CITY OF DOVER

PLANNING TECHNICAL REVIEW COMMITTEE –AGENDA

REVISED

Meeting Type: Regular Meeting
Meeting Location: 1st Floor Conference Room – City Hall, Dover NH
Meeting Date: **Thursday, January 31, 2019**
Meeting Time: **10:30 am**

1. **10:30 AM – 11:15 AM:** Site Review for Groen Construction, Inc., (Owners: Darlene Colwell-Ellis Trustee and City of Dover), Assessor's Map 6, Lots 54D & 54C, zoned CBD, located at 10 Fourth Street. (Proposal is to demolish the existing building and construct a 4,300 sq. ft. new mixed use building with commercial offices on the first floor and residential units above. Related CUP and Lot Line adjustment applications will also appear before the Planning Board). (P19-03)

2. **11:15 AM – 12:00 PM:** Open Space Subdivision for James Gauron, (Owner: Arthur Sweatt), Assessor's Map I, Lot 6, zoned R-12, located at 54 Back River Road. (Proposal is to construct 6 single family detached dwelling units and 2 duplex dwelling units as well as a private driveway and widening Red Barn Drive). (P19-09)

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

January 10, 2019

City of Dover
Planning Office
Attn: Donna Benton, Assistant City Planner
288 Central Ave
Dover, NH 03820

RE: Proposed Site Plan
Groen Construction Inc.
Darlene Colwell-Ellis Revocable Trust Dated January 22, 2007
10 Fourth Street, Dover, N.H.
Tax Map 10, Lot 54D & 54C

Mrs. Benton,

Enclosed please find the following required material in support of the site plan located at 10 Fourth Street.

- 9 Copies of the Site Plan Application
- 9 Copies of the Site Plan Checklist
- 9 Copies of CUP Applications and Narrative
- 9 Copies of the Lot Line Revision Application
- 9 Copies of a Narrative
- 9 Copies of waiver request
- 9 Copies of the Exterminator Report
- 9 Full Size Copies of the project plan set which include architectural drawings
- 6 Copies of the Traffic Impact Analysis Executive Summary
- 3 Copies of the Traffic Impact Analysis
- 2 Full Drainage Analyses
- 1 CD containing the same
- 1 Copy of the list of professionals

Thank you for your time and attention to this matter.

BERRY SURVEYING & ENGINEERING

Christopher R. Berry
Principal, President

City of Dover, New Hampshire
SITE REVIEW APPLICATION

[Revision Date: April 02, 2018]

Office Use Only	Project #: 19-03	Date Received:
	Amount Paid:	Time Received:

APPLICANT AND OWNER INFORMATION

Name of Applicant: Groen Construction, Inc. Telephone # 603-728-8955

Address of Applicant: 120 Washington St. Suite 302, Rochester, NH 03839

E-Mail Address: Ryan@groenconstruction.com

Name of Property Owner (*if different from applicant*): Darlene Colwell-Ellis Rev Fam Tst / City of Dover Telephone # 603-969-6632 / 603-516-6008

Address of Property Owner: 10A Fourth St, Dover, NH 03820 / 288 Central Ave, Dover, Nh 03820 Colwell-ellis@comcast.net

PROPERTY INFORMATION

Address of Property: 10 Fourth Street

Assessor's Map # 6 Lot(s) # 54D & 54C

Zoning District(s) CBD Overlay District(s) None

Size of Parcel: 4,956 / 18,408 sq. ft. 0.11 / 0.42 ac. Property Deed: Book 3781 / 758 Page: 284 / 207

Existing Use of Property: Real Estate office and Doug's Hoagies

SITE PLAN INFORMATION

Describe Proposed Use: Mixed use. 4,300 SF Commercial space with 20 Residential units on 2d, 3d, 4th and 5th floors.

Area of Parcel to be Developed: Revised area = 6,798 SF. Developing a 4,300 SF Building plus overhangs. sq. ft.

If Multi-family Residential, Specify Number of Units & Buildings Proposed: 20 Units / 1 Building

Number of Parking Spaces: Existing 65 (Street + Lot) Proposed 63 (Street + Lot)

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

Number of Employees Total: +/- 5 In Maximum Shift: +/- 5

Disposition of Parcel:

Building Footprint 4,300 sq. ft.

Total Building Area 5,194 sq. ft.

Paved Area 661 sq. ft.

Building Setbacks:

Front Yard 2.32 ft.

Rear Yard 5.51 (CUP Required) ft.

Side Yard: Right 10.47 ft. Left 12.88 ft.

City Water? X Yes ___ No How far is city water from the property? Fourth Street

City Sewer? X Yes ___ No How far is city sewer from the property? Fourth Street

BUILDING INFORMATION

Type of Building to be Built: Insulated Concrete Formed (ICF) Mixed use

Height of Building: 54' Finished Floor Elevation: 76.00

Number of Seats (where applicable) Less than 25

Estimated value of construction: 3 Million Refuse removal: Public/Private (circle one)

WAIVER REQUESTS

Site Review Regulations section(s) to be waived: Site specific soils map.

Justification for waiver request(s) (*attach additional sheets as needed*): The entire site is paved.

SURVEYOR INFORMATION

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

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

Professional License #: 805 E-mail address: K.Berry@BerrySurveying.com

ENGINEER INFORMATION

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

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

Professional License #: 14243 E-mail address: K.Berry@BerrySurveying.com

SIGNATURES

I/We hereby submit this application to the City of Dover Planning Board and attest that to the best of my knowledge all of the information on this application form and in the accompanying application materials and documentation is true and accurate. 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: 1-8-19

Signature of Applicant (*if different from owner*): Date: 1-8-19.

Signature of Agent: _____ Date: _____

AUTHORIZATION TO ENTER SUBJECT PROPERTY

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

Signature of Property Owner: Dashan Cook Eccles Date: 1-8-19.

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: Dashan Cook Eccles Date: 1-8-19.

Signature of Applicant (*if different from owner*): Ryan Cook Date: 1-8-19.

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: Dashan Cook-Eccles Date: 1-8-19.

Signature of Applicant (*if different from owner*): Ryan Cook Date: 1-8-19.

City of Dover, New Hampshire
SITE PLAN REVIEW SUBMISSION CHECKLIST

[Revision Date: June 25, 2018]

This site plan review checklist, as required by Chapter 149-6-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.

Fees will be invoiced and are due along with fifteen (15), folded, copies of the plan set and materials, including response to TRC comments, will be due 3 weeks 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: Groen Construction, Inc. File Number: P19-03

PROJECT TITLE: Fourt Street Depot.

PROPERTY LOCATION: 10 Fourth Street Tax Map: 6 Lot: 54D

	Explain How Provided	Reviewed
1. Completed and signed Application form	X	
2. Electronic copy of the engineered/surveyed plan layout	X	
3. Electronic copy of supplementary materials and application	X	
4. Traffic Impact Assessment and Analysis (Standard or Advanced)	X	
5. Waiver requests to the Site Plan Review Regulations, with written justification	X	
6. Conditional Use Permit applications	X	
7. A colored rendering of the streetscape that will be created along the existing public right-of-way	X	
8. A colored architectural plan showing all sides of buildings	X	
9. List of all professional agents to be notified for Planning Board	X	
10. Letter to Serve from Public and Private Utilities	X	
11. Eight 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	None	
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	
Depict pedestrian walkways and accessible access	X	
Location and width of existing and proposed access/egress ways	X	
Existing and proposed property lines with dimensions and bearings tied into Dover's Geographic Information System coordinate system	X	
	Explain How Provided	**Reviewed**

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	Hydrant on the corner X	
Location and materials of sanitary sewage facilities within project site and projected additional peak hour sewer load	X	
Existing and proposed stormwater lines and facilities	X	
Lighting plan depicting all existing and proposed exterior light fixtures and a lighting level analysis for parking lots	X	
Location of Flood Hazard Zone	N/A X	
Location of all bodies of water and watercourses	N/A X	
Location of wetlands and buffers	N/A X	
Neighborhood plan with aerial underlay showing how project relates to abutting uses within the plan set	X	
Existing natural features and/or significant vegetation on property	N/A 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	
12. 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	N/A X	
Erosion and Sedimentation Control Plan	X	
Landscape Operation and Maintenance Plan	X	
Proposed restrictive covenants or homeowners association documents	Lease Agreement X	
Dates and permit numbers of all required state and federal permits	None Required X	
If wetland buffer, indicate placards locations, as applicable	N/A 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 X	
Provide additional exhibits/technical data determined appropriate by the Planning Board or its staff as required	X	

REVIEWED BY: _____ DATE_____ TRC DATE_____

City of Dover, New Hampshire
CONDITIONAL USE PERMIT APPLICATION

[Revision Date: May 18, 2017]

Office Use Only	Project #: 19-06	Date Received:
	Amount Paid:	Time Received:

APPLICANT AND OWNER INFORMATION

Name of Applicant: Groen Construction, Inc Telephone # 603-728-8955

Address of Applicant: 120 Washington St. Suite 302, Rochester, NH 03839

E-Mail Address: Ryan@groenconstruction.com

Name of Property Owner (if different from applicant): Darlene Colwell-Ellis Rev Fam Tst Telephone # 603-969-6632

Address of Property Owner: 10A Fourth St, Dover, NH 03820 Colwell-ellis@comcast.net

PROPERTY INFORMATION

Assessor's Map # 6 Lot(s) # 54D

Address of Property: 10 Fourth Street

Zoning District(s) CBD Overlay District(s) None

Existing Use of Property: Real Estate office and Doug's Hoagies

CONDITIONAL USE PERMIT INFORMATION

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

☐ Conservation District ☐ RCM Use Overlay District ☐ I-1 District Uses

☐ Groundwater Protection ☐ Off-Street Parking and Loading ☐ Alternative Treatment Center

☐ Wetland Protection District ☒ Central Business District ☐ Heritage Residential District

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

Proposing a 4,300 SF ICF building with 20 Residential units. CUP needed for rear setback.

List Any Associated State or Federal Permits That Have Been or Will Be Applied For and Indicate Their Status: None Required

Name of Professional That Prepared Plans: Kenneth A Berry, PE, LLS
Berry Surveying & Engineering

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

Professional License #: 14243 E-mail address: K.Berry@BerrySurveying.com

SIGNATURES

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

Signature of Property Owner: Dorothea Cox Evans Date: 1-8-19

Signature of Applicant (if different from owner): Ryan Co. Date: 1-8-19.

Signature of Agent: Date:

AUTHORIZATION TO ENTER SUBJECT PROPERTY

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

Signature of Property Owner: Dorothea Cox Evans Date: 1-8-19.

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January 10, 2019

City of Dover Planning Board
Attn: Donna Benton, Assistant City Planner
288 Central Ave
Dover, NH 03820

RE: Proposed Site Plan
Groen Construction Inc.
Darlene Colwell-Ellis Revocable Trust Dated January 22, 2007
10 Fourth Street, Dover, N.H.
Conditional Use Permit

Mr. Chairman and Members of the Dover Planning Board,

Pursuant to Zoning Regulations (Chapter 170-20 B,) Berry Surveying & Engineering (BS&E,) on behalf of Groen Construction Inc. and the Darlene Colwell-Ellis Revocable Trust Dated January 22, 2007, respectfully requests the City of Dover Planning Board to approve the following Conditional Use Permit:

- Minimum Rear Setback of Less than 10 feet (proposed 5.5 feet)

1. Identification of Conditional Use Permit

Dimensional regulations in the General sub-district of the Central Business District (CBD) state that the rear setback minimum is 10 feet.

Below we show the project's compliance with the standards required to grant a Conditional Use Permit, and we provide justification for its approval.

2. Compliance with the following standards

a) That both public and private buildings and landscaping shall contribute to the physical definition of rights of way as civic spaces.

- **The proposed development will enhance the overall streetscape and civic space of the surrounding area by adding landscaping to a location that currently has none. In addition, the use of brick facades along the front of the proposed building will also enhance the streetscape. The**

definition of rights of way are enhanced with this project, with the addition of the two well lit, pedestrian access ways from the municipal lot to Fourth Street.

b) That development shall adequately accommodate automobiles, while respecting the pedestrian and the spatial form of public areas.

- **Part of the proposed development will be to re-stripe the parking on Fourth Street and within the municipal lot so that overall traffic flow will be enhanced. A sidewalk network will also be constructed from both Fourth Street and Chestnut Street to the proposed building and existing parking lot. These sidewalks will serve to increase the pedestrian flow and provide an increased level of safety.**

c) That the design of streets and buildings shall reinforce safe environments.

- **The proposed site layout was designed so that vehicles and pedestrians could access the building and parking lot in a safe and efficient manner. There is no sidewalk network on right the side of Fourth Street. The proposed sidewalk will provide a necessary improvement to the pedestrian safety along Fourth Street.**

d) That architecture and landscape design shall grow from local climate, topography, history, and building practice.

- **The proposed landscaping will utilize a variety of shrubs and perennials that will thrive in the New England climate. The architecture of the proposed building will also conform to the class New England style of building and the use of brick facades will enable the building to conform to the style of building within the Central Business District.**

e) That buildings shall provide their inhabitants with a clear sense of geography and climate through energy efficient methods.

- **The proposed building will utilize energy efficient methods, such as I.C.F., so that the inhabitants will have a clear sense of the geography and climate. Residential heat pumps are proposed for heating and cooling to increase the**

use of efficient technology while reducing the overall living cost.

f) That civic buildings and public gathering places shall be provided as locations that reinforce community identity and activity.

- **Benches are proposed throughout the site to provide areas for community development and identity. This building is also in close proximity to several iconic restaurants and gathering areas, which will further increase the community activity and identity. Enhancements to the abutting areas include walkway definition and an increase of greenery.**

g) That civic buildings shall be distinctive and appropriate to a role more important than the other buildings that constitute the fabric of the city.

- **The proposed building is designed so that it will be distinctive and integral to the City's fabric. This will be achieved through the architecture of the building and the proposed streetscape that will be generated as part of the development.**

h) That the preservation and renewal of historic buildings shall be facilitated.

- **The existing building holds no significant historical value. The proposed building will be designed so that its streetscape and architecture will increase the overall value of the area.**

i) That the harmonious and orderly evolution of urban areas shall be secured through the adoption of these regulations.

- **The proposed site development conforms to the City's master plan by taking underutilized buildings and lots and evolving them into areas that will enhance the surrounding area.**

3. Justification for approval of Conditional Use Permit

The existing building is within 4.5 feet of the rear property line, which does not meet the 10 feet rear setback within the Central Business District. With the proposed lot line revision, the proposed mixed use building will be 5.5 feet from the rear property.

Although it does not meet the 10 foot setback, it will become more nearly conforming to the setback regulation. Pushing the lot line further would put part of the parking lot on private land, which is not the cleanest way to manage the parking lot.

Thank you for your time and attention to this matter, and we hope you look favorably upon the request.

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

James F. Hayden
Engineering Technician

Christopher R. Berry
Principal, President

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January 10, 2019

City of Dover
Attention: Assistant City Planner Donna Benton
288 Central Ave
Dover, NH 03820

Re: Proposed Site Plan
Groen Construction Inc.
Darlene Colwell-Ellis Revocable Trust Dated January 22, 2007
10 Fourth Street, Dover, N.H.
Tax Map 10, Lot 54D & 54C

Dear Mrs. Benton,

On behalf of our clients, Groen Construction Inc. and Darlene Colwell-Ellis Revocable Trust Dated January 22, 2007, Berry Surveying & Engineering (BS&E) is submitting to the TRC to discuss a proposed development off Fourth Street, located in the Central Business District (CBD) Downtown General Sub-District.

Background and General Narrative:

Darlene Colwell-Ellis Revocable Family Trust owns the parcel known as 10 Fourth Street in Dover, NH (Tax Map 10, Lot 54D). Berry Surveying & Engineering has conducted an on-site survey of the parcel which includes a topographic analysis as well as a wetlands analysis. Please note there are no wetlands found on the parcel. The site contains a single structure which sits at the front of the parcel on Fourth Street. The parcel is 0.11 acres in size. There is one entrance off Chestnut Street which is used to access the parcel through Chestnut Street Municipal Lot, Tax Map 10, Lot 54C.

The Proposal:

The proposal is to demolish the existing building on Lot 54D, in order to construct a new mixed use building in its place. The mixed building will have commercial offices on the first floor and residential units above. The building is proposed to be 4,300 Square Feet and will have frontage on Fourth Street. The front of the building will have a brick façade so that it will resemble surrounding buildings in the Central Building District (see architectural plans). The development is proposing to re-stripe Chestnut Street lot and add spaces to Fourth Street. With the redevelopment, there is only a net loss of 2 spaces.

As part of the building construction, the municipal parking lot on Lot 54C will be partially reconstructed, while the remainder of the parking lot will be sealed and re-striped. A 5 foot wide bituminous concrete sidewalk will constructed along the proposed building in order to provide pedestrians a safe way to access the parking lot and proposed building from Chestnut Street and provide access to Fourth Street. Access Easements are provided to the City as part of the application. A portion of Fourth Street will also be reconstructed and re-striped. In addition, the sidewalk along Fourth Street will be extended from the intersection of Chestnut Street down to Lot 54E. The proposed building will be serviced by City Water and Sewer, which is located in Fourth Street.

A landscaping plan is included in the plan set to show the diverse landscaping that will be installed as part of the construction process. Several street trees will be planted in front of the building along Fourth Street, in order to enhance the street scape. Landscaping will also be added to the boundary line abutting Lot 54E, in order to screen the proposed project and add vegetation where very little is currently present, and help with light trespass onto abutting lots. Finally, a shrub landscape buffer will be placed along the property line abutting Lot 54B.

As part of the proposed construction, the applicant is also proposing a lot line adjustment with the City. A portion of Lot 54C will be transferred to Lot 54D in order to provide the applicant with the necessary lot size to build the proposed building. In addition to the lot line adjustment, several easements are proposed. Two of the easements will for access from Fourth Street to the Municipal Parking lot on Lot 54 C, via the proposed sidewalks on either side of the building. Fourth Street is currently deprived of parking and these access easements will allow for pedestrian traffic to flow to and from the lot to Fourth Street. A third easement is proposed around the proposed dumpster on abutting land. The existing dumpster that services the lots currently sits on Lot 54E. The dumpster will be moved away from the existing building.

The applicant is also applying for a conditional use permit for the minimum setback of 10 feet within the Central Business District. The proposed building will have a rear setback of 5.5 feet, which is 1 foot more than the existing building (4.5 feet). Although it does not meet the setback requirements, it will become more nearly conforming.

We look forward to working with staff on this proposal and moving forward to a final submission.

BERRY SURVEYING & ENGINEERING

James Hayden
Engineering Technician

Christopher R. Berry
Principal, President

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January 10, 2019

City of Dover Planning Board
Attn: Donna Benton, Assistant City Planner
288 Central Ave
Dover, NH 03820

RE: Proposed Site Plan
Groen Construction Inc.
Darlene Colwell-Ellis Revocable Trust Dated January 22, 2007
10 Fourth Street, Dover, N.H.
Tax Map 10, Lot 54D & 54C

Mr. Chairperson & Members of the Dover Planning Board:

In accordance with to the Site Review standards the following waiver is hereby requested:

1. **Identification of Waiver Request**: Submission of a Site Specific Soils Map as part of a site plan application.

   - Site Plan application without a Site Specific Soils Map (SSSM).

2. **Explanation:**

The proposal is to demolish the existing building on Lot 54D, in order to construct a new Mixed use building in its place. The mixed building will have commercial offices on the first floor and residential units above. The building is proposed to be 4,300 Square Feet and will have frontage on Fourth Street. The front of the building will have a brick façade so that it will resemble surrounding buildings in the Central Building District. The entire project site is paved, therefore a SSSM is not required.

3. **Waiver Justification**:

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

The intent of this regulation is to ensure that proper data is collected in relation to soils so that the project drainage can be designed accordingly. Given the use of the NRCS Web Soil Survey, the soil type was obtained and only one soil type was found on site. This regulation is more prevalent in jobs that will utilize septic systems or require storm water management systems that utilize infiltration through natural soil types. The proposed site development will not utilize any storm water infiltration. All storm water will be diverted to catch basins, as part of the existing drainage infrastructure, is 100% paved.

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

Strict conformity to this regulation will require the applicant to involve a certified soils scientist, who will have to go on site and delineate the soils type, amongst the impervious surface which would be a wasted effort.

Thank you for your time and attention to this matter and we hope you look favorably upon the requests.

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

James F. Hayden
Engineering Technician

Christopher R. Berry
Principal, President

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City of Dover, New Hampshire
MINOR LOT LINE ADJUSTMENT APPLICATION

[Revision Date: May 18, 2017]

Office Use Only	Project #: 19-08	Date Received:
	Amount Paid:	Time Received:

APPLICANT INFORMATION

Name of Applicant: Groen Construction, Inc. Telephone # 603-728-8955

Address of Applicant: 120 Washington St. Suite 302, Rochester, NH 03839 Ryan@groenconstruction.com

FIRST PROPERTY OWNER AND PARCEL INFORMATION

Name of 1st Property Owner (*if different from applicant*): Darlene Colwell-Ellis Fam Rev Tst Telephone #603-969-6632

Address of 1st Property Owner: 10A Fourth St, Dover, NH 03820 Collwell-ellis@comcast.net

Address of Property: 10 Fourth Street

Assessor's Map # 6 Lot(s) # 54D

Property Deed: Book 3781 Page: 284

Zoning District(s) CBD Overlay District(s) None

Size of Existing Parcel (sq. ft.): 4,956 SF Size of Proposed Parcel (sq. ft.): 6,798 SF

SECOND PROPERTY OWNER AND PARCEL INFORMATION

Name of 2nd Property Owner (*if different from applicant*): City of Dover Telephone #516-6008

Address of 2nd Property Owner: Christopher Parker, Assistant City Manager 288 Central Ave, Dover, NH 03820

Address of Property: Chestnut Street Parking Lot

Assessor's Map # 6 Lot(s) # 54C

Property Deed: Book 758 Page: 207

Zoning District(s) CBD Overlay District(s) None

Size of Existing Parcel (sq. ft.): 18,408 Size of Proposed Parcel (sq. ft.): 16,565

[Use additional application form if more than two lots are being adjusted]

SURVEYOR INFORMATION

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

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

Professional License #: 14243 E-mail address: K.Berry@BerrySurveying.com

SIGNATURES

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

Signature of First Property Owner: _____ Date: 1-8-19

Signature of Second Property Owner: _____ Date: _____

Signature of Applicant (*if different from owner*): _____ Date: 1-8-19

Signature of Agent: _____ Date: _____

AUTHORIZATION TO ENTER SUBJECT PROPERTY

I 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: 1-8-19

City of Dover, New Hampshire
LOT LINE ADJUSTMENT SUBMISSION CHECKLIST

[Revision Date: May 15, 2017]

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.

Fifteen (15), folded, copies of the plan set and materials will be due 3 weeks prior to the Planning Board meeting. Fees will be invoiced and are due 2 weeks prior to Planning Board.

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: Groen Construction, Inc File Number: P19-08

PROPERTY LOCATION: 10 Fourth Street Tax Map: 6 Lot: 54D + 54C

	Explain How Provided	Reviewed
1. Completed and signed Application form	X	
2. Electronic copy of the surveyed plat layout	X	
3. Electronic copy of supplementary materials and application	X	
4. List of all professional agents to be notified for Planning Board	X	
5. Fifteen copies of LLA plan w/scale of not less than 1"=50' or 1"=100' for larger adjustments. Plans shall contain the following items as appropriate:	X	
Location map at appropriate scale	X	
Planning File #	X	
Date, north arrow and scale	X	
Names of all abutting property owners	X	
Name and address of owners	X	
Signature & stamp of NH licensed land surveyor	X	
Zoning District boundaries, including any special or overlay districts	X	
Location of Conservation District areas	None X	
Location, names and widths of existing and streets, including pavement widths, grades, curbs and crosswalks	X	
Location and widths of existing & proposed easements & right of ways	Easement Sheet	
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 buildings and structure locations	N/A X	
Minimum building setbacks or build to lines on all lots	X	
Map and lot numbers for existing and proposed lots as assigned by Tax Assessor	X	
Location, material and size of existing and proposed permanent monuments	X	
All applicable Dover Common Subdivision notes		

REVIEWED BY: _____ DATE_____

EVERSOURCE ENERGY

January 7, 2019

1700 Lafayette Road
Portsmouth, NH 03801

Michael J Busby
603-436-7708 x555-5678
michael.busby@eversource.com

Ryan Greenhalgh
Groen Construction, Inc
120 Washington St, Suite 302
Rochester, NH 03839

Dear Ryan:

I am responding to your request to confirm the availability of electric service for the proposed 10 Fourth St, Dover, NH project being constructed for/by Groen Construction, Inc.

The proposed project consists of a 5-story building with 20 residential units and 4 ground floor commercial units. The proposed development will be constructed along Fourth Street.

The developer will be responsible for the installation of all underground facilities and infrastructure required to service the new building. The service will be as shown on attached marked up Utility Plan (page 10 of 20) for Groen Construction. The proposed building service will be fed from a new 300KVA pad-mounted transformer (53/2T2). The new transformer will be looped between existing pad-mounted transformer (Cara-53/2T1) and new riser pole (P53/1). The developer will work with Eversource to obtain all necessary easements and licenses for the proposed underground facilities listed above.

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

The attached drawing titled "For Groen Construction, Inc, Land of Darlene Colwell Ellis Revocable Family Trust Utility Plan" dated 01/10/2019 shows transformer locations to service your proposed project.

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

If you require additional information or I can be of further assistance please do not hesitate to contact me at our Portsmouth Office, 603-436-7708 Ext. 555-5678

Respectfully.

Michael J. Busby, PE
NH Eastern Regional Engineering and Design Manager, Eversource

cc: (via e-mail)
Michael Lee, Eastern Region Operations Manager, Eversource
Mary Jo Hanson, Field Supervisor, Electric Design, Eversource

NOTES:

1.) OWNER: DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST DATED JANUARY 22, 2007
DARLENE G. COLWELL-ELLIS TRUSTEE
10 FOURTH STREET
DOVER, NH 03820

1A.) APPLICANT: GROEN CONSTRUCTION, INC
120 WASHINGTON STREET, SUITE 302
ROCHESTER, NH 03839

2.) TAX MAP 6, LOT 540

3.) LOT AREA: 4,956 Sq. Ft., 0.11 Ac.

4.) S.C.R.D. BOOK 3781, PAGE 284

5.) ZONING: CBD GENERAL SUB-DISTRICT
PRINCIPAL BUILDING:
LOT SIZE: NA
MIN LOT COVERAGE: 75%
FRONTAGE BUILD-OUT: 70%
FRONT PRIMARY BUILD-TO: +/- 1'
SIDE SETBACK: 0 FT MIN - 24 FT MAX
REAR SETBACK: 10 FT MIN
PRINCIPAL BUILDING: 2 STORY MIN & 5 STORY MAX

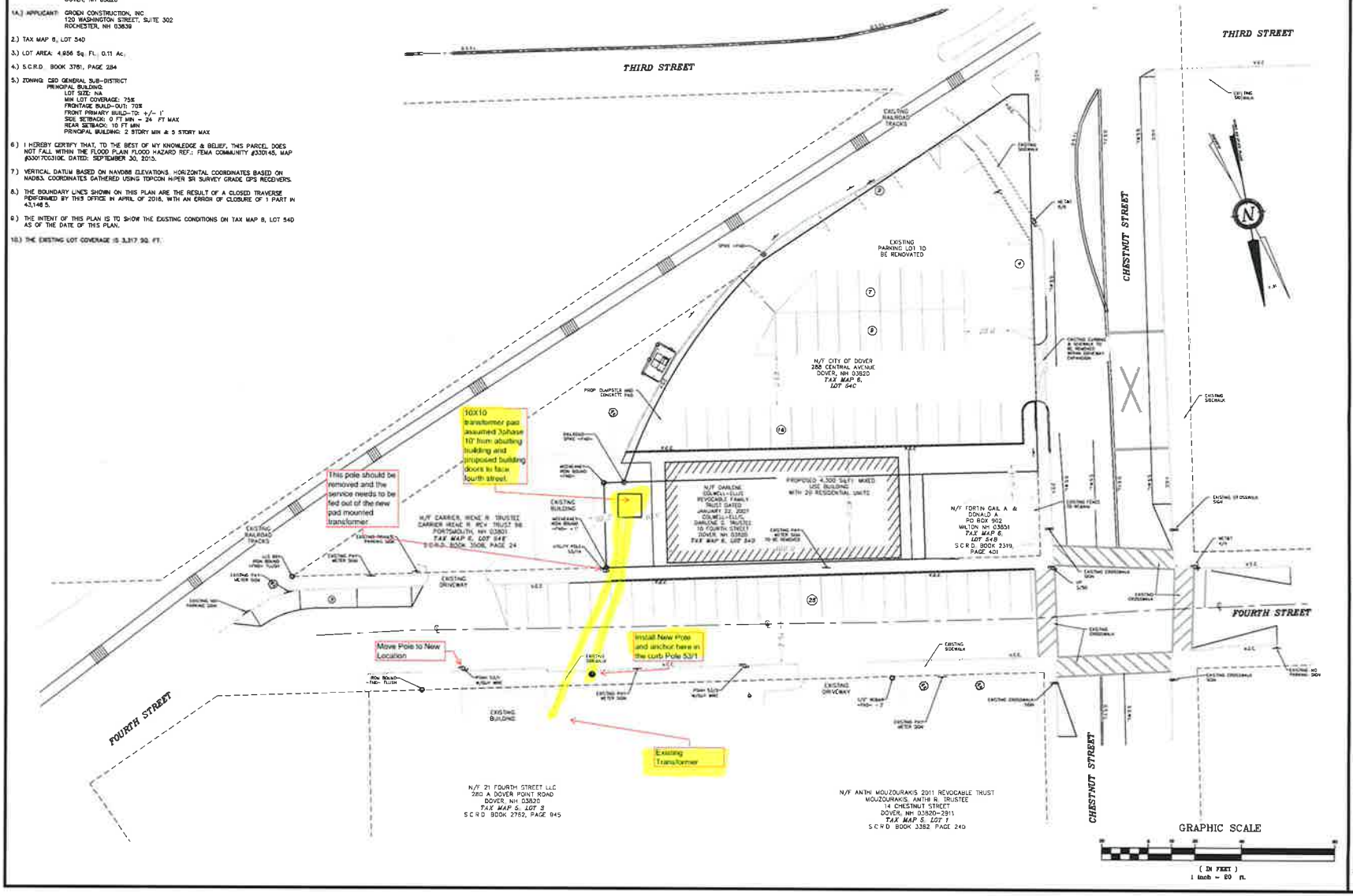
6.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, THIS PARCEL, DOES NOT FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015.

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 APRIL OF 2016, WITH AN ERROR OF CLOSURE OF 1 PART IN 43,146 S.

9.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS ON TAX MAP 6, LOT 540 AS OF THE DATE OF THIS PLAN.

10.) THE EXISTING LOT COVERAGE IS 3,317 SQ. FT.


THIRD STREET
THIRD STREET
CHESTNUT STREET
CHESTNUT STREET
FOURTH STREET
FOURTH STREET
EXISTING RAILROAD TRACKS
EXISTING PARKING LOT TO BE RENOVATED
N/F CITY OF DOVER
288 CENTRAL AVENUE
DOVER, NH 03820
TAX MAP 6, LOT 64C
PROP. DUMPSTER AND CONCRETE PAD
10X10 transformer pad assumed 3phase 10' from abutting building and proposed building doors to face fourth street.
This pole should be removed and the service needs to be fed out of the new pad mounted transformer
N/F DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST DATED JANUARY 22, 2007 COLWELL-ELLIS, DARLENE E. TRUSTEE 10 FOURTH STREET DOVER, NH 03820 TAX MAP 6, LOT 540
PROPOSED 4,300 SQFT MIXED USE BUILDING WITH 20 RESIDENTIAL UNITS
N/F TORTIN GAIL A & DONALD A PO BOX 902 MILTON, NH 03851 TAX MAP 6, LOT 548 S.C.R.D. BOOK 2319, PAGE 401
N/F CARRIER IRENE R. TRUSTEE CARRIER IRENE R. REV. TRUST 98 PORTSMOUTH, NH 03801 TAX MAP 6, LOT 54E S.C.R.D. BOOK 3508, PAGE 24
EXISTING BUILDING
EXISTING DRIVEWAY
Move Pole to New Location
Install New Pole and anchor here in the curb Pole 53/1
Existing Transformer
EXISTING BUILDING
EXISTING DRIVEWAY
N/F 21 FOURTH STREET LLC
280 A DOVER POINT ROAD
DOVER, NH 03820
TAX MAP 6, LOT 3
S.C.R.D. BOOK 3762, PAGE 945
N/F ANTHI MOUZOURAKIS 2011 REVOCABLE TRUST
MOUZOURAKIS, ANTHI R. TRUSTEE
14 CHESTNUT STREET
DOVER, NH 03820-2911
TAX MAP 5, LOT 1
S.C.R.D. BOOK 3382 PAGE 240
EXISTING SIDEWALK
EXISTING CROSSWALK
EXISTING SIGN
EXISTING FENCE TO REMAIN
EXISTING UTILITY POLE
EXISTING HYDRANT
EXISTING CURBING & SIDEWALK TO BE REMOVED TO ALLOW FOR SIDEWALK EXPANSION
EXISTING CURBING & SIDEWALK TO BE REMOVED TO ALLOW FOR SIDEWALK EXPANSION
EXISTING CROSSWALK SIGN
EXISTING NO PARKING SIGN
EXISTING PAINT METER SIGN
EXISTING METER SIGN TO BE REMOVED
EXISTING PAINT METER SIGN
EXISTING METER SIGN
EXISTING PAINT METER SIGN
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EXISTING METER SIGN
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EXISTING METER SIGN
EXISTING PAINT METER SIGN
EXISTING

Unitil

1/7/19

Groan Construction Inc.
120 Washington St. Suite 302
Rochester, NH 03839

RE: Natural gas service to 10 Fourth Street, Dover, NH

Unitil's natural gas division has reviewed the requested site for natural gas service.

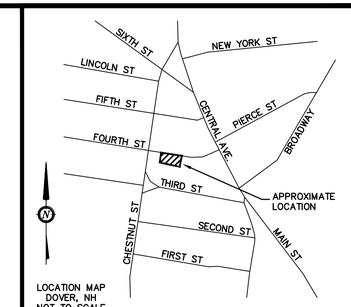
Unitil hereby confirms natural gas is available from Fourth Street to supply the proposed Site at 10 Fourth Street, Dover NH.

Please contact me with any questions at 603-294-5144.

Sincerely,

David Beaulieu
Business Development Executive
Unitil
325 West Road
Portsmouth, NH 03801





LOCATION MAP
DOVER, NH
NOT TO SCALE

LEGEND:

- PROPOSED BUILDING
- EXISTING TO BUILDING REMAIN
- PROPOSED ON SITE PARKING SPACE
- EXISTING OFF SITE PARKING SPACE
- PROPOSED OFF SITE PARKING SPACE
- EXISTING SIDEWALK
- PROPOSED SIDEWALK
- PAVED AREA
- GRASS OR NON-IMPERVIOUS SURFACE

PROPOSED PARKING SPACE CHART

LOCATION	ADA SPACES	TOTAL SPACES
FOURTH STREET	0	25
CHESTNUT STREET LOT	2	38

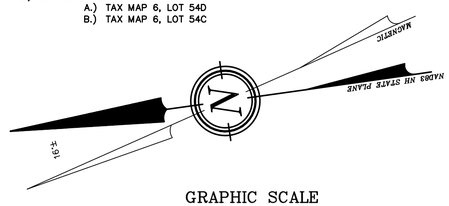
NOTES:

1.) OWNER: A.) DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST DATED JANUARY 22, 2007
DARLENE G. COLWELL–ELLIS TRUSTEE
10A FOURTH STREET
DOVER, NH 03820

B.) CITY OF DOVER
288 CENTRAL AVENUE
DOVER, NH 03820

1A.) APPLICANT: GROEN CONSTRUCTION, INC.
120 WASHINGTON STREET, SUITE 302
ROCHESTER, NH 03839

2.) CITY OF DOVER:
A.) TAX MAP 6, LOT 54D
B.) TAX MAP 6, LOT 54C



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

REVISION	DATE	DESCRIPTION

DOVER PLANNING #P19-03, P19-06, P19-07, P19-08

COLOR NEIGHBORHOOD PLAN
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 – 146

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

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

City of Dover Planning Department
Attention: Assistant City Planner Donna Benton
288 Central Ave.
Dover, NH 03820

January 10th, 2018

RE: Traffic Impact Analysis & Distribution
Groen Construction, Inc.
Darlene Colwell-Ellis Rev. Family Trust Dated January 22, 2007
Darlene G. Colwell-Ellis Trustee
10 Fourth Street
Dover, NH 03820

Mrs. Benton,

Pursuant to the City of Dover Site Review Regulations, Berry Surveying & Engineering (BS&E), on behalf of Groen Construction, Inc. and Darlene G. Colwell-Ellis, has prepared a Standard Traffic Impact Analysis for the development of a five story mixed-use building with four commercial units and twenty residential units proposed at 10 Fourth Street. The two points of analysis are the driveway of the municipal parking lot and Fourth Street east of Chestnut Street.

The following conclusions were reached as a result Traffic Impact Analysis:

- A total build generation of 33 vehicle trips (25 enter/8 exit) are predicted to occur at the AM peak hour and 63 vehicle trips (25 enter/38 exit) at the PM peak hour.
- A total build generation of 33 vehicle trips (25 enter/8 exit) are predicted to occur to the municipal parking lot at the AM peak hour and 45 vehicle trips (16 enter/29 exit) at the PM peak hour.
- A total build generation of 0 vehicle trips are predicted to occur to Fourth Street at the AM peak hour and 18 vehicle trips (9 enter/9 exit) at the PM peak hour.
- This is a total increase in trip generation of 2 AM trips and a decrease of 5 PM trips.
- There is a public bus stop and a train station within a quarter mile that present a further opportunity for reduction of trips generated.
- It is recommended that the existing and surrounding infrastructure will be sufficient to handle the projected increase in vehicle trips and peak hour and all other hours.

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Proposed Development & Introduction

The proposal is to redevelop this site to contain a five story mixed use building containing four commercial units on the first floor and twenty residential units on the second-fifth floors. The building access is proposed at two locations, the existing municipal parking lot at the rear of the building for residential units and Fourth Street for the commercial units. The entrance for the municipal parking lot is proposed to be moved to the south and the parking lot will be sealed and restriped. Fourth Street is proposed to be restriped for additional parking. As both of these locations are proposed to receive trips from the development, they are considered the points of analysis. The purpose of this analysis is to determine the maximum number of trips coming to and leaving the municipal parking lot and Fourth Street parking during certain peak periods of the day. This information is then used in determining the impact on safety as it relates to the existing roadway infrastructure. The following components of the analysis are typical for a project of this size pursuant to the Institute of Traffic Engineers (ITE) manual.

Existing Conditions

Existing Site Description

The existing site consists of two lots, Tax Map 6, Lot 54D and Tax Map 6, Lot 54C. These parcels contain 4,956 Sq. Ft. (0.11 Ac.) and 18,408 Sq. Ft. (0.42 Ac.) of land, respectively. Tax Map 6, Lot 54D has frontage on Fourth Street and is primarily occupied by a single story mixed use building proposed to be removed. This building contains Doug's Hoagies and general office space. Tax Map 6, Lot 54D is proposed to contain the five story mixed use building. Tax Map 6, Lot 54C has frontage on Chestnut Street and is a municipal parking lot with forty-four spaces. The municipal parking lot on Tax Map 6, Lot 54C is proposed to be sealed and restriped, with thirty-eight spaces. Both lots are located in the CBD General Sub-district and are surrounded by commercial and residential lots. The site is adjacent to the intersections of Chestnut Street and Fourth Street as well as the intersection of Chestnut Street and Third Street.

Chestnut Street and Fourth Street Description

Chestnut Street is a two lane major collector road, according to the NHDOT MS2 Transportation Management System (NHDOT). At the intersection of Chestnut Street and Fourth Street, there is a left turn lane for both northbound and southbound traffic. This road provides access to Central Ave to the north and Washington Street to the south. It has an Average Annual Daily Traffic (AADT) of approximately 12,314 (2017) divided between north and south, also as shown by the NHDOT.

Chestnut Street in the area of the project is composed of a fifty-one foot wide paved surface with fourteen foot northbound lane, fifteen foot southbound lane, nine foot left turn lane, on street parking on the west side of the road, and sidewalks with vertical granite curbing on the east and west side of the road. There is centerline delineation and fog / edge lines provided. The posted

speed limit of the roadway is 30 miles per hour (MPH). The geometry of Chestnut Street is relatively flat and straight in the project location.

In the area of the project, Fourth Street is a one way local road that runs west to east, according to the NHDOT MS2 Transportation Management System (NHDOT). Fourth Street is composed of a thirty-seven foot wide paved surface with on street parking and a sidewalk with vertical granite curbing on the north side of the road. There are no centerline delineation or fog / edge lines provided. The posted speed limit of the roadway is 30 miles per hour (MPH). The geometry of Fourth Street is relatively flat and straight in the project location. There are sidewalks, crosswalks, and pedestrian crossing signs in the area of the project.

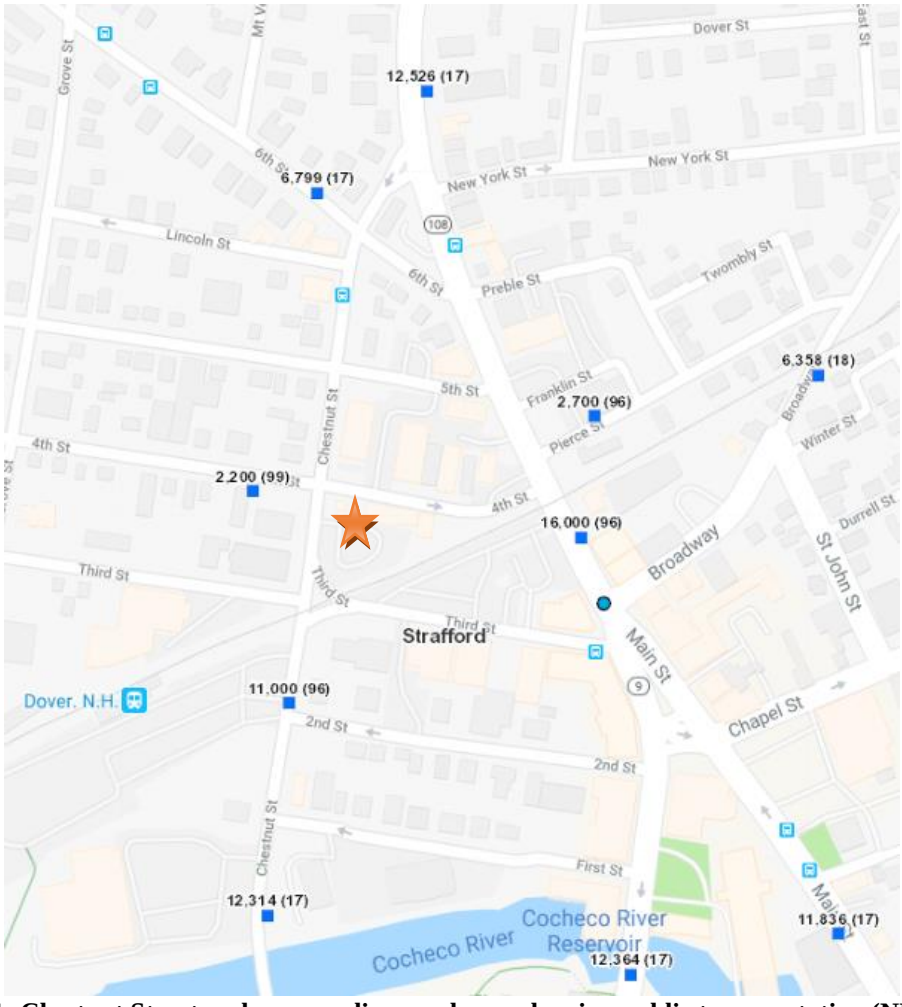


Figure 1: Chestnut Street and surrounding roadways showing public transportation (NHDOT)

Existing Traffic Volumes

According to traffic counts recorded by the NHDOT for October 25th - October 27th 2016, the Chestnut Street AM and PM two-way peaks were 1,007 trips and 1,362 trips, respectively. It was found that Chestnut Street has an AADT of 12,314 vehicles.

The highest peak hour traffic volume on this section of Chestnut Street northbound occurred from 8-9 AM with 366 vehicles and from 4-5 PM with 621 vehicles. South bound highest peak hour traffic volume occurred from 7-8 AM with 648 vehicles and from 4-5 PM with 741 vehicles. Table #1 shows the traffic direction breakdown of Chestnut Street and Figures #1-3 are graphical representations of the traffic variations occurring throughout the day.

Traffic Distribution Chestnut Street						
Date	North Bound		South Bound		Two-Way	
10/25/2016	AM Peak	353	AM Peak	654	AM Peak	1007
	PM Peak	566	PM Peak	731	PM Peak	1297
10/26/2016	AM Peak	363	AM Peak	640	AM Peak	971
	PM Peak	621	PM Peak	741	PM Peak	1362
10/27/2016	AM Peak	366	AM Peak	648	AM Peak	973
	PM Peak	560	PM Peak	719	PM Peak	1274
Average Peak Hour Traffic	AM Peak	360.7	AM Peak	647.3	AM Peak	983.7
	PM Peak	582.3	PM Peak	730.3	PM Peak	1311.0
% Distribution	AM Peak	35.8	AM Peak	64.2		
	PM Peak	44.4	PM Peak	55.6		

Table 1: Directional breakdown of trips occurring on Chestnut Street

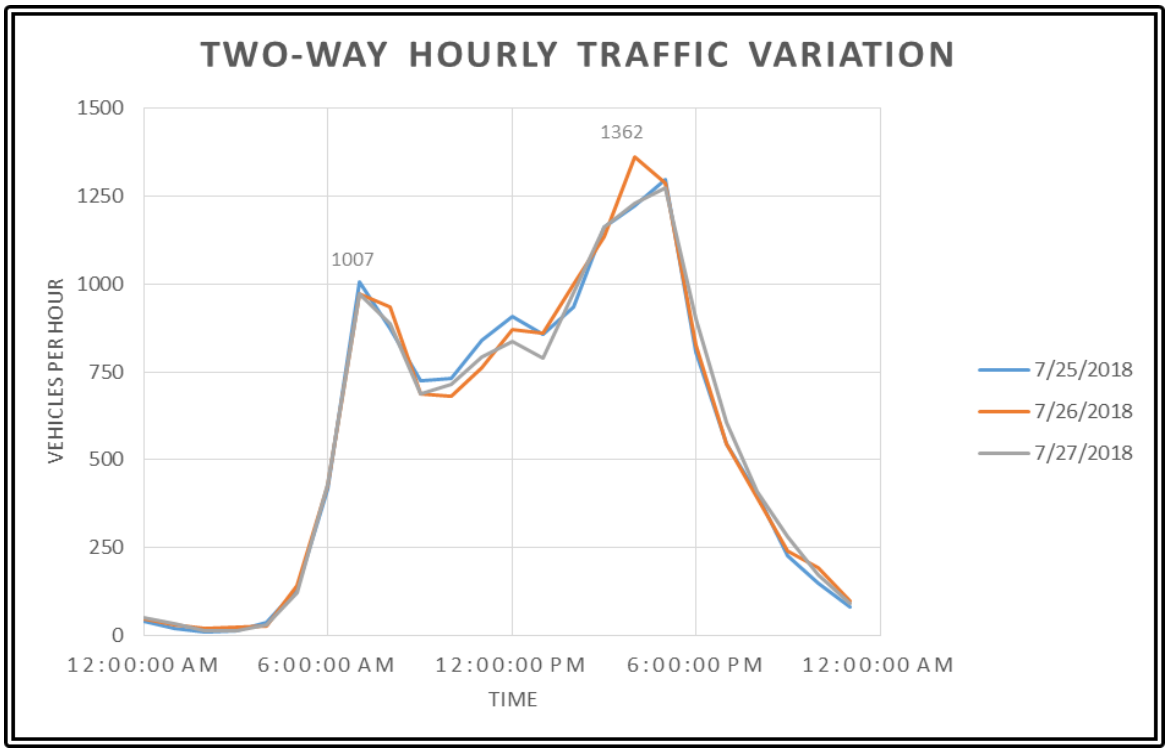


Figure 2: Graph of Chestnut Street two-way hourly variation with peak hour values

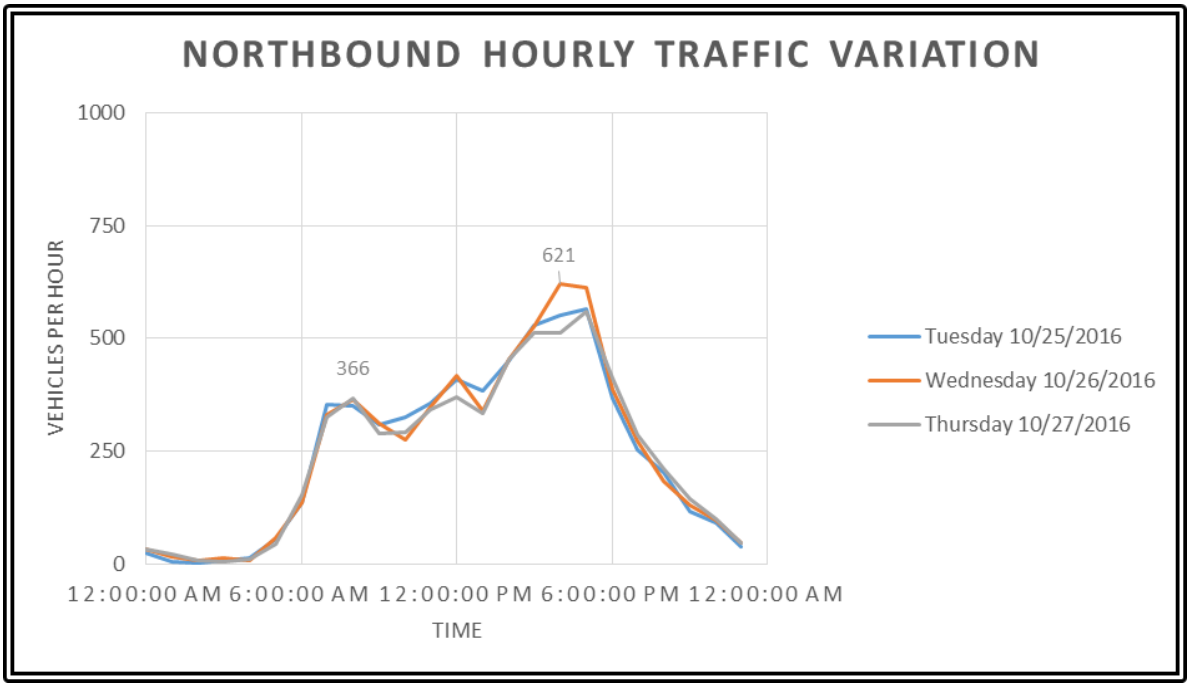


Figure 3: Graph of Chestnut Street northbound hourly variation with peak hour values

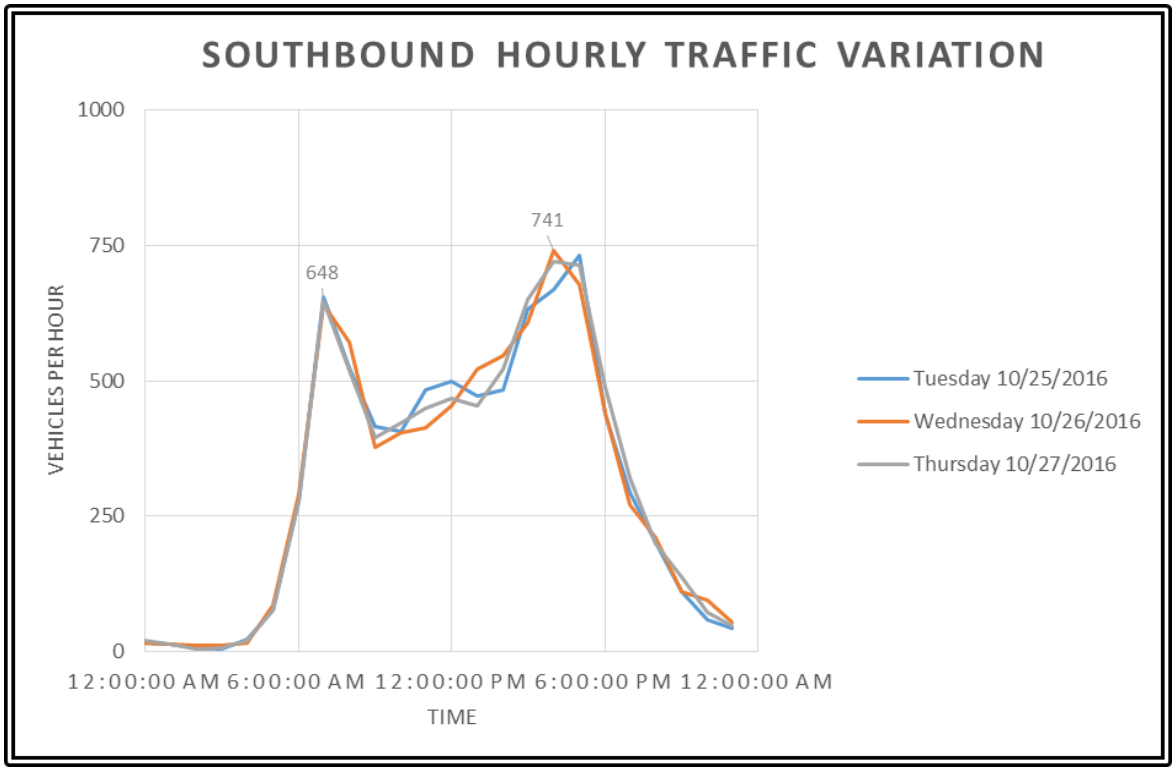


Figure 4: Graph of Chestnut Street southbound hourly variation with peak hour values

Existing Vehicle Speeds

As previously mentioned, Chestnut and Fourth Street are both governed by the city-wide speed limit of 30 MPH. It has been observed by Berry Surveying & Engineering that speeds in the area of the project site are not excessive. The exception is vehicle traffic heading southbound on Chestnut Street, while excessive speeds were rare, and most operators obeyed the posted speed limits within a deviation of 5 MPH. This is consistent with speeds found on urban roads. The 85th percentile derived by observation and consistency with general practice is 35 MPH. For the purposes of this study it is assumed that the majority of operators obey the 30 MPH Dover speed limits for Fourth Street and Chestnut Street northbound and 35 MPH will be used for Chestnut Street southbound.

Proximity to Public Transportation

The proposed build out presents an excellent opportunity for the utilization of public transportation for residents and guests alike. Approximately 500 feet to the south is the Dover Transportation Center. The Dover Transportation Center provides park and ride access as well as access to Coast busses, UNH busses, and rail access with Amtrak service. There are sidewalks and crosswalks that allow for safe access from the site. In addition, approximately 0.2 miles to the south at the corner of Third Street and Central Ave is a Coast bus stop, Route 2, Third

Street/Central Ave. There are sidewalks and crosswalks that allow for safe bus stop access from the site as well. Utilization of these routes also presents an opportunity for a reduction of trips generated by the site and will be discussed later in the analysis. Figure 1, (page 6), shows the locations of bus stops surrounding the site.

Adjacent Intersections

Approximately seventy-five feet to the north of the municipal parking lot, Chestnut Street intersects Fourth Street at an angle of 90 degrees. This intersection uses single stop control of Fourth Street west of Chestnut Street and no stop control for Chestnut Street. Fourth Street east of Chestnut Street is one way until the intersection with Central Ave. Chestnut Street contains left turn lanes for north and southbound traffic at the intersection to allow for vehicle turns to Fourth Street east and westbound. There are sidewalks, crosswalks, and pedestrian crossing signs at all four legs of the intersection to allow for safe pedestrian crossing.

Approximately one hundred and fifty feet to the south of the municipal parking lot, Third Street intersects Chestnut Street at an angle of 90 degrees from the west and with two legs intersecting at approximately 45 degrees from the east. This intersection uses two-way stop control to determine traffic movements. Chestnut Street traffic movements do not stop as they approach the intersection. This section of Chestnut Street also contains a railroad crossing. Four railroad crossing gates are present at the intersection as well as crossing signals. There are sidewalks on all sides of the intersection but a crosswalk only exists across the western side of the intersection across Third Street. The City of Dover is proposing a roundabout at this intersection to alleviate traffic congestion, increase level of service on east / west legs and decrease speeds on north / south legs, and provide better pedestrian access to the Dover Transportation Center. It is felt by BS&E that this roundabout will allow for an increase ability to handle future traffic generation.

Existing Trip Generation

The 9th Edition ITE Trip Generation Manual was used to determine the existing volume of trips. Along with the percentage of entrance-to-exit traffic experienced during the AM & PM peak hours between 7 and 9 AM and 4 and 6 PM. Land Use Codes Park and Ride Lot (90), General Office Building (710), Fast Food Restaurant without Drive-thru (933), and Bread/Donut/Bagel Shop without Drive-thru (939) were used in deriving the trip generation for the existing site. Trip generations were then modified based on the Transportation Research Board's Transit Cooperative Research Program Report 128 entitled *Effects of TOD on Housing, Parking, and Travel*, which states that for a community with access to a small transit system, 72% of commuters are commuters by automobile. Therefore, 72% of the calculated ITE trip generation was used in each case with the exception of the municipal parking lot generation. Tables 2-5 provide average trip rate, total trips generated, enter to exit ratio, and the enter to exit distribution. Table 6 shows the total existing trip generation during the AM and PM peak hours.

Park and Ride Lot Existing Trip Generation:

Time Method	AM Peak Adj. Street (Page 80) Number of Parking Spaces			Time Method	PM Peak Adj. Street (Page 81) Number of Parking Spaces		
Spaces	43			Spaces	43		
Avg. Rate	0.71			Avg. Rate	0.62		
Total Trips	30.5			Total Trips	26.7		
% Enter	79.0	Total Enter	24.1	% Enter	25.0	Total Enter	6.7
% Exit	21.0	Total Exit	6.4	% Exit	75.0	Total Exit	20.0

Table 2: (Park and Ride Lot) Existing peak hour of adj. street traffic AM and PM

General Office Building Existing Trip Generation:

Time Method	AM Peak Hour (Page 1260) 1000 Sq. Ft Gross Floor Area			Time Method	AM Peak Hour (Page 1261) 1000 Sq. Ft Gross Floor Area		
GFA (Ft. Sq.)	0.75			GFA (Ft. Sq.)	0.75		
Avg. Rate	1.56			Avg. Rate	1.49		
Total Trips	1.2			Total Trips	1.1		
Reduced Trips	0.8			Reduced Trips	0.8		
% Enter	88.0	Total Enter	1.0	% Enter	17.0	Total Enter	0.1
% Exit	12.0	Total Exit	0.1	% Exit	83.0	Total Exit	0.7

Table 3: (General Office Building) Existing peak hour AM, PM, & weekday total

Fast Food Restaurant without Drive-thru (Dover Delight) Existing Trip Generation:

Time Method	AM Peak Adj. Street (Page 1906) 1000 Sq. Ft Gross Floor Area	Time Method	PM Peak Adj. Street (Page 1907) 1000 Sq. Ft Gross Floor Area		
GFA (Ft. Sq.)	No AM Peak Hour Generation Opens at 11AM	GFA (Ft. Sq.)	0.4		
Avg. Rate		Avg. Rate	26.15		
Total Trips		Total Trips	10.5		
Reduced Trips		Reduced Trips	7.5		
% Enter		% Enter	51.0	Total Enter	3.8
% Exit		% Exit	49.0	Total Exit	3.7

Table 4: (Dover Delight) Existing peak hour of adj. street traffic AM and PM

Bread/Donut/Bagel Shop without Drive-thru (Doug's Hoagies) Existing Trip Generation:

Time Method	AM Peak Adj. Street (Page 1964) 1000 Sq. Ft Gross Floor Area	Time Method	PM Peak Adj. Street (Page 1964) 1000 Sq. Ft Gross Floor Area		
GFA (Ft. Sq.)	No AM Peak Hour Generation Opens at 9AM	GFA (Ft. Sq.)	1.62		
Avg. Rate		Avg. Rate	28.00		
Total Trips		Total Trips	45.4		
Reduced Trips		Reduced Trips	32.7		
% Enter		% Enter	50.0	Total Enter	16.3
% Exit		% Exit	50.0	Total Exit	16.3

Table 5: (Doug's Hoagies) Existing peak hour of adj. street traffic AM and PM

Total Existing Trip Generation:

Time	AM Peak Hour			Time	PM Peak Hour		
Total Trips	31.4			Total Trips	67.7		
% Enter	79.0	Total Enter	25.1	% Enter	39.9	Total Enter	27.0
% Exit	21.0	Total Exit	6.6	% Exit	60.1	Total Exit	40.7

Table 6: Total existing trip generation peak hour AM and PM

Proposed Trip Generation Increase

The 9th Edition ITE Trip Generation Manual was used to determine the proposed volume of trips, as well as the percentage of entrance-to-exit traffic experienced at the AM & PM peak hours between 7 and 9 AM and 4 and 6 PM. Land Use Codes Park and Ride Lot (90), Mid-Rise Apartment (223) General Office Building (710), and Bread/Donut/Bagel Shop without Drive-thru (939) were used in deriving the trip generation for the proposed site. As with the existing generation, 72% of the calculated trip generation was used on all uses with the exception of the municipal parking lot. A further trip generation reduction of 25% was used for the mid-rise apartments, as tenant parking is largely off site at the Dover Transportation Center. Small increases in tenant parking in the Chestnut Street lot will not affect the conclusions of this analysis. Tables 7-10 provide average trip rate, total trips generated, enter to exit ratio, and the enter to exit distribution. Table 11 shows the total proposed trip generation.

Park and Ride Lot Trip Generation:

Time Method	AM Peak Adj. Street (Page 80) Number of Parking Spaces			Time Method	PM Peak Adj. Street (Page 81) Number of Parking Spaces		
Spaces	38			Spaces	38		
Avg. Rate	0.71			Avg. Rate	0.62		
Total Trips	27.0			Total Trips	23.6		
% Enter	79.0	Total Enter	21.3	% Enter	25.0	Total Enter	5.9
% Exit	21.0	Total Exit	5.7	% Exit	75.0	Total Exit	17.7

Table 7: (Park and Ride Lot) Proposed peak hour of adj. street traffic weekdays AM and PM

Mid-Rise Apartment Trip Generation:

Time Method	AM Peak Adj. Street (Page 387) Dwelling Units			Time Method	PM Peak Adj. Street (Page 388) Dwelling Units		
# Units	20			# Units	20		
Avg. Rate	0.30			Avg. Rate	0.39		
Total Trips	6.0			Total Trips	7.8		
Reduced Trips	4.3			Reduced Trips	5.6		
Off Site Parking Reduction	3.2			Off Site Parking Reduction	4.2		
% Enter	31.0	Total Enter	1.0	% Enter	58.0	Total Enter	2.4
% Exit	69.0	Total Exit	2.2	% Exit	42.0	Total Exit	1.8

Table 8: (Mid-Rise Apartment) Proposed peak hour of adj. street traffic weekdays AM and PM

General Office Building Trip Generation:

Time Method	Weekday Total (Page 296) Dwelling Units			Time Method	AM Peak Adj. Street (Page 297) Dwelling Units			Time Method	PM Peak Adj. Street (Page 298) Dwelling Units		
# Units	7			# Units	7			# Units	7		
Avg. Rate	9.52			Avg. Rate	0.75			Avg. Rate	1.00		
Total Trips	66.6			Total Trips	5.3			Total Trips	7.0		
% Enter	50.0	Total Enter	33.3	% Enter	25.0	Total Enter	1.3	% Enter	63.0	Total Enter	4.4
% Exit	50.0	Total Exit	33.3	% Exit	75.0	Total Exit	3.9	% Exit	37.0	Total Exit	2.6

Table 9: (General Office Building) Proposed peak hour of adj. street traffic weekdays AM and PM

Bread/Donut/Bagel Shop without Drive-thru (Doug's Hoagies) Trip Generation:

Time Method	AM Peak Adj. Street (Page 1964) 1000 Sq. Ft Gross Floor Area	Time Method	PM Peak Adj. Street (Page 1964) 1000 Sq. Ft Gross Floor Area		
GFA (Ft. Sq.)	No AM Peak Hour Generation Opens at 9AM	GFA (Ft. Sq.)	1.22		
Avg. Rate		Avg. Rate	28.00		
Total Trips		Total Trips	34.2		
Reduced Trips		Reduced Trips	24.6		
% Enter		% Enter	50.0	Total Enter	12.3
% Exit		% Exit	50.0	Total Exit	12.3

Table 10: (Doug's Hoagies) Proposed peak hour of adj. street traffic weekdays AM and PM

Total Proposed Trip Generation:

Time	AM Peak Hour			Time	PM Peak Hour		
Total Trips	33.2			Total Trips	55.2		
% Enter	75.1	Total Enter	24.9	% Enter	38.2	Total Enter	21.1
% Exit	24.9	Total Exit	8.3	% Exit	61.8	Total Exit	34.1

Table 11: Total proposed peak hour weekdays AM & PM generation

The calculated trips are then further divided by analysis point. It is assumed that 75% of Doug's Hoagies trips are proposed to use Fourth Street for parking, as the front face of the building is on Fourth Street. The remainder of the trips are proposed to use the municipal parking lot for access. The total build generation includes the PM trips generated by Dover Delight, as their generation will remain unchanged. Table 12 shows the peak hour breakdown for the total build generation, and Tables 13 and 14 break down the generation to the different access points. Table 15 shows the changes in trip generation during the AM and PM peak hours.

Total Build Generation							
Time	AM Peak Hour			Time	PM Peak Hour		
Total Trips	33.2			Total Trips	62.7		
% Enter	75.1	Total Enter	24.9	% Enter	39.8	Total Enter	25.0
% Exit	24.9	Total Exit	8.3	% Exit	60.2	Total Exit	37.8

Table 12: Total weekday build trip generation

Utilizing Driveway Entrance							
Time	AM Peak Hour			Time	PM Peak Hour		
Total Trips	33.2			Total Trips	44.3		
% Enter	75.1	Total Enter	24.9	% Enter	35.5	Total Enter	15.7
% Exit	24.9	Total Exit	8.3	% Exit	64.5	Total Exit	28.6

Table 13: Total weekday build trip generation utilizing the municipal parking lot

Utilizing Fourth Street							
Time	AM Peak Hour			Time	PM Peak Hour		
Total Trips	0.0			Total Trips	18.4		
% Enter		Total Enter		% Enter	50.0	Total Enter	9.2
% Exit		Total Exit		% Exit	50.0	Total Exit	9.2

Table 14: Total weekday build trip generation utilizing Fourth Street

Changes in Trip Generation	
Time	# Trips Increased
AM Peak	1.8
PM Peak	-4.9

Table 15: Change in weekday total trip generation to the municipal parking lot

Build Traffic Projections and Turning Movements

Traffic data obtained from the NH DOT's Transportation Data Management System has been projected to 2019 and projected ten years further to 2029. This has been done using an October peak seasonal adjustment factor of 1.02 (AM & PM) and using an annual growth rate of 1%, compounded annually. The derivation of the peak seasonal adjustment factor comes from an average series of values from other urban highways from across New Hampshire, which can be found as Table 20 in Appendix C. Figures 5 and 6 show the build turning movements to and from the municipal parking lot. These figures also show the projected volume of traffic northbound and southbound on Chestnut Street in 2019 and 2029. Northbound and southbound traffic count projections can be found in Appendix A, page 26, as Tables 18 and 19.

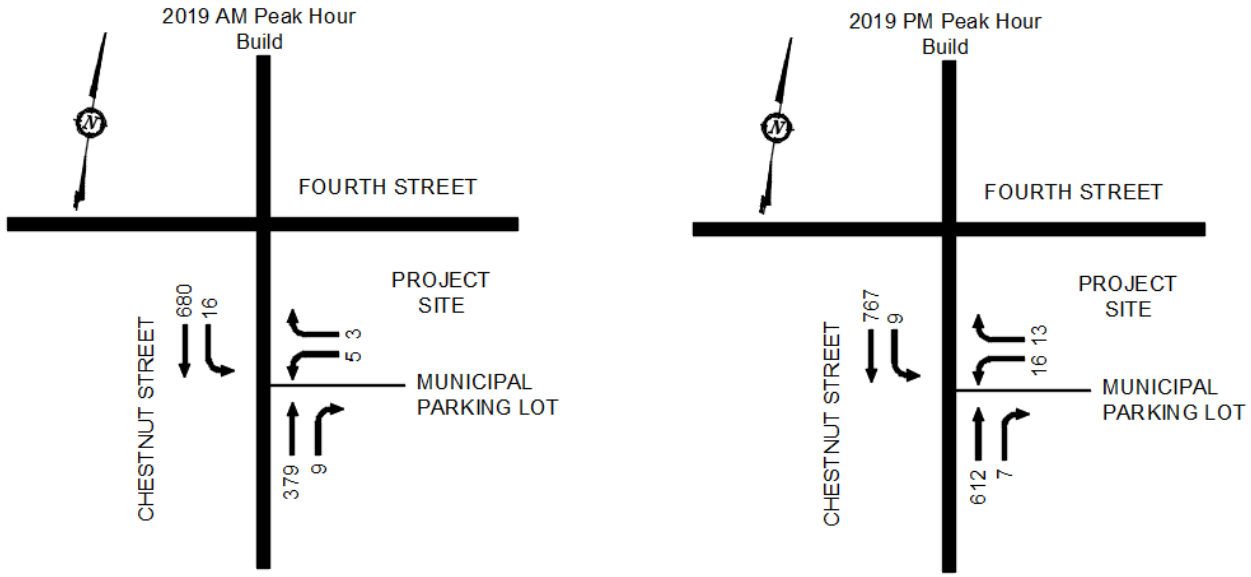


Figure 5: 2019 projected build traffic volumes and turning movements

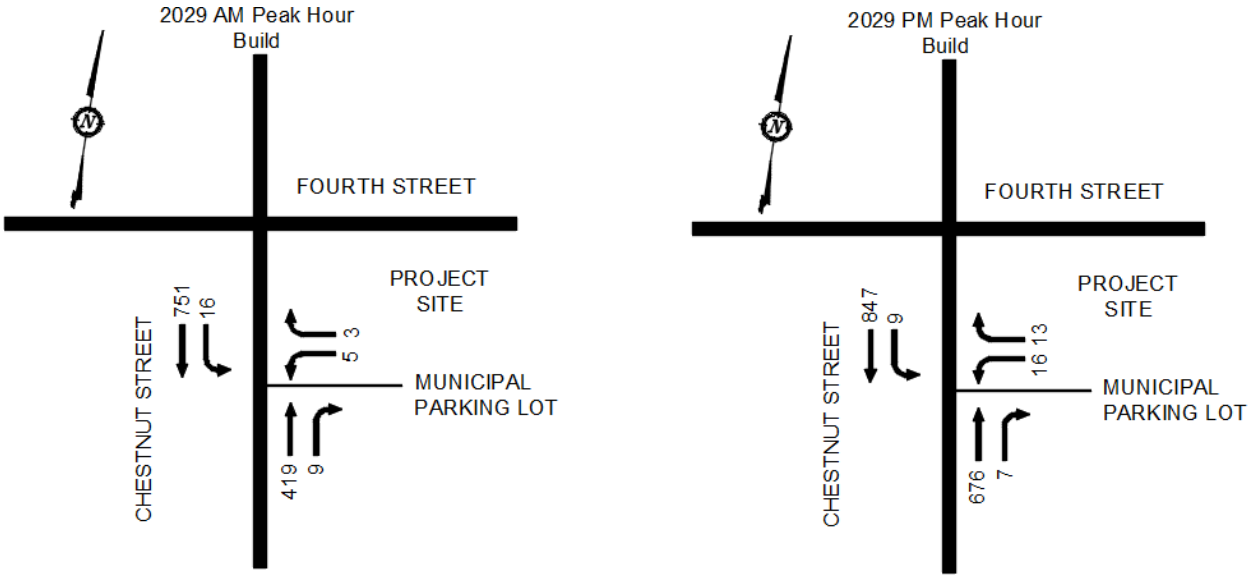


Figure 6: 2029 projected build traffic volumes and turning movements

In Tables 16 and 17, the total trips that are calculated to occur to and from the municipal parking lot are shown at AM and PM weekday peak hours in the build situation. These are further broken down to entrance and exit into the site as well as percentage of left and right turns.

Time	AM Peak Hour	# Trips	Turn Type	% Distribution
Total Trips	33.2			
Trips Enter from Chestnut Street Northbound		8.9	Right	26.9
Trips Enter from Chestnut Street Southbound		16.0	Left	48.2
Trips Exit to Chestnut Street Northbound		3.0	Right	8.9
Trips Exit to Chestnut Street Southbound		5.3	Left	16.0

Table 16: Summary of AM build turning movements to and from the municipal parking lot

Time	PM Peak Hour	# Trips	Turn Type	% Distribution
Total Trips	44.3			
Trips Enter from Chestnut Street Northbound		7.0	Right	15.8
Trips Enter from Chestnut Street Southbound		8.8	Left	19.8
Trips Exit to Chestnut Street Northbound		12.7	Right	28.6
Trips Exit to Chestnut Street Southbound		15.9	Left	35.9

Table 17: Summary of PM build turning movements to and from the municipal parking lot

Sight Distance and Safety Analysis

Sight distance on Chestnut Street to the north and south, as well as roadway alignment are the two determining factors of safety. Sight distance to the north is un-obstructed for well over 250 feet (measured) while sight distance to the south is un-obstructed for well over 250 feet (measured). Using Exhibit 3-1 (Stopping Sight Distance) (Figure 23) in the Geometric Design Manual, and a 30 MPH 85th percentile speed for Chestnut Street northbound and 35 MPH Chestnut Street southbound, requires a stopping sight distance of 200 feet and 250 feet, respectively. In this instance both the northerly and southerly sight distances meet the design required warrant. There are no improvements required to maintain this site distance.

With respect to general safety of Chestnut Street in relation to the peak hour trip generation and AADT, it is our assessment that the cross section of pavement and shoulder widths are appropriate.

*****AASHTO Geometric Design of Highways and Streets (2011)

Conclusions and Recommendations

1.) A total build generation of 33 vehicle trips (25 enter/8 exit) are predicted to occur at the AM peak hour and 63 vehicle trips (25 enter/38 exit) at the PM peak hour

2.) A total build generation of 33 vehicle trips (25 enter/8 exit) are predicted to occur to the municipal parking lot at the AM peak hour and 25 vehicle trips (16 enter/29 exit) at the PM peak hour.

3.) A total build generation of 0 vehicle trips are predicted to occur to Fourth Street at the AM peak hour and 18 vehicle trips (9 enter/9 exit) at the PM peak hour.

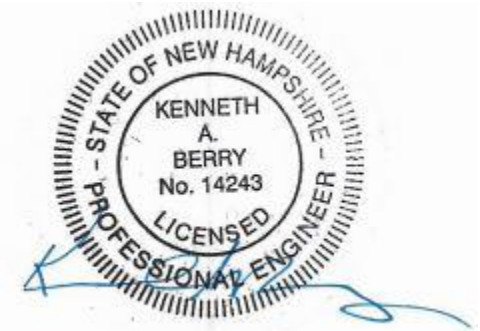
4.) This is a total increase in trip generation of 2 AM trips and a decrease of 5 PM trips.

5.) There is a public bus stop and a train station within a quarter mile that present a further opportunity for reduction of trips generated.

6.) It is recommended that the existing and surrounding infrastructure will be sufficient to handle the projected increase in vehicle trips and peak hour and all other hours.

Respectfully Submitted,

BERRY SURVEYING & ENGINEERING



Christopher R. Berry SIT
Principal, President

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

KRP/krp

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335 Second Crown Pt. Rd., Barrington, NH 03825
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www.BerrySurveying.Com

Appendix A

Chestnut Street Traffic Counts

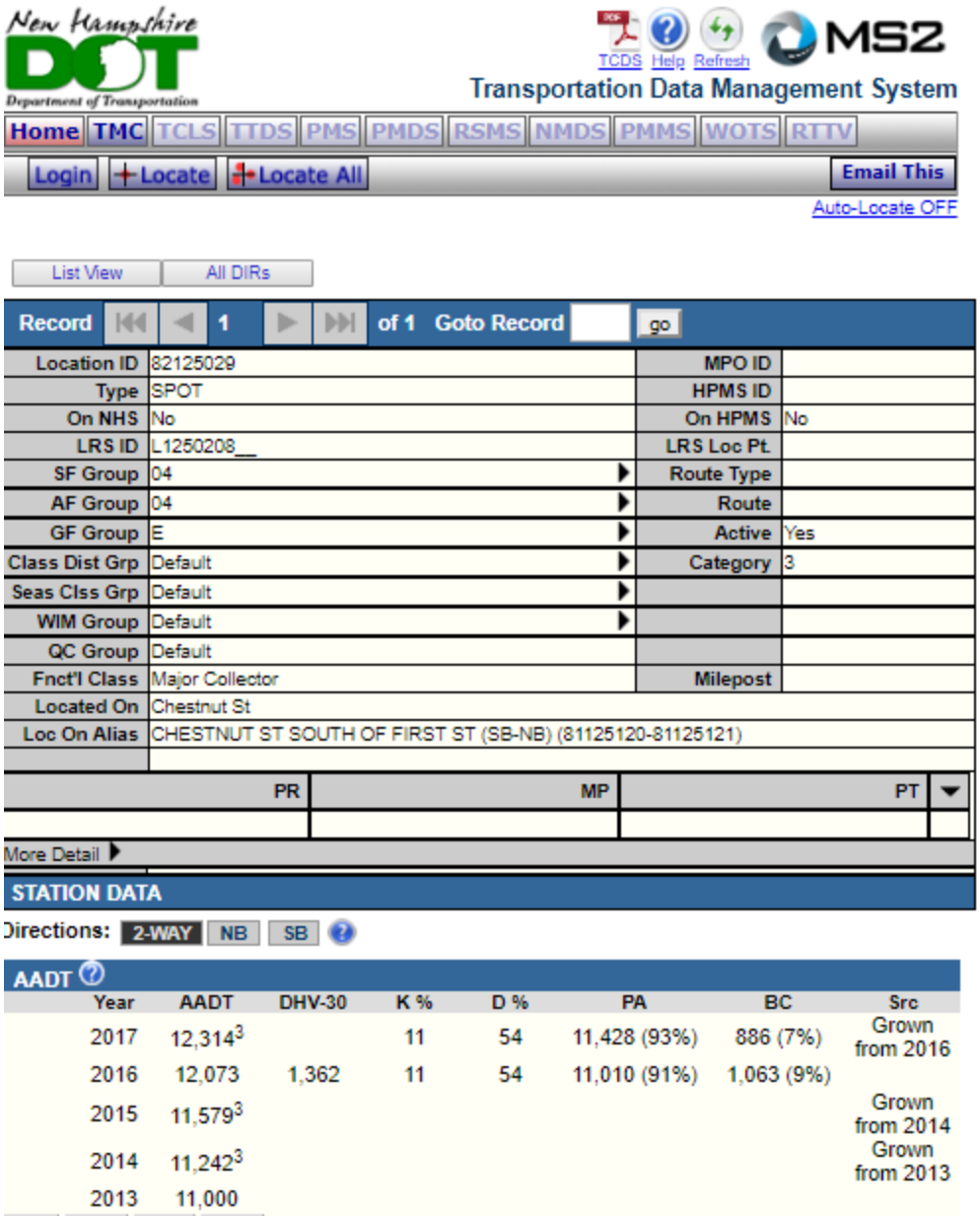


Figure 7: History of AADT values and classification for Chestnut Street

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Volume Count Report

LOCATION INFO	
Location ID	82125029
Type	SPOT
Fnct'l Class	5
Located On	Chestnut St
Loc On Alias	CHESTNUT ST SOUTH OF FIRST ST (SB-NB) (81125120-81125121)
Direction	2-WAY
County	STRAFFORD
Community	DOVER
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

COUNT DATA INFO	
Count Status	Accepted
Start Date	Tue 10/25/2016
End Date	Wed 10/26/2016
Start Time	12:00:00 AM
End Time	12:00:00 AM
Direction	2-WAY
Notes	nhdot
Station	821250295000
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude,Longitude	

INTERVAL:60-MIN	
Time	Hourly Count
0:00-1:00	41
1:00-2:00	21
2:00-3:00	10
3:00-4:00	14
4:00-5:00	37
5:00-6:00	133
6:00-7:00	417
7:00-8:00	1,007
8:00-9:00	874
9:00-10:00	723
10:00-11:00	731
11:00-12:00	838
12:00-13:00	907
13:00-14:00	855
14:00-15:00	935
15:00-16:00	1,160
16:00-17:00	1,221
17:00-18:00	1,297
18:00-19:00	806
19:00-20:00	547
20:00-21:00	404
21:00-22:00	227
22:00-23:00	149
23:00-24:00	82
Total	13,436
AADT	12,180
AM Peak	07:00-08:00 1,007
PM Peak	17:00-18:00 1,297

Figure 8: Tuesday October 25th, 2016 Chestnut Street two-way hourly traffic count

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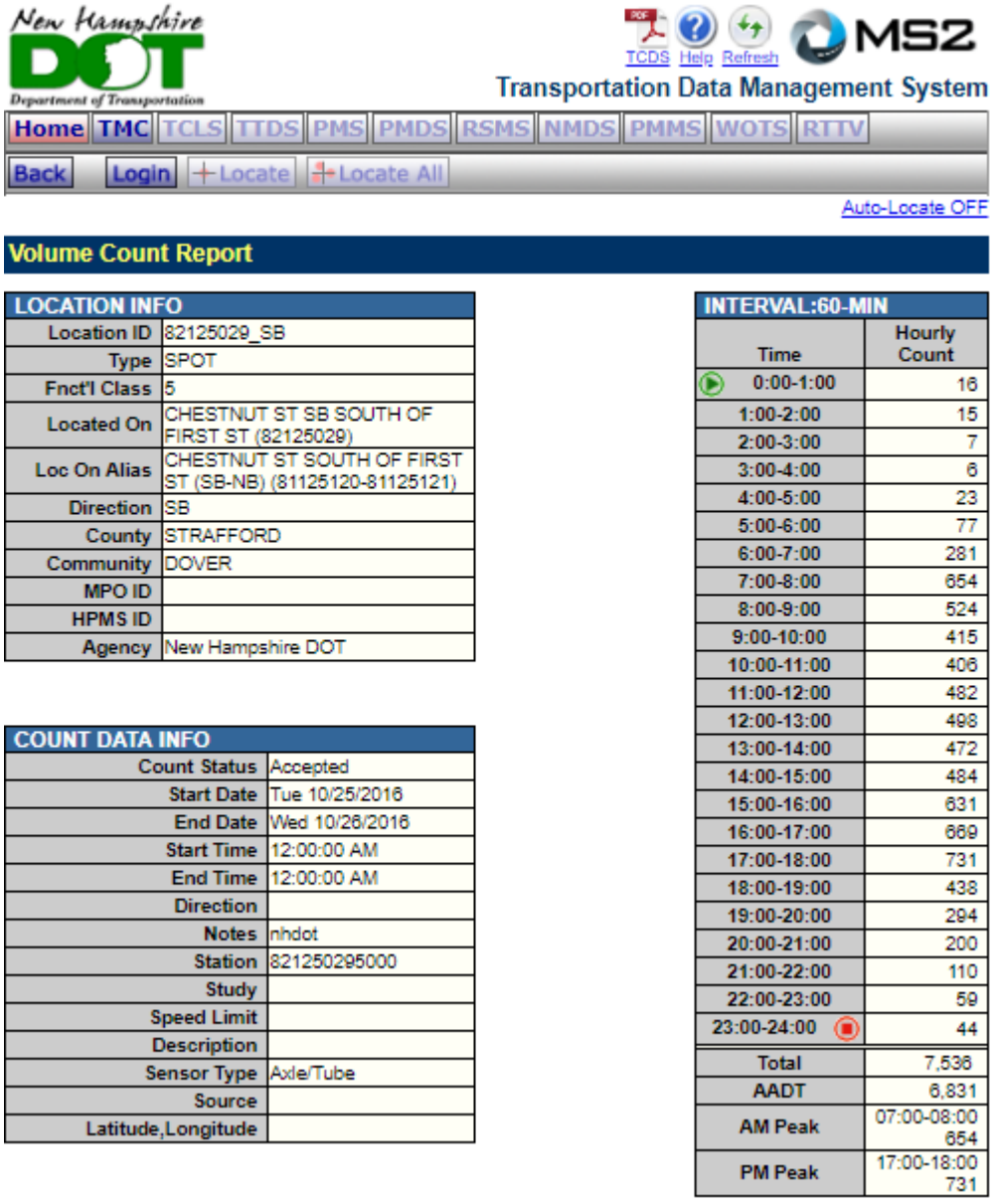
Volume Count Report

LOCATION INFO	
Location ID	82125029_NB
Type	SPOT
Fnct'l Class	5
Located On	CHESTNUT ST NB SOUTH OF FIRST ST (82125029)
Loc On Alias	CHESTNUT ST SOUTH OF FIRST ST (SB-NB) (81125120-81125121)
Direction	NB
County	STRAFFORD
Community	DOVER
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

COUNT DATA INFO	
Count Status	Accepted
Start Date	Tue 10/25/2016
End Date	Wed 10/26/2016
Start Time	12:00:00 AM
End Time	12:00:00 AM
Direction	
Notes	nhdot
Station	821250291000
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude,Longitude	

INTERVAL:60-MIN	
Time	Hourly Count
0:00-1:00	25
1:00-2:00	6
2:00-3:00	3
3:00-4:00	8
4:00-5:00	14
5:00-6:00	56
6:00-7:00	136
7:00-8:00	353
8:00-9:00	350
9:00-10:00	308
10:00-11:00	325
11:00-12:00	356
12:00-13:00	409
13:00-14:00	383
14:00-15:00	451
15:00-16:00	529
16:00-17:00	552
17:00-18:00	566
18:00-19:00	368
19:00-20:00	253
20:00-21:00	204
21:00-22:00	117
22:00-23:00	90
23:00-24:00	38
Total	5,900
AADT	5,348
AM Peak	11:00-12:00 356
PM Peak	17:00-18:00 566

Figure 9: Tuesday October 25th, 2016 Chestnut Street northbound hourly traffic count



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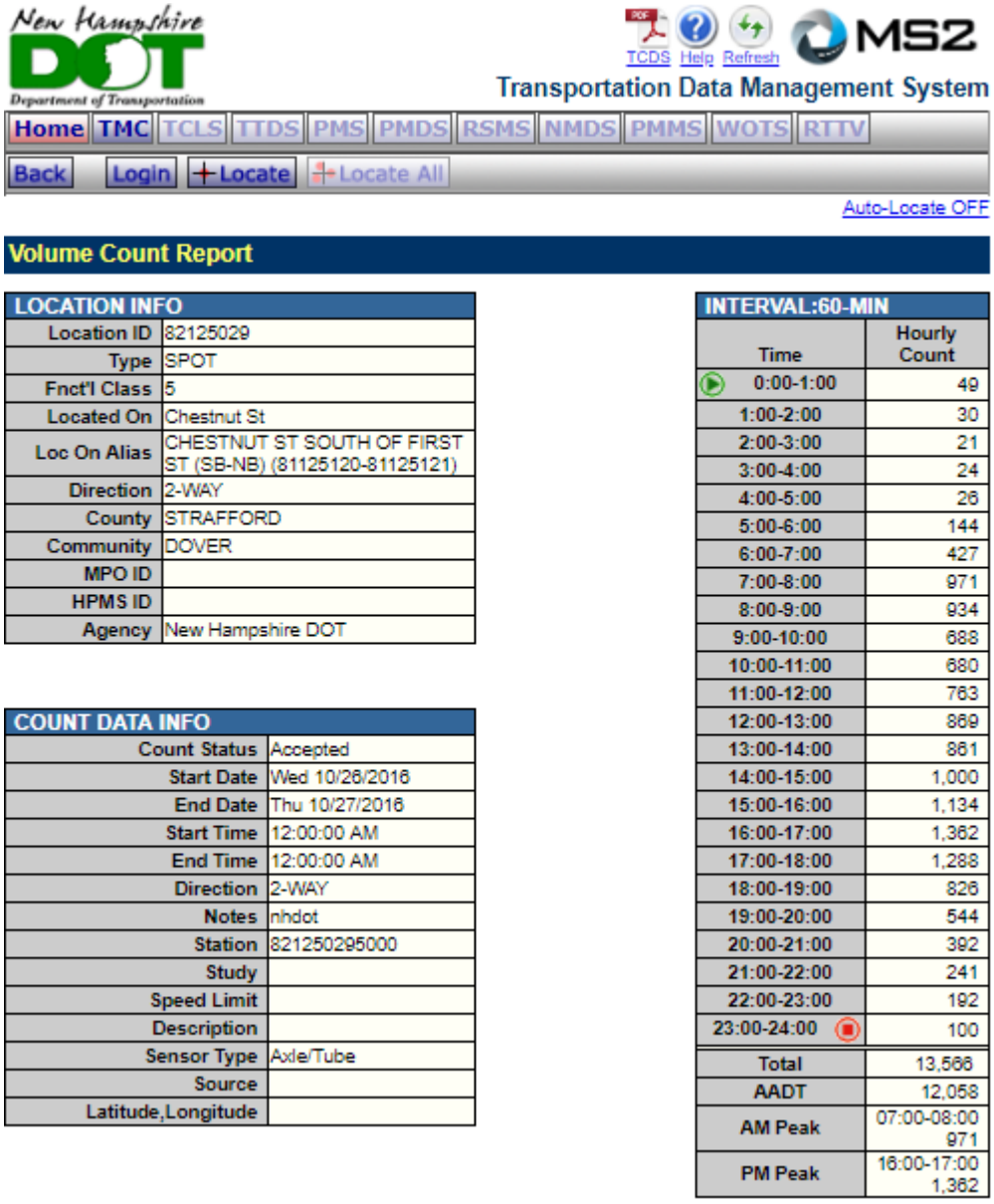
Volume Count Report

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Fnct'l Class	5
Located On	CHESTNUT ST SB SOUTH OF FIRST ST (82125029)
Loc On Alias	CHESTNUT ST SOUTH OF FIRST ST (SB-NB) (81125120-81125121)
Direction	SB
County	STRAFFORD
Community	DOVER
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

COUNT DATA INFO	
Count Status	Accepted
Start Date	Tue 10/25/2016
End Date	Wed 10/26/2016
Start Time	12:00:00 AM
End Time	12:00:00 AM
Direction	
Notes	nhdot
Station	821250295000
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude,Longitude	

INTERVAL:60-MIN	
Time	Hourly Count
0:00-1:00	16
1:00-2:00	15
2:00-3:00	7
3:00-4:00	6
4:00-5:00	23
5:00-6:00	77
6:00-7:00	281
7:00-8:00	654
8:00-9:00	524
9:00-10:00	415
10:00-11:00	406
11:00-12:00	482
12:00-13:00	498
13:00-14:00	472
14:00-15:00	484
15:00-16:00	631
16:00-17:00	669
17:00-18:00	731
18:00-19:00	438
19:00-20:00	294
20:00-21:00	200
21:00-22:00	110
22:00-23:00	59
23:00-24:00	44
Total	7,536
AADT	6,831
AM Peak	07:00-08:00 654
PM Peak	17:00-18:00 731

Figure 10: Tuesday October 25th, 2018 Chestnut Street southbound hourly traffic count



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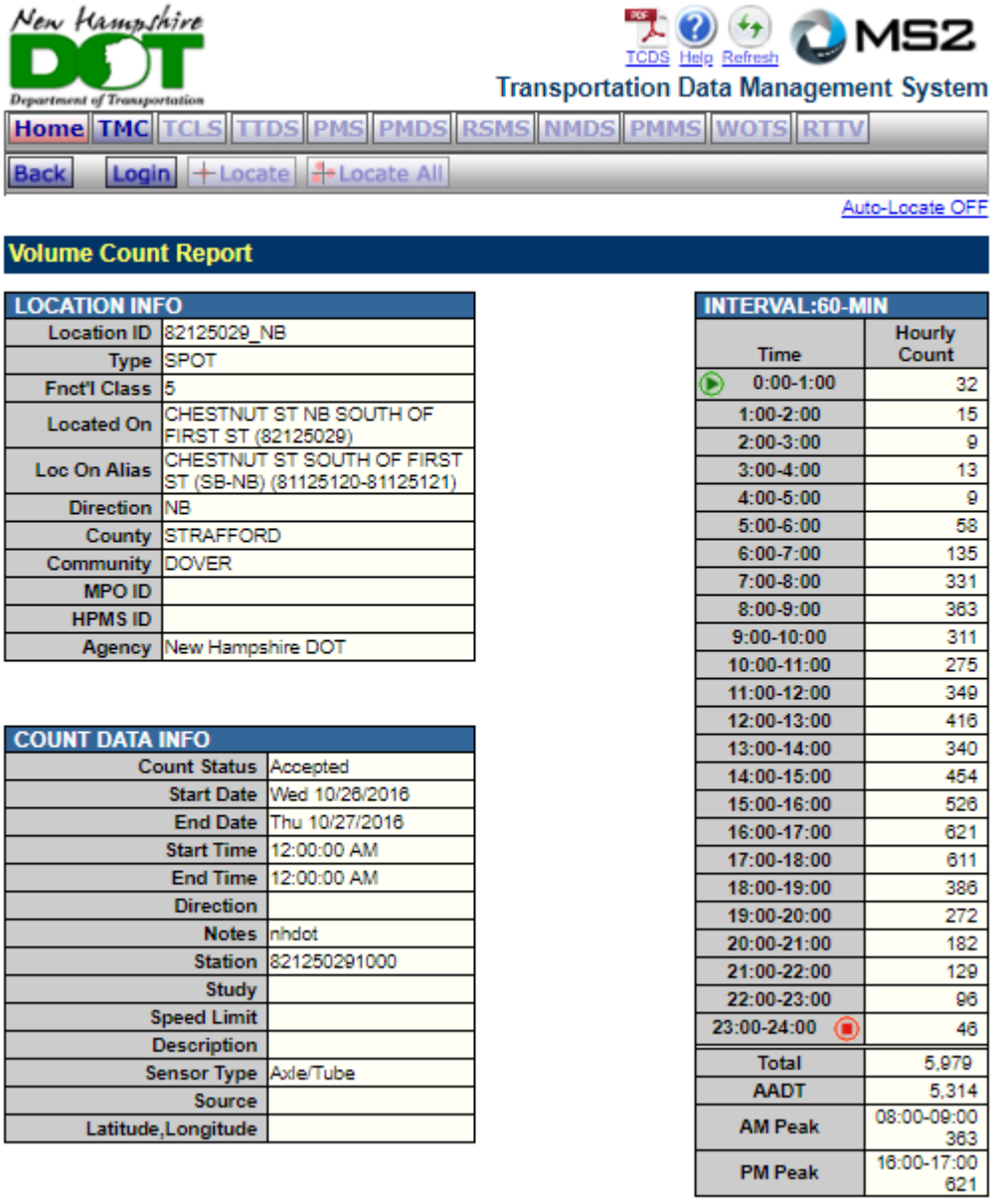
Volume Count Report

LOCATION INFO	
Location ID	82125029
Type	SPOT
Fnct'l Class	5
Located On	Chestnut St
Loc On Alias	CHESTNUT ST SOUTH OF FIRST ST (SB-NB) (81125120-81125121)
Direction	2-WAY
County	STRAFFORD
Community	DOVER
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

COUNT DATA INFO	
Count Status	Accepted
Start Date	Wed 10/26/2016
End Date	Thu 10/27/2016
Start Time	12:00:00 AM
End Time	12:00:00 AM
Direction	2-WAY
Notes	nhdot
Station	821250295000
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude,Longitude	

INTERVAL:60-MIN	
Time	Hourly Count
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1:00-2:00	30
2:00-3:00	21
3:00-4:00	24
4:00-5:00	26
5:00-6:00	144
6:00-7:00	427
7:00-8:00	971
8:00-9:00	934
9:00-10:00	688
10:00-11:00	680
11:00-12:00	763
12:00-13:00	869
13:00-14:00	861
14:00-15:00	1,000
15:00-16:00	1,134
16:00-17:00	1,362
17:00-18:00	1,288
18:00-19:00	826
19:00-20:00	544
20:00-21:00	392
21:00-22:00	241
22:00-23:00	192
23:00-24:00	100
Total	13,566
AADT	12,058
AM Peak	07:00-08:00 971
PM Peak	16:00-17:00 1,362

Figure 11: Wednesday October 26th, 2018 Chestnut Street two-way hourly traffic count



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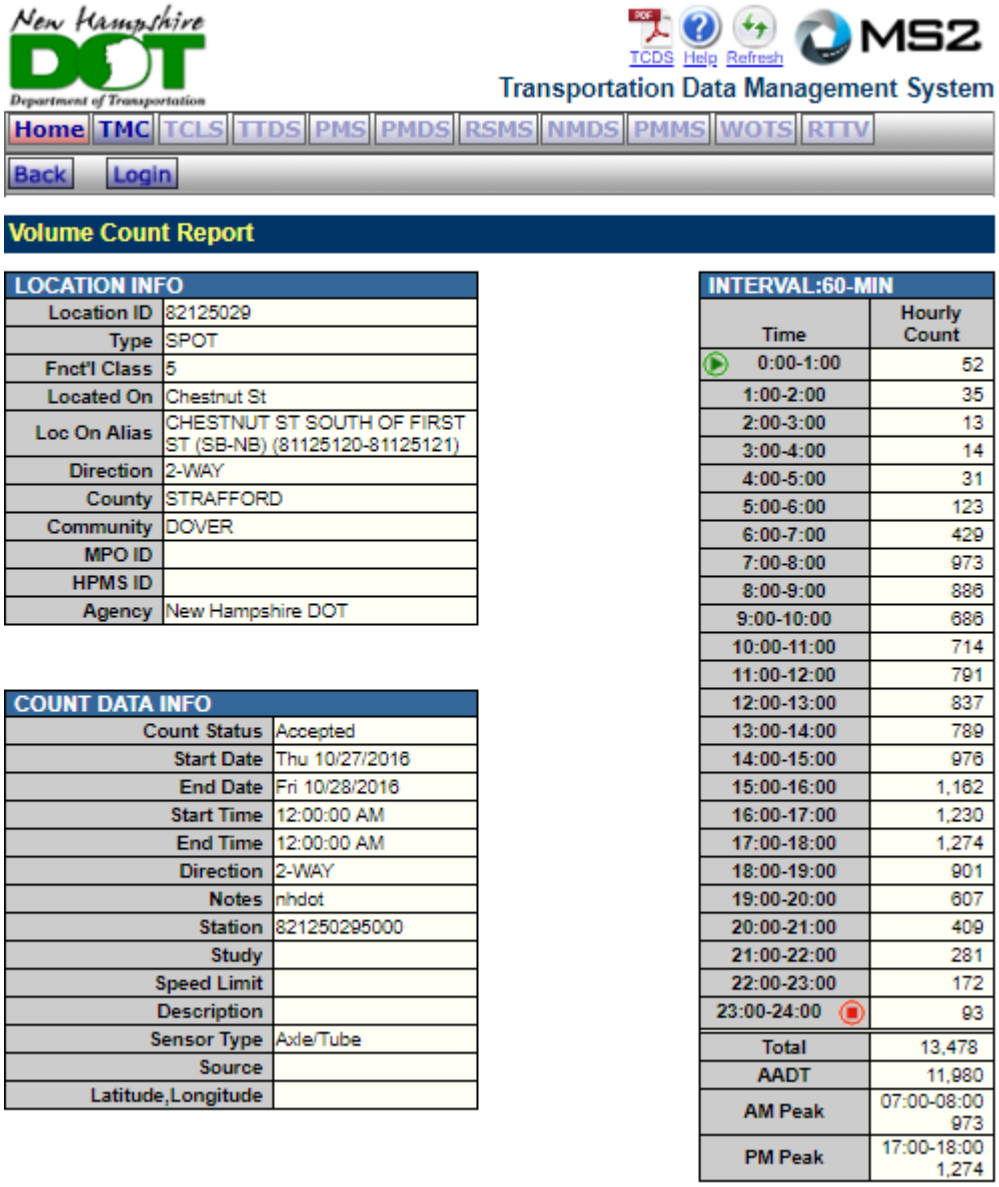
Volume Count Report

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Fnct'l Class	5
Located On	CHESTNUT ST NB SOUTH OF FIRST ST (82125029)
Loc On Alias	CHESTNUT ST SOUTH OF FIRST ST (SB-NB) (81125120-81125121)
Direction	NB
County	STRAFFORD
Community	DOVER
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

COUNT DATA INFO	
Count Status	Accepted
Start Date	Wed 10/26/2016
End Date	Thu 10/27/2016
Start Time	12:00:00 AM
End Time	12:00:00 AM
Direction	
Notes	nhdot
Station	821250291000
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude,Longitude	

INTERVAL:60-MIN	
Time	Hourly Count
0:00-1:00	32
1:00-2:00	15
2:00-3:00	9
3:00-4:00	13
4:00-5:00	9
5:00-6:00	58
6:00-7:00	135
7:00-8:00	331
8:00-9:00	363
9:00-10:00	311
10:00-11:00	275
11:00-12:00	349
12:00-13:00	416
13:00-14:00	340
14:00-15:00	454
15:00-16:00	526
16:00-17:00	621
17:00-18:00	611
18:00-19:00	386
19:00-20:00	272
20:00-21:00	182
21:00-22:00	129
22:00-23:00	96
23:00-24:00	46
Total	5,979
AADT	5,314
AM Peak	08:00-09:00 363
PM Peak	16:00-17:00 621

Figure 12: Wednesday October 26th, 2018 Chestnut Street northbound hourly traffic count



New Hampshire DOT
Department of Transportation

TCDS Help Refresh MS2
Transportation Data Management System

Home | TMC | TCLS | TTDS | PMS | PMDS | RSMS | NMDS | PMMS | WOTS | RTTV

Back | Login

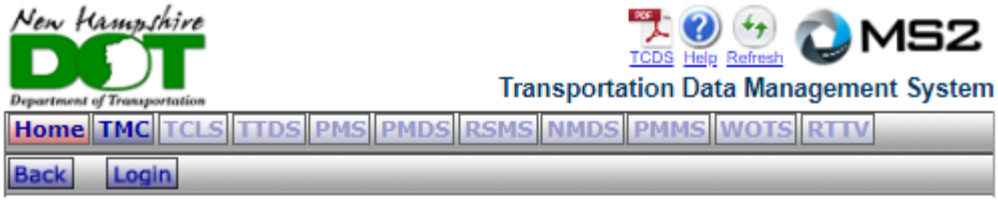
Volume Count Report

LOCATION INFO	
Location ID	82125029
Type	SPOT
Fnct'l Class	5
Located On	Chestnut St
Loc On Alias	CHESTNUT ST SOUTH OF FIRST ST (SB-NB) (81125120-81125121)
Direction	2-WAY
County	STRAFFORD
Community	DOVER
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

COUNT DATA INFO	
Count Status	Accepted
Start Date	Thu 10/27/2016
End Date	Fri 10/28/2016
Start Time	12:00:00 AM
End Time	12:00:00 AM
Direction	2-WAY
Notes	nhdot
Station	821250295000
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude,Longitude	

INTERVAL:60-MIN	
Time	Hourly Count
0:00-1:00	52
1:00-2:00	35
2:00-3:00	13
3:00-4:00	14
4:00-5:00	31
5:00-6:00	123
6:00-7:00	429
7:00-8:00	973
8:00-9:00	886
9:00-10:00	686
10:00-11:00	714
11:00-12:00	791
12:00-13:00	837
13:00-14:00	789
14:00-15:00	976
15:00-16:00	1,162
16:00-17:00	1,230
17:00-18:00	1,274
18:00-19:00	901
19:00-20:00	607
20:00-21:00	409
21:00-22:00	281
22:00-23:00	172
23:00-24:00	93
Total	13,478
AADT	11,980
AM Peak	07:00-08:00 973
PM Peak	17:00-18:00 1,274

Figure 13: Thursday October 27th, 2016 Chestnut Street two-way hourly traffic count



Volume Count Report

LOCATION INFO	
Location ID	82125029_NB
Type	SPOT
Fnct'l Class	5
Located On	CHESTNUT ST NB SOUTH OF FIRST ST (82125029)
Loc On Alias	CHESTNUT ST SOUTH OF FIRST ST (SB-NB) (81125120-81125121)
Direction	NB
County	STRAFFORD
Community	DOVER
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

COUNT DATA INFO	
Count Status	Accepted
Start Date	Thu 10/27/2016
End Date	Fri 10/28/2016
Start Time	12:00:00 AM
End Time	12:00:00 AM
Direction	
Notes	nhdot
Station	821250291000
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude,Longitude	

INTERVAL:60-MIN	
Time	Hourly Count
0:00-1:00	32
1:00-2:00	21
2:00-3:00	7
3:00-4:00	6
4:00-5:00	10
5:00-6:00	45
6:00-7:00	152
7:00-8:00	325
8:00-9:00	366
9:00-10:00	290
10:00-11:00	291
11:00-12:00	342
12:00-13:00	370
13:00-14:00	335
14:00-15:00	454
15:00-16:00	512
16:00-17:00	511
17:00-18:00	560
18:00-19:00	413
19:00-20:00	287
20:00-21:00	211
21:00-22:00	143
22:00-23:00	99
23:00-24:00	46
Total	5,828
AADT	5,180
AM Peak	08:00-09:00 366
PM Peak	17:00-18:00 560

Figure 14: Thursday October 27th, 2016 Chestnut Street northbound hourly traffic count

Chestnut Street AM Peak Hour Volume Projections				
Year	Northbound Volume	Northbound Volume Peaked	Southbound Volume	Southbound Volume Peaked
2016	361	368	647	660
2017	364	372	654	667
2018	368	375	660	674
2019	372	379	667	680
2020	375	383	674	687
2021	379	387	680	694
2022	383	391	687	701
2023	387	394	694	708
2024	391	398	701	715
2025	394	402	708	722
2026	398	406	715	729
2027	402	410	722	737
2028	406	415	729	744
2029	410	419	737	751
Seasonal Peaking Factor (October)		1.02		

Table 18: Chestnut Street projected AM Peak Hour traffic volumes

Chestnut Street PM Peak Hour Volume Projections				
Year	Northbound Volume	Northbound Volume Peaked	Southbound Volume	Southbound Volume Peaked
2016	582	594	730	745
2017	588	600	737	752
2018	594	606	745	760
2019	600	612	752	767
2020	606	618	760	775
2021	612	624	767	783
2022	618	630	775	790
2023	624	636	783	798
2024	630	643	790	806
2025	637	649	798	814
2026	643	656	806	823
2027	649	662	814	831
2028	656	669	823	839
2029	662	676	831	847
Seasonal Peaking Factor (October)		1.02		

Table 19: Chestnut Street projected PM Peak Hour traffic volumes

Appendix B

Trip Generation Derivation

Park-and-Ride Lot with Bus Service
(090)

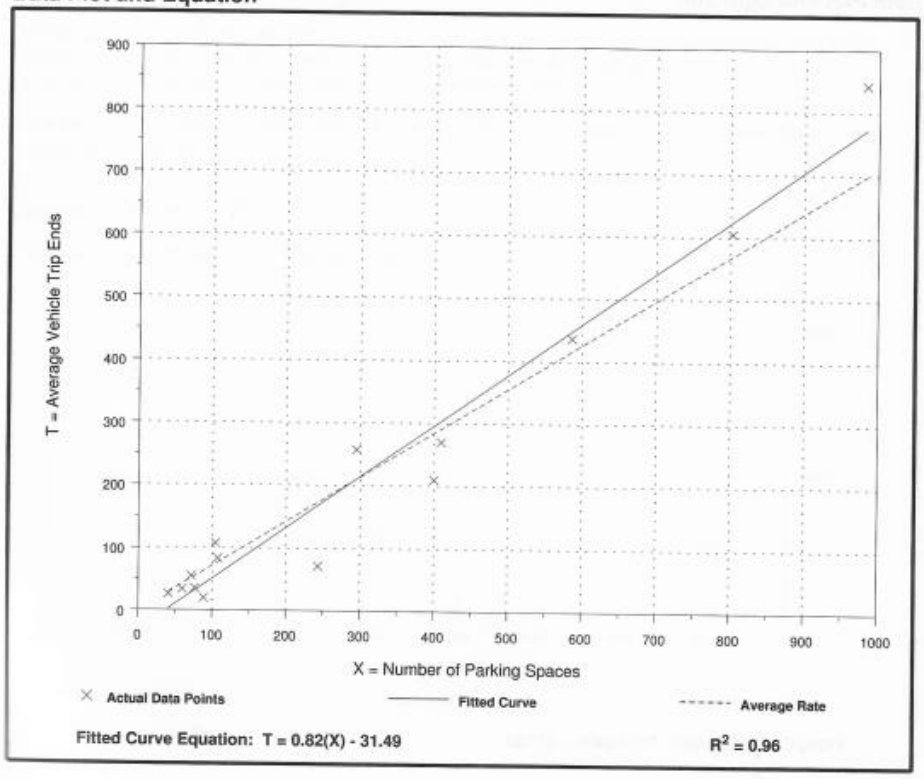
Average Vehicle Trip Ends vs: **Parking Spaces**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Number of Studies: 14
Average Number of Parking Spaces: 305
Directional Distribution: 79% entering, 21% exiting

Trip Generation per Parking Space

Average Rate	Range of Rates	Standard Deviation
0.71	0.22 - 1.02	0.86

Data Plot and Equation



Trip Generation, 9th Edition • Institute of Transportation Engineers

Figure 15: ITE Trip Generation, 9th Edition

Park-and-Ride Lot with Bus Service
(090)

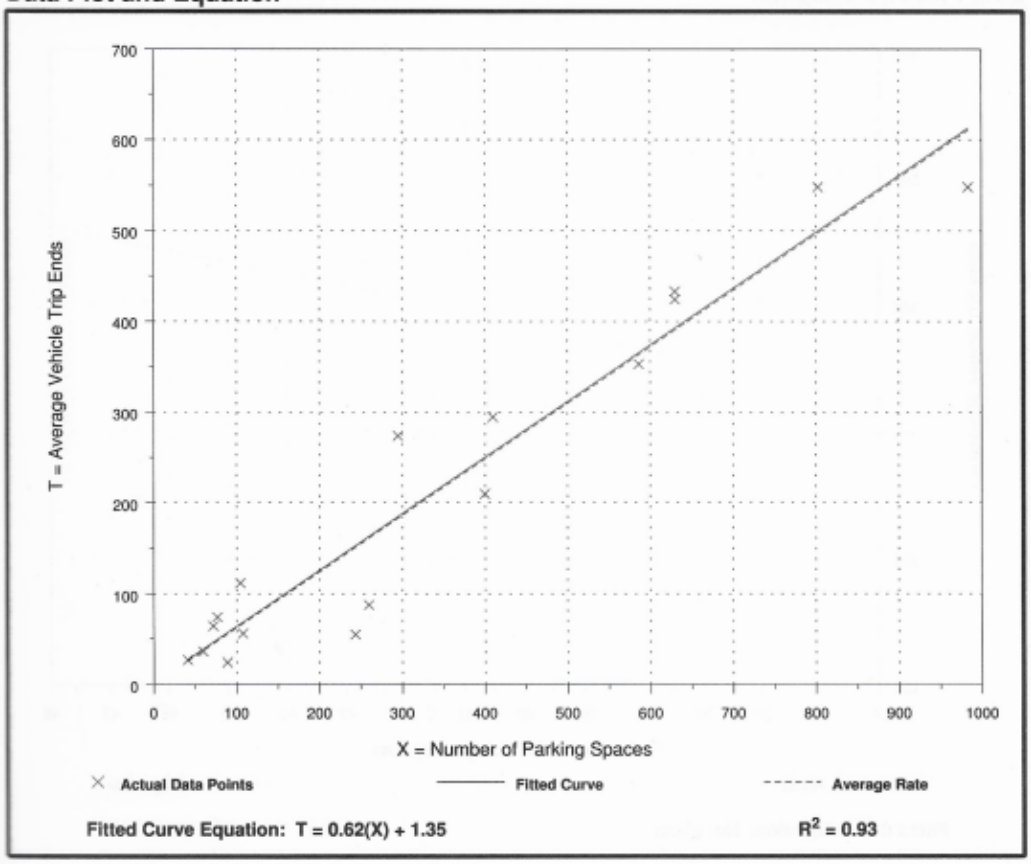
Average Vehicle Trip Ends vs: **Parking Spaces**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Number of Studies: 17
Average Number of Parking Spaces: 341
Directional Distribution: 25% entering, 75% exiting

Trip Generation per Parking Space

Average Rate	Range of Rates	Standard Deviation
0.62	0.23 - 1.07	0.81

Data Plot and Equation



Fitted Curve Equation: T = 0.62(X) + 1.35 $R^2 = 0.93$

Trip Generation, 9th Edition • Institute of Transportation Engineers 81

Figure 16: ITE Trip Generation, 9th Edition

Mid-Rise Apartment
(223)

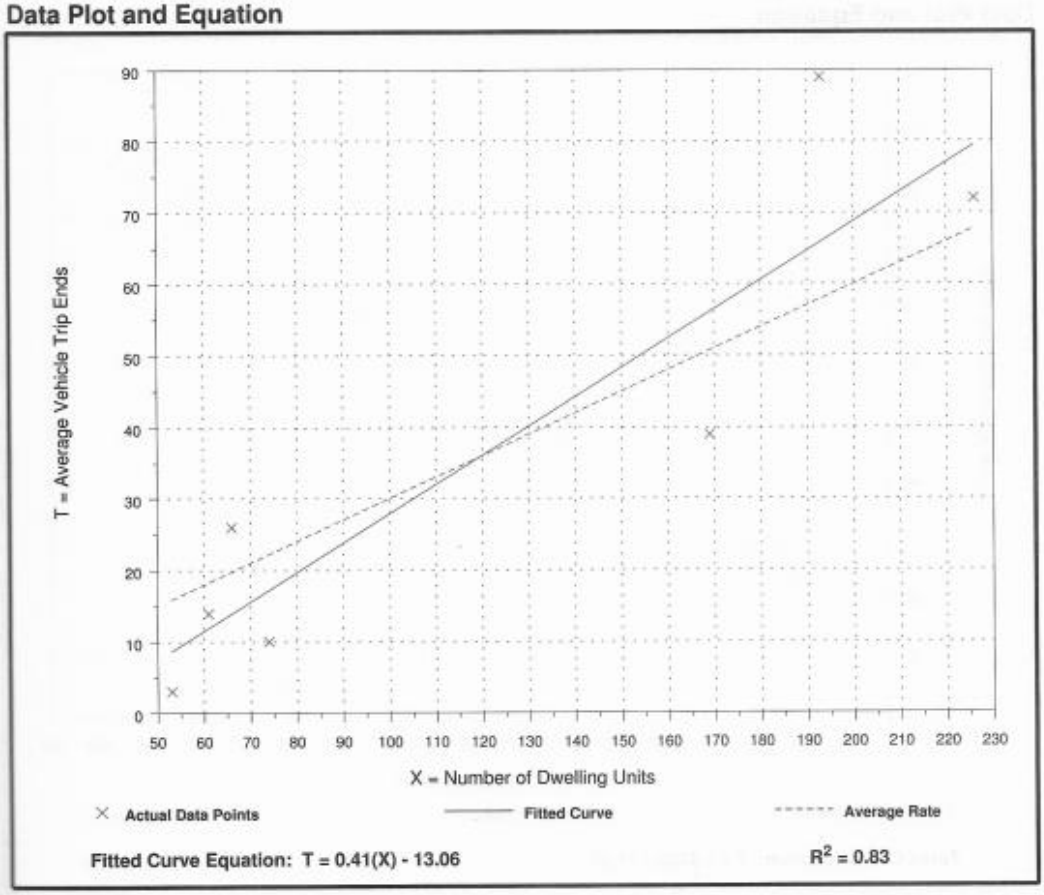
Average Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Number of Studies: 7
Avg. Number of Dwelling Units: 120
Directional Distribution: 31% entering, 69% exiting

Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.30	0.06 - 0.46	0.56

Data Plot and Equation



Trip Generation, 9th Edition • Institute of Transportation Engineers 387

Figure 17: ITE Trip Generation, 9th Edition

Mid-Rise Apartment
(223)

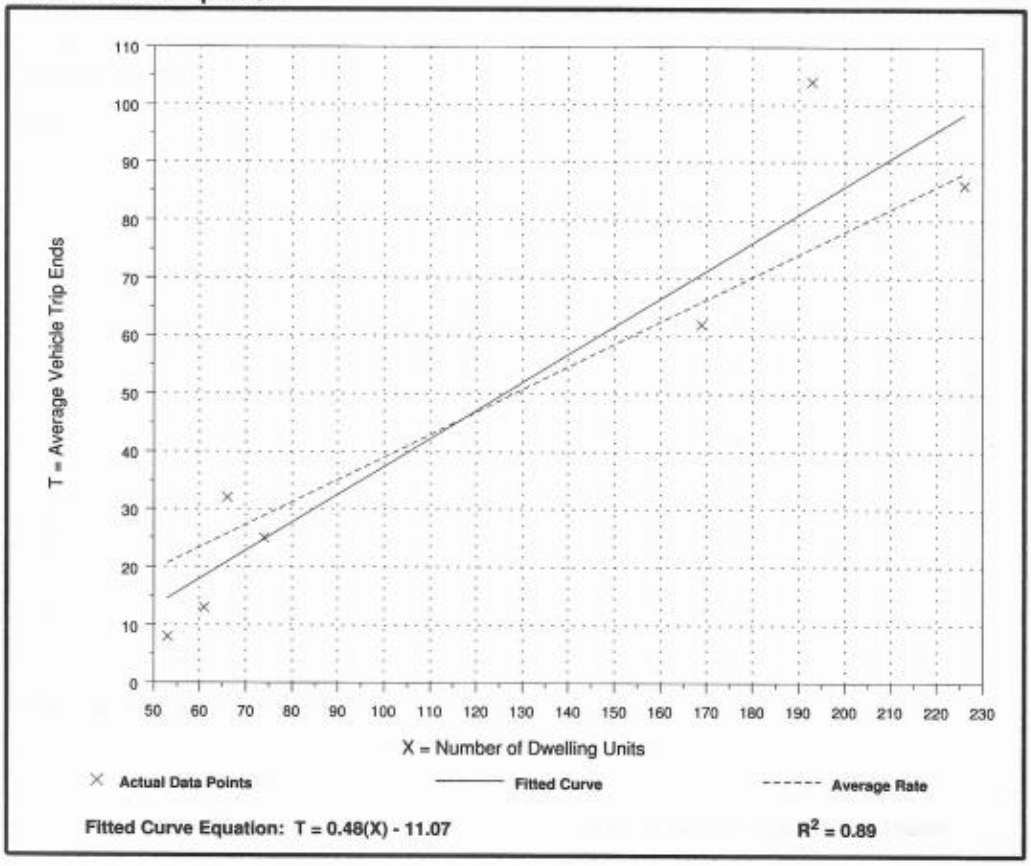
Average Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Number of Studies: 7
Avg. Number of Dwelling Units: 120
Directional Distribution: 58% entering, 42% exiting

Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.39	0.15 - 0.54	0.63

Data Plot and Equation



388 *Trip Generation*, 9th Edition • Institute of Transportation Engineers

Figure 18: ITE Trip Generation, 9th Edition

General Office Building
(710)

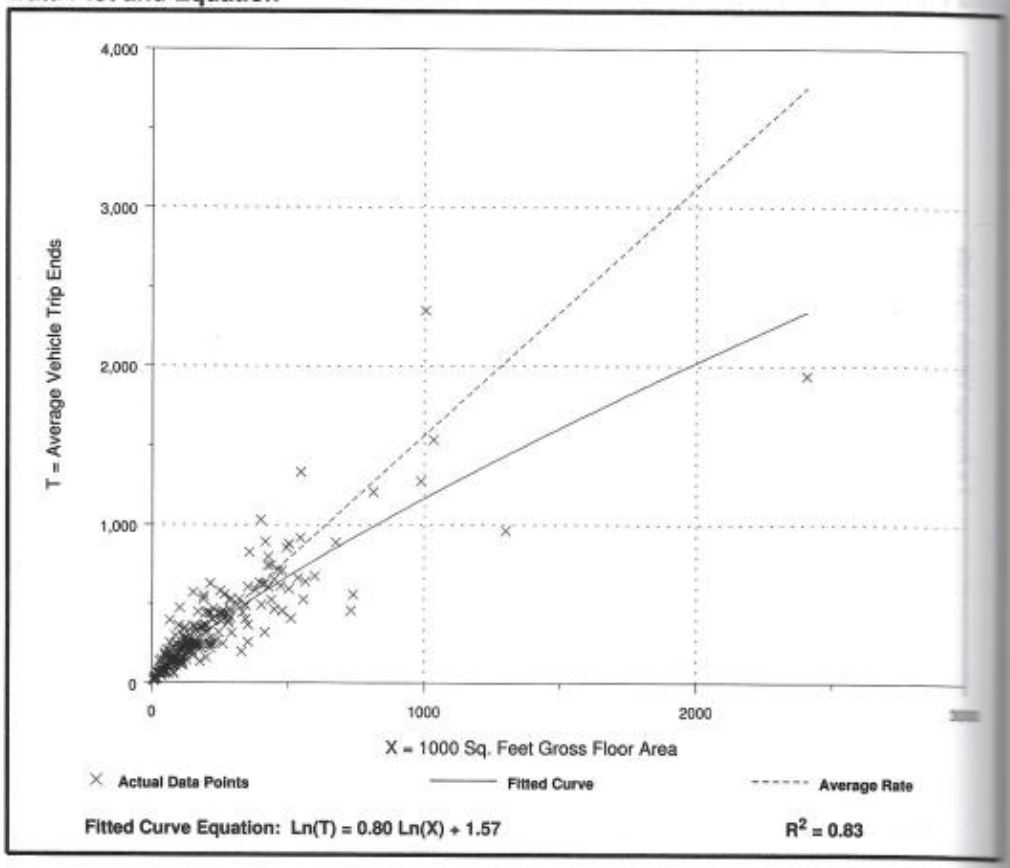
Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Floor Area
On a: Weekday,
A.M. Peak Hour

Number of Studies: 218
Average 1000 Sq. Feet GFA: 222
Directional Distribution: 88% entering, 12% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
1.56	0.60 - 5.98	1.40

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.80 Ln(X) + 1.57 $R^2 = 0.83$

1260 *Trip Generation*, 9th Edition • Institute of Transportation Engineers

Figure 19: ITE Trip Generation, 9th Edition

General Office Building
(710)

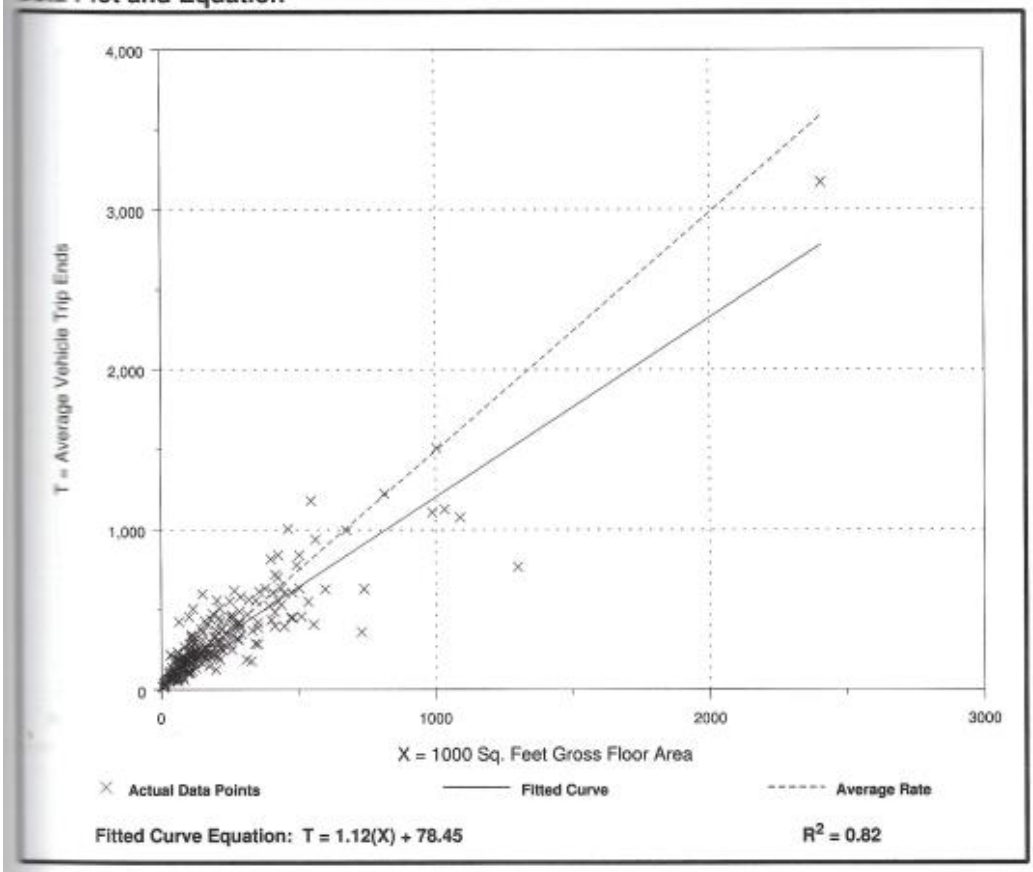
Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Floor Area
On a: Weekday,
P.M. Peak Hour

Number of Studies: 236
Average 1000 Sq. Feet GFA: 215
Directional Distribution: 17% entering, 83% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
1.49	0.49 - 6.39	1.37

Data Plot and Equation



Fitted Curve Equation: T = 1.12(X) + 78.45 $R^2 = 0.82$

Trip Generation, 9th Edition • Institute of Transportation Engineers 1261

Figure 20: ITE Trip Generation, 9th Edition

Fast-Food Restaurant without Drive-Through Window
(933)

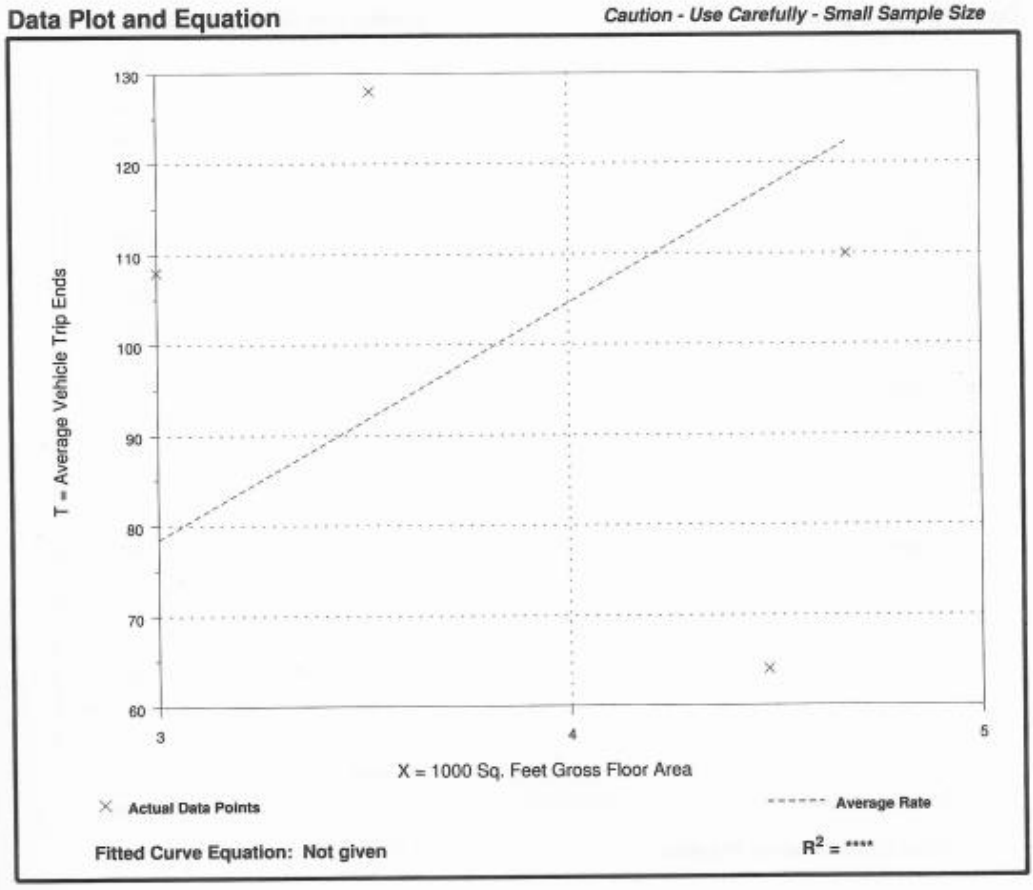
Average Vehicle Trip Ends vs: **1000 Sq. Feet Gross Floor Area**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Number of Studies: 4
Average 1000 Sq. Feet GFA: 4
Directional Distribution: 51% entering, 49% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
26.15	14.28 - 36.36	10.51

Data Plot and Equation *Caution - Use Carefully - Small Sample Size*



Trip Generation, 9th Edition • Institute of Transportation Engineers 1907

Figure 21: ITE Trip Generation, 9th Edition

Land Use: 939
Bread/Donut/Bagel Shop without Drive-Through Window

Independent Variables with One Observation

The following trip generation data are for independent variables with only one observation. This information is shown in this table only; there are no related plots for these data.

Users are cautioned to use data with care because of the small sample size.

Independent Variable	Trip Generation Rate	Size of Independent Variable	Number of Studies	Directional Distribution
1,000 Square Feet Gross Floor Area				
Weekday A.M. Peak Hour of Adjacent Street Traffic	70.22	1.1	1	47% entering, 53% exiting
Weekday P.M. Peak Hour of Adjacent Street Traffic	28.00	2.0	1	50% entering, 50% exiting

1964 *Trip Generation*, 9th Edition • Institute of Transportation Engineers

Figure 22: ITE Trip Generation, 9th Edition

Appendix C

Miscellaneous

Year 2016 Monthly Data			
Group 4 Averages:		Urban Highways	
		Adjustment to	
Month	ADT	Average	Peak
January	13,573	1.16	1.25
February	14,038	1.12	1.21
March	15,731	1.00	1.08
April	16,139	0.97	1.05
May	15,705	1.00	1.08
June	16,766	0.94	1.01
July	15,752	1.00	1.08
August	16,529	0.95	1.03
September	17,007	0.92	1.00
October	16,598	0.94	1.02
November	15,649	1.00	1.09
December	14,638	1.07	1.16
Average ADT:	15,677		
Peak ADT:	17,007		

Table 20: Derivation of the seasonal peaking factor

Metric					US Customary				
			Stopping sight distance					Stopping sight distance	
Design speed (km/h)	Brake reaction distance (m)	Braking distance on level (m)	Calculated (m)	Design (m)	Design speed (mph)	Brake reaction distance (ft)	Braking distance on level (ft)	Calculated (ft)	Design (ft)
20	13.9	4.6	18.5	20	15	55.1	21.6	76.7	80
30	20.9	10.3	31.2	35	20	73.5	38.4	111.9	115
40	27.8	18.4	46.2	50	25	91.9	60.0	151.9	155
50	34.8	28.7	63.5	65	30	110.3	86.4	196.7	200
60	41.7	41.3	83.0	85	35	128.6	117.6	246.2	250
70	48.7	56.2	104.9	105	40	147.0	153.6	300.6	305
80	55.6	73.4	129.0	130	45	165.4	194.4	359.8	360
90	62.6	92.9	155.5	160	50	183.8	240.0	423.8	425
100	69.5	114.7	184.2	185	55	202.1	290.3	492.4	495
110	76.5	138.8	215.3	220	60	220.5	345.5	566.0	570
120	83.4	165.2	248.6	250	65	238.9	405.5	644.4	645
130	90.4	193.8	284.2	285	70	257.3	470.3	727.6	730
					75	275.6	539.9	815.5	820
					80	294.0	614.3	908.3	910

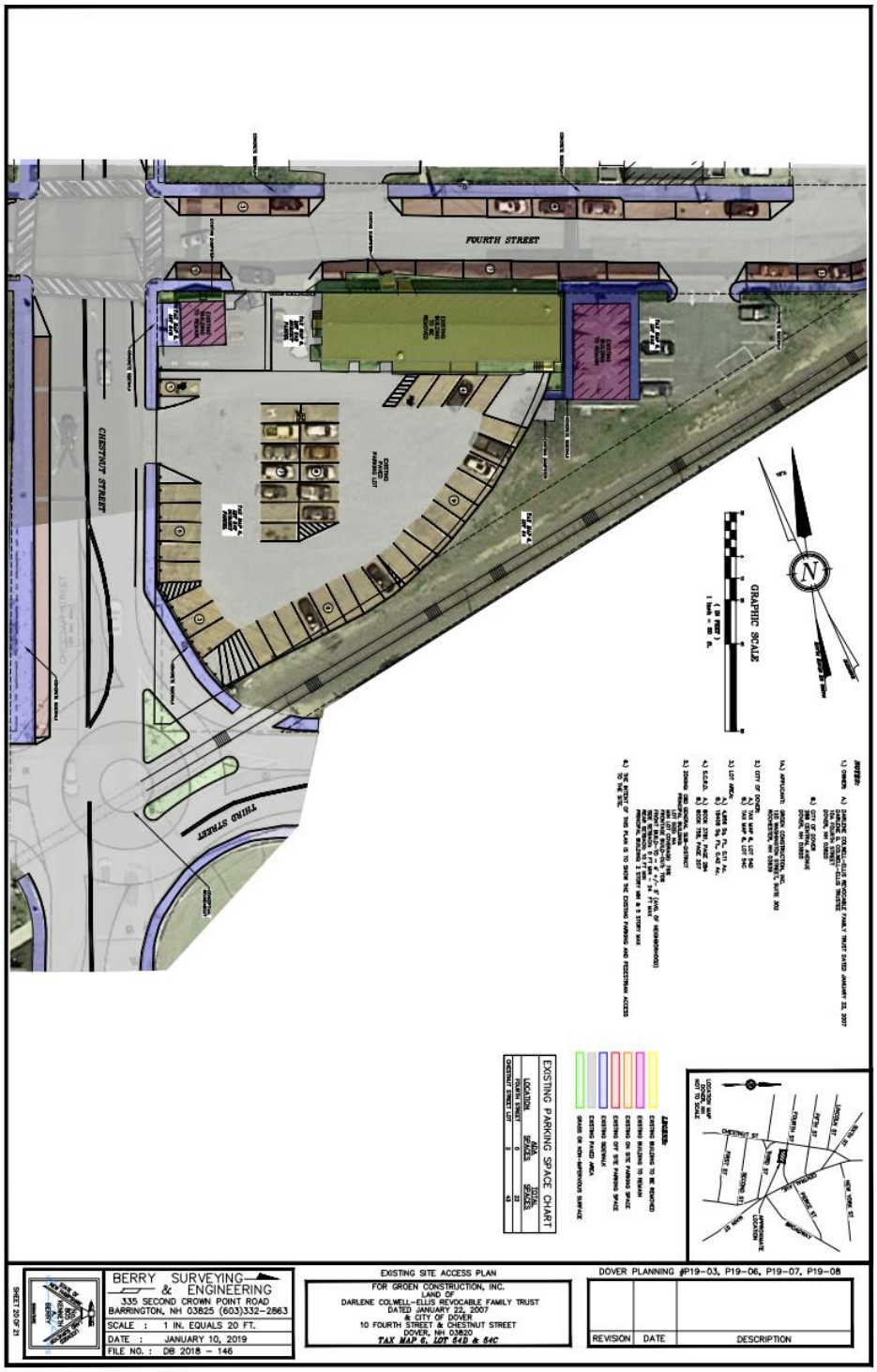
Note: Brake reaction distance predicated on a time of 2.5 s; deceleration rate of 3.4 m/s^2 [11.2 ft/s^2] used to determine calculated sight distance.

Exhibit 3-1. Stopping Sight Distance

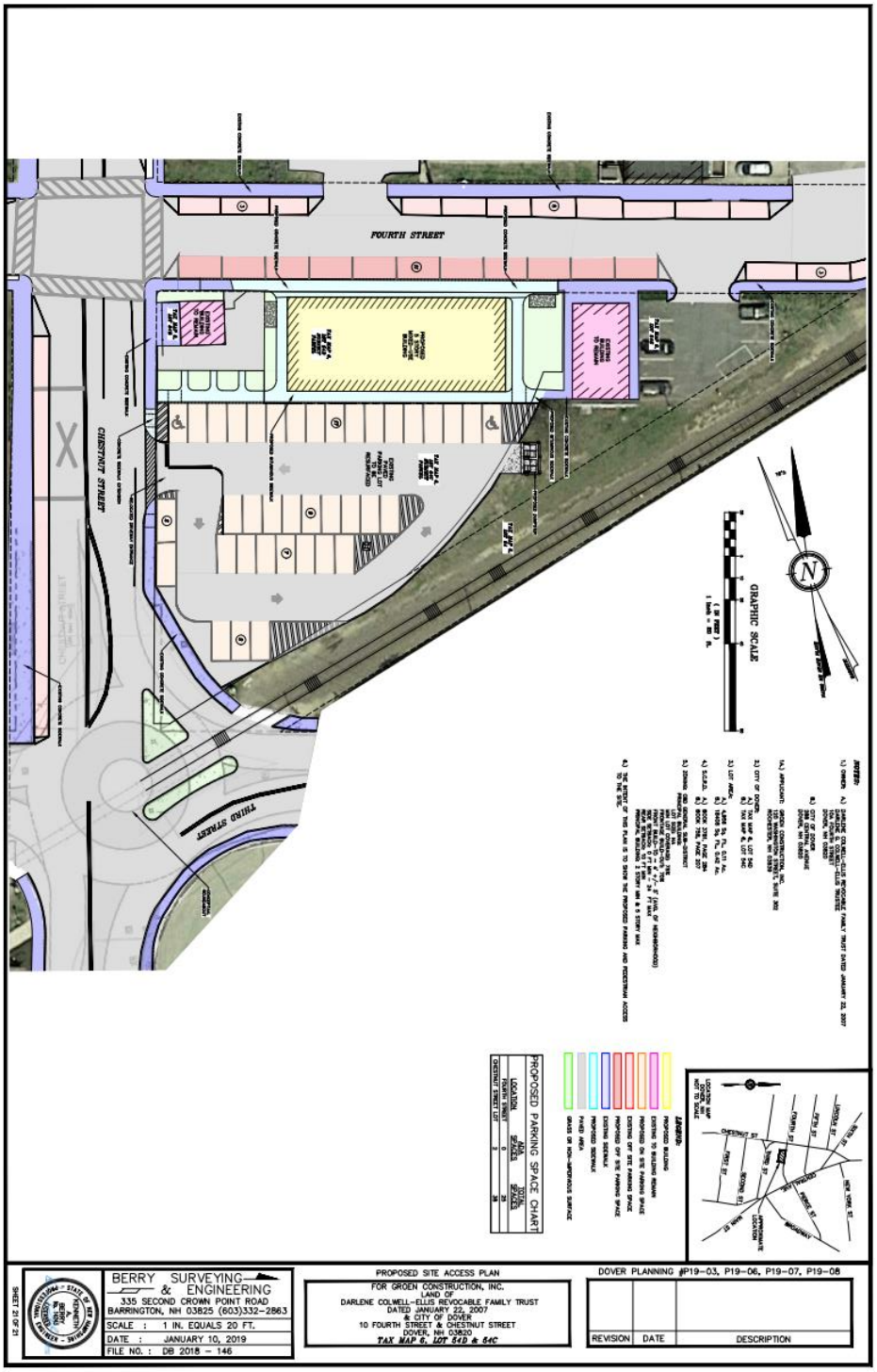
Figure 23: Derivation of stopping sight distance requirements

BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com

Existing Site Access Plan



Proposed Site Access Plan



''FOURTH STREET DEPOT''
SITE PLAN
FOR
GROEN CONSTRUCTION, INC.
10 FOURTH STREET
LAND OF DARLENE COLWELL–ELLIS
& CITY OF DOVER
DOVER, N.H.
TAX MAP 6, LOT 54D & 54C

TABLE OF CONTENTS:

SHEET 1 ~ NEIGHBORHOOD PLAN
SHEET 2 ~ EXISTING CONDITIONS PLAN
SHEET 3 ~ LOT LINE REVISION PLAN*
SHEET 4 ~ EASEMENT PLAN*
SHEET 5 ~ DEMOLITION PLAN
SHEET 6 ~ SITE PLAN
SHEET 7 ~ GRADING PLAN
SHEET 8 ~ DRAIN LINE PROFILES
SHEET 9 ~ EROSION & SEDIMENT CONTROL PLAN
SHEET 10 ~ UTILITY PLAN
SHEET 11 ~ LANDSCAPING PLAN
SHEET 12 ~ LIGHTING PLAN
SHEET 13 ~ E101–EROSION & SEDIMENT CONTROL DETAILS
SHEET 14 ~ E102–EROSION & SEDIMENT CONTROL DETAILS
SHEET 15 ~ C101–CONSTRUCTION DETAILS
SHEET 16 ~ C102–CONSTRUCTION DETAILS
SHEET 17 ~ C103–CONSTRUCTION DETAILS
SHEET 18 ~ U101–UTILITY DETAILS
SHEET 19 ~ U102–UTILITY DETAILS
SHEET 20 ~ EXISTING SITE ACCESS PLAN
SHEET 21 ~ PROPOSED SITE ACCESS PLAN

ASTERISKS NEXT TO PLAN INDICATES IT IS TO BE RECORDED.

OWNER: DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST DATED JANUARY 22, 2007
DARLENE COLWELL–ELLIS TRUSTEE
10A FOURTH STREET
DOVER, NH 03820

CITY OF DOVER
288 CENTRAL AVENUE
DOVER, NH 03820

DEVELOPER: GROEN CONSTRUCTION, INC.
120 WASHINGTON STREET, SUITE 302
ROCHESTER, NH 03839

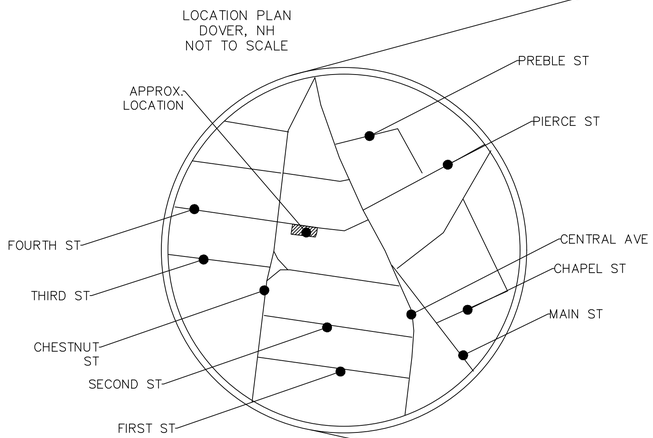
SURVEYOR OF RECORD: KENNETH A. BERRY, PE, LLS
CPSWQ, CPESC, CESSWI
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825
(603) 332–2863

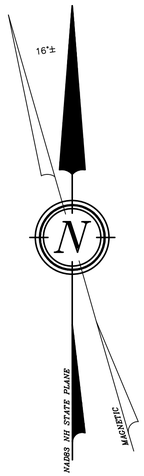
ENGINEER OF RECORD: KENNETH A. BERRY, PE, LLS
CPSWQ, CPESC, CESSWI
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825
(603) 332–2863

WETLAND SCIENTIST: CYNTHIA BALCUS, CWS #61
STONEY RIDGE ENVIRONMENTAL, LLC
229 PROSPECT MOUNTAIN ROAD
ALTON, NH 03809
(603) 776–5825

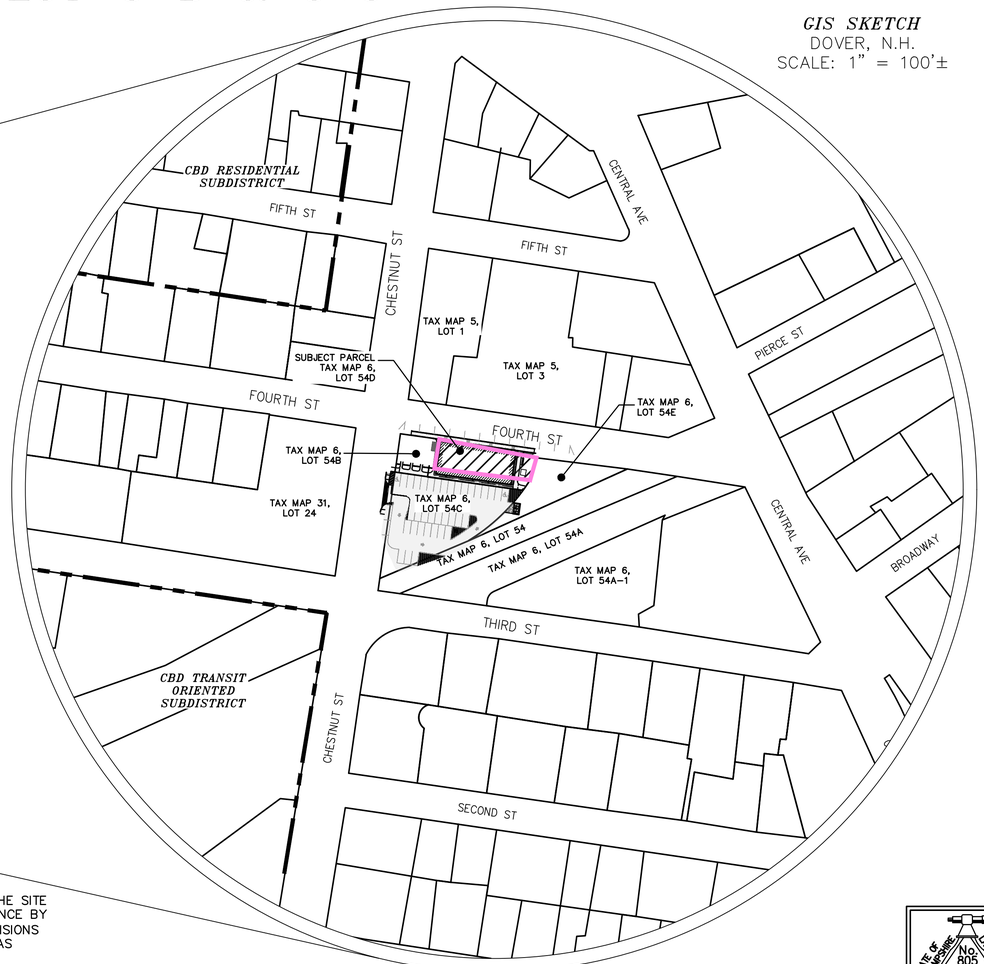
LANDSCAPE ARCHITECT: TERRAIN PLANNING & DESIGN LLC
1 HARDY ROAD #105
BEDFORD, NH 03110
(603)–491–2322

LOCATION PLAN
DOVER, NH
NOT TO SCALE





GIS SKETCH
DOVER, N.H.
SCALE: 1" = 100'±



GENERAL PLAN SET NOTES:

1.) 11x17" PLANS ARE HALF THE PUBLISHED SCALE.

2.) ALL PLANS ARE CONSIDERED TO BE NOT FOR CONSTRUCTION UNLESS THEY CONTAIN THE APPROVAL STAMP OF THE CITY OF DOVER.

3.) BERRY SURVEYING AND ENGINEERING (BS&E) HAS PREPARED A "DRAINAGE ANALYSIS & EROSION AND SEDIMENT CONTROL PLAN" OF EVEN DATE FOR THIS SITE PLAN REVIEW PLAN SET AND PROPOSED DEVELOPMENT. BS&E HAS ALSO PREPARED A "STORM WATER SYSTEM OPERATION AND MAINTENANCE PLAN AND INSPECTION AND MAINTENANCE MANUAL ALSO OF EVEN DATE. BOTH OF THE DOCUMENTS ARE A PART OF THIS PLAN SET AND APPROVAL. THIS PROPOSAL IS NOT SUBJECT TO THE EPA CONSTRUCTION GENERAL PERMIT (CGP) BUT WILL REQUIRE A STORM WATER MANAGEMENT PLAN BASED ON CITY OF DOVER CHAPTER 149–14A TO BE APPROVED BY CITY OF DOVER COMMUNITY SERVICES.

WHETHER OR NOT OTHERWISE EXPRESSLY RECITED ON THIS SITE PLAN, THE SITE 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 SITE REVIEW 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, OR REQUIRE PLAN AMENDMENT APPROVED BY THE DIRECTOR OF PLANNING.

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 805 KENNETH A. BERRY SIGNATURE

REVISION	DATE	DESCRIPTION

DOVER PLANNING #P19–03, P19–06, P19–07, P19–08

COVER SHEET
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

SCALE : AS SHOWN
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 – 146

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

ABBREVIATION LEGEND:

V.G.C.	VERTICAL GRANITE CURB
E.O.P.	EDGE OF PAVEMENT
BITUM.	BITUMINOUS
E.S.H.W.T	ESTIMATED SEASONAL HIGH WATER TABLE
TYP.	TYPICAL
U.G.E.	UNDER GROUND ELECTRIC / UTILITY
HDPE	HIGH DENSITY POLYETHYLENE
ACP	ASBESTOS CONCRETE PIPE
F.G.	FINISHED GRADE
E.G.	EXISTING GRADE
L.D.	LINEAR FOOT
F.F.	FINISHED FLOOR
FND	FOUND
T.B.R.	TO BE REMOVED
P.L.	PROPERTY LINE
E.L.	EASEMENT LINE
T.B.M.	TEMPORARY BENCHMARK
'/.	FEET / FEET

{ } 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:

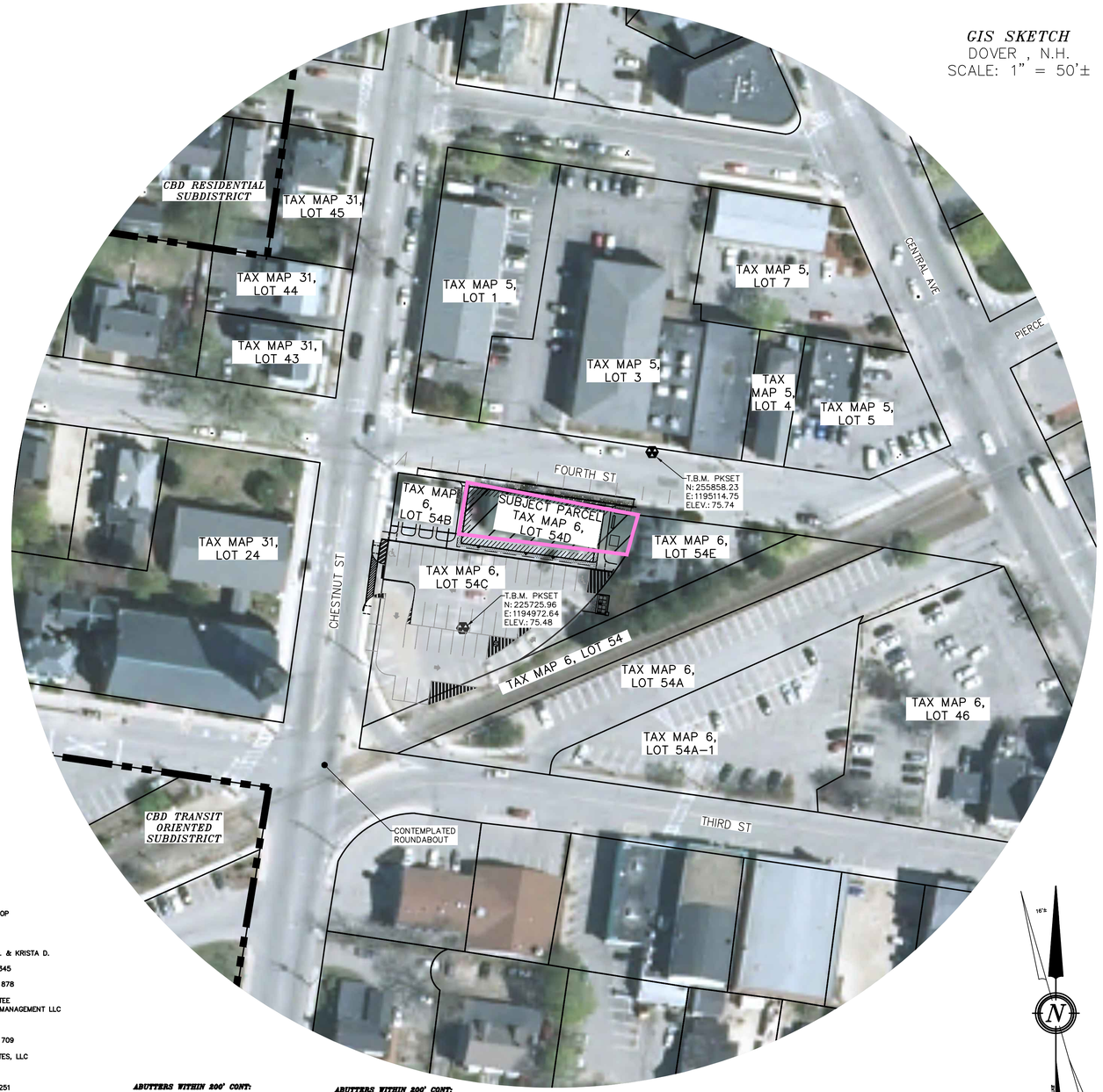
- IRON BOUND (FND)
- REBAR (FND)
- RAILROAD SPIKE (FND)
- UTILITY POLE / GUY WIRE
- SINGLE POST SIGN
- CURB STOP
- GATE VALVE
- GAS VALVE
- FIRE HYDRANT
- CATCH BASIN
- SEWER MANHOLE
- DRAIN MANHOLE
- TREE
- E113.83 EXISTING SPOT ELEVATION
- BUILDING SETBACK LINE
- GAS GAS GAS GAS EXISTING GAS LINE
- EWL EWL EXISTING WATER LINE
- S S EXISTING SEWER LINE
- D D EXISTING DRAIN LINE
- OHU OHU OHU OHU OVERHEAD UTILITIES
- 116 EXISTING CONTOUR MINOR
- 115 EXISTING CONTOUR MAJOR

PROPOSED LEGEND:

- IRON BOUND (FND)
- TEMPORARY BENCHMARK
- TEST PIT/BORING
- PARKING KIOSK
- CURB STOP
- GATE VALVE
- GAS VALVE
- CATCH BASIN
- E101 / E6 SHEET DETAIL
- THRUST BLOCK
- P114.05 LIGHTING
- PROPOSED SPOT ELEVATION
- EASEMENT LINE
- GAS GAS GAS GAS PROPOSED GAS LINE
- W W PROPOSED WATER LINE
- S S PROPOSED SEWER LINE
- D D PROPOSED DRAIN LINE
- U.D. U.D. PROPOSED UNDERDRAIN
- F41 PROPOSED CONTOUR MINOR
- F40 PROPOSED CONTOUR MAJOR
- SAW CUT LINE
- UGE UGE PROPOSED UNDERGROUND UTILITY
- SF SILT FENCE / EROSION MIX BERM
- SS SS SS FILTREXX SILT SOXX (8" or 12" AS NOTED)
- C C C ORANGE CONSTRUCTION PERIMETER FENCE

SIGN ID NUMBER (NEW SIGNS)	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	1	RED	WHITE	WHITE	SQUARE (1)
R5-1	30"x30"	DO NOT ENTER	SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT - FHWA	1	WHITE W/ RED SYMBOL	WHITE	WHITE	SQUARE (1)
R6-1R	36"x12"	ONE WAY	SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT - FHWA	1	BLACK W/ WHITE ARROW	BLACK	WHITE	SQUARE (1)
R7-8a	12"x6"	VAN ACCESSIBLE	SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT - FHWA	1	WHITE	GREEN	GREEN	SQUARE (1)
R8-3	18"x24"	NO PARKING	SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT - FHWA	1	WHITE	RED	RED	SQUARE (1)
SIGN ID NUMBER (EX. SIGNS TO BE REUSED)	SIGN SIZE (WIDTH x HEIGHT)	SIGN	TEXT DIMENSIONS	NO. OF SIGNS	BACKGROUND	LEGEND	BORDER	POST SIZE & QUANTITY
R7-8	12"x18"	RESERVED PARKING	SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT - FHWA	2	WHITE	GREEN W/ WHITE SYMBOL ON BLUE	RED	SQUARE (1)

GIS SKETCH
DOVER , N.H.
SCALE: 1" = 50'±



ABUTTERS WITHIN 200':

N/F ROMAN CATHOLIC BISHOP
150 CENTRAL AVENUE
DOVER, NH 03820-4022
TAX MAP 31, LOT 24

N/F NITSCHELM, ANDREW A. & KRISTA D.
384 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801-5345
TAX MAP 31, LOT 43
S.C.R.D. BOOK 4094, PAGE 878

N/F CAPLE BRIAN C. TRUSTEE
C/O TENNYSON PROPERTY MANAGEMENT LLC
PO BOX 1818
DOVER, NH 03821-1818
TAX MAP 31, LOT 44
S.C.R.D. BOOK 3892, PAGE 709

N/F C&W REALTY ASSOCIATES, LLC
16 FIFTH STREET
DOVER NH 03820
TAX MAP 31, LOT 45
S.C.R.D. BOOK 1911, PAGE 251

N/F FULL CIRCLE CONDOMINIUMS
C/O MOUZOURAKIS KING OF THE MOUNTAIN PROPERTIES, LLC
18 MICA POINT ROAD
BARRINGTON NH 03825-3301
TAX MAP 5, LOT 1
S.C.R.D. BOOK 3382, PAGE 240

N/F 21 FOURTH STREET LLC
280 A DOVER POINT ROAD
DOVER, NH 03820
TAX MAP 5, LOT 3
S.C.R.D. BOOK 2762, PAGE 945

N/F ADMR REALTY LLC
199 CONSTITUTION AVENUE
PORTSMOUTH, NH 03801
TAX MAP 5, LOT 4
S.C.R.D. BOOK 4335, PLAN 501

N/F ADMR REALTY LLC
199 CONSTITUTION AVENUE
PORTSMOUTH, NH 03801
TAX MAP 5, LOT 5
S.C.R.D. BOOK 4204, PAGE 579

ABUTTERS WITHIN 200' CONT:

N/F GOSSELLS, BONNIE & BUCHER E. CO-TRUSTEES
C/O 7 ELEVEN INC
ATTN: PROPERTY TAX STORE 3
PO BOX 711
DALLAS, TX 75221
TAX MAP 5, LOT 7
S.C.R.D. BOOK 3901, PAGE 513

N/F BAMFORD, DAVID K.
466 CENTRAL AVENUE SUITE 122
DOVER, NH 03820
TAX MAP 6, LOT 46
S.C.R.D. BOOK 3041, PAGE 644

N/F BOSTON & MAINE RR
IRON HORSE PARK,
HIGH STREET
BILLERICA, MA 01862
TAX MAP 6, LOT 54

N/F CITY OF DOVER
288 CENTRAL AVENUE
DOVER, NH 03820
TAX MAP 6, LOT 54A & 54C

ABUTTERS WITHIN 200' CONT:

N/F CARNEGIE HOLDINGS, LLC
42J DOVER POINT ROAD
DOVER, NH 03820
TAX MAP 6, LOT 54A-1
S.C.R.D. BOOK 4490, PAGE 574

N/F BOSTON & MAINE RAILROAD
IRON HORSE PARK
HIGH STREET
NORTH BILLERICA, MA 01862
TAX MAP 6, LOT 54

N/F CARRIER, IRENE R. TRUSTEE
CARRIER IRENE R. REV. TRUST 98
PORTSMOUTH, NH 03801
S.C.R.D. BOOK 3508, PAGE 24
TAX MAP 6, LOT 54B
S.C.R.D. BOOK 3508, PAGE 24

N/F FORTIN GAIL A. & DONALD A.
PO BOX 902
MILTON NH 03851
TAX MAP 6, LOT 54B
S.C.R.D. BOOK 2319, PAGE 401

16°± N

AUBE & WHITE BLOCK

STATE OF NEW HAMPSHIRE — No. 805 — KENNETH A. BERRY — LICENSED LAND SURVEYOR — SIGNATURE

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

REVISION	DATE	DESCRIPTION

DOVER PLANNING #P19-03, P19-06, P19-07, P19-08

NEIGHBORHOOD PLAN
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

SCALE : AS SHOWN
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 - 146

SOILS:

SfC – SUFFIELD SILT LOAM, 8 TO 15 PERCENT SLOPES

SEE WEBSOIL USDA–NRCS

PLAN REFERENCES:

1.) "SUBDIVISION PLAN PREPARED FOR CHANGING PLACES, LLC, TAX MAP 6, LOT NO. 54A, THIRD STREET CITY OF DOVER, COUNTY OF STRAFFORD, STATE OF NEW HAMPSHIRE"
BY: MCENEANEY SURVEY ASSOCIATES
DATED: MARCH 2, 2017
S.C.R.D. PLAN #113–96

2.) "SUBDIVISION OF PARCEL B FOR ANTHONY J. FERRIGNO IN DOVER, N.H."
BY B.L. POHOPEK
DATED: DECEMBER 12, 1984
S.C.R.D. PLAN #25–51

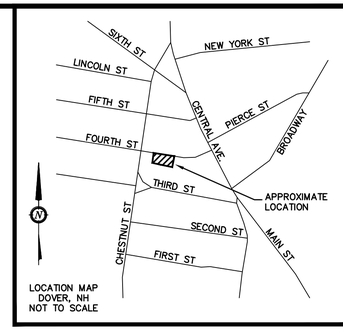
3.) "LAND IN DOVER, N.H., BOSTON & MAINE CORPERATION TO ROLLAND W. GRONDIN AND TO ANTHONY FERRIGNO"
BY: J.D. BATCHELDER
DATED: JULY 1969
S.C.R.D. PLAN #17–20

4.) "PLAN OF LAND FOR FISCHER BLOCK, DOVER NEW HAMPSHIRE"
BY: G.L. DAVIS
DATED: JUNE, 1963
S.C.R.D. PLAN #16, POCKET #4, FOLDER #5

5.) "DOVER, N.H."
BY: OFFICE OF VICE PRES. – ENGINEERING, BOSTON–MASS
DATED: MAY, 1959
S.C.R.D. PLAN #13, POCKET #7, FOLDER #3

LEGEND:

- IRON BOUND/REBAR (FND)
- RAILROAD SPIKE/SPIKE (FND)
- UTILITY POLE
- GUY WIRE
- BORING
- DRAIN MANHOLE W/ STRUCTURE
- SEWER MANHOLE W/ STRUCTURE
- CATCH BASIN W/ STRUCTURE
- WATER LINE
- GAS LINE
- OVER HEAD UTILITIES
- EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- ABUTTING PROPERTY LINE
- EXISTING DRAIN LINE
- EXISTING SEWER LINE
- E75.51 SPOT ELEVATION
- FND FOUND
- TYP TYPICAL
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS



NOTES:

1.) OWNER: A.) DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST DATED JANUARY 22, 2007
DARLENE G. COLWELL–ELLIS TRUSTEE
10A FOURTH STREET
DOVER, NH 03820

B.) CITY OF DOVER
288 CENTRAL AVENUE
DOVER, NH 03820

1A.) APPLICANT: GROEN CONSTRUCTION, INC.
120 WASHINGTON STREET, SUITE 302
ROCHESTER, NH 03839

2.) CITY OF DOVER:
A.) TAX MAP 6, LOT 54D
B.) TAX MAP 6, LOT 54C

3.) LOT AREA:
A.) 4,956 Sq. Ft., 0.11 Ac.
B.) 18,408 Sq. Ft., 0.42 Ac.

4.) S.C.R.D. A.) BOOK 3781, PAGE 284
B.) BOOK 758, PAGE 207

5.) ZONING: CBD GENERAL SUB–DISTRICT
PRINCIPAL BUILDING:
LOT SIZE: NA
MIN LOT COVERAGE: 75%
FRONTAGE BUILD–OUT: 70%
FRONT BUILD–TO ~ 4' +/– 5' (AVG. OF NEIGHBORHOOD)
SIDE SETBACK: 0 FT MIN – 24 FT MAX
REAR SETBACK: 10 FT MIN
PRINCIPAL BUILDING: 2 STORY MIN & 5 STORY MAX

6.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, THIS PARCEL DOES NOT 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 SEPTEMBER OF 2018, WITH AN ERROR OF CLOSURE OF 1 PART IN 43,146.5.

9.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS ON TAX MAP 6–LOT 54D, TAX MAP 6–LOT 54C, FOURTH STREET AND CHESTNUT STREET AS OF THE DATE OF THIS PLAN.

10.) EXISTING LOT COVERAGE:
A.) 3,317 Sq. Ft. (66.9%)
B.) 0 Sq. Ft. (0%)

11.) EXISTING IMPERVIOUS COVERAGE:
A.) 4,230 Sq. Ft. (85.4%)
B.) 17,225 Sq. Ft. (93.6%)

ADDITIONAL ABUTTERS:

N/F FORTIN GAIL A. & DONALD A.
PO BOX 902
MILTON NH 03851
TAX MAP 6, LOT 54B
S.C.R.D. BOOK 2319, PAGE 401

N/F ROMAN CATHOLIC BISHOP
P0153 ASH STREET
MANCHESTER NH 03104
TAX MAP 31, LOT 24

EXISTING PARKING SPACE CHART		
LOCATION	ADA SPACES	TOTAL SPACES
FOURTH STREET	0	22
CHESTNUT STREET LOT	2	43

UTILITY NOTE :

THE UNDERGROUND UTILITIES SHOWN ON THIS PLAN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR NOR THE ENGINEER MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE.

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 LLS 805 DATE

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

REVISION	DATE	DESCRIPTION

DOVER PLANNING #P19–03, P19–06, P19–07, P19–08

EXISTING CONDITIONS PLAN
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 – 146

STATE OF NEW HAMPSHIRE No. 805 KENNETH A. BERRY LICENSED LAND SURVEYOR
SIGNATURE

PLAN REFERENCES:

1.) "SUBDIVISION PLAN PREPARED FOR CHANGING PLACES, LLC, TAX MAP 6, LOT NO. 54A, THIRD STREET CITY OF DOVER, COUNTY OF STRAFFORD, STATE OF NEW HAMPSHIRE"
BY: MCENEANEY SURVEY ASSOCIATES
DATED: MARCH 2, 2017
S.C.R.D. PLAN #113-96

2.) "SUBDIVISION OF PARCEL B FOR ANTHONY J. FERRIGNO IN DOVER, N.H."
BY B.L. POHOPEK
DATED: DECEMBER 12, 1984
S.C.R.D. PLAN #25-51

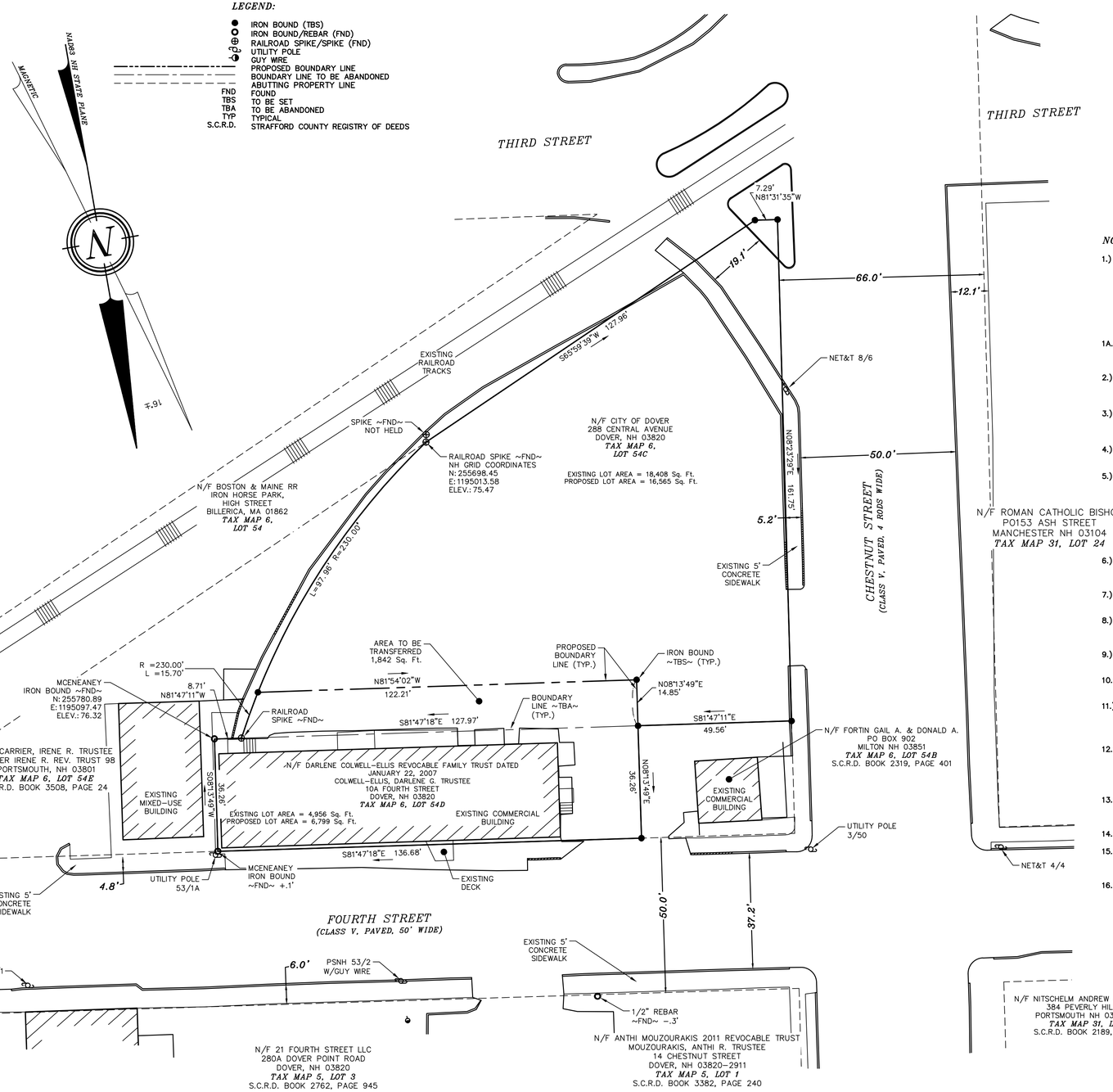
3.) "LAND IN DOVER, N.H., BOSTON & MAINE CORPERATION TO ROLLAND W. GRONDIN AND TO ANTHONY FERRIGNO"
BY: J.D. BATCHELDER
DATED: JULY 1969
S.C.R.D. PLAN #17-20

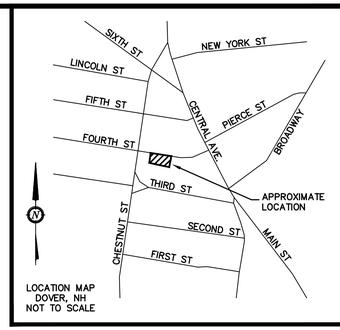
4.) "PLAN OF LAND FOR FISCHER BLOCK, DOVER NEW HAMPSHIRE"
BY: G.L. DAVIS
DATED: JUNE, 1963
S.C.R.D. PLAN #16, POCKET #4, FOLDER #5

5.) "DOVER, N.H."
BY: OFFICE OF VICE PRES. - ENGINEERING, BOSTON-MASS
DATED: MAY, 1959
S.C.R.D. PLAN #13, POCKET #7, FOLDER #3

LEGEND:

- IRON BOUND (TBS)
- IRON BOUND/REBAR (FND)
- RAILROAD SPIKE/SPIKE (FND)
- UTILITY POLE
- GUY WIRE
- PROPOSED BOUNDARY LINE
- BOUNDARY LINE TO BE ABANDONED
- ABUTTING PROPERTY LINE
- FND FOUND
- TBS TO BE SET
- TBA TO BE ABANDONED
- TYP TYPICAL
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS





NOTES:

1.) OWNER: A.) DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST DATED JANUARY 22, 2007
DARLENE G. COLWELL-ELLIS TRUSTEE
10A FOURTH STREET
DOVER, NH 03820

B.) CITY OF DOVER
288 CENTRAL AVENUE
DOVER, NH 03820

1A.) APPLICANT: GROEN CONSTRUCTION, INC.
120 WASHINGTON STREET, SUITE 302
ROCHESTER, NH 03839

2.) CITY OF DOVER:
A.) TAX MAP 6, LOT 54D
B.) TAX MAP 6, LOT 54C

3.) LOT AREA:
A.) 4,956 Sq. Ft., 0.11 Ac.
B.) 18,408 Sq. Ft., 0.42 Ac.

4.) S.C.R.D. A.) BOOK 3781, PAGE 284
B.) BOOK 758, PAGE 207

5.) ZONING: CBD GENERAL SUB-DISTRICT
PRINCIPAL BUILDING:
LOT SIZE: NA
MIN LOT COVERAGE: 75%
FRONTAGE BUILD-OUT: 70%
FRONT BUILD-TO = 4' +/- 5' (AVG. OF NEIGHBORHOOD)
SIDE SETBACK: 0 FT MIN - 24 FT MAX
REAR SETBACK: 10 FT MIN
PRINCIPAL BUILDING: 2 STORY MIN & 5 STORY MAX

6.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, THIS PARCEL DOES NOT 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 SEPTEMBER OF 2018, WITH AN ERROR OF CLOSURE OF 1 PART IN 43,146.5.

9.) THE INTENT OF THIS PLAN IS TO SHOW A LOT LINE REVISION BETWEEN ON TAX MAP 6, LOT 54D & TAX MAP 6, LOT 54C AS OF THE DATE OF THIS PLAN.

10.) TAX MAP 6, LOT 54D IS SERVICED BY MUNICIPAL WATER AND SEWER. TAX MAP 6, LOT 54C IS NOT SERVICED.

11.) THIS IS A 1 SHEET PLAN, AND PART OF AN OVERALL PLAN SET. THIS SHEET WILL BE RECORDED AT THE STRAFFORD COUNTY REGISTRY OF DEEDS. FOR MORE INFORMATION ON THIS LOT LINE REVISION, CONTACT THE CITY OF DOVER PLANNING DEPARTMENT, 288 CENTRAL AVE, DOVER, NH 03820, (603) 516-6008.

12.) AS-BUILT PLANS OF THE SITE SHALL BE SUBMITTED ON PAPER AND IN DIGITAL FORMAT IN PDF AND AUTOCAD DWG, AUTOCAD DXF OR ERSI FORMAT TO THE CITY OF DOVER ENGINEERS OFFICE UPON COMPLETION OF PROJECT. AS-BUILT PLANS SHALL BE PREPARED AND CERTIFIED CORRECT BY A L.L.S. OR P.E. DIGITAL FILE 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. SITE PLANS SHALL SHOW ANY EASEMENTS FOR THESE SERVICES.

14.) THE SUBJECT PARCEL IS SERVED BY MUNICIPAL WATER AND SEWER.

15.) ALL APPLICABLE RIGHT-OF-WAY, CONSERVATION, SLOPE, CONSTRUCTION, POWER LINE, CROSS TRAVEL, OR OTHER EASEMENTS SHALL BE REFERENCED IN A NOTE AND SHOWN ON THE PLAN.

16.) SEE CORRESPONDING EASEMENT PLAN TO BE RECORDED HEREWITH.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

APPROVAL STAMP

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 LLS 805 DATE

DOVER PLANNING #P19-03, P19-06, P19-07, P19-08

REVISION	DATE	DESCRIPTION

LOT LINE REVISION PLAN
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 - 146

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR
No. 805
KENNETH A. BERRY
SIGNATURE

PLAN REFERENCES:

1.) "SUBDIVISION PLAN PREPARED FOR CHANGING PLACES, LLC, TAX MAP 6, LOT NO. 54A, THIRD STREET CITY OF DOVER, COUNTY OF STRAFFORD, STATE OF NEW HAMPSHIRE"
BY: MCENEANEY SURVEY ASSOCIATES
DATED: MARCH 2, 2017
S.C.R.D. PLAN #113-96

2.) "SUBDIVISION OF PARCEL B FOR ANTHONY J. FERRIGNO IN DOVER, N.H."
BY B.L.: POHOPEK
DATED: DECEMBER 12, 1984
S.C.R.D. PLAN #25-51

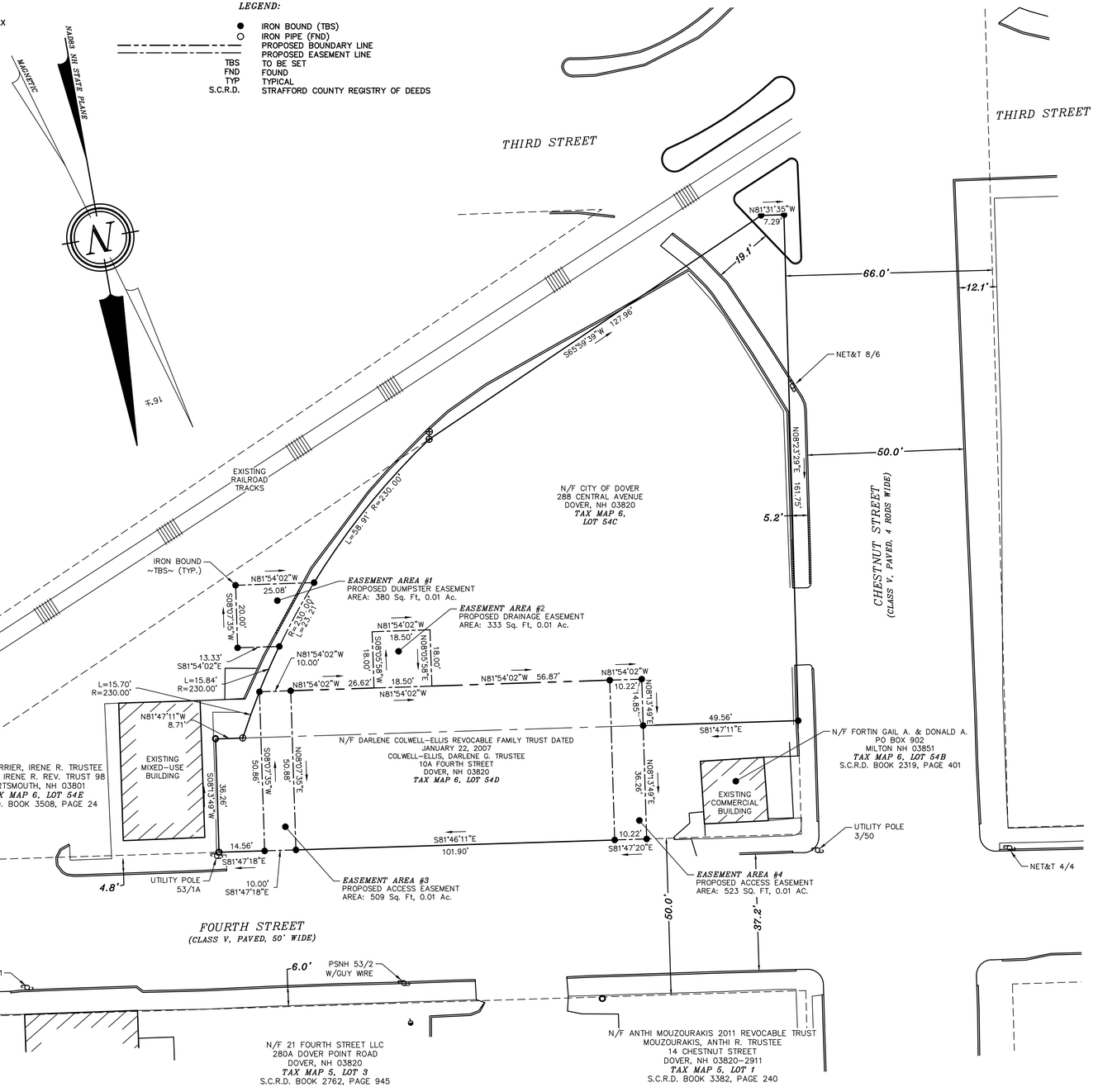
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BY: J.D. BATCHELDER
DATED: JULY 1969
S.C.R.D. PLAN #17-20

4.) "PLAN OF LAND FOR FISCHER BLOCK, DOVER NEW HAMPSHIRE"
BY: G.L. DAVIS
DATED: JUNE, 1963
S.C.R.D. PLAN #16, POCKET #4, FOLDER #5

5.) "DOVER, N.H."
BY: OFFICE OF VICE PRES. - ENGINEERING, BOSTON-MASS
DATED: MAY, 1959
S.C.R.D. PLAN #13, POCKET #7, FOLDER #3

LEGEND:

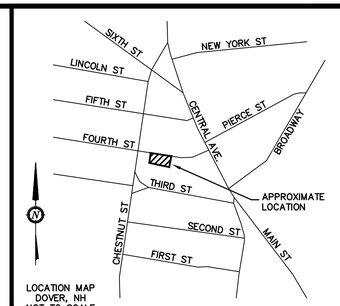
- IRON BOUND (TBS)
- IRON PIPE (FND)
- PROPOSED BOUNDARY LINE
- PROPOSED EASEMENT LINE
- TBS TO BE SET
- FND FOUND
- TYP TYPICAL
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.



LOCATION MAP
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: A.) DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST DATED JANUARY 22, 2007
DARLENE G. COLWELL-ELLIS TRUSTEE
10A FOURTH STREET
DOVER, NH 03820

B.) CITY OF DOVER
288 CENTRAL AVENUE
DOVER, NH 03820

1A.) APPLICANT: GROEN CONSTRUCTION, INC.
120 WASHINGTON STREET, SUITE 302
ROCHESTER, NH 03839

2.) CITY OF DOVER:
A.) TAX MAP 6, LOT 54D
B.) TAX MAP 6, LOT 54C

3.) LOT AREA:
A.) 4,956 Sq. Ft., 0.11 Ac.
B.) 18,408 Sq. Ft., 0.42 Ac.

4.) S.C.R.D. A.) BOOK 3781, PAGE 284
B.) BOOK 758, PAGE 207

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

6.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN SEPTEMBER OF 2018, WITH AN ERROR OF CLOSURE OF 1 PART IN 43,146.5.

7.) THE INTENT OF THIS PLAN IS TO SHOW A LOT LINE REVISION BETWEEN ON TAX MAP 6, LOT 54D & TAX MAP 6, LOT 54C AS OF THE DATE OF THIS PLAN.

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

DOVER PLANNING #P19-03, P19-06, P19-07, P19-08

REVISION	DATE	DESCRIPTION

EASEMENT PLAN
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

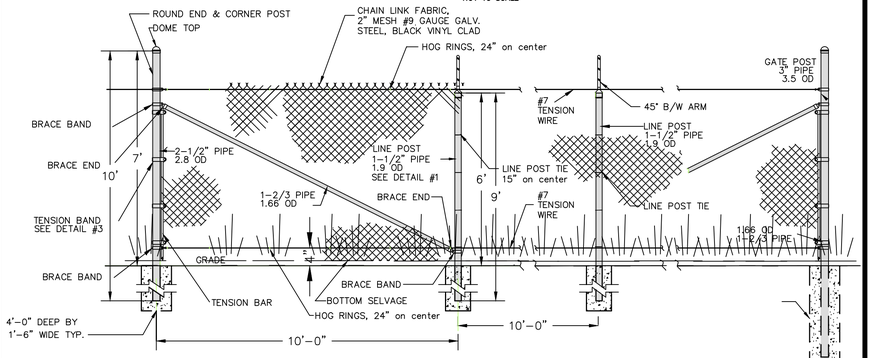
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 - 146

STATE OF NEW HAMPSHIRE No. 805 KENNETH A. BERRY LICENSED LAND SURVEYOR
SIGNATURE

TYPICAL 6' HIGH SAFETY CHAIN LINK FENCE

NOT TO SCALE



THIRD STREET

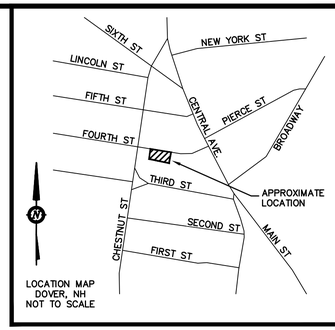
NOTES
1. FENCE LINE SHALL A MAXIMUM 4" REVEAL BETWEEN GROUND SURFACE AND BOTTOM OF FENCE TENSION WIRE.
2. IF THE PROJECT TIME LINE IS OF SHORT DURATION TEMPORARY BASES CAN BE USED AS AN ALTERNATIVE TO THE PERMANENT EMBEDMENT SHOWN.

NOTES:

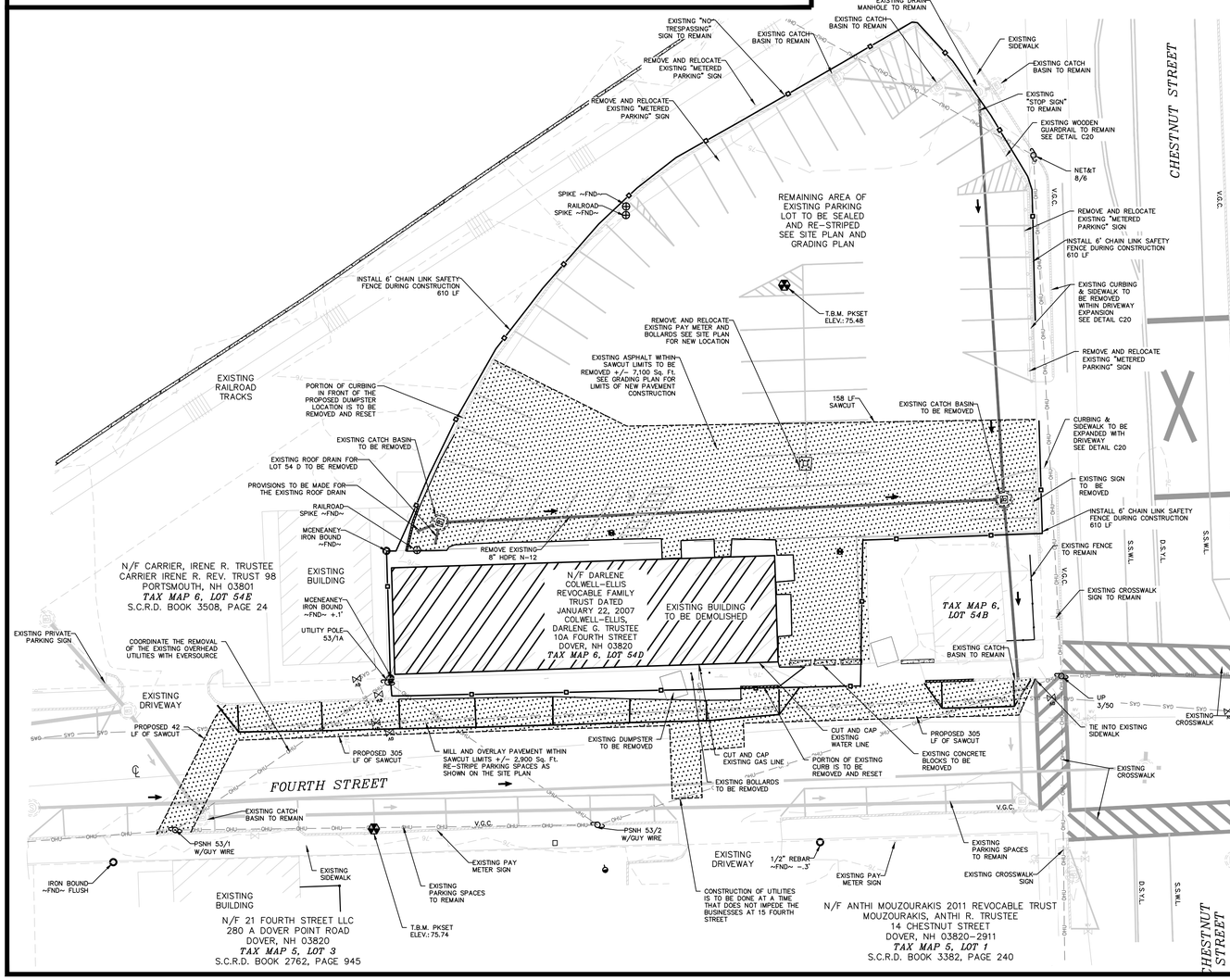
1. OWNER: DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST DATED JANUARY 22, 2007
   DARLENE G. COLWELL–ELLIS TRUSTEE
   10A FOURTH STREET
   DOVER, NH 03820
2. APPLICANT: GROEN CONSTRUCTION, INC.
   120 WASHINGTON STREET, SUITE 302
   ROCHESTER, NH 03839
3. TAX MAP 6, LOT 54D & 54C
4. LOT AREA: 4,956 Sq. Ft., 0.11 Ac.
5. S.C.R.D. BOOK 3781, PAGE 284
6. THE INTENT OF THIS PLAN IS TO SHOW THE ITEMS TO BE DEMOLISHED ON TAX MAP 6, LOT 54D
7. GRADE STAKES ARE TO BE PLACED AROUND ALL BOUNDARIES & CONTROL POINTS TO BE PROTECTED DURING CONSTRUCTION.
8. 6' DEMO FENCE IS REQUIRED.
9. CALL PROFESSIONAL EXTERMINATOR A MINIMUM OF THREE WEEKS AHEAD OF GROUND BREAKING AND PEST CONTROL DEVICES ARE TO BE SET A MINIMUM OF TWO WEEKS BEFORE GROUND BREAKING.
10. ALL DISTURBED MONUMENTS TO BE RE–SET BY BS&E UPON COMPLETION OF PROJECT.
11. COORDINATE WITH INSPECTION SERVICES ON DEMOLITION PERMIT.
12. THE APPLICANT MAY CHOOSE A CURB TO CURB INLAY INSTEAD OF PAYING THE MUNICIPAL PAVEMENT FEE.
13. CONSTRUCTION IN FRONT OF 15 FOURTH STREET IS TO TAKE PLACE DURING OFF PEAK HOURS SO AS NOT TO AFFECT THE BUSINESSES, SERVICED NY THE DRIVEWAY.
14. CONTRACTOR IS TO REUSE THE "METERED PARKING" SIGNS AS SHOWN ON THE SITE PLAN. ANY EXCESS "METERED PARKING" SIGNS ARE TO BE DELIVERED TO DPW OR COORDINATED WITH THE PARKING MANAGER.
15. THIS PLAN SHOWS THE LIMITS OF PAVEMENT CONSTRUCTION WITHIN THE EXISTING PARKING LOT. THE REMAINING AREA OF THE PARKING LOT OUTSIDE THE LIMITS OF CONSTRUCTION IS TO BE SEALED AND RE–STRIPED AS SHOWN ON THE SITE PLAN.
16. CONTRACTOR TO NOTE THAT THE SEWER MAIN IN FOURTH STREET IS CONSIDERED TO BE ACP. CONTRACTOR IS TO TAKE ALL NECESSARY PRECAUTIONS.
17. EXISTING WATER AND SEWER SERVICES TO BE CUT & CAPPED AT MAINS. LOCATIONS UNKNOWN AT THIS TIME.
18. TEMPORARY ACCESS & SAFETY ARRANGEMENTS ARE REQUIRED FOR DOVER DELIGHT TO LIMIT THE IMPACTS ON THE PEAK BUSINESS HOURS.
19. CALL DIG SAFE PRIOR TO BEGINNING WORK (1–888–344–7233).

UTILITY NOTE :

THE UNDERGROUND UTILITIES SHOWN ON THIS PLAN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR NOR THE ENGINEER MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE.



LOCATION MAP
DOVER, NH
NOT TO SCALE



DOVER PLANNING #P19–03, P19–06, P19–07, P19–08

REVISION	DATE	DESCRIPTION

DEMOLITION PLAN
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

1 IN. EQUALS 20 FT.
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 – 146

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

NOTES:

1. OWNER: DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST DATED JANUARY 22, 2007
DARLENE G. COLWELL–ELLIS TRUSTEE
10A FOURTH STREET
DOVER, NH 03820

2. APPLICANT: GROEN CONSTRUCTION, INC.
120 WASHINGTON STREET, SUITE 302
ROCHESTER, NH 03839

3. TAX MAP 6, LOT 54C & 54D

4. LOT AREA: 54C 18,408 Sq. Ft., 0.42 Ac.
54D 4,956 Sq. Ft., 0.11 Ac.

5. S.C.R.D. BOOK 758, PAGE 207
BOOK 3781, PAGE 284

6. ZONING: CBD GENERAL SUB–DISTRICT
PRINCIPAL BUILDING:
LOT SIZE: NA
MIN LOT COVERAGE: 75%
FRONTAGE BUILD–OUT: 70%
FRONT BUILD–TO ~ 4' +/– 5' (AVG. OF NEIGHBORHOOD)
SIDE SETBACK: 0 FT MIN – 24 FT MAX
REAR SETBACK: 10 FT MIN
PRINCIPAL BUILDING: 2 STORY MIN & 5 STORY MAX

7. I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, THIS PARCEL DOES NOT FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015.

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

9. THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN SEPTEMBER OF 2018, WITH AN ERROR OF CLOSURE OF 1 PART IN 43,146.5.

10. THE INTENT OF THIS PLAN IS TO SHOW THE SITE PLAN ELEMENTS ON TAX MAP 6, LOT 54C & 54D.

11. THE EXISTING LOT COVERAGE IS 3,317 SQ. FT.

12. AS–BUILT PLANS OF THE SITE SHALL BE SUBMITTED ON A REPRODUCIBLE MYLAR MEDIUM AND IN A DIGITAL DXF FORMAT ON DISK TO THE CITY OF DOVER ENGINEER'S OFFICE UPON COMPLETION OF PROJECT. AS–BUILT PLANS SHALL BE PREPARED AND CERTIFIED CORRECT BY A L.L.S. OR P.E.

13. THE PROPOSED STRUCTURES SHALL BE SERVED BY A SPRINKLER SYSTEMS AS REQUIRED UNDER CHAPTER 109–30 OF THE CODE OF THE CITY OF DOVER AND THE 2009 STATE BUILDING CODES.

14. SPRINKLER CONNECTIONS MUST BE FLUSHED IN ACCORDANCE WITH NFPA 24 AND A CONTRACTOR'S MATERIALS AND TEST CERTIFICATE FOR UNDERGROUND PIPING FORM MUST BE COMPLETED.

15. FIRE DEPARTMENT CONNECTIONS SHALL BE LOCATED ON THE STREET SIDE OF THE BUILDING PER NFPA 13.

16. A SECURITY SYSTEM SHALL BE INSTALLED AS REQUIRED BY CHAPTER 58, ARTICLE I, SECTION 58–2 OF THE CODE OF THE CITY OF DOVER.

17. ALL ON–SITE UTILITIES SHALL BE INSTALLED UNDERGROUND.

18. THE SUBJECT PARCEL IS SERVED BY MUNICIPAL WATER AND SEWER.

19. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO APPLICABLE CITY AND STATE CODES.

20. APPROVED BACKFLOW PREVENTORS SHALL BE PROVIDED FOR BOTH FIRE AND DOMESTIC WATER LINES.

21. 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.

22. THE LIMITS OF CONSTRUCTION DISTURBANCE SHALL BE STAKED, FLAGGED AND CLEARLY IDENTIFIED PRIOR TO THE COMMENCEMENT OF SITE WORK.

23. ALL TREATMENT SWALES TO BE CONSTRUCTED SHALL HAVE SOD BOTTOMS.

24. A LETTER OF CREDIT FOR THE COST OF RE–VEGETATING ALL DISTURBED AREAS ON THE SITE SHALL BE SUBMITTED PRIOR TO ANY EARTH DISTURBING ACTIVITY OCCURS. COORDINATE WITH CITY OF DOVER, COMMUNITY SERVICES AND ENGINEERING DEPARTMENT.

25. 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.

26. BUILDING ADDRESSES SHALL BE ASSIGNED BY THE BUILDING INSPECTOR AT THE TIME OF ISSUANCE OF A BUILDING PERMIT.

27. THE FOLLOWING FEDERAL AND STATE PERMITS HAVE BEEN ISSUED FOR THE SUBJECT PROPERTY: NONE

28. THIS PLAN PROPOSES 15,500 SQ. FT. OF DISTURBANCE.

29. CALL DIG SAFE PRIOR TO BEGINNING WORK (1–888–344–7233)

30. ALL CONSTRUCTION SHALL CONFORM TO THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. CONSTRUCTION SHALL ALSO CONFORM TO THE CITY OF DOVER POLICIES AND PRACTICES.

31. AREA OF THE PARKING LOT WITHIN THE SAW CUT IS TO BE RECONSTRUCTED FOR THE INSTALLATION OF THE CATCH BASINS AND DRAIN LINE. THE REMAINING AREA SHALL BE SEALED AND RE–STRIPED ACCORDING TO THE PLAN. SEE GRADING PLAN FOR PAVEMENT RECONSTRUCTION LIMITS.

32. RESIDENTS OF THE APARTMENT UNITS IN THE MIXED USE BUILDING WILL PARK BY PERMIT AT THE TRANSPORTATION LOT/CENTER, LOCATED AT 33 CHESTNUT STREET, TAX MAP 31, LOT 48. AS WELL AS NEGOTIATED PERMIT SPACES WITHIN THE CHESTNUT STREET LOT. LEASE AGREEMENTS ARE REQUIRED TO DIRECT TENANTS TO PARKING AREAS.

33. SEE UTILITY PLAN FOR EXTENTS OF PAVEMENT CONSTRUCTION. CUT AND CAP EXISTING WATER AND SEWER LINE

34. 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.

35. THE SITE LAYOUT IS DESIGNED IN COMPLIANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS. THE PROPOSED STRUCTURE WILL ALSO BE DESIGNED IN ACCORDANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS.

36. THE PROPOSED USE FOR THE SITE IS, A MIXED USED BUILDING WITH COMMERCIAL ON THE FIRST FLOOR AND 20 RESIDENTIAL UNITS ABOVE.

37. LIST ANY VARIANCES OR SPECIAL EXCEPTIONS GRANTED BY THE ZONING BOARD IF
ADJUSTMENT: NONE
CONDITIONAL USE PERMITS REQUIRED BY THE PLANNING BOARD: SEE TABLE BELOW FOR LIST.

38. THE CONSTRUCTION HOURS SHALL BE LIMITED TO MONDAY–FRIDAY 7AM–6PM, SATURDAY 9 AM–4PM WITH NO SUNDAY HOURS. HOURS OF CONSTRUCTION SHALL BE DOCUMENTED ON A SITE CONSTRUCTION SIGN ALONG WITH THE CONTACT INFORMATION FOR THE GENERAL CONTRACTOR.

39. COMMERCIAL VEHICLE ROUTE DURING CONSTRUCTION SHALL CONFORM WITH DOVER CITY CODE OR BE COORDINATED WITH THE COMMUNITY SERVICES DIRECTOR.

40. THE INSTALLATION OF ELECTRIC POWER, CABLE TELEVISION AND TELEPHONE LINES SHALL BE UNDERGROUND THROUGHOUT THE SITE FOR WHICH DEVELOPMENT IS PROPOSED. SITE PLANS SHALL SHOW ANY EASEMENTS FOR THESE SERVICES.

NOTES CONT.:

41. FROM GROUND BREAKING THE SITE SHALL REMAIN ACCESSIBLE YEAR ROUND IN ALL WEATHER CONDITIONS.

42. THIS SITE DESIGN HAS BEEN REVIEWED FOR COMPLIANCE WITH THE APPLICABLE ACCESSIBILITY REGULATIONS IN ACCORDANCE WITH NH RSA 155–A:5.

43. EXISTING HANDICAP SIGN LOCATED ON THE EXISTING BUILDING IS TO BE REMOVED AND RELOCATED TO THE VAN ACCESSIBLE HANDICAP PARKING SPOT.

44. WOODEN GUARDRAIL TO BE REMOVED WITHIN THE LIMITS OF THE ENTRANCE CONSTRUCTION. SEE DETAIL C20.

45. THE WAIVERS LISTED ON THIS PLAN WERE GRANTED FOR THE REASONS STATED BY THE APPLICANT AND THAT THE BOARD FOUND THE CRITERIA OF 149–19 HAVE BEEN MET : PENDING

46. SEE GRADING PLAN FOR LOCATION OF ADA ACCESSIBLE ENTRANCES.

47. CALL PROFESSIONAL EXTERMINATOR A MINIMUM OF THREE WEEKS AHEAD OF GROUND BREAKING AND PEST CONTROL DEVICES ARE TO BE SET A MINIMUM OF TWO WEEKS BEFORE GROUND BREAKING.

48. PROPOSED LOT COVERAGE IS 5,194 Sq. Ft. 76.4%

49. LOT 54D (PROPOSED AREAS ARE A FUNCTION OF THE LOT LINE REVISION)
EXISTING BUILDING IMPERVIOUS AREA: 3,317 Sq. Ft. (66.9%)
EXISTING PAVED IMPERVIOUS AREA: 913 Sq. Ft. (18.4%)
TOTAL EXISTING IMPERVIOUS COVER: 4,230 Sq. Ft. (85.4%)
PROPOSED BUILDING IMPERVIOUS AREA: 5,194 Sq. Ft. (76.4%)
PROPOSED PAVED IMPERVIOUS AREA: 661 Sq. Ft. (9.7%)
TOTAL PROPOSED IMPERVIOUS COVER IS 5,855 Sq. Ft. (86.1%)

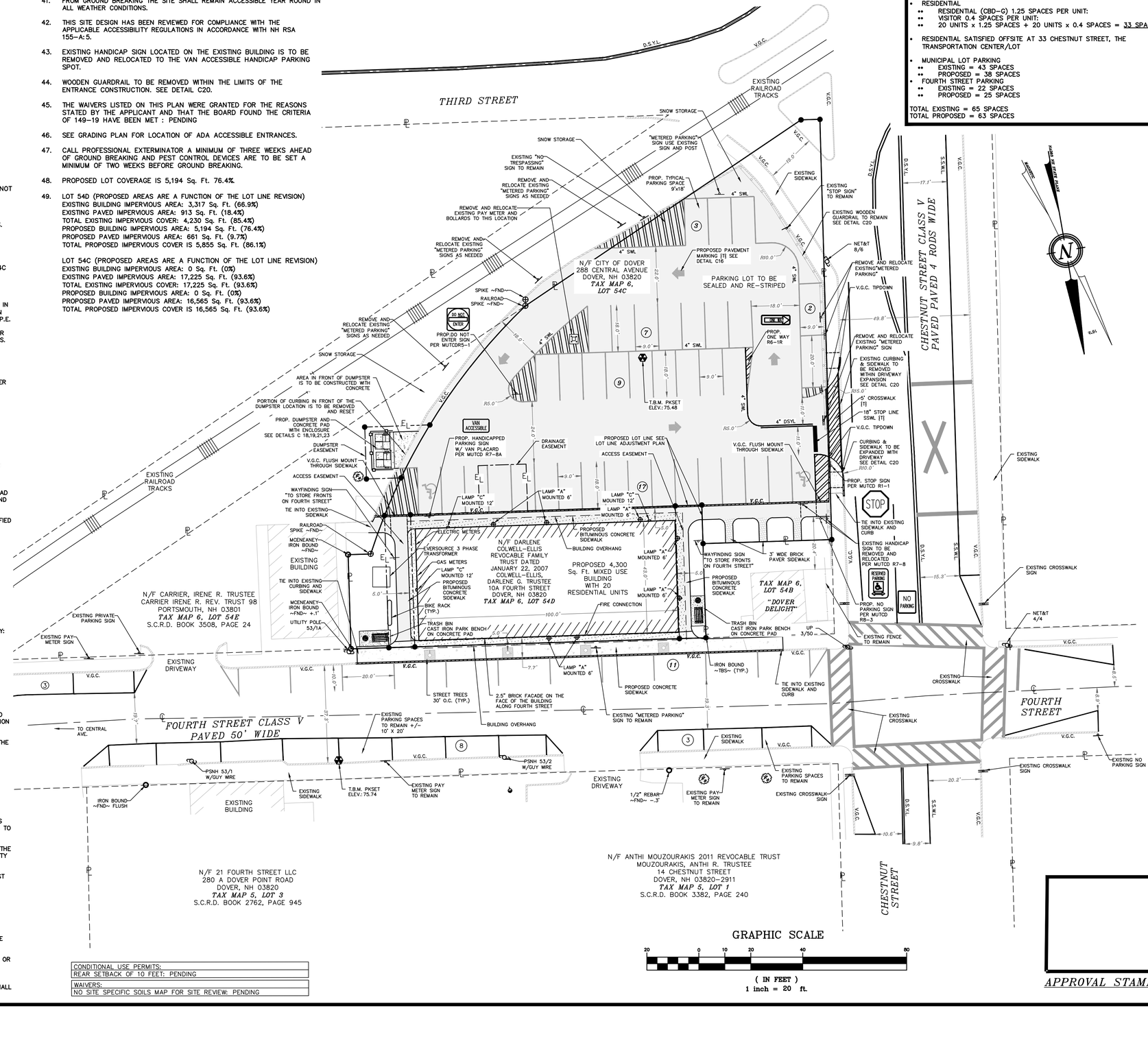
LOT 54C (PROPOSED AREAS ARE A FUNCTION OF THE LOT LINE REVISION)
EXISTING BUILDING IMPERVIOUS AREA: 0 Sq. Ft. (0%)
EXISTING PAVED IMPERVIOUS AREA: 17,225 Sq. Ft. (93.6%)
TOTAL EXISTING IMPERVIOUS COVER: 17,225 Sq. Ft. (93.6%)
PROPOSED BUILDING IMPERVIOUS AREA: 0 Sq. Ft. (0%)
PROPOSED PAVED IMPERVIOUS AREA: 16,565 Sq. Ft. (93.6%)
TOTAL PROPOSED IMPERVIOUS COVER IS 16,565 Sq. Ft. (93.6%)

PARKING REQUIREMENTS:

CHAPTER 149 PARKING TABLE

- RESIDENTIAL
  - RESIDENTIAL (CBD–G) 1.25 SPACES PER UNIT:
  - VISITOR 0.4 SPACES PER UNIT:
  - 20 UNITS x 1.25 SPACES + 20 UNITS x 0.4 SPACES = 33 SPACES
- RESIDENTIAL SATISFIED OFFSITE AT 33 CHESTNUT STREET, THE TRANSPORTATION CENTER/LOT
- MUNICIPAL LOT PARKING
  - EXISTING = 43 SPACES
  - PROPOSED = 38 SPACES
- FOURTH STREET PARKING
  - EXISTING = 22 SPACES
  - PROPOSED = 25 SPACES

TOTAL EXISTING = 65 SPACES
TOTAL PROPOSED = 63 SPACES



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

CONDITIONAL USE PERMITS:
REAR SETBACK OF 10 FEET: PENDING
WAIVERS:
NO SITE SPECIFIC SOILS MAP FOR SITE REVIEW: PENDING

APPROVAL STAMP

REVISION	DATE	DESCRIPTION

DOVER PLANNING #P19–03, P19–06, P19–07, P19–08

SITE PLAN
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 – 146

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14261
LICENSED PROFESSIONAL ENGINEER

SHEET 6 OF 21

NOTES:

1.) OWNER: A.) DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST DATED JANUARY 22, 2007
DARLENE G. COLWELL–ELLIS TRUSTEE
10A FOURTH STREET
DOVER, NH 03820

B.) CITY OF DOVER
288 CENTRAL AVENUE
DOVER, NH 03820

1A.) APPLICANT: GROEN CONSTRUCTION, INC.
120 WASHINGTON STREET, SUITE 302
ROCHESTER, NH 03839

2.) CITY OF DOVER:
A.) TAX MAP 6, LOT 54D
B.) TAX MAP 6, LOT 54C

3.) LOT AREA:
A.) 4,956 Sq. Ft., 0.11 Ac.
B.) 18,408 Sq. Ft., 0.42 Ac.

4.) S.C.R.D.A.) BOOK 3781, PAGE 284
B.) BOOK 758, PAGE 207

5.) THE INTENT OF THIS PLAN IS TO SHOW THE GRADING AND DRAINAGE ENGINEERING DETAIL WITHIN THE SITE PLAN.

STANDARD CONSTRUCTION NOTES:

1.) EXISTING CONDITIONS INFORMATION IS BASED ON A SURVEY PERFORMED BY BERRY SURVEYING & ENGINEERING AND IS ENCLOSED IN THIS PACKAGE.

2.) THIS PROJECT SHALL BE CONSTRUCTED IN ACCORDANCE WITH NHDOT STANDARD SPECIFICATIONS DATED 2010. CURRENT STANDARD PLANS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS INCLUDED IN THE PROPOSAL.

3.) CONTRACTOR SHALL TAKE SPECIAL CARE IN NOT DISTURBING EXISTING MONUMENTS BOUNDS, AND OR BENCHMARKS WITHOUT FIRST MAKING PROVISIONS FOR RELOCATION.

4.) 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.

5.) 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.

6.) THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.

7.) 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. DISTURBANCE OUTSIDE AREAS SHOWN TO BE APPROVED BY DESIGN ENGINEER.

8.) 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)

9.) ALL SYMBOLS, WORDS, TRANSVERSE MARKINGS (STOP BARS, CROSSWALK LINES, AND RAILROAD SYMBOLS), LANE LINES, AND ALL OTHER MARKINGS NOTED WITH [T] SHALL BE THERMOPLASTIC.

10.) THE FOLLOWING FEDERAL AND STATE PERMITS HAVE BEEN ISSUED OR ARE PENDING FOR THE SUBJECT PROPERTY:
NONE

11.) 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.

12.) 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.

13. NOTE THAT THE PROJECT IS NOT SUBJECT TO THE EPA NPDES PHASE II. OPERATION OF THE SITE WILL CONFORM TO THE STORM WATER MANAGEMENT PLAN PER CITY OF DOVER CHAPTER 149–14. WEEKLY INSPECTIONS WILL BE CONDUCTED BY THE DESIGN ENGINEER, OR THIRD PARTY INSPECTOR, SEE E101.

14.) UPON FINAL COMPLETION AND 85% STABILIZATION THE DRAINAGE SYSTEM IS TO BE CLEANED OF ALL DEBRIS TO INCLUDE THE PUMPING OF THE BASIN SUMPS.

16.) ALL BASINS ARE TO HAVE BOOTS INSTALLED ON ALL INLETS AND OUTLETS.

18.) A LETTER OF CREDIT FOR THE COST OF RE–VEGETATING ALL DISTURBED AREAS ON THE SITE SHALL BE SUBMITTED PRIOR TO ANY EARTH DISTURBING ACTIVITY OCCURS, AS MAY BE APPLICABLE.

19.) A PRE–CONSTRUCTION CONFERENCE WITH THE DEVELOPER, THE DESIGN ENGINEER, THE EARTHWORK CONTRACTOR AND DOVER CITY STAFF SHALL OCCUR PRIOR TO ANY EARTH DISTURBING ACTIVITY.

20.) BUILDING ADDRESSES SHALL BE DETERMINED BY THE BUILDING OFFICIAL.

21.) THIS SITE PLAN PROPOSES 15,500 ± SQ. FT. OF DISTURBANCE. PER ENV–WQ 1503.12 (B) AN ALTERATION OF TERRAIN PERMIT IS NOT REQUIRED.

22.) 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.

23.) COMMERCIAL VEHICLE ROUTE DURING CONSTRUCTION SHALL CONFORM WITH CITY OF DOVER CODE OR BE COORDINATED WITH THE COMMUNITY SERVICES DIRECTOR.

24.) THE CONTRACTOR SHALL CALL AND COORDINATE WITH DIGSAFE AT 1–888–344–7233 AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

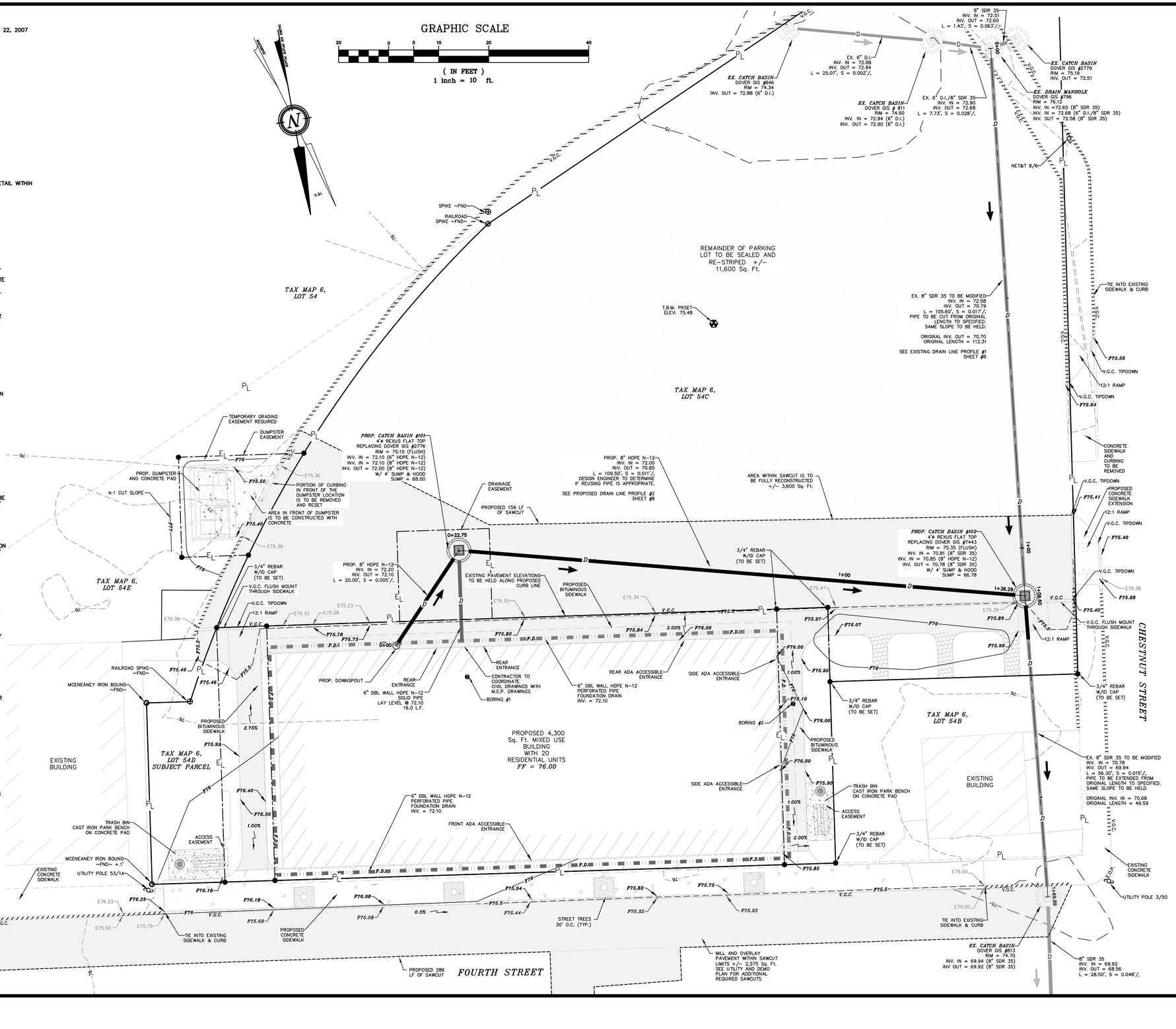
25.) SEE DETAILS CONCERNING SITE LAYOUT, UTILITY, AND SEDIMENT AND EROSION CONTROLS.

26.) ALL DRAINAGE PIPE IS TO BE HDPE N–12, EXCEPT FOR WHERE EXISTING PIPE IS PROPOSED TO BE REUSED. INDIVIDUAL PIPE SIZES ARE SPECIFIED. RECYCLED PIPE IS APPROVED FOR PROJECT SITE. RECYCLED HDPE PIPE "GREEN PIPE" IS ACCEPTABLE FOR THIS PROJECT SITE.

28.) ARCHITECT TO WORK OUT ALL GRADING AT THRESHOLDS WITH BS&E FOR ADA & BUILDING CODE COMPLIANCE PRIOR TO BUILDING OF PROJECT.

29.) ALL CATCH BASINS SHALL BE PRE–CAST H–20 LOADING AND SHALL BE EQUIPPED WITH DEEP SUMPS (4' MIN.) AND HOODS (SEE DETAILS) HOODS ARE TO BE "THE ELIMINATOR" BY KLEANSTREAM. RIMS ARE TO BE REXUS STYLE AND SHALL BE SET FLUSH WITH FINISH GRADE, UNLESS OTHERWISE INSTRUCTED DURING CONSTRUCTION BY DOVER DPW. RIMS ABOVE FINISH GRADE WILL BE NOT BE ACCEPTED. ALL RIMS, GRATES AND COVERS ARE TO BE U.S.A MADE. RIMS ARE TO BE SET AT BINDER GRADE AND RIM–RAISED FOR FINAL TOP COAT. HOODS ARE TO BE INSTALLED IMMEDIATELY AFTER BASIN CONSTRUCTION.

30.) CONTRACTOR TO REVIEW WITH DESIGN ENGINEER THE NEED FOR AN ADDITIONAL INVERT INTO CB #101 FROM ABUTTING LOT PRIOR TO PURCHASING BASIN.



DOVER PLANNING #P19–03, P19–06, P19–07, P19–08

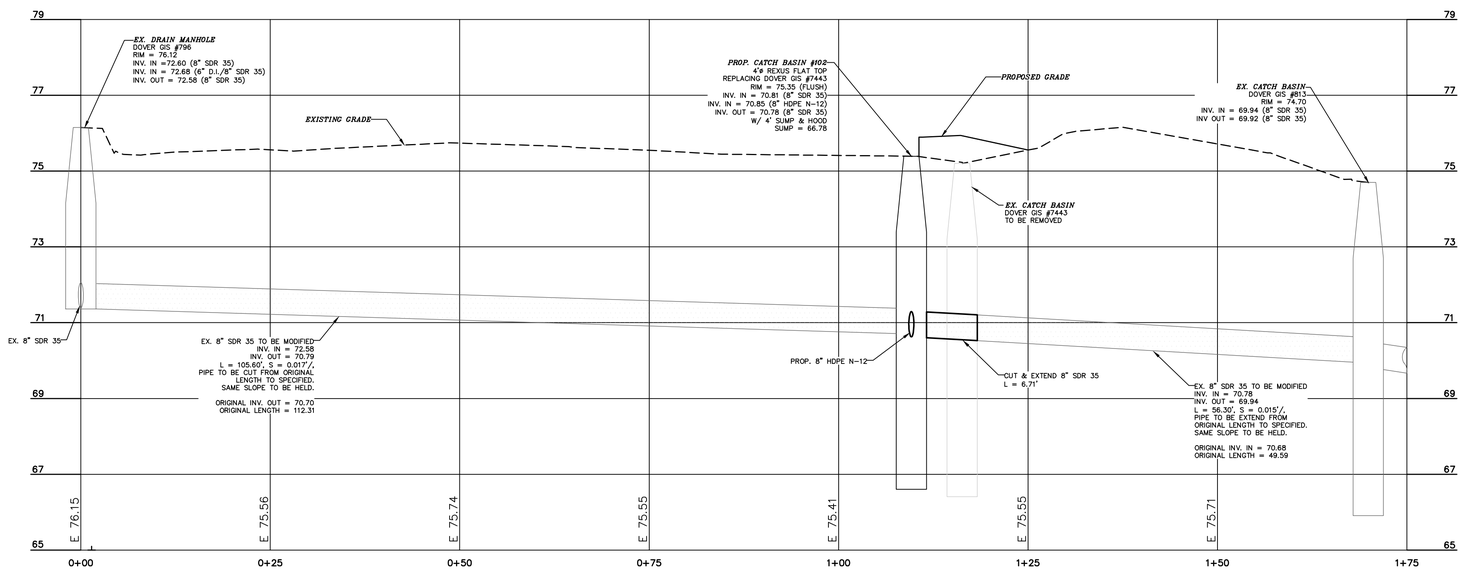
REVISION	DATE	DESCRIPTION

GRADING PLAN
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

SCALE : 1 IN. EQUALS 10 FT.
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 – 146

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



EXISTING DRAIN LINE PROFILE #1

NOTES:

1.) OWNER: A.) DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST DATED JANUARY 22, 2007
DARLENE G. COLWELL-ELLIS TRUSTEE
10A FOURTH STREET
DOVER, NH 03820

B.) CITY OF DOVER
288 CENTRAL AVENUE
DOVER, NH 03820

1A.) APPLICANT: GROEN CONSTRUCTION, INC.
120 WASHINGTON STREET, SUITE 302
ROCHESTER, NH 03839

2.) CITY OF DOVER:
A.) TAX MAP 6, LOT 54D
B.) TAX MAP 6, LOT 54C

3.) LOT AREA:
A.) 4,956 Sq. Ft., 0.11 Ac.
B.) 18,408 Sq. Ft., 0.42 Ac.

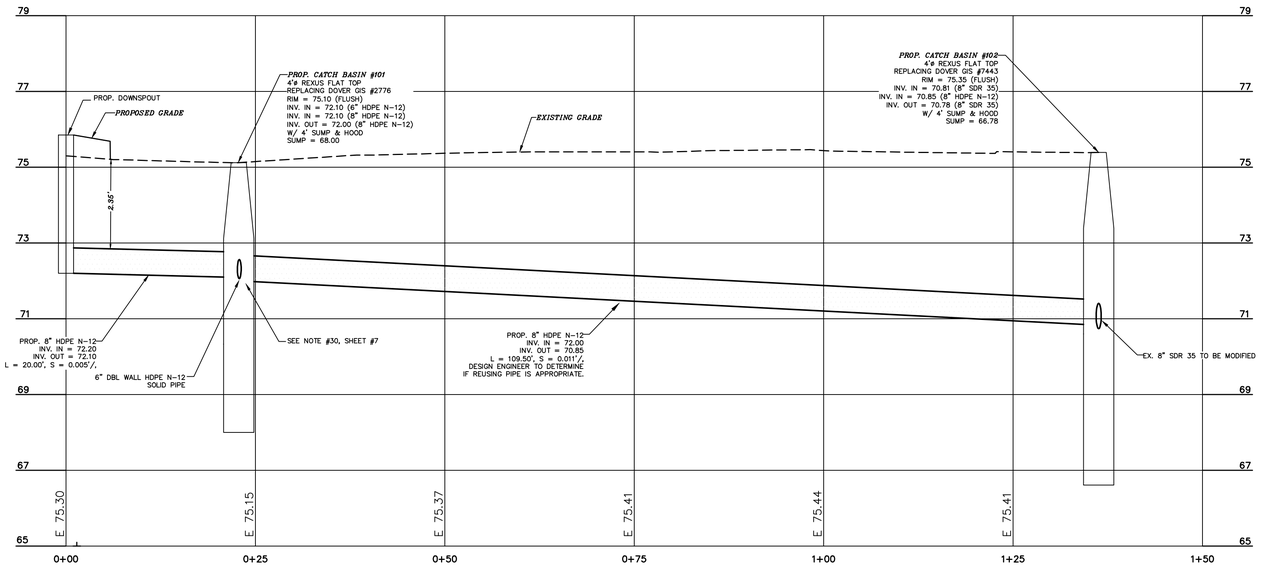
4.) S.C.R.D.A.) BOOK 3781, PAGE 284
B.) BOOK 758, PAGE 207

5.) THE INTENT OF THIS PLAN IS TO SHOW THE PROFILE VIEWS OF THE EXITING DRAIN LINE TO BE MODIFIED AND THE PROPOSED DRAIN LINE.

GRAPHIC SCALE

20 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.
VERTICAL SCALE: 1" = 2'



PROPOSED DRAIN LINE PROFILE #2

GRAPHIC SCALE

20 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.
VERTICAL SCALE: 1" = 2'

DOVER PLANNING #P19-03, P19-06, P19-07, P19-08

REVISION	DATE	DESCRIPTION

DRAIN LINE PROFILES
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

SCALE : 1 IN. EQUALS 10 FT.
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 - 146

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

SOILS & DEWATERING:

SF	*SUFFIELD*	*SILT LOAM*	*K= 0.20*

SEE SITE SPECIFIC SOILS MAP (SSSM)
SEE WEBSOIL USDA-NRCS
ERODIBILITY FACTOR – K, CPESC MANUAL, ENVIROCERT INTERNATIONAL INC. &
ROCKINGHAM COUNTTY SOIL SURVEY, ROCKWEB SOIL ATTRIBUTES.

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 2012 NPDES CONSTRUCTION GENERAL PERMIT (CGP)" DATED MAY 3, 2012 INCLUDED IN THE SWPPP.

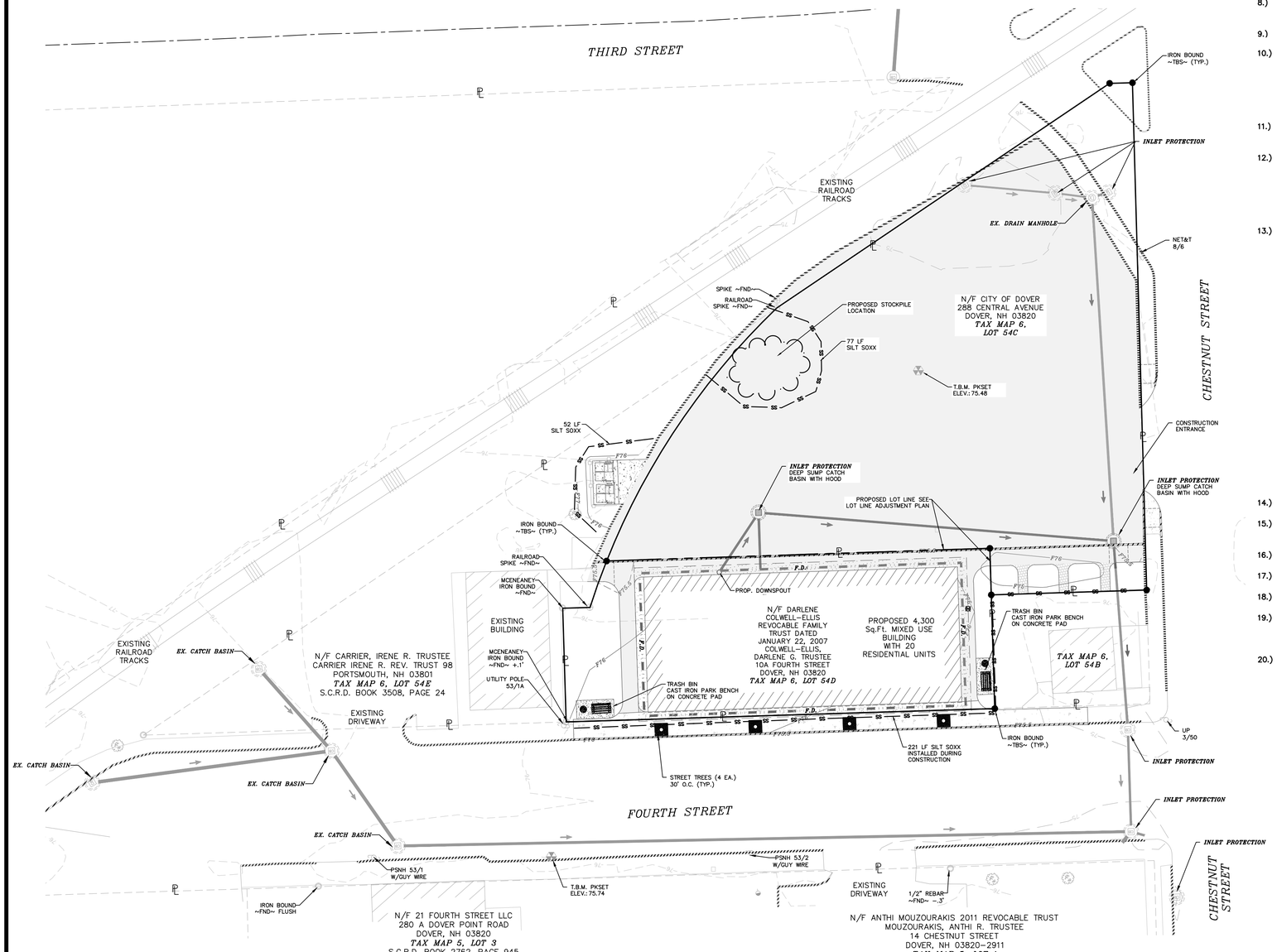
COVER MANAGEMENT DURING CONSTRUCTION FOR EXPOSED SOIL WILL INCLUDE HAY / STRAW APPLIED AT A RATE OF 2.0 TONS PER ACRE, TEMPORARY SEEDING OF ANNUAL RYE GRASS, AND PERMANENT SEEDING AT THE EARLIES OPPORTUNITY. SEE ADDITIONAL REQUIREMENT FOR STABILIZATION ON THE EROSION AND SEDIMENT CONTROL DETAIL SHEETS, 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.

LEGEND:

- (R) RAIN GARDEN BIO-MEDIA PROTECTION
- (P) PERIMETER CONTROL
- (C) RESIDENTIAL/ROADWAY CONSTRUCTION
- IRON PIPE (FND)
- IRON BOUND (FND)
- REBAR (FND)
- UTILITY POLE
- GUY WIRE
- (W) WELL
- BENCHMARK
- CONIFEROUS TREE
- DECIDUOUS TREE
- SF — SILT FENCE
- SS — FILTREXX SILTSOXX
- SS — TREE LINE

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.



NOTES:

1.) OWNER: DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST DATED JANUARY 22, 2007
DARLENE G. COLWELL-ELLIS TRUSTEE
10A FOURTH STREET
DOVER, NH 03820

2.) APPLICANT: GROEN CONSTRUCTION, INC.
120 WASHINGTON STREET, SUITE 302
ROCHESTER, NH 03839

3.) THE PROJECT PARCEL IS TAX MAP 6, LOT 54D

4.) LOT AREA: 4,956 Sq. Ft., 0.11 Ac.

5.) 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.

6.) THE CONTRACTOR SHALL CALL AND COORDINATE WITH DIGSAFE AT 1-888-344-7233 AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

7.) ALL DRAINAGE PIPE IS TO BE HDPE N-12. INDIVIDUAL PIPE SIZES ARE SPECIFIED ON GRADING AND DETAIL PLAN SHEETS, GREEN PIPE.

8.) 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.

9.) UPON FINAL COMPLETION AND 85% STABILIZATION, THE DRAINAGE SYSTEM IS TO BE CLEANED OF ALL DEBRIS. SEDIMENT CONTROL

10.) 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.

11.) SILT FENCE MAY BE SUBSTITUTED WITH FILTREXX SILT SOXX OR EROSION CONTROL MIX BERM. SILT FENCE IS NOT A SUBSTITUTE FOR FILTREXX SILT SOXX OR APPROVED EQUAL.

12.) PER EPA CGP Z.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.

13.) CITY OF DOVER: IN ACCORDANCE WITH SITE PLAN REVIEW REGULATIONS (149-14) THE FOLLOWNG STORMWATER MEASURES ARE REQUIRED. THIS SITE DEVELOPMENT QUALIFIES AS A REDEVELOPMENT PROJECT. THE EXISTING IMPERVIOUS AREA IS 92.0% AND PROPOSED IMPERVIOUS AREA IS 85.2%. THE CONTIGUOUS LAND DISTURBANCE IS 25,800 SQUARE FEET.

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 (CESSWI), OR A CERTIFIED PROFESSIONAL IN STORMWATER QUALITY (CPSWQ). INSPECTION REPORTS WILL BE SUBMITTED TO THE COMMUNITY SERVICES DEPARTMENT.

14.) CONTRACTOR MAY BE REQUIRED TO HAVE A CONSTRUCTION ENTRANCE DEPENDING ON SITE MANAGEMENT.

15.) CONTRACTOR IS RESPONSIBLE FOR SWEEPING THE PARKING LOT, SIDEWALKS AND ANYTHING DISTURBED, TO ENSURE THAT NO SEDIMENT IS BEING TRACKED ONTO CHESTNUT STREET OR FOURTH STREET.

16.) CONTRACTOR IS RESPONSIBLE FOR CLEANING AND MAINTAINING THE INLET PROTECTION ONCE INSTALLED.

17.) FUGITIVE DUST IS TO BE CONTROLLED THROUGHOUT THE CONSTRUCTION PROCESS IN ACCORDANCE WITH ENV-A 1000.

18.) CONTRACTOR IT TO MEET THE REQUIREMENTS SPECIFIED IN RSA 430:51-57 AND AGR 3800, RELATING TO INVASIVE SPECIES.

19.) CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE WATER QUALITY FROM ANY RUN OFF DURING THE CONSTRUCTION PROCESS, IN ACCORDANCE WITH ENV-WQ 1507, IN ORDER TO PREVENT VIOLATIONS OF THE STORM WATER QUALITY STANDARDS.

20.) CATCH BASIN HOODS WILL BE INSTALLED AS SOON AS THE BASIN IS PUT ON LINE. RIM IS TO BE RAISED WITH FINAL GRADE SO THAT STORMWATER RUNOFF CAN DRAIN PROPERLY THROUGHOUT CONSTRUCTION.

REVISION	DATE	DESCRIPTION

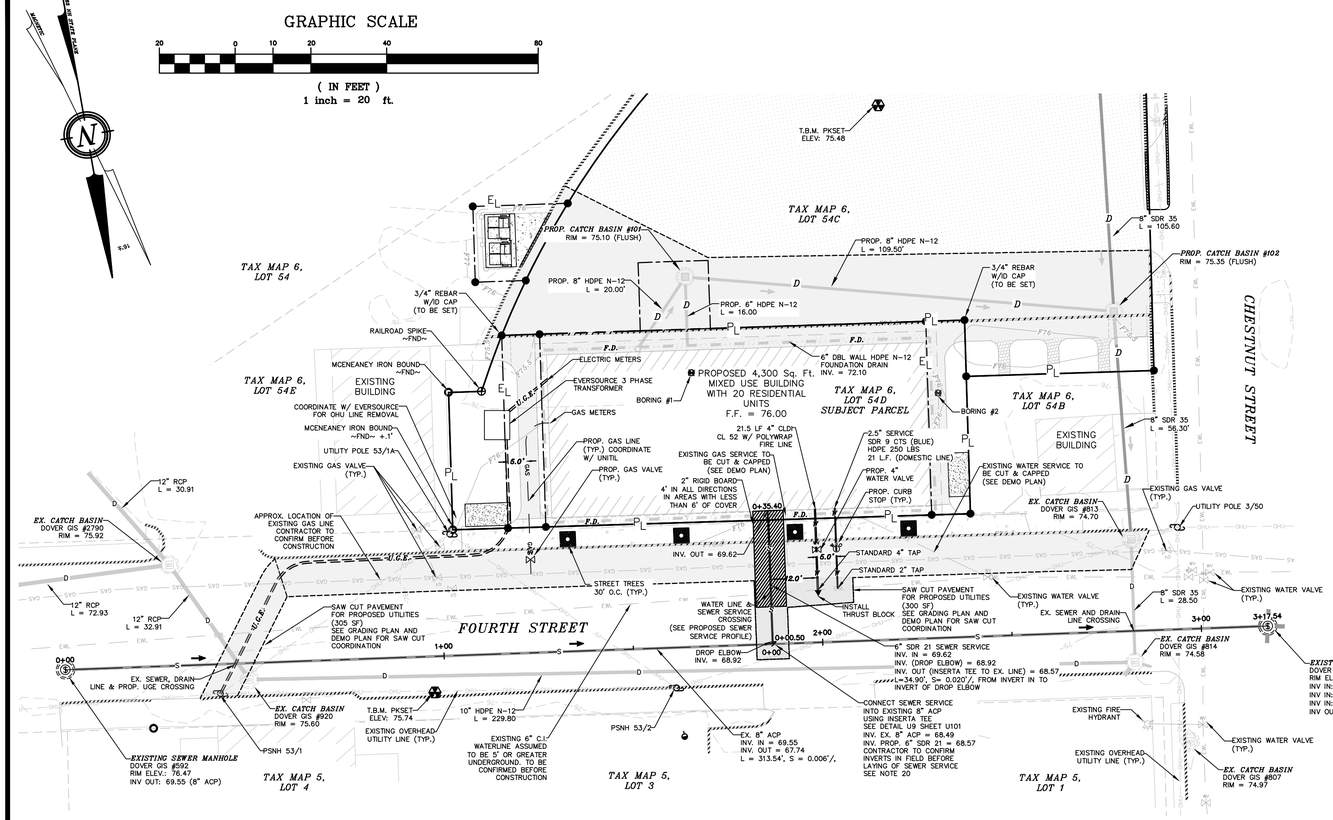
DOVER PLANNING #P19-03, P19-06, P19-07, P19-08

EROSION AND SEDIMENT CONTROL PLAN
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 - 146

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



PLAN VIEW PROPOSED SITE

NOTES:

1.) THE PURPOSE OF THIS PLAN IS TO DEMONSTRATE THE OVERVIEW PRIVATE UTILITIES WITHIN THE SITE PLAN.

2.) 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.

3.) THE CONTRACTOR SHALL CALL AND COORDINATE WITH DIGSAFE 1-888-344-7233 AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

4.) PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED 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 TRAFFIC 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.

5.) 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.

6.) 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.

7.) FINAL UTILITY LOCATIONS TO BE COORDINATED BETWEEN THE CONTRACTOR, ALL APPROPRIATE UTILITY COMPANIES AND THE DOVER DPW.

8.) 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.

9.) ALL WATER MAIN AND SERVICE INSTALLATIONS SHALL CONFORM TO CITY OF DOVER STANDARDS. ALL HIGHWAY CONSTRUCTION WILL MEET THE CITY OF DOVER STANDARDS.

10.) 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.

11.) 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) AND CONFORM WITH ASTM D3034. PVC JOINT SEALS SHALL CONFORM WITH ASTM D3121.

12.) CONTRACTOR SHALL COORDINATE ALL TELECOMMUNICATIONS INSTALLATIONS WITH FAIRPOINT COMMUNICATIONS AT (603) 427-5525.

13.) CONTRACTOR SHALL COORDINATE ALL CABLE INSTALLATIONS WITH COMCAST.

14.) CONTRACTOR SHALL COORDINATE ALL GAS INSTALLATIONS WITH UNITIL.

15.) 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.

16.) CURB BOXES SHOULD BE PLACED IN THE LAWN AREA, OR IF PLACED IN PAVEMENT, A ROAD BOX IS REQUIRED.

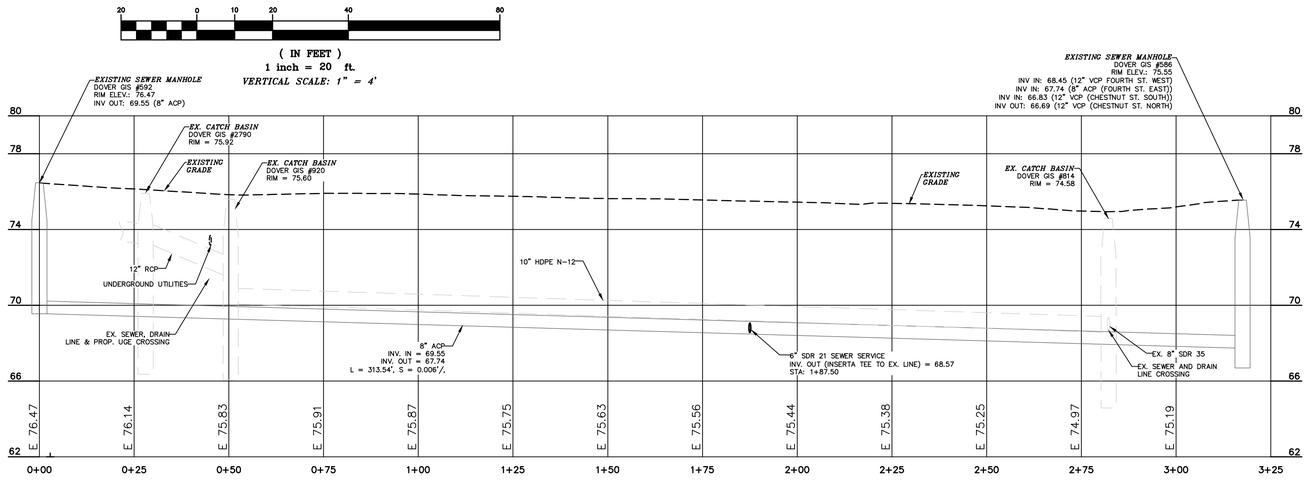
17.) SEE EXISTING CONDTIONS PLAN FOR DATUM. VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL DATUS BASED ON NAD83 STATE PLANE COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS.

18.) 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) AND CONFORM WITH ASTM D3034. PVC JOINT SEALS SHALL CONFORM WITH ASTM D3121.

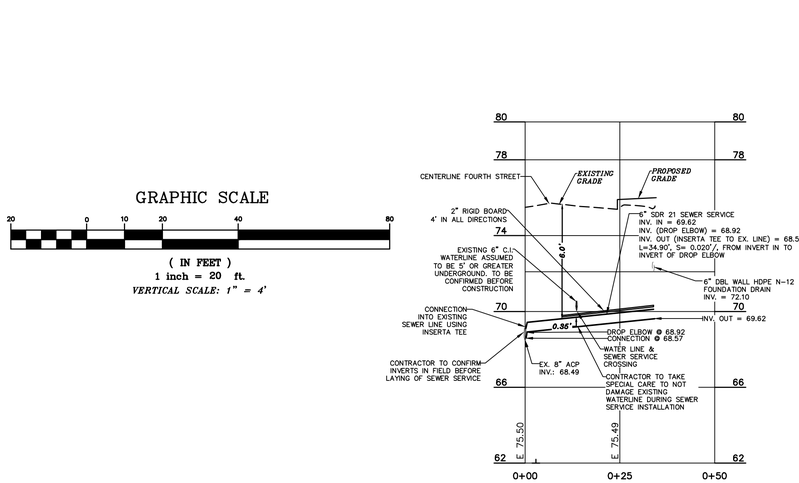
19.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

20.) ENTITIES SUCH AS COMPANIES AND MUNICIPALITIES, AND PERSONS ENGAGED IN ASBESTOS ABATEMENT PROJECTS MUST BE LICENSED AND CERTIFIED BY THE DES ASBESTOS CONTROL PROGRAM. AN ENTITY LICENSE IS NOT REQUIRED FOR MINOR AND SMALL-SCALE, SHORT-DURATION ACTIVITIES. HOWEVER, THE INDIVIDUALS INVOLVED MUST STILL HAVE THE APPROPRIATE LEVEL OF CERTIFICATION FOR THE ACTIVITY AND JOB TASK. THE CERTIFICATION IS TO ASSURE THAT PERSONS PERFORMING ASBESTOS WORK ARE SUITABLY QUALIFIED AND HAVE SUFFICIENT KNOWLEDGE AND ABILITY TO PERFORM THEIR JOB TASKS WITHOUT RISK TO THEMSELVES AND OTHERS. ALL ASBESTOS CONTAINING WASTE MATERIALS MUST BE PROPERLY IDENTIFIED, PACKAGED AND DELIVERED TO A LANDFILL LICENSED BY THE DES SOLID WASTE MANAGEMENT PROGRAM FOR DISPOSAL. CALL (603) 271-2925 FOR MORE INFORMATION.

EXISTING SEWER PROFILE



PROPOSED SEWER SERVICE PROFILE



REVISION	DATE	DESCRIPTION

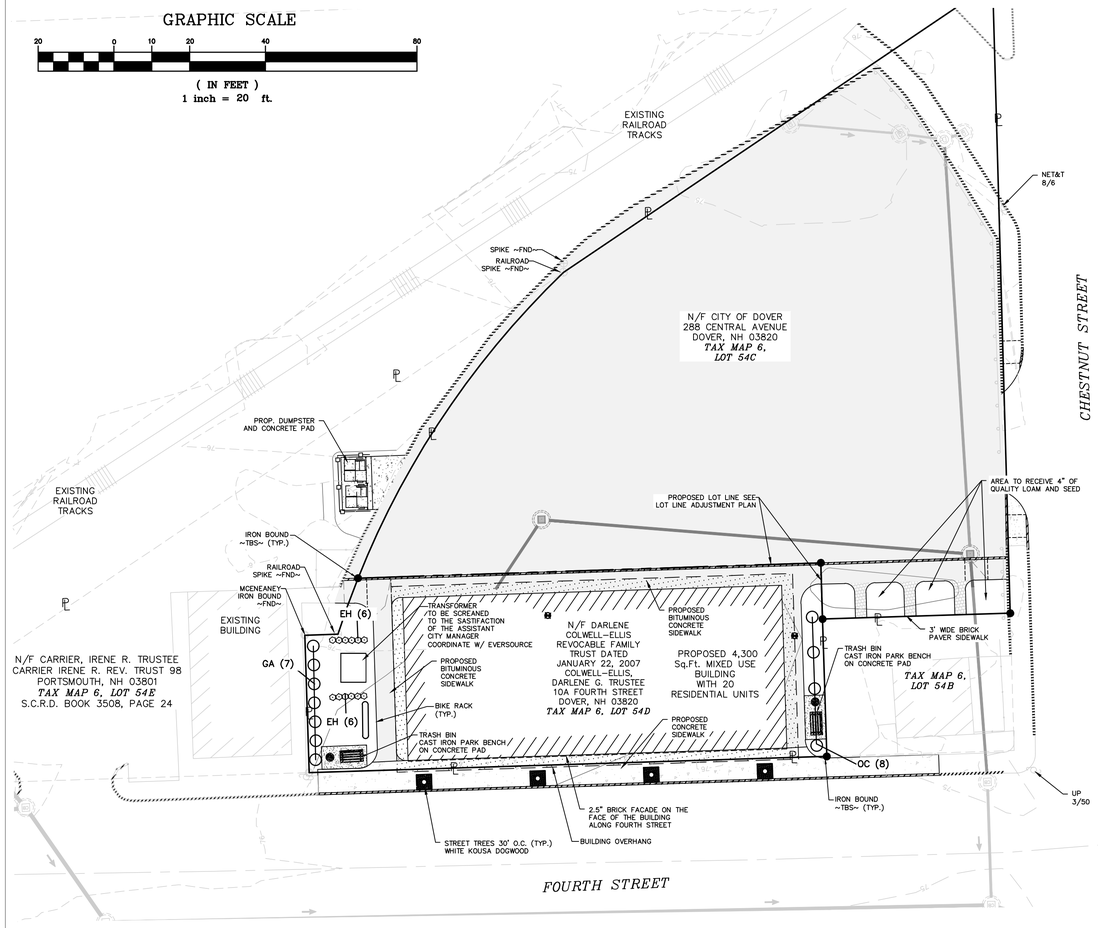
DOVER PLANNING #P19-03, P19-06, P19-07, P19-08

UTILITY PLAN
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

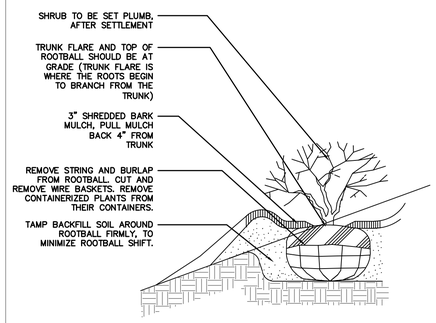
BERRY & SURVEYING ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
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STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER



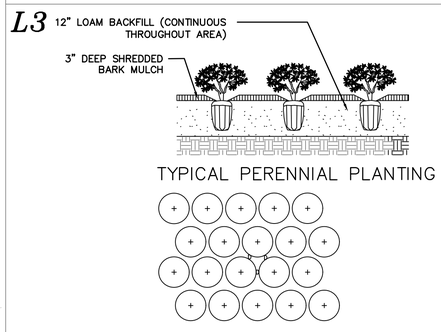
L1



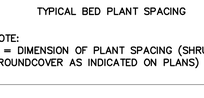
NOTE:
1. DO NOT HEAVILY PRUNE SHRUB AT PLANTING, PRUNE ONLY CROSSOVER LIMBS AND DAMAGED OR DEAD BRANCHES.
2. BACKFILL WITH LOAM, AMEND AS REQUIRED BY LANDSCAPE ARCHITECT.
3. SHRUBS & GROUNDCOVER PLANTED ADJACENT TO CITY SIDEWALKS NEED TO BE PLACED SO THE PLANTS, AT THEIR MATURE HEIGHT & WIDTH, WILL NOT ENCROACH INTO THE CITY'S SIDEWALK.

TYPICAL SHRUB PLANTING

L3



TYPICAL PERENNIAL PLANTING



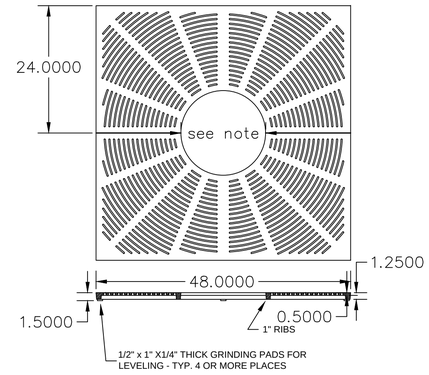
TYPICAL BED PLANT SPACING

NOTE:
D = DIMENSION OF PLANT SPACING (SHRUB OR GROUNDCOVER AS INDICATED ON PLANS)

L2

TREE GRATE #M4804
STYLE: OLYMPIAN

IRONSMITH
41-701 CORPORATE WAY, #3
PALM DESERT, CA 92260
(800) 338-4766
© COPYRIGHT



SLOT WIDTH IS 1/4" MAXIMUM, MEETS ADA COMPLIANCE.
GRATE CAST FROM GRAY IRON OR ALUMINUM
TREE OPENING SIZE. 16" , 20" OR 24"
STEEL ANGLE FRAME REQUIRED
FOR INSTALLATION USE MODEL M4800F
OUTER FRAME DIM. IS 3/4" ± 1/8"
GREATER THAN GRATE. .

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TREE GRATE NOT TO SCALE

L5

PLANTING SCHEDULE
Fourth Street

Botanical Name/ Common Name	Size	Quantity	Label
Trees			
Cornus kousa / White Kousa Dogwood	21/2-3" Cal	4	QP
Shrubs			
Cornus sericea 'Cardinal' / Cardinal Dogwood	#3 3-4'	8	OC
Thuja Occidentalis / Golden Globe Arborvitae	2-3'	7	GA
Perennials			
Hemerocallis 'Happy Returns' / Happy Returns Daylily	#1	12	EH

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General Plant Maintenance Guide

General Plant Bed Maintenance:
- All plant maincenance 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.

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L4

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.

terrain
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1 Hardy Road
Bedford, NH 03110
603. 491. 2322
terrainplanning.com

10 FOURTH STREET

Site Location:
10 FOURTH Street
Dover, NH
Tax Map: 54D

Prepared For:
Berry Surveying & Engineering
335 Second Crown Point Rd
Barrington, NH 03825

LANDSCAPE PLAN

DATE:

SCALE: 1" = 20'

PROJECT #:

Drawn By: ID

Checked By: ERB

REVISIONS: DATE:
Issued for Client Review

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SHEET 11 OF 21

LICENSED LANDSCAPE ARCHITECT
ERIC R. BUCK
078
STATE OF NEW HAMPSHIRE

NOTES:

1.) OWNER: A.) DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST DATED JANUARY 22, 2007
DARLENE G. COLWELL–ELLIS TRUSTEE
10A FOURTH STREET
DOVER, NH 03820

B.) CITY OF DOVER
288 CENTRAL AVENUE
DOVER, NH 03820

1A.) APPLICANT: GROEN CONSTRUCTION, INC.
120 WASHINGTON STREET, SUITE 302
ROCHESTER, NH 03839

2.) CITY OF DOVER:
A.) TAX MAP 6, LOT 54D
B.) TAX MAP 6, LOT 54C

3.) LOT AREA:
A.) 4,956 Sq. Ft., 0.11 Ac.
B.) 18,408 Sq. Ft., 0.42 Ac.

4.) THE INTENT OF THIS PLAN IS TO SHOW THE LIGHTING SCHEME FOR TAX MAP 6, LOT 54D & TAX MAP 6, LOT 54C.

5.) LAMP "A" TO BE MOUNTED AT 6' HIGH (SEE SITE PLANS).

6.) LAMP "C" TO BE MOUNTED AT 12' HIGH (SEE SITE PLANS).

Schedule

Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Filename	Lumens Per Lamp	Light Loss Factor	Wattage
A	A	7	Lithonia Lighting	ODSL10 SRC	CRAFTSTON WALL MOUNTED SMALL DECORATIVE LANTERN, ONE LAMP 13W SPIRAL COMPACT FLUORESCENT, WHITE GLASS DIFFUSER 4.25" DIA. X 6.65" HIGH, ELECTRONIC BALLAST	ONE 13-WATT T4 SPIRAL COMPACT FLUORESCENT, VERTICAL BASE UP POSITION.	1	ODSL10_SRC.ies	900	1	12.6
C	C	3	Lithonia Lighting	WST LED P1 40K VF MVOLT	WST LED, Performance package 1, 4000 K, visual comfort forward throw, MVOLT	LED	1	WST_LED_P1_40K_VF_MVOLT.ies	1639	1.2	12



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

DOVER PLANNING #P19–03, P19–06, P19–07, P19–08

REVISION	DATE	DESCRIPTION

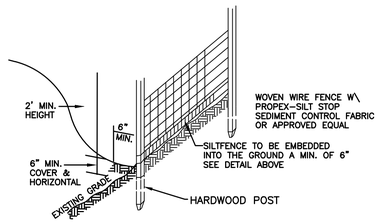
LIGHTING PLAN
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 – 146

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

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 10' 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, 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.

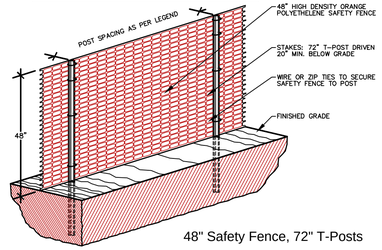
SILT FENCE DETAIL
NOT TO SCALE

E2

CONSTRUCTION SAFETY FENCE
NOT TO SCALE

LEGEND

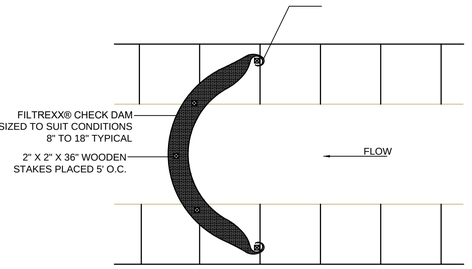
SAF12	48" ORANGE FENCE, 12 FEET O.C.
SAF11	48" ORANGE FENCE, 11 FEET O.C..
SAF10	48" ORANGE FENCE, 10 FEET O.C.
SAF9	48" ORANGE FENCE, 9 FEET O.C.
SAF8	48" ORANGE FENCE, 8 FEET O.C..
SAF7	48" ORANGE FENCE, 7 FEET O.C.
SAF6	48" ORANGE FENCE, 6 FEET O.C.



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.

E3

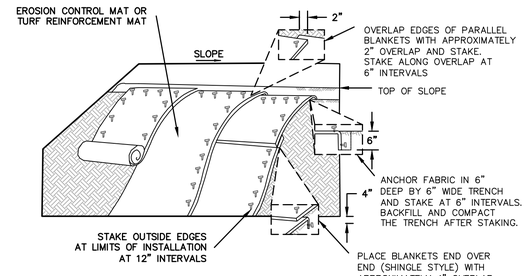


NOTES:
1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. CHECK DAM SHOULD BE USED IN AREAS THAT DRAIN 10 ACRES OR LESS.
3. SEDIMENT SHOULD BE REMOVED FROM BEHIND CHECK DAM ONCE THE ACCUMULATED HEIGHT HAS REACHED ½ THE HEIGHT OF THE CHECK DAM.
4. CHECK DAM CAN BE DIRECT SEEDED AT THE TIME OF INSTALLATION.
5. CONTRACTOR IS REQUIRED TO BE A FILTREXX CERTIFIED™ INSTALLER.

FILTREXX® CHECK DAM

FILTREXX CHECK DAM
NOT TO SCALE

E4

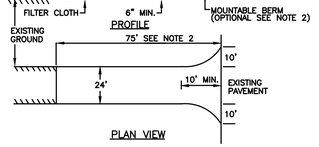


NOTE : STAKING PATTERNS SHALL FOLLOW MANUFACTURERS RECOMMENDATIONS.
MINIMUM SPACING 3' - 0" O.C. ACROSS FABRIC.

INSTALLATION OF EROSION CONTROL FABRICS
NOT TO SCALE

E5

STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE

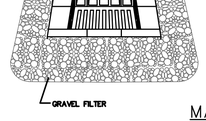


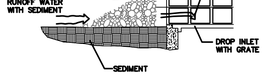
PLAN VIEW

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

BLOCK AND GRAVEL DROP INLET SEDIMENT FILTER





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.

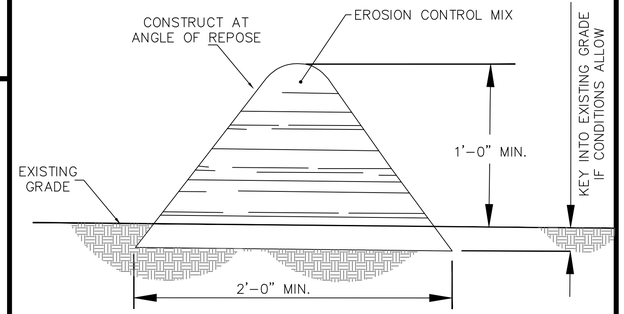
BLOCK & GRAVEL DROP INLET SEDIMENT FILTER
NOT TO SCALE

TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, TEMPORARY STORM DRAIN INLET PROTECTION, PAGE 118.

TO BE USED IN ALL AREAS WHERE THERE WILL BE NO TRAFFIC.

E7

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.

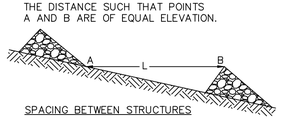
E8

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. DRIVEWAYS AND CUT AND FILL SPLOPES 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-ERSOIVE 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

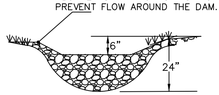
STONE CHECK DAM
NOT TO SCALE

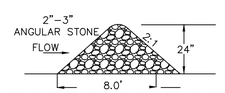


SPACING BETWEEN STRUCTURES

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.

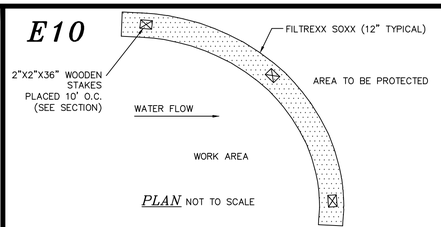
NOTE: KEY STONE INTO CHANNEL BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIUM OF 18" TO PREVENT FLOW AROUND THE DAM.





STONE GRADE STABILIZATION STRUCTURE

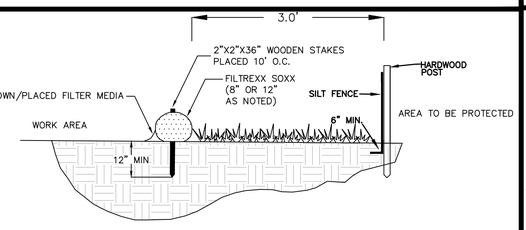
E10



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

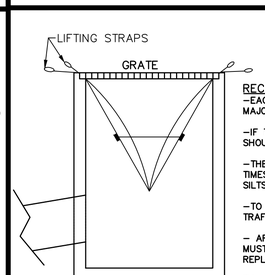


Filtrexx International, LLC
35481 Grafton Eastern Rd | Grafton, Oh 44044
440-926-2607 | fax: 440-926-4021
WWW.FILTREXX.COM
OR APPROVED EQUAL

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

DOVER PLANNING #P19-03, P19-06, P19-07, P19-08

REVISION	DATE	DESCRIPTION

EROSION & SEDIMENT CONTROL DETAILS

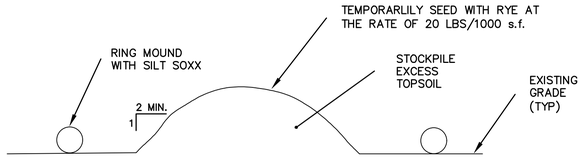
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
DOVER
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

SCALE : AS SHOWN
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 - 146

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

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

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, ODD 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/

RECOMMENDED

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.

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	20	0.45
FLAT PEA	30	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.
RED FESCUE (35%)	75	1.75
TALL FESCUE (25%)	55	1.25
ANNUAL RYEGRASS (12%)	33	0.75
PERENNIAL RYEGRASS (10%)	26	0.60
KENTUCKY BLUEGRASS (10%)	22	0.50
WHITE CLOVER (3%)	7	0.15

E14

WINTER STABILIZATION NOTES

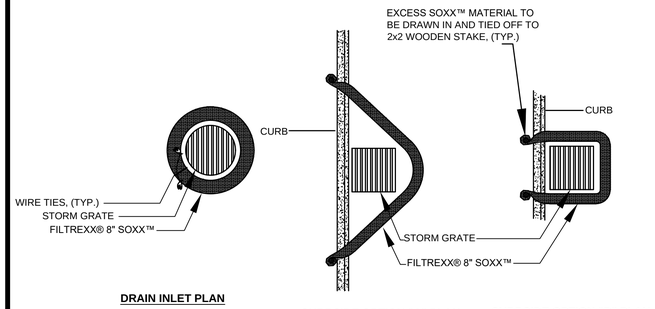
1. ALL DISTURBED AREAS THAT DO NOT HAVE AT LEAST 85% VEGETATIVE COVERAGE PRIOR TO OCTOBER 15TH SHALL BE STABILIZED BY APPLYING MULCH AT A RATE OF 3–4 TONS PER ACRE. ALL SIDE SLOPES, STEEPER THAN 4:1, THAT ARE NOT DIRECTED TO SWALES OR DETENTION BASINS, SHALL BE LINED WITH BIODEGRADABLE/PHOTODEGRADABLE "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 NOVEMBER 15TH, ANY SNOW THAT ACCUMULATES ON DISTURBED AREAS SHALL BE REMOVED. PRIOR TO SPRING THAW ALL AREAS WILL BE STABILIZED, AS DIRECTED ABOVE.

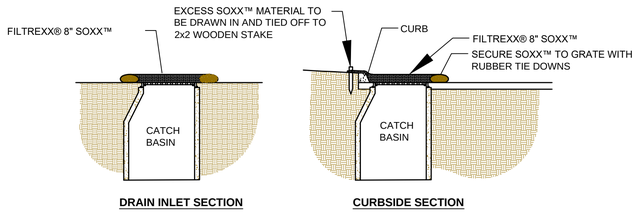
2. ALL SWALES THAT DO NOT HAVE FULLY ESTABLISHED VEGETATION SHALL BE EITHER LINED WITH TEMPORARY JUTE MATTING OR TEMPORARY STONE CHECK DAMS (APPROPRIATELY SPACED). STONE CHECK DAMS WILL BE MAINTAINED THROUGHOUT THE WINTER MONTHS. IF THE SWALES ARE TO BE MATTED WITH PERMANENT LINERS OR RIPRAP WITH ENGINEERING FABRIC, THIS SHALL BE COMPLETED PRIOR TO WINTER SHUTDOWN OR AS SOON AS THEY ARE PROPERLY GRADED AND SHAPED.

3. PRIOR TO NOV. 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 NOVEMBER 15TH, ANY ACCUMULATED SNOW SHALL BE REMOVED FROM ALL ROADWAY AND PARKING AREAS.

4. AFTER OCTOBER 15TH, THE END OF NEW HAMPSHIRE'S AVERAGE GROWING 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.

E15





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

FILTREXX INLET PROTECTION

NOT TO SCALE

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(P205), 100LBS. PER ACRE OR 2.2LBS. PER 1,000 SQ.FT.
   POTASH(K20), 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.

E16

CONSTRUCTION SEQUENCE:

1.) INSTALL SILT FENCE AND CONSTRUCT AND/OR INSTALL TEMPORARY AND PERMANENT SEDIMENT EROSION AND DETENTION CONTROL FACILITES (VEGETATED SWALES, LEVEL SPREADERS, AND CONSTRUCTED FILTER STRIPS), AS REQUIRED. EROSION, SEDIMENT AND FACILITIES SHALL BE INSTALLED AND STABILIZED PRIOR TO ANY EARTH MOVNG OPERATION, AND PRIOR TO DIRECTING RUN–OFF TO THEM. INLET PROTECTION IS INSTRUMENTAL

2.) DEMOLISH, CLEAR, GRUB, AND DISPOSE OF DEBRIS IN APPROVED FACILITIES. .

3.) EXCAVATE AND STOCKPILE TOPSOIL / LOAM. ALL DISTURBED AREAS SHALL BE STABILIZED IMMEDIATELY AFTER GRADING. .

4.) CONSTRUCT THE REPLACEMENT CATCH BASINS AND INSTALL THE REPLACEMENT CULVERT PIPES. INSTALL HOODS AT THE TIME OF INSTALLATION.Y

5.) INSTALL FOOTINGS, FOUNDATION DRAINS, AND FOUNDATION WALLS.

6.) BEGIN PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES AND DISTURBED AREAS SHALL BE SEEDED AND MULCHED AS REQUIRED, OR DIRECTED.

7.) DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINAGE DITCHES, SEDIMENT TRAPS, ETC. TO PREVENT EROSION ON THE SITE AND PREVENT ANY SILTATION OF ABUTTING WATERS OR PROPERTY.

8.) INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION.

9.) COMPLETE PERMANENT SEEDING AND LANDSCAPING.

10.) REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER SEEDING AREAS HAVE ESTABLISHED THEMSELVES AND SITE IMPROVEMENTS ARE COMPLETE. SMOOTH AND RE–VEGETATE ALL DISTURBED AREAS.

11.) ALL SWALES AND DRAINAGE STRUCTURES WILL BE CONSTRUCTED AND STABILIZED PRIOR TO HAVING RUN–OFF BEING DIRECTED TO THEM.

12.) FINISH PAVING ALL ROADWAYS/PARKING.

E17

DEFINITION OF STABLE:

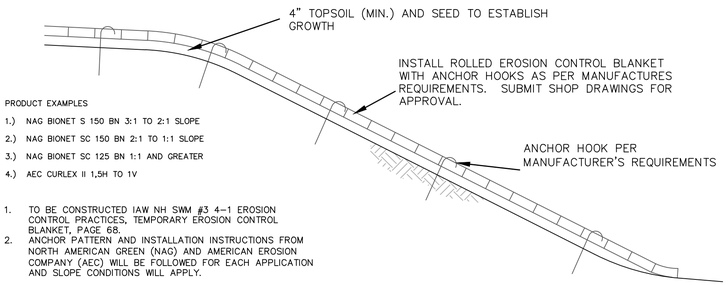
PER ENV–WQ 1500 ALTERATION OF TERRAIN

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.

E18



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.

ROLLED EROSION CONTROL BLANKET (RECB)
SLOPE STABILIZATION DETAIL

NOT TO SCALE

E–102

DOVER PLANNING #P19–03, P19–06, P19–07, P19–08

REVISION	DATE	DESCRIPTION

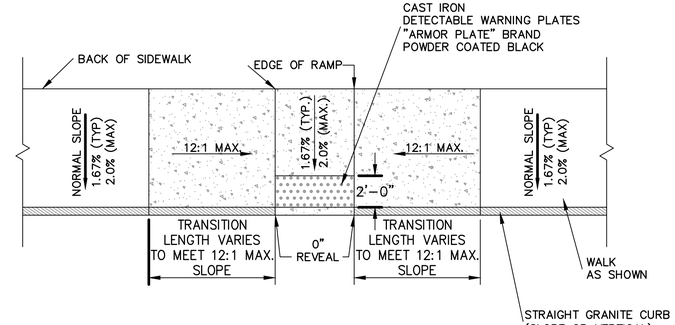
EROSION AND SEDIMENT CONTROL DETAILS
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST
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& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

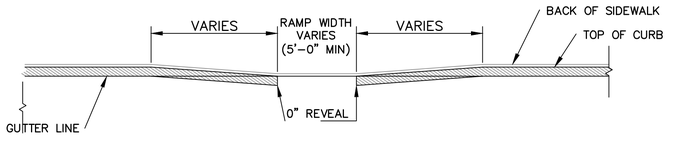
SCALE : AS SHOWN
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 – 146

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 10243 LICENSED PROFESSIONAL ENGINEER

C1



PLAN
(NOT TO SCALE)

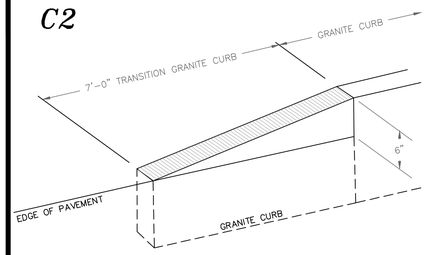


ELEVATION
(NOT TO SCALE)

TYPICAL DETAIL FOR WHEELCHAIR RAMP

(NOT TO SCALE)

C2

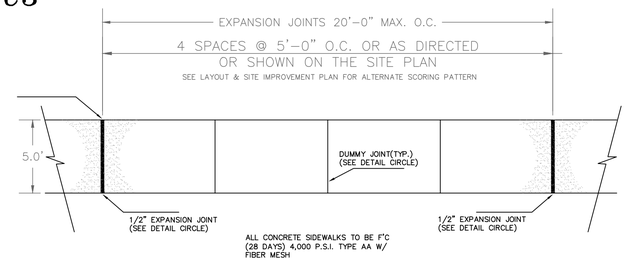


CURB TRANSITION DETAIL

NOT TO SCALE

TO BE USED FOR TRANSITION FROM GRANITE CURB TO EDGE OF PAVEMENT

C3



NOTES:

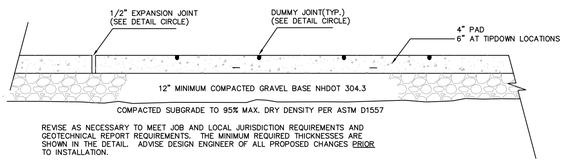
1.) PROVIDE EXPANSION JOINT MATERIAL WHERE CURB RAMP ADJOINS ANY RIGID PAVEMENT, SIDEWALK OR STRUCTURE WITH THE TOP OF JOINT FILLER PLUS SEALANT FLUSH WITH ADJACENT CONCRETE SURFACE.

2.) SEAL JOINTS WITH AN APPROVED SEALING MATERIAL.

3.) PROVIDE SLIP RESISTANT TEXTURE ON CURB RAMP BY COARSE BROOMING TRANSVERSE TO THE SLOPE OF THE RAMP. EXTEND TEXTURE THE FULL WIDTH AND LENGTH OF THE CURB RAMP INCLUDING FLARED SIDE RAMPS.

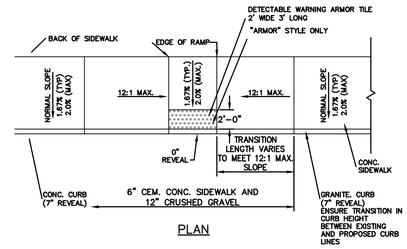
4.) CURB RAMP AND SIDE FLARE LENGTHS ARE VARIABLE AND BASED ON CURB HEIGHT AND THE SIDEWALK PITCH.

5.) WHENEVER POSSIBLE, CONSTRUCT THE TRANSITION SLOPE FROM THE CURB RAMP AND FLARE SIDES TO ADJOINING SURFACES WITH A GRADUAL CURVE RATHER THAN AN ABRUPT ANGLE.



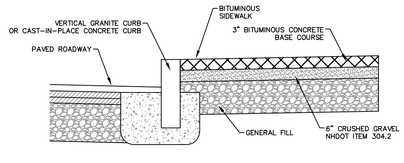
CONCRETE SIDEWALK

NOT TO SCALE



PLAN

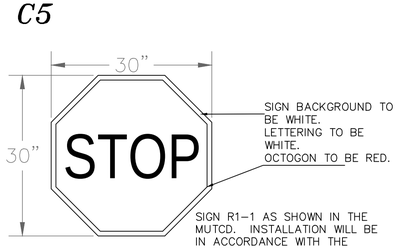
C4

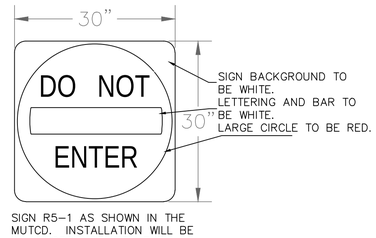


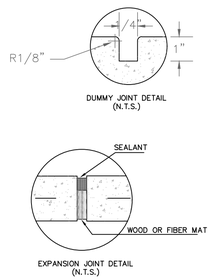
BITUMINOUS SIDEWALK

NOT TO SCALE

C5

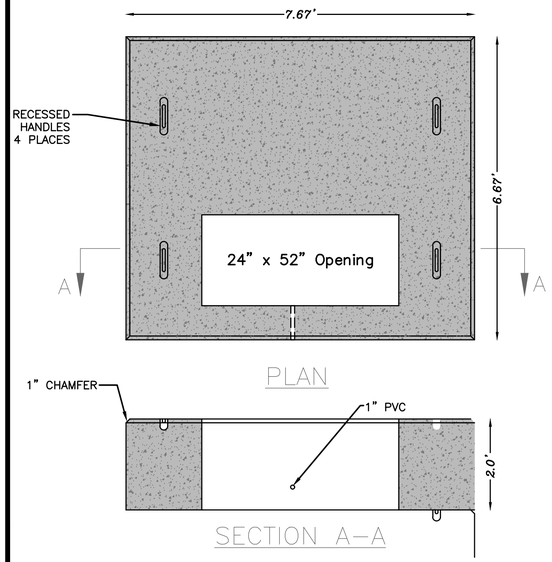






C6

EVERSOURCE– NH 53–111 3 PHASE
TRANSFORMER PAD 75–500 KVA

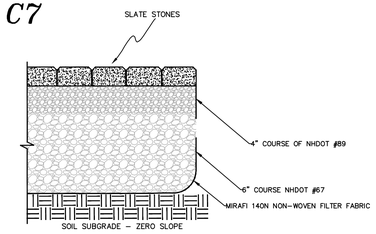


PLAN

SECTION A–A

NOTES:
1. CONCRETE: 4,000 PSI MIN. AFTER 28 DAYS
2. REINFORCEMENT STEEL CONFORMS TO ASTM A615 GRADE 60 #6 REBAR.
3. PAD MEETS OR EXCEEDS EVERSOURCE SPECIFICATIONS
4. TRANSFORMER MUST BE SHEA CONCRETE PRODUCT OR EQUAL.

C7



1.) INSTALL AT THE REAR OF UNITS 9–13 AS SHOWN ON THE SITE PLAN.

2.) STONE TO MEET THE SPECIFICATIONS PROVIDED.

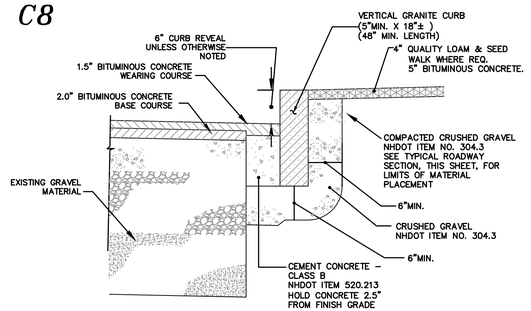
Table 1E -- Required Grading, Graded Coarse Aggregates (English)

Standard Stone Size	#4	#357	#467	#57	#67	#7	#89
Min to Max	3/4 in to 1-1/2 in	No. 4 to 2 in	No. 4 to 1-1/2 in	No. 4 to 1 in	No. 4 to 3/4 in	No. 4 to 1/2 in	No. 16 to 3/8 in
Sieve Size	Percentage by Weight Passing						
2-1/2 in	---	100	---	---	---	---	---
2 in	100	95-100	100	---	---	---	---
1-1/2 in	90-100	---	95-100	100	---	---	---
1 in	20-55	35-70	---	95-100	100	---	---
3/4 in	0-15	---	35-70	---	90-100	100	---
1/2 in	---	10-30	---	25-60	---	90-100	100
3/8 in	0-5	---	10-30	---	20-55	40-70	90-100
No. 4	---	0-5	0-5	0-10	0-10	0-15	20-55
No. 8	---	---	---	0-5	0-5	0-5	5-30
No. 16	---	---	---	---	---	---	0-10
No. 50	---	---	---	---	---	---	0-5

BRICK PAVER SIDEWALK DETAIL

NOT TO SCALE

C8



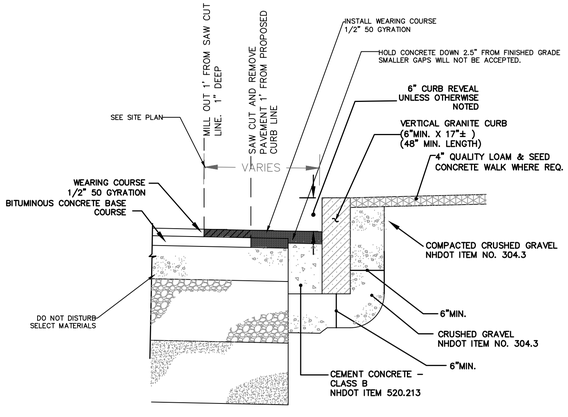
GENERAL NOTE:

1.) TO BE USED IN PLACE OF THE CONCRETE WALK AND INTEGRATED CURB AT THE OWNERS DISCRETION

VERTICAL GRANITE CURB DETAIL ON SITE

NOT TO SCALE

C9



VERTICAL GRANITE CURB DETAIL

NOT TO SCALE

C–101

DOVER PLANNING #P19–03, P19–06, P19–07, P19–08

REVISION	DATE	DESCRIPTION

CONSTRUCTION DETAILS

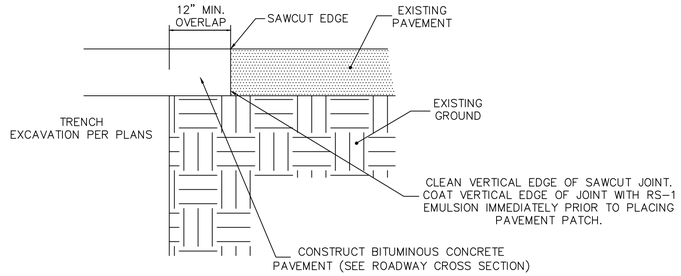
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL–ELLIS REVOCABLE TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

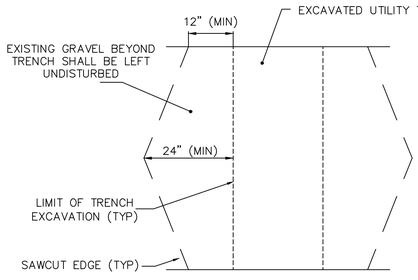
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : AS SHOWN
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 – 146

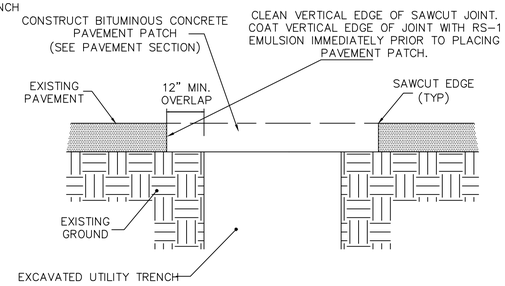
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

C10





PLAN



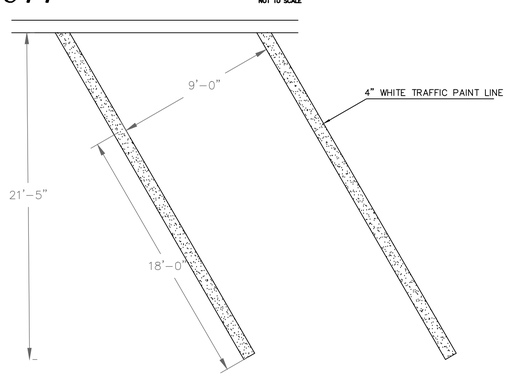
SECTION

NOTES
1. MACHINE CUT EXISTING PAVEMENT.
2. ALL TEMPORARY, DAMAGED, OR DEFECTIVE PAVEMENT SHALL BE REMOVED PRIOR TO PLACEMENT OF PERMANENT TRENCH REPAIRS.
3. DIAMOND PATCHES, SHALL BE REQUIRED FOR ALL TRENCHES CROSSING ROADWAY. DIAMOND PATCHES SHALL MEET NHDOT REQUIREMENTS.

TYPICAL TRENCH PATCH
NOT TO SCALE

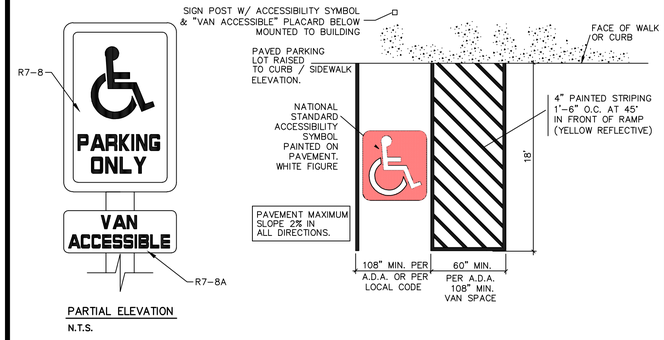
C11

60 DEGREE ANGLED 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

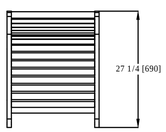
C12



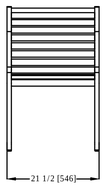
PARKING STALL SIGNAGE FOR THE PHYSICALLY CHALLENGED
NOT TO SCALE

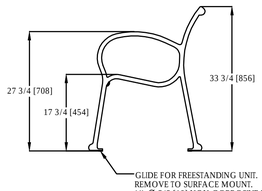
C13

Scarborough™ Bench, 24" Backed, with Horizontal Strap Seat
Product Drawing www.landscapeforms.com Date: 5/19/2010 Ph: 800.521.2546

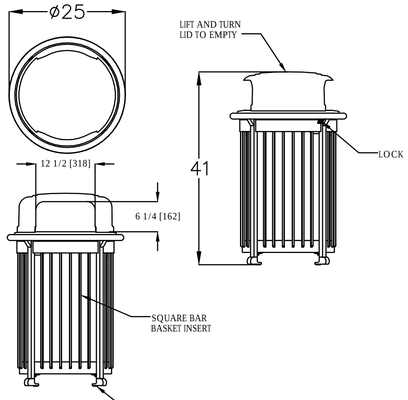


BENCH DETAIL
(NOT TO SCALE)





BIN DETAIL
(NOT TO SCALE)

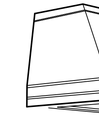


landscapeforms Drawing: SC173-02
Dimensions are in inches [mm]

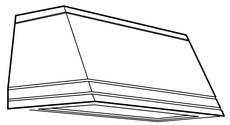
landscapeforms Drawing: SC173-02
Dimensions are in inches [mm]

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C14



TYPICAL RESIDENTIAL LAMP "A"
NOT TO SCALE

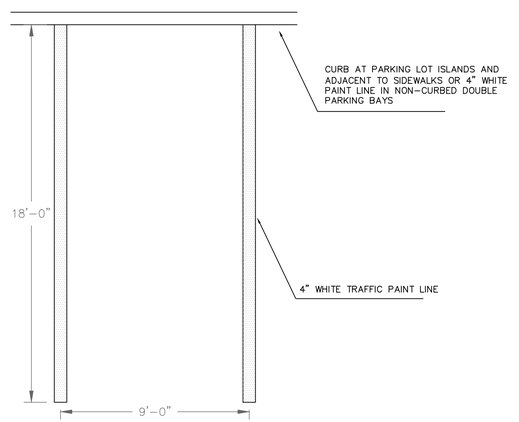


1. WST 100M WT WITH 100-WATT CLEAR ED-17 METAL HALIDE BULB
2. MOUNTED ON BUILDING, SEE LIGHTING PLAN FOR LUMINAIRE SCHEDULE

WALL MOUNTED LIGHTING LAMP "C"
NOT TO SCALE

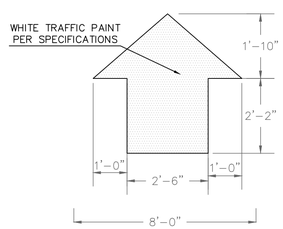
C15

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

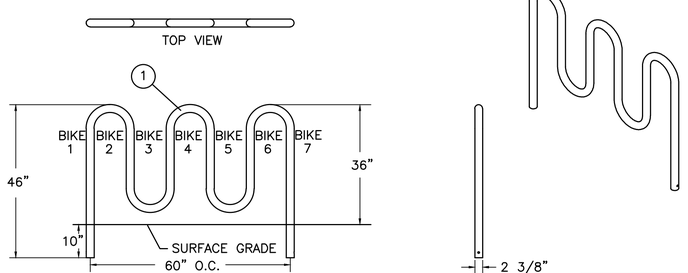
C16



PAVEMENT MARKINGS DETAILS
NOT TO SCALE

C17

MATERIALS LIST
(1) TUBING – ø 2 3/8" x .154" Wall Steel Tubing



BIKE RACK
(NOT TO SCALE)

C-102

DOVER PLANNING #P19-03, P19-06, P19-07, P19-08

REVISION	DATE	DESCRIPTION

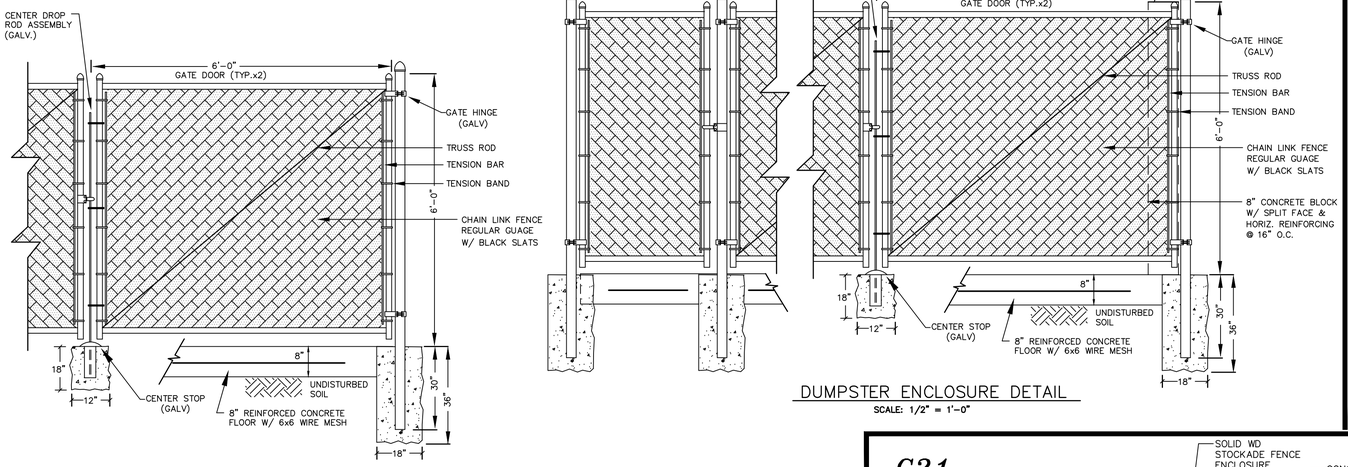
CONSTRUCTION DETAILS
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

SCALE : AS SHOWN
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 – 146

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

C18



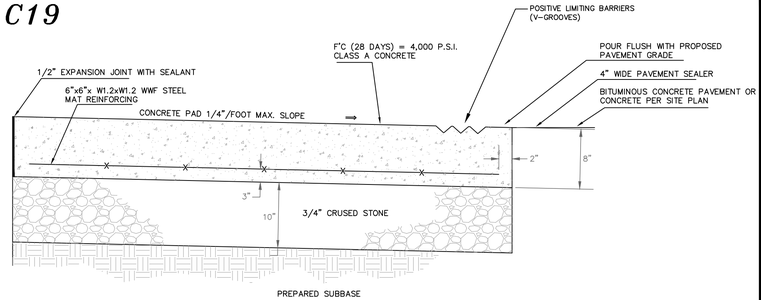
DUMPSTER ENCLOSURE DETAIL

SCALE: 1/2" = 1'-0"

DUMPSTER ENCLOSURE DETAIL

SCALE: 1/2" = 1'-0"

C19



SECTION VIEW

DUMPSTER PAD & CONCRETE PAVEMENT

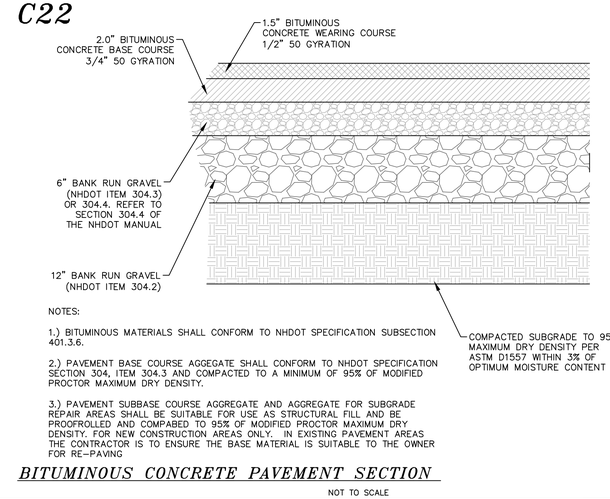
NOT TO SCALE

NOTES:

1.) DUMPSTER PAD WILL BE SCREENED BY STOCKADE FENCE.

2.) CONFIGURATION WILL ENCLOSE 2-8 YARD DUMPSTERS.

C22



NOTES:

1.) BITUMINOUS MATERIALS SHALL CONFORM TO NHDOT SPECIFICATION SUBSECTION 401.3.6.

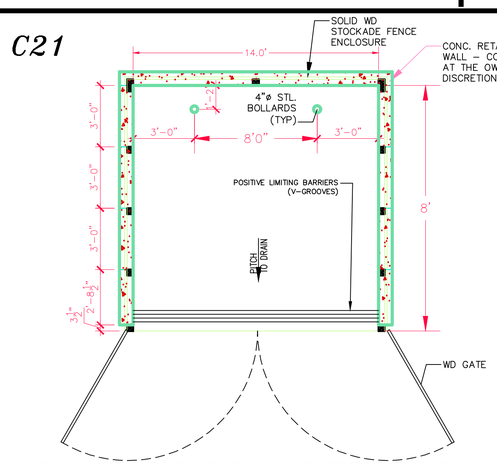
2.) PAVEMENT BASE COURSE AGGEGATE SHALL CONFORM TO NHDOT SPECIFICATION SECTION 304, ITEM 304.3 AND COMPACTED TO A MINIMUM OF 95% OF MODIFIED PROCTOR MAXIMUM DRY DENSITY.

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

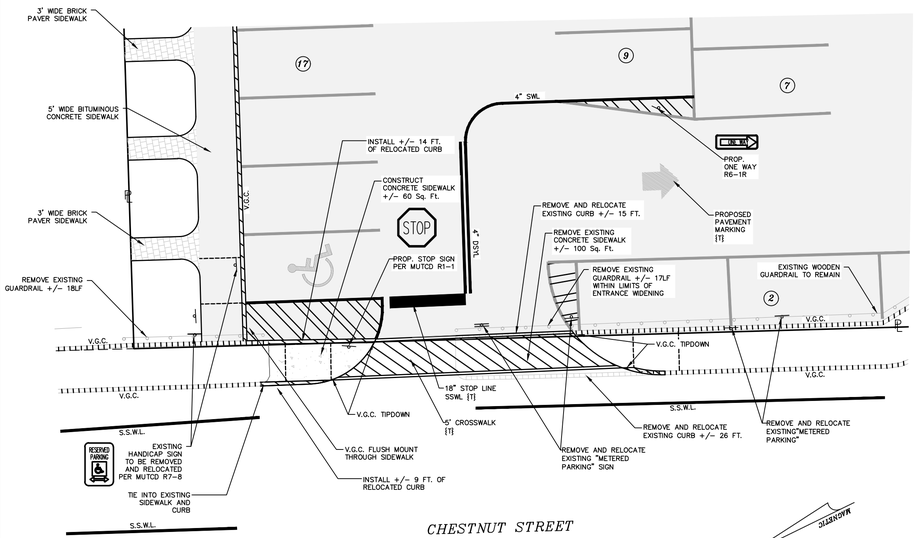
C21



DUMPSTER ENCLOSURE & CONCRETE PAD PLAN

NOT TO SCALE

C20



CHESTNUT STREET

GRAPHIC SCALE

20 0 5 10 20 40

(IN FEET)

1 inch = 10 ft.

MAGNETIC

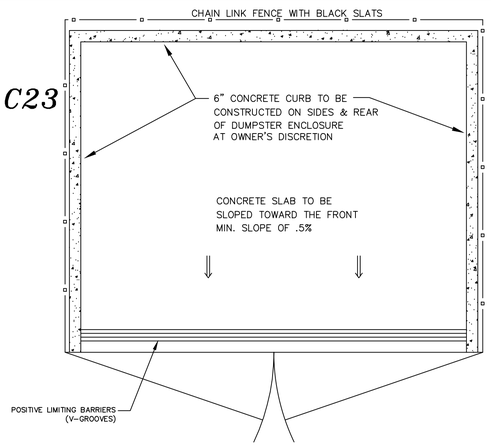
NORTH

MAINE NH STATE PLANE

10°E

ENTRANCE RECONSTRUCTION

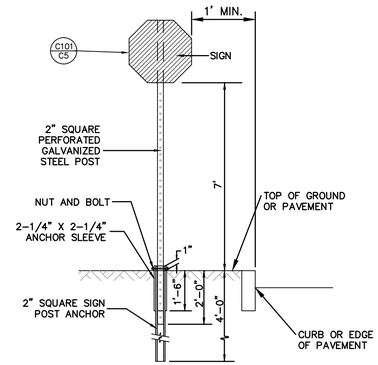
C23



DUMPSTER SLAB DETAILS

N.T.S. NOT TO SCALE

C24



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)

DOVER PLANNING #P19-03, P19-06, P19-07, P19-08

REVISION	DATE	DESCRIPTION

CONSTRUCTION DETAILS

FOR GROEN CONSTRUCTION, INC.

LAND OF

DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST

DATED JANUARY 22, 2007

& CITY OF DOVER

10 FOURTH STREET & CHESTNUT STREET

DOVER, NH 03820

TAX MAP 6, LOT 54D & 54C

BERRY SURVEYING & ENGINEERING

335 SECOND CROWN POINT ROAD

BARRINGTON, NH 03825 (603)332-2863

SCALE : AS SHOWN

DATE : JANUARY 10, 2019

FILE NO. : DB 2018 - 146

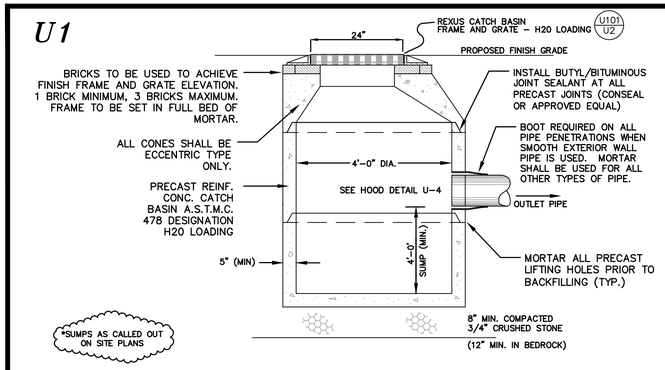
STATE OF NEW HAMPSHIRE

KENNETH A. BERRY No. 14243

LICENSED PROFESSIONAL ENGINEER

C-103

U1



SEE SAND FILTER DETAILS AND GRADING AND DRAINAGE SHEETS

NOTE:
WHEN BASE PAVEMENT IS IN PLACE, THE RIM MUST BE SET LEVEL TO ACCEPT RUN OFF AND MUST BE RAISED WHEN WHEN TOP COAT IS PUT IN PLACE.

CATCH BASIN DETAIL
NOT TO SCALE

U2

Manhole Castings L-1

Rexus Ductile Iron Frame & Cover

REXUS manhole covers feature a unique spring bar locking mechanism and a spline located in the hinge housing for improved security; additional locking options are available to further deter unauthorized access and theft. Made from ductile iron — an engineered material that offers many advantages over traditional cast iron — REXUS covers deliver excellent performance in all the key areas of concern to municipal engineers.

Highlights:
- Ductile iron
- Spring bar locking
- Available in 24" opening
- Hinged cover
- Cover with 90° blocking mechanism
- Exceeds H20 loading
- Optional locking features
- Independently certified



DESCRIPTION	PRODUCT NUMBER
24" REXUS DI MH F & C - Plain	62114 24 P
24" REXUS DI MH F & C - Sewer	62114 24 S
24" REXUS DI MH F & C - Drain	62114 24 D
24" REXUS DI MH F & C - Water	62114 24 WTR
24" REXUS DI CB F & Grate	62114 CB3R
REXUS Pent Lock with Key	62132 P32 01
REXUS Pent Lock without Key	62132 P32 03

NOTE: See page L-2 for the SCS locking device for Rexus and Pamex.



Rexus Frame & Grate

Rexus Frame & Grate In Open Position Showing Hinged Grate

REXUS Anti-Theft Cover Locks

Pent Locking Kit:
- ¼ turn lock actuated by an asymmetrical five-sided bolt head.
- On-site installation takes five minutes:
  1. Punch out the center of the locking bolt area.
  2. Install the kit in compliance with the instructions supplied.
- Lock must be operated with the handling key (supplied with the kit; can be purchased separately).



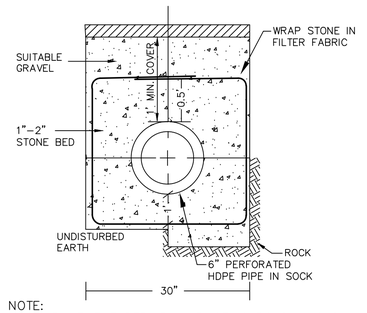
SPECIFICATIONS:
Manhole cover and frame shall be called REXUS or approved equal. Cover and frame shall be manufactured from Ductile Iron and be 3" pavig certified and ISO 9000 approved. Covers shall be hinged and incorporate a 90-degree blocking system to prevent accidental closure. Covers shall be one-man operable using standard tools and shall be capable of withstanding a test load of 100,000 lbs. The cover shall incorporate a spring bar locking system, which automatically activates when the cover is closed. Additional security features to include a device to prevent the cover from being completely removed from the frame. This device shall be capable of being deactivated if required. Frames shall be circular, incorporate a seating ring, and have a nominal 24-inch clear opening. Frame depth shall not exceed 4 inches, and the flange shall incorporate bedding slots and bolt holes.

www.ejprescott.com L-1

CATCH BASIN FRAME AND GRATE WILL BE REXUS, OR APPROVED EQUAL, 24 INCH OPENING, DUCTILE IRON, H20 LOADING.

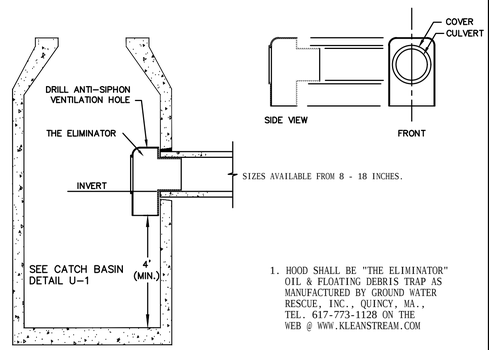
U3

UNDERDRAIN TRENCH DETAIL



NOTE:
1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM TO SUBDIVISION SPECS.

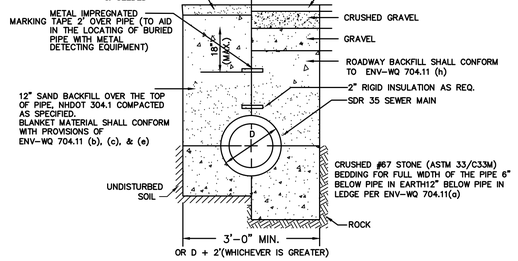
U4



1. HOOD SHALL BE "THE ELIMINATOR" OIL & FLOATING DEBRIS TRAP AS MANUFACTURED BY GROUND WATER RESCUE, INC., QUINCY, MA., TEL. 617-773-1128 ON THE WEB @ WWW.KLEANSTREAM.COM

CATCH BASIN HOOD DETAIL
NOT TO SCALE

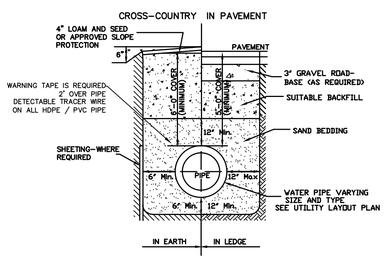
U5



NOTE:
1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM TO SUBDIVISION SPECS.

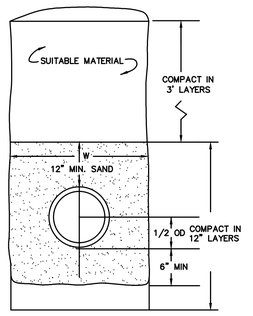
TYPICAL DRAIN AND SEWER PIPE TRENCH
NOT TO SCALE

U6

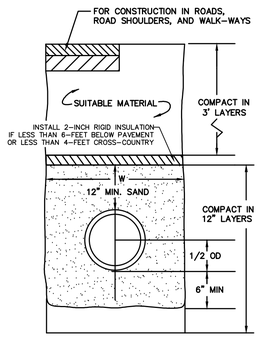


TYPICAL TRENCH DETAIL FOR WATER SYSTEM
NOT TO SCALE

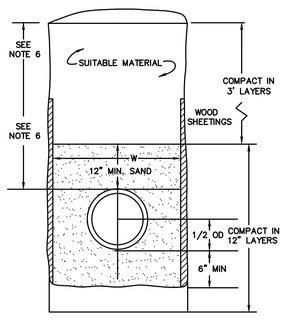
U7



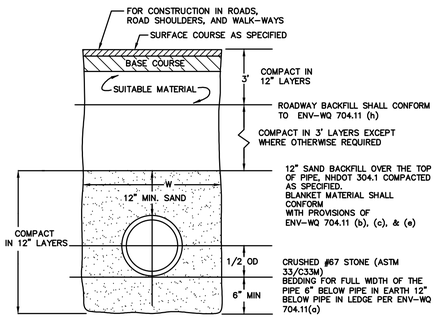
EARTH CONSTRUCTION
NOT TO SCALE



TRENCH INSULATION
NOT TO SCALE

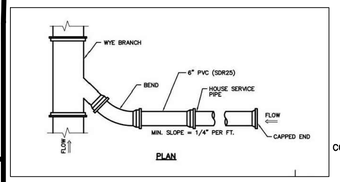


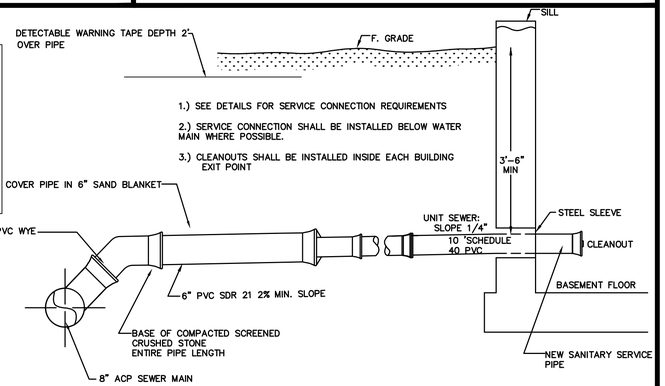
EARTH CONSTRUCTION WITH SHEETING
NOT TO SCALE



LEDGE CONSTRUCTION
NOT TO SCALE

U8





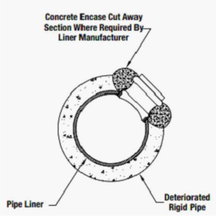
DETAIL OF UNIT SEWER SERVICE
NOT TO SCALE

U9

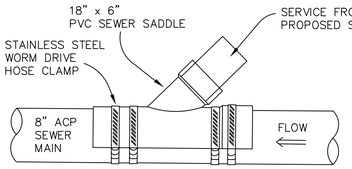
HOLE SAW SIZING CHART

INSERTA TEE Size	Hole Saw Size
2" (51 mm)	2⅝" (67 mm)
3" (75 mm)	3¼" (85 mm)
4" (100 mm)	4½" (114 mm)
6" (150 mm)	6½" (165 mm)
8" (200 mm)	8¾" (222 mm)
10" (250 mm)	10⅞" (276 mm)
12" (300 mm)	12⅞" (327 mm)
15" (375 mm)	15⅞" (402 mm)
18" (450 mm)	19¾" (503 mm)
21" (525 mm)	22⅝" (573 mm)
24" (600 mm)	25⅜" (643 mm)
27" (675 mm)	28" (724 mm)
30" (750 mm)	32⅜" (826 mm)

DETAIL FOR CORING-- DIRECTLY INTO THE LINER



INSERTA TEE DETAIL
NOT TO SCALE



SEWER SADDLE DETAIL
NOT TO SCALE



SPECIFICATIONS

Rubber Sleeve	ASTM F477
Band	301 SS
Screw	305 SS
Housing	301 SS
Gasket	ASTM F477

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

U-101

DOVER PLANNING #P19-03, P19-06, P19-07, P19-08

REVISION	DATE	DESCRIPTION

UTILITY DETAILS

FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 64D & 54C

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

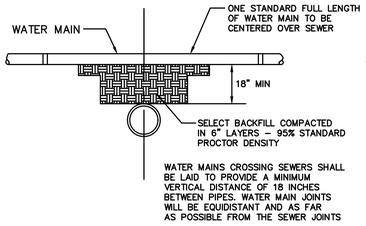
SCALE : AS SHOWN
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 – 146

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

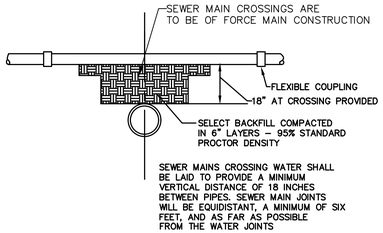
U10

SEPERATION NOTES:

1. WATER MAIN SHALL BE IN ACCORDANCE WITH THE "RECOMMENDED STANDARDS FOR WATER WORKS" SO-CALLED TEN STATE STANDARDS AND NEW HAMPSHIRE WATER SUPPLY AND POLLUTION CONTROL DESIGN STANDARDS, ENV-WQ 700 ADOPTED OCTOBER 14, 2014.
2. WATER MAINS SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED SEWERS. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE. IF THIS DISTANCE CANNOT BE OBTAINED, THEN THE PIPES SHALL BE INSTALLED IN A SEPARATE TRENCH AT AN ELEVATION SO THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER.
3. VERTICAL SEPARATION REQUIREMENTS APPLY TO WATER AND SEWER MAINS AND SERVICE LINES. WHERE SEWER CROSSES WATER MAIN AND WATER SERVICE CROSSES SEWER MAIN, 18 INCH VERTICAL CLEARANCE SHALL BE PROVIDED WITH WATER OVER SEWER.



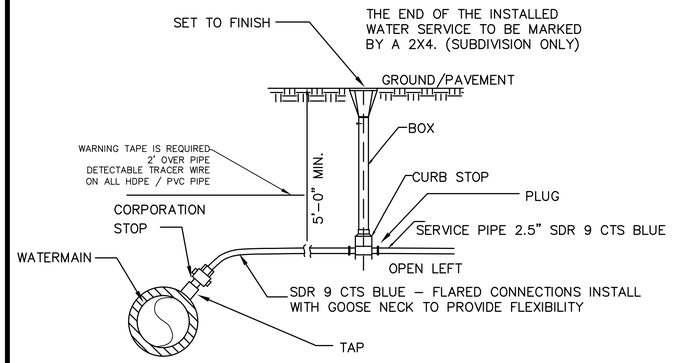
WATER MAIN ABOVE SEWER



WATER MAIN BELOW SEWER

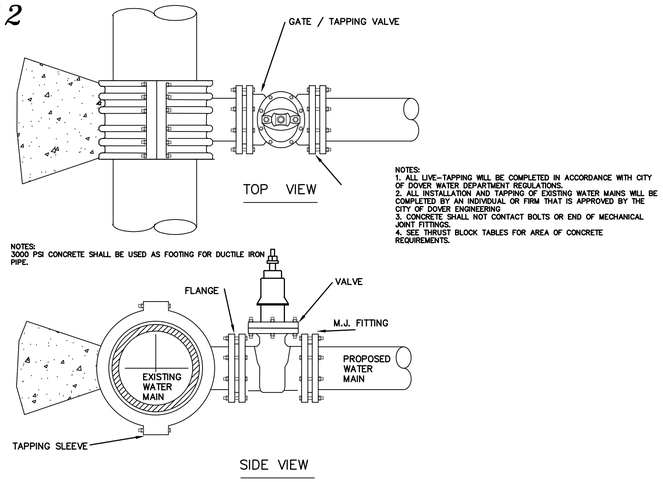
TYPICAL WATER/SEWER SEPERATION DETAILS

U11



TYPICAL WATER SERVICE CONNECTION
NOT TO SCALE

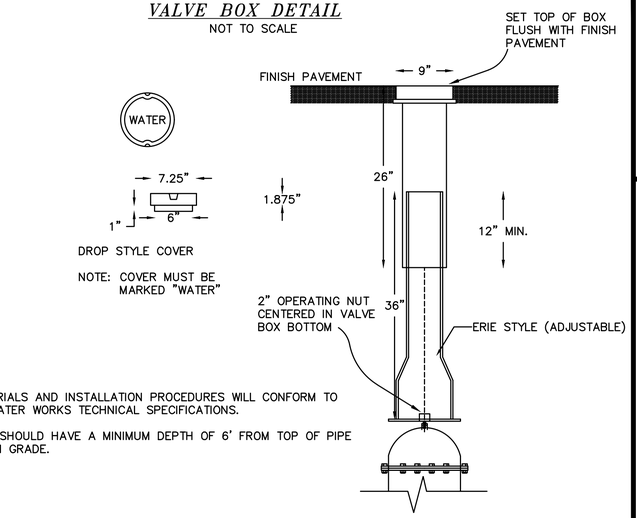
U12



DETAIL FOR STANDARD TAPPING SLEEVE AND VALVE ASSEMBLY
NOT TO SCALE

U13

VALVE BOX DETAIL
NOT TO SCALE



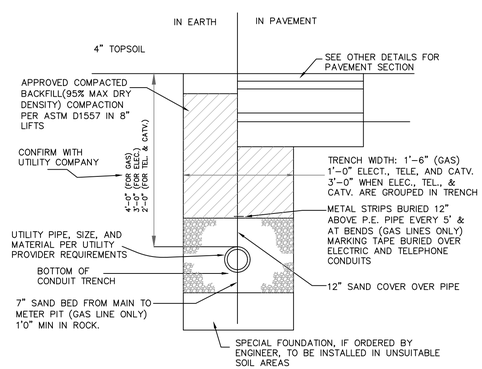
DROP STYLE COVER

NOTE: COVER MUST BE MARKED "WATER"

NOTES:
1.) ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO LOCAL WATER WORKS TECHNICAL SPECIFICATIONS.

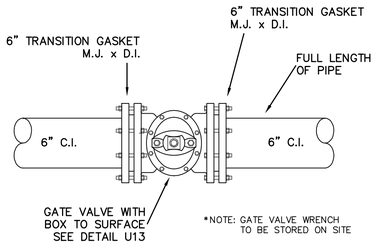
2.) ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 6' FROM TOP OF PIPE TO FINISH GRADE.

U14



ELECTRICAL, TELEPHONE, AND GAS TRENCH
NOT TO SCALE

U15



SHUTOFF VALVE DETAIL
NOT TO SCALE

GENERAL NOTES:

1. ALL FITTINGS & EXPOSED REBAR TO BE WRAPPED W/ TWO LAYERS OF 6 MIL. POLYETHYLENE WHERE COVERED WITH CONCRETE.
2. ALL CONCRETE SHALL BE CLASS C 3000 P.S.I. MINIMUM 28 DAYS COMPRESSIVE STRENGTH.
3. PLACE CONCRETE AGAINST UNDISTURBED EARTH.
4. TABLE DENOTES MINIMUM BEARING AREA OR VOLUME OF THRUST BLOCK. SPECIAL DESIGN FOR EACH INSTALLATION IS REQUIRED IF ALLOWABLE SOIL BEARING CAPACITY IS LESS THAN 3000 P.S.F.
5. VERTICAL SURFACES NOT BEARING AGAINST UNDISTURBED EARTH SHALL BE FORMED.
6. KEEP CONCRETE AWAY FROM FLANGE BOLTS AND FITTINGS.

PIPE I.D.	BEARING AREA, SQUARE FEET						VOLUME OF CONC. CU.YD		
	FIGURE 1	FIGURE 2	FIGURE 3, △				FIGURE 4, △		
			90°	45°	22-1/2°	11-1/4°	45°	22-1/2°	11-1/4°
4"	2	2	2	1	1	1	1.0	.5	.5
6"	2	3	3	2	1	1	1.5	1.0	.5
8"	2	5	6	3	2	1	2.0	1.0	.5
10"	3	7	10	5	3	1	4.0	2.0	1.0
12"	3	10	14	8	4	2			
14"	4	14	20	10	5	3			
16"	4	20	24	12	7	4			
18"	5	24	30	16	10	5			
20"	5	28	40	20	12	6			

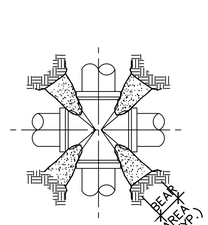


FIGURE 1
CROSS
(ONLY REQ'D IF ANY LEG IS LESS THAN 60 FT. LONG)

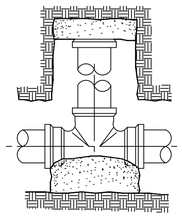


FIGURE 2
TEE, PLUG OR CAP

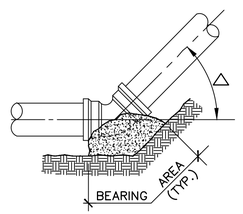


FIGURE 3
HORIZONTAL OR UPWARD VERTICAL BEND

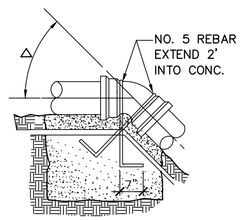


FIGURE 4
DOWNWARD VERTICAL BEND

TYPICAL THRUST BLOCKS
NOT TO SCALE

NOTE:
MECHANICAL JOINTS AT ALL FITTINGS IE: BENDS, TEES, CROSSES, AND VALVES SHALL BE THRUST RESTRAINT. (MEGA-LUG OR APPROVED EQUAL).

DOVER PLANNING #P19-03, P19-06, P19-07, P19-08

REVISION	DATE	DESCRIPTION

UTILITY DETAILS
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

SCALE : AS SHOWN
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 – 146

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

U-102



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NOTES:

1.) OWNER: A.) DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST DATED JANUARY 22, 2007
DARLENE G. COLWELL-ELLIS TRUSTEE
10A FOURTH STREET
DOVER, NH 03820

B.) CITY OF DOVER
288 CENTRAL AVENUE
DOVER, NH 03820

1A.) APPLICANT: GROEN CONSTRUCTION, INC.
120 WASHINGTON STREET, SUITE 302
ROCHESTER, NH 03839

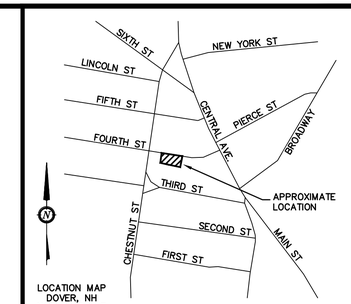
2.) CITY OF DOVER:
A.) TAX MAP 6, LOT 54D
B.) TAX MAP 6, LOT 54C

3.) LOT AREA:
A.) 4,956 Sq. Ft., 0.11 Ac.
B.) 18408 Sq. Ft., 0.42 Ac.

4.) S.C.R.D. A.) BOOK 3781, PAGE 284
B.) BOOK 758, PAGE 207

5.) ZONING: CBD GENERAL SUB-DISTRICT
PRINCIPAL BUILDING:
LOT SIZE: NA
MIN LOT COVERAGE: 75%
FRONTAGE BUILD-OUT: 70%
FRONT BUILD-TO ~ 4' +/- 5' (AVG. OF NEIGHBORHOOD)
SIDE SETBACK: 0 FT MIN - 24 FT MAX
REAR SETBACK: 10 FT MIN
PRINCIPAL BUILDING: 2 STORY MIN & 5 STORY MAX

6.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING PARKING AND PEDESTRIAN ACCESS TO THE SITE.



LOCATION MAP
DOVER, NH
NOT TO SCALE

LEGEND:

- EXISTING BUILDING TO BE REMOVED
- EXISTING BUILDING TO REMAIN
- EXISTING ON SITE PARKING SPACE
- EXISTING OFF SITE PARKING SPACE
- EXISTING SIDEWALK
- EXISTING PAVED AREA
- GRASS OR NON-IMPERVIOUS SURFACE

EXISTING PARKING SPACE CHART

LOCATION	ADA SPACES	TOTAL SPACES
FOURTH STREET	0	22
CHESTNUT STREET LOT	2	43

DOVER PLANNING #P19-03, P19-06, P19-07, P19-08

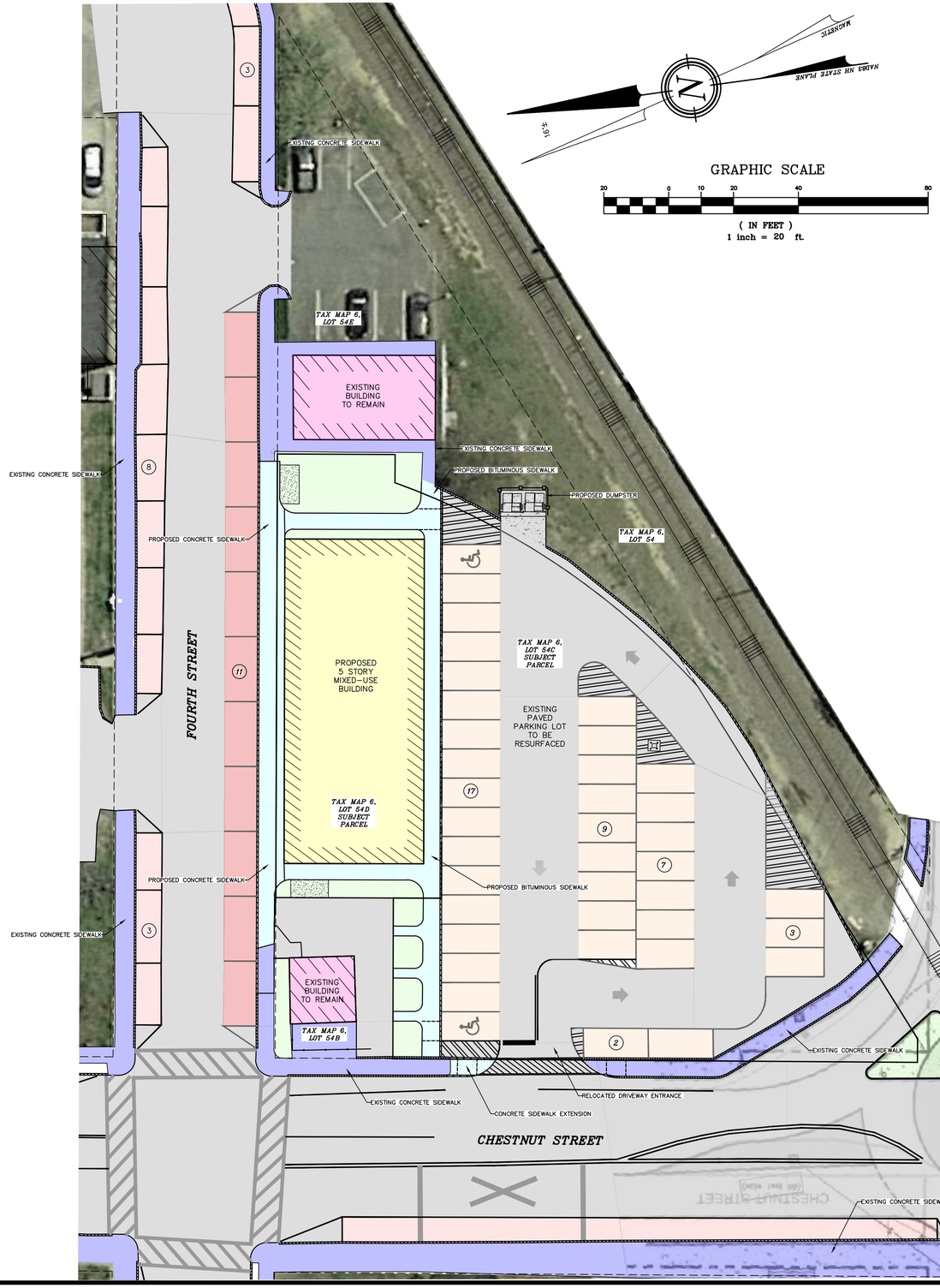
REVISION	DATE	DESCRIPTION

EXISTING SITE ACCESS PLAN
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 - 146

STATE OF NEW HAMPSHIRE No. 805 KENNETH A. BERRY LICENSED LAND SURVEYOR
SIGNATURE



NOTES:

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DARLENE G. COLWELL-ELLIS TRUSTEE
10A FOURTH STREET
DOVER, NH 03820

B.) CITY OF DOVER
288 CENTRAL AVENUE
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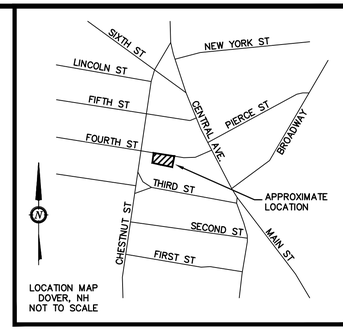
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FRONTAGE BUILD-OUT: 70%
FRONT BUILD-TO ~ 4' +/- 5' (AVG. OF NEIGHBORHOOD)
SIDE SETBACK: 0 FT MIN - 24 FT MAX
REAR SETBACK: 10 FT MIN
PRINCIPAL BUILDING: 2 STORY MIN & 5 STORY MAX

6.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED PARKING AND PEDESTRIAN ACCESS TO THE SITE.



LOCATION MAP
DOVER, NH
NOT TO SCALE

LEGEND:

- PROPOSED BUILDING
- EXISTING TO BUILDING REMAIN
- PROPOSED ON SITE PARKING SPACE
- EXISTING OFF SITE PARKING SPACE
- PROPOSED OFF SITE PARKING SPACE
- EXISTING SIDEWALK
- PROPOSED SIDEWALK
- PAVED AREA
- GRASS OR NON-IMPERVIOUS SURFACE

PROPOSED PARKING SPACE CHART

LOCATION	ADA SPACES	TOTAL SPACES
FOURTH STREET	0	25
CHESTNUT STREET LOT	2	38

REVISION	DATE	DESCRIPTION

DOVER PLANNING #P19-03, P19-06, P19-07, P19-08

PROPOSED SITE ACCESS PLAN
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 - 146

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

DRAINAGE ANALYSIS
&
EROSION AND SEDIMENT
CONTROL PLAN

Fourth Street Depot
10 Fourth Street, Dover, NH

Owned by:

Darlene Colwell-Ellis Revocable Family Trust
10 Fourth Street
Dover, NH 03820

Prepared for:

Groen Construction Inc.
120 Washington St. #302
Rochester, NH 03839

Prepared by:

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

Project Number:
DB 2018-146

January 10, 2019

Table of Contents

USGS Quadrangle Location Maps

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4.0	Erosion & Sediment Control, BMP's	Page 8-13
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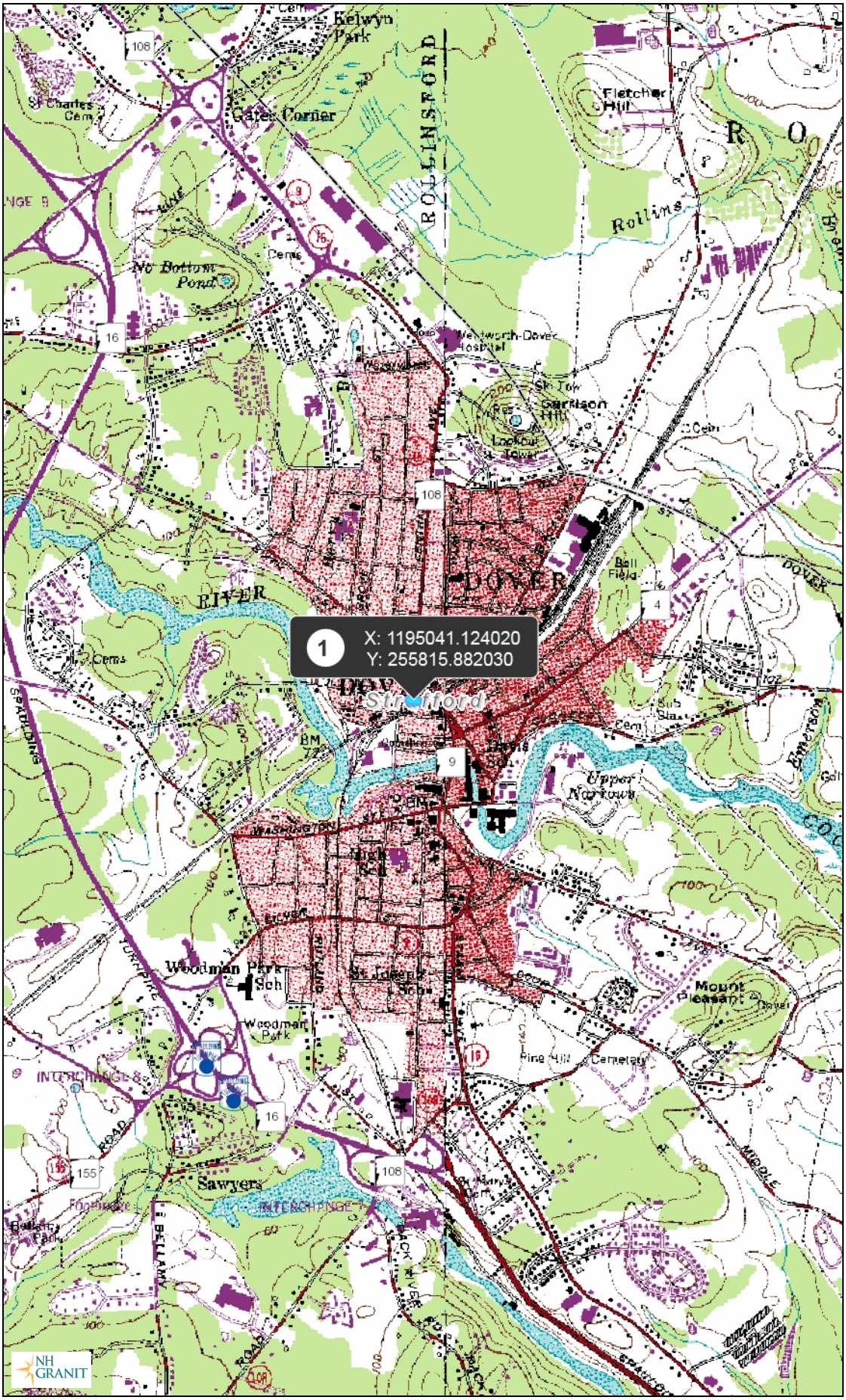
Appendix I - Existing Conditions Analysis
25 Yr.-24 Hr. Full Summary
2 Yr.-24 Hr. Node Listing
10 Yr.-24 Hr. Node Listing
25 Yr.-24 Hr. Node Listing
50 Yr.-24 Hr. Node Listing
100 Yr.-24 Hr. Node Listing

Appendix II - Proposed Conditions Analysis
25 Yr.-24 Hr. Full Summary
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

Appendix III - Calculations, Charts, & Graphs
Extreme Precipitation Table
USDA / NRCS Websoil
Stormwater Management Plan
Watershed Report Card, 303(d) List, & ORW List

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

Map by NH GRANIT



Legend

- State
- County
- City/Town

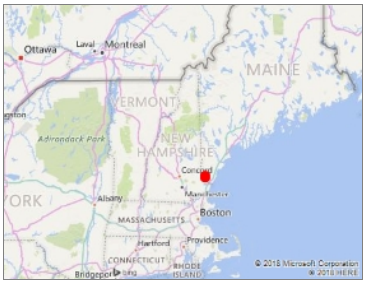
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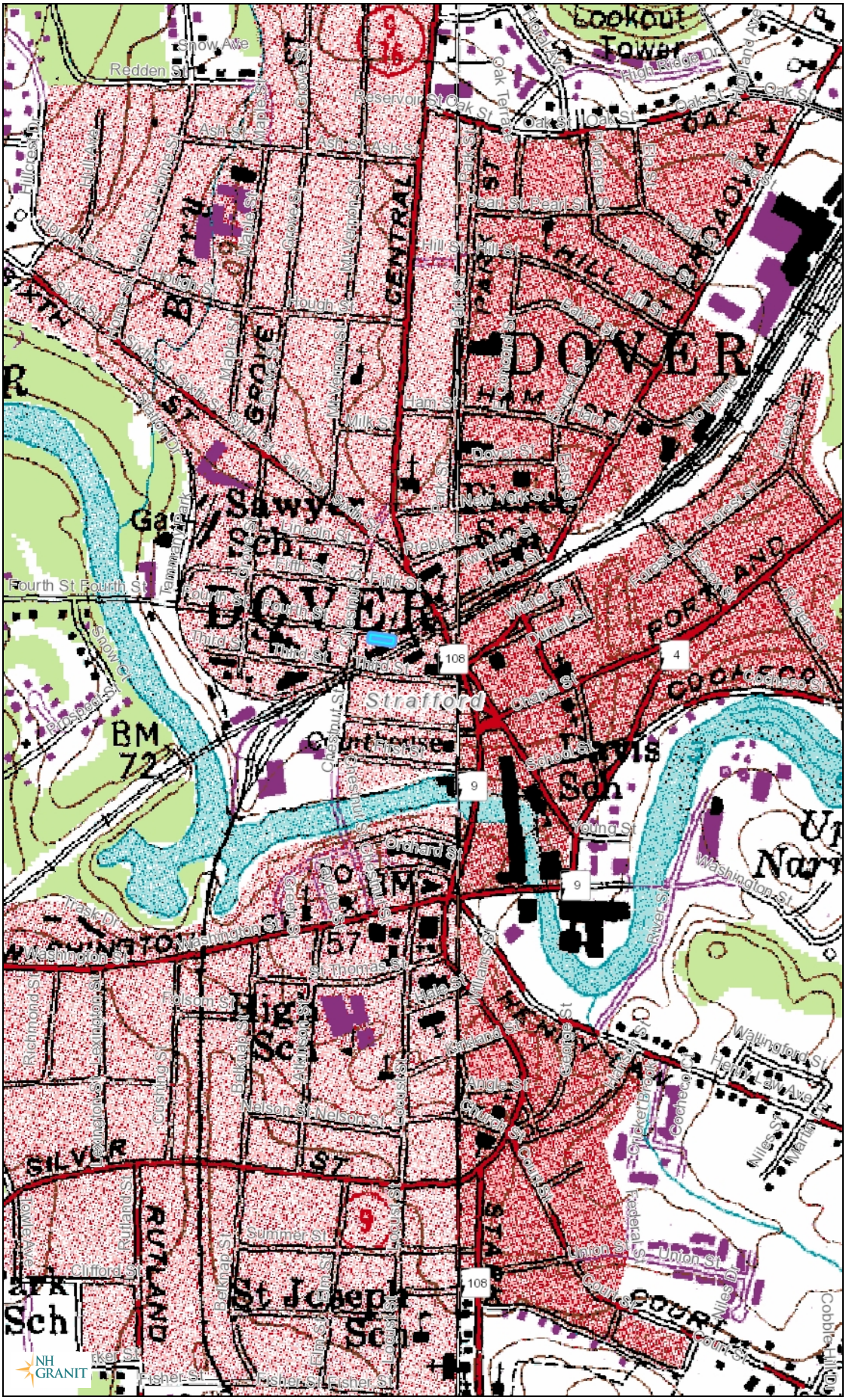
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Map Generated: 9/19/2018

Notes



Map by NH GRANIT



Legend

- State
- County
- City/Town

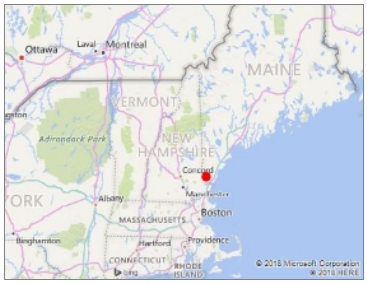
Map Scale

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Map Generated: 1/7/2019

Notes



DESIGN METHOD OBJECTIVES

The owner of Tax Map 6, Lot 54D, Darlene Colwell-Ellis, is proposing to develop the parcel to reposition an existing commercial building and improve area parking. The proposed building will be known as Fourth Street Depot. The proposed development involves a lot line revision with the City of Dover, Tax Map 6, Lot 54C

Existing Topography was based on the topographic survey completed by Berry Surveying & Engineering (BS&E) during the summer and fall of 2018. As the majority of the site is paved, the USDA / NRCS soils as documented on Websoil are being utilized for the drainage analysis.

Both an Existing and Proposed Conditions Analysis were conducted for the purpose of estimating the peak rate of stormwater run-off and to subsequently design adequate mitigation of drainage. There is one existing drainage discharge point which was identified in the existing analysis and duplicated in the proposed conditions analysis. The Final Analysis Point is a catch basin located on Chestnut Street north of Fourth Street. Designing two watershed models we have compared the differences in the rates of peak run-off and surface water volume. Sheet W-1 outlines the characteristics of the site in its existing or pre-construction conditions. The second analysis displays the proposed (post-construction) conditions (See Sheet W-2). The analysis was conducted using data for; 2 Yr - 24 Hr (3.63”), 10 Yr - 24 Hr (5.47”), 25 Yr - 24 Hr (6.90”), 50 Yr - 24 Hr (8.25”), and 100 Yr - 24 Hr (9.86”) storm events. Storm event analysis was accomplished using the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment and 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), in accordance with Alteration of Terrain Administrative Code, ENV-Wq (Attached in Appendix 3). With Dover being a coastal community the initial rainfall data obtained has been increased by 15%.

1.0 Existing Analysis:

Reference: W-1 Sheets - Existing Conditions Watershed Plan (Enclosed)
Sheet 3 - Existing Conditions Plan

The existing property consists of an existing commercial structure located on 0.11 acres. In addition to the locus parcel, off-site properties were evaluated in the analysis with the total existing conditions analysis consisting of 1.3 acres. Off-site area includes the land surrounding all sides of the locus parcel extending from Fourth Street to the railroad tracks and encompassing a portion of Chestnut Street. USDA NRCS soils data obtained from WebSoil (Attached in Appendix 3). The area evaluated consists entirely of HSG C and consists of grassed areas, rooftops, gravel, as well as roadway and parking pavement.

Final Reach #100:

There are eleven subcatchments that contribute runoff to **Final Reach #100**.

Subcatchment #1 consists of the off-site northern portion of Fourth Street. This subcatchment is routed into a catch basin on Fourth Street where it meets Chestnut Street **(Pond #1)** which directs runoff to **Final Reach #100**.

Subcatchment #2 consist of the off-site south side of Fourth Street as well as the northern half of the commercial building to be repositioned with runoff directed into a second catch basin before the intersection of Fourth Street and Chestnut Street **(Pond #2)**. This catch basin is overwhelmed for the 50 Yr – 24 Hr Storm Event if not before.

Subcatchment #3 consists of a small portion of the north side of Fourth Street to the east of the locus parcel contributing runoff to a roadside catch basin **(Pond #3)**.

Subcatchments #4 and #4a consists of a small parking lot for the abutting commercial building to the east and the related entry area from Fourth Street. Each drain to separate catch basins in the parking lot (**Pond #4 and Pond #4a** respectively).

Subcatchment #5 consists of a portion of Fourth Street east of the locus parcel draining to a catch basin **(Pond #5)** at the beginning of the drainage system.

Subcatchment #6 consists of the east side of Chestnut Street extending to the limits of the parking lot used in part for the locus parcel. Runoff drains to a roadside catch basin on Chestnut Street **(Pond #6)**. This catch basin is overwhelmed during the 10 Yr. – 24 Hr. Storm Event.

Subcatchments #7 and #7a consist of the lower portion of the parking lot used in contributing runoff to two separate catch basins (**Pond #7 and Pond #7a**

respectively). These two structures are overwhelmed with surface storage for the 10 Yr. – 24 Hr. Storm Event.

Subcatchment #8 consists of the south side of the existing commercial building as well as the northern portion of the parking lot used in part for the locus parcel contributing runoff to a catch basin in the corner of the parking lot in front of the building **(Pond #8)**. This structure is overwhelmed with surface storage for the 10 Yr. – 24 Hr. Storm Event.

Subcatchment #9 consists of the area near the Chestnut Street entrance of the parking lot that is not captured by the catch basins on Chestnut Street or in the south portion of the parking lot. Runoff drains to a catch basin in the northwest corner of the parking lot **(Pond #9)**. This catch basin is overwhelmed during the 25 Yr – 24 Hr. Storm Event with surface storage.

Summary:

The drainage system which controls the locus parcel and surrounding area directs runoff through a series of catch basins to a point on Chestnut Street north of Fourth Street **(Final Reach #100)**. As a general rule, the catch basins and culvert pipes are found to be too small for adequate drainage.

2.0 Proposed Analysis:

Reference: W-2 Sheets - Proposed Conditions Watershed Plan (Enclosed)
Proposed Site Plan
Proposed Grading & Drainage Overview Plan
Plan and Profile Sheets

The proposal consists of one multi use building including 20 residential units. Surface water is collected into catch basins. Runoff is routed into the central drainage system directing runoff to **Final Reach #100** through relocateddrainage structures.

Final Reach #100:

Subcatchments #1, and #3-#7a are unchanged.

Subcatchment #2 is changed due to the construction of new sidewalks and the proposed roof drainage system for the proposed building.

Subcatchment #8 is changed due to the construction of new sidewalks and the proposed roof drainage system for the proposed building as well as the relocation of the catch basin.

Subcatchment #9 is largely unchanged, the size and cover types of the subcatchment are unchanged, however, the catch basin is relocated to a more efficient location within the subcatchment.

Subcatchment #10 is the only new Subcatchment which shows the effectiveness of the proposed roof drain system of the proposed building.

Summary:

Peak rate and volume of runoff are both reduced for all events except the 10 year storm event when peak rate is increased slightly, yet volume is decreased to **Final Reach #100.** See designer notes in section 3.1.d

3.0 Stormwater Treatment:

Catch basins that are being replaced will have deep sumps and hoods to help in removal of sediment and gross solids.

The receiving waters are Cocheco (sic.) River – Central Ave Dam, (NHIMP600030608-04-08) and are impaired by Mercury and covered by the NE TMDL. There is an impairment of Escherichia coli and covered by the NH Statewide Bacteria TMDL dated September 21, 2010. There is also the impairment of pH that has not been covered by a TMDL as of the 2016 Watershed Report Card. The river is not as an Outstanding Resource Water. The river is not impaired by sediment or turbidity so it is to be considered a Tier 2 stream by NHDES standards and increased level of inspection will be required as part of a Stormwater Pollution Prevention Plan, (US EPA NPDES CGP) or City of Dover Stormwater Management Plan.

Infiltration Practices:

The total amount of impervious material is being reduced when comparing the existing conditions to the proposed conditions and as a result the volume of runoff is being reduced.

3.1 FULL COMPARATIVE ANALYSIS

ANALYSIS	COMPONENT	PEAK RATE DISCHARGE (Cubic Feet / Second)				
		2 Yr.	10 Yr.	25 Yr.	50 Yr.	100 Yr.
Final Reach #100	Existing	3.75	4.76	5.53	6.04	6.49
	Proposed	3.43	4.83	5.42	6.00	6.46

ANALYSIS	COMPONENT	VOLUME (ACRE FEET)				
		2 Yr.	10 Yr.	25 Yr.	50 Yr.	100 Yr.
Final Reach #100	Existing	0.353	0.554	0.706	0.850	1.024
	Proposed	0.343	0.544	0.704	0.841	1.015

Designer Notes:

Due to the size of the culvert pipes in the existing drainage system there is a great deal of oscillation that take place in the modeling of the existing structures. This oscillation is not mitigated in the proposed system because the system does not allow the upgrade of the pipe size in the redevelopment of this parcel.

The volume of runoff is being reduced when comparing the existing to the proposed model due to the reduction of impervious area. The peak rate of runoff if reduced in four of the five storm events evaluated.

In all but the smallest storm event evaluated, the parking lot is storing runoff due to the pipe and catch basin capacities.

It is our opinion that the 1.5% increase that is demonstrated in the 10 YR – 24 Hour storm event is the result of oscillation and not a true representation of the peak flow. The time increments and fine routing factors have been adjusted to the point of minimum severity without adverse implications.

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

Reference: Proposed Site Plan and Grading Plan
Erosion & Sediment Control Plan
Erosion & Sediment Control Details, E-101 & E-102

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 30 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 Management Plan which will be required prior to the Pre-construction meeting.

Due to the nature of this site redevelopment, there are a number of E&SC practices which would be normal and expected that do not apply to this proposal. Several practices have been left on the details and are included in this document in the case that their application be dictated by the construction situation.

Silt Fence / Perimeter Control

The Erosion and Sediment Control Details, Sheet E-101, has the specifications for installation and maintenance of the silt fence. Silt fence is rated to be effective for 100 linear feet of fence to capture runoff from one-quarter acre or basically 100 feet of land area sloping toward the fence. Filtrexx silt soxx have a variable area and depth, see Filtrexx supporting documents. The NHDES Stormwater Manual requires that the maximum spacing for support stakes is six feet.

Filtrexx Silt Soxx, or approved equal, has been specified in numerous locations within the plan set and silt fence is not a substitution for silt soxx. Multiple sizes of this product have been specified for use.

EPA CGP 2012: "You must install sediment control along those perimeter areas of your site that will receive stormwater from earth disturbing activity."

In accordance with EPA CGP 2.1.2.1, Provide Natural Buffers or Equivalent Sediment Controls, and CGP Appendix G, Table G-3, and Table G-7, slopes between 3% and 6% with soils that are Fine Sandy Loams, there is a High Risk Factor and it is required to Double Perimeter Control and 7-Day Site Stabilization.

Erosion Control Mix Berm

As an alternative to the Silt Fence, an Erosion Control Mix Berm can be utilized as a perimeter control. The specifications can be found on Sheet E-101, Detail E6.

Rolled Erosion Control Blanket

Description: Rolled Erosion Control Blankets, such as North American Green Bionet S150, SC150, SC125 (or equal) or turf reinforcement such as North American Green V-Max C-350 (or equal) consist of interlocking fiber mesh, bio-degradable or permanent, used to stabilize sloping earth while vegetation is being established. The product comes in rolls that are laid out over the earth, normally over-lapped, and secured to the soil by the use of anchors or staples. The RECB may be anchored in the earth at the top of the slope to prevent wash-out. Construction specifications are included in the plan set and New Hampshire Stormwater Manual, Volume 3, 4-1 Erosion Control Practices, Temporary Erosion Control Blanket. (Steep slopes are not anticipated on this project.)

Construction Considerations: It is recommended that the blanket be installed in the same direction as the water flow or perpendicular to the slope. The manufacturer will recommend the amount of over-lap from one row to the next and on longer slopes between sections. Care must be taken that the RECB is laid directly on the earth / topsoil and that any existing vegetation not cause tenting as this will cause an issue with the blanket not staying in place. The staples or stakes are to be placed according to the manufacturer based on the slope of the receiving soil and forces that may be encountered. Care must be taken to utilize the correct product as specified. The choice of product are all different and in most cases are not interchangeable. NHDES or NH F&G may specify that some RECBs not be used in some applications.

Maintenance Considerations: RECBs will be inspected during the regular inspection schedule and any construction corrections made if the blanket is compromised.

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

Mixture	Pounds per Acre	Pounds per 1,000 Sq. Ft.
Tall Fescue	55	1.25
Creeping Red Fescue	75	1.75
Annual Ryegrass	33	0.75
Perennial Ryegrass	26	0.60
Kentucky Bluegrass	22	0.50
White Clover	7	0.15

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

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-inch 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-102- Erosion and Sediment Control Detail Plan. Alternatives to the length and berm are demonstrated on the detail. (This item may or may not be required based on operations.)

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. The tracking of sediment onto municipal streets or parking lots are not allowed.

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. (This item should not apply.)

Deep Sump Catch Basin

Deep Sump Catch Basins are used throughout the site as a pretreatment measure to remove sediment and debris from storm water runoff. Deep Sump Catch Basins will be designed with a sump that is four times the depth of the discharge culvert and a minimum of four feet. All pretreatment deep sump catch basins will have an outlet pipe hood which extends one-foot below the outlet invert and will include a hood vent. Sediment must be removed from Deep Sump Catch Basins on a regular basis, at least twice a year and more often if the sumps become half-full. Inspections should be conducted periodically. See construction details.

Outlet Protection

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. See sheet E-102 for details. (Probably does not apply.)

Stockpiled Sediment or Soil

Stockpiled materials including topsoil, excavated materials, borrow materials imported onto the site, construction aggregates, and sediment removed from temporary sediment traps will be located in designated areas at least 50 feet away form concentrated flows. All stockpiles will have erosion protection in the form of silt fence and diversion swales will be applied to protect the material and surrounding areas. Inactive stockpiles will be seeded for temporary stabilization. Erosion control measures will be inspected in accordance with the schedule for all other activities on site.

At a minimum, you must comply with following (EPA 2012 CGP Part 2.1.2.4d) "Do no hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance (unless connected to a sediment basin, sediment trap, or similar effective control,) storm drain inlet, or surface water."

Temporary stock piles and material storage is going to have to be coordinated with the City of Dover on municipal property outside of the locus parcel without impacting the use of Fourth Street

Construction Sequence

1. Install Silt Fence and construct and/or install temporary and permanent sediment erosion and detention control facilities (Vegetated swales, level spreaders, and constructed filter strips), as required. Erosion, sediment and facilities shall be installed and stabilized prior to any earth moving operation, and prior to directing run-off to them. Inlet protection is instrumental.

2. Demolish, clear, grub, and dispose of debris in approved facilities.

3. Excavate and stockpile topsoil / loam. All disturbed areas shall be stabilized immediately after grading.

4. Construct the replacement catch basins and install the replacement culvert pipes.

5. Install footings, foundation drains, and foundation walls.

6. Begin permanent and temporary seeding and mulching. All cut and fill slopes and disturbed areas shall be seeded and mulched as required, or directed.

7. Daily, or as required, construct temporary berms, drainage ditches, sediment traps, etc. to prevent erosion on the site and prevent any siltation of abutting waters or property.

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

9. Complete permanent seeding and landscaping.

10. Remove temporary erosion control measures after seeding areas have established themselves and site improvements are complete. Smooth and re-vegetate all disturbed areas.

11. All swales and drainage structures will be constructed and stabilized prior to having run-off being directed to them.

12. Finish paving all roadways/parking.

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

Perimeter control and inlet protection will be inspected during and after storm events to ensure that the practices still has integrity and is not allowing sediment to pass. Depending on SWMP criteria, all controls will be inspected once every 7 days and after storm events. Inspection reports must be submitted to City of Dover, Engineering Department, Community Services. Sediment build-up in swales and level spreaders will be removed if it is deeper than six inches. See also the Stormwater Management Plan published separately.

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

5.0 CONCLUSION

Peak rates of runoff and volume of flow are reduced in the model in the post-construction analysis / condition, as compared to the pre-construction peak rates of runoff flow at both locations except as explained under the Designer Notes for one storm event for the Peak Rate of Runoff.

The amount of impervious area is being reduced in the proposed configuration. Additional infiltration practices are not being proposed to be implemented.

All replacement catch basins will be installed with deep sumps and hoods to allow for appropriate sediment and gross solid removal.

A Site Specific, Terrain Alteration Permit (RSA 485: A-17) is not required for this site plan due to the area of disturbance being less than 100,000 SF.

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

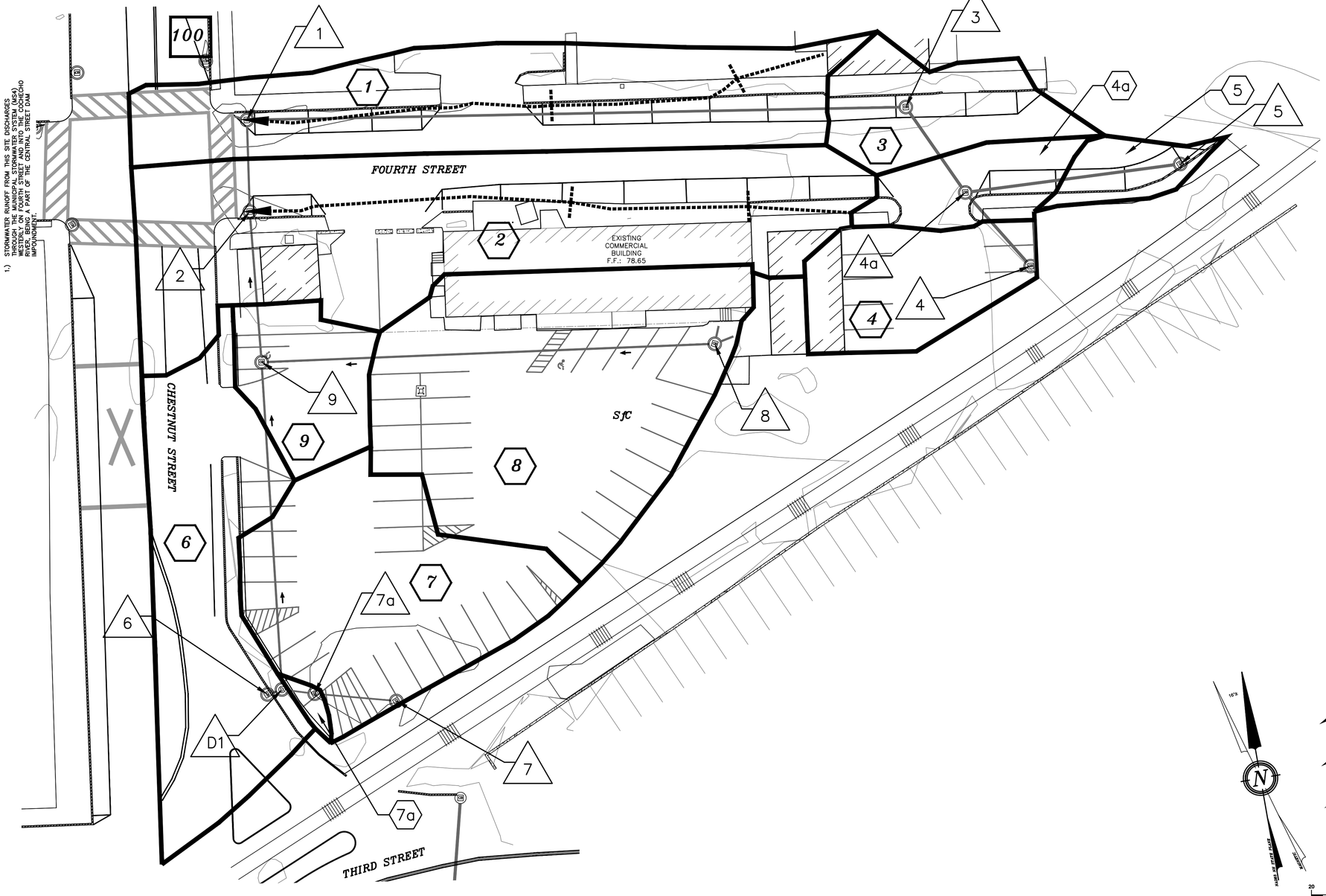
Christopher R. Berry, SIT 567
Principal, President

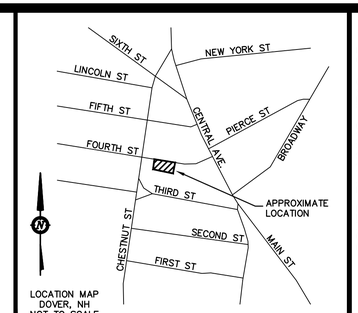
Kenneth A. Berry PE, LLS,
CPSWQ, CPESC, CESSWI
Principal, VP - Technical Operations

SOILS:

SfC – SUFFIELD SILT LOAM, 8 TO 15 PERCENT SLOPES

SEE WEBSOIL USDA–NRCS





LOCATION MAP
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: A.) DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
DARLENE G. COLWELL–ELLIS TRUSTEE
10 FOURTH STREET
DOVER, NH 03820

B.) CITY OF DOVER
288 CENTRAL AVENUE
DOVER, NH 03820

1A.) APPLICANT: GROEN CONSTRUCTION, INC.
120 WASHINGTON STREET, SUITE 302
ROCHESTER, NH 03839

2.) CITY OF DOVER:
A.) TAX MAP 6, LOT 54D
B.) TAX MAP 6, LOT 54C

3.) LOT AREA:
A.) 4,956 Sq. Ft., 0.11 Ac.
B.) 18408 Sq. Ft., 0.42 Ac.

4.) S.C.R.D.: A.) BOOK 3781, PAGE 284
B.) BOOK 758, PAGE 207

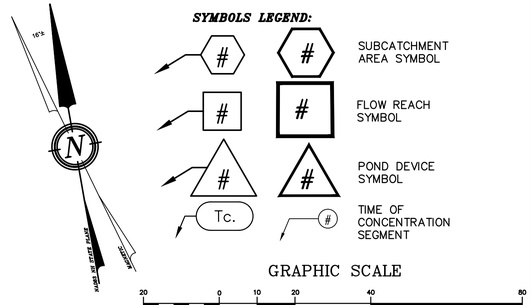
5.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, THIS PARCEL DOES NOT FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015.

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 APRIL OF 2016, WITH AN ERROR OF CLOSURE OF 1 PART IN 43,146.5.

8.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED WATERSHEDS ON AND ADJACENT TO, TAX MAP 6, LOT 54D AS OF THE DATE OF THIS PLAN.

9.) THE EXISTING LOT COVERAGE IS 3,317 SQ. FT.



DOVER PLANNING #P19–03

REVISION	DATE	DESCRIPTION

W–1 EXISTING WATERSHED PLAN
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 – 146

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

SHEET 1 OF 2

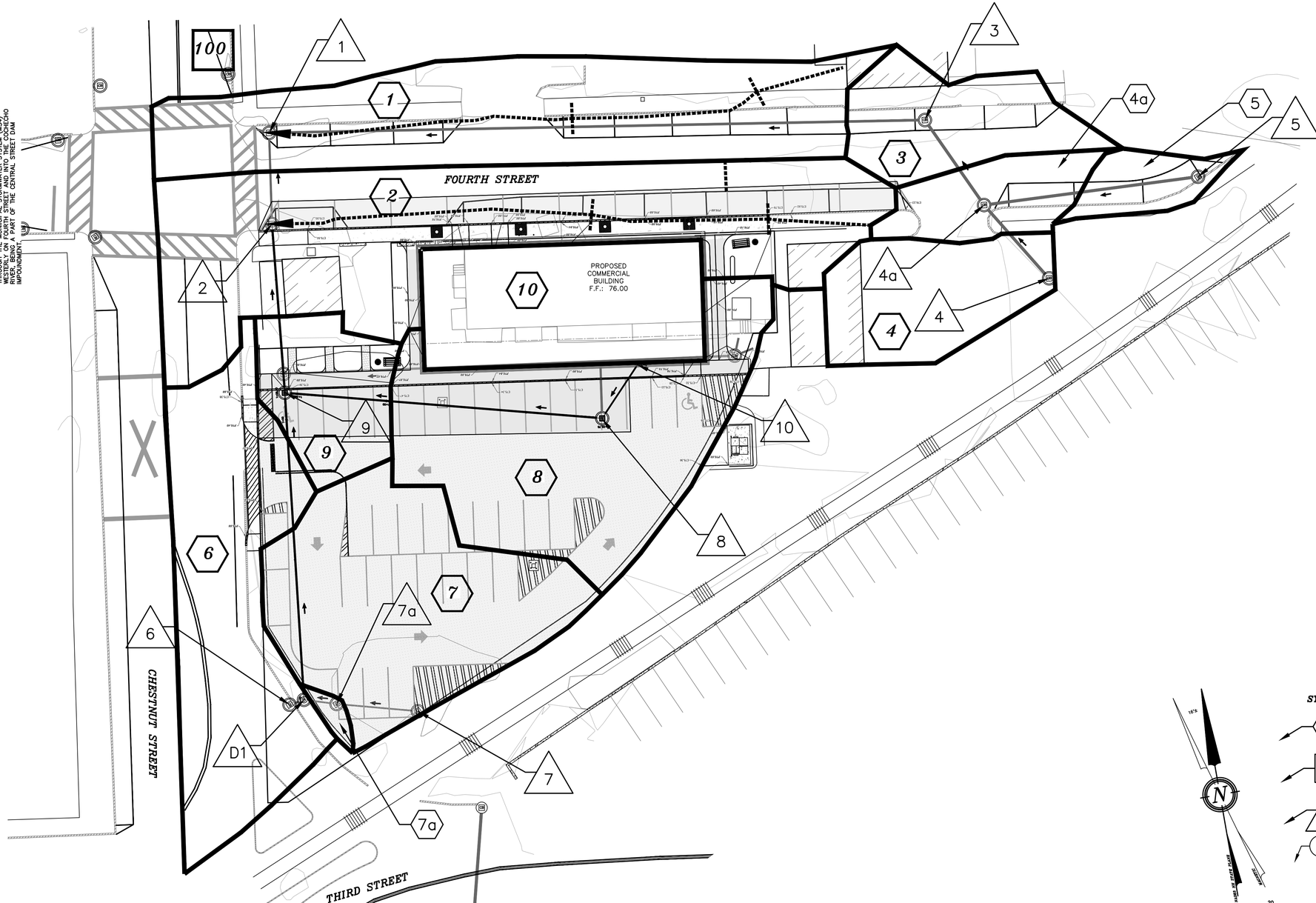
SOILS:

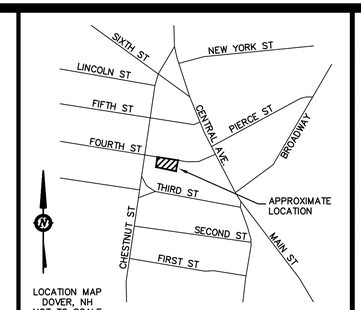
SfC – SUFFIELD SILT LOAM, 8 TO 15 PERCENT SLOPES

SEE WEBSOIL USDA–NRCS

STORMWATER NOTE:

1.) STORMWATER RUNOFF FROM THIS SITE DISCHARGES THROUGH THE MUNICIPAL STORMWATER SYSTEM (MS4) WHERE IT ENTERS A FOURTH STREET AND INTO THE COCHECO RIVER BASIN. A PART OF THE CENTRAL STREET DAM IMPOUNDMENT.





LOCATION MAP
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: A.) DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
DARLENE G. COLWELL–ELLIS TRUSTEE
10 FOURTH STREET
DOVER, NH 03820

B.) CITY OF DOVER
288 CENTRAL AVENUE
DOVER, NH 03820

1A.) APPLICANT: GROEN CONSTRUCTION, INC.
120 WASHINGTON STREET, SUITE 302
ROCHESTER, NH 03839

2.) CITY OF DOVER:
A.) TAX MAP 6, LOT 54D
B.) TAX MAP 6, LOT 54C

3.) LOT AREA:
A.) 4,956 Sq. Ft., 0.11 Ac.
B.) 18408 Sq. Ft., 0.42 Ac.

4.) S.C.R.D.A.) BOOK 3781, PAGE 284
B.) BOOK 758, PAGE 207

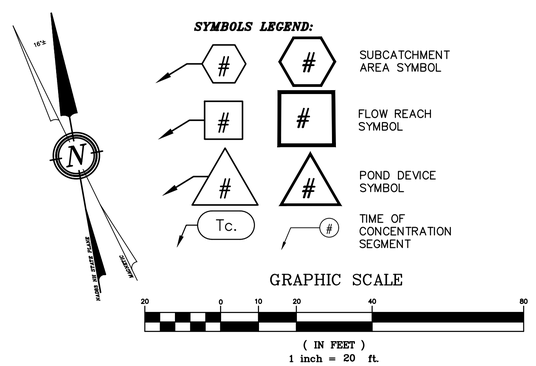
5.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, THIS PARCEL DOES NOT FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD REF.: FEMA COMMUNITY #330145, MAP #33017C0310E, DATED: SEPTEMBER 30, 2015.

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 APRIL OF 2016, WITH AN ERROR OF CLOSURE OF 1 PART IN 43,146.5.

8.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED WATERSHEDS ON AND ADJACENT TO TAX MAP 6, LOT 54D IN RELATION TO THE PROPOSED LOT LINE REVISION AND PROPOSED SITE PLAN REVIEW.

9.) THE EXISTING LOT COVERAGE IS 3,317 SQ. FT.



DOVER PLANNING #P19–03

REVISION	DATE	DESCRIPTION

W–2 PROPOSED WATERSHED PLAN
FOR GROEN CONSTRUCTION, INC.
DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
& CITY OF DOVER
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 – 146

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

SHEET 2 OF 2

SOILS & DEWATERING:

SfC SUFFIELD SILT LOAM K= 0.20

SEE SITE SPECIFIC SOILS MAP (SSSM)
SEE WEBSOIL USDA–NRCS
ERODIBILITY FACTOR – K, CPESC MANUAL, ENVIROCERT INTERNATIONAL INC. & ROCKINGHAM COUNTTY SOIL SURVEY, ROCKWEB SOIL ATTRIBUTES.

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 2012 NPDES CONSTRUCTION GENERAL PERMIT (CGP)" DATED MAY 3, 2012 INCLUDED IN THE SWPPP.

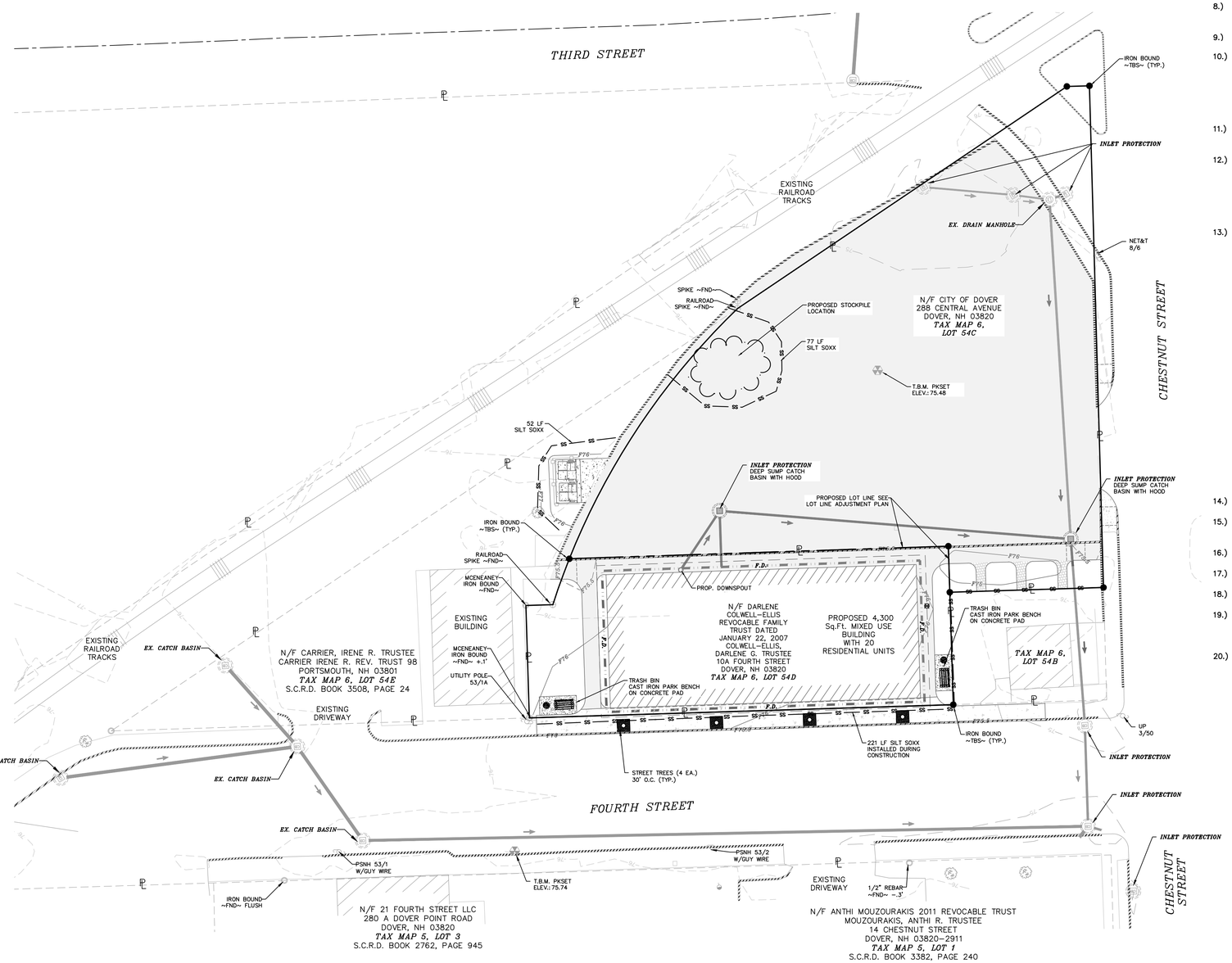
COVER MANAGEMENT DURING CONSTRUCTION FOR EXPOSED SOIL WILL INCLUDE HAY / STRAW APPLIED AT A RATE OF 2.0 TONS PER ACRE, TEMPORARY SEEDING OF ANNUAL RYE GRASS, AND PERMANENT SEEDING AT THE EARLIES OPPORTUNITY. SEE ADDITIONAL REQUIREMENT FOR STABILIZATION ON THE EROSION AND SEDIMENT CONTROL DETAIL SHEETS, 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.

LEGEND:

- (R) RAIN GARDEN BIO–MEDIA PROTECTION
- (P) PERIMETER CONTROL
- (C) RESIDENTIAL/ROADWAY CONSTRUCTION
- IRON PIPE (FND)
- IRON BOUND (FND)
- REBAR (FND)
- UTILITY POLE
- GUY WIRE
- (W) WELL
- BENCHMARK
- CONIFEROUS TREE
- DECIDUOUS TREE
- SILT FENCE
- FILTREXX SILTSOXX
- TREE LINE

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.



NOTES:

1.) OWNER: DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST DATED JANUARY 22, 2007
DARLENE G. COLWELL–ELLIS TRUSTEE
10A FOURTH STREET
DOVER, NH 03820

2.) APPLICANT: GROEN CONSTRUCTION, INC.
120 WASHINGTON STREET, SUITE 302
ROCHESTER, NH 03839

3.) THE PROJECT PARCEL IS TAX MAP 6, LOT 54D

4.) LOT AREA: 4,956 Sq. Ft., 0.11 Ac.

5.) 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.

6.) THE CONTRACTOR SHALL CALL AND COORDINATE WITH DIGSAFE AT 1–888–344–7233 AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

7.) ALL DRAINAGE PIPE IS TO BE HDPE N–12. INDIVIDUAL PIPE SIZES ARE SPECIFIED ON GRADING AND DETAIL PLAN SHEETS, GREEN PIPE.

8.) 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.

9.) UPON FINAL COMPLETION AND 85% STABILIZATION, THE DRAINAGE SYSTEM IS TO BE CLEANED OF ALL DEBRIS. SEDIMENT CONTROL

10.) 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.

11.) SILT FENCE MAY BE SUBSTITUTED WITH FILTREXX SILT SOXX OR EROSION CONTROL MIX BERM. SILT FENCE IS NOT A SUBSTITUTE FOR FILTREXX SILT SOXX OR APPROVED EQUAL.

12.) PER EPA CGP Z.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.

13.) CITY OF DOVER: IN ACCORDANCE WITH SITE PLAN REVIEW REGULATIONS (149–14) THE FOLLOWING STORMWATER MEASURES ARE REQUIRED. THIS SITE DEVELOPMENT QUALIFIES AS A REDEVELOPMENT PROJECT. THE EXISTING IMPERVIOUS AREA IS 92.0% AND PROPOSED IMPERVIOUS AREA IS 85.2%. THE CONTIGUOUS LAND DISTURBANCE IS 25,800 SQUARE FEET.

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.

14.) CONTRACTOR MAY BE REQUIRED TO HAVE A CONSTRUCTION ENTRANCE DEPENDING ON SITE MANAGEMENT.

15.) CONTRACTOR IS RESPONSIBLE FOR SWEEPING THE PARKING LOT, SIDEWALKS AND ANYTHING DISTURBED, TO ENSURE THAT NO SEDIMENT IS BEING TRACKED ONTO CHESTNUT STREET OR FOURTH STREET.

16.) CONTRACTOR IS RESPONSIBLE FOR CLEANING AND MAINTAINING THE INLET PROTECTION ONCE INSTALLED.

17.) FUGITIVE DUST IS TO BE CONTROLLED THROUGHOUT THE CONSTRUCTION PROCESS IN ACCORDANCE WITH ENV–A 1000.

18.) CONTRACTOR IT TO MEET THE REQUIREMENTS SPECIFIED IN RSA 430:51–57 AND AGR 3800, RELATING TO INVASIVE SPECIES.

19.) CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE WATER QUALITY FROM ANY RUN OFF DURING THE CONSTRUCTION PROCESS, IN ACCORDANCE WITH ENV–WQ 1507, IN ORDER TO PREVENT VIOLATIONS OF THE STORM WATER QUALITY STANDARDS.

20.) CATCH BASIN HOODS WILL BE INSTALLED AS SOON AS THE BASIN IS PUT ON LINE. RIM IS TO BE RAISED WITH FINAL GRADE SO THAT STORMWATER RUNOFF CAN DRAIN PROPERLY THROUGHOUT CONSTRUCTION.

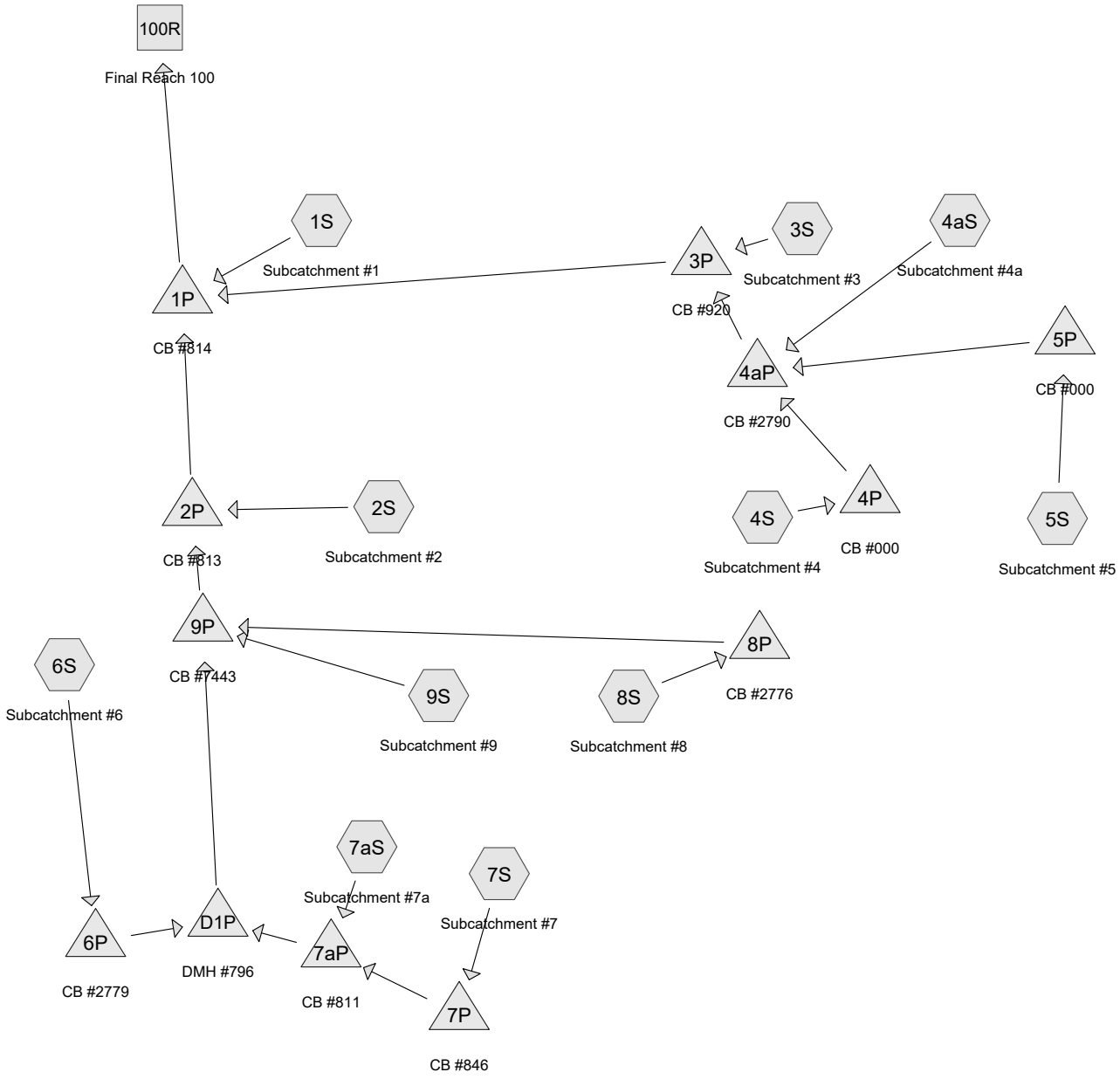
REVISION	DATE	DESCRIPTION
		DOVER PLANNING #P19–03, P19–06, P19–07, P19–08

EROSION AND SEDIMENT CONTROL PLAN
FOR GROEN CONSTRUCTION, INC.
LAND OF
DARLENE COLWELL–ELLIS REVOCABLE FAMILY TRUST
DATED JANUARY 22, 2007
10 FOURTH STREET & CHESTNUT STREET
DOVER, NH 03820
TAX MAP 6, LOT 54D & 54C

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JANUARY 10, 2019
FILE NO. : DB 2018 – 146

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



Routing Diagram for 18-146 Existing Drainage
Prepared by Berry Surveying & Engineering, Printed 1/7/2019
HydroCAD® 10.00-22 s/n 07605 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.009	79	50-75% Grass cover, Fair, HSG C (8S)
0.018	86	<50% Grass cover, Poor, HSG C (2S)
0.043	74	>75% Grass cover, Good, HSG C (1S, 4aS, 5S)
0.004	96	Gravel surface, HSG C (2S)
0.058	98	Paved parking, HSG C (4S)
0.990	98	Unconnected pavement, HSG C (1S, 2S, 4aS, 5S, 6S, 7aS, 7S, 8S, 9S)
0.177	98	Unconnected roofs, HSG C (1S, 2S, 3S, 4S, 8S)
1.297	**97**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.297	HSG C	1S, 2S, 3S, 4aS, 4S, 5S, 6S, 7aS, 7S, 8S, 9S
0.000	HSG D	
0.000	Other	
1.297		**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	0.000	0.009	0.000	0.000	0.009	50-75% Grass cover, Fair	8S
0.000	0.000	0.018	0.000	0.000	0.018	<50% Grass cover, Poor	2S
0.000	0.000	0.043	0.000	0.000	0.043	>75% Grass cover, Good	1S, 4aS, 5S
0.000	0.000	0.004	0.000	0.000	0.004	Gravel surface	2S
0.000	0.000	0.058	0.000	0.000	0.058	Paved parking	4S
0.000	0.000	0.990	0.000	0.000	0.990	Unconnected pavement	1S, 2S, 4aS, 5S, 6S, 7aS, 7S, 8S, 9S
0.000	0.000	0.177	0.000	0.000	0.177	Unconnected roofs	1S, 2S, 3S, 4S, 8S
0.000	**0.000**	**1.297**	**0.000**	**0.000**	**1.297**	**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	1P	68.56	68.56	5.0	0.0000	0.012	12.0	0.0	0.0
2	2P	69.92	68.62	28.5	0.0456	0.012	8.0	0.0	0.0
3	3P	70.08	68.58	229.8	0.0065	0.012	10.0	0.0	0.0
4	4aP	73.14	71.40	32.9	0.0529	0.012	12.0	0.0	0.0
5	4P	73.42	73.27	30.9	0.0049	0.012	12.0	0.0	0.0
6	5P	73.27	73.14	72.9	0.0018	0.012	12.0	0.0	0.0
7	6P	72.51	72.51	1.4	0.0000	0.012	8.0	0.0	0.0
8	7aP	72.90	72.68	7.7	0.0286	0.012	6.0	0.0	0.0
9	7P	72.88	72.88	25.1	0.0000	0.012	6.0	0.0	0.0
10	8P	71.49	70.74	156.9	0.0048	0.012	8.0	0.0	0.0
11	9P	70.68	69.94	49.6	0.0149	0.012	8.0	0.0	0.0
12	D1P	72.58	70.70	112.3	0.0167	0.012	8.0	0.0	0.0

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 3
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=8,582 sf 80.14% Impervious Runoff Depth>6.07"
Flow Length=208' Tc=7.4 min CN=93 Runoff=1.23 cfs 0.100 af

Subcatchment 2S: Subcatchment #2 Runoff Area=12,578 sf 92.70% Impervious Runoff Depth>6.53"
Flow Length=213' Tc=11.0 min CN=97 Runoff=1.66 cfs 0.157 af

Subcatchment 3S: Subcatchment #3 Runoff Area=2,742 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.43 cfs 0.035 af

Subcatchment 4aS: Subcatchment #4a Runoff Area=1,773 sf 91.82% Impervious Runoff Depth>6.42"
Tc=6.0 min CN=96 Runoff=0.27 cfs 0.022 af

Subcatchment 4S: Subcatchment #4 Runoff Area=3,015 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.47 cfs 0.038 af

Subcatchment 5S: Subcatchment #5 Runoff Area=965 sf 99.48% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af

Subcatchment 6S: Subcatchment #6 Runoff Area=6,771 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=1.05 cfs 0.086 af

Subcatchment 7aS: Subcatchment #7a Runoff Area=173 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.03 cfs 0.002 af

Subcatchment 7S: Subcatchment #7 Runoff Area=6,844 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=1.06 cfs 0.087 af

Subcatchment 8S: Subcatchment #8 Runoff Area=10,685 sf 96.50% Impervious Runoff Depth>6.54"
Tc=6.0 min CN=97 Runoff=1.65 cfs 0.134 af

Subcatchment 9S: Subcatchment #9 Runoff Area=2,361 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.37 cfs 0.030 af

Reach 100R: Final Reach 100 Inflow=5.53 cfs 0.706 af
Outflow=5.53 cfs 0.706 af

Pond 1P: CB #814 Peak Elev=71.19' Storage=33 cf Inflow=5.53 cfs 0.706 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=5.53 cfs 0.706 af

Pond 2P: CB #813 Peak Elev=74.43' Storage=57 cf Inflow=3.11 cfs 0.500 af
8.0" Round Culvert n=0.012 L=28.5' S=0.0456 '/' Outflow=3.10 cfs 0.500 af

Pond 3P: CB #920 Peak Elev=71.93' Storage=23 cf Inflow=1.31 cfs 0.107 af
10.0" Round Culvert n=0.012 L=229.8' S=0.0065 '/' Outflow=1.29 cfs 0.107 af

Pond 4aP: CB #2790 Peak Elev=73.62' Storage=6 cf Inflow=0.89 cfs 0.072 af
12.0" Round Culvert n=0.012 L=32.9' S=0.0529 '/' Outflow=0.89 cfs 0.072 af

Pond 4P: CB #000 Peak Elev=73.84' Storage=5 cf Inflow=0.47 cfs 0.038 af
12.0" Round Culvert n=0.012 L=30.9' S=0.0049 '/' Outflow=0.47 cfs 0.038 af

Pond 5P: CB #000 Peak Elev=73.67' Storage=5 cf Inflow=0.15 cfs 0.012 af
12.0" Round Culvert n=0.012 L=72.9' S=0.0018 '/' Outflow=0.15 cfs 0.012 af

Pond 6P: CB #2779 Peak Elev=76.82' Storage=34 cf Inflow=1.05 cfs 0.086 af
8.0" Round Culvert n=0.012 L=1.4' S=0.0000 '/' Outflow=1.09 cfs 0.086 af

Pond 7aP: CB #811 Peak Elev=75.31' Storage=69 cf Inflow=0.98 cfs 0.090 af
Outflow=0.89 cfs 0.090 af

Pond 7P: CB #846 Peak Elev=75.14' Storage=882 cf Inflow=1.06 cfs 0.087 af
6.0" Round Culvert n=0.012 L=25.1' S=0.0000 '/' Outflow=0.98 cfs 0.087 af

Pond 8P: CB #2776 Peak Elev=75.38' Storage=798 cf Inflow=1.65 cfs 0.134 af
8.0" Round Culvert n=0.012 L=156.9' S=0.0048 '/' Outflow=1.28 cfs 0.134 af

Pond 9P: CB #7443 Peak Elev=75.40' Storage=70 cf Inflow=2.20 cfs 0.342 af
8.0" Round Culvert n=0.012 L=49.6' S=0.0149 '/' Outflow=2.10 cfs 0.342 af

Pond D1P: DMH #796 Peak Elev=76.45' Storage=44 cf Inflow=1.16 cfs 0.178 af
8.0" Round Culvert n=0.012 L=112.3' S=0.0167 '/' Outflow=1.29 cfs 0.178 af

Total Runoff Area = 1.297 ac Runoff Volume = 0.703 af Average Runoff Depth = 6.51"
5.57% Pervious = 0.072 ac 94.43% Impervious = 1.225 ac

Summary for Subcatchment 1S: Subcatchment #1

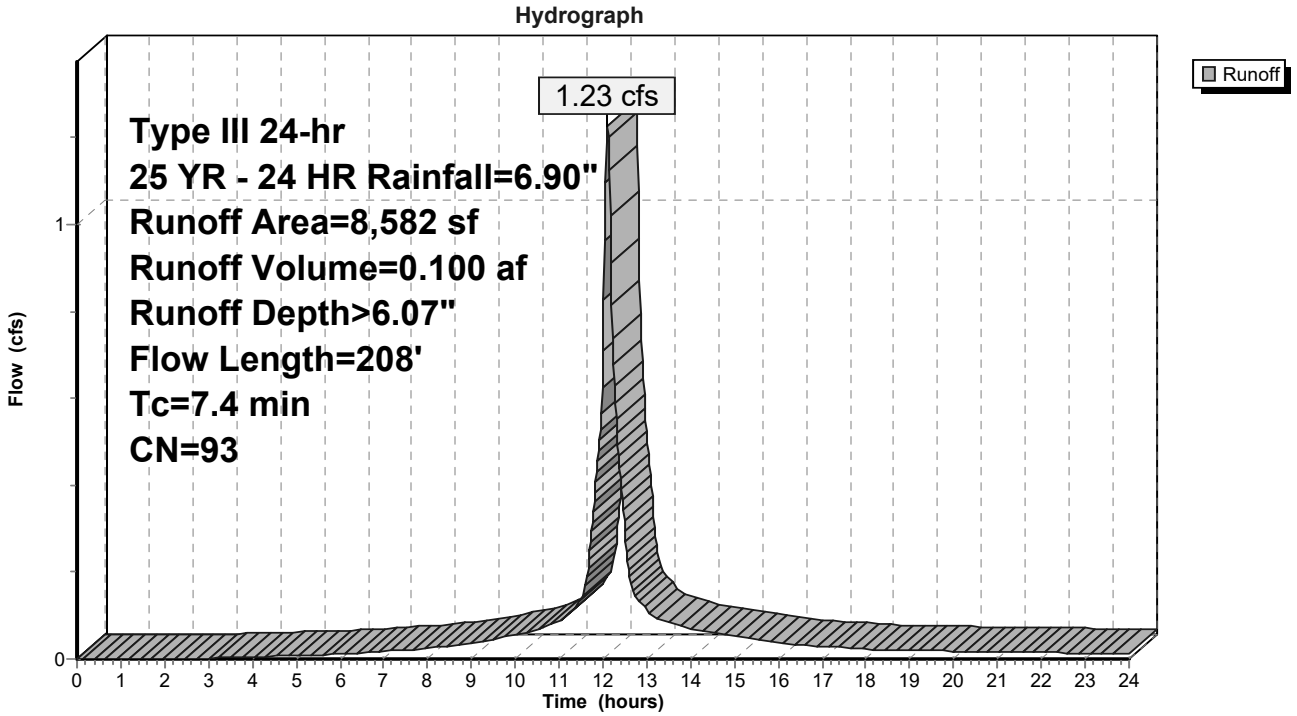
Runoff = 1.23 cfs @ 12.10 hrs, Volume= 0.100 af, Depth> 6.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
111	98	Unconnected roofs, HSG C
1,704	74	>75% Grass cover, Good, HSG C
6,767	98	Unconnected pavement, HSG C
8,582	93	Weighted Average
1,704		19.86% Pervious Area
6,878		80.14% Impervious Area
6,878		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	32	0.0078	0.10		**Sheet Flow, Segment 1** Grass: Short n= 0.150 P2= 3.63"
1.1	68	0.0110	1.07		**Sheet Flow, Segment 2** Smooth surfaces n= 0.011 P2= 3.63"
0.9	108	0.0093	1.96		**Shallow Concentrated Flow, Segment 3** Paved Kv= 20.3 fps
7.4	208	Total			

Subcatchment 1S: Subcatchment #1



Summary for Subcatchment 2S: Subcatchment #2

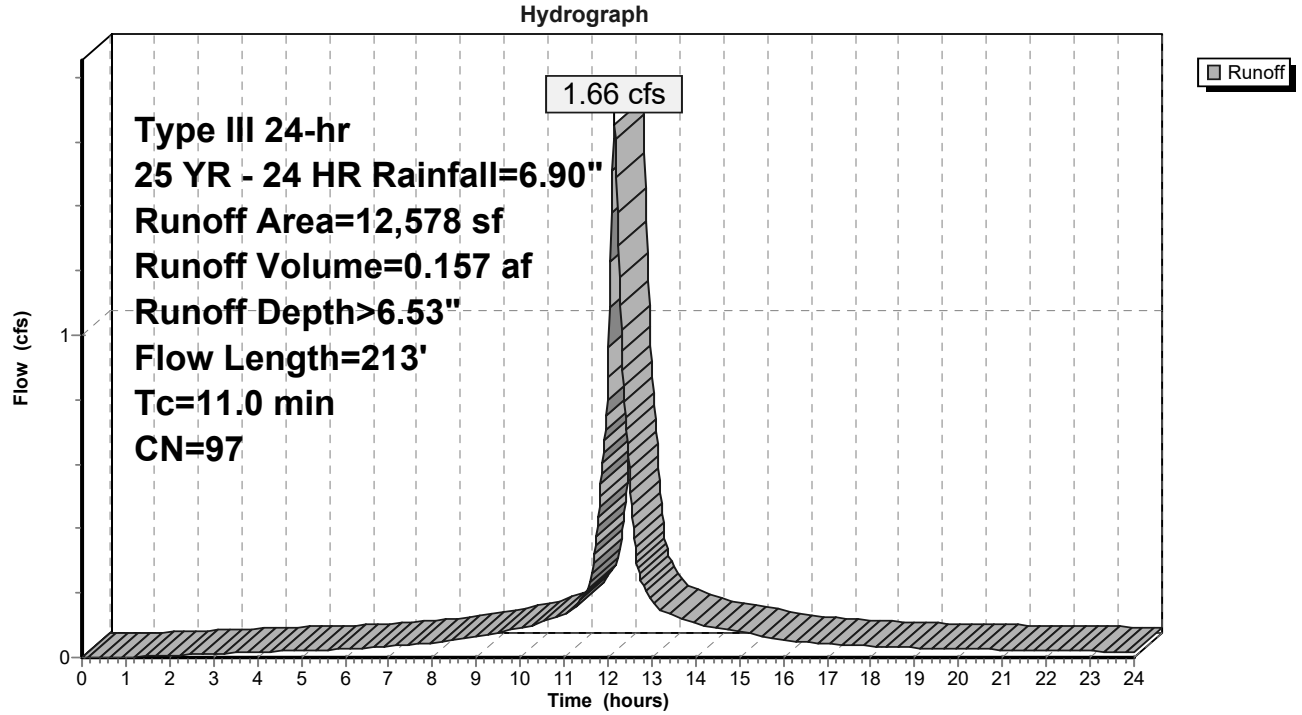
Runoff = 1.66 cfs @ 12.15 hrs, Volume= 0.157 af, Depth> 6.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
2,460	98	Unconnected roofs, HSG C
763	86	<50% Grass cover, Poor, HSG C
9,200	98	Unconnected pavement, HSG C
155	96	Gravel surface, HSG C
12,578	97	Weighted Average
918		7.30% Pervious Area
11,660		92.70% Impervious Area
11,660		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	37	0.0068	0.78		**Sheet Flow, Segment 1** Smooth surfaces n= 0.011 P2= 3.63"
9.2	63	0.0079	0.11		**Sheet Flow, Segment 2** Grass: Short n= 0.150 P2= 3.63"
1.0	113	0.0088	1.90		**Shallow Concentrated Flow, Segment 3** Paved Kv= 20.3 fps
11.0	213	Total			

Subcatchment 2S: Subcatchment #2



Summary for Subcatchment 3S: Subcatchment #3

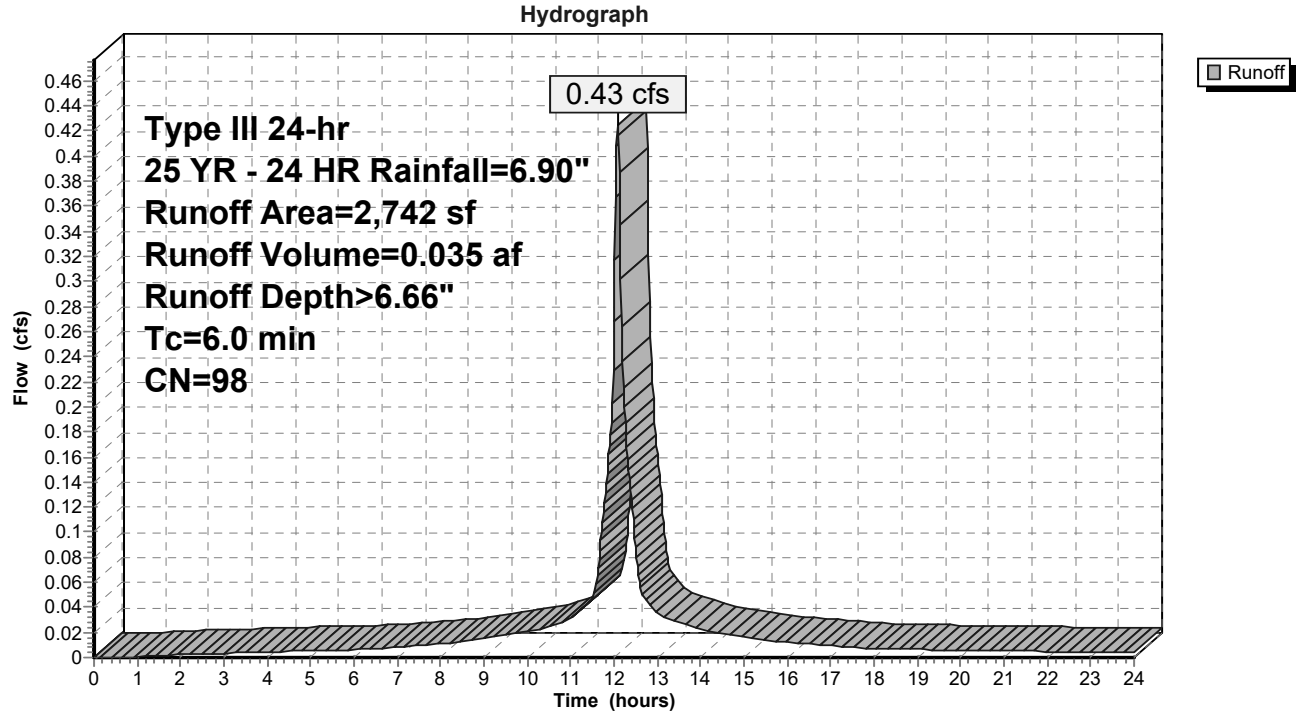
Runoff = 0.43 cfs @ 12.08 hrs, Volume= 0.035 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
274	98	Unconnected roofs, HSG C
2,468	98	Unconnected roofs, HSG C
2,742	98	Weighted Average
2,742		100.00% Impervious Area
2,742		100.00% Unconnected

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

Subcatchment 3S: Subcatchment #3



Summary for Subcatchment 4aS: Subcatchment #4a

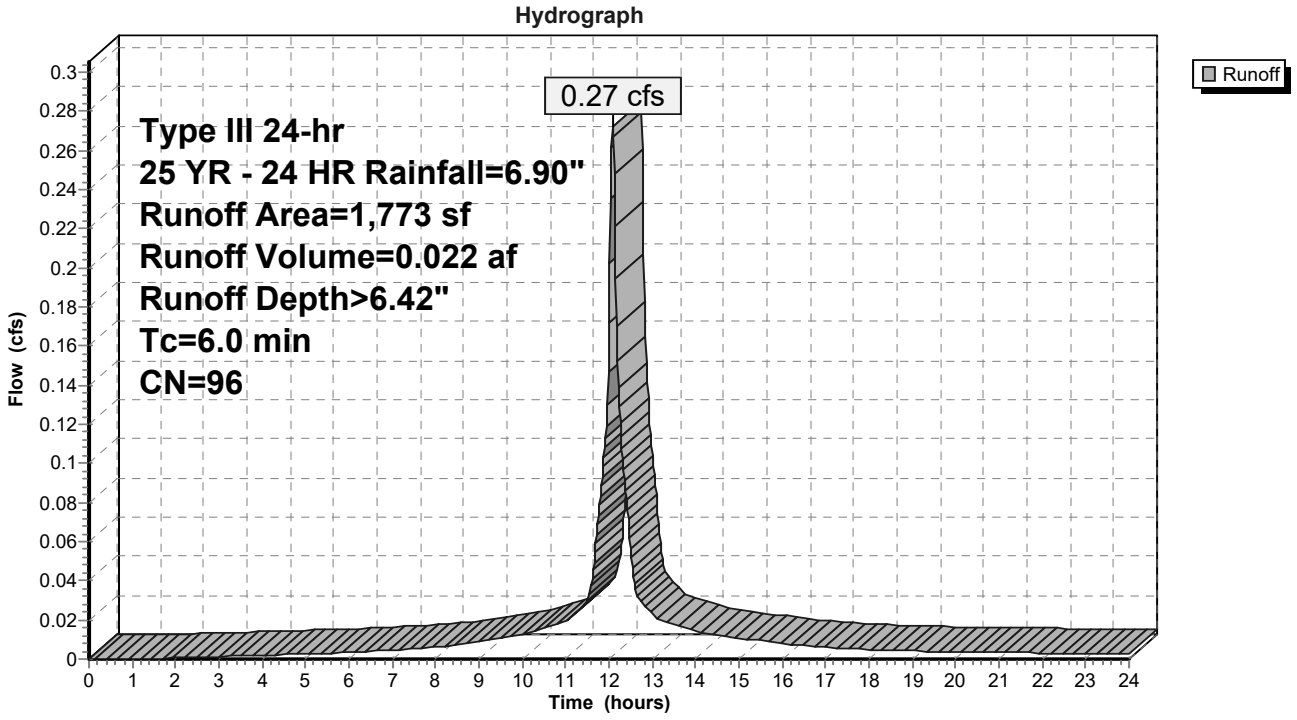
Runoff = 0.27 cfs @ 12.08 hrs, Volume= 0.022 af, Depth> 6.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
145	74	>75% Grass cover, Good, HSG C
1,628	98	Unconnected pavement, HSG C
1,773	96	Weighted Average
145		8.18% Pervious Area
1,628		91.82% Impervious Area
1,628		100.00% Unconnected

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

Subcatchment 4aS: Subcatchment #4a



Summary for Subcatchment 4S: Subcatchment #4

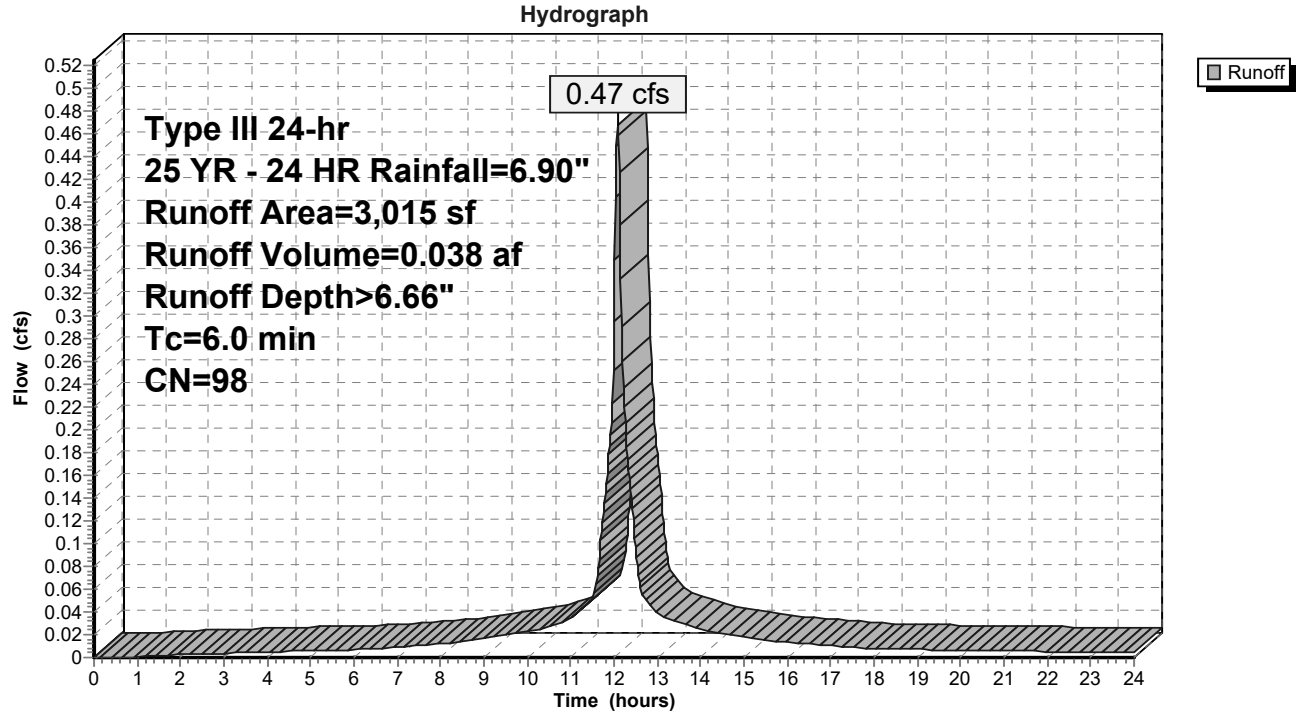
Runoff = 0.47 cfs @ 12.08 hrs, Volume= 0.038 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
506	98	Unconnected roofs, HSG C
2,509	98	Paved parking, HSG C
3,015	98	Weighted Average
3,015		100.00% Impervious Area
506		16.78% Unconnected

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

Subcatchment 4S: Subcatchment #4



Summary for Subcatchment 5S: Subcatchment #5

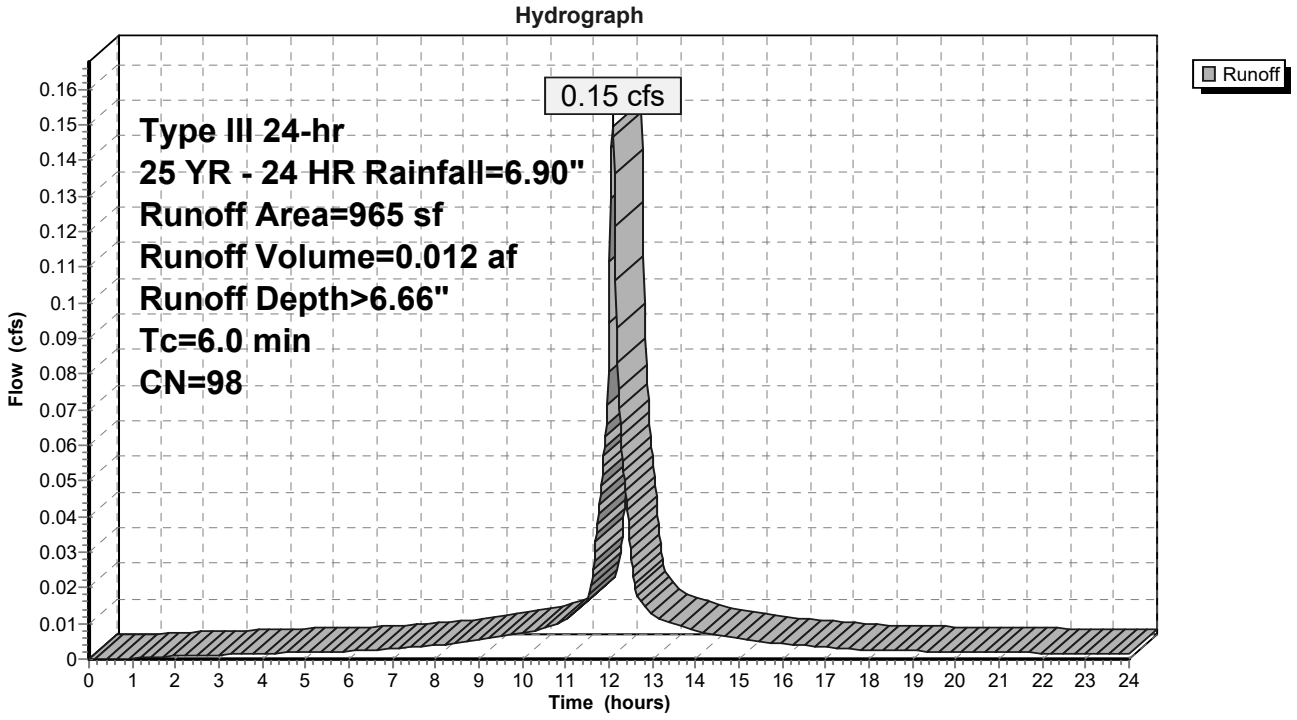
Runoff = 0.15 cfs @ 12.08 hrs, Volume= 0.012 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
5	74	>75% Grass cover, Good, HSG C
960	98	Unconnected pavement, HSG C
965	98	Weighted Average
5		0.52% Pervious Area
960		99.48% Impervious Area
960		100.00% Unconnected

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

Subcatchment 5S: Subcatchment #5



Summary for Subcatchment 6S: Subcatchment #6

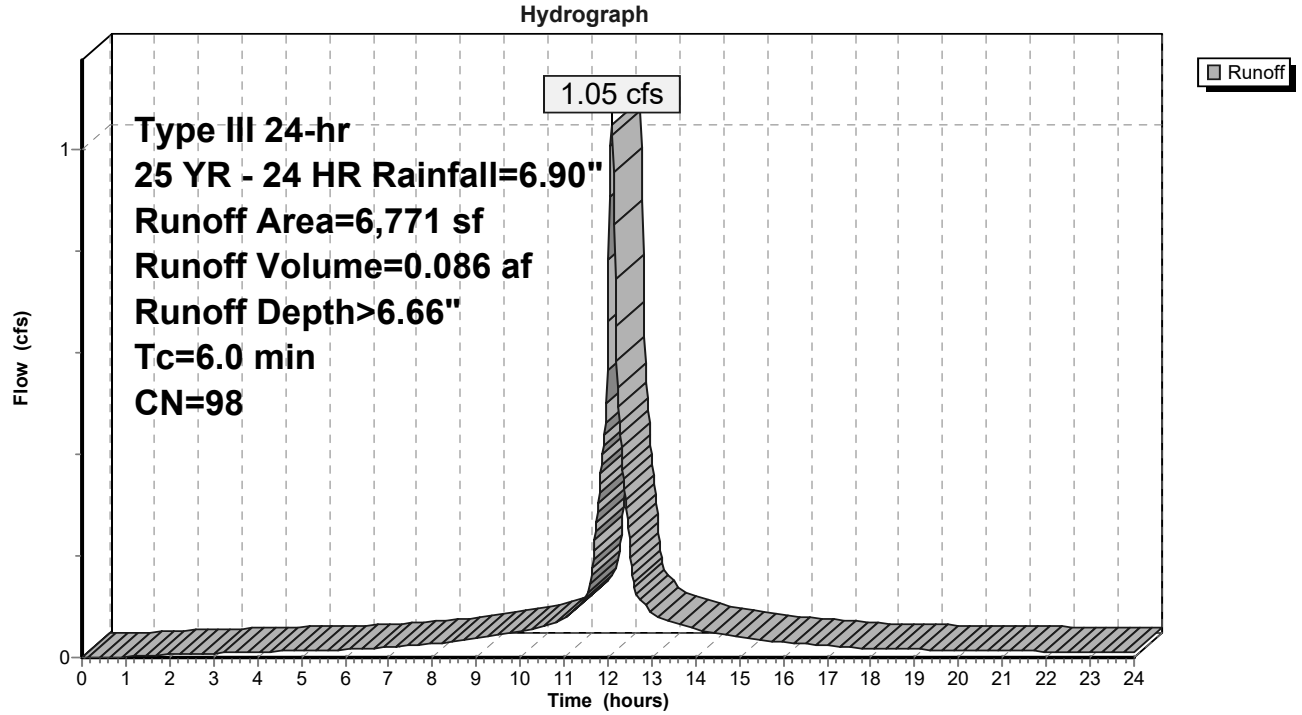
Runoff = 1.05 cfs @ 12.08 hrs, Volume= 0.086 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
6,771	98	Unconnected pavement, HSG C
6,771		100.00% Impervious Area
6,771		100.00% Unconnected

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

Subcatchment 6S: Subcatchment #6



Summary for Subcatchment 7aS: Subcatchment #7a

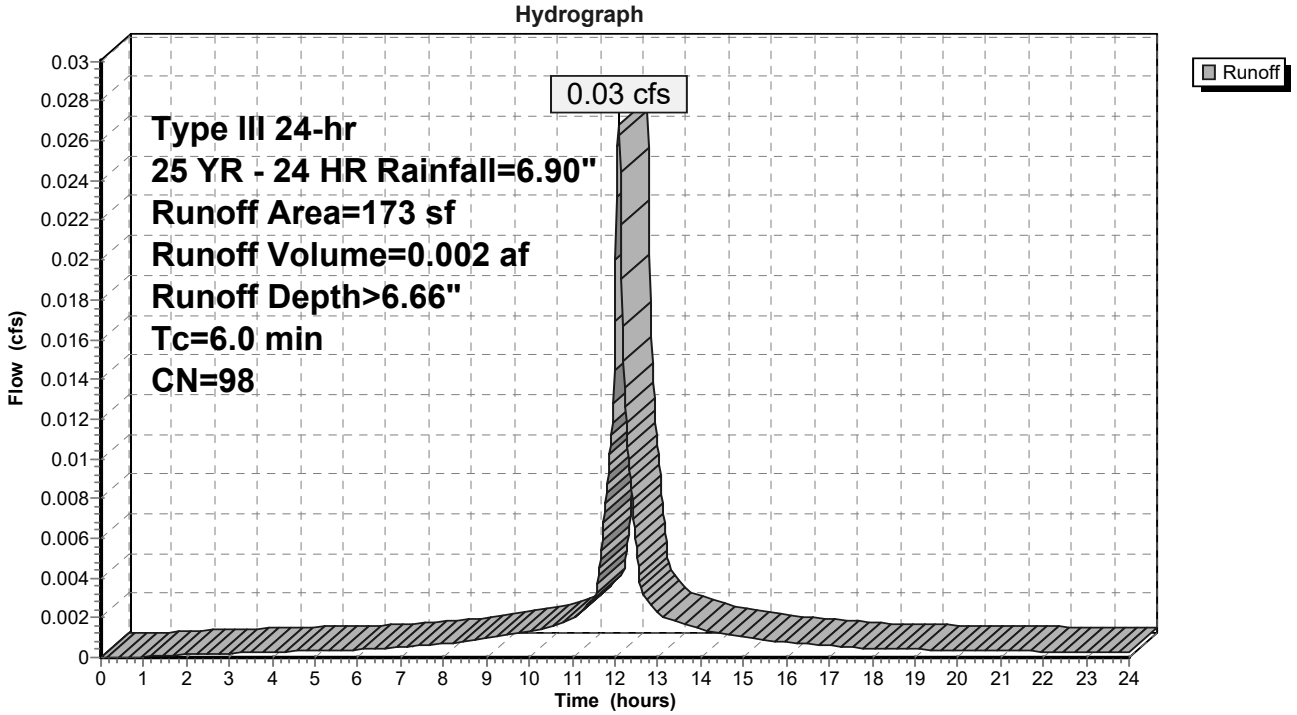
Runoff = 0.03 cfs @ 12.08 hrs, Volume= 0.002 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
173	98	Unconnected pavement, HSG C
173		100.00% Impervious Area
173		100.00% Unconnected

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

Subcatchment 7aS: Subcatchment #7a



Summary for Subcatchment 7S: Subcatchment #7

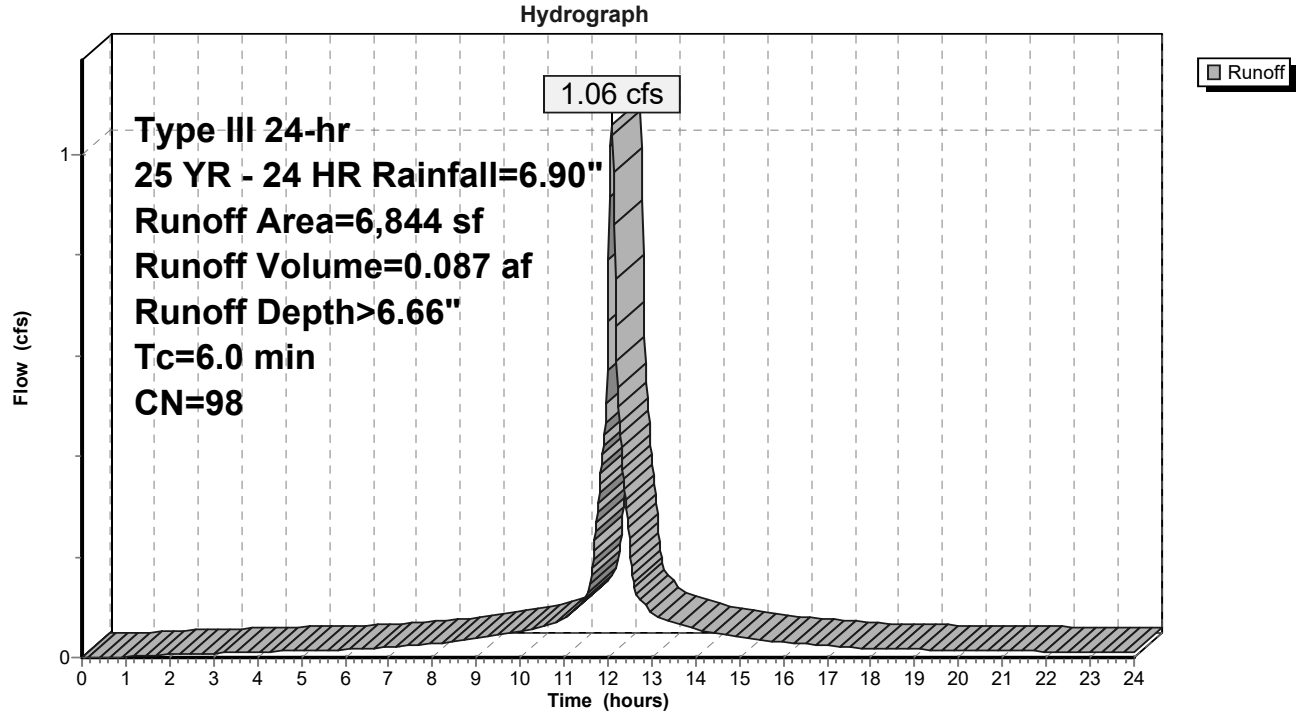
Runoff = 1.06 cfs @ 12.08 hrs, Volume= 0.087 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
6,844	98	Unconnected pavement, HSG C
6,844		100.00% Impervious Area
6,844		100.00% Unconnected

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

Subcatchment 7S: Subcatchment #7



Summary for Subcatchment 8S: Subcatchment #8

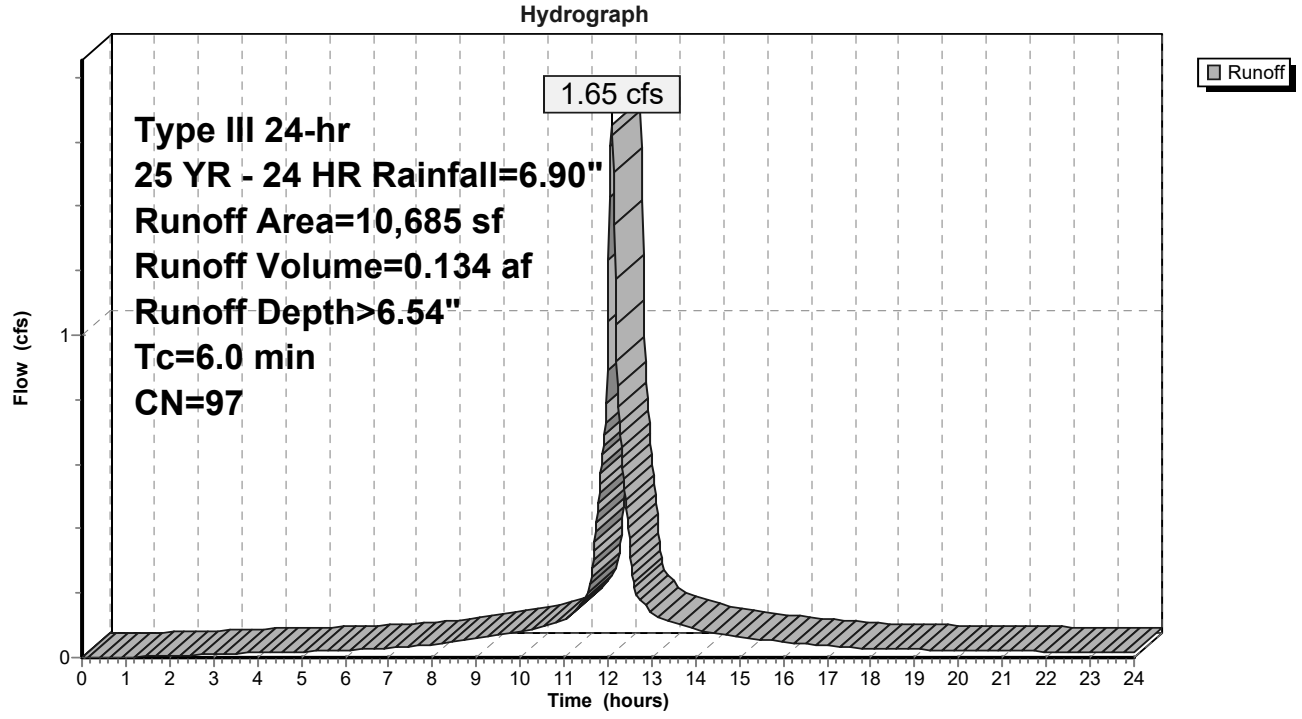
Runoff = 1.65 cfs @ 12.08 hrs, Volume= 0.134 af, Depth> 6.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
1,877	98	Unconnected roofs, HSG C
374	79	50-75% Grass cover, Fair, HSG C
8,434	98	Unconnected pavement, HSG C
10,685	97	Weighted Average
374		3.50% Pervious Area
10,311		96.50% Impervious Area
10,311		100.00% Unconnected

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

Subcatchment 8S: Subcatchment #8



Summary for Subcatchment 9S: Subcatchment #9

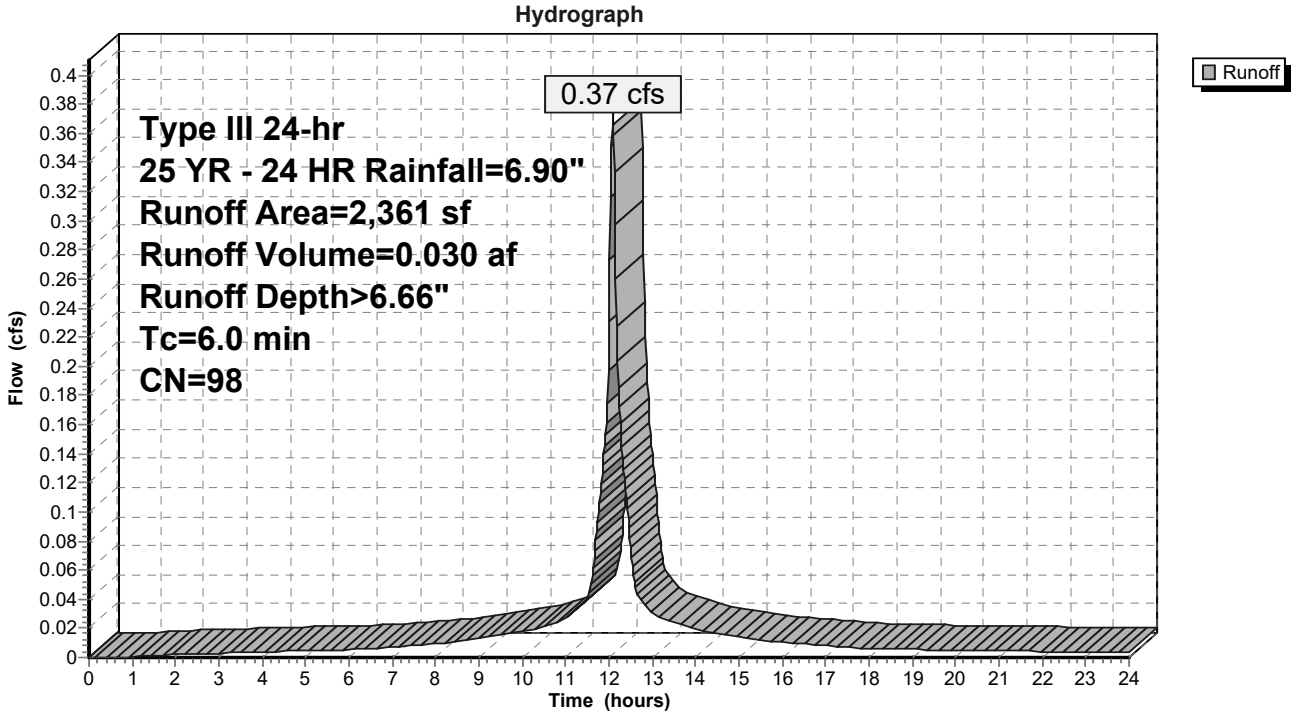
Runoff = 0.37 cfs @ 12.08 hrs, Volume= 0.030 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
2,361	98	Unconnected pavement, HSG C
2,361		100.00% Impervious Area
2,361		100.00% Unconnected

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

Subcatchment 9S: Subcatchment #9



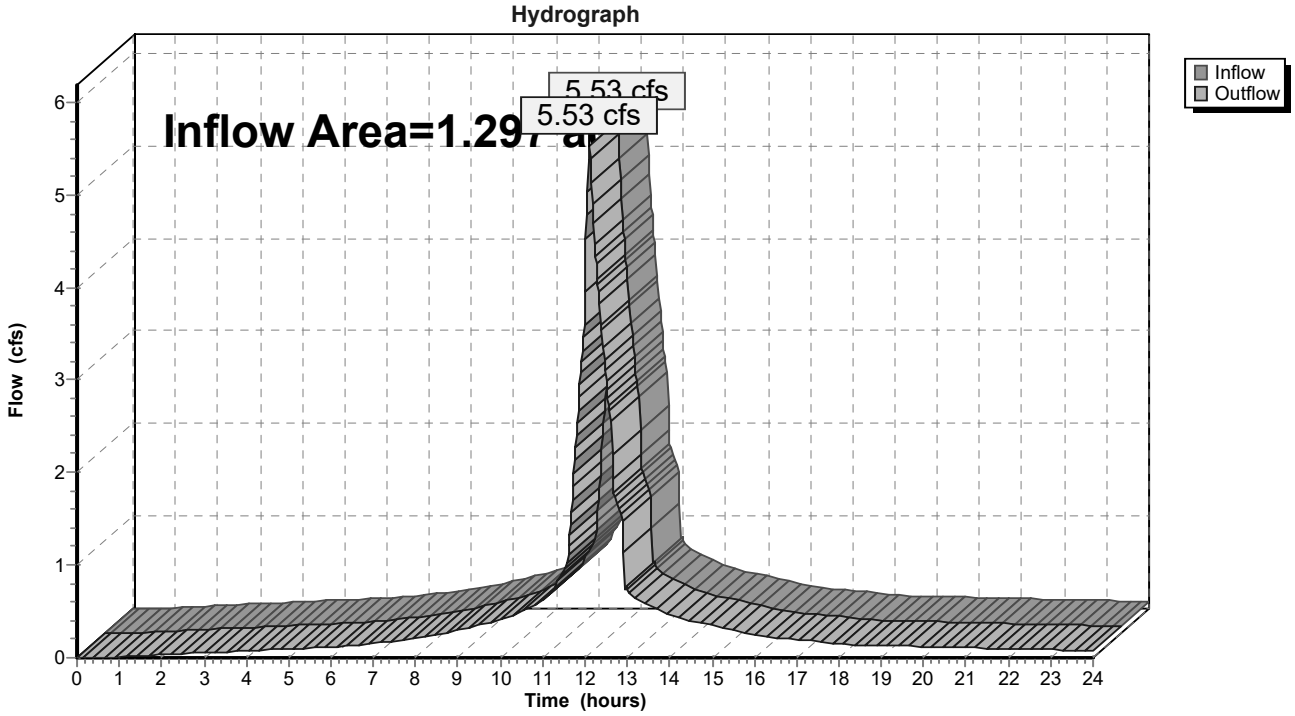
Summary for Reach 100R: Final Reach 100

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

Inflow Area = 1.297 ac, 94.43% Impervious, Inflow Depth > 6.54" for 25 YR - 24 HR event
Inflow = 5.53 cfs @ 12.11 hrs, Volume= 0.706 af
Outflow = 5.53 cfs @ 12.11 hrs, Volume= 0.706 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3

Reach 100R: Final Reach 100



Summary for Pond 1P: CB #814

Inflow Area = 1.297 ac, 94.43% Impervious, Inflow Depth > 6.54" for 25 YR - 24 HR event
Inflow = 5.53 cfs @ 12.10 hrs, Volume= 0.706 af
Outflow = 5.53 cfs @ 12.11 hrs, Volume= 0.706 af, Atten= 0%, Lag= 0.2 min
Primary = 5.53 cfs @ 12.11 hrs, Volume= 0.706 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 71.19' @ 12.11 hrs Surf.Area= 13 sf Storage= 33 cf

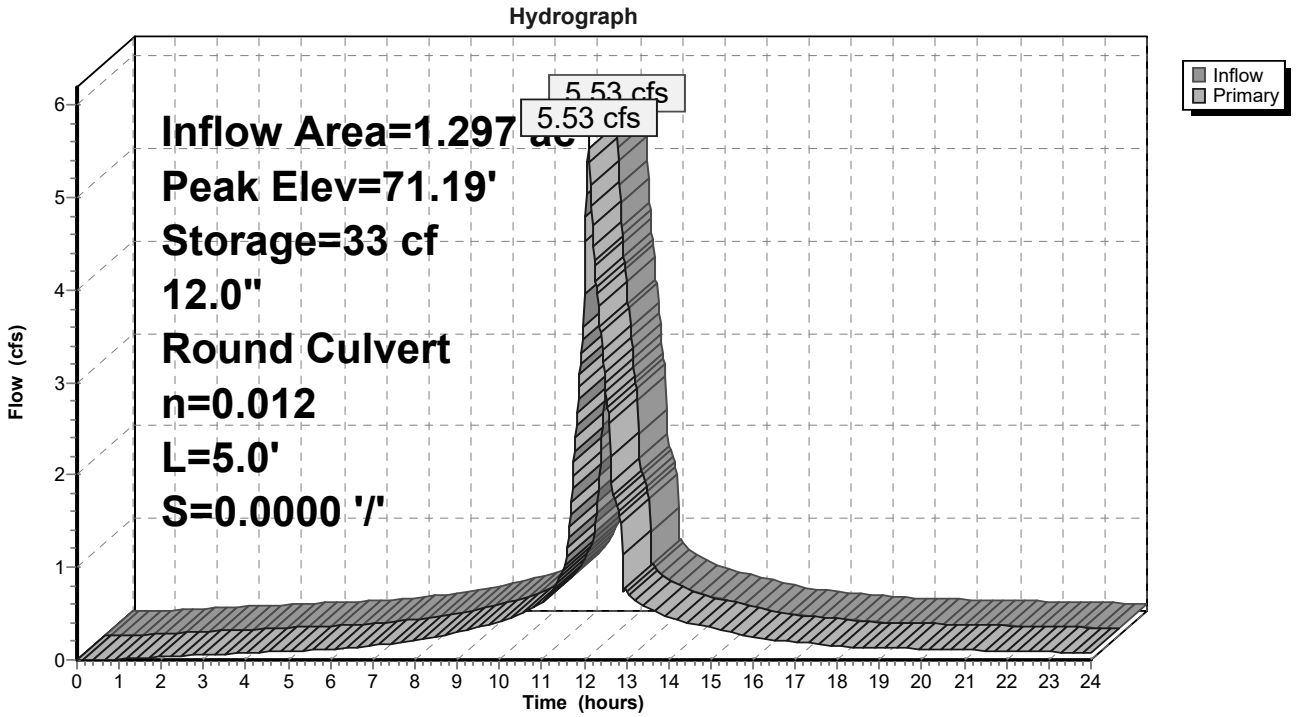
Plug-Flow detention time= 0.2 min calculated for 0.706 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (752.9 - 752.8)

Volume	Invert	Avail.Storage	Storage Description
#1	68.56'	76 cf	**4.00'D x 6.02'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	68.56'	**12.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 68.56' / 68.56' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=5.51 cfs @ 12.11 hrs HW=71.18' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 5.51 cfs @ 7.01 fps)

Pond 1P: CB #814



Summary for Pond 2P: CB #813

Inflow Area = 0.905 ac, 96.72% Impervious, Inflow Depth > 6.63" for 25 YR - 24 HR event
Inflow = 3.11 cfs @ 12.16 hrs, Volume= 0.500 af
Outflow = 3.10 cfs @ 12.19 hrs, Volume= 0.500 af, Atten= 0%, Lag= 1.8 min
Primary = 3.10 cfs @ 12.19 hrs, Volume= 0.500 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 74.43' @ 12.12 hrs Surf.Area= 13 sf Storage= 57 cf

Plug-Flow detention time= 0.2 min calculated for 0.499 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (750.8 - 750.6)

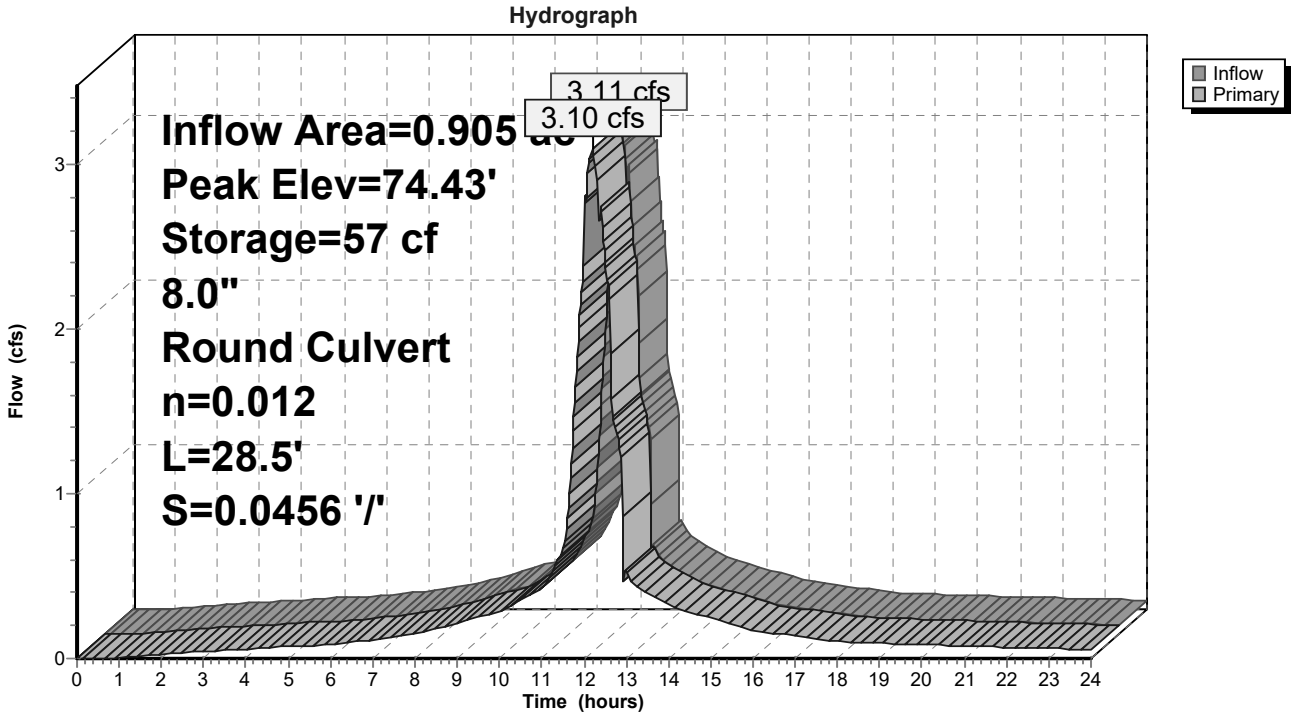
Volume	Invert	Avail.Storage	Storage Description
#1	69.92'	60 cf	**4.00'D x 4.78'H Vertical Cone/Cylinder**
#2	74.70'	435 cf	**Open Water Storage (Irregular)**Listed below (Recalc)
		495 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
74.70	4	8.0	0	0	4
75.00	531	93.0	58	58	687
75.40	1,424	187.6	377	435	2,800

Device	Routing	Invert	Outlet Devices
#1	Primary	69.92'	**8.0" Round Culvert** L= 28.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.92' / 68.62' S= 0.0456 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=3.09 cfs @ 12.19 hrs HW=74.08' TW=70.65' (Dynamic Tailwater)
1=Culvert (Outlet Controls 3.09 cfs @ 8.86 fps)

Pond 2P: CB #813



Summary for Pond 3P: CB #920

Inflow Area = 0.195 ac, 98.23% Impervious, Inflow Depth > 6.60" for 25 YR - 24 HR event
Inflow = 1.31 cfs @ 12.09 hrs, Volume= 0.107 af
Outflow = 1.29 cfs @ 12.09 hrs, Volume= 0.107 af, Atten= 2%, Lag= 0.5 min
Primary = 1.29 cfs @ 12.09 hrs, Volume= 0.107 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 71.93' @ 12.11 hrs Surf.Area= 13 sf Storage= 23 cf

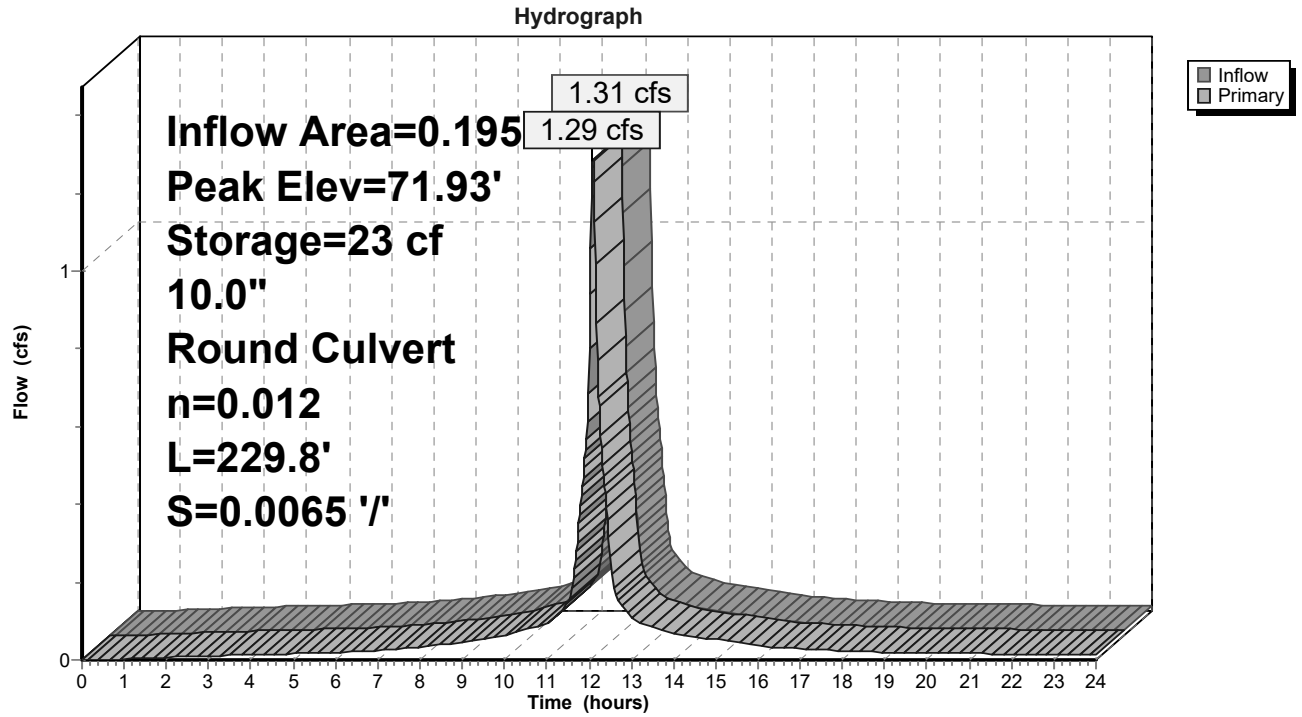
Plug-Flow detention time= 0.5 min calculated for 0.107 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (746.0 - 745.6)

Volume	Invert	Avail.Storage	Storage Description
#1	70.08'	69 cf	**4.00'D x 5.52'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	70.08'	**10.0" Round Culvert** L= 229.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.08' / 68.58' S= 0.0065 '/' Cc= 0.900 n= 0.012, Flow Area= 0.55 sf

Primary OutFlow Max=1.21 cfs @ 12.09 hrs HW=71.88' TW=71.16' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.21 cfs @ 2.22 fps)

Pond 3P: CB #920



Summary for Pond 4aP: CB #2790

Inflow Area = 0.132 ac, 97.39% Impervious, Inflow Depth > 6.58" for 25 YR - 24 HR event
Inflow = 0.89 cfs @ 12.09 hrs, Volume= 0.072 af
Outflow = 0.89 cfs @ 12.09 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.1 min
Primary = 0.89 cfs @ 12.09 hrs, Volume= 0.072 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 73.62' @ 12.09 hrs Surf.Area= 13 sf Storage= 6 cf

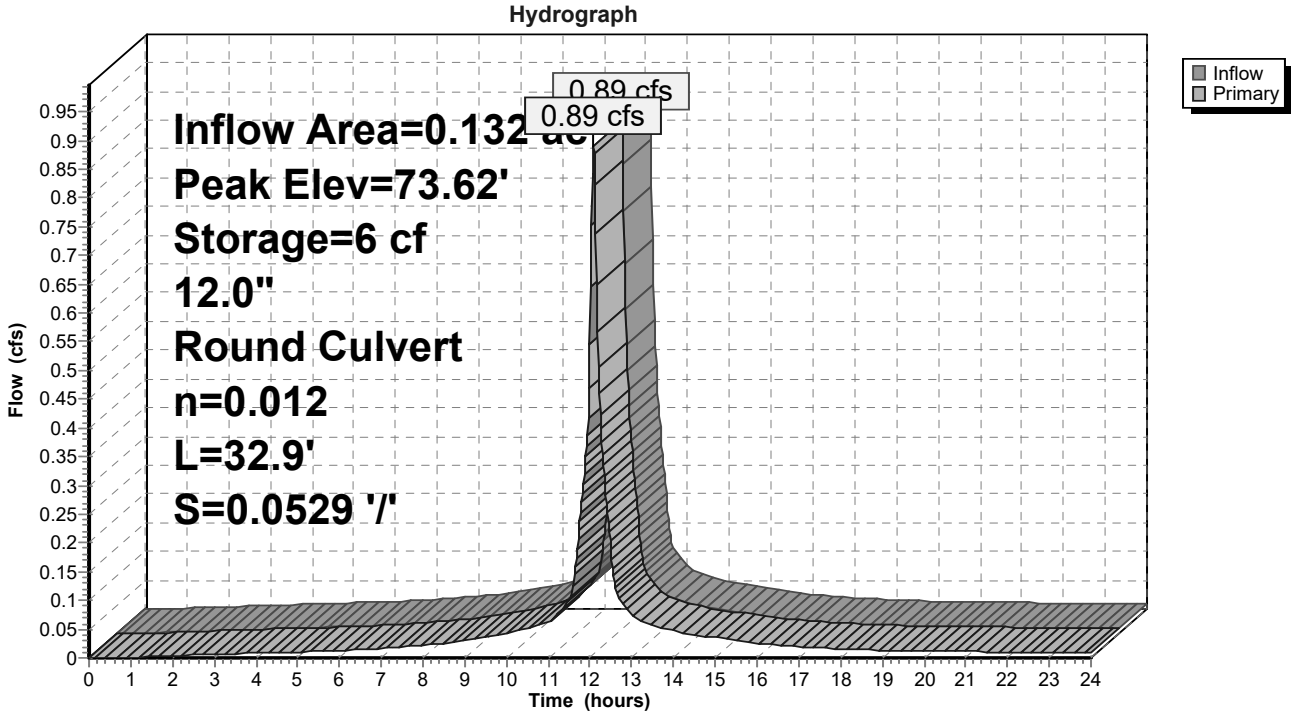
Plug-Flow detention time= 0.4 min calculated for 0.072 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (747.1 - 746.8)

Volume	Invert	Avail.Storage	Storage Description
#1	73.14'	35 cf	**4.00'D x 2.78'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	73.14'	**12.0" Round Culvert** L= 32.9' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.14' / 71.40' S= 0.0529 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.88 cfs @ 12.09 hrs HW=73.62' TW=71.81' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.88 cfs @ 2.36 fps)

Pond 4aP: CB #2790



Summary for Pond 4P: CB #000

Inflow Area = 0.069 ac,100.00% Impervious, Inflow Depth > 6.66" for 25 YR - 24 HR event
Inflow = 0.47 cfs @ 12.08 hrs, Volume= 0.038 af
Outflow = 0.47 cfs @ 12.09 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.1 min
Primary = 0.47 cfs @ 12.09 hrs, Volume= 0.038 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 73.84' @ 12.09 hrs Surf.Area= 13 sf Storage= 5 cf

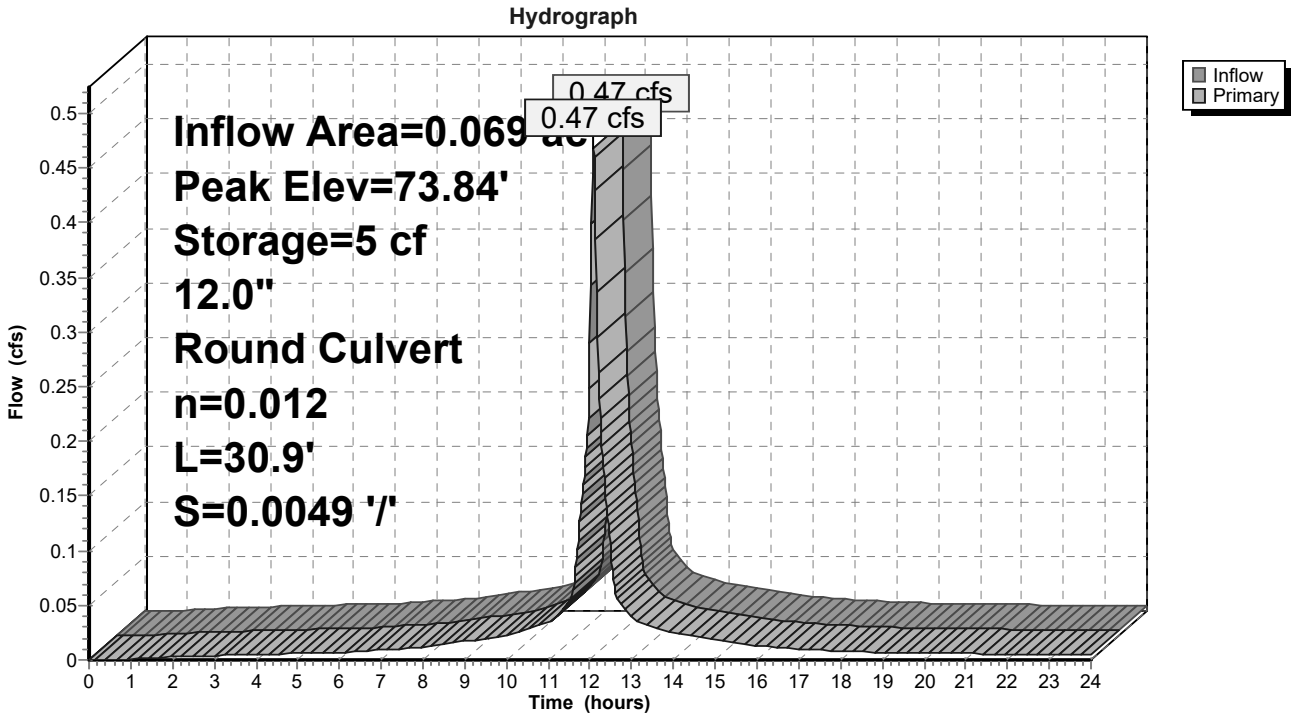
Plug-Flow detention time= 0.7 min calculated for 0.038 af (100% of inflow)
Center-of-Mass det. time= 0.5 min (743.1 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	73.42'	32 cf	**4.00'D x 2.58'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	73.42'	**12.0" Round Culvert** L= 30.9' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.42' / 73.27' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.46 cfs @ 12.09 hrs HW=73.84' TW=73.62' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.46 cfs @ 2.22 fps)

Pond 4P: CB #000



Summary for Pond 5P: CB #000

Inflow Area = 0.022 ac, 99.48% Impervious, Inflow Depth > 6.66" for 25 YR - 24 HR event
Inflow = 0.15 cfs @ 12.08 hrs, Volume= 0.012 af
Outflow = 0.15 cfs @ 12.09 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.4 min
Primary = 0.15 cfs @ 12.09 hrs, Volume= 0.012 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 73.67' @ 12.09 hrs Surf.Area= 13 sf Storage= 5 cf

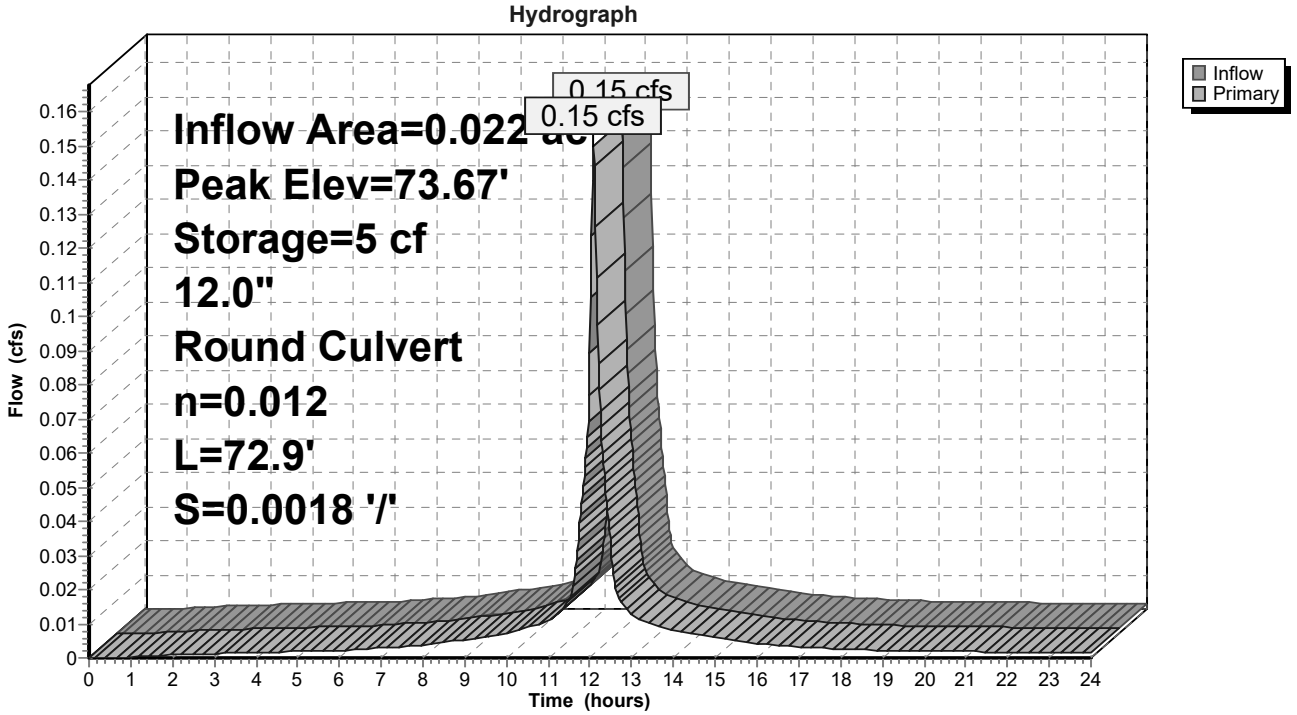
Plug-Flow detention time= 1.8 min calculated for 0.012 af (100% of inflow)
Center-of-Mass det. time= 1.3 min (743.9 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	73.27'	36 cf	**4.00'D x 2.90'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	73.27'	**12.0" Round Culvert** L= 72.9' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.27' / 73.14' S= 0.0018 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.15 cfs @ 12.09 hrs HW=73.66' TW=73.62' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.15 cfs @ 0.76 fps)

Pond 5P: CB #000



Summary for Pond 6P: CB #2779

[93] Warning: Storage range exceeded by 1.63'
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=28)

Inflow Area = 0.155 ac,100.00% Impervious, Inflow Depth > 6.66" for 25 YR - 24 HR event
Inflow = 1.05 cfs @ 12.08 hrs, Volume= 0.086 af
Outflow = 1.09 cfs @ 12.10 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.8 min
Primary = 1.09 cfs @ 12.10 hrs, Volume= 0.086 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 76.82' @ 12.10 hrs Surf.Area= 13 sf Storage= 34 cf

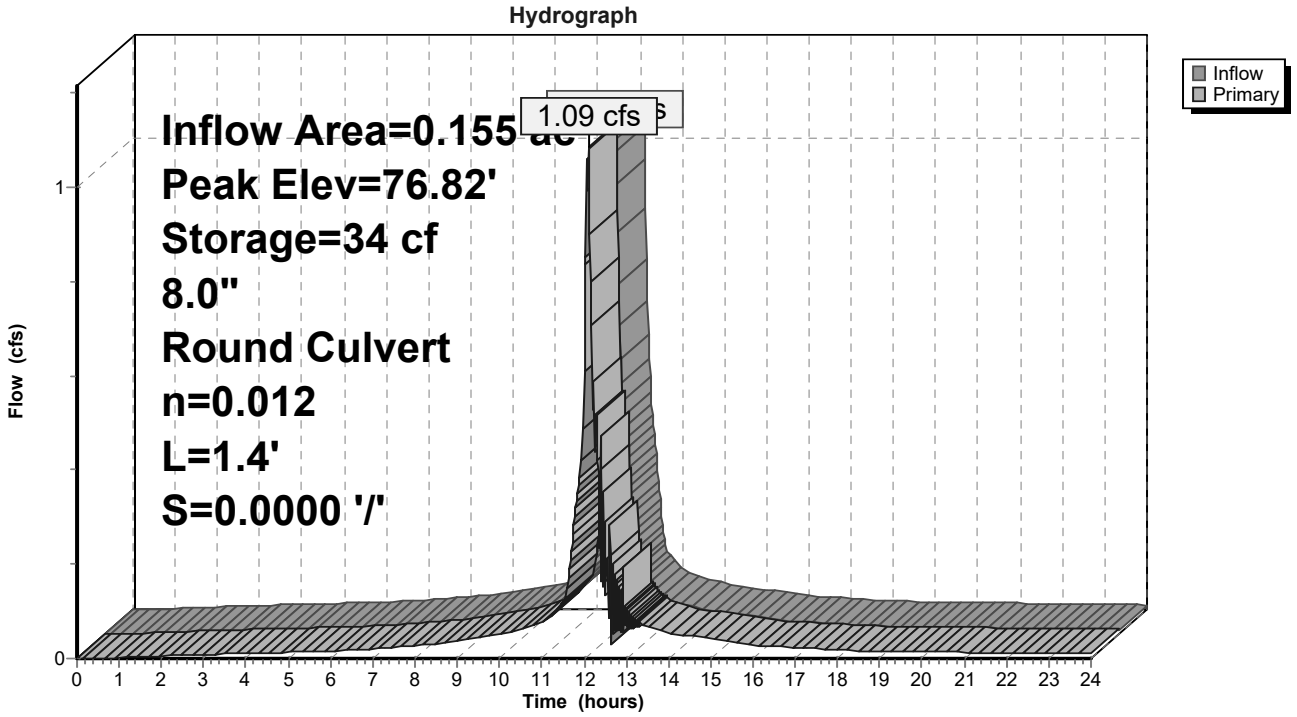
Plug-Flow detention time= 1.2 min calculated for 0.086 af (100% of inflow)
Center-of-Mass det. time= 0.9 min (743.5 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	72.51'	34 cf	**4.00'D x 2.68'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	72.51'	**8.0" Round Culvert** L= 1.4' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.51' / 72.51' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.99 cfs @ 12.10 hrs HW=76.75' TW=76.41' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.99 cfs @ 2.83 fps)

Pond 6P: CB #2779



Summary for Pond 7aP: CB #811

[80] Warning: Exceeded Pond 7P by 0.61' @ 12.02 hrs (0.69 cfs 0.013 af)

Inflow Area = 0.161 ac,100.00% Impervious, Inflow Depth > 6.70" for 25 YR - 24 HR event
Inflow = 0.98 cfs @ 12.64 hrs, Volume= 0.090 af
Outflow = 0.89 cfs @ 12.66 hrs, Volume= 0.090 af, Atten= 10%, Lag= 0.8 min
Primary = 0.89 cfs @ 12.66 hrs, Volume= 0.092 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 75.31' @ 12.20 hrs Surf.Area= 128 sf Storage= 69 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.7 min (751.8 - 751.1)

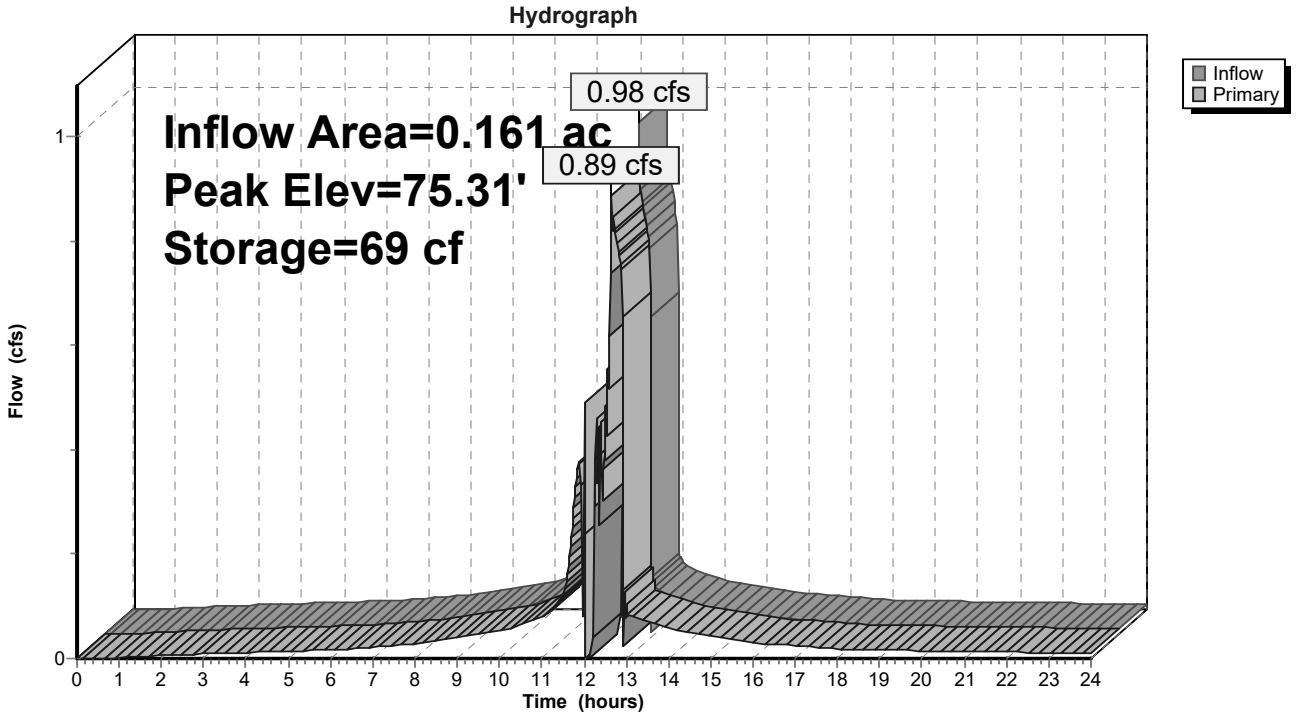
Volume	Invert	Avail.Storage	Storage Description
#1	72.90'	26 cf	**4.00'D x 2.03'H Vertical Cone/Cylinder**
#2	74.93'	159 cf	**Open Water Storage (Irregular)**Listed below
		184 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
74.93	4	8.0	0	0	4
75.00	100	50.0	3	3	198
76.21	160	64.0	156	159	342

Device	Routing	Invert	Outlet Devices
#1	Primary	72.90'	**6.0" Round Culvert** L= 7.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.90' / 72.68' S= 0.0286 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Primary	76.11'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** 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 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.86 cfs @ 12.66 hrs HW=74.09' TW=73.25' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.86 cfs @ 4.39 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 7aP: CB #811



Summary for Pond 7P: CB #846

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=11)

Inflow Area = 0.157 ac,100.00% Impervious, Inflow Depth > 6.66" for 25 YR - 24 HR event
Inflow = 1.06 cfs @ 12.08 hrs, Volume= 0.087 af
Outflow = 0.98 cfs @ 12.64 hrs, Volume= 0.087 af, Atten= 8%, Lag= 33.7 min
Primary = 0.98 cfs @ 12.64 hrs, Volume= 0.088 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 75.14' @ 12.34 hrs Surf.Area= 1,818 sf Storage= 882 cf
Flood Elev= 75.35' Surf.Area= 2,232 sf Storage= 1,302 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 8.9 min (751.5 - 742.6)

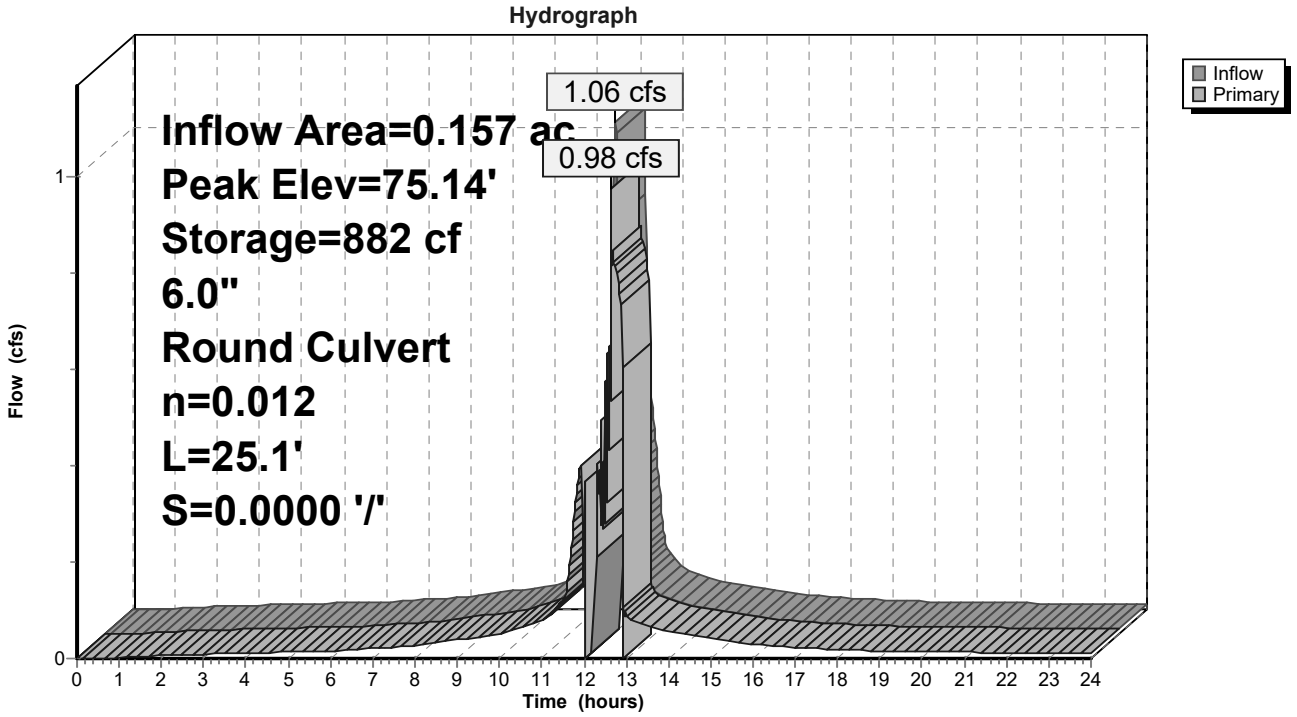
Volume	Invert	Avail.Storage	Storage Description
#1	72.88'	18 cf	**4.00'D x 1.46'H Vertical Cone/Cylinder**
#2	74.33'	1,804 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
		1,822 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
74.33	4	8.0	0	0	4
74.50	804	186.0	49	49	2,752
75.35	2,219	194.0	1,235	1,284	3,043
75.55	3,000	200.0	520	1,804	3,235

Device	Routing	Invert	Outlet Devices
#1	Primary	72.88'	**6.0" Round Culvert** L= 25.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.88' / 72.88' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.89 cfs @ 12.64 hrs HW=74.99' TW=73.98' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.89 cfs @ 4.53 fps)

Pond 7P: CB #846



Summary for Pond 8P: CB #2776

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=9)

Inflow Area = 0.245 ac, 96.50% Impervious, Inflow Depth > 6.54" for 25 YR - 24 HR event
Inflow = 1.65 cfs @ 12.08 hrs, Volume= 0.134 af
Outflow = 1.28 cfs @ 12.46 hrs, Volume= 0.134 af, Atten= 22%, Lag= 22.6 min
Primary = 1.28 cfs @ 12.46 hrs, Volume= 0.134 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 75.38' @ 12.24 hrs Surf.Area= 4,695 sf Storage= 798 cf
Flood Elev= 75.94' Surf.Area= 8,330 sf Storage= 4,411 cf

Plug-Flow detention time= 3.5 min calculated for 0.134 af (100% of inflow)
Center-of-Mass det. time= 3.4 min (752.5 - 749.1)

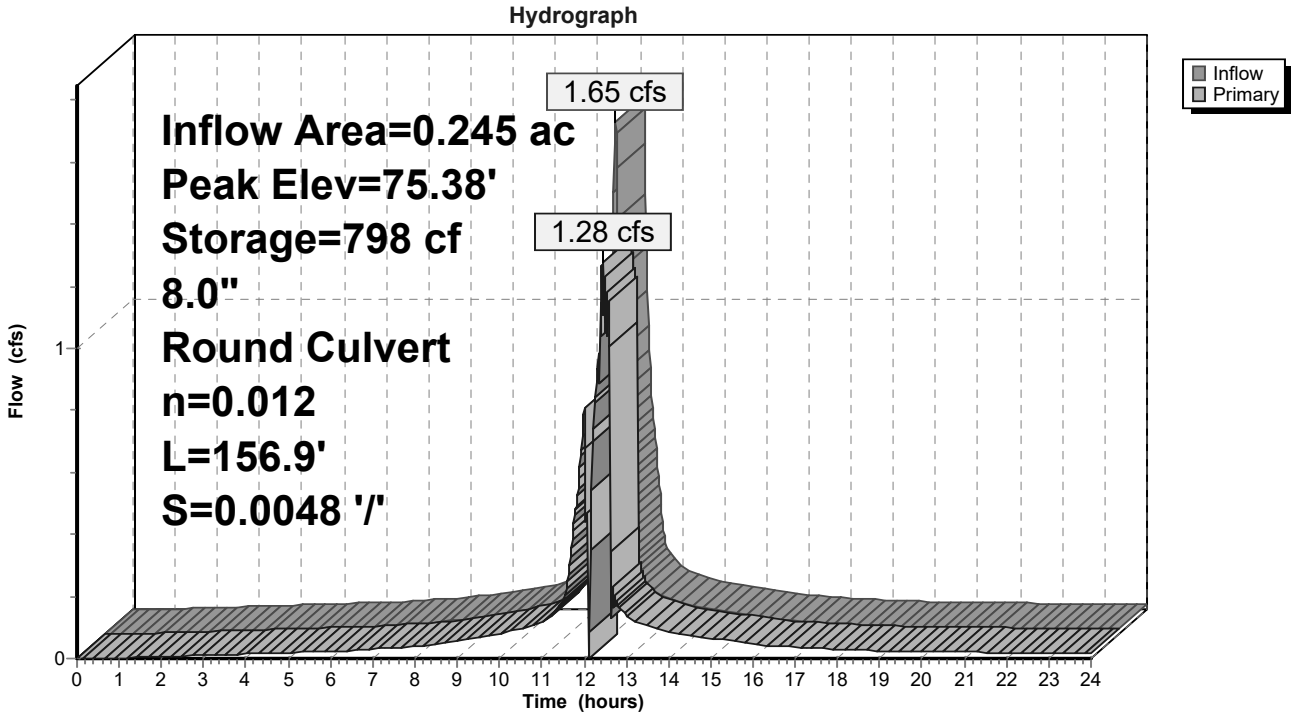
Volume	Invert	Avail.Storage	Storage Description
#1	71.49'	46 cf	**4.00'D x 3.66'H Vertical Cone/Cylinder**
#2	75.14'	4,365 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
		4,411 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.14	4	8.0	0	0	4
75.20	3,000	250.0	62	62	4,973
75.40	4,880	331.0	780	843	8,718
75.94	8,317	401.0	3,522	4,365	12,800

Device	Routing	Invert	Outlet Devices
#1	Primary	71.49'	**8.0" Round Culvert** L= 156.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.49' / 70.74' S= 0.0048 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=1.09 cfs @ 12.46 hrs HW=75.30' TW=73.98' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.09 cfs @ 3.12 fps)

Pond 8P: CB #2776



Summary for Pond 9P: CB #7443

[80] Warning: Exceeded Pond 8P by 0.53' @ 12.62 hrs (0.69 cfs 0.003 af)
[80] Warning: Exceeded Pond D1P by 0.29' @ 12.34 hrs (0.58 cfs 0.003 af)

Inflow Area = 0.616 ac, 98.61% Impervious, Inflow Depth > 6.67" for 25 YR - 24 HR event
Inflow = 2.20 cfs @ 12.42 hrs, Volume= 0.342 af
Outflow = 2.10 cfs @ 12.42 hrs, Volume= 0.342 af, Atten= 5%, Lag= 0.0 min
Primary = 2.10 cfs @ 12.42 hrs, Volume= 0.342 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 75.40' @ 12.10 hrs Surf.Area= 179 sf Storage= 70 cf

Plug-Flow detention time= 0.3 min calculated for 0.342 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (749.5 - 749.2)

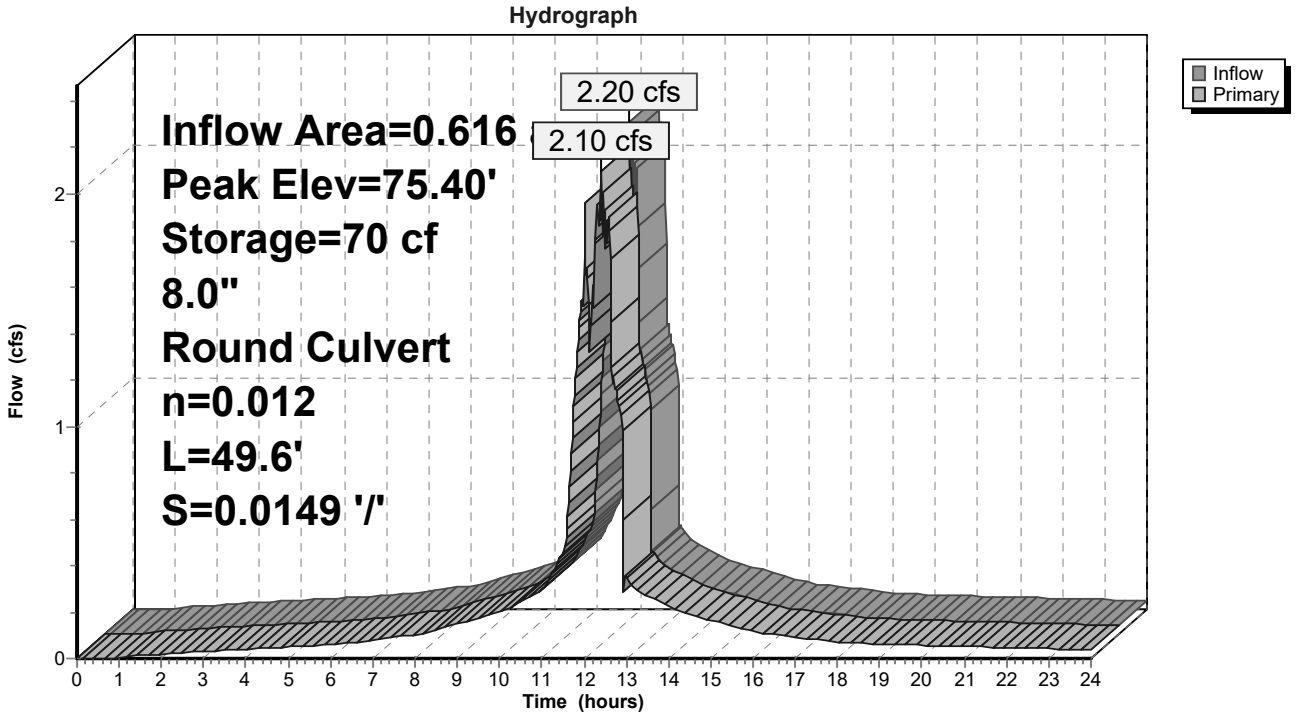
Volume	Invert	Avail.Storage	Storage Description
#1	70.68'	57 cf	**4.00'D x 4.52'H Vertical Cone/Cylinder**
#2	75.20'	657 cf	**Open Water Storage (Irregular)**Listed below (Recalc)
		713 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.20	4	8.0	0	0	4
75.40	165	54.4	13	13	234
76.01	2,374	200.0	644	657	3,183

Device	Routing	Invert	Outlet Devices
#1	Primary	70.68'	**8.0" Round Culvert** L= 49.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.68' / 69.94' S= 0.0149 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=1.77 cfs @ 12.42 hrs HW=74.37' TW=72.87' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.77 cfs @ 5.07 fps)

Pond 9P: CB #7443



Summary for Pond D1P: DMH #796

[93] Warning: Storage range exceeded by 0.33'
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[80] Warning: Exceeded Pond 6P by 0.76' @ 12.32 hrs (1.47 cfs 0.017 af)
[80] Warning: Exceeded Pond 7aP by 1.19' @ 12.10 hrs (6.13 cfs 0.026 af)

Inflow Area = 0.317 ac,100.00% Impervious, Inflow Depth > 6.74" for 25 YR - 24 HR event
Inflow = 1.16 cfs @ 12.01 hrs, Volume= 0.178 af
Outflow = 1.29 cfs @ 12.62 hrs, Volume= 0.178 af, Atten= 0%, Lag= 36.8 min
Primary = 1.29 cfs @ 12.62 hrs, Volume= 0.178 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 76.45' @ 12.10 hrs Surf.Area= 13 sf Storage= 44 cf

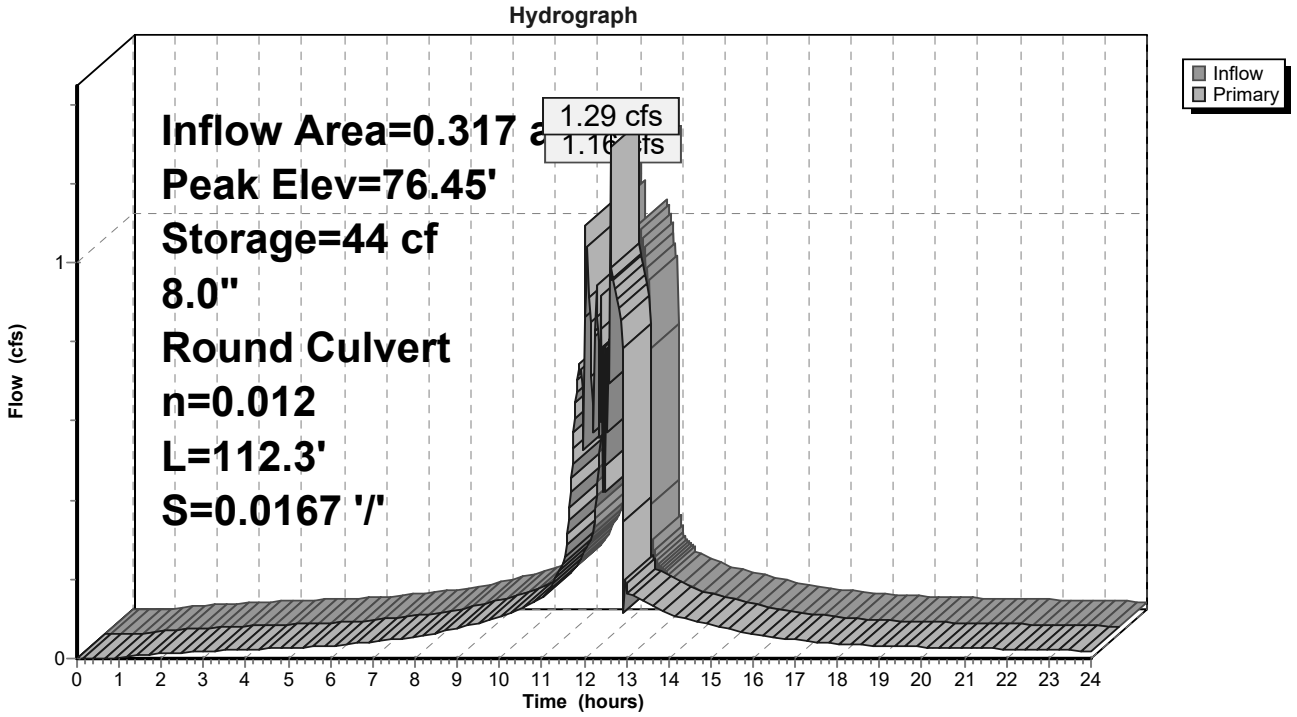
Plug-Flow detention time= 0.4 min calculated for 0.178 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (747.9 - 747.5)

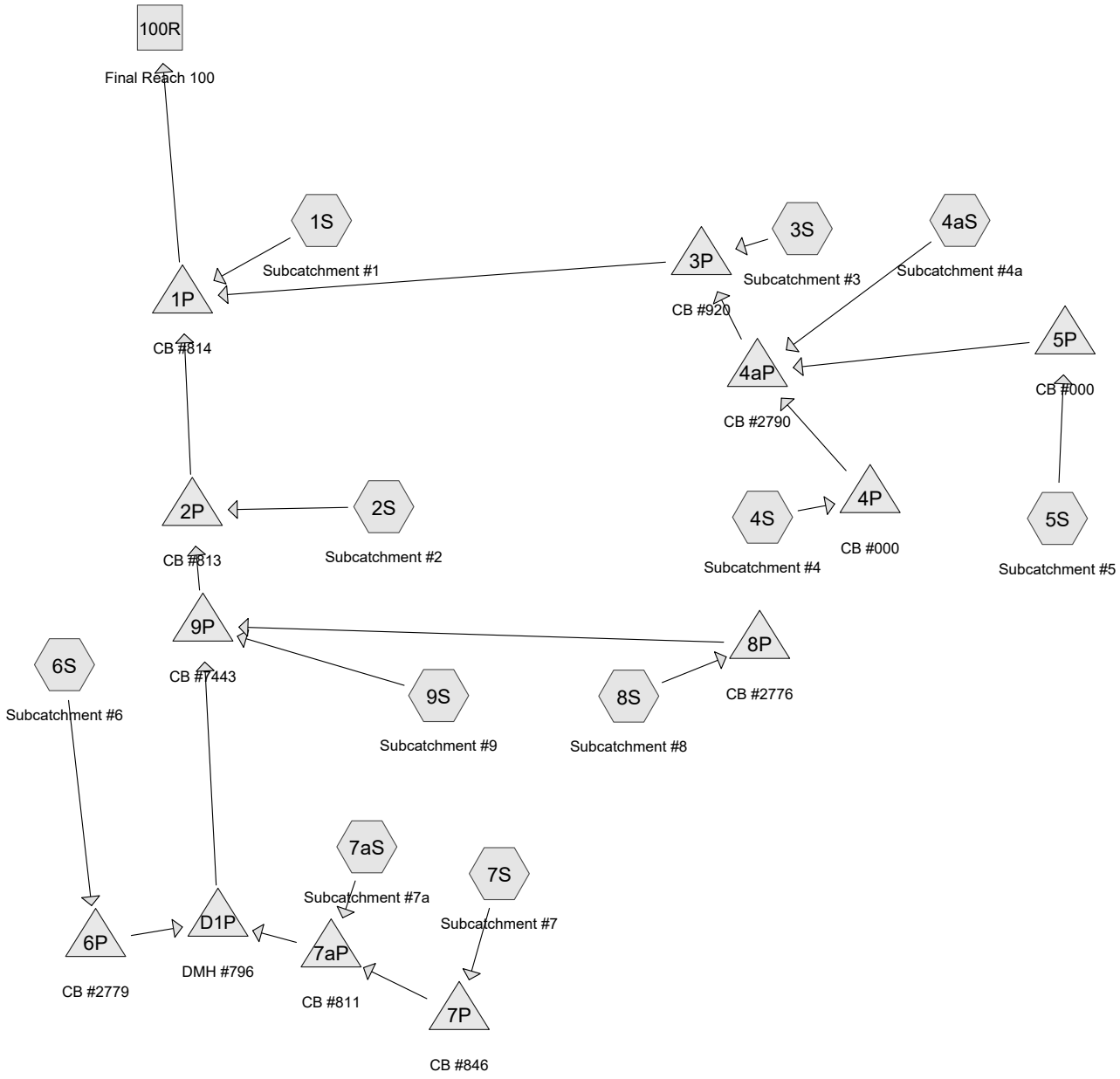
Volume	Invert	Avail.Storage	Storage Description
#1	72.58'	44 cf	**4.00'D x 3.54'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	72.58'	**8.0" Round Culvert** L= 112.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.58' / 70.70' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.97 cfs @ 12.62 hrs HW=73.83' TW=73.04' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.97 cfs @ 2.77 fps)

Pond D1P: DMH #796





Routing Diagram for 18-146 Existing Drainage
Prepared by Berry Surveying & Engineering, Printed 1/7/2019
HydroCAD® 10.00-22 s/n 07605 © 2018 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 3
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=8,582 sf 80.14% Impervious Runoff Depth>2.86"
Flow Length=208' Tc=7.4 min CN=93 Runoff=0.60 cfs 0.047 af

Subcatchment 2S: Subcatchment #2 Runoff Area=12,578 sf 92.70% Impervious Runoff Depth>3.28"
Flow Length=213' Tc=11.0 min CN=97 Runoff=0.86 cfs 0.079 af

Subcatchment 3S: Subcatchment #3 Runoff Area=2,742 sf 100.00% Impervious Runoff Depth>3.39"
Tc=6.0 min CN=98 Runoff=0.22 cfs 0.018 af

Subcatchment 4aS: Subcatchment #4a Runoff Area=1,773 sf 91.82% Impervious Runoff Depth>3.17"
Tc=6.0 min CN=96 Runoff=0.14 cfs 0.011 af

Subcatchment 4S: Subcatchment #4 Runoff Area=3,015 sf 100.00% Impervious Runoff Depth>3.39"
Tc=6.0 min CN=98 Runoff=0.24 cfs 0.020 af

Subcatchment 5S: Subcatchment #5 Runoff Area=965 sf 99.48% Impervious Runoff Depth>3.39"
Tc=6.0 min CN=98 Runoff=0.08 cfs 0.006 af

Subcatchment 6S: Subcatchment #6 Runoff Area=6,771 sf 100.00% Impervious Runoff Depth>3.39"
Tc=6.0 min CN=98 Runoff=0.55 cfs 0.044 af

Subcatchment 7aS: Subcatchment #7a Runoff Area=173 sf 100.00% Impervious Runoff Depth>3.39"
Tc=6.0 min CN=98 Runoff=0.01 cfs 0.001 af

Subcatchment 7S: Subcatchment #7 Runoff Area=6,844 sf 100.00% Impervious Runoff Depth>3.39"
Tc=6.0 min CN=98 Runoff=0.55 cfs 0.044 af

Subcatchment 8S: Subcatchment #8 Runoff Area=10,685 sf 96.50% Impervious Runoff Depth>3.28"
Tc=6.0 min CN=97 Runoff=0.86 cfs 0.067 af

Subcatchment 9S: Subcatchment #9 Runoff Area=2,361 sf 100.00% Impervious Runoff Depth>3.39"
Tc=6.0 min CN=98 Runoff=0.19 cfs 0.015 af

Reach 100R: Final Reach 100 Inflow=3.75 cfs 0.353 af
Outflow=3.75 cfs 0.353 af

Pond 1P: CB #814 Peak Elev=70.14' Storage=20 cf Inflow=3.74 cfs 0.353 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=3.75 cfs 0.353 af

Pond 2P: CB #813 Peak Elev=72.71' Storage=35 cf Inflow=2.65 cfs 0.251 af
8.0" Round Culvert n=0.012 L=28.5' S=0.0456 '/' Outflow=2.64 cfs 0.251 af

Pond 3P: CB #920 Peak Elev=70.72' Storage=8 cf Inflow=0.68 cfs 0.054 af
10.0" Round Culvert n=0.012 L=229.8' S=0.0065 '/' Outflow=0.68 cfs 0.054 af

Pond 4aP: CB #2790 Peak Elev=73.48' Storage=4 cf Inflow=0.46 cfs 0.037 af
12.0" Round Culvert n=0.012 L=32.9' S=0.0529 '/' Outflow=0.46 cfs 0.037 af

Pond 4P: CB #000 Peak Elev=73.70' Storage=4 cf Inflow=0.24 cfs 0.020 af
12.0" Round Culvert n=0.012 L=30.9' S=0.0049 '/' Outflow=0.24 cfs 0.020 af

Pond 5P: CB #000 Peak Elev=73.53' Storage=3 cf Inflow=0.08 cfs 0.006 af
12.0" Round Culvert n=0.012 L=72.9' S=0.0018 '/' Outflow=0.08 cfs 0.006 af

Pond 6P: CB #2779 Peak Elev=75.08' Storage=32 cf Inflow=0.55 cfs 0.044 af
8.0" Round Culvert n=0.012 L=1.4' S=0.0000 '/' Outflow=0.65 cfs 0.044 af

Pond 7aP: CB #811 Peak Elev=74.99' Storage=28 cf Inflow=0.67 cfs 0.046 af
Outflow=0.66 cfs 0.046 af

Pond 7P: CB #846 Peak Elev=74.56' Storage=119 cf Inflow=0.55 cfs 0.044 af
6.0" Round Culvert n=0.012 L=25.1' S=0.0000 '/' Outflow=0.66 cfs 0.044 af

Pond 8P: CB #2776 Peak Elev=74.95' Storage=43 cf Inflow=0.86 cfs 0.067 af
8.0" Round Culvert n=0.012 L=156.9' S=0.0048 '/' Outflow=0.86 cfs 0.067 af

Pond 9P: CB #7443 Peak Elev=74.34' Storage=46 cf Inflow=1.90 cfs 0.173 af
8.0" Round Culvert n=0.012 L=49.6' S=0.0149 '/' Outflow=1.81 cfs 0.173 af

Pond D1P: DMH #796 Peak Elev=75.00' Storage=30 cf Inflow=1.00 cfs 0.090 af
8.0" Round Culvert n=0.012 L=112.3' S=0.0167 '/' Outflow=1.00 cfs 0.090 af

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 3
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=8,582 sf 80.14% Impervious Runoff Depth>4.66"
Flow Length=208' Tc=7.4 min CN=93 Runoff=0.96 cfs 0.076 af

Subcatchment 2S: Subcatchment #2 Runoff Area=12,578 sf 92.70% Impervious Runoff Depth>5.11"
Flow Length=213' Tc=11.0 min CN=97 Runoff=1.31 cfs 0.123 af

Subcatchment 3S: Subcatchment #3 Runoff Area=2,742 sf 100.00% Impervious Runoff Depth>5.23"
Tc=6.0 min CN=98 Runoff=0.34 cfs 0.027 af

Subcatchment 4aS: Subcatchment #4a Runoff Area=1,773 sf 91.82% Impervious Runoff Depth>5.00"
Tc=6.0 min CN=96 Runoff=0.21 cfs 0.017 af

Subcatchment 4S: Subcatchment #4 Runoff Area=3,015 sf 100.00% Impervious Runoff Depth>5.23"
Tc=6.0 min CN=98 Runoff=0.37 cfs 0.030 af

Subcatchment 5S: Subcatchment #5 Runoff Area=965 sf 99.48% Impervious Runoff Depth>5.23"
Tc=6.0 min CN=98 Runoff=0.12 cfs 0.010 af

Subcatchment 6S: Subcatchment #6 Runoff Area=6,771 sf 100.00% Impervious Runoff Depth>5.23"
Tc=6.0 min CN=98 Runoff=0.83 cfs 0.068 af

Subcatchment 7aS: Subcatchment #7a Runoff Area=173 sf 100.00% Impervious Runoff Depth>5.23"
Tc=6.0 min CN=98 Runoff=0.02 cfs 0.002 af

Subcatchment 7S: Subcatchment #7 Runoff Area=6,844 sf 100.00% Impervious Runoff Depth>5.23"
Tc=6.0 min CN=98 Runoff=0.84 cfs 0.068 af

Subcatchment 8S: Subcatchment #8 Runoff Area=10,685 sf 96.50% Impervious Runoff Depth>5.11"
Tc=6.0 min CN=97 Runoff=1.30 cfs 0.104 af

Subcatchment 9S: Subcatchment #9 Runoff Area=2,361 sf 100.00% Impervious Runoff Depth>5.23"
Tc=6.0 min CN=98 Runoff=0.29 cfs 0.024 af

Reach 100R: Final Reach 100 Inflow=4.76 cfs 0.554 af
Outflow=4.76 cfs 0.554 af

Pond 1P: CB #814 Peak Elev=70.65' Storage=26 cf Inflow=4.79 cfs 0.554 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=4.76 cfs 0.554 af

Pond 2P: CB #813 Peak Elev=73.52' Storage=45 cf Inflow=2.97 cfs 0.393 af
8.0" Round Culvert n=0.012 L=28.5' S=0.0456 '/' Outflow=2.92 cfs 0.393 af

Pond 3P: CB #920 Peak Elev=71.10' Storage=13 cf Inflow=1.04 cfs 0.084 af
10.0" Round Culvert n=0.012 L=229.8' S=0.0065 '/' Outflow=1.05 cfs 0.084 af

Pond 4aP: CB #2790 Peak Elev=73.56' Storage=5 cf Inflow=0.70 cfs 0.057 af
12.0" Round Culvert n=0.012 L=32.9' S=0.0529 '/' Outflow=0.70 cfs 0.057 af

Pond 4P: CB #000 Peak Elev=73.78' Storage=5 cf Inflow=0.37 cfs 0.030 af
12.0" Round Culvert n=0.012 L=30.9' S=0.0049 '/' Outflow=0.37 cfs 0.030 af

Pond 5P: CB #000 Peak Elev=73.61' Storage=4 cf Inflow=0.12 cfs 0.010 af
12.0" Round Culvert n=0.012 L=72.9' S=0.0018 '/' Outflow=0.12 cfs 0.010 af

Pond 6P: CB #2779 Peak Elev=75.89' Storage=34 cf Inflow=0.83 cfs 0.068 af
8.0" Round Culvert n=0.012 L=1.4' S=0.0000 '/' Outflow=0.84 cfs 0.068 af

Pond 7aP: CB #811 Peak Elev=75.24' Storage=59 cf Inflow=0.83 cfs 0.073 af
Outflow=0.83 cfs 0.073 af

Pond 7P: CB #846 Peak Elev=74.97' Storage=605 cf Inflow=0.84 cfs 0.068 af
6.0" Round Culvert n=0.012 L=25.1' S=0.0000 '/' Outflow=0.82 cfs 0.068 af

Pond 8P: CB #2776 Peak Elev=75.27' Storage=334 cf Inflow=1.30 cfs 0.104 af
8.0" Round Culvert n=0.012 L=156.9' S=0.0048 '/' Outflow=1.23 cfs 0.104 af

Pond 9P: CB #7443 Peak Elev=74.78' Storage=52 cf Inflow=2.04 cfs 0.270 af
8.0" Round Culvert n=0.012 L=49.6' S=0.0149 '/' Outflow=2.04 cfs 0.270 af

Pond D1P: DMH #796 Peak Elev=75.48' Storage=36 cf Inflow=1.14 cfs 0.142 af
8.0" Round Culvert n=0.012 L=112.3' S=0.0167 '/' Outflow=1.15 cfs 0.142 af

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 3
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=8,582 sf 80.14% Impervious Runoff Depth>6.07"
Flow Length=208' Tc=7.4 min CN=93 Runoff=1.23 cfs 0.100 af

Subcatchment 2S: Subcatchment #2 Runoff Area=12,578 sf 92.70% Impervious Runoff Depth>6.53"
Flow Length=213' Tc=11.0 min CN=97 Runoff=1.66 cfs 0.157 af

Subcatchment 3S: Subcatchment #3 Runoff Area=2,742 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.43 cfs 0.035 af

Subcatchment 4aS: Subcatchment #4a Runoff Area=1,773 sf 91.82% Impervious Runoff Depth>6.42"
Tc=6.0 min CN=96 Runoff=0.27 cfs 0.022 af

Subcatchment 4S: Subcatchment #4 Runoff Area=3,015 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.47 cfs 0.038 af

Subcatchment 5S: Subcatchment #5 Runoff Area=965 sf 99.48% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af

Subcatchment 6S: Subcatchment #6 Runoff Area=6,771 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=1.05 cfs 0.086 af

Subcatchment 7aS: Subcatchment #7a Runoff Area=173 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.03 cfs 0.002 af

Subcatchment 7S: Subcatchment #7 Runoff Area=6,844 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=1.06 cfs 0.087 af

Subcatchment 8S: Subcatchment #8 Runoff Area=10,685 sf 96.50% Impervious Runoff Depth>6.54"
Tc=6.0 min CN=97 Runoff=1.65 cfs 0.134 af

Subcatchment 9S: Subcatchment #9 Runoff Area=2,361 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.37 cfs 0.030 af

Reach 100R: Final Reach 100 Inflow=5.53 cfs 0.706 af
Outflow=5.53 cfs 0.706 af

Pond 1P: CB #814 Peak Elev=71.19' Storage=33 cf Inflow=5.53 cfs 0.706 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=5.53 cfs 0.706 af

Pond 2P: CB #813 Peak Elev=74.43' Storage=57 cf Inflow=3.11 cfs 0.500 af
8.0" Round Culvert n=0.012 L=28.5' S=0.0456 '/' Outflow=3.10 cfs 0.500 af

Pond 3P: CB #920 Peak Elev=71.93' Storage=23 cf Inflow=1.31 cfs 0.107 af
10.0" Round Culvert n=0.012 L=229.8' S=0.0065 '/' Outflow=1.29 cfs 0.107 af

Pond 4aP: CB #2790 Peak Elev=73.62' Storage=6 cf Inflow=0.89 cfs 0.072 af
12.0" Round Culvert n=0.012 L=32.9' S=0.0529 '/' Outflow=0.89 cfs 0.072 af

Pond 4P: CB #000 Peak Elev=73.84' Storage=5 cf Inflow=0.47 cfs 0.038 af
12.0" Round Culvert n=0.012 L=30.9' S=0.0049 '/' Outflow=0.47 cfs 0.038 af

Pond 5P: CB #000 Peak Elev=73.67' Storage=5 cf Inflow=0.15 cfs 0.012 af
12.0" Round Culvert n=0.012 L=72.9' S=0.0018 '/' Outflow=0.15 cfs 0.012 af

Pond 6P: CB #2779 Peak Elev=76.82' Storage=34 cf Inflow=1.05 cfs 0.086 af
8.0" Round Culvert n=0.012 L=1.4' S=0.0000 '/' Outflow=1.09 cfs 0.086 af

Pond 7aP: CB #811 Peak Elev=75.31' Storage=69 cf Inflow=0.98 cfs 0.090 af
Outflow=0.89 cfs 0.090 af

Pond 7P: CB #846 Peak Elev=75.14' Storage=882 cf Inflow=1.06 cfs 0.087 af
6.0" Round Culvert n=0.012 L=25.1' S=0.0000 '/' Outflow=0.98 cfs 0.087 af

Pond 8P: CB #2776 Peak Elev=75.38' Storage=798 cf Inflow=1.65 cfs 0.134 af
8.0" Round Culvert n=0.012 L=156.9' S=0.0048 '/' Outflow=1.28 cfs 0.134 af

Pond 9P: CB #7443 Peak Elev=75.40' Storage=70 cf Inflow=2.20 cfs 0.342 af
8.0" Round Culvert n=0.012 L=49.6' S=0.0149 '/' Outflow=2.10 cfs 0.342 af

Pond D1P: DMH #796 Peak Elev=76.45' Storage=44 cf Inflow=1.16 cfs 0.178 af
8.0" Round Culvert n=0.012 L=112.3' S=0.0167 '/' Outflow=1.29 cfs 0.178 af

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 3
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=8,582 sf 80.14% Impervious Runoff Depth>7.40"
Flow Length=208' Tc=7.4 min CN=93 Runoff=1.48 cfs 0.122 af

Subcatchment 2S: Subcatchment #2 Runoff Area=12,578 sf 92.70% Impervious Runoff Depth>7.88"
Flow Length=213' Tc=11.0 min CN=97 Runoff=1.99 cfs 0.190 af

Subcatchment 3S: Subcatchment #3 Runoff Area=2,742 sf 100.00% Impervious Runoff Depth>8.00"
Tc=6.0 min CN=98 Runoff=0.51 cfs 0.042 af

Subcatchment 4aS: Subcatchment #4a Runoff Area=1,773 sf 91.82% Impervious Runoff Depth>7.76"
Tc=6.0 min CN=96 Runoff=0.33 cfs 0.026 af

Subcatchment 4S: Subcatchment #4 Runoff Area=3,015 sf 100.00% Impervious Runoff Depth>8.00"
Tc=6.0 min CN=98 Runoff=0.56 cfs 0.046 af

Subcatchment 5S: Subcatchment #5 Runoff Area=965 sf 99.48% Impervious Runoff Depth>8.00"
Tc=6.0 min CN=98 Runoff=0.18 cfs 0.015 af

Subcatchment 6S: Subcatchment #6 Runoff Area=6,771 sf 100.00% Impervious Runoff Depth>8.00"
Tc=6.0 min CN=98 Runoff=1.26 cfs 0.104 af

Subcatchment 7aS: Subcatchment #7a Runoff Area=173 sf 100.00% Impervious Runoff Depth>8.00"
Tc=6.0 min CN=98 Runoff=0.03 cfs 0.003 af

Subcatchment 7S: Subcatchment #7 Runoff Area=6,844 sf 100.00% Impervious Runoff Depth>8.00"
Tc=6.0 min CN=98 Runoff=1.27 cfs 0.105 af

Subcatchment 8S: Subcatchment #8 Runoff Area=10,685 sf 96.50% Impervious Runoff Depth>7.88"
Tc=6.0 min CN=97 Runoff=1.98 cfs 0.161 af

Subcatchment 9S: Subcatchment #9 Runoff Area=2,361 sf 100.00% Impervious Runoff Depth>8.00"
Tc=6.0 min CN=98 Runoff=0.44 cfs 0.036 af

Reach 100R: Final Reach 100 Inflow=6.04 cfs 0.850 af
Outflow=6.04 cfs 0.850 af

Pond 1P: CB #814 Peak Elev=71.61' Storage=38 cf Inflow=6.02 cfs 0.850 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=6.04 cfs 0.850 af

Pond 2P: CB #813 Peak Elev=74.92' Storage=87 cf Inflow=3.22 cfs 0.599 af
8.0" Round Culvert n=0.012 L=28.5' S=0.0456 '/' Outflow=3.29 cfs 0.599 af

Pond 3P: CB #920 Peak Elev=72.72' Storage=33 cf Inflow=1.57 cfs 0.129 af
10.0" Round Culvert n=0.012 L=229.8' S=0.0065 '/' Outflow=1.54 cfs 0.129 af

Pond 4aP: CB #2790 Peak Elev=73.68' Storage=7 cf Inflow=1.07 cfs 0.087 af
12.0" Round Culvert n=0.012 L=32.9' S=0.0529 '/' Outflow=1.07 cfs 0.087 af

Pond 4P: CB #000 Peak Elev=73.89' Storage=6 cf Inflow=0.56 cfs 0.046 af
12.0" Round Culvert n=0.012 L=30.9' S=0.0049 '/' Outflow=0.56 cfs 0.046 af

Pond 5P: CB #000 Peak Elev=73.72' Storage=6 cf Inflow=0.18 cfs 0.015 af
12.0" Round Culvert n=0.012 L=72.9' S=0.0018 '/' Outflow=0.18 cfs 0.015 af

Pond 6P: CB #2779 Peak Elev=77.52' Storage=34 cf Inflow=1.26 cfs 0.104 af
8.0" Round Culvert n=0.012 L=1.4' S=0.0000 '/' Outflow=1.33 cfs 0.104 af

Pond 7aP: CB #811 Peak Elev=75.25' Storage=61 cf Inflow=0.98 cfs 0.108 af
Outflow=0.90 cfs 0.108 af

Pond 7P: CB #846 Peak Elev=75.29' Storage=1,167 cf Inflow=1.27 cfs 0.105 af
6.0" Round Culvert n=0.012 L=25.1' S=0.0000 '/' Outflow=0.98 cfs 0.105 af

Pond 8P: CB #2776 Peak Elev=75.49' Storage=1,365 cf Inflow=1.98 cfs 0.161 af
8.0" Round Culvert n=0.012 L=156.9' S=0.0048 '/' Outflow=1.34 cfs 0.161 af

Pond 9P: CB #7443 Peak Elev=75.64' Storage=170 cf Inflow=2.35 cfs 0.409 af
8.0" Round Culvert n=0.012 L=49.6' S=0.0149 '/' Outflow=2.14 cfs 0.409 af

Pond D1P: DMH #796 Peak Elev=76.92' Storage=44 cf Inflow=1.33 cfs 0.212 af
8.0" Round Culvert n=0.012 L=112.3' S=0.0167 '/' Outflow=1.30 cfs 0.212 af

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 3
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=8,582 sf 80.14% Impervious Runoff Depth>9.00"
Flow Length=208' Tc=7.4 min CN=93 Runoff=1.79 cfs 0.148 af

Subcatchment 2S: Subcatchment #2 Runoff Area=12,578 sf 92.70% Impervious Runoff Depth>9.48"
Flow Length=213' Tc=11.0 min CN=97 Runoff=2.38 cfs 0.228 af

Subcatchment 3S: Subcatchment #3 Runoff Area=2,742 sf 100.00% Impervious Runoff Depth>9.61"
Tc=6.0 min CN=98 Runoff=0.61 cfs 0.050 af

Subcatchment 4aS: Subcatchment #4a Runoff Area=1,773 sf 91.82% Impervious Runoff Depth>9.37"
Tc=6.0 min CN=96 Runoff=0.39 cfs 0.032 af

Subcatchment 4S: Subcatchment #4 Runoff Area=3,015 sf 100.00% Impervious Runoff Depth>9.61"
Tc=6.0 min CN=98 Runoff=0.67 cfs 0.055 af

Subcatchment 5S: Subcatchment #5 Runoff Area=965 sf 99.48% Impervious Runoff Depth>9.61"
Tc=6.0 min CN=98 Runoff=0.21 cfs 0.018 af

Subcatchment 6S: Subcatchment #6 Runoff Area=6,771 sf 100.00% Impervious Runoff Depth>9.61"
Tc=6.0 min CN=98 Runoff=1.50 cfs 0.125 af

Subcatchment 7aS: Subcatchment #7a Runoff Area=173 sf 100.00% Impervious Runoff Depth>9.61"
Tc=6.0 min CN=98 Runoff=0.04 cfs 0.003 af

Subcatchment 7S: Subcatchment #7 Runoff Area=6,844 sf 100.00% Impervious Runoff Depth>9.61"
Tc=6.0 min CN=98 Runoff=1.52 cfs 0.126 af

Subcatchment 8S: Subcatchment #8 Runoff Area=10,685 sf 96.50% Impervious Runoff Depth>9.49"
Tc=6.0 min CN=97 Runoff=2.37 cfs 0.194 af

Subcatchment 9S: Subcatchment #9 Runoff Area=2,361 sf 100.00% Impervious Runoff Depth>9.61"
Tc=6.0 min CN=98 Runoff=0.52 cfs 0.043 af

Reach 100R: Final Reach 100 Inflow=6.49 cfs 1.024 af
Outflow=6.49 cfs 1.024 af

Pond 1P: CB #814 Peak Elev=72.01' Storage=43 cf Inflow=6.49 cfs 1.024 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=6.49 cfs 1.024 af

Pond 2P: CB #813 Peak Elev=75.19' Storage=256 cf Inflow=3.57 cfs 0.721 af
8.0" Round Culvert n=0.012 L=28.5' S=0.0456 '/' Outflow=3.41 cfs 0.721 af

Pond 3P: CB #920 Peak Elev=73.61' Storage=44 cf Inflow=1.85 cfs 0.155 af
10.0" Round Culvert n=0.012 L=229.8' S=0.0065 '/' Outflow=1.81 cfs 0.155 af

Pond 4aP: CB #2790 Peak Elev=73.92' Storage=10 cf Inflow=1.24 cfs 0.105 af
12.0" Round Culvert n=0.012 L=32.9' S=0.0529 '/' Outflow=1.25 cfs 0.105 af

Pond 4P: CB #000 Peak Elev=74.03' Storage=8 cf Inflow=0.67 cfs 0.055 af
12.0" Round Culvert n=0.012 L=30.9' S=0.0049 '/' Outflow=0.66 cfs 0.055 af

Pond 5P: CB #000 Peak Elev=73.91' Storage=8 cf Inflow=0.21 cfs 0.018 af
12.0" Round Culvert n=0.012 L=72.9' S=0.0018 '/' Outflow=0.22 cfs 0.018 af

Pond 6P: CB #2779 Peak Elev=78.66' Storage=34 cf Inflow=1.50 cfs 0.125 af
8.0" Round Culvert n=0.012 L=1.4' S=0.0000 '/' Outflow=1.51 cfs 0.124 af

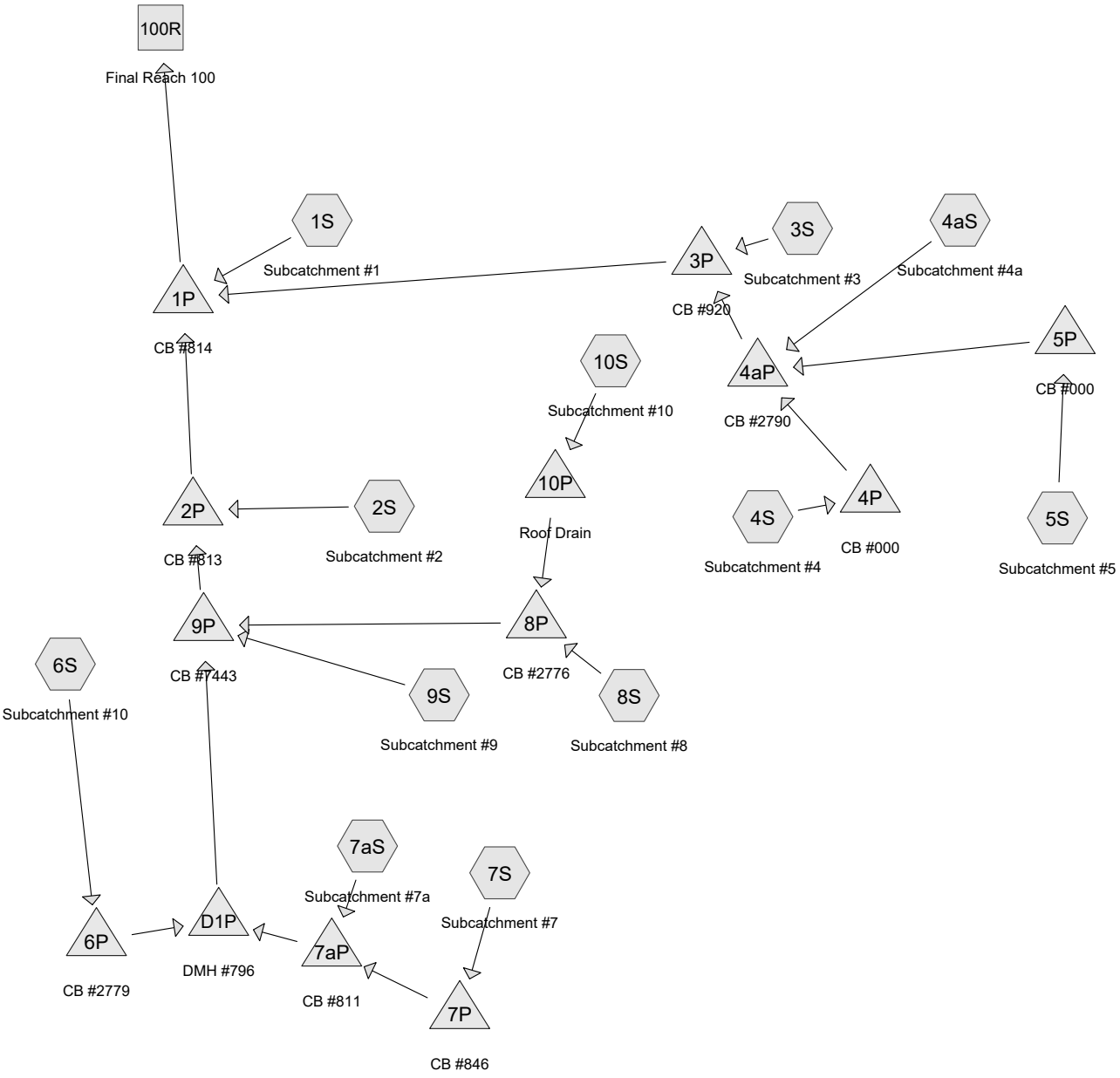
Pond 7aP: CB #811 Peak Elev=75.51' Storage=94 cf Inflow=0.92 cfs 0.130 af
Outflow=0.87 cfs 0.130 af

Pond 7P: CB #846 Peak Elev=75.51' Storage=1,711 cf Inflow=1.52 cfs 0.126 af
6.0" Round Culvert n=0.012 L=25.1' S=0.0000 '/' Outflow=0.91 cfs 0.126 af

Pond 8P: CB #2776 Peak Elev=75.64' Storage=2,200 cf Inflow=2.37 cfs 0.194 af
8.0" Round Culvert n=0.012 L=156.9' S=0.0048 '/' Outflow=1.25 cfs 0.194 af

Pond 9P: CB #7443 Peak Elev=75.83' Storage=367 cf Inflow=2.28 cfs 0.493 af
8.0" Round Culvert n=0.012 L=49.6' S=0.0149 '/' Outflow=2.11 cfs 0.493 af

Pond D1P: DMH #796 Peak Elev=77.87' Storage=44 cf Inflow=1.51 cfs 0.255 af
8.0" Round Culvert n=0.012 L=112.3' S=0.0167 '/' Outflow=1.61 cfs 0.255 af



Subcat Reach Pond Link

Routing Diagram for 18-146 Proposed Drainage
Prepared by Berry Surveying & Engineering, Printed 1/7/2019
HydroCAD® 10.00-22 s/n 07605 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.076	74	>75% Grass cover, Good, HSG C (1S, 2S, 4aS, 5S, 8S, 9S)
0.004	96	Gravel surface, HSG C (2S)
0.058	98	Paved parking, HSG C (4S)
0.968	98	Unconnected pavement, HSG C (1S, 2S, 4aS, 5S, 6S, 7aS, 7S, 8S, 9S)
0.192	98	Unconnected roofs, HSG C (1S, 2S, 3S, 4S, 10S)
1.297	**97**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.297	HSG C	1S, 2S, 3S, 4aS, 4S, 5S, 6S, 7aS, 7S, 8S, 9S, 10S
0.000	HSG D	
0.000	Other	
1.297		**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	0.000	0.076	0.000	0.000	0.076	>75% Grass cover, Good	1S, 2S, 4aS, 5S, 8S, 9S
0.000	0.000	0.004	0.000	0.000	0.004	Gravel surface	2S
0.000	0.000	0.058	0.000	0.000	0.058	Paved parking	4S
0.000	0.000	0.968	0.000	0.000	0.968	Unconnected pavement	1S, 2S, 4aS, 5S, 6S, 7aS, 7S, 8S, 9S
0.000	0.000	0.192	0.000	0.000	0.192	Unconnected roofs	1S, 2S, 3S, 4S, 10S
0.000	**0.000**	**1.297**	**0.000**	**0.000**	**1.297**	**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	1P	68.56	68.56	5.0	0.0000	0.012	12.0	0.0	0.0
2	2P	69.92	68.62	28.5	0.0456	0.012	8.0	0.0	0.0
3	3P	70.08	68.58	229.8	0.0065	0.012	10.0	0.0	0.0
4	4aP	73.14	71.40	32.9	0.0529	0.012	12.0	0.0	0.0
5	4P	73.42	73.27	30.9	0.0049	0.012	12.0	0.0	0.0
6	5P	73.27	73.14	72.9	0.0018	0.012	12.0	0.0	0.0
7	6P	72.51	72.51	1.4	0.0000	0.012	8.0	0.0	0.0
8	7aP	72.90	72.68	7.7	0.0286	0.012	6.0	0.0	0.0
9	7P	72.88	72.88	25.1	0.0000	0.012	6.0	0.0	0.0
10	8P	72.00	70.85	109.5	0.0105	0.012	8.0	0.0	0.0
11	9P	70.78	69.94	56.3	0.0149	0.012	8.0	0.0	0.0
12	10P	72.20	72.10	20.0	0.0050	0.012	6.0	0.0	0.0
13	D1P	72.58	70.79	105.6	0.0170	0.012	8.0	0.0	0.0

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 3
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=8,582 sf 80.14% Impervious Runoff Depth>6.07"
Flow Length=208' Tc=7.4 min CN=93 Runoff=1.23 cfs 0.100 af

Subcatchment 2S: Subcatchment #2 Runoff Area=11,047 sf 93.98% Impervious Runoff Depth>6.53"
Flow Length=213' Tc=11.0 min CN=97 Runoff=1.46 cfs 0.138 af

Subcatchment 3S: Subcatchment #3 Runoff Area=2,742 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.43 cfs 0.035 af

Subcatchment 4aS: Subcatchment #4a Runoff Area=1,773 sf 91.82% Impervious Runoff Depth>6.42"
Tc=6.0 min CN=96 Runoff=0.27 cfs 0.022 af

Subcatchment 4S: Subcatchment #4 Runoff Area=3,015 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.47 cfs 0.038 af

Subcatchment 5S: Subcatchment #5 Runoff Area=965 sf 99.48% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af

Subcatchment 6S: Subcatchment #10 Runoff Area=6,771 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=1.05 cfs 0.086 af

Subcatchment 7aS: Subcatchment #7a Runoff Area=173 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.03 cfs 0.002 af

Subcatchment 7S: Subcatchment #7 Runoff Area=6,844 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=1.06 cfs 0.087 af

Subcatchment 8S: Subcatchment #8 Runoff Area=7,916 sf 92.85% Impervious Runoff Depth>6.42"
Tc=6.0 min CN=96 Runoff=1.22 cfs 0.097 af

Subcatchment 9S: Subcatchment #9 Runoff Area=2,361 sf 83.86% Impervious Runoff Depth>6.18"
Tc=6.0 min CN=94 Runoff=0.36 cfs 0.028 af

Subcatchment 10S: Subcatchment #10 Runoff Area=4,300 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.67 cfs 0.055 af

Reach 100R: Final Reach 100 Inflow=5.42 cfs 0.703 af
Outflow=5.42 cfs 0.703 af

Pond 1P: CB #814 Peak Elev=71.11' Storage=32 cf Inflow=5.43 cfs 0.703 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=5.42 cfs 0.703 af

Pond 2P: CB #813 Peak Elev=74.19' Storage=54 cf Inflow=3.01 cfs 0.496 af
8.0" Round Culvert n=0.012 L=28.5' S=0.0456 '/' Outflow=3.01 cfs 0.496 af

Pond 3P: CB #920 Peak Elev=71.89' Storage=23 cf Inflow=1.31 cfs 0.107 af
10.0" Round Culvert n=0.012 L=229.8' S=0.0065 '/' Outflow=1.32 cfs 0.107 af

Pond 4aP: CB #2790 Peak Elev=73.62' Storage=6 cf Inflow=0.89 cfs 0.072 af
12.0" Round Culvert n=0.012 L=32.9' S=0.0529 '/' Outflow=0.89 cfs 0.072 af

Pond 4P: CB #000 Peak Elev=73.84' Storage=5 cf Inflow=0.47 cfs 0.038 af
12.0" Round Culvert n=0.012 L=30.9' S=0.0049 '/' Outflow=0.47 cfs 0.038 af

Pond 5P: CB #000 Peak Elev=73.67' Storage=5 cf Inflow=0.15 cfs 0.012 af
12.0" Round Culvert n=0.012 L=72.9' S=0.0018 '/' Outflow=0.15 cfs 0.012 af

Pond 6P: CB #2779 Peak Elev=76.76' Storage=34 cf Inflow=1.05 cfs 0.086 af
8.0" Round Culvert n=0.012 L=1.4' S=0.0000 '/' Outflow=1.09 cfs 0.086 af

Pond 7aP: CB #811 Peak Elev=75.32' Storage=64 cf Inflow=0.88 cfs 0.095 af
6.0" Round Culvert n=0.012 L=7.7' S=0.0286 '/' Outflow=0.97 cfs 0.095 af

Pond 7P: CB #846 Peak Elev=75.12' Storage=846 cf Inflow=1.06 cfs 0.087 af
6.0" Round Culvert n=0.012 L=25.1' S=0.0000 '/' Outflow=0.88 cfs 0.087 af

Pond 8P: CB #2776 Peak Elev=75.42' Storage=548 cf Inflow=1.22 cfs 0.145 af
8.0" Round Culvert n=0.012 L=109.5' S=0.0105 '/' Outflow=1.19 cfs 0.145 af

Pond 9P: CB #7443 Peak Elev=75.43' Storage=77 cf Inflow=2.52 cfs 0.358 af
8.0" Round Culvert n=0.012 L=56.3' S=0.0149 '/' Outflow=2.07 cfs 0.358 af

Pond 10P: Roof Drain Peak Elev=72.54' Storage=1,477 cf Inflow=0.67 cfs 0.055 af
6.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=0.19 cfs 0.048 af

Pond D1P: DMH #796 Peak Elev=76.35' Storage=44 cf Inflow=1.45 cfs 0.181 af
8.0" Round Culvert n=0.012 L=105.6' S=0.0170 '/' Outflow=1.28 cfs 0.181 af

Total Runoff Area = 1.297 ac Runoff Volume = 0.700 af Average Runoff Depth = 6.48"
6.14% Pervious = 0.080 ac 93.86% Impervious = 1.217 ac

Summary for Subcatchment 1S: Subcatchment #1

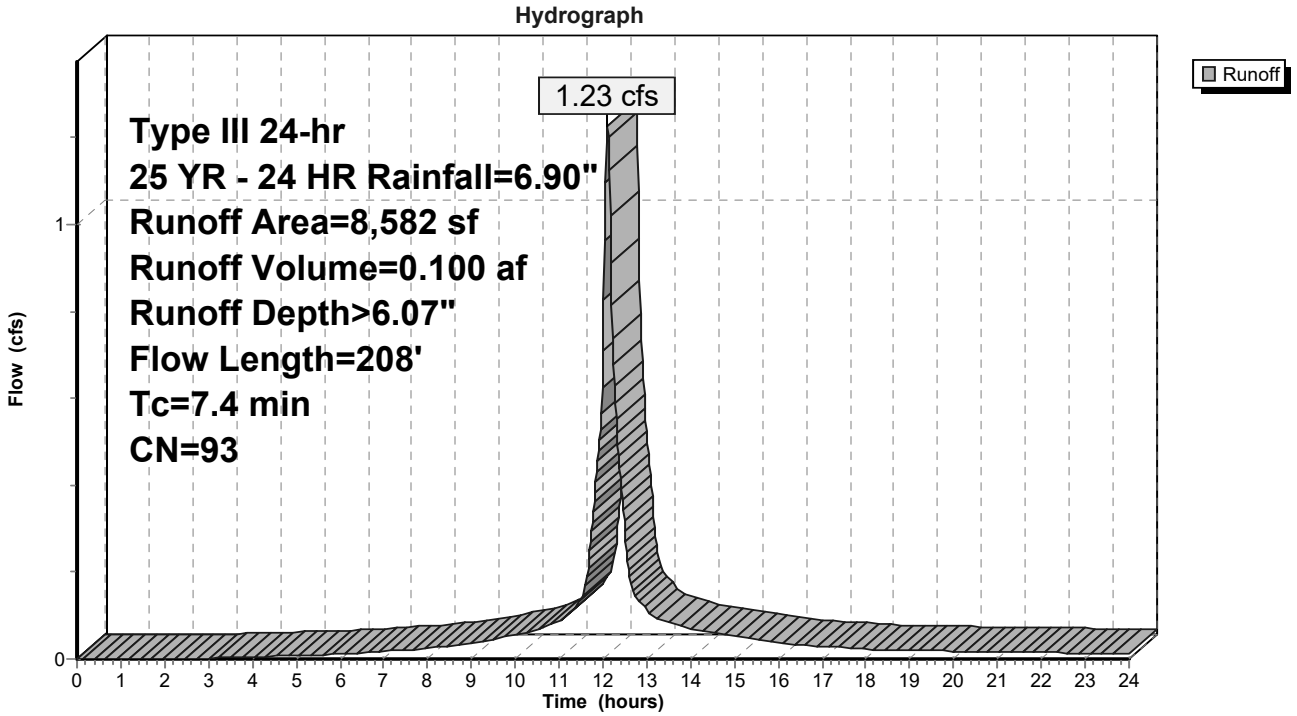
Runoff = 1.23 cfs @ 12.10 hrs, Volume= 0.100 af, Depth> 6.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
111	98	Unconnected roofs, HSG C
1,704	74	>75% Grass cover, Good, HSG C
6,767	98	Unconnected pavement, HSG C
8,582	93	Weighted Average
1,704		19.86% Pervious Area
6,878		80.14% Impervious Area
6,878		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	32	0.0078	0.10		**Sheet Flow, Segment 1** Grass: Short n= 0.150 P2= 3.63"
1.1	68	0.0110	1.07		**Sheet Flow, Segment 2** Smooth surfaces n= 0.011 P2= 3.63"
0.9	108	0.0093	1.96		**Shallow Concentrated Flow, Segment 3** Paved Kv= 20.3 fps
7.4	208	Total			

Subcatchment 1S: Subcatchment #1



Summary for Subcatchment 2S: Subcatchment #2

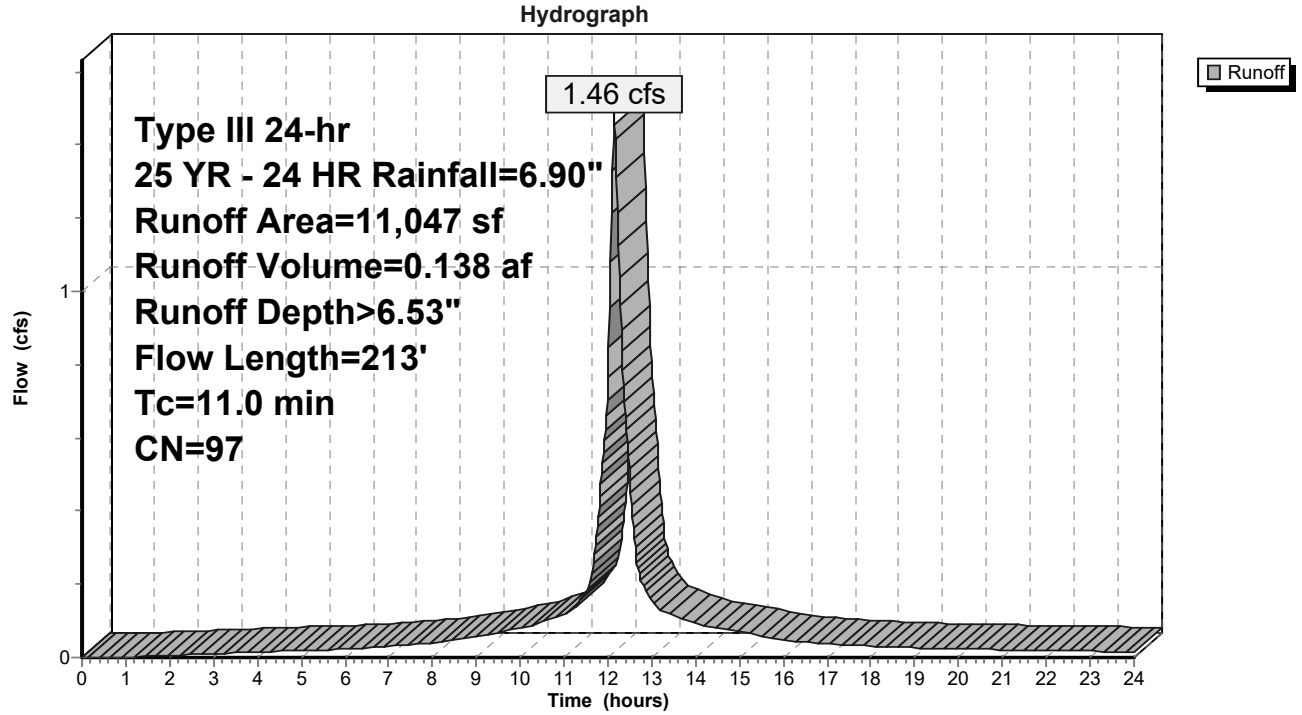
Runoff = 1.46 cfs @ 12.15 hrs, Volume= 0.138 af, Depth> 6.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
690	98	Unconnected roofs, HSG C
510	74	>75% Grass cover, Good, HSG C
9,692	98	Unconnected pavement, HSG C
155	96	Gravel surface, HSG C
11,047	97	Weighted Average
665		6.02% Pervious Area
10,382		93.98% Impervious Area
10,382		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	37	0.0068	0.78		**Sheet Flow, Segment 1** Smooth surfaces n= 0.011 P2= 3.63"
9.2	63	0.0079	0.11		**Sheet Flow, Segment 2** Grass: Short n= 0.150 P2= 3.63"
1.0	113	0.0088	1.90		**Shallow Concentrated Flow, Segment 3** Paved Kv= 20.3 fps
11.0	213	Total			

Subcatchment 2S: Subcatchment #2



Summary for Subcatchment 3S: Subcatchment #3

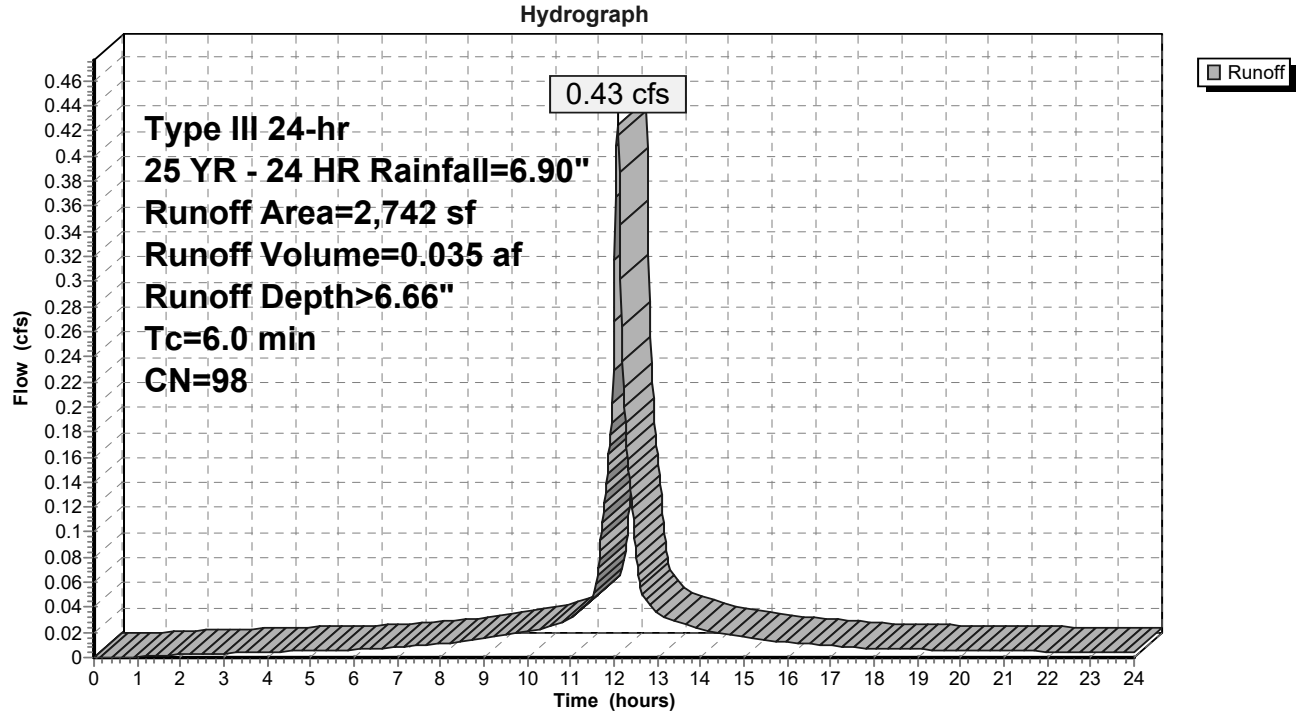
Runoff = 0.43 cfs @ 12.08 hrs, Volume= 0.035 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
274	98	Unconnected roofs, HSG C
2,468	98	Unconnected roofs, HSG C
2,742	98	Weighted Average
2,742		100.00% Impervious Area
2,742		100.00% Unconnected

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

Subcatchment 3S: Subcatchment #3



Summary for Subcatchment 4aS: Subcatchment #4a

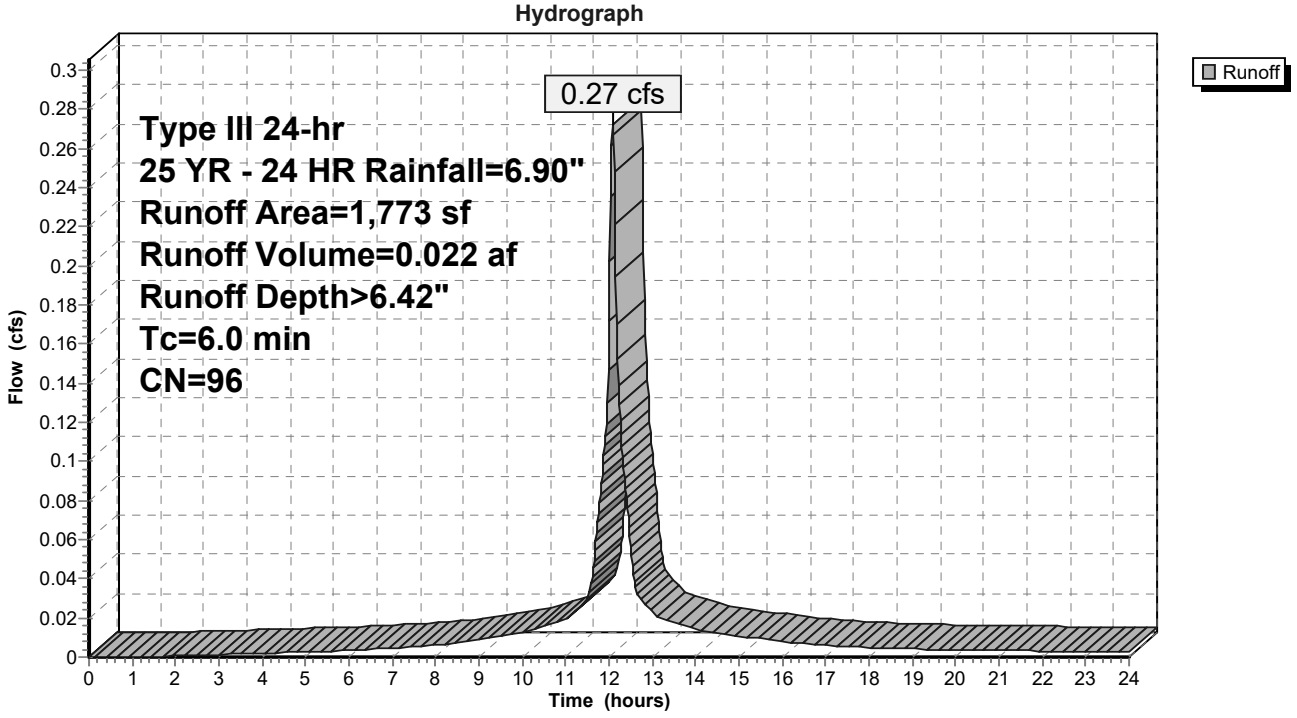
Runoff = 0.27 cfs @ 12.08 hrs, Volume= 0.022 af, Depth> 6.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
145	74	>75% Grass cover, Good, HSG C
1,628	98	Unconnected pavement, HSG C
1,773	96	Weighted Average
145		8.18% Pervious Area
1,628		91.82% Impervious Area
1,628		100.00% Unconnected

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

Subcatchment 4aS: Subcatchment #4a



Summary for Subcatchment 4S: Subcatchment #4

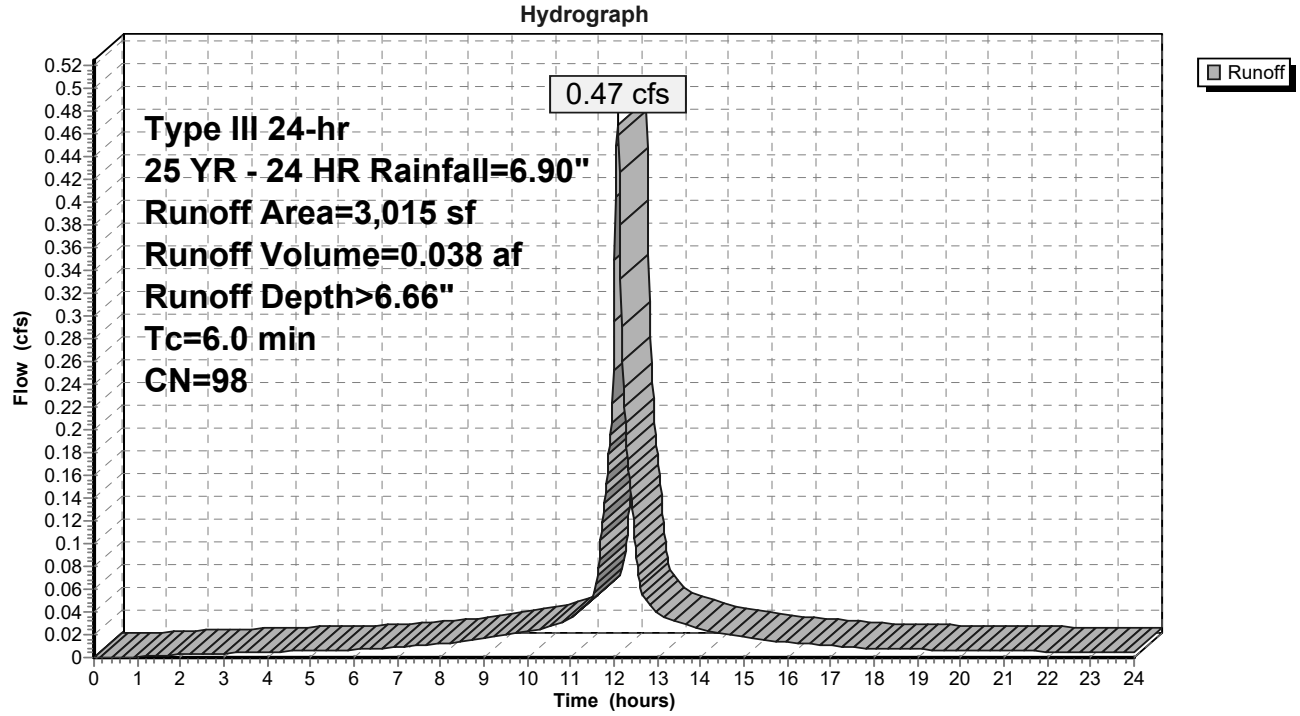
Runoff = 0.47 cfs @ 12.08 hrs, Volume= 0.038 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
506	98	Unconnected roofs, HSG C
2,509	98	Paved parking, HSG C
3,015	98	Weighted Average
3,015		100.00% Impervious Area
506		16.78% Unconnected

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

Subcatchment 4S: Subcatchment #4



Summary for Subcatchment 5S: Subcatchment #5

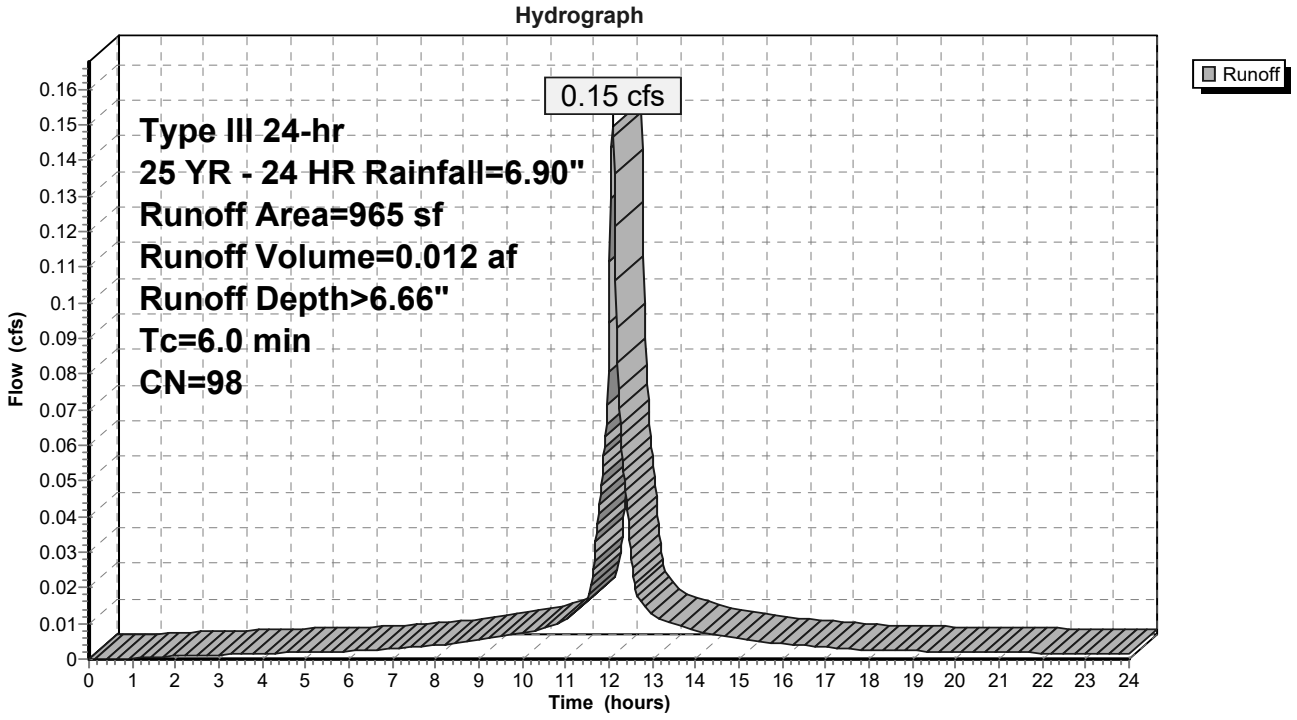
Runoff = 0.15 cfs @ 12.08 hrs, Volume= 0.012 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
5	74	>75% Grass cover, Good, HSG C
960	98	Unconnected pavement, HSG C
965	98	Weighted Average
5		0.52% Pervious Area
960		99.48% Impervious Area
960		100.00% Unconnected

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

Subcatchment 5S: Subcatchment #5



Summary for Subcatchment 6S: Subcatchment #10

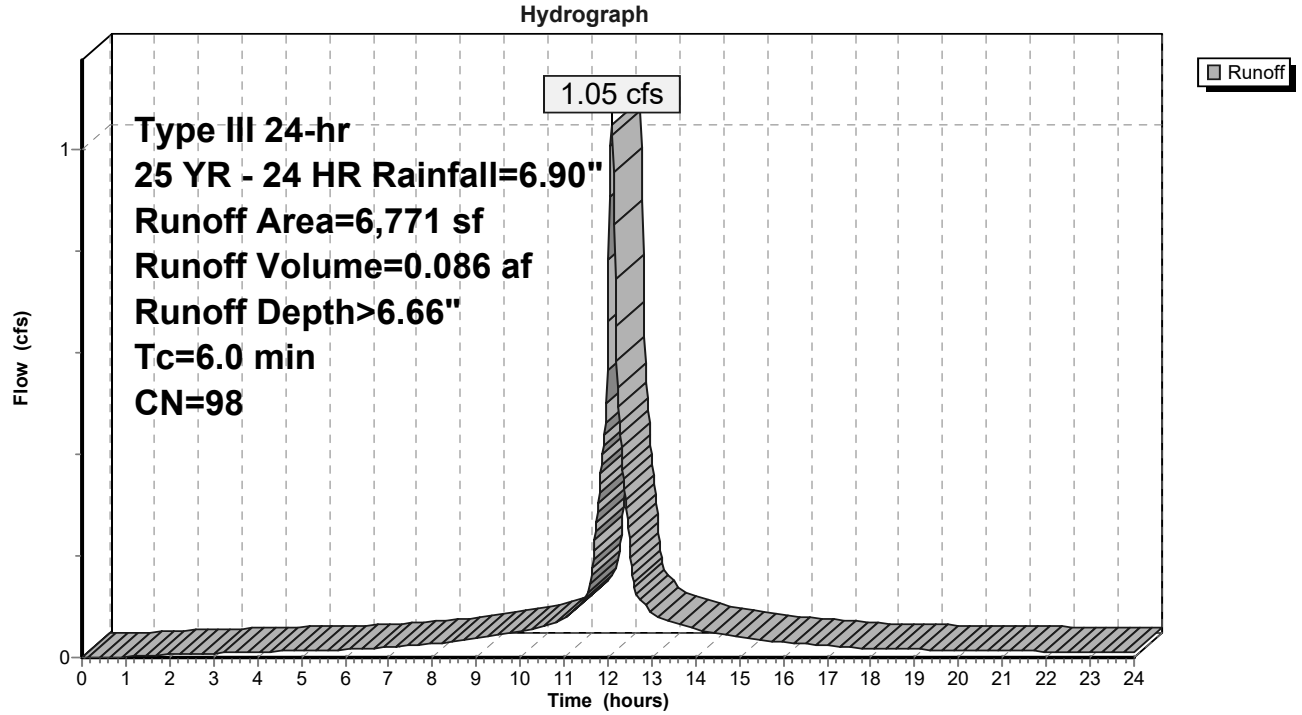
Runoff = 1.05 cfs @ 12.08 hrs, Volume= 0.086 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
6,771	98	Unconnected pavement, HSG C
6,771		100.00% Impervious Area
6,771		100.00% Unconnected

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

Subcatchment 6S: Subcatchment #10



Summary for Subcatchment 7aS: Subcatchment #7a

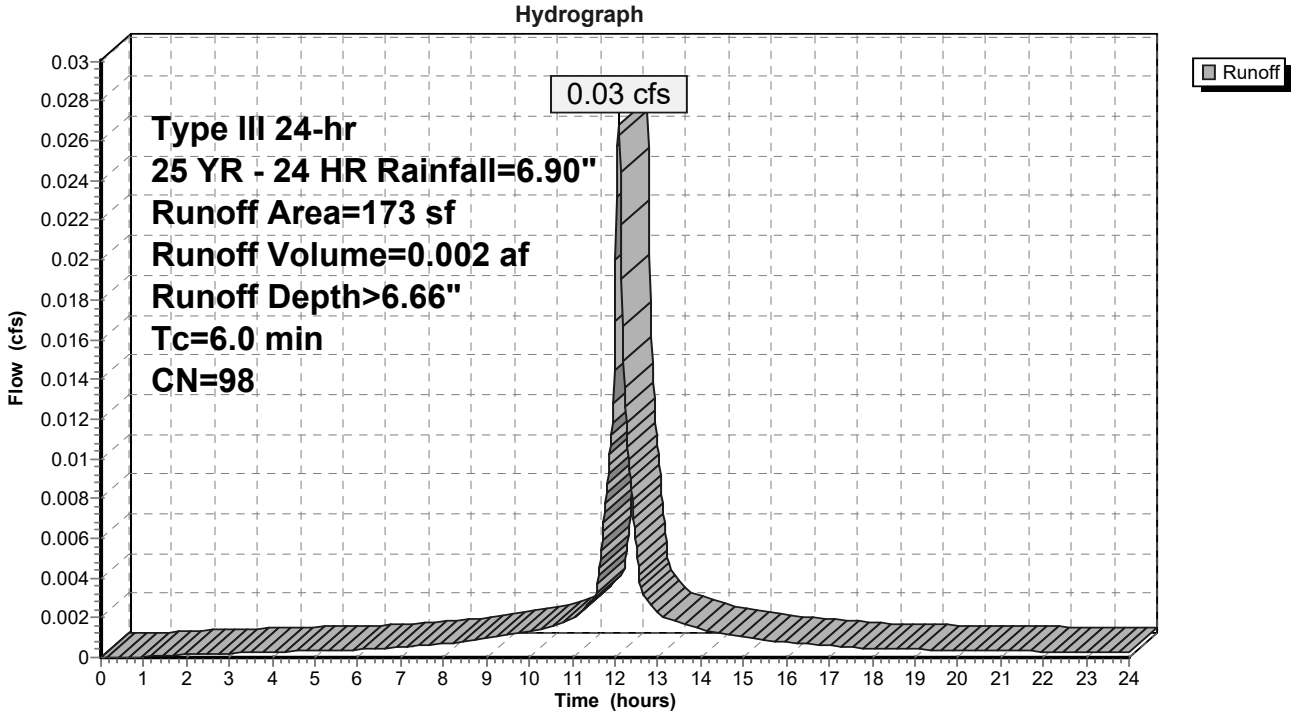
Runoff = 0.03 cfs @ 12.08 hrs, Volume= 0.002 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
173	98	Unconnected pavement, HSG C
173		100.00% Impervious Area
173		100.00% Unconnected

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

Subcatchment 7aS: Subcatchment #7a



Summary for Subcatchment 7S: Subcatchment #7

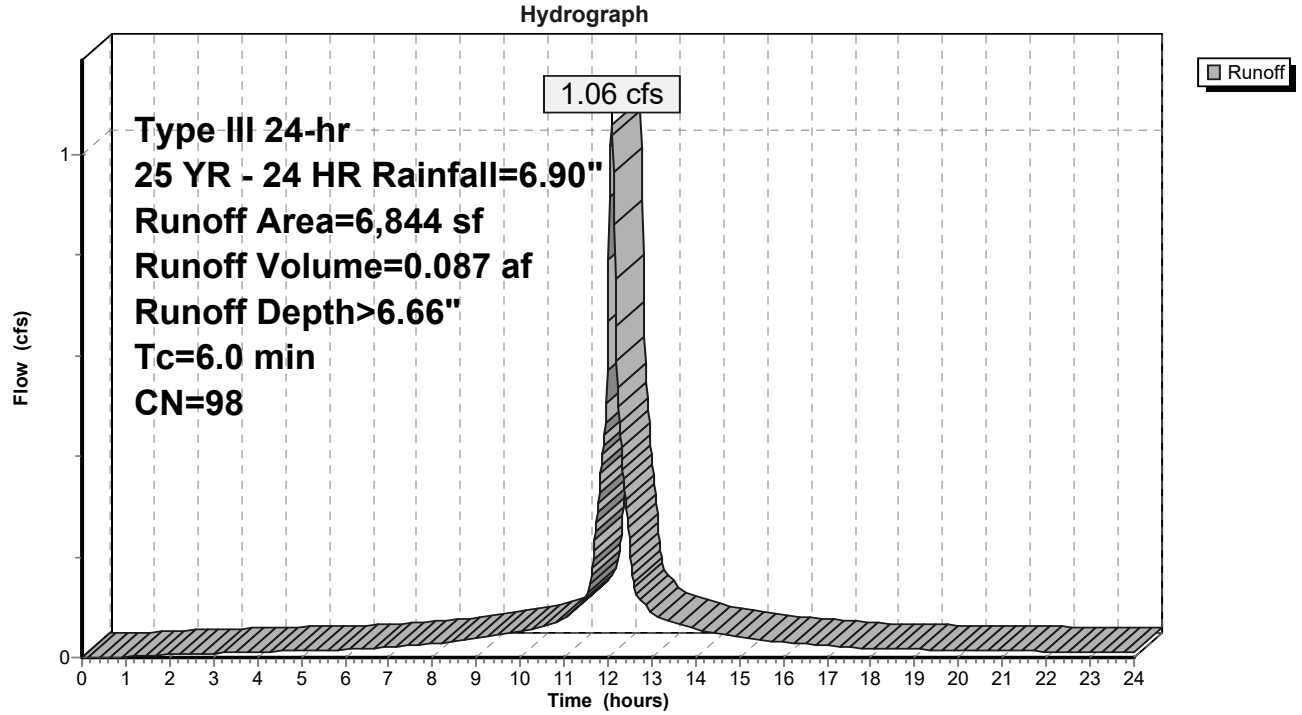
Runoff = 1.06 cfs @ 12.08 hrs, Volume= 0.087 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
6,844	98	Unconnected pavement, HSG C
6,844		100.00% Impervious Area
6,844		100.00% Unconnected

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

Subcatchment 7S: Subcatchment #7



Summary for Subcatchment 8S: Subcatchment #8

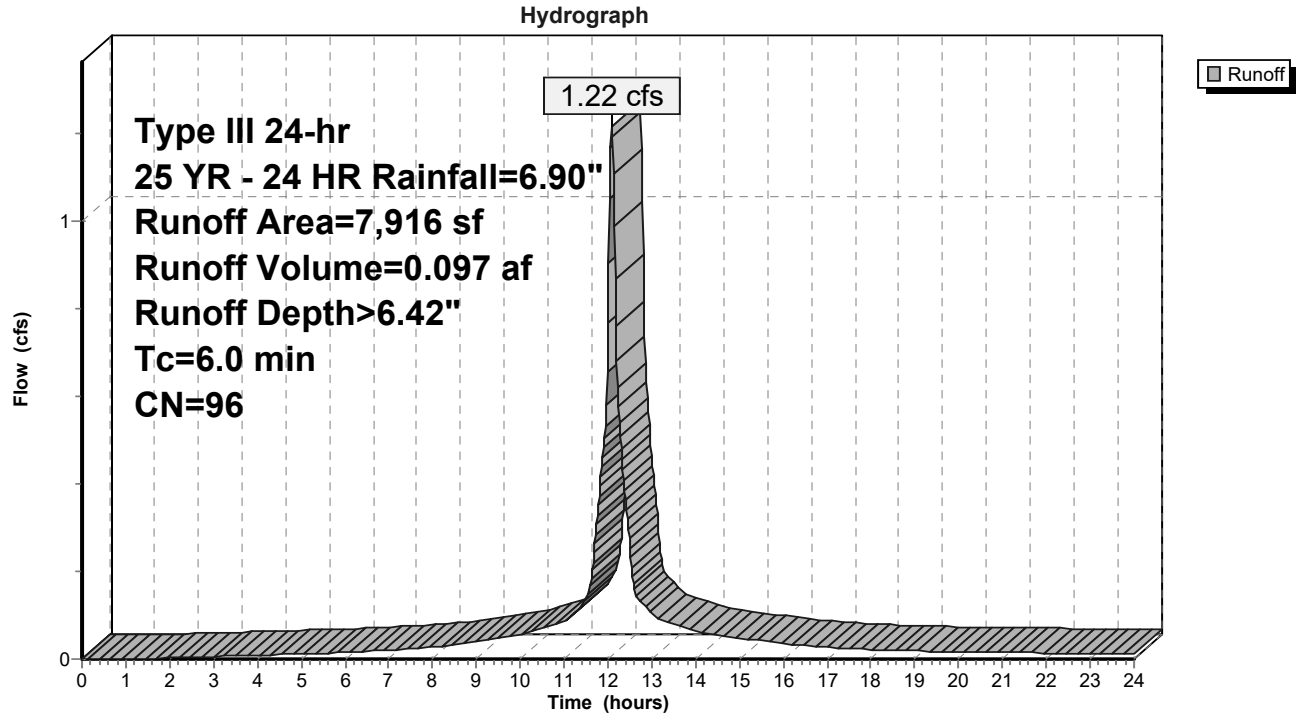
Runoff = 1.22 cfs @ 12.08 hrs, Volume= 0.097 af, Depth> 6.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
566	74	>75% Grass cover, Good, HSG C
7,350	98	Unconnected pavement, HSG C
7,916	96	Weighted Average
566		7.15% Pervious Area
7,350		92.85% Impervious Area
7,350		100.00% Unconnected

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

Subcatchment 8S: Subcatchment #8



Summary for Subcatchment 9S: Subcatchment #9

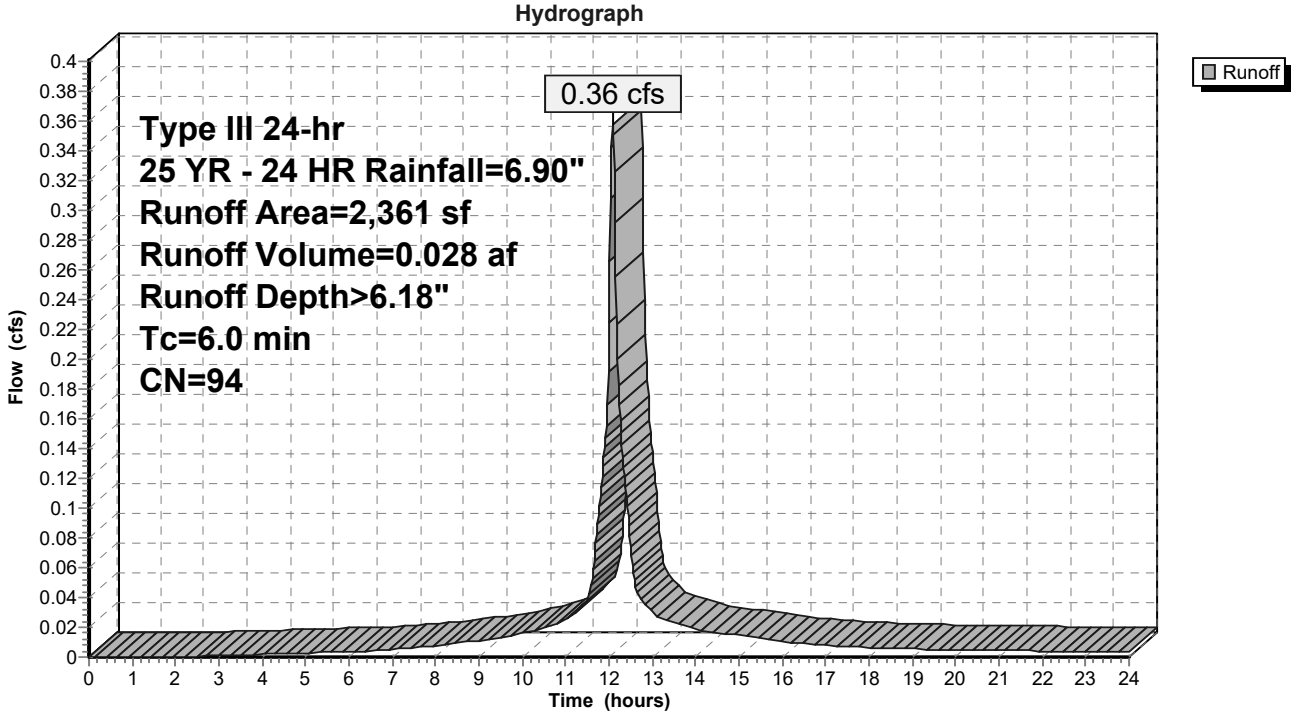
Runoff = 0.36 cfs @ 12.08 hrs, Volume= 0.028 af, Depth> 6.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
1,980	98	Unconnected pavement, HSG C
381	74	>75% Grass cover, Good, HSG C
2,361	94	Weighted Average
381		16.14% Pervious Area
1,980		83.86% Impervious Area
1,980		100.00% Unconnected

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

Subcatchment 9S: Subcatchment #9



Summary for Subcatchment 10S: Subcatchment #10

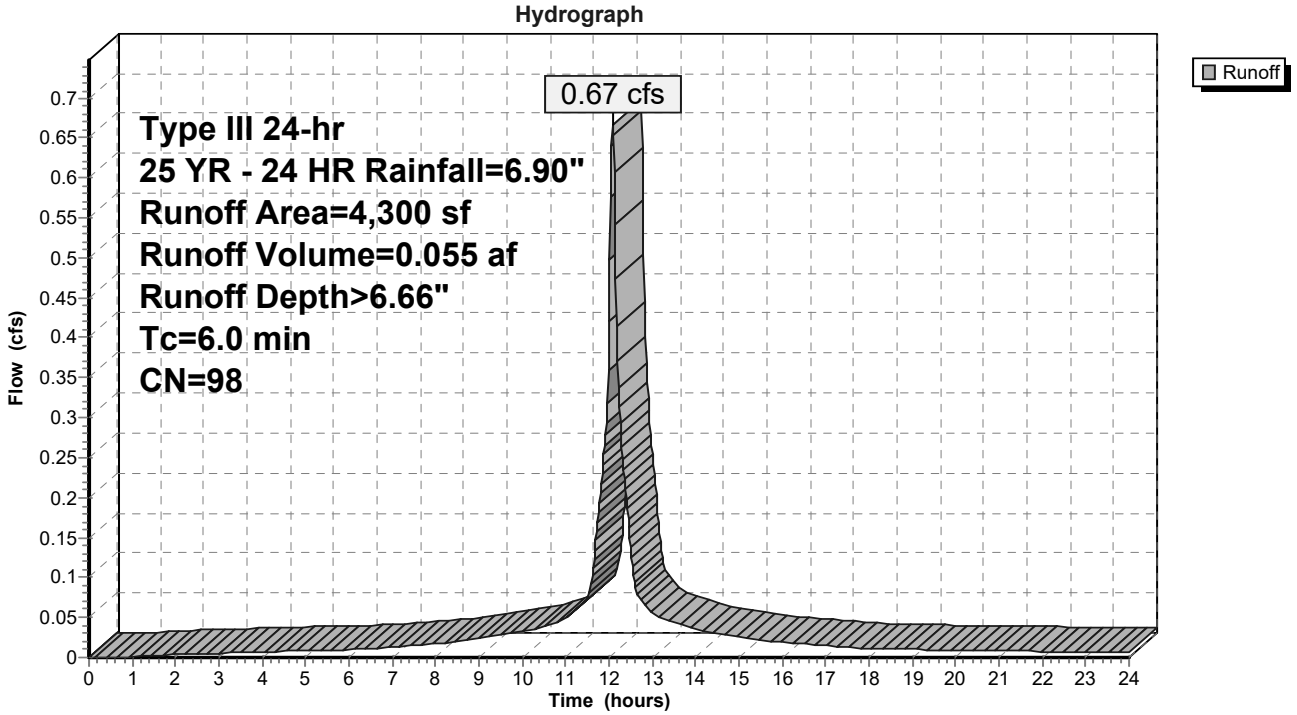
Runoff = 0.67 cfs @ 12.08 hrs, Volume= 0.055 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.90"

Area (sf)	CN	Description
4,300	98	Unconnected roofs, HSG C
4,300		100.00% Impervious Area
4,300		100.00% Unconnected

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

Subcatchment 10S: Subcatchment #10



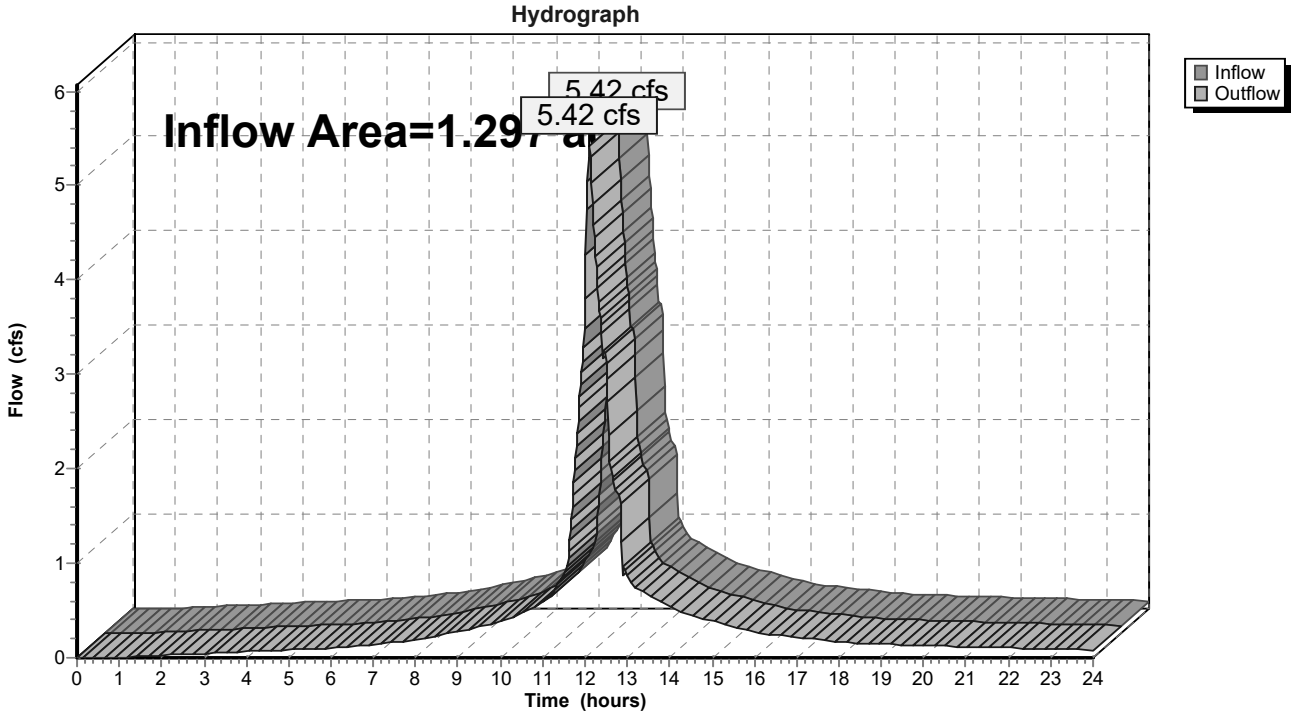
Summary for Reach 100R: Final Reach 100

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

Inflow Area = 1.297 ac, 93.86% Impervious, Inflow Depth > 6.50" for 25 YR - 24 HR event
Inflow = 5.42 cfs @ 12.11 hrs, Volume= 0.703 af
Outflow = 5.42 cfs @ 12.11 hrs, Volume= 0.703 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3

Reach 100R: Final Reach 100



Summary for Pond 1P: CB #814

Inflow Area = 1.297 ac, 93.86% Impervious, Inflow Depth > 6.50" for 25 YR - 24 HR event
Inflow = 5.43 cfs @ 12.11 hrs, Volume= 0.703 af
Outflow = 5.42 cfs @ 12.11 hrs, Volume= 0.703 af, Atten= 0%, Lag= 0.0 min
Primary = 5.42 cfs @ 12.11 hrs, Volume= 0.703 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 71.11' @ 12.11 hrs Surf.Area= 13 sf Storage= 32 cf

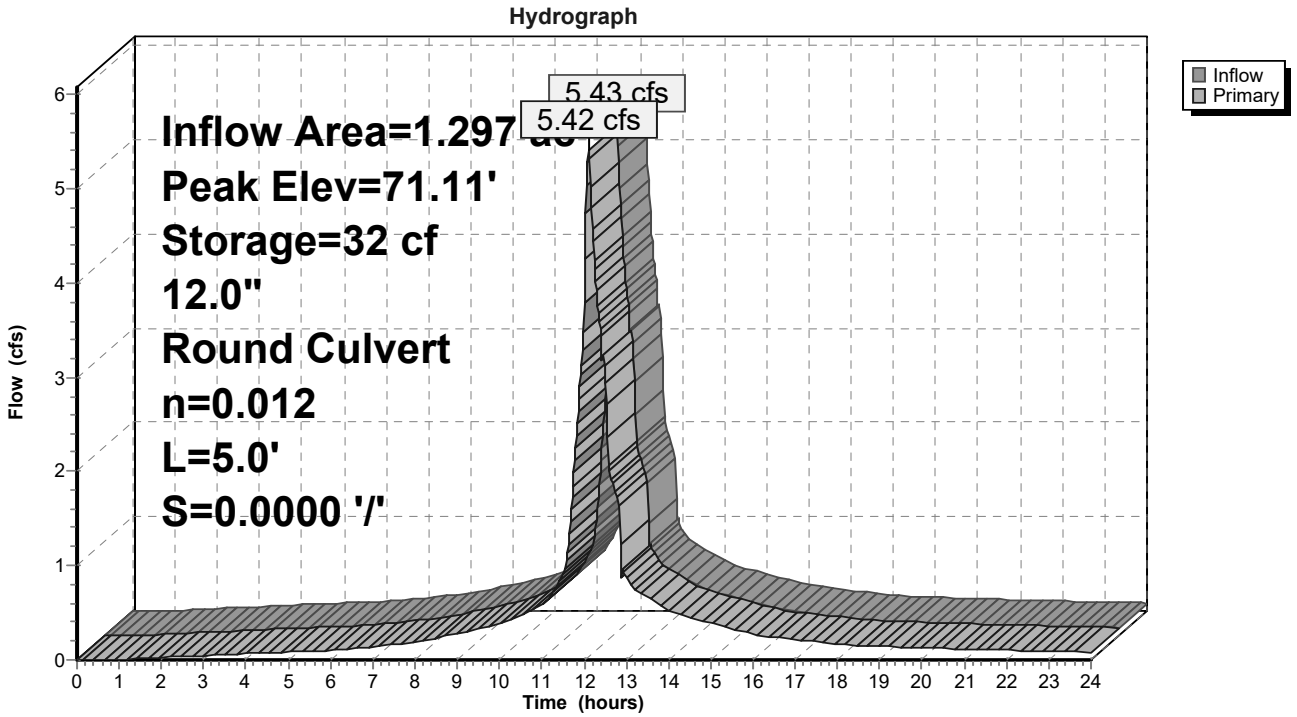
Plug-Flow detention time= 0.2 min calculated for 0.702 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (764.8 - 764.6)

Volume	Invert	Avail.Storage	Storage Description
#1	68.56'	76 cf	**4.00'D x 6.02'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	68.56'	**12.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 68.56' / 68.56' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=5.40 cfs @ 12.11 hrs HW=71.10' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 5.40 cfs @ 6.88 fps)

Pond 1P: CB #814



Summary for Pond 2P: CB #813

Inflow Area = 0.905 ac, 95.91% Impervious, Inflow Depth > 6.58" for 25 YR - 24 HR event
Inflow = 3.01 cfs @ 12.20 hrs, Volume= 0.496 af
Outflow = 3.01 cfs @ 12.21 hrs, Volume= 0.496 af, Atten= 0%, Lag= 0.4 min
Primary = 3.01 cfs @ 12.21 hrs, Volume= 0.496 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 74.19' @ 12.12 hrs Surf.Area= 13 sf Storage= 54 cf

Plug-Flow detention time= 0.2 min calculated for 0.496 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (767.7 - 767.5)

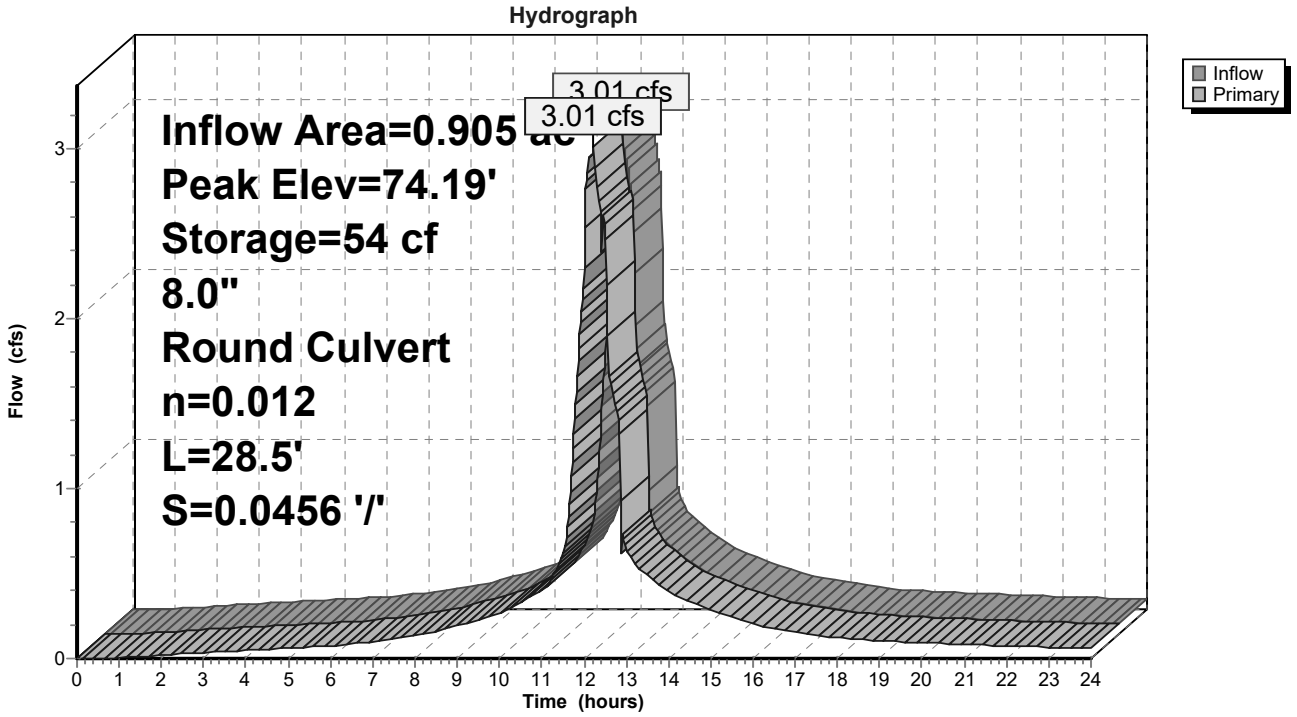
Volume	Invert	Avail.Storage	Storage Description
#1	69.92'	60 cf	**4.00'D x 4.78'H Vertical Cone/Cylinder**
#2	74.70'	435 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
		495 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
74.70	4	8.0	0	0	4
75.00	531	93.0	58	58	687
75.40	1,424	187.6	377	435	2,800

Device	Routing	Invert	Outlet Devices
#1	Primary	69.92'	**8.0" Round Culvert** L= 28.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.92' / 68.62' S= 0.0456 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=3.00 cfs @ 12.21 hrs HW=73.71' TW=70.48' (Dynamic Tailwater)
1=Culvert (Outlet Controls 3.00 cfs @ 8.61 fps)

Pond 2P: CB #813



Summary for Pond 3P: CB #920

Inflow Area = 0.195 ac, 98.23% Impervious, Inflow Depth > 6.60" for 25 YR - 24 HR event
Inflow = 1.31 cfs @ 12.09 hrs, Volume= 0.107 af
Outflow = 1.32 cfs @ 12.09 hrs, Volume= 0.107 af, Atten= 0%, Lag= 0.1 min
Primary = 1.32 cfs @ 12.09 hrs, Volume= 0.107 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 71.89' @ 12.10 hrs Surf.Area= 13 sf Storage= 23 cf

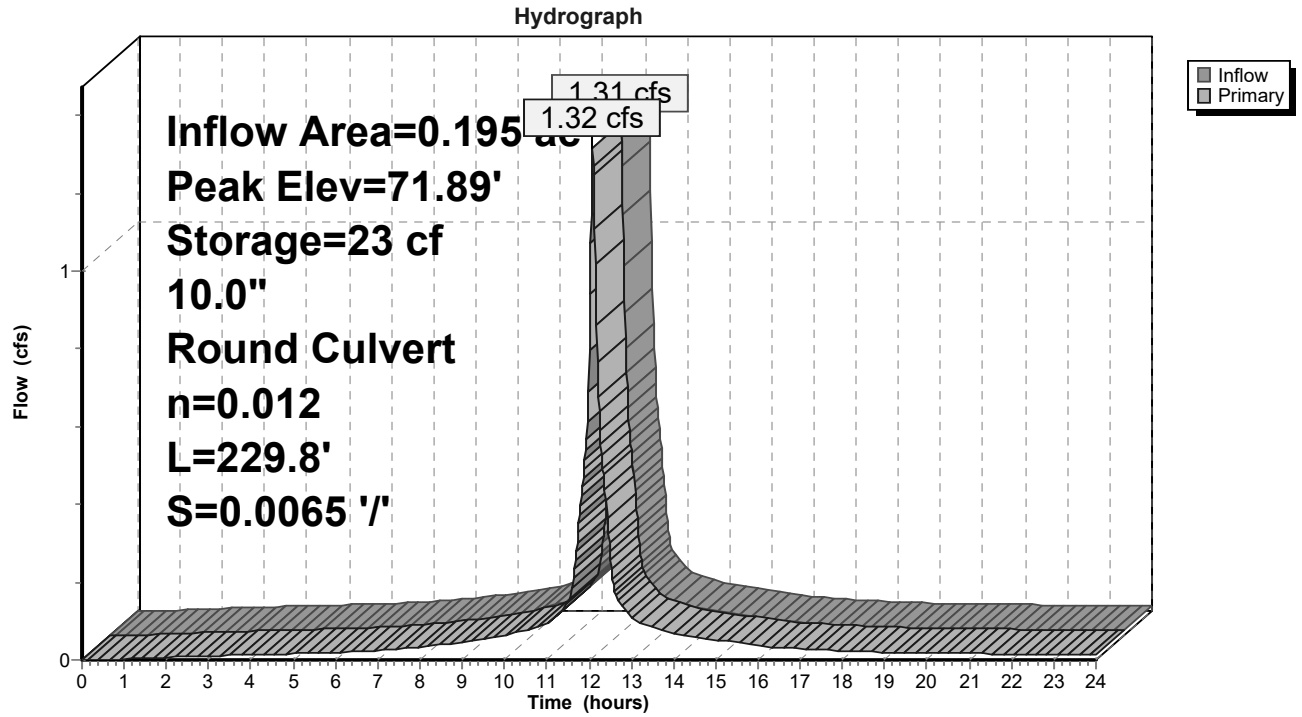
Plug-Flow detention time= 0.5 min calculated for 0.107 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (746.0 - 745.6)

Volume	Invert	Avail.Storage	Storage Description
#1	70.08'	69 cf	**4.00'D x 5.52'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	70.08'	**10.0" Round Culvert** L= 229.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.08' / 68.58' S= 0.0065 '/' Cc= 0.900 n= 0.012, Flow Area= 0.55 sf

Primary OutFlow Max=1.28 cfs @ 12.09 hrs HW=71.84' TW=71.04' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.28 cfs @ 2.35 fps)

Pond 3P: CB #920



Summary for Pond 4aP: CB #2790

Inflow Area = 0.132 ac, 97.39% Impervious, Inflow Depth > 6.58" for 25 YR - 24 HR event
Inflow = 0.89 cfs @ 12.09 hrs, Volume= 0.072 af
Outflow = 0.89 cfs @ 12.09 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.1 min
Primary = 0.89 cfs @ 12.09 hrs, Volume= 0.072 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 73.62' @ 12.09 hrs Surf.Area= 13 sf Storage= 6 cf

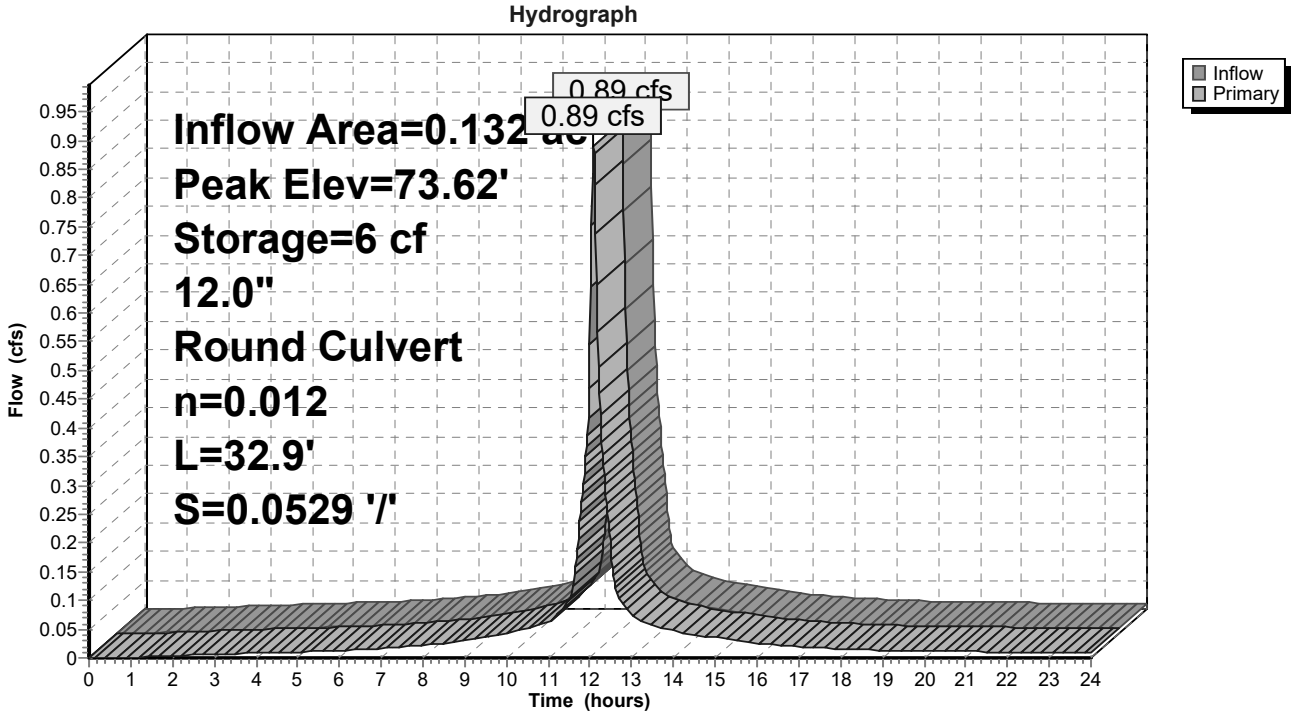
Plug-Flow detention time= 0.4 min calculated for 0.072 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (747.1 - 746.8)

Volume	Invert	Avail.Storage	Storage Description
#1	73.14'	35 cf	**4.00'D x 2.78'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	73.14'	**12.0" Round Culvert** L= 32.9' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.14' / 71.40' S= 0.0529 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.88 cfs @ 12.09 hrs HW=73.62' TW=71.84' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.88 cfs @ 2.36 fps)

Pond 4aP: CB #2790



Summary for Pond 4P: CB #000

Inflow Area = 0.069 ac,100.00% Impervious, Inflow Depth > 6.66" for 25 YR - 24 HR event
Inflow = 0.47 cfs @ 12.08 hrs, Volume= 0.038 af
Outflow = 0.47 cfs @ 12.09 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.1 min
Primary = 0.47 cfs @ 12.09 hrs, Volume= 0.038 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 73.84' @ 12.09 hrs Surf.Area= 13 sf Storage= 5 cf

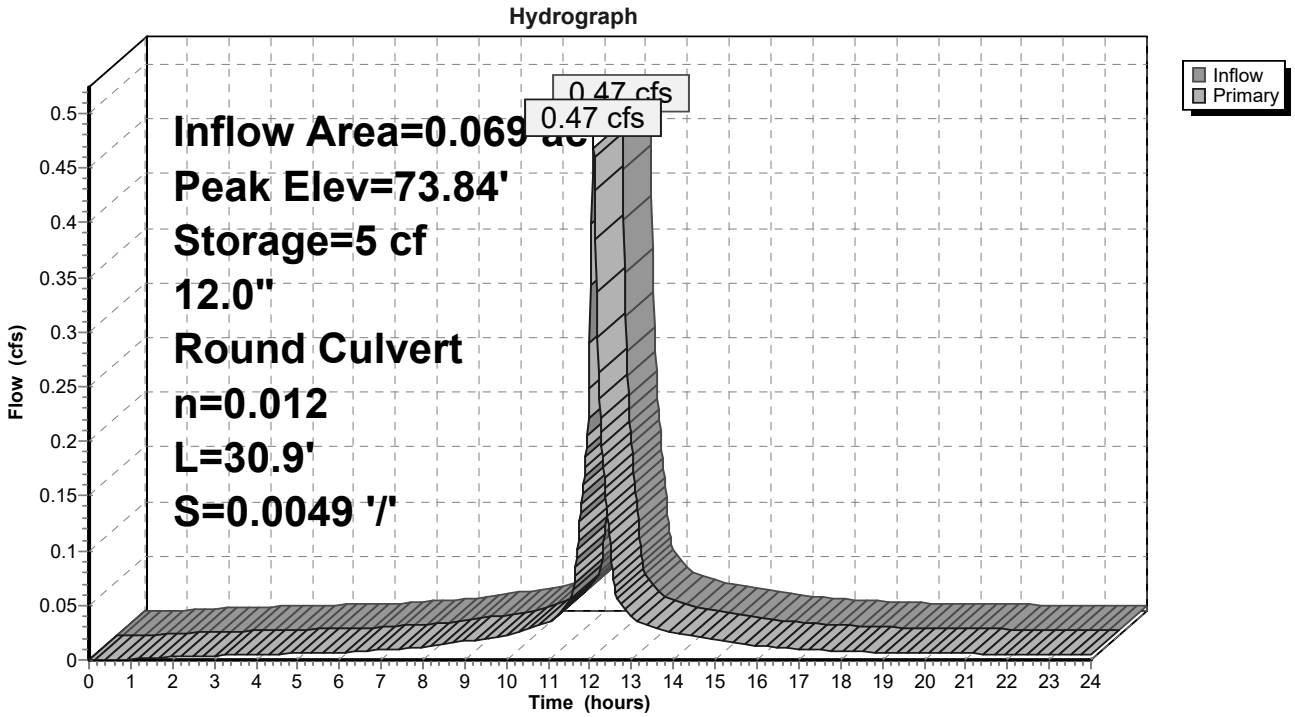
Plug-Flow detention time= 0.7 min calculated for 0.038 af (100% of inflow)
Center-of-Mass det. time= 0.5 min (743.1 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	73.42'	32 cf	**4.00'D x 2.58'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	73.42'	**12.0" Round Culvert** L= 30.9' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.42' / 73.27' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.46 cfs @ 12.09 hrs HW=73.84' TW=73.62' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.46 cfs @ 2.22 fps)

Pond 4P: CB #000



Summary for Pond 5P: CB #000

Inflow Area = 0.022 ac, 99.48% Impervious, Inflow Depth > 6.66" for 25 YR - 24 HR event
Inflow = 0.15 cfs @ 12.08 hrs, Volume= 0.012 af
Outflow = 0.15 cfs @ 12.09 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.4 min
Primary = 0.15 cfs @ 12.09 hrs, Volume= 0.012 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 73.67' @ 12.09 hrs Surf.Area= 13 sf Storage= 5 cf

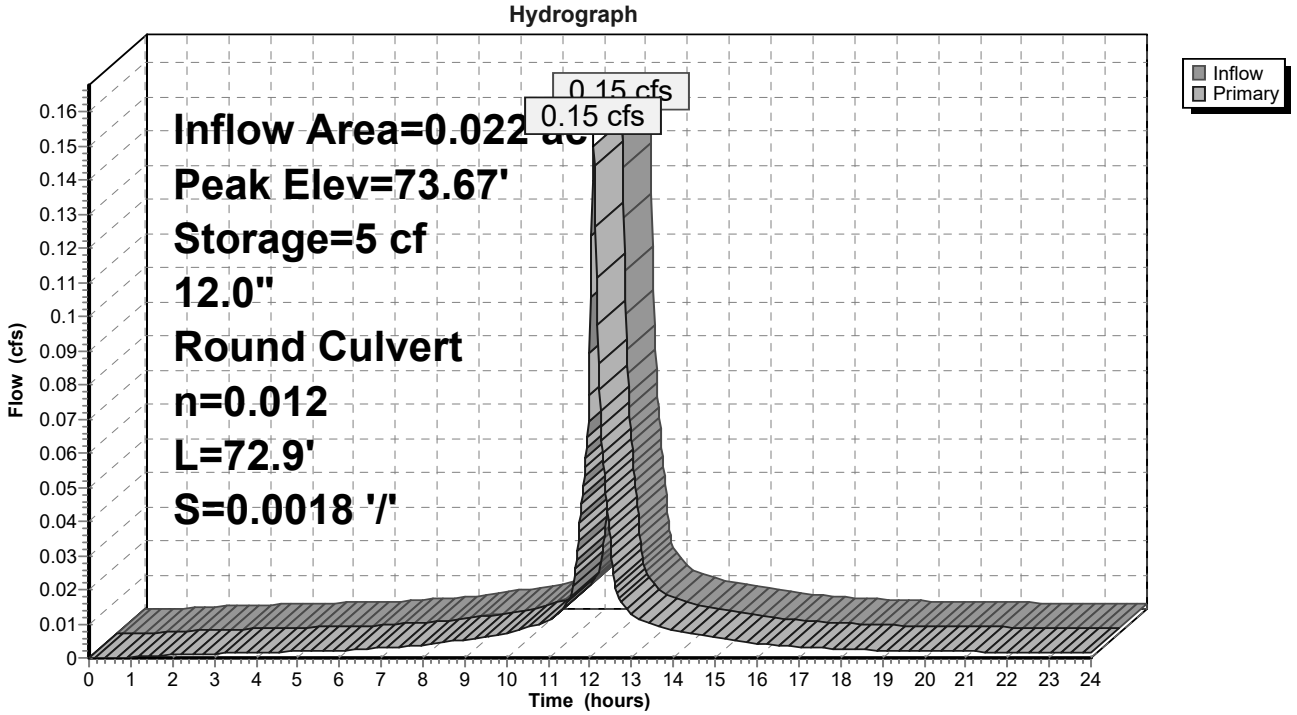
Plug-Flow detention time= 1.8 min calculated for 0.012 af (100% of inflow)
Center-of-Mass det. time= 1.3 min (743.9 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	73.27'	36 cf	**4.00'D x 2.90'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	73.27'	**12.0" Round Culvert** L= 72.9' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.27' / 73.14' S= 0.0018 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.15 cfs @ 12.09 hrs HW=73.66' TW=73.62' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.15 cfs @ 0.76 fps)

Pond 5P: CB #000



Summary for Pond 6P: CB #2779

[93] Warning: Storage range exceeded by 1.57'
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=31)

Inflow Area = 0.155 ac,100.00% Impervious, Inflow Depth > 6.66" for 25 YR - 24 HR event
Inflow = 1.05 cfs @ 12.08 hrs, Volume= 0.086 af
Outflow = 1.09 cfs @ 12.08 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.0 min
Primary = 1.09 cfs @ 12.08 hrs, Volume= 0.086 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 76.76' @ 12.08 hrs Surf.Area= 13 sf Storage= 34 cf

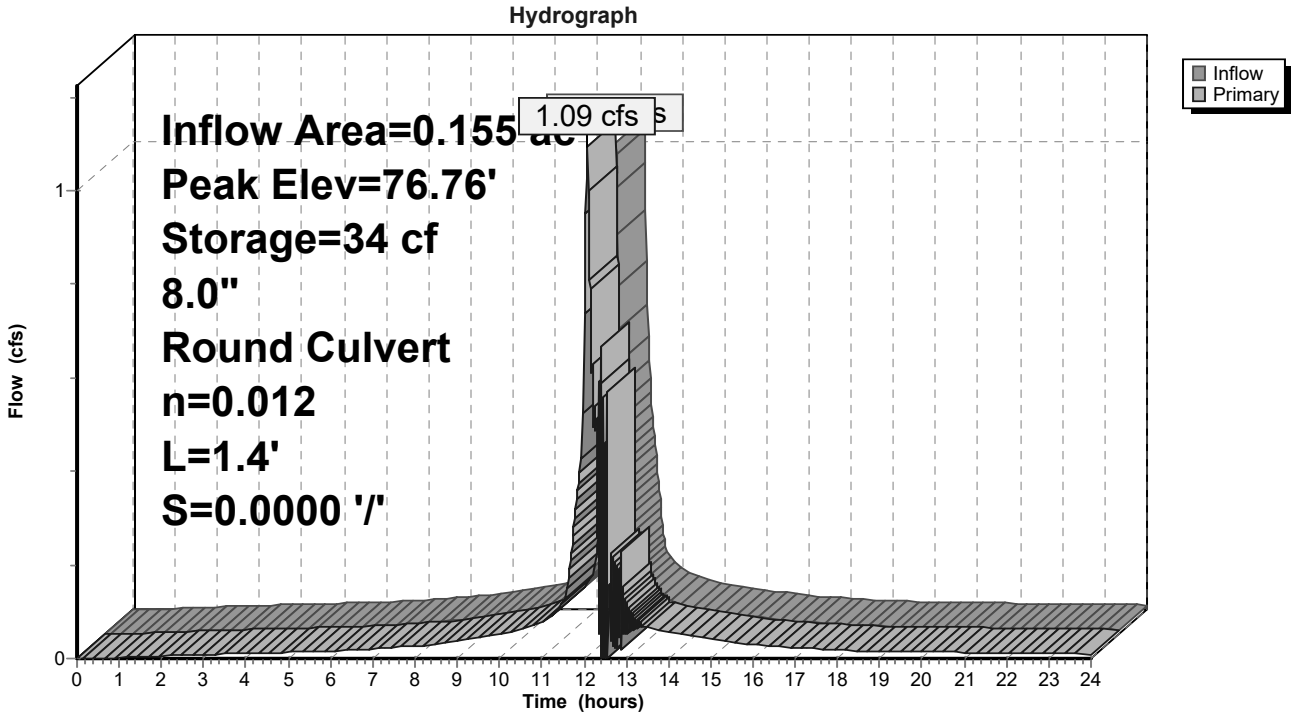
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.8 min (743.5 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	72.51'	34 cf	**4.00'D x 2.68'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	72.51'	**8.0" Round Culvert** L= 1.4' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.51' / 72.51' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=1.05 cfs @ 12.08 hrs HW=76.74' TW=76.35' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.05 cfs @ 3.01 fps)

Pond 6P: CB #2779



Summary for Pond 7aP: CB #811

[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)
[80] Warning: Exceeded Pond 7P by 0.59' @ 12.04 hrs (0.68 cfs 0.011 af)

Inflow Area = 0.161 ac,100.00% Impervious, Inflow Depth > 7.05" for 25 YR - 24 HR event
Inflow = 0.88 cfs @ 12.58 hrs, Volume= 0.095 af
Outflow = 0.97 cfs @ 12.50 hrs, Volume= 0.095 af, Atten= 0%, Lag= 0.0 min
Primary = 0.97 cfs @ 12.50 hrs, Volume= 0.095 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 75.32' @ 12.18 hrs Surf.Area= 127 sf Storage= 64 cf

Plug-Flow detention time= 0.7 min calculated for 0.094 af (100% of inflow)
Center-of-Mass det. time= 0.6 min (750.0 - 749.4)

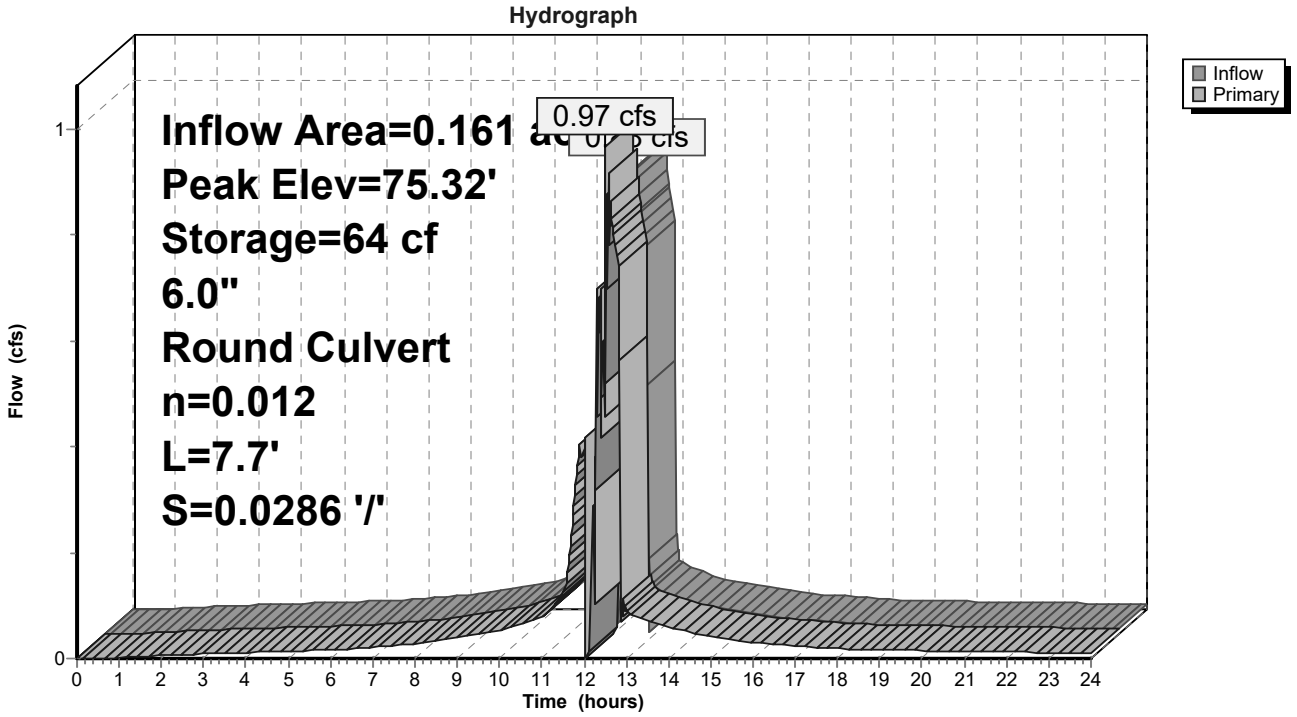
Volume	Invert	Avail.Storage	Storage Description
#1	72.90'	25 cf	**4.00'D x 2.00'H Vertical Cone/Cylinder**
#2	74.90'	160 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
		185 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
74.90	4	8.0	0	0	4
75.00	100	50.0	4	4	198
76.21	160	64.0	156	160	342

Device	Routing	Invert	Outlet Devices
#1	Primary	72.90'	**6.0" Round Culvert** L= 7.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.90' / 72.68' S= 0.0286 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.00 cfs @ 12.50 hrs HW=74.78' TW=75.07' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Pond 7aP: CB #811



Summary for Pond 7P: CB #846

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=10)

Inflow Area = 0.157 ac,100.00% Impervious, Inflow Depth > 6.66" for 25 YR - 24 HR event
Inflow = 1.06 cfs @ 12.08 hrs, Volume= 0.087 af
Outflow = 0.88 cfs @ 12.58 hrs, Volume= 0.087 af, Atten= 18%, Lag= 29.8 min
Primary = 0.88 cfs @ 12.58 hrs, Volume= 0.092 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 75.12' @ 12.40 hrs Surf.Area= 1,780 sf Storage= 846 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 7.7 min (750.3 - 742.6)

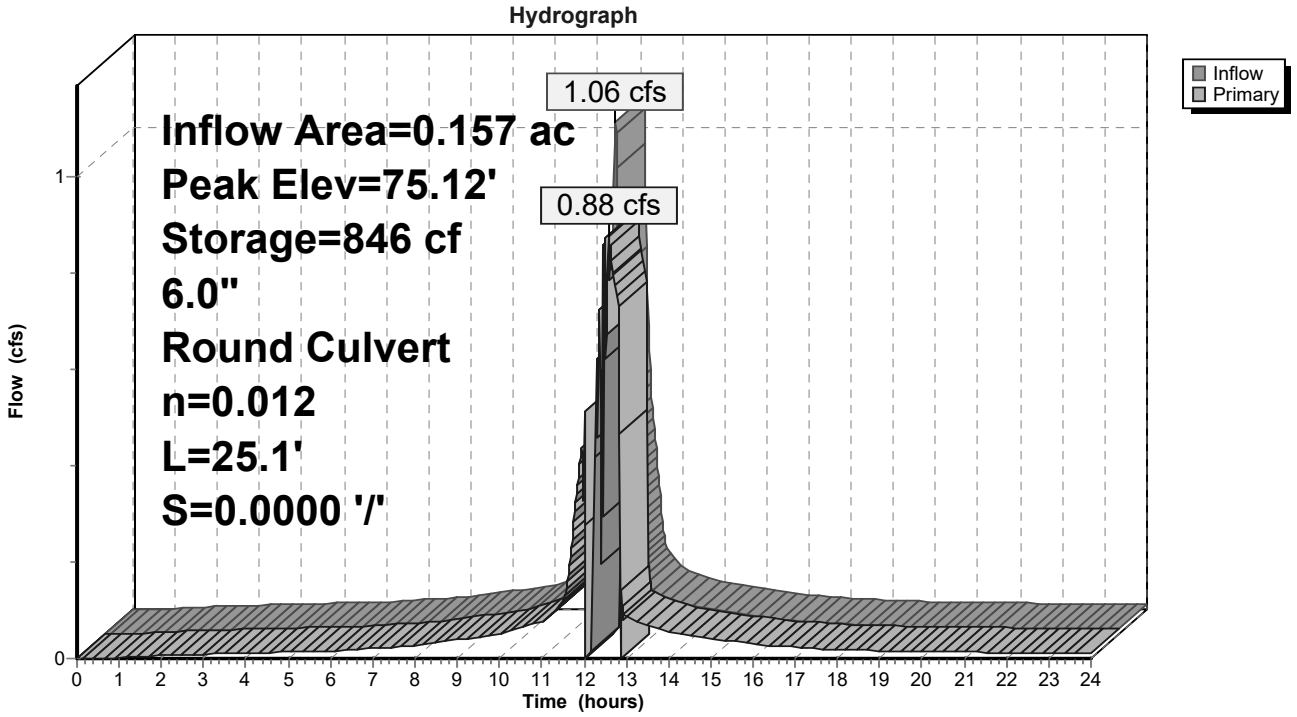
Volume	Invert	Avail.Storage	Storage Description
#1	72.88'	18 cf	**4.00'D x 1.46'H Vertical Cone/Cylinder**
#2	74.33'	1,804 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
		1,822 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
74.33	4	8.0	0	0	4
74.50	804	186.0	49	49	2,752
75.35	2,219	194.0	1,235	1,284	3,043
75.55	3,000	200.0	520	1,804	3,235

Device	Routing	Invert	Outlet Devices
#1	Primary	72.88'	**6.0" Round Culvert** L= 25.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.88' / 72.88' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.84 cfs @ 12.58 hrs HW=74.99' TW=74.08' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.84 cfs @ 4.28 fps)

Pond 7P: CB #846



Summary for Pond 8P: CB #2776

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=9)
[80] Warning: Exceeded Pond 10P by 2.95' @ 12.16 hrs (1.57 cfs 0.074 af)

Inflow Area = 0.280 ac, 95.37% Impervious, Inflow Depth > 6.22" for 25 YR - 24 HR event
Inflow = 1.22 cfs @ 12.08 hrs, Volume= 0.145 af
Outflow = 1.19 cfs @ 12.46 hrs, Volume= 0.145 af, Atten= 2%, Lag= 22.6 min
Primary = 1.19 cfs @ 12.46 hrs, Volume= 0.149 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 75.42' @ 12.19 hrs Surf.Area= 4,389 sf Storage= 548 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1.9 min (807.3 - 805.4)

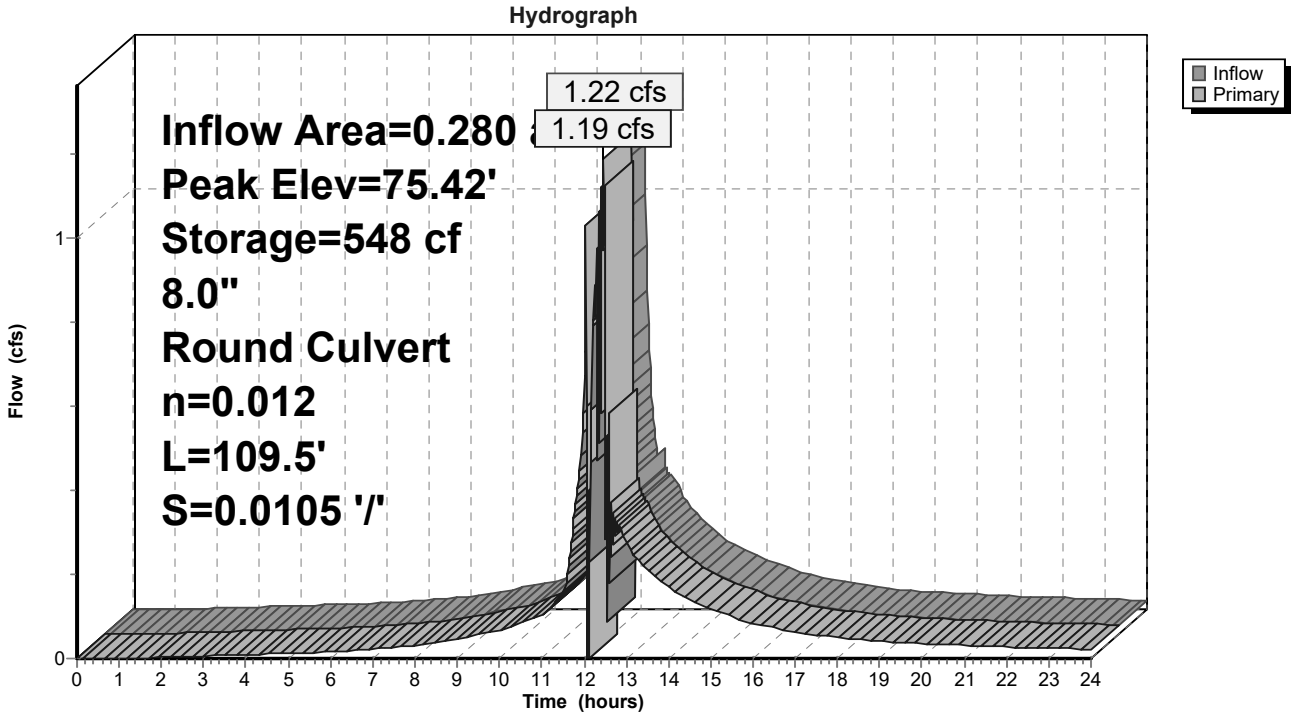
Volume	Invert	Avail.Storage	Storage Description
#1	72.00'	39 cf	**4.00'D x 3.10'H Vertical Cone/Cylinder**
#2	75.09'	926 cf	**OPen Water Storage (Irregular)**Listed below (Recalc)
		965 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.09	4	8.0	0	0	4
75.36	3,000	250.0	280	280	4,973
75.50	6,442	354.2	646	926	9,983

Device	Routing	Invert	Outlet Devices
#1	Primary	72.00'	**8.0" Round Culvert** L= 109.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.00' / 70.85' S= 0.0105 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.83 cfs @ 12.46 hrs HW=75.30' TW=74.73' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.83 cfs @ 2.37 fps)

Pond 8P: CB #2776



Summary for Pond 9P: CB #7443

[80] Warning: Exceeded Pond 8P by 0.63' @ 12.54 hrs (0.87 cfs 0.006 af)

Inflow Area = 0.651 ac, 96.66% Impervious, Inflow Depth > 6.60" for 25 YR - 24 HR event
Inflow = 2.52 cfs @ 12.38 hrs, Volume= 0.358 af
Outflow = 2.07 cfs @ 12.48 hrs, Volume= 0.358 af, Atten= 18%, Lag= 6.0 min
Primary = 2.07 cfs @ 12.48 hrs, Volume= 0.358 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 75.43' @ 12.06 hrs Surf.Area= 232 sf Storage= 77 cf

Plug-Flow detention time= 0.3 min calculated for 0.358 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (772.9 - 772.7)

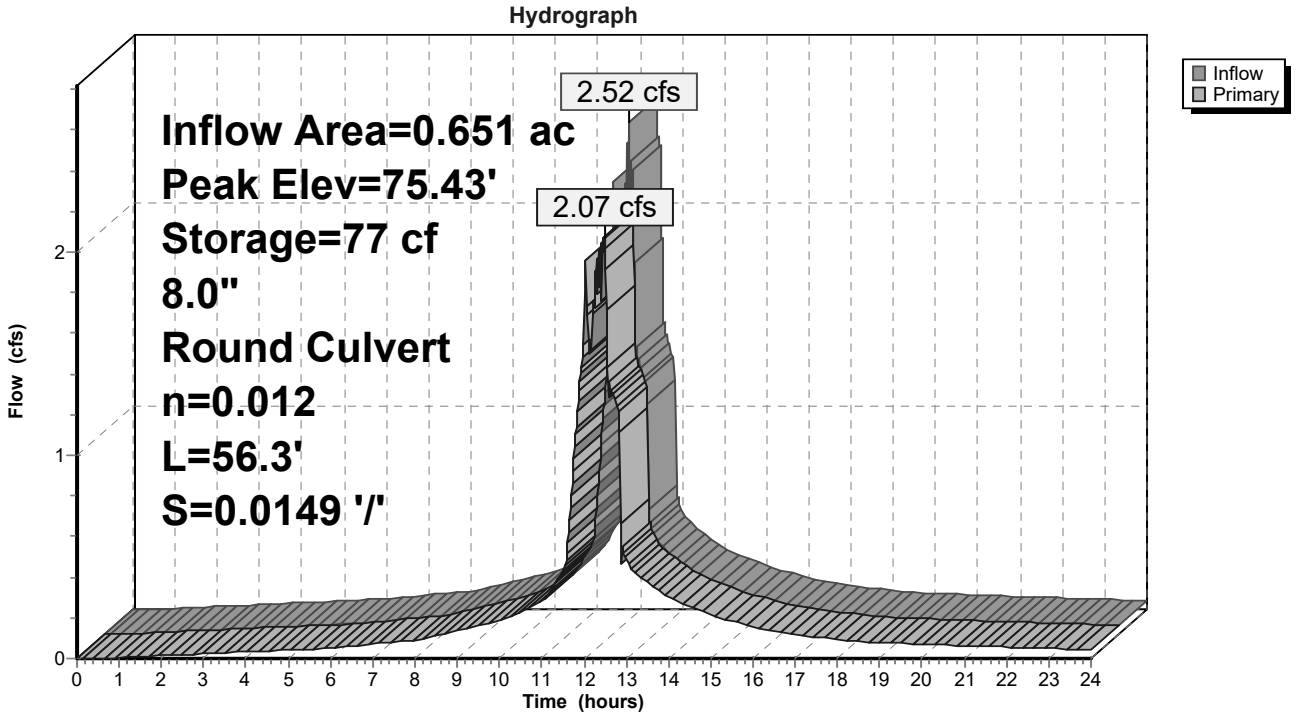
Volume	Invert	Avail.Storage	Storage Description
#1	70.78'	57 cf	**4.00'D x 4.57'H Vertical Cone/Cylinder**
#2	75.20'	657 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
		714 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.20	4	8.0	0	0	4
75.40	165	54.4	13	13	234
76.01	2,374	200.0	644	657	3,183

Device	Routing	Invert	Outlet Devices
#1	Primary	70.78'	**8.0" Round Culvert** L= 56.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.78' / 69.94' S= 0.0149 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=2.08 cfs @ 12.48 hrs HW=74.83' TW=72.57' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 2.08 cfs @ 5.97 fps)

Pond 9P: CB #7443



Summary for Pond 10P: Roof Drain

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=4)

Inflow Area = 0.099 ac,100.00% Impervious, Inflow Depth > 6.66" for 25 YR - 24 HR event
Inflow = 0.67 cfs @ 12.08 hrs, Volume= 0.055 af
Outflow = 0.19 cfs @ 12.84 hrs, Volume= 0.048 af, Atten= 71%, Lag= 45.7 min
Primary = 0.21 cfs @ 12.58 hrs, Volume= 0.048 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 72.54' @ 12.59 hrs Surf.Area= 4,300 sf Storage= 1,477 cf

Plug-Flow detention time= 227.0 min calculated for 0.047 af (87% of inflow)
Center-of-Mass det. time= 167.1 min (909.7 - 742.6)

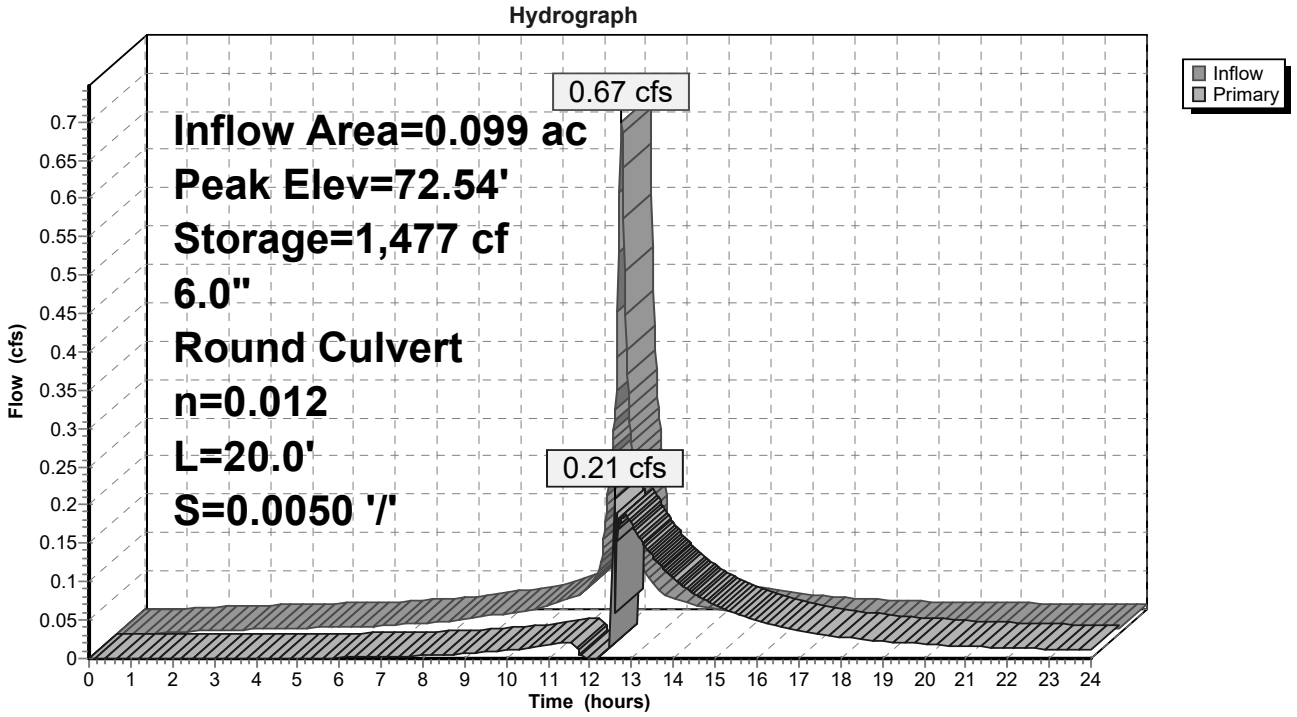
Volume	Invert	Avail.Storage	Storage Description
#1	72.20'	2,150 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
72.20	4,300	286.0	0	0	4,300
72.70	4,300	286.0	2,150	2,150	4,443

Device	Routing	Invert	Outlet Devices
#1	Primary	72.20'	**6.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.20' / 72.10' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.07 cfs @ 12.58 hrs HW=72.54' TW=72.52' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.07 cfs @ 0.66 fps)

Pond 10P: Roof Drain



Summary for Pond D1P: DMH #796

[93] Warning: Storage range exceeded by 0.23'
[80] Warning: Exceeded Pond 6P by 1.53' @ 12.34 hrs (2.08 cfs 0.046 af)
[80] Warning: Exceeded Pond 7aP by 1.14' @ 12.34 hrs (1.01 cfs 0.030 af)

Inflow Area = 0.317 ac,100.00% Impervious, Inflow Depth > 6.88" for 25 YR - 24 HR event
Inflow = 1.45 cfs @ 12.54 hrs, Volume= 0.181 af
Outflow = 1.28 cfs @ 12.38 hrs, Volume= 0.181 af, Atten= 11%, Lag= 0.0 min
Primary = 1.28 cfs @ 12.38 hrs, Volume= 0.181 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 3
Peak Elev= 76.35' @ 12.08 hrs Surf.Area= 13 sf Storage= 44 cf

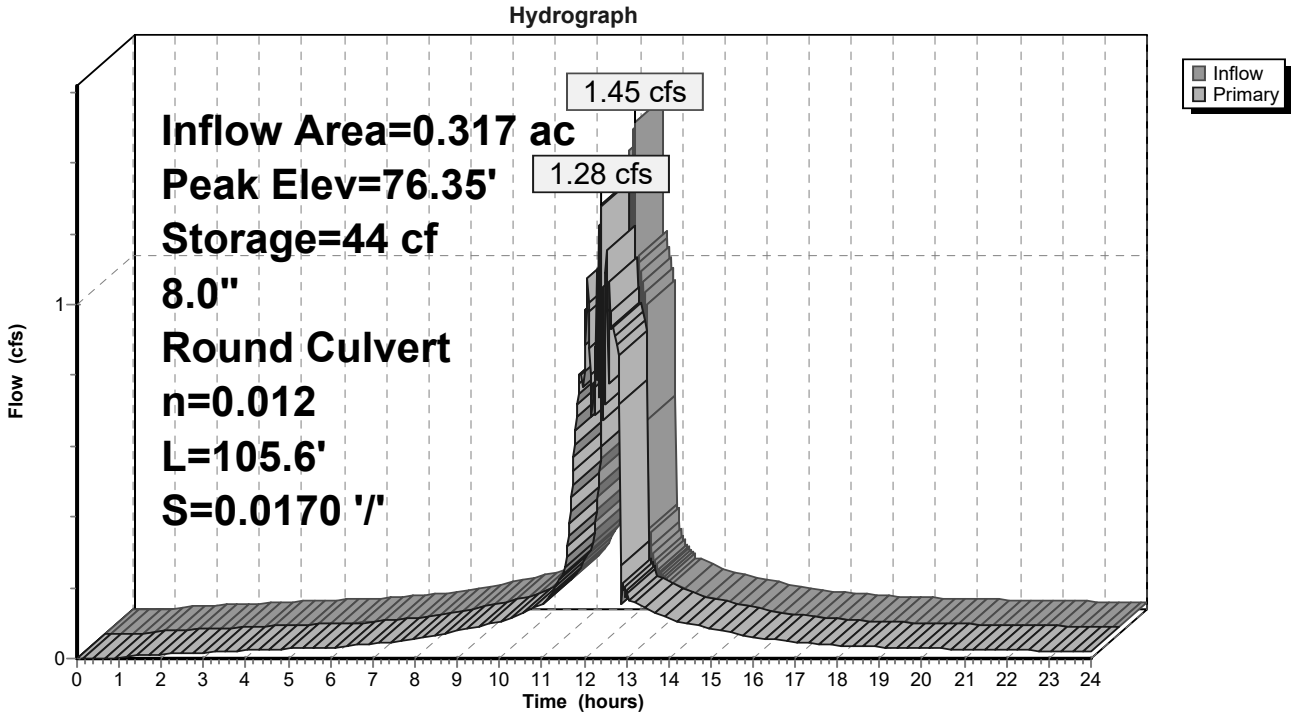
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.3 min (747.2 - 746.8)

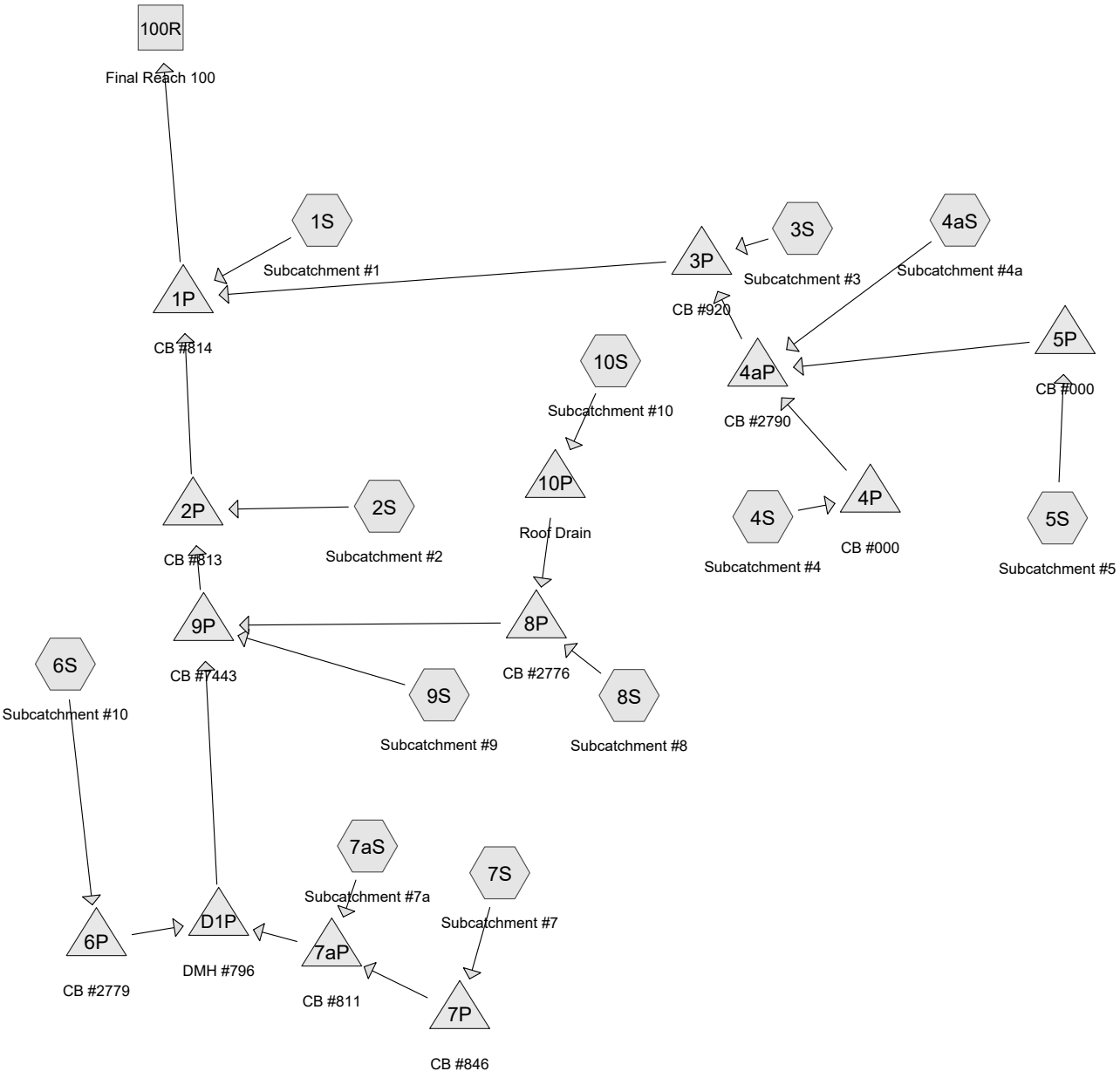
Volume	Invert	Avail.Storage	Storage Description
#1	72.58'	44 cf	**4.00'D x 3.54'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	72.58'	**8.0" Round Culvert** L= 105.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.58' / 70.79' S= 0.0170 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.85 cfs @ 12.38 hrs HW=75.64' TW=75.06' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.85 cfs @ 2.42 fps)

Pond D1P: DMH #796





Subcat Reach Pond Link

Routing Diagram for 18-146 Proposed Drainage
Prepared by Berry Surveying & Engineering, Printed 1/7/2019
HydroCAD® 10.00-22 s/n 07605 © 2018 HydroCAD Software Solutions LLC

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	0.000	0.076	0.000	0.000	0.076	>75% Grass cover, Good	1S, 2S, 4aS, 5S, 8S, 9S
0.000	0.000	0.004	0.000	0.000	0.004	Gravel surface	2S
0.000	0.000	0.058	0.000	0.000	0.058	Paved parking	4S
0.000	0.000	0.968	0.000	0.000	0.968	Unconnected pavement	1S, 2S, 4aS, 5S, 6S, 7aS, 7S, 8S, 9S
0.000	0.000	0.192	0.000	0.000	0.192	Unconnected roofs	1S, 2S, 3S, 4S, 10S
0.000	**0.000**	**1.297**	**0.000**	**0.000**	**1.297**	**TOTAL AREA**	

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 3
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=8,582 sf 80.14% Impervious Runoff Depth>2.86"
Flow Length=208' Tc=7.4 min CN=93 Runoff=0.60 cfs 0.047 af

Subcatchment 2S: Subcatchment #2 Runoff Area=11,047 sf 93.98% Impervious Runoff Depth>3.28"
Flow Length=213' Tc=11.0 min CN=97 Runoff=0.75 cfs 0.069 af

Subcatchment 3S: Subcatchment #3 Runoff Area=2,742 sf 100.00% Impervious Runoff Depth>3.39"
Tc=6.0 min CN=98 Runoff=0.22 cfs 0.018 af

Subcatchment 4aS: Subcatchment #4a Runoff Area=1,773 sf 91.82% Impervious Runoff Depth>3.17"
Tc=6.0 min CN=96 Runoff=0.14 cfs 0.011 af

Subcatchment 4S: Subcatchment #4 Runoff Area=3,015 sf 100.00% Impervious Runoff Depth>3.39"
Tc=6.0 min CN=98 Runoff=0.24 cfs 0.020 af

Subcatchment 5S: Subcatchment #5 Runoff Area=965 sf 99.48% Impervious Runoff Depth>3.39"
Tc=6.0 min CN=98 Runoff=0.08 cfs 0.006 af

Subcatchment 6S: Subcatchment #10 Runoff Area=6,771 sf 100.00% Impervious Runoff Depth>3.39"
Tc=6.0 min CN=98 Runoff=0.55 cfs 0.044 af

Subcatchment 7aS: Subcatchment #7a Runoff Area=173 sf 100.00% Impervious Runoff Depth>3.39"
Tc=6.0 min CN=98 Runoff=0.01 cfs 0.001 af

Subcatchment 7S: Subcatchment #7 Runoff Area=6,844 sf 100.00% Impervious Runoff Depth>3.39"
Tc=6.0 min CN=98 Runoff=0.55 cfs 0.044 af

Subcatchment 8S: Subcatchment #8 Runoff Area=7,916 sf 92.85% Impervious Runoff Depth>3.17"
Tc=6.0 min CN=96 Runoff=0.62 cfs 0.048 af

Subcatchment 9S: Subcatchment #9 Runoff Area=2,361 sf 83.86% Impervious Runoff Depth>2.96"
Tc=6.0 min CN=94 Runoff=0.18 cfs 0.013 af

Subcatchment 10S: Subcatchment #10 Runoff Area=4,300 sf 100.00% Impervious Runoff Depth>3.39"
Tc=6.0 min CN=98 Runoff=0.35 cfs 0.028 af

Reach 100R: Final Reach 100 Inflow=3.43 cfs 0.343 af
Outflow=3.43 cfs 0.343 af

Pond 1P: CB #814 Peak Elev=70.04' Storage=19 cf Inflow=3.42 cfs 0.343 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=3.43 cfs 0.343 af

Pond 2P: CB #813 Peak Elev=72.33' Storage=30 cf Inflow=2.43 cfs 0.242 af
8.0" Round Culvert n=0.012 L=28.5' S=0.0456 '/' Outflow=2.42 cfs 0.242 af

Pond 3P: CB #920 Peak Elev=70.70' Storage=8 cf Inflow=0.68 cfs 0.054 af
10.0" Round Culvert n=0.012 L=229.8' S=0.0065 '/' Outflow=0.68 cfs 0.054 af

Pond 4aP: CB #2790 Peak Elev=73.48' Storage=4 cf Inflow=0.46 cfs 0.037 af
12.0" Round Culvert n=0.012 L=32.9' S=0.0529 '/' Outflow=0.46 cfs 0.037 af

Pond 4P: CB #000 Peak Elev=73.70' Storage=4 cf Inflow=0.24 cfs 0.020 af
12.0" Round Culvert n=0.012 L=30.9' S=0.0049 '/' Outflow=0.24 cfs 0.020 af

Pond 5P: CB #000 Peak Elev=73.53' Storage=3 cf Inflow=0.08 cfs 0.006 af
12.0" Round Culvert n=0.012 L=72.9' S=0.0018 '/' Outflow=0.08 cfs 0.006 af

Pond 6P: CB #2779 Peak Elev=74.71' Storage=28 cf Inflow=0.55 cfs 0.044 af
8.0" Round Culvert n=0.012 L=1.4' S=0.0000 '/' Outflow=0.51 cfs 0.044 af

Pond 7aP: CB #811 Peak Elev=74.76' Storage=23 cf Inflow=0.66 cfs 0.046 af
6.0" Round Culvert n=0.012 L=7.7' S=0.0286 '/' Outflow=0.73 cfs 0.046 af

Pond 7P: CB #846 Peak Elev=74.49' Storage=63 cf Inflow=0.55 cfs 0.044 af
6.0" Round Culvert n=0.012 L=25.1' S=0.0000 '/' Outflow=0.66 cfs 0.044 af

Pond 8P: CB #2776 Peak Elev=74.11' Storage=27 cf Inflow=0.62 cfs 0.070 af
8.0" Round Culvert n=0.012 L=109.5' S=0.0105 '/' Outflow=0.59 cfs 0.070 af

Pond 9P: CB #7443 Peak Elev=73.96' Storage=40 cf Inflow=1.71 cfs 0.173 af
8.0" Round Culvert n=0.012 L=56.3' S=0.0149 '/' Outflow=1.72 cfs 0.173 af

Pond 10P: Roof Drain Peak Elev=72.37' Storage=730 cf Inflow=0.35 cfs 0.028 af
6.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=0.06 cfs 0.022 af

Pond D1P: DMH #796 Peak Elev=74.73' Storage=27 cf Inflow=1.16 cfs 0.089 af
8.0" Round Culvert n=0.012 L=105.6' S=0.0170 '/' Outflow=1.18 cfs 0.089 af

Total Runoff Area = 1.297 ac Runoff Volume = 0.349 af Average Runoff Depth = 3.23"
6.14% Pervious = 0.080 ac 93.86% Impervious = 1.217 ac

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 3
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=8,582 sf 80.14% Impervious Runoff Depth>4.66"
Flow Length=208' Tc=7.4 min CN=93 Runoff=0.96 cfs 0.076 af

Subcatchment 2S: Subcatchment #2 Runoff Area=11,047 sf 93.98% Impervious Runoff Depth>5.11"
Flow Length=213' Tc=11.0 min CN=97 Runoff=1.15 cfs 0.108 af

Subcatchment 3S: Subcatchment #3 Runoff Area=2,742 sf 100.00% Impervious Runoff Depth>5.23"
Tc=6.0 min CN=98 Runoff=0.34 cfs 0.027 af

Subcatchment 4aS: Subcatchment #4a Runoff Area=1,773 sf 91.82% Impervious Runoff Depth>5.00"
Tc=6.0 min CN=96 Runoff=0.21 cfs 0.017 af

Subcatchment 4S: Subcatchment #4 Runoff Area=3,015 sf 100.00% Impervious Runoff Depth>5.23"
Tc=6.0 min CN=98 Runoff=0.37 cfs 0.030 af

Subcatchment 5S: Subcatchment #5 Runoff Area=965 sf 99.48% Impervious Runoff Depth>5.23"
Tc=6.0 min CN=98 Runoff=0.12 cfs 0.010 af

Subcatchment 6S: Subcatchment #10 Runoff Area=6,771 sf 100.00% Impervious Runoff Depth>5.23"
Tc=6.0 min CN=98 Runoff=0.83 cfs 0.068 af

Subcatchment 7aS: Subcatchment #7a Runoff Area=173 sf 100.00% Impervious Runoff Depth>5.23"
Tc=6.0 min CN=98 Runoff=0.02 cfs 0.002 af

Subcatchment 7S: Subcatchment #7 Runoff Area=6,844 sf 100.00% Impervious Runoff Depth>5.23"
Tc=6.0 min CN=98 Runoff=0.84 cfs 0.068 af

Subcatchment 8S: Subcatchment #8 Runoff Area=7,916 sf 92.85% Impervious Runoff Depth>5.00"
Tc=6.0 min CN=96 Runoff=0.96 cfs 0.076 af

Subcatchment 9S: Subcatchment #9 Runoff Area=2,361 sf 83.86% Impervious Runoff Depth>4.77"
Tc=6.0 min CN=94 Runoff=0.28 cfs 0.022 af

Subcatchment 10S: Subcatchment #10 Runoff Area=4,300 sf 100.00% Impervious Runoff Depth>5.23"
Tc=6.0 min CN=98 Runoff=0.53 cfs 0.043 af

Reach 100R: Final Reach 100 Inflow=4.83 cfs 0.544 af
Outflow=4.83 cfs 0.544 af

Pond 1P: CB #814 Peak Elev=70.69' Storage=27 cf Inflow=4.82 cfs 0.544 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=4.83 cfs 0.544 af

Pond 2P: CB #813 Peak Elev=73.57' Storage=46 cf Inflow=2.91 cfs 0.383 af
8.0" Round Culvert n=0.012 L=28.5' S=0.0456 '/' Outflow=2.88 cfs 0.383 af

Pond 3P: CB #920 Peak Elev=71.06' Storage=12 cf Inflow=1.04 cfs 0.084 af
10.0" Round Culvert n=0.012 L=229.8' S=0.0065 '/' Outflow=1.02 cfs 0.084 af

Pond 4aP: CB #2790 Peak Elev=73.56' Storage=5 cf Inflow=0.70 cfs 0.057 af
12.0" Round Culvert n=0.012 L=32.9' S=0.0529 '/' Outflow=0.70 cfs 0.057 af

Pond 4P: CB #000 Peak Elev=73.78' Storage=5 cf Inflow=0.37 cfs 0.030 af
12.0" Round Culvert n=0.012 L=30.9' S=0.0049 '/' Outflow=0.37 cfs 0.030 af

Pond 5P: CB #000 Peak Elev=73.61' Storage=4 cf Inflow=0.12 cfs 0.010 af
12.0" Round Culvert n=0.012 L=72.9' S=0.0018 '/' Outflow=0.12 cfs 0.010 af

Pond 6P: CB #2779 Peak Elev=76.02' Storage=34 cf Inflow=0.83 cfs 0.068 af
8.0" Round Culvert n=0.012 L=1.4' S=0.0000 '/' Outflow=0.90 cfs 0.068 af

Pond 7aP: CB #811 Peak Elev=75.16' Storage=46 cf Inflow=0.79 cfs 0.073 af
6.0" Round Culvert n=0.012 L=7.7' S=0.0286 '/' Outflow=0.90 cfs 0.073 af

Pond 7P: CB #846 Peak Elev=74.94' Storage=553 cf Inflow=0.84 cfs 0.068 af
6.0" Round Culvert n=0.012 L=25.1' S=0.0000 '/' Outflow=0.78 cfs 0.068 af

Pond 8P: CB #2776 Peak Elev=75.24' Storage=93 cf Inflow=0.96 cfs 0.112 af
8.0" Round Culvert n=0.012 L=109.5' S=0.0105 '/' Outflow=0.92 cfs 0.112 af

Pond 9P: CB #7443 Peak Elev=75.03' Storage=53 cf Inflow=2.09 cfs 0.275 af
8.0" Round Culvert n=0.012 L=56.3' S=0.0149 '/' Outflow=1.95 cfs 0.275 af

Pond 10P: Roof Drain Peak Elev=72.47' Storage=1,152 cf Inflow=0.53 cfs 0.043 af
6.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=0.14 cfs 0.036 af

Pond D1P: DMH #796 Peak Elev=75.61' Storage=38 cf Inflow=1.64 cfs 0.142 af
8.0" Round Culvert n=0.012 L=105.6' S=0.0170 '/' Outflow=1.19 cfs 0.142 af

Total Runoff Area = 1.297 ac Runoff Volume = 0.547 af Average Runoff Depth = 5.06"
6.14% Pervious = 0.080 ac 93.86% Impervious = 1.217 ac

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 3
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=8,582 sf 80.14% Impervious Runoff Depth>6.07"
Flow Length=208' Tc=7.4 min CN=93 Runoff=1.23 cfs 0.100 af

Subcatchment 2S: Subcatchment #2 Runoff Area=11,047 sf 93.98% Impervious Runoff Depth>6.53"
Flow Length=213' Tc=11.0 min CN=97 Runoff=1.46 cfs 0.138 af

Subcatchment 3S: Subcatchment #3 Runoff Area=2,742 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.43 cfs 0.035 af

Subcatchment 4aS: Subcatchment #4a Runoff Area=1,773 sf 91.82% Impervious Runoff Depth>6.42"
Tc=6.0 min CN=96 Runoff=0.27 cfs 0.022 af

Subcatchment 4S: Subcatchment #4 Runoff Area=3,015 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.47 cfs 0.038 af

Subcatchment 5S: Subcatchment #5 Runoff Area=965 sf 99.48% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af

Subcatchment 6S: Subcatchment #10 Runoff Area=6,771 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=1.05 cfs 0.086 af

Subcatchment 7aS: Subcatchment #7a Runoff Area=173 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.03 cfs 0.002 af

Subcatchment 7S: Subcatchment #7 Runoff Area=6,844 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=1.06 cfs 0.087 af

Subcatchment 8S: Subcatchment #8 Runoff Area=7,916 sf 92.85% Impervious Runoff Depth>6.42"
Tc=6.0 min CN=96 Runoff=1.22 cfs 0.097 af

Subcatchment 9S: Subcatchment #9 Runoff Area=2,361 sf 83.86% Impervious Runoff Depth>6.18"
Tc=6.0 min CN=94 Runoff=0.36 cfs 0.028 af

Subcatchment 10S: Subcatchment #10 Runoff Area=4,300 sf 100.00% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=98 Runoff=0.67 cfs 0.055 af

Reach 100R: Final Reach 100 Inflow=5.42 cfs 0.703 af
Outflow=5.42 cfs 0.703 af

Pond 1P: CB #814 Peak Elev=71.11' Storage=32 cf Inflow=5.43 cfs 0.703 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=5.42 cfs 0.703 af

Pond 2P: CB #813 Peak Elev=74.19' Storage=54 cf Inflow=3.01 cfs 0.496 af
8.0" Round Culvert n=0.012 L=28.5' S=0.0456 '/' Outflow=3.01 cfs 0.496 af

Pond 3P: CB #920 Peak Elev=71.89' Storage=23 cf Inflow=1.31 cfs 0.107 af
10.0" Round Culvert n=0.012 L=229.8' S=0.0065 '/' Outflow=1.32 cfs 0.107 af

Pond 4aP: CB #2790 Peak Elev=73.62' Storage=6 cf Inflow=0.89 cfs 0.072 af
12.0" Round Culvert n=0.012 L=32.9' S=0.0529 '/' Outflow=0.89 cfs 0.072 af

Pond 4P: CB #000 Peak Elev=73.84' Storage=5 cf Inflow=0.47 cfs 0.038 af
12.0" Round Culvert n=0.012 L=30.9' S=0.0049 '/' Outflow=0.47 cfs 0.038 af

Pond 5P: CB #000 Peak Elev=73.67' Storage=5 cf Inflow=0.15 cfs 0.012 af
12.0" Round Culvert n=0.012 L=72.9' S=0.0018 '/' Outflow=0.15 cfs 0.012 af

Pond 6P: CB #2779 Peak Elev=76.76' Storage=34 cf Inflow=1.05 cfs 0.086 af
8.0" Round Culvert n=0.012 L=1.4' S=0.0000 '/' Outflow=1.09 cfs 0.086 af

Pond 7aP: CB #811 Peak Elev=75.32' Storage=64 cf Inflow=0.88 cfs 0.095 af
6.0" Round Culvert n=0.012 L=7.7' S=0.0286 '/' Outflow=0.97 cfs 0.095 af

Pond 7P: CB #846 Peak Elev=75.12' Storage=846 cf Inflow=1.06 cfs 0.087 af
6.0" Round Culvert n=0.012 L=25.1' S=0.0000 '/' Outflow=0.88 cfs 0.087 af

Pond 8P: CB #2776 Peak Elev=75.42' Storage=548 cf Inflow=1.22 cfs 0.145 af
8.0" Round Culvert n=0.012 L=109.5' S=0.0105 '/' Outflow=1.19 cfs 0.145 af

Pond 9P: CB #7443 Peak Elev=75.43' Storage=77 cf Inflow=2.52 cfs 0.358 af
8.0" Round Culvert n=0.012 L=56.3' S=0.0149 '/' Outflow=2.07 cfs 0.358 af

Pond 10P: Roof Drain Peak Elev=72.54' Storage=1,477 cf Inflow=0.67 cfs 0.055 af
6.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=0.19 cfs 0.048 af

Pond D1P: DMH #796 Peak Elev=76.35' Storage=44 cf Inflow=1.45 cfs 0.181 af
8.0" Round Culvert n=0.012 L=105.6' S=0.0170 '/' Outflow=1.28 cfs 0.181 af

Total Runoff Area = 1.297 ac Runoff Volume = 0.700 af Average Runoff Depth = 6.48"
6.14% Pervious = 0.080 ac 93.86% Impervious = 1.217 ac

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 3
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=8,582 sf 80.14% Impervious Runoff Depth>7.40"
Flow Length=208' Tc=7.4 min CN=93 Runoff=1.48 cfs 0.122 af

Subcatchment 2S: Subcatchment #2 Runoff Area=11,047 sf 93.98% Impervious Runoff Depth>7.88"
Flow Length=213' Tc=11.0 min CN=97 Runoff=1.74 cfs 0.167 af

Subcatchment 3S: Subcatchment #3 Runoff Area=2,742 sf 100.00% Impervious Runoff Depth>8.00"
Tc=6.0 min CN=98 Runoff=0.51 cfs 0.042 af

Subcatchment 4aS: Subcatchment #4a Runoff Area=1,773 sf 91.82% Impervious Runoff Depth>7.76"
Tc=6.0 min CN=96 Runoff=0.33 cfs 0.026 af

Subcatchment 4S: Subcatchment #4 Runoff Area=3,015 sf 100.00% Impervious Runoff Depth>8.00"
Tc=6.0 min CN=98 Runoff=0.56 cfs 0.046 af

Subcatchment 5S: Subcatchment #5 Runoff Area=965 sf 99.48% Impervious Runoff Depth>8.00"
Tc=6.0 min CN=98 Runoff=0.18 cfs 0.015 af

Subcatchment 6S: Subcatchment #10 Runoff Area=6,771 sf 100.00% Impervious Runoff Depth>8.00"
Tc=6.0 min CN=98 Runoff=1.26 cfs 0.104 af

Subcatchment 7aS: Subcatchment #7a Runoff Area=173 sf 100.00% Impervious Runoff Depth>8.00"
Tc=6.0 min CN=98 Runoff=0.03 cfs 0.003 af

Subcatchment 7S: Subcatchment #7 Runoff Area=6,844 sf 100.00% Impervious Runoff Depth>8.00"
Tc=6.0 min CN=98 Runoff=1.27 cfs 0.105 af

Subcatchment 8S: Subcatchment #8 Runoff Area=7,916 sf 92.85% Impervious Runoff Depth>7.76"
Tc=6.0 min CN=96 Runoff=1.46 cfs 0.118 af

Subcatchment 9S: Subcatchment #9 Runoff Area=2,361 sf 83.86% Impervious Runoff Depth>7.52"
Tc=6.0 min CN=94 Runoff=0.43 cfs 0.034 af

Subcatchment 10S: Subcatchment #10 Runoff Area=4,300 sf 100.00% Impervious Runoff Depth>8.00"
Tc=6.0 min CN=98 Runoff=0.80 cfs 0.066 af

Reach 100R: Final Reach 100 Inflow=6.00 cfs 0.841 af
Outflow=6.00 cfs 0.841 af

Pond 1P: CB #814 Peak Elev=71.58' Storage=38 cf Inflow=6.00 cfs 0.841 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=6.00 cfs 0.841 af

Pond 2P: CB #813 Peak Elev=74.77' Storage=62 cf Inflow=3.08 cfs 0.590 af
8.0" Round Culvert n=0.012 L=28.5' S=0.0456 '/' Outflow=3.12 cfs 0.590 af

Pond 3P: CB #920 Peak Elev=72.62' Storage=32 cf Inflow=1.57 cfs 0.129 af
10.0" Round Culvert n=0.012 L=229.8' S=0.0065 '/' Outflow=1.55 cfs 0.129 af

Pond 4aP: CB #2790 Peak Elev=73.68' Storage=7 cf Inflow=1.07 cfs 0.087 af
12.0" Round Culvert n=0.012 L=32.9' S=0.0529 '/' Outflow=1.07 cfs 0.087 af

Pond 4P: CB #000 Peak Elev=73.89' Storage=6 cf Inflow=0.56 cfs 0.046 af
12.0" Round Culvert n=0.012 L=30.9' S=0.0049 '/' Outflow=0.56 cfs 0.046 af

Pond 5P: CB #000 Peak Elev=73.72' Storage=6 cf Inflow=0.18 cfs 0.015 af
12.0" Round Culvert n=0.012 L=72.9' S=0.0018 '/' Outflow=0.18 cfs 0.015 af

Pond 6P: CB #2779 Peak Elev=77.49' Storage=34 cf Inflow=1.26 cfs 0.104 af
8.0" Round Culvert n=0.012 L=1.4' S=0.0000 '/' Outflow=1.27 cfs 0.104 af

Pond 7aP: CB #811 Peak Elev=75.39' Storage=72 cf Inflow=0.89 cfs 0.108 af
6.0" Round Culvert n=0.012 L=7.7' S=0.0286 '/' Outflow=1.03 cfs 0.108 af

Pond 7P: CB #846 Peak Elev=75.28' Storage=1,159 cf Inflow=1.27 cfs 0.105 af
6.0" Round Culvert n=0.012 L=25.1' S=0.0000 '/' Outflow=0.89 cfs 0.105 af

Pond 8P: CB #2776 Peak Elev=75.48' Storage=831 cf Inflow=1.46 cfs 0.177 af
8.0" Round Culvert n=0.012 L=109.5' S=0.0105 '/' Outflow=1.33 cfs 0.177 af

Pond 9P: CB #7443 Peak Elev=75.57' Storage=128 cf Inflow=2.40 cfs 0.424 af
8.0" Round Culvert n=0.012 L=56.3' S=0.0149 '/' Outflow=2.10 cfs 0.424 af

Pond 10P: Roof Drain Peak Elev=72.62' Storage=1,787 cf Inflow=0.80 cfs 0.066 af
6.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=0.29 cfs 0.058 af

Pond D1P: DMH #796 Peak Elev=76.93' Storage=44 cf Inflow=1.47 cfs 0.213 af
8.0" Round Culvert n=0.012 L=105.6' S=0.0170 '/' Outflow=1.34 cfs 0.213 af

Total Runoff Area = 1.297 ac Runoff Volume = 0.846 af Average Runoff Depth = 7.83"
6.14% Pervious = 0.080 ac 93.86% Impervious = 1.217 ac

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 3
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=8,582 sf 80.14% Impervious Runoff Depth>9.00"
Flow Length=208' Tc=7.4 min CN=93 Runoff=1.79 cfs 0.148 af

Subcatchment 2S: Subcatchment #2 Runoff Area=11,047 sf 93.98% Impervious Runoff Depth>9.48"
Flow Length=213' Tc=11.0 min CN=97 Runoff=2.09 cfs 0.200 af

Subcatchment 3S: Subcatchment #3 Runoff Area=2,742 sf 100.00% Impervious Runoff Depth>9.61"
Tc=6.0 min CN=98 Runoff=0.61 cfs 0.050 af

Subcatchment 4aS: Subcatchment #4a Runoff Area=1,773 sf 91.82% Impervious Runoff Depth>9.37"
Tc=6.0 min CN=96 Runoff=0.39 cfs 0.032 af

Subcatchment 4S: Subcatchment #4 Runoff Area=3,015 sf 100.00% Impervious Runoff Depth>9.61"
Tc=6.0 min CN=98 Runoff=0.67 cfs 0.055 af

Subcatchment 5S: Subcatchment #5 Runoff Area=965 sf 99.48% Impervious Runoff Depth>9.61"
Tc=6.0 min CN=98 Runoff=0.21 cfs 0.018 af

Subcatchment 6S: Subcatchment #10 Runoff Area=6,771 sf 100.00% Impervious Runoff Depth>9.61"
Tc=6.0 min CN=98 Runoff=1.50 cfs 0.125 af

Subcatchment 7aS: Subcatchment #7a Runoff Area=173 sf 100.00% Impervious Runoff Depth>9.61"
Tc=6.0 min CN=98 Runoff=0.04 cfs 0.003 af

Subcatchment 7S: Subcatchment #7 Runoff Area=6,844 sf 100.00% Impervious Runoff Depth>9.61"
Tc=6.0 min CN=98 Runoff=1.52 cfs 0.126 af

Subcatchment 8S: Subcatchment #8 Runoff Area=7,916 sf 92.85% Impervious Runoff Depth>9.37"
Tc=6.0 min CN=96 Runoff=1.75 cfs 0.142 af

Subcatchment 9S: Subcatchment #9 Runoff Area=2,361 sf 83.86% Impervious Runoff Depth>9.13"
Tc=6.0 min CN=94 Runoff=0.52 cfs 0.041 af

Subcatchment 10S: Subcatchment #10 Runoff Area=4,300 sf 100.00% Impervious Runoff Depth>9.61"
Tc=6.0 min CN=98 Runoff=0.96 cfs 0.079 af

Reach 100R: Final Reach 100 Inflow=6.46 cfs 1.015 af
Outflow=6.46 cfs 1.015 af

Pond 1P: CB #814 Peak Elev=71.98' Storage=43 cf Inflow=6.46 cfs 1.015 af
12.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=6.46 cfs 1.015 af

Pond 2P: CB #813 Peak Elev=75.06' Storage=155 cf Inflow=3.30 cfs 0.712 af
8.0" Round Culvert n=0.012 L=28.5' S=0.0456 '/' Outflow=3.36 cfs 0.712 af

Pond 3P: CB #920 Peak Elev=73.58' Storage=44 cf Inflow=1.83 cfs 0.155 af
10.0" Round Culvert n=0.012 L=229.8' S=0.0065 '/' Outflow=1.81 cfs 0.155 af

Pond 4aP: CB #2790 Peak Elev=73.91' Storage=10 cf Inflow=1.26 cfs 0.105 af
12.0" Round Culvert n=0.012 L=32.9' S=0.0529 '/' Outflow=1.23 cfs 0.105 af

Pond 4P: CB #000 Peak Elev=74.01' Storage=7 cf Inflow=0.67 cfs 0.055 af
12.0" Round Culvert n=0.012 L=30.9' S=0.0049 '/' Outflow=0.66 cfs 0.055 af

Pond 5P: CB #000 Peak Elev=73.90' Storage=8 cf Inflow=0.21 cfs 0.018 af
12.0" Round Culvert n=0.012 L=72.9' S=0.0018 '/' Outflow=0.23 cfs 0.018 af

Pond 6P: CB #2779 Peak Elev=78.63' Storage=34 cf Inflow=1.50 cfs 0.125 af
8.0" Round Culvert n=0.012 L=1.4' S=0.0000 '/' Outflow=1.50 cfs 0.124 af

Pond 7aP: CB #811 Peak Elev=75.55' Storage=91 cf Inflow=0.97 cfs 0.130 af
6.0" Round Culvert n=0.012 L=7.7' S=0.0286 '/' Outflow=1.01 cfs 0.130 af

Pond 7P: CB #846 Peak Elev=75.55' Storage=1,815 cf Inflow=1.52 cfs 0.126 af
6.0" Round Culvert n=0.012 L=25.1' S=0.0000 '/' Outflow=0.96 cfs 0.126 af

Pond 8P: CB #2776 Peak Elev=78.13' Storage=965 cf Inflow=1.75 cfs 0.213 af
8.0" Round Culvert n=0.012 L=109.5' S=0.0105 '/' Outflow=1.66 cfs 0.213 af

Pond 9P: CB #7443 Peak Elev=75.95' Storage=591 cf Inflow=2.76 cfs 0.511 af
8.0" Round Culvert n=0.012 L=56.3' S=0.0149 '/' Outflow=2.10 cfs 0.511 af

Pond 10P: Roof Drain Peak Elev=75.37' Storage=2,150 cf Inflow=0.96 cfs 0.079 af
6.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=0.35 cfs 0.071 af

Pond D1P: DMH #796 Peak Elev=77.85' Storage=44 cf Inflow=1.55 cfs 0.257 af
8.0" Round Culvert n=0.012 L=105.6' S=0.0170 '/' Outflow=1.65 cfs 0.256 af

Total Runoff Area = 1.297 ac Runoff Volume = 1.019 af Average Runoff Depth = 9.43"
6.14% Pervious = 0.080 ac 93.86% Impervious = 1.217 ac



Map Scale: 1:1,360 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

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 18, Sep 5, 2018

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
SfC	Suffield silt loam, 8 to 15 percent slopes	7.9	100.0%
Totals for Area of Interest		**7.9**	**100.0%**

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Strafford County, New Hampshire



January 4, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:1,360 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

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.

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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)

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

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Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
SfC	Suffield silt loam, 8 to 15 percent slopes	7.9	100.0%
Totals for Area of Interest		**7.9**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

Strafford County, New Hampshire

SfC—Suffield silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9d8v
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Suffield

Typical profile

H1 - 0 to 19 inches: silt loam
H2 - 19 to 28 inches: silt loam
H3 - 28 to 41 inches: silty clay

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 9 percent
Hydric soil rating: No

Buxton

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

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: No

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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	70.877 degrees West
Latitude	43.199 degrees North
Elevation	0 feet
Date/Time	Tue, 23 Oct 2018 11:00:30 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr
1yr	0.26	0.40	0.50	0.65	0.81	1.03	**1yr**	0.70	0.98	1.20	1.54	2.00	2.60	2.87
2yr	0.32	0.49	0.61	0.81	1.01	1.29	**2yr**	0.88	1.17	1.50	1.91	2.45	3.15	3.51
5yr	0.37	0.57	0.72	0.96	1.23	1.58	**5yr**	1.06	1.44	1.85	2.39	3.08	3.98	4.49
10yr	0.40	0.63	0.80	1.09	1.42	1.85	**10yr**	1.22	1.69	2.18	2.83	3.66	4.75	5.42
25yr	0.46	0.74	0.94	1.30	1.72	2.27	**25yr**	1.49	2.09	2.70	3.53	4.61	6.00	6.95
50yr	0.52	0.83	1.06	1.48	2.00	2.67	**50yr**	1.73	2.46	3.18	4.19	5.49	7.17	8.40
100yr	0.58	0.94	1.21	1.71	2.32	3.12	**100yr**	2.01	2.89	3.75	4.96	6.53	8.57	10.15
200yr	0.64	1.05	1.36	1.95	2.70	3.67	**200yr**	2.33	3.40	4.43	5.89	7.79	10.25	12.26
500yr	0.76	1.24	1.62	2.36	3.31	4.54	**500yr**	2.85	4.22	5.50	7.37	9.81	12.98	15.75

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr	
1yr	0.24	0.37	0.45	0.60	0.74	0.90	**1yr**	0.64	0.88	0.92	1.25	1.57	2.13	2.46	
2yr	0.31	0.49	0.60	0.81	1.00	1.18	**2yr**	0.86	1.16	1.36	1.83	2.36	3.04	3.40	
5yr	0.35	0.54	0.67	0.91	1.16	1.40	**5yr**	1.00	1.37	1.61	2.15	2.78	3.71	4.12	
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.81	2.44	3.13	4.27	4.78	
25yr	0.44	0.66	0.83	1.18	1.55	1.91	**25yr**	1.34	1.87	2.11	2.84	3.65	4.95	5.78	
50yr	0.48	0.73	0.91	1.31	1.76	2.19	**50yr**	1.52	2.14	2.35	3.19	4.10	5.65	6.67	
100yr	0.54	0.81	1.02	1.47	2.01	2.51	**100yr**	1.74	2.45	2.63	3.57	4.57	6.44	7.68	1
200yr	0.59	0.90	1.13	1.64	2.29	2.87	**200yr**	1.98	2.81	2.93	3.99	5.10	7.33	8.85	2
500yr	0.69	1.03	1.33	1.93	2.74	3.46	**500yr**	2.37	3.38	3.40	4.62	5.92	8.67	10.65	5

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr
1yr	0.28	0.43	0.53	0.71	0.87	1.08	**1yr**	0.75	1.05	1.23	1.74	2.21	2.87	3.09
2yr	0.33	0.51	0.62	0.85	1.04	1.25	**2yr**	0.90	1.22	1.48	1.95	2.51	3.29	3.63
5yr	0.39	0.61	0.75	1.03	1.31	1.58	**5yr**	1.13	1.55	1.86	2.50	3.20	4.24	4.86
10yr	0.46	0.70	0.87	1.22	1.57	1.92	**10yr**	1.36	1.88	2.23	3.04	3.86	5.21	6.07
25yr	0.56	0.85	1.05	1.50	1.97	2.48	**25yr**	1.70	2.42	2.88	3.96	4.96	7.05	8.15
50yr	0.64	0.98	1.22	1.75	2.35	2.99	**50yr**	2.03	2.93	3.49	4.83	6.02	8.71	10.22
100yr	0.75	1.13	1.42	2.04	2.80	3.62	**100yr**	2.42	3.54	4.24	5.90	7.32	10.75	12.80
200yr	0.87	1.30	1.65	2.39	3.34	4.39	**200yr**	2.88	4.29	5.15	7.22	8.89	13.32	16.07
500yr	1.06	1.58	2.03	2.95	4.20	5.63	**500yr**	3.62	5.51	6.66	9.45	11.52	17.70	21.69



Dover Stormwater Management Plan (SWMP)

For Construction Activities At:

FOURTH STREET DEPOT
DARLENE COLWELL-ELLIS REVOCABLE FAMILY TRUST
10 FOURTH STREET
DOVER, NH
TAX MAP 35, LOT 57

SWMP Prepared for:

Groen Construction, Inc.
120 Washington Street, Suite #302
Rochester, NH 03839

SWMP Prepared by:

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825

PROJECT: DB 2018-146

SWMP PREPARATION DATE:

JANUARY 10, 2019

ESTIMATED PROJECT DATES:

PROJECT START DATE: __ /___ / 2019
PROJECT COMPLETION DATE: 2 /28 /2020

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SECTION 1: CONTACT INFORMATION / RESPONSIBLE PARTIES

1.0 The purpose of this Stormwater Management Plan is to provide a working document for the proposed commercial and residential re-development at 10 Fourth Street, Dover, NH, in conformance with the Site Development Design Criteria, Site Plan Review Regulations Dover Chapter 149. Reference is also made to the New Hampshire Stormwater Manual, Volume 2, Post-Construction Best Management Practices Selection & Design, dated December 2008 with addendums, and Volume 3 Erosion and Sediment Controls During Construction, dated December 2008 with addendums. (NH-SWM Vol. 2 & NH-SWM Vol.3)

1.1 Operator & Owner

Operator:

Groen Construction Inc.
Ryan Greenhalgh, Project Manager
120 Washington Street, Suite #302
Rochester, NH 03839
1-603-728-8955
ryan@groenconstruction.com

Owner:

Darlene Colwell-Ellis Revocable Family Trust
Darlene G. Colwell-Ellis, Trustee
10A Fourth Street
Dover, NH 03820
1-603-969-6632
Colwell-ellis@comcast.net

Emergency 24-Hour Contact:

Groen Construction Inc.
Ryan Greenhalgh, Project Manager
120 Washington Street, Suite #302
Rochester, NH 03839
1-603-728-8955
ryan@groenconstruction.com

1.2 Stormwater Team

Responsibility:
Position:
Name:
Company:
Telephone Number:
Mobile Phone Number:
Email Address:

Responsibility:	Project Manager / SWPPP Inspections
Position:	Project Manager
Name:	Christopher R. Berry, SIT
Company:	Berry Surveying & Engineering (Berry Construction Co., Inc.)
Telephone Number:	1-603-332-2863
Mobile Phone Number:	1-603-781-3403
Email Address:	crberry@berrysurveying.com

Responsibility:	Engineering Plans / Modifications / Inspection Supervision
Position:	Project Engineer (Project Design & SWMP)
Name:	Kenneth A. Berry, PE, LLS, CPSWQ, CPESC, CESSWI
Company:	Berry Surveying & Engineering (Berry Construction Co., Inc.)
Telephone Number:	1-603-332-2863
Mobile Phone Number:	1-603-978-0358
Email Address:	k.berry@berrysurveying.com

Responsibility:	SWPPP Inspections
Position:	SWPPP Inspector
Name:	James Hayden
Company:	Berry Surveying & Engineering (Berry Construction Co., Inc.)
Telephone Number:	1-603-332-2863
Mobile Phone Number:	1-603-953-3049
Email Address:	j.hayden@berrysurveying.com

SECTION 2: SITE EVALUATION, ASSESSMENT AND PLANNING

2.1 Project / Site Information

Project Name and Address

FOURTH STREET DEPOT
10 FOURTH STREET, DOVER, NH
TAX MAP 6, LOT 54D

Groen Construction Inc.
Ryan Greenhalgh, Project Manager
120 Washington Street, Suite #302
Rochester, NH 03839
1-603-728-8955
ryan@groenconstruction.com

Strafford County, Dover, NH

2.2 Discharge Information

Does your project / site discharge stormwater into a Municipal Separate Storm Sewer System (MS4) _X__ Yes ____ No

Are there any surface waters that are located within 50 feet of your construction disturbance: ____ Yes _X__ No ("EPA CGP 2.2.1 … Water of the U.S. …" – A "Water of the United States" as defined in 40 CFR 122.2.)

2.3 Nature of the Construction Activity

General Description of Project

Groen Construction Inc., is proposing to redevelop the property on 10 Fourth Street (Tax Map 6, Lot 54D). The property is currently a commercial structure. The applicants propose to construct a five story building with 4,300 square feet of commercial space on the first floor and twenty residential units on the subsequent four floors.

Size of Construction Project: The project involves the impact to 4,956 square feet of surface area (0.11 acres) on the locus parcel and involves a lot line revision with the City of Dover involving an additional 1,843 square feet (0.04 acres). Utilities will be extended from Fourth Street to include sewer, water, and gas. Drainage currently existing on the land of the City of Dover will be revised. The total area impacted is 15,500 square feet.

Construction Support Activity: None

Table 1 – Names of Receiving Waters

The following is a list of the receiving waters:

Cochecho River – Central Ave Dam (NHEST600030608-04 2016),
Being discharged through two updated catch basins with deep sumps and hoods.

Table 2 – Impaired Waters / TMDLs

Research through the NH Department of Environmental Services has determined that the following impairments are present and associated TMDLs.

Cochecho River – Central Ave Dam (NHI600030608-04 2016)
Mercury, NE Regional Mercury TMDL, December 20, 2008, TMDL #33883
Escherichia coli Pathogen, NH Statewide Bacteria TMDL, Sept 2010, TMDL #39278
pH, Low Priority, 2016, Non-ORW

As a redevelopment site, the proposal is to update the infrastructure that is directly involved to better remove sediment and gross solids.

Table 3 – Tier 2, 2.5, or 3 Waters

Is this surface water designated as a Tier 2, Tier 2.5, or Tier 3 water? (see Appendix F)
☒ YES ☐ NO

As turbidity or sediment is not listed as an impairment in this river, it is considered as a Tier 2 river by the State of New Hampshire. An increase in inspection frequency will be required as a result. (2017 CGP, Section 4, 4.3 and Section 9.1.1 e.) The municipality will require inspections every 7 days and after a storm event of greater than 0.25 inches.

2.4 Sequence and Estimated Dates of Construction Activity

Construction Sequence

1. Install Silt Fence and construct and/or install temporary and permanent sediment erosion and detention control facilities (Vegetated swales, level spreaders, and constructed filter strips), as required. Erosion, sediment and facilities shall be installed and stabilized prior to any earth moving operation, and prior to directing run-off to them. Inlet protection is instrumental.

2. Demolish, clear, grub, and dispose of debris in approved facilities.

3. Excavate and stockpile topsoil / loam. All disturbed areas shall be stabilized immediately after grading.

4. Construct the replacement catch basins and install the replacement culvert pipes. Install hoods at the time of installation.

5. Install footings, foundation drains, and foundation walls.

6. Begin permanent and temporary seeding and mulching. All cut and fill slopes and disturbed areas shall be seeded and mulched as required, or directed.

7. Daily, or as required, construct temporary berms, drainage ditches, sediment traps, etc. to prevent erosion on the site and prevent any siltation of abutting waters or property.

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

9. Complete permanent seeding and landscaping.

10. Remove temporary erosion control measures after seeding areas have established themselves and site improvements are complete. Smooth and re-vegetate all disturbed areas.

11. All swales and drainage structures will be constructed and stabilized prior to having run-off being directed to them.

12. Finish paving all roadways/parking.

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 rain storm event 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.

See also NH-SWM, Vol. 3, 4-1 Construction Phasing, (Page 31)
Note: Contractor will compile a critical path construction sequence that will become an addendum to the SWMP.

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2.5 Allowable Non-Stormwater Discharges

Fire Hydrant flushing *	__X__ Yes	_____ No
Waters used to wash vehicles and equipment	__X__ Yes	_____ No
Water used for dust control	__X__ Yes	_____ No
Foundation and / or footing drains	__X__ Yes	_____ No
Construction dewatering water **	__X__ Yes	_____ No

* Note that fire hydrant flushing discharge cannot discharge concentrations of Chlorine into discharge points. The maximum Chlorine that can be discharged must meet drinking water standards and is believed to be 4 mg/L. After Chlorination of a new waterline, discharge water must be de-chlorinated.

** See also NH NHDES Clarification of Section 9.1.1 - (State of New Hampshire Conditions) and other New Hampshire specific information for the U.S. EPA 2017 NPDES Construction General Permit (CGP), January 17, 2017, attached Appendix B.

SECTION 3: EROSION AND SEDIMENT CONTROLS

The proposed site development is protected from erosion and the roadways and abutting properties are protected from sediment by the use of Best Management Practices as outlined in the New Hampshire Stormwater Manual, Volume 2 & 3, and City of Dover Chapter 149-14 A, Stormwater Management, Erosion Control, and Flood Hazards. Any area disturbed by construction will be re-stabilized within 14 days of achieving final grade. Abutting properties and wetlands will not be adversely affected by this development. All disturbed soils within 100 feet of surface waters or wetlands will be temporarily or permanently stabilized within 7 calendar days. Erosion and sediment control measures shall be installed prior to any soil land disturbance and must be reviewed and approved by the City of Dover Community Services Department. 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 Operation and Maintenance Plan / Inspection & Maintenance Manual and Drainage Analysis & Erosion and Sediment Control Plan which has been written specifically for this project and available to the owner / contractor.

Due to the nature of this site redevelopment, there are a number of E&SC practices which would be normal and expected that do not apply to this proposal. Several practices have been left on the details and are included in this document in the case that their application be dictated by the construction situation.

Reference: W2 - Proposed Watershed Plan
Sheet 9 of 21 Erosion & Sediment Control Plan
Sheet 13 of 21 - E-101 Erosion & Sediment Control Details
Sheet 14 of 21 - E-102 Erosion & Sediment Control Details

3.1 Perimeter Controls / Sediment Controls

Silt Soxx / Erosion Control Mix Berm / Silt Fence

The plan set demonstrates the location of silt fence for sediment control. The Erosion and Sediment Control Details, has the specifications for installation and maintenance of the silt fence. EPA CGP 2017: "You must install sediment control along those perimeter areas of your site that will receive stormwater from earth disturbing activity." See Construction Details Plan in Appendix A, Sheet 14 of 21, E-101, Detail E1, E2, E5, & E9. See also NH-SWM Vol. 3, 4-2, Silt Fence (Page 90), and Erosion Control Mix Berm (Page 106). See also Filtrexx Sediment Control SWPPP Cut Sheet (Attached in Appendix M.)

In accordance with EPA CGP 2.2.1, Provide and maintain natural buffers and / or equivalent erosion and sediment controls, and CGP Appendix G, Table G-3, and Table G-7, slopes between 3% and 6% with soils that are Fine Sandy Loams, there is a High Risk Factor and it is required to Double Perimeter Control and 7-Day Site Stabilization. This provision only apply if wetland buffers are impacted within 50 feet of jurisdictional wetlands. No jurisdictional wetlands found on the locus parcel

3.2 Sediment Track-Out / Stabilized Construction Entrance / Exit

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 between 3-inch coarse aggregate, and the pad itself constructed to a minimum length of 50' 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 Construction Details Plan. The Construction Exit will be maintained in a condition that will prevent tracking of sediment onto the public highway. When the control pad becomes ineffective, the stone should be removed along with the collected soil material, regraded on site, and stabilized. A plan view and profile are shown on the Construction Details Plan in Appendix A, Sheet E-101, Detail E4.

Off-site Vehicle Tracking: A stabilized construction entrance has been provided to help reduce vehicle tracking of sediments. The paved street adjacent to the site entrance will be swept every other week or as necessary to remove any excess mud, dirt or rock tracked from the site. After the binder pavement has been placed, any construction activity that causes the tracking of sediments will also result in street sweeping.

Pavement should be swept prior to surface pavement and periodically to remove materials. Dump trucks hauling material from the construction site will be covered with a tarpaulin. See also NH-SWM Vol.3, 4-2, Temporary Construction Exit, Page 124

3.3 Stockpiled Sediment or Soil

Stockpiled materials including topsoil, excavated materials, borrow materials imported onto the site, construction aggregates, and sediment removed from temporary sediment traps will be located in designated areas at least 50 feet away from concentrated flows. All stockpiles will have erosion protection in the form of silt fence and diversion swales will be applied to protect the material and surrounding areas. Inactive stockpiles will be seeded for temporary stabilization. Erosion control measures will be inspected in accordance with the schedule for all other activities on site. See also NH-SWM Vol. 3, 4-1 Soil Stock Pile Practices, (Page 46) and Detail E15 Sheet E-102.

3.4 Minimize Dust / 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. (CGP 2.2.6) See also NH-SWM Vol. 3, 4-1 Dust Control. (Page 38)

3.5 Storm Drain Inlets

Storm drain inlet protection will be installed per the Sediment & Erosion Control Details as a sediment barrier installed around a storm drain inlet, catch basin, or curb inlet to reduce sediment intrusion into a system after it has been constructed. These are to be constructed in accordance with the Sediment & Erosion Control Details, Sheet E-101 and maintained after every rain event.

3.6 Sediment Basins

Sediment basins and stone check dams will be installed and maintained in accordance with the Sediment & Erosion Control Details, sheet E-101. Sediment will be removed after major storm events and when the control devise has accumulated sediment to render it ineffective. These basins and check dams will be inspected after each storm event and periodic schedule. See NH-SWM Vol. 3, 4-2 Temporary Sediment Basins. (Page 138) Temporary sediment basins may be required during dewatering activities.

3.7 Dewatering Practices

Dewatering practices are potentially going to be required on this site. During construction if this becomes required, an addendum will be published specific for the requirements. As a general rule, ground water that needs to be removed from an excavation will be pumped to a sediment basin or a sediment trap prior to discharge overland through a buffer and from the site. A detailed de-watering plan will be provided by the contractor prior to initiate trenching on this project.

Regarding dewatering practices in the State of New Hampshire, specifically see Construction General Permit Section 9.1.1 NHR12000 State of New Hampshire and "Clarification of Section 9.1.1 … and other New Hampshire specific information for the U.S. EPA 2017 NPDES Construction General Permit (CGP), January 20, 2017" available at the NHDES website. See also NH-SWM Vol. 3, 4-1, Construction Dewatering, Page 144.

3.8 Stabilize exposed portions of the site.

All areas that are disturbed during construction will be stabilized with vegetated material as soon as is practicable. Initiate the installation of stabilization measures immediately in any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 7 or more calendar days; and complete the installation of stabilization measures as soon as practicable, but no later than seven (7) calendar days after stabilization has been initiated. (2017 CGP 2.2.14 a iii (c) Due to Tier 2 waters as defined and directed above.) See also NH-SWM Vol. 3, 4-1 Temporary Vegetation (Page 54) and Permanent Vegetation (Page 60). See also Construction Details, Sheet E-102, Detail E19.

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-1 using seeding mixture C, and areas of steep slopes and within the buffer will be planted with conservation mix.

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		
Red Fescue (35%)	75	1.75
Tall Fescue (25%)	55	1.25
Annual Ryegrass (15%)	33	0.75
Perennial Ryegrass (12%)	26	0.60

Kentucky Bluegrass (10%)	22	0.50
White Clover (3%)	07	0.15
	218 #/Ac	5 Pounds per 1000 Sq. Ft.

3.9 Final Stabilization Criteria (for any areas not covered by permanent structures):

3.14.1. Establish uniform, perennial vegetation (i.e., evenly distributed, without large bare areas) that provides 70 percent or more of the cover that is provided by vegetation native to local undisturbed areas; and/or

3.14.2. Implement permanent non-vegetative stabilization measures to provide effective cover.

3.10 Structural Practices & Post Construction

Structural practices include construction entrances / exits, catch basins, cross culverts, treatment swales, sediment basins, rip rap outlet protection, level spreaders, and a detention pond. All structural practices are detailed on the attached detail sheets prepared by Berry Surveying & Engineering. Reference is also made to the New Hampshire Stormwater Manuals, Volume 2 & 3, December 2008. (NH-SWM Vol. 2 & 3)

The following structural practices and post construction structures are a part of the Third Street design plans.

3.15.1 Perimeter Control (Erosion Control Mix Berm, Silt Fence & Silt Socks)
3.15.2 Construction Entrance / Exit
3.15.3 Inlet Protection
3.15.4 Deep Sump Catch Basins, Drain Manholes, & Outlet Structures
3.15.5 Stockpile Management

3.10.1 Perimeter Control

Description:

The design plans specify erosion control mix berm, silt fence and Filtrexx Silt Soxx (or approved equal) as perimeter control for the construction of the proposed development. In places a combination of, or double layer of perimeter protection is required due to buffer substitution. Erosion control mix berm, silt fence or Silt Socks are placed along the perimeter where surface water runoff leaves the construction site normally at the limit of clearing. Perimeter Control is placed normally along the contour of the terrain to filter stormwater allowing sedimentation to take place up-slope of the control. Silt Fence and Silt Socks filter runoff at different rates and require maintenance at different time intervals. The EPA 2017 CGP requires that sediment controls be place along any

perimeter areas of the site that will receive pollutant discharges. (Sediment / gross solids)

For this project, select location of Filtrexx Silt Soxx may be required during short-term intervals to be coordinated with the engineer and City of Dover.

Maintenance Considerations:

Silt Fence will be inspected periodically in accordance with the project schedule and after rain events. Sediment deposited behind silt fences will be removed when it reached a depth of six-inches, normally and at a point less than half the height of the silt fence at a maximum. Sediment will be removed and deposited in an appropriate manner where it will not be transported back toward perimeter control.

Silt Socks will be inspected and maintained similarly and sediment will be removed when it reaches a depth of on-half the height of the silt socks, either eight-inch or twelve-inch as specified. Sediment will be removed when accumulation has reached one-half of the effective height of the control.

Specifications:

NH-SWM, Vol. 3, 4-2 Silt Fence (Page 90) and Erosion Control Mix Berm (Page 106)
Construction Details, E-101, Detail E1 Silt Fence, E2 Erosion Control Mix Berm, and E6 Filtrexx Sediment Control (or approved equal)
Filtrexx Sediment Control SWPPP Cut Sheet -1.1 attached in Appendix D

3.15.2 Construction Entrance / Exit

Description: 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 between 3-inch crushed stone course aggregate, and the pad itself constructed to a length of 75 feet, except that the minimum length of 50' may be used 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-102, Erosion and Sediment Control Detail Plan.

A Temporary Construction Entrance / Exit may not be required on this project dependent on the operation of the site. Sediment track-out on Fourth Street or Chestnut Street is not allowed at any point.

Maintenance Considerations:

When the temporary construction exit becomes ineffective, the stone and accumulated sediment will be removed and the crushed stone replaced. When sediment is tracked onto the adjacent roadway / highway, sediment will be swept from the pavement and disposed on so that it does not impact perimeter control.

Construction Specifications:

See also NH-SWM Vol.3, 4-1, Temporary Construction Exit, Page 124
Construction Details Plan in Appendix A, Sheet E-101, Detail E5.

3.15.3 Inlet Protection / Storm Drain Inlets

Description: Existing catch basins that may be impacted by surface water runoff from the construction site and proposed catch basins after they have been installed must be protected so that sediment and turbidity does not enter the drainage system and MS4 municipal system. Storm drain inlet protection will be installed per the Erosion & Sediment Control Details as a sediment barrier installed around a storm drain inlet, catch basin, or curb inlet to reduce sediment intrusion into a system after it has been constructed and existing catch basins. These are to be constructed in accordance with the Sediment & Erosion Control Details, Sheet E-101 and maintained after every rain event.

Internal sediment sacks may not be allowed by the City of Dover during the winter months and coordination will be made between the engineer and City of Dover.

Maintenance Considerations: Clean, or remove and replace, the protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, you must remove the deposited sediment by the end of the same work day in which it is found or by the end of the following work day if removal by the same work day is not feasible. Sediment baskets must be maintained after any major storm event. It is vital in the construction of this site that the existing MS4 drainage system not be impacted by sediment. See also **sediment track** out below. See also **Hoods**, below.

Specifications: NH-SWM Vol.3, 4-2, Temporary Storm Drain Inlet Protection, Page 118
Construction Details Plan in Appendix A, Sheet E-101, Detail E4, E6 & E-11.

3.15.3 Deep Sump Catch Basins, Drain Manholes, & Pond Outlet Structures

Description: Deep Sump Catch Basins are used throughout the site as a pretreatment measure to remove sediment and debris from storm water runoff. Deep Sump Catch Basins will be designed with a sump that is four times the depth of the discharge

culvert and a minimum of four feet. All pretreatment deep sump catch basins will have an outlet pipe hood which extends one-foot below the outlet invert and will include a hood vent. Hoods will be installed as soon as the catch basin and culvert pipe are installed to additionally protect the MS4 from sediment discharge. The deep sump will be a minimum of four-feet deep and greater than or equal to four-times the outlet pipe diameter.

Maintenance Considerations: Sediment must be removed from Deep Sump Catch Basins and Deep Sump Manholes on a regular basis, at least twice a year and more often if the sumps become half-full. Inspections should be conducted periodically. At a minimum they should be cleaned after snow-melt and after leaf-drop. Sediment will be removed when it approaches half the sump depth. Damaged outlet hoods must be replaced. It is recommended that a vacuum truck be utilized as contrasted to a clam-shell method to avoid damage to the hood. Hydrocarbons found to be floating in the basin should be removed by skimming, absorbent materials, or other method. Disposal of all material, sediment, and debris must be done in accordance with state and federal regulations.

Specifications: NH-SWM, Vol. 2, 4-4, 5. Deep Sump Catch Basin (Page 152)
Sheet D-101, Drainage Details

3.15.4 Stockpile Management

Description: Stockpiles of topsoil, sediment, and materials temporarily store materials to be used on site or transported at a later date. Stockpiles that are inactive for more than 14 days will be temporarily stabilized or covered. Sediment protection will be placed at the base of stockpiles to prevent sediment transport away from the stockpile.

Maintenance Considerations: Sediment control and temporary stabilization or cover will be maintained so that the environmental protections will remain effective.

Specifications: NH-SWM Vol, 3, 4-1, Soil Stockpile Practices (Page 46)
Construction Details, Sheet E-102, Detail E14.

SECTION 4: POLLUTION PREVENTION STANDARDS (P2)

4.1 Potential Sources of Pollution

Equipment and Vehicle Fuel & Maintenance.
Equipment and vehicle Washing.
For storage, handling and disposal of building products, material and wastes.
For construction and domestic wastes.
For washing … concrete … or other materials.
For application of fertilizers.
Emergency Spill Notification Requirements.
Construction dewatering requirements

4.2 Spill Prevention and Response

Spill Control Practices

In addition to the good housekeeping and material management practices discussed in other sections of this plan, the following practices will be followed for spill prevention and cleanup: (2017 CGP 2.3.1) & (2017 CGP 2.3.2)

- Site personnel will be made aware of the recommended procedures and the location of the information and cleanup supplies.
- For large oil spills, NHDES Petroleum Spill Response program will be notified immediately at (603) 271-3644 and an emergency response contractor would be called in.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area onsite. Equipment and materials may include but not limited to brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for the purpose.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- Spills of toxic or hazardous material will be reported to the appropriate State or local government agency as required by State and Local regulations.
- The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring and how to clean up the spill if there is another one. A description of the spill, what caused it, and the cleanup measures will also be included.
- The site superintendent responsible for the day-to-day site operations will be the spill prevention and cleanup coordinator.

4.3 Fueling and Maintenance of Equipment or Vehicles

Diesel fuel will be delivered by delivery truck or company transport and all due care will be used in the refueling of equipment on site. Equipment will be set on level solid ground during refueling to prevent any spills. It is the operator(s) / contractor (s) responsibility to "CGP Part 2.3.1 Requirement to "provide an effective means of eliminating the discharge of spilled or leaked chemicals, including fuel, from the area where these activities will take place.

4.4 Washing of Equipment and Vehicles

If water for equipment washing is transported on site, a location will be developed and utilized so that any runoff will discharge to a Storm Drain Inlet or sediment basin prior to discharge from the site.

4.5 Storage, Handling, and Disposal of Construction Products, Materials, and Wastes

Material Management Practices

The site superintendent will use best efforts to ensure that the material management practices are used to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff. (2017 CGP 2.3.3)

a. "For **building materials** and building products provide either (1) cover (e.g., plastic sheeting, temporary roofs) to minimize the exposure of these products to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas." (2017 CGP 2.3.3 a)

b. "For **diesel fuel**, oil, hydraulic fluids, other petroleum products, and other chemicals: i. Store chemicals in water-tight containers, and provide either (1) cover (e.g., plastic sheeting, temporary roofs) to minimize the exposure of these containers to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas (e.g., having a spill kit available on site and ensuring personnel are available to respond expeditiously in the event of a leak or spill), or provide secondary containment (e.g., spill berms, decks, spill containment pallets); and ii. Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly. You are prohibited from hosing the area down to clean surfaces or spills. Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge." (2017 CGP 2.3.3 c)

c. "For **construction** and **domestic** wastes: i. Provide **waste containers** (e.g., dumpster, trash receptacle) of sufficient size and number to contain construction and domestic wastes;

ii. Keep waste container lids closed when not in use and close lids at the end of the business day for those containers that are actively used throughout the day. For waste containers that do not have lids, provide either (1) cover (e.g., a tarp, plastic sheeting, temporary roof) to minimize exposure of wastes to precipitation,
or (2) a similarly effective means designed to minimize the discharge of pollutants (e.g., secondary containment);
iii. On business days, clean up and dispose of waste in designated waste containers; and
iv. Clean up immediately if containers overflow.
v. For **sanitary waste**, position **portable toilets** so that they are secure and will not be tipped or knocked over, and located away from waters of the U.S. and stormwater inlets or conveyances." (2017 CGP 2.3.3 e)

GOOD HOUSEKEEPING

The following good housekeeping practices will be followed onsite during the construction project:

- An effort will be made to store only enough products required to do the job.
- All materials stored onsite will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
- Products will be kept in their original containers with the original manufacturer's label.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of a product will be used up before disposing of the container.
- Manufacturers' recommendations for proper use and disposal will be followed.
- Trash on site will be controlled by monitoring and by periodic clean up.

Product Specific Practices

The following product specific practices will be followed onsite:

PETROLEUM PRODUCTS:

All onsite construction vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers, which will be clearly labeled. Any asphalt substances used onsite will be applied according to the manufacturer's recommendations.

FERTILIZERS:

Fertilizers will be applied as directed in the above-mentioned detailed sheet. Pesticide / herbicide applications are limited to pest-specific applications for defined target

species and only low phosphorus; slow release nitrogen fertilizers are permitted. Qualified individuals will apply environmentally sensitive fertilizer.

PAINTS:
The operator will store no paints on the site.

Solid Material Management

Waste Materials
No waste materials generated by work will remain on the site. The contractor will be responsible for policing the materials generated on site and shuttling the waste to off-site receptacles that they maintain.

Hazardous Waste
No hazardous waste will be stored onsite.

Sanitary Waste
All sanitary waste will be collected from the portable units approximately once per week by Dave's Septic Service, (603-668-3402) or another authorized sanitary waste management contractor.

4.6 Washing of Applicators and Containers used for Paint, Concrete, or other materials.

Designated Concrete Washout Area

The Site Coordinator will designate an area(s) for painters and concrete mixing trucks to dispose of paint and concrete wash water as well as excess concrete. This washout area(s) will be located as far away from storm drains, wetlands, road ditches, vegetated treatment swales, storm water management facilities, exposed/un-stabilized soils and any streams as practical and will be properly signed. Sealed containment will be provided, the size of which will be determined based upon the amount of anticipated use. The Site Coordinator will be responsible for communicating the wash out policy to all painting and concrete contractors and for confirming compliance with this procedure.

"For washing applicators and containers used for stucco, paint, **concrete, form release oils**, curing compounds, or other materials:

a. Direct wash water into a leak-proof container or leak-proof and lined pit designed so that no overflows can occur due to inadequate sizing or precipitation;
b. Handle washout or cleanout wastes as follows:
   i. Do not dump liquid wastes in storm sewers or waters of the U.S.;
   ii. Dispose of liquid wastes in accordance with applicable requirements in Part 2.3.3; and

iii. Remove and dispose of hardened concrete waste consistent with your handling of other construction wastes in Part 2.3.3; and

b. Locate any washout or cleanout activities as far away as possible from waters of the U.S. and stormwater inlets or conveyances, and, to the extent feasible, designate areas to be used for these activities and conduct such activities only in these areas." 2017 CGP 2.3.4

On this project due to very limited property constraints, concrete washout may not be allow on the property utilizing off-site washout coordinated with the Operator and the Concrete Company. If abilities allow for washout to be contained and controlled on site, this method may also be utilized but at no time will washout come in contact with the MS4 drainage system.

4.7 Fertilizers

Soil should be tested to determine fertilizer requirements. Only slow or controlled release nitrogen sources of fertilizer will be use. Fertilizer should only be applied according to the manufactures recommendations and application rate. Fertilizers should never be applied closer than 25 feet to critical wetland areas. (2017 CGP 2.3.5)

4.8 Other Pollution Prevention Practices

None identified at this time.

SECTION 5: INSPECTION AND CORRECTIVE ACTION

5.1 Inspection Personnel and Procedures

Personnel Responsible for Inspections

All SWMP 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, as required by the Site Plan Review Regulations, Chapter 149.

Inspection Schedule

At a minimum, you must conduct a site inspection in accordance with one of the two schedules listed below:

1. At least once every 7 calendar days: or, (See Note Below re. storm events.)
   And after a storm event of ¼ inch (0.25") of rainfall with 24 hours.

The rain Gauge Location (if applicable) is located:

Skyhaven Airport, Rochester, NH KDAW / UNH Weather Station

The Inspection Report Forms are located in Appendix B.

MAINTENANCE/INSPECTION PROCEDURE

Erosion and Sediment Control Inspection and Maintenance Practices

These are the inspection and maintenance practices that will be used to maintain erosion and sediment controls:

- All control measures will be monitored daily and inspected every 7 days and following any storm event of 0.25 inches or greater, or as needed (see attached Inspected and Maintenance Report form).
- Built up sediment will be removed from silt fence when it has reached one-third the height of the fence, or as directed by inspector.
- Silt fence will be inspected for depth of sediment, tears, to see if the fabric is securely attached to the stakes, and to see that the stakes are firmly in the ground.
- Catch basins will be inspected for depth of sediment, and built up sediment will be removed prior to a point where the basins do not function properly. Sediment should be removed every six months on a regular schedule.
- Diversion dikes will be inspected and any breaches promptly repaired.
- Temporary and permanent seeding and planting will be inspected for bare spots, washouts, and healthy growth.
- From the time of NOI submission on, a maintenance inspection report will be made after routine inspections. A copy of the report form to be completed by the inspector is attached.
- The onsite supervisor or environmental monitor will be responsible for inspections, maintenance and repair activities, and filling out the inspection and maintenance report.
- The onsite supervisor will receive training in the practices necessary for keeping the erosion and sediment controls used onsite in good working order.

5.2 Corrective Action

Personnel Responsible for Corrective Actions

Groen Construction Inc.
Ryan Greenhalgh, Project Manager
120 Washington Street, Suite #302
Rochester, NH 03839
1-603-728-8955
ryan@groenconstruction.com

Corrective Action Forms are located in Appendix C.

5.3 Delegation of Authority

The following individual(s) or positions within the company who have been delegated authority to sign inspection reports. Attached are copies of signed delegation of authority forms in Appendix J.

Company Name:	Berry Surveying & Engineering
Name:	Kenneth A. Berry, PE, LLS, CPSWQ, CPESC, CESSWI
Position:	Principal, VP – Technical Operations
Address:	335 Second Crown Point Road
City / State / Zip:	Barrington, NH 03825
Telephone No.:	603-332-2863
Mobile Phone No.:	603-978-0358
Fax Number:	603-335-4623
Email Address:	k.berry@berrysurveying.com

Company Name:	Berry Surveying & Engineering
Name:	Christopher R. Berry, SIT
Position:	Principal, President
Address:	335 Second Crown Point Road
City / State / Zip:	Barrington, NH 03825
Telephone No.:	603-332-2863
Mobile Phone No.:	603-781-3404
Fax Number:	603-335-4623
Email Address:	crberry@berrysurveying.com

Company Name:	Berry Surveying & Engineering
Name:	James Hayden
Position:	Design Engineer / SWPPP Inspector
Address:	335 Second Crown Point Road
City / State / Zip:	Barrington, NH 03825
Telephone No.:	603-332-2863
Mobile Phone No.:	603-953-3049
Fax Number:	603-335-4623
Email Address:	j.hayden@berrysurveying.com

STORMWATER SYSTEM OPERATION & MAINTENANCE PLAN CERTIFICATION

Owner	Responsibility
Name: Groen Construction Inc. Address: Ryan Greenhalgh, Proj. Mgr. 120 Washington Street, #302 Rochester, NH 03839 Telephone: 1-603-728-8955	The owner is responsible for the conduct of all construction activities, and ultimate compliance with all the provisions of the Stormwater Management Plan.

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:

SWPPP APPENDICES

Attach the following documentation to the SWPPP:

Appendix A – Site Maps

Appendix B – Inspection Form

Appendix C – Corrective Action Form

Appendix D – Additional Attachments

- City of Dover, Chapter 149-14 Site Development Criteria - Stormwater
- Stormwater System Operation and Maintenance Plan & Inspection and Maintenance Manual, City of Dover
- Drainage Analysis & Erosion and Sediment Control Plan
- NHDES List of ORW and Impaired (4A and 5) Waters for CGP NOI's 5/10/2012
- NHDES Draft 2016 List of Threatened or Impaired Waters that require a TMDL 10/2015
- NHDES River Report Card with Impaired Waters and TMDL's Draft 2014
- Filtrexx Sediment Control SWPPP Cut Sheet

Appendix A – Site Maps

Locus Map, USGS 1" = 2000'
USGS 1" = 1000'

Plan Set, Half Scale Plans:
By Berry Surveying & Engineering

SHEET 1	~ NEIGHBORHOOD PLAN
SHEET 2	~ EXISTING CONDITIONS PLAN
SHEET 3	~ LOT LINE REVISION PLAN*
SHEET 4	~ EASEMENT PLAN*
SHEET 5	~ DEMOLITION PLAN
SHEET 6	~ SITE PLAN
SHEET 7	~ GRADING PLAN
SHEET 8	~ DRAIN LINE PROFILES
SHEET 9	~ EROSION & SEDIMENT CONTROL PLAN
SHEET 10	~ UTILITY PLAN
SHEET 11	~ LANDSCAPING PLAN
SHEET 12	~ LIGHTING PLAN
SHEET 13	~ E101-EROSION & SEDIMENT CONTROL DETAILS
SHEET 14	~ E102-EROSION & SEDIMENT CONTROL DETAILS
SHEET 15	~ C101-CONSTRUCTION DETAILS
SHEET 16	~ C102-CONSTRUCTION DETAILS
SHEET 17	~ C103-CONSTRUCTION DETAILS
SHEET 18	~ U101-UTILITY DETAILS
SHEET 19	~ U102-UTILITY DETAILS
SHEET 20	~ EXISTING SITE ACCESS PLAN
SHEET 21	~ PROPOSED SITE ACCESS PLAN

Sheet W-1	~ Existing Conditions Watershed Plan
Sheet W-2	~ Proposed Conditions Watershed Plan

Appendix B – Copy of Inspection Form

Appendix C – Copy of Corrective Action Form

Appendix D – Additional Attachments

- City of Dover, Chapter 149-14 Site Development Criteria - Stormwater
- Stormwater System Operation and Maintenance Plan & Inspection and Maintenance Manual, City of Dover
- Drainage Analysis & Erosion and Sediment Control Plan
- NHDES List of ORW and Impaired (4A and 5) Waters for CGP NOI's 5/10/2012
- NHDES Draft 2016 List of Threatened or Impaired Waters that require a TMDL 10/2015
- NHDES River Report Card with Impaired Waters and TMDL's Draft 2014
- Filtrexx Sediment Control SWPPP Cut Sheet

Welcome to New Hampshire's Watershed Report Cards built from the 2016, 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, 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 2016 Consolidated Assessment and Listing Methodology (CALM) at https://www.des.nh.gov/organization/divisions/water/wmb/swqa/2016/documents/r-wd-17-08.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/

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. (http://www2.des.state.nh.us/WaterShed_SWQA/SWQA_Map.aspx)

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					

* "Category 1" only exists at the Assessment Unit Level.

^ TMDL stands for Total Maximum Daily Load studies (http://des.nh.gov/organization/divisions/water/wmb/tmdl/index.htm)

November 30, 2017

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 2016

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		COCHECO RIVER	5-P	5-P	4A-M	5-M
NHIMP600030607-02		COCHECO RIVER - GONIC DAM POND	5-M	4A-P	2-G	4A-M
NHIMP600030607-03		COCHECO RIVER - MILL POND DAM	3-PAS	3-ND	3-ND	4A-M
NHIMP600030608-02		COCHECO RIVER - WATSON WALDRON DAM	5-M	2-G	2-G	4A-M
NHIMP600030608-04		COCHECO RIVER - CENTRAL AVE DAM	5-M	2-M	2-G	4A-M
NHIMP600030608-05		CONSERVATION POND DAM	3-ND	3-ND	3-ND	4A-M
NHIMP600030608-06		FRESH CREEK - FARM POND	3-ND	3-ND	3-ND	4A-M
NHLAK600030608-01		FRESH CREEK POND	5-M	4A-P	2-G	4A-M
NHLAK600030608-02		UNNAMED POND	3-ND	3-PAS	3-PAS	4A-M
NHRIV600030607-12		UNNAMED TRIBUTARY - TO COCHECO RIVER	3-ND	3-ND	3-ND	4A-M
NHRIV600030607-13		UNNAMED BROOK - TO COCHECO RIVER	3-ND	3-ND	3-ND	4A-M
NHRIV600030607-14		COCHECO RIVER	3-ND	3-ND	3-ND	4A-M
NHRIV600030607-15		COCHECO RIVER	5-M	2-G	2-G	4A-M
NHRIV600030608-02		BLACKWATER BROOK-CLARK BROOK	3-ND	4A-P	3-ND	4A-M
NHRIV600030608-03		COCHECO RIVER - UNNAMED BROOK	5-M	4A-M	2-G	4A-M
NHRIV600030608-04		REYNERS BROOK	3-ND	4A-P	3-ND	4A-M
NHRIV600030608-05		COCHECO RIVER	5-M	4A-M	2-G	4A-M
NHRIV600030608-06		INDIAN BROOK	5-P	4A-P	3-ND	4A-M
NHRIV600030608-07		EMERSON BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-08		FRESH CREEK - TWOMBLY BROOK	5-P	4A-M	3-ND	4A-M
NHRIV600030608-09		UNNAMED BROOK - ROLLINS BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-10		ROLLINS BROOK	5-P	4A-P	3-ND	4A-M
NHRIV600030608-11		FRESH CREEK	3-PAS	4A-P	4A-M	4A-M
NHRIV600030608-12		UNNAMED TRIBUTARY - TO COCHECO RIVER (DOVER (DOWNSTREAM OF PORTLAND AVE))	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-13		UNNAMED TRIBUTARY - TO COCHECO RIVER - (DOVER (UPSTREAM OF ATLANTIC AVE))	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-14		UNNAMED TRIB. TO COCHECO RIVER, DOVER (FROM LANDFILL)	5-M	3-ND	3-ND	4A-M
NHRIV600030608-15		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

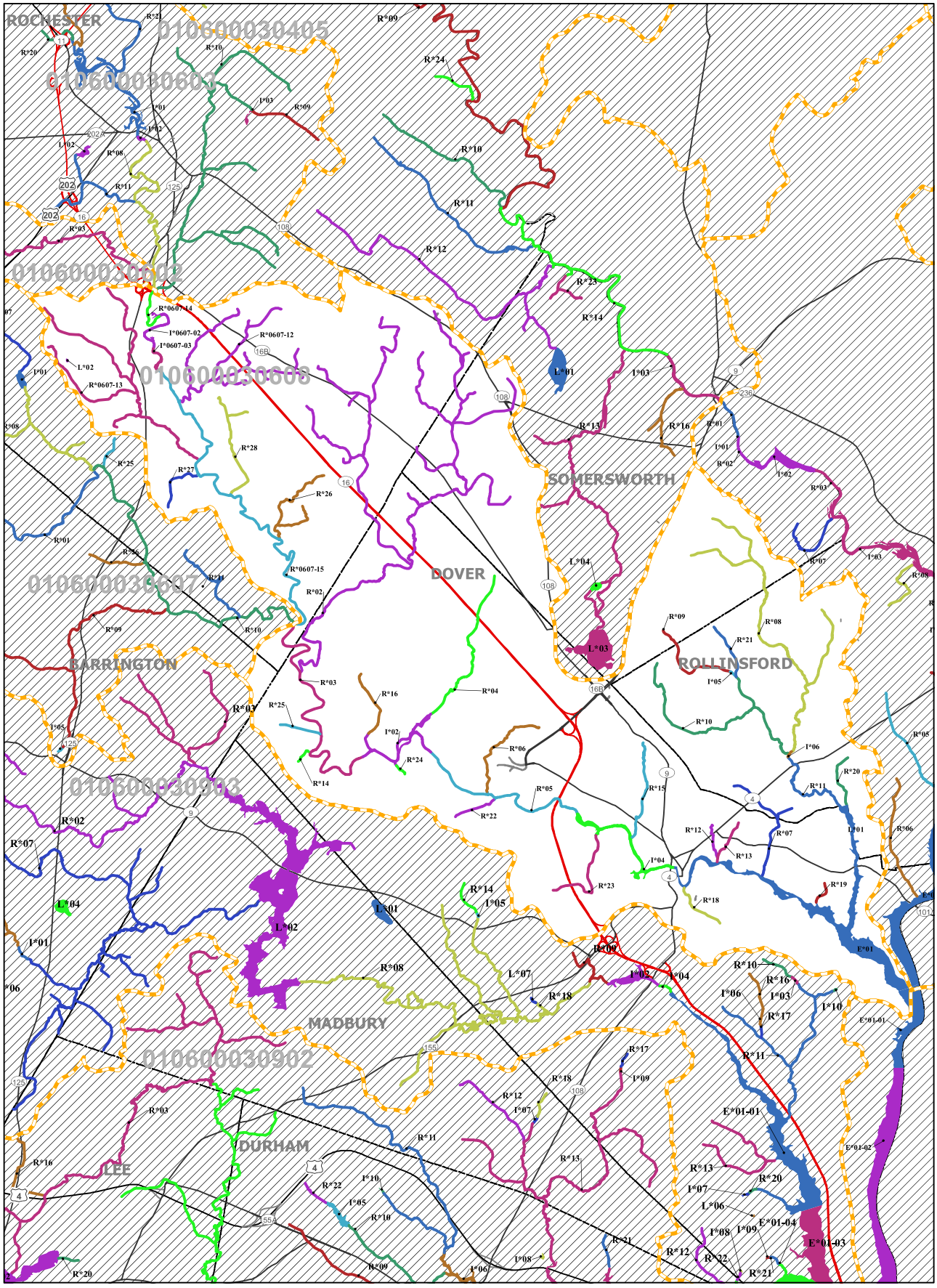
(Locator map on next page only applies to this HUC12)

Assessment Cycle 2016

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		JACKSON BROOK	3-ND	4A-P	3-ND	4A-M
NHRIV600030608-18		UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-19		UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-20		UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-21		UNNAMED BROOK - TO ROLLINS BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-22		HORN BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-23		UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-24		UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-25		UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-26		UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-27		UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-28		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 LAK700060201 - 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\2016\AUIDs\HUC12Maps

Assessment Unit ID NHIMP600030608-04 Size 20.0000 ACRES

Assessment Unit Name COCHECO RIVER - CENTRAL AVE DAM Beach N

Primary Town DOVER Assessment Unit Category*~ 5-M

2016, 305(b)/303(d) - All Reviewed Parameters by Assessment Unit

Designated Use Description	*Desig. Use Category	Desig. Use Threat	Parameter Name	Parameter Threatened (Y/N)	Last Sample	Last Exceed	Parameter Category*	TMDL Priority	Source Name (Impairments only)
Aquatic Life	5-M		ALKALINITY, CARBONATE AS CACO3	N	1999	1999	3-ND		
			ALUMINUM	N	2007	1999	3-ND		
			AMMONIA (UN-IONIZED)	N	2015	N/A	2-G		
			ARSENIC	N	2004	N/A	3-ND		
			CADMIUM	N	1999	1999	3-ND		
			CHLORIDE	N	2015	N/A	3-PAS		
			COPPER	N	1999	1998	3-ND		
			Chlorophyll-a	N			3-ND		
			DISSOLVED OXYGEN SATURATION	N	2015	2013	2-M		
			IRON	N	2004	N/A	3-ND		
			LEAD	N	1999	1999	3-ND		
			OXYGEN, DISSOLVED	N	2015	2014	3-PNS		
			TURBIDITY	N	2014	2004	3-PAS		
			ZINC	N	1999	N/A	3-ND		
			pH	N	2015	2015	5-M	LOW	Atmospheric Deposition - Acidity
Drinking Water After Adequate Treatment	2-G		ARSENIC	N	2004	2004	3-ND		
			COPPER	N	1999	N/A	3-ND		
			ESCHERICHIA COLI	N	2013	2013	3-PNS		
			FECAL COLIFORM	N	1993	1993	3-ND		
			IRON	N	2004	2004	3-ND		
			ZINC	N	1999	N/A	3-ND		
Fish Consumption	4A-M		ARSENIC	N	2004	2004	3-ND		
			COPPER	N	1999	N/A	3-ND		
			Mercury	N			4A-M		Atmospheric Deposition - Toxics
			ZINC	N	1999	N/A	3-ND		
Primary Contact Recreation	2-M		CHLOROPHYLL-A	N	2014	2002	3-PAS		

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)

Assessment Unit ID	NHIMP600030608-04	Size	20.0000	ACRES	**2016, 305(b)/303(d) - All Reviewed Parameters by Assessment Unit**
Assessment Unit Name	COCHECO RIVER - CENTRAL AVE DAM	Beach	N		
Primary Town	DOVER	Assessment Unit Category*~	5-M		

Designated Use Description	*Desig. Use Category	Desig. Use Threat	Parameter Name	Parameter Threatened (Y/N)	Last Sample	Last Exceed	Parameter Category*	TMDL Priority	Source Name (Impairments only)
Primary Contact Recreation	2-M		Escherichia coli	N	2013	2011	2-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)

List of ORW and Impaired (4A and 5) Waters for CGP NOIs 5/10/12							
(Outstanding Resource Waters and Impairments on the 2010 305(b)/303(d) that need, or have a completed, TMDL. File last update May 10, 2012.)							
Assessment Unit ID	**Assessment Unit Name**	**Impairment Name**	**Pollutant allocated in TMDL (if different than "Impairment Name")**	**CGP eNOI Equivalent (to Impairment Name)**	**TMDl Approval Date**	**TMDL Name**	**Outstanding Resource Water (ORW) (AUIDs not shown are non ORWs) {See http://www2.des.state.nh.us/gis/onestop/ if your AUID says "Review OneStop GIS ORW Layer"}**
NHIMP600030405-04	SALMON FALLS RIVER - BAXTER MILL DAM POND	pH		PH/ACIDITY/CAUSTIC CONDITIONS			Non-ORW
NHIMP600030406-02	SALMON FALLS RIVER - LOWER GREAT FALLS DAM	Escherichia coli		PATHOGENS	21-Sep-10	NEW HAMPSHIRE STATEWIDE BACTERIA	Non-ORW
NHIMP600030406-03	SALMON FALLS RIVER - ROLLINSFORD DAM	Oxygen, Dissolved		ORGANIC ENRICHMENT/OXYGEN DEPLETION	22-Nov-99	SALMON FALLS	Non-ORW
NHIMP600030406-04	SALMON FALLS RIVER - SOUTH BERWICK DAM	Chlorophyll-a		ALGAL GROWTH			Non-ORW
NHIMP600030406-04	SALMON FALLS RIVER - SOUTH BERWICK DAM	Escherichia coli		PATHOGENS	21-Sep-10	NEW HAMPSHIRE STATEWIDE BACTERIA	Non-ORW
NHIMP600030406-04	SALMON FALLS RIVER - SOUTH BERWICK DAM	pH		PH/ACIDITY/CAUSTIC CONDITIONS			Non-ORW
NHIMP600030603-01	COCHECO RIVER - CITY DAM 1	Dissolved oxygen saturation		ORGANIC ENRICHMENT/OXYGEN DEPLETION			Non-ORW
NHIMP600030603-01	COCHECO RIVER - CITY DAM 1	Escherichia coli		PATHOGENS			Non-ORW
NHIMP600030603-01	COCHECO RIVER - CITY DAM 1	Oxygen, Dissolved		ORGANIC ENRICHMENT/OXYGEN DEPLETION			Non-ORW
NHIMP600030603-01	COCHECO RIVER - CITY DAM 1	pH		PH/ACIDITY/CAUSTIC CONDITIONS			Non-ORW
NHIMP600030607-02	COCHECO RIVER - GONIC DAM POND	Escherichia coli		PATHOGENS	21-Sep-10	NEW HAMPSHIRE STATEWIDE BACTERIA	Non-ORW
NHIMP600030607-02	COCHECO RIVER - GONIC DAM POND	pH		PH/ACIDITY/CAUSTIC CONDITIONS			Non-ORW
NHIMP600030608-02	COCHECO RIVER - WATSON WALDRON DAM	Escherichia coli		PATHOGENS			Non-ORW
NHIMP600030608-02	COCHECO RIVER - WATSON WALDRON DAM	pH		PH/ACIDITY/CAUSTIC CONDITIONS			Non-ORW
NHIMP600030608-04	COCHECO RIVER - CENTRAL AVE DAM	Escherichia coli		PATHOGENS	21-Sep-10	NEW HAMPSHIRE STATEWIDE BACTERIA	Non-ORW
NHIMP600030608-04	COCHECO RIVER - CENTRAL AVE DAM	pH		PH/ACIDITY/CAUSTIC CONDITIONS			Non-ORW
NHIMP600030701-01	LAMPREY RIVER	pH		PH/ACIDITY/CAUSTIC CONDITIONS			Non-ORW

DRAFT 2016 LIST OF THREATENED OR IMPAIRED WATERS THAT REQUIRE A TMDL

(i.e., Category 5 Impairments - this represents the Section 303(d) List)

(Excluding Fish/Shellfish Consumption Advisories due to Mercury - see Note 3)

Notes:
1. See the Consolidated Assessment and Listing Methodology (CALM) for definitions and details regarding how this list was developed.
2. This list is sorted by Waterbody Type and then Assessment Unit ID.
3. By this note, all marine surface waters in New Hampshire are also included on this list due to statewide fish/shellfish consumption advisories issued because of mercury levels in fish/shellfish tissue. To keep the size of this list manageable, mercury impairment for fish/shellfish consumption are not shown below.
4. TMDL stands for Total Maximum Daily Load study. TMDL schedules are subject to change as funding and resources become available.
5. Waters presented on this list may also be threatened or impaired by other pollutants or nonpollutants that do not require a TMDL.

Assessment Unit ID	Water Name	Primary Town	Water Size	Size Unit	Use Desc	Impairment Name	DES Category	Threatened	TMDL Priority	Source Name
NHEST600031004-10	Little River	North Hampton	0.011	Sq. miles	Shellfishing	Polychlorinated biphenyls	5-M	N	Low	Source Unknown
NHIMP400010605-01	Androscoggin River - D. C. Power Dam	Berlin	100.000	Acres	Aquatic Life	pH	5-M	N	Low	Source Unknown
NHIMP400020103-01	Androscoggin River - Reflection Pond	Shelburne	56.219	Acres	Aquatic Life	pH	5-M		Low	Source Unknown
NHIMP600020105-04	Goodrich Falls Dam-Ellis River	Bartlett	3.000	Acres	Aquatic Life	pH	5-M		Low	Source Unknown
NHIMP600020901-03	Cold Brook - Mill Brook	Freedom	2.000	Acres	Aquatic Life	Dissolved oxygen saturation	5-P	N	Low	Source Unknown
						pH	5-M	N	Low	Atmospheric Deposition - Acidity
NHIMP600030405-03	Salmon Falls River - Great Falls Upper Dam	Somersworth	50.000	Acres	Aquatic Life	PH	5-M	N	Low	Source Unknown
NHIMP600030405-04	Salmon Falls River - Baxter Mill Dam Pond	Rochester	157.000	Acres	Aquatic Life	pH	5-M	N	Low	Atmospheric Deposition - Acidity
NHIMP600030406-03	Salmon Falls River - Rollinsford Dam	Rollinsford	57.000	Acres	Aquatic Life	pH	5-M		Low	Source Unknown
NHIMP600030406-04	Salmon Falls River - South Berwick Dam	Rollinsford	58.000	Acres	Aquatic Life	pH	5-M	N	Low	Atmospheric Deposition - Acidity
					Primary Contact Recreation	Chlorophyll-a	5-M	N	Low	Source Unknown
NHIMP600030603-01	Cocheco River - City Dam 1	Rochester	50.000	Acres	Aquatic Life	Dissolved oxygen saturation	5-M	N	Low	Source Unknown
						Oxygen, Dissolved	5-M	N	Low	Source Unknown
						pH	5-M	N	Low	Atmospheric Deposition - Acidity
NHIMP600030603-02	Cocheco River - Hatfield Dam	Rochester	1.000	Acres	Aquatic Life	pH	5-M		Low	Source Unknown
NHIMP600030607-02	Cocheco River - Gonic Dam Pond	Rochester	18.000	Acres	Aquatic Life	pH	5-M	N	Low	Atmospheric Deposition - Acidity
NHIMP600030608-02	Cocheco River - Watson Waldron Dam	Dover	54.000	Acres	Aquatic Life	pH	5-M	N	Low	Atmospheric Deposition - Acidity
NHIMP600030608-04	Cocheco River - Central Ave Dam	Dover	20.000	Acres	Aquatic Life	pH	5-M	N	Low	Atmospheric Deposition - Acidity
NHIMP600030701-01	Lamprey River	Deerfield	40.000	Acres	Aquatic Life	pH	5-P	N	Low	Atmospheric Deposition - Acidity
NHIMP600030708-03	Piscassic River	Newmarket	4.000	Acres	Aquatic Life	Dissolved oxygen saturation	5-M	N	Low	Source Unknown
						Oxygen, Dissolved	5-P	N	Low	Source Unknown
						pH	5-M	N	Low	Atmospheric Deposition - Acidity
NHIMP600030709-02	Lamprey River - Wiswall Dam	Durham	30.000	Acres	Aquatic Life	pH	5-P	N	Low	Atmospheric Deposition - Acidity
NHIMP600030709-03	Lamprey River - Macallen Dam	Durham	120.000	Acres	Aquatic Life	pH	5-P	N	Low	Atmospheric Deposition - Acidity
NHIMP600030803-03	Exeter River, Imp, Pws	Fremont	24.000	Acres	Aquatic Life	pH	5-M	N	Low	Atmospheric Deposition - Acidity
NHIMP600030901-02	Winnicut River	Greenland	1.000	Acres	Aquatic Life	DISSOLVED OXYGEN SATURATION	5-P	N	Low	Source Unknown

TRITECH
ENGINEERING CORPORATION

755 Central Avenue
Dover, New Hampshire 03820

Telephone 603.742.8107
Facsimile 603.742.3830

January 10, 2019

Christopher G. Parker, AICP
Assistant City Manager
City of Dover, Planning Department
288 Central Avenue
Dover, New Hampshire 03820

Subject: *Subdivision Application*
Bellamy Ridge, Sweatt Property
54 Back River Road
Tax Map I, Lot 6
Job No. 18129

Dear Christopher:

- Eight (8) Full Size copies of the Plan Set.
- One (1) 11 X 17 copy of the Plan Set.
- Eight (8) copies each of the following Supporting Documentation:
  - This cover letter.
  - The Subdivision Application.
  - The Subdivision Submission Checklist.
  - The list of Professional Agents, Applicant & Owner for the project.
  - The Traffic Impact Analysis.

We look forward to reviewing these plans and documentation with the Technical Review Committee on January 31, 2019.

Please advise should you have any questions.

Very truly yours,
TRITECH ENGINEERING CORP.

Robert J. Stowell, P.E., L.L.S.
President

RJS / rms

Enclosures
\\18129_TRC_SubdTRCSubmissLtr.doc

City of Dover, New Hampshire
SUBDIVISION APPLICATION

[Revision Date: August 02, 2017]

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

APPLICANT AND OWNER INFORMATION

Name of Applicant: James Gauron Telephone # (978)-273-5945

Address of Applicant: 15 Starfish Drive, Wells, ME 04090

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

Address of Property Owner: 56 Back River Road, Dover, NH 03820

E-Mail Address: _jim@belcocpa.com

PROPERTY INFORMATION

Address of Property: 54 Back River Road

Assessor's Map # I Lot(s) # 6

Zoning District(s) R-12 Overlay District(s) Conservation & Wetlands Protection

Size of Parcel: 7.162 Acres Property Deed: Book 1605 Page: 169

Existing Use of Property: Single Family House

SUBDIVISION INFORMATION

Subdivision Type: Major (4 + net new lots): X Open Space: X

Existing Number of Lots: 1 Proposed Number of Lots: 9

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

City Sewer? X Yes ___ No How far is city sewer from the property? At the site

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

Estimated Length of Proposed Roads: _____ feet Public or Private Road? _____

WAIVER REQUESTS

Subdivision Regulations section(s) to be waived: _____

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

SURVEYOR INFORMATION

Name of Surveyor and Company (Licensed in N.H.) Robert J. Stowell, Tritech Engineering Corporation

Address 755 Central Avenue, Dover, NH 03820 Telephone #: (602)-742-8107

Professional License #: 884 E-mail address: rjs@tritecheng.com

ENGINEER INFORMATION

Name of Engineer and Company (Licensed in N.H.) Robert J. Stowell, Tritech Engineering Corporation

Address 755 Central Avenue, Dover, NH 03820 Telephone #: (603)-742-8107

Professional License #: 9903 E-mail address: rjs@tritecheng.com

SIGNATURES

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

Signature of Property Owner: _____ Date: _____

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

Signature of Agent: _____, PRESIDENT Date: 01/10/2019

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: _____

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

SURVEYOR INFORMATION

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Signature of Property Owner: as commissioner for the real estate Date: 1/8/19

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

Signature of Agent: _____ Date: _____

AUTHORIZATION TO ENTER SUBJECT PROPERTY

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Signature of Property Owner: as commissioner for the real estate Date: 1/8/19

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: _____ as commissioner for the real estate Date: 1/8/19

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: _____ as commissioner Date: 1/8/19

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: _____ as commissioner for real estate Date: 1/8/19

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

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

SURVEYOR INFORMATION

Name of Surveyor and Company (Licensed in N.H.) Robert J. Stowell, Tritech Engineering Corporation

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SIGNATURES

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Signature of Property Owner: _____ Date: _____

Signature of Applicant (*if different from owner*): _____ Date: 1/7/19

Signature of Agent: _____ Date: _____

AUTHORIZATION TO ENTER SUBJECT PROPERTY

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

Signature of Property Owner: _____ Date: _____

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: _____

Signature of Applicant (*if different from owner*): James P Gamm Date: 1/7/19

CERTIFICATION OF FEES

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

Signature of Property Owner: _____ Date: _____

Signature of Applicant (*if different from owner*): James P Gamm Date: 1/7/19

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: _____

Signature of Applicant (*if different from owner*): James P Gamm Date: 1/7/19

PLANNING BOARD
ESTIMATED FEE SCHEDULE

This is only provided to give you an estimate of the application fees. *After you submit an application, staff will invoice you a total.* All fees must be paid two weeks before the Planning Board meeting. **If the Fee has not been paid, the item will not be placed upon the agenda.**

A. TOTAL FEE paid by cash or check made payable to "City of Dover"

1. Application fee for the following:
   - SUBDIVISION $150.00 x # 8 new lots created = $ 1,200.00
   - LOT LINE ADJUSTMENT $200.00 (if more than two lots involved, add $100.00 per lot) = $ _____
   - SITE REVIEW - RESIDENTIAL $100.00 x # ____ per dwelling unit = $ _____
   - SITE REVIEW – NON-RESIDENTIAL (not to exceed $10,000)
     New construction $.15 sq. ft. x # _____ sq. ft. = $ _____
     Additions (new floor space) $.10 per sq. ft. x # _____sq. ft. = $ _____
   - IMPERVIOUS PAVED AREA (for new development) OR IMPERVIOUS PARKING LOT ADDITIONS (not to exceed $10,000) $.07 sq. ft. x # _____ = $ _____
   - MOTEL/HOTEL $35.00 x # ___ per lodging unit = $ _____
   - CHANGE OF USE (not to exceed $5,000)
     Existing floor space $.10 per sq. ft. x # ____ sq. ft. = $ _____
   - CONDITIONAL USE PERMIT $150.00 x # _____ per application = $ _____
   - GRAVEL PIT/ EXCAVATIONS - Application fee $50.00 & Permit fee $75.00 = $ _____
   - EXTENSIONS OF/AMENDMENTS TO/WAIVERS FOR AN APPROVED PLAN ($150.00 minimum) $50.00 x # ____ per hour of review $ _____
   - REQUEST FOR REZONING $150.00 = $ _____
   - DRIVEWAY WAIVER – $100.00 application fee =
     Letter of rejection from Engineering Department, diagram & letter from owner $ _____

B. Abutter Notification/Mailing Labels - this office will create and print the abutter list and provide labels in triplicate for each abutter. The applicant/owner will need to provide to this office the engineer, architect, land surveyor or soil scientist whose professional seal appears on the plan with names and addresses for notices. You will be notified with the amount due, once this has been completed.

1. Applicant & Owner, engineer, architect, land surveyor or soil scientist Certified letters fee # 5 of x $8.00 =
2. Certified letters fee: # of abutters _____ X $8.00 = $ 40.00
3. First Class Mail fee (for individual owner of units within a condominium or other collective form of ownership): # of abutters _____ X $1.00 = $ _____
4. Creating/Printing Abutter Labels in triplicate per sheet _____ x $10.00 = $ _____

C. Foster's newspaper public notice fee **$ 80.00**

D. Digital Version of the Plan in PDF/A format or Archive Fee $1.00 x # _____ per sheet of plan set = $ _____

(Revised May 15, 2017)

TOTAL FEE **$** 1,320.00

CITY OF DOVER SUBDIVISION
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
I	6	Arthur Sweatt	56 Back River Road, Dover, NH 03820

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS
James Gauron		15 Starfish Drive, Wells, ME 04090

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS
Robert J. Stowell	Tritech Engineering Corporation	755 Central Ave, Dover, NH 03820
Michael Mariano	Highland Soil Services	75 Prospect St, Somersworth, NH 03878
Kim Eric Hazarvartian	TEPP LLC	93 Stiles Road, Suite 201, Salem, NH 03079

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS

City of Dover, New Hampshire
SUBDIVISION SUBMISSION CHECKLIST

[Revision Date: December 15, 2017]

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.

Fees will be invoiced and are due along with fifteen (15), folded, copies of the plan set and materials, including response to TRC comments, will be due 3 weeks 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: James Gauron File Number:_____

PROJECT TITLE: Bellamy Ridge, Sweatt Property

PROPERTY LOCATION: 54 Back River Road, Dover, NH Tax Map: I Lot: 6

	Explain How Provided	Reviewed
1. Completed and signed Application form	Enclosed	
2. Electronic copy of the surveyed plat layout		
3. Electronic copy of supplementary materials and application		
4. Traffic Impact Assessment and Analysis (Standard or Advanced)	N/A	
5. Fiscal Impact Analysis (For more than 10 units)	N/A	
6. Waiver requests to the Subdivision Regulations, with written justification	N/A	
7. Conditional Use Permit applications	N/A	
8. Narrative describing yield plan and cost analysis	N/A	
9. List of all professional agents to be notified for Planning Board	Enclosed	
10. Letter to Serve from Public and Private Utilities	Pending	
11. Eight folded copies of subdivision plan w/scale of not less than 1"=50' or 1"=100' for larger subdivisions, for TRC. Plans shall contain the following items as appropriate:	Enclosed	
Location map at appropriate scale	On Plan	
Proposed subdivision name and title and Planning File #	On Plan	
Date, north arrow and scale	On Plan	
Names of all abutting property owners	On Plan	
Name and address of owners and/or applicants	On Plan	
Signature & stamp of NH licensed land surveyor and/or engineer	On Plan	
Zoning District boundaries, including any special or overlay districts	On Plan	
Location of Conservation District areas	On Plan	
Location, names and widths of existing and proposed streets, including pavement widths, grades, curbs and crosswalks	On Plan	
Location and widths of existing & proposed easements & right of ways	On Plan	
Location and widths of existing and proposed sidewalks	On Plan	
Existing and proposed property lines with dimensions and bearings tied into Dover's Geographic Information System coordinate system	On Plan	
Existing and proposed lot areas in square feet	On Plan	
Existing and proposed topographic information at two foot intervals	On Plan	

	Explain How Provided	Reviewed
Existing and proposed buildings and structure locations	On Plan	
Minimum building setbacks or build to lines on all lots	On Plan	
Location and size of existing and proposed electric, telephone, gas cable and other underground utilities	On Plan	
Existing and proposed water lines and fire hydrants, including materials and capacity needed	On Plan	
Location and materials of sanitary sewage facilities within project site and projected additional peak hour sewer load	On Plan	
Existing and proposed septic system, including test pit locations and results and NHDES subdivision permit number	N/A	
Existing and proposed stormwater lines and facilities	On Plan	
Existing and proposed streetlights	On Plan	
Location of Flood Hazard Zone	On Plan	
Location of all bodies of water and watercourses	On Plan	
Location of wetlands and buffers	On Plan	
Neighborhood plan with aerial underlay showing how project relates to abutting uses	On T-2	
Existing natural features and/or significant vegetation on property	On Plan	
Depict existing contours up to 100 ft. beyond project limits	On Plan	
Soil types	On Plan	
Map and lot numbers for existing and proposed lots as assigned by Tax Assessor	On Plan	
Location of all land offered for dedication for public use or land to be held in common by property owners of the subdivision	On Plan	
Location, material and size of existing and proposed permanent monuments	On Plan	
Existing railroad lines	N/A	
Note regarding solid waste disposal	On Plan	
All applicable Dover Common Subdivision notes	On Plan	
12. Construction Detail Sheets shall contain the following information:		
Profiles showing existing & proposed elevations along the center lines of proposed streets & within 100' of intersections with existing streets	On Plan	
Profiles showing the locations & a typical cross-section detail of streets	On Plan	
Location of street trees, street lighting poles and street signs	On Plan	
Location, size and invert elevations of existing and proposed sanitary sewers, stormwater drains and fire hydrants	On Plan	
Location and size of all water, gas and other underground utilities	On Plan	
13. Additional Information if appropriate		
Stormwater Management Plan depicting the existing and proposed storm drainage system and engineered drainage analysis	Under Seperate Cover	
Stormwater Management System Operation and Maintenance Plan	Under Seperate Cover	
Erosion and Sedimentation Control Plan	On Plan	
Perimeter Landscaping Plan	N/A	
Proposed restrictive covenants or homeowners association documents	In Progress	
Dates and permit numbers of all required state and federal permits	N/A	
If wetland buffer, indicate placards locations, as applicable	N/A	
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	Traffic, Enclosed	

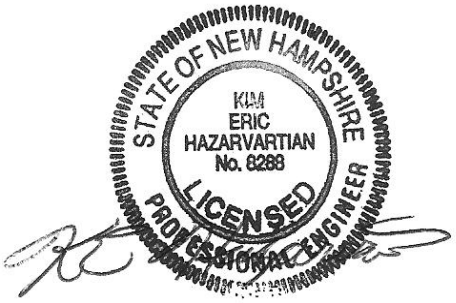
REVIEWED BY: _____ DATE_____ TRC DATE_____

TEPP LLC TRANSPORTATION ENGINEERING, PLANNING AND POLICY

93 Stiles Road, Suite 201, Salem, New Hampshire 03079 USA
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Phone (603) 212-9133 and Fax (603) 226-4108
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MEMORANDUM

Ref: 1402
Subject: Traffic Assessment
Bellamy Ridge Residential Development
Dover, New Hampshire
From: Kim Eric Hazarvartian, Ph.D., P.E., PTOE
Principal
Date: January 10, 2019



INTRODUCTION

Tritech Engineering Corporation has retained TEPP LLC to prepare this traffic-assessment memorandum (TAM). This TAM regards the Bellamy Ridge residential development in the City of Dover, New Hampshire.

This TAM includes:

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

This TAM concludes that:

- relevant sight distances at the Back River Road/proposed driveway intersection will be adequate
- the proposed 8 dwelling units is not anticipated to add significant new traffic to the area

EXISTING SITE DESCRIPTION

The site:

- is along the east side of Back River Road
- has an area of about 7.25 acres
- includes private Red Barn Drive, which intersects the east side of Back River Road
- includes 6 single-family-detached dwelling units and 2 duplex dwelling units along Red Barn Drive
- has proximate residential development and wooded land

PROPOSED PROJECT DESCRIPTION

The project:

- will widen the Red Barn Drive travelway from 20 feet (ft) to 24 ft, with no parking on one side, with curb on both sides and with sidewalk on the west side
- will provide a private proposed driveway, which will intersect the east side of Back River Road about 250 ft south of Red Barn Drive
- will provide 8 additional single-family-detached housing units, with 5 along Red Barn Drive and with 3 along the proposed driveway

ROAD DESCRIPTION

Back River Road:

- is a north-south arterial street under the jurisdiction of the City
- has connections to and from the north with central Dover, with New Hampshire Route 108, an arterial highway, and with the Spaulding Turnpike, a freeway of regional importance
- has a connection to and from the south with U.S. Route 4, an arterial highway of regional importance
- has curvilinear horizontal alignment near the site
- has minor vertical grades near the site
- has asphalt-cement-concrete pavement in overall good condition

- has one travel lane per direction
- includes sidewalk along the east side at or near the site
- has pavement markings including double-yellow lines, separating traffic directions, and single-white edge lines
- includes utility poles along the west side near the site

PUBLIC TRANSIT

University of New Hampshire Wildcat bus-transit Route 3 runs along Central Avenue near Back River Road, with stops at Charles Street and Rutland Street, about 0.6 miles from the site. Route 3 connects with:

- central Dover, to the north
- Central Avenue north of central Dover
- the Town of Durham, to the south
- the University of New Hampshire campus in the Town of Durham
- the Cooperative Alliance for Seacoast Transportation (COAST) bus-transit system

SIGHT DISTANCES

The American Association of State Highway and Transportation Officials (AASHTO) has established authoritative policy for sight distances at unsignalized intersections in terms of:

- stopping sight distance (SSD)
- optional intersection sight distance (ISD)[1]

SSD:

- provides for safety
- enables a driver, on the major road, to perceive and react accordingly to a vehicle entering the major road from a minor road
- is conservative because it encompasses a wide range of brake-reaction times and deceleration rates[2]

[1] AASHTO, *A Policy on Geometric Design of Highways and Streets*, 6th Edition (Washington, DC, 2011), pages 9-28 to 9-29.

[2] AASHTO, pages 3-2 to 3-6.

Optional ISD:

- is ordinarily greater than SSD and may enhance traffic operations
- is not required for safety

Table 1 shows that relevant available sight distances for the Back River Road/proposed driveway intersection will be adequate.

Table 1. Sight distances.

Intersection and View	Sight Distance (ft)[a]	Speeds (miles per hour)	
		Limit	SSD Provides For
Back River Road Road/Proposed Driveway			
Back River Road to/from North	518±	30	45+
Back River Road to/from South	374±	30	45+

[a] Provided by Tritech Engineering Corporation. With appropriate roadside and vegetation maintenance.

CALCULATED TRIP GENERATION

The Institute of Transportation Engineers (ITE) compiles and publishes trip-generation information for a variety of land uses in *Trip Generation Manual*.[3] This authoritative guide for calculating site traffic includes information for single-family-detached housing, based on number of dwelling units.[4]

Table 2 shows calculated vehicle trips due to the proposed 8 dwelling units as:

- weekday daily, 76 (total of in and out)
- weekday AM-street-peak hour, 6 (2 in and 4 out)
- weekday PM-street-peak hour, 8 (5 in and 3 out)

[3] ITE, *Trip Generation Manual*, 10th edition (Washington DC, September 2017).

[4] ITE, *Trip Generation Manual*, pages 332 to 359.

Table 2. Calculated weekday vehicle-trip generation.

	]Vehicle-Trips[a]		
	Daily	AM-Street-Peak Hour	PM-Street-Peak Hour
In	38	2	5
Out	38	4	3
Total	76	6	8

[a] Based on ITE, *Trip Generation Manual*, single-family-detached housing, land use 210, 8 dwelling units.

TRIP DISTRIBUTION/ASSIGNMENT

Calculated trip generation is so low that area traffic operations are not sensitive to trip distribution/assignment. Vehicle-trips to and from the north may predominate largely due to the connections to central Dover and the Spaulding Turnpike.

POTENTIAL TRAFFIC IMPACTS

The calculations show less than 100 peak-hour primary vehicle-trips, due to the proposed 8 dwelling units. More specifically, calculated peak-hour trip generation is:

- 6 to 8 vehicle-trips
- split between Red Barn Drive and the proposed driveway
- split entering versus exiting the site
- further split by orientation to and from the north and south

Therefore, the proposed 8 dwelling units are not anticipated to add significant new traffic to the area.

CONCLUSION

In conclusion:

- relevant sight distances at the Back River Road/proposed driveway intersection will be adequate
- the proposed 8 dwelling units is not anticipated to add significant new traffic to the area

SUBDIVISION AND CONSTRUCTION PLANS

BELLAMY RIDGE

54 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE

LIST OF PLANS

T-1 - TITLE SHEET
T-2 - NEIGHBORHOOD PLAN 1"=100'
EX-1 - EXISTING CONDITIONS PLAN 1"=40'
Y-1 - SUBDIVISION YIELD PLAN 1"=40'
S-1 - OPEN SPACE SUBDIVISION PLAN 1"=40'
S-2 - TOPOGRAPHIC PLAN 1"=40'
SP-1 - SITE DEVELOPMENT PLAN 1"=30'
SP-2 - UTILITIES PLAN 1"=30'
SP-3 - GRADING & DRAINAGE PLAN 1"=30'
C-1 - PLAN & PROFILE - RED BARN DRIVE
C-2 - PLAN & PROFILE - PRIVATE DRIVE
C-3 - CONSTRUCTION DETAILS
C-4 - CONSTRUCTION DETAILS
C-5 - CONSTRUCTION DETAILS
C-6 - CONSTRUCTION DETAILS
C-7 - CONSTRUCTION DETAILS
C-8 - SEWER CONSTRUCTION DETAILS
C-9 - SEWER CONSTRUCTION DETAILS
SD-1 - SITE DISTANCE PLAN

PREPARED BY
TRITECH

OWNER
ARTHUR SWEATT
56 BACK RIVER ROAD
DOVER, NH

PREPARED FOR
JAMES GAURON
15 STARFISH DRIVE
WELLS, ME

TRITECH
ENGINEERING CORPORATION
755 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820
TELEPHONE 603 742 9107
FAX 603 742 3830

REVISIONS
DATE: DESCRIPTION:

TITLE SHEET
BELLAMY RIDGE
54 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE
STRAFFORD COUNTY
JANUARY 10, 2019
JOB No. 18129

SHEET No.
T-1

(P19-00)

NOTES

1.) INTENT: TO SHOW THE CONVENTIONAL SUBDIVISION OF DOVER TAX MAP I LOT 6.

2.) CURRENT OWNER OF RECORD: ARTHUR SWEATT
56 BACK RIVER ROAD
DOVER, N.H.

3.) SUBJECT PARCEL IS LOCATED IN THE CITY OF DOVER, COUNTY OF STRAFFORD AND THE STATE OF NEW HAMPSHIRE.

4.) TOTAL LOT AREA: 311,970 SQ.FT. – 7.162 ACRES

5.) TAX MAP I LOTS 6

6.) PROJECT DEED REFERENCE: BOOK 1605 PAGE 169

7.) ZONING: R–12

MIN. LOT SIZE: 12,000 SQ. FT.	OPEN SPACE REQUIREMENTS MIN. LOT SIZE: 8,000 SQ.FT.
MIN. FRONTAGE: 100 FT	MIN. FRONTAGE: 20 FT
MIN. SETBACKS:	MIN. SETBACKS:
FRONT: 30 FT	FRONT: 10 FT
SIDE: 15 FT	SIDE: 10 FT
REAR: 15 FT	REAR: 10 FT
MAX BUILDING HEIGHT: 35 FT	EXTERIOR BOUNDARY: 30 FT
LOT COVERAGE: 30 %	EXISTING STRUCTURES: 50 FT
	FRONTAGE BUFFER:100 FT

8.) THIS PROPERTY FALLS WITHIN THE FOLLOWING ZONING OVERLAY DISTRICTS: WETLANDS, CONSERVATION, TIDAL

9.) THE RAW UNADJUSTED CLOSURE OF OUR RANDOM POINT TRAVERSE WAS 1 PART IN 35,000, AND WAS ACCOMPLISHED USING A TOPCON 500 GT TOTAL STATION, DURING THE MONTH OF SEPTEMBER, 2018.

10.) IN THE MONTH OF OCTOBER, 2018 MICHAEL MARIANO, STATE OF NEW HAMPSHIRE CERTIFIED SOIL SCIENTIST, NH CERTIFIED WETLAND SCIENTIST, CONDUCTED

11.) AN ON–SITE WETLANDS DELINEATION OF THE SUBJECT PARCEL. WETLANDS WERE IDENTIFIED BASED ON THE CITY OF DOVER ZONING ORDINANCE (170–27.1) AND ON STATE & FEDERAL CRITERIA OUTLINED IN THE "CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL" (DEPT. OF THE ARMY, 1987) ON THIS SITE, WETLANDS BASED ON LOCAL CRITERIA SHARE THE SAME BOUNDARIES WITH THOSE BASED ON STATE AND FEDERAL CRITERIA. NO VERY POORLY DRAINED SOILS WERE FOUND.

PROJECT PLAN REFERENCE:

OPEN SPACE SUBDIVISION PLAN
BELLAMY RIDGE
46 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE
TRITECH ENGINEERING CORPORATION
DECEMBER 24, 2014 SCRD 110–35

PLAN OF LAND OF
ROBERT & MURIEL NESMAN
BACK RIVER ROAD
DOVER, N.H.
McKENNEANEY & O'NEIL SURVEY ASSOCIATES
MAY 6, 1988 SCRD 34–66

PLAN OF LAND OF
BRUCE G. & OLIVE E. STAPLES
BACK RIVER ROAD
DOVER, NEW HAMPSHIRE
K.E. MOORE & B.G. STAPLES
JAN. 1985 SCRD 25–65

PLAN OF LAND FOR
EDWARDS REALTY INC
SAWYERS LOWER MILL
DOVER, NEW HAMPSHIRE
GRANT L. DAVIS
APRIL 1954 SCRD Po 2 Fo 21 PLAN #26

BOUNDARY LINE ADJUSTMENT FOR
LOUISE SWEATT
DOVER, NEW HAMPSHIRE
EMERY ENGINEERING
SEPTEMBER 26, 1991 SCRD 39–79

SUBDIVISION PLAN FOR
LOUISE M. SWEATT
DOVER, NEW HAMPSHIRE
EMERY ENGINEERING
JUNE 6, 1991 SCRD 39–24

12.) BASIS OF BEARING: BEARING SYSTEM BASED ON GPS FIELD OBSERVATIONS ON AUGUST 21, 2018 USING TOPCON HIPER SR RECEIVERS AND OPUS CORRECTED ON AUGUST 24, 2018. DATUM BASED ON NEW HAMPSHIRE STATE PLANE COORDINATES SPC (2800 NH), (VERTICAL DATUM: NAVD 88).

13.) A PORTION OF THE SUBJECT PARCEL IS WITHIN A FEDERALLY DESIGNATED SPECIAL FLOOD HAZARD ZONE (FLOOD HAZARD ZONE A – PANEL 0340E, MAP No. 33017C0340E, DATE: 9–30–2015).

14.) PLANS T–1, T–2, EX–1, Y–1, S–1, S–2, SP–1 THRU SP–3, C–1 THRU C–9 AND SD–1 ARE PART OF THIS APPROVAL.

15.) SUBJECT PARCEL SCS SOIL TYPES –GlB– GLOUCESTER, FINE SANDY LOAM, 3 TO 8% SLOPES
–HgD– HOLLIS–GLOUCESTER, VERY ROCKY FINE SANDY LOAMS, 15 TO 25% SLOPES
–SfC– SUFFIELD, SILT LOAM, 8 TO 15% SLOPES

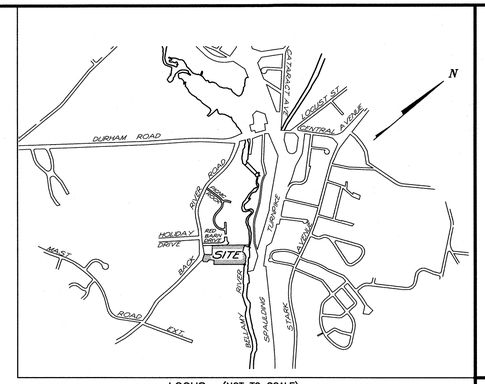
16.) MAP I LOT 6C MAY BE SUBJECT TO FLOWAGE RIGHTS AND MILL PRIVILEGE RIGHTS.

17.) LOTS ARE SERVICED BY CITY WATER AND MUNICIPAL SEWER.

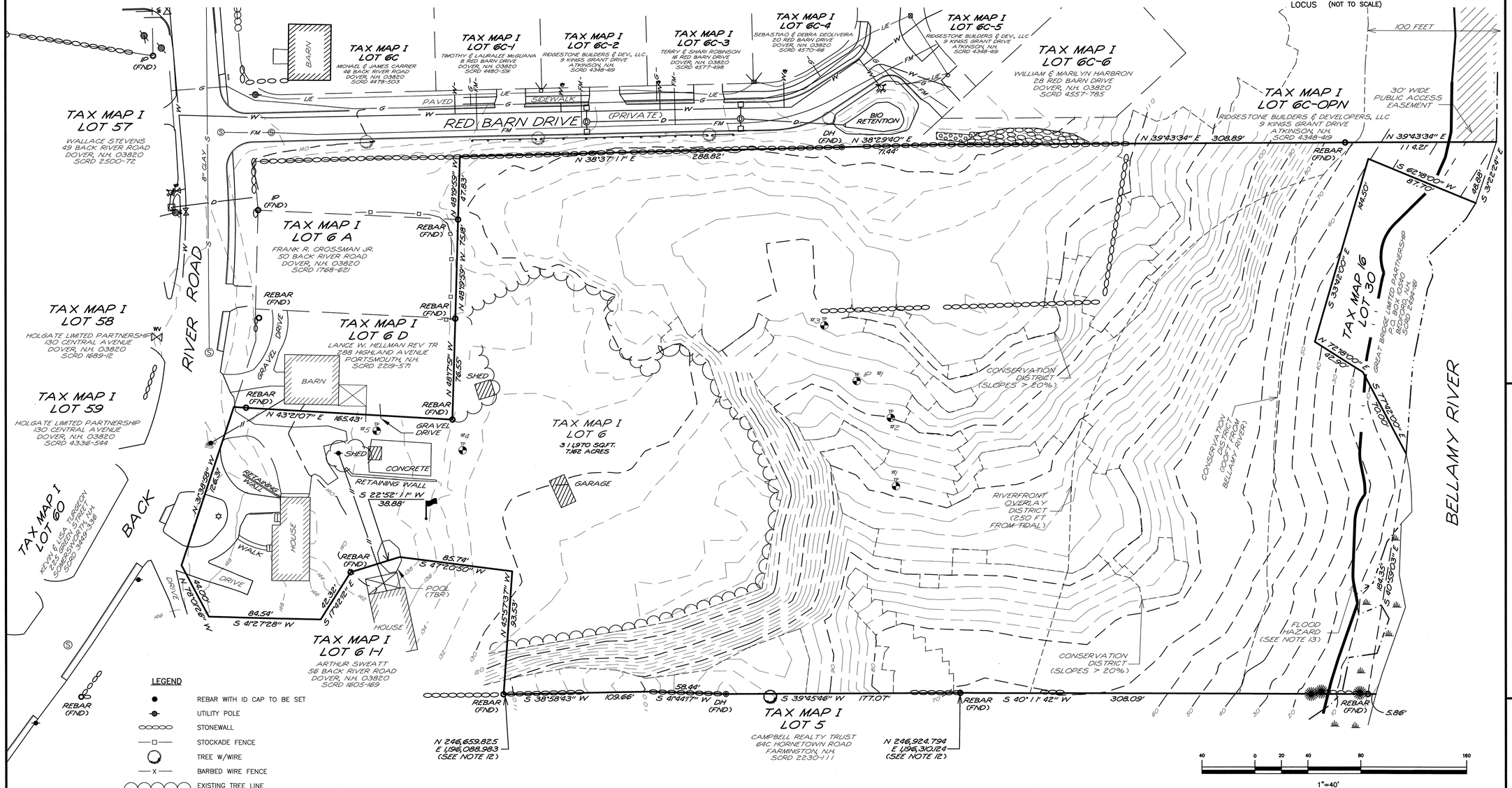
18.) A PORTION OF THE BELLAMY RIVER ADJACENT TO THE SUBJECT PROPERTY IS SUBJECT TO TIDAL ACTION. THE RIVER FRONT OVERLAY DISTRICT DOES APPLY TO A PORTION OF THE SUBJECT PARCEL.

N

TRITECH
ENGINEERING CORPORATION



LOCUS (NOT TO SCALE)



LEGEND

- REBAR WITH ID CAP TO BE SET
- UTILITY POLE
- STONEWALL
- STOCKADE FENCE
- TREE W/WIRE
- BARBED WIRE FENCE
- EXISTING TREE LINE

TRITECH
ENGINEERING CORPORATION
795 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820
TELEPHONE 603 742 8107
FAX 603 742 3550

REVISIONS
DATE: DESCRIPTION:

EXISTING CONDITIONS PLAN

BELLAMY RIDGE

54 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE
STRAFFORD COUNTY

JANUARY 10, 2019 JOB No. 18129
SCALE: 1" = 40'

SHEET No. **EX-1**

(P19-00)

NOTES

1.) INTENT: TO SHOW THE CONVENTIONAL SUBDIVISION OF DOVER TAX MAP I LOT 6.

2.) CURRENT OWNER OF RECORD: ARTHUR SWEATT
56 BACK RIVER ROAD
DOVER, N.H.

3.) SUBJECT PARCEL IS LOCATED IN THE CITY OF DOVER, COUNTY OF STRAFFORD AND THE STATE OF NEW HAMPSHIRE.

4.) TOTAL LOT AREA: 311,970 SQ.FT. – 7.162 ACRES

5.) TAX MAP I LOTS 6

6.) PROJECT DEED REFERENCE: BOOK 1605 PAGE 169

7.) ZONING: R–12

MIN. LOT SIZE: 12,000 SQ. FT.	OPEN SPACE REQUIREMENTS
MIN. FRONTAGE: 100 FT	MIN. LOT SIZE: 8,000 SQ.FT.
MIN. SETBACKS:	MIN. FRONTAGE: 20 FT
FRONT: 30 FT	MIN. SETBACKS:
SIDE: 15 FT	FRONT: 10 FT
REAR: 15 FT	SIDE: 10 FT
MAX BUILDING HEIGHT: 35 FT	REAR: 10 FT
LOT COVERAGE: 30 %	EXTERIOR BOUNDARY: 30 FT
	EXISTING STRUCTURES: 50 FT
	FRONTAGE BUFFER:100 FT

8.) THIS PROPERTY FALLS WITHIN THE FOLLOWING ZONING OVERLAY DISTRICTS: WETLANDS, CONSERVATION, TIDAL

9.) THE RAW UNADJUSTED CLOSURE OF OUR RANDOM POINT TRAVERSE WAS 1 PART IN 35,000, AND WAS ACCOMPLISHED USING A TOPCON 500 GT TOTAL STATION, DURING THE MONTH OF SEPTEMBER, 2018.

10.) IN THE MONTH OF OCTOBER, 2018 MICHAEL MARIANO, STATE OF NEW HAMPSHIRE CERTIFIED SOIL SCIENTIST, NH CERTIFIED WETLAND SCIENTIST, CONDUCTED AN ON–SITE WETLANDS DELINEATION OF THE SUBJECT PARCEL. WETLANDS WERE IDENTIFIED BASED ON THE CITY OF DOVER ZONING ORDINANCE (170–27.1) AND ON STATE & FEDERAL CRITERIA OUTLINED IN THE "CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL" (DEPT. OF THE ARMY, 1987) ON THIS SITE, WETLANDS BASED ON LOCAL CRITERIA SHARE THE SAME BOUNDARIES WITH THOSE BASED ON STATE AND FEDERAL CRITERIA. NO VERY POORLY DRAINED SOILS WERE FOUND.

11.) PROJECT PLAN REFERENCE:

OPEN SPACE SUBDIVISION PLAN
BELLAMY RIDGE
46 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE
TRITECH ENGINEERING CORPORATION
DECEMBER 24, 2014 SCRD 110–35

PLAN OF LAND OF
BRUCE G. & OLIVE E. STAPLES
BACK RIVER ROAD
DOVER, NEW HAMPSHIRE
K.E. MOORE & B.G. STAPLES
JAN. 1985 SCRD 25–65

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LOUISE SWEATT
DOVER, NEW HAMPSHIRE
EMERY ENGINEERING
SEPTEMBER 26, 1991 SCRD 39–79

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SAWYERS LOWER MILL
DOVER, NEW HAMPSHIRE
GRANT L. DAVIS
APRIL 1954 SCRD Po 2 Fo 21 PLAN #26

SUBDIVISION PLAN FOR
LOUISE M. SWEATT
DOVER, NEW HAMPSHIRE
EMERY ENGINEERING
JUNE 6, 1991 SCRD 39–24

12.) BASIS OF BEARING: BEARING SYSTEM BASED ON GPS FIELD OBSERVATIONS ON AUGUST 21, 2018 USING TOPCON HIPER SR RECEIVERS AND OPUS CORRECTED ON AUGUST 24, 2018. DATUM BASED ON NEW HAMPSHIRE STATE PLANE COORDINATES SPC (2800 NH), (VERTICAL DATUM: NAVD 88).

13.) A PORTION OF THE SUBJECT PARCEL IS WITHIN A FEDERALLY DESIGNATED SPECIAL FLOOD HAZARD ZONE (FLOOD HAZARD ZONE A – PANEL 0340E, MAP No. 33017C0340E, DATE: 9–30–2015).

14.) THE LOTS TO BE SERVED BY MUNICIPAL WATER AND SEWER.

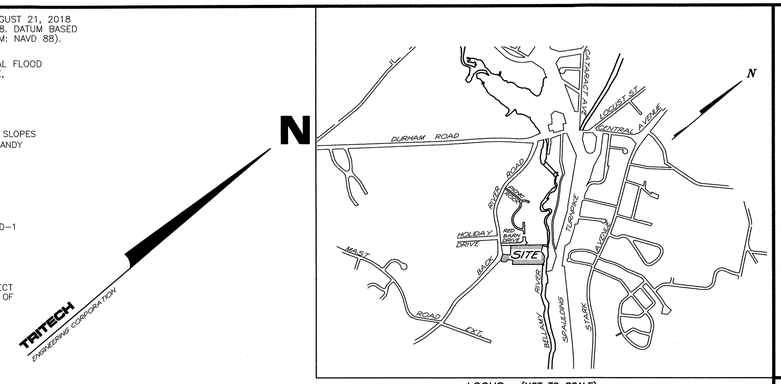
15.) SUBJECT PARCEL SCS SOIL TYPES –GiB– GLOUCESTER, FINE SANDY LOAM, 3 TO 8% SLOPES
–HgD– HOLLIS–GLOUCESTER, VERY ROCKY FINE SANDY LOAMS, 15 TO 25% SLOPES
–SfC– SUFFIELD, SILT LOAM, 8 TO 15% SLOPES

16.) ALL PROPOSED LOTS CONTAIN A MINIMUM OF 12,000 SQ.FT. OF CONTIGUOUS UPLAND, AND MORE THAN 8,000 SQ.FT. OF CONTIGUOUS NON–BUFFER UPLAND.

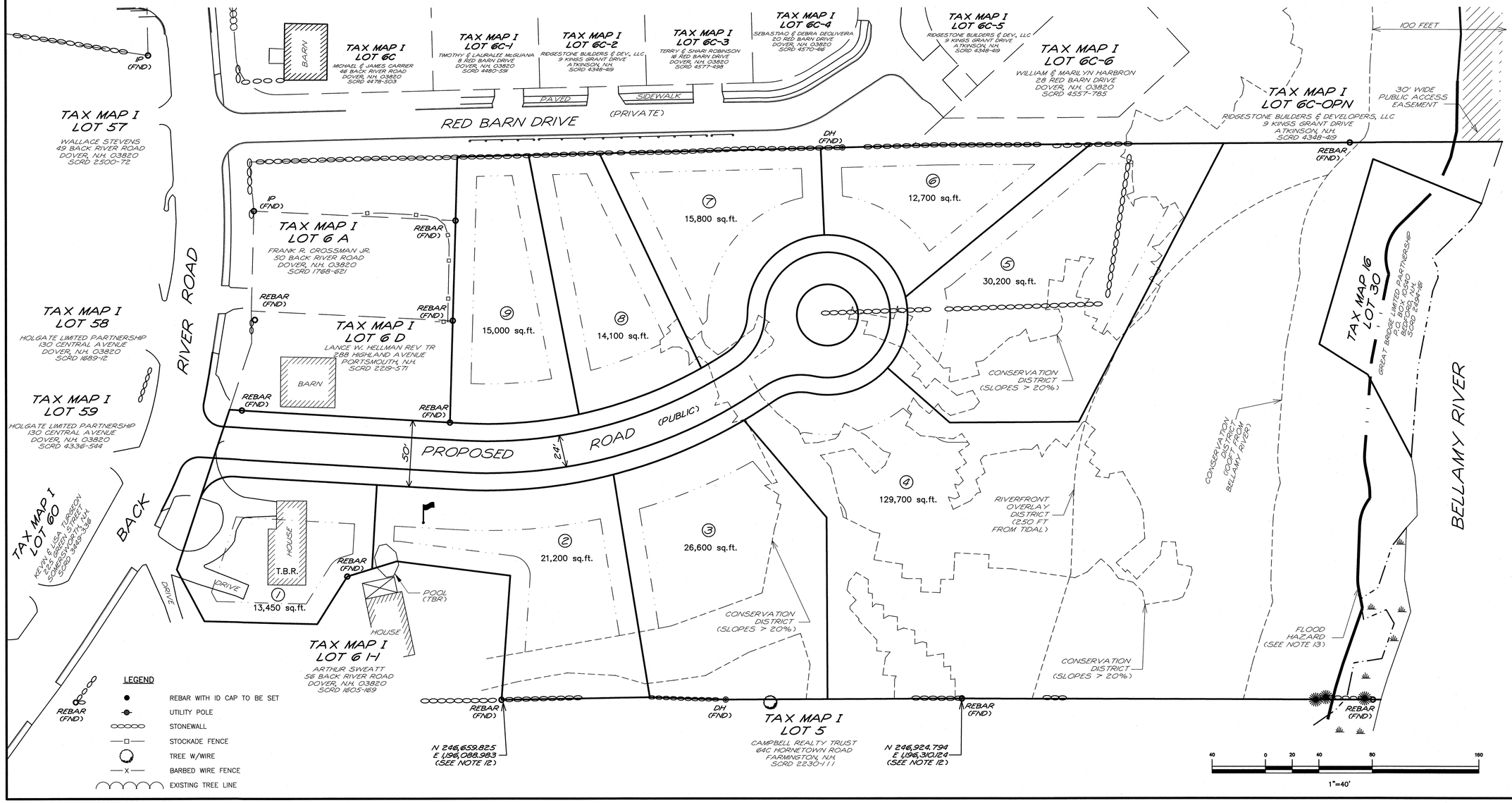
17.) PLANS T–1, T–2, EX–1, Y–1, S–1, S–2, SP–1 THRU SP–3, C–1 THRU C–9 AND SD–1 ARE PART OF THIS APPROVAL.

18.) MAP I LOT 6 MAY BE SUBJECT TO FLOWAGE RIGHTS AND MILL PRIVILEGE RIGHTS.

19.) A PORTION OF THE BELLAMY RIVER ADJACENT TO THE SUBJECT PROPERTY IS SUBJECT TO TIDAL ACTION. THE RIVER FRONT OVERLAY DISTRICT DOES APPLY TO A PORTION OF THE SUBJECT PARCEL.



LOCUS (NOT TO SCALE)



TRITECH
ENGINEERING CORPORATION
755 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820
TELEPHONE 603 749 8107
FAX 603 742 3330

REVISIONS
DATE: DESCRIPTION:

YIELD PLAN
BELLAMY RIDGE
54 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE
STRAFFORD COUNTY
JANUARY 10, 2019 JOB No. 18129
SCALE: 1" = 40'

SHEET NO. **Y-1**

(P19-00)

NOTES

1.) INTENT: TO SHOW THE OPEN SPACE SUBDIVISION OF DOVER TAX MAP I LOT 6. AS AN OPEN SPACE SUBDIVISION WHICH WILL CREATE 8 LOTS, PLUS THE EXISTING HOUSE LOT AT 54 BACK RIVER ROAD. THE OTHER 8 LOTS ARE 7 PROPOSED BUILDING LOTS, AND 1 OPEN SPACE LOT.

2.) CURRENT OWNER OF RECORD: ARTHUR SWEATT
56 BACK RIVER ROAD
DOVER, N.H.

OWNERS SIGNATURE

3.) SUBJECT PARCEL IS LOCATED IN THE CITY OF DOVER, COUNTY OF STRAFFORD AND THE STATE OF NEW HAMPSHIRE.

4.) TOTAL LOT AREA: 311,970 SQ.FT. – 7.162 ACRES

5.) TAX MAP I LOTS 6

6.) PROJECT DEED REFERENCE: BOOK 1605 PAGE 169

7.) ZONING: R–12

		OPEN SPACE REQUIREMENTS	
MIN. LOT SIZE:	12,000 SQ. FT.	MIN. LOT SIZE:	8,000 SQ.FT.
MIN. FRONTAGE:	100 FT	MIN. FRONTAGE:	20 FT
MIN. SETBACKS:		MIN. SETBACKS:	
FRONT:	30 FT	FRONT:	10 FT
SIDE:	15 FT	SIDE:	10 FT
REAR:	15 FT	REAR:	10 FT
MAX BUILDING HEIGHT:	35 FT	EXTERIOR BOUNDARY:	30 FT
LOT COVERAGE:	30 %	EXISTING STRUCTURES:	50 FT
		FRONTAGE BUFFER:	100 FT

8.) THIS PROPERTY FALLS WITHIN THE FOLLOWING ZONING OVERLAY DISTRICTS: WETLANDS, CONSERVATION, TIDAL

9.) THE RAW UNADJUSTED CLOSURE OF OUR RANDOM POINT TRAVERSE WAS 1 PART IN 35,000, AND WAS ACCOMPLISHED USING A TOPCON 500 GT TOTAL STATION, DURING THE MONTH OF SEPTEMBER, 2018.

10.) IN THE MONTH OF OCTOBER, 2018 MICHAEL MARIANO, STATE OF NEW HAMPSHIRE CERTIFIED SOIL SCIENTIST, NH CERTIFIED WETLAND SCIENTIST, CONDUCTED AN ON–SITE WETLANDS DELINEATION OF THE SUBJECT PARCEL. WETLANDS WERE IDENTIFIED BASED ON THE CITY OF DOVER ZONING ORDINANCE (170–27.1) AND ON STATE & FEDERAL CRITERIA OUTLINED IN THE "CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL" (DEPT. OF THE ARMY, 1987) ON THIS SITE, WETLANDS BASED ON LOCAL CRITERIA SHARE THE SAME BOUNDARIES WITH THOSE BASED ON STATE AND FEDERAL CRITERIA. NO VERY POORLY DRAINED SOILS WERE FOUND.

11.) PROJECT PLAN REFERENCE:

OPEN SPACE SUBDIVISION PLAN BELLAMY RIDGE 46 BACK RIVER ROAD DOVER, NEW HAMPSHIRE TRITECH ENGINEERING CORPORATION DECEMBER 24, 2014 SCRD 110–35	PLAN OF LAND OF ROBERT & MURIEL NESMAN BACK RIVER ROAD DOVER, N.H. McMENAMENEY & O'NEIL SURVEY ASSOCIATES MAY 6, 1988 SCRD 34–66
PLAN OF LAND OF BRUCE G. & OLIVE E. STAPLES BACK RIVER ROAD DOVER, NEW HAMPSHIRE K.E. MOORE & B.G. STAPLES JAN. 1985 SCRD 25–65	PLAN OF LAND FOR EDWARDS REALTY INC SAWYERS LOWER MILL DOVER, NEW HAMPSHIRE GRANT L. DAVIS APRIL 1954 SCRD Po 2 Fo 21 PLAN #26
BOUNDARY LINE ADJUSTMENT FOR LOUISE SWEATT DOVER, NEW HAMPSHIRE EMERY ENGINEERING SEPTEMBER 26, 1991 SCRD 39–79	SUBDIVISION PLAN FOR LOUISE M. SWEATT DOVER, NEW HAMPSHIRE EMERY ENGINEERING JUNE 6, 1991 SCRD 39–24

12.) BASIS OF BEARING: BEARING SYSTEM BASED ON GPS FIELD OBSERVATIONS ON AUGUST 21, 2018 USING TOPCON HIPER SR RECEIVERS AND OPUS CORRECTED ON AUGUST 24, 2018. DATUM BASED ON NEW HAMPSHIRE STATE PLANE COORDINATES SPC (2800 NH), (VERTICAL DATUM: NAVD 88).

13.) A PORTION OF THE SUBJECT PARCEL IS WITHIN A FEDERALLY DESIGNATED SPECIAL FLOOD HAZARD ZONE (FLOOD HAZARD ZONE A – PANEL 0340E, MAP No. 33017C0340E, DATE: 9–30–2015).

14.) THE LOTS WILL BE SERVICED BY MUNICIPAL SEWER AND WATER.

15.) STREET ADDRESSES FOR THE NEW LOTS SHALL BE ASSIGNED BY THE BUILDING OFFICIAL AT THE TIME OF ISSUANCE OF A BUILDING PERMIT.

16.) ALL ON–SITE UTILITIES SHALL BE INSTALLED UNDERGROUND.

17.) THE FINAL SUBDIVISION PLAN SHALL BE SUBMITTED IN A DIGITAL DXF FORMAT ON A TRANSFERABLE DISK TO THE CITY OF DOVER PLANNING DEPARTMENT'S OFFICE.

18.) VARIANCES, SPECIAL EXCEPTIONS, CONDITIONAL USE PERMITS: NONE

19.) THE PROPOSED USE FOR THE SITE IS SINGLE FAMILY RESIDENTIAL.

20.) PLANS T–1, T–2, EX–1, Y–1; S–1, S–2, SP–1 THRU SP–3, C–1 THRU C–9 AND SD–1 ARE PART OF THIS APPROVAL.

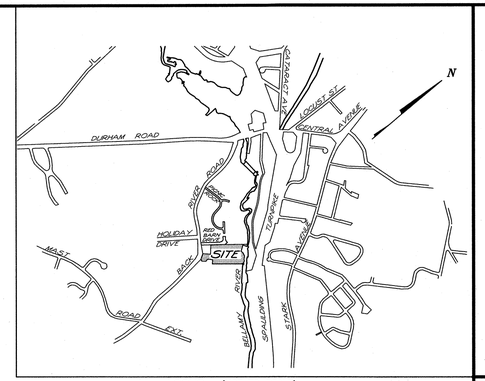
21.) MAP I LOT 6 MAY BE SUBJECT TO FLOWAGE RIGHTS AND MILL PRIVILEGE RIGHTS.

22.) LOTS TO BE SERVICED BY CITY WATER AND SEWER. ALL NEW DWELLING UNITS SHALL BE ASSESSED THE CURRENT WATER AND SEWER INVESTMENT FEES IN PLACE AT THE TIME OF THE BUILDING PERMIT APPLICATION.

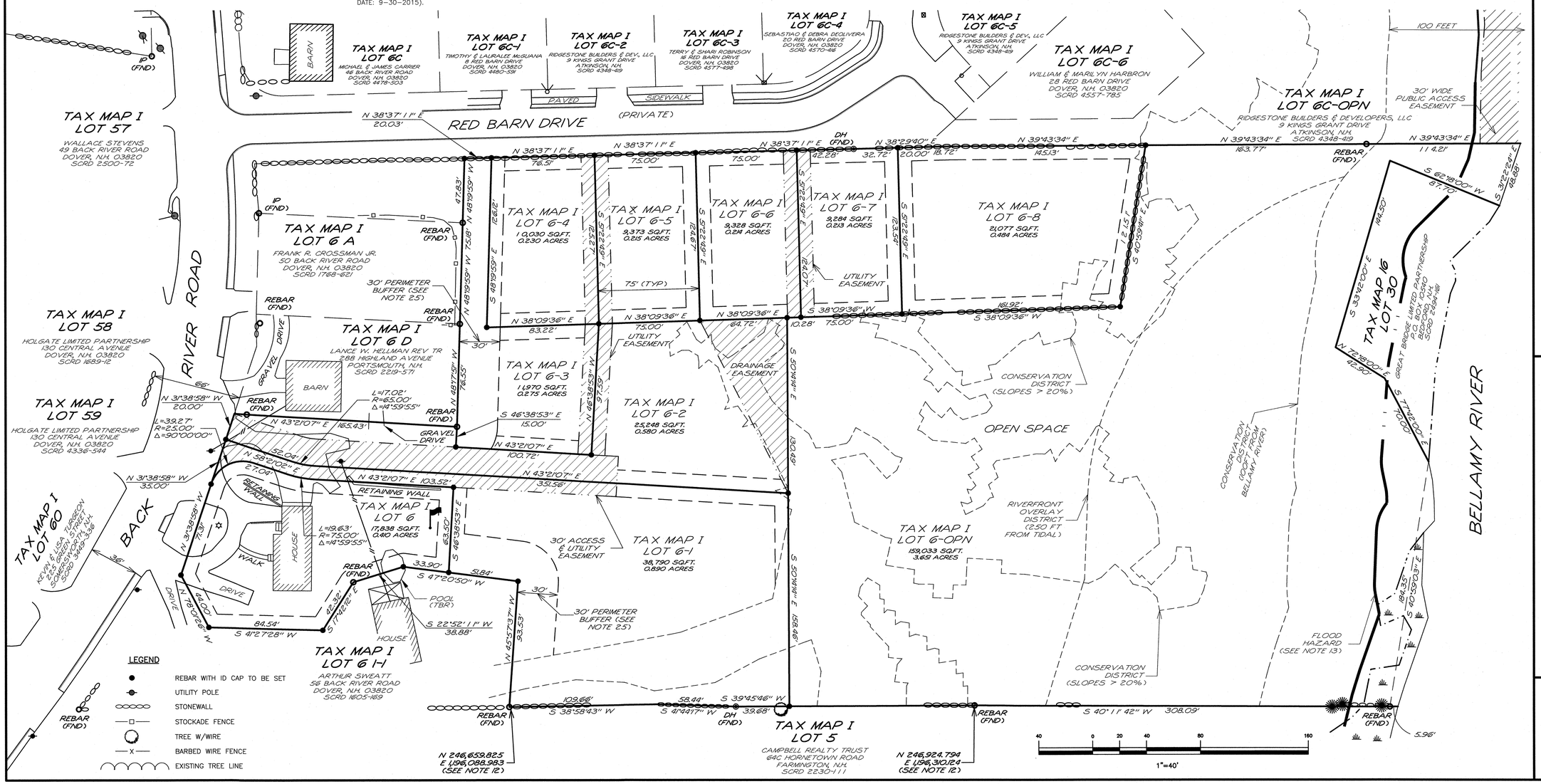
23.) A PORTION OF THE BELLAMY RIVER ADJACENT TO THE SUBJECT PROPERTY IS SUBJECT TO TIDAL ACTION. THE RIVER FRONT OVERLAY DISTRICT DOES APPLY TO THE SUBJECT PARCEL.

24.) * OPEN SPACE REQUIRED: 9 LOTS x 4,000 SQ.FT. = 36,000 SQ.FT.
* TOTAL OPEN SPACE PROVIDED: 159,033 SQ.FT.
* TOTAL AREA OF USEABLE OPEN SPACE REQUIRED: 36,000 SQ.FT. x 50% = 18,000 SQ.FT.
* TOTAL AREA OF USEABLE OPEN SPACE PROVIDED: 24,200 SQ.FT. (CONTIGUOUS NON–CONSERVATION DISTRICT)

25.) 30' PERIMETER BUFFERS SHALL COMPLY WITH CITY OF DOVER CODE 155–22.F.



LOCUS (NOT TO SCALE)



TRITECH
ENGINEERING CORPORATION
755 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820
TELEPHONE 603.749.9107
FAX 603.742.8630

REVISIONS
DATE: DESCRIPTION:

CONSERVATION SUBDIVISION PLAN
BELLAMY RIDGE
54 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE
STRAFFORD COUNTY
JANUARY 10, 2019 JOB No. 1812.9
SCALE: 1" = 40'

SHEET No. S-1

(P19-00)

NOTES

1.) INTENT: TO SHOW THE OPEN SPACE SUBDIVISION OF DOVER TAX MAP I LOT 6. AS AN OPEN SPACE SUBDIVISION WHICH WILL CREATE 8 LOTS, PLUS THE EXISTING HOUSE LOT AT 54 BACK RIVER ROAD. THE OTHER 8 LOTS ARE 7 PROPOSED BUILDING LOTS, AND 1 OPEN SPACE LOT.

2.) CURRENT OWNER OF RECORD: ARTHUR SWEATT
56 BACK RIVER ROAD
DOVER, N.H.

OWNERS SIGNATURE

3.) SUBJECT PARCEL IS LOCATED IN THE CITY OF DOVER, COUNTY OF STRAFFORD AND THE STATE OF NEW HAMPSHIRE.

4.) TOTAL LOT AREA: 311,970 SQ.FT. – 7.162 ACRES

5.) TAX MAP I LOTS 6

6.) PROJECT DEED REFERENCE: BOOK 1605 PAGE 169

7.) ZONING: R–12

		OPEN SPACE REQUIREMENTS	
MIN. LOT SIZE:	12,000 SQ. FT.	MIN. LOT SIZE:	8,000 SQ.FT.
MIN. FRONTAGE:	100 FT	MIN. FRONTAGE:	20 FT
MIN. SETBACKS:		MIN. SETBACKS:	
FRONT:	30 FT	FRONT:	10 FT
SIDE:	15 FT	SIDE:	10 FT
REAR:	15 FT	REAR:	10 FT
MAX BUILDING HEIGHT:	35 FT	EXTERIOR BOUNDARY:	30 FT
LOT COVERAGE:	30 %	EXISTING STRUCTURES:	50 FT
		FRONTAGE BUFFER:	100 FT

8.) THIS PROPERTY FALLS WITHIN THE FOLLOWING ZONING OVERLAY DISTRICTS: WETLANDS, CONSERVATION, TIDAL

9.) THE RAW UNADJUSTED CLOSURE OF OUR RANDOM POINT TRAVERSE WAS 1 PART IN 35,000, AND WAS ACCOMPLISHED USING A TOPCON 500 GT TOTAL STATION, DURING THE MONTH OF SEPTEMBER, 2018.

10.) IN THE MONTH OF OCTOBER, 2018 MICHAEL MARIANO, STATE OF NEW HAMPSHIRE CERTIFIED SOIL SCIENTIST, NH CERTIFIED WETLAND SCIENTIST, CONDUCTED AN ON–SITE WETLANDS DELINEATION OF THE SUBJECT PARCEL. WETLANDS WERE IDENTIFIED BASED ON THE CITY OF DOVER ZONING ORDINANCE (170–27.1) AND ON STATE & FEDERAL CRITERIA OUTLINED IN THE "CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL" (DEPT. OF THE ARMY, 1987) ON THIS SITE, WETLANDS BASED ON LOCAL CRITERIA SHARE THE SAME BOUNDARIES WITH THOSE BASED ON STATE AND FEDERAL CRITERIA. NO VERY POORLY DRAINED SOILS WERE FOUND.

11.) PROJECT PLAN REFERENCE:

OPEN SPACE SUBDIVISION PLAN BELLAMY RIDGE 46 BACK RIVER ROAD DOVER, NEW HAMPSHIRE TRITECH ENGINEERING CORPORATION DECEMBER 24, 2014 SCRD 110–35	PLAN OF LAND OF ROBERT & MURIEL NESMAN BACK RIVER ROAD DOVER, N.H. McENEANEY & O'NEIL SURVEY ASSOCIATES MAY 6, 1988 SCRD 34–66
PLAN OF LAND OF BRUCE G. & OLIVE E. STAPLES BACK RIVER ROAD DOVER, NEW HAMPSHIRE K.E. MOORE & B.G. STAPLES JAN. 1985 SCRD 25–65	PLAN OF LAND FOR EDWARDS REALTY INC SAWYERS LOWER MILL DOVER, NEW HAMPSHIRE GRANT L. DAVIS APRIL 1954 SCRD Po 2 Fo 21 PLAN #26
BOUNDARY LINE ADJUSTMENT FOR LOUISE SWEATT DOVER, NEW HAMPSHIRE EMERY ENGINEERING SEPTEMBER 26, 1991 SCRD 39–79	SUBDIVISION PLAN FOR LOUISE M. SWEATT DOVER, NEW HAMPSHIRE EMERY ENGINEERING JUNE 6, 1991 SCRD 39–24

12.) BASIS OF BEARING: BEARING SYSTEM BASED ON GPS FIELD OBSERVATIONS ON AUGUST 21, 2018 USING TOPCON HIPER SR RECEIVERS AND OPUS CORRECTED ON AUGUST 24, 2018. DATUM BASED ON NEW HAMPSHIRE STATE PLANE COORDINATES SPC (2800 NH), (VERTICAL DATUM: NAVD 88).

13.) A PORTION OF THE SUBJECT PARCEL IS WITHIN A FEDERALLY DESIGNATED SPECIAL FLOOD HAZARD ZONE (FLOOD HAZARD ZONE A – PANEL 0340E, MAP No. 33017C0340E, DATE: 9–30–2015).

14.) THE LOTS WILL BE SERVICED BY MUNICIPAL SEWER AND WATER.

15.) STREET ADDRESSES FOR THE NEW LOTS SHALL BE ASSIGNED BY THE BUILDING OFFICIAL AT THE TIME OF ISSUANCE OF A BUILDING PERMIT.

16.) ALL ON–SITE UTILITIES SHALL BE INSTALLED UNDERGROUND.

17.) THE FINAL SUBDIVISION PLAN SHALL BE SUBMITTED IN A DIGITAL DXF FORMAT ON A TRANSFERABLE DISK TO THE CITY OF DOVER PLANNING DEPARTMENT'S OFFICE.

18.) VARIANCES, SPECIAL EXCEPTIONS, CONDITIONAL USE PERMITS: NONE

19.) THE PROPOSED USE FOR THE SITE IS SINGLE FAMILY RESIDENTIAL.

20.) PLANS T–1, T–2, EX–1, Y–1, S–1, S–2, SP–1 THRU SP–3, C–1 THRU C–9 AND SD–1 ARE PART OF THIS APPROVAL.

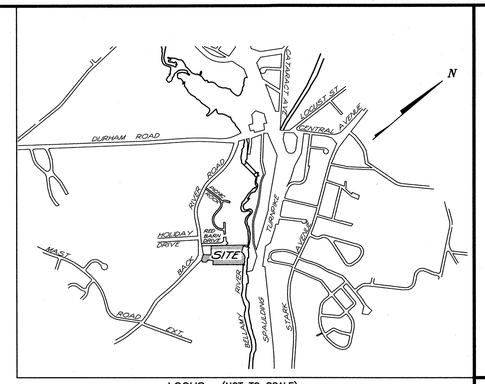
21.) MAP I LOT 6 MAY BE SUBJECT TO FLOWAGE RIGHTS AND MILL PRIVILEGE RIGHTS.

22.) LOTS TO BE SERVICED BY CITY WATER AND SEWER. ALL NEW DWELLING UNITS SHALL BE ASSESSED THE CURRENT WATER AND SEWER INVESTMENT FEES IN PLACE AT THE TIME OF THE BUILDING PERMIT APPLICATION.

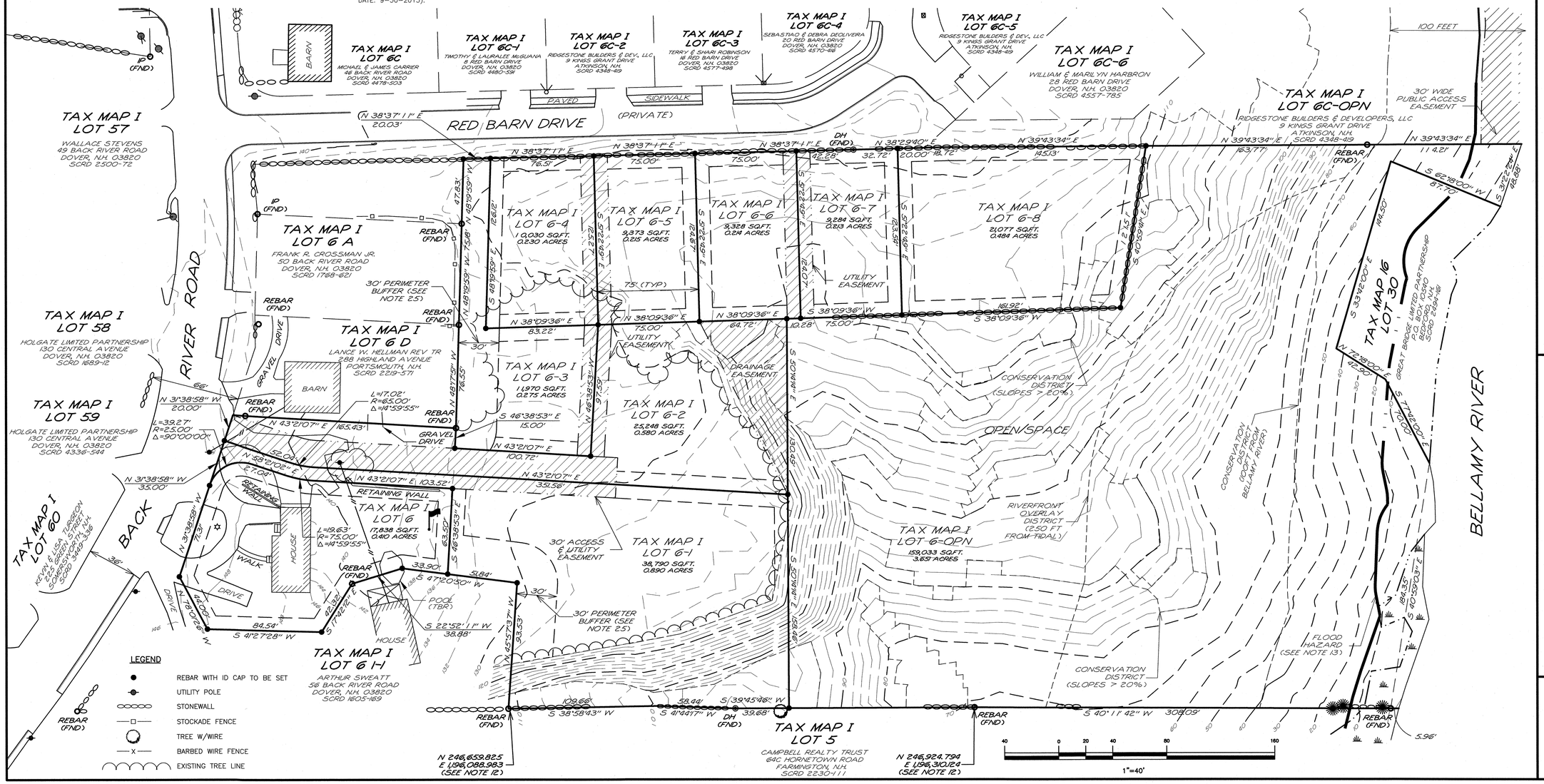
23.) A PORTION OF THE BELLAMY RIVER ADJACENT TO THE SUBJECT PROPERTY IS SUBJECT TO TIDAL ACTION. THE RIVER FRONT OVERLAY DISTRICT DOES APPLY TO THE SUBJECT PARCEL.

24.) * OPEN SPACE REQUIRED: 9 LOTS x 4,000 SQ.FT. = 36,000 SQ.FT.
* TOTAL OPEN SPACE PROVIDED: 159,033 SQ.FT.
* TOTAL AREA OF USEABLE OPEN SPACE REQUIRED: 36,000 SQ.FT. x 50% = 18,000 SQ.FT.
* TOTAL AREA OF USEABLE OPEN SPACE PROVIDED: 24,200 SQ.FT. (CONTIGUOUS NON–CONSERVATION DISTRICT)

25.) 30' PERIMETER BUFFERS SHALL COMPLY WITH CITY OF DOVER CODE 155–22.F.



LOCUS (NOT TO SCALE)



LEGEND

N

TRITECH
ENGINEERING CORPORATION

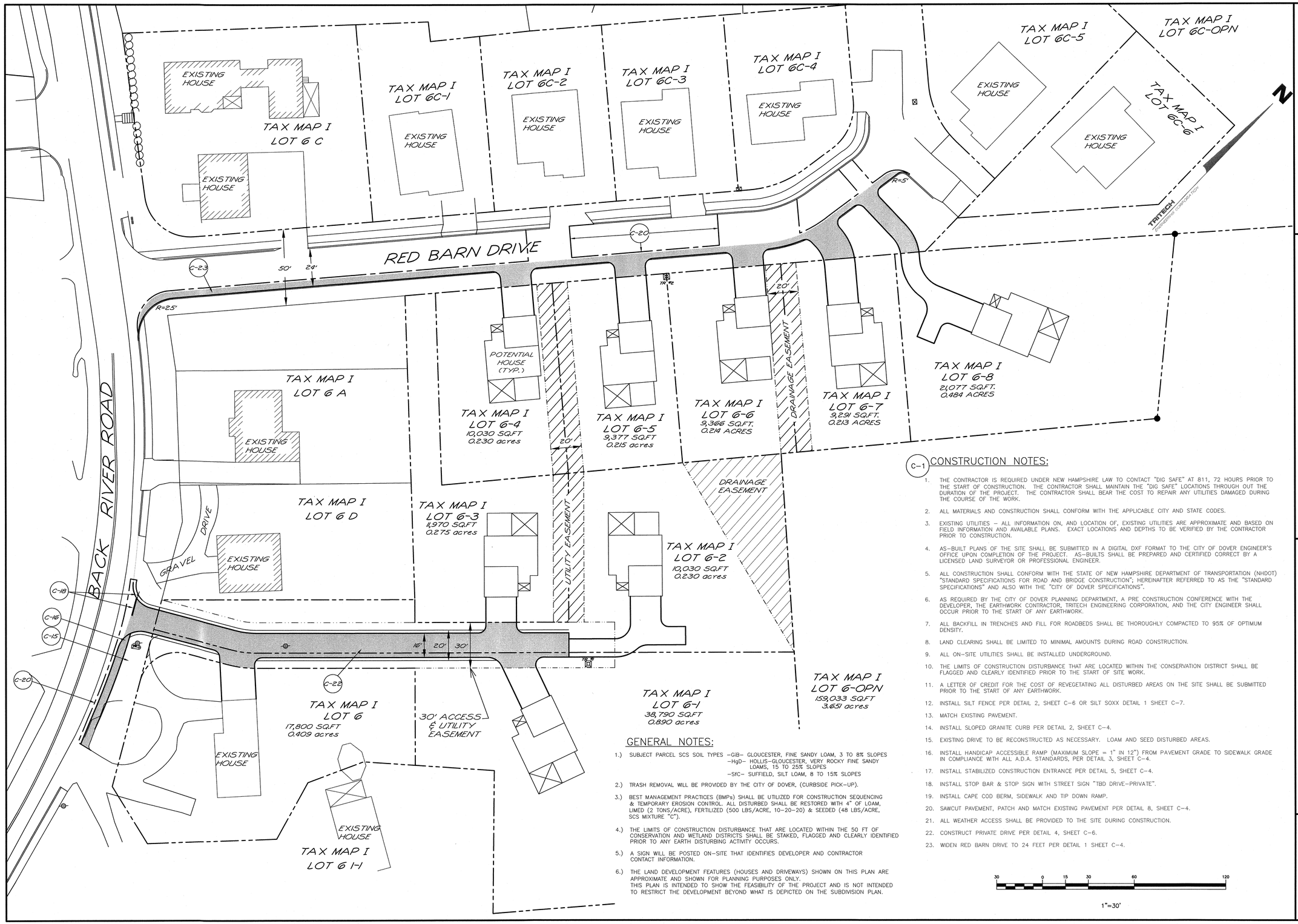
TRITECH
ENGINEERING CORPORATION
755 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820
TELEPHONE 603 742 8107
FAX 603 742 3550

REVISIONS
DATE: DESCRIPTION:

TOPOGRAPHIC PLAN
BELLAMY RIDGE
54 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE
STRAFFORD COUNTY
JANUARY 10, 2019 JOB No. 1812.9
SCALE: 1" = 40'

SHEET NO. **S-2**

(P19-00)



GENERAL NOTES:

1.) SUBJECT PARCEL SCS SOIL TYPES –GlB– GLOUCESTER, FINE SANDY LOAM, 3 TO 8% SLOPES
–HgD– HOLLIS–GLOUCESTER, VERY ROCKY FINE SANDY LOAMS, 15 TO 25% SLOPES
–SfC– SUFFIELD, SILT LOAM, 8 TO 15% SLOPES

2.) TRASH REMOVAL WILL BE PROVIDED BY THE CITY OF DOVER, (CURBSIDE PICK–UP).

3.) BEST MANAGEMENT PRACTICES (BMPs) SHALL BE UTILIZED FOR CONSTRUCTION SEQUENCING & TEMPORARY EROSION CONTROL. ALL DISTURBED SHALL BE RESTORED WITH 4" OF LOAM, LIMED (2 TONS/ACRE), FERTILIZED (500 LBS/ACRE, 10–20–20) & SEEDED (48 LBS/ACRE, SCS MIXTURE "C").

4.) THE LIMITS OF CONSTRUCTION DISTURBANCE THAT ARE LOCATED WITHIN THE 50 FT OF CONSERVATION AND WETLAND DISTRICTS SHALL BE STAKED, FLAGGED AND CLEARLY IDENTIFIED PRIOR TO ANY EARTH DISTURBING ACTIVITY OCCURS.

5.) A SIGN WILL BE POSTED ON–SITE THAT IDENTIFIES DEVELOPER AND CONTRACTOR CONTACT INFORMATION.

6.) THE LAND DEVELOPMENT FEATURES (HOUSES AND DRIVEWAYS) SHOWN ON THIS PLAN ARE APPROXIMATE AND SHOWN FOR PLANNING PURPOSES ONLY. THIS PLAN IS INTENDED TO SHOW THE FEASIBILITY OF THE PROJECT AND IS NOT INTENDED TO RESTRICT THE DEVELOPMENT BEYOND WHAT IS DEPICTED ON THE SUBDIVISION PLAN.

C–1 CONSTRUCTION NOTES:

1. THE CONTRACTOR IS REQUIRED UNDER NEW HAMPSHIRE LAW TO CONTACT "DIG SAFE" AT 811, 72 HOURS PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL MAINTAIN THE "DIG SAFE" LOCATIONS THROUGH OUT THE DURATION OF THE PROJECT. THE CONTRACTOR SHALL BEAR THE COST TO REPAIR ANY UTILITIES DAMAGED DURING THE COURSE OF THE WORK.
2. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH THE APPLICABLE CITY AND STATE CODES.
3. EXISTING UTILITIES – ALL INFORMATION ON, AND LOCATION OF, EXISTING UTILITIES ARE APPROXIMATE AND BASED ON FIELD INFORMATION AND AVAILABLE PLANS. EXACT LOCATIONS AND DEPTHS TO BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
4. AS–BUILT PLANS OF THE SITE SHALL BE SUBMITTED IN A DIGITAL DXF FORMAT TO THE CITY OF DOVER ENGINEER'S OFFICE UPON COMPLETION OF THE PROJECT. AS–BUILTS SHALL BE PREPARED AND CERTIFIED CORRECT BY A LICENSED LAND SURVEYOR OR PROFESSIONAL ENGINEER.
5. ALL CONSTRUCTION SHALL CONFORM WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION (NHDOT) "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION"; HEREINAFTER REFERRED TO AS THE "STANDARD SPECIFICATIONS" AND ALSO WITH THE "CITY OF DOVER SPECIFICATIONS".
6. AS REQUIRED BY THE CITY OF DOVER PLANNING DEPARTMENT, A PRE CONSTRUCTION CONFERENCE WITH THE DEVELOPER, THE EARTHWORK CONTRACTOR, TRITECH ENGINEERING CORPORATION, AND THE CITY ENGINEER SHALL OCCUR PRIOR TO THE START OF ANY EARTHWORK.
7. ALL BACKFILL IN TRENCHES AND FILL FOR ROADBEDS SHALL BE THOROUGHLY COMPACTED TO 95% OF OPTIMUM DENSITY.
8. LAND CLEARING SHALL BE LIMITED TO MINIMAL AMOUNTS DURING ROAD CONSTRUCTION.
9. ALL ON–SITE UTILITIES SHALL BE INSTALLED UNDERGROUND.
10. THE LIMITS OF CONSTRUCTION DISTURBANCE THAT ARE LOCATED WITHIN THE CONSERVATION DISTRICT SHALL BE FLAGGED AND CLEARLY IDENTIFIED PRIOR TO THE START OF SITE WORK.
11. A LETTER OF CREDIT FOR THE COST OF REVEGETATING ALL DISTURBED AREAS ON THE SITE SHALL BE SUBMITTED PRIOR TO THE START OF ANY EARTHWORK.
12. INSTALL SILT FENCE PER DETAIL 2, SHEET C–6 OR SILT SOXX DETAIL 1 SHEET C–7.
13. MATCH EXISTING PAVEMENT.
14. INSTALL SLOPED GRANITE CURB PER DETAIL 2, SHEET C–4.
15. EXISTING DRIVE TO BE RECONSTRUCTED AS NECESSARY. LOAM AND SEED DISTURBED AREAS.
16. INSTALL HANDICAP ACCESSIBLE RAMP (MAXIMUM SLOPE = 1" IN 12") FROM PAVEMENT GRADE TO SIDEWALK GRADE IN COMPLIANCE WITH ALL A.D.A. STANDARDS, PER DETAIL 3, SHEET C–4.
17. INSTALL STABILIZED CONSTRUCTION ENTRANCE PER DETAIL 5, SHEET C–4.
18. INSTALL STOP BAR & STOP SIGN WITH STREET SIGN "TBD DRIVE–PRIVATE".
19. INSTALL CAPE COD BERM, SIDEWALK AND TIP DOWN RAMP.
20. SAWCUT PAVEMENT, PATCH AND MATCH EXISTING PAVEMENT PER DETAIL 8, SHEET C–4.
21. ALL WEATHER ACCESS SHALL BE PROVIDED TO THE SITE DURING CONSTRUCTION.
22. CONSTRUCT PRIVATE DRIVE PER DETAIL 4, SHEET C–6.
23. WIDEN RED BARN DRIVE TO 24 FEET PER DETAIL 1 SHEET C–4.

30 0 15 30 60 120

1"=30'

TRITECH
ENGINEERING CORPORATION
755 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820
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FAX 603 742 3630

REVISIONS
DATE: DESCRIPTION:

SITE DEVELOPMENT PLAN

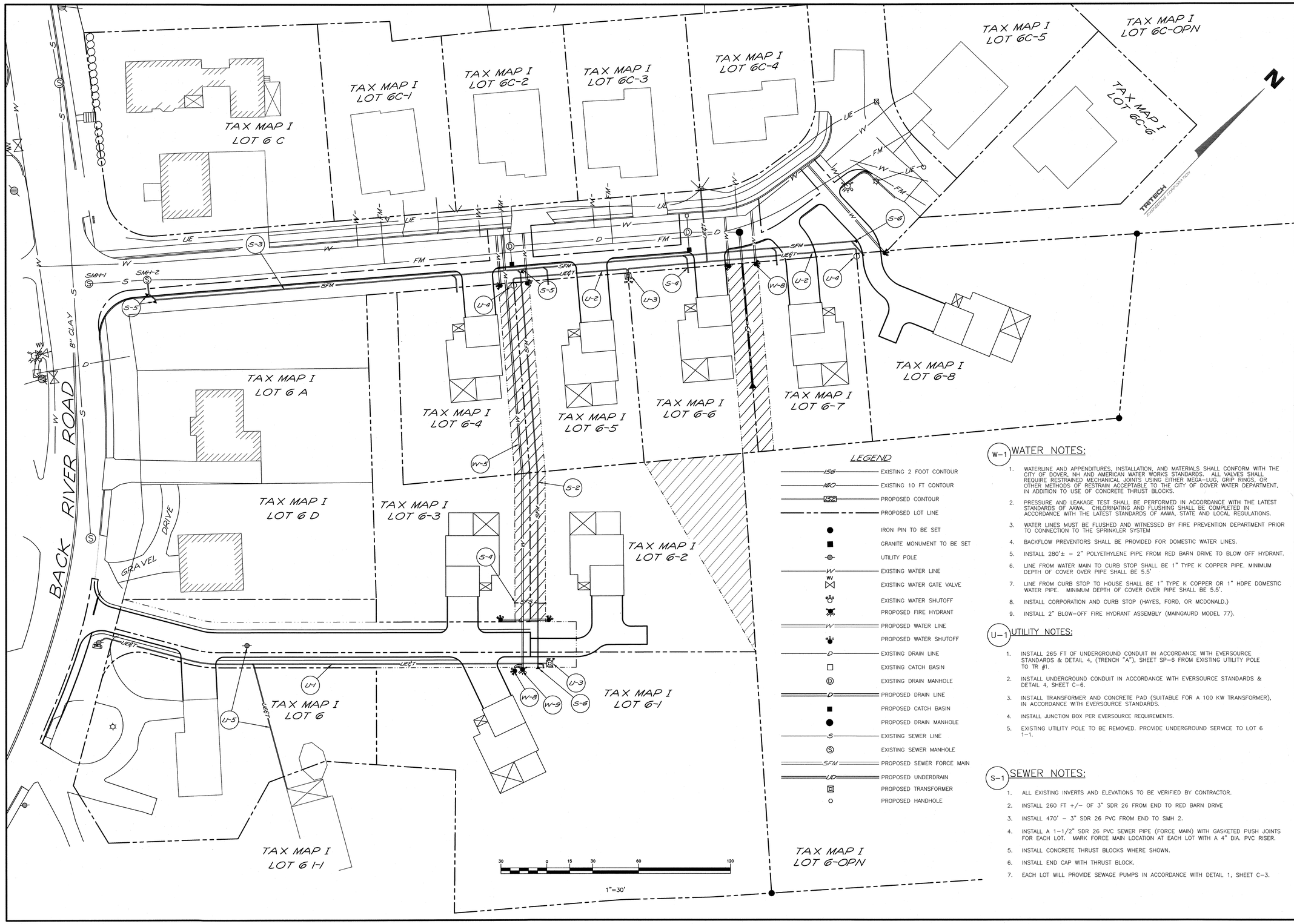
BELLAMY RIDGE

54 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE

JANUARY 10, 2019 JOB No. 18129
SCALE: 1" = 30'

SHEET NO. SP-1

(P19-00)



LEGEND

- 156 — EXISTING 2 FOOT CONTOUR
- 160 — EXISTING 10 FT CONTOUR
- 152 — PROPOSED CONTOUR
- PROPOSED LOT LINE
- IRON PIN TO BE SET
- GRANITE MONUMENT TO BE SET
- UTILITY POLE
- W — EXISTING WATER LINE
- WV — EXISTING WATER GATE VALVE
- EXISTING WATER SHUTOFF
- PROPOSED FIRE HYDRANT
- W — PROPOSED WATER LINE
- PROPOSED WATER SHUTOFF
- D — EXISTING DRAIN LINE
- EXISTING CATCH BASIN
- Ⓓ EXISTING DRAIN MANHOLE
- D — PROPOSED DRAIN LINE
- PROPOSED CATCH BASIN
- PROPOSED DRAIN MANHOLE
- S — EXISTING SEWER LINE
- Ⓢ EXISTING SEWER MANHOLE
- SFM — PROPOSED SEWER FORCE MAIN
- UD — PROPOSED UNDERDRAIN
- PROPOSED TRANSFORMER
- PROPOSED HANDHOLE

W-1 WATER NOTES:

1. WATERLINE AND APPENDITURES, INSTALLATION, AND MATERIALS SHALL CONFORM WITH THE CITY OF DOVER, NH AND AMERICAN WATER WORKS STANDARDS. ALL VALVES SHALL REQUIRE RESTRAINED MECHANICAL JOINTS USING EITHER MEGA-LUG, GRIP RINGS, OR OTHER METHODS OF RESTRAIN ACCEPTABLE TO THE CITY OF DOVER WATER DEPARTMENT, IN ADDITION TO USE OF CONCRETE THRUST BLOCKS.
2. PRESSURE AND LEAKAGE TEST SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST STANDARDS OF AAWA. CHLORINATING AND FLUSHING SHALL BE COMPLETED IN ACCORDANCE WITH THE LATEST STANDARDS OF AAWA, STATE AND LOCAL REGULATIONS.
3. WATER LINES MUST BE FLUSHED AND WITNESSED BY FIRE PREVENTION DEPARTMENT PRIOR TO CONNECTION TO THE SPRINKLER SYSTEM
4. BACKFLOW PREVENTORS SHALL BE PROVIDED FOR DOMESTIC WATER LINES.
5. INSTALL 280'± – 2" POLYETHYLENE PIPE FROM RED BARN DRIVE TO BLOW OFF HYDRANT.
6. LINE FROM WATER MAIN TO CURB STOP SHALL BE 1" TYPE K COPPER PIPE. MINIMUM DEPTH OF COVER OVER PIPE SHALL BE 5.5'
7. LINE FROM CURB STOP TO HOUSE SHALL BE 1" TYPE K COPPER OR 1" HDPE DOMESTIC WATER PIPE. MINIMUM DEPTH OF COVER OVER PIPE SHALL BE 5.5'.
8. INSTALL CORPORATION AND CURB STOP (HAYES, FORD, OR MCDONALD.)
9. INSTALL 2" BLOW-OFF FIRE HYDRANT ASSEMBLY (MAINGAURD MODEL 77).

U-1 UTILITY NOTES:

1. INSTALL 265 FT OF UNDERGROUND CONDUIT IN ACCORDANCE WITH EVERSOURCE STANDARDS & DETAIL 4, (TRENCH "A"), SHEET SP-6 FROM EXISTING UTILITY POLE TO TR #1.
2. INSTALL UNDERGROUND CONDUIT IN ACCORDANCE WITH EVERSOURCE STANDARDS & DETAIL 4, SHEET C-6.
3. INSTALL TRANSFORMER AND CONCRETE PAD (SUITABLE FOR A 100 KW TRANSFORMER), IN ACCORDANCE WITH EVERSOURCE STANDARDS.
4. INSTALL JUNCTION BOX PER EVERSOURCE REQUIREMENTS.
5. EXISTING UTILITY POLE TO BE REMOVED. PROVIDE UNDERGROUND SERVICE TO LOT 6 1-1.

S-1 SEWER NOTES:

1. ALL EXISTING INVERTS AND ELEVATIONS TO BE VERIFIED BY CONTRACTOR.
2. INSTALL 260 FT +/- OF 3" SDR 26 FROM END TO RED BARN DRIVE
3. INSTALL 470' – 3" SDR 26 PVC FROM END TO SMH 2.
4. INSTALL A 1-1/2" SDR 26 PVC SEWER PIPE (FORCE MAIN) WITH GASKETED PUSH JOINTS FOR EACH LOT. MARK FORCE MAIN LOCATION AT EACH LOT WITH A 4" DIA. PVC RISER.
5. INSTALL CONCRETE THRUST BLOCKS WHERE SHOWN.
6. INSTALL END CAP WITH THRUST BLOCK.
7. EACH LOT WILL PROVIDE SEWAGE PUMPS IN ACCORDANCE WITH DETAIL 1, SHEET C-3.

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REVISIONS
DATE: DESCRIPTION:

UTILITIES PLAN

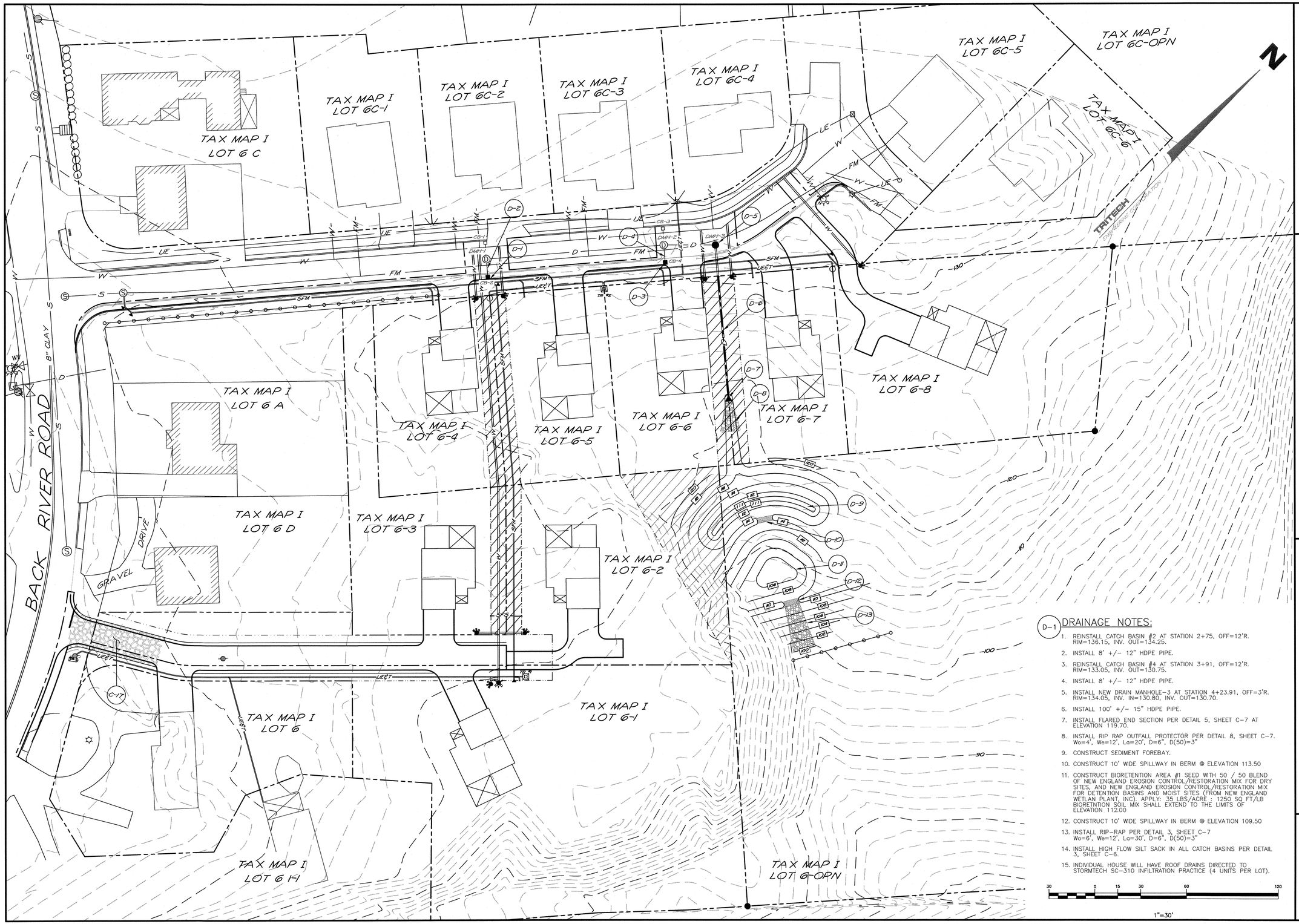
BELLAMY RIDGE

54 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE

JANUARY 10, 2019 JOB No. 1829
SCALE: 1" = 30'

SHEET NO. SP-2

(P19-00)



D-1 DRAINAGE NOTES:

1. REINSTALL CATCH BASIN #2 AT STATION 2+75, OFF=12'R. RIM=136.15, INV. OUT=134.25.
2. INSTALL 8' +/- 12" HDPE PIPE.
3. REINSTALL CATCH BASIN #4 AT STATION 3+91, OFF=12'R. RIM=133.05, INV. OUT=130.75.
4. INSTALL 8' +/- 12" HDPE PIPE.
5. INSTALL NEW DRAIN MANHOLE-3 AT STATION 4+23.91, OFF=3'R. RIM=134.05, INV. IN=130.80, INV. OUT=130.70.
6. INSTALL 100' +/- 15" HDPE PIPE.
7. INSTALL FLARED END SECTION PER DETAIL 5, SHEET C-7 AT ELEVATION 119.70.
8. INSTALL RIP RAP OUTFALL PROTECTOR PER DETAIL 8, SHEET C-7. Wo=4', We=12', La=20', D=6", D(50)=3"
9. CONSTRUCT SEDIMENT FOREBAY.
10. CONSTRUCT 10' WIDE SPILLWAY IN BERM @ ELEVATION 113.50
11. CONSTRUCT BIORETENTION AREA #1 SEED WITH 50 / 50 BLEND OF NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DRY SITES, AND NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES (FROM NEW ENGLAND WETLAN PLANT, INC). APPLY: 35 LBS/ACRE - 1250 SQ FT/LB BIORETITION SOIL MIX SHALL EXTEND TO THE LIMITS OF ELEVATION 112.00
12. CONSTRUCT 10' WIDE SPILLWAY IN BERM @ ELEVATION 109.50
13. INSTALL RIP-RAP PER DETAIL 3, SHEET C-7 Wo=6', We=12', La=30', D=6", D(50)=3"
14. INSTALL HIGH FLOW SILT SACK IN ALL CATCH BASINS PER DETAIL 3, SHEET C-6.
15. INDIVIDUAL HOUSE WILL HAVE ROOF DRAINS DIRECTED TO STORMTECH SC-310 INFILTRATION PRACTICE (4 UNITS PER LOT).

30 0 15 30 60 120
1"=30'

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REVISIONS
DATE: DESCRIPTION:

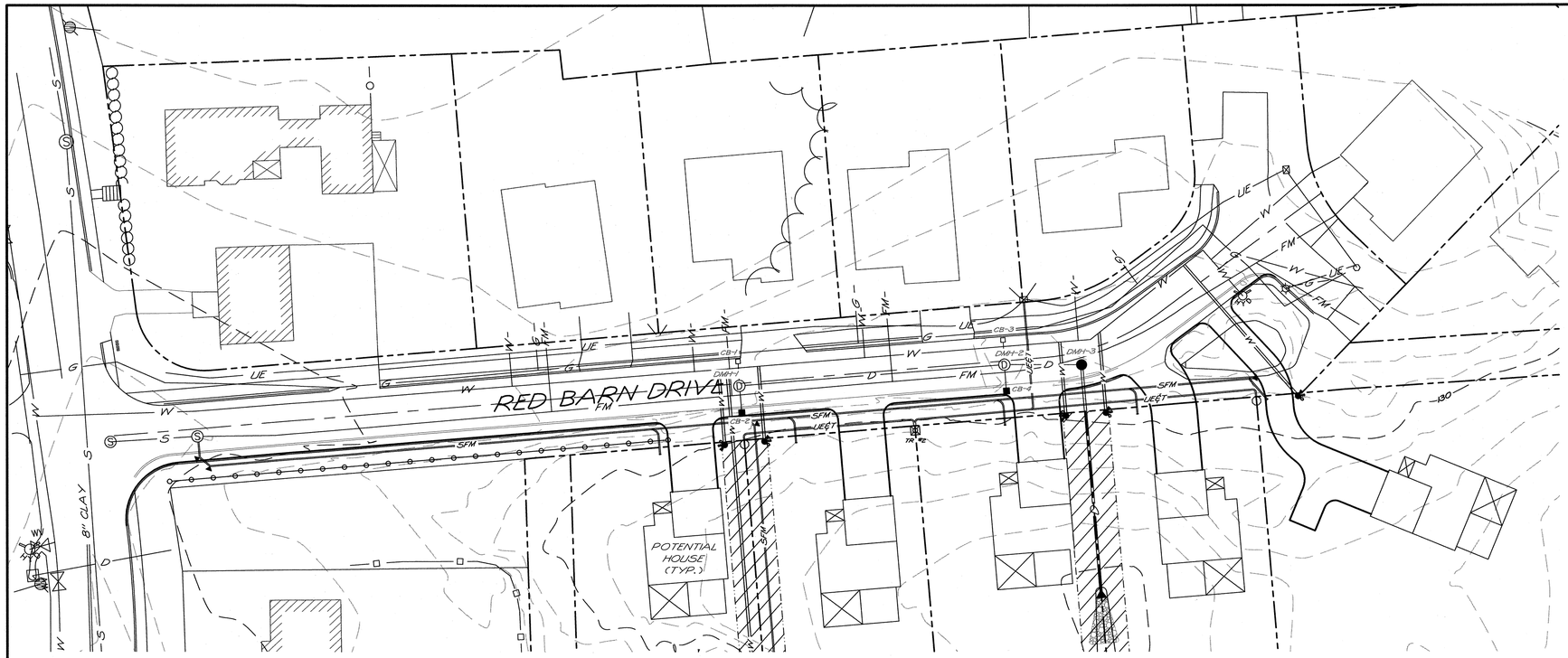
GRADING AND DRAINAGE PLAN

BELLAMY RIDGE

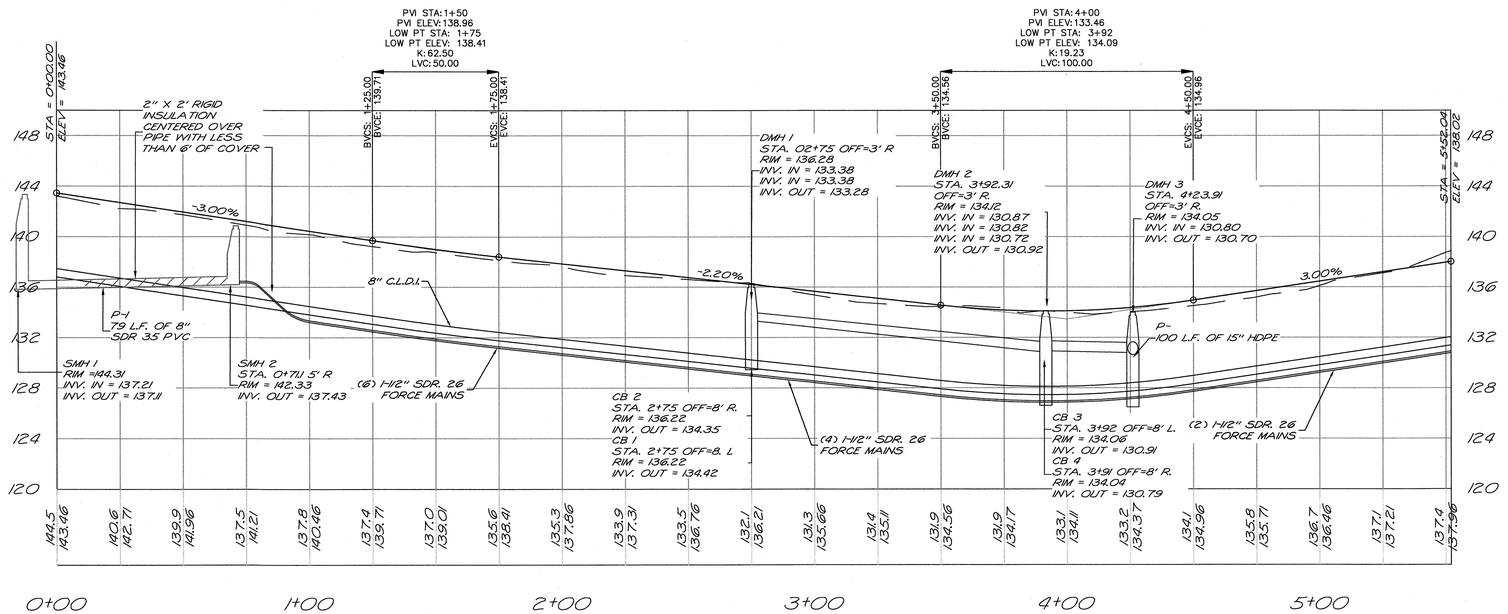
54 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE
JANUARY 10, 2019 JOB No. 1812.9
SCALE: 1" = 30'

SHEET NO. **SP-3**

(P19-00)



PLAN VIEW–RED BARN DRIVE: STA. 0+00–5+52.04



PROFILE VIEW–RED BARN DRIVE: STA. 0+00–5+52.04

LEGEND

- 156 — EXISTING 2 FOOT CONTOUR
- 160 — EXISTING 10 FT CONTOUR
- 152 — PROPOSED CONTOUR
- PROPOSED LOT LINE
- IRON PIN TO BE SET
- GRANITE MONUMENT TO BE SET
- UTILITY POLE
- W — EXISTING WATER LINE
- WV — EXISTING WATER GATE VALVE
- EXISTING WATER SHUTOFF
- PROPOSED FIRE HYDRANT
- W — PROPOSED WATER LINE
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- EXISTING DRAIN MANHOLE
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- PROPOSED CATCH BASIN
- PROPOSED DRAIN MANHOLE
- S — EXISTING SEWER LINE
- EXISTING SEWER MANHOLE
- SFM — PROPOSED SEWER FORCE MAIN
- UD — PROPOSED UNDERDRAIN
- PROPOSED TRANSFORMER
- PROPOSED HANDHOLE

30 0 15 30 60 120

1"=30'

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REVISIONS
DATE: DESCRIPTION:

CONSTRUCTION NOTES & DETAILS

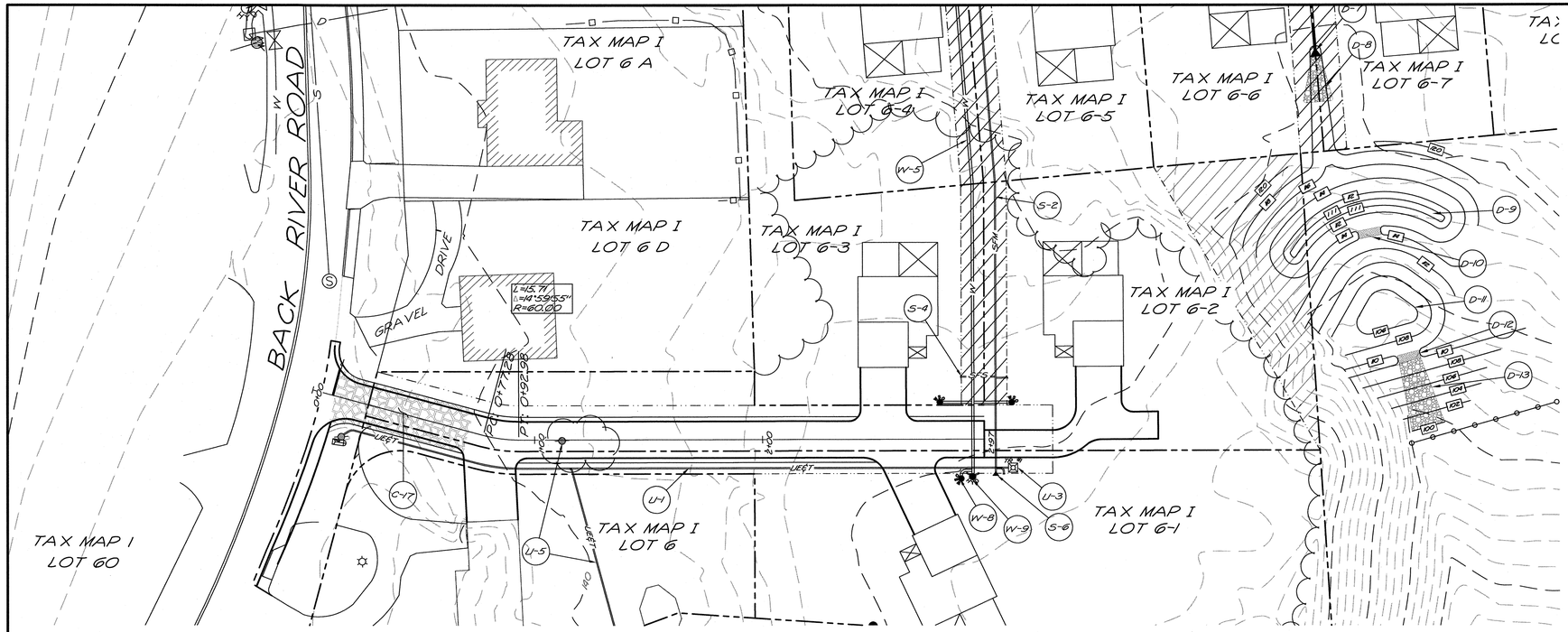
BELLAMY RIDGE

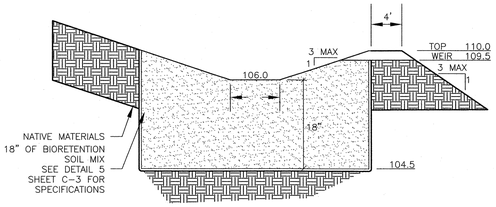
54 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE

JANUARY 10, 2019 JOB No. 18129
SCALE: 1" = 30'

SHEET NO. C-1

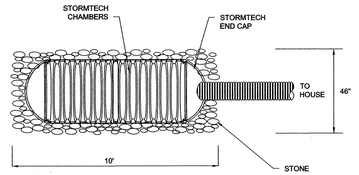
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TAX MAP I LOT 6 A
TAX MAP I LOT 6-4
TAX MAP I LOT 6-5
TAX MAP I LOT 6-6
TAX MAP I LOT 6-7
TAX MAP I LOT 6 D
TAX MAP I LOT 6-3
TAX MAP I LOT 6-2
TAX MAP I LOT 6-1
TAX MAP I LOT 6
TAX MAP I LOT 60
BACK RIVER ROAD
GRAVEL DRIVE
L=45.71
Δ=41°59'55"
R=60.00
D-1
D-8
D-9
D-10
D-11
D-12
D-13
W-5
S-2
S-4
S-5
S-6
W-8
W-9
U-1
U-3
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SECTION VIEW

1 TYPICAL BIORETENTION BASIN WITH WEIR OUTLET
NOT TO SCALE

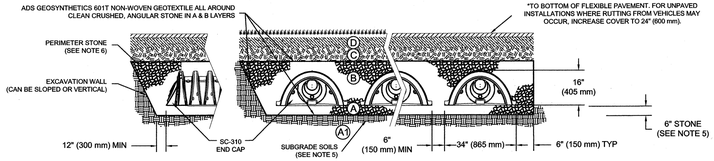


2 STORMTECH UNDERDRAIN DETAIL
NOT TO SCALE

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. [2,3]

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

COMPONENT MATERIAL	PERCENT BY VOLUME	GRADATION OF MATERIAL	
		SIEVE No.	% PASSING BY WEIGHT
ASTM C-33 CONCRETE SAND	50-55%		
LOAMY SAND TOPSOIL	20-30%	200	15-25%
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH	20-30%	200	<5%



1. SC-310 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-310 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE "SITE DESIGN ENGINEER" REFERS TO THE ENGINEER RESPONSIBLE FOR THE DESIGN AND LAYOUT OF THE STORMTECH CHAMBERS FOR THIS PROJECT.
5. SUBBASE SOIL SHALL BE AS FOLLOWS: At FILL SECTION.
6. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.

7 STORMTECH ACCEPTABLE FILL MATERIALS
NOT TO SCALE

NEW ENGLAND WETLAND PLANTS INC.
NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES

THE MIX MAY BE APPLIED BY HAND, BY MECHANICAL SPREADER, OR BY HYDRO-SEEDER. AFTER SOWING, LIGHTLY RAKE, ROLL, OR CULTIPACK TO INSURE GOOD SEED-TO-SOIL CONTACT. BEST RESULTS ARE OBTAINED WITH A SPRING OR LATE SUMMER SEEDING. LATE FALL AND WINTER DORMANT SEEDING REQUIRES AN INCREASE IN THE APPLICATION RATE. A LIGHT MULCHING OF CLEAN, WEED-FREE STRAW IS RECOMMENDED.

NEW ENGLAND WETLAND PLANTS INC.
NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DRY SITES

THE NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DRY SITES MAY BE APPLIED BY HYDRO SEEDING, BY MECHANICAL SPREADER, OR ON SMALL SITES IT CAN BE SPREAD BY HAND. LIGHTLY RAKE, OR ROLL TO ENSURE PROPER SOIL-SEED CONTACT. BEST RESULTS ARE OBTAINED WITH A SPRING OR LATE SUMMER SEEDING. LATE SPRING THROUGH MID-SUMMER SEEDING WILL BENEFIT FROM A LIGHT MULCHING OF WEED-FREE STRAW TO CONSERVE MOISTURE. IF CONDITIONS ARE DRIER THAN USUAL, WATERING WILL BE REQUIRED. FERTILIZATION IS NOT REQUIRED UNLESS THE SOILS ARE PARTICULARLY INFERTILE. PREPARATION OF A CLEAN WEED FREE SEED BASE IS NECESSARY FOR OPTIMAL RESULTS.

ANYWHERE ON THE SITE THAT EXISTING VEGETATION IS TO BE REMOVED WILL REQUIRE IMMEDIATE EROSION CONTROL TREATMENT. SPECIAL CARE SHOULD BE TAKEN WHERE RUNOFF ENTERS WETLANDS. ALL STORM WATER AREAS SHALL BE STABILIZED PRIOR TO DIRECTING STORM WATER TO THEM; SPECIFICALLY ALL BIORETENTION BASINS AND ALL INFILTRATION AREAS.

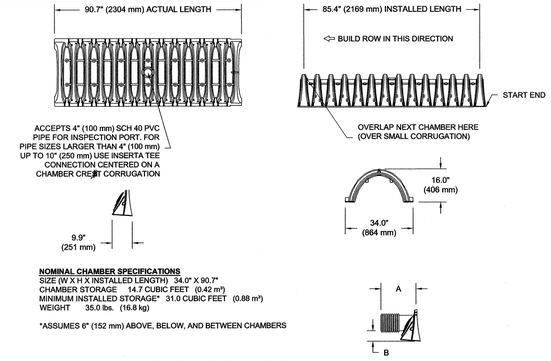
SEEDING LEGEND

– 50/50 BLEND OF NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DRY SITES AND NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES.

BOTH MIXES FROM NEW ENGLAND WETLAND PLANTS INC.
APPLY: 35 LBS/ACRE : 1250 SQ FT/LB

– LIMITS OF BIORETENTION SOIL MIX

3 BIORETENTION SEEDING
NOT TO SCALE



NOMINAL CHAMBER SPECIFICATIONS
SIZE (W X H X INSTALLED LENGTH) 34.0" X 90.7"
CHAMBER STORAGE 14.7 CUBIC FEET (0.42 m³)
MINIMUM INSTALLED STORAGE* 31.0 CUBIC FEET (0.88 m³)
WEIGHT 35.0 lbs. (16.8 kg)

*ASSUMES 6" (152 mm) ABOVE, BELOW, AND BETWEEN CHAMBERS

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

ALL STUBS, EXCEPT FOR THE SC310EPE12B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC310EPE12B THE 12" (300 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 0.25" (6 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

4 STORMTECH SC-310
NOT TO SCALE

1. PARTICLE SIZE DISTRIBUTION BY SEPARATES:
   a. EXCLUDE ANY MATERIAL >4.76MM – 0%
   b. VERY COARSE SAND/GRAVEL: GRAVEL (2.0 TO 4.76 mm) 5% MAXIMUM (% BY DRY WEIGHT)
   c. SAND (0.42 TO 2.0 mm) 60 – 85% (% BY DRY WEIGHT)
   d. SILT (0.075 TO 0.42 mm) 20% MAXIMUM (% BY DRY WEIGHT)
   e. CLAY (LESS THAN 0.075mm) 5% MAXIMUM (% BY DRY WEIGHT)

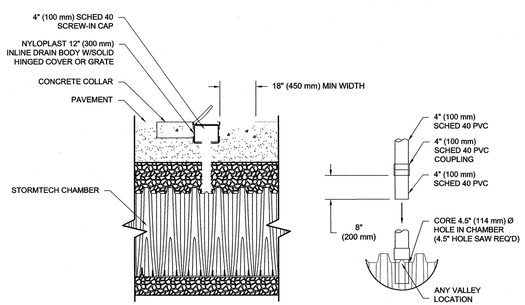
ACCEPTABLE PARTICLE SIZE DISTRIBUTION OF FINAL BIORETENTION SOIL MIX:

SIEVE	% PASSING
#4	100
#10	95
#40	40 – 15
#200	10 – 20
<#200	0 – 5

2. FRAGMENT SIZE DISTRIBUTION:
   a. STICKS AND ROOTS: SHOULD BE MINIMIZED AND PREFERABLY LIMITED TO NOTHING LARGER THAN 4.76mm
   b. DEBRIS AND OTHER FOREIGN MATERIALS: SHOULD BE MINIMIZED
3. PERCENTAGE ORGANIC MATTER: MINIMUM 3% BY VOLUME AND MAXIMUM 8% BY VOLUME
4. SOIL REACTION: pH OF 6 TO 7
5. CEC OF TOTAL SOIL: MINIMUM 10 meq/100mL AT pH OF 7.0
6. BASIS-OF-DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS INDICATED ON DRAWINGS
7. BASIC PROPERTIES: MANUFACTURED SOIL SHALL NOT CONTAIN THE FOLLOWING:
   a. UNACCEPTABLE MATERIALS: CONCRETE SLURRY, CONCRETE LAYERS OR CHUNKS, CEMENT, PLASTER, BUILDING DEBRIS, ASPHALT, BRICKS, OILS, GASOLINE, DIESEL FUEL, PAINT THINNER, TURPENTINE, TAR, ROOFING COMPOUND, ACID, SOLID WASTE, AND OTHER EXTRANEOUS MATERIALS THAT ARE HARMFUL TO PLANT GROWTH.
   b. UNSUITABLE MATERIALS: STONES, ROOTS, PLANTS, SOD, CLAY LUMPS, AND POCKETS OF COARSE SAND THAT EXCEED A COMBINED MAXIMUM OF 5% BY DRY WEIGHT OF THE MANUFACTURED SOIL.
   c. LARGE MATERIALS: STONES, CLODS, ROOTS, CLAY LUMPS, AND POCKETS OF COARSE SAND EXCEEDING 0.187 INCHES (4.76mm) IN ANY DIMENSION

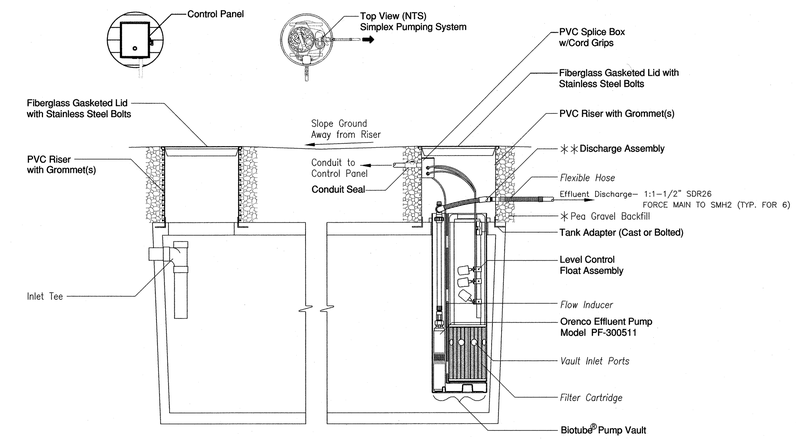
ACCEPTABLE SOIL AMENDMENTS
   A. NO COMPOST SHOULD BE USED IN THE PLANTING MIX
   B. SPHAGNUM PEAT: PARTIALLY DECOMPOSED SPHAGNUM PEAT MOSS, FINELY DIVIDED OR OF GRANULAR TEXTURE WITH 100% PASSING THROUGH THE 1/2-INCH (13mm) SIEVE, A pH OF 3.4 TO 4.8
   C. WOOD DERIVATIVES: SHREDDED WOOD, WOOD CHIPS, GROUND BARK, OR WOOD WASTE; OF UNIFORM TEXTURE AND FREE OF STONES, STICKS, SOIL, OR TOXIC MATERIALS.
   D. MEDIA AMENDMENTS SUCH AS ZERO-VALENT IRON AND/OR DRINKING WATER TREATMENT RESIDUALS (ALUM) TO ENHANCE PHOSPHORUS SORPTION AS SPECIFIED BY ENGINEER.

5 BIORETENTION SOIL MIX
NOT TO SCALE



NOTES:
1. INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION VALLEY
2. ALL SCHEDULE 40 FITTINGS TO BE SOLVENT CEMENTED.

6 STORMTECH-INSPECTION PORT
NOT TO SCALE



*Pea Gravel Backfill Recommended to Help Prevent Frost Heave
**Discharge Line and Distribution System Must be Configured to Allow Complete Drainage. (distribution system not shown)

8 Effluent Pumping System for Cold Weather Applications (db style)
NTS

TRITECH
ENGINEERING CORPORATION
755 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820
TELEPHONE 603 742 8107
FAX 603 742 3830

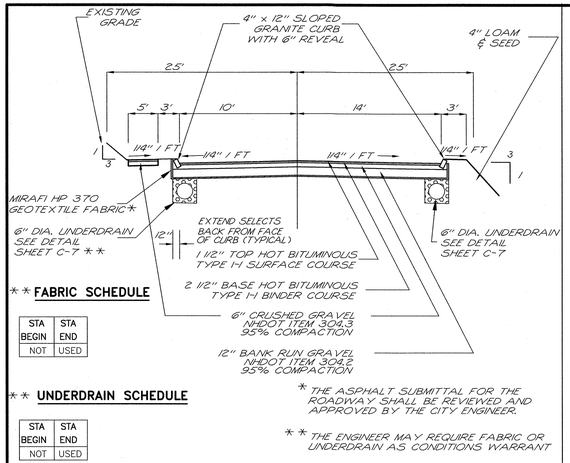
REVISIONS
DATE: DESCRIPTION:

CONSTRUCTION DETAILS

BELLAMY RIDGE
54 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE
JANUARY 10, 2019 JOB No. 1812.9
SCALE: 1" = 30'

SHEET NO.
C-3

(P19-00)



** **FABRIC SCHEDULE**

STA BEGIN	STA END
NOT	USED

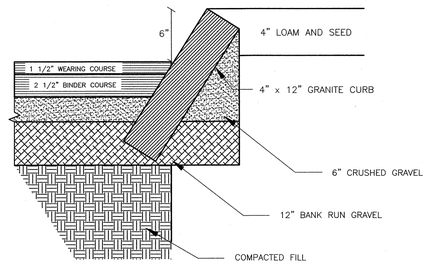
** **UNDERDRAIN SCHEDULE**

STA BEGIN	STA END
NOT	USED

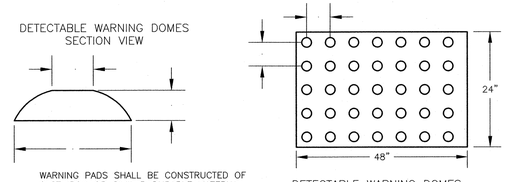
* THE ASPHALT SUBMITTAL FOR THE ROADWAY SHALL BE REVIEWED AND APPROVED BY THE CITY ENGINEER.

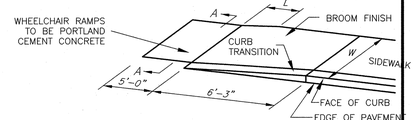
** THE ENGINEER MAY REQUIRE FABRIC OR UNDERDRAIN AS CONDITIONS WARRANT

1 RED BARN DRIVE CROSS SECTION
NOT TO SCALE

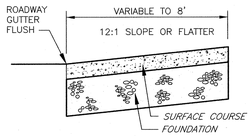


2 SLOPED GRANITE CURB SECTION
NOT TO SCALE





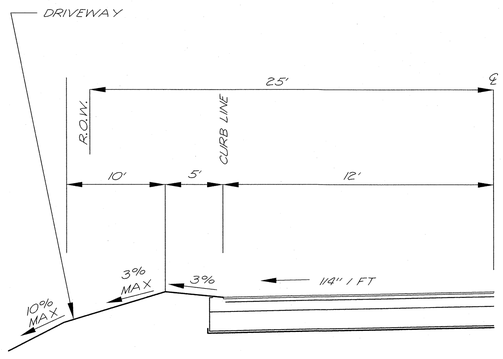
NOTES:
1. THE DIMENSIONS SHOWN AT ROADWAY EDGE ARE FIXED DISTANCES.
2. RAMP CROSS SECTION TO BE SAME AS ADJACENT SIDEWALK; I.E., DEPTH OF SURFACE AND FOUNDATION.
3. PORTLAND CEMENT CONCRETE RAMPS ARE TO BE TEXTURED BY BROOMING IN A DIRECTION PARALLEL TO THE LENGTH OF THE RAMP.
4. SIDEWALKS THAT CROSS DRIVEWAYS SHALL BE RAMPED TO MEET THE GRADE OF DRIVEWAY.
5. THESE DIMENSIONS ARE SUBJECT TO CHANGE IN THE FIELD IF EXISTING APPURTENANCES OR CONDITIONS WILL MAKE THE RAMP LOCATIONS IMPRACTICAL OR UNSAFE.
6. DETECTABLE WARNINGS TO BE INSTALLED 6" FROM EDGE OF RAMP
7. DETECTABLE WARNINGS PADS SHALL BE CONSTRUCTED OF CAST IRON OR SIMILAR DURABLE MATERIAL APPROVED BY THE CITY OF ROCHESTER.



SECTION A–A

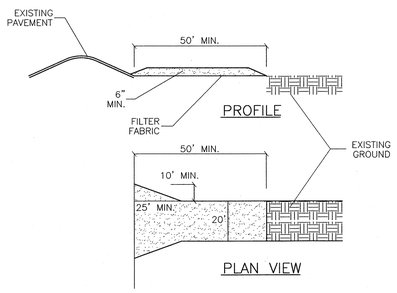
W	L	S.Y.
5'–0"	2'–9"±	6.3
6'–0"	2'–0"±	7.2
7'–0"	1'–3"±	8.0
8'–0"	0'–0"	8.1

3 WHEEL CHAIR RAMP
NOT TO SCALE

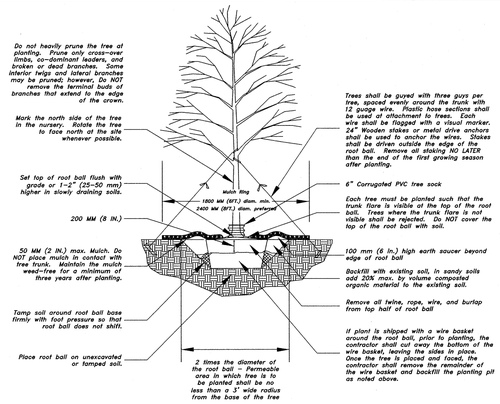


4 DRIVEWAY PAVEMENT MATCH DETAIL
NOT TO SCALE

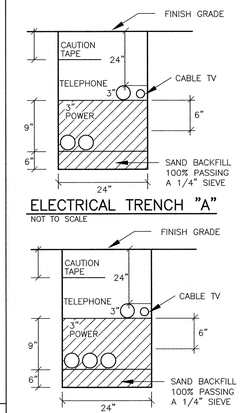
1. GRADE AND COMPACT ACCESS ROAD ENTRANCE AS NECESSARY PLACE FILTER FABRIC (MIRAFI OR EQUAL) AND PLACE 6" OF 1" – 2" STONE TO MATCH SLOPE OF EXISTING ROAD
2. PROVIDE NECESSARY SWALES OR DIVERSIONS TO MINIMIZE DIRECT FLOW OF WATER ONTO STONE AREA.
3. CONSTRUCTION ENTRANCE SHALL BE MAINTAINED AS NECESSARY TO REMOVE SILT FROM TIRES PRIOR TO ENTERING PUBLIC ROADS. A SMALL SWALE SHALL BE CONSTRUCTED ON THE DOWN GRADIENT SIDE TO TRAP ANY SILT WASHED FROM THE STONE.
4. HAYBALES OR SILT FENCE SHALL BE PLACED ON THE DOWN GRADIENT SIDE AS SHOWN ON THE EROSION CONTROL PLAN.



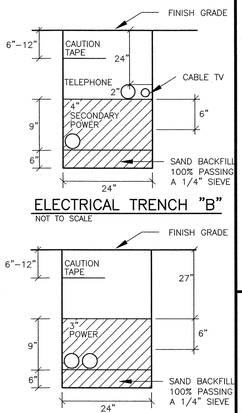
5 STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE



6 PLANTING DETAIL
NOT TO SCALE



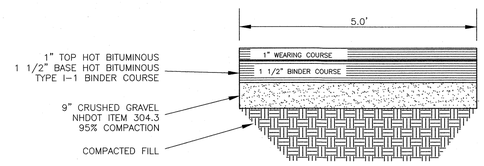
ELECTRICAL TRENCH "A"
NOT TO SCALE



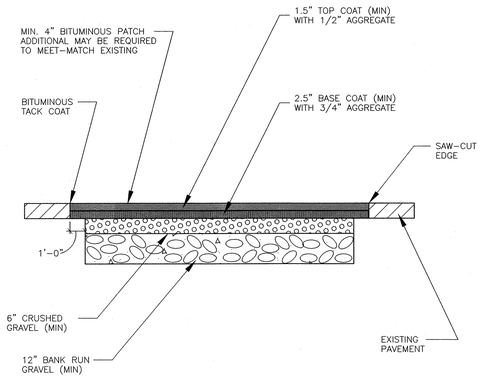
ELECTRICAL TRENCH "B"
NOT TO SCALE

ELECTRICAL TRENCH "C"
NOT TO SCALE

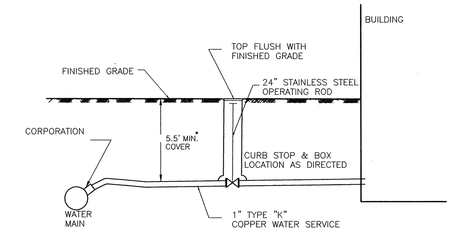
ELECTRICAL TRENCH "D"
NOT TO SCALE



7 BITUMINOUS CONCRETE WALK DETAILS
NOT TO SCALE



8 TRENCH PATCH DETAIL
NOT TO SCALE



* USE 2" x 2' RIGID BOARD INSULATION OVER PIPE WHEN COVER REQUIREMENT CANNOT BE SATISFIED.

NOTES:
1.) SERVICE TO BE TYPE "K" COPPER OR EQUAL, APPROVED BY LOCAL AND STATE SPECIFICATIONS.
2.) BALL VALVE CURB STOP COMPRESSION (NO DRAIN)

9 BUILDING WATER SERVICE
NOT TO SCALE

1.) TELEPHONE CONDUIT SHALL BE 3" SCHEDULE 40 PVC, WITH STEEL SWEEPS AT RISER POLE, 90° BENDS AND AT BUILDING.
2.) LEAVE PULL ROPE IN ALL CONDUITS FOR CABLE INSTALLATION.
3.) FOR COMPLETE SPECIFICATION SEE "PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE CONSTRUCTION SPECIFICATIONS FOR UNDERGROUND CONDUIT SYSTEMS".
4.) CONTRACTOR SHOULD VERIFY THE NUMBER & SIZE OF CONDUIT WITH THE APPROPRIATE UTILITIES.

10 TYPICAL TRENCH DETAIL
NOT TO SCALE

TRITECH
ENGINEERING CORPORATION
755 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820
TELEPHONE 603 742 8107
FAX 603 742 3630

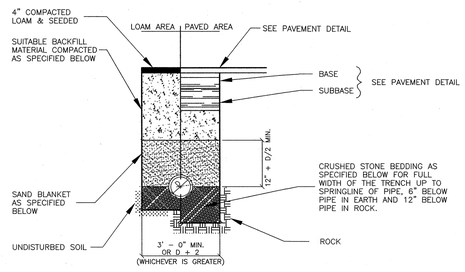
REVISIONS DESCRIPTION:
DATE:

CONSTRUCTION DETAILS

BELLAMY RIDGE
54 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE
JOB No. 1829
JANUARY 10, 2019
SCALE: 1" = 30'

SHEET NO.
C-4

(P19-00)

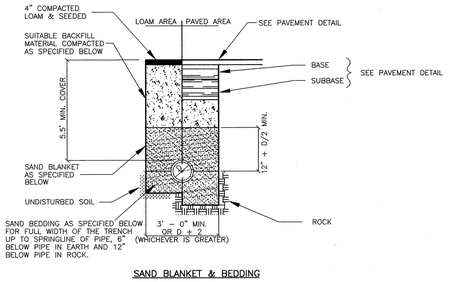


SAND BLANKET		CRUSHED STONE BEDDING*	
SIEVE SIZE	%FINER BY WEIGHT	SIEVE SIZE	%FINER BY WEIGHT
1/2"	90 – 100	1"	100
200	0 – 15	3/4"	90 – 100
		3/8"	20 – 55
		#4	0 – 10
		#8	0 – 5

*EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

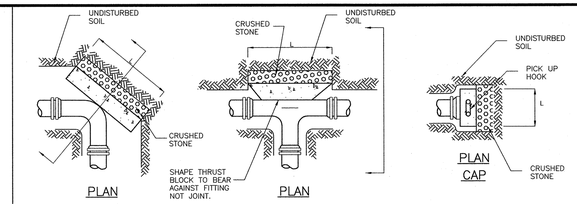
1 STORM DRAINAGE & SEWER PIPE TRENCH
NOT TO SCALE



SAND BLANKET & BEDDING	
SIEVE SIZE	%FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

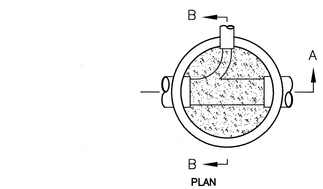
2 WATER LINE TRENCH
NOT TO SCALE

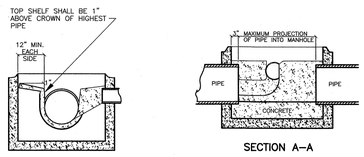


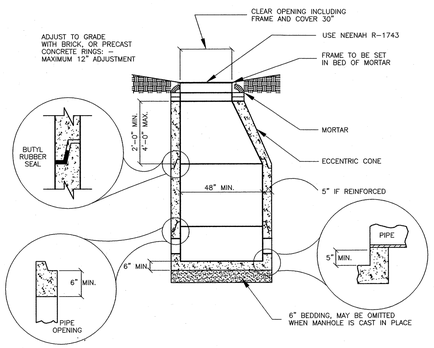
NOMINAL DIA. (IN)	PIPE SIZE					
	4	6	8	10	12	16
TEES, CAPS, PLUGS & TAPPING SLEEVES	1.05	2.32	4.15	6.37	9.15	16.23
90° BENDS	1.48	3.29	5.86	9.01	12.93	22.96
45° BENDS	0.80	1.78	3.17	4.88	7.00	12.42
22 1/2° BENDS	0.41	0.91	1.62	2.49	3.57	6.33
11 1/4° BENDS	0.21	0.46	0.81	1.25	1.79	3.18
SYSTEM PRESSURE: 100 PSI SAFETY FACTOR: 1.5 SOIL BEARING CAPACITY: 2,000 PSF						

NOTES:
1. ALL THRUST BLOCKS SHALL BE PRE–CAST CONCRETE AND A MINIMUM SIZE OF 2' x 2' x 3'.
2. THE MINIMUM BEARING AREAS SHOWN IN THE THRUST BLOCK SCHEDULE ARE BASED ON A SYSTEM PRESSURE OF 100 PSI. IF THE SYSTEM PRESSURE IS ABOVE 100 PSI, INCREASE THE NOTED AREAS PROPORTIONAL TO THE ACTUAL SYSTEM PRESSURE. FOR EXAMPLE, IF THE ACTUAL SYSTEM PRESSURE IS 160 PSI, MULTIPLY THE ABOVE VALUES BY 160%.
3. SELECT THRUST BLOCKS SUCH THAT THE LENGTH (L) OF THE BLOCK IS APPROX. TWICE AS LONG AS THE DEPTH (H).
4. PLACE CRUSHED STONE BEHIND THRUST BLOCKS AGAINST UNDISTURBED SOIL.
5. PLACE THRUST BLOCKS ALONG THE FULL LENGTH OF THE FITTING TO MAXIMIZE BEARING AREA.
6. PLACE 2 LAYERS OF POLYETHYLENE OR ROOFING PAPER AROUND FITTINGS AS PROTECTION AGAINST DAMAGE FROM CONCRETE BLOCK.
7. PLACE A 12" LONG STEEL HORSESHOE–SHAPED PICKUP HOOK IN ALL PLUG AND CAP THRUST BLOCKS. DIAMETER OF HOOK SHALL BE A MINIMUM OF 5/8".
8. COAT ALL THREADED RODS, NUTS, AND BOLTS WITH BITUMINOUS PAINT.
9. CONCRETE COMPRESSIVE STRENGTH: 2,000 PSI MINIMUM.
10. USE OF THRUST BLOCKS DOES NOT ELIMINATE THE REQUIREMENT OF OTHER RESTRAINTS. ALL VALVES AND FITTINGS SHALL BE RESTRAINED MJ.

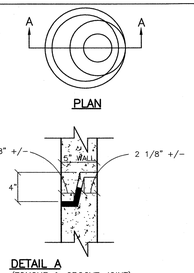
3 PRECAST CONCRETE THRUST BLOCKS AND ANCHORS
NOTE TO SCALE



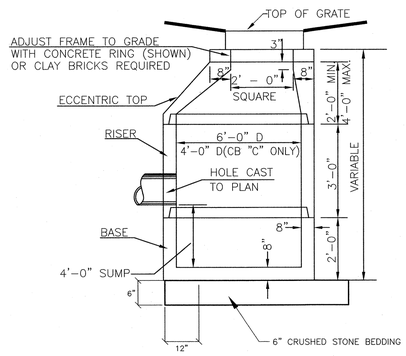




5 DRAIN MANHOLE DETAILS
NOT TO SCALE

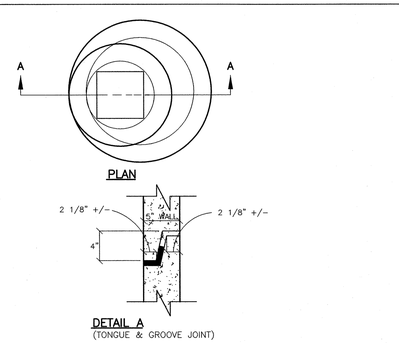


NOTES
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE OR GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FOOT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H–20 LOADING.
6. FOR SHALLOW INVERTS, A FLAT TOP SLAB WITH TONGUE AND GROOVE JOINTS (DETAIL A), MEETING H–20 LOADING MAY BE USED.

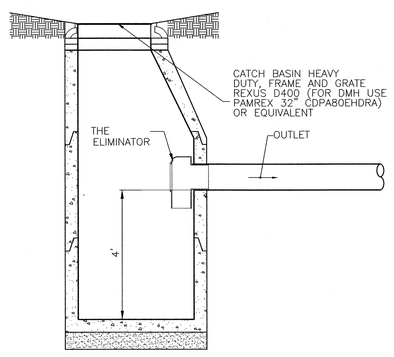


SECTION A–A

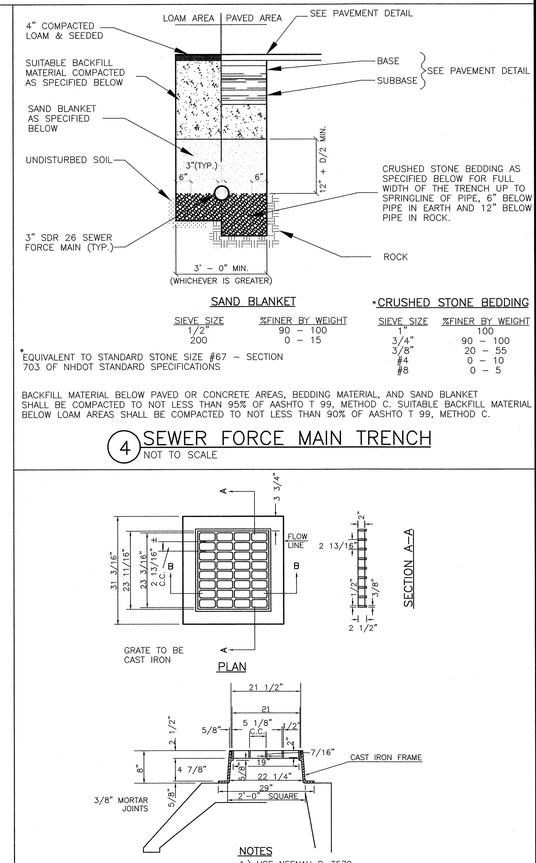
6 CATCH BASIN
NOT TO SCALE



NOTES
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE OR GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FOOT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H–20 LOADING.
6. FOR SHALLOW INVERTS, A FLAT TOP SLAB WITH TONGUE AND GROOVE JOINTS (DETAIL A), MEETING H–20 LOADING MAY BE USED.



7 DEEP SUMP HOODED CATCH BASIN
NOT TO SCALE



SAND BLANKET		*CRUSHED STONE BEDDING	
SIEVE SIZE	%FINER BY WEIGHT	SIEVE SIZE	%FINER BY WEIGHT
1/2"	90 – 100	1"	100
200	0 – 15	3/4"	90 – 100
		3/8"	20 – 55
		#4	0 – 10
		#8	0 – 5

*EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

4 SEWER FORCE MAIN TRENCH
NOT TO SCALE

NOTES
1.) USE NEENAH R–3570
2.) FOR SHALLOW INVERTS, USE NEENAH R–3570–A.

8 CATCH BASIN FRAME & GRATE
NOT TO SCALE

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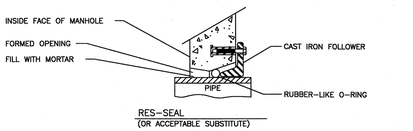
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DATE: DESCRIPTION:

CONSTRUCTION DETAILS

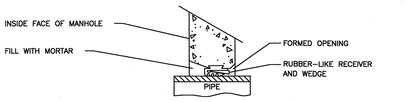
BELLAMY RIDGE
54 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE
JOB No. 1829
JANUARY 10, 2019
SCALE: 1" = 30'

SHEET NO.
C-5

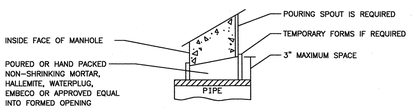
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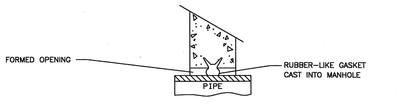
RES-SEAL
(OR ACCEPTABLE SUBSTITUTE)



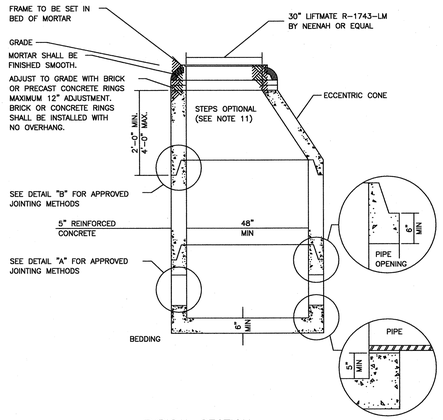
PRESS-WEDGE II
(OR ACCEPTABLE SUBSTITUTE)



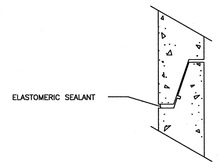
NON-SHRINKING MORTAR
(OR ACCEPTABLE SUBSTITUTE)



A-LOK
(OR ACCEPTABLE SUBSTITUTE)



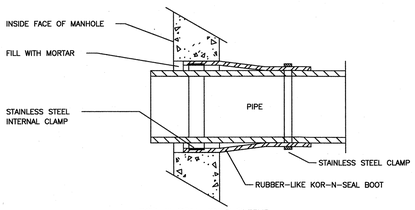
TYPICAL SECTION



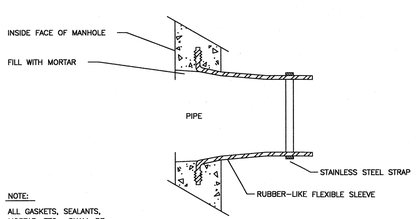
ELASTOMERIC SEALANT

NOTE:
ALL GASKETS AND SEALANTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS

DETAIL "B" – HORIZONTAL JOINTS

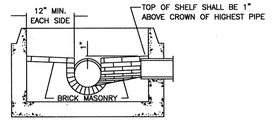


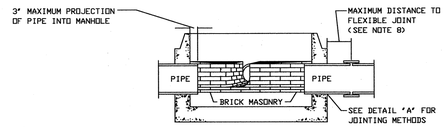
KOR-N-SEAL JOINT SLEEVE
(OR ACCEPTABLE SUBSTITUTE)



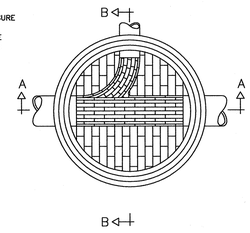
NOTE:
ALL GASKETS, SEALANTS, MORTAR, ETC... SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS

DETAIL "A" – PIPE TO MANHOLE JOINTS





NOTES:
A) INVERT AND SHELF TO BE PLACED AFTER LEAKAGE TEST
B) CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. INVERT BRICKS SHALL BE LAID ON EDGE.
C) BASE SECTION TO BE FULL WALL THICKNESS AND MONOLITHIC TO A POINT 6" ABOVE THE PIPE CROWN



GENERAL NOTES

1) IT IS THE INTENTION THAT THE MANHOLE, INCLUDING ALL COMPONENT PARTS, HAVE ADEQUATE SPACE, STRENGTH AND LEAK PROOF 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, WITH ADEQUATE JOINTING, OR CONCRETE CAST MONOLITHICALLY IN PLACE WITH REINFORCEMENT. IN ANY APPROVED MANHOLE, THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND LOADS OF 8 TONS(H-20 LOADING) WITHOUT FAILURE AND PREVENT LEAKAGE IN EXCESS OF ONE GALLON PER DAY PER VERTICAL FOOT OF MANHOLE, CONTINUOUSLY FOR THE LIFE OF THE STRUCTURE. A PERIOD GENERALLY IN EXCESS OF 25 YEARS IS TO BE UNDERSTOOD IN BOTH CASES.

2) BARRELS AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE, OR POURED IN PLACE REINFORCED CONCRETE.

3) PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C478.

4) LEAKAGE TEST SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS.

5) INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF THE PIPE AND FLOW. AT CHANGES IN DIRECTIONS, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY.

6) FRAMES AND COVERS: MANHOLES FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. A 3-INCH (MINIMUM HEIGHT) WORD "SEWER" FOR SEWERS AND "DRAIN" FOR DRAINS SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER LIFTMATE R-1743-LM BY NEENAH OR EQUAL.

7) BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33, SIZE NUMBER 67.
100% PASSING 1 INCH SCREEN 0-10% PASSING #4 SIEVE
90-100% PASSING INCH SCREEN 0-5% PASSING #8 SIEVE
20-55% PASSING INCH SCREEN
WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE INCH TO 1 INCH SHALL BE USED.

8) FLEXIBLE JOINT: A FLEXIBLE JOINT SHALL BE PROVIDE WITHIN THE FOLLOWING DISTANCES: RCP & CI PIPE – ALL SIZES – 48"

9) 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.

10) MANHOLE STEPS MAY BE PERMITTED UPON REQUEST BY THE OWNER AS SECONDARY ADDITIONAL SAFETY FEATURE SUPPLEMENTARY TO THE PRIMARY PORTABLE LADDER ENTRY AND WHEN INSTALLED UNDER THE FOLLOWING CONDITIONS:

1. THE STEPS SHALL BE MANUFACTURED OF PLASTIC COVERED STEEL. THEY SHALL BE SHAPED SO THEY CANNOT BE PULLED OUT OF THE CONCRETE WALL IN WHICH THEY ARE EMBEDDED.
2. THE STEPS SHALL BE EMBEDDED IN THE CONCRETE BY THE MANUFACTURER DURING MANUFACTURE OR IMMEDIATELY FOLLOWING REMOVAL OF FORMS. SECURING THE STEPS WITH MORTAR IN DRILLED OR CAST HOLES, WILL NOT BE ACCEPTABLE.
3. THE STEPS SHALL BE OF THE DROP TYPE WITH A DEPRESSED SECTION FOR HANDHOLD. APPROXIMATELY 14"X10" IN DIMENSION.

11) HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF A TYPE APPROVED BY THE ENGINEER, WHICH TYPE SHALL, IN GENERAL, DEPEND FOR WATERTIGHTNESS UPON AN ELASTOMERIC OR MASTIC-LIKE GASKET. APPROVED ELASTOMERIC SEALANTS ARE: RAM-NEK
KENT SEAL NO.2
EZ

12) PIPE TO MANHOLE JOINTS SHALL BE ONLY AS APPROVED BY THE ENGINEER AND IN GENERAL, WILL DEPEND FOR WATERTIGHTNESS UPON EITHER AN APPROVED NON-SHRINKING MORTAR OR ELASTOMERIC SEALANT.

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755 CENTRAL AVENUE
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REVISIONS DESCRIPTION:
DATE:

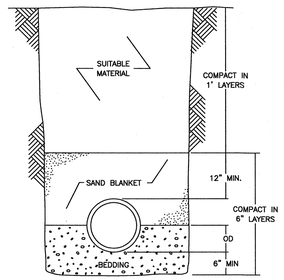
STANDARD SEWER DETAILS

BELLAMY RIDGE
54 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE

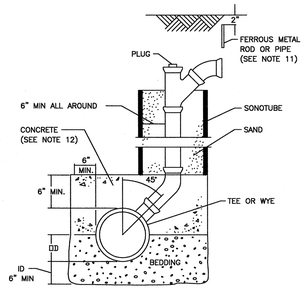
JANUARY 10, 2019 JOB No. 1829
SCALE: 1" = 30'

SHEET NO.
C-8

(P19-00)

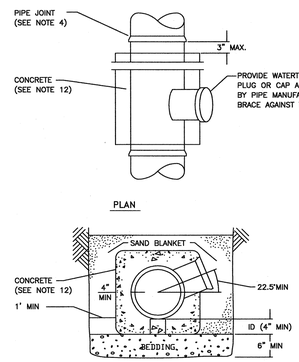


TRENCH CROSS-SECTION
NOT TO SCALE

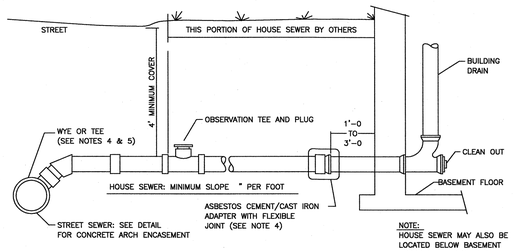


NO BACKFILLING BEFORE CONCRETE HAS TAKEN INITIAL SET (7 HRS. MIN.). BACKFILLING TO BE BROUGHT UP EVENLY ON ALL SIDES.

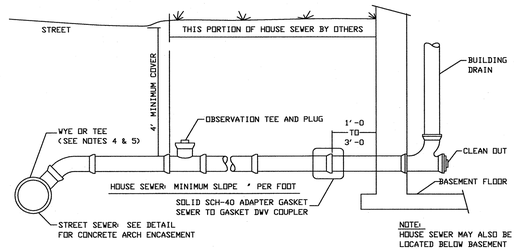
CHIMNEY (SEE NOTE 13)
NOT TO SCALE



CONCRETE FULL ENCASEMENT
NOT TO SCALE



ASBESTOS CEMENT SEWER AND HOUSE SEWER
NOT TO SCALE



SEWER AND HOUSE SEWER
NOT TO SCALE

NOT USED

GENERAL NOTES

1) MINIMUM SIZE PIPE FOR HOUSE SERVICE SHALL BE FOUR INCHES.

2) PIPE AND JOINT MATERIALS:

A. PLASTIC SEWER PIPE

1. PIPE AND FITTINGS SHALL CONFORM TO THE FOLLOWING ASTM STANDARDS:

ASTM STANDARDS	GENERIC PIPE MATERIAL	SIZES APPROVED
D3034	*PVC (SOLID WALL)	8" THROUGH 15" (SDR 35)
F679	PVC (SOLID WALL)	18" THROUGH 27" (T-1 & T-2)
F789	PVC (SOLID WALL)	4" THROUGH 18" (T-1 TO T-3)
F794	PVC (RIBBED WALL)	8" THROUGH 36"
D2680	*ABS (COMPOSITES WALL)	8" THROUGH 15"

*PVC: POLY VINYL CHLORIDE
*ABS: ACRYLONITRILE-BUTADIENE-STYRENE

2. JOINTS SEALS FOR PVC PIPE SHALL BE OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL CONFORMING TO ASTM D-3212 AND SHALL BE PUSH-ON, BELL AND SPIGOT TYPE.

ABS TRUSS PIPE AND FITTINGS SHALL CONFORM TO ASTM D-2680, POLYMER COMPOUNDING SHALL BE TO ASTM D-1788 (CLASS 322).

JOINTS FOR ABS TRUSS PIPE SHALL BE CHEMICAL WELDED COUPLINGS TYPE SC IN ACCORDANCE WITH ASTM D-2680, FORMING A CHEMICAL WELDED JOINT.

B. DUCTILE-IRON PIPE, FITTINGS AND JOINTS.

1. DUCTILE IRON PIPE AND FITTINGS SHALL CONFORM TO THE FOLLOWING STANDARDS OF THE UNITED STATES OF AMERICA STANDARDS INSTITUTE:
A21.50 THICKNESS DESIGN OF DUCTILE IRON PIPE AND WITH ASTM A-536 DUCTILE IRON CASTINGS.
A21.51 DUCTILE IRON PIPE, CENTRIFUGALLY CAST IN METAL MOLDS OR SAND-LINED MOLDS FOR WATER OR OTHER LIQUIDS.

2. JOINTS SHALL BE OF THE MECHANICAL OR PUSH-ON TYPE. JOINTS AND GASKETS SHALL CONFORM TO:
A21.11 RUBBER GASKETS JOINTS FOR CAST IRON PRESSURE PIPE & FITTINGS

3) DAMAGED PIPE SHALL BE REJECTED AND REMOVED FROM THE JOB SITE.

4) JOINTS SHALL BE DEPENDENT UPON A NEOPRENE OR ELASTOMERIC GASKET FOR WATER-TIGHTNESS. ALL JOINTS SHALL BE PROPERLY MATCHED WITH THE PIPE MATERIALS USED. WHERE DIFFERING MATERIALS ARE TO BE CONNECTED, AS AT THE STREET SEWER WYE OR AT THE FOUNDATION WALL, APPROPRIATE MANUFACTURED ADAPTERS SHALL BE USED.

5) TEES AND WYES: WHERE A TEE OR WYE IS NOT AVAILABLE IN THE EXISTING STREET SEWER, AN APPROPRIATE CONNECTION SHALL BE MADE, FOLLOWING MANUFACTURERS' INSTRUCTIONS USING A BOLTED, CLAMPED OR EPOXY-CEMENTED SADDLE TAPPED INTO A SMOOTHLY DRILLED OR SAWN OPENING IN THE SEWER. THE PRACTICE OF BREAKING AN OPENING WITH A SLEDGE HAMMER, STUFFING CLOTH OR OTHER SUCH MATERIAL AROUND THE JOINT, OR APPLYING MORTAR TO HOLD THE CONNECTION, AND ANY OTHER SIMILAR CRUDE PRACTICES OR INEPT OR HASTY IMPROVISATIONS WILL NOT BE PERMITTED. THE CONNECTION SHALL BE CONCRETE ENCASED AS SHOWN IN THE DETAIL UP TO AND INCLUDING 15" DIAMETER.

6) HOUSE SEWER INSTALLATION: THE PIPE SHALL BE HANDLED, PLACED AND JOINTED IN ACCORDANCE WITH INSTALLATION GUIDES OF THE APPROPRIATE MANUFACTURER. IT SHALL BE CAREFULLY BEDDED ON A 4 INCH LAYER OF CRUSHED STONE AND/OR GRAVEL AS SPECIFIED IN NOTE 10. BEDDING AND RE-FILL FOR DEPTH OF 12 INCHES ABOVE THE TOP OF THE PIPE SHALL BE CAREFULLY AND THOROUGHLY TAMPED BY HAND OR WITH APPROPRIATE MECHANICAL DEVICES.

THE PIPE SHALL BE LAID AT A CONTINUOUS AND CONSTANT GRADE FROM THE STREET SEWER CONNECTION TO THE FOUNDATION AT A GRADE OF NOT LESS THAN INCH PER FOOT. PIPE JOINTS MUST BE MADE UNDER DRY CONDITIONS. IF WATER IS PRESENT, ALL NECESSARY STEPS SHALL BE TAKEN TO DEWATER THE TRENCH.

7) TESTING: THE COMPLETED HOUSE SEWER SHALL BE SUBJECTED TO A LEAKAGE TEST IN ANY OF THE FOLLOWING MANNERS: (PRIOR TO BACKFILLING)

A. AN OBSERVATION TEE SHALL BE INSTALLED AS SHOWN AND WHEN READY FOR TESTING, AN INFLATABLE BLADDER OR PLUG SHALL BE INSERTED JUST UPSTREAM FROM THE OPENING IN THE TEE. AFTER INFLATION, WATER SHALL BE INTRODUCED INTO THE SYSTEM ABOVE THE PLUG TO A HEIGHT OF 5 FEET ABOVE THE LEVEL OF THE PLUG.

B. THE PIPE SHALL BE LEFT EXPOSED AND LIBERALLY HOSED WITH WATER, TO SIMULATE, AS NEARLY AS POSSIBLE, WET TRENCH CONDITIONS OR, IF TRENCH IS WET, THE GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE. INSPECTIONS FOR LEAKS SHALL BE MADE THROUGH THE CLEANOUT WITH A FLASHLIGHT.

C. DRY FLUORESCENE DYE SHALL BE SPRINKLED INTO THE TRENCH OVER THE PIPE. IF THE TRENCH IS DRY, THE PIPE SHALL BE LIBERALLY HOSED WITH WATER, OR IF THE TRENCH IS WET, GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE. OBSERVATION FOR LEAKS SHALL BE MADE IN THE FIRST DOWN-STREAM MANHOLE.

LEAKAGE OBSERVED IN ANY ONE OF THE ABOVE ALTERNATE TESTS SHALL BE CAUSE FOR NON-ACCEPTANCE AND THE PIPE SHALL BE DUG-UP IF NECESSARY AND RE-LAID SO AS TO ASSURE WATER TIGHTNESS.

8) ILLEGAL CONNECTIONS: NOTHING BUT SANITARY WASTE FLOW FROM HOUSE TOILETS, SINKS, LAUNDRY ETC. SHALL BE PERMITTED. ROOF LEADERS, FOOTING DRAINS, SUMP PUMPS OR OTHER SIMILAR CONNECTIONS CARRYING RAIN WATER, DRAINAGE OR GROUND WATER SHALL NOT BE PERMITTED.

9) HOUSE WATER SERVICE SHALL NOT BE LAID IN SAME TRENCH AS SEWER SERVICE.

10) BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATERIAL AND MEETING ASTM C33-67.

100% PASSING	1 INCH SCREEN
90%-100% PASSING	3/4 INCH SCREEN
20%- 55% PASSING	3/8 INCH SCREEN
0%- 10% PASSING	#4 SIEVE
0%- 5% PASSING	#8 SIEVE

WHERE ORDERED BY THE ENGINEER TO STABILIZE THE TRENCH BASE, SCREENED GRAVEL OR CRUSHED STONE 1/2 INCH TO 1 1/2 INCH SHALL BE USED.

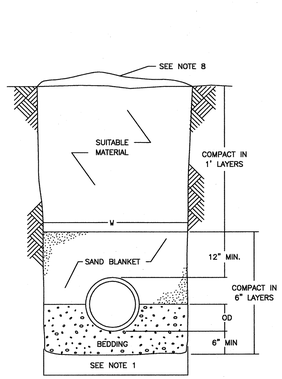
11) LOCATION: THE LOCATION OF THE TEE OR WYE SHALL BE RECORDED AND FILED IN THE MUNICIPAL RECORDS. IN ADDITION, A FERROUS METAL ROD OR PIPE SHALL BE PLACED OVER THE TEE OR WYE AS DESCRIBED IN THE TYPICAL "CHIMNEY" DETAIL, TO AID IN LOCATING THE BURIED PIPE WITH A DIP NEEDLE OR PIPEFINDER.

12) CONCRETE: CONCRETE SHALL CONFORM TO THE REQUIREMENTS FOR CLASS A (3000 PSI) CONCRETE OF THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION STANDARDS SPECIFICATIONS AS FOLLOWS:

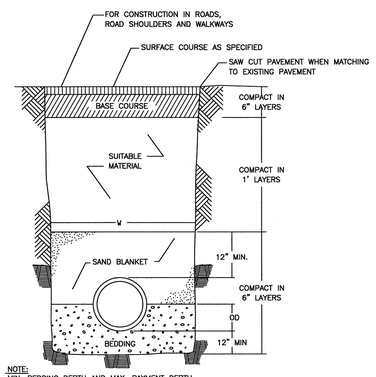
CEMENT: 6.0 BAGS PER CUBIC YARD
WATER: 5.75 GALLONS PER BAG CEMENT
MAXIMUM SIZE OF AGGREGATE: 1 INCH

13) CHIMNEYS: IF VERTICAL DROP INTO SEWER IS GREATER THAN 4 FEET, A CHIMNEY SHALL BE CONSTRUCTED FOR THE HOUSE CONNECTION. CHIMNEY INSTALLATION AS RECOMMENDED BY THE PIPE MANUFACTURER MAY BE USED IF APPROVED BY THE ENGINEER.

14) MAINTAIN A 10' HORIZONTAL SEPARATION BETWEEN SEWER LINES AND WATER LINES, AND AN 18" VERTICAL SEPARATION AT SEWER AND WATER CROSSINGS, WITH WATER OVER SEWER

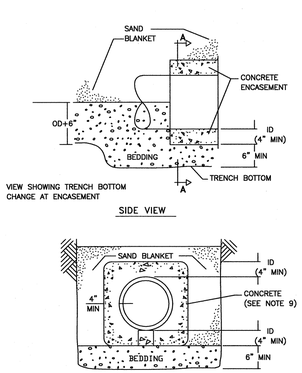


TYPICAL SECTION
NOT TO SCALE



NOTE:
MIN. BEDDING DEPTH AND MAX. PAYMENT DEPTH FOR LEDGE EXCAVATION SHALL BE 12"

LEDGE CONSTRUCTION
NOT TO SCALE



CONCRETE FULL ENCASEMENT
NOT TO SCALE

GENERAL NOTES

1) ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE. REFILL WITH BEDDING MATERIAL. FOR TRENCH WIDTH SEE NOTE 7.

2) BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33 STONE SIZE NO. 67.

100% PASSING	1 INCH SCREEN
90%-100% PASSING	3/4 INCH SCREEN
20%- 55% PASSING	3/8 INCH SCREEN
0%- 10% PASSING	#4 SIEVE
0%- 5% PASSING	#8 SIEVE

WHERE ORDERED BY THE ENGINEER TO STABILIZE THE TRENCH BASE, GRADED SCREENED GRAVEL OR CRUSHED STONE 1/2 INCH TO 1 1/2 INCH SHALL BE USED.

3) SAND BLANKET: CLEAN SAND FREE FROM ORGANIC MATTER SO GRADED THAT 90%-100% PASSES A 1/2 INCH SIEVE AND NOT MORE THAT 15% WILL PASS A #200 SIEVE. BLANKET MAY BE OMITTED FOR DUCTILE IRON AND REINFORCED CONCRETE PIPE PROVIDED THAT NO STONE LARGER THAN 2 INCHES IS IN CONTACT WITH THE PIPE.

4) SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALK-WAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT OR CLAY, ALL EXCAVATED LEDGE MATERIAL, AND ALL ROCKS OVER SIX INCHES IN LARGEST DIMENSION, OR ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.

IN CROSS-COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK OR PEAT, IF HE IS SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER FOR MAINTENANCE AND POSSIBLY RECONSTRUCTION, WHEN NECESSARY WILL BE PRESERVED.

5) BASE COURSE, IF ORDERED BY THE ENGINEER, SHALL MEET THE REQUIREMENTS OF DIVISION 300 OF THE LATEST EDITION OF THE:
STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
OF THE STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION.

6) WOOD SHEETING, IF REQUIRED. WHERE SHEETING IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID-DIAMETER, IT SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION NOT LESS THAN 1 FOOT ABOVE THE TOP OF THE PIPE. WHERE SHEETING IS ORDERED BY THE ENGINEER TO BE LEFT IN PLACE, IT SHALL BE CUT OFF AT LEAST 3 FEET BELOW FINISHED GRADE, BUT NOT LESS THAN 1 FOOT ABOVE THE TOP OF THE PIPE.

7) W= MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES, FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE O.D. W SHALL ALSO BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.

8) FOR CROSS COUNTRY CONSTRUCTION, BACKFILL OR FILL SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.

9) CONCRETE FOR ENCASEMENT SHALL CONFORM TO THE REQUIREMENTS FOR CLASS A (3000 LB) CONCRETE OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AS FOLLOWS: CEMENT: 6.0 BAGS PER CUBIC YARD
WATER: 5.75 GALLONS PER BAG CEMENT
MAXIMUM SIZE OF AGGREGATE: 1 INCH

10) IF FULL ENCASEMENT IS UTILIZED, DEPTH OF CONCRETE BELOW PIPE SHALL BE 1/4 I.D. (4" MIN.) BLOCK SUPPORT SHALL BE SOLID CONCRETE BLOCKS.

TRITECH
ENGINEERING CORPORATION
755 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820
TELEPHONE 603 742 8107
FAX 603 742 3630

REVISIONS
DATE: DESCRIPTION:

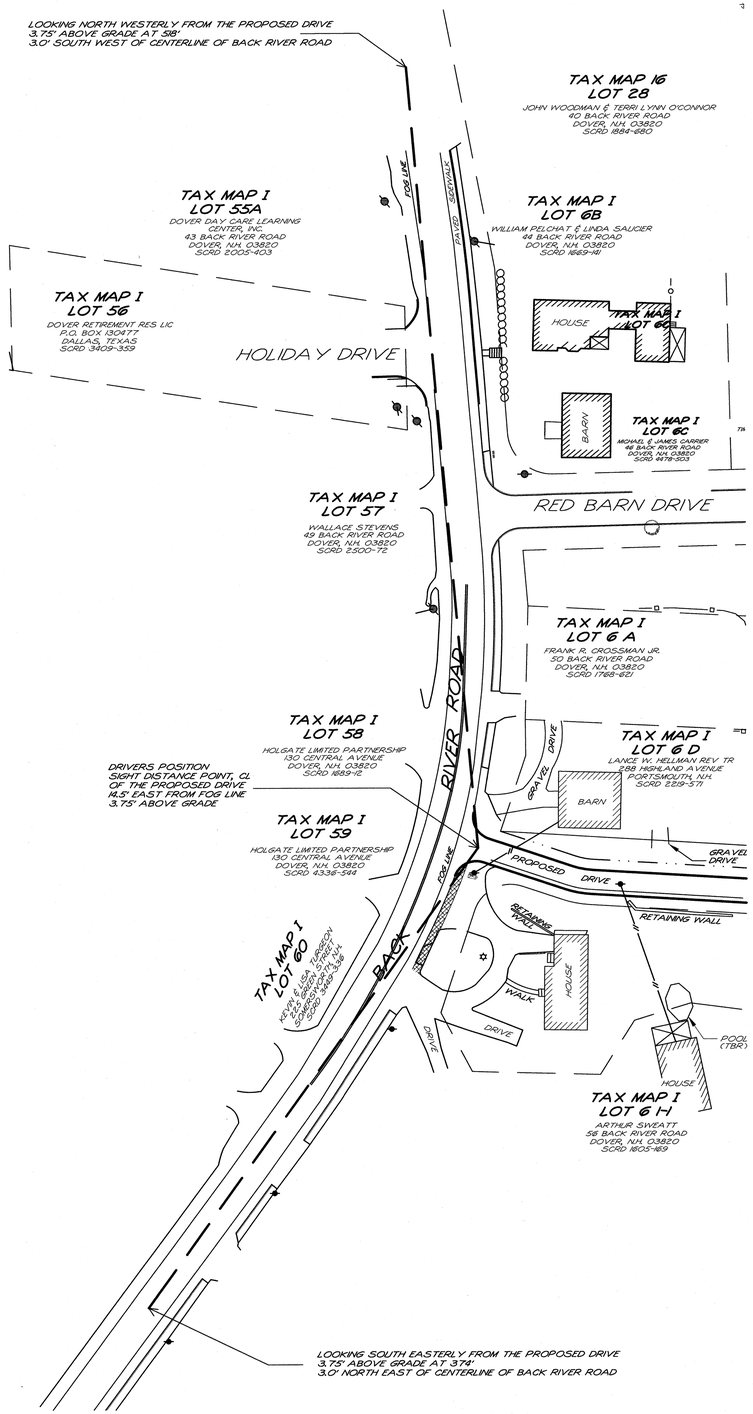
STANDARD SEWER DETAILS

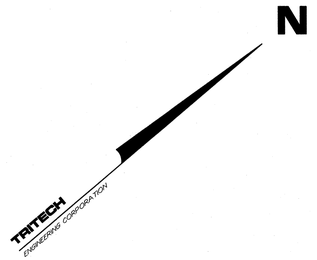
BELLAMY RIDGE
54 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE

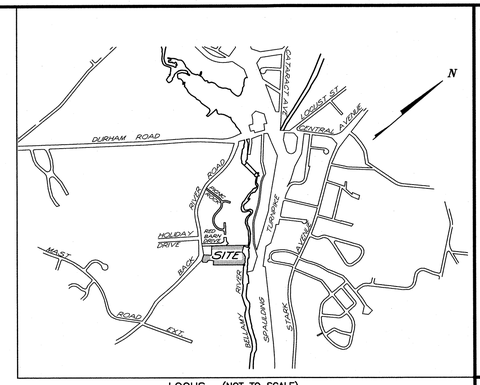
JANUARY 10, 2019 JOB No. 1812.9
SCALE: 1" = 30'

SHEET NO.
C-9

(P19-00)







LOCUS (NOT TO SCALE)



TRITECH
ENGINEERING CORPORATION
755 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820
TELEPHONE 603 742 8107
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REVISIONS
DATE: DESCRIPTION:

SIGHT DISTANCE PLAN

BELLAMY RIDGE

54 BACK RIVER ROAD
DOVER, NEW HAMPSHIRE
STRAFFORD COUNTY

JANUARY 10, 2019 JOB NO. 18129
SCALE: 1" = 50'

SHEET NO.

SD-1

(P19-00)