, PAGE 316

(26) N/F WILLIAMS, THOMAS R. & CAROLYN E.
60 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-B
S.C.R.D. BOOK 2073, PAGE 290

ADDITIONAL ABUTTERS:

(27) N/F KEEFE, PATRICIA
54 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-H
S.C.R.D. BOOK 1484, PAGE 700

(28) N/F BEAN, BONNIE E. &
CITAK, TERESA
48 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-E
S.C.R.D. BOOK 4438, PAGE 210

(32) WHITTIER FALLS INC.
62 WHITTIER STREET
DOVER, NH 03820
TAX MAP E, LOT 65-C
S.C.R.D. BOOK 4224, PAGE 554

ADDITIONAL ABUTTERS:

(33) WHITTIER FALLS INC.
62 WHITTIER STREET
DOVER, NH 03820
TAX MAP E, LOT 74-A
S.C.R.D. BOOK 4224, PAGE 554

(34) LIBERTY MUTUAL INSURANCE CO.
ATTN: TYLER MUNGER
175 BERKELEY STREET
BOSTON, MA 02116
TAX MAP E, LOT 24
S.C.R.D. BOOK 1364, PAGE 453

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,388,309 Sq. Ft.±, 31.87 Ac.±
LOT AREA LOT 65-A: 546,643 Sq. Ft.±, 12.55 Ac.±

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

5.) ZONING: (R-20) LOW DENSITY
MINIMUM FRONTAGE ~ 125'
CONTIGUOUS MINIMUM LOT SIZE
~ 20,000 Sq. Ft. (SINGLE FAMILY) UPLAND
CONTIGUOUS MINIMUM LOT SIZE ~ 30,000 Sq. Ft. (DUPLEX) UPLAND
18,000 Sq. Ft. OUTSIDE WETLAND BUFFER
FRONT SETBACK ~ 20'
REAR SETBACK ~ 30'
SIDE SETBACK ~ 20'
WETLANDS BUFFER ~ 50.0'
MAX. BUILDING HEIGHT: 35'
MAX. LOT COVERAGE: 30%

6.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, A PORTION OF THIS PARCEL DOES FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015.

7.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

8.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN SPRING OF 2021, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

9.) THE INTENT OF THIS PLAN IS TO SHOW THE DUPLEX SUBDIVISION YIELD OF 28 DUPLEX LOTS USING R-20 ZONING ON TAX MAP E, LOT 65-1 AND LOT 65-A

LOT FRONTAGE	LOT AREA	CONTIGUOUS UPLAND AREA	AREA OUTSIDE BUFFERS
TAX MAP E, LOT 65-1 FRONTAGE: 125.00 L.F.	*TAX MAP E, LOT 65-1* AREA: 50,148 S.F.	*TAX MAP E, LOT 65-1* AREA: 32,034 S.F.	*TAX MAP E, LOT 65-1* AREA: 18,629 S.F.
TAX MAP E, LOT 65-2 FRONTAGE: 166.18 L.F.	*TAX MAP E, LOT 65-2* AREA: 34,521 S.F.	*TAX MAP E, LOT 65-2* AREA: 30,037 S.F.	*TAX MAP E, LOT 65-2* AREA: 20,093 S.F.
TAX MAP E, LOT 65-3 FRONTAGE: 156.55 L.F.	*TAX MAP E, LOT 65-3* AREA: 35,631 S.F.	*TAX MAP E, LOT 65-3* AREA: 30,300 S.F.	*TAX MAP E, LOT 65-3* AREA: 20,564 S.F.
TAX MAP E, LOT 65-4 FRONTAGE: 438.03 L.F.	*TAX MAP E, LOT 65-4* AREA: 41,098 S.F.	*TAX MAP E, LOT 65-4* AREA: 38,034 S.F.	*TAX MAP E, LOT 65-4* AREA: 27,519 S.F.
TAX MAP E, LOT 65-5 FRONTAGE: 391.11 L.F.	*TAX MAP E, LOT 65-5* AREA: 32,130 S.F.	*TAX MAP E, LOT 65-5* AREA: 30,040 S.F.	*TAX MAP E, LOT 65-5* AREA: 18,458 S.F.
TAX MAP E, LOT 65-6 FRONTAGE: 125.36 L.F.	*TAX MAP E, LOT 65-6* AREA: 40,228 S.F.	*TAX MAP E, LOT 65-6* AREA: 30,207 S.F.	*TAX MAP E, LOT 65-6* AREA: 18,952 S.F.
TAX MAP E, LOT 65-7 FRONTAGE: 236.09 L.F.	*TAX MAP E, LOT 65-7* AREA: 49,946 S.F.	*TAX MAP E, LOT 65-7* AREA: 30,192 S.F.	*TAX MAP E, LOT 65-7* AREA: 20,714 S.F.
TAX MAP E, LOT 65-8 FRONTAGE: 431.92 L.F.	*TAX MAP E, LOT 65-8* AREA: 37,041 S.F.	*TAX MAP E, LOT 65-8* AREA: 33,347 S.F.	*TAX MAP E, LOT 65-8* AREA: 23,926 S.F.
TAX MAP E, LOT 65-9 FRONTAGE: 481.55 L.F.	*TAX MAP E, LOT 65-9* AREA: 78,677 S.F.	*TAX MAP E, LOT 65-9* AREA: 42,556 S.F.	*TAX MAP E, LOT 65-9* AREA: 18,869 S.F.
TAX MAP E, LOT 65-10 FRONTAGE: 174.50 L.F.	*TAX MAP E, LOT 65-10* AREA: 111,874 S.F.	*TAX MAP E, LOT 65-10* AREA: 63,163 S.F.	*TAX MAP E, LOT 65-10* AREA: 26,102 S.F.
TAX MAP E, LOT 65-11 FRONTAGE: 282.87 L.F.	*TAX MAP E, LOT 65-11* AREA: 71,379 S.F.	*TAX MAP E, LOT 65-11* AREA: 64,333 S.F.	*TAX MAP E, LOT 65-11* AREA: 18,003 S.F.
TAX MAP E, LOT 65-12 FRONTAGE: 125.00 L.F.	*TAX MAP E, LOT 65-12* AREA: 37,410 S.F.	*TAX MAP E, LOT 65-12* AREA: 34,319 S.F.	*TAX MAP E, LOT 65-12* AREA: 18,043 S.F.
TAX MAP E, LOT 65-13 FRONTAGE: 125.00 L.F.	*TAX MAP E, LOT 65-13* AREA: 38,618 S.F.	*TAX MAP E, LOT 65-13* AREA: 31,206 S.F.	*TAX MAP E, LOT 65-13* AREA: 20,276 S.F.
TAX MAP E, LOT 65-14 FRONTAGE: 125.00 L.F.	*TAX MAP E, LOT 65-14* AREA: 35,215 S.F.	*TAX MAP E, LOT 65-14* AREA: 35,135 S.F.	*TAX MAP E, LOT 65-14* AREA: 24,585 S.F.
TAX MAP E, LOT 65-15 FRONTAGE: 257.29 L.F.	*TAX MAP E, LOT 65-15* AREA: 39,911 S.F.	*TAX MAP E, LOT 65-15* AREA: 31,118 S.F.	*TAX MAP E, LOT 65-15* AREA: 18,565 S.F.
TAX MAP E, LOT 65-16 FRONTAGE: 330.49 L.F.	*TAX MAP E, LOT 65-16* AREA: 35,150 S.F.	*TAX MAP E, LOT 65-16* AREA: 31,280 S.F.	*TAX MAP E, LOT 65-16* AREA: 21,397 S.F.
TAX MAP E, LOT 65-17 FRONTAGE: 218.25 L.F.	*TAX MAP E, LOT 65-17* AREA: 36,804 S.F.	*TAX MAP E, LOT 65-17* AREA: 30,371 S.F.	*TAX MAP E, LOT 65-17* AREA: 20,058 S.F.
TAX MAP E, LOT 65-18 FRONTAGE: 241.19 L.F.	*TAX MAP E, LOT 65-18* AREA: 63,047 S.F.	*TAX MAP E, LOT 65-18* AREA: 54,210 S.F.	*TAX MAP E, LOT 65-18* AREA: 24,826 S.F.
TAX MAP E, LOT 65-19 FRONTAGE: 257.57 L.F.	*TAX MAP E, LOT 65-19* AREA: 56,520 S.F.	*TAX MAP E, LOT 65-19* AREA: 53,482 S.F.	*TAX MAP E, LOT 65-19* AREA: 18,011 S.F.
TAX MAP E, LOT 65-20 FRONTAGE: 131.00 L.F.	*TAX MAP E, LOT 65-20* AREA: 53,620 S.F.	*TAX MAP E, LOT 65-20* AREA: 47,925 S.F.	*TAX MAP E, LOT 65-20* AREA: 18,568 S.F.
TAX MAP E, LOT 65-21 FRONTAGE: 145.58 L.F.	*TAX MAP E, LOT 65-21* AREA: 97,863 S.F.	*TAX MAP E, LOT 65-21* AREA: 50,656 S.F.	*TAX MAP E, LOT 65-21* AREA: 30,874 S.F.
TAX MAP E, LOT 65-22 FRONTAGE: 125.49 L.F.	*TAX MAP E, LOT 65-22* AREA: 91,747 S.F.	*TAX MAP E, LOT 65-22* AREA: 55,248 S.F.	*TAX MAP E, LOT 65-22* AREA: 21,267 S.F.
TAX MAP E, LOT 65-23 FRONTAGE: 276.94 L.F.	*TAX MAP E, LOT 65-23* AREA: 222,920 S.F.	*TAX MAP E, LOT 65-23* AREA: 115,127 S.F.	*TAX MAP E, LOT 65-23* AREA: 67,787 S.F.
TAX MAP E, LOT 65-24 FRONTAGE: 130.00 L.F.	*TAX MAP E, LOT 65-24* AREA: 129,503 S.F.	*TAX MAP E, LOT 65-24* AREA: 81,054 S.F.	*TAX MAP E, LOT 65-24* AREA: 35,669 S.F.
TAX MAP E, LOT 65-25 FRONTAGE: 322.03 L.F.	*TAX MAP E, LOT 65-25* AREA: 57,252 S.F.	*TAX MAP E, LOT 65-25* AREA: 48,872 S.F.	*TAX MAP E, LOT 65-25* AREA: 26,423 S.F.
TAX MAP E, LOT 65-26 FRONTAGE: 373.48 L.F.	*TAX MAP E, LOT 65-26* AREA: 56,617 S.F.	*TAX MAP E, LOT 65-26* AREA: 52,959 S.F.	*TAX MAP E, LOT 65-26* AREA: 30,166 S.F.
TAX MAP E, LOT 65-27 FRONTAGE: 363.97 L.F.	*TAX MAP E, LOT 65-27* AREA: 54,145 S.F.	*TAX MAP E, LOT 65-27* AREA: 37,630 S.F.	*TAX MAP E, LOT 65-27* AREA: 22,900 S.F.
TAX MAP E, LOT 65-28 FRONTAGE: 312.52 L.F.	*TAX MAP E, LOT 65-28* AREA: 65,009 S.F.	*TAX MAP E, LOT 65-28* AREA: 38,122 S.F.	*TAX MAP E, LOT 65-28* AREA: 25,938 S.F.
	TAX MAP E, LOT 65-29 (R.O.W.) AREA: 181,089 S.F.		

ENVIRONMENTAL DISTURBANCE:
WETLAND DISTURBANCE AREA (5) = 8,618 Sq. Ft.
WETLAND BUFFER AREA (12) = 28,181 Sq. Ft.
DISTURBANCE OF AREA GREATER THAN 20% SLOPE FOR 2,000 Sq. Ft. (4) = 6,949 Sq. Ft.

N/F BRODERICK, BRIDGET
26 NYE LANE
DOVER, NH 03820
TAX MAP E, LOT 49-6
S.C.R.D. BOOK 4034, PAGE 254

N/F CHAKRAVARTY, DILIP & MITALI
11411 RUNNING BEAR COURT
BELTSVILLE, MD 20705-1478
TAX MAP E, LOT 49-7
S.C.R.D. BOOK 3988, PAGE 795

N/F BERGSTROM, EVA K. & CEDINS, KURT
38 NYE LANE
DOVER, NH 03820
TAX MAP E, LOT 49-8
S.C.R.D. BOOK 4499, PAGE 734

N/F MARTEL, PAUL J.
P.O. BOX 182
DOVER, NH 03821-0182
TAX MAP E, LOT 57-3
S.C.R.D. BOOK 1433, PAGE 200

N/F MONE, SEAMUS D.
1 MONE'S FOLLY DRIVE
DOVER, NH 03820
TAX MAP E, LOT 57-C-1
S.C.R.D. BOOK 4833, PAGE 841

N/F MAXON FAMILY REVOCABLE TRUST
MAXON, THOMAS & PATRICIA TRUSTEES
40 BALDPATE ROAD
GEORGETOWN, MA 01833
TAX MAP E, LOT 57-G
S.C.R.D. BOOK 4018, PAGE 118

N/F FORBES, DONALD W. & LINDA R.
181 OLD FIELDS ROAD
SOUTH BERWICK, ME 03908
TAX MAP E, LOT 64
S.C.R.D. BOOK 1906, PAGE 249

N/F GEORGE, DOUGLAS A.
65 TOLEND ROAD
DOVER, NH 03820
TAX MAP E, LOT 65
S.C.R.D. BOOK 3953, PAGE 464

N/F BSTANDIG, MARTHA A. REVOCABLE TRUST
BSTANDIG, MARTHA A. TRUSTEE
53 TOLEND ROAD
DOVER, NH 03820
TAX MAP E, LOT 65-B
S.C.R.D. BOOK 4639, PAGE 921

N/F CLOUGH, VERNON L. & OLGA
43 TOLEND ROAD
DOVER, NH 03820
TAX MAP E, LOT 74-D
S.C.R.D. BOOK 2703, PAGE 371

N/F SICARD RHONDA J. & BASTIANELLI GREGORY
14 ATINU WAY
DOVER, NH 03820
TAX MAP E, LOT 74
S.C.R.D. BOOK 4505, PAGE 898

N/F FINN, CAROL ANNE
10 SUN HAWK LANE
DOVER, NH 03820
TAX MAP E, LOT 74-C
S.C.R.D. BOOK 1598, PAGE 215

COCHECHO RIVER

TOLEND ROAD

SUN HAWK LANE

N.H. ROUTE 16 SPAULDING TURNPIKE

ABUTTERS ACROSS THE RIVER (34)

ABUTTERS ACROSS ROUTE 16 (32) (33)

100' CITY OF DOVER SETBACK / CONSERVATION DISTRICT

150' NHDES WOODLAND BUFFER ZONE

50' PRIMARY SETBACK

2334'± ALONG SOUTHERLY SIDE OF RIVER

975 LF TO NECK OF CUL-DE-SAC

ROAD LENGTH TO NECK OF CUL-DE-SAC 794 Lf.

ROAD LENGTH TO NECK OF CUL-DE-SAC 1,067 Lf.

EDGE OF POORLY DRAINED JURISDICTIONAL WETLANDS (TYP.) BY: JOHN P. HAYES III, CWS #18

50' WETLAND BUFFER (TYP.)

20' FRONT & SIDE SETBACK (TYP.)

20' SIDE SETBACK (TYP.)

30' REAR SETBACK (TYP.)

40' X 40' FOOTPRINT

EMERGENCY ACCESS

HAM FAMILY CEMETERY

LOT #1 LOT #2 LOT #3 LOT #4 LOT #5 LOT #6 LOT #7 LOT #8 LOT #9 LOT #10 LOT #11 LOT #12 LOT #13 LOT #14 LOT #15 LOT #16 LOT #17 LOT #18 LOT #19 LOT #20 LOT #21 LOT #22 LOT #23 LOT #24 LOT #25 LOT #26 LOT #27 LOT #28

WETLAND BUFFER IMPACT #1 TOTAL PERMANENT IMPACT = 1,122 SF
WETLAND BUFFER IMPACT #2 TOTAL PERMANENT IMPACT = 2,546 SF
WETLAND BUFFER IMPACT #3 TOTAL PERMANENT IMPACT = 1,894 SF
WETLAND BUFFER IMPACT #4 TOTAL PERMANENT IMPACT = 2,921 SF
WETLAND BUFFER IMPACT #5 TOTAL PERMANENT IMPACT = 759 SF
WETLAND BUFFER IMPACT #6 TOTAL PERMANENT IMPACT = 4,037 SF
WETLAND BUFFER IMPACT #7 TOTAL PERMANENT IMPACT = 3,203 SF
WETLAND BUFFER IMPACT #8 TOTAL PERMANENT IMPACT = 3,140 SF
WETLAND BUFFER IMPACT #9 TOTAL PERMANENT IMPACT = 5,490 SF
WETLAND BUFFER IMPACT #10 TOTAL PERMANENT IMPACT = 285 SF
WETLAND BUFFER IMPACT #11 TOTAL PERMANENT IMPACT = 3,334 SF
WETLAND BUFFER IMPACT #12 TOTAL PERMANENT IMPACT = 1,122 SF
WETLAND BUFFER IMPACT #14 TOTAL PERMANENT IMPACT = 1,092 SF
WETLAND CROSSING IMPACT #1 TOTAL PERMANENT IMPACT = 1,977 SF
WETLAND CROSSING IMPACT #2 TOTAL PERMANENT IMPACT = 1,839 SF
WETLAND CROSSING IMPACT #5 TOTAL PERMANENT IMPACT = 564 SF
WETLAND CROSSING IMPACT #6 TOTAL PERMANENT IMPACT = 1,297 SF
>20% SLOPE FOR 2,000 SQ.FT. OF CONTIGUOUS AREA DISTURBANCE #2 PERMANENT IMPACT = 2,417 SF
>20% SLOPE FOR 2,000 SQ.FT. OF CONTIGUOUS AREA DISTURBANCE #3 PERMANENT IMPACT = 92 SF
>20% SLOPE FOR 2,000 SQ.FT. OF CONTIGUOUS AREA DISTURBANCE #4 PERMANENT IMPACT = 2,357 SF
>20% SLOPE FOR 2,000 SQ.FT. OF CONTIGUOUS AREA DISTURBANCE #7 PERMANENT IMPACT = 2,074 SF

DOVER PLANNING FILE #23-XX

REVISION	DATE	DESCRIPTION

YIELD PLAN (28 DUPLEX LOTS)
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 100 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 13243
LICENSED PROFESSIONAL ENGINEER

SHEET 17 OF 100

NOT FOR CONSTRUCTION

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

LEGEND:

- ■ GRANITE BOUND ~TBS~
- ● 3/4" REBAR W/ ID CAP ~TBS~
- ⊕ STEEL STAKE ~FND~
- ○ IRON PIPE ~FND~
- ○ IRON BOUND/REBAR/IRON ROD ~FND~
- ⊠ NHHB/GRANITE BOUND
- UTILITY POLE
- PROPOSED BOUNDARY LINE
- APPROX. ABUTTING LOT LINE
- PERIMETER BOUNDARY LINE
- SURVEY TIE LINE
- HIGHWAY FENCE

FND FOUND
TBS TO BE SET
S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TBR TO BE REMOVED
TBA TO BE ABANDONED

ADDITIONAL ABUTTERS:

(12) N/F CHAKRAVARTY, DILIP & MITALI
N/F THIBAULT, DANIEL JACOB
40 NYE LANE
DOVER, NH 03820
TAX MAP E, LOT 49-9
S.C.R.D. BOOK 4631, PAGE 150

(20) N/F THAYER SMITH FAMILY REV. TRUST
SMITH, TRAVIS K. & THAYER, MEGAN
TRUSTEES
88 TOLEND ROAD
DOVER, NH 03820
TAX MAP C, LOT 24-C
S.C.R.D. BOOK, 4347, PAGE 303

(21) N/F GERVAIS, ANDREW TODD
80 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-M
S.C.R.D. BOOK 4250, PAGE 900

(22) N/F ROBERTSON, JAMES M. & LINDA S.
78 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-L
S.C.R.D. BOOK 2611, PAGE 738

ADDITIONAL ABUTTERS:

(23) N/F ROBERTS, MEREDITH
74 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-F
S.C.R.D. BOOK 4542, PAGE 440

(24) N/F WYNDBROOK AT DOVER HOMEOWNERS ASSOCIATION
P.O. BOX 1685
DOVER, NH 03821
TAX MAP G, LOT 24-J
S.C.R.D. BOOK 4359, PAGE 116

(25) N/F DAMON, TIMOTHY JAMES & CATHERINE E.
64 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-G
S.C.R.D. BOOK 4228, PAGE 316

(26) N/F WILLIAMS, THOMAS R. & CAROLYN E.
60 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-B
S.C.R.D. BOOK 2073, PAGE 290

ADDITIONAL ABUTTERS:

(27) N/F KEEFE, PATRICIA
54 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-H
S.C.R.D. BOOK 1484, PAGE 700

(28) N/F BEAN, BONNIE E, &
CITAK, TERESA
48 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-E
S.C.R.D. BOOK 4438, PAGE 210

(32) WHITTIER FALLS INC.
62 WHITTIER STREET
DOVER, NH 03820
TAX MAP E, LOT 65-C
S.C.R.D. BOOK 4224, PAGE 554

(33) WHITTIER FALLS INC.
62 WHITTIER STREET
DOVER, NH 03820
TAX MAP E, LOT 74-A
S.C.R.D. BOOK 4224, PAGE 554

(34) LIBERTY MUTUAL INSURANCE CO.
ATTN: TYLER MUNGER
175 BERKELEY STREET
BOSTON, MA 02116
TAX MAP E, LOT 24
S.C.R.D. BOOK 1364, PAGE 453

(34) ABUTTERS ACROSS THE RIVER

N/F BRODERICK, BRIDGET
26 NYE LANE
DOVER, NH 03820
TAX MAP E, LOT 49-6
S.C.R.D. BOOK 4034, PAGE 254

N81°35'55"E 254.77'
41'±
6"x10" GRANITE BOUND ~FND~ (1.0' HIGH)
N09°16'14"W 100.92'
TRITECH IRON BOUND ~FND~ (0.3' HIGH) NH GRID COORD. N.:257829.09 E.:1187222.41 ELEV.:91.13
N09°15'04"W 85.67'
N08°11'03"W 216.79'
1/4" REBAR ~FND~ (1.2' HIGH)
74.31' N08°28'56"W
TRITECH IRON BOUND ~FND~ (0.1' HIGH)
29.52' N08°21'44"W
N/F BERGSTROM, EVA K. & EDDINS, KURT
38 NYE LANE
DOVER, NH 03820
TAX MAP E, LOT 49-8
S.C.R.D. BOOK 4499, PAGE 734
N08°37'16"W 141.30'
(12)
TRITECH IRON BOUND ~FND~ (0.6' HIGH)
29.50' N08°29'24"W
1 1/2" IRON PIPE ~FND~ (3.3' HIGH)
N/F MARTEL, PAUL J.
P.O. BOX 182
DOVER, NH 03821-0182
TAX MAP E, LOT 57-3
S.C.R.D. BOOK 1433, PAGE 200
N08°38'08"W 337.62'
HAM FAMILY CEMETERY
1" IRON PIPE ~FND~ (1.3' HIGH) W/ WITNESS POST
N/F MONE, SEAMUS D.
1 MONE'S FOLLY DRIVE
DOVER, NH 03820
TAX MAP E, LOT 57-C-1
S.C.R.D. BOOK 4833, PAGE 841
N07°54'49"W 162.76'
N/F MAXON FAMILY REVOCABLE TRUST
MAXON, THOMAS & PATRICIA TRUSTEES
40 BALDPATE ROAD
GEORGETOWN, MA 01833
TAX MAP E, LOT 57-C
S.C.R.D. BOOK 4018, PAGE 118
82.82' N05°23'19"W
45.17' N11°06'19"W
N/F FORBES, DONALD W. & LINDA R.
181 OLD FIELDS ROAD
SOUTH BERWICK, ME 03908
TAX MAP E, LOT 64
S.C.R.D. BOOK 1906, PAGE 249
N11°06'14"W 150.00'
266.94' S71°43'49"W
10.00' S75°43'58"W

SURVEY TIE LINE – NOT A BOUNDARY LINE
S76°42'27"E 999.34'
COCHECHO RIVER
MEAN HIGH WATER EDGE OF RIVER LOCATED IN SPRING 2021
2339'± ALONG SOUTHERLY SIDE OF RIVER PROPOSED

S19°05'01"E 79.50' ±
28" HEMLOCK W/ BARBED WIRE (HELD)
S19°05'01"E 146.79'
24" PINE W/ BARBED WIRE (HELD)
AREA TO BE TRANSFERRED FROM LOT 65-A TO 65-1
420,757 Sq.Ft.±
9.66 Ac.±
(LOT B)
BOUNDARY LINE ~TBA~
S22°26'01"E 650.84'
NITRATE EASEMENT IN FAVOR LOT TAX MAP E, LOT 65-1
42,092 Sq.Ft.
PROPOSED BOUNDARY LINE
TAX MAP E, LOT 65-A
EX. LOT AREA:
546,643 Sq.Ft.±
12.55 Ac.±
PRO. LOT AREA:
125,886 Sq.Ft.
2.89 Ac.
S83°45'20"E 59.00'
EXISTING SHED
72.76' N 21°22'39" E
35.00' N 21°22'39" E
N 89°51'49" W 203.42'
(LOT A)
EXISTING HOUSE ~TBR~
3/4" IRON PIPE ~FND~ (2.1' HIGH) NOT HELD OFF LINE 1.88'
1/4" IRON ROD ~FND~ (3.0' HIGH) NOT HELD OFF LINE 1.14'
N 81°51'49" W 127.54'
R =35.00' L=42.24'
205.42' S65°13'07"W
N 05°52'21" E 2.51' SEE DETAIL "B"
7.20' S64°55'26"W
LLS 223 IRON BOUND ~FND~ (0.1' HIGH)
CIVIL CONSULTANTS IRON BOUND ~FND~ (0.9' HIGH)
CIVIL CONSULTANTS IRON BOUND ~FND~ (0.7' HIGH)
164.15' S54°12'54"W
12.10' N22°26'01"W
77.02' S48°21'04"W
112.94' S38°43'33"W
28.02' S41°27'33"W
CIVIL CONSULTANTS IRON BOUND ~FND~
159.96' S41°11'58"W
63.30' S55°13'36"W
103.27' S73°48'07"W
CIVIL CONSULTANTS IRON BOUND ~FND~ (0.9' HIGH)
STEEL STAKE ~FND~ (FLUSH) LOCATED AT BASE
N/F CLOUGH, VERNON L. & OLGA
43 TOLEND ROAD
DOVER, NH 03820
TAX MAP E, LOT 74-D
S.C.R.D. BOOK 2703, PAGE 371
GRAVEL TRAVEL WAY OWNED BY NHDOT. S.C.R.D. BOOK 650, PG 344 & 350
N/F SICARD RHONDA J. & BASTIANELLI GREGORY
14 ATINA WAY
DOVER, NH 03820
TAX MAP E, LOT 74
S.C.R.D. BOOK 4505, PAGE 898
N/F FINN, CAROL ANNE
10 SUN HAWK LANE
DOVER, NH 03820
TAX MAP E, LOT 74-C
S.C.R.D. BOOK 1598, PAGE 215
SUN HAWK LANE
NHHB ~FND~ (0.4' HIGH)
261.08' S17°19'42"W
NHHB ~FND~ (0.1' HIGH)

N 53°43'34" E 1,154.25'
L = 504.58'
R = 2,060.00'
CB = S20°08'41"W
CL = 503.32'
ABUTTERS ACROSS ROUTE 16
N.H. ROUTE 16 SPAULDING TURNPIKE
3/4" REBAR W/ ID CAP ~TBS~ (TYP.)
N 84°26'43" E 137.97'
HIGHWAY FENCE
L = 621.94'
R = 2,060.00'
CB = S04°28'43"W
CL = 619.58'
EXISTING BILLBOARD
LLS 211 IRON BOUND ~FND~ (0.1' HIGH) HELD FOR LINE SEE DETAIL "A"
NHHB ~FND~ (0.1' HIGH)
L = 0.71'
R = 2,060.01'
CB = S27°10'18"W
CL = 0.71'
SEE DETAIL "C"
178.08' S27°10'54"W
71'±
NHHB ~FND~ (0.5' HIGH)

TAX MAP E, LOT 65-1
EX. LOT AREA:
1,388,309 Sq. Ft.±
31.87 Ac.±
PRO. LOT AREA:
1,809,066 Sq.Ft.±
41.53 Ac.±

NAD83 NH STATE PLANE MAGNETIC

TOLEND ROAD
24' PAVED 4 RODS WIDE PUBLIC, CLASS V.

N/F GEORGE, DOUGLAS A.
65 TOLEND ROAD
DOVER, NH 03820
TAX MAP E, LOT 65
S.C.R.D. BOOK 3953, PAGE 464
316.21' S78°15'10"W
CIVIL CONSULTANTS IRON BOUND ~FND~ (0.8' HIGH)
CIVIL CONSULTANTS IRON BOUND ~FND~ (1.4' HIGH) NH GRID COORD. N.:256925.91 E:1187926.32 ELEV.:112.29
S14°16'11"E 295.09'
N07°22'51"W 294.99'
CIVIL CONSULTANTS IRON BOUND ~FND~ (FLUSH)
CIVIL CONSULTANTS IRON BOUND ~FND~ (0.3' HIGH)
DAVIS STEEL STAKE ~FND~ (FLUSH) LOCATED AT BASE
82.07' S82°40'56"W
95.78' S88°53'19"W
181.20' N84°02'15"W
220.35' S05°57'45"W
N02°39'47"E 196.60'
N/F BSTANDIG, MARTHA A. REVOCABLE TRUST
BSTANDIG, MARTHA A. TRUSTEE
53 TOLEND ROAD
DOVER, NH 03820
TAX MAP E, LOT 65-B
S.C.R.D. BOOK 4639, PAGE 921

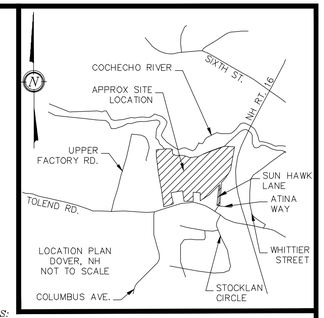
(20) (21) (22) (23) (24) (25) (26) (27) (28)

APPROVED DOVER

DETAIL "B"
SCALE: 1" = 5'
R =35.00' L=42.24'
2.51' S 05°52'21" W
205.42' S 65°13'07" W
7.20' S 64°55'26" W
LLS 223 I.B. (FND) +0.1'

DETAIL "C"
SCALE: 1" = 5'
EXISTING HIGHWAY FENCE
178.08' S 27°10'54" W
L=504.58' R =2,060.00'
R =2,060.01' L=0.71'
NHHB ~FND~ (0.1' HIGH)

DETAIL "A"
SCALE: 1" = 5'
HIGHWAY FENCE
LLS 211 IRON BOUND ~FND~ (0.1' HIGH) HELD FOR LINE
205.42' S65°13'07"W
0.31' S65°13'07"W



LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

A.) TAX MAP E, LOT 65-1

B.) EXISTING LOT AREA: 1,388,309 Sq.Ft.±, 31.87 Ac.±
PROPOSED LOT AREA: 1,809,066 Sq.Ft.±, 41.53 Ac.±

C.) S.C.R.D. BOOK 5044, PAGE 744

2.) OWNER: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

A.) TAX MAP E, LOT 65-A

B.) EXISTING LOT AREA: 546,643 Sq.Ft.±, 12.55 Ac.±
PROPOSED LOT AREA: 125,886 Sq.Ft., 2.89 Ac.

C.) S.C.R.D. BOOK 1571, PAGE 86

3.) ZONING: (R-20) LOW DENSITY
MINIMUM FRONTAGE ~ 125'
MINIMUM LOT SIZE ~ 20,000 Sq. Ft.
FRONT SETBACK ~ 20'
REAR SETBACK ~ 30'
SIDE SETBACK ~ 20'
WETLANDS BUFFER ~ 50.0'
MAX. BUILDING HEIGHT: 35'
MAX. LOT COVERAGE: 30%

4.) THIS LOT LINE REVISION IS PART OF A LARGER 100 PAGE PLAN SET. SHEETS #18, 19, & 21–24 ARE TO BE RECORDED AT THE S.C.R.D.

5.) SEE SHEET #2 FOR COMMON NOTES.

6.) SUN HAWK LANE IS PRIVATE FROM THE END OF WHERE NHDOT OWNS AND IS TO BE USED FOR EMERGENCY VEHICLE ACCESS.

7.) OWNERS OF LOT A TO USE THE PRIVATE ROAD SUN HAWK LANE TO ACCESS THEIR PROPERTY AND/OR FOR UTILITY ACCESS.

8.) THE OWNERS OF LOT B WILL MAINTAIN AND PLOW SUN HAWK LANE AT THEIR SOLE EXPENSE.

9.) A VARIANCE HAS BEEN RECEIVED ON APRIL 20, 2020 (CASE #XX-XX-XXXX) FOR A LOT WITH ZERO FRONTAGE.

PLAN REFERENCES:

1.) "STANDARD PROPERTY SURVEY AND SUBDIVISION OF LAND OF THE EDWARD J. GEORGE FAMILY TRUST"
BY: CIVIL CONSULTANTS
DATED: APRIL 2, 2011
S.C.R.D.: PLAN #102–24

2.) "PLAN OF LAND PREPARED FOR FAIRVIEW PARNERS, LLC
TAX MAP E, LOT NO. 74B 35 TOLEND ROAD CITY OF DOVER COUNTY OF STRAFFORD STATE OF NEW HAMPSHIRE"
BY: MCENEANEY SURVEY ASSOCIATES INC.
DATED: MARCH 4, 2016

3.) "SUBDIVISION OF LAND FOR KAREN & JAMES BECKINGHAM & MARY & SCOTT MCEWAN IN DOVER, N.H."
BY: BRUCE L. POHOPEK
DATED: FEBRUARY 19, 1986
S.C.R.D.: PLAN #29–67

4.) "SUBDIVISION OF LAND FOR PAUL MARTEL IN DOVER, N.H."
BY: BRUCE L. POHOPEK
DATED: OCTOBER 4, 1978
S.C.R.D.: PLAN #19A–47

5.) "PLAN OF LOT ERNEST BSTANDIG DOVER NEW HAMPSHIRE"
BY: G.L. DAVIS & ASSOCIATES
DATED: MAY, 1969
S.C.R.D.: BOOK 858, PAGE 159

PLAN REFERENCES:

6.) "PLAN OF LAND, HAROLD A. & YVONNE M. CLEWLEY & LINDA J. NOURY, NORTH SIDE OF TOLEND ROAD," DOVER, NH
BY: R.W. MCCRONE
DATED: MARCH 1986
S.C.R.D. PLAN #28A–04

7.) "BOUNDARY LINE ADJUSTMENT, THE HEIRS OF KENNETH & IRENE M. NYE AND PAUL & KATHERINE MARTEL, UPPER FACTORY ROAD, DOVER, NH"
BY: TRITECH ENGINEERING CORPORATION
DATED: OCTOBER 25, 2004
S.C.R.D. PLAN #77–87

8.) "SUBDIVISION OF LAND FOR ANTONIO BASTIANELLI IN DOVER, N.H."
BY: BRUCE L. POHOPEK, LAND SURVEYOR
DATED: JULY 31, 1989, AS REVISED 5/28/90
S.C.R.D. PLAN #32–149

9.) "STATE OF NEW HAMPSHIRE, DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS, PLAN OF PROPOSED LS1824(1), SPAULDING TURNPIKE"
DATED: OCTOBER 19, 1955
S.C.R.D. PLAN #32, POCKET 15, FOLDER 3 &
S.C.R.D. PLAN #36, POCKET 15, FOLDER 3 &
ON FILE AT NH DOT RIGHTS–OF–WAY, CONCORD, NH

REVISION	DATE	DESCRIPTION

LOT LINE REVISION
LAND OF
59 TOLEND ROAD, LLC AND
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

I CERTIFY THAT THIS PLAT EXCEEDS THE MINIMUM REQUIREMENT FOR ACCURACY AND COMPLETENESS OF THE STATE OF N.H. AND OF THE CITY OF DOVER, N.H. – 1:10,000–

KENNETH A. BERRY L.L.S. 805 DATE

STATE OF NEW HAMPSHIRE No. 805 LICENSED LAND SURVEYOR KENNETH A. BERRY SIGNATURE

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT RD.
BARRINGTON, N.H. (603)332–2863

SCALE : 1 IN. EQUALS 100 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023–031

SHEET 18 OF 100 DOVER PLANNING FILE #P23–XX

NOT FOR CONSTRUCTION

WETLAND NOTES:

WETLANDS WERE DELINEATED BY JOHN P. HAYES SPRING 2021 & OCTOBER OF 2022.

1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.0, UNITED STATES DEPARTMENT OF AGRICULTURE (2016).
3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

JOHN P. HAYES III, CWS #18

ZONING NOTES:

1.) ZONING: (R-20) LOW DENSITY:	1.) PROVIDED:	
MIN. FRONTAGE ~ 125'	177.85' & 266.94' (LOT 65-1), 65.86' EX. 0' PROP. (SEE VARIANCE REQUEST (LOT 65-A))	
MIN. LOT SIZE ~ 20,000 Sq. Ft. SINGLE FAMILY	N/A	
MIN. LOT SIZE ~ 30,000 Sq.Ft., TWO FAMILY	SINGLE-FAMILY PROPOSED AS AN OSS CLUSTER	
FRONT BUILD-TO ~ 20' ~ 35'	SEE OSS BELOW	
REAR SETBACK ~ 30'	SEE OSS BELOW	
SIDE SETBACK ~ 20'	SEE OSS BELOW	
WETLANDS BUFFER ~ 50.0'	50.0'	
MAX. BUILDING HEIGHT: 35'	35'	
MAX. LOT COVERAGE: 30%	59,582 SF (3.3%) LOT 65-1, 3,472 SF (2.8%) LOT 65-A (FUNCTION OF LLR)	
OPEN SPACE SUBDIVISION (OSS)		
15 Ac. MINIMUM	41.51 Ac	
MIN. LOT SIZE ~ 12,000 Sq. Ft.,	CLUSTER PROVIDED WITH LIMITED COMMON AREA LINES	
MIN. FRONTAGE ~ 30'	MIN' 30' FRONTAGE PROVIDED IN CLUSTER FORMAT	
MIN. BUFFER ALONG FRONTAGE ~ 100'	100' (CURB CUT EXCEPTED)	
STREET SIDE ~ 15'	20' MIN	
BETWEEN UNITS ~ 25'	25' MIN.	
MIN. DISTANCE TO ABUTTING STRUCTURES ~ 75'	243' TO THE CLOSEST ABUTTING STRUCTURE TO A PROPOSED STRUCTURE 89' FROM CLOSEST ABUTTING STRUCTURE TO PROPOSED THEODORE DRIVE.	
MIN. BUFFER TO EXTERNAL BOUNDARIES ~ 40'	18' AT THE CLOSEST FOR ROAD CONSTRUCTION. WAIVER REQUESTED	
CONSERVATION OVERLAY DISTRICT:	100' MIN.	
COCHECHO RIVER ~ 100'	SEE CUP REQUEST	
STEEP SLOPES LARGER THEN 2,000 Sq.Ft., IN SIZE	SEE CUP REQUEST	
WETLANDS OVERLAY DISTRICT		

ADDITIONAL ABUTTERS:

(12) N/F CHAKRAVARTY, DILIP & MITALI
N/F THIBAULT, DANIEL JACOB
40 NYE LANE
DOVER, NH 03820
TAX MAP E, LOT 49-9
S.C.R.D. BOOK 4631, PAGE 150

(20) N/F THAYER SMITH FAMILY REV. TRUST
SMITH, TRAVIS K. & THAYER, MEGAN
TRUSTEES
88 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-C
S.C.R.D. BOOK, 4347, PAGE 303

(22) N/F ROBERTSON, JAMES M. & LINDA S.
78 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-L
S.C.R.D. BOOK 2611, PAGE 738

(23) N/F ROBERTS, MEREDITH
74 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-F
S.C.R.D. BOOK 4542, PAGE 440

(24) N/F WYNDBROOK AT DOVER
HOMEOWNERS ASSOCIATION
P.O. BOX 1685
DOVER, NH 03821
TAX MAP G, LOT 24-J
S.C.R.D. BOOK 4359, PAGE 116

ADDITIONAL ABUTTERS:

(25) N/F DAMON, TIMOTHY JAMES & CATHERINE E.
64 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-G
S.C.R.D. BOOK 4228, PAGE 316

(26) N/F WILLIAMS, THOMAS R. & CAROLYN E.
60 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-B
S.C.R.D. BOOK 2073, PAGE 290

(28) N/F BEAN, BONNIE E. & CITAK, TERESA
48 TOLEND ROAD
DOVER, NH 03820
TAX MAP G, LOT 24-E
S.C.R.D. BOOK 4438, PAGE 210

ADDITIONAL ABUTTERS:

(34) LIBERTY MUTUAL INSURANCE CO.
ATTN: TYLER MUNGER
175 BERKELEY STREET
BOSTON, MA 02116
TAX MAP E, LOT 24
S.C.R.D. BOOK 1364, PAGE 453

ABUTTERS ACROSS ROUTE 16::

(32) WHITTIER FALLS INC.
62 WHITTIER STREET
DOVER, NH 03820
TAX MAP E, LOT 65-C
S.C.R.D. BOOK 4224, PAGE 554

(33) WHITTIER FALLS INC.
62 WHITTIER STREET
DOVER, NH 03820
TAX MAP E, LOT 74-A
S.C.R.D. BOOK 4224, PAGE 554

I CERTIFY THAT THIS PLAT EXCEEDS THE MINIMUM REQUIREMENT FOR ACCURACY AND COMPLETENESS OF THE STATE OF N.H. AND OF THE CITY OF DOVER, N.H. – 1:10,000–

KENNETH A. BERRY L.L.S. 805 DATE

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

PLAN REFERENCES:

1.) "STANDARD PROPERTY SURVEY AND SUBDIVISION OF LAND OF THE EDWARD J. GEORGE FAMILY TRUST"
BY: CIVIL CONSULTANTS
DATED: APRIL 2, 2011
S.C.R.D.: PLAN #102-24

2.) "PLAN OF LAND PREPARED FOR FAIRVIEW PARNERS, LLC TAX MAP E, LOT NO. 74B 35 TOLEND ROAD CITY OF DOVER COUNTY OF STRAFFORD STATE OF NEW HAMPSHIRE"
BY: MCENEANEY SURVEY ASSOCIATES INC.
DATED: MARCH 4, 2016

3.) "SUBDIVISION OF LAND FOR KAREN & JAMES BECKINGHAM & MARY & SCOTT MCEWAN IN DOVER, N.H."
BY: BRUCE L. POHOPEK
DATED: FEBRUARY 19, 1986
S.C.R.D.: PLAN #29-67

4.) "SUBDIVISION OF LAND FOR PAUL MARTEL IN DOVER, N.H."
BY: BRUCE L. POHOPEK
DATED: OCTOBER 4, 1978
S.C.R.D.: PLAN #19A-47

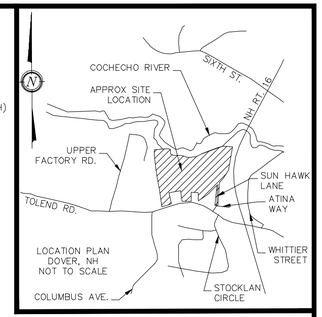
5.) "PLAN OF LOT ERNEST BSTANDIG DOVER NEW HAMPSHIRE"
BY: G.L. DAVIS & ASSOCIATES
DATED: MAY, 1969
S.C.R.D.: BOOK 858, PAGE 159

6.) "PLAN OF LAND, HAROLD A. & YVONNE M. CLEWLEY & LINDA J. NOURY, NORTH SIDE OF TOLEND ROAD, DOVER, NH"
BY: R.W. MCCRONE
DATED: MARCH 1986
S.C.R.D. PLAN #28A-04

7.) "BOUNDARY LINE ADJUSTMENT, THE HEIRS OF KENNETH & IRENE M. NYE AND PAUL & KATHERINE MARTEL, UPPER FACTORY ROAD, DOVER, NH"
BY: TRITECH ENGINEERING CORPORATION
DATED: OCTOBER 25, 2004
S.C.R.D. PLAN #77-87

8.) "SUBDIVISION OF LAND FOR ANTONIO BASTIANELLI IN DOVER, N.H."
BY: BRUCE L. POHOPEK, LAND SURVEYOR
DATED: JULY 31, 1989, AS REVISED 5/28/90
S.C.R.D. PLAN #32-149

9.) "STATE OF NEW HAMPSHIRE, DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS, PLAN OF PROPOSED LS1824(1), SPAULDING TURNPIKE"
DATED: OCTOBER 19, 1955
S.C.R.D. PLAN #32, POCKET 15, FOLDER 3 &
S.C.R.D. PLAN #36, POCKET 15, FOLDER 3 &
ON FILE AT NH DOT RIGHTS-OF-WAY, CONCORD, NH



NOTES:

1.) OWNER: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

A.) TAX MAP E, LOT 65-1

B.) EXISTING LOT AREA: 1,809,066 Sq.Ft., 41.53 Ac.±

C.) S.C.R.D. BOOK 5044, PAGE 744

2.) OWNER: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

A.) TAX MAP E, LOT 65-A

B.) EXISTING LOT AREA: 125,886 Sq.Ft., 2.89 Ac.

C.) S.C.R.D. BOOK 1571, PAGE 86

3.) THE INTENT OF THIS PLAN IS TO SHOW AN OVERVIEW OF THE PROPOPSED SUBDIVISION.

4.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

5.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, A PORTION OF THIS PARCEL DOES FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015.

6.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

7.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN WINTER OF 2021, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

8.) THE INTENT OF THIS PLAN IS TO SHOW THE SUBDIVISION OF TAX MAP E, LOT 65-1, WITH THE CREATION OF A DEVELOPED AREA AND TWO OPEN SPACE AREAS.

LEGEND:

- 3/4" REBAR W/ID CAP ~TBS~
- GRANITE BOUND ~TBS~
- IRON BOUND ~FND~
- IRON PIPE ~FND~
- NHHB BOUND ~FND~
- UTILITY POLE / GUY WIRE
- MATCH POINT
- MATCH LINE
- BUILDING SETBACK LINE
- POORLY DRAINED WETLAND LINE
- EXISTING RIVER
- EXISTING TRAIL
- 50' WETLAND BUFFER
- FEMA FLOOD ZONE
- 100' LOCAL CONSERVATION OVERLAY ZONE
- PROPOSED LCA LINE
- SURVEY TIE LINE – NOT A PROPERTY BOUNDARY
- PROPOSED EASEMENT

S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. TYPICAL
FND FOUND
TBS TO BE SET
LCA LIMITED COMMON AREA
(##) ABUTTER – SEE OVERVIEW PLAN, SHEET 19 OF 100

REVISION	DATE	DESCRIPTION

OVERVIEW SUBDIVISION PLAN
LAND OF
59 TOLEND ROAD, LLC AND
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

STATE OF NEW HAMPSHIRE – LICENSED LAND SURVEYOR – NO. 805 – KENNETH A. BERRY – SIGNATURE

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT RD.
BARRINGTON, N.H. (603)332-2863

SCALE : 1 IN. EQUALS 100 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023-031

SHEET 19 OF 100 DOVER PLANNING FILE #P23-XX

APPROVED DOVER

NOT FOR CONSTRUCTION

WETLAND NOTES:

WETLANDS WERE DELINEATED BY JOHN P. HAYES SPRING 2021 AND OCTOBER 2022.

1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.0. UNITED STATES DEPARTMENT OF AGRICULTURE (2016).
3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

STATE OF NEW HAMPSHIRE · JOHN P. HAYES, III · CWS 18 · CERTIFIED WETLAND SCIENTIST

JOHN P. HAYES III, CWS #18

NRCS SOILS:

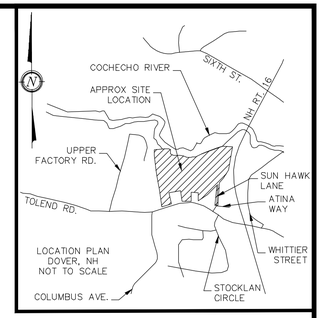
BzB – BUXTON SILT LOAM, 3 TO 8 PERCENT SLOPES
HcB – HOLLIS–CHARLTON FINE SANDY LOAMS, 3 TO 8 PERCENT SLOPES
ScA – SCANTIC SILT LOAM, 0 TO 3 PERCENT SLOPES
ScB – SCANTIC SILT LOAM, 3 TO 8 PERCENT SLOPES
SfC – SUFFIELD SILT LOAM, 8 TO 15 PERCENT SLOPES

SEE WEBSOIL USDA–NRCS

LEGEND:

- STEEL STAKE ~FND~
- IRON PIPE ~FND~
- IRON BOUND/REBAR/IRON ROD ~FND~
- NHHB/GRANITE BOUND
- UTILITY POLE
- PROPOSED LCA LINE
- APPROX. ABUTTING LOT LINE
- 40' PERIMETER BUFFER
- PERIMETER BOUNDARY LINE
- HIGHWAY FENCE
- FEMA FLOOD ZONE BOUNDARY
- PROPOSED EASEMENT LINE
- 50' WETLAND BUFFER
- 100' LOCAL CONSERVATION OVERLAY ZONE
- POORLY DRAINED WETLAND LINE
- 50 NHDES — 50' NHDES WATERFRONT BUFFER
- 150 NHDES — 150' NHDES WOODLAND BUFFER
- 250 NHDES — 250' NHDES SHORELAND PROTECTION ZONE
- USDA/NRCS SOIL BOUNDARY
- TEMPORARY BENCHMARK

FND FOUND
LCA LIMITED COMMON AREA
S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
T.B.M. TEMPORARY BENCHMARK
NHHB NEW HAMPSHIRE HIGHWAY BOUND



NOTES:

1.) OWNER: 59 TOLEND ROAD, LLC
42J DOVER POINT ROAD
DOVER, NH 03820

A.) TAX MAP E, LOT 65–1

B.) EXISTING LOT AREA: 1,388,309 Sq.Ft.±, 31.87 Ac.±
PROPOSED LOT AREA: 1,809,066 Sq.Ft., 41.51 Ac.±

C.) S.C.R.D. BOOK 5044, PAGE 744

2.) OWNER: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

A.) TAX MAP E, LOT 65–A

B.) EXISTING LOT AREA: 546,643 Sq.Ft.±, 12.55 Ac.±
PROPOSED LOT AREA: 125,886 Sq.Ft., 2.89 Ac.

C.) S.C.R.D. BOOK 1571, PAGE 86

3.) ZONING: (R–20) LOW DENSITY
MINIMUM FRONTAGE ~ 125'
MINIMUM LOT SIZE ~ 20,000 Sq. Ft.
FRONT SETBACK ~ 20'
REAR SETBACK ~ 30'
SIDE SETBACK ~ 20'
WETLANDS BUFFER ~ 50.0'
MAX. BUILDING HEIGHT: 35'
MAX. LOT COVERAGE: 30%

4.) TOPOGRAPHY SHOWN AT 5' INTERVALS.

5.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, A PORTION OF THIS PARCEL DOES FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015.

6.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

7.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN WINTER OF 2021, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

8.) THE INTENT OF THIS PLAN IS TO SHOW THE TOPOGRAPHY OF THE SUBDIVISION OF TAX MAP E, LOT 65–1, WITH THE CREATION OF A DEVELOPED AREA AND TWO OPEN SPACE AREAS. THE TOPOGRAPHY WAS COMPLETED AS A PART OF THE FIELD WORK: MARCH 2021 AND SEPTEMBER 2022.

9.) SEE OVERVIEW SUBDIVISION PLAN FOR ABUTTERS, PLAN REFERENCES AND ADDITIONAL NOTES, SHEET 19 OF 100.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

REVISION	DATE	DESCRIPTION

TOPOGRAPHIC SUBDIVISION PLAN
LAND OF
59 TOLEND ROAD, LLC AND
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

STATE OF NEW HAMPSHIRE · NO. 805 · KENNETH A. BERRY · SIGNATURE · LICENSED LAND SURVEYOR

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT RD.
BARRINGTON, N.H. (603)332–2863

SCALE : 1 IN. EQUALS 100 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023–031

SHEET 20 OF 100

DOVER PLANNING FILE #P23–XX

NOT FOR CONSTRUCTION

PLAN REFERENCES:

1.) "STANDARD PROPERTY SURVEY AND SUBDIVISION OF LAND OF THE EDWARD J. GEORGE FAMILY TRUST"
BY: CIVIL CONSULTANTS
DATED: APRIL 2, 2011
S.C.R.D.: PLAN #102-24

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BY: MCENEANEY SURVEY ASSOCIATES INC.
DATED: MARCH 4, 2016

3.) "SUBDIVISION OF LAND FOR KAREN & JAMES BECKINGHAM & MARY & SCOTT MCEWAN IN DOVER, N.H."
BY: BRUCE L. POHOPEK
DATED: FEBRUARY 19, 1986
S.C.R.D.: PLAN #29-67

4.) "SUBDIVISION OF LAND FOR PAUL MARTEL IN DOVER, N.H."
BY: BRUCE L. POHOPEK
DATED: OCTOBER 4, 1978
S.C.R.D.: PLAN #19A-47

PLAN REFERENCES CONTINUED:

5.) "PLAN OF LOT ERNEST BSTANDIG DOVER NEW HAMPSHIRE"
BY: G.L. DAVIS & ASSOCIATES
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6.) "PLAN OF LAND, HAROLD A. & YVONNE M. CLEWLEY & LINDA J. NOURY, NORTH SIDE OF TOLEND ROAD, DOVER, NH"
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PLAN REFERENCES CONTINUED:

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DATED: OCTOBER 19, 1955
S.C.R.D. PLAN #32, POCKET 15, FOLDER 3 &
S.C.R.D. PLAN #36, POCKET 15, FOLDER 3 &
ON FILE AT NH DOT RIGHTS-OF-WAY, CONCORD, NH

STATE OF NEW HAMPSHIRE
JOHN P. HAYES, III
WWR 16
CERTIFIED WETLAND SCIENTIST

JOHN P. HAYES III, CWS #18

WETLAND NOTES:

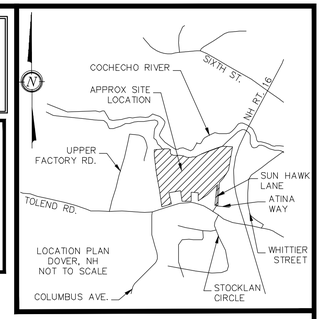
WETLANDS WERE DELINEATED BY JOHN P. HAYES SPRING 2021 & OCTOBER OF 2022

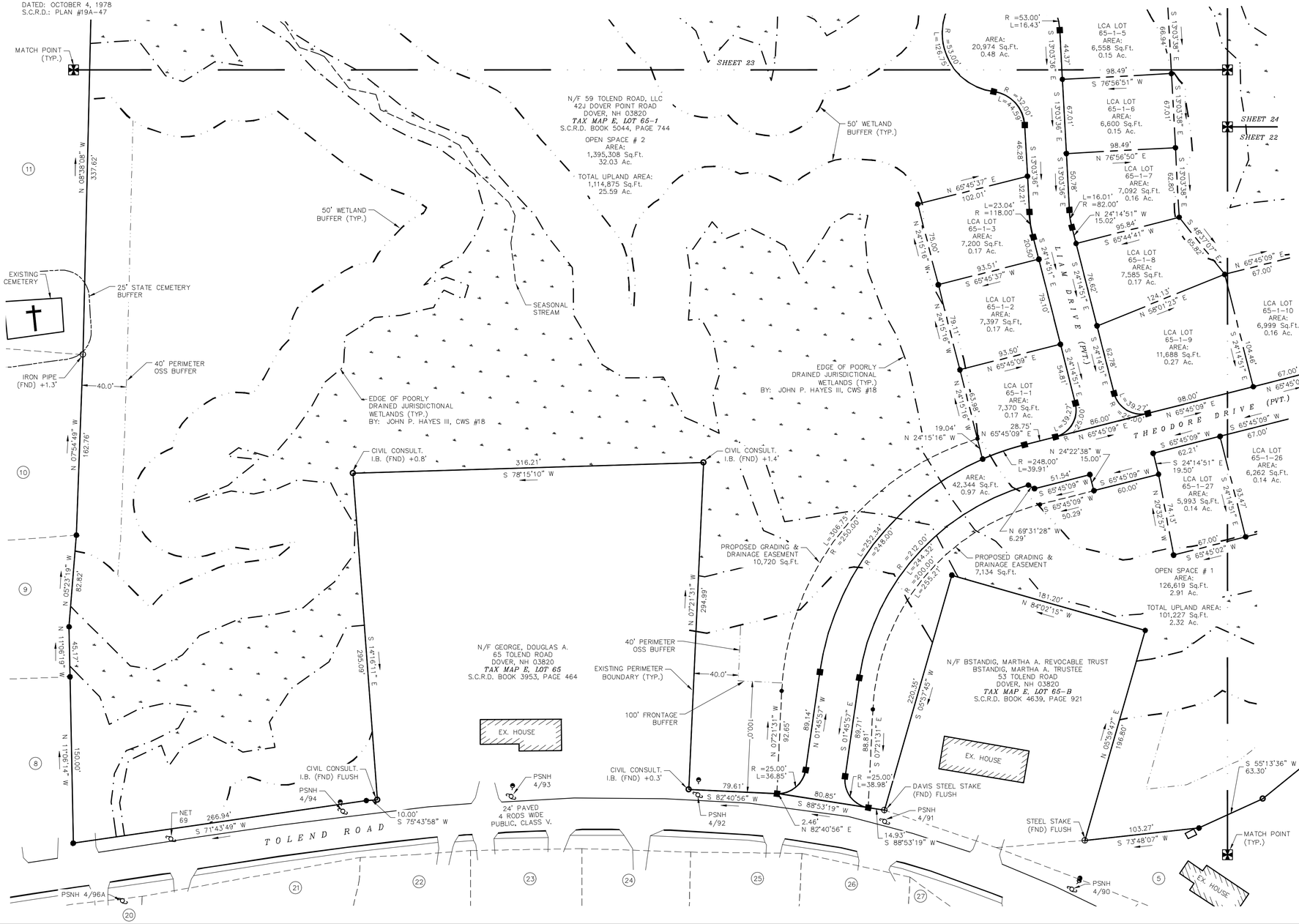
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KENNETH A. BERRY L.L.S. 805 DATE

APPROVED DOVER





NOTES:

1.) OWNER: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

A.) TAX MAP E, LOT 65-1

B.) EXISTING LOT AREA: 1,809,086 Sq.Ft., 41.53 Ac.±

C.) S.C.R.D. BOOK 5044, PAGE 744

2.) OWNER: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

A.) TAX MAP E, LOT 65-A

B.) EXISTING LOT AREA: 125,886 Sq.Ft., 2.89 Ac.

C.) S.C.R.D. BOOK 1571, PAGE 86

3.) THE INTENT OF THIS PLAN IS TO SHOW A DETAILED VIEW OF THE PROPOSED SUBDIVISION. THIS IS SHEET 21 OF 100.

4.) SEE THE OVERVIEW SUBDIVISION PLAN, SHEET 19 OF 100, FOR COMPLETE ABUTTER LIST AND MORE NOTES.

5.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

LEGEND:

- ● 3/4" REBAR W/ID CAP ~TBS~
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- ⊙ IRON PIPE ~FND~
- ⊠ NHHB BOUND ~FND~
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- MATCH LINE
- BUILDING SETBACK LINE / OSS BUFFER
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- EXISTING RIVER
- EXISTING TRAIL
- 50' WETLAND BUFFER
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- 100' LOCAL CONSERVATION OVERLAY ZONE
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- PROPOSED EASEMENT

S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. TYPICAL
FND FOUND
TBS TO BE SET
LCA LIMITED COMMON AREA

(##) ABUTTER – SEE OVERVIEW PLAN, SHEET 19 OF 100

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

REVISION	DATE	DESCRIPTION

SUBDIVISION DETAIL PLAN, SOUTHWEST
LAND OF
59 TOLEND ROAD, LLC AND
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR
No. 805
KENNETH A. BERRY
SIGNATURE

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT RD.
BARRINGTON, N.H. (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023-031

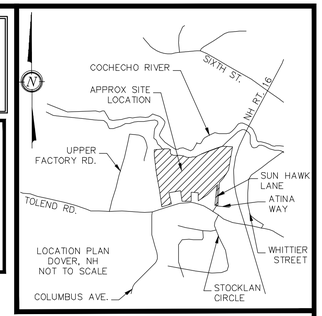
DOVER PLANNING FILE #P23-XX

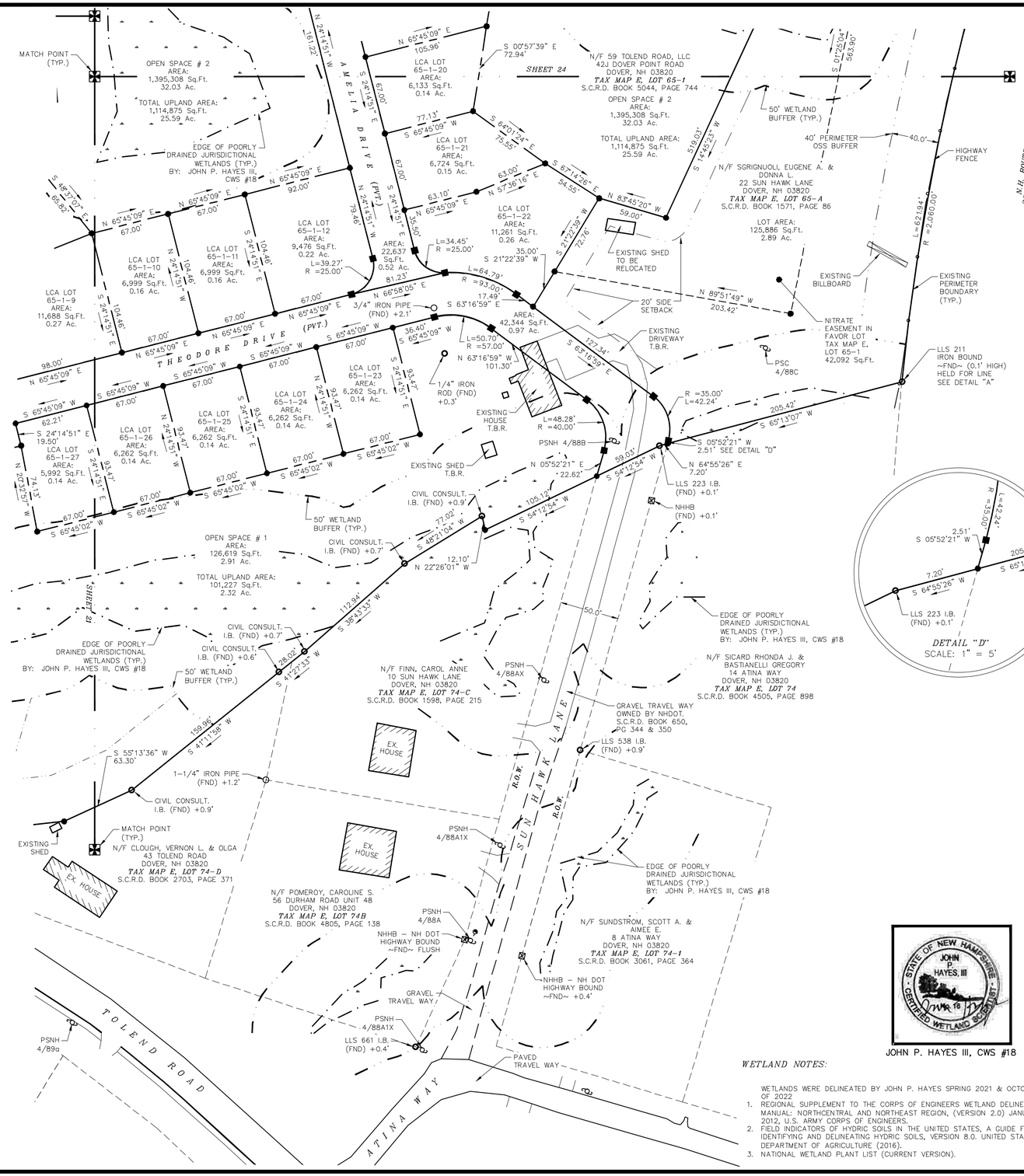
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KENNETH A. BERRY L.L.S. 805 DATE

APPROVED DOVER





JOHN P. HAYES III, CWS #18

WETLAND NOTES:

WETLANDS WERE DELINEATED BY JOHN P. HAYES SPRING 2021 & OCTOBER OF 2022

1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
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3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

NOTES:

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42J DOVER POINT ROAD
DOVER, NH 03820

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B.) EXISTING LOT AREA: 1,809,086 Sq.Ft., 41.53 Ac.±

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- PROPOSED EASEMENT

S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. TYPICAL
FND FOUND
TBS TO BE SET
LCA LIMITED COMMON AREA

(##) ABUTTER – SEE OVERVIEW PLAN, SHEET 19 OF 100

16°±

NAD83 NH STATE PLANE

MAGNETIC

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

PLAN REFERENCES:

1.) "STANDARD PROPERTY SURVEY AND SUBDIVISION OF LAND OF THE EDWARD J. GEORGE FAMILY TRUST"
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DATED: APRIL 2, 2011
S.C.R.D.: PLAN #102–24

2.) "PLAN OF LAND PREPARED FOR FAIRVIEW PARNERS, LLC TAX MAP E, LOT NO. 74B 35 TOLEND ROAD CITY OF DOVER COUNTY OF STRAFFORD STATE OF NEW HAMPSHIRE"
BY: MCENEANEY SURVEY ASSOCIATES INC.
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DATED: MARCH 1986
S.C.R.D. PLAN #28A–04

7.) "BOUNDARY LINE ADJUSTMENT, THE HEIRS OF KENNETH & IRENE M. NYE AND PAUL & KATHERINE MARTEL, UPPER FACTORY ROAD, DOVER, NH"
BY: TRITECH ENGINEERING CORPORATION
DATED: OCTOBER 25, 2004
S.C.R.D. PLAN #77–87

8.) "SUBDIVISION OF LAND FOR ANTONIO BASTIANELLI IN DOVER, N.H."
BY: BRUCE L. POHOPEK, LAND SURVEYOR
DATED: JULY 31, 1989, AS REVISED 5/28/90
S.C.R.D. PLAN #32–149

9.) "STATE OF NEW HAMPSHIRE, DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS, PLAN OF PROPOSED LS1824(1), SPAULDING TURNPIKE"
DATED: OCTOBER 19, 1955
S.C.R.D. PLAN #32, POCKET 15, FOLDER 3 &
S.C.R.D. PLAN #36, POCKET 15, FOLDER 3 &
ON FILE AT NH DOT RIGHTS–OF–WAY, CONCORD, NH

REVISION	DATE	DESCRIPTION

SUBDIVISION DETAIL PLAN, SOUTHEAST
LAND OF
59 TOLEND ROAD, LLC AND
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

STATE OF NEW HAMPSHIRE No. 805 KENNETH A. BERRY SIGNATURE LICENSED LAND SURVEYOR

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT RD.
BARRINGTON, N.H. (603)332–2863

SCALE :	1 IN. EQUALS 50 FT.
DATE :	APRIL 27, 2023
FILE NO. :	DB 2023–031

SHEET 22 OF 100 DOVER PLANNING FILE #P23–XX

NOT FOR CONSTRUCTION

WETLAND NOTES:

WETLANDS WERE DELINEATED BY JOHN P. HAYES SPRING 2021 & OCTOBER OF 2022

1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.0. UNITED STATES DEPARTMENT OF AGRICULTURE (2016).
3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

STATE OF NEW HAMPSHIRE — JOHN P. HAYES, III — CERTIFIED WETLAND SCIENTIST — MAR 18

JOHN P. HAYES III, CWS #18

PLAN REFERENCES:

1.) "STANDARD PROPERTY SURVEY AND SUBDIVISION OF LAND OF THE EDWARD J. GEORGE FAMILY TRUST"
BY: CIVIL CONSULTANTS
DATED: APRIL 2, 2011
S.C.R.D.: PLAN #102–24

2.) "PLAN OF LAND PREPARED FOR FAIRVIEW PARNERS, LLC TAX MAP E, LOT NO. 74B 35 TOLEND ROAD CITY OF DOVER COUNTY OF STRAFFORD STATE OF NEW HAMPSHIRE"
BY: MCENEANEY SURVEY ASSOCIATES INC.
DATED: MARCH 4, 2016

3.) "SUBDIVISION OF LAND FOR KAREN & JAMES BECKINGHAM & MARY & SCOTT MCEWAN IN DOVER, N.H."
BY: BRUCE L. POHOPEK
DATED: FEBRUARY 19, 1986
S.C.R.D.: PLAN #29–67

4.) "SUBDIVISION OF LAND FOR PAUL MARTEL IN DOVER, N.H.
BY: BRUCE L. POHOPEK"
DATED: OCTOBER 4, 1978
S.C.R.D.: PLAN #19A–47

5.) PLAN OF LOT ERNEST BSTANDIG DOVER NEW HAMPSHIRE
BY: G.L. DAVIS & ASSOCIATES
DATED: MAY, 1969
S.C.R.D.: BOOK 858, PAGE 159

6.) "PLAN OF LAND, HAROLD A. & YVONNE M. CLEWLEY & LINDA J. NOURY, NORTH SIDE OF TOLEND ROAD, DOVER, NH"
BY: R.W. MCCRONE
DATED: MARCH 1986
S.C.R.D. PLAN #28A–04

7.) "BOUNDARY LINE ADJUSTMENT, THE HEIRS OF KENNETH & IRENE M. NYE AND PAUL & KATHERINE MARTEL, UPPER FACTORY ROAD, DOVER, NH"
BY: TRITECH ENGINEERING CORPORATION
DATED: OCTOBER 25, 2004
S.C.R.D. PLAN #77–87

PLAN REFERENCES CONTINUED:

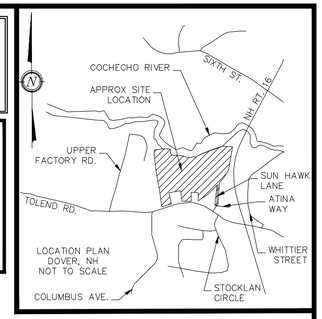
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BY: BRUCE L. POHOPEK, LAND SURVEYOR
DATED: JULY 31, 1989, AS REVISED 5/28/90
S.C.R.D. PLAN #32–149

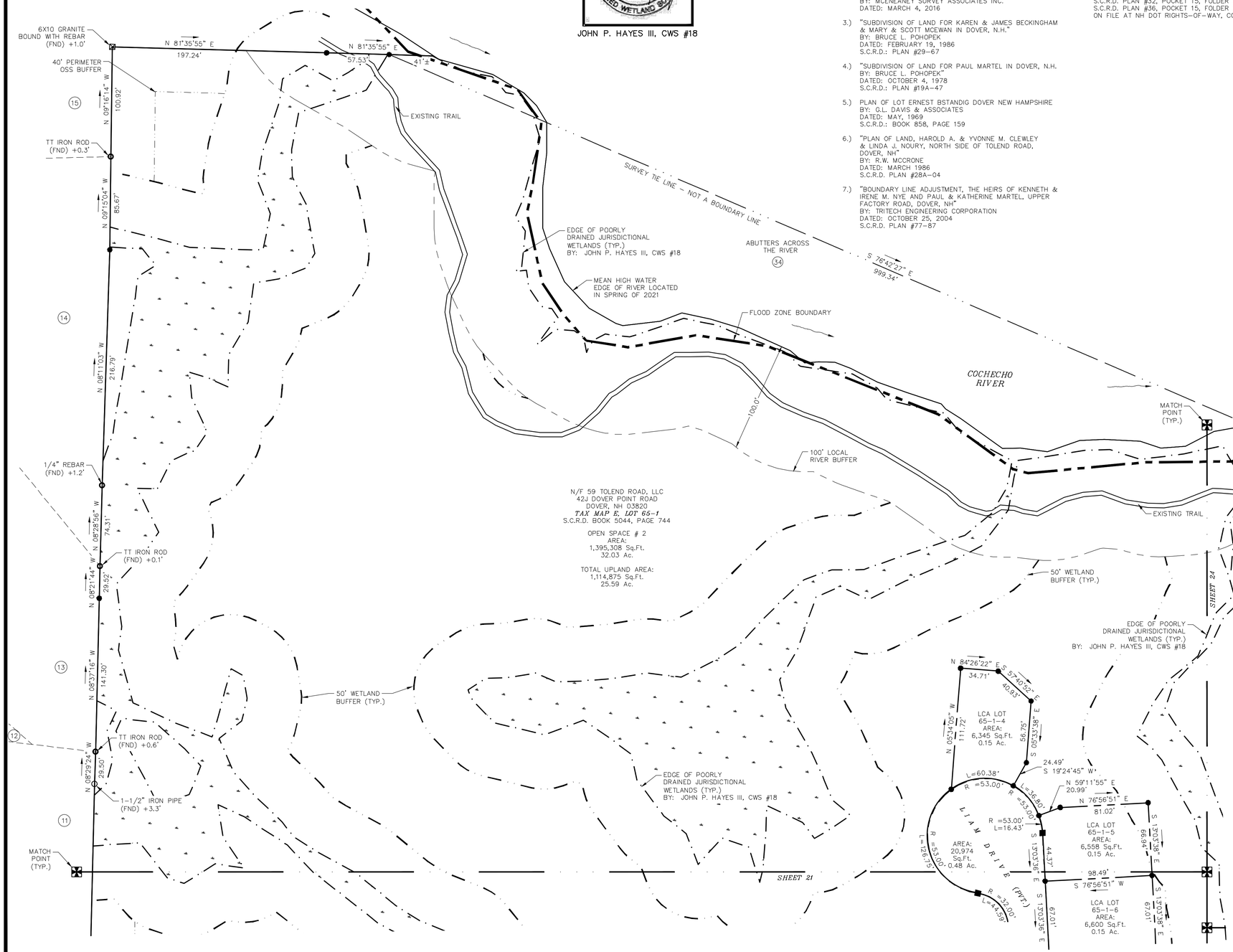
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DATED: OCTOBER 19, 1955
S.C.R.D. PLAN #32, POCKET 15, FOLDER 3 &
S.C.R.D. PLAN #36, POCKET 15, FOLDER 3 &
ON FILE AT NH DOT RIGHTS–OF–WAY, CONCORD, NH

I CERTIFY THAT THIS PLAT EXCEEDS THE MINIMUM REQUIREMENT FOR ACCURACY AND COMPLETENESS OF THE STATE OF N.H. AND OF THE CITY OF DOVER, N.H. – 1:10,000–

KENNETH A. BERRY L.L.S. 805 DATE

APPROVED DOVER





NOTES:

1.) OWNER: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

A.) TAX MAP E, LOT 65–1

B.) EXISTINGD LOT AREA: 1,809,066 Sq.Ft., 41.53 Ac.±

C.) S.C.R.D. BOOK 5044, PAGE 744

2.) OWNER: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

A.) TAX MAP E, LOT 65–A

B.) EXISTING LOT AREA: 125,886 Sq.Ft., 2.89 Ac.

C.) S.C.R.D. BOOK 1571, PAGE 86

3.) THE INTENT OF THIS PLAN IS TO SHOW A DETAILED VIEW OF THE PROPOSED SUBDIVISION. THIS IS SHEET 21 OF 100.

4.) SEE THE OVERVIEW SUBDIVISION PLAN, SHEET 19 OF 100, FOR COMPLETE ABUTTER LIST AND MORE NOTES.

5.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

LEGEND:

- ● 3/4" REBAR W/ID CAP ~TBS~
- ■ GRANITE BOUND ~TBS~
- ■ IRON BOUND ~FND~
- ○ IRON PIPE ~FND~
- ⊠ NHHB BOUND ~FND~
- UTILITY POLE / GUY WIRE
- MATCH POINT
- MATCH LINE
- BUILDING SETBACK LINE / OSS BUFFER
- POORLY DRAINED WETLAND LINE
- EXISTING RIVER
- EXISTING TRAIL
- 50' WETLAND BUFFER
- FEMA FLOOD ZONE
- 100' LOCAL CONSERVATION OVERLAY ZONE
- PROPOSED LCA LINE
- SURVEY TIE LINE – NOT A PROPERTY BOUNDARY
- PROPOSED EASEMENT

S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. TYPICAL
FND FOUND
TBS TO BE SET
LCA LIMITED COMMON AREA
(##) ABUTTER – SEE OVERVIEW PLAN, SHEET 19 OF 100

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

REVISION	DATE	DESCRIPTION

SUBDIVISION DETAIL PLAN, NORTHWEST
LAND OF
59 TOLEND ROAD, LLC AND
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

STATE OF NEW HAMPSHIRE — No. 805 — KENNETH A. BERRY — LICENSED LAND SURVEYOR — SIGNATURE

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT RD.
BARRINGTON, N.H. (603)332–2863

SCALE :	1 IN. EQUALS 50 FT.
DATE :	APRIL 27, 2023
FILE NO. :	DB 2023–031

SHEET 23 OF 100

DOVER PLANNING FILE #P23–XX

NOT FOR CONSTRUCTION

PLAN REFERENCES:

1.) "STANDARD PROPERTY SURVEY AND SUBDIVISION OF LAND OF THE EDWARD J. GEORGE FAMILY TRUST"
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ON FILE AT NH DOT RIGHTS-OF-WAY, CONCORD, NH

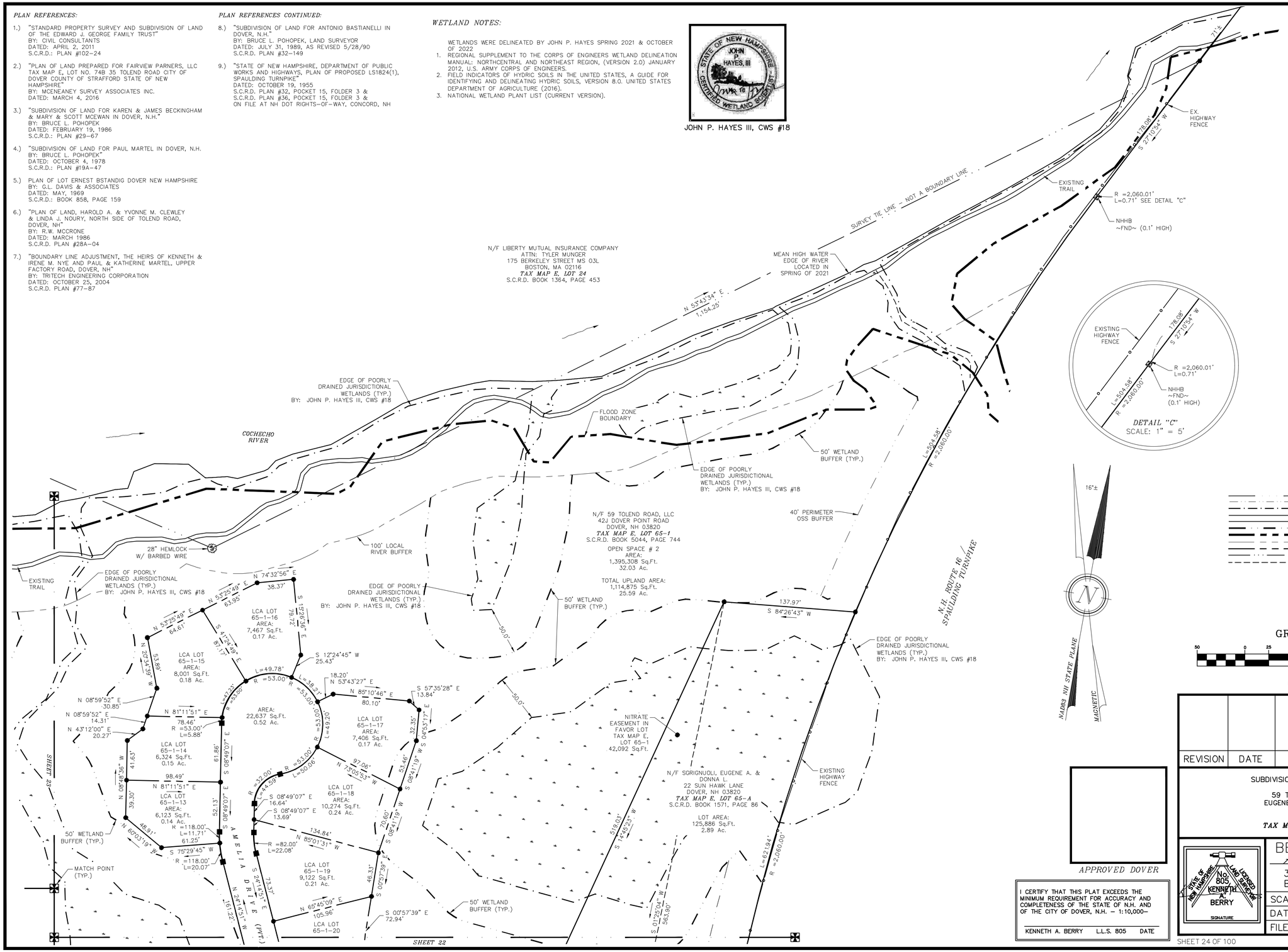
WETLAND NOTES:

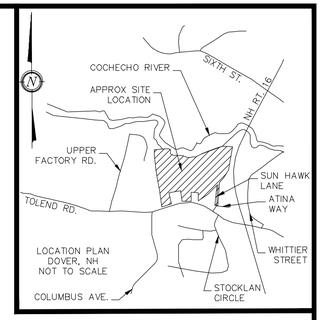
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3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

STATE OF NEW HAMPSHIRE
JOHN P. HAYES, III
CERTIFIED WETLAND SCIENTIST

JOHN P. HAYES III, CWS #18





NOTES:

1.) OWNER: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

A.) TAX MAP E, LOT 65-1

B.) EXISTING LOT AREA: 1,809,066 Sq.Ft., 41.53 Ac.±

C.) S.C.R.D. BOOK 5044, PAGE 744

2.) OWNER: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

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3.) THE INTENT OF THIS PLAN IS TO SHOW A DETAILED VIEW OF THE PROPOSED SUBDIVISION. THIS IS SHEET 21 OF 100.

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DETAIL "C"
SCALE: 1" = 5'

LEGEND:

- ● 3/4" REBAR W/ID CAP ~TBS~
- ■ GRANITE BOUND ~TBS~
- ○ IRON BOUND ~FND~
- ○ IRON PIPE ~FND~
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S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. TYPICAL
FND FOUND
TBS TO BE SET
LCA LIMITED COMMON AREA

(##) ABUTTER - SEE OVERVIEW PLAN, SHEET 19 OF 100

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

REVISION	DATE	DESCRIPTION

SUBDIVISION DETAIL PLAN, NORTHEAST
LAND OF
59 TOLEND ROAD, LLC AND
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

APPROVED DOVER

I CERTIFY THAT THIS PLAT EXCEEDS THE MINIMUM REQUIREMENT FOR ACCURACY AND COMPLETENESS OF THE STATE OF N.H. AND OF THE CITY OF DOVER, N.H. - 1:10,000-

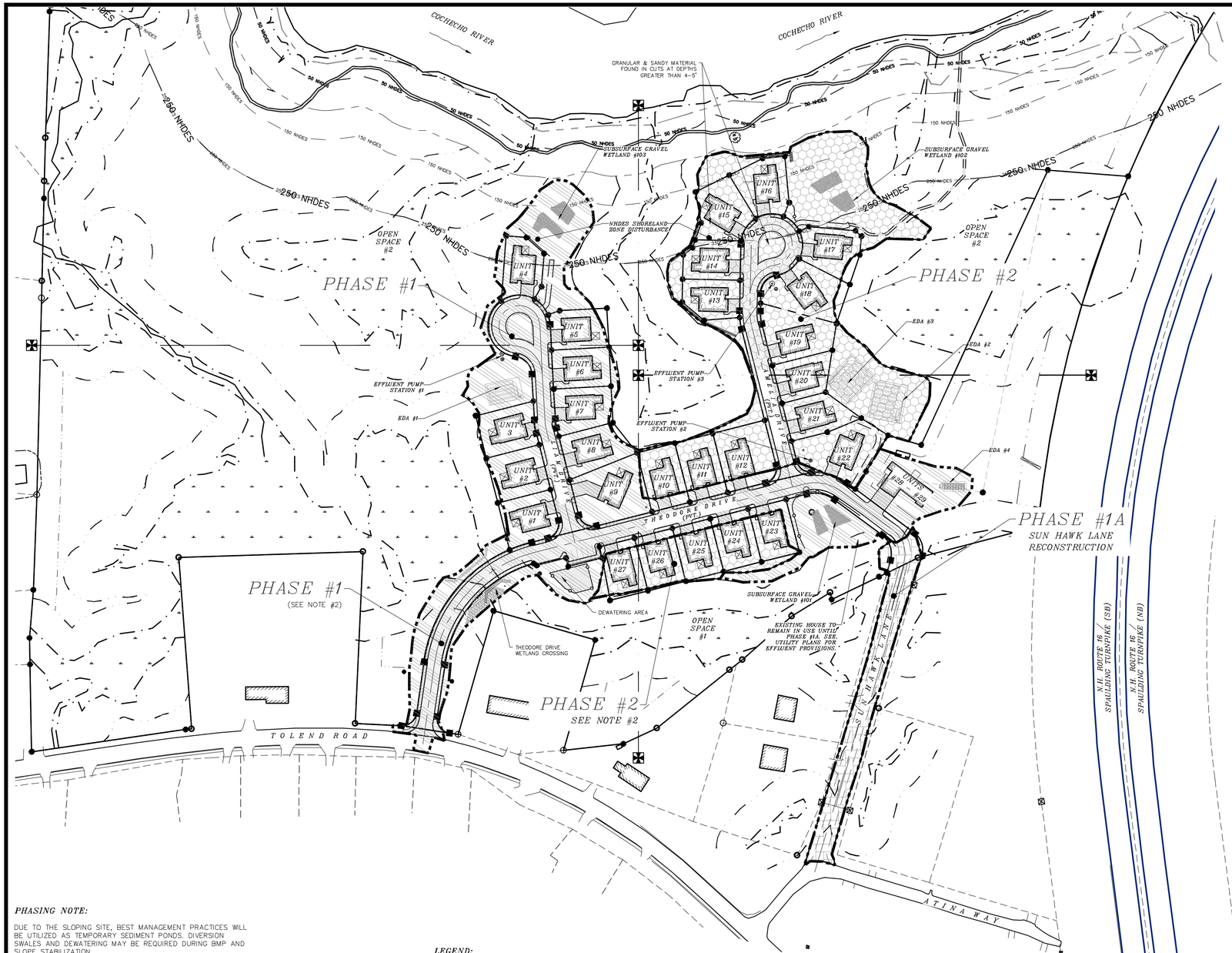
KENNETH A. BERRY LL.S. 805 DATE

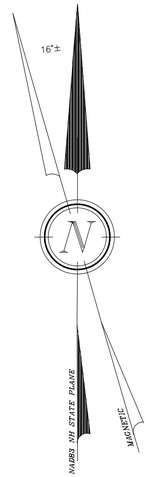
STATE OF NEW HAMPSHIRE NO. 805 LICENSED LAND SURVEYOR KENNETH A. BERRY SIGNATURE

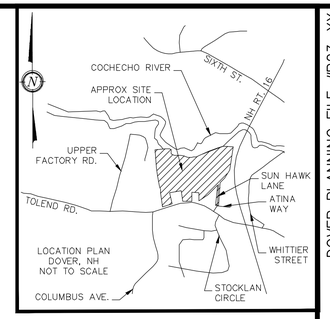
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT RD.
BARRINGTON, N.H. (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023-031

NOT FOR CONSTRUCTION







NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) EXISTING LOT AREA 65–1: 1,388,308 Sq. Ft.±, 31.87 Ac.±
PROPOSED LOT AREA 65–1: 1,809,066 Sq. Ft.±, 41.53 Ac.±

EXISTING LOT AREA 65–A: 546,643 Sq. Ft.±, 12.55 Ac.±
PROPOSED LOT AREA 65–A: 125,886 Sq. Ft.±, 2.89 Ac.±

4.) S.C.R.D. BOOK 5044, PAGE 744, LOT 65–1
S.C.R.D. BOOK 1571, PAGE 86, LOT 65–A

5.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED 2 PHASES OF THE SITE PLAN.

6.) SEE INTERIM DESIGN PLANS FOR MORE DETAILS AND INFORMATION.

DISTURBANCE PER PHASES:

NOTE #1: REQUIRED I.A.W. ENV–WQ 1505.03(f), AN ENVIRONMENTAL MONITOR IS REQUIRED DURING ALL PROJECT PHASES DUE TO DISTURBANCE OF SOILS WITH ERODIBILITY FACTORS OF 0.4 OR GREATER (ALL PHASES) AND DISTURBANCE OF SLOPES GREATER THAN 25% (ALL PHASES). SEE EROSION & SEDIMENT CONTROL PLAN FOR MORE INFORMATION.

NOTE #2: PORTIONS OF PHASE 1 AND PHASE 2 ARE TO REMAIN IN A NATURAL STATE REGARDING TOPSOIL AND STUMPS WHERE DEWATERING FOR WETLAND CROSSINGS WILL TAKE PLACE. (SEE DEWATERING PLANS). THE DISCHARGE FROM DEWATERING MUST TAKE PLACE OVER GROUND THAT IS STABILIZED OUTSIDE OF THE WETLAND BUFFER.

PHASE #1 & #1A TOTAL: 241,490 Sq. Ft., 5.54 Ac. TOTAL DISTURBANCE

- THEODORE DRIVE TO COMPLETION
- LIAM DRIVE TO COMPLETION
- AMELIA DRIVE 10+00–10+30
- SUN HAWK LANE UPGRADE TO COMPLETION
- SUBSURFACE GRAVEL WETLANDS #101 & #103, RETAINING WALL
- EFFLUENT PUMP STATION #1 & EDA'S #1 & #4
- RESIDENTIAL UNITS #1–9, #28 & 29 (11 UNITS)

– PHASE #1 IS 217,800 Sq. Ft., 5.00 Ac.
– PHASE #1A IS 23,690 Sq. Ft., 0.54 Ac.
– WHEN SUN HAWK LANE UPGRADE STREET UTILITY WORK IS COMPLETED DISTURBANCE WILL RETURN UNDER 5 ACRES.
– PHASE #2 CANNOT BEGIN UNTIL PHASE #1 & #1A ARE STABILIZED.
– THE 39,567 Sq. Ft. OF PHASE #1A IS NOT COUNTED TWICE IN THE TOTAL DISTURBANCE.

PHASE #2: 202,455 Sq. Ft., 4.65 Ac. TOTAL DISTURBANCE

- AMELIA DRIVE TO COMPLETION
- SUBSURFACE GRAVEL WETLAND #102, RETAINING WALLS
- EFFLUENT PUMP STATIONS & EDA'S #2 & #3
- RESIDENTIAL UNITS #10–27 (18 UNITS)

TOTAL IMPACT: 443,945 SQ. FT., 10.19 Ac.

BS&E TO STAKEOUT THE LIMIT OF DISTURBANCE PER PHASE PRIOR TO PHASE CONSTRUCTION. AS PHASE IS STABILIZED AND COMPLETED, BS&E TO STAKEOUT THE NEXT PHASE PRIOR TO ADDITIONAL DISTURBANCE.

SEE ALSO WINTER CONSTRUCTION NOTES FOR MAXIMUM OPEN AREA REQUIREMENTS.

PHASING NOTE:

DUE TO THE SLOPING SITE, BEST MANAGEMENT PRACTICES WILL BE UTILIZED AS TEMPORARY SEDIMENT PONDS. DIVERSION SWALES AND DEWATERING MAY BE REQUIRED DURING BMP AND SLOPE STABILIZATION.

ENVIRONMENTAL MONITOR:

1.) AN ENVIRONMENTAL MONITOR WILL BE REQUIRED DUE TO DISTURBANCE OF STEEP SLOPES.

2.) THE ENVIRONMENTAL MONITOR SHALL: (1) INSPECT THE PROJECT SITE AT LEAST ONCE EACH WEEK FROM THE START OF TERRAIN ALTERATION ACTIVITIES UNTIL ALL TERRAIN ALTERATION ACTIVITIES ARE COMPLETED AND THE SITE IS STABILIZED; (2) IN ADDITION TO REGULAR WEEKLY INSPECTIONS, INSPECT THE PROJECT SITE DURING ANY RAIN EVENT IN WHICH 0.5 INCH OF PRECIPITATION OR MORE FALLS WITHIN A 24 HOUR PERIOD, PROVIDED THAT IF THE ENVIRONMENTAL MONITOR IS UNABLE TO BE PRESENT DURING SUCH A STORM, THE MONITOR SHALL INSPECT THE SITE WITHIN 24 HOURS OF THE RAIN EVENT; (3) SUBMIT A WRITTEN REPORT, STAMPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST, TO THE DEPARTMENT WITHIN 24 HOURS OF EACH INSPECTION THAT: A. DESCRIBES THE PROGRESS OF THE PROJECT, INCLUDING WHETHER ALL CONDITIONS OF THE PERMIT ARE BEING MET AND, IF NOT, WHICH REQUIREMENTS ARE NOT BEING MET; B. IF ANY REQUIREMENTS ARE NOT BEING MET, AN EXPLANATION OF THE CORRECTIVE ACTION(S) THAT WILL BE OR ARE BEING TAKEN TO BRING THE PROJECT INTO COMPLIANCE WITH APPLICABLE REQUIREMENTS AND THE DEADLINE BY WHICH SUCH ACTIONS WILL BE COMPLETED; AND C. INCLUDES PHOTOGRAPHS OF THE SITE THAT ARE REPRESENTATIVE OF THE PROJECT; AND (4) RETAIN A COPY OF THE REPORT PREPARED PURSUANT TO (3), ABOVE, ON–SITE FOR REVIEW DURING SITE INSPECTIONS BY FEDERAL, STATE, AND LOCAL OFFICIALS.

LEGEND:

WETLAND LINE
EXISTING STREAM
EXISTING TRAIL
WETLAND BUFFER
50' NHDES PRIMARY SETBACK
150' NHDES NATURAL WOODLAND BUFFER
250' NHDES SHORELAND PROTECTION ZONE
100' LOCAL CONSERVATION OVERLAY ZONE
PHASE LINE/LIMIT OF DISTURBANCE
PHASE #1
PHASE #1A
PHASE #2
E.D.A.
EFFLUENT DISPOSAL AREA

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

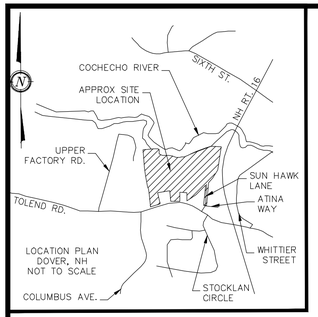
PROJECT PHASING PLAN
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 100 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 15443
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



SITE PLANS TABLE OF CONTENTS:

SHEET #26: OVERVIEW SITE PLAN PLAN
SHEET #27: SITE PLAN THEODORE DRIVE 0+00–5+00
SHEET #28: SITE PLAN THEODORE DRIVE 5+00–8+68
SHEET #29: SITE PLAN SUN HAWK LANE 31+00–38+12.85
SHEET #30: SITE PLAN AMELIA DRIVE 10+00–16+53
SHEET #31: SITE PLAN LIAM DRIVE 20+00–26+07.57
SHEETS #89–#92: CONSTRUCTION DETAILS C-101–C104

EXISTING LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- NHHB BOUND ~FND~
- UTILITY POLE / GUY WIRE
- BUILDING SETBACK LINE/OSS PERIMETER BUFFER
- OVERHEAD UTILITIES LINE
- WETLAND LINE
- EXISTING STREAM
- EXISTING TRAIL
- FEMA FLOOD ZONE
- 50'WETLAND BUFFER
- 50' NHDES PRIMARY SETBACK
- 150' NHDES NATURAL WOODLAND BUFFER
- 250' NHDES SHORELAND PROTECTION ZONE
- 100' LOCAL CONSERVATION OVERLAY ZONE
- GREATER THAN 20% SLOPE FOR 2,000 Sq. Ft. CONTIGUOUS AREA
- S.C.R.D. — STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. — TYPICAL
- FND — FOUND

PROPOSED LEGEND:

- 3/4" REBAR W/ ID CAP ~TBS~
- PROPOSED LIMITED COMMON AREA (LCA) LINE
- E101 / E6 — DETAIL SHEET / DETAIL
- MATCH POINT / MATCH LINE
- TRANSFORMER & PAD / SHOULDER / CENTER LINE / BUILDING SETBACK LINE / GUARD RAIL
- SUBSURFACE GRAVEL WETLAND
- SNOW STORAGE
- RECREATION SPACE
- EFFLUENT PUMP STATION
- EFFLUENT DISPOSAL AREA
- PERMANENT WETLAND IMPACT AREA
- TEMPORARY WETLAND IMPACT AREA
- PERMANENT WETLAND BUFFER IMPACT AREA
- TEMPORARY WETLAND BUFFER IMPACT AREA
- GREATER THAN 20% SLOPE FOR 2,000 Sq. Ft. CONTIGUOUS AREA DISTURBED

NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) LOT AREA LOT 65–1: 1,809,066 Sq. Ft., 41.53 Ac. +/–
LOT AREA LOT 65–A: 125,886 Sq. Ft., 2.89 Ac. +/–

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

5.) THE INTENT OF THIS PLAN IS TO PROVIDE AN OVERVIEW OF SITE DEVELOPMENT.

6.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX).

7.) BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

8.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

9.) SEE SHEET 2, NOTE #23 FOR PROPOSED UNIT BEDROOMS COUNTS.

OPEN SPACE CALCULATIONS:
28 PROPOSED LOTS ON YIELD PLAN REQUIRING 30,000 Sq.Ft, / PER UNIT = 840,000 Sq.Ft,
OPEN SPACE REQUIRED = 420,000 Sq.Ft. UPLAND REQUIREMENT FOR OPEN SPACE = 210,000 Sq.Ft.,
OPEN SPACE #1 PROVIDED = 126,619 Sq.Ft, UPLAND IN OPEN SPACE #1 PROVIDED = 101,227 Sq.Ft. OPEN SPACE #2 PROVIDED = 1,395,308 +/– Sq.Ft, UPLAND IN OPEN SPACE #2 PROVIDED = 1,114,875 Sq.Ft.
TOTAL OPEN SPACE PROVIDED = 1,521,927 Sq.Ft, TOTAL UPLAND IN OPEN SPACE PROVIDED = 1,216,102 Sq.Ft
TOTAL AREA LOT 65–A–1 = 125,886 Sq.Ft. TOTAL UPLAND AREA: 91,446 Sq.Ft.

CONDITIONAL USE PERMITS:
TOTAL 50' WETLAND BUFFER OF IMPACT: 28,921 Sq.Ft.
PERMANENT 50' BUFFER IMPACT: 20,850 Sq.Ft.
TEMPORARY 50' BUFFER IMPACT: 8,071 Sq.Ft.
TOTAL WETLANDS AREA OF IMPACT: 4,140 Sq.Ft.
PERMANENT WETLANDS IMPACT: 2,156 Sq.Ft.
TEMPORARY WETLANDS IMPACT: 1,983 Sq.Ft.
GREATER THAN 20% SLOPE FOR 2,000 SQ.FT. OF CONTIGUOUS AREA DISTURBED: 2,472 Sq.Ft.
SEE APPLICATION AND NARRATIVE FOR EXPLANATIONS & JUSTIFICATIONS

WAIVER REQUESTS:
MINIMUM PERIMETER BUFFER TO PERMIT OSS BUFFER LESS THAN 40' IN ONE LOCATION 157–21F(4)
4% INTERSECTION GRADE WITHIN 75' WHERE 3% MAX ALLOWED (157–32G)

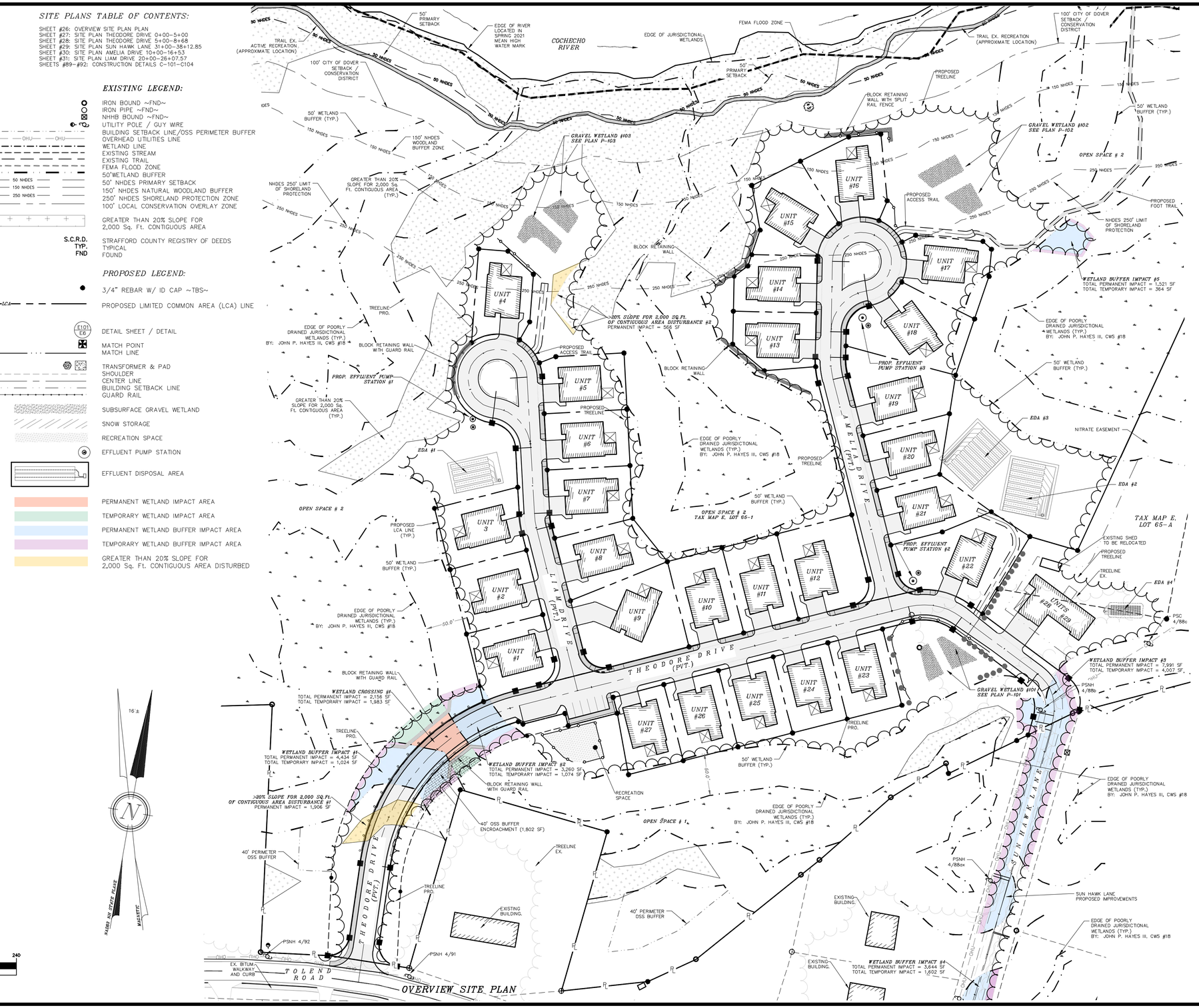
PARKING REQUIREMENTS:

CHAPTER 153–14D PARKING TABLE
- RESIDENTIAL
  - RESIDENTIAL (NON CBD–G) 1.4 SPACES PER UNIT:
    - VISITOR 0.5 SPACES PER UNIT:
    - EACH UNIT HAS A TWO CAR GARAGE AND DRIVEWAY PARKING
    - 29 UNITS * 1.9 SPACES PER UNIT = 56 SPACES REQ

5% BICYCLE RACK STORAGE = 3 SPACES REQ. 20+ PROVIDED (3 LOCATIONS)
5% EV SPACE REQ. = 3 SPACES REQ., 3 GARAGES PROVIDED.
SEE NOTE #42 ON PROJECT NOTES.

SNOW STORAGE:

- STORAGE CALCULATION (6:1 RATIO USED)
  - PAVED AREA = 55,583 Sq.Ft. / 6 = 9,264 Sq. Ft.
  - >13,236 Sq. Ft. PROVIDED
  - THIS CALCULATION BASED ON PRIMARY ROADS ONLY



OVERVIEW SITE PLAN

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

OVERVIEW SITE PLAN
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

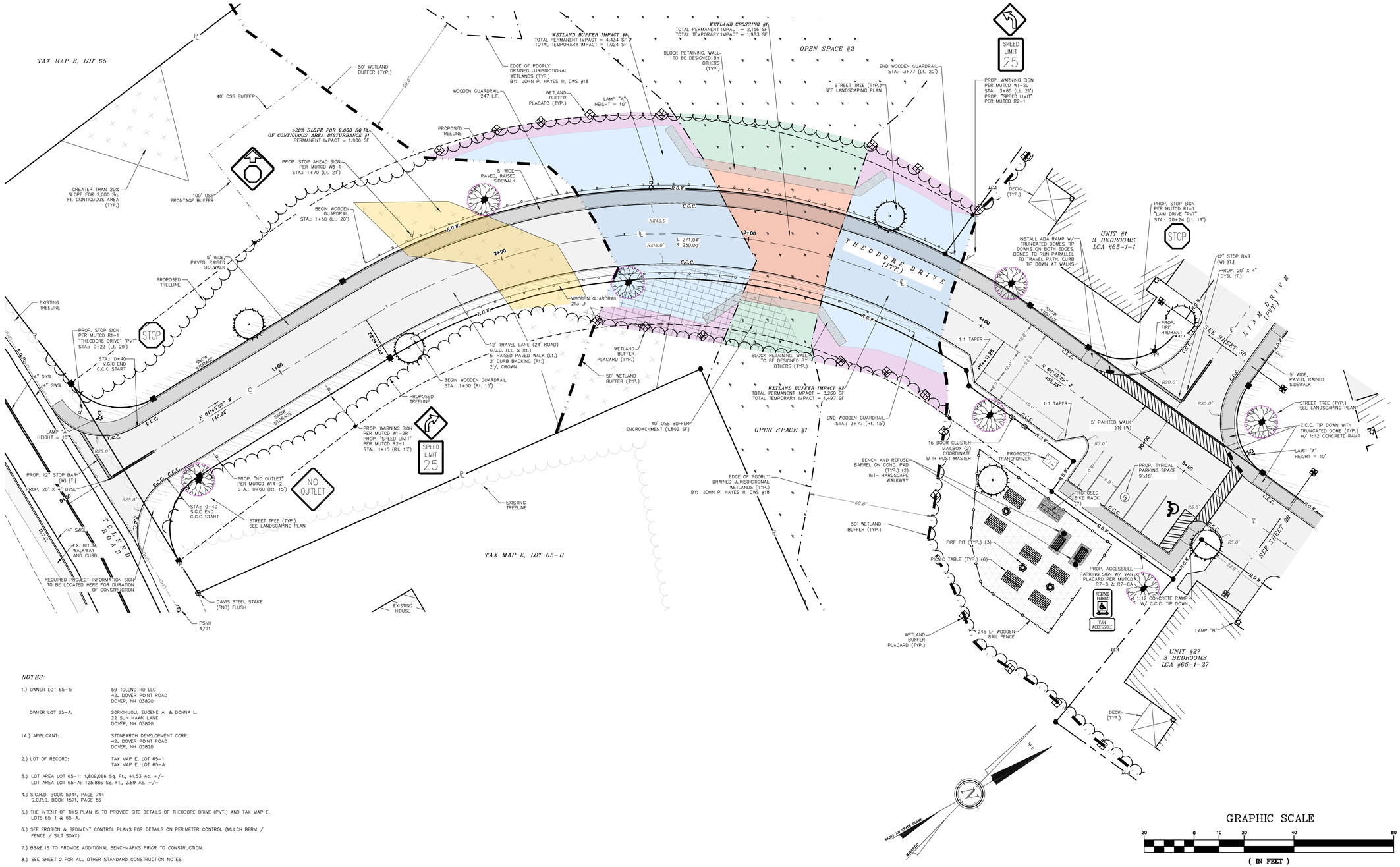
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 60 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14043
LICENSED PROFESSIONAL ENGINEER

SHEET 26 OF 100

NOT FOR CONSTRUCTION



PLAN VIEW THEODORE DRIVE (PVT.) 0+00 TO 5+00

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

SITE PLAN THEODORE DRIVE (PVT.) 0+00 TO 5+00
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SCRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 15443
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

SITE PLAN THEODORE DRIVE (PVT.) 5+00 TO 8+68
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14043
LICENSED PROFESSIONAL ENGINEER

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,809,066 Sq. Ft., 41.53 Ac. +/-
LOT AREA LOT 65-A: 125,886 Sq. Ft., 2.89 Ac. +/-

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

5.) THE INTENT OF THIS PLAN IS TO PROVIDE SITE DETAILS OF THEODORE DRIVE (PVT.) AND TAX MAP E, LOTS 65-1 & 65-A.

6.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX).

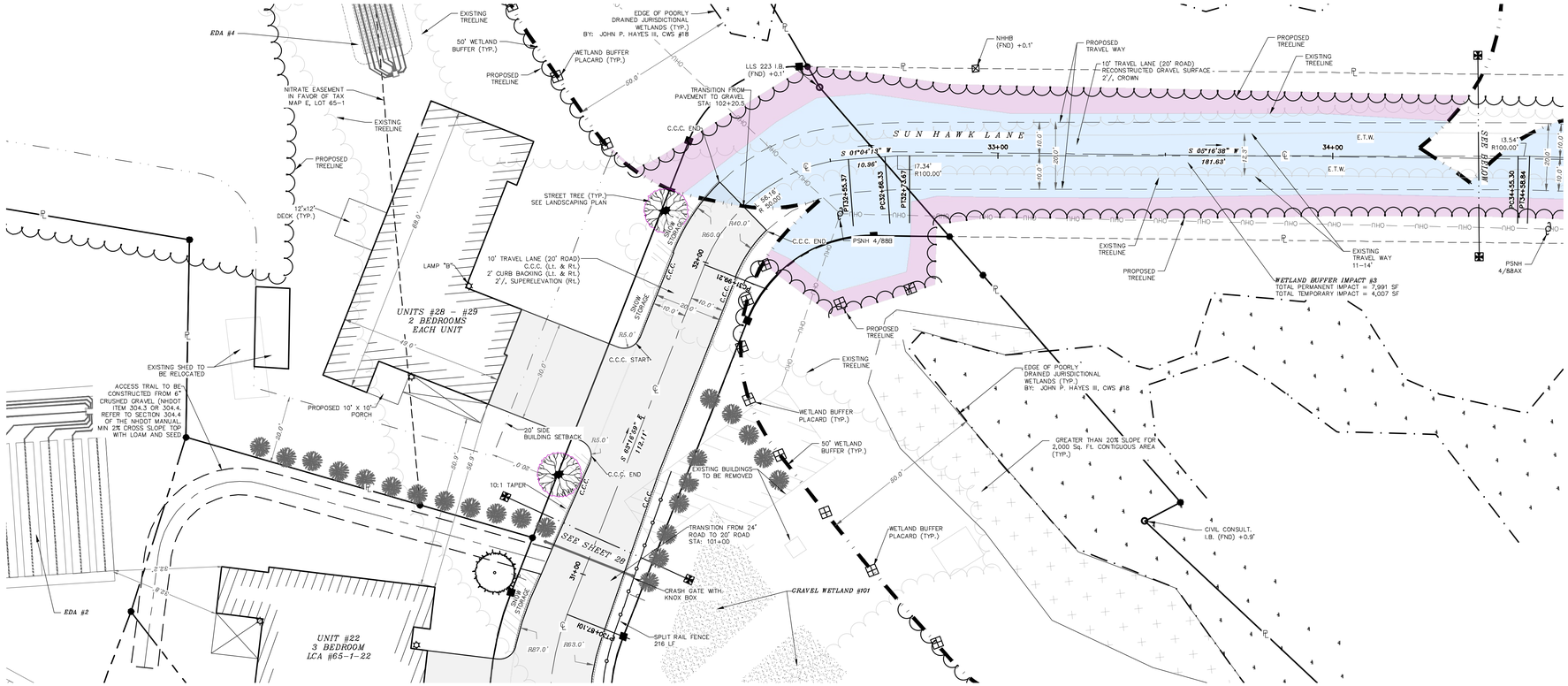
7.) BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

8.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

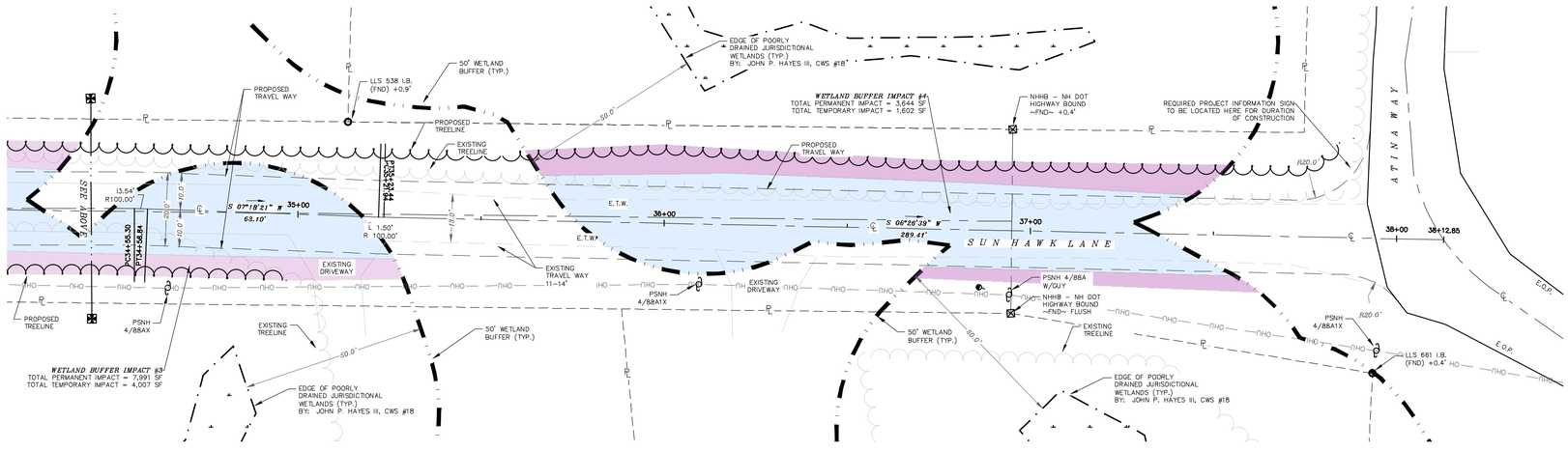
PLAN VIEW THEODORE DRIVE (PVT.) 5+00 TO 8+68

NOT FOR CONSTRUCTION



SITE PLAN SUN HAWK LANE 31+00 TO 34+50

SITE PLAN SUN HAWK LANE 34+50 TO 38+12.85



NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,809,066 Sq. Ft., 41.53 Ac. +/-
LOT AREA LOT 65-A: 125,886 Sq. Ft., 2.89 Ac.

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

5.) THE INTENT OF THIS PLAN IS TO PROVIDE SITE DETAILS OF SUNHAWK LANE AND TAX MAP E, LOTS 65-1 & 65-A.

6.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERMETER CONTROL (MULCH BERM / FENCE / SILT SOXX).

7.) BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

8.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

SITE PLAN SUN HAWK LANE 31+00 TO 38+12.85
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14043
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
421 DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
421 DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,809,066 Sq. Ft., 41.53 Ac. +/-
LOT AREA LOT 65-A: 125,886 Sq. Ft., 2.89 Ac.

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

5.) THE INTENT OF THIS PLAN IS TO PROVIDE SITE DETAILS OF AMELIA DRIVE (PVT.) AND TAX MAP E, LOTS 65-1 & 65-A.

6.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX).

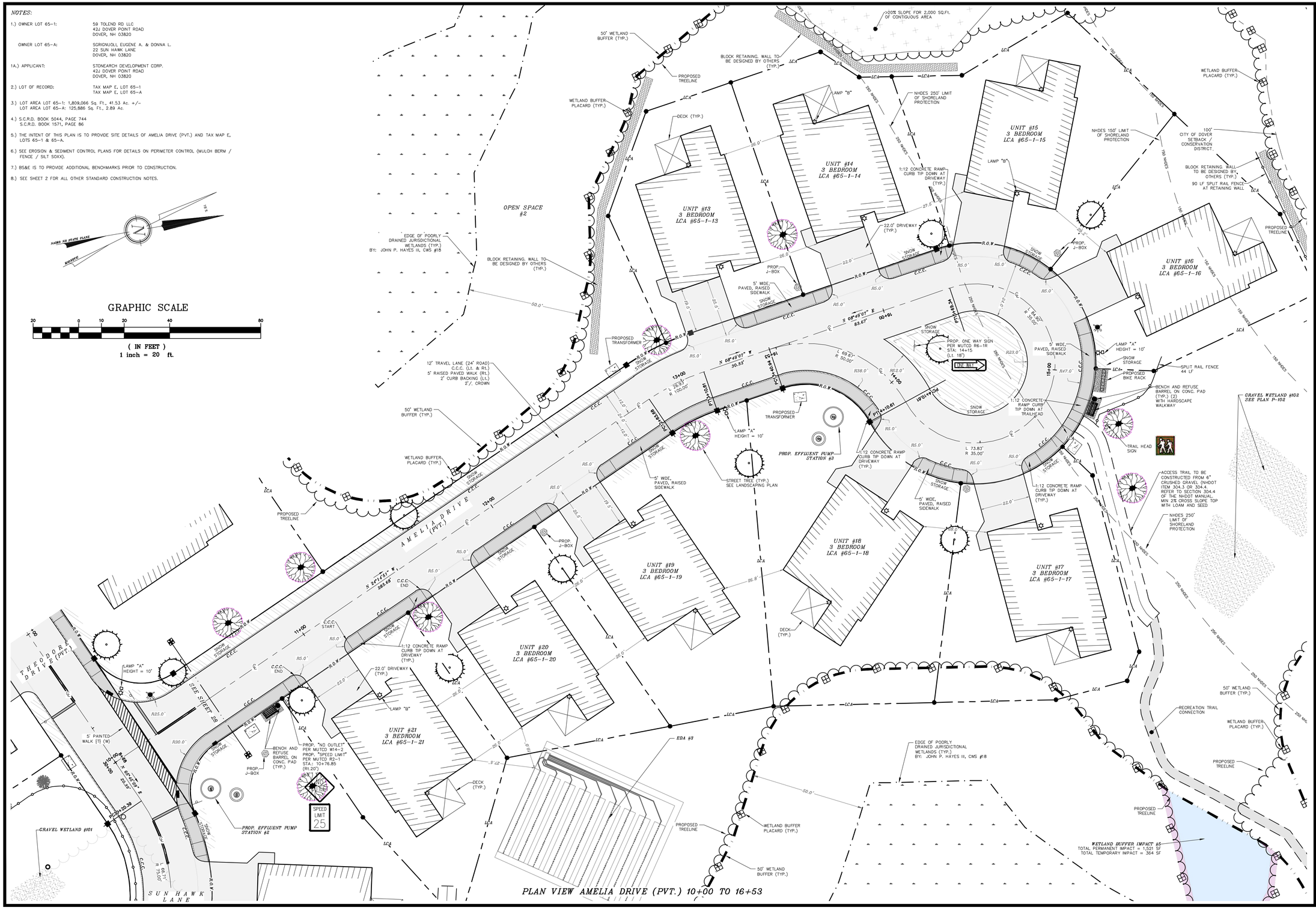
7.) BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

8.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.



PLAN VIEW AMELIA DRIVE (PVT.) 10+00 TO 16+53

DOVER PLANNING FILE #P23-XX

NO.	REVISION	DATE	DESCRIPTION

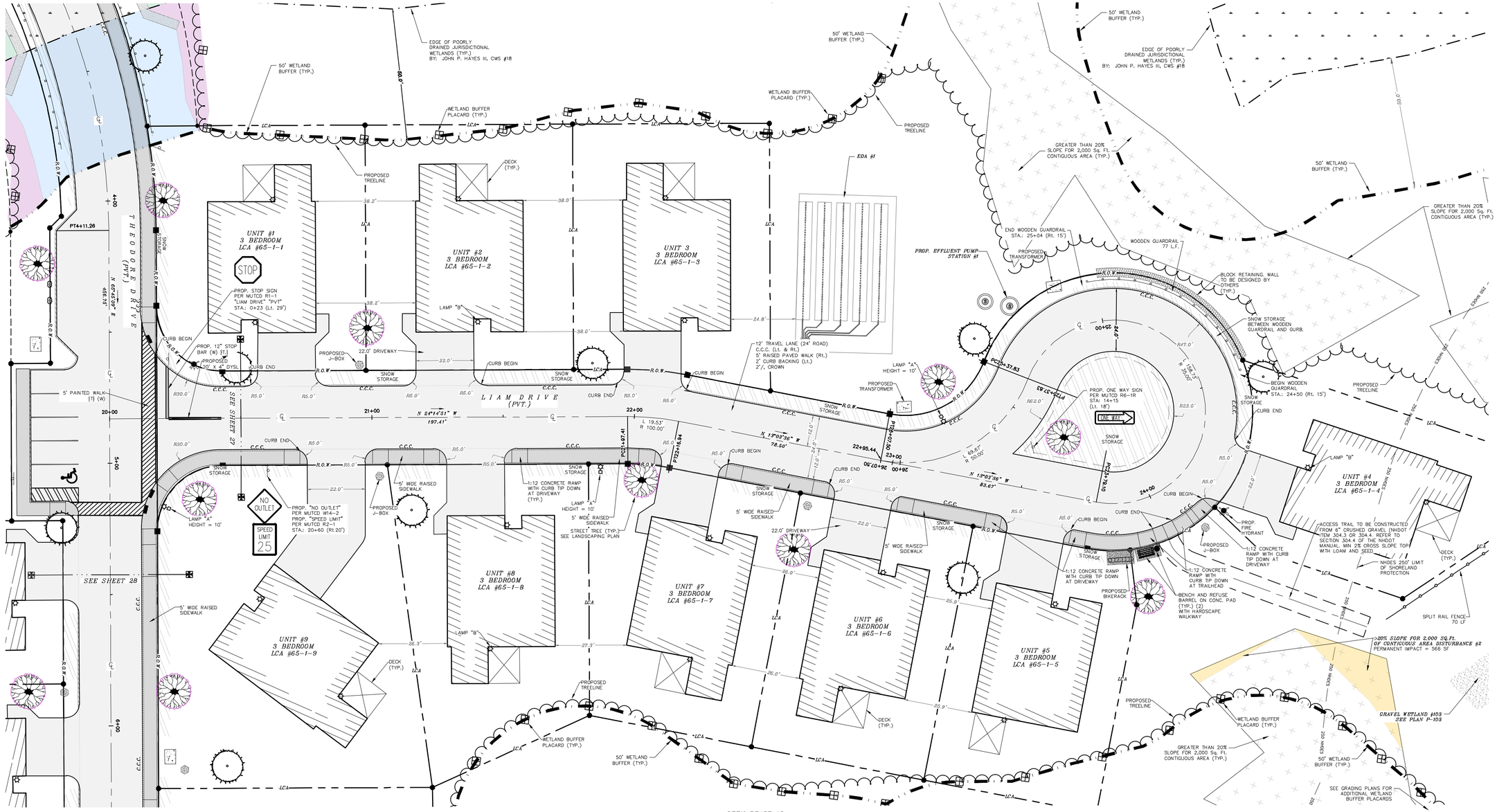
SITE PLAN AMELIA DRIVE (PVT.) 10+00 TO 16+53
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 15243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



PLAN VIEW LIAM DRIVE (PVT.) 20+00 TO 26+07.50

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
421 DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
421 DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,809,066 Sq. Ft., 41.51 Ac. +/-
LOT AREA LOT 65-A: 125,886 Sq. Ft., 2.93 Ac.

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

5.) THE INTENT OF THIS PLAN IS TO PROVIDE SITE DETAILS OF LIAM DRIVE (PVT.) AND TAX MAP E, LOTS 65-1 & 65-A.

6.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX).

7.) BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

8.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

SITE PLAN LIAM DRIVE (PVT.) 20+00 TO 26+07.50
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14043
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE AN OVERVIEW OF GRADING AND DRAINAGE ACTIVITIES IN SUPPORT OF THE SITE PLAN. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 5' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) ALL BASINS AND DRAINS ARE PROPOSED WITH NO SUMPS OR HOODS. BASINS WITHIN ANY GRASS LINED AREAS OUTSIDE THE ROADWAY WILL HAVE "BEE HIVE" GRATES TO NOT ALLOW FOR ENTRAPMENT OF ANIMALS IN THE STRUCTURE. OUTLET CONTROL STRUCTURES WILL NOT HAVE SUMPS. IF REQUIRED TO BE INSTALLED DURING THE PRE-CASTING PROCESS, THEY ARE TO BE FILLED WITH STONE ON SITE. BASINS ARE TO HAVE NH STANDARD FRAMES AND GRATES MADE IN NORTH AMERICA. PLEASE NOTE SOME GRATES ARE SPECIALIZED FOR THE LOCATION AND USE AND ARE CALLED OUT ON THE GRADING PLANS. GRATES ARE TO BE INSTALLED BINDER FLUSH PRIOR TO BASE PAVE. UPON PROJECT COMPLETION FRAMES AND GRATES ARE TO BE CUT AND RIM RAISED TO FINAL PAVEMENT SURFACE. THIS IS TO ENSURE STORMWATER ENTERS THE SYSTEM AS DESIGN DURING THE INTERIM CONSTRUCTION PERIOD.

6.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

EXISTING LEGEND:

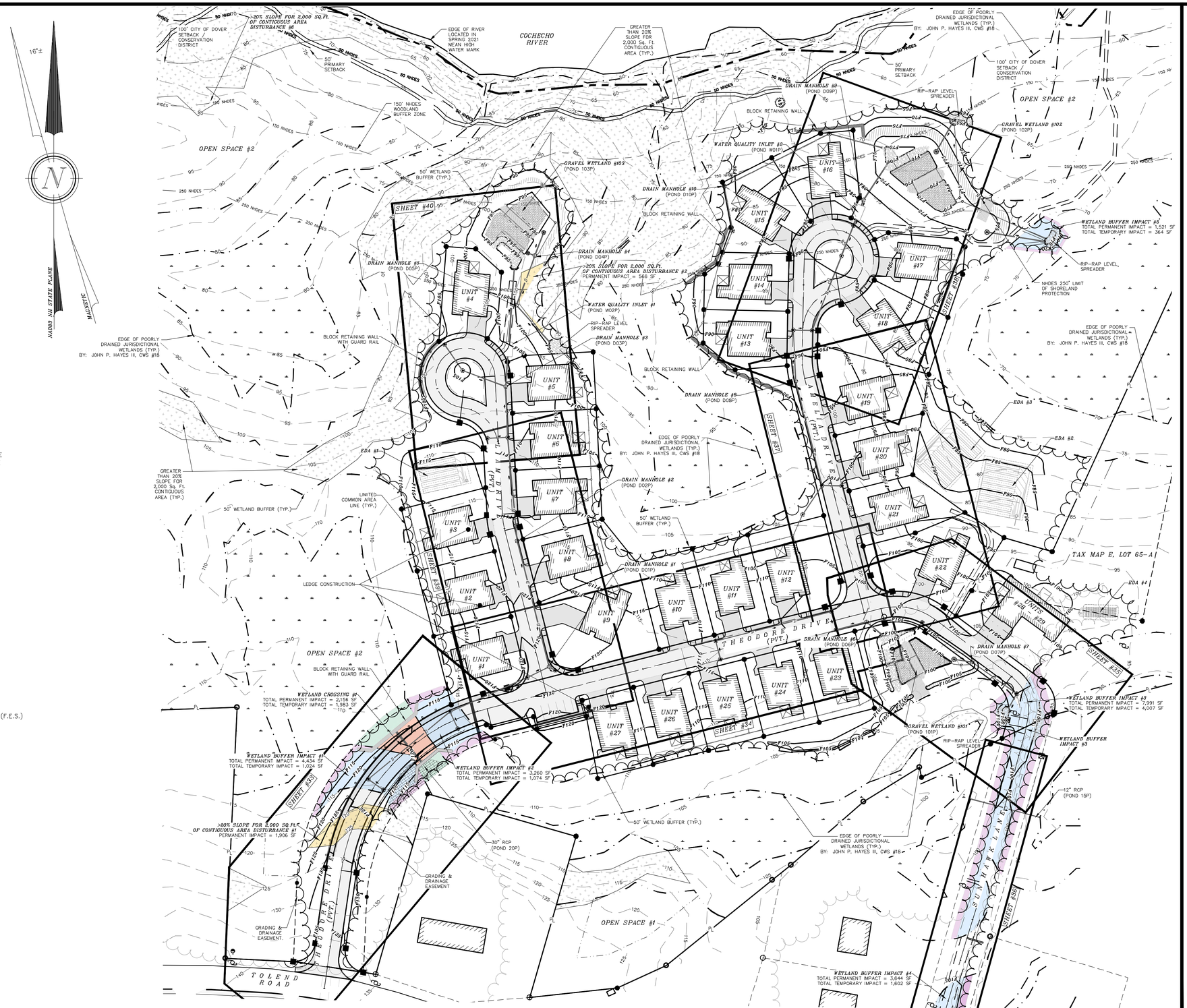
- IRON BOUND ~FND~
- IRON PIPE ~FND~
- NHHB BOUND ~FND~
- UTILITY POLE / GUY WIRE
- BUILDING SETBACK LINE
- OVERHEAD UTILITIES LINE
- CONTOUR LINE, MINOR
- CONTOUR LINE, MAJOR
- WETLAND LINE
- EXISTING STREAM
- EXISTING TRAIL
- WETLAND BUFFER
- DRAINAGE LINE
- 50' NHDES PRIMARY SETBACK
- 150' NHDES NATURAL WOODLAND BUFFER
- 250' NHDES SHORELAND PROTECTION ZONE
- 100' LOCAL CONSERVATION OVERLAY ZONE
- GREATER THAN 20% SLOPE FOR 2,000 Sq. Ft. CONTIGUOUS AREA
- TEST PIT
- S.C.R.D. — STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. — TYPICAL
- FND — FOUND

PROPOSED LEGEND:

- 3/4" REBAR W/ ID CAP ~TBS~
- PROPOSED LIMITED COMMON AREA LINE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE
- FLOW ARROW
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- MATCH POINT
- MATCH LINE
- F241 — CONTOUR MINOR, PROPOSED
- F240 — CONTOUR MAJOR, PROPOSED
- D — DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- SHOULDER
- CENTER LINE
- BUILDING SETBACK LINE
- U.D — UNDER DRAIN
- RIP RAP
- SUBSURFACE GRAVEL WETLAND
- BERM
- F103.31 — PROPOSED SPOT ELEVATION

GRADING PLANS TABLE OF CONTENTS:

SHEET #32: 60 SCALE OVERVIEW GRADING PLAN
SHEET #33: GRADING P&P THEODORE DRIVE 0+00–4+00
SHEET #34: GRADING P&P THEODORE DRIVE 4+00–END
SHEET #35: GRADING P&P SUN HAWK LANE 30+00–33+00
SHEET #36: GRADING P&P SUN HAWK LANE 33+00–END
SHEET #37: GRADING P&P AMELIA DRIVE 10+00–13+00
SHEET #38: GRADING P&P AMELIA DRIVE 13+00–END
SHEET #39: GRADING P&P LIAM DRIVE 20+00–23+00
SHEET #40: GRADING P&P LIAM DRIVE 23+00–END
SHEETS #41–44: DRAINAGE P&P'S
SHEETS #45–#50: GRAVEL WETLANDS #101–#103
SHEETS #51&#52: EROSION & SEDIMENT CONTROL PLANS
SHEETS #89–#92: CONSTRUCTION DETAILS C–101–C104
SHEETS #93&#94: DRAINAGE CONSTRUCTION DETAILS D–101–D102



DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

OVERVIEW GRADING PLAN
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 60 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

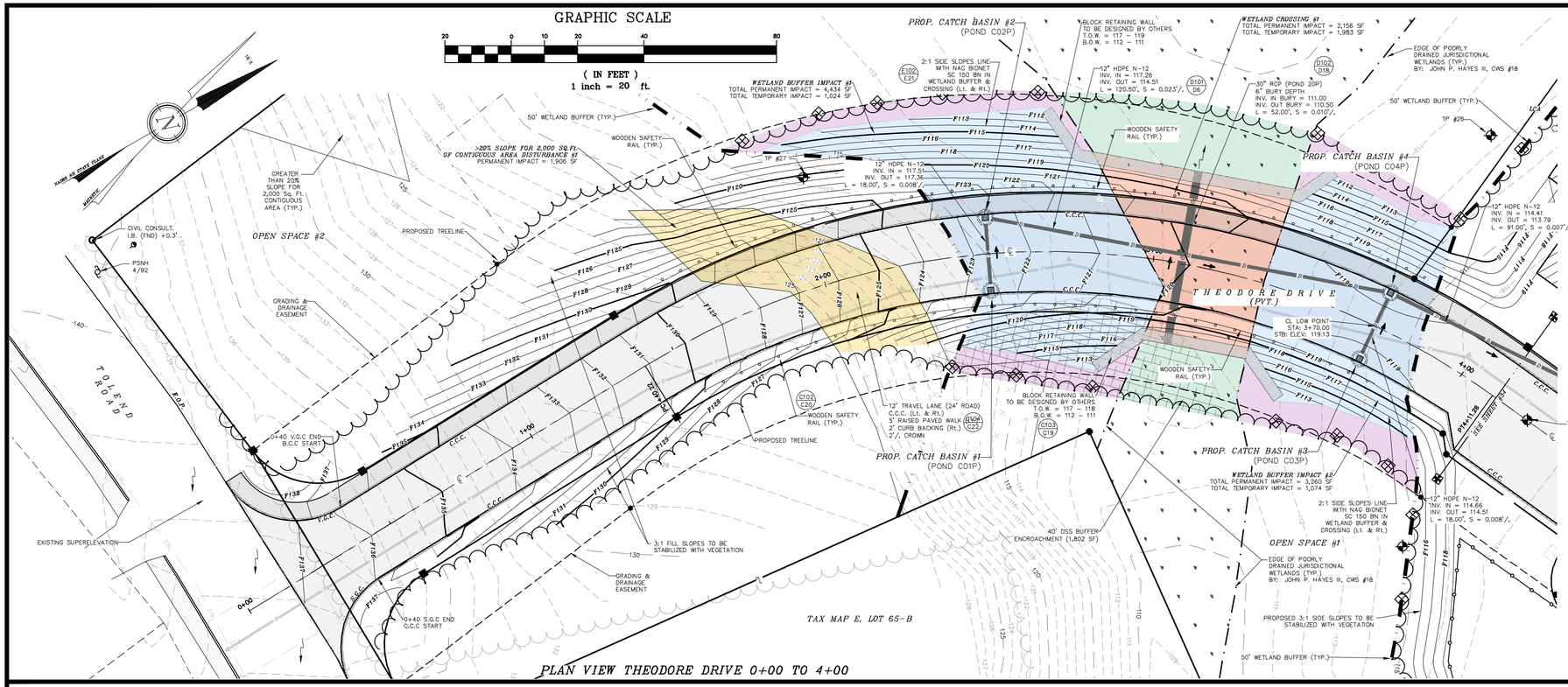
STATE OF NEW HAMPSHIRE — KENNETH A. BERRY No. 14143 — LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

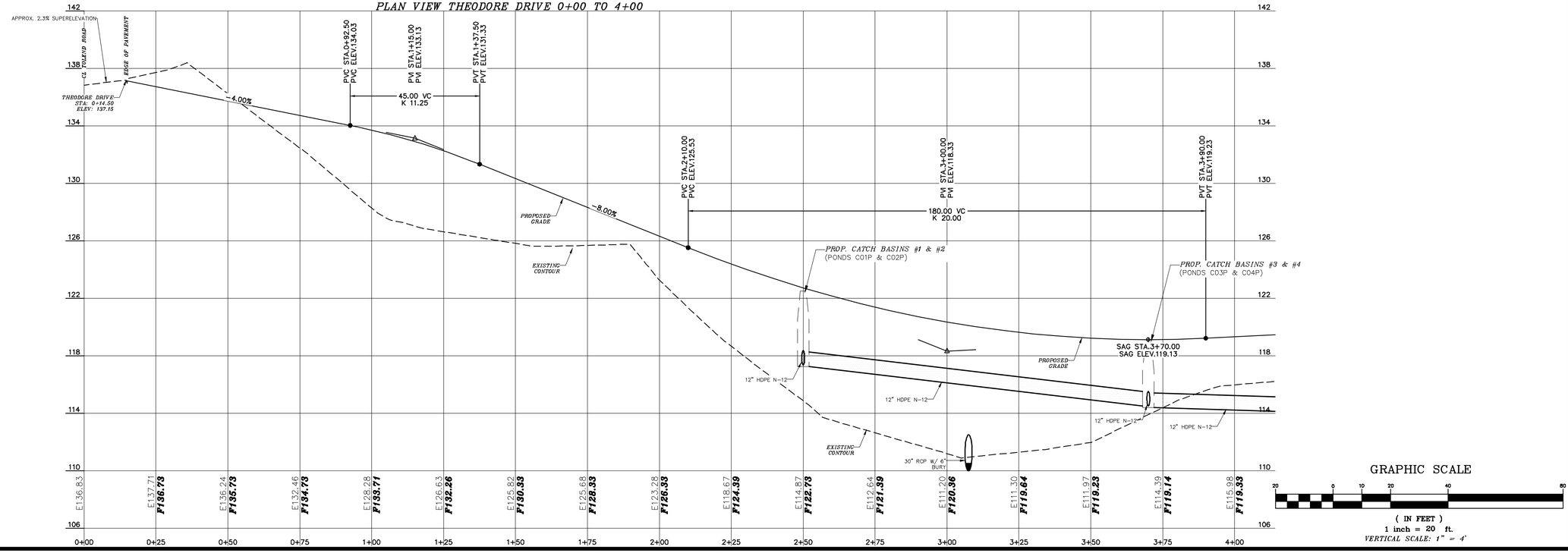
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.



PLAN VIEW THEODORE DRIVE 0+00 TO 4+00



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42u DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42u DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE GRADING & ENGINEERING DETAILS OF THEODORE DRIVE EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) ALL BASINS AND DRAINS ARE PROPOSED WITH NO SUMPS OR HOODS. BASINS WITHIN ANY GRASS LINED AREAS OUTSIDE THE ROADWAY WILL HAVE "BEE HIVE" GRATES TO NOT ALLOW FOR ENTRAPMENT OF ANIMALS IN THE STRUCTURE. OUTLET CONTROL STRUCTURES WILL NOT HAVE SUMPS. IF REQUIRED TO BE INSTALLED DURING THE PRE-CASTING PROCESS, THEY ARE TO BE FILLED WITH STONE ON SITE. BASINS ARE TO HAVE NH STANDARD FRAMES AND GRATES MADE IN NORTH AMERICA. PLEASE NOTE SOME GRATES ARE SPECIALIZED FOR THE LOCATION AND USE AND ARE CALLED OUT ON THE GRADING PLANS. GRATES ARE TO BE INSTALLED BINDER FLUSH PRIOR TO BASE PAVE. UPON PROJECT COMPLETION FRAMES AND GRATES ARE TO BE CUT AND RIM RAISED TO FINAL PAVEMENT SURFACE. THIS IS TO ENSURE STORMWATER ENTERS THE SYSTEM AS DESIGN DURING THE INTERIM CONSTRUCTION PERIOD.

6.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

STRUCTURES TABLE:

D101 D1 | D101 D3 — *PROP. CATCH BASIN #1* (POND C01P)
4'ø STRUCTURE W/ TYPE "I" GRATE
STA: 2+50.00 (Lt. 11.00')
RIM = 122.51 (FLUSH)
INV. OUT = 117.51 (12" HDPE N-12) (CB #2)

PROP. CATCH BASIN #2 (POND C02P)
4'ø STRUCTURE W/ TYPE "I" GRATE
STA: 2+50.00 (Rt. 11.00')
RIM = 122.51 (FLUSH)
INV. IN = 117.36 (12" HDPE N-12) (CB #1)
INV. OUT = 117.26 (12" HDPE N-12) (CB #4)

D101 D1 | D101 D2 — *PROP. CATCH BASIN #3* (POND C03P)
4'ø STRUCTURE W/ FLAT TOP & TYPE "B" GRATE
STA: 3+70.00 (Lt. 11.00')
RIM = 118.91 (FLUSH)
INV. OUT = 114.66 (12" HDPE N-12) (CB #4)

PROP. CATCH BASIN #4 (POND C04P)
4'ø STRUCTURE W/ FLAT TOP & TYPE "B" GRATE
STA: 3+70.00 (Rt. 11.00')
RIM = 118.91 (FLUSH)
INV. IN = 114.51 (12" HDPE N-12) (CB #3)
INV. IN = 114.51 (12" HDPE N-12) (CB #2)
INV. OUT = 114.41 (12" HDPE N-12) (CB #6)

DOVER PLANNING FILE #23-XX

REVISION	DATE	DESCRIPTION

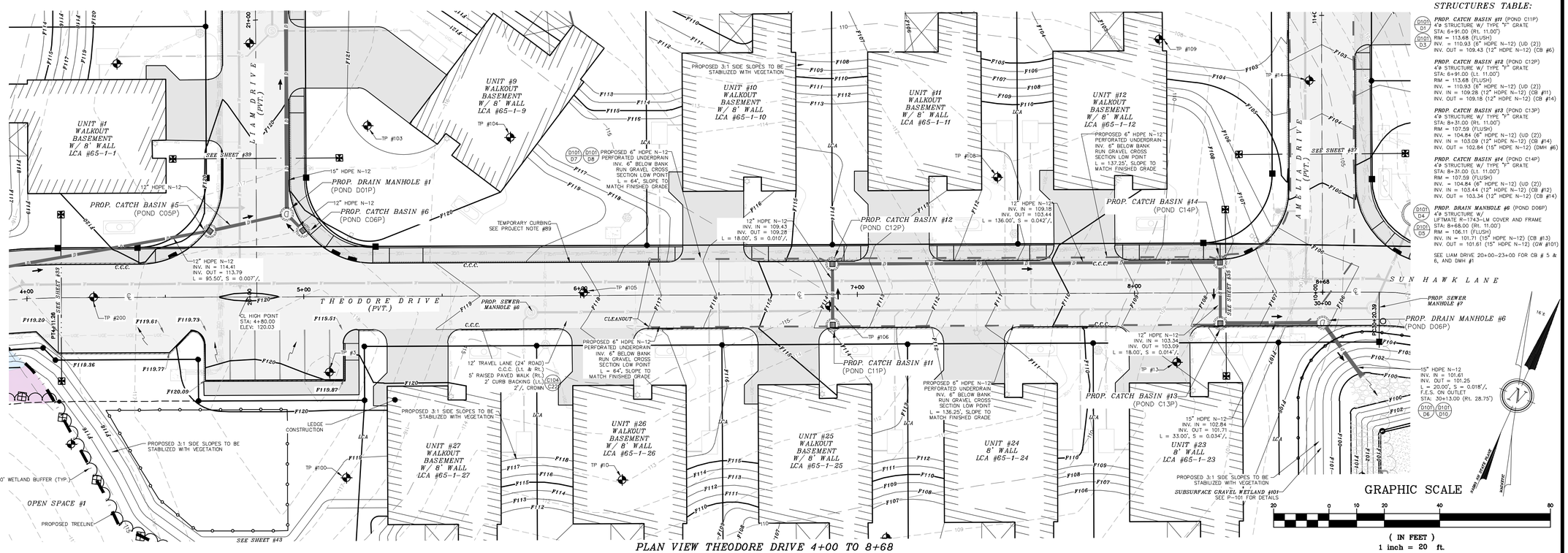
PLAN & PROFILE THEODORE DRIVE 0+00 TO 4+00
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY & SURVEYING ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

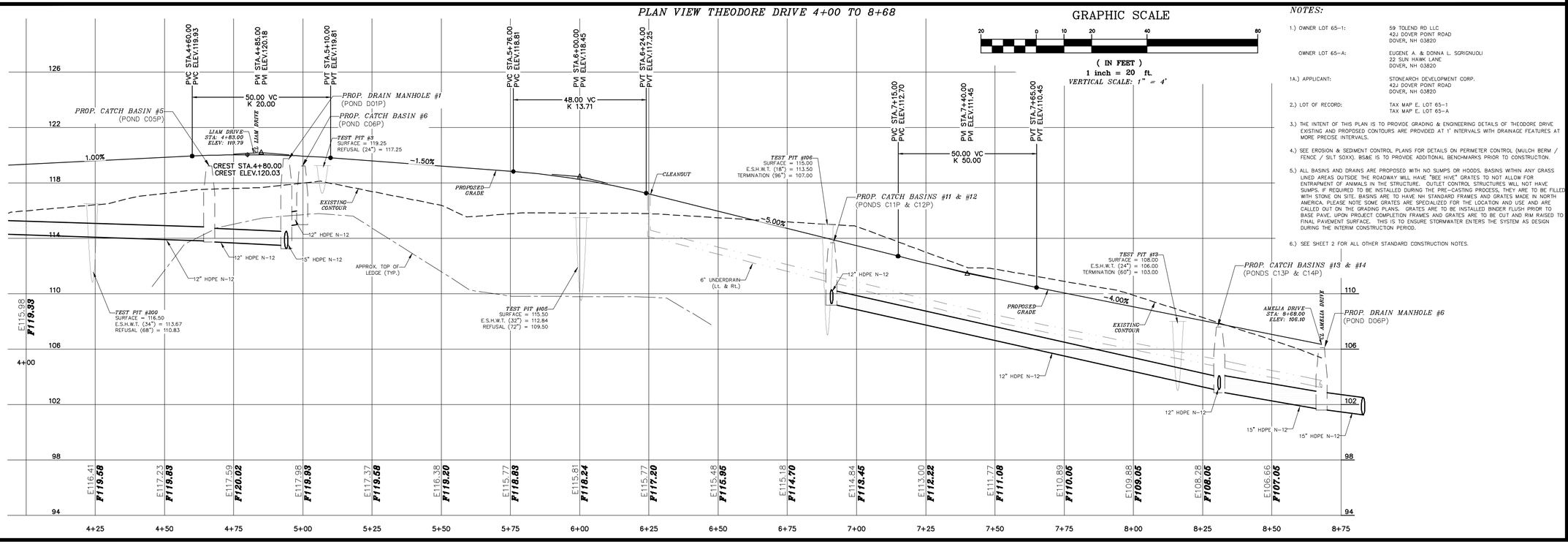
SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 18243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



PLAN VIEW THEODORE DRIVE 4+00 TO 8+68



NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
421 DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
421 DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE GRADING & ENGINEERING DETAILS OF THEODORE DRIVE EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) ALL BASINS AND DRAINS ARE PROPOSED WITH NO SUMPS OR HOODS. BASINS WITHIN ANY GRASS LINED AREAS OUTSIDE THE ROADWAY WILL HAVE "BEE HIVE" GRATES TO NOT ALLOW FOR ENTRAPMENT OF ANIMALS IN THE STRUCTURE. OUTLET CONTROL STRUCTURES WILL NOT HAVE SUMPS. IF REQUIRED TO BE INSTALLED DURING THE PRE-CASTING PROCESS, THEY ARE TO BE FILLED WITH STONE ON SITE. BASINS ARE TO HAVE NH STANDARD FRAMES AND GRATES MADE IN NORTH AMERICA. PLEASE NOTE SOME GRATES ARE SPECIALIZED FOR THE LOCATION AND USE AND ARE CALLED OUT ON THE GRADING PLANS. GRATES ARE TO BE INSTALLED BINDER FLUSH PRIOR TO BASE PAVE. UPON PROJECT COMPLETION FRAMES AND GRATES ARE TO BE CUT AND RIM RAISED TO FINAL PAVEMENT SURFACE. THIS IS TO ENSURE STORMWATER ENTERS THE SYSTEM AS DESIGN DURING THE INTERIM CONSTRUCTION PERIOD.

6.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

PLAN & PROFILE THEODORE DRIVE 4+00 – 8+68
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 19243
LICENSED PROFESSIONAL ENGINEER

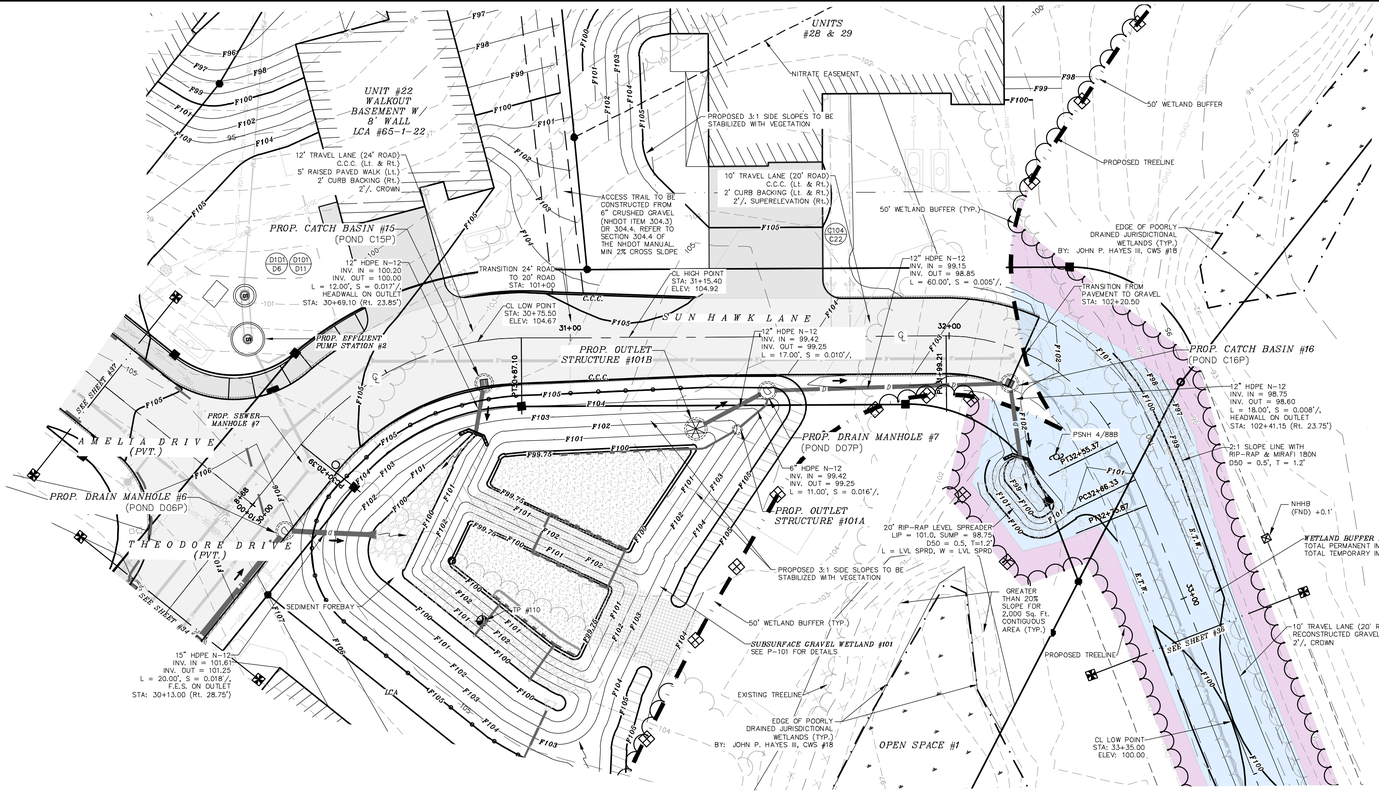
NOT FOR CONSTRUCTION

STRUCTURES TABLE:

PROP. CATCH BASIN #15 (POND C15P) (D101 D1) (D101 D2)
4'ø STRUCTURE W/ TYPE "B" GRATE
STA: 30+75.50 (Rt. 11.00')
RIM = 104.45 (FLUSH)
INV. OUT = 100.20 (12" HDPE N-12) (GW #101)

PROP. CATCH BASIN #10 (POND C10P)
4'ø STRUCTURE W/ FLAT TOP & TYPE "B" GRATE
STA: 32+20.25 (Rt. 9.00')
RIM = 102.15 (FLUSH)
INV. IN = 98.85 (12" HDPE N-12) (DMH #2)
INV. OUT = 98.75 (12" HDPE N-12) (LVL SPRD)

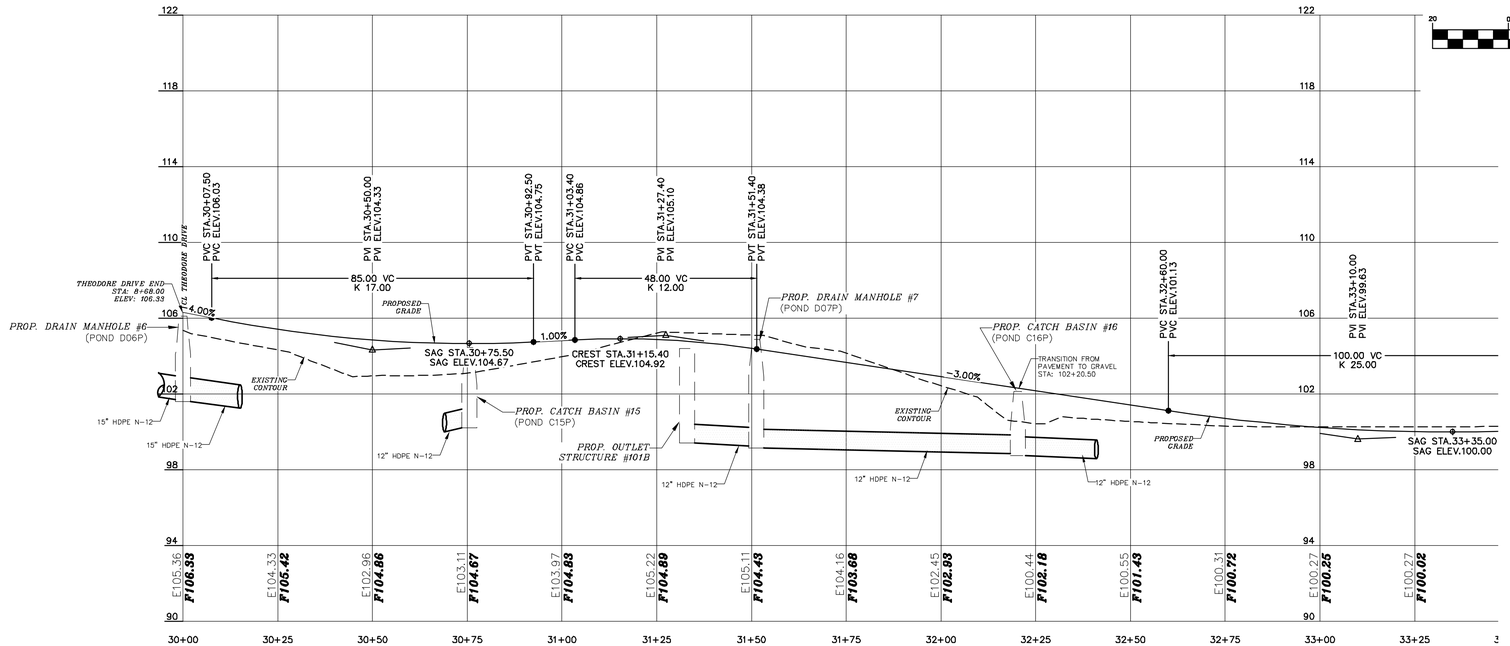
PROP. DRAIN MANHOLE #7 (POND D07P) (D101 D4) (D101 D5)
4'ø STRUCTURE W/
LIFTMATE R-1743-LM COVER AND FRAME
STA: 31+51.25 (Rt. 14.25')
RIM = 104.90 (FLUSH)
INV. IN = 99.25 (6" HDPE N-12) (OS #101A)
INV. IN = 99.25 (12" HDPE N-12) (OS #101B)
INV. OUT = 99.15 (12" HDPE N-12) (CB #16)



PLAN VIEW SUN HAWK LANE 30+00 TO 33+00

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

PROFILE VIEW SUN HAWK LANE 30+00 TO 33+00



GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE GRADING & ENGINEERING DETAILS OF SUNHAWK LANE. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) ALL BASINS AND DRAINS ARE PROPOSED WITH NO SUMPS OR HOODS. BASINS WITHIN ANY GRASS LINED AREAS OUTSIDE THE ROADWAY WILL HAVE "BEE HIVE" GRATES TO NOT ALLOW FOR ENTRAPMENT OF ANIMALS IN THE STRUCTURE. OUTLET CONTROL STRUCTURES WILL NOT HAVE SUMPS. IF REQUIRED TO BE INSTALLED DURING THE PRE-CASTING PROCESS, THEY ARE TO BE FILLED WITH STONE ON SITE. BASINS ARE TO HAVE NH STANDARD FRAMES AND GRATES MADE IN NORTH AMERICA. PLEASE NOTE SOME GRATES ARE SPECIALIZED FOR THE LOCATION AND USE AND ARE CALLED OUT ON THE GRADING PLANS. GRATES ARE TO BE INSTALLED BINDER FLUSH PRIOR TO BASE PAVE. UPON PROJECT COMPLETION FRAMES AND GRATES ARE TO BE CUT AND RIM RAISED TO FINAL PAVEMENT SURFACE. THIS IS TO ENSURE STORMWATER ENTERS THE SYSTEM AS DESIGN DURING THE INTERIM CONSTRUCTION PERIOD.

6.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

PLAN & PROFILE SUN HAWK LANE 30+00 TO 33+00
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE GRADING & ENGINEERING DETAILS OF SUNHAWK LANE. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

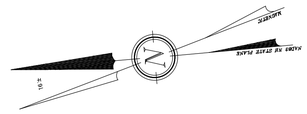
5.) ALL BASINS AND DRAINS ARE PROPOSED WITH NO SUMPS OR HOODS. BASINS WITHIN ANY GRASS LINED AREAS OUTSIDE THE ROADWAY WILL HAVE "BEE HIVE" GRATES TO NOT ALLOW FOR ENTRAPMENT OF ANIMALS IN THE STRUCTURE. OUTLET CONTROL STRUCTURES WILL NOT HAVE SUMPS. IF REQUIRED TO BE INSTALLED DURING THE PRE-CASTING PROCESS, THEY ARE TO BE FILLED WITH STONE ON SITE. BASINS ARE TO HAVE NH STANDARD FRAMES AND GRATES MADE IN NORTH AMERICA. PLEASE NOTE SOME GRATES ARE SPECIALIZED FOR THE LOCATION AND USE AND ARE CALLED OUT ON THE GRADING PLANS. GRATES ARE TO BE INSTALLED BINDER FLUSH PRIOR TO BASE PAVE. UPON PROJECT COMPLETION FRAMES AND GRATES ARE TO BE CUT AND RIM RAISED TO FINAL PAVEMENT SURFACE. THIS IS TO ENSURE STORMWATER ENTERS THE SYSTEM AS DESIGN DURING THE INTERIM CONSTRUCTION PERIOD.

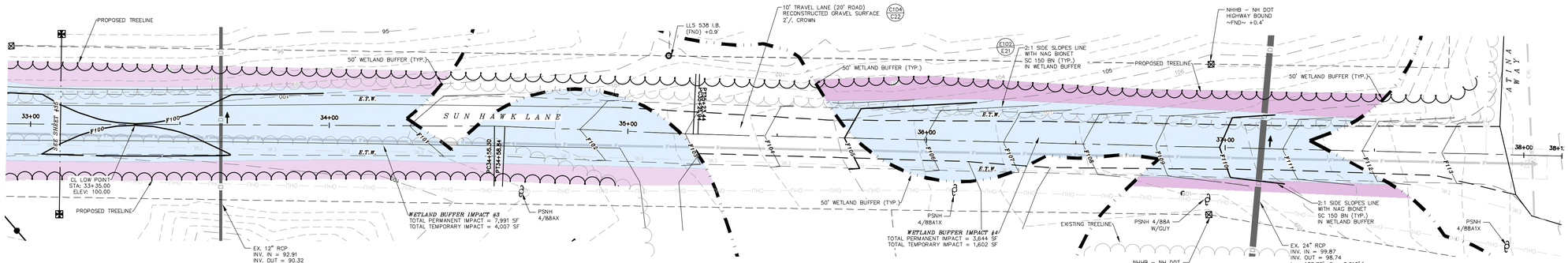
6.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.





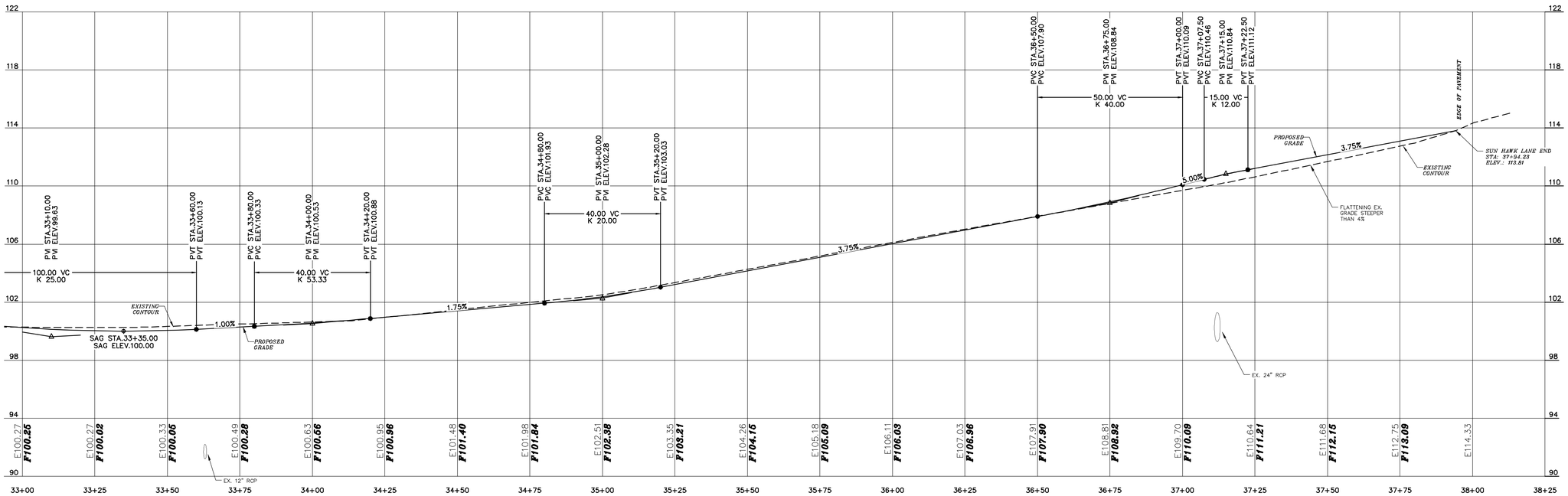
PLAN VIEW SUN HAWK LANE 33+00 – ATINA WAY

PROFILE VIEW SUN HAWK LANE 33+00 – ATINA WAY

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'



DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

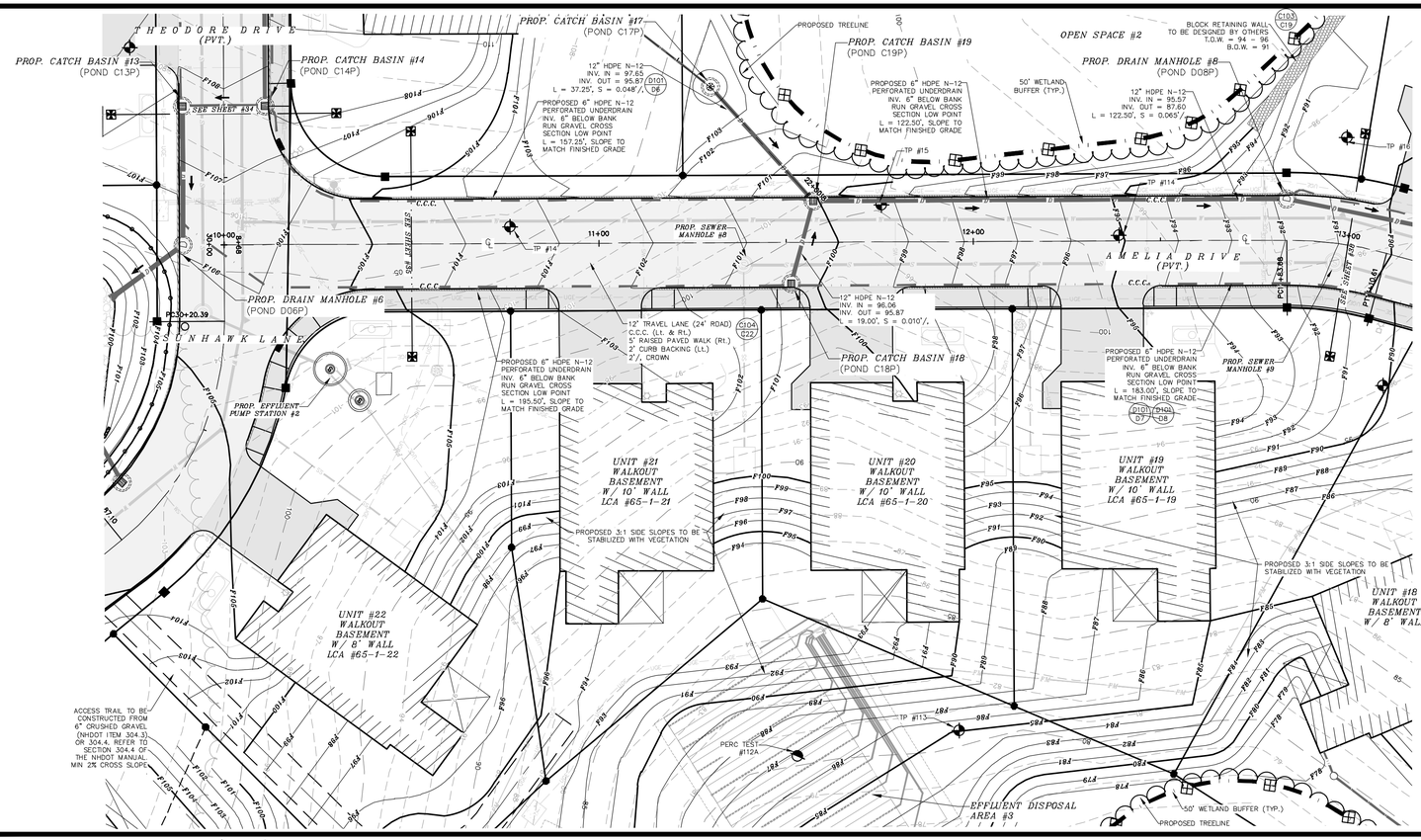
PLAN & PROFILE SUN HAWK LANE 33+00 TO ATINA WAY
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14043
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



STRUCTURES TABLE:

D101 D1 / D101 D12 — ***PROP. CATCH BASIN #17*** (POND C17P)
4'ø STRUCTURE W/ DOME GRATE
STA: 11+30.00 (Lt. 41.50')
RIM = 101.90 (FLUSH)
INV. IN = 97.75 (6" HDPE N-12) (CO #207)
INV. OUT = 97.65 (12" HDPE N-12) (CB #19)

D101 D1 / D101 D3 — ***PROP. CATCH BASIN #18*** (POND C18P)
4'ø STRUCTURE W/ TYPE "F" GRATE
STA: 11+51.30 (Rt. 11.00')
RIM = 100.31 (FLUSH)
INV. = 97.56 (6" HDPE N-12) (UD (2))
INV. OUT = 96.06 (12" HDPE N-12) (CB #21)

PROP. CATCH BASIN #19 (POND C19P)
4'ø STRUCTURE W/ TYPE "F" GRATE
STA: 11+57.35 (Lt. 11.00')
RIM = 100.07 (FLUSH)
INV. = 97.52 (6" HDPE N-12) (UD (2))
INV. IN = 95.67 (12" HDPE N-12) (CB #17)
INV. IN = 95.67 (12" HDPE N-12) (CB #18)
INV. OUT = 95.57 (12" HDPE N-12) (DMH #8)

D101 D1 / D101 D5 — ***PROP. DRAIN MANHOLE #8*** (POND D08P)
4'ø STRUCTURE W/
LEITMATE R-1743-LM COVER AND FRAME
STA: 12+83.70 (lt. 11.00')
RIM = 91.75 (FLUSH)
INV. = 89.00 (6" HDPE N-12) (UD (2))
INV. IN = 87.60 (12" HDPE N-12) (CB #19)
INV. OUT = 87.50 (12" HDPE N-12) (CB #21)

NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC, 42J DOVER POINT ROAD, DOVER, NH 03820

OWNER LOT 65–A: EUGENE A. & DONNA L. SGRIGNUOLI, 22 SUN HAWK LANE, DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP., 42J DOVER POINT ROAD, DOVER, NH 03820

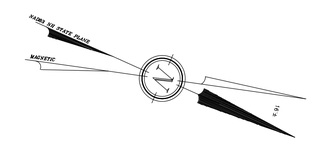
2.) LOT OF RECORD: TAX MAP E, LOT 65–1; TAX MAP E, LOT 65–A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE GRADING & ENGINEERING DETAILS OF AMELIA DRIVE. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) ALL BASINS AND DRAINS ARE PROPOSED WITH NO SUMPS OR HOODS. BASINS WITHIN ANY GRASS LINED AREAS OUTSIDE THE ROADWAY WILL HAVE "BEE HIVE" GRATES TO NOT ALLOW FOR ENTRAPMENT OF ANIMALS IN THE STRUCTURE. OUTLET CONTROL STRUCTURES WILL NOT HAVE SUMPS. IF REQUIRED TO BE INSTALLED DURING THE PRE-CASTING PROCESS, THEY ARE TO BE FILLED WITH STONE ON SITE. BASINS ARE TO HAVE NH STANDARD FRAMES AND GRATES MADE IN NORTH AMERICA. PLEASE NOTE SOME GRATES ARE SPECIALIZED FOR THE LOCATION AND USE AND ARE CALLED OUT ON THE GRADING PLANS. GRATES ARE TO BE INSTALLED BINDER FLUSH PRIOR TO BASE PAVE. UPON PROJECT COMPLETION FRAMES AND GRATES ARE TO BE CUT AND RIM RAISED TO FINAL PAVEMENT SURFACE. THIS IS TO ENSURE STORMWATER ENTERS THE SYSTEM AS DESIGN DURING THE INTERIM CONSTRUCTION PERIOD.

6.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

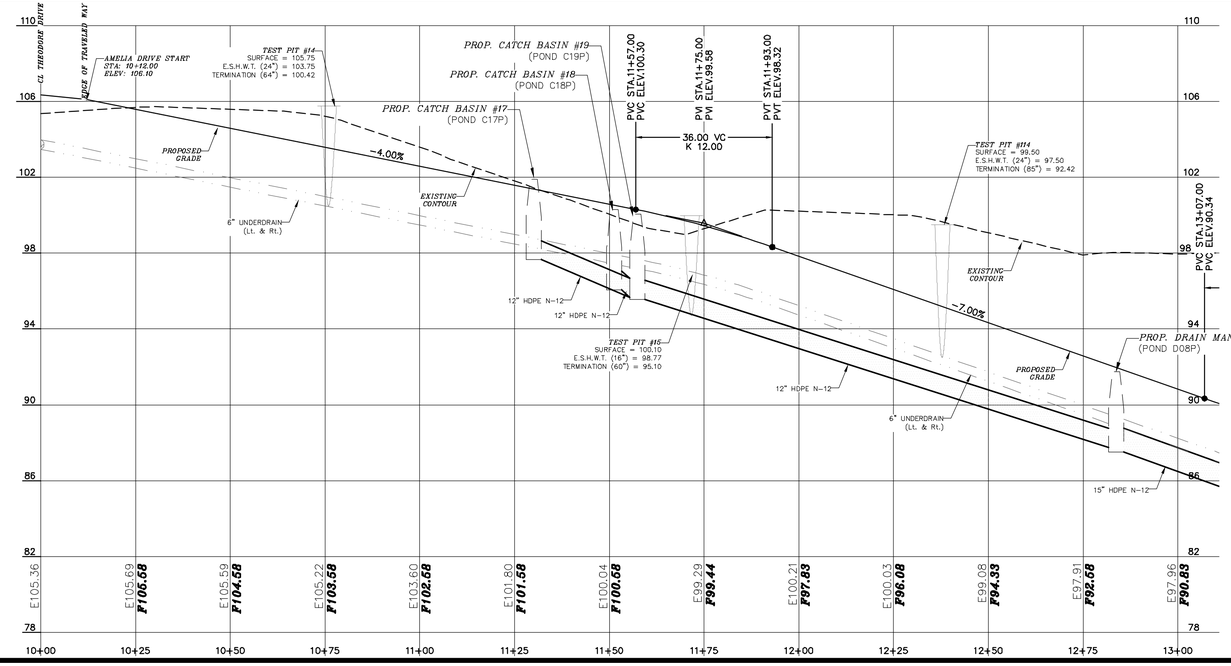
PLAN VIEW AMELIA DRIVE 10+00 TO 13+00

PLAN VIEW AMELIA DRIVE 10+00 TO 13+00

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'



DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

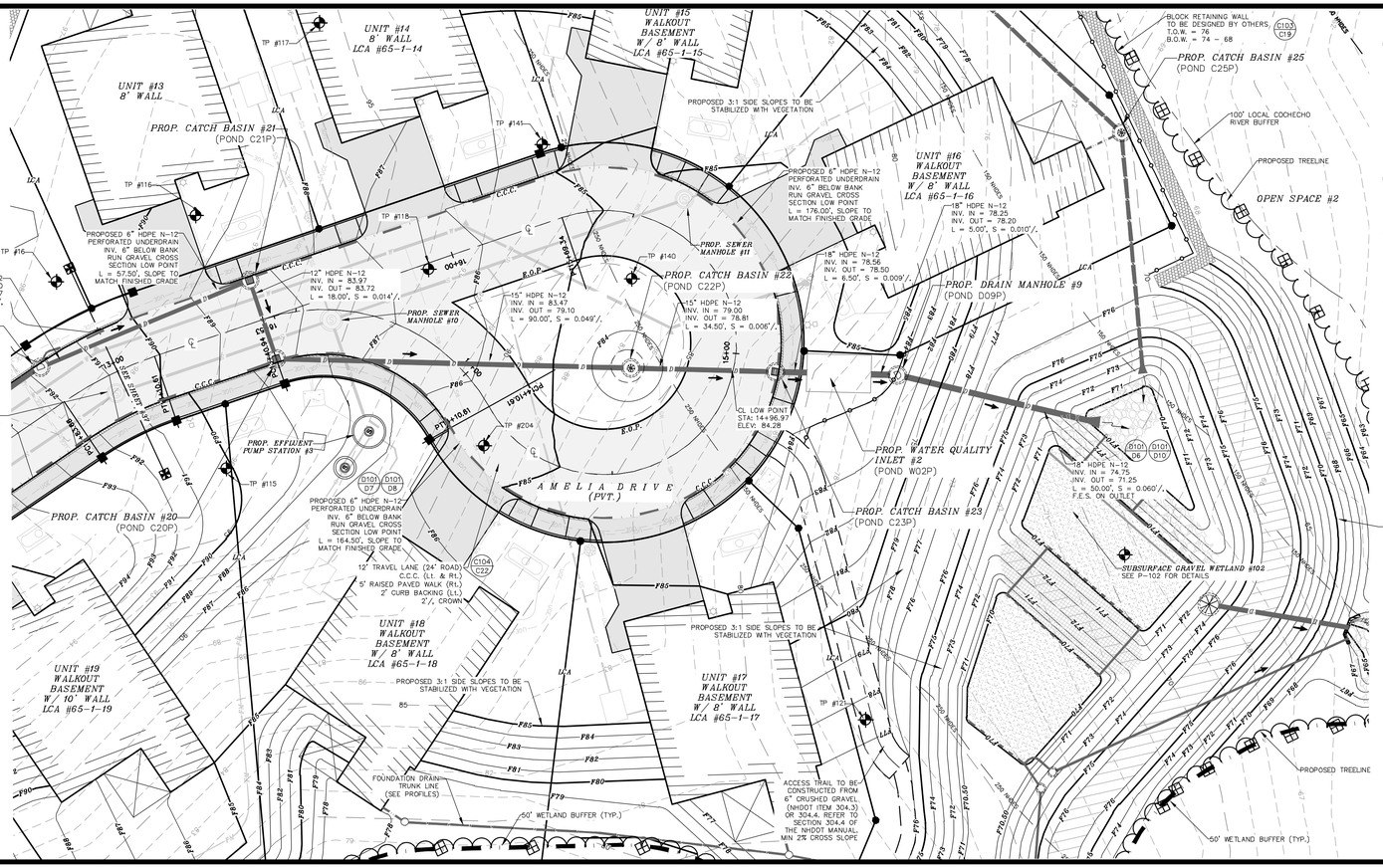
PLAN & PROFILE AMELIA DRIVE 10+00 – 13+00
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY & SURVEYING ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE — KENNETH A. BERRY No. 10243 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



STRUCTURES TABLE:

PROP. CATCH BASIN #20 (POND C20P)
4'ø STRUCTURE W/ TYPE "S" GRATE
STA: 13+40.94 (Rt. 11.00')
RIM = 88.22 (FLUSH)
INV. = 85.47 (6" HDPE N-12) (UD (2))
INV. IN = 83.72 (12" HDPE N-12) (CB #21)
INV. OUT = 83.47 (15" HDPE N-12) (CB #22)

PROP. CATCH BASIN #21 (POND C21P)
4'ø STRUCTURE W/ TYPE "S" GRATE
STA: 13+40.94 (Lt. 11.00')
RIM = 88.22 (FLUSH)
INV. = 85.47 (6" HDPE N-12) (UD (2))
INV. IN = 84.07 (12" HDPE N-12) (DMH #8)
INV. OUT = 83.97 (12" HDPE N-12) (CB #20)

PROP. CATCH BASIN #22 (POND C22P)
4'ø STRUCTURE W/ DOME GRATE
STA: 14+76.10 (Lt. 24.25')
RIM = 83.75 (FLUSH)
INV. IN = 79.10 (15" HDPE N-12) (CB #20)
INV. OUT = 79.00 (15" HDPE N-12) (CB #23)

PROP. CATCH BASIN #23 (POND C23P)
4'ø STRUCTURE W/ TYPE "B" GRATE
STA: 15+14.00 (Rt. 30.00')
RIM = 84.06 (FLUSH)
INV. = 81.31 (6" HDPE N-12) (UD (2))
INV. IN = 78.81 (15" HDPE N-12) (CB #22)
INV. OUT = 78.56 (18" HDPE N-12) (WQI #2)

PROP. DRAIN MANHOLE #9 (POND D09P)
4'ø STRUCTURE W/
LIFTMATE RL-1743-LM COVER AND FRAME
STA: 15+00.00 (Rt. 43.00')
RIM = 84.00 (FLUSH)
INV. IN = 78.20 (18" HDPE N-12) (WQI #2)
INV. OUT = 74.75 (18" HDPE N-12) (GW #102)

PROP. WATER QUALITY INLET #2 (POND W02P)
7,500 GAL. CUSTOM TANK W/ RISERS TO
SURFACE
TOP INSIDE TANK = 82.25
INV. IN = 78.50 (18 HDPE N-12) (CB #23)
INV. OUT = 78.25 (18" HDPE N-12) (DMH #9)

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

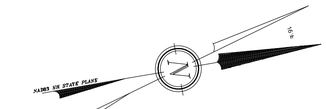
2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE GRADING & ENGINEERING DETAILS OF AMELIA DRIVE. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) ALL BASINS AND DRAINS ARE PROPOSED WITH NO SUMPS OR HOODS. BASINS WITHIN ANY GRASS LINED AREAS OUTSIDE THE ROADWAY WILL HAVE "BEE HIVE" GRATES TO NOT ALLOW FOR ENTRAPMENT OF ANIMALS IN THE STRUCTURE. OUTLET CONTROL STRUCTURES WILL NOT HAVE SUMPS. IF REQUIRED TO BE INSTALLED DURING THE PRE-CASTING PROCESS, THEY ARE TO BE FILLED WITH STONE ON SITE. BASINS ARE TO HAVE NH STANDARD FRAMES AND GRATES MADE IN NORTH AMERICA. PLEASE NOTE SOME GRATES ARE SPECIALIZED FOR THE LOCATION AND USE AND ARE CALLED OUT ON THE GRADING PLANS. GRATES ARE TO BE INSTALLED BINDER FLUSH PRIOR TO BASE PAVE. UPON PROJECT COMPLETION FRAMES AND GRATES ARE TO BE CUT AND RM RAISED TO FINAL PAVEMENT SURFACE. THIS IS TO ENSURE STORMWATER ENTERS THE SYSTEM AS DESIGN DURING THE INTERIM CONSTRUCTION PERIOD.

6.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

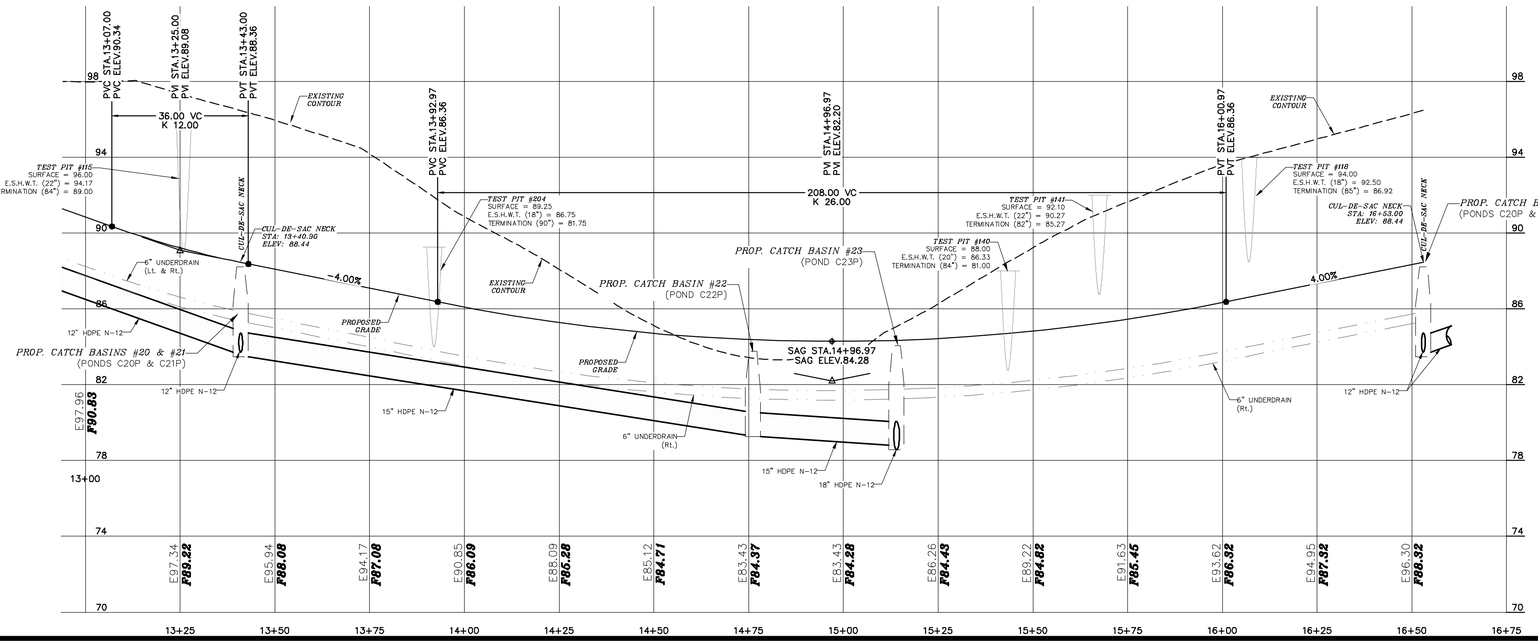
PLAN VIEW AMELIA DRIVE 13+00 TO 16+53

PLAN VIEW AMELIA DRIVE 13+00 TO 16+53

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'



DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

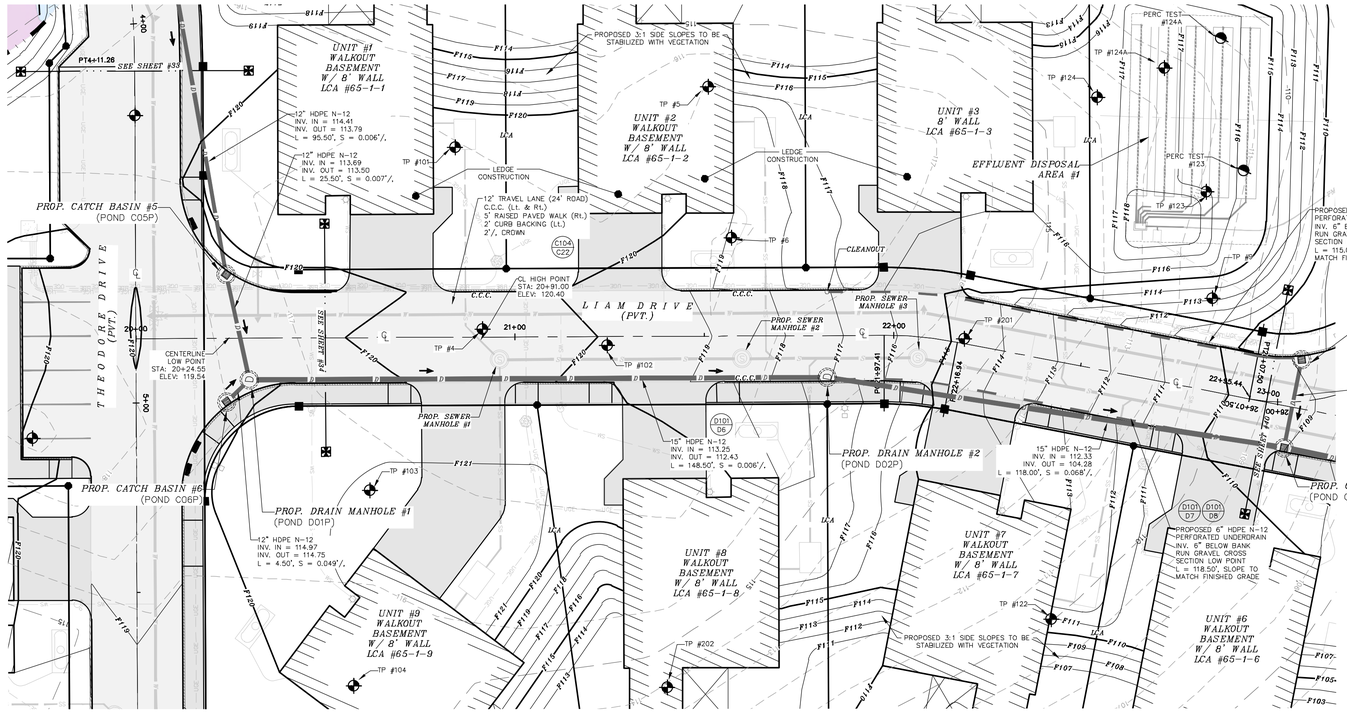
PLAN & PROFILE AMELIA DRIVE 13+00 – 16+53
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY & SURVEYING ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



PLAN VIEW LIAM DRIVE 20+00 TO 23+00

PROFILE VIEW LIAM DRIVE 20+00 TO 23+00

STRUCTURES TABLE:

D101 D1 / D101 D2 — ***PROP. CATCH BASIN #5*** (POND C05P)
4'ø STRUCTURE W/ TYPE "B" GRATE
STA: 20+23.90 (Lt. 16.80')
RIM = 119.22 (FLUSH)
INV. IN = 113.82 (12" HDPE N-12) (CB #4)
INV. OUT = 113.72 (12" HDPE N-12) (DMH #1)

PROP. CATCH BASIN #6 (POND C06P)
4'ø STRUCTURE W/ TYPE "B" GRATE
STA: 20+23.90 (Rt. 16.80')
RIM = 119.22 (FLUSH)
INV. OUT = 114.97 (12" HDPE N-12) (DMH #1)

D101 D1 / D101 D3 — ***PROP. CATCH BASIN #7*** (POND C07P)
4'ø STRUCTURE W/ TYPE "T" GRATE
STA: 23+06.85 (Lt. 12.35')
RIM = 106.13 (FLUSH)
INV. = 104.84 (6" HDPE N-12) (UD)
INV. OUT = 104.63 (12" HDPE N-12) (CB #8)

PROP. CATCH BASIN #8 (POND C08P)
4'ø STRUCTURE W/ TYPE "T" GRATE
STA: 23+06.85 (Lt. 12.35')
RIM = 109.03 (FLUSH)
INV. = 106.28 (6" HDPE N-12) (UD)
INV. IN = 104.53 (12" HDPE N-12) (CB #7)
INV. IN = 104.28 (15" HDPE N-12) (DMH #2)
INV. OUT = 104.03 (18" HDPE N-12) (DMH #3)

D101 D4 / D101 D5 — ***PROP. DRAIN MANHOLE #1*** (POND D01P)
4'ø STRUCTURE W/ LIFTMATE R-1743-LM COVER AND FRAME
STA: 20+29.90 (Rt. 11.00')
RIM = 119.40 (FLUSH)
INV. IN = 113.50 (12" HDPE N-12) (CB #5)
INV. IN = 114.75 (12" HDPE N-12) (CB #6)
INV. OUT = 113.25 (15" HDPE N-12) (DMH #2)

PROP. DRAIN MANHOLE #2 (POND D02P)
4'ø STRUCTURE W/ LIFTMATE R-1743-LM COVER AND FRAME
STA: 21+82.40 (Rt. 11.00')
RIM = 117.08 (FLUSH)
INV. = 114.33 (6" HDPE N-12) (UD (2))
INV. IN = 112.43 (15" HDPE N-12) (DMH #1)
INV. OUT = 112.33 (15" HDPE N-12) (CB #8)

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

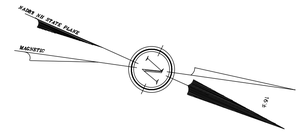
2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE GRADING & ENGINEERING DETAILS OF LIAM DRIVE. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) ALL BASINS AND DRAINS ARE PROPOSED WITH NO SUMPS OR HOODS. BASINS WITHIN ANY GRASS LINED AREAS OUTSIDE THE ROADWAY WILL HAVE "BEE HIVE" GRATES TO NOT ALLOW FOR ENTRAPMENT OF ANIMALS IN THE STRUCTURE. OUTLET CONTROL STRUCTURES WILL NOT HAVE SUMPS. IF REQUIRED TO BE INSTALLED DURING THE PRE-CASTING PROCESS, THEY ARE TO BE FILLED WITH STONE ON SITE. BASINS ARE TO HAVE NH STANDARD FRAMES AND GRATES MADE IN NORTH AMERICA. PLEASE NOTE SOME GRATES ARE SPECIALIZED FOR THE LOCATION AND USE AND ARE CALLED OUT ON THE GRADING PLANS. GRATES ARE TO BE INSTALLED BINDER FLUSH PRIOR TO BASE PAVE. UPON PROJECT COMPLETION FRAMES AND GRATES ARE TO BE CUT AND RIM RAISED TO FINAL PAVEMENT SURFACE. THIS IS TO ENSURE STORMWATER ENTERS THE SYSTEM AS DESIGN DURING THE INTERIM CONSTRUCTION PERIOD.

6.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.



GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

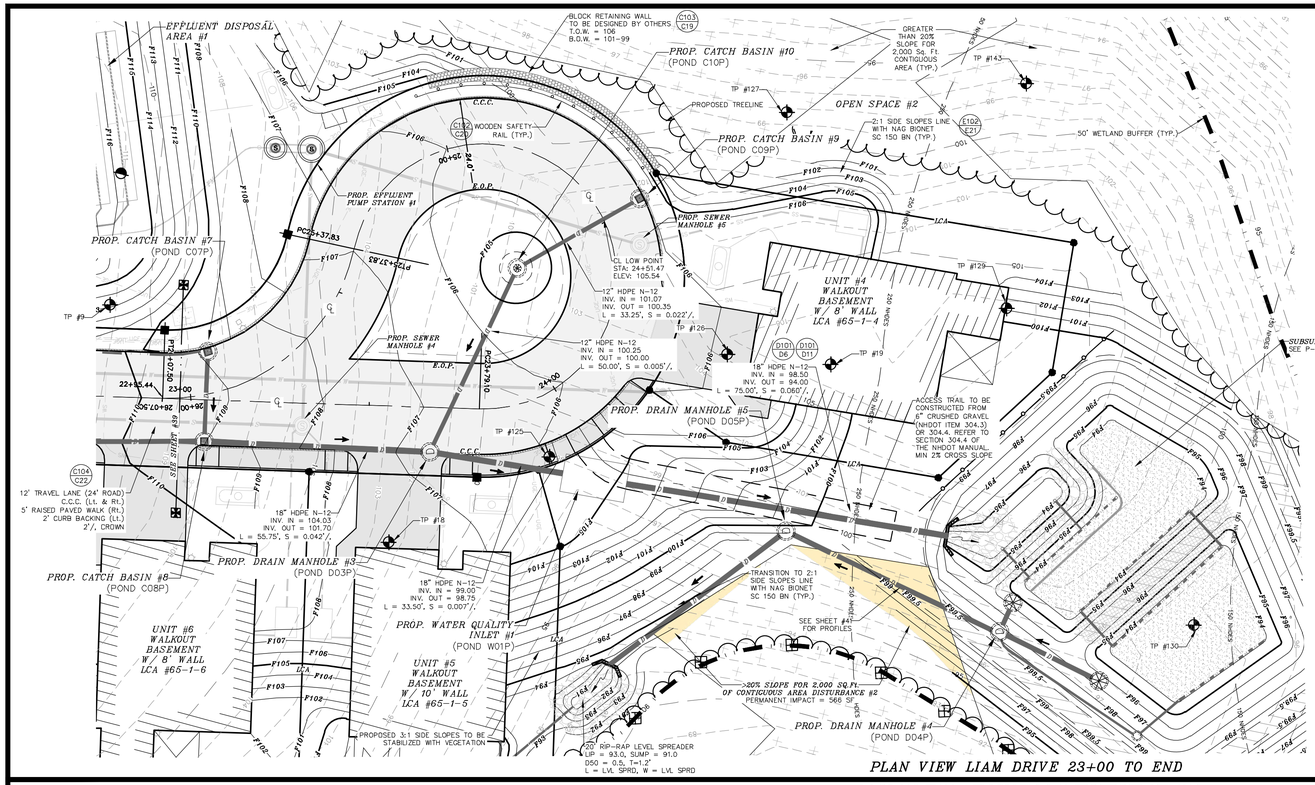
PLAN & PROFILE LIAM DRIVE 20+00 TO 23+00
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

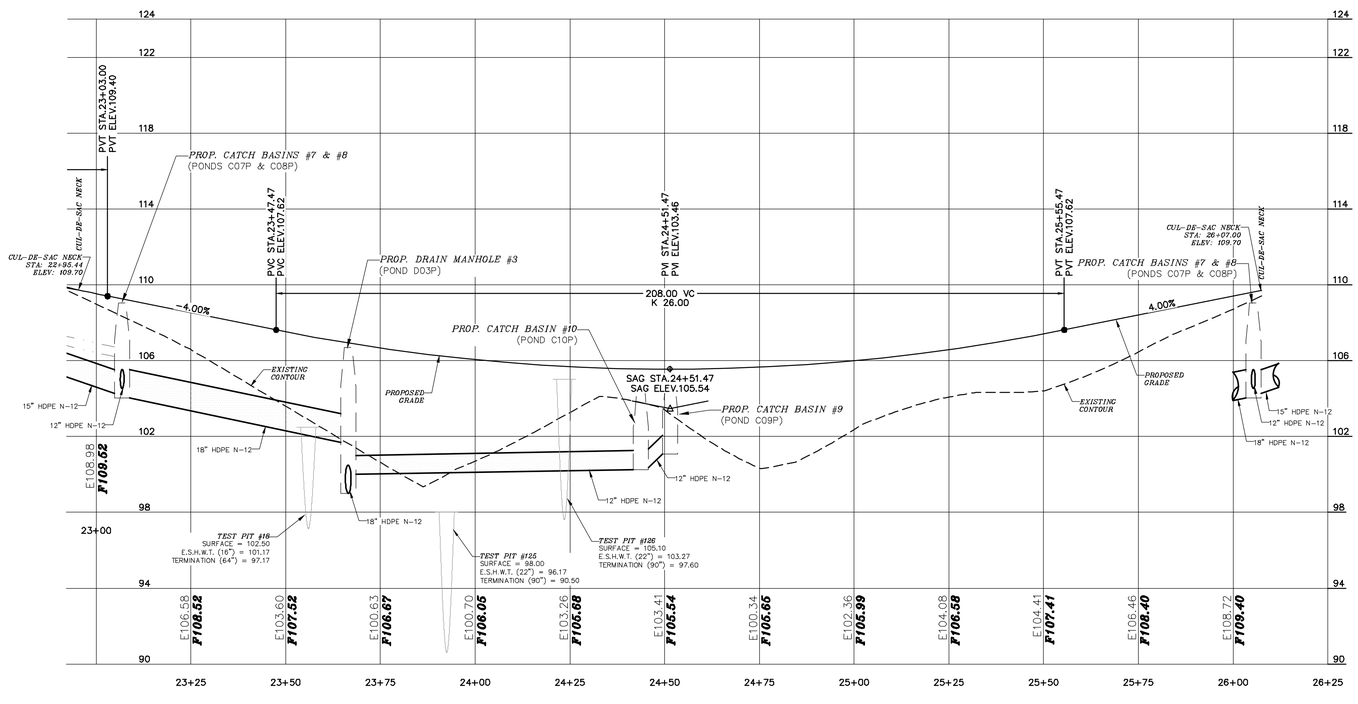
SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE — KENNETH A. BERRY No. 15447 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



PLAN VIEW LIAM DRIVE 23+00 TO END



PROFILE VIEW LIAM DRIVE 23+00 TO END

STRUCTURES TABLE:

D101 D1 / D101 D2 — ***PROP. CATCH BASIN #9*** (POND C09P)
4'ø STRUCTURE W/ FLAT TOP & TYPE "B" GRATE
STA: 24+51.50 (Rt. 11.00')
RIM = 105.32 (FLUSH)
INV. OUT = 101.07 (12" HDPE N-12) (CB #33)

D101 D1 / D101 D12 — ***PROP. CATCH BASIN #10*** (POND C10P)
4'ø STRUCTURE W/ DOME GRATE
STA: 24+43.75 (Lt. 26.00')
RIM = 104.50 (FLUSH)
INV. IN = 100.35 (12" HDPE N-12) (CB #32)
INV. OUT = 100.25 (12" HDPE N-12) (DMH #12)

D101 D4 / D101 D5 — ***PROP. DRAIN MANHOLE #3*** (POND D03P)
4'ø STRUCTURE W/ LIFTMATE R-1743-LM COVER AND FRAME
STA: 23+66.50 (Rt. 11.75')
RIM = 106.70 (FLUSH)
INV. IN = 101.70 (18" HDPE N-12) (CB #8)
INV. IN = 100.00 (12" HDPE N-12) (CB #9)
INV. OUT = 99.00 (18" HDPE N-12) (CB #35)

D102 D21 — ***PROP. WATER QUALITY INLET #1*** (POND W01P)
7,500 GAL. CUSTOM TANK W/ RISERS TO SURFACE
TOP INSIDE TANK = 102.50
INV. IN = 98.75 (18 HDPE N-12) (DMH #3)
INV. OUT = 98.50 (18" HDPE N-12) (GW #103)

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

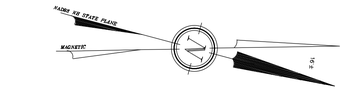
2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE GRADING & ENGINEERING DETAILS OF LIAM DRIVE. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) ALL BASINS AND DRAINS ARE PROPOSED WITH NO SUMPS OR HOODS. BASINS WITHIN ANY GRASS LINED AREAS OUTSIDE THE ROADWAY WILL HAVE "BEE HIVE" GRATES TO NOT ALLOW FOR ENTRAPMENT OF ANIMALS IN THE STRUCTURE. OUTLET CONTROL STRUCTURES WILL NOT HAVE SUMPS. IF REQUIRED TO BE INSTALLED DURING THE PRE-CASTING PROCESS, THEY ARE TO BE FILLED WITH STONE ON SITE. BASINS ARE TO HAVE NH STANDARD FRAMES AND GRATES MADE IN NORTH AMERICA. PLEASE NOTE SOME GRATES ARE SPECIALIZED FOR THE LOCATION AND USE AND ARE CALLED OUT ON THE GRADING PLANS. GRATES ARE TO BE INSTALLED BINDER FLUSH PRIOR TO BASE PAVE. UPON PROJECT COMPLETION FRAMES AND GRATES ARE TO BE CUT AND RIM RAISED TO FINAL PAVEMENT SURFACE. THIS IS TO ENSURE STORMWATER ENTERS THE SYSTEM AS DESIGN DURING THE INTERIM CONSTRUCTION PERIOD.

6.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

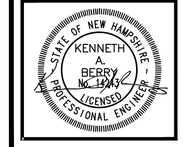
DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

PLAN & PROFILE LIAM DRIVE 23+00 TO END
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

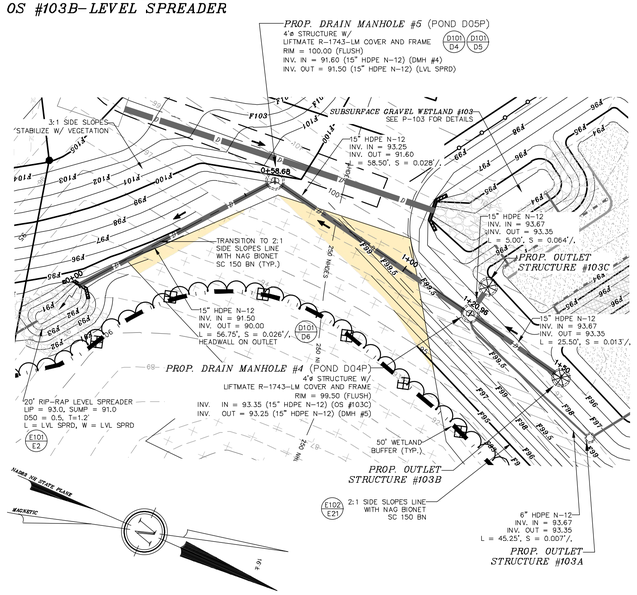
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031



NOT FOR CONSTRUCTION

PLAN & PROFILE VIEW
OS #103B–LEVEL SPREADER

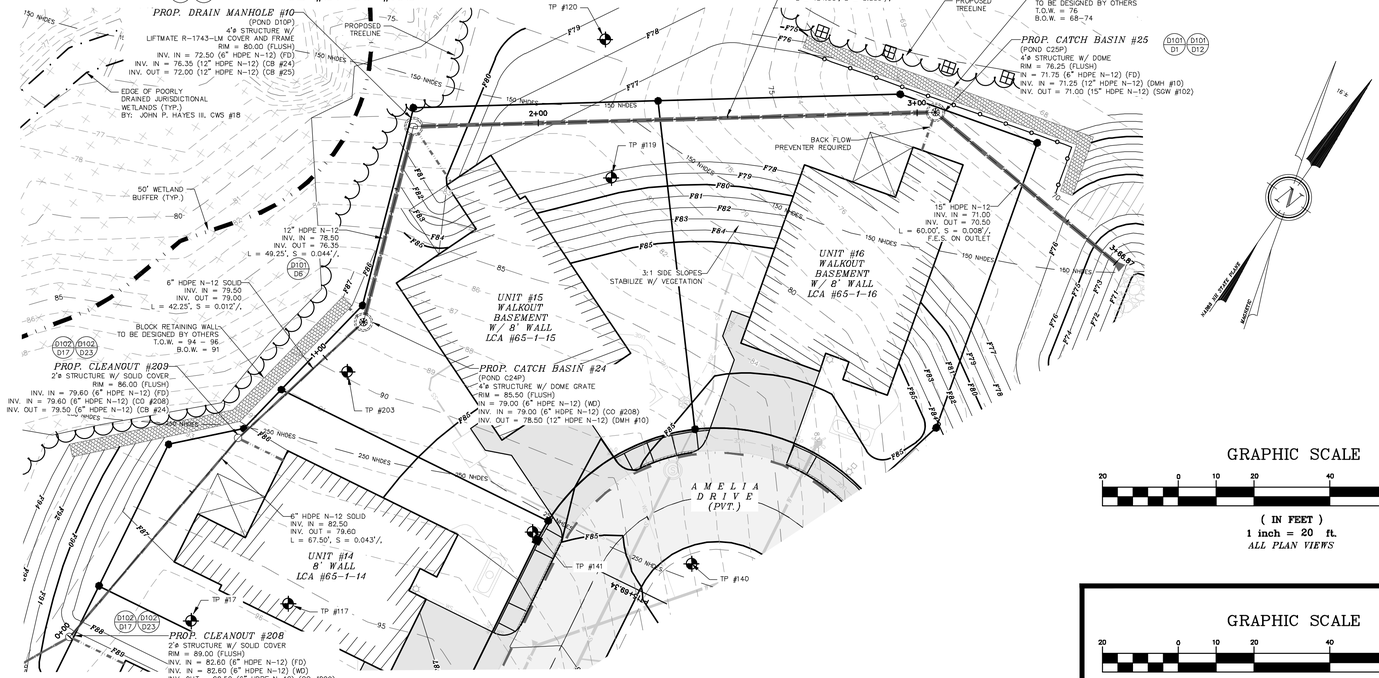


GRAPHIC SCALE

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(IN FEET)
1 inch = 20 ft.

PLAN & PROFILE VIEW
CB #24–GW #102



GRAPHIC SCALE

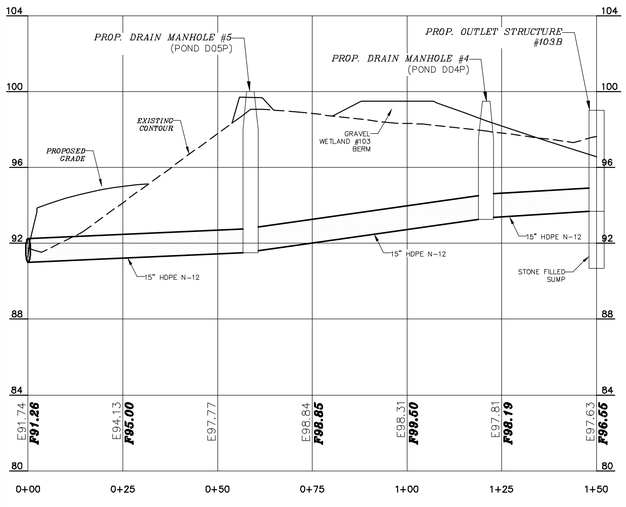
20 0 10 20 40 80

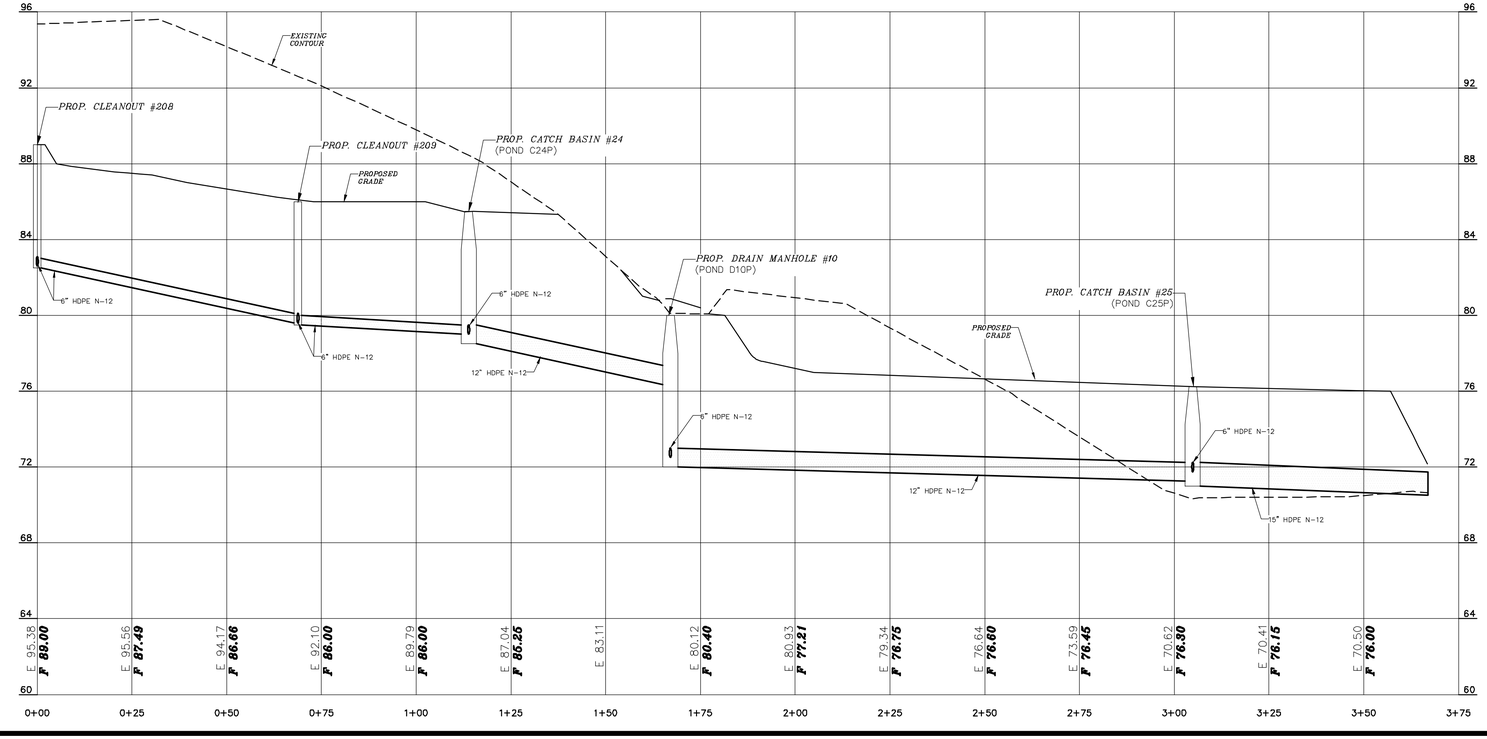
(IN FEET)
1 inch = 20 ft.
ALL PLAN VIEWS

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'
ALL PROFILES





DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

DRAINAGE PIPE PROFILES
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

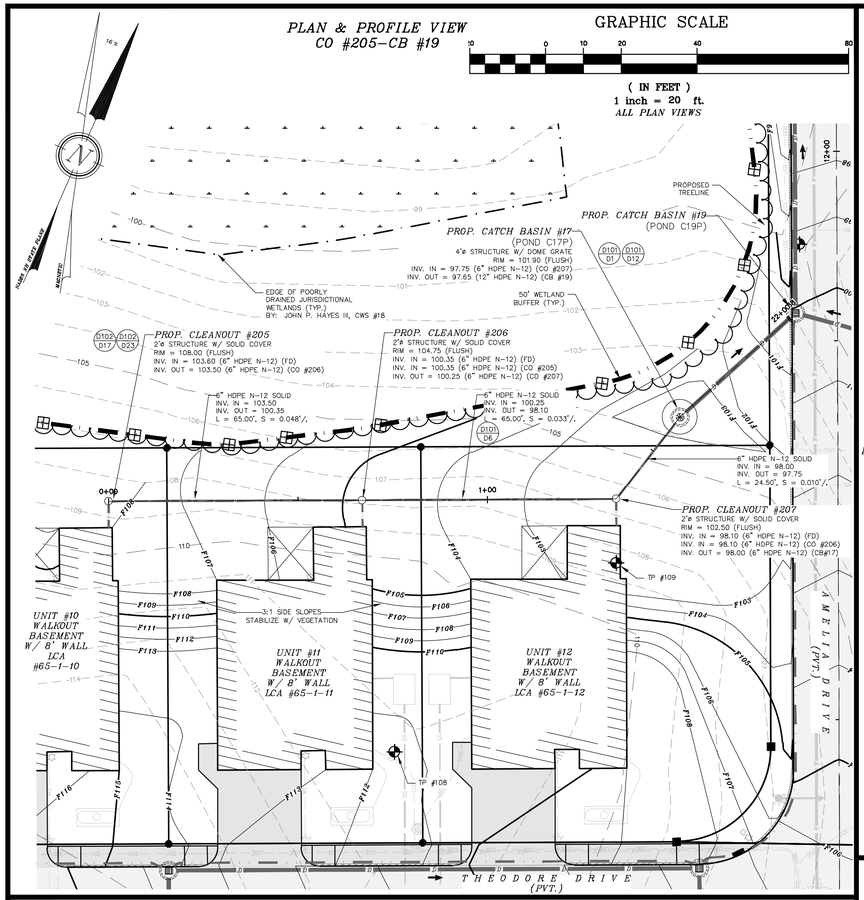
SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 10993
LICENSED PROFESSIONAL ENGINEER

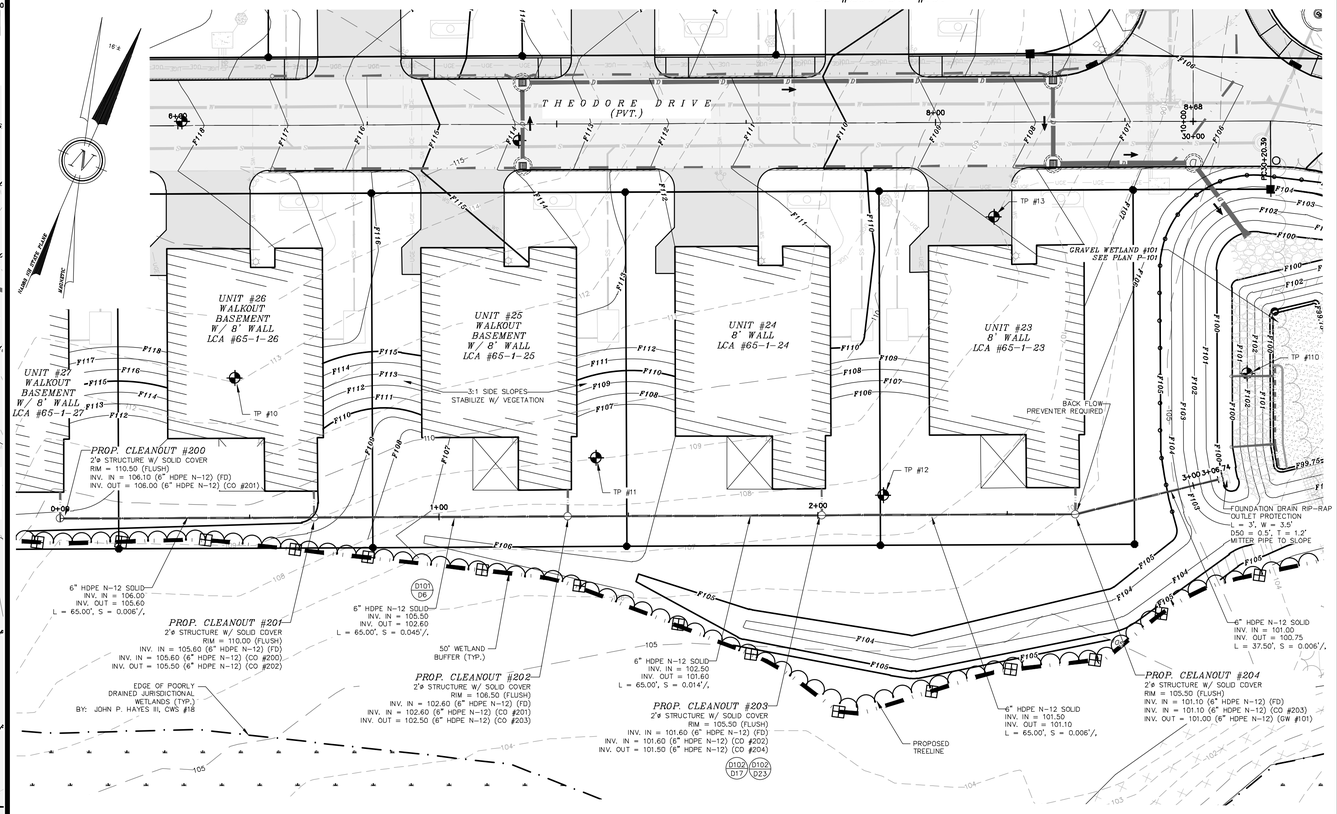
NOT FOR CONSTRUCTION

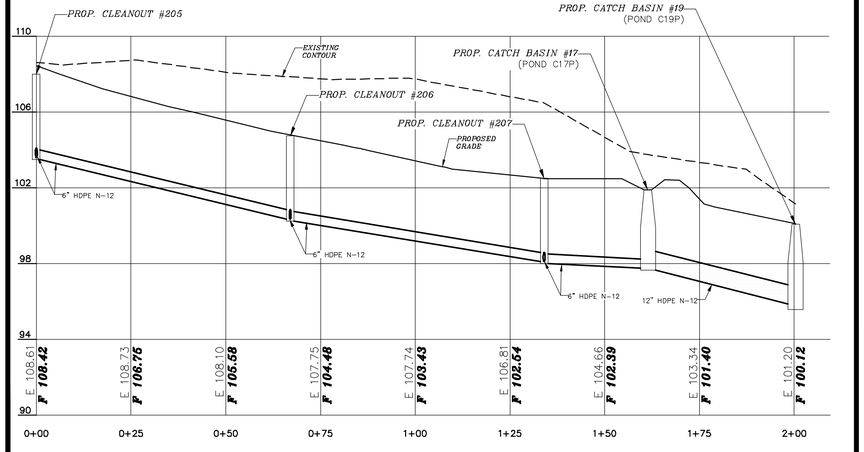
PLAN & PROFILE VIEW
CO #205-CB #19

GRAPHIC SCALE
10 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.
ALL PLAN VIEWS

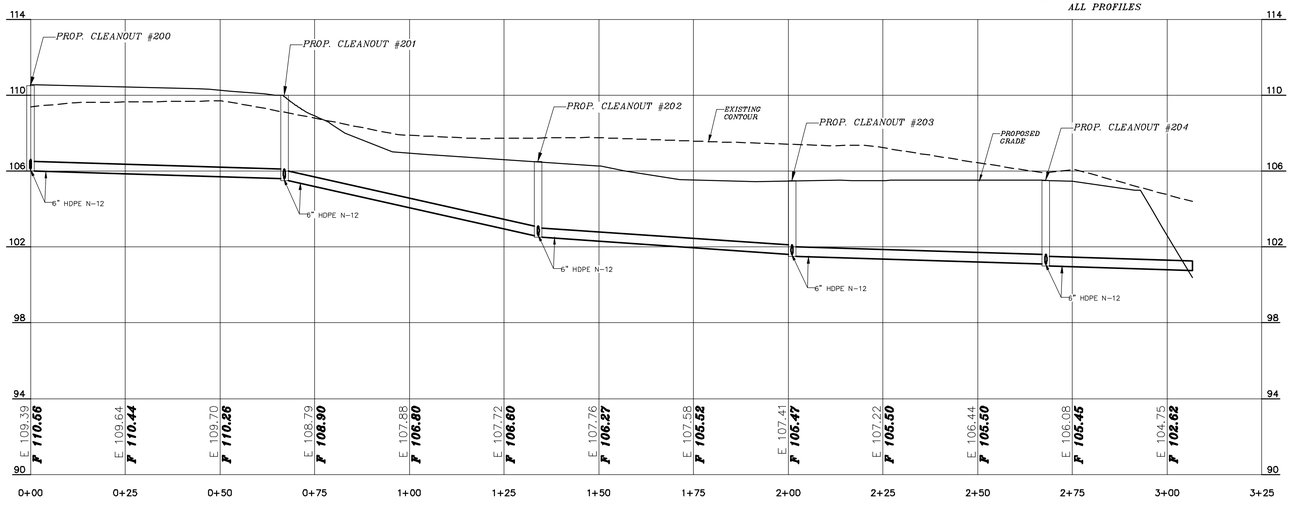


PLAN & PROFILE VIEW
CO #200-GW #101





GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'
ALL PROFILES



DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

DRAINAGE PIPE PROFILES (2)
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

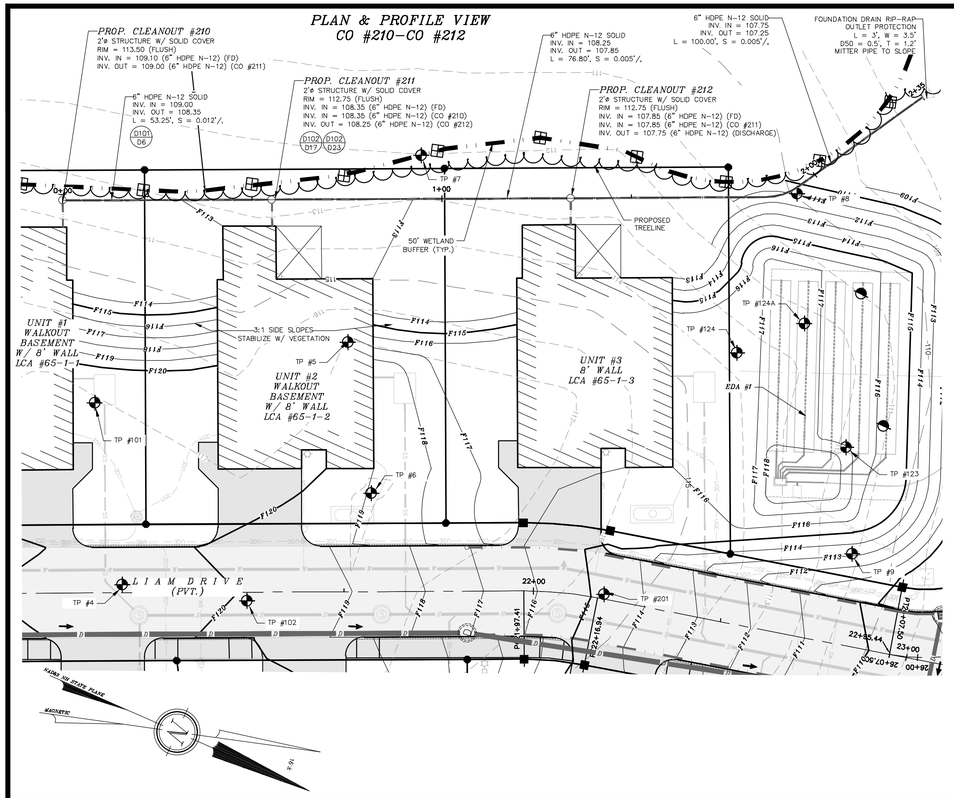
SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 15443
LICENSED PROFESSIONAL ENGINEER

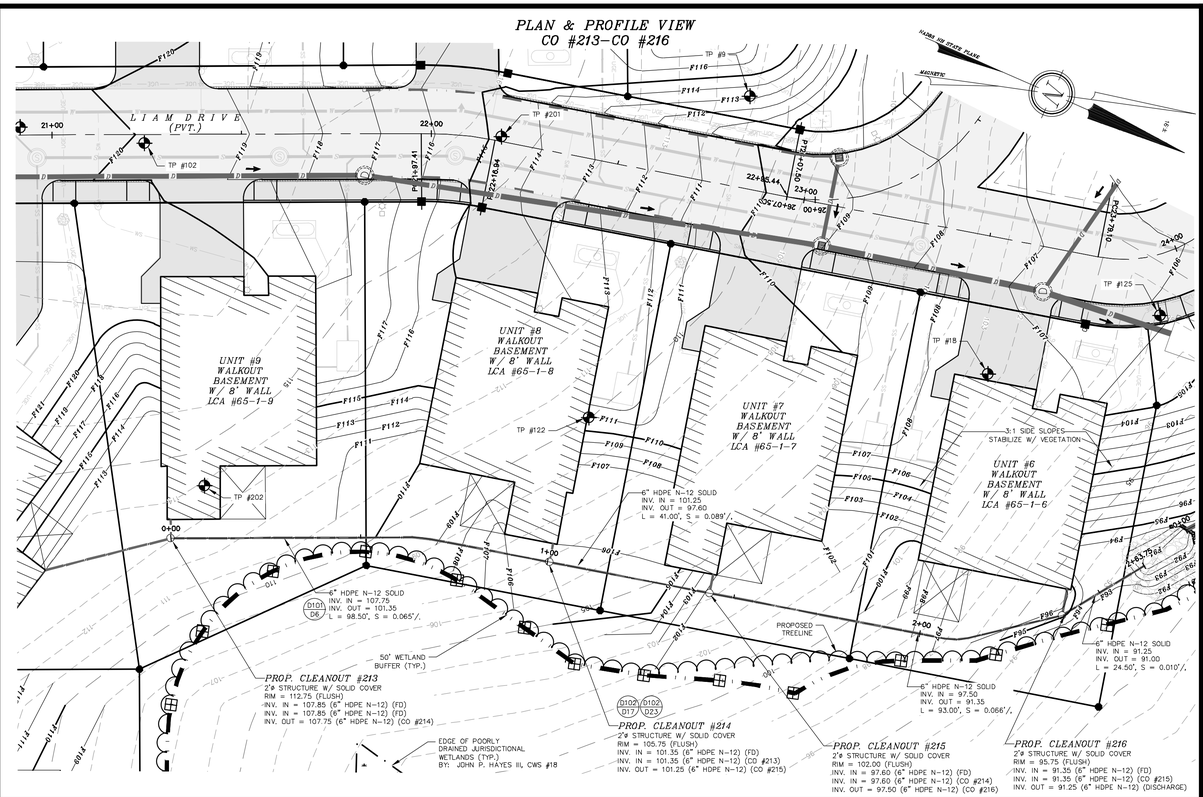
SHEET 42 OF 100

NOT FOR CONSTRUCTION

PLAN & PROFILE VIEW
CO #210–CO #212



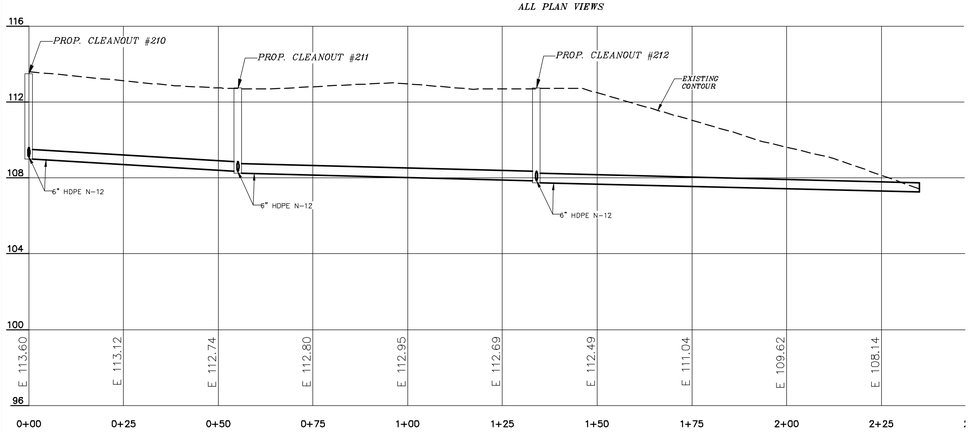
PLAN & PROFILE VIEW
CO #213–CO #216



GRAPHIC SCALE



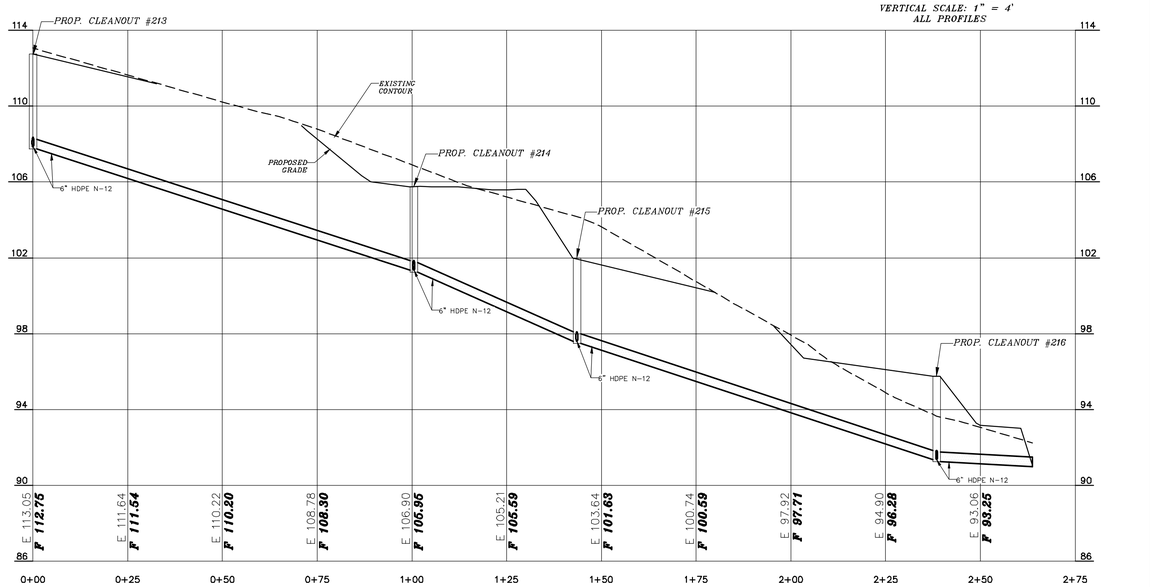
(IN FEET)
1 inch = 20 ft.
ALL PLAN VIEWS



GRAPHIC SCALE



(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'
ALL PROFILES



DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

DRAINAGE PIPE PROFILES (3)
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

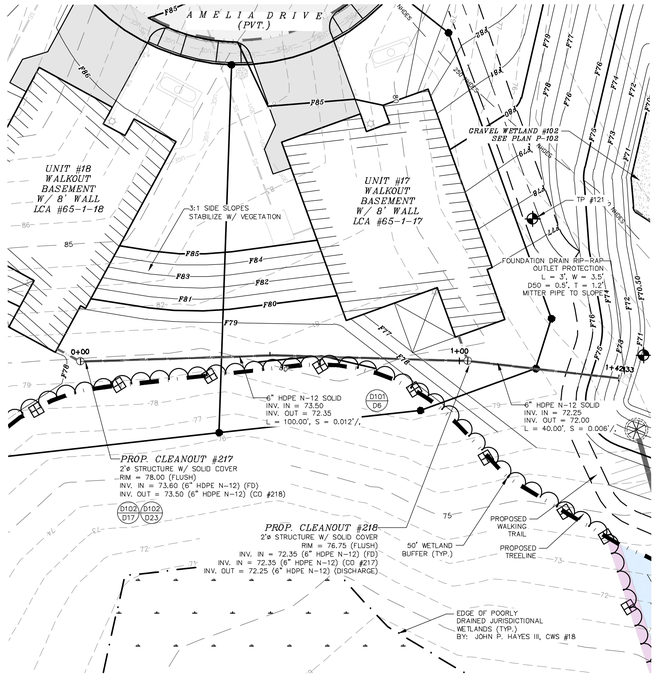
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

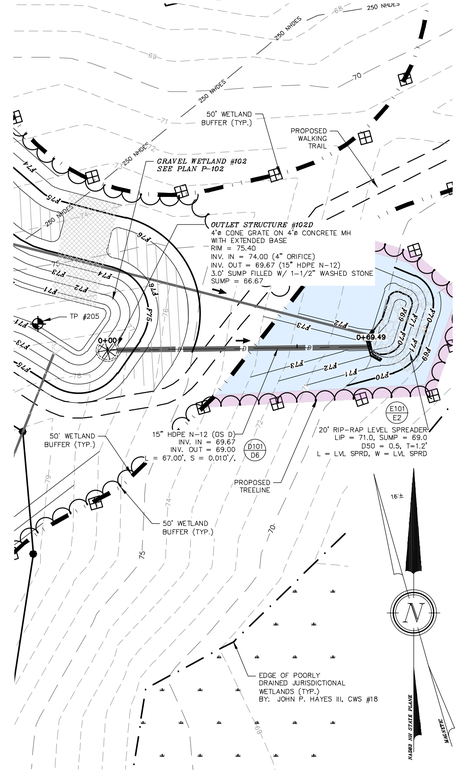
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14143
LICENSED PROFESSIONAL ENGINEER

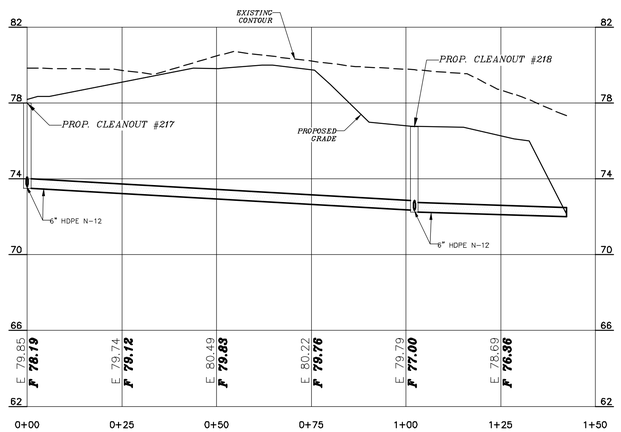
NOT FOR CONSTRUCTION

PLAN & PROFILE VIEW
CO #217–CW #102



PLAN & PROFILE VIEW
CW #102 OS D

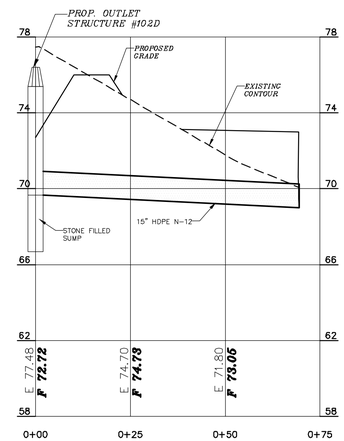




GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'
ALL PROFILES



DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

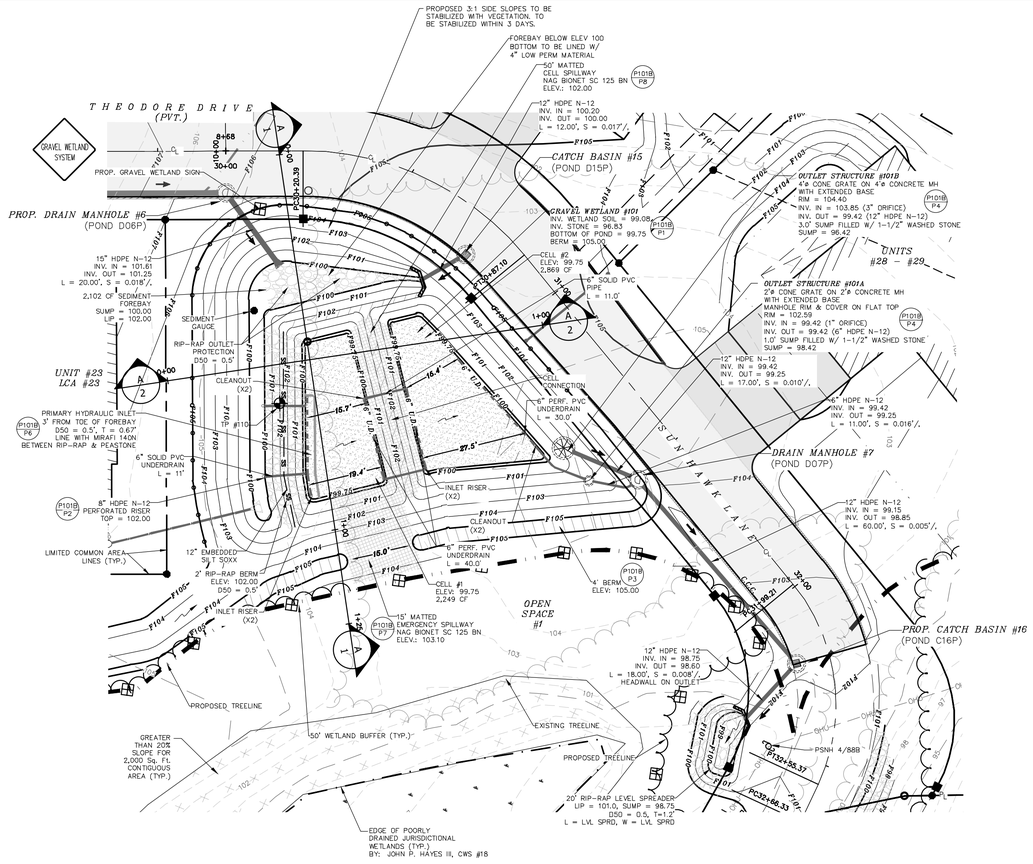
DRAINAGE PIPE PROFILES (4)
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY & SURVEYING ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 12443
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



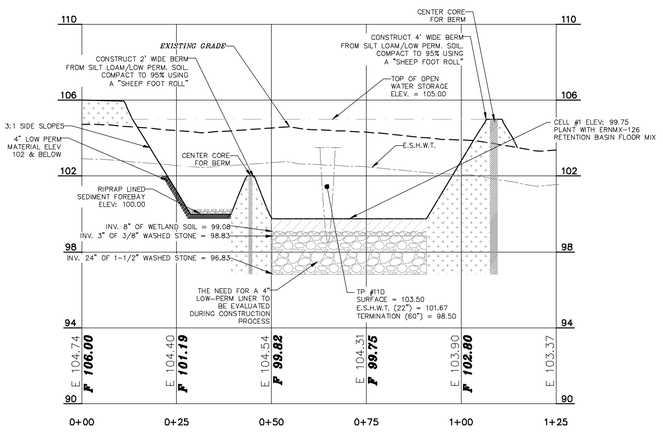
PLAN VIEW
GRAVEL WETLAND #101
SEE P-101B FOR DETAILS



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.



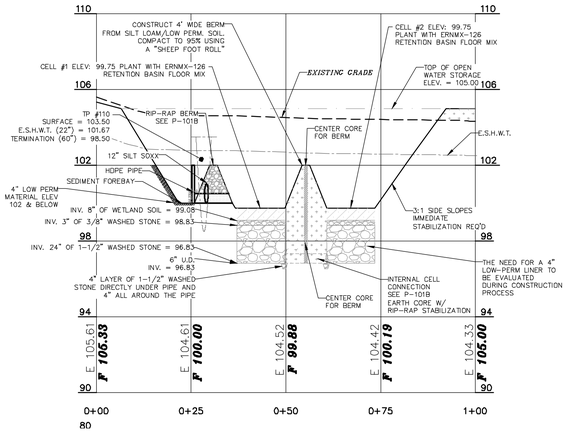
SECTION OF GRAVEL WETLAND #101

A 1

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET) *VERTICAL SCALE: 1" = 4'*
1 inch = 20 ft.



SECTION OF GRAVEL WETLAND #101

A 2

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET) *VERTICAL SCALE: 1" = 4'*
1 inch = 20 ft.

PLAN VIEW / SECTIONS

P-101A

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

SUBSURFACE GRAVEL WETLAND #101 PLAN VIEW & PROFILES
LAND OF
59 TOLEND RD LLC & EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP 8, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

MAINTENANCE REQUIREMENTS

ACTIVITY — CLOGGING AND SYSTEM PERFORMANCE	FREQUENCY
INSPECT INLETS AND OUTLETS TO ENSURE GOOD CONDITION AND NO EVIDENCE OF DETERIORATION. CHECK TO SEE IF HIGH-FLOW BYPASS IS FUNCTIONING. REMEDY: REPAIR OR REPLACE ANY DAMAGED STRUCTUAL PARTS, INLETS AND OUTLETS. CLEAR OR REMOVE DEBRIS OR RESTRICTIONS.	ANNUALLY, MORE FREQUENTLY IN THE FIRST YEAR OF OPERATION
CHECK FOR INTERNAL EROSION, EVIDENCE OF SHORT-CIRCUITING, AND ANIMAL BURROWS. REMEDY: SOIL EROSION FROM SHORT-CIRCUITING OR ANIMAL BOROUGHS SHOULD BE REPAIRED WHEN THEY OCCUR.	
CHECK THAT THE SYSTEM IS FULLY DRAINING WITHIN A 24-48 HOUR PERIOD AFTER RAIN EVENTS. REMEDY: REPAIR OR RESTORE HYDRAULIC INLET OR OUTLET CONFIGURATION.	

VEGETATION	
CHECK FOR ROBUST VEGETATION COVERAGE THROUGHOUT THE SYSTEM AND DEAD OR DYING PLANTS REMEDY: VEGETATION SHOULD COVER > 75% OF THE SYSTEM AND SHOULD BE RESEEDED AND CARED FOR AS NEEDED	ANNUALLY, OR AS NEEDED
CUT AND REMOVE VEGETATION FROM GRAVEL WETLAND SYSTEM AND FOREBAY IN ORDER TO MAINTAIN NITROGEN REMOVAL PERFORMANCE REMEDY: THE VEGETATION SHOULD BE CUT AND REMOVED FROM THE SYSTEM TO PREVENT NITROGEN FROM CYCLING BACK INTO THE SYSTEM	ONCE EVERY 3 YEARS

3/8" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
1/2"	100
3/8"	95 – 100
# 4	22 – 55
# 8	0 – 10

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

1-1/2" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1-1/2"	90 – 100
1"	20 – 55
1-1/2"	0 –15
3/8"	0 –5

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

WETLAND SOIL

SIEVE SIZE	% PASSING BY WEIGHT
0.5	100
#10"	90 – 75
#100	40 – 50
#200	25 –50

SIEVE SIZE	% PASSING TOLERANCES
0.5	±10.0
#10	±5.0
#100	±5.0
#200	±5.0

CONSTRUCTION NOTE: THE DESIGN ENGINEER IS TO BE ON SITE PRIOR TO AND DURING THE PLACEMENT OF THE RESERVOIR STONE, AND TO WITNESS THE INSTALLATION OF THE UNDER-DRAIN AND INTER-CHAMBER PIPES. PLEASE PROVIDE 24 HOURS NOTICE PRIOR TO REQUESTED INSPECTION.

DESIGN REFERENCES

1 UNH STORMWATER CENTER

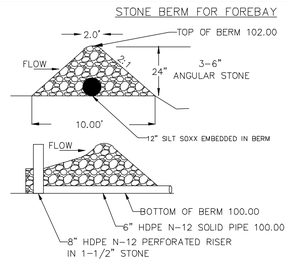
STABILIZATION NOTE:
SEE NOTE #6, SHEET E-102, DETAIL E-18
SIDE SLOPES ARE TO BE STABILIZED WITHIN THREE WORKING DAY UPON COMPLETION OF FINAL GRADE.

GRAVEL WETLAND CONSTRUCTION & MAINTENANCE SPECIFICATIONS

P1

P2

STONE BERM FOR FOREBAY

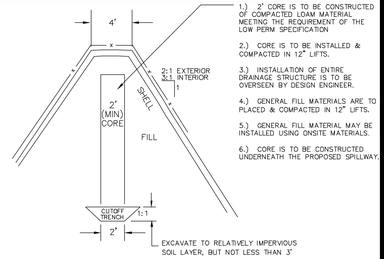


GRAVEL WETLAND SEDIMENT FOREBAY
NOT TO SCALE

P3

LOW PERMEABILITY MATERIAL GRADATION

SIEVE SIZE	% PASSING BY WEIGHT
#4	95 – 100
#40	60 – 95
#100	40 – 60
#200	25 – 45



1.) 2" CORE IS TO BE CONSTRUCTED OF COMPACTED LOAM MATERIAL MEETING THE REQUIREMENT OF THE LOW PERM SPECIFICATION

2.) CORE IS TO BE INSTALLED & COMPACTED IN 12" LIFTS.

3.) INSTALLATION OF ENTIRE DRAINAGE STRUCTURE IS TO BE OVERSEEN BY DESIGN ENGINEER.

4.) GENERAL FILL MATERIALS ARE TO PLACED & COMPACTED IN 12" LIFTS.

5.) GENERAL FILL MATERIAL MAY BE INSTALLED USING ONSITE MATERIALS.

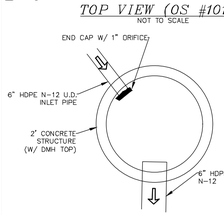
6.) CORE IS TO BE CONSTRUCTED UNDERNEATH THE PROPOSED SPILLWAY.

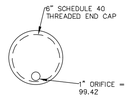
GRAVEL WETLAND BERM CONSTRUCTION
NOT TO SCALE

GRAVEL WETLAND STRUCTURES & DETAILS
NOT TO SCALE

P4

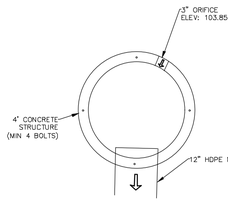
TOP VIEW (OS #101A)
NOT TO SCALE

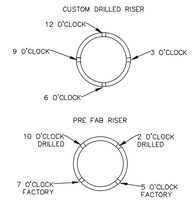




CAP WITH CONTROL ORIFICE (OS #101A)
NOT TO SCALE

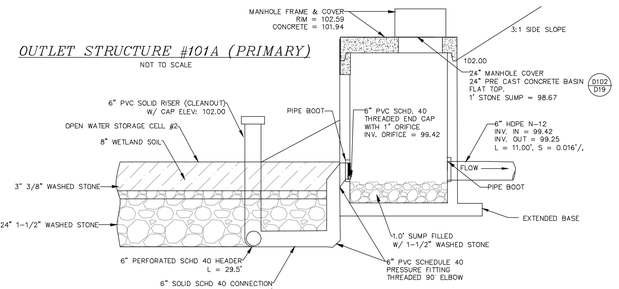
TOP VIEW (OS #101B)
NOT TO SCALE



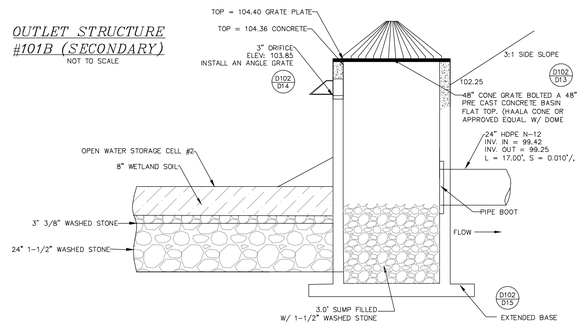


PERFORATED RISER DETAIL
NOT TO SCALE

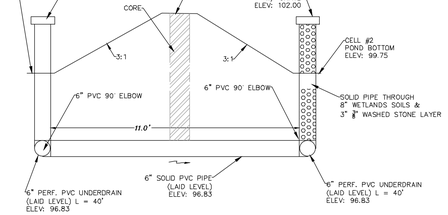
OUTLET STRUCTURE #101A (PRIMARY)
NOT TO SCALE



OUTLET STRUCTURE #101B (SECONDARY)
NOT TO SCALE

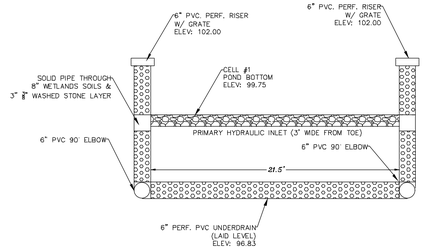


P5



GRAVEL WETLAND CONNECTION SYSTEM
NOT TO SCALE

P6



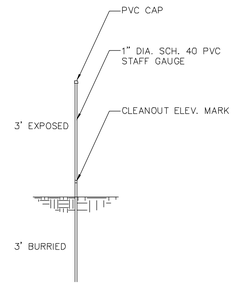
GRAVEL WETLAND INLET SYSTEM
NOT TO SCALE

P9

SEDIMENT FORBAY GAUGE DETAIL

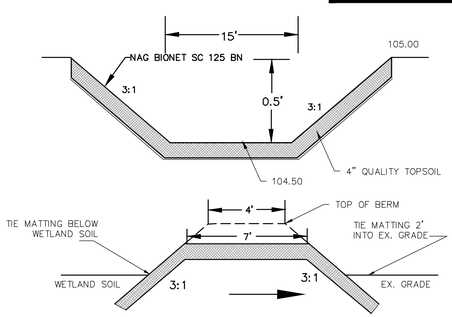
1.) SCHEDULE 40 PVC TO BE DRIVEN OR PLACED IN GROUND A MIN. 3'

2.) CLEANOUT MARK ON STAFF TO BE RED PAINT SET 6" ABOVE POND BOTTOM



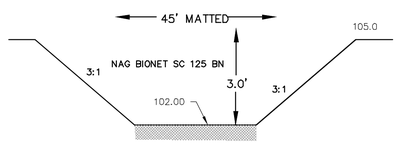
P7

GRAVEL WETLAND SPILLWAY DETAILS
NOT TO SCALE



EMERGENCY SPILLWAY PROFILE
NOT TO SCALE

P8



GRAVEL WETLAND CELL SPILLWAY PROFILE
NOT TO SCALE

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

SUBSURFACE GRAVEL WETLAND #101 DETAILS
LAND OF
59 TOLEND RD LLC & EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP 8, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : N/A
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

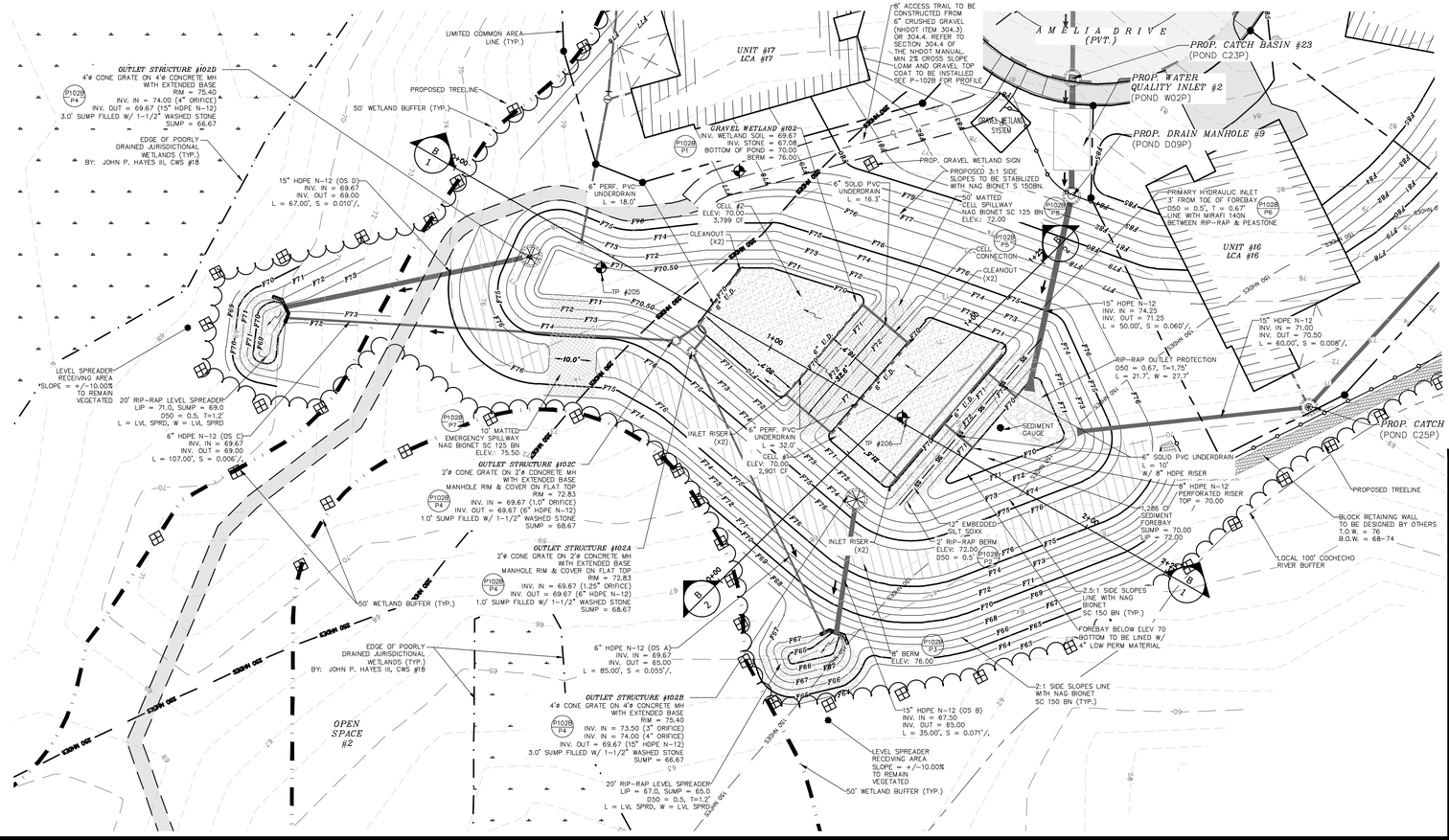
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

DETAILS

P-101B

NOT FOR CONSTRUCTION

NOTE:
FOUR OUTLET STRUCTURES (OS) ARE UTILIZED TO PROPERLY DISTRIBUTE DISCHARGE. OS A&B FLOW TO THE NORTH AND OS C&D FLOW TO THE EAST

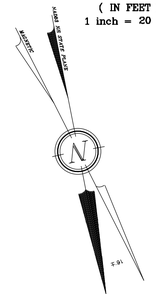


PLAN VIEW
GRAVEL WETLAND #102
SEE P-102B FOR DETAILS

GRAPHIC SCALE

20 0 10 20 40 80

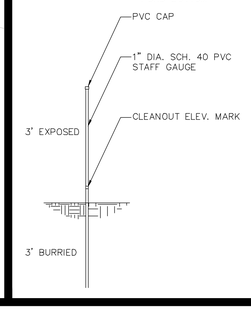
(IN FEET)
1 inch = 20 ft.



SEDIMENT FORBAY GAUGE DETAIL

1.) SCHEDULE 40 PVC TO BE DRIVEN OR PLACED IN GROUND A MIN. 3'

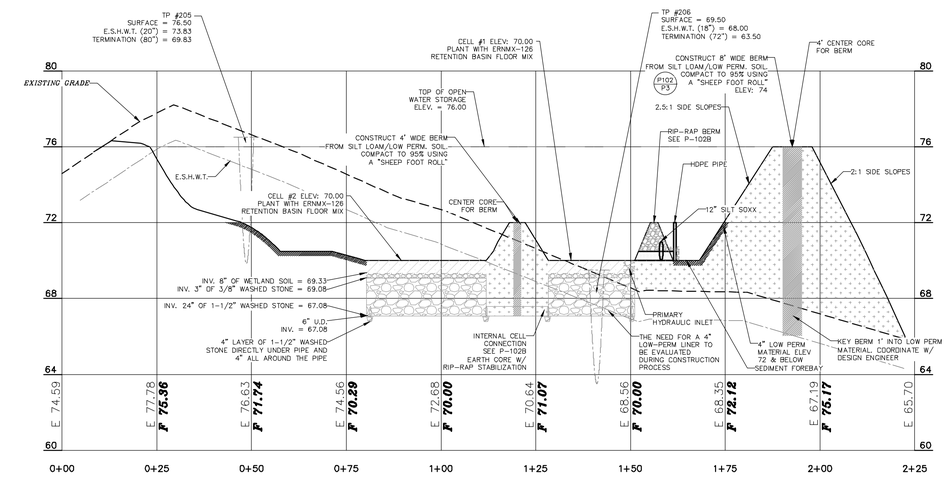
2.) CLEANOUT MARK ON STAFF TO BE RED PAINT SET 6" ABOVE POND BOTTOM



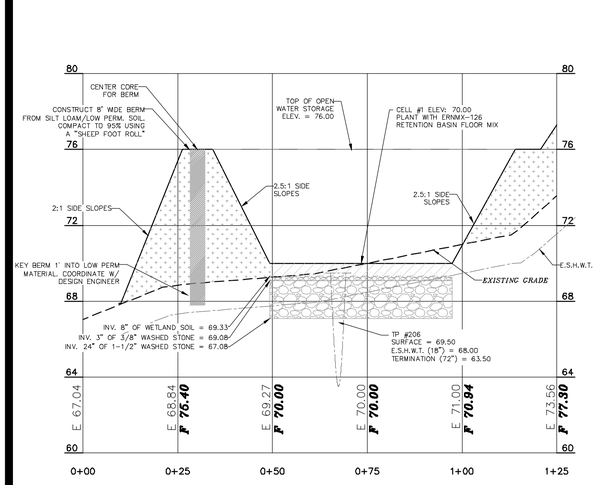
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'



B 1 — SECTION OF GRAVEL WETLAND #102 — B 1



B 2 — SECTION OF GRAVEL WETLAND #102 — B 2

PLAN VIEW / SECTIONS

P-102A

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

SUBSURFACE GRAVEL WETLAND #102 PLAN VIEW & PROFILES
59 TOLEND RD LLC & EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE — KENNETH A. BERRY — No. 15443 — LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

MAINTENANCE REQUIREMENTS

ACTIVITY	CLOGGING AND SYSTEM PERFORMANCE	FREQUENCY
INSPECT INLETS AND OUTLETS TO ENSURE GOOD CONDITION AND NO EVIDENCE OF DETERIORATION. CHECK TO SEE IF HIGH-FLOW BYPASS IS FUNCTIONING.		ANNUALLY, MORE FREQUENTLY IN THE FIRST YEAR OF OPERATION
REMEDY: REPAIR OR REPLACE ANY DAMAGED STRUCTUAL PARTS, INLETS AND OUTLETS. CLEAR OR REMOVE DEBRIS OR RESTRICTIONS.		
CHECK FOR INTERNAL EROSION, EVIDENCE OF SHORT-CIRCUITING, AND ANIMAL BURROWS.		
REMEDY: SOIL EROSION FROM SHORT-CIRCUITING OR ANIMAL BOROUGHS SHOULD BE REPAIRED WHEN THEY OCCUR.		
CHECK THAT THE SYSTEM IS FULLY DRAINING WITHIN A 24-48 HOUR PERIOD AFTER RAIN EVENTS.		
REMEDY: REPAIR OR RESTORE HYDRAULIC INLET OR OUTLET CONFIGURATION.		

VEGETATION

CHECK FOR ROBUST VEGETATION COVERAGE THROUGHOUT THE SYSTEM AND DEAD OR DYING PLANTS	ANNUALLY, OR AS NEEDED
REMEDY: VEGETATION SHOULD COVER > 75% OF THE SYSTEM AND SHOULD BE RESEEDED AND CARED FOR AS NEEDED	
CUT AND REMOVE VEGETATION FROM GRAVEL WETLAND SYSTEM AND FOREBAY IN ORDER TO MAINTAIN NITROGEN REMOVAL PERFORMANCE	ONCE EVERY 3 YEARS
REMEDY: THE VEGETATION SHOULD BE CUT AND REMOVED FROM THE SYSTEM TO PREVENT NITROGEN FROM CYCLING BACK INTO THE SYSTEM	

3/8" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
1/2"	100
3/8"	95 – 100
# 4	22 – 55
# 8	0 – 10

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

1-1/2" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1-1/2"	90 – 100
1"	20 – 55
1-1/2"	0 –15
3/8"	0 –5

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

WETLAND SOIL

SIEVE SIZE	% PASSING BY WEIGHT
0.6	100
#10"	90 – 75
#100	40 – 50
#200	25 –50
SIEVE SIZE	% PASSING TOLERANCES
0.5	±10.0
#10	±5.0
#100	±5.0
#200	±5.0

CONSTRUCTION NOTE: THE DESIGN ENGINEER IS TO BE ON SITE PRIOR TO AND DURING THE PLACEMENT OF THE RESERVOIR STONE, AND TO WITNESS THE INSTALLATION OF THE UNDER-DRAIN AND INTER-CHAMBER PIPES. PLEASE PROVIDE 24 HOURS NOTICE PRIOR TO REQUESTED INSPECTION.

DESIGN REFERENCES

1 UNH STORMWATER CENTER

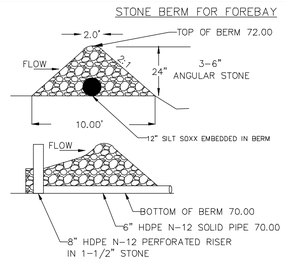
STABILIZATION NOTE:
SEE NOTE #6, SHEET E-102, DETAIL E-18
SIDE SLOPES ARE TO BE STABILIZED WITHIN THREE WORKING DAY UPON COMPLETION OF FINAL GRADE.

GRAVEL WETLAND CONSTRUCTION & MAINTENANCE SPECIFICATIONS

P1

P2

STONE BERM FOR FOREBAY

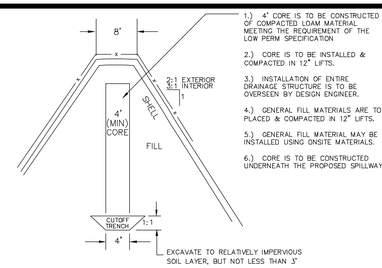


GRAVEL WETLAND SEDIMENT FOREBAY
NOT TO SCALE

P3

LOW PERMEABILITY MATERIAL GRADATION

SIEVE SIZE	% PASSING BY WEIGHT
#4	95 – 100
#40	60 – 95
#100	40 – 60
#200	25 – 45



1.) 4" CORE IS TO BE CONSTRUCTED OF COMPACTED LOAM MATERIAL MEETING THE REQUIREMENT OF THE LOW PERM SPECIFICATION

2.) CORE IS TO BE INSTALLED & COMPACTED IN 12" LIFTS.

3.) INSTALLATION OF ENTIRE DRAINAGE STRUCTURE IS TO BE OVERSEEN BY DESIGN ENGINEER.

4.) GENERAL FILL MATERIALS ARE TO PLACED & COMPACTED IN 12" LIFTS.

5.) GENERAL FILL MATERIAL MAY BE INSTALLED USING ONSITE MATERIALS.

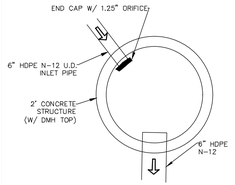
6.) CORE IS TO BE CONSTRUCTED UNDERNEATH THE PROPOSED SPILLWAY.

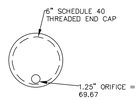
GRAVEL WETLAND BERM CONSTRUCTION
NOT TO SCALE

GRAVEL WETLAND STRUCTURES & DETAILS
NOT TO SCALE

P4

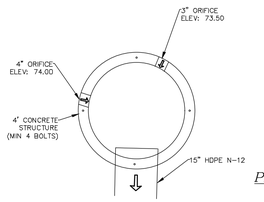
TOP VIEW (OS #102A)
NOT TO SCALE

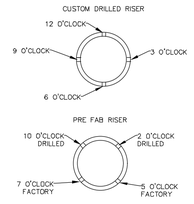




CAP WITH CONTROL ORIFICE (OS #102A)
NOT TO SCALE

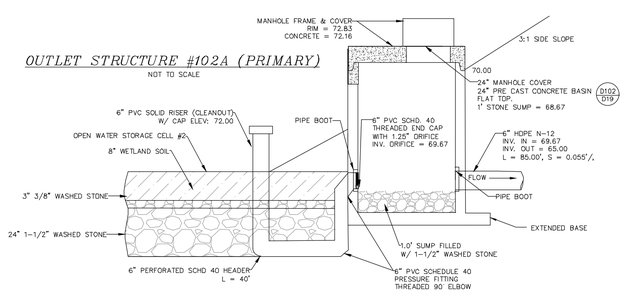
TOP VIEW (OS #102B)
NOT TO SCALE



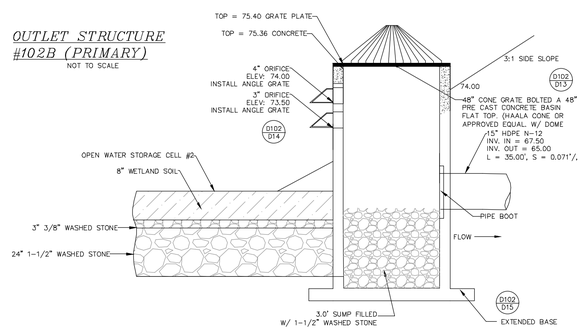


PERFORATED RISER DETAIL
NOT TO SCALE

OUTLET STRUCTURE #102A (PRIMARY)
NOT TO SCALE

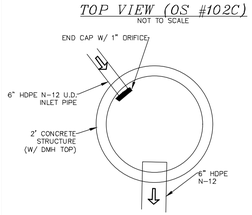


OUTLET STRUCTURE #102B (PRIMARY)
NOT TO SCALE



GRAVEL WETLAND STRUCTURES & DETAILS
NOT TO SCALE

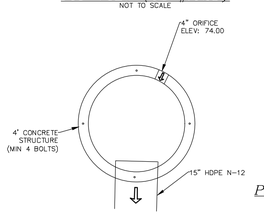
TOP VIEW (OS #102C)
NOT TO SCALE

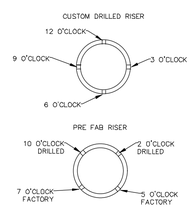




CAP WITH CONTROL ORIFICE (OS #102C)
NOT TO SCALE

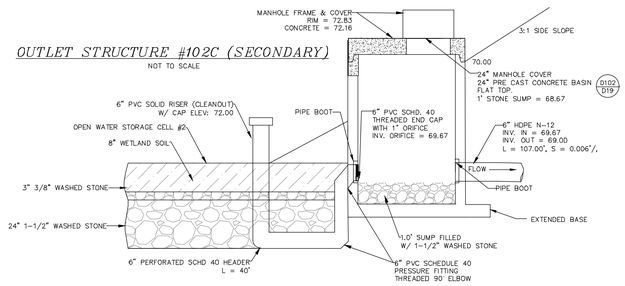
TOP VIEW (OS #102D)
NOT TO SCALE



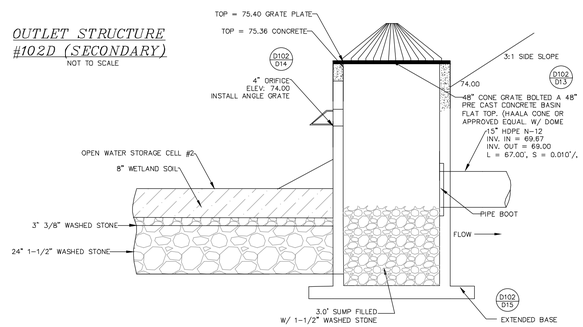


PERFORATED RISER DETAIL
NOT TO SCALE

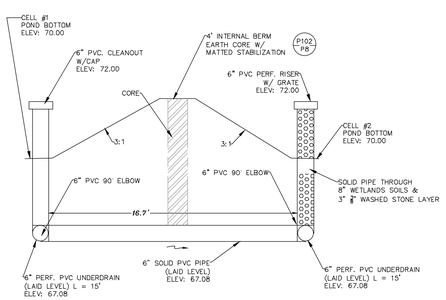
OUTLET STRUCTURE #102C (SECONDARY)
NOT TO SCALE



OUTLET STRUCTURE #102D (SECONDARY)
NOT TO SCALE

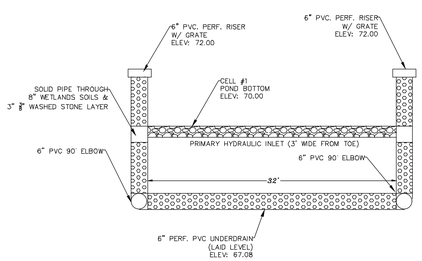


P5



GRAVEL WETLAND CONNECTION SYSTEM
NOT TO SCALE

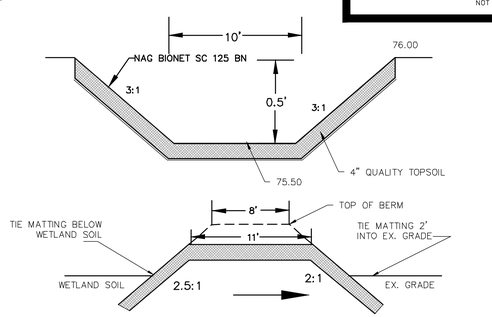
P6



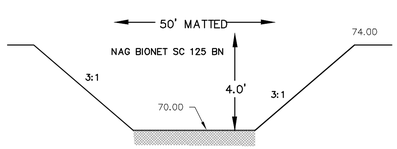
GRAVEL WETLAND INLET SYSTEM
NOT TO SCALE

P7

GRAVEL WETLAND SPILLWAY DETAILS
NOT TO SCALE



EMERGENCY SPILLWAY PROFILE
NOT TO SCALE



GRAVEL WETLAND CELL SPILLWAY PROFILE
NOT TO SCALE

P8

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

SUBSURFACE GRAVEL WETLAND #102 DETAILS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : N/A
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

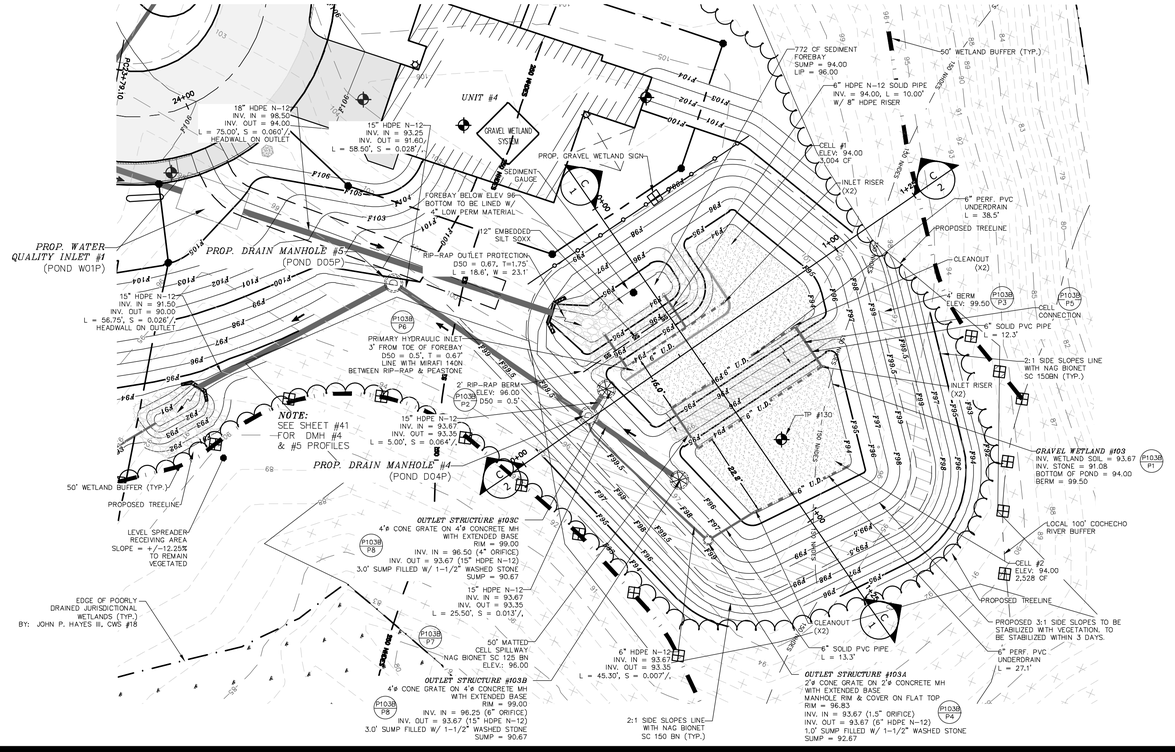
STATE OF NEW HAMPSHIRE – KENNETH A. BERRY NO. 14243 – LICENSED PROFESSIONAL ENGINEER

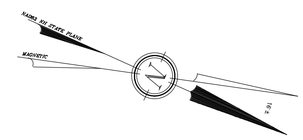
DETAILS

P-102B

NOT FOR CONSTRUCTION

PLAN VIEW
GRAVEL WETLAND #103
SEE P-103B FOR DETAILS

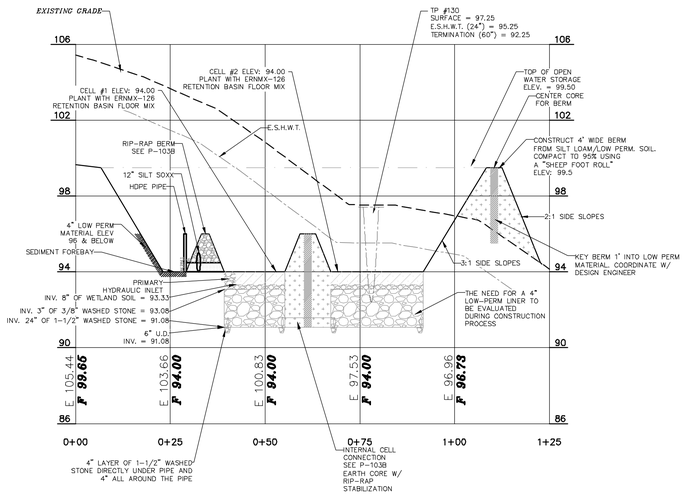




GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.



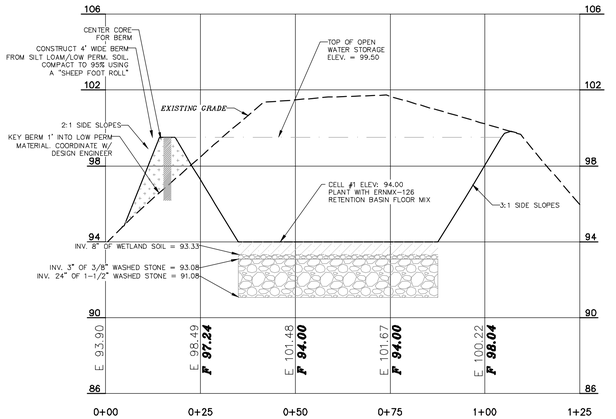
SECTION OF GRAVEL WETLAND #103

C 1 — C 1

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET) VERTICAL SCALE: 1" = 4'
1 inch = 20 ft.



SECTION OF GRAVEL WETLAND #103

C 2 — C 2

PLAN VIEW / SECTIONS

P-103A

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

SUBSURFACE GRAVEL WETLAND #103 PLAN VIEW & PROFILES
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY & SURVEYING ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
NO. 14143
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

P1

MAINTENANCE REQUIREMENTS

ACTIVITY	CLOGGING AND SYSTEM PERFORMANCE	FREQUENCY
	INSPECT INLETS AND OUTLETS TO ENSURE GOOD CONDITION AND NO EVIDENCE OF DETERIORATION. CHECK TO SEE IF HIGH-FLOW BYPASS IS FUNCTIONING. REMEDY: REPAIR OR REPLACE ANY DAMAGED STRUCTUAL PARTS, INLETS AND OUTLETS. CLEAR OR REMOVE DEBRIS OR RESTRICTIONS.	ANNUALLY, MORE FREQUENTLY IN THE FIRST YEAR OF OPERATION
	CHECK FOR INTERNAL EROSION, EVIDENCE OF SHORT-CIRCUITING, AND ANIMAL BURROWS. REMEDY: SOIL EROSION FROM SHORT-CIRCUITING OR ANIMAL BOROUGHS SHOULD BE REPAIRED WHEN THEY OCCUR.	
	CHECK THAT THE SYSTEM IS FULLY DRAINING WITHIN A 24-48 HOUR PERIOD AFTER RAIN EVENTS. REMEDY: REPAIR OR RESTORE HYDRAULIC INLET OR OUTLET CONFIGURATION.	

VEGETATION		
	CHECK FOR ROBUST VEGETATION COVERAGE THROUGHOUT THE SYSTEM AND DEAD OR DYING PLANTS REMEDY: VEGETATION SHOULD COVER > 75% OF THE SYSTEM AND SHOULD BE RESEEDED AND CARED FOR AS NEEDED	ANNUALLY, OR AS NEEDED
	CUT AND REMOVE VEGETATION FROM GRAVEL WETLAND SYSTEM AND FOREBAY IN ORDER TO MAINTAIN NITROGEN REMOVAL PERFORMANCE REMEDY: THE VEGETATION SHOULD BE CUT AND REMOVED FROM THE SYSTEM TO PREVENT NITROGEN FROM CYCLING BACK INTO THE SYSTEM	ONCE EVERY 3 YEARS

3/8" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
1/2"	100
3/8"	95 - 100
# 4	22 - 55
# 8	0 - 10

* EQUIVALENT TO STANDARD WASHED STONE - SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

1-1/2" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1-1/2"	90 - 100
1"	20 - 55
1-1/2"	0 -15
3/8"	0 -5

* EQUIVALENT TO STANDARD WASHED STONE - SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

WETLAND SOIL

SIEVE SIZE	% PASSING BY WEIGHT
0.5	100
#10"	90 - 75
#100	40 - 50
#200	25 -50
SIEVE SIZE	% PASSING TOLERANCES
0.5	±10.0
#10	±5.0
#100	±5.0
#200	±5.0

CONSTRUCTION NOTE: THE DESIGN ENGINEER IS TO BE ON SITE PRIOR TO AND DURING THE PLACEMENT OF THE RESERVOIR STONE, AND TO WITNESS THE INSTALLATION OF THE UNDER-DRAIN AND INTER-CHAMBER PIPES. PLEASE PROVIDE 24 HOURS NOTICE PRIOR TO REQUESTED INSPECTION.

DESIGN REFERENCES

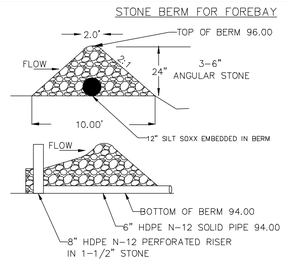
1 UNH STORMWATER CENTER

STABILIZATION NOTE:
SEE NOTE #6, SHEET E-102, DETAIL E-18
SIDE SLOPES ARE TO BE STABILIZED WITHIN THREE WORKING DAY UPON COMPLETION OF FINAL GRADE.

GRAVEL WETLAND CONSTRUCTION & MAINTENANCE SPECIFICATIONS

P2

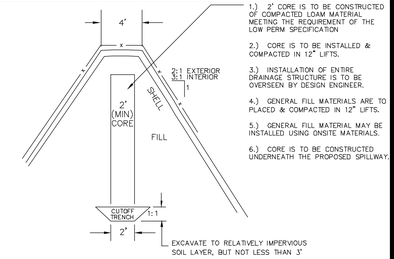
STONE BERM FOR FOREBAY



GRAVEL WETLAND SEDIMENT FOREBAY
NOT TO SCALE

P3

LOW PERMEABILITY MATERIAL GRADATION	
SIEVE SIZE	% PASSING BY WEIGHT
#4	95 - 100
#40	60 - 95
#100	40 - 60
#200	25 - 45



1.) 2" CORE IS TO BE CONSTRUCTED OF COMPACTED LOAM MATERIAL MEETING THE REQUIREMENT OF THE LOW PERM SPECIFICATION

2.) CORE IS TO BE INSTALLED & COMPACTED IN 12" LIFTS.

3.) INSTALLATION OF ENTIRE DRAINAGE STRUCTURE IS TO BE OVERSEEN BY DESIGN ENGINEER.

4.) GENERAL FILL MATERIALS ARE TO PLACED & COMPACTED IN 12" LIFTS.

5.) GENERAL FILL MATERIAL MAY BE INSTALLED USING ONSITE MATERIALS.

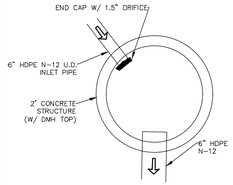
6.) CORE IS TO BE CONSTRUCTED UNDERNEATH THE PROPOSED SPILLWAY.

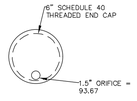
GRAVEL WETLAND BERM CONSTRUCTION
NOT TO SCALE

GRAVEL WETLAND STRUCTURES & DETAILS
NOT TO SCALE

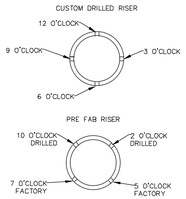
P4

TOP VIEW (OS #103A)
NOT TO SCALE



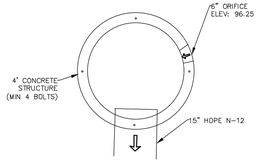


CAP WITH CONTROL ORIFICE (OS #103A)
NOT TO SCALE

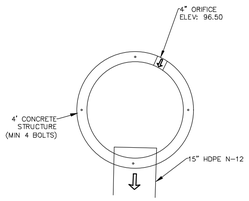


PERFORATED RISER DETAIL
NOT TO SCALE

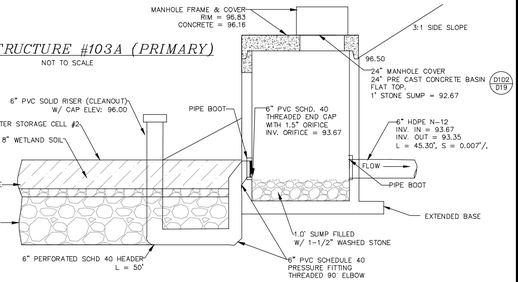
TOP VIEW (OS #103B)
NOT TO SCALE



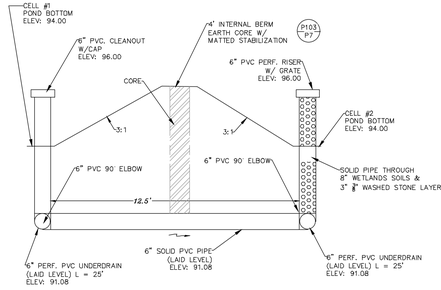
TOP VIEW (OS #103C)
NOT TO SCALE



OUTLET STRUCTURE #103A (PRIMARY)
NOT TO SCALE

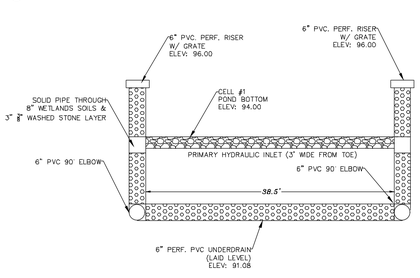


P5



GRAVEL WETLAND CONNECTION SYSTEM
NOT TO SCALE

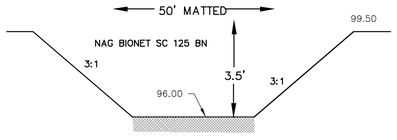
P6



GRAVEL WETLAND INLET SYSTEM
NOT TO SCALE

P7

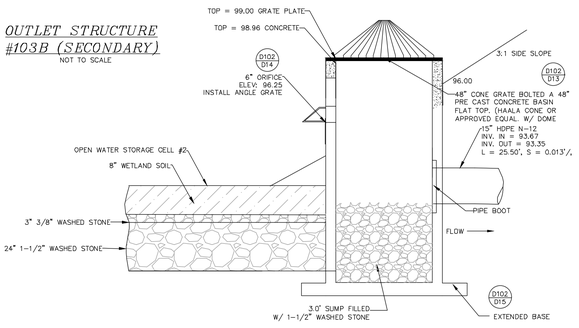
GRAVEL WETLAND SPILLWAY DETAILS
NOT TO SCALE



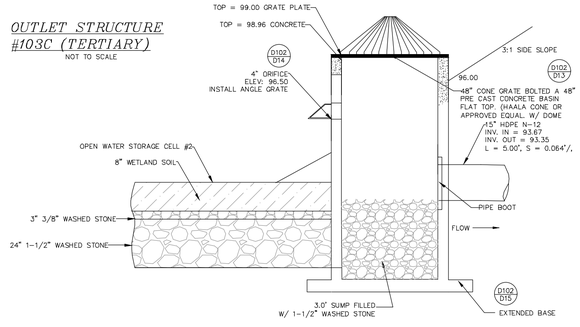
GRAVEL WETLAND CELL SPILLWAY PROFILE
NOT TO SCALE

P8

OUTLET STRUCTURE #103B (SECONDARY)
NOT TO SCALE



OUTLET STRUCTURE #103C (TERTIARY)
NOT TO SCALE

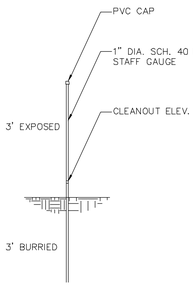


P9

SEDIMENT FORBAY GAUGE DETAIL

1.) SCHEDULE 40 PVC TO BE DRIVEN OR PLACED IN GROUND A MIN. 3'

2.) CLEANOUT MARK ON STAFF TO BE RED PAINT SET 6" ABOVE POND BOTTOM



DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

SUBSURFACE GRAVEL WETLAND #103 DETAILS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP 8, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : N/A
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 15434
LICENSED PROFESSIONAL ENGINEER

DETAILS

P-103B

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

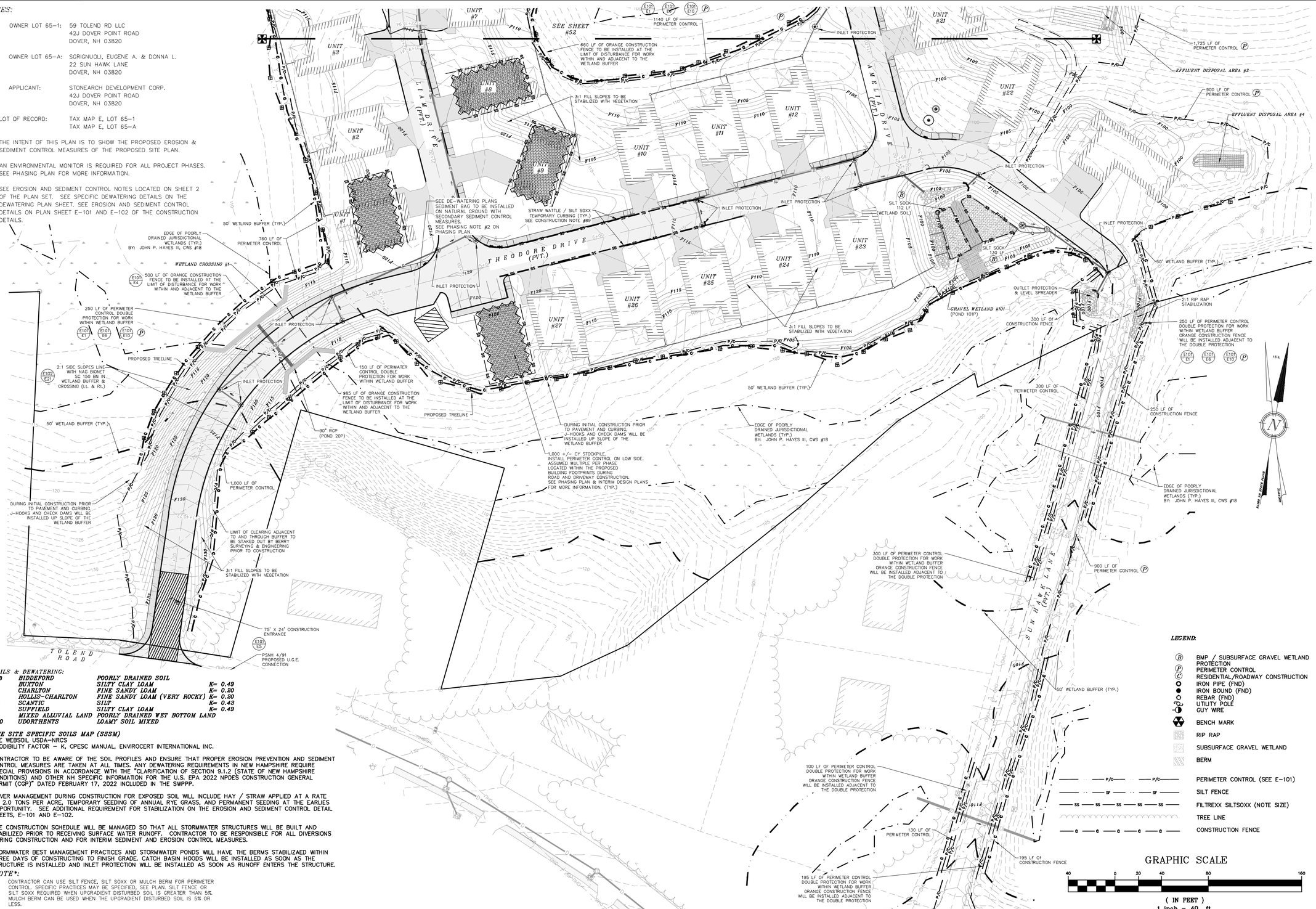
1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED EROSION & SEDIMENT CONTROL MEASURES OF THE PROPOSED SITE PLAN.

4.) AN ENVIRONMENTAL MONITOR IS REQUIRED FOR ALL PROJECT PHASES. SEE PHASING PLAN FOR MORE INFORMATION.

5.) SEE EROSION AND SEDIMENT CONTROL NOTES LOCATED ON SHEET 2 OF THE PLAN SET. SEE SPECIFIC DEWATERING DETAILS ON THE DEWATERING PLAN SHEET. SEE EROSION AND SEDIMENT CONTROL DETAILS ON PLAN SHEET E–101 AND E–102 OF THE CONSTRUCTION DETAILS.



LEGEND:

- (B) BMP / SUBSURFACE GRAVEL WETLAND PROTECTION
- (P) PERIMETER CONTROL
- (C) RESIDENTIAL/ROADWAY CONSTRUCTION
- IRON PIPE (FND)
- IRON BOUND (FND)
- REBAR (FND)
- UTILITY POLE
- GUY WIRE
- BENCH MARK
- RIP RAP
- SUBSURFACE GRAVEL WETLAND
- BERM
- P/C — P/C — PERIMETER CONTROL (SEE E–101)
- SF — SF — SILT FENCE
- SS — SS — SS — SS — SS — FILTREXX SILTSOXX (NOTE SIZE)
- TREE LINE
- C — C — C — C — C — CONSTRUCTION FENCE

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

SOILS & DEWATERING:

BmB	BIDDEFORD	POORLY DRAINED SOIL	
Bx	BUXTON	SILTY CLAY LOAM	K= 0.49
Ch	CHARLTON	FINE SANDY LOAM	K= 0.20
Hk	HOLLIS–CHARLTON	FINE SANDY LOAM (VERY ROCKY)	K= 0.20
Sc	SCANTIC	SILT	K= 0.43
Sf	SUFFIELD	SILTY CLAY LOAM	K= 0.49
Mi	MIXED ALLUVIAL LAND	POORLY DRAINED WET BOTTOM LAND	
SOO	UDORTHENTS	LOAMY SOIL MIXED	

SEE SITE SPECIFIC SOILS MAP (SSSM)
SEE WEBSOIL USDA–NRCS
ERODIBILITY FACTOR – K, CPESC MANUAL, ENVIROCERT INTERNATIONAL INC.

CONTRACTOR TO BE AWARE OF THE SOIL PROFILES AND ENSURE THAT PROPER EROSION PREVENTION AND SEDIMENT CONTROL MEASURES ARE TAKEN AT ALL TIMES. ANY DEWATERING REQUIREMENTS IN NEW HAMPSHIRE REQUIRE SPECIAL PROVISIONS IN ACCORDANCE WITH THE "CLARIFICATION OF SECTION 9.1.2 (STATE OF NEW HAMPSHIRE CONDITIONS) AND OTHER NH SPECIFIC INFORMATION FOR THE U.S. EPA 2022 NPDES CONSTRUCTION GENERAL PERMIT (CGP)" DATED FEBRUARY 17, 2022 INCLUDED IN THE SWPPP.

COVER MANAGEMENT DURING CONSTRUCTION FOR EXPOSED SOIL WILL INCLUDE HAY / STRAW APPLIED AT A RATE OF 2.0 TONS PER ACRE, TEMPORARY SEEDING OF ANNUAL RYE GRASS, AND PERMANENT SEEDING AT THE EARLIES OPPORTUNITY. SEE ADDITIONAL REQUIREMENT FOR STABILIZATION ON THE EROSION AND SEDIMENT CONTROL DETAIL SHEETS, E–101 AND E–102.

THE CONSTRUCTION SCHEDULE WILL BE MANAGED SO THAT ALL STORMWATER STRUCTURES WILL BE BUILT AND STABILIZED PRIOR TO RECEIVING SURFACE WATER RUNOFF. CONTRACTOR TO BE RESPONSIBLE FOR ALL DIVERSIONS DURING CONSTRUCTION AND FOR INTERIM SEDIMENT AND EROSION CONTROL MEASURES.

STORMWATER BEST MANAGEMENT PRACTICES AND STORMWATER PONDS WILL HAVE THE BERMS STABILIZED WITHIN THREE DAYS OF CONSTRUCTING TO FINISH GRADE. CATCH BASIN HOODS WILL BE INSTALLED AS SOON AS THE STRUCTURE IS INSTALLED AND INLET PROTECTION WILL BE INSTALLED AS SOON AS RUNOFF ENTERS THE STRUCTURE.

**NOTE*:*

1.) CONTRACTOR CAN USE SILT FENCE, SILT SOXX OR MULCH BERM FOR PERIMETER CONTROL. SPECIFIC PRACTICES MAY BE SPECIFIED, SEE PLAN. SILT FENCE OR SILT SOXX REQUIRED WHEN UPGRADIENT DISTURBED SOIL IS GREATER THAN 5%. MULCH BERM CAN BE USED WHEN THE UPGRADIENT DISTURBED SOIL IS 5% OR LESS.

2.) INTERIM SLOPE CONTROL MAY BE NEEDEDDURING RESIDENTIAL CONSTRUCTION.

DOVER PLANNING FILE #P23–XX

	REVISION	DATE	DESCRIPTION

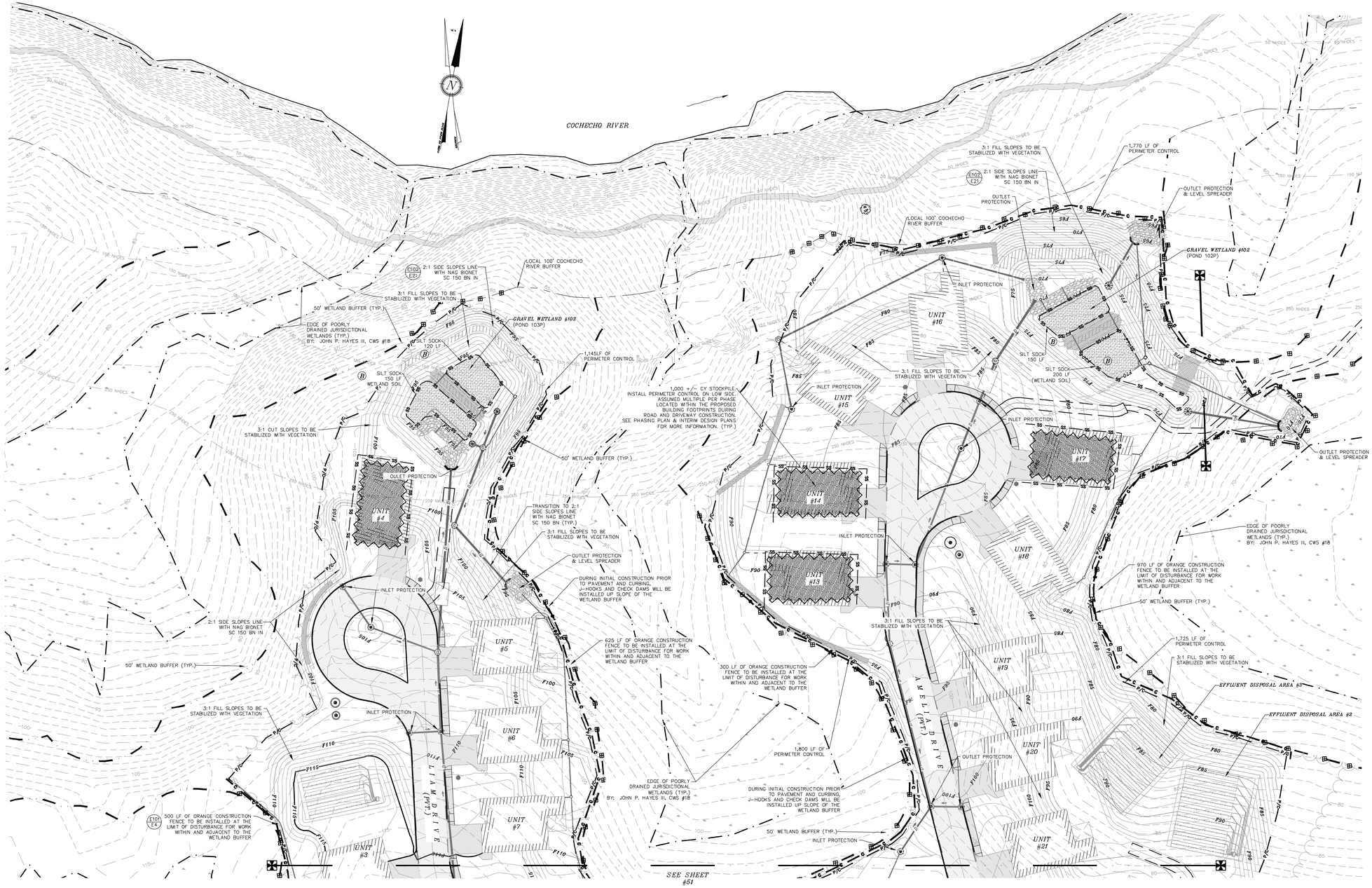
EROSION AND SEDIMENT CONTROL PLAN
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 40 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 13243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

NOTES:

3.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED EROSION & SEDIMENT CONTROL MEASURES OF THE PROPOSED SITE PLAN.

4.) AN ENVIRONMENTAL MONITOR IS REQUIRED FOR ALL PROJECT PHASES. SEE PHASING PLAN FOR MORE INFORMATION.

5.) SEE EROSION AND SEDIMENT CONTROL NOTES LOCATED ON SHEET 2 OF THE PLAN SET. SEE SPECIFIC DEWATERING DETAILS ON THE DEWATERING PLAN SHEET. SEE EROSION AND SEDIMENT CONTROL DETAILS ON PLAN SHEET E–101 AND E–102 OF THE CONSTRUCTION DETAILS.

**NOTE*:*

1.) CONTRACTOR CAN USE SILT FENCE, SILT SOXX OR MULCH BERM FOR PERIMETER CONTROL. SPECIFIC PRACTICES MAY BE SPECIFIED, SEE PLAN. SILT FENCE OR SILT SOXX REQUIRED WHEN UPGRADIENT DISTURBED SOIL IS GREATER THAN 5% MULCH BERM CAN BE USED WHEN THE UPGRADIENT DISTURBED SOIL IS 5% OR LESS.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

EROSION AND SEDIMENT CONTROL PLAN
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 40 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE AND OVERVIEW OF UTILITY AND ENGINEERING DETAILS OF RIVERSIDE ESTATES. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 5' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

EXISTING LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- NHHB BOUND ~FND~
- UTILITY POLE / GUY WIRE
- BUILDING SETBACK LINE
- OVERHEAD UTILITIES LINE
- CONTOUR LINE, MINOR
- CONTOUR LINE, MAJOR
- WETLAND LINE
- EXISTING STREAM
- EXISTING TRAIL
- 50' WETLAND BUFFER
- DRAINAGE LINE
- 50' NHDES PRIMARY SETBACK
- 150' NHDES NATURAL WOODLAND BUFFER
- 250' NHDES SHORELAND PROTECTION ZONE
- 100' LOCAL CONSERVATION OVERLAY ZONE
- TEST PIT
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. TYPICAL
- FND FOUND

PROPOSED LEGEND:

- 3/4" REBAR W/ ID CAP ~TBS~
- PROPOSED LOT LINE REVISION LINE
- LIGHT TYPE "A" MOUNTED LIGHT POLE
- LIGHT TYPE "B" MOUNTED ON UNIT
- SEWER MANHOLE W/ STRUCTURE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 DETAIL SHEET / DETAIL
- MATCH POINT
- MATCH LINE
- CONTOUR MINOR, PROPOSED
- CONTOUR MAJOR, PROPOSED
- DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- SHOULDER
- CENTER LINE
- TRANSFORMER / J.BOX
- UNDERGROUND UTILITY
- UNDER DRAIN
- GATE VALVE
- CURB STOP
- FIRE HYDRANT OR POST HYDRANT
- THRUST BLOCKS
- PROPOSED WATER MAIN LINE
- PROPOSED WATER SERVICE
- PROPOSED GRAVITY SEWER LINE
- PROPOSED SEWER FORCEMAIN
- PROPOSED GRAVITY SEWER SERVICE
- PROPOSED GAS LINE / UG LP TANK
- EFFLUENT DISPOSAL AREA

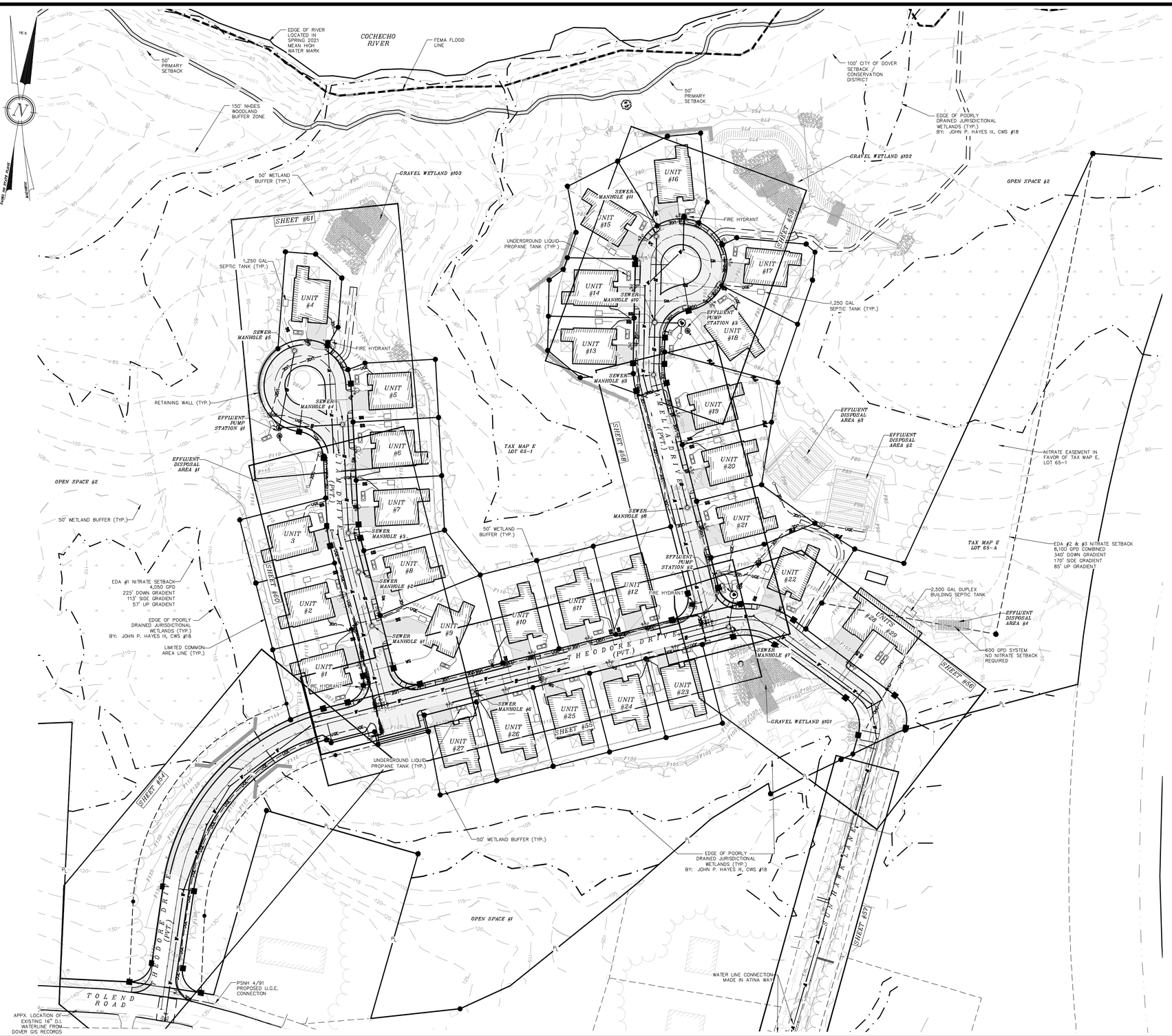
UTILITY PLANS TABLE OF CONTENTS:

SHEET #53: OVERVIEW UTILITY PLAN
SHEET #54: UTILITY P&P THEODORE DRIVE 0+00–4+00
SHEET #55: UTILITY P&P THEODORE DRIVE 4+00–END
SHEET #56: UTILITY P&P SUN HAWK LANE 30+00–30+00
SHEET #57: UTILITY P&P SUN HAWK LANE 33+00–END
SHEET #58: UTILITY P&P AMELIA DRIVE 10+00–13+00
SHEET #59: UTILITY P&P AMELIA DRIVE 13+00–END
SHEET #60: UTILITY P&P LIAM DRIVE 20+00–23+00
SHEET #61: UTILITY P&P LIAM DRIVE 23+00–END
SHEET #62: FORCEMAIN P&P'S
SHEET #63: GST SYSTEM EDA #1
SHEET #64: GST SYSTEM EDA #2
SHEET #65: GST SYSTEM EDA #3
SHEET #66: GST EDA SYSTEM SECTIONS
SHEET #67: ADVANCED ENVIRO SYSTEM EDA #4
SHEETS #95–#98: UTILITY CONSTRUCTION DETAILS U–101–U104

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.



DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

RESIDENTIAL OVERVIEW UTILITY PLAN
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 60 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14143
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE UTILITY AND ENGINEERING DETAILS OF THEODORE DRIVE. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

6.) APPROXIMATE INTERNAL PLUMBING SHOWN FOR PLANNING BUILDING EXIT PURPOSES ONLY. NO INTERNAL CLEANOUTS ALLOWED.

TAX MAP E, LOT 65–1

TAX MAP E, LOT 65–B

TOLEND ROAD

THEODORE DRIVE (PVT.)

CIVIL CONSULT. I.B. (FND) +0.3'

PSNH 4/92

LAMP "A" HEIGHT = 10'

PAVEMENT INLAY 20' X 27.5' (550 SF)

8" D.I. GATE VALVE (TAPPING X M.J.)

APPX. LOCATION OF EXISTING 16" D.I. WATERLINE FROM DOVER GIS RECORDS

8"x16" STAINLESS STEEL TAPPING SLEEVE M.J. X TAPPING VALVE INSTALL T. BLOCK.

CHLORINATION TAP

3/4" TYPE "K" COPPER PIPE TO CURB STOP

PSNH 4/91 PROPOSED U.G.E. CONNECTION

TP #27

TP #26

TP #200

PROP. CATCH BASIN #2

PROP. CATCH BASIN #4

PROP. CATCH BASIN #1

PROP. CATCH BASIN #3

30" RCP

12" HDPE N–12

INSTALL 11.25° BEND W/ THRUST BLOCK

INSTALL 22.5° BEND W/ THRUST BLOCK

80 LF 8" CLDI CL 52 W/ POLYWRAP

51 LF 8" CLDI CL 52 W/ POLYWRAP

123 LF 8" CLDI CL 52 W/ POLYWRAP

150 LF 8" CLDI CL 52 W/ POLYWRAP

EDGE OF POORLY DRAINED JURISDICTIONAL WETLANDS (TYP.) BY: JOHN P. HAYES III, CWS #18

1+00

2+00

3+00

4+00

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PLAN VIEW THEODORE DRIVE 0+00 TO 4+00

PLAN VIEW THEODORE DRIVE 0+00 TO 4+00

THEODORE DRIVE STA: 0+14.50 ELEV: 137.15

EDGE OF PAVEMENT

4.00%

-8.00%

PVC STA.0+92.50 PVC ELEV.134.03

45.00 VC K 11.25

PVI STA.1+15.00 PVI ELEV.133.13

PVT STA.1+37.50 PVT ELEV.131.33

PVC STA.2+10.00 PVC ELEV.129.53

180.00 VC K 20.00

PVI STA.3+00.00 PVI ELEV.118.33

PVT STA.3+90.00 PVT ELEV.119.23

SAG STA.3+70.00 SAG ELEV.119.13

EXISTING 16" D.I. WATERLINE PER DOVER GIS RECORDS. ASSUMED 5' DEEP CONFIRM BEFORE CONSTRUCTION. STAINLESS STEEL TAP AND SLEEVE.

CHLORINATION TAP

UNDERGROUND UTILITIES

PROPOSED GRADE

EXISTING CONTOUR

8" C.L.D.I. CL 52 W/ POLYWRAP

30" RCP W/ 6" BURY

1.5' MIN OF VERTICAL SEPARATION AT ALL UTILITY CROSSINGS (TYP.)

E 137.00

–0+15

E136.83	E137.71	E136.24	E132.46	E128.28	E126.63	E125.82	E125.68	E123.28	E118.67	E114.87	E112.64	E111.20	E111.30	E111.97	E114.39	E115.98			
	F136.78	F135.79	F134.79	F133.71	F132.26	F130.33	F128.33	F126.83	F124.39	F122.79	F121.39	F120.36	F119.84	F119.23	F119.14	F119.33			
0+00	0+25	0+50	0+75	1+00	1+25	1+50	1+75	2+00	2+25	2+50	2+75	3+00	3+25	3+50	3+75	4+00			

138 134 130 126 122 118 114 110 106

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

UTILITY & PROFILE THEODORE DRIVE 0+00 TO 4+00
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE KENNETH A. BERRY No. 19343 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE UTILITY AND ENGINEERING DETAILS OF THEODORE DRIVE. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

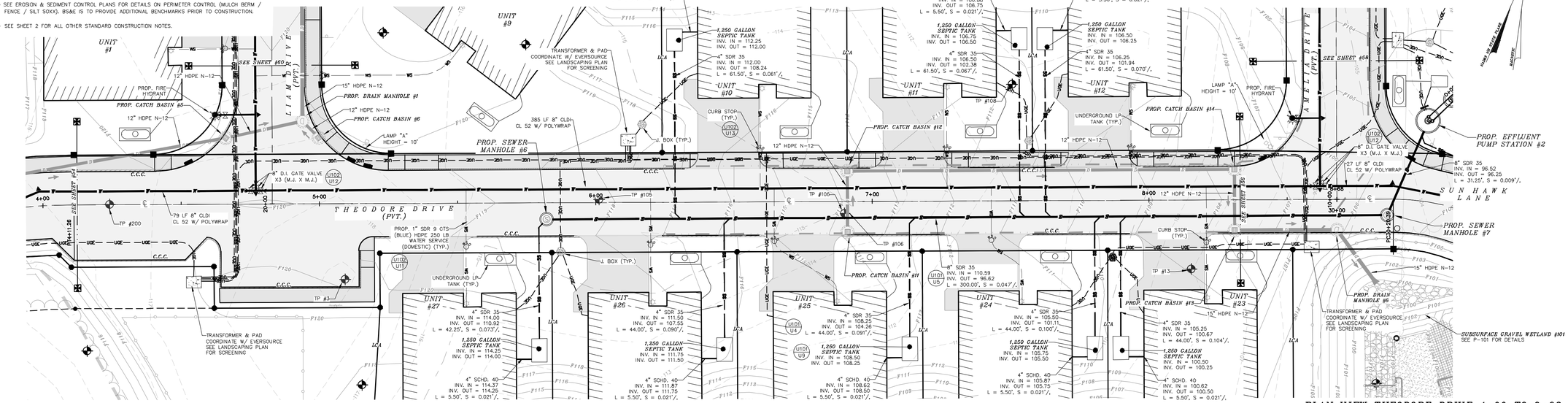
GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

STRUCTURES TABLE:

U101 U1 U2 U102 U3

PROP. SEWER MANHOLE #6
4'ø STRUCTURE
W/ LIFTMATE R-1743-LM FRAME & COVER
STA: 5+82.25 (Rt. 6.00')
RIM = 118.59 (FLUSH)
INV. IN = 110.92 (4" SDR 35) (UNIT #27)
INV. OUT = 110.59 (8" SDR 35) (SMH #7)

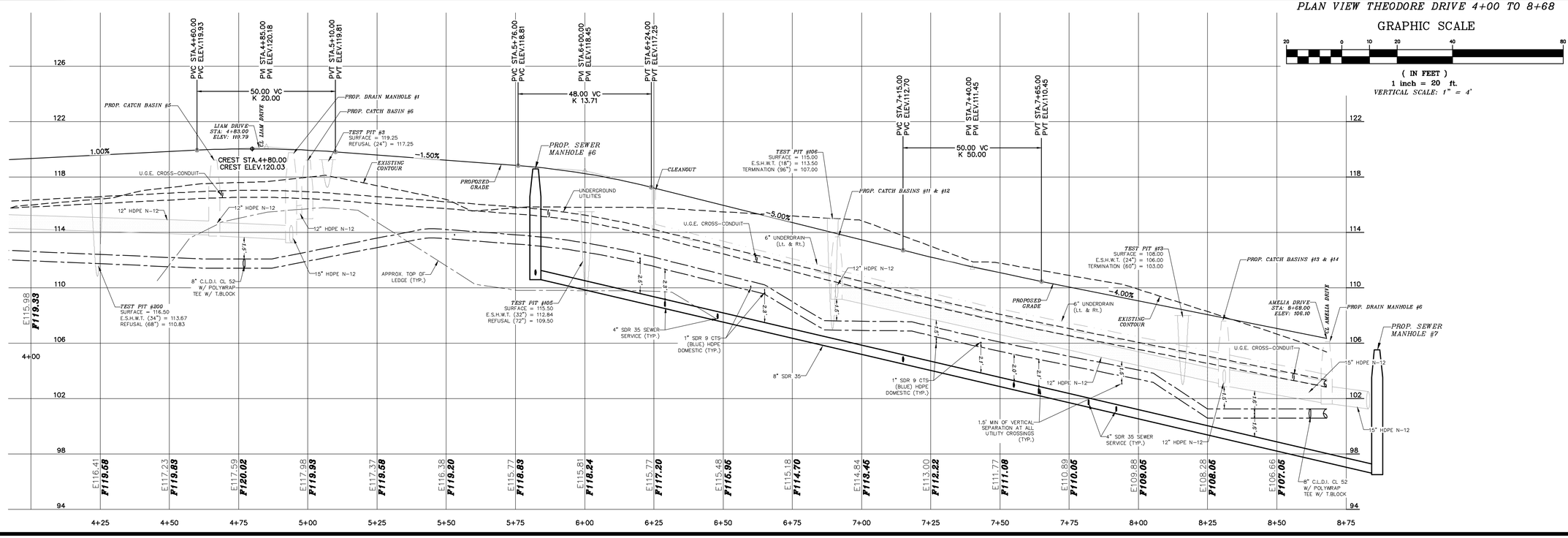
PROP. SEWER MANHOLE #7
4'ø STRUCTURE
W/ LIFTMATE R-1743-LM FRAME & COVER
STA: 30+18.25 (Rt. 7.75')
RIM = 105.52 (FLUSH)
INV. IN = 96.62 (8" SDR 35) (SMH #6)
INV. OUT = 96.52 (8" SDR 35) (PUMP STATION #2)



PLAN VIEW THEODORE DRIVE 4+00 TO 8+68

PLAN VIEW THEODORE DRIVE 4+00 TO 8+68

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'



PLAN VIEW THEODORE DRIVE 4+00 TO 8+68

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

UTILITY PLAN & PROFILE THEODORE DRIVE 4+00 – 8+68
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 19443
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

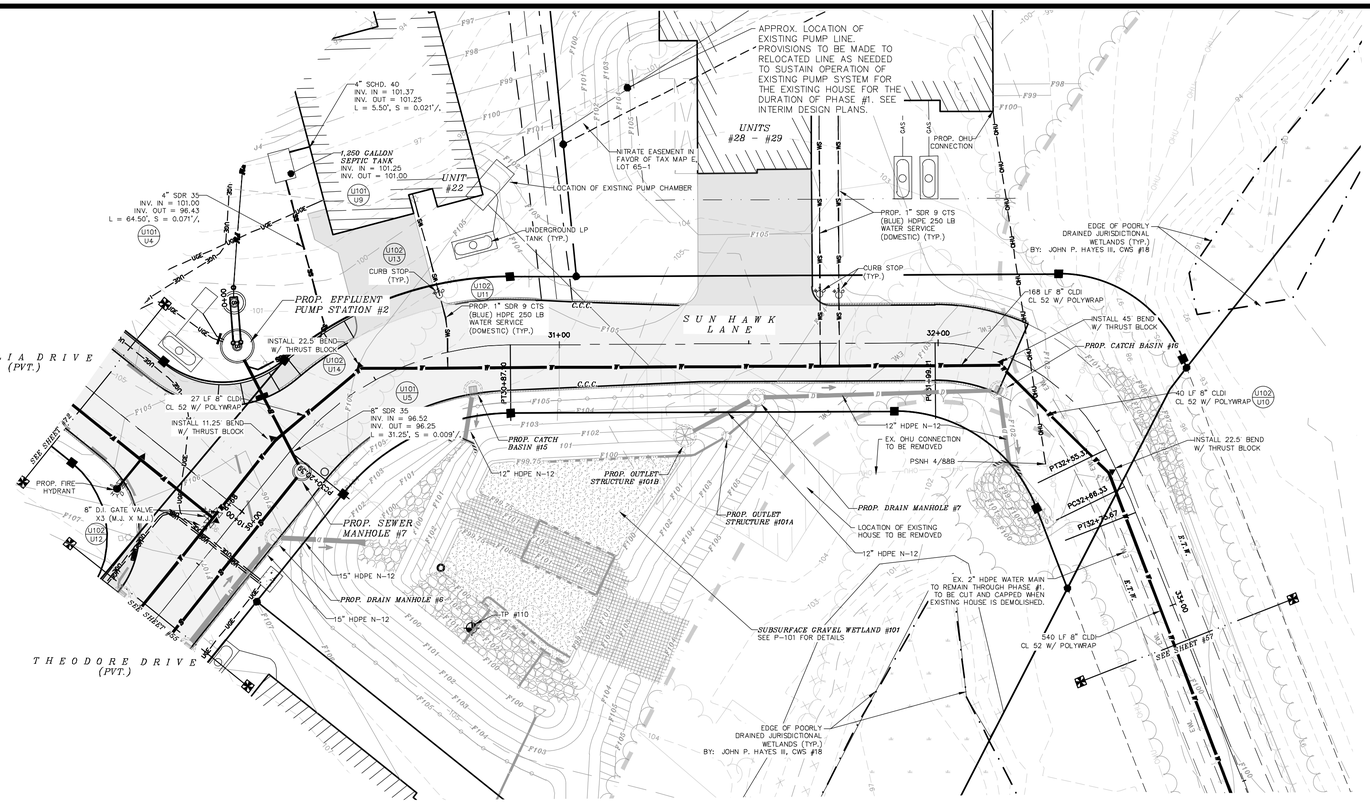
STRUCTURES TABLE:

U101 U1 U101 U2 U101 U3

PROP. SEWER MANHOLE #7
4'ø STRUCTURE
W/ LIFTNATE R-1743-LM FRAME & COVER
STA: 30+18.25 (Rt. 7.75')
RIM = 105.52 (FLUSH)
INV. IN = 96.62 (8" SDR 35) (SMH #5)
INV. OUT = 96.52 (8" SDR 35) (PUMP STATION #2)

U103 U21 U104 U23

PROP. EFFLUENT PUMP STATION #2
8'ø STRUCTURE
STA: 30+29.75 (Rt. 29.00')
RISER = 105.75 (FLUSH)
TOP CHAMBER = 101.25
INV. IN = 96.25 (8" SDR 35) (SMH #6)
INV. OUT = 96.00 (2" SDR 11) (EDA #2)
CHAMBER BOTTOM = 91.25



PLAN VIEW SUN HAWK LANE 30+00 TO 33+00

NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

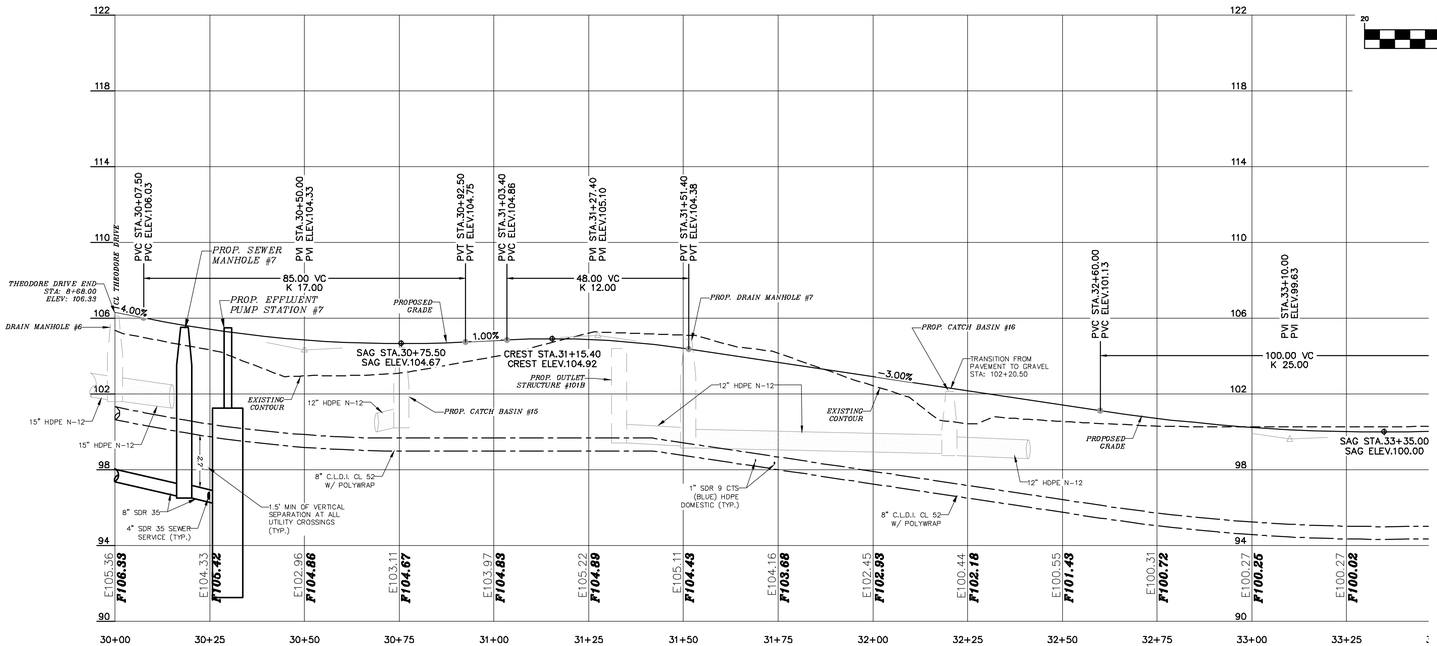
3.) THE INTENT OF THIS PLAN IS TO PROVIDE UTILITY AND ENGINEERING DETAILS OF SUN HAWK LANE. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

PROFILE VIEW SUN HAWK LANE 30+00 TO 33+00



GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

UTILITY

PLAN & PROFILE SUN HAWK LANE 30+00 TO 33+00
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

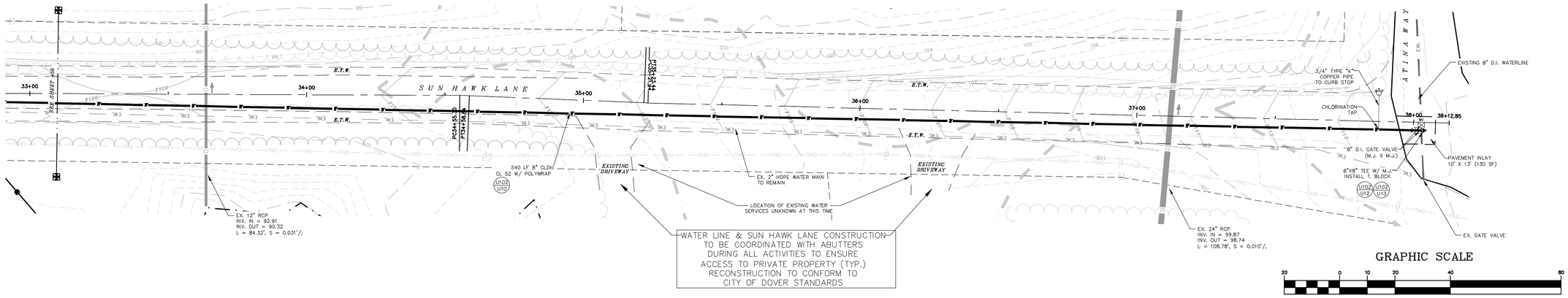
1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE UTILITY AND ENGINEERING DETAILS OF SUN HAWK LANE. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.



WATER LINE & SUN HAWK LANE CONSTRUCTION TO BE COORDINATED WITH ABUTTERS DURING ALL ACTIVITIES TO ENSURE ACCESS TO PRIVATE PROPERTY (TYP.) RECONSTRUCTION TO CONFORM TO CITY OF DOVER STANDARDS

PLAN VIEW SUN HAWK LANE 33+00 – ATINA WAY

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

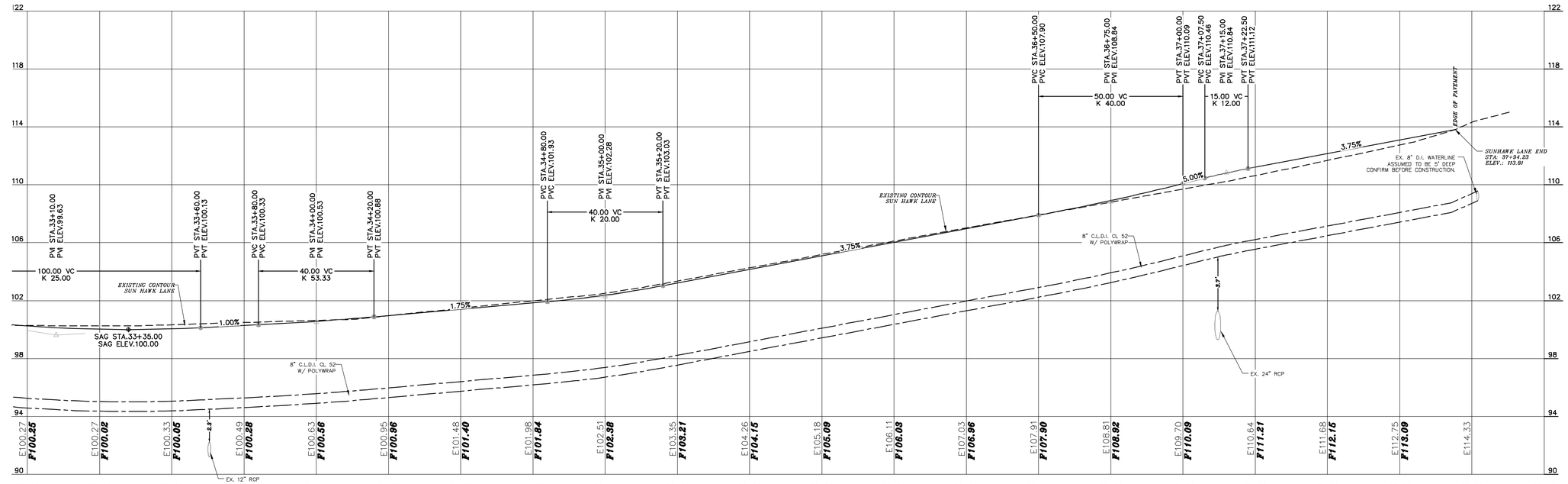
PLAN VIEW SUN HAWK LANE 33+00 – ATINA WAY

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

VERTICAL SCALE: 1" = 4'



DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

UTILITY

PLAN & PROFILE SUN HAWK 33+00 TO ATINA WAY
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14043
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE UTILITY AND ENGINEERING DETAILS OF AMELIA DRIVE. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

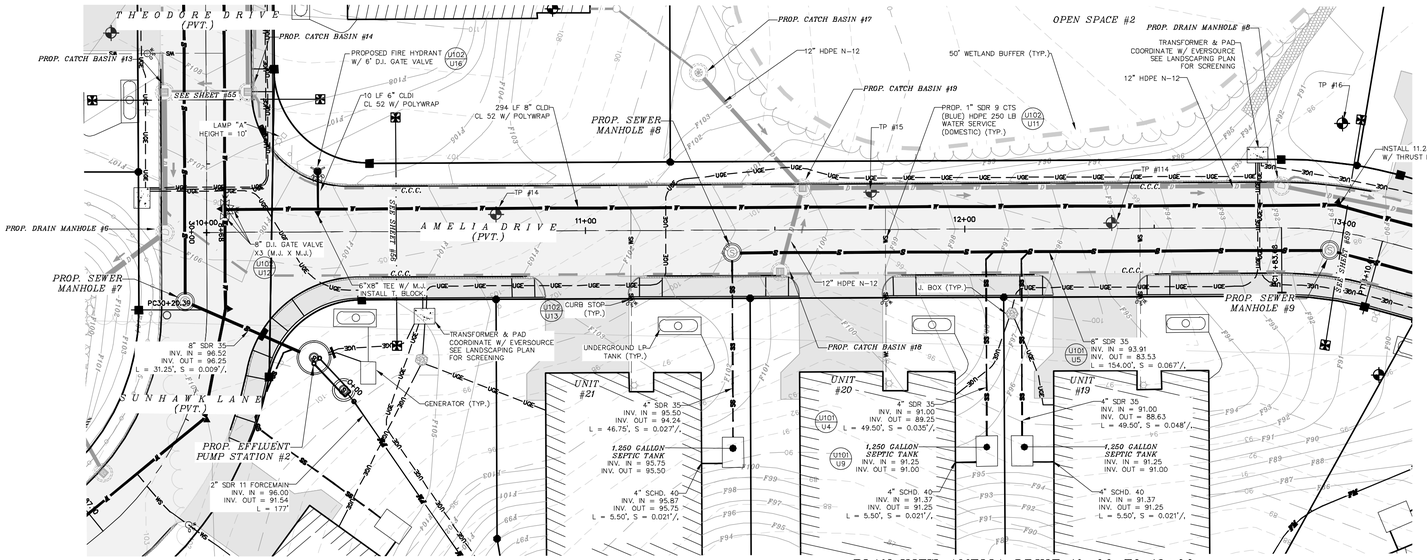
5.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

STRUCTURES TABLE:

U101 U1 U101 U2 U101 U3

PROP. SEWER MANHOLE #8
4'ø STRUCTURE
W/ LIFTMATE R-1743-LM FRAME & COVER
STA: 11+38.65 (Rt. 6.00')
RIM = 100.91 (FLUSH)
INV. IN = 94.24 (4" SDR 35) (UNIT #21)
INV. OUT = 93.91 (8" SDR 35) (SMH #8)

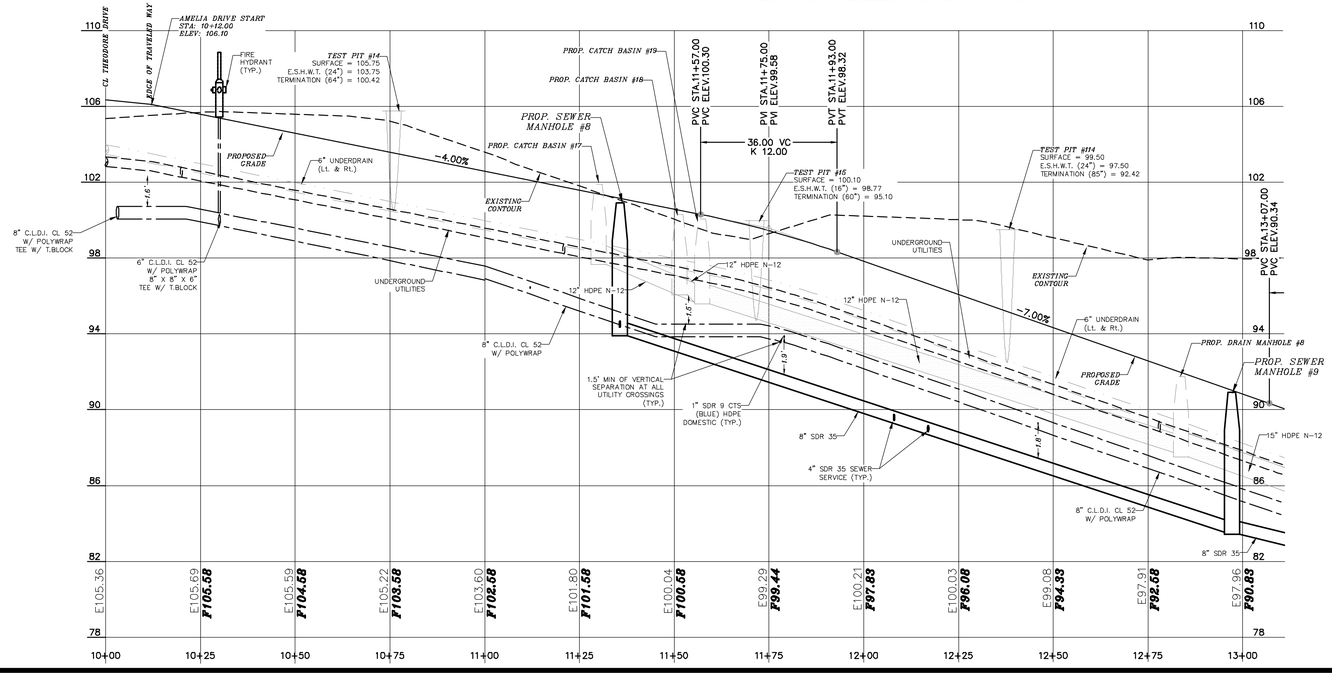
PROP. SEWER MANHOLE #9
4'ø STRUCTURE
W/ LIFTMATE R-1743-LM FRAME & COVER
STA: 12+97.15 (Rt. 5.15')
RIM = 90.93 (FLUSH)
INV. IN = 83.53 (8" SDR 35) (SMH #8)
INV. OUT = 83.43 (8" SDR 35) (SMH #10)



GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

PLAN VIEW AMELIA DRIVE 10+00 TO 13+00

PLAN VIEW AMELIA DRIVE 10+00 TO 13+00



GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

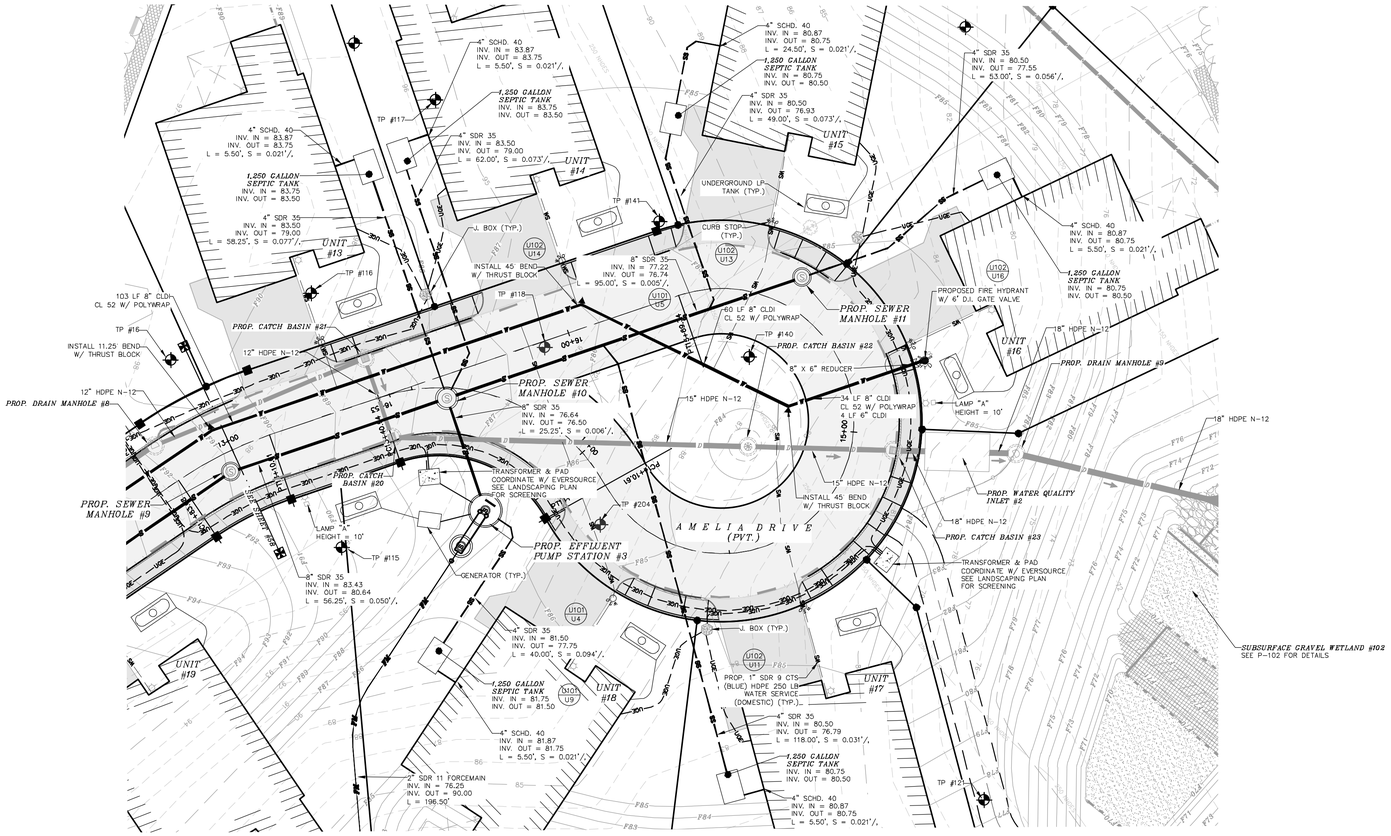
UTILITY
PLAN & PROFILE AMELIA DRIVE 10+00 - 13+00
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE KENNETH A. BERRY NO. 14043 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



STRUCTURES TABLE:

U101 U1 / U101 U2
PROP. SEWER MANHOLE #10
5'ø STRUCTURE
W/ LIFTMATE R-1743-LM FRAME & COVER
STA: 13+59.50 (Rt. 2.75')
RIM = 87.64 (FLUSH)
INV. IN = 79.00 (4" SDR 35 INTERNAL DROP) (UNIT #13)
INV. IN = 79.00 (4" SDR 35 INTERNAL DROP) (UNIT #14)
INV. IN = 80.64 (8" SDR 35 INTERNAL DROP) (SMH #9)
INV. IN = 76.74 (8" SDR 35) (SMH #11)
INV. OUT = 76.64 (8" SDR 35) (PUMP STATION #3)

PROP. SEWER MANHOLE #11
4'ø STRUCTURE
W/ LIFTMATE R-1743-LM FRAME & COVER
STA: 15+39.95 (Rt. 8.50')
RIM = 84.47 (FLUSH)
INV. IN = 77.55 (4" SDR 35) (UNIT #16)
INV. OUT = 77.22 (8" SDR 35) (SMH #10)

U103 U21 / U104 U24
PROP. EFFLUENT PUMP STATION #3
5'ø STRUCTURE
STA: 13+87.50 (Rt. 28.65')
RISER = 87.50 (FLUSH)
TOP CHAMBER = 83.50
INV. IN = 77.75 (4" SDR 35) (UNIT #18)
INV. IN = 76.50 (8" SDR 35) (SMH #10)
INV. OUT = 76.25 (2" SDR 11) (EDA #3)
CHAMBER BOTTOM = 71.50

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

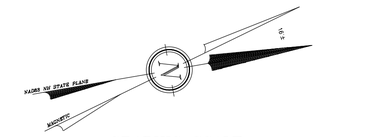
1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE UTILITY AND ENGINEERING DETAILS OF AMELIA DRIVE. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

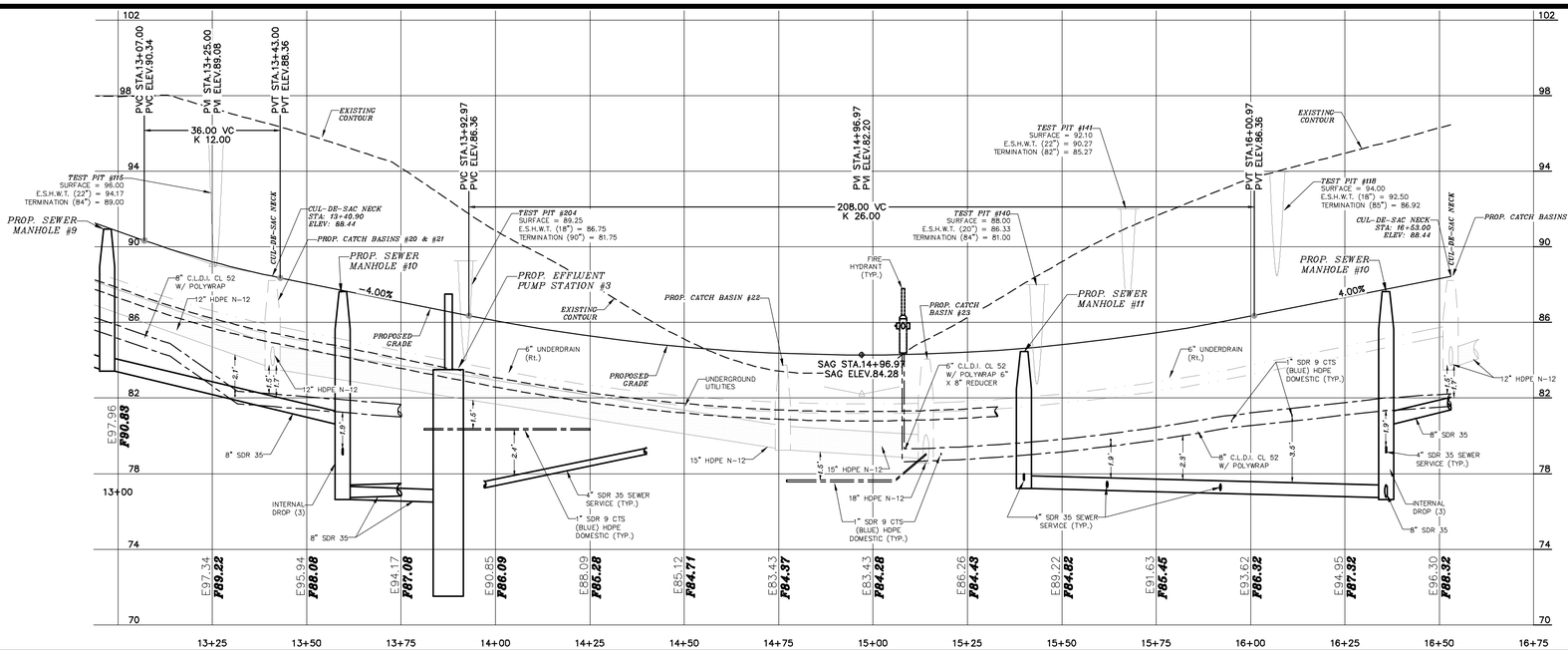


GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PLAN VIEW AMELIA DRIVE 13+00 TO 16+53



PLAN VIEW AMELIA DRIVE 13+00 TO 16+53

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

DOVER PLANNING FILE #P23-XX

DESCRIPTION	DATE	REVISION

UTILITY

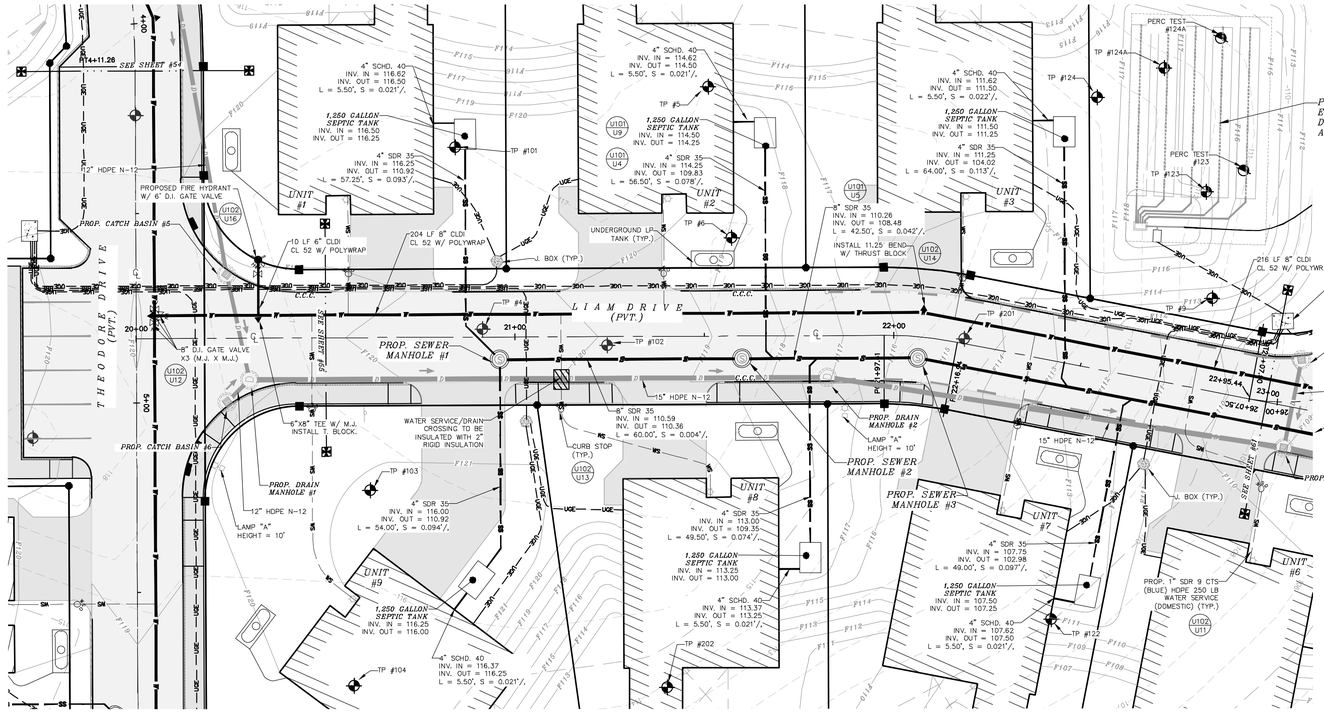
PLAN & PROFILE AMELIA DRIVE 13+00 – 16+53
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14143
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



PLAN VIEW LIAM DRIVE 20+00 TO 23+00

STRUCTURES TABLE:

PROP. SEWER MANHOLE #1
4'ø STRUCTURE
W/ LIFTMATE R-1743-LM FRAME & COVER
STA: 20+96.00 (Rt. 6.00')
RIM = 120.34 (FLUSH)
INV. IN = 110.92 (4" SDR 35) (UNIT #1)
INV. IN = 110.92 (4" SDR 35) (UNIT #9)
INV. OUT = 110.59 (8" SDR 35) (SMH #2)

PROP. SEWER MANHOLE #2
4'ø STRUCTURE
W/ LIFTMATE R-1743-LM FRAME & COVER
STA: 21+60.00 (Rt. 6.00')
RIM = 118.51 (FLUSH)
INV. IN = 110.36 (8" SDR 35) (SMH #2)
INV. OUT = 110.26 (8" SDR 35) (SMH #4)

PROP. SEWER MANHOLE #3
4'ø STRUCTURE
W/ LIFTMATE R-1743-LM FRAME & COVER
STA: 22+06.90 (Rt. 5.60')
RIM = 115.48 (FLUSH)
INV. IN = 108.48 (8" SDR 35 INTERNAL DROP) (SMH #2)
INV. OUT = 108.48 (8" SDR 35) (SMH #4)

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC, 42J DOVER POINT ROAD, DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI, 22 SUN HAWK LANE, DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP., 42J DOVER POINT ROAD, DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1; TAX MAP E, LOT 65-A

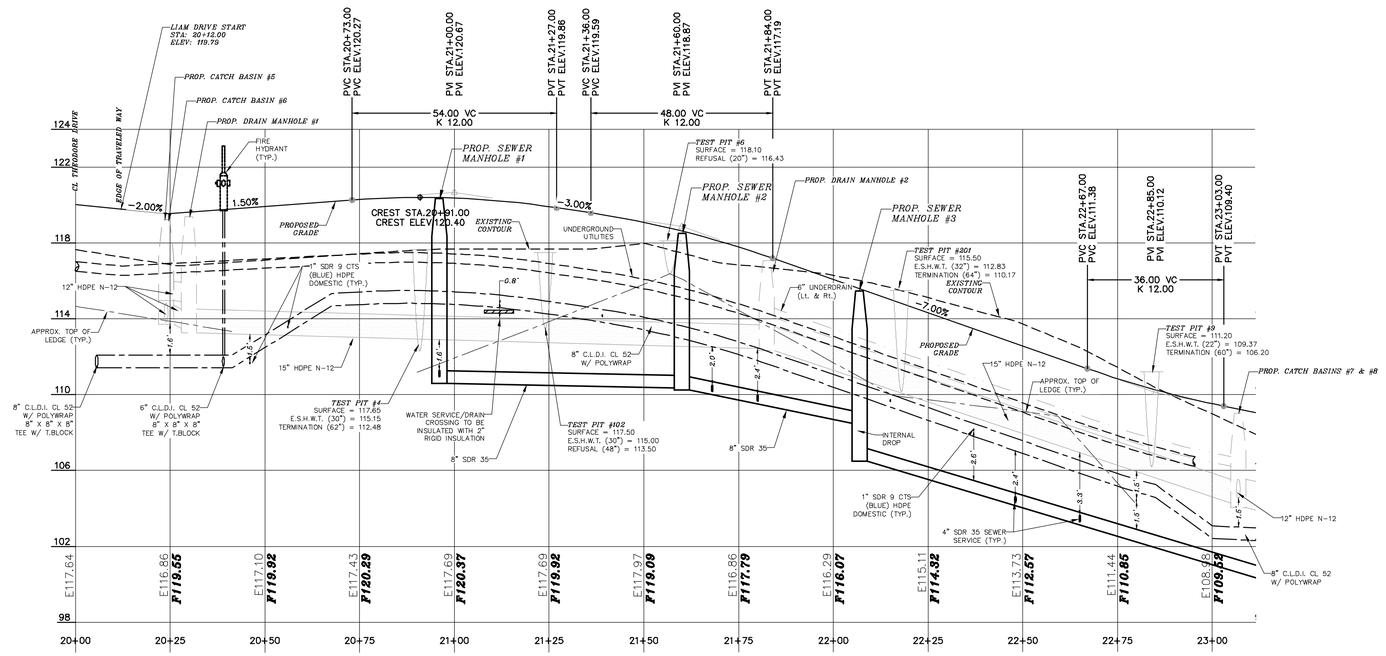
3.) THE INTENT OF THIS PLAN IS TO PROVIDE UTILITY AND ENGINEERING DETAILS OF LIAM DRIVE. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

PROFILE VIEW LIAM DRIVE 20+00 TO 23+00



GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

UTILITY

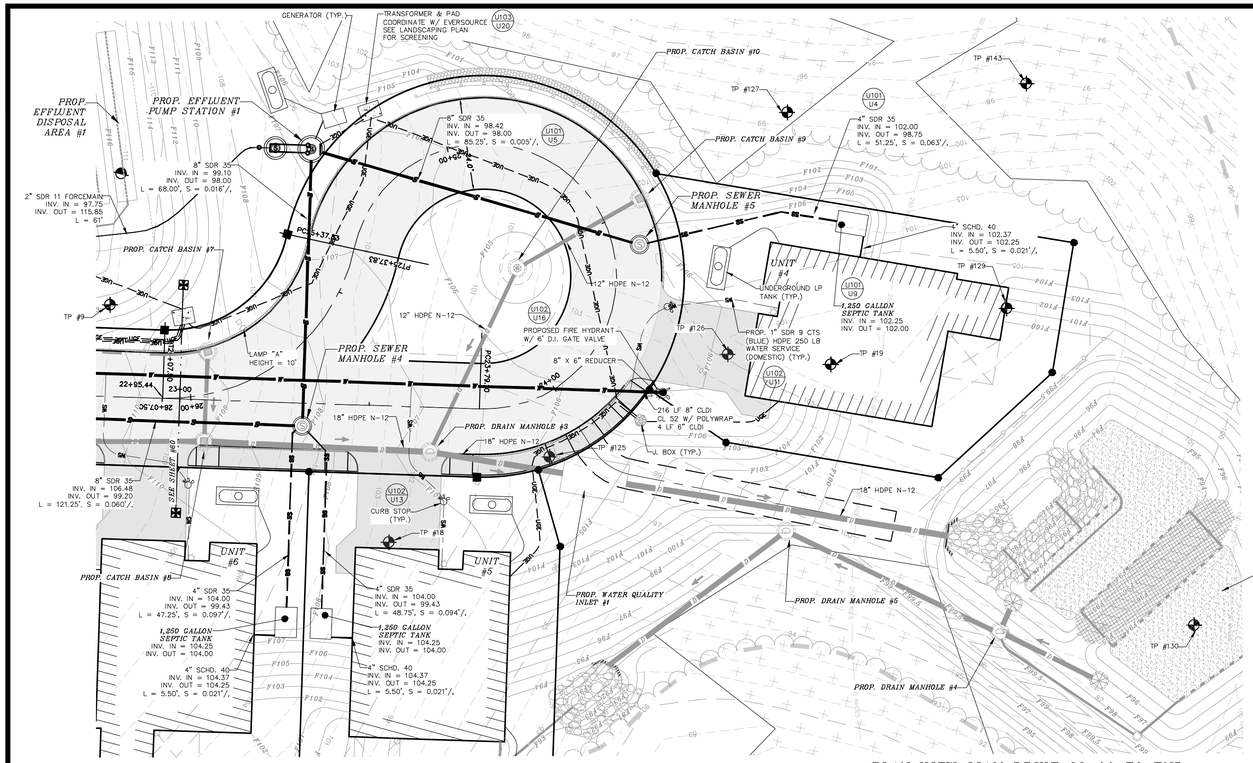
PLAN & PROFILE LIAM DRIVE 20+00 TO 23+00
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

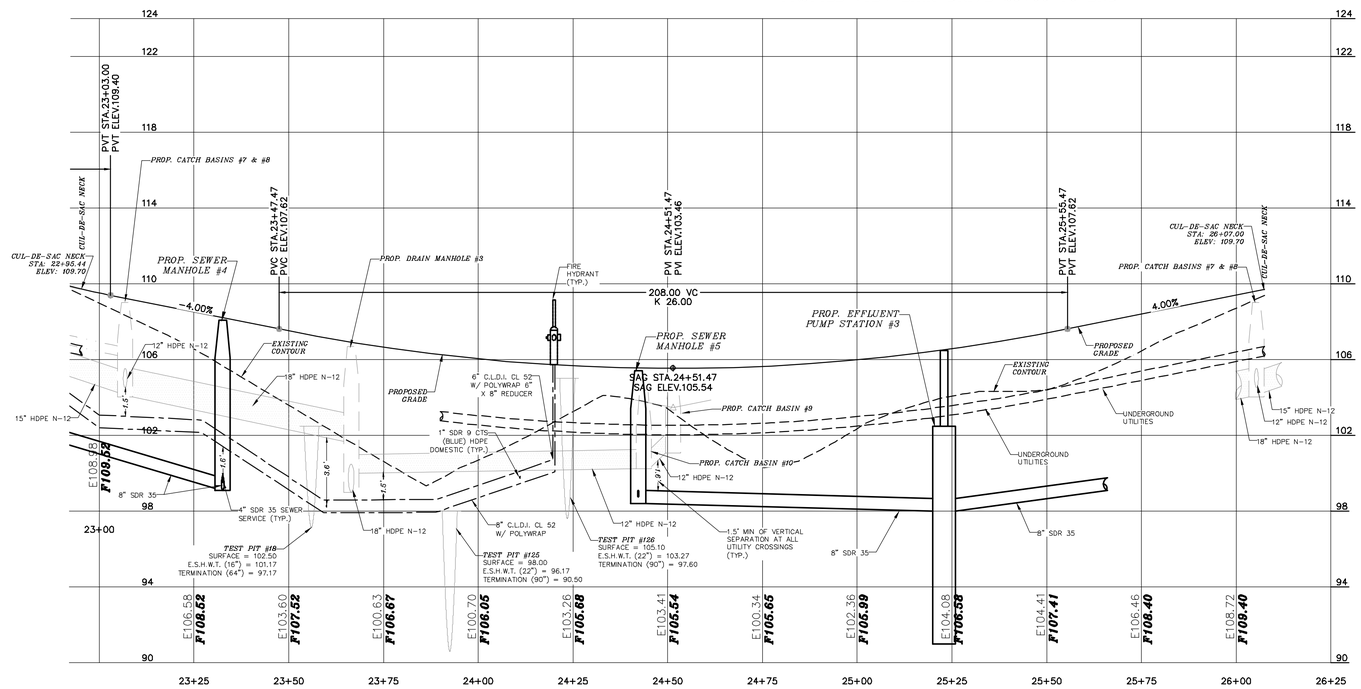
SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14043
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



PLAN VIEW LIAM DRIVE 23+00 TO END



PROFILE VIEW LIAM DRIVE 23+00 TO END

STRUCTURES TABLE:

U101 U110 U1 U2 U101 U3 — *PROP. SEWER MANHOLE #4*
4'ø STRUCTURE
W/ LIFTMATE R-1743-LM FRAME & COVER
STA: 23+32.60 (Rt. 6.00')
RIM = 108.10 (FLUSH)
INV. IN = 99.43 (4" SDR 35) (UNIT #5)
INV. IN = 99.43 (4" SDR 35) (UNIT #6)
INV. IN = 99.20 (8" SDR 35) (SMH #3)
INV. OUT = 99.10 (8" SDR 35) (PUMP STATION #1)

PROP. SEWER MANHOLE #5
4'ø STRUCTURE
W/ LIFTMATE R-1743-LM FRAME & COVER
STA: 24+42.25 (Rt. 7.00')
RIM = 109.42 (FLUSH)
INV. IN = 98.75 (4" SDR 35) (UNIT #4)
INV. OUT = 98.42 (8" SDR 35) (PUMP STATION #1)

U103 U107 U21 U22 — *PROP. EFFLUENT PUMP STATION #1*
6'ø STRUCTURE
STA: 25+23.00 (Rt. 21.50')
RISER = 106.50 (FLUSH)
TOP CHAMBER = 102.50
INV. IN = 98.00 (8" SDR 35) (SMH #4)
INV. IN = 98.00 (8" SDR 35) (SMH #5)
INV. OUT = 97.75 (2" SDR 11) (EDA #1)
CHAMBER BOTTOM = 91.00

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

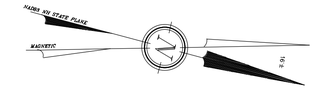
1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE UTILITY AND ENGINEERING DETAILS OF LIAM DRIVE. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

UTILITY

PLAN & PROFILE LIAM DRIVE 23+00 TO END
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

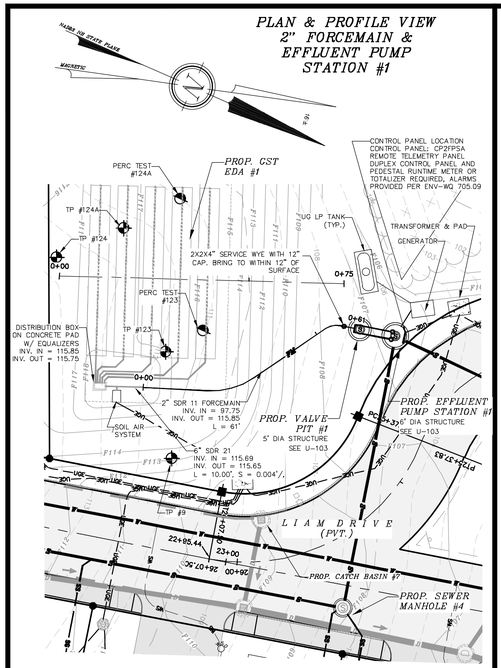
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

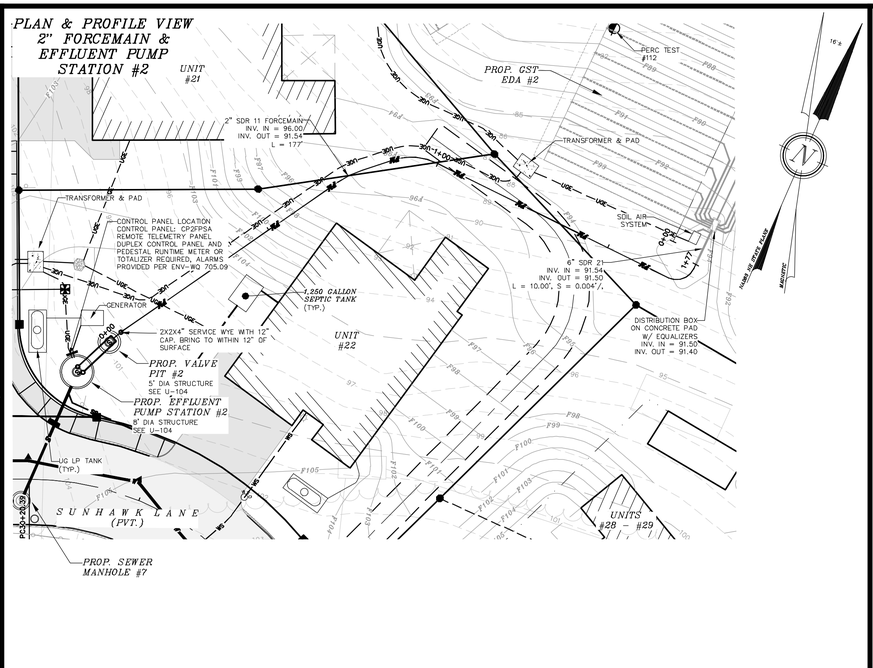
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

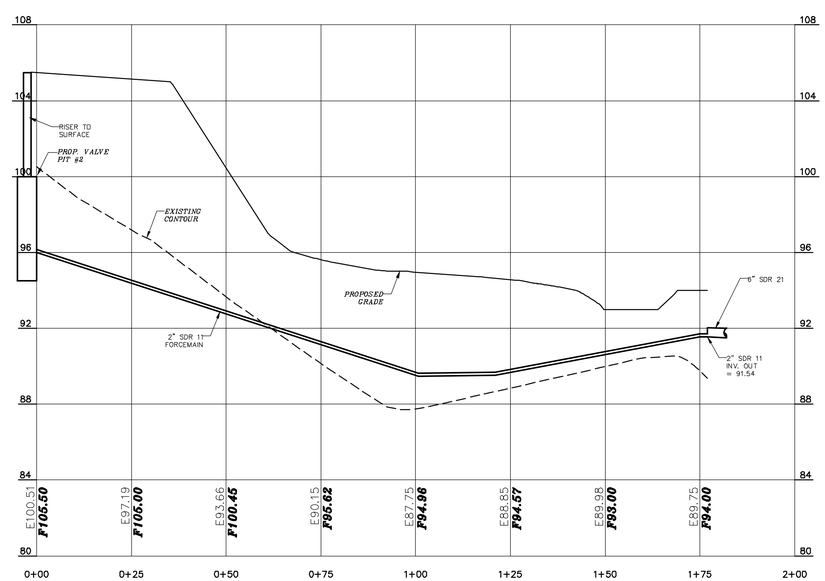
NOT FOR CONSTRUCTION

PLAN & PROFILE VIEW 2" FORCEMAIN & EFFLUENT PUMP STATION #1



PLAN & PROFILE VIEW 2" FORCEMAIN & EFFLUENT PUMP STATION #2

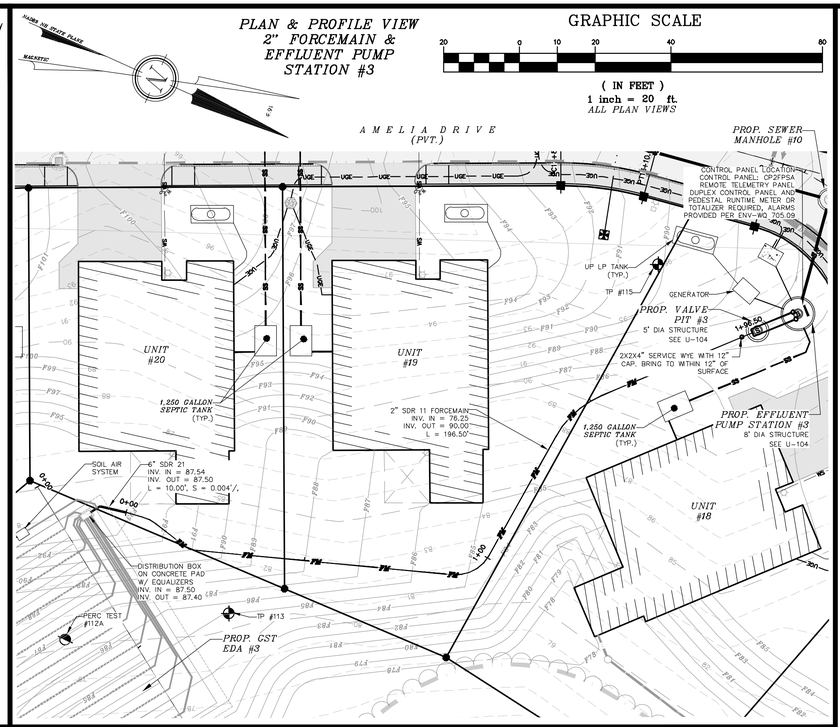


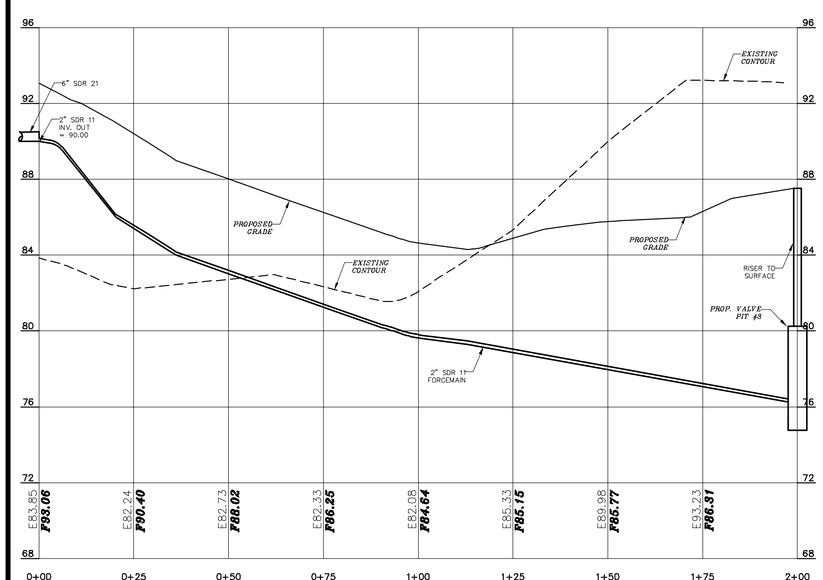


PLAN & PROFILE VIEW 2" FORCEMAIN & EFFLUENT PUMP STATION #3

GRAPHIC SCALE

(IN FEET)
1 inch = 20 ft.
ALL PLAN VIEWS





GRAPHIC SCALE

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'
ALL PROFILE VIEWS

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

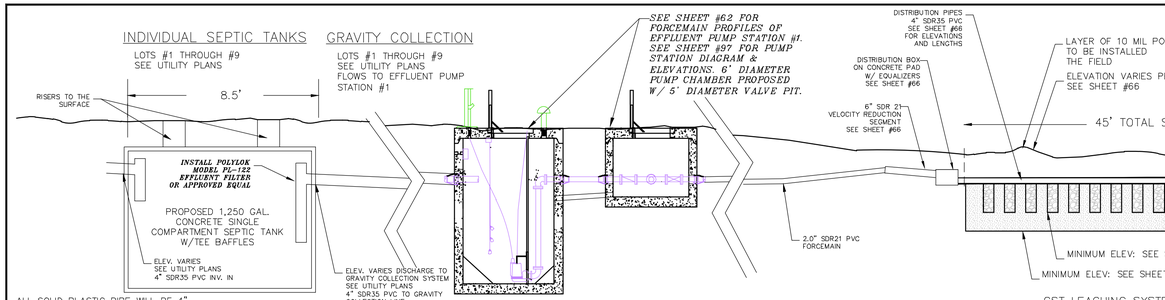
FORCEMAIN PROFILES
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

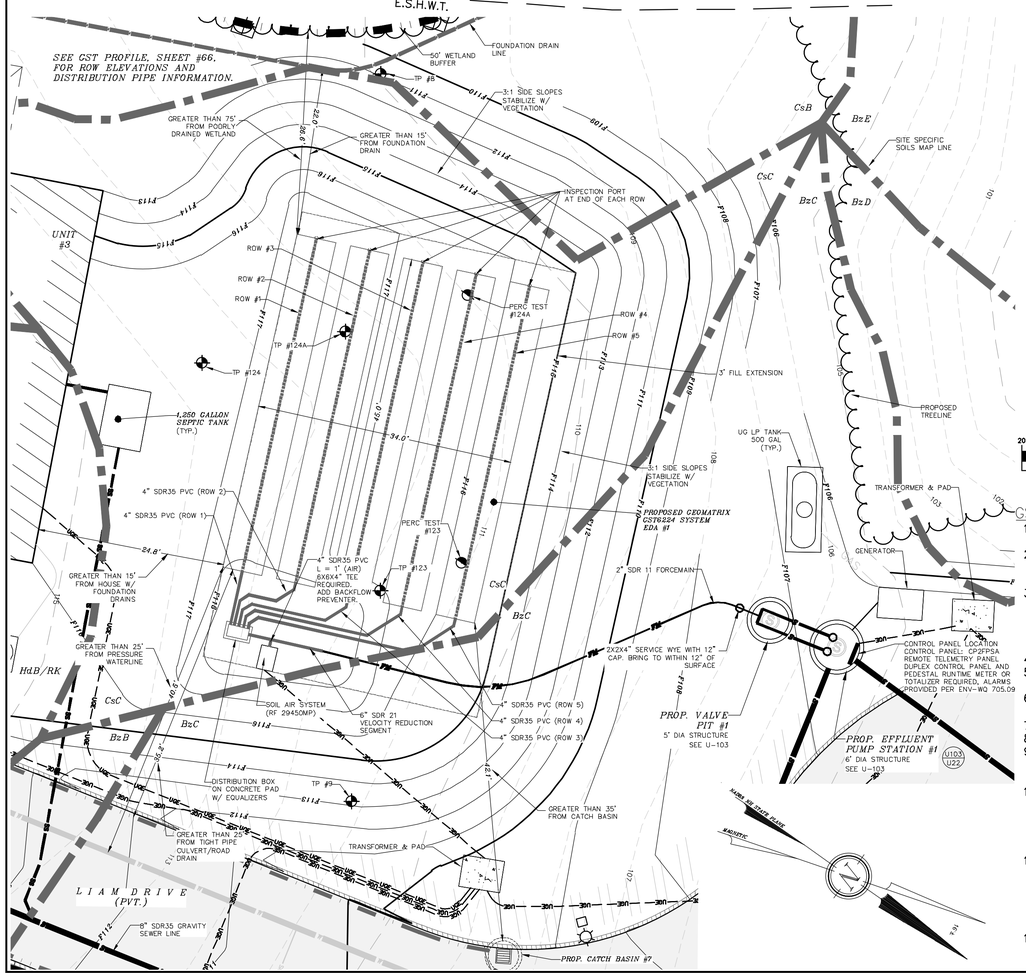
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 15447
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION





VENTING NOTE:

THE MANUFACTURERS SPECIFICATIONS FOR GST SYSTEM INSTALLATIONS REQUIRE THAT THE INSTALLATION OF A VENT IF THE SYSTEM IS GREATER THAN 18" DEEP. GEOMATRIX RECOMMENDS THAT SYSTEMS DEEPER THAN 24" UTILIZE SOILAIR SYSTEM.

AS SOILAIR SYSTEM IS UTILIZED, NO VENTING FOR THE FIELD IS ALLOWED.

PLAN INTENT :

THE SEPTIC SYSTEM IS TO BE CONSTRUCTED WITH THE BOTTOM OF THE LEACH BED (STONE) IS 0.25' ABOVE THE HIGH POINT OF THE EXISTING LAND.

IN THE EVENT OF LEACH BED FAILURE, IT MAY BE REBUILT IN PLACE WITH NHDES APPROVAL.

CAUTION !!!!!

ANY DEVIATION FROM THIS PLAN IN GRADE OR LOCATION OF THE SEPTIC SYSTEM WHEN CONSTRUCTED WITHOUT THE APPROVAL OF THE DESIGNER AND NH-DES SUBSURFACE SYSTEMS BUREAU MAY RESULT IN THE FAILURE OF THE SYSTEM TO PASS INSPECTION BY NH-DES SUBSURFACE SYSTEMS BUREAU PRIOR TO OPERATION APPROVAL, OR FUNCTION PROPERLY AND SAFELY.

SOIL DATA :

CsC – CHARLTON (VERY STONY), 8 TO 15% SLOPES

SEE SITE SPECIFIC SOILS MAP

CALCULATIONS :

27 BEDROOMS TOTAL, 4,050 GPD
USE 6' DIA. CIRCULAR CONCRETE PUMP CHAMBER (FROM SHEA CONCRETE OR EQUIV.)

GST 6224 SYSTEM
3.7 MIN/IN MEASURED PERC RATE
6 MIN./IN DESIGN PERC RATE
6,278 SF SYSTEM SIZE REQUIRED
32.1 SF/LF TOTAL SURFACE AREA
195.6 – MIN. LENGTH GST SEPTIC PIPE REQUIRED
225 – PROPOSED LENGTH OF GST SEPTIC PIPE
5 ROWS OF SEPTIC PIPE, EACH ROW 45' LONG
16.3 MAX. GAL/DOSE
STATIC HEAD = 24.85'

PUMP SIZING :

DESIGN FLOW RATE: 53.0 GPM
TOTAL DYNAMIC HEAD: 32.0 FT
PUMP: DUAL ALTERNATING LIBERTY FL50 EFFLUENT PUMP

ELEVATIONS :

SEE PROFILE, SHEET #66.

TESTHOLE DATA : #123

0-6 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6-18 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
18-30 2.5Y 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, MASSIVE, FRIABLE
30-40 5Y 5/3 OLIVE, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
40-68 5Y 4/2 OLIVE GRAY, SILTY CLAY WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 30"
RESTRICTIVE LAYER @ 30"
GROUND WATER @ N/A
TERMINATED @ 68"
REFUSAL @ N/A
PERC RATE = 3.7 MIN/INCH

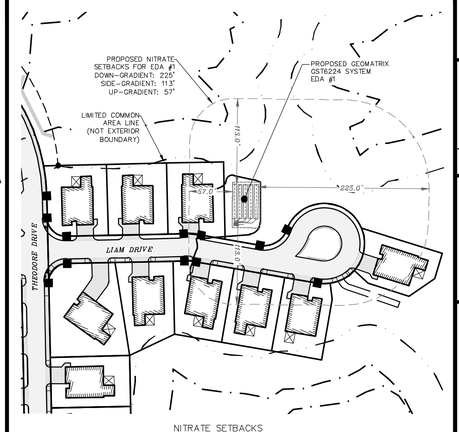
TESTHOLE DATA : #124A

0-6 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6-18 10YR 4/6 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
18-28 2.5Y 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, MASSIVE, FRIABLE
28-68 2.5Y 5/2 GRAYISH BROWN, GRAVELLY FINE SANDY LOAM WITH REDOX. FEAT. PRESENT, MASSIVE, FRIABLE
E.S.H.W.T. @ 28"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 68"
REFUSAL @ N/A
PERC RATE = 3.1 MIN/INCH

GST6224 NOTES

1.– WHEELED VEHICLES AND MACHINERY MUST BE KEPT OFF OWTS, UNLESS DESIGNED FOR H-20 LOADING.
2.– OWTS SHALL BE INSTALLED PER; GST LEACHING SYSTEM – NEW HAMPSHIRE, DESIGN MANUAL DATED MAY 28, 2020.
3.– APPROVAL OF THIS PLAN ALLOWS CONSTRUCTION OF THE GST DESIGN ONLY.
CONSTRUCTION OF A CONVENTIONAL SYSTEM REQUIRES;
A.– A SEPARATE DESIGN.
B.– SUBMISSION & APPROVAL.
4.– TYPE GST6224 FORMS ARE TO BE USED (62"W).
5.– INSTALLER TO SCHEDULE ALL INSTALLATIONS WITH FORM SUPPLIER A WEEK PRIOR TO SYSTEM INSTALL.
6.– THIS ISDS IS NOT DESIGNED FOR BACKWASH FROM A WATER CONDITIONER.
7.– ANY OWTS WITH MORE THAN 18" OF COVER MUST BE VENTED.
8.– SCARIFY SUB-SOIL IMMEDIATELY PRIOR TO PLACEMENT OF FILL.
9.– A SERIALIZED INSPECTION PORT – PN:IPGST15 – IS REQUIRED ON EACH GST SYSTEM & EACH ROW IS TO HAVE INSPECTION PORT EXTENDED TO FINISHED GRADE (SEE PAGE(S) 7 & 17 OF MANUAL).
10.– FOR GST SYSTEMS UNDER DRIVEWAYS OR SUBJECT TO H-20 WHEEL LOADING CONDITIONS, SYSTEM MUST BE INSTALLED PER MANUFACTURERS REQUIREMENTS AS DESCRIBED IN THE MAY 28 2020 "DESIGN MANUAL". (A SUPPLEMENTAL DETAIL IS AVAILABLE UPON REQUEST, BUT IS NOT REQUIRED FOR NH-DES APPROVAL.)
11.– INSTALLER TO PLACE #5 X 12" REBAR (PROVIDED) NEXT TO INSPECTION PORT TO FACILITATE FUTURE LOCATING SHOULD INSPECTION CAP BECOME BURIED. DECAL PROVIDED SHALL BE PLACE ON STRUCTURE ELECTRICAL METER SOCKET OR EFFLUENT PUMP CONTROL PANEL IF ONE IS PRESENT, THIS IS TO IDENTIFY SYSTEM TYPE FOR FUTURE SYSTEM INSPECTION PURPOSES.
12.– PATENTED GST FORMS ARE AVAILABLE TO RENT FROM;
SEPTIC ASSISTANT LLC 1-603-660-1603
181 GOULD RD – WEARE, NH 03281

Total Lot Loading Area Buxton (Sq. Ft.)	Total Lot Loading Area Hollis-Charlton (Sq. Ft.)
115864	55,338
Total Area Buxton (Sq. Ft.)	**Total Area Hollis-Charlton (Sq. Ft.)**
956142	55,338
Total GPD Buxton	**Total GPD Hollis-Charlton**
1773	1,689
Total Lot Loading Area Biddeford (Sq. Ft.)	**Total Lot Loading Area Suffield (Sq. Ft.)**
0	502,672
Total Area Biddeford (Sq. Ft.)	**Total Area Suffield (Sq. Ft.)**
16,216	502,672
Total GPD Biddeford	**Total GPD Suffield**
0	12,599
Total Lot Loading Area Charlton (Sq. Ft.)	**Total Lot Loading Area Scantic (Sq. Ft.)**
73,880	0
Total Area Charlton (Sq. Ft.)	**Total Area Scantic (Sq. Ft.)**
73,880	330,704
Total GPD Charlton	**Total GPD Scantic**
2,312	0
Total Lot Loading Area (Sq. Ft.)	
747,754	
Total Lot Area (Sq. Ft.)	
1,934,962	
Total GPD Yield	
18,373	



NITRATE SETBACKS FOR EDA #1

SCALE: 1" = 100'

THE WETLAND DELINEATION WAS COMPLETED SPRING, 2021 & OCTOBER, 2022 IN ACCORDANCE WITH THE 1987 CORP OF ENGINEERS WETLAND DELINEATION MANUAL. JURISDICTIONAL WETLANDS WERE IDENTIFIED AND DELINEATED USING THE ROUTINE DETERMINATIONS METHOD AS OUTLINED IN THE MANUAL. THE DELINEATION WAS DONE BY:

JOHN P. HAYES III, CWS #18

JOHN P. HAYES III, CSS #87

NOTES:

1.) OWNER: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

A.) TAX MAP E, LOT 65-1

B.) LOT AREA: 1,809,066 Sq.Ft.±, 41.53 Ac.±

C.) S.C.R.D. BOOK 5044, PAGE 744

2.) DESIGNER: CHRISTOPHER R. BERRY, PERMIT #1886
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825

3.) SUBDIVISION STATUS: PENDING

4.) FOUNDATION DRAINS WILL START AT LEAST 15' FROM THE LEACH FIELD, AND AT LEAST 5' FROM THE SEPTIC TANK.

5.) THERE IS NO SURFACE WATER OR VERY POORLY DRAINED SOILS WITHIN 50', OR POORLY DRAINED SOILS WITHIN 75' OF THE PROPOSED SEPTIC SYSTEM.

6.) THIS DESIGN DOES NOT ALLOW FOR THE USE OF A GARBAGE GRINDER. IF A GRINDER IS TO BE INCORPORATED A LARGER SEPTIC TANK WILL BE REQUIRED.

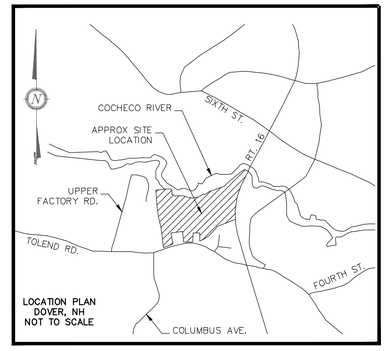
7.) THIS DESIGN DOES NOT ALLOW FOR THE ACCEPTANCE OF WATER TREATMENT BACKWASH. IF A WATER TREATMENT SYSTEM IS TO BE INCORPORATED A LARGER LEACHFIELD WILL BE REQUIRED.

8.) IN THE EVENT A DISCREPANCY IS FOUND ON THIS PLAN, THE DESIGNER SHOULD BE CONTACTED IMMEDIATELY AT 603-332-2863 TO DISCUSS AN APPROPRIATE PLAN OF ACTION.

9.) THE PROPOSED USE OF THESE UNITS ARE SINGLE FAMILY HOMES TO BE SOLD, THE EDA WILL BE UNDER THE SINGLE OWNERSHIP OF THE ROLLING HILL ESTATES HOME OWNERS ASSOCIATION.

10.) EDA #1 RECEIVES 9 UNITS, WITH 3 BEDROOMS PER UNIT FOR A FLOW OF 450 GPD/UNIT.

11.) SEE LOT LOADING CALCULATIONS. THE TOTAL PROJECT FLOW IS PROPOSED TO BE 12,750 GPD. SEE EDA #1, 2, & 3. THE TOTAL LOT LOADING AVAILABLE IS 18,373 GPD.



LOCATION PLAN
DOVER, NH
NOT TO SCALE

REVISION	DATE	DESCRIPTION

GEOMATRIX GST6224 SYSTEM – EFFLUENT DISPOSAL SYSTEM #1
LAND OF
59 TOLEND ROAD LLC
TOLEND ROAD
DOVER, NH 03820
TAX MAP E LOTS 65-1
FOR STONEARCH DEVELOPMENT CORP.
SYSTEM #1

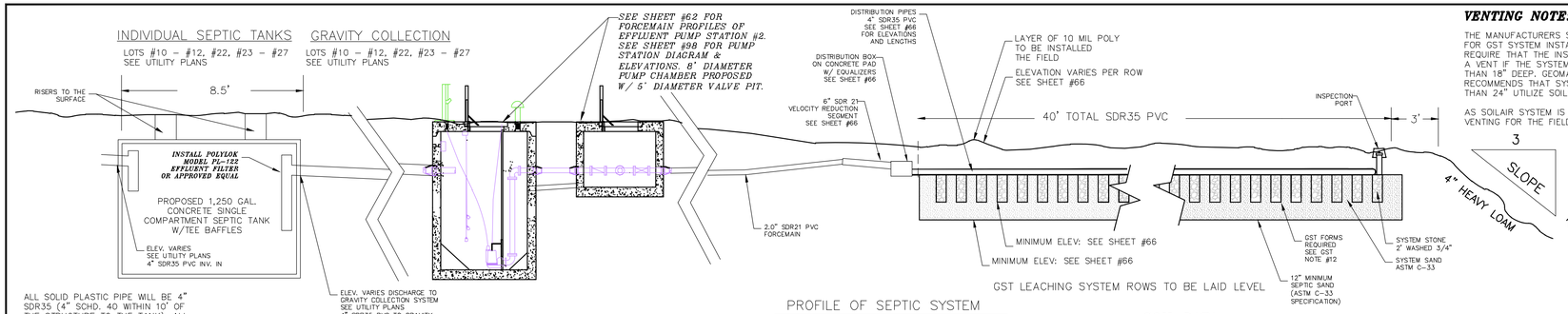
STATE OF NEW HAMPSHIRE · KENNETH A. BERRY · No. 14240 · LICENSED PROFESSIONAL ENGINEER

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT RD.
BARRINGTON, N.H. 332-2863

SCALE : 1 IN. EQUALS 10 FT.
DATE : APRIL 27, 2022
FILE NO. : DB 2023 – 031

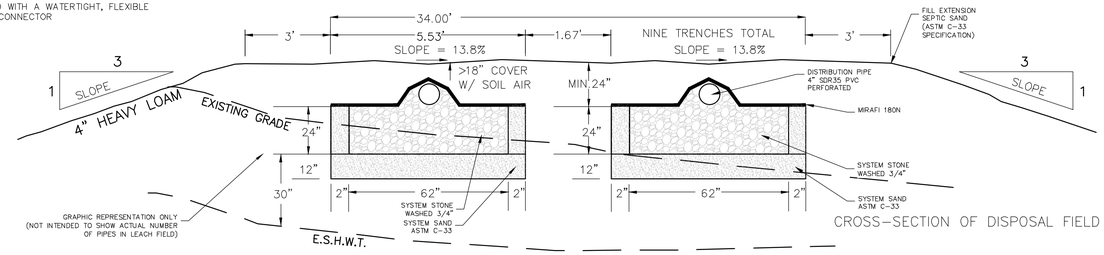
SHEET 63 OF 100

NOT FOR CONSTRUCTION



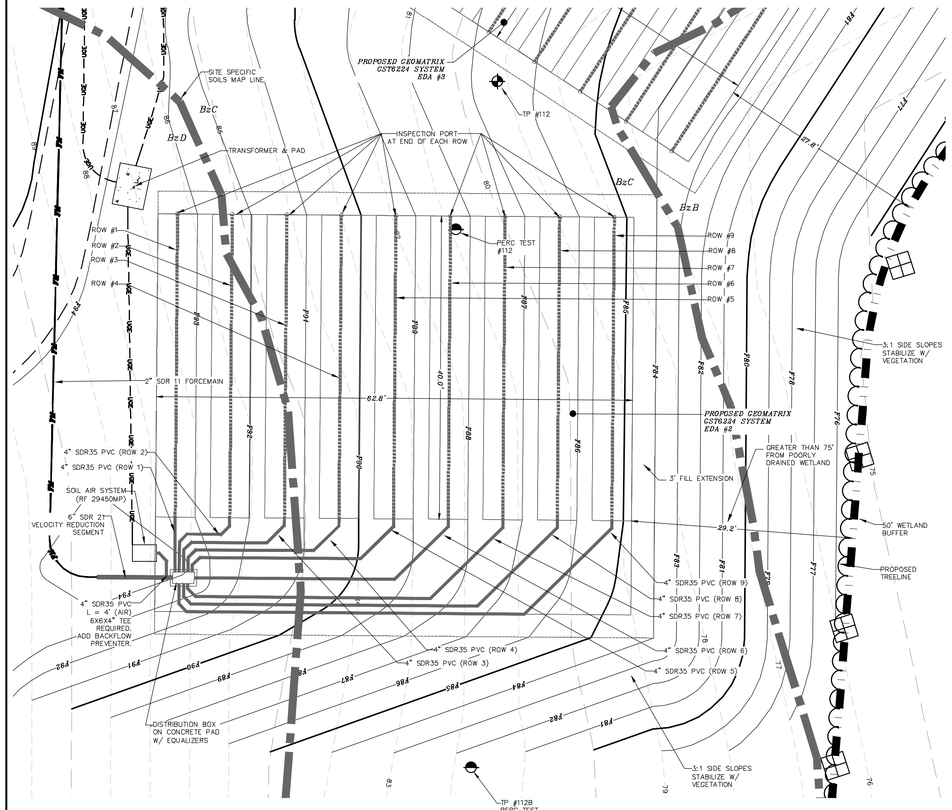
ALL SOLID PLASTIC PIPE WILL BE 4" SDR35 (4" SCHD. 40 WITHIN 10' OF THE STRUCTURE TO THE TANK). ALL CONNECTIONS BETWEEN THE SEPTIC TANK AND THE PIPES LEADING TO AND EXITING FROM THE TANK SHALL BE SEALED WITH A WATERTIGHT, FLEXIBLE JOINT CONNECTOR

PROFILE OF SEPTIC SYSTEM



CROSS-SECTION OF DISPOSAL FIELD

SEE GST PROFILE, SHEET #66. FOR ROW ELEVATIONS AND DISTRIBUTION PIPE INFORMATION.



SOIL DATA :

BzC – BUXTON, 8 TO 15% SLOPES

SEE SITE SPECIFIC SOILS MAP

CALCULATIONS :

27 BEDROOMS TOTAL, 4,050 GPD
USE 8' DIA. CIRCULAR CONCRETE PUMP CHAMBER (FROM SHEA CONCRETE OR EQUIV.)

GST 6224 SYSTEM
4.3 MIN/IN MEASURED PERC RATE
20 MIN/IN DESIGN PERC RATE
10,125 SF SYSTEM SIZE REQUIRED
32.1 SF/LF TOTAL SURFACE AREA
315.4 – MIN. LENGTH GST SEPTIC PIPE REQUIRED
360 – PROPOSED LENGTH OF GST SEPTIC PIPE
9 ROWS OF SEPTIC PIPE, EACH ROW 40' LONG
294 MAX. GAL/DOSE
STATIC HEAD = 0.29'

PUMP SIZING :

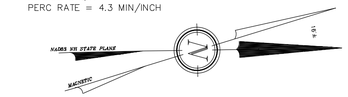
DESIGN FLOW RATE: 66.0 GPM
TOTAL DYNAMIC HEAD: 24.0 FT
PUMP: DUAL ALTERNATING LIBERTY FL50 EFFLUENT PUMP

ELEVATIONS :

SEE PROFILE, SHEET #66.

TESTHOLE DATA : #112

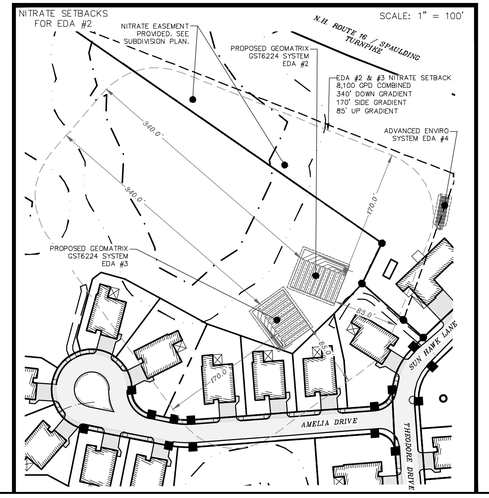
0–9 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
9–16 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, BLOCKY, FRIABLE
16–45 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
44–60 5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 16"
RESTRICTIVE LAYER @ 16"
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ N/A
PERC RATE = 4.3 MIN/INCH



GRAPHIC SCALE

20 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.



VENTING NOTE:

THE MANUFACTURERS SPECIFICATIONS FOR GST SYSTEM INSTALLATIONS REQUIRE THAT THE INSTALLATION OF A VENT IF THE SYSTEM IS GREATER THAN 18" DEEP. GEOMATRIX RECOMMENDS THAT SYSTEMS DEEPER THAN 24" UTILIZE SOILAIR SYSTEM.

AS SOILAIR SYSTEM IS UTILIZED, NO VENTING FOR THE FIELD IS ALLOWED.

PLAN INTENT :

THE SEPTIC SYSTEM IS TO BE CONSTRUCTED WITH THE BOTTOM OF THE LEACH BED (STONE) IS 1.25' ABOVE THE HIGH POINT OF THE EXISTING LAND.

IN THE EVENT OF LEACH BED FAILURE, IT MAY BE REBUILT IN PLACE WITH NHDES APPROVAL.

CAUTION !!!!!

ANY DEVIATION FROM THIS PLAN IN GRADE OR LOCATION OF THE SEPTIC SYSTEM WHEN CONSTRUCTED WITHOUT THE APPROVAL OF THE DESIGNER AND NH-DES SUBSURFACE SYSTEMS BUREAU MAY RESULT IN THE FAILURE OF THE SYSTEM TO PASS INSPECTION BY NH-DES SUBSURFACE SYSTEMS BUREAU PRIOR TO OPERATION APPROVAL, OR FUNCTION PROPERLY AND SAFELY.



JOHN P. HAYES III, CSS #87

THE WETLAND DELINEATION WAS COMPLETED SPRING, 2021 & OCTOBER, 2022 IN ACCORDANCE WITH THE 1987 CORP OF ENGINEERS WETLAND DELINEATION MANUAL. JURISDICTIONAL WETLANDS WERE IDENTIFIED AND DELINEATED USING THE ROUTINE DETERMINATIONS METHOD AS OUTLINED IN THE MANUAL. THE DELINEATION WAS DONE BY:

JOHN P. HAYES III, CWS #18

Total Lot Loading Area Buxton (Sq. Ft.)	Total Lot Loading Area Hollis-Charlton (Sq. Ft.)
115864	55,338
Total Area Buxton (Sq. Ft.)	**Total Area Hollis-Charlton (Sq. Ft.)**
958142	55,338
Total GPD Buxton	**Total GPD Hollis-Charlton**
1773	1,689
Total Lot Loading Area Biddeford (Sq. Ft.)	**Total Lot Loading Area Suffield (Sq. Ft.)**
0	502,672
Total Area Biddeford (Sq. Ft.)	**Total Area Suffield (Sq. Ft.)**
16,216	502,672
Total GPD Biddeford	**Total GPD Suffield**
0	12,599
Total Lot Loading Area Charlton (Sq. Ft.)	**Total Lot Loading Area Scantic (Sq. Ft.)**
73,880	0
Total Area Charlton (Sq. Ft.)	**Total Area Scantic (Sq. Ft.)**
73,880	330,704
Total GPD Charlton	**Total GPD Scantic**
2,312	0
Total Lot Loading Area (Sq. Ft.)	
747,754	
Total Lot Area (Sq. Ft.)	
1,934,952	
Total GPD Yield	
18,373	

GST6224 NOTES

1.– WHEELED VEHICLES AND MACHINERY MUST BE KEPT OFF OWTS, UNLESS DESIGNED FOR H-20 LOADING.
2.– OWTS SHALL BE INSTALLED PER;
GST LEACHING SYSTEM – NEW HAMPSHIRE, DESIGN MANUAL DATED MAY 28, 2020.
3.– APPROVAL OF THIS PLAN ALLOWS CONSTRUCTION OF THE GST DESIGN ONLY.
CONSTRUCTION OF A CONVENTIONAL SYSTEM REQUIRES;
A.– A SEPARATE DESIGN.
B.– SUBMISSION & APPROVAL.
4.– TYPE GST6224 FORMS ARE TO BE USED (62"W).
5.– INSTALLER TO SCHEDULE ALL INSTALLATIONS WITH FORM SUPPLIER A WEEK PRIOR TO SYSTEM INSTALL.
6.– THIS ISDS IS NOT DESIGNED FOR BACKWASH FROM A WATER CONDITIONER.
7.– ANY OWTS WITH MORE THAN 18" OF COVER MUST BE VENTED.
8.– SCARIFY SUB-SOIL IMMEDIATELY PRIOR TO PLACEMENT OF FILL.
9.– A SERIALIZED INSPECTION PORT – PN:IPGST15 – IS REQUIRED ON EACH GST SYSTEM & EACH ROW IS TO HAVE INSPECTION PORT EXTENDED TO FINISHED GRADE (SEE PAGE(S) 7 & 17 OF MANUAL).
10.– FOR GST SYSTEMS UNDER DRIVEWAYS OR SUBJECT TO H-20 WHEEL LOADING CONDITIONS, SYSTEM MUST BE INSTALLED PER MANUFACTURERS REQUIREMENTS AS DESCRIBED IN THE MAY 28 2020 "DESIGN MANUAL". (A SUPPLEMENTAL DETAIL IS AVAILABLE UPON REQUEST, BUT IS NOT REQUIRED FOR NH-DES APPROVAL.)
11.– INSTALLER TO PLACE #5 X 12" REBAR (PROVIDED) NEXT TO INSPECTION PORT TO FACILITATE FUTURE LOCATING SHOULD INSPECTION CAP BECOME BURIED. DECAL PROVIDED SHALL BE PLACE ON STRUCTURE ELECTRICAL METER SOCKET OR EFFLUENT PUMP CONTROL PANEL IF ONE IS PRESENT, THIS IS TO IDENTIFY SYSTEM TYPE FOR FUTURE SYSTEM INSPECTION PURPOSES.
12.– PATENTED GST FORMS ARE AVAILABLE TO RENT FROM;
SEPTIC ASSISTANT LLC 1-603-660-1603
181 GOULD RD – WEARE, NH 03281

NOTES:

1.) OWNER: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

A.) TAX MAP E, LOT 65-1

B.) LOT AREA: 1,809,066 Sq.Ft.±, 41.53 Ac.±

C.) S.C.R.D. BOOK 5044, PAGE 744

2.) DESIGNER: CHRISTOPHER R. BERRY, PERMIT #1886
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825

3.) SUBDIVISION STATUS: PENDING

4.) FOUNDATION DRAINS WILL START AT LEAST 15' FROM THE LEACH FIELD, AND AT LEAST 5' FROM THE SEPTIC TANK.

5.) THERE IS NO SURFACE WATER OR VERY POORLY DRAINED SOILS WITHIN 50', OR POORLY DRAINED SOILS WITHIN 75' OF THE PROPOSED SEPTIC SYSTEM.

6.) THIS DESIGN DOES NOT ALLOW FOR THE USE OF A GARBAGE GRINDER. IF A GRINDER IS TO BE INCORPORATED A LARGER SEPTIC TANK WILL BE REQUIRED.

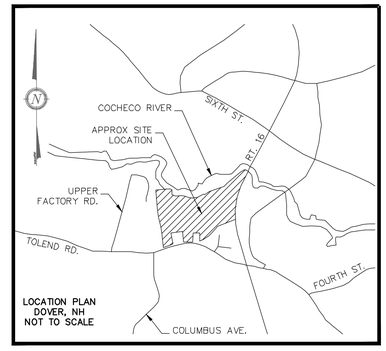
7.) THIS DESIGN DOES NOT ALLOW FOR THE ACCEPTANCE OF WATER TREATMENT BACKWASH. IF A WATER TREATMENT SYSTEM IS TO BE INCORPORATED A LARGER LEACHFIELD WILL BE REQUIRED.

8.) IN THE EVENT A DISCREPANCY IS FOUND ON THIS PLAN, THE DESIGNER SHOULD BE CONTACTED IMMEDIATELY AT 603-332-2863 TO DISCUSS AN APPROPRIATE PLAN OF ACTION.

9.) THE PROPOSED USE OF THESE UNITS ARE SINGLE FAMILY HOMES TO BE SOLD, THE EDA WILL BE UNDER THE SINGLE OWNERSHIP OF THE ROLLING HILL ESTATES HOME OWNERS ASSOCIATION.

10.) EDA #2 RECEIVES 9 UNITS, WITH 3 BEDROOMS PER UNIT FOR A FLOW OF 450 GPD/UNIT.

11.) SEE LOT LOADING CALCULATIONS. THE TOTAL PROJECT FLOW IS PROPOSED TO BE 12,750 GPD. SEE EDA #1, 2, & 3. THE TOTAL LOT LOADING AVAILABLE IS 18,373 GPD.



LOCATION PLAN
DOVER, NH
NOT TO SCALE

REVISION	DATE	DESCRIPTION

GEOMATRIX GST6224 SYSTEM – EFFLUENT DISPOSAL SYSTEM #2
LAND OF
59 TOLEND ROAD LLC
TOLEND ROAD
DOVER, NH 03820
TAX MAP E LOTS 65-1
FOR STONEARCH DEVELOPMENT CORP.
SYSTEM #2

STATE OF NEW HAMPSHIRE – KENNETH A. BERRY No. 10143 LICENSED PROFESSIONAL ENGINEER

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT RD.
BARRINGTON, N.H. 332-2863

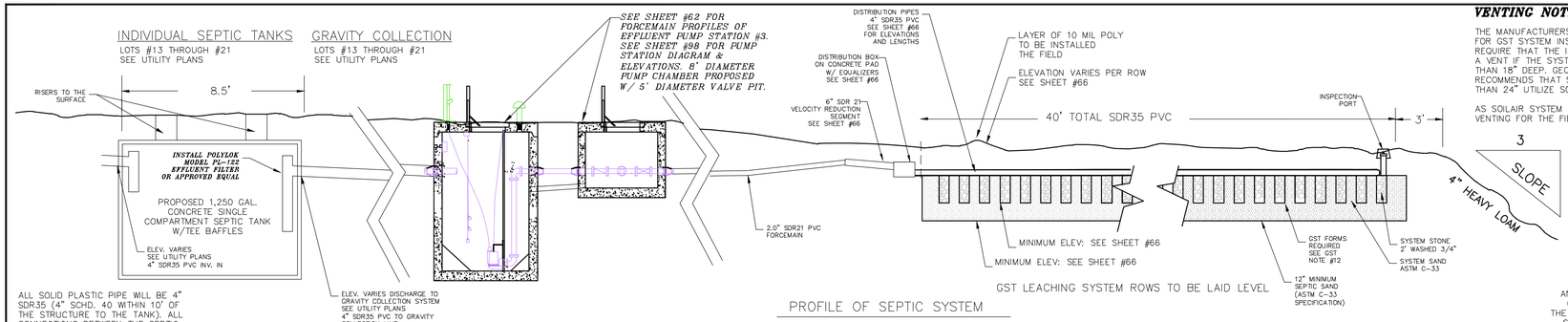
SCALE : 1 IN. EQUALS 10 FT.
DATE : APRIL 27, 2022
FILE NO. : DB 2023 – 031

NOT FOR CONSTRUCTION

INDIVIDUAL SEPTIC TANKS
LOTS #13 THROUGH #21
SEE UTILITY PLANS

GRAVITY COLLECTION
LOTS #13 THROUGH #21
SEE UTILITY PLANS

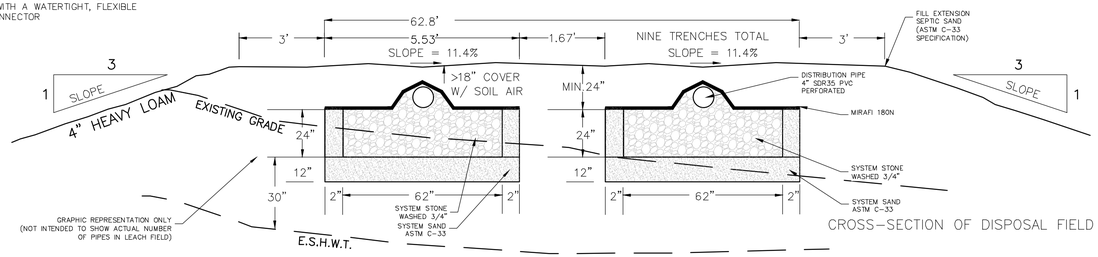
SEE SHEET #62 FOR FORCEMAIN PROFILES OF EFFLUENT PUMP STATION #3. SEE SHEET #98 FOR PUMP STATION DIAGRAM & ELEVATIONS. 8' DIAMETER PUMP CHAMBER PROPOSED W/ 5' DIAMETER VALVE PIT.



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GST LEACHING SYSTEM ROWS TO BE LAID LEVEL

PROFILE OF SEPTIC SYSTEM



CROSS-SECTION OF DISPOSAL FIELD

SOIL DATA :

BzC – BUXTON, 8 TO 15% SLOPES

SEE SITE SPECIFIC SOILS MAP

CALCULATIONS :

27 BEDROOMS TOTAL, 4,050 GPD
USE 8' DIA. CIRCULAR CONCRETE PUMP CHAMBER (FROM SHEA CONCRETE OR EQUIV.)

GST 6224 SYSTEM
4.3 MIN./IN MEASURED PERC RATE
20 MIN./IN DESIGN PERC RATE
10,125 SF SYSTEM SIZE REQUIRED
32.1 SF/LF TOTAL SURFACE AREA
315.4 – MIN. LENGTH GST SEPTIC PIPE REQUIRED
360 – PROPOSED LENGTH OF GST SEPTIC PIPE
9 ROWS OF SEPTIC PIPE, EACH ROW 40' LONG
294 MAX. GAL/DOSE
STATIC HEAD = 16.04'

PUMP SIZING :

DESIGN FLOW RATE: 51.0 GPM
TOTAL DYNAMIC HEAD: 33.5 FT
PUMP: DUAL ALTERNATING LIBERTY FL50 EFFLUENT PUMP

ELEVATIONS :

SEE PROFILE, SHEET #66.

VENTING NOTE:

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JOHN P. HAYES III, CWS #18



JOHN P. HAYES III, CSS #87

NOTES:

1.) OWNER: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

A.) TAX MAP E, LOT 65-1

B.) LOT AREA: 1,809,066 Sq.Ft.±, 41.53 Ac.±

C.) S.C.R.D. BOOK 5044, PAGE 744

2.) DESIGNER: CHRISTOPHER R. BERRY, PERMIT #1886
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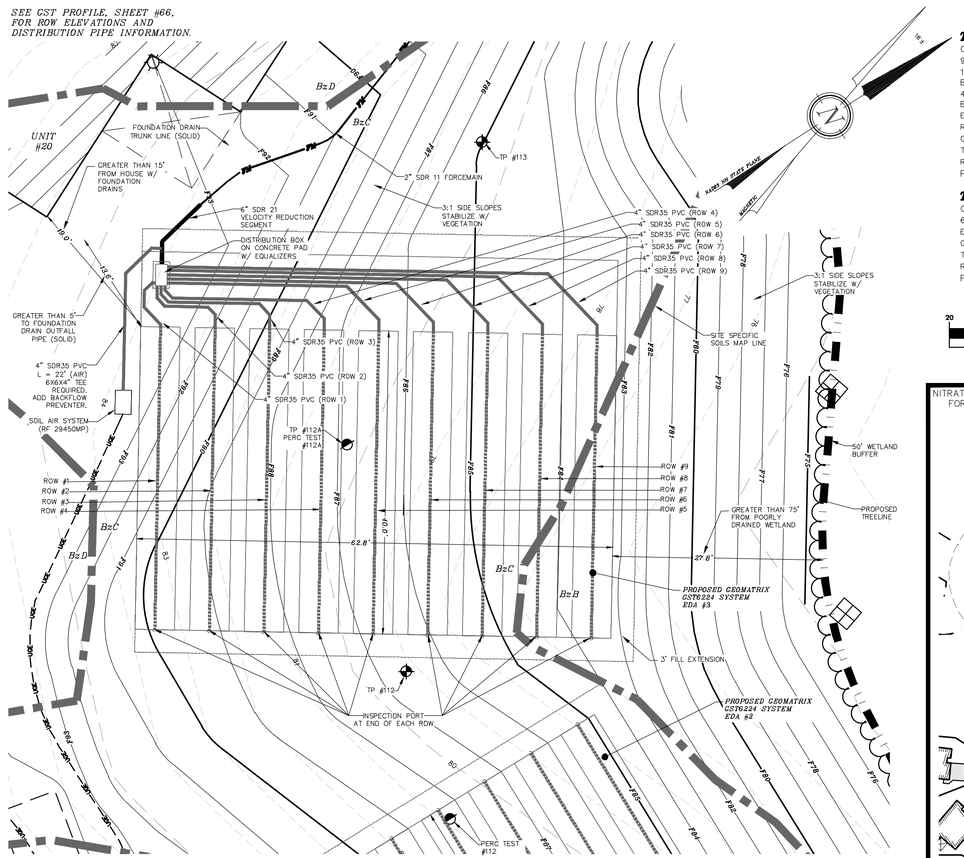
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10.) EDA #3 RECEIVES 9 UNITS, WITH 3 BEDROOMS PER UNIT FOR A FLOW OF 450 GPD/UNIT.

11.) SEE LOT LOADING CALCULATIONS. THE TOTAL PROJECT FLOW IS PROPOSED TO BE 12,750 GPD. SEE EDA #1, 2, & 3. THE TOTAL LOT LOADING AVAILABLE IS 18,373 GPD.

SEE GST PROFILE, SHEET #66. FOR ROW ELEVATIONS AND DISTRIBUTION PIPE INFORMATION.



TESTHOLE DATA : #112

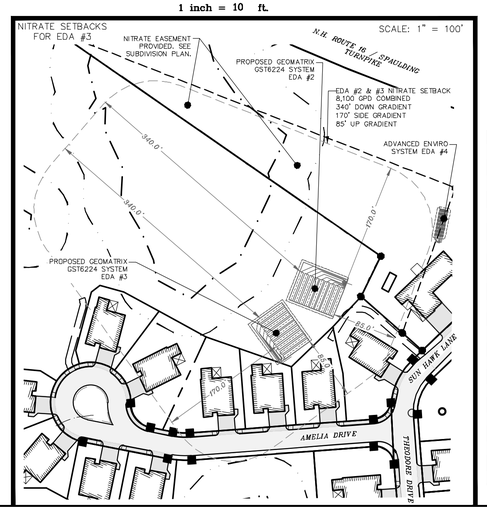
0-9 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
9-16 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, BLOCKY, FRIABLE
16-45 2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
44-60 5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM
E.S.H.W.T. @ 16"
RESTRICTIVE LAYER @ 16"
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ N/A
PERC RATE = 4.3 MIN/INCH

TESTHOLE DATA : #112A

0-6 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6-21 10YR 4/4 DARK YELLOWISH BROWN, SILT LOAM, BLOCKY, FRIABLE
E.S.H.W.T. @ 21"
GROUND WATER @ N/A
TERMINATED @ 21"
REFUSAL @ N/A
PERC RATE = 3.0 MIN/INCH

GRAPHIC SCALE

20 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.



GST6224 NOTES

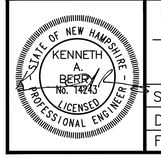
1.– WHEELED VEHICLES AND MACHINERY MUST BE KEPT OFF OWTS, UNLESS DESIGNED FOR H-20 LOADING.
2.– OWTS SHALL BE INSTALLED PER; GST LEACHING SYSTEM – NEW HAMPSHIRE, DESIGN MANUAL DATED MAY 28, 2020.
3.– APPROVAL OF THIS PLAN ALLOWS CONSTRUCTION OF THE GST DESIGN ONLY.
CONSTRUCTION OF A CONVENTIONAL SYSTEM REQUIRES;
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B.– SUBMISSION & APPROVAL.
4.– TYPE GST6224 FORMS ARE TO BE USED (62"W).
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7.– ANY OWTS WITH MORE THAN 18" OF COVER MUST BE VENTED.
8.– SCARIFY SUB-SOIL IMMEDIATELY PRIOR TO PLACEMENT OF FILL.
9.– A SERIALIZED INSPECTION PORT – PN:IPGST15 – IS REQUIRED ON EACH GST SYSTEM & EACH ROW IS TO HAVE INSPECTION PORT EXTENDED TO FINISHED GRADE (SEE PAGE(S) 7 & 17 OF MANUAL).
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11.– INSTALLER TO PLACE #5 X 12" REBAR (PROVIDED) NEXT TO INSPECTION PORT TO FACILITATE FUTURE LOCATING SHOULD INSPECTION CAP BECOME BURIED. DECAL PROVIDED SHALL BE PLACE ON STRUCTURE ELECTRICAL METER SOCKET OR EFFLUENT PUMP CONTROL PANEL IF ONE IS PRESENT, THIS IS TO IDENTIFY SYSTEM TYPE FOR FUTURE SYSTEM INSPECTION PURPOSES.
12.– PATENTED GST FORMS ARE AVAILABLE TO RENT FROM;
SEPTIC ASSISTANT LLC 1-603-660-1603
181 GOULD RD – WEARE, NH 03281

Total Lot Loading Area Buxton (Sq. Ft.)	Total Lot Loading Area Hollis-Charlton (Sq. Ft.)
115864	55,338
Total Area Buxton (Sq. Ft.)	**Total Area Hollis-Charlton (Sq. Ft.)**
956142	55,338
Total GPD Buxton	**Total GPD Hollis-Charlton**
1773	1,689
Total Lot Loading Area Biddeford (Sq. Ft.)	**Total Lot Loading Area Suffield (Sq. Ft.)**
0	502,672
Total Area Biddeford (Sq. Ft.)	**Total Area Suffield (Sq. Ft.)**
16,216	502,672
Total GPD Biddeford	**Total GPD Suffield**
0	12,599
Total Lot Loading Area Charlton (Sq. Ft.)	**Total Lot Loading Area Scantic (Sq. Ft.)**
73,880	0
Total Area Charlton (Sq. Ft.)	**Total Area Scantic (Sq. Ft.)**
73,880	330,704
Total GPD Charlton	**Total GPD Scantic**
2,312	0
Total Lot Loading Area (Sq. Ft.)	
747,754	
Total Lot Area (Sq. Ft.)	
1,934,952	
Total GPD Yield	
18,373	

LOCATION PLAN
DOVER, NH
NOT TO SCALE

REVISION	DATE	DESCRIPTION

GEOMATRIX GST6224 SYSTEM – EFFLUENT DISPOSAL SYSTEM #3
LAND OF
59 TOLEND ROAD LLC
TOLEND ROAD
DOVER, NH 03820
TAX MAP E LOTS 65-1
FOR STONEARCH DEVELOPMENT CORP.
SYSTEM #3

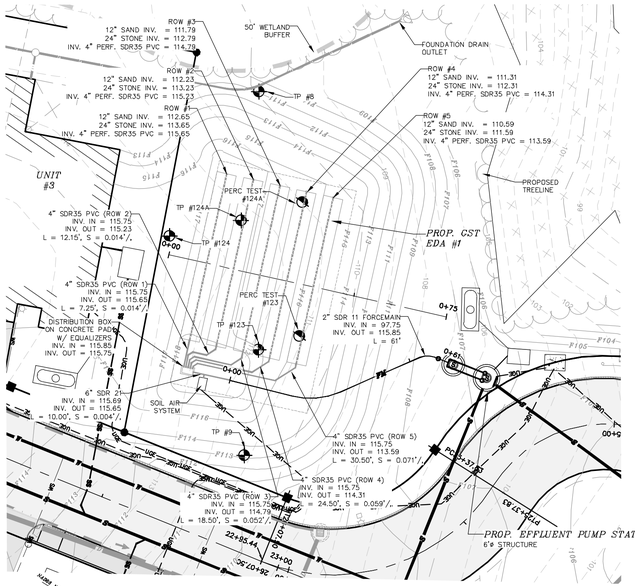


BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT RD.
BARRINGTON, N.H. 332-2863

SCALE : 1 IN. EQUALS 10 FT.
DATE : APRIL 27, 2022
FILE NO. : DB 2023 – 031

NOT FOR CONSTRUCTION

PLAN & PROFILE VIEW EDA #1

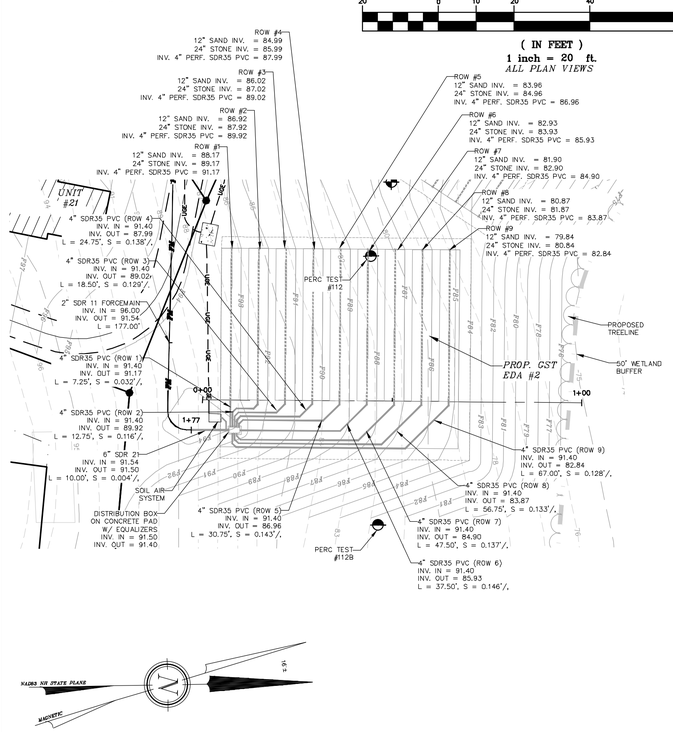


PLAN & PROFILE VIEW EDA #2

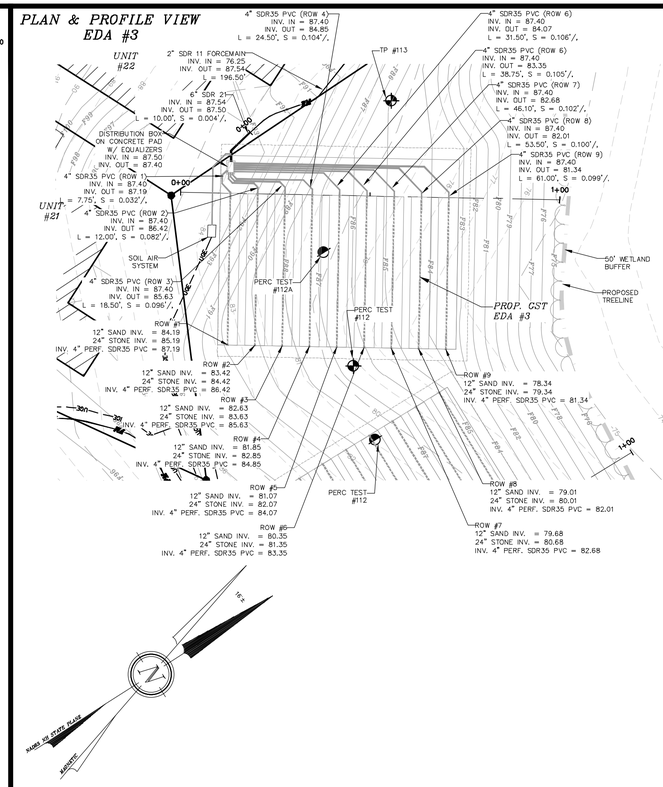
GRAPHIC SCALE

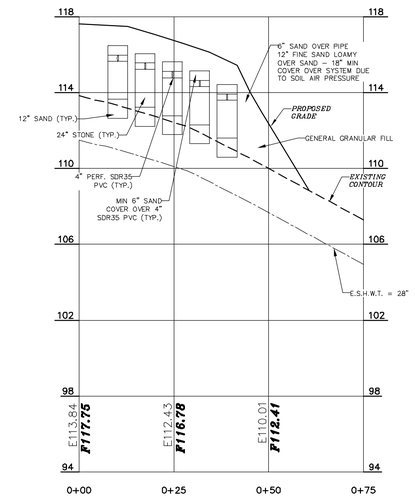
20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
ALL PLAN VIEWS



PLAN & PROFILE VIEW EDA #3

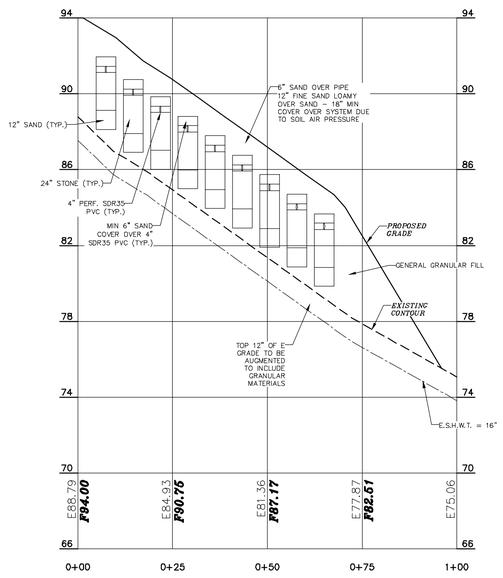


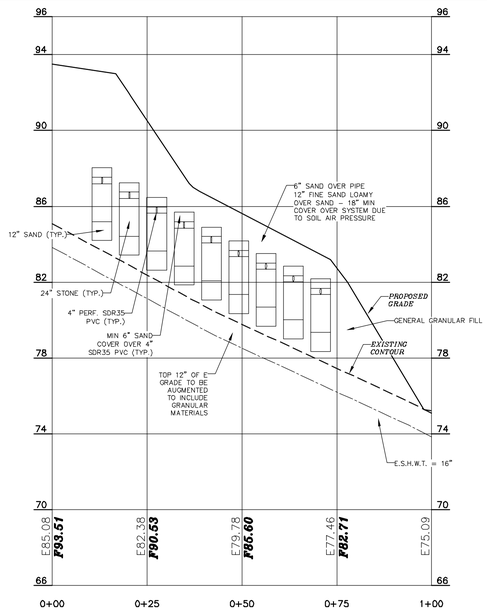


GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'
ALL PROFILE VIEWS





DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

UTILITY

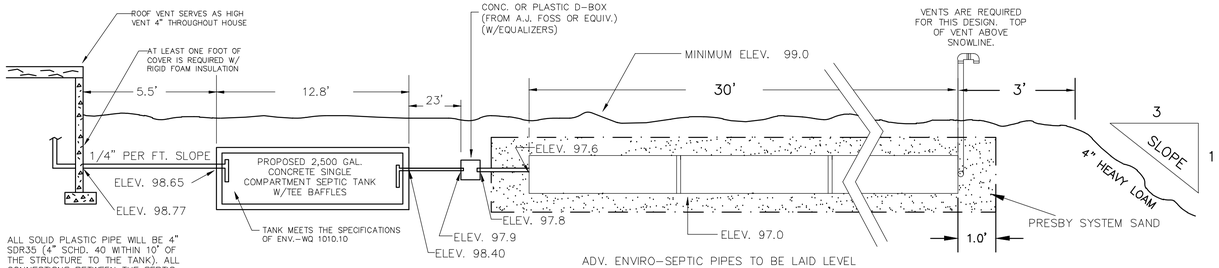
GST 6224 SYSTEM SECTIONS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

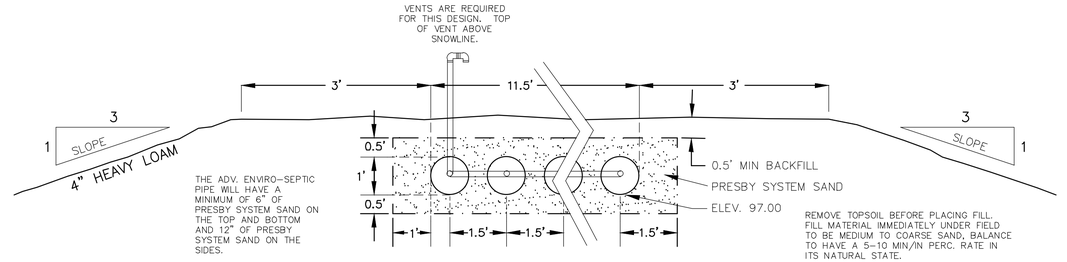
SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14043
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



PROFILE OF SEPTIC SYSTEM



CROSS-SECTION OF DISPOSAL FIELD

SOIL DATA :

BzC – BUXTON, 8 TO 15% SLOPES

SEE SITE SPECIFIC SOILS MAP

TESTHOLE DATA : #111

0–12	10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12–18	10YR 4/4 DARK YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
18–24	2.5Y 5/4 LIGHT OLIVE BROWN, SILT LOAM, BLOCKY, FRIABLE
24–60	2.5Y 5/3 LIGHT OLIVE BROWN, SILTY CLAY LOAM WITH REDOX. FEAT. PRESENT, BLOCKY, FIRM

E.S.H.W.T. @ 24"
RESTRICTIVE LAYER @ 24"
GROUND WATER @ N/A
TERMINATED @ 60"
REFUSAL @ N/A

PERC RATE @ 20 MIN/INCH

CALCULATIONS :

4 BEDROOM DUPLEX, 600 GPD
USE 2,500 GAL. SINGLE COMPARTMENT CONCRETE SEPTIC TANK (FROM A.J. FOSS OR EQUIV.)

20 MIN/IN MEASURED PERC RATE
20 MIN/IN DESIGN PERC RATE
280 – MIN. LENGTH ADV. ENVIRO SEPTIC PIPE REQUIRED
280 – PROPOSED LENGTH OF ADV. ENVIRO SEPTIC PIPE
28 – TOTAL NUMBER OF 10' SECTIONS OF ADV. ENVIRO SEPTIC PIPE REQUIRED
8 ROWS OF ADV. ENVIRO SEPTIC PIPE, EACH ROW 35 LONG

ELEVATIONS :

101.0 – HIGH POINT OF LEACH BED (EX PIPE & STONE)
94.5 – S.H.W.T. (24" TP #111 DONE AT EXISTING TOE OF PIPE & STONE SYSTEM SLOPE)
94.5 – IMPERVIOUS LAYER
97.0 – BOTTOM OF ADV. ENVIRO-SEPTIC PIPES

PLAN INTENT :

THE SEPTIC SYSTEM IS TO BE CONSTRUCTED WITH THE BOTTOM OF THE LEACH BED 4' BELOW THE HIGH POINT OF THE EXISTING LAND.
IN THE EVENT OF LEACH BED FAILURE, IT MAY BE REBUILT IN PLACE WITH NHDES APPROVAL.

CAUTION !!!!!

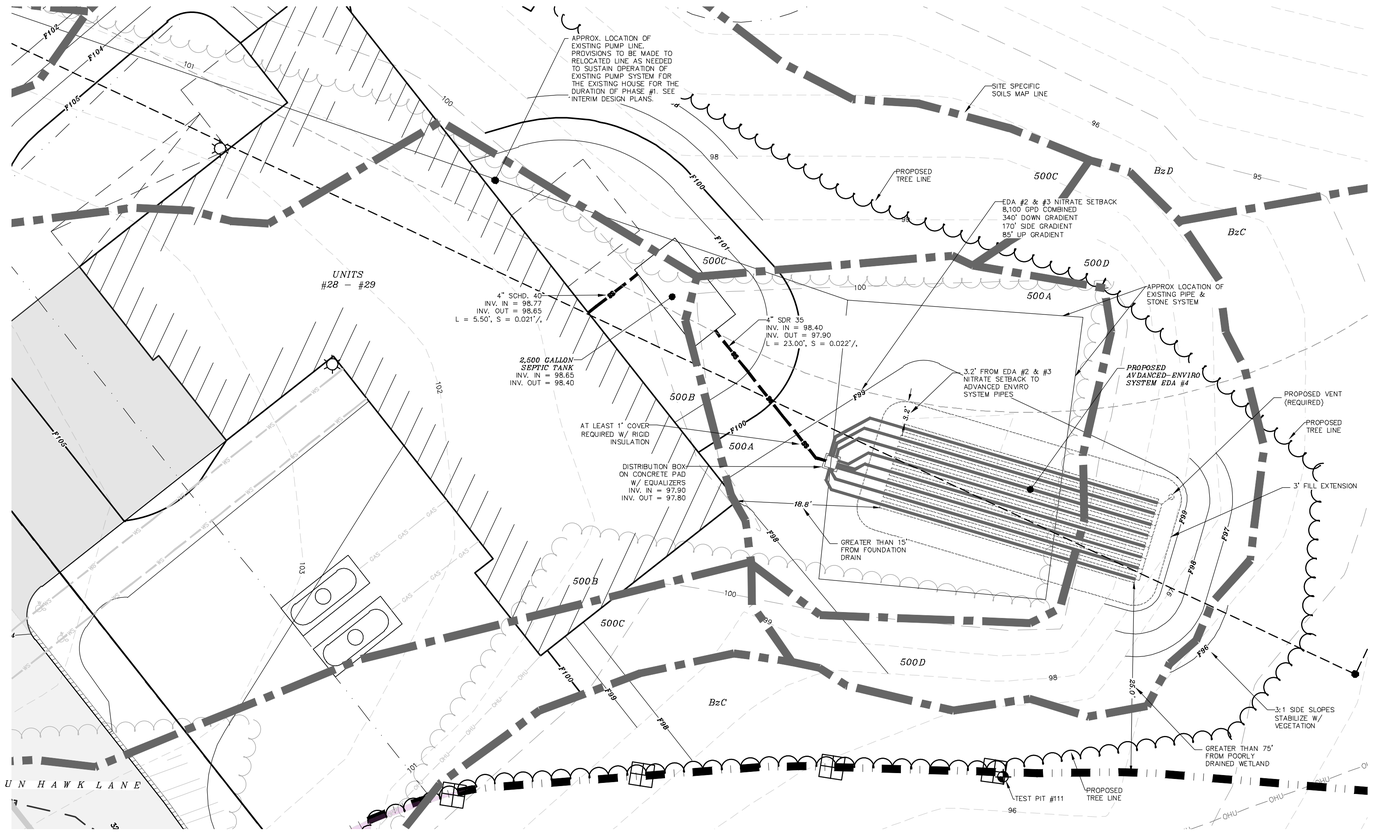
ANY DEVIATION FROM THIS PLAN IN GRADE OR LOCATION OF THE SEPTIC SYSTEM WHEN CONSTRUCTED WITHOUT THE APPROVAL OF THE DESIGNER AND NH-DES SUBSURFACE SYSTEMS BUREAU MAY RESULT IN THE FAILURE OF THE SYSTEM TO PASS INSPECTION BY NH-DES SUBSURFACE SYSTEMS BUREAU PRIOR TO OPERATION APPROVAL, OR FUNCTION PROPERLY AND SAFELY.

THE WETLAND DELINEATION WAS COMPLETED SPRING, 2021 & OCTOBER, 2022 IN ACCORDANCE WITH THE 1987 CORP OF ENGINEERS WETLAND DELINEATION MANUAL. JURISDICTIONAL WETLANDS WERE IDENTIFIED AND DELINEATED USING THE ROUTINE DETERMINATIONS METHOD AS OUTLINED IN THE MANUAL. THE DELINEATION WAS DONE BY:

JOHN P. HAYES III, CWS #18

STATE OF NEW HAMPSHIRE
JOHN P. HAYES III
NO. 087
CERTIFIED SOIL SCIENTIST

JOHN P. HAYES III, CSS #87



NOTES:

1.) OWNER: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

A.) TAX MAP E, LOT 65–A

B.) PROPOSED LOT AREA: 125,886 Sq.Ft., 2.89 Ac.

C.) S.C.R.D. BOOK 1571, PAGE 86

2.) DESIGNER: KENNETH A. BERRY, PERMIT #125
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825

3.) SUBDIVISION STATUS: PENDING

4.) FOUNDATION DRAINS WILL START AT LEAST 15' FROM THE LEACH FIELD, AND AT LEAST 5' FROM THE SEPTIC TANK.

5.) THERE IS NO SURFACE WATER OR VERY POORLY DRAINED SOILS WITHIN 50', OR POORLY DRAINED SOILS WITHIN 75' OF THE PROPOSED SEPTIC SYSTEM.

6.) THIS DESIGN DOES NOT ALLOW FOR THE USE OF A GARBAGE GRINDER. IF A GRINDER IS TO BE INCORPORATED A LARGER SEPTIC TANK WILL BE REQUIRED.

7.) THIS DESIGN DOES NOT ALLOW FOR THE ACCEPTANCE OF WATER TREATMENT BACKWASH. IF A WATER TREATMENT SYSTEM IS TO BE INCORPORATED A LARGER LEACHFIELD WILL BE REQUIRED.

8.) IN THE EVENT A DISCREPANCY IS FOUND ON THIS PLAN, THE DESIGNER SHOULD BE CONTACTED IMMEDIATELY AT 603-332-2863 TO DISCUSS AN APPROPRIATE PLAN OF ACTION.

9.) THE PROPOSED USE OF UNITS #28 & #29 IS A DUPLEX OWNED BY THE SGRIGNOULI'S AND WILL BE MAINTAINED BY THEM.

10.) EDA #4 RECEIVES 2 UNITS, WITH 2 BEDROOMS PER UNIT FOR A FLOW OF 300 GPD/UNIT.

11.) SEE LOT LOADING CALCULATIONS. THE TOTAL PROJECT FLOW IS PROPOSED TO BE 12,750 GPD. SEE EDA #1, 2, 3 & 4. THE TOTAL LOT LOADING AVAILABLE IS 18,373 GPD.

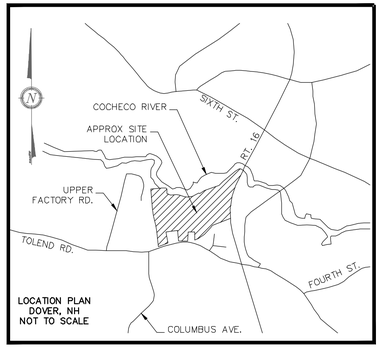
12.) EDA #4: CONVERSION TO CONDOMINIUMS (SEPARATE OWNERSHIP) WILL REQUIRE NHDES SUBDIVISION APPROVAL. UNITS ARE TO REMAIN UNDER COMMON OWNERSHIP UNTIL SUCH TIME AS THAT APPROVAL IS GRANTED.



GRAPHIC SCALE

20 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.



LOCATION PLAN
DOVER, NH
NOT TO SCALE

Total Lot Loading Area Buxton (Sq. Ft.)	Total Lot Loading Area Hollis-Charlton (Sq. Ft.)
115864	55,338
Total Area Buxton (Sq. Ft.)	**Total Area Hollis-Charlton (Sq. Ft.)**
956142	55,338
Total GPD Buxton	**Total GPD Hollis-Charlton**
1773	1,689
Total Lot Loading Area Biddeford (Sq. Ft.)	**Total Lot Loading Area Suffield (Sq. Ft.)**
0	502,672
Total Area Biddeford (Sq. Ft.)	**Total Area Suffield (Sq. Ft.)**
16,216	502,672
Total GPD Biddeford	**Total GPD Suffield**
0	12,599
Total Lot Loading Area Charlton (Sq. Ft.)	**Total Lot Loading Area Scantic (Sq. Ft.)**
73,880	0
Total Area Charlton (Sq. Ft.)	**Total Area Scantic (Sq. Ft.)**
73,880	330,704
Total GPD Charlton	**Total GPD Scantic**
2,312	0
Total Lot Loading Area (Sq. Ft.)	
747,754	
Total Lot Area (Sq. Ft.)	
1,934,952	
Total GPD Yield	
18,373	

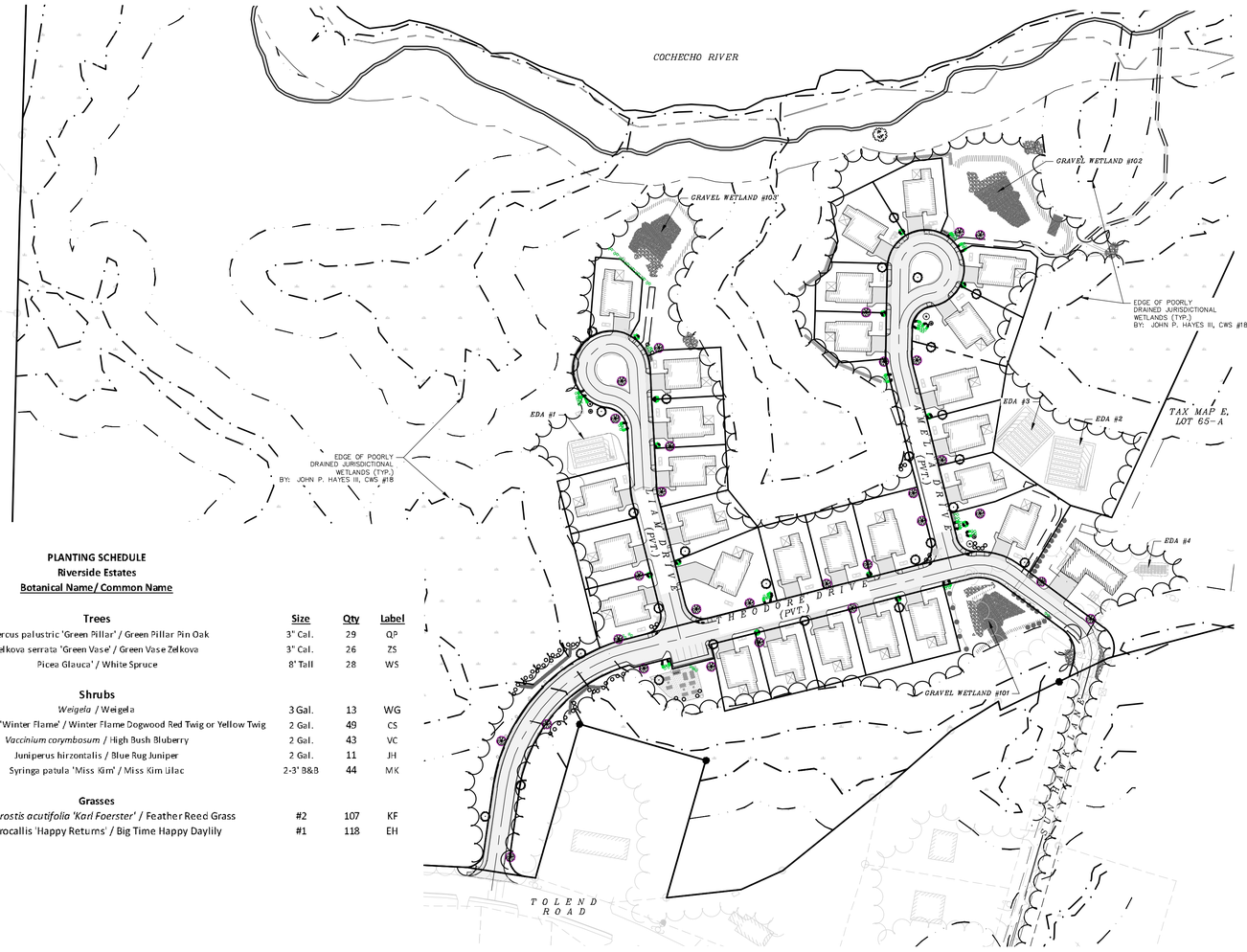
REVISION	DATE	DESCRIPTION

ADVANCED ENVIRO SYSTEM – EFFLUENT DISPOSAL SYSTEM #4
LAND OF
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, NH 03820
TAX MAP E LOTS 65–A
FOR STONEARCH DEVELOPMENT CORP.
SYSTEM #4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT RD.
BARRINGTON, N.H. 332–2863

SCALE : 1 IN. EQUALS 10 FT.
DATE : APRIL 27, 2022
FILE NO. : DB 2023 – 031

NOT FOR CONSTRUCTION

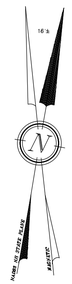


PLANTING SCHEDULE
Riverside Estates
Botanical Name/ Common Name

	Size	Qty	Label
Trees			
Quercus palustric 'Green Pillar' / Green Pillar Pin Oak	3" Cal.	29	QP
Zelkova serrata 'Green Vase' / Green Vase Zelkova	3" Cal.	26	ZS
Picea Glauca' / White Spruce	8' Tall	28	WS
Shrubs			
Weigela / Weigela	3 Gal.	13	WG
Cornus sanguina 'Winter Flame' / Winter Flame Dogwood Red Twig or Yellow Twig	2 Gal.	49	CS
Vaccinium corymbosum / High Bush Bluberry	2 Gal.	43	VC
Juniperus hirzontalis / Blue Rug Juniper	2 Gal.	11	JH
Syringa patula 'Miss Kim' / Miss Kim Lilac	2-3' B&B	44	MK
Grasses			
Calamagrostis acutifolia 'Karl Foerster' / Feather Reed Grass	#2	107	KF
Hemerocallis 'Happy Returns' / Big Time Happy Daylily	#1	118	EH

NOTES:

1. CALL DIG SAFE PRIOR TO BEGINNING WORK. (1-888-344-7233). THE LANDSCAPE CONTRACTOR IS ADVISED OF THE PRESENCE OF UNDERGROUND UTILITIES AND SHALL VERIFY THE EXISTENCE AND LOCATION OF THE SAME BEFORE COMMENCING AND DIGGING OPERATIONS. THE LANDSCAPE CONTRACTOR SHALL REPLACE OR REPAIR UTILITIES, PAVING, WALKS, CURBING, ETC DAMAGED IN PERFORMANCE OF THIS JOB AT NO ADDITIONAL COST TO THE OWNER OR GENERAL CONTRACTOR.
2. CONTRACTOR SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL SITE CONDITIONS PRIOR TO CONSTRUCTION BIDDING.
3. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTINGS SHOWN ON THE DRAWINGS. VARIATIONS IN QUANTITIES ARE TO BE APPROVED BY THE DESIGN ENGINEER.
4. PROVIDED SMOOTH TRANSITION WHERE NEW WORK MEETS EXISTING CONDITIONS.
5. ALL PLANT MATERIAL INSTALLED SHALL MEET THE SPECIFICATIONS OF "AMERICAN STANDARD FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN
6. ALL PLANT MATERIALS SHALL BE FREE FROM INSECTS AND DISEASE.
7. ALL PLANTINGS SHALL BE DONE IN ACCORDANCE WITH ACCEPTABLE HORTICULTURAL PRACTICES. THIS IS TO INCLUDE PROPER PLANTING MIX, PLANT BED AND TREE PIT PREPARATION, PRUNING STAKING OR GUYING, WRAPPING, SPRAYING, FERTILIZATION, PLANTING AND ADEQUATE MAINTENANCE UNTIL ACCEPTANCE FROM OWNER.
8. ALL GRASS, OTHER VEGETATION AND DEBRIS SHALL BE REMOVED FROM ALL PLANTING AREAS PRIOR TO PLANTING.
9. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF EXISTING AND NEWLY PLANTED TREES AND SHRUBS DURING THE CONSTRUCTION PROCESS. WHERE REQUIRED, THE CONTRACTOR SHALL INSTALL TEMPORARY FENCING (SNOW OR EQUAL) AROUND EXISTING TREES AND SHRUBS THAT COULD BE IMPACTED BY THE CONSTRUCTION PROCESS. STORAGE OF CONSTRUCTION EQUIPMENT, CONSTRUCTION MATERIALS, SNOW STORAGE AND OR VEHICLE PARKING SHALL NOT BE PERMITTED WITHIN THE DRIP LINE OF TREES OR TWENTY FEET WHICH EVER IS GREATER.
10. NEW PLANTINGS SHALL BE INSTALLED PER PROJECT DRAWINGS AND SPECIFICATION THAT INCLUDE FERTILIZATION AND MULCHING AS REQUIRED.
11. ALL SHRUB BEDS AND TREE PITS SHALL BE MULCHED WITH 3" CLEAN SHREDDED BLACK MULCH
12. WHERE INDICATED ON PLAN, PLANTING SOIL MIXTURE FOR GROUND COVER AND PERENNIAL BED AREAS SHALL CONSIST OF FOUR PARTS TOPSOIL, TWO PARTS SPHAGNUM PEAT MOSS, AND ONE PART HORTICULTURAL PERLITE BY VOLUME. PEAT MOSS MAY BE SUBSTITUTED WITH WELL-ROTTED OR DEHYDRATED MANURE OR COMPOST. ROTOTILL BEDS TO A DEPTH OF 8 INCHES.
13. MAINTENANCE OF NEW PLANTINGS AND LAWNS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND OR LANDSCAPE SUBCONTRACTOR UNTIL ACCEPTANCE BY THE OWNER. RESPONSIBILITIES SHALL INCLUDE WATERING WEEDING AND MOWING AS NECESSARY. ALL PLANT MATERIAL SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE, REPLACEMENT MATERIAL SHALL BE GUARANTEED FOR AND ADDITIONAL YEAR FROM TIME OF INSTALLATION.
14. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TEMPORARY EROSION CONTROL MEASURES DURING THE CONSTRUCTION PHASE AND UNTIL ALL AREAS HAVE BEEN STABILIZED AND ACCEPTED BY THE OWNER. THE GENERAL CONTRACTOR SHALL PROVIDE WEEKLY INSPECTIONS OF EROSION MEASURE AND IMMEDIATELY AFTER STORM EVENTS AND REPAIR AS NECESSARY.
15. THE GENERAL CONTRACTOR AND OR THE LANDSCAPE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL THREE GUYING MATERIAL ONCE PLANT MATERIAL HAS BEEN ESTABLISHED. (MINIMUM OF ONE GROWING SEASON). ALL TEMPORARY EROSION CONTROL MEASURE SHALL BE REMOVED ONCE STABILIZATION OF DISTURBANCE HAS BEEN ACCEPTED BY OWNER.
16. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR A MINIMUM OF TWO MOWINGS FOR ALL TURF AREAS OR UNTIL ACCEPTANCE BY THE OWNER. A MINIMUM UNIFORM 75% CATCH OF TURF IS REQUIRED FOR ACCEPTANCE.
17. ALL PLANTINGS SHALL BE WATERED REGULARLY DURING THEIR FIRST YEAR AND MAINTAINED PERMANENTLY IN GOOD GROWING CONDITION AS AN EFFECTIVE VISUAL SCREEN.
18. SHRUBS OR TREES WHICH DIE SHALL BE REPLACED WITHIN ONE GROWING SEASON WITH NEW SHRUBS OR TREES TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE LANDSCAPING REQUIREMENTS.
19. ALL REQUIRED LANDSCAPING SHALL BE INSTALLED BEFORE OCCUPANCY, OR WITHIN SIX MONTHS IF OCCUPANCY OCCURS DURING WINTER CONDITIONS.
20. TREES ARE TO BE 6' TALL AT PLANTING.
21. ALL PLANT STOCK SHALL CONFORM TO ANSI Z260.1 – NURSERY STOCK, LATEST EDITIONS (AMERICAN ASSOCIATION OF NURSERYMEN, INC.)
22. 4" AGED PINEBARK MULCH AND A WEED BARRIER (TY-PAR FABRIC OR APPROVED EQUAL) SHALL BE APPLIED TO ALL SHRUB AND GROUND COVER BEDS. INSTALL WEED BARRIER AS PER MANUFACTURERS RECOMMENDATIONS.
23. PLANT-PIT BACK-FILL SHALL BE MIXED AT A RATE OF 7 PARTS OF TOPSOIL TO 2 PARTS OF DEHYDRATED COW MANURE. SLOW RELEASE FERTILIZER SHALL BE APPLIED AS PER MANUFACTURERS RECOMMENDATIONS. USE EXISTING ON-SITE TOPSOIL AS PART OF BACK FILL WHEN AVAILABLE.
24. ALL LANDSCAPED AREAS NOT PLANTED WITH TREES, SHRUBS OR GROUNDCOVER SHALL BE RESTORED WITH SEED OR SOD AS INDICATED ON PLANS.
25. TOPSOIL WILL BE TESTED FOR FERTILIZATION REQUIREMENTS, AND SLOW RELEASE ENVIRONMENTALLY FRIENDLY FERTILIZER WILL BE APPLIED AT THE RECOMMENDED RATES.
26. ALL DISTURBED WETLAND BUFFER AREAS, EXCEPT FOR AREAS THAT ARE PART OF THE DRAINAGE SYSTEM, ARE TO BE RESEEDED WITH A CONSERVATION SEED MIX AND ONLY MOWED TWICE PER YEAR.
27. ALL PLANT SUBSTITUTIONS MUST BE APPROVED BY THE ENGINEER.
28. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, UPON DELIVERY OR AT THE JOB SITE WHILE WORK IS ONGOING TO CONFORMITY TO SPECIFIED QUALITY, SIZE AND VARIETY.
29. PLANTS FURNISHED IN CONTAINERS SHALL HAVE THE ROOTS WELL ESTABLISHED IN THE SOIL MASS AND SHALL HAVE AT LEAST ONE (1) GROWING SEASON. ROOT-BOUND PLANTS OR INADEQUATELY SIZED CONTAINERS TO SUPPORT THE PLANT MAY BE DEEMED UNACCEPTABLE.
30. ALL PLANTS SHALL BE GUARANTEED BY THE CONTRACTOR FOR NO LESS THAN ONE FULL YEAR FROM THE TIME OF INSTALLATION. DURING THIS TIME, THE OWNER SHALL MAINTAIN ALL PLANT MATERIALS IN THE ABOVE MANNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT THE PLANTS TO ENSURE PROPER CARE. IF THE CONTRACTOR IS DISSATISFIED WITH THE CARE GIVEN, HE SHALL IMMEDIATELY AND IN SUFFICIENT TIME TO PERMIT THE CONDITION TO BE RECTIFIED, NOTIFY THE OWNER IN WRITING OR OTHERWISE FORFEIT HIS CLAIM.
31. BY THE END OF THE GUARANTEE PERIOD, THE CONTRACTOR SHALL HAVE REPLACED ANY PLANT MATERIAL THAT IS MISSING, NOT TRUE TO SIZE AS SPECIFIED, THAT HAS DIED, THAT HAS LOST NATURAL SHAPE DUE TO DEAD BRANCHES, EXCESS PRUNING OR INADEQUATE OR IMPROPER CARE, OR IS, IN THE OPINION OF THE OWNER, IN UNHEALTHY OR UNSIGHTLY CONDITION.
32. THE CONTRACTOR IS TO USE TEMPORARY MEASURES FOR WATERING PLANTS DURING THE ESTABLISHMENT PERIOD, INCLUDING CONNECTING TEMPORARY HOSES TO THE STRUCTURE WATER SUPPLY LINE AND UTILIZING SPRINKLERS UNTIL 85% GROWTH OCCURS.



GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

PLANTING NOTES

1. CONTRACTOR SHALL OBTAIN APPROVAL FROM L.A. PRIOR TO PURCHASING &/OR INSTALLING SUBSTITUTE PLANT MATERIAL PRIOR TO PURCHASE OF ANY SUBSTITUTE MATERIALS.
2. CONSTRUCTION ACCESS WILL BE AS DIRECTED BY L.A. CONTRACTOR IS RESPONSIBLE FOR RESTORATION OF ACCESS ROUTE AND ALL AREAS DISTURBED BY PLANTING OPERATIONS UPON COMPLETION OF CONSTRUCTION OPERATIONS, AT NO ADDITIONAL COST TO THE OWNER.
3. LAYOUT OF ALL PLANTING BEDS AND LOCATION OF PLANTS TO BE APPROVED BY L.A. ON SITE PRIOR TO CONSTRUCTION AND INSTALLATION.
4. CONTRACTOR TO REMOVE ALL DEBRIS GENERATED BY PLANT INSTALLATION. DEBRIS TO BE DISPOSED OF IN A LEGAL MANNER.
5. ALL PLANT MATERIAL SHALL BE GUARANTEED TO BE IN GOOD, HEALTHY & FLOURISHING CONDITION FOR ONE YEAR FROM THE DATE OF FINAL INSTALLATION APPROVAL BY L.A. CONTRACTOR SHALL REPLACE, WITHOUT COST TO OWNER, AND AS SOON AS WEATHER CONDITIONS PERMIT, ALL DEAD AND NON-FLOURISHING PLANTS AS DETERMINED BY THE L.A. REPLACEMENT PLANTS SHALL BE BE GUARANTEED IDENTICALLY TO ORIGINAL PLANTS, TIME PERIOD COMMENCING FROM DATE OF REPLACEMENT PLANTING APPROVAL BY L.A.
6. ALL BEDS TO BE MULCHED WITH 3" DEPTH SHREDDED BARK MULCH UNLESS NOTED OTHERWISE.
7. CONTRACTOR TO PROVIDE NECESSARY TEMPORARY IRRIGATION IF NEEDED BASED ON TIME OF YEAR THE PROJECT IS IMPLEMENTED.

TEMPORARY WATERING NOTES

1. CONTRACTOR IS RESPONSIBLE FOR MAKING SURE ALL PLANT MATERIAL HAS ADEQUATE WATER DURING THE ESTABLISHMENT PERIOD.
2. THE USE OF GATOR BAGS, SOAKER HOSE, HAND WATERING AND OTHER TECHNIQUES SHOULD BE USED TO ASSURE PROPER HYDRATION OF THE PLANTINGS IS MAINTAINED.
3. TEMPORARY IRRIGATION SYSTEMS CAN BE SET UP TO ASSIST IN WATERING ACTIVITIES.

terrain
planning & design llc

General Plant Maintenance Guide

General Plant Bed Maintenance:

- All plant maintenance should be performed by a qualified horticulturalist or licensed arborist. Cleaning the dead material out of the planting bed in the fall helps keep litter from building up around the plants and in some cases killing the plants. Watering the first year during dry periods will help get the plants established. Mulching every year is not necessary. Raking the old mulch and turning it over is all that is needed. When necessary only install one inch of mulch and do not place the mulch closer than 3" to the trunks or stems of woody plants.

Trees

- The first year watering during dry periods will be necessary.
- 3" inches of mulch maybe used. The mulch should be kept 3 inches from the trunk.
- Fertilizing is not necessary for the first year. Fertilizing in subsequent years only when and if the foliage is looking weak.
- Fertilization should occur prior to Mat 31st or after trees have dropped their leaves for the year.
- Prune dead wood once a year.
- Depending on the amount of compaction the bed area receives, deep root aeration may be needed over time

Woody Shrubs

- The first year watering during dry periods will be necessary.
- 3" inches of mulch maybe used. The mulch should be kept 3 inches from the stems.
- Fertilizing is not necessary for the first year. Fertilizing in subsequent years only when and if the foliage is looking weak.
- Fertilization should occur prior to Mat 31st or after shrubs have dropped their leaves or gone dormant for the year.
- Prune dead wood once a year.

Grasses

- Grasses only need to be clipped back at the end of the growing season and all the clippings removed from the area.
- Do not over mulch. Too much mulch will prohibit the grass from developing into a strong clump.

Perennials

- All perennials need to be pruned back after the first or second hard frost. A two-step method; first dead head all the flower heads and let drop to the ground for re-seeding. Second cut the stems back to 3" above the ground and remove the stem and leaf litter and place in compost. Do not over mulch. Too much mulch will prohibit the growth and development
- Fertilizing perennials once in the spring with a low phosphate fertilizer will help the plants to get started in the spring.

terrain
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311 kast hill road
hopkinton, nh 03229
603. 491. 2322
terrainplanning.com

RIVERSIDE ESTATES

Site Location:
Tolend Road & Sun Hawk Lane
Dover, NH
TAX MAP: E
Lot: 65-1 & 65-A

Prepared For:
Berry Surveying & Engineering
335 Second Crown Point Rd
Barrington, NH 03825

LANDSCAPE PLAN

DATE:

SCALE: 1" = 100'

PROJECT #: 1802

Drawn By: ID

Checked By: ERB

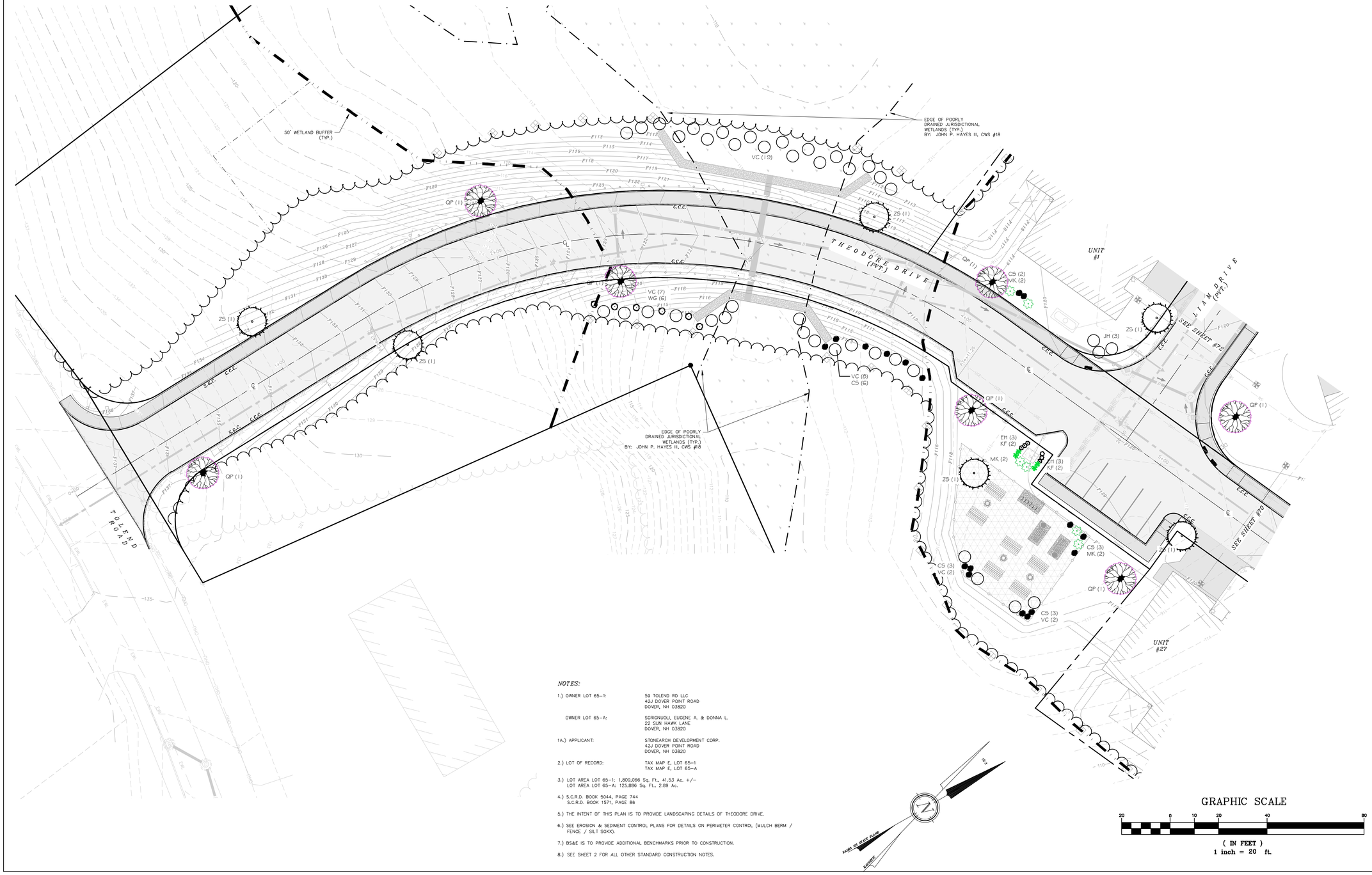
REVISIONS: DATE:
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L - 01

SHEET 68 OF 100

NOT FOR CONSTRUCTION



NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: SORIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,809,066 Sq. Ft., 41.53 Ac. +/-
LOT AREA LOT 65-A: 125,886 Sq. Ft., 2.89 Ac.

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

5.) THE INTENT OF THIS PLAN IS TO PROVIDE LANDSCAPING DETAILS OF THEODORE DRIVE.

6.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX).

7.) BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

8.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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603. 491. 2322
terrainplanning.com

RIVERSIDE ESTATES

Site Location:
Tolend Road
Dover, NH
TAX MAP: E
Lot: 65-1 & 65-A

Prepared For:
Berry Surveying & Engineering
335 Second Crown Point Rd
Barrington, NH 03825

LANDSCAPE PLAN

DATE:

SCALE: 1" = 20'

PROJECT #: 1802

Drawn By: ID

Checked By: ERB

REVISIONS: DATE:
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L - 02

SHEET 69 OF 100

NOT FOR CONSTRUCTION



NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,809,066 Sq. Ft., 41.53 Ac. +/-
LOT AREA LOT 65-A: 125,886 Sq. Ft., 2.89 Ac.

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

5.) THE INTENT OF THIS PLAN IS TO PROVIDE LANDSCAPING DETAILS OF THEODORE DRIVE.

6.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX).

7.) BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

8.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.

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hopkinton, nh 03229
603. 491. 2322
terrainplanning.com

RIVERSIDE ESTATES

Site Location:
Tolend Road
Dover, NH
TAX MAP: E
Lot: 65-1 & 65-A

Prepared For:
Berry Surveying & Engineering
335 Second Crown Point Rd
Barrington, NH 03825

LANDSCAPE PLAN

DATE:

SCALE: 1" = 20'

PROJECT #: 1802

Drawn By: ID

Checked By: ERB

REVISIONS: DATE:
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L - 03

SHEET 70 OF 100

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: SORIANOU, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,809,066 Sq. Ft., 41.53 Ac. +/-
LOT AREA LOT 65-A: 125,856 Sq. Ft., 2.89 Ac.

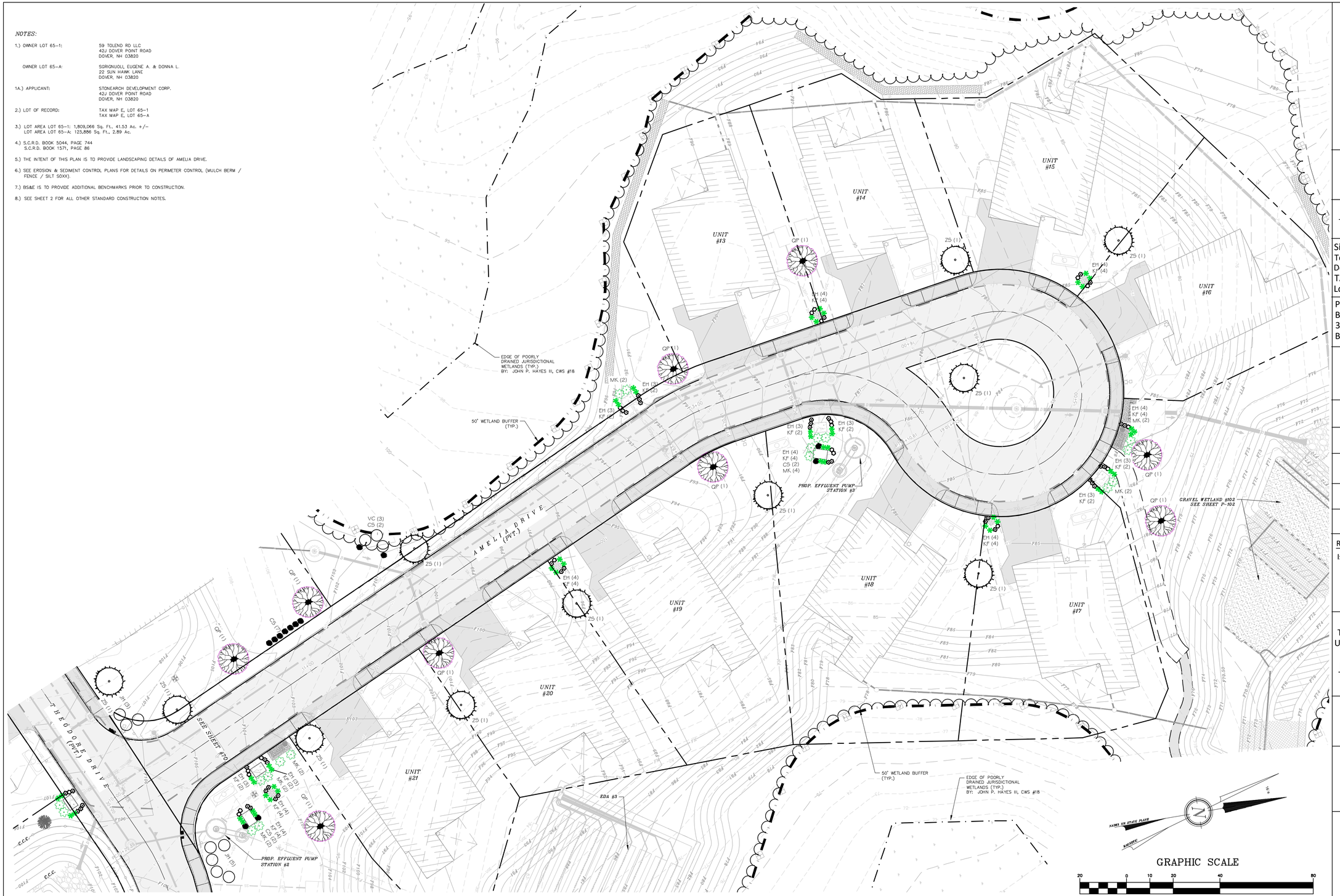
4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

5.) THE INTENT OF THIS PLAN IS TO PROVIDE LANDSCAPING DETAILS OF AMELIA DRIVE.

6.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX).

7.) BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

8.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.



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hopkinton, nh 03229
603. 491. 2322
terrainplanning.com

RIVERSIDE ESTATES

Site Location:
Tolend Road
Dover, NH
TAX MAP: E
Lot: 65-1 & 65-A

Prepared For:
Berry Surveying & Engineering
335 Second Crown Point Rd
Barrington, NH 03825

LANDSCAPE PLAN

DATE:

SCALE: 1" = 20'

PROJECT #: 1802

Drawn By: ID

Checked By: ERB

REVISIONS: DATE:
Issued for Client Review

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L - 04

SHEET 71 OF 100

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,809,066 Sq. Ft., 41.531 Ac. +/-
LOT AREA LOT 65-A: 125,886 Sq. Ft., 2.89 Ac.

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

5.) THE INTENT OF THIS PLAN IS TO PROVIDE LANDSCAPING DETAILS OF LIAM DRIVE.

6.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX).

7.) BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

8.) SEE SHEET 2 FOR ALL OTHER STANDARD CONSTRUCTION NOTES.



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hopkinton, nh 03229
603. 491. 2322
terrainplanning.com

RIVERSIDE ESTATES

Site Location:
Tolend Road
Dover, NH
TAX MAP: E
Lot: 65-1 & 65-A

Prepared For:
Berry Surveying & Engineering
335 Second Crown Point Rd
Barrington, NH 03825

LANDSCAPE PLAN

DATE:

SCALE: 1" = 20'

PROJECT #: 1802

Drawn By: ID

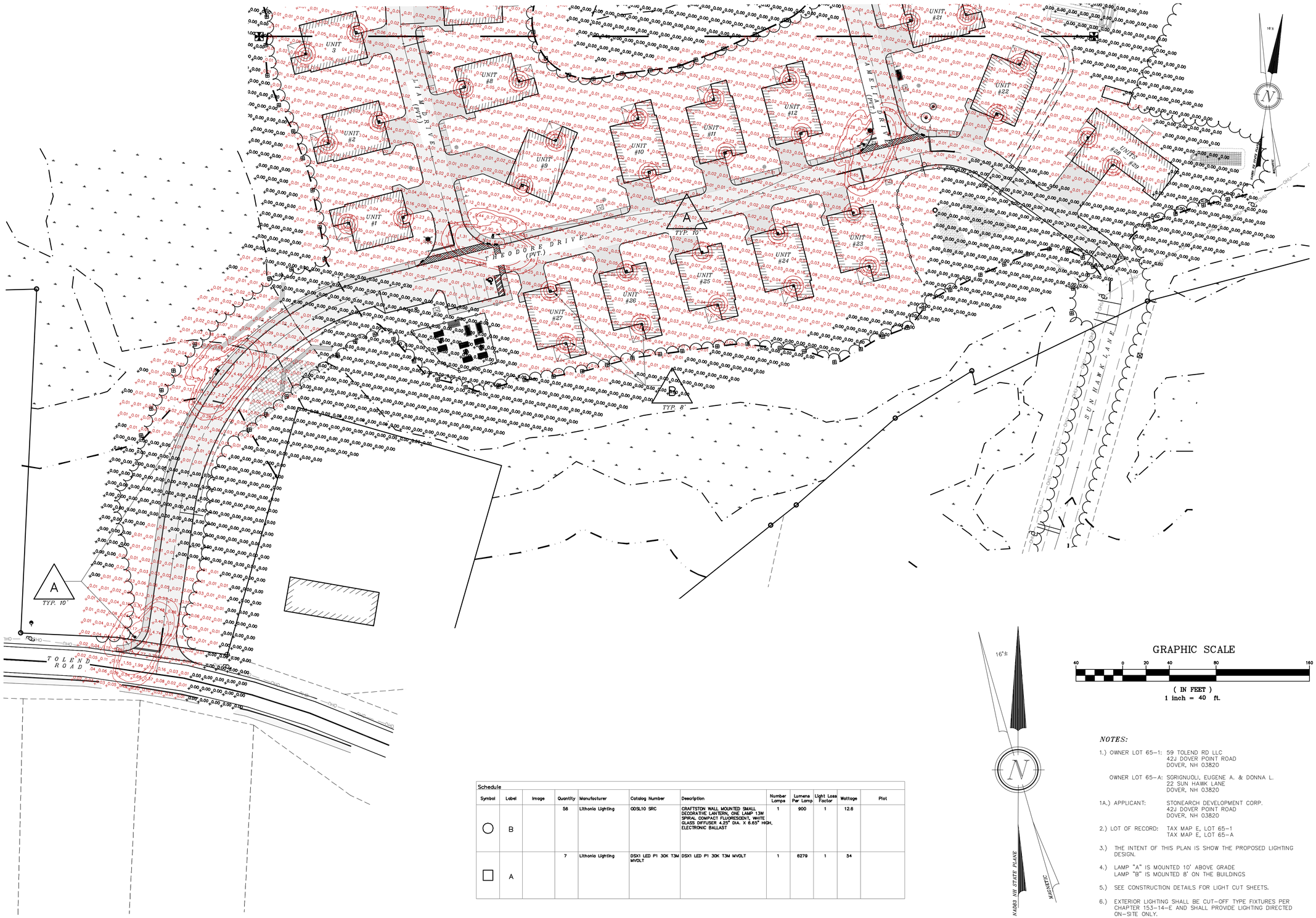
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L - 05

NOT FOR CONSTRUCTION



Schedule											
Symbol	Label	Image	Quantity	Manufacturer	Catalog Number	Description	Number Lamps	Lumens Per Lamp	Light Loss Factor	Wattage	Plot
○	B		56	Lithonia Lighting	ODSL10 SRC	CRAFTSTON WALL MOUNTED SMALL DECORATIVE LANTERN, ONE LAMP 13W SPIRAL COMPACT FLUORESCENT, WHITE GLASS DIFFUSER 4.25" DIA. X 6.85" HIGH, ELECTRONIC BALLAST	1	900	1	12.6	
□	A		7	Lithonia Lighting	DSX1 LED P1 30K T3M MVOLT	DSX1 LED P1 30K T3M MVOLT	1	6279	1	54	

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

NOTES:

1.) OWNER LOT 65–1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65–A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65–1
TAX MAP E, LOT 65–A

3.) THE INTENT OF THIS PLAN IS SHOW THE PROPOSED LIGHTING DESIGN.

4.) LAMP "A" IS MOUNTED 10' ABOVE GRADE
LAMP "B" IS MOUNTED 8' ON THE BUILDINGS

5.) SEE CONSTRUCTION DETAILS FOR LIGHT CUT SHEETS.

6.) EXTERIOR LIGHTING SHALL BE CUT–OFF TYPE FIXTURES PER CHAPTER 153–14–E AND SHALL PROVIDE LIGHTING DIRECTED ON–SITE ONLY.

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

LIGHTING PLAN
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, NH
TAX MAP E, LOT 65–1 & 65–A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 60 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 12043
LICENSED PROFESSIONAL ENGINEER

SHEET 73 OF 100

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND RD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: SGRIGNUOLI, EUGENE A. & DONNA L.
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) THE INTENT OF THIS PLAN IS SHOW THE PROPOSED LIGHTING DESIGN.

4.) LAMP "A" IS MOUNTED 10' ABOVE GRADE
LAMP "B" IS MOUNTED 8' ON THE BUILDINGS

5.) SEE CONSTRUCTION DETAILS FOR LIGHT CUT SHEETS.

6.) EXTERIOR LIGHTING SHALL BE CUT-OFF TYPE FIXTURES PER CHAPTER 153-14-E AND SHALL PROVIDE LIGHTING DIRECTED ON-SITE ONLY.

COCHECHO RIVER

50 NHDES

150 NHDES

UNIT #1 · UNIT #2 · UNIT #3 · UNIT #4 · UNIT #5 · UNIT #6 · UNIT #7 · UNIT #8 · UNIT #9 · UNIT #10 · UNIT #11 · UNIT #12 · UNIT #13 · UNIT #14 · UNIT #15 · UNIT #16 · UNIT #17 · UNIT #18 · UNIT #19 · UNIT #20 · UNIT #21

A TYP. 10

B TYP. 8

MANEL LA (PVT.)

MANEL LA (PVT.)

16°±

N

NAD83 NH STATE PLANE

MONUMENT

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

LIGHTING PLAN
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 60 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

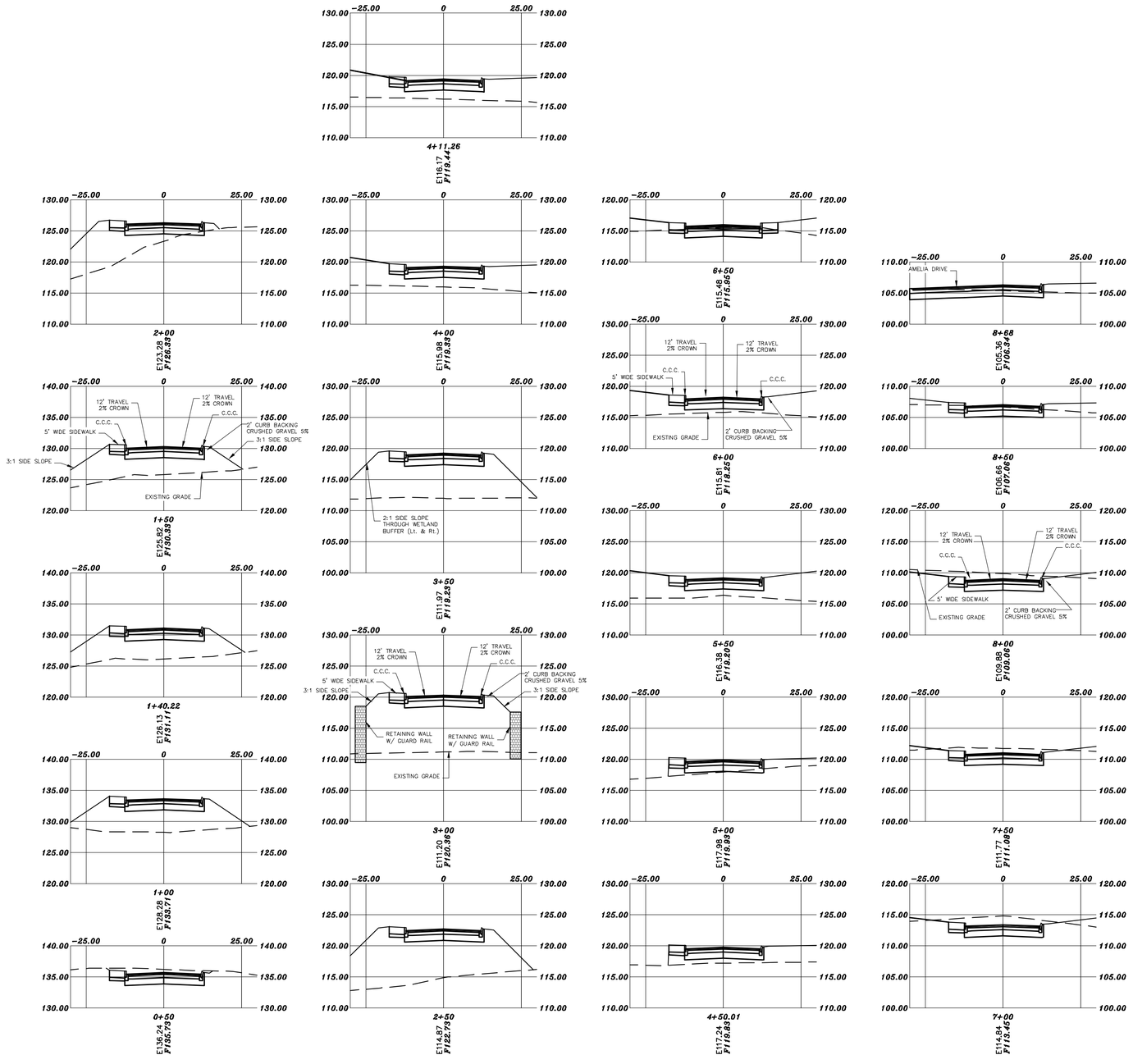
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
Vertical Scale : 1 inch = 10 ft.



DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

THEODORE DRIVE CROSS SECTIONS 0+00 – 8+68
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY & SURVEYING ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

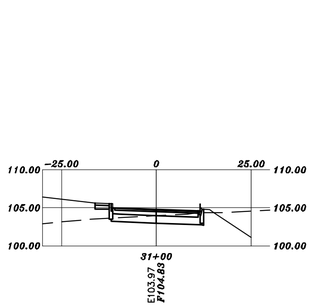
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
NO. 14443
LICENSED PROFESSIONAL ENGINEER

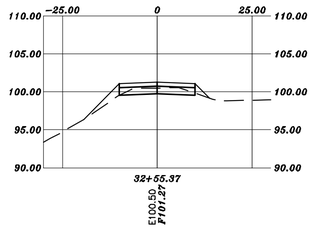
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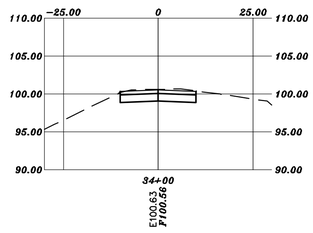
GRAPHIC SCALE

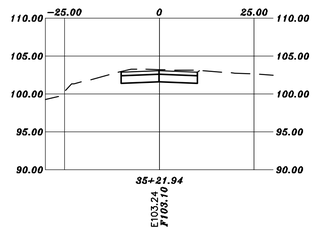
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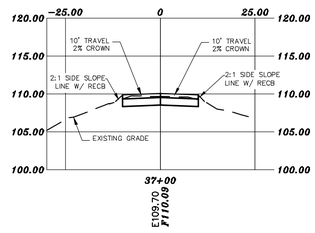
(IN FEET)
1 inch = 20 ft.
Vertical Scale : 1 inch = 10 ft.

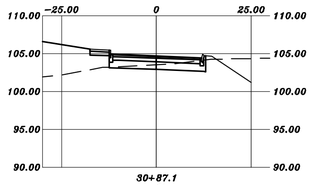


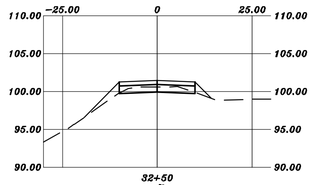


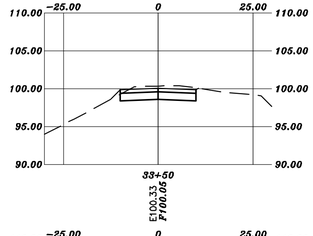


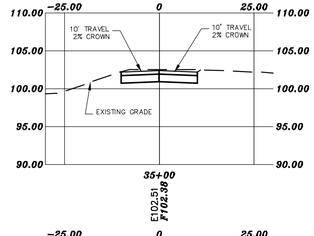


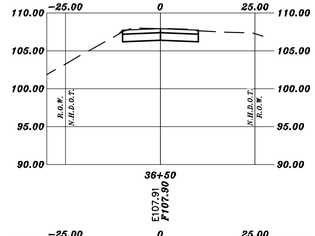


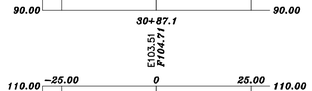


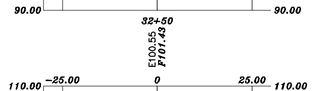


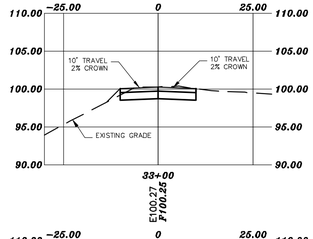


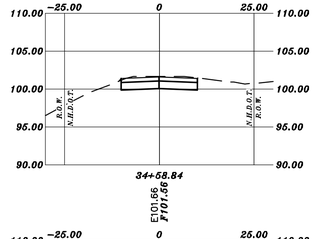


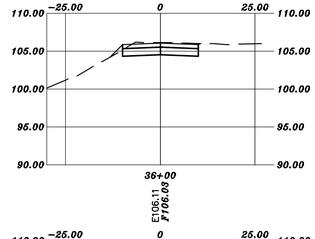


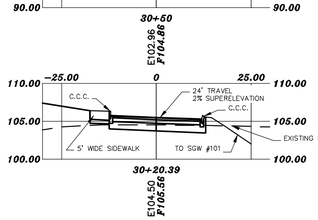


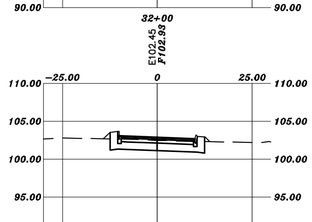


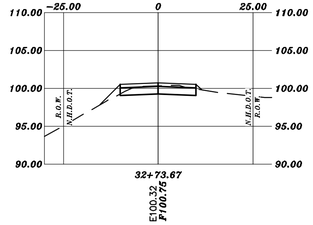


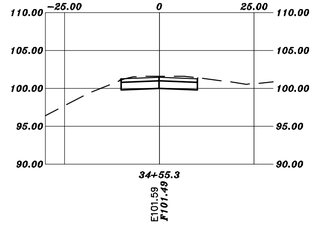


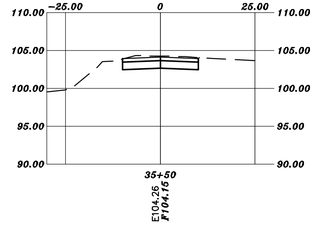


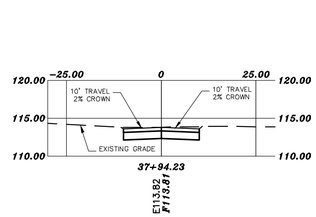


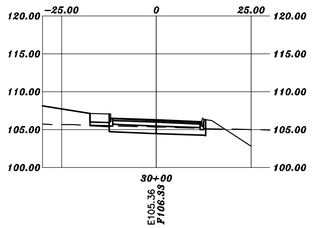


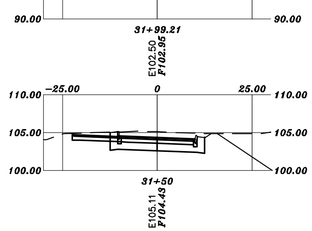


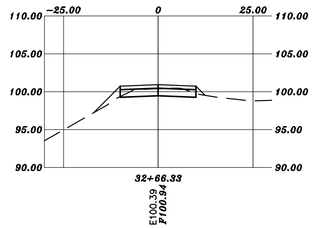


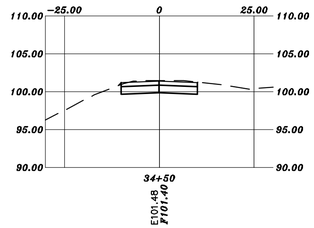


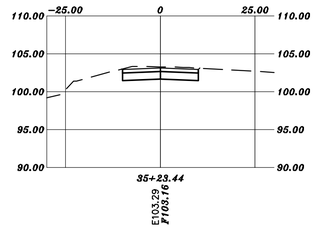


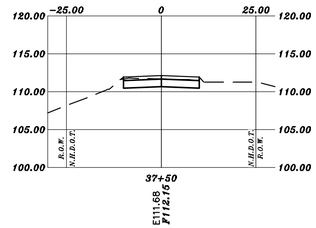












NOT FOR CONSTRUCTION

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

SUN HAWK LANE CROSS SECTIONS 30+00 – 37+94.23
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

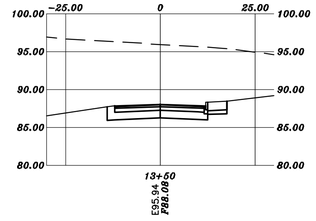
SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

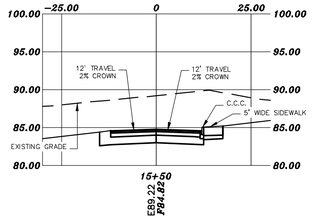
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

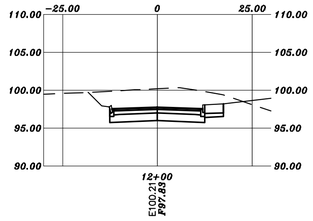
GRAPHIC SCALE

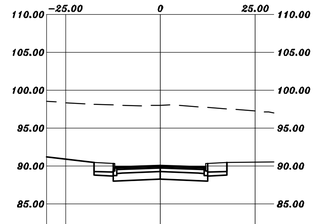
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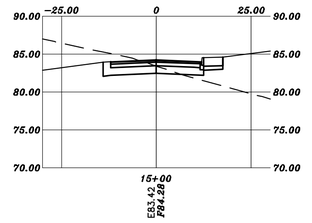
(IN FEET)
1 inch = 20 ft.
Vertical Scale : 1 inch = 10 ft.

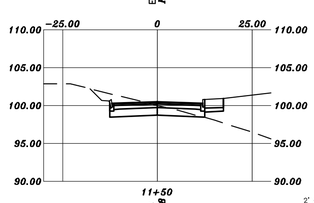


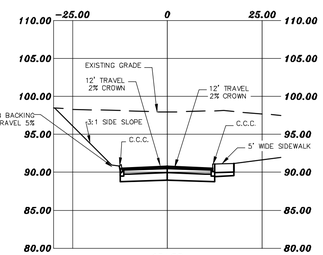


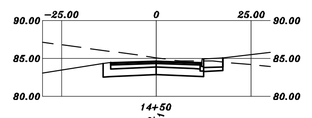


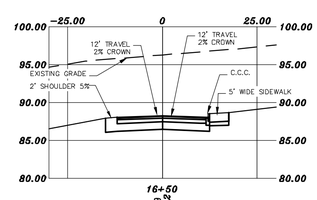


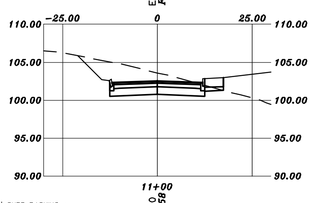


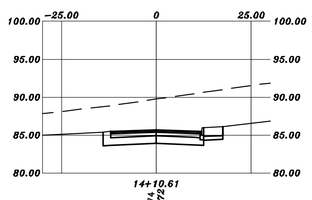


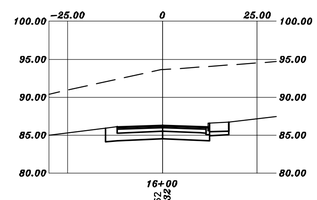


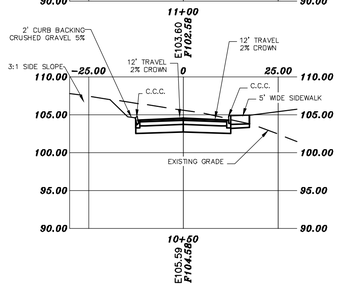


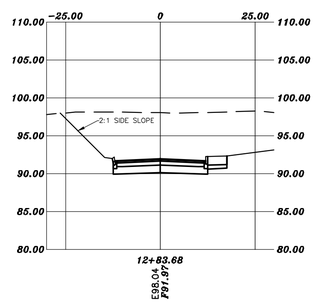


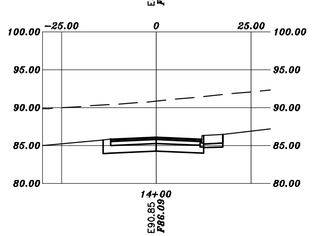


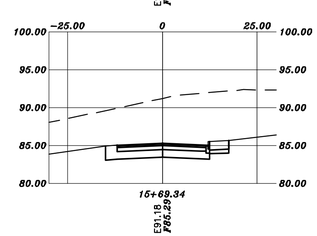












NOT FOR CONSTRUCTION

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

AMELIA DRIVE CROSS SECTIONS 10+25 – 16+50
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

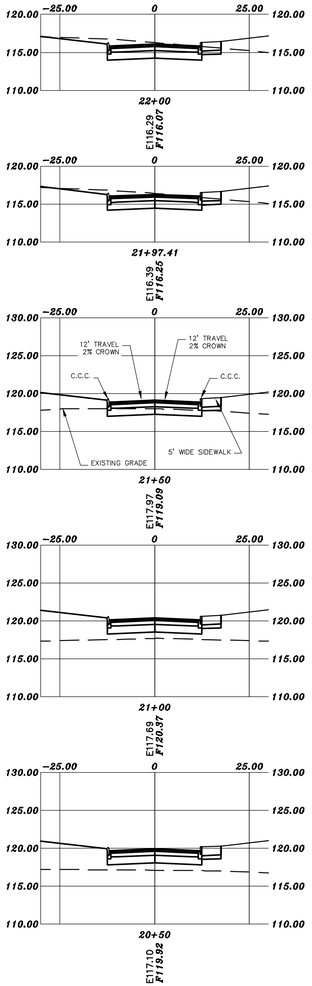
SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

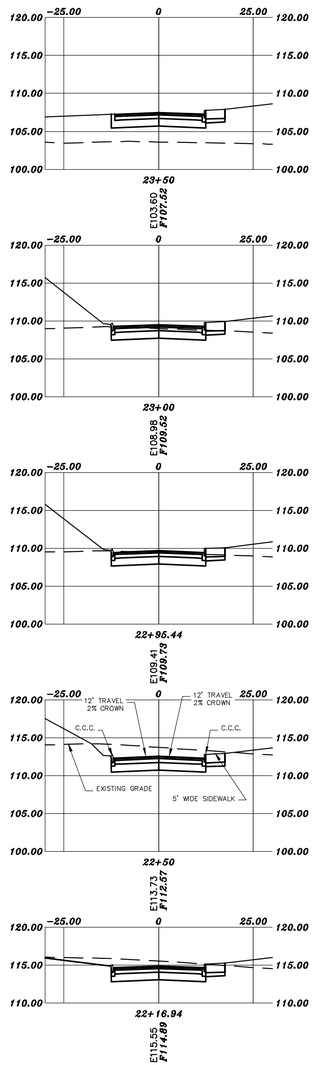
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14043
LICENSED PROFESSIONAL ENGINEER

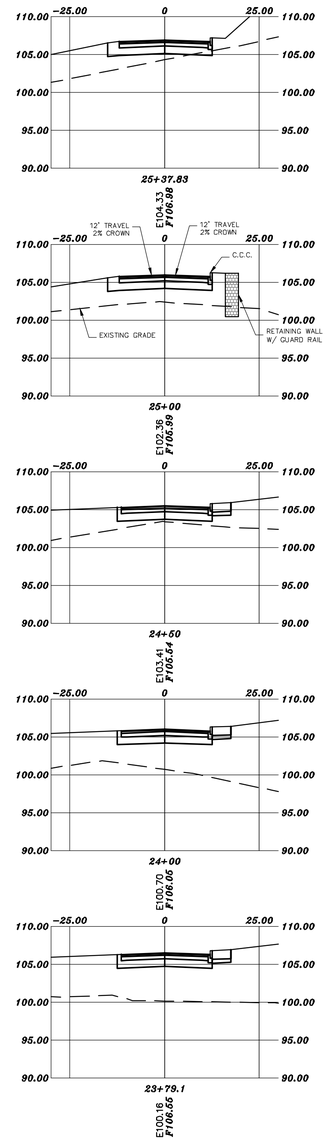
GRAPHIC SCALE

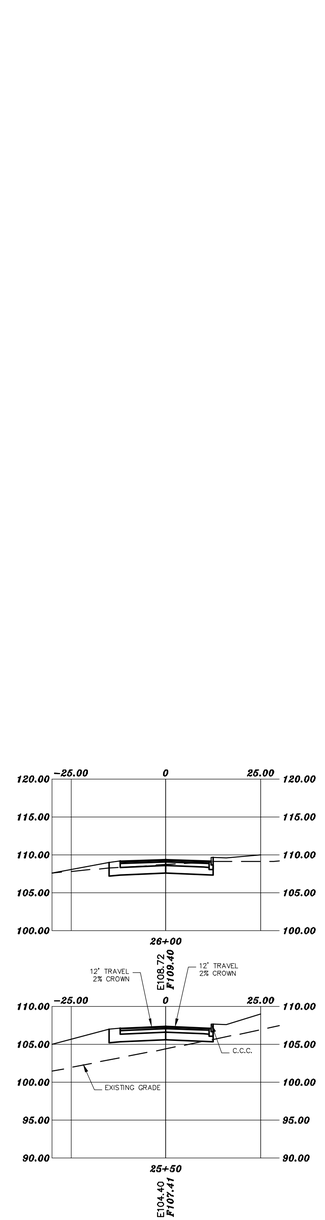
20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
Vertical Scale : 1 inch = 10 ft.









DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

LIAM DRIVE CROSS SECTIONS 20+00 – 26+00
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND ROAD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,809,066 Sq. Ft., 41.53 Ac. +/-
LOT AREA LOT 65-A: 125,886 Sq. Ft., 2.89 Ac. +/-

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

NOTES CONT.:

5.) THIS IS A RESIDENTIAL SUBDIVISION.

6.) THE INTENT OF THIS PLAN IS TO DEMONSTRATE THE AVAILABLE SIGHT DISTANCE FROM THE PROPOSED ROADWAY KNOWN AS THEODORE DRIVE.

7.) EXISTING CONDITIONS INFORMATION IS BASED ON A SURVEY PERFORMED BY BERRY SURVEYING & ENGINEERING AND IS ENCLOSED IN THIS PACKAGE. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE 1' INTERVALS.

8.) THIS PROJECT SHALL BE CONSTRUCTED IN ACCORDANCE WITH NHDOT STANDARD SPECIFICATIONS DATED 2016, CURRENT STANDARD PLANS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS INCLUDED IN THE PROPOSAL.

9.) WHERE AN EXISTING UNDERGROUND UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.

10.) THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.

NOTES CONT.:

11.) AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.

12.) THE TERM "PROPOSED" (PROP.) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS, OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE & RESET" (R & R).

13.) ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS NOTED OTHERWISE.

14.) ALL SYMBOLS, WORDS, TRANSVERSE MARKINGS (STOP BARS, CROSSWALK LINES, AND RAILROAD SYMBOLS), LANE LINES, AND ALL OTHER MARKINGS NOTED WITH (T) SHALL BE THERMOPLASTIC.

15.) ALL DISTURBED AREAS NOT DESIGNATED TO BE PAVED SHALL HAVE LOAM PLACED AND SEEDED. THE LOAM SHALL HAVE A MINIMUM DEPTH OF 4 INCHES AND SHALL BE PLACED FLUSH WITH THE TOP OF THE ADJACENT CURB, EDGING, BERM OR PAVEMENT SURFACE.

16.) THE SPEED LIMIT ON TOLEND ROAD IS 30 MPH. 85TH PERCENTILE OF TRAFFIC IS ASSUMED TO BE 40 MPH.

LEGEND:

- IRON PIPE ~FND~
- IRON BOUND ~FND~
- NH HIGHWAY BOUND ~FND~
- 3/4" IRON BOUND W/ ID CAP ~TBS~
- GRANITE BOUND ~TBS~
- SIGNAGE
- UTILITY POLE
- GUY WIRE
- OHU — OHU — OHU — OVERHEAD UTILITIES LINE
- POORLY DRAINED WETLAND LINE
- 50' POORLY DRAINED WETLAND BUFFER
- SHOULDER
- BUILDING SETBACK LINE
- SUBDIVISION BOUNDARY LINE
- EASEMENT LINE
- CENTER LINE
- CLEAR ZONE LINE
- MILL

S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. TYPICAL
FND FOUND
PL PROPERTY LINE
EL EASEMENT LINE
R.O.W. RIGHT OF WAY
E.O.P. EDGE OF PAVEMENT
SSL (W) SINGLE SOLD LINE (WHITE)
DSL (Y) DOUBLE SOLID LINE (YELLOW)

SIGHT DISTANCE REQUIREMENT:

DESIGN SPEED: 30 MPH / 85TH ASSUMED 40 MPH

FROM AASHTO GEOMETRIC DESIGN OF HIGHWAYS AND STREETS (2011) EXHIBIT 3.1

289' 3% UP GRADE, 315' DOWN GRADE REQUIRED BY AASHTO

289' AND 315' PROVIDED

TOLEND ROAD AADT (2021): 4,069 (NHDOT)

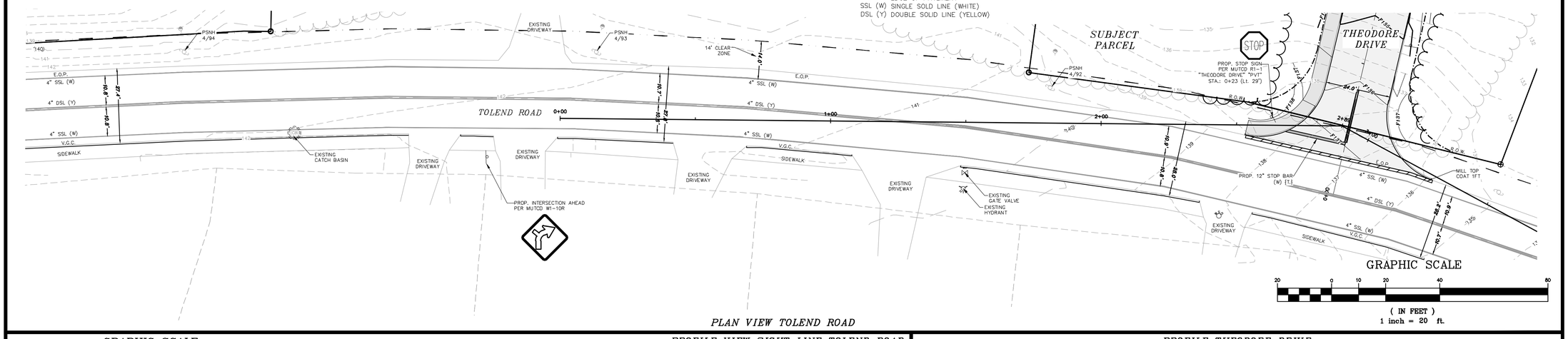
CLEAR ZONE CALCULATION:

DESIGN SPEED: 30 MPH / 85TH ASSUMED 40 MPH

WESTBOUND DESIGN ADT (2021): 2,035 (NHDOT)

FROM AASHTO ROADSIDE DESIGN GUIDE (2004) TABLE 3.1 PAGE 3-6

CLEAR ZONE REQUIRED TO BE 12-14 FEET (1V:5H TO 1V:4H)
-14 FEET HAS BEEN SELECTED



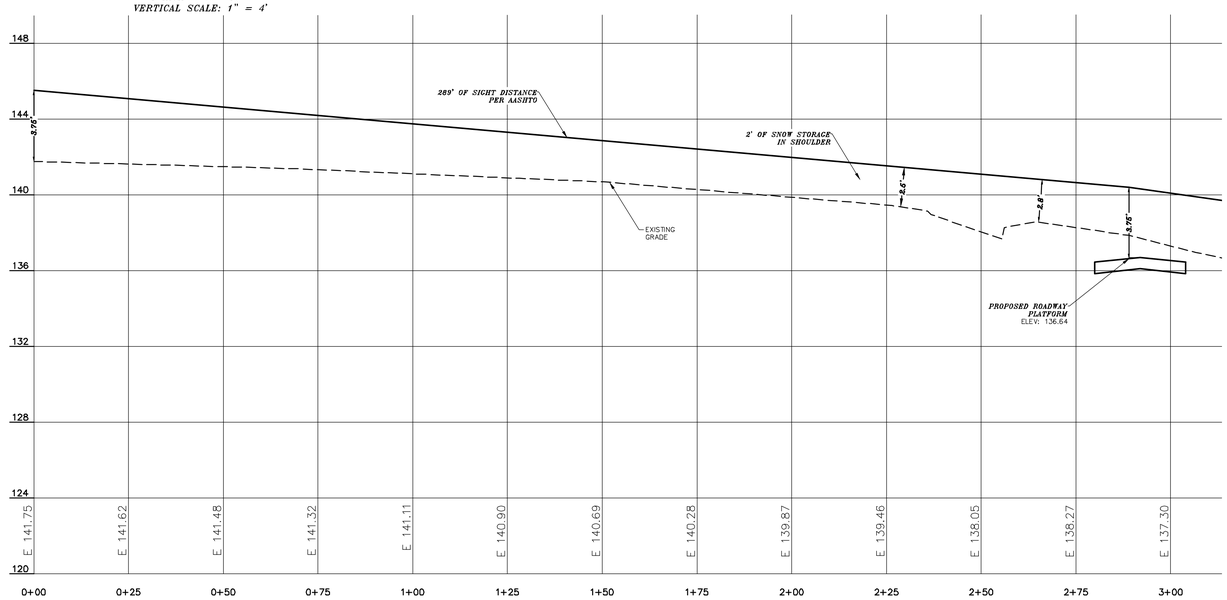
PLAN VIEW TOLEND ROAD

PROFILE VIEW SIGHT LINE TOLEND ROAD

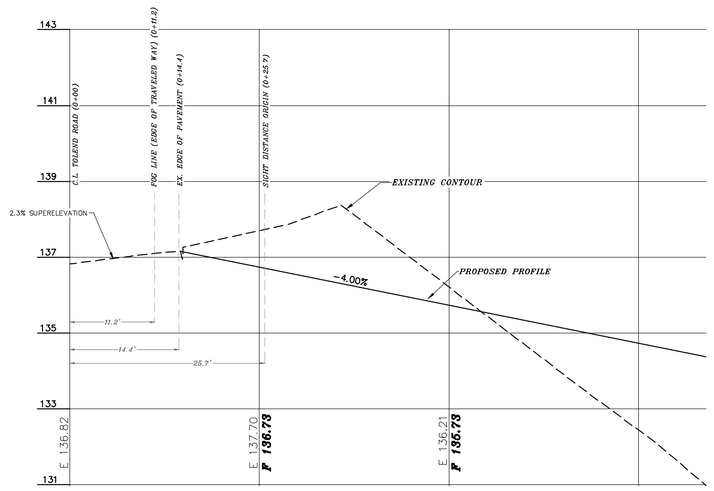
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'



PROFILE THEODORE DRIVE



GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.
VERTICAL SCALE: 1" = 2'

RWA-1

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

ROADWAY ACCESS PLAN EASTBOUND
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14043
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER LOT 65-1: 59 TOLEND ROAD LLC
42J DOVER POINT ROAD
DOVER, NH 03820

OWNER LOT 65-A: EUGENE A. & DONNA L. SGRIGNUOLI
22 SUN HAWK LANE
DOVER, NH 03820

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

2.) LOT OF RECORD: TAX MAP E, LOT 65-1
TAX MAP E, LOT 65-A

3.) LOT AREA LOT 65-1: 1,809,066 Sq. Ft., 41.53 Ac. +/-
LOT AREA LOT 65-A: 125,886 Sq. Ft., 2.89 Ac. +/-

4.) S.C.R.D. BOOK 5044, PAGE 744
S.C.R.D. BOOK 1571, PAGE 86

NOTES CONT.:

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6.) THE INTENT OF THIS PLAN IS TO DEMONSTRATE THE AVAILABLE SIGHT DISTANCE FROM THE PROPOSED ROADWAY KNOWN AS THEODORE DRIVE.

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NOTES CONT.:

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16.) THE SPEED LIMIT ON TOLEND ROAD IS 30 MPH. 85TH PERCENTILE OF TRAFFIC IS ASSUMED TO BE 40 MPH.

SIGHT DISTANCE REQUIREMENT:

DESIGN SPEED: 30 MPH / 85TH ASSUMED 40 MPH

FROM AASHTO GEOMETRIC DESIGN OF HIGHWAYS AND STREETS (2011) EXHIBIT 3.1

289' 3% UP GRADE, 315' DOWN GRADE REQUIRED BY AASHTO

289' AND 315' PROVIDED

TOLEND ROAD AADT (2021): 4,069 (NHDOT)

CLEAR ZONE CALCULATION:

DESIGN SPEED: 30 MPH / 85TH ASSUMED 40 MPH

WESTBOUND DESIGN ADT (2021): 2,035 (NHDOT)

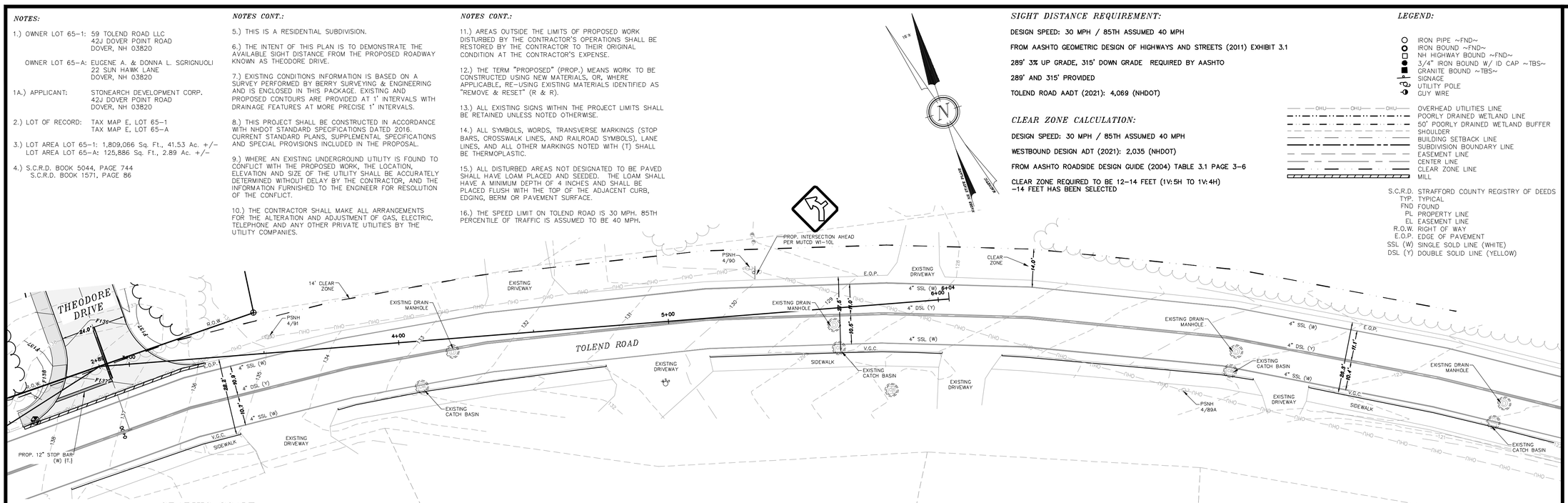
FROM AASHTO ROADSIDE DESIGN GUIDE (2004) TABLE 3.1 PAGE 3-6

CLEAR ZONE REQUIRED TO BE 12-14 FEET (1V:5H TO 1V:4H)
-14 FEET HAS BEEN SELECTED

LEGEND:

- IRON PIPE ~FND~
- IRON BOUND ~FND~
- NH HIGHWAY BOUND ~FND~
- 3/4" IRON BOUND W/ ID CAP ~TBS~
- GRANITE BOUND ~TBS~
- SIGNAGE
- UTILITY POLE
- GUY WIRE
- OHU OVERHEAD UTILITIES LINE
- POORLY DRAINED WETLAND LINE
- 50' POORLY DRAINED WETLAND BUFFER
- SHOULDER
- BUILDING SETBACK LINE
- SUBDIVISION BOUNDARY LINE
- EASEMENT LINE
- CENTER LINE
- CLEAR ZONE LINE
- MILL

S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. TYPICAL
FND FOUND
PL PROPERTY LINE
EL EASEMENT LINE
R.O.W. RIGHT OF WAY
E.O.P. EDGE OF PAVEMENT
SSL (W) SINGLE SOLID LINE (WHITE)
DSL (Y) DOUBLE SOLID LINE (YELLOW)



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

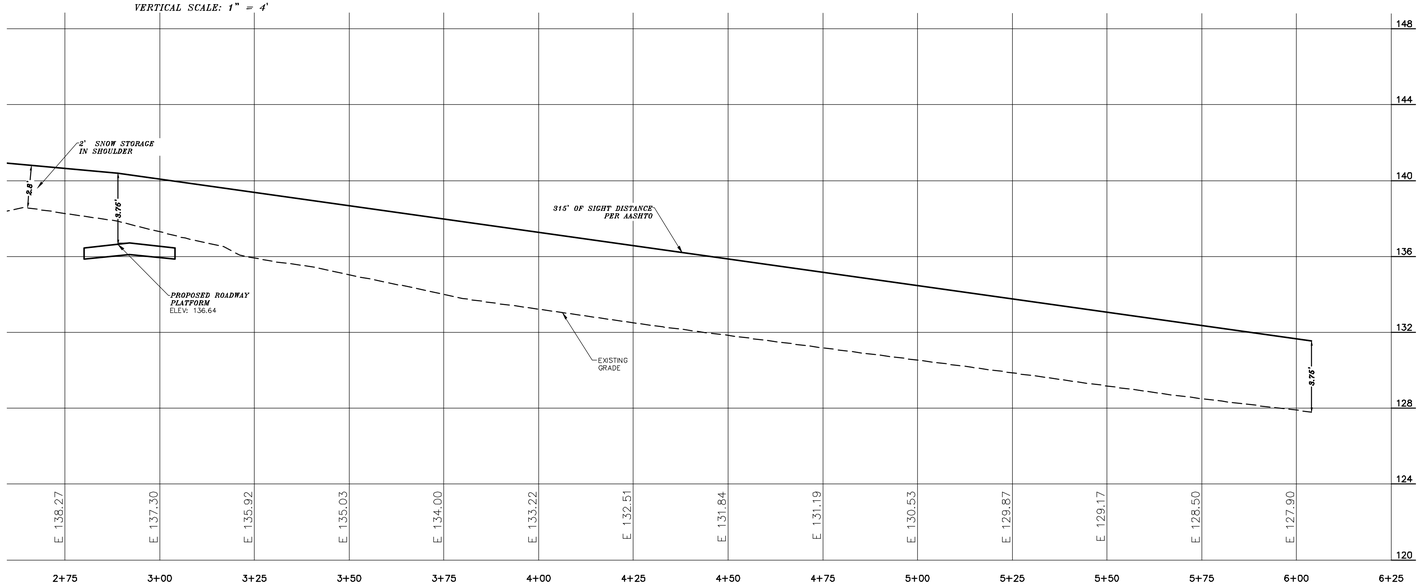
PLAN VIEW TOLEND ROAD

PROFILE VIEW SIGHT LINE TOLEND ROAD

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'



RWA-2

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

ROADWAY ACCESS PLAN WESTBOUND
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-A

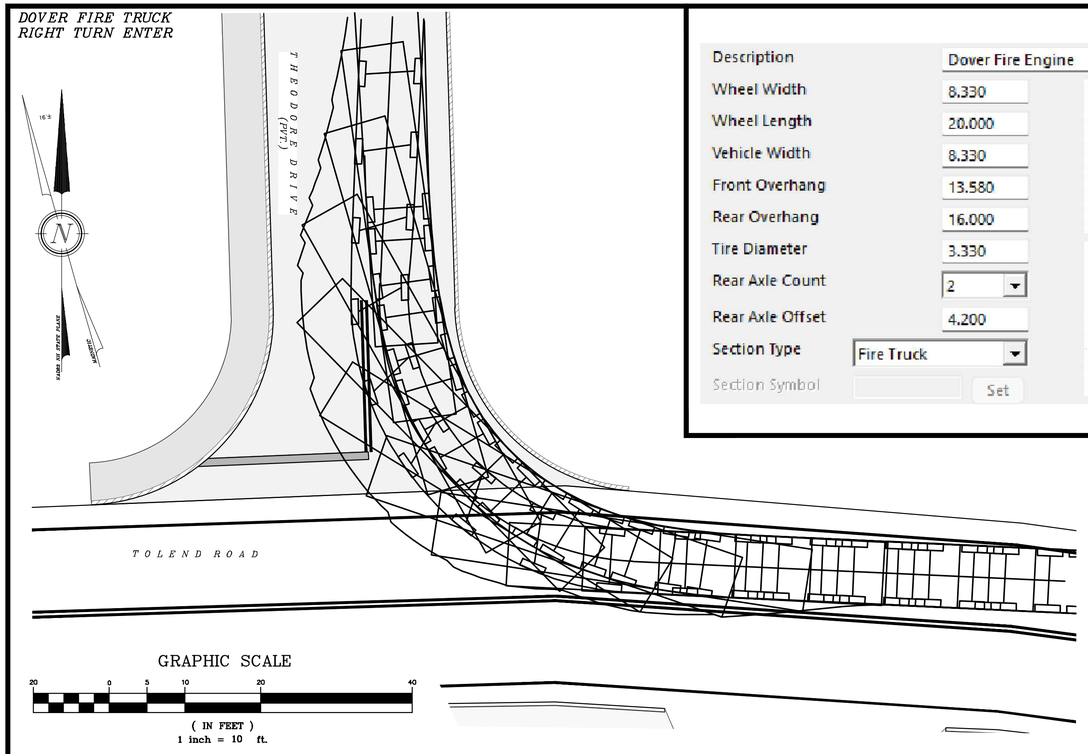
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14043
LICENSED PROFESSIONAL ENGINEER

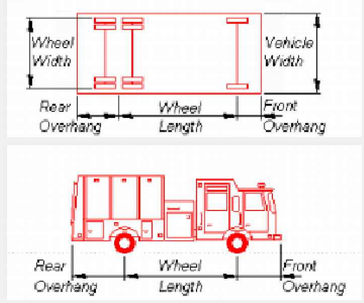
NOT FOR CONSTRUCTION

DOVER FIRE TRUCK
RIGHT TURN ENTER

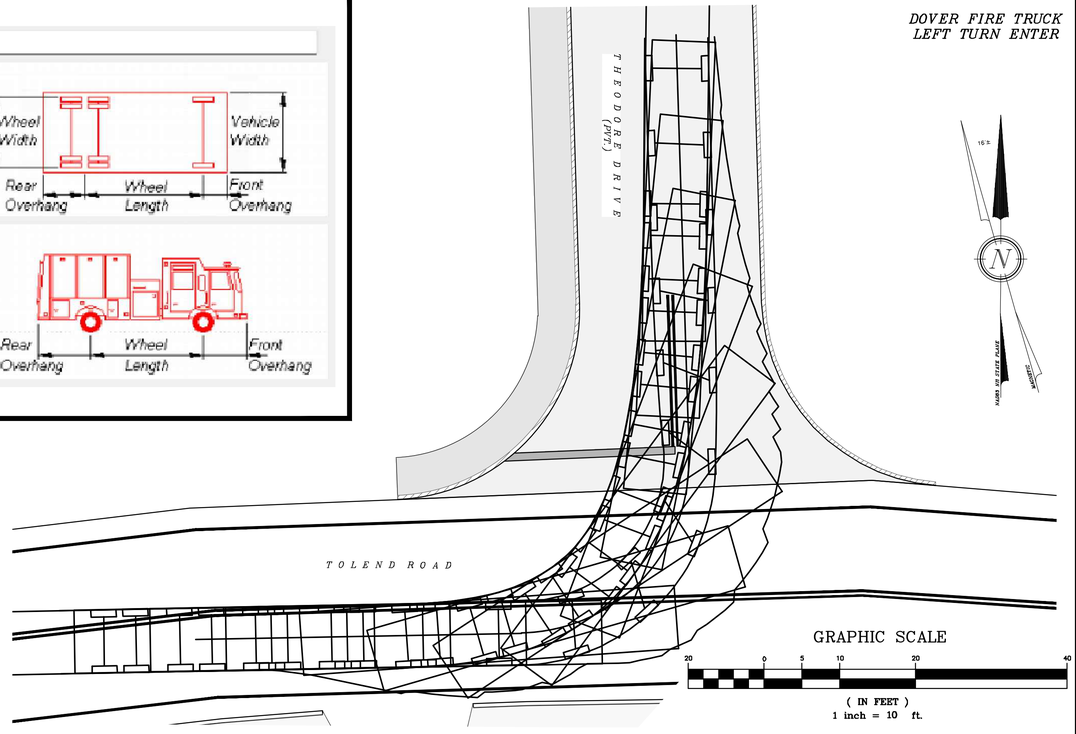


GRAPHIC SCALE
20 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

Description	Dover Fire Engine
Wheel Width	8.330
Wheel Length	20.000
Vehicle Width	8.330
Front Overhang	13.580
Rear Overhang	16.000
Tire Diameter	3.330
Rear Axle Count	2
Rear Axle Offset	4.200
Section Type	Fire Truck
Section Symbol	Set



DOVER FIRE TRUCK
LEFT TURN ENTER



GRAPHIC SCALE
20 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

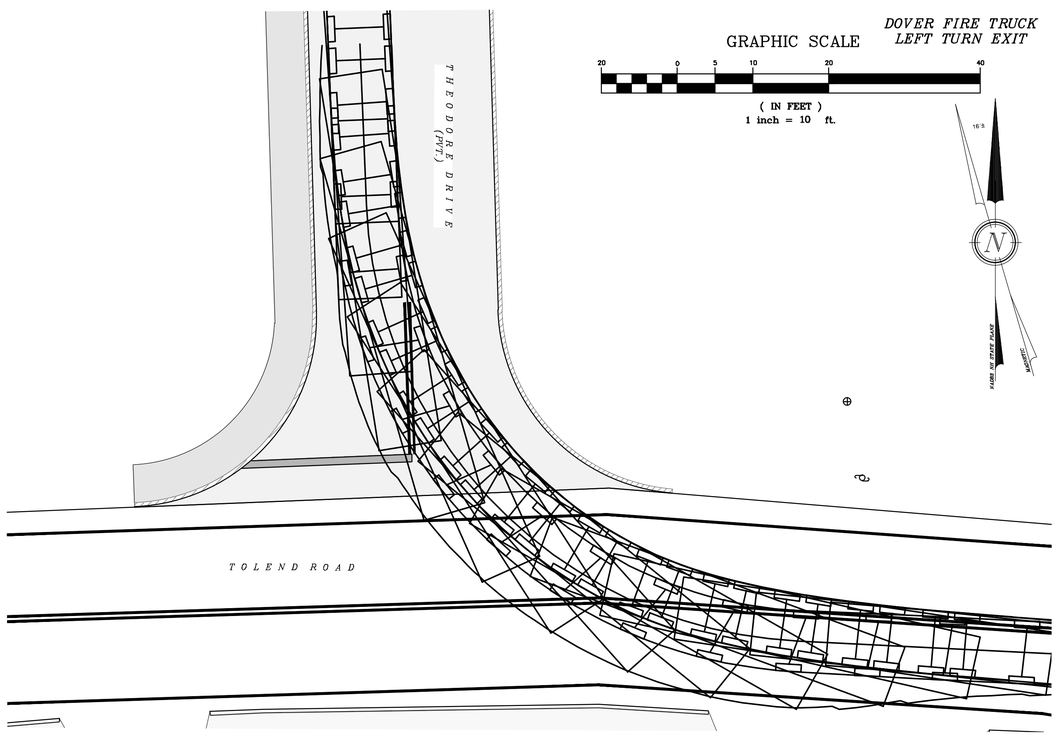
GRAPHIC SCALE
20 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

DOVER FIRE TRUCK
RIGHT TURN EXIT



GRAPHIC SCALE
20 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

DOVER FIRE TRUCK
LEFT TURN EXIT



DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

THEODORE DRIVE AND TOLAND ROAD INTERSECTION T1 TURNING
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 10 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14143
LICENSED PROFESSIONAL ENGINEER

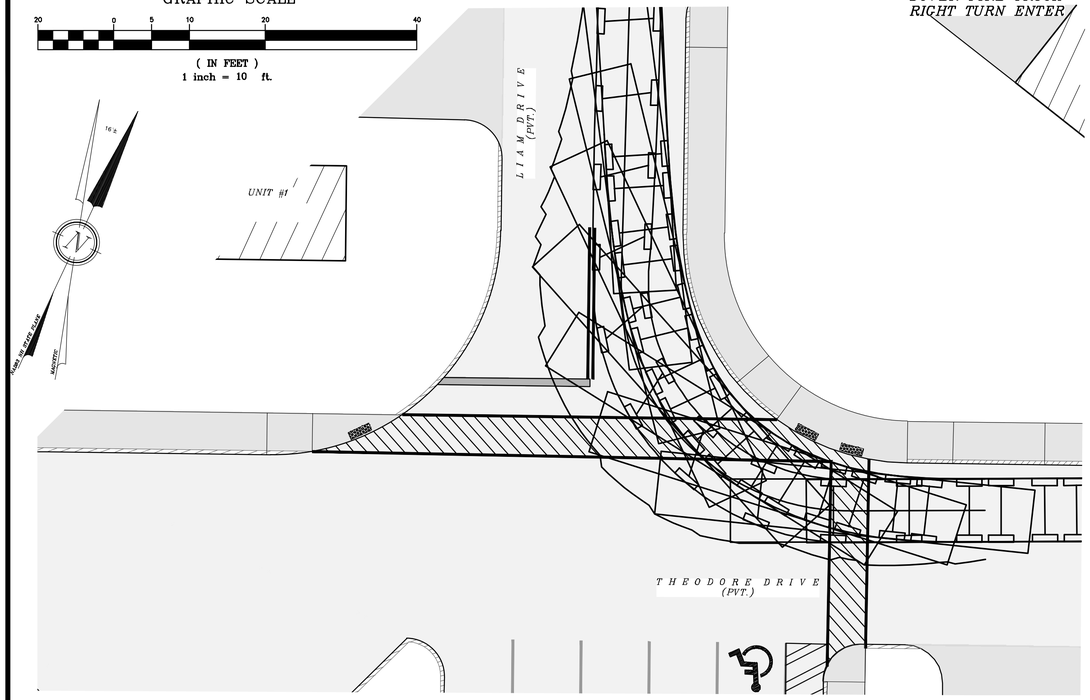
NOT FOR CONSTRUCTION

GRAPHIC SCALE

20 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

DOVER FIRE TRUCK
RIGHT TURN ENTER

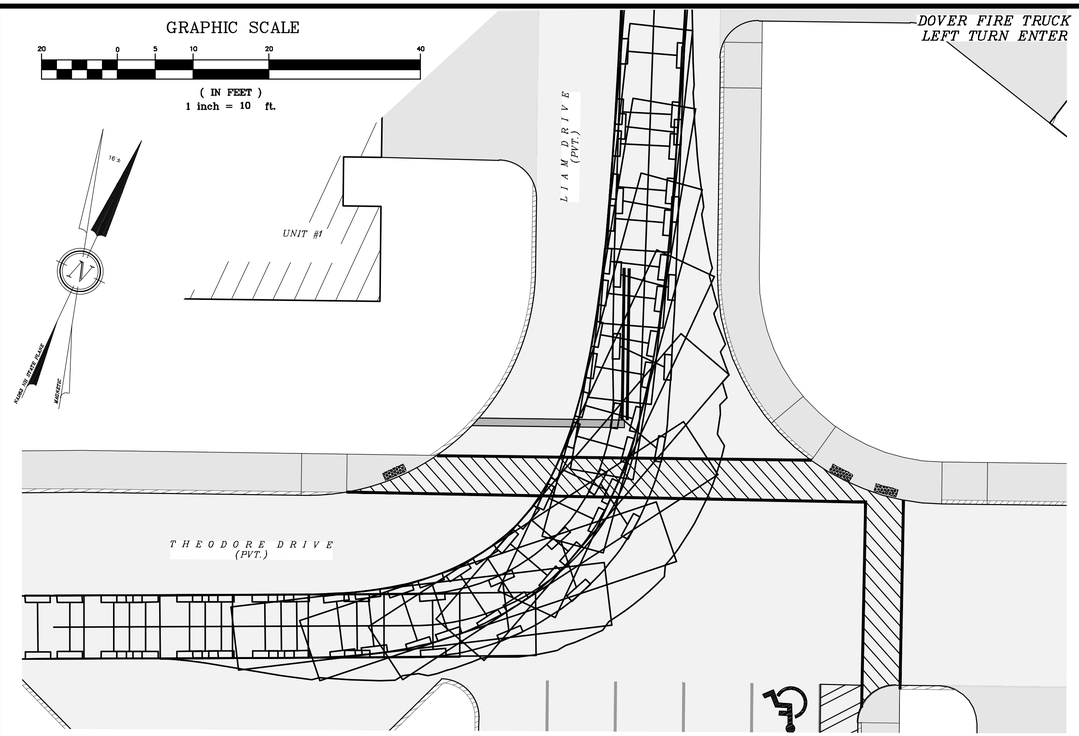


GRAPHIC SCALE

20 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

DOVER FIRE TRUCK
LEFT TURN ENTER

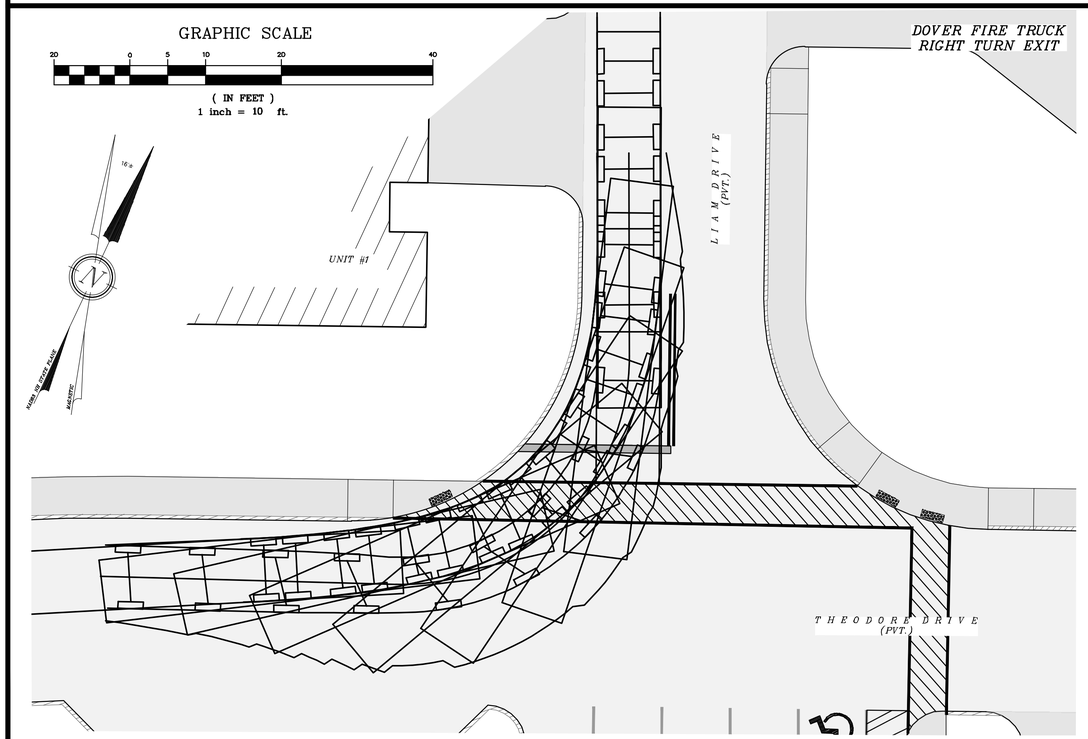


GRAPHIC SCALE

20 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

DOVER FIRE TRUCK
RIGHT TURN EXIT

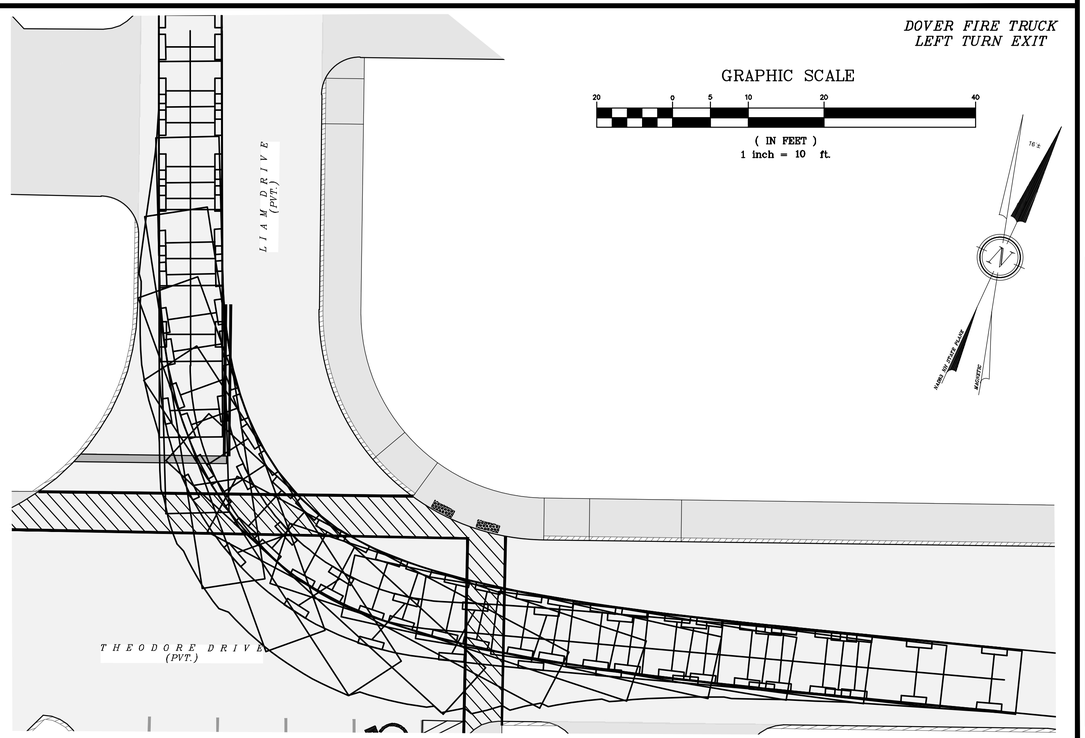


DOVER FIRE TRUCK
LEFT TURN EXIT

GRAPHIC SCALE

20 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.



DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

THEODORE DRIVE AND LIAM DRIVE INTERSECTION T1 TURNING
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 10 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

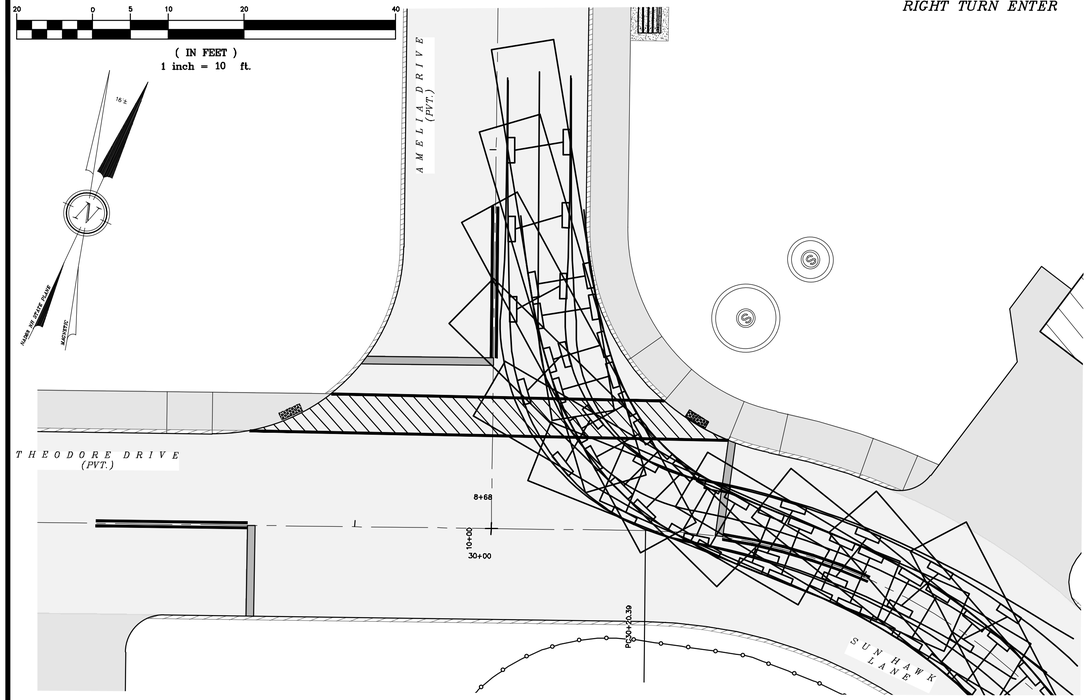
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 15443
LICENSED
PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

GRAPHIC SCALE

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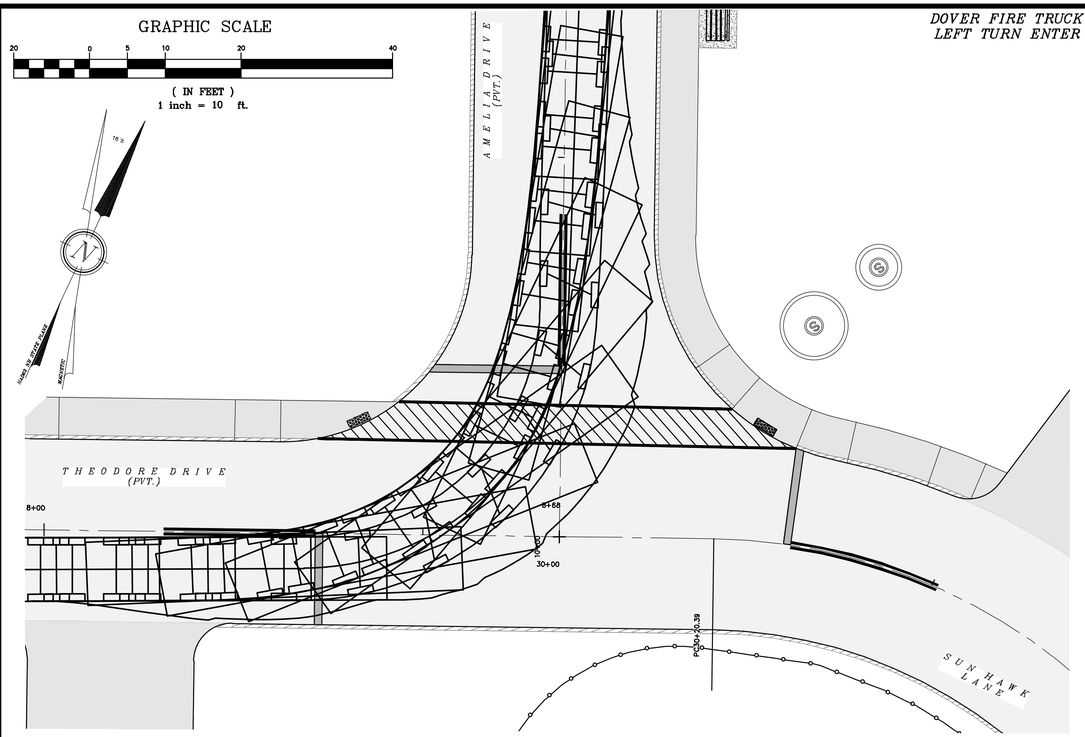
(IN FEET)
1 inch = 10 ft.



GRAPHIC SCALE

20 0 5 10 20 40

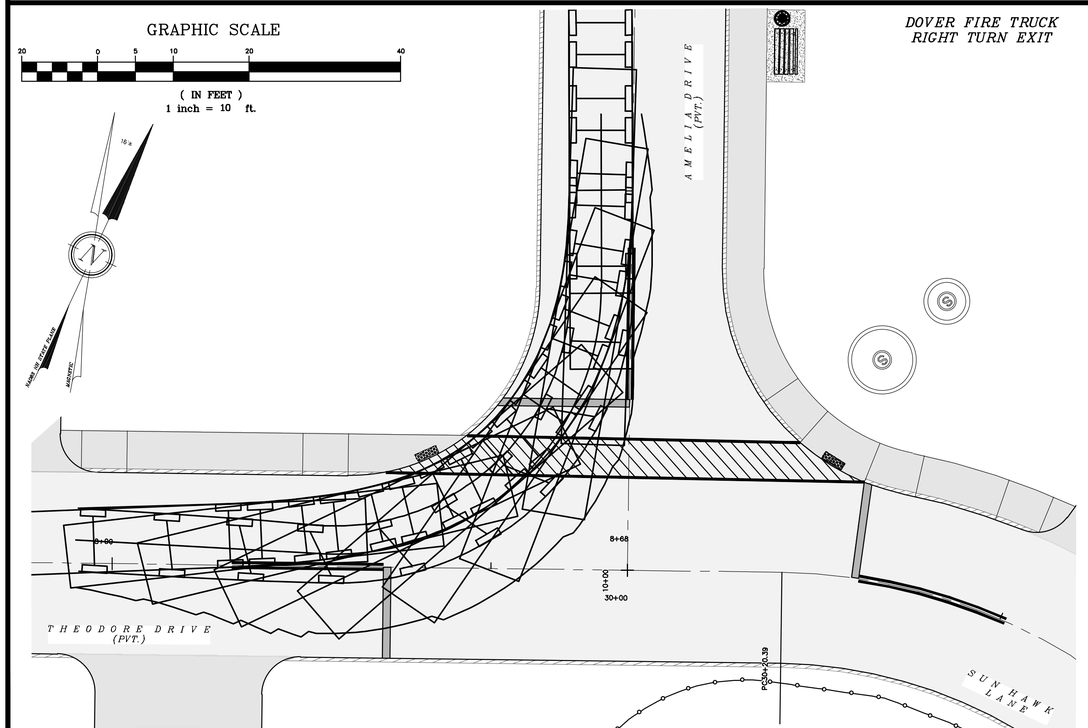
(IN FEET)
1 inch = 10 ft.



GRAPHIC SCALE

20 0 5 10 20 40

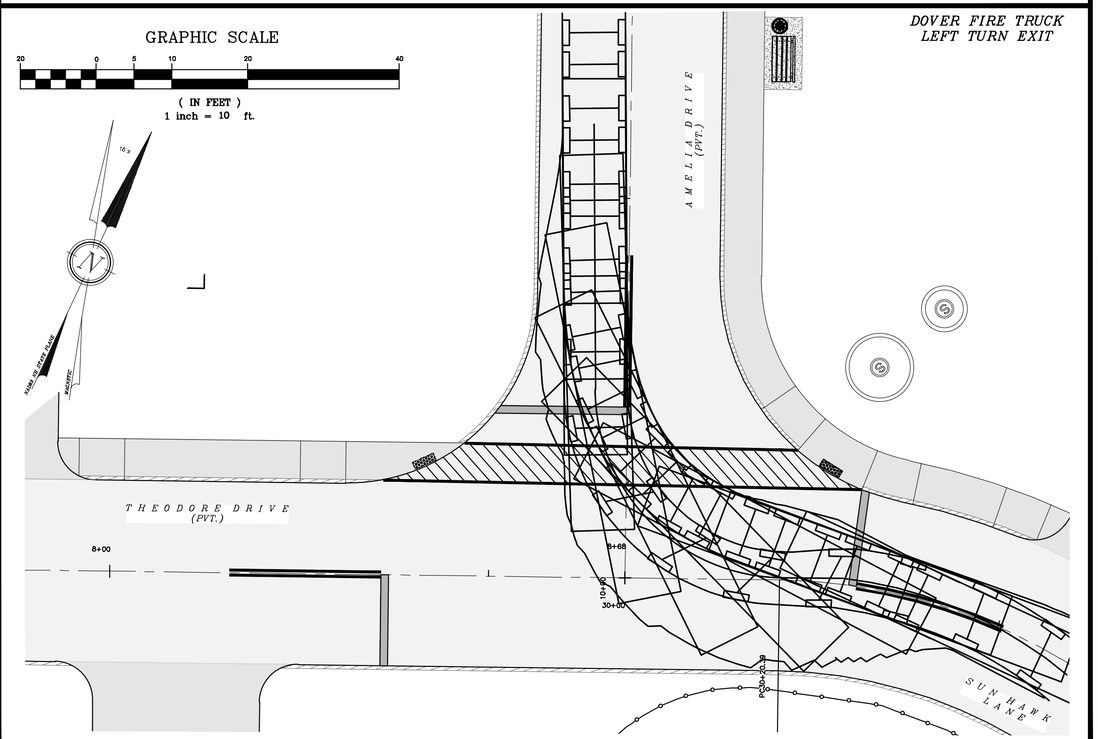
(IN FEET)
1 inch = 10 ft.



GRAPHIC SCALE

20 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.



DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

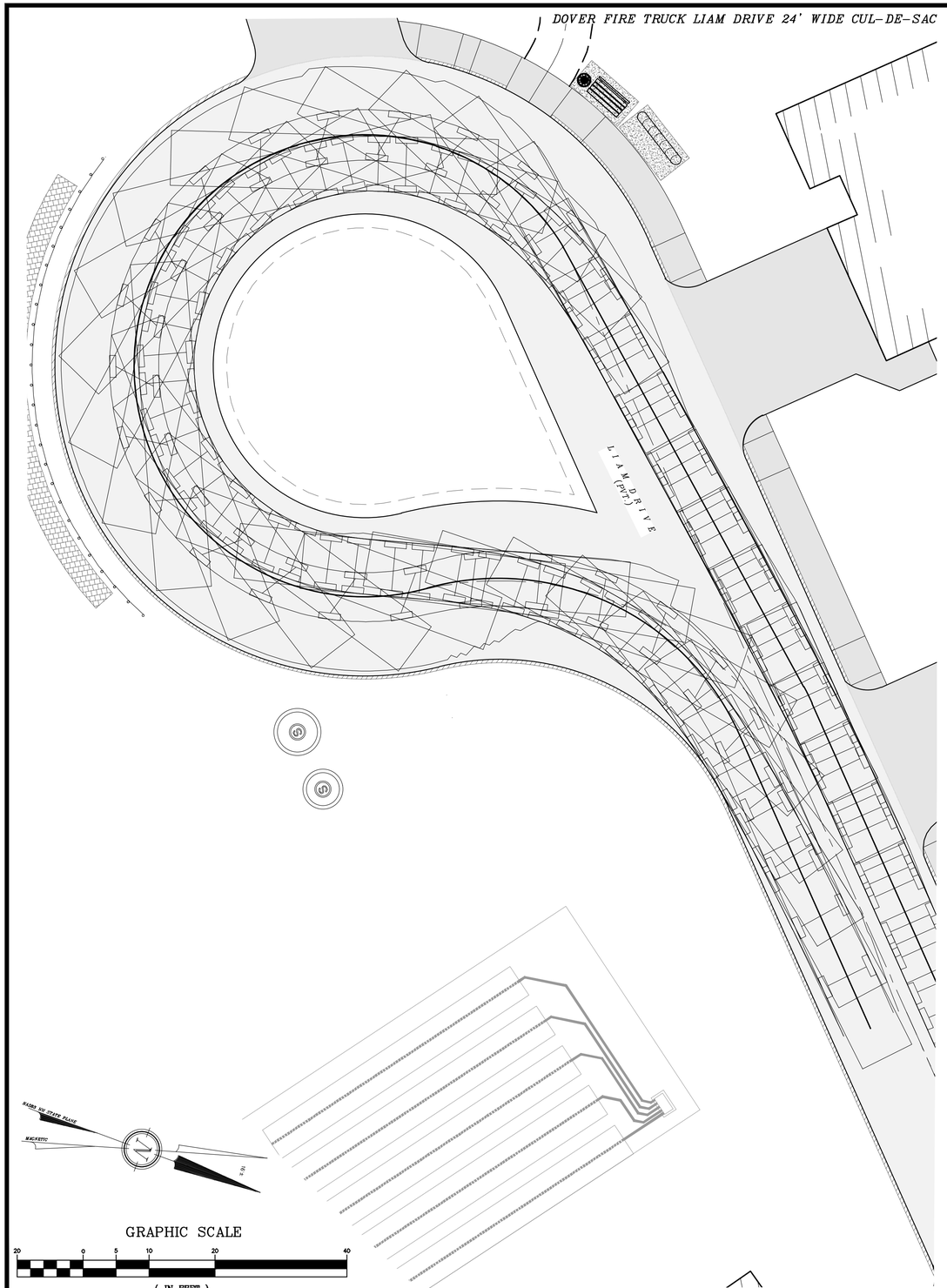
THEODORE DRIVE & ACCESS ROAD INTERSECTION T1 TURNING
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

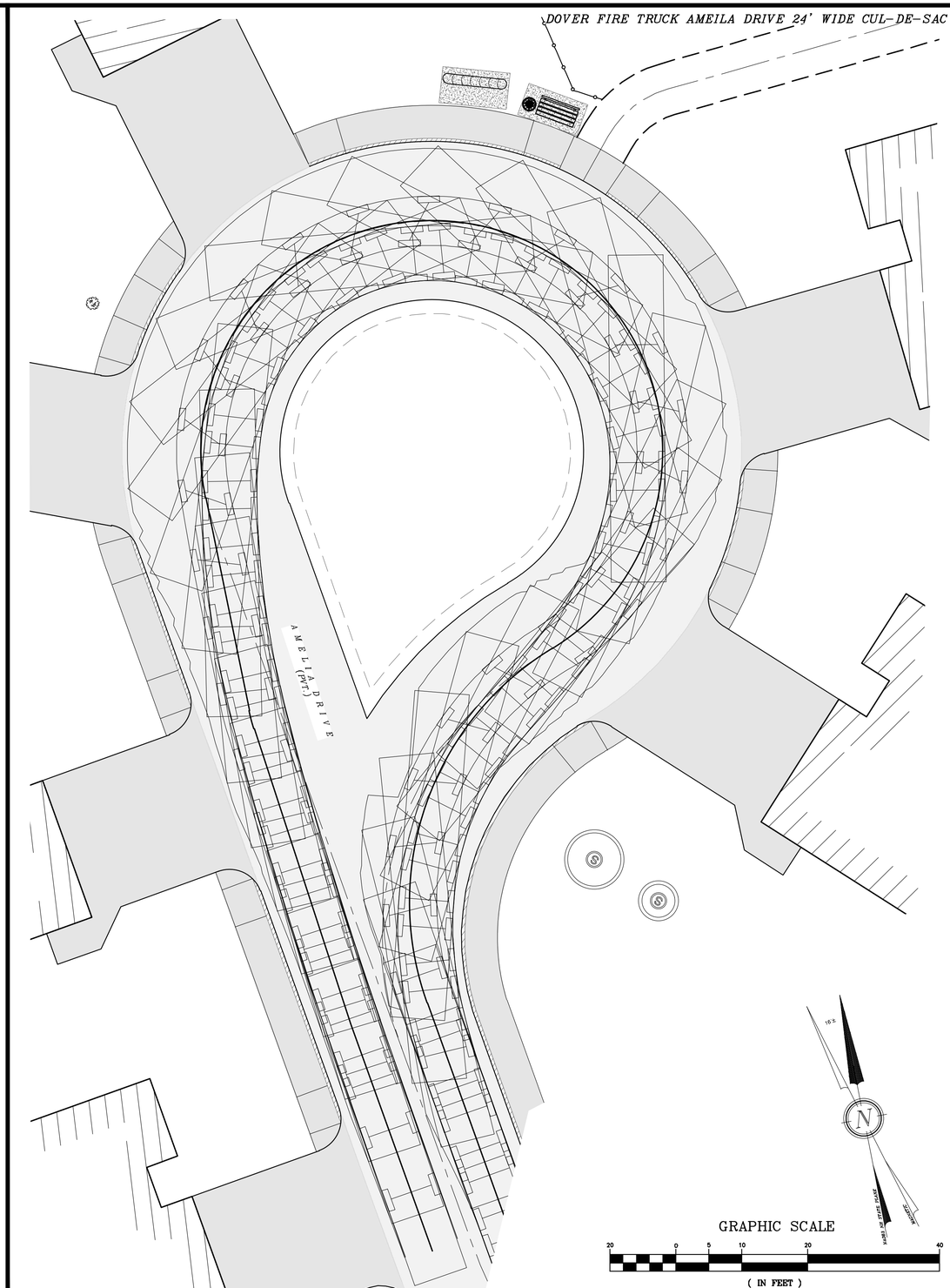
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 10 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION





DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

LIAM DRIVE & AMELIA DRIVE CUL-DE-SAC T1 TURNING
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 10 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 15443
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

NAD83 TO STATE PLANE

MAGNETIC

DOVER FIRE TRUCK TURNING SUN HAWK LANE 20' WIDE DRIVEWAY
EXIT TO ATINA WAY / TOLEND ROAD

SUN HAWK LANE

ATINA WAY

TOLEND ROAD

AMELIA DRIVE (PVT.)

THEODORE DRIVE (PVT.)

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

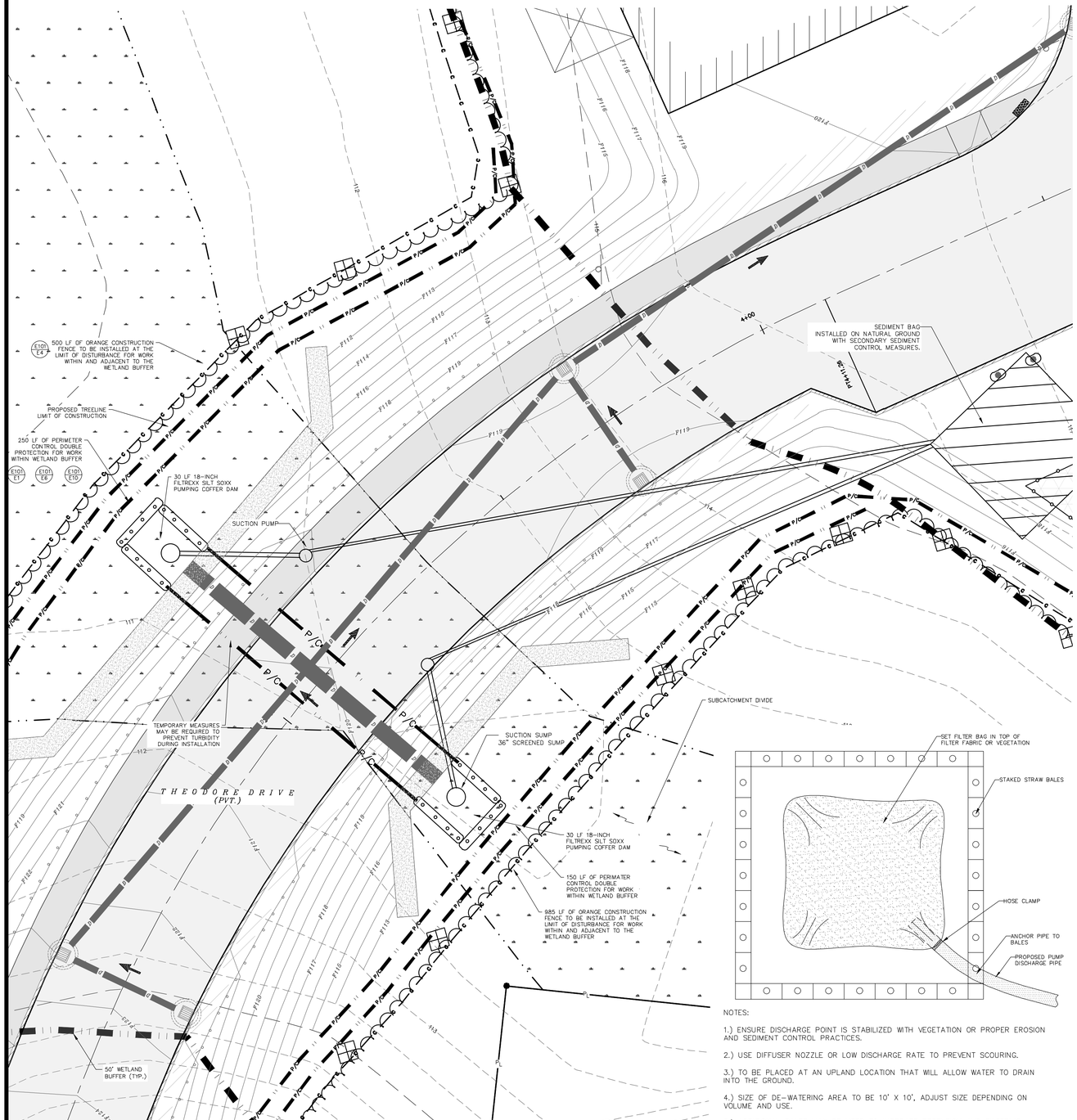
FIRE TRUCK TURNING SUN HAWK LANE
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP 65, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 30 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 15443
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



PROPOSED CROSSING DE-WATERING 3+10

NOTES:

1.) ENSURE DISCHARGE POINT IS STABILIZED WITH VEGETATION OR PROPER EROSION AND SEDIMENT CONTROL PRACTICES.

2.) USE DIFFUSER NOZZLE OR LOW DISCHARGE RATE TO PREVENT SCOURING.

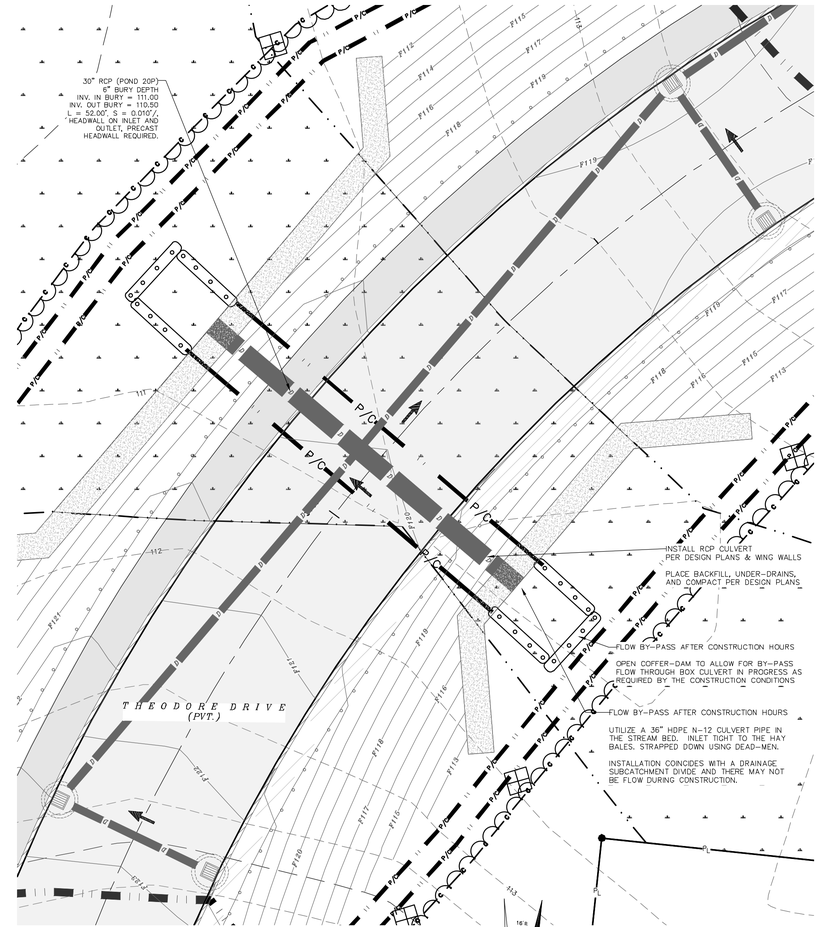
3.) TO BE PLACED AT AN UPLAND LOCATION THAT WILL ALLOW WATER TO DRAIN INTO THE GROUND.

4.) SIZE OF DE-WATERING AREA TO BE 10' X 10', ADJUST SIZE DEPENDING ON VOLUME AND USE.

5.) ADDITIONAL BALES MAY BE USED TO INCREASE RETENTION AND FILTERING.

DE-WATERING BASIN

NOT TO SCALE



CONSTRUCTION DIVERSION PLAN 3+10

NOTES:

1.) EROSION AND SEDIMENT CONTROL INSPECTIONS TO BE CONDUCTED ONCE PER EVERY SEVEN DAYS AND AT AN INCREASED FREQUENCY INCLUDING WITHIN 24-HOURS OF A 0.25 INCH RAIN EVENT. INSPECTIONS TO BE CONDUCTED BY A "QUALIFIED PERSON" AS DEFINED BY EPA CGP 6.31 AND INSPECTION REPORTS SUBMITTED TO THE CITY OF DOVER, NH, ENGINEERING DEPARTMENT WITHIN 24 HOURS IN ACCORDANCE WITH CGP 4.3 AND MAINTAINED BY THE OWNER FOR A PERIOD OF THREE YEARS AFTER THE PROJECT IS COMPLETED. SEE ALSO CITY OF DOVER ADDITIONAL INSPECTION REQUIREMENTS BELOW. A QUALIFIED PERSON WILL BE TRAINED IN EROSION AND SEDIMENT CONTROL MEASURES AND HAVE A PROFESSIONAL CERTIFICATION.

2.) THE DESIGN ENGINEER WILL BE PRESENT DURING THE INSTALLATION OF THE CULVERT AND PROVIDED TWO-DAYS NOTICE PRIOR TO CONSTRUCTION. THE DESIGN ENGINEER AND SWPPP INSPECTOR WILL BE NOTIFIED WHEN DEWATERING IS TO TAKE PLACE AND WILL ENSURE THAT THE DISCHARGE FROM THE SEDIMENT BAG AD SECONDARY CONTAINMENT IS CLEAN WATER. THE INTENT OF THE DISCHARGE IS TO FLOW OVER NATURAL EARTH AND TO BE CONDUCTED UP-SLOPE OF THE PERIMETER CONTROL.

3.) SEDIMENT WILL BE CONFINED WITHIN THE LIMITS OF CONSTRUCTION AND THERE IS TO BE NO TURBIDITY WITHIN THE JURISDICTIONAL WETLANDS. THE CONTRACTOR IS REQUIRED TO TAKE ANY AND ALL ADDITIONAL MEASURES TO CONTROL EROSION AND SEDIMENT CONTROL. THE USE OF STRAW OR HAY ON EXPOSED SOILS MAY BE REQUIRED AS A TEMPORARY STABILIZATION MEASURE. SLOPES WILL BE STABILIZED WITHIN THREE-DAYS OF ACHIEVING FINISH GRADE AND WITHIN 14 DAYS OF DISTURBING THE SOIL.

4.) REFERENCE IS MADE TO THE EROSION AND SEDIMENT CONTROL PLANS.

LEGEND:

- (B) BMP / SUBSURFACE GRAVEL WETLAND PROTECTION
- (P) PERIMETER CONTROL
- (C) RESIDENTIAL/ROADWAY CONSTRUCTION
- IRON PIPE (FND)
- IRON BOUND (FND)
- REBAR (FND)
- UTILITY POLE
- GUY WIRE
- BENCH MARK
- RIP RAP
- SUBSURFACE GRAVEL WETLAND
- BERM
- P/C — PERIMETER CONTROL (SEE E-101)
- SF — SILT FENCE
- SS SS SS — FILTREXX SILTSOXX (NOTE SIZE)
- TREE LINE
- C C — CONSTRUCTION FENCE

GRAPHIC SCALE

20 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

CULVERT CROSSING 3+10 AND DE-WATERING PLAN
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

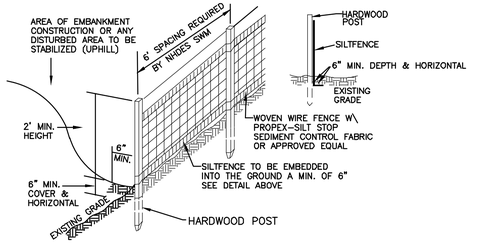
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 10 FT.
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14147
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

E1



SILT FENCE CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES AND FILTER CLOTH SHALL BE FASTENED TO WOVEN WIRE EVERY 24" AT TOP MID AND BOTTOM SECTIONS AND BE EMBEDDED INTO GROUND A MINIMUM OF 8" THE FENCE POSTS SHALL BE A MINIMUM 48" LONG, SPACED A MAXIMUM 6' APART, AND DRIVEN A MINIMUM OF 16" INTO THE GROUND.
2. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THE ENDS OF THE FABRIC SHALL BE OVERLAPPED BY SIX INCHES, FOLDED AND STAPLED TO PREVENT SEDIMENT FROM BY-PASSING.
3. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SEDIMENT REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE AND PROPERLY DISPOSED OF. SEE MAINTENANCE NOTE BELOW.
4. REMOVAL OF SEDIMENT REQUIRED AT A DEPTH OF 6-INCHES.
4. PLACE THE ENDS OF THE SILT FENCE UP CONTOUR TO PROVIDE FOR SEDIMENT STORAGE.
5. SILT FENCES SHALL BE REMOVED WHEN NO LONGER NEEDED AND THE SEDIMENT COLLECTED SHALL BE DISPOSED AS DIRECTED BY THE ENGINEER.
6. THE AREA DISTURBED BY THE REMOVAL SHALL BE SMOOTHED AND RE-VEGETATED.
7. TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, SILT FENCE, PAGE 90.

SILT FENCE MAINTENANCE

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

SILT FENCE DETAIL
NOT TO SCALE

E2

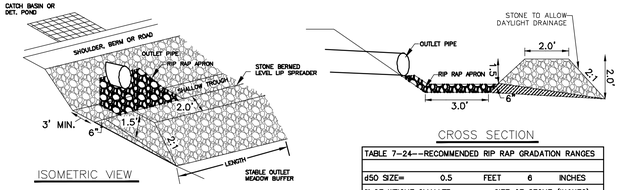
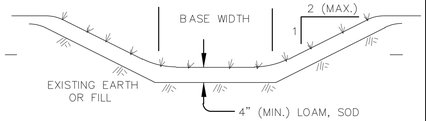


TABLE 7-24--RECOMMENDED RIP RAP GRADATION RANGES			
d50 SIZE=	0.5	FEET	6 INCHES
% OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE	SIZE OF STONE (INCHES) FROM		TO
100%	9		12
85%	8		11
50%	6		9
15%	2		3

1. CONSTRUCT THE LEVEL SPREADER LIP ON A 0% GRADE TO INSURE UNIFORM SPREADING OF RUNOFF.
2. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL AND NOT ON FILL.
3. THE ENTIRE LEVEL LIP AREA SHALL BE PROTECTED BY PLACING EXCELSIOR ENFORCER MATTING BENEATH THE STONE. EACH STRIP SHALL OVERLAP BY AT LEAST SIX INCHES.
4. THE FLOW FROM THE LEVEL SPREADER SHALL OUTLET ONTO STABILIZED AREAS. WATER SHOULD NOT RE-CONCENTRATE IMMEDIATELY BELOW THE SPREADER.
5. MAINTENANCE: THE LEVEL SPREADER SHOULD BE CHECKED PERIODICALLY AND AFTER EVERY MAJOR STORM TO DETERMINE IF THE LIP HAS BEEN DAMAGED AND THE DESIGN CONDITIONS HAVE NOT CHANGED. ANY DETRIMENTAL SEDIMENT ACCUMULATION SHOULD BE REMOVED. IF STONE REMOVAL HAS TAKEN PLACE ON THE LIP, THEN THE DAMAGE SHOULD BE REPAIRED.
6. REFERENCE IS MADE TO NHDES SWM VOL. 2, 4-6, STONE BERM LEVEL SPREADERS, PAGE 162

STONE BERM LEVEL SPREADER
NOT TO SCALE

E3



GRASS CONVEYANCE SWALE
NOT TO SCALE

INSPECT ANNUALLY FOR EROSION, SEDIMENT ACCUMULATIONS, VEGETATION LOSS, & INVASIVE SPECIES. REPAIR AS NECESSARY.

MOW GRASS ANNUALLY TO A DEPTH OF 4".

INSTALL STABILIZATION MATTING DURING CONSTRUCATION

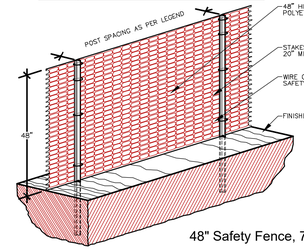
TO BE CONSTRUCTED IAW NH SWM #2 CHAPTER 4, #5 TREATMENT SWALES, PAGE 123.

E4

CONSTRUCTION SAFETY FENCE
NOT TO SCALE

LEGEND

SAF12	48" ORANGE FENCE, 12 FEET O.C.
SAF11	48" ORANGE FENCE, 11 FEET O.C..
SAF10	48" ORANGE FENCE, 10 FEET O.C.
SAF9	48" ORANGE FENCE, 9 FEET O.C.
SAF8	48" ORANGE FENCE, 8 FEET O.C..
SAF7	48" ORANGE FENCE, 7 FEET O.C.
SAF6	48" ORANGE FENCE, 6 FEET O.C.



48" Safety Fence, 72" T-Posts

1. ALL SENSITIVE AREAS SHALL BE PROTECTED AS PER PLAN.
2. ALL TREES IN THE CONSTRUCTION AREA NOT SPECIFICALLY DESIGNATED FOR REMOVAL SHALL BE PRESERVED AND PROTECTED WITH HIGH VISIBILITY FENCE AS PER PLAN.
3. WHEN PRACTICABLE, INSTALL HIGH VISIBILITY 3 FEET OUTSIDE OF THE DRIP LINE OF THE TREE.
4. SAFETY FENCE SHOULD BE FASTENED SECURELY TO THE T-POSTS.
5. THE FENCING MUST REMAIN IN PLACE DURING ALL PHASES OF CONSTRUCTION; ANY CHANGE OF THE PROTECTIVE FENCING MUST BE APPROVED.

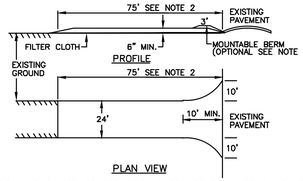
DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

EROSION & SEDIMENT CONTROL DETAILS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

E5

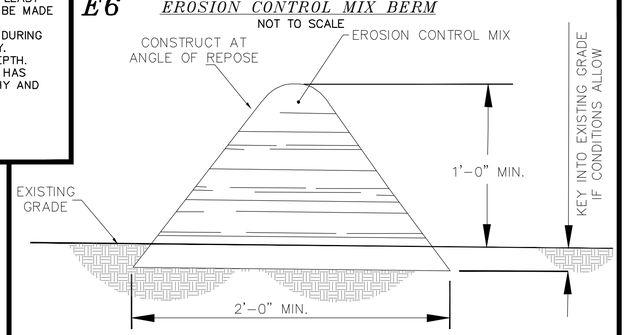
STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE



1. STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 3 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 75 FEET, EXCEPT THAT THE MINIMUM LENGTH MAY BE REDUCED TO 50 FEET IF A 3-INCH TO 6-INCH BERM IS INSTALLED AT THE ENTRANCE OF THE PROJECT SITE.
3. THE THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS OR 10 FEET, WHICH EVER IS GREATER.
5. GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING
6. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED, OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.
8. TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, TEMPORARY CONSTRUCTION EXIT, PAGE 124.

E6

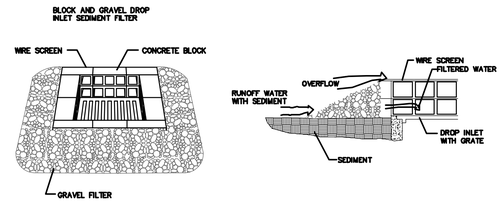
EROSION CONTROL MIX BERM
NOT TO SCALE



EROSION CONTROL MIX BERMS SHALL BE USED ONLY AS FOLLOWS:

1. BERMS SHALL BE USED IN AREAS WHERE EROSION WILL OCCUR ONLY IN THE FORM OF SHEET EROSION AND THERE IS NO CONCENTRATION OF WATER IN A CHANNEL OR DRAINAGE WAY ABOVE THE BERM.
2. THE BERMS SHALL BE INSTALLED FOLLOWING THE CONTOUR OF THE LAND AS CLOSLY AS POSSIBLE.
3. THE BERMS SHALL BE INSTALLED ON SLOPES LESS THAN 5%.
4. SUBJECT TO (E), BELOW, THE MIX SHALL HAVE AN ORGANIC PORTION BETWEEN 80 AND 100%, DRY WEIGHT BASIS, AND BE FIBROUS AND ELONGATED SUCH AS FROM SHREDDED BARK, STUMP GRINDINGS, COMPOSED BARK, OR EQUIVALENT MANUFACTURED PRODUCTS.
5. WOOD AND BARK CHIPS, GROUND CONSTRUCTION DEBRIS, OR REPROCESSED WOOD PRODUCTS SHALL NOT BE USED AS ORGANIC MATERIAL.
6. THE MIX SHALL NOT CONTAIN SILTS, CLAY, OR FINE SANDS.
7. THE MIX SHALL HAVE A PARTICLE SIZE BY WEIGHT OF 70 TO 85% PASSING A 6-INCH SCREEN AND A MAXIMUM OF 85% PASSING THE 0.75-INCH SCREEN.
8. THE MIX PH SHALL BE BETWEEN 5.0 AND 8.0.
9. THE BERM SHALL BE AT LEAST 12 INCHES HIGH AND AT LEAST 2 FEET WIDE.
10. TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, EROSION CONTROL MIX BERMS, PAGE 106.

E7



MAINTENANCE

ALL STRUCTURES SHOULD BE INSPECTED AFTER EVERY RAIN STORM AND REPAIRS MADE AS NECESSARY. SEDIMENT SHOULD BE REMOVED FROM TRAPPING DEVICES AFTER THE SEDIMENT HAS REACHED A MAXIMUM OF ONE HALF THE DEPTH OF THE TRAP. THE SEDIMENT SHOULD BE DISPOSED OF IN A SUITABLE AREA AND PROTECTED FROM EROSION BY EITHER STRUCTURE OR VEGETATIVE MEANS. THE TEMPORARY TRAPS SHOULD BE REMOVED AND THE AREA REPAIRED AS SOON AS THE CONTRIBUTING DRAINAGE AREA TO THE INLET HAS BEEN COMPLETELY STABILIZED.

BLOCK & GRAVEL DROP INLET SEDIMENT FILTER
NOT TO SCALE

TO BE USED IN ALL AREAS WHERE THERE WILL BE NO TRAFFIC.

TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, TEMPORARY STORM DRAIN INLET PROTECTION, PAGE 118.

E8

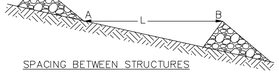
TEMPORARY EROSION CONTROL MEASURES

1. THE SMALLEST PRACTICAL AREA OF LAND SHALL BE EXPOSED AT ANY ONE TIME.
2. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND AT LOCATIONS AS REQUIRED, DIRECTED BY THE ENGINEER.
3. ALL DISTURBED AREAS SHALL BE RETURNED TO ORIGINAL GRADES AND ELEVATIONS. DISTURBED AREAS SHALL BE LOAMED WITH A MINIMUM OF 4" OF LOAM AND SEEDED WITH NOT LESS THAN ONE POUND OF SEED PER 50 SQUARE YARDS OF AREA. (SEE SEED SPECIFICATIONS THIS SHEET)
4. ALL DISTURBED AREAS WILL BE RESTABILIZED WITHIN 45 DAYS. AT ANY ONE TIME, NO MORE THAN 5 ACRES, (217,800 Sq. Ft.) WILL BE DISTURBED.
5. SILT FENCES AND PERIMETER BARRIERS SHALL BE INSPECTED PERIODICALLY AND AFTER EVERY RAIN DURING THE LIFE OF THE PROJECT. ALL DAMAGED AREAS SHALL BE REPAIRED, SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED OF.
6. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, THE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE REMOVED AND THE AREA DISTURBED BY THE REMOVAL SMOOTHED AND RE-VEGETATED.
7. PER THE EPA CGP REQUIREMENTS THERE WILL BE REPORTS OF THE EROSION CONTROL INSPECTIONS IAW SWPPP PREPARED BY BS&E. ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER 0.25" OR GREATER RAIN EVENT.
8. DITCHES, SWALES, AND BASINS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
9. DO NOT TRAFFIC EXPOSED SOIL SURFACES WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION SYSTEM.
10. ROADWAYS, DRIVEWAYS AND CUT AND FILL SLOPES MUST BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINAL GRADE.
11. STABILIZATION MEANS:
    - 11.1. A MINIMUM OF 85% OF VEGETATIVE COVER HAS BEEN ESTABLISHED.
    - 11.2. A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP RAP HAS BEEN INSTALLED, OR
    - 11.3. EROSION CONTROL BLANKETS HAVE BEEN INSTALLED.
12. THIS PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.
13. THE NHDES STORMWATER MANUAL, IN THREE VOLUMES, DATED DECEMBER 2008, IS A PART OF THIS PLAN SET AND THE MORE RESTRICTIVE WILL GOVERN. (NH SWM)

E9

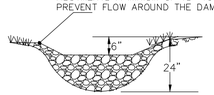
STONE CHECK DAM
NOT TO SCALE

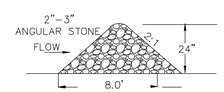
THE DISTANCE SUCH THAT POINTS A AND B ARE OF EQUAL ELEVATION.



SPACING BETWEEN STRUCTURES

NOTE: KEY STONE INTO CHANNEL BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIUM OF 18" TO PREVENT FLOW AROUND THE DAM.

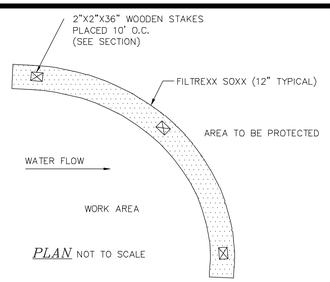




STONE GRADE STABILIZATION STRUCTURE

1.) CHECK DAMS SHOULD BE INSTALLED BEFORE RUNOFF IS DIRECTED TO THE SWALE OR DRAINAGE DITCH.
2.) THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE DAM SHOULD BE LESS THEN ONE ACRE.
3.) THE MAXIMUM HEIGHT OF THE DAM SHOULD BE TWO FEET.
4.) THE CENTER OF THE DAM SHOULD BE AT LEAST SIX INCHES LOWER THAN THE OUTER EDGES.
5.) THE MAXIMUM SPACING IS AS SHOWN ON THE PROJECT SITE PLANS.
6.) CHECK DAMS WILL NOT BE USED IN A FLOWING STREAM.
7.) TEMPORARY CHECK DAMS WILL BE REMOVED ONCE THE SWALE OR DITCH IS DETERMINED STABLE.
8.) TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, TEMPORARY CHECK DAMS, PAGE 114.

E10

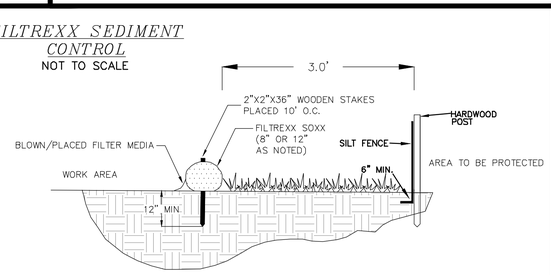


PLAN NOT TO SCALE

NOTES

1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2. FILTER MEDIA FILL TO MEET APPLICATION REQUIRMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.
4. SILTSOXX MAY BE USED IN PLACE OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
5. SILTSOXX COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIRMENTS OF THE SPECIFIC APPLICATION.
6. FILTREXX SOXX IS A REGISTERED TRADEMARK OF FILTREXXIN TERNATIONAL, LLC.
7. SILT FENCE IS NOT A SUBSTITUTION FOR SILT SOXX AND ANY EQUAL SUBSTITUTION TO BE APPROVED.
8. TO BE CONSTRUCTED IAW FILTREXX, SECTION 1:EROSION & SEDIMENT CONTROL (PAGE 323) - CONSTRUCTION ACTIVITIES, SWPPP CUT SHEET: FILTREXX SEDIMENT CONTROL

FILTREXX SEDIMENT CONTROL
NOT TO SCALE

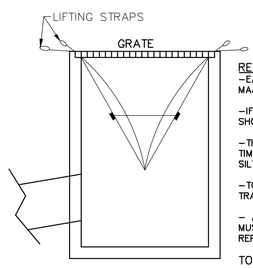


Filtrexx International, LLC
35481 Grafton Eastern Rd | Grafton, Oh 44044
440-926-2607 | fax: 440-926-4021
WWW.FILTREXX.COM
OR APPROVED EQUAL

NOTE: FOR AREAS REQUIRING DOUBLE PERIMETER CONTROL WITHIN 50' OF JURISDICTIONAL WETLANDS AND NOT FOR ALL SILT SOXX APPLICATIONS. THIS DUPLICATION MAY BE SPECIFIED AS 12" SILT SOXX OR ORANGE CONSTRUCTION FENCE AS NOTED.

SECTION NOT TO SCALE

E11



RECOMMENDED MAINTENANCE SCHEDULE

-EACH SILTSACK SHOULD BE INSPECTED AFTER EVERY MAJOR RAIN EVENT, AND MUST BE MAINTAINED.

-IF THERE HAVE BEEN NO MAJOR EVENTS, SILTSACK SHOULD BE INSPECTED EVERY 2-3 WEEKS.

-THE RESTRAINT CORD SHOULD BE VISIBLE AT ALL TIMES. IF CORD IS COVERED WITH SEDIMENT, THE SILTSACK SHOULD BE EMPTIED.

-TO BE USED IN ALL AREAS WHERE THERE WILL BE TRAFFIC.

- ARE SUBJECT TO DAMAGE BY SNOW PLOWS, AND MUST BE INSPECTED AFTER ANY SNOW EVENT AND REPLACED AS REQUIRED.

TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, TEMPORARY STORM DRAIN INLET PROTECTION, PAGE 118.

SILTSACK DETAIL
NOT TO SCALE

E-101

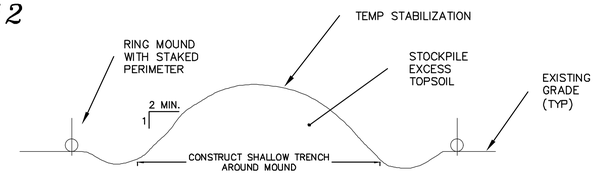
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

E12



TO BE CONSTRUCTED IAW NH SWM #3 4-1 EROSION CONTROL PRACTICES, SOIL STOCKPILE PRACTICES, PAGE 46.

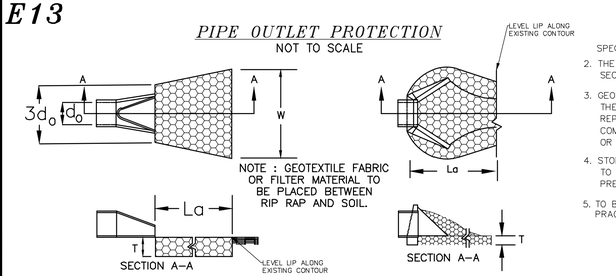
TOPSOIL STOCKPILE MOUND

NOT TO SCALE

E13

PIPE OUTLET PROTECTION

NOT TO SCALE



PIPE OUTLET TO FLAT AREA WITH NO DEFINED CHANNEL

PIPE OUTLET TO WELL-DEFINED CHANNEL

PIPE OUTLET PROTECTION CONSTRUCTION SPECIFICATIONS

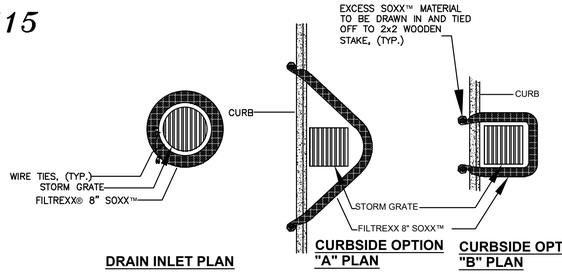
SPECIFIED GRADATION.

2. THE ROCK OR GRAVEL USED FOR FILTER OF RIP RAP SHALL CONFORM TO NHDOT SECTION 583.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIP RAP DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
4. STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.
5. TO BE CONSTRUCTED IAW NH SWM #2 4-6 CONVEYANCE PRACTICES, 6. OUTLET PROTECTION, PAGE 172.

E14

TABLE 7-24--RECOMMENDED RIP RAP GRADATION RANGES			
d50 SIZE=	0.5	FEET	6 INCHES
% OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE	SIZE OF STONE (INCHES) FROM		TO
100%	9		12
85%	8		11
50%	6		9
15%	2		3

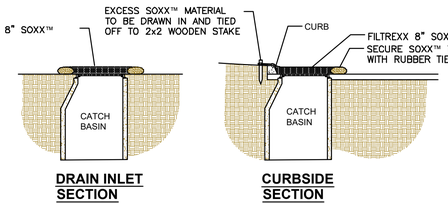
E15



DRAIN INLET PLAN

CURBSIDE OPTION "A" PLAN

CURBSIDE OPTION "B" PLAN



DRAIN INLET SECTION

CURBSIDE SECTION

NOTES:
1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2. FILTER MEDIA™ FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

FILTREXX INLET PROTECTION

NOT TO SCALE

E16

NOTE: THIS PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

NOTE: Temporary seed mix for stabilization of turf shall be winter rye or oats at a rate of 2.5 lbs. per 1000 s.f. and shall be placed prior to OCT. 15, if permanent seeding not yet complete.

SEEDING GUIDE

USE	SEEDING MIXTURE 1/	DROUGHTY	WELL DRAINED	MODERATELY WELL DRAINED	POORLY DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	FAIR	GOOD	GOOD	FAIR
	B	POOR	GOOD	FAIR	FAIR
	C	POOR	GOOD	EXCELLENT	GOOD
	D	FAIR	FAIR	GOOD	EXCELLENT
	E	FAIR	EXCELLENT	EXCELLENT	POOR
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A	GOOD	GOOD	GOOD	FAIR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
	D	GOOD	EXCELLENT	EXCELLENT	FAIR
LIGHTLY USED PARKING LOTS, OOD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES.	A	GOOD	GOOD	GOOD	FAIR
	B	GOOD	GOOD	FAIR	POOR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
	D	FAIR	GOOD	GOOD	EXCELLENT
PLAY AREAS AND ATHLETIC FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.)	F	FAIR	EXCELLENT	EXCELLENT	2/
	G	FAIR	EXCELLENT	EXCELLENT	2/

GRAVEL PIT, SEE NH-PM-.24 IN APPENDIX FOR RECOMMENDATION REGARDING RECLAMATION OF SAND AND GRAVEL PITS.

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

RECOMMENDED *

SEEDING RATES

MIXTURE	POUNDS PER ACRE	POUNDS PER 1,000 Sq. Ft.
A. TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
RED TOP	2	0.05
TOTAL	42	0.95
B. TALL FESCUE	15	0.35
CREEPING RED FESCUE	10	0.25
CROWN VETCH	15	0.35
OR		
FLAT PEA	30	0.75
TOTAL	40 OR 55	0.95 OR 1.35
C. TALL FESCUE	24	0.55
CREEPING RED FESCUE	24	0.55
BIRDS FOOT TREFOIL	REMOVED	REMOVED
TOTAL	48	1.10
D. TALL FESCUE	30	0.45
FLAT PEA	20	0.75
TOTAL	50	1.20
E. CREEPING RED FESCUE 1/	50	1.15
KENTUCKY BLUEGRASS 1/	50	1.15
TOTAL	100	2.30
F. TALL FESCUE 1	150	3.60

CONSERVATION MIX	POUNDS PER ACRE	POUNDS PER 1,000 S.F.
TALL FESCUE (35%)	15	0.35
CREEPING RED FESCUE (25%)	15	0.35
ANNUAL RYEGRASS (12%)	5	0.12
PERENNIAL RYEGRASS (10%)	5	0.12
KENTUCKY BLUEGRASS (10%)	15	0.35
WHITE CLOVER (3%)	7	0.16

SEEDING SPECIFICATIONS

1. GRADING AND SHAPING
   A. SLOPES SHALL NOT BE STEEPER THAN 2:1;3:1 SLOPES OR FLATTER ARE PREFERRED.
   WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.
2. SEEDBED PREPARATION
   A. SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
   B. STONES LARGER THAN 4 INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEED BED AND MIX FERTILIZER AND LIME INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.
3. ESTABLISHING A STAND
   A. LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING
   AND INCORPORATED INTO THE SOIL KINDS AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE,
   THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:
   AGRICULTURAL LIMESTONE, 2 TONS PER ACRE OR 100LBS. PER 1,000 SQ.FT.
   NITROGEN(N), 50LBS. PER ACRE OR 1.1LBS. PER 1,000 SQ.FT.
   PHOSPHATE(P2O5), 100LBS. PER ACRE OR 2.2LBS. PER 1,000 SQ.FT.
   POTASH(K2O), 100LBS. PER ACRE OR 2.2LBS. PER 1,000 SQ.FT.
   (NOTE: THIS IS THE EQUIVALENT OF 500LBS. PER ACRE OF 10-20-20 FERTILIZER OR 1,000LBS. PER ACRE OF 5-10-10.)
   B. SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH .25 INCH OF SOIL OR LESS, BY CULTIPACKING OR RAKING.
   C. REFER TO TABLE(G-E1 THIS SHEET) FOR APPROPRIATE SEED MIXTURES AND TABLE(H-E1 THIS SHEET) FOR RATES OF SEEDING. ALL LEGUMES (CROWNVETCH, BIRDSFOOT TREFOIL, AND FLATPEA) MUST BE INOCULATED WITH THEIR SPECIFIC INOCULANT.
   D. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 10 TO SEPTEMBER 1.
4. MULCH
   A. HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.
   B. MULCH WILL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE BEST MANAGEMENT PRACTICE FOR MULCHING. HAY OR STRAW MULCH SHALL BE PLACED AT A RATE OF 90LBS PER 1000 S.F.
5. MAINTENANCE TO ESTABLISH A STAND
   A. PLANTED AREA SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.
   B. FERTILIZATION NEEDS SHOULD BE DETERMINED BY ONSITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIAL STAKE 2 TO 3 YEARS TO BECOME ESTABLISHED.
   C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, OCCASIONAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.
6. TO BE CONSTRUCTED IAW NH SWM #3 4-1 EROSION CONTROL PRACTICES, PERMANENT VEGETATION, PAGE 60.
7. SEE RAIN GARDEN AND INFILTRATION DETAIL SHEETS FOR SPECIFIC PLANTING INSTRUCTIONS AND SEEDING.

E17

CONSTRUCTION SEQUENCE:

1.) CUT AND REMOVE TREES IN CONSTRUCTION AREA ONLY AS REQUIRED, RELOCATE ANY PROJECT T.B.M.

2.) CONSTRUCT AND/OR INSTALL TEMPORARY AND PERMANENT SEDIMENT EROSION AND DETENTION CONTROL FACILITIES AS SPECIFIED. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY SOIL LAND DISTURBANCE AND MUST BE REVIEWED AND APPROVED BY THE COMMUNITY SERVICES DEPARTMENT.

3.) EROSION, SEDIMENT AND DETENTION CONTROL FACILITY SHALL BE INSTALLED & STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.TEMPORARY DIVERSIONS MAY BE REQUIRED. POST CONSTRUCTION STORM WATER MANAGEMENT PRACTICES MUST BE INITIATED AND STABILIZED EARLY IN THE PROCESS. RUNOFF MUST BE DIRECTED TO TEMPORARY PRACTICES UNTIL STORMWATER BMPs ARE STABILIZED.

4.) CLEAR, CUT AND DISPOSE OF DEBRIS IN APPROVED FACILITY

5.) CONSTRUCT TEMPORARY CULVERTS AS REQUIRED, OR DIRECTED

6.) CONSTRUCT ROADWAYS FOR ACCESS TO DESIRED CONSTRUCTION AREAS. ALL ROADS SHALL BE STABILIZED IMMEDIATELY. SEE BEST MANAGEMENT PRACTICES FOR BLASTING ON SHEET C-104.

7.) START BUILDING CONSTRUCTION.

8.) INSTALL PIPE AND CONSTRUCTION ASSOCIATED APPURTENANCES AS REQUIRED OR DIRECTED. INSTALL SUBSURFACE GRAVEL WETLANDS. ALL DISTURBED AREAS SHALL BE STABILIZED IMMEDIATELY AFTER GRADING.

9.) BEGIN PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES AND DISTURBED AREAS SHALL BE SEEDED OR MULCHED AS REQUIRED, OR DIRECTED. NO AREA IS ALLOWED TO BE DISTURBED FOR A LENGTH OF TIME THAT EXCEEDS 45 DAYS BEFORE BEING STABILIZED, DAILY, OR AS REQUIRED. ALL ROADWAYS AND PARKING AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADES. ALL CUT AND FILL SLOPES SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADES. LIMIT THE LENGTH OF EXPOSURE OF UNSTABILIZED SOIL TO 45 DAYS OR LESS.

10.) CONSTRUCT TEMPORARY BERMS, DRAINS DITCHES, SILT FENCES, SEDIMENT TRAPS, ETC. MULCH AND SEED AS REQUIRED.

11.) INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION. ALL SWPPP INSPECTIONS MUST BE CONDUCTED BY A QUALIFIED PROFESSIONAL SUCH AS A CERTIFIED PROFESSIONAL ENGINEER (PE), A CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC), A CERTIFIED EROSION SEDIMENT AND STORM WATER INSPECTOR (CESSW), OR A CERTIFIED PROFESSIONAL IN STORM WATER QUALITY (CPSWQ). INSPECTION REPORTS SHALL BE SUBMITTED TO THE COMMUNITY SERVICES DEPARTMENT. EROSION AND SEDITMENT CONTROL PRACTICES ARE TO BE INSPECTED WEEKLY AND AFTER 0.5" OF RAINFALL.

12.) COMPLETE PERMANENT SEEDING AND LANDSCAPING.

13.) REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER SEEDING AREAS HAVE ESTABLISHED THEMSELVES AND SITE IMPROVEMENTS ARE COMPLETE.

14.) SMOOTH AND REVEGETATE ALL DISTURBED AREAS.

15.) FINISH PAVING ALL ROADWAYS.

16.) LOT DISTURBANCE, OTHER THAN THAT SHOWN ON THE APPROVED PLANS, SHALL NOT COMMENCE UNTIL AFTER THE ROADWAY HAS THE BASE COURSE TO DESIGN ELEVATION AND THE ASSOCIATED DRAINAGE IS COMPLETE AND STABLE.

E18 *DEFINITION OF STABLE:*

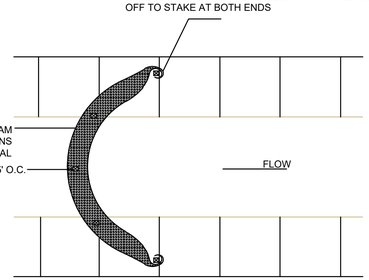
PER ENV-WQ 1500 ALTERATION OF TERRAIN

1. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED.
2. A MINIMUM OF 85 PERCENT VEGETATED GROWTH HAS BEEN ESTABLISHED..
3. A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP-RAP HAS BEEN INSTALLED.
4. OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

ADDITION STABILIZATION NOTES:

5. HAY MULCH OR OTHER APPROVED METHODS SHALL BE USED TO CONTROL EROSION OF NEWLY GRADED AREAS. ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED WITHIN 72 HOURS AFTER THEIR CONSTRUCTION.
6. DISTURBED SOIL AREAS SHALL BE EITHER TEMPORARILY OR PERMANENTLY STABILIZED. IN AREAS WHERE FINAL GRADING HAS NOT OCCURRED, TEMPORARY STABILIZATION MEASURES SHOULD BE IN PLACE WITHIN SEVEN (7) CALENDAR DAYS FOR EXPOSED SOIL AREAS THAT ARE WITHIN ONE HUNDRED (100) FEET OF A SURFACE WATER BODY OR A WETLAND AND NO MORE THAN 14 CALENDAR DAYS FOR ALL OTHER AREAS. PERMANENT STABILIZATION SHOULD BE IN PLACE WITHIN THREE (3) CALENDAR DAYS FOLLOWING COMPLETION OF FINAL GRADING OF EXPOSED SOIL AREAS.

E19

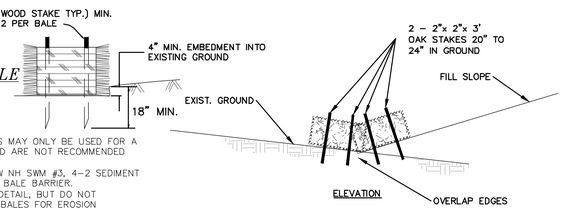


FILTREXX CHECK DAM

NOT TO SCALE

NOTES:
1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2. CHECK DAM SHOULD BE USED IN AREAS THAT DRAIN 1 ACRE OR LESS.
3. SEDIMENT SHOULD BE REMOVED FROM BEHIND CHECK DAM ONCE THE ACCUMULATED HEIGHT HAS REACHED ½ THE HEIGHT OF THE CHECK DAM.
4. CHECK DAM CAN BE DIRECT SEEDED AT THE TIME OF INSTALLATION.
5. CONTRACTOR IS REQUIRED TO BE A FILTREXX CERTIFIED INSTALLER.

E20

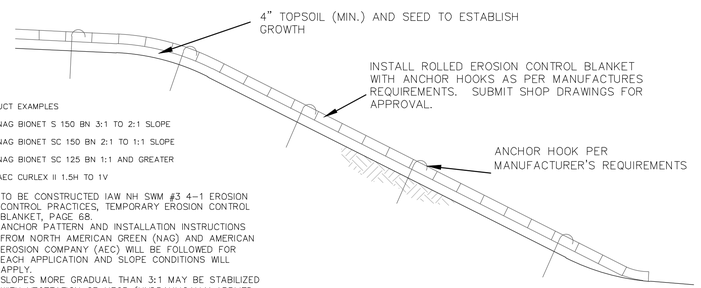


STAKED HAYBALE DETAIL

NOT TO SCALE

1.) HAY BALES BARRIERS MAY ONLY BE USED FOR A MAXIMUM OF 60 DAYS AND ARE NOT RECOMMENDED FOR PERIMETER CONTROL.
2.) TO BE INSTALLED IAW NH SWM #3, 4-2 SEDIMENT CONTROL, STRAW OR HAY BALE BARRIER.
3.) REQUIRED TO SHOW DETAIL, BUT DO NOT RECCOMEND USE OF HAY BALES FOR EROSION CONTROL.

E21



PRODUCT EXAMPLES

1.) NAG BIONET S 150 BN 3:1 TO 2:1 SLOPE
2.) NAG BIONET SC 150 BN 2:1 TO 1:1 SLOPE
3.) NAG BIONET SC 125 BN 1:1 AND GREATER
4.) AEC CURLEX II 1.5H TO 1V

1. TO BE CONSTRUCTED IAW NH SWM #3 4-1 EROSION CONTROL PRACTICES, TEMPORARY EROSION CONTROL BLANKET, PAGE 68.
2. ANCHOR PATTERN AND INSTALLATION INSTRUCTIONS FROM NORTH AMERICAN GREEN (NAG) AND AMERICAN EROSION COMPANY (AEC) WILL BE FOLLOWED FOR EACH APPLICATION AND SLOPE CONDITIONS WILL APPLY.
3. SLOPES MORE GRADUAL THAN 3:1 MAY BE STABILIZED WITH VEGETATION OR HECP (HYDRAULICALLY APPLIED EROSION CONTROL MIX)/BONDED FIBER MATRIX. HOWEVER THE ENGINEER RESERVES THE RIGHT TO REQUEST INCREASED RECB TO BE INSTALLED ON ANY SLOPE.
4. ALL RECB IS TO CONSIST OF ALL NATURAL MATERIAL WITH NO SYNTHETIC COMPONENTS (NO PHOTO BIODEGRADABLE NETTING)

ROLLED EROSION CONTROL BLANKET (RECB) SLOPE STABILIZATION DETAIL

NOT TO SCALE

E22

WINTER STABILIZATION NOTES

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

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

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

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

5. ENV-WQ 1505.06 COLD WEATHER SITE STABILIZATION (B)(1) LIMITS AREA OF EXPOSURE TO ONE ACRE OF UNSTABILIZED SOIL WITHOUT OBTAINING A WAIVER AND WINTER CONSTRUCTION PLAN.

E-102

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

EROSION & SEDIMENT CONTROL DETAILS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

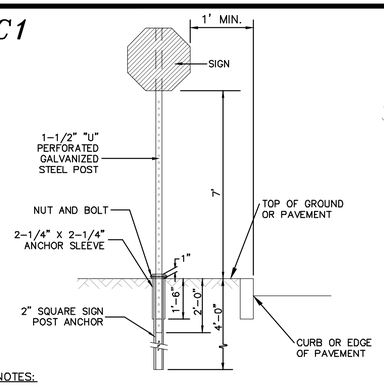
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

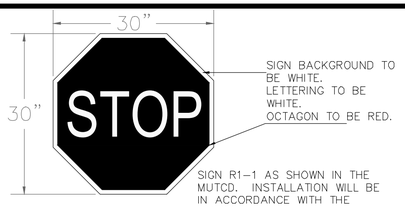
SCALE : AS NOTED
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14043
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

C1

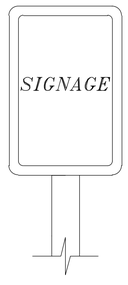




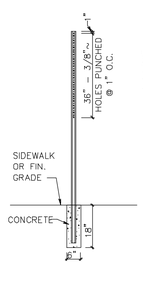
NOTES:

1. ALL SIGNAGE SHALL BE TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) STANDARDS AND NHDOT STANDARDS.
2. THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS/CATALOG CUTS TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ERECTING SIGNS.
3. THE LOCATION OF THE SIGNS SHALL BE AS INDICATED ON THE DRAWINGS AND/OR AS DIRECTED BY THE CITY OF DOVER DEPARTMENT OF PUBLIC WORKS.

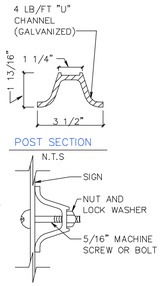
TYPICAL SIGN POST
(NOT TO SCALE)



PARTIAL ELEVATION
N.T.S.



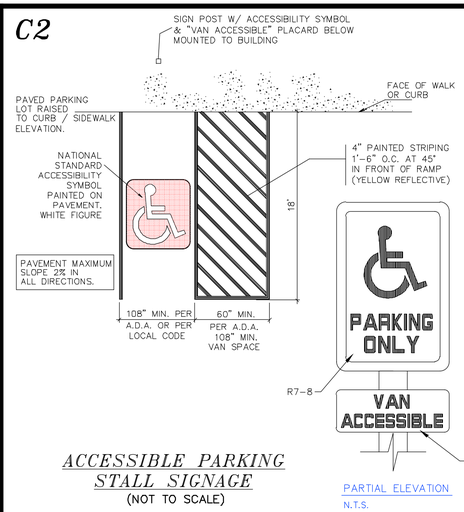
POST
N.T.S.



POST SECTION
N.T.S

MOUNTING
N.T.S.

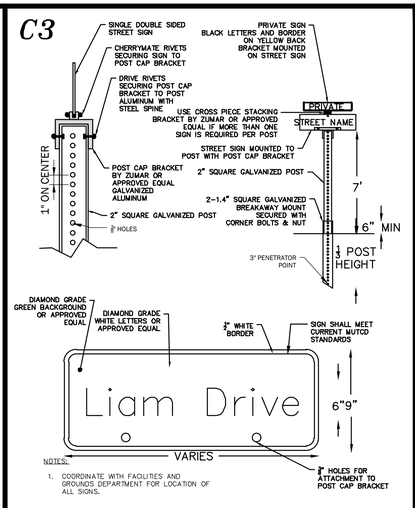
C2



PARTIAL ELEVATION
N.T.S.

ACCESSIBLE PARKING STALL SIGNAGE
(NOT TO SCALE)

C3



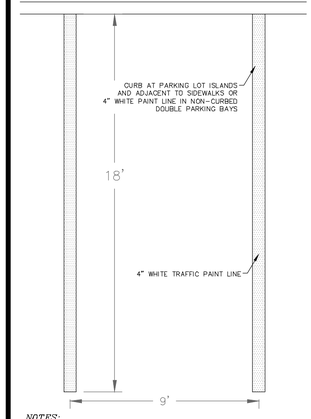
NOTES:

1. COORDINATE WITH FACILITIES AND GROUNDS DEPARTMENT FOR LOCATION OF ALL SIGNS.

STREET SIGN
NOT TO SCALE

C4

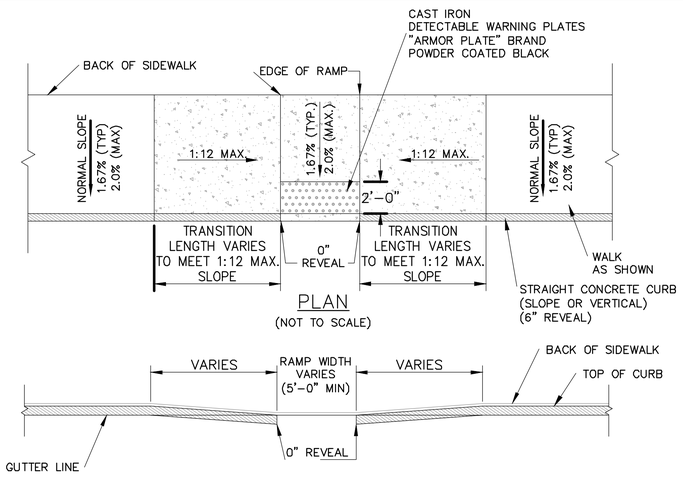
PARKING SPACE DETAIL
NOT TO SCALE



NOTES:

1.) PROVIDE TWO COATS OF PAINT ON ALL PARKING LINES.
2.) SEE PROPOSED SITE PLANS FOR LOCATION OF PARKING SPACES.
3.) PAINTED SPACES ONLY WHERE MARKED ON SITE PLAN

C5

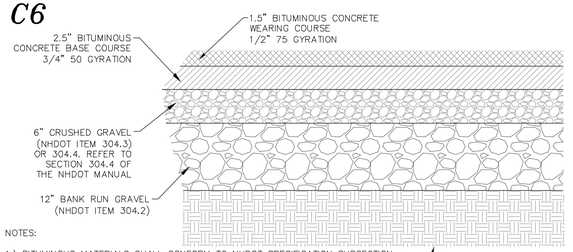


PLAN
(NOT TO SCALE)

ELEVATION

TYPICAL DETAIL FOR ACCESSIBLE RAMP
NOT TO SCALE

C6



NOTES:

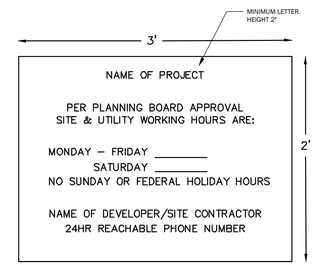
1.) BITUMINOUS MATERIALS SHALL CONFORM TO NHDOT SPECIFICATION SUBSECTION 401.3.6.

2.) PAVEMENT BASE COURSE AGGEGATE SHALL CONFORM TO NHDOT SPECIFICATION SECTION 304, ITEM 304.3 AND COMPACTED TO A MINIMUM OF 95% OF MODIFIED PROCTOR MAXIMUM DRY DENSITY.

3.) PAVEMENT SUBBASE COURSE AGGREGATE AND AGGREGATE FOR SUBGRADE REPAIR AREAS SHALL BE SUITABLE FOR USE AS STRUCTURAL FILL AND BE PROOFROLLED AND COMPABED TO 95% OF MODIFIED PROCTOR MAXIMUM DRY DENSITY. FOR NEW CONSTRUCTION AREAS ONLY. IN EXISTING PAVEMENT AREAS THE CONTRACTOR IS TO ENSURE THE BASE MATERIAL IS SUITABLE TO THE OWNER FOR RE-PAVING

BITUMINOUS CONCRETE PAVEMENT SECTION
NOT TO SCALE

C7

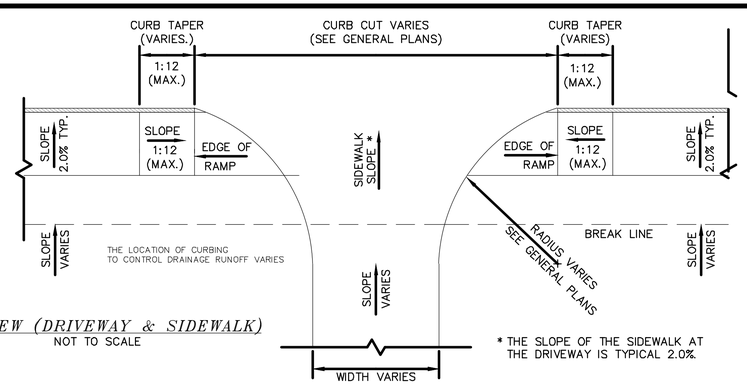


NOTES:

1. SIGN SHALL HAVE BLACK LETTERS ON A WHITE BACKGROUND
2. SIGN SHALL BE WEATHER RESISTANT AND SECURED TO THE GROUND
3. TO BE PLACED AT THE INTERSECTION OF TOLEND RD/THEODORE DR & SUN HAWK LANE/ATINA WAY

REQUIRED PROJECT INFORMATION SIGN
NOT TO SCALE

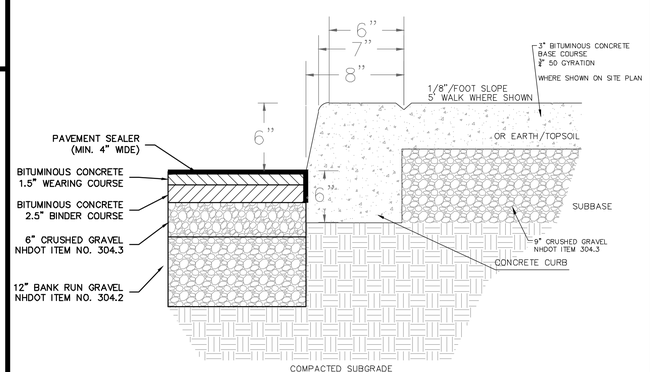
C8



PLAN VIEW (DRIVEWAY & SIDEWALK)
NOT TO SCALE

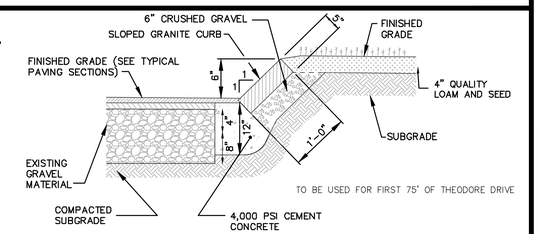
* THE SLOPE OF THE SIDEWALK AT THE DRIVEWAY IS TYPICAL 2.0%.

C9



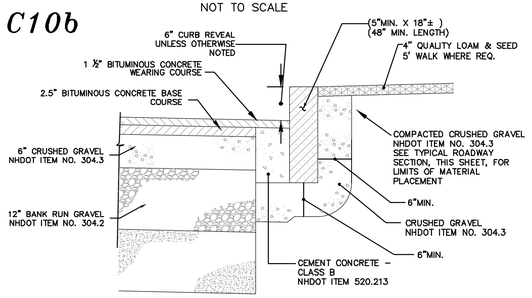
CAST-IN-PLACE (SLIPFORM) CONCRETE CURB
NOT TO SCALE

C10a



SLOPE GRANITE CURB DETAIL
NOT TO SCALE

C10b



VERTICAL GRANITE CURB DETAIL
NOT TO SCALE

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

SITE CONSTRUCTION DETAILS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

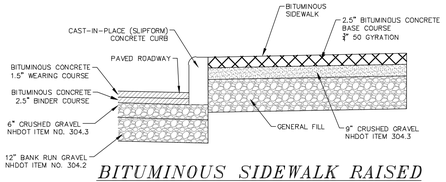
SCALE : AS NOTED
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14242
LICENSED PROFESSIONAL ENGINEER

C-101

NOT FOR CONSTRUCTION

C11

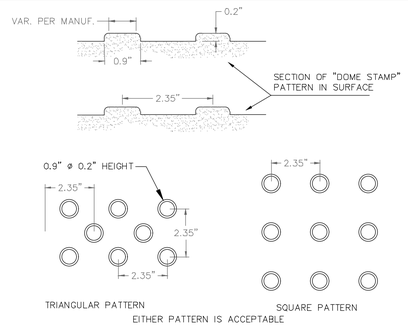


BITUMINOUS SIDEWALK RAISED

NOT TO SCALE

SEE C-101, DETAIL C8

C12



DETECTABLE WARNING SURFACE

NOT TO SCALE

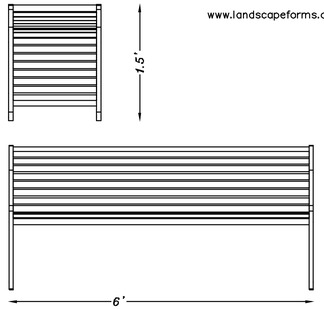
C13

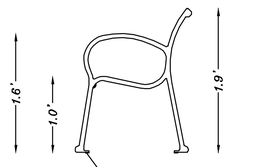
Scarborough Bench, 24" Backed, with Horizontal Strap Seat
Product Drawing

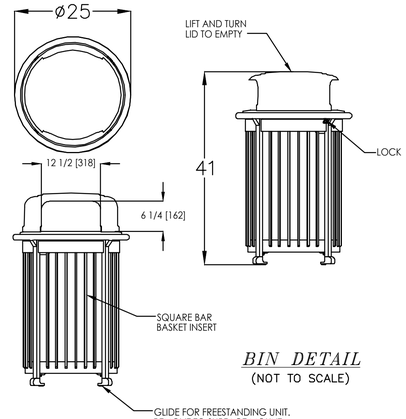
BENCH DETAIL
(NOT TO SCALE)

Scarborough Bench, 24" Backed, with Horizontal Strap Seat

www.landscapeforms.com Date: 5/19/2010 Ph: 800.521.2546







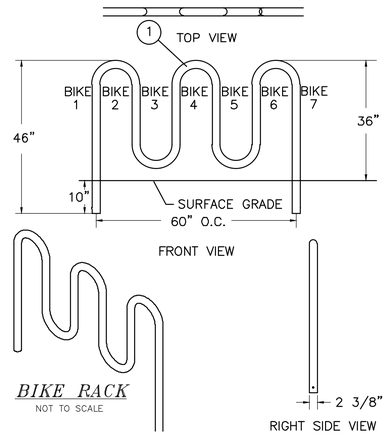
Scarborough Bench, 24" Backed, with Horizontal Strap Seat

BIN DETAIL
(NOT TO SCALE)

landscapeforms Drawing: SC173-02
Dimensions are in inches [mm]

C14

MATERIALS LIST
(1) TUBING, – ø 2 3/8" x .154" Wall Steel Tubing



BIKE RACK

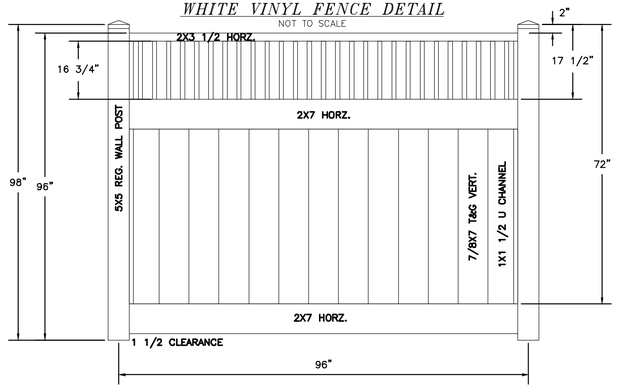
NOT TO SCALE

C15

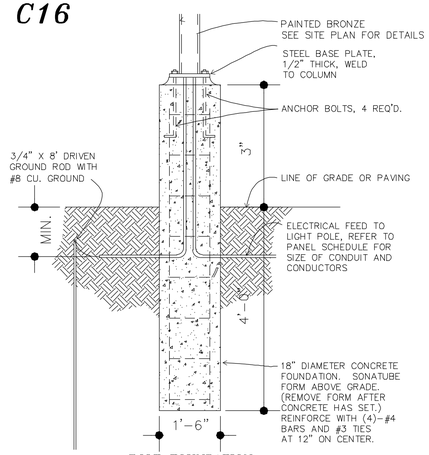
MONTAUK 72X96

WHITE VINYL FENCE DETAIL

NOT TO SCALE



C16



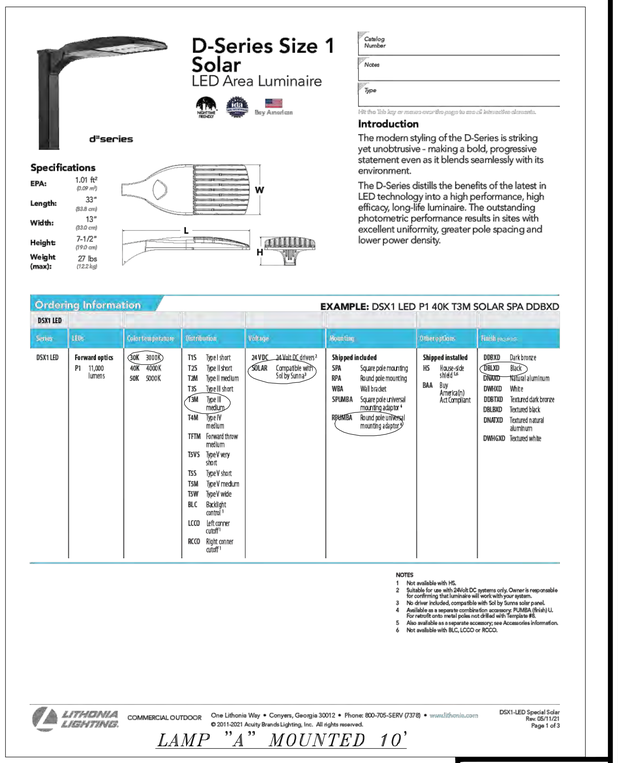
LIGHT BASE DETAIL

NOT TO SCALE



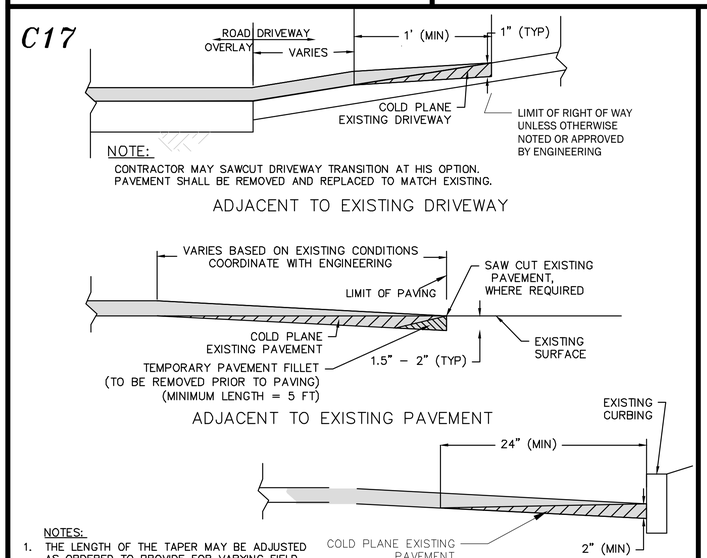
TYPICAL RESIDENTIAL LAMP "B"

NOT TO SCALE



LAMP "A" MOUNTED 10'

C17

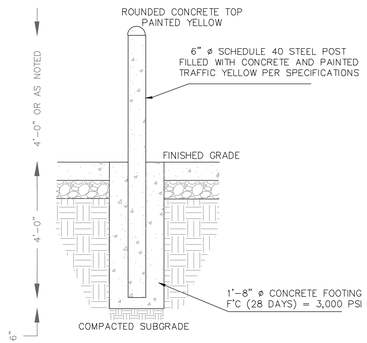


NOTES:
1. THE LENGTH OF THE TAPER MAY BE ADJUSTED AS ORDERED TO PROVIDE FOR VARYING FIELD CONDITIONS OR CHANGES IN SINGLE COURSE DEPTH.

PAVEMENT OVERLAY

NOT TO SCALE

C18



BOLLARD DETAIL

NOT TO SCALE

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

SITE CONSTRUCTION DETAILS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP 8, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 7971
LICENSED PROFESSIONAL ENGINEER

C-102

NOT FOR CONSTRUCTION

C19

See Redi-Rock.com for Detailed Section Drawings of Each Condition Shown in the Design Charts

NOTES:

1.) USE THE 41" BOTTOM BLOCK TO INSTALL THE FIRST COURSE. NOTE EMBEDMENT REQUIREMENT. COURSE DEPTH IS 1.5'

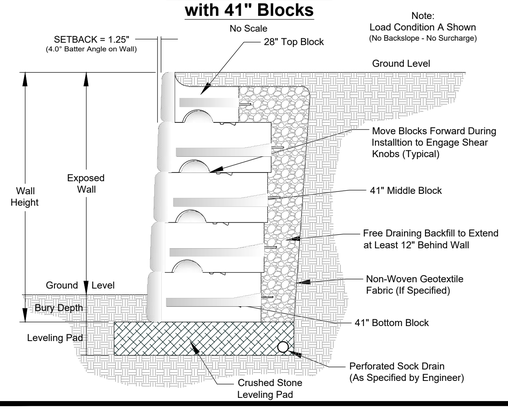
3.) USE 41" MIDDLE BLOCK FOR MIDDLE ROWS, APPROXIMATELY 7 COURSES DEPENDING ON WALL HEIGHT.

4.) USE 41" TOP BLOCK ALONG TOP OF WALL. NOTE WALL DROPS ARE TO BE FULL BLOCK DEPTHS.

5.) USE 41" HALF BLOCKS FOR RADIAL TURNS AND END SECTIONS.

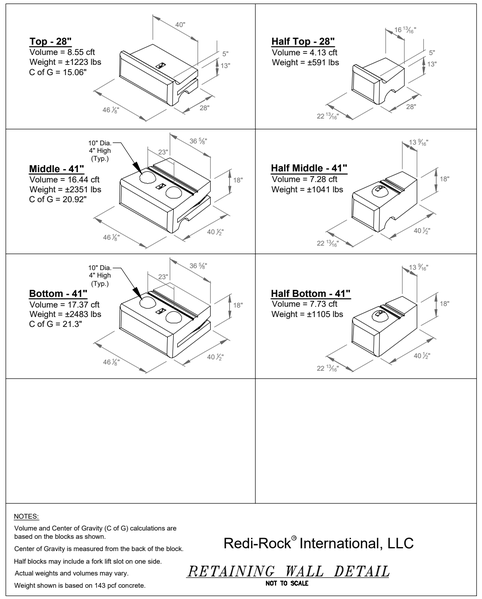
6.) THE WALL MANUFACTURER TYPICALLY PROVIDES WALL PROFILE AND BLOCK COUNT TO THE CONTRACTOR AS REQUIRED FOR CONSTRUCTION. THIS IS TO BE REVIEWED BY BOTH ENGINEERING AND DESIGN ENGINEER FOR CORRELATION WITH PROJECT SITE PLANS AND IS TO BE DESIGNED AND STAMPED BY A STRUCTURAL ENGINEER (OTHERS).

Typical Gravity Wall with 41" Blocks



Note:
Load Condition A Shown
(No Backslope - No Surcharge)

41" SERIES BLOCKS



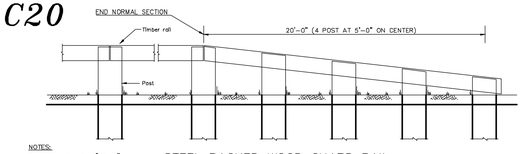
NOTES:
Volume and Center of Gravity (C of G) calculations are based on the blocks as shown.
Center of Gravity is measured from the back of the block.
Half blocks may include a fork lift slot on one side.
Actual weights and volumes may vary.
Weight shown is based on 143 pcf concrete.

Redi-Rock® International, LLC

RETAINING WALL DETAIL
NOT TO SCALE

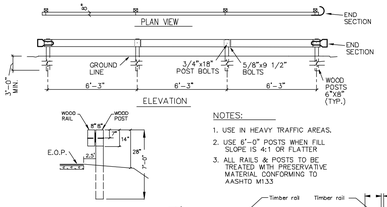
NOTE: RETAINING WALL TO BE DESIGNED BY A LICENSED PROFESSIONAL GEOTECHNICAL/STRUCTURAL ENGINEER.

C20

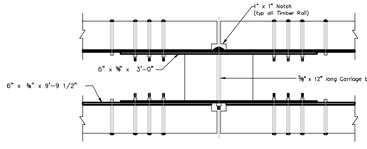


NOTES:
1. POST TYPE : 10" x 10" WOOD
2. BEAM TYPE : 6" x 10" WOOD
3. POST SPACING : 5'-0" O.C.
4. NOMINAL BARRIER HEIGHT : 27"

STEEL BACKED WOOD GUARD RAIL TERMINAL UNIT DETAIL



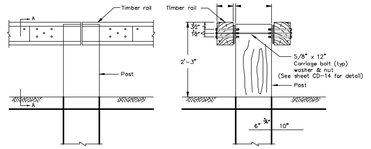
NOTES:
1. USE IN HEAVY TRAFFIC AREAS.
2. USE 6'-0" POSTS WHEN FILL SLOPE IS 4:1 OR FLATTER
3. ALL RAILS & POSTS TO BE TREATED WITH PRESERVATIVE MATERIAL CONFORMING TO AASHTO M133



POST/RAIL CONNECTION DETAIL

NOTES:
1. POST TYPE : 10" x 12" WOOD
2. BEAM TYPE : 6" x 10" WOOD WITH STEEL PLATE BACKING
3. POST SPACING : 10'-0" O.C.
4. NOMINAL BARRIER HEIGHT : 27"
5. STEEL PLATE BACKING AND SPLICE PLATE – A36 GALVANIZED STEEL
6. ALL BOLTS & WASHERS TO BE GALVANIZED

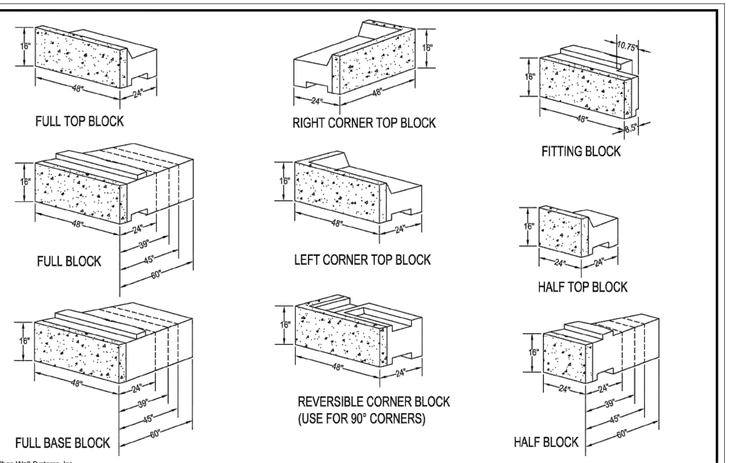
GUARD RAIL STEEL PLATE BACKED (WOODEN RAIL)
NOT TO SCALE



POST CONNECTION DETAIL

SECTION A–A

C21



Copyright 2009 Shea Wall Systems, Inc.

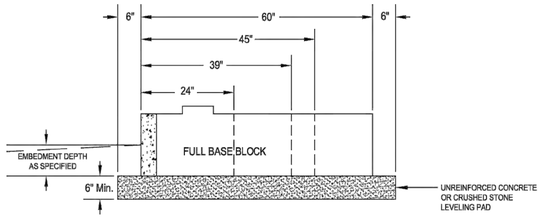
Design is for internal stability of the Shea wall structure only. External stability, including but not limited to foundation and slope stability is the responsibility of the Owner. The design is based on the assumption that the materials within the retained mass, methods of construction, and quality of materials conform to Shea's specification for this project.

Disclaimer: This drawing was prepared by Shea Wall Systems, Inc. and to the best of our knowledge, accurately represents the product use in the application that is illustrated. This drawing is for conceptual, instructional, and estimating purposes only. Anyone making use of this drawing does so at their own risk and assumes all liability for such use. Final design for construction purposes must be done by a registered professional engineer who is familiar with the product and who has taken into account the specific site conditions.

SHEA CONCRETE PRODUCTS
Retaining Wall Systems
DRAWING # 100

BLOCK TYPES

SHEA WALL SYSTEMS, INC
87 Haverhill Street
Amesbury,MA 01913
Phone: 800-696-7432
Phone: 978-388-1509
www.sheaconcrete.com



NOTES:
1. LEVELING PAD SHOULD BE AS SPECIFIED BY THE DESIGN ENGINEER IN THE PROJECT PLAN SET.
2. THE WIDTH OF THE LEVELING PAD MUST EXTEND 6" (MINIMUM) IN FRONT AND 6" (MINIMUM) IN BACK OF THE BASE BLOCK. AS A RESULT, THE TYPICAL WIDTH OF LEVELING PAD WOULD BE:
   24" DEEP BASE BLOCK...LEVELING PAD WIDTH IS 36"
   39" DEEP BASE BLOCK...LEVELING PAD WIDTH IS 51"
   45" DEEP BASE BLOCK...LEVELING PAD WIDTH IS 57"
   60" DEEP BASE BLOCK...LEVELING PAD WIDTH IS 72"
3. **WHEN SETTING THE BASE BLOCK AND CHECKING FOR LEVEL FROM FRONT TO BACK, IT IS RECOMMENDED THAT THE BACK EDGE OF THE BLOCK BE ABOUT 1/2" BELOW THE FRONT EDGE OF THE BLOCK.**
4. COMPACTION TO THE SPECIFIED EMBEDMENT DEPTH SHALL BE DONE IN FRONT OF THE BASE BLOCK **BEFORE** COMPACTION IS DONE BEHIND THE BASE BLOCK. THIS REDUCES THE CHANCE THAT COMPACTION BEHIND THE BASE BLOCK WILL ROLL THE BASE BLOCK FORWARD.
5. SEE BLOCK SPECIFICATION & INSTALLATION INSTRUCTIONS FOR MORE DETAILS.

Copyright 2009 Shea Wall Systems, Inc.

Design is for internal stability of the Shea wall structure only. External stability, including but not limited to foundation and slope stability is the responsibility of the Owner. The design is based on the assumption that the materials within the retained mass, methods of construction, and quality of materials conform to Shea's specification for this project.

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SHEA CONCRETE PRODUCTS
Retaining Wall Systems
DRAWING # 101

TYPICAL BASE BLOCK PLACEMENT

SHEA WALL SYSTEMS, INC
87 Haverhill Street
Amesbury,MA 01913
Phone: 800-696-7432
Phone: 978-388-1509
www.sheaconcrete.com

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

SITE CONSTRUCTION DETAILS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP 8, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE – KENNETH A. BERRY No. 15478 LICENSED PROFESSIONAL ENGINEER

C–103

NOT FOR CONSTRUCTION

CROSS SECTION NOTES

1. ALL ROADWAY FILL TO BRING ROAD TO SUBGRADE SHALL BE INSTALLED IN LIFTS NO GREATER THAN 12".

2. ALL FILL SHALL BE COMPACTED TO 95% MINIMUM. COMPACTION TESTS TO BE CONDUCTED AT THE START OF THE PROJECT AND NO FURTHER THAN 100 FEET APART.

3. GUARD RAIL REQUIRED AS NOTED ON PLAN & PROFILE SHEETS.

4. TEST PITTING WAS DONE WITHIN THE ROADWAY ALIGNMENT BY JOHN P. HAYES III. IN SOME LOCATIONS, UNSUITABLE MATERIALS WERE ENCOUNTERED IN THOSE TEST PITS. UNSUITABLE MATERIALS TO BE REMOVED DURING CONSTRUCTION (LEDGE).

COMPACTED SUBGRADE – CONTRACTOR SHALL SCARIFY SUBGRADE TO A DEPTH OF 30 INCHES BELOW F-GRADE. ALL STONES GREATER THAN 6" IN DIAMETER SHALL BE REMOVED FROM THE SCARIFIED LAYER. ANY IMPORTED FILL SHALL BE FREE OF ORGANICS AND FROST AND SHALL HAVE NO ROCKS LARGER THAN 6" IN DIAMETER. FILL MATERIAL SHALL BE APPROVED BY THE DESIGN ENGINEER.

C23

REQUIRED BLASTING AND EXCAVATION NOTES:

BEST MANAGEMENT PRACTICES FOR BLASTING. ALL ACTIVITIES RELATED TO BLASTING SHALL FOLLOW BEST MANAGEMENT PRACTICES (BMPS) TO PREVENT CONTAMINATION OF GROUNDWATER INCLUDING PREPARING, REVIEWING AND FOLLOWING AN APPROVED BLASTING PLAN; PROPER DRILLING, EXPLOSIVE HANDING AND LOADING PROCEDURES; OBSERVING THE ENTIRE BLASTING PROCEDURES; EVALUATING BLASTING PERFORMANCE; AND HANDLING AND STORAGE OF BLASTED ROCK.

(1) LOADING PRACTICES. THE FOLLOWING BLASTHOLE LOADING PRACTICES TO MINIMIZE ENVIRONMENTAL EFFECTS SHALL BE FOLLOWED:

(a) DRILLING LOGS SHALL BE MAINTAINED BY THE DRILLER AND COMMUNICATED DIRECTLY TO THE BLASTER. THE LOGS SHALL INDICATE DEPTHS AND LENGTHS OF VOIDS, CAVITIES, AND FAULT ZONES OR OTHER WEAK ZONES ENCOUNTERED AS WELL AS GROUNDWATER CONDITIONS.

(b) EXPLOSIVE PRODUCTS SHALL BE MANAGED ON SITE SO THAT THEY ARE EITHER USED IN THE BOREHOLE, RETURNED TO THE DELIVERY VEHICLE, OR PLACED IN SECURE CONTAINERS FOR OFFSITE DISPOSAL.

(c) SPILLAGE AROUND THE BOREHOLE SHALL EITHER BE PLACED IN THE BOREHOLE OR CLEANED UP AND RETURNED TO AN APPROPRIATE VEHICLE FOR HANDLING OR PLACEMENT IN SECURED CONTAINERS FOR OFF SITE DISPOSAL.

(d) LOADED EXPLOSIVES SHALL BE DETONATED AS SOON AS POSSIBLE AND SHALL NOT BE LEFT IN THE BLASTHOLES OVERNIGHT, UNLESS WEATHER OR OTHER SAFETY CONCERNS REASONABLY DICTATE THAT DETONATION SHOULD BE POSTPONED.

(e) LOADING EQUIPMENT SHALL BE CLEANED IN AN AREA WHERE WASTEWATER CAN BE PROPERLY CONTAINED AND HANDLED IN A MANNER THAT PREVENTS RELEASE OF CONTAMINANTS TO THE ENVIRONMENT.

(f) EXPLOSIVES SHALL BE LOADED TO MAINTAIN GOOD CONTINUITY IN THE COLUMN LOAD TO PROMOTE COMPLETE DETONATION. INDUSTRY ACCEPTED LOADING PRACTICES FOR PRIMING, STEMMING, DECKING AND COLUMN RISE NEED TO BE ATTENDED TO.

(2) EXPLOSIVE SELECTION. THE FOLLOWING BMPS SHALL BE FOLLOWED TO REDUCE THE POTENTIAL FOR GROUNDWATER CONTAMINATION WHEN EXPLOSIVES ARE USED:

(a) EXPLOSIVE PRODUCTS SHALL BE SELECTED THAT ARE APPROPRIATE FOR SITE CONDITIONS AND SAFE BLAST EXECUTION.

(b) EXPLOSIVE PRODUCTS SHALL BE SELECTED THAT HAVE THE APPROPRIATE WATER RESISTANCE FOR THE SITE CONDITIONS PRESENT TO MINIMIZE THE POTENTIAL FOR HAZARDOUS EFFECT OF THE PRODUCT UPON GROUNDWATER.

(3) PREVENTION OF MISFIRES: APPROPRIATE PRACTICES SHALL BE DEVELOPED AND IMPLEMENTED TO PREVENT MISFIRES.

(4) MUCK PILE MANAGEMENT. MUCK PILES (THE BLASTED PIECES OF ROCK) AND ROCK PILES SHALL BE MANAGED IN A MANNER TO REDUCE THE POTENTIAL FOR CONTAMINATION BY IMPLEMENTING THE FOLLOWING MEASURES:

(a) REMOVE THE MUCK PILE FROM THE BLAST AREA AS SOON AS REASONABLY POSSIBLE.

(b) MANAGE THE INTERACTION OF BLASTED ROCK PILES AND STORMWATER TO PREVENT CONTAMINATION OF WATER SUPPLY WELLS OR SURFACE WATER.

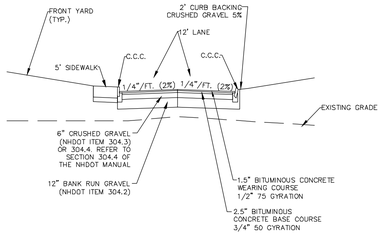
(5) SPILL PREVENTION MEASURES AND SPILL MITIGATION. SPILL PREVENTION AND SPILL MITIGATION MEASURES SHALL BE IMPLEMENTED TO PREVENT THE RELEASE OF FUEL AND OTHER RELATED SUBSTANCES TO THE ENVIRONMENT. THE MEASURES SHALL INCLUDE AT A MINIMUM:

(a) THE FUEL STORAGE REQUIREMENTS SHALL INCLUDE:
1. STORAGE OF REGULATED SUBSTANCES ON AN IMPERVIOUS SURFACE.
2. SECURE STORAGE AREAS AGAINST UNAUTHORIZED ENTRY.
3. LABEL REGULATED CONTAINERS CLEARLY AND VISIBLY.
4. INSPECT STORAGE AREAS WEEKLY.
5. COVER REGULATED CONTAINERS IN OUTSIDE STORAGE AREAS.
6. WHEREVER POSSIBLE, KEEP REGULATED CONTAINERS THAT ARE STORED OUTSIDE MORE THAN 50 FEET FROM SURFACE WATER AND STORM DRAINS, 75 FEET FROM PRIVATE WELLS, AND 400 FEET FROM PUBLIC WELLS.
7. SECONDARY CONTAINMENT IS REQUIRED FOR CONTAINERS CONTAINING REGULATED SUBSTANCES STORED OUTSIDE, EXCEPT FOR ON PREMISE USE HEATING FUEL TANKS, OR ABOVEGROUND OR UNDERGROUND STORAGE TANKS OTHERWISE REGULATED.

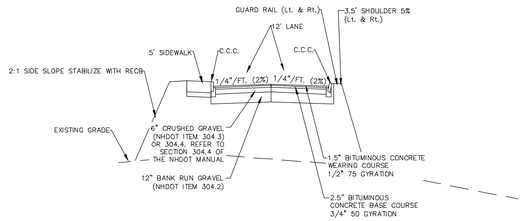
(a) THE FUEL HANDLING REQUIREMENTS SHALL INCLUDE:
1. EXCEPT WHEN IN USE, KEEP CONTAINERS CONTAINING REGULATED SUBSTANCES CLOSED AND SEALED.
2. PLACE DRIP PANS UNDER SPIGOTS, VALVES, AND PUMPS.
3. HAVE SPILL CONTROL AND CONTAINMENT EQUIPMENT READILY AVAILABLE IN ALL WORK AREAS.
4. USE FUNNELS AND DRIP PANS WHEN TRANSFERRING REGULATED SUBSTANCES.
5. PERFORM TRANSFERS OF REGULATED SUBSTANCES OVER AN IMPERVIOUS SURFACE.

(a) THE TRAINING OF ON-SITE EMPLOYEES AND THE ON-SITE POSTING OF RELEASE RESPONSE INFORMATION DESCRIBING WHAT TO DO IN THE EVENT OF A SPILL OF REGULATED SUBSTANCES.

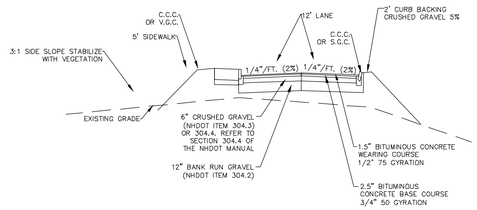
(b) FUELING AND MAINTENANCE OF EXCAVATION, EARTHMOVING AND OTHER CONSTRUCTION RELATED EQUIPMENT WILL COMPLY WITH THE REGULATIONS OF NHDES [NOTE THESE REQUIREMENTS ARE SUMMARIZED IN WD-DWGB-22-6: "BEST MANAGEMENT PRACTICES FOR FUELING AND MAINTENANCE OF EXCAVATION AND EARTHMOVING EQUIPMENT"OR ITS SUCCESSOR DOCUMENT.



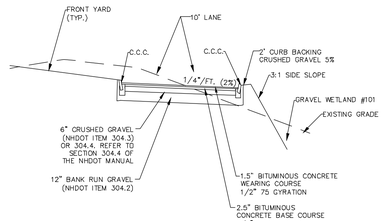
TYPICAL ROADWAY SECTION THEODORE DRIVE
4+00–END
(NOT TO SCALE)



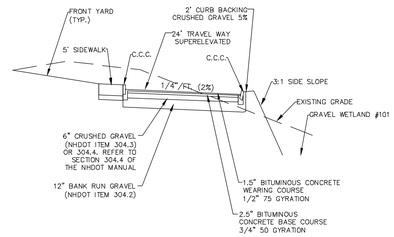
TYPICAL ROADWAY SECTION THEODORE DRIVE
1+50–4+00
(NOT TO SCALE)



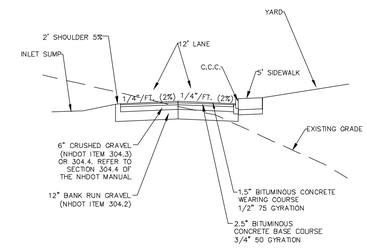
TYPICAL ROADWAY SECTION THEODORE DRIVE
0+00–1+50
(NOT TO SCALE)



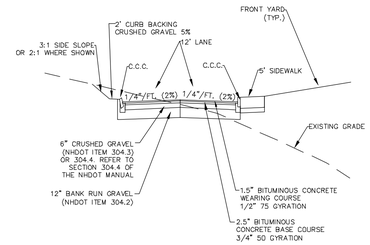
TYPICAL ROADWAY SECTION SUN HAWK LANE
101+00–102+25
(NOT TO SCALE)



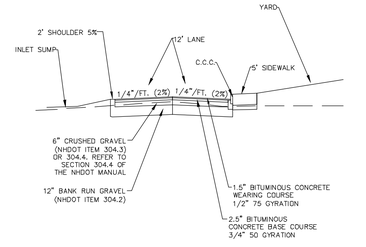
TYPICAL ROADWAY SECTION SUN HAWK LANE
30+00–31+00
(NOT TO SCALE)



TYPICAL ROADWAY SECTION AMELIA DRIVE
13+40.94–16+53
(NOT TO SCALE)



TYPICAL ROADWAY SECTION AMELIA DRIVE
10+00–13+40.94
(NOT TO SCALE)



TYPICAL ROADWAY SECTION LIAM DRIVE
20+00–22+95.44
(NOT TO SCALE)

C22

C-104

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

CONSTRUCTION DETAILS TYPICAL ROADWAY CROSS SECTIONS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

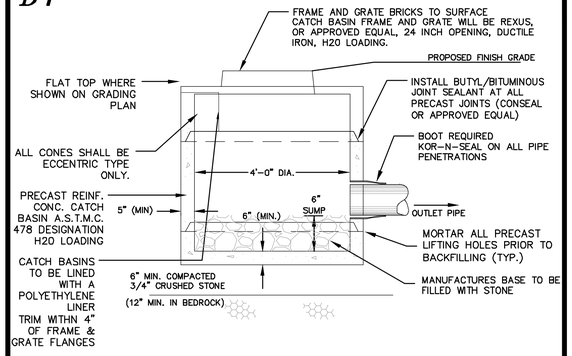
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14243
LICENSED PROFESSIONAL ENGINEER

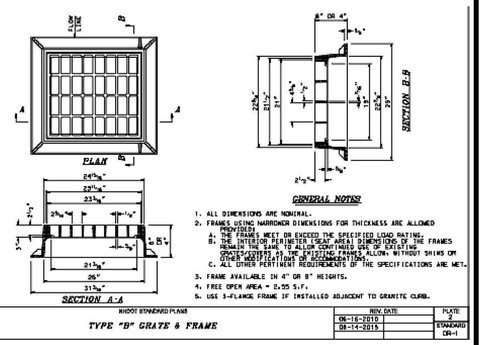
NOT FOR CONSTRUCTION

D1



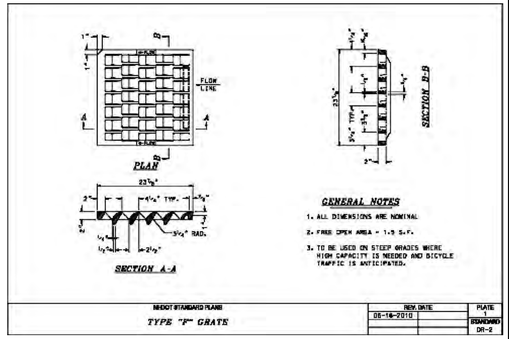
CATCH BASIN DETAIL
NOT TO SCALE

D2



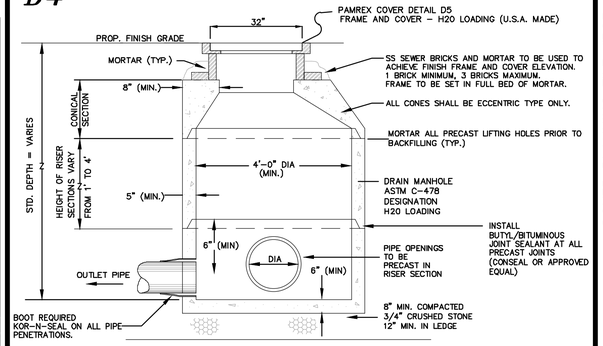
CATCH BASIN GRATE (TYPE "B")
NOT TO SCALE

D3



CATCH BASIN GRATE (TYPE "F")
NOT TO SCALE

D4



PRECAST DRAIN MANHOLE DETAIL
NOT TO SCALE

D5

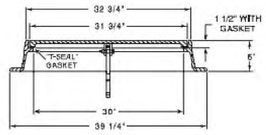
R-1743-LM
LiftMate Frame, Solid Gasketed Lid

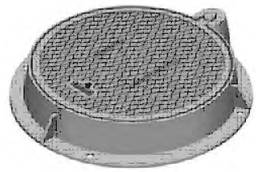
Heavy Duty

Furnished with four 1" anchor holes on 36-7/8" diameter bolt circle.

Hinge plug available for self-seal application.

See p. 13 for LiftMate information.

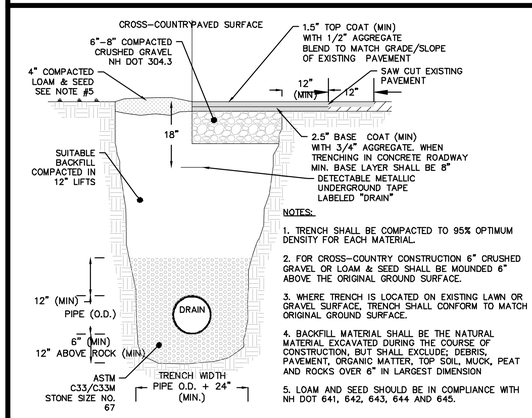




DRAIN MANHOLE FRAME AND GRATE WILL BE LIFTMATE R-1743-LM, OR APPROVED EQUAL, 32 INCH OPENING, CAST IRON, H20 LOADING.

DRAIN MANHOLE COVER DETAIL
NOT TO SCALE

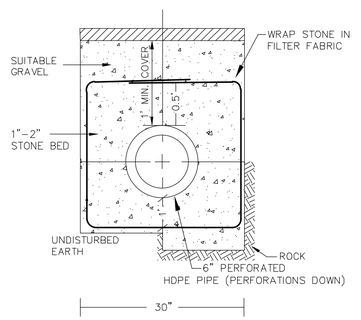
D6



NOTES:
1. TRENCH SHALL BE COMPACTED TO 95% OPTIMUM DENSITY FOR EACH MATERIAL.
2. FOR CROSS-COUNTRY CONSTRUCTION 6" CRUSHED GRAVEL OR LOAM & SEED SHALL BE MOUNDED 6" ABOVE THE ORIGINAL GROUND SURFACE.
3. WHERE TRENCH IS LOCATED ON EXISTING LAWN OR GRAVEL SURFACE, TRENCH SHALL CONFORM TO MATCH ORIGINAL GROUND SURFACE.
4. BACKFILL MATERIAL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE; DEBRIS, PAVEMENT, ORGANIC MATTER, TOP SOIL, MUCK, PEAT AND ROCKS OVER 6" IN LARGEST DIMENSION
5. LOAM AND SEED SHOULD BE IN COMPLIANCE WITH NH DOT 641, 642, 643, 644 AND 645.

TYPICAL DRAIN PIPE TRENCH
NOT TO SCALE

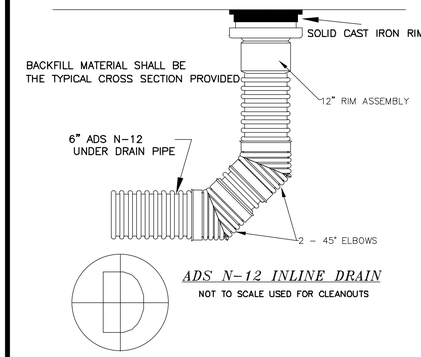
D7



NOTE:
1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS.

UNDERDRAIN TRENCH DETAIL
NOT TO SCALE

D8



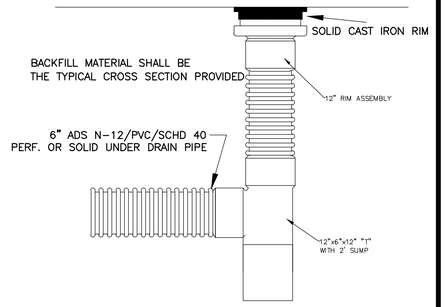
ADS N-12 INLINE DRAIN
NOT TO SCALE USED FOR CLEANOUTS

12" CAST IRON GRATE
NOT TO SCALE

CASTINGS ARE RATED FOR H20 WHEEL LOAD TRAFFIC

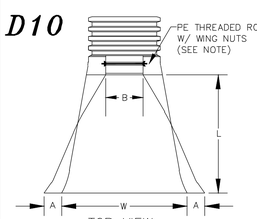
PAINT: CASTINGS ARE FURNISHED WITH A BLACK PAINT

D9

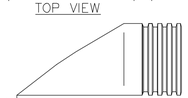


ADS N-12, PVC, SCHD. 40 INLINE DRAIN
NOT TO SCALE USED FOR GRAVEL WETLAND CLEANOUTS

D10



TOP VIEW

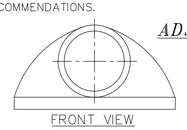


RIGHT SIDE VIEW

NOTE: FLARED END SECTION IS REQUIRED TO BE ANCHORED TO PREVENT FLOTATION.

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

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

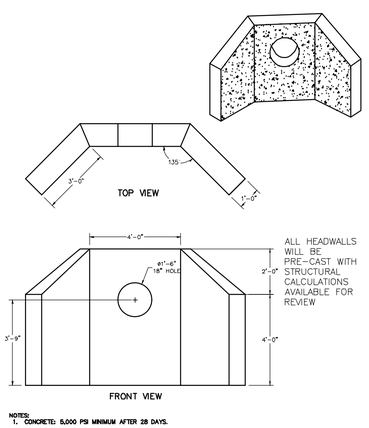


FRONT VIEW

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

D11

HEADWALL (CONCRETE)
NOT TO SCALE



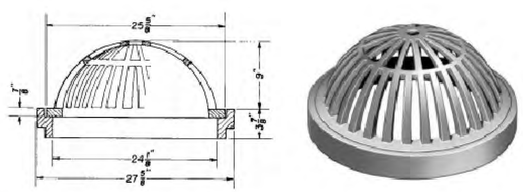
NOTES:
1. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS.

D12

R-4353
Beehive Grate, Frame

Light Duty

CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET
R-4353	Beehive	1.8	6.7



Also available with 2 - 7/8" tall frame, if requested.

CATCH BASIN IN GRASSED AREA FRAME & GRATE DETAIL
NOT TO SCALE

REFERENCE IS MADE TO A LONG TERM MAINTENANCE MANUAL PREPARED BY BERRY SURVEYING & ENGINEERING, WHICH IS ON FILE AT THE CITY OF DOVER PLANNING DEPARTMENT, AND CAN BE FOUND AT THE OFFICE OF BERRY SURVEYING & ENGINEERING. (603) 332-2863

D-101

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

DRAINAGE CONSTRUCTION DETAILS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 11743
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

D13

CONE GRATE
NOT TO SCALE

NOTE:
MUST BE HAALA INDUSTRIES INC.
OR EQUAL.

Cone Grates Top Mount



CG12TM
Part No. CG12TM

Save Trees

Top Mount Cone Grates are designed to mount on the top of round manhole inlet or outlet structures to keep debris from entering the storm water system. Top mount cone grates are easy to install and allow for at grade manhole installations but can be used in a variety of applications. Grates 96" and larger are made as a two piece, bolt together design.

- Plate and bar hybrid design is both clean and cost effective
- Made from 1/2" plate with 3/4" or 1" round bars depending on grate size
- Anti vortex plate can be added upon request
- Hinged and lockable access doors can be added upon request
- Galvanized steel construction. Can be made from aluminum or stainless steel.

D14

ANGLE GRATE
NOT TO SCALE

NOTE:
MUST BE HAALA INDUSTRIES INC.
OR EQUAL.

Angle Grates For Manholes



AG0808-58
Part No. AG0808-58

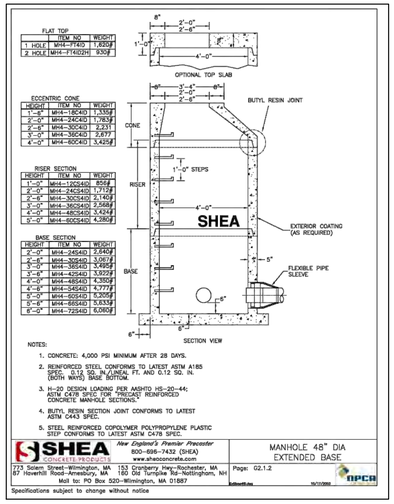
Save Trees

Angle Grates are designed to cover inlet orifices and prevent small to medium debris from passing through. The top angled design helps to minimize the amount of debris that settles on top after the water receeds. All grates are made from plate for a clean and smooth contact surface.

- Plate design for a clean appearance
- Standard 2" openings (other sizes can be made)
- Angled top/front plate to maximize debris deflection
- Mounting flanges on 3 sides allows grate to be mounted at floor level inverts
- Galvanized steel construction. Can be made from aluminum or stainless steel.

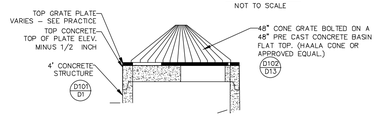
D15

48" MANHOLE ROUND EXTENDED BASE
NOT TO SCALE

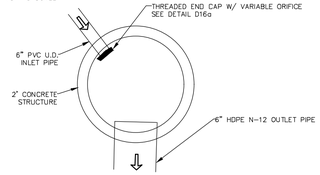


D16

4' OUTLET STRUCTURE TOP VIEW
NOT TO SCALE

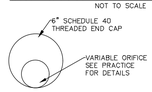


2' OUTLET STRUCTURE INTERNAL VIEW
NOT TO SCALE

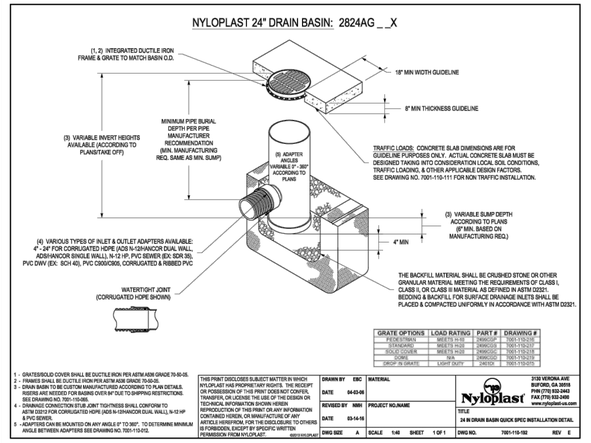


D16a

CAP WITH CONTROL ORIFICE
NOT TO SCALE

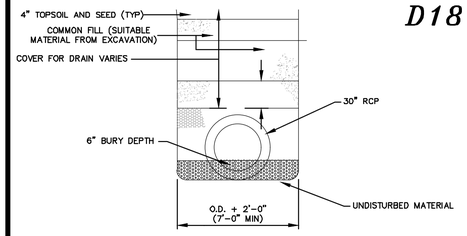


D17



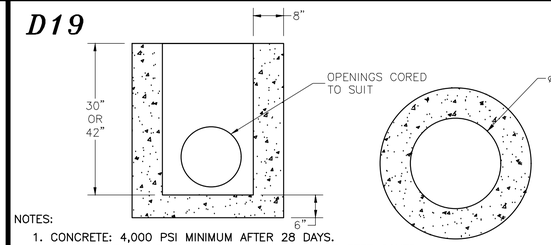
24" NYLOPLAST DRAIN BASIN
NOT TO SCALE

D18



WETLAND CROSSING #1 CULVERT DETAIL
NOT TO SCALE

D19

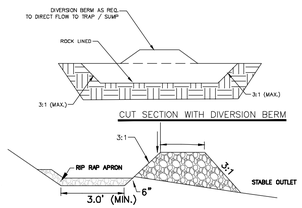


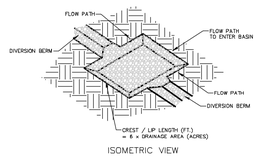
NOTES:
1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. DESIGNED FOR AASHTO HS-20 LOADING, 1 TO 5 FEET COVER.

2' DIA OUTLET GRAVEL WETLAND OUTLET STRUCTURE
NOT TO SCALE

D20

1. TRAP TO BE INSTALLED AS CLOSE TO THE DISTURBED AREA OR SOURCE OF SEDIMENT AS POSSIBLE.
2. THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE TRAP SHALL BE LESS THAN 5 ACRES.
3. THE MINIMUM VOLUME OF THE TRAP SHALL BE 3,600 CUBIC FEET OF STORAGE FOR EACH ACRE OF DRAINAGE AREA.
4. THE SIDE SLOPES OF THE TRAP SHALL BE 3:1 OR FLATTER AND SHALL BE STABILIZED IMMEDIATELY AFTER THEIR CONSTRUCTION.
5. THE OUTLET OF THE TRAP SHALL BE A MINIMUM OF ONE FOOT BELOW THE CREST OF THE TRAP AND SHALL DISCHARGE TO A STABILIZED AREA.
6. THE TRAP SHALL BE CLEANED WHEN 50 PERCENT OF THE ORIGINAL VOLUME IS FILLED.
7. THE MATERIALS REMOVED FROM THE TRAP SHALL BE PROPERLY DISPOSED OF AND STABILIZED.

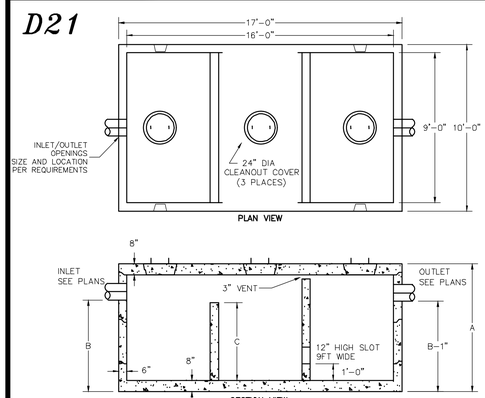




SIEVE DESIGNATION	SIZE OF STONE (INCHES)
100%	12
84–100%	6
68–83%	3
42–55%	1
8–12%	NO. 4

STONE LINED SEDIMENT TRAP
NOT TO SCALE

D21



NOTES:
1. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS.
2. DESIGNED FOR AASHTO HS-20 LOADING, COVER 1 TO 5 FEET.
3. TONGUE AND GROOVE JOINT SEALED WITH BUTYL RESIN. INLET HEIGHT MAY INCREASE SLIGHTLY DUE TO THE BUTYL RESIN USED.

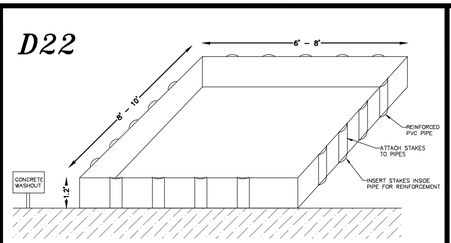
CUSTOM INLET/OUTLET 7,500 GALLON WQI (4)

GALLONS	A (HEIGHT)	B (INLET)	C (BAFFLE)	WEIGHT (LBS)
5,000	92"	66"	56"	58,180
7,500	118"	92"	82"	66,510
10,000	146"	120"	110"	75,500

*OTHER SIZES AVAILABLE

WATER QUALITY INLET TANK
NOT TO SCALE

D22



NOTES:

1.) CONCRETE WASHOUT SHALL BE INSTALLED PRIOR TO ANY CONCRETE POURS.

2.) SIGNS SHALL BE INSTILLED TO CLEARLY INDICATE WHERE THE LOCATION OF THE WASHOUT AREA IS.

3.) CONTRACTOR IS IRRESPONSIBLE TO MAINTAIN AND REPLACE WASHOUT AREA AS NEEDED.

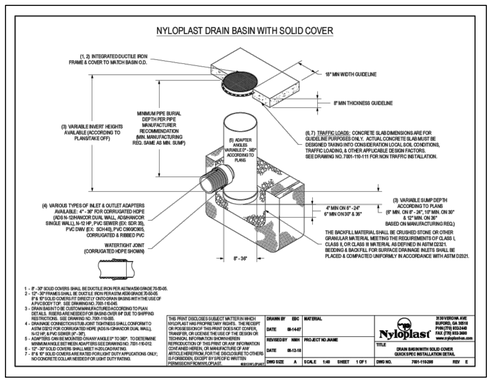
4.) RESIDUE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.

5.) DO NOT WASH CONCRETE TRUCKS OUT INTO DRAINAGE AREAS, SWALES, STREETS OR UNDISTURBED AREAS.

6.) WASHOUT AREA SHALL BE PLACED AWAY FROM DRAINAGE FEATURES AND OUTSIDE AND WETLAND BUFFERS.

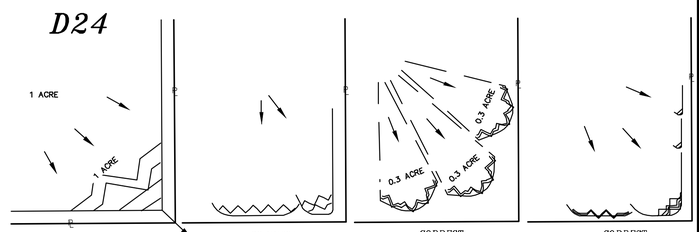
CONCRETE WASHOUT
NOT TO SCALE

D23



NYLOPLAST SOLID COVER
NOT TO SCALE

D24



PERIMETER CONTROL
NOT TO SCALE

DESIGN CONSIDERATIONS:

1. THE MAXIMUM LENGTH OF SLOPE ABOVE PERIMETER CONTROL IS 100 FEET.
2. SILT FENCE OR SILT SOXX REQUIRED WHEN UPGRADIENT DISTURBED SOIL IS GREATER THAN 5% (50% SLOPE MAX). MULCH BERM CAN BE USED WHEN THE UPGRADIENT DISTURBED SOIL IS 5% OR LESS.
3. THE MAXIMUM CONTRIBUTING DRAINAGE AREA OF ONE-QUARTER ACRE PER 100-FEET OF PRACTICE LENGTH.
4. PERIMETER CONTROL IS TO BE INSTALLED PRIOR TO EARTH MOVING ACTIVITIES, INCLUDING GRUBBING AND CLEARING.

NOTES

1. DO NOT LAYOUT PERIMETER CONTROL ALONG SLOPING PROPERTY PERIMETER WITHOUT INSTALLING "J HOOKS" AT HIGH CONCENTRATION AREAS. RUNOFF WILL CONCENTRATE AND CAUSE FAILURES ALONG THE PERIMETER.
2. "J HOOKS" CAN BE USED TO HELP LIMIT THE CONCENTRATION OF RUNOFF AND PROVIDE MORE STABILITY TO THE PERIMETER.
3. SILT FENCE AND EROSION CONTROL MULCH BERM MAY BE USED INTERCHANGEABLY. IN SPECIFIED AREA, SILT FENCE MAY NOT BE SUBSTITUTED FOR FILTREXX SILT SOXX OR APPROVED ALTERNATIVE.
4. SEE HAMPSHIRE STORM WATER MANUAL: VOLUME 3, PAGE 99 FOR FURTHER DETAILS AND SPECIFICATIONS

D-102

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

CONSTRUCTION DETAILS
DRAINAGE CONSTRUCTION DETAILS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14245
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

U1

NOTES ON MANHOLE AND SEWER CONSTRUCTION:

1) IT IS THE INTENTION THAT THE MANHOLE, INCLUDING ALL COMPONENT PARTS, HAVE ADEQUATE SPACE, STRENGTH AND LEAKPROOF QUALITIES CONSIDERED NECESSARY FOR THE INTENDED SERVICE. SPACE REQUIREMENTS AND CONFIGURATIONS, SHALL BE AS SHOWN ON THE DRAWING. MANHOLES SHALL BE AN ASSEMBLY OF PRECAST SECTIONS, WITH STEEL REINFORCEMENT AND ADEQUATE JOINTING. THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND HS-20-44 LOADING, INCLUDING THE COVER. ALL SMH CONSTRUCTION AND MATERIALS WILL BE IAW ENV.-WQ 704.13 ADOPTED OCTOBER 15, 2014

2) BARRELS AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE. (IAW ENV.-WQ 704.12 (d))

3) SEWER MANHOLE DIAMETER SHALL BE AS INDICATED ON THE PLANS.

4) PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C478.

5) GRAVITY SEWER PIPE TESTING WILL BE IN ACCORDANCE WITH ENV.-WQ 704.06 AND MAN HOLE TESTING IAW ENV.-WQ 704.17 DATED OCTOBER 15, 2014.

6) INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF THE PIPE AND FLOW. INVERT BRICKS SHALL BE LAID ON EDGE AND THE BASE SECTION SHALL BE FULL. AT CHANGES IN DIRECTIONS, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. CARE SHALL BE TAKEN TO ENSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY. (IAW ENV.-WQ 704.13 (a) (9)), MORTAR SHALL CONFORM WITH REQUIREMENTS OF IAW ENV.-WQ 704.13 (c).

7) FRAMES AND COVERS: MANHOLES FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. 3-INCH (MINIMUM HEIGHT) LETTERS WITH THE WORD "SEWER" SHALL BE PLAINLY CAST INTO THE CENTER OF EACH MANHOLE COVER. (IAW ENV.-WQ 704.13 (a) (4-6)) SEWER MAN HOLE COVERS ARE TO PAMREX.

8) SHALLOW MANHOLE: IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED HAVING AN ECCENTRIC ENTRANCE OPENING AND CAPABLE OF SUPPORTING H-20 LOADS.

9) HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF A TYPE APPROVED BY THE DOVER DPW, WHICH TYPE SHALL, IN GENERAL, DEPEND FOR WATERTIGHTNESS UPON A DOUBLE ROW OF AN OVERLAPPING TYPE ELASTOMERIC OR MASTIC-LIKE GASKET. APPROVED ELASTOMERIC SEALANTS ARE: RAM-NEK, KENT SEAL NO. 2, EZ, OR EQUAL.

10) IN CROSS COUNTRY AREAS OUTSIDE OF THE PAVED ROADWAY SURFACE, THE MANHOLE FRAME ELEVATION SHALL BE A MINIMUM OF 6" ABOVE FINISHED GRADE. GRADE TO PROVIDE POSITIVE DRAINAGE AWAY FROM THE MANHOLE. SEE TYPICAL TRENCH DETAIL ON SHEET D-102.

11.) ALL FRAMES AND GRATES ARE TO BE U.S.A. MADE. MANHOLE STEPS ARE REQUIRED IN THIS MUNICIPALITY AND MUST CONFORM TO THE REQUIREMENTS OF ENV-WQ 704.14.

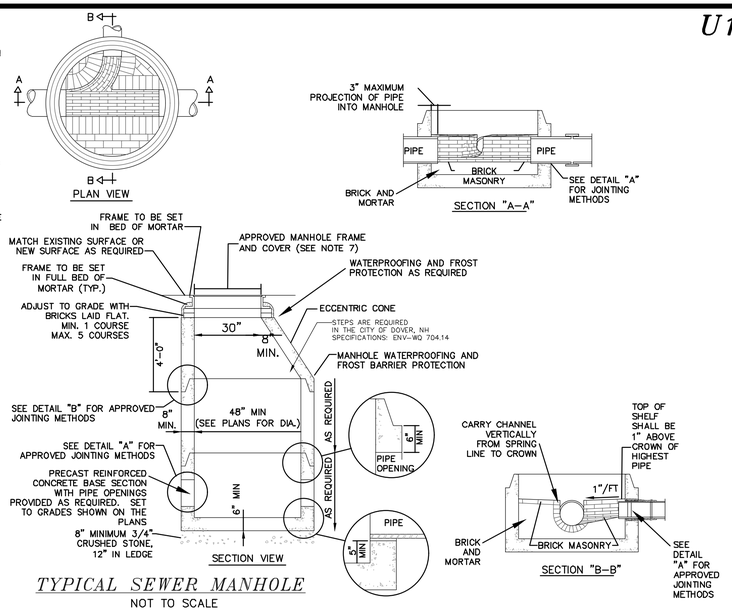
12.) THE CONTRACTOR TO WORK WITH CITY OF DOVER REVIEW ENGINEER AND SEWER DEPARTMENT ON THE MEANS AND METHODS USED TO INSTALL ALL SEWER STRUCTURES.

13.) ANY WORK INVOLVING THE CUTTING INTO THE EXISTING A.C. PIPE SHALL MEET THE REQUIREMENTS OF ENV-A 1800.

14.) THE "CITY OF DOVER, NEW HAMPSHIRE, DEPARTMENT OF COMMUNITY SERVICES, CONSTRUCTION GUIDELINES, PERMITS, RULES, AND REGULATIONS" (DATED MARCH 13, 2018) ARE A PART OF THE CONSTRUCTION DETAILS AND TO BE FOLLOWED.

15.) MANHOLES SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST IN ACCORDANCE WITH THE ASTM C1244 STANDARD AND ENV-WQ 704.17.

16.) ALL FRAMES AND GRATES ARE TO BE U.S.A. MADE. MANHOLE STEPS ARE REQUIRED IN THIS MUNICIPALITY AND MUST CONFORM TO THE REQUIREMENTS OF ENV-WQ 704.14.



TYPICAL SEWER MANHOLE
NOT TO SCALE

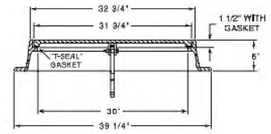
U2

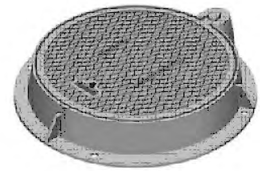
R-1743-LM
LiftMate Frame, Solid Gasketed Lid
Heavy Duty

Furnished with four 1" anchor holes on 36-7/8" diameter bolt circle.

Hinge plug available for self-seal application.

See p. 13 for LiftMate information.

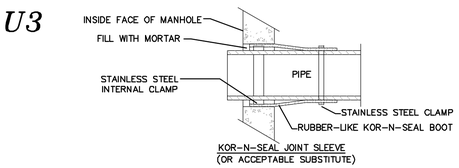




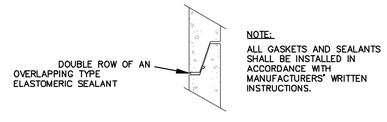
SEWER MANHOLE FRAME AND GRATE WILL BE LIFTMATE R-1743-LM, OR APPROVED EQUAL, 32 INCH OPENING, CAST IRON, H20 LOADING.

SEWER MANHOLE COVER DETAIL
NOT TO SCALE

U3

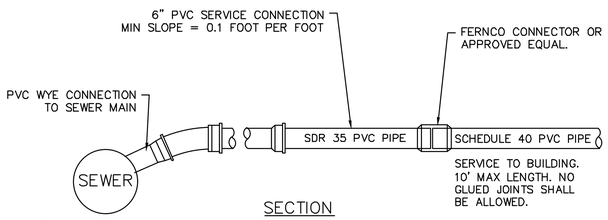


DETAIL "A" – PIPE TO MANHOLE JOINTS
NOT TO SCALE



DETAIL "B" HORIZONTAL JOINTS
NOT TO SCALE

U4

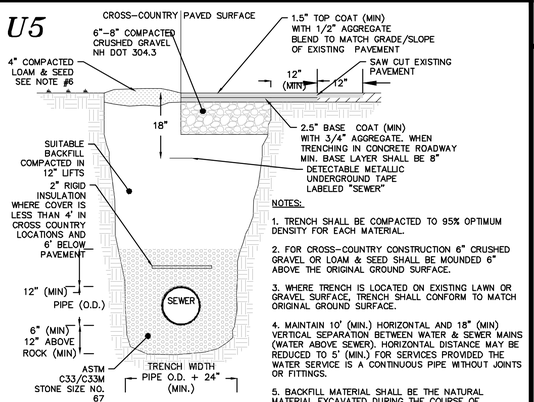


NOTES:

1. TRENCHING AND BEDDING REQUIREMENTS PER CITY SEWER TRENCH DETAIL (U5).
2. SERVICE LATERAL DIAMETER VARIES PER APPLICATION. REVIEW SIZE WITH CITY ENGINEER PRIOR TO INSTALLATION.
3. SDR 35 SHALL NOT EXTEND INTO THE BUILDING

SEWER SERVICE DETAIL
NOT TO SCALE

U5

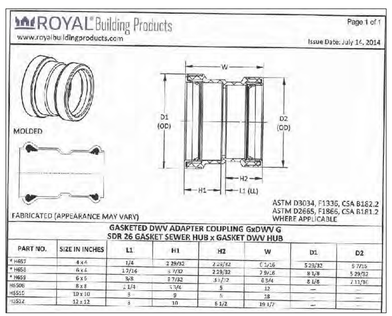


NOTES:

1. TRENCH SHALL BE COMPACTED TO 95% OPTIMUM DENSITY FOR EACH MATERIAL.
2. FOR CROSS-COUNTRY CONSTRUCTION 6" CRUSHED GRAVEL OR LOAM & SEED SHALL BE MOUNDED 6" ABOVE THE ORIGINAL GROUND SURFACE.
3. WHERE TRENCH IS LOCATED ON EXISTING LAWN OR GRAVEL SURFACE, TRENCH SHALL CONFORM TO MATCH ORIGINAL GROUND SURFACE.
4. MAINTAIN 10' (MIN.) HORIZONTAL AND 18" (MIN) VERTICAL SEPARATION BETWEEN WATER & SEWER MAINS (WATER ABOVE SEWER). HORIZONTAL DISTANCE MAY BE REDUCED TO 5' (MIN.) FOR SERVICES PROVIDED THE WATER SERVICE IS A CONTINUOUS PIPE WITHOUT JOINTS OR FITTINGS.
5. BACKFILL MATERIAL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE: DEBRIS, PAVEMENT, ORGANIC MATTER, TOP SOIL, MUCK, PEAT AND ROCKS OVER 6" IN LARGEST DIMENSION
6. LOAM AND SEED SHOULD BE IN COMPLIANCE WITH NH DOT 641, 642, 643, 644 AND 645.

TYPICAL SEWER PIPE TRENCH
NOT TO SCALE

U6



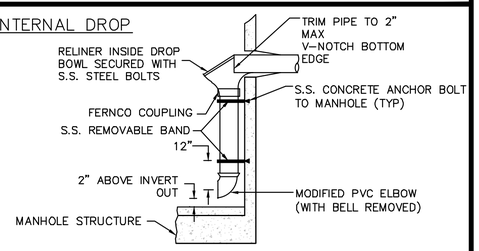
GASKETED DWV ADAPTER COUPLING GxDWV G SDR 26 GASKET SEWER HUB x GASKET DWV HUB

PART NO.	SIZE IN INCHES	L1	H1	H2	W	D1	D2
* H857	4 x 4	1/4	2.29/32	2.23/32	1 5/16	5.23/32	5.7/16
* H858	4 x 4	1 7/16	4.19/32	2.23/32	2 5/16	5.3/8	5.29/32
* H859	6 x 6	3/8	3.7/32	3.1/16	3 5/16	8.3/8	7.13/16
H8586	8 x 8	1 3/4	1 1/16	5	13	—	—
H8587	10 x 10	3	9	5	18	—	—
H8814	12 x 12	3	10	5 1/2	19 1/2	—	—

COUPLING DETAIL
NOT TO SCALE

U7

INTERNAL DROP

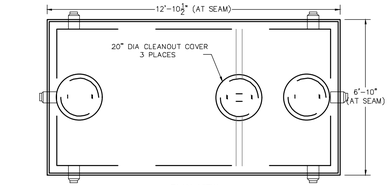


NOTES:

1. INTERNAL DROPS ARE PROHIBITED UNLESS APPROVED BY THE CITY ENGINEER.
2. BRICK INVERT NOT SHOWN ON DETAIL.

SEWER INTERNAL DROP DETAIL
NOT TO SCALE

U8



NOTES:

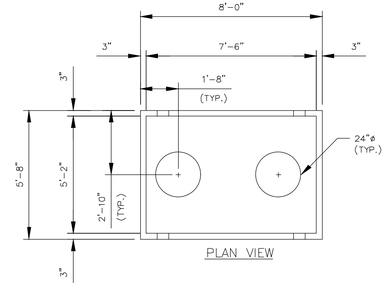
1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. CONSTRUCTION OF SEPTIC TANK CONFORMS WITH 310 CMR, SECTION 15.00 DEP TITLE 5 REGS.
3. ALL REINFORCEMENT PER ASTM C1227.
4. TEES AND GAS BAFFLE SOLD SEPARATELY.
5. TONGUE & GROOVE JOINT SEALED WITH BUTYL RESIN.
6. IF COVER EXCEEDS 4 FEET, HEAVY DUTY TANK REQUIRED. ALSO AVAILABLE IN AASHTO HS-20 LOADING.

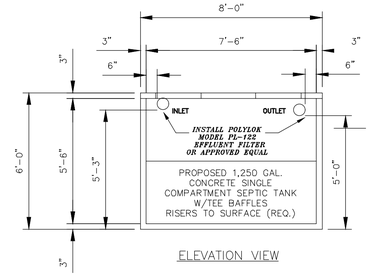
ITEM NO.	2500	STANDARD	WEIGHT 21,750#
	2500H	H20	21,750#
	2500ZCH	H20	22,650#
	2500ZH	H20	22,650#

SEPTIC TANK 2500 GALLON

2,500 GAL DUPLEX SEPTIC TANK (TYP.)
NOT TO SCALE

U9





1,250 GAL SEPTIC TANK (TYP.)
NOT TO SCALE

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

UTILITY CONSTRUCTION DETAILS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP 6, LOT 65-1 & 65-4

BERRY & SURVEYING ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 9442
LICENSED PROFESSIONAL ENGINEER

U-101

NOT FOR CONSTRUCTION

U10

NOTES:

1. TRENCH SHALL BE COMPACTED TO 95% OPTIMUM DENSITY FOR EACH MATERIAL.

2. FOR CROSS-COUNTRY CONSTRUCTION 6" CRUSHED GRAVEL OR LOAM & SEED SHALL BE MOUNDED 6" ABOVE THE ORIGINAL GROUND SURFACE.

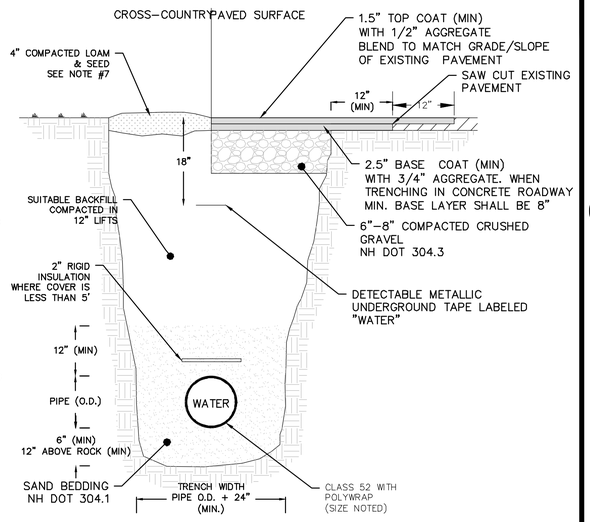
3. WHERE TRENCH IS LOCATED ON EXISTING LAWN OR GRAVEL SURFACE, TRENCH SHALL CONFORM TO MATCH ORIGINAL GROUND SURFACE.

4. MAINTAIN 10' (MIN.) HORIZONTAL AND 18" (MIN) VERTICAL SEPARATION BETWEEN WATER & SEWER MAINS (WATER ABOVE SEWER). HORIZONTAL DISTANCE MAY BE REDUCED TO 5' (MIN.) FOR SERVICES PROVIDED THE WATER SERVICE IS A CONTINUOUS PIPE WITHOUT JOINTS OR FITTINGS.

5. BACKFILL MATERIAL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE; DEBRIS, PAVEMENT, ORGANIC MATTER, TOP SOIL, MUCK, PEAT, AND ROCKS OVER 6" IN LARGEST DIMENSION

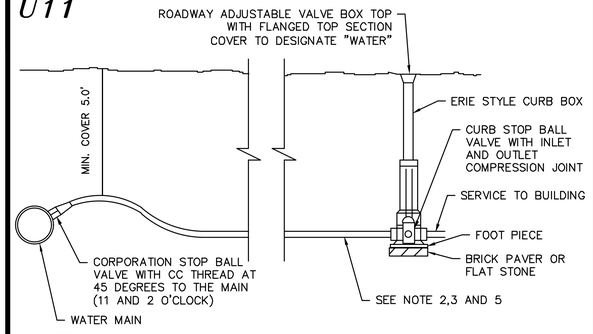
6. PROVIDE MINIMUM 5' OF COVER. ENGINEERING APPROVAL REQUIRED FOR LESS THAN 5' OF COVER.

7. LOAM AND SEED SHOULD BE IN COMPLIANCE WITH NH DOT 641, 642, 643, 644 AND 645.



WATER PIPE TRENCH
NOT TO SCALE

U11



NOTES:

1. ALL WATER LINES 4" OR GREATER SHALL BE DUCTILE IRON WITH AN 8 MIL POLYETHYLENE WRAP, INCLUDING TEE AND OTHER CONNECTIONS.

2. WATER SERVICE LINES SHALL BE COPPER TUBING (TYPE K) BETWEEN MAIN AND CURB STOP.

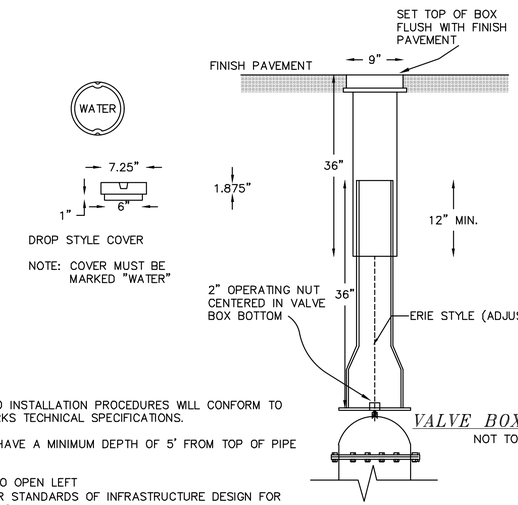
3. SERVICE BETWEEN CURB STOP AND BUILDING MAY BE (BLUE OR BLACK) CTS SDR 9 PLASTIC POLYETHYLENE RATED FOR 250 psi.

4. CAM-LOCK REQUIRED FOR CTS OR IPS, MJ ADAPTER REQUIRED FOR HDPE

5. ¾"- COPPER, CTS
   1"- COPPER, CTS
   2"- CTS, HDPE, IPS

WATER SERVICE CONNECTION
NOT TO SCALE

U12



NOTES:

1.) ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO LOCAL WATER WORKS TECHNICAL SPECIFICATIONS.

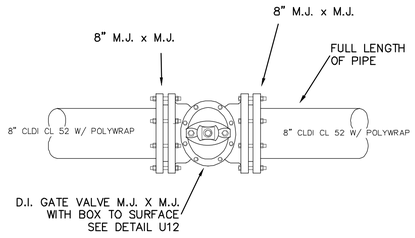
2.) ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.

3.) ALL VALVES ARE TO OPEN LEFT

4.) SEE CITY OF DOVER STANDARDS OF INFRASTRUCTURE DESIGN FOR POTABLE WATER DETAILS

VALVE BOX DETAIL
NOT TO SCALE

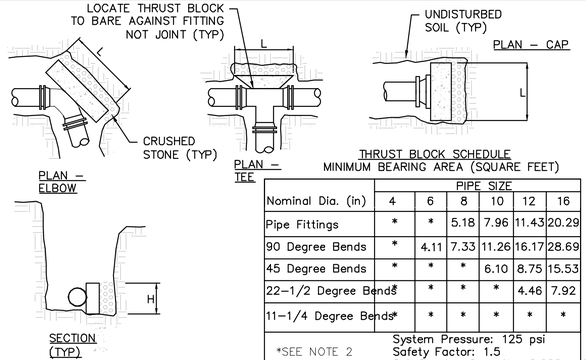
U13



SHUTOFF VALVE DETAIL
NOT TO SCALE

1.) ALL VALVES ARE TO OPEN LEFT
2.) SEE CITY OF DOVER STANDARDS OF INFRASTRUCTURE DESIGN FOR POTABLE WATER DETAILS

U14



THRUST BLOCK SCHEDULE
MINIMUM BEARING AREA (SQUARE FEET)

	PIPE SIZE					
Nominal Dia. (in)	4	6	8	10	12	16
Pipe Fittings	*	*	5.18	7.96	11.43	20.29
90 Degree Bends	*	4.11	7.33	11.26	16.17	28.69
45 Degree Bends	*	*	*	6.10	8.75	15.53
22-1/2 Degree Bends	*	*	*	*	4.46	7.92
11-1/4 Degree Bends	*	*	*	*	*	*

*SEE NOTE 2

System Pressure: 125 psi
Safety Factor: 1.5
Soil Bearing Capacity: 2,000 psf

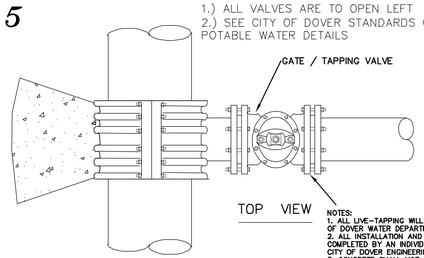
NOTES:

1. ALL THRUST BLOCKS SHALL BE PRE-CAST CONCRETE UNLESS APPROVED BY THE CITY ENGINEER.
2. 2'X2'X2' MINIMUM THRUST BLOCK REQUIRED, ANY BEARING AREA OVER 4SF REQUIRES THRUST BLOCKS, RESTRAINED JOINTS AND CALCULATIONS ASSOCIATED WITH THE JOINT.
3. THE MINIMUM BEARING AREAS SHOWN IN THE THRUST BLOCK SCHEDULE ARE BASED ON A SYSTEM PRESSURE OF 125 PSI. IF THE SYSTEM PRESSURE IS ABOVE 125 PSI, INCREASE THE NOTED AREAS PROPORTIONALLY TO THE ACTUAL SYSTEM PRESSURE.
4. FOR MINIMUM BEARING AREAS OVER 4 SF, THE LENGTH (L) OF THE BLOCK IS APPROXIMATELY TWICE AS LONG AS THE HEIGHT (H).
5. PLACE CRUSHED STONE BEHIND THRUST BLOCK AGAINST UNDISTURBED SOIL.
6. PLACE THRUST BLOCK ALONG MAXIMUM LENGTH OF THE FITTING TO MAXIMIZE BEARING AREA.
7. CONCRETE COMPRESSIVE STRENGTH: 2,000 PSI MINIMUM.
8. USE OF THRUST BLOCKS DOES NOT ELIMINATE THE REQUIREMENT OF OTHER RESTRAINTS OR VICE VERSA.

THRUST BLOCKS
NOT TO SCALE

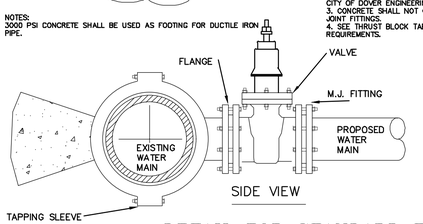
U15

1.) ALL VALVES ARE TO OPEN LEFT
2.) SEE CITY OF DOVER STANDARDS OF INFRASTRUCTURE DESIGN FOR POTABLE WATER DETAILS



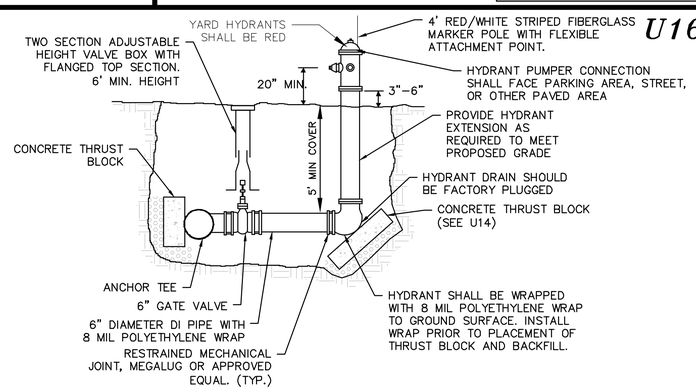
NOTES:
1. ALL LIVE-TAPPING WILL BE COMPLETED IN ACCORDANCE WITH CITY OF DOVER WATER DEPARTMENT REGULATIONS.
2. ALL INSTALLATION AND TAPPING OF EXISTING WATER MAINS WILL BE COMPLETED BY AN INDIVIDUAL OR FIRM THAT IS APPROVED BY THE CITY OF DOVER ENGINEERING.
3. CONCRETE SHALL NOT CONTACT BOLTS OR END OF MECHANICAL JOINT FITTINGS.
4. SEE THRUST BLOCK TABLES FOR AREA OF CONCRETE REQUIREMENTS.

NOTES:
3000 PSI CONCRETE SHALL BE USED AS FOOTING FOR DUCTILE IRON PIPE.



DETAIL FOR STANDARD TAPPING SLEEVE AND VALVE ASSEMBLY
NOT TO SCALE

U16

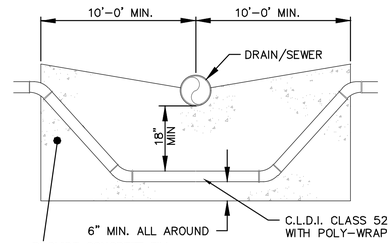


NOTES:

1. FIRE HYDRANTS SHALL BE FACTORY SEALED EDDY STYLE 2641.
2. HYDRANT SHALL BE PAINTED RED WITH EPOXY PAINT AS RECOMMENDED BY THE HYDRANT MANUFACTURER.
3. HYDRANT SHALL OPEN LEFT.

FIRE HYDRANT
NOT TO SCALE

U17



1.) SEE CITY OF DOVER STANDARDS OF INFRASTRUCTURE DESIGN FOR POTABLE WATER DETAILS

WATER MAIN INSTALLATION - BELOW DRAIN & SEWER
NOT TO SCALE

U-102

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

UTILITY CONSTRUCTION DETAILS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
59 TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

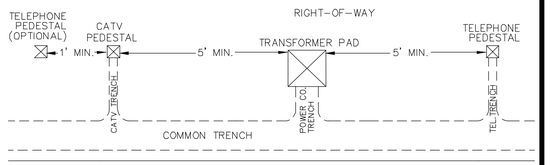
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 13043
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

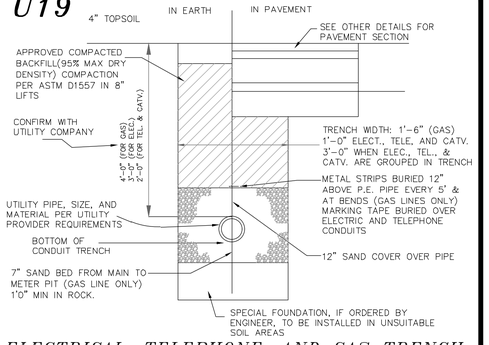
U18



PEDESTAL PLACEMENT

NOT TO SCALE

U19



ELECTRICAL, TELEPHONE, AND GAS TRENCH

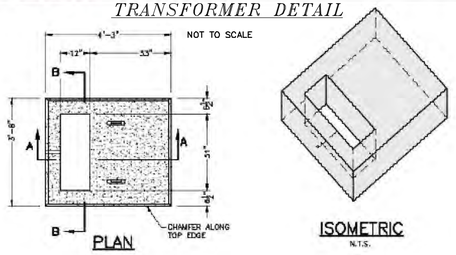
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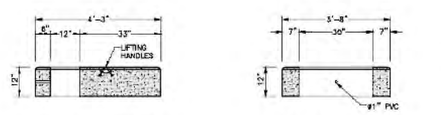
U20

SHEA CONCRETE PRODUCTS — New England's Premier Precaster — 800-696-7432 (SHEA) — www.sheaconcrete.com — MAILING ADDRESS: 87 HAVERHILL RD AMESBURY, MA 01913

EVERSOURCE-NH 53-102
TRANSFORMER PAD 25-75 KVA

TRANSFORMER DETAIL





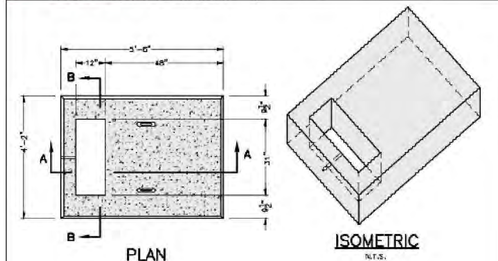
NOTES:
1. CONCRETE MINIMUM STRENGTH 4,000 PSI AFTER 28 DAYS.
2. REINFORCEMENT STEEL CONFORMS TO ASTM A615 GRADE 60 #6 REBAR.
3. MEETS OR EXCEEDS EVERSOURCE SPECIFICATIONS.

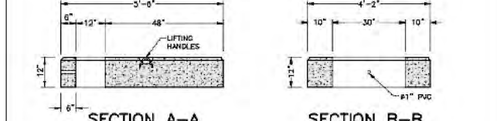
SHEA PRODUCT ID:	25-75 KVA	FILE NAME:	ES-NH TP 53-102	
WEIGHT (LBS):	1,936#	DRAWN BY:	MNN	DATE: 01/02/2018	PAGE: III.C.1

773 Salem Street-Wilmington, MA | 153 Cranberry Hwy-Rochester, MA | 87 Haverhill Road-Amesbury, MA | 140 Old Turnpike Rd-Northgrton, NH

Specifications subject to change without notice

EVERSOURCE-NH 53-102L
TRANSFORMER PAD 100 TO 250 KVA





NOTES:
1. CONCRETE MINIMUM STRENGTH 4,000 PSI AFTER 28 DAYS.
2. REINFORCEMENT STEEL CONFORMS TO ASTM A615 GRADE 60 #6 REBAR.
3. MEETS OR EXCEEDS EVERSOURCE SPECIFICATIONS.

SHEA PRODUCT ID:	100-250 KVA	FILE NAME:	ES-NH TP 53-102L	
WEIGHT (LBS):	3,022#	DRAWN BY:	MNN	DATE: 01/02/2018	PAGE: III.C.2

773 Salem Street-Wilmington, MA | 153 Cranberry Hwy-Rochester, MA | 87 Haverhill Road-Amesbury, MA | 140 Old Turnpike Rd-Northgrton, NH

Specifications subject to change without notice

U21

PUMP STATION NOTES:

1.) EACH PUMP STATION SHALL PROVIDE, PER Env-Wq 705.03(B), A MINIMUM OF TWO PUMPS, EACH DESIGNED TO HANDLE PEAK HOURLY FLOWS SHALL BE PROVIDED.

2.) ENV-WQ 705.05(B) REQUIRES THE PUMP STATION BE EQUIPPED WITH A RUNNING METER THAT INDICATES CUMULATIVE RUNNING TIME OF EACH PUMP OR CONTINUOUS FLOW RECORDING AND TOTALIZER CAPABILITY, WHICH IS PROVIDED WITHIN THE EXISTING CONTROL PANEL.

3.) ENV-WQ 705.07 REQUIRES THAT SUBMERSIBLE PUMPS AND ELECTRICAL SYSTEMS AND COMPONENTS INSTALLED WITHIN RAW SEWAGE WET WELLS BE CERTIFIED AS COMPLYING WITH THE NEC REQUIREMENTS ADOPTED BY REFERENCE IN THE STATE BUILDING CODE PURSUANT TO RSA 155-A:1,IV FOR CLASS 1, DIVISION 1 LOCATIONS. ADDITIONALLY, ALL ELECTRICAL EQUIPMENT AND WORK SHALL COMPLY WITH THE REQUIREMENTS OF NEC AS ADOPTED BY REFERENCE IN THE STATE BUILDING CODE PURSUANT TO RSA 155-A:1, IV, AND NFPA AS ADOPTED BY REFERENCE IN THE STATE FIRE CODE IN SAF-C 6000 IN EFFECT AT THE TIME OF INSTALLATION.

4.) ACCESS DOORS TO WET WELLS SHALL HAVE WARNING SIGNS ON THE UNDERSIDE THAT READ "WARNING – HAZARDOUS AREA, ENTER ONLY WITH PROPER EQUIPMENT" OR "CONFINED SPACE, ENTRY BY PERMIT ONLY", AS APPROPRIATE.

5.) PUMP STATION TO MEET ALL ENV-WQ 705.09 ALARM SYSTEM REQUIREMENTS OR IF ADDITIONAL IMPROVEMENTS ARE NECESSARY. NOTE THAT ALARM SYSTEM POWER SOURCE SHALL BE AN INDEPENDENT BATTERY WITH CONTINUOUS CHARGE OR MAIN LINE POWER WITH BACK-UP BATTERY SYSTEM CONNECTED AUTOMATICALLY SHOULD MAIN POWER FAIL.

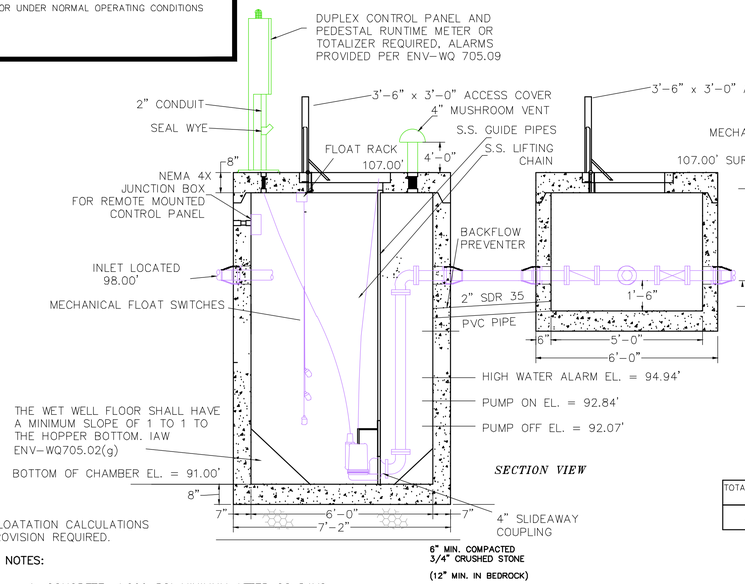
GENERATOR NOTES:

THE FOLLOWING REQUIREMENTS OF ENV-WQ 705.11 REQUIRE THAT THE EMERGENCY POWER GENERATOR: (APPLICABLE FOR ALL THREE PUMP STATIONS)

- SHALL BE AUTOMATICALLY ACTIVATED BY FAILURE OF ANY PHASE OF POWER SUPPLY OR UPON ANY FLUCTUATION IN VOLTAGE, THE AMOUNT OR DURATION OF WHICH WOULD CAUSE DAMAGE TO THE MOTORS. INSTALLATIONS SHALL COMPLY WITH ALL APPLICABLE REQUIREMENTS OF THE NEC AND THE STATE FIRE CODE IN SAF-C 6000.
- SHALL BE PERMANENTLY SECURED IN PLACE WITH PROVISIONS FOR REMOVAL TO FACILITATE REPAIR OR REPLACEMENT.
- SHALL INCLUDE PROVISIONS FOR AUTOMATIC AND MANUAL START-UP AND CUT-IN. THE CONTROLS SHALL BE SUCH THAT UPON AUTOMATIC START-UP UNDER EMERGENCY CONDITIONS, SHUT-DOWN SHALL BE ACCOMPLISHED AUTOMATICALLY ON RESTORATION OF UTILITY POWER WITH CONTROLLED SHUT-DOWN OF UNIT. MANUAL SHUT DOWN SHALL ALSO BE PROVIDED. PROVISIONS SHALL BE MADE TO ALLOW PUMPS TO RUN DOWN BEFORE RE-ENERGIZING ON TRANSFER POWER.
- SHALL BE EQUIPPED WITH AN AUTOMATIC EXERCISER WHICH CAN BE SET ON ANY SELECTED SCHEDULE TO START THE GENERATOR, RUN THE GENERATOR UNDER NO-LOAD OR LOAD CONDITIONS BY SELECTION, AND SHUT THE GENERATOR OFF WITHOUT ACTUATING THE ALARM SYSTEM.
- SHALL BE PROVIDED WITH ENOUGH FUEL STORAGE TO RUN UNDER FULL LOAD OR PEAK STATION FLOW FOR AT LEAST 48 HOURS OR UNDER NORMAL OPERATING CONDITIONS FOR AT LEAST 96 HOURS, WHICHEVER REQUIRES THE GREATER AMOUNT OF FUEL.

U22

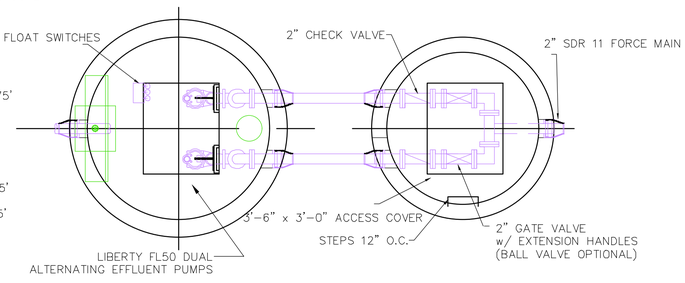
DUPLEX PUMP STATION



SECTION VIEW

DUPLEX PUMP STATION

VALVE PIT



PLAN VIEW

	A	B	C	D	E		
TOTAL DYNAMIC HEAD	PUMP RATE	PUMP CHAMBER BOTTOM	PUMP CHAMBER INVERT IN	PUMP OFF ELEVATION	PUMP ON ELEVATION	ALARM ON ELEVATION	SYSTEM TYPE	PUMP TYPE
32.0'	53 GPM	91.00'	98.00'	92.07'	92.84'	92.94'	DUAL ALTERNATING EFFLUENT	LIBERTY FL50

NOTES:

1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS. ASTM C990 SPEC
2. REINFORNCED STEEL CONFORMS TO LATEST ASTM A185
3. BUTYL RESIN SECTION JOINT CONFORMS TO LATEST ASTM
4. WET WELL TESTING IS REQUIRED IAW ENV-WQ 705.02(i).

EFFLUENT PUMP STATION #1

NOT TO SCALE

U-103

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

UTILITY CONSTRUCTION DETAILS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP 8, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE – KENNETH A. BERRY No. 14043 LICENSED PROFESSIONAL ENGINEER

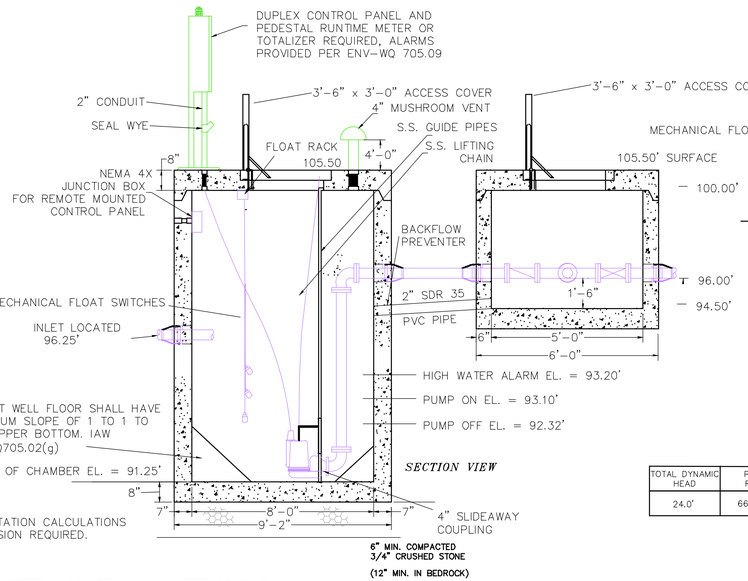
NOT FOR CONSTRUCTION

U23

EFFLUENT PUMP STATION #2

NOT TO SCALE

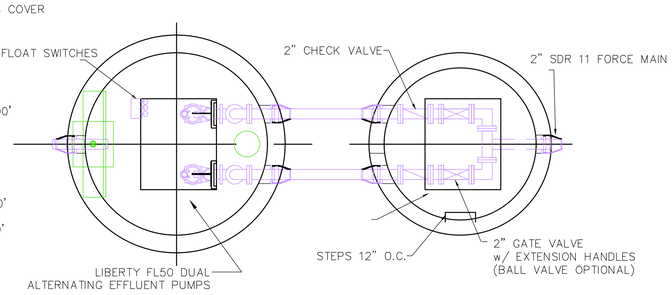
DUPLEX PUMP STATION



SECTION VIEW

DUPLEX PUMP STATION

VALVE PIT



PLAN VIEW

	A	*B*	*C*	*D*	*E*			
TOTAL DYNAMIC HEAD	PUMP RATE	PUMP CHAMBER BOTTOM	PUMP CHAMBER INVERT IN	PUMP OFF ELEVATION	PUMP ON ELEVATION	ALARM ON ELEVATION	SYSTEM TYPE	PUMP TYPE
24.0'	66 GPM	91.25'	96.25'	92.32'	93.10'	93.20'	DUAL ALTERNATING EFFLUENT	LIBERTY FL50

NOTES:

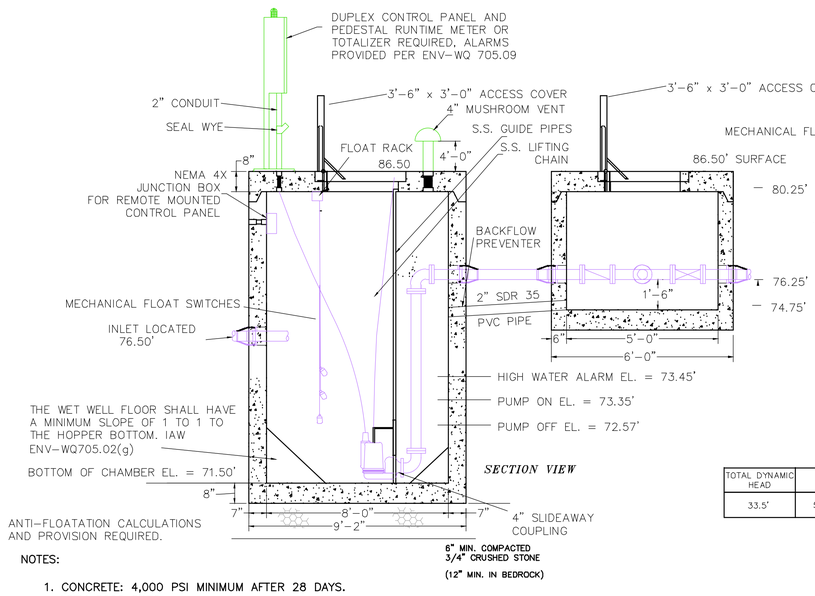
1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS. ASTM C990 SPEC
2. REINFORNCED STEEL CONFORMS TO LATEST ASTM A185
3. BUTYL RESIN SECTION JOINT CONFORMS TO LATEST ASTM
4. WET WELL TESTING IS REQUIRED IAW ENV-WQ 705.02(i).

U24

EFFLUENT PUMP STATION #3

NOT TO SCALE

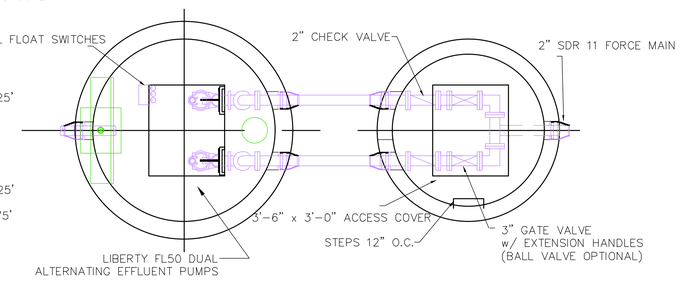
DUPLEX PUMP STATION



SECTION VIEW

DUPLEX PUMP STATION

VALVE PIT



PLAN VIEW

	A	*B*	*C*	*D*	*E*			
TOTAL DYNAMIC HEAD	PUMP RATE	PUMP CHAMBER BOTTOM	PUMP CHAMBER INVERT IN	PUMP OFF ELEVATION	PUMP ON ELEVATION	ALARM ON ELEVATION	SYSTEM TYPE	PUMP TYPE
33.5'	51 GPM	71.50'	76.50'	72.57'	73.35'	73.45'	DUAL ALTERNATING EFFLUENT	LIBERTY FL50

NOTES:

1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS. ASTM C990 SPEC
2. REINFORNCED STEEL CONFORMS TO LATEST ASTM A185
3. BUTYL RESIN SECTION JOINT CONFORMS TO LATEST ASTM
4. WET WELL TESTING IS REQUIRED IAW ENV-WQ 705.02(i).

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

UTILITY CONSTRUCTION DETAILS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP 8, LOT 65-1 & 65-4

BERRY SURVEYING & ENGINEERING
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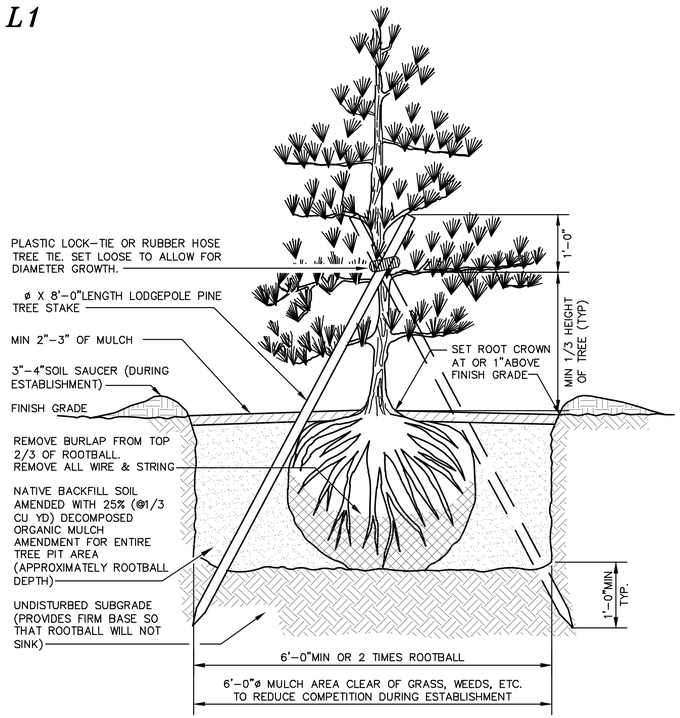
SCALE : AS NOTED
DATE : APRIL 27, 2023
FILE NO. : DB 2023 - 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14043
LICENSED PROFESSIONAL ENGINEER

U-104

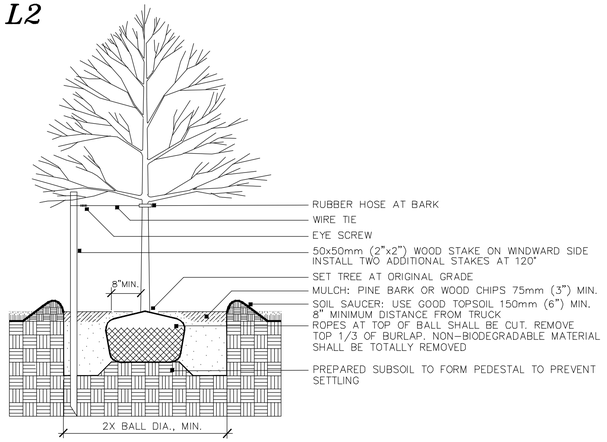
NOT FOR CONSTRUCTION

L1



CONIFEROUS TREE PLANTING
NOT TO SCALE

L2



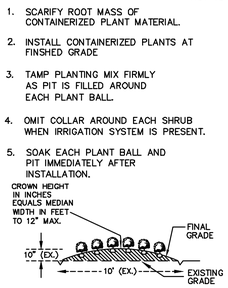
DECIDUOUS TREE PLANTING
NOT TO SCALE

NOTE: STAKING TO BE USED IN PARKING ISLANDS AND OTHER CONFINED AREAS AS NECESSARY TO AVOID CONFLICTS WITH PEDESTRIANS

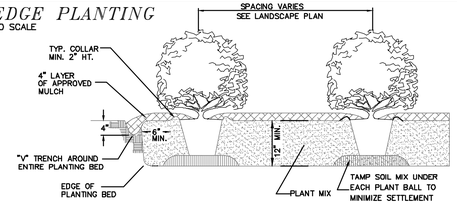
L3

NOTES: *SHRUB & HEDGE PLANTING*
NOT TO SCALE

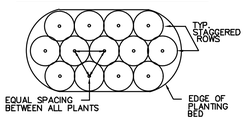
1. SCARIFY ROOT MASS OF CONTAINERIZED PLANT MATERIAL.
2. INSTALL CONTAINERIZED PLANTS AT FINSHED GRADE
3. TAMP PLANTING MIX FIRMLY AS PIT IS FILLED AROUND EACH PLANT BALL.
4. OMIT COLLAR AROUND EACH SHRUB WHEN IRRIGATION SYSTEM IS PRESENT.
5. SOAK EACH PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.



TYPICAL BED CROWNING



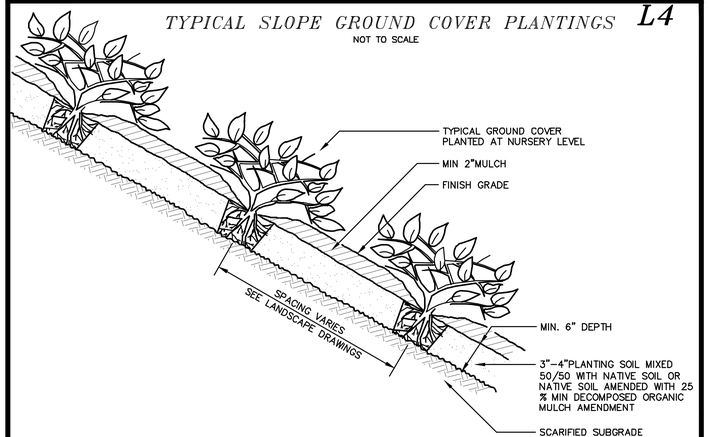
TYPICAL PLANTING BED DETAIL



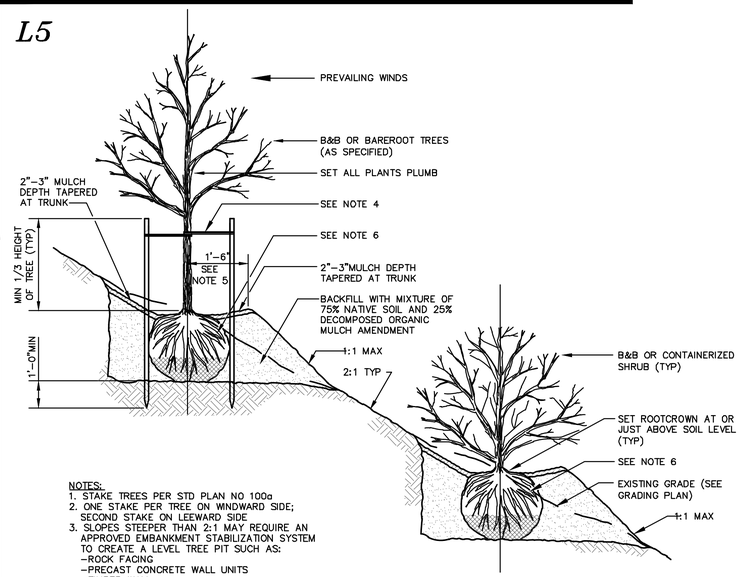
TYPICAL PLANTING BED PLAN

L4

TYPICAL SLOPE GROUND COVER PLANTINGS
NOT TO SCALE



L5



NOTES:
1. STAKE TREES PER STD PLAN NO 100a
2. ONE STAKE PER TREE ON WINDWARD SIDE; SECOND STAKE ON LEEWARD SIDE
3. SLOPES STEEPER THAN 2:1 MAY REQUIRE AN APPROVED EMBANKMENT STABILIZATION SYSTEM TO CREATE A LEVEL TREE PIT SUCH AS:
   - ROCK FACING
   - PRECAST CONCRETE WALL UNITS
   - TIMBER WALL
   - MANUFACTURED SLOPE RETENTION UNITS
4. CHAINLOCK TREE TIE. LOOP EACH TIE AROUND TREE LOOSELY TO PROVIDE 1" SLACK FOR DIAMETER GROWTH.
5. SHAPE SOIL TO PROVIDE 3' DIAMETER OR ROOTBALL DIAMETER, WHICHEVER IS GREATER, WATERING RING.
6. REMOVE ALL WIRE AND STRING. REMOVE TOP 2/3 OF BURLAP.

TREE PLANTING ON SLOPES
NOT TO SCALE

L6

NOTES:

1.) CALL DIG SAFE PRIOR TO BEGINNING WORK. (1-888-344-7233). THE LANDSCAPE CONTRACTOR IS ADVISED OF THE PRESENCE OF UNDERGROUND UTILITIES AND SHALL VERIFY THE EXISTENCE AND LOCATION OF THE SAME BEFORE COMMENCING AND DIGGING OPERATIONS. THE LANDSCAPE CONTRACTOR SHALL REPLACE OR REPAIR UTILITIES, PAVING, WALKS, CURBING, ETC DAMAGED IN PERFORMANCE OF THIS JOB AT NO ADDITIONAL COST TO THE OWNER OR GENERAL CONTRACTOR.

2.) CONTRACTOR SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL SITE CONDITIONS PRIOR TO CONSTRUCTION BIDDING.

3.) PROVIDED SMOOTH TRANSITION WHERE NEW WORK MEETS EXISTING CONDITIONS.

4.) ALL PLANT MATERIAL INSTALLED SHALL MEET THE SPECIFICATIONS OF "AMERICAN STANDARD FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN.

5.) ALL PLANT MATERIALS SHALL BE FREE FROM INSECTS AND DISEASE.

6.) ALL PLANTINGS SHALL BE DONE IN ACCORDANCE WITH ACCEPTABLE HORTICULTURAL PRACTICES. THIS IS TO INCLUDE PROPER PLANTING MIX, PLANT BED AND TREE PIT PREPARATION, PRUNING STAKING OR GUYING, WRAPPING, SPRAYING, FERTILIZATION, PLANTING AND ADEQUATE MAINTENANCE UNTIL ACCEPTANCE FROM OWNER.

7.) ALL GRASS, OTHER VEGETATION AND DEBRIS SHALL BE REMOVED FROM ALL PLANTING AREAS PRIOR TO PLANTING.

8.) THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF EXISTING AND NEWLY PLANTED TREES AND SHRUBS DURING THE CONSTRUCTION PROCESS. WHERE REQUIRED, THE CONTRACTOR SHALL INSTALL TEMPORARY FENCING (SNOW OR EQUAL) AROUND EXISTING TREES AND SHRUBS THAT COULD BE IMPACTED BY THE CONSTRUCTION PROCESS. STORAGE OF CONSTRUCTION EQUIPMENT, CONSTRUCTION MATERIALS, SNOW STORAGE AND OR VEHICLE PARKING SHALL NOT BE PERMITTED WITHIN THE DRIP LINE OF TREES OR TWENTY FEET WHICH EVER IS GREATER.

9.) NEW PLANTINGS SHALL BE INSTALLED PER PROJECT DRAWINGS AND SPECIFICATION THAT INCLUDE FERTILIZATION AND MULCHING AS REQUIRED.

10.) ALL SHRUB BEDS AND TREE PITS SHALL BE MULCHED WITH 3" CLEAN SHREDDED BLACK MULCH.

11.) WHERE INDICATED ON PLAN, PLANTING SOIL MIXTURE FOR GROUND COVER AND PERENNIAL BED AREAS SHALL CONSIST OF FOUR PARTS TOPSOIL, TWO PARTS SPHAGNUM PEAT MOSS, AND ONE PART HORTICULTURAL PERLITE BY VOLUME. PEAT MOSS MAY BE SUBSTITUTED WITH WELL-ROTTED OR DEHYDRATED MANURE OR COMPOST. ROTOTILL BEDS TO A DEPTH OF 8 INCHES.

12.) MAINTENANCE OF NEW PLANTINGS AND LAWNS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND OR LANDSCAPE SUBCONTRACTOR UNTIL ACCEPTANCE BY THE OWNER. RESPONSIBILITIES SHALL INCLUDE WATERING WEEDING AND MOWNG AS NECESSARY. ALL PLANT MATERIAL SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE, REPLACEMENT MATERIAL SHALL BE GUARANTEED FOR AND ADDITIONAL YEAR FROM TIME OF INSTALLATION.

13.) THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TEMPORARY EROSION CONTROL MEASURES DURING THE CONSTRUCTION PHASE AND UNTIL ALL AREAS HAVE BEEN STABILIZED AND ACCEPTED BY THE OWNER. THE GENERAL CONTRACTOR SHALL PROVIDE WEEKLY INSPECTIONS OF EROSION MEASURE AND IMMEDIATELY AFTER STORM EVENTS AND REPAIR AS NECESSARY.

14.) THE GENERAL CONTRACTOR AND OR THE LANDSCAPE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL THREE GUYING MATERIAL ONCE PLANT MATERIAL HAS BEEN ESTABLISHED. (MINIMUM OF ONE GROWNG SEASON). ALL TEMPORARY EROSION CONTROL MEASURE SHALL BE REMOVED ONCE STABILIZATION OF DISTURBANCE HAS BEEN ACCEPTED BY OWNER.

15.) THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR A MINIMUM OF TWO MOWINGS FOR ALL TURF AREAS OR UNTIL ACCEPTANCE BY THE OWNER. A MINIMUM UNIFORM 75% CATCH OF TURF IS REQUIRED FOR ACCEPTANCE.

16.) ALL PLANTINGS SHALL BE WATERED REGULARLY DURING THEIR FIRST YEAR AND MAINTAINED PERMANENTLY IN GOOD GROWING CONDITION AS AN EFFECTIVE VISUAL SCREEN.

17.) SHRUBS OR TREES WHICH DIE SHALL BE REPLACED WITHIN ONE GROWING SEASON WITH NEW SHRUBS OR TREES TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE LANDSCAPING REQUIREMENTS.

18.) ALL REQUIRED LANDSCAPING SHALL BE INSTALLED BEFORE OCCUPANCY, OR WITHIN SIX MONTHS IF OCCUPANCY OCCURS DURING WINTER CONDITIONS.

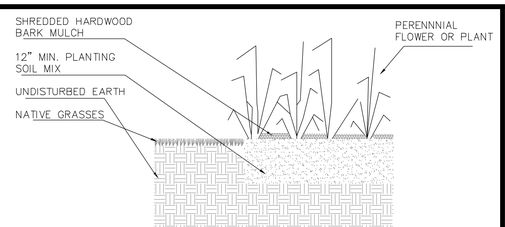
19.) TREES ARE TO BE 3.5" CALIPER 6" OFF THE ROOT BALL.

20.) ALL PLANT STOCK SHALL CONFORM TO ANSI Z260.1 – NURSERY STOCK, LATEST EDITIONS (AMERICAN ASSOCIATION OF NURSERYMEN, INC.)

21.) 4" AGED PINEBARK MULCH AND A WEED BARRIER (TY-PAR FABRIC OR APPROVED EQUAL) SHALL BE APPLIED TO ALL SHRUB AND GROUND COVER BEDS. INSTALL WEED BARRIER AS PER MANUFACTURERS RECOMMENDATIONS.

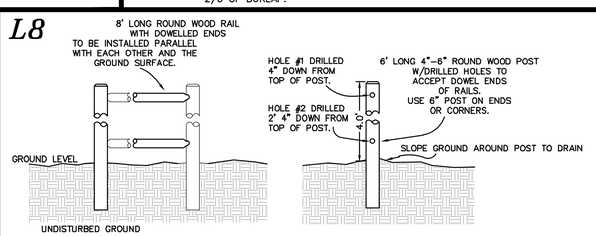
22.) PLANT-PIT BACK-FILL SHALL BE MIXED AT A RATE OF 7 PARTS OF TOPSOIL TO 2 PARTS OF DEHYDRATED COW MANURE. SLOW RELEASE FERTILIZER SHALL BE APPLIED AS PER MANUFACTURERS RECOMMENDATIONS. USE EXISTING ON-SITE TOPSOIL AS PART OF BACK FILL WHEN AVAILABLE.

L7



PERENNIAL PLANTING DETAIL
NOT TO SCALE

L8



TYPICAL POST & RAIL FENCE DETAIL
NOT TO SCALE

DOVER PLANNING FILE #P23-XX

REVISION	DATE	DESCRIPTION

LANDSCAPING CONSTRUCTION DETAILS
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65-1 & 65-4

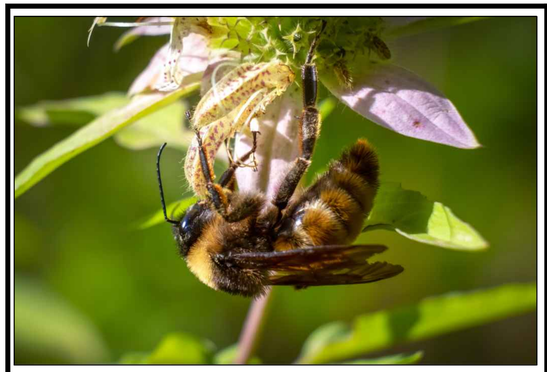
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 13043
LICENSED PROFESSIONAL ENGINEER

L-101

NOT FOR CONSTRUCTION



AMERICAN BUMBLE BEE

IDENTIFICATION/DESCRIPTION:

BOMBUS PENSYLVANICUS IS A LARGE BUMBLE BEE WITH THE QUEEN MEASURING 1 IN, THE WORKER FROM 0.5 IN, AND THE MALE FROM 0.75 IN IN LENGTH. THE QUEEN IS MOSTLY BLACK, INCLUDING THE LEGS, SPURS AND TEGULAE (BASE OF WING). TERGITE 1, OR THE MOST ANTERIOR BACK PORTION OF THE QUEEN IS OFTEN YELLOW ESPECIALLY IN THE MIDDLE. WORKER BEES' MIDDLE TERGITES ARE YELLOW, THE TAIL BLACK, AND FACE LONG. THEIR CHEEKS ARE SLIGHTLY LONGER THAN BROAD, AND THE CLYPEUS (NOSE) HAS LARGE PUNCTURES EXCEPT ON THE MID LINE. THE HAIR ON THE TOP OF THE HEAD IS BLACK, SHORT AND EVEN. MALES HAVE A YELLOW ABDOMEN WITH A BLACK HEAD AND BLACK STRIPING IN THE LOWER THORAX.



BLANDINGS TURTLE

IDENTIFICATION/DESCRIPTION:

A 7– TO 9–INCH TURTLE WITH YELLOW SPECKLES THAT OFTEN RUN TOGETHER TO FORM STREAKS ON THE CARAPACE. EASILY IDENTIFIED WHEN BASKING FROM ITS CHARACTERISTIC YELLOW THROAT AND CHIN.



NORTHERN BLACK RACER

IDENTIFICATION/DESCRIPTION:

A SLENDER BLACK SNAKE MEASURING 36–60 INCHES. BLACK RACERS ARE GLOSSY BLACK ON THE TOP AND BOTTOM WITH A WHITE THROAT AND CHIN. YOUNG RACERS ARE PATTERNED WITH BROWN OR REDDISH PATCHES ON A LIGHTER BASE OF GRAY.



SMOOTH GREEN SNAKE

IDENTIFICATION/DESCRIPTION:

A THIN, SLENDER BRIGHT–GREEN SNAKE MEASURING 10–20 INCHES. THE UNDERSIDE IS WHITE OR A PALE YELLOW.



LITTLE BROWN BAT

IDENTIFICATION/DESCRIPTION:

THE LITTLE BROWN BAT IS A SMALL MAMMAL WITH A BODY LENGTH OF 2 1/2 – 4" AND WEIGHING APPROXIMATELY 1/8 TO 1/2 AN OUNCE. THE WINGSPAN OF LITTLE BROWN BATS RANGE FROM 9 – 11". BATS ARE THE ONLY MAMMALS THAT ENGAGE IN TRULY ACTIVE FLIGHT. AS THEIR NAME SUGGESTS THEY ARE GLOSSY BROWN ABOVE WITH A LIGHTER GRAY COLOR BELOW. THESE BATS CAN LIVE 20 TO 30 YEARS.



NORTHERN LONG–EARED BAT

IDENTIFICATION/DESCRIPTION:

THE NORTHERN LONG–EARED BAT IS A MEDIUM–SIZED BAT WITH A BODY LENGTH OF 3 TO 3.7 INCHES BUT A WINGSPAN OF 9 TO 10 INCHES. THEIR FUR COLOR CAN BE MEDIUM TO DARK BROWN ON THE BACK AND TAWNY TO PALE–BROWN ON THE UNDERSIDE. AS ITS NAME SUGGESTS, THIS BAT IS DISTINGUISHED BY ITS LONG EARS, PARTICULARLY AS COMPARED TO OTHER BATS IN ITS GENUS, MYOTIS



EASTERN SMALL–FOOTED BAT

IDENTIFICATION/DESCRIPTION:

THE EASTERN SMALL–FOOTED BAT HAS BROWNISH FUR, OFTEN WITH A GOLDEN SHEEN, THAT CONTRASTS WITH ITS BLACKISH FACE AND EARS, AND BLACKISH–BROWN WINGS AND TAIL MEMBRANE. IT CAN BE DISTINGUISHED FROM OTHER MYOTIS SPECIES BY ITS BLACK MASK AND SMALL SIZE. THE BODY IS LITTLE MORE THAN 3½ INCHES LONG, INCLUDING A 1½–INCH TAIL. ITS SMALL FEET, WHICH PROVIDE THE COMMON NAME, ARE LESS THAN A HALF–INCH AND ITS WINGSPAN RANGES FROM 8¼ TO 9¾INCHES. THIS SPECIES FLIES SLOWLY AND ERRATICALLY, USUALLY ABOUT ONE TO THREE YARDS ABOVE THE GROUND.



SILVER HAIRED BAT

IDENTIFICATION/DESCRIPTION:

THE SILVER–HAIRED BAT IS A MEDIUM–SIZED BAT WITH VERY DARK FUR TIPPED WITH SILVER OR WHITE. THE WINGS AND TAIL MEMBRANE ARE BLACK. EARS ARE SHORT AND ROUND WITH A SHORT, BLUNT–TIPPED TRAGUS. THE DORSAL SURFACE OF THE TAIL MEMBRANE IS PARTIALLY FURRED AND THE CALCAR LACKS A KEEL



TRI–COLORED BAT

IDENTIFICATION/DESCRIPTION:

THE TRICOLORED BAT, FORMERLY KNOWN AS THE EASTERN PIPISTRELLE (PIPISTRELLUS SUBFLAVUS), IS A SMALL BAT WEIGHING 0.2 TO 0.3 OUNCES (5 TO 8 GR) AND HAS A WINGSPAN OF 8 TO 10 INCHES. THE TERM "TRICOLORED" REFERS TO THE BAT'S YELLOWISHBROWN COAT THAT IS DARK AT THE BASE, YELLOWISH–BROWN IN THE MIDDLE, AND DARK AT THE TIPS. THE WING MEMBRANES ARE BLACKISH, BUT THE FACE AND EARS HAVE A PINKISH COLOR. AN OBVIOUS IDENTIFYING CHARACTERISTIC OF THIS SPECIES IS THE PINK COLOR OF THE SKIN ON THE RADIUS BONE. THE FEET ARE ALSO RELATIVELY LARGE COMPARED TO ITS BODY SIZE.



SPOTTED TURTLE

IDENTIFICATION/DESCRIPTION:

A SMALL 3–5 INCH TURTLE RECOGNIZED BY NUMEROUS YELLOW SPOTS COVERING A DARK CARAPACE. THE NUMBER OF SPOTS IS VARIABLE. SPOTS CAN ALSO BE FOUND ON THE HEAD AND LIMBS.



WOOD TURTLE

IDENTIFICATION/DESCRIPTION:

A 5–8 INCH TURTLE CHARACTERIZED BY ITS HIGHLY SCULPTED SHELL WHERE EACH LARGE SCUTE TAKES AN IRREGULAR PYRAMIDAL SHAPE. THE NECK AND FORELIMBS ARE ORANGE.

W–101

DOVER PLANNING FILE #P23–XX

REVISION	DATE	DESCRIPTION

WILDLIFE IDENTIFICATION PLAN
LAND OF
59 TOLEND RD LLC &
EUGENE A. & DONNA L. SGRIGNUOLI
TOLEND ROAD
DOVER, N.H.
TAX MAP E, LOT 65–1 & 65–4

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : NONE
DATE : APRIL 27, 2023
FILE NO. : DB 2023 – 031

STATE OF NEW HAMPSHIRE – KENNETH A. BERRY No. 13243 – LICENSED PROFESSIONAL ENGINEER

SHEET100OF 100

NOT FOR CONSTRUCTION