

**Date: 3/26/12**

**Subject: Crosswalk Church YC060**

**To: JCC Stormwater Division**

**From: Tina Creech – JCC ERP**

**Comments: Mylar included**

D/E  
SWMP  
2/11/13  
JMP

TRANSMITTAL

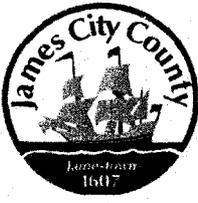
**DATE:** March 22, 2011  
**TO:** Records Management  
JCSA  
Fire  
Environmental  
Stormwater

Environmental Division

MAR 22 2011

RECEIVED

**FROM:** Jennifer VanDyke, Administrative Services Coordinator  
**SUBJECT:** SP-0095-2010, Crosswalk Church Parking Expansion  
**TAX ID:** 2321100001b  
**ACTION:** For your files.



COUNTY OF JAMES CITY, VIRGINIA

DECLARATION OF COVENANTS  
INSPECTION/MAINTENANCE OF DRAINAGE SYSTEM

**Please type or print legibly in black ink. Covenantor(s) should submit this form to the JCC Environmental Division, 101-E Mounts Bay Road, Williamsburg, VA 23185.**

THIS DECLARATION OF COVENANTS, made this 3rd day of February, 2011,  
between Crosswalk Community Church, Incorporated, and all successors in interest,  
("COVENANTOR(S)"), owner(s) of the following property:

Parcel Identification Number: 2321100001B

Legal Description: Parcel B containing 8.78 acres shown on Plat as recorded instrument no: 060013607

Project or Subdivision Name: Crosswalk Community Church Parking Expansion

Document/Instrument No. 060026982 or Deed Book \_\_\_\_\_, Page No. \_\_\_\_\_,  
and the County of James City, Virginia ("COUNTY.")

WITNESSETH:

I (We), the COVENANTOR(S), with full authority to execute deeds, mortgages, other covenants, and all rights, titles and interests in the property described above, do hereby covenant with the COUNTY as follows:

1. The COVENANTOR(S) shall provide maintenance for the drainage system including any runoff control facilities, conveyance systems and associated easements, hereinafter referred to as the "SYSTEM," located on and serving the above-described property to ensure that the SYSTEM is and remains in proper working condition in accordance with approved design standards, and with the law and applicable executive regulations. The SYSTEM shall not include any elements located within any Virginia Department of Transportation rights-of-way.

2. If necessary, the COVENANTOR(S) shall levy regular or special assessments against all present or subsequent owners of property served by the SYSTEM to ensure that the SYSTEM is properly maintained.

3. The COVENANTOR(S) shall provide and maintain perpetual access from public right-of-ways to the SYSTEM for the COUNTY, its agent and its contractor.

4. The COVENANTOR(S) shall grant the COUNTY, its agent and its contractor a right of entry to the SYSTEM for the purpose of inspecting, monitoring, operating, installing, constructing, reconstructing, maintaining or repairing the SYSTEM.

5. If, after reasonable notice by the COUNTY, the COVENANTOR(S) shall fail to maintain the SYSTEM in accordance with the approved design standards and with the law and applicable executive regulations, the COUNTY may perform all necessary repair or maintenance work, and the COUNTY may assess the COVENANTOR(S) and/or all property served by the SYSTEM for the cost of the work and any applicable penalties.

6. The COVENANTOR(S) shall indemnify and save the COUNTY harmless from any and all claims for damages to persons or property arising from the installation, construction, maintenance, repair, operation or use of the SYSTEM.

7. The COVENANTOR(s) shall promptly notify the COUNTY when the COVENANTOR(S) legally transfers any of the COVENANTOR(S) responsibilities for the SYSTEM. The COVENANTOR(S) shall supply the COUNTY with a copy of any document of transfer, executed by both parties.

8. The covenants contained herein shall run with the land and shall bind the COVENANTOR(S) and the COVENANTOR(S)' heirs, executors, administrators, successors and assignees, and shall bind all present and subsequent owners of property served by the SYSTEM.

9. This COVENANT shall be recorded in the County Land Records.

IN WITNESS WHEREOF, the COVENANTOR(S) has executed this DECLARATION OF COVENANTS as of the date first above written.

COVENANTOR(S)

Lloyd D. Hansen  
Signature

Lloyd Hansen, Manager

Print Name and Title

ACKNOWLEDGMENT

COMMONWEALTH OF VIRGINIA  
CITY/COUNTY OF Williamsburg, to wit:

I hereby certify that on this 8 day of February, 2011, before the subscribed, a Notary Public for the Commonwealth of Virginia, personally appeared Lloyd D. Hansen and did acknowledge the foregoing instrument to be his/her Act.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal this 8 day of February, 2011.



Darlene Gay Ashley  
NOTARY PUBLIC  
Commonwealth of Virginia  
Reg. #7345376  
My Commission Expires  
November 30, 2014

Darlene Gay Ashley  
Notary Public

Notary Registration Number: 7345376  
My Commission expires: 11-30-2014

Approved as to form:

Blankinsman  
County Attorney

This Declaration of Covenants prepared by:

Signature: Ashby Walbre Print Name and Title: Ashby Walbre Deal Manager  
Address: 15871 City View Drive, Suite 300, Midlothian, VA 23113  
Phone Number: (804) 419-0723

Drainage1\_pre\_doc  
(Revised 9-5-08)

060 026982

THIS DEED IS EXEMPT FROM RECORDATION TAXES UNDER THE CODE OF  
VIRGINIA § 58.1-811 (A)(2)

DEED

Tax Map No. 2321100001B

Consideration: \$4,460,000.00  
Assessment \$3,402,500.00

THIS DEED, made this twentieth day of October, 2006, by and between KIP DEVELOPMENT COMPANY, L.L.C., a North Carolina limited liability company, Grantor, and CROSS WALK COMMUNITY CHURCH, INCORPORATED, a Virginia corporation, Grantee, the address for which is P O Box 6421, Williamsburg, VA 23188.

WITNESSETH:

That for and in consideration of the sum of Ten and 00/100 Dollars (\$10.00), cash in hand paid, and other good and valuable consideration, the receipt of which is hereby acknowledged, the said Grantor does grant and convey, with SPECIAL WARRANTY OF TITLE unto the said Grantee, the following described property, to-wit:

See Attached Schedule "A"

Together with all and singular the buildings and improvements thereon, the tenements, hereditaments and appurtenances thereunto belonging or in anywise appertaining.

Subject to restrictions, covenants, conditions and easements of record contained in duly recorded deeds, plats and other instruments constituting actual or constructive notice in the chain of title to the property hereby conveyed, which have not expired or have otherwise become ineffective.

This conveyance is made subject to all easements, restrictions and limitations of record or apparent on the ground.

193

WITNESS the following signature and seal:

KTP DEVELOPMENT COMPANY, L.L.C., a  
North Carolina limited liability company

 (SEAL)  
Alex G. Perkins, Manager

STATE OF VIRGINIA

CITY OF WILLIAMSBURG

The foregoing instrument was acknowledged before me this 25<sup>th</sup> day of October,  
2006, by Alex G. Perkins, Manager, KTP Development Company, L.L.C., a North Carolina  
limited liability company

My commission expires: 10/31/2010

  
NOTARY PUBLIC



Prepared by and return to:  
Geddy Harris Franck & Hickman, L. L. P  
1177 Jamustown Road  
Williamsburg, VA 23185  
757-220-6500  
FILE #5996-5-6 SMF JL

203

SCHEDULE A

All that certain piece, parcel or lot of land situate in James City County, Virginia, set out and described as Parcel B as shown on a certain plat entitled "PLAT OF SUBDIVISION & PROPERTY LINE EXTINGUISHMENT BETWEEN THE PROPERTIES OWNED BY JOHN B. BARNETT JR., CHICKASAW, L.L.C. AND BARNETT DEVELOPMENT COMPANY, INC., POWHATAN DISTRICT, JAMES CITY COUNTY, VIRGINIA" dated April 4, 2006 and made by AES Consulting Engineers of Williamsburg, Virginia, recorded in the Clerk's Office of the Circuit Court for the City of Williamsburg and County of James City, Virginia as Instrument Number 060013607.

BEING a portion of the same property conveyed to KIP Development Company, L.L.C., a North Carolina limited liability company, by Deed of Distribution dated June 9, 2006, recorded on June 27, 2006, in the aforesaid Clerk's Office as Instrument Number 060015359

VIRGINIA: CITY OF WILLIAMSBURG & COUNTY OF JAMES CITY  
This document was admitted to record on 27 Nov 06  
at 11:18 AM. The taxes imposed by Virginia Code  
Section 58.1-801, 58.1-802 & 58.1-814 have been paid.

STATE TAX	LOCAL TAX	ADDITIONAL TAX
		4,460. <sup>00</sup>

TESTE: BETSY B. WOORIDGE, CLERK  
BY Betsy B. Wooridge Clerk

Issued By:

CHICAGO TITLE INSURANCE COMPANY

Report of Title



Case Number:

28730309B

Customer number:

## LIMITED TITLE REPORT

The Company hereby certifies that we have carefully examined the land records in the Office of the Clerk of Court for the City/County of James City County, Virginia, as same are disclosed by the respective indices thereto for the examination period indicated, with the following report reflecting the status of title to the referenced property as of the date indicated.

Issued to: The Rebkee Company for CVS

1. Owner as Shown on Last Deed of Record:

Cross Walk Community Church, Incorporated, a Virginia corporation by deed from KTP Development Company, L.L.C., a North Carolina limited liability company, dated October 20, 2006, recorded November 2, 2006, as Instrument No. 060026982.

2. Legal Description:

ALL that certain parcel or lot of land situate in James City County, Virginia, set out and described as Parcel B as shown on a certain plat entitled "PLAT OF SUBDIVISION & PROPERTY LINE EXTINGUISHMENT BETWEEN THE PROPERTIES OWNED BY JOHN B. BARNETT, JR., CHICKASAW, L.L.C. AND BARNETT DEVELOPMENT COMPANY, INC., POWHATAN DISTRICT, JAMES CITY COUNTY, VIRGINIA", dated April 4, 2006 and made by AES Consulting Engineers of Williamsburg, Virginia, recorded in the Clerk's Office of the Circuit court for the City of Williamsburg and County of James City, Virginia, as Instrument No. 060013607.

3. The above referenced property is subject to the following:

A. Real Estate Taxes:

This property is tax exempt.

Tax Assessment: 2010/2011

Land	\$902,500.00
Imp	\$2,500,000.00
Total	\$3,402,500.00
Total Tax	\$N/A
Account/Parcel No.	2321100001B
RPC#	30055

Taxes are Exempt - Religious

830 EAST MAIN ST.-16TH FL, RICHMOND, VA 23219

Telephone: (804)643-5404

Fax: (804)521-5756

Issued By:

CHICAGO TITLE INSURANCE COMPANY

Report of Title (cont'd)



Customer number:

Case Number:

28730309B

B. Deed(s) of Trust:

(a) Deed of Trust from Crosswalk Community Church Incorporated, a Virginia nonprofit corporation, a/k/a Cross Walk Community Church, Incorporated to Hunt Title and Escrow Agency, Inc. , Trustee(s) for Assemblies of God Loan Fund, dated August 9, 2010, recorded August 9, 2010, as Instrument No. 100016217, and re-recorded August 25, 2010, as Instrument No. 100017723, securing the principal amount of \$2,037,200.00.

(b) Deed of Trust from Cross Walk Community Church, Incorporated to Andrew M. Franck and Vernon M. Geddy, Trustee(s) for Assemblies of God/Potomac District Council, dated November 13, 2006, recorded November 14, 2006, as Instrument No. 060027694, securing the principal amount of \$100,000.00.

NOTE: By Subordination Agreement dated August 4, 2010, recorded August 9, 2010, as Instrument No. 100016218, the aforesaid Deed of Trust was subordinated to Deed of Trust at Instrument No. 100016217.

C. Financing Statement(s)/Misc. Liens:

NONE

D. Judgments:

NONE

E. Covenants, Conditions and Restrictions:

NONE WITHIN SEARCH PERIOD

OMITTING ANY COVENANTS OR RESTRICTIONS, IF ANY, BASED UPON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, MARITAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, ANCESTRY, OR SOURCE OF INCOME, AS SET FORTH IN APPLICABLE STATE OR FEDERAL LAWS, EXCEPT TO THE EXTENT THAT SAID COVENANT OR RESTRICTION IS PERMITTED BY APPLICABLE LAW.

F. Rights of way/Easements and Reservations:

NONE WITHIN SEARCH PERIOD

830 EAST MAIN ST.-16TH FL, RICHMOND, VA 23219

Telephone: (804)643-5404

Fax: (804)521-5756

Issued By:

CHICAGO TITLE INSURANCE COMPANY

Report of Title (cont'd)



Customer number:

Case Number:

28730309B

G. Easements Per Plat of Subdivision:

Plat recorded as Instrument No. 060013607 shows:

- (a) 100' RPA Buffer
- (b) new 100' ingress & egress easement for the benefit of all parcels (A,B, C, D & E), (Future 100' right-of-way)

H. Objections:

- (1) Rights or claims of parties in possession not shown by the public records.
- (2) Encroachments, overlaps, boundary line disputes, and any other matters which would be disclosed by an accurate survey and inspection of the premises.
- (3) Easements or claims of easements not shown by the public records.
- (4) Any lien, or right to a lien, for services, labor or material heretofore or hereafter furnished, imposed by law, and not shown by the public records.
- (5) Taxes or special exceptions which are not shown as existing liens by the public records.
- (6) The exact acreage or volume of land stated hereinabove is not insured.
- (7) This report does not include a search of the Bankruptcy records.

I. Notes:

This is a current owner report

Examination period from: June 17, 2006 at 8:00 a.m. (START DATE)  
Examination period to: October 26, 2010 at 8:00 a.m. (FINISH DATE)

No liability is assumed with respect to any defects in the title, including but not limited to, liens, encumbrances, restrictive covenants, easements or other matters existing prior to the START DATE.

The Company's liability for this Report is limited to actual losses of the Applicant not to exceed \$500.00. No liability is assumed for items not indexed or mis-indexed, or for matters which would be disclosed by an accurate survey or

830 EAST MAIN ST.-16TH FL, RICHMOND, VA 23219

Telephone: (804)643-5404

Fax: (804)521-5756

Issued By:

CHICAGO TITLE INSURANCE COMPANY

Report of Title (cont'd)



Customer number:

Case Number:

28730309B

inspection of the premises. This Report and the legal description given herein are based upon information supplied by the Applicant as to the location and identification of the premises in question, and no liability is assumed for any discrepancies resulting therefrom. This Report is offered to you as a courtesy, and does not represent either a Commitment to insure title, or an opinion of title, or an opinion as to the marketability of title to the subject premises. In the event that a Title Insurance Commitment is issued in reliance upon the information contained in this Report, then the liability of the Company will be determined solely in accordance with, and subject to, the Requirements, Exceptions and Conditions of the issued Title Insurance Commitment.

COUNTERSIGNED AND VALIDATED 11/03/10 AT 8:00 A.M.

  
Signature

[Home](#) [Search](#) [Disclaimer](#)

[Search Criteria](#) [Search Results](#) [Property Sheet](#) [Map](#)

 **Printer-Friendly**

 **View Property in Interactive Map**

**Parcel ID ?**  
2321100001B

**Tax Account**  
548918

**RPC #**  
30055

[Summary](#) [Improvements](#) [Ownership History](#) [Assessment](#)

**Owner's Name:** CROSS WALK COMMUNITY CHURCH, INCORPO **Property Address:** 7575 RICHMOND ROAD WMSBURG , VA 231881917

**Mailing Address:** 7575 RICHMOND RD  
WILLIAMSBURG , VA 231887226

**Legal Acreage:** 8.72100  
**Legal Description:** P-B BARNETT, CHICKASAW LLC, & BARNETT DEV CO., INC.

**Zoning:** MU Mixed Use  
**Property Class:** 606 Exempt - Religious

**Location**

**Schools**

**Utilities**

**Subdivision:** Barnett, John B, Jr., Chickasa  
**VA House District:** 96  
**Election District:** Stonehouse  
**Voting Precinct:** Stonehouse B  
**Polling Place:** Norge Elementary School  
**Primary Service Area:** Yes  
**Census:** 804.02

**Elementary School:** Norge  
**Middle School:** Toano  
**High School:** Warhill

**Water:** N  
**Sewer:** N

*Note: If there is no data, the parcel has been created during this tax year*

Please send all questions and comments to [khazelwood@james-city.va.us](mailto:khazelwood@james-city.va.us)



Environmental Division

NOV 21 2011

RECEIVED

James City County, Virginia  
Environmental Division

### Stormwater Management / BMP Facilities Record Drawing and Construction Certification Forms

*(Note: In accordance with the requirements of the Chesapeake Bay Preservation Ordinance, Chapter 23, Section 23-10(4), BMP's shall be designed and constructed in accordance with the manual entitled James City County Guidelines for Design and Construction of Stormwater Management BMP's. Erosion and sediment control policy and approved plans generally require that at the completion of the project and prior to release of surety, an "as-built" plan prepared by a registered Professional Engineer or Certified Land Surveyor must be provided for the drainage system for the project, including any Best Management Practice (BMP) facilities. In addition, for BMP facilities involving the construction of an impounding structure or dam embankment, certification is required by a Professional Engineer who has inspected the structure during its construction. Currently there are over 20 water quality type BMP's accepted by the County.)*

**Section 1 – Site Information:**

Project Name: Crosswalk Community Church Parking Expansion  
Structure/BMP Name: Bioretention - YC-060  
Project Location: 7575 Richmond Road  
BMP Location: Western side of parking lot  
County Plan No.: SP - 0095 - 2010

Project Type:  Residential  Business  Office  Industrial  Roadway  
 Commercial  Institutional  Public  Other  
Tax Map/Parcel No.: 384010003G  
BMP ID Code (if known): YC-060  
Zoning District: MU  
Land Use: Church  
Site Area (sf or acres): 8.72 AC

Brief Description of Stormwater Management/BMP Facility: Bioretention added to treat parking expansion (current and future spaces).

Nearest Visible Landmark to SWM/BMP Facility: \_\_\_\_\_

Nearest Vertical Ground Control (if known):  
 JCC Geodetic Ground Control  USGS  Temporary  Arbitrary  Other  
Station Number or Name: #306  
Datum or Reference Elevation: NGVD 29  
Control Description: \_\_\_\_\_  
Control Location from Subject Facility: \_\_\_\_\_

**Section 2 – Stormwater Management / BMP Facility Construction Information:**

PreConstruction Meeting Held for Construction of SWM/BMP Facility:  Yes  No  Unknown  
Approx. Construction Start Date for SWM/BMP Facility: \_\_\_\_\_  
Facility Monitored by County Representative during Construction:  Yes  No  Unknown  
Name of Site Work Contractor Who Constructed Facility: Henderson Inc.  
Name of Professional Firm Who Routinely Monitored Construction: \_\_\_\_\_  
Date of Completion for SWM/BMP Facility: July 2011  
Date of Record Drawing/Construction Certification Submittal: 9/14/11

*(Note: Record Drawing and Construction Certifications are required within thirty (30) days of the completion of Stormwater Management and/or BMP facility construction. Record Drawings and Construction Certifications must be reviewed and approved by the James City County Environmental Division prior to final inspection, acceptance and bond or surety release.)*

**Section 3 – Owner / Designer / Contractor Information:**

Owner/Developer: *(Note: Site Owner or Applicant responsible for development of the project.)*

Name: Crosswalk Church  
Mailing Address: 7575 Richmond Road  
Williamsburg, VA 23185  
Business Phone: 757.258.2825 Fax: \_\_\_\_\_  
Contact Person: Lloyd Hensen Title: \_\_\_\_\_

Design Professional: *(Note: Professional Engineer or Certified Land Surveyor responsible for the design and preparation of plans and specifications for the Stormwater Management / BMP facility.)*

Firm Name: AES Consulting Engineers  
Mailing Address: 5248 Olde Towne Road  
Williamsburg, VA 23188  
Business Phone: 757.253.0040  
Fax: 757.220.8994  
Responsible Plan Preparer: Jason Grimes  
Title: Project Manager  
Plan Name: Crosswalk Community Church - Parking Expansion  
Firm's Project No. W10157  
Plan Date: 1/18/11  
Sheet No.'s Applicable to SWM/BMP Facility: 2 / 3 / 4 / \_\_\_\_\_ / \_\_\_\_\_

BMP Contractor: *(Note: Site Work Contractor directly responsible for construction of the Stormwater Management / BMP facility.)*

Name: Henderson Incorporated  
Mailing Address: 5806 Mooretown Road  
Williamsburg, VA 23188  
Business Phone: 757.565.1090  
Fax: 757.564.9120  
Contact Person: Julie Russell  
Site Foreman/Supervisor: \_\_\_\_\_  
Specialty Subcontractors & Purpose (for BMP Construction Only):  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Section 4 – Professional Certifications:**

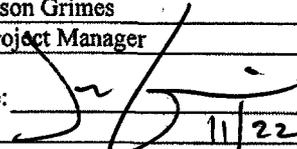
Certifying Professionals: *(Note: A Registered Professional Engineer of Certified Land Surveyor is responsible for preparation of a Record Drawing, sometimes referred to as an As-Built plan, for the drainage system for the project including any Stormwater Management/BMP Facilities. A Registered Professional Engineer is responsible for the inspection, monitoring and certification of Stormwater Management / BMP facilities during its construction.)*

**Record Drawing and Construction Certifications for Stormwater Management / BMP Facilities**

**Record Drawing Certification**

Firm Name: AES Consulting Engineers  
Mailing Address: 5248 Olde Towne Road  
Williamsburg, VA 23188  
Business Phone: 757.253.0040  
Fax: 757.220.8994

Name: Jason Grimes  
Title: Project Manager

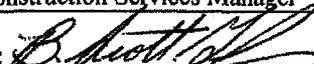
Signature:   
Date: 11/22/11

I hereby certify to the best of my knowledge and belief that this record drawing represents the actual condition of the Stormwater Management / BMP facility. The facility appears to conform with the provisions of the approved design plan, specifications and stormwater management plan, except as specifically noted.

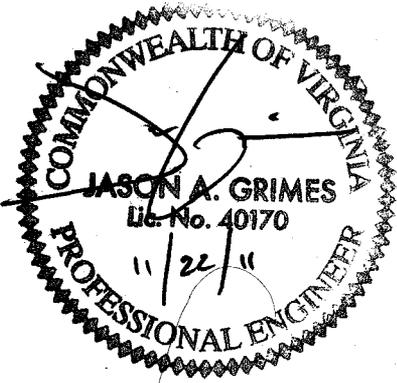
**Construction Certification**

Firm Name: ECS  
Mailing Address: 108 Ingram Road, Suite 1  
Williamsburg, VA 23188  
Business Phone: 757.229.6677  
Fax: 757.229.9978

Name: B. Scott Gresham, P.E.  
Title: Construction Services Manager

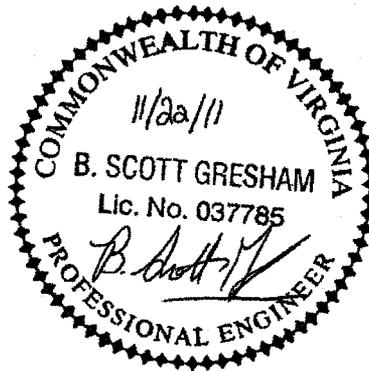
Signature:   
Date: 11/22/11

I hereby certify to the best of my knowledge and belief that this Stormwater Management / BMP facility was monitored and constructed in accordance with the provisions of the approved design plan, specifications and stormwater management plan, except as specifically noted.



(Seal)

Virginia Registered Professional Engineer  
Or Certified Land Surveyor



(Seal)

Virginia Registered  
Professional Engineer



**James City County Environmental Division  
Stormwater Management/BMP Record Drawing and  
Construction Certification Review Tracking Form**

Project Name: Crosswalk Community Church - Parking Lot Exp.  
 County Plan No.: SP-095-10  
 Stormwater Management Facility: Bioretention  
 BMP Phase #:  I  II  III  
 Information Package Received. Date/By: 8/31/11 - Landtech / RD  
 Completeness Check:  
 Record Drawing Date/By: 8/31/11 Landtech  
 Construction Certification Date/By: \_\_\_\_\_  
 RD/CC Standard Forms (Required for all BMPs after Feb 1<sup>st</sup> 2001 Only)  
 Insp/Maint Agreement # / Date: 2/3/11  
 BMP Maintenance Plan Location: Sheet 4 of approved plan  
 Other: \_\_\_\_\_  
 Standard E&SC Note on Approved Plan Requiring RD/CC or County comment in plan review  
 Yes  No Location: Sheet 4  
 Assign County BMP ID Code #: Code: IC-000  
 Preliminary Input/Log into Division's "As-Built Tracking Log"  
 Add Location to GIS Map. Obtain basic site information (GPIN, Owner, Address, etc.)  
 Preliminary Log into Access Database (BMP ID #, Plan No., GPIN, Project Name, etc.)  
 Active Project File Review (correspondence, H&H, design computations, etc.)  
 Initial As-Built File setup (File label, folder, copy plan/details/design information, etc.)  
 Inspector Check of RD/CC (forward to Inspector using transmittal for cursory review).  
 Pre-Inspection Drawing Review of Approved Plan (Quick look prior to Field Inspection)  
 Final Inspection (FI) Performed Date: 9/28/11, 10/20/11, 11/27/11, and 2/29/12  
 Record Drawing (RD) Review Date: 2/28/12  
 Construction Certification (CC) Review Date: 11/22/11  
 Actions:  
 No comments.  
 Comments. Letter Forwarded. Date: 9/28/11, 10/20/11, 11/27/11, & 2/29/12  
 Record Drawing (RD)  
 Construction Certification (CC)  
 Construction-Related (CR)  
 Site Issues (SI)  
 Other: \_\_\_\_\_  
 Second Submission: 11/27/11  
 Reinspection (if necessary): 2/28/12 (4th re-insp)  
 Acceptable for SWM Purposes (RD/CC/CR/Other). Ok to proceed with bond release.  
 Complete "Surety Request Form".  
 Check/Clean active file of any remaining material and finish "As-Built" file.  
 Add to County BMP Inventory/Inspection schedule (Phase I, II or III).  
 Copy Final Inspection Report into County BMP Inspection Program file.  
 Obtain Digital Photographs of BMP and save into County BMP Inventory.  
 Request mylar/reproducible from As-Built plan preparer.  
 Complete "As-built Tracking Log".  
 Last check of BMP Access Database (County BMP Inventory).  
 Add BMP to JCC Hydrology & Hydraulic database (optional).  
 Add BMP to Municipal BMP list (if a County-owned facility)  
 Add BMP to PRIDE BMP ratings database.

**Final Sign-Off**

Inspector: Jing O'neal  
 Chief Engineer: [Signature]

Date: 3/26/12  
 Date: 3/26/12

\*\*\* See separate checklist, if needed.



# SITE PLAN FOR CROSSWALK COMMUNITY CHURCH PARKING EXPANSION

STONEHOUSE DISTRICT      JAMES CITY COUNTY      VIRGINIA

COUNTY OF JAMES CITY FINAL SITE PLAN	
APPROVALS	DATE
Fire Dept. _____	_____
Health Dept. _____	_____
VDOT _____	_____
Planning _____	_____
Environ. _____	_____
Zoning Adm. _____	_____
JCSA _____	_____
County Eng. _____	_____
REA _____	_____
Other _____	_____

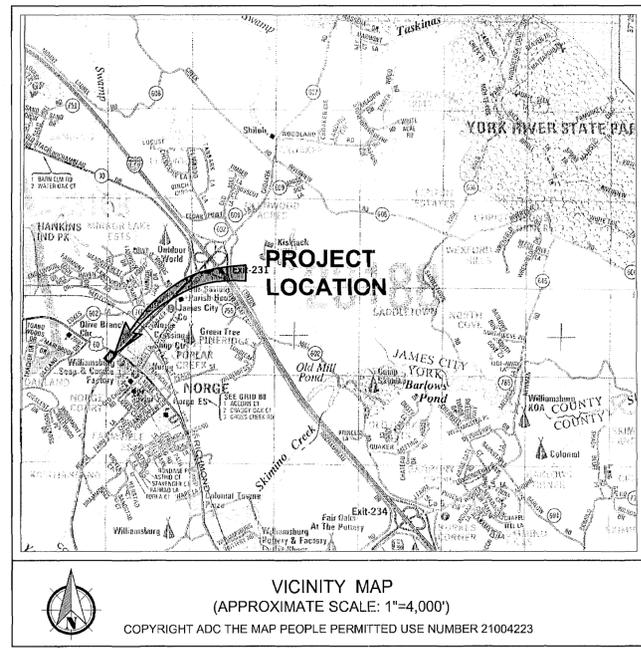
Rev.	Date	Description
1	12/15/10	REV PER JCC COMMENTS 11/25/10

Environmental Division  
DEC 15 2010  
RECEIVED



**GENERAL NOTES:**

1. PROPERTY IS SUBJECT TO PROFFERS ASSOCIATED WITH REZONING CASE Z-3-97.
2. SITE IS SERVED BY PUBLIC WATER AND SEWER.
3. NO ADDITIONAL WATER OR SEWER CONNECTION ARE REQUIRED FOR THIS PROJECT.
4. ANY EXISTING UNUSED WELLS SHALL BE ABANDONED IN ACCORDANCE WITH STATE PRIVATE WELL REGULATIONS AND JAMES CITY COUNTY CODE.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING MISS UTILITY (1-800-552-7001) FOR EXISTING UTILITY LOCATIONS PRIOR TO COMMENCING CONSTRUCTION.
6. EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.
7. ALL UTILITIES WILL BE PLACED UNDERGROUND.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FOR THIS PROJECT.
9. ANY UTILITIES TO BE RELOCATED SHALL BE RELOCATED AT THE OWNER/DEVELOPER'S EXPENSE, INCLUDING UTILITIES WITHIN THE CITY RIGHT-OF-WAY.
10. ON-SITE EXTERIOR CONCRETE IS TO BE A MINIMUM OF 3000 PSI WITH 5% TO 7% AIR ENTRAINMENT.
11. OWNER IS RESPONSIBLE FOR MAINTENANCE OF ALL SITE IMPROVEMENTS, INCLUDING LANDSCAPING, AS SHOWN ON THE APPROVED PLAN.
12. BENCHMARK STATION NO. 306, EASTING (X) 11986404.356, NORTHING (Y) 3661140.546, ELEVATION = 100.40  
 HORIZONTAL DATUM: JAMES CITY COUNTY GEODETIC CONTROL NETWORK  
 VIRGINIA STATE PLANE COORDINATE SYSTEM - SOUTH ZONE  
 NAD 83 (1984 VA HARN)  
 VERTICAL DATUM: JAMES CITY COUNTY GEODETIC CONTROL NETWORK NGVD 29
13. ALL OBJECTIONABLE AND DELETERIOUS MATERIALS IS TO BE REMOVED FROM THE SITE AND DISPOSED OF IN A STATE APPROVED FACILITY MEETING THE REQUIREMENTS OF ALL APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS.



**INDEX OF SHEETS:**

SHEET NO.	SHEET DESCRIPTION
1	COVER SHEET
2	DEMOLITION AND SITE PLAN
3	NOTES & DETAILS
4	NOTES & DETAILS

**OWNER/DEVELOPER INFORMATION:**

CROSSWALK COMMUNITY CHURCH  
 CONTACT: LLOYD HANSEN  
 7575 RICHMOND ROAD  
 WILLIAMSBURG, VA 23185  
 PHONE NO.: (757) 258-2825  
 E-MAIL: lloyd.hansen@crosswalk.cc

**CERTIFIED RESPONSIBLE LAND DISTURBER:**

JASON GRIMES, P.E.  
 AES CONSULTING ENGINEERS  
 5248 OLDE TOWNE ROAD, SUITE 1  
 WILLIAMSBURG, VIRGINIA, 23188  
 TELEPHONE: 757-253-0040

\* FOR SITE PLAN REVIEW PROCESS ONLY. OWNER OR CONTRACTOR SHALL NAME RESPONSIBLE LAND DISTURBER FOR CONSTRUCTION PROCESS.

**SITE DATA:**

SITE ADDRESS: 7575 RICHMOND ROAD, WILLIAMSBURG, VA 23188  
 TOTAL PARCEL AREA: 8.78 ACRES  
 ZONING: MU - MIXED USE  
 PROPOSED IMPERVIOUS AREA: 19,580 S.F.±, 0.45 AC.± (INCLUDES FUTURE PARKING AREA)  
 TOTAL DISTURBED AREA: 33,480 S.F.±, 0.77 AC.±  
 FLOOD HAZARD MAP: THIS PROPERTY IS IN FLOOD ZONE X AS SHOWN ON MAP NUMBER 51095C, PANEL 0110C, DATED 2007 OF THE FLOOD INSURANCE RATE MAPS FOR JAMES CITY COUNTY, VIRGINIA. ZONE X IS DEFINED AS OUTSIDE THE 500-YEAR FLOODPLAIN.  
 PARKING PROVIDED: 24 ADDITIONAL SPACES ARE PROPOSED  
 THIS PROJECT IS LOCATED IN SUBWATERSHED 103 OF THE YARMOUTH CREEK WATERSHED MANAGEMENT PLAN IN JAMES CITY COUNTY FOR WHICH A WATERSHED MANAGEMENT PLAN WAS DEVELOPED.

COUNTY PROJECT NO.: SP-0095-2010  
 COUNTY PIN NO.: (23-2)(11-0-0001-B)  
 ORIGINAL SUBMITTAL DATE: 10/20/10  
 APPROVAL DATE:

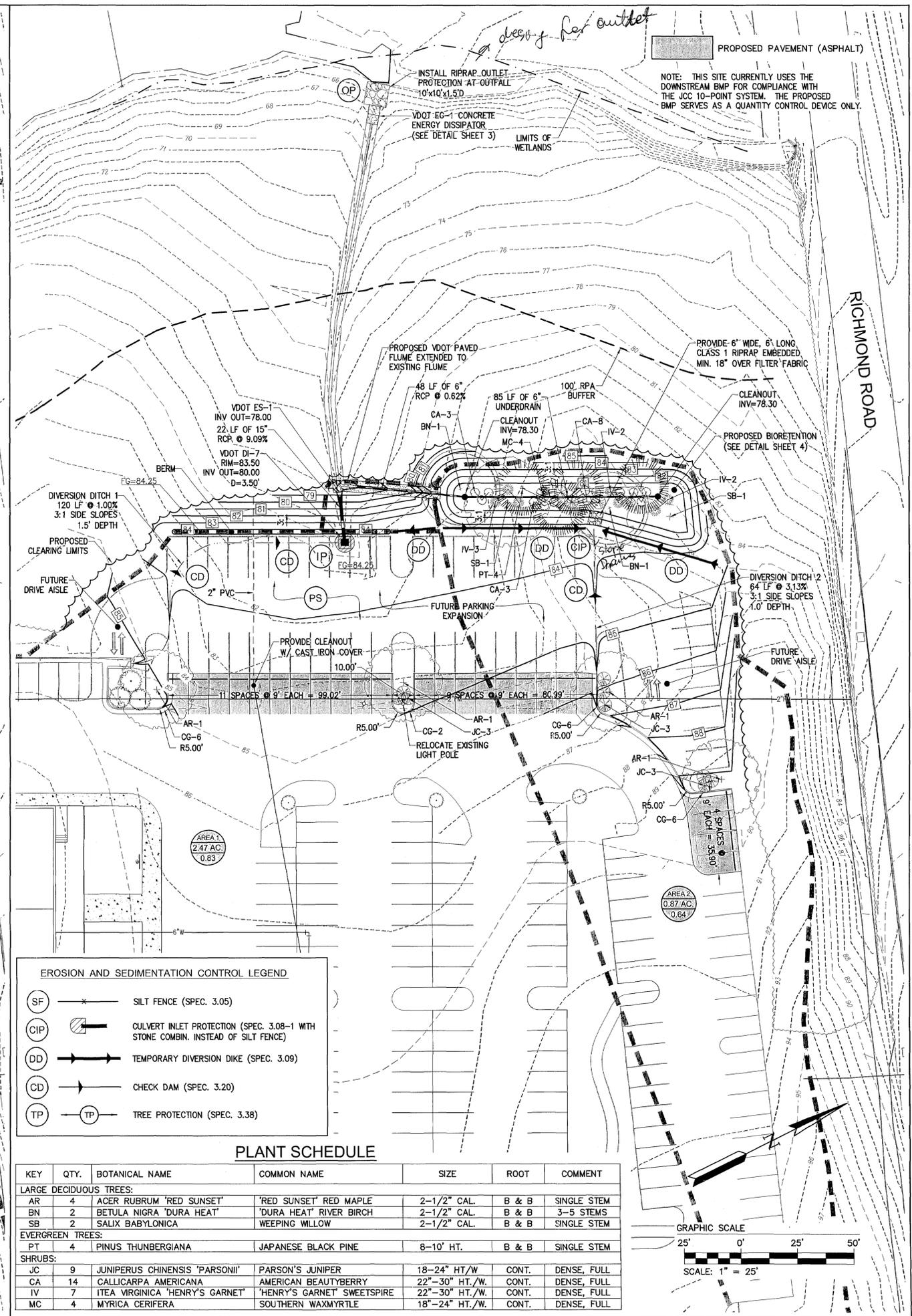
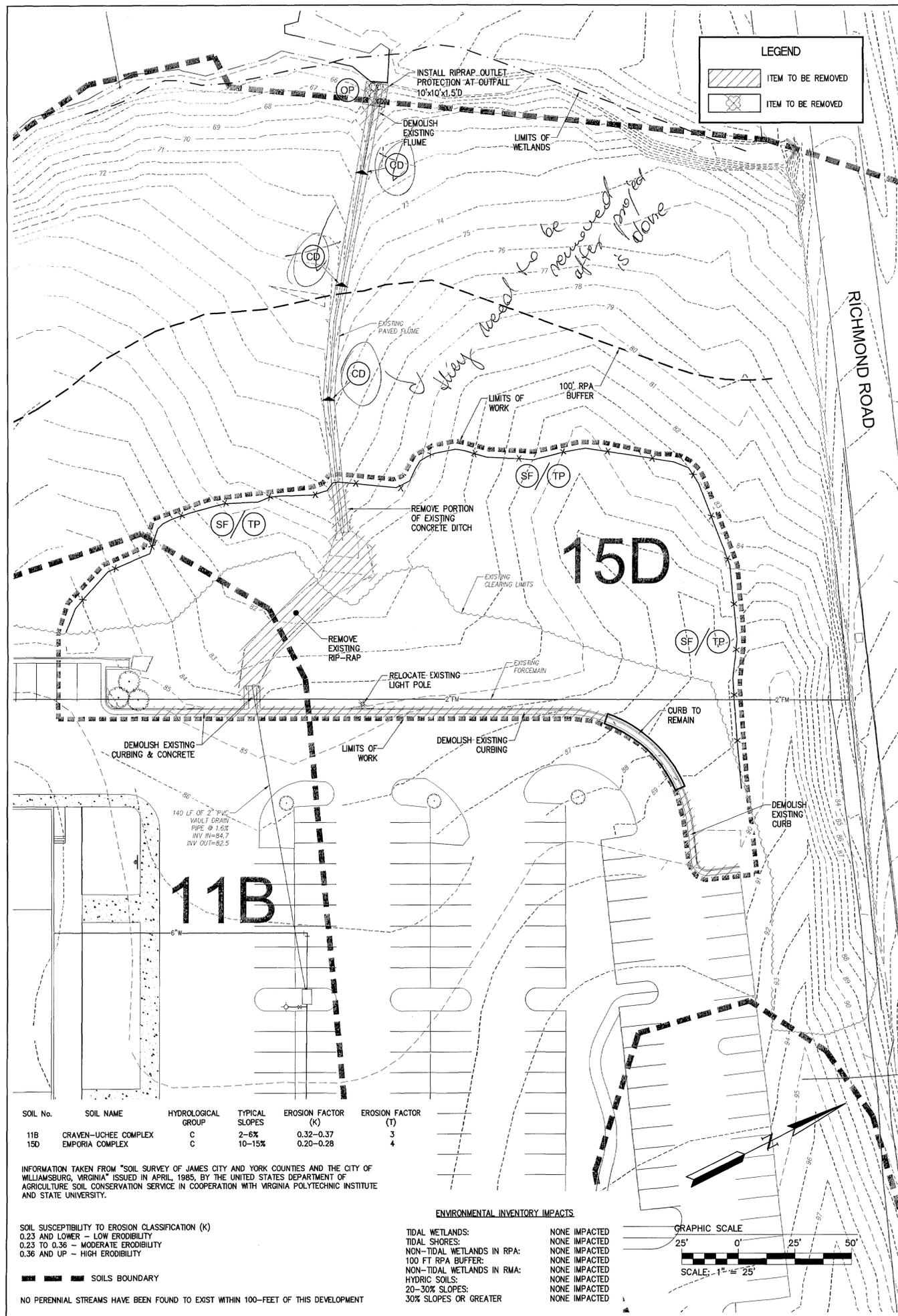


3/12/11  
Amendment  
w/ bmp file



PARKING EXPANSION  
CROSSWALK  
COMMUNITY CHURCH  
STONEHOUSE DISTRICT JAMES CITY COUNTY VIRGINIA

Project Contacts:	JAG, AMR
Project Number:	W10157
Scale:	Date:
AS NOTED	10/20/10
Sheet Title: COVER SHEET	
Sheet Number 1	



JAG  
 Revised By

1 12/18/10 REV. PER JCC COMMENTS 11/20/10  
 Date Description

6248 Old Towne Road, Suite 108  
 Williamsburg, VA 23185  
 Phone: (757) 235-0040  
 Fax: (757) 235-8884  
 www.aesva.com

**AES**  
 CONSULTING ENGINEERS

Hampton Roads | Central Virginia | Middle Peninsula

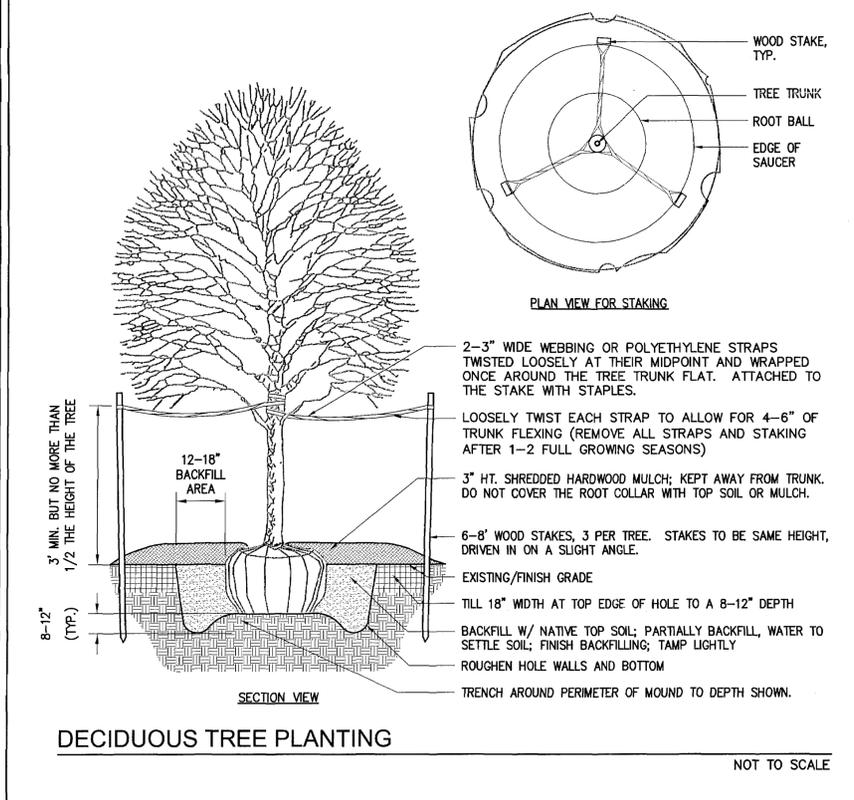
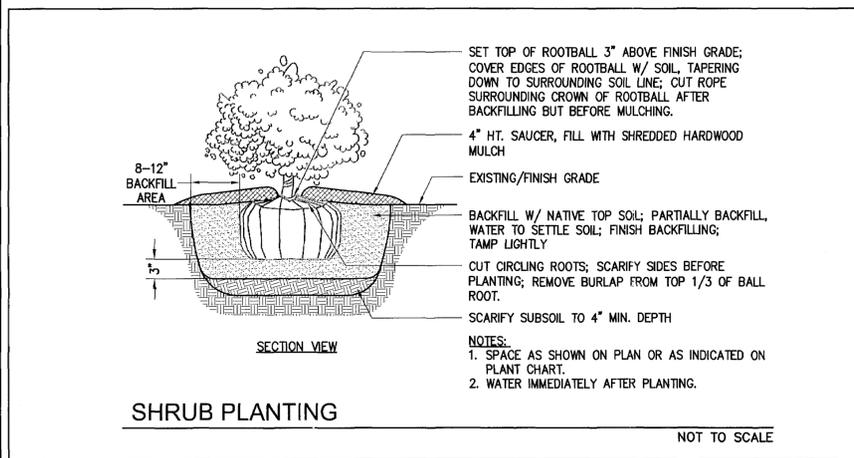
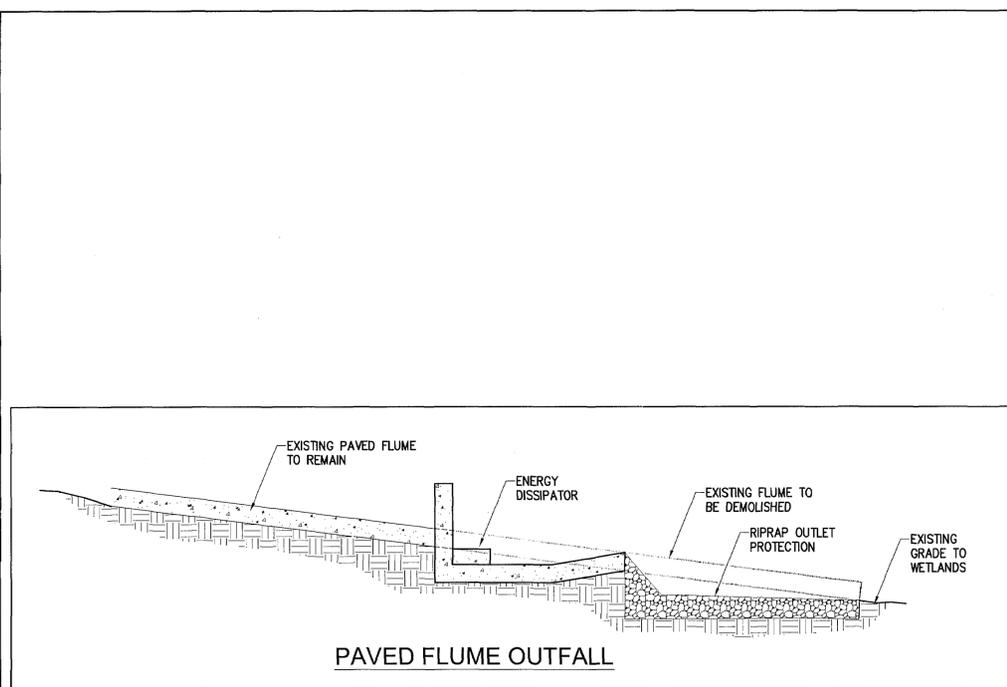
STONEHOUSE DISTRICT | JAMES CITY COUNTY | VIRGINIA

**PARKING EXPANSION  
 CROSSWALK  
 COMMUNITY CHURCH**

Project Contacts: JAG, AMR  
 Project Number: W10157  
 Scale: 1"=25'  
 Date: 10/20/10

Sheet Title:  
**DEMOLITION &  
 SITE PLAN**

Sheet Number  
**2**



**SITE SPECIFIC SEEDING MIXTURES FOR COASTAL PLAIN AREA**

MIXTURE	TOTAL LBS. PER ACRE
<b>MINIMUM CARE LAWN</b>	
COMMERCIAL OR RESIDENTIAL	
-KENTUCKY 31 OR TURF-TYPE TALL FESCUE	175-200 LBS.
OR	
-COMMON BERMUDA GRASS **	75 LBS.
<b>HIGH-MAINTENANCE LAWN</b>	
-KENTUCKY 31 OR TURF-TYPE TALL FESCUE	200-250 LBS.
OR	
-HYBRID BERMUDAGRASS (SEED)**	40 LBS. (UNHALLED)
OR	
-HYBRID BERMUDAGRASS (BY OTHER VEGETATIVE ESTABLISHMENT METHOD, SEE STD. & SPEC. 3.34)	30 LBS. (HALLED)
<b>GENERAL SLOPE (3:1 OR LESS)</b>	
-KENTUCKY 31 FESCUE	128 LBS.
-RED TOP GRASS	2 LBS.
-SEASONAL NURSE CROP *	20 LBS.
-SERICEA LESPEDEZA **	150 LBS.
<b>LOW MAINTENANCE SLOPE (STEEPER THAN 3:1)</b>	
-KENTUCKY 31 TALL FESCUE	93-108 LBS.
-COMMON BERMUDAGRASS **	0-15 LBS.
-RED TOP GRASS	2 LBS.
-SEASONAL NURSE CROP *	20 LBS.
-SERICEA LESPEDEZA **	20 LBS.

\* USE SEASONAL CROP IN ACCORDANCE WITH SEEDING DATES AS STATED BELOW:  
FEBRUARY, MARCH THROUGH APRIL.....ANNUAL RYE  
MAY 1ST THROUGH AUGUST.....FOXTAIL MILLET  
SEPTEMBER, OCTOBER THROUGH NOVEMBER 15TH.....ANNUAL RYE  
NOVEMBER 16TH THROUGH JANUARY.....WINTER RYE

\*\* MAY THROUGH OCTOBER, USE HULLED SEED. ALL OTHER SEEDING PERIODS, USE UNHALLED SEED. WEEPING LOVEGRASS MAY BE ADDED TO ANY SLOPE OR LOW-MAINTENANCE MIX DURING WARMER SEEDING PERIODS; ADD 10-20 LBS./ACRE IN MIXES.

**PO-2A**

**OUTSIDE ROAD DITCHES**

FRONT SLOPE OF DITCH 2:1  
BACK SLOPE 3:1

TYPE	D	FRONT SLOPE	BACK SLOPE	WT	W2	K	SO. YDS. SURFACE AREA PER LINE FT.
A1	6"	2:1	3:1	4"	2"	48	0.565
A2	6"	2:1	3:1	4"	2"	48	0.759
A3	6"	2:1	3:1	4"	2"	48	0.559
A4	6"	2:1	3:1	4"	2"	48	0.689
A5	6"	2:1	3:1	4"	2"	48	0.463
B1	6"	2:1	3:1	4"	2"	48	0.618
B2	6"	2:1	3:1	4"	2"	48	0.537
B3	6"	2:1	3:1	4"	2"	48	0.978
B4	6"	2:1	3:1	4"	2"	48	0.472
B5	6"	2:1	3:1	4"	2"	48	0.583
B6	6"	2:1	3:1	4"	2"	48	0.458
B7	6"	2:1	3:1	4"	2"	48	0.548
B8	6"	2:1	3:1	4"	2"	48	0.398
B9	6"	2:1	3:1	4"	2"	48	0.500
B10	6"	2:1	3:1	4"	2"	48	0.483
B11	6"	2:1	3:1	4"	2"	48	0.428

**MEDIAN DITCH**

TYPE D  
D = DEPTH  
W1 = WIDTH  
W2 = WIDTH  
K = SURFACE AREA PER LINE FT.

TYPE E  
D = DEPTH  
W1 = WIDTH  
W2 = WIDTH  
K = SURFACE AREA PER LINE FT.

**DITCH AT TOE OF FILL OR TOP OF CUT**

TYPE E  
D = DEPTH  
W1 = WIDTH  
W2 = WIDTH  
K = SURFACE AREA PER LINE FT.

**CURTAIN WALL DETAIL**

4" DOWELS, 18" LONG @ 5'-0" C-C

CURTAIN WALL TO BE LOCATED AT BEGINNING AND END OF ALL CHANNELS AND ON THE LOWER END OF EACH EXPANSION JOINT.

**PLAN FOR TRANSITION OF PAVED MEDIAN DITCH TO MEDIAN DROP INLET GUTTER**

SECTION D-D  
SECTION E-E

**ALTERNATE METHOD OF FORMING DITCHES**

1" RADIUS

**STANDARD PAVED DITCHES**

VIRGINIA DEPARTMENT OF TRANSPORTATION

**VDOT ROAD AND BRIDGE STANDARDS**

REVISION DATE: SHEET 1 OF 1  
100.01

**EG-1A**

**STANDARD ENERGY DISSIPATOR FOR USE WITH PAVED FLUMES**

VIRGINIA DEPARTMENT OF TRANSPORTATION

**VDOT ROAD AND BRIDGE STANDARDS**

REVISION DATE: SHEET 1 OF 1  
101.01

**NOTES:**  
AMOUNT OF PAVED DITCH REPLACED BY ENERGY DISSIPATOR FABRICATED BY DEPTHS AS SHOWN IN STANDARD PG-2A. THIS ITEM MAY BE PRECAST OR CAST IN PLACE. CONCRETE TO BE CLASS A3 IF CAST IN PLACE. FOR PRECAST SEE SHEET 100.02. THE 2" SECTION MAY BE USED ON EITHER VERTICAL OR DIAGONAL SLOPES.  
EO-ENERGY DISSIPATOR WITHOUT GRATE.  
EO-1A-ENERGY DISSIPATOR WITH GRATE.

**PLAN VIEW**

**SECTION A-A**

**SECTION B-B**

**APPROXIMATE QUANTITIES**

ITEM	QTY	UNIT	QTY	UNIT
CONCRETE	0.7479	CU. YDS.	61.20	CU. YDS.
REINFORCING STEEL	0.5921	LBS.	57.63	LBS.

**SCHEDULE OF REINFORCING STEEL**

MARK	NO.	SIZE	LENGTH	SHAPE	
A1	8	2"	10'	3	STRAIGHT
A2	4	2"	10'	3	STRAIGHT
A3	4	1"	10'	3	STRAIGHT
B	8	3"	5'	3	STRAIGHT
C	8	3"	5'	3	STRAIGHT
D1	4	1"	10'	3	STRAIGHT
D2	4	1"	10'	3	STRAIGHT
D3	4	1"	10'	3	STRAIGHT
D4	4	2"	10'	3	STRAIGHT
D5	4	2"	10'	3	STRAIGHT
E1	4	1"	10'	3	STRAIGHT
E2	4	1"	10'	3	STRAIGHT

**VDOT ROAD AND BRIDGE STANDARDS**

REVISION DATE: SHEET 1 OF 1  
101.01

**CG-6**

**COMBINATION CURB AND GUTTER**

N.T.S.

**PAVED FLUME SECTION**

N.T.S.

**NOSE DOWN CURB**

N.T.S.

**CONC. WHEEL STOP DETAIL**

N.T.S.

**STANDARD 6" CURB**

N.T.S.

**CG-2**

**STANDARD DITCH DROP INLET**

N.T.S.

**VDOT ROAD AND BRIDGE STANDARDS**

REVISION DATE: SHEET 1 OF 1  
101.01

**NOTES:**  
1. THIS ITEM MAY BE PRECAST OR CAST IN PLACE.  
2. CONCRETE TO BE CLASS A3 IF CAST IN PLACE, 4000 PSI IF PRECAST.  
3. CURB HAVING A RADIUS OF 300' OR LESS (ALONG FACE OF CURB) WILL BE PAID FOR AS RADIAL CURB.  
4. THE DEPTH OF CURB MAY BE REDUCED AS MUCH AS 3" (2" DEPTH) IN ORDER THAT THE BOTTOM OF THE CURB WILL CONFORM WITH THE TOP OF A COURSE OF THE PAVEMENT SUBSTRUCTURE. OTHERWISE, THE DEPTH IS TO BE 18" AS SHOWN. NO ADJUSTMENT IN THE PRICE BID IS TO BE MADE FOR A DECREASE OR AN INCREASE IN DEPTH.  
5. CG-2 IS TO BE USED ON ROADWAYS MEETING THE REQUIREMENTS FOR CG-6 AS SHOWN IN APPENDIX A OF THE VDOT ROAD DESIGN MANUAL.

**STANDARD DITCH DROP INLET**

VIRGINIA DEPARTMENT OF TRANSPORTATION

**NOTES:**  
WHERE PAVED DITCHES ARE REQUIRED JOINTS ARE TO BE CONCRETE WITH SMOOTH FINISH. JOINTS SHALL BE APPROX. 12" TO 18" LONG TO PREVENT SETTLEMENT.  
If the depth of slope is 2:1, 3:1, 4:1, 5:1, 6:1, 7:1, 8:1, 9:1, 10:1, 11:1, 12:1, 13:1, 14:1, 15:1, 16:1, 17:1, 18:1, 19:1, 20:1, 21:1, 22:1, 23:1, 24:1, 25:1, 26:1, 27:1, 28:1, 29:1, 30:1, 31:1, 32:1, 33:1, 34:1, 35:1, 36:1, 37:1, 38:1, 39:1, 40:1, 41:1, 42:1, 43:1, 44:1, 45:1, 46:1, 47:1, 48:1, 49:1, 50:1, 51:1, 52:1, 53:1, 54:1, 55:1, 56:1, 57:1, 58:1, 59:1, 60:1, 61:1, 62:1, 63:1, 64:1, 65:1, 66:1, 67:1, 68:1, 69:1, 70:1, 71:1, 72:1, 73:1, 74:1, 75:1, 76:1, 77:1, 78:1, 79:1, 80:1, 81:1, 82:1, 83:1, 84:1, 85:1, 86:1, 87:1, 88:1, 89:1, 90:1, 91:1, 92:1, 93:1, 94:1, 95:1, 96:1, 97:1, 98:1, 99:1, 100:1, 101:1, 102:1, 103:1, 104:1, 105:1, 106:1, 107:1, 108:1, 109:1, 110:1, 111:1, 112:1, 113:1, 114:1, 115:1, 116:1, 117:1, 118:1, 119:1, 120:1, 121:1, 122:1, 123:1, 124:1, 125:1, 126:1, 127:1, 128:1, 129:1, 130:1, 131:1, 132:1, 133:1, 134:1, 135:1, 136:1, 137:1, 138:1, 139:1, 140:1, 141:1, 142:1, 143:1, 144:1, 145:1, 146:1, 147:1, 148:1, 149:1, 150:1, 151:1, 152:1, 153:1, 154:1, 155:1, 156:1, 157:1, 158:1, 159:1, 160:1, 161:1, 162:1, 163:1, 164:1, 165:1, 166:1, 167:1, 168:1, 169:1, 170:1, 171:1, 172:1, 173:1, 174:1, 175:1, 176:1, 177:1, 178:1, 179:1, 180:1, 181:1, 182:1, 183:1, 184:1, 185:1, 186:1, 187:1, 188:1, 189:1, 190:1, 191:1, 192:1, 193:1, 194:1, 195:1, 196:1, 197:1, 198:1, 199:1, 200:1, 201:1, 202:1, 203:1, 204:1, 205:1, 206:1, 207:1, 208:1, 209:1, 210:1, 211:1, 212:1, 213:1, 214:1, 215:1, 216:1, 217:1, 218:1, 219:1, 220:1, 221:1, 222:1, 223:1, 224:1, 225:1, 226:1, 227:1, 228:1, 229:1, 230:1, 231:1, 232:1, 233:1, 234:1, 235:1, 236:1, 237:1, 238:1, 239:1, 240:1, 241:1, 242:1, 243:1, 244:1, 245:1, 246:1, 247:1, 248:1, 249:1, 250:1, 251:1, 252:1, 253:1, 254:1, 255:1, 256:1, 257:1, 258:1, 259:1, 260:1, 261:1, 262:1, 263:1, 264:1, 265:1, 266:1, 267:1, 268:1, 269:1, 270:1, 271:1, 272:1, 273:1, 274:1, 275:1, 276:1, 277:1, 278:1, 279:1, 280:1, 281:1, 282:1, 283:1, 284:1, 285:1, 286:1, 287:1, 288:1, 289:1, 290:1, 291:1, 292:1, 293:1, 294:1, 295:1, 296:1, 297:1, 298:1, 299:1, 300:1, 301:1, 302:1, 303:1, 304:1, 305:1, 306:1, 307:1, 308:1, 309:1, 310:1, 311:1, 312:1, 313:1, 314:1, 315:1, 316:1, 317:1, 318:1, 319:1, 320:1, 321:1, 322:1, 323:1, 324:1, 325:1, 326:1, 327:1, 328:1, 329:1, 330:1, 331:1, 332:1, 333:1, 334:1, 335:1, 336:1, 337:1, 338:1, 339:1, 340:1, 341:1, 342:1, 343:1, 344:1, 345:1, 346:1, 347:1, 348:1, 349:1, 350:1, 351:1, 352:1, 353:1, 354:1, 355:1, 356:1, 357:1, 358:1, 359:1, 360:1, 361:1, 362:1, 363:1, 364:1, 365:1, 366:1, 367:1, 368:1, 369:1, 370:1, 371:1, 372:1, 373:1, 374:1, 375:1, 376:1, 377:1, 378:1, 379:1, 380:1, 381:1, 382:1, 383:1, 384:1, 385:1, 386:1, 387:1, 388:1, 389:1, 390:1, 391:1, 392:1, 393:1, 394:1, 395:1, 396:1, 397:1, 398:1, 399:1, 400:1, 401:1, 402:1, 403:1, 404:1, 405:1, 406:1, 407:1, 408:1, 409:1, 410:1, 411:1, 412:1, 413:1, 414:1, 415:1, 416:1, 417:1, 418:1, 419:1, 420:1, 421:1, 422:1, 423:1, 424:1, 425:1, 426:1, 427:1, 428:1, 429:1, 430:1, 431:1, 432:1, 433:1, 434:1, 435:1, 436:1, 437:1, 438:1, 439:1, 440:1, 441:1, 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585:1, 586:1, 587:1, 588:1, 589:1, 590:1, 591:1, 592:1, 593:1, 594:1, 595:1, 596:1, 597:1, 598:1, 599:1, 600:1, 601:1, 602:1, 603:1, 604:1, 605:1, 606:1, 607:1, 608:1, 609:1, 610:1, 611:1, 612:1, 613:1, 614:1, 615:1, 616:1, 617:1, 618:1, 619:1, 620:1, 621:1, 622:1, 623:1, 624:1, 625:1, 626:1, 627:1, 628:1, 629:1, 630:1, 631:1, 632:1, 633:1, 634:1, 635:1, 636:1, 637:1, 638:1, 639:1, 640:1, 641:1, 642:1, 643:1, 644:1, 645:1, 646:1, 647:1, 648:1, 649:1, 650:1, 651:1, 652:1, 653:1, 654:1, 655:1, 656:1, 657:1, 658:1, 659:1, 660:1, 661:1, 662:1, 663:1, 664:1, 665:1, 666:1, 667:1, 668:1, 669:1, 670:1, 671:1, 672:1, 673:1, 674:1, 675:1, 676:1, 677:1, 678:1, 679:1, 680:1, 681:1, 682:1, 683:1, 684:1, 685:1, 686:1, 687:1, 688:1, 689:1, 690:1, 691:1, 692:1, 693:1, 694:1, 695:1, 696:1, 697:1, 698:1, 699:1, 700:1, 701:1, 702:1, 703:1, 704:1, 705:1, 706:1, 707:1, 708:1, 709:1, 710:1, 711:1, 712:1, 713:1, 714:1, 715:1, 716:1, 717:1, 718:1, 719:1, 720:1, 721:1, 722:1, 723:1, 724:1, 725:1, 726:1, 727:1, 728:1, 729:1, 730:1, 731:1, 732:1, 733:1, 734:1, 735:1, 736:1, 737:1, 738:1, 739:1, 740:1, 741:1, 742:1, 743:1, 744:1, 745:1, 746:1, 747:1, 748:1, 749:1, 750:1, 751:1, 752:1, 753:1, 754:1, 755:1, 756:1, 757:1, 758:1, 759:1, 760:1, 761:1, 762:1, 763:1, 764:1, 765:1, 766:1, 767:1, 768:1, 769:1, 770:1, 771:1, 772:1, 773:1, 774:1, 775:1, 776:1, 777:1, 778:1, 779:1, 780:1, 781:1, 782:1, 783:1, 784:1, 785:1, 786:1, 787:1, 788:1, 789:1, 790:1, 791:1, 792:1, 793:1, 794:1, 795:1, 796:1, 797:1, 798:1, 799:1, 800:1, 801:1, 802:1, 803:1, 804:1, 805:1, 806:1, 807:1, 808:1, 809:1, 810:1, 811:1, 812:1, 813:1, 814:1, 815:1, 816:1, 817:1, 818:1, 819:1, 820:1, 821:1, 822:1, 823:1, 824:1, 825:1, 826:1, 827:1, 828:1, 829:1, 830:1, 831:1, 832:1, 833:1, 834:1, 835:1, 836:1, 837:1, 838:1, 839:1, 840:1, 841:1, 842:1, 843:1, 844:1, 845:1, 846:1, 847:1, 848:1, 849:1, 850:1, 851:1, 852:1, 853:1, 854:1, 855:1, 856:1, 857:1, 858:1, 859:1, 860:1, 861:1, 862:1, 863:1, 864:1, 865:1, 866:1, 867:1, 868:1, 869:1, 870:1, 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1012:1, 1013:1, 1014:1, 1015:1, 1016:1, 1017:1, 1018:1, 1019:1, 1020:1, 1021:1, 1022:1, 1023:1, 1024:1, 1025:1, 1026:1, 1027:1, 1028:1, 1029:1, 1030:1, 1031:1, 1032:1, 1033:1, 1034:1, 1035:1, 1036:1, 1037:1, 1038:1, 1039:1, 1040:1, 1041:1, 1042:1, 1043:1, 1044:1, 1045:1, 1046

THE FOLLOWING STANDARD EROSION AND SEDIMENT CONTROL (E&S) NOTES SHALL BECOME PART OF APPROVED EROSION AND SEDIMENT CONTROL PLANS FOR ALL PLAN OF DEVELOPMENT PROJECTS IN JAMES CITY COUNTY, VIRGINIA.

- ALL THE PROVISIONS OF VIRGINIA EROSION AND SEDIMENT CONTROL LAW AND REGULATIONS, MINIMUM STANDARDS, HANDBOOKS, AND TECHNICAL BULLETINS AS PUBLISHED BY THE VIRGINIA SOIL & WATER CONSERVATION BOARD AND/OR THE VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION, DIVISION OF SOIL & WATER CONSERVATION SHALL APPLY TO THE PROJECT.
- MINIMUM STANDARDS # 1 THROUGH # 19 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS (4VAC50-30-40) SHALL APPLY TO THE PROJECT.
- THE OWNER OR APPLICANT SHALL BE RESPONSIBLE TO REGISTER FOR COVERAGE UNDER THE GENERAL PERMIT FOR DISCHARGE OF STORMWATER FROM CONSTRUCTION ACTIVITIES, IN ACCORDANCE WITH CURRENT REQUIREMENTS OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) AND THE VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION.
- THE OWNER OR APPLICANT SHALL PROVIDE THE NAME OF AN INDIVIDUAL HOLDING A VALID RESPONSIBLE LAND DISTURBER (RLD) CERTIFICATE OF COMPETENCE WHO WILL BE RESPONSIBLE FOR THE LAND-DISTURBING ACTIVITY PRIOR TO ENGAGING IN THE LAND-DISTURBING ACTIVITY. THIS WILL BE NECESSARY PRIOR TO ISSUANCE OF A LAND-DISTURBING PERMIT FOR THE PROJECT. THE RLD IS REQUIRED TO ATTEND THE PRECONSTRUCTION CONFERENCE FOR THE PROJECT.
- THE CONTRACTOR IS RESPONSIBLE TO CONTACT MISS UTILITY (DIAL 811 IN VA OR 1-800-552-7001) PRIOR TO ANY UTILITY OR SITE WORK EXCAVATIONS.
- ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PLANNED, DESIGNED, IMPLEMENTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH). THE CONTRACTOR SHALL MAINTAIN, INSPECT AND REPAIR ALL EROSION AND SEDIMENT CONTROL MEASURES AS NEEDED THROUGHOUT THE LIFE OF THE PROJECT TO ENSURE CONTINUED ACCEPTABLE PERFORMANCE.
- A PRECONSTRUCTION CONFERENCE (MEETING) SHALL BE HELD ON SITE BETWEEN THE COUNTY ENVIRONMENTAL DIVISION, THE OWNER-APPLICANT, THE RESPONSIBLE LAND-DISTURBER (RLD), THE CONTRACTOR AND OTHER RESPONSIBLE AGENCIES, AS APPLICABLE, PRIOR TO ISSUANCE OF A LAND-DISTURBING PERMIT. THE OWNER OR APPLICANT IS REQUIRED TO COORDINATE SCHEDULING OF THE PRECONSTRUCTION CONFERENCE BETWEEN ALL APPLICABLE PARTIES. THE CONTRACTOR SHALL SUBMIT A SEQUENCE OF CONSTRUCTION TO THE COUNTY ENVIRONMENTAL DIVISION FOR REVIEW AND APPROVAL PRIOR TO THE PRECONSTRUCTION MEETING.
- ALL PERIMETER EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND-DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE.
- ADDITIONAL SAFETY FENCE OR DUST CONTROL MEASURES, IN ACCORDANCE WITH THE PROVISIONS OF MINIMUM STANDARDS & SPECS. 3.01 AND 3.39 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH), MAY BE REQUIRED TO BE IMPLEMENTED IN ADDITION TO THAT SHOWN ON THE APPROVED PLAN IN ORDER TO ENSURE ADEQUATE PROTECTION OF THE HEALTH, SAFETY AND WELFARE OF THE PUBLIC OR IF SITE CONDITIONS CHANGE, BECOME APPARENT OR ALTER SIGNIFICANTLY FOLLOWING THE DATE OF PLAN APPROVAL.
- EROSION AND SEDIMENT CONTROL MEASURES MAY REQUIRE MINOR FIELD ADJUSTMENTS AT OR FOLLOWING TIME OF CONSTRUCTION TO ENSURE THEIR INTENDED PURPOSE IS ACCOMPLISHED, TO ENSURE ADEQUATE PROTECTION OF THE HEALTH, SAFETY AND WELFARE OF THE PUBLIC, OR IF SITE CONDITIONS CHANGE, BECOME APPARENT OR ALTER SIGNIFICANTLY FOLLOWING THE DATE OF PLAN APPROVAL. COUNTY ENVIRONMENTAL DIVISION APPROVAL SHALL BE REQUIRED FOR ANY DEVIATION OF EROSION AND SEDIMENT CONTROL MEASURES FROM THE APPROVED PLAN.
- OFF-SITE WASTE OR BORROW AREAS SHALL BE APPROVED BY THE COUNTY ENVIRONMENTAL DIVISION PRIOR TO THE IMPORT OF ANY BORROW OR EXPORT OF ANY WASTE TO OR FROM THE PROJECT SITE.
- CULVERT AND STORM DRAIN INLET PROTECTIONS, IN ACCORDANCE WITH THE PROVISIONS OF MINIMUM STANDARDS & SPECS. 3.07 & 3.08 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH), MAY BE REMOVED AT THE DISCRETION OF THE ASSIGNED COUNTY ENVIRONMENTAL DIVISION INSPECTOR SHOULD PLACEMENT OF THE MEASURE RESULT IN EXCESSIVE ROAD FLOODING OR TRAFFIC HAZARD OR RESULT IN THE REDIRECTION OF DRAINAGE ONTO OR TOWARD EXISTING LOTS, DRIVEWAYS OR STRUCTURES. DECISIONS SHALL BE MADE ON A CASE-BY-CASE BASIS BASED ON FIELD SITUATIONS ENCOUNTERED.
- DRAINAGE FACILITIES SHALL BE INSTALLED AND FUNCTIONAL WITHIN 30 DAYS FOLLOWING COMPLETION OF ROUGH GRADING AT ANY POINT WITHIN THE PROJECT.
- NO MORE THAN 300 FEET OF TRENCH MAY BE OPEN AT ONE TIME FOR UNDERGROUND UTILITY LINES, INCLUDING STORM WATER CONVEYANCES. ALL OTHER PROVISIONS OF MINIMUM STANDARD # 16 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS APPLY.
- IF DISTURBED AREA STABILIZATION IS TO BE ACCOMPLISHED DURING THE MONTHS OF DECEMBER, JANUARY OR FEBRUARY, STABILIZATION SHALL CONSIST OF MULCHING IN ACCORDANCE WITH MINIMUM STANDARD & SPEC. 3.35 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH). SEEDING WILL THEN TAKE PLACE AS SOON AS THE SEASON PERMITS.
- THE TERM SEEDING, FINAL VEGETATIVE COVER OR STABILIZATION ON THE APPROVED PLAN SHALL MEAN THE SUCCESSFUL GERMINATION AND ESTABLISHMENT OF A STABLE GRASS COVER FROM A PROPERLY PREPARED SEEDBED, IN ACCORDANCE WITH MINIMUM STANDARDS & SPECS. 3.29 THROUGH 3.37 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH), AS APPLICABLE. IRRIGATION, IF NECESSARY, SHALL COMPLY WITH ALL APPLICABLE OUTDOOR WATER USE RESTRICTIONS OF THE JAMES CITY SERVICE AUTHORITY.
- TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL NOT BE REMOVED UNTIL ALL DISTURBED AREAS ARE STABILIZED. REMOVAL SHALL NOT OCCUR WITHOUT AUTHORIZATION BY THE COUNTY ENVIRONMENTAL DIVISION. DISTURBANCES ASSOCIATED WITH THE REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROPERLY STABILIZED.
- NO SEDIMENT TRAP OR SEDIMENT BASIN SHALL BE REMOVED UNTIL A) AT LEAST 75 PERCENT OF THE SINGLE-FAMILY LOTS WITHIN THE DRAINAGE AREA TO THE TRAP OR BASIN HAVE BEEN SOLD TO A THIRD PARTY FOR THE CONSTRUCTION OF HOMES (UNRELATED TO THE DEVELOPER); AND/OR, B) 60 PERCENT OF THE SINGLE-FAMILY LOTS WITHIN THE DRAINAGE AREA TO THE TRAP OR BASIN ARE COMPLETED AND STABILIZED. A BULK SALE OF THE LOTS TO ANOTHER BUILDER DOES NOT SATISFY THIS PROVISION. SEDIMENT TRAPS AND SEDIMENT BASINS SHALL NOT BE REMOVED WITHOUT AUTHORIZATION OF THE COUNTY ENVIRONMENTAL DIVISION.
- APPLICABLE PROVISIONS OF THE COUNTY BMP MANUAL (JAMES CITY COUNTY GUIDELINES FOR DESIGN AND CONSTRUCTION OF STORMWATER MANAGEMENT BMP'S) AND THE VIRGINIA STORMWATER MANAGEMENT HANDBOOK (VSMH) APPLY TO THE PROJECT.
- DESIGN AND CONSTRUCTION OF PRIVATE-TYPE STORM DRAINAGE SYSTEMS, OUTSIDE VDOT RIGHT-OF-WAY, SHALL BE PERFORMED IN ACCORDANCE WITH THE CURRENT VERSION OF THE JAMES CITY COUNTY ENVIRONMENTAL DIVISION, STORMWATER DRAINAGE CONVEYANCE SYSTEMS (NON-BMP RELATED), GENERAL DESIGN AND CONSTRUCTION GUIDELINES.
- RECORD DRAWINGS (ASBUILTS) AND CONSTRUCTION CERTIFICATIONS ARE REQUIRED FOR ALL STORMWATER FACILITIES INCLUDING STORMWATER MANAGEMENT/BMP FACILITIES AND STORM DRAINAGE CONVEYANCE SYSTEMS. RECORD DRAWINGS AND CONSTRUCTION CERTIFICATIONS MUST MEET ESTABLISHED PROGRAM REQUIREMENTS OF BOTH THE COUNTY ENVIRONMENTAL AND STORMWATER DIVISIONS.
- ALL STORMWATER FACILITIES INCLUDING BMP'S, STORM DRAINAGE PIPES, STORMWATER CONVEYANCES, INLETS, MANHOLES, OUTFALLS AND ROADSIDE AND OTHER OPEN CHANNELS SHALL BE INSPECTED BY THE COUNTY STORMWATER DIVISION AND GEOTECHNICAL ENGINEER IN ACCORDANCE WITH ESTABLISHED COUNTY STORMWATER DIVISION PROGRAM REQUIREMENTS.

## STORMWATER NARRATIVE

### PROJECT DESCRIPTION

THIS PLAN OF DEVELOPMENT IS FOR A SITE EXPANSION OF CROSSWALK COMMUNITY CHURCH. THE PROJECT INCLUDES AN EXPANSION OF THE EXISTING PARKING LOT ON THE EASTERN EDGE OF THE SITE, AS WELL AS, GRADING TO PREPARE FOR AN ADDITIONAL FUTURE PARKING EXPANSION. ALL PROPOSED GRADING AND DRAINAGE WILL BE DIRECTED TOWARDS A PROPOSED DRY POND TO THE EAST OF THE PARKING EXPANSION. THE PROPOSED POND WILL DISCHARGE INTO AN EXISTING PAVED FLUME TO THE EDGE OF WETLANDS.

### EXISTING/PROPOSED SITE CONDITIONS

THE EXISTING SITE IS MOSTLY IMPERVIOUS AREA INCLUDING PAVED PARKING AND THE CHURCH BUILDING ITSELF. A MAJORITY OF THE SITE DRAINS NATURALLY OR BY EXISTING PAVED FLUME TOWARDS THE EAST INTO YARMOUTH CREEK THROUGH A WETLAND AND CREEK SYSTEM. THE SITE IS BOUNDED BY RICHMOND ROAD TO THE NORTH, UNDEVELOPED WOODED LANDS TO THE SOUTH/SOUTHEAST, AND A SMALL SHOPPING CENTER TO THE WEST.

### SOILS

THE ENVIRONMENTAL INVENTORY SHEET IDENTIFIES THE SOILS ON-SITE.

### CRITICAL EROSION AREAS

THERE ARE NO AREAS OF HIGHLY ERODIBLE SOILS AND SLOPES IN EXCESS OF 25% BEING IMPACTED ON-SITE.

### EROSION AND SEDIMENT CONTROL MEASURES

UNLESS OTHERWISE INDICATED, ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH). THE MINIMUM STANDARDS OF THE VESCH SHALL BE ADHERED TO UNLESS OTHERWISE WAIVED OR APPROVED BY THE ON-SITE E&S CONTROL INSPECTOR. THESE MEASURES SHALL INCLUDE STANDARD SILT FENCE, DIVERSIONS, DIVERSION DIKES, ROCK CHECK DAMS, AND BOTH STANDARD AND CULVERT INLET PROTECTION.

### MANAGEMENT STRATEGIES

- CONSTRUCTION WILL BE SEQUENCED SUCH THAT GRADING OPERATIONS CAN BEGIN AND END AS QUICKLY AS POSSIBLE.
- E&S CONTROL DEVICES WILL BE INSTALLED PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES.
- TEMPORARY SEEDING OR OTHER STABILIZATION WILL FOLLOW IMMEDIATELY AFTER GRADING.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION, INSPECTION, AND MAINTENANCE OF ALL E&S CONTROL MEASURES.

### PERMANENT STABILIZATION

ALL DISTURBED AREAS SHALL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY FOLLOWING FINISH GRADING. SEEDING SHALL BE IN ACCORDANCE WITH THE VESCH.

### MAINTENANCE

ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CHECKED ROUTINELY AND AFTER EACH SIGNIFICANT RAINFALL EVENT TO INSURE THAT THEY ARE OPERATING EFFECTIVELY. ALL MEASURES SHALL BE MAINTAINED IN ACCORDANCE WITH THE VESCH.

### GENERAL SEQUENCE OF CONSTRUCTION

- INSTALL ALL PERIMETER EROSION & SEDIMENT CONTROL FEATURES PRIOR TO PERFORMING ANY CONSTRUCTION ACTIVITIES;
- COORDINATE REMOVAL OF EXISTING TREES;
- PERFORM SITE DEMOLITION IN ACCORDANCE WITH SHEET 2. CONTRACTOR TO COORDINATE WITH OWNER ON TIMING OF PARKING CLOSURE TO AVOID CONSTRUCTION CONFLICTS;
- INSTALL PARKING AND STORMWATER MANAGEMENT POND WITHIN THE CONSTRUCTION LIMITS;
- FINALIZE PARKING GRADES AND INSTALL CURBING;
- APPLY SURFACE ASPHALT TO PARKING AREAS;
- TOPSOIL AND STABILIZE AREA OF FUTURE PARKING EXPANSION;
- REMOVE PERIMETER EROSION CONTROL MEASURES;
- REMOVE ALL SITE EROSION AND SEDIMENT CONTROL MEASURES.

## EROSION AND SEDIMENT CONTROL NARRATIVE

### DESCRIPTION

THIS PROJECT IS FOR THE CONSTRUCTION OF A PARKING LOT EXPANSION AT CROSSWALK COMMUNITY CHURCH IN THE STONEHOUSE DISTRICT OF JAMES CITY COUNTY. THIS INCLUDES THE CONSTRUCTION OF THE PARKING, DRY POND, AND ASSOCIATED DITCHES. THE EXPANSION WILL BE TO THE NORTH-WEST OF THE EXISTING PARKING LOT. THE STORMWATER RUNOFF ASSOCIATED WITH THIS SITE WILL BE COLLECTED INTO A PROPOSED DRY POND AND DISCHARGED INTO THE ADJACENT EXISTING BMP.

### EXISTING SITE CONDITIONS

THE AREA TO BE DEVELOPED IS GENTLY SLOPING TOWARDS A RAVINE INTO EXISTING WETLANDS.

### ADJACENT PROPERTIES

THE SITE IS BORDERED TO THE SOUTH AND WEST BY UNDEVELOPED WOODED LAND, TO THE EAST BY A SHOPPING CENTER, AND RICHMOND ROAD TO THE NORTH.

### OFF-SITE AREAS

THERE ARE NO AREAS OF PROPOSED OFF-SITE IMPROVEMENTS.

### CRITICAL AREAS

THERE ARE NO CRITICAL AREAS ON THE SITE. ALL LAND-DISTURBING ACTIVITIES WILL BE CONTAINED WITHIN THE LIMITS OF DISTURBANCE SHOWN ON THE CONSTRUCTION PLANS AND PROTECTED BY ADEQUATE EROSION AND SEDIMENT CONTROL MEASURES. ALL PROPOSED SLOPES SHALL BE 3:1 OR FLATTER TO THE EXTENT POSSIBLE THROUGHOUT THE SITE.

MEASURES. ALL PROPOSED SLOPES SHALL BE 3:1 OR FLATTER TO THE EXTENT POSSIBLE THROUGHOUT THE SITE.

### SOILS

A DELINEATION AND TABLE OF ASSOCIATED SOIL CHARACTERISTICS FOR THE SOILS ASSUMED TO BE ENCOUNTERED ON THE SITE IS SHOWN BELOW.

### EROSION AND SEDIMENT CONTROL MEASURES

FOR MAXIMUM EROSION AND SEDIMENT CONTROL PROTECTION, THE FOLLOWING MEASURES WILL BE UTILIZED AND INSTALLED IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK TO MINIMIZE THE TRANSPORTATION OF SEDIMENT:

ROCK CHECK DAMS  
TREE PROTECTION  
CULVERT INLET PROTECTION

SILT FENCE  
DIVERSION DIKE

### PERMANENT STABILIZATION

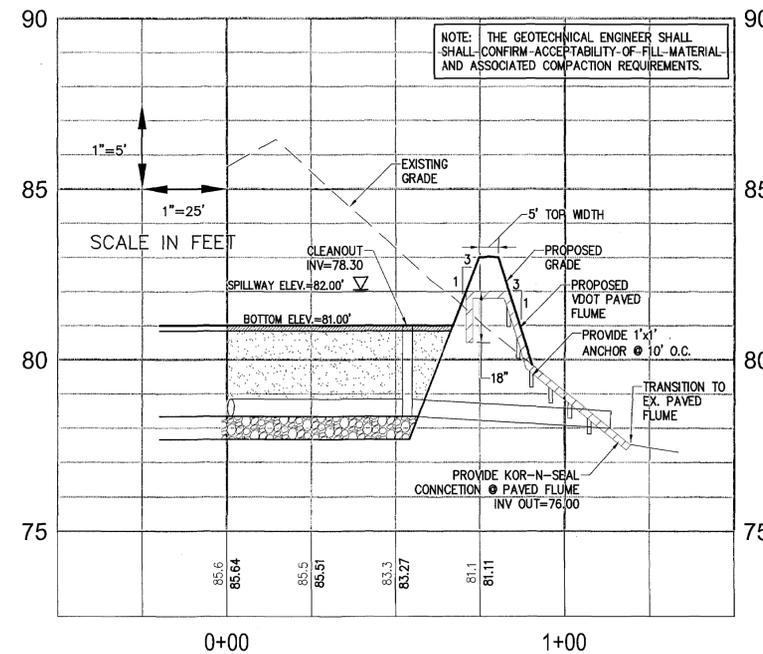
PERMANENT SEEDING WILL BE USED TO STABILIZE THE SITE PRIOR TO PROJECT COMPLETION.

### STORMWATER RUNOFF CONSIDERATIONS

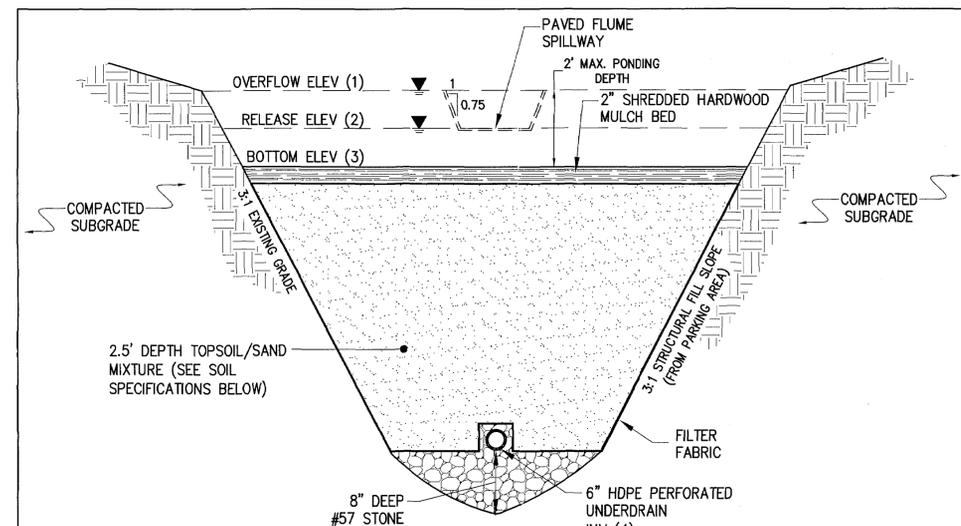
STORMWATER GENERATED FROM THE PROJECT SITE WILL BE CONVEYED BY PIPE TO THE ADJACENT EXISTING STORM NETWORK.

## SEQUENCE OF CONSTRUCTION

- PRIOR TO OBTAINING LAND DISTURBING PERMIT, THE CONTRACTOR SHALL OBTAIN A VSMP PERMIT (VIRGINIA STORMWATER MANAGEMENT PROGRAM) FROM DCR (VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION).
- THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE JAMES CITY COUNTY ENVIRONMENTAL DIVISION PRIOR TO BEGINNING ANY WORK AT THE SITE. *→ shh*
- DEMOLISH EXISTING SITE IMPROVEMENTS.
- INSTALL TREE PROTECTION AND SILT FENCE AS SHOWN PRIOR TO BEGINNING LAND DISTURBING ACTIVITIES.
- CLEAR THE SITE, REMOVING EXISTING TREES AS SHOWN.
- INSTALL TEMPORARY SLOPE DRAINS AND PROVIDE CULVERT INLET PROTECTION FOR ALL. *→ not shown on plan*
- FINE GRADE THE SITE AND CONSTRUCT PARKING EXPANSION. PLACE BASE STONE AND INSTALL CURB. INSTALL BASE ASPHALT.
- PLACE TOPSOIL AND SEED ALL DISTURBED AREAS AS NECESSARY TO EFFECT PERMANENT VEGETATIVE COVER. INSTALL LANDSCAPING.
- INSTALL SURFACE PAVEMENT ON PARKING.
- REPAIR ANY INADVERTENT EROSION AND REMOVE ANY INADVERTENT SEDIMENTATION.
- REMOVE ALL EROSION AND SEDIMENT CONTROL MEASURES WITHIN THIRTY DAYS OF FINAL SITE STABILIZATION, BUT ONLY AFTER APPROVAL IS OBTAINED FROM THE ASSIGNED JAMES CITY COUNTY ENVIRONMENTAL INSPECTOR.



BMP SECTION A-A  
NTS



## BIORETENTION BASIN & FILTER

MINIMUM STANDARD 3.11A - VIRGINIA STORMWATER MANAGEMENT HANDBOOK

N.T.S.

	OVERFLOW ELEV	RELEASE ELEV	BOTTOM ELEV	UNDERDRAIN INV	WATER QUALITY VOLUME PROVIDED
BIORETENTION	(1) 83.0'	(2) 82.0'	(3) 81.0'	(4) 78.30'	1,781 (CU. FT.)

### PLANTING REQUIREMENTS

MIXTURE OF GRASS COVERS, SHRUBS, AND TREES SHALL BE PLANTED IN BIO RETENTION AREAS. LANDSCAPE PLANS SHALL BE INCLUDED IN PARK/OPEN SPACE PLANS BY DEVELOPER.

### SOIL SPECIFICATIONS

THE BIORETENTION AREAS SHALL CONTAIN A PLANTING SOIL MIXTURE OF 50% SAND, 30% LEAF COMPOST (FULLY COMPOSTED, NOT PARTIALLY ROTTED LEAVES), AND 20% TOPSOIL. TOPSOIL SHALL BE SANDY LOAM OR LOAMY SAND OF UNIFORM COMPOSITION, CONTAINING NO MORE THAN 5% CLAY, FREE OF STONES, STUMPS, ROOTS OR SIMILAR OBJECTS GREATER THAN ONE INCH, BRUSH, OR ANY OTHER MATERIAL OR SUBSTANCE WHICH MAY BE HARMFUL TO PLANT GROWTH, OR A HINDERANCE TO PLANT GROWTH OR MAINTENANCE. THE TOPSOIL SHALL BE FREE OF PLANTS OR PLANT PARTS OF BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, MUDGRASS, NUTCRACK, POISON Ivy, CANADIAN THISTLE, CATTAIL, OR OTHERS AS SPECIFIED. IT SHALL NOT CONTAIN TOXIC SUBSTANCES HARMFUL TO PLANT GROWTH.

THE TOP SOIL SHALL BE TESTED AND MEET THE MINIMUM CRITERIA SET FORTH IN SECTION 3.11-28 OF THE VIRGINIA STORMWATER MANAGEMENT HANDBOOK (LATEST EDITION). A MULCH LAYER SHALL BE PROVIDED ON TOP OF THE PLANTING SOIL. AN ACCEPTABLE MULCH LAYER SHALL INCLUDE SHREDDED HARDWOOD OR SHREDDED WOOD CHIPS OR OTHER SIMILAR PRODUCT.

### MAINTENANCE PROGRAM & SCHEDULE

INSPECT AND REPAIR EROSION  
REPAIR ANY VOID AREAS  
MONTHLY  
WHENEVER NEEDED

REMOVE PREVIOUS MULCH AND REAPPLY  
REMOVAL AND REPLACEMENT OF ALL DISEASED VEGETATION  
EVERY 3 YEARS  
WHENEVER NEEDED

CONSIDERED BEYOND TREATMENT  
CHECK FOR ACCUMULATED SEDIMENTS  
INSPECT AND REMOVE ANY DEBRIS THAT MAY COLLECT AT THE  
DROP INLET  
MONTHLY  
AFTER MAJOR STORM  
EVENTS/OR SEMI ANNUALLY

### NOTES

WATER PLANT MATERIAL EACH DAY FOR FOURTEEN CONSECUTIVE DAYS AFTER CONSTRUCTION.

CONTRACTOR SHALL REFER TO COUNTY BMP MANUAL (GROUP D, PGS. 48-50) AND MINIMUM STANDARDS 3.11 AND 3.13 OF THE VIRGINIA STORMWATER MANAGEMENT HANDBOOK FOR METHODS/MATERIAL ASSOCIATED WITH CONSTRUCTION OF THE BIORETENTION CELLS.

VDOT SHALL BE SAVED HARMLESS FROM THE MAINTENANCE RESPONSIBILITY OR LIABILITY ASSOCIATED WITH ANY FAILURE OF THE STORM WATER MANAGEMENT FACILITY AND ITS STRUCTURES.

A PROFESSIONAL ENGINEER WHO HAS INSPECTED THE BASIN DURING CONSTRUCTION SHALL CERTIFY THE CONSTRUCTION OF THE BIORETENTION BASIN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE BIORETENTION BASIN CONSTRUCTION SCHEDULE WITH THE ENGINEER TO ENSURE ON SITE MONITORING.

Rev.	Date	Description
1	12/10/10	REV. PER JCC COMMENTS 1/15/10



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PARKING EXPANSION  
CROSSWALK  
COMMUNITY CHURCH

STONEHOUSE DISTRICT | JAMES CITY COUNTY | VIRGINIA

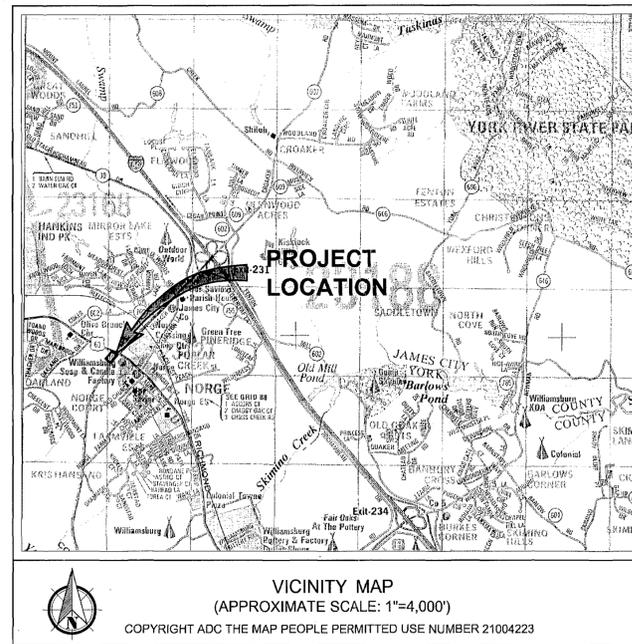
Project Contacts:	JAG, AMR
Project Number:	W10157
Scale:	Date:
AS NOTED	10/20/10
Sheet Title:	
NOTES & DETAILS	

# SITE PLAN FOR CROSSWALK COMMUNITY CHURCH PARKING EXPANSION

STONEHOUSE DISTRICT      JAMES CITY COUNTY      VIRGINIA

**GENERAL NOTES:**

1. PROPERTY IS SUBJECT TO PROFFERS ASSOCIATED WITH REZONING CASE Z-3-97.
2. SITE IS SERVED BY PUBLIC WATER AND SEWER.
3. NO ADDITIONAL WATER OR SEWER CONNECTION ARE REQUIRED FOR THIS PROJECT.
4. ANY EXISTING UNUSED WELLS SHALL BE ABANDONED IN ACCORDANCE WITH STATE PRIVATE WELL REGULATIONS AND JAMES CITY COUNTY CODE.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING MISS UTILITY (1-800-552-7001) FOR EXISTING UTILITY LOCATIONS PRIOR TO COMMENCING CONSTRUCTION.
6. EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.
7. ALL UTILITIES WILL BE PLACED UNDERGROUND.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FOR THIS PROJECT.
9. ANY UTILITIES TO BE RELOCATED SHALL BE RELOCATED AT THE OWNER/DEVELOPER'S EXPENSE, INCLUDING UTILITIES WITHIN THE CITY RIGHT-OF-WAY.
10. ON-SITE EXTERIOR CONCRETE IS TO BE A MINIMUM OF 3000 PSI WITH 5% TO 7% AIR ENTRAINMENT.
11. OWNER IS RESPONSIBLE FOR MAINTENANCE OF ALL SITE IMPROVEMENTS, INCLUDING LANDSCAPING, AS SHOWN ON THE APPROVED PLAN.
12. BENCHMARK STATION NO. 306, EASTING (X) 11986404.356, NORTHING (Y) 3661140.546, ELEVATION = 100.40  
 HORIZONTAL DATUM: JAMES CITY COUNTY GEODETIC CONTROL NETWORK  
 VIRGINIA STATE PLANE COORDINATE SYSTEM - SOUTH ZONE  
 NAD 83 (1984 VA HARN)  
 VERTICAL DATUM: JAMES CITY COUNTY GEODETIC CONTROL NETWORK NGVD 29
13. ALL OBJECTIONABLE AND DELETERIOUS MATERIALS IS TO BE REMOVED FROM THE SITE AND DISPOSED OF IN A STATE APPROVED FACILITY MEETING THE REQUIREMENTS OF ALL APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS.



COUNTY PROJECT NO.: SP-0095-2010  
 COUNTY PIN NO.: (23-2)(11-0-0001-B)  
 ORIGINAL SUBMITTAL DATE: 10/20/10  
 APPROVAL DATE:



**INDEX OF SHEETS:**

SHEET NO.	SHEET DESCRIPTION
1	COVER SHEET
2	DEMOLITION AND SITE PLAN
3	NOTES & DETAILS
4	NOTES & DETAILS

**OWNER/DEVELOPER INFORMATION:**

CROSSWALK COMMUNITY CHURCH  
 CONTACT: LLOYD HANSEN  
 7575 RICHMOND ROAD  
 WILLIAMSBURG, VA 23185  
 PHONE NO.: (757) 258-2825  
 E-MAIL: lloyd.hansen@crosswalk.cc

**CERTIFIED RESPONSIBLE LAND DISTURBER:**

JASON GRIMES, P.E.  
 AES CONSULTING ENGINEERS  
 5248 OLDE TOWNE ROAD, SUITE 1  
 WILLIAMSBURG, VIRGINIA, 23188  
 TELEPHONE: 757-253-0040

\* FOR SITE PLAN REVIEW PROCESS ONLY. OWNER OR CONTRACTOR SHALL NAME RESPONSIBLE LAND DISTURBER FOR CONSTRUCTION PROCESS.

**SITE DATA:**

SITE ADDRESS: 7575 RICHMOND ROAD  
 WILLIAMSBURG, VA 23188

TOTAL PARCEL AREA: 8.78 ACRES

ZONING: MU - MIXED USE

PROPOSED IMPERVIOUS AREA: 19,580 S.F.±, 0.45 AC.± (INCLUDES FUTURE PARKING AREA)

TOTAL DISTURBED AREA: 33,480 S.F.±, 0.77 AC.±

FLOOD HAZARD MAP: THIS PROPERTY IS IN FLOOD ZONE X AS SHOWN ON MAP NUMBER 51095C, PANEL 0110C, DATED 2007 OF THE FLOOD INSURANCE RATE MAPS FOR JAMES CITY COUNTY, VIRGINIA. ZONE X IS DEFINED AS OUTSIDE THE 500-YEAR FLOODPLAIN.

PARKING PROVIDED: 24 ADDITIONAL SPACES ARE PROPOSED

THIS PROJECT IS LOCATED IN SUBWATERSHED 103 OF THE YARMOUTH CREEK WATERSHED MANAGEMENT PLAN IN JAMES CITY COUNTY FOR WHICH A WATERSHED MANAGEMENT PLAN WAS DEVELOPED.



COUNTY OF JAMES CITY FINAL SITE PLAN	
APPROVALS	DATE
Fire Dept. <i>JBL/AV</i>	<i>1/25/11</i>
Health Dept.	
VDOT	
Planning <i>CM</i>	<i>2/11/11</i>
Environ. <i>STL/AV</i>	<i>2/11/11</i>
Zoning Adm. <i>ME/CHS</i>	<i>2/11/11</i>
JCSA <i>DL/AV</i>	<i>2/11/11</i>
County Eng.	
REA	
Other	

Rev.	Date	Description
2	1/18/11	REV. PER JCC COMMENTS 12/20/10
1	12/10/10	REV. PER JCC COMMENTS 11/20/10

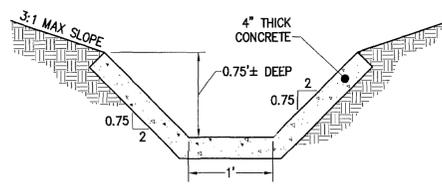


PARKING EXPANSION  
 CROSSWALK  
 COMMUNITY CHURCH  
 STONEHOUSE DISTRICT      JAMES CITY COUNTY      VIRGINIA

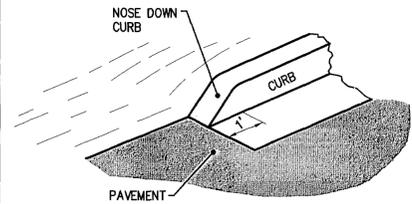
Project Contacts:	JAG, AMR
Project Number:	W10157
Scale:	Date:
AS NOTED	10/20/10
Sheet Title:	COVER SHEET
Sheet Number:	1

S-0095-2010

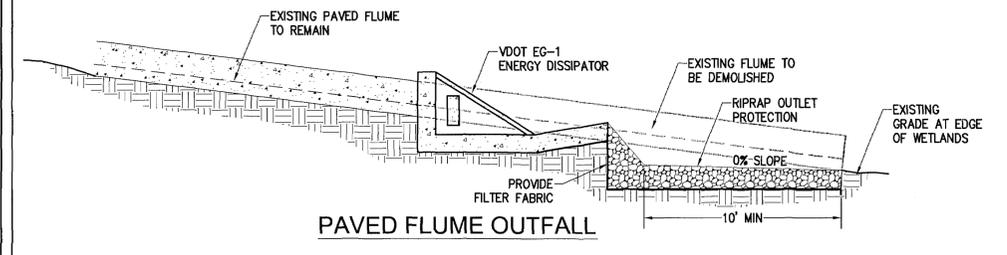




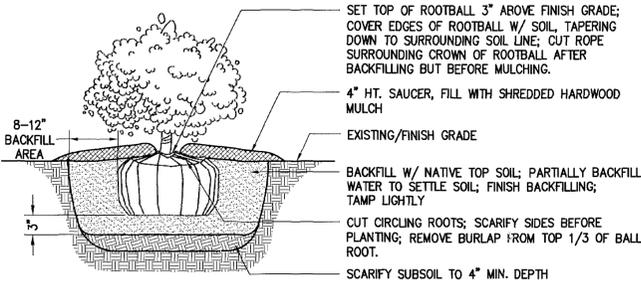
PAVED FLUME SECTION  
N.T.S.



NOSE DOWN CURB  
N.T.S.

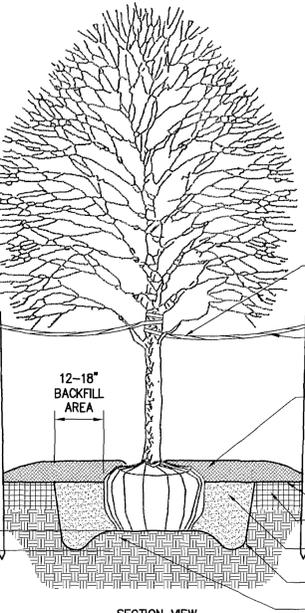


PAVED FLUME OUTFALL



SHRUB PLANTING

NOT TO SCALE



DECIDUOUS TREE PLANTING

NOT TO SCALE

OUTSIDE ROAD DITCHES

TYPE	D	FRONT SLOPE	BACK SLOPE	W1	W2	K	SQ. YDS. SURFACE AREA PER LIN. FT.
A1	6"	3:1	4:1	2'-0"	2'-0"	48	0.565
A2	8"	3:1	4:1	2'-0"	2'-0"	104	0.759
A3	10"	3:1	4:1	2'-0"	2'-0"	180	1.390
B1	6"	3:1	4:1	2'-0"	2'-0"	32	0.385
B2	8"	3:1	4:1	2'-0"	2'-0"	68	0.843
B3	10"	3:1	4:1	2'-0"	2'-0"	116	1.453
C1	6"	3:1	4:1	2'-0"	2'-0"	32	0.385
C2	8"	3:1	4:1	2'-0"	2'-0"	68	0.843
C3	10"	3:1	4:1	2'-0"	2'-0"	116	1.453

MEDIAN DITCH

TYPE	D	DEPTH	W1	W2	SQ. YDS. SURFACE AREA PER LIN. FT.
K-82	8"	2'-0"	2'-0"	2'-0"	0.611
K-15	12"	2'-0"	2'-0"	2'-0"	0.900

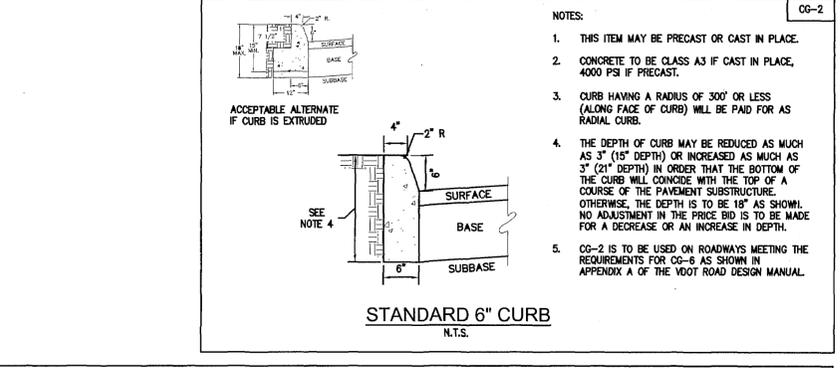
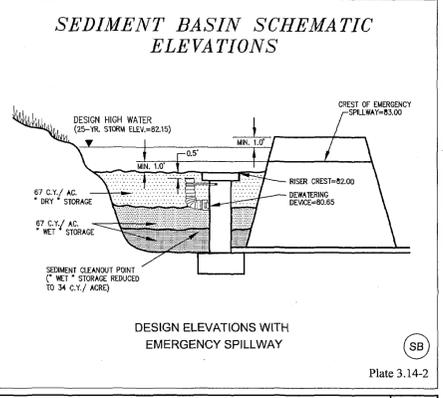
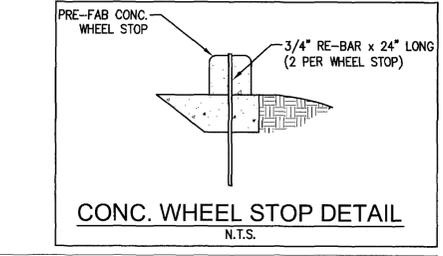
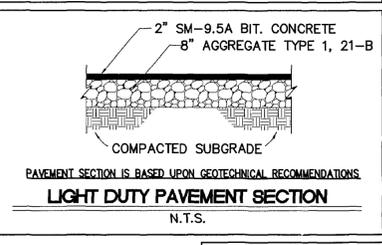
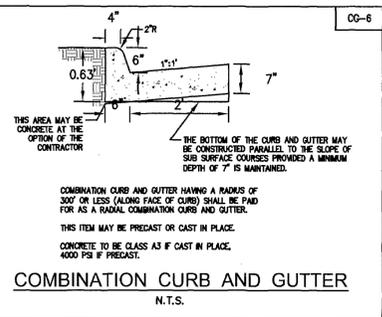
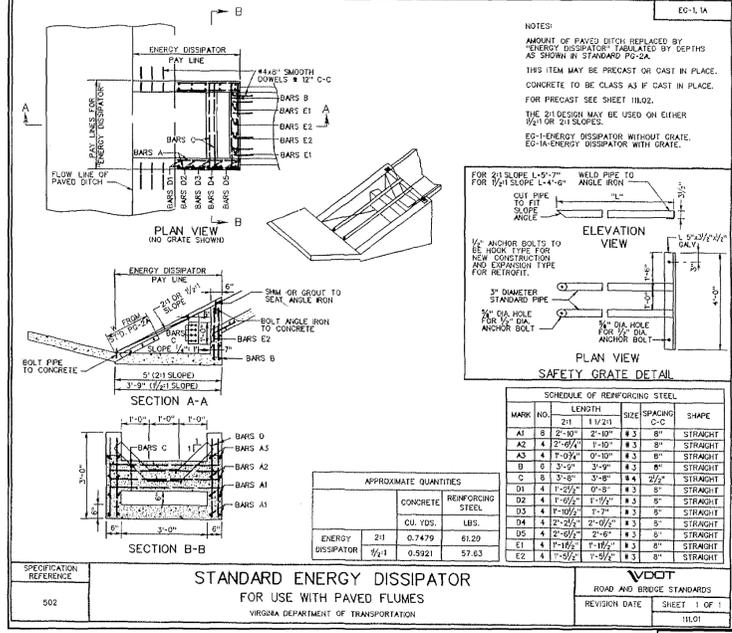
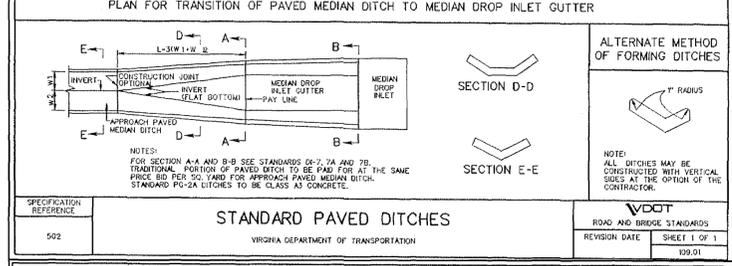
DITCH AT TOE OF FILL OR TOP OF CUT

CURTAIN WALL DETAIL

PLAN FOR TRANSITION OF PAVED MEDIAN DITCH TO MEDIAN DROP INLET GUTTER

ALTERNATE METHOD OF FORMING DITCHES

NOTES: ALL DITCHES MAY BE CONSTRUCTED WITH VERTICAL SIDES AT THE OPTION OF THE CONTRACTOR.

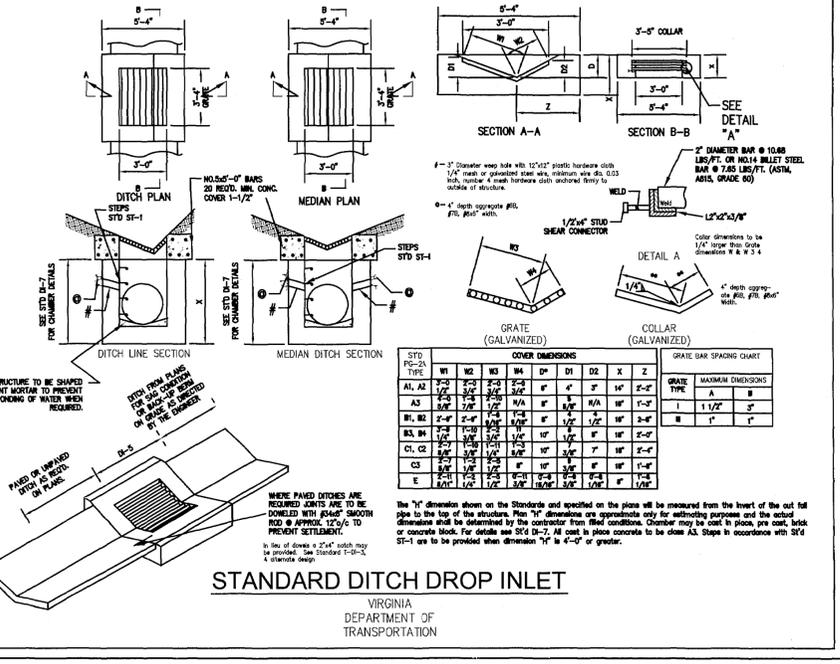


SITE SPECIFIC SEEDING MIXTURES FOR COASTAL PLAIN AREA

MIXTURE	TOTAL LBS. PER ACRE
MINIMUM CARE LAWN, COMMERCIAL OR RESIDENTIAL - KENTUCKY 31 OR TURF-TYPE TALL FESCUE OR COMMON BERMU DA GRASS **	175-200 LBS.
COMMON BERMU DA GRASS **	75 LBS.
HIGH-MAINTENANCE LAWN - KENTUCKY 31 OR TURF-TYPE TALL FESCUE OR HYBRID BERMU DA GRASS (SEED)**	200-250 LBS.
HYBRID BERMU DA GRASS (BY OTHER VEGETATIVE ESTABLISHMENT METHOD, SEE STD. & SPEC. 3.34)	40 LBS. (UNHALLED) OR 30 LBS. (HULLED)
GENERAL SLOPE (3:1 OR LESS) - KENTUCKY 31 FESCUE OR RED TOP GRASS OR SEASONAL NURSE CROP *	128 LBS., 2 LBS., 20 LBS., 150 LBS.
LOW MAINTENANCE SLOPE (STEEPER THAN 3:1) - KENTUCKY 31 TALL FESCUE OR COMMON BERMU DA GRASS ** OR RED TOP GRASS OR SEASONAL NURSE CROP * OR SERICEA LESPEDEZA **	93-108 LBS., 0-15 LBS., 2 LBS., 20 LBS., 150 LBS.

\* USE SEASONAL CROP IN ACCORDANCE WITH SEEDING DATES AS STATED BELOW:  
 FEBRUARY, MARCH THROUGH APRIL.....ANNUAL RYE  
 MAY 1ST THROUGH AUGUST.....FOXTAIL MILLET  
 SEPTEMBER, OCTOBER THROUGH NOVEMBER 15TH.....ANNUAL RYE  
 NOVEMBER 16TH THROUGH JANUARY.....WINTER RYE

\*\* MAY THROUGH OCTOBER, USE HULLED SEED. ALL OTHER SEEDING PERIODS, USE UNHULLED SEED. WEEPING LOVEGRASS MAY BE ADDED TO ANY SLOPE OR LOW-MAINTENANCE MIX DURING WARMER SEEDING PERIODS; ADD 10-20 LBS./ACRE IN MIXES.



REV.	DATE	DESCRIPTION
1	12/10/10	REV. PER. JCC COMMENTS 10/20/10
2	1/18/11	REV. PER. JCC COMMENTS 10/20/10



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PARKING EXPANSION  
**CROSSWALK**  
**COMMUNITY CHURCH**

STONEHOUSE DISTRICT | JAMES CITY COUNTY | VIRGINIA

Project Contacts: JAG, AMR  
 Project Number: W10157  
 Scale: AS NOTED  
 Date: 10/20/10

Sheet Title:  
**NOTES & DETAILS**

Sheet Number  
**3**

THE FOLLOWING STANDARD EROSION AND SEDIMENT CONTROL (E&S) NOTES SHALL BECOME PART OF APPROVED EROSION AND SEDIMENT CONTROL PLANS FOR ALL PLAN OF DEVELOPMENT PROJECTS IN JAMES CITY COUNTY, VIRGINIA.

- ALL THE PROVISIONS OF VIRGINIA EROSION AND SEDIMENT CONTROL LAW AND REGULATIONS, MINIMUM STANDARDS, HANDBOOKS, AND TECHNICAL BULLETINS AS PUBLISHED BY THE VIRGINIA SOIL & WATER CONSERVATION BOARD AND/OR THE VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION, DIVISION OF SOIL & WATER CONSERVATION SHALL APPLY TO THE PROJECT.
- MINIMUM STANDARDS # 1 THROUGH # 19 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS (4VAC50-30-40) SHALL APPLY TO THE PROJECT.
- THE OWNER OR APPLICANT SHALL BE RESPONSIBLE TO REGISTER FOR COVERAGE UNDER THE GENERAL PERMIT FOR DISCHARGE OF STORMWATER FROM CONSTRUCTION ACTIVITIES, IN ACCORDANCE WITH CURRENT REQUIREMENTS OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) AND THE VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION.
- THE OWNER OR APPLICANT SHALL PROVIDE THE NAME OF AN INDIVIDUAL HOLDING A VALID RESPONSIBLE LAND DISTURBER (RLD) CERTIFICATE OF COMPETENCE WHO WILL BE RESPONSIBLE FOR THE LAND-DISTURBING ACTIVITY PRIOR TO ENGAGING IN THE LAND-DISTURBING ACTIVITY. THIS WILL BE NECESSARY PRIOR TO ISSUANCE OF A LAND-DISTURBING PERMIT FOR THE PROJECT. THE RLD IS REQUIRED TO ATTEND THE PRECONSTRUCTION CONFERENCE FOR THE PROJECT.
- THE CONTRACTOR IS RESPONSIBLE TO CONTACT MISS UTILITY (DIAL 811 IN VA OR 1-800-552-7001) PRIOR TO ANY UTILITY OR SITE WORK EXCAVATIONS.
- ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PLANNED, DESIGNED, IMPLEMENTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH). THE CONTRACTOR SHALL MAINTAIN, INSPECT AND REPAIR ALL EROSION AND SEDIMENT CONTROL MEASURES AS NEEDED THROUGHOUT THE LIFE OF THE PROJECT TO ENSURE CONTINUED ACCEPTABLE PERFORMANCE.
- A PRECONSTRUCTION CONFERENCE (MEETING) SHALL BE HELD ON SITE BETWEEN THE COUNTY ENVIRONMENTAL DIVISION, THE OWNER-APPLICANT, THE RESPONSIBLE LAND-DISTURBER (RLD), THE CONTRACTOR AND OTHER RESPONSIBLE AGENCIES, AS APPLICABLE, PRIOR TO ISSUANCE OF A LAND-DISTURBING PERMIT. THE OWNER OR APPLICANT IS REQUIRED TO COORDINATE SCHEDULING OF THE PRECONSTRUCTION CONFERENCE BETWEEN ALL APPLICABLE PARTIES. THE CONTRACTOR SHALL SUBMIT A SEQUENCE OF CONSTRUCTION TO THE COUNTY ENVIRONMENTAL DIVISION FOR REVIEW AND APPROVAL PRIOR TO THE PRECONSTRUCTION MEETING.
- ALL PERIMETER EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND-DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE.
- ADDITIONAL SAFETY FENCE OR DUST CONTROL MEASURES, IN ACCORDANCE WITH THE PROVISIONS OF MINIMUM STANDARDS & SPECS. 3.01 AND 3.39 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH), MAY BE REQUIRED TO BE IMPLEMENTED IN ADDITION TO THAT SHOWN ON THE APPROVED PLAN IN ORDER TO ENSURE ADEQUATE PROTECTION OF THE HEALTH, SAFETY AND WELFARE OF THE PUBLIC OR IF SITE CONDITIONS CHANGE, BECOME APPARENT OR ALTER SIGNIFICANTLY FOLLOWING THE DATE OF PLAN APPROVAL.
- EROSION AND SEDIMENT CONTROL MEASURES MAY REQUIRE MINOR FIELD ADJUSTMENTS AT OR FOLLOWING TIME OF CONSTRUCTION TO ENSURE THEIR INTENDED PURPOSE IS ACCOMPLISHED, TO ENSURE ADEQUATE PROTECTION OF THE HEALTH, SAFETY AND WELFARE OF THE PUBLIC, OR IF SITE CONDITIONS CHANGE, BECOME APPARENT OR ALTER SIGNIFICANTLY FOLLOWING THE DATE OF PLAN APPROVAL. COUNTY ENVIRONMENTAL DIVISION APPROVAL SHALL BE REQUIRED FOR ANY DEVIATION OF EROSION AND SEDIMENT CONTROL MEASURES FROM THE APPROVED PLAN.
- OFF-SITE WASTE OR BORROW AREAS SHALL BE APPROVED BY THE COUNTY ENVIRONMENTAL DIVISION PRIOR TO THE IMPORT OF ANY BORROW OR EXPORT OF ANY WASTE TO OR FROM THE PROJECT SITE.
- CULVERT AND STORM DRAIN INLET PROTECTIONS, IN ACCORDANCE WITH THE PROVISIONS OF MINIMUM STANDARDS & SPECS. 3.07 & 3.08 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH), MAY BE REMOVED AT THE DISCRETION OF THE ASSIGNED COUNTY ENVIRONMENTAL DIVISION INSPECTOR SHOULD PLACEMENT OF THE MEASURE RESULT IN EXCESSIVE ROAD FLOODING OR TRAFFIC HAZARD OR RESULT IN THE REDIRECTION OF DRAINAGE ONTO OR TOWARD EXISTING LOTS, DRIVEWAYS OR STRUCTURES. DECISIONS SHALL BE MADE ON A CASE-BY-CASE BASIS BASED ON FIELD SITUATIONS ENCOUNTERED.
- DRAINAGE FACILITIES SHALL BE INSTALLED AND FUNCTIONAL WITHIN 30 DAYS FOLLOWING COMPLETION OF ROUGH GRADING AT ANY POINT WITHIN THE PROJECT.
- NO MORE THAN 300 FEET OF TRENCH MAY BE OPEN AT ONE TIME FOR UNDERGROUND UTILITY LINES, INCLUDING STORM WATER CONVEYANCES. ALL OTHER PROVISIONS OF MINIMUM STANDARD # 16 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS APPLY.
- IF DISTURBED AREA STABILIZATION IS TO BE ACCOMPLISHED DURING THE MONTHS OF DECEMBER, JANUARY OR FEBRUARY, STABILIZATION SHALL CONSIST OF MULCHING IN ACCORDANCE WITH MINIMUM STANDARD & SPEC. 3.35 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH). SEEDING WILL THEN TAKE PLACE AS SOON AS THE SEASON PERMITS.
- THE TERM SEEDING, FINAL VEGETATIVE COVER OR STABILIZATION ON THE APPROVED PLAN SHALL MEAN THE SUCCESSFUL GERMINATION AND ESTABLISHMENT OF A STABLE GRASS COVER FROM A PROPERLY PREPARED SEEDBED, IN ACCORDANCE WITH MINIMUM STANDARDS & SPECS. 3.29 THROUGH 3.37 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH), AS APPLICABLE. IRRIGATION, IF NECESSARY, SHALL COMPLY WITH ALL APPLICABLE OUTDOOR WATER USE RESTRICTIONS OF THE JAMES CITY SERVICE AUTHORITY.
- TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL NOT BE REMOVED UNTIL ALL DISTURBED AREAS ARE STABILIZED. REMOVAL SHALL NOT OCCUR WITHOUT AUTHORIZATION BY THE COUNTY ENVIRONMENTAL DIVISION. DISTURBANCES ASSOCIATED WITH THE REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROPERLY STABILIZED.
- NO SEDIMENT TRAP OR SEDIMENT BASIN SHALL BE REMOVED UNTIL A) AT LEAST 75 PERCENT OF THE SINGLE-FAMILY LOTS WITHIN THE DRAINAGE AREA TO THE TRAP OR BASIN HAVE BEEN SOLD TO A THIRD PARTY FOR THE CONSTRUCTION OF HOMES (UNRELATED TO THE DEVELOPER); AND/OR, B) 60 PERCENT OF THE SINGLE-FAMILY LOTS WITHIN THE DRAINAGE AREA TO THE TRAP OR BASIN ARE COMPLETED AND STABILIZED. A BULK SALE OF THE LOTS TO ANOTHER BUILDER DOES NOT SATISFY THIS PROVISION. SEDIMENT TRAPS AND SEDIMENT BASINS SHALL NOT BE REMOVED WITHOUT AUTHORIZATION OF THE COUNTY ENVIRONMENTAL DIVISION.
- APPLICABLE PROVISIONS OF THE COUNTY BMP MANUAL (JAMES CITY COUNTY GUIDELINES FOR DESIGN AND CONSTRUCTION OF STORMWATER MANAGEMENT BMP'S) AND THE VIRGINIA STORMWATER MANAGEMENT HANDBOOK (VSMH) APPLY TO THE PROJECT.
- DESIGN AND CONSTRUCTION OF PRIVATE-TYPE STORM DRAINAGE SYSTEMS, OUTSIDE VDOT RIGHT-OF-WAY, SHALL BE PERFORMED IN ACCORDANCE WITH THE CURRENT VERSION OF THE JAMES CITY COUNTY ENVIRONMENTAL DIVISION, STORMWATER DRAINAGE CONVEYANCE SYSTEMS (NON-BMP RELATED), GENERAL DESIGN AND CONSTRUCTION GUIDELINES.
- RECORD DRAWINGS (ASBUILTS) AND CONSTRUCTION CERTIFICATIONS ARE REQUIRED FOR ALL STORMWATER FACILITIES INCLUDING STORMWATER MANAGEMENT/BMP FACILITIES AND STORM DRAINAGE CONVEYANCE SYSTEMS. RECORD DRAWINGS AND CONSTRUCTION CERTIFICATIONS MUST MEET ESTABLISHED PROGRAM REQUIREMENTS OF BOTH THE COUNTY ENVIRONMENTAL AND STORMWATER DIVISIONS.
- ALL STORMWATER FACILITIES INCLUDING BMP'S, STORM DRAINAGE PIPES, STORMWATER CONVEYANCES, INLETS, MANHOLES, OUTFALLS AND ROADSIDE AND OTHER OPEN CHANNELS SHALL BE INSPECTED BY THE COUNTY STORMWATER DIVISION AND GEOTECHNICAL ENGINEER IN ACCORDANCE WITH ESTABLISHED COUNTY STORMWATER DIVISION PROGRAM REQUIREMENTS.

## STORMWATER NARRATIVE

### PROJECT DESCRIPTION

THIS PLAN OF DEVELOPMENT IS FOR A SITE EXPANSION OF CROSSWALK COMMUNITY CHURCH. THE PROJECT INCLUDES AN EXPANSION OF THE EXISTING PARKING LOT ON THE EASTERN EDGE OF THE SITE, AS WELL AS, GRADING TO PREPARE FOR AN ADDITIONAL FUTURE PARKING EXPANSION. ALL PROPOSED GRADING AND DRAINAGE WILL BE DIRECTED TOWARDS A PROPOSED DRY POND TO THE EAST OF THE PARKING EXPANSION. THE PROPOSED POND WILL DISCHARGE INTO AN EXISTING PAVED FLUME TO THE EDGE OF WETLANDS.

### EXISTING/PROPOSED SITE CONDITIONS

THE EXISTING SITE IS MOSTLY IMPERVIOUS AREA INCLUDING PAVED PARKING AND THE CHURCH BUILDING ITSELF. A MAJORITY OF THE SITE DRAINS NATURALLY OR BY EXISTING PAVED FLUME TOWARDS THE EAST INTO YARMOUTH CREEK THROUGH A WETLAND AND CREEK SYSTEM. THE SITE IS BOUNDED BY RICHMOND ROAD TO THE NORTH, UNDEVELOPED WOODED LANDS TO THE SOUTH/SOUTHEAST, AND A SMALL SHOPPING CENTER TO THE WEST.

### SOILS

THE ENVIRONMENTAL INVENTORY SHEET IDENTIFIES THE SOILS ON-SITE.

### CRITICAL EROSION AREAS

THERE ARE NO AREAS OF HIGHLY ERODIBLE SOILS AND SLOPES IN EXCESS OF 25% BEING IMPACTED ON-SITE.

### EROSION AND SEDIMENT CONTROL MEASURES

UNLESS OTHERWISE INDICATED, ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH). THE MINIMUM STANDARDS OF THE VESCH SHALL BE ADHERED TO UNLESS OTHERWISE WAIVED OR APPROVED BY THE ON-SITE E&S CONTROL INSPECTOR. THESE MEASURES SHALL INCLUDE STANDARD SILT FENCE, DIVERSIONS, DIVERSION DIKES, ROCK CHECK DAMS, AND BOTH STANDARD AND CULVERT INLET PROTECTION.

### MANAGEMENT STRATEGIES

- CONSTRUCTION WILL BE SEQUENCED SUCH THAT GRADING OPERATIONS CAN BEGIN AND END AS QUICKLY AS POSSIBLE.
- E&S CONTROL DEVICES WILL BE INSTALLED PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES.
- TEMPORARY SEEDING OR OTHER STABILIZATION WILL FOLLOW IMMEDIATELY AFTER GRADING.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION, INSPECTION, AND MAINTENANCE OF ALL E&S CONTROL MEASURES.

### PERMANENT STABILIZATION

ALL DISTURBED AREAS SHALL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY FOLLOWING FINISH GRADING. SEEDING SHALL BE IN ACCORDANCE WITH THE VESCH.

### MAINTENANCE

ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CHECKED ROUTINELY AND AFTER EACH SIGNIFICANT RAINFALL EVENT TO INSURE THAT THEY ARE OPERATING EFFECTIVELY. ALL MEASURES SHALL BE MAINTAINED IN ACCORDANCE WITH THE VESCH.

### GENERAL SEQUENCE OF CONSTRUCTION

- INSTALL ALL PERIMETER EROSION & SEDIMENT CONTROL FEATURES PRIOR TO PERFORMING ANY CONSTRUCTION ACTIVITIES;
- COORDINATE REMOVAL OF EXISTING TREES AND INSTALL SEDIMENT BASIN;
- PERFORM SITE DEMOLITION IN ACCORDANCE WITH SHEET 2. CONTRACTOR TO COORDINATE WITH OWNER ON TIMING OF PARKING CLOSURE TO AVOID CONSTRUCTION CONFLICTS;
- INSTALL PARKING AND BIORETENTION (INSURING WATER IS DIRECTED AWAY UNTIL SOIL IS STABILIZED);
- FINALIZE PARKING GRADES AND INSTALL CURBING;
- APPLY SURFACE ASPHALT TO PARKING AREAS;
- TOPSOIL AND STABILIZE AREA OF FUTURE PARKING EXPANSION; REDIRECT DRAINAGE TO BIORETENTION AS SHOWN;
- REMOVE PERIMETER EROSION CONTROL MEASURES;
- REMOVE ALL SITE EROSION AND SEDIMENT CONTROL MEASURES.

## EROSION AND SEDIMENT CONTROL NARRATIVE

### DESCRIPTION

THIS PROJECT IS FOR THE CONSTRUCTION OF A PARKING LOT EXPANSION AT CROSSWALK COMMUNITY CHURCH IN THE STONEHOUSE DISTRICT OF JAMES CITY COUNTY. THIS INCLUDES THE CONSTRUCTION OF THE PARKING, DRY POND, AND ASSOCIATED DITCHES. THE EXPANSION WILL BE TO THE NORTH-WEST OF THE EXISTING PARKING LOT. THE STORMWATER RUNOFF ASSOCIATED WITH THIS SITE WILL BE COLLECTED INTO A PROPOSED DRY POND AND DISCHARGED INTO THE ADJACENT EXISTING BMP.

### EXISTING SITE CONDITIONS

THE AREA TO BE DEVELOPED IS GENTLY SLOPING TOWARDS A RAVINE INTO EXISTING WETLANDS.

### ADJACENT PROPERTIES

THE SITE IS BORDERED TO THE SOUTH AND WEST BY UNDEVELOPED WOODED LAND, TO THE EAST BY A SHOPPING CENTER, AND RICHMOND ROAD TO THE NORTH.

### OFF-SITE AREAS

THERE ARE NO AREAS OF PROPOSED OFF-SITE IMPROVEMENTS.

### CRITICAL AREAS

THERE ARE NO CRITICAL AREAS ON THE SITE. ALL LAND-DISTURBING ACTIVITIES WILL BE CONTAINED WITHIN THE LIMITS OF DISTURBANCE SHOWN ON THE CONSTRUCTION PLANS AND PROTECTED BY ADEQUATE EROSION AND SEDIMENT CONTROL MEASURES.

MEASURES. ALL PROPOSED SLOPES SHALL BE 3:1 OR FLATTER TO THE EXTENT POSSIBLE THROUGHOUT THE SITE.

### SOILS

A DELINEATION AND TABLE OF ASSOCIATED SOIL CHARACTERISTICS FOR THE SOILS ASSUMED TO BE ENCOUNTERED ON THE SITE IS SHOWN BELOW.

### EROSION AND SEDIMENT CONTROL MEASURES

FOR MAXIMUM EROSION AND SEDIMENT CONTROL PROTECTION, THE FOLLOWING MEASURES WILL BE UTILIZED AND INSTALLED IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK TO MINIMIZE THE TRANSPORTATION OF SEDIMENT:

ROCK CHECK DAMS  
TREE PROTECTION  
CULVERT INLET PROTECTION

SILT FENCE  
DIVERSION DIKE

### PERMANENT STABILIZATION

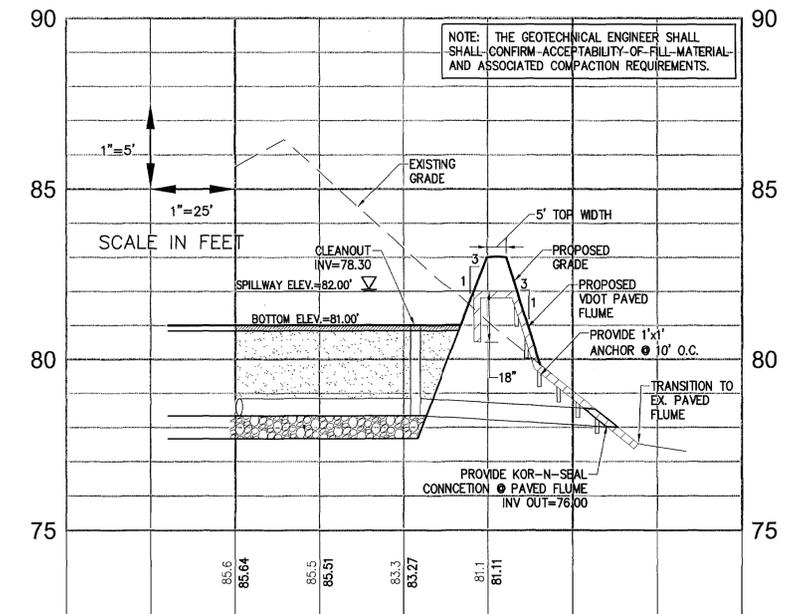
PERMANENT SEEDING WILL BE USED TO STABILIZE THE SITE PRIOR TO PROJECT COMPLETION.

### STORMWATER RUNOFF CONSIDERATIONS

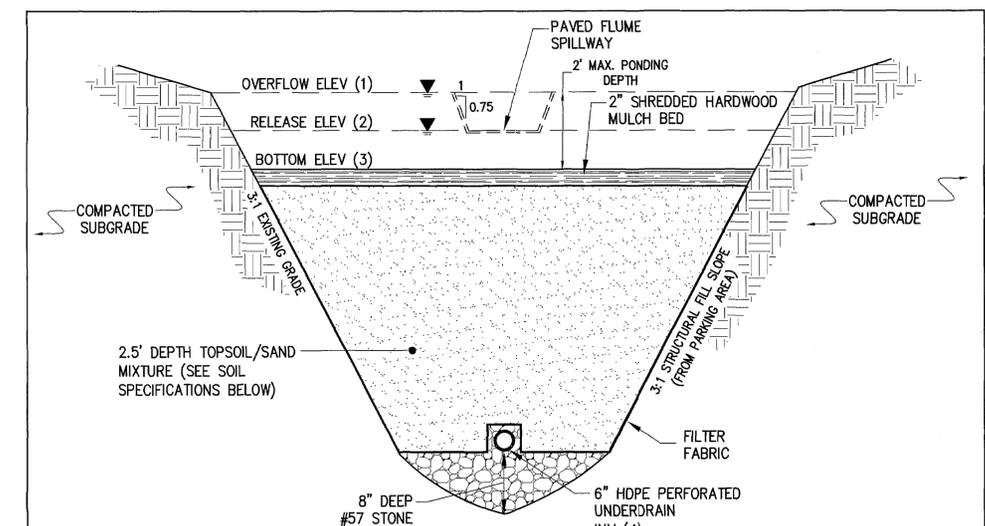
STORMWATER GENERATED FROM THE PROJECT SITE WILL BE CONVEYED BY PIPE TO THE ADJACENT EXISTING STORM NETWORK.

## SEQUENCE OF CONSTRUCTION

- PRIOR TO OBTAINING LAND DISTURBING PERMIT, THE CONTRACTOR SHALL OBTAIN A VSMP PERMIT (VIRGINIA STORMWATER MANAGEMENT PROGRAM) FROM DCR (VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION).
- THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE JAMES CITY COUNTY ENVIRONMENTAL DIVISION INSPECTOR A MINIMUM OF 48 HOURS PRIOR TO BEGINNING ANY WORK AT THE SITE.
- DEMOLISH EXISTING SITE IMPROVEMENTS.
- INSTALL TREE PROTECTION AND SILT FENCE AS SHOWN PRIOR TO BEGINNING LAND DISTURBING ACTIVITIES.
- CLEAR THE SITE, REMOVING EXISTING TREES AS SHOWN.
- INSTALL TEMPORARY SLOPE DRAIN AND PROVIDE CULVERT INLET PROTECTION.
- FINE GRADE THE SITE AND CONSTRUCT PARKING EXPANSION. PLACE BASE STONE AND INSTALL CURB. INSTALL BASE ASPHALT.
- PLACE TOPSOIL AND SEED ALL DISTURBED AREAS AS NECESSARY TO EFFECT PERMANENT VEGETATIVE COVER. INSTALL LANDSCAPING.
- INSTALL SURFACE PAVEMENT ON PARKING.
- REPAIR ANY INADVERTENT EROSION AND REMOVE ANY INADVERTENT SEDIMENTATION.
- REMOVE ALL EROSION AND SEDIMENT CONTROL MEASURES WITHIN THIRTY DAYS OF FINAL SITE STABILIZATION, BUT ONLY AFTER APPROVAL IS OBTAINED FROM THE ASSIGNED JAMES CITY COUNTY ENVIRONMENTAL INSPECTOR.



BMP SECTION A-A  
NTS



BIORETENTION BASIN & FILTER  
MINIMUM STANDARD 3.11A - VIRGINIA STORMWATER MANAGEMENT HANDBOOK  
N.T.S.

	OVERFLOW ELEV	RELEASE ELEV	BOTTOM ELEV	UNDERDRAIN INV	WATER QUALITY VOLUME PROVIDED
BIORETENTION	(1)	(2)	(3)	(4)	(CU. FT.)
	83.0'	82.0'	81.0'	78.30'	1,781

### PLANTING REQUIREMENTS

MIXTURE OF GROUND COVERS, SHRUBS, AND TREES SHALL BE PLANTED IN BIO RETENTION AREAS. LANDSCAPE PLANS SHALL BE INCLUDED IN PARK/OPEN SPACE PLANS BY DEVELOPER.

### SOIL SPECIFICATIONS

THE BIORETENTION AREAS SHALL CONTAIN A PLANTING SOIL MIXTURE OF 50% SAND, 30% LEAF COMPOST (FULLY COMPOSTED, NOT PARTIALLY ROTTED LEAVES), AND 20% TOPSOIL. TOPSOIL SHALL BE SANDY LOAM OR LOAMY SAND OF UNIFORM COMPOSITION, CONTAINING NO MORE THAN 5% CLAY, FREE OF STONES, STUMPS, ROOTS, OR SIMILAR OBJECTS GREATER THAN ONE INCH, BRUSH, OR ANY OTHER MATERIAL OR SUBSTANCE WHICH MAY BE HARMFUL TO PLANT GROWTH, OR A HINDERANCE TO PLANT GROWTH OR MAINTENANCE. THE TOPSOIL SHALL BE FREE OF PLANTS OR PLANT PARTS OF BERBERIS, GRASS, QUACK GRASS, JOHNSON GRASS, MUGWORT, NUTSEDGE, POISON IVY, CANADIAN THISTLE, CATTAIL, OR OTHERS AS SPECIFIED. IT SHALL NOT CONTAIN TOXIC SUBSTANCES HARMFUL TO PLANT GROWTH.

THE TOP SOIL SHALL BE TESTED AND MEET THE MINIMUM CRITERIA SET FORTH IN SECTION 3.11-28 OF THE VIRGINIA STORMWATER MANAGEMENT HANDBOOK (LATEST EDITION). A MULCH LAYER SHALL BE PROVIDED ON TOP OF THE PLANTING SOIL. AN ACCEPTABLE MULCH LAYER SHALL INCLUDE SHREDDED HARDWOOD OR SHREDDED WOOD CHIPS OR OTHER SIMILAR PRODUCT.

### MAINTENANCE PROGRAM & SCHEDULE

INSPECT AND REPAIR EROSION  
REMOVAL ANY VOID AREAS  
REMOVAL PREVIOUS MULCH AND REAPPLY  
REMOVAL AND REPLACEMENT OF ALL DISEASED VEGETATION  
CONSIDERED BEYOND TREATMENT  
CHECK FOR ACCUMULATED SEDIMENTS  
INSPECT AND REMOVE ANY DEBRIS THAT MAY COLLECT AT THE DROP INLET

MONTHLY  
WHENEVER NEEDED  
EVERY 3 YEARS  
WHENEVER NEEDED  
MONTHLY  
AFTER MAJOR STORM  
EVENTS/OR SEMI ANNUALLY

### NOTES

WATER PLANT MATERIAL EACH DAY FOR FOURTEEN CONSECUTIVE DAYS AFTER CONSTRUCTION.  
CONTRACTOR SHALL REFER TO COUNTY BMP MANUAL (GROUP D, PGS. 48-50) AND MINIMUM STANDARDS 3.11 AND 3.13 OF THE VIRGINIA STORMWATER MANAGEMENT HANDBOOK FOR METHODS/MATERIAL ASSOCIATED WITH CONSTRUCTION OF THE BIORETENTION CELLS.  
VDOT SHALL BE SAVED HARMLESS FROM THE MAINTENANCE RESPONSIBILITY OR LIABILITY ASSOCIATED WITH ANY FAILURE OF THE STORM WATER MANAGEMENT FACILITY AND ITS STRUCTURES.  
A PROFESSIONAL ENGINEER WHO HAS INSPECTED THE BASIN DURING CONSTRUCTION SHALL CERTIFY THE CONSTRUCTION OF THE BIORETENTION BASIN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE BIORETENTION BASIN CONSTRUCTION SCHEDULE WITH THE ENGINEER TO ENSURE ON SITE MONITORING.

REV.	DATE	DESCRIPTION
1	12/10/10	REV. PER LCC COMMENTS 11/20/10
2	1/19/11	REV. PER LCC COMMENTS 10/20/10



5248 Clove Towne Road, Suite 1  
Williamsburg, Virginia 23188  
Phone: (757) 223-8894  
Fax: (757) 223-8894  
www.avs.com

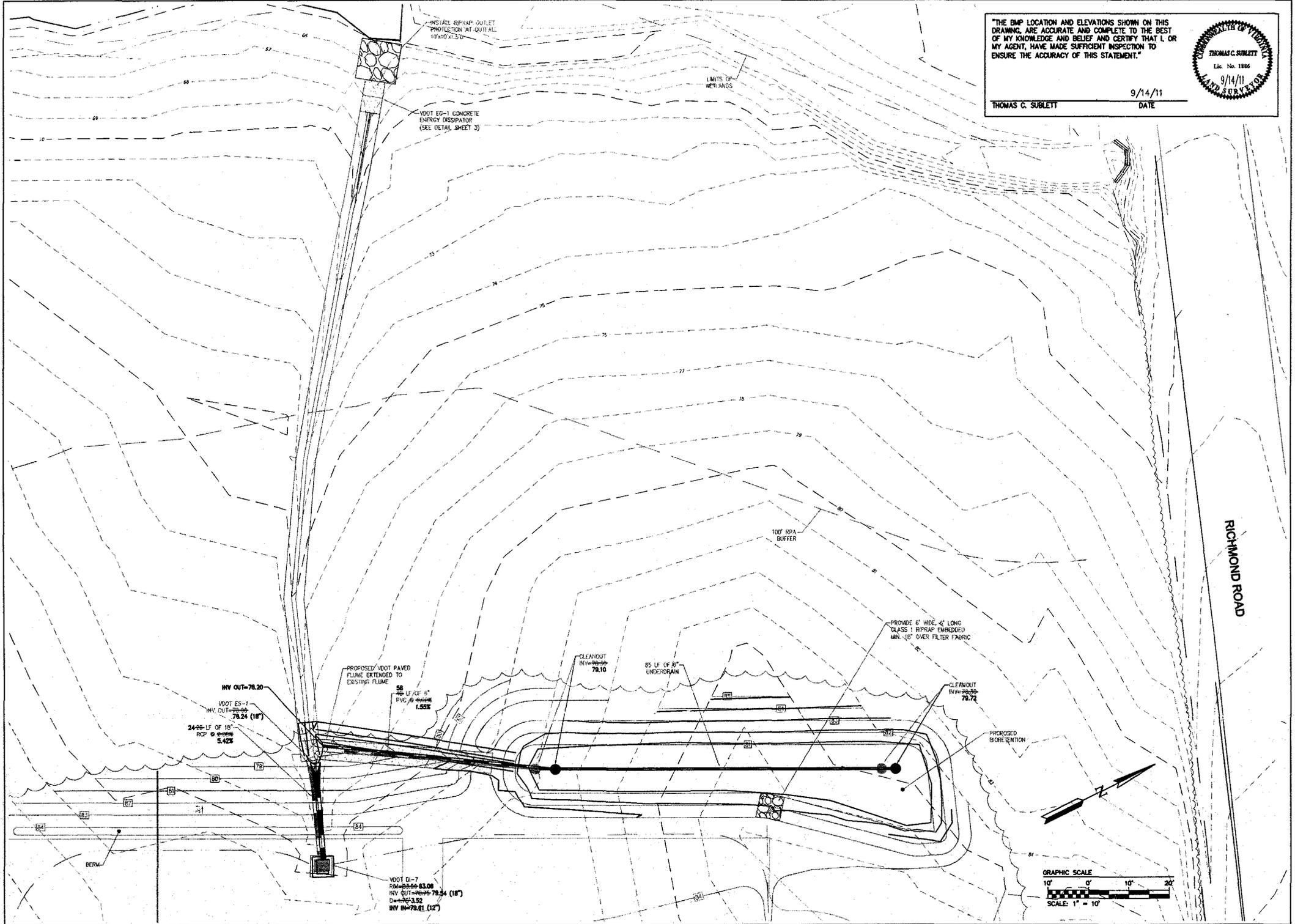
**AVS**  
CONSULTING ENGINEERS

Hampton Roads | Central Virginia | Middle Peninsula

PARKING EXPANSION  
CROSSWALK  
COMMUNITY CHURCH

STONEHOUSE DISTRICT | JAMES CITY COUNTY | VIRGINIA

Project Contacts: JAG, AMR  
Project Number: W10157  
Scale: Date:  
AS NOTED 10/20/10  
Sheet Title:  
**NOTES & DETAILS**



"THE BMP LOCATION AND ELEVATIONS SHOWN ON THIS DRAWING ARE ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF AND CERTIFY THAT I, OR MY AGENT, HAVE MADE SUFFICIENT INSPECTION TO ENSURE THE ACCURACY OF THIS STATEMENT."

THOMAS C. SUBLETT  
DATE 9/14/11




1001 Park Avenue, Suite 101  
 Williamsburg, Virginia 23186  
 Phone: (757) 233-8888  
 Fax: (757) 233-8888  
 www.ads-engineers.com

CONSULTING ENGINEERS  
 Hampton Roads | Central Virginia | Middle Peninsula

PARKING EXPANSION  
**CROSSWALK**  
**COMMUNITY CHURCH**

STONEHOUSE DISTRICT JAMES CITY COUNTY VIRGINIA

Project Contactor: JAG, AIA  
 Project Number: W91017  
 Scale: Date: 09/14/11  
 Sheet Title: STORM AS-BUILTS



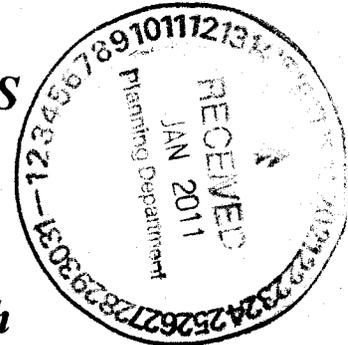
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***DRAINAGE CALCULATIONS***

***FOR***

***Crosswalk Community Church  
Parking Expansion***



*Environmental Division*

*JAN 24 2011*

*RECEIVED*

***SITE:***

James City County

***SUBMITTED TO:***

James City County Environmental Division

County Plan No.: SP-95-2010

***Prepared By:***

AES Consulting Engineers  
5248 Olde Towne Road, Suite 1  
Williamsburg, Virginia 23188

*SP-95-10*

AES Project No. 8509-04



## Table of Contents

- **Stormwater Management**
  - A. Post-Development Routings
    - 1. 100-Year
  
- **Ditch Calculations**
  - A. Paved Flume
  
- **Outlet Protection Design**

# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

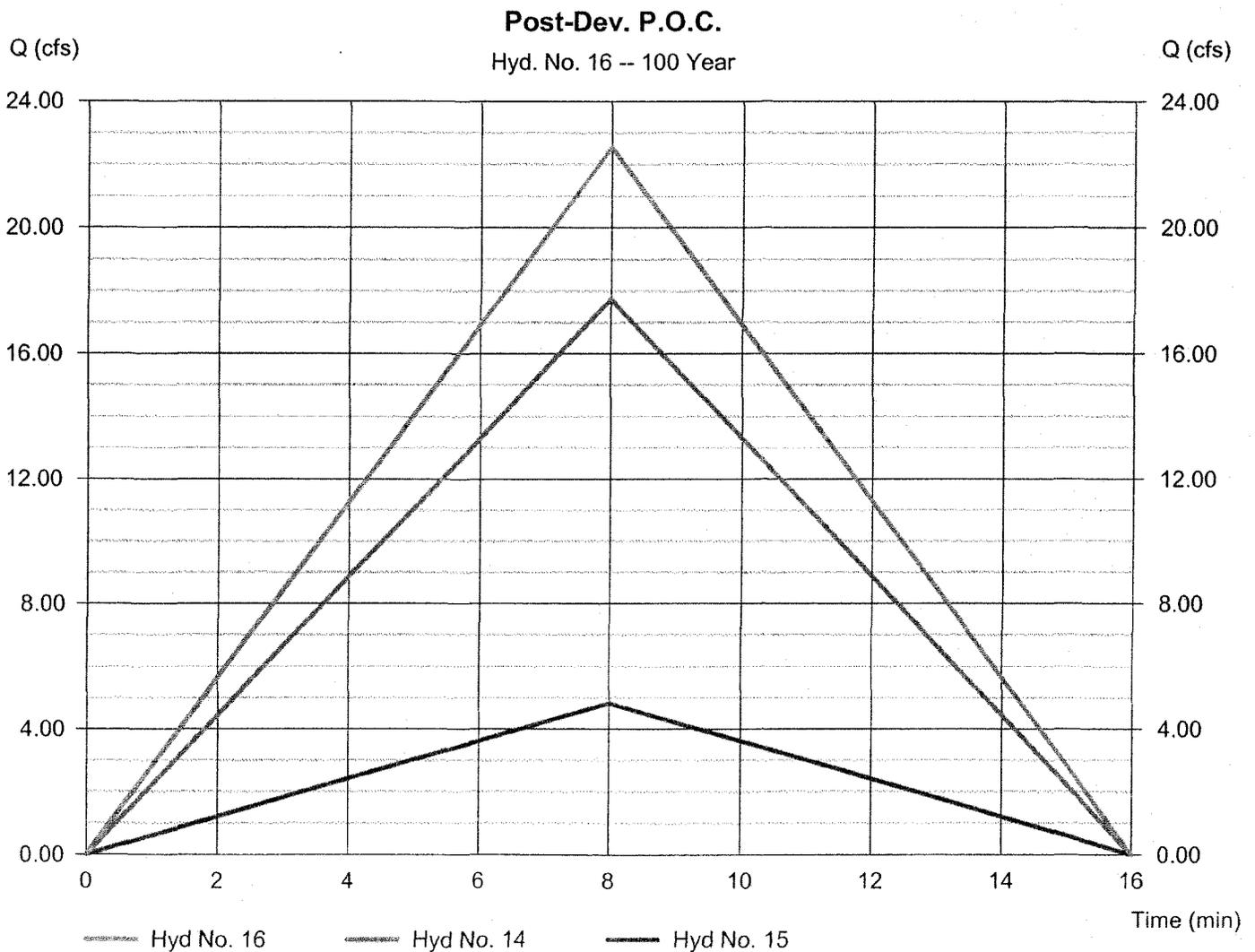
Friday, Jan 7, 2011

## Hyd. No. 16

Post-Dev. P.O.C.

Hydrograph type = Combine  
Storm frequency = 100 yrs  
Time interval = 1 min  
Inflow hyds. = 14, 15

Peak discharge = 22.55 cfs  
Time to peak = 8 min  
Hyd. volume = 10,825 cuft  
Contrib. drain. area = 3.340 ac



# Channel Report

*Q100 in Flume*

Hydraflow Express Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc.

Friday, Jan 7 2011

## Paved Flume

### Trapezoidal

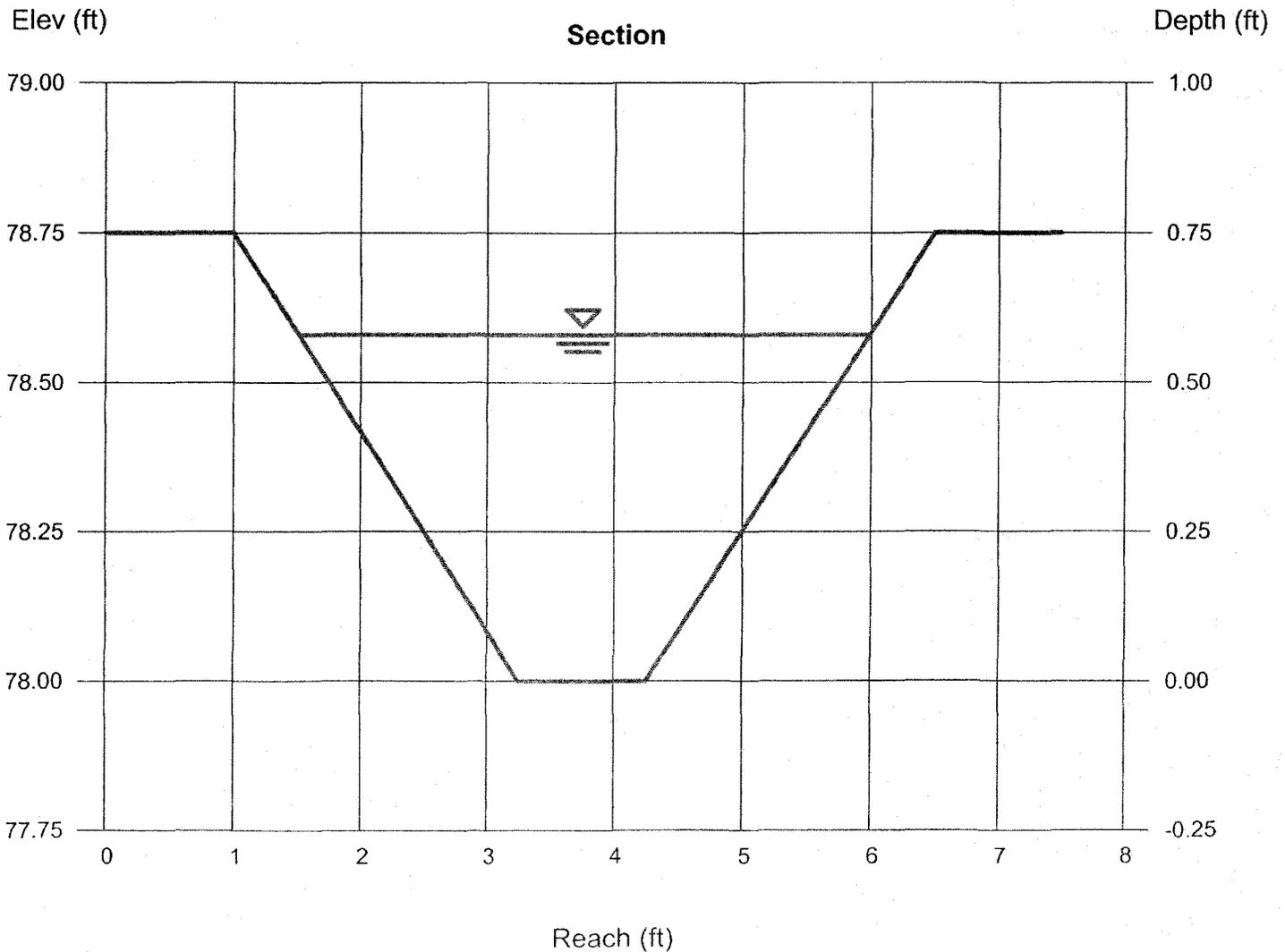
Bottom Width (ft) = 1.00  
Side Slopes (z:1) = 3.00, 3.00  
Total Depth (ft) = 0.75  
Invert Elev (ft) = 78.00  
Slope (%) = 8.90  
N-Value = 0.015

### Highlighted

Depth (ft) = 0.58  
Q (cfs) = 22.55  
Area (sqft) = 1.59  
Velocity (ft/s) = 14.19  
Wetted Perim (ft) = 4.67  
Crit Depth, Yc (ft) = 0.75  
Top Width (ft) = 4.48  
EGL (ft) = 3.71

### Calculations

Compute by: Known Q  
Known Q (cfs) = 22.55



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***DRAINAGE CALCULATIONS***

***FOR***

***Crosswalk Community Church  
Parking Expansion***

Environmental Division

OCT 21 2010

RECEIVED

***SITE:***

James City County

***SUBMITTED TO:***

James City County Environmental Division

County Plan No.:

***Prepared By:***

AES Consulting Engineers  
5248 Olde Towne Road, Suite 1  
Williamsburg, Virginia 23188

October 19, 2010

AES Project No. 8509-04



Table of Contents

- **Impervious/ C Factor Calculation**
- **Stormwater Management**
  - a. Pre-Development Routings
    - 1. 2 - Year
    - 2. 10-Year
    - 3. 100-Year
  - b. Post-Development Routings
    - a. Post Development
      - 1. 2 - Year
      - 2. 10-Year
      - 3. 100-Year
    - b. Dry Pond Data Sheet
    - c. Dry Pond Routings
      - 1. 2 - Year
      - 2. 10-Year
      - 3. 100-Year
- **Ditch Calculations**
  - 1. Diversion Ditch 1
  - 2. Diversion Ditch 2

*Must meet  
SEP  
Requirements*

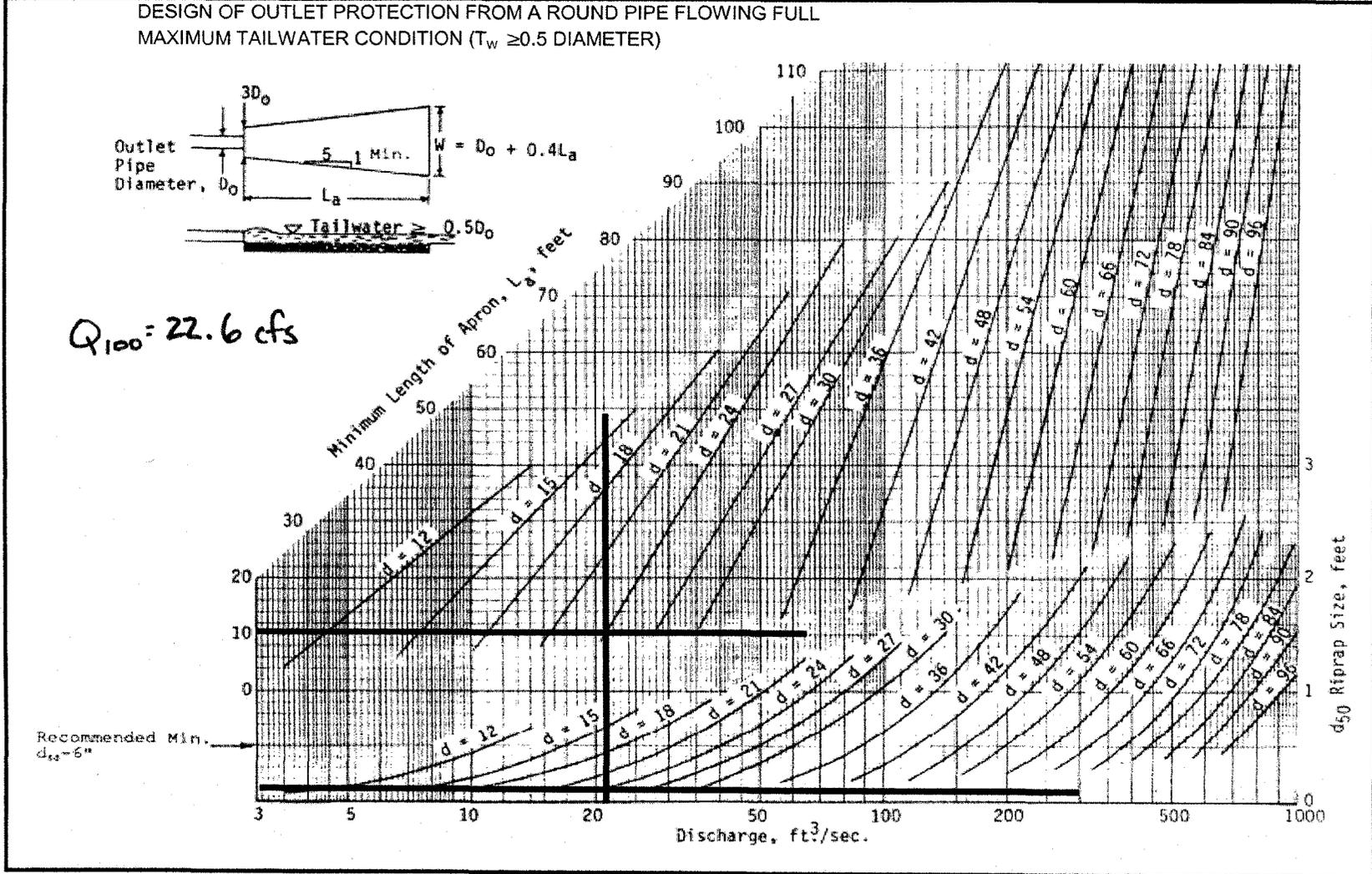
**Outlet Location: BMP Outlet Protection**

DESIGN OF OUTLET PROTECTION FROM A ROUND PIPE FLOWING FULL  
 MAXIMUM TAILWATER CONDITION ( $T_w \geq 0.5$  DIAMETER)

Source: USDA-SCS

III - 165

Plate 3.18-4



1992

3.18

$Q =$	<u>22.55</u> cfs	$3D_0 =$	<u>6</u> ft	$W =$	<u>6</u> ft	$Depth =$	<u>1.5</u> ft
$D_0 =$	<u>24</u> in	$L_a =$	<u>10</u> ft	$d_{50} =$	<u>0.5</u> ft		



# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

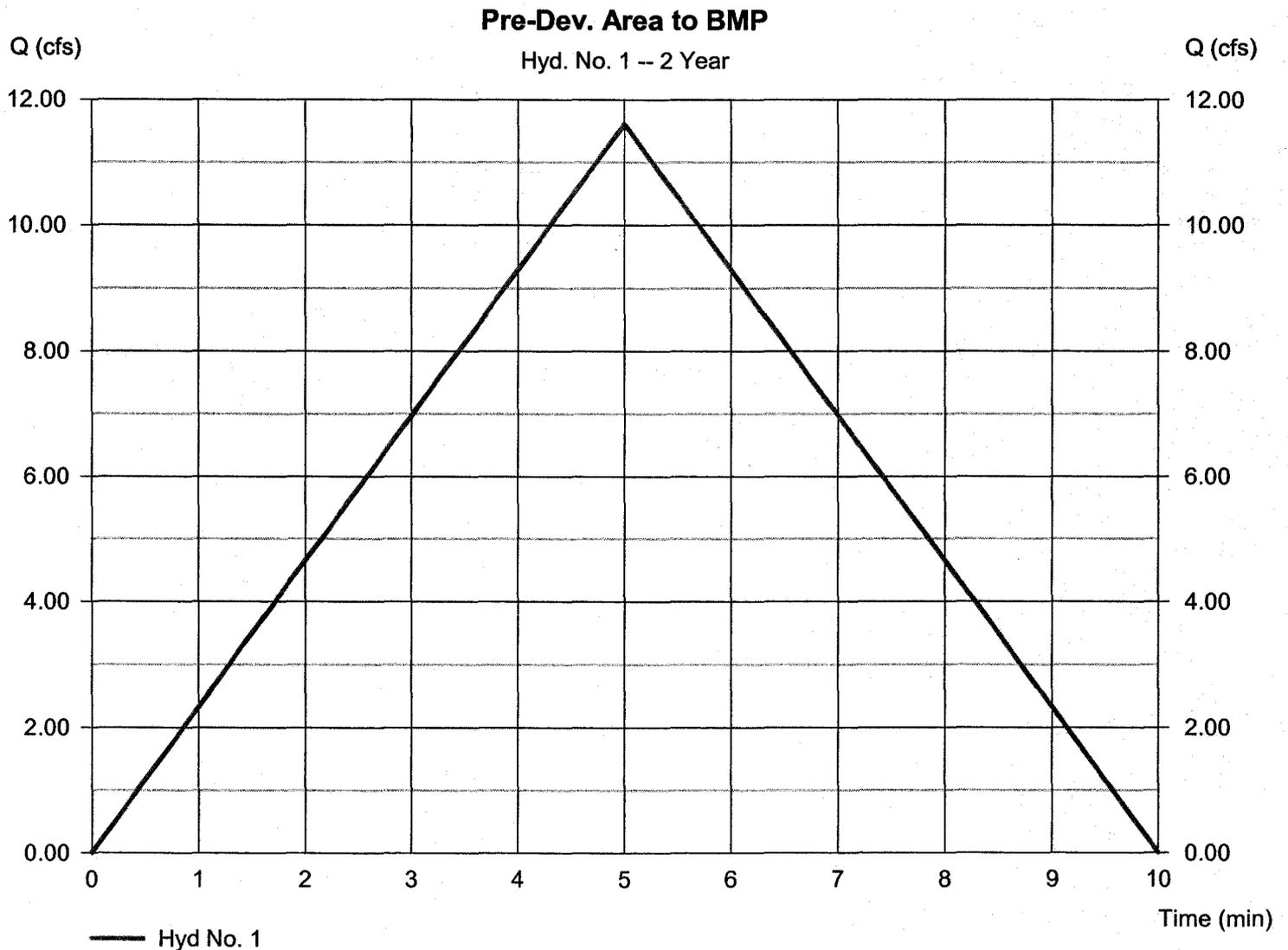
Tuesday, Oct 19, 2010

## Hyd. No. 1

Pre-Dev. Area to BMP

Hydrograph type = Rational  
Storm frequency = 2 yrs  
Time interval = 1 min  
Drainage area = 3.240 ac  
Intensity = 5.783 in/hr  
IDF Curve = JamesCity-NW-14.IDF

Peak discharge = 11.62 cfs  
Time to peak = 5 min  
Hyd. volume = 3,485 cuft  
Runoff coeff. = 0.62  
Tc by User = 5.00 min  
Asc/Rec limb fact = 1/1



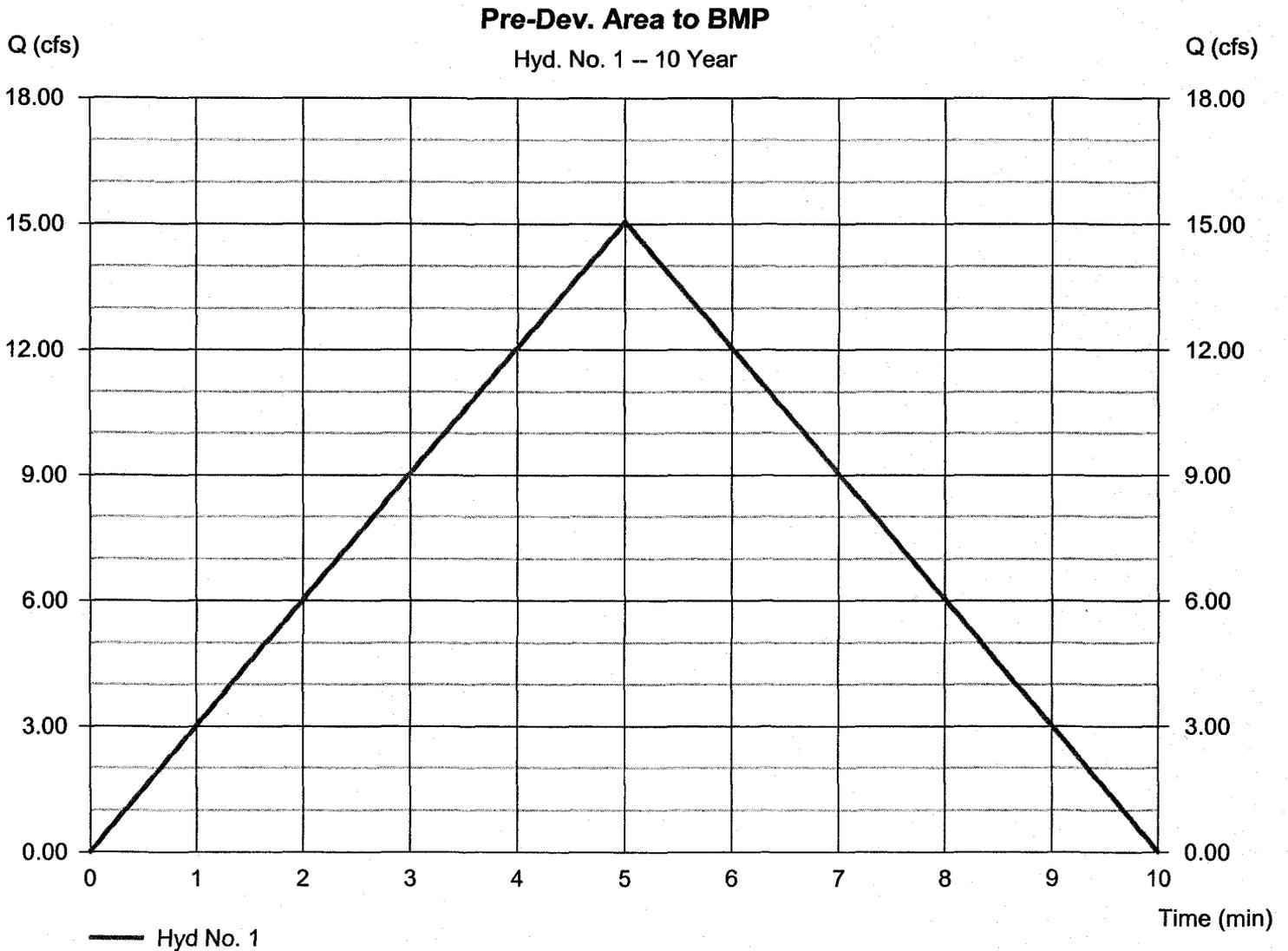
# Hydrograph Report

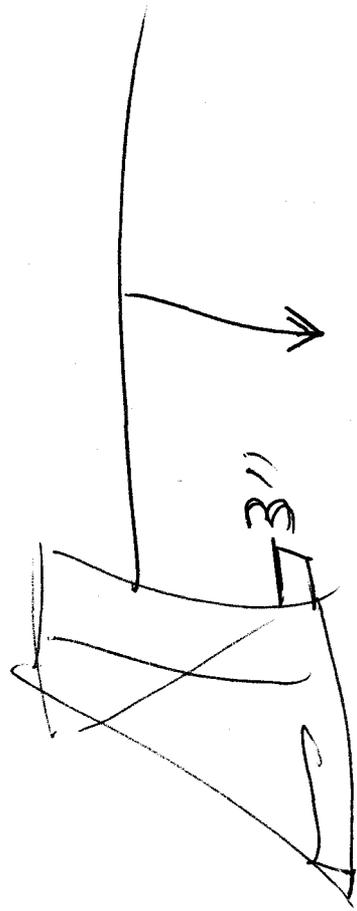
## Hyd. No. 1

Pre-Dev. Area to BMP

Hydrograph type = Rational  
Storm frequency = 10 yrs  
Time interval = 1 min  
Drainage area = 3.240 ac  
Intensity = 7.496 in/hr  
IDF Curve = JamesCity-NW-14.IDF

Peak discharge = 15.06 cfs  
Time to peak = 5 min  
Hyd. volume = 4,518 cuft  
Runoff coeff. = 0.62  
Tc by User = 5.00 min  
Asc/Rec limb fact = 1/1





24



# Channel Report

## Diversion Ditch 1

### Triangular

Side Slopes (z:1) = 3.00, 3.00  
Total Depth (ft) = 1.00

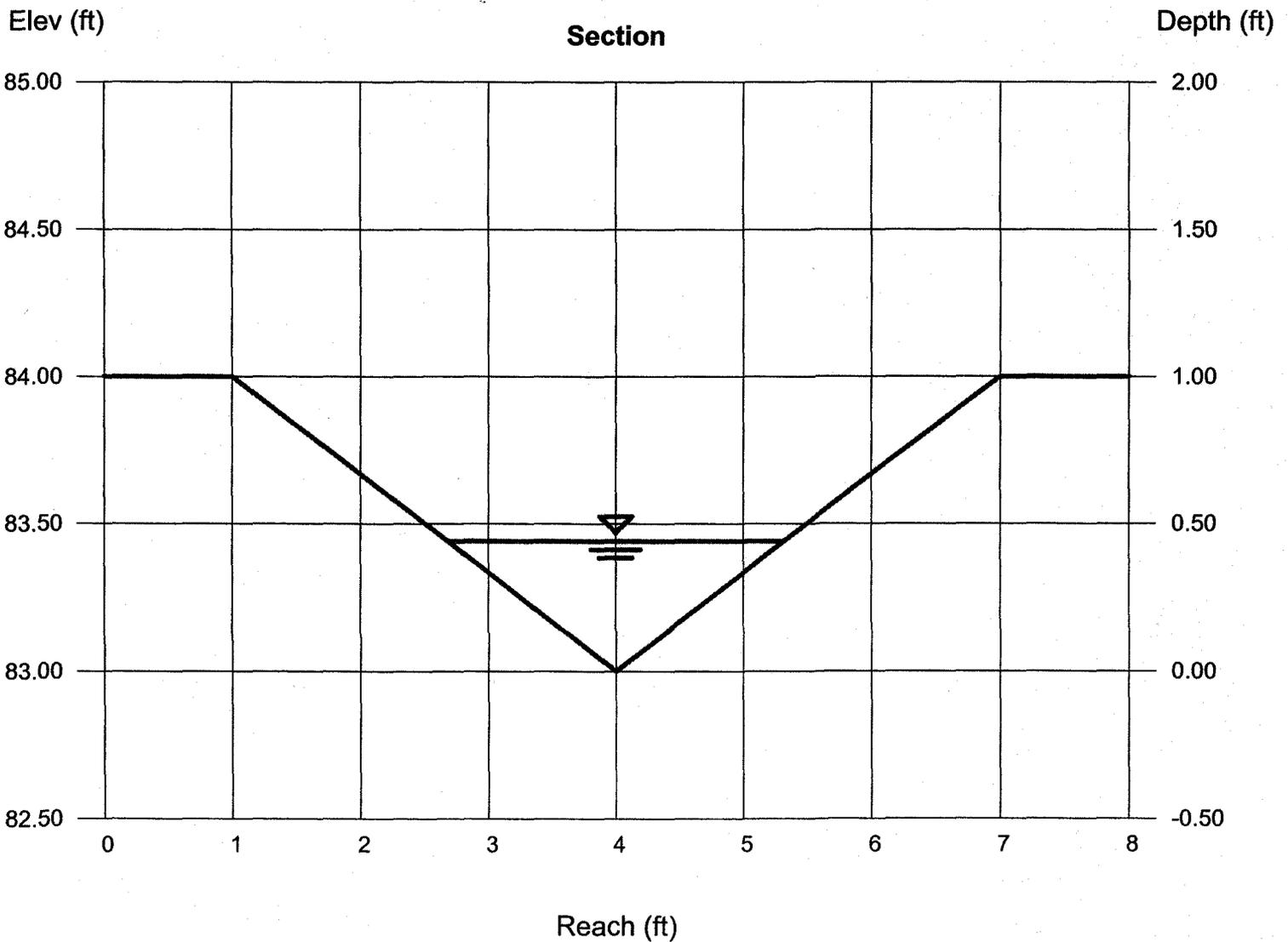
Invert Elev (ft) = 83.00  
Slope (%) = 1.75  
N-Value = 0.050

### Calculations

Compute by: Known Q  
Known Q (cfs) = 0.80

### Highlighted

Depth (ft) = 0.44  
Q (cfs) = 0.800  
Area (sqft) = 0.58  
Velocity (ft/s) = 1.38  
Wetted Perim (ft) = 2.78  
Crit Depth, Yc (ft) = 0.34  
Top Width (ft) = 2.64  
EGL (ft) = 0.47



# Channel Report

## Diversion Ditch 2

### Triangular

Side Slopes (z:1) = 3.00, 3.00  
Total Depth (ft) = 1.00

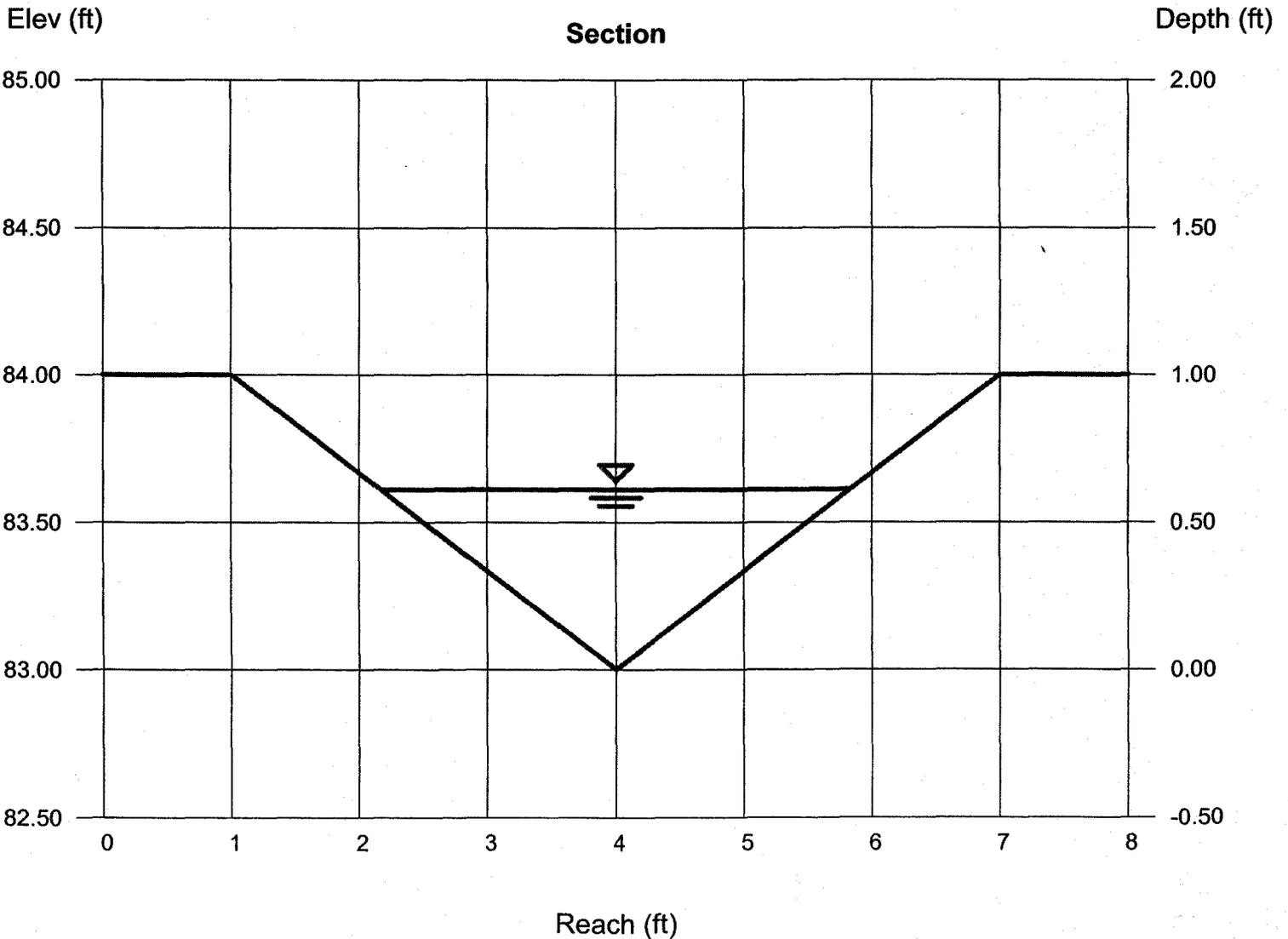
Invert Elev (ft) = 83.00  
Slope (%) = 3.35  
N-Value = 0.050

### Calculations

Compute by: Known Q  
Known Q (cfs) = 2.55

### Highlighted

Depth (ft) = 0.61  
Q (cfs) = 2.550  
Area (sqft) = 1.12  
Velocity (ft/s) = 2.28  
Wetted Perim (ft) = 3.86  
Crit Depth,  $Y_c$  (ft) = 0.54  
Top Width (ft) = 3.66  
EGL (ft) = 0.69



**IV. OUTLET PROTECTIONS:**

Yes	No	N/A
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Sized for maximum design release (generally 10-year storm).

Flared end section or endwall.

Dimensions.

Rock or riprap size, quantity and placement thickness.

Slope at 0 percent (Level Grade).

Geotextiles (nonwoven).

Special energy dissipators are required for design discharge velocities that exceed eighteen (18) feet per second; or if use of standard outlet protection would result in velocities exceeding permissible channel velocities; or if space restricts or limits their use.

**IV. ADDITIONAL COMMENTS OR INFORMATION SPECIFIC TO THE PLAN:**

Plan Preparer: AR  
Date: \_\_\_\_\_

Copy of JCC: SWMProg/BMP/Checklist/ChkList



*Environmental Division*

DEC 15 2010

RECEIVED

**Geotechnical Engineering Analysis and Subsurface Exploration  
Crosswalk Community Church  
Parking Expansion and BMP Facility**

**ECS Project No. 07:10942**

**For  
The Rebkee Company  
15871 City View Drive, Suite 300  
Midlothian, Virginia 23113  
Attn: Mr. David Todd**

**December 2, 2010**



**ECS MID-ATLANTIC, LLC**

*"Setting the Standard for Service"*

Geotechnical • Construction Materials • Environmental • Facilities

December 2, 2010

Mr. David Todd  
The Rebkee Company  
15871 City View Drive, Suite 300  
Midlothian, Virginia 23113

ECS Project No. 07:10942

Reference: Subsurface Exploration and Geotechnical Engineering Analysis  
Crosswalk Community Church  
Parking Expansion and BMP Facility  
James City County, Virginia

Dear Mr. Todd,

ECS Mid-Atlantic, LLC (ECS) has completed a subsurface exploration and engineering evaluation of the above referenced project. This report presents the results of the subsurface exploration and engineering analyses for the proposed parking expansion and BMP facility. This report has been completed in general in accordance with our proposal No. 07:15438 dated October 26, 2010.

**Introduction:**

The project site is located north of the existing Church building and immediately east of the existing parking lot within the Crosswalk Community Church project which is located at 7575 Richmond Road, in James City County, Virginia. A "Demolition and Site Plan" and a "Notes and Details" drawings, prepared by AES Consulting Engineers, Inc (AES) and dated 10/20/2010, were provided to ECS. Based on the available drawings, we understand the project will consist of the construction of a parking lot expansion containing 24 new parking spaces with provisions for 48 future parking spaces. Based on the available site plan, approximately 2 feet of cut and 5 feet of fill will be necessary to grade the future parking lot area. Additionally, a BMP dry pond to service storm water runoff is planned immediately east of the parking expansion area. Based on the available drawings, the BMP bottom elevation is planned to be EL. 80, mean sea level (msl) and will require approximately 4 feet of cut in the northern third of the pond and 8 feet of fill in the area of the spillway pipe (dam). The pond embankment is planned to be constructed as a zoned dam with a clay core and key.

The purpose of this exploration was to explore the soil and groundwater conditions at the site and to develop soils-related engineering recommendations to guide design and construction of the parking lot and BMP facility. Our proposed investigation included drilling of two (2) hand auger borings to explore the subsurface soil and groundwater conditions, perform a site reconnaissance to observe general topography, and analyzing field and laboratory data to

develop appropriate geotechnical engineering recommendations regarding the planned construction.

### **Site Conditions**

At the time of the field exploration the majority of the project site was open and covered with grass with the remainder of the site was lightly wooded. The topography of the site slopes downward from the east to the west with a grade change across the project area of approximately 10 feet. The topographic high (EL. 86, msl) is located in the northern portion of the site and the topographic low (EL. 76, msl) is located in the western portion of the site.

### **Field Exploration Procedures:**

Two (2) hand auger borings were completed within the north and south ends of the BMP pond to a depth of 8 feet below surface elevations. The soil test borings were performed by ECS personnel utilizing hand auger equipment.

Representative soil samples were obtained at 2 foot intervals. Field logs of the soils encountered in the borings were maintained by field personnel. After recovery, each sample was removed from the auger and visually classified. Representative portions of each sample were sealed in plastic bags and delivered to our laboratory in Williamsburg, Virginia, for further visual examination and laboratory testing.

### **Subsurface Conditions:**

Experienced personnel from our office classified each soil sample in accordance with the Unified Soil Classification System (USCS). Select samples from the test borings were subjected to laboratory classification testing to confirm our visual classifications. The group symbols for each soil type are indicated in parentheses following the soil descriptions on the boring logs. The geotechnical engineer grouped the various soil types into the major zones noted on the boring logs. The stratification lines designating the interfaces between earth materials on the boring logs are approximate; in situ, the transitions may be gradual. The boring logs are included in Appendix II and a brief explanation of the USCS and a Reference Notes for Boring Log sheet is provided in Appendix III of this report.

Our subsurface exploration and site reconnaissance determined that the site is generally covered with approximately 4 inches of topsoil. The soil profile encountered at each of the boring locations was observed to differ significantly.

The soils encountered below the topsoil in boring B-1, located at the north end of the BMP, consisted of interbedded layers of Silty SAND (SM) and Clayey SAND (SC) to a depth of about 6 feet below existing ground surface (bgs). Below 6 feet, a porous Poorly Graded SAND with Silt (SP-SM) was encountered to boring termination depth of 8 feet.

The soils encountered below the topsoil in boring B-2, located at the south end of the BMP, consisted of Silty SAND (SM) to a depth of approximately 2 feet bgs. Below 2 feet bgs, the soils consisted of a low permeability Sandy Lean CLAY (CL).

Groundwater was not encountered at the boring locations. Please note that due to the near surface fine grained soils encountered at boring location B-2, a perched water condition is possible. Also note that groundwater levels are influenced by seasonal conditions and by periods of significant precipitation or prolonged drought. If ground water is encountered, we recommend it be pumped from sumps located below the base subgrade elevation.

**Infiltration Potential:**

In order to evaluate infiltration potential of the soils encountered, the United States Department of Agriculture (USDA) textural classification of each stratum was evaluated and compared to published data indicating approximate ranges of infiltration rates for these soils. It should be noted that field infiltration tests were not performed and the infiltration rates below have been estimated. In accordance with USDA textural classifications, we have categorized the soils encountered into three basic soil types as follows:

1. *Soil Type I [Loamy Sand to Loam]:* Silty Sand (SM) – Estimated infiltration rate is 2.41 to 0.52 inches per hour (or greater), Hydrologic Soil Grouping A to B,
2. *Soil Type II [Loam to Sandy Clay Loam]:* Clayey Sand (SC) - Estimated infiltration rate is 0.52 to 0.17 inches per hour, Hydrologic Soil Grouping B to C,
3. *Soil Type III [Sandy Clay Loam to Clay]:* Sandy Clay and Clay (CL and CH) - Estimated infiltration rate is 0.17 to 0.02 inches per hour, or less, Hydrologic Soil Grouping C to D

**Estimated Infiltration Rates**

<b>Boring Location</b>	<b>Approximate Surface Elevation</b>	<b>Soil Type I depth (feet)</b>	<b>Soil Type II Depth (feet)</b>	<b>Soil Type III Depth (feet)</b>	<b>Water Table Depth (feet)</b>
B-1	85.0	6-8	0-2;4-8	2-4	Greater than 8'
B-2	80.0	None	0-2	2-8	Greater than 8'

A suitable infiltration rate for these purposes is assumed to be 0.52 inches per hour or faster. Typically, soils with the Hydrologic Soil Group designations of A and B are considered to be potentially suitable for infiltration purposes. Some soils designated as C type soils can be suitable for infiltration practices but these soils would need to be evaluated on a case specific basis. Soils with group designations of D are generally not considered suitable.

Based on the soil test borings, potentially porous soils (Hydrologic Soil Grouping A) were encountered in the cut areas of the pond (B-1) at a depth of approximately 6 feet, bgs (EL. 81, msl) which is near the proposed bottom of pond elevation of EL. 80, msl.

**Subgrade Preparation and Earthwork Operations:**

The data developed during this study indicate that the subsurface soil and groundwater conditions at the site are generally suitable for support of the proposed pavement and BMP facility construction provided the recommendations in this report are followed.

It is our experience that newly exposed subgrades will deteriorate more rapidly upon demolition of overlying existing pavement materials that exist along the eastern and northeastern edges of the proposed parking lot and stripping the site of topsoil and vegetation. Furthermore, the existing soils on this site are expected to be sensitive to moisture and disturbance once they are exposed. Because of this, it is recommended that additional steps be taken to protect the existing subgrades once they are exposed.

The depth of topsoil recorded in the test borings was 4 inches. However, stripping topsoil typically disturbs soils to a depth greater than the actual topsoil thickness. Therefore, for project planning purposes, we anticipate a 6 inch stripping depth for this site to remove topsoil, and associated organic matter. Isolated areas may require further cuts of an additional 6 inches or more within the low lying areas, the existing swale, and within wooded areas due to tree stumps and heavy root mat from existing trees. We recommend stripping of any organic or unstable material. The stripping depth should be evaluated at the time of construction by representatives of the Geotechnical Engineer. If additional stripping becomes necessary, suitable methods should be employed to determine additional stripping depths beyond the contract depth (such as elevations determined before and after additional stripping, etc.). If undercuts are recommended and extend into large areas, the undercut volume could be reduced by the use of geotextiles or geogrids. The use of geosynthetic reinforcement should be evaluated by the geotechnical engineer. Cut and fill operations should extend a minimum of 5 feet beyond the project limits. Suitable materials may be stockpiled on site for reuse, as appropriate and as approved by the Geotechnical Engineer.

After removing all unsuitable materials, cutting to the desired grade and prior to Engineered Fill placement, subgrades should be observed by the Geotechnical Engineer. Proofrolling using a 10-ton drum roller or a loaded tandem axle dump truck having an axle weight of at least 10 tons should be used at this time to aid in identifying localized soft or unsuitable material. Any soft or unsuitable materials encountered during proofrolling should be removed and replaced with an approved backfill (Engineered Fill material) or scarified and recompacted as recommended by the Geotechnical Engineer.

Existing subgrades as well as subsequent layers of Engineered Fill should be properly compacted. We recommend that the existing subgrades to a depth of at least 8 inches and all Engineered Fill be moisture conditioned to within +/- 3% of optimum moisture content then be compacted to a dry density at least 95% of that soil's Standard Proctor maximum dry density (ASTM D 698). Engineered Fill lifts should be a maximum of 8 inches in loose thickness. Field density testing of subgrades and each lift of fill should be performed at a rate of no less than one test per 10,000 square feet in pavement areas, but not less than 2 tests per lift. Compaction of natural subgrade surfaces may be waived by the Geotechnical Engineer if they are observed to be stable during proofrolling observation.

The Engineered Fill should extend laterally at least 5 ft beyond the building limits and at least 2 feet beyond the edges of the pavement before being sloped. Fill and cut slopes should not be constructed steeper than 2.5H:1V.

It is expected that the on-site soils will possess higher than optimum moisture contents. Therefore, scarifying and drying of the on-site soils may be required before the specified compaction can be achieved. Drying and compaction of wet soils is typically difficult during the cold, winter months. Accordingly, we recommend earthwork be performed during the warmer, drier times of the year. Proper drainage should be maintained during the earthwork phases of construction to prevent prolonged periods of standing water which has a tendency to degrade soil subgrades.

The following fill types are recommended for use in areas other than the BMP area on this project:

**On-Site Borrow Engineered Fill:** Granular soil material classified as Sand, Clayey Sand, or Sandy Clay (CL, SM, SC, SP, SW or better per ASTM D-2487) containing a maximum 60% by dry weight Silt or Clay, a maximum liquid Limit of 35 and maximum plasticity index of 15 and free of organics and debris and rock greater than 4 inches in diameter. The majority of the on-site cut soils should be suitable for re-use as Engineered Fill.

**Imported Engineered Fill:** Granular soil material classified as Sand (SM, SC, SP, SW or better per ASTM D-2487) containing a maximum 15% by dry weight Silt or Clay and free of organics and debris and rock greater than 4 inches in diameter.

**Pavement Base Material:** VDOT Type I, Size 21B.

It is recommended that all materials to be used for Engineered Fill be analyzed and approved by ECS prior to their use on the site. Specific requirements for fill in the BMP area are included below.

### **BMP Pond Recommendations**

It is anticipated that a dam embankment will be constructed to achieve water detention in the excavated BMP dry pond. Maximum dam embankment height is expected to be 8 feet. The proposed dam can be designed as a zoned earth embankment with a clay core and key. Soils used as fill for the core/key and shell should satisfy the following criteria:

**Dam Core/Key Fill:** Fill used to backfill around the spillway structure and heighten the embankment should consist of an inorganic, non-expansive soil material classified as CLAY (CL and CH) with at least 50% passing the No. 200 sieve. The fill soils should contain a maximum of 5% gravel size particles as indicated in the "Particle Size Identification" section of the Reference Notes for Boring Logs included in Appendix III. Maximum gravel size should be limited to 3 inches. It appears that the majority of the soils within the proposed cut areas identified on the boring logs are not suitable for this purpose. Therefore, provisions should be made to import suitable soils for the construction of the dam core and key.

**Shell Material:** Fill used as shell material should consist of an inorganic, non-expansive soil material classified as Clayey SAND (SC) or Sandy or Silty CLAY (CL and CH) and containing at least 30% by dry weight Clay. Maximum rock size should be limited to 4 inches. The soils identified on the boring logs as Clayey SAND (SC) and Clay (CL) should be suitable for this purpose.

**Homogeneous Earth Dam Embankment Fill:** Fill used to construct a homogeneous earth dam embankment and its key should consist of an inorganic, non-expansive soil material classified as Clayey SAND (SC) or Sandy CLAY (CL or CH) and containing at least 45% by dry weight Clay. Maximum rock size should be limited to 4 inches. Natural soils identified on the boring logs as Clayey SAND (SC) and Clay (CL) should be suitable for this purpose but must be selectively mined.

The embankment should have side slopes of 3H:1V or flatter. In order to minimize seepage below a dam embankment, we recommend that the dam be provided with a key, constructed of Dam Core/Key Fill or Earth Dam Embankment Fill (depending on whether the Dam is constructed as a homogeneous Dam), as described above. The key should extend a minimum of 3 feet below the existing grade. The key should have a width of at least 6 feet at its base and side slopes of 1H:1V or flatter. The key should extend up the shoulders of the ravine to an elevation at or above the 100-year flood elevation. The key bottom should be lowered if porous materials are encountered in the subgrade.

The horizontal spillway pipe should be supported by a concrete cradle, constructed in accordance with industry standards. The cradle should extend under the pipe from the spillway riser to a point at least two-thirds the dam width toward the embankment's downstream toe. The cradle can be constructed by setting the pipe about 8 or more inches above the pipe trench bottom, anchoring it in place to prevent floating, and backfilling to the spring line with concrete. Downstream of the cradle and to the pipe outlet, the pipe should be directly supported by a bed of No. 57 Stone wrapped in a non-woven, medium duty filter fabric, such as Mirafi 140N or equivalent, to prevent loss of fines into the voids of the stone. The gravel should be about 6 to 8 inches thick below the pipe and generally conform to the cross-sectional shape of the concrete cradle. A filter diaphragm should be employed to collect excessive seepage. ECS would be pleased to provide additional assistance in dam design upon request.

All Dam Embankment Fill should be placed in maximum 8-inch loose lifts (4 inches for light compaction equipment) and moisture conditioned to within -1 to +3% of the soil's optimum moisture content prior to compaction. Compaction should be accomplished using sheepsfoot rollers, or a vibratory drum roller for more granular soils, until a minimum density of 95% of the soil's Standard Proctor maximum dry density (ASTM D698) is achieved. Care should be exercised to achieve thorough compaction around and above the pipes and cradle using tampers. A qualified Soils Technician under the direction of a Geotechnical Engineer should be called on to provide compaction testing during the fill placement to assure that the minimum compaction requirements are being met. At least 1 test per 5,000 square feet per lift, but not less than 1 test per lift, should be performed. Compaction testing in trenches should be performed at a rate of at least 1 test per 50 linear feet per lift, but not less than 1 test per lift.

Depending on seasonal conditions, soils excavated from the impoundment and key trench may be either substantially wet or dry of their optimum moisture content. Dam Embankment Fill soils

should be spread, manipulated, and moisture conditioned to within -1 to +3% of their optimum moisture content prior to compaction.

Dam maintenance is an essential requirement for assuring that dams perform as intended over time. The embankments should be periodically inspected for indications of seepage and erosion. Trees should be kept from growing on the embankments, heavy grass growth should be maintained, and animal burrows should be filled. Pipes should be inspected for indications of leakage or for the presence of sediment, which might indicate leakage. If deterioration which might compromise the performance or safety of the dam is observed, a qualified Geotechnical Engineer should be called on to assist in the repair.

The groundwater table was not encountered within our borings. However, depending on the time of year of construction and weather conditions, accumulation of water in the key trench excavation during construction should be anticipated. Therefore, a dewatering system consisting of multiple shallow gravel lined sumps may be required to adequately dewater the key trench. It should be incumbent on the contractor to plan for dewatering and to provide a plan and budget for these services during construction.

### **Pavements**

It is anticipated that pavement areas are to be surfaced with asphalt. A dumpster pad area is not indicated on the available plans. It is anticipated that the parking spaces will be limited to automobile traffic with a maximum traffic loading of 150 vehicles per day including the future parking area. Based on the results of the hand auger borings and grading plan, it appears that the soils that will be exposed as pavement subgrades will consist mainly of Silty SAND (SM) and approved Engineered Fill soil. We have estimated a design CBR value of 8 for this site. The following minimum pavement sections are recommended. The Civil Engineer should review actual traffic patterns and loading to determine whether or not these sections are appropriate for given traffic patterns and loading.

#### **Drive Lanes and Parking Stalls**

- Asphalt Surface - 2.0 inches Asphalt Concrete Surface Mix.
- Aggregate Base - 8.0 inches untreated Aggregate, Type I, Size 21B.
- Subgrade - Stable and compacted to a dry density of at least 95% of the soil's Standard Proctor maximum dry density (ASTM D698) to a depth of 8.0 inches below subgrade elevation.

It should be noted that these designs do not consider instability of the subgrade due to soft, wet subgrade materials. Unstable materials will require undercutting and backfilling with Engineered Fill or Aggregate Base Material and possibly using geotextile fabric.

Heavy dumpster trucks exert concentrated dynamic wheel loads on pavements during trash pick up. This type of loading typically results in rutting of the base and subgrade materials and ultimately pavement failures. Therefore, we recommend that the pavement in the dumpster pickup and loading area (if applicable), to include the position of the truck's front wheels, consist of a minimum 6-inch-thick, mesh-reinforced concrete slab supported on at least a 6-inch layer of Aggregate Base Material, VDOT Type I, Size 21A, compacted to at least 95% of the Standard Proctor (ASTM D698).

For the construction of new pavements, we recommend that any soft, unstable and/or unsuitable materials be removed from the pavement areas and be replaced with Engineered Fill or Aggregate Base Material. The stripped surface should be proofrolled and carefully observed at the time of construction in order to aid in identifying any localized soft, unstable, or unsuitable materials. This material, where encountered, should be closely evaluated during construction and should be removed from below the pavement as required or considered necessary by the Geotechnical Engineer.

**General Construction Considerations:**

All topsoil and organics should be removed to suitable natural soils within the construction area. The stripping depth should extend up the slopes to at least the 100 year flood elevation. As such, some of the side slopes may need to be reconstructed. The slopes should be reconstructed utilizing engineered fill placed in controlled, compacted lifts that are benched into the existing slopes. On-site sandy or clayey soils are considered suitable for engineered fill to regrade the slopes. This material should be placed in horizontal lifts not exceeding 8 inches in loose thickness, moisture conditioned to within  $\pm 3\%$  of the optimum moisture content, and compacted to a minimum 95% of the maximum dry density obtained in accordance with ASTM Specification D-698, Standard Proctor method. Slopes should be constructed no greater than 3:1. Also, the side slopes should be seeded to promote vegetation growth and further add to the stability of the slopes.

Exposure to the environment may weaken the soils at the bearing level if the excavations remain open for too long a time. Therefore, excavations should be backfilled the same day that the excavations are made whenever possible. If the bearing soils are softened by surface water intrusion or exposure, the softened soils must be removed from the excavation bottom immediately prior to placement of the next lift of fill.

Proper compaction control of fill is an important aspect of this project. All fill materials should be placed, compacted and tested in accordance with the recommendations contained in this report. We recommend that all cut and fill operations be observed full-time by a qualified Soil Technician to determine if minimum earthwork and compaction requirements are being met.

In a dry and undisturbed state, the subgrade soils at the site will provide adequate subgrade support for fill placement and construction operations. When over optimum moisture, the moisture sensitive subgrade soils may degrade quickly with disturbance from contractor operations. Therefore, good site drainage and dewatering operation should be maintained during earthwork operations so as to help maintain the stability of the soil.

**General Comments:**

This report has been prepared in order to aid in the evaluation of this site and to assist the Contractor, Architect and Engineer in the design and planning of the project. The report scope is limited to the specific project and location described, and the project description represents our understanding of the significant aspects relevant to soil and foundation characteristics.

We have appreciated being of service to The Rebkee Company during the design phase of this project and look forward to its successful construction. If you should have any questions regarding the information and recommendations contained in this report or if we can be of any further assistance, please contact our office.

Respectfully,

ECS MID-ATLANTIC, LLC.



David J. Schlotterer, C.P.S.S., A.O.S.E.  
Project Manager



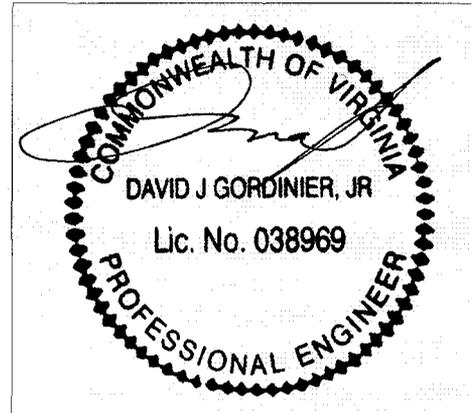
W. Lloyd Ward, P.E.  
Geotechnical Engineer  
Principal Engineer

- Appendix:
- I. Boring Location Plan (1)
  - II. Hand Auger Logs (2)
  - III. Unified Soil Classification System/  
Reference Notes for Boring Logs (2)
  - IV. Laboratory Test Summary (1)

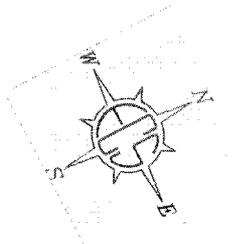
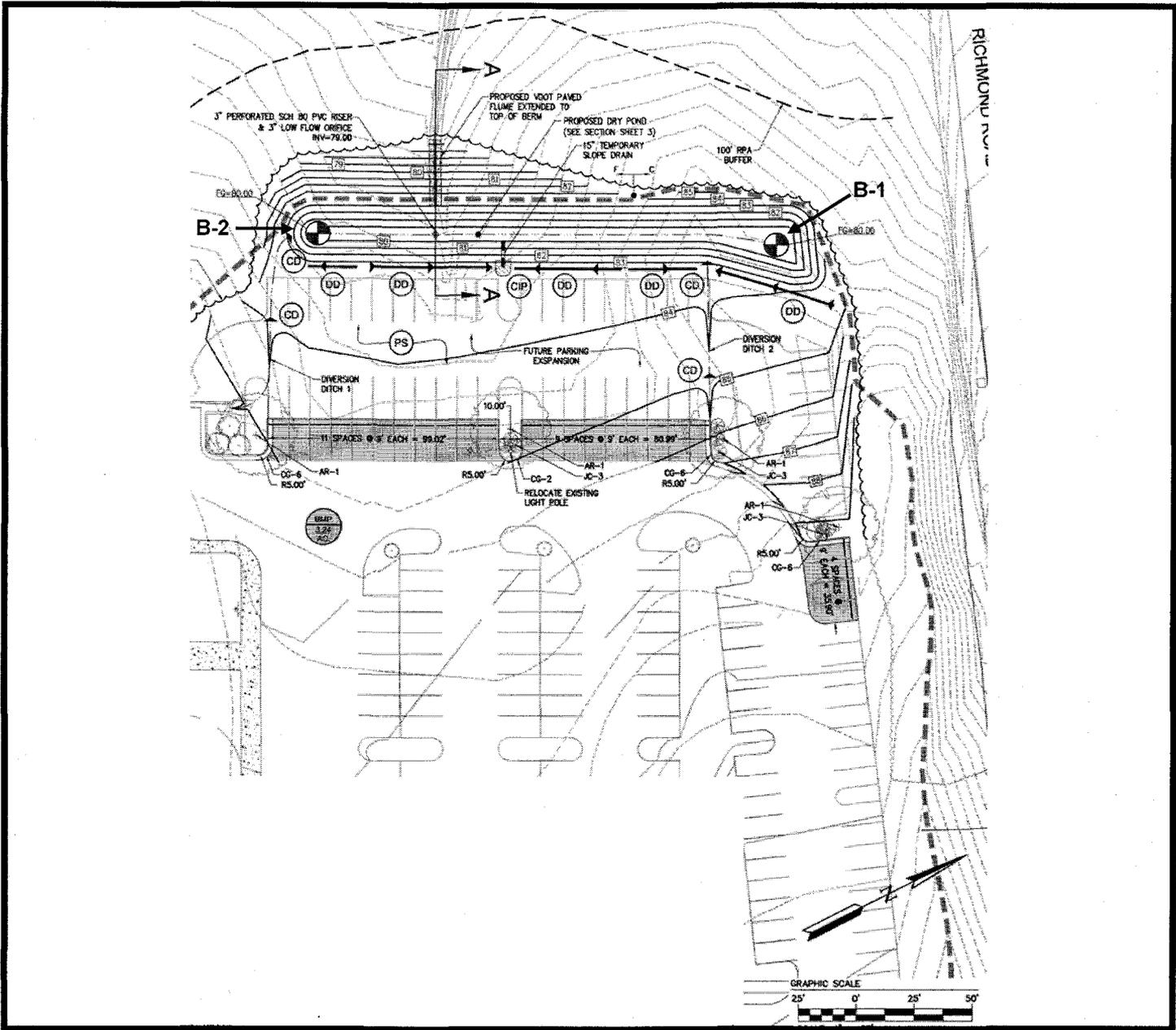
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  - (1) AES Consulting Engineers via email [ [jgrimes@aesva.com](mailto:jgrimes@aesva.com) ]



David J. Gordinier, P.E.  
Geotechnical



**Appendix I**  
**Boring Location Plan**



**LEGEND**

 - Approximate Boring Location

**SCALE**

NTS

**SOURCE**

AES Consulting Engineers, Inc.

DATED:

October 10, 2010



**FIGURE 1**

BORING LOCATION PLAN  
 Crosswalk Community Church  
 Parking Expansion  
 James City County, Virginia

ECS PROJECT NO. 07:10942

**Appendix II**  
**Soil Boring Logs**

CLIENT The Rebkee Company	JOB # 10942	BORING # B-1	SHEET 1 OF 1	<b>ECS</b> LLC MID-ATLANTIC
PROJECT NAME Crosswalk Community Church Parking Expansion	ARCHITECT-ENGINEER AES Consulting Engineers, Inc.			

SITE LOCATION  
Richmond Road, James City County, Virginia

○ CALIBRATED PENETROMETER  
TONS/FT. <sup>3</sup>

1 2 3 4 5+

PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %  
X ----- ● ----- Δ

ROCK QUALITY DESIGNATION & RECOVERY  
RQD% --- REC.% ---  
20% --- 40% --- 60% --- 80% --- 100%

⊗ STANDARD PENETRATION BLOWS/FT.

10 20 30 40 50+

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVELS ELEVATION (FT)
					BOTTOM OF CASING	LOSS OF CIRCULATION 100%	
					SURFACE ELEVATION	85.0	
0	1	SS	24	24	Topsoil Depth 4"		
	2	SS	24	24	Silty SAND, Yellowish Brown, Moist, (SM)		16.6
	3	SS	24	24	Clayey SAND, Orangish Brown, Moist, (SC)		18.2
5	4	SS	24	24	Silty SAND, Orangish Brown, Moist, (SM)		
					Poorly Graded SAND With Silt, Reddish Brown, Moist, (SP-SM)		
10	END OF BORING @ 8.00'						

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

▽WL DRY	WS OR	BORING STARTED	11/8/2010
▽WL(BCR)	▽WL(ACR)	BORING COMPLETED	11/8/2010
▽WL	RIG	FOREMAN ECS	CAVE IN DEPTH ● NONE
			DRILLING METHOD Handauger

D.S (11-5-10) D.S (11-5-10) D.S (12-01-10)

Schlertner

CLIENT The Rebkee Company	JOB # 10942	BORING # B-2	SHEET 1 OF 1	<b>ECS</b> LLC MID-ATLANTIC
PROJECT NAME Crosswalk Community Church Parking Expansion	ARCHITECT-ENGINEER AES Consulting Engineers, Inc.			

SITE LOCATION  
Richmond Road, James City County, Virginia

○ CALIBRATED PENETROMETER  
TONS/FT. <sup>2</sup>

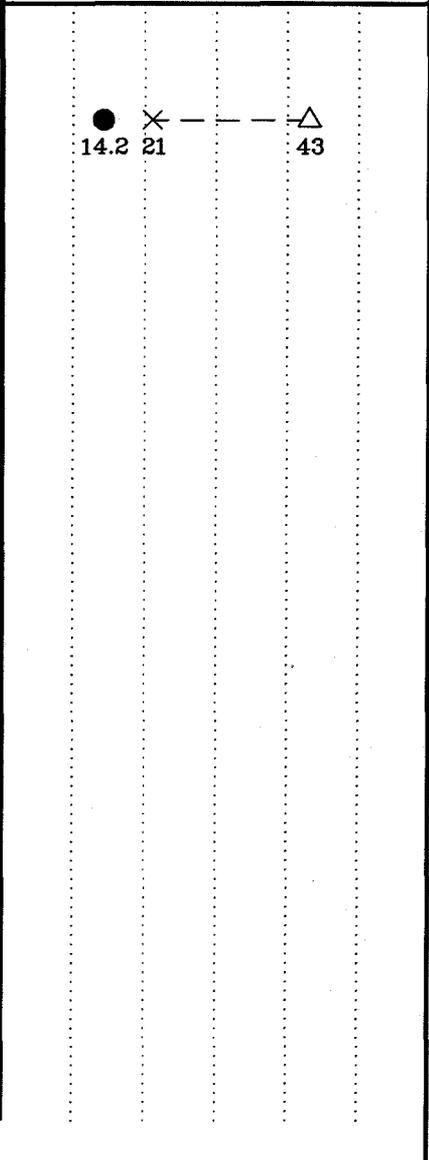
1 2 3 4 5+

PLASTIC LIMIT %      WATER CONTENT %      LIQUID LIMIT %  
X ----- ● ----- Δ

ROCK QUALITY DESIGNATION & RECOVERY  
RQD% --- REC.% ---  
20% --- 40% --- 60% --- 80% --- 100%

⊗ STANDARD PENETRATION BLOWS/FT.  
10 20 30 40 50+

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVELS ELEVATION (FT)
0					SURFACE ELEVATION 80.0		
0	1	SS	18	18	Topsoil Depth 4"		
					Silty SAND, Yellowish Brown, Moist, (SM)		
					Sandy Lean CLAY, Orangish Brown With Light Gray Mottles, Moist, (CL)		
5	2	SS	78	78			
10					END OF BORING @ 8.00'		
15							
20							
25							
30							



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

▽ WL DRY	WS OR (D)	BORING STARTED	11/8/2010	
▽ WL(BCR)	▽ WL(ACR)	BORING COMPLETED	11/8/2010	CAVE IN DEPTH ● NONE
▽ WL		RIG	FOREMAN ECS	DRILLING METHOD Handauger

D.S (11-15-10) D.S (11-15-10) D.S (12-01-10)

D.Schothore(11/15/2010 01:03:18 pm)

**Appendix III**

**Unified Soil Classification System and  
Reference Notes for Boring Logs**

# UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)

Major Divisions		Group Symbols	Typical Names	Laboratory Classification Criteria		
Coarse-grained soils (More than half of material is larger than No. 200 Sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows: Less than 5 percent GW, GP, SW, SP More than 5 percent GM, GC, SM, SC 5 to 12 percent Borderline cases requiring dual symbols <sup>b</sup>	$C_u = D_{60}/D_{10}$ greater than 4 $C_c = (D_{30})^2 / (D_{10} \times D_{60})$ between 1 and 3	
		GP	Poorly graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for GW	
		GM <sup>a</sup>	d		Silty gravels, gravel-sand mixtures	Atterberg limits below "A" line or P.I. less than 4  Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
			u			
	GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits below "A" line or P.I. less than 7			
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW		Well-graded sands, gravelly sands, little or no fines	$C_u = D_{60}/D_{10}$ greater than 6 $C_c = (D_{30})^2 / (D_{10} \times D_{60})$ between 1 and 3
			SP		Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW
		SM <sup>a</sup>	d		Silty sands, sand-silt mixtures	Atterberg limits above "A" line or P.I. less than 4  Limits plotting in CL-ML zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
			u			
		SC	Clayey sands, sand-clay mixtures		Atterberg limits above "A" line with P.I. greater than 7	
Fine-grained soils (More than half material is smaller than No. 200 Sieve)		Silts and clays (Liquid limit less than 50)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity	<p style="text-align: center;">Plasticity Chart</p> <p style="text-align: center;">Plasticity Index</p> <p style="text-align: center;">Liquid Limit</p>	
	CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
	OL		Organic silts and organic silty clays of low plasticity			
	Silts and clays (Liquid limit greater than 50)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts			
		CH	Inorganic clays of high plasticity, fat clays			
		OH	Organic clays of medium to high plasticity, organic silts			
	Highly Organic soils	Pt	Peat and other highly organic soils			

<sup>a</sup> Division of GM and SM groups into subdivisions of d and u are for roads and airfields only. Subdivision is based on Atterberg limits; suffix d used when L.L. is 28 or less and the P.I. is 6 or less; the suffix u used when L.L. is greater than 28.

<sup>b</sup> Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example: GW-GC, well-graded gravel-sand mixture with clay binder. (From Table 2.16 - Winterkorn and Fang, 1975)

## REFERENCE NOTES FOR BORING LOGS

### I. Drilling Sampling Symbols

SS	Split Spoon Sampler	ST	Shelby Tube Sampler
RC	Rock Core, NX, BX, AX	PM	Pressuremeter
DC	Dutch Cone Penetrometer	RD	Rock Bit Drilling
BS	Bulk Sample of Cuttings	PA	Power Auger (no sample)
HSA	Hollow Stem Auger	WS	Wash sample
REC	Rock Sample Recovery %	RQD	Rock Quality Designation %

### II. Correlation of Penetration Resistances to Soil Properties

Standard Penetration (blows/ft) refers to the blows per foot of a 140 lb. hammer falling 30 inches on a 2-inch OD split-spoon sampler, as specified in ASTM D 1586. The blow count is commonly referred to as the N-value.

#### A. Non-Cohesive Soils (Silt, Sand, Gravel and Combinations)

<i>Density</i>		<i>Relative Properties</i>	
Under 4 blows/ft	Very Loose	Adjective Form	12% to 49%
5 to 10 blows/ft	Loose	With	5% to 12%
11 to 30 blows/ft	Medium Dense		
31 to 50 blows/ft	Dense		
Over 51 blows/ft	Very Dense		

<i>Particle Size Identification</i>		
Boulders		8 inches or larger
Cobbles		3 to 8 inches
Gravel	Coarse	1 to 3 inches
	Medium	½ to 1 inch
	Fine	¼ to ½ inch
Sand	Coarse	2.00 mm to ¼ inch (dia. of lead pencil)
	Medium	0.42 to 2.00 mm (dia. of broom straw)
	Fine	0.074 to 0.42 mm (dia. of human hair)
Silt and Clay		0.0 to 0.074 mm (particles cannot be seen)

#### B. Cohesive Soils (Clay, Silt, and Combinations)

<i>Blows/ft</i>	<i>Consistency</i>	<i>Unconfined Comp. Strength Q<sub>p</sub> (tsf)</i>	<i>Degree of Plasticity</i>	<i>Plasticity Index</i>
Under 2	Very Soft	Under 0.25	None to slight	0 - 4
3 to 4	Soft	0.25-0.49	Slight	5 - 7
5 to 8	Medium Stiff	0.50-0.99	Medium	8 - 22
9 to 15	Stiff	1.00-1.99	High to Very High	Over 22
16 to 30	Very Stiff	2.00-3.00		
31 to 50	Hard	4.00-8.00		
Over 51	Very Hard	Over 8.00		

### III. Water Level Measurement Symbols

WL	Water Level	BCR	Before Casing Removal	DCI	Dry Cave-In
WS	While Sampling	ACR	After Casing Removal	WCI	Wet Cave-In
WD	While Drilling	▽	Est. Groundwater Level	▽	Est. Seasonal High GWT

The water levels are those levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in a granular soil. In clay and plastic silts, the accurate determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally applied.

**Appendix IV**  
**Laboratory Test Summary**



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***DRAINAGE CALCULATIONS***

***FOR***

***Crosswalk Community Church  
Parking Expansion***

***SITE:***

James City County

***SUBMITTED TO:***

James City County Environmental Division

County Plan No.: SP-0095-2010

***Prepared By:***

AES Consulting Engineers  
5248 Olde Towne Road, Suite 1  
Williamsburg, Virginia 23188

Revised: December 14, 2010

AES Project No. W10157-00

Environmental Division

DEC 15 2010

RECEIVED



## Table of Contents

- **Stormwater Narrative**
- **BMP Point Worksheet**
- **Stormwater Management**
  - 1. Runoff Coefficients
  - 2. Pre-Development Routings
    - a. Area 1
      - 1. 10-Year
      - 2. 100-Year
    - b. Area 2
      - 1. 10-Year
      - 2. 100-Year
    - c. P.O.C.
      - 1. 10-Year
      - 2. 100-Year
  - 3. Post-Development Routings
    - a. Area 1
      - 3. 10-Year
      - 4. 100-Year
    - b. Area 2
      - 5. 10-Year
      - 6. 100-Year
    - c. P.O.C.
      - 7. 10-Year
      - 8. 100-Year
  - 4. Bioretention
    - a. Water Quality Volume
    - b. Pond Report
- **Drainage Calculations**
  - 1. Paved Flume
  - 2. Storm Pipe
- **Erosion & Sediment Control**
  - 1. Sediment Basin Calculations
    - a. VESCH Sediment Basin Design Sheet
    - b. Pond Report and Routings
  - 2. Ditch Calculations
    - a. Diversion Ditch 1
    - b. Diversion Ditch 2
  - 3. Paved Flume Outlet Protection
- **Overall Drainage Map**

# Stormwater Management and Drainage Design Report

## Crosswalk Community Church Parking Expansion

AES Project Number W10157

Revised December 2010

### Project Description

This plan of development is for a site expansion of Crosswalk Community Church. The project includes an expansion of the existing parking lot on the eastern edge of the site, as well as, providing grading and stormwater management for an additional future parking expansion. All proposed grading and drainage will ultimately be directed towards a the existing paved flumed which carries the water to an existing 10-pt wet pond facility.

### Description of Site Drainage

The existing site is mostly impervious area including paved parking and the church building itself, while the remainder of the site is wooded. A majority of the site drains naturally or by existing paved flume towards the east into Yarmouth Creek through a wetland and creek system.

### Stormwater Management/Best Management Practices

The proposed development will be treated through a bioretention facility which is designed to treat runoff equal to the amount that is being proposed in accordance the requirements of the Virginia Stormwater Handbook and James City County BMP Handbook and associated stormwater policies. The existing site already achieves the full 10-pt requirement by the downstream wet pond; the added bioretention facility serves only to treat an equivalent area of impervious cover which is being added to the site (including future development).

### Special Stormwater Criteria (SSC)

The site and proposed parking expansion lies within the Yarmouth Creek Watershed. The Yarmouth Creek watershed requires by JCC policy adherence to the Special Stormwater Criteria and by SUP condition that requirement was extended to include all portions of the site. The SSC requirement is to provide 2 unit measures for the entire site. The following are the SSC measures that are being sought credit for:



- SSCP #5 – Increasing time of concentration flow paths= 1 unit
  - **Site wide we have tried to sheet flow everything to the pond, eliminating underground pipe networks.**



- SSCP #8 – Limit use of underground storm drain piping = 1 unit

- **The site drains via a system of curbs and swales into a bioretention facility. The only piping added was to discharge water to the flume in order to prevent erosion on the slopes.**
- SSCP #20 – Enhanced outlet protection measures at pipe & channel outfalls = 1 unit
  - **Adequately sized outlet protection has been added to the downstream outfall of the existing paved flume which was previously not provided.**
- SSCP #38 – “Weighted Points over 10” for traditional SWM, 10 point system = 1 unit
  - **In addition to the existing 10 point pond, our proposed facility has increased our weighted points over 10.**

### Conclusion

It is our belief that the stormwater management plan as presented works to not only meet the requirements of the state and local stormwater requirements but exceeds them in many ways.

S:\Jobs\W10157\00-Crosswalk\Admin\Reports\Eng\Stormwater Management Report.doc

TABLE 3

WORKSHEET FOR BMP POINT SYSTEM  
 CROSSWALK COMMUNITY CHURCH, AES PROJECT No. W10157  
 TOTAL AREA = 8.78 ACRE(s)

A. STRUCTURAL BMP POINT ALLOCATION

<u>BMP</u>	<u>BMP Drainage Area</u>	<u>BMP Points</u>		<u>Fraction of Site Served by BMP</u> (BMP Drainage Area/Total Area)	<u>Weighted BMP Points</u>
EXISTING BMP	8.78	10	X	1.000	= 10.00
PROP. BMP	0.87	10	X	0.099	= 0.99
			X		=
			X		=
			X		=
<b>TOTAL WEIGHTED STRUCTURAL BMP POINTS:</b>					<b>10.99</b>

B. NATURAL OPEN SPACE CREDIT

<u>Open Space Area</u>	<u>Fraction of Site</u> (Open Space Area/Total Area)	<u>Natural Open Space Credit</u>		<u>Points for Natural Open Space</u> (Fraction of Site * Natural Open Space Credit %)
2.44	27.79	(0.1 per 1%)	=	2.78
		(0.15 per 1%)	=	
<b>TOTAL OPEN SPACE POINTS:</b>				<b>2.78</b>

C. TOTAL WEIGHTED POINTS

10.99	+	2.78	=	13.77
Structural BMP Points		Natural Open Space Points		TOTAL

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***STORMWATER MANAGEMENT***



Project: Crosswalk Community Church  
 Project No.: W10157  
 Subject: Runoff Coefficients  
 Date: December 8, 2010  
 Calculated By: AMR

Runoff Coefficients used in the following calculations were taken from Table 4-3 of the Virginia Stormwater Management Handbook.

**Subject Area: Drainage Areas**

Area Description	Pervious	Imperv		
	0.30	0.90		
Pre-Dev. Area 1	0.53	1.94		
Pre-Dev. Area 2	0.58	0.29		
Post-Dev. Area 1	0.28	2.19		
Post-Dev. Area 2	0.38	0.49		

Total Area	C x A	Weighted C
2.47	1.90	0.77
0.87	0.44	0.50
2.47	2.05	0.83
0.87	0.56	0.64
0.00		
0.00		
0.00		
0.00		
0.00		
0.00		

\* Increased impervious area (Pre to Post) = 0.45 acres

# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

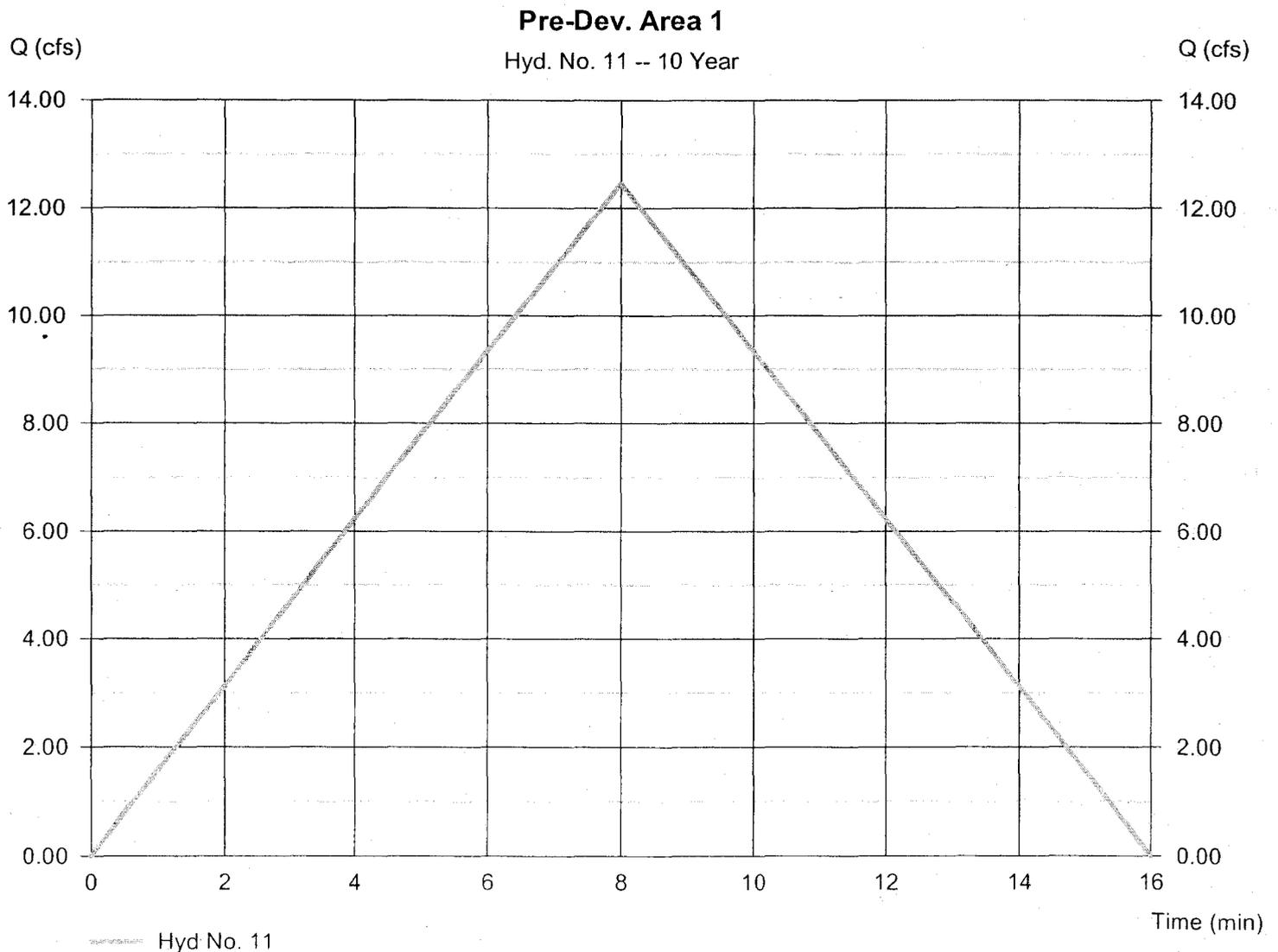
Wednesday, Dec 8, 2010

## Hyd. No. 11

Pre-Dev. Area 1

Hydrograph type = Rational  
Storm frequency = 10 yrs  
Time interval = 1 min  
Drainage area = 2.470 ac  
Intensity = 6.550 in/hr  
IDF Curve = JamesCity-NW-14.IDF

Peak discharge = 12.46 cfs  
Time to peak = 8 min  
Hyd. volume = 5,980 cuft  
Runoff coeff. = 0.77  
Tc by User = 8.00 min  
Asc/Rec limb fact = 1/1



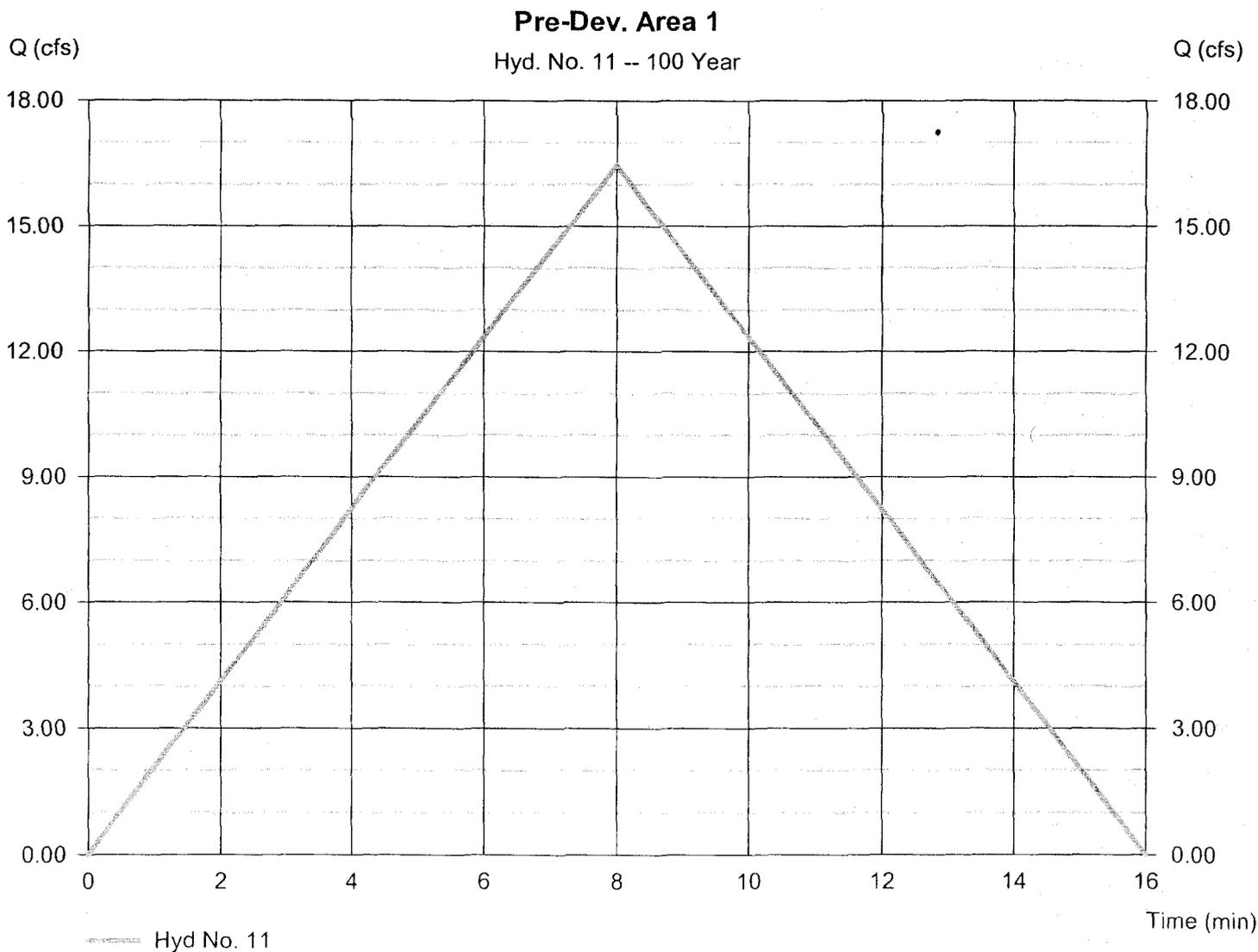
# Hydrograph Report

## Hyd. No. 11

Pre-Dev. Area 1

Hydrograph type = Rational  
Storm frequency = 100 yrs  
Time interval = 1 min  
Drainage area = 2.470 ac  
Intensity = 8.651 in/hr  
IDF Curve = JamesCity-NW-14.IDF

Peak discharge = 16.45 cfs  
Time to peak = 8 min  
Hyd. volume = 7,897 cuft  
Runoff coeff. = 0.77  
Tc by User = 8.00 min  
Asc/Rec limb fact = 1/1



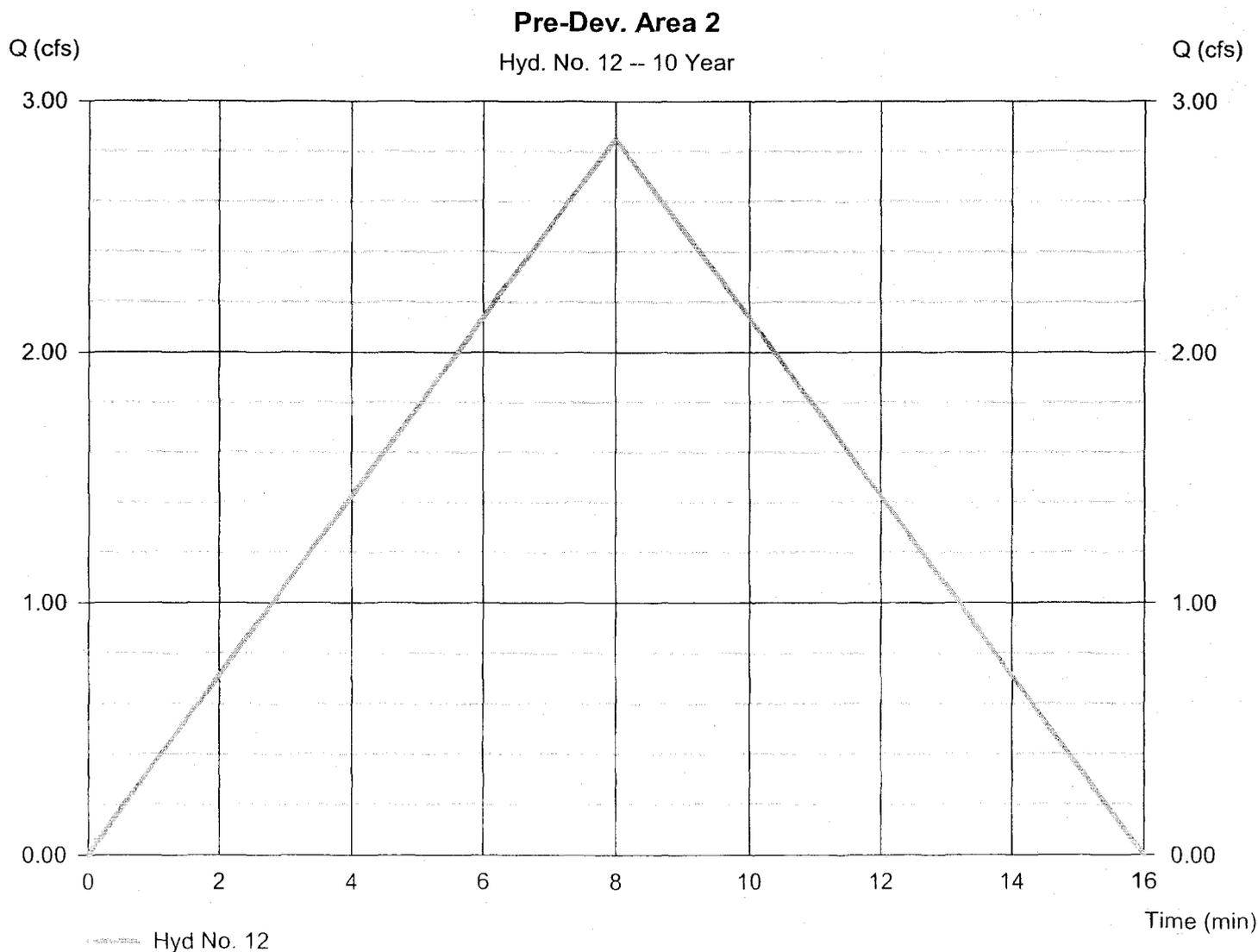
# Hydrograph Report

## Hyd. No. 12

Pre-Dev. Area 2

Hydrograph type = Rational  
Storm frequency = 10 yrs  
Time interval = 1 min  
Drainage area = 0.870 ac  
Intensity = 6.550 in/hr  
IDF Curve = JamesCity-NW-14.IDF

Peak discharge = 2.849 cfs  
Time to peak = 8 min  
Hyd. volume = 1,368 cuft  
Runoff coeff. = 0.5  
Tc by User = 8.00 min  
Asc/Rec limb fact = 1/1



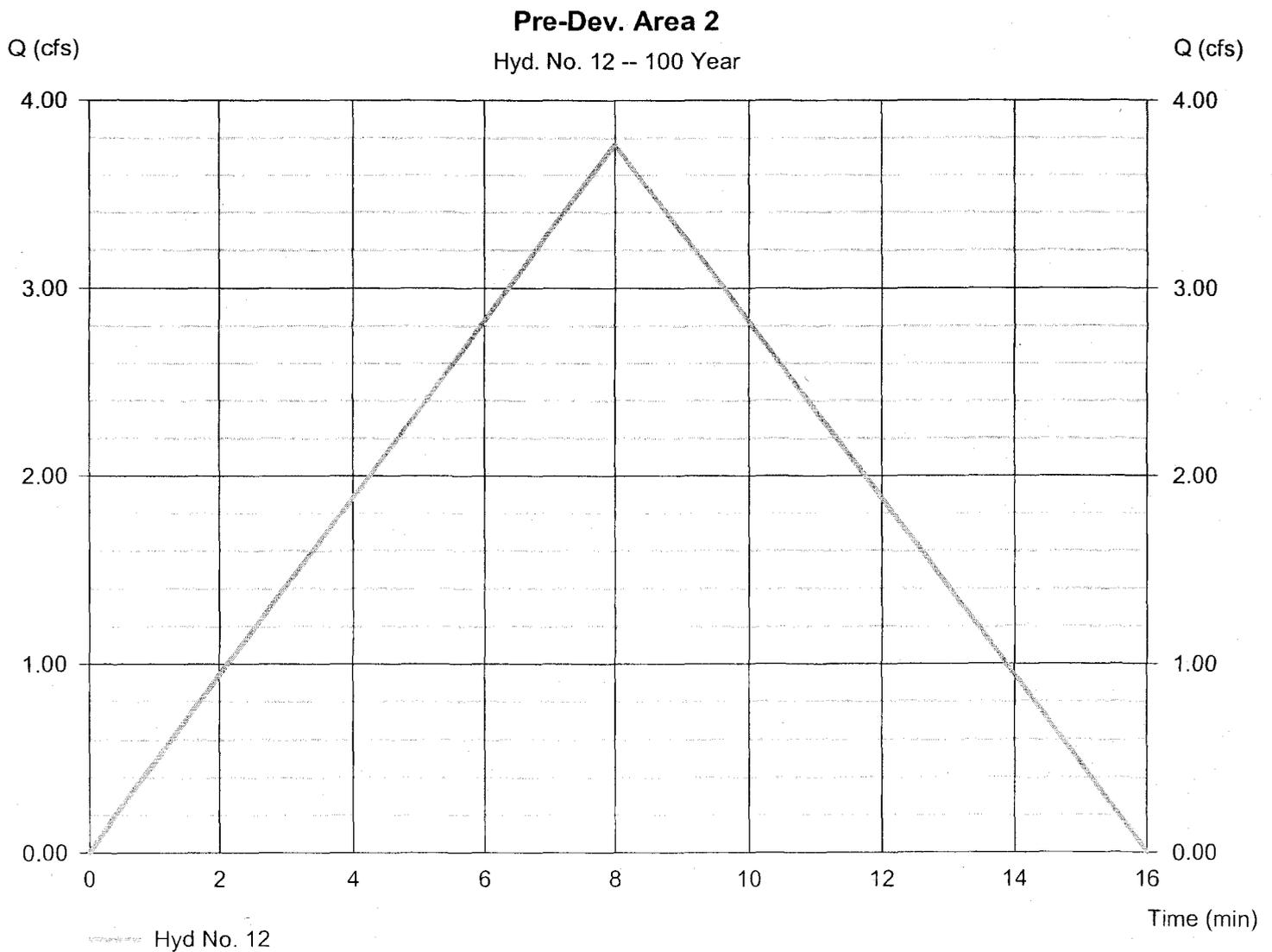
# Hydrograph Report

## Hyd. No. 12

Pre-Dev. Area 2

Hydrograph type = Rational  
Storm frequency = 100 yrs  
Time interval = 1 min  
Drainage area = 0.870 ac  
Intensity = 8.651 in/hr  
IDF Curve = JamesCity-NW-14.IDF

Peak discharge = 3.763 cfs  
Time to peak = 8 min  
Hyd. volume = 1,806 cuft  
Runoff coeff. = 0.5  
Tc by User = 8.00 min  
Asc/Rec limb fact = 1/1



# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

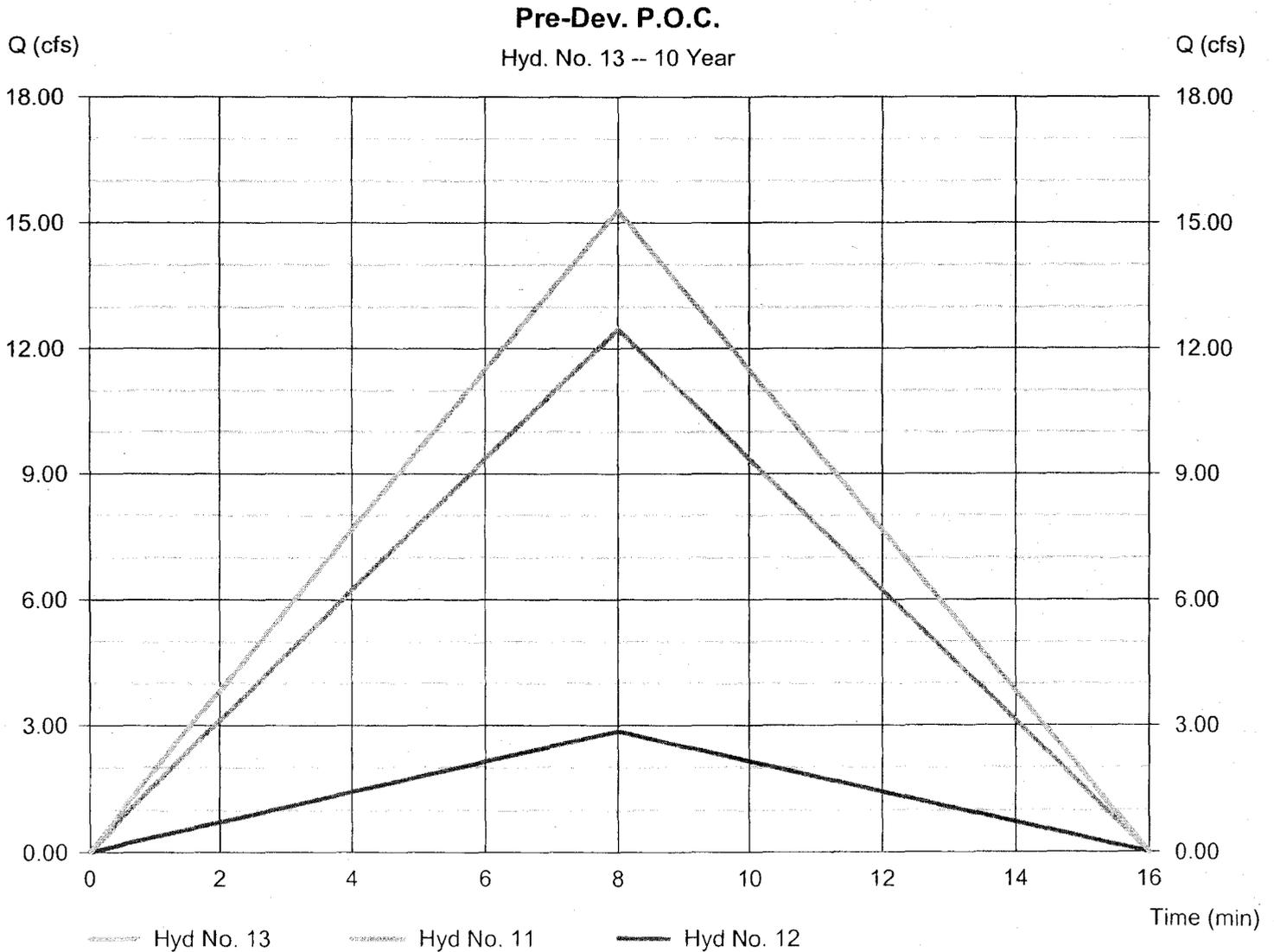
Wednesday, Dec 8, 2010

## Hyd. No. 13

Pre-Dev. P.O.C.

Hydrograph type = Combine  
Storm frequency = 10 yrs  
Time interval = 1 min  
Inflow hyds. = 11, 12

Peak discharge = 15.31 cfs  
Time to peak = 8 min  
Hyd. volume = 7,347 cuft  
Contrib. drain. area = 3.340 ac



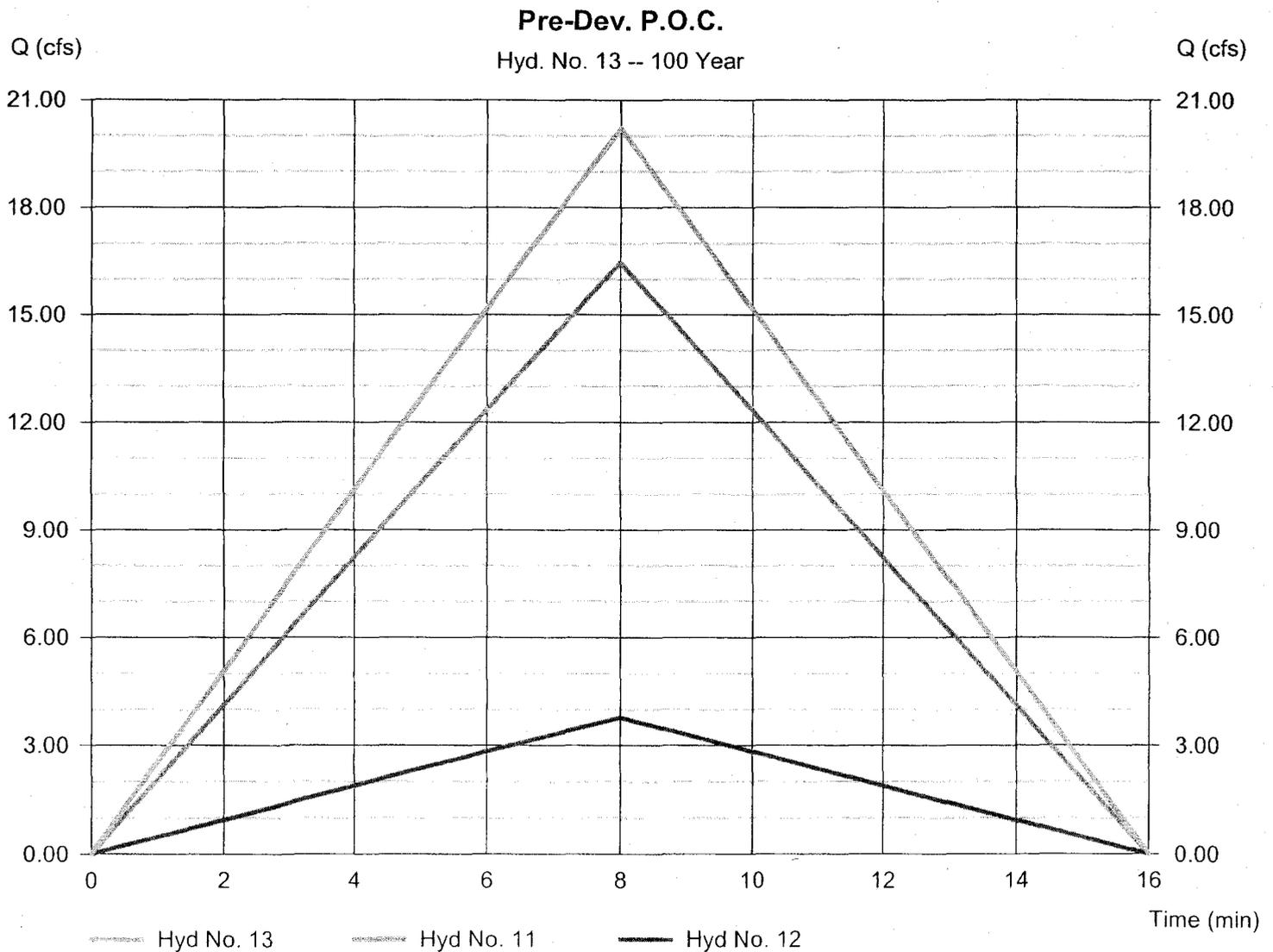
# Hydrograph Report

## Hyd. No. 13

Pre-Dev. P.O.C.

Hydrograph type = Combine  
Storm frequency = 100 yrs  
Time interval = 1 min  
Inflow hyds. = 11, 12

Peak discharge = 20.22 cfs  
Time to peak = 8 min  
Hyd. volume = 9,704 cuft  
Contrib. drain. area = 3.340 ac



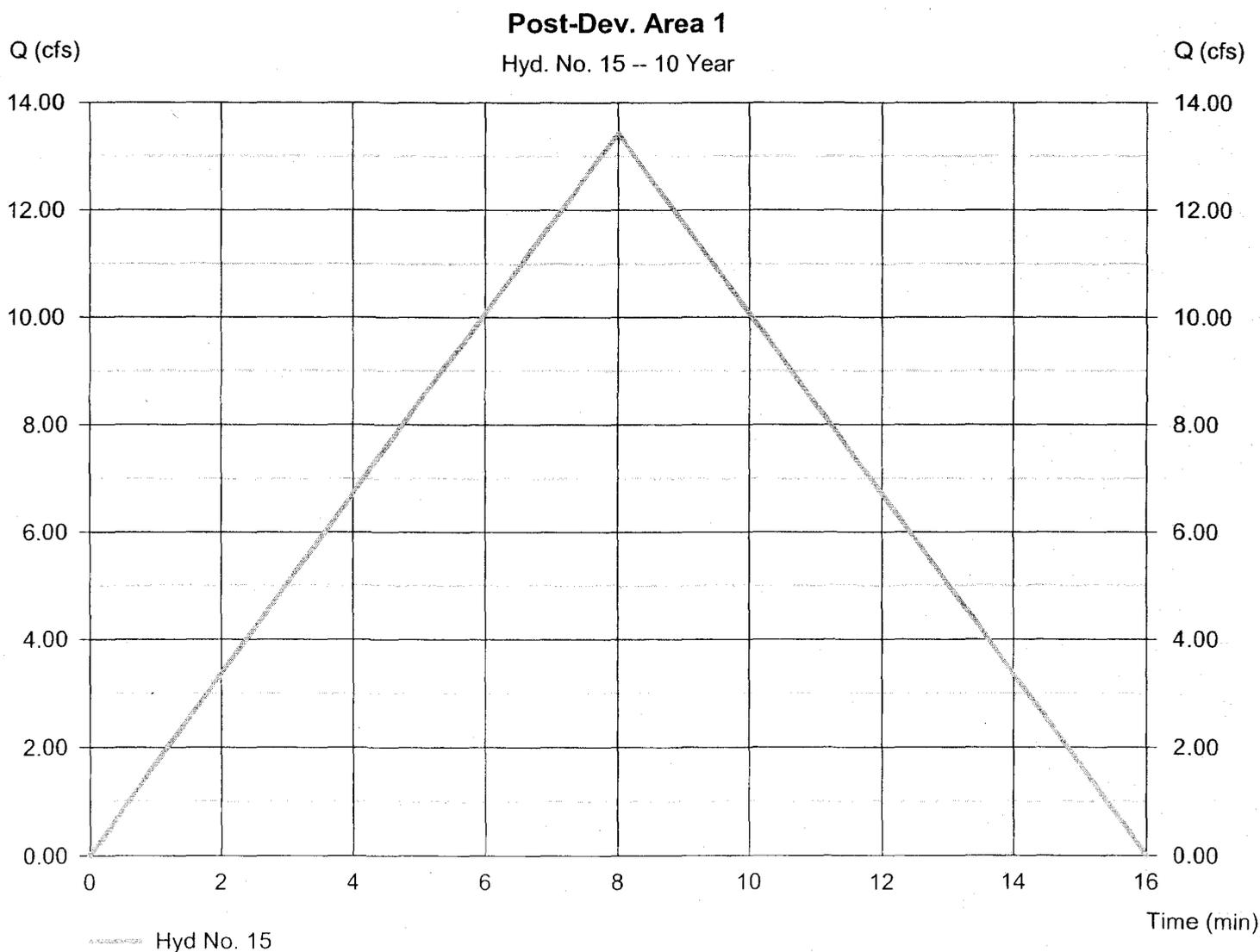
# Hydrograph Report

## Hyd. No. 15

Post-Dev. Area 1

Hydrograph type = Rational  
Storm frequency = 10 yrs  
Time interval = 1 min  
Drainage area = 2.470 ac  
Intensity = 6.550 in/hr  
IDF Curve = JamesCity-NW-14.IDF

Peak discharge = 13.43 cfs  
Time to peak = 8 min  
Hyd. volume = 6,446 cuft  
Runoff coeff. = 0.83  
Tc by User = 8.00 min  
Asc/Rec limb fact = 1/1



# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

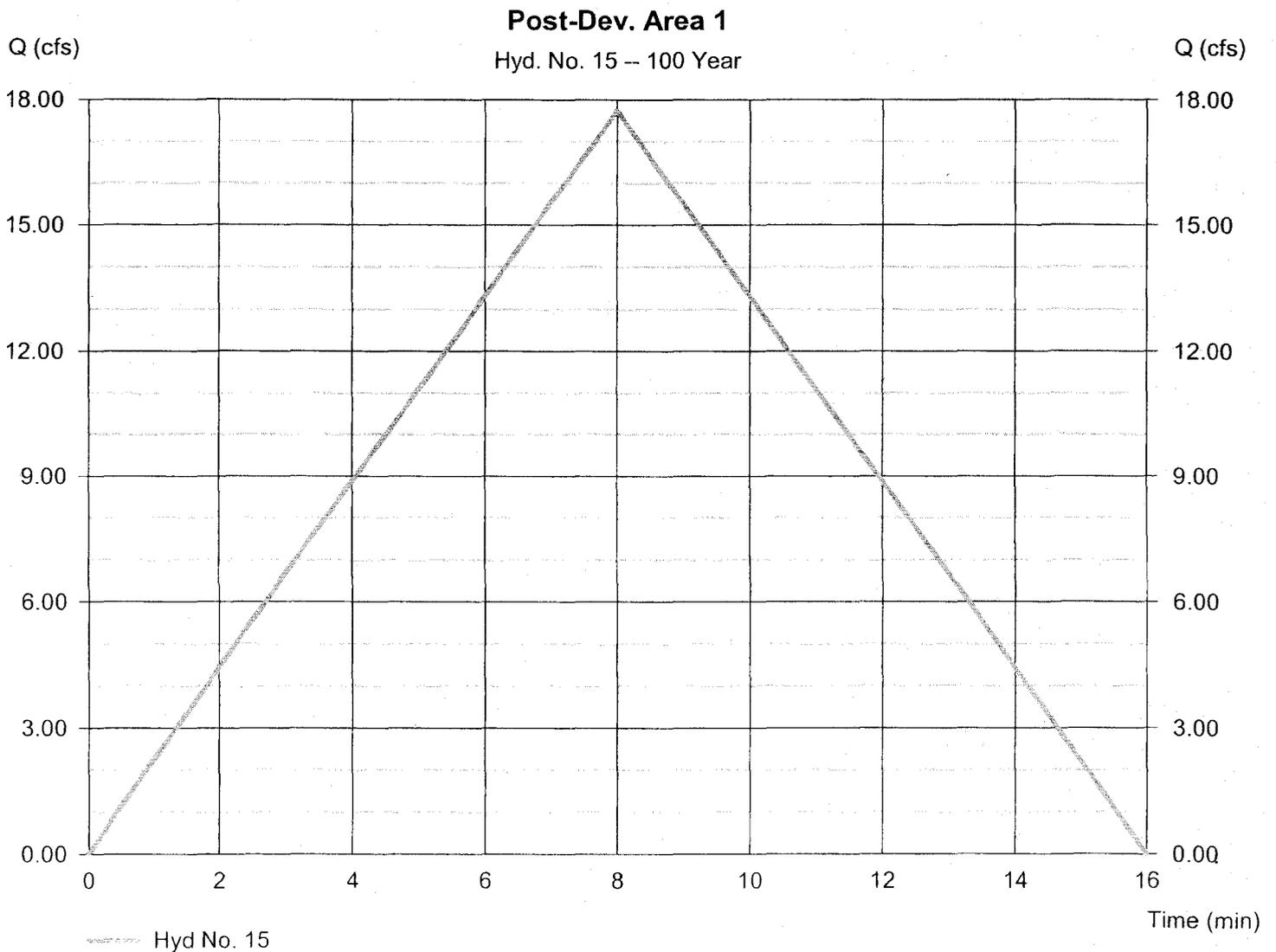
Wednesday, Dec 8, 2010

## Hyd. No. 15

Post-Dev. Area 1

Hydrograph type = Rational  
Storm frequency = 100 yrs  
Time interval = 1 min  
Drainage area = 2.470 ac  
Intensity = 8.651 in/hr  
IDF Curve = JamesCity-NW-14.IDF

Peak discharge = 17.73 cfs  
Time to peak = 8 min  
Hyd. volume = 8,513 cuft  
Runoff coeff. = 0.83  
Tc by User = 8.00 min  
Asc/Rec limb fact = 1/1



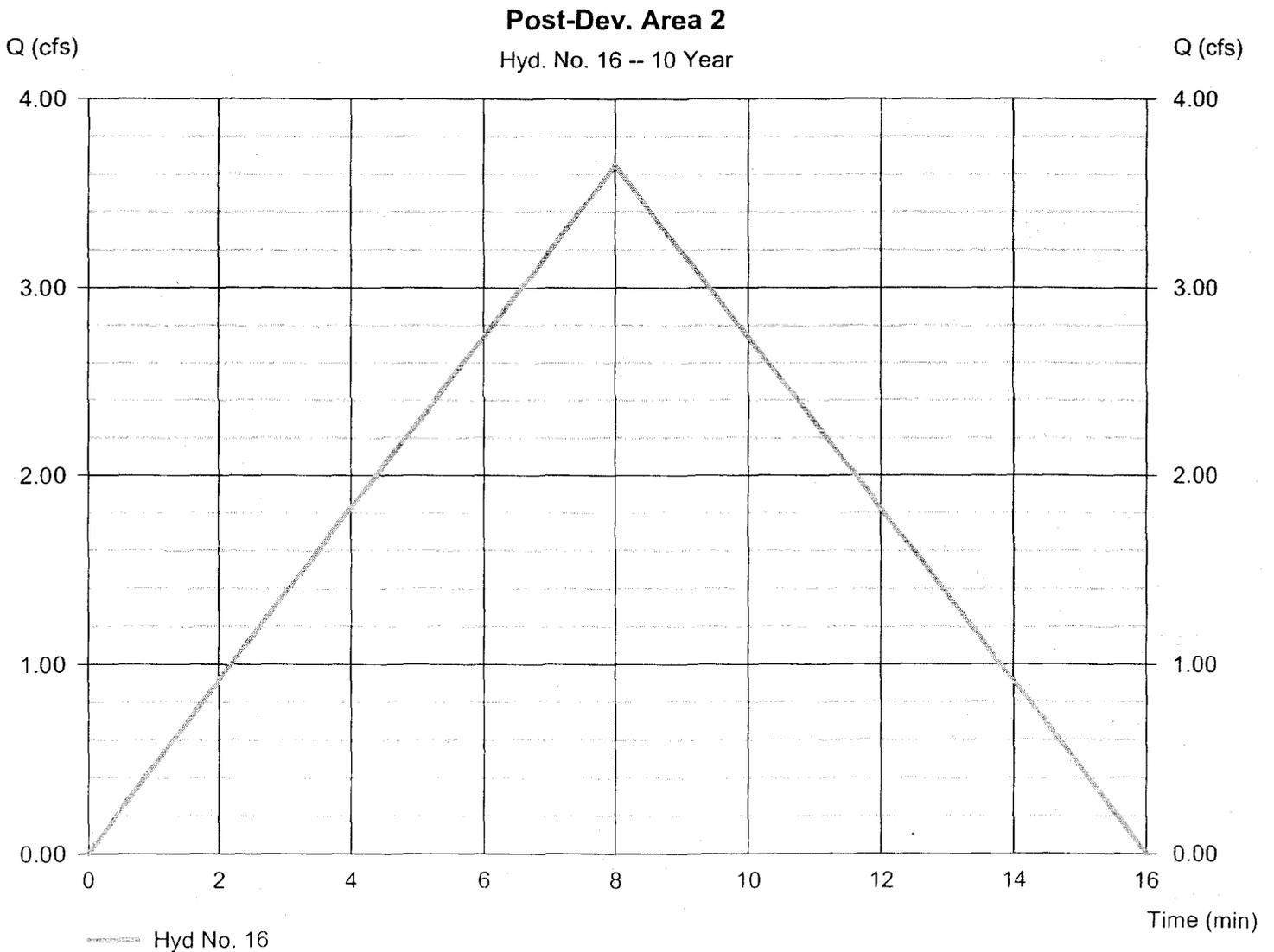
# Hydrograph Report

## Hyd. No. 16

Post-Dev. Area 2

Hydrograph type = Rational  
Storm frequency = 10 yrs  
Time interval = 1 min  
Drainage area = 0.870 ac  
Intensity = 6.550 in/hr  
IDF Curve = JamesCity-NW-14.IDF

Peak discharge = 3.647 cfs  
Time to peak = 8 min  
Hyd. volume = 1,751 cuft  
Runoff coeff. = 0.64  
Tc by User = 8.00 min  
Asc/Rec limb fact = 1/1



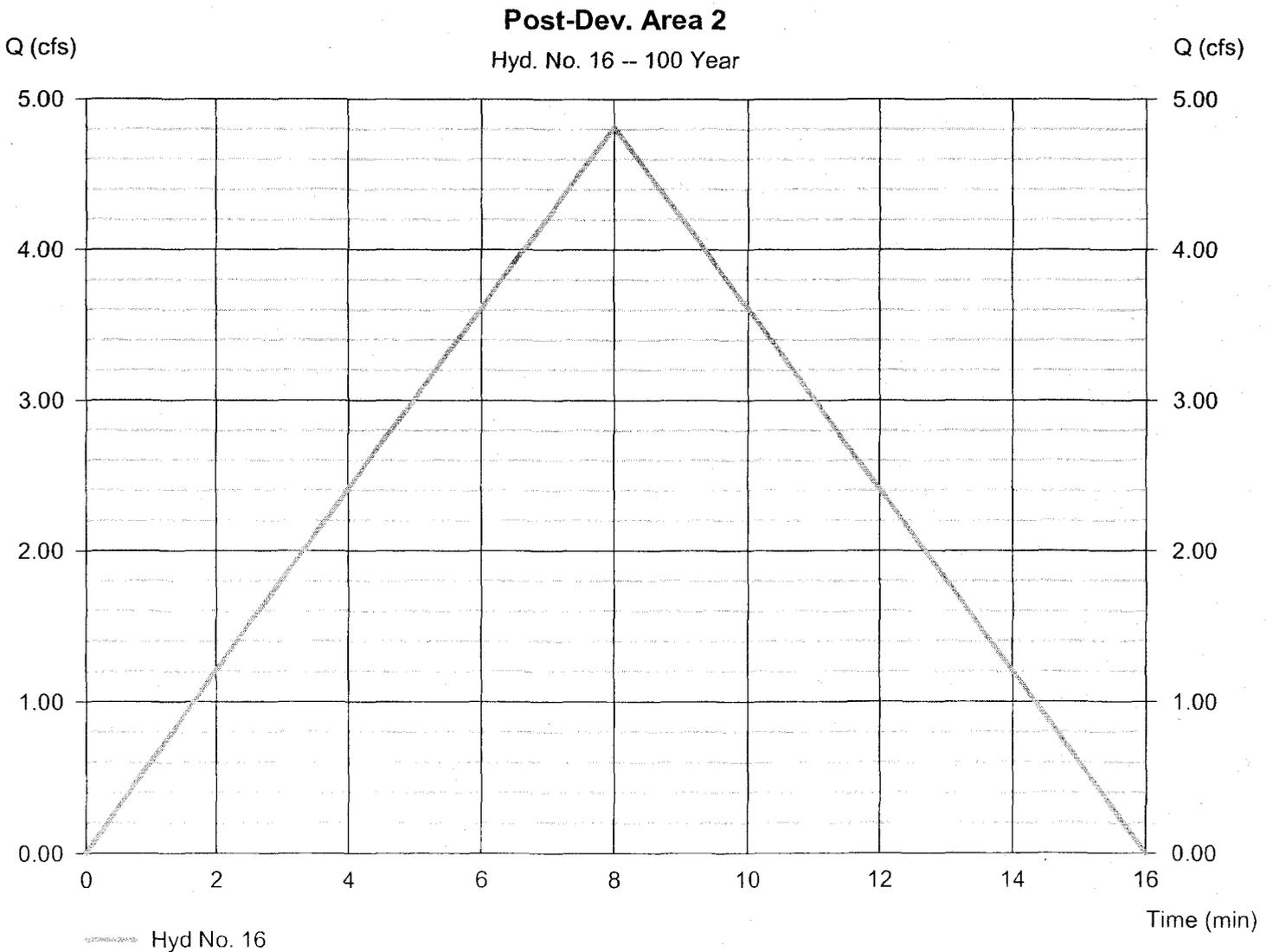
# Hydrograph Report

## Hyd. No. 16

Post-Dev. Area 2

Hydrograph type = Rational  
Storm frequency = 100 yrs  
Time interval = 1 min  
Drainage area = 0.870 ac  
Intensity = 8.651 in/hr  
IDF Curve = JamesCity-NW-14.IDF

Peak discharge = 4.817 cfs  
Time to peak = 8 min  
Hyd. volume = 2,312 cuft  
Runoff coeff. = 0.64  
Tc by User = 8.00 min  
Asc/Rec limb fact = 1/1



# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

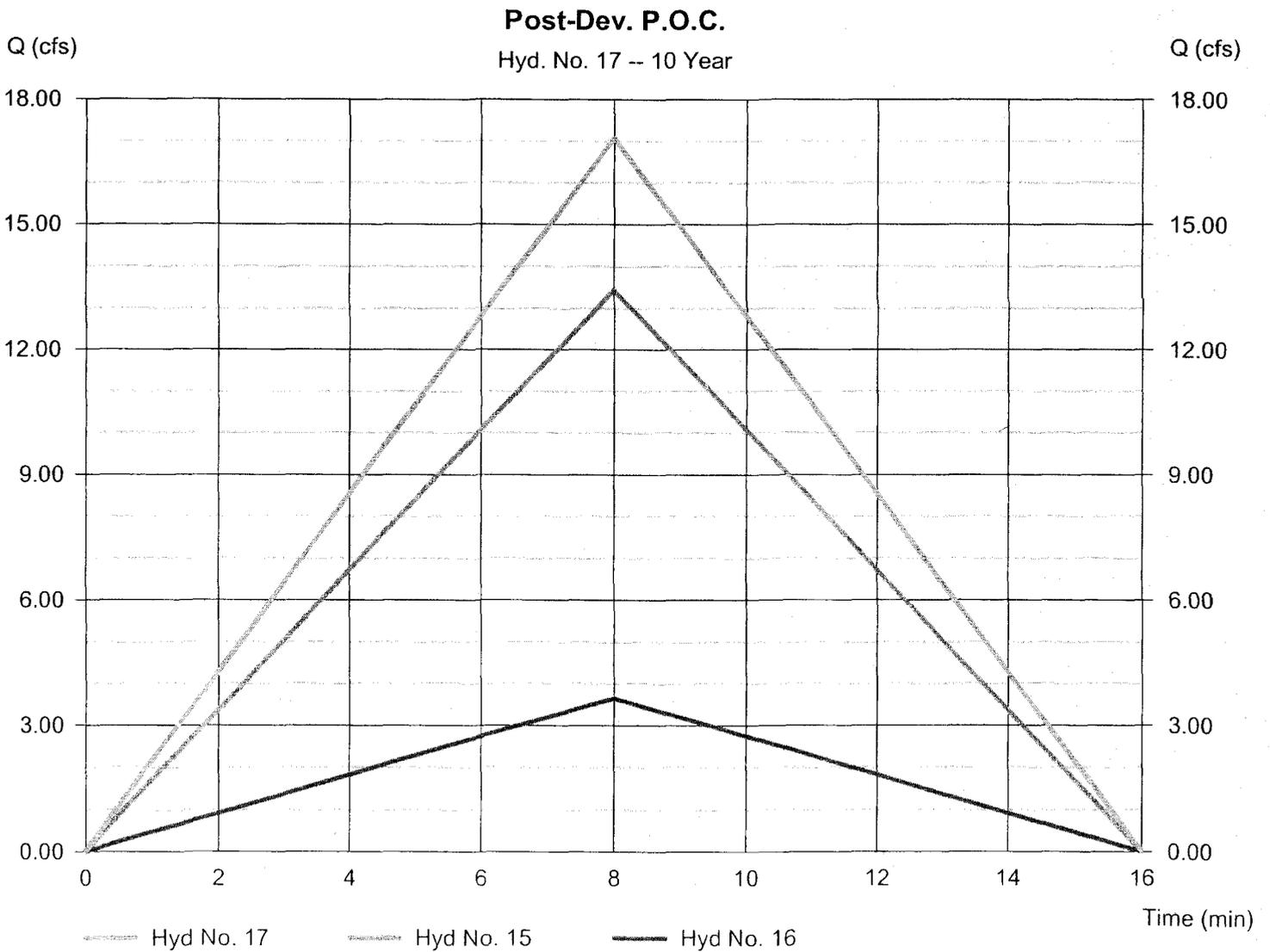
Wednesday, Dec 8, 2010

## Hyd. No. 17

Post-Dev. P.O.C.

Hydrograph type = Combine  
Storm frequency = 10 yrs  
Time interval = 1 min  
Inflow hyds. = 15, 16

Peak discharge = 17.08 cfs  
Time to peak = 8 min  
Hyd. volume = 8,196 cuft  
Contrib. drain. area = 3.340 ac



# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

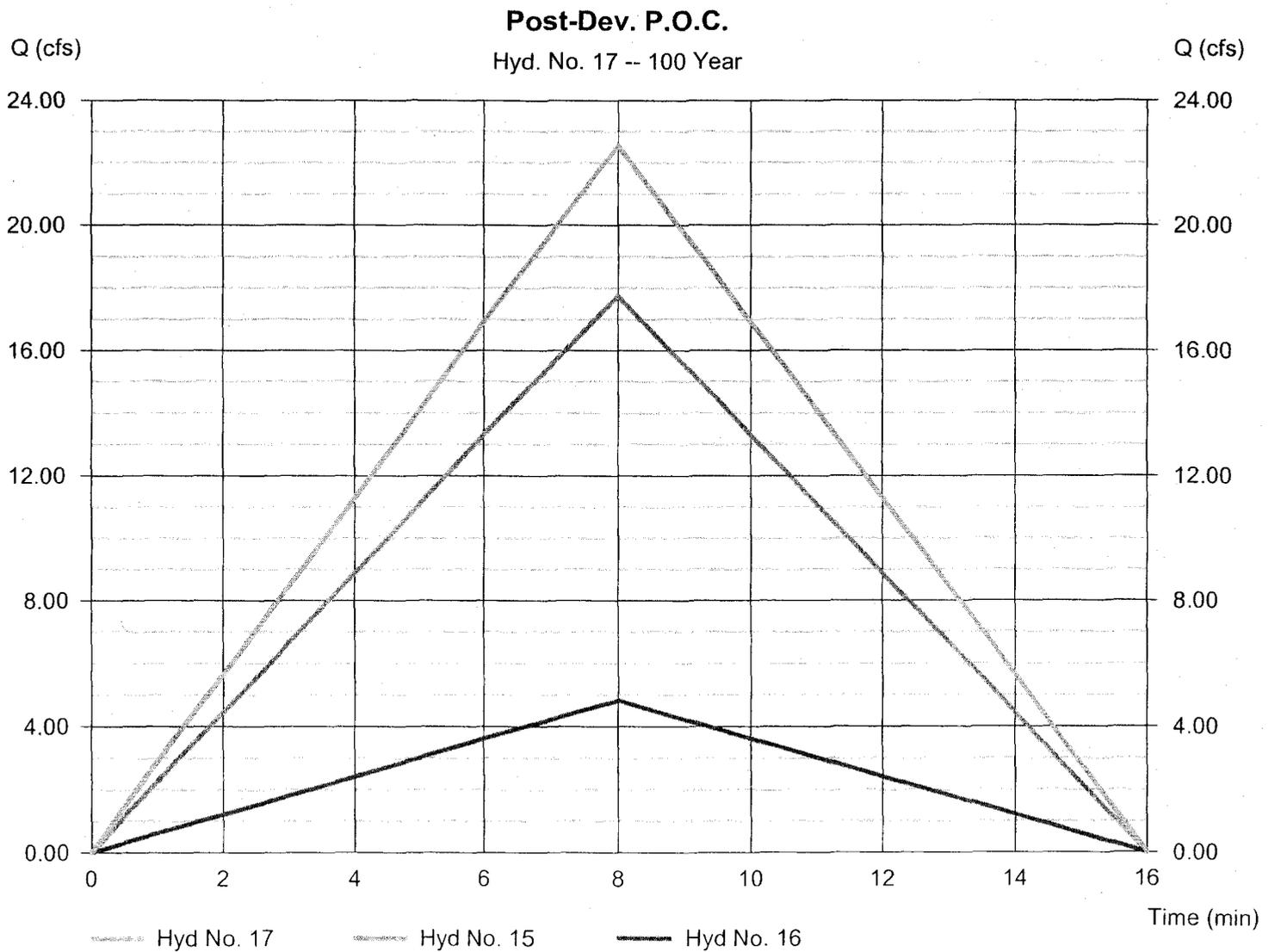
Wednesday, Dec 8, 2010

## Hyd. No. 17

Post-Dev. P.O.C.

Hydrograph type = Combine  
Storm frequency = 100 yrs  
Time interval = 1 min  
Inflow hyds. = 15, 16

Peak discharge = 22.55 cfs  
Time to peak = 8 min  
Hyd. volume = 10,825 cuft  
Contrib. drain. area = 3.340 ac





Project: Courthouse Common  
Project No.: W10157  
Subject: Water Quality Volume  
Bioretention  
Date: 12/7/2010  
Calculated By: AMR

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BMP Type = Bioretention

$$\begin{aligned} \text{Water Quality Volume} &= 0.5 \text{ in.} \times \underline{0.483} \text{ acres of impervious coverage} \\ &= (0.5 / 12) \times (43,560 \times 0.483) \\ &= \boxed{877 \text{ CF}} \end{aligned}$$

$$\begin{aligned} \text{Total Storage Volume Required} &= \underline{2} \times \text{Water Quality Volume} \\ &= 2 \times 877 \\ &= 1753.3 \text{ CF @ } 82.00 = \underline{1,781 \text{ CF Storage Provided}} \end{aligned}$$

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# Pond Report

## Pond No. 3 - Bioretention

### Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 81.00 ft

### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	81.00	1,428	0	0
1.00	82.00	2,159	1,781	1,781
2.00	83.00	2,947	2,543	4,323

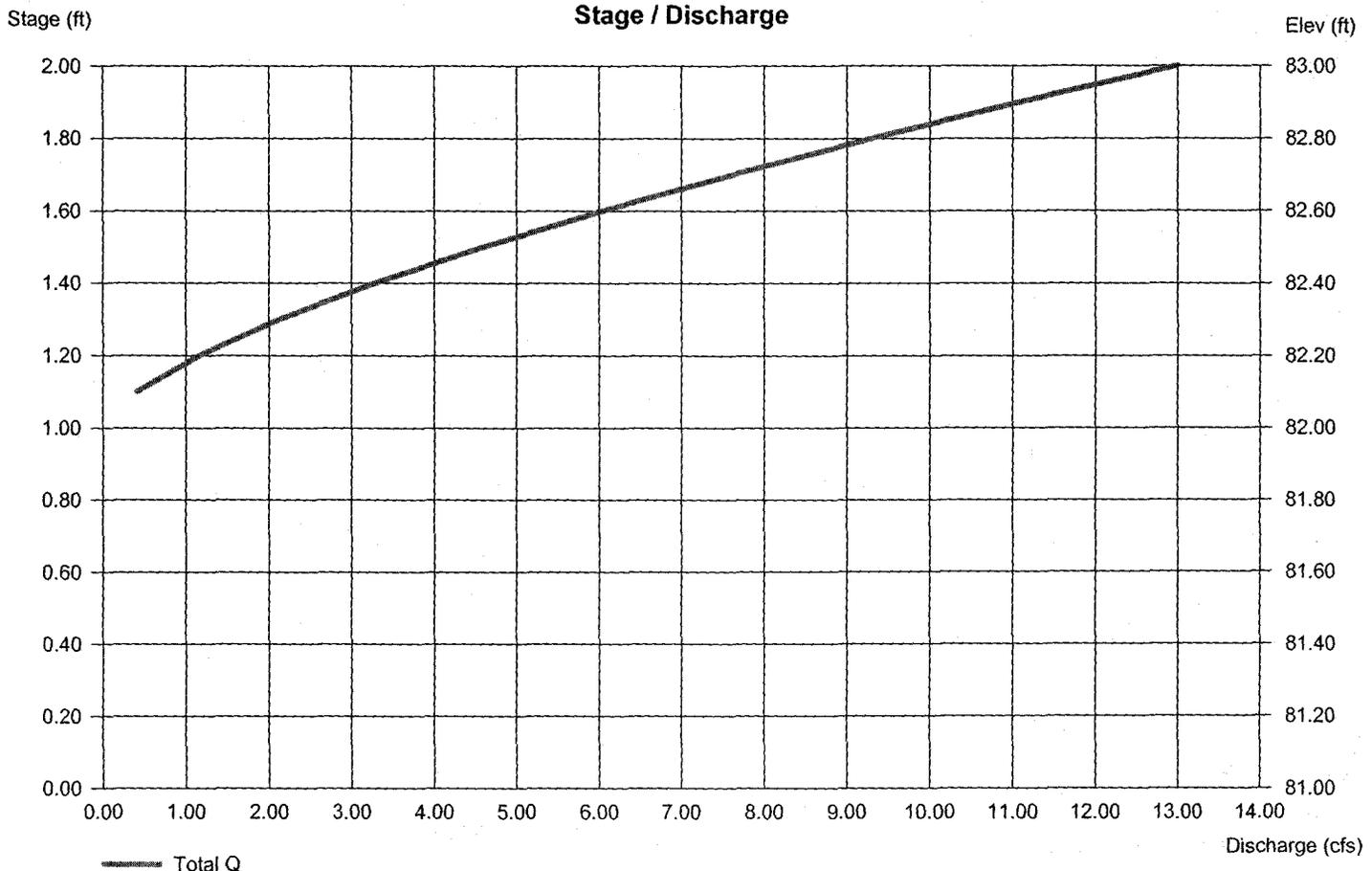
### Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 5.00	0.00	0.00	0.00
Crest El. (ft)	= 82.00	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



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***DRAINAGE CALCULATIONS***

# Channel Report

## Paved Flume

### Trapezoidal

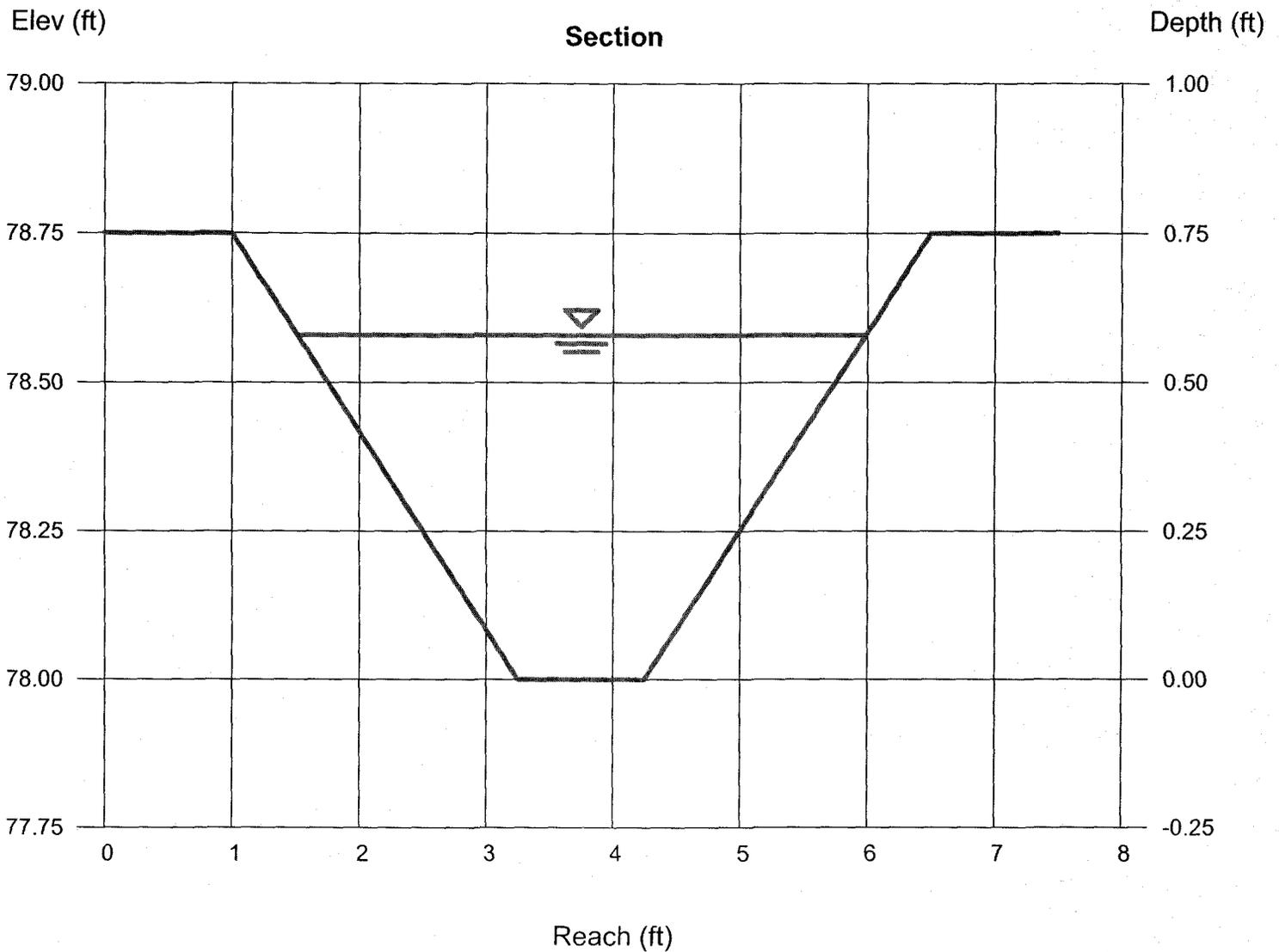
Bottom Width (ft) = 1.00  
Side Slopes (z:1) = 3.00, 3.00  
Total Depth (ft) = 0.75  
Invert Elev (ft) = 78.00  
Slope (%) = 8.90  
N-Value = 0.015

### Highlighted

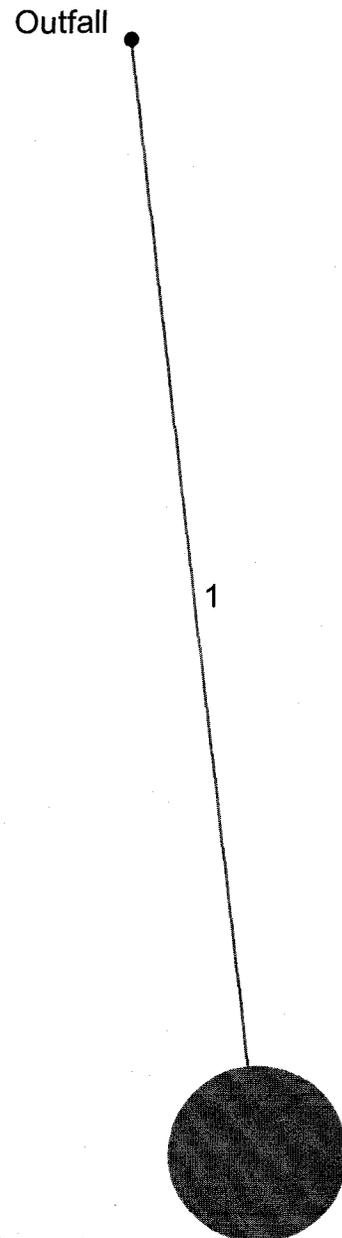
Depth (ft) = 0.58  
Q (cfs) = 22.55  
Area (sqft) = 1.59  
Velocity (ft/s) = 14.19  
Wetted Perim (ft) = 4.67  
Crit Depth, Yc (ft) = 0.75  
Top Width (ft) = 4.48  
EGL (ft) = 3.71

### Calculations

Compute by: Known Q  
Known Q (cfs) = 22.55



# Hydraflow Storm Sewers Extension for AutoCAD® Civil 3D® 2009 Plan



Project File: Storm Pipe.stm

Number of lines: 1

Date: 12-13-2010

# Storm Sewer Tabulation

Station		Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (l) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr (ac)	Total (ac)		Incr	Total	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	26.000	2.47	2.47	0.83	2.05	2.05	5.0	5.0	7.5	15.37	17.84	8.70	18	2.88	78.00	78.75	80.91	81.47	0.00	83.50	

Project File: Storm Pipe.stm

Number of lines: 1

Run Date: 12-13-2010

NOTES: Intensity =  $55.52 / (\text{Inlet time} + 10.00)^{0.74}$ ; Return period = 10 Yrs. ; c = cir e = ellip b = box

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***EROSION & SEDIMENT CONTROL***



Project: Crosswalk Church Parking Expansion  
Project No.: W10157  
Subject: Sediment Basin Design  
Date: 12/13/2010  
Calculated By: AMR

1992

3.14

**TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET**  
(with or without an emergency spillway)

Total area draining to basin: 3.16 acres.

Basin Volume Design

**Wet Storage:**

1. Minimum required volume = 67 cu. yds. x Total Drainage Area (acres).

$$67 \text{ cu. yds.} \times \underline{3.16} \text{ acres} = \underline{211.72} \text{ cu. yds.}$$

2. Available basin volume = 218 cu. yds. at elevation 80.65. (From storage - elevation curve)

3. Excavate 218 cu. yds. to obtain required volume\*.

\* Elevation corresponding to required volume = invert of the dewatering orifice.

4. Available volume before cleanout required.

$$33 \text{ cu. yds.} \times \underline{3.16} \text{ acres} = \underline{104.28} \text{ cu. yds.}$$

5. Elevation corresponding to cleanout level = 79.65.

(From Storage - Elevation Curve)

6. Distance from invert of the dewatering orifice to cleanout level = 79.65 ft.  
(Min. = 1.0 ft.)

**Dry Storage:**

7. Minimum required volume = 67 cu. yds. x Total Drainage Area (acres).

$$67 \text{ cu. yds.} \times \underline{3.16} \text{ acres} = \underline{211.72} \text{ cu. yds.}$$

8. Total available basin volume at crest of riser\* = 434 cu. yds. at elevation 82. (From Storage - Elevation Curve)

\*Minimum = 134 cu. yds./acre of total drainage area.

9. Diameter of dewatering orifice = 3 in.
10. Diameter of flexible tubing = 5 in. (diameter of dewatering orifice plus 2 inches).

#### Preliminary Design Elevations

11. Crest of Riser = 82
- Top of Dam = 84
- Design High Water = 82.2
- Upstream Toe of Dam = 77

#### Basin Shape

12.  $\frac{\text{Length of Flow}}{\text{Effective Width}} = \frac{L}{We} = \underline{0.9}$
- If > 2, baffles are not required \_\_\_\_\_
- If < 2, baffles are required ✓

#### Runoff

13.  $Q_2 = \underline{0.232}$  cfs (From Chapter 5)
14.  $Q_{25} = \underline{1.614}$  cfs (From Chapter 5)

#### Principal Spillway Design

15. With emergency spillway, required spillway capacity  $Q_p = Q_2 = \underline{0.232}$  cfs. (riser and barrel)
- Without emergency spillway, required spillway capacity  $Q_p = Q_{25} = \underline{1.614}$  cfs. (riser and barrel)

16. With emergency spillway:

$$\text{Assumed available head (h)} = \underline{1} \text{ ft. (Using } Q_2\text{)}$$

$h = \text{Crest of Emergency Spillway Elevation} - \text{Crest of Riser Elevation}$

Without emergency spillway:

$$\text{Assumed available head (h)} = \underline{-} \text{ ft. (Using } Q_{25}\text{)}$$

$h = \text{Design High Water Elevation} - \text{Crest of Riser Elevation}$

17. Riser diameter ( $D_r$ ) = 5 in. Actual head (h) = - ft.

(From Plate 3.14-8.)

Note: Avoid orifice flow conditions.

18. Barrel length (l) = 26 ft.

$$\text{Head (H) on barrel through embankment} = \underline{5} \text{ ft.}$$

(From Plate 3.14-7).

19. Barrel diameter = 15 in.

(From Table 3.14-B [concrete pipe] or Table 3.14-A [corrugated pipe]).

20. Trash rack and anti-vortex device

$$\text{Diameter} = \underline{72} \text{ inches.}$$

$$\text{Height} = \underline{21} \text{ inches.}$$

(From Table 3.14-D).

#### Emergency Spillway Design

21. Required spillway capacity  $Q_e = Q_{25} - Q_p = \underline{1.382}$  cfs.

22. Bottom width (b) = 8 ft.; the slope of the exit channel (s) = 0.16 ft./foot; and the minimum length of the exit channel (x) = 15 ft.

(From Table 3.14-C)

Anti-Seep Collar Design

23. Depth of water at principal spillway crest (Y) = 3 ft.  
 Slope of upstream face of embankment (Z) = 2 :1.  
 Slope of principal spillway barrel ( $S_b$ ) = 7.69 %  
 Length of barrel in saturated zone ( $L_s$ ) = 26 ft.
24. Number of collars required = 2 dimensions = 2.5x2.5  
 (From Plate 3.14-12).

Final Design Elevations

25. Top of Dam = 84  
 Design High Water = 82.2  
 Emergency Spillway Crest = 83  
 Principal Spillway Crest = 82  
 Dewatering Orifice Invert = 80.65  
 Cleanout Elevation = 70.65  
 Elevation of Upstream Toe of Dam  
 or Excavated Bottom of "Wet Storage  
 Area" (if excavation was performed) = 80.65

# Pond Report

## Pond No. 1 - Sediment Basin

### Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 79.00 ft

### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	79.00	3,109	0	0
1.00	80.00	3,625	3,363	3,363
2.00	81.00	4,172	3,895	7,258
3.00	82.00	4,750	4,457	11,716
4.00	83.00	5,360	5,051	16,767

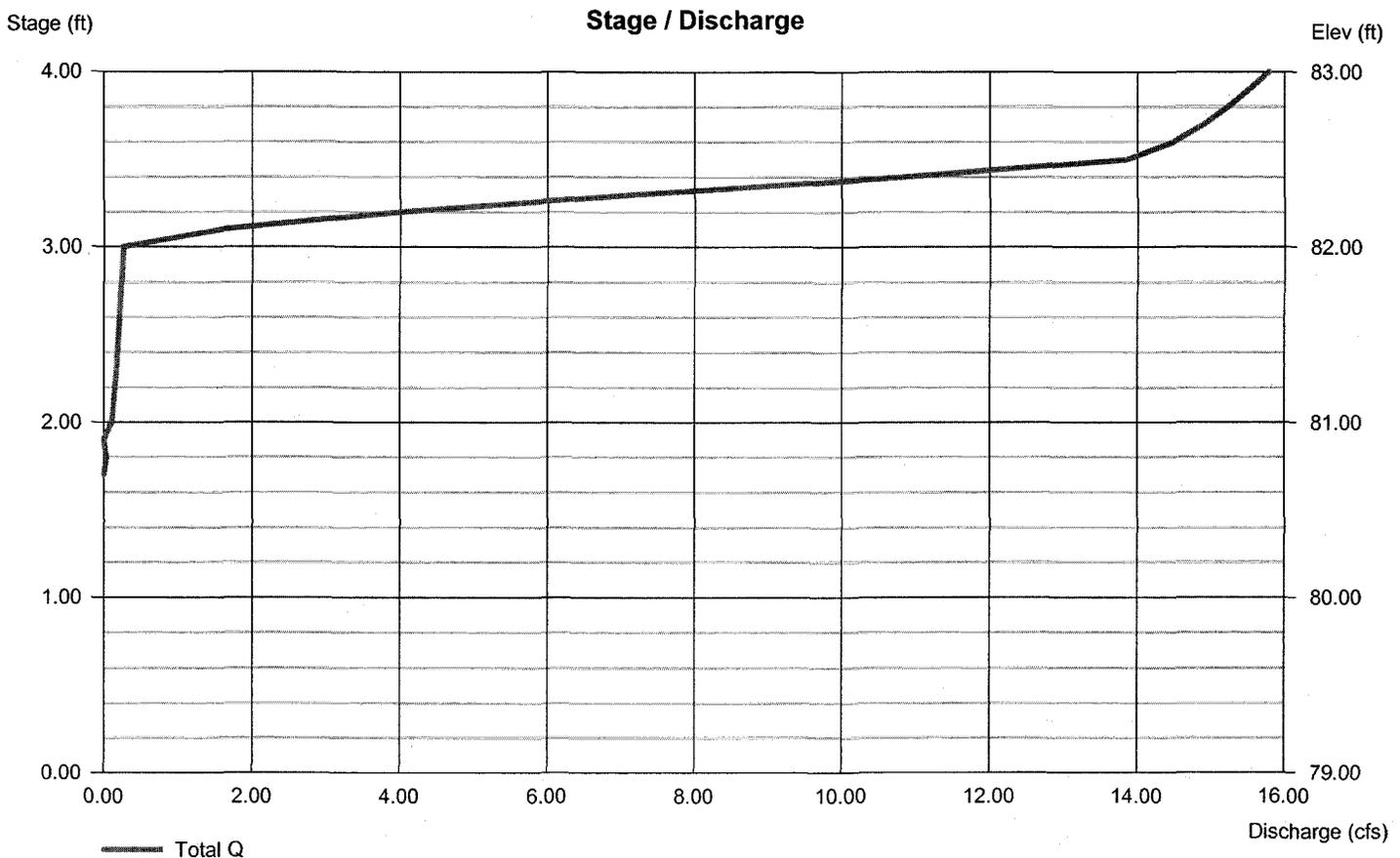
### Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 82.00	3.00	0.00	0.00
Span (in)	= 18.00	3.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 78.75	80.65	0.00	0.00
Length (ft)	= 26.00	0.00	0.00	0.00
Slope (%)	= 2.88	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 12.56	5.00	0.00	0.00
Crest El. (ft)	= 82.00	83.00	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Riser	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

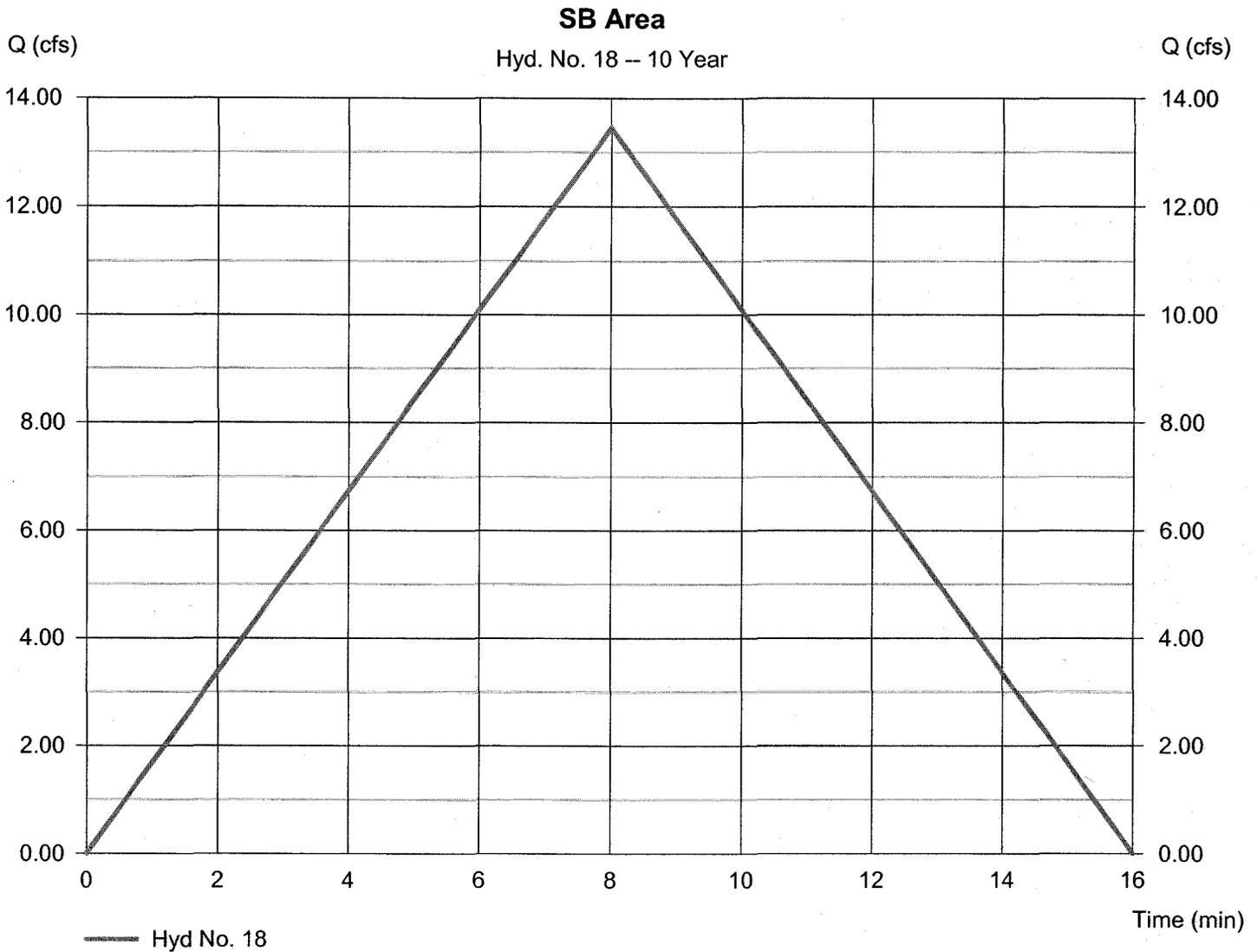
Monday, Dec 13, 2010

## Hyd. No. 18

SB Area

Hydrograph type = Rational  
Storm frequency = 10 yrs  
Time interval = 1 min  
Drainage area = 3.160 ac  
Intensity = 6.550 in/hr  
IDF Curve = JamesCity-NW-14.IDF

Peak discharge = 13.45 cfs  
Time to peak = 8 min  
Hyd. volume = 6,458 cuft  
Runoff coeff. = 0.65  
Tc by User = 8.00 min  
Asc/Rec limb fact = 1/1



# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

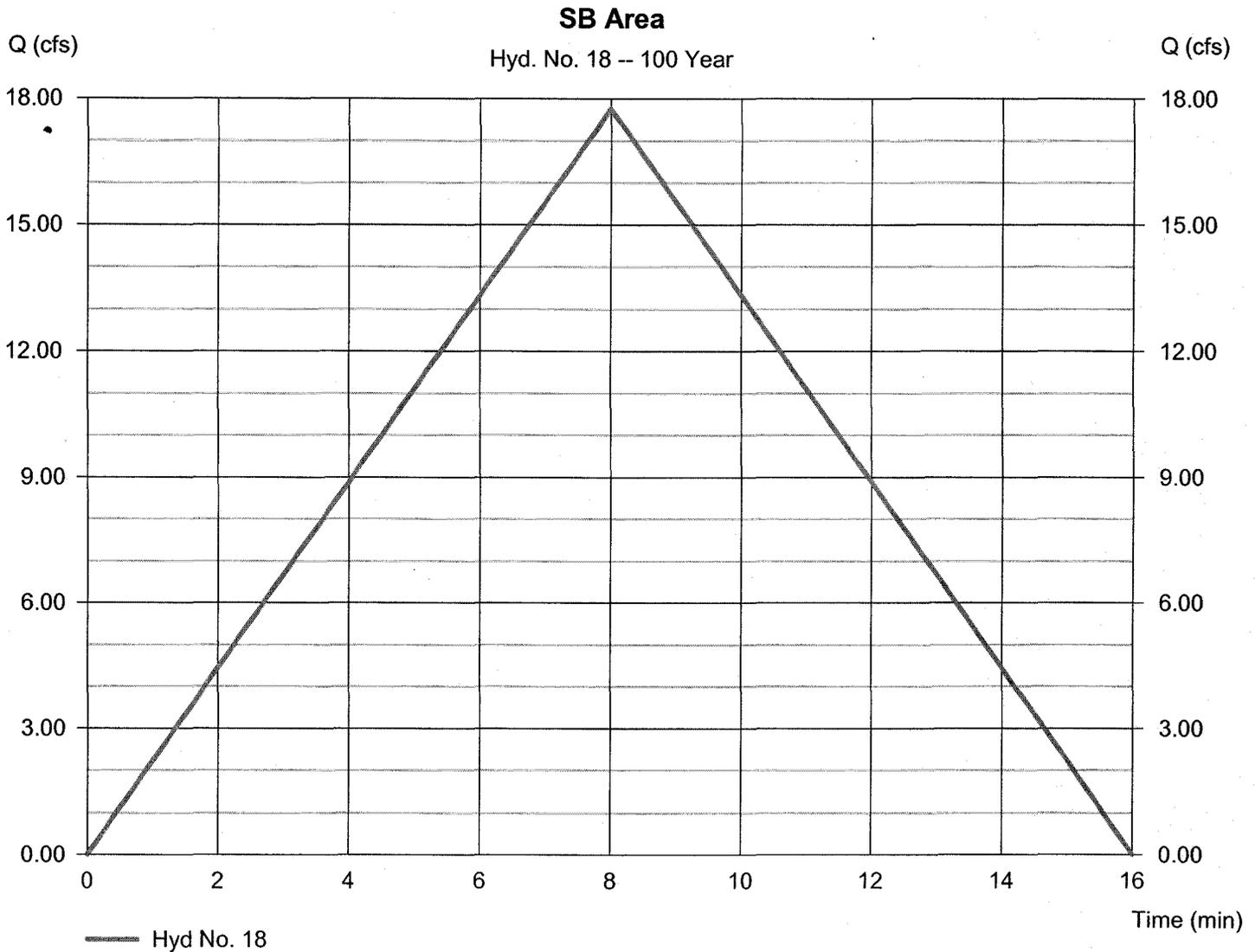
Monday, Dec 13, 2010

## Hyd. No. 18

SB Area

Hydrograph type = Rational  
Storm frequency = 100 yrs  
Time interval = 1 min  
Drainage area = 3.160 ac  
Intensity = 8.651 in/hr  
IDF Curve = JamesCity-NW-14.IDF

Peak discharge = 17.77 cfs  
Time to peak = 8 min  
Hyd. volume = 8,529 cuft  
Runoff coeff. = 0.65  
Tc by User = 8.00 min  
Asc/Rec limb fact = 1/1



# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Monday, Dec 13, 2010

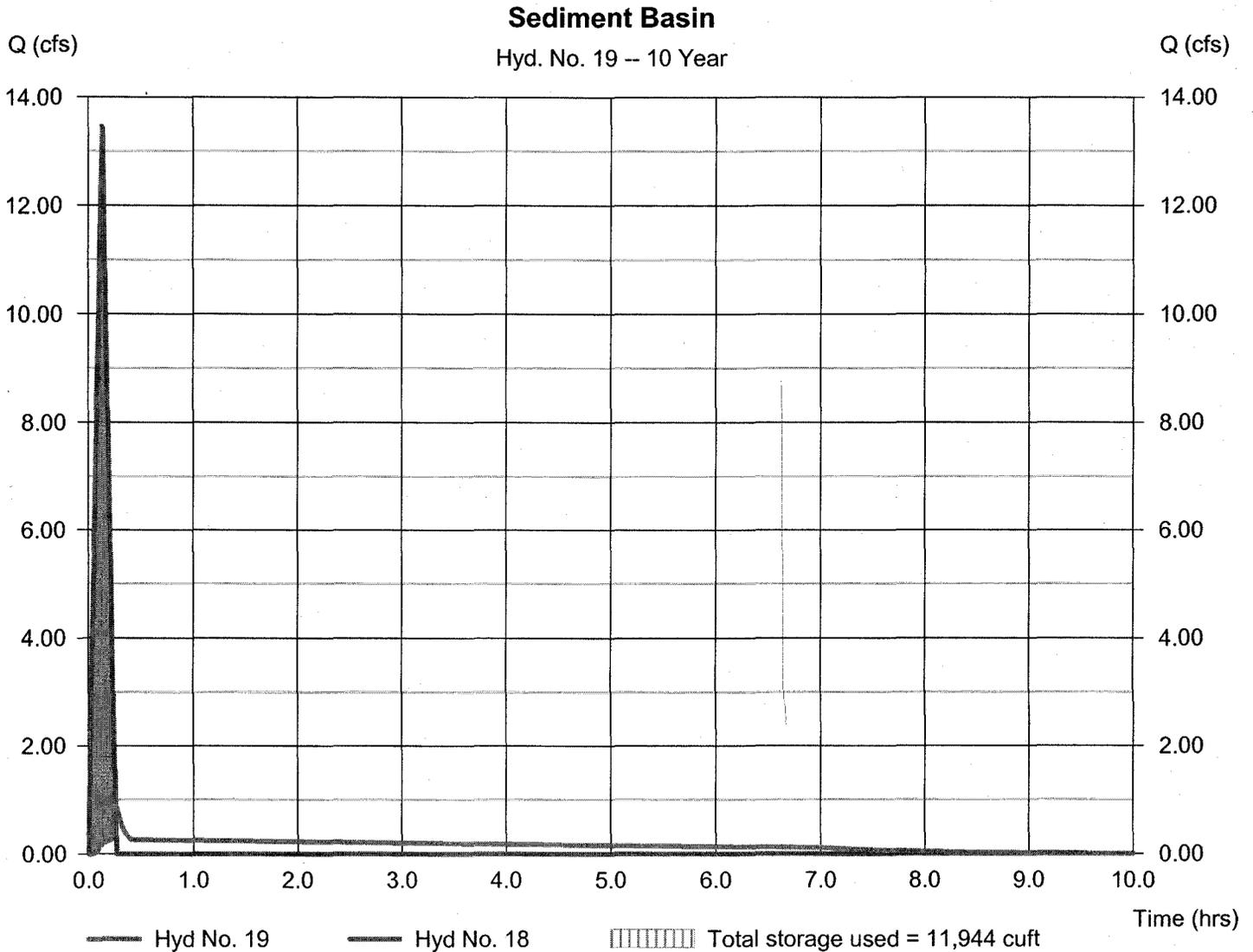
## Hyd. No. 19

Sediment Basin

Hydrograph type = Reservoir  
Storm frequency = 10 yrs  
Time interval = 1 min  
Inflow hyd. No. = 18 - SB Area  
Reservoir name = Sediment Basin

Peak discharge = 0.864 cfs  
Time to peak = 15 min  
Hyd. volume = 5,286 cuft  
Max. Elevation = 82.05 ft  
Max. Storage = 11,944 cuft

Storage Indication method used. Wet pond routing start elevation = 80.60 ft.



# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Monday, Dec 13, 2010

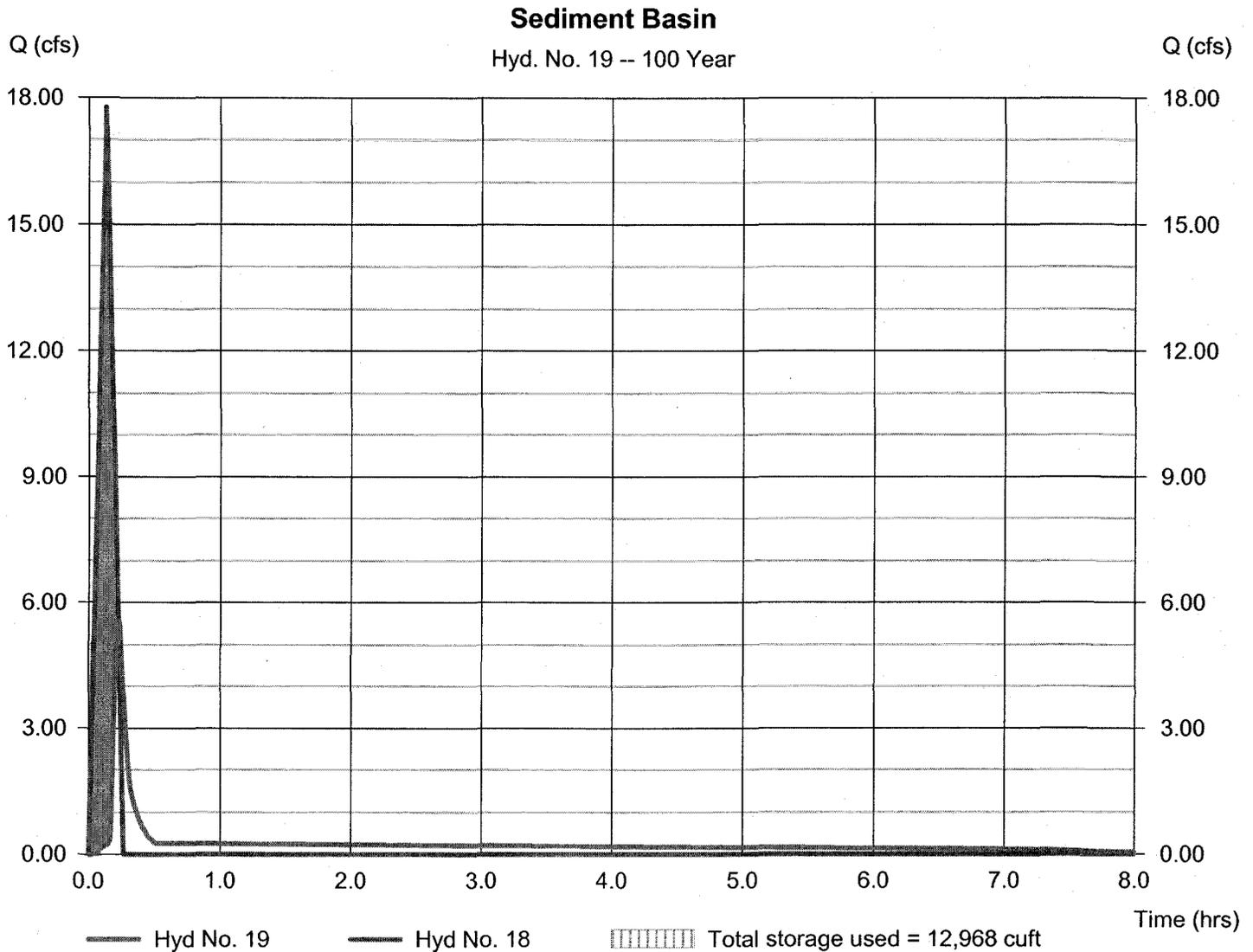
## Hyd. No. 19

### Sediment Basin

Hydrograph type = Reservoir  
Storm frequency = 100 yrs  
Time interval = 1 min  
Inflow hyd. No. = 18 - SB Area  
Reservoir name = Sediment Basin

Peak discharge = 5.526 cfs  
Time to peak = 14 min  
Hyd. volume = 7,357 cuft  
Max. Elevation = 82.25 ft  
Max. Storage = 12,968 cuft

Storage Indication method used. Wet pond routing start elevation = 80.60 ft.



# Channel Report

## Diversion Ditch 1

### Triangular

Side Slopes (z:1) = 3.00, 3.00  
Total Depth (ft) = 1.50

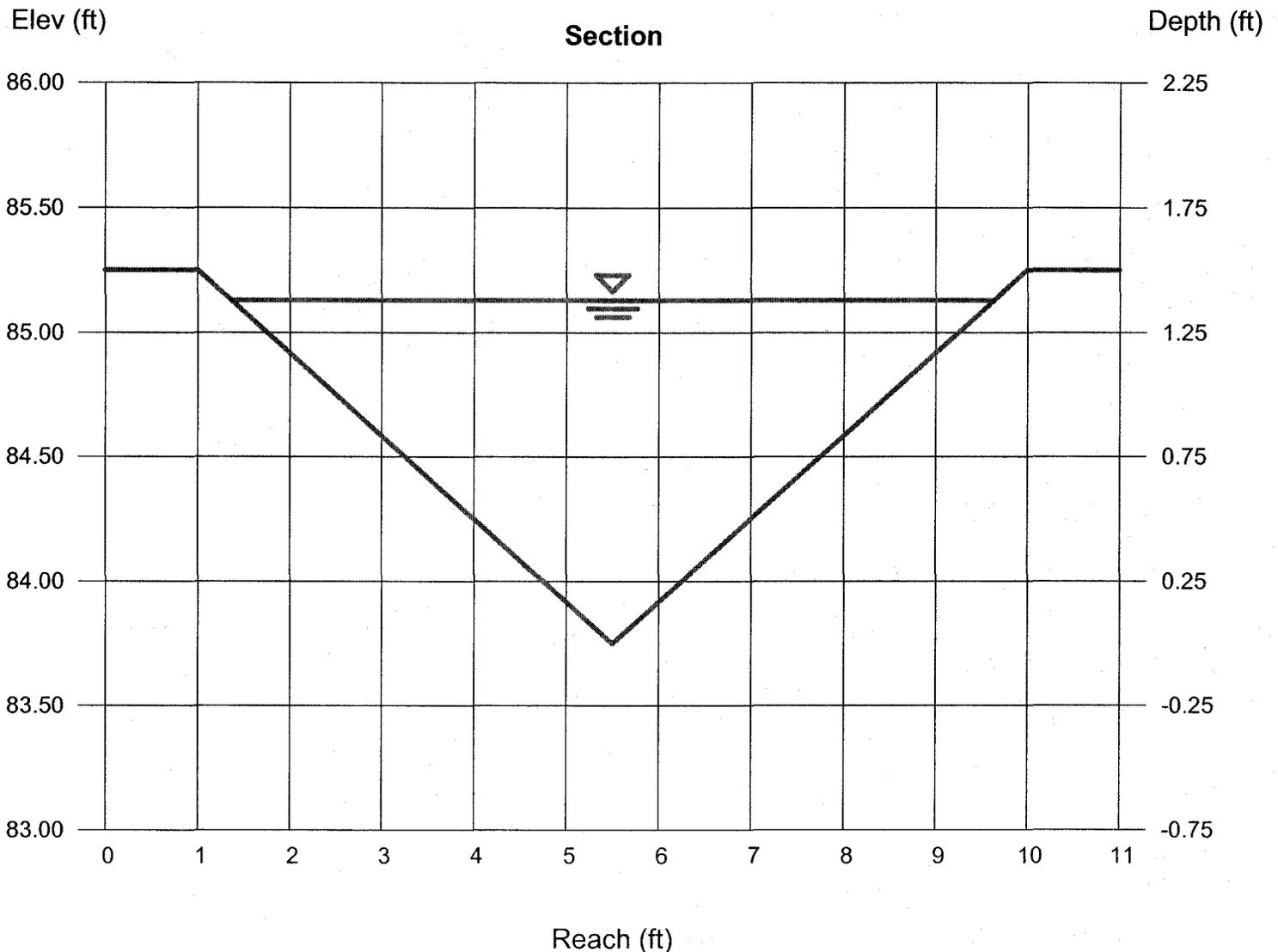
Invert Elev (ft) = 83.75  
Slope (%) = 1.00  
N-Value = 0.050

### Calculations

Compute by: Known Q  
Known Q (cfs) = 12.71

### Highlighted

Depth (ft) = 1.38  
Q (cfs) = 12.71  
Area (sqft) = 5.71  
Velocity (ft/s) = 2.22  
Wetted Perim (ft) = 8.73  
Crit Depth, Yc (ft) = 1.03  
Top Width (ft) = 8.28  
EGL (ft) = 1.46



# Channel Report

Hydraflow Express Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc.

Wednesday, Dec 8 2010

## Diversion Ditch 2

### Triangular

Side Slopes (z:1) = 3.00, 3.00  
Total Depth (ft) = 1.00

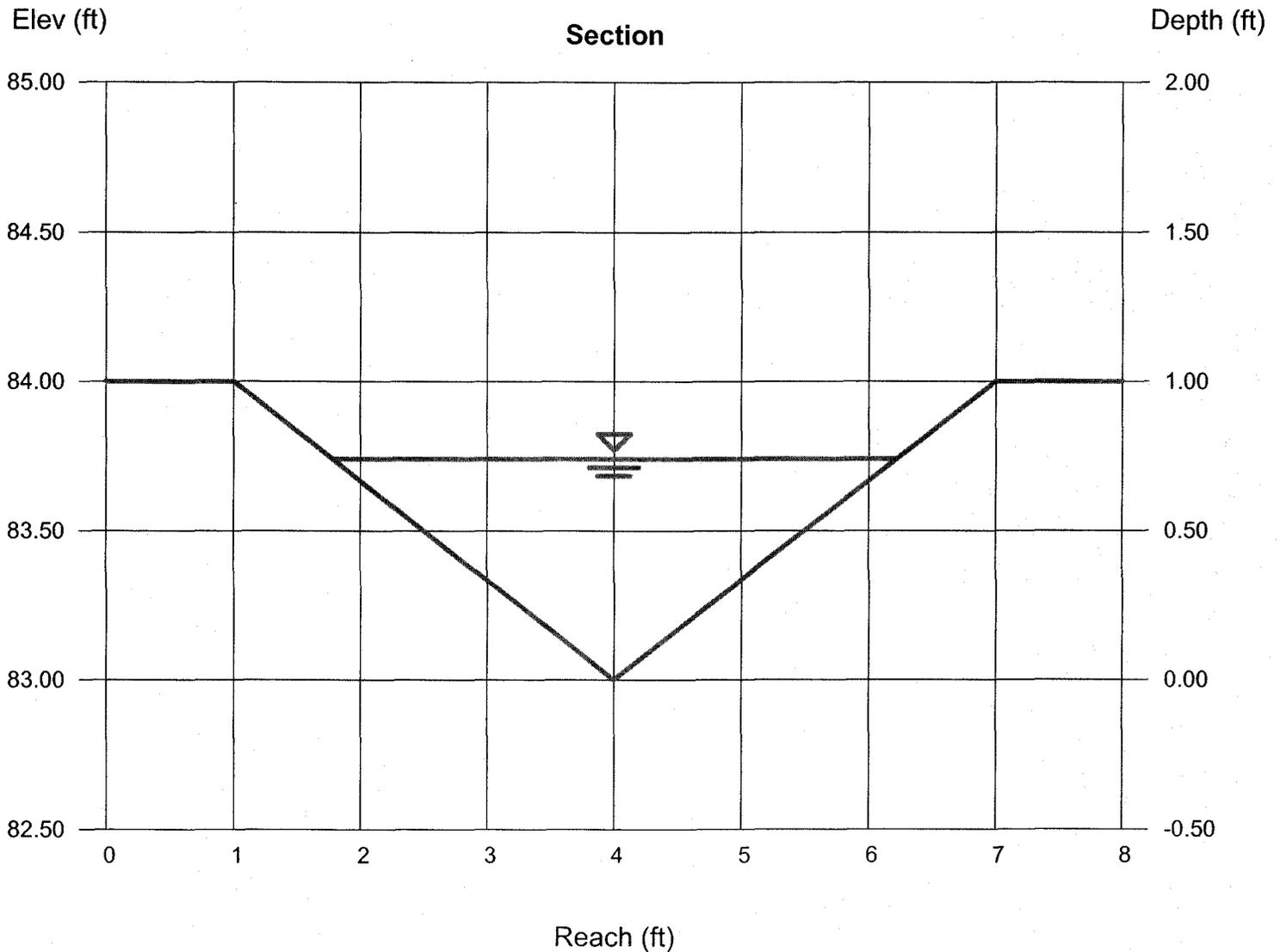
Invert Elev (ft) = 83.00  
Slope (%) = 3.13  
N-Value = 0.050

### Calculations

Compute by: Known Q  
Known Q (cfs) = 4.18

### Highlighted

Depth (ft) = 0.74  
Q (cfs) = 4.180  
Area (sqft) = 1.64  
Velocity (ft/s) = 2.54  
Wetted Perim (ft) = 4.68  
Crit Depth,  $Y_c$  (ft) = 0.66  
Top Width (ft) = 4.44  
EGL (ft) = 0.84



## OUTLET PROTECTION CALCULATION

Baffled outlets are not included in the VA SWM Handbook. Hydraulic design procedures are found in the U.S. Department of Interior, Bureau of Reclamation, Design of Small Canal Structures, 1978 and are as follows:

**Step 1:** Determine input parameters, including:

v = Channel velocity  
d = Flow depth entering the basin, ft  
Fr = Froude number =  $v / (g d)^{0.5}$ , dimensionless  
g = Gravitational constant = 32.2 feet/second<sup>2</sup>

**Step 2:** Calculate the minimum basin width, W, in feet, using the following equation:

$$W / d = 2.88 (Fr)^{0.566}$$

Where:

W = minimum basin width, feet  
d = depth of incoming flow, feet  
Fr = Froude number =  $v / (g d)^{0.5}$

The limits of the W/d ratio are from 3 to 10, which corresponds to Froude numbers 1 to 9. If the basin is much wider than W, flow will pass under the baffle and energy dissipation will not be effective.

**Step 3:** Calculate other basin dimensions as a function of W,

Refer to the Schematic of Baffled Outlet in Appendix 11C for other dimensions as a function of W and to identify variables that are used below in other steps.

**-VDOT EG-1 Baffle selected**

## OUTLET PROTECTION CALCULATION

**Step 4:** Calculate the required protection for the transition from the baffled outlet to the natural channel based on the outlet width. A riprap apron shall be added of width W, length W (or a 5-foot minimum), and depth f (W/6). The side slopes shall be 1.5:1, and the median rock diameter shall be at least W/20.

$$v = \underline{14.2 \text{ ft/second}}$$

$$d = \underline{0.75 \text{ ft}}$$

$$\text{Fr} = \text{Froude number} = 14.2 / (32.2 \times 0.75)^{0.5} = \underline{1.18}$$

$$g = \text{Gravitational constant} = \underline{32.2 \text{ feet/second}^2}$$

$$W / d = 2.88 (\text{Fr})^{0.566}$$

Where:

W = minimum basin width, feet

$$d = \underline{0.75 \text{ ft}}$$

$$\text{Fr} = \underline{0.29}$$

$$W = (2.88 (\text{Fr})^{0.566})d$$

$$W = (2.88 (1.18)^{0.566})0.75$$

$$W = \underline{1.44 \text{ ft}}$$

**-Riprap outlet protection sized at 10'x10' as a minimum to ensure protection of downstream pond**

TRANSMITTAL

**DATE:** March 22, 2011  
**TO:** Records Management  
JCSA  
Fire  
Environmental  
Stormwater

Environmental Division

MAR 22 2011

RECEIVED

**FROM:** Jennifer VanDyke, Administrative Services Coordinator  
**SUBJECT:** SP-0095-2010, Crosswalk Church Parking Expansion  
**TAX ID:** 2321100001b  
**ACTION:** For your files.



**Development Management**  
101-A Mounts Bay Road  
P.O. Box 8784  
Williamsburg, VA 23187-8784  
P: 757-253-6671  
F: 757-253-6822  
devman@james-city.va.us  
[jamescitycountyva.gov](http://jamescitycountyva.gov)

**Building Safety and Permits**  
757-253-6620

**Engineering and Resource Protection**  
757-253-6670

**Planning**  
757-253-6685

**Zoning Enforcement**  
757-253-6671

February 29, 2012

Mr. Lloyd Hansen  
Crosswalk Community Church  
7575 Richmond Road  
Williamsburg, VA. 23185

Re: Crosswalk Community Church  
County Plan No. SP-095-10  
County BMP ID Code: YC060

Dear Mr. Hansen:

The Engineering and Resource Protection Division has received a record drawing (asbuilt) and construction certification for the stormwater management facility for the above referenced project. The record drawing provides as-built information for a bioretention basin situated in the northwest corner of the site.

Based on our review of the project and a concurrent field inspection as performed on February 28, 2012, the items indicated in the January 27, 2012 letter have been adequately addressed with exception to the following construction related item below.

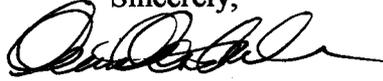
**Construction - Related Item:**

1. The slope to the bioretention area was re-graded, seeded, and matted on February 23, 2012. Typically we require established vegetation prior to release of bonds. However, Thomas Warren with Henderson, Inc. has agreed to ensure that the area will be properly stabilized and has made the commitment to monitor the area in question and apply additional stabilization as needed.

Please provide final record drawings and certifications in .pdf format on a CD and one Mylar and blue/black line set of the record drawings to our office with the next submittal.

Please contact me at 757-253-6702 or the assigned Environmental Division inspector, Tina Creech, at 757-253-6743 if you have any further comments or questions.

Sincerely,



William Cain, P.E.  
Chief Engineer  
JCC Engineering and Resource Protection Division

cc: Landtech Resources, Inc. – Matthew Connolly - via email  
Ashland Construction – Ed Bussey – via email  
Henderson Inc., - Jordan Anglin - via email  
JCC Inspector – Tina Creech – via email

\\jccdeptstore\dmo1\DMData\environmental\Projects\AsBuilts\Reviews\Fina\YC060



# James City County Environmental Division

## Stormwater Management / BMP Inspection Report

### Bioretention Facilities

County BMP ID Code (if known): 4C060

Name of Facility: Crosswalk Church BMP No.: 1 Date: 9/28/11

Location: 7575 Richmond Road

Name of Owner: Lloyd Hansen

Name of Inspector: Tina Creech / Amy Parker

Type of Facility: Bioretention

Weather Conditions: Sunny Type:  Final Inspection  County BMP Inspection Program  Owner Inspection

If an inspection item is not applicable, mark NA, otherwise mark the appropriate column.

- O.K. - The item checked is in adequate condition and the maintenance program is currently satisfactory. No action required.
- Routine - The item checked requires attention, but does not present an immediate threat to the function/integrity of the BMP.
- Urgent - The item checked requires immediate attention to keep the BMP operational and prevent damage to the facility.

Provide an explanation and details in the comment column, if routine or urgent are marked.

Facility Item	O.K.	Routine	Urgent	Comments
<b>Accessibility:</b>				
Roads	✓			
Parking Areas	✓			
Gates				
Locks				
Safety Fencing				
<b>Observation Wells/Areas:</b>				
Trap Doors				
Manhole Covers	✓			Unable to open clean out's
Grates				
Steps				
<b>Pretreatment Devices:</b> <input checked="" type="checkbox"/> Inlet <input type="checkbox"/> Sump <input type="checkbox"/> Forebay <input type="checkbox"/> Other				
Sediment	✓			
Trash & Debris	✓			
Structure	✓			
Other				
*Reinsp - 1/27/12 & Final on 2/29/12 - See both letters. Total (3) letters sent.				
<b>Inflow Structure (Describe Type/Location):</b>				

Facility Item	O.K.	Routine	Urgent	Comments
Condition				
Erosion				
Trash and Debris				
Sediment				
Aesthetics				
Other				
<b>Primary Infiltration (Bioretention Cell) Area:</b>				
Specialty Landscaping				
Mulch Layer	✓			} need CC for soils info
Planting Soil/Sand	✓			
Subgrade Soil	✓			
Aggregate				
Underdrain				*unable to inspect
Sediment	✓	✓		minor erosion at (SF)
Aesthetics	✓			
<b>Overflow or Bypass Control Structure (Describe Type/Location):</b> Concrete Ditch				
Condition	✓			
Erosion	✓			
Trash & Debris	✓			
Sediment	✓			
Other				
<b>Outlet Structure (Describe Type/Location):</b> Pipe (PVC) along concrete ditch				
Condition	✓			
Erosion	✓			
Trash & Debris	✓			
Sediment	✓			
Other				
<b>Contributing Drainage Area/Perimeter Conditions:</b>				
Land Use	✓			erosion around (SF) protecting bioretention - need to grade the slope once (SF) is removed and stabilize.  Complete See 2/25/12 notes
Stabilization	✓	✓		
Trash & Debris	✓			
Pollutant Hazard	✓			
Other				
<b>Sketch and/or Remarks:</b>				

\* Outlet protection (10'x10'x1.5' D)  
contaminated cleaned

\* Concrete dissipator missing  
Called Jimmy Conorder & will  
be installed installed 12/12

Overall Environmental Division Internal Rating: 4.5

Signature: Jera Greed

Date: 9/28/11

Title: Env. Insp



BMP Number: YC060

Project Name: Crosswalk Church  
 Location: 7575 Richmond Rd  
 Project Number: SP-095-10  
 Date of Inspection: 4/25/11  
 Inspector(s): Tina Creech  
 Date: 4/21/11  
 Time: 1:30pm

**Infiltration and Filtering Practice Construction Inspection Checklist**

Development Status (Active, Inactive, Complete): Active  
 Stage of Construction (Pre-Construction, Installation, etc): Installation

**Key Questions**

Item	X	Comments
1. Type of facility (check all that apply)		
a. Infiltration - C1, C2, C3 or C4		
b. Filtration - D2, D3, D4, D5, or D6		
c. Bioretention - D1	X	
d. Extended detention (storage for Cpv)		
2. Facility Location		
a. Surface	X	
b. Underground		
3. Filtration Media		
a. No filtration media (e.g. dry well)		
b. Sand		
c. Bioretention soil	X	* Sent biosoil info via email to Bussey (Ashland) & Jimmy
d. Peat		
e. Other		
4. Hydraulic configuration		
a. On-line facility		
b. Off-line facility		
5. Type of pretreatment facility		Pretreatment must be provided
a. Sediment forebay (above ground)		
b. Sedimentation chamber		
c. Grass channel		
d. Grass filter strip	X	
e. Plunge pool		
f. Stone diaphragm	X	
g. Other		Type:

**A. Pre-Construction**

S = Satisfactory U = Unsatisfactory N/A = Not Applicable

Item	S	U	N/A	Comments
1. Pre-construction meeting	✓			2/17/11
a. Review of facility details, testing reqts and sequence of construction	✓			
b. Review of required inspections, geo-tech reports, checklists & certificates	✓			

<b>B. Site Preparation</b>						
S = Satisfactory U = Unsatisfactory N/A = Not Applicable						
Item	S	U	N/A	Comments		
1. If infiltration practice, facility is not used for sediment control during construction						
2. Stormwater runoff diverted around facility						
3. Tree save and non-compaction areas						
4. Facility location staked out and cleared		✓				
<b>C. Excavation/Grading</b>						
S = Satisfactory U = Unsatisfactory N/A = Not Applicable						
Item	S	U	N/A	Comments		
1. Excavation and grading conform to plans	✓			BENCHMARK INSPECTION 4/25/11		
a. Location, size and depth of facility are correct	✓			visually - yes"		
2. If infiltration practice, underlying soils not compacted during excavation						
3. Embankment/berm constructed according to plan						
a. Suitable fill material used for construction of embankment/berm	✓			ECS verified		
b. Compaction completed in accordance with approved plans and specifications	✓					
c. Embankment/berm elevations, slopes and top widths are correct	✓					
<b>D. Installation</b>						
S = Satisfactory U = Unsatisfactory N/A = Not Applicable						
Item	S	U	N/A	Comments		
1. If off-line facility, flow diversion structure installed according to plans						
2. Pretreatment facility installed according to approved plans						
3. Inlet(s) and inlet protection installed	✓					
4. Structural components (e.g. foundation, walls) installed according to plans						
5. Underground chambers or pipes installed correctly with bedding if required	✓			BENCHMARK INSPECTION 4/25/11		
6. Liner installed correctly, if applicable				BENCHMARK INSPECTION		
7. Filter bed composition, depth and installation conforms to approved plans and	✓			BENCHMARK INSPECTION 4/27/11		
8. Riser/outlet structure installed correctly						
a. Location, dimensions and type of riser are correct	✓					
b. Riser equipped with removable trash rack or maintenance access	✓					
c. Location, dimensions and type of low flow orifice are correct						
d. Low flow orifice installed correctly and adequately protected from clogging						

e.	If a filtration system, underdrain system installed correctly	✓				
8.	Emergency overflow structure/spillway installed according to plans	✓				Concrete lined ditch

**E. Vegetation**

S = Satisfactory U = Unsatisfactory N/A = Not Applicable

Item	S	U	N/A	Comments
1. Vegetation complies with approved planting plan and specifications	✓			*hydroseed & straw

**F. Final Inspection**

S = Satisfactory U = Unsatisfactory N/A = Not Applicable

Item	S	U	N/A	Comments
1. Contributing drainage area stabilized	✓			9/28/11 AMP Insp - See notes
2. If off-line facility, flow diversion installed and operational				See "disclaimer" in last 3/12 letter sent
3. Pretreatment facility installed and operational	✓			
4. Inlet(s) installed and operational	✓			
5. Configuration, size and depth of bioretention facility conforms with approved plans	✓			↑
7. Vegetation established	✓			*
8. Riser/Outlet Structure installed and operational	✓			
9. Emergency overflow structure/spillway installed and operational	✓			
10. Maintenance access routes provided	✓			
11. Observation Ports Installed	✓			
12. Flow diversions removed; runoff reaches facility	✓			

**G. Permit Approval and Documentation**

S = Satisfactory U = Unsatisfactory N/A = Not Applicable

Item	S	U	N/A	Comments
1. Construction certification submitted	✓			
2. As-built plans submitted and approved	✓			
3. Performance bond status				
a. Not released				
b. Partial release				
c. Full release	✓			
4. Certificate of completion issued				

\* Total of 4 final Unspw/notes for Const items, etc.  
All issues resolved per 3/26/12 release.

