I look forward to meeting with the Board at its next regularly scheduled meeting to discuss the enclosed application.

Respectfully submitted,
CADmaster Drafting, Land
Surveying and Septic Design

George Bouchles, PLS 2295, LSE 338

TABLE OF CONTENTS

Affordable Well Drilling, Inc.

28 Bowdoinham Rd
Sabattus, ME 04280
Phone: 207-375-7204 Fax: 207-375-7205
email: affordablewelldrillinginc@gmail.com

Date: November 06, 2017

To Whom It May Concern;

I have reviewed our well records and information published by the Maine Geological Survey with respect to the availability of water to serve the needs for the well proposed for Bouffard McFarland Builders located at the Woodbury subdivision, Auburn, ME. Wells in this area obtain drinking water from fractured bedrock aquifers. Based on my research, knowledge and experience of drilling wells in this area, it is my opinion that ground water should be sufficient in both quantity and quality to serve the needs of the proposed subdivision. Treatment, however, in some cases is needed for excessive mineral content. Accordingly, my opinion that groundwater should be available in adequate supply should not be considered a guarantee by Affordable Well Drilling.

Sincerely,

James R Bisson

James Bisson
DL# 0014

November 6, 2017

Planning Board
City of Auburn

Re: B&M Developers

Dear Planning Board Members:

Please know that Norway Savings Bank has held a comprehensive banking relationship with B&M Developers since June of 2015. During that time Norway Savings Bank has assisted with the purchase and financing of various subdivisions and the acquisition of realty upon which the firm builds houses for their various clients.

B&M Developers has told me of their plans for Phase IV of Woodbury Heights. Norway Savings Bank fully intends to financial partner with B&M in the development of Phase IV. The financial budget and scope of the project appear well within the means of this firm.

Please do reach out to me with any follow-up questions you might have.

Sincerely,

Jack W. Day
Regional Vice President
Norway Savings Bank
1-207-393-3615

MARK HAMPTON ASSOCIATES, INC.
SOIL EVALUATION • WETLAND DELINEATIONS • SOIL SURVEYS • WETLAND PERMITTING

5135
October 23, 2017

Mr. Kyle Bouffard
Bouffard & McFarland Builders
195 Center Street
Auburn, ME 04210

Re: Wetland Delineation, 10 acre parcel Old Danville Road Auburn, ME

Dear Kyle,

Today, I completed a wetland delineation on an 10 acre parcel located on Old Danville Road, Auburn, ME. The wetland delineation was completed in accordance with the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual for the Northcentral and Northeast Regions dated January 2012. These manuals require the presence of three parameters for a wetland to be present, wetland hydrology, hydrophytic vegetation, and hydric soils.

I found no wetlands or other regulated natural resources on the property.

If you have any questions or require additional information, please contact me.

Sincerely,

Mark J. Hampton C.S.S., L.S.E.
Certified Soil Scientist #216
Licensed Site Evaluator #263

P.O. BOX 1931 • PORTLAND, ME 04104-1931 • 207-756-2900 • mhampto1@maine.rr.com

CADmaster

586 Park Avenue - Auburn, Maine 04210
office - 207-689-3232 cell - 207-240-5567
e-mail - gsb@cadmasterr.com

Land Surveying and Septic Design

November 10, 2017

Mr. Gary McFarland
Mr. Reggie Bouffard
B&M Developers, Inc.
32 Woodbury Road
Auburn, Maine 04210

RE: Preliminary Soils Investigation Report
"Woodbury Heights - Phase 4"
(7 Lot Residential Major Subdivision)
Mountain View Drive - Auburn, Maine

Dear Mr. McFarland & Mr. Bouffard:

At your request, preliminary Site/Soils Investigations were performed on seven (7) lots of a proposed seven (7) lot subdivision you propose to create from a 14.77 acre parcel of land you own on Mountain View Drive and the Old Danville Road in the City of Auburn, Maine. The portion of the property you propose to subdivide is shown on a plan entitled "Subdivison Plan – Woodbury Heights - Phase 4" prepared by George S. Bouchles, PLS 2295 and depicts seven (7) proposed residential house lots ranging in area from 1.00 acres to 5.11 acres.

The purpose of the preliminary investigation was to determine suitability for on-site Subsurface Waste Water Disposal Systems to accommodate a four (4) bedroom single family dwelling on each of the lots in accordance with the current ***Maine Subsurface Waste Water Disposal Rules*** (SWWDR), dated January 1, 1998, and as amended.

Date of Investigation: November 1, 2017

Method of Investigation: Dutch Auger test pits

Method of Ground Control: Test pits were located in relationship to boundary information observed in the field and boundary information as shown on the above referenced plan as well as existing survey control stations in relationship to proposed lot lines also shown on the above referenced plan.

Findings: The site is, for the most part, partially tree covered with a mix of hardwood and softwood remaining after recent logging operations. The terrain is generally sloping down from the Danville Corner Road and then levels off in a field.

Test pit results for the proposed seven (7) lots tested indicate the underlying Parent Material to be of a "Basal Glacial Till" type material, and designated as 3C & 3D, soils as defined in the current SWWDR referred to above.

Soil textures for these test pits consisted of approximately 1 to 2 inches of humus containing decaying leaves, twigs and sticks at the surface. The next 4 to 6 inches consisted of a brown to light brown fine sandy loam textured soils with roots present and angular rocks were observed. The next 10 to 20 inches consisted of a light yellowish brown fine sandy loam textured soils with roots present and angular rock fragments observed. The remainder of the profile consisted of a light yellowish brown to light olive gray fine sandy loam textured soil with no roots visible, angular rock fragments were still present with the soil textures being firm and difficult to excavate.

Pit depths were limited to 12 inches below the observed seasonal high water table or to refusal.

Recommendations: It is my recommendation that, based upon results of the test pits evaluated and site conditions observed, there is suitable soils and sufficient area for the seven (7) new single-family dwelling sites proposed.

Test Pit Summary

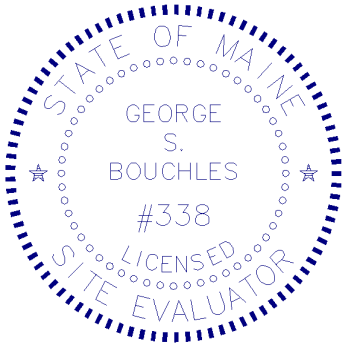
Test Pit no.	Preliminary Soil	Mottling Layer	Restrictive Refusal	Bedrock/	System Type	Size Recomm.
23	3 C	-18”	-16”	none	Enviro-Septic	10x50
24	3 C	-18”	-16”	none	Enviro-Septic	10x50
25	3 C	-18”	-16”	none	Enviro-Septic	10x50
26	3 C	-24”	-26”	none	Enviro-Septic	10x50
27	3 C	-20”	-22”	none	Enviro-Septic	10x50
28	3 D	-14”	-16”	none	Enviro-Septic	10x50
29	3 D	-13”	-15”	none	Enviro-Septic	10x50

The site and soils information contained within this report is preliminary and intended for the purpose of review and planning purposes only. Prior to the issuance of any municipal permits, a full site and soils evaluation of each lot will be required, and a complete design of the proposed subsurface waste water disposal system and location must be delineated on the State supplied HHE-200 soils design forms.

I trust the enclosed information will satisfy your immediate needs. Should you have any questions, feel free to give me a call.

Respectfully yours,
CADmaster Drafting & Septic Design

George S. Bouchles, LSE 338



CADmaster

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Land Surveying and Septic Design

January 4, 2018

Auburn Planning Board
City of Auburn
60 Court Street
Auburn, Maine 04210

RE: "Woodbury Heights - Phase 4" – 7 Lot Residential Major Subdivision
Mountain View Drive & Old Danville Road
Auburn, Maine

"Cul-de-sacWaiver Request Justification" - Ridge View

Dear Planning Board Members:

As part of the original submission for Phase 4 of "Woodbury Heights" Major Subdivision Application, a cul-de-sac Waiver Request was submitted to allow for the total length of the proposed road, "Ridge View", to exceed the total maximum length allowed (600') under the City of Auburn Land Use Ordinance, with a total new length of 1,631 ft. We note, however, that almost 1,000 feet of this stated length was previously approved by you as part of Mountain View Drive.

This request is pursuant to Chapter 60, Sec. 60-1336 of the Auburn Code of Ordinances, as any cul-de-sac streets over 600 ft. in length are subject to Planning Board approval, as per Chapter 46, Sec. 46-180 (3).

This request is being made to allow for the creation of the proposed Ridge View and the proposed cul-de-sac at the end of the road due to site conditions that would prohibit the construction of a through road to Old Danville Road due to steep slopes in excess of the City's maximum slopes allowed for any new roads as well as the inability to meet Sight Distance requirements at Old Danville Road. Specifically, the maximum slope (grade) for roads of this type as permitted by the City in Section 46-175 is 8 percent, while the site's actual slope (grade) in order to reach Old Danville Road is 11 percent or greater. Also, the maximum possible sight distance along Old Danville Road, even if a through road could be constructed, would be 250 feet, which is less than the City's permitted minimum sight distance of 350 feet per Section 46-179. Any reduction in the City's minimum sight distance requirements would impose potential safety concerns for motorists using Old Danville Road and Danville Corner Road at this location.

Additionally, we're requesting the waiver to allow for the creation of the new lots along Ridge View with a portion of the total length of this new road being partially along Mountain View Drive, which has already been granted a waiver as part of the previously approved Phase 3 subdivision process. This new section of Ridge View will be 667.91 feet in length from the centerline intersection of Mountain View Drive to the center of the cul-de-sac.

As stated above, because of the site constraints of steep slopes exceeding the maximum allowed by the City's Ordinance in the area of the Old Danville Road, the inability to obtain the minimum Sight Distance required along Old Danville Road, and the need to minimize the impacts on down slope adjacent properties, the best and safest location for this new proposed road is depicted on the Phase 4 plan submitted to you. This location will have the least amount of impact on the existing site and the surrounding areas adjacent to the new road.

I trust the above information will be sufficient to be considered for the above referred to waiver request.

I look forward to discussing this waiver request at the next regularly scheduled Planning Board Meeting.

Respectfully submitted,
CADmaster Drafting, Land
Surveying and Septic Design

George Bouchles, PLS 2295, LSE 338

CADmaster

586 Park Avenue - Auburn, Maine 04210
office - 207-689-3232 cell - 207-240-5567
e-mail - gsb@cadmasterr.com

Land Surveying and Septic Design

November 10, 2017

Auburn Planning Board
City of Auburn
60 Court Street
Auburn, Maine 04210

RE: "Woodbury Heights - Phase 4" – 7 Lot Residential Major Subdivision
Mountain View Drive & Old Danville Road
Auburn, Maine
Major Subdivision Application

Dear Planning Board Members:

On behalf of Mr. Gary McFarland & Mr. Reggie Bouffard, please find attached an application for a Major Subdivision Application and supportive documentation for review and approvals of a seven (7) lot residential subdivision to be located off of Mountain View Drive and Old Danville Road in the City of Auburn. Lot 20 on the previously approved "Woodbury Heights - Phase 3" plan and a portion of Lot 2 as previously approved and as shown on a plan entitled "Standard Boundary Survey - Norwood Subdivision" dated August 10, 1999 (plan reference Book 40, Page 189), are being reconfigured to reflect the proposed Phase 4 Subdivision.

Briefly, Mr. McFarland and Mr. Bouffard c/o B&M Developers, Inc. propose to subdivide a portion of a 57.39 acre parcel of land they jointly own located on the Danville Corner Road and the Woodbury Road (municipal tax map no. 110, lot no. 9), and a 9.57 acre parcel, being a portion of the premises adjacent to the above referenced parcel (municipal tax map no 110, portion of lot no. 11), currently under contract, into seven (7) residential house lots. The proposed development parcels will be divided into seven (7) lots ranging in size from 1.00 acres to 5.01 acres. The proposed subdivision will require the construction of a new road, to be known as Ridge View which will be accessed from Mountain View Drive. The proposed new road will be 1,631.78 feet in length from Danville Corner Road, along the existing Mountain View Drive and along the proposed Ridge View with a cul-d-sac turn-around at the end of the proposed road.

All lots will be serviced by on-site drilled wells and subsurface waste water disposal system.

I trust the following information will be sufficient for review and approval of the enclosed Subdivision Application.

Development Review Application

City of Auburn Planning and Permitting Department
City of Lewiston Department of Planning and Code Enforcement

PROJECT NAME: Woodbury Heights - Phase 4

PROPOSED DEVELOPMENT ADDRESS: Mountain View Drive & Old Danville Road

PARCEL ID#: Map 110, Portion of Lot 009 & Portion of Lot 11

REVIEW TYPE:

Site Plan □	Site Plan Amendment □
Subdivision x□	Subdivision Amendment □

PROJECT DESCRIPTION: B&M Developers, Inc. is proposing to create a 7 Lot Residential Major Subdivision to be located on Mountain View Drive (7 Lots), and partially on the Old Danville Road. Each lot will be serviced by on-site individual Subsurface Waste Water Disposal System and Drilled Wells. No extension of Municipal Services (i.e., road construction, water or septic sewer mains, etc.) are proposed at this time.

CONTACT INFORMATION:

Applicant: B&M Developers, Inc.	Property Owner: B&M Developers, Inc.
Name: Gary McFarland, Reggie Bouffard	Name: Gary McFarland, Reggie Bouffard
Address: 32 Woodbury Rd. - Auburn, ME	Address:32 Woodbury Road - Auburn, ME
Zip Code: 04210	Zip Code: 04210
Work #: 783-6224	Work #: 783-6224
Cell #: 576-0573 (Gary)	Cell #: 576-0669 (Reggie)
Fax #: 783-4994	Fax #: 783-4994
Home #: n/a	Home #: n/a
Email: bmhouse@al.com	Email: rkbouffard@aol.com

Project Representative	Other professional representatives for the project (surveyors, engineers, etc.),
Name: George Bouchles, PLS 2295	Name: Sean Thies, eng.
Address: 586 Park Ave. - Auburn, ME	Address: 465 South Main St. - Brewer
Zip Code: 04210	Zip Code: 04412
Work #: 786-3232	Work #: 989-4824
Cell #: 240-5567	Cell #:
Fax #: 786-3232	Fax #: n/a
Home #: n/a	Home #: n/a
Email: gsb@cadmasterr.com	Email:sthies@ces-maine.com

PROJECT DATA

The following information is required where applicable, in order complete the application

IMPERVIOUS SURFACE AREA/RATIO

Existing Total Impervious Area	53,031	sq. ft.
Proposed Total Paved Area	64,217	sq. ft.
Proposed Total Impervious Area	80,406	sq. ft.
Proposed Impervious Net Change	27,375	sq. ft.
Impervious surface ratio existing	1.8	% of lot area
Impervious surface ratio proposed	2.8%	% of lot area

BUILDING AREA/LOT COVERAGE

Existing Building Footprint	N/A	sq. ft.
Proposed Building Footprint	N/A	sq. ft.
Proposed Building Footprint Net change	N/A	sq. ft.
Existing Total Building Floor Area	N/A	sq. ft.
Proposed Total Building Floor Area	N/A	sq. ft.
Proposed Building Floor Area Net Change	N/A	sq. ft
New Building	N/A	(yes or no)
Building Area/Lot coverage existing	N/A	% of lot area
Building Area/Lot coverage proposed	N/A	% of lot area

ZONING

Existing	
Proposed, if applicable	

LAND USE

Existing	
Proposed	

RESIDENTIAL, IF APPLICABLE

Existing Number of Residential Units	
Proposed Number of Residential Units	
Subdivision, Proposed Number of Lots	

PARKING SPACES

Existing Number of Parking Spaces	
Proposed Number of Parking Spaces	
Number of Handicapped Parking Spaces	
Proposed Total Parking Spaces	

ESTIMATED COST OF PROJECT

DELEGATED REVIEW AUTHORITY CHECKLIST

SITE LOCATION OF DEVELOPMENT AND STORMWATER MANAGEMENT

Existing Impervious Area	53,301	sq. ft.
Proposed Disturbed Area	156,469	sq. ft.
Proposed Impervious Area	80,406	sq. ft.

1. ***If the proposed disturbance is greater than one acre, then the applicant shall apply for a Maine Construction General Permit (MCGP) with MDEP.***
2. ***If the proposed impervious area is greater than one acre including any impervious area crated since 11/16/05, then the applicant shall apply for a MDEP Stormwater Management Permit, Chapter 500, with the City.***
3. ***If total impervious area (including structures, pavement, etc) is greater than 3 acres since 1971 but less than 7 acres, then the applicant shall apply for a Site Location of Development Permit with the City. If more than 7 acres then the application shall be made to MDEP unless determined otherwise.***
4. ***If the development is a subdivision of more than 20 acres but less than 100 acres then the applicant shall apply for a Site Location of Development Permit with the City. If more than 100 acres then the application shall be made to MDEP unless determined otherwise.***

TRAFFIC ESTIMATE

Total traffic estimated in the peak hour-existing (Since July 1, 1997) 0 passenger car equivalents (PCE)

Total traffic estimated in the peak hour-proposed (Since July 1, 1997) 18 passenger car equivalents (PCE)

If the proposed increase in traffic exceeds 100 one-way trips in the peak hour then a traffic movement permit will be required.

Zoning Summary

1. Property is located in the Low Density Rural Residence District zoning district.
2. Parcel Area: 14.77 acres / _____ square feet(sf).

Regulations	Required/Allowed	Provided
Min Lot Area	43,560 sq. ft.	/
Street Frontage	250 ft.	/
Min Front Yard	25 ft.	/
Min Rear Yard	25 ft.	/
Min Side Yard	15 ft.	/
Max. Building Height	35 ft.	/
Use Designation	Residential	/
Parking Requirement	1 space/ per N/A square feet of floor area	
Total Parking:	N/A	/
Overlay zoning districts (if any):	N/A	/ /
Urban impaired stream watershed?	YES/NO If yes, watershed name	N/A

DEVELOPMENT REVIEW APPLICATION SUBMISSION

Submissions shall include fifteen (15) complete packets containing the following materials:

1. 5 Full size plans and 10 smaller (no larger than 11" x 17") plans containing the information found in the attached sample plan checklist.
2. Application form that is completed and signed by the property owner or designated representative. (NOTE: All applications will be reviewed by staff and any incomplete application will be not be accepted until all deficiencies are corrected.
3. Cover letter stating the nature of the project.
4. All written submittals including evidence of right, title and interest.
5. Copy of the checklist completed for the proposal listing the material contained in the submitted application.

Refer to the application checklist for a detailed list of submittal requirements.

L/A's development review process and requirements have been made similar for convenience and to encourage development. Each Citys ordinances are available online at their prospective websites:
Auburn: www.auburnmaine.org under City Departments/ Planning and Permitting/Land Use Division/Zoning Ordinance
Lewiston: http://www.ci.lewiston.me.us/clerk/ordinances.htm Refer to Appendix A of the Code of Ordiances

I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, I certify that the City's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.

This application is for development review only; a Performance Guarantee, Inspection Fee, Building Permit Application and other associated fees and permits will be required prior to construction.

Signature of Applicant:	**Date:** **November 10, 2017**

Bk 8997 Ps44 #16385
09-18-2014 @ 10:57a

Warranty Deed

Inez Buck of Auburn, Androscoggin County, Maine, **Nancy D. McNeill** of Portland, Cumberland County, Maine and **Judith D. Davis (f/k/a Judith D. Davis-Kovats)** of The Villages, Sumter County, Florida, for consideration paid, grant to **B & M Developers, Inc.**, a Maine corporation with a mailing address of 195 Center Street, Auburn, Androscoggin County, Maine, with **Warranty Covenants**, certain lots or parcels of land, with any buildings thereon, situated in Auburn, Androscoggin County, Maine, bounded and described as follows, to wit:

Parcel 1: A certain lot or parcel of land situated in said Auburn, and being all and the same premises conveyed to Sarah B. Martin and Jarius Martin by Daniel Guptil and Alpheus Rollins as will appear by their deed of warranty dated June 13, 1881, and recorded in the Androscoggin County Registry of Deeds in Book 103, Page 516.

Also a certain other parcel of land situated in said Auburn containing thirty (30) acres, more or less, and being all and the same premises described in a certain deed of quitclaim from Samuel A. Robinson to Jarius Martin dated June 11, 1881, and recorded in said Registry in Book 102, Page 205, and which parcel is also described in another deed from Joseph F. Hammond, Administrator with the Will annexed of the Estate of Clarissa A. Smith to said Jarius Martin dated June 13, 1881, and recorded in said Registry in Book 104, Page 254, to all of which deeds and their respective records, reference is hereby made for a further description and identification of the premises hereby conveyed.

MAINE REAL ESTATE
TRANSFER TAX PAID

Parcel 2: A certain lot or parcel of land abutting the northerly line of Woodbury Hill Road (also referred to as Woodbury Road and Old Danville Road) in the City of Auburn, County of Androscoggin, State of Maine, more particularly described as follows:

All of the following described land which lies northerly of said Woodbury Hill Road as now laid out:

The land described in a deed from Shirley D. Schneider to Gilman R. Drinkwater et al. dated August 27, 1974, recorded in the Androscoggin County Registry of Deeds in Book 1121, Page 82.

Parcel 3: A certain lot or parcel of land being essentially triangular in shape and located on the northwesterly side of the Woodbury Road in Auburn, County of Androscoggin, State of Maine, and being also described as Lot 15 on Tax Map 2C on the Assessor's maps.

For source of title to the above described premises, reference should be made to (a) a Release Deed of Distribution from Nancy D. McNeill and Judith D. Davis-Kovats, Co-Personal Representatives of the Estate of Ruth A. Davis to Nancy D. McNeill and Judith D. Davis-Kovats as tenants in common dated March 9, 1995 and recorded in said Registry in Book 3393, Page 111; (b) a Release Deed from Roy C. Buck and Inez D.

Buck to Roy C. Buck, Inez D. Buck, Nancy D. McNeill and Judith D. Davis-Kovats, the latter two as Co-Personal Representatives of the Estate of Ruth A. Davis dated February 8, 1995 recorded in said Registry in Book 3384, Page 143; and (c) a Warranty Deed from Ruth S. Drinkwater to Ruth A. Davis, Inez D. Buck and Roy C. Buck dated November 10, 1992 recorded in said Registry in Book 2952, Page 348. In addition to the above, Roy Buck died on May 14, 1999 evidenced by Inheritance Tax Discharge recorded in said Registry in Book 4363, Pages 8 and 9, and Ruth Davis died on September 3, 1994, whose probate is on file in the Androscoggin County Registry of Probate under Docket #94-427.

In Witness Whereof, the Grantors have set their hands and seals effective this 15th day of September, 2014.

K. Alexander Visbaras
Witness

Inez Buck
Inez Buck

AS TO BOTH
Witness

Nancy D. McNeill
Nancy D. McNeill

Robert F. LeBlanc
Witness

Judith D Davis
Judith D. Davis

State of Florida
County of Sumter, SS.

September 12, 2014

Then personally appeared the above-named **Judith D. Davis (f/k/a Judith D. Davis-Kovats)** and acknowledged the foregoing instrument to be her free act and deed.

VICKI K. BRESLIN
Notary Public - State of Florida
My Comm. Expires Oct 20, 2017
Commission # FF 031327
Bonded Through National Notary Assn.

Before me,

Vicki K Breslin
Notary Public: Vicki K Breslin
My Commission Expires: Oct 20, 2017

State of Maine
Androscoggin, SS.

September 15, 2014

Then personally appeared the above-named **Inez Buck** and **Nancy D. McNeill** and acknowledged the foregoing instrument to be their free act and deed.

Before me,

K. Alexander Visbaras
K. Alexander Visbaras, Attorney-At-Law

:odh: H:\Clients\B&M Builders\113 Woodbury Road Auburn\Deed

ANDROSCOGGIN COUNTY
TINA M CHOUINARD
REGISTER OF DEEDS

Purchase and Sale Agreement

Agreement made effective this 5th day of October, 2017 by and between **Cynthia A. St. Hilaire**, with an address of _____ (hereafter "Seller"), and **WCB LLC,** a Maine limited liability company with a mailing address of 32 Woodbury Road, Auburn, Maine 04210, or any other related entity selected by WCB LLC to take title to the property identified in this Agreement (collectively hereafter "Buyer").

Whereas, Seller is the current owner of a certain lot or parcel of real estate located in Auburn, Androscoggin County, Maine, depicted as Lot 2 on a subdivision plan entitled "Amended Norwood Subdivision" recorded in the Androscoggin County Registry of Deeds in Plan Book 43, Page 42, and being a portion of the property acquired by Seller by deed recorded in said Registry in Book 3910, Page 172; and

Whereas, Seller has offered to sell a portion of said Lot 2 (as defined hereafter) to Buyer (said portion of Lot 2 to be sold to Buyer hereafter referred to as the "Property"), and

Whereas, Buyer has agreed to purchase the Property from Seller under certain terms and conditions, which are the purposes of this Agreement to recite.

Now Therefore, in consideration of the mutual covenants and promises hereinafter set forth, Buyer and Seller hereby mutually agree as follows:

1. **Purchase Price and Methods of Payment.** Buyer shall purchase the Property from Seller for a purchase price of One Hundred Twenty Thousand and 00/100 Dollars ($120,000.00), which shall be paid as follows: (a) An earnest money deposit of Sixty Thousand and 00/100 Dollars ($60,000.00) in immediately available United States funds shall be paid to Seller upon execution of this Agreement until closing or until refunded to Buyer under the terms of this Agreement, and (b) the balance of Sixty Thousand and 00/100 Dollars ($60,000.00) to be paid by Buyer to Seller in immediately available United States funds at closing.

2. **Buyer Financing.** Buyer's obligations hereunder are not contingent upon Buyer obtaining Property acquisition financing prior to closing.

3. **Property Condition and Seller's Retained Lot.** Buyer's obligations hereunder are contingent upon Buyer, at Buyer's sole cost and expense, obtaining a satisfactory boundary survey of the Property consistent with Buyer's intended purposes for the Property. Buyer will seek to have the survey performed as soon as practicable, but no later than the closing date under this Agreement. If the survey is not performed by Buyer prior to the closing date, this contingency shall be deemed waived, null, void and of no further effect. Buyer and Seller shall further, cooperatively and in conjunction with Buyer's survey due diligence above, designate by a metes and bounds legal description satisfactory to both Seller and Buyer a portion of said Lot 2 to be retained by Seller, with approximately 387 feet of road frontage on Danville Corner Road and approximately 340 feet of road frontage on Old Danville Road. The side and rear lines of Seller's retained parcel, and final road frontage dimensions of said

parcel, shall be determined by survey prior to closing and agreed to by Seller and Buyer. The parcel to be retained by Seller shall be in full compliance with the dimensional requirements established by the City of Auburn Zoning and Land Use Ordinance, and shall be excluded from the deed of the Property from Seller to Buyer at closing. At any time while this Agreement is in effect, Buyer shall have the right to cut down any trees on the Property, as determined solely by Buyer, at no cost to Seller and without the payment of any additional consideration to Seller. Seller agrees that she shall have no claim whatsoever to the stumpage resulting from this cutting and shall not assert any claim against Buyer for any activities on the Property resulting from said cutting.

4. Title. Buyer will within twenty (20) calendar days measured from the effective date of this Agreement perform a title search on the Property prior to closing to determine whether the Property is marketable under the title standards adopted by the Maine State Bar Association and insurable with a reputable title insurance company authorized to do business in the State of Maine. Buyer shall be solely responsible for all costs and premiums due from any title examination or title insurance policy. In the event the Property is both not marketable and not insurable as set forth above, Seller shall have sixty (60) days from the date Buyer notifies Seller of those defects in title rendering the Property unmarketable and uninsurable to remedy said defects. In the event said defects are so remedied by Seller, this contingency shall be deemed null, void and of no further effect. In the event said defects cannot be so remedied, whether within the above noted time frame or any extension thereof which may be mutually agreed between Seller and Buyer, then this Agreement shall terminate, Buyer's earnest money deposit shall be immediately refunded in full to Buyer, and the parties hereto shall have no further obligations between them hereunder.

5. Closing. The closing shall take place at the office of Buyer's counsel, Visbaras Law, LLC, 195 Center Street, Auburn, Maine or by other means or other location mutually agreed upon by Buyer and Seller, on or before March 30, 2018, unless either closed earlier or extended by mutual written agreement between Buyer and Seller.

6. Tax Relief. If Seller's interest in the Property has received any temporary tax relief in the form of deferred, reduced or abated taxes, reduced assessments or like benefits from any governmental authority, which benefits shall require the payment to any governmental authority of any such deferment, abatement or reduction or any penalty resulting from the sale of either of said interests to Buyer, then any such payment or penalty shall be the responsibility of Seller, which sums shall be paid at closing.

7. Tax Proration. Buyer and Seller mutually agree that any and all real estate taxes, assessments and charges relating to the Property will be prorated at closing, but based only upon the tax liability attributable to Property itself and not that portion of Lot 2 to be retained by Seller.

8. **Post Closing Possession.** Buyer shall have full and unimpeded possession of the Property immediately after closing.

9. **Risk of Loss.** The risk of loss or damage to the Property, until closing, is assumed by and shall remain with Seller until closing. Seller shall convey the Property to Buyer in substantially the same condition as of the date of this Agreement at closing. The risk of loss to the Property shall rest solely with Buyer after closing.

10. **Insurance.** Seller shall maintain all current casualty and/or liability insurance policies on the Property up to the date of closing. After closing, all said insurance responsibilities shall rest with Buyer.

11. **Authorizations.** Buyer and Seller represent, each to the other, as applicable, that (a) they have full power and authority to enter into this Agreement and to consummate fully the transactions contemplated herein; (b) this Agreement has been duly executed and delivered by each of them and constitutes their valid and legally binding obligation, enforceable against them in accordance with its terms; and (c) the execution, delivery and performance of this Agreement will not conflict with, or result in a breach of, any of the terms, covenants and provisions of any writ, judgment, injunction or decree of any court or governmental authority or any agreement or instrument to which either party is or may be bound. Each party shall execute and deliver to the other party such other documents with respect to the transaction contemplated hereby as such party shall reasonably request.

12. **Costs.** Buyer and Seller mutually agree that Seller shall be responsible for the cost of preparing the deed conveying the Property to the Buyer and the associated Maine Real Estate Transfer Tax Declaration, along with Seller's own attorney's fees. Seller shall also be solely responsible for any Maine Real Estate Withholding Tax due at closing, if said tax is applicable to Seller. Buyer shall be responsible for the preparation of this Agreement, all other costs of closing, title insurance premiums and Buyer's own attorney's fees. Buyer and Seller shall each be responsible for their statutory share of Maine Real Estate Transfer Tax associated with this sale. Seller agrees to execute all reasonable title insurance documents that may be necessary for Buyer to obtain title insurance on the Property

13. **Real Estate Commissions and Fees.** Buyer and Seller each represent and warrant to the other that they have not dealt with any brokers, finders, or intermediaries of any kind in connection with this transaction. Buyer and Seller do hereby indemnify and agree to hold the other harmless from and against any or all claims, demands, losses, liabilities, fees, commissions, damages and expenses, including but not limited to, attorneys fees and court costs in connection with any claim for commissions, fees, compensation or other charges relating in any way to this transaction, or the consummation thereof which may be made by any other person, firm or entity based on any actual or alleged stated facts inconsistent or at variance with the representations or warranties contained in this Paragraph.

14. Default. In the event of a default by Buyer under this Agreement, Seller's sole remedy shall be retention of Buyer's earnest money deposit. In the event of a default by Seller under this Agreement, Buyer shall have all remedies available to Buyer under Maine law, including but in no way limited to an action for specific performance of this Agreement by Seller.

15. Entire Agreement. This instrument constitutes the entire Agreement between Buyer and Seller concerning the sale of the Property to Buyer. Buyer and Seller shall not be bound by any terms, conditions, statements, or representations, oral or written, not contained herein. Buyer and Seller hereby acknowledge that in executing this Agreement they have not been induced, persuaded or motivated by any promise or representation made by any other party, unless expressly set forth herein. All previous negotiations, statements, representations and preliminary instruments by Buyer and Seller or their respective representatives are merged in their entirety into this instrument. No modification of this Agreement shall be valid or binding unless such modification is in writing, duly dated and signed by Buyer and Seller.

16. Time Of Essence. As used herein, time is of the essence in this Agreement.

17. Governing Jurisdiction. This Agreement is made in and shall be construed and governed in accordance with the laws of the State of Maine.

18. Assignment and Binding Effect. This Agreement shall be binding upon and inure to the benefit of the parties hereto; however, this Agreement and any of the terms hereof shall not be assigned to any other person or entity.

In Witness Whereof, Buyer and Seller have hereunto executed this Agreement establishing an effective date of October 5, 2017, without regard to the actual date this Agreement is signed by Seller and Buyer.

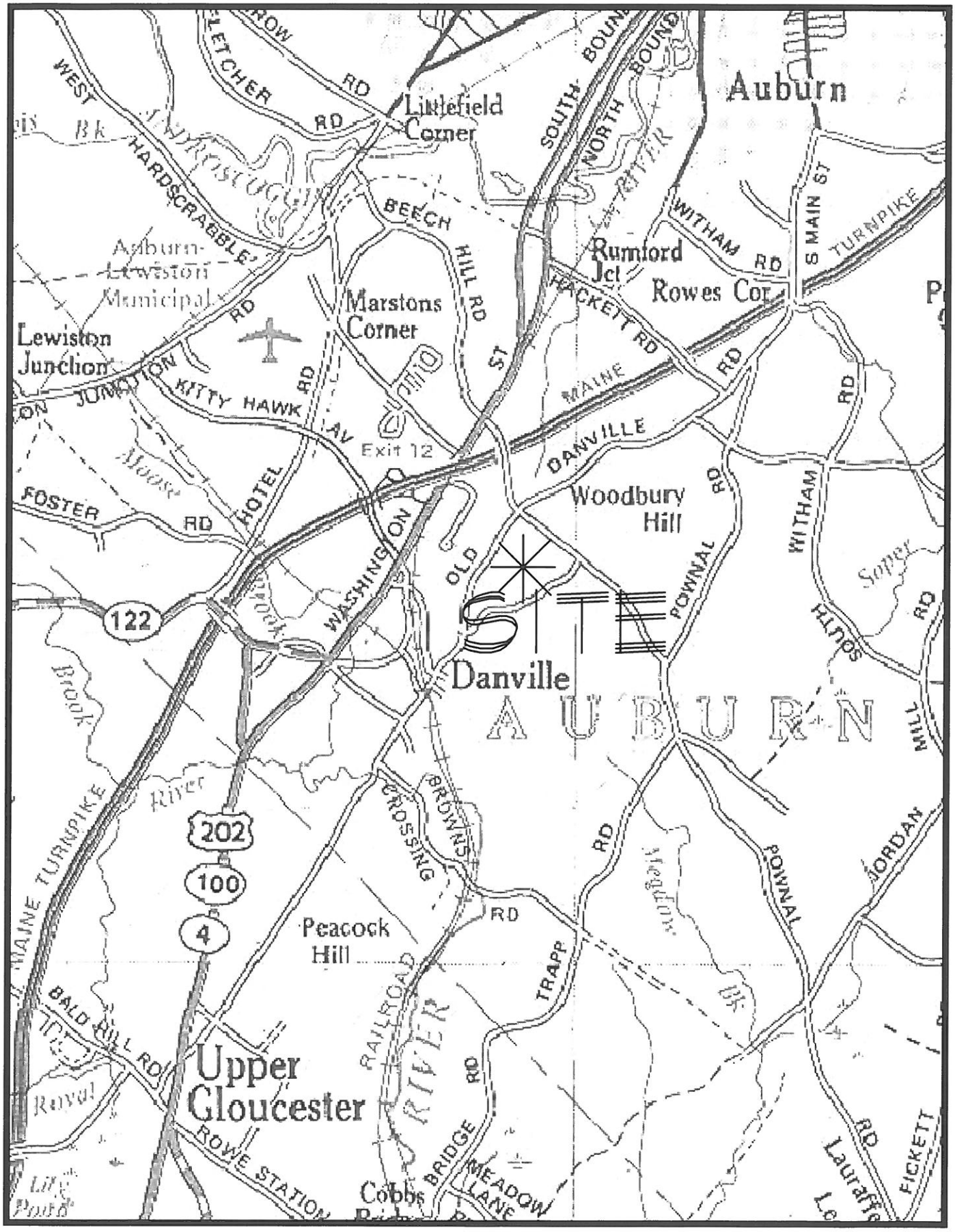
_____ _____

Witness **Cynthia A. St. Hilaire**, Seller

_____ _____

Witness **WCB LLC**, Buyer
By: Kyle Bouffard, Duly Authorized Member

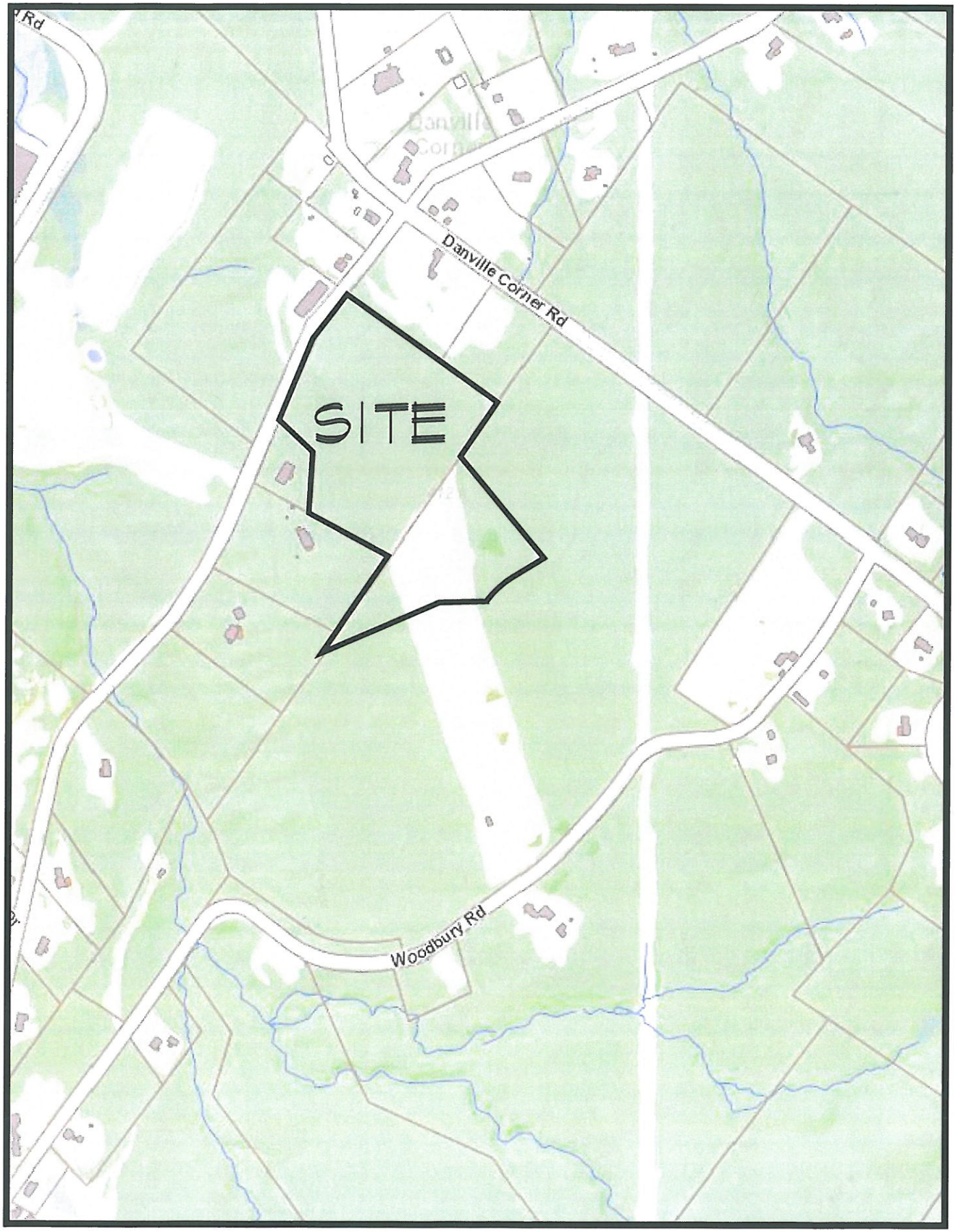
LOCATION MAP



SOURCE : DELORME "MAINE ATLAS & GAZETTEER"
(NOT TO SCALE)

prepared by
CADmaster Drafting
& Septic Design

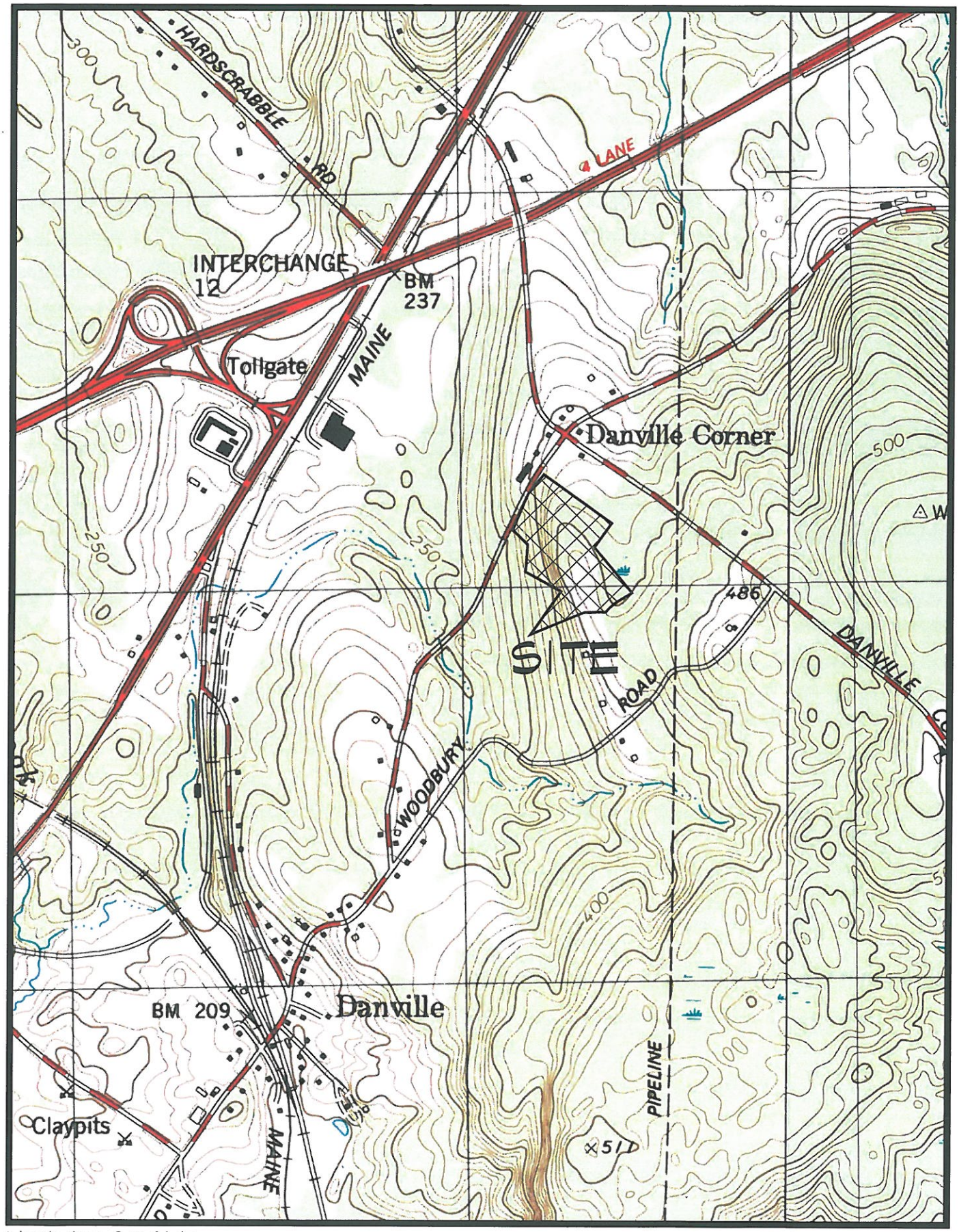
TAX MAP



SCALE : NOT TO SCALE
SOURCE : CITY OF AUBURN TAX MAP NO. 110

prepared by
CADmaster Drafting
& Septic Design

U.S.G.S. CONTOUR MAP



NOT TO SCALE
SOURCE : AUBURN
(7.5 MINUTE QUADRANGLES)

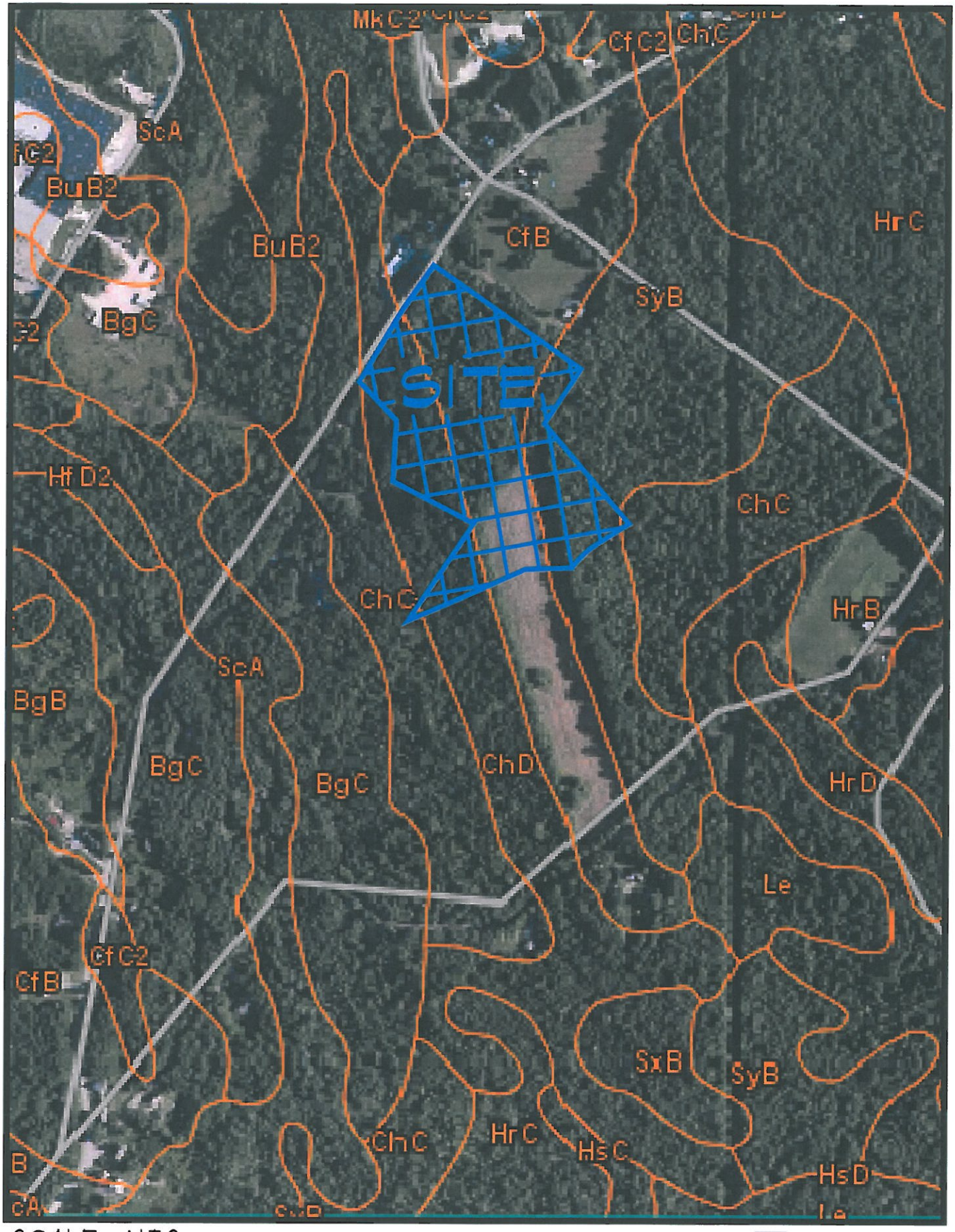
prepared by
CADmaster Drafting
& Septic Design

FLOOD MAP

NOT TO SCALE
FLOOD INSURANCE RATE MAP
TOWN OF SABATTUS PANEL 5 OF 10

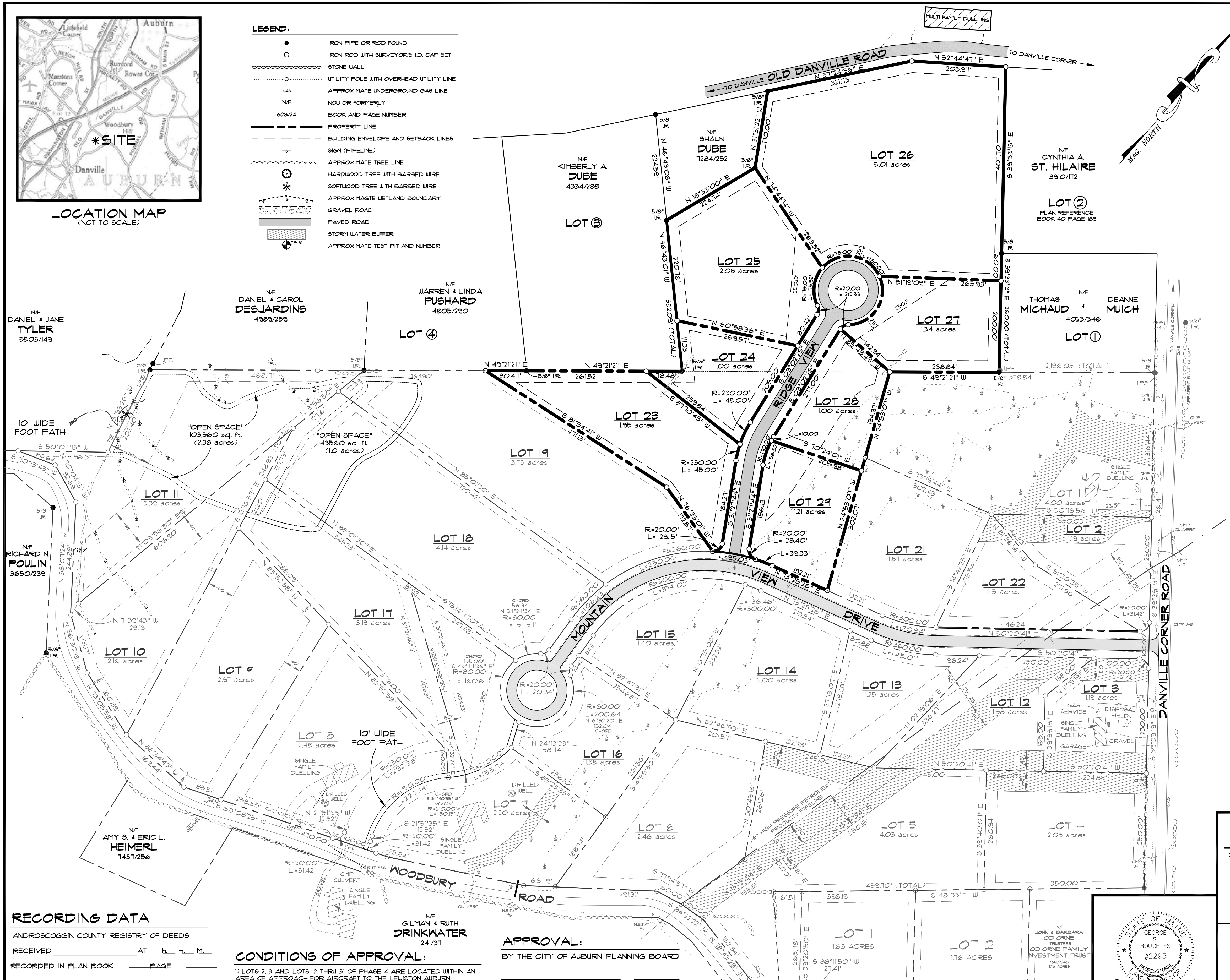
prepared by
CADmaster Drafting
& Septic Design

SOILS MAP



SCALE : N.T.S.
SOURCE :WEB SOILS SURVEY
ANDROSCOGGIN COUNTY

prepared by
CADmaster Drafting
& Septic Design


LOCATION MAP
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SITE
LEGEND:
IRON PIPE OR ROD FOUND
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STONE WALL
UTILITY POLE WITH OVERHEAD UTILITY LINE
APPROXIMATE UNDERGROUND GAS LINE
N/F NOW OR FORMERLY
628/24 BOOK AND PAGE NUMBER
PROPERTY LINE
BUILDING ENVELOPE AND SETBACK LINES
SIGN (PIPELINE)
APPROXIMATE TREE LINE
HARDWOOD TREE WITH BARBED WIRE
SOFTWOOD TREE WITH BARBED WIRE
APPROXIMATE WETLAND BOUNDARY
GRAVEL ROAD
PAVED ROAD
STORM WATER BUFFER
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DANVILLE CORNER ROAD
MOUNTAIN VIEW DRIVE
RIDGE VIEW
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"OPEN SPACE" 103,560 sq. ft. (2.38 acres)
"OPEN SPACE" 43560 sq. ft. (1.0 acres)
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N/F SHAWN DUBE 7284/252
N/F CYNTHIA A. ST. HILAIRE 3910/172
N/F THOMAS MICHAUD & DEANNE MUICH 4023/346
N/F WARREN & LINDA PUSHARD 4805/290
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N/F DANIEL & JANE TYLER 5503/149
N/F RICHARD N. POULIN 3650/239
N/F AMY S. & ERIC L. HEIMERL 7437/256
N/F GILMAN & RUTH DRINKWATER 1241/37
HIGH PRESSURE PETROLEUM PRODUCTS PIPELINE
MULTI FAMILY DWELLING

NOTES:

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C) MINIMUM FRONT AND REAR YARD SETBACK = 25'
D) MINIMUM SIDE YARD SETBACK = 15'
F) MAXIMUM HEIGHTS = 35'

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12) THIS PLAN WAS PREPARED UNDER THE DIRECT SUPERVISION OF GEORGE S BOUCHLES, PLS 2295.

REDUCTION

SCALE : 1" = 100'

0 50' 100' 200' 300' 400'

RECORDING DATA

ANDROSCOGGIN COUNTY REGISTRY OF DEEDS

RECEIVED ______________ AT ___ h. ___ M.

RECORDED IN PLAN BOOK _____ PAGE _____

ATTEST ______________

REGISTRAR

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APPROVAL:

BY THE CITY OF AUBURN PLANNING BOARD

CHAIRMAN: ______________ DATE: ______

PRELIMINARY MAJOR SUBDIVISION PLAN

WOODBURY HEIGHTS - PHASE 4

OLD DANVILLE ROAD & MOUNTAIN VIEW DRIVE - AUBURN, MAINE

ANDROSCOGGIN COUNTY

OWNERS OF RECORD AND PREPARED FOR

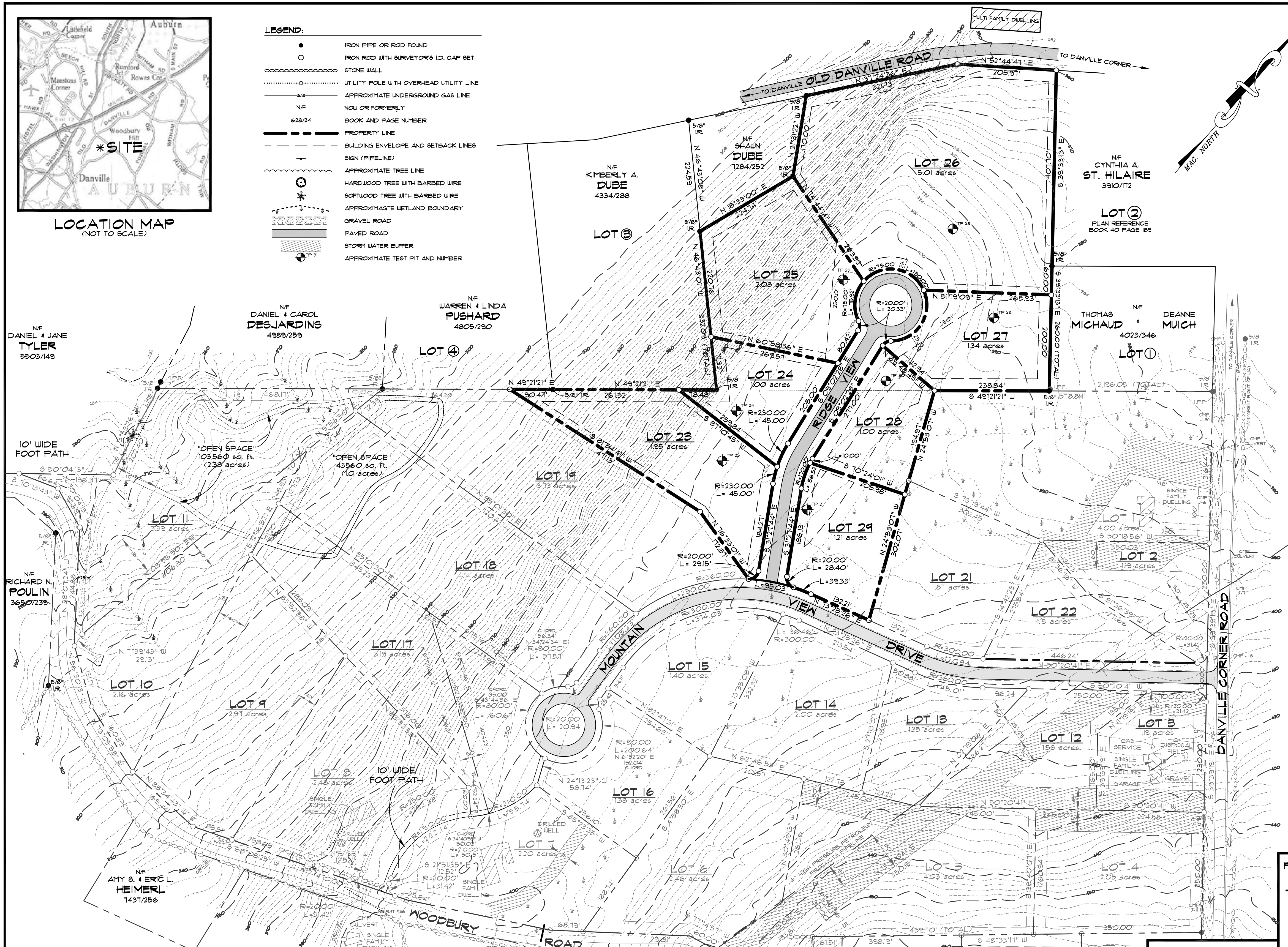
B&M DEVELOPERS, INC.

DANVILLE CORNER ROAD - AUBURN, MAINE 04210

STATE OF MAINE
GEORGE S. BOUCHLES
#2295
PROFESSIONAL LAND SURVEYOR

prepared by
CADmaster Drafting,
Land Surveying & Septic Designs
191 Madison St. - Auburn, ME 04210
tel/fax = 689-3232 cell=240-3567

PLAN DATE: NOVEMBER 6, 2017	SCALE: 1" = 100'	SHEET
JOB NUMBER: 14-060	CADD: 14-060PHASE4.DWG	1 OF 2


LOCATION MAP
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N/F CYNTHIA A. ST. HILAIRE 3910/172
LOT ② PLAN REFERENCE BOOK 40 PAGE 189
LOT ③
LOT ④
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MAG. NORTH

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SCALE : 1" = 100'

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STATE OF MAINE
GEORGE S. BOUCHLES
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PRELIMINARY MAJOR SUBDIVISION AND TOPOGRAPHIC PLAN

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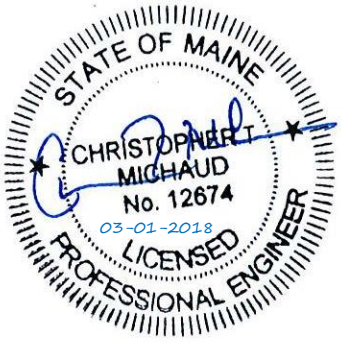
PLAN DATE: NOVEMBER 6, 2017	SCALE: 1" = 100'	SHEET
JOB NUMBER: 14-060	CADD: 14-060PHASE4.DWG	2 OF 2

CES INC Engineers ◆ Environmental Scientists ◆ Surveyors

MEMO



To: Zach Mosher, City of Auburn Planner

From: Christopher Michaud, P.E., Project Engineer

RE: Peer Review Response of Danville Road Subdivision | Auburn, Maine

Date: March 1, 2018

CES, Inc. (CES) has addressed the Peer Review comments provided by Woodward and Curran for the proposed Danville Road Subdivision located West of Danville Corner Road in Auburn, Maine.

The comment provided by Woodard & Curran is shown in italics, followed by the response from CES in bold.

MDEP CHAPTER 500 GENERAL STANDARD

Based on the Stormwater Treatment Plan, it does not appear that driveways have been considered in the treatment calculations; the Applicant should clarify and make sure that provisions have been included for the treatment of driveways.

The client has provided CES with impervious lot areas of approximately 3,000 SF per lot. This area includes the footprint of both a residence and driveway. Treatment for driveways are therefore accounted for in the sizing calculations and HydroCAD model but locations have not been shown on the plans. Language has been added to Stormwater Management Narrative, General Submission section to provide clarity.

It appears that the Applicant is proposing Buffers along the frontage of several residential lots, such as Lots 3, 12, 21, and 22. The Applicant should clarify how access will be provided to these lots without disturbing the proposed Buffer areas, and provide plans showing the locations of all proposed driveway entrances.

Aerial photography shows that the entrance to Lot 3 intersects Danville Corner Road. The driveway to Lot 12 is proposed on the upgradient side of the proposed buffer and is not expected to interfere with the buffer's location. A section of buffer has been removed as a part of the revised Stormwater Management Plan to account for intersecting driveways to Lots 21 and 22. Please see Sheet C700.

Seven Locations in Maine | www.ces-maine.com

465 South Main Street
PO Box 639
Brewer, Maine 04412
T 207.989.4824
F 207.989.4881

A subsurface evaluation should be conducted by a soil scientist to determine the condition of soils throughout the proposed buffers.

Multiple test pits have been performed throughout the area of proposed treatment buffers for septic designs. The Site Evaluator has verified that the subsurface conditions on these locations reveal soils of Hydraulic Soil Group C. Please see the enclosed letter prepared by George Bouchles, SE, detailing these findings.

Areas designated as Buffers must be protected from disturbance by deed restrictions and covenants. The Applicant should provide draft documents for review and approval by the City.

Suggested templates for deed restrictions, prepared by the MDEP, have been included with the revised Stormwater Management Narrative for the Applicants use.

The Post-Construction Inspection and Corrective Action Section of the Stormwater Management Narrative should be revised to include the maintenance requirements for Buffers.

The Stormwater Management Narrative has been revised to include maintenance requirements for Vegetative Buffers.

Subsurface explorations (test pits or borings) should be made within the bioretention cell basin area to identify depths to seasonal high groundwater and bedrock.

As an alternative to performing test pits or borings to determine ground water depths and bedrock, CES, Inc. has advised the client that bioretention cells must be lined with a 20 mil geomembrane to mitigate the requirement for separation between the cell and groundwater or bedrock. No bedrock has been encountered to date. Please refer to the Bioretention Cell Detail on Sheet C501.

The surface area of the filter must be no less than 7% from the impervious area and 3% from the landscaped area draining to the filter; calculations demonstrating conformance to this requirement should be provided.

The narrative has been updated to show the filter area sizing requirement in relation to the 7% of impervious area and 3% of landscaped area.

The size of a bioretention bed should not exceed 2000 sq. ft. in basin bottom area or have more than one acre of subwatershed draining to the structure, as larger sizes are difficult to construct and maintain. All of the proposed bioretention cells do not comply with either of these standards.

The City of Auburn has reviewed the sizing of the bioretention cells as previously submitted and has determined that they are acceptable.

The Bioretention Cell Detail shall be updated to specify underdrain bedding equal to MaineDOT 703.22 Type B material, or alternatively, a 6-inch coarse gravel layer should be added above the crushed stone underdrain bedding.

The Bioretention Cell detail on Sheet C501 has been updated to include a 6-inch layer of coarse gravel above the crushed stone underdrain bedding.

Pretreatment devices such as a grassed swale, grass or meadow filter strip and sediment trap should be provided to minimize the discharge of sediment to the bioretention filter basin. A rock forebay is recommended to reduce flow velocity into the basin. Pretreatment structures should be sized to hold an annual sediment load calculated using a sand application rate of 50 cubic feet per acre per year for sanding of the pavement surface within the basin's subcatchment area.

The flow path to proposed bioretention filter basins will be grassed lawns or grassed ditches to mitigate the discharge of sediment to basin entrances. A note with this statement has been added to Sheet C700. Additionally, a requirement for stone check dams as biocell entrances has been noted on Sheet C700. A more detailed design of bioretention cells and supporting check dams can be provided with the preparation of construction documents.

The soil filter surface should be planted with plants that are tolerant of well drained soils and frequent inundation. Native plants should be chosen for their tolerance to urban runoff, moisture fluctuation, pollutant loading, light amount, temperature and ph. Based upon the expected full-grown size of the plant, the plants' spacing should be no more than 18 inches to 3 feet on center. A landscape planting plan should be provided for each bioretention cell.

A note has been added to the Bioretention Cell Detail on Sheet C501 that proposed plantings shall be in accordance with MDEP Storm Management BMP's.

A proper layout of the pipe underdrain system is necessary to effectively drain the entire filter area. The pipes should be spaced no further than 15 feet apart and should have a positive gradient. More detailed design plans of the proposed bioretention cells showing the underdrain layout should be provided.

Please refer to Bioretention Cell Detail on Detail Sheet C501 where a note identifying underdrain pipe spacing has been included. Based on previous projects permitted through the City of Auburn, a detailed design for bioretention cells has not been required at the time of permit application submission. More detailed design information can be provided through the construction design process.

At least 4 inches of material should be provided above and beneath the underdrain pipe; the bioretention cell detail should be revised to specify this requirement.

The previously submitted bioretention cell detail has been updated to identify 4-inches of material above and below proposed underdrain pipes.

The 18" Mulch Layer in the bioretention cell detail should be revised to comply with the Soil Filter Bed material requirements.

The Bioretention Cell Details has been revised to reflect the most recent MDEP Bioretention Cell detail.

MDEP CHAPTER 500 FLOODING STANDARD

The Applicant has proposed bioretention cells to attenuate flows. However, the proposed project will result in an increase in peak discharge for the two and ten-year storm events at Summation Points 2 and 3 (abutting properties). The Applicant should revise and resubmit the stormwater management plan to demonstrate compliance with the City Code.

Because the proposed development does not exceed three acres of impervious surface or 20 acres of developed area, the stormwater quantity portion of Section 46-209(a)(3)a of the City of Auburn Ordinance does not apply. However, the development does require a MDEP Site Law permit due to the number of lots in the subdivision, so the development does need to follow the Flooding Standard section of the MDEP Chapter 500 Rules. In accordance with those rules, we are requesting the following waiver for an insignificant increase in peak flow rates.

The Applicant has requested a waiver to the Chapter 500 Flooding Standard per Chapter 500 Section 4.F.3.b Insignificant increases in peak flow rates from a project site. The proposed development results in insignificant (less than 1 cfs) increases in peak flow rates at two of the summation points for the 2 and 10- year storm events. Peak flow rates are decreased at all summation points for the 25-year storm event. Both summation points where insignificant increases occur have long sections of flow through undeveloped areas of the property. One is through a long wetland area that drains to Danville Corner Road. The other flows through a long section of open space in a southwesterly direction toward Woodbury Hill Road. There are no areas where flow is designed to be concentrated onto adjacent properties. Any areas of concentrated flow within the proposed development will be converted to sheet flow through buffers before entering the undeveloped portions of the site.

We are not aware of any downstream flooding that occurs at these summation points and do not believe that the development will unreasonably increase the extent, frequency, or duration of flooding at downstream flow controls and conveyance structures. We also do

not believe that the insignificant increase will have an unreasonable adverse effect on protected natural resources. Additional stormwater controls to mitigate such a small increase in peak flows are not practical for this development.

The HydroCAD Reports indicate that the proposed project will result in an increase of approximately 2.5 acres of impervious area; however, the stormwater narrative indicates an increase of approximately 3.5 acres. The Applicant should clarify this discrepancy and submit revised calculations that are consistent for both the Flooding and General Standards.

Upon internal review, it was determined that when cross-referencing the total impervious area between the HydroCAD model and the Stormwater Management Narrative, the Impervious Area Treated for the Linear Portion and Site work were added together. However, the summary of impervious area for site work includes treatment of existing impervious treating by buffers previously permitted through by the City of Auburn. Language has been added to the Stormwater Management Narrative to clarify this discrepancy and the tables have been fixed accordingly.

The Post-Development Stormwater Plan notes that the area of subcatchments 2 and 4 shall be "regarded" such that the flow is towards Skyline Drive; however, the provided topography indicates that runoff will flow away from Skyline Drive. The Applicant should clarify whether this area is intended to be "re-graded" and provide an appropriate Grading Plan that shows the proposed contours. Additionally, the Applicant should clarify how Biocell 3 discharges to Summation Point 1, and how Biocell 1 and 2 discharge to Summation Point 2 and provide an appropriate drainage plan that shows all proposed drainage infrastructure.

Detailed grading of this area has been provided as a part of this revision. Please see attached Sheet C700.

It is unclear what the flood elevation and emergency spillway provisions of the bioretention cells are. The Applicant should clarify and provide more detailed plans of the proposed bioretention cells.

An overflow structure has been proposed for each bioretention cell. Overflow structure elevations can be found in the Bioretention Cell Elevations Table on Sheet C501. Based on projects previously permitted through the City of Auburn, a more detailed design can be provided with the preparation of construction design documents.

The "treatment area provided" and "treatment volume provided" specified in the Bioretention Cell Detail do not agree with the HydroCAD model (for Biocell 1 the surface area and volume in the model is greater than those specified on the detail). The Applicant should clarify and ensure that the model is consistent with the design plans.

The bioretention cells have been sized to provide the required treatment, but also to detain stormwater runoff, so in the HydroCAD model, they are shown as larger.

GENERAL ENGINEERING

It appears that an easement associated with High Pressure Petroleum Products Pipeline may cut through the proposed development; the Applicant should clarify.

An easement for the High Pressure Petroleum Products Pipeline does exist, as the pipeline passes through the Applicant's property. Please refer to the Subdivision Plan for easement location.

The Applicant should clarify whether any wetland impacts are anticipated to result from the proposed development and the status of permits from the MaineDEP for work adjacent to natural resources.

The appropriate permits have been obtained through the MDEP regarding wetlands on the site.

DANVILLE ROAD SUBDIVISION
STORMWATER MANAGEMENT NARRATIVE
AUBURN, MAINE

STORMWATER MANAGEMENT NARRATIVE

This Stormwater Management Plan is for the Danville Road and Woodbury Heights Subdivision and is in accordance with the Maine Department of Environmental Protection (MDEP) Chapter 500 rules. This project will create a total of approximately 63,206 square feet of new impervious roadway surface and 78,685 square feet of landscaped area. As the development is a subdivision road project, it is defined as a linear project and is therefore only required to treat 75% of new impervious and 50% of disturbed area for that portion. For the on-lot development portion of the project we are required to treat 95% of new impervious area and 80% of the developed area. Portions of the project have been developed with residences, which have been taken into account with the calculations. Lots that have not yet been developed have been assigned a developed area footprint for treatment and quantity calculation purposes. We are proposing to utilize buffers and bioretention cells to provide the required treatment for the project.

BASIC STANDARD SUBMISSION

Information is provided as required for the Basic Standard Submission, which addressed both temporary and permanent erosion and sedimentation controls.

A. Narrative. The proposed construction will require the implementation of temporary and permanent erosion control measures. These measures will be implemented in accordance with the Maine Erosion and Sediment Control Best Management Practices (BMPs) Manual, prior to removal of any on site vegetation or disturbance of any on site soil. The general erosion and sediment control specifications and details, as provided within this section, are intended to describe measures to be used by contractors working on the site to maintain compliance with the standards established in the BMPs. These standards include information on temporary and permanent erosion control measures, rates of seeding and applied mulch, slope and soil stabilization, effect of construction schedule, and other details.

   The proposed location and use of erosion control measures on site are shown on the plan and profile sheets included in this application submission. There are no known existing erosion control concerns with the site. Implementation of proper erosion control measures will be required by site contractors to confine sediment and debris within the limit of soil disturbance. Proper use and maintenance of erosion control measures will provide protection against off-site transport of sediment and discharge of sediment to undisturbed areas of the development.

B. Completion Date. The schedule for the completion of the roadway is expected to be early 2018.

C. Site Features. For site features please refer to the enclosed plan.

D. Temporary and Permanent Erosion Control Measures. For temporary and permanent erosion control measures please refer to the enclosed plan.

E. Limits of Disturbed Areas. Areas of disturbance will be limited to the proposed work shown on the enclosed plan.

F. Design Drawings and Specifications. For design drawings please refer to the enclosed plan. The following specifications will be utilized by the site contractor during construction of the project.

EROSION CONTROL PLAN SPECIFICATIONS

A. General
   1. All work and measures will be as per the Maine Erosion and Sediment Control BMPs manual.
   2. The following specifications will be employed.

B. Prior to Construction
   1. Prior to any soil disturbance silt fence or filter berms will be installed.

C. During Construction
   1. Exposed soil surfaces will be treated immediately if they are to remain ungraded more than 30 days, or if they are at final grades.
   2. Drainage ways, either designed or incidental, will have filter barriers installed.
   3. All work and materials necessary to minimize sediment loss from the site will be provided.
   4. All erosion control measures will be inspected and repaired after every rainfall greater than ½-inch and at least daily during rain events lasting longer than 24 hours.

D. Post Construction
   1. Erosion control measures will be maintained until permanent soil stabilization has been achieved with a growth of vegetation greater than 90%.

SOIL PROTECTION AND EROSION CONTROL

PART 1 - GENERAL

1.01 Description of Work

A. Provide and maintain devices to control erosion, siltation, sedimentation, and dust that occur during construction operations. Undertake every reasonable precaution and do whatever is necessary to avoid erosion of soil and to prevent silting of wetland areas and drainage ditches.

B. Provide measures to control dust caused whether on or off the project site.

C. Deficiencies in erosion control measures indicated by failures or erosion will be corrected as soon as reasonably possible by providing additional measures or different techniques to correct the situation and prevent subsequent erosion.

D. Exposure of soils on embankments, excavations, and graded areas will be kept as short as possible. Initiate seeding and other erosion control practices as soon as reasonably possible.

E. Install erosion control measures in any ditch, swale, or channel before water is allowed to flow in the waterway.

1.02 Quality Assurance

A. Conform to all requirements of applicable Federal, State and local permits and conform to the recommendations of the Maine Erosion and Sediment Control BMPs (see Part B below) whether the measures are specifically noted herein, or not.

B. Standards: Maine Erosion and Sediment Control BMPs Manual, hereinafter called Erosion Control Handbook.

PART 2 - PRODUCTS

2.01 Materials: Use the following materials to implement and construct erosion control measures.

A. Hay Bale: Rectangular shaped bales of hay or straw weighting at least 40 pounds per bale; free from noxious weed seeds and rough or woody materials.

B. Mulch: Type and use as specified by the Erosion Control Handbook
   1. Long fibered hay or straw in dry condition and which are relatively free of weeds and foreign matter detrimental to plant life.
   2. Mulch netting: Plastic or nylon mesh netting with approximate openings of ¼-inch to 1-inch.

C. Permanent Seeding: Cut and fill slopes and disturbed areas will be stabilized as follows:
   1. Four inches of loam will be spread over disturbed areas and smoothed to a uniform surface.
   2. In lieu of tests, agricultural limestone will be spread at the rate of three tons per acre. 10-20-20 fertilizer will follow at the rate of 800 lbs. per acre. These two soil additives will be incorporated into the soil prior to seeding.
   3. Following seed bed preparation, back slopes will be seeded to a mixture of 83% creeping red fescue, and 17% rye grass. Seeding rate is 3 lbs. per 1,000 square feet. Lawn quality sod may be substituted for seed.

4. Hay mulch at the rate of 90 lbs. per 1,000 square feet of a hydro-application of asphalt, wood, or paper fiber will be applied following seeding. A suitable binder such as curason or terrtack will be used on hay mulch for wind control.
5. If final seeding of the disturbed areas is not completed by September 15th of the year of the construction, then on that date these areas will be graded and a cover crop of rye at the rate of 112 lbs/acre or 3 lbs/1,000 sq. ft. will be applied. The rye seeding will be preceded by an application of 3 tons of lime and 800 lbs. of 10-20-20 fertilizer or its equivalent and covered by a layer of jute mat to aide in stabilization.

D. Sediment Barriers: Prior to construction, sediment barriers will be installed downgradient of all disturbed areas. Sediment barriers will include silt fence, bark mulch berms, or additional measures which may become necessary.

Sediment barriers will also be installed adjacent to any significant natural drainage channel, not otherwise protected. All installed sediment barriers will be maintained until disturbed areas are permanently stabilized.

PART 3 - EXECUTION

3.01 Construction

A. Hay Bales:
1. Install as directed by Erosion Control Handbook, and stake with required stakes.

B. Mulch:
1. Undertake after each area has been properly prepared.
2. When seed for erosion control is sown prior to placing the mulch, place mulch on the seeded areas within 48 hours after seeding.
3. Blowing chopped mulch will be permitted.
4. Hay mulch should cover the ground enough to shade it, but the mulch should not be so thick that a person standing cannot see the ground through the mulch.
5. Remove matted mulch or bunches.

C. Temporary Erosion Control Matting (where necessary):
1. Surface Preparation:
   a. Conform to grades for slopes and ditches shown of the drawings.
   b. Finish to a smooth and even condition with all debris, roots, stones, and lumps raked out and removed.
   c. Loosen soil surface to permit bedding of the matting.
   d. Unless otherwise directed, apply seed prior to placement.

2. Installation:
   a. Place strips lengthwise in the direction of the flow of water.
   b. Where strips are laid parallel or meet as in a tee, overlap at least four inches.
   c. Overlap ends at least six inches in a shingle fashion.
   d. The up-slope end of each strip of the matting will be turned down and buried to a depth of not less than six inches with the soil firmly tamped against it.

e. Build check slots at right angles to the direction of the flow of water. Space so that one check slot or one end occurs within each 50 feet of slope length. Construct by placing a tight fold of the matting at least six inches vertically into the ground and tamp the same as up-slope ends.
f. Bury edges of matting around the edges of the catch basins and other structures.
g. Where determined by the Engineers, additional seed will be spread over matting, particularly at those locations disturbed by building the slots. Matting will then be pressed onto the ground with a light lawn roller or by other satisfactory means.
h. Drive staples vertically into the ground flush with the surface.
i. On slopes flatter than 4:1, space staples not more than three feet and one row, alternately spaced, down the center.
j. On grades 4:1 or steeper, place in the same three rows, but spaced two feet apart.

k. On all overlapping or butting edges, double the number of staples, with the spacing halved; all ends of the matting and all required check slots will likewise have staples spaced every foot.

D. Permanent Seeding:
1. Seed with appropriate seeds and application rates as noted in Section 2.01D.
2. Mulch areas where seeding has been applied. Do not mulch seeded areas where matting will be immediately installed.

E. Topsoil Storage:
1. Topsoil which is stockpiled on the site for use in loam applications will be placed out of natural drainages, in piles that have side slopes of 2:1 to 1.5:1.
2. A trench (depth as required) will be constructed around the base of the pile to prevent eroding soil from washing into drainages.

F. Dust Control: Utilize the application of sprinkled water to reduce the emission of airborne soil particulates from the Project site.

G. Temporary Berms: Construct temporary barriers along the toe of embankments using side drains as necessary.

H. Temporary Basins: Construct temporary sedimentation basins adequate to avoid siltation of surface water bodies.

I. Other Temporary Measures:
1. Type and use will be as specified in the Erosion Control Handbook.

J. Winter Stabilization Notes
1. The winter construction season is between October 15th and May 1st. Construction performed during these times must adhere to the following construction practices.
a. All disturbed areas not stabilized with stone or other measures will have approved erosion control matting installed and be dormant seeded.
b. No frozen soil material or material containing significant snow or ice will be used for fill material.

c. All material stockpiles will have silt fence and/or hay bales installed downgradient of piles.
d. Follow general erosion control notes described previously wherever possible and as conditions permit.

3.02 Maintenance

A. Inspect erosion control practices immediately after each rainfall greater than ½-inch and at least daily during rainfall lasting longer than 24 hours or snowmelt for damage. Provide maintenance and make appropriate repairs or replacement.

B. Remove silt from around hay bales when it has reached one foot above grade or prior to expected heavy runoff or siltation.

C. Repair matting if any staples become loosened or raised, or if any matting becomes loose, torn, or undermined, make satisfactory repairs immediately.

3.03 Removal of Temporary Erosion Control

A. Remove temporary materials and devices when permanent soil stabilization has been substantially achieved. For vegetated areas, substantially complete means 95% vegetated cover has been established.

B. Level and grade to the extent required to present a sightly appearance and to prevent any obstruction of the flow of water or any other interference with the operation of or access to the permanent works.

C. Remove unsuitable materials from site and dispose of in a lawful manner.

The following Maintenance Plan will be employed for this project. The owner(s) or their assigns will be responsible for all maintenance.

A Pre- and Post-Construction Maintenance Plan for the stormwater management system and erosion control measures are included in this section.

MAINTENANCE PLAN

The MDEP's Stormwater Management for Maine: Best Management Practices (2006), and the MDEP's Chapter 500: Stormwater Management were used as guidelines in the development of this Maintenance Plan. General maintenance requirements are listed below.

A. DURING CONSTRUCTION

The general contractor will be responsible for the inspection and maintenance of all stormwater management system components during construction.

Inspection: Inspection of disturbed and impervious areas, erosion control measures, materials' storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site will be performed at least once a week as well as before and after a storm event, and prior to completing permanent stabilization measures. Inspections shall be conducted by a person with knowledge of erosion and stormwater control, including the standards and conditions in the permit.

Maintenance: All erosion control measures will be kept in effective operating condition until areas are permanently stabilized. If BMPs need to be maintained or modified, additional BMPs are necessary, or other corrective action is needed, implementation will be completed within 7 calendar days and prior to any rainfall event.

Documentation: A log shall be kept summarizing the inspections and any corrective action taken. A copy of the log is provided at the end of this section, and is titled, Construction Inspection Log.

B. POST-CONSTRUCTION

The owner(s) or their assigns will be responsible for the inspection and maintenance of all stormwater management system components.

Inspection and Corrective Action

1. Vegetated Buffers: Inspections and maintenance of vegetated areas will be performed early in the growing season or after significant rainfall to identify any erosion problems. Buffers shall be inspected for evidence of erosion, concentrated flow, or encroachment by development. Areas where erosion is evident will be covered with an appropriate lining, or erosive flows will be diverted to an area able to handle the flows. Any bare areas or areas with sparse growth will be replanted. Manage the buffers vegetation with the requirements in any deed restriction. Down-slopes of all spreaders and turn-outs shall be inspected and repaired as necessary. If necessary for improved flow, install additional level spreaders or ditch turnouts. Accumulate sediment and debris shall be cleaned out of spreader bays and turnout pools. Vegetated buffers should be mowed no short than six inches and less than three times per year.
2. Ditches, Swales, and Culverts: Inspections and maintenance of ditches, culverts, and swales will be performed in the Spring, late Fall, and after rain events greater than 1-inch in depth to remove any obstructions to flow, to remove any accumulated sediments within the structures, and to repair any erosion of channel linings, check dams, inlet protection, or outlet protection. Vegetated ditches and swales must be mowed no more than twice per year and cut no less than 6-inch in height.
3. Bioretention Cell: Maintenance of the bioretention cell built for the treatment of stormwater will at a minimum include the items listed below.
    a. Basin Inspection: During the first year, the basin will be inspected semi-annually and following major storm events. Debris and sediment buildup shall be removed from the forebay and basin as needed. Any bare area or erosion rills shall be repaired with new filter media or sandy loam then planted and mulched. A healthy plant cover will minimize clogging with fine sediments and if ponding exceeds 48 hours, the filter bed must be rototilled and reestablished.

b. Maintenance Agreement: A legal entity should be established with responsibility for inspecting and maintaining any biocells. The legal agreement should establish the entity, list all specific maintenance responsibilities (including timetables) and provide for the funding to cover long-term inspection and maintenance.

c. Filter Inspection: The soil filter should be inspected after every major storm in the first year to be sure it is functioning properly and that the plants are establishing. Thereafter, the filter should be inspected at least once every six months to ensure that it is draining within 48 hours following a one-inch storm or greater.

d. Soil Filter Replacement: The mulch shall be replaced with fresh material on a yearly basis.

e. Sediment Removal: Sediment and plant debris should be removed from the pretreatment structure at least annually. Removed sediments should be disposed of in an acceptable manner.

f. Fertilization: Fertilization of the underdrained filter area should be avoided unless absolutely necessary to establish vegetation.

g. Harvesting and Weeding: Harvesting and pruning of excessive growth will need to be done occasionally. Weeding to control unwanted or invasive plants may also be necessary. Plants that are not thriving must be replaced.

3. Roadways: All roadways shall be swept at least once per year.
4. Documentation: A log will be kept summarizing the inspections, maintenance, and any corrective action taken. A copy of the log is provided at the end of this section, and is titled, BMP Inspection Log.

DANVILLE ROAD SUBDIVISION
LOG OF INSPECTIONS DURING CONSTRUCTION

Inspection Date	Inspector (Name and Qualifications)	Major Observations	Work Performed

Notes

1) Major Observations include the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicle access points to the parcel. Major Observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for particular locations, and locations(s) where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken.
2) Work Performed will include a description of the corrective action taken, the date the corrective action was taken, and the name and qualifications of the person taking the corrective actions
3) The log must be made accessible to MDEP staff and a copy must be provided upon request.
4) The permittee shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.

DANVILLE ROAD SUBDIVISION
BMP INSPECTION LOG

Date	Inspector (Name and Qualifications)	ID Number	BMP Structure	Work Performed	Comments

Notes

1) If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed after removal.
2) BMP structures shall be numbered sequentially and located on attached site map.
3) The log must be made accessible to MDEP staff and a copy must be provided upon request.
4) The permittee shall retain a copy of the log for a period of at least five years from the completion of permanent stabilization.

INSPECTION AND MAINTENANCE PLAN FOR STORMWATER MANAGEMENT STRUCTURES (BMPS)		
	INSPECTION SCHEDULE	**CORRECTIVE ACTIONS**
VEGETATED AREAS	Annually early Spring and after heavy rains	Inspect all slopes and embankments and replant areas of bare soil or with sparse growth
		Armor rill erosion areas with riprap or divert the runoff to a stable area
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Mow vegetation as specified for the area
DITCHES, SWALES, AND OPEN STORMWATER CHANNELS	Annually Spring and late Fall and after heavy rains	Remove obstructions, sediments or debris from ditches, swales and other open channels
		Repair any erosion of the ditch lining
		Mow vegetated ditches
		Remove woody vegetation growing through riprap
		Repair any slumping side slopes
		Repair riprap where underlying filter fabric or gravel is showing or if stones have dislodged.
CULVERTS	Spring and late Fall and after heavy rains	Remove accumulated sediments and debris at the inlet, outlet, or within the conduit
		Remove any obstruction to flow
		Repair any erosion damage at the culvert's inlet and outlet
CATCH BASINS	Annually in the Spring	Remove sediments and debris from the bottom of the basin and inlet grates
		Remove floating debris and oils (using oil absorptive pads) from any trap
ROADWAYS AND PARKING AREAS	Annually in the Spring or as needed	Clear and remove accumulated winter sand in parking lots and along roadways
		Sweep pavement to remove sediment
		Grade road shoulders and remove accumulated winter sand
		Grade gravel roads and gravel shoulders
		Clean-out the sediment within water bars or open-top culverts
		Ensure that stormwater runoff is not impeded by false ditches of sediment in the shoulder
RESOURCE AND TREATMENT BUFFERS	Annually in the Spring	Inspect buffers for evidence of erosion, concentrated flow, or encroachment by development
		Manage the buffer's vegetation with the requirements in any deed restrictions
		Repair any sign of erosion within a buffer
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Install more level spreaders, or ditch turn-outs if needed for a better distribution of flow
		Clean-out any accumulation of sediment within the spreader bays or turnout pools
		Mow non-wooded buffers no shorter than six inches and less than three times per year
WET PONDS AND DETENTION BASINS	Annually in Fall and after heavy rains	Inspect the embankments for settlement, slope erosion, piping, and slumping
		Mow the embankment to control woody vegetation
		Inspect the outlet structure for broken seals, obstructed orifices, and plugged trash racks
		Remove and dispose of sediments and debris within the control structure
		Repair any damage to trash racks or debris guards
		Replace any dislodged stone in riprap spillways
		Remove and dispose of accumulated sediments within the impoundment and forebay
FILTRATION AND INFILTRATION BASINS	Annually in the Spring and late Fall	Clean the basin of debris, sediment and hydrocarbons
		Provide for the removal and disposal of accumulated sediments within the basin
		Renew the basin media if it fails to drain within 72 hours after a one-inch rainfall event
		Till, seed and mulch the basin if vegetation is sparse
		Repair riprap where underlying filter fabric or gravel is showing or where stones have dislodged
PROPRIETARY DEVICES	As specified by manufacturer	Contract with a third-party for inspection and maintenance
		Follow the manufacturer's plan for cleaning of devices
OTHER PRACTICES	As specified for devices	Contact the department for appropriate inspection and maintenance requirements for other drainage control and runoff treatment measures.

Housekeeping

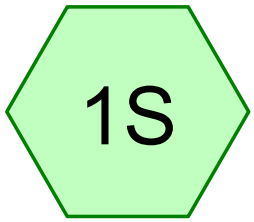
1. Spill Prevention - During construction, controls will be used to prevent pollutants from being discharged from materials on site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.
2. Groundwater Protection - During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater will not be stored or handled in areas of the site draining to an infiltration area. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.
3. Fugitive Sediment and Dust - Actions will be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil will not be used for dust control. Water will be used for dust control during construction. Operations during wet months that cause mud to be tracked off the site onto public roads will provide sweeping of the road areas at least once per week and prior to significant storm events.
4. Debris and Other Materials - Litter, construction debris, and chemicals exposed to stormwater will be prevented from becoming a pollutant source. The nature of this development will not cause problems related to debris and other materials.
5. Trench or Foundation De-Watering - If de-watering is necessary, the collected water will be removed from the ponded area and spread through natural wooded buffers or discharged into a construction sedimentation basin. The water will not be allowed to flow over disturbed areas to the site.

FLOODING STANDARD SUBMISSION

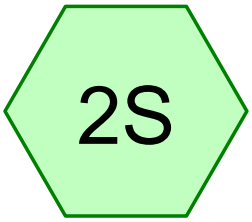
The project is proposing to treat the subdivision roadway with vegetated buffers and bioretention cells (rain gardens). This will minimize impacts to the surrounding landscape and allow the stormwater runoff to enter the vegetated buffers in a natural manner. We are proposing to capture and treat runoff from a portion of the proposed roadways and lot areas by rain gardens. This will allow for staggered arrival times by having roadway runoff sheet off outside the project area. This will stagger the arrival times and provide an overall runoff similar in pre-and post-development conditions. HydroCAD calculations were performed to compare pre-development and post-development conditions. It is expected that the use of the buffers to return runoff to sheet flow in the wooded and meadow areas as well as collecting portions of the development with rain gardens will sufficiently stagger arrival times to allow for similar runoff flows in pre-and post-development conditions.

There is a slight increase for the 2-year and 10-year storm events at Summation Point 2 from pre- to post-development, but the 25-year storm event is a decrease from pre- to post-development. The increase of 0.13 cfs and 0.36 cfs for the 2-year and 10-year storm events at Summation Point 2 should be considered insignificant. At Summation Point 3, there is also an increase in the 2-year and 10-year storm events when comparing pre- to post-development conditions, but since the area drains to a large wetland it is expected to be insignificant. The HydroCAD results are included at the end of this section for review.

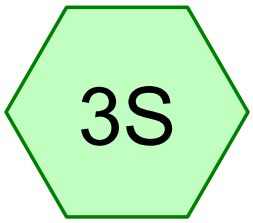
	2-YR (Pre / Post)	10-YR (Pre / Post)	25-YR (Pre / Post)
Subarea 1 / Summation Point 1	0.00 cfs / 0.00 cfs	0.02 cfs / 0.00 cfs	0.11 cfs / 0.02 cfs
Subarea 2 / Summation Point 2	0.01 cfs / 0.10 cfs	0.51 cfs / 0.87 cfs	3.08 cfs / 2.32 cfs
Subarea 3 / Summation Point 3	3.43 cfs / 4.46 cfs	14.78 cfs / 14.90 cfs	28.26 cfs / 26.84 cfs



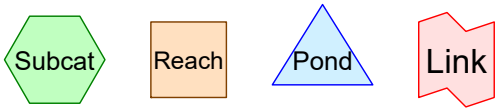
Subarea 1



Subarea 2



Subarea 3



Routing Diagram for 10788.006 Pre-Development
Prepared by CES, Inc., Printed 3/1/2018

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

Subcatchment 1S: Subarea 1 Runoff Area=293,250 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=450' Tc=30.1 min CN=35 Runoff=0.00 cfs 0.000 af

Subcatchment 2S: Subarea 2 Runoff Area=1,060,758 sf 0.48% Impervious Runoff Depth>0.00"
Flow Length=1,249' Tc=31.8 min CN=42 Runoff=0.01 cfs 0.001 af

Subcatchment 3S: Subarea 3 Runoff Area=1,579,525 sf 0.59% Impervious Runoff Depth>0.25"
Flow Length=1,540' Tc=49.3 min CN=59 Runoff=3.47 cfs 0.742 af

Total Runoff Area = 67.345 ac Runoff Volume = 0.743 af Average Runoff Depth = 0.13"
99.51% Pervious = 67.015 ac 0.49% Impervious = 0.329 ac

Summary for Subcatchment 1S: Subarea 1

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.00"

Area (sf)	CN	Description
231,928	36	Woods, Fair, HSG A
61,322	30	Meadow, non-grazed, HSG A
293,250	35	Weighted Average
293,250		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.2	100	0.0120	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
2.9	350	0.1570	1.98		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
30.1	450	Total			

Summary for Subcatchment 2S: Subarea 2

Runoff = 0.01 cfs @ 20.00 hrs, Volume= 0.001 af, Depth> 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.00"

Area (sf)	CN	Description
577,601	36	Woods, Fair, HSG A
193,211	30	Meadow, non-grazed, HSG A
245,387	60	Woods, Fair, HSG B
926	73	Woods, Fair, HSG C
25,763	71	Meadow, non-grazed, HSG C
3,356	98	Roofs, HSG A
12,815	76	Gravel roads, HSG A
1,699	98	Roofs, HSG C
1,060,758	42	Weighted Average
1,055,703		99.52% Pervious Area
5,055		0.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0240	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
11.2	1,149	0.1170	1.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
31.8	1,249	Total			

Summary for Subcatchment 3S: Subarea 3

Runoff = 3.47 cfs @ 12.68 hrs, Volume= 0.742 af, Depth> 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.00"

Area (sf)	CN	Description
617,218	36	Woods, Fair, HSG A
28,829	30	Meadow, non-grazed, HSG A
238,220	79	Woods, Fair, HSG D
581,479	73	Woods, Fair, HSG C
89,967	71	Meadow, non-grazed, HSG C
5,597	98	Roofs, HSG A
6,226	76	Gravel roads, HSG A
3,699	98	Roofs, HSG C
8,290	89	Gravel roads, HSG C
1,579,525	59	Weighted Average
1,570,229		99.41% Pervious Area
9,296		0.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.2	100	0.0120	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
22.1	1,440	0.0470	1.08		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
49.3	1,540	Total			

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

Subcatchment 1S: Subarea 1 Runoff Area=293,250 sf 0.00% Impervious Runoff Depth>0.01"
Flow Length=450' Tc=30.1 min CN=35 Runoff=0.02 cfs 0.004 af

Subcatchment 2S: Subarea 2 Runoff Area=1,060,758 sf 0.48% Impervious Runoff Depth>0.11"
Flow Length=1,249' Tc=31.8 min CN=42 Runoff=0.51 cfs 0.228 af

Subcatchment 3S: Subarea 3 Runoff Area=1,579,525 sf 0.59% Impervious Runoff Depth>0.74"
Flow Length=1,540' Tc=49.3 min CN=59 Runoff=14.78 cfs 2.224 af

Total Runoff Area = 67.345 ac Runoff Volume = 2.456 af Average Runoff Depth = 0.44"
99.51% Pervious = 67.015 ac 0.49% Impervious = 0.329 ac

Summary for Subcatchment 1S: Subarea 1

Runoff = 0.02 cfs @ 19.91 hrs, Volume= 0.004 af, Depth> 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=4.30"

Area (sf)	CN	Description
231,928	36	Woods, Fair, HSG A
61,322	30	Meadow, non-grazed, HSG A
293,250	35	Weighted Average
293,250		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.2	100	0.0120	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
2.9	350	0.1570	1.98		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
30.1	450	Total			

Summary for Subcatchment 2S: Subarea 2

Runoff = 0.51 cfs @ 13.10 hrs, Volume= 0.228 af, Depth> 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=4.30"

Area (sf)	CN	Description
577,601	36	Woods, Fair, HSG A
193,211	30	Meadow, non-grazed, HSG A
245,387	60	Woods, Fair, HSG B
926	73	Woods, Fair, HSG C
25,763	71	Meadow, non-grazed, HSG C
3,356	98	Roofs, HSG A
12,815	76	Gravel roads, HSG A
1,699	98	Roofs, HSG C
1,060,758	42	Weighted Average
1,055,703		99.52% Pervious Area
5,055		0.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0240	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
11.2	1,149	0.1170	1.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
31.8	1,249	Total			

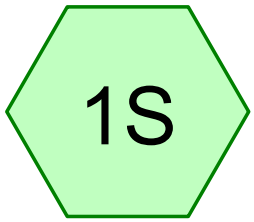
Summary for Subcatchment 3S: Subarea 3

Runoff = 14.78 cfs @ 12.57 hrs, Volume= 2.224 af, Depth> 0.74"

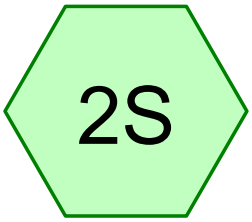
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=4.30"

Area (sf)	CN	Description
617,218	36	Woods, Fair, HSG A
28,829	30	Meadow, non-grazed, HSG A
238,220	79	Woods, Fair, HSG D
581,479	73	Woods, Fair, HSG C
89,967	71	Meadow, non-grazed, HSG C
5,597	98	Roofs, HSG A
6,226	76	Gravel roads, HSG A
3,699	98	Roofs, HSG C
8,290	89	Gravel roads, HSG C
1,579,525	59	Weighted Average
1,570,229		99.41% Pervious Area
9,296		0.59% Impervious Area

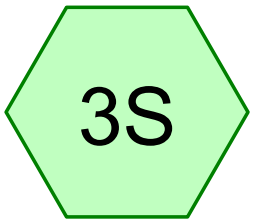
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.2	100	0.0120	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
22.1	1,440	0.0470	1.08		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
49.3	1,540	Total			



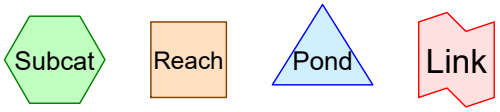
Subarea 1



Subarea 2



Subarea 3



Routing Diagram for 10788.006 Pre-Development
Prepared by CES, Inc., Printed 3/1/2018

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

Subcatchment 1S: Subarea 1 Runoff Area=293,250 sf 0.00% Impervious Runoff Depth>0.10"
Flow Length=450' Tc=30.1 min CN=35 Runoff=0.11 cfs 0.055 af

Subcatchment 2S: Subarea 2 Runoff Area=1,060,758 sf 0.48% Impervious Runoff Depth>0.34"
Flow Length=1,249' Tc=31.8 min CN=42 Runoff=3.33 cfs 0.690 af

Subcatchment 3S: Subarea 3 Runoff Area=1,579,525 sf 0.59% Impervious Runoff Depth>1.28"
Flow Length=1,540' Tc=49.3 min CN=59 Runoff=28.57 cfs 3.875 af

Total Runoff Area = 67.345 ac Runoff Volume = 4.620 af Average Runoff Depth = 0.82"
99.51% Pervious = 67.015 ac 0.49% Impervious = 0.329 ac

Summary for Subcatchment 1S: Subarea 1

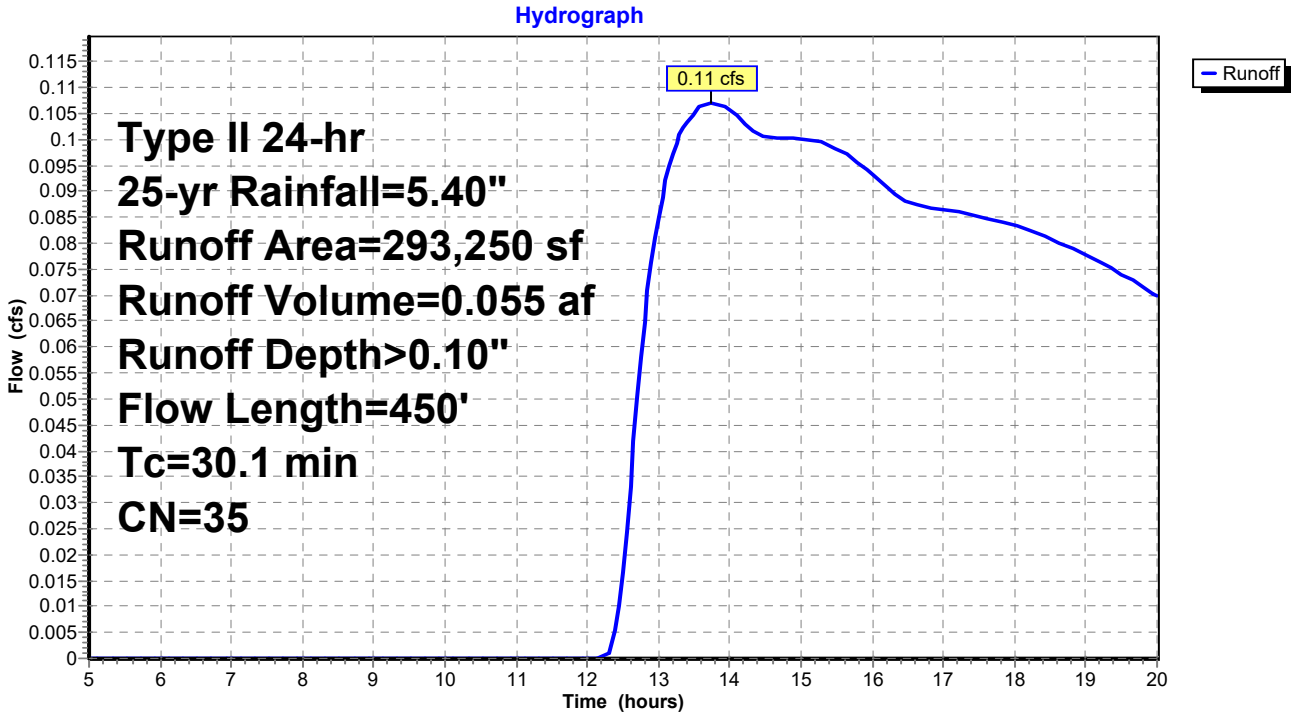
Runoff = 0.11 cfs @ 13.74 hrs, Volume= 0.055 af, Depth> 0.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=5.40"

Area (sf)	CN	Description
231,928	36	Woods, Fair, HSG A
61,322	30	Meadow, non-grazed, HSG A
293,250	35	Weighted Average
293,250		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.2	100	0.0120	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
2.9	350	0.1570	1.98		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
30.1	450	Total			

Subcatchment 1S: Subarea 1



Summary for Subcatchment 2S: Subarea 2

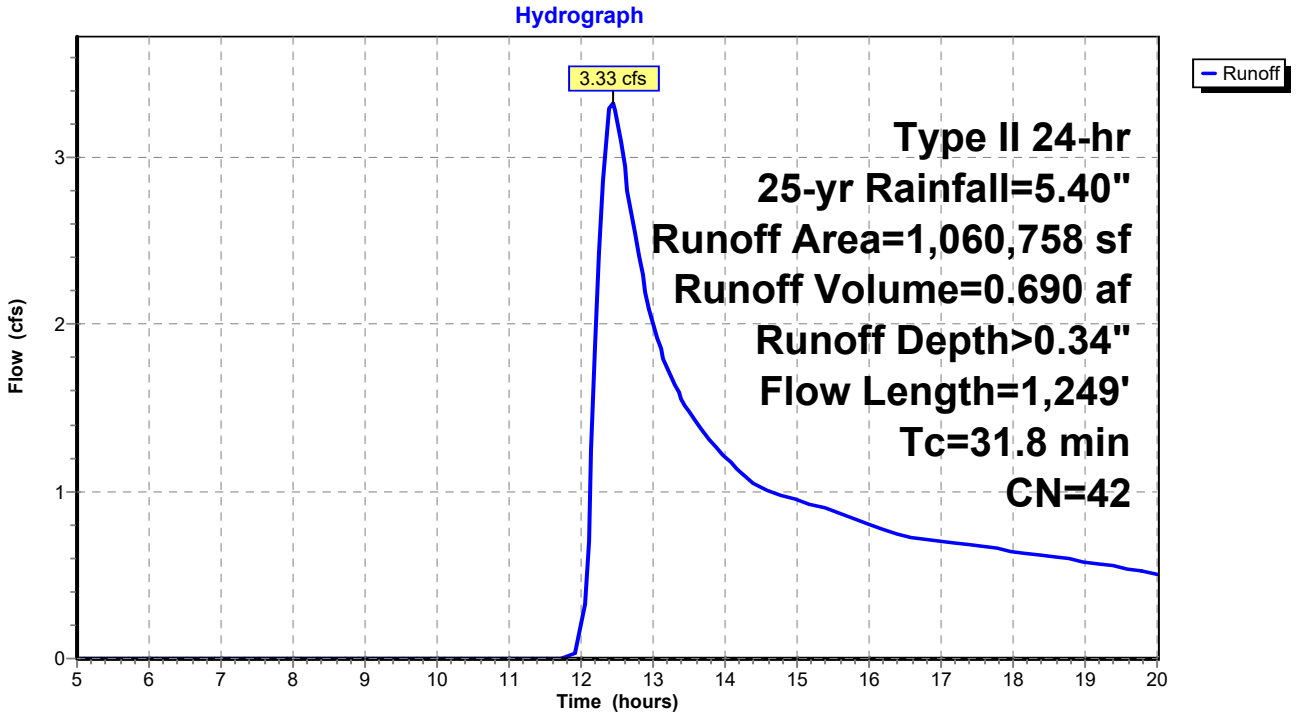
Runoff = 3.33 cfs @ 12.44 hrs, Volume= 0.690 af, Depth> 0.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=5.40"

Area (sf)	CN	Description
577,601	36	Woods, Fair, HSG A
193,211	30	Meadow, non-grazed, HSG A
245,387	60	Woods, Fair, HSG B
926	73	Woods, Fair, HSG C
25,763	71	Meadow, non-grazed, HSG C
3,356	98	Roofs, HSG A
12,815	76	Gravel roads, HSG A
1,699	98	Roofs, HSG C
1,060,758	42	Weighted Average
1,055,703		99.52% Pervious Area
5,055		0.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	100	0.0240	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
11.2	1,149	0.1170	1.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
31.8	1,249	Total			

Subcatchment 2S: Subarea 2



Summary for Subcatchment 3S: Subarea 3

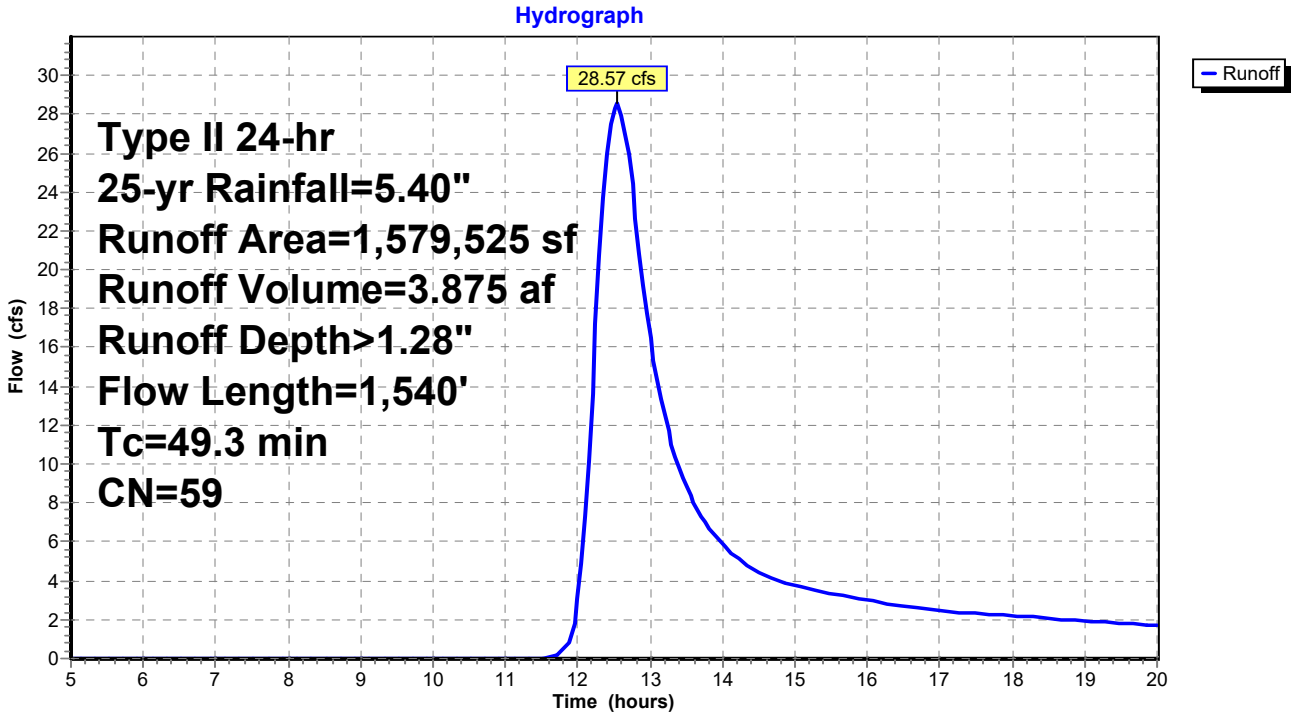
Runoff = 28.57 cfs @ 12.54 hrs, Volume= 3.875 af, Depth> 1.28"

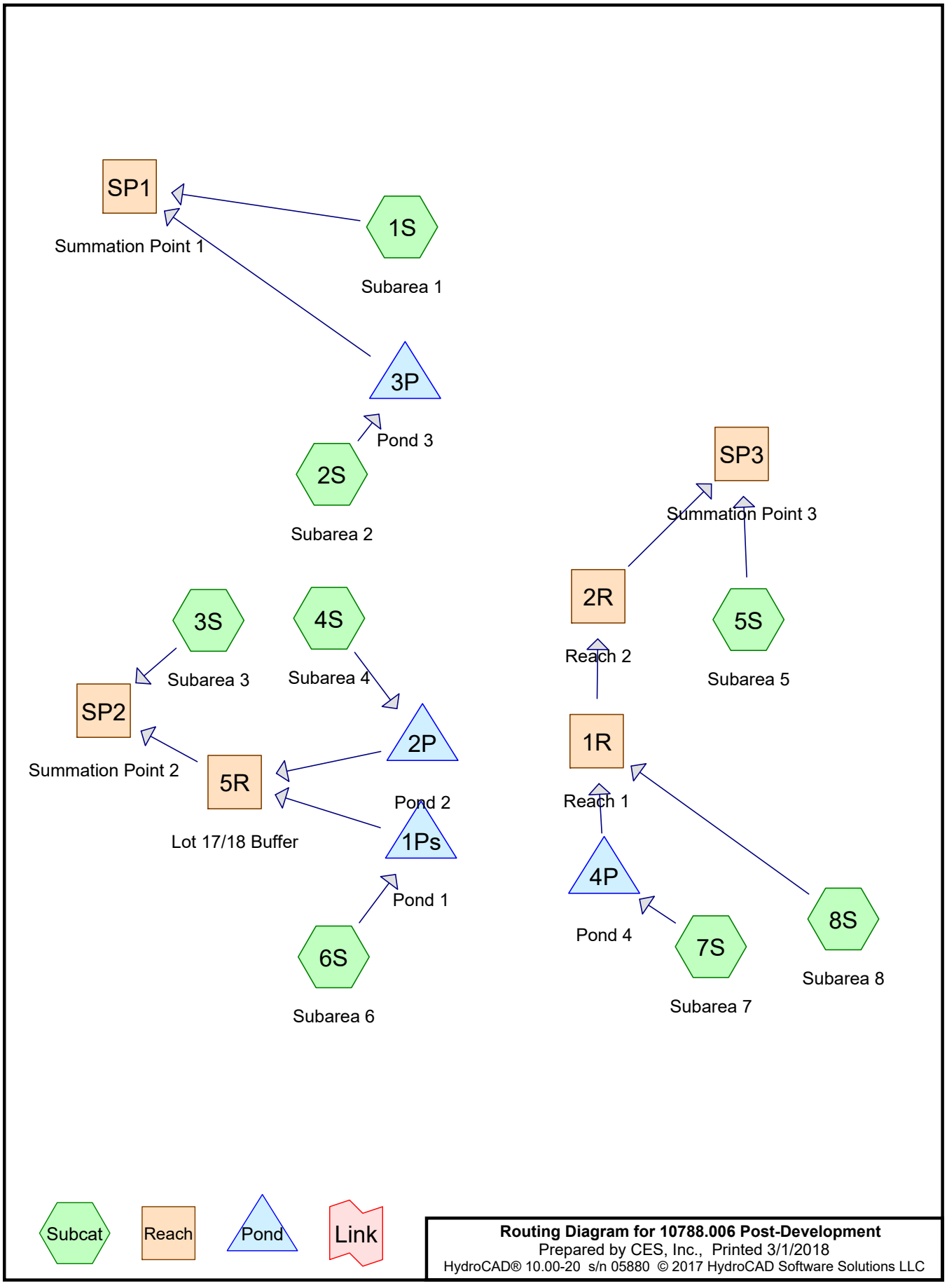
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=5.40"

Area (sf)	CN	Description
617,218	36	Woods, Fair, HSG A
28,829	30	Meadow, non-grazed, HSG A
238,220	79	Woods, Fair, HSG D
581,479	73	Woods, Fair, HSG C
89,967	71	Meadow, non-grazed, HSG C
5,597	98	Roofs, HSG A
6,226	76	Gravel roads, HSG A
3,699	98	Roofs, HSG C
8,290	89	Gravel roads, HSG C
1,579,525	59	Weighted Average
1,570,229		99.41% Pervious Area
9,296		0.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.2	100	0.0120	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
22.1	1,440	0.0470	1.08		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
49.3	1,540	Total			

Subcatchment 3S: Subarea 3





Routing Diagram for 10788.006 Post-Development
Prepared by CES, Inc., Printed 3/1/2018

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

Subcatchment 1S: Subarea 1 Runoff Area=145,978 sf 2.42% Impervious Runoff Depth=0.00"
Flow Length=430' Tc=15.5 min CN=32 Runoff=0.00 cfs 0.000 af

Subcatchment 2S: Subarea 2 Runoff Area=60,575 sf 9.91% Impervious Runoff Depth=0.00"
Flow Length=180' Tc=10.8 min CN=37 Runoff=0.00 cfs 0.000 af

Subcatchment 3S: Subarea 3 Runoff Area=1,100,588 sf 1.76% Impervious Runoff Depth=0.00"
Flow Length=1,249' Tc=21.7 min CN=38 Runoff=0.00 cfs 0.000 af

Subcatchment 4S: Subarea 4 Runoff Area=51,319 sf 11.69% Impervious Runoff Depth>0.00"
Flow Length=180' Tc=10.8 min CN=42 Runoff=0.00 cfs 0.000 af

Subcatchment 5S: Subarea 5 Runoff Area=720,603 sf 7.63% Impervious Runoff Depth>0.37"
Flow Length=660' Tc=26.1 min CN=63 Runoff=4.46 cfs 0.508 af

Subcatchment 6S: Subarea 6 Runoff Area=60,407 sf 23.83% Impervious Runoff Depth>0.81"
Flow Length=262' Tc=12.9 min CN=74 Runoff=1.66 cfs 0.094 af

Subcatchment 7S: Subarea 7 Runoff Area=68,758 sf 8.73% Impervious Runoff Depth>0.77"
Flow Length=200' Slope=0.0450 '/' Tc=11.8 min CN=73 Runoff=1.84 cfs 0.101 af

Subcatchment 8S: Subarea 8 Runoff Area=727,175 sf 2.78% Impervious Runoff Depth>0.08"
Flow Length=1,012' Tc=39.3 min CN=51 Runoff=0.25 cfs 0.110 af

Reach 1R: Reach 1 Avg. Flow Depth=0.19' Max Vel=3.86 fps Inflow=0.45 cfs 0.169 af
15.0" Round Pipe n=0.013 L=56.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=0.45 cfs 0.169 af

Reach 2R: Reach 2 Avg. Flow Depth=0.06' Max Vel=0.57 fps Inflow=0.45 cfs 0.169 af
n=0.035 L=721.0' S=0.0122 '/' Capacity=88.62 cfs Outflow=0.41 cfs 0.157 af

Reach 5R: Lot 17/18 Buffer Avg. Flow Depth=0.02' Max Vel=0.06 fps Inflow=0.12 cfs 0.041 af
n=0.400 L=150.0' S=0.0800 '/' Capacity=198.58 cfs Outflow=0.10 cfs 0.036 af

Reach SP1: Summation Point 1 Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach SP2: Summation Point 2 Inflow=0.10 cfs 0.036 af
Outflow=0.10 cfs 0.036 af

Reach SP3: Summation Point 3 Inflow=4.46 cfs 0.665 af
Outflow=4.46 cfs 0.665 af

Pond 1Ps: Pond 1 Peak Elev=400.30' Storage=2,425 cf Inflow=1.66 cfs 0.094 af
Outflow=0.12 cfs 0.041 af

Pond 2P: Pond 2 Peak Elev=400.18' Storage=2 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 3P: Pond 3 Peak Elev=401.58' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 4P: Pond 4 Peak Elev=403.26' Storage=2,003 cf Inflow=1.84 cfs 0.101 af
Outflow=0.30 cfs 0.059 af

Total Runoff Area = 67.388 ac Runoff Volume = 0.812 af Average Runoff Depth = 0.14"
95.55% Pervious = 64.390 ac 4.45% Impervious = 2.997 ac

Summary for Subcatchment 1S: Subarea 1

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.00"

Area (sf)	CN	Description
142,450	30	Meadow, non-grazed, HSG A
3,528	98	Paved parking, HSG A
145,978	32	Weighted Average
142,450		97.58% Pervious Area
3,528		2.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	22	0.0200	0.98		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
13.6	78	0.0150	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.5	330	0.2700	3.64		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.5	430	Total			

Summary for Subcatchment 2S: Subarea 2

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.00"

Area (sf)	CN	Description
54,575	30	Meadow, non-grazed, HSG A
6,000	98	Roofs, HSG A
60,575	37	Weighted Average
54,575		90.09% Pervious Area
6,000		9.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0600	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.3	80	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.8	180	Total			

Summary for Subcatchment 3S: Subarea 3

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.00"

Area (sf)	CN	Description
810,042	30	Meadow, non-grazed, HSG A
7,378	98	Paved parking, HSG A
10,340	98	Roofs, HSG A
1,699	98	Roofs, HSG C
245,387	58	Meadow, non-grazed, HSG B
12,927	71	Meadow, non-grazed, HSG C
12,815	76	Gravel roads, HSG A
1,100,588	38	Weighted Average
1,081,171		98.24% Pervious Area
19,417		1.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0240	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
8.0	1,149	0.1170	2.39		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
21.7	1,249	Total			

Summary for Subcatchment 4S: Subarea 4

Runoff = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af, Depth> 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.00"

Area (sf)	CN	Description
40,415	30	Meadow, non-grazed, HSG A
6,000	98	Roofs, HSG A
4,904	71	Meadow, non-grazed, HSG C
51,319	42	Weighted Average
45,319		88.31% Pervious Area
6,000		11.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0600	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.3	80	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.8	180	Total			

Summary for Subcatchment 5S: Subarea 5

Runoff = 4.46 cfs @ 12.26 hrs, Volume= 0.508 af, Depth> 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.00"

Area (sf)	CN	Description
211,507	30	Meadow, non-grazed, HSG A
15,621	98	Paved parking, HSG A
4,800	98	Roofs, HSG A
14,804	98	Paved parking, HSG C
291,290	71	Meadow, non-grazed, HSG C
156,625	79	Woods, Fair, HSG D
16,438	98	Roofs, HSG C
6,170	89	Gravel roads, HSG C
3,348	98	Paved parking, HSG D
720,603	63	Weighted Average
665,592		92.37% Pervious Area
55,011		7.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	100	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
11.4	560	0.0270	0.82		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.1	660	Total			

Summary for Subcatchment 6S: Subarea 6

Runoff = 1.66 cfs @ 12.06 hrs, Volume= 0.094 af, Depth> 0.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.00"

Area (sf)	CN	Description
5,863	30	Meadow, non-grazed, HSG A
2,934	98	Paved parking, HSG A
8,460	98	Paved parking, HSG C
38,601	71	Meadow, non-grazed, HSG C
1,549	79	Woods, Fair, HSG D
3,000	98	Roofs, HSG C
60,407	74	Weighted Average
46,013		76.17% Pervious Area
14,394		23.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0400	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.5	102	0.0280	1.17		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	60	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
12.9	262	Total			

Summary for Subcatchment 7S: Subarea 7

Runoff = 1.84 cfs @ 12.05 hrs, Volume= 0.101 af, Depth> 0.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.00"

Area (sf)	CN	Description
6,000	98	Roofs, HSG A
62,758	71	Meadow, non-grazed, HSG C
68,758	73	Weighted Average
62,758		91.27% Pervious Area
6,000		8.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	100	0.0450	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.1	100	0.0450	1.48		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.8	200	Total			

Summary for Subcatchment 8S: Subarea 8

Runoff = 0.25 cfs @ 13.26 hrs, Volume= 0.110 af, Depth> 0.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.00"

Area (sf)	CN	Description
382,892	30	Meadow, non-grazed, HSG A
3,213	98	Paved parking, HSG A
2,049	98	Paved parking, HSG C
238,990	71	Meadow, non-grazed, HSG C
76,728	79	Woods, Fair, HSG D
7,604	98	Roofs, HSG C
7,345	98	Roofs, HSG A
6,226	76	Gravel roads, HSG A
2,128	89	Gravel roads, HSG C
727,175	51	Weighted Average
706,964		97.22% Pervious Area
20,211		2.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0240	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
2.7	380	0.1100	2.32		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
22.9	532	0.0060	0.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
39.3	1,012	Total			

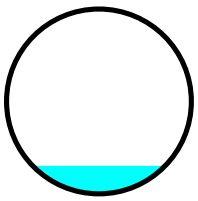
Summary for Reach 1R: Reach 1

Inflow Area = 18.272 ac, 3.29% Impervious, Inflow Depth > 0.11" for 2-yr event
Inflow = 0.45 cfs @ 12.75 hrs, Volume= 0.169 af
Outflow = 0.45 cfs @ 12.75 hrs, Volume= 0.169 af, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.86 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.19 fps, Avg. Travel Time= 0.3 min

Peak Storage= 7 cf @ 12.74 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.14 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 56.0' Slope= 0.0200 '/'
Inlet Invert= 404.00', Outlet Invert= 402.88'



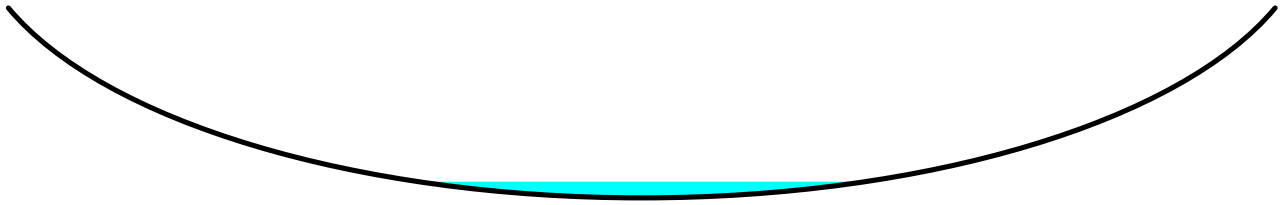
Summary for Reach 2R: Reach 2

Inflow Area = 18.272 ac, 3.29% Impervious, Inflow Depth > 0.11" for 2-yr event
Inflow = 0.45 cfs @ 12.75 hrs, Volume= 0.169 af
Outflow = 0.41 cfs @ 13.62 hrs, Volume= 0.157 af, Atten= 9%, Lag= 51.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.57 fps, Min. Travel Time= 21.2 min
Avg. Velocity = 0.47 fps, Avg. Travel Time= 25.4 min

Peak Storage= 523 cf @ 13.26 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 0.75' Flow Area= 30.0 sf, Capacity= 88.62 cfs

60.00' x 0.75' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 721.0' Slope= 0.0122 '/'
Inlet Invert= 399.30', Outlet Invert= 390.50'



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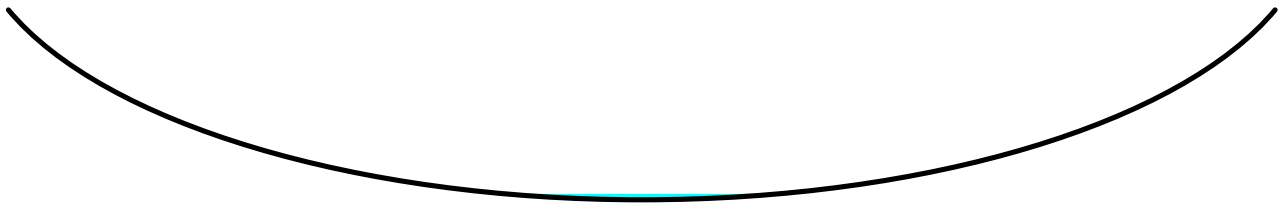
Summary for Reach 5R: Lot 17/18 Buffer

Inflow Area = 2.565 ac, 18.25% Impervious, Inflow Depth > 0.19" for 2-yr event
Inflow = 0.12 cfs @ 13.42 hrs, Volume= 0.041 af
Outflow = 0.10 cfs @ 14.81 hrs, Volume= 0.036 af, Atten= 19%, Lag= 83.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.06 fps, Min. Travel Time= 38.9 min
Avg. Velocity = 0.06 fps, Avg. Travel Time= 45.4 min

Peak Storage= 236 cf @ 14.16 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 0.75' Flow Area= 300.0 sf, Capacity= 198.58 cfs

600.00' x 0.75' deep Parabolic Channel, n= 0.400 Sheet flow: Woods+light brush
Length= 150.0' Slope= 0.0800 '/'
Inlet Invert= 0.00', Outlet Invert= -12.00'



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Summary for Reach SP1: Summation Point 1

Inflow Area = 4.742 ac, 4.61% Impervious, Inflow Depth = 0.00" for 2-yr event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP2: Summation Point 2

Inflow Area = 27.831 ac, 3.28% Impervious, Inflow Depth > 0.02" for 2-yr event
Inflow = 0.10 cfs @ 14.81 hrs, Volume= 0.036 af
Outflow = 0.10 cfs @ 14.81 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP3: Summation Point 3

Inflow Area = 34.815 ac, 5.36% Impervious, Inflow Depth > 0.23" for 2-yr event
Inflow = 4.46 cfs @ 12.26 hrs, Volume= 0.665 af
Outflow = 4.46 cfs @ 12.26 hrs, Volume= 0.665 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1Ps: Pond 1

Inflow Area = 1.387 ac, 23.83% Impervious, Inflow Depth > 0.81" for 2-yr event
Inflow = 1.66 cfs @ 12.06 hrs, Volume= 0.094 af
Outflow = 0.12 cfs @ 13.42 hrs, Volume= 0.041 af, Atten= 93%, Lag= 81.4 min
Primary = 0.12 cfs @ 13.42 hrs, Volume= 0.041 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 400.30' @ 13.42 hrs Surf.Area= 3,655 sf Storage= 2,425 cf

Plug-Flow detention time= 219.1 min calculated for 0.041 af (43% of inflow)
Center-of-Mass det. time= 125.1 min (941.8 - 816.7)

Volume	Invert	Avail.Storage	Storage Description
#1	399.58'	10,382 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
399.58	3,200	0	0
400.00	3,325	1,370	1,370
401.00	4,418	3,872	5,242
402.00	5,862	5,140	10,382

Device	Routing	Invert	Outlet Devices
#1	Primary	393.33'	**6.0" Round Culvert**
			L= 100.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 393.33' / 392.33' S= 0.0100 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2 Device 1 400.25' **12.0" Horiz. Orifice/Grate** C= 0.600
Limited to weir flow at low heads

Primary OutFlow Max=0.12 cfs @ 13.42 hrs HW=400.30' (Free Discharge)
└**1=Culvert** (Passes 0.12 cfs of 1.38 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 0.12 cfs @ 0.75 fps)

Summary for Pond 2P: Pond 2

Inflow Area = 1.178 ac, 11.69% Impervious, Inflow Depth > 0.00" for 2-yr event
Inflow = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 400.18' @ 20.00 hrs Surf.Area= 2,001 sf Storage= 2 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	400.18'	4,976 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
400.18	2,000	0	0
401.00	2,528	1,856	1,856
402.00	3,711	3,120	4,976

Device	Routing	Invert	Outlet Devices
#1	Primary	396.33'	**6.0" Round Culvert**
			L= 100.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 396.33' / 395.33' S= 0.0100 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	400.85'	**12.0" Horiz. Orifice/Grate** C= 0.600
			Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=400.18' (Free Discharge)
└**1=Culvert** (Passes 0.00 cfs of 1.05 cfs potential flow)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 3P: Pond 3

Inflow Area = 1.391 ac, 9.91% Impervious, Inflow Depth = 0.00" for 2-yr event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

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

Peak Elev= 401.58' @ 5.00 hrs Surf.Area= 2,500 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	401.58'	4,316 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
401.58	2,500	0	0
402.00	2,635	1,078	1,078
403.00	3,840	3,238	4,316

Device	Routing	Invert	Outlet Devices
#1	Primary	398.40'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 398.40' / 397.40' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	402.25'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=401.58' (Free Discharge)
↑**1=Culvert** (Passes 0.00 cfs of 0.97 cfs potential flow)
↑**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 4P: Pond 4

Inflow Area = 1.578 ac, 8.73% Impervious, Inflow Depth > 0.77" for 2-yr event
Inflow = 1.84 cfs @ 12.05 hrs, Volume= 0.101 af
Outflow = 0.30 cfs @ 12.51 hrs, Volume= 0.059 af, Atten= 84%, Lag= 27.7 min
Primary = 0.30 cfs @ 12.51 hrs, Volume= 0.059 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 403.26' @ 12.51 hrs Surf.Area= 2,902 sf Storage= 2,003 cf

Plug-Flow detention time= 163.1 min calculated for 0.059 af (59% of inflow)
Center-of-Mass det. time= 76.4 min (894.7 - 818.4)

Volume	Invert	Avail.Storage	Storage Description
#1	402.50'	8,833 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
402.50	2,500	0	0
403.00	2,609	1,277	1,277
404.00	3,721	3,165	4,442
405.00	5,060	4,391	8,833

Device	Routing	Invert	Outlet Devices
#1	Primary	399.25'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 399.25' / 398.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	403.17'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.29 cfs @ 12.51 hrs HW=403.26' (Free Discharge)
↑—**1=Culvert** (Passes 0.29 cfs of 1.07 cfs potential flow)
↑—**2=Orifice/Grate** (Weir Controls 0.29 cfs @ 1.00 fps)

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

Subcatchment 1S: Subarea 1 Runoff Area=145,978 sf 2.42% Impervious Runoff Depth=0.00"
Flow Length=430' Tc=15.5 min CN=32 Runoff=0.00 cfs 0.000 af

Subcatchment 2S: Subarea 2 Runoff Area=60,575 sf 9.91% Impervious Runoff Depth>0.03"
Flow Length=180' Tc=10.8 min CN=37 Runoff=0.01 cfs 0.003 af

Subcatchment 3S: Subarea 3 Runoff Area=1,100,588 sf 1.76% Impervious Runoff Depth>0.04"
Flow Length=1,249' Tc=21.7 min CN=38 Runoff=0.16 cfs 0.081 af

Subcatchment 4S: Subarea 4 Runoff Area=51,319 sf 11.69% Impervious Runoff Depth>0.12"
Flow Length=180' Tc=10.8 min CN=42 Runoff=0.03 cfs 0.011 af

Subcatchment 5S: Subarea 5 Runoff Area=720,603 sf 7.63% Impervious Runoff Depth>0.96"
Flow Length=660' Tc=26.1 min CN=63 Runoff=14.80 cfs 1.319 af

Subcatchment 6S: Subarea 6 Runoff Area=60,407 sf 23.83% Impervious Runoff Depth>1.66"
Flow Length=262' Tc=12.9 min CN=74 Runoff=3.46 cfs 0.192 af

Subcatchment 7S: Subarea 7 Runoff Area=68,758 sf 8.73% Impervious Runoff Depth>1.59"
Flow Length=200' Slope=0.0450 '/' Tc=11.8 min CN=73 Runoff=3.91 cfs 0.209 af

Subcatchment 8S: Subarea 8 Runoff Area=727,175 sf 2.78% Impervious Runoff Depth>0.39"
Flow Length=1,012' Tc=39.3 min CN=51 Runoff=3.04 cfs 0.541 af

Reach 1R: Reach 1 Avg. Flow Depth=0.59' Max Vel=7.28 fps Inflow=4.16 cfs 0.708 af
15.0" Round Pipe n=0.013 L=56.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=4.17 cfs 0.708 af

Reach 2R: Reach 2 Avg. Flow Depth=0.18' Max Vel=1.13 fps Inflow=4.17 cfs 0.708 af
n=0.035 L=721.0' S=0.0122 '/' Capacity=88.62 cfs Outflow=3.87 cfs 0.689 af

Reach 5R: Lot 17/18 Buffer Avg. Flow Depth=0.06' Max Vel=0.12 fps Inflow=1.40 cfs 0.138 af
n=0.400 L=150.0' S=0.0800 '/' Capacity=198.58 cfs Outflow=0.87 cfs 0.132 af

Reach SP1: Summation Point 1 Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach SP2: Summation Point 2 Inflow=0.87 cfs 0.213 af
Outflow=0.87 cfs 0.213 af

Reach SP3: Summation Point 3 Inflow=14.90 cfs 2.008 af
Outflow=14.90 cfs 2.008 af

Pond 1Ps: Pond 1 Peak Elev=400.54' Storage=3,312 cf Inflow=3.46 cfs 0.192 af
Outflow=1.40 cfs 0.138 af

Pond 2P: Pond 2 Peak Elev=400.42' Storage=494 cf Inflow=0.03 cfs 0.011 af
Outflow=0.00 cfs 0.000 af

Pond 3P: Pond 3 Peak Elev=401.63' Storage=131 cf Inflow=0.01 cfs 0.003 af
Outflow=0.00 cfs 0.000 af

Pond 4P: Pond 4 Peak Elev=403.74' Storage=3,508 cf Inflow=3.91 cfs 0.209 af
Outflow=1.12 cfs 0.167 af

Total Runoff Area = 67.388 ac Runoff Volume = 2.356 af Average Runoff Depth = 0.42"
95.55% Pervious = 64.390 ac 4.45% Impervious = 2.997 ac

Summary for Subcatchment 1S: Subarea 1

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=4.30"

Area (sf)	CN	Description
142,450	30	Meadow, non-grazed, HSG A
3,528	98	Paved parking, HSG A
145,978	32	Weighted Average
142,450		97.58% Pervious Area
3,528		2.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	22	0.0200	0.98		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
13.6	78	0.0150	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.5	330	0.2700	3.64		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.5	430	Total			

Summary for Subcatchment 2S: Subarea 2

Runoff = 0.01 cfs @ 18.07 hrs, Volume= 0.003 af, Depth> 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=4.30"

Area (sf)	CN	Description
54,575	30	Meadow, non-grazed, HSG A
6,000	98	Roofs, HSG A
60,575	37	Weighted Average
54,575		90.09% Pervious Area
6,000		9.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0600	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.3	80	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.8	180	Total			

Summary for Subcatchment 3S: Subarea 3

Runoff = 0.16 cfs @ 17.61 hrs, Volume= 0.081 af, Depth> 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=4.30"

Area (sf)	CN	Description
810,042	30	Meadow, non-grazed, HSG A
7,378	98	Paved parking, HSG A
10,340	98	Roofs, HSG A
1,699	98	Roofs, HSG C
245,387	58	Meadow, non-grazed, HSG B
12,927	71	Meadow, non-grazed, HSG C
12,815	76	Gravel roads, HSG A
1,100,588	38	Weighted Average
1,081,171		98.24% Pervious Area
19,417		1.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0240	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
8.0	1,149	0.1170	2.39		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
21.7	1,249	Total			

Summary for Subcatchment 4S: Subarea 4

Runoff = 0.03 cfs @ 12.48 hrs, Volume= 0.011 af, Depth> 0.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=4.30"

Area (sf)	CN	Description
40,415	30	Meadow, non-grazed, HSG A
6,000	98	Roofs, HSG A
4,904	71	Meadow, non-grazed, HSG C
51,319	42	Weighted Average
45,319		88.31% Pervious Area
6,000		11.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0600	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.3	80	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.8	180	Total			

Summary for Subcatchment 5S: Subarea 5

Runoff = 14.80 cfs @ 12.23 hrs, Volume= 1.319 af, Depth> 0.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=4.30"

Area (sf)	CN	Description
211,507	30	Meadow, non-grazed, HSG A
15,621	98	Paved parking, HSG A
4,800	98	Roofs, HSG A
14,804	98	Paved parking, HSG C
291,290	71	Meadow, non-grazed, HSG C
156,625	79	Woods, Fair, HSG D
16,438	98	Roofs, HSG C
6,170	89	Gravel roads, HSG C
3,348	98	Paved parking, HSG D
720,603	63	Weighted Average
665,592		92.37% Pervious Area
55,011		7.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	100	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
11.4	560	0.0270	0.82		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.1	660	Total			

Summary for Subcatchment 6S: Subarea 6

Runoff = 3.46 cfs @ 12.05 hrs, Volume= 0.192 af, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=4.30"

Area (sf)	CN	Description
5,863	30	Meadow, non-grazed, HSG A
2,934	98	Paved parking, HSG A
8,460	98	Paved parking, HSG C
38,601	71	Meadow, non-grazed, HSG C
1,549	79	Woods, Fair, HSG D
3,000	98	Roofs, HSG C
60,407	74	Weighted Average
46,013		76.17% Pervious Area
14,394		23.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0400	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.5	102	0.0280	1.17		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	60	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
12.9	262	Total			

Summary for Subcatchment 7S: Subarea 7

Runoff = 3.91 cfs @ 12.04 hrs, Volume= 0.209 af, Depth> 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=4.30"

Area (sf)	CN	Description
6,000	98	Roofs, HSG A
62,758	71	Meadow, non-grazed, HSG C
68,758	73	Weighted Average
62,758		91.27% Pervious Area
6,000		8.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	100	0.0450	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.1	100	0.0450	1.48		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.8	200	Total			

Summary for Subcatchment 8S: Subarea 8

Runoff = 3.04 cfs @ 12.50 hrs, Volume= 0.541 af, Depth> 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=4.30"

Area (sf)	CN	Description
382,892	30	Meadow, non-grazed, HSG A
3,213	98	Paved parking, HSG A
2,049	98	Paved parking, HSG C
238,990	71	Meadow, non-grazed, HSG C
76,728	79	Woods, Fair, HSG D
7,604	98	Roofs, HSG C
7,345	98	Roofs, HSG A
6,226	76	Gravel roads, HSG A
2,128	89	Gravel roads, HSG C
727,175	51	Weighted Average
706,964		97.22% Pervious Area
20,211		2.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0240	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
2.7	380	0.1100	2.32		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
22.9	532	0.0060	0.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
39.3	1,012	Total			

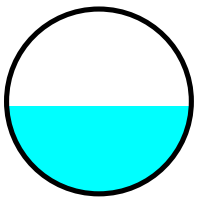
Summary for Reach 1R: Reach 1

Inflow Area = 18.272 ac, 3.29% Impervious, Inflow Depth > 0.46" for 10-yr event
Inflow = 4.16 cfs @ 12.50 hrs, Volume= 0.708 af
Outflow = 4.17 cfs @ 12.50 hrs, Volume= 0.708 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.28 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.67 fps, Avg. Travel Time= 0.2 min

Peak Storage= 32 cf @ 12.50 hrs
Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.14 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 56.0' Slope= 0.0200 '/'
Inlet Invert= 404.00', Outlet Invert= 402.88'



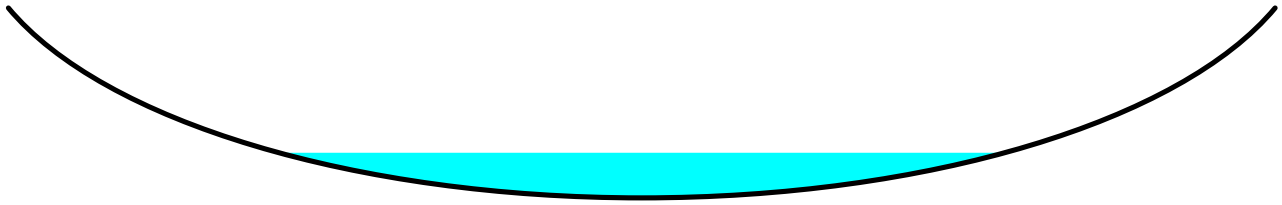
Summary for Reach 2R: Reach 2

Inflow Area = 18.272 ac, 3.29% Impervious, Inflow Depth > 0.46" for 10-yr event
Inflow = 4.17 cfs @ 12.50 hrs, Volume= 0.708 af
Outflow = 3.87 cfs @ 12.83 hrs, Volume= 0.689 af, Atten= 7%, Lag= 19.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.13 fps, Min. Travel Time= 10.7 min
Avg. Velocity = 0.71 fps, Avg. Travel Time= 17.0 min

Peak Storage= 2,477 cf @ 12.65 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 0.75' Flow Area= 30.0 sf, Capacity= 88.62 cfs

60.00' x 0.75' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 721.0' Slope= 0.0122 '/'
Inlet Invert= 399.30', Outlet Invert= 390.50'



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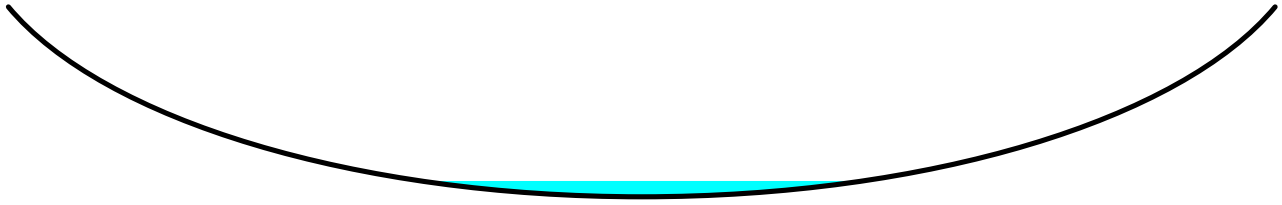
Summary for Reach 5R: Lot 17/18 Buffer

Inflow Area = 2.565 ac, 18.25% Impervious, Inflow Depth > 0.64" for 10-yr event
Inflow = 1.40 cfs @ 12.23 hrs, Volume= 0.138 af
Outflow = 0.87 cfs @ 12.84 hrs, Volume= 0.132 af, Atten= 38%, Lag= 36.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.12 fps, Min. Travel Time= 20.0 min
Avg. Velocity = 0.07 fps, Avg. Travel Time= 33.5 min

Peak Storage= 1,052 cf @ 12.50 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 0.75' Flow Area= 300.0 sf, Capacity= 198.58 cfs

600.00' x 0.75' deep Parabolic Channel, n= 0.400 Sheet flow: Woods+light brush
Length= 150.0' Slope= 0.0800 '/'
Inlet Invert= 0.00', Outlet Invert= -12.00'



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Summary for Reach SP1: Summation Point 1

Inflow Area = 4.742 ac, 4.61% Impervious, Inflow Depth = 0.00" for 10-yr event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP2: Summation Point 2

Inflow Area = 27.831 ac, 3.28% Impervious, Inflow Depth > 0.09" for 10-yr event
Inflow = 0.87 cfs @ 12.84 hrs, Volume= 0.213 af
Outflow = 0.87 cfs @ 12.84 hrs, Volume= 0.213 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP3: Summation Point 3

Inflow Area = 34.815 ac, 5.36% Impervious, Inflow Depth > 0.69" for 10-yr event
Inflow = 14.90 cfs @ 12.24 hrs, Volume= 2.008 af
Outflow = 14.90 cfs @ 12.24 hrs, Volume= 2.008 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1Ps: Pond 1

Inflow Area = 1.387 ac, 23.83% Impervious, Inflow Depth > 1.66" for 10-yr event
Inflow = 3.46 cfs @ 12.05 hrs, Volume= 0.192 af
Outflow = 1.40 cfs @ 12.23 hrs, Volume= 0.138 af, Atten= 60%, Lag= 10.5 min
Primary = 1.40 cfs @ 12.23 hrs, Volume= 0.138 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 400.54' @ 12.24 hrs Surf.Area= 3,911 sf Storage= 3,312 cf

Plug-Flow detention time= 114.5 min calculated for 0.138 af (72% of inflow)
Center-of-Mass det. time= 46.0 min (847.8 - 801.8)

Volume	Invert	Avail.Storage	Storage Description
#1	399.58'	10,382 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
399.58	3,200	0	0
400.00	3,325	1,370	1,370
401.00	4,418	3,872	5,242
402.00	5,862	5,140	10,382

Device	Routing	Invert	Outlet Devices
#1	Primary	393.33'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 393.33' / 392.33' S= 0.0100 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2 Device 1 400.25' **12.0" Horiz. Orifice/Grate** C= 0.600
Limited to weir flow at low heads

Primary OutFlow Max=1.40 cfs @ 12.23 hrs HW=400.53' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.40 cfs @ 7.11 fps)
└**2=Orifice/Grate** (Passes 1.40 cfs of 1.56 cfs potential flow)

Summary for Pond 2P: Pond 2

Inflow Area = 1.178 ac, 11.69% Impervious, Inflow Depth > 0.12" for 10-yr event
Inflow = 0.03 cfs @ 12.48 hrs, Volume= 0.011 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 400.42' @ 20.00 hrs Surf.Area= 2,153 sf Storage= 494 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	400.18'	4,976 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
400.18	2,000	0	0
401.00	2,528	1,856	1,856
402.00	3,711	3,120	4,976

Device	Routing	Invert	Outlet Devices
#1	Primary	396.33'	**6.0" Round Culvert**
			L= 100.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 396.33' / 395.33' S= 0.0100 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	400.85'	**12.0" Horiz. Orifice/Grate** C= 0.600
			Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=400.18' (Free Discharge)
└**1=Culvert** (Passes 0.00 cfs of 1.05 cfs potential flow)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 3P: Pond 3

Inflow Area = 1.391 ac, 9.91% Impervious, Inflow Depth > 0.03" for 10-yr event
Inflow = 0.01 cfs @ 18.07 hrs, Volume= 0.003 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

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

Peak Elev= 401.63' @ 20.00 hrs Surf.Area= 2,517 sf Storage= 131 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	401.58'	4,316 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
401.58	2,500	0	0
402.00	2,635	1,078	1,078
403.00	3,840	3,238	4,316

Device	Routing	Invert	Outlet Devices
#1	Primary	398.40'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 398.40' / 397.40' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	402.25'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=401.58' (Free Discharge)
↑—**1=Culvert** (Passes 0.00 cfs of 0.97 cfs potential flow)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 4P: Pond 4

Inflow Area = 1.578 ac, 8.73% Impervious, Inflow Depth > 1.59" for 10-yr event
Inflow = 3.91 cfs @ 12.04 hrs, Volume= 0.209 af
Outflow = 1.12 cfs @ 12.27 hrs, Volume= 0.167 af, Atten= 71%, Lag= 13.7 min
Primary = 1.12 cfs @ 12.27 hrs, Volume= 0.167 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 403.74' @ 12.27 hrs Surf.Area= 3,431 sf Storage= 3,508 cf

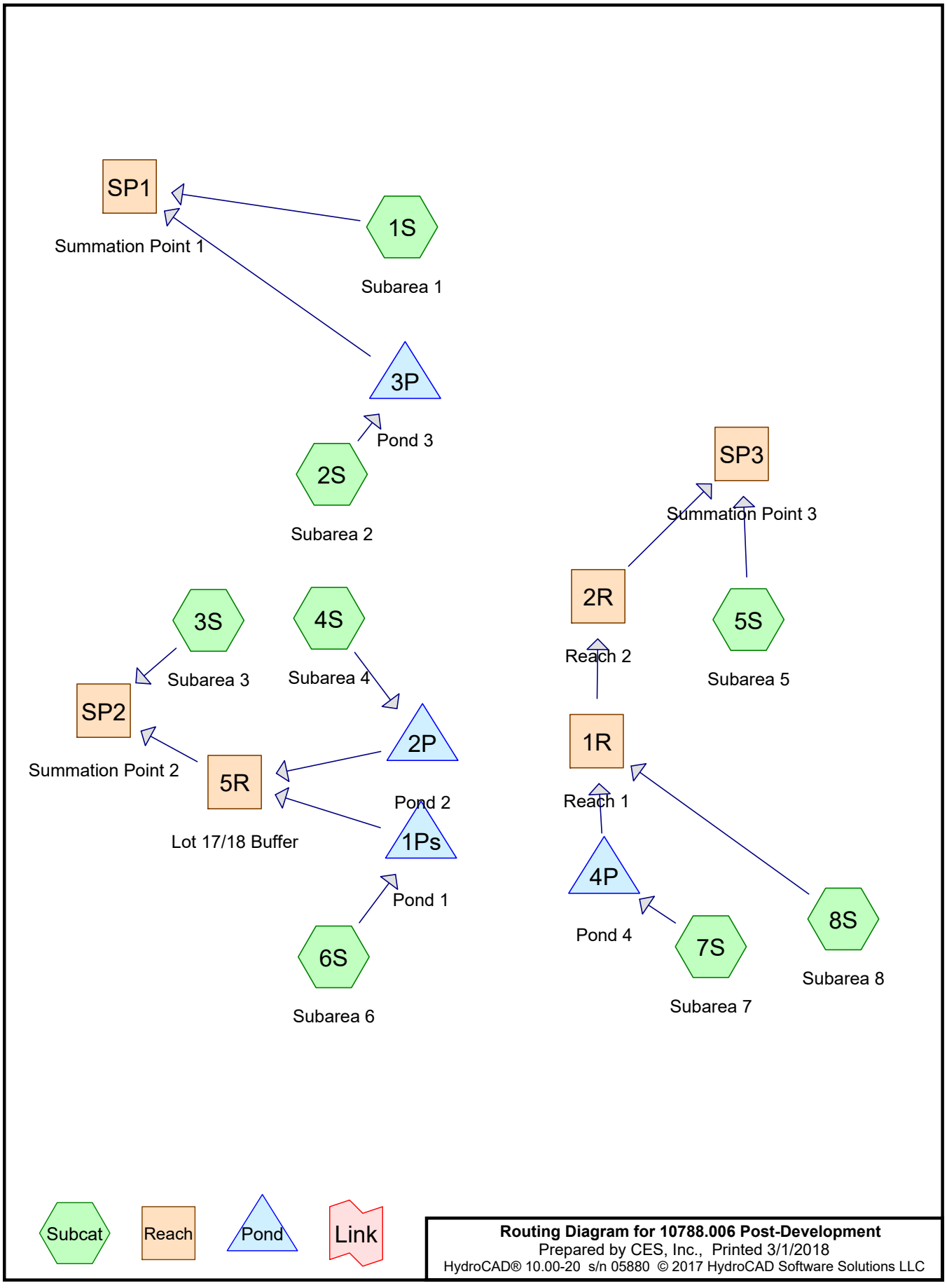
Plug-Flow detention time= 92.6 min calculated for 0.166 af (80% of inflow)
Center-of-Mass det. time= 36.6 min (839.5 - 802.9)

Volume	Invert	Avail.Storage	Storage Description
#1	402.50'	8,833 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
402.50	2,500	0	0
403.00	2,609	1,277	1,277
404.00	3,721	3,165	4,442
405.00	5,060	4,391	8,833

Device	Routing	Invert	Outlet Devices
#1	Primary	399.25'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 399.25' / 398.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	403.17'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.12 cfs @ 12.27 hrs HW=403.74' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 1.12 cfs @ 5.72 fps)
↑—**2=Orifice/Grate** (Passes 1.12 cfs of 2.85 cfs potential flow)



Routing Diagram for 10788.006 Post-Development
Prepared by CES, Inc., Printed 3/1/2018

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

Subcatchment 1S: Subarea 1 Runoff Area=145,978 sf 2.42% Impervious Runoff Depth>0.03"
Flow Length=430' Tc=15.5 min CN=32 Runoff=0.02 cfs 0.010 af

Subcatchment 2S: Subarea 2 Runoff Area=60,575 sf 9.91% Impervious Runoff Depth>0.16"
Flow Length=180' Tc=10.8 min CN=37 Runoff=0.05 cfs 0.018 af

Subcatchment 3S: Subarea 3 Runoff Area=1,100,588 sf 1.76% Impervious Runoff Depth>0.19"
Flow Length=1,249' Tc=21.7 min CN=38 Runoff=1.18 cfs 0.399 af

Subcatchment 4S: Subarea 4 Runoff Area=51,319 sf 11.69% Impervious Runoff Depth>0.35"
Flow Length=180' Tc=10.8 min CN=42 Runoff=0.30 cfs 0.034 af

Subcatchment 5S: Subarea 5 Runoff Area=720,603 sf 7.63% Impervious Runoff Depth>1.58"
Flow Length=660' Tc=26.1 min CN=63 Runoff=25.97 cfs 2.179 af

Subcatchment 6S: Subarea 6 Runoff Area=60,407 sf 23.83% Impervious Runoff Depth>2.47"
Flow Length=262' Tc=12.9 min CN=74 Runoff=5.14 cfs 0.285 af

Subcatchment 7S: Subarea 7 Runoff Area=68,758 sf 8.73% Impervious Runoff Depth>2.38"
Flow Length=200' Slope=0.0450 '/' Tc=11.8 min CN=73 Runoff=5.86 cfs 0.313 af

Subcatchment 8S: Subarea 8 Runoff Area=727,175 sf 2.78% Impervious Runoff Depth>0.79"
Flow Length=1,012' Tc=39.3 min CN=51 Runoff=7.99 cfs 1.097 af

Reach 1R: Reach 1 Avg. Flow Depth=1.03' Max Vel=8.49 fps Inflow=9.18 cfs 1.368 af
15.0" Round Pipe n=0.013 L=56.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=9.16 cfs 1.368 af

Reach 2R: Reach 2 Avg. Flow Depth=0.26' Max Vel=1.44 fps Inflow=9.16 cfs 1.368 af
n=0.035 L=721.0' S=0.0122 '/' Capacity=88.62 cfs Outflow=8.62 cfs 1.343 af

Reach 5R: Lot 17/18 Buffer Avg. Flow Depth=0.08' Max Vel=0.14 fps Inflow=1.44 cfs 0.230 af
n=0.400 L=150.0' S=0.0800 '/' Capacity=198.58 cfs Outflow=1.39 cfs 0.223 af

Reach SP1: Summation Point 1 Inflow=0.02 cfs 0.010 af
Outflow=0.02 cfs 0.010 af

Reach SP2: Summation Point 2 Inflow=2.32 cfs 0.622 af
Outflow=2.32 cfs 0.622 af

Reach SP3: Summation Point 3 Inflow=26.84 cfs 3.522 af
Outflow=26.84 cfs 3.522 af

Pond 1Ps: Pond 1 Peak Elev=400.98' Storage=5,153 cf Inflow=5.14 cfs 0.285 af
Outflow=1.44 cfs 0.230 af

Pond 2P: Pond 2 Peak Elev=400.85' Storage=1,481 cf Inflow=0.30 cfs 0.034 af
Outflow=0.00 cfs 0.000 af

Pond 3P: Pond 3 Peak Elev=401.89' Storage=800 cf Inflow=0.05 cfs 0.018 af
Outflow=0.00 cfs 0.000 af

Pond 4P: Pond 4 Peak Elev=404.35' Storage=5,835 cf Inflow=5.86 cfs 0.313 af
Outflow=1.19 cfs 0.271 af

Total Runoff Area = 67.388 ac Runoff Volume = 4.336 af Average Runoff Depth = 0.77"
95.55% Pervious = 64.390 ac 4.45% Impervious = 2.997 ac

Summary for Subcatchment 1S: Subarea 1

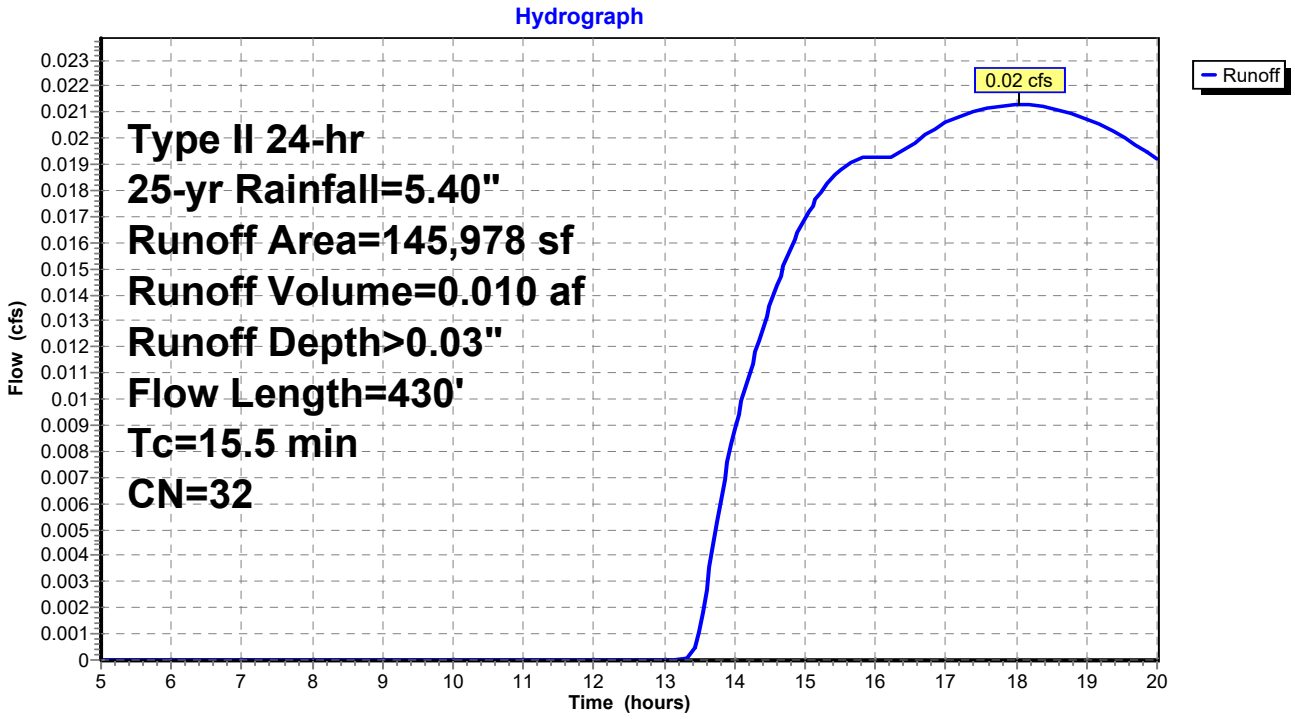
Runoff = 0.02 cfs @ 18.05 hrs, Volume= 0.010 af, Depth> 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=5.40"

Area (sf)	CN	Description
142,450	30	Meadow, non-grazed, HSG A
3,528	98	Paved parking, HSG A
145,978	32	Weighted Average
142,450		97.58% Pervious Area
3,528		2.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	22	0.0200	0.98		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
13.6	78	0.0150	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.5	330	0.2700	3.64		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.5	430	Total			

Subcatchment 1S: Subarea 1



Summary for Subcatchment 2S: Subarea 2

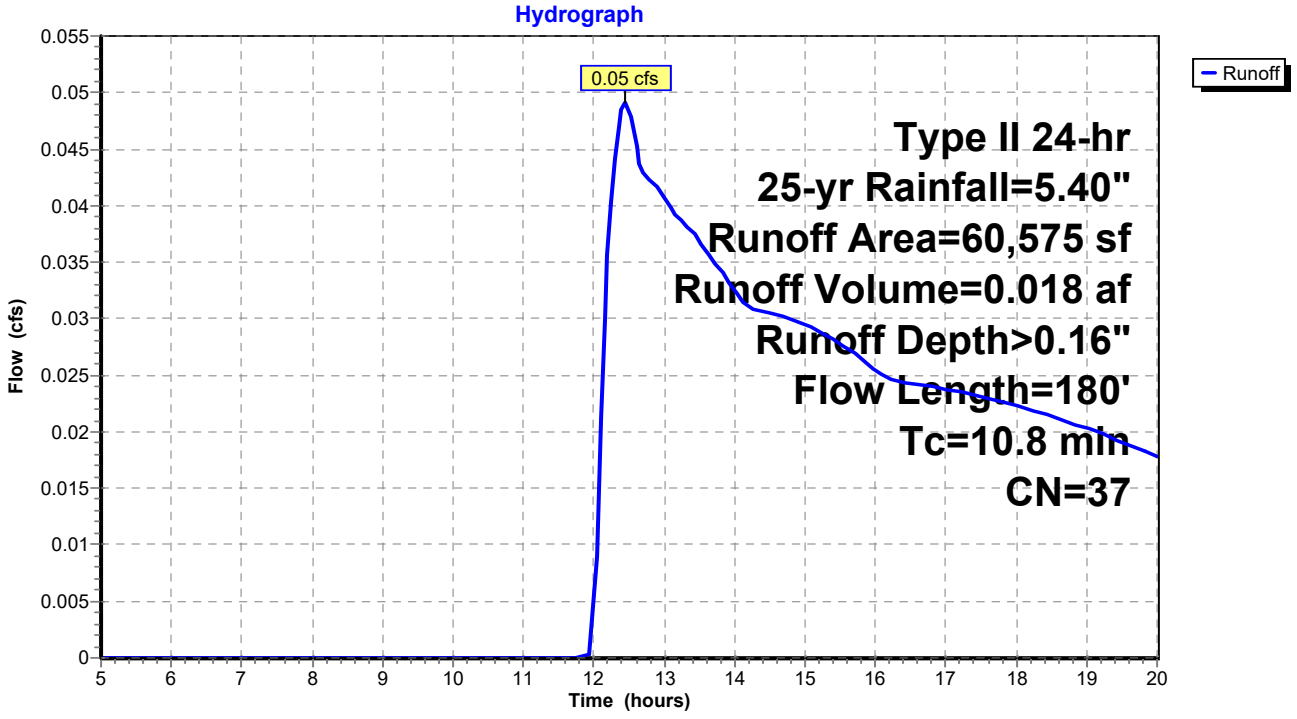
Runoff = 0.05 cfs @ 12.45 hrs, Volume= 0.018 af, Depth> 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=5.40"

Area (sf)	CN	Description
54,575	30	Meadow, non-grazed, HSG A
6,000	98	Roofs, HSG A
60,575	37	Weighted Average
54,575		90.09% Pervious Area
6,000		9.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0600	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.3	80	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.8	180	Total			

Subcatchment 2S: Subarea 2



Summary for Subcatchment 3S: Subarea 3

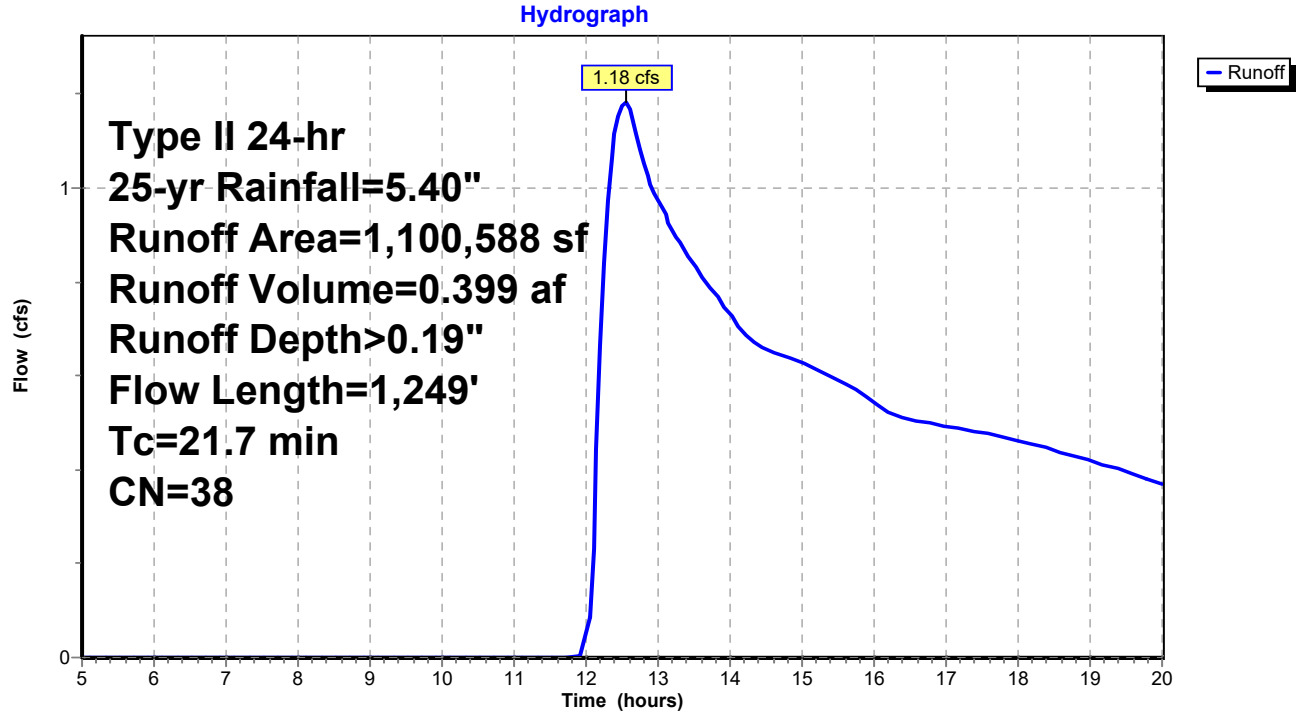
Runoff = 1.18 cfs @ 12.54 hrs, Volume= 0.399 af, Depth> 0.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=5.40"

Area (sf)	CN	Description
810,042	30	Meadow, non-grazed, HSG A
7,378	98	Paved parking, HSG A
10,340	98	Roofs, HSG A
1,699	98	Roofs, HSG C
245,387	58	Meadow, non-grazed, HSG B
12,927	71	Meadow, non-grazed, HSG C
12,815	76	Gravel roads, HSG A
1,100,588	38	Weighted Average
1,081,171		98.24% Pervious Area
19,417		1.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0240	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
8.0	1,149	0.1170	2.39		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
21.7	1,249	Total			

Subcatchment 3S: Subarea 3



Summary for Subcatchment 4S: Subarea 4

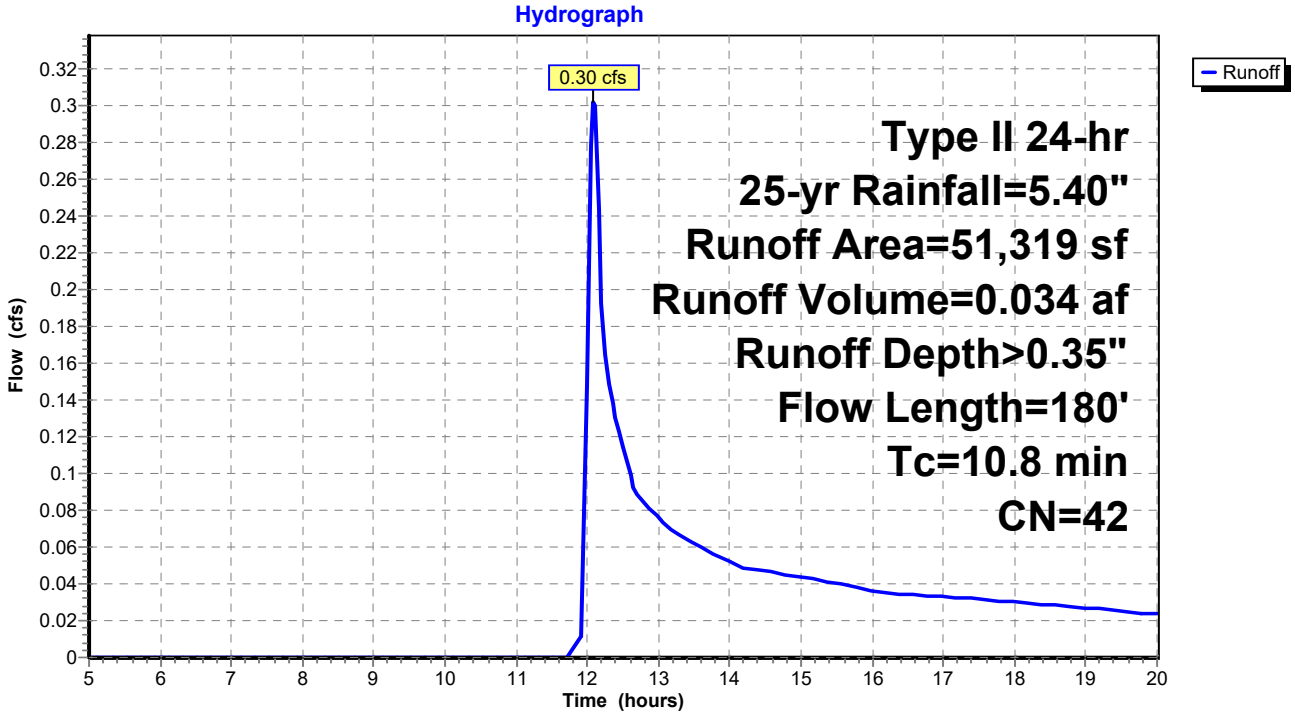
Runoff = 0.30 cfs @ 12.09 hrs, Volume= 0.034 af, Depth> 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=5.40"

Area (sf)	CN	Description
40,415	30	Meadow, non-grazed, HSG A
6,000	98	Roofs, HSG A
4,904	71	Meadow, non-grazed, HSG C
51,319	42	Weighted Average
45,319		88.31% Pervious Area
6,000		11.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0600	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.3	80	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.8	180	Total			

Subcatchment 4S: Subarea 4



Summary for Subcatchment 5S: Subarea 5

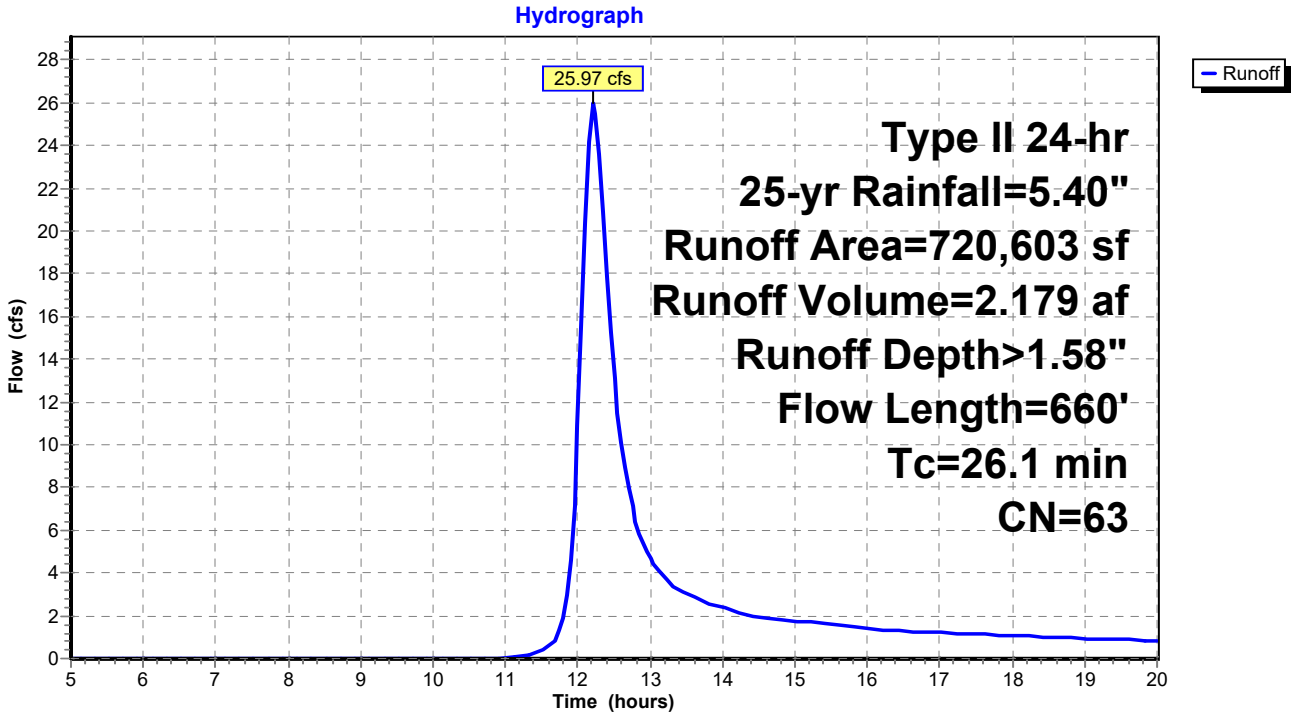
Runoff = 25.97 cfs @ 12.22 hrs, Volume= 2.179 af, Depth> 1.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=5.40"

Area (sf)	CN	Description
211,507	30	Meadow, non-grazed, HSG A
15,621	98	Paved parking, HSG A
4,800	98	Roofs, HSG A
14,804	98	Paved parking, HSG C
291,290	71	Meadow, non-grazed, HSG C
156,625	79	Woods, Fair, HSG D
16,438	98	Roofs, HSG C
6,170	89	Gravel roads, HSG C
3,348	98	Paved parking, HSG D
720,603	63	Weighted Average
665,592		92.37% Pervious Area
55,011		7.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	100	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
11.4	560	0.0270	0.82		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.1	660	Total			

Subcatchment 5S: Subarea 5



Summary for Subcatchment 6S: Subarea 6

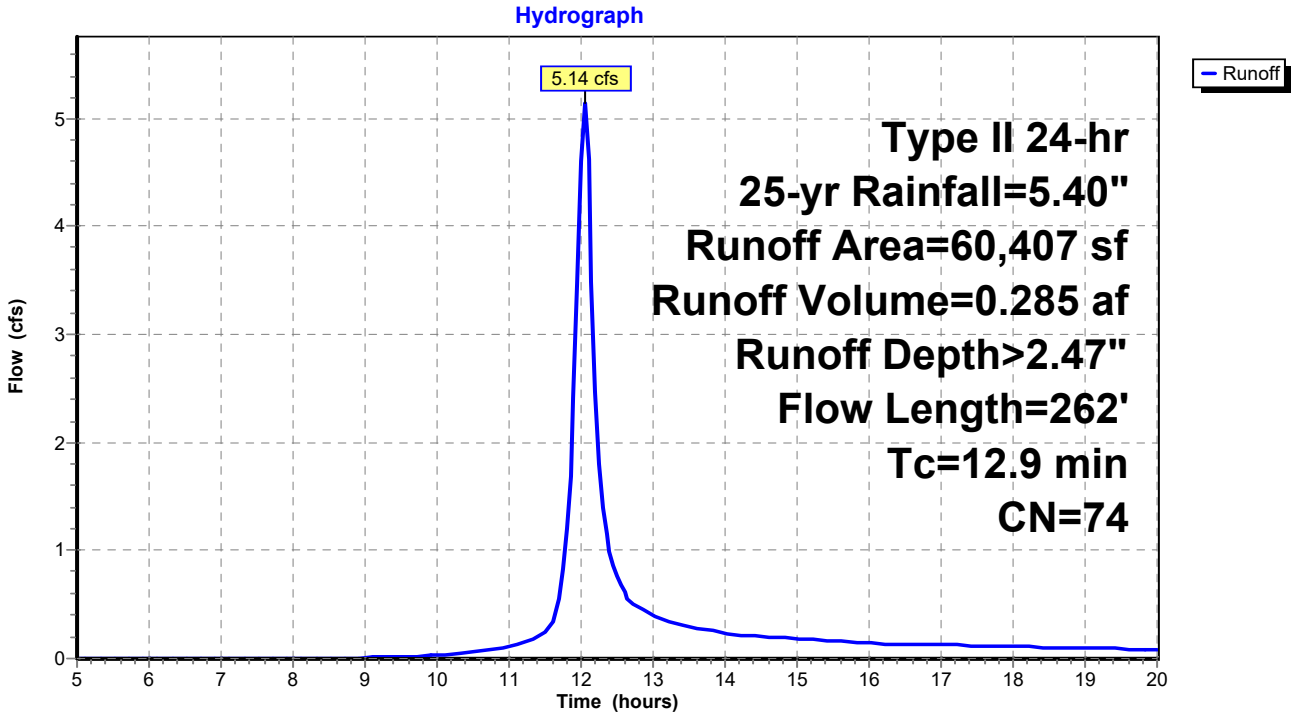
Runoff = 5.14 cfs @ 12.05 hrs, Volume= 0.285 af, Depth> 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=5.40"

Area (sf)	CN	Description
5,863	30	Meadow, non-grazed, HSG A
2,934	98	Paved parking, HSG A
8,460	98	Paved parking, HSG C
38,601	71	Meadow, non-grazed, HSG C
1,549	79	Woods, Fair, HSG D
3,000	98	Roofs, HSG C
60,407	74	Weighted Average
46,013		76.17% Pervious Area
14,394		23.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0400	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.5	102	0.0280	1.17		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	60	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
12.9	262	Total			

Subcatchment 6S: Subarea 6



Summary for Subcatchment 7S: Subarea 7

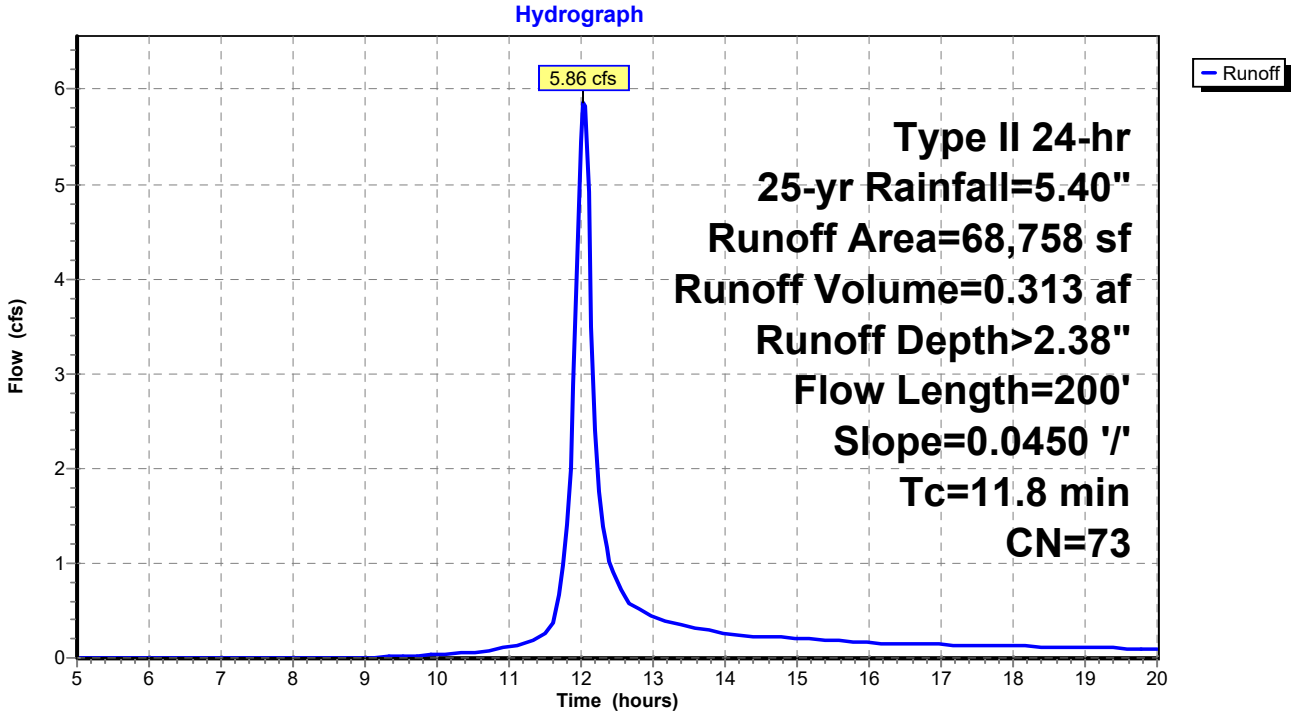
Runoff = 5.86 cfs @ 12.04 hrs, Volume= 0.313 af, Depth> 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=5.40"

Area (sf)	CN	Description
6,000	98	Roofs, HSG A
62,758	71	Meadow, non-grazed, HSG C
68,758	73	Weighted Average
62,758		91.27% Pervious Area
6,000		8.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	100	0.0450	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
1.1	100	0.0450	1.48		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.8	200	Total			

Subcatchment 7S: Subarea 7



Summary for Subcatchment 8S: Subarea 8

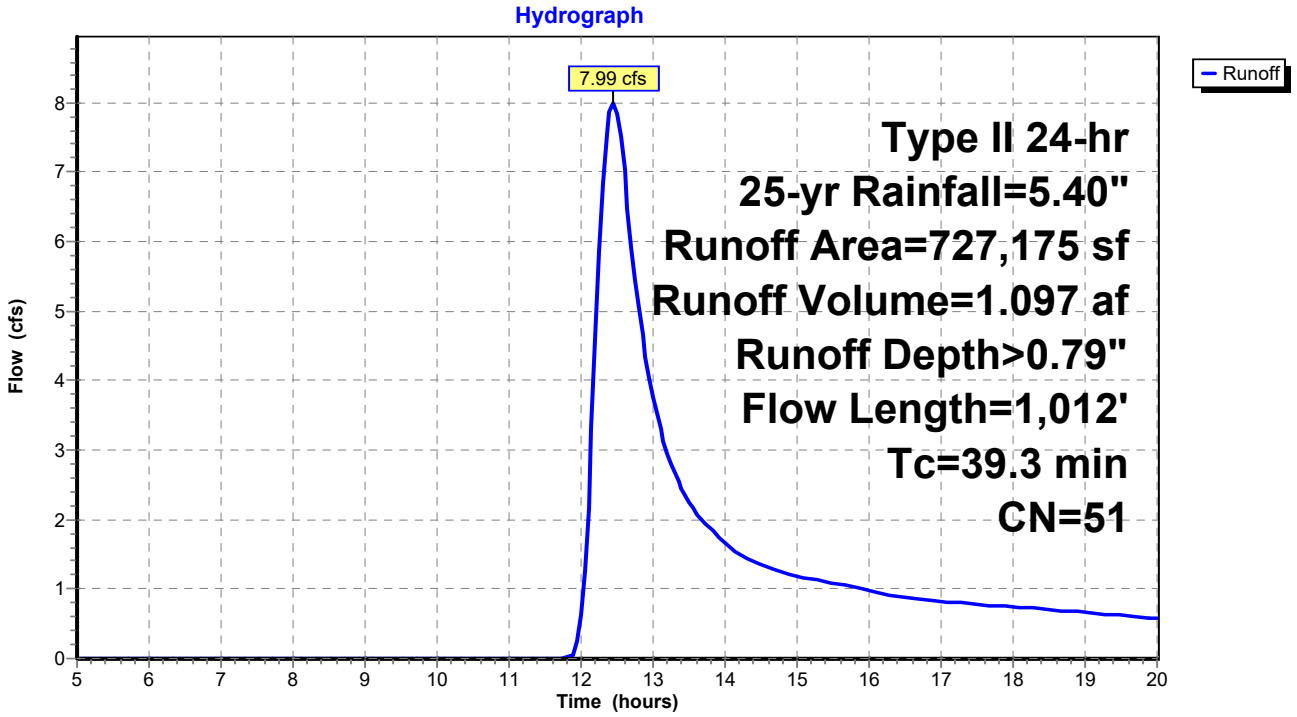
Runoff = 7.99 cfs @ 12.45 hrs, Volume= 1.097 af, Depth> 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=5.40"

Area (sf)	CN	Description
382,892	30	Meadow, non-grazed, HSG A
3,213	98	Paved parking, HSG A
2,049	98	Paved parking, HSG C
238,990	71	Meadow, non-grazed, HSG C
76,728	79	Woods, Fair, HSG D
7,604	98	Roofs, HSG C
7,345	98	Roofs, HSG A
6,226	76	Gravel roads, HSG A
2,128	89	Gravel roads, HSG C
727,175	51	Weighted Average
706,964		97.22% Pervious Area
20,211		2.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0240	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
2.7	380	0.1100	2.32		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
22.9	532	0.0060	0.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
39.3	1,012	Total			

Subcatchment 8S: Subarea 8



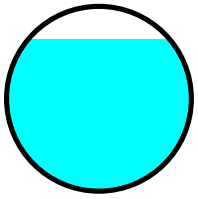
Summary for Reach 1R: Reach 1

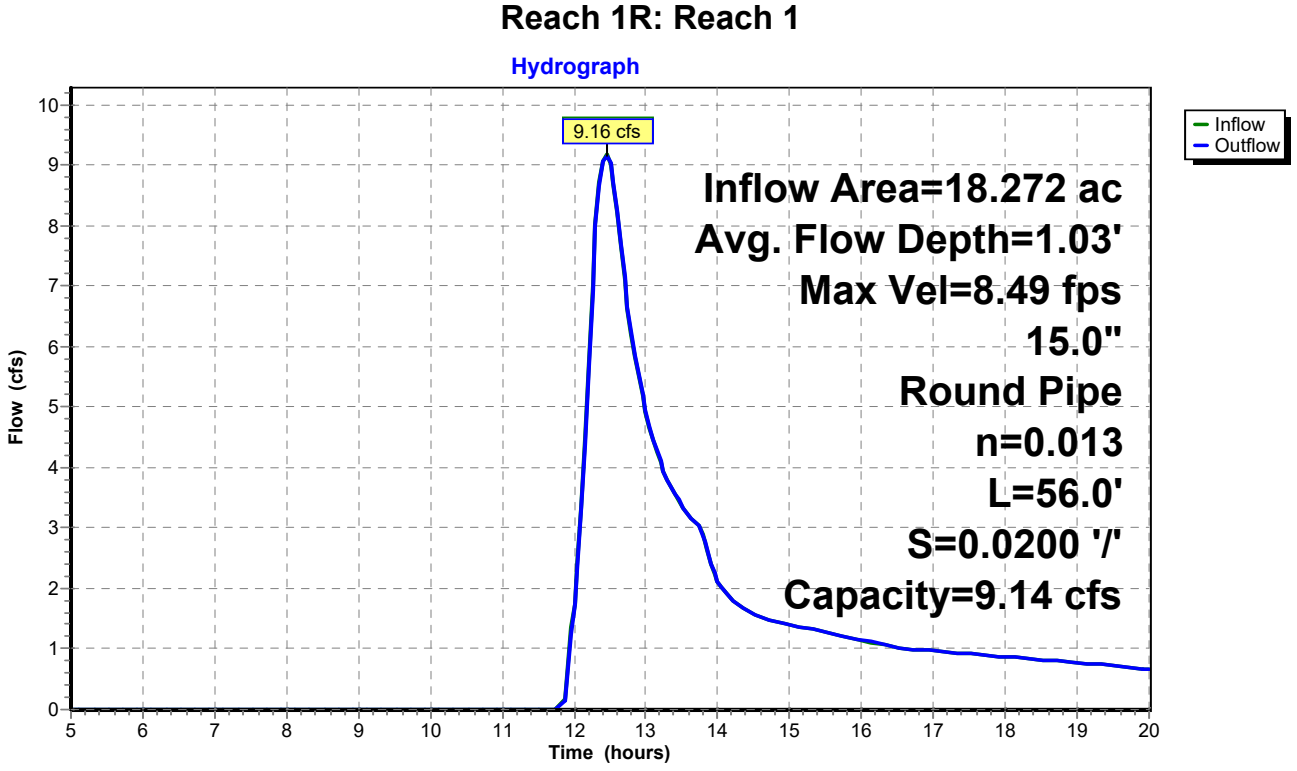
Inflow Area = 18.272 ac, 3.29% Impervious, Inflow Depth > 0.90" for 25-yr event
Inflow = 9.18 cfs @ 12.45 hrs, Volume= 1.368 af
Outflow = 9.16 cfs @ 12.45 hrs, Volume= 1.368 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.49 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 5.48 fps, Avg. Travel Time= 0.2 min

Peak Storage= 60 cf @ 12.45 hrs
Average Depth at Peak Storage= 1.03'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.14 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 56.0' Slope= 0.0200 '/'
Inlet Invert= 404.00', Outlet Invert= 402.88'





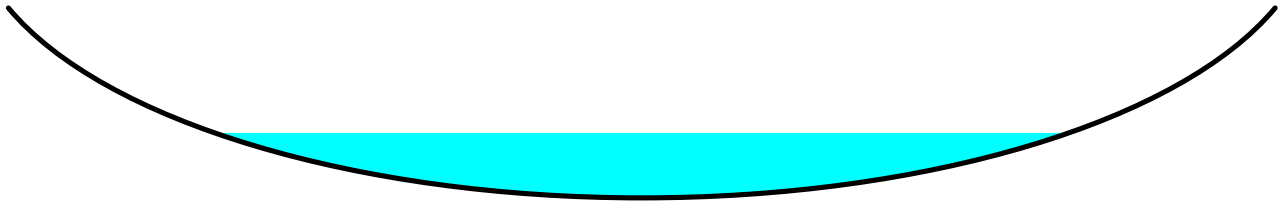
Summary for Reach 2R: Reach 2

Inflow Area = 18.272 ac, 3.29% Impervious, Inflow Depth > 0.90" for 25-yr event
Inflow = 9.16 cfs @ 12.45 hrs, Volume= 1.368 af
Outflow = 8.62 cfs @ 12.70 hrs, Volume= 1.343 af, Atten= 6%, Lag= 15.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.44 fps, Min. Travel Time= 8.3 min
Avg. Velocity = 0.85 fps, Avg. Travel Time= 14.2 min

Peak Storage= 4,317 cf @ 12.56 hrs
Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 0.75' Flow Area= 30.0 sf, Capacity= 88.62 cfs

60.00' x 0.75' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 721.0' Slope= 0.0122 '/'
Inlet Invert= 399.30', Outlet Invert= 390.50'



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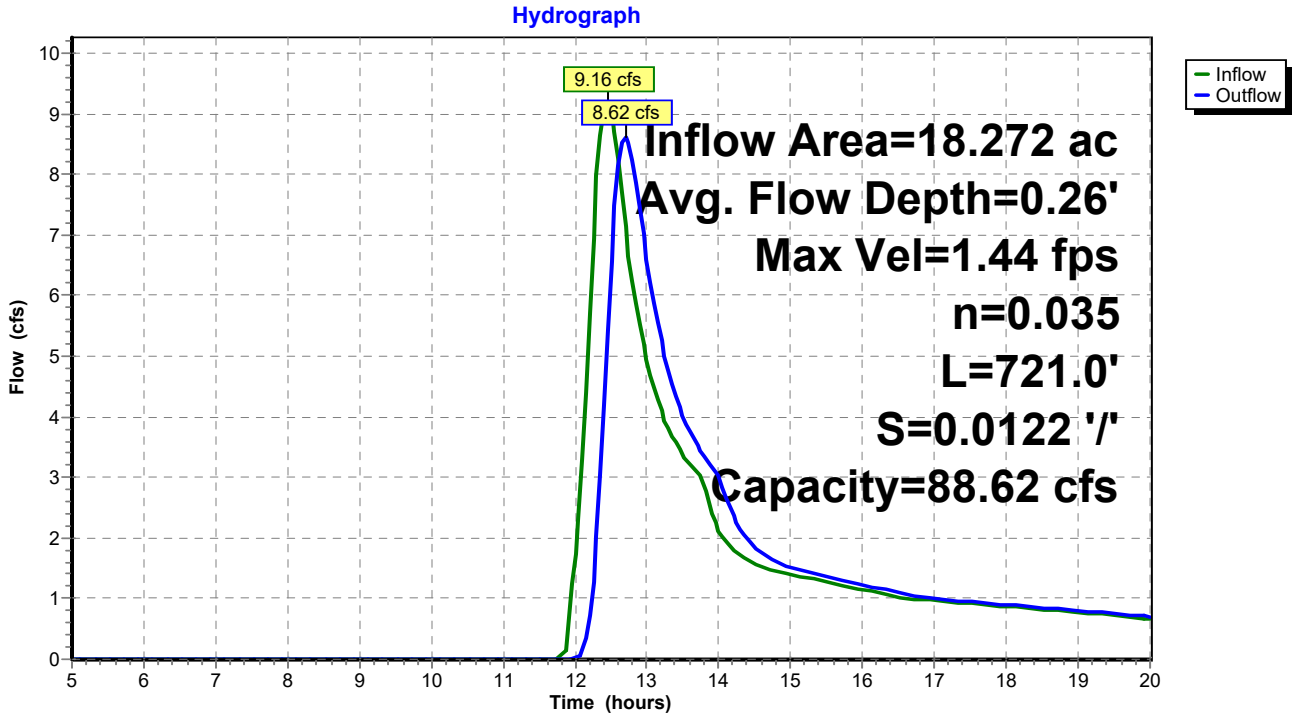
Reach 2R: Reach 2



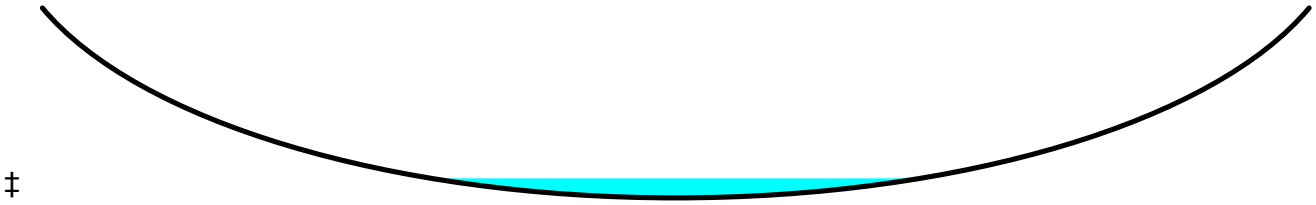
Summary for Reach 5R: Lot 17/18 Buffer

Inflow Area = 2.565 ac, 18.25% Impervious, Inflow Depth > 1.08" for 25-yr event
Inflow = 1.44 cfs @ 12.30 hrs, Volume= 0.230 af
Outflow = 1.39 cfs @ 13.24 hrs, Volume= 0.223 af, Atten= 3%, Lag= 56.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.14 fps, Min. Travel Time= 17.4 min
Avg. Velocity = 0.08 fps, Avg. Travel Time= 29.5 min

Peak Storage= 1,450 cf @ 12.97 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 0.75' Flow Area= 300.0 sf, Capacity= 198.58 cfs

600.00' x 0.75' deep Parabolic Channel, n= 0.400 Sheet flow: Woods+light brush
Length= 150.0' Slope= 0.0800 '/'
Inlet Invert= 0.00', Outlet Invert= -12.00'



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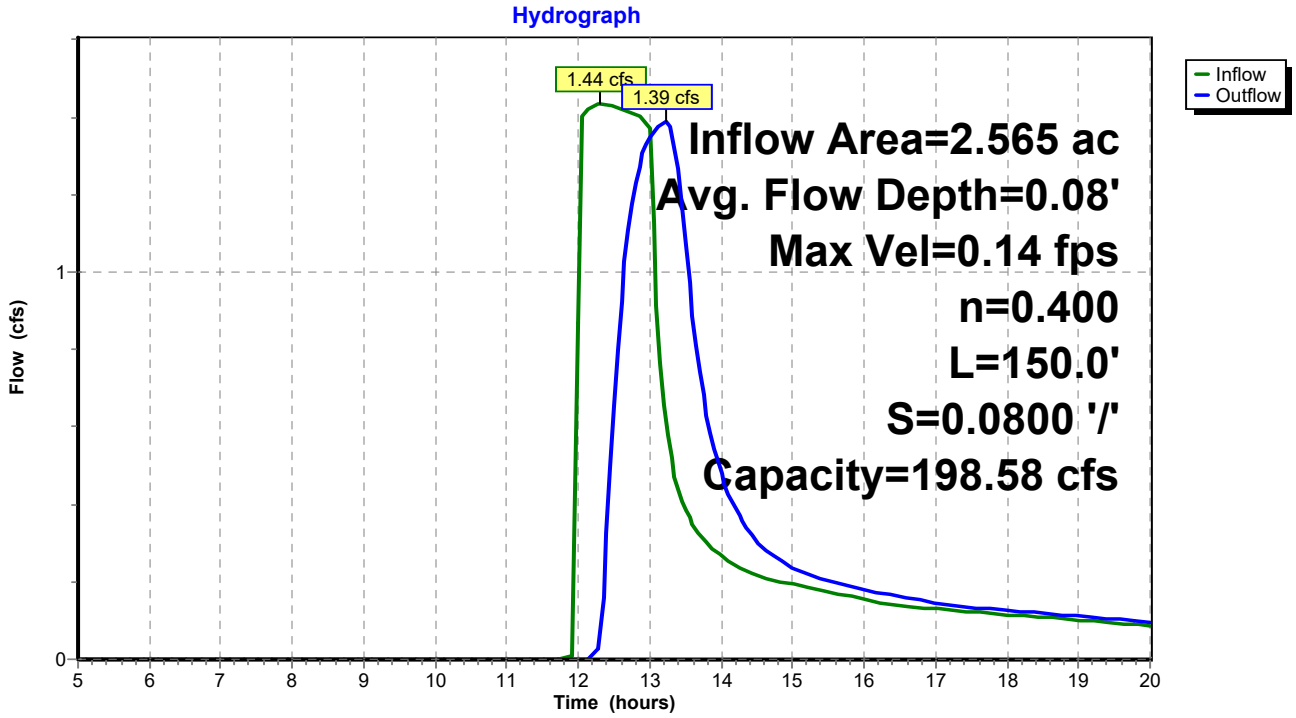
Reach 5R: Lot 17/18 Buffer

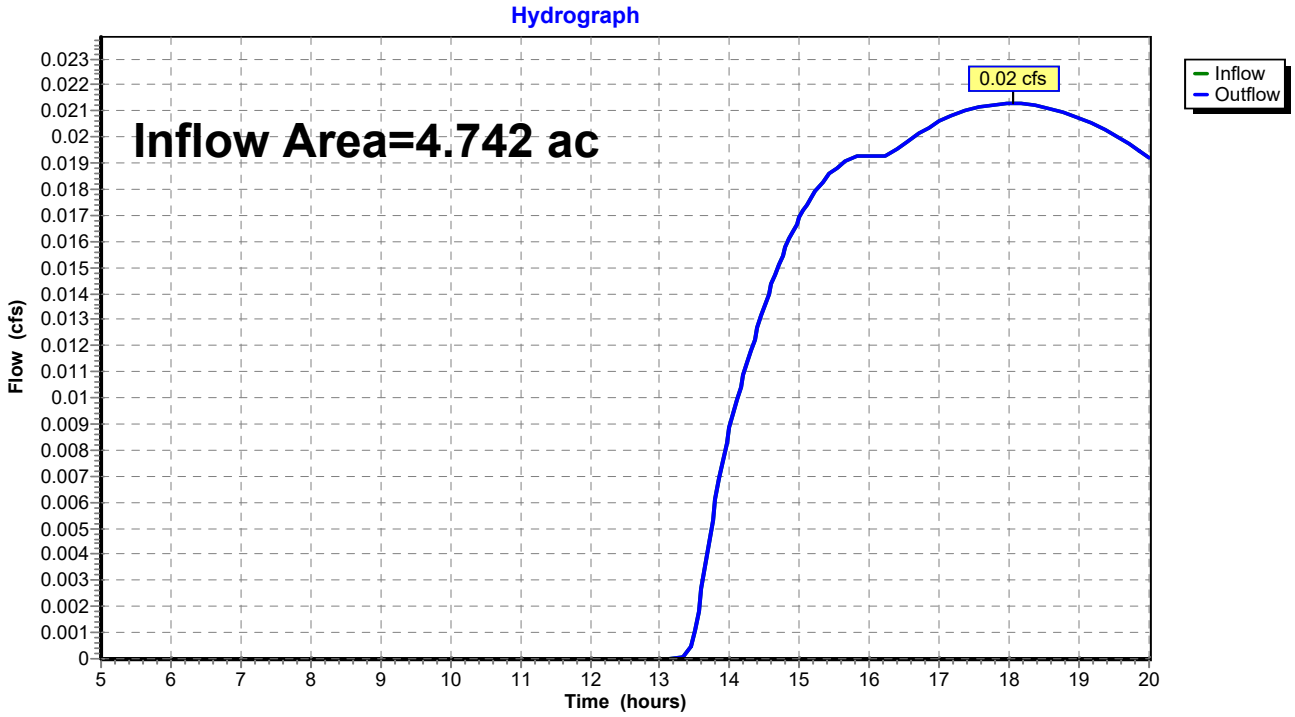


Summary for Reach SP1: Summation Point 1

Inflow Area = 4.742 ac, 4.61% Impervious, Inflow Depth > 0.02" for 25-yr event
Inflow = 0.02 cfs @ 18.05 hrs, Volume= 0.010 af
Outflow = 0.02 cfs @ 18.05 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

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

Reach SP1: Summation Point 1

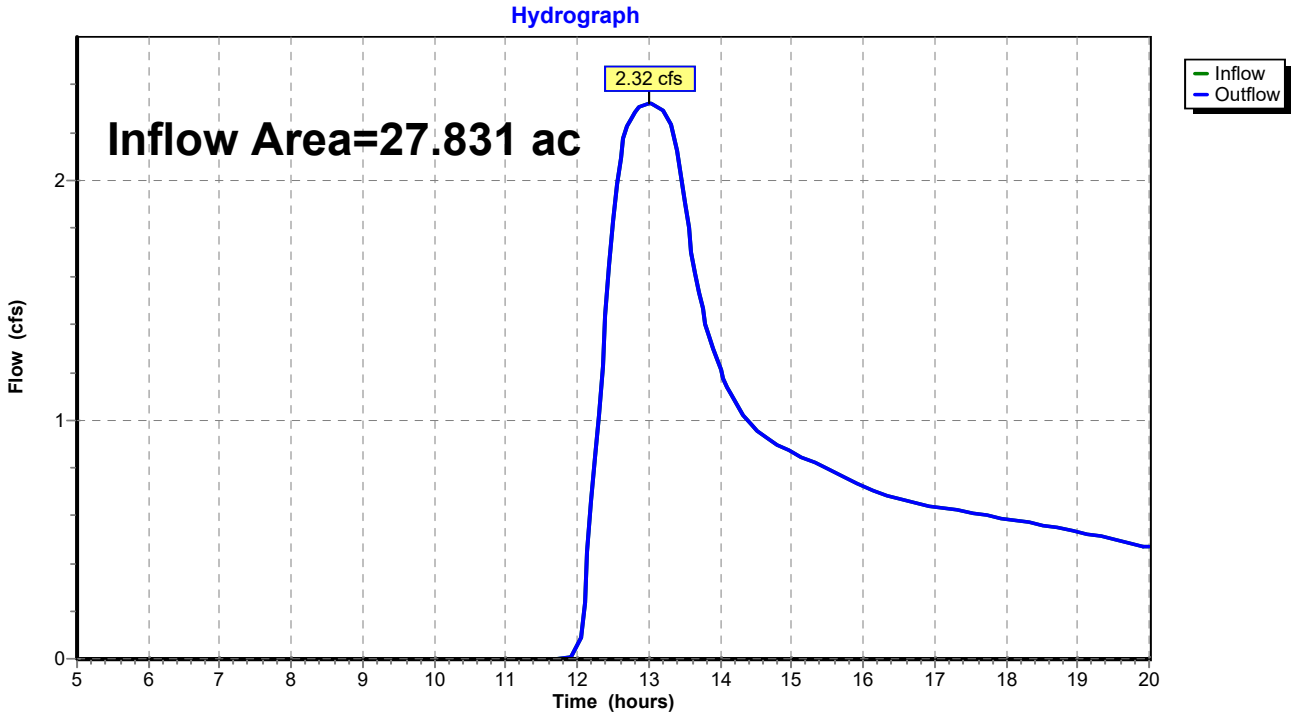


Summary for Reach SP2: Summation Point 2

Inflow Area = 27.831 ac, 3.28% Impervious, Inflow Depth > 0.27" for 25-yr event
Inflow = 2.32 cfs @ 13.01 hrs, Volume= 0.622 af
Outflow = 2.32 cfs @ 13.01 hrs, Volume= 0.622 af, Atten= 0%, Lag= 0.0 min

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

Reach SP2: Summation Point 2

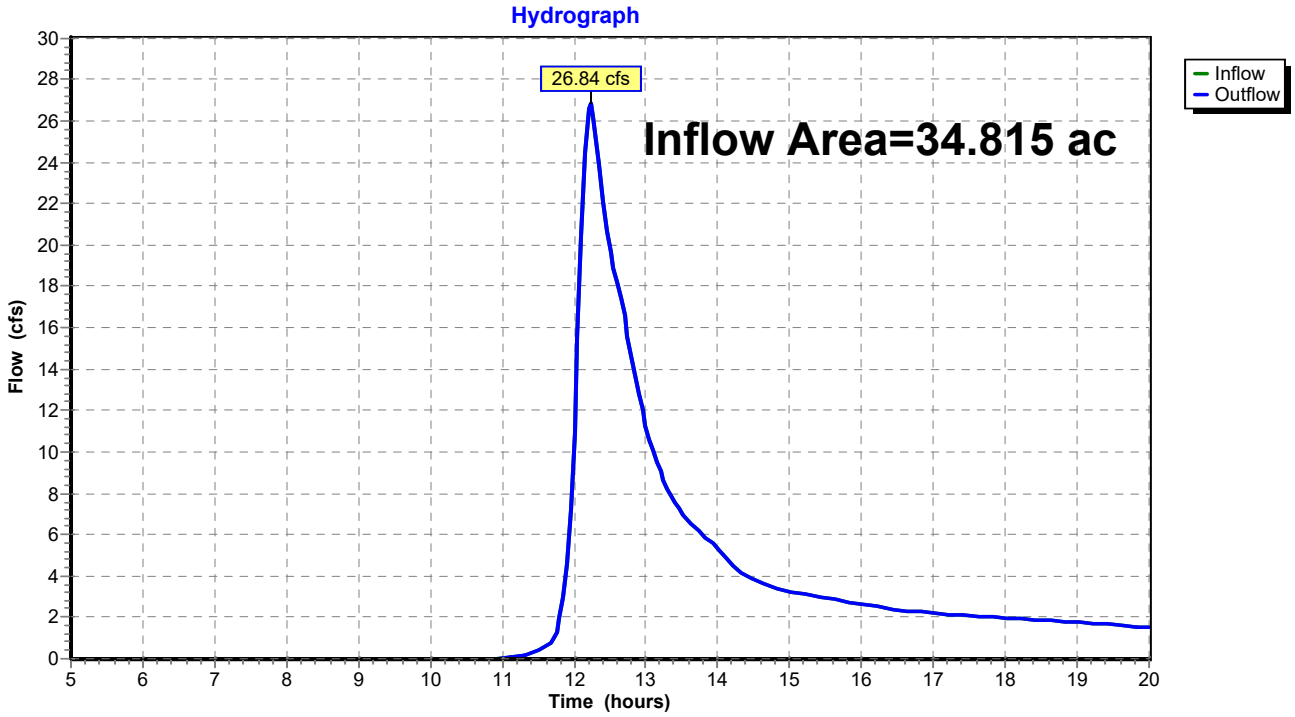


Summary for Reach SP3: Summation Point 3

Inflow Area = 34.815 ac, 5.36% Impervious, Inflow Depth > 1.21" for 25-yr event
Inflow = 26.84 cfs @ 12.23 hrs, Volume= 3.522 af
Outflow = 26.84 cfs @ 12.23 hrs, Volume= 3.522 af, Atten= 0%, Lag= 0.0 min

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

Reach SP3: Summation Point 3



Summary for Pond 1Ps: Pond 1

Inflow Area = 1.387 ac, 23.83% Impervious, Inflow Depth > 2.47" for 25-yr event
Inflow = 5.14 cfs @ 12.05 hrs, Volume= 0.285 af
Outflow = 1.44 cfs @ 12.30 hrs, Volume= 0.230 af, Atten= 72%, Lag= 15.0 min
Primary = 1.44 cfs @ 12.30 hrs, Volume= 0.230 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 400.98' @ 12.30 hrs Surf.Area= 4,396 sf Storage= 5,153 cf

Plug-Flow detention time= 92.8 min calculated for 0.230 af (81% of inflow)
Center-of-Mass det. time= 39.7 min (833.2 - 793.5)

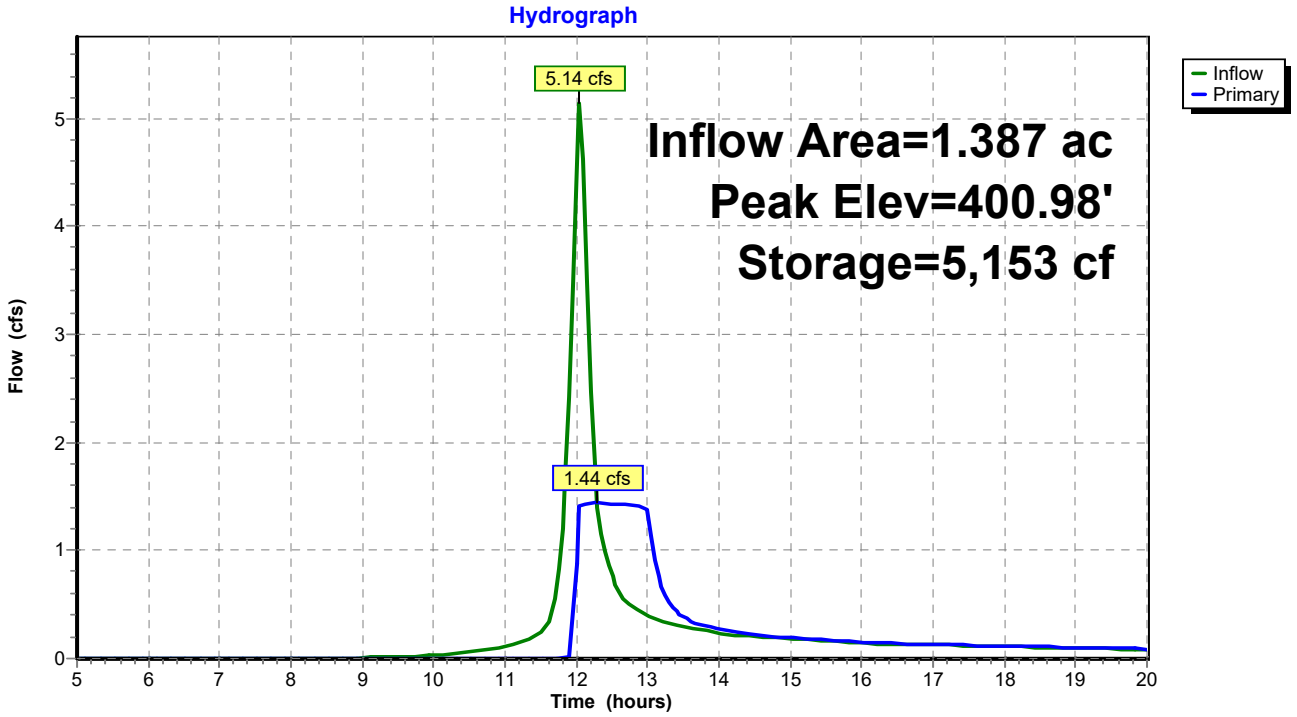
Volume	Invert	Avail.Storage	Storage Description
#1	399.58'	10,382 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
399.58	3,200	0	0
400.00	3,325	1,370	1,370
401.00	4,418	3,872	5,242
402.00	5,862	5,140	10,382

Device	Routing	Invert	Outlet Devices
#1	Primary	393.33'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 393.33' / 392.33' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	400.25'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.44 cfs @ 12.30 hrs HW=400.98' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.44 cfs @ 7.31 fps)
└**2=Orifice/Grate** (Passes 1.44 cfs of 3.23 cfs potential flow)

Pond 1Ps: Pond 1



Summary for Pond 2P: Pond 2

Inflow Area = 1.178 ac, 11.69% Impervious, Inflow Depth > 0.35" for 25-yr event
Inflow = 0.30 cfs @ 12.09 hrs, Volume= 0.034 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 400.85' @ 20.00 hrs Surf.Area= 2,431 sf Storage= 1,481 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

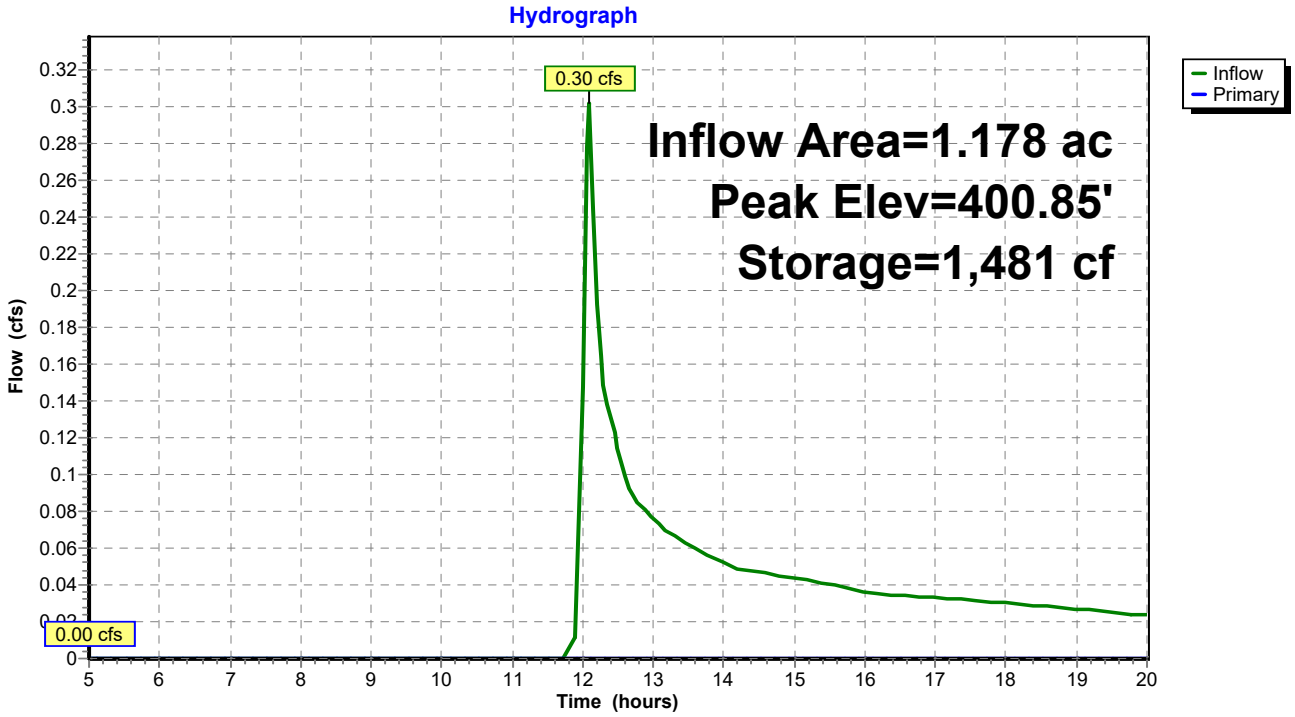
Volume	Invert	Avail.Storage	Storage Description
#1	400.18'	4,976 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
400.18	2,000	0	0
401.00	2,528	1,856	1,856
402.00	3,711	3,120	4,976

Device	Routing	Invert	Outlet Devices
#1	Primary	396.33'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 396.33' / 395.33' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	400.85'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=400.18' (Free Discharge)
↑—**1=Culvert** (Passes 0.00 cfs of 1.05 cfs potential flow)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 2P: Pond 2



Summary for Pond 3P: Pond 3

Inflow Area = 1.391 ac, 9.91% Impervious, Inflow Depth > 0.16" for 25-yr event
Inflow = 0.05 cfs @ 12.45 hrs, Volume= 0.018 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 401.89' @ 20.00 hrs Surf.Area= 2,601 sf Storage= 800 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

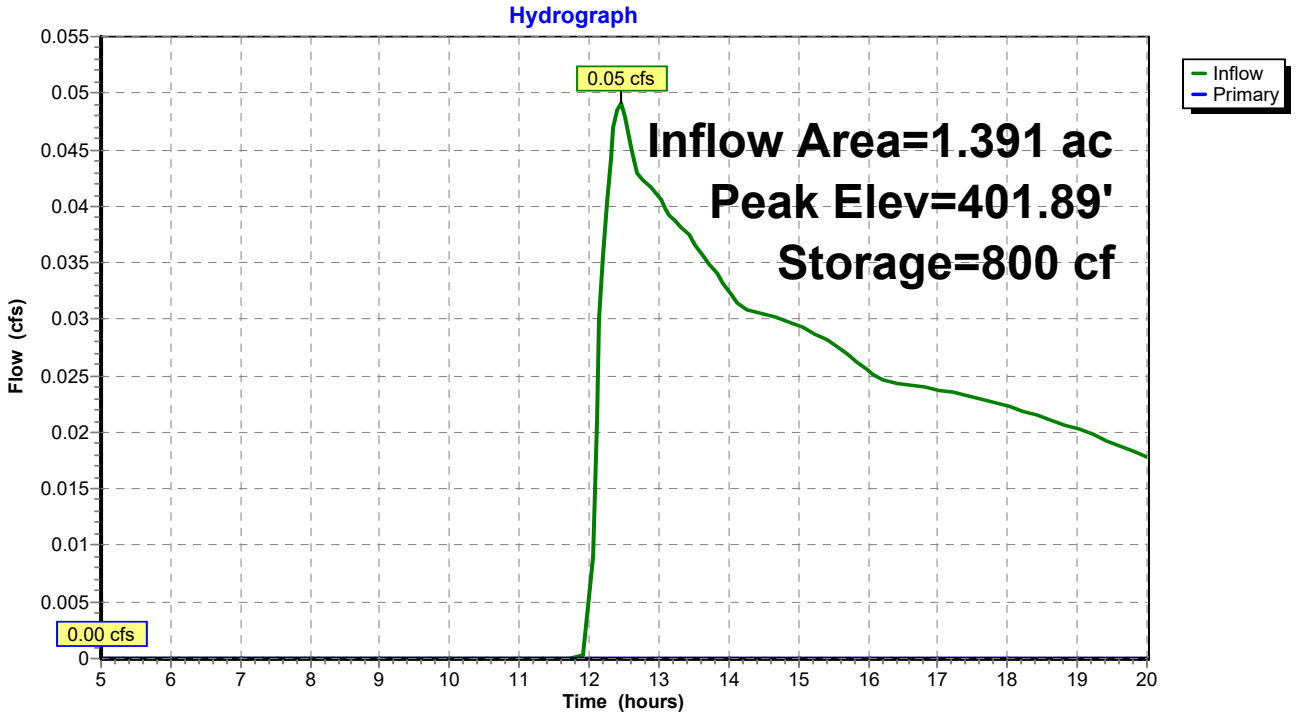
Volume	Invert	Avail.Storage	Storage Description
#1	401.58'	4,316 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
401.58	2,500	0	0
402.00	2,635	1,078	1,078
403.00	3,840	3,238	4,316

Device	Routing	Invert	Outlet Devices
#1	Primary	398.40'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 398.40' / 397.40' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	402.25'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=401.58' (Free Discharge)
↑—**1=Culvert** (Passes 0.00 cfs of 0.97 cfs potential flow)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: Pond 3



Summary for Pond 4P: Pond 4

Inflow Area = 1.578 ac, 8.73% Impervious, Inflow Depth > 2.38" for 25-yr event
Inflow = 5.86 cfs @ 12.04 hrs, Volume= 0.313 af
Outflow = 1.19 cfs @ 12.35 hrs, Volume= 0.271 af, Atten= 80%, Lag= 18.5 min
Primary = 1.19 cfs @ 12.35 hrs, Volume= 0.271 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 404.35' @ 12.35 hrs Surf.Area= 4,192 sf Storage= 5,835 cf

Plug-Flow detention time= 85.6 min calculated for 0.271 af (86% of inflow)
Center-of-Mass det. time= 43.0 min (837.5 - 794.5)

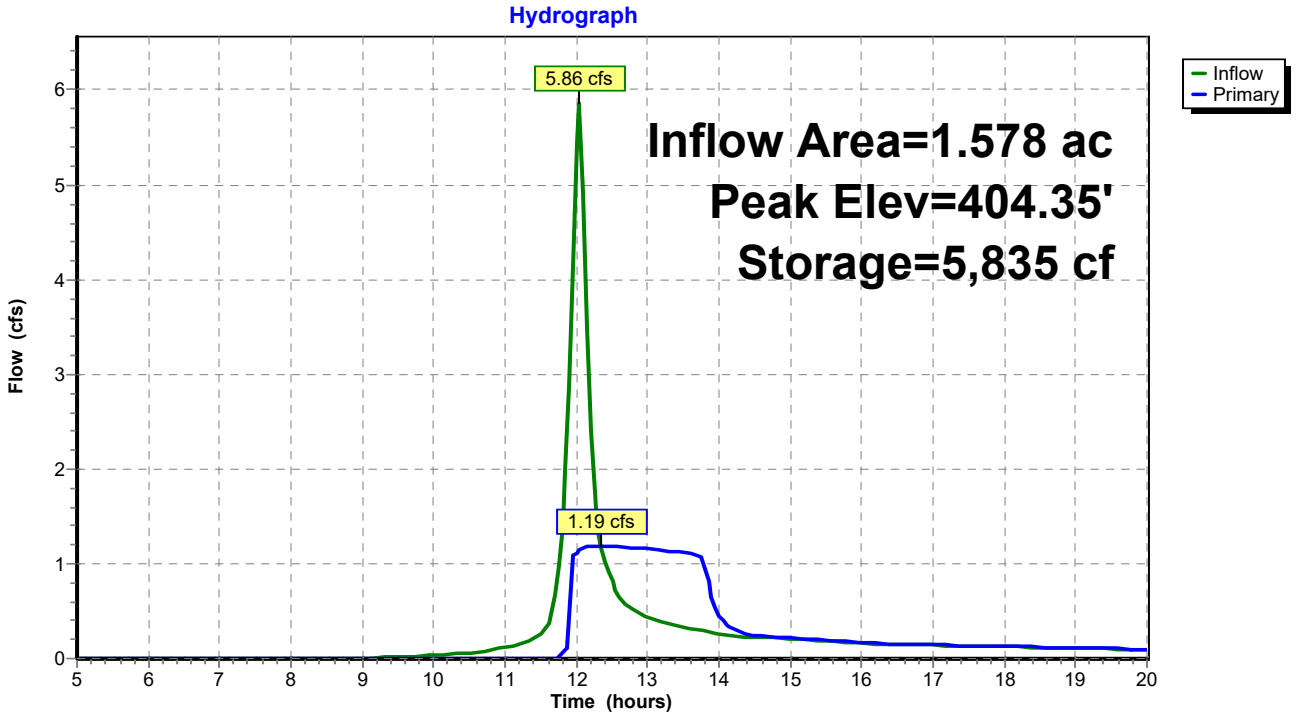
Volume	Invert	Avail.Storage	Storage Description
#1	402.50'	8,833 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
402.50	2,500	0	0
403.00	2,609	1,277	1,277
404.00	3,721	3,165	4,442
405.00	5,060	4,391	8,833

Device	Routing	Invert	Outlet Devices
#1	Primary	399.25'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 399.25' / 398.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	403.17'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.19 cfs @ 12.35 hrs HW=404.35' (Free Discharge)
↑**1=Culvert** (Barrel Controls 1.19 cfs @ 6.06 fps)
↑**2=Orifice/Grate** (Passes 1.19 cfs of 4.11 cfs potential flow)

Pond 4P: Pond 4



GENERAL STANDARD SUBMISSIONS

The proposed project is a roadway approximately 2,181 linear feet in length to serve residential lots off Danville Corner Road. The project will include the creation of approximately 63,206 square feet of new impervious roadway area and approximately 78,685 square feet of adjacent vegetated area, as well as approximately 53,012 SF of impervious area associated with lot development (driveways and residences). Each residence and associated driveway are anticipated to have a total footprint of approximately 3,000 SF.

The entire project area is located west of the Danville Corner and Woodbury Road intersection. Stormwater runoff discharges to an unnamed stream that discharges to a tributary of Royal River. The Maine Department of Environmental Protection General Standards require the treatment of 95% of the impervious area and 80% of the developed area resulting from the lot development and 75% of the impervious surface and 50% of the developed area resulting from the roadway development under the Chapter 500 Section 4.C(5)(c) linear portion exception of the General Standards. At this time, the project is proposing to utilize a combination of forested and meadow buffers and a bioretention cell to meet the stormwater quality standards for the roadway. The following chart summarizes the roadway treatment structure, area treated, and relationship with the total impervious and developed areas for the project.

Project Roadway Area (Linear Portion)

PROJECT AREA	IMPERVIOUS AREA	DEVELOPED AREA
ROADWAY AREA	63,206 SF	141,891 SF

TREATMENT METHOD	SITE AREA TREATED	
	IMPERVIOUS	DEVELOPED
Forested Buffer A	20,985 SF	33,164 SF
Meadow Buffer C	12,504 SF	19,115 SF
Meadow Buffer D	5,640 SF	12,029 SF
Forested Buffer E	7,151 SF	28,448 SF
Bioretention Cell 1	11,471 SF	32,311 SF
Total Area Treated	58,351 SF	125,667 SF
Percent Treated of Areas	**92.33%**	**88.57%**
Percent Required	**75%**	**50%**

A description of each treatment area is as follows.

a. Forested Buffer A: A forested buffer adjacent to the downhill side of a two-lane road will be established on the westerly side of the proposed roadway. The forested buffer will receive stormwater runoff from both lanes of the roadway as sheet flow and is broken at the driveway entrances for Lots 21 and 22. The buffer was sized by Appendix F of Chapter 500, the Stormwater Management Rules, and are also found in table 5.6 of the *MDEP Stormwater BMPs Technical Design Manual*. For a Forested buffer, two travel lanes, a 55-foot flow path is required.

b. Forested Buffer C: A level lip spreader will be constructed at the toe of slope on lots 17 and 18. The buffer will receive stormwater runoff from portions of the proposed roadway, adjacent vegetated area, and from lots 17 and 18 as well as a portion of 16. The drainage area is graded to collect runoff from around the cul-de-sac area and deliver it to the level spreader. The buffer was sized by the following calculation:

   Impervious Area: 20,004 SF (12,504 SF Road, 7,500 SF Site)
   Landscaped Area: 26,615 SF (19,115 SF Road/7,600 SF Site)

   Chapter 500 sizing to calculate the berm length is based on table 5.5 of the DEP Stormwater BMPs Technical Design Manual. For a meadow buffer, 0-8% slope, class C sandy loam soils, and 75-foot flow path through the buffer, the length of berm is calculated:

   (125 FT/acre x 0.459 acres) + (35 FT/acre x 0.610 acres) = 78.7 FT
   The berm length provided is 80 FT.

c. Meadow Buffer D: A level lip spreader will be constructed to the east of the proposed roadway at approximately station 7+31. The buffer will receive stormwater runoff from portions of the proposed roadway and adjacent vegetated area. The drainage area is graded to collect runoff to the northeast of the roadway's entrance and deliver it to the level spreader. The buffer was sized by the following calculation:

   Impervious Area: 5,640 SF
   Landscaped Area: 6,389 SF

   Chapter 500 sizing to calculate the berm length is based on table 5.5 of the DEP Stormwater BMPs Technical Design Manual. For a meadow buffer, 0-8% slope, class C sandy loam soils, and 75-foot flow path through the buffer, the length of berm is calculated:

   (125 FT/acre x 0.129 acres) + (35 FT/acre x 0.147 acres) = 21.3 FT
   The berm length provided is 25 FT.

d. Meadow Buffer E: A level lip spreader will be constructed to the west of the proposed roadway at approximately station 7+31. The buffer will receive stormwater runoff from portions of the proposed roadway and adjacent vegetated area. The drainage area is graded to collect runoff to the northwest of the roadway's entrance and deliver it to the level spreader. The buffer was sized by the following calculation:

   Impervious Area: 7,151 SF
   Landscaped Area: 21,297 SF

   Chapter 500 sizing to calculate the berm length is based on table 5.5 of the DEP Stormwater BMPs Technical Design Manual. For a meadow buffer, 0-8% slope, class C sandy loam soils, and 75-foot flow path through the buffer, the length of berm is calculated:

   (125 FT/acre x 0.164 acres) + (35 FT/acre x 0.489 acres) = 37.6 FT
   The berm length provided is 40 FT.

e. Bioretention Cell 1: A bioretention cell will be constructed and established to the west of the proposed intersection of Mountain View and Skyline Drive and will collect runoff from the portions of the roadway and associated landscaped area. Bioretention Cell 1 outlets a

controlled flow westerly offsite. Sizing calculations for the proposed Bioretention Cell 1 is as follows:

Impervious Area: 11,471 SF
Landscape Area: 20,840 SF

Chapter 500 sizing is based on 1" × the impervious area + 0.4" × the landscape area.

(0.07)(11,471 SF) + (0.03)(20,840 SF) = 1,428 SF Surface Area Required
11,471 SF x 1" = 956 CF or Required Storage
20,840 SF x 0.4" = 695 CF of Required Storage
1,651 CF of Required Storage @ 12" Deep (6" within the filter layer and 6" above it) = 1,651 SF of Filter Area. 2,700 SF was provided by to meet the flooding standards.

Project Site Area

PROJECT AREA	IMPERVIOUS AREA	DEVELOPED AREA
SITE AREA (LOT DEVELOPMENT)	53,012 SF	53,012 SF

Stormwater Treatment Systems

TREATMENT METHOD	SITE AREA TREATED	
	IMPERVIOUS	DEVELOPED
Existing Permitted Stormwater Buffers	12,000 SF	12,000 SF
Bioretention Cell 2	6,000 SF	6,000 SF
Bioretention Cell 3	6,000 SF	6,000 SF
Bioretention Cell 4	6,000 SF	6,000 SF
Forested Buffer (Lots 17 / 18 / portion 16)	7,500 SF	7,500 SF
Lot 12 Meadow Buffer	3,000 SF	3,000 SF
Lot 21 Meadow Buffer	3,000 SF	3,000 SF
Lot 22 Meadow Buffer	3,000 SF	3,000 SF
Lot 26 Meadow Buffer	3,000 SF	3,000 SF
Lot 27 Meadow Buffer	3,000 SF	3,000 SF
Lot 28 / 29 Meadow Buffer	6,000 SF	6,000 SF
Total Area Treated	52,500 SF	52,500 SF
Percent Treated of Areas	**99.03%**	**99.03%**
Percent Required	**95%**	**80%**

A description of each treatment area is as follows.

f. Bioretention Cell 2: A bioretention cell will be constructed and established to the west of the proposed Skyline Drive on lot 23 and will collect runoff from lots 19 and 23. Bioretention Cell 2 outlets a controlled flow westerly offsite. Sizing calculations for the proposed Bioretention Cell 2 is as follows:

Impervious Area: 6,000 SF
Landscape Area: 45,319 SF

Chapter 500 sizing is based on 1" × the impervious area + 0.4" × the landscape area, and 7% of the impervious area and 3% of the landscaped area.

(0.07)(6,000 SF) + (0.03)(45,319 SF) = 1,780 SF Surface Area Required
6,000 SF x 1" = 500 CF or Required Storage
45,319 SF x 0.4" = 1,510 CF of Required Storage
2,010 CF of Required Storage @ 12" Deep (6" within the filter layer and 6" above it) = 2,010 SF of Filter Area. 2,100 SF was provided.

g. Bioretention Cell 3: A bioretention cell will be constructed and established to the west of Skyline Drive between lots 24 and 25 and will collect runoff from the eastern portions of lots 24 and 25. Lots 24 and 25 shall be graded to direct flow to the bioretention cell. Bioretention Cell 3 outlets a controlled flow westerly to an existing forested area. Sizing calculations for the proposed Bioretention Cell 3 is as follows:

Impervious Area: 6,000 SF
Landscape Area: 54,575 SF

Chapter 500 sizing is based on 1" × the impervious area + 0.4" × the landscape area.

(0.07)(6,000 SF) + (0.03)(54,575 SF) = 2,057 SF Surface Area Required
6,000 SF x 1" = 500 CF or Required Storage
54,575 SF x 0.4" = 1,819 CF of Required Storage
2,319 CF of Required Storage @ 12" Deep (6" within the filter layer and 6" above it) = 2,319 SF of Filter Area. 2,500 SF was provided by design to meet the flooding standards.

h. Bioretention Cell 4: A bioretention cell will be constructed and established to the south of Mountain View Drive and will collect runoff from lots 13 and 14. Bioretention Cell 4 outlets a controlled flow westerly to an existing forested wetland. Sizing calculations for the proposed Bioretention Cell 4 is as follows:

Impervious Area: 6,000 SF
Landscape Area: 62,758 SF

Chapter 500 sizing is based on 1" × the impervious area + 0.4" × the landscape area.

(0.07)(6,000 SF) + (0.03)(62,758 SF) = 2,303 SF Surface Area Required
6,000 SF x 1" = 500 CF or Required Storage
62,758 SF x 0.4" = 2,092 CF of Required Storage
2,592 CF of Required Storage @ 12" Deep (6" within the filter layer and 6" above it) = 2,592 SF of Filter Area. 2,600 SF was provided by design to was provided by design to meet the flooding standards.

i. Type C Soil Residential Lot Buffers: A vegetated buffer adjacent downgradient of a single family residential lot will be established on lots 22 and 26. The meadow buffer will receive stormwater runoff from developed lot area. The buffer was sized by Appendix F of Chapter 500, the Stormwater Management Rules, and are also found in Table 5.3 of the *MDEP Stormwater BMPs Technical Design Manual*. For a meadow buffer, type C loamy sand soils, a 70-foot flow path is required.

j. Lot 28 / 29 Buffer: A level lip spreader will be constructed in the southern setback area of lot 27. This level lip spreader will receive runoff from Lot 28 and 29 which is delivered by a proposed ditch to the treatment structure. The buffer was sized by the following calculation:

Impervious Area: 6,000 SF
Landscaped Area: 6,000 SF

Chapter 500 sizing to calculate the berm length is based on table 5.5 of the DEP Stormwater BMPs Technical Design Manual. For a meadow buffer, 0-8% slope, class C sandy loam soils, and 75-foot flow path through the buffer, the length of berm is calculated:

(125 FT/acre x 0.14 acres) + (35 FT/acre x 0.14 acres) = 22.2 FT
The berm length provided is 25 FT.

The proposed stormwater quality control devices have been designed according to the standards outlined in the *Stormwater Management for Maine, Volume III BMP Manual*, January 2006 and revised July 2009. Construction and maintenance will be according to standards outlined in this manual.

CADmaster

586 Park Avenue - Auburn, Maine 04210
office - 207-689-3232 cell - 207-240-5567
e-mail - gsb@cadmasterr.com

Land Surveying and Septic Design

February 28, 2018

Christopher "Toby" Michaud, P.E.
c/o CES, Inc.
465 South Main Street
P.O. Box 639
Brewer, Maine 04412

RE: Woodbury Heights - Phase IV - Storm Water Buffer Locations

Dear Toby;

Per your request I've reviewed the plan entitled "Stormwater Treatment Plan", dated 1/09/2018 prepared for Bouffard & McFarland Builders for the Woodbury Heights Subdivision - Phase IV.

My review is limited to the locations of the proposed Stormwater Buffer Areas as shown on the above referrenced plan in relationship to the existing wetland areas shown on said plan.

Based on multiple Test Pits done on the property for Septic Designs, the wetlands delineation that has been prepared, and published soils maps that the buffers are located on upland areas with Soils Classification as "C" soils, and none of the proposed buffers will fall within any of the wetland areas as shown on said plan.

I trust this information will satisfy your immediate needs.

Should you have any further questions feel free to give me a call.

Respectfully yours,
For CADmaster Land Surveying and
Septic Design
George Bouchles, PLS 2295, SE 338

APPENDIX G. Suggested templates for deed restrictions and conservation easements for use under the Stormwater Management Law

1. Forested buffer, limited disturbance

DECLARATION OF RESTRICTIONS (Forested Buffer, Limited Disturbance)

THIS DECLARATION OF RESTRICTIONS is made this _____day of _____, 20___, by _____ , _____,
(name) (street address)
_____, _____County, Maine, _____, (herein referred to as the
(city or town) (county) (zip code)
"Declarant"), pursuant to a permit received from the Maine Department of Environmental Protection under the Stormwater Management Law, to preserve a buffer area on a parcel of land near _____,_____ .
(road name) (known feature and/or town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(town)
described in a deed from_____ to _____dated
(name) (name of Declarant)
_____, 20____, and recorded in Book ____ Page ____ at the _____County Registry of Deeds, herein referred to as the "property"; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows: (Note: Insert description of restricted buffer area location here)

WHEREAS, pursuant to the Stormwater Management Law, 38 M.R.S. Section 420-D and Chapter 500 of rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"), Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1. **Restrictions on Restricted Buffer Area**. Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.

   a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material may be placed, stored or dumped on the Restricted Buffer Area, nor may the topography of the area be altered or manipulated in any way;

   b. Any removal of trees or other vegetation within the Restricted Buffer Area must be limited to the following:

      (i) No purposefully cleared openings may be created and an evenly distributed stand of trees and other vegetation must be maintained. An "evenly distributed stand of trees" is defined as maintaining a minimum rating score of 24 points in any 25 foot by 50 foot rectangle (1,250 square feet) area, as determined by the rating scheme in Table 11:

Table 11.
Point System for Determining an Evenly Distributed Stand of Trees

Diameter of tree at 4½ feet above ground level	Points
2 - 4 inches	1
4 - 8 inches	2
8 - 12 inches	4
>12 inches	8

      Where existing trees and other vegetation result in a rating score less than 24 points, no trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained;

      (ii) No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;

   c. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole (whether constructed of wood, steel or other materials) and appurtenant equipment such as guys and guy anchors, or fence;

   d. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area;

e. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. **Enforcement**. The MDEP may enforce any of the Restrictions set forth in Section 1 above.

3. **Binding Effect**. The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.

4. **Amendment**. Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.

5. **Effective Provisions of Declaration**. Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.

6. **Severability**. Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.

7. **Governing Law**. This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

_____
(NAME)

STATE OF MAINE_____ County, _____, 20__.
(County) (date)

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

_____
Notary Public

_____

2. Forested buffer, no disturbance

DECLARATION OF RESTRICTIONS (Forested Buffer, No Disturbance)

THIS DECLARATION OF RESTRICTIONS is made this _____day of _____ , 20___, by _____, _____ ,
(name) (street address)
_____, _____County, Maine, _____ , (herein referred to as the
(city or town) (county) (zip code)
"Declarant", pursuant to a permit received from the Maine Department of Environmental Protection under the Stormwater Management Law, to preserve a buffer area on a parcel of land near _____, _____ .
(road name) (known feature and/or town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(town)
described in a deed from _____to _____, dated
(name) (name of Declarant)
_____, 20____, and recorded in Book ____ Page ____ at the _____County Registry of Deeds, herein referred to as the "property"; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows: (Note: Insert description of restricted buffer location here)

WHEREAS, pursuant to the Stormwater Management Law, 38 M.R.S. Section 420-D and Chapter 500 of rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"), Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions

and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1. **Restrictions on Restricted Buffer Area**. Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.

   a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Restricted Buffer Area, nor shall the topography of the area be altered or manipulated in any way;

   b. No trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained;

   c. No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;

   d. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence (whether constructed of wood, steel or other materials) and appurtenant equipment such as guys and guy anchors;

   e. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area;

   f. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

   Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. **Enforcement**. The MDEP may enforce any of the Restrictions set forth in Section 1 above.

3. **Binding Effect**. The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.

4. **Amendment**. Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.

5. **Effective Provisions of Declaration**. Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.

6. **Severability**. Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.

7. **Governing Law**. This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

_____

(NAME)

STATE OF MAINE, _____County, dated _____, 20__.
(County)

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

_____
Notary Public

_____

3. Meadow buffer

DECLARATION OF RESTRICTIONS (Non-Wooded Meadow Buffer)

THIS DECLARATION OF RESTRICTIONS is made this _____day of _____, 20___, by _____, _____
(name) (street address)
_____, _____County, Maine,_____, (herein referred to as the
(city or town) (county) (zip code)
"Declarant"), pursuant to a permit received from the Maine Department of Environmental Protection under the Stormwater Management Law, to preserve a buffer area on a parcel of land near _____, _____ .
(road name) (known feature and/or town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(town)
described in a deed from _____ to _____, dated
(name) (name of Declarant)
_____, 20____, and recorded in Book ____ Page ____ at the _____County Registry of Deeds, herein referred to as the "property"; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows: (Note: Insert description of restricted buffer location here)

WHEREAS, pursuant to the Stormwater Management Law, 38 M.R.S. Section 420-D and Chapter 500 of rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"), Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1. **Restrictions on Restricted Buffer Area**. Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.

   a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Restricted Buffer Area, nor may the topography or the natural mineral soil of the area be altered or manipulated in any way;

   b. A dense cover of grassy vegetation must be maintained over the Restricted Buffer Area, except that shrubs, trees and other woody vegetation may also be planted or allowed to grow in the area. The Restricted Buffer Area may not be maintained as a lawn or used as a pasture. If vegetation in the Restricted Buffer Area is mowed, it may be mown no more than two times per year.

   c. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence (whether constructed of wood, steel or other materials) and appurtenant equipment such as guys and guy anchors;

   d. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area, except for vehicles used in mowing;

   e. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

   Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. **Enforcement**. The MDEP may enforce any of the Restrictions set forth in Section 1 above.

3. **Binding Effect**. The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.

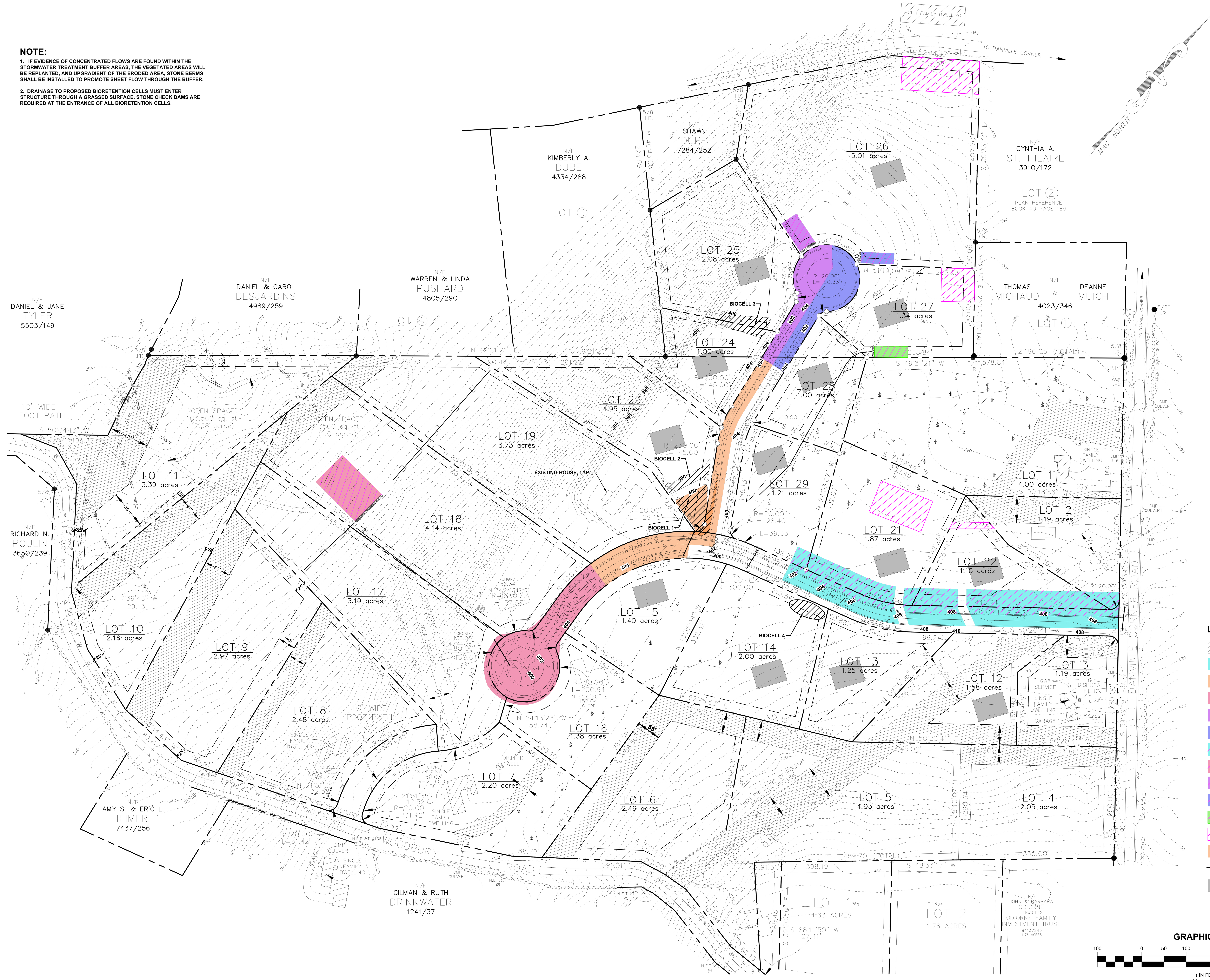
4. **Amendment**. Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.

5. **Effective Provisions of Declaration**. Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.

NOTE:

1. IF EVIDENCE OF CONCENTRATED FLOWS ARE FOUND WITHIN THE STORMWATER TREATMENT BUFFER AREAS, THE VEGETATED AREAS WILL BE REPLANTED, AND UPGRADIENT OF THE ERODED AREA, STONE BERMS SHALL BE INSTALLED TO PROMOTE SHEET FLOW THROUGH THE BUFFER.

2. DRAINAGE TO PROPOSED BIORETENTION CELLS MUST ENTER STRUCTURE THROUGH A GRASSED SURFACE. STONE CHECK DAMS ARE REQUIRED AT THE ENTRANCE OF ALL BIORETENTION CELLS.



LEGEND:

- EXISTING PERMITTED STORMWATER BUFFER
- TREATMENT AREA A - PHASE III
- TREATMENT AREA B - PHASE III / IV
- TREATMENT AREA C - PHASE III
- TREATMENT AREA D - PHASE IV
- TREATMENT AREA E - PHASE IV
- BUFFER A - PHASE III
- BUFFER C - PHASE III
- BUFFER D - PHASE IV
- BUFFER E - PHASE IV
- LOT 28/29 BUFFER
- LOT 28/29 BUFFER
- BIOCELL 1 (AREA B) - PHASE III / IV
- PROPOSED DITCHING
- APPROX. LOCATION OF PROPOSED HOUSE

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

CES INC
Engineers • Environmental Scientists • Surveyors

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465 South Main Street
PO Box 639
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Waterville
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T.207-288-0587
F.207-288-0588

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F.207-795-6128

PROJECT TITLE
**BOUFFARD - MCFARLAND BUILDERS
AUBURN, MAINE**

SHEET TITLE
STORMWATER TREATMENT PLAN

REV.	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R1				
R2				
R3				
R4				
R5				
R6				
R7				

ISSUE STATUS
NOT FOR CONSTRUCTION

STATE OF MAINE
CHRISTOPHER T. MICHAUD
No. 12674
03/01/2018
LICENSED PROFESSIONAL ENGINEER

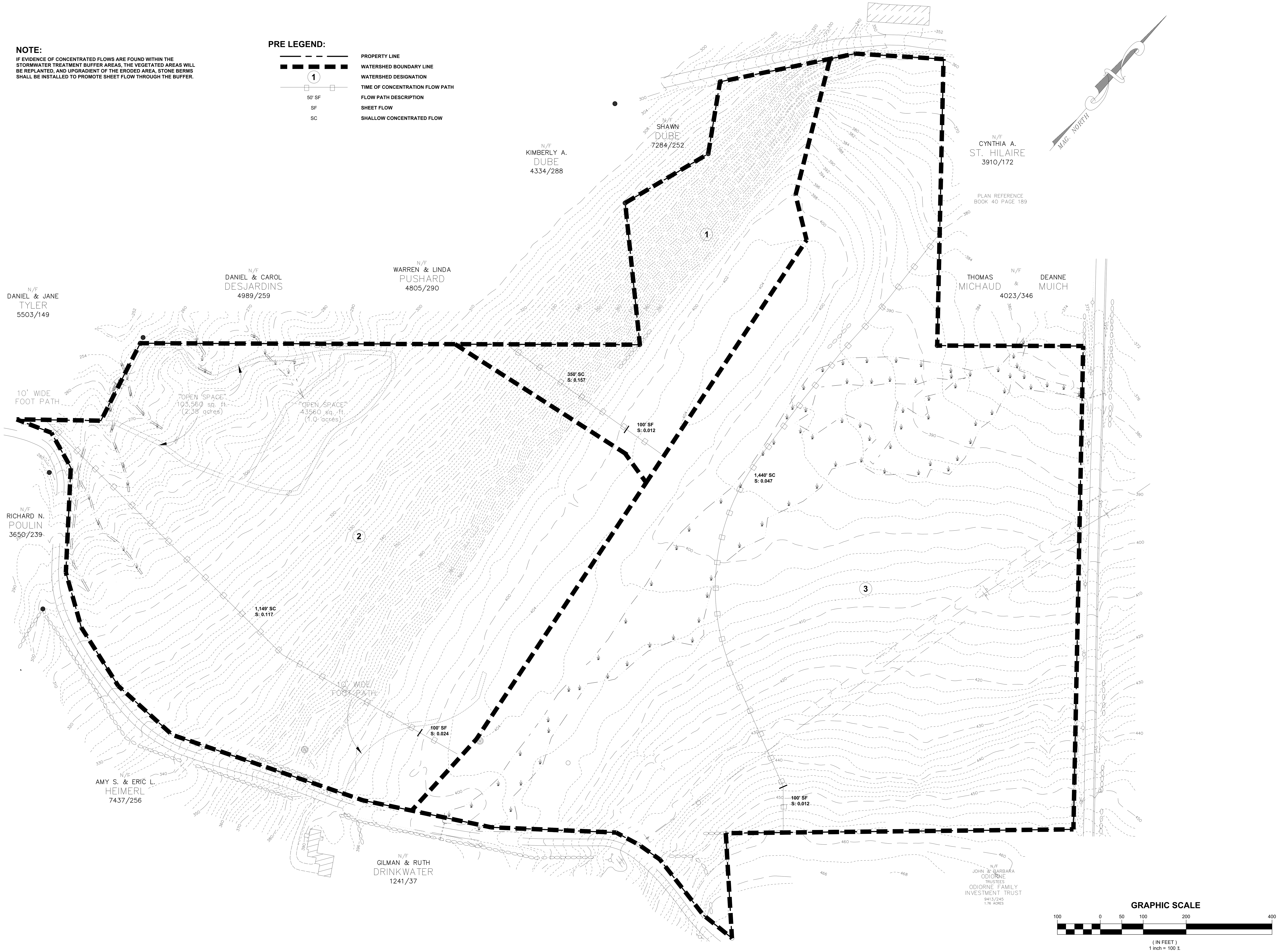
SCALE	1"=100'		
DATE	2018-01-09		
DRAWN BY	WAB	CHECKED BY	CTM
DESIGNED BY	WAB/JAD	APPROVED BY	SMT
JOB NUMBER	10788.008		

DRAWING NUMBER
C700

NOTE:
IF EVIDENCE OF CONCENTRATED FLOWS ARE FOUND WITHIN THE STORMWATER TREATMENT BUFFER AREAS, THE VEGETATED AREAS WILL BE REPLANTED, AND UPGRADIENT OF THE ERODED AREA, STONE BERMS SHALL BE INSTALLED TO PROMOTE SHEET FLOW THROUGH THE BUFFER.

PRE LEGEND:

— - —	PROPERTY LINE
▬ ▬ ▬	WATERSHED BOUNDARY LINE
(1)	WATERSHED DESIGNATION
	TIME OF CONCENTRATION FLOW PATH
50' SF	FLOW PATH DESCRIPTION
SF	SHEET FLOW
SC	SHALLOW CONCENTRATED FLOW



CES INC
Engineers • Environmental Scientists • Surveyors

Brewer, 465 South Main Street, PO Box 639, Brewer, ME, T 207-989-4824, F 207-989-4881
Presque Isle, 549 Main Street, PO Box 827, Presque Isle, ME, T 207-764-8412, F 207-764-8414
Waterville, 44 Main Street, Suite 204, Waterville, ME, T 207-680-2202, F 207-680-2204
Machias, 61 Dublin Street, PO Box 587, Machias, ME, T 207-255-3270, F 207-255-8367
Bar Harbor, 1066 State Hwy 102, Bar Harbor, ME, T 207-288-0567, F 207-288-0588
Lewiston, 640 Main Street, Lewiston, ME, T 207-795-6009, F 207-795-6128

PROJECT TITLE: BOUFFARD - MCFARLAND BUILDERS, AUBURN, MAINE

SHEET TITLE: PRE DEVELOPMENT STORMWATER PLAN

NOT FOR CONSTRUCTION

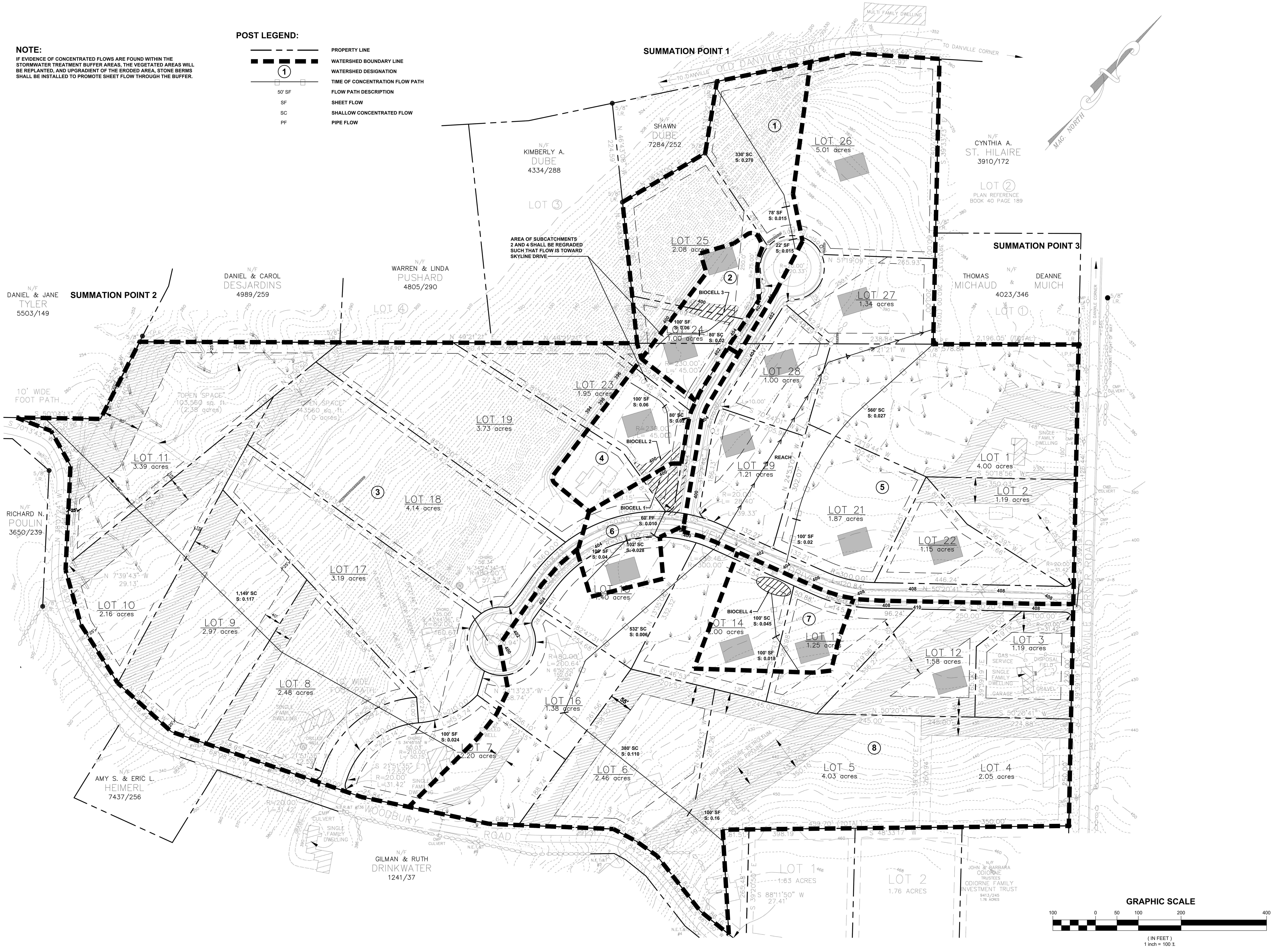
STATE OF MAINE, CHRISTOPHER T. MICHAUD, No. 12674, 03/01/2018, LICENSED, PROFESSIONAL ENGINEER

SCALE	1"=100'
DATE	2018-01-09
DRAWN BY	WAB
CHECKED BY	CTM
DESIGNED BY	WAB/JAD
APPROVED BY	SMT
JOB NUMBER	10788.008
DRAWING NUMBER	C701

NOTE:
IF EVIDENCE OF CONCENTRATED FLOWS ARE FOUND WITHIN THE STORMWATER TREATMENT BUFFER AREAS, THE VEGETATED AREAS WILL BE REPLANTED, AND UPGRADIENT OF THE ERODED AREA, STONE BERMS SHALL BE INSTALLED TO PROMOTE SHEET FLOW THROUGH THE BUFFER.

POST LEGEND:

(line)	PROPERTY LINE
(heavy dashed line)	WATERSHED BOUNDARY LINE
①	WATERSHED DESIGNATION
(line)	TIME OF CONCENTRATION FLOW PATH
50' SF	FLOW PATH DESCRIPTION
SF	SHEET FLOW
SC	SHALLOW CONCENTRATED FLOW
PF	PIPE FLOW



GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

CES INC
Engineers • Environmental Scientists • Surveyors

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PROJECT TITLE
BOUFFARD - MCFARLAND BUILDERS
AUBURN, MAINE

SHEET TITLE
POST DEVELOPMENT STORMWATER PLAN

REV.	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R1				
R2				
R3				
R4				
R5				
R6				
R7				

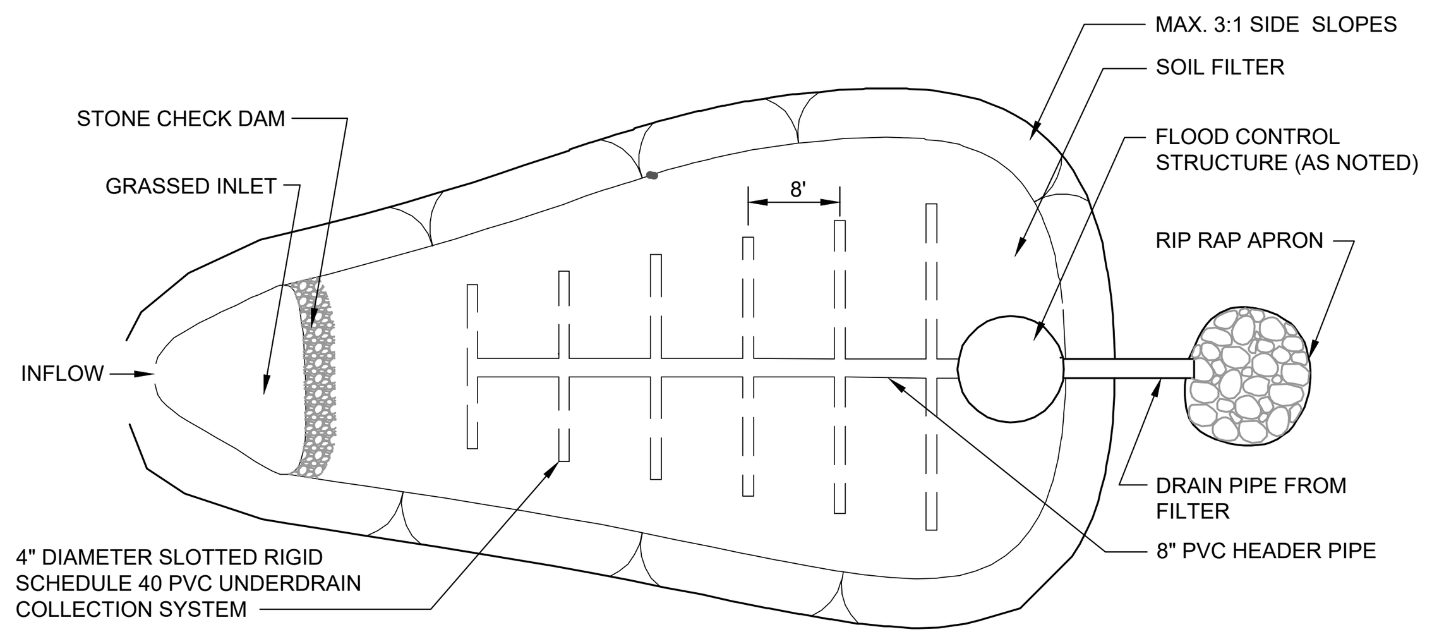
ISSUE STATUS
NOT FOR CONSTRUCTION

STATE OF MAINE
CHRISTOPHER T. MICHAUD
No. 12674
03/01/2018
LICENSED PROFESSIONAL ENGINEER

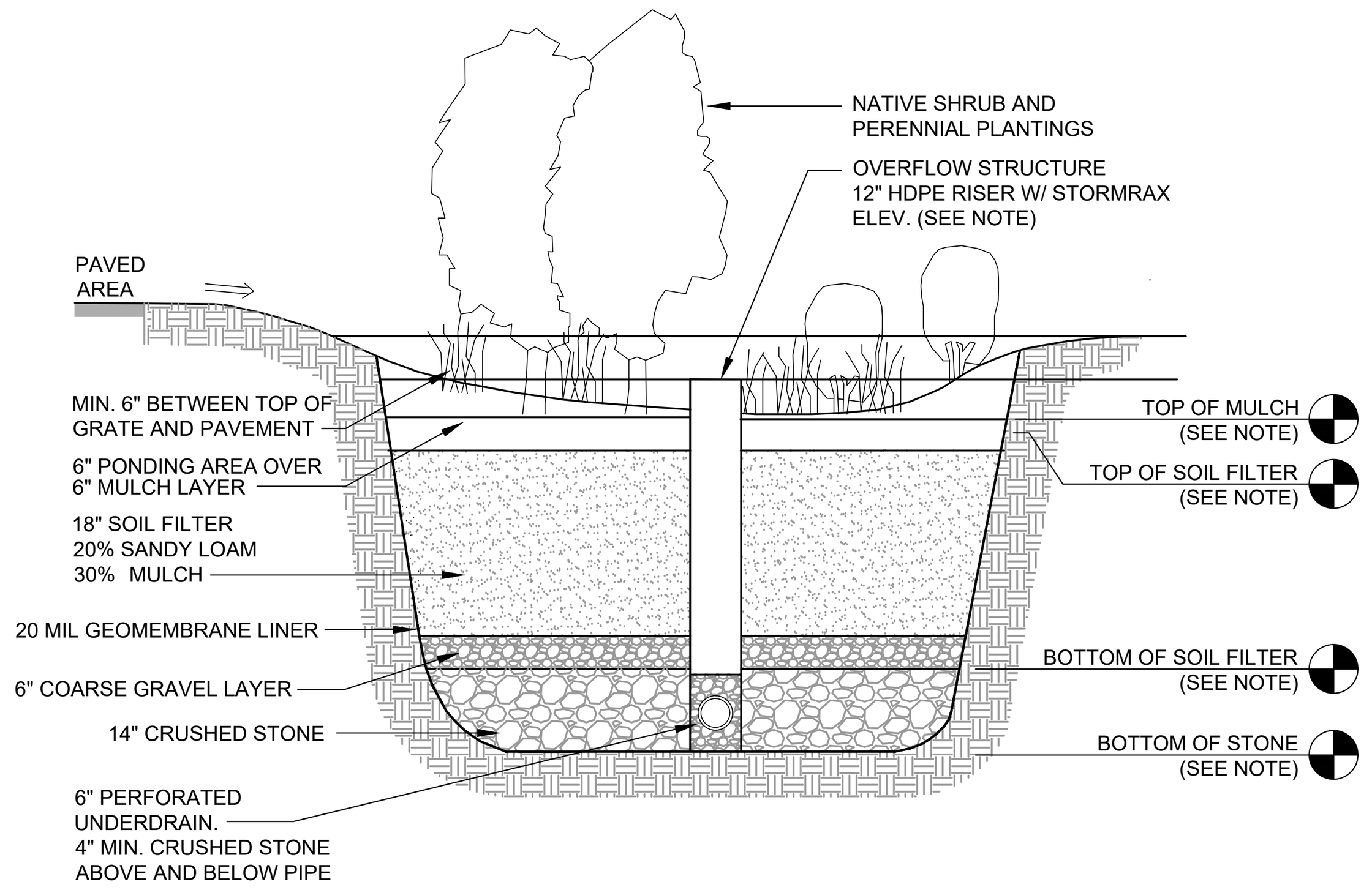
SCALE	1"=100'
DATE	2018-01-09
DRAWN BY: WAB	CHECKED BY: CTM
DESIGNED BY: WAB/JAD	APPROVED BY: SMT
JOB NUMBER	10788.008
DRAWING NUMBER	C702

BIORETENTION CELL ELEVATIONS

ID	APPROXIMATE EXISITNG ELEVATION (FT)	TOP OF MULCH (FT)	TOP OF SOIL FILTER (FT)	BOTTOM OF SOIL FILTER (FT)	BOTTOM OF STONE (FT)	OUTLET PIPE ELEVATION (FT)	OVERFLOW STRUCTURE ELEVATION (FT)	TREATMENT AREA REQUIRED / PROVIDED (SF/SF)	TREATMENT VOLUME REQUIRED / PROVIDED (CF/CF)
Biocell 1	403.00	399.75	399.58	398.08	397.08	396.33	400.25	1,428 / 1,700	1,651 / 1,700
Biocell 2	403.00	400.35	400.18	398.68	397.68	396.33	400.85	1,700 / 2,100	2,010 / 2,100
Biocell 3	404.00	401.75	401.58	400.08	399.08	398.40	402.25	2,057 / 2,500	2,319 / 2,500
Biocell 4	404.00	402.67	402.50	401.00	400.00	399.25	403.17	2,303 / 2,600	2,592 / 2,600



PLAN VIEW



CONSTRUCTION OVERSIGHT: INSPECTION BY A PROFESSIONAL ENGINEER WILL OCCUR AT A MINIMUM:

- AFTER THE PRELIMINARY CONSTRUCTION OF THE FILTER GRADES AND ONCE THE UNDERDRAIN PIPES ARE INSTALLED BUT NOT BACKFILLED,
- AFTER THE DRAINAGE LAYER IS CONSTRUCTED AND PRIOR TO THE INSTALLATION OF THE FILTER MEDIA,
- AFTER THE FILTER MEDIA HAS BEEN INSTALLED AND SEEDED. BIO-RETENTION CELLS MUST BE STABILIZED PER THE PROVIDED PLANTING SCHEME AND DENSITY FOR THE CANOPY COVERAGE OF 30 AND 50%.
- AFTER ONE YEAR TO INSPECT HEALTH OF THE VEGETATION AND MAKE CORRECTIONS, AND
- ALL THE MATERIAL USED FOR THE CONSTRUCTION OF THE FILTER BASIN MUST BE CONFIRMED AS SUITABLE BY THE DESIGN ENGINEER. TESTING MUST BE DONE BY A CERTIFIED LABORATORY TO SHOW THAT THEY ARE PASSING DEP SPECIFICATIONS.

LINER
1. NONWOVEN 20MIL GEOMEMBRANE.

PLANT SPECIES
1. PLANT SPECIES SHALL BE CHOSEN IN ACCORDANCE WITH MAINE DEP CHAPTER 500 BMP'S.

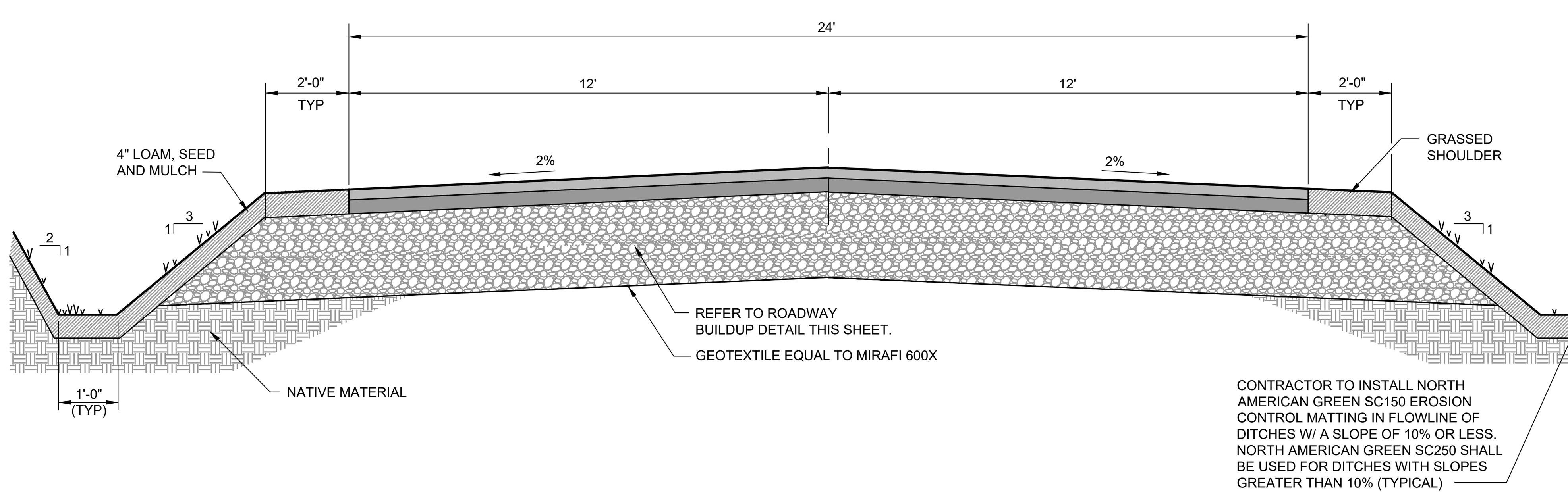
UNDERDRAIN LAYOUT
1. PIPES SHALL BE PLACED AT A MAXIMUM OF 15' APART WITH A POSITIVE GRADIENT.

MAINTENANCE
DURING THE FIRST YEAR, THE BASIN WILL BE INSPECTED SEMI-ANNUALLY AND FOLLOWING MAJOR STORM EVENTS

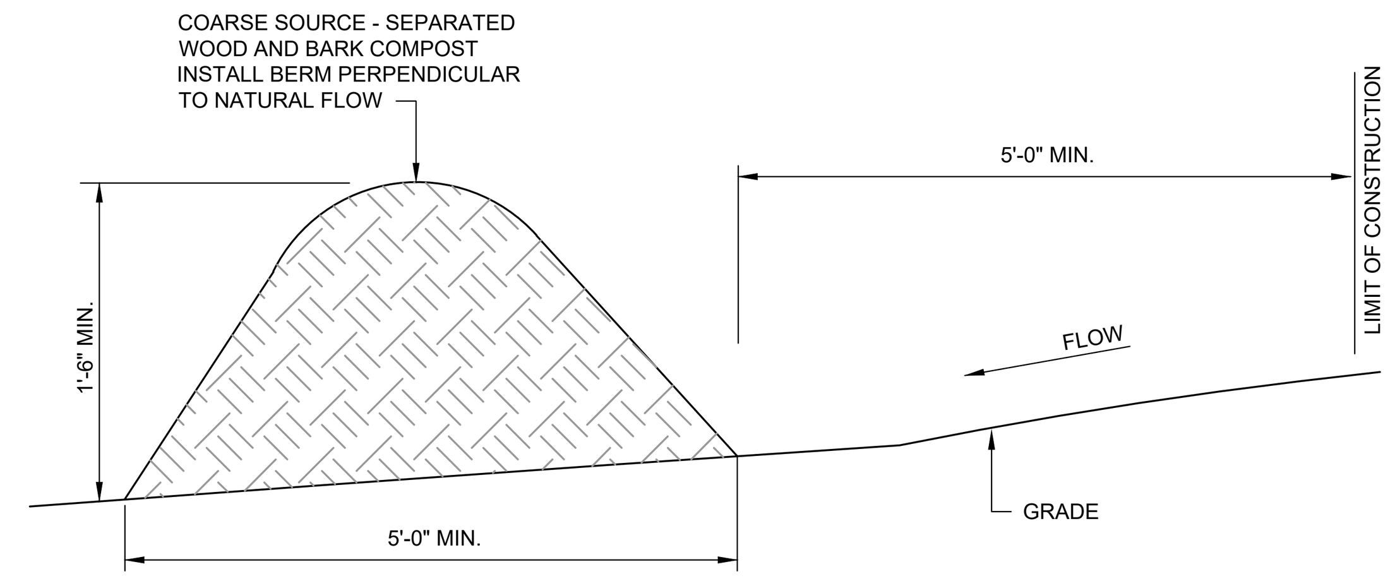
1. DEBRIS AND SEDIMENT BUILDUP SHALL BE REMOVED FROM TEH FOREBAY AND BASIN AS NEEDED. MOWING OF GRASSED BASIN CAN OCCUR SEMI-ANNUALLY TO A HEIGHT OF NO LESS THAN 6 INCHES.
2. ANY BARE AREA OR EROSION RILLS SHALL BE REPAIRED WITH NEW FILTER MEDIA OR SANDY LOAM, SEEDED AND MULCHED OR SODDED.
3. MAINTAINING GOOD GRASS COVER WILL MINIMIZE CLOGGING WITH FINE SEDIMENTS AND IF PONDING EXCEEDS 48 HOURS, THE TOP OF THE FILTER BED MUST BE ROTOTILLED TO REESTABLISH THE SOIL'S FILTRATION CAPACITY.
4. IN BIORETENTION CELLS, RAKING AND REPLACING THE DEGRADED MULCH BETWEEN PLANTS WILL BE NECESSARY ON AN ANNUAL BASIS. PLANTS THAT ARE NOT ESTABLISHED WITH NEED TO BE REPLACED.

NOTE:
REFER TO GRASSED BIORETENTION CELL FILTER ELEVATIONS TABLE FOR ELEVATIONS.

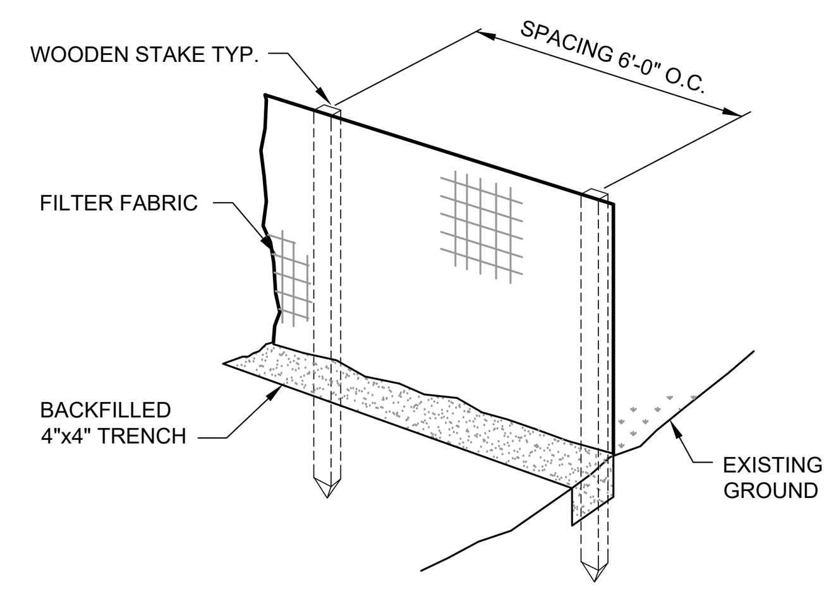
BIORETENTION CELL DETAIL
N.T.S.



TYPICAL ROADWAY CROSS SECTION
N.T.S.

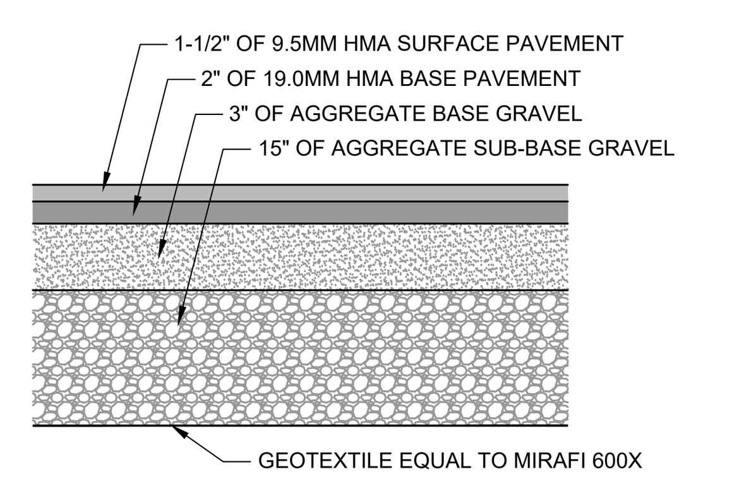


EROSION CONTROL BERM DETAIL
N.T.S. (MAY BE USED AS AN ALTERNATE TO SILT FENCE)

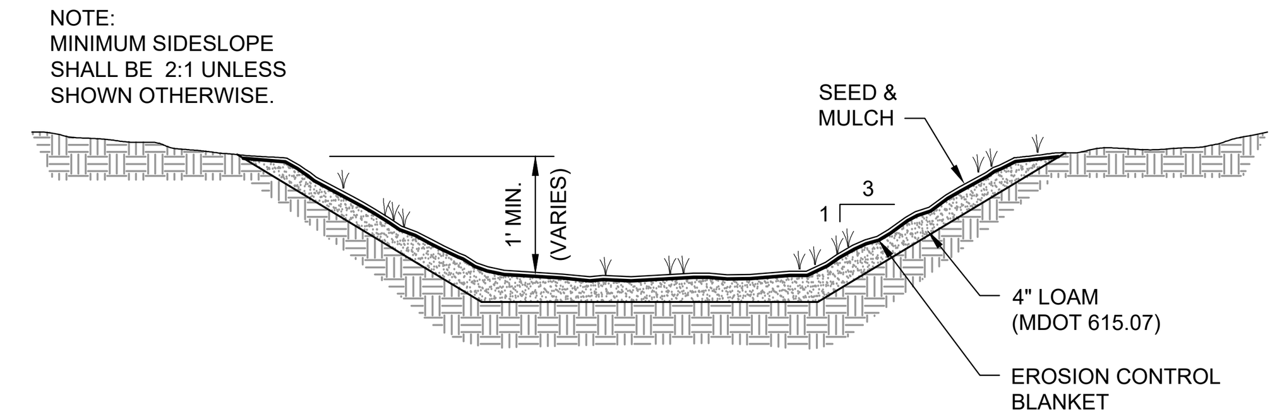


NOTES:
1. KEY FABRIC IN A 4"x4" TRENCH W/BACKFILL.
2. SILT FENCE SHALL BE A 3' FENCE WITH A MINIMUM GRAB STRENGTH OF 120 LBS.

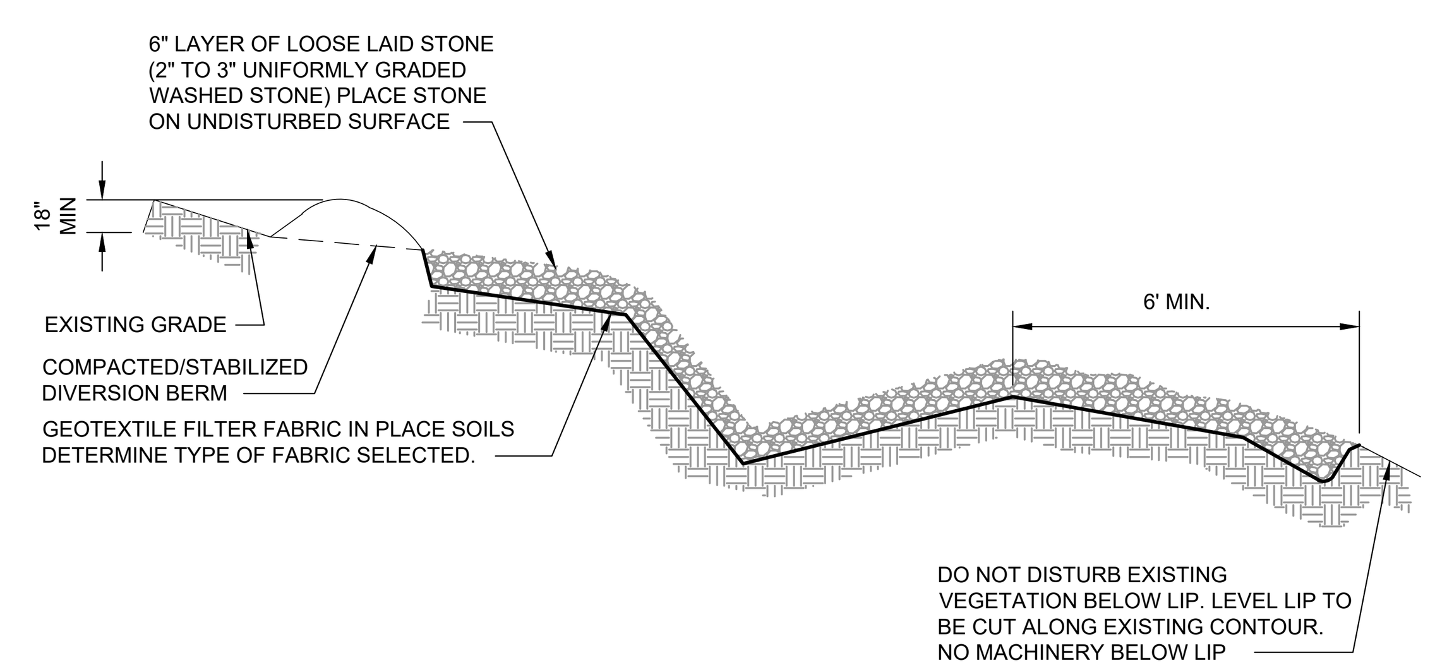
SILT FENCE DETAIL
N.T.S.



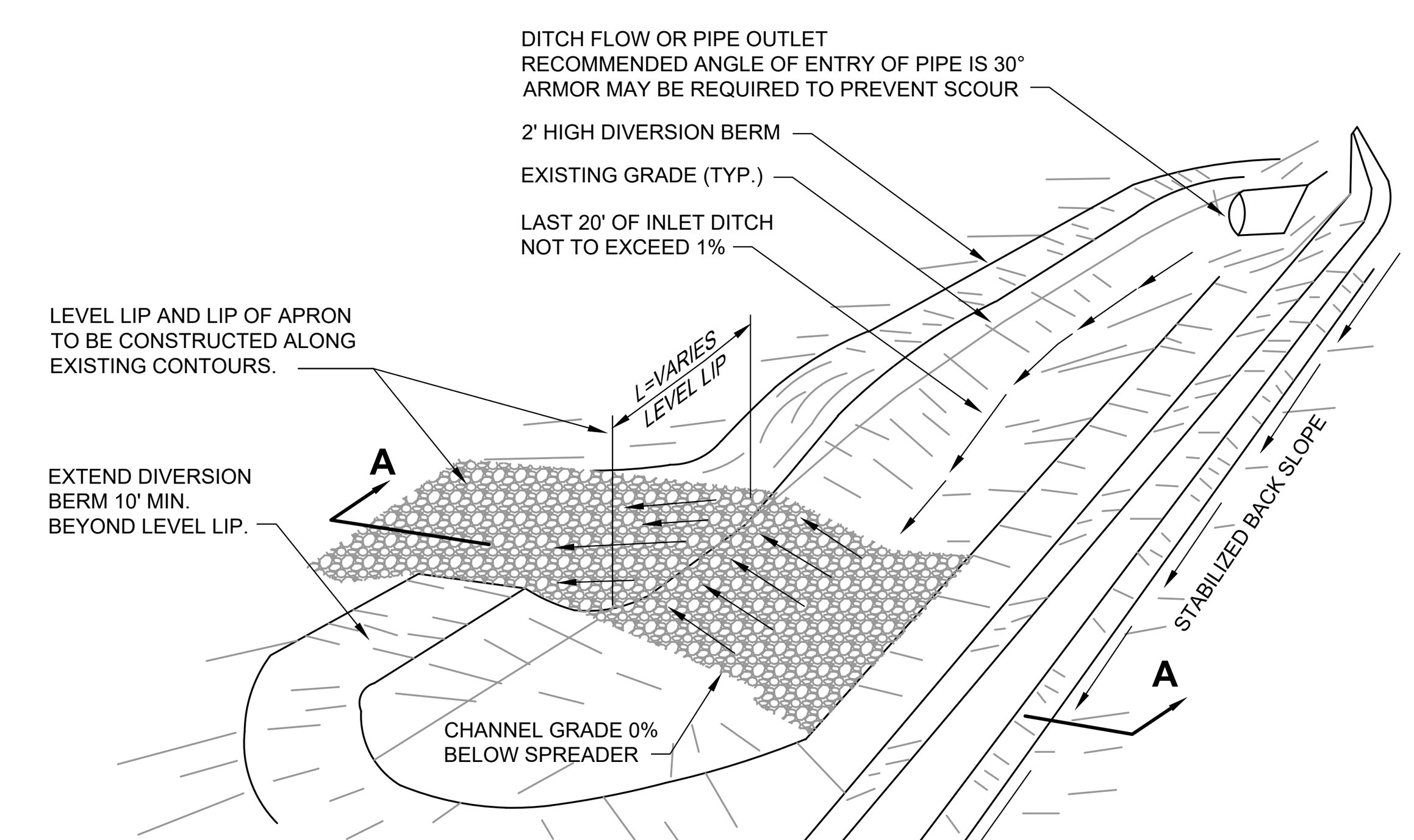
TYPICAL PAVEMENT BUILDUP DETAIL
N.T.S.



TYPICAL GRASS LINED DITCH DETAIL
N.T.S.



TYPICAL BUFFER LEVEL SPREADER SYSTEM - SECTION A-A
N.T.S.



1. SPREADERS SHALL BE INSTALLED WITH A LEVEL INSTRUMENT. CONSTRUCT LEVEL UP TO 0% GRADE TO ENSURE UNIFORM SHEET FLOW. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL (NOT FILL).
2. SELECT GEOTEXTILE FABRIC BASED ON UNDISTURBED SOILS (SANDS, SILTS, CLAYS, ETC.)
3. PLACE 6" LAYER OF UNIFORMLY GRADED STONE 2" TO 3" IN DIA. RAKE TO FORM SMOOTH UNIFORM SURFACE. DO NOT FILL VOIDS IN STONE.
4. THE INLET DITCH SHALL NOT EXCEED A 1% GRADE FOR AT LEAST 20 FEET BEFORE ENTERING THE SPREADER.
5. STORM RUN-OFF CONVERTED TO SHEET FLOW ACROSS OUTLET APRON SHALL FLOW ONTO STABILIZED AREAS. RUN-OFF SHALL NOT BE RECONCENTRATED IMMEDIATELY BELOW THE POINT OF DISCHARGE.
6. PERIODIC INSPECTION AND REQUIRED MAINTENANCE SHALL BE PROVIDED.
7. CONSTRUCTION OF LEVEL UP SPREADER SHALL BE FROM UPHILL SIDE ONLY. LEVEL UP & AREA BELOW SPREADER SHALL BE AT EXISTING GRADES & UNDISTURBED BY EARTHWORK OR EQUIPMENT.
8. CONSTRUCT SPREADER WITH LIP AT EXISTING ELEVATION AS SPECIFIED.
9. DOWNGRADIENT RECEIVING AREA MUST BE NATURALLY WELL VEGETATED.
10. DISCHARGE NOT PERMITTED WITHIN 25' OF A STREAM OR WETLAND. CONSULT DEP IF STRUCTURE MUST BE WITHIN 75' OF STREAM OR WATER BODY.

LEVEL LIP SPREADER DETAIL
N.T.S.

EROSION CONTROL NOTES

1. ALL SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE MAINE EROSION AND SEDIMENTATION CONTROL BMPS, PUBLISHED BY THE BUREAU OF LAND AND WATER QUALITY, MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, LATEST EDITION.
2. SILT FENCE WILL BE INSPECTED, REPLACED AND/OR REPAIRED IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL OR SNOW MELT OR LOSS OF SERVICEABILITY DUE TO SEDIMENT ACCUMULATION. AT A MINIMUM, ALL EROSION CONTROL DEVICES WILL BE OBSERVED WEEKLY.
3. DURING THE CONSTRUCTION PHASE, INTERCEPTED SEDIMENT WILL BE RETURNED TO CONSTRUCTION SITE.
4. SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL AREAS UPSLOPE ARE STABILIZED BY A SUITABLE GROWTH OF GRASS. ONCE A SUITABLE GROWTH OF GRASS HAS BEEN OBTAINED, ALL TEMPORARY EROSION CONTROL ITEMS SHALL BE REMOVED BY THE CONTRACTOR. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THEY ARE REMOVED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED, SEEDED, AND MULCHED IMMEDIATELY.
5. ALL DISTURBED AREAS WILL BE SEEDED WITH 2.5 LBS. RED FESCUE AND 0.5 LBS. RYE GRASS PER 1,000 SQUARE FEET AND MULCHED AT A RATE OF 90 LBS. PER 1,000 SQUARE FEET OR EQUIVALENT APPLICATION OF SEED AND MULCH.
6. A SUITABLE BINDER SUCH AS CURASOL OR TERRTACK WILL BE USED ON THE HAY MULCH FOR WIND CONTROL.
7. IF FINAL SEEDING OF DISTURBED AREAS IS NOT COMPLETED BY SEPTEMBER 15th OF THE YEAR OF CONSTRUCTION, THEN ON THAT DATE THESE AREAS WILL BE GRADED AND SEEDED WITH WINTER RYE AT THE RATE OF 112 POUNDS PER ACRE OR 3 POUNDS PER 1000 SQUARE FEET. THE RYE SEEDING WILL BE PRECEDED BY AN APPLICATION OF 3 TONS OF LIME AND 800 LBS. OF 10-20-20 FERTILIZER OR ITS EQUIVALENT. MULCH WILL BE APPLIED AT A RATE OF 90 POUNDS PER 1000 SQUARE FEET.
8. IF THE RYE SEEDING CANNOT BE COMPLETED BY OCTOBER 1st OR IF THE RYE DOES NOT MAKE ADEQUATE GROWTH BY DECEMBER 1st, THEN ON THOSE DATES, HAY MULCH WILL BE APPLIED AT 150 POUNDS PER 1000 SQUARE FEET.
9. INTERIOR SILT FENCES ALONG CONTOUR DIVIDING FLAT AND STEEP SLOPES, AREAS WITH DIFFERENT DISTURBANCE SCHEDULES, AROUND TEMPORARY STOCKPILES OR IN OTHER UNSPECIFIED POSSIBLE CIRCUMSTANCES SHOULD BE CONSIDERED BY THE CONTRACTOR. THE INTENT OF SUCH INTERIOR SILT FENCES IS TO LIMIT SEDIMENT TRANSPORT WITHIN THE SITE TOWARD THE PROTECTED CATCH BASIN INLETS TO MINIMIZE SEDIMENT REMOVAL REQUIRED BY THE EROSION CONTROL NOTE 9 PROTECTIONS AND EXTEND LIFE OF SUCH DEVICES.
10. THE CONTRACTOR SHALL PROVIDE A SEDIMENT BASIN FOR ALL WATER PUMPED FROM EXCAVATIONS. BASIN SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE "MAINE EROSION AND SEDIMENT HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES". THE CONTRACTOR SHALL SUBMIT FOR REVIEW/APPROVAL PRIOR TO BEGINNING ANY PROJECT WORK.
11. CONSTRUCTION OVERSIGHT:
THE CONTRACTOR WILL RETAIN THE SERVICES OF A PROFESSIONAL ENGINEER TO INSPECT THE CONSTRUCTION AND STABILIZATION OF ALL STORMWATER MANAGEMENT STRUCTURES. IF NECESSARY, THE INSPECTING ENGINEER WILL INTERPRET THE POND'S CONSTRUCTION PLAN FOR THE CONTRACTOR. ONCE ALL STORMWATER MANAGEMENT STRUCTURES ARE CONSTRUCTED AND STABILIZED, THE INSPECTING ENGINEER WILL NOTIFY THE DEPARTMENT IN WRITING WITHIN 30 DAYS TO STATE THAT THE POND HAS BEEN COMPLETED. ACCOMPANYING THE ENGINEER'S NOTIFICATION MUST BE A LOG OF THE ENGINEER'S INSPECTIONS GIVING THE DATE OF EACH INSPECTION, THE TIME OF EACH INSPECTION, AND THE ITEMS INSPECTED ON EACH VISIT, AND INCLUDE ANY TESTING DATA OR SIEVE ANALYSIS DATA OF EVERY MINERAL SOIL AND SOIL MEDIA SPECIFIED IN THE PLANS AND USED ON SITE.
12. UNDERDRAINED FILTER BASINS:
CONSTRUCTION SEQUENCE: THE SOIL FILTER MEDIA AND VEGETATION MUST NOT BE INSTALLED UNTIL THE AREA THAT DRAINS TO THE FILTER HAS BEEN PERMANENTLY STABILIZED WITH PAVEMENT OR OTHER STRUCTURE, 90% VEGETATION COVER, OR OTHER PERMANENT STABILIZATION UNLESS THE RUNOFF FROM THE CONTRIBUTING DRAINAGE AREA IS DIVERTED AROUND THE FILTER UNTIL STABILIZATION IS COMPLETED.
COMPACTION OF SOIL FILTER: FILTER SOIL MEDIA AND UNDERDRAIN BEDDING MATERIAL MUST BE COMPACTED TO BETWEEN 90% AND 92% STANDARD PROCTOR. THE BED SHOULD BE INSTALLED IN AT LEAST 2 LIFTS OF 9 INCHES TO PREVENT POCKETS OF LOOSE MEDIA.
CONSTRUCTION OVERSIGHT: INSPECTION BY A PROFESSIONAL ENGINEER WILL OCCUR AT A MINIMUM:
   - AFTER THE PRELIMINARY CONSTRUCTION OF THE FILTER GRADES AND ONCE THE UNDERDRAIN PIPES ARE INSTALLED BUT NOT BACKFILLED,
   - AFTER THE DRAINAGE LAYER IS CONSTRUCTED AND PRIOR TO THE INSTALLATION OF THE FILTER MEDIA,
   - AFTER THE FILTER MEDIA HAS BEEN INSTALLED AND SEEDED. BIO-RETENTION CELLS MUST BE STABILIZED PER THE PROVIDED PLANTING SCHEME AND DENSITY FOR THE CANOPY COVERAGE OF 30 AND 50%.
   - AFTER ONE YEAR TO INSPECT HEALTH OF THE VEGETATION AND MAKE CORRECTIONS, AND
   - ALL THE MATERIAL USED FOR THE CONSTRUCTION OF THE FILTER BASIN MUST BE CONFIRMED AS SUITABLE BY THE DESIGN ENGINEER. TESTING MUST BE DONE BY A CERTIFIED LABORATORY TO SHOW THAT THEY ARE PASSING DEP SPECIFICATIONS.

   TESTING AND SUBMITTALS: THE CONTRACTOR SHALL IDENTIFY THE LOCATION OF THE SOURCE OF EACH COMPONENT OF THE FILTER MEDIA. ALL RESULTS OF FIELD AND LABORATORY TESTING SHALL BE SUBMITTED TO THE PROJECT ENGINEER FOR CONFIRMATION. THE CONTRACTOR SHALL:
   - SELECT SAMPLES FOR SAMPLING OF EACH TYPE OF MATERIAL TO BE BLENDED FOR THE MIXED FILTER MEDIA AND SAMPLES OF THE UNDERDRAIN BEDDING MATERIAL. SAMPLES MUST BE A COMPOSITE OF THREE DIFFERENT LOCATIONS (GRABS) FROM THE STOCKPILE OR PIT FACE. SAMPLE SIZE REQUIRED WILL BE DETERMINED BY THE TESTING LABORATORY.
   - PERFORM A SIEVE ANALYSIS CONFORMING TO STM C136 (STANDARD TEST METHOD FOR SIEVE ANALYSIS OF FINE AND COURSE AGGREGATES 1996A) ON EACH TYPE OF THE SAMPLE MATERIAL. THE RESULTING SOIL FILTER MEDIA MIXTURE MUST HAVE 8% TO 12% BY WEIGHT PASSING THE #200 SIEVE, A CLAY CONTENT OF LESS THAN 2% (DETERMINED HYDROMETER GRAIN SIZE ANALYSIS) AND HAVE 10% DRY WEIGHT OF ORGANIC MATTER.
   - PERFORM A PERMEABILITY TEST ON THE SOIL FILTER MEDIA MIXTURE CONFORMING TO ASTM D2434 WITH THE MIXTURE COMPACTED TO 90-92% OF MAXIMUM DRY DENSITY BASED ON ASTM D698.
14. LOT GRADING AND DRIVEWAY LOCATION
INSPECTIONS BY A PROFESSIONAL ENGINEER WILL CONSIST OF A VISIT TO THE SITE PRIOR TO CONSTRUCTION TO CONSULT WITH THE EARTHWORK CONTRACTOR AND A POST CONSTRUCTION MEETING TO CONFIRM GRADING ON LOTS AND FOR ALL DRIVEWAYS TO ENSURE RUNOFF IS DIRECTED ACCORDING TO PLANS AND TO OVERSEE THE RE-STABILIZATION OF THE LOT INTO A VEGETATED COVER.
15. BUFFERS - GENERAL
GENERAL FOREST USE MEANS THAT THE LAND MUST BE MAINTAINED WITH A FOREST COVER AND UNDISTURBED SOIL, DUFF LAYER GROUND COVER VEGETATION, AND UNDERSTORY VEGETATION. TIMBER MAY BE HARVESTED ON A SELECTIVE BASIS PROVIDED THAT NO MORE THAN 40% OF THE VOLUME IS HARVESTED WITHIN ANY 10 YEAR PERIOD.
16. STONE BERMED LEVEL LIP SPREADER
INSPECTIONS BY A PROFESSIONAL ENGINEER SHALL CONSIST OF WEEKLY VISITS TO THE SITE TO INSPECT EACH LEVEL SPREADERS CONSTRUCTION, STONE BERM MATERIAL AND PLACEMENT, SETTLING BASIN FROM INITIAL GROUND DISTURBANCE TO FINAL STABILIZATION OF THE LEVEL SPREADER.
17. ROAD DITCH TURNOUTS
INSPECTIONS BY A PROFESSIONAL ENGINEER SHALL CONSIST OF WEEKLY VISITS TO THE SITE TO INSPECT EACH TURNOUT CONSTRUCTION, TURNOUT'S STONE BERM MATERIAL AND PLACEMENT, FROM INITIAL GROUND DISTURBANCE TO FINAL STABILIZATION OF THE LEVEL SPREADER.
18. DEWATERING
A DEWATERING PLAN IS NEEDED TO ADDRESS EXCAVATION DE-WATERING FOLLOWING HEAVY RAINFALL EVENTS OR WHERE THE EXCAVATION MAY INTERCEPT THE GROUNDWATER TABLE DURING CONSTRUCTION. THE COLLECTED WATER NEEDS TREATMENT AND A DISCHARGE POINT THAT WILL NOT CAUSE DOWNGRADIENT EROSION AND OFFSITE SEDIMENTATION OR WITHIN A RESOURCE. PLEASE FOLLOW THE DETAILS OF SUCH A PLAN.
19. BASIC STANDARDS - EROSION CONTROL MEASURES:
MINIMUM EROSION CONTROL MEASURES WILL NEED TO BE IMPLEMENTED AND THE CONTRACTOR WILL BE RESPONSIBLE TO MAINTAIN ALL COMPONENTS OF THE EROSION CONTROL PLAN UNTIL THE SITE IS FULLY STABILIZED. HOWEVER, BASED ON SITE AND WEATHER CONDITIONS DURING CONSTRUCTION, ADDITIONAL EROSION CONTROL MEASURES MAY NEED TO BE IMPLEMENTED. ALL AREAS OF INSTABILITY AND EROSION MUST BE REPAIRED IMMEDIATELY DURING CONSTRUCTION AND NEED TO BE MAINTAINED UNTIL THE SITE IS FULLY STABILIZED OR VEGETATION IS ESTABLISHED. A CONSTRUCTION LOG MUST BE MAINTAINED FOR THE EROSION AND SEDIMENTATION CONTROL INSPECTIONS AND MAINTENANCE

CONTRACTOR WILL BE RESPONSIBLE FOR FOLLOWING PROCEDURES FOUND IN THE "MAINE EROSION AND SEDIMENT CONTROL PRACTICES FIELD GUIDE FOR CONTRACTORS" (PUBLISHED MARCH 2015). THE PUBLICATION CAN BE FOUND AT: HTTP://WWW.MAINE.GOV/DEP/LAND/EROSION/ESCBMPS/INDEX.HTML

CES INC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
BOUFFARD - MCFARLAND BUILDERS
AUBURN, MAINE

SHEET TITLE
PHASE IV
SITE DETAILS

ISSUE STATUS
NOT FOR CONSTRUCTION

SCALE	NTS
DATE	2018-02-13
DRAWN BY	WAB
CHECKED BY	CTM
DESIGNED BY	WAB
APPROVED BY	SMT
JOB NUMBER	10788.008
DRAWING NUMBER	C501