CITY OF DOVER

PLANNING TECHNICAL REVIEW COMMITTEE –AGENDA

Meeting Type: Regular Meeting
Meeting Location: Council Conference Room – City Hall, Dover NH
Meeting Date: **Thursday, October 22, 2020**
Meeting Time: **10:30 AM**

1. 10:30 AM – 11:15 AM: Site Review for Index Packaging Inc., Assessor's Map D, Lot 9A, zoned IT (Innovative Technology), and located at 150 Venture Drive. (Proposal is to construct a 47,900 s.f. warehouse building off the back of the existing building creating 26,781 of manufacturing space as well as 6,870 warehouse space and 13,792 of office space). (P20-66)

City of Dover, New Hampshire
SITE REVIEW APPLICATION

[Revision Date: June 4, 2019]

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

APPLICANT AND OWNER INFORMATION

Name of Applicant: Index Packaging Inc. Telephone # 603-312-3281

Address of Applicant: 1055 White Mountain Highway, Milton NH 03851

E-Mail Address: Mwiles@indexpackaging.com

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

Address of Property Owner:

PROPERTY INFORMATION

Address of Property: 150 Venture Drive

Assessor's Map # D Lot(s) # 9A

Zoning District(s) IT Innovative Technology Overlay District(s)

Size of Parcel: 404,461 sq. ft. 9.29 ac. Property Deed: Book 4769 Page: 941

Existing Use of Property: Existing office, printing space & warehouse

SITE PLAN INFORMATION

Describe Proposed Use: Proposed 36,400 SF building expansion phase I
Proposed 6,500 SF building expansion phase II

Area of Parcel to be Developed: 95,000 Sq.Ft. sq. ft.

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

Number of Parking Spaces: Existing 112 Proposed 93

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

Number of Employees Total: 0 In Maximum Shift: +/-10

Disposition of Parcel:

Building Footprint 88,357 sq. ft.

Total Building Area Existing 40,457 / Proposed 47,900 sq. ft.

Paved Area 8,500 sq. ft.

Building Setbacks:

Front Yard 50 ft.

Rear Yard 50 ft.

Side Yard: Right 75 ft. Left 50 ft.

City Water? X Yes ___ No How far is city water from the property? Existing building

City Sewer? X Yes ___ No How far is city sewer from the property? Existing building

BUILDING INFORMATION

Type of Building to be Built: Manufacturing. warehouse & some office space

Height of Building: 20' +/- Finished Floor Elevation: 180.00

Number of Seats (where applicable) N/A

Estimated value of construction: 2,000,000 Refuse removal: Public/Private (circle one)

WAIVER REQUESTS

Site Review Regulations section(s) to be waived: Required parking

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

Streetscape Site Plan Regulation 153-13.A.17

Outdoor lighting requirements per Site Plan Regulation 153-14.E.1.e

SURVEYOR INFORMATION

Name of Surveyor and Company (Licensed in N.H.) Kenneth A Berry, PE, LLS
Christopher R. Berry
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
crberry@metrocast.net

ENGINEER INFORMATION

Name of Engineer and Company (Licensed in N.H.) Kenneth A Berry, PE, LLS
Christopher R. Berry
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
crberry@metrocast.net

ARCHITECT INFORMATION

Name of Architect and Company (Licensed in N.H.) T & W Designs

Address 254 Drkae Hill Road, Strafford NH 03884 Telephone #: 664-2181

Professional License #: _____ E-mail address: _____

LANDSCAPE ARCHITECT INFORMATION

Name of Landscape Architect and Company (Licensed in N.H.) Eric Buck Terrain planning & design

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

Professional License #: 78 E-mail address: _____

SOIL SCIENTIST INFORMATION

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

Address 7 Limestone Way, North Hampton NH 03862 Telephone #: _____

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

CONSERVATION EASEMENT HOLDER

Name of Easement Holder: _____ Telephone # 205-4396

Address Easement Holder: _____

SIGNATURES

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

Signature of Property Owner: _____ Date: 7-13-20

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

Signature of Agent: _____ Date: 7-13-20

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: 7-13-20

AUTHORIZATION TO COMPLETE THE PROJECT ON SUBJECT PROPERTY

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

Signature of Property Owner: _____ Date: 7-13-20

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

CERTIFICATION OF FEES

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

Signature of Property Owner: _____ Date: 7-13-20

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

City of Dover, New Hampshire
SITE PLAN REVIEW SUBMISSION CHECKLIST

[Revision Date: June 4, 2019]

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

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

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

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

APPLICANT: Index Packaging Inc File Number: _____

PROJECT TITLE: Index Packaging

PROPERTY LOCATION: 150 Venture Drive Tax Map: D Lot: 9A

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

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

REVIEWED BY: _____ DATE_____ TRC DATE_____

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

September 23, 2020

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

Re: Proposed Site Plan
Index Packaging Inc
150 Venture Drive
Tax Map D, Lot 9A

Dear Mrs. Benton,

On behalf of our client Index Packaging Inc. Berry Surveying & Engineering (BS&E) is submitting for TRC to discuss a proposed site development at Venture Drive.

Background and General Narrative:

Index Packaging Inc, owns the parcel known as 150 Venture Drive in Dover, NH (Tax Map D, Lot 9A). Berry Surveying & Engineering has conducted an on-site survey of the parcel which includes a topographic analysis as well as a wetlands analysis. All on site wetlands have been delineated by a certified wetland scientist. The lot contains an existing commercial building at the front and is lightly wooded in the back. The site contains an existing building that is currently used as office space, with vacant manufacturing space in the back. The building also contains adjacent parking lots and loading docks. The site was the former location of Fosters.

The Proposal:

The applicant is proposing to construct two additions onto the existing building. The first building expansion phase will include the construction of a 36,400 SF manufacturing addition, with additional loading docks adjacent to the existing loading docks. The second building expansion phase will include a 11,500 SF addition. As part of the building design, the existing parking lot to the northeast will be re-configured to be more efficient. A waiver is being requested for the required parking. The applicant will only house +/- 10 employees and needs very few parking spaces.

As part of the building expansion, a rain garden will be constructed along the northern boundary line. The proposed rain garden will capture and treat the generated runoff from the proposed building, as well as some of the runoff from the existing building and parking areas. A copy of the storm water analysis has been included in the submission.

The proposed building expansions will utilize the utilities within the existing building. No additional exterior utility services will be required. In addition, the proposed building will have a sprinkler system that will tie into the sprinkler system in the existing building. Testing & upgrades to that system are pending.

All proper erosion and sediment control measures will be taken to ensure that no sediment runs off onto abutting properties or gets tracked onto Venture Drive.

As part of the site plan application the applicant is requesting a waiver to allow offsite lighting due to the location of the existing lamps and for not providing a street scape as part of the site plan requirements. See attached waiver request for more information.

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

James F. Hayden
Engineering Technician

Christopher R. Berry
Principal, President

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

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September 23, 2020

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

Re: Proposed Site Plan
Index Packaging Inc.
150 Venture Drive
Tax Map D, Lot 9A

Mr. Chairperson & Members of the Dover Planning Board:

In accordance with to the subdivision standards Article 153-51, the following waiver is hereby requested:

1. **Identification of Waiver Request**: All outdoor lighting fixtures shall be designed, orientated or shielded to prevent light or glare onto adjacent property per Dover Site Plan Regulations 153-14.E.1.e

- Existing lights in the parking lot shed light onto Lot 11-A.

2. **Explanation:**

The existing parking lot along the western boundary line is to be re striped and provide parking for the existing building and the proposed addition. There are 4 existing lights along the parking array, one on both ends, and two double lamps in the array. The existing lights are proposed to remain unaltered.

3. **Waiver Justification**:

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

The intent of the lighting regulation is to ensure that no abutting lots are illuminated by proposed development. This is particularly necessary when there are existing streets, residential structures or ecologically sensitive areas. The existing lights were installed when the existing building was constructed in the 90's. At that time, all the surrounding lots were under the same ownership. Furthermore, the abutting lot to the west is an empty field with no ecological significance.

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

Requiring the applicant meet the lighting regulations, would require the applicant to remove the existing lights and either move them or replace them. This would be unnecessary given the insignificance of the abutting lot.

1. Identification of Waiver Request: A site development plan shall be drawn to an appropriate scale, not less than one inch equals 50 feet, and shall show a color rendering of the streetscape per Dover Site Plan Regulations 153-13.A.17

- Proposed site plan with no streetscape.

2. Explanation:

The applicant is proposing to construct a building addition on the backside of the existing building. The existing front that faces Venture Drive will continue to be the front of the building and main access point.

3. Waiver Justification:

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

The intent of the streetscape regulation is to provide the City of Dover with a visual representation of what the proposed building will look like from the public right of way. In this case however, the proposed building addition will not be seen from any right of way because the adjacent lots are wooded. Architectural drawings are provided.

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

Requiring the applicant to provide a streetscape would be unnecessary cost given the location of the proposed building expansion.

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

James F. Hayden
Engineering Technician

Christopher R. Berry
Principal, President

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SHEET 8 ~ SITE PLAN
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SHEET 11 ~ P-101 RAIN GARDEN 101
SHEET 12 ~ EROSION AND SEDIMENT CONTROL PLAN
SHEET 13 ~ LANDSCAPING PLAN
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SITE PLAN FOR INDEX PACKAGING, INC. 1055 WHITE MOUNTAIN HIGHWAY DOVER, N.H. TAX MAP D, LOT 9A

NOTE:

BERRY SURVEYING & ENGINEERING HAS PREPARED AN INSPECTION & MAINTENANCE MANUAL AS PART OF THIS PROJECTS DOCUMENTATION. ALL USERS ARE BOUND TO THIS DOCUMENT AS PART OF THE APPROVAL OF THE PLANNING BOARD. COPIES OF THE YEARLY INSPECTIONS ARE TO BE DELIVERED TO THE CITY OF DOVER COMMUNITY SERVICES DEPARTMENT.

OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

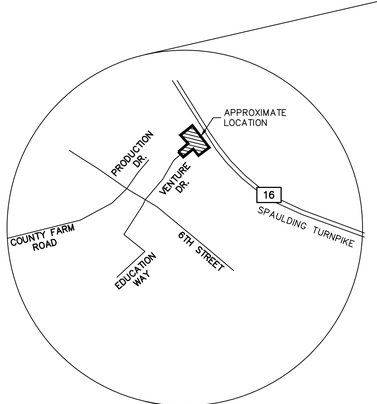
APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

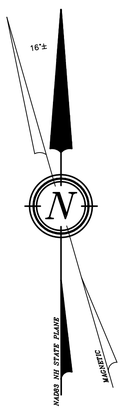
SURVEYOR OF RECORD: KENNETH A. BERRY, PE, LLS
CPSWQ, CPESC, CESSWI
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825
(603) 332-2863

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

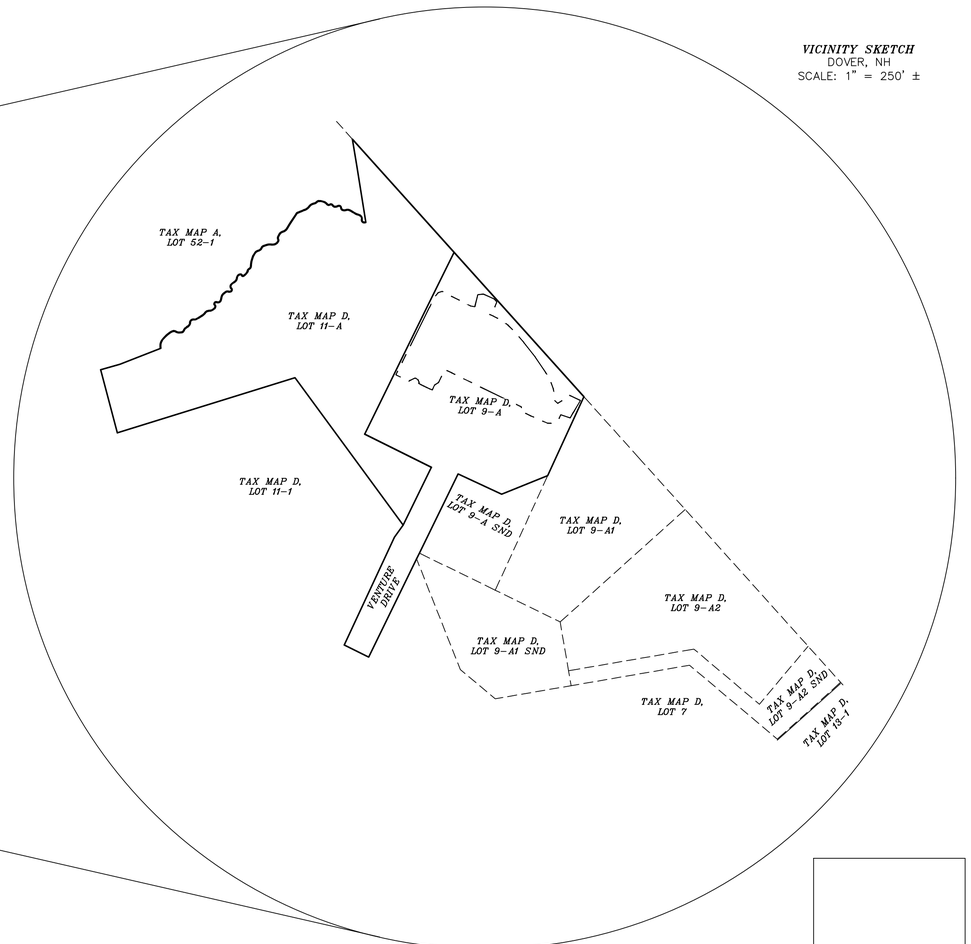
WETLAND SCIENTIST: & SOIL SCIENTIST: JOHN P. HAYES III, CSS, CWS
7 LIMESTONE WAY
NORTH HAMPTON, NH 03862
(603) 205-4396

LOCATION PLAN
DOVER, NH
NOT TO SCALE





VICINITY SKETCH
DOVER, NH
SCALE: 1" = 250' ±



REQUIRED PERMITS:

~ US EPA NOI & SWPPP	2 WEEKS PRIOR TO CONSTRUCTION
~ NATURAL HERITAGE BUREAU	NHB20-1412
~ NH DIVISION OF HISTORICAL RESOURCES	(PENDING)

WHETHER OR NOT OTHERWISE EXPRESSLY RECITED ON THIS SITE PLAN, THE SITE PLAN APPROVAL GRANTED IS CONDITIONED ON FAITHFUL AND DILIGENT ADHERENCE BY THE OWNER/SUBDIVIDER/DEVELOPER OF ALL TERMS, CONDITIONS, PROVISIONS AND SPECIFICATIONS OF THE CITY OF DOVER LAND SITE PLAN REGULATIONS AS AMENDED OR AS MAY LATER BE AMENDED, IN EFFECT ON THE DATE OF APPROVAL, UNLESS OR EXCEPT INSOFAR AS EXPRESSLY WAIVED, IN ANY PARTICULAR, BELOW. NON – ADHERENCE MAY RESULT IN A REVOCATION OF APPROVAL. ANY VARIATION FROM THE APPROVED PLAN WILL REQUIRE A RESUBMISSION FOR SITE PLAN APPROVAL.

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.

APPROVED DOVER

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

STATE OF NEW HAMPSHIRE KENNETH A. BERRY No. 14142 LICENSED PROFESSIONAL ENGINEER

DOVER PLANNING FILE #

REVISION	DATE	DESCRIPTION

SITE PLAN
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : AS SHOWN
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 – 152

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
F.G.	FINISHED GRADE
E.G.	EXISTING GRADE
L.F.	LINEAR FOOT
F.D.	FINISHED FLOOR
FND	FOUND
T.B.R.	TO BE REMOVED
P.L.	PROPERTY LINE
E.L.	EASEMENT LINE
T.B.M.	TEMPORARY BENCHMARK
'/,	FOOT / FOOT

{ } 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
- EXISTING GAS LINE
- EXISTING WATER LINE
- EXISTING SEWER LINE
- EXISTING DRAIN LINE
- OVERHEAD UTILITIES
- EXISTING CONTOUR MINOR
- EXISTING CONTOUR MAJOR

PROPOSED LEGEND:

- IRON BOUND (FND)
- TEMPORARY BENCHMARK
- E101 / E6 SHEET DETAIL
- LIGHTING
- P114.05 PROPOSED SPOT ELEVATION
- EASEMENT LINE
- PROPOSED DRAIN LINE
- PROPOSED UNDERDRAIN
- PROPOSED CONTOUR MINOR
- PROPOSED CONTOUR MAJOR
- PROPOSED UNDERGROUND UTILITY
- SILT FENCE / EROSION MIX BERM
- FILTREXX SILT SOXX (8" or 12" AS NOTED)
- ORANGE CONSTRUCTION PERIMETER FENCE

ABUTTERS WITHIN 200':

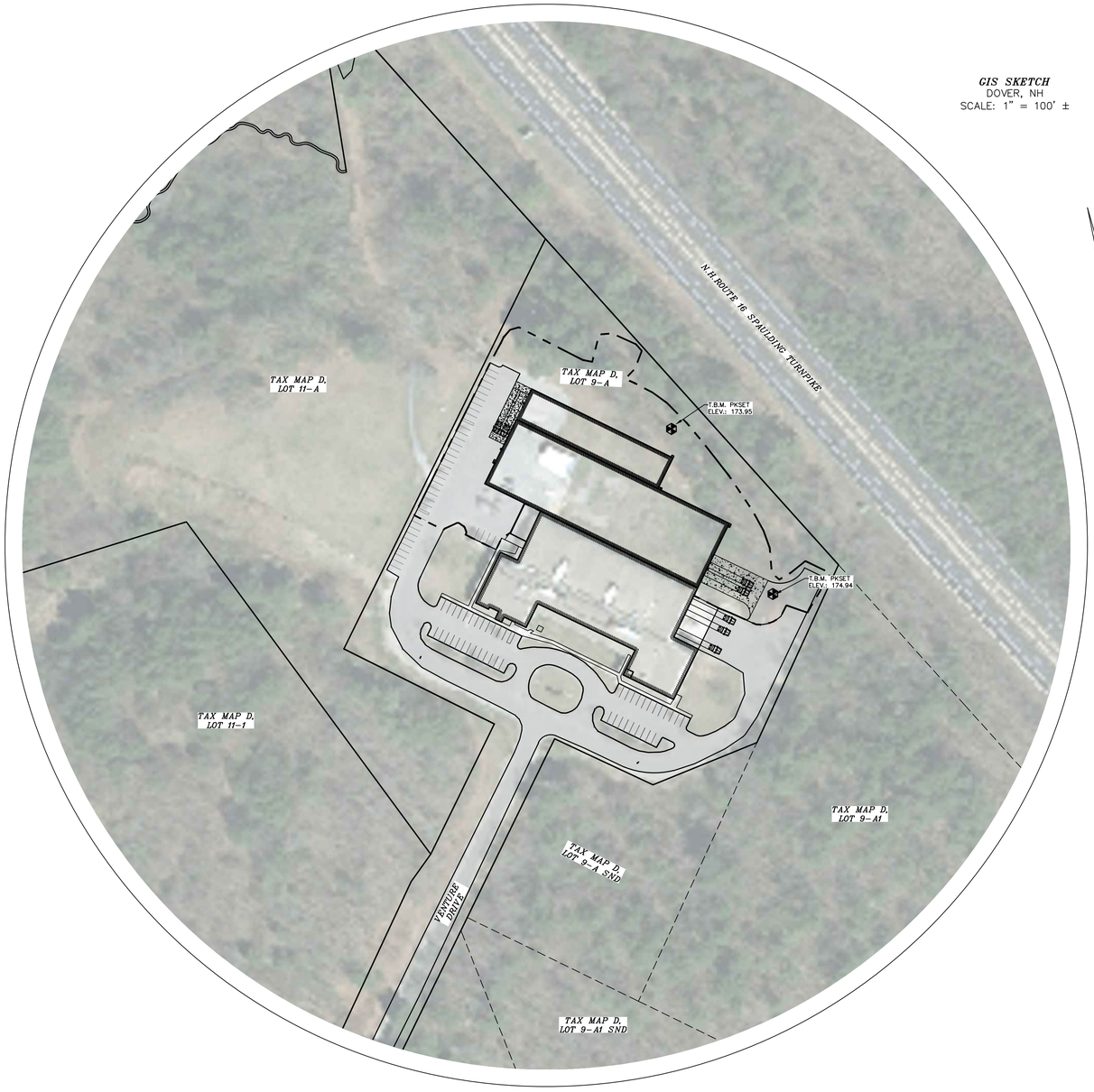
N/F MARK E JOHNSTONE 2014 TST
MARK E JOHNSTONE TSTEE
51 SANDY LN
DOVER, NH 038201
TAX MAP A, LOT 52-1
S.C.R.D. BOOK 4252, PAGE 470

N/F DOVER BUSINESS & IND DEV AUTHORITY
288 CENTRAL AVE
DOVER, NH 03820
TAX MAP D, LOT 11-1
S.C.R.D. BOOK 4368, PAGE 691

N/F APW PROPERTIES LLC
9 CAPITOL ST
CONCORD, NH 03301
TAX MAP D, LOT 11
S.C.R.D. BOOK 3984, PAGE 847

N/F 150 VENTURE DRIVE LLC
192 DOVER POINT RD
DOVER, NH 03820
TAX MAP D, LOT 9-A1-SND
TAX MAP D, LOT 9-A-SND
TAX MAP D, LOT 9-A-1
TAX MAP D, LOT 11-A
S.C.R.D. BOOK 3851, PAGE 308

GIS SKETCH
DOVER, NH
SCALE: 1" = 100' ±



16°±
MAGNETIC NORTH
MAGNETIC NORTH STATE PLANE

DOVER PLANNING FILE #

REVISION	DATE	DESCRIPTION

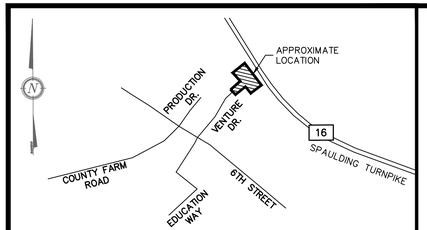
NEIGHBORHOOD PLAN
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : AS SHOWN
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 - 152

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

STATE OF NEW HAMPSHIRE - KENNETH A. BERRY No. 14242 LICENSED PROFESSIONAL ENGINEER



LOCATION PLAN
DOVER, NH
NOT TO SCALE

WETLANDS WERE DELINEATED BY JOHN P. HAYES, IN SPRING OF 2020 UTILIZING THE FOLLOWING STANDARDS:

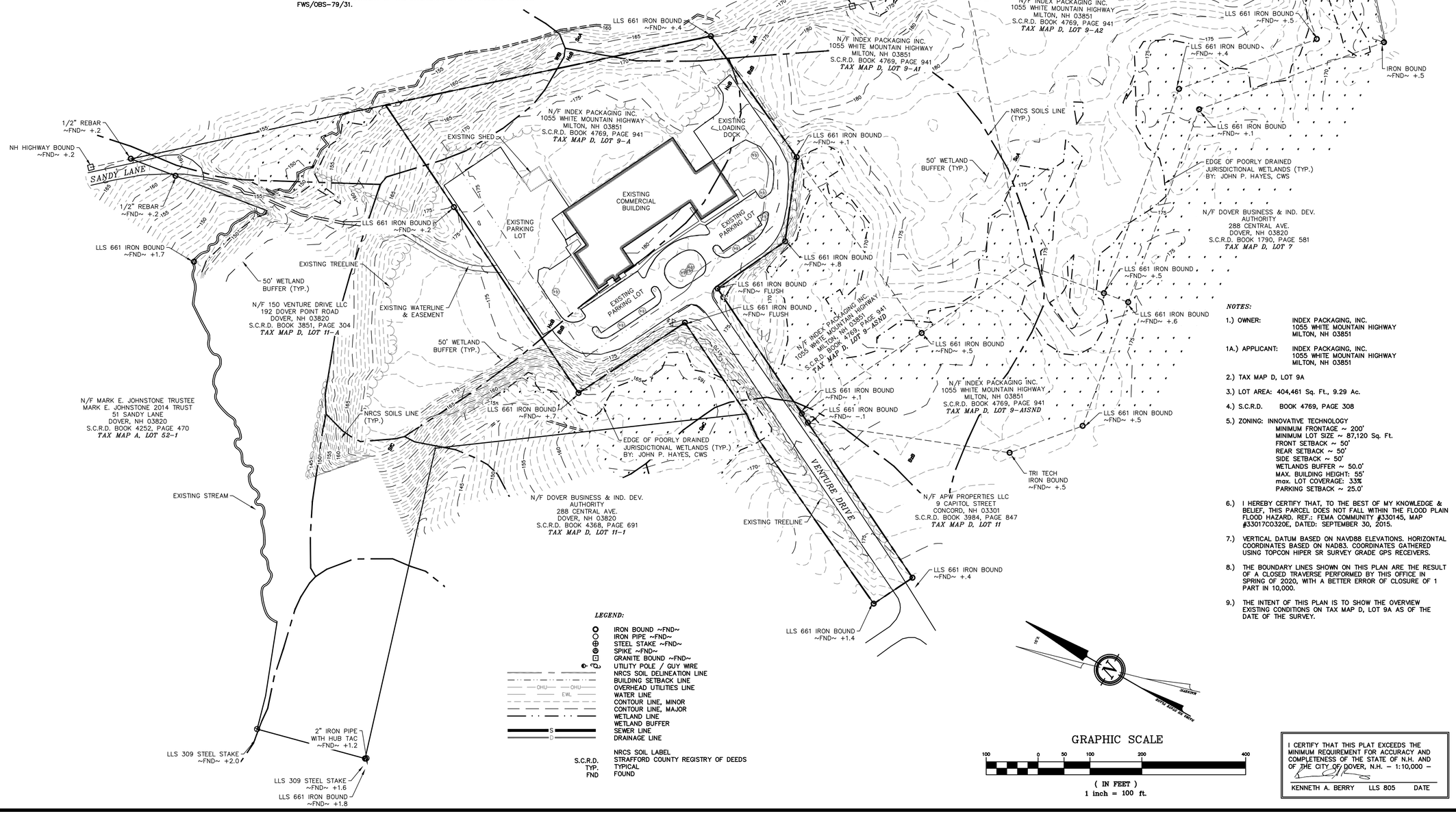
1) FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 7.0. 2010. L.M. VASILAS, G.W. HURT, AND C.V. NOBLE (EDS.). UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS.
2) FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. VERSION 3. APRIL 2004. NEIWPCC WETLANDS WORKGROUP. WILMINGTON, MA 01887.
3) NORTH AMERICAN DIGITAL FLORA: NATIONAL WETLAND PLANT LIST, VERSION 2.1.0 (HTTP://WETLAND_PLANTS.USACE.ARMY.MIL). U.S. ARMY CORPS OF ENGINEERS, ENGINEER RESEARCH AND DEVELOPMENT CENTER, COLD REGIONS RESEARCH AND ENGINEERING LABORATORY, HANOVER, NH, AND BONAP, CHAPEN HILL.
4) STATE OF NEW HAMPSHIRE 2014 WETLAND PLANT LIST. LICHVAR, R.W., M. BUTTERWICH, N.C. MELVIN, AND W.N. KIRCHNER. 2014. THE NATIONAL WETLAND PLANT LIST: 2014 UPDATE OF WETLAND RATINGS. PHYTONEURON 2014-41:1-42.
5) CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL. JANUARY 1987. WETLANDS RESEARCH PROGRAM TECHNICAL REPORT Y-87-1.
6) REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. JANUARY 2012, VERSION 2. U.S. ARMY CORPS OF ENGINEERS. ENVIRONMENTAL LABORATORY ERDC/EL TR-12-1.
7) CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES. DECEMBER 1979. L. COWARDIN, V. CARTER, F. GOLET, AND E. LAROE. US DEPARTMENT OF THE INTERIOR. FISH AND WILDLIFE SERVICE. FWS/OBS-79/31.

JOHN P. HAYES III, CWS #18

SOILS:

BxA – BUXTON SILT LOAM, 0 TO 3 PERCENT SLOPES
ElwB – ELMWOOD FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
GlB – GLOUCESTER FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES
GsC – GLOUCESTER STONY FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES
HcB – HOLLIS FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
ScA – SCANTIC SILT LOAM, 0 TO 3 PERCENT SLOPES
SfC – SUFFIELD SILT LOAM, 8 TO 15 PERCENT SLOPES
SwaA – SWANTON FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES
WfB – WINDSOR LOAMY FINE SAND, 0 TO 8 PERCENT SLOPES

SEE WEBSOIL USDA-NRCS



LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- STEEL STAKE ~FND~
- SPIKE ~FND~
- GRANITE BOUND ~FND~
- UTILITY POLE / GUY WIRE
- NRCS SOIL DELINEATION LINE
- BUILDING SETBACK LINE
- OVERHEAD UTILITIES LINE
- WATER LINE
- CONTOUR LINE, MINOR
- CONTOUR LINE, MAJOR
- WETLAND LINE
- WETLAND BUFFER
- SEWER LINE
- DRAINAGE LINE

S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. TYPICAL
FND FOUND

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

NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

2.) TAX MAP D, LOT 9A

3.) LOT AREA: 404,461 Sq. Ft., 9.29 Ac.

4.) S.C.R.D. BOOK 4769, PAGE 308

5.) ZONING: INNOVATIVE TECHNOLOGY
MINIMUM FRONTAGE ~ 200'
MINIMUM LOT SIZE ~ 87,120 Sq. Ft.
FRONT SETBACK ~ 50'
REAR SETBACK ~ 50'
SIDE SETBACK ~ 50'
WETLANDS BUFFER ~ 50.0'
MAX. BUILDING HEIGHT: 55'
max. LOT COVERAGE: 33%
PARKING SETBACK ~ 25.0'

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 #33017C0320E, DATED: SEPTEMBER 30, 2015.

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

8.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN SPRING OF 2020, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

9.) THE INTENT OF THIS PLAN IS TO SHOW THE OVERVIEW EXISTING CONDITIONS ON TAX MAP D, LOT 9A AS OF THE DATE OF THE SURVEY.

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 FILE #

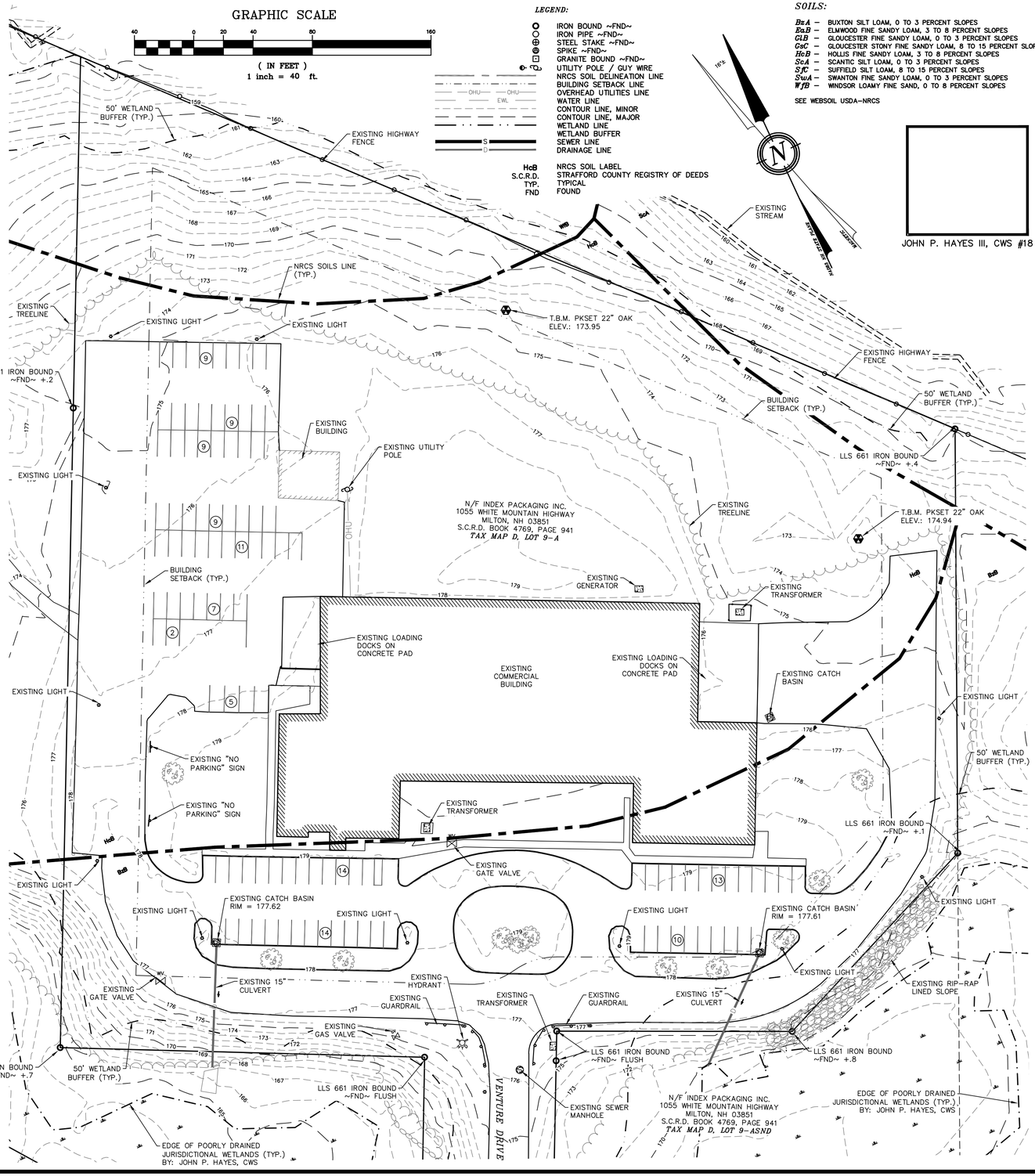
REVISION	DATE	DESCRIPTION

EXISTING CONDITIONS PLAN OVERVIEW
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 100 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 – 152

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



LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- STEEL STAKE ~FND~
- SPIKE ~FND~
- GRANITE BOUND ~FND~
- UTILITY POLE / GUY WIRE
- NRCS SOIL DELINEATION LINE
- BUILDING SETBACK LINE
- OVERHEAD UTILITIES LINE
- WATER LINE
- CONTOUR LINE, MINOR
- CONTOUR LINE, MAJOR
- WETLAND LINE
- WETLAND BUFFER
- SEWER LINE
- DRAINAGE LINE

HeB — NRCS SOIL LABEL
S.C.R.D. — STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. — TYPICAL
FND — FOUND

SOILS:

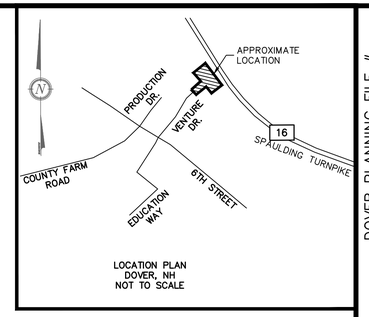
- *BxA* — BUXTON SILT LOAM, 0 TO 3 PERCENT SLOPES
- *EuB* — ELMWOOD FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
- *GLB* — GLOUCESTER FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES
- *GsC* — GLOUCESTER STONY FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES
- *HeB* — HOLLIS FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
- *ScA* — SCANTIC SILT LOAM, 0 TO 3 PERCENT SLOPES
- *SfC* — SUFFIELD SILT LOAM, 8 TO 15 PERCENT SLOPES
- *SwA* — SWANTON FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES
- *WfB* — WINDSOR LOAMY FINE SAND, 0 TO 8 PERCENT SLOPES

SEE WEBSOIL USDA-NRCS

JOHN P. HAYES III, CWS #18

WETLANDS WERE DELINEATED BY JOHN P. HAYES, IN SPRING OF 2020 UTILIZING THE FOLLOWING STANDARDS:

1) FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 7.0. 2010. L.M. VASILAS, G.W. HURT, AND C.V. NOBLE (EDS.). UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS.
2) FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. VERSION 3. APRIL 2004. NEIWPCC WETLANDS WORKGROUP. WILMINGTON, MA 01887.
3) NORTH AMERICAN DIGITAL FLORA: NATIONAL WETLAND PLANT LIST, VERSION 2.1.0 (HTTP://WETLAND_PLANTS.USACE.ARMY.MIL). U.S. ARMY CORPS OF ENGINEERS, ENGINEER RESEARCH AND DEVELOPMENT CENTER, COLD REGIONS RESEARCH AND ENGINEERING LABORATORY, HANOVER, NH, AND BONAP, CHAPEN HILL.
4) STATE OF NEW HAMPSHIRE 2014 WETLAND PLANT LIST. LICHVAR, R.W., M. BUTTERWICH, N.C. MELVIN, AND W.N. KIRCHNER. 2014. THE NATIONAL WETLAND PLANT LIST: 2014 UPDATE OF WETLAND RATINGS. PHYTONEURON 2014-41:1-42.
5) CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL. JANUARY 1987. WETLANDS RESEARCH PROGRAM TECHNICAL REPORT Y-87-1.
6) REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. JANUARY 2012, VERSION 2. U.S. ARMY CORPS OF ENGINEERS. ENVIRONMENTAL LABORATORY ERDC/EL TR-12-1.
7) CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES. DECEMBER 1979. L. COWARDIN, V. CARTER, F. GOLET, AND E. LAROE. US DEPARTMENT OF THE INTERIOR. FISH AND WILDLIFE SERVICE. FWS/OBS-79/31.



LOCATION PLAN
DOVER, NH
NOT TO SCALE

PLAN REFERENCES:

1.) "LOT LINE ADJUSTMENT PLAN PREPARED FOR 150 VENTURE DRIVE, LLC, TAX MAP D, LOT Nos. 9A & 11A, VENTURE DRIVE AND SANDY LANE, CITY OF DOVER, COUNTY OF STRAFFORD, STATE OF NEW HAMPSHIRE" BY: MCENEANEY SURVEY ASSOCIATES, INC. DATED: MARCH 17, 2015 S.C.R.D. PLAN #109-98

2.) "LOT LINE ADJUSTMENT PLAN PREPARED FOR GEORGE J. FOSTER & CO., INC., TAX MAP D, LOT Nos. 9A & 11A, VENTURE DRIVE AND SANDY LANE, CITY OF DOVER, COUNTY OF STRAFFORD, STATE OF NEW HAMPSHIRE" BY: MCENEANEY SURVEY ASSOCIATES, INC. DATED: MARCH 17, 2010 S.C.R.D. PLAN #100-23

3.) "MINOR SUBDIVISION PLAN PREPARED FOR GEORGE J. FOSTER & Co., INC., TAX MAP D, LOT Nos. 9A & 11A, VENTURE DRIVE AND SANDY LANE, CITY OF DOVER, COUNTY OF STRAFFORD, STATE OF NEW HAMPSHIRE" BY: MCENEANEY SURVEY ASSOCIATES, INC. DATED: MARCH 17, 2015 S.C.R.D. PLAN #100-22

4.) "LOT LINE ADJUSTMENT AND SUBDIVISION PLAN OF LAND PREPARED FOR GEORGE J. FOSTER & Co., INC. AND DOVER BUSINESS AND INDUSTRIAL DEVELOPMENT AUTHORITY, TAX MAP D, LOT Nos. 9A & 11-1, VENTURE DRIVE AND QUALITY WAY, DOVER, STRAFFORD COUNTY, NEW HAMPSHIRE" BY: MCENEANEY SURVEY ASSOCIATES, INC. DATED: JUNE 12, 2006 S.C.R.D. PLAN #86-73

5.) "AMENDED SUBDIVISION PLAN AND LOT LINE ADJUSTMENT PLAN PREPARED FOR GEORGE J. FOSTER & Co., INC. AND DOVER BUSINESS AND INDUSTRIAL DEVELOPMENT AUTHORITY, TAX MAP D, LOT Nos. 9A & 11-1, VENTURE DRIVE AND QUALITY WAY, DOVER, STRAFFORD COUNTY, NEW HAMPSHIRE" BY: MCENEANEY SURVEY ASSOCIATES, INC. DATED: FEBRUARY 14, 2006 S.C.R.D. PLAN #85-99

6.) "SUBDIVISION OF LAND PREPARED FOR DOVER INDUSTRIAL DEVELOPMENT AUTHORITY, TAX MAP H, LOT No. 11-1, VENTURE DRIVE, DOVER, STRAFFORD COUNTY, NEW HAMPSHIRE" BY: MCENEANEY SURVEY ASSOCIATES, INC. DATED: FEBRUARY 28, 2005 S.C.R.D. PLAN #79-87

7.) "SUBDIVISION PLAN ALBERT & CHRISTINE ESTES AND NANCY HUSON MOLL, LONG HILL ROAD, EXT., DOVER, NEW HAMPSHIRE" BY: TRITECH ENGINEERING CORPORATION DATED: JUNE 26, 2000 S.C.R.D. PLAN #63-39

8.) "SITE PLAN BEAN ENGINEERING "ENTERPRISE PARK" VENTURE DRIVE, DOVER, NEW HAMPSHIRE" BY: CIVIL CONSULTANTS DATED: MAY 26, 1998 S.C.R.D. PLAN #54-92

9.) "TRANSFER OF DEVELOPMENT RIGHTS SENDING AREA SUBDIVISION PLAN PREPARED FOR CRAMER FABRICS, INC. AND DOVER INDUSTRIAL DEVELOPMENT AUTHORITY OFF VENTURE DRIVE, DOVER, NEW HAMPSHIRE" BY: MCENEANEY SURVEY ASSOCIATES, INC. DATED: AUGUST 7, 1997 S.C.R.D. PLAN #50-70

10.) "LOT LINE ADJUSTMENT PLAN PREPARED FOR GEORGE J. FOSTER Co. INC. AND ALBERT AND CHRISTINE ESTES, LONG HILL ROAD EXTENSION, DOVER, NEW HAMPSHIRE" BY: MCENEANEY SURVEY ASSOCIATES, INC. DATED: NOVEMBER 17, 1994 S.C.R.D. PLAN #45-35

11.) "SUBDIVISION OF LAND PREPARED FOR DOVER INDUSTRIAL DEVELOPMENT AUTHORITY, VENTURE DRIVE, DOVER, NEW HAMPSHIRE" BY: MCENEANEY SURVEY ASSOCIATES, INC. DATED: AUGUST 4, 1994 S.C.R.D. PLAN #45-32

12.) "BOUNDARY LINE ADJUSTMENT VENTURE REALTY TRUST & DOVER INDUSTRIAL DEVELOPMENT AUTHORITY, 111 VENTURE DRIVE, DOVER, NEW HAMPSHIRE" BY: TRITECH ENGINEERING CORPORATION DATED: MARCH 17, 1994 S.C.R.D. PLAN #44-10

13.) "BOUNDARY LINE CONSOLIDATION, DOVER INDUSTRIAL DEVELOPMENT AUTHORITY ENTERPRISE PARK, DOVER, NEW HAMPSHIRE" BY: TRITECH ENGINEERING CORPORATION DATED: MAY 5, 1993 S.C.R.D. PLAN #42-14

NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

2.) TAX MAP D, LOT 9A

3.) LOT AREA: 404,461 Sq. Ft., 9.29 Ac.

4.) S.C.R.D. BOOK 4769, PAGE 941

5.) ZONING: INNOVATIVE TECHNOLOGY
MINIMUM FRONTAGE ~ 200'
MINIMUM LOT SIZE ~ 87,120 Sq. Ft.
FRONT SETBACK ~ 50'
REAR SETBACK ~ 50'
SIDE SETBACK ~ 50'
WETLANDS BUFFER ~ 50.0'
MAX. BUILDING HEIGHT: 55'
MAX. LOT COVERAGE: 33%
PARKING SETBACK ~ 25.0'

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 #33017C0320E, DATED: SEPTEMBER 30, 2015.

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

8.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN SPRING OF 2020, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

9.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS DETAIL ON TAX MAP D, LOT 9A AS OF THE DATE OF THE SURVEY.

PLAN REFERENCES CONTINUED:

14.) "SUBDIVISION PLAN DOVER INDUSTRIAL DEVELOPMENT AUTHORITY, SIXTH STREET/LONG HILL ROAD EXT., DOVER, NEW HAMPSHIRE" BY: TERRASCAN DATED: JANUARY 17, 1992 S.C.R.D. PLAN #41-91 & 92 STAMPED BY ROBERT G. MOYNIHAN LLS #309

15.) "PLAN OF LANDS FOR DOVER INDUSTRIAL DEVELOPMENT AUTHORITY, LONG HILL ROAD EXT., SPAULDING TURNPIKE & SIXTH ST. CONNECTOR, DOVER, N.H." BY: MCENEANEY SURVEY ASSOCIATES DATED: MAY 20, 1991 S.C.R.D. PLAN #39-90 & 91

16.) "PLAN OF LAND RINDEN PROPERTY OFF SIXTH STREET, DOVER, NEW HAMPSHIRE, PREPARED FOR DOVER INDUSTRIAL DEVELOPMENT AUTHORITY" BY: MCENEANEY SURVEY ASSOCIATES DATED: SEPTEMBER 30, 1991 S.C.R.D PLAN #39-89

17.) "LOT LINE ADJUSTMENT PLAN PREPARED FOR WHITE ENTERPRISES AND DOVER INDUSTRIAL DEVELOPMENT AUTHORITY, LONGHILL ROAD, DOVER, N.H." BY: MCENEANEY SURVEY ASSOCIATES DATED: JULY 3, 1991 S.C.R.D. PLAN #39-37

18.) "MINOR SUBDIVISION FOR JOSEPH MCCARTHY IN DOVER, N.H." BY: BRUCE L. POHOPEK DATED: DECEMBER 14, 1977 S.C.R.D. PLAN #18A-18

18.) "LOT LINE REVISION PLAN LAND OF 150 VENTURE DRIVE, LLC VENTURE DRIVE & SHADY DRIVE LANE DOVER N.H." BY: BERRY SURVEYING & ENGINEERING DATED: MARCH 24, 2020 FILE NO.: DB 2019-152

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 FILE #

REVISION	DATE	DESCRIPTION

EXISTING CONDITIONS DETAIL PLAN
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 40 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 – 152

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

SITE SPECIFIC SOILS LEGEND

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
CsC	CHARLTON (VERY STONY)	B
CsD	CHARLTON (VERY STONY)	B
GsE	GLOUCESTER (VERY STONY)	A
AcC	ACTON	B
HcA/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcB/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcC/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcD/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcE/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B

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

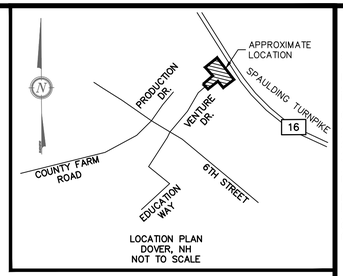
DENOMINATOR: /VPD = VERY POORLY DRAINED /PD = POORLY DRAINED /SWPD = SOMEWHAT POORLY DRAINED /MWD = MODERATELY WELL DRAINED

SITE SPECIFIC SOILS LEGEND (CONT.)

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
BzA	BOXFORD	C
BzB	BOXFORD	C
BzC	BOXFORD	C
ScA	SCITICO	D
ScB	SCITICO	D
ScC	SCITICO	D
BeA	MAYBID	D
WfC	WINDSOR VARIANT (CLAY SUBSOIL)	A
WfD	WINDSOR VARIANT (CLAY SUBSOIL)	A
WfE	WINDSOR VARIANT (CLAY SUBSOIL)	A
EaB	ELMWOOD	C
EaC	ELMWOOD	C
EaD	ELMWOOD	C
500B	UDORTHENTS	B
500C	UDORTHENTS	B
500D	UDORTHENTS	B

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

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



LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

2.) TAX MAP D, LOT 9A

3.) LOT AREA: 404,461 Sq. Ft., 9.29 Ac.

4.) S.C.R.D. BOOK 3851, PAGE 308

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 #33017C0320E, 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 SPRING OF 2020, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

8.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING OVERVIEW SOIL CONDITIONS ON TAX MAP D, LOT 9A AS OF THE DATE OF THE SURVEY.

SOILS LEGEND NRCS

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
BzB	BUXTON SILT LOAM	C/D
EaB	ELMWOOD FINE SANDY LOAM	B
GlB	GLOUCESTER FINE SANDY LOAM	A
GsC	GLOUCESTER VERY STONY FINE SANDY LOAM	A
HcB	HOLLIS–CHARLTON FINE SANDY LOAMS	D
ScA	SCANTIC SILT LOAM	C/D
SfC	SUFFIELD SILT LOAM	C
SwA	SWANTON FINE SANDY LOAM	C/D
WdA	WINDSOR LOAMY SAND	A
WdB	WINDSOR LOAMY SAND	A
WfB	WINDSOR LOAMY FINE SAND	A

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

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

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

DOVER PLANNING FILE #

REVISION	DATE	DESCRIPTION

SITE SPECIFIC SOILS MAP OVERVIEW
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 100 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 – 152

STATE OF NEW HAMPSHIRE – KENNETH A. BERRY No. 14748 LICENSED PROFESSIONAL ENGINEER

SITE SPECIFIC SOILS LEGEND

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
CsC	CHARLTON (VERY STONY)	B
CsD	CHARLTON (VERY STONY)	B
GsE	GLOUCESTER (VERY STONY)	A
AcC	ACTON	B
HcA/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcB/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcC/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcD/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcE/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B

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

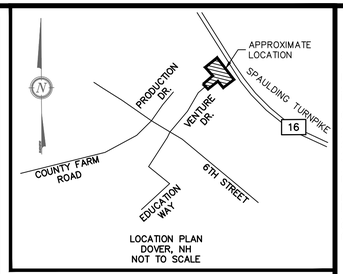
DENOMINATOR: /VPD = VERY POORLY DRAINED /PD = POORLY DRAINED /SWPD = SOMEWHAT POORLY DRAINED /MWD = MODERATELY WELL DRAINED

SITE SPECIFIC SOILS LEGEND (CONT.)

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
BzA	BOXFORD	C
BzB	BOXFORD	C
BzC	BOXFORD	C
ScA	SCITICO	D
ScB	SCITICO	D
ScC	SCITICO	D
BeA	MAYBID	D
WfC	WINDSOR VARIANT (CLAY SUBSOIL)	A
WfD	WINDSOR VARIANT (CLAY SUBSOIL)	A
WfE	WINDSOR VARIANT (CLAY SUBSOIL)	A
EaB	ELMWOOD	C
EaC	ELMWOOD	C
EaD	ELMWOOD	C
500B	UDORTHENTS	B
500C	UDORTHENTS	B
500D	UDORTHENTS	B

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

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



LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

2.) TAX MAP D, LOT 9A

3.) LOT AREA: 404,461 Sq. Ft., 9.29 Ac.

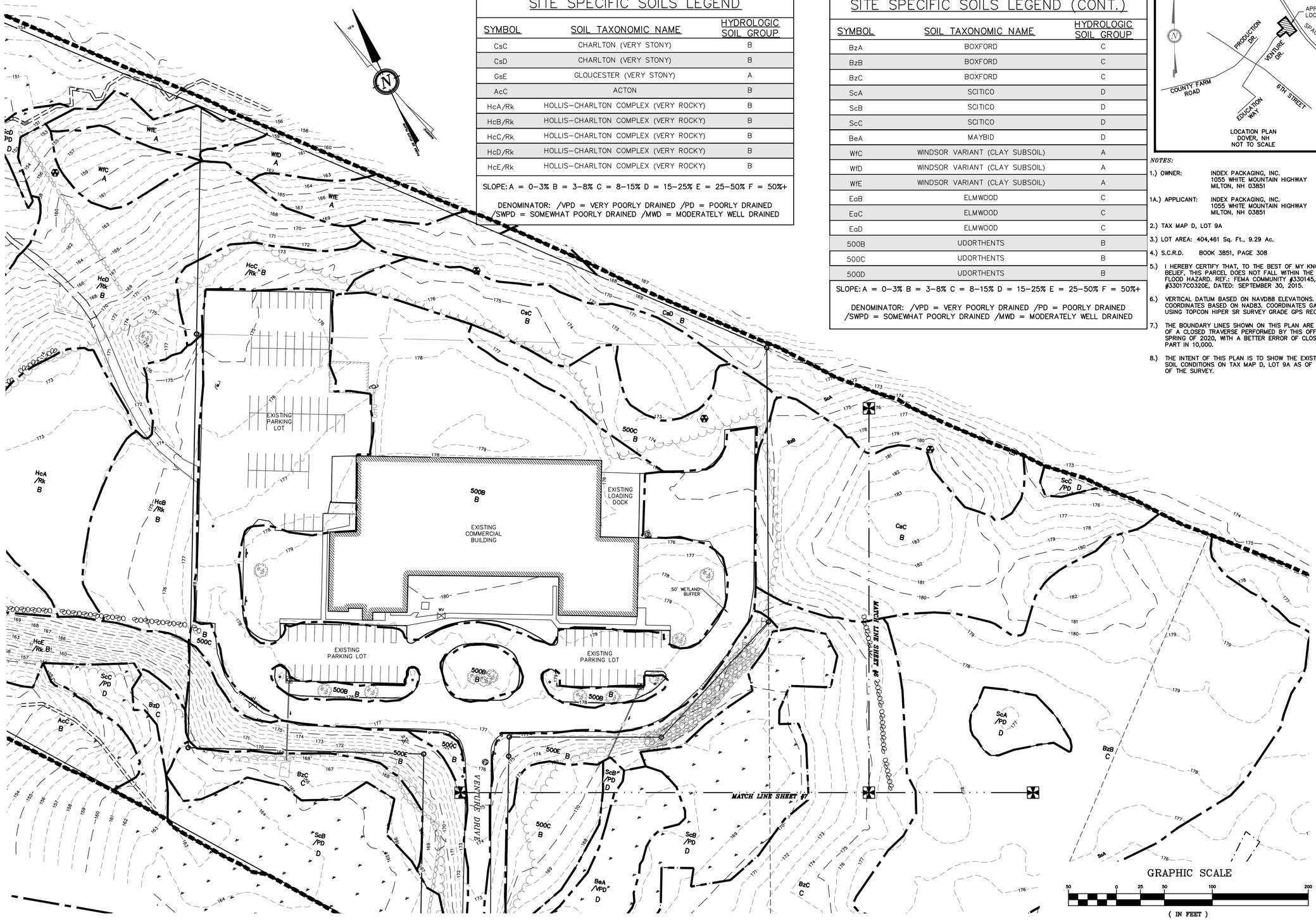
4.) S.C.R.D. BOOK 3851, PAGE 308

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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 SPRING OF 2020, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

8.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING DETAIL SOIL CONDITIONS ON TAX MAP D, LOT 9A AS OF THE DATE OF THE SURVEY.



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #

REVISION	DATE	DESCRIPTION

SITE SPECIFIC SOILS MAP NORTH
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 50 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 – 152

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14748 LICENSED PROFESSIONAL ENGINEER

SITE SPECIFIC SOILS LEGEND

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
CsC	CHARLTON (VERY STONY)	B
CsD	CHARLTON (VERY STONY)	B
GsE	GLOUCESTER (VERY STONY)	A
AcC	ACTON	B
HcA/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcB/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcC/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcD/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcE/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B

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

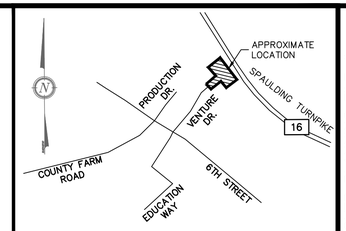
DENOMINATOR: /VPD = VERY POORLY DRAINED /PD = POORLY DRAINED /SWPD = SOMEWHAT POORLY DRAINED /MWD = MODERATELY WELL DRAINED

SITE SPECIFIC SOILS LEGEND (CONT.)

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
BzA	BOXFORD	C
BzB	BOXFORD	C
BzC	BOXFORD	C
ScA	SCITICO	D
ScB	SCITICO	D
ScC	SCITICO	D
BeA	MAYBID	D
WfC	WINDSOR VARIANT (CLAY SUBSOIL)	A
WfD	WINDSOR VARIANT (CLAY SUBSOIL)	A
WfE	WINDSOR VARIANT (CLAY SUBSOIL)	A
EaB	ELMWOOD	C
EaC	ELMWOOD	C
EaD	ELMWOOD	C
500B	UDORTHENTS	B
500C	UDORTHENTS	B
500D	UDORTHENTS	B

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

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LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

2.) TAX MAP D, LOT 9A

3.) LOT AREA: 404,461 Sq. Ft., 9.29 Ac.

4.) S.C.R.D. BOOK 3851, PAGE 308

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7.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN SPRING OF 2020, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

8.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING DETAIL SOIL CONDITIONS ON TAX MAP D, LOT 9A AS OF THE DATE OF THE SURVEY.

MATCH LINE SHEET #5

MATCH LINE SHEET #7

50' WETLAND BUFFER

JURISDICTIONAL WETLAND LINE

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #

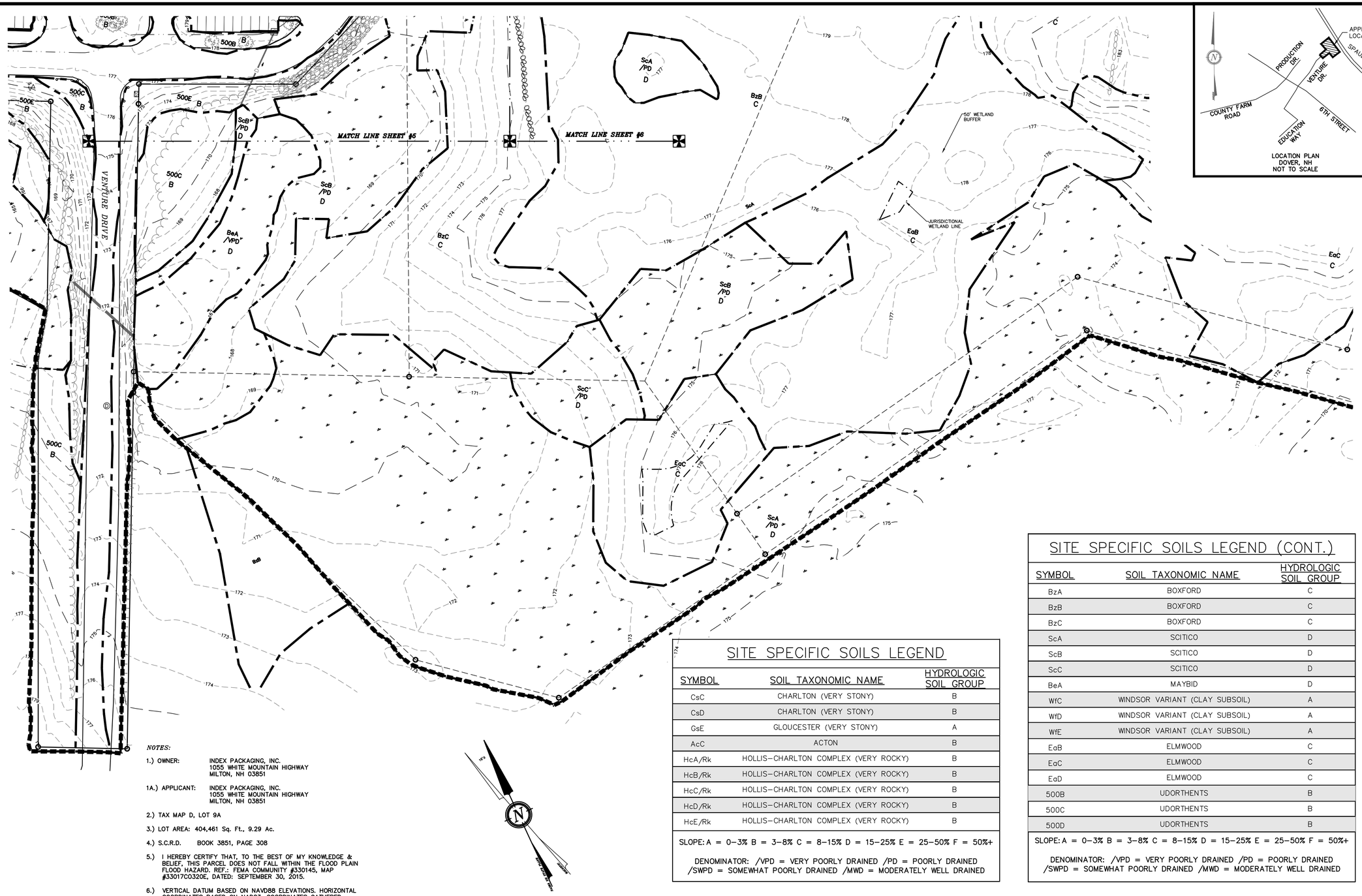
REVISION	DATE	DESCRIPTION

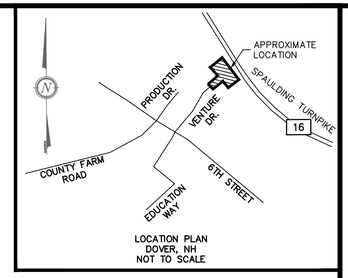
SITE SPECIFIC SOILS MAP SOUTHEAST
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 50 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 – 152

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14746
LICENSED PROFESSIONAL ENGINEER





SITE SPECIFIC SOILS LEGEND

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
CsC	CHARLTON (VERY STONY)	B
CsD	CHARLTON (VERY STONY)	B
GsE	GLOUCESTER (VERY STONY)	A
AcC	ACTON	B
HcA/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcB/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcC/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcD/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcE/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B

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SITE SPECIFIC SOILS LEGEND (CONT.)

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
BzA	BOXFORD	C
BzB	BOXFORD	C
BzC	BOXFORD	C
ScA	SCITICO	D
ScB	SCITICO	D
ScC	SCITICO	D
BeA	MAYBID	D
WfC	WINDSOR VARIANT (CLAY SUBSOIL)	A
WfD	WINDSOR VARIANT (CLAY SUBSOIL)	A
WfE	WINDSOR VARIANT (CLAY SUBSOIL)	A
EaB	ELMWOOD	C
EaC	ELMWOOD	C
EaD	ELMWOOD	C
500B	UDORTHENTS	B
500C	UDORTHENTS	B
500D	UDORTHENTS	B

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

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NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

2.) TAX MAP D, LOT 9A

3.) LOT AREA: 404,461 Sq. Ft., 9.29 Ac.

4.) S.C.R.D. BOOK 3851, PAGE 308

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7.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN SPRING OF 2020, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

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GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #

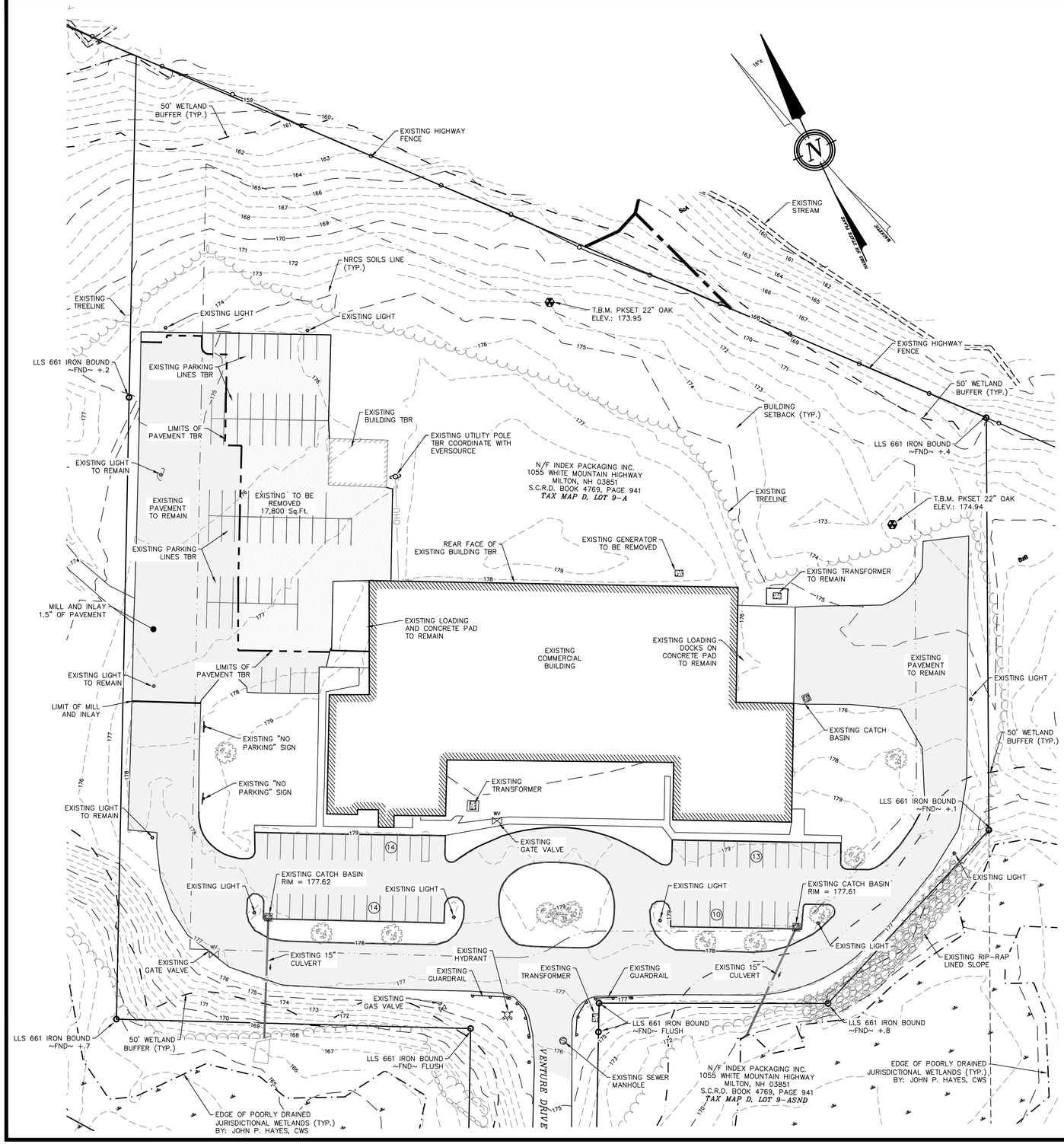
REVISION	DATE	DESCRIPTION

SITE SPECIFIC SOILS MAP SOUTHWEST
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

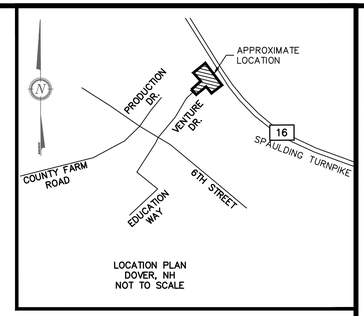
SCALE : 1 IN. EQUALS 50 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 – 152

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14748 LICENSED PROFESSIONAL ENGINEER



LEGEND:

○	IRON BOUND ~FND~
○	IRON PIPE ~FND~
⊕	STEEL STAKE ~FND~
◎	SPIKE ~FND~
⊡	GRANITE BOUND ~FND~
⊶	UTILITY POLE / GUY WIRE
BSL	BUILDING SETBACK LINE
OHU	OVERHEAD UTILITIES LINE
W	WATER LINE
C	CONTOUR LINE, MINOR
C	CONTOUR LINE, MAJOR
WL	WETLAND LINE
WB	WETLAND BUFFER
S	SEWER LINE
D	DRAINAGE LINE
S.C.R.D.	STRAFFORD COUNTY REGISTRY OF DEEDS
TYP.	TYPICAL
FND	FOUND



LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

2.) TAX MAP D, LOT 9A

3.) LOT AREA: 404,461 Sq. Ft., 9.29 Ac.

4.) S.C.R.D. BOOK 3851, PAGE 308

5.) ZONING: INNOVATIVE TECHNOLOGY
MINIMUM FRONTAGE ~ 200'
MINIMUM LOT SIZE ~ 87,120 Sq. Ft.
FRONT SETBACK ~ 50'
REAR SETBACK ~ 50'
SIDE SETBACK ~ 50'
WETLANDS BUFFER ~ 50.0'
MAX. BUILDING HEIGHT: 55'
MAX. LOT COVERAGE: 33%
PARKING SETBACK ~ 25.0'

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9.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING SITE ELEMENTS THAT ARE TO BE REMOVED.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

DOVER PLANNING FILE #

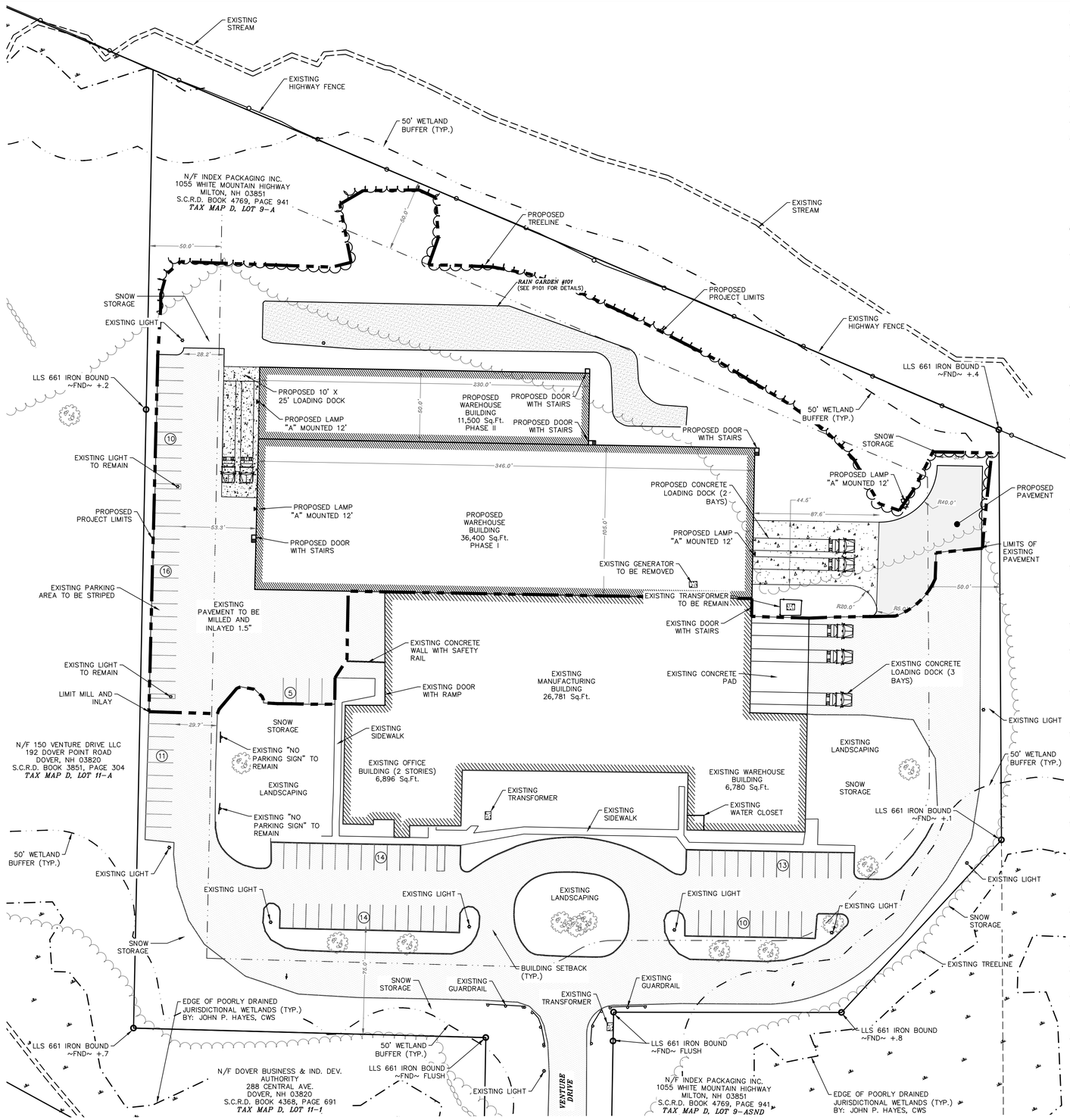
REVISION	DATE	DESCRIPTION

DEMOLITION PLAN
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 40 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 - 152

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



NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

2.) TAX MAP D, LOT 9A

3.) LOT AREA: 404,461 Sq. Ft., 9.29 Ac.

4.) S.C.R.D. BOOK 4769, PAGE 941

5.) ZONING: (IT) INNOVATIVE TECHNOLOGY
MINIMUM FRONTAGE ~ 400'
MINIMUM LOT SIZE ~ 217,800 Sq. Ft.
FRONT SETBACK ~ 75'
REAR SETBACK ~ 75'
SIDE SETBACK ~ 75'
WETLANDS BUFFER ~ 50.0'
MAX. BUILDING HEIGHT: 55'
MAX. LOT COVERAGE: 33%
PARKING SETBACK ~ 25.0'

6.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED SITE PLAN DEVELOPMENT FOR THE SUBJECT PARCEL.

7.) LIST ANY VARIANCES OR SPECIAL EXCEPTIONS GRANTED BY THE ZONING BOARD OF ADJUSTMENT OR CONDITIONAL USE PERMITS GRANTED BY THE PLANNING BOARD FOR THE PROPOSED USE OR STRUCTURE, INCLUDING THE CASE NUMBER AND DATE OF DECISION AND ANY CONDITIONS. **NONE**

8.) AS-BUILT PLANS OF THE SITE PLAN SHALL BE SUBMITTED ON PAPER AND IN DIGITAL FORMAT AUTOCAD DWG, AUTOCAD DXF OR ESRI FORMAT TO THE CITY OF DOVER ENGINEER'S OFFICE UPON COMPLETION OF PROJECT IF A STREET IS PROPOSED FOR CITY ACCEPTANCE. AS-BUILT PLANS SHALL BE PREPARED AND CERTIFIED CORRECT BY A L.L.S OR P.E. DIGITAL FILES SHALL BE GEO-REFERENCED TO NEW HAMPSHIRE STATE PLANE COORDINATES NAD83 AND SHALL BE EXPRESSED IN FEET.

9.) THE INSTALLATION OF ELECTRIC POWER, CABLE TELEVISION AND TELEPHONE LINES SHALL BE UNDERGROUND THROUGHOUT THE SITE FOR WHICH DEVELOPMENT IS PROPOSED.

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

11.) ALL CONSTRUCTION SHALL CONFORM WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF NHDOT TRANSPORTATION "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" AND WITH THE CITY OF DOVER COMMUNITY SERVICES REGULATIONS AND STANDARD SPECIFICATION FOR CONSTRUCTION. THE MORE STRINGENT SPECIFICATION SHALL APPLY.

12.) 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.

13.) THE LIMITS OF CONSTRUCTION DISTURBANCE THAT ARE LOCATED IN OR WITHIN THE 50 FT. OF CONSERVATION AND WETLAND DISTRICTS SHALL BE STAKED, FLAGGED AND CLEARLY IDENTIFIED PRIOR ANY EARTH DISTURBING ACTIVITY OCCURS. NO DISTURBANCE WITHIN THE 50' BUFFER IS PROPOSED.

14.) ALL TREATMENT SWALES TO BE CONSTRUCTED SHALL HAVE SOD BOTTOMS.

15.) A LETTER OF CREDIT FOR THE COST OF REVEGETATING ALL DISTURBED AREAS ON THE SITE SHALL BE SUBMITTED, AND THE APPROVED CONSTRUCTION SIGN INSTALLED PRIOR TO ANY EARTH DISTURBING ACTIVITY OCCURS.

16.) 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.

17.) SITE CONSTRUCTION HOURS SHALL BE LIMITED TO MONDAY-SUNDAY 7 AM-6 PM. HOURS OF CONSTRUCTION MUST BE DOCUMENTED ON A SITE CONSTRUCTION SIGN ALONG WITH THE CONTACT INFORMATION FOR THE GENERAL CONTRACTOR. SAID SIGNAGE MUST BE LOCATED AND APPROVED BY THE CITY ENGINEER OR ASSISTANT CITY MANAGER.

18.) BUILDING ADDRESSES SHALL BE ASSIGNED BY THE BUILDING OFFICIAL AT THE TIME OF ISSUANCE OF A BUILDING PERMIT.

19.) THE PROPOSED USE FOR THE SITE IS FOR A AN EXPANSION ON THE EXISTING BUILDING, TO PROVIDE ADDITIONAL WAREHOUSE SPACE.

20.) THE FOLLOWING FEDERAL AND STATE PERMITS HAVE BEEN ISSUED FOR THE SUBJECT PROPERTY:
- US EPA NOI & SWPPP: PENDING
- NATURAL HERITAGE BUREAU: APPROVED NHB20-1412
- NH DIVISION OF HISTORICAL RESOURCES: PENDING

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

22.) ANY RETAINING WALL TALLER THAN FOUR FEET (4') REQUIRES ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.

23.) ANY FENCE TALLER THAN SEVEN FEET (7') REQUIRES THE ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.

24.) APPLICANT SHALL COMPLETE LAND USE DEVELOPMENT TRACKING FORM, MOST RECENTLY REVISED VERSION, UTILIZING THE ONLINE POLLUTION TRACKING AND ACCOUNTING PILOT PROJECT (PTAPP) PORTAL.

25.) THE OWNER OF RECORD SHALL RECORD AT THE REGISTRY OF DEEDS DOCUMENTATION SUFFICIENT TO PROVIDE NOTICE TO ALL PERSONS/ENTITIES THAT MAY ACQUIRE ANY PROPERTY SUBJECT TO THE REQUIREMENTS AND RESPONSIBILITIES DESCRIBED IN THE APPROVED STORMWATER MANAGEMENT PLAN. THE NOTICE SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS FOR RECORDING CONTAINED IN RSA 477 AND 478. THE NOTICE NEED NOT SET FORTH THE REQUIREMENTS AT LENGTH, SO LONG AS IT IS SUFFICIENT TO PROVIDE NOTICE TO PROSPECTIVE PURCHASERS TO THE REQUIREMENTS FOR MAINTENANCE AND REPORTING.

PARKING REQUIREMENTS:

CHAPTER 153 PARKING TABLE
- EXISTING OFFICE SPACE
  - 1 SPACE PER 300 Sq.Ft.:
  - (6,896 Sq.Ft. * 2) / 300 Sq.Ft. PER SPACE = 45 SPACES
- EXISTING WAREHOUSE & MANUFACTURING
  - 1 SPACE PER 800 Sq.Ft.:
  - (6,780 Sq.Ft. + 26,781 Sq.Ft.) / 800 Sq.Ft. PER SPACE = 42 SPACES
- PROPOSED WAREHOUSE
  - 1 SPACE PER 800 Sq.Ft.:
  - 47,900 Sq.Ft. / 800 Sq.Ft. PER SPACE = 60 SPACES

MAXIMUM SPACES FOR EXISTING & PROPOSED USES = 147 SPACES
TOTAL PROPOSED PARKING = 93 SPACES

NOTES CONTINUED:

26.) EXTERIOR LIGHTING SHALL BE CUT-OFF TYPE FIXTURES PER CHAPTER 153-14-E AND SHALL PROVIDE LIGHTING DIRECTED ON-SITE ONLY.

27.) APPROVED BACKFLOW PREVENTERS SHALL BE PROVIDED FOR BOTH FIRE AND DOMESTIC WATER LINES.

28.) THE EXISTING STRUCTURE IS SERVICED BY SPIRNKLERS. THE PROPOSED EXPANSION WILL HAVE A SPRINKLER SYSTEM AS REQUIRED BY CHAPTER 81- 30 OF THE CODE OF THE CITY OF DOVER AND THE ADOPTED STATE OF NH BUILDING AND FIRE CODES.

29.) SPRINKLER CONNECTIONS MUST BE FLUSHED IN ACCORDANCE WITH NFPA 24 AND A CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR UNDERGROUND PIPING FORM MUST BE COMPLETED AND APPROVED BY INSPECTION SERVICES PRIOR TO CONNECTION OF THE BACKFLOW DEVICE.

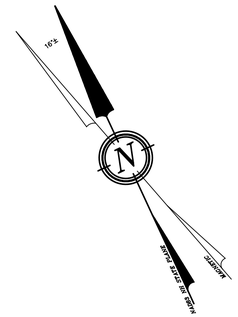
30.) FIRE DEPARTMENT CONNECTIONS SHALL BE LOCATED ON THE STREET SIDE OF THE BUILDING PER NFPA 13. ACCESS TO THE FDC SHALL MAINTAIN A CLEAR AND UNOBSTRUCTED PATH AT ALL TIMES.

31.) THE SITE LAYOUT IS DESIGNED IN COMPLIANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS. THE PROPOSED STRUCTURE WILL BE ALSO BE DESIGNED IN ACCORDANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS. (I.E. IBC, ANSI-117.1) AND NH RSA 155-A:5.

32.) THE PROJECT WILL CONSIST OF TWO PHASES. THE FIRST PHASE WILL BE FOR THE CONSTRUCTION THE 36,400 Sq.Ft. EXPANSION OFF THE BACK OF THE EXISTING BUILDING. THE CONSTRUCTION TWO LOADING DOCKS OFF THE EAST SIDE OF THE EXPANSION. THE SECOND PHASE WILL BE FOR THE CONSTRUCTION OF AN ADDITIONAL 11,500 Sq.Ft. BUILDING EXPANSION.

33.) IF REQUIRED, SNOW SHALL BE REMOVED TO AN APPROVED LOCATION. SNOW STORAGE SHALL NOT IMPEDE DRAINAGE.
PAVEMENT COVERAGE: 86,200 Sq. Ft.
SNOW STORAGE: 14,367 Sq. Ft.
6:1 RATIO PROVIDED

WAIVERS:
ON SITE LIGHTING 153-14.E.1.E: PENDING
STREETSCAPE 153-13.A.17: PENDING



GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

DOVER PLANNING FILE #

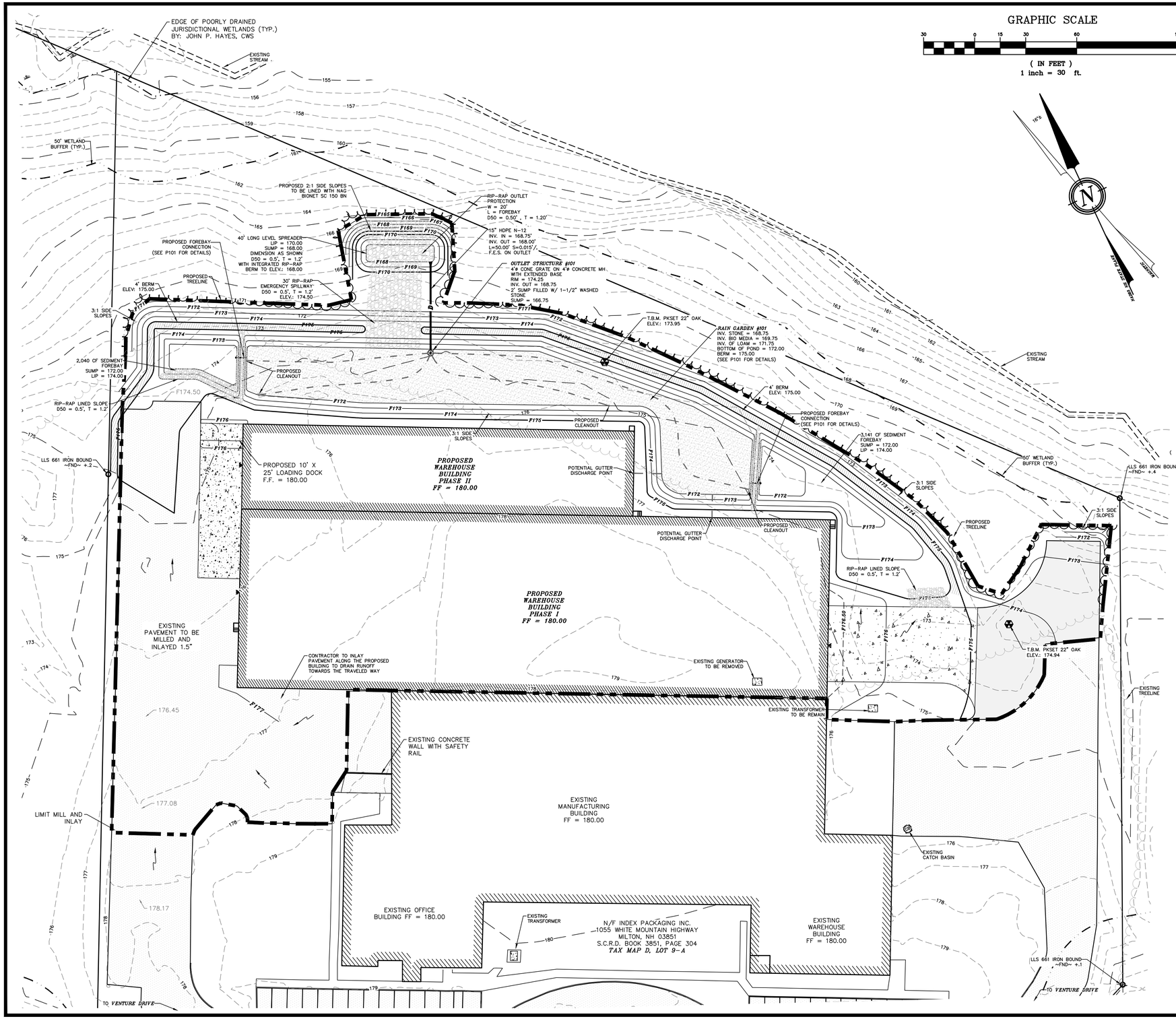
REVISION	DATE	DESCRIPTION

SITE PLAN
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 40 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 - 152

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14143
LICENSED PROFESSIONAL ENGINEER



NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

2.) TAX MAP D, LOT 9A

3.) LOT AREA: 404,461 Sq. Ft., 9.29 Ac.

4.) S.C.R.D. BOOK 3851, PAGE 308

5.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED GRADING AND DRAINAGE DESIGN FOR THE PROPOSED BUILDING EXPANSION.

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

7.) 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

8.) 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.

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

10.) AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE. LIMIT OF GRADING SHOULD NOT BE EXPANDED WITHOUT CONSULTING THE DESIGN ENGINEER. SEE ALSO E&SC PLAN.

11.) 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).

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

13.) 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.

14.) 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.

15.) NOTE THAT THE PROJECT IS SUBJECT TO THE EPA NPDES PHASE II. THE NOTICE OF INTENT (NOI) MUST BE FILED ALONG WITH A STORMWATER POLLUTION PREVENTION PLAN (SWPPP). BIWEEKLY INSPECTIONS WILL BE CONDUCTED BY THE DESIGN ENGINEER AND AFTER STORM EVENTS OF OVER 0.25".

16.) UPON FINAL COMPLETION AND 85% STABILIZATION THE DRAINAGE SYSTEM IS TO BE CLEANED OF ALL DEBRIS TO INCLUDE THE PUMPING OF THE BASIN SUMPS. SEE SHEET E102, DETAIL E18 FOR DEFINITION OF STABLE.

17.) ALL TREATMENT SWALE TO BE CONSTRUCTED SHALL HAVE SOD BOTTOMS UNLESS OTHERWISE INSTRUCTED BY THE DESIGN ENGINEER DURING CONSTRUCTION.

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 STAGF SHALL OCCUR PRIOR TO ANY EARTH DISTURBING ACTIVITY.

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

21.) 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.

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

23.) THE PROPOSED BUILDING EXPANSION IS PROPOSED TO USE THE SAME UTILITIES IN THE EXISTING BUILDING. TO INCLUDE, WATER, GAS, ELECTRICAL AND SEWER.

24.) THIS PROJECT PROPOSES 95,000 Sq.Ft. OF DISTURBANCE.

25.) THE PROPOSED BUILDINGS ARE TO HAVE GUTTERS AND DOWN SPOUTS THAT DISCHARGE INTO THE PROPOSED RAIN GARDEN. DESIGN BY OTHERS. DISCHARGE POINT TO BE LINED WITH RIP-RAP.

DOVER PLANNING FILE #

REVISION	DATE	DESCRIPTION

GRADING PLAN
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 30 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 - 152

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14748
LICENSED PROFESSIONAL ENGINEER

P1

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

3/8" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
1/2"	100
3/8"	95 – 100
# 4	22 – 55
# 8	0 – 10

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

1-1/2" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1-1/2"	90 – 100
1"	20 – 55
1/2"	0 –15
3/8"	0 –5

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

NOTES

1. WHEN CONTRACTOR EXCAVATES RAIN GARDEN AREA TO SUBGRADE, DESIGN ENGINEER SHALL PERFORM SUBSURFACE EVALUATION PRIOR TO THE PLACEMENT OF ANY SELECT MATERIAL OR OTHER BACKFILL.
2. SOIL BIORETENTION FILTER MEDIA SHALL BE AS SHOWN ABOVE. "BIO MEDIA" MEANS BIORETENTION FILTER MADIA.
3. COMPACTION IS NOT TO OCCUR IN THE RAIN GARDEN AREAS PRIOR TO CONSTRUCTION. SCARIFICATION REQUIRED IN THE EVENT COMPACTION TAKES PLACE.
4. DO NOT PLACE THE BIORETENTION SYSTEM INTO SERVICE UNTIL THE BMP HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
5. DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF WATER FROM EXCAVATIONS) TO THE BIORETENTION AREA DURING ANY STAGE OF CONSTRUCTION.
6. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.

MAINTENANCE REQUIREMENTS

1 SYSTEMS SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND FOLLOWING ANY RAINFALL EXCEEDING 2.5 INCHES IN A 24-HOUR PERIOD, WITH MAINTENANCE OR REHABILITATION CONDUCTED AS A WARRANTED BY SUCH INSPECTION.

2 PRETREATMENT MEASURES SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND CLEANED OF ACCUMULATED SEDIMENT AS WARRANTED BY INSPECTION, BUT NO LESS THAN ONCE ANNUALLY.

3 AT LEAST ONCE ANNUALLY, SYSTEM SHOULD BE INSPECTED FOR DRAWDOWN TIME. IF BIORETENTION SYSTEM DOES NOT DRAIN WITHIN 72–HOURS FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHOULD ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION FUNCTION OR INFILTRATION FUNCTION (AS APPLICABLE), INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER MEDIA.

4 VEGETATION SHOULD BE INSPECTED AT LEAST ANNUALLY, AND MAINTAINED IN HEALTHY CONDITION, INCLUDING, PRUNING, REMOVAL, AND REPLACEMENT OF DEAD OR DISEASED VEGETATION, AND REMOVAL OF INVASIVE SPECIES.

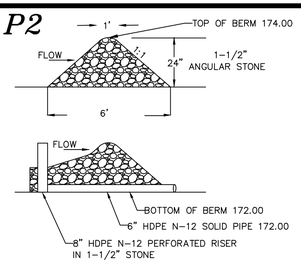
DESIGN REFERENCES

1 UNH STORMWATER CENTER
2 NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 2, DECEMBER 2008 AS AMENDED.

RAIN GARDEN MIX

THE GRASS THAT IS PLANTED WITHIN A RAIN GARDEN BIO-FILTRATION SYSTEM WITHIN THE BIO-MEDIA MUST CONSIST OF A COMBINATION OF WARM SEASON GRASS SEED AND COLD SEASON GRASS SEED IN ORDER FOR THE GRASS TO START GROWING FOR STABILIZATION AND CONTINUE GROWING IN THE SANDY WELL-DRAINED ENVIRONMENT. PLANTING SPECIFICATION WILL MEET THE REQUIREMENTS AS OUTLINED IN "VEGETATION NEW HAMPSHIRE SAND AND GRAVEL PITS' MIX 1 (WARM SEASON GRASSES) (15 LBS/AC) AND INCLUDE ANNUAL AND PERENNIAL RYE GRASS SEED (15 LBS/AC); THE NEW ENGLAND NATIVE WARM SEASON GRASS MIX (23 LBS/AC) BY NEW ENGLAND WETLAND PLANTS, INC.; RAIN GARDEN MIX 180 (15 LBS/AC & 15 LBS/AC OF RYE) / RAIN GARDEN GRASS MIX 180-1 (20 LBS/AC & 10 LBS/AC OF RYE) BY ERNST CONSERVATION SEEDS; OR APPROVED EQUAL.

P2

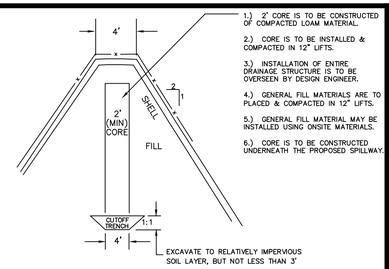


STONE BERM FOR FOREBAY

P3

LOW PERMEABILITY MATERIAL GRADATION

SIEVE SIZE	% PASSING BY WEIGHT
#4	95 – 100
#40	60 – 95
#100	40 – 60
#200	25 – 45



1.) 2' CORE IS TO BE CONSTRUCTED OF COMPACTED LOAM MATERIAL.

2.) CORE IS TO BE INSTALLED & COMPACTED IN 12" LIFTS.

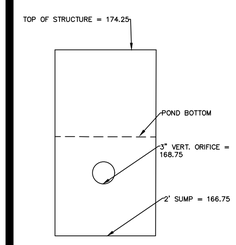
3.) INSTALLATION OF ENTIRE DRAINAGE STRUCTURE IS TO BE OVERSEEN BY DESIGN ENGINEER.

4.) GENERAL FILL MATERIALS ARE TO PLACED & COMPACTED IN 12" LIFTS.

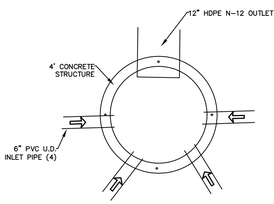
5.) GENERAL FILL MATERIAL MAY BE INSTALLED USING ONSITE MATERIALS.

6.) CORE IS TO BE CONSTRUCTED UNDERNEATH THE PROPOSED SPILLWAY.

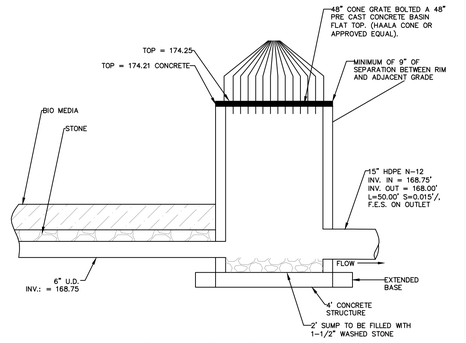
P4



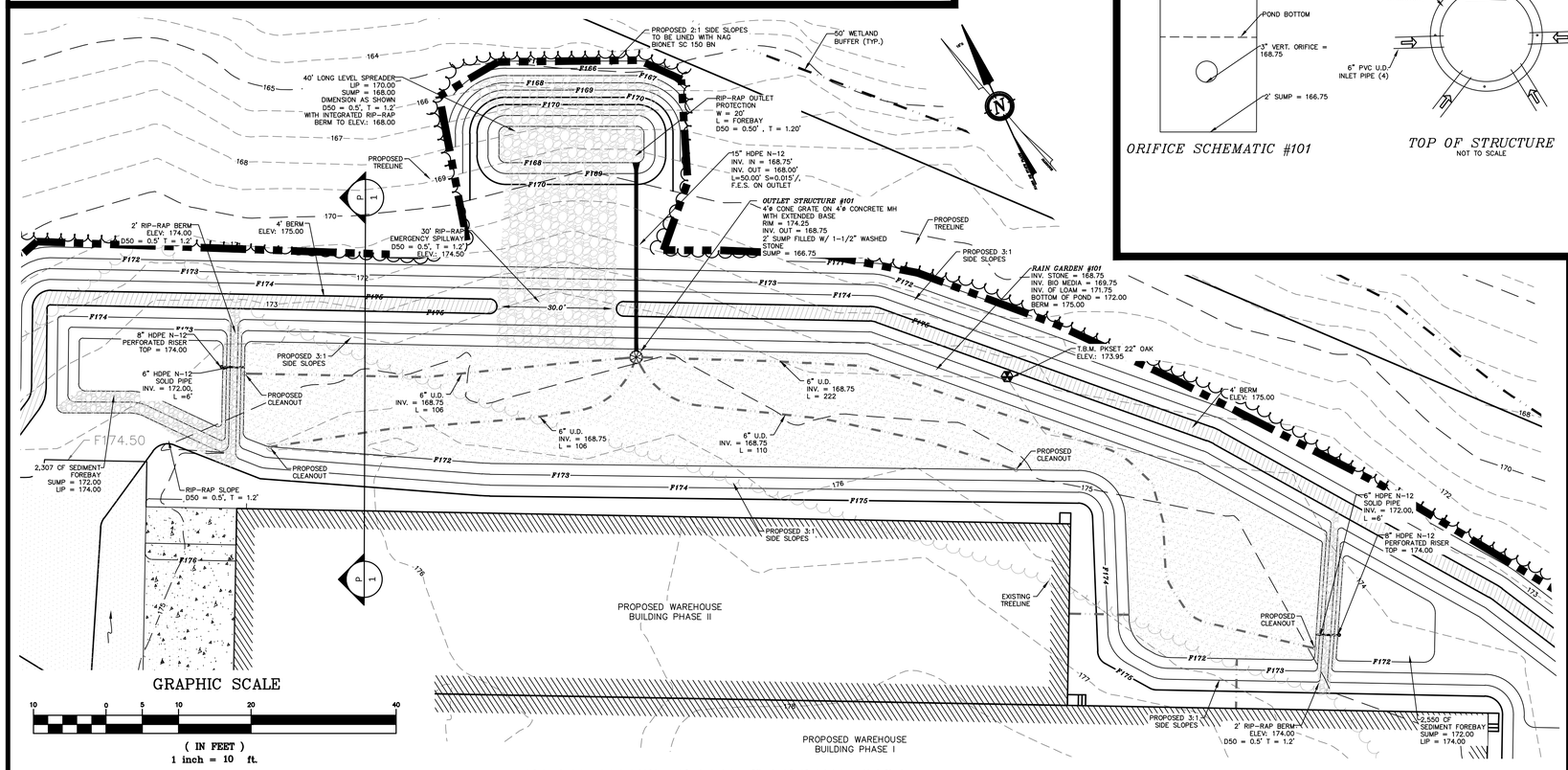
ORIFICE SCHEMATIC #101



TOP OF STRUCTURE
NOT TO SCALE

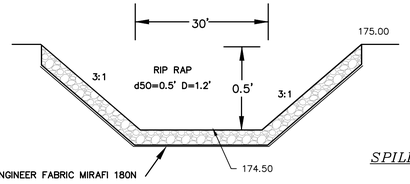


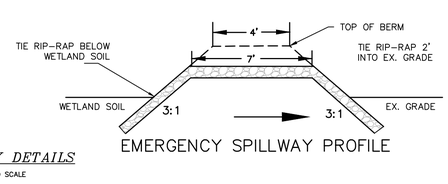
OUTLET STRUCTURE #101
NOT TO SCALE



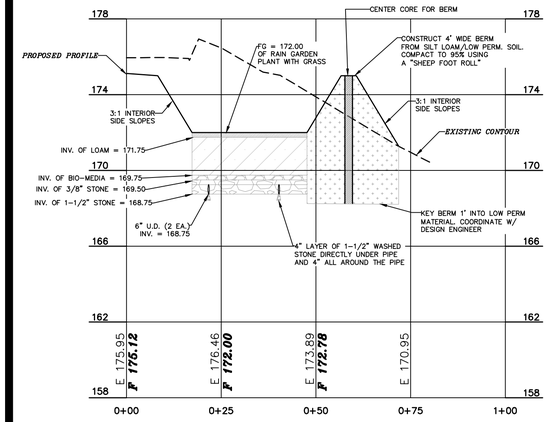
PLAN VIEW RAIN GARDEN #101

P5





SPILLWAY DETAILS
NOT TO SCALE



SECTION OF RAIN GARDEN 101

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

VERTICAL SCALE: 1" = 4'

P101

DOVER PLANNING FILE #

REVISION	DATE	DESCRIPTION

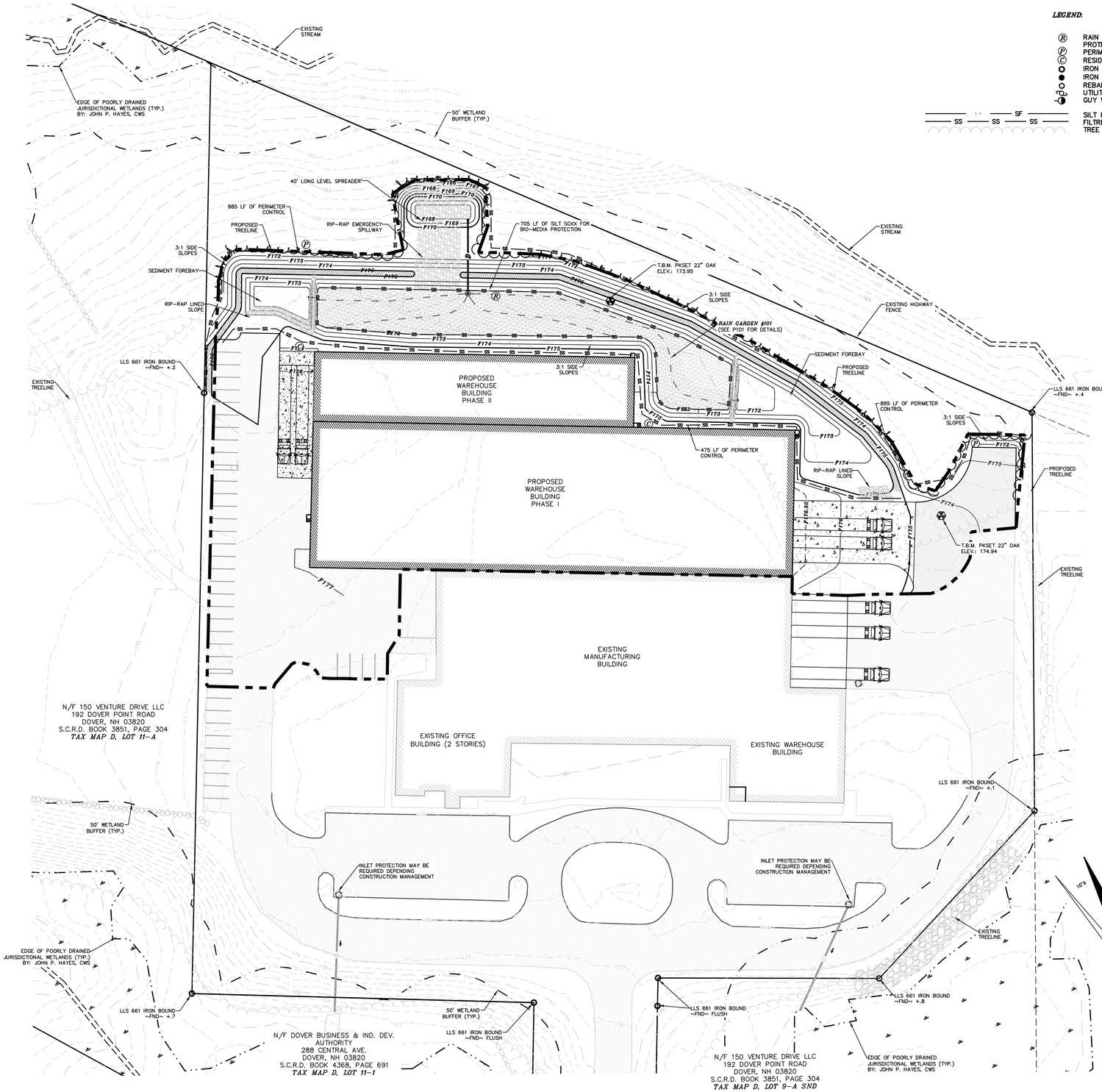
RAIN GARDEN #101
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : SEPTEMBER 14, 2020
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STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14748
LICENSED PROFESSIONAL ENGINEER

SHEET 11 OF 18



LEGEND:

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

NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

2.) TAX MAP D, LOT 9A

3.) LOT AREA: 404,461 Sq. Ft., 9.29 Ac.

4.) S.C.R.D. BOOK 3851, PAGE 308

5.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED EROSION AND SEDIMENT CONTROL DESIGN FOR THE PROPOSED BUILDING EXPANSION.

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

7.) CONTRACTOR IS RESPONSIBLE FOR SWEEPING THE PARKING LOT, SIDEWALKS AND ANYTHING DISTURBED, TO ENSURE THAT NO SEDIMENT IS BEING TRACKED ONTO THE EXISTING PARKING AREA OR VENTURE DRIVE.

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

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

10.) 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.

11.) 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 4.1.1AND INSPECTION REPORTS SUBMITTED TO THE CITY OF DOVER, NH, ENGINEERING DEPARTMENT WITHIN24 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.

12.) 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.

13.) PER EPA CGP 2.1.2.2 (INSTALL PERIMETER CONTROL), "YOU MUST INSTALL SEDIMENT CONTROLS ALONG THOSE PERIMETER AREAS OF YOUR SITE THAT WILL RECEIVE STORMWATER FROM EARTH DISTURBING ACTIVITIES." AS A RESULT OF SWPPP INSPECTIONS, THE CONTRACTOR MAY HAVE TO EXPAND PERIMETER CONTROLS TO MEET THIS REQUIREMENT. THE EASC PLAN IS INITIAL GUIDANCE AS TO THE ANTICIPATED REQUIREMENTS AND IT THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT STORMWATER VIOLATION DO NOT OCCUR.

14.) IF STOCKPILES ARE NEEDED FOR CONSTRUCTION THEY SHOULD BE PLACED IN THE PHASE II BUILDING LOCATION. IF STOCKPILES ARE PLACED IN THIS LOCATION, OR ANY LOCATION UPHILL OF THE RAIN GARDEN, THE CONTRACTOR WILL BE REQUIRED TO INSTALL AND MAINTAIN PERIMETER CONTROL AT THE TOE OF THE STOCKPILE TO ENSURE THAT NO SEDIMENT RUNS OFF INTO THE RAIN GARDEN.

SOILS & DEWATERING:

CnC	CHARLTON	SILT LOAM	K= 0.43
CnD	CHARLTON	SILT LOAM	K= 0.43
GnE	GLOUCESTER	SANDY TILL	K= 0.17
AnC	ACTON	GLACIAL TILL	K= 0.43
HnA	HOLLIS	SILT LOAM	K= 0.20
HnB	HOLLIS	SILT LOAM	K= 0.20
HnC	HOLLIS	SILT LOAM	K= 0.43
HnD	HOLLIS	SILT LOAM	K= 0.43
HnE	HOLLIS	SILT LOAM	K= 0.43
BnA	BOXFORD	CLAYEY SEDIMENT	K= 0.49
BnB	BOXFORD	CLAYEY SEDIMENT	K= 0.49
BnC	BOXFORD	CLAYEY SEDIMENT	K= 0.49
ScA	SCITICO	SILT CLAY	K= 0.20
ScB	SCITICO	SILT CLAY	K= 0.20
ScC	SCITICO	SILT CLAY	K= 0.20
BmA	MAYBID	SILT CLAY	K= 0.20
WfC	WINDSOR	SANDY	K= 0.17
WfD	WINDSOR	SANDY	K= 0.17
WfE	WINDSOR	SANDY	K= 0.17
EnB	ELMWOOD	SILT LOAM	K= 0.32
EnC	ELMWOOD	SILT LOAM	K= 0.32
EnD	ELMWOOD	SILT LOAM	K= 0.32
500B	UDORTHENS	SANDY LOAM	K= N/A
500C	UDORTHENS	SANDY LOAM	K= N/A
500D	UDORTHENS	SANDY LOAM	K= N/A

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.

DOVER PLANNING FILE #

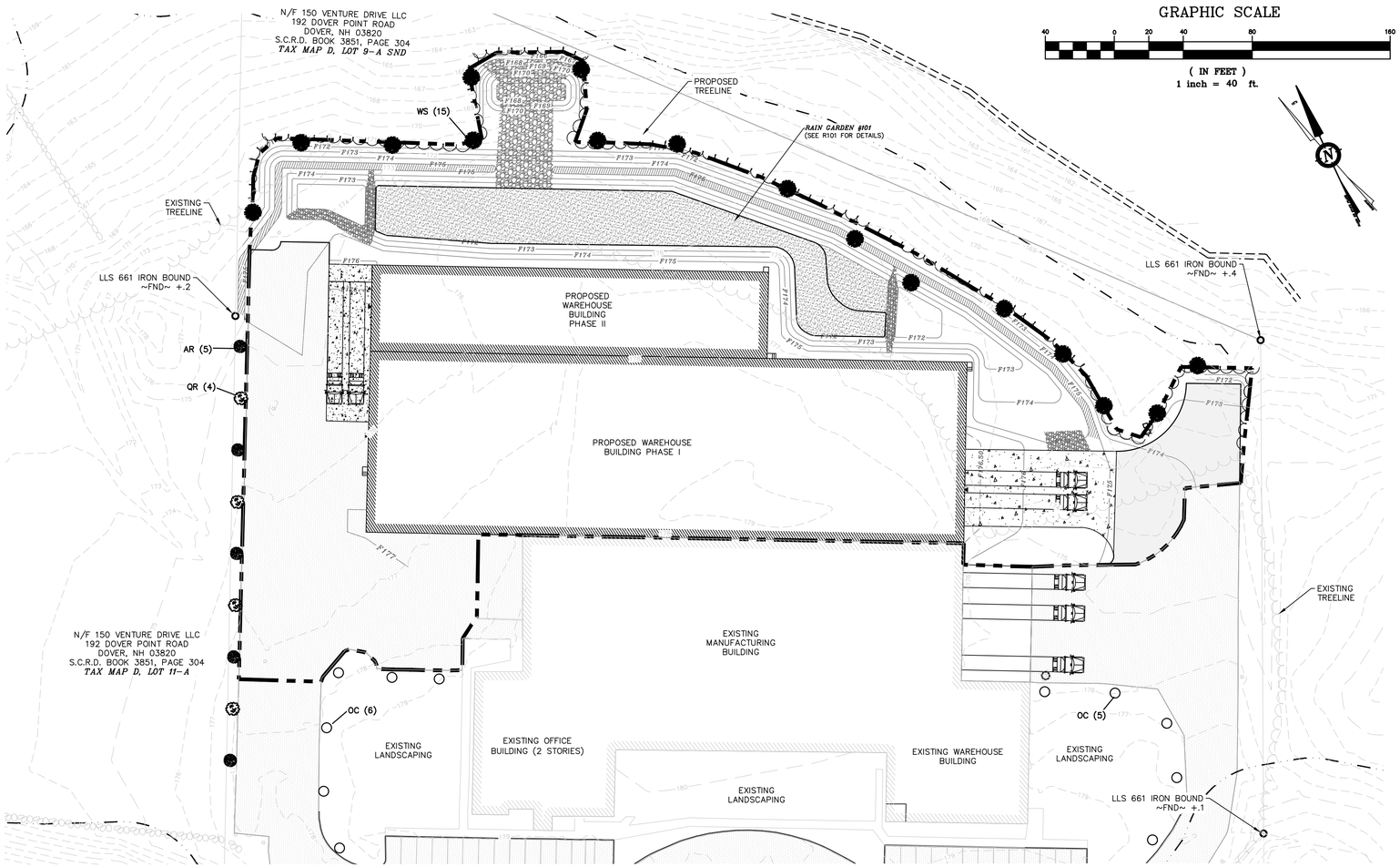
REVISION	DATE	DESCRIPTION

EROSION AND SEDIMENT CONTROL PLAN
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

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STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14748
LICENSED PROFESSIONAL ENGINEER



PLANTING NOTES

1. CONTRACTOR SHALL OBTAIN APPROVAL FROM L.A. PRIOR TO PURCHASING &/OR INSTALLING SUBSTITUTE PLANT MATERIAL PRIOR TO PURCHASE OF ANY SUBSTITUTE MATERIALS.

2. CONSTRUCTION ACCESS WILL BE AS DIRECTED BY L.A. CONTRACTOR IS RESPONSIBLE FOR RESTORATION OF ACCESS ROUTE AND ALL AREAS DISTURBED BY PLANTING OPERATIONS UPON COMPLETION OF CONSTRUCTION OPERATIONS, AT NO ADDITIONAL COST TO THE OWNER.

3. LAYOUT OF ALL PLANTING BEDS AND LOCATION OF PLANTS TO BE APPROVED BY L.A. ON SITE PRIOR TO CONSTRUCTION AND INSTALLATION.

4. CONTRACTOR TO REMOVE ALL DEBRIS GENERATED BY PLANT INSTALLATION. DEBRIS TO BE DISPOSED OF IN A LEGAL MANNER.

5. ALL PLANT MATERIAL SHALL BE GUARANTEED TO BE IN GOOD, HEALTHY & FLOURISHING CONDITION FOR ONE YEAR FROM THE DATE OF FINAL INSTALLATION APPROVAL BY L.A. CONTRACTOR SHALL REPLACE, WITHOUT COST TO OWNER, AND AS SOON AS WEATHER CONDITIONS PERMIT, ALL DEAD AND NON-FLOURISHING PLANTS AS DETERMINED BY THE L.A. REPLACEMENT PLANTS SHALL BE BE GUARANTEED IDENTICALLY TO ORIGINAL PLANTS, TIME PERIOD COMMENCING FROM DATE OF REPLACEMENT PLANTING APPROVAL BY L.A.

6. ALL BEDS TO BE MULCHED WITH 3" DEPTH SHREDDED BARK MULCH UNLESS NOTED OTHERWISE.

7. CONTRACTOR TO PROVIDE NECESSARY TEMPORARY IRRIGATION IF NEEDED BASED ON TIME OF YEAR THE PROJECT IS IMPLEMENTED.

8. ALL PLANT MATERIAL TO COMPLY WITH THE CITY OF DOVER'S SITE REVIEW REGULATIONS, 149-14(G), SUCH THAT THERE SHALL BE DECIDUOUS SHADE TREES PLANTED 40 FEET O.C. ALONG THE PERIMTERE OF THE PARKING LOTS AND SHRUBS PLANTED 5 FEET O.C. WITHIN THE PERIMETER BUFFER. SEE PLANT LIST FOR SPECIES AND SIZE OF PLANTS.

TEMPORARY WATERING NOTES

1. CONTRACTOR IS RESPONSIBLE FOR MAKING SURE ALL PLANT MATERIAL HAS ADEQUATE WATER DURING THE ESTABLISHMENT PERIOD.

2. THE USE OF GATOR BAGS, SOAKER HOSE, HAND WATERING AND OTHER TECHNIQUES SHOULD BE USED TO ASSURE PROPER HYDRATION OF THE PLANTINGS IS MAINTAINED.

3. TEMPORARY IRRIGATION SYSTEMS CAN BE SET UP TO ASSIST IN WATERING ACTIVITIES.

PLANTING SCHEDULE
150 Venture Drive
Botanical Name/ Common Name

Trees	Size	Qty	Label
Picea glauca / White Spruce	6' high	15	WS
Quercus robur 'Fastigiata' / Columnar English Oak	3.5" Cal.	4	QR
Acer Rubrum' / Red Maple	3.5" Cal.	5	AR
Shrubs			
Cornus sericea 'Cardinal' / Cardinal Dogwood	#3 3-4'	11	OC

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 TWCE 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.

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General Plant Maintenance Guide

General Plant Bed Maintenance:

- All plant maintenance should be performed by a qualified horticulturalist or licensed arborist. Cleaning the dead material out of the planting bed in the fall helps keep litter from building up around the plants and in some cases killing the plants. Watering the first year during dry periods will help get the plants established. Mulching every year is not necessary. Raking the old mulch and turning it over is all that is needed. When necessary only install one inch of mulch and do not place the mulch closer than 3" to the trunks or stems of woody plants.

Trees

- The first year watering during dry periods will be necessary.
- 3" inches of mulch maybe used. The mulch should be kept 3 inches from the trunk.
- Fertilizing is not necessary for the first year. Fertilizing in subsequent years only when and if the foliage is looking weak.
- Fertilization should occur prior to Mat 31st or after trees have dropped their leaves for the year.
- Prune dead wood once a year.
- Depending on the amount of compaction the bed area receives, deep root aeration may be needed over time

Woody Shrubs

- The first year watering during dry periods will be necessary.
- 3" inches of mulch maybe used. The mulch should be kept 3 inches from the stems.
- Fertilizing is not necessary for the first year. Fertilizing in subsequent years only when and if the foliage is looking weak.
- Fertilization should occur prior to Mat 31st or after shrubs have dropped their leaves or gone dormant for the year.
- Prune dead wood once a year.

Grasses

- Grasses only need to be clipped back at the end of the growing season and all the clippings removed from the area.
- Do not over mulch. Too much mulch will prohibit the grass from developing into a strong clump.

Perennials

- All perennials need to be pruned back after the first or second hard frost. A two-step method; first dead head all the flower heads and let drop to the ground for re-seeding. Second cut the stems back to 3" above the ground and remove the stem and leaf litter and place in compost. Do not over mulch. Too much mulch will prohibit the growth and development
- Fertilizing perennials once in the spring with a low phosphate fertilizer will help the plants to get started in the spring.

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311 kast hill road
hopkinton, nh 03229
603. 491. 2322
terrainplanning.com

150 VENTURE DRIVE

Site Location:
150 VENTURE DRIVE
Dover, NH
Tax Map: D

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

LANDSCAPE PLAN

DATE:

SCALE: 1" = 20'

PROJECT #: 19-152

Drawn By: ID

Checked By: ERB

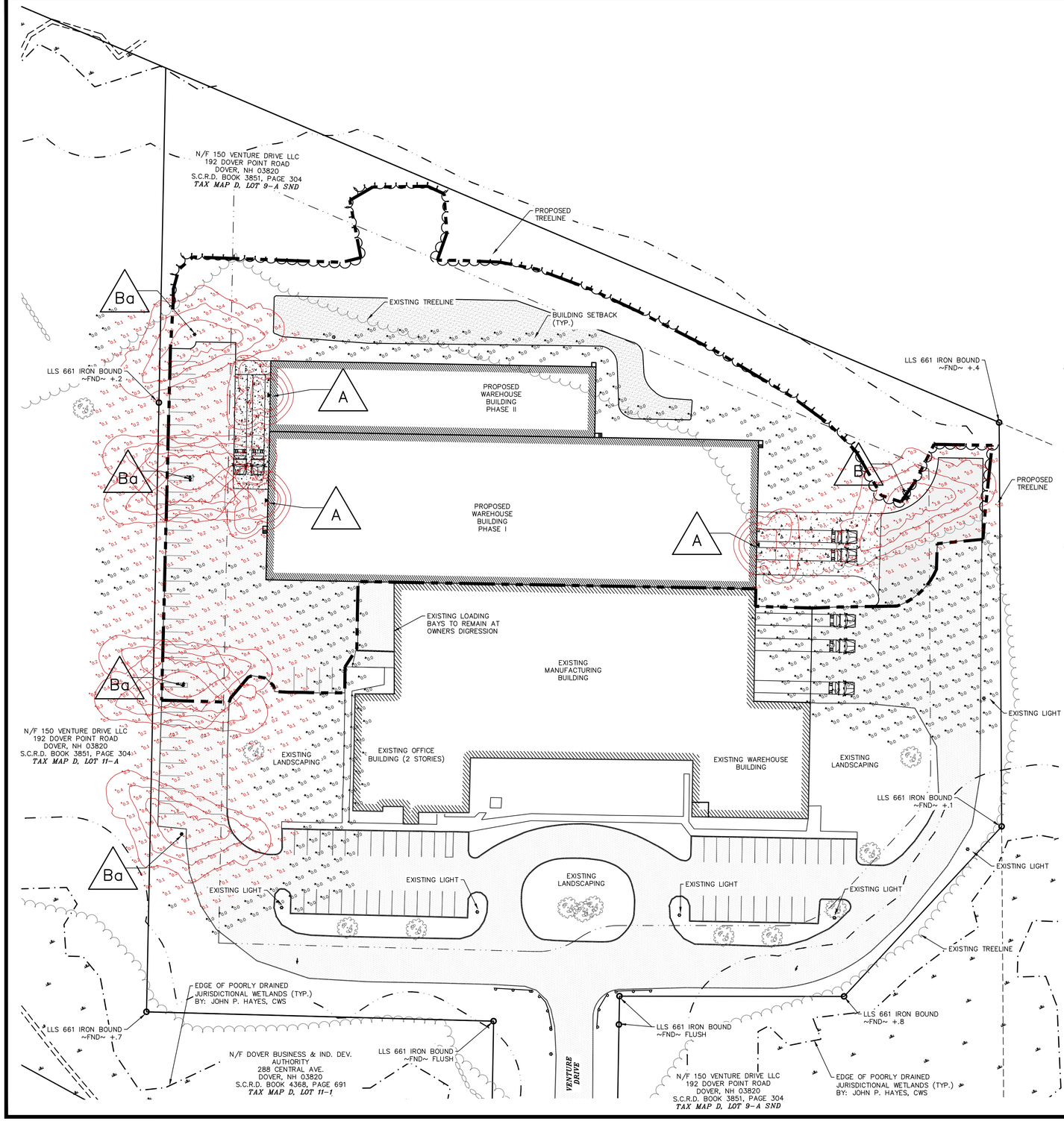
REVISIONS: DATE:
Issued for Client Review

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L - 01

SHEET 13 OF 18

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



NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

2.) TAX MAP D, LOT 9A

3.) LOT AREA: 404,461 Sq. Ft., 9.29 Ac.

4.) S.C.R.D. BOOK 3851, PAGE 308

5.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED LIGHTING DESIGN FOR THE BUILDING EXPANSION.

6.) SEE CONSTRUCTION DETAILS FOR LIGHT PRODUCT CUT SHEETS.

7.) LAMP A IS TO BE MOUNTED 12' ON THE BUILDING. LAMP B & BA ARE TO BE MOUNTED 20' ABOVE GRADE.

8.) LAMPS DENOTED AS "Ba" ARE EXISTING AND LAMPS DENOTED AS "B" & "A" ARE PROPOSED.

9.) UNIFORMITY RATIOS ARE NOT PROVIDED BECAUSE ALL THE LIGHTS ON SITE ARE EXISTING EXCEPT FOR LAMPS PROVIDED IN LOADING DOCK AREAS.

Schedule

Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Filename	Lumens Per Lamp	Light Loss Factor	Wattage
	A	3	Lithonia Lighting	WSR LED 1 10A700/40K SR4 MVOLT	WSR LED WITH 1 MODULE, 10 LED's, 700mA DRIVER, 4000K COLOR TEMPERATURE, TYPE 4 LENS	LED	1	WSR_LED_1_10A700_40K_SR4_MVOLT.ies	1927	1	24
	B	1	Lithonia Lighting	KSE1 70S R2	16" SQUARE ARM-MOUNTED CUTOFF LUMINAIRE WITH SEGMENTED TYPE II REFLECTOR MEETS THE 'NIGHTTIME FRIENDLY' CRITERIA	ONE 70-WATT CLEAR ET-23.5 HIGH PRESSURE SODIUM	1	KSE1_70S_R2.ies	6300	1	94
	B	4	Lithonia Lighting	KSE1 70S R2	16" SQUARE ARM-MOUNTED CUTOFF LUMINAIRE WITH SEGMENTED TYPE II REFLECTOR MEETS THE 'NIGHTTIME FRIENDLY' CRITERIA	ONE 70-WATT CLEAR ET-23.5 HIGH PRESSURE SODIUM	1	KSE1_70S_R2.ies	6300	1	94

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

DOVER PLANNING FILE #

REVISION	DATE	DESCRIPTION

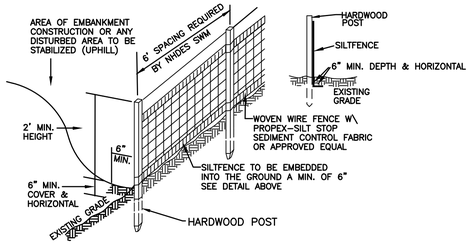
LIGHTING PLAN
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 40 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 - 152

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 7443
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 6' APART, AND DRIVEN A MINIMUM OF 16" INTO THE GROUND.
2. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THE ENDS OF THE FABRIC SHALL BE OVERLAPPED BY SIX INCHES, FOLDED AND STAPLED TO PREVENT SEDIMENT FROM BY-PASSING.
3. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SEDIMENT REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE AND PROPERLY DISPOSED OF. SEE MAINTENANCE NOTE BELOW, REMOVAL OF SEDIMENT REQUIRED AT A DEPTH OF 6-INCHES.
4. PLACE THE ENDS OF THE SILT FENCE UP CONTOUR TO PROVIDE FOR SEDIMENT STORAGE.
5. SILT FENCES SHALL BE REMOVED WHEN NO LONGER NEEDED AND THE SEDIMENT COLLECTED SHALL BE DISPOSED AS DIRECTED BY THE ENGINEER.
6. THE AREA DISTURBED BY THE REMOVAL SHALL BE SMOOTHED AND RE-VEGETATED.
7. TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, SILT FENCE, PAGE 90.

SILT FENCE MAINTENANCE

1. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE MADE IMMEDIATELY.
2. IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN THEY REACH SIX-INCHES IN DEPTH.
4. SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

SILT FENCE DETAIL
NOT TO SCALE

E2

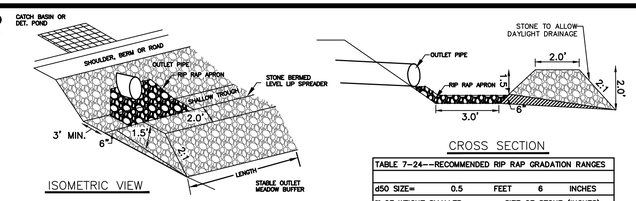
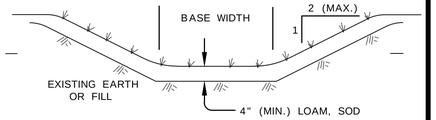


TABLE 7-24--RECOMMENDED RIP RAP GRADATION RANGES			
d50 SIZE=	0.5	FEET	6 INCHES
% OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE	SIZE OF STONE (INCHES) FROM		TO
100%	9		12
85%	8		11
50%	6		9
15%	2		3

1. CONSTRUCT THE LEVEL SPREADER LIP ON A 0% GRADE TO INSURE UNIFORM SPREADING OF RUNOFF.
2. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL AND NOT ON FILL.
3. THE ENTIRE LEVEL LIP AREA SHALL BE PROTECTED BY PLACING EXCELSIOR ENFORCER MATTING BENEATH THE STONE. EACH STRIP SHALL OVERLAP BY AT LEAST SIX INCHES.
4. THE FLOW FROM THE LEVEL SPREADER SHALL OUTLET ONTO STABILIZED AREAS. WATER SHOULD NOT RE-CONCENTRATE IMMEDIATELY BELOW THE SPREADER.
5. MAINTENANCE: THE LEVEL SPREADER SHOULD BE CHECKED PERIODICALLY AND AFTER EVERY MAJOR STORM TO DETERMINE IF THE LIP HAS BEEN DAMAGED AND THE DESIGN CONDITIONS HAVE NOT CHANGED. ANY DETRIMENTAL SEDIMENT ACCUMULATION SHOULD BE REMOVED. IF STONE REMOVAL HAS TAKEN PLACE ON THE LIP, THEN THE DAMAGE SHOULD BE REPAIRED.
6. REFERENCE IS MADE TO NHDES SWM VOL. 2, 4-6, STONE BERM LEVEL SPREADERS, PAGE 162

STONE BERM LEVEL SPREADER
NOT TO SCALE

E3



GRASS TREATMENT SWALE
NOT TO SCALE

INSPECT ANNUALLY FOR EROSION, SEDIMENT ACCUMULATIONS, VEGETATION LOSS, & INVASIVE SPECIES. REPAIR AS NECESSARY.

MOW GRASS ANNUALLY TO A DEPTH OF 4".

INSTALL STABILIZATION MATTING DURING CONSTRUCATION

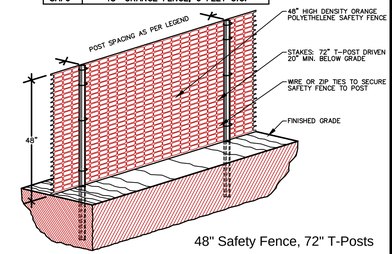
TO BE CONSTRUCTED IAW NH SWM #2 CHAPTER 4, #5 TREATMENT SWALES, PAGE 123.

E4

CONSTRUCTION SAFETY FENCE
NOT TO SCALE

LEGEND

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



48" Safety Fence, 72" T-Posts

1. ALL SENSITIVE AREAS SHALL BE PROTECTED AS PER PLAN.
2. ALL TREES IN THE CONSTRUCTION AREA NOT SPECIFICALLY DESIGNATED FOR REMOVAL SHALL BE PRESERVED AND PROTECTED WITH HIGH VISIBILITY FENCE AS PER PLAN.
3. WHEN PRACTICABLE, INSTALL HIGH VISIBILITY 3 FEET OUTSIDE OF THE DRIP LINE OF THE TREE.
4. SAFETY FENCE SHOULD BE FASTENED SECURELY TO THE T-POSTS.
5. THE FENCING MUST REMAIN IN PLACE DURING ALL PHASES OF CONSTRUCTION; ANY CHANGE OF THE PROTECTIVE FENCING MUST BE APPROVED.

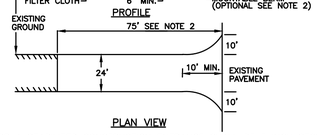
DOVER PLANNING FILE #

REVISION	DATE	DESCRIPTION

EROSION & SEDIMENT CONTROL DETAILS
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

E5

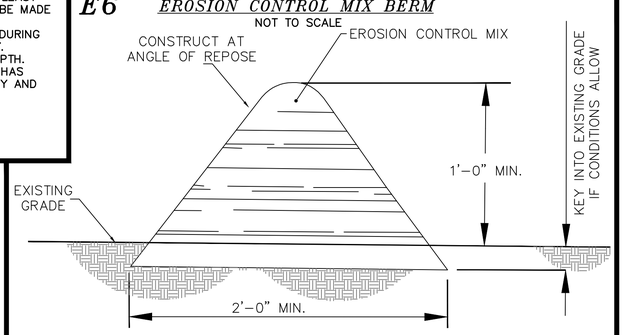
STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE



1. STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 3 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 75 FEET, EXCEPT THAT THE MINIMUM LENGTH MAY BE REDUCED TO 50 FEET IF A 3-INCH TO 6-INCH BERM IS INSTALLED AT THE ENTRANCE OF THE PROJECT SITE.
3. THE THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS OR 10 FEET, WHICH EVER IS GREATER.
5. GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING
6. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED, OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.
8. TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, TEMPORARY CONSTRUCTION EXIT, PAGE 124.

E6

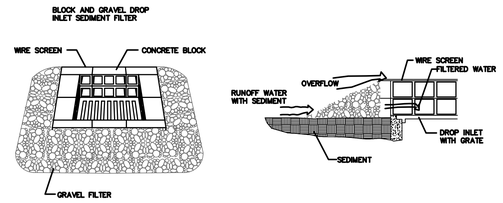
EROSION CONTROL MIX BERM
NOT TO SCALE



EROSION CONTROL MIX BERMS SHALL BE USED ONLY AS FOLLOWS:

1. BERMS SHALL BE USED IN AREAS WHERE EROSION WILL OCCUR ONLY IN THE FORM OF SHEET EROSION AND THERE IS NO CONCENTRATION OF WATER IN A CHANNEL OR DRAINAGE WAY ABOVE THE BERM.
2. THE BERMS SHALL BE INSTALLED FOLLOWING THE CONTOUR OF THE LAND AS CLOSLY AS POSSIBLE.
3. THE BERMS SHALL BE INSTALLED ON SLOPES LESS THAN 5%
4. SUBJECT TO (E), BELOW, THE MIX SHALL HAVE AN ORGANIC PORTION BETWEEN 80 AND 100%, DRY WEIGHT BASIS, AND BE FIBROUS AND ELONGATED SUCH AS FROM SHREDDED BARK, STUMP GRINDINGS, COMPOSED BARK, OR EQUIVALENT MANUFACTURED PRODUCTS.
5. WOOD AND BARK CHIPS, GROUND CONSTRUCTION DEBRIS, OR REPROCESSED WOOD PRODUCTS SHALL NOT BE USED AS ORGANIC MATERIAL.
6. THE MIX SHALL NOT CONTAIN SILTS, CLAY, OR FINE SANDS.
7. THE MIX SHALL HAVE A PARTICLE SIZE BY WEIGHT OF 70 TO 85% PASSING A 6-INCH SCREEN AND A MAXIMUM OF 85% PASSING THE 0.75-INCH SCREEN.
8. THE MIX PH SHALL BE BETWEEN 5.0 AND 8.0.
9. THE BERM SHALL BE AT LEAST 12 INCHES HIGH AND AT LEAST 2 FEET WIDE.
10. TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, EROSION CONTROL MIX BERMS, PAGE 106.

E7



MAINTENANCE

ALL STRUCTURES SHOULD BE INSPECTED AFTER EVERY RAIN STORM AND REPAIRS MADE AS NECESSARY. SEDIMENT SHOULD BE REMOVED FROM TRAPPING DEVICES AFTER THE SEDIMENT HAS REACHED A MAXIMUM OF ONE HALF THE DEPTH OF THE TRAP. THE SEDIMENT SHOULD BE DISPOSED OF IN A SUITABLE AREA AND PROTECTED FROM EROSION BY EITHER STRUCTURE OR VEGETATIVE MEANS. THE TEMPORARY TRAPS SHOULD BE REMOVED AND THE AREA REPAIRED AS SOON AS THE CONTRIBUTING DRAINAGE AREA TO THE INLET HAS BEEN COMPLETELY STABILIZED.

BLOCK & GRAVEL DROP INLET SEDIMENT FILTER
NOT TO SCALE

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

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

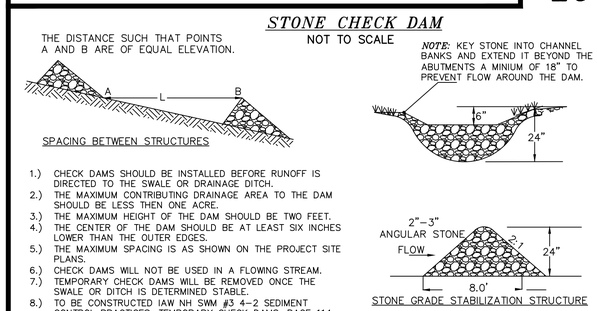
E8

TEMPORARY EROSION CONTROL MEASURES

1. THE SMALLEST PRACTICAL AREA OF LAND SHALL BE EXPOSED AT ANY ONE TIME.
2. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND AT LOCATIONS AS REQUIRED, DIRECTED BY THE ENGINEER.
3. ALL DISTURBED AREAS SHALL BE RETURNED TO ORIGINAL GRADES AND ELEVATIONS. DISTURBED AREAS SHALL BE LOAMED WITH A MINIMUM OF 4" OF LOAM AND SEEDED WITH NOT LESS THAN ONE POUND OF SEED PER 50 SQUARE YARDS OF AREA. (SEE SEED SPECIFICATIONS THIS SHEET)
4. ALL DISTURBED AREAS WILL BE RESTABILIZED WITHIN 45 DAYS. AT ANY ONE TIME, NO MORE THAN 5 ACRES, (217,800 Sq. Ft.) WILL BE DISTURBED.
5. SILT FENCES AND PERIMETER BARRIERS SHALL BE INSPECTED PERIODICALLY AND AFTER EVERY RAIN DURING THE LIFE OF THE PROJECT. ALL DAMAGED AREAS SHALL BE REPAIRED, SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED OF.
6. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, THE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE REMOVED AND THE AREA DISTURBED BY THE REMOVAL SMOOTHED AND RE-VEGETATED.
7. PER THE EPA CGP REQUIREMENTS THERE WILL BE REPORTS OF THE EROSION CONTROL INSPECTIONS IAW SWPPP PREPARED BY BS&E. ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER 0.25" OR GREATER RAIN EVENT.
8. DITCHES, SWALES, AND BASINS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
9. DO NOT TRAFFIC EXPOSED SOIL SURFACES WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION SYSTEM.
10. 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-EROSIVE MATERIAL SUCH AS STONE OR RIP RAP HAS BEEN INSTALLED, OR
    - 11.3. EROSION CONTROL BLANKETS HAVE BEEN INSTALLED.
12. THIS PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.
13. THE NHDES STORMWATER MANUAL, IN THREE VOLUMES, DATED DECEMBER 2008, IS A PART OF THIS PLAN SET AND THE MORE RESTRICTIVE WILL GOVERN. (NH SWM)

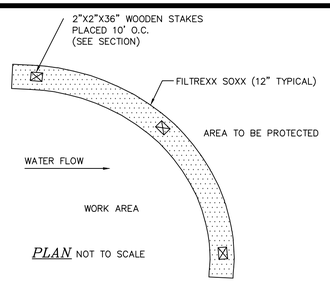
E9

STONE CHECK DAM
NOT TO SCALE



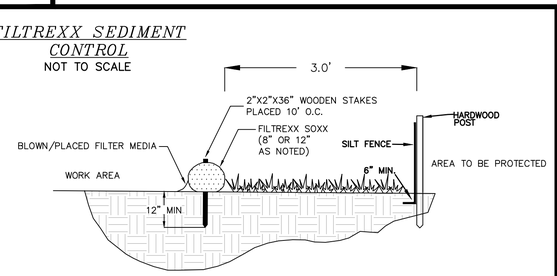
1.) CHECK DAMS SHOULD BE INSTALLED BEFORE RUNOFF IS DIRECTED TO THE SWALE OR DRAINAGE DITCH.
2.) THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE DAM SHOULD BE LESS THEN ONE ACRE.
3.) THE MAXIMUM HEIGHT OF THE DAM SHOULD BE TWO FEET.
4.) THE CENTER OF THE DAM SHOULD BE AT LEAST SIX INCHES LOWER THAN THE OUTER EDGES.
5.) THE MAXIMUM SPACING IS AS SHOWN ON THE PROJECT SITE PLANS.
6.) CHECK DAMS WILL NOT BE USED IN A FLOWING STREAM.
7.) TEMPORARY CHECK DAMS WILL BE REMOVED ONCE THE SWALE OR DITCH IS DETERMINED STABLE.
8.) TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, TEMPORARY CHECK DAMS, PAGE 114.

E10



PLAN NOT TO SCALE

FILTREXX SEDIMENT CONTROL
NOT TO SCALE



NOTES

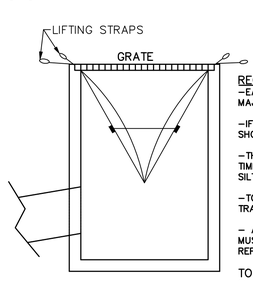
1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2. FILTER MEDIA FILL TO MEET APPLICATION REQUIRMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.
4. SILTSOXX MAY BE USED IN PLACE OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
5. SILTSOXX COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL 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 International, LLC
35481 Grafton Eastern Rd | Grafton, Oh 44044
440-926-2607 | fax: 440-926-4021
WWW.FILTREXX.COM
OR APPROVED EQUAL

NOTE: FOR AREAS REQUIRING DOUBLE PERIMETER CONTROL WITHIN 50' OF JURISDICTIONAL WETLANDS AND NOT FOR ALL SILT SOXX APPLICATIONS. THIS DUPLICATION MAY BE SPECIFIED AS 12" SILT SOXX OR ORANGE CONSTRUCTION FENCE AS NOTED.

SECTION NOT TO SCALE

E11



RECOMMENDED MAINTENANCE SCHEDULE

-EACH SILTSACK SHOULD BE INSPECTED AFTER EVERY MAJOR RAIN EVENT, AND MUST BE MAINTAINED.

-IF THERE HAVE BEEN NO MAJOR EVENTS, SILTSACK SHOULD BE INSPECTED EVERY 2-3 WEEKS.

-THE RESTRAINT CORD SHOULD BE VISIBLE AT ALL TIMES. IF CORD IS COVERED WITH SEDIMENT, THE SILTSACK SHOULD BE EMPTIED.

-TO BE USED IN ALL AREAS WHERE THERE WILL BE TRAFFIC.

- ARE SUBJECT TO DAMAGE BY SNOW PLOWS, AND MUST BE INSPECTED AFTER ANY SNOW EVENT AND REPLACED AS REQUIRED.

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

SILTSACK DETAIL
NOT TO SCALE

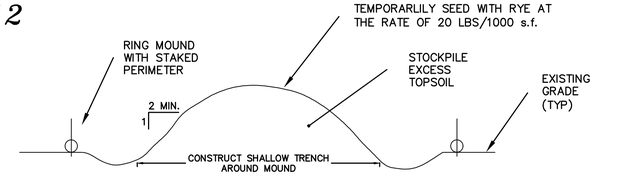
E-101

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

AS NOTED
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 - 152

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14248
LICENSED PROFESSIONAL ENGINEER

E12



TO BE CONSTRUCTED IAW NH SWM #3 4–1 EROSION CONTROL PRACTICES, SOIL STOCKPILE PRACTICES, PAGE 46.

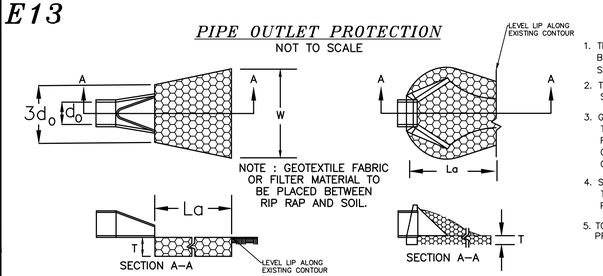
TOPSOIL STOCKPILE MOUND

NOT TO SCALE

E13

PIPE OUTLET PROTECTION

NOT TO SCALE



PIPE OUTLET TO FLAT AREA WITH NO DEFINED CHANNEL

PIPE OUTLET TO WELL–DEFINED CHANNEL

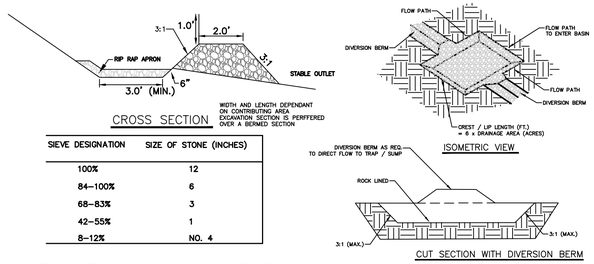
PIPE OUTLET PROTECTION CONSTRUCTION SPECIFICATIONS

1. THE SUB GRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIP RAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS. SPECIFIED GRADATION.
2. THE ROCK OR GRAVEL USED FOR FILTER OF RIP RAP SHALL CONFORM TO NHDOT SECTION 583.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIP RAP DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
4. STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.
5. TO BE CONSTRUCTED IAW NH SWM #2 4–6 CONVEYANCE PRACTICES, 6. OUTLET PROTECTION, PAGE 172.

E14

TABLE 7–24––RECOMMENDED RIP RAP GRADATION RANGES		
d50 SIZE= 0.5	FEET	6 INCHES
% OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE	SIZE OF STONE (INCHES) FROM	TO
100%	9	12
85%	8	11
50%	6	9
15%	2	3

E15



SIEVE DESIGNATION	SIZE OF STONE (INCHES)
100%	12
84–100%	6
68–83%	3
42–55%	1
8–12%	NO. 4

1. TRAP TO BE INSTALLED AS CLOSE TO THE DISTURBED AREA OR SOURCE OF SEDIMENT AS POSSIBLE.
2. THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE TRAP SHALL BE LESS THAN 5 ACRES.
3. THE MINIMUM VOLUME OF THE TRAP SHALL BE 3,600 CUBIC FEET OF STORAGE FOR EACH ACRE OF DRAINAGE AREA.
4. THE SIDE SLOPES OF THE TRAP SHALL BE 3:1 OR FLATTER AND SHALL BE STABILIZED IMMEDIATELY AFTER THEIR CONSTRUCTION.
5. THE OUTLET OF THE TRAP SHALL BE A MINIMUM OF ONE FOOT BELOW THE CREST OF THE TRAP AND SHALL DISCHARGE TO A STABILIZED AREA.
6. THE TRAP SHALL BE CLEANED WHEN 50 PERCENT OF THE ORIGINAL VOLUME IS FILLED.
7. THE MATERIALS REMOVED FROM THE TRAP SHALL BE PROPERLY DISPOSED OF AND STABILIZED.

STONE LINED SEDIMENT TRAP

E16

NOTE: THIS PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

NOTE: Temporary seed mix for stabilization of turf shall be winter rye or oats at a rate of 2.5 lbs. per 1000 s.f. and shall be placed prior to OCT. 15, if permanent seeding not yet complete.

SEEDING GUIDE

USE	SEEDING MIXTURE 1/	DROUGHTY	WELL DRAINED	MODERATELY WELL DRAINED	POORLY DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	FAIR	GOOD	GOOD	FAIR
	B	POOR	GOOD	FAIR	FAIR
	C	POOR	GOOD	EXCELLENT	GOOD
	D	FAIR	FAIR	GOOD	EXCELLENT
	E	FAIR	EXCELLENT	EXCELLENT	POOR
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A	GOOD	GOOD	GOOD	FAIR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
	D	GOOD	EXCELLENT	EXCELLENT	FAIR
LIGHTLY USED PARKING LOTS, 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/

GRAVEL PIT, SEE NH–PM–24 IN APPENDIX FOR RECOMMENDATION REGARDING RECLAMATION OF SAND AND GRAVEL PITS.

1/ REFER TO SEEDING MIXTURES AND RATES IN TABLE 7–36.
2/ POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREA AND ATHLETIC FIELDS.

* RECOMMENDED

SEEDING RATES

MIXTURE	POUNDS PER ACRE	POUNDS PER 1,000 Sq. Ft.
A. TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
RED TOP	2	0.05
TOTAL	42	0.95
B. TALL FESCUE	15	0.35
CREEPING RED FESCUE	10	0.25
CROWN VETCH	15	0.35
OR		
FLAT PEA	30	0.75
TOTAL	40 OR 55	0.95 OR 1.35
C. TALL FESCUE	24	0.55
CREEPING RED FESCUE	24	0.55
BIRDS FOOT TREFOIL	REMOVED	REMOVED
TOTAL	48	1.10
D. TALL FESCUE	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.
TALL FESCUE (35%)	15	0.35
CREEPING RED FESCUE (25%)	15	0.35
ANNUAL RYEGRASS (12%)	5	0.12
PERENNIAL RYEGRASS (10%)	5	0.12
KENTUCKY BLUEGRASS (10%)	15	0.35
WHITE CLOVER (3%)	7	0.16

SEEDING SPECIFICATIONS

1. GRADING AND SHAPING
   A. SLOPES SHALL NOT BE STEEPER THAN 2:1;3:1 SLOPES OR FLATTER ARE PREFERRED.
   WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.
2. SEEDBED PREPARATION
   A. SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
   B. STONES LARGER THAN 4 INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEED BED AND MIX FERTILIZER AND LIME INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.
3. ESTABLISHING A STAND
   A. LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING
   AND INCORPORATED INTO THE SOIL KINDS AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE,
   THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:
   AGRICULTURAL LIMESTONE, 2 TONS PER ACRE OR 100LBS. PER 1,000 SQ.FT.
   NITROGEN(N), 50LBS. PER ACRE OR 1.1LBS. PER 1,000 SQ.FT.
   PHOSPHATE(P2O5), 100LBS. PER ACRE OR 2.2LBS. PER 1,000 SQ.FT.
   POTASH(K2O), 100LBS. PER ACRE OR 2.2LBS. PER 1,000 SQ.FT.
   (NOTE: THIS IS THE EQUIVALENT OF 500LBS. PER ACRE OF 10–20–20 FERTILIZER OR 1,000LBS. PER ACRE OF 5–10–10.)
   B. SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH .25 INCH OF SOIL OR LESS, BY CULTIPACKING OR RAKING.
   C. REFER TO TABLE(G–E1 THIS SHEET) FOR APPROPRIATE SEED MIXTURES AND TABLE(H–E1 THIS SHEET) FOR RATES OF SEEDING. ALL LEGUMES (CROWNVETCH, BIRDSFOOT TREFOIL, AND FLATPEA) MUST BE INOCULATED WITH THEIR SPECIFIC INOCULANT.
   D. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 10 TO SEPTEMBER 1.
4. MULCH
   A. HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.
   B. MULCH WILL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE BEST MANAGEMENT PRACTICE FOR MULCHING. HAY OR STRAW MULCH SHALL BE PLACED AT A RATE OF 90LBS PER 1000 S.F.
5. MAINTENANCE TO ESTABLISH A STAND
   A. PLANTED AREA SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.
   B. FERTILIZATION NEEDS SHOULD BE DETERMINED BY ONSITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIAL STAKE 2 TO 3 YEARS TO BECOME ESTABLISHED.
   C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, OCCASIONAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.
6. TO BE CONSTRUCTED IAW NH SWM #3 4–1 EROSION CONTROL PRACTICES, PERMANENT VEGETATION, PAGE 60.

E17

CONSTRUCTION SEQUENCE:

1.) CUT AND REMOVE TREES IN CONSTRUCTION AREA ONLY AS REQUIRED, RELOCATE ANY PROJECT T.B.M.

2.) CONSTRUCT AND/OR INSTALL TEMPORARY AND PERMANENT SEDIMENT EROSION AND DETENTION CONTROL FACILITIES AS SPECIFIED. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY SOIL LAND DISTURBANCE AND MUST BE REVIEWED AND APPROVED BY THE COMMUNITY SERVICES DEPARTMENT.

3.) EROSION, SEDIMENT AND DETENTION CONTROL FACILITY SHALL BE INSTALLED & STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.TEMPORARY DIVERSIONS MAY BE REQUIRED. POST CONSTRUCTION STORM WATER MANAGEMENT PRACTICES MUST BE INITIATED AND STABILIZED EARLY IN THE PROCESS.

4.) CLEAR, CUT AND DISPOSE OF DEBRIS IN APPROVED FACILITY

5.) CONSTRUCT TEMPORARY CULVERTS AS REQUIRED, OR DIRECTED

6.) CONSTRUCT ROADWAYS FOR ACCESS TO DESIRED CONSTRUCTION AREAS. ALL ROADS SHALL BE STABILIZED IMMEDIATELY

7.) START BUILDING CONSTRUCTION

8.) INSTALL PIPE AND CONSTRUCTION ASSOCIATED APPURTENANCES AS REQUIRED OR DIRECTED. INSTALL RAIN GARDENS. ALL DISTURBED AREAS SHALL STABILIZED IMMEDIATELY AFTER GRADING.

9.) BEGIN PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES AND DISTURBED AREAS SHALL BE SEEDED OR MULCHED AS REQUIRED, OR DIRECTED. NO AREA IS ALLOWED TO BE DISTURBED FOR A LENGTH OF TIME THAT EXCEEDS 60 DAYS BEFORE BEING STABILIZED. DAILY, OR AS REQUIRED. ALL ROADWAYS AND PARKING AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADES. ALL CUT AND FILL SLOPES SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADES.

10.) CONSTRUCT TEMPORARY BERMS, DRAINS DITCHES, SILT FENCES, SEDIMENT TRAPS, ETC. MULCH AND SEED AS REQUIRED.

11.) INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION. ALL SWPPP INSPECTIONS MUST BE CONDUCTED BY A QUALIFIED PROFESSIONAL SUCH AS A PROFESSIONAL ENGINEER (PE), A CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC), A CERTIFIED EROSION SEDIMENT AND STORM WATER INSPECTOR (CESSW), OR A CERTIFIED PROFESSIONAL IN STORM WATER QUALITY (CPSWQ). INSPECTION REPORTS SHALL BE SUBMITTED TO THE COMMUNITY SERVICES DEPARTMENT.

12.) COMPLETE PERMANENT SEEDING AND LANDSCAPING.

13.) REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER SEEDING AREAS HAVE ESTABLISHED THEMSELVES AND SITE IMPROVEMENTS ARE COMPLETE.

14.) SMOOTH AND REVEGETATE ALL DISTURBED AREAS.

15.) FINISH PAVING ALL ROADWAYS.

E18

DEFINITION OF STABLE:

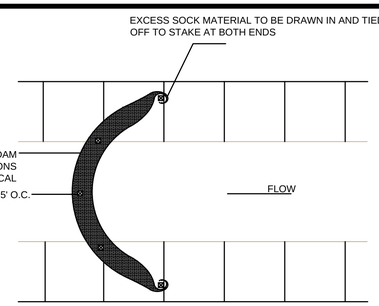
PER ENV–WQ 1500 ALTERATION OF TERRAIN

1. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED.
2. A MINIMUM OF 85 PERCENT VEGETATED GROWTH HAS BEEN ESTABLISHED..
3. A MINIMUM OF 3 INCHES OF NON–EROSIVE MATERIAL SUCH AS STONE OR RIP–RAP HAS BEEN INSTALLED.
4. OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

ADDITION STABILIZATION NOTES:

5. HAY MULCH OR OTHER APPROVED METHODS SHALL BE USED TO CONTROL EROSION OF NEWLY GRADED AREAS. ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED WITHIN 72 HOURS AFTER THEIR CONSTRUCTION.
6. DISTURBED SOIL AREAS SHALL BE EITHER TEMPORARILY OR PERMANENTLY STABILIZED. IN AREAS WHERE FINAL GRADING HAS NOT OCCURRED, TEMPORARY STABILIZATION MEASURES SHOULD BE IN PLACE WITHIN SEVEN (7) CALENDAR DAYS FOR EXPOSED SOIL AREAS THAT ARE WITHIN ONE HUNDRED (100) FEET OF A SURFACE WATER BODY OR A WETLAND AND NO MORE THAN 14 CALENDAR DAYS FOR ALL OTHER AREAS. PERMANENT STABILIZATION SHOULD BE IN PLACE WITHIN THREE (3) CALENDAR DAYS FOLLOWING COMPLETION OF FINAL GRADING OF EXPOSED SOIL AREAS.

E19

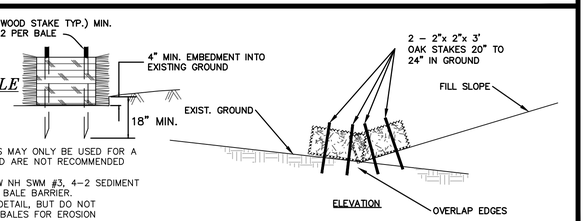


FILTREXX CHECK DAM

NOT TO SCALE

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

E20

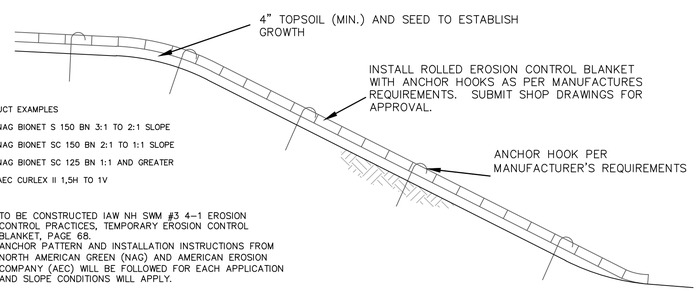


STAKED HAYBALE DETAIL

NOT TO SCALE

1.) HAY BALES BARRIERS MAY ONLY BE USED FOR A MAXIMUM OF 60 DAYS AND ARE NOT RECOMMENDED FOR PERIMETER CONTROL.
2.) TO BE INSTALLED IAW NH SWM #3, 4–2 SEDIMENT CONTROL, STRAW OR HAY BALE BARRIER.
3.) REQUIRED TO SHOW DETAIL, BUT DO NOT RECCOMEND USE OF HAY BALES FOR EROSION CONTROL.

E21



PRODUCT EXAMPLES

1.) NAG BIONET S 150 BN 3:1 TO 2:1 SLOPE
2.) NAG BIONET SC 150 BN 2:1 TO 1:1 SLOPE
3.) NAG BIONET SC 125 BN 1:1 AND GREATER
4.) AEC CURLEX II 1,5H TO 1V

1. TO BE CONSTRUCTED IAW NH SWM #3 4–1 EROSION CONTROL PRACTICES, TEMPORARY EROSION CONTROL BLANKET, PAGE 68.
2. ANCHOR PATTERN AND INSTALLATION INSTRUCTIONS FROM NORTH AMERICAN GREEN (NAG) AND AMERICAN EROSION COMPANY (AEC) WILL BE FOLLOWED FOR EACH APPLICATION AND SLOPE CONDITIONS WILL APPLY.

ROLLED EROSION CONTROL BLANKET (RECB)
SLOPE STABILIZATION DETAIL

NOT TO SCALE

E22

WINTER STABILIZATION NOTES

1. ALL DISTURBED AREAS THAT DO NOT HAVE AT LEAST 85% VEGETATIVE COVERAGE PRIOR TO OCTOBER 15TH SHALL BE STABILIZED BY APPLYING MULCH AT A RATE OF 3–4 TONS PER ACRE. ALL SIDE SLOPES, STEEPER THAN 4:1, THAT ARE NOT DIRECTED TO SWALES OR DETENTION BASINS, SHALL BE LINED WITH BIODEGRADABLE/PHOTODEGRADABLE "JUTE MATTING" (EXCELSIOR'S CURLEX II OR EQUAL). ALL OTHER SLOPES SHALL BE MULCHED AND TACKED AT A RATE OF 3–4 TONS PER ACRE. THE APPLICATION OF MULCH AND/OR JUTE MATTING SHALL NOT OCCUR OVER EXISTING SNOW COVER. IF THE SITE IS ACTIVE AFTER OCTOBER 15TH, ANY SNOW THAT ACCUMULATES ON DISTURBED AREAS SHALL BE REMOVED. PRIOR TO SPRING THAW ALL AREAS WILL BE STABILIZED, AS DIRECTED ABOVE.

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

3. PRIOR TO OCT. 15TH ALL ROADWAY AND PARKING AREAS SHALL BE BROUGHT UP TO AND THROUGH THE BANK RUN GRAVEL APPLICATION. IF THESE AREAS' ELEVATIONS ARE PROPOSED TO REMAIN BELOW THE PROPOSED SUBGRADE ELEVATION, THE SUBGRADE MATERIAL SHALL BE ROUGHLY CROWNED AND A 3" LAYER OF CRUSHED GRAVEL SHALL BE PLACED AND COMPACTED. THIS WILL ALLOW THE SUBGRADE TO SHED RUNOFF AND WILL REDUCE ROADWAY EROSION. THIS CRUSHED GRAVEL DOES NOT HAVE TO CONFORM TO NH DOT 304.3, BUT SHALL HAVE BETWEEN 15–25% PASSING THE #200 SIEVE AND THE LARGEST STONE SIZE SHALL BE 2". IF THE SITE IS ACTIVE AFTER OCTOBER 15TH, ANY ACCUMULATED SNOW SHALL BE REMOVED FROM ALL ROADWAY AND PARKING AREAS.

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

DOVER PLANNING FILE #

REVISION	DATE	DESCRIPTION

EROSION & SEDIMENT CONTROL DETAILS
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

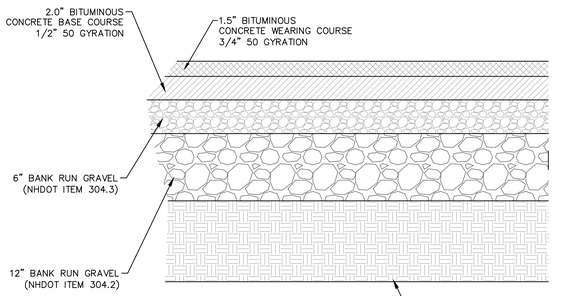
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

AS NOTED
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 – 152

STATE OF NEW HAMPSHIRE – KENNETH A. BERRY No. 14248 LICENSED PROFESSIONAL ENGINEER

E–102

C1



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

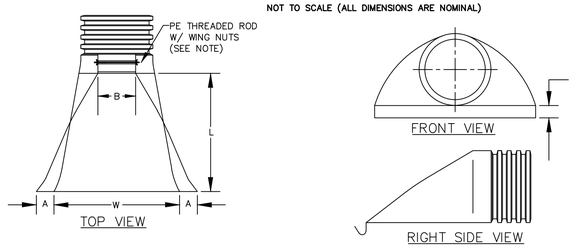
C2

PART No.	PIPE SIZE	A	B(MAX)	H	L	W
1510-NP	15" 375 mm	6.5" 165 mm	10" 254 mm	6.5" 165 mm	25" 635 mm	29" 735 mm
1810-NP	18" 450 mm	7.5" 190 mm	15" 380 mm	6.5" 165 mm	32" 812 mm	35" 890 mm
2410-NP	24" 600 mm	7.5" 190 mm	18" 450 mm	6.5" 165 mm	36" 900 mm	45" 1140 mm
3010-NP	30" 750 mm	10.5" 266 mm	N/A	7.0" 178 mm	53" 1345 mm	68" 1725 mm
3610-NP	36" 900 mm	10.5" 266 mm	N/A	7.0" 178 mm	53" 1345 mm	68" 1725 mm

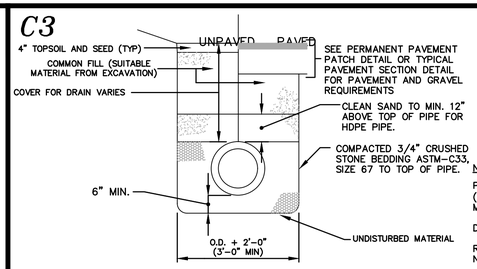
NOTE: PE THREADED ROD W/ WING NUTS PROVIDED FOR END SECTIONS 15"-24". 30" & 36" END SECTIONS TO BE WELDED PER MANUFACTURER'S RECOMMENDATIONS.

ADS N-12 FLARED END SECTIONS

NOT TO SCALE (ALL DIMENSIONS ARE NOMINAL)



C3



NOTE:

PLASTIC DRAIN PIPE (HDPE) SHALL BE ADS N-12 (CORRUGATED EXTERIOR/SMOOTH INTERIOR) OR EQUAL MEETING AASHTO M-252 AND H-20 LOADING.

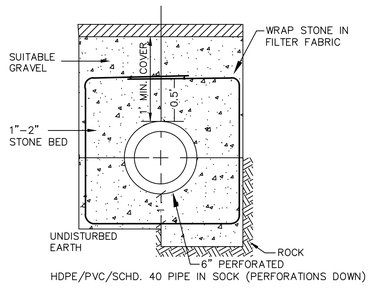
DI DRAIN PIPE SHALL BE CL. 50.

RC DRAIN PIPE SHALL BE CLASS III UNLESS OTHERWISE NOTED.

TYPICAL DRAIN PIPE TRENCH

NOT TO SCALE

C4



HDPE/PVC/SCHD. 40 PIPE IN SOCK (PERFORATIONS DOWN)

30"

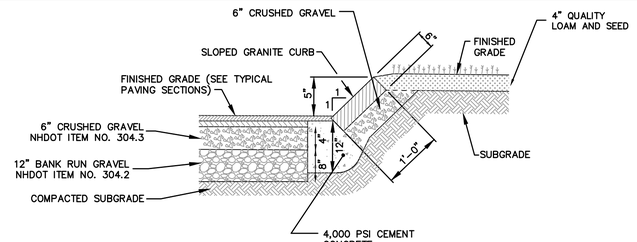
NOTE:

1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS.

UNDERDRAIN TRENCH DETAIL

NOT TO SCALE

C5



SLOPE GRANITE CURB DETAIL

NOT TO SCALE

C6

CONE GRATE

NOT TO SCALE

NOTE:

MUST BE HAALA INDUSTRIES INC. OR EQUAL.

Cone Grates Top Mount



CG12TM
Part No. CG12TM

Save Trees

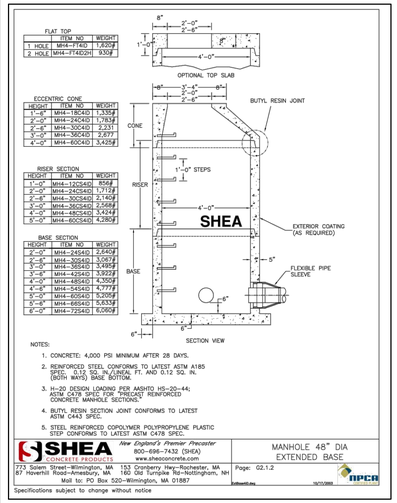
Top Mount Cone Grates are designed to mount on the top of round manhole inlet or outlet structures to keep debris from entering the storm water system. Top mount cone grates are easy to install and allow for at grade manhole installations but can be used in a variety of applications. Grates 96" and larger are made as a two piece, bolt together design.

- Plate and bar hybrid design is both clean and cost effective
- Made from 1/2" plate with 3/4" or 1" round bars depending on grate size
- Anti vortex plate can be added upon request
- Hinged and lockable access doors can be added upon request
- Galvanized steel construction. Can be made from aluminum or stainless steel.

C7

48" MANHOLE ROUND EXTENDED BASE

NOT TO SCALE



NOTES:

1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. REINFORCED STEEL CONFORMS TO LATEST ASTM A185 SPEC. 0.17 SQ. IN./LINEAL FT. AND 0.12 SQ. IN. (BOTH WAYS) BASE BOTTOM.
3. H-20 DESIGN LOADING PER AASHTO HS-20-44; ASTM C478 SPEC FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS."
4. BUTYL RESIN SECTION JOINT CONFORMS TO LATEST ASTM C443 SPEC.
5. STEEL REINFORCED COPOLYMER POLYPROPYLENE PLASTIC STEP CONFORMS TO LATEST ASTM C478 SPEC.

SHEA CONCRETE PRODUCTS — *New England's Premier Precaster* 800-696-7432 (SHEA) www.sheaconcrete.com

773 Salem Street-Wilmington, MA 153 Cranberry Hwy-Rochester, MA
87 Haverhill Road-Amesbury, MA 160 Old Turnpike Rd-Nottingham, NH
Mail to: PO Box 520-Wilmington, MA 01887

MANHOLE 48" DIA EXTENDED BASE

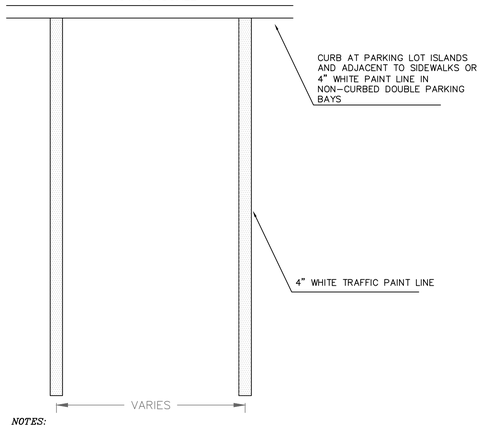
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Specifications subject to change without notice

C8

PARKING SPACE DETAIL

NOT TO SCALE

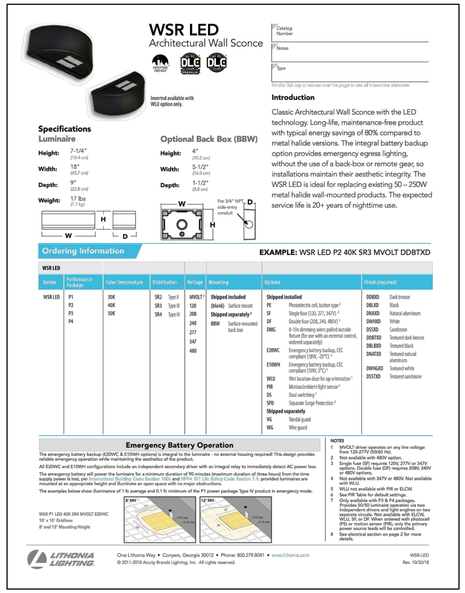


NOTES:

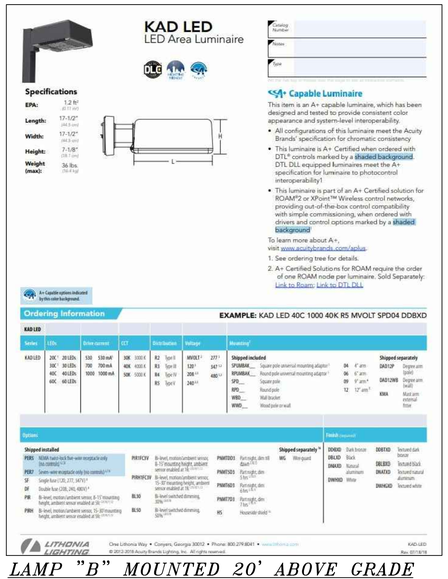
1.) PROVIDE TWO COATS OF PAINT ON ALL PARKING LINES.
2.) SEE PROPOSED SITE PLANS FOR LOCATION OF PARKING SPACES.
3.) PAINTED SPACES ONLY WHERE MARKED ON SITE PLAN

C9

LAMP "A" MOUNTED 12' ON BUILDING



C10



LAMP "B" MOUNTED 20' ABOVE GRADE

DOVER PLANNING FILE #

REVISION	DATE	DESCRIPTION

CONSTRUCTION DETAILS
LAND OF
INDEX PACKAGING INC.
150 VENTURE
DOVER, N.H.
TAX MAP D, LOT 9A

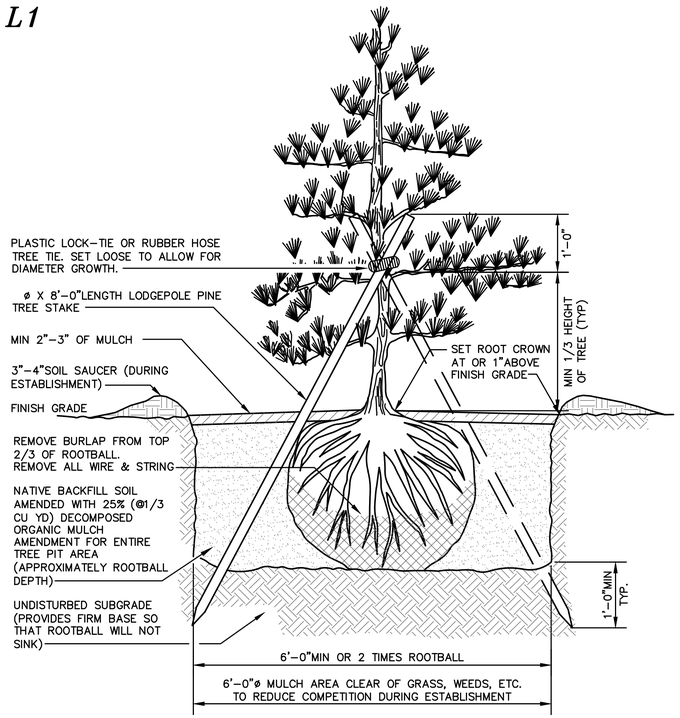
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

AS NOTED
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 - 152

STATE OF NEW HAMPSHIRE — KENNETH A. BERRY No. 14745 — LICENSED PROFESSIONAL ENGINEER

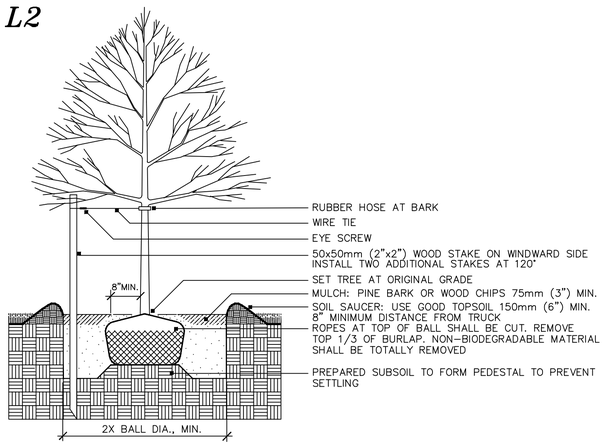
C-101

L1



CONIFEROUS TREE PLANTING

L2



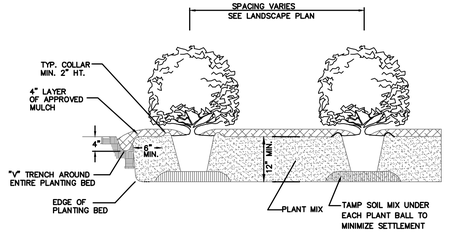
DECIDUOUS TREE PLANTING

NOTE: STAKING TO BE USED IN PARKING ISLANDS AND OTHER CONFINED AREAS AS NECESSARY TO AVOID CONFLICTS WITH PEDESTRIANS

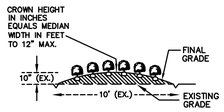
L3

NOTES:

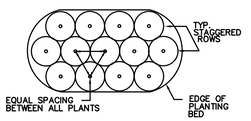
1. SCARIFY ROOT MASS OF CONTAINERIZED PLANT MATERIAL.
2. INSTALL CONTAINERIZED PLANTS AT FINSHED GRADE
3. TAMP PLANTING MIX FIRMLY AS PIT IS FILLED AROUND EACH PLANT BALL.
4. OMIT COLLAR AROUND EACH SHRUB WHEN IRRIGATION SYSTEM IS PRESENT.
5. SOAK EACH PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.



TYPICAL PLANTING BED DETAIL



TYPICAL BED CROWNING

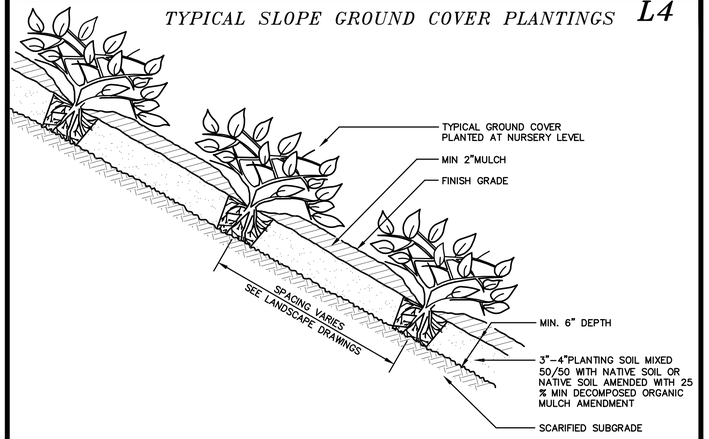


TYPICAL PLANTING BED PLAN

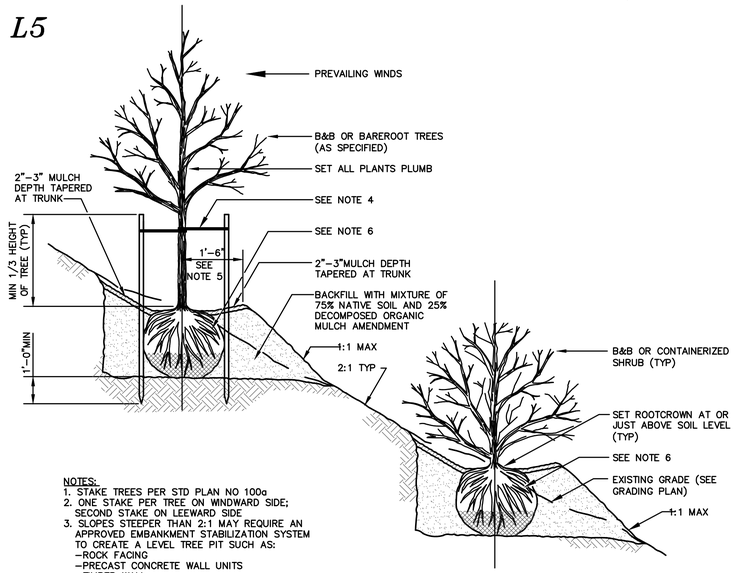
SHRUB & HEDGE PLANTING

L4

TYPICAL SLOPE GROUND COVER PLANTINGS



L5



NOTES:
1. STAKE TREES PER STD PLAN NO 100a
2. ONE STAKE PER TREE ON WINDWARD SIDE; SECOND STAKE ON LEEWARD SIDE
3. SLOPES STEEPER THAN 2:1 MAY REQUIRE AN APPROVED EMBANKMENT STABILIZATION SYSTEM TO CREATE A LEVEL TREE PIT SUCH AS:
   –ROCK FACING
   –PRECAST CONCRETE WALL UNITS
   –TIMBER WALL
   –MANUFACTURED SLOPE RETENTION UNITS
4. CHAINLOCK TREE TIE. LOOP EACH TIE AROUND TREE LOOSELY TO PROVIDE 1" SLACK FOR DIAMETER GROWTH.
5. SHAPE SOIL TO PROVIDE 3' DIAMETER OR ROOTBALL DIAMETER, WHICHEVER IS GREATER, WATERING RING.
6. REMOVE ALL WIRE AND STRING. REMOVE TOP 2/3 OF BURLAP.

TREE PLANTING ON SLOPES

L6

NOTES:

1.) CALL DIG SAFE PRIOR TO BEGINNING WORK. (1–888–344–7233). THE LANDSCAPE CONTRACTOR IS ADVISED OF THE PRESENCE OF UNDERGROUND UTILITIES AND SHALL VERIFY THE EXISTENCE AND LOCATION OF THE SAME BEFORE COMMENCING AND DIGGING OPERATIONS. THE LANDSCAPE CONTRACTOR SHALL REPLACE OR REPAIR UTILITIES, PAVING, WALKS, CURBING, ETC DAMAGED IN PERFORMANCE OF THIS JOB AT NO ADDITIONAL COST TO THE OWNER OR GENERAL CONTRACTOR.

2.) CONTRACTOR SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL SITE CONDITIONS PRIOR TO CONSTRUCTION BIDDING. SEE NOTE XXX ON OVERALL SITE PLAN.

3.) PROVIDED SMOOTH TRANSITION WHERE NEW WORK MEETS EXISTING CONDITIONS.

4.) ALL PLANT MATERIAL INSTALLED SHALL MEET THE SPECIFICATIONS OF "AMERICAN STANDARD FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN.

5.) ALL PLANT MATERIALS SHALL BE FREE FROM INSECTS AND DISEASE.

6.) ALL PLANTINGS SHALL BE DONE IN ACCORDANCE WITH ACCEPTABLE HORTICULTURAL PRACTICES. THIS IS TO INCLUDE PROPER PLANTING MIX, PLANT BED AND TREE PIT PREPARATION, PRUNING STAKING OR GUYING, WRAPPING, SPRAYING, FERTILIZATION, PLANTING AND ADEQUATE MAINTENANCE UNTIL ACCEPTANCE FROM OWNER.

7.) ALL GRASS, OTHER VEGETATION AND DEBRIS SHALL BE REMOVED FROM ALL PLANTING AREAS PRIOR TO PLANTING.

8.) THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF EXISTING AND NEWLY PLANTED TREES AND SHRUBS DURING THE CONSTRUCTION PROCESS. WHERE REQUIRED, THE CONTRACTOR SHALL INSTALL TEMPORARY FENCING (SNOW OR EQUAL) AROUND EXISTING TREES AND SHRUBS THAT COULD BE IMPACTED BY THE CONSTRUCTION PROCESS. STORAGE OF CONSTRUCTION EQUIPMENT, CONSTRUCTION MATERIALS, SNOW STORAGE AND OR VEHICLE PARKING SHALL NOT BE PERMITTED WITHIN THE DRIP LINE OF TREES OR TWENTY FEET WHICH EVER IS GREATER.

9.) NEW PLANTINGS SHALL BE INSTALLED PER PROJECT DRAWINGS AND SPECIFICATION THAT INCLUDE FERTILIZATION AND MULCHING AS REQUIRED.

10.) ALL SHRUB BEDS AND TREE PITS SHALL BE MULCHED WITH 3" CLEAN SHREDDED BLACK MULCH.

11.) WHERE INDICATED ON PLAN, PLANTING SOIL MIXTURE FOR GROUND COVER AND PERENNIAL BED AREAS SHALL CONSIST OF FOUR PARTS TOPSOIL, TWO PARTS SPHAGNUM PEAT MOSS, AND ONE PART HORTICULTURAL PERLITE BY VOLUME. PEAT MOSS MAY BE SUBSTITUTED WITH WELL–ROTTED OR DEHYDRATED MANURE OR COMPOST. ROTOTILL BEDS TO A DEPTH OF 8 INCHES.

12.) MAINTENANCE OF NEW PLANTINGS AND LAWNS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND OR LANDSCAPE SUBCONTRACTOR UNTIL ACCEPTANCE BY THE OWNER. RESPONSIBILITIES SHALL INCLUDE WATERING WEEDING AND 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.

13.) THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TEMPORARY EROSION CONTROL MEASURES DURING THE CONSTRUCTION PHASE AND UNTIL ALL AREAS HAVE BEEN STABILIZED AND ACCEPTED BY THE OWNER. THE GENERAL CONTRACTOR SHALL PROVIDE WEEKLY INSPECTIONS OF EROSION MEASURE AND IMMEDIATELY AFTER STORM EVENTS AND REPAIR AS NECESSARY.

14.) THE GENERAL CONTRACTOR AND OR THE LANDSCAPE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL THREE GUYING MATERIAL ONCE PLANT MATERIAL HAS BEEN ESTABLISHED. (MINIMUM OF ONE GROWNG SEASON). ALL TEMPORARY EROSION CONTROL MEASURE SHALL BE REMOVED ONCE STABILIZATION OF DISTURBANCE HAS BEEN ACCEPTED BY OWNER.

15.) THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR A MINIMUM OF TWO MOWINGS FOR ALL TURF AREAS OR UNTIL ACCEPTANCE BY THE OWNER. A MINIMUM UNIFORM 75% CATCH OF TURF IS REQUIRED FOR ACCEPTANCE.

16.) ALL PLANTINGS SHALL BE WATERED REGULARLY DURING THEIR FIRST YEAR AND MAINTAINED PERMANENTLY IN GOOD GROWING CONDITION AS AN EFFECTIVE VISUAL SCREEN.

17.) SHRUBS OR TREES WHICH DIE SHALL BE REPLACED WITHIN ONE GROWING SEASON WITH NEW SHRUBS OR TREES TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE LANDSCAPING REQUIREMENTS.

18.) ALL REQUIRED LANDSCAPING SHALL BE INSTALLED BEFORE OCCUPANCY, OR WITHIN SIX MONTHS IF OCCUPANCY OCCURS DURING WINTER CONDITIONS.

19.) TREES ARE TO BE 2–2.5" CALIPER 6" OFF THE ROOT BALL.

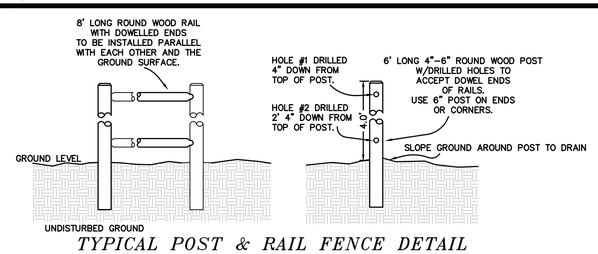
20.) ALL PLANT STOCK SHALL CONFORM TO ANSI Z260.1 – NURSERY STOCK, LATEST EDITIONS (AMERICAN ASSOCIATION OF NURSERYMEN, INC.)

21.) 4" AGED PINEBARK MULCH AND A WEED BARRIER (TY–PAR FABRIC OR APPROVED EQUAL) SHALL BE APPLIED TO ALL SHRUB AND GROUND COVER BEDS. INSTALL WEED BARRIER AS PER MANUFACTURERS RECOMMENDATIONS.

22.) PLANT–PIT BACK–FILL SHALL BE MIXED AT A RATE OF 7 PARTS OF TOPSOIL TO 2 PARTS OF DEHYDRATED COW MANURE. SLOW RELEASE FERTILIZER SHALL BE APPLIED AS PER MANUFACTURERS RECOMMENDATIONS. USE EXISTING ON–SITE TOPSOIL AS PART OF BACK FILL WHEN AVAILABLE.

23.) ALL LANDSCAPED AREAS NOT PLANTED WITH TREES, SHRUBS OR GROUNDCOVER SHALL BE RESTORED WITH SEED OR SOD AS INDICATED ON PLANS.

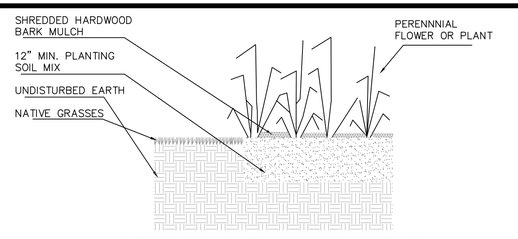
L7



TYPICAL POST & RAIL FENCE DETAIL

N.T.S.

L8



PERENNIAL PLANTING DETAIL

DOVER PLANNING FILE #

REVISION	DATE	DESCRIPTION

LANDSCAPING CONSTRUCTION DETAILS
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

AS NOTED
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 – 152

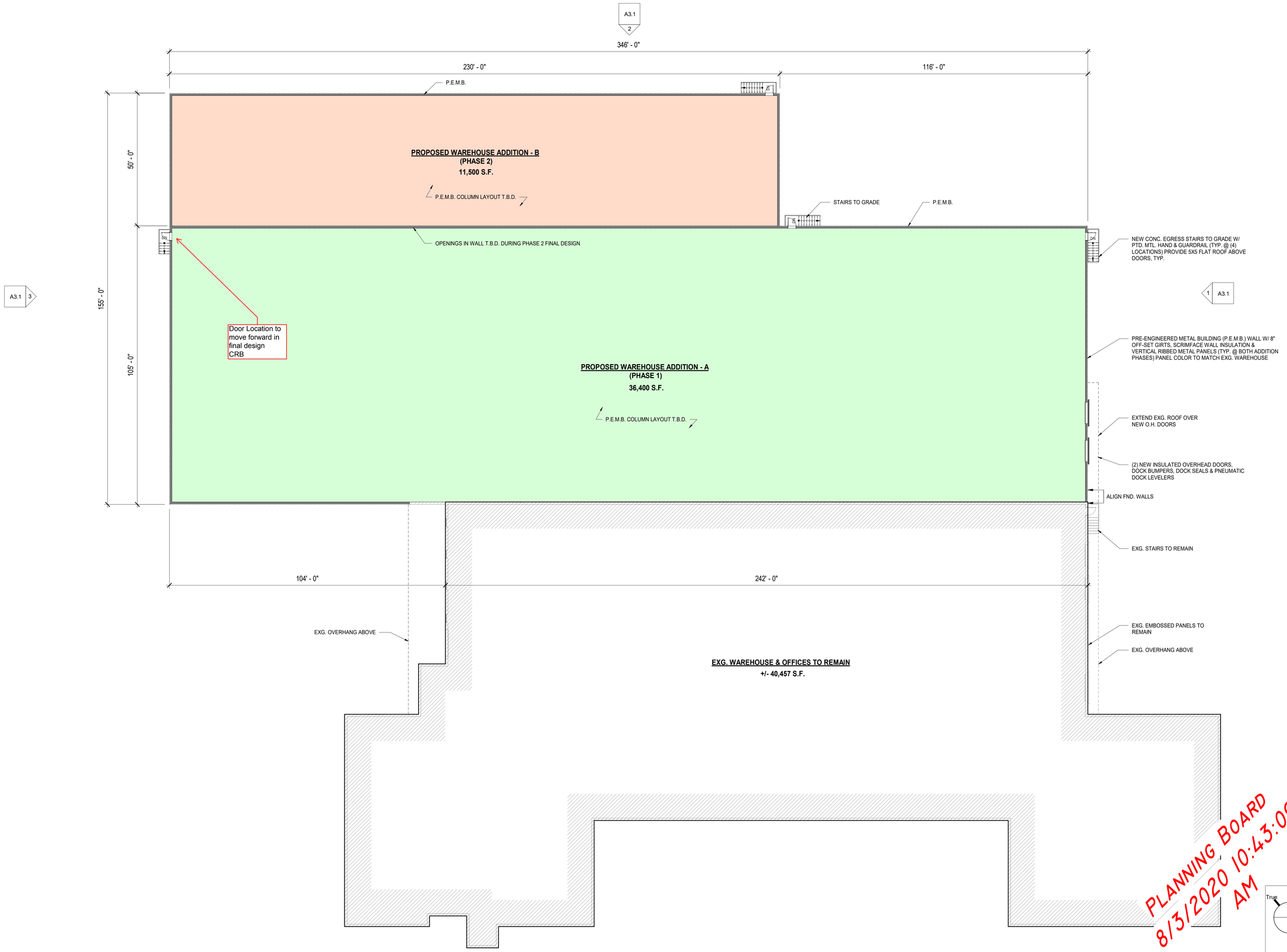
STATE OF NEW HAMPSHIRE – KENNETH A. BERRY No. 14245 – LICENSED PROFESSIONAL ENGINEER

L–101

T W DESIGNS LLC
254 DRAKE HILL RD. STRAFFORD, NH
P: 603.664.2181 | F: 603.664.9508

DESIGN | BUILD Architectural Document Set -
Prepared For Exclusive Use By :

WHITCHER BUILDERS



1 PROPOSED ADDITIONS
1/16" = 1'-0"

PLANNING BOARD
8/3/2020 10:43:09 AM

True

PROJECT NORTH

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No.	Description	Date

Revision Schedule

Project Info:

Index Packaging, Inc.

Venture Dr.
Dover, NH

Sheet Status:

Latest Release:
Issued For: Planning Board
Org. Issue Date: N.F.C.

JOB NO: 20037
DRAFTED: MLN
CHECKED: JMT

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

Sheet Title:

Proposed Addition Floor Plan & Ext. Elevations

Sheet Number:

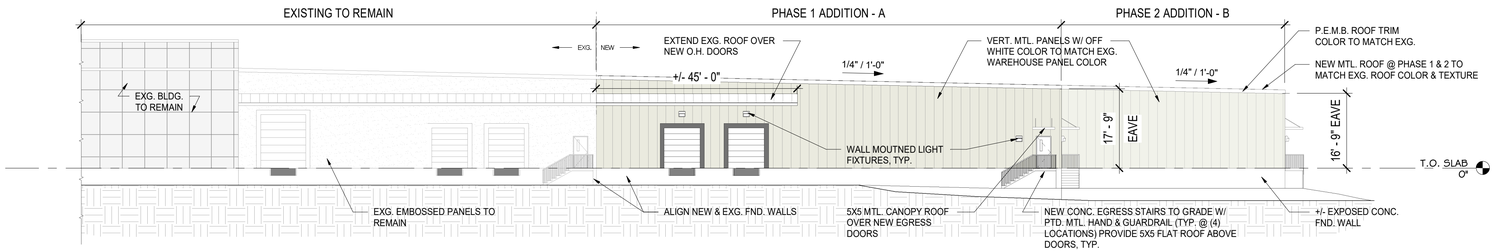
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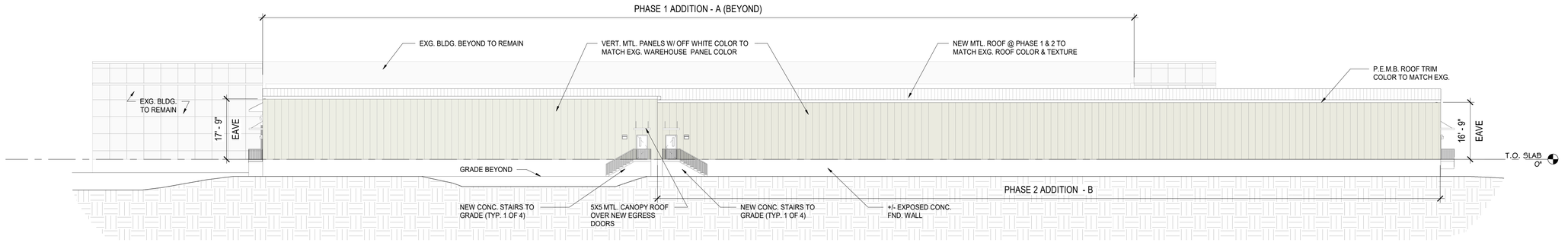
TW DESIGNS LLC
254 DRAKE HILL RD. STRAFFORD, NH
P: 603.664.2181 | F: 603.664.9508

DESIGN | BUILD Architectural Document Set -
Prepared For Exclusive Use By :

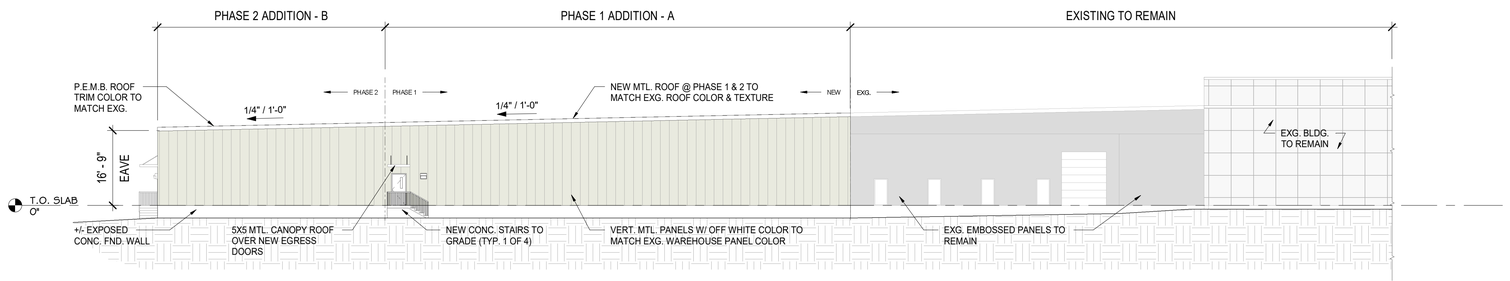
WHITCHER BUILDERS



1 EAST EXTERIOR ELEVATION
1/16" = 1'-0"



2 NORTH EXTERIOR ELEVATION
1/16" = 1'-0"



3 WEST EXTERIOR ELEVATION
1/16" = 1'-0"

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No.	Description	Date

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Project Info:

Index Packaging, Inc.

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JOB NO: 20037
DRAFTED: MLN
CHECKED: JMT

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

Sheet Title:

Exterior Elevations

Sheet Number:

A3.1

PLANNING BOARD
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DRAINAGE ANALYSIS
&
EROSION & SEDIMENT CONTROL PLAN

Prepared for:

Index Packaging, Inc.
1055 White Mountain Highway
Milton, NH 03851

LOCATION

150 VENTURE DRIVE
TAX MAP M, LOT 6

Prepared by:

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

Project Number:
DB 2019-152

September 14, 2020

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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

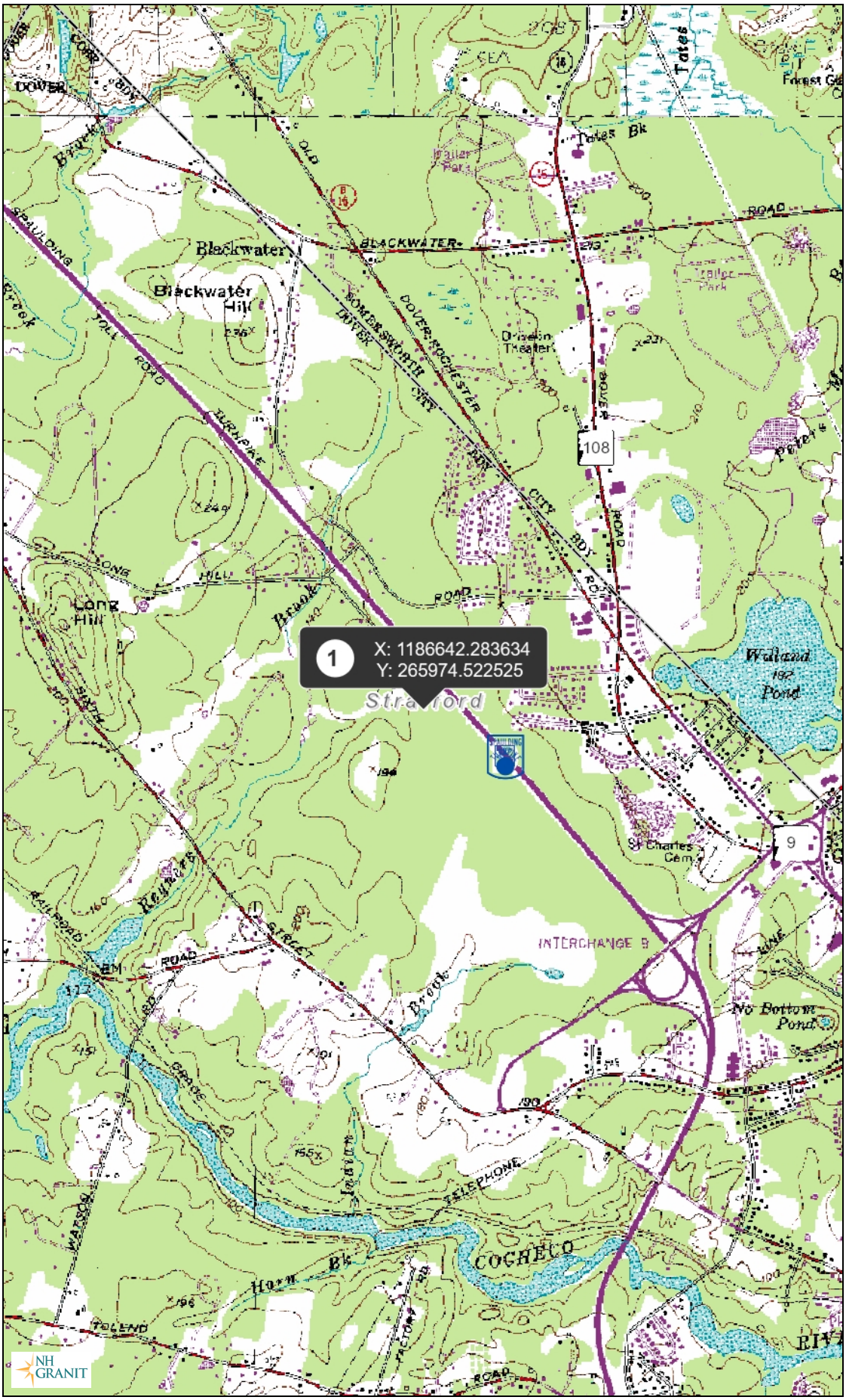
Appendix II - Proposed Conditions Analysis

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 Tables
Rip Rap Calculations
AoT Stormwater Treatment Shreadsheets
NCRS USDA Web-soil Map
Inspection and Maintenance Manual Stormwater System Management
Watershed Report Card, 303(d) List, & ORW List

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

Map by NH GRANIT



Legend

- State
- County
- City/Town

Map Scale

1: 24,000

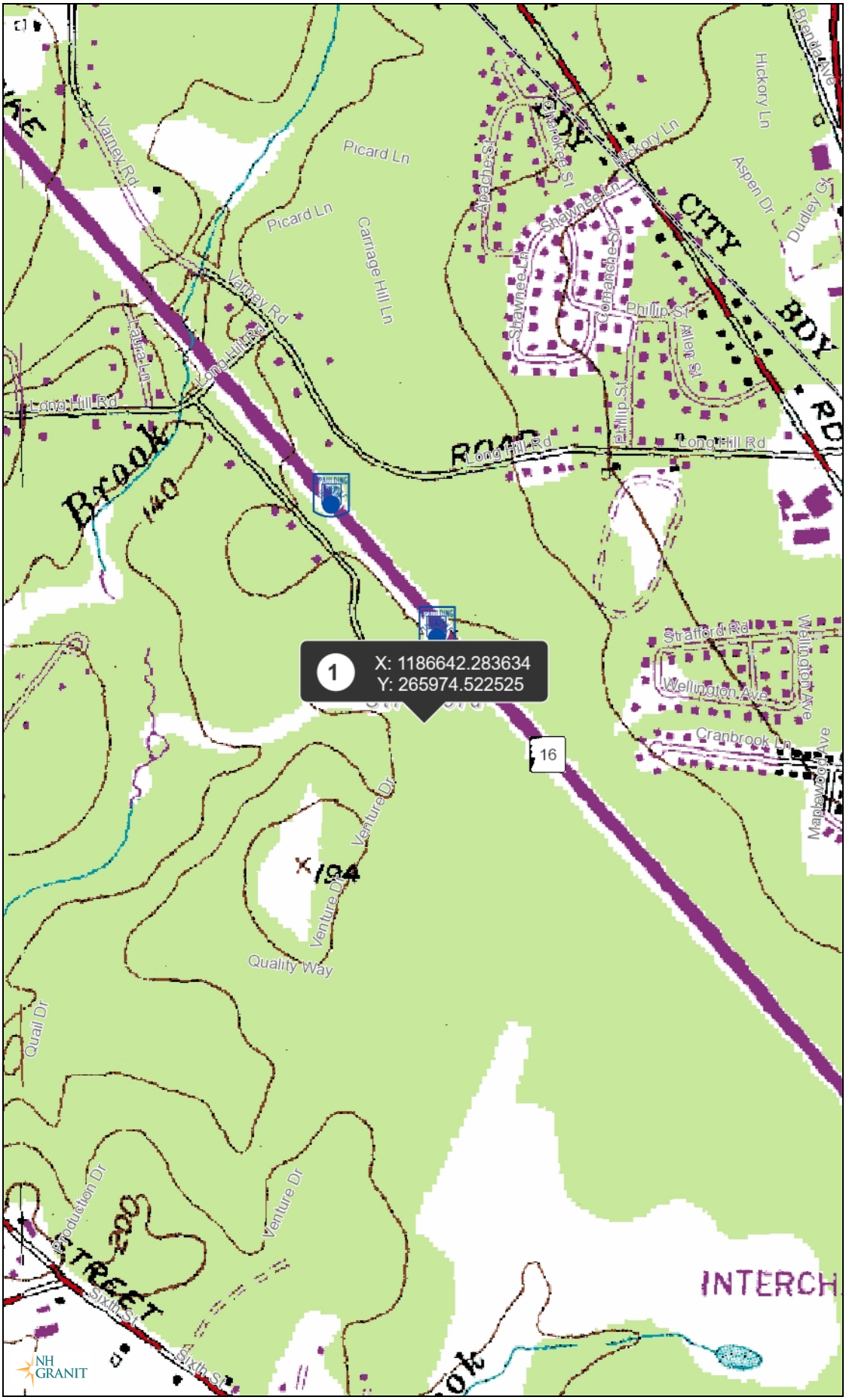
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Map Generated: 5/5/2020

Notes



Map by NH GRANIT



Legend

- State
- County
- City/Town

Map Scale

1: 10,000

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Map Generated: 5/5/2020

Notes



DESIGN METHOD OBJECTIVES

The owner / developer of Tax Map D, Lot 9A, Index Packaging, Inc. are proposing to develop the property at 150 Venture Drive adding a commercial building. The site currently includes a single commercial building.

An Existing and Proposed Conditions analysis was conducted for the purpose of estimating the peak rate of stormwater run-off and to subsequently design adequate mitigation of drainage. There are two existing drainage discharge points which was identified in the existing analysis and duplicated in the proposed conditions analysis. There are also two depressions in the existing analysis that capture and hold surface water runoff. Designing two watershed models we have compared the differences in these rates of peak run-off and surface water volume. Sheet W1, Existing Conditions Watershed Plan, outlines the characteristics of the site in its existing or pre-construction conditions. The second analysis displays the proposed (post-construction) conditions (See Sheet W2). The analysis was conducted using data for; 2 Yr – 24 Hr (3.61"), 10 Yr – 24 Hr (5.43"), 25 Yr -24 Hr (6.85"), 50 Yr – 24 Hr (8.19"), and 100 YR-24 Hr (9.78") storm events. Storm event analysis was accomplished using the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment. Rainfall quantities are based on the Extreme Precipitation Table for this location from the Northeast Regional Climate Center / Cornell University (http://precip.eas.cornell.edu). As Dover is considered a part of the Coastal Region, and therefore a 15% escalation on rain fall depths has been applied to this application.

1.0 Existing Conditions Analysis:

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

The existing parcel of land is being used for commercial purposes with a single existing commercial building, with parking and access. The land is partial grass land and partially woodland.

The soils within the development area are made up of multiple soil types, containing Hydrologic Soil Group (HSG) A, B, C & D. See Site Specific Soils Map and report for more information.

The applicant is proposing to construct two additions onto the existing building. The first building expansion phase will include the construction of a 36,400 Square Feet (SF) manufacturing addition, with additional loading docks adjacent to the existing loading docks. The second building expansion phase will include a 11,500 SF addition. As part of the building design, the existing parking lot to the northeast will be re-configured to be more efficient.

Final Reach #100

Subcatchments #1, #5, and #6 are included as addressed above. They discharge surface water runoff through existing infrastructure to the existing wetland along Venture Drive.

Subcatchments #5 & #6 consists of the existing parking arrays that drain directly into the existing catch basins (**Ponds 5 & 6**). The catch basins drain directly to **Final Reach #100**.

Subcatchment #1 consists of the remaining area on Lot 9-A and abutting Lot 9-A1 This subcatchment drains directly to **Final Reach #100**.

Final Reach #1000

Subcatchments #2, #3, #4 and #7 are included as addressed above. They discharge surface water runoff over the rear of the property and to the northwest corner of the lot.

Subcatchments #2, #3 & #4 consists of the area behind the existing building on Lot 9-A and 9-A1. Each subcatchment drains to an intermediate analysis point (**Reach #200, #300 & #400**) respectively, and ultimately to **Final Reach #1000.**

Subcatchment #7 consists of the area behind the existing building that drains to an existing 8" PVC pipe drain by the loading dock (**Pond 7**). The PVC drain overland flows to **Reach #200** and ultimately to **Final Reach #1000.**

2.0 Proposed Conditions Analysis:

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

The proposed conditions analysis consists of the same discharge point and patterns. The introduction of the building expansion increase the Weighted Curve number and the runoff is directed the rain gardens to be treated, detained, and infiltrated. The rip-rap spillway is inactive for the the design events.

Final Reach #100

There are no proposed changes in **Subcatchments #2, #3, #4 and #7,** thus there will be no increase in peak rate to **Final Reach #100**.

Final Reach #1000

Subcatchments #2, #3 & #4 are reduced in size due to the building addition and the construction of the rain garden. Each subcatchment drains to an intermediate analysis point (**Reach #200, #300 & #400**) respectively, and ultimately to **Final Reach #1000.**

Subcatchment #7 consists of the area behind the existing building that drains to an existing 8" PVC pipe drain by the loading dock (**Pond 7**). The PVC drain overland flows to **Reach #200** and ultimately to **Final Reach #1000.**

Subcatchment #8 is the area that runs off directly into the rain garden (**Pond #101**). This area consists of most of the parking along the wester boundary line and some of the proposed loading docks on the eastern side of the building. The proposed rain garden drains directly into the level spreader (**Pond #102**), and ultimately to **Final Reach #1000**.

Subcatchments #9, #10 & #11 consist of the existing and proposed buildings. The existing and proposed buildings are proposed to have gutters and downspouts that will discharge into rani garden #101 (**Pond #101**).

Subcatchment #12 is the area that runs off directly into the level spreader (**Pond #12**). The subcatchment flow over land (**Reach 12**) to analysis point **Reach #400**.

3.0 FULL COMPARATIVE ANALYSIS

Peak Rate of Discharge

ANALYSIS	COMPONENT	PEAK RATE DISCHARGE (Cubic Feet / Second)				
		2 Yr	10 Yr	25 Yr	50 Yr.	100 Yr.
Final Reach #100	Existing	6.29	14.42	21.48	28.44	36.91
	Proposed	6.29	14.42	21.48	28.44	36.91
Final Reach #200	Existing	2.43	6.00	9.13	12.26	16.08
	Proposed	1.65	4.01	6.09	8.14	10.66
Final Reach #300	Existing	2.43	6.22	9.78	13.48	17.99
	Proposed	1.65	4.06	6.36	8.68	11.56
Final Reach #400	Existing	6.36	13.81	20.31	26.70	34.49
	Proposed	1.94	4.43	7.42	16.25	28.05
Final Reach #1000	Existing	6.36	13.81	20.31	26.70	34.49
	Proposed	1.94	4.43	7.42	16.25	28.05

ANALYSIS	COMPONENT	VOLUME (ACRE FEET)				
		2 Yr	10 Yr	25 Yr	50 Yr.	100 Yr.
Final Reach #100	Existing	0.903	1.930	2.831	3.730	4.838
	Proposed	0.903	1.930	2.831	3.730	4.838
Final Reach #1000	Existing	0.604	1.259	1.835	2.410	3.121
	Proposed	0.587	0.976	1.546	2.115	2.822

Stormwater Treatment:

Treatment takes place within the designed rain garden on site. Pre-treatment is in the form of sheet-flow and forebays. The stormwater quality volume capability is treated within the rain garden.

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

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

The proposed site development is protected from erosion and the abutting properties are protected from sediment by the use of Best Management Practices as outlined in the New Hampshire Stormwater Manual, Volume 2, Post-Construction Best Management Practices Selection & Design (December 2008, NHDES & US EPA). Any area disturbed by construction will be re-stabilized within 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 System Operation and Maintenance Plan / Inspection & Maintenance Manual which has been written specifically for this project and available to the owner.

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

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

Bioretention System (Rain Garden)

Description: Rain Gardens, or bioretention areas are located close to the source of runoff. They are intended to integrate with the site landscaping an become an aesthetically attractive opportunity to provide highly effective stormwater treatment. The rain gardens associated with this proposed development contribute toward recharge of surface water run-off into the ground. It is important that sediment be removed from run-off prior to discharge into the bioretention area to preserve the mulch and soil mix ratio. During construction it is important that the ground surface not be exposed to traffic or construction equipment to preserve the infiltration capabilities of the existing soil. Construction specifications are included in the plan set and New Hampshire Stormwater Manual, Volume 2, 4-3 Treatment Practices, 4c Bioretention System.

Maintenance Considerations:
Rain Gardens should be inspected at least twice annually and following any rainfall event exceeding 2.5 inches in a twenty-four hour period. Maintenance rehabilitation

will be conducted as warranted by each inspection. Trash and debris will be removed at each inspection.

On an annual basis the infiltration capabilities need to be confirmed by evaluation the drawdown time. If the bioretention system does not drain within 72-hours following a rainfall event, a qualified professional will assess the condition of the rain garden to determine measures required to restore the infiltration function. This is normally the direct result of sediment accumulation which will be removed to restore the filter media ratio.

Also on an annual basis the vegetation should be inspected to ensure healthy condition. Invasive species need to be removed along with dead or diseased vegetation.

Vegetated Stabilization

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

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

Conservation Mix

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

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

Stabilized Construction Entrance

A temporary gravel construction entrance provides an area where mud can be dislodged from tires before the vehicle leaves the construction site to reduce the amount of mud and sediment transported onto paved municipal and state roads. The stone size for the

pad should be 3" coarse aggregate, and the pad itself constructed to a minimum length of 75' for the full width of the access road. The aggregate should be placed at least six inches thick. A plan view and profile are shown on Sheet E-101- Erosion & Sediment Control Detail Plan. (If applicable).

Environmental Dust Control

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

Vegetated Filter Strips / Buffers

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

Drainage Swales / Stormwater Conveyance Channels

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

Construction Sequence

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

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

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

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

5. Construct temporary culverts as required, or directed.

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

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

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

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

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

11. Complete permanent seeding and landscaping.

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

13. Smooth and revegetate all disturbed areas.

14. Finish paving all roadways.

Temporary Erosion Control Measures

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

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

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

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

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

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

Inspection and Maintenance Schedule

Fencing (if used) will be inspected during and after storm events to ensure that the fence still has integrity and is not allowing sediment to pass. Depending on SWPPP criteria, all controls will be inspected either once every 7 days or once every 14 days and after storm events. Inspection reports must be submitted to City of Dover Engineering Department. See also Stormwater System Operation & Maintenance Plan and Inspection & Maintenance Manual published separately also by Berry Surveying & Engineering. See also Storm Water Pollution Prevention Plan (SWPPP) developed in accordance with EPA NPDES requirements & the City of Dover Stormwater regulations.

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 flow are modeled to be reduced in the post-construction analysis / condition, as compared to the pre-construction peak rates of runoff flow. This reduction

occurs during the 10 Yr, 25 Yr, 50 Yr, and 100 Yr/24 Hr. extreme storm events due to the installation of the low impact development stormwater devices.

The volume of stormwater discharge from the site at is reduced due to construction grading and the retention of the rain garden. The rain garden is designed to manage the stormwater volume to threat the runoff.

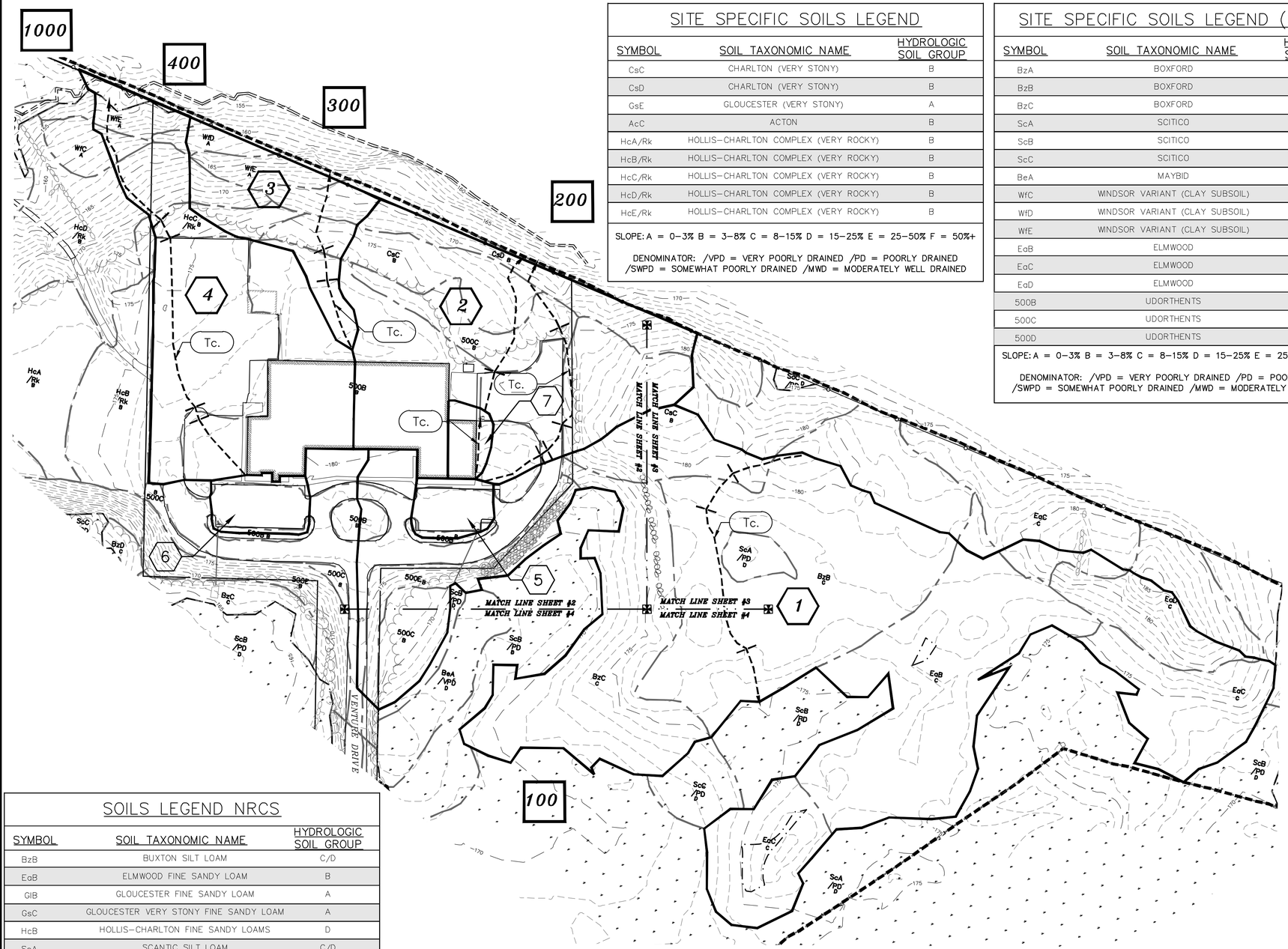
A Site Specific, Terrain Alteration Permit (RSA 485: A-17) is not required for this site plan due to the area of disturbance being less than 100,000 SF. The impact is approximately 92,000 square feet, so that an EPA Notice of Intent will be required to be filed prior to construction and a Stormwater Pollution Prevention Plan prepared.

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

Christopher R. Berry, SIT 567
Principal, President

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

James F. Hayden
Design Engineer / Project Manager



SITE SPECIFIC SOILS LEGEND

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
CsC	CHARLTON (VERY STONY)	B
CsD	CHARLTON (VERY STONY)	B
GsE	GLOUCESTER (VERY STONY)	A
AcC	ACTON	B
HcA/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcB/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcC/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcD/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcE/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B

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

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

SITE SPECIFIC SOILS LEGEND (CONT.)

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
BzA	BOXFORD	C
BzB	BOXFORD	C
BzC	BOXFORD	C
ScA	SCITICO	D
ScB	SCITICO	D
ScC	SCITICO	D
BeA	MAYBID	D
WfC	WINDSOR VARIANT (CLAY SUBSOIL)	A
WfD	WINDSOR VARIANT (CLAY SUBSOIL)	A
WfE	WINDSOR VARIANT (CLAY SUBSOIL)	A
EaB	ELMWOOD	C
EaC	ELMWOOD	C
EaD	ELMWOOD	C
500B	UDORTHENTS	B
500C	UDORTHENTS	B
500D	UDORTHENTS	B

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

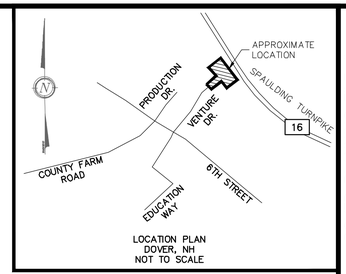
DENOMINATOR: /VPD = VERY POORLY DRAINED /PD = POORLY DRAINED /SWPD = SOMEWHAT POORLY DRAINED /MWD = MODERATELY WELL DRAINED

SOILS LEGEND NRCS

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
BzB	BUXTON SILT LOAM	C/D
EaB	ELMWOOD FINE SANDY LOAM	B
GlB	GLOUCESTER FINE SANDY LOAM	A
GsC	GLOUCESTER VERY STONY FINE SANDY LOAM	A
HcB	HOLLIS–CHARLTON FINE SANDY LOAMS	D
ScA	SCANTIC SILT LOAM	C/D
SfC	SUFFIELD SILT LOAM	C
SwA	SWANTON FINE SANDY LOAM	C/D
WdA	WINDSOR LOAMY SAND	A
WdB	WINDSOR LOAMY SAND	A
WfB	WINDSOR LOAMY FINE SAND	A

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

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



LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

2.) TAX MAP D, LOT 9A

3.) LOT AREA: 404,461 Sq. Ft., 9.29 Ac.

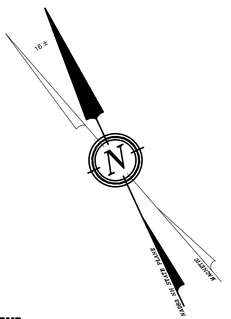
4.) S.C.R.D. BOOK 3851, PAGE 308

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 #33017C0320E, DATED: SEPTEMBER 30, 2015.

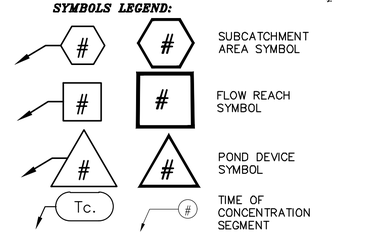
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8.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING DRAINAGE CONDITIONS ON TAX MAP D, LOT 9A AS OF THE DATE OF THE SURVEY.



SYMBOLS LEGEND:



GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

DOVER PLANNING FILE #

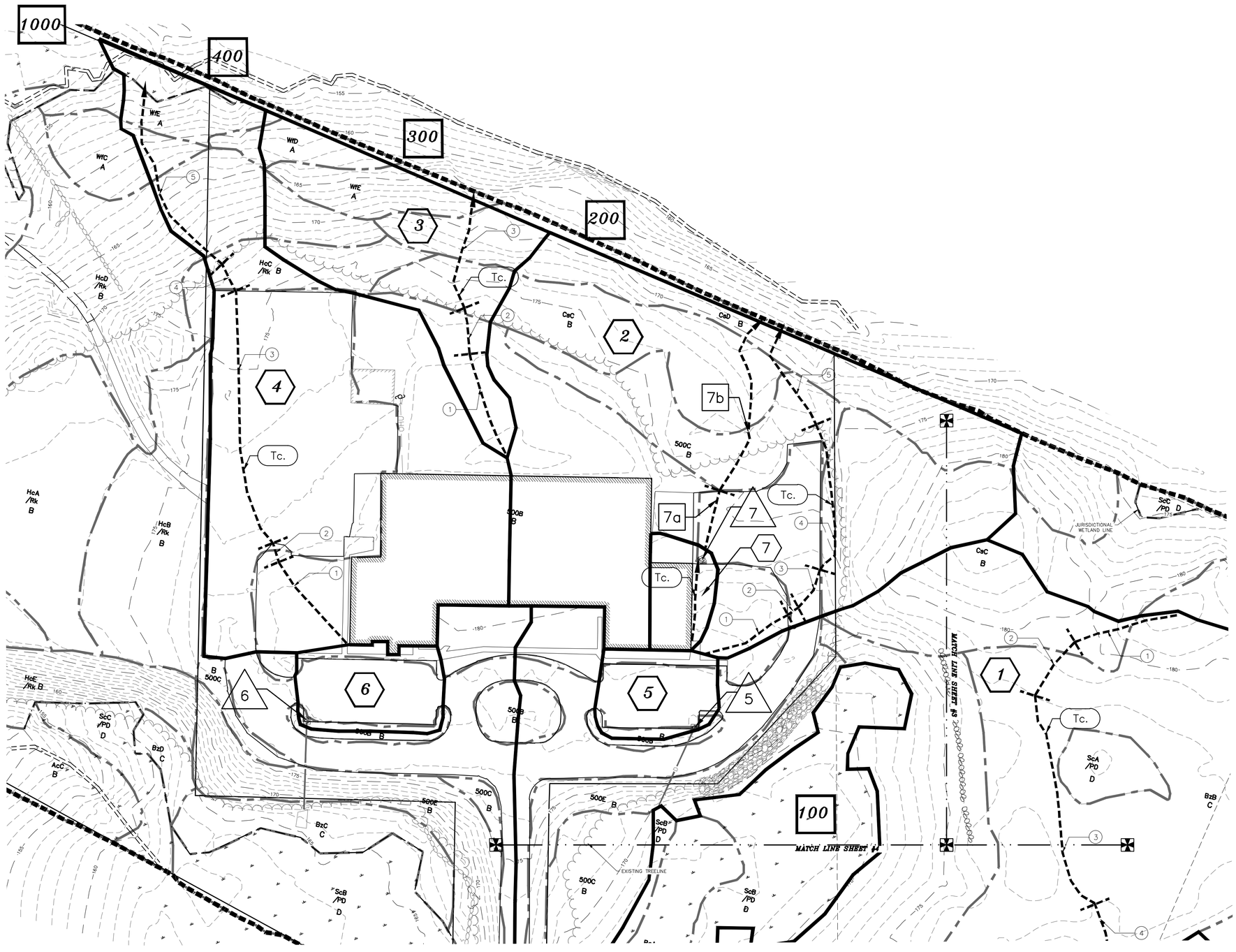
REVISION	DATE	DESCRIPTION

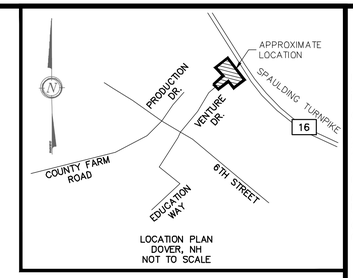
EXISTING CONDITIONS WATERSHED OVERVIEW
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 80 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 – 152

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





LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

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1055 WHITE MOUNTAIN HIGHWAY
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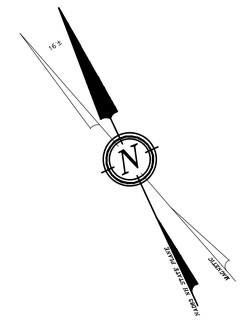
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SYMBOLS LEGEND:

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

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #

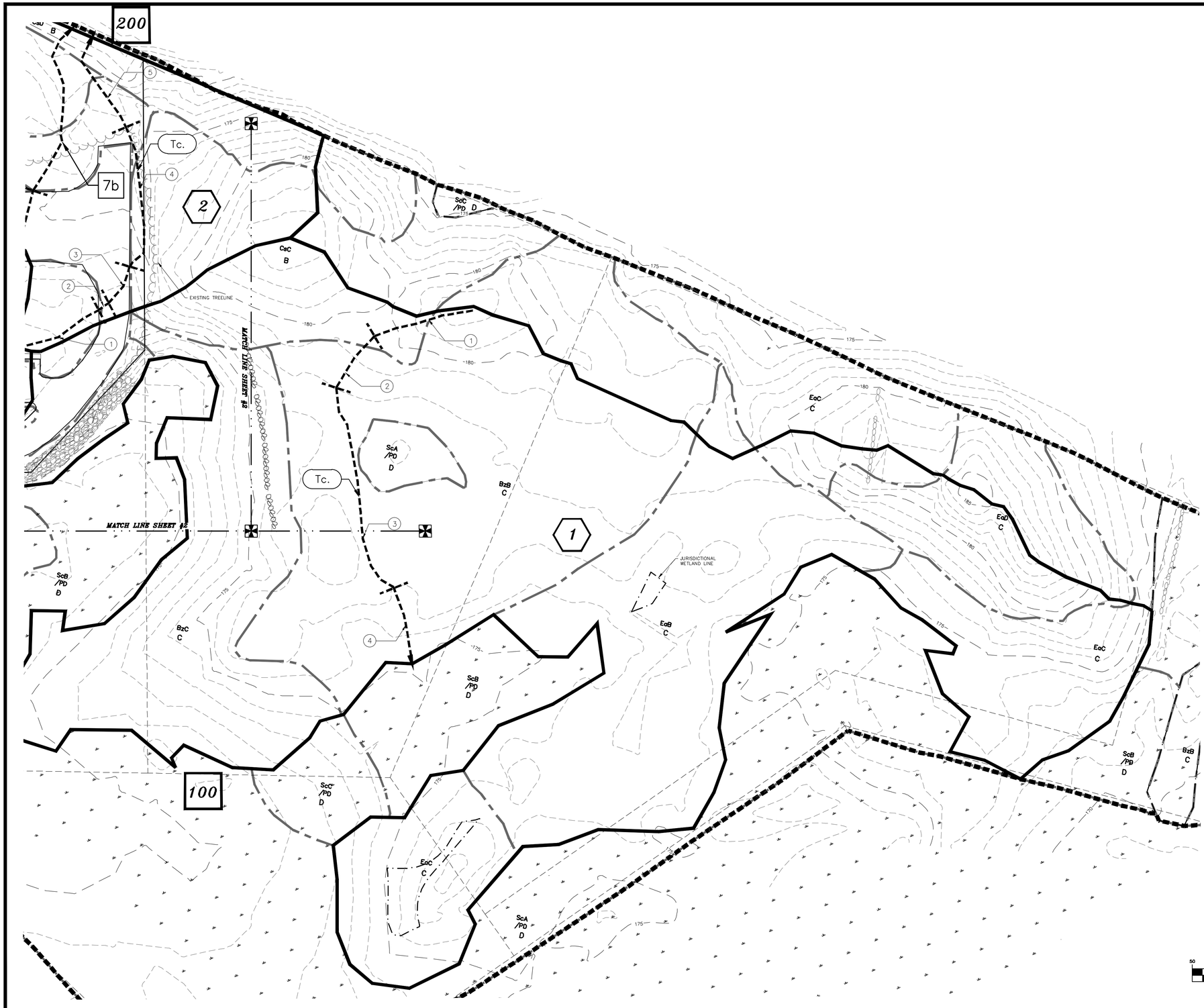
REVISION	DATE	DESCRIPTION

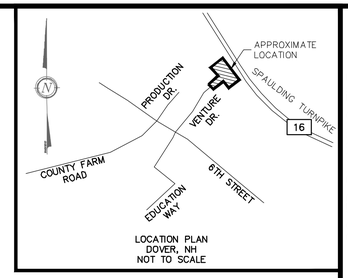
EXISTING CONDITIONS WATERSHED NORTH
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 50 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 – 152

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





LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

2.) TAX MAP D, LOT 9A

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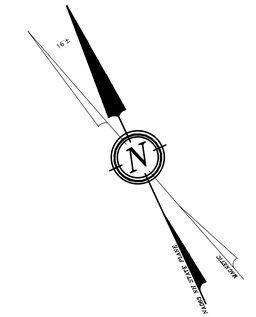
4.) S.C.R.D. BOOK 3851, PAGE 308

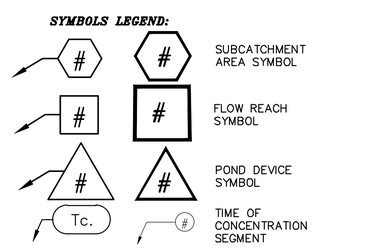
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GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #

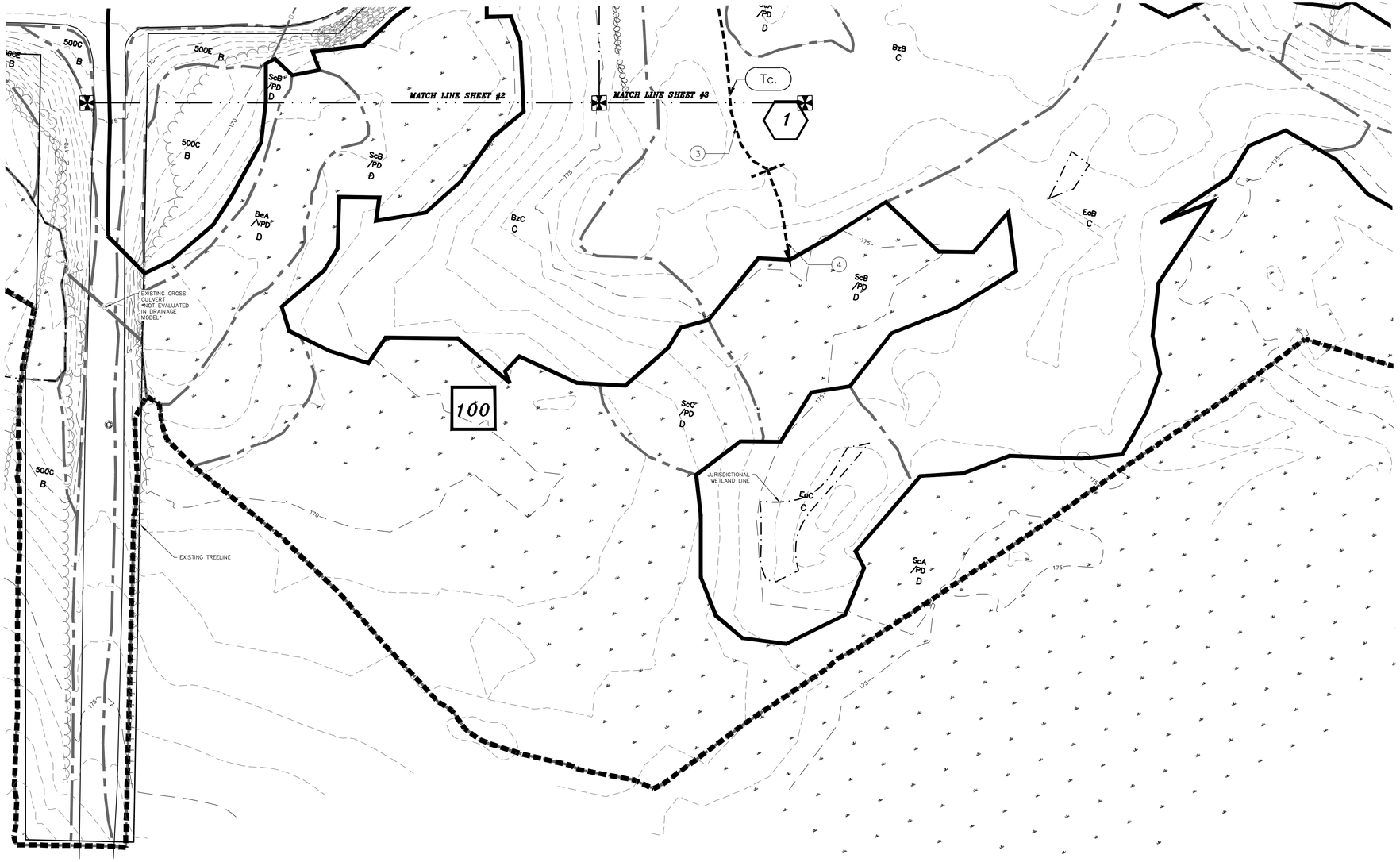
REVISION	DATE	DESCRIPTION

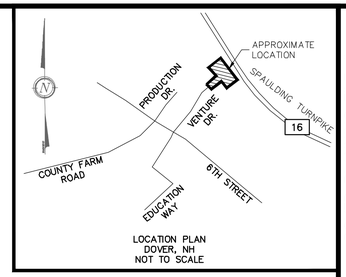
EXISTING CONDITIONS WATERSHED SOUTHEAST
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 50 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 - 152

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





LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

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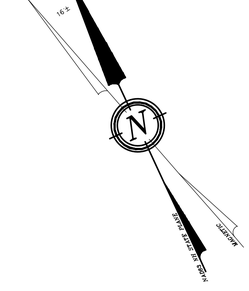
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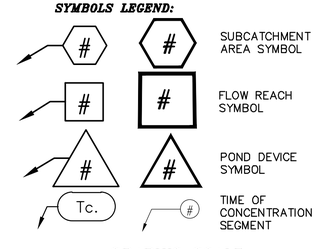
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SYMBOLS LEGEND:



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #

REVISION	DATE	DESCRIPTION

LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 50 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 - 152

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

SITE SPECIFIC SOILS LEGEND

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
CsC	CHARLTON (VERY STONY)	B
CsD	CHARLTON (VERY STONY)	B
GsE	GLOUCESTER (VERY STONY)	A
AcC	ACTON	B
HcA/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcB/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcC/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcD/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B
HcE/Rk	HOLLIS–CHARLTON COMPLEX (VERY ROCKY)	B

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

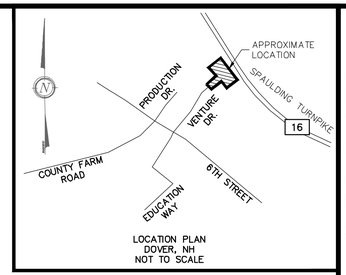
DENOMINATOR: /VPD = VERY POORLY DRAINED /PD = POORLY DRAINED /SWPD = SOMEWHAT POORLY DRAINED /MWD = MODERATELY WELL DRAINED

SITE SPECIFIC SOILS LEGEND (CONT.)

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
BzA	BOXFORD	C
BzB	BOXFORD	C
BzC	BOXFORD	C
ScA	SCITICO	D
ScB	SCITICO	D
ScC	SCITICO	D
BeA	MAYBID	D
WfC	WINDSOR VARIANT (CLAY SUBSOIL)	A
WfD	WINDSOR VARIANT (CLAY SUBSOIL)	A
WfE	WINDSOR VARIANT (CLAY SUBSOIL)	A
EaB	ELMWOOD	C
EaC	ELMWOOD	C
EaD	ELMWOOD	C
500B	UDORTHENTS	B
500C	UDORTHENTS	B
500D	UDORTHENTS	B

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

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



LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

2.) TAX MAP D, LOT 9A

3.) LOT AREA: 404,461 Sq. Ft., 9.29 Ac.

4.) S.C.R.D. BOOK 3851, PAGE 308

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SOILS LEGEND NRCS

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
BzB	BUXTON SILT LOAM	C/D
EgB	ELMWOOD FINE SANDY LOAM	B
GlB	GLOUCESTER FINE SANDY LOAM	A
GsC	GLOUCESTER VERY STONY FINE SANDY LOAM	A
HcB	HOLLIS–CHARLTON FINE SANDY LOAMS	D
ScA	SCANTIC SILT LOAM	C/D
SfC	SUFFIELD SILT LOAM	C
SwA	SWANTON FINE SANDY LOAM	C/D
WdA	WINDSOR LOAMY SAND	A
WdB	WINDSOR LOAMY SAND	A
WfB	WINDSOR LOAMY FINE SAND	A

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

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SYMBOLS LEGEND:

SUBCATCHMENT AREA SYMBOL

FLOW REACH SYMBOL

POND DEVICE SYMBOL

TIME OF CONCENTRATION SEGMENT

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

DOVER PLANNING FILE #

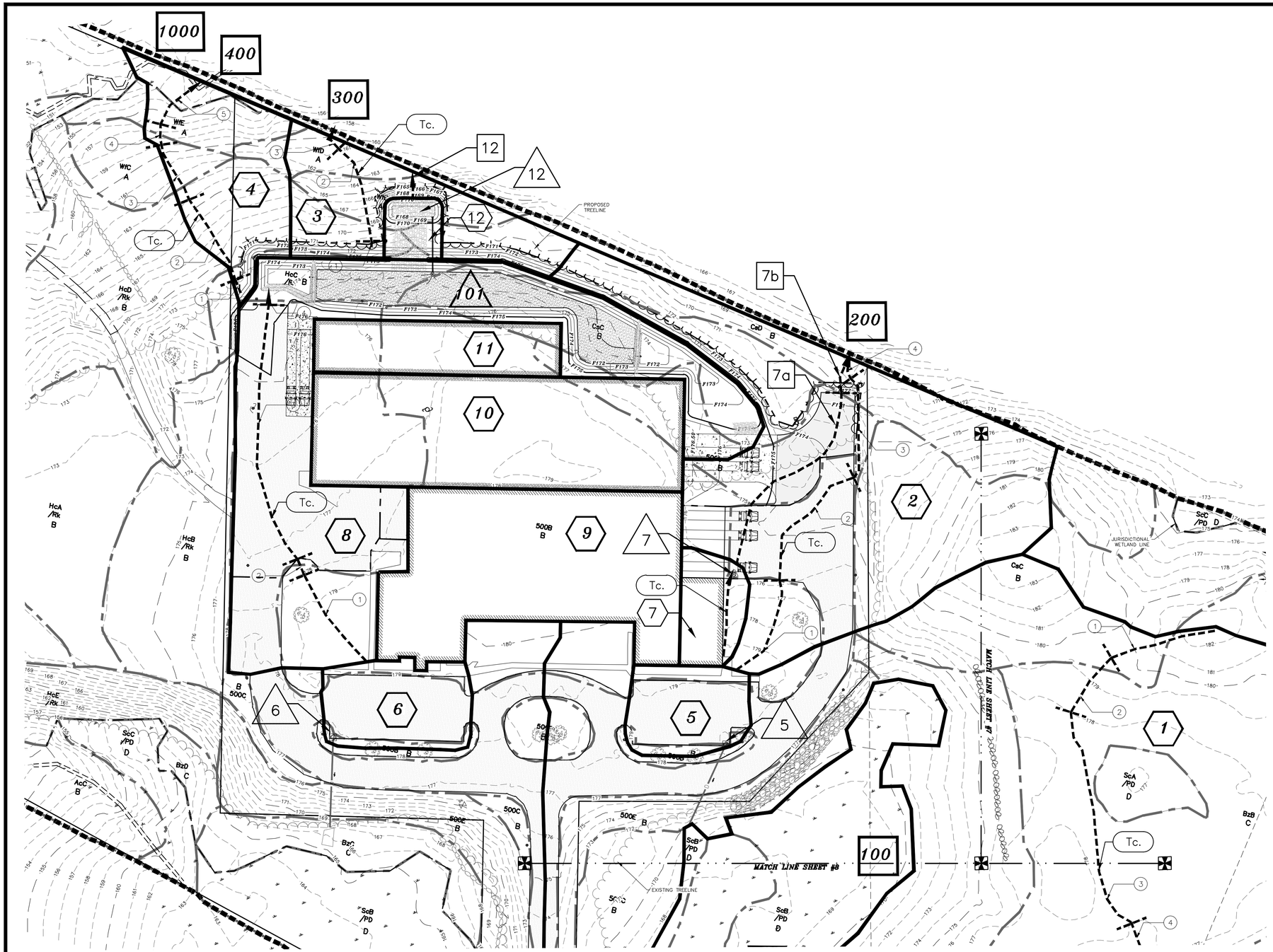
REVISION	DATE	DESCRIPTION

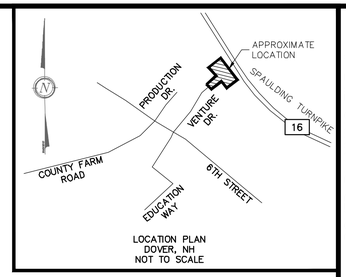
PROPOSED CONDITIONS WATERSHED OVERVIEW
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 80 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 – 152

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





LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

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MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
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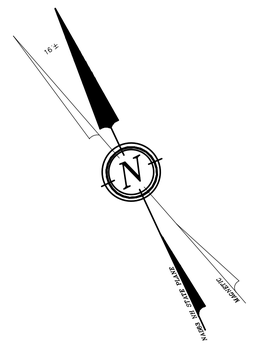
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SYMBOLS LEGEND:

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- # — POND DEVICE SYMBOL
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GRAPHIC SCALE

50 0 25 50 100 200

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DOVER PLANNING FILE #

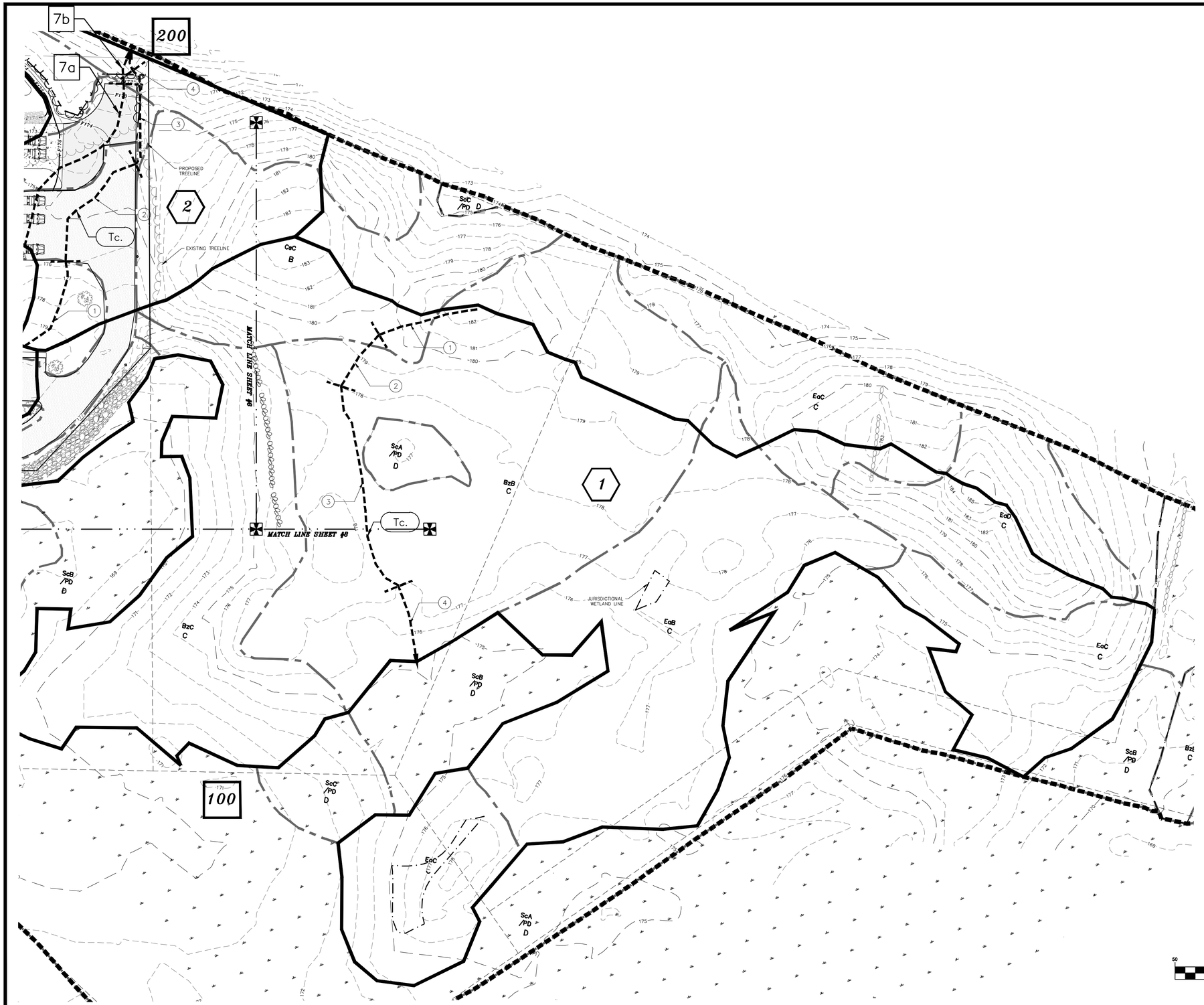
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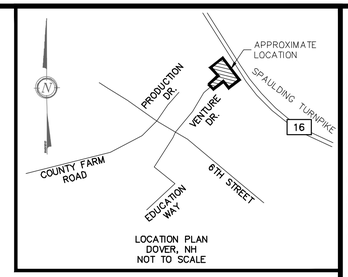
PROPOSED CONDITIONS WATERSHED NORTH
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 50 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 – 152

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





LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

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1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

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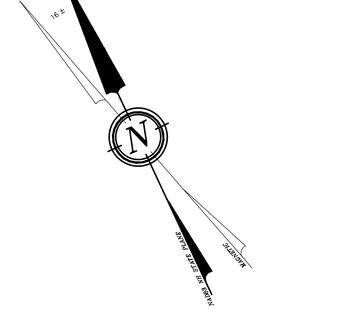
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5.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, THIS PARCEL DOES NOT FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0320E, DATED: SEPTEMBER 30, 2015.

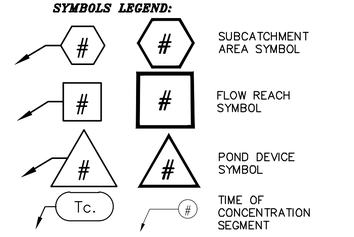
6.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

7.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN SPRING OF 2020, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

8.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED DRAINAGE CONDITIONS ON TAX MAP D, LOT 9A AS OF THE DATE OF THE SURVEY.



SYMBOLS LEGEND:



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #

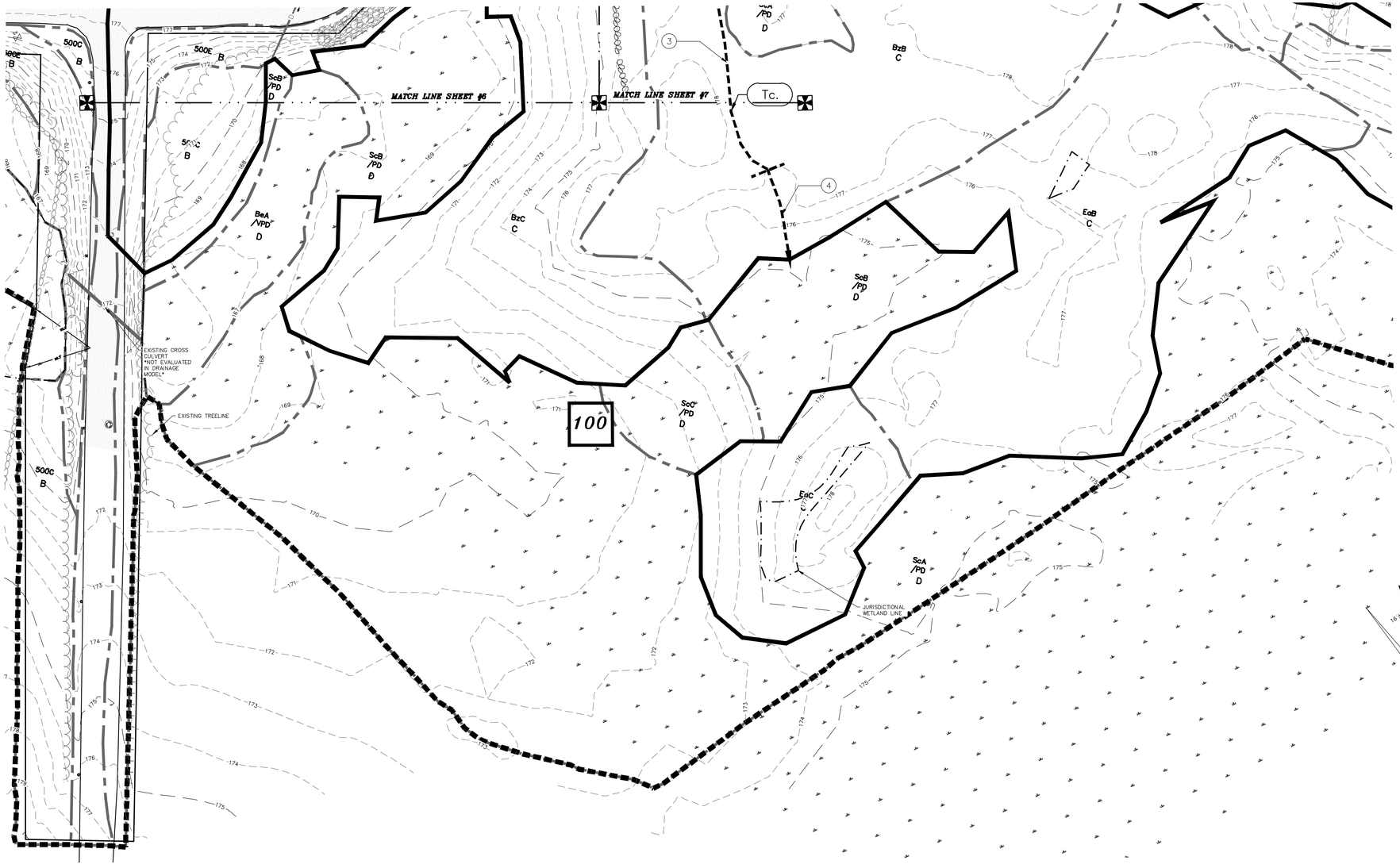
REVISION	DATE	DESCRIPTION

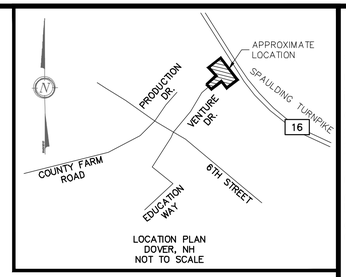
PROPOSED CONDITIONS WATERSHED SOUTHEAST
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 50 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 – 152

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





LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

2.) TAX MAP D, LOT 9A

3.) LOT AREA: 404,461 Sq. Ft., 9.29 Ac.

4.) S.C.R.D. BOOK 3851, PAGE 308

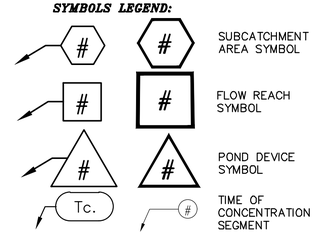
5.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, THIS PARCEL DOES NOT FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0320E, DATED: SEPTEMBER 30, 2015.

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 SPRING OF 2020, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

8.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED DRAINAGE CONDITIONS ON TAX MAP D, LOT 9A AS OF THE DATE OF THE SURVEY.

SYMBOLS LEGEND:



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

DOVER PLANNING FILE #

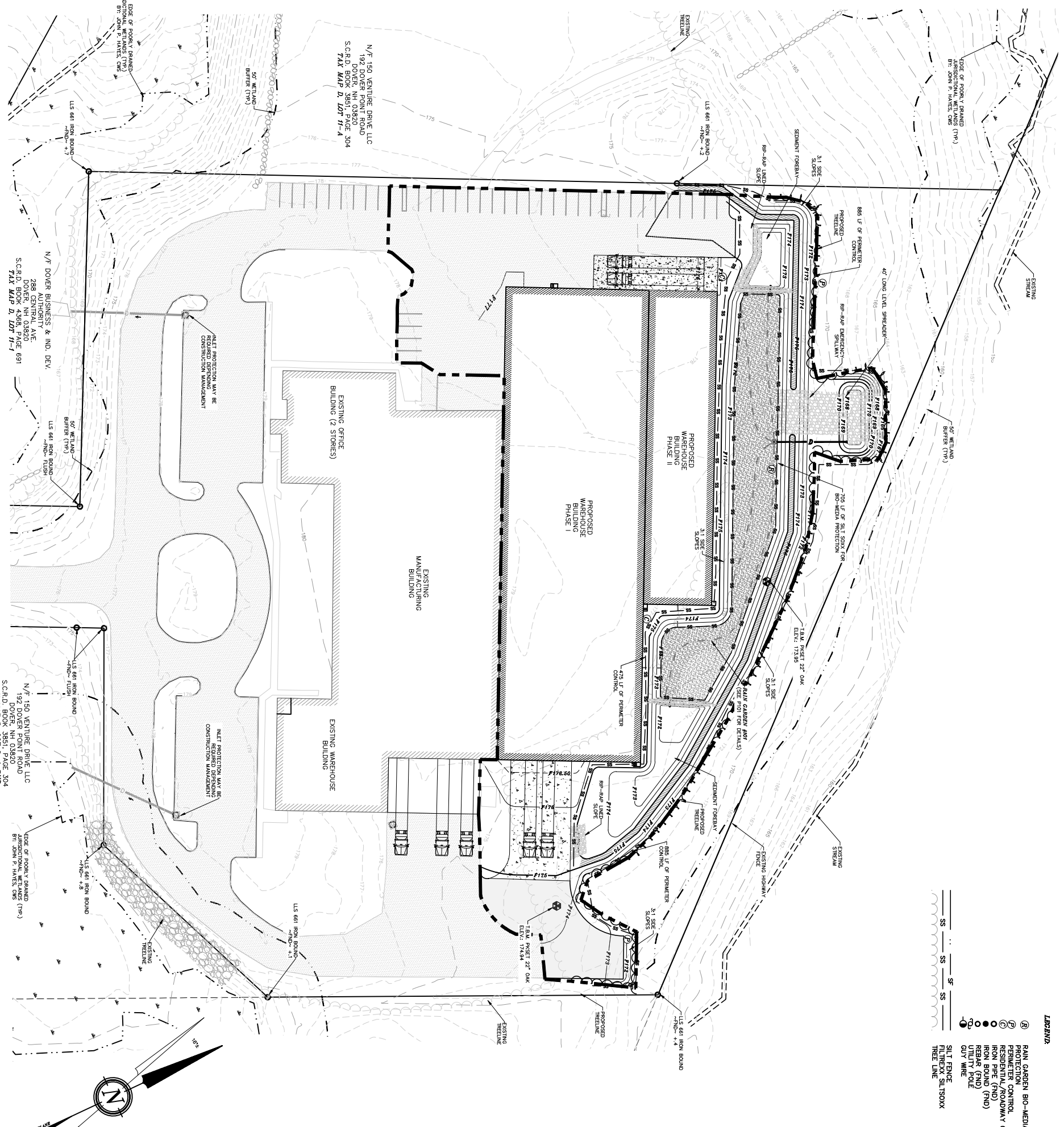
REVISION	DATE	DESCRIPTION

LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 50 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 – 152

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



NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

2.) TAX MAP D, LOT 9A

3.) LOT AREA: 404,461 Sq. Ft., 9.29 Ac.

4.) S.C.R.D. BOOK 3851, PAGE 308

5.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED EROSION AND SEDIMENT CONTROL DESIGN FOR THE PROPOSED BUILDING EXPANSION.

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

7.) CONTRACTOR IS RESPONSIBLE FOR SWEEPING THE PARKING LOT, SIDEWALKS AND ANYTHING DISTURBED, TO ENSURE THAT NO SEDIMENT IS BEING TRACKED ONTO THE EXISTING PARKING AREA OR VENTURE DRIVE.

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

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

10.) 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.

11.) 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 4.1.1AND INSPECTION REPORTS SUBMITTED TO THE CITY OF DOVER, NH, ENGINEERING DEPARTMENT WITHIN24 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.

12.) 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.

13.) PER EPA CGP 2.1.2.2 (INSTALL PERIMETER CONTROL), "YOU MUST INSTALL SEDIMENT CONTROLS ALONG THOSE PERIMETER AREAS OF YOUR SITE THAT WILL RECEIVE STORMWATER FROM EARTH DISTURBING ACTIVITIES." AS A RESULT OF SWPPP INSPECTIONS, THE CONTRACTOR MAY HAVE TO EXPAND PERIMETER CONTROLS TO MEET THIS REQUIREMENT. THE E&SC PLAN IS INITIAL GUIDANCE AS TO THE ANTICIPATED REQUIREMENTS AND IT THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT STORMWATER VIOLATION DO NOT OCCUR.

14.) IF STOCKPILES ARE NEEDED FOR CONSTRUCTION THEY SHOULD BE PLACED IN THIS LOCATION. IF STOCKPILES ARE PLACED IN THIS LOCATION, DURING CONSTRUCTION OF THE RAIN GARDEN, THE CONTRACTOR WILL BE REQUIRED TO INSTALL AND MAINTAIN PERIMETER CONTROL AT THE TOE OF THE STOCKPILE TO ENSURE THAT NO SEDIMENT RUNS OFF INTO THE RAIN GARDEN.

SOILS & DEWATERING:

CaC	CHARLTON	SILT LOAM	K= 0.43
CaD	CHARLTON	SILT LOAM	K= 0.43
CbC	CHARLTON	SANDY FILL	K= 0.17
CeC	CHARLESTER	GLACIAL TILL	K= 0.17
HaA	ACTON	SILT LOAM	K= 0.20
HbA	HOLLIS	SILT LOAM	K= 0.20
HbB	HOLLIS	SILT LOAM	K= 0.20
HbC	HOLLIS	SILT LOAM	K= 0.43
HbD	HOLLIS	SILT LOAM	K= 0.43
HbE	HOLLIS	SILT LOAM	K= 0.43
BmA	BOXFORD	CLAYEY SEDIMENT	K= 0.49
BmB	BOXFORD	CLAYEY SEDIMENT	K= 0.49
BmC	BOXFORD	CLAYEY SEDIMENT	K= 0.49
SmA	SCITICO	SILT CLAY	K= 0.20
SmB	SCITICO	SILT CLAY	K= 0.20
SmC	SCITICO	SILT CLAY	K= 0.20
MaA	MAYBID	SILT CLAY	K= 0.20
WnA	WINDSOR	SANDY	K= 0.17
WnB	WINDSOR	SANDY	K= 0.17
WnC	WINDSOR	SANDY	K= 0.17
EmB	ELMWOOD	SILT LOAM	K= 0.32
EmC	ELMWOOD	SILT LOAM	K= 0.32
EmD	ELMWOOD	SILT LOAM	K= 0.32
600B	UDORTHENS	SANDY LOAM	K= N/A
600C	UDORTHENS	SANDY LOAM	K= N/A
600D	UDORTHENS	SANDY LOAM	K= N/A

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

DOVER PLANNING FILE #

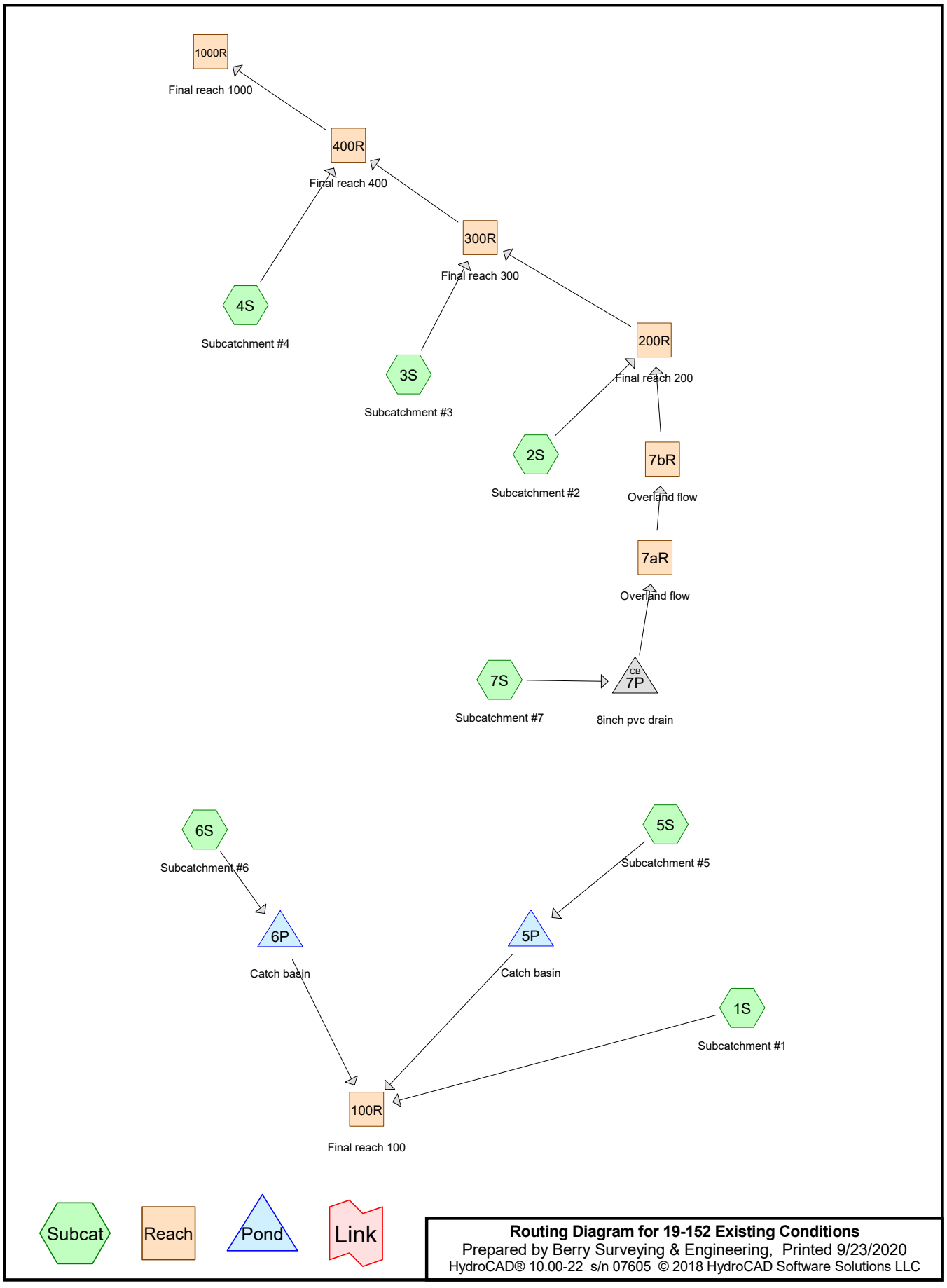
REVISION	DATE	DESCRIPTION

EROSION AND SEDIMENT CONTROL PLAN
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE :	1 IN. EQUALS 30 FT.
DATE :	SEPTEMBER 14, 2020
FILE NO. :	DB 2019 - 152

KENNETH A. BERRY No. 7444 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE



Routing Diagram for 19-152 Existing Conditions
Prepared by Berry Surveying & Engineering, Printed 9/23/2020
HydroCAD® 10.00-22 s/n 07605 © 2018 HydroCAD Software Solutions LLC

Project Notes

CarlsonStageIncrement|1.0000|

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.632	61	>75% Grass cover, Good HSG B (4S, 6S)
1.557	61	>75% Grass cover, Good HSG B (1S, 2S, 3S, 5S, 7S)
0.009	74	>75% Grass cover, Good HSG C (1S)
1.155	98	Paved parking HSG B (4S, 6S)
0.909	98	Paved parking HSG B (1S, 2S, 5S, 7S)
0.471	98	Roofs HSG B (4S)
0.487	98	Roofs HSG B (2S, 7S)
0.179	30	Woods, Good HSG A (4S)
0.188	55	Woods, Good HSG B (4S)
0.055	77	Woods, Good HSG D (4S)
0.234	30	Woods, Good HSG A (3S)
2.457	55	Woods, Good HSG B (1S, 2S, 3S)
7.249	70	Woods, Good HSG C (1S)
0.117	77	Woods, Good HSG D (1S)
15.699	**71**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.413	HSG A	3S, 4S
7.855	HSG B	1S, 2S, 3S, 4S, 5S, 6S, 7S
7.258	HSG C	1S
0.172	HSG D	1S, 4S
0.000	Other	
15.699		**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	2.189	0.009	0.000	0.000	2.198	>75% Grass cover, Good	1S, 2S, 3S, 4S, 5S, 6S, 7S
0.000	2.063	0.000	0.000	0.000	2.063	Paved parking	1S, 2S, 4S, 5S, 6S, 7S
0.000	0.958	0.000	0.000	0.000	0.958	Roofs	2S, 4S, 7S
0.413	2.645	7.249	0.172	0.000	10.479	Woods, Good	1S, 2S, 3S, 4S
0.413	**7.855**	**7.258**	**0.172**	**0.000**	**15.699**	**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	5P	169.96	169.67	81.9	0.0035	0.010	15.0	0.0	0.0
2	6P	173.37	116.10	82.0	0.6984	0.010	15.0	0.0	0.0

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Subcatchment #1 Runoff Area=393,349 sf 4.54% Impervious Runoff Depth>3.47"
Flow Length=453' Tc=30.5 min CN=70 Runoff=20.67 cfs 2.613 af

Subcatchment 2S: Subcatchment #2 Runoff Area=122,881 sf 25.49% Impervious Runoff Depth>3.18"
Flow Length=392' Tc=12.4 min CN=67 Runoff=8.39 cfs 0.748 af

Subcatchment 3S: Subcatchment #3 Runoff Area=36,012 sf 0.00% Impervious Runoff Depth>1.49"
Flow Length=584' Tc=16.6 min CN=49 Runoff=0.88 cfs 0.103 af

Subcatchment 4S: Subcatchment #4 Runoff Area=105,863 sf 58.44% Impervious Runoff Depth>4.55"
Flow Length=251' Tc=12.2 min CN=80 Runoff=10.47 cfs 0.921 af

Subcatchment 5S: Subcatchment #5 Runoff Area=8,890 sf 79.74% Impervious Runoff Depth>5.79"
Tc=6.0 min CN=91 Runoff=1.27 cfs 0.098 af

Subcatchment 6S: Subcatchment #6 Runoff Area=10,871 sf 82.28% Impervious Runoff Depth>5.79"
Tc=6.0 min CN=91 Runoff=1.55 cfs 0.120 af

Subcatchment 7S: Subcatchment #7 Runoff Area=5,969 sf 76.06% Impervious Runoff Depth>5.56"
Flow Length=72' Slope=0.0622 '/' Tc=6.0 min CN=89 Runoff=0.83 cfs 0.063 af

Reach 7aR: Overland flow Avg. Flow Depth=0.08' Max Vel=1.85 fps Inflow=0.83 cfs 0.063 af
n=0.013 L=57.1' S=0.0131 '/' Capacity=9.91 cfs Outflow=0.83 cfs 0.063 af

Reach 7bR: Overland flow Avg. Flow Depth=0.11' Max Vel=1.46 fps Inflow=0.83 cfs 0.063 af
n=0.035 L=175.8' S=0.0370 '/' Capacity=19.59 cfs Outflow=0.80 cfs 0.063 af

Reach 100R: Final reach 100 Inflow=21.48 cfs 2.831 af
Outflow=21.48 cfs 2.831 af

Reach 200R: Final reach 200 Inflow=9.13 cfs 0.811 af
Outflow=9.13 cfs 0.811 af

Reach 300R: Final reach 300 Inflow=9.78 cfs 0.914 af
Outflow=9.78 cfs 0.914 af

Reach 400R: Final reach 400 Inflow=20.31 cfs 1.835 af
Outflow=20.31 cfs 1.835 af

Reach 1000R: Final reach 1000 Inflow=20.31 cfs 1.835 af
Outflow=20.31 cfs 1.835 af

Pond 5P: Catch basin Peak Elev=170.60' Storage=8 cf Inflow=1.27 cfs 0.098 af
15.0" Round Culvert n=0.010 L=81.9' S=0.0035 '/' Outflow=1.27 cfs 0.098 af

Pond 6P: Catch basin Peak Elev=174.06' Storage=9 cf Inflow=1.55 cfs 0.120 af
15.0" Round Culvert n=0.010 L=82.0' S=0.6984 '/' Outflow=1.55 cfs 0.120 af

Pond 7P: 8inch pvc drain Peak Elev=175.93' Inflow=0.83 cfs 0.063 af
Outflow=0.83 cfs 0.063 af

Total Runoff Area = 15.699 ac Runoff Volume = 4.666 af Average Runoff Depth = 3.57"
80.75% Pervious = 12.677 ac 19.25% Impervious = 3.022 ac

Summary for Subcatchment 1S: Subcatchment #1

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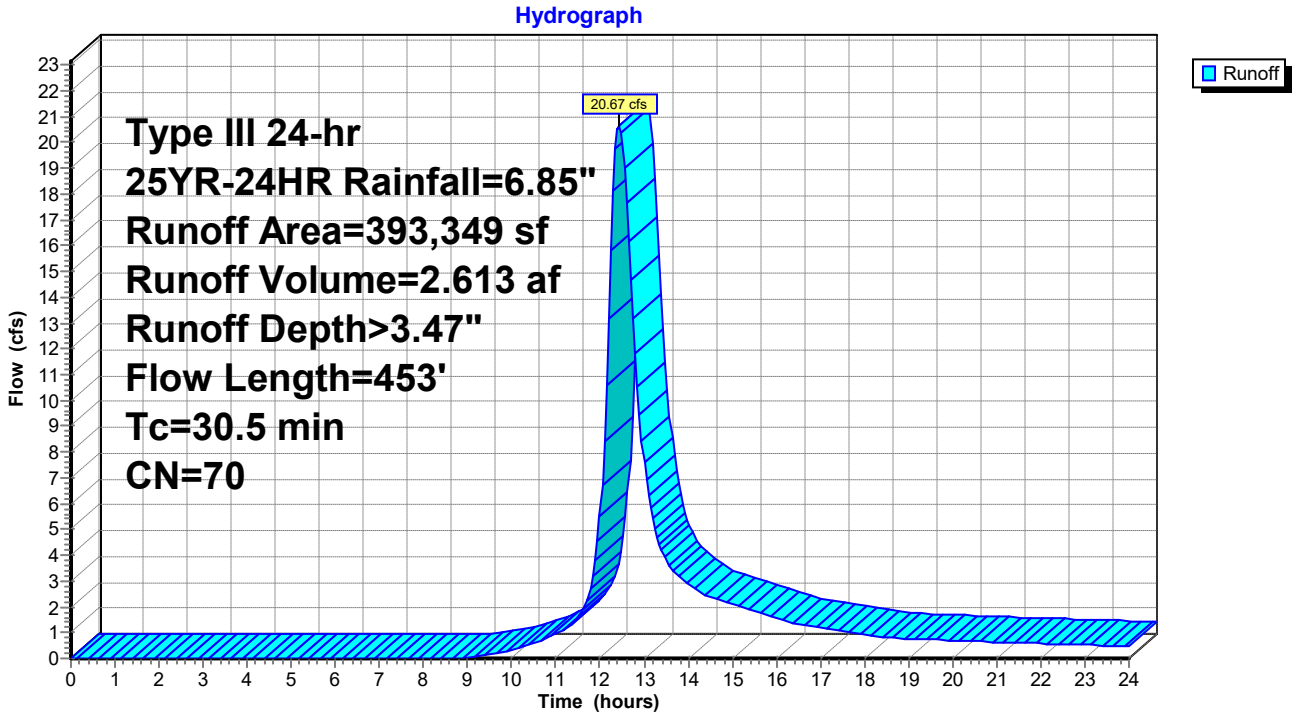
Runoff = 20.67 cfs @ 12.43 hrs, Volume= 2.613 af, Depth> 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
26,086	61	>75% Grass cover, Good HSG B
399	74	>75% Grass cover, Good HSG C
17,869	98	Paved parking HSG B
28,119	55	Woods, Good HSG B
315,762	70	Woods, Good HSG C
5,114	77	Woods, Good HSG D
393,349	70	Weighted Average
375,480		95.46% Pervious Area
17,869		4.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	100	0.0300	0.10		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
1.4	64	0.0236	0.77		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
10.3	212	0.0047	0.34		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
1.6	77	0.0260	0.81		**Shallow Concentrated Flow, Segment #4** Woodland Kv= 5.0 fps
30.5	453	Total			

Subcatchment 1S: Subcatchment #1



Summary for Subcatchment 2S: Subcatchment #2

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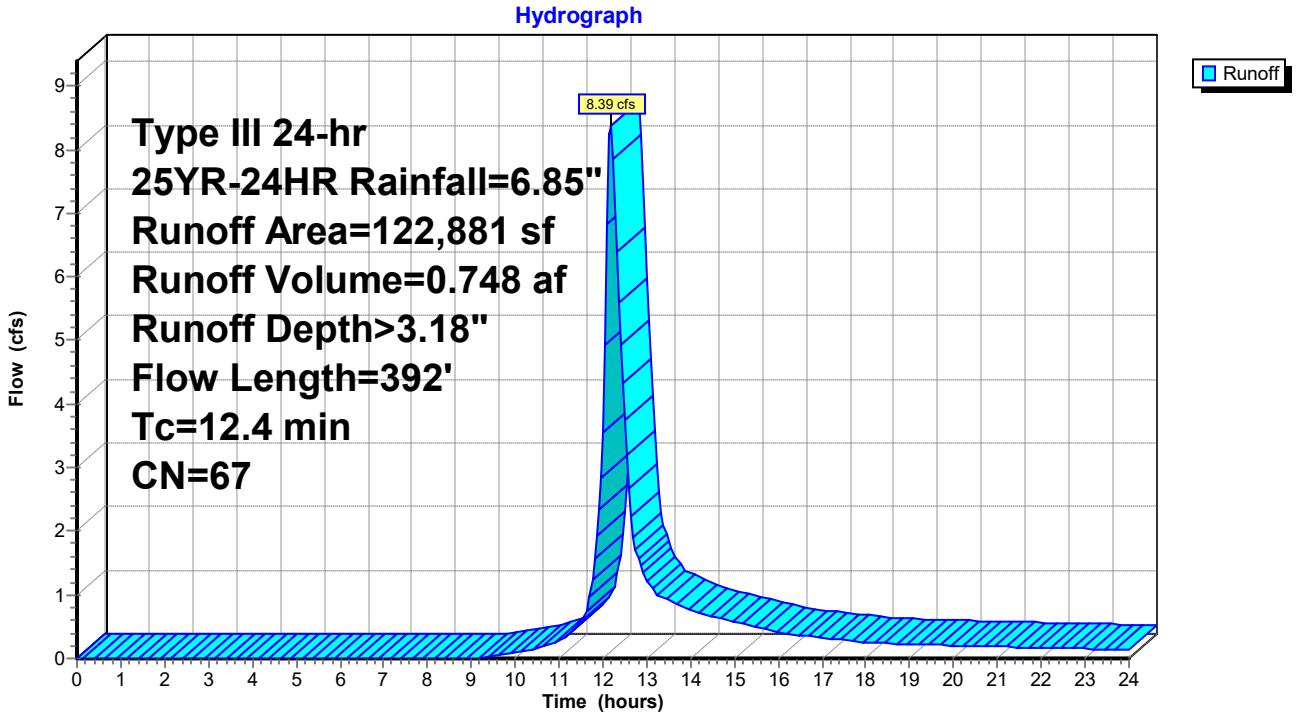
Runoff = 8.39 cfs @ 12.18 hrs, Volume= 0.748 af, Depth> 3.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
17,983	98	Roofs HSG B
29,637	61	>75% Grass cover, Good HSG B
13,335	98	Paved parking HSG B
61,926	55	Woods, Good HSG B
122,881	67	Weighted Average
91,563		74.51% Pervious Area
31,318		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	88	0.0199	0.18		**Sheet Flow, Segment #1** Grass: Short n= 0.150 P2= 3.61"
0.2	12	0.0208	0.97		**Sheet Flow, Segment #2** Smooth surfaces n= 0.011 P2= 3.61"
0.2	42	0.0356	3.83		**Shallow Concentrated Flow, Segment #3** Paved Kv= 20.3 fps
2.2	146	0.0240	1.08		**Shallow Concentrated Flow, Segment #4** Short Grass Pasture Kv= 7.0 fps
1.5	104	0.0526	1.15		**Shallow Concentrated Flow, Segment #5** Woodland Kv= 5.0 fps
12.4	392	Total			

Subcatchment 2S: Subcatchment #2



Summary for Subcatchment 3S: Subcatchment #3

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CarlsonSurface|M:\Office Network\2019 Projects\19-152 Dover - Index\DTM\TIN\Existing\19-152 Existing.tin|

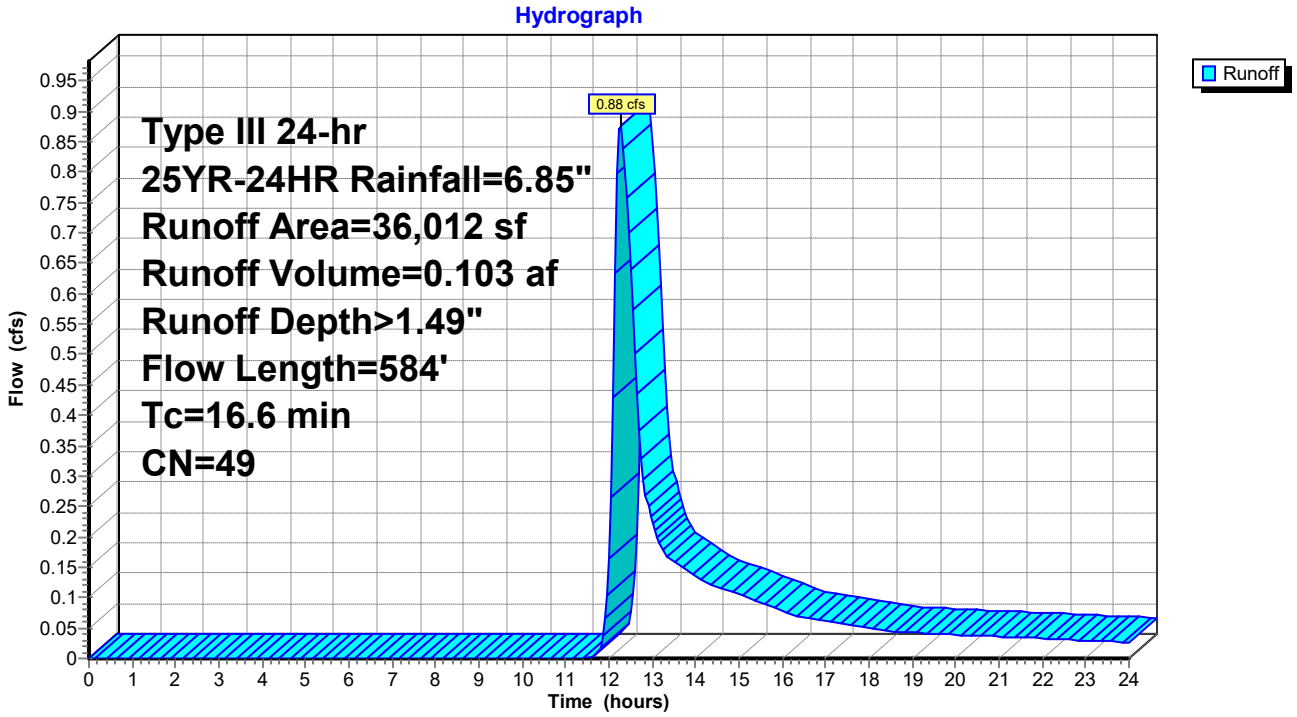
Runoff = 0.88 cfs @ 12.27 hrs, Volume= 0.103 af, Depth> 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
8,869	61	>75% Grass cover, Good HSG B
10,179	30	Woods, Good HSG A
16,964	55	Woods, Good HSG B
36,012	49	Weighted Average
36,012		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	100	0.0100	0.14		**Sheet Flow, Segment #1** Grass: Short n= 0.150 P2= 3.61"
0.2	19	0.0532	1.61		**Shallow Concentrated Flow, Segment #2** Short Grass Pasture Kv= 7.0 fps
1.8	245	0.0132	2.33		**Shallow Concentrated Flow, Segment #3** Paved Kv= 20.3 fps
0.3	28	0.0618	1.74		**Shallow Concentrated Flow, Segment #4** Short Grass Pasture Kv= 7.0 fps
2.1	192	0.0966	1.55		**Shallow Concentrated Flow, Segment #5** Woodland Kv= 5.0 fps
16.6	584	Total			

Subcatchment 3S: Subcatchment #3



Summary for Subcatchment 4S: Subcatchment #4

CarlsonPlanXYPos|1186519.3133|266146.3309|
CarlsonSurface|M:\Office Network\2019 Projects\19-152 Dover - Index\DTM\TIN\Existing\19-152 Existing.tin|

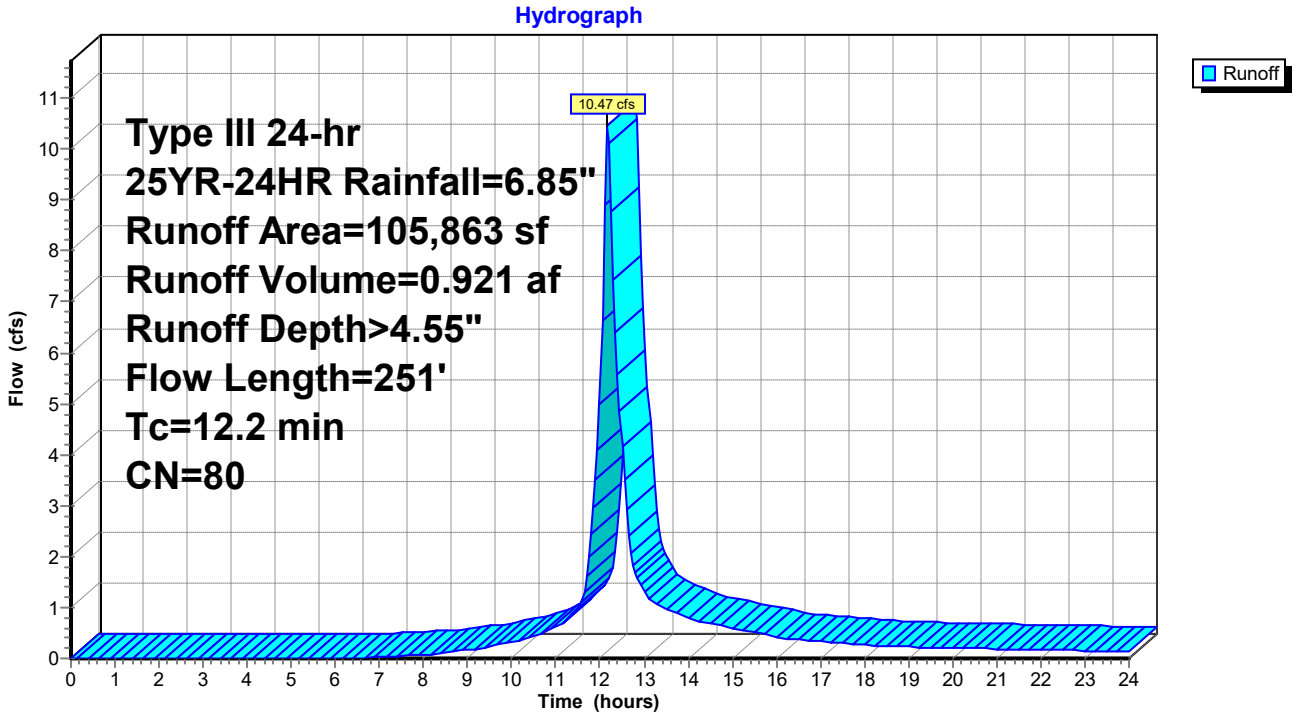
Runoff = 10.47 cfs @ 12.17 hrs, Volume= 0.921 af, Depth> 4.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
20,509	98	Roofs HSG B
25,612	61	>75% Grass cover, Good HSG B
41,354	98	Paved parking HSG B
7,819	30	Woods, Good HSG A
8,189	55	Woods, Good HSG B
2,380	77	Woods, Good HSG D
105,863	80	Weighted Average
44,000		41.56% Pervious Area
61,863		58.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0150	0.16		**Sheet Flow, Segment #1** Grass: Short n= 0.150 P2= 3.61"
0.6	44	0.0343	1.30		**Shallow Concentrated Flow, Segment #2** Short Grass Pasture Kv= 7.0 fps
1.3	107	0.0770	1.39		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
12.2	251	Total			

Subcatchment 4S: Subcatchment #4



Summary for Subcatchment 5S: Subcatchment #5

CarlsonPlanXYPos|1186745.8956|265788.8439|
CarlsonSurface|M:\Office Network\2019 Projects\19-152 Dover - Index\DTM\TIN\Existing\19-152 Existing.tin|

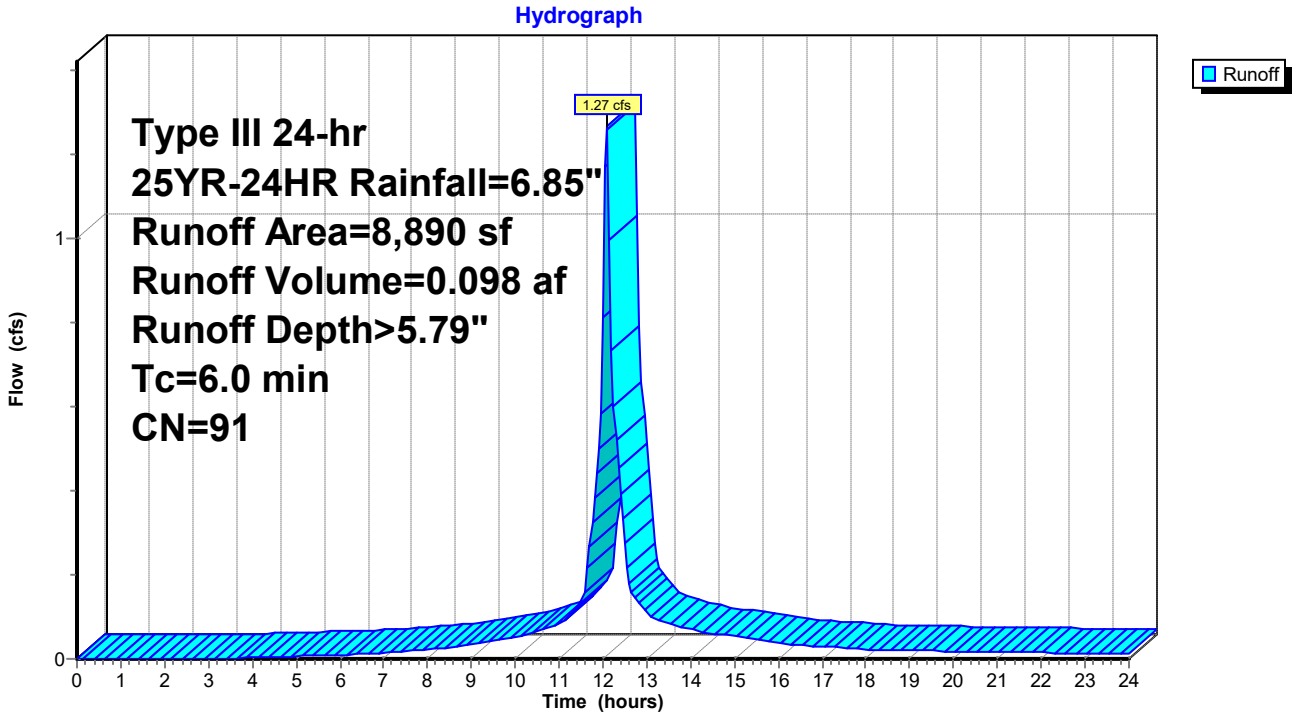
Runoff = 1.27 cfs @ 12.09 hrs, Volume= 0.098 af, Depth> 5.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
1,801	61	>75% Grass cover, Good HSG B
7,089	98	Paved parking HSG B
8,890	91	Weighted Average
1,801		20.26% Pervious Area
7,089		79.74% Impervious Area

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

CarlsonPlanXYPos|1186515.4048|265901.2381|
CarlsonSurface|M:\Office Network\2019 Projects\19-152 Dover - Index\DTM\TIN\Existing\19-152 Existing.tin|

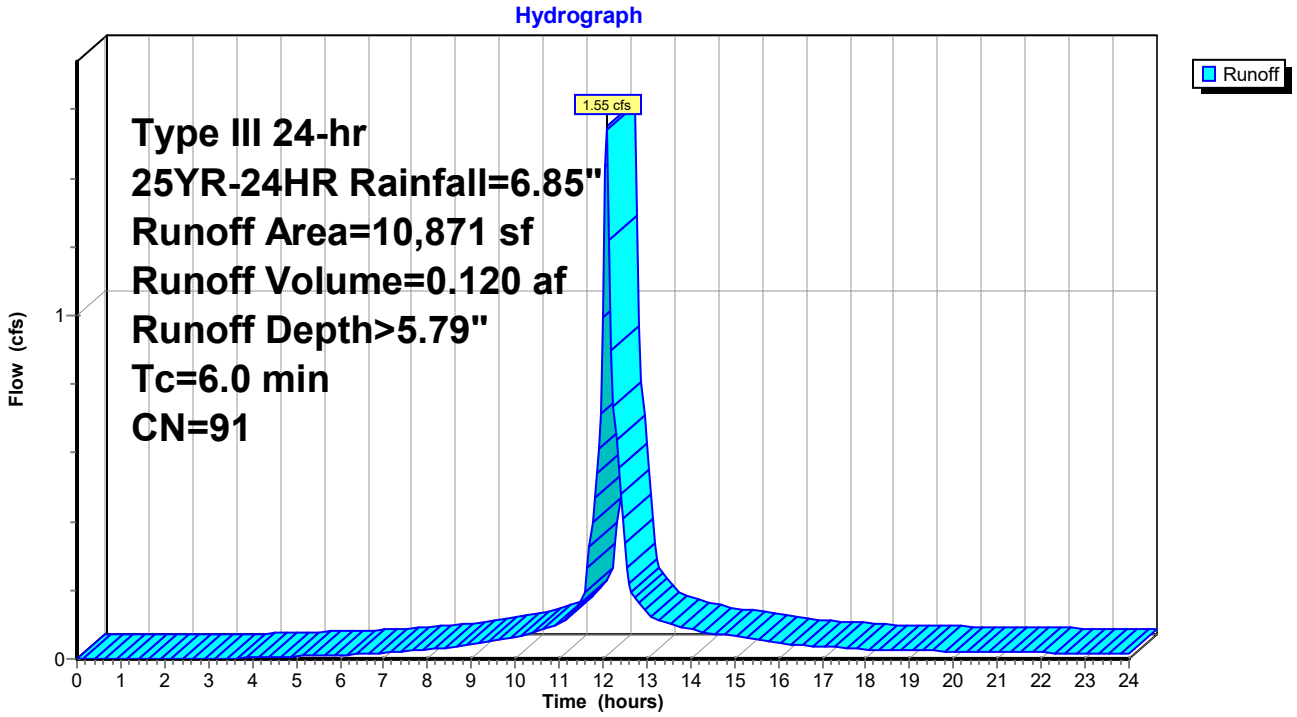
Runoff = 1.55 cfs @ 12.09 hrs, Volume= 0.120 af, Depth> 5.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
1,926	61	>75% Grass cover, Good HSG B
8,945	98	Paved parking HSG B
10,871	91	Weighted Average
1,926		17.72% Pervious Area
8,945		82.28% Impervious Area

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 7S: Subcatchment #7

CarlsonPlanXYPos|1186775.3885|265869.1508|
CarlsonSurface|M:\Office Network\2019 Projects\19-152 Dover - Index\DTM\TIN\Existing\19-152 Existing.tin|

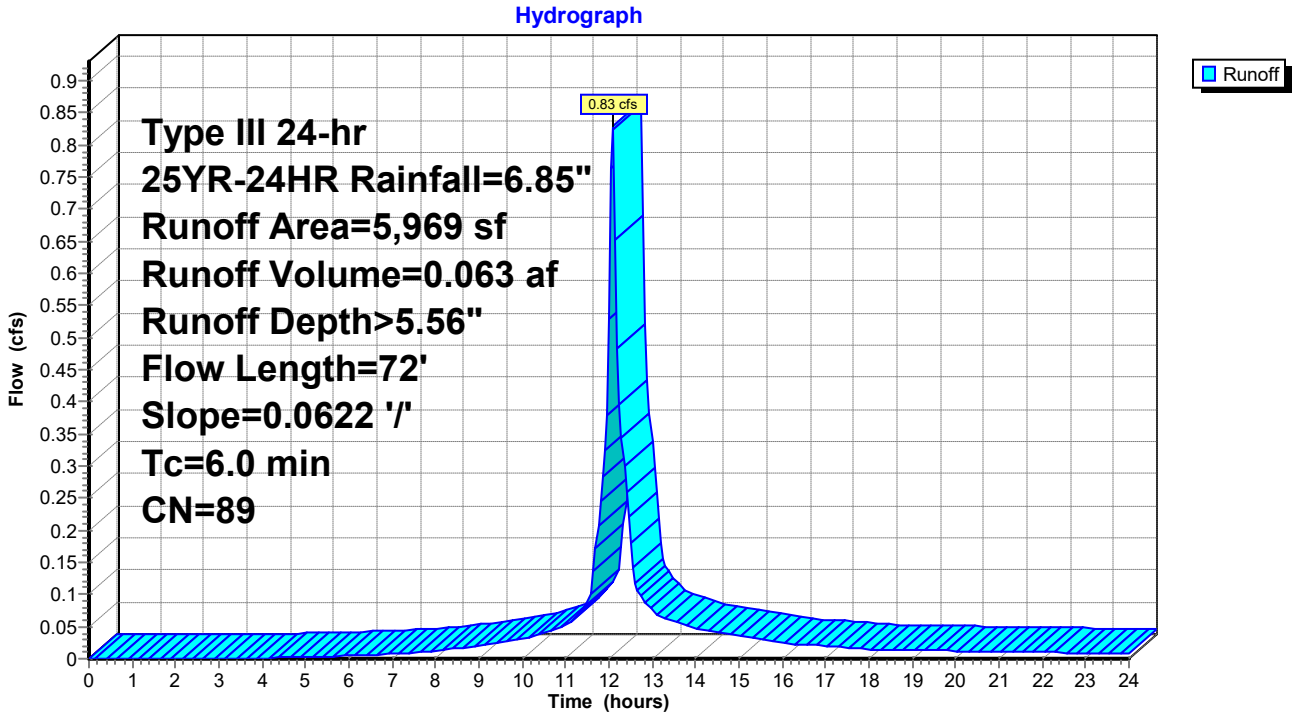
Runoff = 0.83 cfs @ 12.09 hrs, Volume= 0.063 af, Depth> 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
3,250	98	Roofs HSG B
1,429	61	>75% Grass cover, Good HSG B
1,290	98	Paved parking HSG B
5,969	89	Weighted Average
1,429		23.94% Pervious Area
4,540		76.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	72	0.0622	0.27		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.61"
4.5	72	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 7S: Subcatchment #7



Summary for Reach 7aR: Overland flow

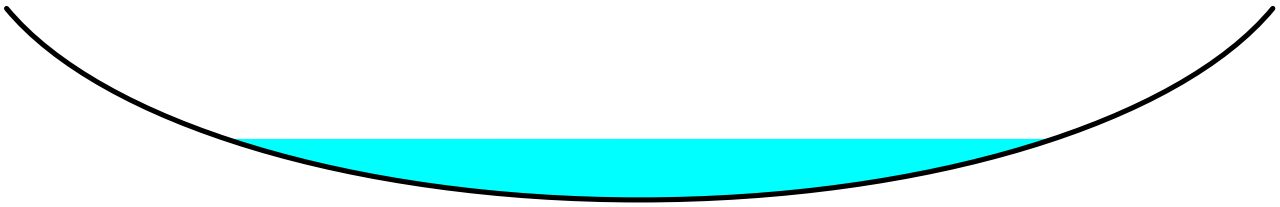
[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 0.137 ac, 76.06% Impervious, Inflow Depth > 5.56" for 25YR-24HR event
Inflow = 0.83 cfs @ 12.09 hrs, Volume= 0.063 af
Outflow = 0.83 cfs @ 12.09 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.4 min

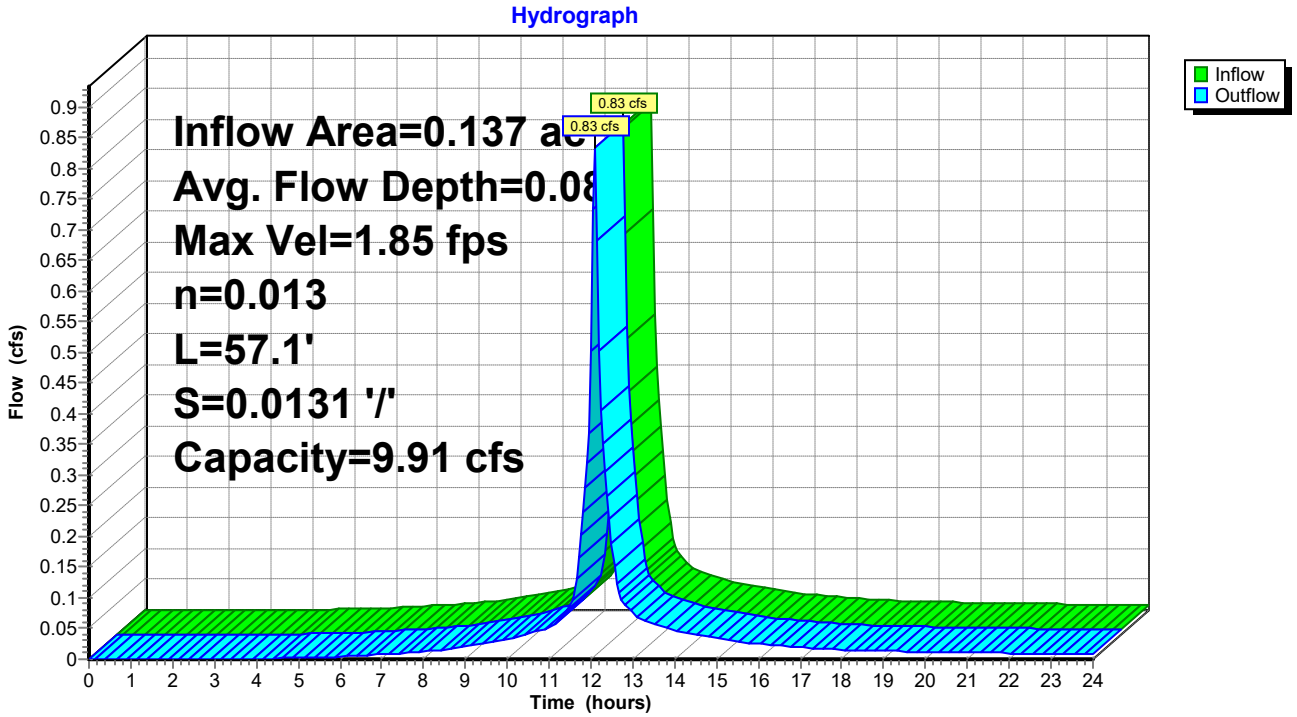
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.85 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.59 fps, Avg. Travel Time= 1.6 min

Peak Storage= 26 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 0.25' Flow Area= 2.5 sf, Capacity= 9.91 cfs

15.00' x 0.25' deep Parabolic Channel, n= 0.013 Asphalt, smooth
Length= 57.1' Slope= 0.0131 '/'
Inlet Invert= 175.75', Outlet Invert= 175.00'



‡



Summary for Reach 7bR: Overland flow

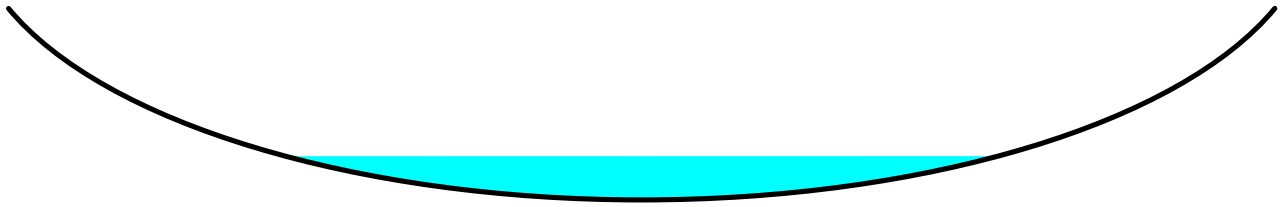
[62] Hint: Exceeded Reach 7aR OUTLET depth by 0.04' @ 12.15 hrs

Inflow Area = 0.137 ac, 76.06% Impervious, Inflow Depth > 5.56" for 25YR-24HR event
Inflow = 0.83 cfs @ 12.09 hrs, Volume= 0.063 af
Outflow = 0.80 cfs @ 12.12 hrs, Volume= 0.063 af, Atten= 4%, Lag= 1.4 min

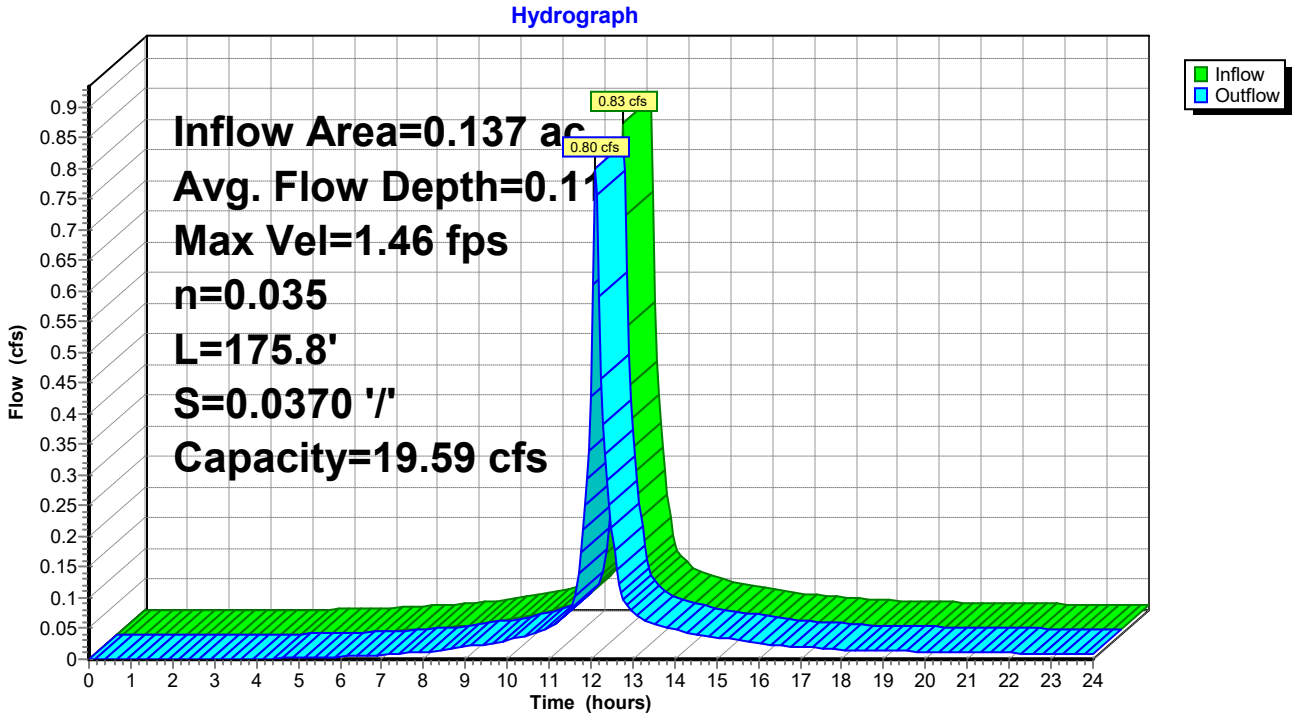
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.46 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 0.48 fps, Avg. Travel Time= 6.1 min

Peak Storage= 96 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 0.50' Flow Area= 5.0 sf, Capacity= 19.59 cfs

15.00' x 0.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 175.8' Slope= 0.0370 '/'
Inlet Invert= 175.00', Outlet Invert= 168.50'



‡



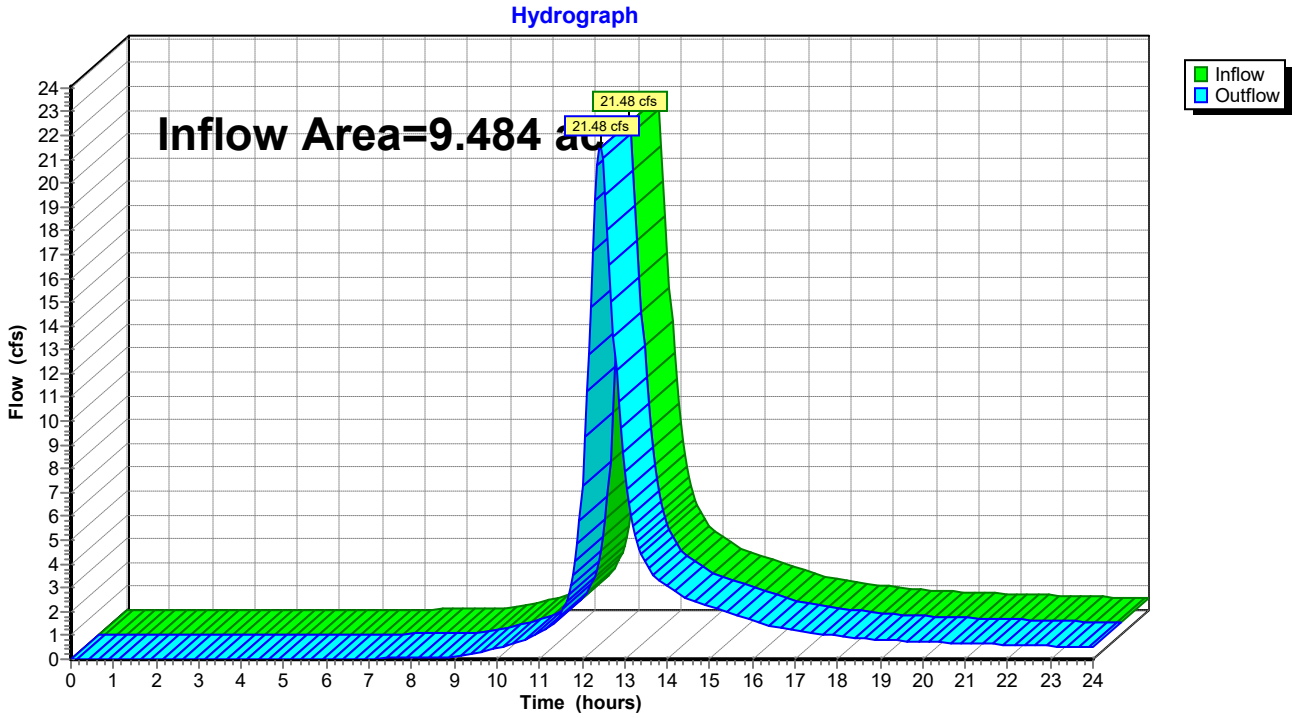
Summary for Reach 100R: Final reach 100

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

Inflow Area = 9.484 ac, 8.21% Impervious, Inflow Depth > 3.58" for 25YR-24HR event
Inflow = 21.48 cfs @ 12.42 hrs, Volume= 2.831 af
Outflow = 21.48 cfs @ 12.42 hrs, Volume= 2.831 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 100R: Final reach 100



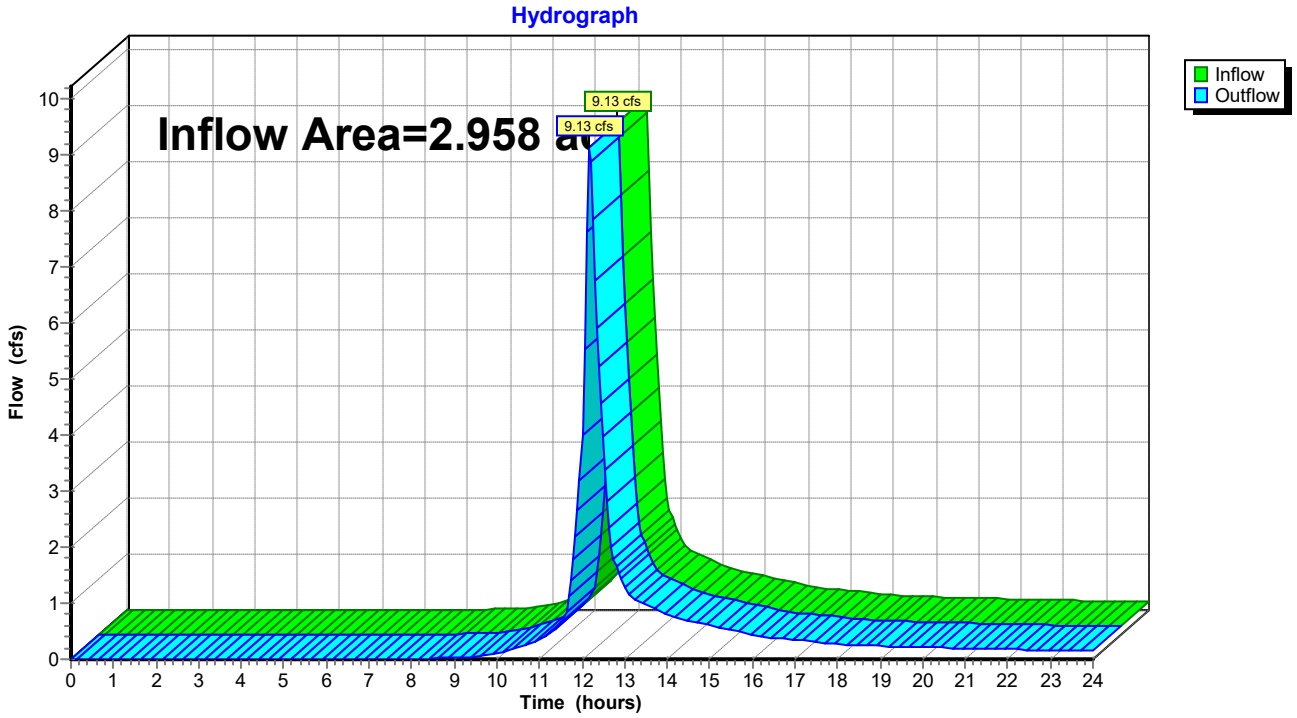
Summary for Reach 200R: Final reach 200

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

Inflow Area = 2.958 ac, 27.83% Impervious, Inflow Depth > 3.29" for 25YR-24HR event
Inflow = 9.13 cfs @ 12.17 hrs, Volume= 0.811 af
Outflow = 9.13 cfs @ 12.17 hrs, Volume= 0.811 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 200R: Final reach 200



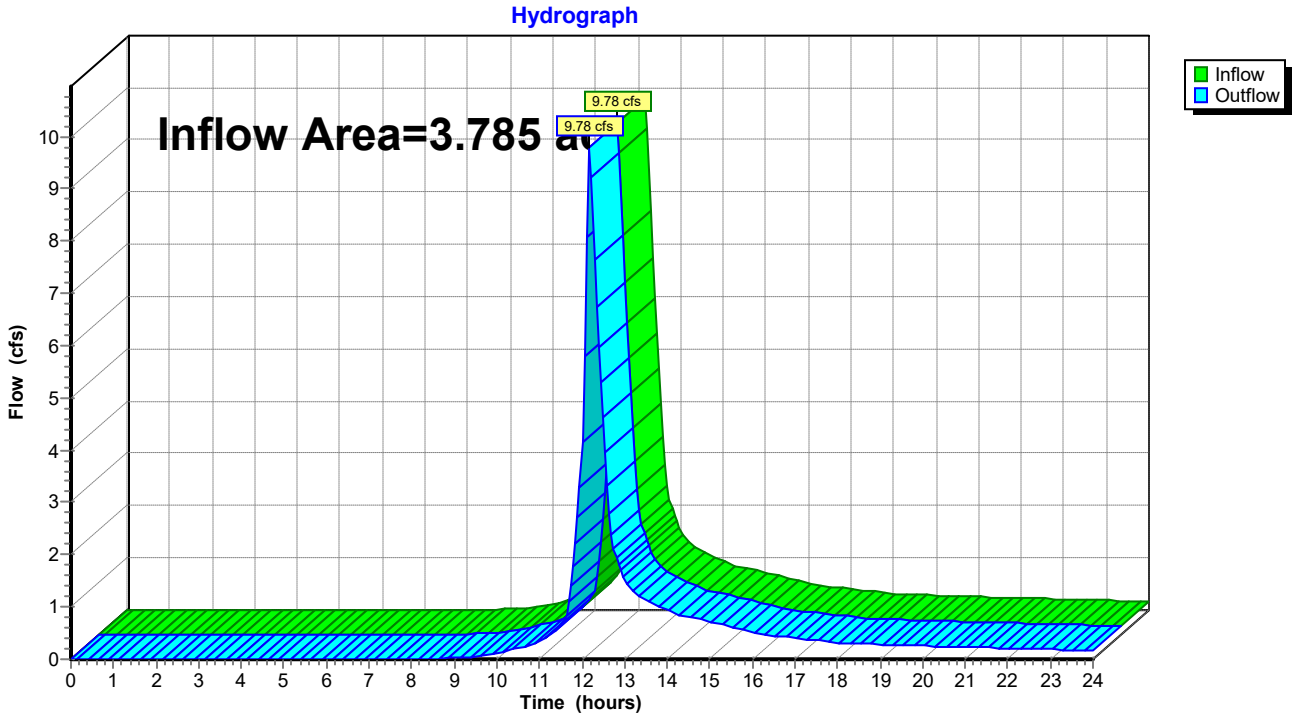
Summary for Reach 300R: Final reach 300

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

Inflow Area = 3.785 ac, 21.75% Impervious, Inflow Depth > 2.90" for 25YR-24HR event
Inflow = 9.78 cfs @ 12.18 hrs, Volume= 0.914 af
Outflow = 9.78 cfs @ 12.18 hrs, Volume= 0.914 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 300R: Final reach 300



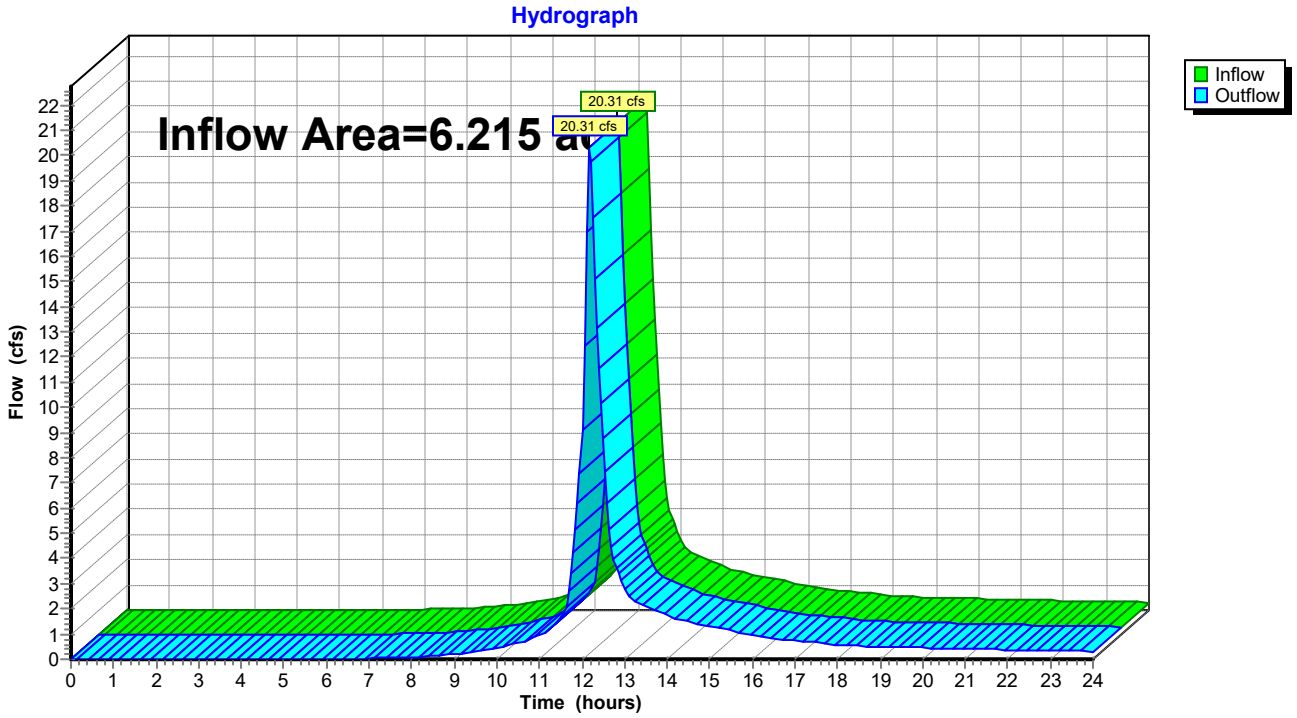
Summary for Reach 400R: Final reach 400

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

Inflow Area = 6.215 ac, 36.10% Impervious, Inflow Depth > 3.54" for 25YR-24HR event
Inflow = 20.31 cfs @ 12.17 hrs, Volume= 1.835 af
Outflow = 20.31 cfs @ 12.17 hrs, Volume= 1.835 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 400R: Final reach 400



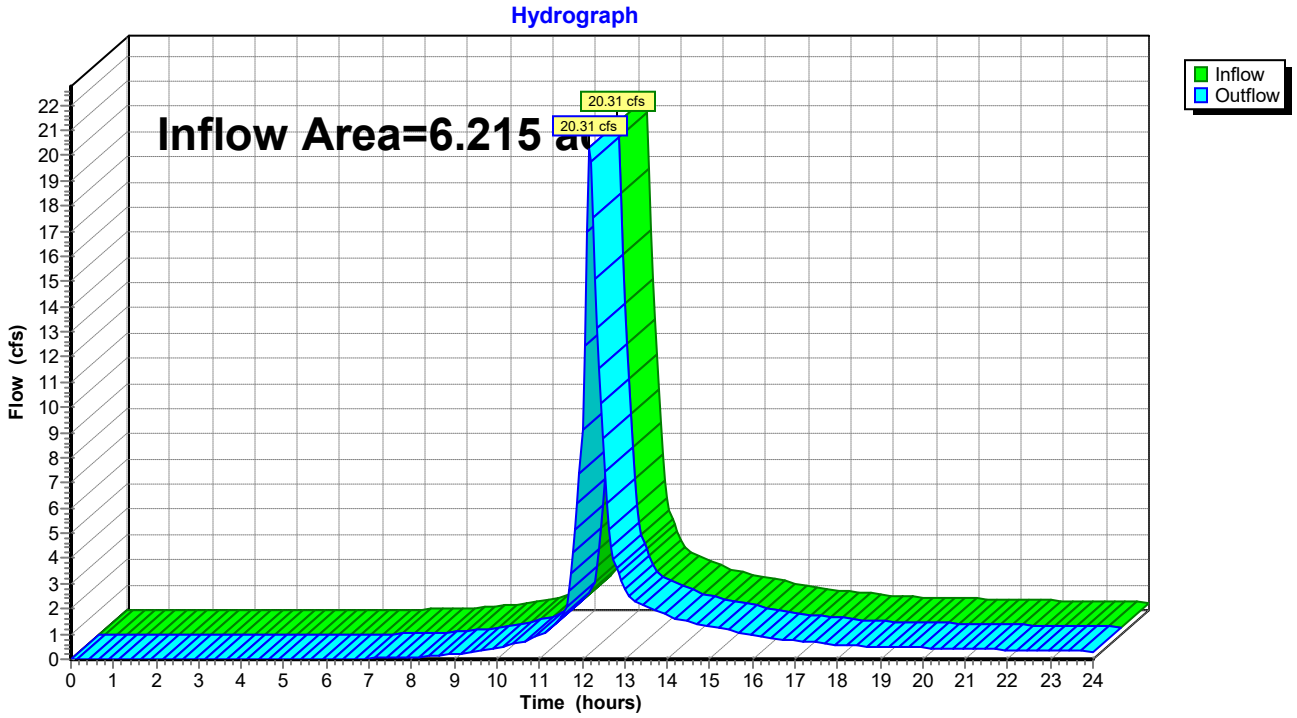
Summary for Reach 1000R: Final reach 1000

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

Inflow Area = 6.215 ac, 36.10% Impervious, Inflow Depth > 3.54" for 25YR-24HR event
Inflow = 20.31 cfs @ 12.17 hrs, Volume= 1.835 af
Outflow = 20.31 cfs @ 12.17 hrs, Volume= 1.835 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1000R: Final reach 1000



Summary for Pond 5P: Catch basin

Inflow Area = 0.204 ac, 79.74% Impervious, Inflow Depth > 5.79" for 25YR-24HR event
Inflow = 1.27 cfs @ 12.09 hrs, Volume= 0.098 af
Outflow = 1.27 cfs @ 12.09 hrs, Volume= 0.098 af, Atten= 0%, Lag= 0.1 min
Primary = 1.27 cfs @ 12.09 hrs, Volume= 0.098 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 170.60' @ 12.09 hrs Surf.Area= 13 sf Storage= 8 cf
Flood Elev= 177.61' Surf.Area= 13 sf Storage= 96 cf

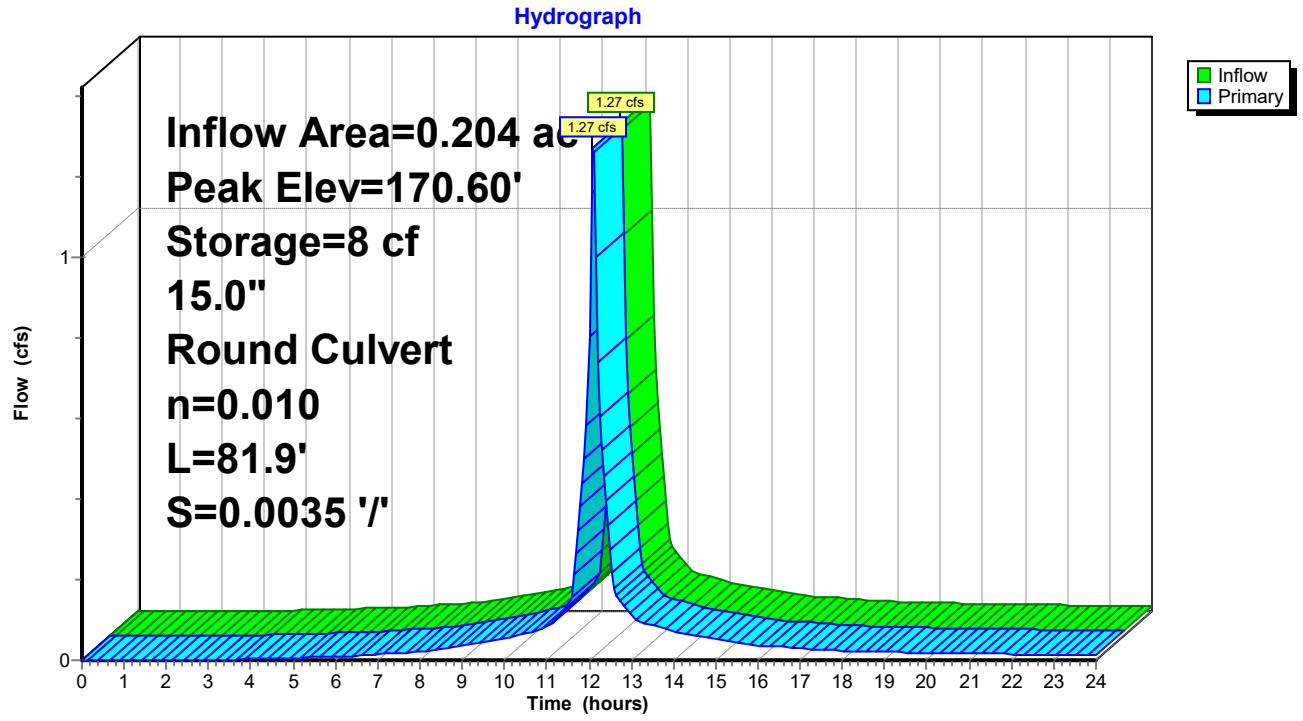
Plug-Flow detention time= 0.4 min calculated for 0.098 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (776.9 - 776.6)

Volume	Invert	Avail.Storage	Storage Description
#1	169.96'	96 cf	**4.00'D x 7.65'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	169.96'	**15.0" Round 15" RCP** L= 81.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 169.96' / 169.67' S= 0.0035 '/' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=1.24 cfs @ 12.09 hrs HW=170.59' TW=0.00' (Dynamic Tailwater)
1=15" RCP (Barrel Controls 1.24 cfs @ 2.92 fps)

Pond 5P: Catch basin



Summary for Pond 6P: Catch basin

Inflow Area = 0.250 ac, 82.28% Impervious, Inflow Depth > 5.79" for 25YR-24HR event
Inflow = 1.55 cfs @ 12.09 hrs, Volume= 0.120 af
Outflow = 1.55 cfs @ 12.09 hrs, Volume= 0.120 af, Atten= 0%, Lag= 0.1 min
Primary = 1.55 cfs @ 12.09 hrs, Volume= 0.120 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 174.06' @ 12.09 hrs Surf.Area= 13 sf Storage= 9 cf
Flood Elev= 177.62' Surf.Area= 13 sf Storage= 53 cf

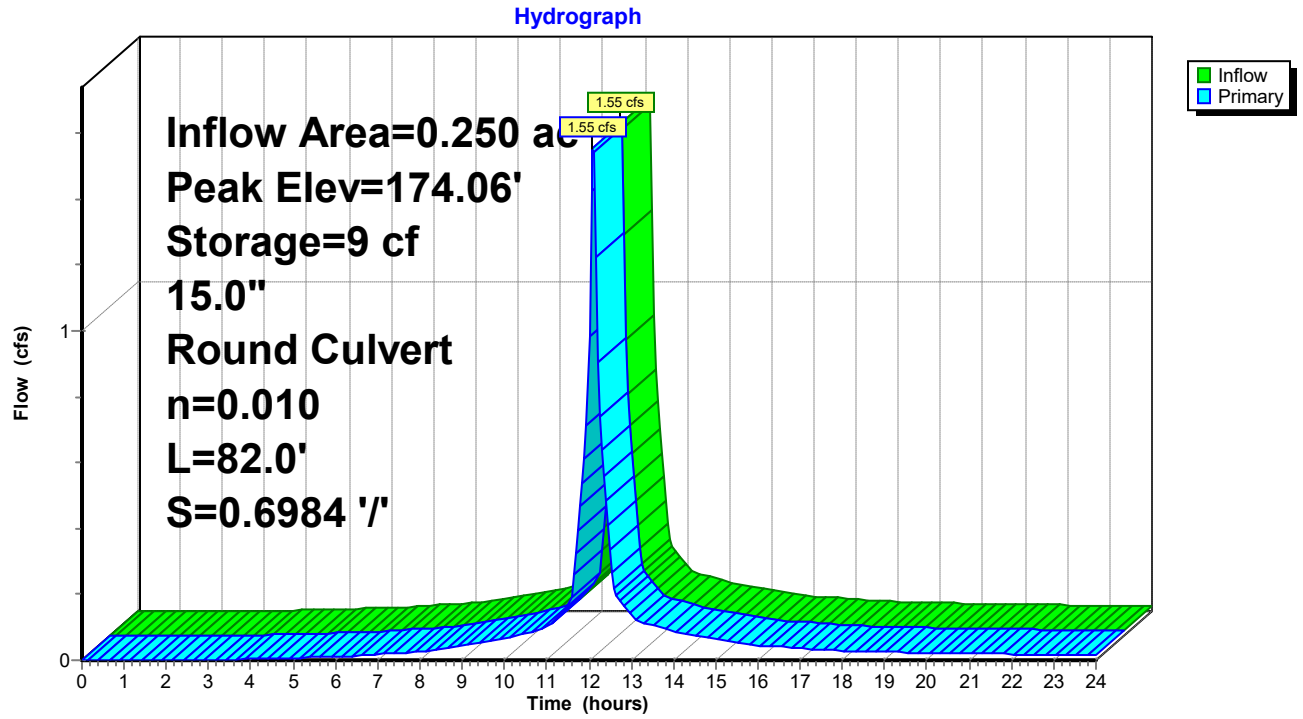
Plug-Flow detention time= 0.3 min calculated for 0.120 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (776.8 - 776.6)

Volume	Invert	Avail.Storage	Storage Description
#1	173.37'	53 cf	**4.00'D x 4.25'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	173.37'	**15.0" Round 15" RCP** L= 82.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 173.37' / 116.10' S= 0.6984 '/' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=1.51 cfs @ 12.09 hrs HW=174.05' TW=0.00' (Dynamic Tailwater)
1=15" RCP (Inlet Controls 1.51 cfs @ 2.22 fps)

Pond 6P: Catch basin



Summary for Pond 7P: 8inch pvc drain

[57] Hint: Peaked at 175.93' (Flood elevation advised)

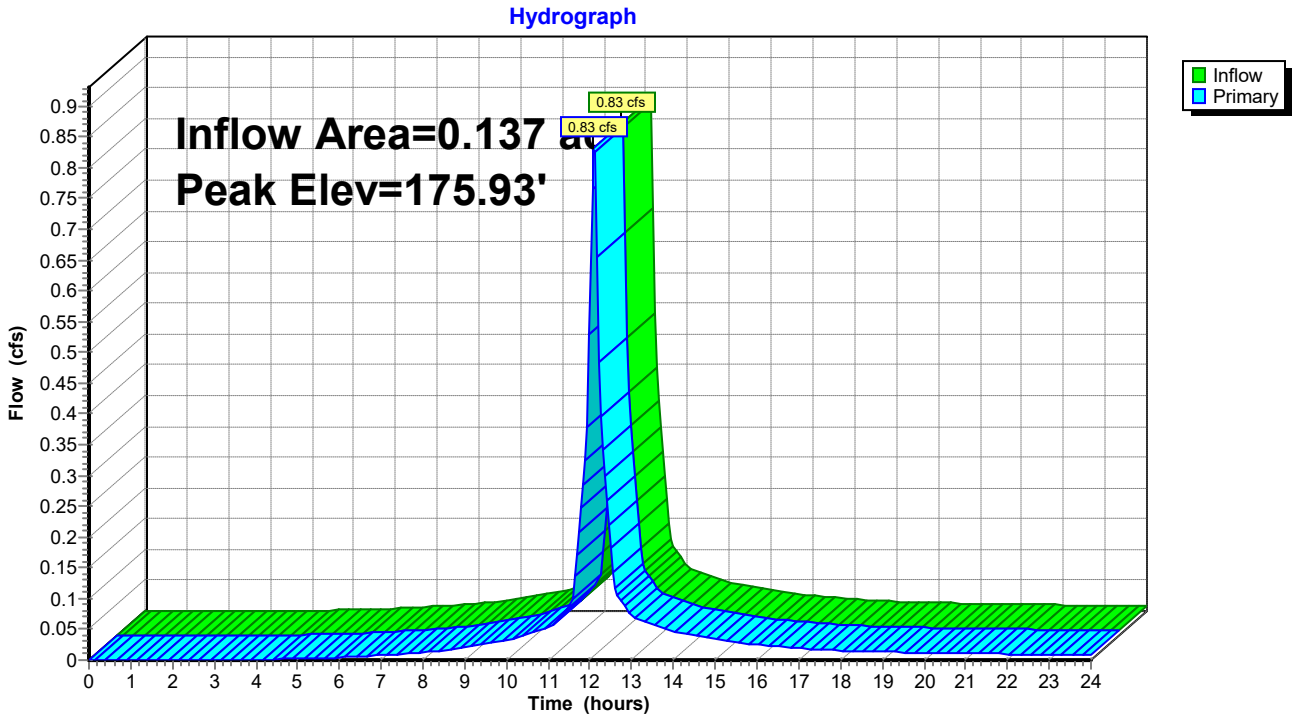
Inflow Area = 0.137 ac, 76.06% Impervious, Inflow Depth > 5.56" for 25YR-24HR event
Inflow = 0.83 cfs @ 12.09 hrs, Volume= 0.063 af
Outflow = 0.83 cfs @ 12.09 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.0 min
Primary = 0.83 cfs @ 12.09 hrs, Volume= 0.063 af

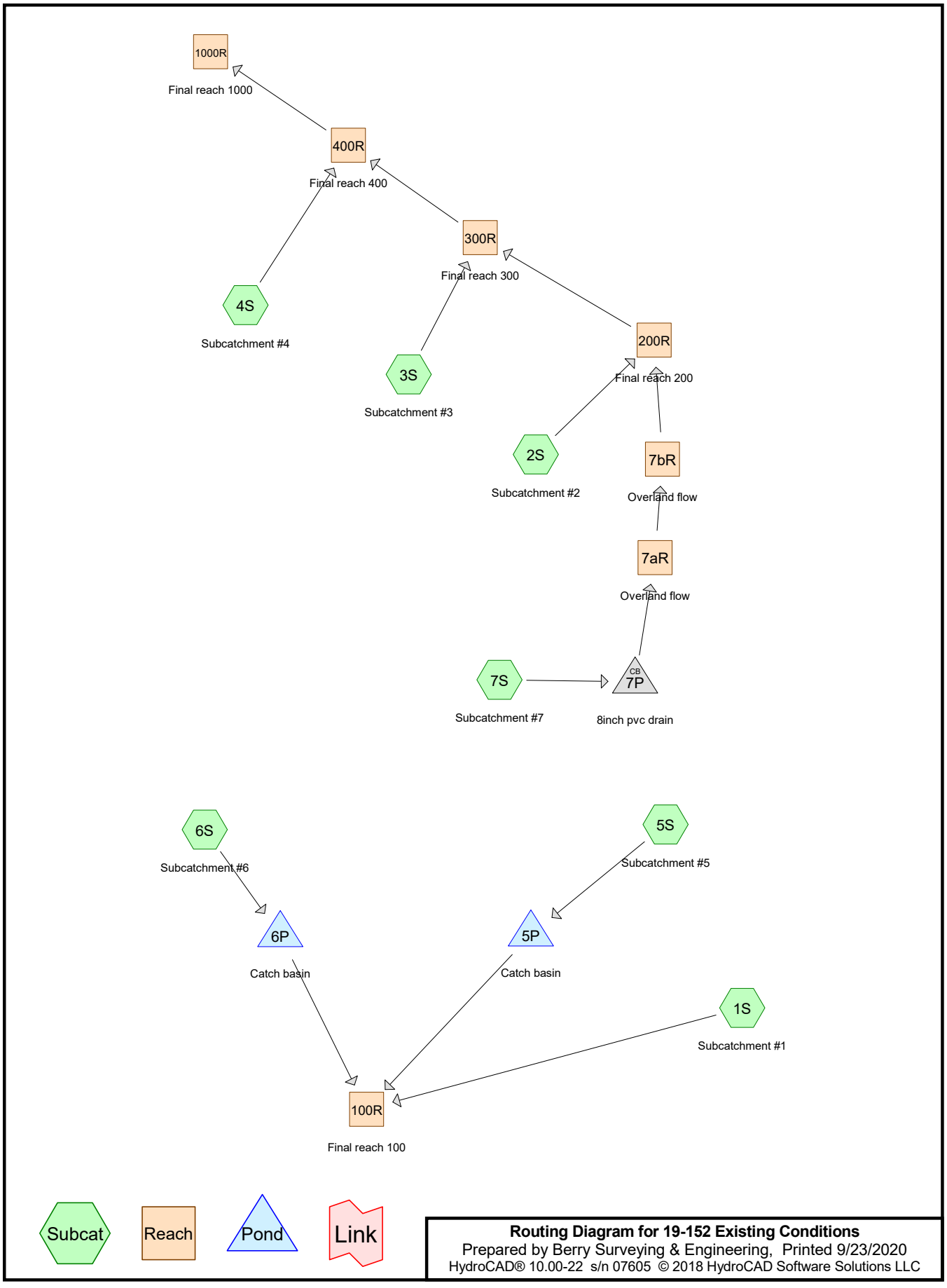
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 175.93' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	175.75'	**5.0' long x 8.0' 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 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=0.79 cfs @ 12.09 hrs HW=175.93' TW=175.83' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.79 cfs @ 0.90 fps)

Pond 7P: 8inch pvc drain





Routing Diagram for 19-152 Existing Conditions
Prepared by Berry Surveying & Engineering, Printed 9/23/2020
HydroCAD® 10.00-22 s/n 07605 © 2018 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Subcatchment #1 Runoff Area=393,349 sf 4.54% Impervious Runoff Depth>1.07"
Flow Length=453' Tc=30.5 min CN=70 Runoff=5.93 cfs 0.803 af

Subcatchment 2S: Subcatchment #2 Runoff Area=122,881 sf 25.49% Impervious Runoff Depth>0.91"
Flow Length=392' Tc=12.4 min CN=67 Runoff=2.14 cfs 0.214 af

Subcatchment 3S: Subcatchment #3 Runoff Area=36,012 sf 0.00% Impervious Runoff Depth>0.19"
Flow Length=584' Tc=16.6 min CN=49 Runoff=0.04 cfs 0.013 af

Subcatchment 4S: Subcatchment #4 Runoff Area=105,863 sf 58.44% Impervious Runoff Depth>1.72"
Flow Length=251' Tc=12.2 min CN=80 Runoff=3.96 cfs 0.348 af

Subcatchment 5S: Subcatchment #5 Runoff Area=8,890 sf 79.74% Impervious Runoff Depth>2.64"
Tc=6.0 min CN=91 Runoff=0.60 cfs 0.045 af

Subcatchment 6S: Subcatchment #6 Runoff Area=10,871 sf 82.28% Impervious Runoff Depth>2.64"
Tc=6.0 min CN=91 Runoff=0.74 cfs 0.055 af

Subcatchment 7S: Subcatchment #7 Runoff Area=5,969 sf 76.06% Impervious Runoff Depth>2.46"
Flow Length=72' Slope=0.0622 '/' Tc=6.0 min CN=89 Runoff=0.38 cfs 0.028 af

Reach 7aR: Overland flow Avg. Flow Depth=0.06' Max Vel=1.46 fps Inflow=0.38 cfs 0.028 af
n=0.013 L=57.1' S=0.0131 '/' Capacity=9.91 cfs Outflow=0.38 cfs 0.028 af

Reach 7bR: Overland flow Avg. Flow Depth=0.08' Max Vel=1.14 fps Inflow=0.38 cfs 0.028 af
n=0.035 L=175.8' S=0.0370 '/' Capacity=19.59 cfs Outflow=0.36 cfs 0.028 af

Reach 100R: Final reach 100 Inflow=6.29 cfs 0.903 af
Outflow=6.29 cfs 0.903 af

Reach 200R: Final reach 200 Inflow=2.43 cfs 0.242 af
Outflow=2.43 cfs 0.242 af

Reach 300R: Final reach 300 Inflow=2.43 cfs 0.255 af
Outflow=2.43 cfs 0.255 af

Reach 400R: Final reach 400 Inflow=6.36 cfs 0.604 af
Outflow=6.36 cfs 0.604 af

Reach 1000R: Final reach 1000 Inflow=6.36 cfs 0.604 af
Outflow=6.36 cfs 0.604 af

Pond 5P: Catch basin Peak Elev=170.38' Storage=5 cf Inflow=0.60 cfs 0.045 af
15.0" Round Culvert n=0.010 L=81.9' S=0.0035 '/' Outflow=0.61 cfs 0.045 af

Pond 6P: Catch basin Peak Elev=173.83' Storage=6 cf Inflow=0.74 cfs 0.055 af
15.0" Round Culvert n=0.010 L=82.0' S=0.6984 '/' Outflow=0.74 cfs 0.055 af

Pond 7P: 8inch pvc drain Peak Elev=175.86' Inflow=0.38 cfs 0.028 af
Outflow=0.38 cfs 0.028 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Subcatchment #1 Runoff Area=393,349 sf 4.54% Impervious Runoff Depth>2.34"
Flow Length=453' Tc=30.5 min CN=70 Runoff=13.81 cfs 1.764 af

Subcatchment 2S: Subcatchment #2 Runoff Area=122,881 sf 25.49% Impervious Runoff Depth>2.10"
Flow Length=392' Tc=12.4 min CN=67 Runoff=5.44 cfs 0.494 af

Subcatchment 3S: Subcatchment #3 Runoff Area=36,012 sf 0.00% Impervious Runoff Depth>0.81"
Flow Length=584' Tc=16.6 min CN=49 Runoff=0.39 cfs 0.056 af

Subcatchment 4S: Subcatchment #4 Runoff Area=105,863 sf 58.44% Impervious Runoff Depth>3.26"
Flow Length=251' Tc=12.2 min CN=80 Runoff=7.56 cfs 0.661 af

Subcatchment 5S: Subcatchment #5 Runoff Area=8,890 sf 79.74% Impervious Runoff Depth>4.40"
Tc=6.0 min CN=91 Runoff=0.98 cfs 0.075 af

Subcatchment 6S: Subcatchment #6 Runoff Area=10,871 sf 82.28% Impervious Runoff Depth>4.40"
Tc=6.0 min CN=91 Runoff=1.20 cfs 0.091 af

Subcatchment 7S: Subcatchment #7 Runoff Area=5,969 sf 76.06% Impervious Runoff Depth>4.18"
Flow Length=72' Slope=0.0622 '/' Tc=6.0 min CN=89 Runoff=0.63 cfs 0.048 af

Reach 7aR: Overland flow Avg. Flow Depth=0.07' Max Vel=1.70 fps Inflow=0.63 cfs 0.048 af
n=0.013 L=57.1' S=0.0131 '/' Capacity=9.91 cfs Outflow=0.64 cfs 0.048 af

Reach 7bR: Overland flow Avg. Flow Depth=0.10' Max Vel=1.34 fps Inflow=0.64 cfs 0.048 af
n=0.035 L=175.8' S=0.0370 '/' Capacity=19.59 cfs Outflow=0.61 cfs 0.048 af

Reach 100R: Final reach 100 Inflow=14.42 cfs 1.930 af
Outflow=14.42 cfs 1.930 af

Reach 200R: Final reach 200 Inflow=6.00 cfs 0.542 af
Outflow=6.00 cfs 0.542 af

Reach 300R: Final reach 300 Inflow=6.22 cfs 0.598 af
Outflow=6.22 cfs 0.598 af

Reach 400R: Final reach 400 Inflow=13.81 cfs 1.259 af
Outflow=13.81 cfs 1.259 af

Reach 1000R: Final reach 1000 Inflow=13.81 cfs 1.259 af
Outflow=13.81 cfs 1.259 af

Pond 5P: Catch basin Peak Elev=170.51' Storage=7 cf Inflow=0.98 cfs 0.075 af
15.0" Round Culvert n=0.010 L=81.9' S=0.0035 '/' Outflow=0.98 cfs 0.075 af

Pond 6P: Catch basin Peak Elev=173.97' Storage=7 cf Inflow=1.20 cfs 0.091 af
15.0" Round Culvert n=0.010 L=82.0' S=0.6984 '/' Outflow=1.20 cfs 0.091 af

Pond 7P: 8inch pvc drain Peak Elev=175.90' Inflow=0.63 cfs 0.048 af
Outflow=0.63 cfs 0.048 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Subcatchment #1 Runoff Area=393,349 sf 4.54% Impervious Runoff Depth>3.47"
Flow Length=453' Tc=30.5 min CN=70 Runoff=20.67 cfs 2.613 af

Subcatchment 2S: Subcatchment #2 Runoff Area=122,881 sf 25.49% Impervious Runoff Depth>3.18"
Flow Length=392' Tc=12.4 min CN=67 Runoff=8.39 cfs 0.748 af

Subcatchment 3S: Subcatchment #3 Runoff Area=36,012 sf 0.00% Impervious Runoff Depth>1.49"
Flow Length=584' Tc=16.6 min CN=49 Runoff=0.88 cfs 0.103 af

Subcatchment 4S: Subcatchment #4 Runoff Area=105,863 sf 58.44% Impervious Runoff Depth>4.55"
Flow Length=251' Tc=12.2 min CN=80 Runoff=10.47 cfs 0.921 af

Subcatchment 5S: Subcatchment #5 Runoff Area=8,890 sf 79.74% Impervious Runoff Depth>5.79"
Tc=6.0 min CN=91 Runoff=1.27 cfs 0.098 af

Subcatchment 6S: Subcatchment #6 Runoff Area=10,871 sf 82.28% Impervious Runoff Depth>5.79"
Tc=6.0 min CN=91 Runoff=1.55 cfs 0.120 af

Subcatchment 7S: Subcatchment #7 Runoff Area=5,969 sf 76.06% Impervious Runoff Depth>5.56"
Flow Length=72' Slope=0.0622 '/' Tc=6.0 min CN=89 Runoff=0.83 cfs 0.063 af

Reach 7aR: Overland flow Avg. Flow Depth=0.08' Max Vel=1.85 fps Inflow=0.83 cfs 0.063 af
n=0.013 L=57.1' S=0.0131 '/' Capacity=9.91 cfs Outflow=0.83 cfs 0.063 af

Reach 7bR: Overland flow Avg. Flow Depth=0.11' Max Vel=1.46 fps Inflow=0.83 cfs 0.063 af
n=0.035 L=175.8' S=0.0370 '/' Capacity=19.59 cfs Outflow=0.80 cfs 0.063 af

Reach 100R: Final reach 100 Inflow=21.48 cfs 2.831 af
Outflow=21.48 cfs 2.831 af

Reach 200R: Final reach 200 Inflow=9.13 cfs 0.811 af
Outflow=9.13 cfs 0.811 af

Reach 300R: Final reach 300 Inflow=9.78 cfs 0.914 af
Outflow=9.78 cfs 0.914 af

Reach 400R: Final reach 400 Inflow=20.31 cfs 1.835 af
Outflow=20.31 cfs 1.835 af

Reach 1000R: Final reach 1000 Inflow=20.31 cfs 1.835 af
Outflow=20.31 cfs 1.835 af

Pond 5P: Catch basin Peak Elev=170.60' Storage=8 cf Inflow=1.27 cfs 0.098 af
15.0" Round Culvert n=0.010 L=81.9' S=0.0035 '/' Outflow=1.27 cfs 0.098 af

Pond 6P: Catch basin Peak Elev=174.06' Storage=9 cf Inflow=1.55 cfs 0.120 af
15.0" Round Culvert n=0.010 L=82.0' S=0.6984 '/' Outflow=1.55 cfs 0.120 af

Pond 7P: 8inch pvc drain Peak Elev=175.93' Inflow=0.83 cfs 0.063 af
Outflow=0.83 cfs 0.063 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Subcatchment #1 Runoff Area=393,349 sf 4.54% Impervious Runoff Depth>4.60"
Flow Length=453' Tc=30.5 min CN=70 Runoff=27.45 cfs 3.462 af

Subcatchment 2S: Subcatchment #2 Runoff Area=122,881 sf 25.49% Impervious Runoff Depth>4.27"
Flow Length=392' Tc=12.4 min CN=67 Runoff=11.41 cfs 1.004 af

Subcatchment 3S: Subcatchment #3 Runoff Area=36,012 sf 0.00% Impervious Runoff Depth>2.25"
Flow Length=584' Tc=16.6 min CN=49 Runoff=1.43 cfs 0.155 af

Subcatchment 4S: Subcatchment #4 Runoff Area=105,863 sf 58.44% Impervious Runoff Depth>5.79"
Flow Length=251' Tc=12.2 min CN=80 Runoff=13.24 cfs 1.173 af

Subcatchment 5S: Subcatchment #5 Runoff Area=8,890 sf 79.74% Impervious Runoff Depth>7.11"
Tc=6.0 min CN=91 Runoff=1.54 cfs 0.121 af

Subcatchment 6S: Subcatchment #6 Runoff Area=10,871 sf 82.28% Impervious Runoff Depth>7.11"
Tc=6.0 min CN=91 Runoff=1.88 cfs 0.148 af

Subcatchment 7S: Subcatchment #7 Runoff Area=5,969 sf 76.06% Impervious Runoff Depth>6.87"
Flow Length=72' Slope=0.0622 '/' Tc=6.0 min CN=89 Runoff=1.01 cfs 0.078 af

Reach 7aR: Overland flow Avg. Flow Depth=0.09' Max Vel=1.97 fps Inflow=1.01 cfs 0.078 af
n=0.013 L=57.1' S=0.0131 '/' Capacity=9.91 cfs Outflow=1.02 cfs 0.078 af

Reach 7bR: Overland flow Avg. Flow Depth=0.13' Max Vel=1.55 fps Inflow=1.02 cfs 0.078 af
n=0.035 L=175.8' S=0.0370 '/' Capacity=19.59 cfs Outflow=0.98 cfs 0.078 af

Reach 100R: Final reach 100 Inflow=28.44 cfs 3.730 af
Outflow=28.44 cfs 3.730 af

Reach 200R: Final reach 200 Inflow=12.26 cfs 1.082 af
Outflow=12.26 cfs 1.082 af

Reach 300R: Final reach 300 Inflow=13.48 cfs 1.237 af
Outflow=13.48 cfs 1.237 af

Reach 400R: Final reach 400 Inflow=26.70 cfs 2.410 af
Outflow=26.70 cfs 2.410 af

Reach 1000R: Final reach 1000 Inflow=26.70 cfs 2.410 af
Outflow=26.70 cfs 2.410 af

Pond 5P: Catch basin Peak Elev=170.67' Storage=9 cf Inflow=1.54 cfs 0.121 af
15.0" Round Culvert n=0.010 L=81.9' S=0.0035 '/' Outflow=1.54 cfs 0.121 af

Pond 6P: Catch basin Peak Elev=174.14' Storage=10 cf Inflow=1.88 cfs 0.148 af
15.0" Round Culvert n=0.010 L=82.0' S=0.6984 '/' Outflow=1.88 cfs 0.148 af

Pond 7P: 8inch pvc drain Peak Elev=175.96' Inflow=1.01 cfs 0.078 af
Outflow=1.01 cfs 0.078 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Subcatchment #1 Runoff Area=393,349 sf 4.54% Impervious Runoff Depth>5.99"
Flow Length=453' Tc=30.5 min CN=70 Runoff=35.71 cfs 4.510 af

Subcatchment 2S: Subcatchment #2 Runoff Area=122,881 sf 25.49% Impervious Runoff Depth>5.63"
Flow Length=392' Tc=12.4 min CN=67 Runoff=15.05 cfs 1.322 af

Subcatchment 3S: Subcatchment #3 Runoff Area=36,012 sf 0.00% Impervious Runoff Depth>3.26"
Flow Length=584' Tc=16.6 min CN=49 Runoff=2.17 cfs 0.225 af

Subcatchment 4S: Subcatchment #4 Runoff Area=105,863 sf 58.44% Impervious Runoff Depth>7.30"
Flow Length=251' Tc=12.2 min CN=80 Runoff=16.52 cfs 1.478 af

Subcatchment 5S: Subcatchment #5 Runoff Area=8,890 sf 79.74% Impervious Runoff Depth>8.68"
Tc=6.0 min CN=91 Runoff=1.86 cfs 0.148 af

Subcatchment 6S: Subcatchment #6 Runoff Area=10,871 sf 82.28% Impervious Runoff Depth>8.68"
Tc=6.0 min CN=91 Runoff=2.27 cfs 0.181 af

Subcatchment 7S: Subcatchment #7 Runoff Area=5,969 sf 76.06% Impervious Runoff Depth>8.43"
Flow Length=72' Slope=0.0622 '/' Tc=6.0 min CN=89 Runoff=1.23 cfs 0.096 af

Reach 7aR: Overland flow Avg. Flow Depth=0.10' Max Vel=2.09 fps Inflow=1.23 cfs 0.096 af
n=0.013 L=57.1' S=0.0131 '/' Capacity=9.91 cfs Outflow=1.23 cfs 0.096 af

Reach 7bR: Overland flow Avg. Flow Depth=0.14' Max Vel=1.65 fps Inflow=1.23 cfs 0.096 af
n=0.035 L=175.8' S=0.0370 '/' Capacity=19.59 cfs Outflow=1.19 cfs 0.096 af

Reach 100R: Final reach 100 Inflow=36.91 cfs 4.838 af
Outflow=36.91 cfs 4.838 af

Reach 200R: Final reach 200 Inflow=16.08 cfs 1.419 af
Outflow=16.08 cfs 1.419 af

Reach 300R: Final reach 300 Inflow=17.99 cfs 1.643 af
Outflow=17.99 cfs 1.643 af

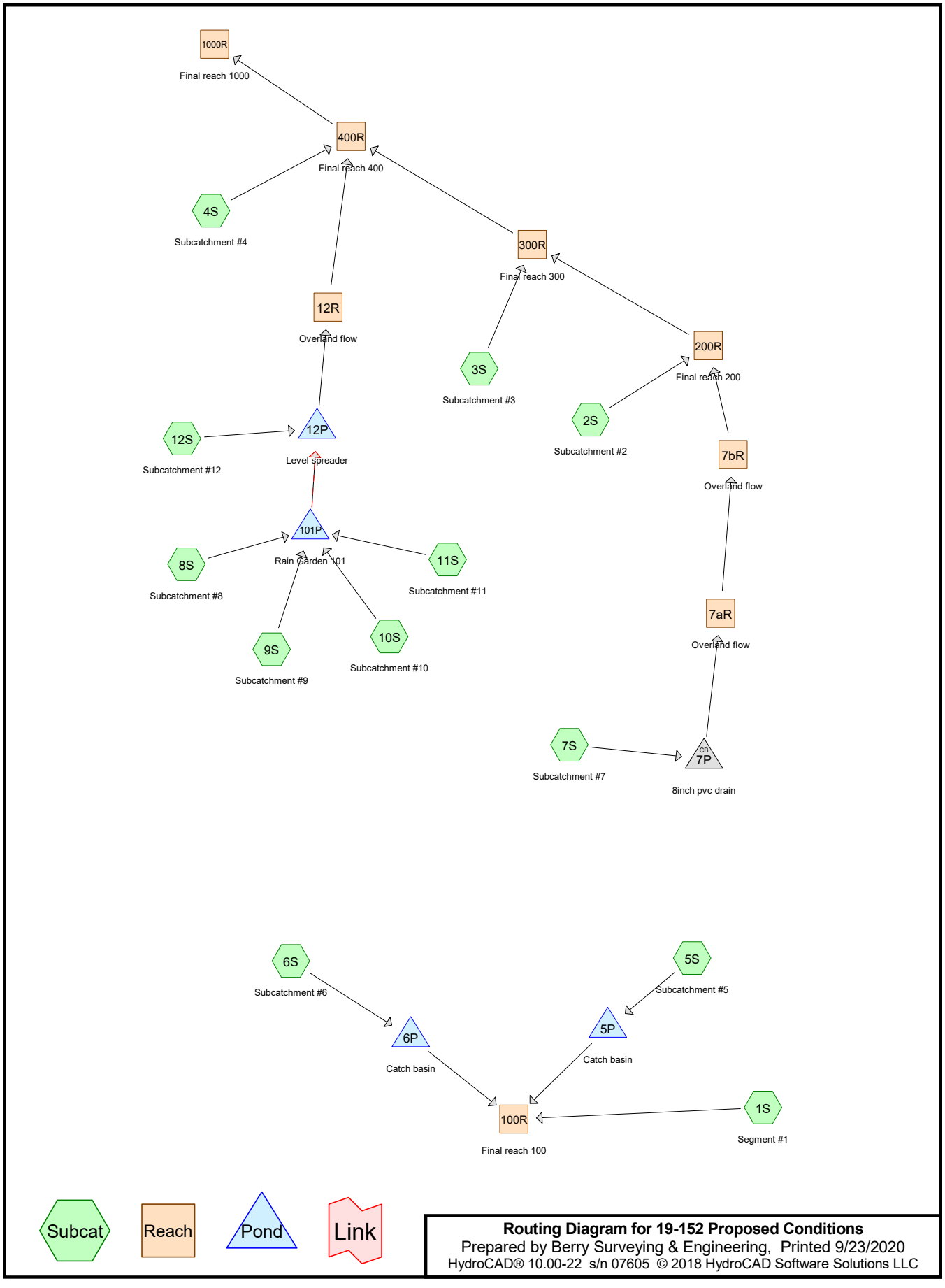
Reach 400R: Final reach 400 Inflow=34.49 cfs 3.121 af
Outflow=34.49 cfs 3.121 af

Reach 1000R: Final reach 1000 Inflow=34.49 cfs 3.121 af
Outflow=34.49 cfs 3.121 af

Pond 5P: Catch basin Peak Elev=170.76' Storage=10 cf Inflow=1.86 cfs 0.148 af
15.0" Round Culvert n=0.010 L=81.9' S=0.0035 '/' Outflow=1.86 cfs 0.148 af

Pond 6P: Catch basin Peak Elev=174.24' Storage=11 cf Inflow=2.27 cfs 0.181 af
15.0" Round Culvert n=0.010 L=82.0' S=0.6984 '/' Outflow=2.28 cfs 0.180 af

Pond 7P: 8inch pvc drain Peak Elev=175.98' Inflow=1.23 cfs 0.096 af
Outflow=1.23 cfs 0.096 af



Routing Diagram for 19-152 Proposed Conditions
Prepared by Berry Surveying & Engineering, Printed 9/23/2020
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Project Notes

CarlsonStageIncrement|1.0000|

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.021	39	>75% Grass cover, Good HSG A (3S)
2.041	61	>75% Grass cover, Good HSG B (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S)
0.009	74	>75% Grass cover, Good HSG C (1S)
0.031	39	>75% Grass cover, Good, HSG A (12S)
0.039	61	>75% Grass cover, Good, HSG B (12S)
2.056	98	Paved parking HSG B (1S, 2S, 5S, 6S, 7S, 8S)
1.098	98	Roofs HSG B (9S, 11S)
0.835	98	Unconnected roofs, HSG B (10S)
0.361	30	Woods, Good HSG A (3S, 4S)
1.786	55	Woods, Good HSG B (1S, 2S, 3S, 4S)
7.249	70	Woods, Good HSG C (1S)
0.172	77	Woods, Good HSG D (1S, 4S)
15.697	**73**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.413	HSG A	3S, 4S, 12S
7.854	HSG B	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S
7.258	HSG C	1S
0.172	HSG D	1S, 4S
0.000	Other	
15.697		**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
0.053	2.080	0.009	0.000	0.000	2.141	>75% Grass cover, Good	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 12S
0.000	2.056	0.000	0.000	0.000	2.056	Paved parking	1S, 2S, 5S, 6S, 7S, 8S
0.000	1.098	0.000	0.000	0.000	1.098	Roofs	9S, 11S
0.000	0.835	0.000	0.000	0.000	0.835	Unconnected roofs	10S
0.361	1.786	7.249	0.172	0.000	9.567	Woods, Good	1S, 2S, 3S, 4S
0.413	**7.854**	**7.258**	**0.172**	**0.000**	**15.697**	**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	5P	169.96	169.67	81.9	0.0035	0.010	15.0	0.0	0.0
2	6P	173.37	116.10	82.0	0.6984	0.010	15.0	0.0	0.0
3	101P	168.75	168.00	50.0	0.0150	0.012	15.0	0.0	0.0

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Segment #1 Runoff Area=393,349 sf 4.54% Impervious Runoff Depth>3.47"
Flow Length=453' Tc=30.5 min CN=70 Runoff=20.67 cfs 2.613 af

Subcatchment 2S: Subcatchment #2 Runoff Area=74,584 sf 28.44% Impervious Runoff Depth>3.28"
Flow Length=347' Tc=9.2 min CN=68 Runoff=5.79 cfs 0.469 af

Subcatchment 3S: Subcatchment #3 Runoff Area=17,250 sf 0.00% Impervious Runoff Depth>1.08"
Flow Length=115' Tc=10.4 min CN=44 Runoff=0.30 cfs 0.036 af

Subcatchment 4S: Subcatchment #4 Runoff Area=19,029 sf 0.00% Impervious Runoff Depth>1.41"
Flow Length=227' Tc=12.5 min CN=48 Runoff=0.47 cfs 0.051 af

Subcatchment 5S: Subcatchment #5 Runoff Area=8,890 sf 79.74% Impervious Runoff Depth>5.79"
Tc=6.0 min CN=91 Runoff=1.27 cfs 0.098 af

Subcatchment 6S: Subcatchment #6 Runoff Area=10,871 sf 82.28% Impervious Runoff Depth>5.79"
Tc=6.0 min CN=91 Runoff=1.55 cfs 0.120 af

Subcatchment 7S: Subcatchment #7 Runoff Area=2,719 sf 48.18% Impervious Runoff Depth>4.44"
Flow Length=72' Slope=0.0622 '/' Tc=6.0 min CN=79 Runoff=0.32 cfs 0.023 af

Subcatchment 8S: Subcatchment #8 Runoff Area=69,845 sf 47.44% Impervious Runoff Depth>4.44"
Flow Length=371' Tc=12.4 min CN=79 Runoff=6.72 cfs 0.593 af

Subcatchment 9S: Subcatchment #9 Runoff Area=40,745 sf 100.00% Impervious Runoff Depth>6.61"
Tc=6.0 min CN=98 Runoff=6.14 cfs 0.515 af

Subcatchment 10S: Subcatchment #10 Runoff Area=36,361 sf 100.00% Impervious Runoff Depth>6.61"
Tc=6.0 min CN=98 Runoff=5.48 cfs 0.460 af

Subcatchment 11S: Subcatchment #11 Runoff Area=7,078 sf 100.00% Impervious Runoff Depth>6.61"
Tc=6.0 min CN=98 Runoff=1.07 cfs 0.089 af

Subcatchment 12S: Subcatchment #12 Runoff Area=3,051 sf 0.00% Impervious Runoff Depth>1.67"
Tc=6.0 min CN=51 Runoff=0.12 cfs 0.010 af

Reach 7aR: Overland flow Avg. Flow Depth=0.05' Max Vel=1.49 fps Inflow=0.32 cfs 0.023 af
n=0.013 L=201.4' S=0.0174 '/' Capacity=11.40 cfs Outflow=0.30 cfs 0.023 af

Reach 7bR: Overland flow Avg. Flow Depth=0.06' Max Vel=1.57 fps Inflow=0.30 cfs 0.023 af
n=0.035 L=34.4' S=0.1090 '/' Capacity=33.63 cfs Outflow=0.30 cfs 0.023 af

Reach 12R: Overland flow Avg. Flow Depth=0.17' Max Vel=4.92 fps Inflow=4.92 cfs 0.980 af
n=0.035 L=33.0' S=0.2424 '/' Capacity=50.15 cfs Outflow=4.98 cfs 0.982 af

Reach 100R: Final reach 100 Inflow=21.48 cfs 2.831 af
Outflow=21.48 cfs 2.831 af

Reach 200R: Final reach 200 Inflow=6.09 cfs 0.492 af
Outflow=6.09 cfs 0.492 af

Reach 300R: Final reach 300 Inflow=6.36 cfs 0.527 af
Outflow=6.36 cfs 0.527 af

Reach 400R: Final reach 400 Inflow=7.44 cfs 1.561 af
Outflow=7.44 cfs 1.561 af

Reach 1000R: Final reach 1000 Inflow=7.44 cfs 1.561 af
Outflow=7.44 cfs 1.561 af

Pond 5P: Catch basin Peak Elev=170.60' Storage=8 cf Inflow=1.27 cfs 0.098 af
15.0" Round Culvert n=0.010 L=81.9' S=0.0035 '/' Outflow=1.27 cfs 0.098 af

Pond 6P: Catch basin Peak Elev=174.06' Storage=9 cf Inflow=1.55 cfs 0.120 af
15.0" Round Culvert n=0.010 L=82.0' S=0.6984 '/' Outflow=1.55 cfs 0.120 af

Pond 7P: 8inch pvc drain Peak Elev=175.85' Inflow=0.32 cfs 0.023 af
Outflow=0.32 cfs 0.023 af

Pond 12P: Level spreader Peak Elev=171.20' Storage=1,662 cf Inflow=4.83 cfs 1.013 af
Outflow=4.92 cfs 0.980 af

Pond 101P: Rain Garden 101 Peak Elev=174.47' Storage=34,983 cf Inflow=18.21 cfs 1.657 af
Primary=4.80 cfs 1.003 af Secondary=0.00 cfs 0.000 af Outflow=4.80 cfs 1.003 af

Total Runoff Area = 15.697 ac Runoff Volume = 5.077 af Average Runoff Depth = 3.88"
74.59% Pervious = 11.709 ac 25.41% Impervious = 3.989 ac

Summary for Subcatchment 1S: Segment #1

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CarlsonSurface||

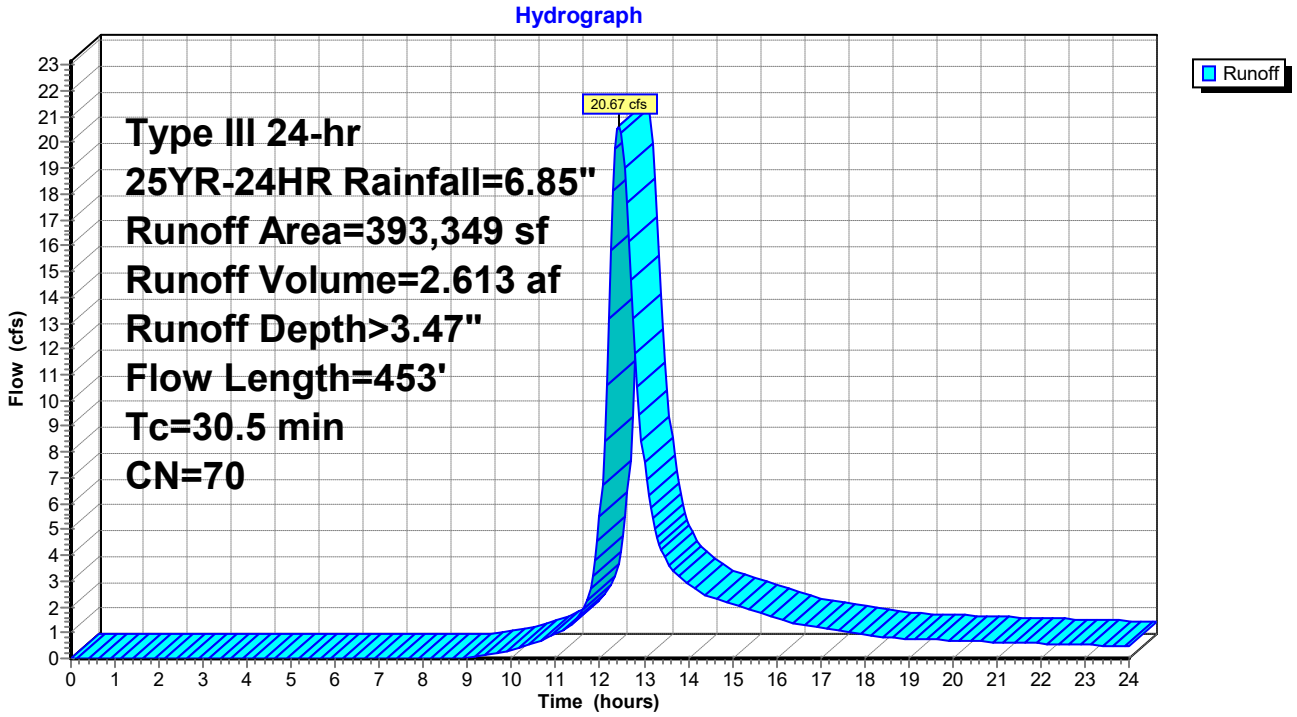
Runoff = 20.67 cfs @ 12.43 hrs, Volume= 2.613 af, Depth> 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
26,086	61	>75% Grass cover, Good HSG B
399	74	>75% Grass cover, Good HSG C
17,869	98	Paved parking HSG B
28,119	55	Woods, Good HSG B
315,762	70	Woods, Good HSG C
5,114	77	Woods, Good HSG D
393,349	70	Weighted Average
375,480		95.46% Pervious Area
17,869		4.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	100	0.0300	0.10		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
1.4	64	0.0236	0.77		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
10.3	212	0.0047	0.34		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
1.6	77	0.0260	0.81		**Shallow Concentrated Flow, Segment #4** Woodland Kv= 5.0 fps
30.5	453	Total			

Subcatchment 1S: Segment #1



Summary for Subcatchment 2S: Subcatchment #2

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CarlsonSurface||

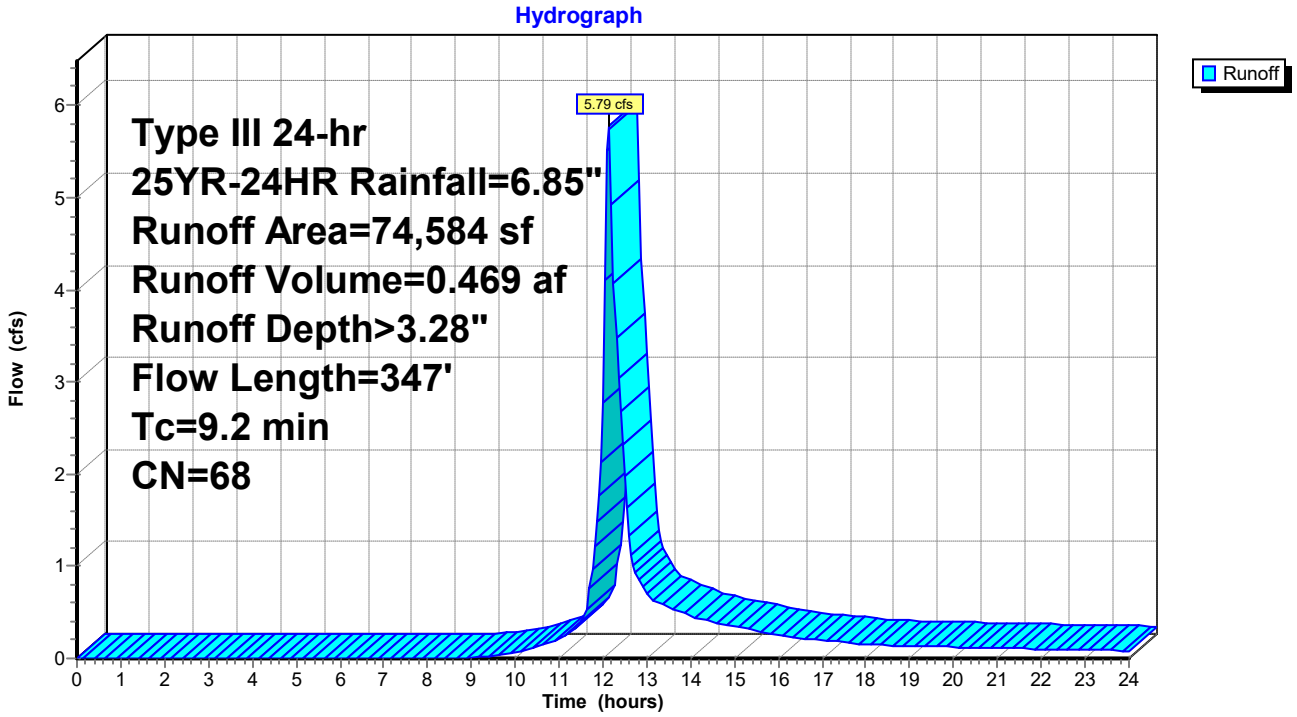
Runoff = 5.79 cfs @ 12.14 hrs, Volume= 0.469 af, Depth> 3.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
15,160	61	>75% Grass cover, Good HSG B
21,215	98	Paved parking HSG B
38,209	55	Woods, Good HSG B
74,584	68	Weighted Average
53,369		71.56% Pervious Area
21,215		28.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.0400	0.24		**Sheet Flow, Segment #1** Grass: Short n= 0.150 P2= 3.61"
0.9	130	0.0153	2.51		**Shallow Concentrated Flow, Segment #2** Paved Kv= 20.3 fps
1.0	97	0.0517	1.59		**Shallow Concentrated Flow, Segment #3** Short Grass Pasture Kv= 7.0 fps
0.3	20	0.0501	1.12		**Shallow Concentrated Flow, Segment #4** Woodland Kv= 5.0 fps
9.2	347	Total			

Subcatchment 2S: Subcatchment #2



Summary for Subcatchment 3S: Subcatchment #3

CarlsonPlanXYPos|1186739.5463|266302.0373|
CarlsonSurface||

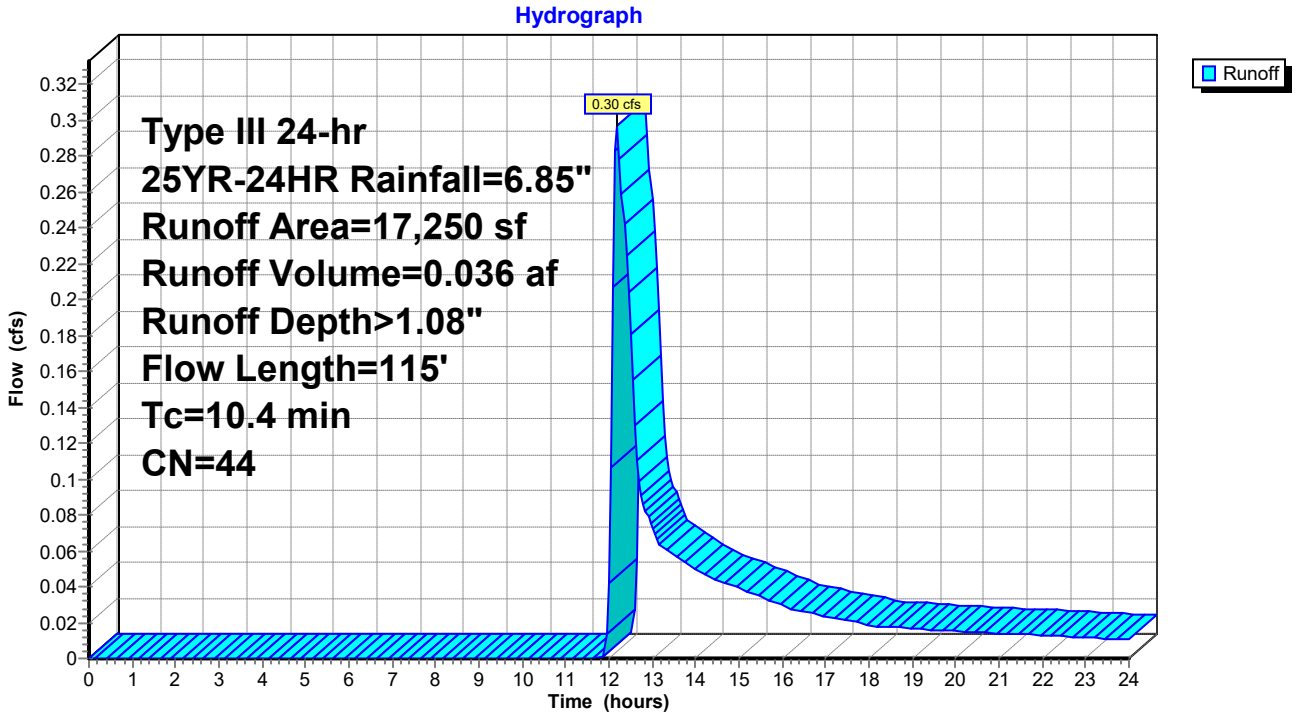
Runoff = 0.30 cfs @ 12.20 hrs, Volume= 0.036 af, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
925	39	>75% Grass cover, Good HSG A
4,327	61	>75% Grass cover, Good HSG B
7,898	30	Woods, Good HSG A
4,100	55	Woods, Good HSG B
17,250	44	Weighted Average
17,250		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	6	0.1815	0.25		**Sheet Flow, Segment #1** Grass: Short n= 0.150 P2= 3.61"
9.8	94	0.1085	0.16		**Sheet Flow, Segment #2** Woods: Light underbrush n= 0.400 P2= 3.61"
0.2	15	0.0654	1.28		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
10.4	115	Total			

Subcatchment 3S: Subcatchment #3



Summary for Subcatchment 4S: Subcatchment #4

CarlsonPlanXYPos|1186549.0722|266395.0403|
CarlsonSurface||

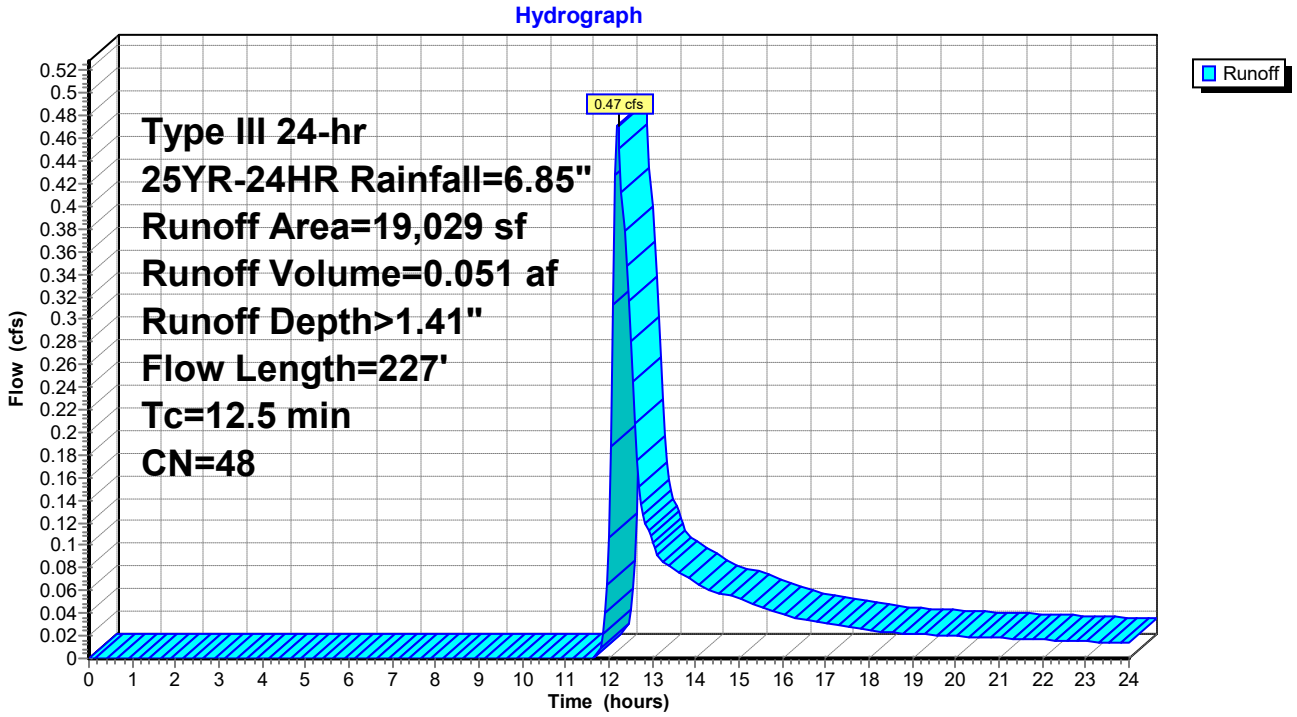
Runoff = 0.47 cfs @ 12.21 hrs, Volume= 0.051 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
1,479	61	>75% Grass cover, Good HSG B
7,819	30	Woods, Good HSG A
7,351	55	Woods, Good HSG B
2,380	77	Woods, Good HSG D
19,029	48	Weighted Average
19,029		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	13	0.1136	0.24		**Sheet Flow, Segment #1** Grass: Short n= 0.150 P2= 3.61"
10.1	87	0.0864	0.14		**Sheet Flow, Segment #2** Woods: Light underbrush n= 0.400 P2= 3.61"
0.7	58	0.0694	1.32		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
0.2	19	0.1542	1.96		**Shallow Concentrated Flow, Segment #4** Woodland Kv= 5.0 fps
0.6	50	0.0797	1.41		**Shallow Concentrated Flow, Segment #5** Woodland Kv= 5.0 fps
12.5	227	Total			

Subcatchment 4S: Subcatchment #4



Summary for Subcatchment 5S: Subcatchment #5

CarlsonPlanXYPos|1186726.4546|265793.9842|
CarlsonSurface||

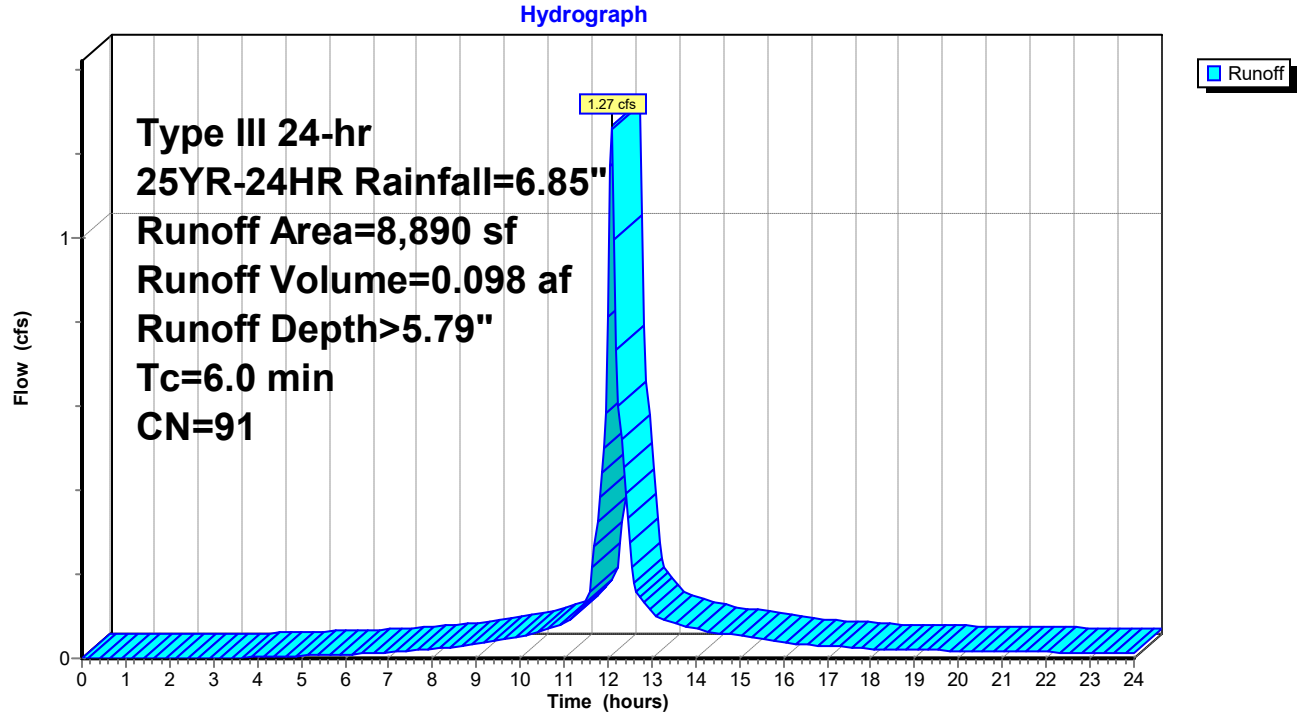
Runoff = 1.27 cfs @ 12.09 hrs, Volume= 0.098 af, Depth> 5.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
1,801	61	>75% Grass cover, Good HSG B
7,089	98	Paved parking HSG B
8,890	91	Weighted Average
1,801		20.26% Pervious Area
7,089		79.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 5S: Subcatchment #5



Summary for Subcatchment 6S: Subcatchment #6

CarlsonPlanXYPos|1186470.0613|265918.7728|
CarlsonSurface||

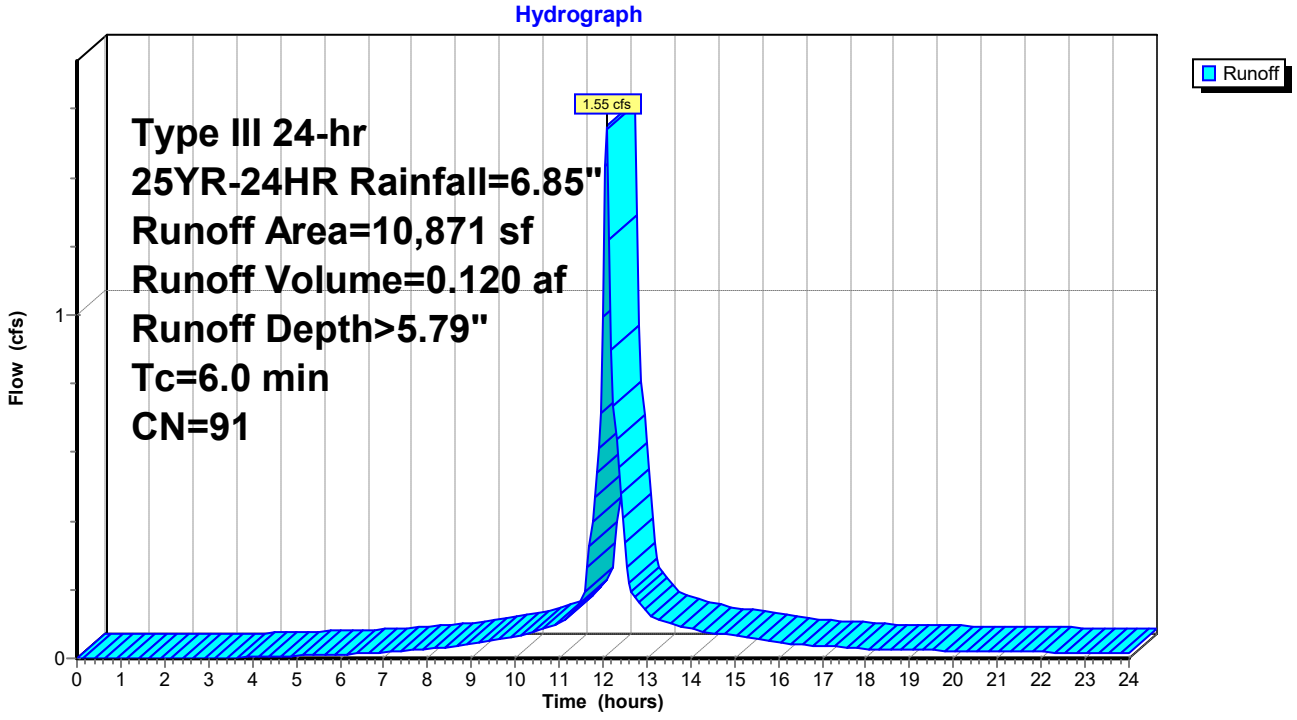
Runoff = 1.55 cfs @ 12.09 hrs, Volume= 0.120 af, Depth> 5.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
1,926	61	>75% Grass cover, Good HSG B
8,945	98	Paved parking HSG B
10,871	91	Weighted Average
1,926		17.72% Pervious Area
8,945		82.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 6S: Subcatchment #6



Summary for Subcatchment 7S: Subcatchment #7

CarlsonPlanXYPos|1186799.1279|265870.5927|
CarlsonSurface||

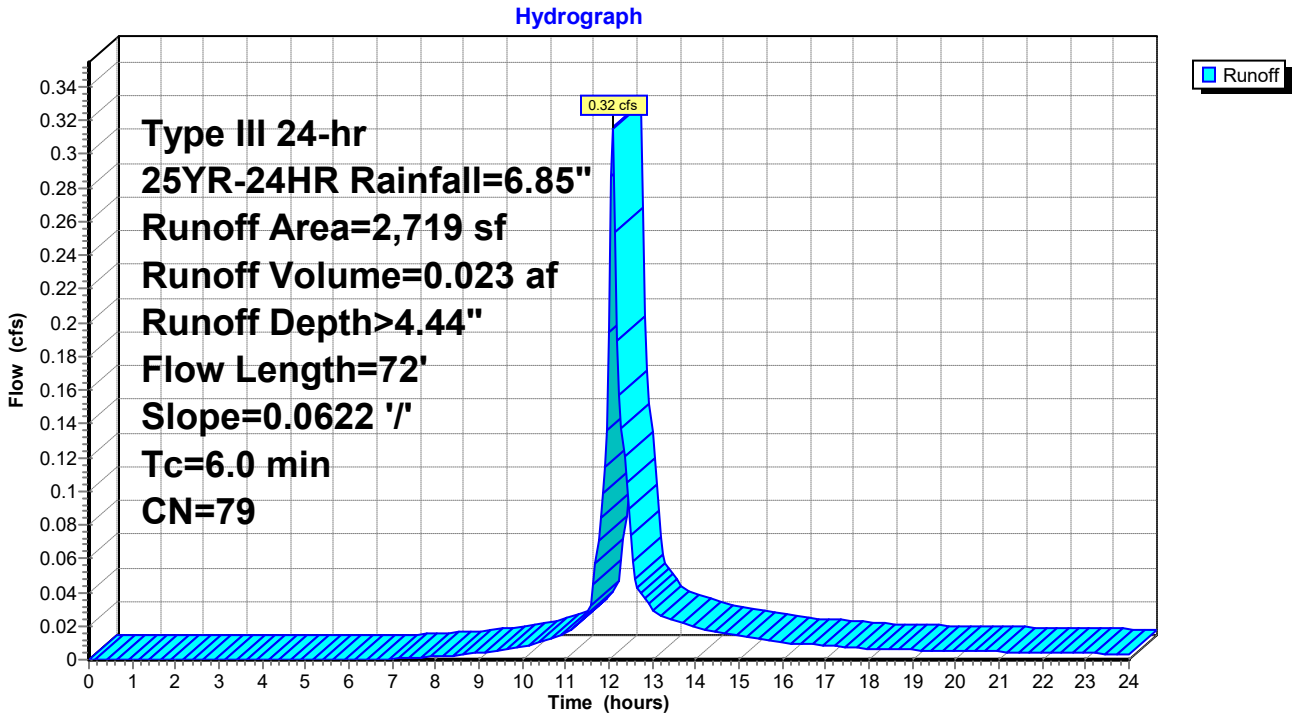
Runoff = 0.32 cfs @ 12.09 hrs, Volume= 0.023 af, Depth> 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
1,409	61	>75% Grass cover, Good HSG B
1,310	98	Paved parking HSG B
2,719	79	Weighted Average
1,409		51.82% Pervious Area
1,310		48.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	72	0.0622	0.27		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.61"
4.5	72	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 7S: Subcatchment #7



Summary for Subcatchment 8S: Subcatchment #8

CarlsonPlanXYPos|1186448.5737|266115.9567|
CarlsonSurface||

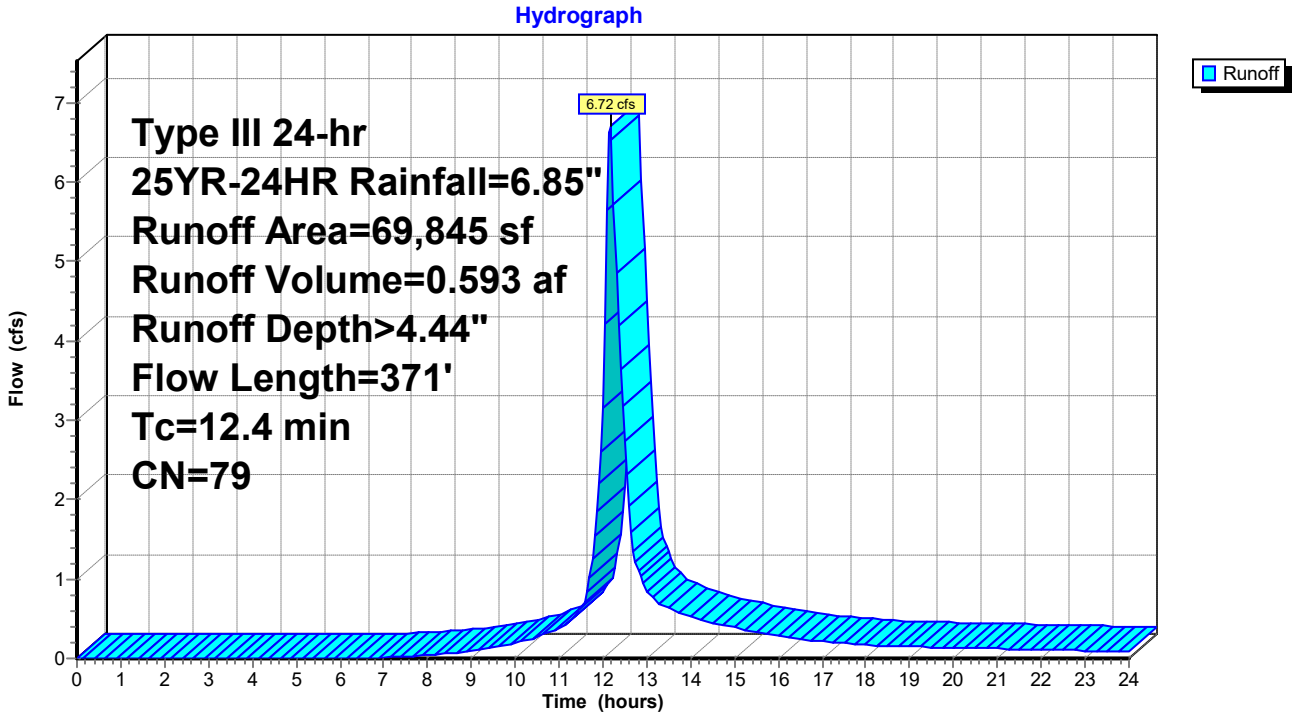
Runoff = 6.72 cfs @ 12.17 hrs, Volume= 0.593 af, Depth> 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
36,714	61	>75% Grass cover, Good HSG B
33,131	98	Paved parking HSG B
69,845	79	Weighted Average
36,714		52.56% Pervious Area
33,131		47.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0150	0.16		**Sheet Flow, Segment #1** Grass: Short n= 0.150 P2= 3.61"
0.2	16	0.0308	1.23		**Shallow Concentrated Flow, Segment #2** Short Grass Pasture Kv= 7.0 fps
1.8	247	0.0122	2.24		**Shallow Concentrated Flow, Segment #3** Paved Kv= 20.3 fps
0.1	8	0.0623	1.75		**Shallow Concentrated Flow, Segment #4** Short Grass Pasture Kv= 7.0 fps
12.4	371	Total			

Subcatchment 8S: Subcatchment #8



Summary for Subcatchment 9S: Subcatchment #9

CarlsonPlanXYPos|1186626.7579|265996.5417|
CarlsonSurface||

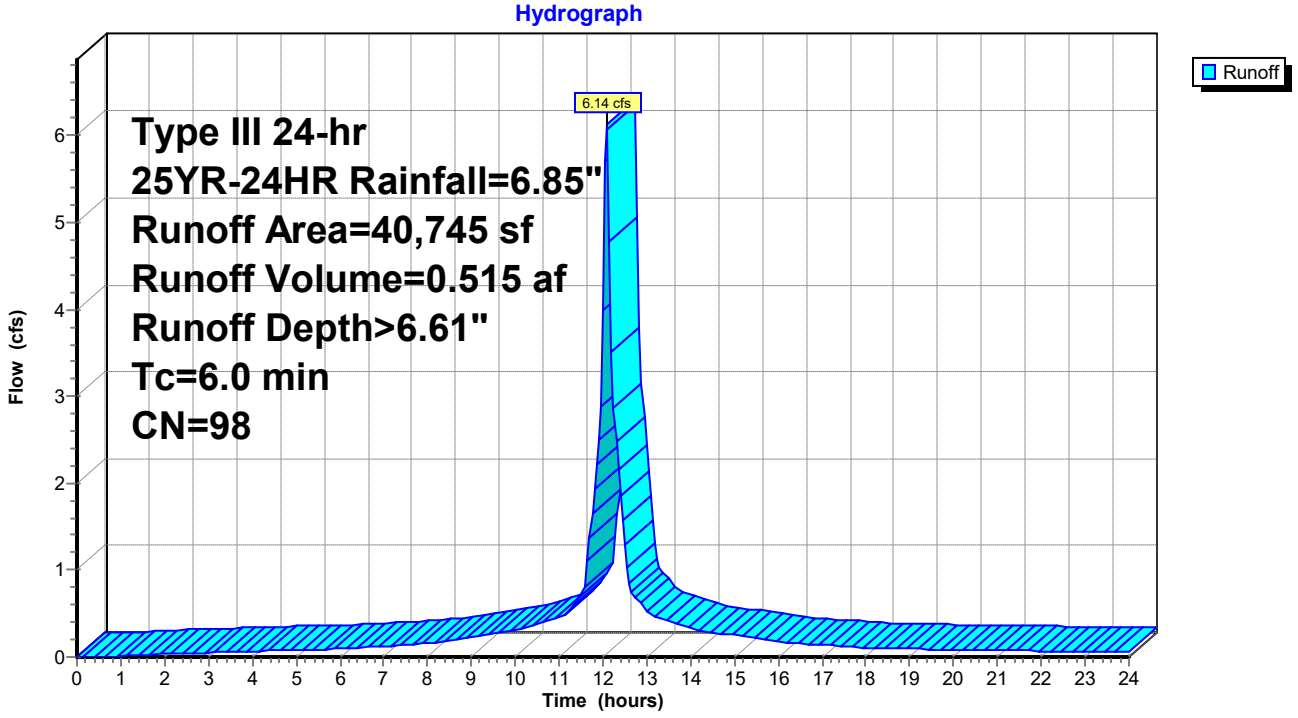
Runoff = 6.14 cfs @ 12.09 hrs, Volume= 0.515 af, Depth> 6.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
40,745	98	Roofs HSG B
40,745		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 9S: Subcatchment #9



Summary for Subcatchment 10S: Subcatchment #10

CarlsonPlanXYPos|1186633.2441|266105.7052|
CarlsonSurface||

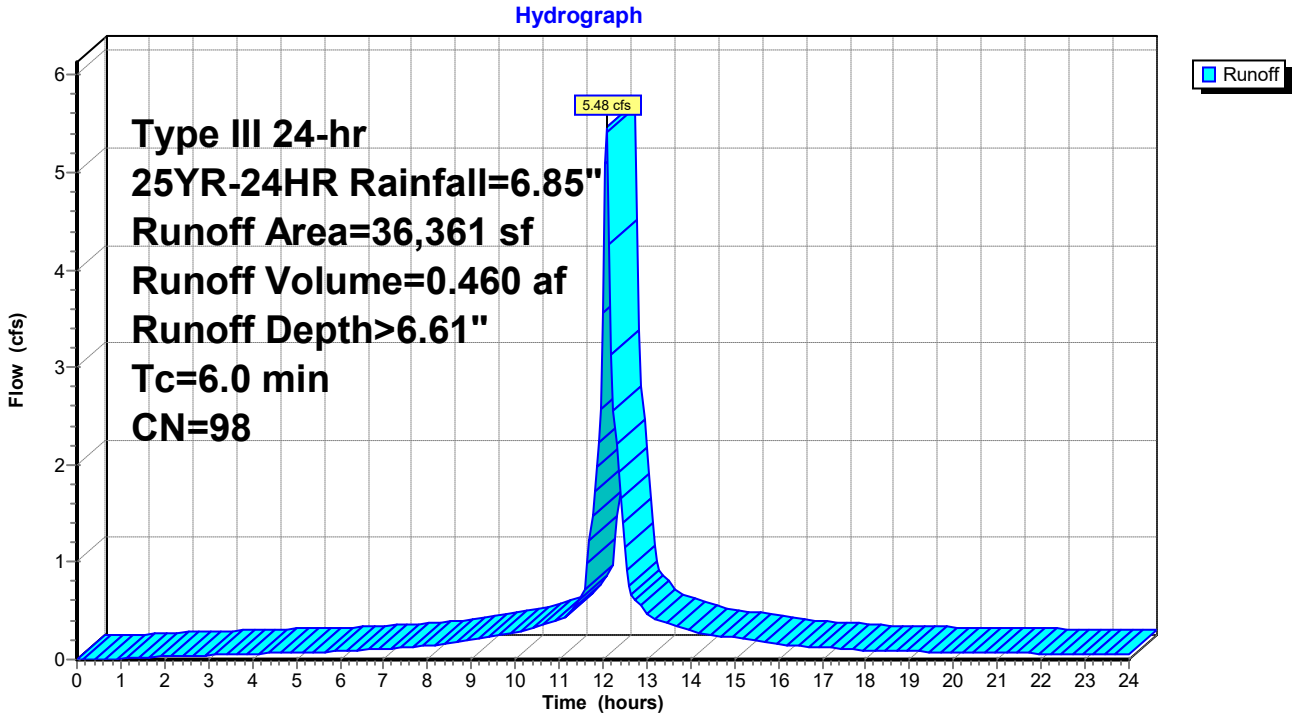
Runoff = 5.48 cfs @ 12.09 hrs, Volume= 0.460 af, Depth> 6.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
36,361	98	Unconnected roofs, HSG B
36,361		100.00% Impervious Area
36,361		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 10S: Subcatchment #10



Summary for Subcatchment 11S: Subcatchment #11

CarlsonPlanXYPos|1186682.5759|266183.9517|
CarlsonSurface||

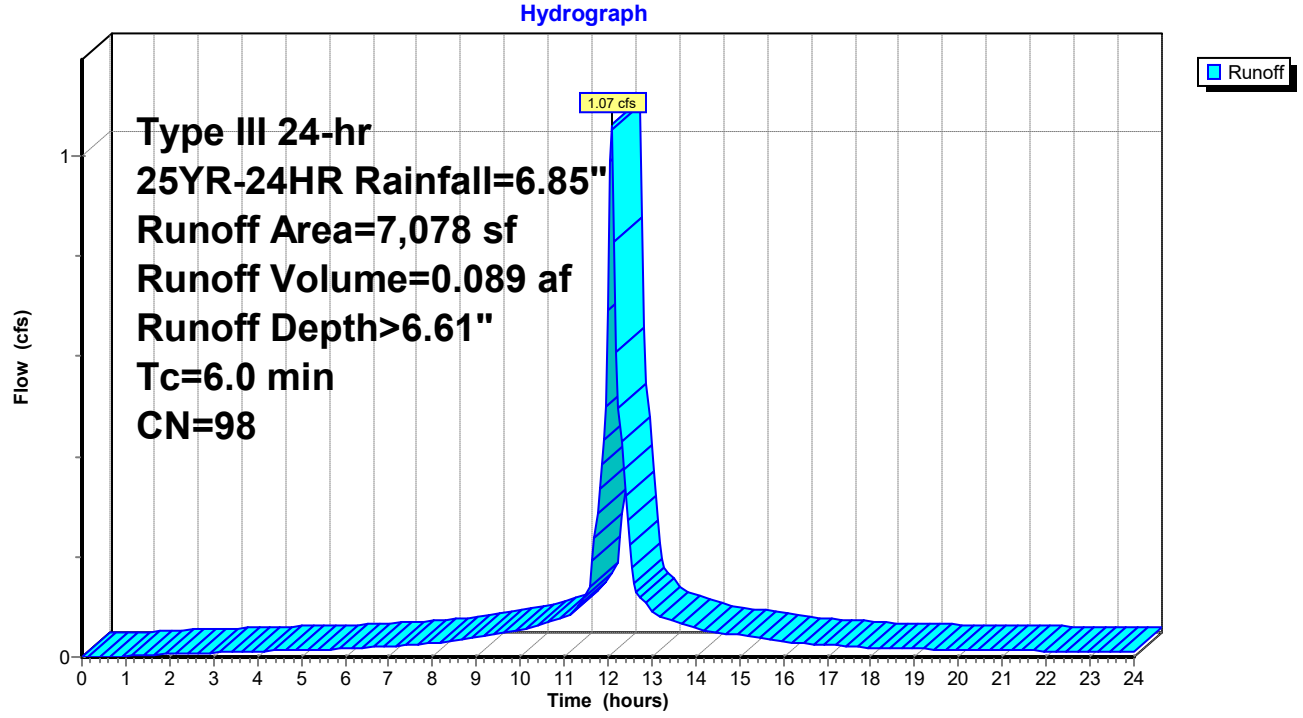
Runoff = 1.07 cfs @ 12.09 hrs, Volume= 0.089 af, Depth> 6.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
7,078	98	Roofs HSG B
7,078		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 11S: Subcatchment #11



Summary for Subcatchment 12S: Subcatchment #12

CarlsonPlanXYPos|1186680.5307|266306.4458|
CarlsonSurface||

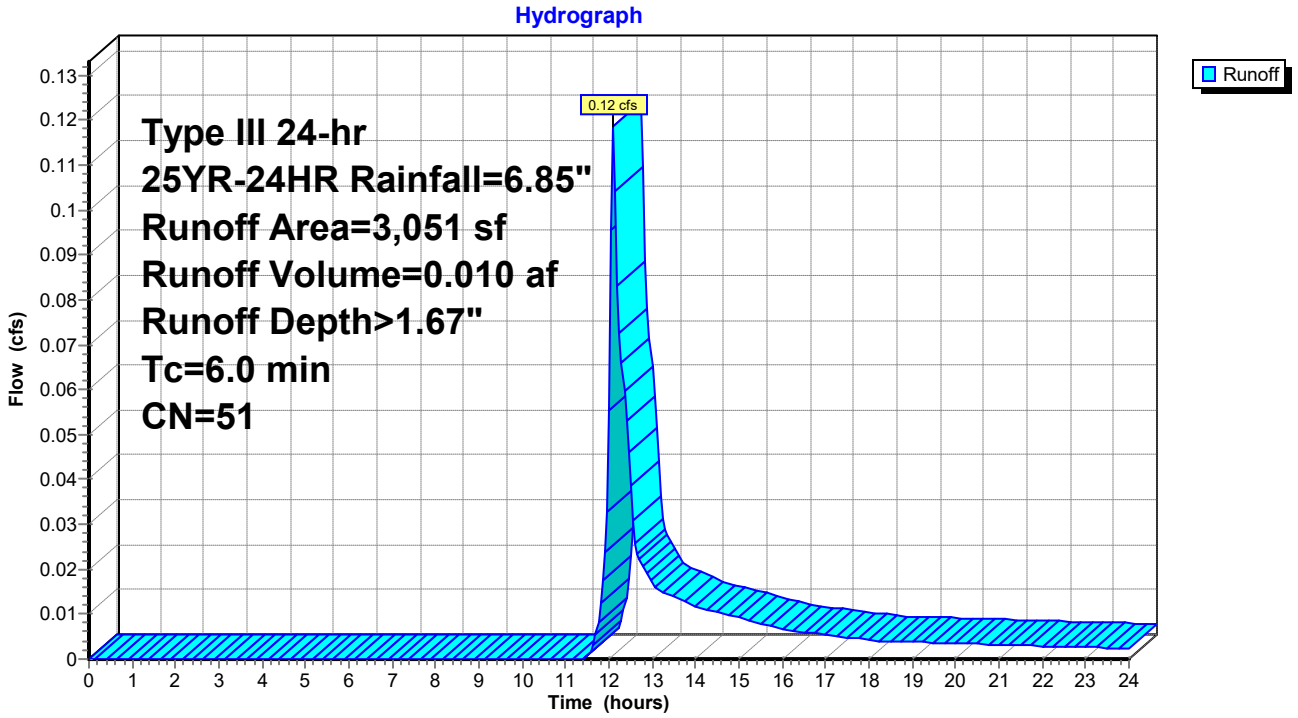
Runoff = 0.12 cfs @ 12.11 hrs, Volume= 0.010 af, Depth> 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR-24HR Rainfall=6.85"

Area (sf)	CN	Description
1,365	39	>75% Grass cover, Good, HSG A
1,686	61	>75% Grass cover, Good, HSG B
3,051	51	Weighted Average
3,051		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 12S: Subcatchment #12



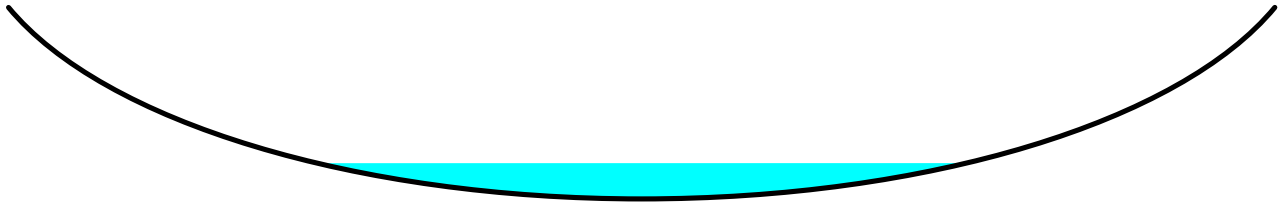
Summary for Reach 7aR: Overland flow

Inflow Area = 0.062 ac, 48.18% Impervious, Inflow Depth > 4.44" for 25YR-24HR event
Inflow = 0.32 cfs @ 12.09 hrs, Volume= 0.023 af
Outflow = 0.30 cfs @ 12.12 hrs, Volume= 0.023 af, Atten= 4%, Lag= 1.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.49 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 0.51 fps, Avg. Travel Time= 6.6 min

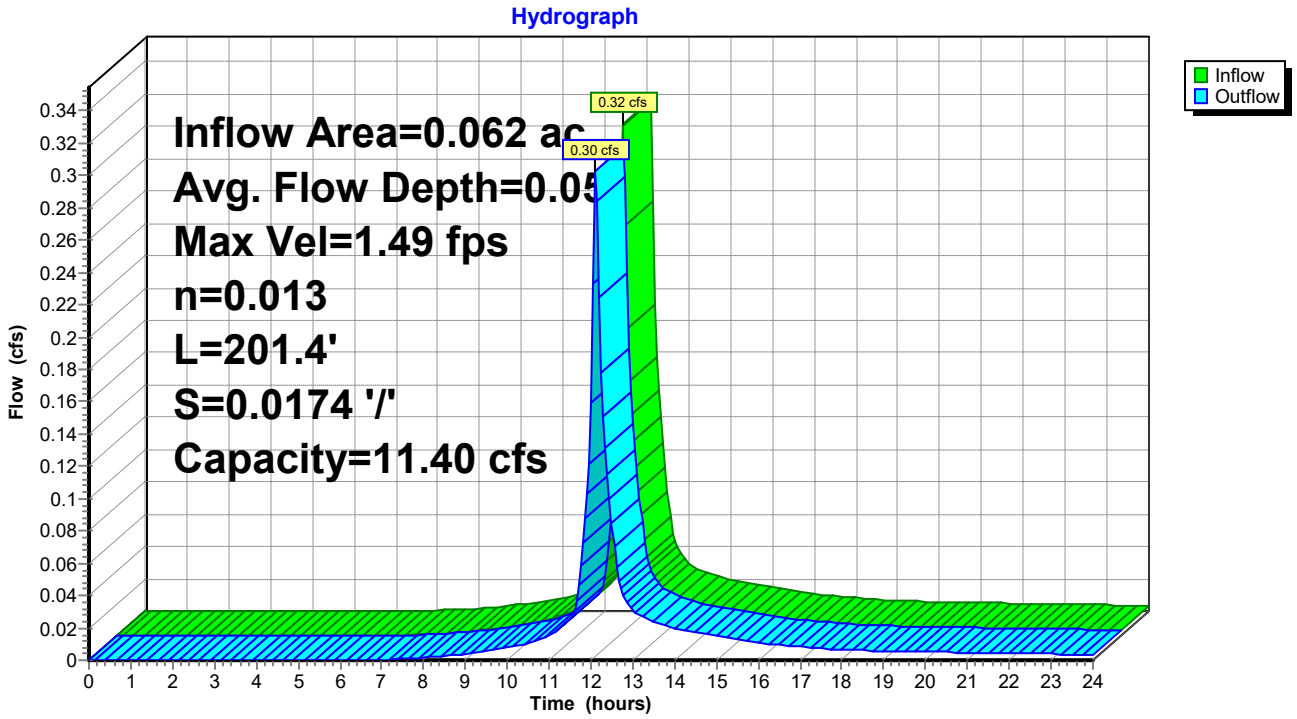
Peak Storage= 41 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 0.25' Flow Area= 2.5 sf, Capacity= 11.40 cfs

15.00' x 0.25' deep Parabolic Channel, n= 0.013 Asphalt, smooth
Length= 201.4' Slope= 0.0174 '/'
Inlet Invert= 175.75', Outlet Invert= 172.25'



‡

Reach 7aR: Overland flow



Summary for Reach 7bR: Overland flow

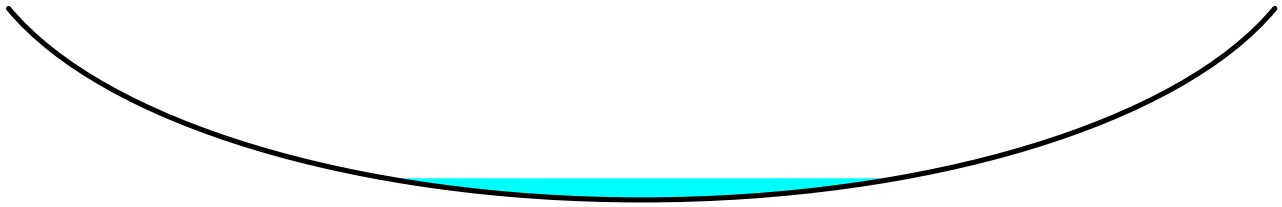
[62] Hint: Exceeded Reach 7aR OUTLET depth by 0.01' @ 12.15 hrs

Inflow Area = 0.062 ac, 48.18% Impervious, Inflow Depth > 4.44" for 25YR-24HR event
Inflow = 0.30 cfs @ 12.12 hrs, Volume= 0.023 af
Outflow = 0.30 cfs @ 12.12 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.3 min

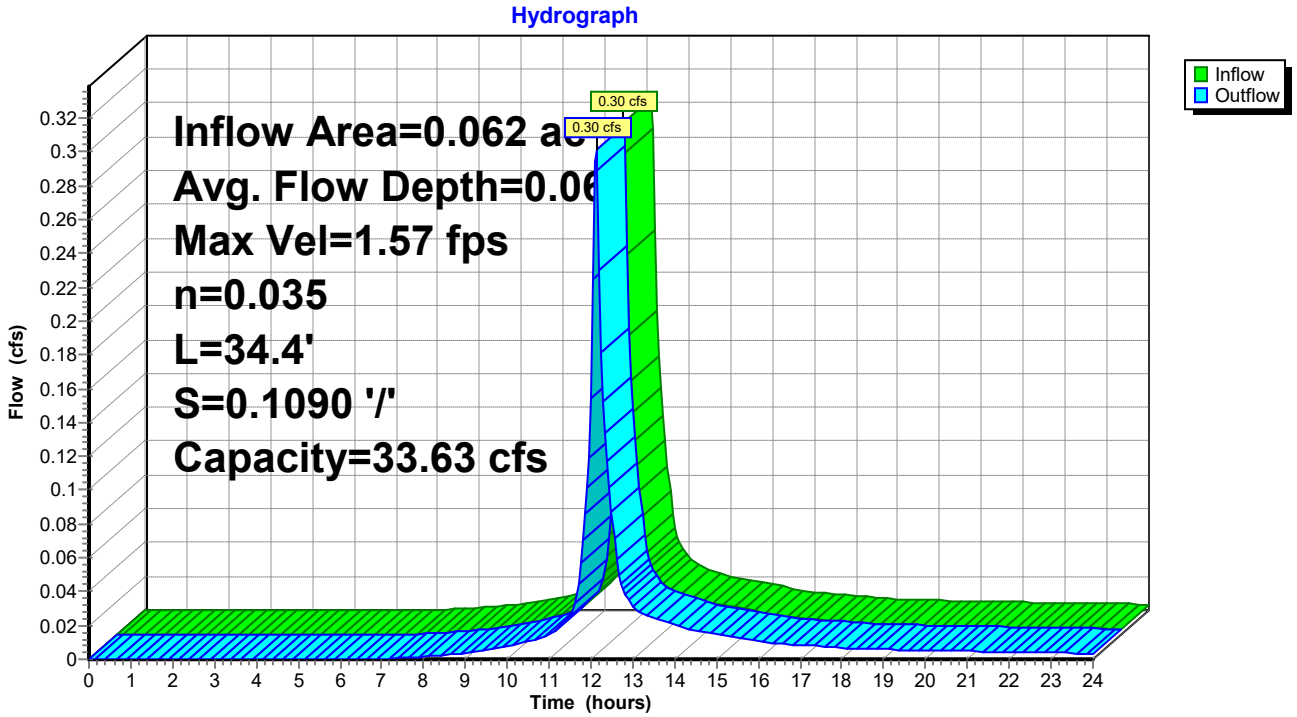
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.57 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.55 fps, Avg. Travel Time= 1.0 min

Peak Storage= 7 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 0.50' Flow Area= 5.0 sf, Capacity= 33.63 cfs

15.00' x 0.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 34.4' Slope= 0.1090 '/'
Inlet Invert= 172.25', Outlet Invert= 168.50'



‡



Summary for Reach 12R: Overland flow

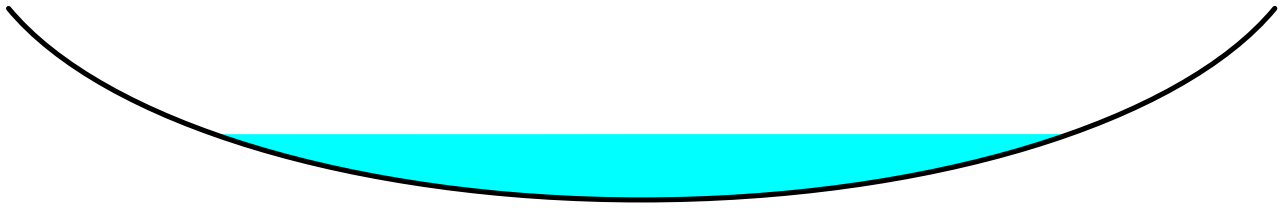
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[80] Warning: Exceeded Pond 12P by 0.04' @ 14.80 hrs (3.26 cfs 0.689 af)

Inflow Area = 3.606 ac, 74.68% Impervious, Inflow Depth > 3.26" for 25YR-24HR event
Inflow = 4.92 cfs @ 12.55 hrs, Volume= 0.980 af
Outflow = 4.98 cfs @ 12.59 hrs, Volume= 0.982 af, Atten= 0%, Lag= 2.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.92 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.38 fps, Avg. Travel Time= 0.2 min

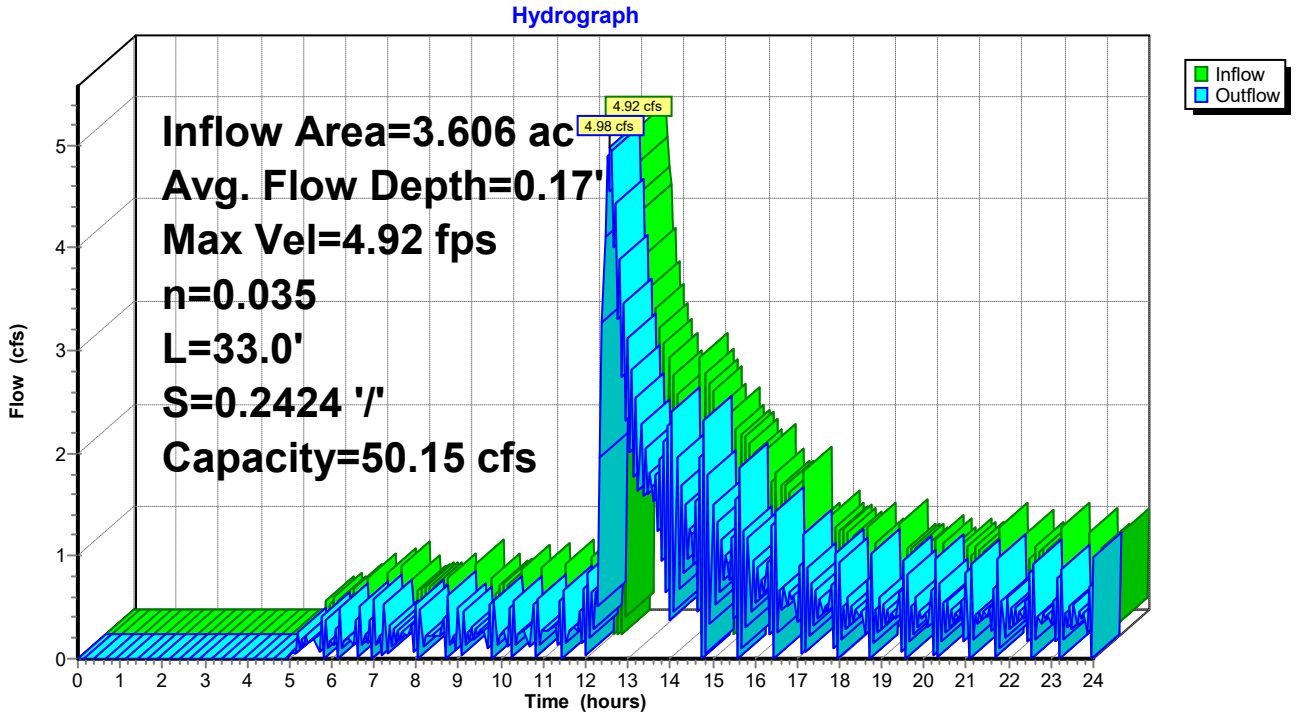
Peak Storage= 33 cf @ 12.59 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 0.50' Flow Area= 5.0 sf, Capacity= 50.15 cfs

15.00' x 0.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 33.0' Slope= 0.2424 '/'
Inlet Invert= 171.00', Outlet Invert= 163.00'



‡

Reach 12R: Overland flow



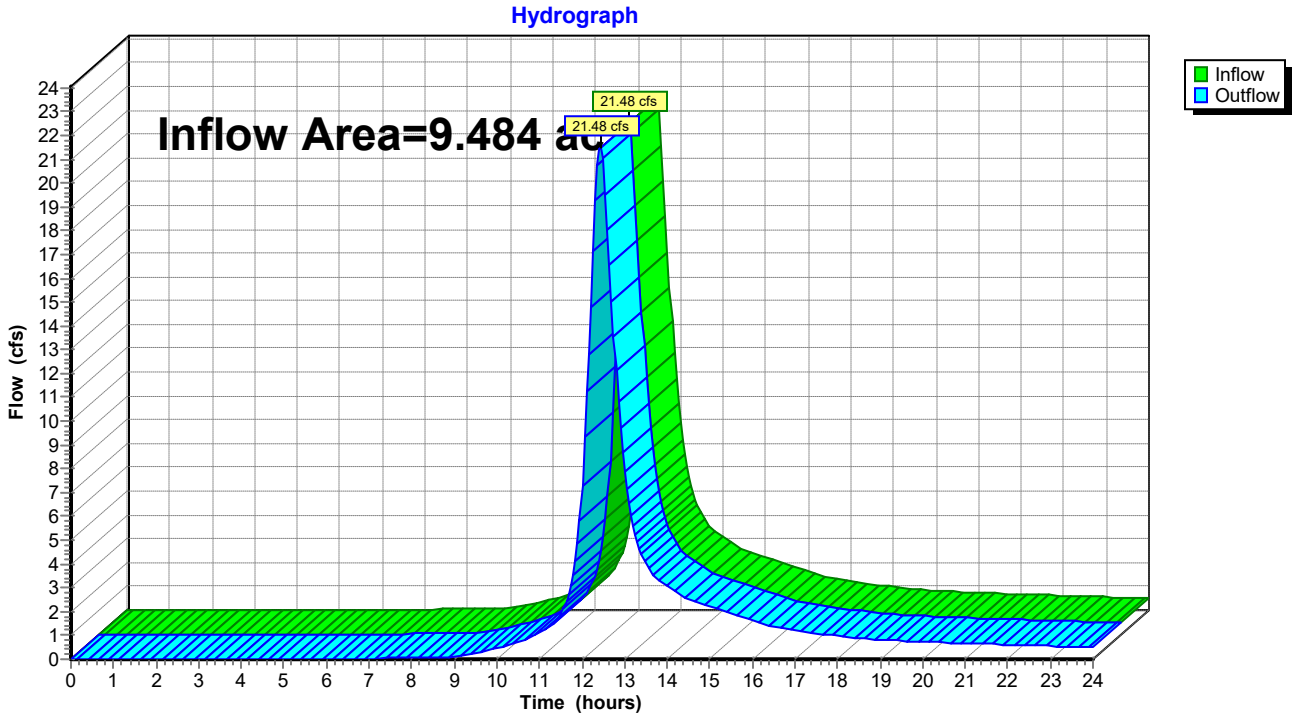
Summary for Reach 100R: Final reach 100

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

Inflow Area = 9.484 ac, 8.21% Impervious, Inflow Depth > 3.58" for 25YR-24HR event
Inflow = 21.48 cfs @ 12.42 hrs, Volume= 2.831 af
Outflow = 21.48 cfs @ 12.42 hrs, Volume= 2.831 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 100R: Final reach 100



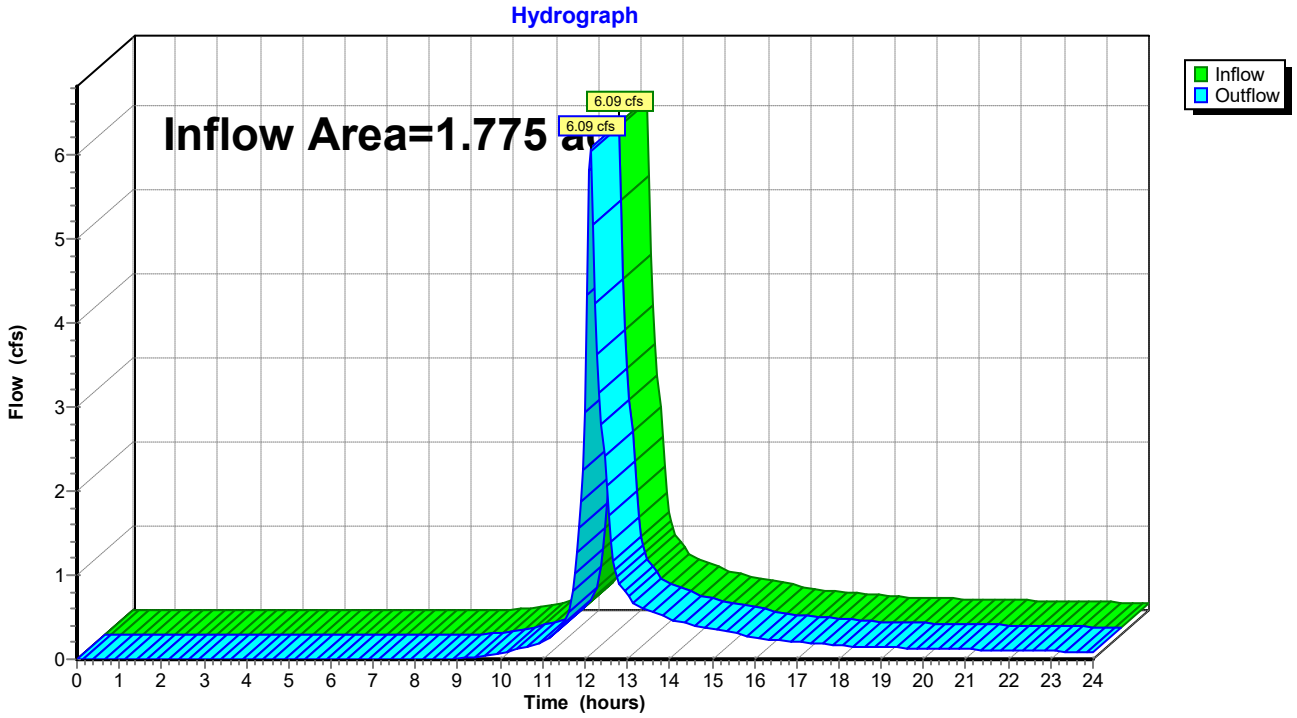
Summary for Reach 200R: Final reach 200

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

Inflow Area = 1.775 ac, 29.14% Impervious, Inflow Depth > 3.32" for 25YR-24HR event
Inflow = 6.09 cfs @ 12.14 hrs, Volume= 0.492 af
Outflow = 6.09 cfs @ 12.14 hrs, Volume= 0.492 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 200R: Final reach 200



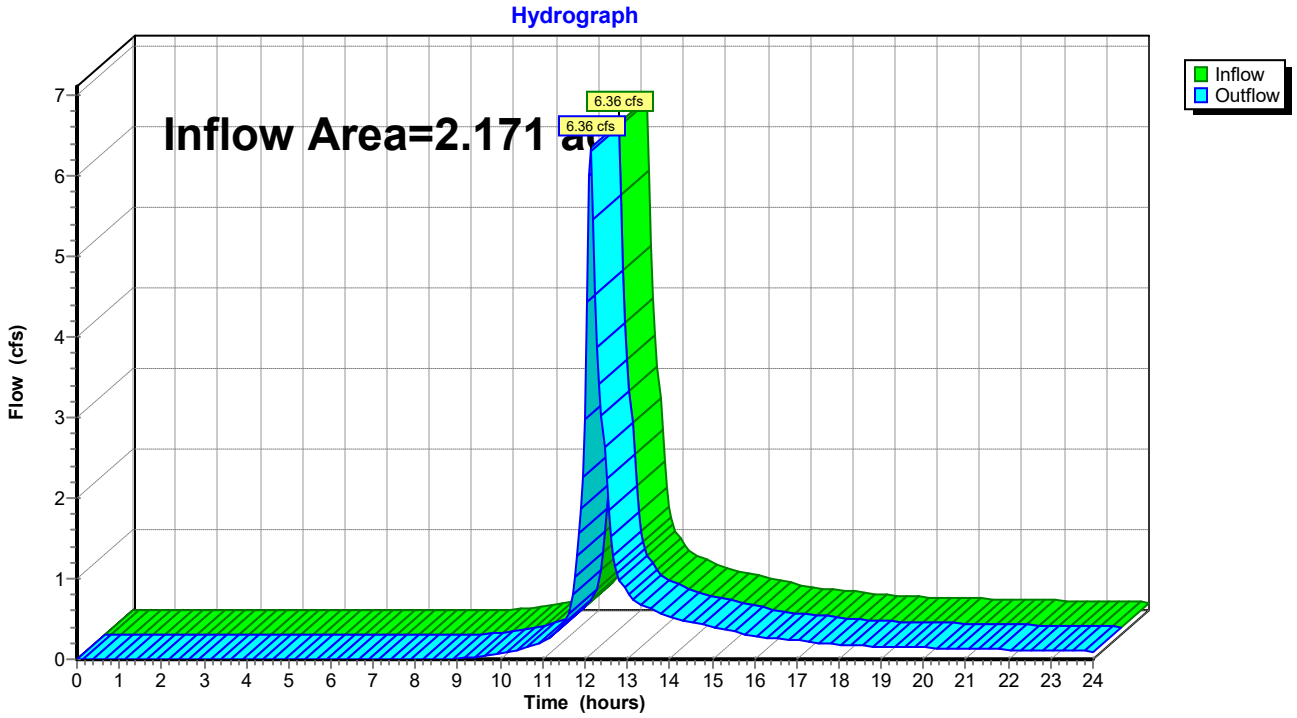
Summary for Reach 300R: Final reach 300

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

Inflow Area = 2.171 ac, 23.82% Impervious, Inflow Depth > 2.92" for 25YR-24HR event
Inflow = 6.36 cfs @ 12.14 hrs, Volume= 0.527 af
Outflow = 6.36 cfs @ 12.14 hrs, Volume= 0.527 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 300R: Final reach 300



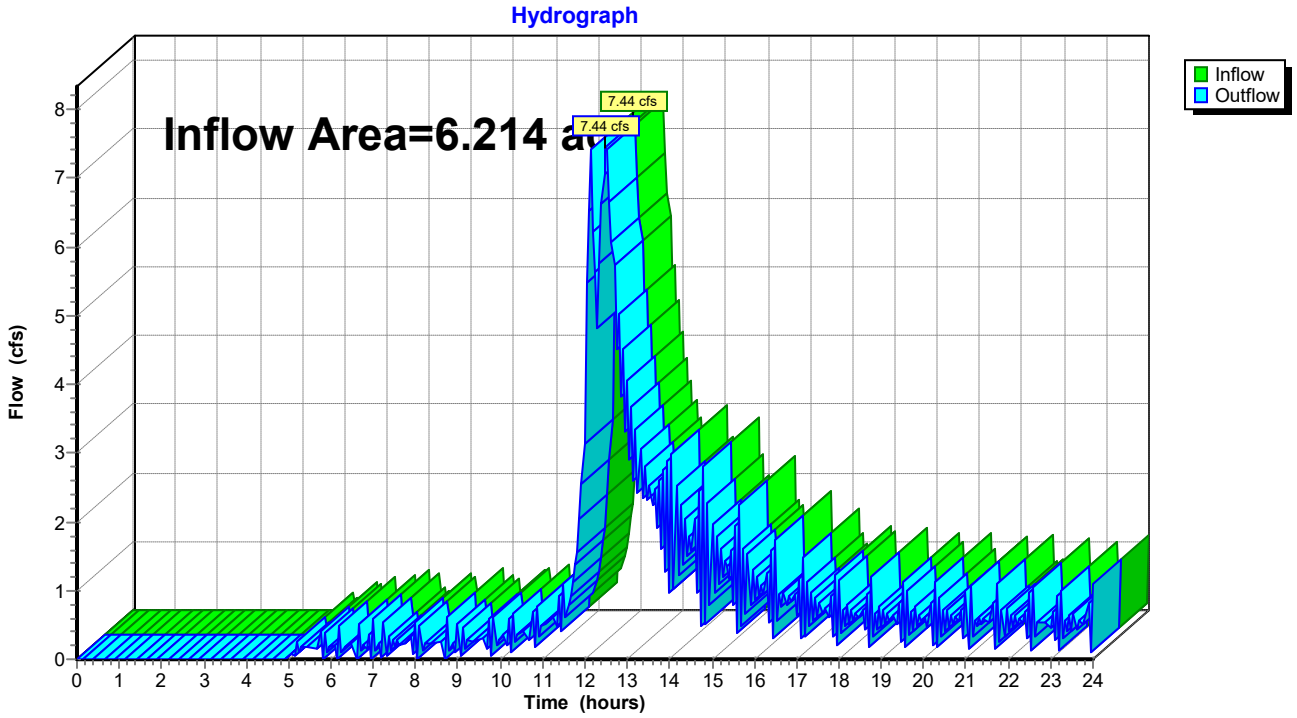
Summary for Reach 400R: Final reach 400

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

Inflow Area = 6.214 ac, 51.67% Impervious, Inflow Depth > 3.01" for 25YR-24HR event
Inflow = 7.44 cfs @ 12.49 hrs, Volume= 1.561 af
Outflow = 7.44 cfs @ 12.49 hrs, Volume= 1.561 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 400R: Final reach 400



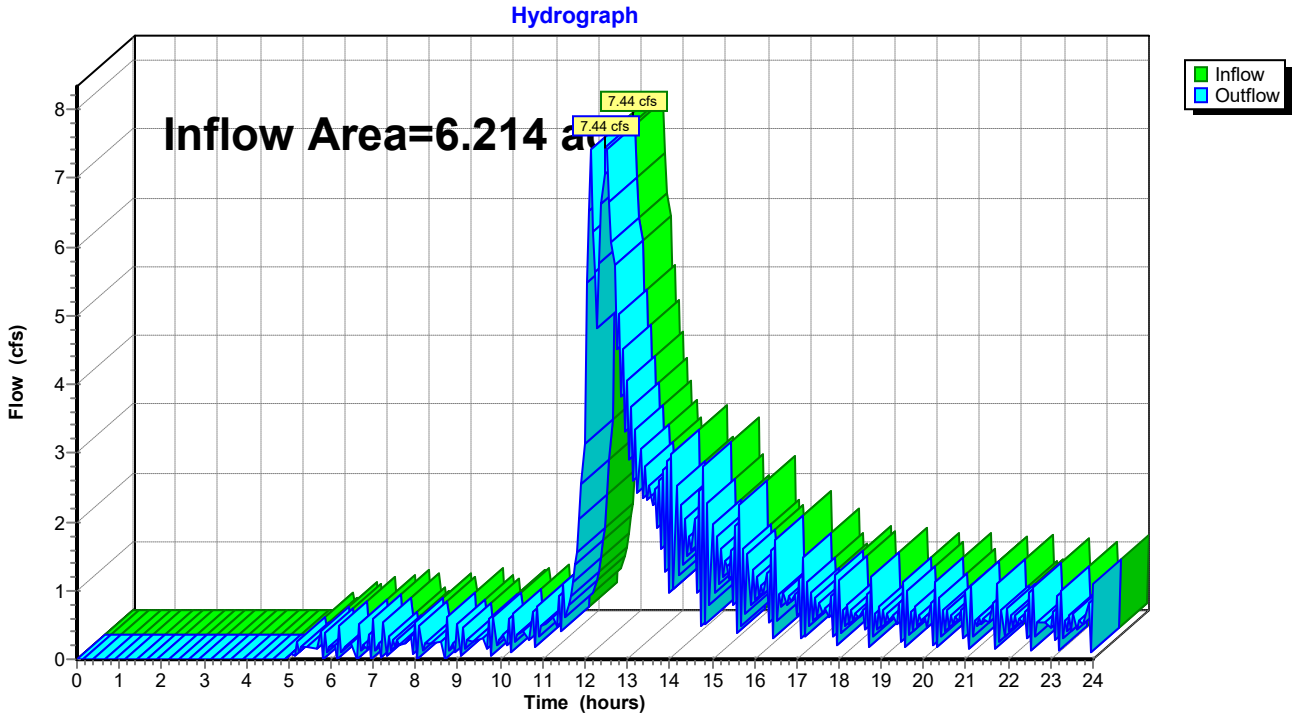
Summary for Reach 1000R: Final reach 1000

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

Inflow Area = 6.214 ac, 51.67% Impervious, Inflow Depth > 3.01" for 25YR-24HR event
Inflow = 7.44 cfs @ 12.49 hrs, Volume= 1.561 af
Outflow = 7.44 cfs @ 12.49 hrs, Volume= 1.561 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 1000R: Final reach 1000



Summary for Pond 5P: Catch basin

Inflow Area = 0.204 ac, 79.74% Impervious, Inflow Depth > 5.79" for 25YR-24HR event
Inflow = 1.27 cfs @ 12.09 hrs, Volume= 0.098 af
Outflow = 1.27 cfs @ 12.09 hrs, Volume= 0.098 af, Atten= 0%, Lag= 0.1 min
Primary = 1.27 cfs @ 12.09 hrs, Volume= 0.098 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 170.60' @ 12.09 hrs Surf.Area= 13 sf Storage= 8 cf
Flood Elev= 177.61' Surf.Area= 13 sf Storage= 96 cf

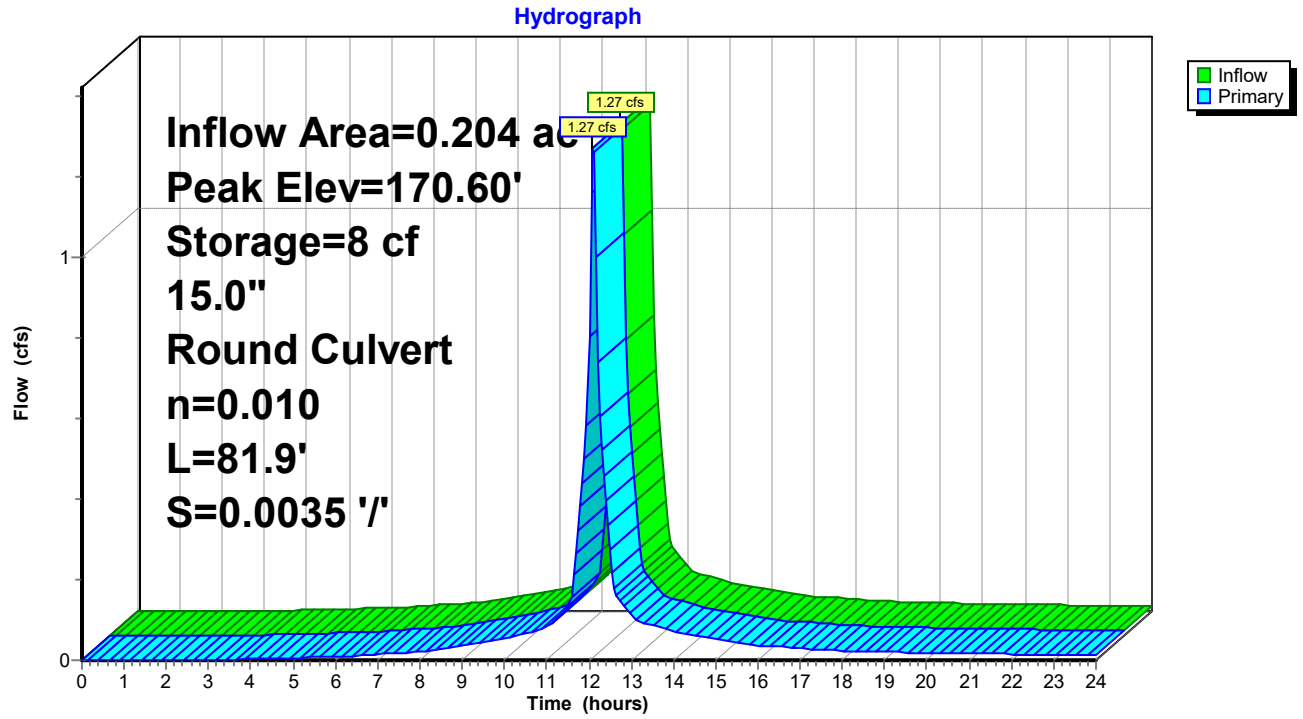
Plug-Flow detention time= 0.4 min calculated for 0.098 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (776.9 - 776.6)

Volume	Invert	Avail.Storage	Storage Description
#1	169.96'	96 cf	**4.00'D x 7.65'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	169.96'	**15.0" Round 15" RCP** L= 81.9' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 169.96' / 169.67' S= 0.0035 '/' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=1.24 cfs @ 12.09 hrs HW=170.59' TW=0.00' (Dynamic Tailwater)
1=15" RCP (Barrel Controls 1.24 cfs @ 2.92 fps)

Pond 5P: Catch basin



Summary for Pond 6P: Catch basin

Inflow Area = 0.250 ac, 82.28% Impervious, Inflow Depth > 5.79" for 25YR-24HR event
Inflow = 1.55 cfs @ 12.09 hrs, Volume= 0.120 af
Outflow = 1.55 cfs @ 12.09 hrs, Volume= 0.120 af, Atten= 0%, Lag= 0.1 min
Primary = 1.55 cfs @ 12.09 hrs, Volume= 0.120 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 174.06' @ 12.09 hrs Surf.Area= 13 sf Storage= 9 cf
Flood Elev= 177.62' Surf.Area= 13 sf Storage= 53 cf

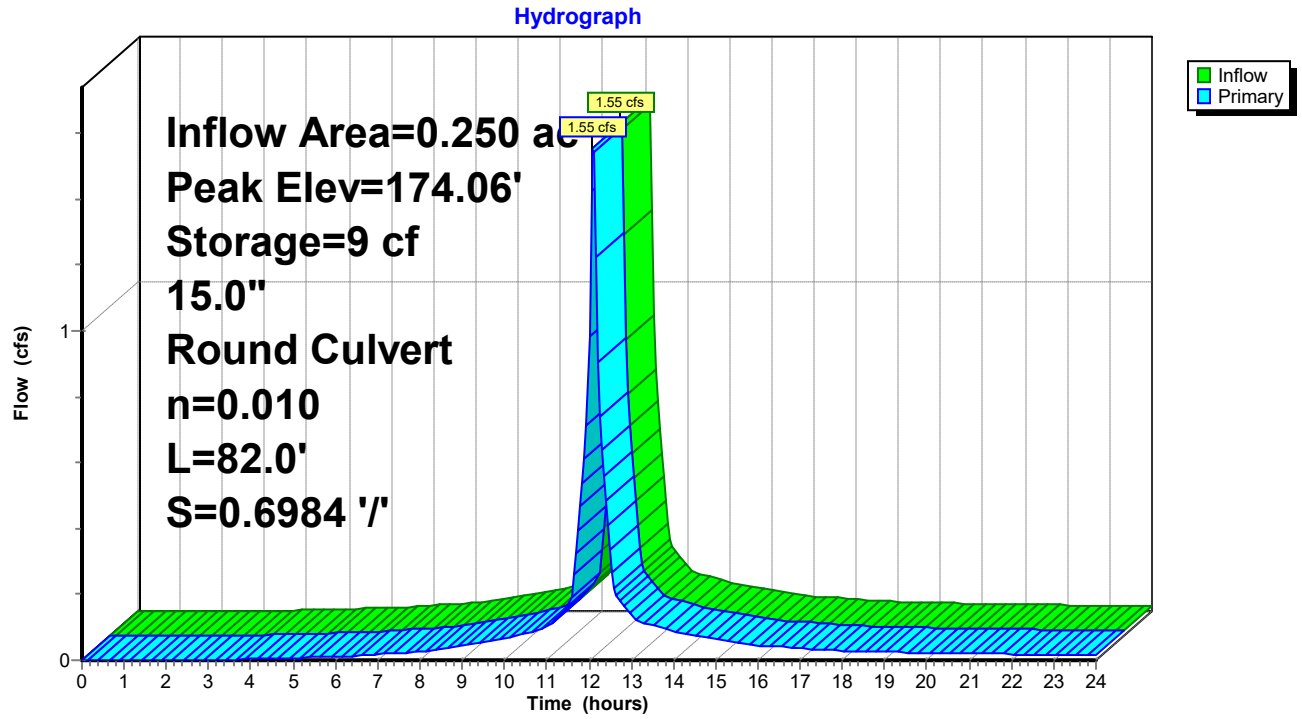
Plug-Flow detention time= 0.3 min calculated for 0.120 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (776.8 - 776.6)

Volume	Invert	Avail.Storage	Storage Description
#1	173.37'	53 cf	**4.00'D x 4.25'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	173.37'	**15.0" Round 15" RCP** L= 82.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 173.37' / 116.10' S= 0.6984 '/' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=1.51 cfs @ 12.09 hrs HW=174.05' TW=0.00' (Dynamic Tailwater)
1=15" RCP (Inlet Controls 1.51 cfs @ 2.22 fps)

Pond 6P: Catch basin



Summary for Pond 7P: 8inch pvc drain

[57] Hint: Peaked at 175.85' (Flood elevation advised)

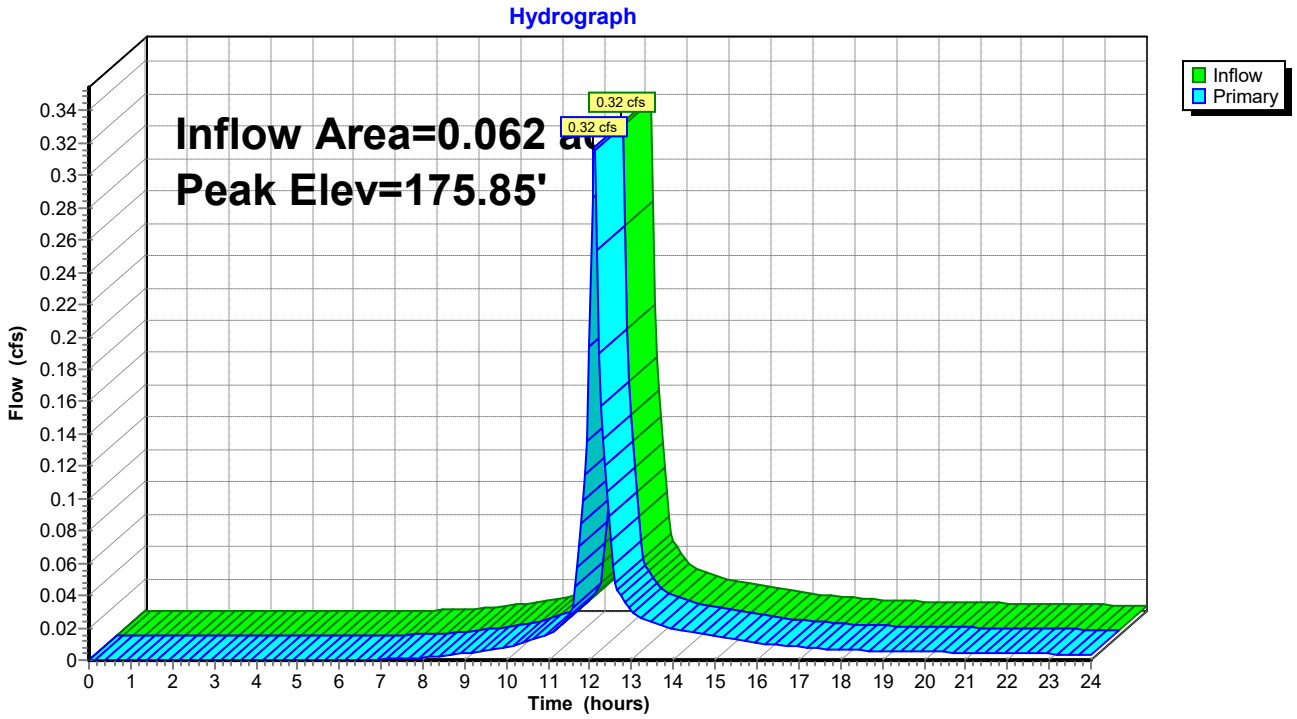
Inflow Area = 0.062 ac, 48.18% Impervious, Inflow Depth > 4.44" for 25YR-24HR event
Inflow = 0.32 cfs @ 12.09 hrs, Volume= 0.023 af
Outflow = 0.32 cfs @ 12.09 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min
Primary = 0.32 cfs @ 12.09 hrs, Volume= 0.023 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 175.85' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	175.75'	**5.0' long x 8.0' 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 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=0.30 cfs @ 12.09 hrs HW=175.84' TW=175.80' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 0.30 cfs @ 0.64 fps)

Pond 7P: 8inch pvc drain



Summary for Pond 12P: Level spreader

[58] Hint: Peaked 0.20' above defined flood level
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=156)

Inflow Area = 3.606 ac, 74.68% Impervious, Inflow Depth > 3.37" for 25YR-24HR event
Inflow = 4.83 cfs @ 12.53 hrs, Volume= 1.013 af
Outflow = 4.92 cfs @ 12.55 hrs, Volume= 0.980 af, Atten= 0%, Lag= 1.2 min
Primary = 4.92 cfs @ 12.55 hrs, Volume= 0.980 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 171.20' @ 12.56 hrs Surf.Area= 1,090 sf Storage= 1,662 cf
Flood Elev= 171.00' Surf.Area= 1,090 sf Storage= 1,444 cf

Plug-Flow detention time= 42.2 min calculated for 0.980 af (97% of inflow)
Center-of-Mass det. time= 24.0 min (890.2 - 866.2)

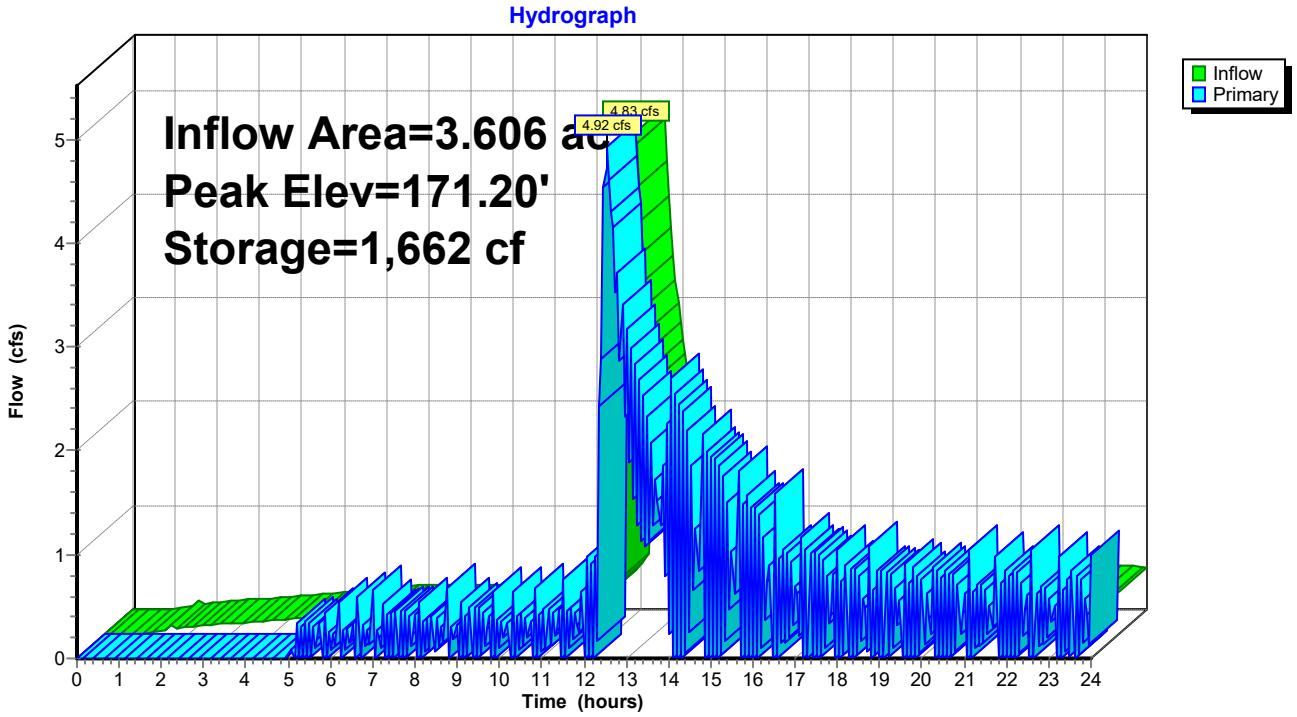
Volume	Invert	Avail.Storage	Storage Description
#1	169.00'	1,989 cf	**Open water storage (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
169.00	397	96.6	0	0	397
170.00	715	115.5	548	548	733
171.00	1,090	134.3	896	1,444	1,127
171.50	1,090	134.3	545	1,989	1,194

Device	Routing	Invert	Outlet Devices
#1	Primary	171.00'	**40.0' 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=5.20 cfs @ 12.55 hrs HW=171.20' TW=171.17' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 5.20 cfs @ 0.65 fps)

Pond 12P: Level spreader



Summary for Pond 101P: Rain Garden 101

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=11)

Inflow Area = 3.536 ac, 76.16% Impervious, Inflow Depth > 5.62" for 25YR-24HR event
Inflow = 18.21 cfs @ 12.10 hrs, Volume= 1.657 af
Outflow = 4.80 cfs @ 12.53 hrs, Volume= 1.003 af, Atten= 74%, Lag= 25.9 min
Primary = 4.80 cfs @ 12.53 hrs, Volume= 1.003 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 174.47' @ 12.53 hrs Surf.Area= 26,910 sf Storage= 34,983 cf
Flood Elev= 175.00' Surf.Area= 32,601 sf Storage= 45,747 cf

Plug-Flow detention time= 206.3 min calculated for 1.003 af (61% of inflow)
Center-of-Mass det. time= 97.1 min (866.1 - 769.0)

Volume	Invert	Avail.Storage	Storage Description
#1	172.00'	2,040 cf	**Forebay 1 (Irregular)** Listed below (Recalc) -Impervious
#2	172.00'	3,141 cf	**Forebay 2 (Irregular)** Listed below (Recalc) -Impervious
#3	168.75'	37 cf	**Stone storage (Irregular)** Listed below (Recalc) -Impervious 9,208 cf Overall x 0.4% Voids
#4	169.75'	37 cf	**Bio media (Irregular)** Listed below (Recalc) 18,416 cf Overall x 0.2% Voids
#5	171.75'	5 cf	**Loam (Irregular)** Listed below (Recalc) -Impervious 2,302 cf Overall x 0.2% Voids
#6	172.00'	40,488 cf	**Open water storage (Irregular)** Listed below (Recalc)
		45,747 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
172.00	677	116.8	0	0	677
173.00	1,014	137.8	840	840	1,121
174.00	1,397	157.4	1,200	2,040	1,605

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
172.00	600	98.2	0	0	600
173.00	1,484	209.0	1,009	1,009	3,313
174.00	2,853	289.0	2,132	3,141	6,493

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
168.75	9,208	701.0	0	0	9,208
169.75	9,208	701.0	9,208	9,208	9,909

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
169.75	9,208	701.0	0	0	9,208
171.75	9,208	701.0	18,416	18,416	10,610

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.75	9,208	701.0	0	0	9,208
172.00	9,208	701.0	2,302	2,302	9,383

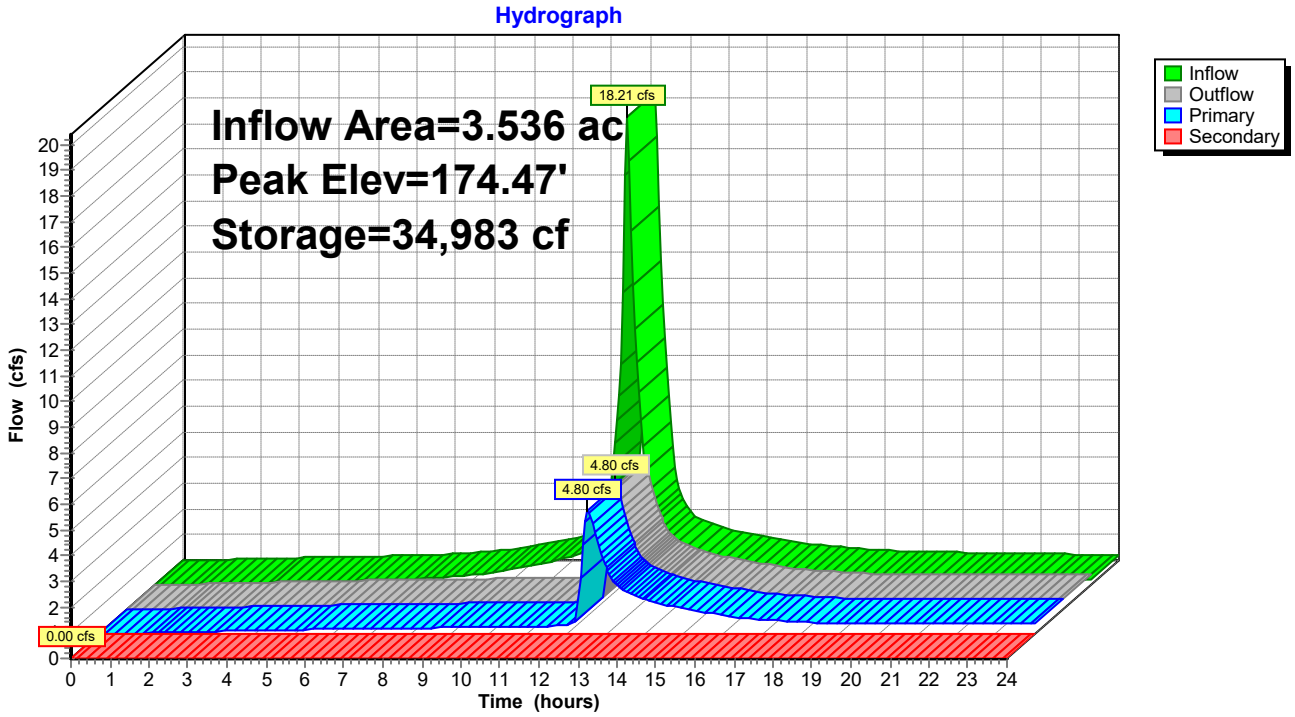
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
172.00	9,208	701.0	0	0	9,208
173.00	11,213	717.0	10,194	10,194	11,148
174.00	13,244	733.0	12,214	22,408	13,131
175.00	23,393	1,130.5	18,080	40,488	72,085

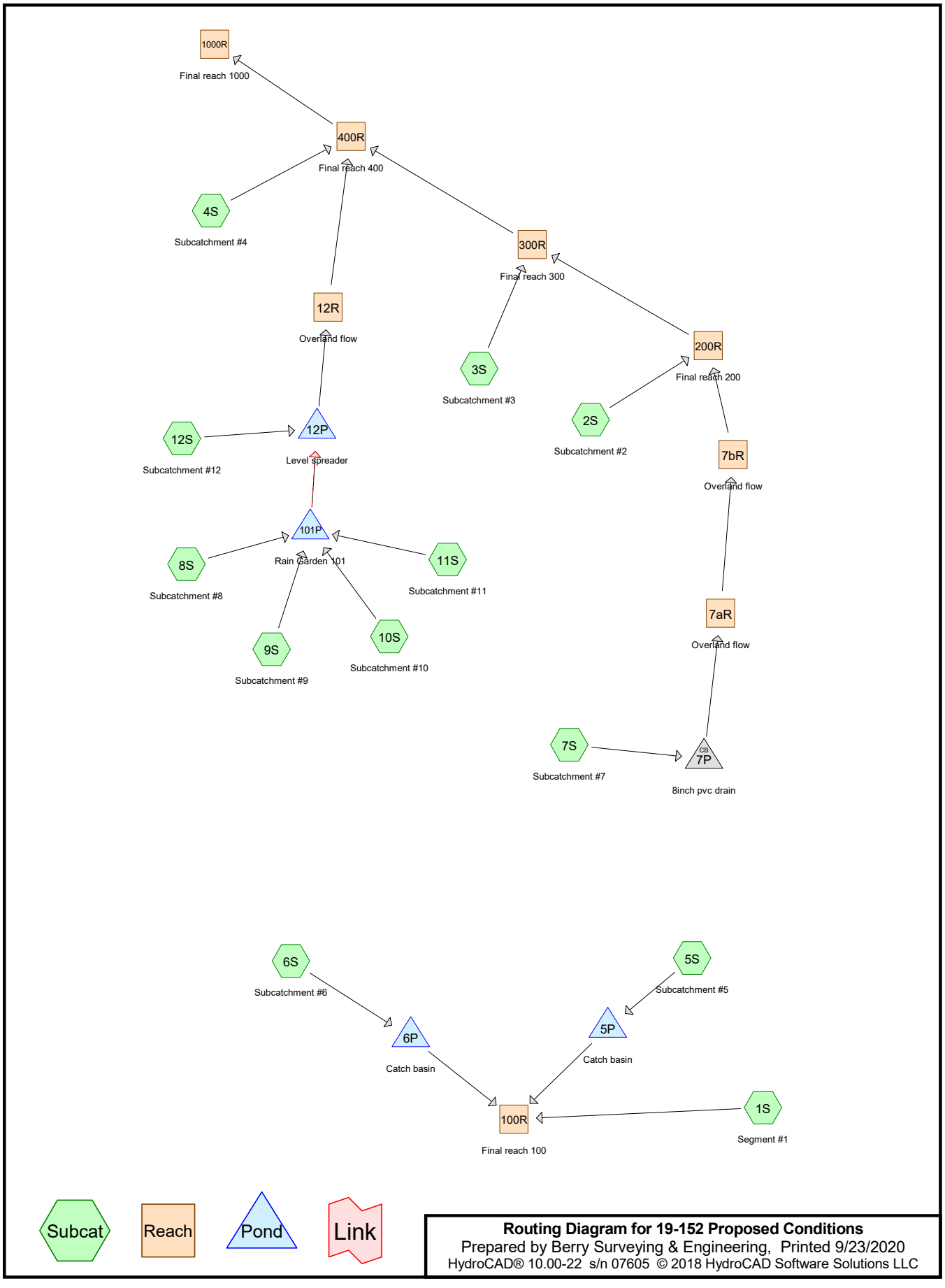
Device	Routing	Invert	Outlet Devices
#1	Primary	168.75'	**15.0" Round 15" HDPE N-12** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 168.75' / 168.00' S= 0.0150 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Device 1	168.75'	**3.0" Vert. 3" Orifice** C= 0.600
#3	Device 1	174.25'	**48.0" Horiz. 4' Structure** C= 0.600 Limited to weir flow at low heads
#4	Secondary	174.50'	**30.0' long x 4.0' 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 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#5	Device 2	169.75'	**10.000 in/hr Exfiltration over Surface area**

Primary OutFlow Max=4.77 cfs @ 12.53 hrs HW=174.47' TW=171.19' (Dynamic Tailwater)
- **1=15" HDPE N-12** (Passes 4.77 cfs of 8.45 cfs potential flow)
  - **2=3" Orifice** (Orifice Controls 0.43 cfs @ 8.72 fps)
    - **5=Exfiltration** (Passes 0.43 cfs of 6.23 cfs potential flow)
  - **3=4' Structure** (Weir Controls 4.34 cfs @ 1.55 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=168.75' TW=169.00' (Dynamic Tailwater)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 101P: Rain Garden 101





Routing Diagram for 19-152 Proposed Conditions
Prepared by Berry Surveying & Engineering, Printed 9/23/2020
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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Segment #1 Runoff Area=393,349 sf 4.54% Impervious Runoff Depth>1.07"
Flow Length=453' Tc=30.5 min CN=70 Runoff=5.93 cfs 0.803 af

Subcatchment 2S: Subcatchment #2 Runoff Area=74,584 sf 28.44% Impervious Runoff Depth>0.96"
Flow Length=347' Tc=9.2 min CN=68 Runoff=1.54 cfs 0.137 af

Subcatchment 3S: Subcatchment #3 Runoff Area=17,250 sf 0.00% Impervious Runoff Depth>0.08"
Flow Length=115' Tc=10.4 min CN=44 Runoff=0.00 cfs 0.003 af

Subcatchment 4S: Subcatchment #4 Runoff Area=19,029 sf 0.00% Impervious Runoff Depth>0.17"
Flow Length=227' Tc=12.5 min CN=48 Runoff=0.02 cfs 0.006 af

Subcatchment 5S: Subcatchment #5 Runoff Area=8,890 sf 79.74% Impervious Runoff Depth>2.64"
Tc=6.0 min CN=91 Runoff=0.60 cfs 0.045 af

Subcatchment 6S: Subcatchment #6 Runoff Area=10,871 sf 82.28% Impervious Runoff Depth>2.64"
Tc=6.0 min CN=91 Runoff=0.74 cfs 0.055 af

Subcatchment 7S: Subcatchment #7 Runoff Area=2,719 sf 48.18% Impervious Runoff Depth>1.65"
Flow Length=72' Slope=0.0622 '/' Tc=6.0 min CN=79 Runoff=0.12 cfs 0.009 af

Subcatchment 8S: Subcatchment #8 Runoff Area=69,845 sf 47.44% Impervious Runoff Depth>1.65"
Flow Length=371' Tc=12.4 min CN=79 Runoff=2.47 cfs 0.220 af

Subcatchment 9S: Subcatchment #9 Runoff Area=40,745 sf 100.00% Impervious Runoff Depth>3.37"
Tc=6.0 min CN=98 Runoff=3.21 cfs 0.263 af

Subcatchment 10S: Subcatchment #10 Runoff Area=36,361 sf 100.00% Impervious Runoff Depth>3.37"
Tc=6.0 min CN=98 Runoff=2.86 cfs 0.235 af

Subcatchment 11S: Subcatchment #11 Runoff Area=7,078 sf 100.00% Impervious Runoff Depth>3.37"
Tc=6.0 min CN=98 Runoff=0.56 cfs 0.046 af

Subcatchment 12S: Subcatchment #12 Runoff Area=3,051 sf 0.00% Impervious Runoff Depth>0.25"
Tc=6.0 min CN=51 Runoff=0.01 cfs 0.001 af

Reach 7aR: Overland flow Avg. Flow Depth=0.03' Max Vel=1.09 fps Inflow=0.12 cfs 0.009 af
n=0.013 L=201.4' S=0.0174 '/' Capacity=11.40 cfs Outflow=0.11 cfs 0.009 af

Reach 7bR: Overland flow Avg. Flow Depth=0.04' Max Vel=1.15 fps Inflow=0.11 cfs 0.009 af
n=0.035 L=34.4' S=0.1090 '/' Capacity=33.63 cfs Outflow=0.11 cfs 0.009 af

Reach 12R: Overland flow Avg. Flow Depth=0.08' Max Vel=2.91 fps Inflow=0.98 cfs 0.431 af
n=0.035 L=33.0' S=0.2424 '/' Capacity=50.15 cfs Outflow=0.89 cfs 0.433 af

Reach 100R: Final reach 100 Inflow=6.29 cfs 0.903 af
Outflow=6.29 cfs 0.903 af

Reach 200R: Final reach 200 Inflow=1.65 cfs 0.146 af
Outflow=1.65 cfs 0.146 af

Reach 300R: Final reach 300 Inflow=1.65 cfs 0.149 af
Outflow=1.65 cfs 0.149 af

Reach 400R: Final reach 400 Inflow=1.89 cfs 0.588 af
Outflow=1.89 cfs 0.588 af

Reach 1000R: Final reach 1000 Inflow=1.89 cfs 0.588 af
Outflow=1.89 cfs 0.588 af

Pond 5P: Catch basin Peak Elev=170.38' Storage=5 cf Inflow=0.60 cfs 0.045 af
15.0" Round Culvert n=0.010 L=81.9' S=0.0035 '/' Outflow=0.61 cfs 0.045 af

Pond 6P: Catch basin Peak Elev=173.83' Storage=6 cf Inflow=0.74 cfs 0.055 af
15.0" Round Culvert n=0.010 L=82.0' S=0.6984 '/' Outflow=0.74 cfs 0.055 af

Pond 7P: 8inch pvc drain Peak Elev=175.80' Inflow=0.12 cfs 0.009 af
Outflow=0.12 cfs 0.009 af

Pond 12P: Level spreader Peak Elev=171.07' Storage=1,518 cf Inflow=0.37 cfs 0.465 af
Outflow=0.98 cfs 0.431 af

Pond 101P: Rain Garden 101 Peak Elev=173.44' Storage=18,494 cf Inflow=8.57 cfs 0.764 af
Primary=0.37 cfs 0.463 af Secondary=0.00 cfs 0.000 af Outflow=0.37 cfs 0.463 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Segment #1 Runoff Area=393,349 sf 4.54% Impervious Runoff Depth>2.34"
Flow Length=453' Tc=30.5 min CN=70 Runoff=13.81 cfs 1.764 af

Subcatchment 2S: Subcatchment #2 Runoff Area=74,584 sf 28.44% Impervious Runoff Depth>2.19"
Flow Length=347' Tc=9.2 min CN=68 Runoff=3.80 cfs 0.312 af

Subcatchment 3S: Subcatchment #3 Runoff Area=17,250 sf 0.00% Impervious Runoff Depth>0.53"
Flow Length=115' Tc=10.4 min CN=44 Runoff=0.10 cfs 0.018 af

Subcatchment 4S: Subcatchment #4 Runoff Area=19,029 sf 0.00% Impervious Runoff Depth>0.75"
Flow Length=227' Tc=12.5 min CN=48 Runoff=0.19 cfs 0.027 af

Subcatchment 5S: Subcatchment #5 Runoff Area=8,890 sf 79.74% Impervious Runoff Depth>4.40"
Tc=6.0 min CN=91 Runoff=0.98 cfs 0.075 af

Subcatchment 6S: Subcatchment #6 Runoff Area=10,871 sf 82.28% Impervious Runoff Depth>4.40"
Tc=6.0 min CN=91 Runoff=1.20 cfs 0.091 af

Subcatchment 7S: Subcatchment #7 Runoff Area=2,719 sf 48.18% Impervious Runoff Depth>3.17"
Flow Length=72' Slope=0.0622 '/' Tc=6.0 min CN=79 Runoff=0.23 cfs 0.017 af

Subcatchment 8S: Subcatchment #8 Runoff Area=69,845 sf 47.44% Impervious Runoff Depth>3.17"
Flow Length=371' Tc=12.4 min CN=79 Runoff=4.82 cfs 0.423 af

Subcatchment 9S: Subcatchment #9 Runoff Area=40,745 sf 100.00% Impervious Runoff Depth>5.19"
Tc=6.0 min CN=98 Runoff=4.86 cfs 0.405 af

Subcatchment 10S: Subcatchment #10 Runoff Area=36,361 sf 100.00% Impervious Runoff Depth>5.19"
Tc=6.0 min CN=98 Runoff=4.33 cfs 0.361 af

Subcatchment 11S: Subcatchment #11 Runoff Area=7,078 sf 100.00% Impervious Runoff Depth>5.19"
Tc=6.0 min CN=98 Runoff=0.84 cfs 0.070 af

Subcatchment 12S: Subcatchment #12 Runoff Area=3,051 sf 0.00% Impervious Runoff Depth>0.94"
Tc=6.0 min CN=51 Runoff=0.06 cfs 0.005 af

Reach 7aR: Overland flow Avg. Flow Depth=0.04' Max Vel=1.34 fps Inflow=0.23 cfs 0.017 af
n=0.013 L=201.4' S=0.0174 '/' Capacity=11.40 cfs Outflow=0.22 cfs 0.016 af

Reach 7bR: Overland flow Avg. Flow Depth=0.05' Max Vel=1.41 fps Inflow=0.22 cfs 0.016 af
n=0.035 L=34.4' S=0.1090 '/' Capacity=33.63 cfs Outflow=0.21 cfs 0.016 af

Reach 12R: Overland flow Avg. Flow Depth=0.11' Max Vel=3.70 fps Inflow=1.87 cfs 0.612 af
n=0.035 L=33.0' S=0.2424 '/' Capacity=50.15 cfs Outflow=1.95 cfs 0.614 af

Reach 100R: Final reach 100 Inflow=14.42 cfs 1.930 af
Outflow=14.42 cfs 1.930 af

Reach 200R: Final reach 200 Inflow=4.01 cfs 0.329 af
Outflow=4.01 cfs 0.329 af

Reach 300R: Final reach 300 Inflow=4.06 cfs 0.346 af
Outflow=4.06 cfs 0.346 af

Reach 400R: Final reach 400 Inflow=4.72 cfs 0.987 af
Outflow=4.72 cfs 0.987 af

Reach 1000R: Final reach 1000 Inflow=4.72 cfs 0.987 af
Outflow=4.72 cfs 0.987 af

Pond 5P: Catch basin Peak Elev=170.51' Storage=7 cf Inflow=0.98 cfs 0.075 af
15.0" Round Culvert n=0.010 L=81.9' S=0.0035 '/' Outflow=0.98 cfs 0.075 af

Pond 6P: Catch basin Peak Elev=173.97' Storage=7 cf Inflow=1.20 cfs 0.091 af
15.0" Round Culvert n=0.010 L=82.0' S=0.6984 '/' Outflow=1.20 cfs 0.091 af

Pond 7P: 8inch pvc drain Peak Elev=175.83' Inflow=0.23 cfs 0.017 af
Outflow=0.23 cfs 0.017 af

Pond 12P: Level spreader Peak Elev=171.10' Storage=1,555 cf Inflow=0.91 cfs 0.646 af
Outflow=1.87 cfs 0.612 af

Pond 101P: Rain Garden 101 Peak Elev=174.30' Storage=32,073 cf Inflow=13.94 cfs 1.259 af
Primary=0.91 cfs 0.641 af Secondary=0.00 cfs 0.000 af Outflow=0.91 cfs 0.641 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Segment #1 Runoff Area=393,349 sf 4.54% Impervious Runoff Depth>3.47"
Flow Length=453' Tc=30.5 min CN=70 Runoff=20.67 cfs 2.613 af

Subcatchment 2S: Subcatchment #2 Runoff Area=74,584 sf 28.44% Impervious Runoff Depth>3.28"
Flow Length=347' Tc=9.2 min CN=68 Runoff=5.79 cfs 0.469 af

Subcatchment 3S: Subcatchment #3 Runoff Area=17,250 sf 0.00% Impervious Runoff Depth>1.08"
Flow Length=115' Tc=10.4 min CN=44 Runoff=0.30 cfs 0.036 af

Subcatchment 4S: Subcatchment #4 Runoff Area=19,029 sf 0.00% Impervious Runoff Depth>1.41"
Flow Length=227' Tc=12.5 min CN=48 Runoff=0.47 cfs 0.051 af

Subcatchment 5S: Subcatchment #5 Runoff Area=8,890 sf 79.74% Impervious Runoff Depth>5.79"
Tc=6.0 min CN=91 Runoff=1.27 cfs 0.098 af

Subcatchment 6S: Subcatchment #6 Runoff Area=10,871 sf 82.28% Impervious Runoff Depth>5.79"
Tc=6.0 min CN=91 Runoff=1.55 cfs 0.120 af

Subcatchment 7S: Subcatchment #7 Runoff Area=2,719 sf 48.18% Impervious Runoff Depth>4.44"
Flow Length=72' Slope=0.0622 '/' Tc=6.0 min CN=79 Runoff=0.32 cfs 0.023 af

Subcatchment 8S: Subcatchment #8 Runoff Area=69,845 sf 47.44% Impervious Runoff Depth>4.44"
Flow Length=371' Tc=12.4 min CN=79 Runoff=6.72 cfs 0.593 af

Subcatchment 9S: Subcatchment #9 Runoff Area=40,745 sf 100.00% Impervious Runoff Depth>6.61"
Tc=6.0 min CN=98 Runoff=6.14 cfs 0.515 af

Subcatchment 10S: Subcatchment #10 Runoff Area=36,361 sf 100.00% Impervious Runoff Depth>6.61"
Tc=6.0 min CN=98 Runoff=5.48 cfs 0.460 af

Subcatchment 11S: Subcatchment #11 Runoff Area=7,078 sf 100.00% Impervious Runoff Depth>6.61"
Tc=6.0 min CN=98 Runoff=1.07 cfs 0.089 af

Subcatchment 12S: Subcatchment #12 Runoff Area=3,051 sf 0.00% Impervious Runoff Depth>1.67"
Tc=6.0 min CN=51 Runoff=0.12 cfs 0.010 af

Reach 7aR: Overland flow Avg. Flow Depth=0.05' Max Vel=1.49 fps Inflow=0.32 cfs 0.023 af
n=0.013 L=201.4' S=0.0174 '/' Capacity=11.40 cfs Outflow=0.30 cfs 0.023 af

Reach 7bR: Overland flow Avg. Flow Depth=0.06' Max Vel=1.57 fps Inflow=0.30 cfs 0.023 af
n=0.035 L=34.4' S=0.1090 '/' Capacity=33.63 cfs Outflow=0.30 cfs 0.023 af

Reach 12R: Overland flow Avg. Flow Depth=0.17' Max Vel=4.92 fps Inflow=4.92 cfs 0.980 af
n=0.035 L=33.0' S=0.2424 '/' Capacity=50.15 cfs Outflow=4.98 cfs 0.982 af

Reach 100R: Final reach 100 Inflow=21.48 cfs 2.831 af
Outflow=21.48 cfs 2.831 af

Reach 200R: Final reach 200 Inflow=6.09 cfs 0.492 af
Outflow=6.09 cfs 0.492 af

Reach 300R: Final reach 300 Inflow=6.36 cfs 0.527 af
Outflow=6.36 cfs 0.527 af

Reach 400R: Final reach 400 Inflow=7.44 cfs 1.561 af
Outflow=7.44 cfs 1.561 af

Reach 1000R: Final reach 1000 Inflow=7.44 cfs 1.561 af
Outflow=7.44 cfs 1.561 af

Pond 5P: Catch basin Peak Elev=170.60' Storage=8 cf Inflow=1.27 cfs 0.098 af
15.0" Round Culvert n=0.010 L=81.9' S=0.0035 '/' Outflow=1.27 cfs 0.098 af

Pond 6P: Catch basin Peak Elev=174.06' Storage=9 cf Inflow=1.55 cfs 0.120 af
15.0" Round Culvert n=0.010 L=82.0' S=0.6984 '/' Outflow=1.55 cfs 0.120 af

Pond 7P: 8inch pvc drain Peak Elev=175.85' Inflow=0.32 cfs 0.023 af
Outflow=0.32 cfs 0.023 af

Pond 12P: Level spreader Peak Elev=171.20' Storage=1,662 cf Inflow=4.83 cfs 1.013 af
Outflow=4.92 cfs 0.980 af

Pond 101P: Rain Garden 101 Peak Elev=174.47' Storage=34,983 cf Inflow=18.21 cfs 1.657 af
Primary=4.80 cfs 1.003 af Secondary=0.00 cfs 0.000 af Outflow=4.80 cfs 1.003 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Segment #1 Runoff Area=393,349 sf 4.54% Impervious Runoff Depth>4.60"
Flow Length=453' Tc=30.5 min CN=70 Runoff=27.45 cfs 3.462 af

Subcatchment 2S: Subcatchment #2 Runoff Area=74,584 sf 28.44% Impervious Runoff Depth>4.39"
Flow Length=347' Tc=9.2 min CN=68 Runoff=7.77 cfs 0.626 af

Subcatchment 3S: Subcatchment #3 Runoff Area=17,250 sf 0.00% Impervious Runoff Depth>1.73"
Flow Length=115' Tc=10.4 min CN=44 Runoff=0.57 cfs 0.057 af

Subcatchment 4S: Subcatchment #4 Runoff Area=19,029 sf 0.00% Impervious Runoff Depth>2.15"
Flow Length=227' Tc=12.5 min CN=48 Runoff=0.79 cfs 0.078 af

Subcatchment 5S: Subcatchment #5 Runoff Area=8,890 sf 79.74% Impervious Runoff Depth>7.11"
Tc=6.0 min CN=91 Runoff=1.54 cfs 0.121 af

Subcatchment 6S: Subcatchment #6 Runoff Area=10,871 sf 82.28% Impervious Runoff Depth>7.11"
Tc=6.0 min CN=91 Runoff=1.88 cfs 0.148 af

Subcatchment 7S: Subcatchment #7 Runoff Area=2,719 sf 48.18% Impervious Runoff Depth>5.68"
Flow Length=72' Slope=0.0622 '/' Tc=6.0 min CN=79 Runoff=0.40 cfs 0.030 af

Subcatchment 8S: Subcatchment #8 Runoff Area=69,845 sf 47.44% Impervious Runoff Depth>5.67"
Flow Length=371' Tc=12.4 min CN=79 Runoff=8.53 cfs 0.758 af

Subcatchment 9S: Subcatchment #9 Runoff Area=40,745 sf 100.00% Impervious Runoff Depth>7.95"
Tc=6.0 min CN=98 Runoff=7.34 cfs 0.619 af

Subcatchment 10S: Subcatchment #10 Runoff Area=36,361 sf 100.00% Impervious Runoff Depth>7.95"
Tc=6.0 min CN=98 Runoff=6.55 cfs 0.553 af

Subcatchment 11S: Subcatchment #11 Runoff Area=7,078 sf 100.00% Impervious Runoff Depth>7.95"
Tc=6.0 min CN=98 Runoff=1.28 cfs 0.108 af

Subcatchment 12S: Subcatchment #12 Runoff Area=3,051 sf 0.00% Impervious Runoff Depth>2.47"
Tc=6.0 min CN=51 Runoff=0.19 cfs 0.014 af

Reach 7aR: Overland flow Avg. Flow Depth=0.05' Max Vel=1.61 fps Inflow=0.40 cfs 0.030 af
n=0.013 L=201.4' S=0.0174 '/' Capacity=11.40 cfs Outflow=0.39 cfs 0.030 af

Reach 7bR: Overland flow Avg. Flow Depth=0.06' Max Vel=1.69 fps Inflow=0.39 cfs 0.030 af
n=0.035 L=34.4' S=0.1090 '/' Capacity=33.63 cfs Outflow=0.39 cfs 0.029 af

Reach 12R: Overland flow Avg. Flow Depth=0.25' Max Vel=6.27 fps Inflow=11.13 cfs 1.339 af
n=0.035 L=33.0' S=0.2424 '/' Capacity=50.15 cfs Outflow=10.86 cfs 1.340 af

Reach 100R: Final reach 100 Inflow=28.44 cfs 3.730 af
Outflow=28.44 cfs 3.730 af

Reach 200R: Final reach 200 Inflow=8.14 cfs 0.656 af
Outflow=8.14 cfs 0.656 af

Reach 300R: Final reach 300 Inflow=8.68 cfs 0.713 af
Outflow=8.68 cfs 0.713 af

Reach 400R: Final reach 400 Inflow=16.49 cfs 2.131 af
Outflow=16.49 cfs 2.131 af

Reach 1000R: Final reach 1000 Inflow=16.49 cfs 2.131 af
Outflow=16.49 cfs 2.131 af

Pond 5P: Catch basin Peak Elev=170.67' Storage=9 cf Inflow=1.54 cfs 0.121 af
15.0" Round Culvert n=0.010 L=81.9' S=0.0035 '/' Outflow=1.54 cfs 0.121 af

Pond 6P: Catch basin Peak Elev=174.14' Storage=10 cf Inflow=1.88 cfs 0.148 af
15.0" Round Culvert n=0.010 L=82.0' S=0.6984 '/' Outflow=1.88 cfs 0.148 af

Pond 7P: 8inch pvc drain Peak Elev=175.86' Inflow=0.40 cfs 0.030 af
Outflow=0.40 cfs 0.030 af

Pond 12P: Level spreader Peak Elev=171.31' Storage=1,783 cf Inflow=10.94 cfs 1.372 af
Outflow=11.13 cfs 1.339 af

Pond 101P: Rain Garden 101 Peak Elev=174.60' Storage=37,336 cf Inflow=22.26 cfs 2.038 af
Primary=8.55 cfs 1.312 af Secondary=2.35 cfs 0.046 af Outflow=10.85 cfs 1.358 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Segment #1 Runoff Area=393,349 sf 4.54% Impervious Runoff Depth>5.99"
Flow Length=453' Tc=30.5 min CN=70 Runoff=35.71 cfs 4.510 af

Subcatchment 2S: Subcatchment #2 Runoff Area=74,584 sf 28.44% Impervious Runoff Depth>5.76"
Flow Length=347' Tc=9.2 min CN=68 Runoff=10.19 cfs 0.822 af

Subcatchment 3S: Subcatchment #3 Runoff Area=17,250 sf 0.00% Impervious Runoff Depth>2.62"
Flow Length=115' Tc=10.4 min CN=44 Runoff=0.94 cfs 0.086 af

Subcatchment 4S: Subcatchment #4 Runoff Area=19,029 sf 0.00% Impervious Runoff Depth>3.13"
Flow Length=227' Tc=12.5 min CN=48 Runoff=1.21 cfs 0.114 af

Subcatchment 5S: Subcatchment #5 Runoff Area=8,890 sf 79.74% Impervious Runoff Depth>8.68"
Tc=6.0 min CN=91 Runoff=1.86 cfs 0.148 af

Subcatchment 6S: Subcatchment #6 Runoff Area=10,871 sf 82.28% Impervious Runoff Depth>8.68"
Tc=6.0 min CN=91 Runoff=2.27 cfs 0.181 af

Subcatchment 7S: Subcatchment #7 Runoff Area=2,719 sf 48.18% Impervious Runoff Depth>7.18"
Flow Length=72' Slope=0.0622 '/' Tc=6.0 min CN=79 Runoff=0.50 cfs 0.037 af

Subcatchment 8S: Subcatchment #8 Runoff Area=69,845 sf 47.44% Impervious Runoff Depth>7.17"
Flow Length=371' Tc=12.4 min CN=79 Runoff=10.68 cfs 0.958 af

Subcatchment 9S: Subcatchment #9 Runoff Area=40,745 sf 100.00% Impervious Runoff Depth>9.53"
Tc=6.0 min CN=98 Runoff=8.78 cfs 0.743 af

Subcatchment 10S: Subcatchment #10 Runoff Area=36,361 sf 100.00% Impervious Runoff Depth>9.53"
Tc=6.0 min CN=98 Runoff=7.83 cfs 0.663 af

Subcatchment 11S: Subcatchment #11 Runoff Area=7,078 sf 100.00% Impervious Runoff Depth>9.53"
Tc=6.0 min CN=98 Runoff=1.52 cfs 0.129 af

Subcatchment 12S: Subcatchment #12 Runoff Area=3,051 sf 0.00% Impervious Runoff Depth>3.53"
Tc=6.0 min CN=51 Runoff=0.28 cfs 0.021 af

Reach 7aR: Overland flow Avg. Flow Depth=0.06' Max Vel=1.72 fps Inflow=0.50 cfs 0.037 af
n=0.013 L=201.4' S=0.0174 '/' Capacity=11.40 cfs Outflow=0.49 cfs 0.037 af

Reach 7bR: Overland flow Avg. Flow Depth=0.07' Max Vel=1.82 fps Inflow=0.49 cfs 0.037 af
n=0.035 L=34.4' S=0.1090 '/' Capacity=33.63 cfs Outflow=0.48 cfs 0.037 af

Reach 12R: Overland flow Avg. Flow Depth=0.31' Max Vel=7.31 fps Inflow=17.62 cfs 1.778 af
n=0.035 L=33.0' S=0.2424 '/' Capacity=50.15 cfs Outflow=17.94 cfs 1.781 af

Reach 100R: Final reach 100 Inflow=36.91 cfs 4.838 af
Outflow=36.91 cfs 4.838 af

Reach 200R: Final reach 200 Inflow=10.66 cfs 0.859 af
Outflow=10.66 cfs 0.859 af

Reach 300R: Final reach 300 Inflow=11.56 cfs 0.945 af
Outflow=11.56 cfs 0.945 af

Reach 400R: Final reach 400 Inflow=27.94 cfs 2.840 af
Outflow=27.94 cfs 2.840 af

Reach 1000R: Final reach 1000 Inflow=27.94 cfs 2.840 af
Outflow=27.94 cfs 2.840 af

Pond 5P: Catch basin Peak Elev=170.76' Storage=10 cf Inflow=1.86 cfs 0.148 af
15.0" Round Culvert n=0.010 L=81.9' S=0.0035 '/' Outflow=1.86 cfs 0.148 af

Pond 6P: Catch basin Peak Elev=174.24' Storage=11 cf Inflow=2.27 cfs 0.181 af
15.0" Round Culvert n=0.010 L=82.0' S=0.6984 '/' Outflow=2.28 cfs 0.180 af

Pond 7P: 8inch pvc drain Peak Elev=175.88' Inflow=0.50 cfs 0.037 af
Outflow=0.50 cfs 0.037 af

Pond 12P: Level spreader Peak Elev=171.41' Storage=1,887 cf Inflow=17.92 cfs 1.812 af
Outflow=17.62 cfs 1.778 af

Pond 101P: Rain Garden 101 Peak Elev=174.75' Storage=40,300 cf Inflow=27.07 cfs 2.493 af
Primary=8.73 cfs 1.560 af Secondary=9.20 cfs 0.232 af Outflow=17.77 cfs 1.792 af

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	70.906 degrees West
Latitude	43.226 degrees North
Elevation	0 feet
Date/Time	Wed, 20 May 2020 11:19:31 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.81	1.03	**1yr**	0.70	0.98	1.20	1.54	1.99	2.59	2.87	**1yr**	2.29	2.76	3.16	3.89	4.45	**1yr**
2yr	0.32	0.49	0.61	0.81	1.01	1.28	**2yr**	0.87	1.17	1.50	1.91	2.44	3.14	3.50	**2yr**	2.78	3.37	3.86	4.59	5.23	**2yr**
5yr	0.37	0.57	0.72	0.96	1.23	1.58	**5yr**	1.06	1.44	1.85	2.38	3.06	3.96	4.48	**5yr**	3.50	4.31	4.93	5.79	6.55	**5yr**
10yr	0.40	0.63	0.80	1.09	1.42	1.85	**10yr**	1.22	1.69	2.18	2.82	3.65	4.72	5.40	**10yr**	4.18	5.20	5.95	6.91	7.76	**10yr**
25yr	0.46	0.74	0.94	1.30	1.72	2.27	**25yr**	1.49	2.09	2.70	3.52	4.59	5.96	6.93	**25yr**	5.28	6.66	7.61	8.72	9.73	**25yr**
50yr	0.52	0.83	1.06	1.49	2.01	2.67	**50yr**	1.73	2.46	3.18	4.18	5.46	7.12	8.36	**50yr**	6.30	8.04	9.18	10.41	11.55	**50yr**
100yr	0.58	0.94	1.21	1.71	2.33	3.13	**100yr**	2.01	2.89	3.75	4.95	6.49	8.50	10.10	**100yr**	7.52	9.71	11.07	12.43	13.72	**100yr**
200yr	0.65	1.05	1.37	1.96	2.71	3.68	**200yr**	2.34	3.40	4.43	5.88	7.74	10.15	12.19	**200yr**	8.98	11.72	13.35	14.85	16.29	**200yr**
500yr	0.76	1.25	1.63	2.37	3.32	4.55	**500yr**	2.87	4.22	5.51	7.36	9.75	12.84	15.66	**500yr**	11.37	15.06	17.12	18.79	20.47	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.24	0.37	0.45	0.60	0.74	0.90	**1yr**	0.64	0.88	0.92	1.25	1.54	2.07	2.45	**1yr**	1.84	2.36	2.93	3.43	4.10	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.18	**2yr**	0.86	1.15	1.36	1.82	2.35	3.05	3.40	**2yr**	2.70	3.27	3.74	4.47	5.08	**2yr**
5yr	0.35	0.54	0.67	0.91	1.16	1.40	**5yr**	1.00	1.37	1.61	2.14	2.77	3.69	4.12	**5yr**	3.27	3.96	4.60	5.39	6.09	**5yr**
10yr	0.38	0.59	0.73	1.02	1.31	1.60	**10yr**	1.13	1.56	1.81	2.43	3.12	4.24	4.77	**10yr**	3.75	4.58	5.31	6.21	6.97	**10yr**
25yr	0.44	0.66	0.83	1.18	1.55	1.91	**25yr**	1.34	1.87	2.11	2.83	3.63	5.07	5.76	**25yr**	4.49	5.54	6.47	7.49	8.34	**25yr**
50yr	0.48	0.73	0.91	1.31	1.77	2.19	**50yr**	1.52	2.14	2.36	3.19	4.07	5.81	6.63	**50yr**	5.14	6.38	7.51	8.62	9.53	**50yr**
100yr	0.54	0.81	1.02	1.47	2.02	2.51	**100yr**	1.74	2.45	2.65	3.57	4.53	6.66	7.63	**100yr**	5.89	7.34	8.72	9.92	10.88	**100yr**
200yr	0.60	0.90	1.14	1.65	2.30	2.87	**200yr**	1.98	2.81	2.96	4.01	5.05	7.62	8.78	**200yr**	6.74	8.44	10.11	11.41	12.43	**200yr**
500yr	0.70	1.04	1.33	1.94	2.75	3.46	**500yr**	2.38	3.39	3.44	4.65	5.84	9.07	10.55	**500yr**	8.03	10.15	12.29	13.75	14.76	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.53	0.71	0.87	1.08	**1yr**	0.75	1.05	1.23	1.73	2.20	2.82	3.08	**1yr**	2.50	2.96	3.39	4.18	4.75	**1yr**
2yr	0.33	0.51	0.62	0.84	1.04	1.24	**2yr**	0.90	1.22	1.47	1.95	2.51	3.25	3.62	**2yr**	2.87	3.48	3.99	4.75	5.40	**2yr**
5yr	0.39	0.60	0.75	1.03	1.31	1.58	**5yr**	1.13	1.54	1.85	2.49	3.19	4.22	4.85	**5yr**	3.73	4.66	5.29	6.22	6.98	**5yr**
10yr	0.46	0.70	0.87	1.21	1.57	1.91	**10yr**	1.35	1.87	2.23	3.03	3.84	5.18	6.05	**10yr**	4.59	5.82	6.67	7.63	8.50	**10yr**
25yr	0.56	0.84	1.05	1.50	1.97	2.46	**25yr**	1.70	2.41	2.87	3.95	4.94	6.83	8.13	**25yr**	6.04	7.81	8.93	10.04	11.06	**25yr**
50yr	0.64	0.98	1.22	1.75	2.36	2.97	**50yr**	2.03	2.91	3.48	4.81	6.00	8.40	10.18	**50yr**	7.43	9.79	11.17	12.34	13.52	**50yr**
100yr	0.75	1.13	1.42	2.05	2.81	3.59	**100yr**	2.43	3.51	4.22	5.88	7.30	10.33	12.76	**100yr**	9.14	12.27	13.96	15.20	16.53	**100yr**
200yr	0.87	1.31	1.66	2.40	3.35	4.34	**200yr**	2.89	4.25	5.13	7.18	8.86	12.74	16.01	**200yr**	11.27	15.40	17.46	18.71	20.24	**200yr**
500yr	1.07	1.58	2.04	2.96	4.21	5.57	**500yr**	3.64	5.45	6.63	9.39	11.49	16.84	21.62	**500yr**	14.90	20.79	23.50	24.67	26.47	**500yr**

Powered by ACIS Northeast Regional Climate Center

RIP RAP CALCULATIONS

19-152 Index Packaging Inc
Venture Drive
Dover, NH

Berry Surveying & Engineering
335 Second Crown Point Road
Barrington, NH
14-Jul-20

Rip Rap equations were obtained from the *Stormwater Management and Erosion Control Handbook for Urban and Developing Areas in New Hampshire.* Rip Rap was sized for the 25 year storm event. (Some d50 sizes and T values have been modified)

TAILWATER < HALF THE Do

La = (1.8 x Q) / Do 3/2 + (7 x Do) Q = Peak Flow & Do is Pipe Diameter
W = La + 3*Do or defined channel width
d50 = (0.02 x Q4/3) / (Tw x Do) Tw = Tailwater Depth
T = Largest Stone Size x 1.5

Culvert or Catch Basin	Tailwater (Feet) Tw	Discharge (C.F.S.) Q	Diameter of Pipe Do	Length of Rip Rap La (feet)	Width of Rip Rap W (feet)	d50-Stone Rip Rap d50(ft.)	Actual Size	Thickness
12" HDPE (Pond #1CP)	0.20	5.52	1.00	16.9	19.9	0.98	0.50	1.20

Please note that the designer chose to use the 25 Year Event for the dimensional calculations.

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d50 Size =	0.5	Feet	6	Inches
% of Weight Smaller Than the Given d50 Size	Size of Stone (Inches) From		To	
100%	9		12	
85%	8		11	
50%	6		9	
15%	2		3	

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Rain Garden #101**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable

YES		Have you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a)?	
3.51	ac	A = Area draining to the practice	
2.70	ac	A_I = Impervious area draining to the practice	
0.77	decimal	I = percent impervious area draining to the practice, in decimal form	
0.74	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
2.61	ac-in	WQV= 1" x Rv x A	
9,458	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
2,364	cf	25% x WQV (check calc for sediment forebay volume)	
7,093	cf	75% x WQV (check calc for surface sand filter volume)	
Sediment Forebay		Method of Pretreatment? (not required for clean or roof runoff)	
5,182	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
9,208	sf	A_{SA} = surface area of the practice	
10.00	iph	$Ksat_{DESIGN}$ = design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
1.2	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← ≤ 72-hrs
169.75	feet	E_{FC} = elevation of the bottom of the filter course material[2]	
168.75	feet	E_{UD} = invert elevation of the underdrain (UD), if applicable	
168.00	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
166.00	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = depth to UD from the bottom of the filter course	← ≥ 1'
3.75	feet	$D_{FC\ to\ ROCK}$ = depth to bedrock from the bottom of the filter course	← ≥ 1'
1.75	feet	$D_{FC\ to\ SHWT}$ = depth to SHWT from the bottom of the filter course	← ≥ 1'
173.87	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
175.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes

If a surface sand filter or underground sand filter is proposed:

YES	ac	Drainage Area check.	← < 10 ac
	cf	V = volume of storage[3] (attach a stage-storage table)	← ≥ 75%WQV
	inches	D_{FC} = filter course thickness	← 18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification	
	Yes/No	Access grate provided?	← yes

If a bioretention area is proposed:

YES	ac	Drainage Area no larger than 5 ac?	← **yes**
31,259	cf	V = volume of storage[3] (attach a stage-storage table)	← **≥ WQV**
24"	inches	D_{FC} = filter course thickness	← **18", or 24" if within GPA**
Sheet	R-101	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	← **≥3:1**
Sheet	R-101	Note what sheet in the plan set contains the planting plans and surface cover	

If porous pavement is proposed:

		Type of pavement proposed (concrete? Asphalt? Pavers? Etc)	
	acres	A_{SA} = surface area of the pervious pavement	
	:1	ratio of the contributing area to the pervious surface area	← **≤ 5:1**
	inches	D_{FC} = filter course thickness	← **12", or 18" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course spec.	← **304.1 sand**

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

Groundwater Recharge Volume (GRV) Calculation

-	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
-	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
0.88	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
-	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.10	inches	Rd = weighted groundwater recharge depth	
0.0878	ac-in	GRV = AI * Rd	
319	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12")	

Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

Waiver Request

Stage-Area-Storage for Pond 101P: Rain Garden 101

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
168.75	0	0	169.79	9,208	38
168.77	0	1	169.81	9,208	38
168.79	0	1	169.83	9,208	38
168.81	0	2	169.85	9,208	39
168.83	0	3	169.87	9,208	39
168.85	0	4	169.89	9,208	39
168.87	0	4	169.91	9,208	40
168.89	0	5	169.93	9,208	40
168.91	0	6	169.95	9,208	41
168.93	0	7	169.97	9,208	41
168.95	0	7	169.99	9,208	41
168.97	0	8	170.01	9,208	42
168.99	0	9	170.03	9,208	42
169.01	0	10	170.05	9,208	42
169.03	0	10	170.07	9,208	43
169.05	0	11	170.09	9,208	43
169.07	0	12	170.11	9,208	43
169.09	0	13	170.13	9,208	44
169.11	0	13	170.15	9,208	44
169.13	0	14	170.17	9,208	45
169.15	0	15	170.19	9,208	45
169.17	0	15	170.21	9,208	45
169.19	0	16	170.23	9,208	46
169.21	0	17	170.25	9,208	46
169.23	0	18	170.27	9,208	46
169.25	0	18	170.29	9,208	47
169.27	0	19	170.31	9,208	47
169.29	0	20	170.33	9,208	48
169.31	0	21	170.35	9,208	48
169.33	0	21	170.37	9,208	48
169.35	0	22	170.39	9,208	49
169.37	0	23	170.41	9,208	49
169.39	0	24	170.43	9,208	49
169.41	0	24	170.45	9,208	50
169.43	0	25	170.47	9,208	50
169.45	0	26	170.49	9,208	50
169.47	0	27	170.51	9,208	51
169.49	0	27	170.53	9,208	51
169.51	0	28	170.55	9,208	52
169.53	0	29	170.57	9,208	52
169.55	0	29	170.59	9,208	52
169.57	0	30	170.61	9,208	53
169.59	0	31	170.63	9,208	53
169.61	0	32	170.65	9,208	53
169.63	0	32	170.67	9,208	54
169.65	0	33	170.69	9,208	54
169.67	0	34	170.71	9,208	55
169.69	0	35	170.73	9,208	55
169.71	0	35	170.75	9,208	55
169.73	0	36	170.77	9,208	56
169.75	9,208	37	170.79	9,208	56
169.77	9,208	37	170.81	9,208	56

Stage-Area-Storage for Pond 101P: Rain Garden 101 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
170.83	9,208	57
170.85	9,208	57
170.87	9,208	57
170.89	9,208	58
170.91	9,208	58
170.93	9,208	59
170.95	9,208	59
170.97	9,208	59
170.99	9,208	60
171.01	9,208	60
171.03	9,208	60
171.05	9,208	61
171.07	9,208	61
171.09	9,208	62
171.11	9,208	62
171.13	9,208	62
171.15	9,208	63
171.17	9,208	63
171.19	9,208	63
171.21	9,208	64
171.23	9,208	64
171.25	9,208	64
171.27	9,208	65
171.29	9,208	65
171.31	9,208	66
171.33	9,208	66
171.35	9,208	66
171.37	9,208	67
171.39	9,208	67
171.41	9,208	67
171.43	9,208	68
171.45	9,208	68
171.47	9,208	69
171.49	9,208	69
171.51	9,208	69
171.53	9,208	70
171.55	9,208	70
171.57	9,208	70
171.59	9,208	71
171.61	9,208	71
171.63	9,208	71
171.65	9,208	72
171.67	9,208	72
171.69	9,208	73
171.71	9,208	73
171.73	9,208	73
171.75	9,208	74
171.77	9,208	74
171.79	9,208	74
171.81	9,208	75
171.83	9,208	75
171.85	9,208	76
171.87	9,208	76
171.89	9,208	76
171.91	9,208	77
171.93	9,208	77
171.95	9,208	77
171.97	9,208	78
171.99	9,208	78
172.01	18,435	183
172.03	18,473	394
172.05	18,512	606
172.07	18,550	819
172.09	18,588	1,034
172.11	18,627	1,249
172.13	18,665	1,466
172.15	18,704	1,684
172.17	18,743	1,903
172.19	18,782	2,123
172.21	18,821	2,345
172.23	18,860	2,568
172.25	18,899	2,792
172.27	18,938	3,017
172.29	18,977	3,243
172.31	19,016	3,471
172.33	19,056	3,700
172.35	19,095	3,930
172.37	19,135	4,162
172.39	19,174	4,394
172.41	19,214	4,628
172.43	19,254	4,863
172.45	19,294	5,100
172.47	19,334	5,338
172.49	19,374	5,577
172.51	19,414	5,817
172.53	19,454	6,058
172.55	19,494	6,301
172.57	19,535	6,546
172.59	19,575	6,791
172.61	19,616	7,038
172.63	19,656	7,286
172.65	19,697	7,536
172.67	19,738	7,786
172.69	19,778	8,039
172.71	19,819	8,292
172.73	19,860	8,547
172.75	19,901	8,803
172.77	19,942	9,061
172.79	19,984	9,319
172.81	20,025	9,580
172.83	20,066	9,841
172.85	20,108	10,104
172.87	20,149	10,369
172.89	20,191	10,635

Stage-Area-Storage for Pond 101P: Rain Garden 101 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
172.91	20,232	10,902	173.95	22,346	26,798
172.93	20,274	11,170	173.97	22,389	27,145
172.95	20,316	11,440	173.99	22,431	27,493
172.97	20,358	11,712	174.01	22,539	27,801
172.99	20,400	11,984	174.03	22,715	28,069
173.01	20,440	12,259	174.05	22,891	28,341
173.03	20,479	12,534	174.07	23,069	28,616
173.05	20,519	12,811	174.09	23,248	28,895
173.07	20,558	13,090	174.11	23,428	29,178
173.09	20,597	13,369	174.13	23,609	29,464
173.11	20,636	13,651	174.15	23,792	29,754
173.13	20,675	13,933	174.17	23,975	30,047
173.15	20,715	14,217	174.19	24,160	30,345
173.17	20,754	14,503	174.21	24,345	30,646
173.19	20,794	14,789	174.23	24,532	30,950
173.21	20,833	15,078	174.25	24,720	31,259
173.23	20,873	15,367	174.27	24,910	31,571
173.25	20,913	15,659	174.29	25,100	31,887
173.27	20,953	15,951	174.31	25,292	32,206
173.29	20,993	16,245	174.33	25,484	32,530
173.31	21,033	16,541	174.35	25,678	32,857
173.33	21,073	16,838	174.37	25,873	33,189
173.35	21,113	17,136	174.39	26,069	33,524
173.37	21,153	17,436	174.41	26,266	33,863
173.39	21,193	17,737	174.43	26,465	34,206
173.41	21,233	18,040	174.45	26,664	34,554
173.43	21,274	18,345	174.47	26,865	34,905
173.45	21,314	18,650	174.49	27,067	35,260
173.47	21,355	18,958	174.51	27,270	35,619
173.49	21,395	19,267	174.53	27,474	35,982
173.51	21,436	19,577	174.55	27,679	36,350
173.53	21,476	19,889	174.57	27,886	36,721
173.55	21,517	20,202	174.59	28,093	37,097
173.57	21,558	20,517	174.61	28,302	37,477
173.59	21,599	20,834	174.63	28,512	37,860
173.61	21,640	21,152	174.65	28,723	38,249
173.63	21,681	21,471	174.67	28,935	38,641
173.65	21,722	21,792	174.69	29,148	39,038
173.67	21,763	22,115	174.71	29,363	39,439
173.69	21,804	22,439	174.73	29,578	39,844
173.71	21,846	22,765	174.75	29,795	40,254
173.73	21,887	23,092	174.77	30,013	40,667
173.75	21,928	23,421	174.79	30,232	41,086
173.77	21,970	23,752	174.81	30,452	41,508
173.79	22,011	24,084	174.83	30,673	41,935
173.81	22,053	24,417	174.85	30,896	42,367
173.83	22,095	24,753	174.87	31,119	42,803
173.85	22,137	25,090	174.89	31,344	43,243
173.87	22,178	25,428	174.91	31,570	43,688
173.89	22,220	25,768	174.93	31,797	44,138
173.91	22,262	26,110	174.95	32,025	44,592
173.93	22,304	26,453	174.97	32,255	45,051

Stage-Area-Storage for Pond 101P: Rain Garden 101 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
174.99	**32,485**	**45,514**



Map Scale: 1:4,840 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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 19, Sep 16, 2019

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
BzB	Buxton silt loam, 3 to 8 percent slopes	13.1	11.5%
EaB	Elmwood fine sandy loam, 3 to 8 percent slopes	19.6	17.2%
GlB	Gloucester fine sandy loam, 3 to 8 percent slopes	6.2	5.4%
GsC	Gloucester very stony fine sandy loam, 8 to 15 percent slopes	10.7	9.4%
HcB	Hollis-Charlton fine sandy loams, 3 to 8 percent slopes	7.5	6.6%
ScA	Scantic silt loam, 0 to 3 percent slopes	24.7	21.7%
SfC	Suffield silt loam, 8 to 15 percent slopes	2.5	2.2%
SwA	Swanton fine sandy loam, 0 to 3 percent slopes	3.9	3.4%
WdA	Windsor loamy sand, 0 to 3 percent slopes	0.3	0.2%
WdB	Windsor loamy sand, 3 to 8 percent slopes	2.8	2.5%
WfB	Windsor loamy fine sand, clay subsoil variant, 0 to 8 percent slopes	22.6	19.9%
Totals for Area of Interest		**113.7**	**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



May 5, 2020

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: 1:4,840 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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 19, Sep 16, 2019

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
BzB	Buxton silt loam, 3 to 8 percent slopes	13.1	11.5%
EaB	Elmwood fine sandy loam, 3 to 8 percent slopes	19.6	17.2%
GlB	Gloucester fine sandy loam, 3 to 8 percent slopes	6.2	5.4%
GsC	Gloucester very stony fine sandy loam, 8 to 15 percent slopes	10.7	9.4%
HcB	Hollis-Charlton fine sandy loams, 3 to 8 percent slopes	7.5	6.6%
ScA	Scantic silt loam, 0 to 3 percent slopes	24.7	21.7%
SfC	Suffield silt loam, 8 to 15 percent slopes	2.5	2.2%
SwA	Swanton fine sandy loam, 0 to 3 percent slopes	3.9	3.4%
WdA	Windsor loamy sand, 0 to 3 percent slopes	0.3	0.2%
WdB	Windsor loamy sand, 3 to 8 percent slopes	2.8	2.5%
WfB	Windsor loamy fine sand, clay subsoil variant, 0 to 8 percent slopes	22.6	19.9%
Totals for Area of Interest		**113.7**	**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

BzB—Buxton silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9d6p
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: All areas are prime farmland

Map Unit Composition

Buxton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Buxton

Setting

Parent material: Glaciomarine

Typical profile

H1 - 0 to 10 inches: silt loam
H2 - 10 to 28 inches: silty clay loam
H3 - 28 to 43 inches: silty clay

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Elmwood

Percent of map unit: 10 percent
Hydric soil rating: No

Not named

Percent of map unit: 5 percent
Hydric soil rating: No

EaB—Elmwood fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9d71
Elevation: 0 to 1,000 feet
Mean annual precipitation: 28 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 120 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Elmwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Elmwood

Setting

Parent material: Glaciomarine

Typical profile

H1 - 0 to 16 inches: fine sandy loam
H2 - 16 to 20 inches: fine sandy loam
H3 - 20 to 43 inches: silty clay

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately 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: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 10 percent
Hydric soil rating: No

Deerfield

Percent of map unit: 5 percent

Hydric soil rating: No

GIB—Gloucester fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9d73
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

Gloucester and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gloucester

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 28 inches: very gravelly loamy sand
H3 - 28 to 40 inches: very gravelly coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Acton

Percent of map unit: 5 percent
Hydric soil rating: No

Hollis

Percent of map unit: 5 percent

Hydric soil rating: No

Not named pan

Percent of map unit: 5 percent
Hydric soil rating: No

GsC—Gloucester very stony fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9d76
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: Not prime farmland

Map Unit Composition

Gloucester and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gloucester

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: very stony fine sandy loam
H2 - 14 to 28 inches: very gravelly loamy sand
H3 - 28 to 40 inches: very gravelly coarse sand

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Not named
Percent of map unit: 5 percent
Hydric soil rating: No

Acton
Percent of map unit: 5 percent
Hydric soil rating: No

Hollis
Percent of map unit: 5 percent
Hydric soil rating: No

HcB—Hollis-Charlton fine sandy loams, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9d7j
Elevation: 0 to 1,000 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 120 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition
Hollis and similar soils: 55 percent
Charlton and similar soils: 35 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hollis

Setting
Parent material: Till

Typical profile
H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 18 inches: bedrock

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Charlton

Setting

Parent material: Till

Typical profile

H1 - 0 to 13 inches: fine sandy loam
H2 - 13 to 36 inches: fine sandy loam
H3 - 36 to 40 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 5 percent
Hydric soil rating: No

Buxton

Percent of map unit: 5 percent
Hydric soil rating: No

ScA—Scantic silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9d8s
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 local importance

Map Unit Composition

Scantic and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scantic

Setting

Landform: Marine terraces

Typical profile

H1 - 0 to 13 inches: silt loam
H2 - 13 to 23 inches: silty clay loam
H3 - 23 to 40 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Medium
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: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Not named wet

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Swanton

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Biddeford

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

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

SwA—Swanton fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9d90
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 local importance

Map Unit Composition

Swanton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swanton

Setting

Landform: Marine terraces

Typical profile

H1 - 0 to 19 inches: fine sandy loam
H2 - 19 to 26 inches: sandy loam
H3 - 26 to 41 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Medium
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: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Not named wet

Percent of map unit: 10 percent
Landform: Marine terraces
Hydric soil rating: Yes

Scantic

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

WdA—Windsor loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svkg
Elevation: 0 to 990 feet
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 local importance

Map Unit Composition

Windsor, loamy sand, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor, Loamy Sand

Setting

Landform: Outwash terraces, outwash plains, deltas, dunes
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand
C - 25 to 65 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Deerfield, loamy sand

Percent of map unit: 10 percent
Landform: Terraces, deltas, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Hinckley, loamy sand

Percent of map unit: 5 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

WdB—Windsor loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svkf
Elevation: 0 to 1,210 feet
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 local importance

Map Unit Composition

Windsor, loamy sand, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor, Loamy Sand

Setting

Landform: Outwash plains, outwash terraces, deltas, dunes
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand
C - 25 to 65 inches: sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Hinckley, loamy sand

Percent of map unit: 10 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Deerfield, loamy sand

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

WfB—Windsor loamy fine sand, clay subsoil variant, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9d9b
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: All areas are prime farmland

Map Unit Composition

Windsor variant and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor Variant

Typical profile

H1 - 0 to 26 inches: loamy fine sand
H2 - 26 to 30 inches: loamy sand
H3 - 30 to 42 inches: silt loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 15 percent
Hydric soil rating: No

References

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John P. Hayes III CSS, CWS,
7 Limestone Way
North Hampton, NH 03862
603-205-4396
johnphayes@comcast.net

6/19/20

Christopher Berry
Berry Surveying and Engineering
335 Second Crown Point Road
Barrington NH 03825

Job # 20-005

Site Specific Soil Survey
Map D lots 9A and11A
Venture Drive Dover, NH

Dear Chris,

This letter report presents the findings of a Site Specific Soil Survey conducted on the referenced property by John P. Hayes III on June 17, 2020. The soil survey was conducted in accordance with the New Hampshire Supplement of the Site-Specific Soil Mapping Standard For New Hampshire and Vermont, Version 5.0, December 2017, Special Publication # 3, published by the Society of Soil Scientist of Northern New England.

The portion of the property that is subject of the soil survey is located northeast of Venture Drive, and southwest of Route 16, in Dover NH. The mapped area of the pacel is approximately 9.3 acres in size. The plans used for these soil maps are a 100 scale plan, where 1 inch equals 100 feet, with two foot contours.

The purpose of the soil survey is to provide the client with soils information for urban and suburban or rural land planning. Soil characteristics on the property were evaluated through observation of numerous test holes and hand auger probes conducted throughout the property. Slope phases were determined with the use of the topography provided on the plan. The Site-specific Soil Map Units identified are taken from the New Hampshire State-Wide Numerical Soils Legend, Issue #10 January 2011, and are briefly described below. Official Series Descriptions (OSD) for each of these soil series are enclosed with this report. The soil map units comply with the Range In Characteristics described in the OSD. Dissimilar inclusions are noted above. Limits of the Site Specific mapping units are highlighted on the plan.

Portions of the soil map with the map unit denominator P and VP contain poorly, and very poorly drained soils respectively. Portions of the soil map with the map unit and denominator Hc/Rk identify the Hollis-Charlton soil complex. They are soils that have the potential to have areas of bedrock substratum within 40 inches of the soil surface. The portions of the soil map with the map unit 500, are disturbed soils that have been filled, or excavated and/or regraded, and are loamy in texture. A Disturbed Soil Mapping Unit Supplement for New Hampshire DES AoT Site Specific Soil Maps, is also included. This supplement explains the additional information given about each of the disturbed soil map units that are present on the site.

MAP UNIT #	SOIL TAXANOMIC NAME	DESCRIPTION
CsC (State No. 63)	**Charlton (very stony)**	The Charlton series consists of very deep, well drained soils formed in loamy melt-out till. They are nearly level to very steep soils on moraines, hills, and ridges. Saturated hydraulic conductivity is moderately high or high. The hydrologic soil group is B. Slope ranges from 8% to 15%.
CsD (State No. 63)	**Charlton (very stony)**	The Charlton series consists of very deep, well drained soils formed in loamy melt-out till. They are nearly level to very steep soils on moraines, hills, and ridges. Saturated hydraulic conductivity is moderately high or high. The hydrologic soil group is B. Slope ranges from 15% to 25%.
GsE (State No, 111)	**Gloucester (very stony)**	The Gloucester series consists of very deep, somewhat excessively drained soils formed in sandy till. They are nearly level through very steep soils on ground moraine uplands and moraines. Saturated hydraulic conductivity is high or very high. The hydrologic soil group is A. Slope ranges from 25% to 50%.
AcC (State No. 146)	**Acton**	The Acton series consists of very deep, moderately well drained soils that formed in sandy glacial till on uplands. Permeability is moderately rapid in the surface layer and moderately rapid to rapid in the subsoil and substratum. The hydrologic soil group is B. Slope ranges from 8% to 15%.
HcA Rk (State No. 175)	**Hollis-Charlton Complex (very rocky)**	The Hollis series consists of well drained and somewhat excessively drained soils formed in a thin mantle of till. They are shallow to bedrock. They are nearly level to very steep upland soils on bedrock-controlled hills and ridges. Saturated hydraulic conductivity is moderately high or high. Depth to hard bedrock ranges from 25 to 50 cm. The hydrologic soil group is C/D.The Charlton series consists of very deep, well drained soils formed in loamy melt-out till. They are nearly level to very steep soils on moraines, hills, and ridges. Saturated hydraulic conductivity is moderately high or high. The hydrologic soil group is B. Slope ranges from 0% to 3%.
HcB Rk (State No. 175)	**Hollis-Charlton Complex (very rocky)**	The Hollis series consists of well drained and somewhat excessively drained soils formed in a thin mantle of till. They are shallow to bedrock. They are nearly level to very steep upland soils on bedrock-controlled hills and ridges. Saturated hydraulic conductivity is moderately high or high. Depth to hard bedrock ranges from 25 to 50 cm. The hydrologic soil group is C/D.The Charlton series consists of very deep, well drained soils formed in loamy melt-out till. They are nearly level to very steep soils on moraines, hills, and ridges. Saturated hydraulic conductivity is moderately high or high. The hydrologic soil group is B. Slope ranges from 3% to 8%.

MAP UNIT #	SOIL TAXANOMIC NAME	DESCRIPTION
HcC **Rk** **(State No. 175)**	**Hollis-Charlton Complex (very rocky)**	The Hollis series consists of well drained and somewhat excessively drained soils formed in a thin mantle of till. They are shallow to bedrock. They are nearly level to very steep upland soils on bedrock-controlled hills and ridges. Saturated hydraulic conductivity is moderately high or high. Depth to hard bedrock ranges from 25 to 50 cm. The hydrologic soil group is C/D.The Charlton series consists of very deep, well drained soils formed in loamy melt-out till. They are nearly level to very steep soils on moraines, hills, and ridges. Saturated hydraulic conductivity is moderately high or high. The hydrologic soil group is B. Slope ranges from 8% to 15%.
HcD **Rk** **(State No. 175)**	**Hollis-Charlton Complex (very rocky)**	The Hollis series consists of well drained and somewhat excessively drained soils formed in a thin mantle of till. They are shallow to bedrock. They are nearly level to very steep upland soils on bedrock-controlled hills and ridges. Saturated hydraulic conductivity is moderately high or high. Depth to hard bedrock ranges from 25 to 50 cm. The hydrologic soil group is C/D.The Charlton series consists of very deep, well drained soils formed in loamy melt-out till. They are nearly level to very steep soils on moraines, hills, and ridges. Saturated hydraulic conductivity is moderately high or high. The hydrologic soil group is B. Slope ranges from 15% to 25%.
HcE **Rk** **(State No. 175)**	**Hollis-Charlton Complex (very rocky)**	The Hollis series consists of well drained and somewhat excessively drained soils formed in a thin mantle of till. They are shallow to bedrock. They are nearly level to very steep upland soils on bedrock-controlled hills and ridges. Saturated hydraulic conductivity is moderately high or high. Depth to hard bedrock ranges from 25 to 50 cm. The hydrologic soil group is C/D.The Charlton series consists of very deep, well drained soils formed in loamy melt-out till. They are nearly level to very steep soils on moraines, hills, and ridges. Saturated hydraulic conductivity is moderately high or high. The hydrologic soil group is B. Slopes are greater than 25%.
BzA **(State No. 32)**	**Boxford**	The Boxford series consists of very deep, moderately well to somewhat poorly drained soils formed in clayey marine sediments. These soils are nearly level and are on terraces. Permeability is slow in the upper part of the B horizon and slow to very slow in the lower part of the B and in the C horizons. The hydrologic soil group is C. Slope ranges from 0% to 3%.

MAP UNIT #	SOIL TAXANOMIC NAME	DESCRIPTION
BzB (State No. 32)	**Boxford**	The Boxford series consists of very deep, moderately well to somewhat poorly drained soils formed in clayey marine sediments. These soils are nearly level and are on terraces. Permeability is slow in the upper part of the B horizon and slow to very slow in the lower part of the B and in the C horizons. The hydrologic soil group is C. Slope ranges from 3% to 8%.
BzC (State No. 32)	**Boxford**	The Boxford series consists of very deep, moderately well to somewhat poorly drained soils formed in clayey marine sediments. These soils are nearly level and are on terraces. Permeability is slow in the upper part of the B horizon and slow to very slow in the lower part of the B and in the C horizons.The hydrologic soil group is C. Slope ranges from 8% to 15%.
ScA P (State No. 33)	**Scitico**	The Scitico series consists of very deep, poorly drained soils formed in silty and clayey sediments. They are nearly level to very gently sloping soils in low-lying positions of glaciolacustrine and marine terraces. Permeability is moderate or moderately slow in the surface layer, moderately slow or slow in the upper part of the subsoil, slow or very slow in the lower part of the subsoil, and very slow in the substratum. The hydrologic soil group is D. Slope ranges from 0% to 3%.
ScB P (State No. 33)	**Scitico**	The Scitico series consists of very deep, poorly drained soils formed in silty and clayey sediments. They are nearly level to very gently sloping soils in low-lying positions of glaciolacustrine and marine terraces. Permeability is moderate or moderately slow in the surface layer, moderately slow or slow in the upper part of the subsoil, slow or very slow in the lower part of the subsoil, and very slow in the substratum. The hydrologic soil group is D. Slope ranges from 3% to 8%.
ScC P (State No. 33)	**Scitico**	The Scitico series consists of very deep, poorly drained soils formed in silty and clayey sediments. They are nearly level to very gently sloping soils in low-lying positions of glaciolacustrine and marine terraces. Permeability is moderate or moderately slow in the surface layer, moderately slow or slow in the upper part of the subsoil, slow or very slow in the lower part of the subsoil, and very slow in the substratum. The hydrologic soil group is D. Slope ranges from 8% to 15%.
BeA VP (State No. 134)	**Maybid**	The Maybid series consists of very deep, very poorly drained soils formed in lacustrine or marine sediments. They are nearly level or level soils on lowlands. Slope ranges from 0 to 3 percent. Saturated hydraulic conductivity is moderately high or high in the surface subsoil and substratum. The hydrologic soil group is D. Slope ranges from 0% to 3%.

MAP UNIT #	SOIL TAXANOMIC NAME	DESCRIPTION
WfC (State No. 327)	**Windsor Variant (clay Subsoil)**	The Windsor series consists of very deep, excessively drained soils formed in sandy outwash or eolian deposits, that have a clay subsoil. They are nearly level through very steep soils on glaciofluvial landforms. Saturated hydraulic conductivity is high or very high. The hydrologic soil group is A. Slope ranges from 0% to 3%.
WfD (State No. 327)	**Windsor Variant (clay Subsoil)**	The Windsor series consists of very deep, excessively drained soils formed in sandy outwash or eolian deposits, that have a clay subsoil. They are nearly level through very steep soils on glaciofluvial landforms. Saturated hydraulic conductivity is high or very high. The hydrologic soil group is A. Slope ranges from 3% to 8%.
WfE (State No. 327)	**Windsor Variant (clay Subsoil)**	The Windsor series consists of very deep, excessively drained soils formed in sandy outwash or eolian deposits, that have a clay subsoil. They are nearly level through very steep soils on glaciofluvial landforms. Saturated hydraulic conductivity is high or very high. The hydrologic soil group is A. Slope ranges from 8% to 15%.
EaB (State No. 338)	**Elmwood**	The Elmwood series consists of very deep, moderately well drained soils that formed in a thin mantle of loamy outwash materials over clayey marine or lacustrine deposits on lake and marine plains, and outwash plains and deltas. Permeability is moderately rapid in the loamy mantle and slow or very slow in the clayey substratum. The hydrologic soil group is C. Slope ranges from 3% to 8%.
EaC (State No. 338)	**Elmwood**	The Elmwood series consists of very deep, moderately well drained soils that formed in a thin mantle of loamy outwash materials over clayey marine or lacustrine deposits on lake and marine plains, and outwash plains and deltas. Permeability is moderately rapid in the loamy mantle and slow or very slow in the clayey substratum. The hydrologic soil group is C. Slope ranges from 8% to 15%.
EaD (State No. 338)	**Elmwood**	The Elmwood series consists of very deep, moderately well drained soils that formed in a thin mantle of loamy outwash materials over clayey marine or lacustrine deposits on lake and marine plains, and outwash plains and deltas. Permeability is moderately rapid in the loamy mantle and slow or very slow in the clayey substratum. The hydrologic soil group is C. Slope ranges from 15% to 25%

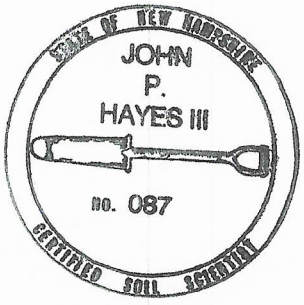
MAP UNIT #	SOIL TAXANOMIC NAME	DESCRIPTION
500B (ccadb)	**Udorthents**	This map unit is characterized typically by soil textures that are sandy loam, loam, or silt loam within the particle size control section (25 – 100cm or 10 – 40"). Saturated hydraulic conductivity (Ksat) is low through high. Drainage class ranges from well drained to somewhat poorly drained. These areas typically represent excavated glacial till or perhaps areas where sand and gravel was excavated down to the loamy underlying material. The hydrologic soil group is B. Slope ranges from 3% to 8%
500C (ccadb)	**Udorthents**	This map unit is characterized typically by soil textures that are sandy loam, loam, or silt loam within the particle size control section (25 – 100cm or 10 – 40"). Saturated hydraulic conductivity (Ksat) is low through high. Drainage class ranges from well drained to somewhat poorly drained. These areas typically represent excavated glacial till or perhaps areas where sand and gravel was excavated down to the loamy underlying material. The hydrologic soil group is B. Slope ranges from 8% to 15%
500D (ccabd) ccadb	**Udorthents**	This map unit is characterized typically by soil textures that are sandy loam, loam, or silt loam within the particle size control section (25 – 100cm or 10 – 40"). Saturated hydraulic conductivity (Ksat) is low through high. Drainage class ranges from well drained to somewhat poorly drained. These areas typically represent excavated glacial till or perhaps areas where sand and gravel was excavated down to the loamy underlying material. The hydrologic soil group is B. Slope ranges from 15% to 25%

Slope Phases

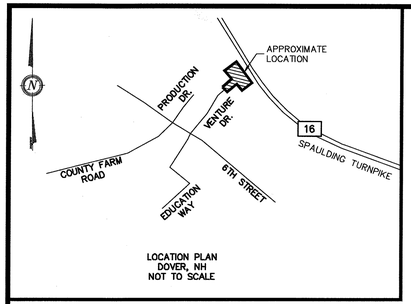
Alpha Slope Symbol	Range
A	**0 – 3%**
B	**3 – 8%**
C	**8 – 15%**
D	**15 – 25%**
E	**25 – 50%**
F	**> 50%**

I trust that this Soil Survey and report meet your current planning needs. Please do not hesitate to contact me if you have any questions.

Sincerely:



John P. Hayes III CSS, CWS



LOCATION PLAN
DOVER, NH
NOT TO SCALE

WETLANDS WERE DELINEATED BY JOHN P. HAYES, IN SPRING OF 2020 UTILIZING THE FOLLOWING STANDARDS:

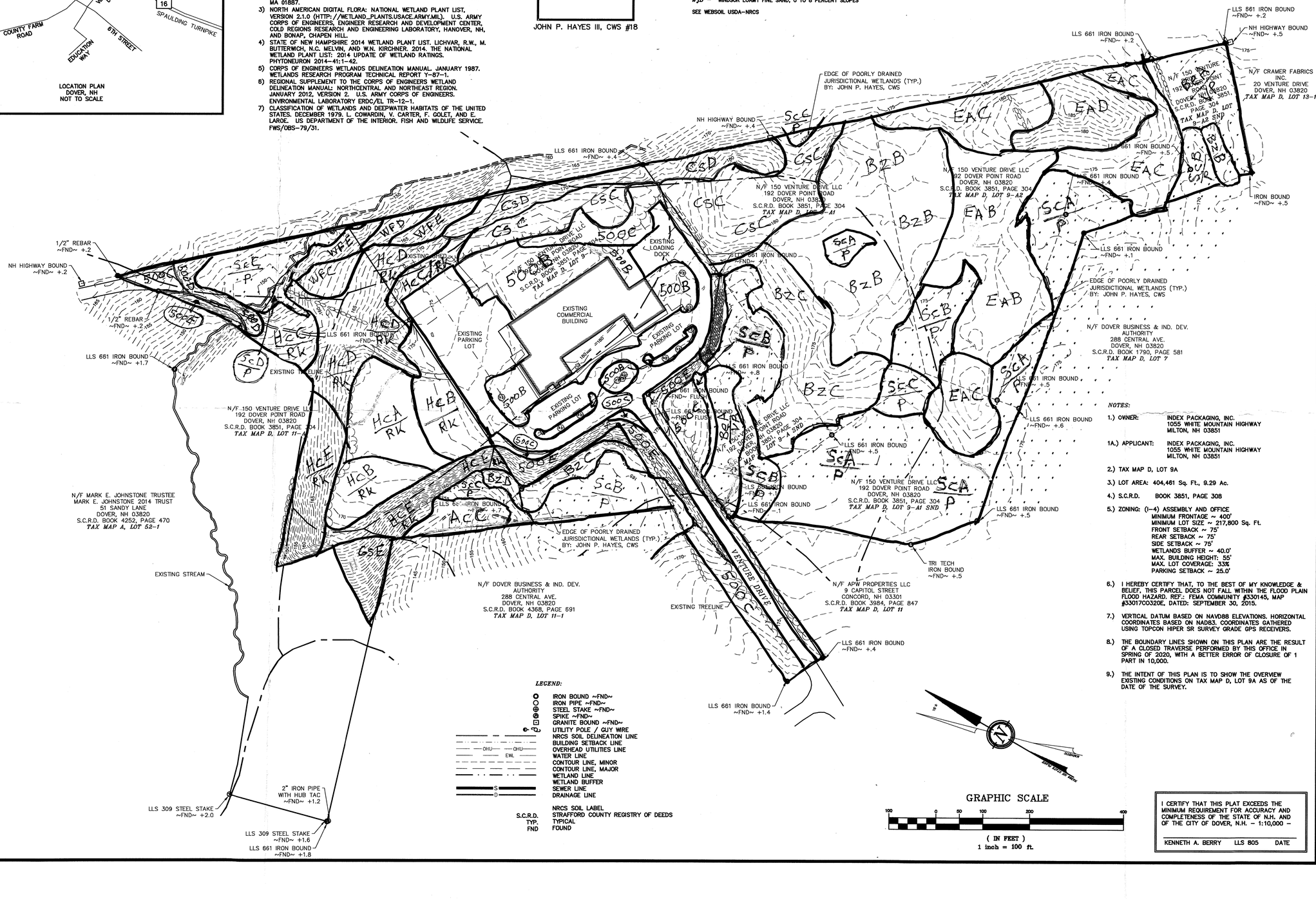
1) FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 7.0. 2010. L.M. VASILAS, G.W. HURT, AND C.V. NOBLE (EDS.). UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS.
2) FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. VERSION 3. APRIL 2004. NEIWPCC WETLANDS WORKGROUP. WILMINGTON, MA 01887.
3) NORTH AMERICAN DIGITAL FLORA: NATIONAL WETLAND PLANT LIST, VERSION 2.1.0 (HTTP://WETLAND_PLANTS.USACE.ARMY.MIL). U.S. ARMY CORPS OF ENGINEERS, ENGINEER RESEARCH AND DEVELOPMENT CENTER, COLD REGIONS RESEARCH AND ENGINEERING LABORATORY, HANOVER, NH, AND BONAP, CHAPEN HILL.
4) STATE OF NEW HAMPSHIRE 2014 WETLAND PLANT LIST. LICHVAR, R.W., M. BUTTERWICH, N.C. MELVIN, AND W.N. KIRCHNER. 2014. THE NATIONAL WETLAND PLANT LIST: 2014 UPDATE OF WETLAND RATINGS. PHYTONEURON 2014–41:1–42.
5) CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL. JANUARY 1987. WETLANDS RESEARCH PROGRAM TECHNICAL REPORT Y–87–1.
6) REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. JANUARY 2012, VERSION 2. U.S. ARMY CORPS OF ENGINEERS. ENVIRONMENTAL LABORATORY ERDC/EL TR–12–1.
7) CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES. DECEMBER 1979. L. COWARDIN, V. CARTER, F. GOLET, AND E. LAROE. US DEPARTMENT OF THE INTERIOR. FISH AND WILDLIFE SERVICE. FWS/OBS–79/31.

JOHN P. HAYES III, CWS #18

SOILS:

BxA – BUXTON SILT LOAM, 0 TO 3 PERCENT SLOPES
EsB – ELMWOOD FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
GlB – GLOUCESTER FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES
GsC – GLOUCESTER STONY FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES
HcB – HOLLIS FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
ScA – SCANTIC SILT LOAM, 0 TO 3 PERCENT SLOPES
SfC – SUFFIELD SILT LOAM, 8 TO 15 PERCENT SLOPES
SwA – SWANTON FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES
WfB – WINDSOR LOAMY FINE SAND, 0 TO 8 PERCENT SLOPES

SEE WEBSOIL USDA–NRCS



LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- STEEL STAKE ~FND~
- SPIKE ~FND~
- GRANITE BOUND ~FND~
- UTILITY POLE / GUY WIRE
- NRCS SOIL DELINEATION LINE
- BUILDING SETBACK LINE
- OVERHEAD UTILITIES LINE
- WATER LINE
- CONTOUR LINE, MINOR
- CONTOUR LINE, MAJOR
- WETLAND LINE
- WETLAND BUFFER
- SEWER LINE
- DRAINAGE LINE
- NRCS SOIL LABEL

S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. TYPICAL
FND FOUND

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

NOTES:

1.) OWNER: INDEX PACKAGING, INC. 1055 WHITE MOUNTAIN HIGHWAY MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC. 1055 WHITE MOUNTAIN HIGHWAY MILTON, NH 03851

2.) TAX MAP D, LOT 9A

3.) LOT AREA: 404,461 Sq. Ft., 9.29 Ac.

4.) S.C.R.D. BOOK 3851, PAGE 308

5.) ZONING: (I–4) ASSEMBLY AND OFFICE
MINIMUM FRONTAGE ~ 400'
MINIMUM LOT SIZE ~ 217,800 Sq. Ft.
FRONT SETBACK ~ 75'
REAR SETBACK ~ 75'
SIDE SETBACK ~ 75'
WETLANDS BUFFER ~ 40.0'
MAX. BUILDING HEIGHT: 55'
MAX. LOT COVERAGE: 33%
PARKING SETBACK ~ 25.0'

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 #33017C0320E, DATED: SEPTEMBER 30, 2015.

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

8.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN SPRING OF 2020, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

9.) THE INTENT OF THIS PLAN IS TO SHOW THE OVERVIEW EXISTING CONDITIONS ON TAX MAP D, LOT 9A AS OF THE DATE OF THE SURVEY.

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

REVISION	DATE	DESCRIPTION

EXISTING CONDITIONS PLAN OVERVIEW
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 100 FT.
DATE :
FILE NO. : DB 2019 – 152

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

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

Inspection and Maintenance Manual

Stormwater System Management

150 Venture Drive

Prepared for

Index Packaging, Inc.
1055 White Mountain Highway
Milton, NH 03851

Land of

Index Packaging, Inc.
1055 White Mountain Highway
Milton, NH 03851

Prepared By

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

File Number
DB2019-152

September 14, 2020

Stormwater System Operation and Maintenance Plan

And

Inspection and Maintenance Manual

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Control of Invasive Species ..... Page 7

Annual Report ..... Page 8

Inspection & Maintenance Manual Checklist ..... Page 9

Inspection & Maintenance Log Sheet ..... Page 12

Deicing Log Sheet ..... Page 13

Owner Certification ..... Page 14

Site Plans Attached – 2 Page

Control of Invasive Plants, NH Department of Agriculture Attached – 4 Pages

NHDES Green SnoPro Utilization Chart

Introduction

The Best Management Practices (BMP) described in this manual are specified in more detail within the plan set giving design details and specifications. The New Hampshire Stormwater Manual, Volume 2, Post-Construction Best Management Practices Selection & Design (December 2008, NHDES & US EPA) is included by reference to this manual. Additional details, construction specifications, and example drawings are provided within this reference. (http://des.nh.gov/organization/divisions/water/stormwater/)

The BMP's are covered below in the general order in which the storm water flows. Each BMP has a description and maintenance consideration listed. A Check List table is proved after the narrative to summarize the maintenance responsibilities and schedule. A Log Form is also provided for the owners use.

For details regarding the design of the Storm Water System see also Drainage Analysis & Sediment and Erosion Control Plan also published by Berry Surveying & Engineering originally dated February 20, 2019, as revised. See also plan set completed for Graystone Builders, Inc. originally dated February 20, 2019, as revised.

Index Packaging, Inc. is responsible for the Stormwater System Operation and Maintenance. A significant step in this responsibility is the Inspection and Maintenance of each component of the system. Ongoing, semi-annual, and annual inspection and maintenance requirement are documented below and must be taken seriously. Failure of any component of the system can result in surface water run-off ponding and/or freezing in the roadway and parking lots, leaving the developed site untreated, and/or causing violations to issued permits. The owner must maintain, and have available, plans of the Stormwater System in order properly inspect and maintain the system. (Reduced copies attached.) Index Packaging, Inc., as the owner / operator, is responsible to ensure that any subsequent owner or subcontractor has copies of the Log Form and Annual Report records and fully understands the responsibilities of this plan. The grantor owner will ensure this document is provided to the grantee owner by duplicating the Ownership Responsibility Sheet which is found toward the back of this document, which will be maintained with the Inspection & Maintenance Logs, provided to the City of Dover, Community Services, DPW, Engineering Department, with the Annual Report.

The owner of Tax Map D, Lots 9A, Index Packaging Inc., is proposing to the construction of a commercial buildings adjacent to the existing building on site and to expand the

parking and maneuvering pavement. There is a rain garden proposed to manage the surface water runoff.

The following drainage features will all require periodic inspections and maintenance based on this manual in addition to deep sump catch basins throughout:

Catch Basins (Existing)

Conveyance Swales with Check Dams

Sediment Forebays

Rain Garden #101 w/ Under-drains, outlet structure, and emergency spillway.

Level Spreader

Catch Basins and Drain Manholes

Design Intent: There are three existing catch basins on the property. There are no deep sump catch basins designed into the site plan revisions.

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. During construction the catch basins will be protected by inlet protection per the approved construction plans. The practice of street sweeping on a bi-annual basis will help reduce maintenance of these deep sumps.

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. 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. Culvert pipes will be inspected to ensure that surface water runoff is capable of leaving the structures.

Conveyance & Treatment Swales

Design Intent: There are no new conveyance or treatment swales within the site plan design changes to the parcel. There are some existing conveyance swales within the current operations.

Description: "Swales are stabilized channels designed to convey runoff at non-erosive velocities." (NHDES SWM) A conveyance swale is intended to move surface water runoff from one point to another where as a treatment swale will slow the velocity to a point where sediment will settle out of the stormwater flow. A treatment swale will be constructed to a width of between four and eight feet and have a minimum length of

100 feet. The flow characteristics will also meet design criteria. A conveyance swale will be designed so that there is the capacity to convey the 10 year 24 hour storm event.

Project Intent: The swales are individually designed in the drainage analysis and specified on the design plans. Temporary check dams will be installed as specified and removed upon completion of the project.

Maintenance Considerations: Grassed swales will be inspected twice annually, removing accumulated sediment and gross solids. Grass will be mowed periodically but to a depth of not less than 4 inches. Any damage to the vegetation will be repaired and woody vegetation and invasive vegetation will be removed.

Sediment Forebay

Design Intent: A Sediment Forebay is designed to pre-treat surface water runoff from the paved surfaces on the northeasterly portion of the property. A second sediment forebay has been designed on the westerly end of the rain garden to pre-treat runoff from that segment of new pavement.

Description: A sediment forebay is designed to reduce the velocity of incoming surface water runoff allowing sediment to fall out of suspension initially pre-treating the runoff before it is sent to a treatment structure. This earthen basin will have vegetated side-slopes and will a check dam to further reduce and pretreat the runoff. At the point of incoming runoff, the basin will be protected by rip rap outlet protection construction and the outgoing edge will be protected with rip rap. The check dam will be constructed from one side of the basin to the other and cause runoff to either go through or over. The volume of the forebay is generally one-tenth the volume of the Water Quality Volume (WQV). Construction specifications are included in the plan set and New Hampshire Stormwater Manual, Volume 2, 4-4 Pretreatment Practices 1, Sediment Forebays.

Maintenance Considerations: The basin and slopes will be periodically mowed, at least twice per year ensuring that woody material does not get an opportunity to grow. Sediment accumulated in the basin will be removed and properly disposed of when it reaches half the height of the check dam. Erosion or other damage to the basin will be repaired and revegetated. (See Outlet Protection below.)

Bioretention System (Rain Gardens)

Design Intent: Surface water runoff from the northeasterly pavement sections, existing and proposed, enters the sediment forebay discussed above, and the surface water runoff from the buildings, existing and proposed, enters the Rain Garden directly from the roof drains. The rain garden is designed to treat the Water Quality Volume from these areas.

Description: Rain Gardens, or bioretention areas are located close to the source of runoff. They are intended to integrate with the site landscaping an become an aesthetically attractive opportunity to provide highly effective stormwater treatment. The rain gardens associated with this proposed development contribute toward recharge of surface water run-off into the ground. It is important that sediment be removed from run-off prior to discharge into the bioretention area to preserve the mulch and soil mix ratio. During construction it is important that the ground surface not be exposed to traffic or construction equipment to preserve the infiltration capabilities of the existing soil. Construction specifications are included in the plan set and New Hampshire Stormwater Manual, Volume 2, 4-3 Treatment Practices, 4c Bioretention System.

Maintenance Considerations:
Rain Gardens should be inspected at least twice annually and following any rainfall event exceeding 2.5 inches in a twenty-four hour period. Maintenance rehabilitation will be conducted as warranted by each inspection. Trash and debris will be removed at each inspection.

On an annual basis the infiltration capabilities need to be confirmed by evaluation the drawdown time. If the bioretention system does not drain within 72-hours following a rainfall event, a qualified professional will assess the condition of the rain garden to determine measures required to restore the infiltration function. This is normally the direct result of sediment accumulation which will be removed to restore the filter media ratio.

Also on an annual basis the vegetation should be inspected to ensure healthy condition. Invasive species need to be removed along with dead or diseased vegetation.

Outlet Protection & Level Spreaders

Description: Outlet Protection consists of a riprap apron or preformed scour hole that is designed to provide velocity reduction of the surface water run-off that is leaving a culvert. The design is dependent on the culvert size, soil conditions, velocity, and quantity of the run-off. There are to be no bend or curves at the intersection of the conduit and apron. Level spreaders are intended to provide a level lip where surface water runoff is allowed to continue downhill closer to sheet flow. The level lip is to be constructed as level as possible for the entire length.

Maintenance Considerations: The riprap outlet protection will be inspected annually for damage, which must be corrected immediately. Any sediment buildup will be removed and disposed of correctly. Sediment and subsequent vegetation will build up in the Level Spreader. This material will be cleaned out along with any gross solids and disposed of properly. (See invasive species below) Any rip rap that has been displaced from the original construction will be repaired, especially recreating the level lip.

CONTROL OF INVASIVE PLANTS

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described on the following pages. They should be controlled as described on the following pages.

Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:

- becoming weedy and overgrown;
- killing established shade trees;
- obstructing pipes and drainage systems;
- forming dense beds in water;
- lowering water levels in lakes, streams, and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.

Annual Report

Description: The owner is responsible to keep an **I & M Activity Log** that documents inspection, maintenance and repairs to the storm water management system, and a **Deicing Log** to track the amount and type of deicing material applied to the site. The original owner is responsible to ensure that any subsequent owner (s) have copies of the Stormwater System Operation and Maintenance Plan & Inspection and Maintenance Manual, copies of past logs and check lists. This includes any owner association for potential condominium conversion of the property. The Annual Report will be prepared and submitted to the City of Dover, Community Services, Engineering Department with copies of both logs and check lists no later than December 15th of each year and made available to NHDES upon request. Upon an ownership change, the Annual Report will include the Transfer of Ownership Responsibility Forms duplicated from the form found below.

The plans that accompanies this manual includes a plan sheet, "Inspection & Maintenance Plan". Index Packaging, Inc. will also maintain a complete set of the approved original design plans.

Respectfully
BERRY SURVEYING & ENGINEERING

James F. Hayden
Design Engineer / Project Manager

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

STORMWATER SYSTEM OPERATION AND MAINTENANCE PLAN

Inspection & Maintenance Manual Checklist

150 Venture Drive – Dover, NH
Index Packaging, Inc.
1055 White Mountain Highway
Milton, NH 03851

☑	Date	BMP / System	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance / Cleanout Threshold
		Pavement Sweeping	Three Times Per Year	N/A	N/A
		Litter/Trash Removal	Routinely	Inspect dumpsters, outdoor waste receptacles area, and yard areas.	Parcel will be free of litter/trash.
		Deicing Agents	N/A	N/A	Use salt as the primary agent for roadway safety during winter.
		Invasive Species	Two times per year.	Inspect for Invasive Species	Remove and dispose invasive species.
		Closed Drainage System:			
		Drainage Pipes	1 time per 2 years	Check for sediment accumulation & clogging.	Less than 2" sediment depth

		Deep Sump Catch Basins	2 times per year	Check for sediment accumulation & clogging.	Sediment accumulated to a depth of 2 feet.
☑	**Date**	**BMP / System**	**Minimum Inspection Frequency**	**Minimum Inspection Requirements**	**Maintenance / Cleanout Threshold**
		Rain Gardens,	2 times per year	Check for sediment and debris accumulation buildup.	Remove sediment & debris when required. Remove Invasive Species
		Rain Garden	Annually	72-Hour drawdown time evaluation and vegetation evaluation. Underdrain flushing.	Remove dead & diseased vegetation along with all debris, take corrective measures of filtration media if required. Flush underdrain clean-outs with a hose.
		Riprap Outlet Protection	Annually	Check for sediment buildup and structure damage.	Remove excess sediment and repair damage.
		Winter Maintenance	Ongoing	Remove snow as directed.	Ongoing
		Post Winter Maintenance	Annually	Remove excess sand, gross solids, and repair vegetation and plantings	Parcel will be free of excess sand, litter/trash.
		Annual Report	1 time per year	Submit Annual Report to Dover Engineering Dept. and kept on file by the owner.	Report to be submitted on or before December 15th each year.

Inspection Check List: Page 3

The following drainage features will all require periodic inspections and maintenance based on this manual in addition to deep sump catch basins throughout:

Catch Basins (Existing)

Conveyance Swales with Check Dams

Sediment Forebays

Rain Garden #101 w/ Under-drains, outlet structure, and emergency spillway.

Level Spreader

Inspection Notes:

STORMWATER SYSTEM OPERATION AND MAINTENANCE PLAN

Inspection & Maintenance Manual Log Form

150 Venture Drive – Dover, NH
Index Packaging, Inc.
1055 White Mountain Highway
Milton, NH 03851

BMP / System	Date Inspected	Inspector	Cleaning/Repair (List Items & Comments)	Repair Date	Performed By:

STORMWATER SYSTEM OPERATION AND MAINTENANCE PLAN

Deicing Log Form

150 Venture Drive – Dover, NH
Index Packaging, Inc.
1055 White Mountain Highway
Milton, NH 03851

Date	Amount Applied	Performed By:	Date	Amount Applied	Performed By:

STORMWATER SYSTEM OPERATION & MAINTENANCE PLAN CERTIFICATION

Owner	Responsibility
Name: Index Packaging, Inc. Michael Wiles, President Address: 1055 White Mountain Highway Milton, NH 03851 Telephone: 603-312-3281 (cell) mwiles@indexpackaging.com	The owner is responsible for the conduct of all construction activities, and ultimate compliance with all the provisions of the Stormwater System Operation & Maintenance Plan and the implementation of the Inspection and Maintenance Manual.

OWNER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: _____ Date: _____

Printed Name:

Representing:

150 Venture Drive – Dover, NH
Index Packaging, Inc.
1055 White Mountain Highway
Milton, NH 03851

Michael Wiles, President
603-350-0013 (office)
603-312-3281 (cell)
mwiles@indexpackaging.com

Control of Invasive Plants

New Hampshire
Department of Agriculture,
Markets & Food
Douglas Cygan
603-271-3488
doug.cygan@agr.nh.gov

This guide lists garden plants and weeds which are already causing significant changes to natural areas in the Mid-Atlantic. **Measures for controlling each species are indicated by number, e.g., (3), in the text with a full explanation at the end of this article.** Click on the word Control: to jump to that section. Then click your "back" button to return to the text. Following each section suggested alternative plants are given. These alternatives are native plants, well adapted and needing little care, attractive to birds and butterflies, and an important part of the food web for our indigenous species.

INVASIVE TREES

NORWAY MAPLE (*Acer platanoides*) has large leaves similar to sugar maple. To easily confirm that the plant is Norway maple, break off a leaf and if it's truly Norway maple it will exude milky white sap. Fall foliage is yellow. (Exception: cultivars such as 'Crimson King,' which have red leaves in spring or summer, may have red autumn leaves.) The leaves turn color late, usually in late October after native trees have dropped their foliage. This tree suppresses growth of grass, garden plants, and forest understory beneath it, at least as far as the drip-line. Its wind-borne seeds can germinate and grow in deep shade. The presence of young Norway maples in our woodlands is increasing.

Control: (1); (7), (8), (9), or (10); (11) in mid-October to early November, before the leaves turn color.

TREE OF HEAVEN (*Ailanthus altissima*), is incredibly tough and can grow in the poorest conditions. It produces huge quantities of wind-borne seeds, grows rapidly, and secretes a toxin that kills other plants. Its long compound leaves, with 11-25 lance-shaped leaflets, smell like peanut butter or burnt coffee when crushed. Once established, this tree cannot be removed by mechanical means alone.

Control: (1) - seedlings only. Herbicide - use Garlon 3a (9) with no more than a 1" gap between cuts, or (10); plus (11) on re-growth. Or paint bottom 12" of bark with Garlon 4 Ultra (in February or March to protect surrounding plants). USE MAXIMUM STRENGTH SPECIFIED ON LABEL for all herbicide applications on Ailanthus. Glyphosate is not effective against Ailanthus.

INVASIVE SHRUBS

AUTUMN OLIVE (*Eleagnus umbellata*): Formerly recommended for erosion control and wildlife value, these have proved highly invasive and diminish the overall quality of wildlife habitat.

Control: (1) - up to 4" diameter trunks; (7) or (10) or bury stump. Do not mow.

MULTIFLORA ROSE (*Rosa multiflora*), formerly recommended for erosion control, hedges, and wildlife habitat, becomes a huge shrub that chokes out all other vegetation and is too dense for many species of birds to nest in, though a few favor it. In shade, it grows up trees like a vine. It is covered with white flowers in June. (Our native roses have fewer flowers, mostly pink.) Distinguish multiflora by its size, and by the presence of very hard, curved thorns, and a fringed edge to the leaf stalk.

Control: (1) - pull seedlings, dig out larger plants at least 6" from the crown and 6" down; (4) on extensive infestations; (10) or (11). It may remain green in winter, so herbicide may *applied when other plants are dormant. For foliar application, mix Rodeo with extra sticker-spreader, or use Roundup Sure Shot Foam on small plants.*

BUSH HONEYSUCKLES (*Lonicera spp.*), including Belle, Amur, Morrow's, and Tatarian honeysuckle. (In our region, assume that any honeysuckle is exotic unless it is a scarlet-flowered vine). Bush honeysuckles create denser shade than native shrubs, reducing plant diversity and eliminating nest sites for many forest interior species.
Control: (2) on ornamentals; (1); on shady sites only, brush cut in early spring and again in early fall (3); (4) during the growing season; (7); or (10) late in the growing season.

BLUNT-LEAVED PRIVET (*Ligustrum* obtusifolium). *Control:* (1); (7) or (10); or trim off all flowers. Do not cut back or mow.

BURNING BUSH, WINGED EUONYMUS (*Euonymus alatus*), identified by wide, corky wings on the branches.
Control: (1); (7) or (10); or trim off all flowers.

JAPANESE BARBERRY (*Berberis thunbergii*), and all cultivars and varieties.
Control: (1); (7) or (10); or trim off all flowers.

INVASIVE WOODY VINES

All of these vines shade out the shrubs and young trees of the forest understory, eventually killing them, and changing the open structure of the forest into a dense tangle. DO NOT PLANT NEXT TO OPEN SPACE.

JAPANESE HONEYSUCKLE (*Lonicera japonica*), including Hall's honeysuckle, has gold-and-white flowers with a heavenly scent and sweet nectar in June. This is probably the familiar honeysuckle of your childhood. It is a rampant grower that spirals around trees, often strangling them.
Control: (1); (3); (10); (11) in fall or early spring when native vegetation is dormant. Plan to re-treat repeatedly.

ORIENTAL BITTERSWEET (*Celastrus orbiculatus*) has almost completely displaced American bittersweet (*C. scandens*). The Asian plant has its flowers and bright orange seed capsules in clusters all along the stem, while the native species bears them only at the branch tips.
Control: (1); keep ornamental plants cut back, remove all fruits as soon as they open, and bag or burn fruits; to eradicate use Garlon 3a (10).

JAPANESE KNOTWEED, MEXICAN BAMBOO (*Polygonum cuspidatum*) can grow in shade. The stems have knotty joints, reminiscent of bamboo. It grows 6-10' tall and has large pointed oval or triangular leaves.
Control: Cut at least 3 times each growing season and/or treat with Rodeo (10) or (11). In gardens, heavy mulch or dense shade may kill it.

INVASIVE HERBACEOUS PLANTS

GARLIC MUSTARD (*Alliaria petiolata*, *A. officinalis*), a white-flowered biennial with rough, scalloped leaves (kidney-, heart- or arrow-shaped), recognizable by the smell of garlic and taste of mustard when its leaves are crushed. (The odor fades by fall.)
Control: Pull before it flowers in spring (1), removing crown and roots. Tamp down soil afterwards. Once it has flowered, cut (2), being careful not to scatter seed, then bag and burn or send to the landfill. (11) may be appropriate in some settings.

JAPANESE STILT GRASS (*Microstegium vimineum*) can be identified by its lime-green color and a line of silvery hairs down the middle of the 2-3" long blade. It tolerates sun or dense shade and quickly invades areas left bare or disturbed by tilling or flooding. An annual grass, it builds up a large seed bank in the soil.

Control: Easily pulled in early to mid-summer (1) - be sure to pull before it goes to seed. If seeds have formed, bag and burn or send to landfill. Mowing weekly or when it has just begun to flower may prevent it from setting seed (3). Use glyphosate (11) or herbicidal soap (less effective) on large infestations. Follow up with (5) in spring.

MILE-A-MINUTE VINE, DEVIL'S TAIL TEARTHUMB (*Polygonum perfoliatum*), a rapidly growing annual vine with triangular leaves, barbed stems, and turquoise berries in August which are spread by birds. It quickly covers and shades out herbaceous plants.
Control: same as for stilt grass.

SPOTTED KNAPWEED (*Centaurea maculosa*), a biennial with thistle-like flowers.
Control: Do NOT pull (1) unless the plant is young and the ground is very soft - the tap root will break off and produce several new plants. Wear sturdy gloves. (2); (6); (10) or (11).

CONTROL MEASURES

(1) PULL seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs.
(2) DEADHEAD to prevent spread of seeds of invasive plants. Cut off seeds or fruits before they ripen. Bag, and burn or send to a landfill.
(3) MOW or CUTTING at least 4 times a season to deplete plants' store of nutrients and carbohydrates, reduce seed formation, and kill or minimize spread of plants. If necessary, repeat each year.
(4) CONTROLLED BURNING during the spring, repeated over several years, allows native vegetation to compete more effectively with the invasive species. This requires a permit. Spot treatment with glyphosate in late fall can be used to make this method more effective.
(5) Use a CORN-BASED PRE-EMERGENCE HERBICIDE on annual weeds. This product is also an organic fertilizer, i.e., it can stimulate growth of existing plants, including weeds, so it is appropriate for lawns and gardens but may not be appropriate in woodlands.
(6) In lawns, SPOT TREAT with BROAD-LEAF WEEDKILLER. Good lawn-care practices (test soil; use lime and fertilizer only when soil test shows a need; mow high and frequently; leave clippings on lawn) reduce weed infestations.
(7) CUT DOWN the tree. Grind out the stump, or clip off re-growth.
(8) GIRDLE tree: cut through the bark and growing layer (cambium) all around the trunk, about 6" above the ground. Girdling is most effective in spring when the sap is rising, and from middle to late summer when the tree is sending down food to the roots. Clip off sucker sprouts.
(9) FRILL: Using a machete, hatchet or similar device, hack scars (several holes in larger trees) downward into the cambium layer, and squirt in glyphosate (or triclopyr if recommended in text above). Follow label directions for Injection and Frill Applications. This is most effective from middle to late summer. Clip off any sucker sprouts or treat with glyphosate.
(10) CUT STEM / CUT STUMP WITH GLYPHOSATE (or triclopyr if specified above). Follow label directions for Cut Stump Application. Clip off sucker sprouts or paint with glyphosate. See Note on Herbicides.
(11) FOLIAR SPRAY WITH GLYPHOSATE herbicide (see Note on Herbicides). Use a backpack or garden sprayer or mist blower, following label directions. Avoid overspray and/or dripping onto non-target plants, because glyphosate kills most plants except moss. If it rolls off waxy or grass-like foliage, use additional sticker-spreader. Deciduous trees, shrubs, and perennials move nutrients down to the roots in late summer. Glyphosate is particularly effective at this time and when plants have just gone out of flowering. Several invasive species retain their foliage after native plants have lost theirs, and resume growth earlier in spring than most natives. This allows you to treat them without harming the natives. However, the plant must be actively growing for the herbicide to work. Retreatments may be necessary the following year if suckering occurs or the plant hasn't been entirely killed.

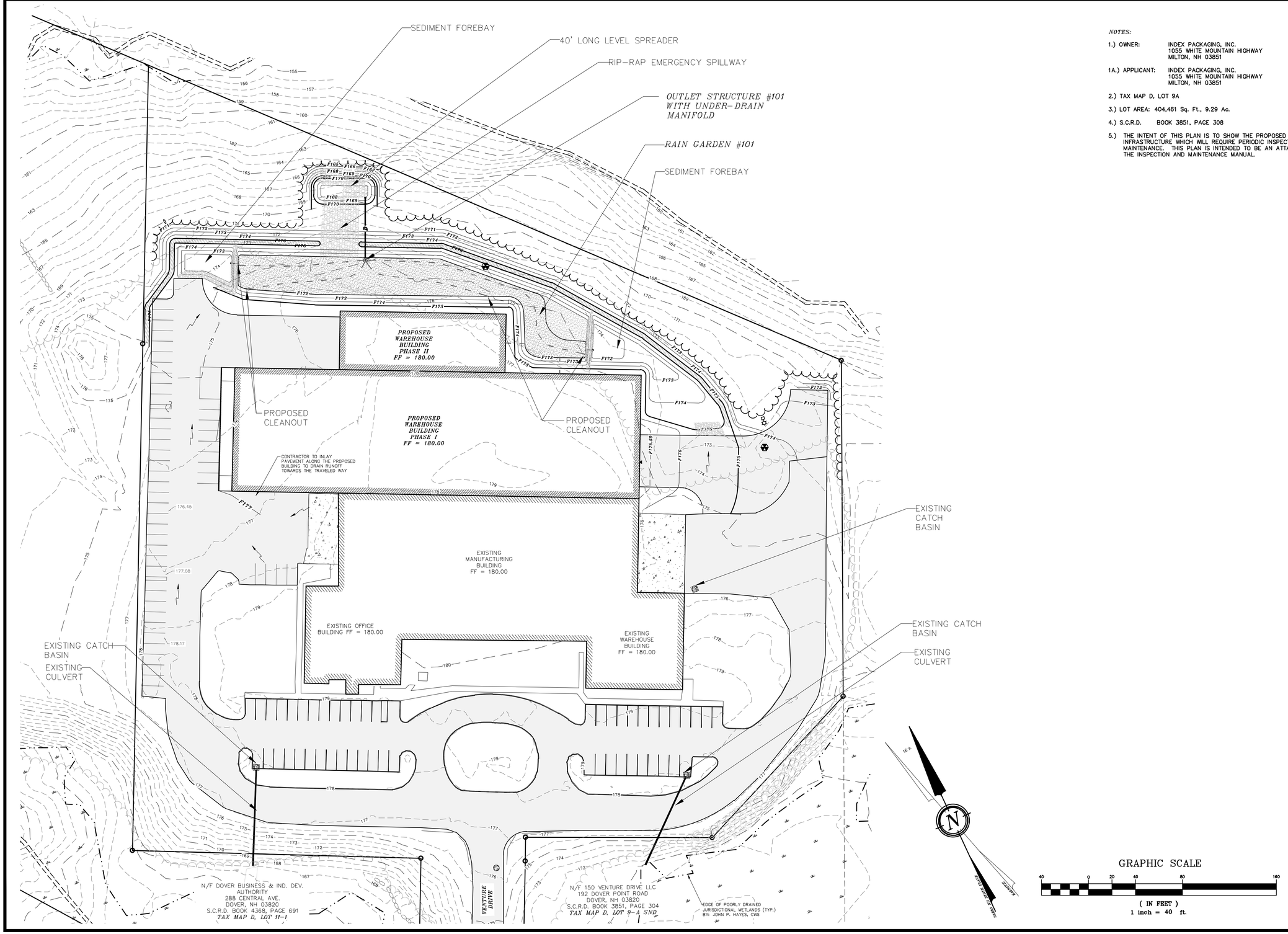
NOTE ON HERBICIDES: It is highly recommended that small populations try to be controlled using non-chemical methods wherever feasible. However, for large infestations, and for a few plants specified above, herbicide use is essential. Apply herbicides carefully to avoid non-target plants, glyphosate is the least environmentally damaging herbicide in most cases. Add food coloring for visibility, and a soap-based sticker such as Cide-Kick. Glyphosate is ineffective on some

plants; for these, triclopyr (Garlon) may be indicated. When using herbicides, read the entire label and observe all precautions listed, including proper disposal. If in doubt, call your local Cooperative Extension Service.

Pavement Temp. (°F) and Trend (↑ ↓)	Weather Condition	Maintenance Actions	Application Rate (lbs/per 1000 sq.ft.)			
			Salt Prewetted/Pretreated with salt brine	Salt Prewetted/Pretreated with other blends	Dry salt	Winter sand
>30 ↑	Snow	Plow, treat intersections only				Not recommended
	Frz. Rain	Apply chemical				Not recommended
30 ↓	Snow	Plow and apply chemical				Not recommended
	Frz. Rain	Apply chemical				Not recommended
25 - 30 ↑	Snow	Plow and apply chemical				Not recommended
	Frz. Rain	Apply chemical				Not recommended
25 - 30 ↓	Snow	Plow and apply chemical				Not recommended
	Frz. Rain	Apply chemical				3.25
20 - 25 ↑	Snow or frz. Rain	Plow and Apply chemical				3.25 for frz. Rain
20 - 25 ↓	Snow	Plow and apply chemical				Not recommended
	Frz. Rain	Apply chemical				3.25
15 - 20 ↑	Snow	Plow and apply chemical				Not recommended
	Frz. Rain	Apply chemical				3.25
15 - 20 ↓	Snow or Frz. Rain	Plow and apply chemical				3.25 for frz. Rain
0 to 15 ↑↓	Snow	Plow, treat with blends, sand hazardous areas	Not recommended		Not recommended	5.0 and spot-treat as needed
< 0	Snow	Plow, treat with blends, sand hazardous areas	Not recommended		Not recommended	5.0 and spot-treat as needed

Table 19. Application Rates for Deicing

These rates & table format are based on road application guidelines (Mn Snow & Ice Control Field Handbook, Manual 2005-1). Develop your own application rates by adjusting your current rates incrementally downward toward these guidelines. Where temperature categories overlap, select the rate most applicable to your situation.



NOTES:

1.) OWNER: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

1A.) APPLICANT: INDEX PACKAGING, INC.
1055 WHITE MOUNTAIN HIGHWAY
MILTON, NH 03851

2.) TAX MAP D, LOT 9A

3.) LOT AREA: 404,461 Sq. Ft., 9.29 Ac.

4.) S.C.R.D. BOOK 3851, PAGE 308

5.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED DRAINAGE INFRASTRUCTURE WHICH WILL REQUIRE PERIODIC INSPECTION AND MAINTENANCE. THIS PLAN IS INTENDED TO BE AN ATTACHMENT TO THE INSPECTION AND MAINTENANCE MANUAL.

DOVER PLANNING FILE #

REVISION	DATE	DESCRIPTION

INSPECTION AND MAINTENANCE PLAN
LAND OF
INDEX PACKAGING INC.
150 VENTURE DRIVE
DOVER, N.H.
TAX MAP D, LOT 9A

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

SCALE : 1 IN. EQUALS 40 FT.
DATE : SEPTEMBER 14, 2020
FILE NO. : DB 2019 - 152

Welcome to New Hampshire's Watershed Report Cards built from the 2018, 305(b)/303(d)

Each Watershed Report Card covers a single 12 digit Hydrologic Unit Code (HUC12), on average a 34 square mile area. Each Watershed Report Card has three components;

1. REPORT CARD - A one page card that summarizes the overall use support for Aquatic Life Integrity, Primary Contact (i.e. Swimming), and Secondary Contact (i.e. Boating) Designated Uses on every Assessment Unit ID (AUID) within the HUC12.
2. HUC 12 MAP - A map of the watershed with abbreviated labels for each AUID within the HUC12.
3. ASSESSMENT DETAILS - Anywhere from one to forty pages with the detailed assessment information for each and every AUID in the Report Card and Map.

How are the Surface Water Quality Assessment determinations made?

All readily available data with reliable Quality Assurance/Quality Control is used in the biennial surface water quality assessments. For a full understanding of how the Surface Water Quality Standards (Env-Wq 1700) are translated into surface water quality assessments we urge the reader to review the 2018 Consolidated Assessment and Listing Methodology (CALM) at https://www.des.nh.gov/organization/divisions/water/wmb/swqa/2018/documents/r-wd-19-04.pdf.

Where can I find more advanced mapping resources?

GIS files are available by assessment cycle at ftp://pubftp.nh.gov/DES/wmb/WaterQuality/SWQA/2018/GIS

I'd like to see the more raw water quality data?

The web mapping tool allows you to download the data used in the assessment of the primary contact and aquatic life designated uses by clicking on the "Data Access Waterbody Data (Aquatic Life and Swimming Uses)" link for any assessment unit. (https://www.des.nh.gov/organization/divisions/water/wmb/swqa/assessment-viewers.htm)

How are assessments coded in the report card?

Assessment outcomes are displayed on a color scale as well as an alpha numeric scale that provides additional distinctions for the designated use and parameter level assessments as outlined in the table below.

		Severe Not Supporting, Severe	**Poor** Not Supporting, Marginal	**Likely Bad** Insufficient Information – Potentially Not Supporting	**No Data** No Data	**Likely Good** Insufficient Information – Potentially Full Supporting	**Marginal** Full Support, Marginal	**Good** Full Support, Good
CATEGORY	**Description**							
Category 2	Meets standards						2-M or 2-OBS	2-G
Category 3	Insufficient Information			3-PNS	3-ND	3-PAS		
Category 4	Does not Meet Standards;							
4A	TMDL* Completed	4A-P	4A-M or 4A-T					
4B	Other enforceable measure will correct the issue.	4B-P	4B-M or 4B-T					
4C	Non-pollutant (i.e. exotic weeds)	4C-P	4C-M					
Category 5	TMDL^ Needed	5-P	5-M or 5-T					

* TMDL stands for Total Maximum Daily Load studies (http://des.nh.gov/organization/divisions/water/wmb/tmdl/index.htm)

WATERSHED 305(b) ASSESSMENT SUMMARY REPORT:

HUC 12 010600030608

HUC 12 NAME LOWER COCHECO RIVER

(Locator map on next page only applies to this HUC12)

Assessment Cycle 2018

Good		Full Support Good
Marginal		Full Support Marginal
Likely Good		Insufficient Information – Potentially Full Support
No Data		No Data
Likely Bad		Insufficient Information – Potentially Not Support
Poor		Not Support Marginal
Severe		Not Support Severe



ASSESSMENT UNIT ID	MAP LABEL	ASSESSMENT UNIT NAME	AQUATIC LIFE	SWIMMING	BOATING	FISH CONSUMP.
NHEST600030608-01	E*01	COCHECO RIVER	5-P	5-P	4A-M	5-M
NHIMP600030607-02	I*0607-02	COCHECO RIVER - GONIC DAM POND	5-M	4A-P	2-G	4A-M
NHIMP600030607-03	I*0607-03	COCHECO RIVER - MILL POND DAM	3-PAS	3-ND	3-ND	4A-M
NHIMP600030608-02	I*02	COCHECO RIVER - WATSON WALDRON DAM	5-M	2-G	2-G	4A-M
NHIMP600030608-04	I*04	COCHECO RIVER - CENTRAL AVE DAM	5-M	2-G	2-G	4A-M
NHIMP600030608-05	I*05	CONSERVATION POND DAM	3-ND	3-ND	3-ND	4A-M
NHIMP600030608-06	I*06	FRESH CREEK - FARM POND	3-ND	3-ND	3-ND	4A-M
NHLAK600030608-01	L*01	FRESH CREEK POND	5-M	4A-P	2-G	4A-M
NHLAK600030608-02	L*02	UNNAMED POND	3-ND	3-PAS	3-PAS	4A-M
NHRIV600030607-12	R*0607-12	UNNAMED TRIBUTARY - TO COCHECO RIVER	3-ND	3-ND	3-ND	4A-M
NHRIV600030607-13	R*0607-13	UNNAMED BROOK - TO COCHECO RIVER	3-ND	3-ND	3-ND	4A-M
NHRIV600030607-14	R*0607-14	COCHECO RIVER	3-ND	3-ND	3-ND	4A-M
NHRIV600030607-15	R*0607-15	COCHECO RIVER	5-M	2-G	2-G	4A-M
NHRIV600030608-02	R*02	BLACKWATER BROOK-CLARK BROOK	3-ND	4A-P	3-ND	4A-M
NHRIV600030608-03	R*03	COCHECO RIVER - UNNAMED BROOK	5-M	4A-M	2-G	4A-M
NHRIV600030608-04	R*04	REYNERS BROOK	3-ND	4A-P	3-ND	4A-M
NHRIV600030608-05	R*05	COCHECO RIVER	5-M	4A-M	2-G	4A-M
NHRIV600030608-06	R*06	INDIAN BROOK	5-P	4A-P	3-ND	4A-M
NHRIV600030608-07	R*07	EMERSON BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-08	R*08	FRESH CREEK - TWOMBLY BROOK	5-P	4A-M	3-ND	4A-M
NHRIV600030608-09	R*09	UNNAMED BROOK - ROLLINS BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-10	R*10	ROLLINS BROOK	5-P	4A-P	3-ND	4A-M
NHRIV600030608-11	R*11	FRESH CREEK	3-PNS	4A-P	4A-M	4A-M
NHRIV600030608-12	R*12	UNNAMED TRIBUTARY - TO COCHECO RIVER (DOVER (DOWNSTREAM OF PORTLAND AVE))	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-13	R*13	UNNAMED TRIBUTARY - TO COCHECO RIVER - (DOVER (UPSTREAM OF ATLANTIC AVE))	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-14	R*14	UNNAMED TRIB. TO COCHECO RIVER, DOVER (FROM LANDFILL)	5-M	3-ND	3-ND	4A-M
NHRIV600030608-15	R*15	BERRY BROOK	5-M	4A-P	2-G	4A-M

WATERSHED 305(b) ASSESSMENT SUMMARY REPORT:

HUC 12 010600030608

HUC 12 NAME LOWER COCHECO RIVER

(Locator map on next page only applies to this HUC12)

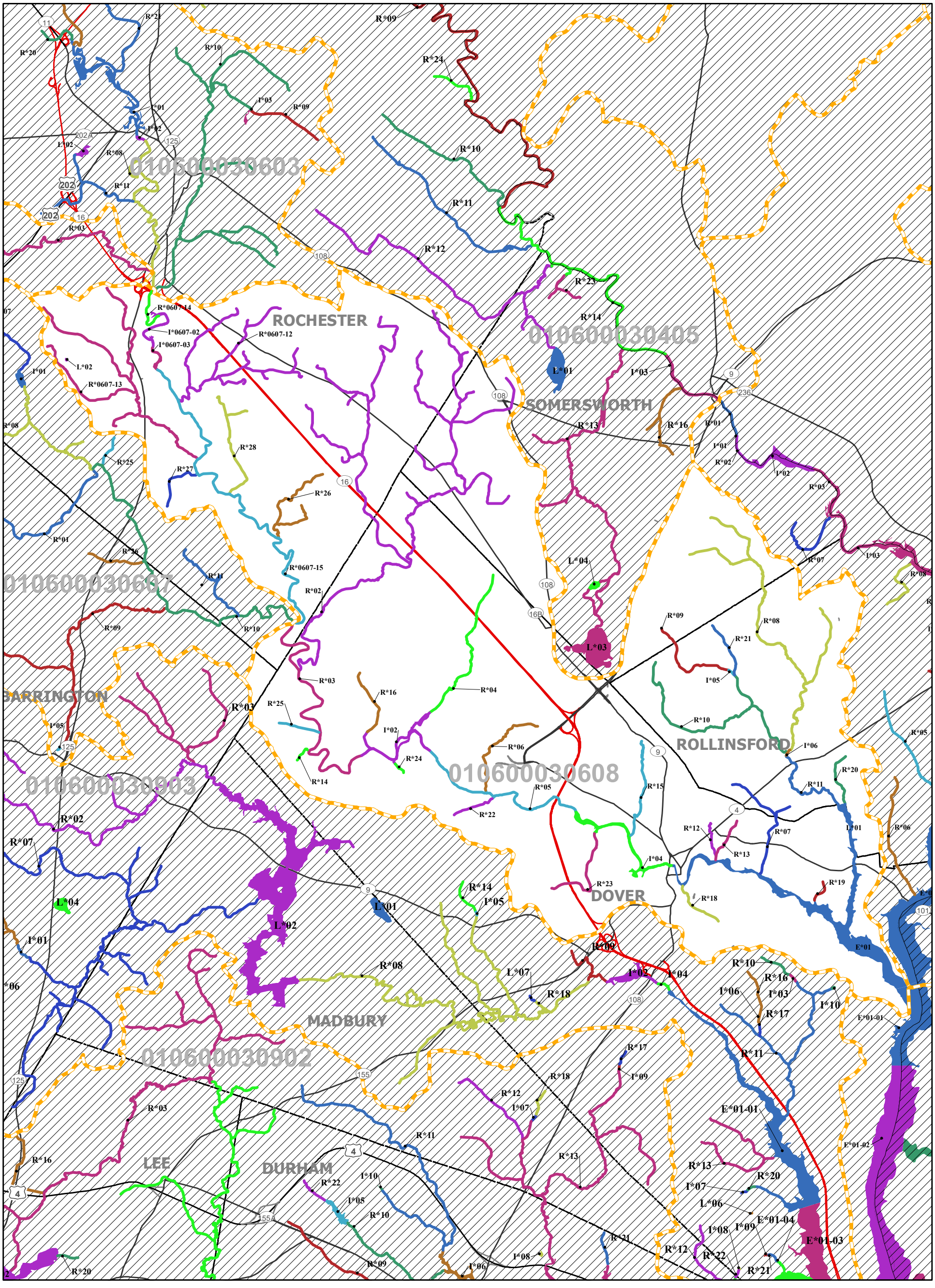
Assessment Cycle 2018

Good		Full Support Good
Marginal		Full Support Marginal
Likely Good		Insufficient Information – Potentially Full Support
No Data		No Data
Likely Bad		Insufficient Information – Potentially Not Support
Poor		Not Support Marginal
Severe		Not Support Severe



ASSESSMENT UNIT ID	MAP LABEL	ASSESSMENT UNIT NAME	AQUATIC LIFE	SWIMMING	BOATING	FISH CONSUMP.
NHRIV600030608-16	R*16	JACKSON BROOK	3-ND	4A-P	3-ND	4A-M
NHRIV600030608-18	R*18	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-19	R*19	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-20	R*20	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-21	R*21	UNNAMED BROOK - TO ROLLINS BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-22	R*22	HORN BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-23	R*23	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-24	R*24	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-25	R*25	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-26	R*26	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-27	R*27	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030608-28	R*28	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M

AUIDs For HUC12: 010600030608 - Lower Cocheco River



HUC12 Boundaries
Town Boundaries
Major Roads
Interstate Highway
US Highway
State Highway

Assessment Unit Coloring
AUs Ending with:
0 =
1 =
2 =
3 =
4 =
5 =
6 =
7 =
8 =
9 =

N
W E
S

Abbrv. Label	HUC 12
L* 03	010 700060201

AUID = NH L AK 700060201 - 03

Assessment Unit IDs are derived from the HUC12 they reside within. The labels have been shortened on this map for presentation purposes.
Example: the Label "L*03" in HUC12 = 010700060201 represents AUID = "NHLAK700060201-03"
In rare cases where an AUID extends beyond the boundary of a single HUC12, additional portions of the end of the HUC 12 number have also been replaced.

0 0.6 1.2 1.8 2.4 Miles

Scale:1:59,820

S:\WD-Watershed\WQ_Planning\305b_303d\2018\AUIDs\HUC12Maps

Assessment Unit ID NHRIV600030608-04

Assessment Unit Name REYNERS BROOK

Primary Town DOVER

Size 1.7700 MILES

Beach N

Assessment Unit Category*~ 4A-P

2018, 305(b)/303(d) - All Reviewed Parameters by Assessment Unit

Designated Use Description	*Desig. Use Category	Parameter Name	Parameter Threatened (Y/N)	Last Sample	Last Exceed	Parameter Category*	TMDL Priority
Aquatic Life Integrity	3-ND	Benthic-Macroinvertebrate Bioassessments (Streams)	N			3-ND	
		CHLORIDE	N	2008	N/A	3-ND	
		Dissolved oxygen saturation	N			3-ND	
		Fishes Bioassessments (Streams)	N			3-ND	
		Oxygen, Dissolved	N			3-ND	
		pH	N			3-ND	
Fish Consumption	4A-M	Mercury	N			4A-M	
Potential Drinking Water Supply	2-G	ESCHERICHIA COLI	N	2007	2007	3-ND	
Primary Contact Recreation	4A-P	Escherichia coli	N	2007	2007	4A-P	
Secondary Contact Recreation	3-ND	ESCHERICHIA COLI	N	2007	N/A	3-ND	
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"}**
NHRIV600030607-04	AYERS POND BROOK	pH		PH/ACIDITY/CAUSTIC CONDITIONS			Non-ORW
NHRIV600030607-09	GREEN HILL BROOK	pH		PH/ACIDITY/CAUSTIC CONDITIONS			Non-ORW
NHRIV600030607-10	ISINGLASS RIVER	Dissolved oxygen saturation		ORGANIC ENRICHMENT/OXYGEN DEPLETION			Non-ORW
NHRIV600030607-10	ISINGLASS RIVER	Escherichia coli		PATHOGENS	29-Aug-11	58 NH BACTERIA IMPAIRED WATERS	Non-ORW
NHRIV600030607-10	ISINGLASS RIVER	pH		PH/ACIDITY/CAUSTIC CONDITIONS			Non-ORW
NHRIV600030607-16	SCRUTON POND OUTLET BROOK	Dissolved oxygen saturation		ORGANIC ENRICHMENT/OXYGEN DEPLETION			Non-ORW
NHRIV600030607-16	SCRUTON POND OUTLET BROOK	Oxygen, Dissolved		ORGANIC ENRICHMENT/OXYGEN DEPLETION			Non-ORW
NHRIV600030607-16	SCRUTON POND OUTLET BROOK	pH		PH/ACIDITY/CAUSTIC CONDITIONS			Non-ORW
NHRIV600030608-02	BLACKWATER BROOK-CLARK BROOK	Escherichia coli		PATHOGENS	21-Sep-10	NEW HAMPSHIRE STATEWIDE BACTERIA	Non-ORW
NHRIV600030608-03	COCHECO RIVER - UNNAMED BROOK	Dissolved oxygen saturation		ORGANIC ENRICHMENT/OXYGEN DEPLETION			Non-ORW
NHRIV600030608-03	COCHECO RIVER - UNNAMED BROOK	Escherichia coli		PATHOGENS	21-Sep-10	NEW HAMPSHIRE STATEWIDE BACTERIA	Non-ORW
NHRIV600030608-03	COCHECO RIVER - UNNAMED BROOK	pH		PH/ACIDITY/CAUSTIC CONDITIONS			Non-ORW
NHRIV600030608-04	REYNERS BROOK	Escherichia coli		PATHOGENS	21-Sep-10	NEW HAMPSHIRE STATEWIDE BACTERIA	Non-ORW
NHRIV600030608-05	COCHECO RIVER	Escherichia coli		PATHOGENS	21-Sep-10	NEW HAMPSHIRE STATEWIDE BACTERIA	Non-ORW
NHRIV600030608-05	COCHECO RIVER	pH		PH/ACIDITY/CAUSTIC CONDITIONS			Non-ORW
NHRIV600030608-06	INDIAN BROOK	Chloride		SALINITY/TOTAL DISSOLVED SOLIDS/CHLORIDES/SULFATES			Non-ORW

Cycle	Assessment Unit ID (AUID)	Assessment Unit Name	Town(s) Primary Town is Listed First	Water Size	Size Unit	Designated Use Description	Parameter Name	NHDES Category	Threatened	TMDL Priority
2018	NHRIV600030607-01	ISINGLASS RIVER	BARRINGTON, ROCHESTER	7.336	MILES	Aquatic Life Integrity	pH	5-P	N	LOW
2018	NHRIV600030607-03	AYERS POND BROOK	BARRINGTON	0.128	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-M	N	LOW
2018	NHRIV600030607-03	AYERS POND BROOK	BARRINGTON	0.128	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030607-04	AYERS POND BROOK	BARRINGTON	1.691	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-M	N	LOW
2018	NHRIV600030607-04	AYERS POND BROOK	BARRINGTON	1.691	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030607-08	HANSON BROOK	ROCHESTER, BARRINGTON	2.411	MILES	Aquatic Life Integrity	pH	5-M		LOW
2018	NHRIV600030607-09	GREEN HILL BROOK	BARRINGTON	3.224	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030607-10	ISINGLASS RIVER	ROCHESTER, BARRINGTON	3.796	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030607-15	COCHECO RIVER	ROCHESTER	4.414	MILES	Aquatic Life Integrity	Iron	5-M	N	LOW
2018	NHRIV600030607-15	COCHECO RIVER	ROCHESTER	4.414	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030607-16	SCRUTON POND OUTLET BROOK	BARRINGTON	0.071	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P	N	LOW
2018	NHRIV600030607-16	SCRUTON POND OUTLET BROOK	BARRINGTON	0.071	MILES	Aquatic Life Integrity	pH	5-P	N	LOW
2018	NHRIV600030608-03	COCHECO RIVER - UNNAMED BROOK	DOVER, ROCHESTER	3.267	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030608-05	COCHECO RIVER	DOVER	2.060	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030608-06	INDIAN BROOK	DOVER	1.106	MILES	Aquatic Life Integrity	Chloride	5-P	N	LOW
2018	NHRIV600030608-08	FRESH CREEK - TWOMBLY BROOK	ROLLINSFORD, SOMERSWORTH	4.983	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P	N	LOW
2018	NHRIV600030608-08	FRESH CREEK - TWOMBLY BROOK	ROLLINSFORD, SOMERSWORTH	4.983	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030608-10	ROLLINS BROOK	ROLLINSFORD	2.856	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P	N	LOW
2018	NHRIV600030608-10	ROLLINS BROOK	ROLLINSFORD	2.856	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030608-14	UNNAMED TRIB. TO COCHECO RIVER,	DOVER	0.169	MILES	Aquatic Life Integrity	Iron	5-M	N	LOW
2018	NHRIV600030608-15	BERRY BROOK	DOVER	1.106	MILES	Aquatic Life Integrity	Benthic-Macroinvertebrate Bioassessments	5-M	N	LOW
2018	NHRIV600030608-15	BERRY BROOK	DOVER	1.106	MILES	Aquatic Life Integrity	Chloride	5-M	N	LOW
2018	NHRIV600030701-01	LAMPREY RIVER - AND HEADWATER	NORTHWOOD, DEERFIELD	13.652	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P	N	LOW
2018	NHRIV600030701-01	LAMPREY RIVER - AND HEADWATER	NORTHWOOD, DEERFIELD	13.652	MILES	Aquatic Life Integrity	pH	5-P	N	LOW
2018	NHRIV600030701-08	HARTFORD BROOK	DEERFIELD	10.734	MILES	Aquatic Life Integrity	Aluminum	5-M	N	LOW
2018	NHRIV600030701-08	HARTFORD BROOK	DEERFIELD	10.734	MILES	Aquatic Life Integrity	Benthic-Macroinvertebrate Bioassessments	5-P	N	LOW
2018	NHRIV600030701-08	HARTFORD BROOK	DEERFIELD	10.734	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030701-09	LAMPREY RIVER	DEERFIELD	7.767	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P	N	LOW
2018	NHRIV600030701-09	LAMPREY RIVER	DEERFIELD	7.767	MILES	Aquatic Life Integrity	pH	5-P	N	LOW
2018	NHRIV600030701-13	LAMPREY RIVER	DEERFIELD	0.041	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030702-06	NORTH BRANCH RIVER - UNNAMED	DEERFIELD, CANDIA	5.185	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P	N	LOW
2018	NHRIV600030702-06	NORTH BRANCH RIVER - UNNAMED	DEERFIELD, CANDIA	5.185	MILES	Aquatic Life Integrity	pH	5-P	N	LOW
2018	NHRIV600030702-07	NORTH BRANCH RIVER - UNNAMED	CANDIA, DEERFIELD	10.013	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P	N	LOW
2018	NHRIV600030702-07	NORTH BRANCH RIVER - UNNAMED	CANDIA, DEERFIELD	10.013	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-01	UNNAMED BROOK - TO ONWAY LAKE	RAYMOND, CANDIA	5.450	MILES	Aquatic Life Integrity	Benthic-Macroinvertebrate Bioassessments	5-P	N	LOW
2018	NHRIV600030703-01	UNNAMED BROOK - TO ONWAY LAKE	RAYMOND, CANDIA	5.450	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-04	DUDLEY BROOK - UNNAMED BROOK	RAYMOND, DEERFIELD,	4.340	MILES	Aquatic Life Integrity	Lead	5-M	N	LOW
2018	NHRIV600030703-04	DUDLEY BROOK - UNNAMED BROOK	RAYMOND, DEERFIELD,	4.340	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P	N	LOW
2018	NHRIV600030703-04	DUDLEY BROOK - UNNAMED BROOK	RAYMOND, DEERFIELD,	4.340	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-05	LAMPREY RIVER	RAYMOND	2.647	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-09	LAMPREY RIVER	RAYMOND	2.295	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-10	LAMPREY RIVER	RAYMOND	0.558	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-11	LAMPREY RIVER	EPPING, RAYMOND	3.270	MILES	Aquatic Life Integrity	Aluminum	5-M	N	LOW
2018	NHRIV600030703-11	LAMPREY RIVER	EPPING, RAYMOND	3.270	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-14	PAWTUCKAWAY RIVER - UNNAMED	NOTTINGHAM, EPPING,	6.751	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-P	N	LOW
2018	NHRIV600030703-14	PAWTUCKAWAY RIVER - UNNAMED	NOTTINGHAM, EPPING,	6.751	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-15	LAMPREY RIVER	EPPING	4.692	MILES	Aquatic Life Integrity	Oxygen, Dissolved	5-M	N	LOW
2018	NHRIV600030703-15	LAMPREY RIVER	EPPING	4.692	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-17	UNNAMED BROOK - TO LAMPREY RIVER	EPPING	3.280	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-18	LAMPREY RIVER	EPPING	3.247	MILES	Aquatic Life Integrity	pH	5-M	N	LOW
2018	NHRIV600030703-20	RUM BROOK	EPPING	4.791	MILES	Aquatic Life Integrity	pH	5-M	N	LOW

SWPPP Cut Sheet:

Filtrexx® Sediment Control

Sediment & Perimeter Control Technology

PURPOSE & DESCRIPTION

Filtrexx® Sediment control is a three-dimensional tubular sediment control and storm water runoff filtration device typically used for **perimeter control** of sediment and other soluble pollutants (such as phosphorus and petroleum hydrocarbons), on and around construction activities.

APPLICATION

Filtrexx® Sediment control is to be installed down slope of any disturbed area requiring erosion and sediment control and filtration of soluble pollutants from runoff. Sediment control is effective when installed perpendicular to sheet or low concentrated flow. Acceptable applications include:

- Site perimeters
- Above and below disturbed areas subject to sheet runoff, interrill and rill erosion
- Above and below exposed and erodable slopes
- Around area drains or inlets located in a 'sump'
- On compacted soils where trenching of silt fence is difficult or impossible
- Around sensitive trees where trenching of silt fence is not beneficial for tree survival or may unnecessarily disturb established vegetation.
- On frozen ground where trenching of silt fence is impossible.
- On paved surfaces where trenching of silt fence is impossible.

INSTALLATION

1. Sediment control used for perimeter control of sediment and soluble pollutants in storm runoff shall meet Filtrexx® Soxx™ Material Specifications and use Certified Filtrexx® FilterMedia™.
2. Contractor is required to be Filtrexx® Certified™, or use pre-filled Filtrexx® Sediment control products manufactured by a Filtrexx® Certified Manufacturer™ as determined by Filtrexx® International, LLC (440-926-2607 or visit www.filtrexx.com). Certification shall be considered current if appropriate identification is shown during time of bid or at time of application. Look for the Filtrexx® Certified™ Seal.
3. Sediment control will be placed at locations indicated on plans as directed by the Engineer.
4. Sediment control should be installed parallel to the base of the slope or other disturbed area. In extreme conditions (i.e., 2:1 slopes), a second Sediment control shall be constructed at the top of the slope.
5. Effective Soxx™ height in the field should be as follows: 8" Diameter Sediment control = 6.5" high, 12" Diameter Sediment control = 9.5" high, 18" Diameter SiltSoxx™ = 14.5" high, 24" Diameter Sediment control = 19" high.
6. Stakes shall be installed through the middle of the Sediment control on 10 ft (3m) centers, using 2 in (50mm) by 2 in (50mm) by 3 ft (1m) hard wood stakes. In the event staking is not possible, i.e., when Sediment control is used on pavement, heavy concrete blocks shall be used behind the Sediment control to help stabilize during rainfall/runoff events.
7. Staking depth for sand and silt loam soils shall be 12 in (300mm), and 8 in (200mm) for clay soils.
8. Loose compost may be backfilled along the upslope side of the Sediment control, filling the seam between the soil surface and the device, improving filtration and sediment retention.
9. If the Sediment control is to be left as a permanent filter or part of the natural landscape, it may be seeded at time of installation for

establishment of permanent vegetation. The Engineer will specify seed requirements.

10. Filtrexx® Sediment control is not to be used in perennial, ephemeral, or intermittent streams.

See design drawing schematic for correct Filtrexx® Sediment control installation (Figure 1.1).

INSPECTION AND MAINTENANCE

Routine inspection should be conducted within 24 hrs of a runoff event or as designated by the regulating authority. Sediment control should be regularly inspected to make sure they maintain their shape and are producing adequate hydraulic flow-through. If ponding becomes excessive, additional Sediment control may be required to reduce effective slope length or sediment removal may be necessary. Sediment control shall be inspected until area above has been permanently stabilized and construction activity has ceased

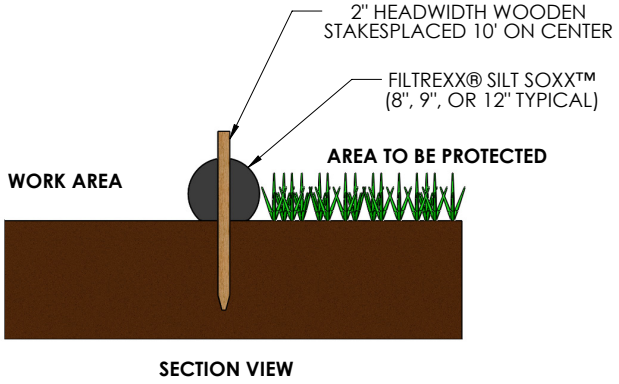
1. The Contractor shall maintain the Sediment control in a functional condition at all times and it shall be routinely inspected.
2. If the Sediment control has been damaged, it shall be repaired, or replaced if beyond repair.
3. The Contractor shall remove sediment at the base of the upslope side of the Sediment control when accumulation has reached 1/2 of the effective height of the Sediment control, or as directed by the Engineer. Alternatively, a new Sediment control can be placed on top of and slightly behind the original one creating more sediment storage capacity without soil disturbance.
4. Sediment control shall be maintained until disturbed area above the device has been permanently stabilized and construction activity has ceased.
5. The FilterMedia™ will be dispersed on site once disturbed area has been permanently stabilized, construction activity has ceased, or as determined by the Engineer.
6. For long-term sediment and pollution control applications, Sediment control can be seeded at the time of installation to create a vegetative filtering system for prolonged and increased filtration of sediment and soluble pollutants (contained vegetative filter strip). The appropriate seed mix shall be determined by the Engineer.

Slope Percent	Maximum Slope Length Above Sediment Control in Feet (meters)*				
	8 in (200 mm) Sediment control	12 in (300 mm) Sediment control	18 in (450 mm) Sediment control	24 in (600mm) Sediment control	32 in (800mm) Sediment control
	6.5 in (160 mm)**	9.5 in (240 mm) **	14.5 in (360 mm) **	19 in (480 mm) **	26 in (650 mm) **
2 (or less)	600 (180)	750 (225)	1000 (300)	1300 (400)	1650 (500)
5	400 (120)	500 (150)	550 (165)	650 (200)	750 (225)
10	200 (60)	250 (75)	300 (90)	400 (120)	500 (150)
15	140 (40)	170 (50)	200 (60)	325 (100)	450 (140)
20	100 (30)	125 (38)	140 (42)	260 (80)	400 (120)
25	80 (24)	100 (30)	110 (33)	200 (60)	275 (85)
30	60 (18)	75 (23)	90 (27)	130 (40)	200 (60)
35	60 (18)	75 (23)	80 (24)	115 (35)	150 (45)
40	60 (18)	75 (23)	80 (24)	100 (30)	125 (38)
45	40 (12)	50 (15)	60 (18)	80 (24)	100 (30)
50	40 (12)	50 (15)	55 (17)	65 (20)	75 (23)

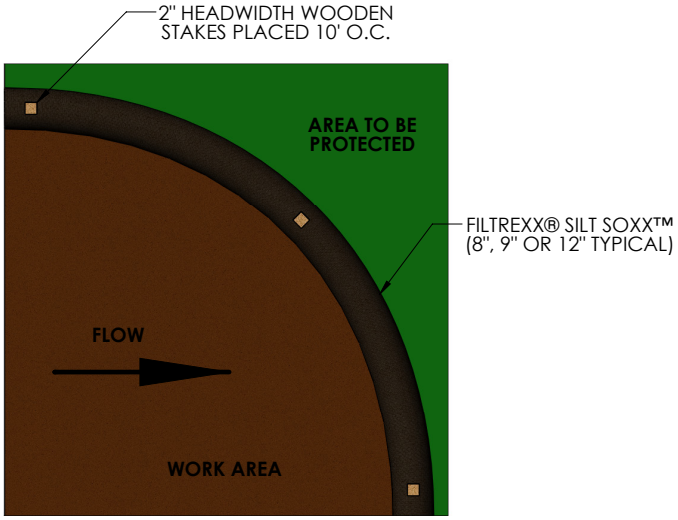
* Based on a failure point of 36 in (0.9 m) super silt fence (wire reinforced) at 1000 ft (303 m) of slope, watershed width equivalent to receiving length of sediment control device, 1 in/ 24 hr (25 mm/24 hr) rain event.

** Effective height of Sediment control after installation and with constant head from runoff as determined by Ohio State University.

FILTREXX® SILT SOXX™

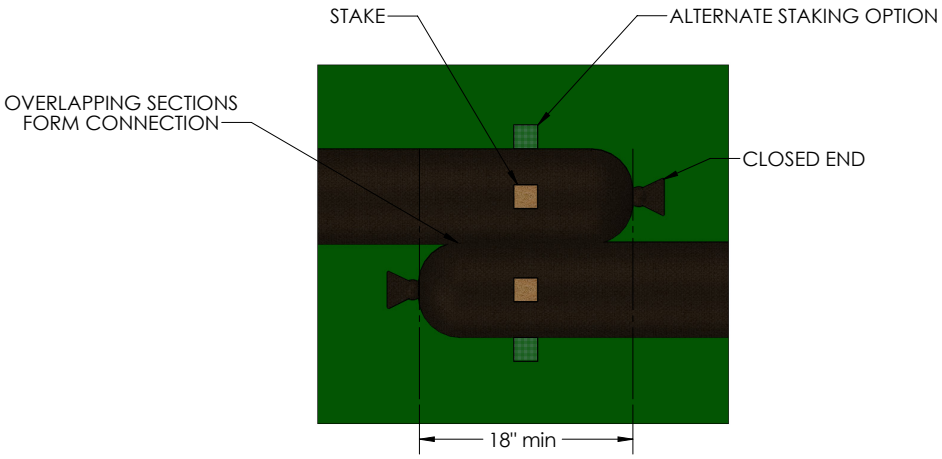


SECTION VIEW

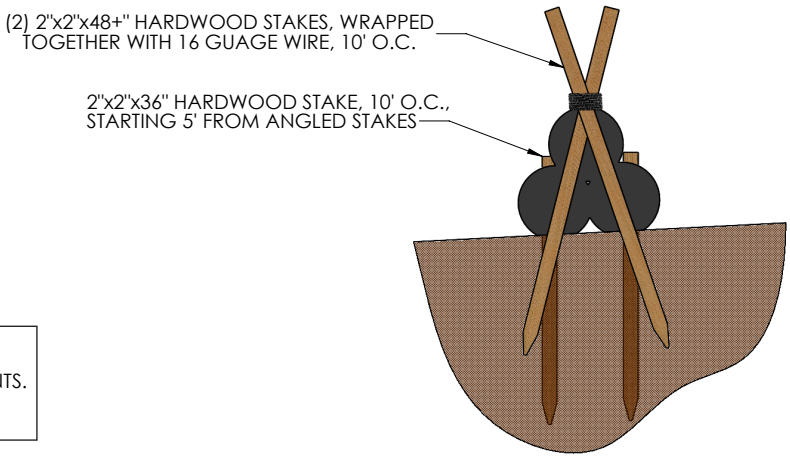


TOP VIEW

COMPOST SOCK CONNECTION/ATTACHMENT DETAIL



FILTREXX® PYRAMID STAKING DETAIL



NOTES:
1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. SILT SOXX™ FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

SWPPP Cut Sheet:

Filtrexx® Inlet Protection

Sediment & Perimeter Control Technology

PURPOSE & DESCRIPTION

Filtrexx® Inlet protection is a three-dimensional tubular sediment control and storm water runoff filtration device typically used for storm drain **inlet protection** of sediment and soluble pollutants (such as phosphorus and petroleum hydrocarbons) on and around construction activities.

APPLICATION

Drain inlets are located in areas that receive runoff from surrounding lands, often exposed and disturbed soils, and are located at a low point, or in a sump. Inlet protection used around drain inlets (or *Drain* Inlet protection) should completely enclose the circumference of the drain and where possible should not be placed on a grade or slope. Inlet protection used around drain inlets should never be the only form of site sediment control and should be accompanied by erosion control/slope stabilization practices, such as Slope protection or rolled erosion control blankets (RECB). Inlet protection should never be placed where they divert runoff flow from the drain inlet, or on top of the inlet, which can cause flooding. Under high runoff and sediment loading conditions placement of 1-2 in (25-50 mm) diameter rock (AASHTO #2) may be placed around the outer circumference of the Inlet protection up to ½ the height of the Inlet protection. This will slow runoff velocity as it contacts the Inlet protection and will reduce sediment build-up and clogging of the Inlet protection.

Curb inlets are generally located on paved surfaces and are designed to rapidly drain storm runoff from roadways to prevent flooding that poses a hazard to vehicular traffic. Inlet protection devices should be placed in a manner which intercepts runoff prior to entering the inlet, but does not block or divert runoff from the inlet. To prevent diversion of runoff, Inlet protection used around curbs (or *Curb* Inlet protection) should be used in low points, or sumps, and minor slopes or grades. Inlet protection should never be placed in or on the curb inlet drain, or placed in a manner than obstructs vehicular traffic. Inlet protection height should be at least 1 in (25 mm) lower than top of curb inlet to allow for overflow into the drain and not over the curb. Maximum sediment removal efficiency occurs when minor ponding exists behind Inlet protection but should never lead to flooding.

Curb sediment containment systems are used to reduce the sediment and pollutant load flowing to a curb inlet. They are generally placed on paved surfaces perpendicular to runoff flow and should be lower than the height of the curb. Curb sediment containment systems should never cause flooding or placed where they are a hazard to vehicular traffic. Inlet protection used for curb sediment containment (or *Curb Sediment Containment* Inlet protection) can be placed on a grade but should never be placed directly upslope from curb inlet where it may inadvertently divert runoff from entering curb inlet.

INSTALLATION

1. Inlet protection used for inlet protection to reduce sediment and soluble pollutants entering storm drains shall meet Filtrexx® FilterSoxx™ Material Specifications and use Certified Filtrexx® FilterMedia™.
2. Contractor is required to be a Filtrexx® Certified™ Installer as determined by Filtrexx® International, LLC (440-926-2607 or visit web site at Filtrexx.com). Certification shall be considered current if appropriate identification is shown during time of bid or at time of application (current list of installers can be found at www.filtrexx.com). Look for the Filtrexx® Certified™ Installer Seal.

3. Filtrexx® Inlet protection shall be placed at locations indicated on plans as directed by the Engineer. Inlet protection should be installed in a pattern that allows complete protection of the inlet area.
4. Installation of curb Inlet protection will ensure a minimal overlap of at least 1 ft (300mm) on either side of the opening being protected. The Inlet protection will be anchored to the soil behind the curb using staples, stakes or other devices capable of holding the Inlet protection in place.
5. Standard Inlet protection for curb inlet protection and curb sediment containment will use 8 in (200mm) diameter Inlet protection, and drain inlets on soil will use 12 in (300mm) or 18 in (450mm) diameter Inlet protection. In severe flow situations, larger Inlet protection may be specified by the Engineer. During curb installation, Inlet protection shall be compacted to be slightly shorter than curb height.
6. If Inlet protection becomes clogged with debris and sediment, they shall be maintained so as to assure proper drainage and water flow into the storm drain. In severe storm events, overflow of the Inlet protection may be acceptable in order to keep the area from flooding.
7. Curb and drain Inlet protection shall be positioned so as to provide a permeable physical barrier to the drain itself, allowing sediment to collect on the outside of the Inlet protection.
8. For drains and inlets that have only curb cuts, without street grates, a spacer is required in order to keep the Inlet protection away from the drain opening. This spacer should be a hog wire screen bent to overlap the grate opening and keep the sock from falling into the opening. Use at least one spacer for every 4 ft (1.2m) of curb drain opening. The wire grid also prevents other floatable waste from passing over the Inlet protection.
9. Stakes shall be installed through the middle of the drain Inlet protection on 5 ft (1.5m) centers, using 2 in (50mm) x 2 in (50mm) x 3 ft (1m) wood stakes.
10. Staking depth for sand and silt loam soils shall be 12 in (300mm), and 8 in (200mm) for clay soils.

INSPECTION AND MAINTENANCE

Routine inspection should be conducted within 24 hrs of a runoff event or as designated by the regulating authority. Inlet protection should be regularly inspected to make sure they maintain their shape and are producing adequate hydraulic flow-through. If ponding becomes excessive, additional Inlet protection may be required or sediment removal may be necessary. Inlet protection shall be inspected until contributing drainage area has been permanently stabilized and construction activity has ceased

1. The Contractor shall maintain the Inlet protection in a functional condition at all times and it shall be routinely inspected.
2. If the Inlet protection has been damaged, it shall be repaired, or replaced if beyond repair.
3. The Contractor shall remove sediment at the base of the upslope side of the Inlet protection when accumulation has reached 1/2 of the effective height of the Inlet protection, or as directed by the Engineer. Alternatively, for drain Inlet protection a new Soxx™ may be placed on top of the original increasing the sediment storage capacity without soil disturbance.
4. Inlet protection shall be maintained until disturbed area above or around the device has been permanently stabilized and construction activity has ceased.
5. Regular maintenance includes lifting the Inlet protection and cleaning around and under them as sediment collects.
6. The FilterMedia™ will be removed from paved areas or dispersed on site soil or behind curb once disturbed area has been permanently stabilized, construction activity has ceased, or as determined by the Engineer.

Table 2.4 Spacing for Curb Sediment Containment Systems.

Grade (%)	Spacing (ft)	Spacing (mm)
0.5	100	30
1.0	50	15
2.0	25	8
3.0	16	5
4.0	13	4
5.0	10	3

Source: Fifield, 2001.

Figure 2.1. Engineering Design Drawing for Curb and Drain Inlet Protection

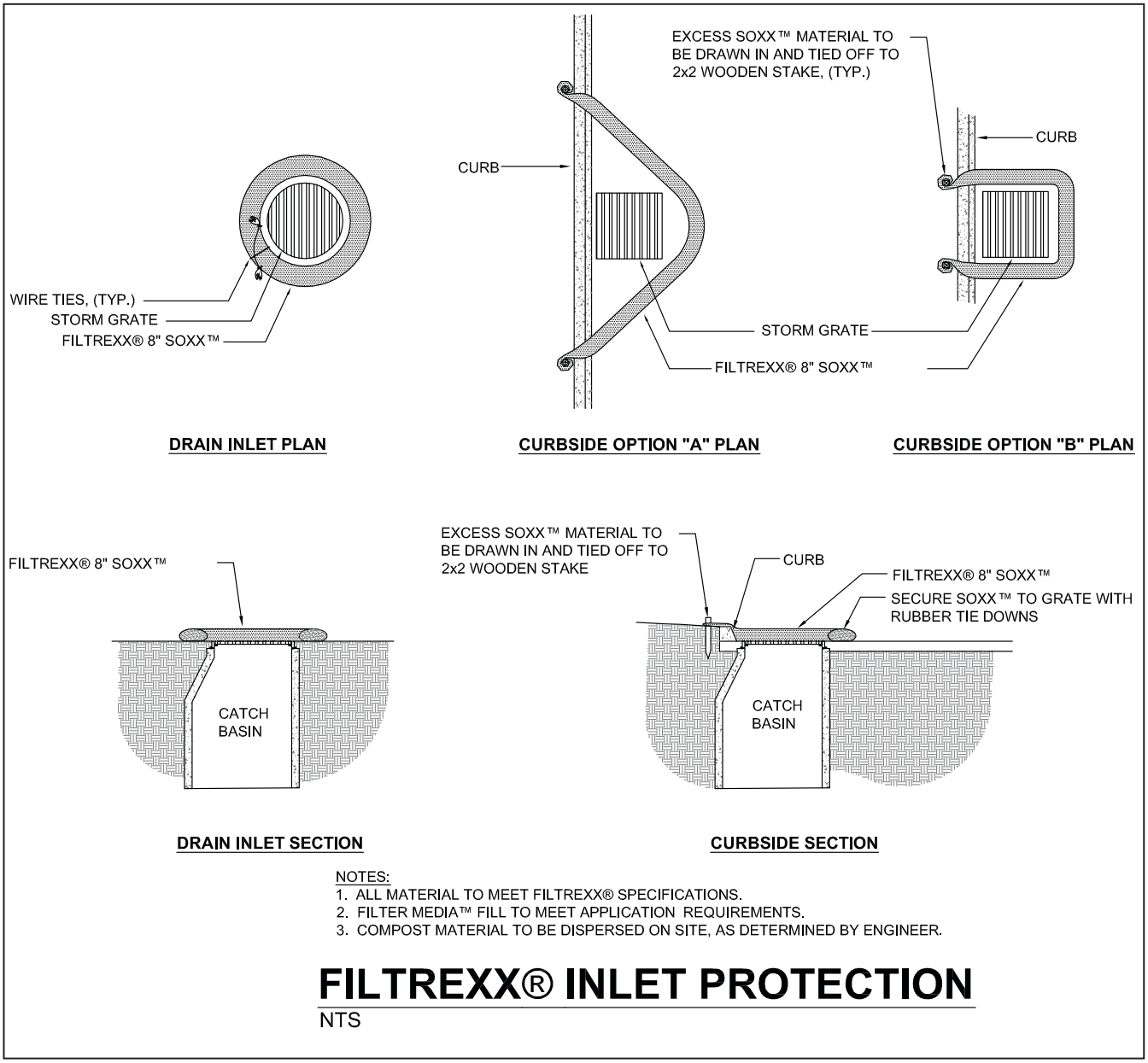
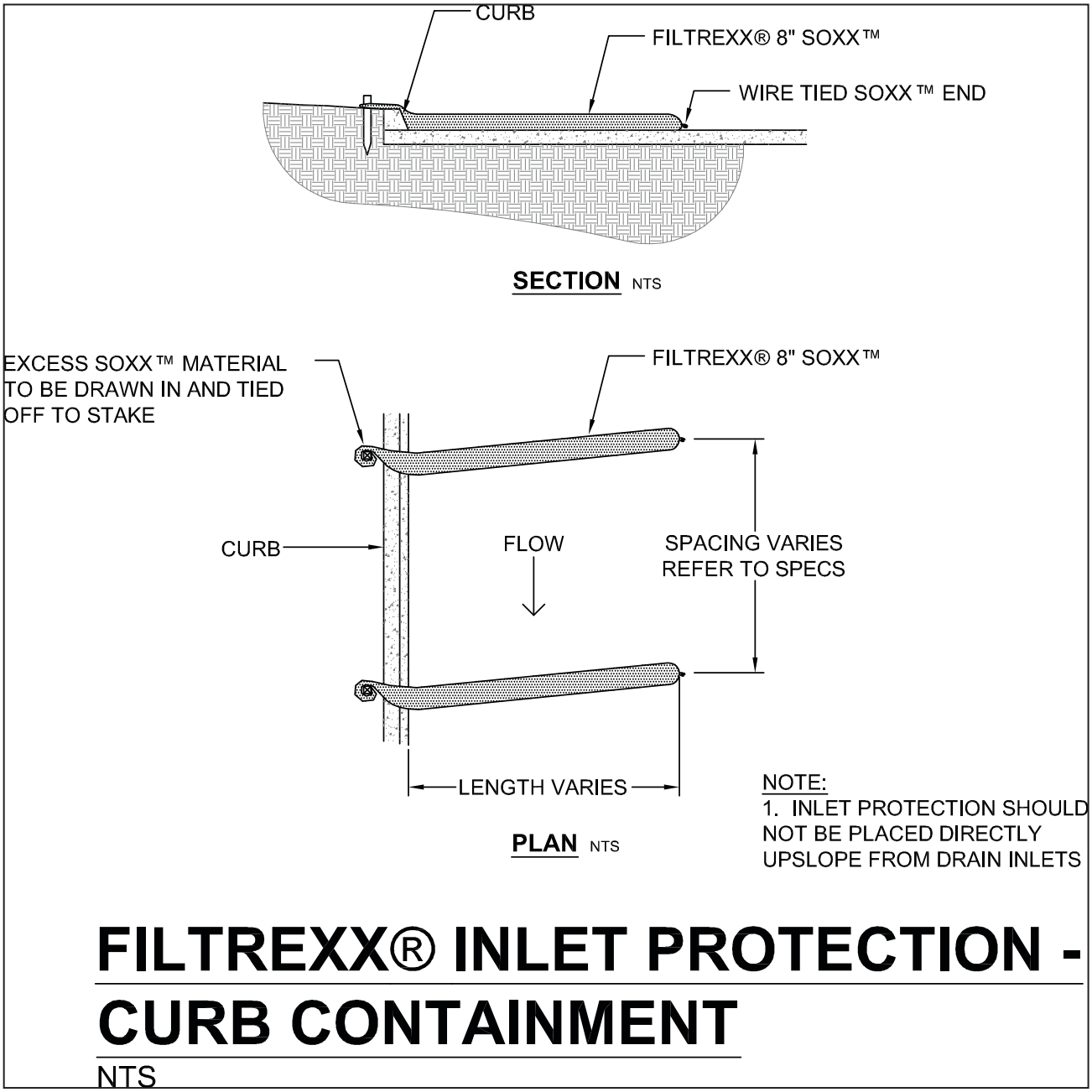


Figure 2.2. Engineering Design Drawing for Curb Sediment Containment Inlet Protection



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

September 14, 2020

Re: Proposed Site Plan
Index Packaging Inc
150 Venture Drive
Tax Map D, Lot 9A

Dear Mrs. Benton,

Pursuant to the City of Dover Site Review Regulations, Berry Surveying & Engineering (BS&E), on behalf of Index Packaging, Inc., has prepared a Trip Generation Summary for the construction of a 47,900 Sq. Ft. warehouse building off the back of an existing building with 26,781 manufacturing space, 6,870 warehouse space & 13,792 office space. The building will be accessed by Venture Drive.

The following trip generations are calculated from the 10th Edition Trip Generation Manual using Code 140, Manufacturing, Code 150, Warehousing & General Office Building, code 710.

- AM Peak Hour of Adjacent Street Traffic (Code 140): Avg Rate 0.62T/1,000 GFA
  0.62T/1,000 GFA X 26,781 GFA = 16.6T (14 Trips Entering, 3 exiting)

- AM Peak Hour of Adjacent Street Traffic (Code 150): Avg Rate 0.22T/1,000 GFA
  0.22T/1,000 GFA X 54,680 = 12.03T (10 Trips Entering, 2 Exiting)

- AM Peak Hour of Adjacent Street Traffic (Code 710): Avg Rate 1.45T/1,000 GFA
  1.45T/1,000 GFA X 13,792 = 19.99T (18 Trips Entering, 2 Exiting)

    - 42 trips entering Venture Drive, 7 trips exiting.

- PM Peak Hour of Adjacent Street Traffic (Code 140): Avg Rate 0.67T/1,000 GFA
  0.67T/1,000 GFA X 26,781 GFA = 17.94T (6 Trips Entering, 12 exiting)

- PM Peak Hour of Adjacent Street Traffic (Code 150): Avg Rate 0.22T/1,000 GFA
  0.19T/1,000 GFA X 54,680 = 10.42T (3 Trips Entering, 8 Exiting)

- PM Peak Hour of Adjacent Street Traffic (Code 710): Avg Rate 1.50T/1,000 GFA
  1.50T/1,000 GFA X 13,792 = 20.68T (3 Trips Entering, 18 Exiting)

    - 12 trips entering Venture Drive, 38 exiting.

- Total daily trips (Code 140): Avg Rate 3.93T/1,000 GFA
  3.93T/1,000 GFA X 26,781 GFA = 106T (53 Trips Entering, 53 exiting)

- Total daily trips (Code 150): Avg Rate 1.75T/1,000 GFA
  1.74T/1,000 GFA X 54,680 = 96T (48 Trips Entering, 48 Exiting)

- Total daily trips (Code 710): Avg Rate 14.87T/1,000 GFA
  14.87T/1,000 GFA X 13,792 = 206T (103 Trips Entering, 103 Exiting)

    - 194 trips entering Venture Drive, 194 trips exiting.

There is an existing COAST bus stop located in front of the existing building. This has the potential to reduce the generated trips.

Several improvements have been made to the intersection of Sixth Street and Venture Drive over the past several months. Venture Drive was widened at the entrance and right turn slip lane was added to Sixth Street to allow for smoother and more efficient turning onto Venture Drive. It is anticipated that the proposed use and the existing office, manufacturing and warehouse space will generate less trips than when the building was used by Fosters. Due to the high traffic volume that would be generated by a newspaper company.

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 for Venture Drive and Sixth Street.

Respectfully Submitted,

BERRY SURVEYING & ENGINEERING

Christopher R. Berry, SIT
Principal, President

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

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