



**DeLUCA-HOFFMAN ASSOCIATES, INC.**  
**CONSULTING ENGINEERS**

778 MAIN STREET  
SUITE 8  
SOUTH PORTLAND, MAINE 04106  
TEL. 207.775.1121  
FAX 207.879.0896

- SITE PLANNING AND DESIGN
- ROADWAY DESIGN
- ENVIRONMENTAL ENGINEERING
- PERMITTING
- AIRPORT ENGINEERING
- CONSTRUCTION ADMINISTRATION

August 12, 2011

Ms. Christine Woodruff  
Maine Department of Environmental Protection  
312 Canco Road  
Portland, Maine 04103

**Subject: RSU 14 Windham/Raymond Schools – Windham, Maine**  
**Windham School Campus**  
**Gravel Parking Northeast of Field #10**  
**Minor Amendment Application to Permit L-15060-22-A-N**

Dear Ms. Woodruff:

Enclosed as Attachment A please find two (2) copies of a Minor Amendment Application for the Site Law Permit Application for improvements at the Windham School Campus. The minor amendment to the subject site for the location shown on the aerial figure contained in Attachment B is as follows:

### **Project History**

Within the Windham School Campus there is a parcel of land with an abandoned residential structure with attached barn located at 205 Windham Center Road. This 10.1 acre property was purchased by the Town of Windham in 2002 and is known as the Strout Parcel, a deed for this purchase is provided in Attachment C. The majority of the Strout Parcel was developed as part of the athletic field and high school expansion project that took place in 2002. The remaining portion of the property containing the home and barn is approximately 1.2 acres and includes the area of the proposed construction and is part of the approximate 90 acre Windham School Campus.

Since the completion of the High School and Athletic Field Expansion Project in 2002 there has been an increase in the need for athletic field event parking at the Windham School Campus.

### **Project Description**

The proposed project includes the construction of a 120 foot by 153 foot gravel parking area designed for approximately 60 vehicles. Access to this gravel parking area will be from an 18 foot wide gravel drive which will connect to an existing paved parking lot as shown on the attached figures. This new parking area is located northeasterly of Field #10 which was formerly referred to as Field #4 as part of the 2002 project.

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### **Visual Quality & Scenic Character**

The existing residence located on the project site contains landscaping which includes large shrubs and plantings. As part of the proposed project select existing shrubs will be used as a visual buffer by re-planting them along the northeast edge of the gravel parking lot along Windham Center Road. These plantings will help to screen the parking lot from both Windham Center Road and the residence directly across from the gravel parking lot.

### **Historic Sites**

A letter dated August 8, 2011 has been submitted by DeLuca-Hoffman Associates, Inc. to the Maine Historic Preservation Commission for review of features of historical significance on the project site. A copy of the same letter has been sent to the Maine Department of Environmental Protection in Portland, Maine.

### **Soils**

In September of 2001, Haley & Aldrich performed geotechnical investigations for the Windham Athletic Field Expansion Project. As part of this investigation was the analysis of the Strout Parcel which included test pit HSTP-17, location shown on Figure 2. The HSTP-17 test pit log and excerpts, pertaining to the proposed project area, from the Soils and Geotechnical Report are included as Attachment D. HSTP-17 was excavated to a depth of 4.5 feet and groundwater was not encountered during excavation.

Deluca-Hoffman Associates, Inc. also performed a hand auger probe on August 11, 2011 in the area of the proposed filter for groundwater investigation purposes only. The location of this probe is shown on Figure 2. The hand probe was excavated starting at elevation 270.00 to a depth of 42 inches (approx. elev. 266.50) and as a result groundwater was not encountered. The proposed filter has a bottom elevation of 267.00 allowing for at least 6 inches of separation to groundwater.

### **Stormwater Management**

The existing site contains approximately 0.1 acres of rooftop and 0.08 acres of paved driveway surface which will all be removed prior to the gravel lot construction. Currently the majority of this parcel is tributary to adjacent wetlands east of the site while the remainder of the site is tributary to the water quality pond constructed in 2002. This wetland area can be best described in an excerpt from the Natural Resources Permit Application submitted in 2001:

*“A series of narrow drainage swales drain into the intermittent stream. These swales are generally steep sided with small inclusions of wetland. A number of the swales have associated watercourses. One swale extends to the northern end of the track and receives flow, via a grassed drainage swale, from a shrub swamp that extends from the southern end of the track up to the Windham Center Road between the Strout and Library parcels.*

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*Water flow is assumed to be intermittent based on low flows at the time of the site visit. The vegetation within these areas includes silky dogwood (Cornus amomum), speckled alder, honeysuckle (Lonicera morrowii), rough-stemmed goldenrod, creeping bentgrass (Agrostis stolonifera), various grasses, and Sphagnum species (Sphagnum spp)."*

On the existing site stormwater sheets through a wooded area prior to entering the wetlands, this wooded area will be maintained and undisturbed acting as an informal buffer for a portion of the gravel lot runoff. As part of this project, an underdrained soil filter meeting current Chapter 500 Stormwater Regulations is being provided for treatment in an existing grassed area east of the wooded area. The sizing for this filter and all other treatment calculations are shown on the attached Figure 6. This filter will be maintained by RSU 14 in accordance with the notes shown in the Erosion and Sediment Control Narrative, a sample maintenance log is included in Attachment E.

The remainder of the site will flow southwesterly toward the existing water quality pond. Included in this remaining portion of the site is the approximately 0.03 acre gravel access drive. Due to grading restrictions based on existing elevations of the nearby parking lot and due to the presence of rock outcrops, it is difficult and not cost effective to capture this proposed gravel drive. Although the 0.03 acres of gravel drive will remain untreated, the existing 0.08 acres of paved driveways to be removed provides sufficient area to offset the gravel drive for water quality purposes.

Due to the addition of the approximate 0.45 acres of impervious area a flow analysis has been generated to verify that this re-development meets flooding standards. The HydroCAD software analysis is included in Attachment F. Point of Interest #1 was analyzed in the model and Figure 6 shows the location and flow results for this point of interest. As a result of this analysis, Point of Interest #1 experiences a decrease in flow for the 2- and 10-year storm events and a slight increase in flow of 0.69 cfs for the 25-year storm event. Point of Interest #1 is located on RSU 14 property therefore any increase at this location will not have an effect on abutting properties. Also the downstream swale from this location is stable and there currently are no signs of erosion present as viewed on August 11, 2011 by Orry Cummings of Deluca-Hoffman Associates, Inc. Photos of this area are included in Attachment G.

### **Erosion & Sedimentation Control**

The majority of the stormwater will reach the underdrained soil filter via a vegetated swale. Sheet flow will carry the stormwater to the edge of the gravel parking area and into the swale where stone check dams will be installed as well as a stone level spreader at the end of the swale prior to the filter. Additional erosion and sediment control measures such as silt fence and a stabilized construction entrance are shown on the construction drawings. All these measures with installation details can be seen on the attached Figures 2, 3 & 4, as well as an Erosion and Sedimentation Control Narrative on Figure 5.

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### **Wastewater Disposal & Water Supply**

As shown on Figure 1, the project site contains a subsurface well and septic system. As part of this project, all chambers associated with the septic system will be removed completely and disposed of properly. The septic tanks' top will be removed along with all contents and then backfilled with gravel.

The area of the underground well, as shown on the plans, was inspected but the physical location of the well was not located. The work associated with this project will not disturb the wooded area where the well is shown; therefore, the well will remain undisturbed as part of this project. Portland Water District was also contacted to verify the presence of a public water service and they have indicated that there is no record of public water at the project location. The correspondence with Portland Water District is included in Attachment H.

### **Solid Waste**

Prior to constructing the gravel parking lot, the existing abandoned structures and residential paved driveway will be removed from the site. RSU 14 will contract with Pine Tree Waste of Scarborough, Maine for the removal and disposal of approximately 500 to 600 cubic yards of solid waste associated with this project. All solid waste will be taken by Pine Tree Waste to the MeDEP licensed Ecomaine facility located at 64 Blueberry Road, Portland, ME 04102.

### **Blasting**

It is the intent of this project to avoid the removal of rock ledge; in the event that rock does need to be removed it will be removed by mechanical means.

### **Notices**

The Notice of Intent to File has been distributed by certified mail to all the appropriate abutters as well as the Town of Windham Municipal Office. An advertisement showing this notice will also appear in the Portland Press Herald on August 12, 2011.

Please contact our office with any questions regarding this application.

Sincerely,

DELUCA-HOFFMAN ASSOCIATES, INC.



Orry Cummings  
Design Engineer I

OSC/cet/smk

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Enclosures: Check for \$865.00/Check for \$135.00 Previously Provided on July 22, 2011  
Attachment A – Minor Amendment Application and Associated Forms  
Attachment B – Figure A - Site Location  
Attachment C – Strout Parcel Warranty Deed  
Attachment D – Geotechnical Data  
Attachment E – BMP Inspection and Maintenance Log  
Attachment F – HydroCAD Software Calculations  
Attachment G – Photos of Point of Interest #1  
Attachment H – Portland Water District Correspondence  
Attachment I – Figures 1-6

c: Windham Municipal Office  
William Hansen, P.E.  
Dwight Anderson, P.E.

R:\2146.19 - Windham Gravel Lot\Admin\DEP Minor Amendment Application 08-12-11\2011-08-12-Woodruff-DEP Minor Amendment.doc

## **ATTACHMENT A**

### **Minor Amendment Application and Associated Forms**

Department of Environmental Protection  
Bureau of Land & Water Quality  
17 State House Station  
Augusta, Maine 04333  
Telephone: 207-287-3901

FOR DEP USE

FORM A PAGE 1

04/08

ATS # \_\_\_\_\_  
L- \_\_\_\_\_  
Total Fees: \_\_\_\_\_  
Date: Received \_\_\_\_\_

\*\*\*\*\*

**SITE LOCATION OF DEVELOPMENT PERMIT APPLICATION 38 M.R.S.A. §§481-490**

PLEASE TYPE OR PRINT IN *INK ONLY*

This application is for: (CHECK THE ONE THAT APPLIES)		<input type="checkbox"/> 20 acre development	<input type="checkbox"/> Marine Oil Terminal	<input type="checkbox"/> Major Amendment
		<input type="checkbox"/> Planning Permit	<input type="checkbox"/> Structure	<input checked="" type="checkbox"/> Minor Amendment
		<input type="checkbox"/> Metallic Mining	<input type="checkbox"/> Subdivision	
1. Name of Applicant:	William Hansen, P.E.		6. Name of Agent: (if applicable)	Orry S. Cummings
2. Applicant's Mailing Address:	228 Windham Center Rd. Windham, ME 04062-4862		7. Agent's Mailing Address:	778 Main St, Suite 8 South Portland, ME 04106
3. Applicant's Daytime Phone #:	(207) 892-1800		8. Agent's Daytime Phone #:	(207) 775-1121
4. Applicant's Fax #: (if available)	(207) 892-1805		9. Agent's Fax #:	(207) 879-0896
5. Applicant's e-mail address: (license will be sent via e-mail)	bhansen@windhamraymondschools.org		10. Agent's e-mail address: (license will be sent via e-mail)	ocummings@delucahoffman.com
<b>PROJECT INFORMATION</b>				
11. Name of Development:	Gravel Parking Northeast of Field #10			
12. Map and Lot #'s:	Map #:12	Lot #:26	13. Deed Reference #'s:	Book #: 17194 Page #: 241
14. Location of Project City/Town:	Windham	15. County:	Cumberland	16. UTM Northing
				17. UTM Easting
18. Brief Description of Project including total parcel size:	See attached cover letter dated August 12, 2011 w/ attachments			
19. Type of Direct Watershed: (Check all that apply)	<input type="checkbox"/> Lake not most at risk <input type="checkbox"/> River, stream or brook <input type="checkbox"/> Coastal wetland <input type="checkbox"/> Lake most at risk <input type="checkbox"/> Urban impaired stream <input type="checkbox"/> Wellhead or public water <input type="checkbox"/> Lake most at risk, severely blooming <input checked="" type="checkbox"/> Freshwater wetland			
19. Name of Waterbody Project Site drains to:	Pleasant River			
21. Amount of Developed Area:	Total acres: 1.22	Existing Developed area: 1.22 acres	New Developed area: 0 acres	
22. Amount of Impervious Area:	Total acres: 0.45	Existing Impervious area: 0.18 acres	New Impervious area: 0.45acres	
23. Development started prior to obtaining a license?:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
24. Development or any portion of the site subject to enforcement action?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		If yes, name of enforcement staff involved?	
25. Common scheme of development?:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	26. Title, Right or Interest:	<input checked="" type="checkbox"/> own <input type="checkbox"/> lease	<input type="checkbox"/> purchase option <input type="checkbox"/> written agreement
27. Natural Resources Protection Act permit required?:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes:	<input type="checkbox"/> PBR <input type="checkbox"/> Tier 1 <input type="checkbox"/> Full Permit <input type="checkbox"/> Tier 2	
28. Existing DEP Permit number (if applicable):	L-15060-22-A-N			
29. Names of DEP staff person(s) present at the pre-application meeting:	Christine Woodruff & Ben Viola			
30. Does agent have an interest in project? If yes, what is the interest?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			

CERTIFICATIONS AND SIGNATURES LOCATED ON PAGE 2

**IMPORTANT: IF THE SIGNATURE BELOW IS NOT THE APPLICANT'S SIGNATURE, ATTACH LETTER OF AGENT AUTHORIZATION SIGNED BY THE APPLICANT.**

By signing below the applicant (or authorized agent), certifies that he or she has read and understood the following :

### CERTIFICATIONS / SIGNATURES

"I certify under penalty of law that I have personally examined the information submitted in this document and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the information is true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment. I authorize the Department to enter the property that is the subject of this application, at reasonable hours, including buildings, structures or conveyances on the property, to determine the accuracy of any information provided herein.

Signed: [Signature] Title DESIGN ENGINEER Date: 8-12-11

Notice of Intent to Comply  
with Maine Construction  
General Permit

With this Site Law application form and my signature, I am filing notice of my intent to carry out work which meets the requirements of the Maine Construction General Permit (MCGP). I have read and will comply with all of the MCGP standards.

If this form is not being signed by the landowner or lessee of the property, attach documentation showing authorization to sign.

Signed [Signature] Date: 8-12-11

**NOTE: You must file a MCGP Notice of Termination (Form K) within 20 days of completing permanent stabilization of the project site.**

### CERTIFICATION

The person responsible for preparing this application and/or attaching pertinent site and design information hereto, by signing below, certifies that the application for development approval is complete and accurate to the best of his/her knowledge.

Signature: [Signature]

Name (print): Dwight D. Anderson

Date: 8/12/11

Re/Cert/Lic No.: 9275

Engineer X

Geologist \_\_\_\_\_

Soil Scientist \_\_\_\_\_

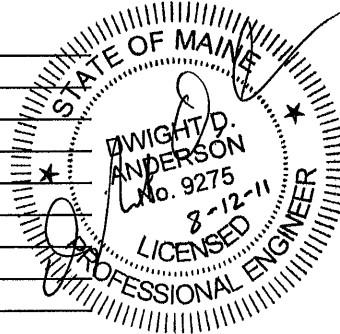
Land Surveyor \_\_\_\_\_

Site Evaluator \_\_\_\_\_

Active Member of the Maine Bar \_\_\_\_\_

Professional Landscape Architect \_\_\_\_\_

Other \_\_\_\_\_



"I hereby authorize the DEP to send me an electronically signed decision on the license I am applying for with this application by emailing the decision to the address located on the front page of this application (see #5 for the applicant and #10 for the agent). **Do not sign if you elect to "opt out" or receive the decision via regular mail.**

Signed (Applicant) [Signature] <sup>ON BEHALF OF</sup> WILLIAM HANSEN, PE Date: 8-12-11

and/or Signed (Agent) [Signature] Date: 8-12-11



WINDHAM RAYMOND SCHOOL DISTRICT  
Regional School Unit #14

*SUPERINTENDENT*  
Sanford J. Prince IV

228 Windham Center Road  
Windham, Maine 04062  
(207) 892-1800 Fax (207) 892-1805  
<http://www.windhamraymondschools.org>

*Assistant Superintendent*  
Donn S. Davis

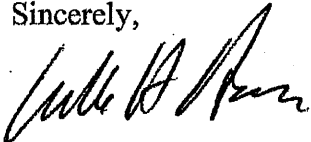
July 21, 2011

To Whom It May Concern:

**Subject: Agent Authorization Letter**

RSU 14 Windham/Raymond School Department has retained DeLuca-Hoffman Associates, Inc. to assist in the preparation of local and state permit applications for improvements on the Windham School Campus in Windham, Maine. DeLuca-Hoffman Associates, Inc. is authorized to act as an agent in matters related to these permits.

Sincerely,



William Hansen, P.E.  
Director of Facilities, Property Services and Special Projects

OSC/osc/JN2146.19/Agent Letter

**PUBLIC NOTICE:  
NOTICE OF INTENT TO FILE**

Please take notice that the RSU 14 Windham/Raymond School Department, 228 Windham Center Road, Windham, ME 04062-4862, phone (207) 892-1800 intends to file a Site Location of Development Act permit minor amendment application with the Maine Department of Environmental Protection, pursuant to the provisions of 38 M.R.S.A. §§ 481 thru 490, on or about August 12, 2011.

The application is for the demolition and removal of the structures located at 205 Windham Center Road and the construction of a new 60 vehicle capacity gravel parking area to support additional event parking at the following location: The Windham School Campus, Windham, ME.

A request for a public hearing or a request that the Board of Environmental Protection assume jurisdiction over this application must be received by the Department in writing, no later than 20 days after the application is found by the Department to be complete and is accepted for processing. A public hearing may or may not be held at the discretion of the Commissioner or Board of Environmental Protection. Public comment on the application will be accepted throughout the processing of the application.

For Federally licensed, permitted, or funded activities in the Coastal Zone, review of this application shall also constitute the State's consistency review in accordance with the Maine Coastal Program pursuant to Section 307 of the federal Coastal Zone Management Act, 16 U.S.C. § 1456.

The application will be filed for public inspection at the Department of Environmental Protection's office in Portland during normal working hours. A copy of the application may also be seen at the municipal offices in Windham, Maine.

Written public comments may be sent to the regional office in Portland, where the application is filed for public inspection: MDEP, Southern Maine Regional Office, 312 Canco Road, Portland, Maine 04103.

## PUBLIC NOTICE FILING AND CERTIFICATION

The DEP Rules, Chapter 2, require an applicant to provide public notice for all Site Location projects with the exception of minor revisions and condition compliance applications. In the notice, the applicant must describe the proposed activity and where it is located. "**Abutter**" for the purposes of the notice provision means any person who owns property that is BOTH (1) adjoining and (2) within one mile of the delineated project boundary, including owners of property directly across a public or private right of way.

1. **Newspaper:** You must publish the Notice of Intent to File in a newspaper circulated in the area where the activity is located. The notice must appear in the newspaper within 30 days prior to the filing of the application with the Department. You may use the attached Notice of Intent to File form, or one containing identical information, for newspaper publication and certified mailing.
2. **Abutting Property Owners:** You must send a copy of the Notice of Intent to File by certified mail to the owners of the property abutting the activity. Their names and addresses can be obtained from the town tax maps or local officials. They must receive notice within 30 days prior to the filing of the application with the Department.
3. **Municipal Office:** You must send a copy of the Notice of Intent to File and a **duplicate of the entire application** to the Municipal Office.

**ATTACH a list of the names and addresses of the owners of abutting property.**

### CERTIFICATION

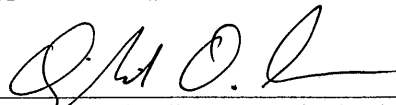
By signing below, the applicant or authorized agent certifies that:

1. A Notice of Intent to File was published in a newspaper circulated in the area where the project site is located within 30 days prior to filing the application;
2. A certified mailing of the Notice of Intent to File was sent to all abutters within 30 days of the filing of the application;
3. A certified mailing of the Notice of Intent to File, and a duplicate copy of the application was sent to the town office of the municipality in which the project is located; and
- 4. Provided notice of, if required, and held a public informational meeting in accordance with Chapter 2, Rules Concerning the Processing of Applications, Section 14, prior to filing the application. Notice of the meeting was sent by certified mail to abutters and to the town office of the municipality in which the project is located at least ten days prior to the meeting. Notice of the meeting was also published once in a newspaper circulated in the area where the project site is located at least seven days prior to the meeting.

Not  
Required

The Public Informational Meeting was held on Not Required  
Date

Approximately — members of the public attended the Public Informational Meeting.

  
Signature of Applicant or authorized agent

8/12/11  
Date

position is 3.5 days per wk. w/benefits. Radiology license required as well as 3-5 years exp. Fax or e-mail your resume to: 207-761-0756 shastp@maine.rr.com

Professional

To apply, please visit our website  
(www.jarden.com)  
click on "careers" & follow the prompts.

We are an Equal Opportunity Employer  
(M/F/D/V)

## MECHANIC

**Portland Jetport**  
Ground support equipment shop seeking Ground Support Equipment Technician. With strong diesel engine, air/hydraulic brake systems, hydraulic systems, electrical, fuel suspension and power generation systems. Candidate must have their own tools, at least 2 yrs exp. Second shift. 1pm-9pm, Monday-Friday. Send cover letter and resume to: Judy Coyle, HR Mgr, Northeast Air, 1011 Westbrook St, Portland, ME 04102; FAX: 207-774-9244; or e-mail to: ludyc@northeastair.com

## PUBLIC NOTICES

### PUBLIC NOTICE

#### PUBLIC NOTICE: NOTICE OF INTENT TO FILE

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The application is for the modification and removal of the structures located at 205 Windham Center Road and the construction of a new 60 vehicle capacity gravel parking area to support additional event parking at the following location: The Windham School Campus, Windham, ME.

A request for a public hearing or a request that the Board of Environmental Protection assume jurisdiction over this application must be received by the Department in writing, no later than 20 days after the application is found by the Department to be complete and is accepted for processing. A public hearing may or may not be held at the discretion of the Commissioner or Board of Environmental Protection. Public comment on the application will be accepted throughout the processing of the application.

For Federally licensed, permitted, or funded activities in the Coastal Zone, review of this application shall also constitute the State's consistency review in accordance with the Maine Coastal Program pursuant to Section 307 of the Federal Coastal Zone Management Act, 16 U.S.C. § 1456.

The application will be filed for public inspection at the Department of Environmental Protection's office in Portland during normal working hours. A copy of the application may also be seen at the municipal offices in Windham, Maine.

Written public comments may be sent to the regional office in Portland, where the application is filed for public inspection: MDEP, Southern Maine Regional Office, 312 Canco Road, Portland, Maine 04103. #4383629

## NOTICES

### PUBLIC NOTICE

#### NOTICE OF MORTGAGEE'S SALE OF REAL ESTATE

90 Zakelo Road, Harrison, Maine

By virtue of the Power of Sale contained in a certain Commercial Mortgage Security Agreement and Assignment of Leases and Rents (the "Mortgage") given by New Horizon Capital Investment, LLC to TD Bank, N.A., dated September 15, 2009, recorded in the Cumberland County Registry of Deeds in Book 27269, Page 1, and covering land at or near 90 Zakelo Road, Harrison, Maine, of which Mortgagee TD Bank, N.A., is the present holder, for breach of the conditions of said Mortgage and for the purpose of foreclosing the same, there will be sold at a public auction sale to be conducted at 90 Zakelo Road, Harrison, Maine, being at or near the mortgaged premises, on August 30, 2011, at 11:00 a.m., all and singular the real and personal property described in said Mortgage (the "Property").

The sale is authorized by an Order, dated July 21, 2011, issued by the United States Bankruptcy Court for the District of Maine in the bankruptcy proceeding of New Horizon Capital Investment, LLC, docket number 11-20655, which Order grants TD Bank, N.A., relief from the automatic bankruptcy stay to enforce the Mortgage.

The Property will be sold as is, where is, without any warranties, express or implied as to the condition of the property or the status of title.

A bidder who wishes to bid on the Property must submit, as a qualification to bid, a deposit in the amount of twenty-five thousand dollars (\$25,000.00) by certified check payable to bidder for endorsement to the auctioneer, Tranzon Auction Properties. The deposit of the successful bidder will be retained as all or a portion of the earnest money deposit. Said deposit amount shall be increased as necessary to at least ten percent (10%) of the purchase price within five (5) business days of the auction. The closing is required within forty-five (45) days of the auction date.

The Property may be sold either as a whole or in parcels.

Bank reserves the right to modify or add to the terms of sale, the final terms and conditions of sale, including additions to or modifications of the terms set forth above, will be announced at the sale. Further information regarding the property may be obtained by contacting the auctioneer, Tranzon Auction Properties, 93 Exchange Street, Portland, ME 04101, (207) 775-4300, or by visiting <http://www.tranzon.com>.

Dated: August 2, 2011

/s/ Bradford R. Bowman, Esq.  
Bradford R. Bowman, Esq.  
Attorney for TD Bank, N.A.

#4378565

justified, an opportunity for public hearing. A request for public hearing or the Board of Environmental Protection must be received by the Department, in writing, no later than 20 days after the application is accepted by the Department as complete for processing.

The application, supporting documentation will be available for review at Bureau of Air Quality (BAQ) DEP Office, Augusta, (207) 287-2100 during normal work hours. A copy of the application and supporting documentation will also be available at the municipal office in South Portland, Maine.

Written public comments may be sent to Lynn Cornfield at Bureau of Air Quality State House Station, Augusta, Maine 04355 #43585

### PUBLIC NOTICE

STATE OF MAINE  
CUMBERLAND, SS  
DISTRICT COURT  
DISTRICT NINE  
LOCATION: PORTLAND  
DOCKET NO.  
POR-PC-10-46

LEGAL NOTICE TO: Jose Martinez. Who abouts unknown. Pursuant to an Order for Service by Publication dated 07/20/2011 NOTICE IS HEREBY GIVEN THAT:

1. Pursuant to M.R.S.A. §54032, et al, the State of Maine Department of Health and Human Services, petitioned the Court for a Child Protection Order concerning Stephanie Meek, DOB 6/13/2005, in addition pursuant to 22 M.R.S. §54052-4056, the State of Maine Department of Health and Human Services has petitioned the Court for the termination of parental rights to Stephanie Meek, DOB 6/13/2005.
2. The putative father of the child is Jose Martinez, who whereabouts are unknown.
3. A hearing on the Petition for Child Protection Order and this Petition for Termination of Parental Rights will be held at the Maine District Court, 205 Newbury Street, Portland, ME 04112-0287, on September 6, 2011 at 8:30 a.m.
4. Right to legal counsel. Parents are entitled to legal counsel in these proceedings; you want an attorney but are unable to afford one you should contact the Court at the telephone number (207) 822-4109 as soon as possible to request appointed counsel.
5. Failure to appear. Hearings regarding the matter may be determined to indicate intent to abandon a child, pursuant to M.R.S.A. §4002 (1-A).
6. These proceedings could eventually lead to a termination of parental rights under M.R.S.A. §54051-4057.
7. If you have questions regarding this matter you may contact the Maine Department of Health and Human Services, Division of Child and Family Services (207) 822-2231.
8. In these proceedings the State of Maine Department of Health and Human Services is represented by the Maine Department Attorney General, 4 Congress St., Suite 300, Portland, ME 04101: Dated: 7/20/2011

Peter Goranitz  
Judge  
Maine District Court  
#43793



## COUNTY OF CUMBERLAND SHERIFF DEPARTMENT PATROL DEPUTY

The Cumberland County Sheriff's Office is currently accepting applicants for a full-time law enforcement position. Cumberland County is the largest Sheriff's Office in the state of Maine that provides law enforcement services for 14 communities with beautiful mountain ranges, lakes and oceans. The Sheriff's Office also offers specialized units such as K-9, ESU, Dive, Marine Patrol and Criminal Investigations. If you are looking for a rewarding challenge in law enforcement, Cumberland County is the place for you.

**REQUIRED QUALIFICATIONS** include completion of the Maine Criminal Justice Academy (MCJA) pre-service 100 hour course, knowledge of criminal and motor vehicle laws, experience and training in law enforcement or the military and a high school diploma/GED.

**DESIRED QUALIFICATIONS** include completion of the MCJA Basic Police School (or waiver) and one to two years of college/completion of a Criminal Justice program.

The starting salary for this full time position is \$19.28 per hour. The successful candidate must satisfactorily complete an interview, MCJA physical agility test, background investigation, polygraph, and psychological examination.

Applications must be received by the Human Resources Department by 4:00 PM **August 19, 2011** for consideration.

Required applications are available to download from our website, [www.cumberlandcountyny.org](http://www.cumberlandcountyny.org). They may be requested from the Human Resources Department by calling 775-6809 or may be picked up at the Human Resources Office.

Please submit applications to:

**Cumberland County Human Resources**  
142 Federal Street, Room 100, Portland, ME 04101

The County of Cumberland encourages diversity in its workforce.  
We are an Equal Opportunity/Affirmative Action Employer.

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Maine Evening Telegram  
Sponsored by  
Maine State Police

# PhotoBin

6 Home Movies converted to  
DVD for just \$49!

By: \_\_\_\_\_  
Its: Director, Bureau of Land & Water Quality

DEPARTMENT OF ENVIRONMENTAL PROTECTION

FORM J 04/06

Bureau of Land and Water Quality  
17 State House Station  
Augusta, Maine 04333-0017

**CERTIFICATION – SITE LOCATION OF DEVELOPMENT LAW**

(To be completed and sent to the DEP after the contractor and any subcontractors have been shown a copy of the approval with conditions by the developer, and the owner and each contractor and subcontractor have certified, on this form provided by the department, that the approval and conditions have been received and read, and the work will be carried out in accordance with the approval and conditions.)

**Name of Applicant:** \_\_\_\_\_

**Town where project located:** \_\_\_\_\_

**Type of project:** \_\_\_\_\_

**Permit number:** \_\_\_\_\_

Work done by a contractor or subcontractor pursuant to an approval under the Site Location of Development Act (Site Law) may not begin before the contractor and any subcontractors have been shown a copy of the approval with conditions by the developer, and the owner and each contractor and subcontractor have certified, on this form provided by the department, that the approval and conditions have been received and read, and the work will be carried out in accordance with the approval and conditions. Completed certifications forms must be forwarded to the department.

This certification form must be completed and mailed to sent to Shari Berry Goodwin, Department of Environmental Protection, Bureau of Land and Water Quality, 17 State House Station, Augusta, Maine 04333 or to the project manager at the appropriate office prior to start of construction. Separate forms may be submitted for each person, or persons may be listed on a single form. List the name, address, phone number, of each person signing the form.

**I certify that I have personally received and read the approval and conditions described below, and that the work will be carried out in accordance with the approval and conditions.**

<b>Owner (Applicant)</b> Name (typed or printed), address, and phone number :	
<b>Signature:</b>	

<b>Contractor Name</b> (typed or printed), address, and phone number:	
<b>Signature:</b>	

<b>Subcontractor Name</b> (typed or printed), address, and phone number:	
---	--

**NOTICE OF TERMINATION**  
for use with **CONSTRUCTION GENERAL PERMIT**

FORM K 04/06

PLEASE TYPE OR PRINT IN **BLACK INK ONLY**

<b>Name of Applicant (Owner):</b>		<b>Applicant Mailing Address:</b>	
<b>Town/City:</b>		<b>State:</b>	<b>Zip Code:</b>
<b>Daytime phone: (with area code)</b>		<b>E Mail, if available:</b>	
<b>Name of Agent:</b>	<b>Agent Phone #:</b>	<b>Permit number (if known):</b>	
<b>Project Location: (Town/City):</b>	<b>UTM Northing: (if known)</b>	<b>UTM Easting: (if known)</b>	
<b>Map #:</b>	<b>Lot #:</b>	<b>County:</b>	
<b>Name of waterbody(ies) to which the disturbed area drains, or name of municipality if area drains to an MS4:</b>			
<b>Name/description of project</b>			

I am filing notice of my Notice of Termination indicating that permanent stabilization has been completed or, if the project was a common plan of development or sale, that the requirements of the Construction General Permit at Part IV(B)(2) have been completed. I have attached all the required submittals. *Notification forms cannot be accepted without the necessary attachments.*

- ☐ ALL: Photographs showing the completed project and affected area, except as provided in Part IV(B)(3)(c) of the MCGP.
- ☐ IF this form is not being signed by the landowner or lessee of the property, attach documentation showing authorization to sign; OR
- ☐ Check here to reference documentation showing authorization to sign that was submitted with the Notice of Intent if the documentation showing authorization to sign applies and is still current.

I authorize staff of the Departments of Environmental Protection to access the project site for the purpose of determining compliance with the general permit.

<b>Signature of Applicant:</b>	<b>Date:</b>
--------------------------------	--------------

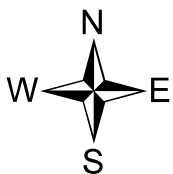
*Retain your records.* The permittee is required to retain copies of any forms, submissions, reports, or other materials required by this general permit for a period of at least three years from the completion of permanent stabilization.

OFFICE USE ONLY			Staff	Staff	
NOI #	FP	Date	Acc. Date	Def. Date	After Photos

## **ATTACHMENT B**

### **Figure A – Site Location**





**LOCATION MAP**  
**RSU #14 WINDHAM SCHOOL CAMPUS**  
**WINDHAM, MAINE**

SOURCE: MAINE OFFICE OF GIS - DRGCLIP LAYER

**DeLuca-Hoffman Associates, Inc.**  
**778 MAIN STREET, SUITE 8**  
**SOUTH PORTLAND, ME 04106**  
**207-775-1121**  
**[www.delucahoffman.com](http://www.delucahoffman.com)**

DRAWN: DED  
CHECKED: DDA  
DATE: JULY 2011  
FILENAME: 2146.19-AERIAL  
SCALE: 1 inch = 1,000 feet

**FIGURE**

**A**



**ATTACHMENT C**

**Strout Parcel Warranty Deed**

0003091

PK 17194 PG 241

### WARRANTY DEED

KNOW ALL MEN BY THESE PRESENTS, THAT GERTRUDE K. STROUT, of Windham, County of Cumberland, State of Maine, in consideration of one dollar and other valuable consideration paid by TOWN OF WINDHAM, a municipal corporation whose mailing address is 8 School Road, Windham, Maine 04062, the receipt whereof is hereby acknowledged, does hereby give, grant, bargain, sell and convey unto the said TOWN OF WINDHAM, its successors and assigns forever,

All my right, title and interest in and to a certain lot or parcel of land, together with the buildings thereon, situated in the Town of Windham, County of Cumberland and State of Maine, formerly being the homestead place of Lida J. Webb, on the southerly side of the road leading from Windham Center to Windham Hill, about ten acres of land, with the buildings thereon, bounded and described as follows:

Beginning at the northeast corner of land now or formerly owned by George B. Hanson; thence southwesterly on a line of said Hanson's land to land now or formerly owned by Willard Lamb; thence northwesterly on a line of said Lamb's land and land of Jason Knight to land formerly owned by Joshua Tukey; thence northeasterly along said Tukey's land to line of road above mentioned; thence southeasterly along line of said road to point of beginning.

Excepting and reserving to the seller herein a life estate in the existing residential structure and surrounding house lot of approximately 53,000 square feet described as follows: Beginning at a point on the southwesterly sideline of the Windham Center Road at the most northeasterly corner of abutting land of the Town of Windham's public library; thence southwesterly along the Town of Windham library land, 198.21 feet, more or less to a point; thence northwesterly parallel to the southwesterly sideline of said Windham Center Road, 241.48 feet to a point; thence northeasterly 196.96 feet to a point on the southwesterly sideline of said Windham Center Road located 270 feet, more or less, from the point of beginning; thence southeasterly by the southwesterly sideline of said Windham Center Road, 270 feet to said Windham Public Library lot and the point of beginning.

Being the same premises conveyed to Gertrude K. Strout by Cora E. Strout by deed dated October 22, 1947 and recorded in Cumberland County Registry of Deeds in Book 1904, Page 45. This conveyance is made pursuant to an Option to Purchase these premises dated September 29, 1982, recorded in Cumberland County Registry of Deeds in Book 5041, Page 168.

MAINE REAL ESTATE TAX PAID


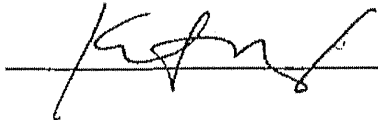
BK 17194 PG 242

TO HAVE AND TO HOLD, the aforegranted and bargained premises with all the privileges and appurtenances thereof to the said TOWN OF WINDHAM, its successors and assigns, to its and their use and behoof forever.

AND I do COVENANT with the said Grantee, its successors and assigns, that I am lawfully seized in fee of the premises, that they are free of all encumbrances, that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs and assigns shall and will warrant and defend the same to the said Grantee, its successors and assigns forever, against the lawful claims and demands of all persons.

IN WITNESS WHEREOF, the said Gertrude K. Strout has hereunto set her hand and seal this 11 day of the month of January, 2002.

SIGNED, SEALED and DELIVERED  
in presence of:

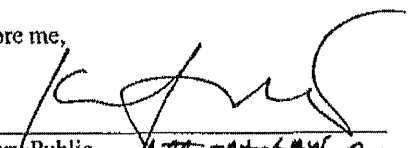
  
Gertrude K. Strout

STATE OF MAINE  
Cumberland, ss

Jan 11, 2002

Then personally appeared the above named Gertrude K. Strout and acknowledged the foregoing instrument to be her free act and deed.

Before me,

  
Notary Public

Print Name

Commission Expires

Affix Notarial Seal Here

RECEIVED  
RECORDED REGISTRY OF DEED:

2002 JAN 11 AM 11:34

CUMBERLAND COUNTY

John B O'Brien

## **ATTACHMENT D**

### **Geotechnical Data**

**Agricultural Testing** - The three composited topsoil samples, collected from the Strout property (designated AG-1), the existing T/S/F field (AG-2) and the Manchester School site (AG-3), were submitted to Maine Soil Testing Service at the University of Maine, Orono, Maine for testing. Each sample was tested for phosphorus, potassium, calcium, magnesium, soil pH and organic matter. The test results are presented in Appendix B.

## **SITE AND SUBSURFACE CONDITIONS**

### **Site Conditions**

**High School Site** - The site is made up of three parcels; the High School parcel, the Strout parcel and the Public Works parcel (see Figure 2).

- ☐ The High School parcel consists of an approximately 7.2-acre area currently occupied by the track/football/soccer field, an open grass-covered hillside and a wooded area. The ground surface in the existing track and field area is relatively level and ranges in elevation from approximately El. 244 to 245. The ground surface is grass covered except for the bituminous concrete track. The ground surface in the hillside area rises to the east from the track and field grade to approximately El. 260. The wooded area adjacent to the east and south of the hillside area ranges from about El. 245 to El. 260 and contains a drainage way (intermittent stream) that allows surface water to drain in a southwesterly direction across the site.
- ☐ The Strout parcel consists of an approximately 10.1-acre area currently occupied by grass-covered fields and a residence with attached barn and two detached storage buildings. The parcel is bisected by a southwesterly trending ridge with its crest ranging from approximately El. 275 at the north end of the parcel to El. 262 at the south end (adjacent to the High School parcel hillside area). The ground surface east of the ridge slopes downward to about El. 260 near the property boundary. West of the ridge the ground surface slopes downward to between El. 234 and El. 250 near the property boundary (Public Works parcel). The western and northwestern portions of the property are wooded and contain drainage ways that direct water into the Public Works parcel.
- ☐ The Public Works parcel consists of an approximately 8-acre wooded area. The ground surface within the parcel is irregular with a general downward slope to the west to a westward flowing stream that forms the northern and western boundaries of the parcel. Ground surface elevations within the parcel range from approximately El. 245 to El. 195. Bedrock is exposed in the stream bed. At the time of the field work (September 2001) the water in the stream was several inches deep. There is a drainage way that bisects the site and directs water in a westerly direction into the stream bed that forms the northerly boundary of the parcel. There are a series of walking trails that meander through the parcel.

**Manchester School site** – The site consists of an approximately 5.8-acre wooded area adjacent to the Manchester School fields (see Figure 3). The ground surface within the site is relatively flat, ranging from approximately El. 307 to El. 308. There are several paths throughout the area.

### **Subsurface Conditions**

The subsurface explorations conducted at the two sites encountered four principal naturally deposited soil units (Alluvial, Glacial-outwash, Glacial-marine and Glacial till) and bedrock beneath a layer of topsoil (fields) and/or forest debris (wooded areas). Areas adjacent to the northern limits of the existing athletic fields at the High School site are likely to contain accumulations of disturbed soil deposits (fill material) that were placed to facilitate site grading for construction of the fields; the fill will likely consist of naturally deposited soils similar to those encountered in the explorations. Not all of the soil units or bedrock were encountered in every exploration. The topsoil/forest debris, principal soil units and bedrock are generally described as follows:

**Topsoil/Forest Debris** – The topsoil encountered in the fields at the High School site and in the Manchester School site is a brown silty SAND with roots and organic matter. The encountered thickness ranged from approximately 6 to 12 in. The forest debris encountered in the wooded areas of the High School site consisted of wood, leaves and other organic matter and was generally 2 to 5 in. thick.

**Alluvial Deposits**– Brown to gray SILT and silty SAND. The unit was encountered beneath the topsoil layer in the hillside area of T/S/F (HSTP-1 through 5), SF-1 (HSTP-14 to 17), SF-2 (HSEP-10 and 11), and PWF-2 (HSTP-6 through 8). Test pit HSTP-8 penetrated to a depth of 14 ft. below ground surface and did not penetrate through the unit. The explorations in T/S/F and SF-1 typically encountered 1 to 5 ft. of the unit beneath the topsoil layer.

**Glacial-outwash** - Brown to red-brown SAND and GRAVEL. The unit was encountered beneath the alluvial deposits in the area of SF-2 (HSTP-13 and 15) and throughout the Manchester School site (MSTP-1 through 4).

**Glacial-marine** – Brown to gray sandy lean CLAY and SILT with sand. Test pit HSTP-12 encountered the unit at the northwestern corner of SP-2.

**Glacial Till** – Brown silty SAND with gravel and occasional cobbles and boulders to 18 in. in diameter. The unit was encountered near the ground surface within the limits of PWF-1 (HSTP-9) and at depth in PW-2 (HSTP-6). When the unit was penetrated, it was found to be located on surface of bedrock.

**Bedrock** – Bedrock cored in borings B-1 through B-5 consisted of a gray, soft to hard, slightly weathered schist. The rock encountered in HSTP-11 was very soft and weathered

and the backhoe was able to penetrate several feet below the rock surface. Bedrock was also reported in a number of the DeLuca-Hoffman power probes (see Table 1) and test pits HSTP-1, 2

Refer to the test pit and test boring logs in Appendix A of this report for specific conditions encountered in each exploration and Table I for a summary of the encountered conditions.

**Groundwater** - The only evidence to suggest the presence of groundwater was encountered in borings B-2 through B-6, test pit HSTP-1 and from seepage and wet areas near the stream in the Public Works parcel. The soils in the remaining explorations were described as being dry or moist and there was no evidence of seepage from the sides or bottoms of the test pits.

There was seepage of water from the sides and bottom of test pit HSTP-1 in the elevation range of El. 233 to 238. Water was noted in borings B-4 through B-6 at depths ranging from approximately 5 to 6 ft. below ground surface. These water level observations were made immediately upon completion of the test pits and borings and may not necessarily represent stabilized groundwater conditions.

Observation wells were installed in boring B-2 and B-3 and were monitored at the time of the well installations and approximately 5 days thereafter. The water level recorded in B-2 (OW) on 18 September 2001 was at a depth of 7.2 ft. below ground surface or approximately El. 238. The water level recorded in B-3 (OW) on 18 September was at a depth of 5.6 ft. below ground surface or approximately El. 240.5. It is anticipated that the water levels recorded in the two observation wells represents stabilized groundwater conditions at that time. It is noted that groundwater level fluctuations are expected seasonally due to precipitation, snow melt and other conditions. Groundwater levels in the two observation wells may vary by several feet from those noted on 18 September 2001.

Water was observed flowing in the stream bed that forms the northern boundary of the Public Works parcel. The bottom of the stream bed ranges in elevation from approximately El. 220 at its eastern end to El. 185 at the western end of the parcel.

## **GEOTECHNICAL ENGINEERING RECOMMENDATIONS AND COMMENTS**

### **General**

The components of the proposed athletic field expansion project are shown on Figures 2 and 3. Site development will involve cuts and fills to create the athletic fields, the establishment of turf for the playing surfaces, bituminous concrete pavement structures for the access roads, walkways, parking areas and track, foundations for the bleachers and light poles and the construction of storm water detention basins. Our geotechnical comments and recommendations for these site development considerations follow.

## TEST PIT LOG

Test Pit No. HSTP-17

Project Proposed Athletic Field Expansion  
 Location Windham, Maine  
 Client Windham School Department  
 Contractor W. H. Lavigne, Inc.  
 Equipment Used Track-mounted Backhoe Linkbelt 2700

File No. 28062-000  
 Date 6 September 2001  
 Weather Clear, 70 degrees  
 H&A Rep J. Weaver

Ground El.: 269 ft Location: See Plan Groundwater depths/entry rates (in./min.): None  
 El. Datum: NGVD

Depth (ft)	Sample ID	Stratum Change Depth (ft)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel						Sand				Field Test			
					% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength				
0		0.6	SM	Grass and brown silty SAND, 20 % roots, organic odor, dry -TOPSOIL-														
2			ML	Light-brown SILT with sand, mps = 2 mm, no odor, moist -ALLUVIAL DEPOSIT-				5	45	50								
4		4.5		Bottom of Exploration @ 4.5 ft.														

Obstructions: None

Remarks: None

## Field Tests

Dilatancy R - Rapid S - Slow N - None  
 Toughness L - Low M - Medium H - High  
 Plasticity N - Nonplastic L - Low M - Medium H - High  
 Dry Strength N - None L - Low M - Medium H - High V - Very High

## Standing Water in Completed Pit

at depth Dry ft  
 measured after -- hours elapsed

## Boulders

Diameter (in.) Number Approx. Vol. (cu.ft)  
 12" to 24" -- = --  
 over 24" -- = --

## Test Pit Dimensions (ft)

Pit Depth 4.5  
 Pit Length x Width 4 x 6

NOTE: Soil Identification based on visual-manual methods of the USCS system as practiced by Haley &amp; Aldrich, Inc.



**ATTACHMENT E**

**BMP Inspection and Maintenance Log**

# Stormwater BMP Inspection and Maintenance Log

Facility Name	
Address	
Begin Date	End Date

[illegible]

**Instructions:** Record all inspections and maintenance for all treatment BMPs on this form. Use additional log sheets and/ or attach extended comments or documentation as necessary. Submit a copy of the completed log with the annual independent inspectors' report to the municipality, and start a new log at that time.

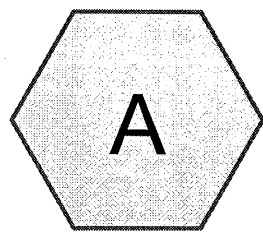
- **BMP ID#** — Always use ID# from the Operation and Maintenance Manual.
- **Inspected by** — Note all inspections and maintenance on this form, including the required independent annual inspection.
- **Cause for inspection** — Note if the inspection is routine, pre-rainy-season, post-storm, annual, or in response to a noted problem or complaint.
- **Exceptions noted** — Note any condition that requires correction or indicates a need for maintenance.
- **Comments and actions taken** — Describe any maintenance done and need for follow-up.

**ATTACHMENT F**

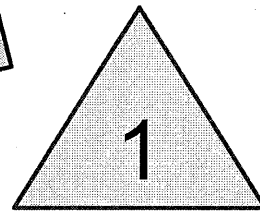
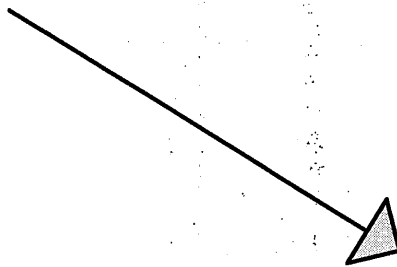
**HydroCAD Software Calculations**



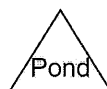
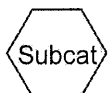
## **Predevelopment**



PRE



POI #1 (PRE)



**Drainage Diagram for Pre Development**

Prepared by Deluca-Hoffman Associates, Inc., Printed 8/10/2011  
HydroCAD® 8.50 s/n 000734 © 2007 HydroCAD Software Solutions LLC

## Pre Development

Prepared by Deluca-Hoffman Associates, Inc.

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Page 2

### Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.768	61	>75% Grass cover, Good, HSG B (A)
0.934	74	>75% Grass cover, Good, HSG C (A)
0.057	98	Driveway (A)
0.039	98	Rooftop (A)
<b>1.798</b>		<b>TOTAL AREA</b>

## Pre Development

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Page 3

### Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.768	HSG B	A
0.934	HSG C	A
0.000	HSG D	
0.097	Other	A
<b>1.798</b>		<b>TOTAL AREA</b>

## Pre Development

Type II 24-hr 2 year Rainfall=3.00"

Prepared by Deluca-Hoffman Associates, Inc.

Printed 8/10/2011

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Page 4

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

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

### Subcatchment A: PRE

Runoff Area=78,313 sf 5.37% Impervious Runoff Depth>0.63"  
Flow Length=349' Tc=17.1 min CN=70 Runoff=1.37 cfs 0.094 af

### Pond 1: POI #1 (PRE)

Inflow=1.37 cfs 0.094 af  
Primary=1.37 cfs 0.094 af

Total Runoff Area = 1.798 ac Runoff Volume = 0.094 af Average Runoff Depth = 0.63"  
94.63% Pervious = 1.701 ac 5.37% Impervious = 0.097 ac



**Pre Development**

Prepared by Deluca-Hoffman Associates, Inc.

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Type II 24-hr 2 year Rainfall=3.00"

Printed 8/10/2011

Page 5

**Summary for Subcatchment A: PRE**

Runoff = 1.37 cfs @ 12.12 hrs, Volume= 0.094 af, Depth&gt; 0.63"

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

Area (sf)	CN	Description
33,443	61	>75% Grass cover, Good, HSG B
40,664	74	>75% Grass cover, Good, HSG C
* 2,492	98	Driveway
* 1,714	98	Rooftop
78,313	70	Weighted Average
74,107		Pervious Area
4,206		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	150	0.0160	0.16		<b>Sheet Flow, AB</b> Grass: Short n= 0.150 P2= 3.00"
0.5	24	0.0160	0.89		<b>Shallow Concentrated Flow, BC</b> Short Grass Pasture Kv= 7.0 fps
0.1	15	0.2000	3.13		<b>Shallow Concentrated Flow, CD</b> Short Grass Pasture Kv= 7.0 fps
1.2	160	0.0219	2.22		<b>Shallow Concentrated Flow, DE</b> Grassed Waterway Kv= 15.0 fps
17.1	349	Total			

## Pre Development

Prepared by Deluca-Hoffman Associates, Inc.

HydroCAD® 8.50 s/n 000734 © 2007 HydroCAD Software Solutions LLC

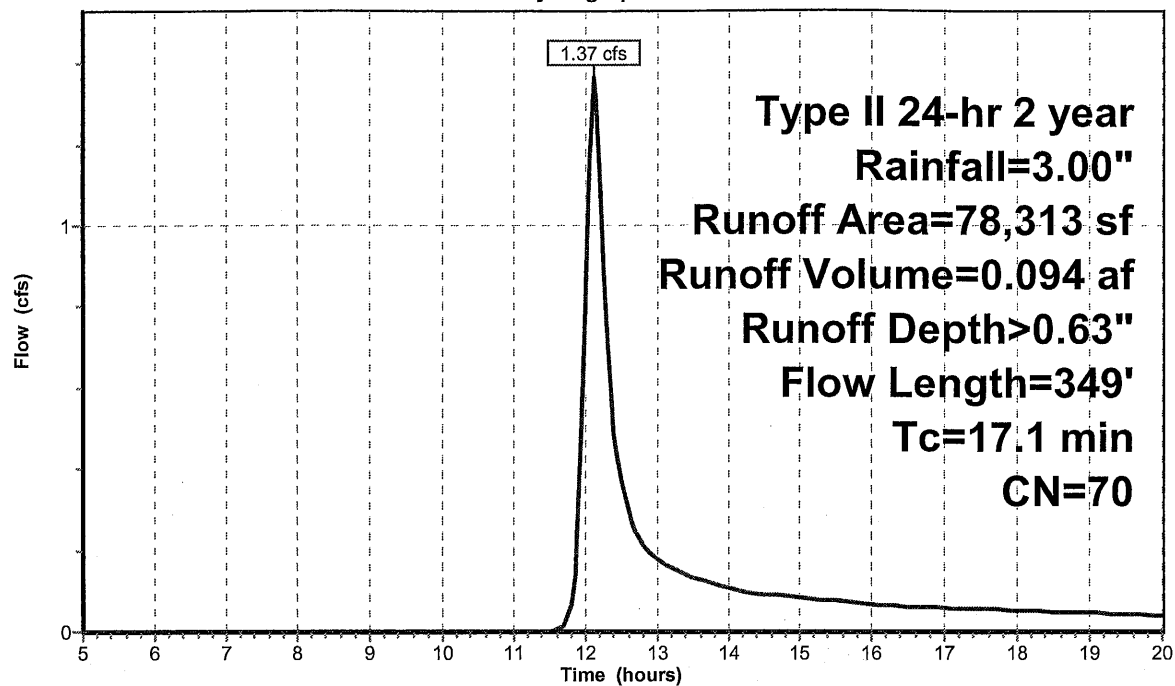
Type II 24-hr 2 year Rainfall=3.00"

Printed 8/10/2011

Page 6

### Subcatchment A: PRE

Hydrograph



## Pre Development

Prepared by Deluca-Hoffman Associates, Inc.

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Type II 24-hr 2 year Rainfall=3.00"

Printed 8/10/2011

Page 7

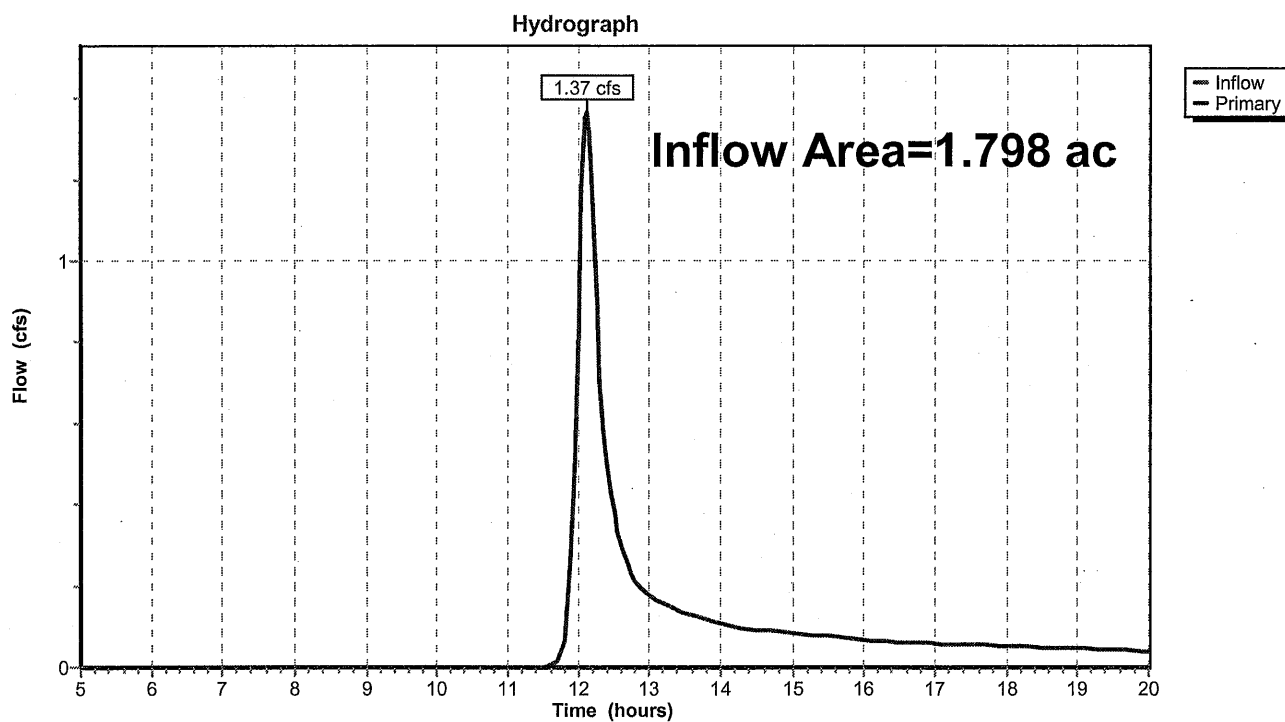
### Summary for Pond 1: POI #1 (PRE)

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

Inflow Area = 1.798 ac, 5.37% Impervious, Inflow Depth > 0.63" for 2 year event  
Inflow = 1.37 cfs @ 12.12 hrs, Volume= 0.094 af  
Primary = 1.37 cfs @ 12.12 hrs, Volume= 0.094 af, Atten= 0%, Lag= 0.0 min

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

### Pond 1: POI #1 (PRE)



## Pre Development

Prepared by Deluca-Hoffman Associates, Inc.

HydroCAD® 8.50 s/n 000734 © 2007 HydroCAD Software Solutions LLC

Type II 24-hr 10 year Rainfall=4.70"

Printed 8/10/2011

Page 8

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

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

### Subcatchment A: PRE

Runoff Area=78,313 sf 5.37% Impervious Runoff Depth>1.65"  
Flow Length=349' Tc=17.1 min CN=70 Runoff=3.86 cfs 0.246 af

### Pond 1: POI #1 (PRE)

Inflow=3.86 cfs 0.246 af  
Primary=3.86 cfs 0.246 af

**Total Runoff Area = 1.798 ac Runoff Volume = 0.246 af Average Runoff Depth = 1.65"**  
**94.63% Pervious = 1.701 ac 5.37% Impervious = 0.097 ac**

**Pre Development**

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Type II 24-hr 10 year Rainfall=4.70"

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**Summary for Subcatchment A: PRE**

Runoff = 3.86 cfs @ 12.10 hrs, Volume= 0.246 af, Depth&gt; 1.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type II 24-hr 10 year Rainfall=4.70"

Area (sf)	CN	Description
33,443	61	>75% Grass cover, Good, HSG B
40,664	74	>75% Grass cover, Good, HSG C
* 2,492	98	Driveway
* 1,714	98	Rooftop
78,313	70	Weighted Average
74,107		Pervious Area
4,206		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	150	0.0160	0.16		<b>Sheet Flow, AB</b> Grass: Short n= 0.150 P2= 3.00"
0.5	24	0.0160	0.89		<b>Shallow Concentrated Flow, BC</b> Short Grass Pasture Kv= 7.0 fps
0.1	15	0.2000	3.13		<b>Shallow Concentrated Flow, CD</b> Short Grass Pasture Kv= 7.0 fps
1.2	160	0.0219	2.22		<b>Shallow Concentrated Flow, DE</b> Grassed Waterway Kv= 15.0 fps
17.1	349	Total			

**Pre Development**

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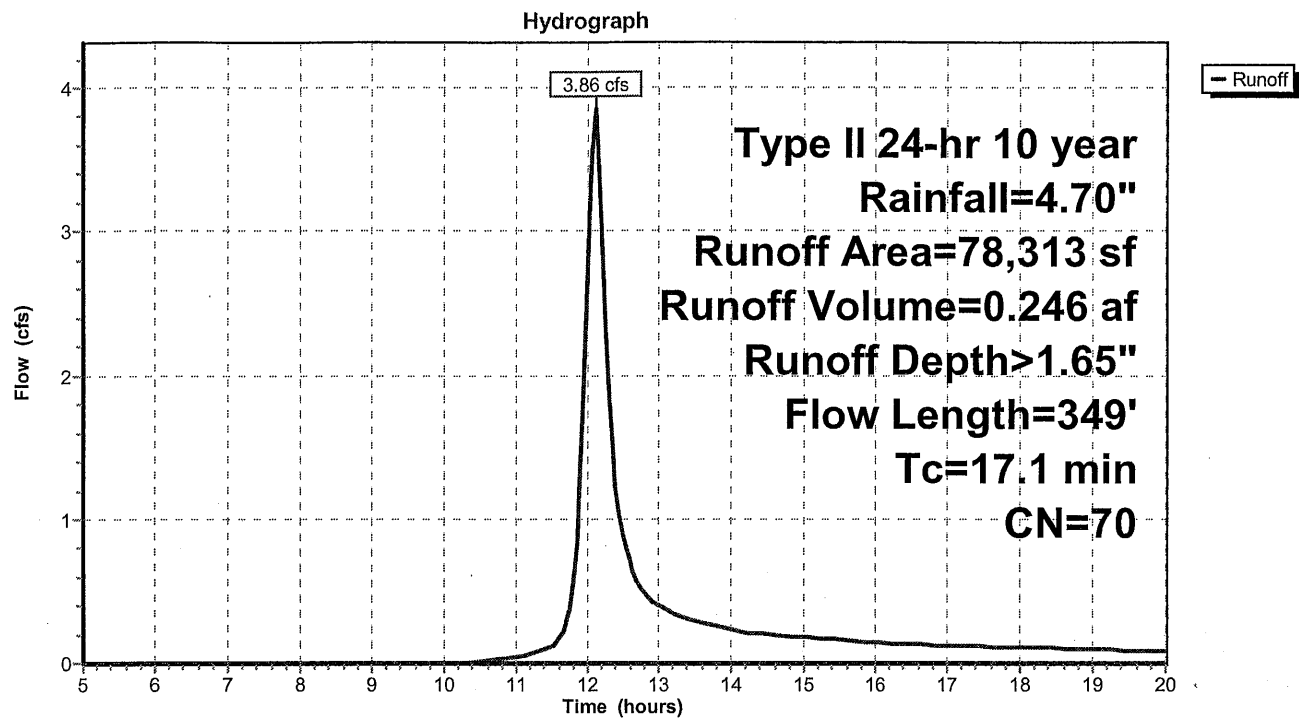
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Type II 24-hr 10 year Rainfall=4.70"

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**Subcatchment A: PRE**



## Pre Development

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Type II 24-hr 10 year Rainfall=4.70"

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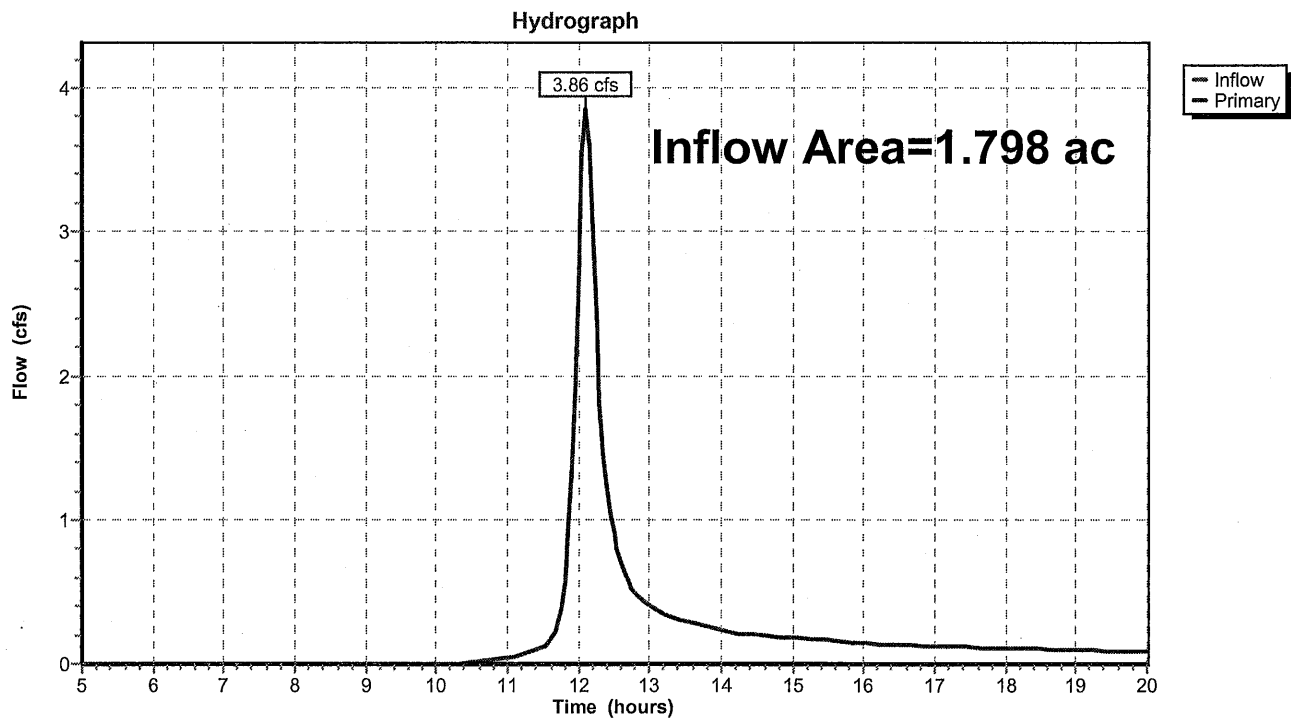
### Summary for Pond 1: POI #1 (PRE)

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

Inflow Area = 1.798 ac, 5.37% Impervious, Inflow Depth > 1.65" for 10 year event  
Inflow = 3.86 cfs @ 12.10 hrs, Volume= 0.246 af  
Primary = 3.86 cfs @ 12.10 hrs, Volume= 0.246 af, Atten= 0%, Lag= 0.0 min

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

### Pond 1: POI #1 (PRE)



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Type II 24-hr 25 year Rainfall=5.50"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

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

### Subcatchment A: PRE

Runoff Area=78,313 sf 5.37% Impervious Runoff Depth>2.20"  
Flow Length=349' Tc=17.1 min CN=70 Runoff=5.19 cfs 0.330 af

### Pond 1: POI #1 (PRE)

Inflow=5.19 cfs 0.330 af  
Primary=5.19 cfs 0.330 af

**Total Runoff Area = 1.798 ac Runoff Volume = 0.330 af Average Runoff Depth = 2.20"**  
**94.63% Pervious = 1.701 ac 5.37% Impervious = 0.097 ac**



**Pre Development**

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Type II 24-hr 25 year Rainfall=5.50"

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**Summary for Subcatchment A: PRE**

Runoff = 5.19 cfs @ 12.10 hrs, Volume= 0.330 af, Depth&gt; 2.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 year Rainfall=5.50"

Area (sf)	CN	Description
33,443	61	>75% Grass cover, Good, HSG B
40,664	74	>75% Grass cover, Good, HSG C
* 2,492	98	Driveway
* 1,714	98	Rooftop
78,313	70	Weighted Average
74,107		Pervious Area
4,206		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	150	0.0160	0.16		<b>Sheet Flow, AB</b> Grass: Short n= 0.150 P2= 3.00"
0.5	24	0.0160	0.89		<b>Shallow Concentrated Flow, BC</b> Short Grass Pasture Kv= 7.0 fps
0.1	15	0.2000	3.13		<b>Shallow Concentrated Flow, CD</b> Short Grass Pasture Kv= 7.0 fps
1.2	160	0.0219	2.22		<b>Shallow Concentrated Flow, DE</b> Grassed Waterway Kv= 15.0 fps
17.1	349	Total			

**Pre Development**

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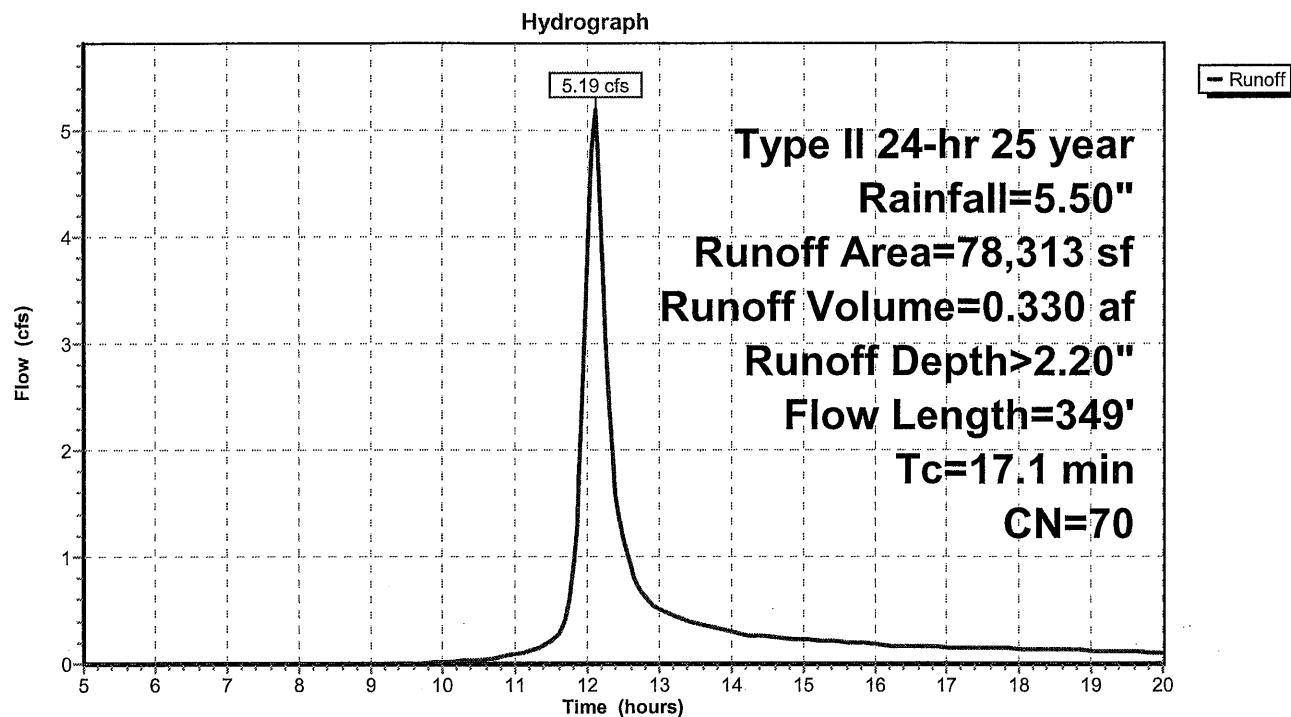
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**Subcatchment A: PRE**



## Pre Development

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Type II 24-hr 25 year Rainfall=5.50"

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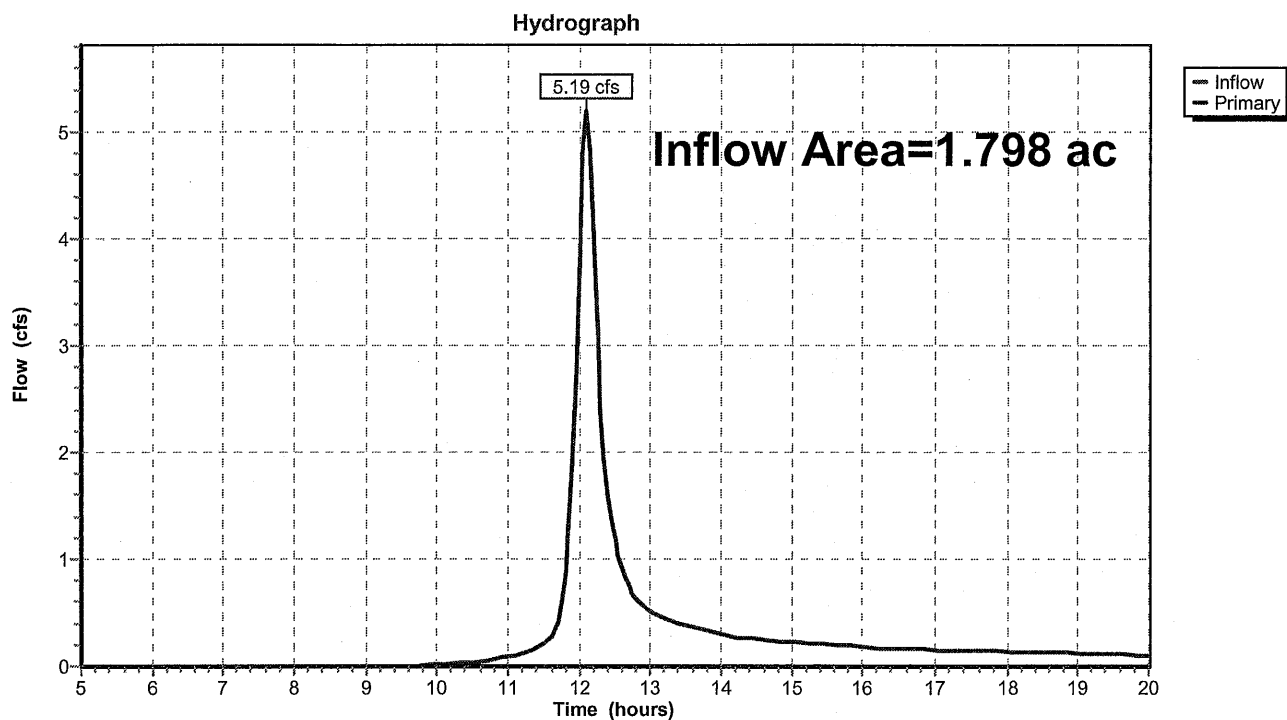
### Summary for Pond 1: POI #1 (PRE)

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

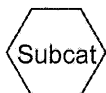
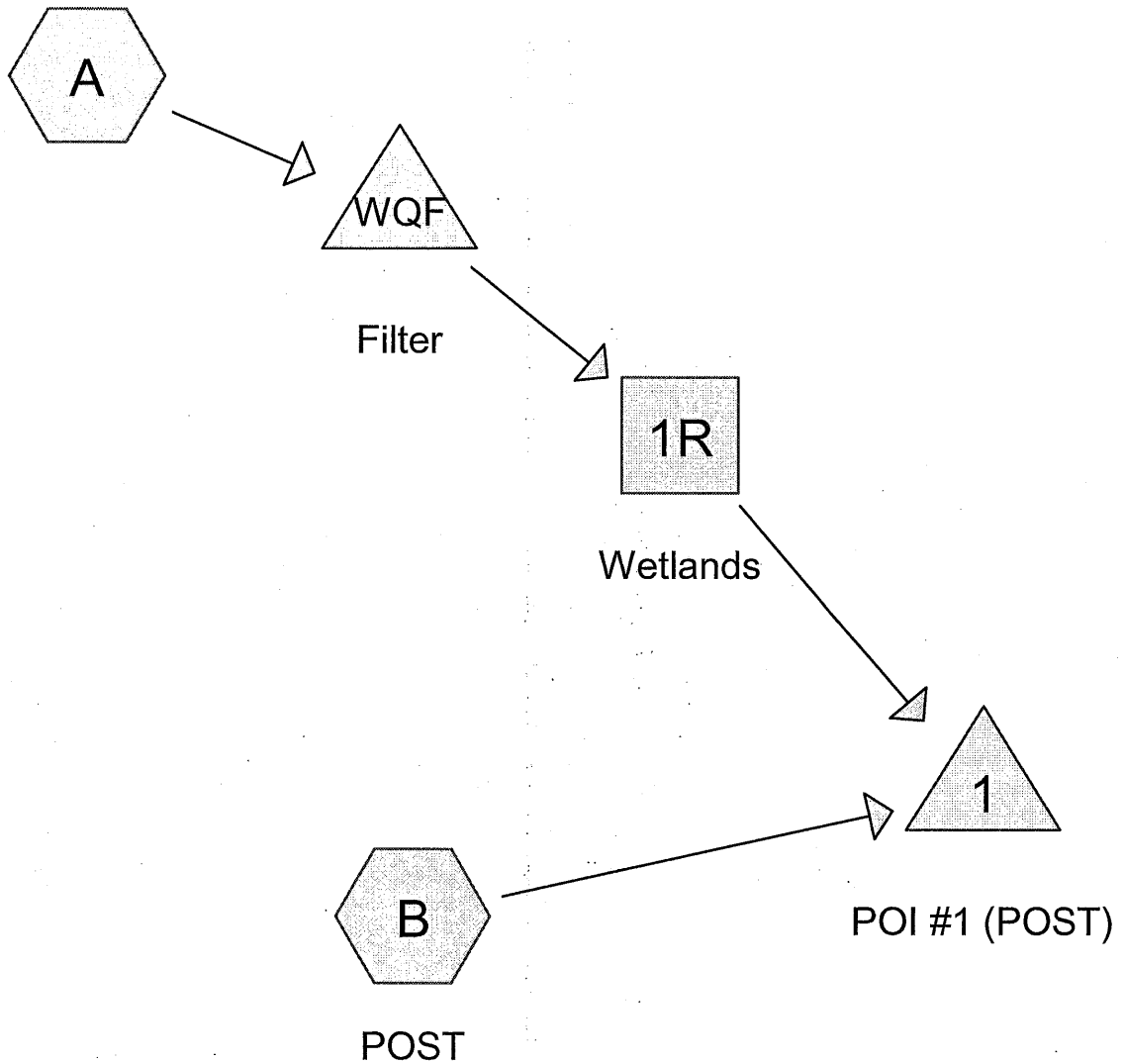
Inflow Area = 1.798 ac, 5.37% Impervious, Inflow Depth > 2.20" for 25 year event  
Inflow = 5.19 cfs @ 12.10 hrs, Volume= 0.330 af  
Primary = 5.19 cfs @ 12.10 hrs, Volume= 0.330 af, Atten= 0%, Lag= 0.0 min

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

### Pond 1: POI #1 (PRE)



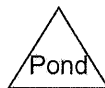
## **Post Development**



Subcat



Reach



Pond



Link

**Drainage Diagram for Post Development**

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### Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.773	61	>75% Grass cover, Good, HSG B (B)
0.848	74	>75% Grass cover, Good, HSG C (A,B)
0.421	89	Gravel roads, HSG C (A)
<b>2.042</b>		<b>TOTAL AREA</b>

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### Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.773	HSG B	B
1.269	HSG C	A, B
0.000	HSG D	
0.000	Other	
<b>2.042</b>		<b>TOTAL AREA</b>

**Post Development**

Type II 24-hr 2 year Rainfall=3.00"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

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

**Subcatchment A:**Runoff Area=36,642 sf 0.00% Impervious Runoff Depth>1.27"  
Flow Length=330' Tc=3.6 min CN=82 Runoff=2.22 cfs 0.089 af**Subcatchment B: POST**Runoff Area=52,311 sf 0.00% Impervious Runoff Depth>0.47"  
Flow Length=349' Tc=17.1 min CN=66 Runoff=0.62 cfs 0.047 af**Reach 1R: Wetlands**Avg. Depth=0.01' Max Vel=0.21 fps Inflow=0.07 cfs 0.007 af  
n=0.080 L=240.0' S=0.0146 '/ Capacity=446.12 cfs Outflow=0.03 cfs 0.007 af**Pond 1: POI #1 (POST)**Inflow=0.62 cfs 0.054 af  
Primary=0.62 cfs 0.054 af**Pond WQF: Filter**Peak Elev=271.25' Storage=3,550 cf Inflow=2.22 cfs 0.089 af  
Outflow=0.07 cfs 0.007 af**Total Runoff Area = 2.042 ac Runoff Volume = 0.136 af Average Runoff Depth = 0.80"**  
**100.00% Pervious = 2.042 ac 0.00% Impervious = 0.000 ac**



## Post Development

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Type II 24-hr 2 year Rainfall=3.00"

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### Summary for Subcatchment A:

[49] Hint:  $T_c < 2dt$  may require smaller  $dt$

Runoff = 2.22 cfs @ 11.94 hrs, Volume= 0.089 af, Depth> 1.27"

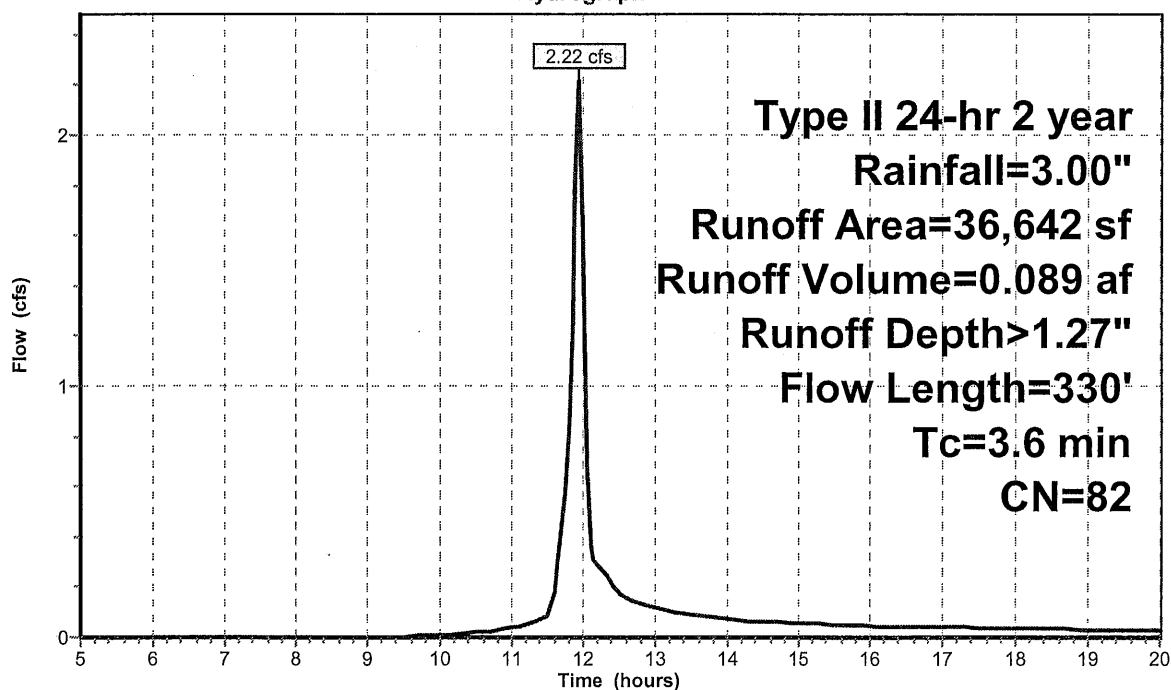
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs,  $dt=0.05$  hrs  
Type II 24-hr 2 year Rainfall=3.00"

Area (sf)	CN	Description
18,360	89	Gravel roads, HSG C
18,282	74	>75% Grass cover, Good, HSG C
36,642	82	Weighted Average
36,642		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	65	0.0500	1.76		Sheet Flow, AB Smooth surfaces $n=0.011$ $P2=3.00"$
0.8	65	0.0230	1.29		Sheet Flow, BC Smooth surfaces $n=0.011$ $P2=3.00"$
2.2	200	0.0100	1.50		Shallow Concentrated Flow, CD Grassed Waterway $K_v=15.0$ fps
3.6	330	Total			

### Subcatchment A:

Hydrograph



## Post Development

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Type II 24-hr 2 year Rainfall=3.00"

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### Summary for Subcatchment B: POST

Runoff = 0.62 cfs @ 12.13 hrs, Volume= 0.047 af, Depth> 0.47"

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

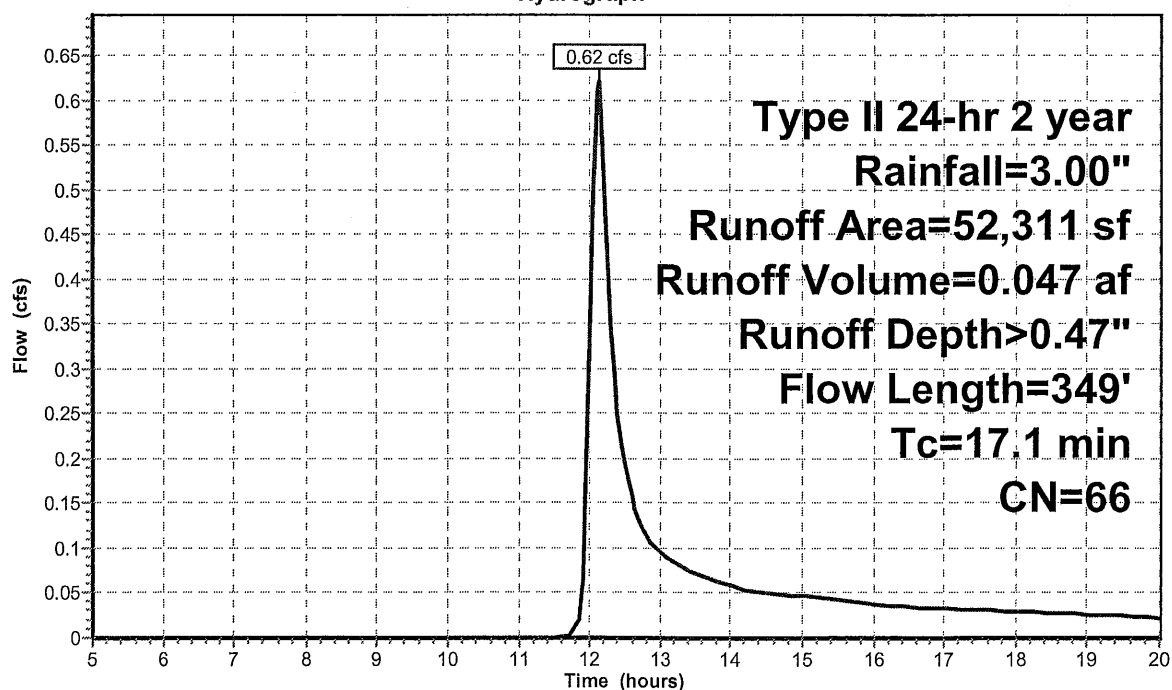
Area (sf)	CN	Description
33,672	61	>75% Grass cover, Good, HSG B
18,639	74	>75% Grass cover, Good, HSG C
52,311	66	Weighted Average
52,311		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	150	0.0160	0.16		<b>Sheet Flow, AB</b> Grass: Short n= 0.150 P2= 3.00"
0.5	24	0.0160	0.89		<b>Shallow Concentrated Flow, BC</b> Short Grass Pasture Kv= 7.0 fps
0.1	15	0.2000	3.13		<b>Shallow Concentrated Flow, CD</b> Short Grass Pasture Kv= 7.0 fps
1.2	160	0.0219	2.22		<b>Shallow Concentrated Flow, DE</b> Grassed Waterway Kv= 15.0 fps
17.1	349	Total			

### Subcatchment B: POST

Hydrograph



## Post Development

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Type II 24-hr 2 year Rainfall=3.00"

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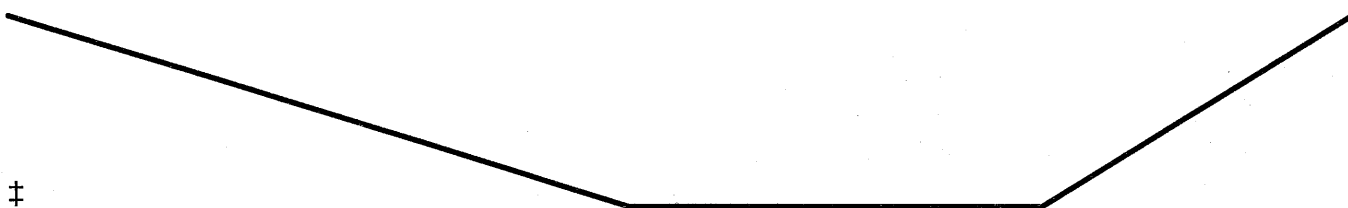
### Summary for Reach 1R: Wetlands

Inflow Area = 0.841 ac, 0.00% Impervious, Inflow Depth > 0.10" for 2 year event  
Inflow = 0.07 cfs @ 17.35 hrs, Volume= 0.007 af  
Outflow = 0.03 cfs @ 18.34 hrs, Volume= 0.007 af, Atten= 52%, Lag= 59.2 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Max. Velocity= 0.21 fps, Min. Travel Time= 18.6 min  
Avg. Velocity= 0.21 fps, Avg. Travel Time= 18.6 min

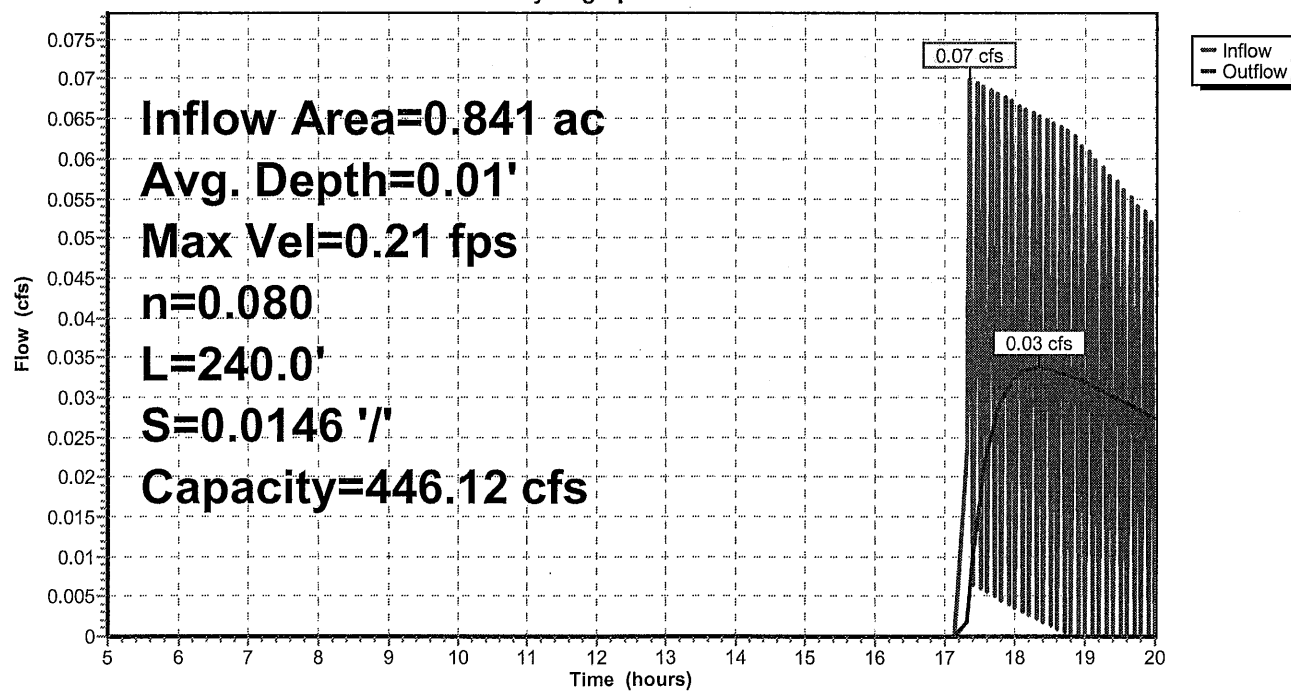
Peak Storage= 38 cf @ 18.34 hrs, Average Depth at Peak Storage= 0.01'  
Bank-Full Depth= 3.00', Capacity at Bank-Full= 446.12 cfs

20.00' x 3.00' deep channel, n= 0.080 Earth, long dense weeds  
Side Slope Z-value= 10.0 5.0 '/' Top Width= 65.00'  
Length= 240.0' Slope= 0.0146 '/'  
Inlet Invert= 265.00', Outlet Invert= 261.50'



### Reach 1R: Wetlands

Hydrograph



## Post Development

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Type II 24-hr 2 year Rainfall=3.00"

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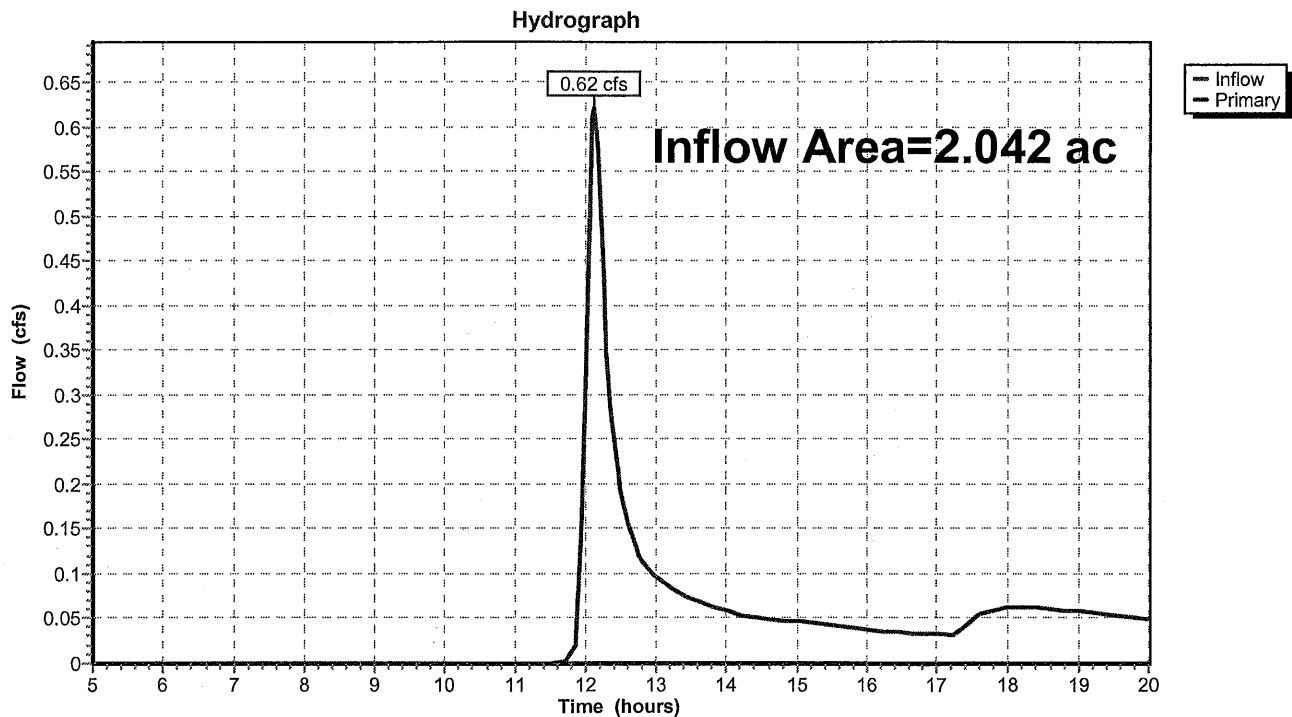
### Summary for Pond 1: POI #1 (POST)

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

Inflow Area = 2.042 ac, 0.00% Impervious, Inflow Depth > 0.32" for 2 year event  
Inflow = 0.62 cfs @ 12.13 hrs, Volume= 0.054 af  
Primary = 0.62 cfs @ 12.13 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min

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

### Pond 1: POI #1 (POST)



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Type II 24-hr 2 year Rainfall=3.00"

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**Summary for Pond WQF: Filter**

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.841 ac, 0.00% Impervious, Inflow Depth > 1.27" for 2 year event  
 Inflow = 2.22 cfs @ 11.94 hrs, Volume= 0.089 af  
 Outflow = 0.07 cfs @ 17.35 hrs, Volume= 0.007 af, Atten= 97%, Lag= 324.4 min  
 Primary = 0.07 cfs @ 17.35 hrs, Volume= 0.007 af

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

Peak Elev= 271.25' @ 17.35 hrs Surf.Area= 0 sf Storage= 3,550 cf

Plug-Flow detention time= 439.8 min calculated for 0.007 af (8% of inflow)

Center-of-Mass det. time= 323.4 min ( 1,113.9 - 790.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	269.50'	3,550 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) -Impervious

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
269.50	1,315	0	0
270.00	1,845	790	790
271.00	2,400	2,123	2,913
271.25	2,700	638	3,550

Device	Routing	Invert	Outlet Devices
#1	Primary	271.25'	<b>145.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

**Primary OutFlow** Max=0.07 cfs @ 17.35 hrs HW=271.25' TW=265.00' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 0.07 cfs @ 0.15 fps)

# Post Development

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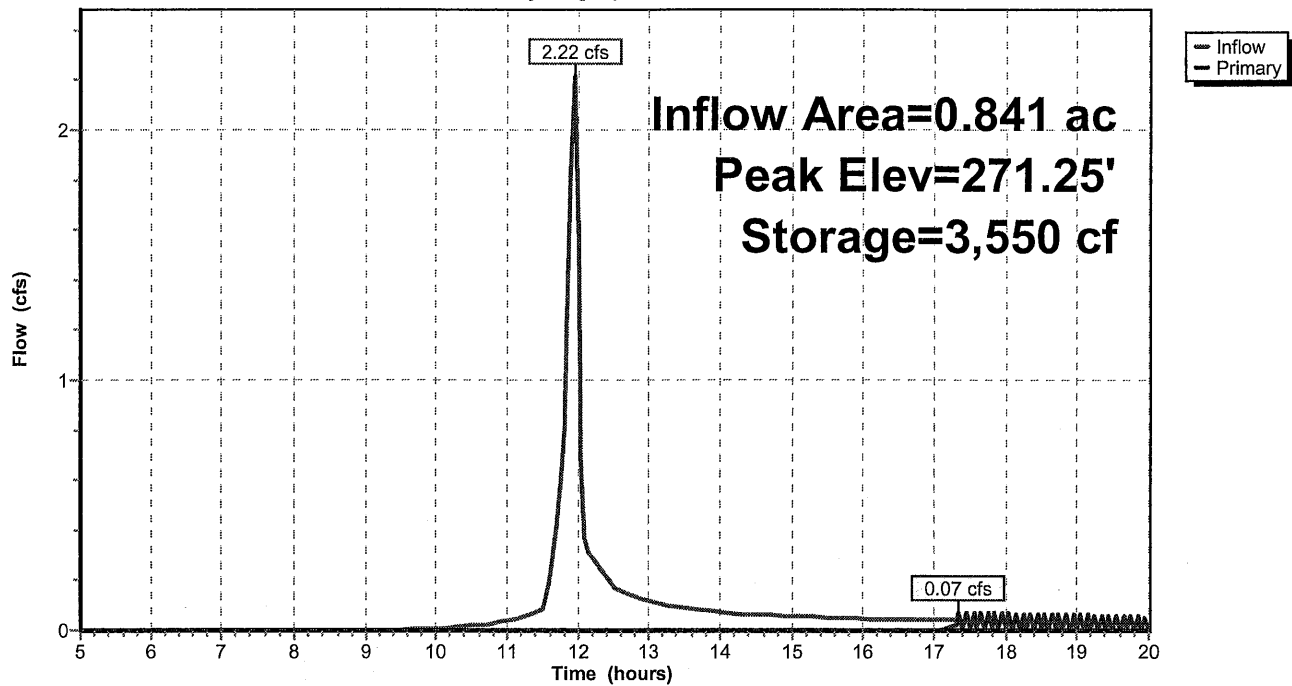
Type II 24-hr 2 year Rainfall=3.00"

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## Pond WQF: Filter

### Hydrograph



## Post Development

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Type II 24-hr 10 year Rainfall=4.70"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

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

### Subcatchment A:

Runoff Area=36,642 sf 0.00% Impervious Runoff Depth>2.61"  
Flow Length=330' Tc=3.6 min CN=82 Runoff=4.42 cfs 0.183 af

### Subcatchment B: POST

Runoff Area=52,311 sf 0.00% Impervious Runoff Depth>1.37"  
Flow Length=349' Tc=17.1 min CN=66 Runoff=2.11 cfs 0.137 af

### Reach 1R: Wetlands

Avg. Depth=0.13' Max Vel=0.56 fps Inflow=5.09 cfs 0.102 af  
n=0.080 L=240.0' S=0.0146 '/ Capacity=446.12 cfs Outflow=1.55 cfs 0.100 af

### Pond 1: POI #1 (POST)

Inflow=3.52 cfs 0.237 af  
Primary=3.52 cfs 0.237 af

### Pond WQF: Filter

Peak Elev=271.31' Storage=3,550 cf Inflow=4.42 cfs 0.183 af  
Outflow=5.09 cfs 0.102 af

**Total Runoff Area = 2.042 ac Runoff Volume = 0.320 af Average Runoff Depth = 1.88"**  
**100.00% Pervious = 2.042 ac 0.00% Impervious = 0.000 ac**

## Post Development

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Type II 24-hr 10 year Rainfall=4.70"

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### Summary for Subcatchment A:

[49] Hint:  $T_c < 2dt$  may require smaller  $dt$

Runoff = 4.42 cfs @ 11.94 hrs, Volume= 0.183 af, Depth> 2.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs,  $dt=0.05$  hrs  
Type II 24-hr 10 year Rainfall=4.70"

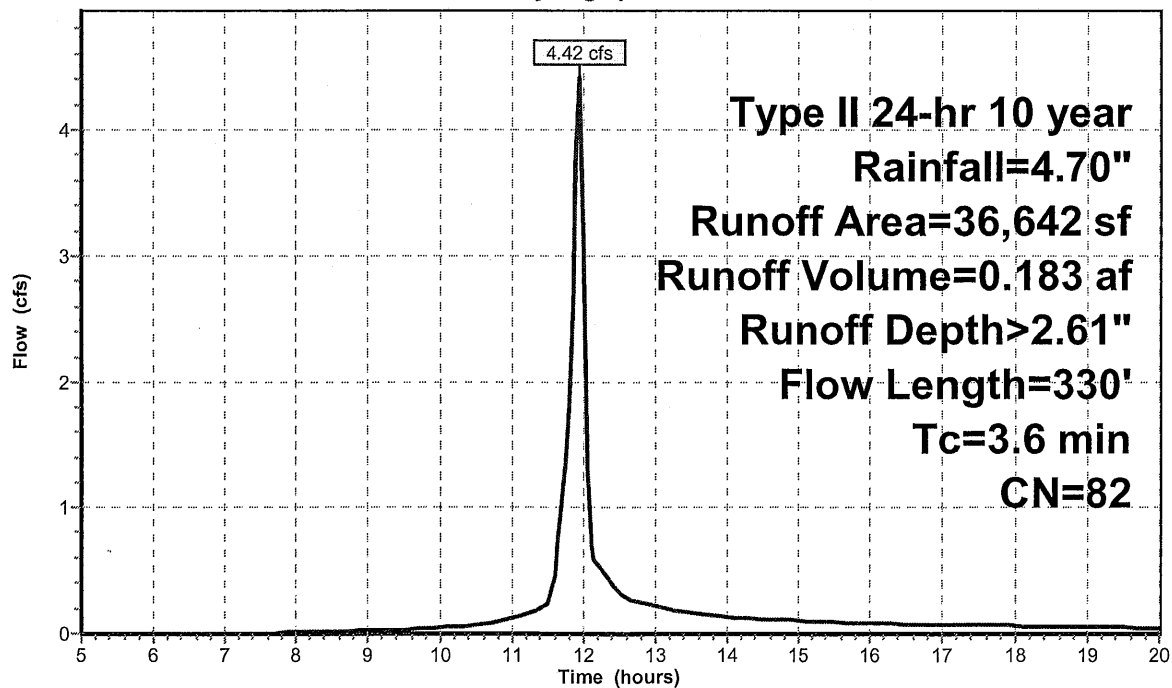
Area (sf)	CN	Description
18,360	89	Gravel roads, HSG C
18,282	74	>75% Grass cover, Good, HSG C
36,642	82	Weighted Average
36,642		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	65	0.0500	1.76		Sheet Flow, AB Smooth surfaces $n=0.011$ $P2=3.00"$
0.8	65	0.0230	1.29		Sheet Flow, BC Smooth surfaces $n=0.011$ $P2=3.00"$
2.2	200	0.0100	1.50		Shallow Concentrated Flow, CD Grassed Waterway $K_v=15.0$ fps
3.6	330	Total			

### Subcatchment A:

Hydrograph





**Post Development**

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Type II 24-hr 10 year Rainfall=4.70"

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**Summary for Subcatchment B: POST**

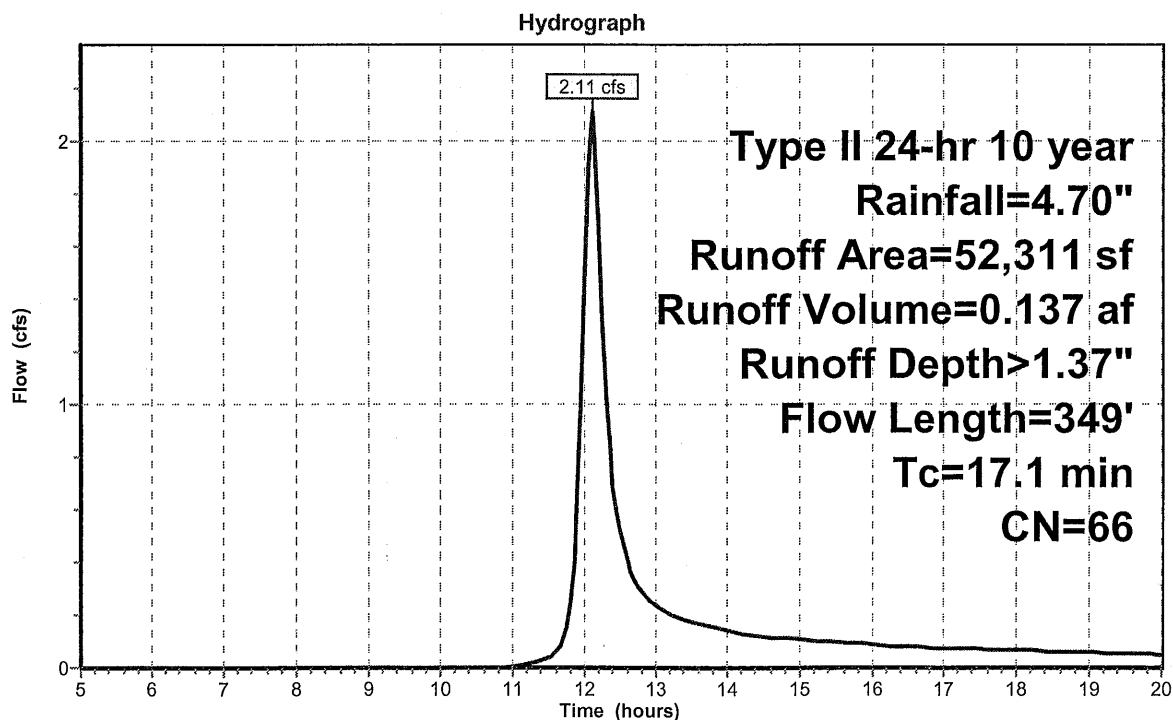
Runoff = 2.11 cfs @ 12.11 hrs, Volume= 0.137 af, Depth&gt; 1.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10 year Rainfall=4.70"

Area (sf)	CN	Description
33,672	61	>75% Grass cover, Good, HSG B
18,639	74	>75% Grass cover, Good, HSG C
52,311	66	Weighted Average
52,311		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	150	0.0160	0.16		<b>Sheet Flow, AB</b> Grass: Short n= 0.150 P2= 3.00"
0.5	24	0.0160	0.89		<b>Shallow Concentrated Flow, BC</b> Short Grass Pasture Kv= 7.0 fps
0.1	15	0.2000	3.13		<b>Shallow Concentrated Flow, CD</b> Short Grass Pasture Kv= 7.0 fps
1.2	160	0.0219	2.22		<b>Shallow Concentrated Flow, DE</b> Grassed Waterway Kv= 15.0 fps
17.1	349	Total			

**Subcatchment B: POST**

## Post Development

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Type II 24-hr 10 year Rainfall=4.70"

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### Summary for Reach 1R: Wetlands

Inflow Area = 0.841 ac, 0.00% Impervious, Inflow Depth > 1.45" for 10 year event  
Inflow = 5.09 cfs @ 12.00 hrs, Volume= 0.102 af  
Outflow = 1.55 cfs @ 12.06 hrs, Volume= 0.100 af, Atten= 70%, Lag= 3.5 min

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

Max. Velocity= 0.56 fps, Min. Travel Time= 7.1 min

Avg. Velocity= 0.24 fps, Avg. Travel Time= 16.8 min

Peak Storage= 661 cf @ 12.06 hrs, Average Depth at Peak Storage= 0.13'

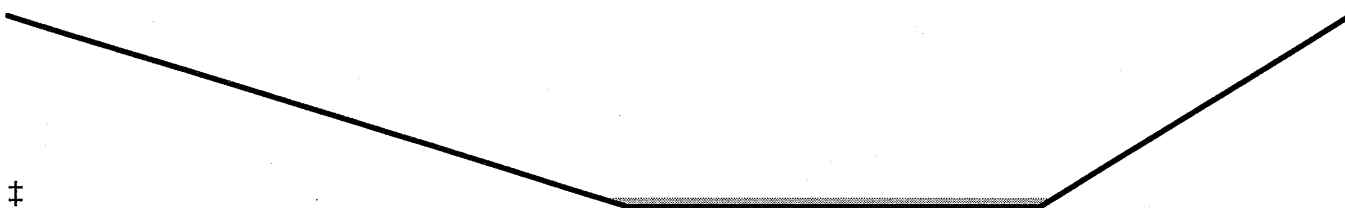
Bank-Full Depth= 3.00', Capacity at Bank-Full= 446.12 cfs

20.00' x 3.00' deep channel, n= 0.080 Earth, long dense weeds

Side Slope Z-value= 10.0 5.0 '/' Top Width= 65.00'

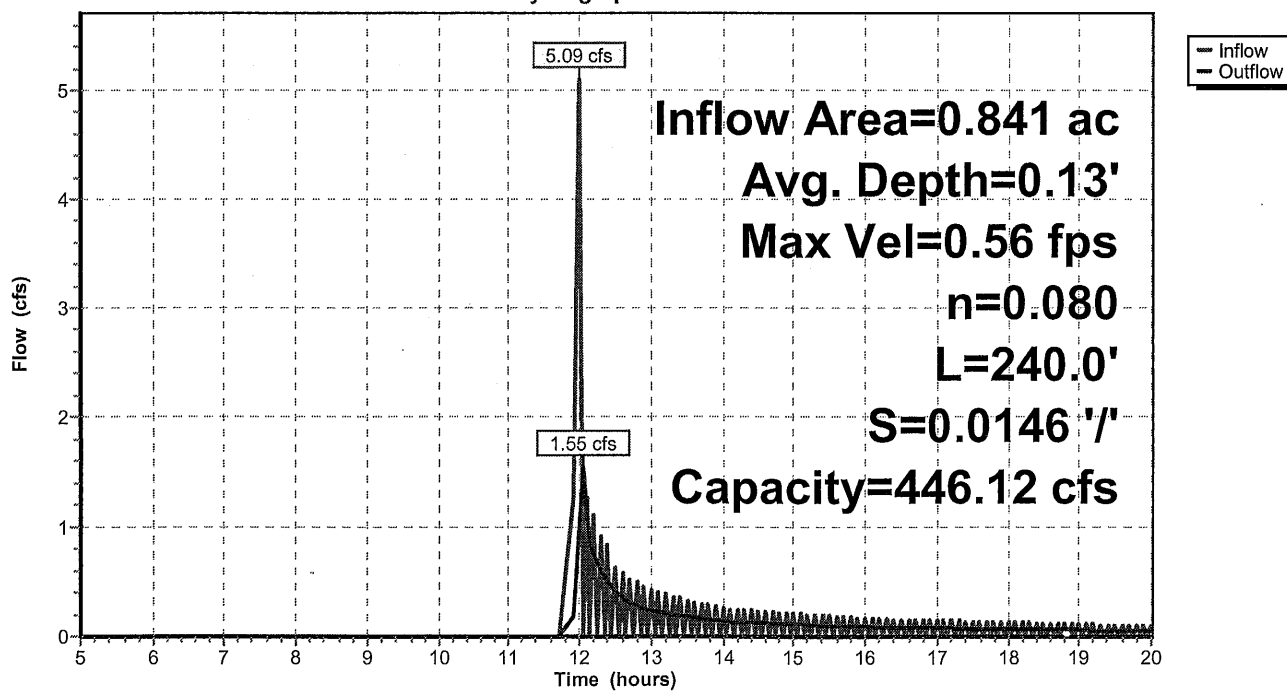
Length= 240.0' Slope= 0.0146 '/'

Inlet Invert= 265.00', Outlet Invert= 261.50'



### Reach 1R: Wetlands

Hydrograph



## Post Development

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Type II 24-hr 10 year Rainfall=4.70"

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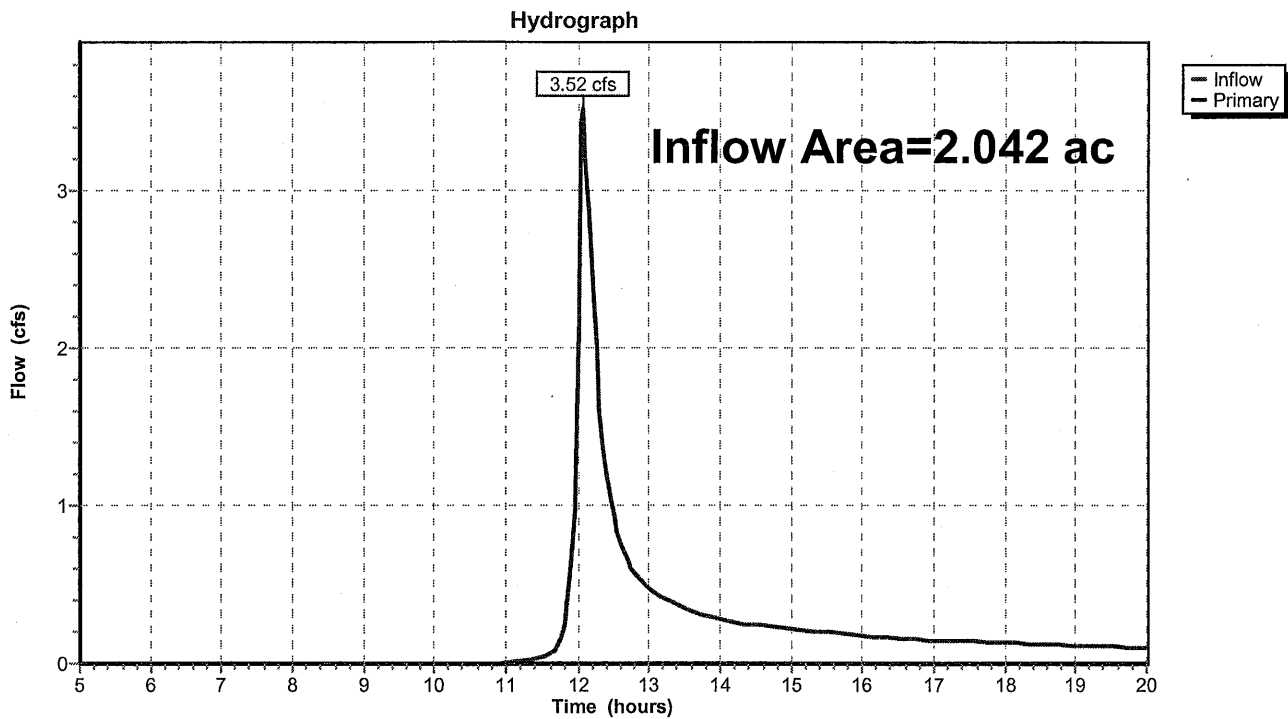
### Summary for Pond 1: POI #1 (POST)

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

Inflow Area = 2.042 ac, 0.00% Impervious, Inflow Depth > 1.40" for 10 year event  
Inflow = 3.52 cfs @ 12.07 hrs, Volume= 0.237 af  
Primary = 3.52 cfs @ 12.07 hrs, Volume= 0.237 af, Atten= 0%, Lag= 0.0 min

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

### Pond 1: POI #1 (POST)



**Post Development**

Type II 24-hr 10 year Rainfall=4.70"

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**Summary for Pond WQF: Filter**

[93] Warning: Storage range exceeded by 0.06'

[90] Warning: Qout&gt;Qin may require Finer Routing or smaller dt

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.841 ac, 0.00% Impervious, Inflow Depth > 2.61" for 10 year event  
 Inflow = 4.42 cfs @ 11.94 hrs, Volume= 0.183 af  
 Outflow = 5.09 cfs @ 12.00 hrs, Volume= 0.102 af, Atten= 0%, Lag= 3.5 min  
 Primary = 5.09 cfs @ 12.00 hrs, Volume= 0.102 af

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

Peak Elev= 271.31' @ 12.01 hrs Surf.Area= 0 sf Storage= 3,550 cf

Plug-Flow detention time= 140.9 min calculated for 0.101 af (55% of inflow)

Center-of-Mass det. time= 66.0 min ( 840.8 - 774.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	269.50'	3,550 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) -Impervious

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
269.50	1,315	0	0
270.00	1,845	790	790
271.00	2,400	2,123	2,913
271.25	2,700	638	3,550

Device	Routing	Invert	Outlet Devices
#1	Primary	271.25'	<b>145.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=5.09 cfs @ 12.00 hrs HW=271.31' TW=265.08' (Dynamic Tailwater)

↑1=Broad-Crested Rectangular Weir (Weir Controls 5.09 cfs @ 0.61 fps)

## Post Development

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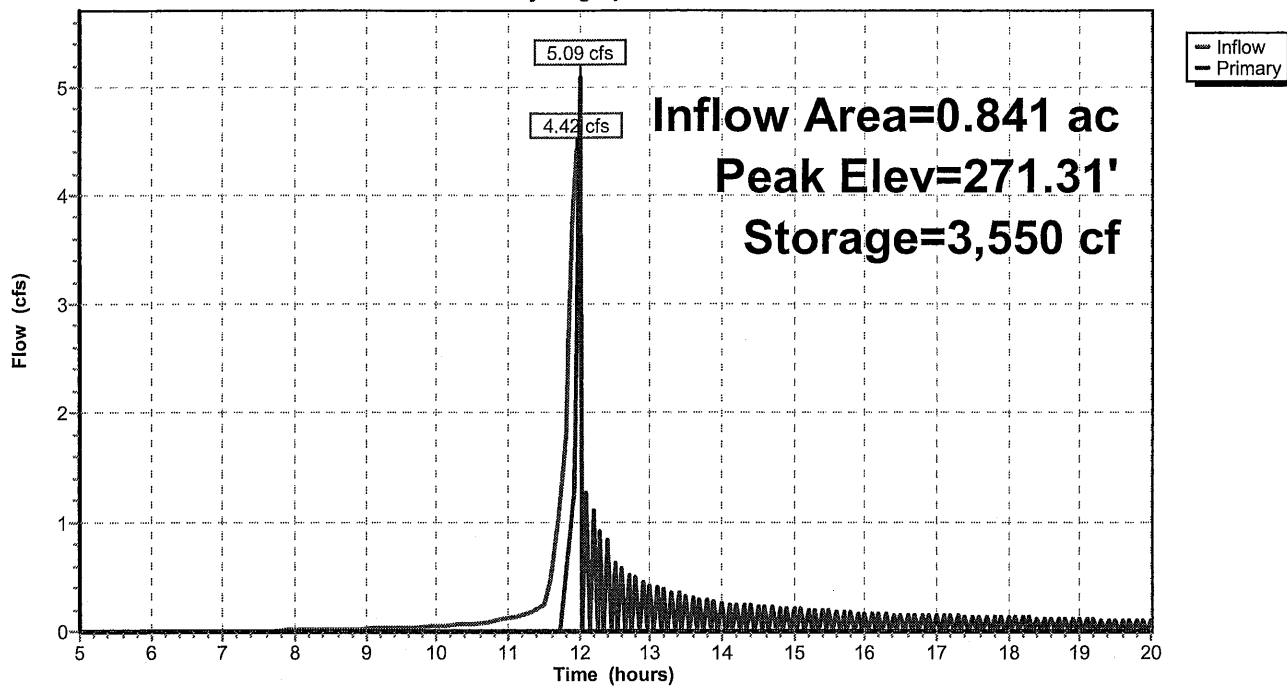
Type II 24-hr 10 year Rainfall=4.70"

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### Pond WQF: Filter

#### Hydrograph



## Post Development

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Type II 24-hr 25 year Rainfall=5.50"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

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

### Subcatchment A:

Runoff Area=36,642 sf 0.00% Impervious Runoff Depth>3.29"  
Flow Length=330' Tc=3.6 min CN=82 Runoff=5.49 cfs 0.231 af

### Subcatchment B: POST

Runoff Area=52,311 sf 0.00% Impervious Runoff Depth>1.88"  
Flow Length=349' Tc=17.1 min CN=66 Runoff=2.94 cfs 0.188 af

### Reach 1R: Wetlands

Avg. Depth=0.21' Max Vel=0.75 fps Inflow=9.32 cfs 0.149 af  
n=0.080 L=240.0' S=0.0146 '/' Capacity=446.12 cfs Outflow=3.46 cfs 0.148 af

### Pond 1: POI #1 (POST)

Inflow=5.88 cfs 0.336 af  
Primary=5.88 cfs 0.336 af

### Pond WQF: Filter

Peak Elev=271.34' Storage=3,550 cf Inflow=5.49 cfs 0.231 af  
Outflow=9.32 cfs 0.149 af

**Total Runoff Area = 2.042 ac Runoff Volume = 0.418 af Average Runoff Depth = 2.46"**  
**100.00% Pervious = 2.042 ac 0.00% Impervious = 0.000 ac**

## Post Development

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Type II 24-hr 25 year Rainfall=5.50"

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### Summary for Subcatchment A:

[49] Hint:  $T_c < 2dt$  may require smaller  $dt$

Runoff = 5.49 cfs @ 11.94 hrs, Volume= 0.231 af, Depth> 3.29"

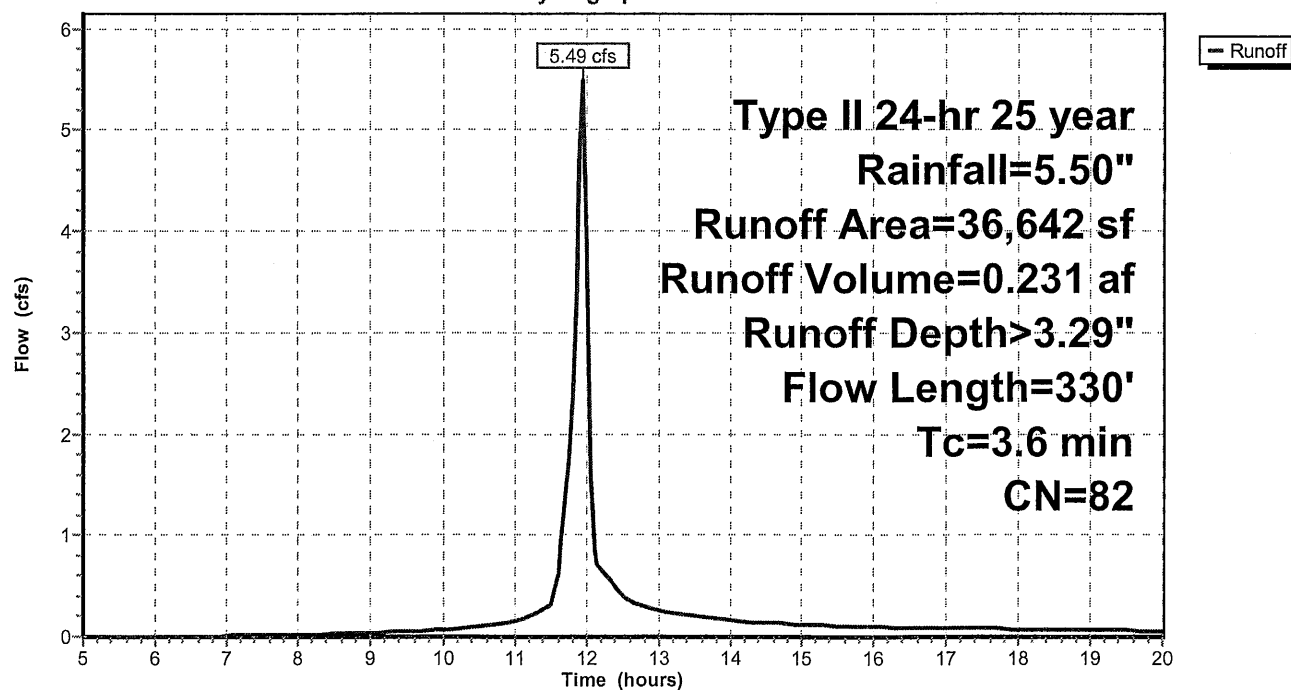
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs,  $dt=0.05$  hrs  
Type II 24-hr 25 year Rainfall=5.50"

Area (sf)	CN	Description
18,360	89	Gravel roads, HSG C
18,282	74	>75% Grass cover, Good, HSG C
36,642	82	Weighted Average
36,642		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	65	0.0500	1.76		Sheet Flow, AB Smooth surfaces $n=0.011$ $P2=3.00"$
0.8	65	0.0230	1.29		Sheet Flow, BC Smooth surfaces $n=0.011$ $P2=3.00"$
2.2	200	0.0100	1.50		Shallow Concentrated Flow, CD Grassed Waterway $K_v=15.0$ fps
3.6	330	Total			

### Subcatchment A:

Hydrograph



## Post Development

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Type II 24-hr 25 year Rainfall=5.50"

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### Summary for Subcatchment B: POST

Runoff = 2.94 cfs @ 12.10 hrs, Volume= 0.188 af, Depth> 1.88"

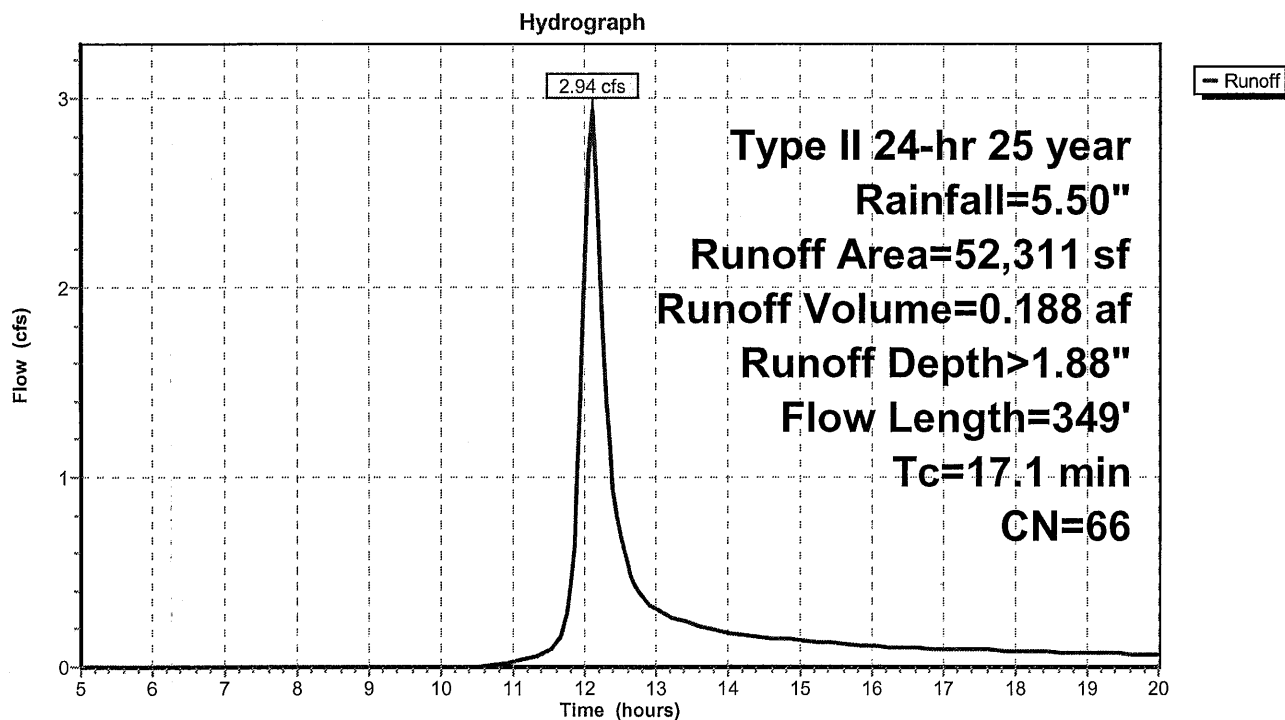
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type II 24-hr 25 year Rainfall=5.50"

Area (sf)	CN	Description
33,672	61	>75% Grass cover, Good, HSG B
18,639	74	>75% Grass cover, Good, HSG C
52,311	66	Weighted Average
52,311		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	150	0.0160	0.16		<b>Sheet Flow, AB</b> Grass: Short n= 0.150 P2= 3.00"
0.5	24	0.0160	0.89		<b>Shallow Concentrated Flow, BC</b> Short Grass Pasture Kv= 7.0 fps
0.1	15	0.2000	3.13		<b>Shallow Concentrated Flow, CD</b> Short Grass Pasture Kv= 7.0 fps
1.2	160	0.0219	2.22		<b>Shallow Concentrated Flow, DE</b> Grassed Waterway Kv= 15.0 fps
17.1	349	Total			

### Subcatchment B: POST





## Post Development

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Type II 24-hr 25 year Rainfall=5.50"

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### Summary for Reach 1R: Wetlands

Inflow Area = 0.841 ac, 0.00% Impervious, Inflow Depth > 2.12" for 25 year event  
Inflow = 9.32 cfs @ 11.95 hrs, Volume= 0.149 af  
Outflow = 3.46 cfs @ 12.01 hrs, Volume= 0.148 af, Atten= 63%, Lag= 3.9 min

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

Max. Velocity= 0.75 fps, Min. Travel Time= 5.3 min

Avg. Velocity = 0.25 fps, Avg. Travel Time= 15.9 min

Peak Storage= 1,098 cf @ 12.02 hrs, Average Depth at Peak Storage= 0.21'

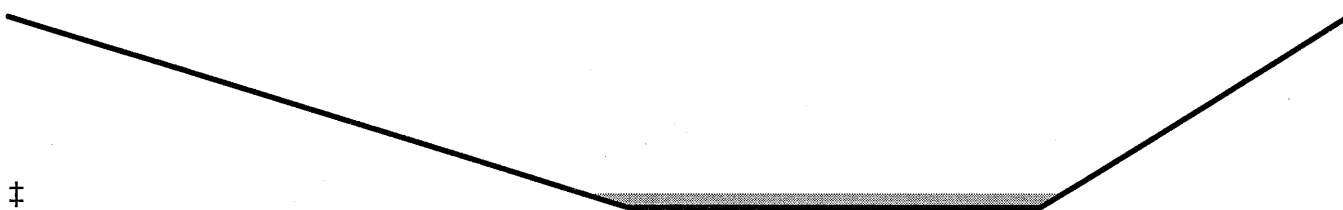
Bank-Full Depth= 3.00', Capacity at Bank-Full= 446.12 cfs

20.00' x 3.00' deep channel, n= 0.080 Earth, long dense weeds

Side Slope Z-value= 10.0 5.0 '/' Top Width= 65.00'

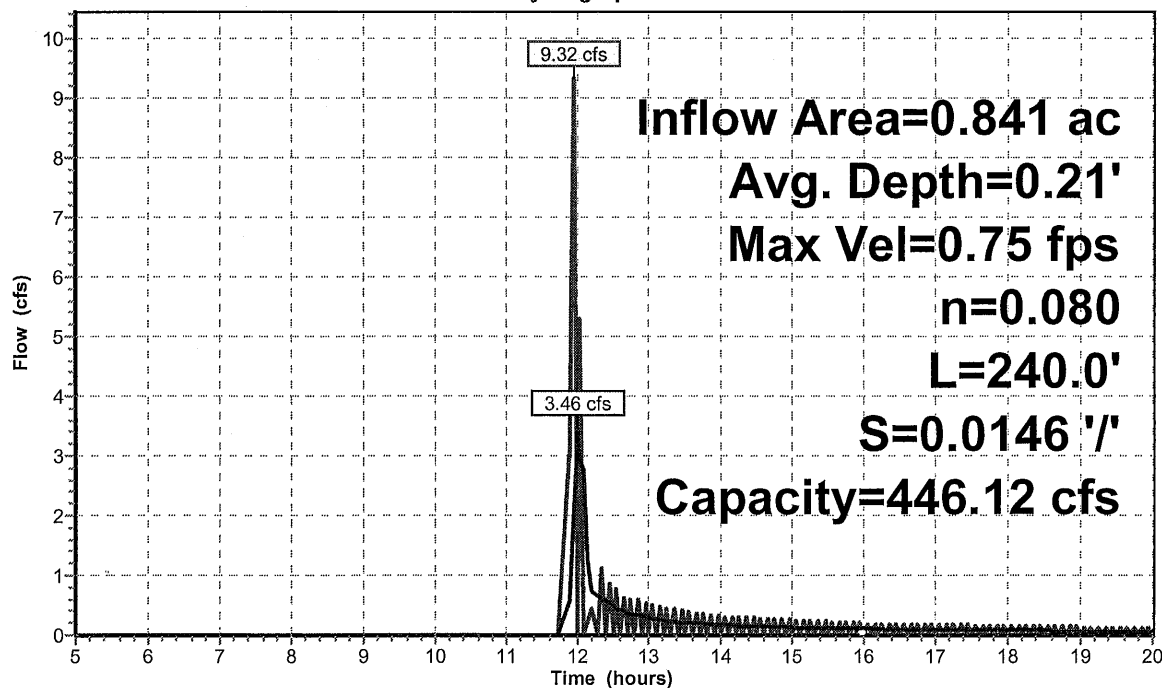
Length= 240.0' Slope= 0.0146 '/'

Inlet Invert= 265.00', Outlet Invert= 261.50'



### Reach 1R: Wetlands

Hydrograph



## Post Development

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Type II 24-hr 25 year Rainfall=5.50"

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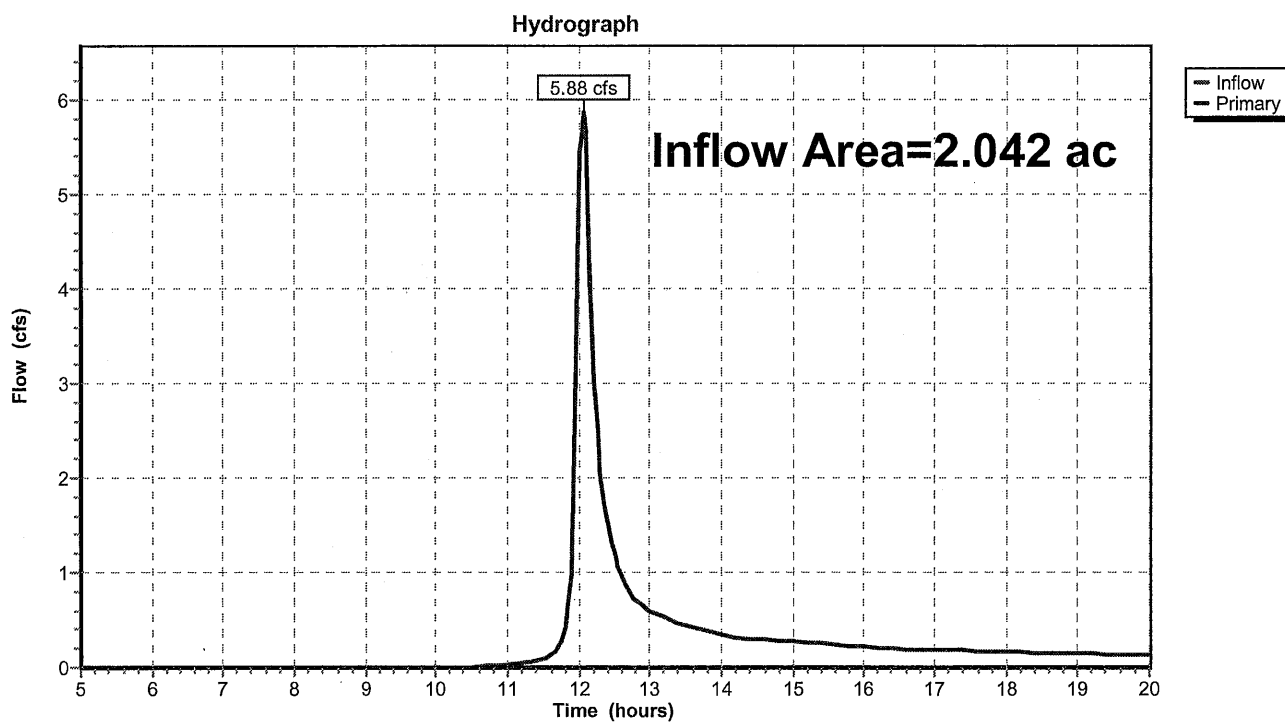
### Summary for Pond 1: POI #1 (POST)

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

Inflow Area = 2.042 ac, 0.00% Impervious, Inflow Depth > 1.97" for 25 year event  
Inflow = 5.88 cfs @ 12.08 hrs, Volume= 0.336 af  
Primary = 5.88 cfs @ 12.08 hrs, Volume= 0.336 af, Atten= 0%, Lag= 0.0 min

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

### Pond 1: POI #1 (POST)



**Post Development**

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Type II 24-hr 25 year Rainfall=5.50"

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**Summary for Pond WQF: Filter**

[93] Warning: Storage range exceeded by 0.09'

[90] Warning: Qout&gt;Qin may require Finer Routing or smaller dt

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.841 ac, 0.00% Impervious, Inflow Depth > 3.29" for 25 year event  
 Inflow = 5.49 cfs @ 11.94 hrs, Volume= 0.231 af  
 Outflow = 9.32 cfs @ 11.95 hrs, Volume= 0.149 af, Atten= 0%, Lag= 0.6 min  
 Primary = 9.32 cfs @ 11.95 hrs, Volume= 0.149 af

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

Peak Elev= 271.34' @ 11.95 hrs Surf.Area= 0 sf Storage= 3,550 cf

Plug-Flow detention time= 117.8 min calculated for 0.148 af (64% of inflow)

Center-of-Mass det. time= 48.6 min ( 818.2 - 769.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	269.50'	3,550 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) -Impervious

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
269.50	1,315	0	0
270.00	1,845	790	790
271.00	2,400	2,123	2,913
271.25	2,700	638	3,550

Device	Routing	Invert	Outlet Devices
#1	Primary	271.25'	<b>145.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=9.32 cfs @ 11.95 hrs HW=271.34' TW=265.14' (Dynamic Tailwater)

↑1=Broad-Crested Rectangular Weir (Weir Controls 9.32 cfs @ 0.75 fps)

# Post Development

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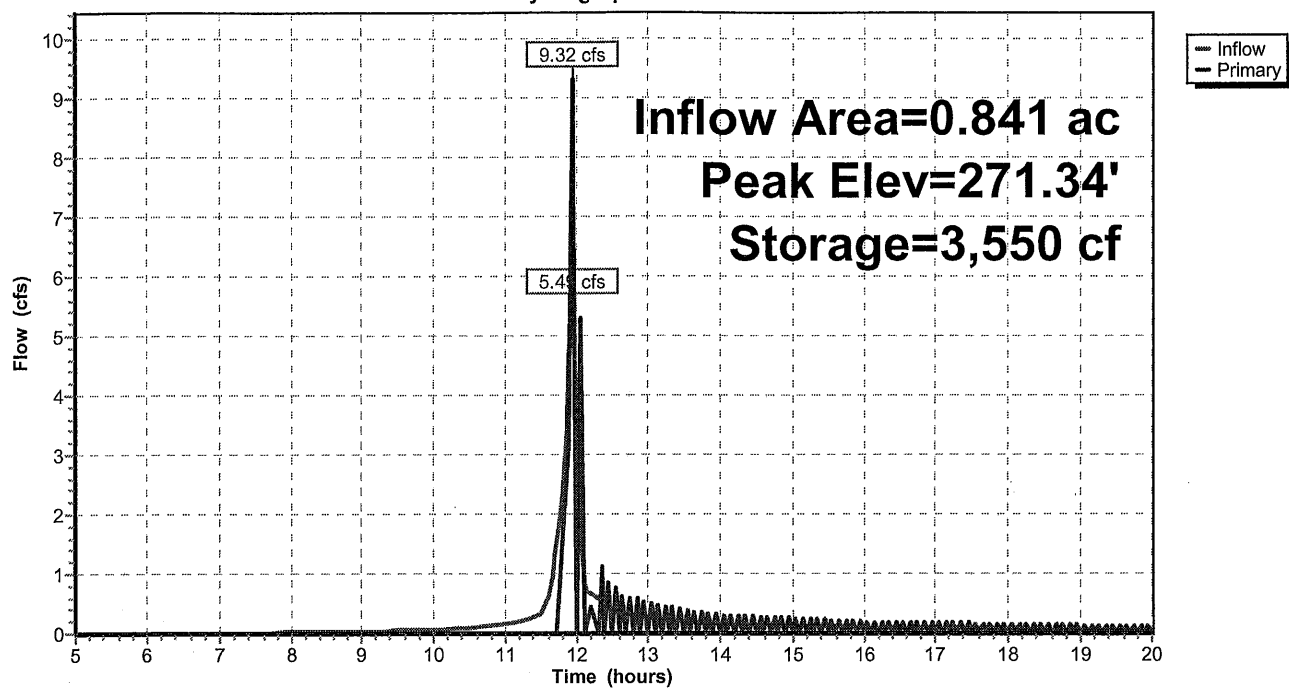
Type II 24-hr 25 year Rainfall=5.50"

Printed 8/10/2011

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## Pond WQF: Filter

### Hydrograph



**ATTACHMENT G**

**Photos of Point of Interest #1**



**Photo 1 – View at Point of Interest #1 looking southwest.**



**Photo 2 – View at Point of Interest #1 looking northeast.**



**DeLUCA-HOFFMAN ASSOCIATES,  
INC.  
CONSULTING ENGINEERS  
778 MAIN STREET, SUITE 8  
SOUTH PORTLAND, MAINE 04106  
TEL. 207-775-1121  
FAX: 207-879-0896**

**Point of Interest #1 – Windham School Campus  
Photos Taken 08-11-11 by Orry Cummings  
(DHAI JN 2146.19)**

## **ATTACHMENT H**

### **Portland Water District Correspondence**

## Orry Cummings

---

**From:** AMAP Means E-mail [means@pwd.org]  
**Sent:** Wednesday, August 10, 2011 10:52 AM  
**To:** Orry Cummings  
**Subject:** 205 Windham Center Road, Windham

Hello Orry,

I cannot find any record of public water at 205 Windham Center Road in Windham.

Thank you,  
Glissen

---

**From:** [ocummings@delucahoffman.com](mailto:ocummings@delucahoffman.com) [mailto:ocummings@delucahoffman.com  
<mailto:ocummings@delucahoffman.com> ]  
**Sent:** Tuesday, August 09, 2011 12:52 PM  
**To:** Tony Alves  
**Subject:** PWD.org Contact: House Demolition

Mr. Alves,

We are proposing a project at 205 Windham Center Road in Windham, Me and this project will include the demolition of the home at this location. I was wondering if this house has an existing service and if so how can we coordinate the discontinuation of this service prior to demolition?

Thank you for any assistance that you can give on this matter.

Regards,

Orry Cummings  
Design Engineer  
Deluca-Hoffman Assoc., Inc.  
207-775-1121

Orry Cummings



## ATTACHMENT I

### Figures 1-6

**Figure 1 – Site Layout and Removals Plan – Revised 08.04.11**

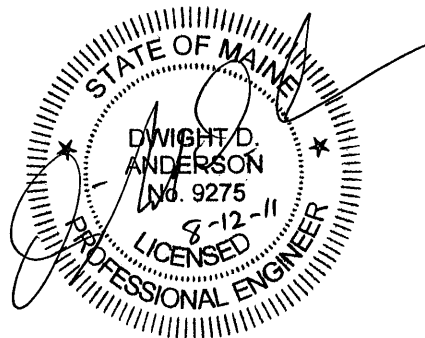
**Figure 2 – Grading and Drainage Plan – Revised 08.12.11**

**Figure 3 – Details – Revised 08.12.11**

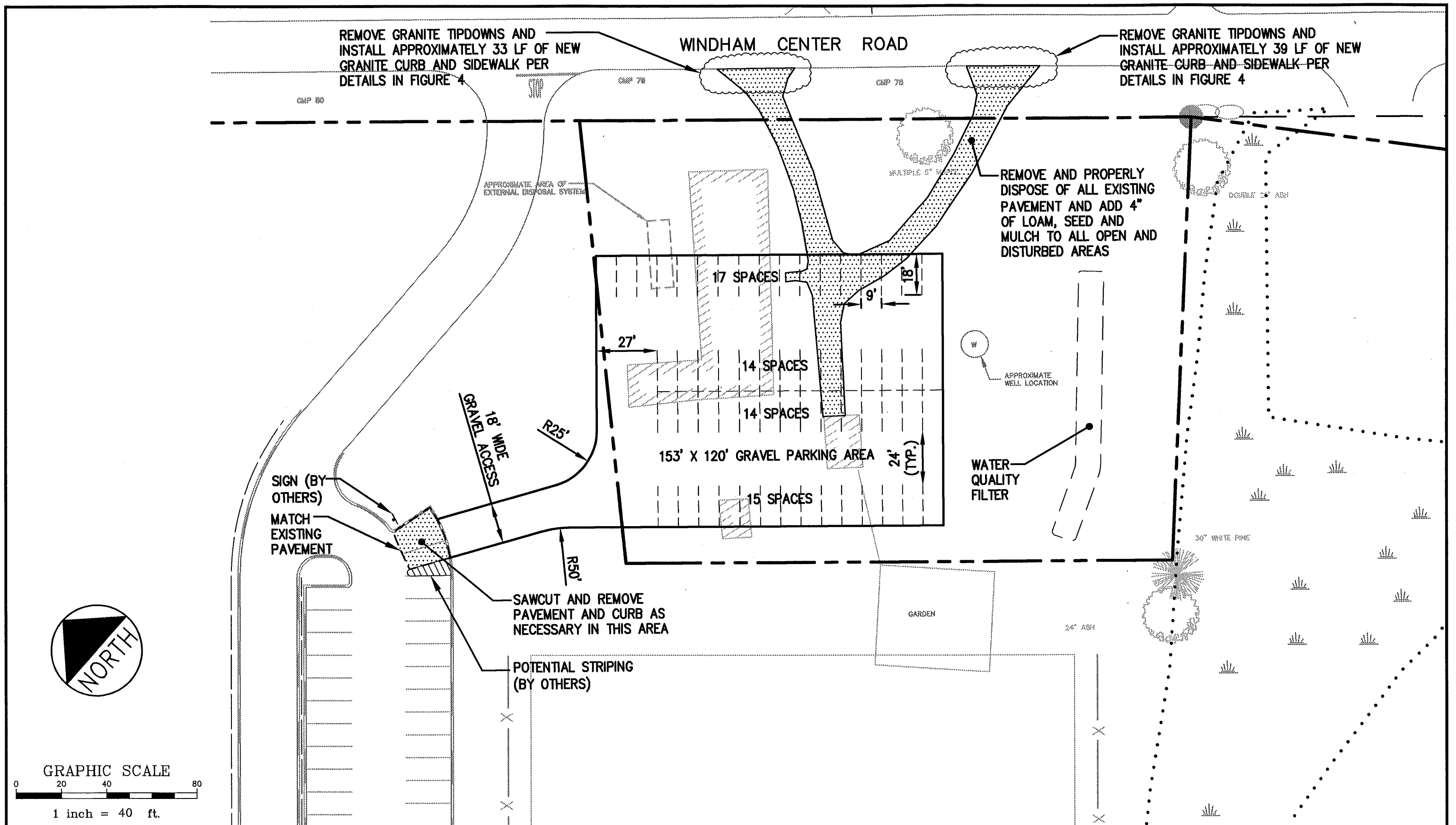
**Figure 4 – Details – Revised 08.12.11**

**Figure 5 – Erosion and Sediment Control Narrative**

**Figure 6 – Water Quality Plan**



*Stamp covers all 6 figures.*



DeLuca-Hoffman Associates, Inc.  
778 MAIN STREET, SUITE 8  
SOUTH PORTLAND, ME 04106  
(207) 775-1121  
DHA@DELUCAHOFFMAN.COM

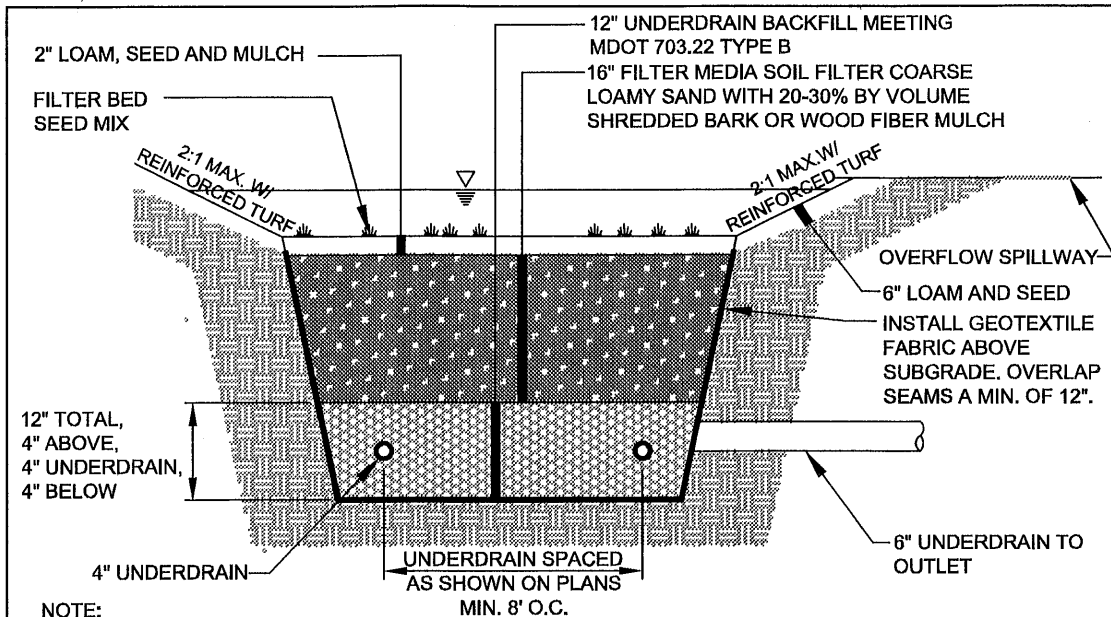
DRAWN:	DMB	DATE:	JULY 2011
DESIGNED:	OSC	SCALE:	1"=40'
CHECKED:	DDA	JOB NO.	2146.19
FILE NAME:	2146.19-SP		

RSU #14  
WINDHAM SCHOOL CAMPUS

GRAVEL PARKING NORTHEAST OF FIELD #10  
SITE LAYOUT AND REMOVALS PLAN

FIGURE  
1  
REVISED 08.04.11





**NOTE:**  
 FILTER IS DESIGNED TO TREAT 1.0" RUNOFF FROM PAVED OR IMPERVIOUS SURFACES AND 0.4" RUNOFF FROM LANDSCAPED AREAS.

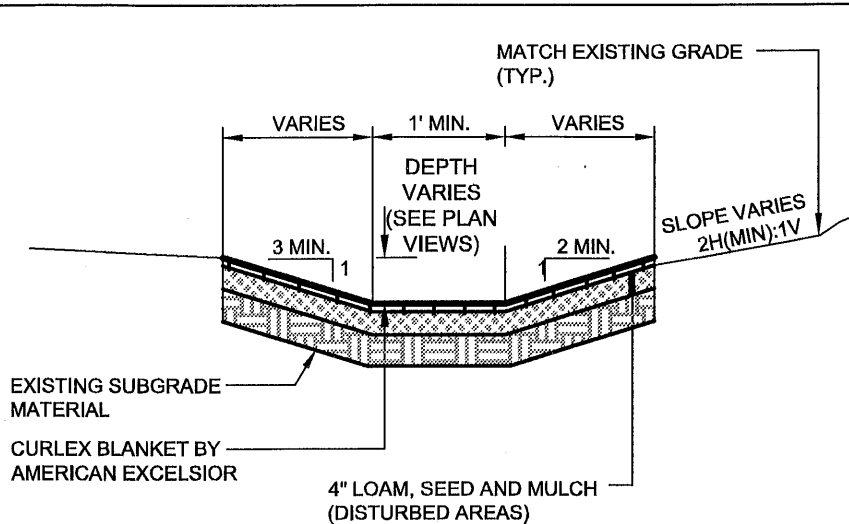
**A. SOIL FILTER BED:** THE SOIL FILTER MUST BE AT LEAST 18 INCHES DEEP ON TOP OF THE GRAVEL UNDERDRAIN PIPE BEDDING AND MUST EXTEND ACROSS THE BOTTOM OF THE ENTIRE FILTER AREA. THIS SOIL MIXTURE SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS, OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS CAN BE MIXED WITHIN THE FILTER.

**B. SOIL FILTER MEDIA:** SOIL MEDIA MUST CONSIST OF A SILTY SAND SOIL OR SOIL MIXTURE COMBINED WITH 20% TO 30% BY VOLUME (NO LESS THAN 10% BY DRY WEIGHT) OF A MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH. OTHER ORGANIC SOURCES MUST BE APPROVED BY THE DEPARTMENT; HOWEVER AN AGRICULTURAL SOURCE IS NOT ACCEPTABLE FOR THE ORGANIC COMPONENT OF THE MEDIA.  
 THE RESULTING MIXTURE MUST HAVE NO LESS THAN 8% PASSING THE 200 SIEVE AND SHALL HAVE A CLAY CONTENT OF LESS THAN 2%. THE SYSTEM MUST BE DESIGNED TO DRAIN THE SURFACE STORAGE VOLUME IN NO LESS THAN 24 HOURS AND NO MORE THAN 48 HOURS.

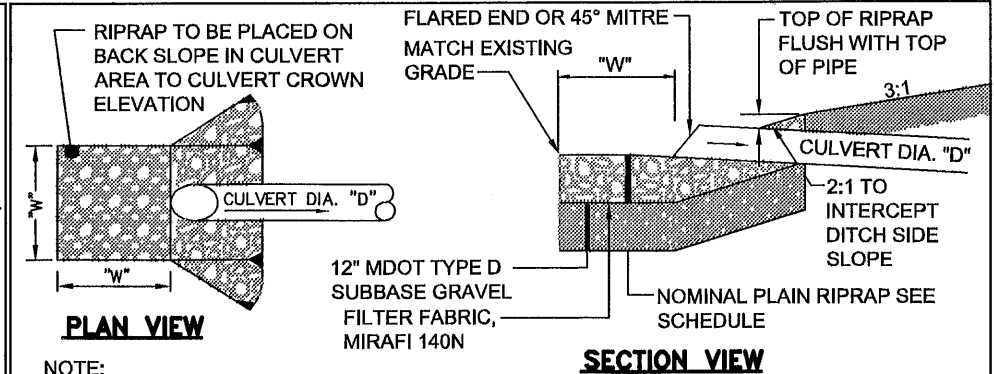
AS AN EXAMPLE, THE MIXTURE MAY CONTAIN BY VOLUME THE FOLLOWING:  
 50% OF SANDY (MEDOT #703.01 CONTAINS INSUFFICIENT FINE FOR THE MEDIA)  
 20% OF LOAMY TOPSOIL  
 30 % OF COMPOSTED WOODY FIBERS AND FINE SHREDDED BARK, SUPERHUMUS OR EQUIVALENT

**C. CONSTRUCTION OVERSIGHT:** INSPECTION OF THE FILTER BASIN SHALL BE PROVIDED FOR EACH PHASE OF CONSTRUCTION BY THE DESIGN ENGINEER WITH REQUIRED REPORTING TO THE DEP. AT A MINIMUM, INSPECTIONS WILL OCCUR:  
 - AFTER 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 SEEDING;  
 - AFTER ONE YEAR TO INSPECT HEALTH OF THE VEGETATION AND MAKE CORRECTIONS; AND  
 - ALL MATERIAL USED FOR THE CONSTRUCTION OF THE FILTER BASIN WILL BE APPROVED BY THE DESIGN ENGINEER AFTER TESTS BY A CERTIFIED LABORATORY SHOW THAT THEY ARE PASSING DEP SPECIFICATIONS.

**(A) TYPICAL SECTION FOR WATER QUALITY FILTER**  
 N.T.S.



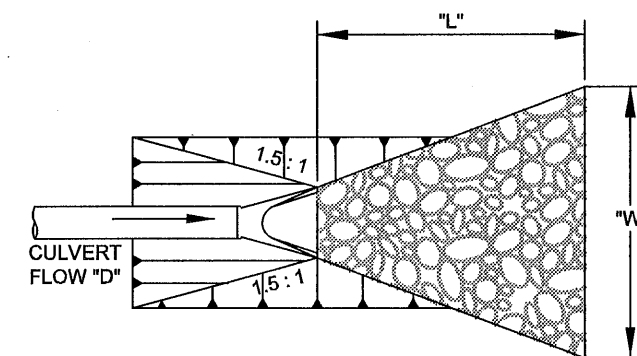
**(B) VEGITATED DITCH**  
 N.T.S.



**NOTE:**  
 RIPRAP GRADATION AND PLACEMENT - THE RIPRAP GRADATION SHALL BE A WELL-GRADED MIX FROM ABOUT 1.5 TIMES THE D SIZE TO ABOUT 25 PERCENT OF THE D SIZE. THE RIPRAP STONES SHALL BE CAREFULLY PLACED WORKING FROM THE TOE OF THE SLOPE UPWARD. THE STONES SHOULD BE LOWERED TO THE SLOPE AND NOT BE ALLOWED TO DROP MORE THAN 12 INCHES ONTO THE GEOTEXTILE. THE FINISHED SURFACE SHALL BE A RELATIVELY SMOOTH UNIFORMLY SLOPED SURFACE.

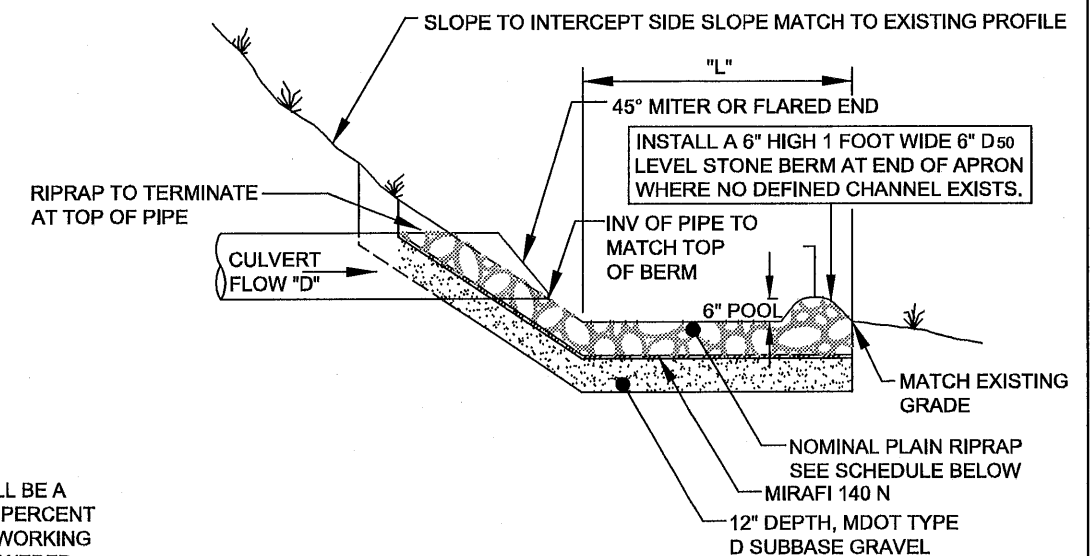
SCHEDULE FOR STORM DRAIN			
CULVERT DIAMETER (D)	WIDTH (W)	STONE ds 50	RIPRAP THICKNESS
12"	2'	6"	14"
15"	4'	6"	14"

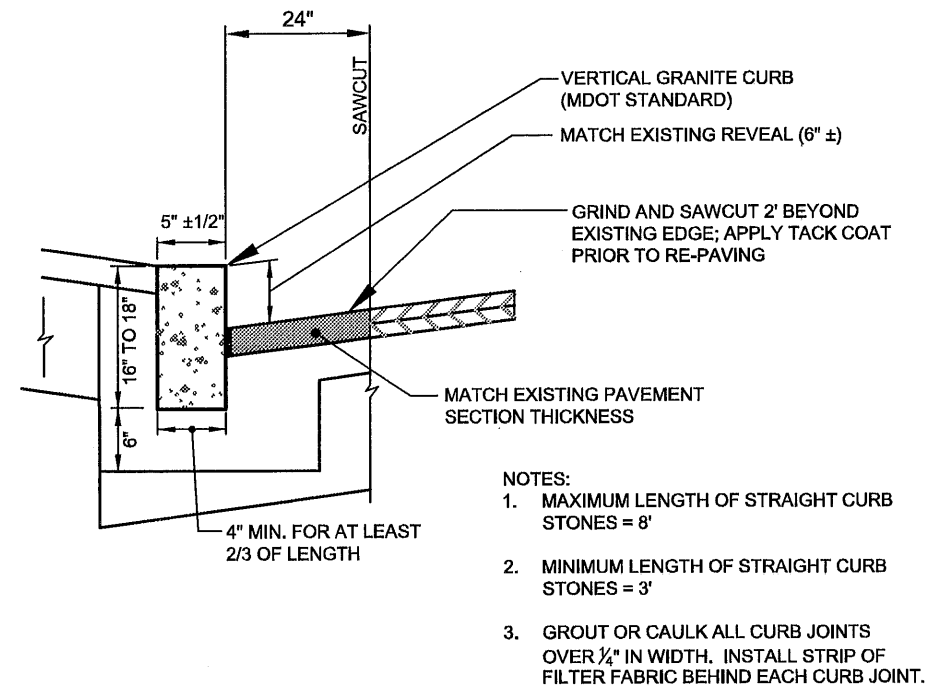
**(D) CULVERT INLET APRON IN FILL AREAS**  
 N.T.S.



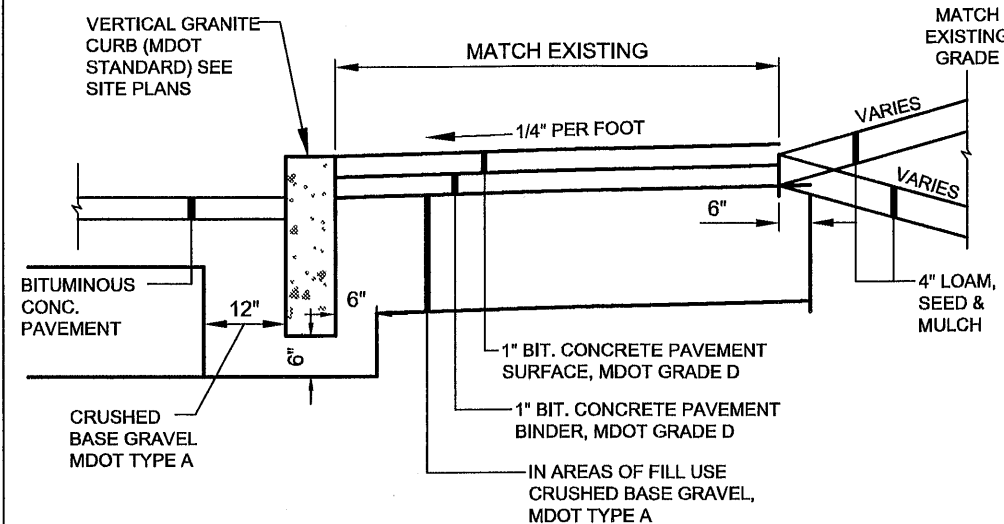
**NOTES:**  
 1. RIPRAP GRADATION AND PLACEMENT - THE RIPRAP GRADATION SHALL BE A WELL-GRADED MIX FROM ABOUT 1.5 TIMES THE D SIZE TO ABOUT 25 PERCENT OF THE D SIZE. THE RIPRAP STONES SHALL BE CAREFULLY PLACED WORKING FROM THE TOE OF THE SLOPE UPWARD. THE STONES SHOULD BE LOWERED TO THE SLOPE AND NOT BE ALLOWED TO DROP MORE THAN 12 INCHES ONTO THE GEOTEXTILE. THE FINISHED SURFACE SHALL BE A RELATIVELY SMOOTH UNIFORMLY SLOPED SURFACE.  
 2. THIS DETAIL WITHOUT THE STONE BERM AT THE END IS TO BE USED WHERE CONCENTRATED FLOW BELOW THE ROADWAY SECTION IS OBVIOUS. A FLOW DISPERSION BERM IS TO BE ADDED AT 12" CULVERTS AS DETERMINED BY THE FIELD ENGINEER WHERE CONCENTRATED FLOWS ARE NOT OBVIOUS.  
 3. WHERE EXISTING SLOPE GRADES AT CULVERT OUTLETS EXCEED 30%, THE 6" POOL IS NOT REQUIRED.

**(C) CULVERT OUTLET APRON**  
 N.T.S.

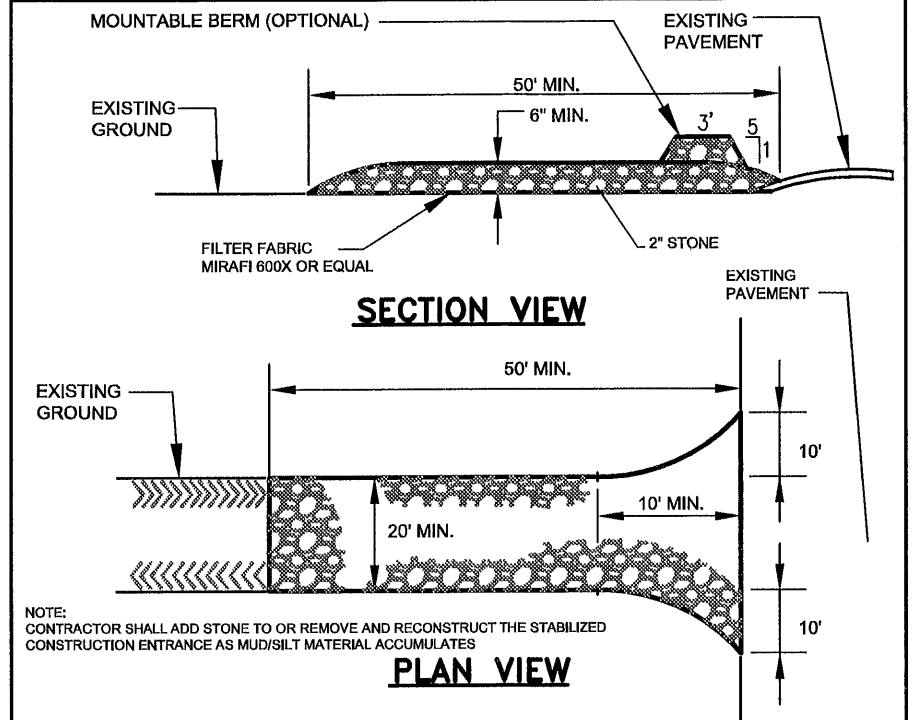




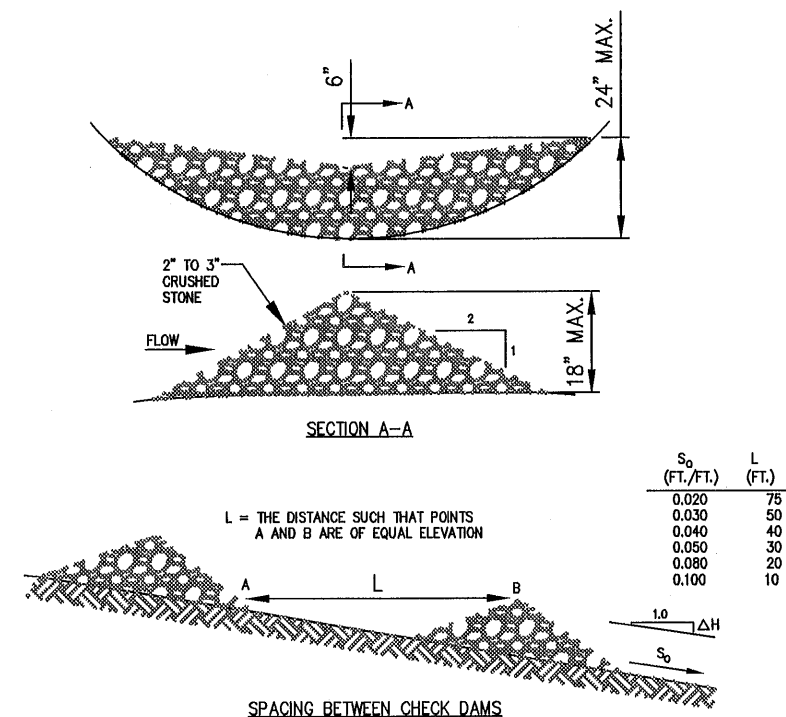
**(A) VERTICAL GRANITE CURB INSTALLATION DETAIL**  
N.T.S.



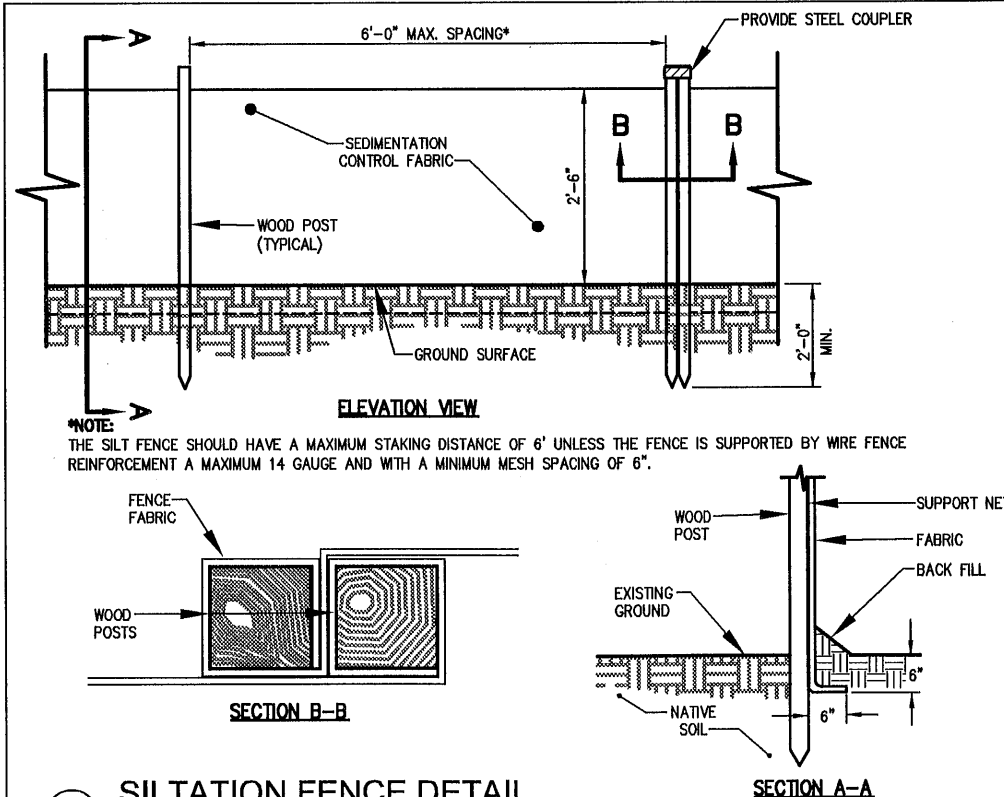
**(B) BITUMINOUS SIDEWALK WITH VERTICAL GRANITE CURB DETAIL**  
N.T.S.



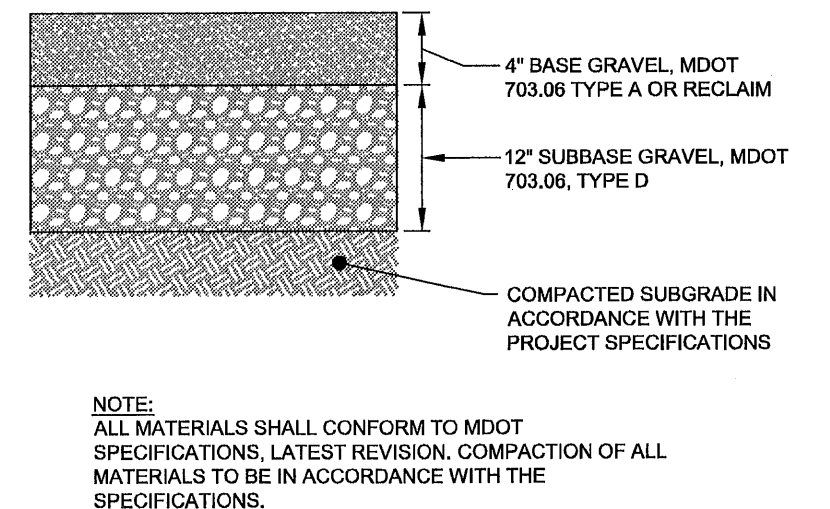
**(C) STABILIZED CONSTRUCTION ENTRANCE DETAIL**  
N.T.S.



**(D) STONE CHECK DAMS**  
N.T.S.



**(E) SILTATION FENCE DETAIL**  
N.T.S.



**(F) GRAVEL PARKING AND ACCESS DRIVE SECTION**  
N.T.S.



OVERVIEW OF SOIL EROSION AND SEDIMENTATION CONCERNS

THE PRIMARY EMPHASIS OF THE EROSION AND SEDIMENTATION CONTROL PLAN TO BE IMPLEMENTED FOR THIS PROJECT IS AS FOLLOWS:

1. DEVELOPMENT OF A CAREFUL CONSTRUCTION SEQUENCE THAT INCLUDES THE INITIAL INSTALLATION OF TEMPORARY EROSION AND SEDIMENT CAPTURE MEASURES. THE USE OF SEDIMENT BARRIERS AND SHELTERS WILL BE PRIORITIZED.
2. RAPID STABILIZATION OF DENUDED AREAS TO MINIMIZE THE PERIOD OF SOIL EXPOSURE. THE PLAN INCLUDES MEASURES TO INTERCEPT AND CONVEY RUNOFF TO TEMPORARY SEDIMENT CONTROL DEVICES AS THE CONSTRUCTION OF THE PROJECT OCCURS. WHERE POSSIBLE, RUNOFF SHOULD BE DIVERTED TO TEMPORARY AND/OR STABILIZED MEASURES THAT ARE INTENDED TO CAPTURE SEDIMENT-LADEN RUNOFF.
3. INSTALLING SEDIMENT SUMPS AND SWALES EARLY IN THE CONSTRUCTION SEQUENCE TO PROVIDE SECONDARY RELIEF FOR EROSION CONTROL MEASURES WITHIN THE SITE UNTIL LATE IN THE PROJECT WHEN THE SEDIMENTATION AREAS NEED TO BE REMOVED FOR FINAL RESTORATION
4. STABILIZATION OF AREAS DENUDED TO UNDERLYING PARENT MATERIAL TO MINIMIZE THE PERIOD OF SOIL EXPOSURE.
5. RAPID STABILIZATION OF DRAINAGE PATHS TO AVOID RILL AND GULLY EROSION MAY NEED TO BE INSTALLED MULTIPLE TIMES AS WORK ZONES SHIFT AND WATER IS COMPLETED.
6. THE USE OF ON-SITE MEASURES TO CAPTURE SEDIMENT (HAY BALES/SILT FENCE, ETC.) BEFORE RUNOFF IS CONVEYED TO SEDIMENT SUMPS OR OTHER STORMWATER MEASURES.
7. PROTECTION OF NATURAL RESOURCE AREAS INCLUDING WETLANDS THROUGH BUFFERING AND BMPs.
8. THE IMPLEMENTATION OF LONG-TERM MEASURES FOR EROSION/SEDIMENT CONTROL AND POLLUTANT TREATMENT THROUGH THE CONSTRUCTION OF PERMANENT SURFACE STABILIZATION AND LONG-TERM SITE MAINTENANCE BY THE OWNER.
9. ACTIONS MUST BE TAKEN TO ENSURE THAT ACTIVITIES DO NOT RESULT IN NOTICEABLE EROSION OF SOILS OR FUGITIVE DUST EMISSIONS DURING OR AFTER CONSTRUCTION. OIL MAY NOT BE USED FOR DUST CONTROL.
10. TRENCH DEWATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, AND OTHER AREAS WITHIN THE CONSTRUCTION AREA THAT RETAIN WATER AFTER EXCAVATION. IN MOST CASES THE COLLECTED WATER IS HEAVILY SILTED AND HINDERS CORRECT AND SAFE CONSTRUCTION PRACTICES. THE COLLECTED WATER MUST BE REMOVED FROM THE PONDED AREA, EITHER THROUGH GRAVITY OR PUMPING, AND MUST BE SPREAD THROUGH NATURAL WOODED BUFFERS OR REMOVED TO AREAS THAT ARE SPECIFICALLY DESIGNED TO COLLECT THE MAXIMUM AMOUNT OF SEDIMENT POSSIBLE, LIKE A COPPERDAM DITCHES. AVOID ALLOWING THE WATER TO FLOW OVER DISTURBED AREAS OF THE SITE.

EROSION/SEDIMENTATION CONTROL DEVICES

THE FOLLOWING EROSION AND SEDIMENT CONTROL DEVICES WILL BE IMPLEMENTED BY THE CONTRACTOR AS PART OF THE SITE DEVELOPMENT. THESE DEVICES SHALL BE INSTALLED AS INDICATED ON THE PLANS OR AS DESCRIBED WITHIN THIS REPORT. FOR FURTHER REFERENCE, SEE THE MAINE EROSION AND SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES, DATED MARCH 2003.

1. SILTATION FENCE OR EQUIVALENT SEDIMENT BARRIER SHALL BE INSTALLED DOWNSLOPE OF ANY DISTURBED AREAS TO TRAP RUNOFF-BORNE SEDIMENTS UNTIL THE SITE IS REVEGETATED. THE SILT FENCE SHALL BE INSTALLED PER THE DETAIL PROVIDED IN THE PLAN SET AND INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL, AND IN ACCORDANCE WITH THE MAINE CONSTRUCTION GENERAL PERMIT REQUIREMENTS. REPAIRS SHALL BE MADE IMMEDIATELY BY THE CONTRACTOR IF THERE ARE ANY SIGNS OF EROSION OR SEDIMENTATION BELOW THE FENCE LINE. PROPER PLACEMENT OF STAKES AND KEYING THE BOTTOM OF THE FABRIC INTO THE GROUND ARE CRITICAL TO THE EFFECTIVENESS OF THE FENCE. IF THERE ARE SIGNS OF UNDERCUTTING AT THE CENTER OR THE EDGES, OR IMPOUNDING OF LARGE VOLUMES OF WATER BEHIND THE FENCE, THE BARRIER SHALL BE REPLACED WITH A STONE CHECK DAM AND MEASURES SHALL BE TAKEN TO AVOID THE CONCENTRATION OF FLOWS NOT INTENDED TO BE DIRECTED TO SILT FENCE OR OTHER SEDIMENTATION BARRIER.
2. STRAW OR HAY MULCH INCLUDING HYDROSEEDING IS INTENDED TO PROVIDE COVER FOR DENUDED OR SEEDED AREAS UNTIL REVEGETATION IS ESTABLISHED. MULCH PLACED ON SLOPES OF LESS THAN 10 PERCENT SHALL BE ANCHORED BY APPLYING WATER; MULCH PLACED ON SLOPES STEEPER THAN 10 PERCENT SHALL BE COVERED WITH A FABRIC NETTING AND ANCHORED WITH STAPLES IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. PROPOSED DRAINAGE CHANNELS THAT ARE TO BE REVEGETATED SHALL RECEIVE CURLEAF BLANKETS BY AMERICAN EXCELSIOR OR EQUIVALENT. ALL BLANKETS SHALL BE SELECTED BASED ON THE CHANNEL SLOPE, FLOW VELOCITY AND WHETHER THE MEASURES ARE TEMPORARY OR LONG-TERM IN NATURE. ALL FABRIC NETTING SHALL BE BIODEGRADABLE UNLESS OTHERWISE SPECIFIED. MULCH APPLICATION RATES ARE PROVIDED TO THE RIGHT ON THIS PLAN. HAY MULCH SHALL BE AVAILABLE ON SITE AT ALL TIMES IN ORDER TO PROVIDE IMMEDIATE TEMPORARY STABILIZATION WHEN NECESSARY. WHERE NECESSARY, A WINDOW OF CRUSHED STONE AND/OR GRAVEL SHALL BE PLACED AT THE TOP OF A SLOPE AND FLOWS MAY BE DIRECTED TO A TEMPORARY STONE CHANNEL PIPE SLUICE THAT SHALL BE USED TO CONVEY RUNOFF DOWN STEEPER SLOPES. A DISPERSION DEVICE SUCH AS STONE OR A PLUNGE POOL SHOULD BE INSTALLED AT THE BASE OF THE SLOPE AND SLUICE OUTLET TO DISSIPATE THE ENERGY OF THE RUNOFF.
3. RIPRAP SLOPES, DITCH LININGS, STONE CHECK DAMS, HAY BALE BARRIERS, AND CULVERT OUTLET APRONS ARE INTENDED TO REDUCE RUNOFF VELOCITIES AND PROTECT DENUDED SOIL SURFACES FROM CONCENTRATED FLOWS. INSTALLATION DETAILS AND STONE SIZES ARE PROVIDED IN THE CONSTRUCTION PLAN SET ON THE EROSION CONTROL DETAIL SHEETS.
4. ONE OR MORE CONSTRUCTION ENTRANCES WILL BE PREPARED AND MAINTAINED AT ACCESS POINTS ONTO THE SITE TO PREVENT TRACKING OF SOIL ONTO ADJACENT LOCAL ROADS AND PARKING LOTS.
5. LOAM AND SEED IS INTENDED TO SERVE AS THE PRIMARY PERMANENT REVEGETATIVE MEASURE FOR ALL DENUDED AREAS NOT PROVIDED WITH OTHER EROSION CONTROL MEASURES, SUCH AS PAVING OR GRAVEL. APPLICATION RATES ARE PROVIDED IN THIS SECTION FOR PERMANENT SEEDINGS IN NON-WETLAND AREAS.

TEMPORARY EROSION/SEDIMENTATION CONTROL MEASURES

THE FOLLOWING ARE PLANNED AS TEMPORARY EROSION/SEDIMENTATION CONTROL MEASURES DURING CONSTRUCTION:

1. ONE OR MORE CRUSHED STONE-STABILIZED CONSTRUCTION ENTRANCES SHALL BE PLACED AND MAINTAINED AT ANY SITE ACCESS POINTS. STONE-STABILIZED CONSTRUCTION ENTRANCES REQUIRE THE STONE BE REMOVED AND REPLACED AS IT BECOMES COVERED OR FILLED WITH MUD AND MATERIAL. ENTRANCES MAY REQUIRE RELOCATION AS THE COURSE OF SITE ACTIVITY OCCURS.
2. SILTATION FENCE OR OTHER ACCEPTABLE SILTATION BARRIER SHALL BE INSTALLED ALONG THE DOWNGRADEMENT SIDE OF THE PROPOSED IMPROVEMENT AREAS. THE SILTATION BARRIER WILL REMAIN IN PLACE AND BE PROPERLY MAINTAINED UNTIL THE SITE IS REVEGETATED TO AT LEAST A 90% COVERAGE LEVEL.
3. TEMPORARY STOCKPILES OF STUMPS, GRUBBINGS OR COMMON EXCAVATION WILL BE PROTECTED AS FOLLOWS:
  - A) TEMPORARY STOCKPILES SHALL NOT BE LOCATED WITHIN 25 FEET OF ANY DRAINAGE DITCHES AND AT LEAST 10 FEET UPGRADIENT OF A DOUBLE ROW OF PERIMETER SILT BARRIER.
  - B) INACTIVE STOCKPILES SHALL BE STABILIZED WITHIN 5 DAYS BY EITHER TEMPORARILY SEEDING THE STOCKPILE WITH A HYDROSEED METHOD CONTAINING AN EMULSIFIED MULCH TACKIFIER OR BY COVERING THE STOCKPILE WITH MULCH. IF NECESSARY, MESH SHALL BE INSTALLED TO PREVENT WIND FROM REMOVING THE MULCH.
4. SLOPES STEEPER THAN 3:1 SHALL RECEIVE REINFORCED TURF SUCH AS MANUFACTURED BY NORTH AMERICAN GREEN OR EQUIVALENT. IN AREAS TO BE ROUTINELY MOWED OR MAINTAINED, THE FABRIC NETTING SHALL BE BIODEGRADABLE.
5. TEMPORARY DIVERSION BERMS SHALL BE USED TO DIVERT RUNOFF AROUND WORK AREAS OR TO STABILIZED CONVEYANCE MEASURES.

STANDARDS FOR STABILIZING SITES FOR THE WINTER

1. THE CONSTRUCTION OF THE PROJECTS WILL OCCUR PRIOR TO THE WINTER SEASON, IN THE CASE THAT CONSTRUCTION CONTINUES INTO WINTER THE FOLLOWING STANDARDS SHALL APPLY:
2. STANDARD FOR THE TIMELY STABILIZATION OF DITCHES AND CHANNELS: THE CONTRACTOR SHALL CONSTRUCT AND STABILIZE ALL STONE-LINED DITCHES AND CHANNELS ON THE SITE BY NOVEMBER 15. THE CONTRACTOR SHALL CONSTRUCT AND STABILIZE ALL GRASS-LINED DITCHES AND CHANNELS ON THE SITE BY SEPTEMBER 15. IF THE CONTRACTOR FAILS TO STABILIZE A DITCH OR CHANNEL TO BE GRASS-LINED BY SEPTEMBER 15, THEN THE CONTRACTOR SHALL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE DITCH FOR LATE FALL AND WINTER.
  - I. INSTALL A SOD LINING IN THE DITCH. THE CONTRACTOR SHALL LINE THE DITCH WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE APPLICANT PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL, AND ANCHORING THE SOD WITH JUTE OR PLASTIC MESH TO PREVENT THE SOD STRIPS FROM SLOUGHING DURING FLOW CONDITIONS.
  - II. INSTALL A STONE LINING IN THE DITCH. THE CONTRACTOR SHALL LINE THE DITCH WITH STONE RIPRAP BY NOVEMBER 15. THE CONTRACTOR SHALL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE AND LINING THICKNESS NEEDED TO WITHSTAND THE ANTICIPATED FLOW VELOCITIES AND FLOW DEPTHS WITHIN THE DITCH. IF NECESSARY, THE CONTRACTOR SHALL REGRADE THE DITCH PRIOR TO PLACING THE STONE LINING SO AS TO PREVENT THE STONE LINING FROM REDUCING THE DITCH'S CROSS-SECTIONAL AREA.
3. STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SLOPES: THE CONTRACTOR SHALL CONSTRUCT AND STABILIZE STONE-COVERED SLOPES BY NOVEMBER 15. THE CONTRACTOR SHALL SEED AND MULCH ALL SLOPES TO BE VEGETATED BY SEPTEMBER 15. THE DEPARTMENT WILL CONSIDER ANY AREA HAVING A GRADE GREATER THAN 15% (10H:1V) TO BE A SLOPE. IF THE CONTRACTOR FAILS TO STABILIZE ANY SLOPE TO BE VEGETATED BY SEPTEMBER 15, THEN THE CONTRACTOR SHALL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SLOPE FOR LATE FALL AND WINTER.
  - I. STABILIZE THE SOIL WITH TEMPORARY VEGETATION AND EROSION CONTROL MESH. BY OCTOBER 1 THE CONTRACTOR SHALL SEED THE DISTURBED SLOPE WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET AND APPLY EROSION CONTROL MATS OVER THE MULCHED SLOPE. THE CONTRACTOR SHALL MONITOR GROWTH OF THE RYE OVER THE NEXT 45 DAYS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR FAILS TO COVER AT LEAST 75% OF THE DISTURBED SLOPE BY NOVEMBER 15, THEN THE CONTRACTOR SHALL COVER THE SLOPE WITH A LAYER OF WOOD WASTE COMPOST AS DESCRIBED IN ITEM III OF THIS STANDARD OR WITH STONE RIP-RAP AS DESCRIBED IN ITEM IV OF THIS STANDARD.
  - II. STABILIZE THE SLOPE WITH SOD. THE CONTRACTOR SHALL STABILIZE THE DISTURBED SLOPE WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE CONTRACTOR PINNING THE SOD ONTO THE SLOPE WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL. THE CONTRACTOR SHALL NOT USE LATE-SEASON SOD INSTALLATION TO STABILIZE SLOPES HAVING A GRADE GREATER THAN 33% (3H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
  - III. STABILIZE THE SLOPE WITH WOOD WASTE COMPOST. THE CONTRACTOR SHALL PLACE A SIX-INCH LAYER OF WOOD WASTE COMPOST ON THE SLOPE BY NOVEMBER 15. PRIOR TO PLACING THE WOOD WASTE COMPOST, THE CONTRACTOR SHALL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED SLOPE. THE CONTRACTOR SHALL NOT USE WOOD WASTE COMPOST TO STABILIZE SLOPES HAVING GRADES GREATER THAN 50% (2H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
  - IV. STABILIZE THE SLOPE WITH STONE RIP RAP. THE CONTRACTOR SHALL PLACE A LAYER OF STONE RIPRAP ON THE SLOPE BY NOVEMBER 15. THE CONTRACTOR SHALL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE NEEDED FOR STABILITY AND TO DESIGN A FILTER LAYER FOR UNDERNEATH THE RIPRAP.
4. STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SOIL: BY SEPTEMBER 15, THE CONTRACTOR SHALL SEED AND MULCH ALL DISTURBED SOILS ON AREAS HAVING A SLOPE LESS THAN 15%. IF THE CONTRACTOR FAILS TO STABILIZE THESE SOILS BY THIS DATE, THEN THE CONTRACTOR SHALL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SOIL FOR LATE FALL AND WINTER.
  - I. STABILIZE THE SOIL WITH TEMPORARY VEGETATION. BY OCTOBER 1, THE CONTRACTOR SHALL SEED THE DISTURBED SOIL WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET, LIGHTLY MULCH THE SEEDED SOIL WITH HAY OR STRAW AT 75 POUNDS PER 1000 SQUARE FEET, AND ANCHOR THE MULCH WITH PLASTIC NETTING. THE CONTRACTOR SHALL MONITOR GROWTH OF THE RYE OVER THE NEXT 45 DAYS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR FAILS TO COVER AT LEAST 75% OF THE DISTURBED SOIL BEFORE NOVEMBER 15, THEN THE CONTRACTOR SHALL MULCH THE AREA FOR OVER-WINTER PROTECTION AS DESCRIBED IN ITEM II OF THIS STANDARD.
  - II. STABILIZE THE SOIL WITH SOD. THE CONTRACTOR SHALL STABILIZE THE DISTURBED SOIL WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE CONTRACTOR PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL.
  - III. STABILIZE THE SOIL WITH MULCH. BY NOVEMBER 15, THE CONTRACTOR SHALL MULCH THE DISTURBED SOIL BY SPREADING HAY OR STRAW AT A RATE OF AT LEAST 150 POUNDS PER 1000 SQUARE FEET ON THE AREA SO THAT NO SOIL IS VISIBLE THROUGH THE MULCH. PRIOR TO APPLYING THE MULCH, THE CONTRACTOR SHALL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED AREA. IMMEDIATELY AFTER APPLYING THE MULCH, THE CONTRACTOR SHALL ANCHOR THE MULCH WITH PLASTIC NETTING TO PREVENT WIND FROM MOVING THE MULCH OFF THE DISTURBED SOIL.

SPECIAL MEASURES FOR SUMMER CONSTRUCTION

THE SUMMER PERIOD IS GENERALLY OPTIMUM FOR CONSTRUCTION IN MAINE, BUT IT IS ALSO THE PERIOD WHEN INTENSE, SHORT-DURATION STORMS ARE MOST COMMON, MAKING DENUDED AREAS VERY SUSCEPTIBLE TO EROSION. WHEN DUST CONTROL NEEDS TO BE THE MOST STRINGENT, AND WHEN THE POTENTIAL TO ESTABLISH VEGETATION IS OFTEN RESTRICTED BY MOISTURE DEFICIT, DURING THESE PERIODS THE CONTRACTOR MUST:

IMPLEMENT A PROGRAM TO APPLY DUST CONTROL MEASURES ON A DAILY BASIS EXCEPT THOSE DAYS WHERE THE PRECIPITATION EXCEEDS 0.25 INCH. THIS PROGRAM SHALL EXTEND TO AND INCLUDE ADJACENT STREETS.

1. SPRAY ANY MULCHES WITH WATER AFTER ANCHORING TO DAMPEN THE SOIL AND ENCOURAGE EARLY GROWTH. SPRAYING MAY BE REQUIRED SEVERAL TIMES. TEMPORARY SEED MAY BE REQUIRED UNTIL THE LATER SUMMER SEEDING SEASON.
2. MULCH, COVER, AND MOISTEN STOCKPILES OF FINE-GRAINED MATERIALS WHICH ARE SUSCEPTIBLE TO EROSION. IN THE SUMMER MONTHS THE POTENTIAL FOR WIND EROSION IS OF CONCERN, AS WELL AS EROSION FROM THE INTENSE, SHORT-DURATION STORMS WHICH ARE MORE PREVALENT IN THE SUMMER MONTHS.
3. TAKE ADDITIONAL STEPS NECESSARY TO CONTROL FUGITIVE DUST EMISSIONS TO MINIMIZE REDUCTIONS IN VISIBILITY AND THE AIRBORNE DISBURSEMENT OF FINE-GRAINED SOILS. THIS IS PARTICULARLY IMPORTANT ALONG THE ADJACENT STREETS.

THESE MEASURES MAY ALSO BE REQUIRED IN THE SPRING AND FALL DURING THE DRIER PERIODS OF THESE SEASONS.

PERMANENT EROSION CONTROL MEASURES

THE FOLLOWING PERMANENT EROSION CONTROL MEASURES HAVE BEEN DESIGNED AS PART OF THE EROSION/SEDIMENTATION CONTROL PLAN:

1. ALL STORM DRAIN PIPES SHALL HAVE RIPRAP APRONS AT THEIR OUTLET TO PROTECT THE OUTLET AND RECEIVING CHANNEL OF THE CULVERTS FROM SCOUR AND DETERIORATION. INSTALLATION DETAILS ARE PROVIDED IN THE PLAN SET. THE APRONS SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING RUNOFF TO THE TRIBUTARY PIPE OR CULVERT.
2. ALL AREAS DISTURBED DURING CONSTRUCTION, BUT NOT SUBJECT TO OTHER RESTORATION (PAVING, RIPRAP, ETC.) WILL BE LOAMED, LIMED, FERTILIZED, MULCHED, AND SEEDED. FABRIC NETTING, ANCHORED WITH STAPLES, SHALL BE PLACED OVER THE MULCH IN AREAS WHERE THE FINISH GRADE SLOPE IS GREATER THAN 10 PERCENT. NATIVE TOPSOIL SHALL BE STOCKPILED AND TEMPORARILY STABILIZED WITH SEED AND MULCH AND REUSED FOR FINAL RESTORATION WHEN IT IS OF SUFFICIENT QUALITY.

TIMING AND SEQUENCE OF EROSION/SEDIMENTATION CONTROL MEASURES

THE FOLLOWING GENERAL CONSTRUCTION SEQUENCE SHALL BE REQUIRED TO ENSURE THE EFFECTIVENESS OF THE EROSION AND SEDIMENTATION CONTROL MEASURES ARE OPTIMIZED. THE CONTRACTOR SHALL USE THIS SEQUENCE TO FORM THE BASIS OF THEIR CONSTRUCTION SCHEDULE, WHICH SHALL BE PROVIDED FOR THE OWNER'S REVIEW.

NOTE: FOR ALL GRADING-RELATED ACTIVITIES, THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION NOT TO OVEREXPOSE THE SITE BY LIMITING THE DISTURBED AREA. THE CONTRACTOR SHALL STABILIZE ANY STEEP SLOPES (>3:1) WITHIN 24 HOURS IF FINAL STAGE GRADING AND STABILIZATION WILL NOT BE COMPLETED WITHIN 7 DAYS. ALL SLOPES THAT HAVE REACHED FINAL GRADE SHALL HAVE PERMANENT STABILIZATION MEASURES INSTALLED WITHIN 7 DAYS OF COMPLETION.

1. INSTALL AND MAINTAIN CRUSHED STONE STABILIZED CONSTRUCTION ENTRANCE AS SHOWN ON THE GRADING & DRAINAGE PLAN AT ALL DESIGNATED ACCESS POINTS.
2. INSTALL ALL SAFETY AND CONSTRUCTION FENCING TO SECURE ACTIVE CONSTRUCTION AREAS.
3. INSTALL SILTATION FENCE OR OTHER SILTATION BARRIER.
4. CONDUCT DEMOLITION ACTIVITIES AND EARTHWORK TO BRING SITE AREAS TO SUBGRADE.
5. INSTALL STONE CHECK DAMS OR EQUIVALENT VELOCITY-REDUCING MEASURE AT ANY CONCENTRATED FLOW DISCHARGE POINTS.
6. INSTALL STORM DRAIN AND APPURTENANCE STRUCTURES, UNDERGROUND ELECTRIC, FOUNDATIONS, IRRIGATION AND OTHER UTILITY WORK. INSTALL INLET AND OUTLET PROTECTION IMMEDIATELY AFTER THE INSTALLATION OF ANY CULVERTS.
7. REMOVE, REPAIR OR RELOCATE TEMPORARY EROSION CONTROL MEASURES THROUGHOUT THE COURSE OF EARTHWORK ACTIVITY AS NECESSARY TO MINIMIZE EROSION AND SEDIMENT TRANSPORT ACROSS THE SITE.
8. THE TEMPORARY PLACEMENT OF EROSION CONTROL MEASURES SUCH AS, BUT NOT LIMITED TO, MULCH, EROSION CONTROL BLANKET, CRUSHED STONE, SOD OR OTHER MEASURE SHALL BE INSTALLED WITHIN 7 DAYS OF REACHING FINAL GRADE OR IN ADVANCE OF PREDICTED RAINFALL EVENT OF 0.5" OR GREATER.
9. BRING SITE TO SUBGRADE AND COMPLETE TEMPORARY SLOPE STABILIZATION AS NECESSARY IF SLOPES WILL NOT BE ACTIVELY WORKED WITHIN 7 DAYS.
10. COMPLETE DRIVEWAY CONSTRUCTION GRAVELS.
11. CONSTRUCT OTHER SITE IMPROVEMENTS AND UTILITIES.
12. INSTALL PAVEMENT AS DETAILED ON THE SITE PLANS.
13. COMPLETE LANDSCAPE PLANTING.
14. LOAM, LIME, FERTILIZE, SEED, AND MULCH ALL REMAINING DISTURBED AND DENUDED AREAS.
15. REMOVE ACCUMULATED SEDIMENT FROM SILT BARRIERS.
16. REEVALUATE STABILITY OF THE SITE. IF A 90% CATCH OF GRASS IS ACHIEVED, REMOVE TEMPORARY EROSION CONTROL DEVICES INCLUDING ALL SILT BARRIERS, CONSTRUCTION ENTRANCES, ETC.

SOIL WILL BE CONSIDERED DISTURBED IF IT DOES NOT HAVE AN ESTABLISHED STAND OF VEGETATION COVERING AT LEAST 90% OF THE SOIL SURFACE OR HAS NOT BEEN MULCHED WITH HAY APPLIED AT A RATE OF 230 LB/1,000 SQ. FT.

CONSTRUCTION PROCEDURE

THE PROJECT WILL BE CONSTRUCTED BY A GENERAL CONTRACTOR UNDER CONTRACT TO RSU 14. THE CONTRACTOR SHALL SUBMIT A SCHEDULE FOR THE COMPLETION OF THE WORK THAT WILL SATISFY THE FOLLOWING CRITERIA:

1. THE ABOVE CONSTRUCTION SEQUENCE SHOULD GENERALLY BE COMPLETED IN THE SPECIFIED ORDER; HOWEVER, SEVERAL SEPARATE ITEMS MAY BE CONSTRUCTED SIMULTANEOUSLY. WORK MUST ALSO BE SCHEDULED OR PHASED TO LIMIT THE EXTENT OF THE EXPOSED AREAS AS SPECIFIED BELOW. THE INTENT OF THIS SEQUENCE IS TO PROVIDE FOR EROSION CONTROL AND TO HAVE STRUCTURAL MEASURES SUCH AS SILT FENCE AND CONSTRUCTION ENTRANCES IN PLACE BEFORE LARGE AREAS OF LAND ARE DENUDED.
2. THE WORK SHALL BE CONDUCTED IN SECTIONS WHICH WILL:
  - a) LIMIT THE AMOUNT OF EXPOSED AREA TO THOSE AREAS IN WHICH WORK IS EXPECTED TO BE UNDERTAKEN DURING THE PROCEEDING 30 DAYS.
  - b) REVEGETATE DISTURBED AREAS AS RAPIDLY AS POSSIBLE. ALL AREAS SHALL BE PERMANENTLY STABILIZED WITHIN 7 DAYS OF FINAL GRADING OR BEFORE A PREDICTED STORM EVENT, OR TEMPORARILY STABILIZED WITHIN 14 DAYS FOR ALL OTHER AREAS.
  - c) INCORPORATE PLANNED INLETS AND DRAINAGE SYSTEM AS EARLY AS POSSIBLE INTO THE CONSTRUCTION PHASE. THE DITCHES SHALL BE IMMEDIATELY LINED OR REVEGETATED AS SOON AS THEIR INSTALLATION IS COMPLETE.
3. THE AREA OF DENUDED NON-STABILIZED CONSTRUCTION SHALL BE LIMITED TO THE MINIMUM AREA PRACTICABLE. AN AREA SHALL BE CONSIDERED TO BE DENUDED UNTIL THE SUBBASE GRAVEL IS INSTALLED, OR THE AREAS OF FUTURE LOAM AND SEED HAVE BEEN LOAMED, SEEDED, AND MULCHED. THE MULCH RATE SHALL BE TWICE THE RATE SPECIFIED IN THE SEEDING PLAN. [FOR EXAMPLE, 115#/1,000 S.F. X 2 = 230#/1,000 S.F.]
4. THE CONTRACTOR MUST MAINTAIN AN ACCURATE SET OF RECORD DRAWINGS INDICATING THE DATE WHEN AN AREA IS FIRST DENUDED, THE DATE OF TEMPORARY STABILIZATION, AND THE DATE OF FINAL STABILIZATION. ON OCTOBER 1 OF ANY CALENDAR YEAR, THE CONTRACTOR SHALL SUBMIT A DETAILED PLAN FOR STABILIZING THE SITE FOR THE WINTER AND A DESCRIPTION OF WHAT ACTIVITIES ARE PLANNED DURING THE WINTER.
5. THE CONTRACTOR MUST INSTALL ANY ADDED MEASURES WHICH MAY BE NECESSARY TO CONTROL EROSION/SEDIMENTATION FROM THE SITE DEPENDENT UPON THE ACTUAL SITE AND WEATHER CONDITIONS.

WATER QUALITY FILTER

1. SPECIFIC DESIGN CRITERIA

- A. UNDERDRAIN PIPE: PROPER LAYOUT OF THE PIPE UNDERDRAIN SYSTEM IS NECESSARY TO EFFECTIVELY DRAIN THE ENTIRE FILTER AREA. THERE MUST BE AT LEAST ONE LINE OF UNDERDRAIN PIPE FOR EVERY EIGHT FEET OF FILTER AREA'S WIDTH. THE SLOPE OF THE INSTALLED UNDERDRAIN PIPE MUST BE POSITIVE. THE UNDERDRAIN PIPING SHOULD BE 4" TO 6" SLOTTED, RIGID SCHEDULE 40 PVC OR SDSS. STRUCTURE JOINTS SHALL BE SEALED SO THAT THEY ARE WATERTIGHT.
- B. PIPE BEDDING AND TRANSITION ZONE: THE 4 TO 6 INCH DIAMETER PERFORATED UNDERDRAIN PIPE(S) MUST BE BEDDED IN 12 TO 14 INCHES OF UNDERDRAIN MATERIAL WITH AT LEAST 4 INCHES OF MATERIAL BENEATH THE PIPE AND 4 INCHES ABOVE.

THE UNDERDRAIN MATERIAL CONSISTS OF WELL GRADED, CLEAN, COARSE GRAVEL MEETING THE MEDOT SPECIFICATION 703.22 UNDERDRAIN TYPE B FOR UNDERDRAIN BACKFILL. THE MATERIAL MUST CONTAIN LESS THAN 5% FINES PASSING THE #200 SIEVE. NO TRANSITION ZONE IS NECESSARY SINCE THE DRAINAGE PIPE IS BEDDED IN LESS PERVIOUS GRAVEL AND THIS DESIGN IS ACCEPTABLE FOR AREAS WHERE THE HEAD OR DEPTH TO SEASONAL HIGH GROUNDWATER IS CLOSE TO THE BOTTOM OF THE DRAINAGE LAYER. UNDERDRAIN PIPES MUST BE PLACED NO FURTHER THAN 6 FEET APART.

- C. CLAY CONTENT: USE OF SOILS WITH MORE THAN 2 % CLAY CONTENT COULD CAUSE FAILURE OF THE SYSTEM AND CARE SHOULD BE TAKEN, ESPECIALLY IN AREAS WHERE THE PREDOMINANT SOIL CONTAINS MARINE CLAY, THAT THE SAND AND TOPSOIL USED IN THE MIXTURE HAVE VERY LITTLE OR NO CLAY CONTENT.

- D. FILTER PERMEABILITY: THE FILTER MUST BE PERMEABLE ENOUGH TO INSURE DRAINAGE WITHIN 48 HOURS MAXIMUM, YET HAVE SUFFICIENT FINES TO INSURE FILTRATION OF FINE PARTICLES AND REMOVAL OF DISSOLVED POLLUTANTS. THE DESIGN MAY EITHER RELY ON THE SOIL PERMEABILITY, IF KNOWN, TO PROVIDE THE SLOW RELEASE OF THE WATER TREATMENT VOLUME OVER A MINIMUM OF 24 HOURS, OR MAY INSURE THIS RATE BY INSTALLING A CONSTRUCTIVE ORIFICE OR VALVE ON THE UNDERDRAIN OUTLET. IN DETERMINING THE PERMEABILITY OF THE MEDIA, THE PERCENT FINES OF THE MIXTURE AND THE LEVEL OF COMPACTION SHOULD BE CONSIDERED. GENERALLY, THE SOIL MEDIA SHOULD BE ONLY LIGHTLY COMPACTED BETWEEN 90 AND 92% STANDARD PROCTOR (ASTM D698) AND SHALL HAVE A PERMEABILITY OF 2.4 INHR TO 4 INHR.

- E. GRADATION TESTING: GRADATION TESTS, INCLUDING HYDROMETER TESTING FOR CLAY CONTENT, AND PERMEABILITY TESTING OF THE SOIL FILTER MATERIAL, SHALL BE PERFORMED BY A QUALIFIED SOIL TESTING LABORATORY AND SUBMITTED TO THE PROJECT ENGINEER FOR REVIEW BEFORE PLACEMENT AND COMPACTION.

- F. GEOTEXTILE FABRIC: A GEOTEXTILE FABRIC WITH SUITABLE CHARACTERISTICS MAY BE PLACED BETWEEN THE SIDES OF THE FILTER LAYER AND ADJACENT SOIL. THE FABRIC WILL PREVENT THE SURROUNDING SOIL FROM MIGRATING INTO AND CLOGGING THE FILTER AND CLOGGING THE OUTLET. OVERLAP SEAMS MUST BE A MINIMUM OF 12 INCHES. DO NOT WRAP FABRIC OVER THE TOP OF THE PIPE BEDDING AS IT WILL CAUSE CLOGGING AND WILL PREVENT FLOWS OUT OF THE FILTER. THE GEOTEXTILE FABRIC SHALL BE MIRA1 170K OR EQUIVALENT.

2. CONSTRUCTION CRITERIA

- A. Basin Excavation: THE AREA OF THE BASIN MAY BE EXCAVATED IN PREPARATION OF THE INSTALLATION OF THE UNDERDRAIN AND CAN BE USED AS A SEDIMENT TRAP FOR THE SITE DURING CONSTRUCTION. AFTER EXCAVATION OF THE BASIN, THE OUTLET STRUCTURE AND PIPING SYSTEM MUST BE INSTALLED AT THE APPROPRIATE ELEVATION AND PROTECTED WITH A SEDIMENT BARRIER. IF THE BASIN IS TO BE USED AS A SEDIMENT TRAP, THE SIDES OF THE EMBANKMENTS MUST BE MULCHED AND MAINTAINED TO PREVENT EROSION.

- B. 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 8 INCHES TO PREVENT POCKETS OF LOOSE MEDIA.

- C. CONSTRUCTION SEQUENCE: EROSION AND SEDIMENTATION FROM UNSTABLE SUBCATCHMENTS IS THE MOST COMMON REASON FOR FILTER FAILURE. NOT HEEDING THE CONSTRUCTION SEQUENCING CRITERIA IS LIKELY TO RESULT IN THE NEED TO REPLACE THE SOIL FILTER. 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. OTHERWISE, THE RUNOFF FROM THE CONTRIBUTING DRAINAGE AREA MUST BE DIVERTED AROUND THE FILTER UNTIL STABILIZATION IS COMPLETED UNLESS THE DEPARTMENT HAS DETERMINED, ON A CASE-BY-CASE BASIS, THAT SUFFICIENT MEASURES ARE BEING TAKEN TO PREVENT EROSION OF MATERIAL FROM THE UNSTABLE CATCHMENT AREA AND DEPOSITION ON THE FILTER.

- D. REMEDIAL LOAM COVER: TO RAPIDLY ESTABLISH VEGETATION IN THE FILTER AREA, THE CONTRACTOR WILL INSTALL A 2-3 INCH LAYER OF SANDY LOAM TOPSOIL (WITH LESS THAN 2% CLAY AS TESTED VIA HYDROMETER TEST) ABOVE THE GRASS FILTER PRIOR TO SEEDING, MULCHING, AND ANCHORING EROSION CONTROL MESH.

- E. 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:

SUBMIT SAMPLES 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 ASTM C136 (STANDARD TEST METHOD FOR SIEVE ANALYSIS OF FINE AND COARSE 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.

3. MAINTENANCE CRITERIA

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.

MOWING OF A GRASSED BASIN CAN OCCUR SEMIANNUALLY TO A HEIGHT NO LESS THAN 6 INCHES.

ANY BARE AREA OR EROSION RILLS SHALL BE REPAIRED WITH NEW FILTER MEDIA OR SANDY LOAM THEN SEEDED AND MULCHED.

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 IF EXTENDED PONDING IS OBSERVED.

- A. MAINTENANCE AGREEMENT: THE SCHOOL DEPT IS RESPONSIBLE FOR INSPECTING AND MAINTAINING ANY UNDERDRAINED FILTER.

- B. SOIL FILTER INSPECTION: THE SOIL FILTER SHOULD BE INSPECTED AFTER EVERY MAJOR STORM IN THE FIRST YEAR TO BE SURE IT IS FUNCTIONING PROPERLY. THEREAFTER, THE FILTER SHOULD BE INSPECTED AT LEAST EVERY SIX MONTHS TO ENSURE THAT IT IS DRAINING WITHIN 48 HOURS FOLLOWING A ONE INCH STORM OR GREATER, AND THAT FOLLOWING STORMS THAT FILL THE SYSTEM TO OVERFLOW, IT DRAINS IN NO LESS THAN 36 TO 60 HOURS. IF THE SYSTEM DRAINS TOO FAST, AN ORIFICE MAY NEED TO BE ADDED ON THE UNDERDRAIN OUTLET OR, IF ALREADY PRESENT, MAY NEED TO BE MODIFIED.

- C. SOIL FILTER REPLACEMENT: THE TOP SEVERAL INCHES OF THE FILTER SHALL BE REPLACED WITH FRESH MATERIAL WHEN WATER PONDS ON THE SURFACE OF THE BED FOR MORE THAN 72 HOURS. THE REMOVED SEDIMENTS SHOULD BE DISPOSED OF IN AN ACCEPTABLE MANNER.

- D. MOWING: IF MOWING IS DESIRED, ONLY HANDHELD STRING TRIMMERS OR PUSH-MOWERS ARE ALLOWED ON THE FILTER (NO TRACTOR) AND THE GRASS BED SHOULD BE MOWED NO MORE THAN 2 TIMES PER GROWING SEASON TO MAINTAIN GRASS HEIGHTS OF NO LESS THAN 6 INCHES.

- E. FERTILIZATION: FERTILIZATION OF THE UNDERDRAINED FILTER AREA SHOULD BE AVOIDED UNLESS ABSOLUTELY NECESSARY TO ESTABLISH VEGETATION.

- F. 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. ADD NEW MULCH ONLY AS NECESSARY FOR BIORETENTION CELL.

THE CONTRACTOR HAS SOLE RESPONSIBILITY FOR COMPLYING WITH THE EROSION/SEDIMENT CONTROL REPORT, INCLUDING CONTROL OF FUGITIVE DUST, AND SHALL BE RESPONSIBLE FOR ANY MONETARY PENALTIES RESULTING FROM FAILURE TO COMPLY WITH THESE STANDARDS.

PERMANENT SEEDING PLAN

PROJECT: GRAVEL LOT NORTHEAST OF FIELD #10

SITE LOCATION: WINDHAM, MAINE

\_\_\_ X \_\_\_ PERMANENT SEEDING \_\_\_ TEMPORARY SEEDING

1. INSTRUCTIONS ON PREPARATION OF SOIL: PREPARE A GOOD SEED BED FOR PLANTING METHOD USED.
2. APPLY LIME AS FOLLOWS: \_\_\_ #ACRES, OR \_\_\_ 115# /M SQ. FT. OR PER SOIL TEST
3. FERTILIZE WITH: \_\_\_ 1.0 \_\_\_ POUND OF ACTIVE N#1000 S.F. OF 10-20-20 (N-P20-K20).
4. METHOD OF APPLYING LIME AND FERTILIZER: SPREAD AND WORK INTO THE SOIL BEFORE SEEDING.

5. SEED WITH THE FOLLOWING MIXTURE:

35% TALL FESCUE  
30% CREEPING RED FESCUE  
20% PERENNIAL RYEGRASS  
15% ANNUAL RYEGRASS

6. MULCHING INSTRUCTIONS: APPLY AT THE RATE OF \_\_\_ 115# POUNDS PER M. SQ. FT.

7. APPLICATION:

TYPE/UNIT # (LBS./APPLICATION RATE)

TOTAL LIME 115#/1,000 S.F.  
TOTAL FERTILIZER 1.0 LB. ACTIVE N#1,000 S.F.  
TOTAL SEED 5.0#/1,000 S.F.  
TOTAL MULCH 115#/1,000 S.F.

PERMANENT SEEDING PLAN (UNDERDRAINED FILTER BEDS)

PROJECT: GRAVEL LOT NORTHEAST OF FIELD #10

SITE LOCATION: WINDHAM, MAINE

\_\_\_ X \_\_\_ PERMANENT SEEDING \_\_\_ TEMPORARY SEEDING

1. AREA TO BE SEEDED: UNDERDRAINED FILTERED BEDS. APPROXIMATELY \_\_\_ 0.03 \_\_\_ ACRE(S) OR \_\_\_ /M. SQ. FT.
2. INSTRUCTIONS ON PREPARATION OF SOIL: PREPARE A GOOD SEED BED FOR PLANTING METHOD USED.
3. APPLY LIME AS FOLLOWS: \_\_\_ #ACRES OR \_\_\_ 115# /M SQ. FT. OR PER SOIL TEST
4. FERTILIZE: \_\_\_ POUNDS OF \_\_\_ - \_\_\_ N-P-K/AC.

0 POUNDS OF 10-0-20 N-P-K/M SQ. FT. OR PER SOIL TEST

5. METHOD OF APPLYING LIME AND FERTILIZER: SPREAD AND WORK INTO THE SOIL BEFORE SEEDING.

6. SEED WITH THE FOLLOWING MIXTURE:

NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR MOIST SITES AS MANUFACTURED BY "NEW ENGLAND WETLAND PLANTS, INC. - AMHERST, MA" CONSISTING OF THE FOLLOWING SPECIES:

SWITCHGRASS	N. ENGLAND ASTER
VA. WILD RYE	GRASS-LEAVED GOLDENROD
CREEPING RED FESCUES	NODDING BUR MARIGOLD
FOX SEDGE	GREEN BULRUSH
CREEPING BENTGRASS	JOE-PYE WEED
SOFT RUSH	BONASET



WATER QUALITY FILTER CALCULATIONS			
<b>REQUIRED TREATMENT VOLUME:</b>			
<b>IMPERVIOUS VOLUME</b>	<b>LANDSCAPED VOLUME</b>	<b>REQUIRED TREATMENT VOLUME</b>	<b>*ACTUAL TREATMENT VOLUME</b>
1,530 cf (18,360 sf x 1")	610 cf (18,282 sf x 0.4")	2,140 cf	3,550 cf
<b>*ACTUAL TREATMENT VOLUME:</b>			
<b>FILTER ELEVATION</b>	<b>SURFACE AREA</b>	<b>CUMULATIVE VOLUME</b>	
269.50	**1,315 sf	0 cf	
270.00	1,845 sf	790 cf	
271.00	2,400 sf	2,913 cf	
271.25	2,700 sf	3,550 cf	
<b>REQUIRED FILTER AREA:</b>			
<b>IMPERVIOUS AREA</b>	<b>LANDSCAPED AREA</b>	<b>REQUIRED FILTER AREA</b>	<b>**ACTUAL FILTER AREA</b>
918 sf (18,360 x 5%)	366 sf (18,282 x 2%)	1,284 sf	1,315 sf
<b>AREAS OF TREATMENT</b>			
<b>POST-DEVELOPMENT:</b>			
<b>IMPERVIOUS AREA</b>	<b>TREATED IMPERVIOUS</b>	<b>% IMPERVIOUS TREATED</b>	<b>REQUIRED TREATMENT</b>
19,660 sf	18,360 sf	*93.39%	95%
<b>NEW LANDSCAPED AREA</b>	<b>TREATED NEW LANDSCAPE</b>	<b>% NEW LANSCAPE TREATED</b>	<b>REQUIRED TREATMENT</b>
22,152 sf	18,282 sf	82.53%	80%
* 0.08 ACRES OF EXISTING DRIVEWAY WILL BE REMOVED PRIOR TO THE GRAVEL LOT CONSTRUCTION, THIS AREA OFFSETS THE 0.01 ACRES OF ADDITIONAL TREATMENT NEEDED TO MEET THE 95% IMPERVIOUS TREATMENT REQUIREMENT.			
<b>FLOOD ANALYSIS</b>			
<b>PRE-DEVELOPMENT:</b>			
<b>POINT OF INTEREST</b>	<b>STORM EVENT</b>		
1	<b>2 YEAR</b>	<b>10 YEAR</b>	<b>25 YEAR</b>
	1.37 cfs	3.86 cfs	5.19 cfs
<b>POST-DEVELOPMENT:</b>			
<b>POINT OF INTEREST</b>	<b>STORM EVENT</b>		
1	<b>2 YEAR</b>	<b>10 YEAR</b>	<b>25 YEAR</b>
	0.62 cfs	3.52 cfs	5.88 cfs

WATERSHED LEGEND

- WATERSHED BOUNDARY
- A → B

WATERSHED FLOW PATH
- A

EXISTING SUBCATCHMENT
- A

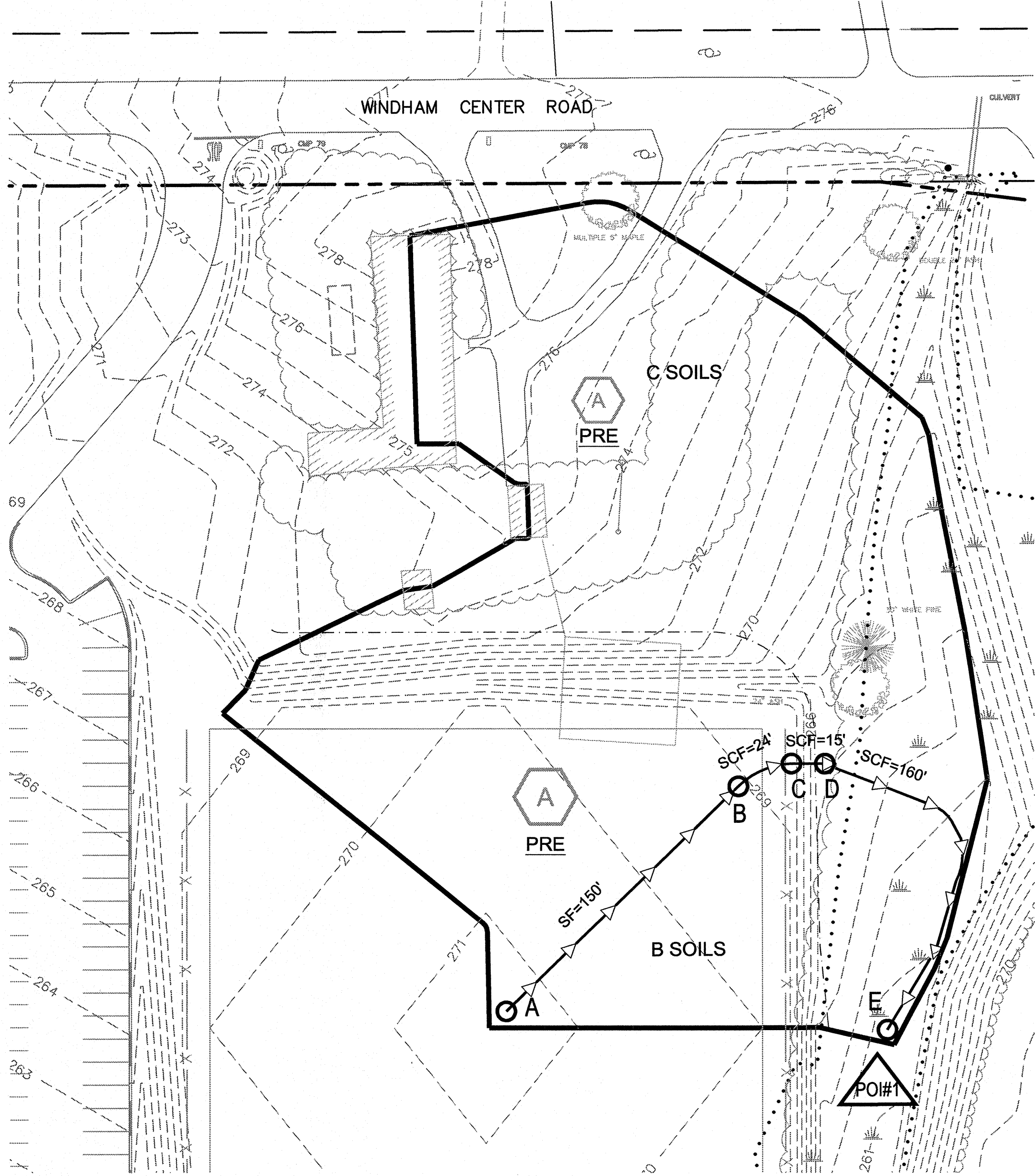
PROPOSED SUBCATCHMENT
- 1

REACH
- SF

SHEET FLOW
- SCF

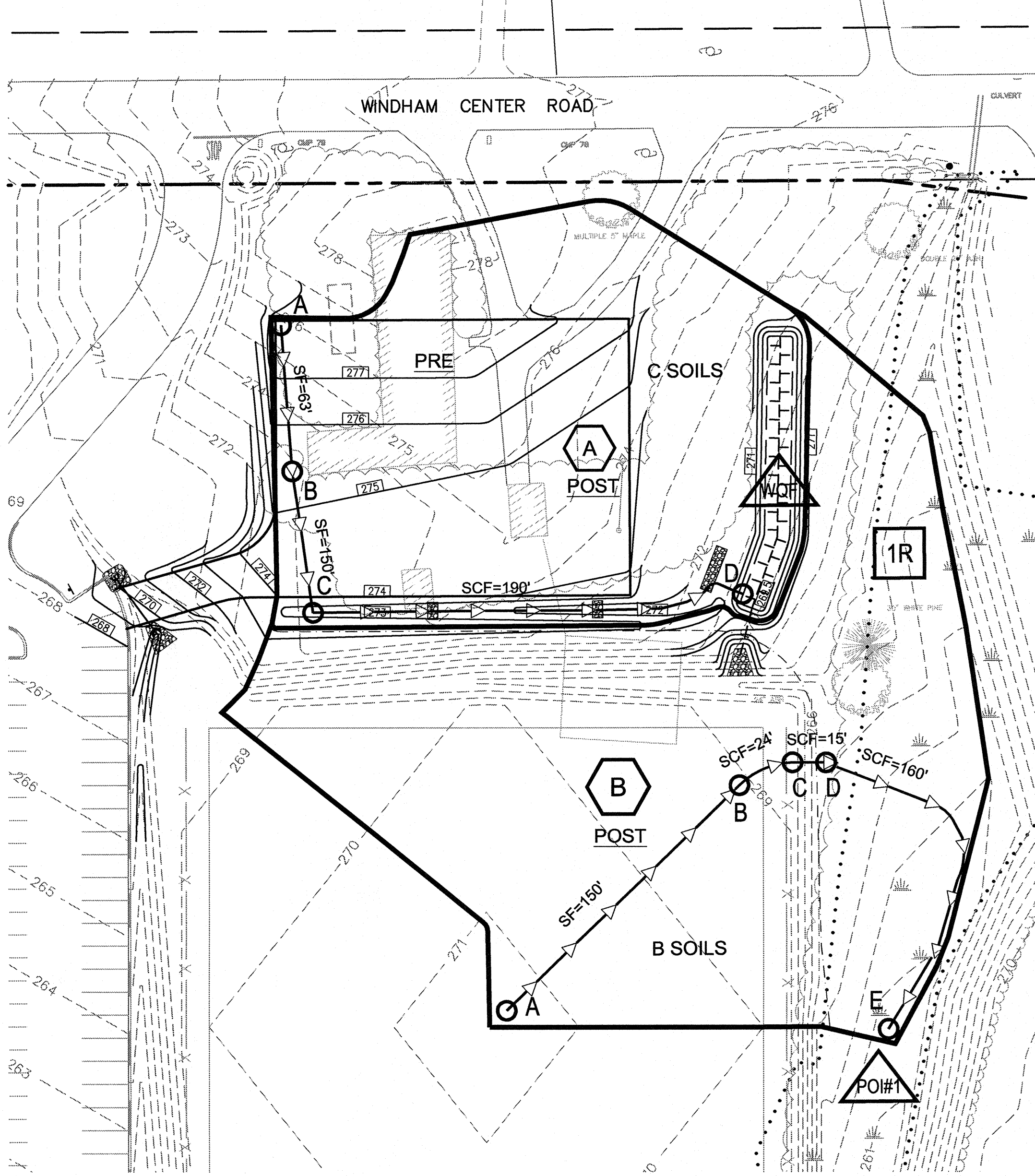
SHALLOW CONCENTRATED FLOW
- 1

POND



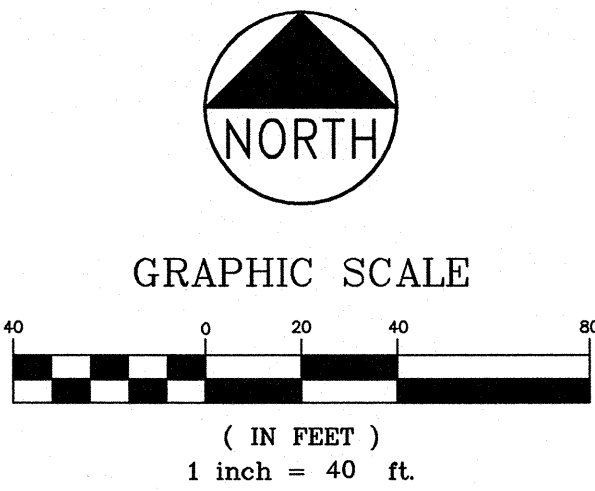
PRE-DEVELOPMENT WATERSHED PLAN



SCALE: 1" = 40'



POST-DEVELOPMENT WATERSHED PLAN

SCALE: 1" = 40'



								DeLUCA-HOFFMAN ASSOCIATES, INC. 778 MAIN STREET, SUITE 8 SOUTH PORTLAND, ME 04106 207.775.1121 WWW.DELUCAHOFFMAN.COM	
						PROJECT GRAVEL PARKING NORTHEAST OF FIELD #10 WATER QUALITY PLAN			
						SHEET TITLE  WATER QUALITY PLAN			
1		08.12.11	SUBMITTED TO MADEP FOR APPROVAL	P.E. DWIGHT D. ANDERSON LIC. #9275		CLIENT RSU #14 WINDHAM SCHOOL CAMPUS		DRAWN: PBF    DATE: 08.09.11	
REV		DATE	DESCRIPTION	LIC. #9275				DESIGNED: OSC    SCALE: 1"=40'	
		REVISIONS						CHECKED: OSC    JOB NO. 2146.19	
								FILE NAME: 2146.19-SP.DWG	
								SHEET FIGURE 6	