AES
CONSULTING ENGINEERS

Hampton Roads | Central Virginia | Middle Peninsula

5240 Olde Towne Road, Suite 1, Williamsburg, Virginia 23188
Phone (757) 253-0040 / Fax (757) 220-8994

aesva.com

Environmental Division

FEB 14 2012

RECEIVED

Letter of Transmittal

ATTN:	**Amy Parker**	DATE 12/22/11	JOB NO. 9888-34
CO.:	**Engineering & Resource**	FROM: L. Bruce Abbott	
Address:	101-A Mounts Bay Road	RE DJ Montague BMP	
	Williamsburg, Va. 23185		
cc:	Alan Robertson	PC 263	

WE ARE SENDING YOU THE FOLLOWING ITEMS: ☒ Attached ☐ Under separate cover via

☒ Original(s) -☐ Print(s) ☐ Plan(s) ☐ Specification(s) ☐ Change Order

☐ Copy of letter(s) ☐ Other:

COPIES	DATE	No. of Pages	DESCRIPTION
1	9/28/11	4	Record drawings BMP mylar's

THESE ARE TRANSMITTED as checked below:

☐ For your approval ☐ For your signature ☐ For review and comment

☒ For your use ☐ As you requested ☐ As requested by:

☐ Other:

REMARKS:

VIA: ☒Hand Deliver ☐UPS Ground ☐UPS Next Day Air ☐USPS Mail ☐ Other:

If enclosures are not as noted, kindly notify us at once.

James City County Engineering and Resource Protection Division
Stormwater Management/BMP Record Drawing and Construction Certification Review Tracking Form

Project Name: W/JCC D.J. Montague Parking + Playground Improvements
County Plan No. (List any amendments): SP-08-11
Stormwater Management Facility Type: Bioretention + Grass-lined swale
BMP Phase #: ☐ I ☐ II ☐ III

- ☒ Information Package Submittal Date: 12/22/11
- ☒ Completeness Check:
  - ☒ Record Drawing — Date/By: 12/21/11 - Thomas Suplett
  - ☒ Construction Certification — Date/By: 12/21/11 - Marc Bennett
  - ☒ RD/CC Standard Forms — (Ensure that all forms for the BMP type are included)
  - ☒ Insp/Maint Agreement — # / Date: N/A
  - ☒ BMP Maintenance Plan — Location: R-03 (Record Drawing Set)
  - ☐ Special Considerations:
- ☒ Standard E&SC Notes on Approved Plan Requiring RD/CC or County comment in plan review
  Location (sheet #): C-09
- ☒ **County BMP ID Code #:** PC-263
- ☒ Log into Division's "As-Built Tracking Log"
- ☒ Obtain basic site information (GPIN, Owner, Address, etc.)
- ☒ Log into Access Database (BMP ID #, Plan No., GPIN, Project Name, etc.)
- ☒ Copy from Active Project File (correspondence, H&H, design computations, etc.).
- ☒ Create As-Built File using Project File information (File label, folder, copy plan/details/design information, etc.).
- ☒ Inspector Review of RD/CC (consult with Chief Engineer prior to completion of comments).
- ☒ Record Drawing Review against Approved Plan prior to Field Inspection.
- ☒ Final Site Inspection (FI) Performed — Date: 1/10/12
- ☒ Record Drawing (RD) Review — Date: 1/10/12
- ☒ Construction Certification (CC) Review — Date: 1/10/12
- ☒ Actions:
  - ☒ No comments.
  - ☐ Comments. Letter Forwarded. — Date:
  - ☐ Record Drawing (RD)
  - ☐ Construction Certification (CC)
  - ☐ Construction-Related (CR)
  - ☐ Site Issues (SI)
  - ☐ Other :
- ☒ Resubmittal (# and date): N/A
- ☒ Re-inspection (if necessary): N/A
- ☒ Drainage System Information Acceptable (RD/CC/System Info). Ok for bond release.
- ☒ Complete "Surety Request Form".
- ☒ Final Inspection of active file copying any relevant information to "As-Built" file.
- ☒ On County BMP Inventory (Phase I, II or III).
- ☒ Copy Final Inspection Report into County BMP Inspection Program file.
- ☒ Provide 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: Amy Parker — Date: 2/28/12

Chief Engineer: [signature] — Date: 2/26/12

*** See separate checklist, if needed.

James City County Environmental Division
Stormwater Management / BMP Inspection Report
Bioretention Facilities

County BMP ID Code (if known): PC-263

Name of Facility: DJ Montague Elementary BMP No.: 1 of 1 Date: 1/10/12

Location: 5380 Centerville Rd.

Name of Owner: WJCC Schools

Name of Inspector: 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
Accessibility:				
Roads	✓			
Parking Areas	✓			
Gates	N/A			
Locks	N/A			
Safety Fencing	N/A			
Observation Wells/Areas:				
Trap Doors	N/A			
Manhole Covers	N/A			
Grates	✓			
Steps	N/A			
Pretreatment Devices: ☐ **Inlet** ☒ **Sump** ☐ **Forebay** ☐ **Other**				
Sediment	✓			
Trash & Debris		✓		leaf litter
Structure				
Other				
Inflow Structure (Describe Type/Location): concrete lined swale				

Facility Item	O.K.	Routine	Urgent	Comments
Condition	✓			
Erosion	✓			
Trash and Debris		✓		leaf debris
Sediment	✓			
Aesthetics	✓			
Other				
Primary Infiltration (Bioretention Cell) Area:				
Specialty Landscaping	✓			
Mulch Layer	✓			
Planting Soil/Sand	✓			
Subgrade Soil	✓			
Aggregate	✓			
Underdrain	✓			
Sediment	✓			
Aesthetics	✓			
Overflow or Bypass Control Structure (Describe Type/Location): [redacted]				
Condition	✓			
Erosion	✓			
Trash & Debris	✓			
Sediment	✓			
Other				
Outlet Structure (Describe Type/Location):				
Condition	✓			
Erosion	✓			
Trash & Debris	✓			
Sediment	✓			
Other				
Contributing Drainage Area/Perimeter Conditions:				
Land Use	✓			
Stabilization	✓			
Trash & Debris	✓			
Pollutant Hazard	✓			
Other				

Facility Item	O.K.	Routine	Urgent	Comments

Sketch and/or Remarks:

Overall Environmental Division Internal Rating: 5/5

Signature: Amy Parker **Date:** 1/10/12

Title: Environmental Inspector

SWMProg\BMP\CoInspProg\Bioret.wpd

Environmental Division

DEC 22 2011

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	Williamsburg, Va. 23185		
CC:	Alan Robertson		

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COPIES	DATE	No. of Pages	DESCRIPTION
1		10	BMP Certification
1	9/28/11	3	Record drawings

PC 263
SP-8-11

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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: DJ Montague E S Additional Parking and Playground Drainage Improvements
Structure/BMP Name: Bioretention Basin
Project Location: 5380 Centerville Road Williamsburg VA. 23188
BMP Location: Intersection between main drive and bus loop
County Plan No.: SP - 0008 - 2011

Project Type:
- ☐ Residential
- ☐ Commercial
- ☐ Institutional
- ☐ Public
- ☑ Other School
- ☐ Business
- ☐ Office
- ☐ Industrial
- ☐ Roadway

Tax Map/Parcel No.: 3130100049
BMP ID Code (if known): JCC PC 263
Zoning District:: PL
Land Use: Public Lands
Site Area (sf or acres): 22.9

Brief Description of Stormwater Management/BMP Facility:
Bioretention basin to capture addition runoff from newly constructed parking lot.

Nearest Visible Landmark to SWM/BMP Facility: intersection between bus and car parking on site

Nearest Vertical Ground Control (if known):
☑ JCC Geodetic Ground Control ☐ USGS ☐ Temporary ☐ Arbitrary ☐ Other
Station Number or Name: 309
Datum or Reference Elevation: 101.76
Control Description: 3 1/4" disk in concrete, set approx. 6" below the ground surface
Control Location from Subject Facility: approx. 25' Southeast of centerline of pavement of SR 614 Centerville Rd), 14.2' Northeast of a route sign, and 49.2' Southwest of telephone manhole.

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: 8/2/11
Facility Monitored by County Representative during Construction: ☑ Yes ☐ No ☐ Unknown
Name of Site Work Contractor Who Constructed Facility: David A. Nice Builders, Inc.
Name of Professional Firm Who Routinely Monitored Construction: AES
Date of Completion for SWM/BMP Facility: 11/10/11
Date of Record Drawing/Construction Certification Submittal: 12/9/11

(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: Williamsburg James City School System
Mailing Address: 597 Jolly Pond Road
Williamsburg, Va. 23188
Business Phone: (757) 259-7157 Fax: (757) 564-1462
Contact Person: Alan Robertson Title: Facilities Manager

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 Rd.
Williamsburg, Va. 23188
Business Phone: (757) 253-0040
Fax: (757) 220-8994
Responsible Plan Preparer: V. Marc Bennett, P.E.
Title: Senior Project Manager
Plan Name: Site plan Amendment to DJ Montague E. S. Additional Parking
Firm's Project No. W10162-00
Plan Date: 2/2/11
Sheet No.'s Applicable to SWM/BMP Facility: R03 / R04 / R05 / ____ / ____

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

Name: David A. Nice Builders, Inc.
Mailing Address: 4571 Ware Creek Rd.
Williamsburg, Va. 23188
Business Phone: (757) 566-3032
Fax: (757) 566-4686
Contact Person: Nathan Skalak
Site Foreman/Supervisor: Nathan Skalak
Specialty Subcontractors & Purpose (for BMP Construction Only):

Section 4 - Professional Certifications:

Certifying Professionals: *(Note: A Registered Professional Engineer or 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 Rd
Williamsburg, Va. 23188
Business Phone: (757) 253-0040
Fax: (757) 220-8994

Name: Thomas C. Sublett
Title: Land Surveyor
Signature: Thomas C. Sublett
Date: 12/21/11

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.

COMMONWEALTH OF VIRGINIA
Thomas C. Sublett
THOMAS C. SUBLETT
Lic. No. 001886
12/21/11
LAND SURVEYOR

_____ (Seal)

Virginia Registered Professional Engineer or Certified Land Surveyor

Construction Certification

Firm Name: AES Consulting Engineers
Mailing Address: 5248 Olde Towne Rd
Williamsburg, Va. 23188
Business Phone: (757) 253-0040
Fax: (757) 220-8994

Name: V. Marc Bennett, P.E.
Title: Senior Project Manager
Signature: V. Marc Bennett
Date: 12/21/2011

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.

COMMONWEALTH OF VIRGINIA
V. Marc Bennett
VAN MARC BENNETT
Lic. No. 026628
12/21/2011
PROFESSIONAL ENGINEER

V. Marc Bennett (Seal)

Virginia Registered Professional Engineer

Section 5 - Record Drawing and Construction Certification Requirements and Instructions:

- ☑ PreConstruction Meeting - Provides an opportunity to review SWM / BMP facility construction, maintenance and operation plans and address any questions regarding construction and/or monitoring of the structure. The design engineer, certifying professionals (if different), Owner/Applicant, Contractor and County representative(s) are encouraged to attend the preconstruction meeting. Advanced notice to the Environmental Division is requested. Usually, this requirement can be met simultaneously with Erosion and Sediment Control preconstruction meetings held for the project.

- ☑ A fully completed ***STORMWATER MANAGEMENT / BMP FACILITIES, RECORD DRAWING and CONSTRUCTION CERTIFICATION FORM*** and ***RECORD DRAWING CHECKLIST.*** All applicable sections shall be completed in their entirety and certification statements signed and sealed by the registered professional responsible for individual record drawing and/or construction certification.

- ☑ The Record Drawing shall be prepared by a Registered Professional Engineer or Certified Land Surveyor for the drainage system of the project including any Best Management Practices.

- ☑ Construction Certification. Construction of Stormwater Management / BMP facilities which contain impoundments, embankments and related engineered appurtenances including subgrade preparation, compacted soils, structural fills, liners, geosynthetics, filters, seepage controls, cutoffs, toe drains, hydraulic flow control structures, etc. shall be visually observed and monitored by a Registered Professional Engineer or his/her authorized representative. The Engineer must certify that the structure, embankment and associated appurtenances were built in accordance with the approved design plan, specifications and stormwater management plan and standard accepted construction practice and shall submit a written certification and/or drawings to the Environmental Division as required. Soil and compaction test reports, concrete test reports, inspection reports, logs and other required construction material or installation documentation may be required by the Environmental Division to substantiate the certification, if specifically requested. The Engineer shall have the authority and responsibility to make minor changes to the approved plan, in coordination with the assigned County inspector, in order to compensate for unsafe or unusual conditions encountered during construction such as those related to bedrock, soils, groundwater, topography, etc. as long as changes do not adversely affect the integrity of the structure(s). Major changes to the approved design plan or structure must be reviewed and approved by the original design professional and the James City County Environmental Division.

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

  Dual Purpose Facilities - Completion of construction also includes an interim stage for Stormwater Management / BMP facilities which serve dual purpose as temporary sediment basins during construction and as permanent stormwater management / BMP facilities following construction, once development and stabilization are substantially complete. For these dual purpose facilities, construction certification is required once the temporary sediment basin phase of construction is complete. Final record drawing and construction certification of additional permanent components is required once permanent facility construction is complete.

  Interim Construction Certification is required for those dual purpose embankment-type facilities that are generally ten (10) feet or greater in dam height (*) and may not be converted, modified or begin function as a permanent SWM / BMP structure for a period generally ranging from six (6) to eighteen (18) months or more from issuance of a Land Disturbance permit for construction.

Interim or final record drawing and construction certifications are not required for temporary sediment basins which are designed and constructed in accordance with current minimum standards and specifications for temporary sediment basins per the Virginia Erosion and Sediment Control Handbook (VESCH); have a temporary service life of less than eighteen (18) months; and will be removed completely once associated disturbed areas are stabilized, unless a distinct hazard to the public's health, safety and welfare is determined by the Environmental Division due to the size or presence of the structure or due to evidence of improper construction.

(*Note: Dam Height as referenced above is generally defined as the vertical distance from the natural bed of the stream or waterway at the downstream toe of the embankment to the top of the embankment structure in accordance with 4VAC50-20-30, Virginia Impoundment Structure Regulations and the Virginia Dam Safety Program.)

☑ Record Drawings shall provide, at a minimum, all information as shown within these requirements and the attached **RECORD DRAWING CHECKLIST** specific to the type of SWM/BMP facility being constructed. Other additional record data may be formally requested by the James City County Environmental Division. *(Note: Refer to the current edition of the James City County Guidelines for Design and Construction of Stormwater Management BMP's manual for a complete list of acceptable BMP's. Currently there are over 20 acceptable water quality type BMP's accepted by the County.)*

☑ Record Drawings shall consist of blue/black line prints and a reproducible (mylar, sepia, diazo, etc.) set of the approved stormwater management plan including applicable plan views, profiles, sections, details, maintenance plans, etc. as related to the subject SWM / BMP facility. The set shall indicate **"RECORD DRAWING "** in large text in the lower right hand corner of each sheet with record elevations, dimensions and data drawn in a clearly annotated format and/or boxed beside design values. Approved design plan values, dimensions and data shall not be removed or erased. Drawing sheet revision blocks shall be modified as required to indicate record drawing status. Elevations to the nearest 0.1' are sufficiently accurate except where higher accuracy is needed to show positive drainage. Certification statements as shown in Section 4 of the Record Drawing and Construction Certification Form, ***or similar forms thereof***, and professional signatures and seals, with dates matching that of the record drawing status in the revision or title block, are also required on all associated record drawing plans, prints or reproducibles.

☑ Submission Requirements. Initial and subsequent submissions for review shall consist of a minimum of one (1) blue/black line set for record drawings and one copy of the construction certification documents with appropriate transmittal. Under certain circumstances, it is understood that the record drawing and construction certification submissions may be performed by different professional firms. Therefore, record drawing submission may be in advance of construction certification or vice versa. Upon approval and prior to release of bond/surety, final submission shall include one (1) reproducible set of the record drawings, one (1) blue/black line set of the record drawings and one (1) copy of the construction certification. Also for current and/or future incorporation into the County BMP database and GIS system, it is requested that the record drawings also be submitted to the Environmental Division on a diskette or CD-ROM in an acceptable electronic file format such as *.dxf, *.dwg, etc. or in a standard scanned and readable format. The electronic file requirement can be discussed and coordinated with Environmental Division staff at the time of final submission.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

(Key for Checklist is as follows: XX Acceptable N/A Not Applicable Inc Incomplete)

I. Methods and Presentation: *(Required for all Stormwater Management / BMP facilities.)*

XX 1. All constructed facilities meet approved design plans, unless otherwise shown. Record information or deviations from approved design plan shown in clearly annotated format and/or boxed beside design values.

XX 2. Elevations to the nearest 0.1' unless higher accuracy is needed to show positive drainage.

XX 3. All plan sheets labeled with "RECORD DRAWING" in large text in lower right hand corner (Approved County Plan Number and BMP ID Code can be included if known).

XX 4. All plan sheet revision blocks modified to indicate date and record drawing status.

XX 5. All plan sheets have certification statements and certifying professional's signature and seal.

II. Minimum Standards: *(Required for all Stormwater Management / BMP facilities, as applicable.)*

XX 1. All requirements of Section I (Methods and Presentation) apply to this section.

XX 2. Plan Views: Show general location, arrangement and dimensions. Location and alignment shall generally match approved design plans.

XX 3. Profile or elevations along top or berm of the facility. At a minimum, elevations are required at each end, at intervals not to exceed 50 feet and where low spots may be present. Top of embankment or berm elevations must be no less than design elevation plus any settlement allowances.

XX 4. Top widths, berm widths and embankment side slopes.

XX 5. Show length, width and depth of facility or grading, contours or spot elevations as required to verify permanent pool and design storage volumes were met or were reasonably close to the approved design. Evaluation of as-built grading, contours, spot elevations, or cross-sections, may be necessary by the professional to ensure approved design configurations, depths and volumes were closely maintained. If grading or elevations are significantly different from the approved plan, the Environmental Division shall be contacted immediately to determine whether the variation is acceptable or whether further evidence will be required. Facilities which do not closely resemble approved plan grades, elevations or configurations may require regrading by the Contractor; check volumetric computations; and/or a check hydraulic routing to ensure approved design water surface elevations, discharges or freeboard were closely maintained.

N/A 6. Cross-section of the embankment through the principal spillway or outlet barrel. Must extend at least 100 ft. downstream of the pipe outlet or to recorded site property line, whichever is closer. Proper correlation is required between principal spillway (control structure) crest, emergency spillway crest, orifice and weirs and the top of the dam or facility. All elevations and dimensions must reasonably match the design plan or be sequentially relative to each other and the facility must reflect the required design storage volume(s) and/or design depth.

N/A 7. Profile or elevations along the entire centerline of the emergency spillway. Emergency spillway may be steeper, but no flatter or narrower than design.

XX 8. Elevation of the principal spillway crest or outlet crest of the structure.

XX	9.	Primary control structure (riser) diameter or dimensions, height, type of material and base size. Indicate provisions for access that are present such as steps, ladders, etc.
XX	10.	Dimensions, locations and elevations of outlet orifices, weirs, slots and drains.
N/A	11.	Type and size of anti-vortex and trash rack device. Height, diameter, dimensions, bar spacings (if applicable) and elevations relative to the principal spillway crest. Indicate if lockable hatch is present or not.
N/A	12.	Type, location, size and number of anti-seep collars or documentation of other methods utilized for seepage control. **May need to obtain this information during construction.**
N/A	13.	Top of impervious core embankment, core trench limits and elevation of cut-off trench bottom. **May need to obtain this information during construction.**
XX	14.	Elevation of the principal spillway barrel (outlet pipe) inlet and outlet invert.
XX	15.	Outlet barrel diameter, length, slope, type and thickness class of material and type of flared end sections, headwall or endwall.
N/A	16.	Outfall protection dimension, type and depth of rock and if underlain filter fabric is present.
XX	17.	BMP interior and periphery landscaping zones conform with arrangements and requirements of the approved design plan.
XX	18.	Maintenance plan taken from approved design plan transposed onto record drawing set.
N/A	19.	Fencing location and type, if applicable to facility.
XX	20.	BMP vicinity properly cleaned of stockpiles and construction debris.
XX	21.	No visual signs of erosion or channel degradation immediately downstream of facility.
N/A	22.	Any other information formally requested by the Environmental Division specific to the constructed SWM/BMP facility.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

(Key for Checklist is as follows: XX Acceptable N/A Not Applicable Inc Incomplete)

VI. Group D - Filtering Systems *(Includes D-1 Bioretention Cells; D-2 Surface Sand Filters; D-3 Underground Sand Filters; D-4 Perimeter Sand Filters; D-5 Organic Filters; and D-6 Pocket Sand Filters)*

XX D1. All requirements of Section II, Minimum Standards, apply to Group D facilities.

XX D2. Sediment pretreatment devices provided.

XX D3. For D-1 BMPs (Bioretention Cells), pretreatment consisting of a grass filter strip below level spreader (deflector); a gravel diaphragm; and mulch and planting soil layers were provided.

XX D4. For D-1 BMPs (Bioretention Cells), plantings consist of native plant species; vegetation provided was based on zones of hydric tolerances; trees and understory of shrubs and herbaceous materials were provided; woody vegetation is absent from inflow locations; and trees are located around facility perimeter.

N/A D5. Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.

XX D6. No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed .

N/A D7. Filtering system is off-line from storm drainage conveyance system.

XX D8. Overflow outlet has adequate erosion protection.

XX D9. Deflector, diversion, flow splitter or regulator structure provided to divert the water quality volume to the filtering structure.

XX D10. Minimum four (4) inch perforated underdrain provided in a clean aggregate envelope layer beneath the facility.

N/A D11. Minimum fifty (50) foot separation from any slope fifteen (15) percent or greater. Minimum one hundred (100) foot separation horizontally from any known water supply well. Minimum one hundred (100) foot separation upslope and twenty-five (25) foot separation downslope from any building.

XX D12. Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility.

XX D13. No visual signs of erosion or channel degradation immediately downstream of facility.

XX D14. Adequate, direct access provided to the pretreatment area and/or filter bed for future maintenance.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

(Key for Checklist is as follows: XX Acceptable N/A Not Applicable Inc Incomplete)

X. Storm Drainage Systems (Associated with BMP's Only)

(Includes all incidental stormwater drainage conveyance systems associated with SWM/BMP facilities such as onsite or offsite storm drains, open channels, inlets, manholes, junctions, outlet protections, deflectors, etc. These facilities are external to the treatment function of, but are directly associated with drainage to and/or from a constructed SWM/BMP facility. The intent of this portion of the certification is to accurately identify the type and quantity of inflow or outflow points associated with the facility for future reference. The Professional may use his/her own discretion to determine inclusive facilities to meet the intent of this section. As a general rule, storm drainage systems would include incidental facilities to the nearest access structure upslope or downslope from the normal physical limits of the facility or 800 feet of storm drainage conveyance system length, whichever is less.)

XX SD1. All requirements of Section II, Minimum Standards, apply to Storm Drainage Systems.

XX SD2. Horizontal location of all pipe and structures relative to the SWM/BMP facility.

XX SD3. Type, top elevation and invert elevation of all access type structures (inlets, manholes, etc.).

XX SD4. Material type, size or diameter, class, invert elevations, lengths and slopes for all pipe segments.

XX SD5. Class, length, width and depth of riprap and outlet protections or dimensions of special energy dissipation structures.

XII. Other Systems

(Includes any non-typical, specialty, manufactured or innovative stormwater management/BMP practices or systems generally accepted for use as or in conjunction with other acceptable stormwater management / BMP practices. Requires evidence of prior satisfactory industry use and prior Environmental Division approval, waiver or exception .)

N/A O1. All requirements of Section II, Minimum Standards, apply to this section.

N/A O2. Certification criteria to be determined on a case-by-case basis by the Environmental Division specific to the proposed SWM/BMP facility.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

XIII. References

(The James City County Record Drawing and Construction Certification Forms and Checklists for Stormwater Management / BMP facilities were developed using the following sources and references.)

- ☐ Baltimore County, Maryland Soil Conservation District, As-Built Stormwater Management Pond Checklist.
- ☐ James City County, Virginia, Guidelines for Design and Construction of Stormwater Management BMP's (October 1999).
- ☑ James City County, Virginia, Stormwater Detention/Retention Basin Design Checklist and Erosion and Sediment Control and Stormwater Management Design Plan Checklists.
- ☐ James City County Stormwater Policy Framework, Final Report of the James City County BMP Policy Project, October 1998, The Center for Watershed Protection.
- ☐ Prince Georges County, Maryland, As-Built Requirements Retention or Detention Pond/Basin.
- ☐ Prince William County, Virginia, Stormwater Management Fact Sheet.
- ☐ Stafford County, Virginia, As-Built Plan Checklist.
- ☐ Stormwater Management Design Manual, NRCS Maryland Code No. 378, Pond Standards and Specifications.
- ☐ USEPA/Watershed Management Institute, Stormwater Management Inspection Forms.
- ☐ Virginia Impounding Structure Regulations (Dam Safety), Department of Conservation & Recreation, 1997.
- ☐ Virginia Erosion and Sediment Control Handbook, Third Edition 1992, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation.
- ☐ Virginia Stormwater Management Handbook, 1999 edition, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation.

File: Shared\SWMProg\BMP\Certif\RDCC_fillable.wpd

SP.0008-2011

GENERAL NOTES

1. SITE IS CURRENTLY ZONED PUBLIC LANDS, PL.
2. SITE ADDRESS: 5380 CENTERVILLE ROAD WILLIAMSBURG, VA 23188
3. TAX MAP PARCEL ID. 3130100049
4. APPLICANT: WILLIAMSBURG JAMES CITY COUNTY PUBLIC SCHOOLS
   597 JOLLY POND ROAD
   WILLIAMSBURG VA. 23188-7328
   CONTACT: ALAN ROBERTSON
   PHONE: (757) 259-7157
   FAX: (757) 565-1462
5. THIS SITE PLAN IS AN AMENDMENT TO SP-0017-2010 TO ADD ADDITIONAL PARKING SPACES AND PROVIDE DRAINAGE IMPROVEMENTS TO THE EXISTING PLAYGROUND AREA.
6. PROPERTY SHOWN HEREON LIES IN ZONE "X", (AREA DETERMINED TO BE OUTSIDE THE 500 YEAR FLOOD PLAIN) PER F.I.R.M. #51095C0120C, DATED 9/28/07.
7. PROJECT LIES WITHIN SUB WATERSHED 204-101-1 OF THE POWHATAN CREEK WATERSHED.
8. THIS PROPERTY IS LOCATED IN THE POWHATAN DISTRICT AND IS WITHIN A COMMUNITY CHARACTER CORRIDOR.
9. SITE IS SERVED BY PUBLIC SEWER AND WATER.
10. NO ADDITIONAL WATER OR SEWER CONNECTIONS ARE REQUIRED FOR THIS PROJECT.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING MISS UTILITY (1-800-552-7001) AND A PRIVATE LOCATOR FOR EXISTING UTILITY LOCATIONS PRIOR TO COMMENCING CONSTRUCTION.
12. EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.
13. ALL UTILITIES WILL BE PLACED UNDERGROUND.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FOR THIS PROJECT.
15. ALL EXISTING BUILDINGS WILL BE RETAINED IN CURRENT USE, UNLESS OTHERWISE NOTED.
16. ON-SITE EXTERIOR CONCRETE IS TO BE A MINIMUM OF 3500 PSI WITH 5% TO 7% AIR ENTRAINIMENT.
17. PROPERTY OWNER IS RESPONSIBLE FOR MAINTENANCE OF ALL SITE IMPROVEMENTS, INCLUDING LANDSCAPING, AS SHOWN ON THE APPROVED PLAN.
18. ALL EXISTING PAVED SURFACES SHALL BE KEEP CLEAN DAILY, NO TRUCK SHALL ENTER CENTERVILLE ROAD WITH MUD ON THE TIRES.
19. HORIZONTAL DATUM – NAD83 (1986) VIRGINIA STATE PLANE COORDINATE SYSTEM SOUTH ZONE VERTICAL DATUM – NGVD29 VIRGINIA STATE PLANE COORDINATE SYSTEM SOUTH ZONE. JAMES CITY COUNTY MONUMENTS USED – 309.
20. ALL ERRORS OR DISCREPANCIES WITH THE PLANS OR EXISTING SITE CONDITIONS SHALL BE REPORTED TO THE ENGINEER OF RECORD BEFORE PROCEEDING WITH THE WORK.
21. CONTOUR INTERVAL IS 1 FOOT. TOPOGRAPHICAL INFORMATION BASED UPON A SURVEY PROVIDED BY AES.
22. ANY EXISTING, UNUSED WELLS SHALL BE ABANDONED IN ACCORDANCE WITH THE VIRGINIA PRIVATE WELL REGULATIONS AND JAMES CITY COUNTY CODE.
23. THE CONTRACTOR SHALL MAINTAIN A COMPLETE SET OF THE APPROVED PLANS AT THE PROJECT SITE AT ALL TIMES DURING CONSTRUCTION.
24. CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF CONSTRUCTION EFFORTS WITH THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT), LOCAL EMERGENCY SERVICES, AND ALL NECESSARY UTILITY COMPANIES INCLUDING, BUT NOT LIMITED TO, ELECTRICITY, NATURAL GAS, TELECOMMUNICATIONS, CABLE TELEVISION, WATER, SEWER, PRIVATE LIGHTING, AND OTHERS THAT MAY BE REQUIRED.
25. THE CONTRACTOR SHALL SATISFY HIMSELF AS TO ALL SITE CONDITIONS PRIOR TO CONSTRUCTION.
26. OUTDOOR SIGNS ON THE PROPERTY WITHIN THE DISTRICT SHALL COMPLY WITH REGULATIONS FOR EXTERIOR SIGNS IN ACCORDANCE WITH ARTICLE II, DIVISION 3 OF THE ZONING ORDINANCE.
27. ALL CONSTRUCTION METHODS AND MATERIALS SHALL CONFORM WITH THE CURRENT JAMES CITY COUNTY STANDARDS AND SPECIFICATIONS, VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE STANDARDS AND SPECIFICATIONS, HAMPTON ROADS PLANNING DISTRICT COMMISSION (HRPDC) SPECIFICATIONS AND SUPPLEMENT CONDITIONS FOUND IN BID DOCUMENTS, VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS, AND ANY OTHER APPLICABLE CITY OR STATE ORDINANCES, CODES, AND LAWS PRIOR TO ANY CONSTRUCTION ACTIVITY.
28. THIS TOPOGRAPHIC SURVEY WAS COMPLETED UNDER THE DIRECT AND RESPONSIBLE CHARGE OF THOMAS C. SUBLETT, L.S. FROM AN ACTUAL GROUND SURVEY MADE UNDER HIS SUPERVISION. THE ORIGINAL DATA WAS OBTAINED ON NOVEMBER 2, 2010. THIS TOPOGRAPHIC SURVEY MAP MEETS MINIMUM ACCURACY STANDARDS AND IS REFERENCED TO NATIONAL GEODETIC VERTICAL DATUM 1929 (JAMES CITY COUNTY GEODETIC CONTROL MAIN STATION 309 RESET 1990, NGVD 1929).
29. BOUNDARY INFORMATION SHOWN ON THESE DRAWING DOES NOT REPRESENT A CURRENT BOUNDARY SURVEY BY AES.
30. ALL TRAFFIC CONTROL SIGNS AND PAVEMENT MARKINGS SHALL CONFORM TO THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS.
31. BURNING OF DEBRIS ON SITE IS NOT PERMITTED.
32. THE JAMES CITY COUNTY BOARD OF SUPERVISORS APPROVED JCC-SUP-0032-2010 WITH CONDITIONS AT THE MARCH 8, 2011 BOARD MEETING.

LEGEND

EXISTING		PROPOSED	EXISTING		PROPOSED
W	WATER	W		CONCRETE	
S	SANITARY SEWER	S		AGGREGATE/GRAVEL	
	STORM SEWER			TREELINE	
FM	FORCE MAIN	FM	8"MAPLE	TREE	1-CM
C	COMMUNICATIONS	C		LIMITS OF CLEARING	
UG-TEL	UNDERGROUND PHONE LINE	UG-TEL		RIP RAP	
	OVERHEAD ELECTRIC LINE			BENCH MARK	
GAS	GAS LINE	G	25.1	GROUND ELEVATION	
FO	FIBER OPTIC	FO		TOP OF CURB ELEV.	TC= ELEV
UG-CATV	UNDERGROUND CABLE TV	UG-CATV		FINISH GRADE ELEV.	FG= ELEV
TELPED	TELEPHONE PEDESTAL			TOP OF WALL ELEV.	TW= ELEV
	SANITARY MANHOLE			GRADING LINE TIE-IN	
	STORM MANHOLE		80	CONTOUR ELEV.	80
	CURB DROP INLET			RESERVED HANDICAP PARKING	
	YARD DROP INLET			YARD HYDRANT	W
	FLARED END SECTION			MAILBOX	
W	VALVE			SIGN	
FH	FIRE HYDRANT ASSEMBLY			WETLANDS	
	BLOW-OFF VALVE			RPA BUFFER	
	REDUCER			100 YR. FLOODPLAIN	
	AIR RELEASE ASSEMBLY			HIGH POINT	HP
CO	CLEAN OUT			CENTERLINE/BASELINE	
WM	WATER METER			RIGHT OF WAY	
PP	POWER POLE			PROPERTY LINE	
	POWER POLE W/GUY WIRE			EASEMENT LINE	
LP	LIGHT POLE			SETBACK LINE	
	STREETLIGHT				
	FENCE				
	℄ DITCH/SWALE/STREAM				
	CONCRETE LINED DITCH				
	EC-2/EC-3 LINED DITCH				
	BITUMINOUS CONCRETE				

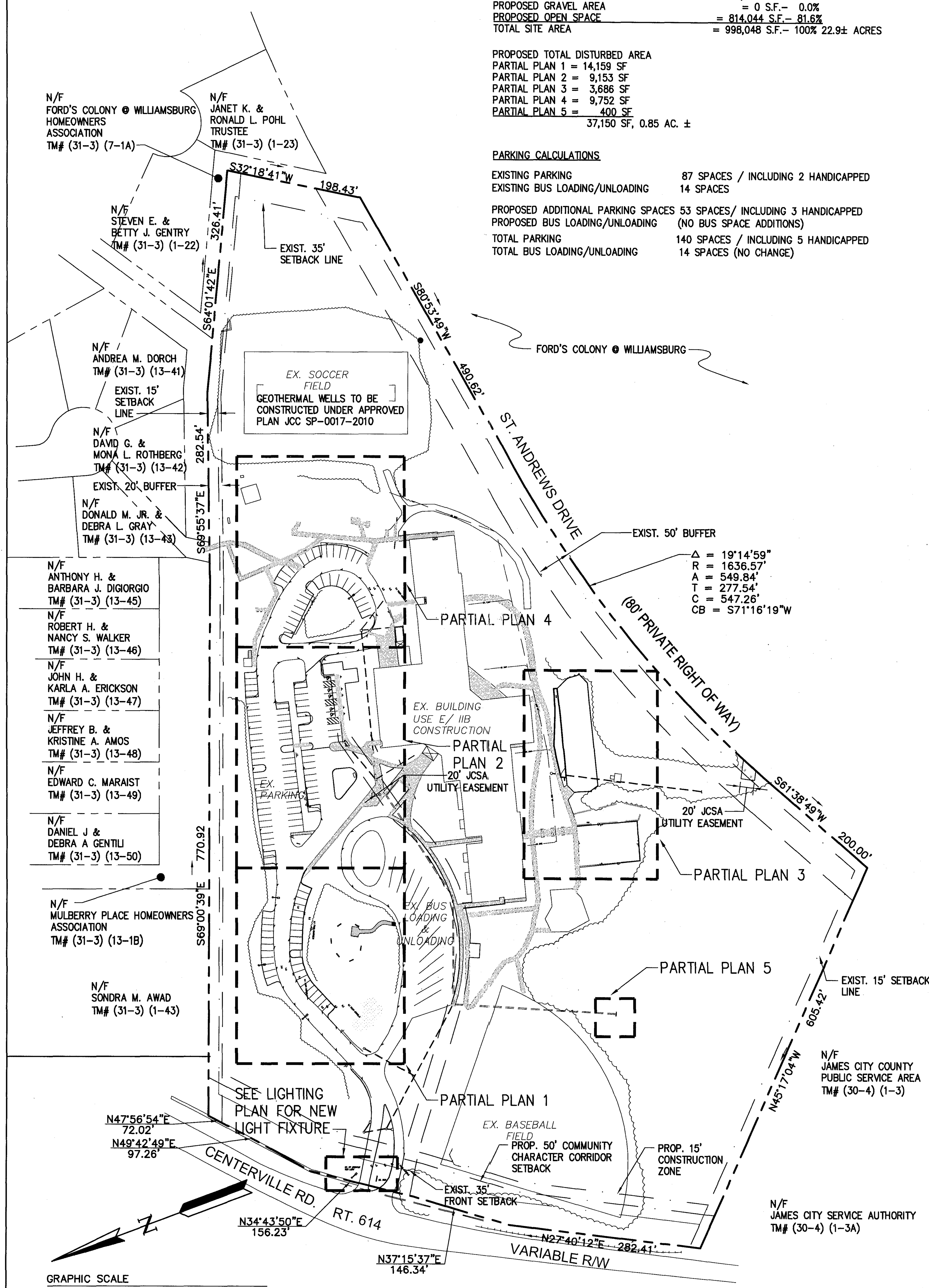
D. J. MONTAGUE ELEMENTARY SCHOOL

EXISTING BUILDING AREA	= 55,418 S.F.– 5.6%
EXISTING VEHICULAR PAVEMENT AREA	= 95,793 S.F.– 9.6%
EXISTING SIDEWALK CONCRETE AREA	= 21,711 S.F.– 2.2%
EXISTING GRAVEL AREA	= 2,052 S.F.– 0.2%
EXISTING OPEN SPACE	= 823,074 S.F.– 82.4%
TOTAL SITE AREA	= 998,048 S.F.– 100% 22.9± ACRES
PROPOSED BUILDING AREA	= 55,418 S.F.– 5.6%
PROPOSED VEHICULAR PAVEMENT AREA	= 106,251 S.F.– 10.6%
PROPOSED SIDEWALK CONCRETE AREA	= 22,335 S.F.– 2.2%
PROPOSED GRAVEL AREA	= 0 S.F.– 0.0%
PROPOSED OPEN SPACE	= 814,044 S.F.– 81.6%
TOTAL SITE AREA	= 998,048 S.F.– 100% 22.9± ACRES

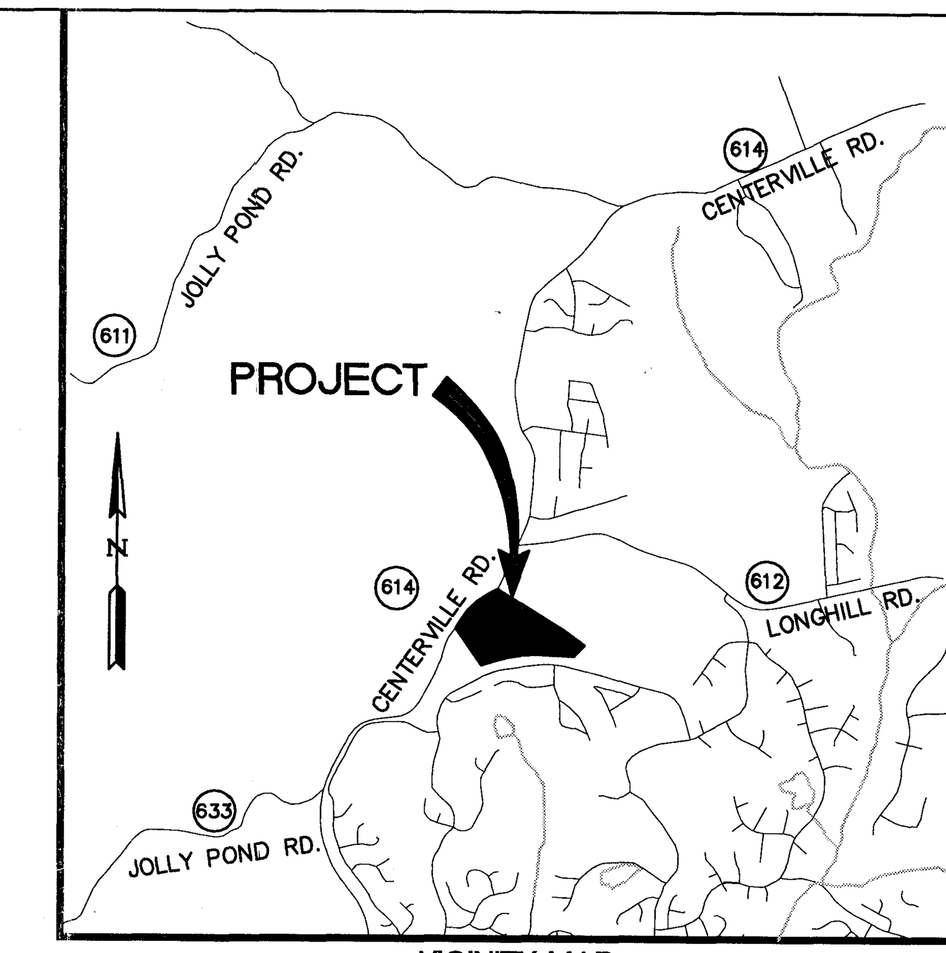
PROPOSED TOTAL DISTURBED AREA
PARTIAL PLAN 1 = 14,159 SF
PARTIAL PLAN 2 = 9,153 SF
PARTIAL PLAN 3 = 3,686 SF
PARTIAL PLAN 4 = 9,752 SF
PARTIAL PLAN 5 = 400 SF
37,150 SF, 0.85 AC. ±

PARKING CALCULATIONS

EXISTING PARKING	87 SPACES / INCLUDING 2 HANDICAPPED
EXISTING BUS LOADING/UNLOADING	14 SPACES
PROPOSED ADDITIONAL PARKING SPACES	53 SPACES/ INCLUDING 3 HANDICAPPED
PROPOSED BUS LOADING/UNLOADING	(NO BUS SPACE ADDITIONS)
TOTAL PARKING	140 SPACES / INCLUDING 5 HANDICAPPED
TOTAL BUS LOADING/UNLOADING	14 SPACES (NO CHANGE)



OVERALL SITE PLAN



VICINITY MAP
SCALE: 1"=2000'

JCC PLAN SP-0008-2011
INDEX OF SHEETS

C01 AMENDED SITE, COVER SHEET
C02 DEMOLITION & ENVIRONMENTAL INVENTORY PLAN
C03 DRAINAGE / GRADING / E&S / PARTIAL PLAN 1 & DETAILS
C04 DRAINAGE / GRADING / E&S / PARTIAL PLAN 2 & 3
C05 DRAINAGE / GRADING / E&S / PARTIAL PLANS 4 / 5 & DETAILS
C06 SITE LAYOUT PARTIAL PLAN 1 & DETAILS
C07 SITE LAYOUT PARTIAL PLAN 2 & 3
C08 SITE LAYOUT PARTIAL PLAN 4 & DETAILS
C09 NOTES & DETAILS
C10 LANDSCAPING & LIGHTING PLAN
C11 LIGHTING & LIGHTING PLAN / NOTES & DETAILS

CERTIFIED RESPONSIBLE LAND DISTURBER:

THE PROFESSIONAL WHOSE SEAL IS AFFIXED HEREON SHALL ACT AS THE "RESPONSIBLE LAND DISTURBER" FOR PURPOSES OF PLAN APPROVAL ONLY. PRIOR TO ISSUANCE OF THE LAND DISTURBING PERMIT, THE CONTRACTOR SHALL PROVIDE THE NAME OF A "RESPONSIBLE LAND DISTURBER" WHO SHALL ASSUME RESPONSIBILITY AS THE "RESPONSIBLE LAND DISTURBER" FOR THE CONSTRUCTION PHASE OF THE PROJECT. THE CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION SHOULD THE "RESPONSIBLE LAND DISTURBER" CHANGE DURING CONSTRUCTION.

COUNTY OF JAMES CITY
FINAL SITE PLAN

APPROVALS	DATE
Fire Dept. JB/Lc	2/9/11
Health Dept.	
VDOT BC/Lc	3/1/11
Planning CMJ	5/9/11
Environ. ST/Lc	4/4/11
Zoning Adm. MOB	5/9/11
JCSA DW/Jc	5/5/11
County Eng. DC/Lc	2/15/11
RFA	
Other TC/Lc BSP	4/2/11

Environmental Division
MAY 13 2011
RECEIVED

RECEIVED MAY 2011 Planning Department

COMMONWEALTH OF VIRGINIA
VANMARC BENNETT
3/23/11
PROFESSIONAL ENGINEER

Rev.	Date	Description	Revised By
1	3/23/11	REVISION PER JCC COMMENTS	LBA

AES CONSULTING ENGINEERS
Hampton Roads | Central Virginia | Middle Peninsula
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
Phone: (757) 253-0040
Fax: (757) 220-8994
www.aesva.com

SITE PLAN AMENDMENT
TO
D. J. MONTAGUE ELEMENTARY SCHOOL
ADDITIONAL PARKING
AND
PLAYGROUND DRAINAGE IMPROVEMENTS
W/JCC PUBLIC SCHOOLS
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Project Contacts:	LBA
Project Number:	10162-00
Scale: AS NOTED	Date: 2/2/11

Sheet Title:
AMENDED SITE, COVER SHEET

Sheet Number
C01

DEMOLITION NOTES

1. REMOVE ALL EXISTING CONCRETE WHEEL STOPS AND STORE ON SITE FOR RE-USE.
2. REMOVE EXISTING SIGNS AS INDICATED, SALVAGE AND RE-INSTALL AS INDICATED ON LAYOUT SHEETS.
3. SAW CUT EXISTING PAVEMENT AREAS AS INDICATED ON PLAN TO PROVIDE A FULL BAY FOR NEW PARKING SPACES OR TO ESTABLISH ISLANDS FOR LANDSCAPING.
4. ERADICATE ALL PAVEMENT MARKINGS WITH IN PARKING AREAS.
5. IN PLAYGROUND REPAIR AREA; SOME EXISTING CHAINLINK FENCING WILL REQUIRE REMOVAL TO PERFORM REPAIRS, FENCING TO BE RE-INSTALLED UPON COMPLETION OF REPAIRS.
6. ALL ASPHALT, GRAVEL, AND EXCAVATED MATERIAL TO BE REMOVED OFF SITE TO AN APPROVED LANDFILL.

LEGEND

EXISTING		PROPOSED	EXISTING		PROPOSED
—W—	WATER	—W—		CONCRETE	
—S—	SANITARY SEWER	—S—		AGGREGATE/GRAVEL	
	STORM SEWER			TREELINE	
—FM—	FORCE MAIN	—FM—	8" MAPLE	TREE	1–CM
—C—	COMMUNICATIONS	—C—		LIMITS OF CLEARING	
—UG–TEL—	UNDERGROUND PHONE LINE	—UG–TEL—		RIP RAP	
	OVERHEAD ELECTRIC LINE			BENCH MARK	
—GAS—	GAS LINE	—G—	25.1	GROUND ELEVATION	
—FO—	FIBER OPTIC	—FO—	25.1	TOP OF CURB ELEV.	TC= ELEV
—UG–CATV—	UNDERGROUND CABLE TV	—UG–CATV—		FINISH GRADE ELEV.	FG= ELEV
TELPED	TELEPHONE PEDESTAL			TOP OF WALL ELEV.	TW= ELEV
	SANITARY MANHOLE			GRADING LINE TIE–IN	
	STORM MANHOLE		80	CONTOUR ELEV.	80
	CURB DROP INLET			RESERVED HANDICAP PARKING	
	YARD DROP INLET			YARD HYDRANT	
	FLARED END SECTION			MAILBOX	
	VALVE			SIGN	
FH	FIRE HYDRANT ASSEMBLY			WETLANDS	
	BLOW–OFF VALVE			RPA BUFFER	
	REDUCER			100 YR. FLOODPLAIN	
	AIR RELEASE ASSEMBLY			HIGH POINT	HP
CO	CLEAN OUT			CENTERLINE/BASELINE	
WM	WATER METER			RIGHT OF WAY	
PP	POWER POLE			PROPERTY LINE	
	POWER POLE W/GUY WIRE			EASEMENT LINE	
LP	LIGHT POLE			SETBACK LINE	
	STREETLIGHT				
	FENCE				
	℄ DITCH/SWALE/STREAM				
	CONCRETE LINED DITCH				
	EC–2/EC–3 LINED DITCH				
	BITUMINOUS CONCRETE				

EROSION & SEDIMENT CONTROL AND STORMWATER CONTROL NARRATIVE

THE FOLLOWING TEXT WILL SERVE AS A BRIEF OUTLINE OR NARRATIVE FOR THE ABOVE REFERENCED PLAN. THIS NARRATIVE WILL EXPLAIN THE EROSION AND SEDIMENT CONTROL PLAN AND SEQUENCE AS WELL AS THE STORM WATER CONTROL UTILIZED ON THIS SITE PLAN.

EROSION AND SEDIMENT CONTROL

THE EROSION AND SEDIMENT CONTROL FOR THIS SITE UTILIZES MEASURES AND PRACTICES FOUND IN THE VIRGINIA EROSION AND SEDIMENT CONTROL (VESCH) HANDBOOK THIRD EDITION DATED 1992.
CONSTRUCTION WORK WILL BEGIN WITH THE INSTALLATION OF THE SEDIMENT TRAP AND OTHER PERIMETER CONTROLS LOCATED ON THE PLAN SHEETS. THESE CONTROLS ARE TO BE INSTALLED AND FUNCTIONAL BEFORE ANY DEMOLITION OR LAND DISTURBANCE IS TO BEGIN. IT SHOULD BE NOTED THAT THE SEDIMENT TRAP IS LOCATED AT THE PROPOSED BIO–RETENTION SITE. THIS AREA WILL SERVE AS A SEDIMENT TRAPPING FACILITY UNTIL THE CONTRIBUTING DRAINAGE AREA TO THE FINAL FACILITY IS STABILIZED.

STORMWATER CONTROL

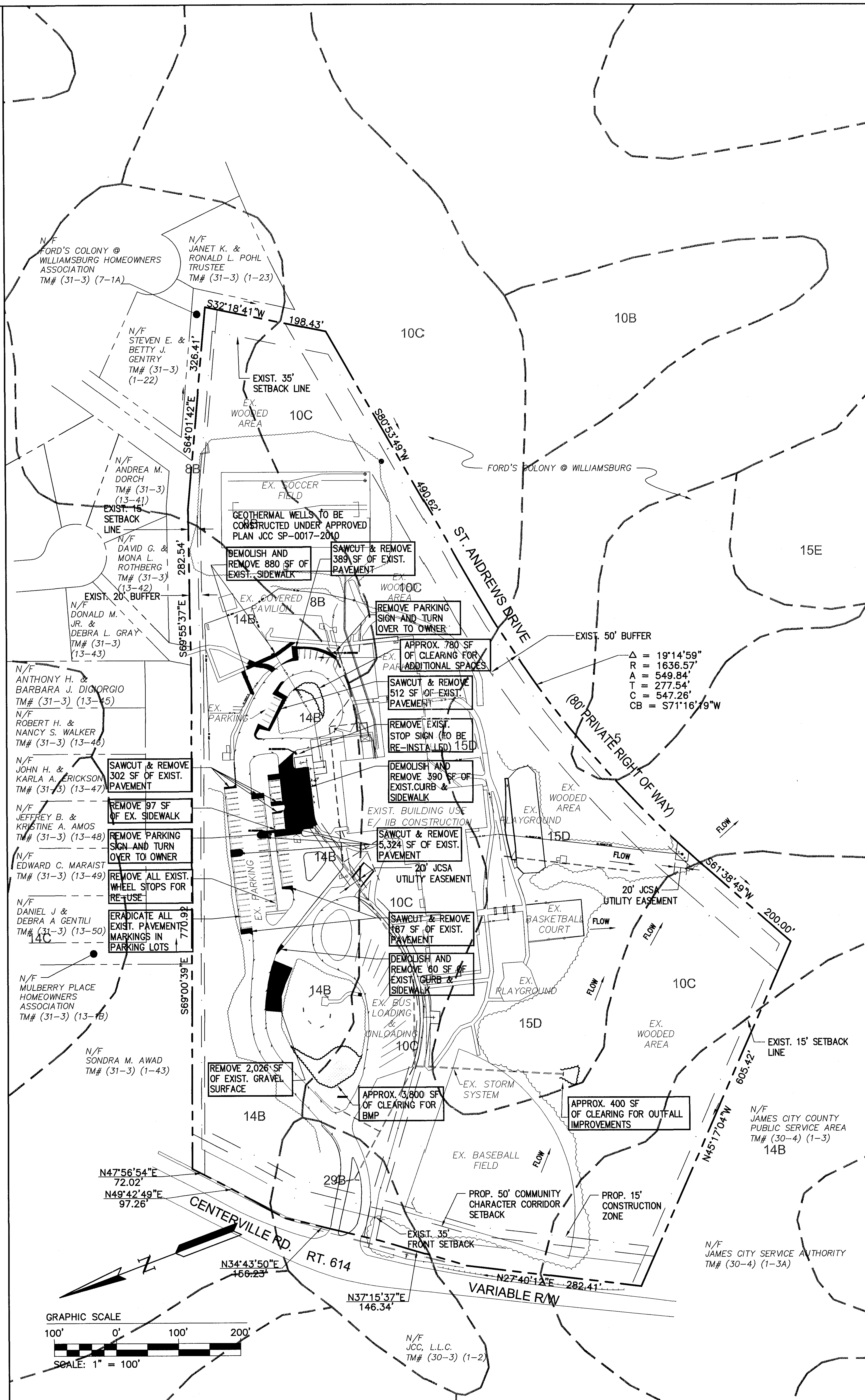
WITH THE INSTALLATION OF THE EROSION AND SEDIMENT MEASURES, THE STORM SEWER MODIFICATIONS AND THE SWALES SHOWN ON THE PLAN CAN NOW BE INSTALLED. STORMWATER FROM THE EXISTING STORM SEWERS SHOWN IN THIS PLAN CURRENTLY CONTRIBUTE TO AN EXISTING BMP#3 (JCC#PC080I – LOCATED AT FORD'S COLONY GOLF HOLE #7) WITHIN THE EXISTING FORD'S COLONY SUBDIVISION (AS SHOWN ON THE FORD'S COLONY OVERALL LAND PLAN SUBMITTED WITH THIS PLAN SET). COMPUTATIONS HAVE SHOWN A MODERATE DECREASE IN THE RATE OF FLOW FROM THE SCHOOL SITE TO THE EXISTING STORM SEWER.
ONCE THE AREA IS STABILIZED THE BIO–RETENTION BASIN CAN THEN BE EXCAVATED OF ANY SEDIMENT ACCUMULATION FROM THE SEDIMENT TRAP BASIN THAT OCCURRED DURING THE CONSTRUCTION PROCESS. THE CONTRACTOR SHALL NOT CONSTRUCT OR CONVERT TO THE FINAL BIO–RETENTION FACILITY UNTIL THE COUNTY ENVIRONMENTAL INSPECTOR HAS DEEMED THE BASIN DRAINAGE AREA IS STABILIZED AND THAT ANY CONSTRUCTION ACTIVITY SEDIMENT TRANSPORT HAS ELIMINATED. THE INFILTRATION AREA OF THE FACILITY CAN BE EXCAVATED AND BACKFILLED WITH THE INFILTRATION MEDIA AS SHOWN IN THE PLANS AT THIS TIME.
THE 10–YEAR EVENT FLOW WAS APPLIED TO THE EXISTING STORM SEWER SYSTEM #2. AS NOTED ABOVE, THE BIO–RETENTION FACILITY RESULTED IN A REDUCTION OF FLOW TO THE EXISTING STORM SEWER SYSTEM #2. EXISTING STORM SEWER SYSTEM #2 HAS COMPUTATIONS PROVIDED FOR BOTH EXISTING AND PROPOSED CONDITIONS. THE EXISTING STORM SEWER #2 CONTRIBUTES, AS STATED ABOVE, TO EXISTING BMP#3 (JCC#PC080I).
THE ORIGINAL DESIGN OF BMP #33 (JCC#PC080I) HAS A PUBLISHED VOLUME 400,000 CUBIC FEET OF STORAGE. FOR THE PURPOSE OF THE NARRATIVE, IT IS ASSUMED THAT THE IMPERVIOUS AREA OF FORD'S COLONY SECTION 10 IS CURRENTLY AT 70 PERCENT OF THE SECTION 10 DRAINAGE AREA TO BMP3 (JCC#PC080I), THIS PERCENTAGE RESULTS IN 10.0 ACRES OF IMPERVIOUS COVER FOR SECTION 10. THE IMPERVIOUS AREA OF THE D.J. MONTAGUE SITE IS PROPOSED TO BE 18% IMPERVIOUS AREA WHICH RESULTS IN 4.3 ACRES OF IMPERVIOUS AREA TO BMP3 (JCC#PC080I). THE TOTAL IMPERVIOUS AREA FOR THIS SITE IS EXPECTED TO BE AT 14.3 ACRES TOTAL. BASED UPON THE COUNTY CRITERIA, FOR THE CURRENTLY APPROVED 6–POINT FACILITY, THE WATER QUALITY VOLUME (WQV) NEEDS TO TREAT 1.5" OF STORM–WATER OVER THE IMPERVIOUS AREA. THIS REQUIREMENT RESULTS IN A WQV OF 77,864 CUBIC FEET. THIS NUMBER IS WELL BELOW THE PUBLISHED VOLUME OF 400,000 CUBIC FEET CURRENTLY PROVIDED IN THE EXISTING BMP#33 (JCC#PC080I).
THE CONCLUSION IS THAT THIS FACILITY IS ALREADY MORE THAN ADEQUATE TO ACCEPT THE INCREASED DRAINAGE AREA OF THE PROPOSED D. J. MONTAGUE SITE IMPROVEMENTS.

SPECIAL STORMWATER CRITERIA

SINCE THIS SITE IS IN THE POWHATAN CREEK WATERSHED THE SPECIAL STORMWATER CRITERIA (SSC) FOR THIS SITE HAS BEEN ADDRESSED AS WELL. BASED UPON THE AMOUNT OF DISTURBED AREA FOR THIS SITE AN SSC REQUIREMENT OF 2 MEASURES ARE TO BE PROVIDED FOR THIS SITE.
THE FIRST OF THESE TWO MEASURES IS THE APPLICATION OF A HIGH PERFORMANCE–TURF REINFORCEMENT MATTING WITHIN THE SWALES TO COMPLY WITH SSCP#28. THE SWALES REQUIRING THIS APPLICATION IS A FLAT BOTTOM TRAPEZOIDAL SWALE ADJACENT TO THE PLAYGROUND AREA, AND A V–DITCH LOCATED AT THE DELIVERY AREA. WITH THESE TWO APPLICATIONS THIS MEASURE HAS COMPLIED WITH THE SITE–WIDE REQUIREMENT.
THE BIO–RETENTION BASIN, SSCP#12, IS THE SECOND MEASURE USED ON THIS SITE. THIS FACILITY WILL TREAT THE LARGEST INCREASE OF IMPERVIOUS AREA IN THIS PLAN AS WELL AS THE EXISTING IMPERVIOUS AREA.

ENVIRONMENTAL IMPACTS

THERE ARE NO ENVIRONMENTAL IMPACTS ASSOCIATED WITH THIS PROJECT.



ENVIRONMENTAL INVENTORY PLAN

ENVIRONMENTAL INVENTORY IMPACTS

TOTAL DISTURBANCE:	IMPACT
TIDAL WETLANDS:	NONE ON SITE
TIDAL SHORES:	NONE ON SITE
NON-TIDAL WETLANDS IN RMA:	NOT IMPACTED
100 FT RPA BUFFER:	NOT IMPACTED
NON-TIDAL WETLANDS IN RPA:	NOT IMPACTED
25% SLOPES OR GREATER:	NOT IMPACTED
100 YEAR FLOOD PLAIN:	NONE ON SITE

ENVIRONMENTAL IMPACTS HATCH LEGEND

- 25% SLOPES IMPACTS
- 25% SLOPES (AS KNOWN IN TOPOGRAPHICALLY SURVEYED AREAS)

SOILS TABLE

SOILS NO.	SOIL NAME	HYDROLOGIC SOIL GROUP	TYPICAL SLOPES	EROSION FACTOR (K)	EROSION FACTOR (T)
8B	CAROLINE FINE SANDY LOAM	C	2–6%	0.32–0.43	5
10C	CRAVEN FINE SILTY LOAM	C	6–10%	0.32–0.37	3
14B	EMPORIA FINE SANDY LOAM	C	2–6%	0.20–0.28	4
15D	EMPORIA COMPLEX	C	10–15%	0.20–0.28	4
29B	SLAGE FINE SANDY LOAM	C	2–6%	0.24	3

INFORMATION TAKEN FROM "SOIL SURVEY OF JAMES CITY AND YORK COUNTIES AND THE CITY OF WILLIAMSBURG, VIRGINIA" ISSUED IN APRIL, 1985, BY THE UNITED STATES DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE IN COOPERATION WITH VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY.

SOIL SUSCEPTIBILITY TO EROSION CLASSIFICATION (K)
0.23 AND LOWER – LOW ERODIBILITY
0.23 TO 0.36 – MODERATE ERODIBILITY
0.36 AND UP – HIGH ERODIBILITY

THE MAP SHOWN IS A "BEST FIT MODEL" OF THE SCS MAPS WITH EXISTING BASE INFORMATION.

EROSION & SEDIMENT CONTROL

DESCRIPTION
THIS PROJECT CONSISTS OF THE EXPANSION OF THE EXISTING D. J. MONTAGUE SCHOOL PARKING AREA, AND DRAINAGE IMPROVEMENTS AROUND PLAYGROUND.

EXISTING SITE CONDITIONS
MINOR CLEARING IS ANTICIPATED FOR THIS SITE. THE MAJORITY OF THE CONSTRUCTION AREA IS AN EXISTING GRASS SURFACE OR DENUDED TOPSOIL.

ADJACENT AREAS
THE SITE IS BORDERED TO THE WEST BY MULBERRY PLACE SUBDIVISION (A SINGLE FAMILY RESIDENTIAL COMMUNITY), TO THE EAST BY FORD'S COLONY (A PLANNED RESIDENTIAL COMMUNITY), UNDEVELOPED PROPERTIES OF JAMES CITY COUNTY TO THE SOUTHEAST, AND CENTERVILLE ROAD (VDOT PUBLIC RIGHT–OF–WAY) TO THE NORTH.

OFF–SITE AREAS
THERE IS NO OFF–SITE LAND DISTURBANCE RELATED TO THIS PROJECT.

CRITICAL AREAS
ALL LAND–DISTURBING ACTIVITIES WILL BE CONTAINED WITHIN THE EROSION AND SEDIMENT MEASURES SHOWN ON THE CONSTRUCTION PLANS. ALL PROPOSED SLOPES SHALL BE 3:1 OR FLATTER TO THE EXTENT POSSIBLE THROUGHOUT THE SITE.

SOILS
THE PROJECT AREA IS COMPRISED OF VARIOUS SOIL TYPES. THIS SHEET CONTAINS A SOIL TYPE DELINEATION MAP AND TABLE OF ASSOCIATED SOIL CHARACTERISTICS FOR THE SOILS TYPICALLY ENCOUNTERED ON THE SITE.

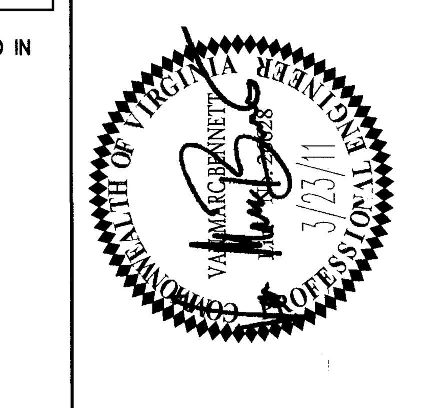
EROSION AND SEDIMENT CONTROL MEASURES
FOR MAXIMUM EROSION AND SEDIMENT CONTROL PROTECTION, THE FOLLOWING MEASURES HAVE BEEN UTILIZED ON THIS SITE IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK TO MINIMIZE THE TRANSPORTATION OF SEDIMENT:

1. SF – 3.05. (SILT FENCE) INSTALL SILT FENCE IN ACCORDANCE WITH THE VESCH HANDBOOK, DATED 1992. THE SILT FENCE IS TO BE INSTALLED AT THE LOCATIONS SHOWN ON THESE PLANS.
2. IP – 3.07. (INLET PROTECTION) INSTALL STORM DRAIN INLET PROTECTION (PHASE II E&S) IN ACCORDANCE WITH THE VESCH HANDBOOK, DATED 1992. INLET PROTECTION IS TO BE LOCATED AT THE PROPOSED INLETS LOCATED ON SHEETS 3–5. ALSO, UPON RECOMMENDATION OF THE COUNTY E&S INSPECTOR ADDITIONAL INLET PROTECTION MAY BE REQUIRED AROUND EXISTING INLETS.
4. DD – 3.09. INSTALL THE DIVERSION DIKES IN ACCORDANCE WITH THE VESCH HANDBOOK, DATED 1992. THE DIVERSION DIKES ARE TO BE INSTALLED AT THE LOCATIONS SHOWN ON THESE PLANS.
5. ST – 3.13. (SEDIMENT TRAP) INSTALL THE SEDIMENT TRAPS IN ACCORDANCE WITH THE VESCH HANDBOOK, DATED 1992. THE SEDIMENT TRAPS LOCATED ON SHEET 3 WILL BE UTILIZED TO CONTROL SEDIMENT LADEN RUN–OFF.
6. CD – 3.20. (CHECK DAM) INSTALL ROCK CHECK DAMS IN ACCORDANCE WITH THE VESCH HANDBOOK, DATED 1992. THE CHECK DAMS ARE TO BE INSTALLED AT THE LOCATIONS SHOWN ON PLAN SHEETS4&5.
7. TO – 3.30. (TOPSOILING) APPLY TOPSOIL IN ACCORDANCE WITH THE VESCH HANDBOOK PRIOR TO FINAL STABILIZATION AND PERMANENT SEEDING.
8. PS – 3.32. (PERMANENT SEEDING) TO BE APPLIED IN ACCORDANCE WITH THE VESCH HANDBOOK, DATED 1992, REFER TO THE E&S DETAIL SHEET FOR APPLICATION RATES.
9. MU – 3.35. (MULCHING) TO BE APPLIED IN ACCORDANCE WITH THE VESCH HANDBOOK AFTER PERMANENT SEEDING HAS BEEN APPLIED.
10. EC–3 – 3.36. (B/M–BLANKET MATTING) EC–3 OR VDOT STD. TREATMENT TYPE 2 MATTING IS TO BE USED ON SLOPES 3:1 OR STEEPER.
11. TP – 3.38. (TREE PRESERVATION AND PROTECTION) TO BE INSTALLED IN ACCORDANCE WITH THE VESCH HANDBOOK PRIOR TO COMMENCING CLEARING AND GRUBBING OPERATIONS.

LEGEND

INDICATES AREA OF DEMOLITION AND REMOVAL OR ADJUSTMENT

Rev.	Date	Description	Revised By
1	3/23/11	REVISION PER JCC COMMENTS	LBA



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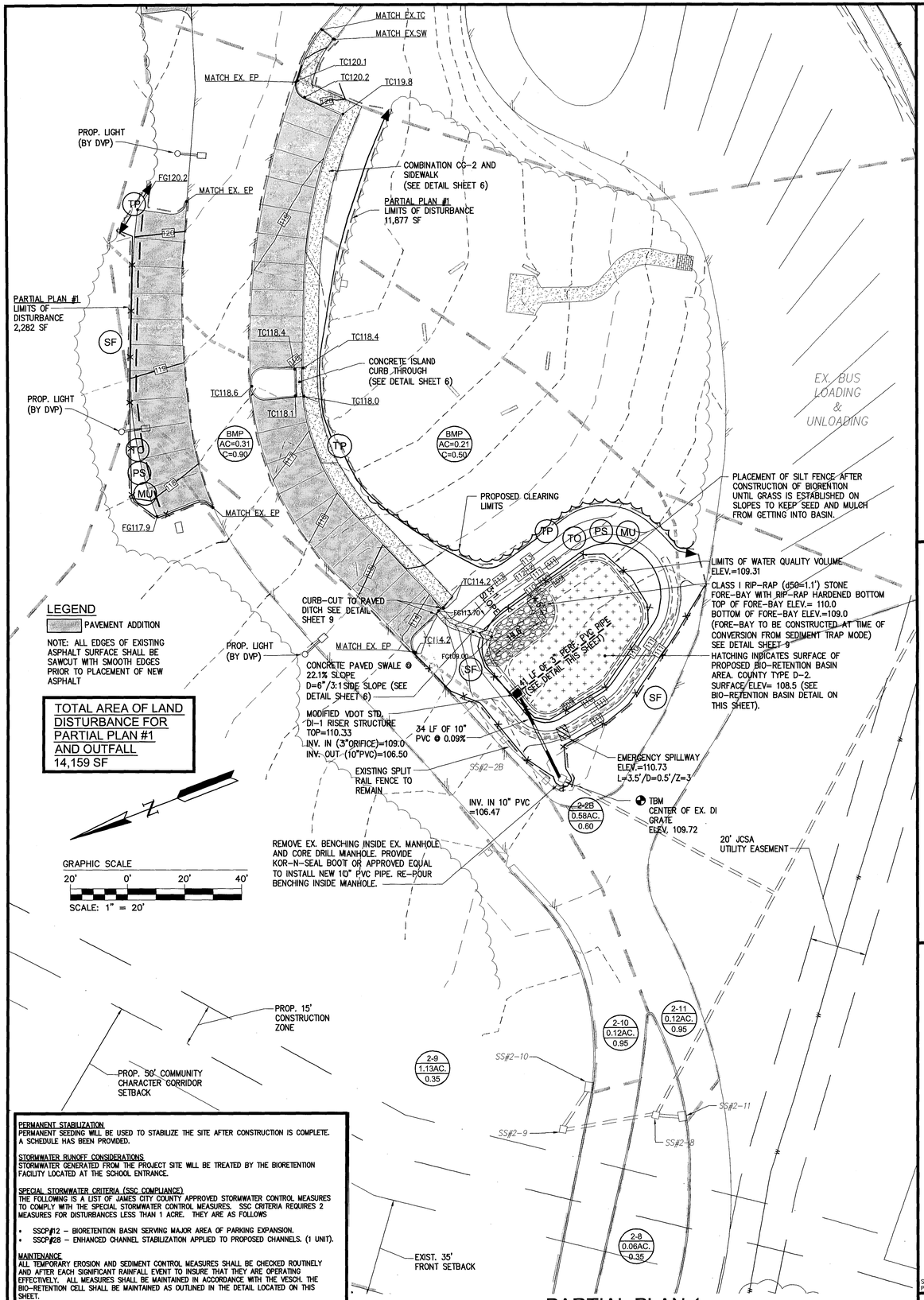
SITE PLAN AMENDMENT
TO
D. J. MONTAGUE ELEMENTARY SCHOOL
ADDITIONAL PARKING
AND
PLAYGROUND DRAINAGE IMPROVEMENTS
W/JCC PUBLIC SCHOOLS
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Project Contacts:	LBA
Project Number:	10162-00
Scale: AS NOTED	Date: 2/2/11

Sheet Title:
DEMOLITION & ENVIRONMENTAL INVENTORY PLAN

Sheet Number
C02



LEGEND

PAVEMENT ADDITION

NOTE: ALL EDGES OF EXISTING ASPHALT SURFACE SHALL BE SAWCUT WITH SMOOTH EDGES PRIOR TO PLACEMENT OF NEW ASPHALT

TOTAL AREA OF LAND DISTURBANCE FOR PARTIAL PLAN #1 AND OUTFALL 14,159 SF

PERMANENT STABILIZATION
PERMANENT SEEDING WILL BE USED TO STABILIZE THE SITE AFTER CONSTRUCTION IS COMPLETE. A SCHEDULE HAS BEEN PROVIDED.

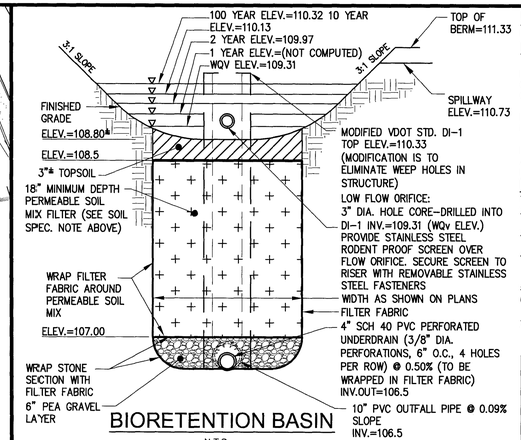
STORMWATER RUNOFF CONSIDERATIONS
STORMWATER GENERATED FROM THE PROJECT SITE WILL BE TREATED BY THE BIORETENTION FACILITY LOCATED AT THE SCHOOL ENTRANCE.

SPECIAL STORMWATER CRITERIA (SSC COMPLIANCE)
THE FOLLOWING IS A LIST OF JAMES CITY COUNTY APPROVED STORMWATER CONTROL MEASURES TO COMPLY WITH THE SPECIAL STORMWATER CONTROL MEASURES. SSC CRITERIA REQUIRES 2 MEASURES FOR DISTURBANCES LESS THAN 1 ACRE. THEY ARE AS FOLLOWS

- SSCP#12 – BIORETENTION BASIN SERVING MAJOR AREA OF PARKING EXPANSION.
- SSCP#28 – ENHANCED CHANNEL STABILIZATION APPLIED TO PROPOSED CHANNELS. (1 UNIT).

MAINTENANCE
ALL TEMPORARY 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. THE BIO-RETENTION CELL SHALL BE MAINTAINED AS OUTLINED IN THE DETAIL LOCATED ON THIS SHEET.

PARTIAL PLAN 1



BIORETENTION BASIN

N.T.S.

MAINTENANCE PROGRAM & SCHEDULE

INSPECT AND REPAIR EROSION	MONTHLY
REMOVAL AND REPLACEMENT OF ALL DISEASED VEGETATION CONSIDERED BEYOND TREATMENT	WHENEVER NEEDED
CHECK FOR ACCUMULATED SEDIMENTS	MONTHLY
INSPECT AND REMOVE ANY DEBRIS THAT MAY COLLECT AT THE 6" OUTLET CULVERT	AFTER MAJOR STORM EVENTS/OR SEMI ANNUALLY
STABILIZATION & RESEEDING OF BARE SPOTS	AS NEEDED
CHECK FOR ACCUMULATED SEDIMENT	MONTHLY
INSPECT & REMOVE DEBRIS THAT MAY COLLECT IN DRY SWALE	AFTER MAJOR EVENT OR SEMI-ANNUALLY

PLANTING REQUIREMENTS

MIXTURE OF GROUND COVERS, SHRUBS, AND TREES SHALL BE PLANTED IN DRY SWALE AREAS.

PERMEABLE SOIL MIX SPECIFICATIONS

THE DRY SWALE AREAS SHALL CONTAIN A PLANTING SOIL MIXTURE OF 50% SAND, 30% LEAF COMPOST (FULLY COMPOSTED, NOT PARTIALLY DECOMPOSED 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 HINDRANCE TO PLANT GROWTH OR MAINTENANCE.

THE TOPSOIL SHALL BE FREE OF PLANTS OR PLANT PARTS OF BERMUDA 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.

NOTES

1. WATER PLANT MATERIAL EACH DAY FOR FOURTEEN CONSECUTIVE DAYS AFTER INSTALLATION.
2. 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.
3. VDOT SHALL BE SAVED HARMLESS FROM THE MAINTENANCE RESPONSIBILITY OR LIABILITY ASSOCIATED WITH ANY FAILURE OF THE STORM WATER MANAGEMENT FACILITY AND ITS STRUCTURES.
4. 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.
5. STANDING WATER SHOULD NOT BE PRESENT FOR MORE THAN A 48 HOUR PERIOD.
6. THE STORMWATER MANGEMENT/BMP FACILITY AS PROPOSED FOR THIS PROJECT WILL REQUIRE SUBMISSION, REVIEW AND APPROVAL OF A RECORD DRAWING (AS-BUILT) AND CONSTRUCTION CERTIFICATION PRIOR TO RELEASE OF THE POSTED BOND/SURETY.
7. THE SWM/BMP FACILITY AS-BUILT DRAWINGS AND CONSTRUCTION CERTIFICATION AND SUBMITTALS ARE TO BE COORDINATED AND PERFORMED BEFORE, DURING AND FOLLOWING CONSTRUCTION IN ACCORDANCE WITH CURRENT COUNTY GUIDELINES.THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE.

EROSION AND SEDIMENTATION CONTROL LEGEND

SF	SILT FENCE (SPEC. 3.05)
IP	STORM DRAIN INLET PROTECTION (SPEC. 3.07)
DD	TEMPORARY DIVERSION DIKE (SPEC. 3.09)
ST	TEMPORARY SEDIMENT TRAP (SPEC. 3.13)
TO	TOP SOIL (SPEC. 3.30)
PS	PERMANENT SEEDING (SPEC. 3.32)
MU	MULCHING (SPEC. 3.35)
TP	TREE PROTECTION (SPEC. 3.38)

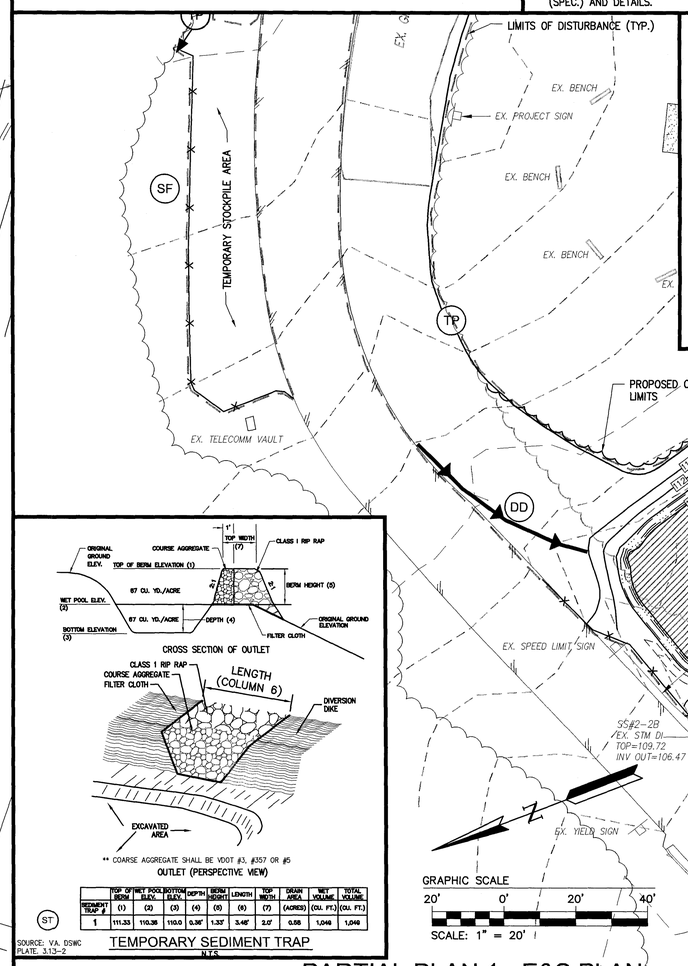
NOTE: SEE VIRGINIA EROSION & SEDIMENT CONTROL HANDBOOK LATEST EDITION FOR EROSION CONTROL SPECIFICATIONS (SPEC.) AND DETAILS.

SEDIMENT TRAP #	TOP OF BERM (1)	WET POOL ELEV. (2)	BOTTOM ELEV. (3)	DEPTH (4)	BERM HEIGHT (5)	LENGTH (6)	TOP WIDTH (7)	DRAIN AREA (ACRES)	WET VOLUME (CU. FT.)	TOTAL VOLUME (CU. FT.)
1	111.33	110.38	110.0	0.38'	1.33'	3.48'	2.0'	0.58	1,048	1,048

(ST) TEMPORARY SEDIMENT TRAP

N.T.S.

SOURCE: VA. DSWC PLATE. 3.13-2



PARTIAL PLAN 1 - E&S PLAN

CONSTRUCTION SEQUENCE

1. PRIOR TO OBTAINING LAND DISTURBING PERMIT, THE GENERAL CONTRACTOR SHALL OBTAIN A VSMP PERMIT (VIRGINIA STORMWATER MANAGEMENT PROGRAM) FROM DCR (VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION).
2. THE GENERAL CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE JAMES CITY COUNTY ENVIRONMENTAL DIVISION PRIOR TO BEGINNING ANY WORK AT THE SITE.
3. CONTACT "MISS UTILITY" FOR PUBLIC SERVICES AND CONTACT A PRIVATE UTILITY LOCATOR FOR PRIVATE SERVICES.
4. INSTALL SILT FENCE, DIVERSION DIKE, INLET PROTECTION, TREE PROTECTION.
5. CLEAR AND GRUB CLEARING AREAS NOTED ON PLAN.
6. CONSTRUCT SEDIMENT TRAP.
8. STRIP AND STOCKPILE TOPSOIL. TEMPORARILY SEED AS SPECIFIED.
9. REMOVE EXISTING PAVEMENT, GRAVEL, SIDEWALKS, WHEELSTOPS, ERADICATE TRAFFIC PAINT AND SIGNS AS NOTED ON THE PLAN.
10. ROUGH GRADE CUT AND FILL AREAS.
11. PROOF ROLL SUBGRADE AND PLACE STONE BASE.
12. PLACE ASPHALT, PAINT TRAFFIC STRIPPING, AND INSTALL WHEEL STOPS.
13. FINE GRADE, TOPSOIL, PLANT PERMANENT SEEDING AND PLACE EC-3 MATTING.
14. CONVERT SEDIMENT TRAP TO BIO-RETENTION BASIN.
15. INSTALL LANDSCAPING
16. 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.

SEDIMENT TRAP CONSTRUCTION NOTES:

1. THE CONTRACTOR IS TO UTILIZE THE BASIN OF THE DRY SWALE AS THE BASIN FOR THE TEMPORARY SEDIMENT TRAP.
2. THE SEDIMENT TRAP SHALL NOT BE EXCAVATED BELOW ELEVATION 110 TO ENSURE UNDERLYING SOIL INTEGRITY OF THE PROPOSED BIORETENTION BASIN.
3. THE CONTRACTOR SHALL NOT CONVERT THE SEDIMENT TRAP TO THE FINAL BIORETENTION UNTIL THE JAMES CITY COUNTY ENVIRONMENTAL INSPECTOR HAS BEEN SATISFIED THAT THE CONTRIBUTING DRAINAGE AREA HAS BEEN ADEQUATELY STABILIZED.
4. UPON APPROVAL FROM THE INSPECTOR THE CONTRACTOR SHALL REMOVE ANY ACCUMULATED SEDIMENT FROM THE BASIN PRIOR TO EXCAVATING THE REMAINDER OF THE BASIN AND THE BIORETENTION BASIN FILTER VOLUME. INSTALLATION OF THE UNDERLYING TRENCH DRAINAGE PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAIL ON THIS SHEET.

Rev.	Date	Description	Revised By
1	3/23/11	REVISION PER JCC COMMENTS	LBA

COMMONWEALTH OF VIRGINIA
LAURA BANNER
LICENSED PROFESSIONAL ENGINEER
3/23/11

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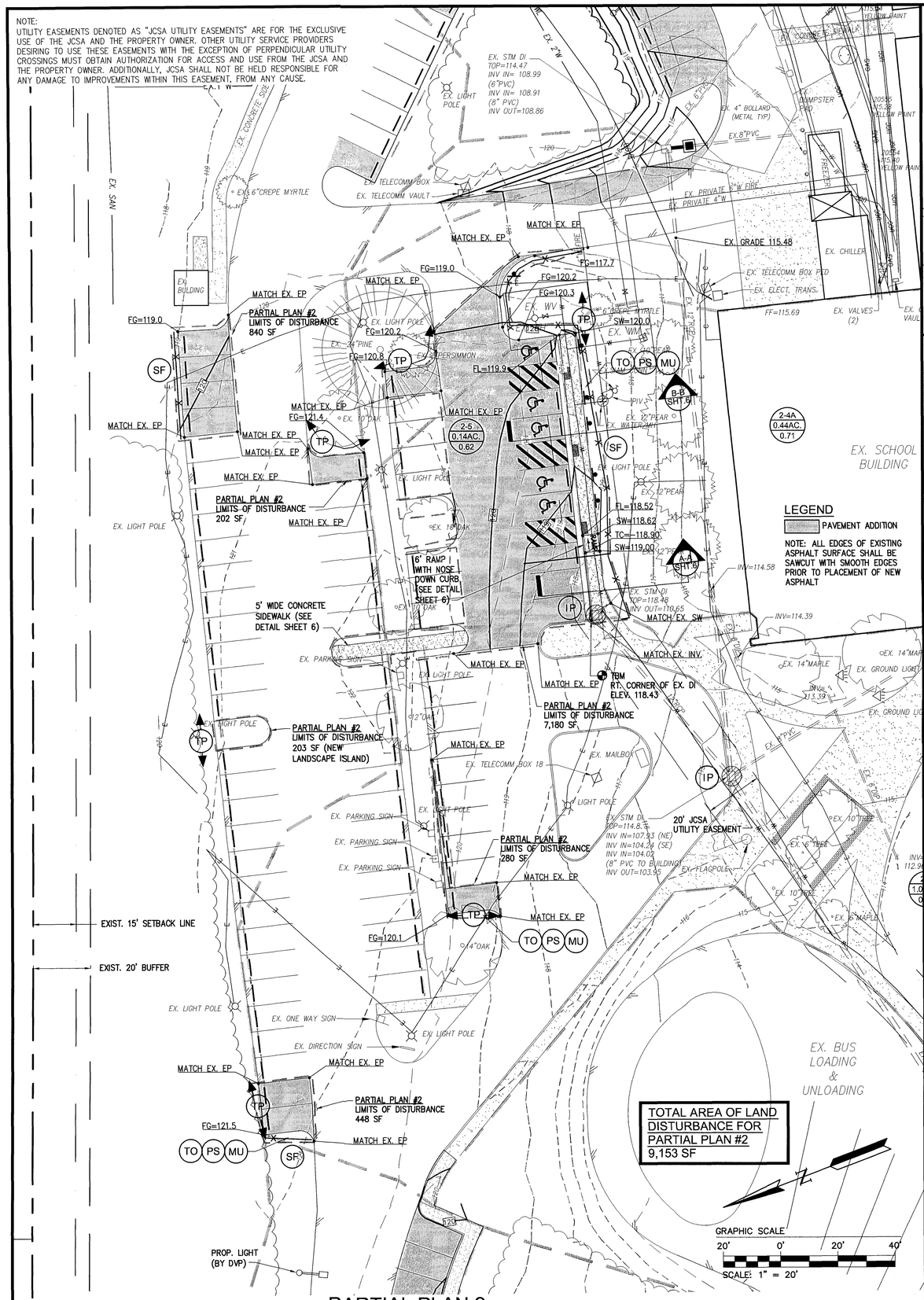
SITE PLAN AMENDMENT TO D. J. MONTAGUE ELEMENTARY SCHOOL ADDITIONAL PARKING AND PLAYGROUND DRAINAGE IMPROVEMENTS WJCC PUBLIC SCHOOLS
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Project Contacts:	LBA
Project Number:	10162-00
Scale: AS NOTED	Date: 2/2/11

Sheet Title: DRAINAGE / GRADING / E&S PARTIAL 1 PLAN & DETAILS

Sheet Number C03

NOTE:
UTILITY EASEMENTS DENOTED AS "JCSA UTILITY EASEMENTS" ARE FOR THE EXCLUSIVE USE OF THE JCSA AND THE PROPERTY OWNER. OTHER UTILITY SERVICE PROVIDERS DESIRING TO USE THESE EASEMENTS WITH THE EXCEPTION OF PERPENDICULAR UTILITY CROSSINGS MUST OBTAIN AUTHORIZATION FOR ACCESS AND USE FROM THE JCSA AND THE PROPERTY OWNER. ADDITIONALLY, JCSA SHALL NOT BE HELD RESPONSIBLE FOR ANY DAMAGE TO IMPROVEMENTS WITHIN THIS EASEMENT, FROM ANY CAUSE.

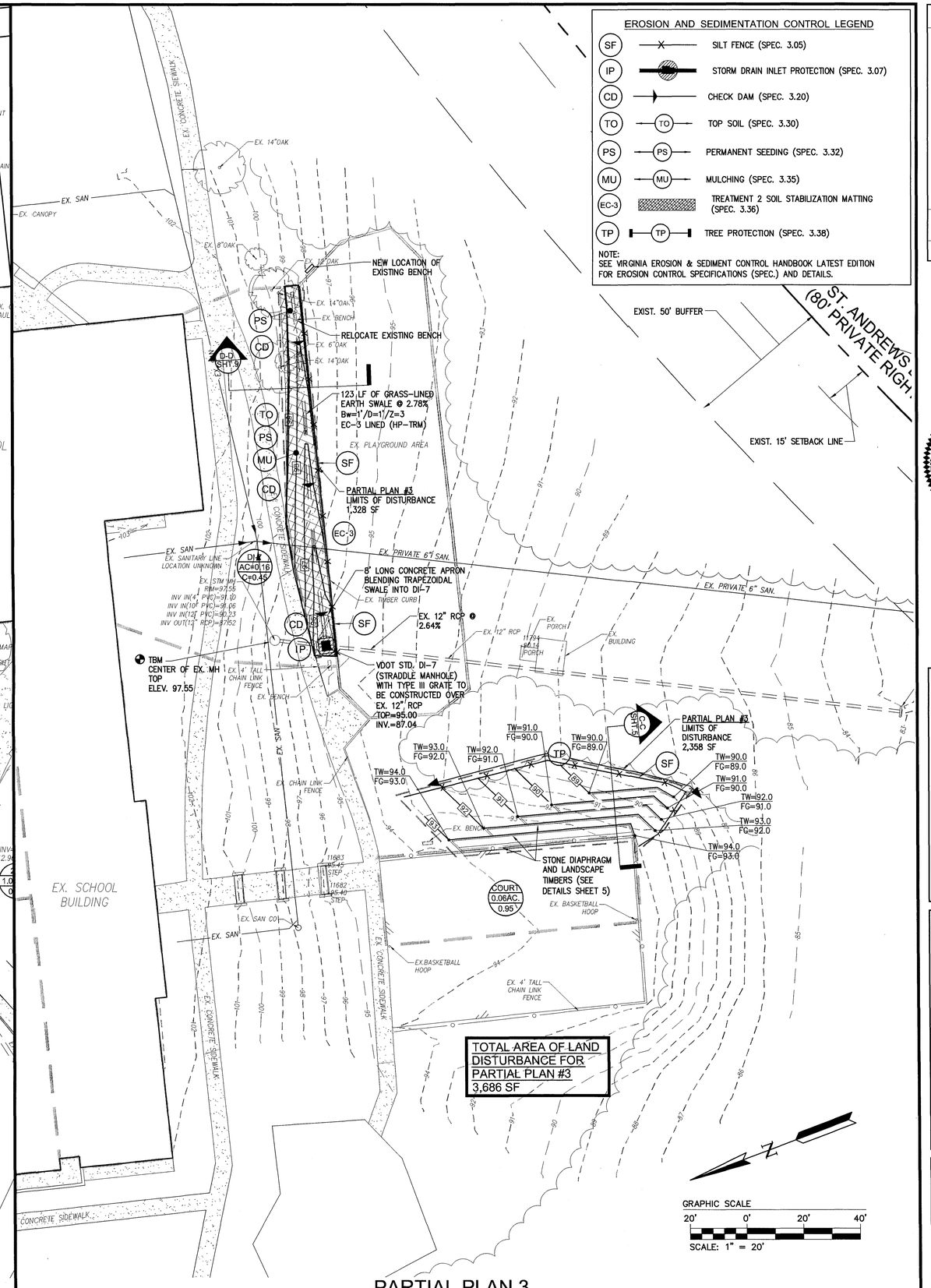


PARTIAL PLAN 2

LEGEND

PAVEMENT ADDITION

NOTE: ALL EDGES OF EXISTING ASPHALT SURFACE SHALL BE SAWCUT WITH SMOOTH EDGES PRIOR TO PLACEMENT OF NEW ASPHALT



PARTIAL PLAN 3

EROSION AND SEDIMENTATION CONTROL LEGEND

SF	SILT FENCE (SPEC. 3.05)
IP	STORM DRAIN INLET PROTECTION (SPEC. 3.07)
CD	CHECK DAM (SPEC. 3.20)
TO	TOP SOIL (SPEC. 3.30)
PS	PERMANENT SEEDING (SPEC. 3.32)
MU	MULCHING (SPEC. 3.35)
EC-3	TREATMENT 2 SOIL STABILIZATION MATTING (SPEC. 3.36)
TP	TREE PROTECTION (SPEC. 3.38)

NOTE:
SEE VIRGINIA EROSION & SEDIMENT CONTROL HANDBOOK LATEST EDITION FOR EROSION CONTROL SPECIFICATIONS (SPEC.) AND DETAILS.

Rev.	Date	Description	Reviewed By
1	3/23/11	REVISION PER JCC COMMENTS	LBA

COMMONWEALTH OF VIRGINIA
VIRGINIA MICHAEL NETT
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3/23/11

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SITE PLAN AMENDMENT
TO
D. J. MONTAGUE ELEMENTARY SCHOOL
ADDITIONAL PARKING
AND
PLAYGROUND DRAINAGE IMPROVEMENTS
WJCC PUBLIC SCHOOLS
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Project Contacts:	LBA
Project Number:	10162-00
Scale: AS NOTED	Date: 2/2/11
Sheet Title: DRAINAGE / GRADING / E&S / PARTIAL PLAN 2 & 3	
Sheet Number	C04

NOTE:
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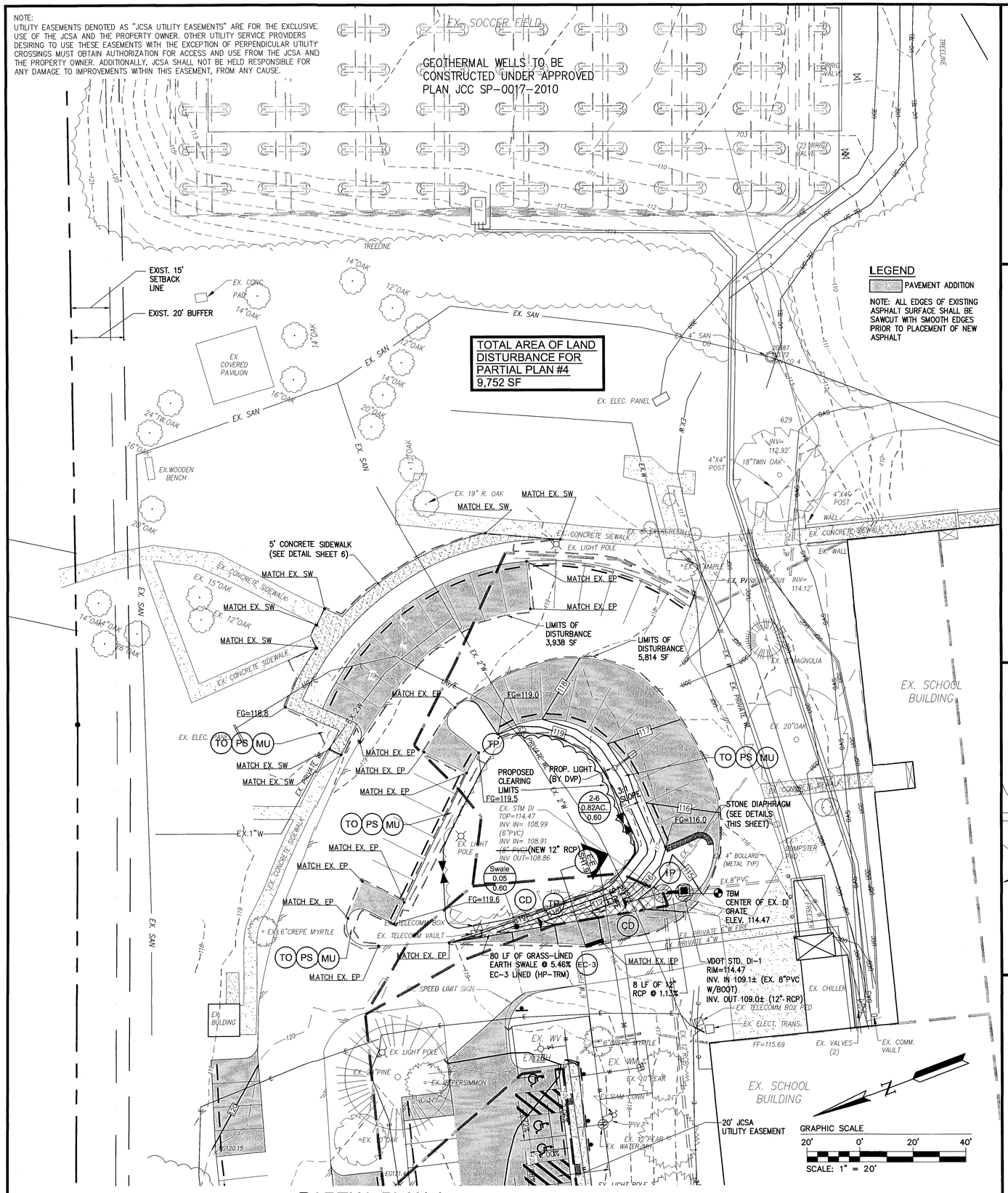
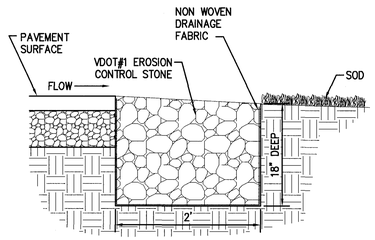


PARTIAL PLAN 4



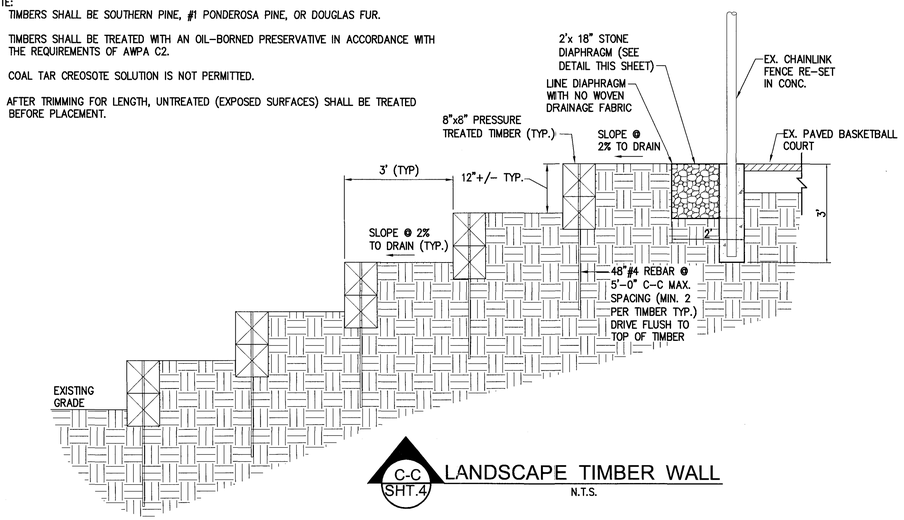
STONE DIAPHRAGM
N.T.S.

EROSION AND SEDIMENTATION CONTROL LEGEND

SF	SILT FENCE (SPEC. 3.05)
IP	STORM DRAIN INLET PROTECTION (SPEC. 3.07)
CD	CHECK DAM (SPEC. 3.20)
TO	TOP SOIL (SPEC. 3.30)
PS	PERMANENT SEEDING (SPEC. 3.32)
MU	MULCHING (SPEC. 3.35)
EC-3	TREATMENT 2 SOIL STABILIZATION MATTING (SPEC. 3.36)
TP	TREE PROTECTION (SPEC. 3.38)

NOTE:
SEE VIRGINIA EROSION & SEDIMENT CONTROL HANDBOOK LATEST EDITION FOR EROSION CONTROL SPECIFICATIONS (SPEC.) AND DETAILS.

NOTE:
1. TIMBERS SHALL BE SOUTHERN PINE, #1 PONDEROSA PINE, OR DOUGLAS FUR.
2. TIMBERS SHALL BE TREATED WITH AN OIL-BORNED PRESERVATIVE IN ACCORDANCE WITH THE REQUIREMENTS OF AWPA C2.
3. COAL TAR CREOSOTE SOLUTION IS NOT PERMITTED.
4. AFTER TRIMMING FOR LENGTH, UNTREATED (EXPOSED SURFACES) SHALL BE TREATED BEFORE PLACEMENT.

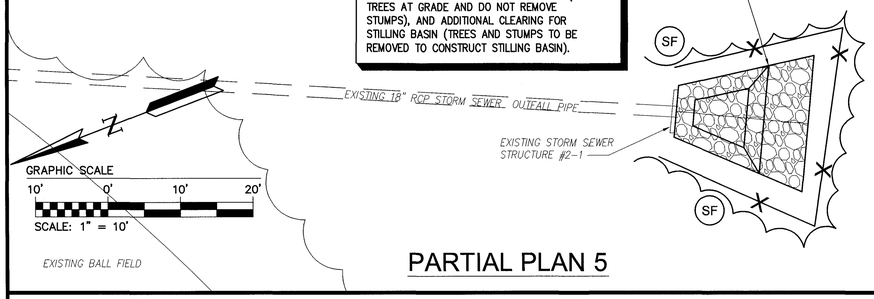


C-C SHT.4 LANDSCAPE TIMBER WALL
N.T.S.

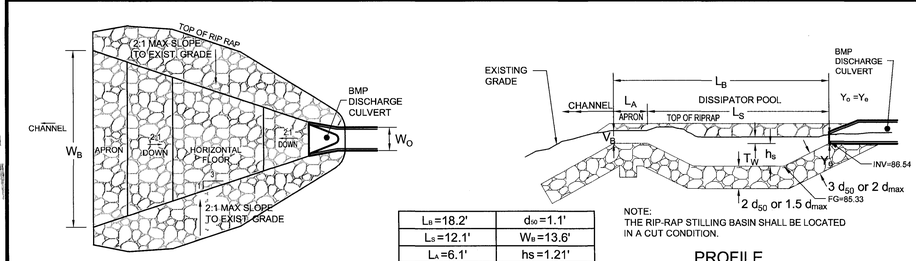
TOTAL AREA OF LAND DISTURBANCE FOR PARTIAL PLAN #5 400 SF

ENHANCED OUTLET PROTECTION (SEE DETAIL THIS SHEET) CLASS I RIP-RAP (d50=1.1') EMBEDDED 18"MIN. DEPTH OVER FILTER FABRIC.

NOTE:
CONTRACTOR TO PERFORM MINOR CLEARING TO GAIN ACCESS TO EXISTING HEADWALL (CUT TREES AT GRADE AND DO NOT REMOVE STUMPS), AND ADDITIONAL CLEARING FOR STILLING BASIN (TREES AND STUMPS TO BE REMOVED TO CONSTRUCT STILLING BASIN).



PARTIAL PLAN 5



L_B=18.2'	d_{50}=1.1'
L_S=12.1'	W_B=13.6'
L_A=6.1'	hs=1.21'

NOTE:
THE RIP-RAP STILLING BASIN SHALL BE LOCATED IN A CUT CONDITION.

PLAN PROFILE

ENHANCED OUTLET PROTECTION DETAIL (EXISTING STORM STRUCTURE. 2-1)
N.T.S

Rev.	Date	Description	Revised By
1	3/23/11	REVISION PER JCC COMMENTS	LBA

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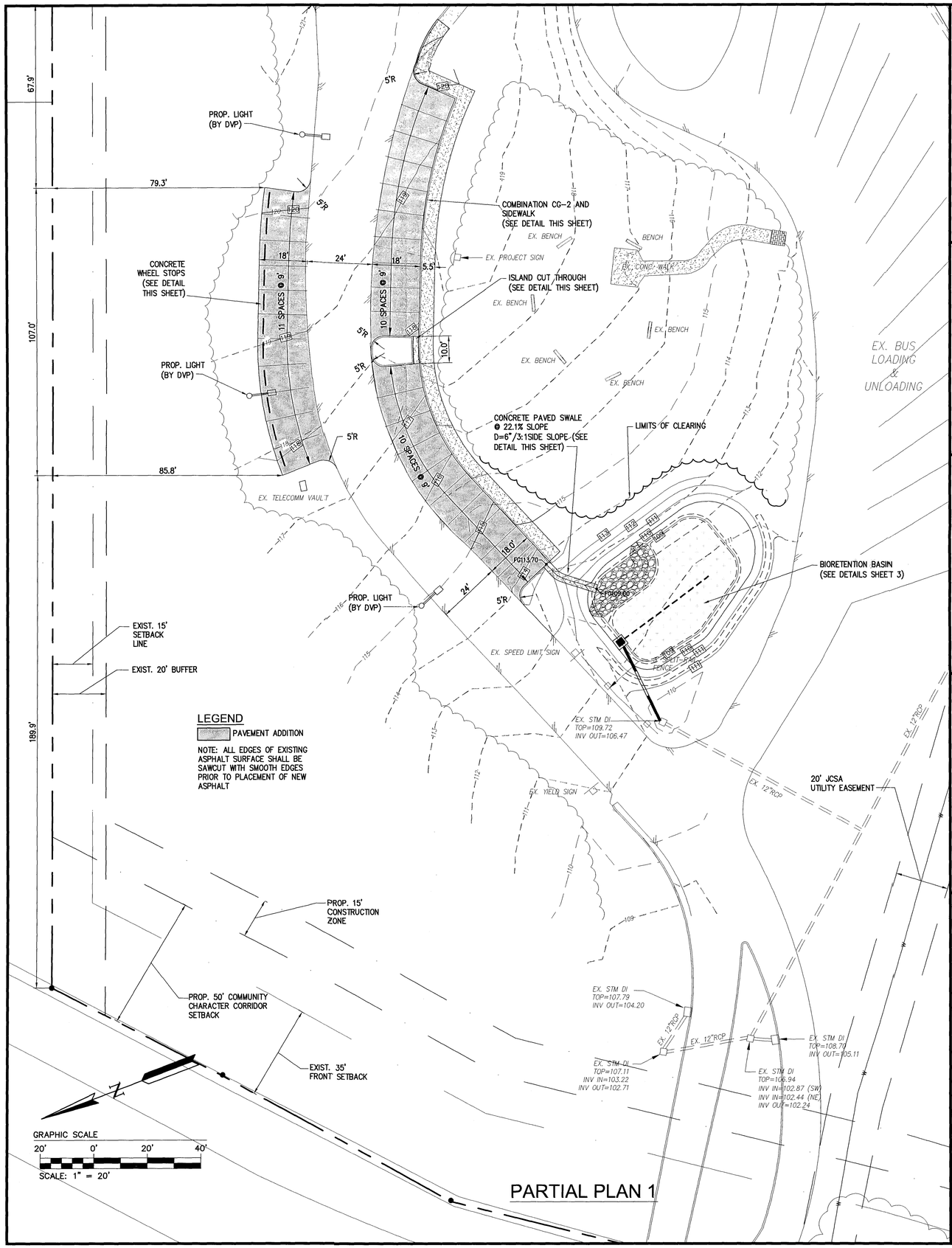
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

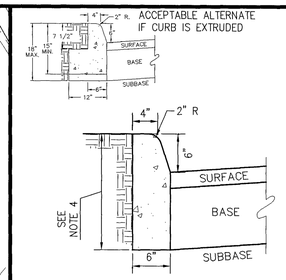
Project Contacts:	LBA
Project Number:	10162-00
Scale: AS NOTED	Date: 2/2/11

Sheet Title:
DRAINAGE/ GRADING / E&S / PARTIAL PLAN 4 / 5 & DETAILS

Sheet Number
C05



PARTIAL PLAN 1

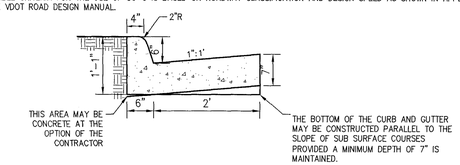


NOTES:
1. THIS ITEM MAY BE PRECAST OR CAST IN PLACE.
2. CONCRETE TO BE CLASS A3a IF CAST IN PLACE, 3500 PSI IF PRECAST.
3. CURB HAVING A RADIUS OF 300' OR LESS (ALONG FACE OF CURB) WILL BE PAID FOR AS RADIAL CURB.
4. THE DEPTH OF CURB MAY BE REDUCED AS MUCH AS 3" (15" DEPTH) OR INCREASED AS MUCH AS 3" (21" DEPTH) IN ORDER THAT THE BOTTOM OF THE CURB WILL COINCIDE 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.

CG-2 STANDARD 6" CURB

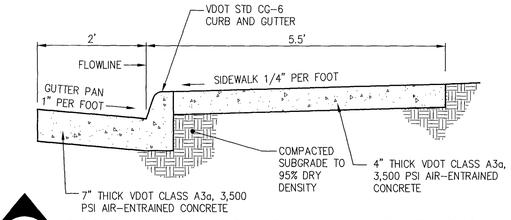
N.T.S.

NOTES:
1. THIS ITEM MAY BE PRECAST OR CAST IN PLACE.
2. CONCRETE TO BE CLASS A3a IF CAST IN PLACE, 3500 PSI IF PRECAST.
3. COMBINATION CURB AND GUTTER HAVING A RADIUS OF 300' OR LESS (ALONG FACE OF CURB) SHALL BE PAID FOR AS A RADIAL COMBINATION CURB AND GUTTER.
4. FOR USE WITH STABILIZED OPEN-GRADED DRAINAGE LAYER, THE BOTTOM OF THE CURB AND GUTTER SHALL BE CONSTRUCTED PARALLEL TO THE SLOPE OF THE PAVEMENT.
5. ALLOWABLE CRITERIA FOR THE USE OF CG-6 IS BASED ON ROADWAY CLASSIFICATION AND DESIGN SPEED AS SHOWN IN APPENDIX A OF THE VDOT ROAD DESIGN MANUAL.



CG-6 COMBINATION CURB AND GUTTER

N.T.S.

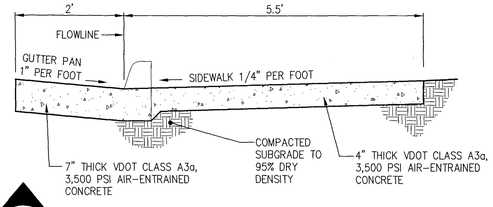


A-A SHT.4

COMBINATION CG-6 CURB AND SIDEWALK

N.T.S.

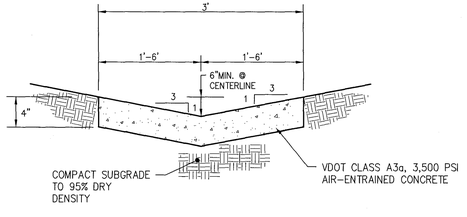
NOTE: THIS TYPICAL SECTION SHALL APPLY TO ALL AREAS WHERE SIDEWALK AND GUTTER PAN IS ADJACENT TO ADA PARKING OR ADA ACCESS ISLES.



B-B SHT.4

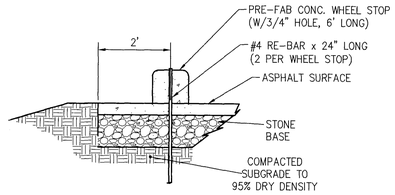
COMBINATION GUTTER AND SIDEWALK

N.T.S.



CONCRETE PAVED SWALE DETAIL

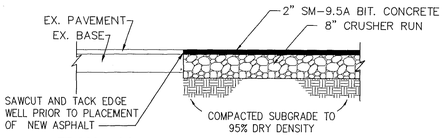
N.T.S.



CONC. WHEEL STOP DETAIL

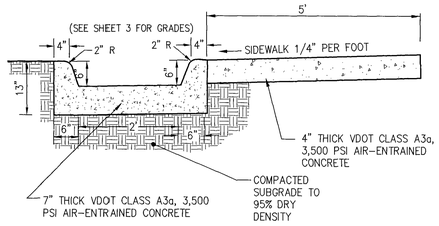
N.T.S.

WHERE ADJOINING EXISTING ASPHALT SURFACES, THE EDGE OF THE EXISTING SURFACE SHALL BE TACK COATED WITH RC-250 GRADE LIQUID ASPHALT AND APPLIED IN ACCORDANCE WITH VDOT SPECIFICATIONS



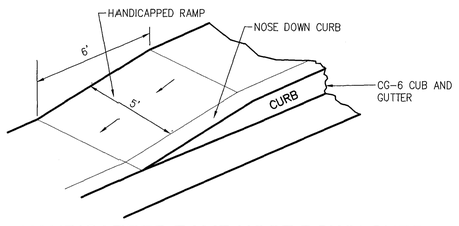
TYPICAL PAVEMENT SECTION

N.T.S.



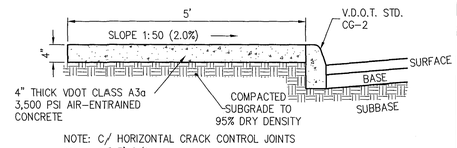
ISLAND CUT THROUGH

N.T.S.



HANDICAPPED RAMP NOSE DOWN CURB DETAIL

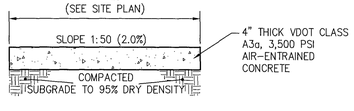
N.T.S.



NOTE: C/ HORIZONTAL CRACK CONTROL JOINTS SHALL BE 5' C/C.

COMBINATION CG-2 AND SIDEWALK

N.T.S.



TYPICAL SIDEWALK SECTION

N.T.S.

Rev.	Date	Description	Revised By
1	3/23/11	REVISION PER JCC COMMENTS	LBA

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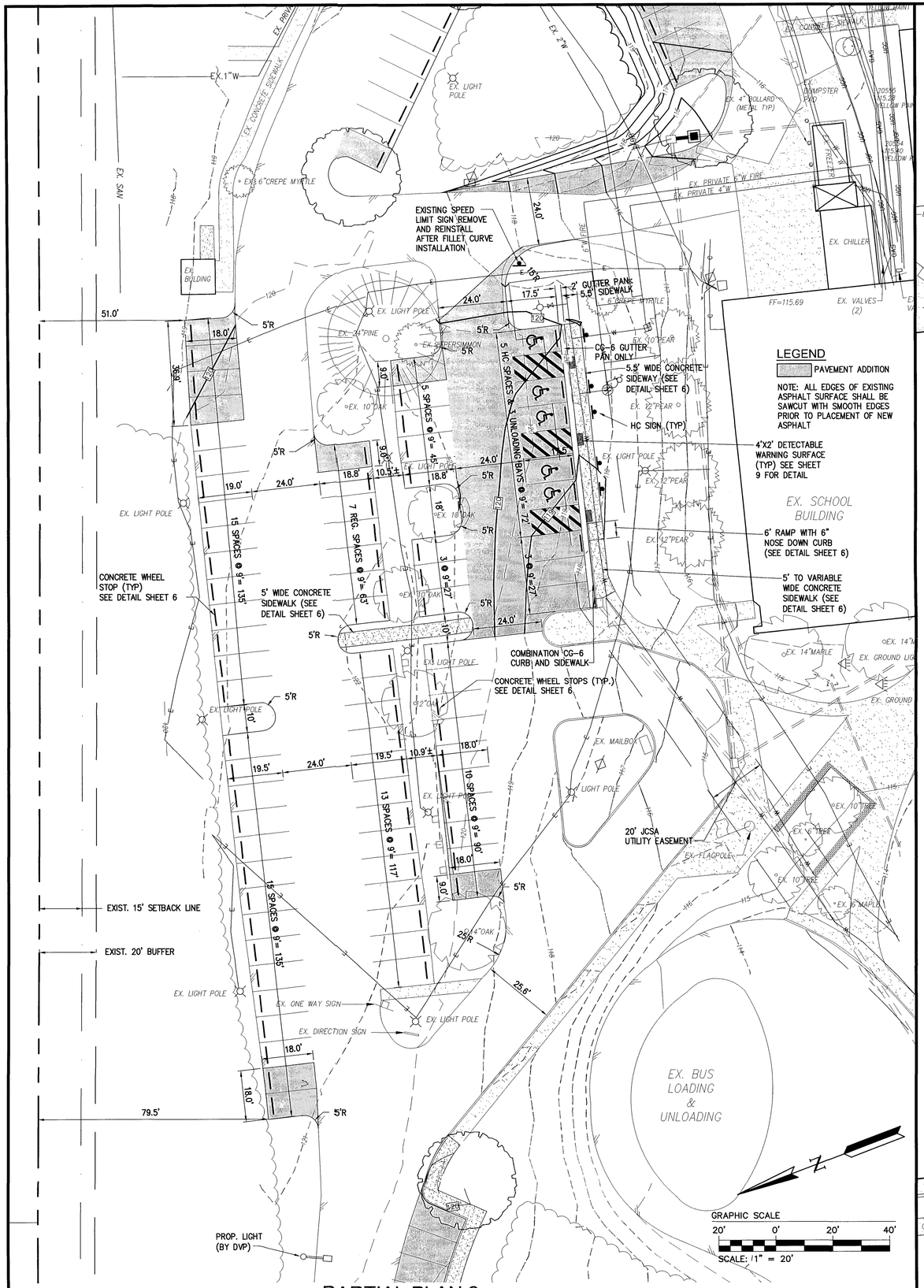
COMMONWEALTH OF VIRGINIA
LICENSED PROFESSIONAL ENGINEER
No. 036 LARRY BRYANT ENGLAND
3/23/11

SITE PLAN AMENDMENT
TO
D. J. MONTAGUE ELEMENTARY SCHOOL
ADDITIONAL PARKING
AND
PLAYGROUND DRAINAGE IMPROVEMENTS
W/JCC PUBLIC SCHOOLS
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Project Contacts:	LBA
Project Number:	10162-00
Scale: AS NOTED	Date: 2/2/11
Sheet Title: SITE LAYOUT PARTIAL PLAN 1 & DETAILS	
Sheet Number	C06

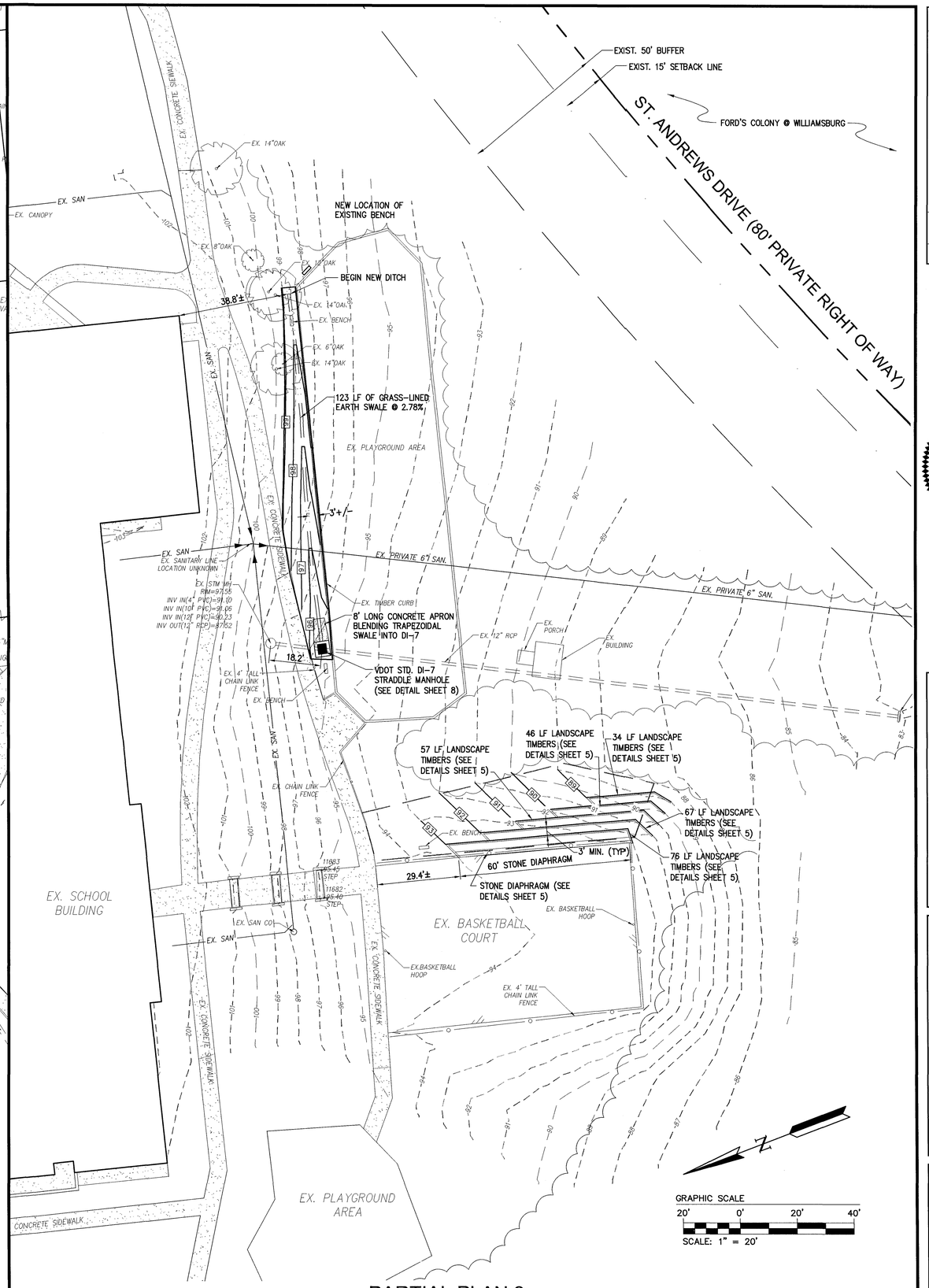


PARTIAL PLAN 2

LEGEND

PAVEMENT ADDITION

NOTE: ALL EDGES OF EXISTING ASPHALT SURFACE SHALL BE SAWCUT WITH SMOOTH EDGES PRIOR TO PLACEMENT OF NEW ASPHALT



PARTIAL PLAN 3

Rev.	Date	Description	Revised By
1	3/23/11	REVISION PER JCC COMMENTS	LBA

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SITE PLAN AMENDMENT
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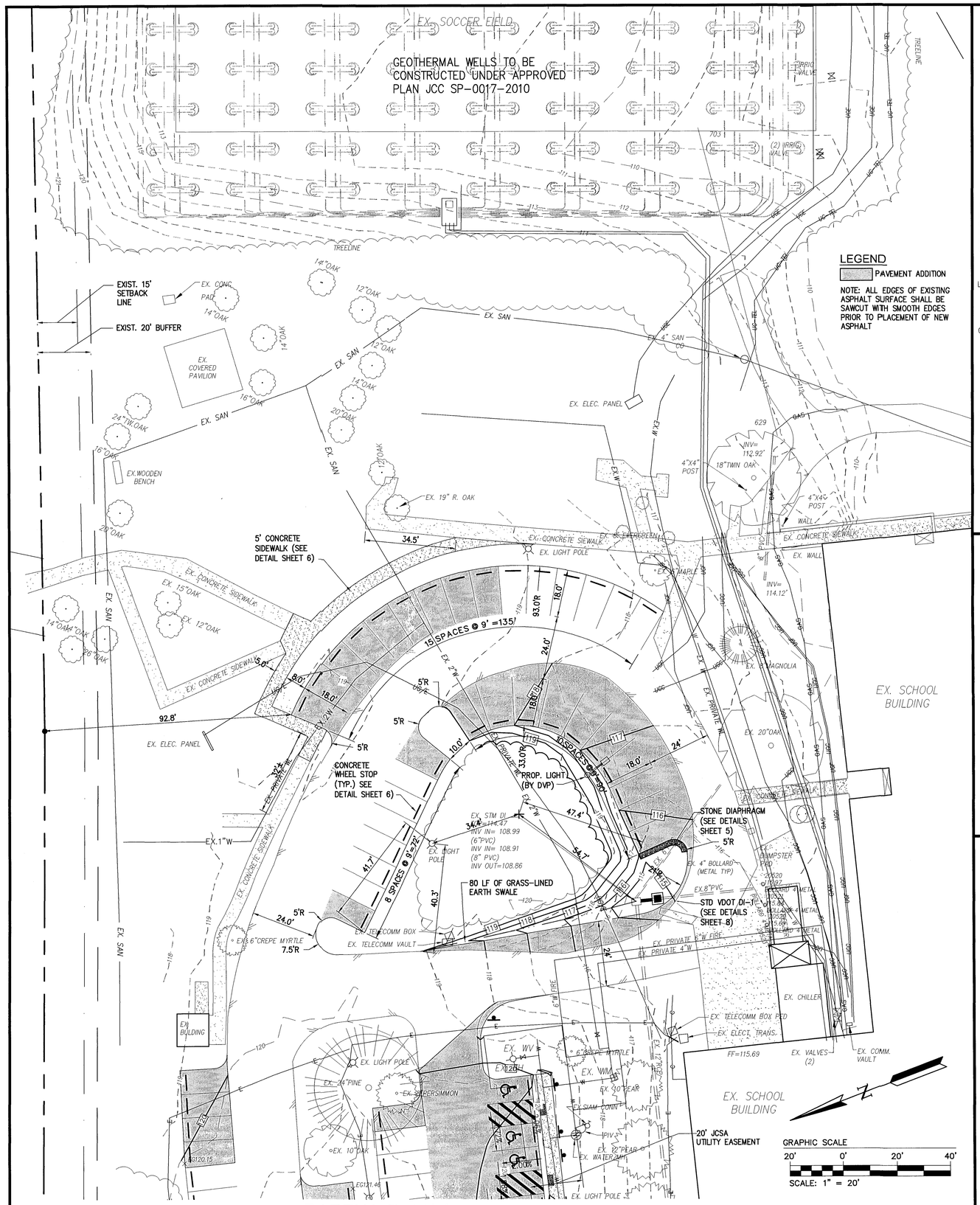
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Project Contacts:	LBA
Project Number:	10162-00
Scale: AS NOTED	Date: 2/2/11

Sheet Title:
SITE LAYOUT
PARTIAL PLAN 2 & 3

Sheet Number
C07

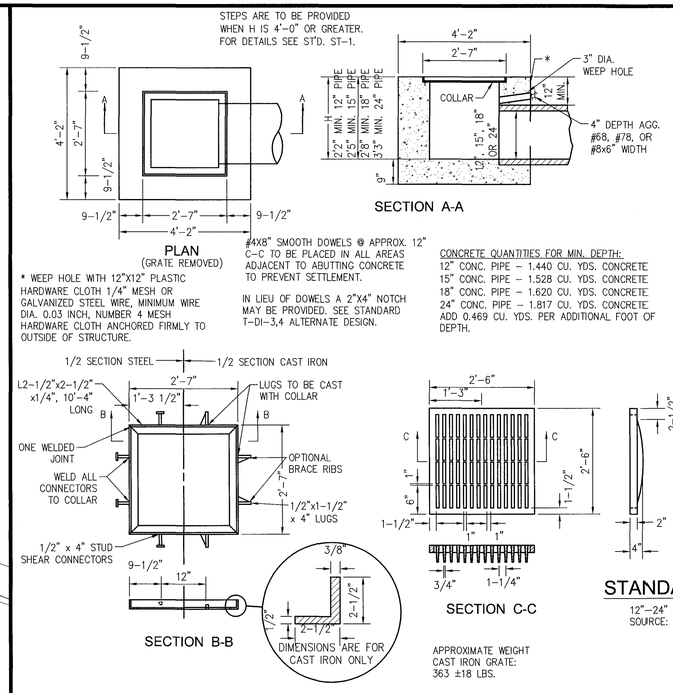


PARTIAL PLAN 4

LEGEND

PAVEMENT ADDITION

NOTE: ALL EDGES OF EXISTING ASPHALT SURFACE SHALL BE SAWCUT WITH SMOOTH EDGES PRIOR TO PLACEMENT OF NEW ASPHALT



NOTES:

MAXIMUM DEPTH (H) TO BE 10'. FOR GREATER DEPTH USE STANDARD DI-1A.

WHEN SPECIFIED ON PLANS THE INVERT IS TO BE SHAPED IN ACCORDANCE WITH STANDARD PLAN IS-1. THE COST OF FURNISHING AND PLACING ALL MATERIALS INCIDENTAL TO THE SHAPING IS TO BE INCLUDED IN THE PRICE BID FOR THE DROP INLET COMPLETE.

THIS ITEM MAY BE PRECAST OR CAST IN PLACE.

ALL CAST IN PLACE CONCRETE TO BE CLASS A3. FOR PRECAST SEE SHEET 103.03.

THE "H" DIMENSIONS SHOWN ON THE STANDARDS AND SPECIFIED ON THE PLANS WILL BE MEASURED FROM THE INVERT OF THE OUTFALL PIPE TO THE TOP OF THE STRUCTURE. PLAN "H" DIMENSIONS ARE APPROXIMATE ONLY FOR ESTIMATING PURPOSES AND THE ACTUAL DIMENSIONS SHALL BE DETERMINED BY THE CONTRACTOR FROM FIELD CONDITIONS.

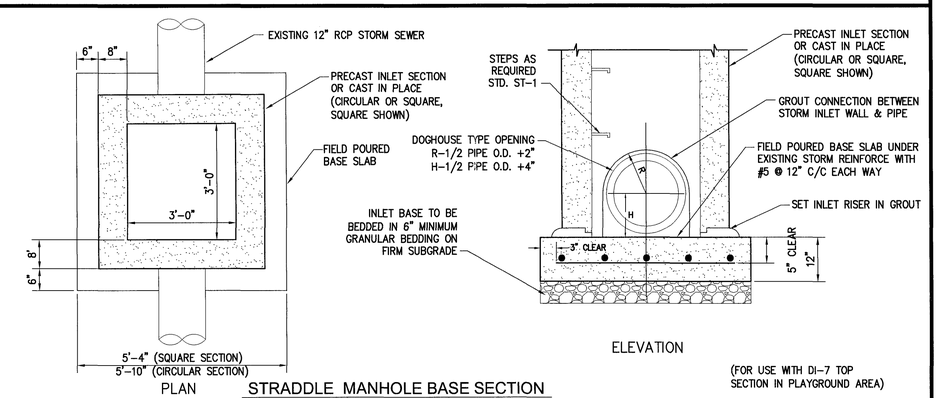
IN THE EVENT THE INVERT OF THE OUTFALL PIPE IS HIGHER THAN THE BOTTOM OF THE STRUCTURE. THE INVERT OF THE STRUCTURE SHALL BE SHAPED WITH CEMENT MORTAR TO PREVENT STANDING OR PONDING OF WATER IN THE STRUCTURE. THE COST FOR INVERT SHAPING SHALL BE INCLUDED IN THE PRICE BID FOR THE STRUCTURE.

NOTES:

ANY ALTERNATE METHODS OF ANCHORAGE, MEETING THE APPROVAL OF THE ENGINEER, MAY BE SUBSTITUTED FOR THE CAST IRON LUGS AS SHOWN HEREON.

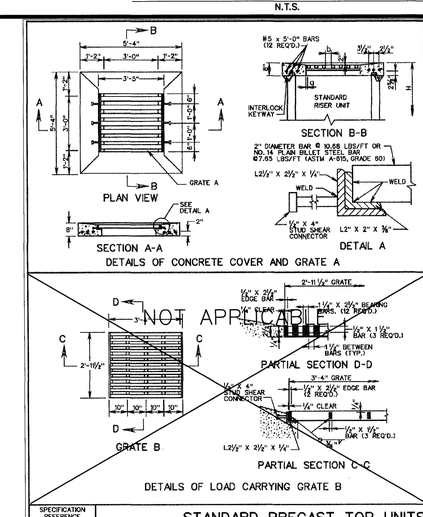
STANDARD DROP INLET DI-1

12"-24" PIPE MAXIMUM DEPTH (H)=10' N.T.S.
SOURCE: VDOT ROAD AND BRIDGE STANDARDS, VOLUME I

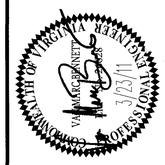


STRADDLE MANHOLE BASE SECTION

N.T.S.



Rev.	Date	Description	Revised By
1	3/23/11	REVISION PER JCC COMMENTS	LBA



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POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Project Contacts:	LBA
Project Number:	10162-00
Scale: AS NOTED	Date: 2/2/11

Sheet Title:
SITE LAYOUT
PARTIAL PLAN 4
AND DETAILS

Sheet Number
C08

JAMES CITY COUNTY ENVIRONMENTAL DIVISION
STANDARD EROSION AND SEDIMENT CONTROL NOTES
REVISED OCTOBER 1, 2009

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

1. 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.
2. MINIMUM STANDARDS # 1 THROUGH # 19 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS (4VAC50–30–40) SHALL APPLY TO THE PROJECT.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. DRAINAGE FACILITIES SHALL BE INSTALLED AND FUNCTIONAL WITHIN 30 DAYS FOLLOWING COMPLETION OF ROUGH GRADING AT ANY POINT WITHIN THE PROJECT.
14. 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.
15. 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.
16. 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.
17. 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.
18. 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.
19. APPLICABLE PROVISIONS OF THE COUNTY BMP MANUAL (JAMES CITY COUNTY GUIDELINES FOR DESIGN AND CONSTRUCTION OF STORMWATER MANAGEMENT BMPS) AND THE VIRGINIA STORMWATER MANAGEMENT HANDBOOK (VSMH) APPLY TO THE PROJECT.
20. 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.
21. 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.
22. ALL STORMWATER FACILITIES INCLUDING BMPS, 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.

MINIMUM CARE LAWN	TOTAL LBS. PER ACRE
COMMERCIAL OR RESIDENTIAL	
–COMMON BERMUDA GRASS**	75 LBS.
OR	
–ZOYSIA GRASS	60 LBS.

** MAY THROUGH OCTOBER, USE HULLED SEED. ALL OTHER SEEDING PERIODS, USE UNHULLED SEED.

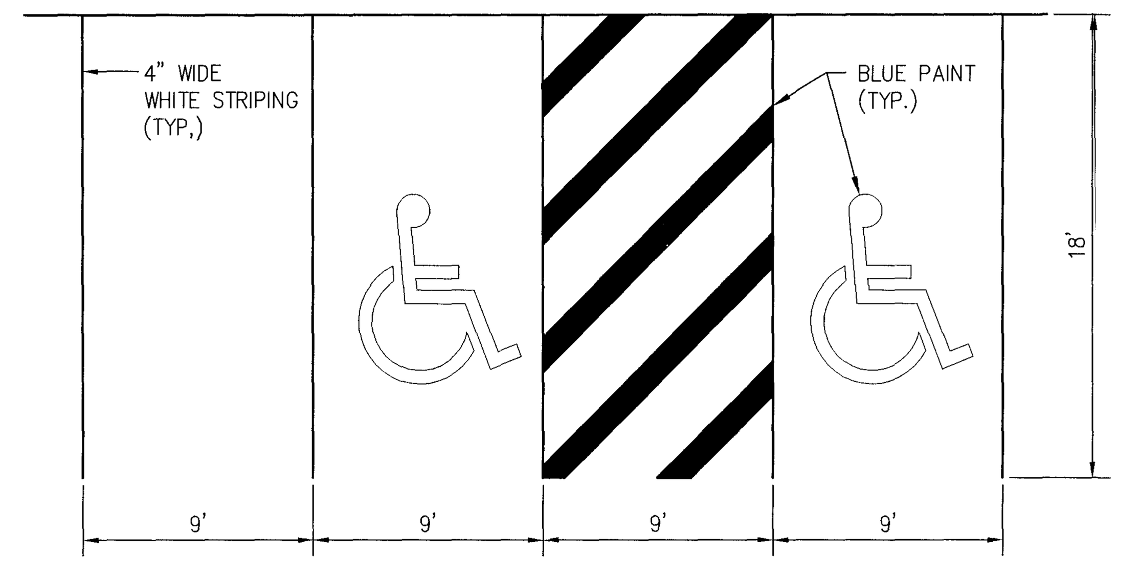
(PS) SITE SPECIFIC SEEDING MIXTURES FOR COASTAL PLAIN AREA

SPECIES	SEEDING RATE		SOUTH (b)			PLANT CHARACTERISTICS
	ACRE	1000 FT SQ.	2/15 TO 4/30	5/1 TO 9/1	9/2 TO 11/15	
OATS (AVENA SATIVA)	3 BU. (UP TO 100 LBS., NOT LESS THAN 50 LBS.)	2 lbs.	X	–	–	Use spring varieties (e.g., Noble).
RYE (SECALE CEREALE)	2 bu. (up to 110 lbs., not less than 50 lbs.)	2.5 lbs.	X	–	X	Use for late fall seedings, winter cover. Tolerates cold and low moisture.
GERMAN MILLET (SETARIA ITALICA)	50 lbs.	approx. 1 lb.	–	X	–	Warm–season annual. Dies at first frost. May be added to summer mixes.
ANNUAL RYEGRASS (LOLIUM MULTI–FLORUM)	60 lbs.	1–1/2 lbs.	X	–	X	May be added in mixes. Will mow out of most stands.
WEEPING LOVEGRASS (ERAGROTIS CURVULA)	15 lbs.	5–1/2 ozs.	–	X	–	Warm–season perennial. May bunch. Tolerates hot, dry slopes and acid, infertile soils. May be added to mixes.
KOREAN LESPEDEZA (LESPEDEZA STIPULACEA)	25 lbs.	approx. 1–1/2 lbs.	X	X	–	Warm–season annual legume. Tolerates acid soils. May be added to mixes.

b: SOUTHERN PIEDMONT AND COASTAL PLAIN.
c: MAY BE USED AS A COVER CROP WITH SPRING SEEDING.
d: MAY BE USED AS A COVER CROP WITH FALL SEEDING.
X: MAY BE PLANTED BETWEEN THESE DATES.
–: MAY NOT BE PLANTED BETWEEN THESE DATES.

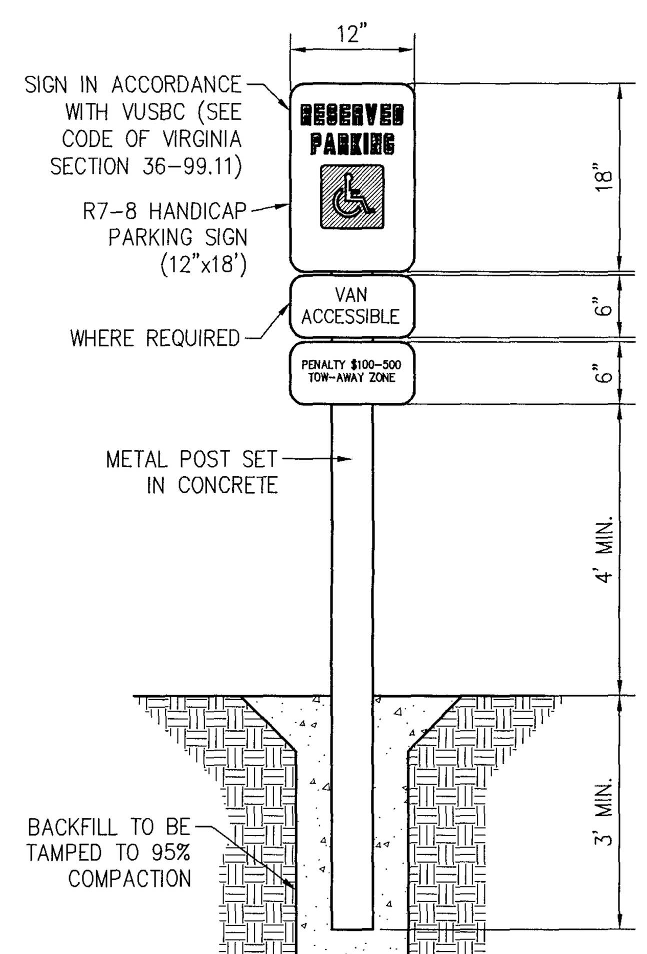
SOURCE: VA. DSWC
TABLE 3.31–C

(TS) TEMPORARY SEEDING
N.T.S.



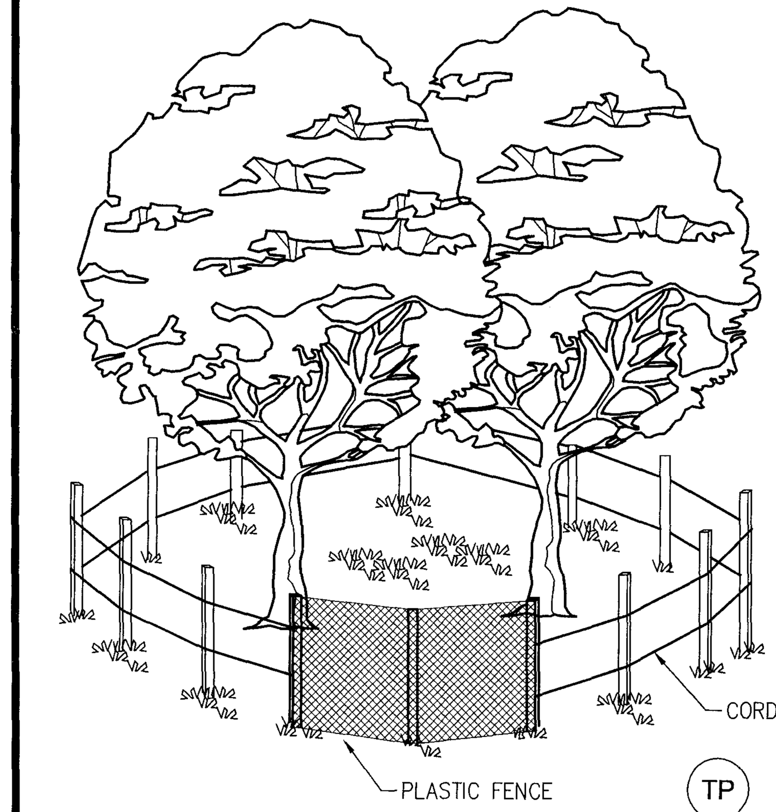
PARKING SPACE DETAIL
N.T.S.

1. PARKING SPACES SHALL BE DELINEATED BY 4" PAVEMENT STRIPING.
2. ALL PARKING SPACES ARE TO BE PROVIDED WITH 4–INCH WHITE PAINTED STRIPING AND HANDICAP ACCESS AISLES WITH 1 FT. WIDE BLUE PAINTED HATCHING. HANDICAP PARKING SPACES SHALL BE DESIGNATED BY ABOVE GROUND SIGNS PER UNIFORM STATEWIDE BUILDING CODE (USBC) REQUIREMENTS.
3. ALL PROPOSED ON–SITE PAVEMENT MARKINGS SHALL BE REFLECTORIZED TYPE A (PAINT) OR TYPE B (PREFORMED OR THERMOPLASTIC MATERIAL) IN ACCORDANCE WITH THE LATEST EDITION OF THE VDOT ROAD AND BRIDGE SPECIFICATIONS. PARKING SPACES SHALL BE DELINEATED BY 4" WHITE LINES, (FEDERAL STANDARD COLOR # 595–17886 OR EQUIVALENT),HANDICAPPED PARKING SPACES SHALL BE DELINEATED BY 4" BLUE LINES (BENNETE'S PAINT BLUE WAVE Q13–28T OR EQUIVALENT) FOR SPACES AND SYMBOLS, FIRE LANES AND PARCEL PICK–UP MARKINGS SHALL BE 4" YELLOW (FEDERAL STANDARD COLOR #595–13538 OR EQUIVALENT).



NOTES:
1. THE SIGN SHALL BE FABRICATED IN ACCORDANCE WITH SECTION 701 AND INSTALLED PER INSTALLATION DETAIL WSP–1 TYPE C OF THE VDOT ROAD AND BRIDGE STANDARDS AND SPECIFICATIONS.
2. VAN ACCESSIBLE SPACES SHALL HAVE ADDITIONAL SIGNAGE READING "VAN ACCESSIBLE".

HANDICAP SIGN DETAIL
N.T.S.



PLASTIC FENCING–40" HIGH "INTERNATIONAL ORANGE" PLASTIC (POLYETHYLENE) WEB FENCING SECURED TO CONVENTIONAL METAL "T" OR "U" POSTS DRIVEN TO A MINIMUM DEPTH OF 18" ON 6' MINIMUM CENTERS SHALL BE INSTALLED AT THE LIMITS OF CLEARING. THE FENCE SHALL HAVE THE FOLLOWING MINIMUM PHYSICAL QUALITIES:

TENSILE YIELD: AVERAGE 2,000 LBS. PER 4' WIDTH (ASTM D638)

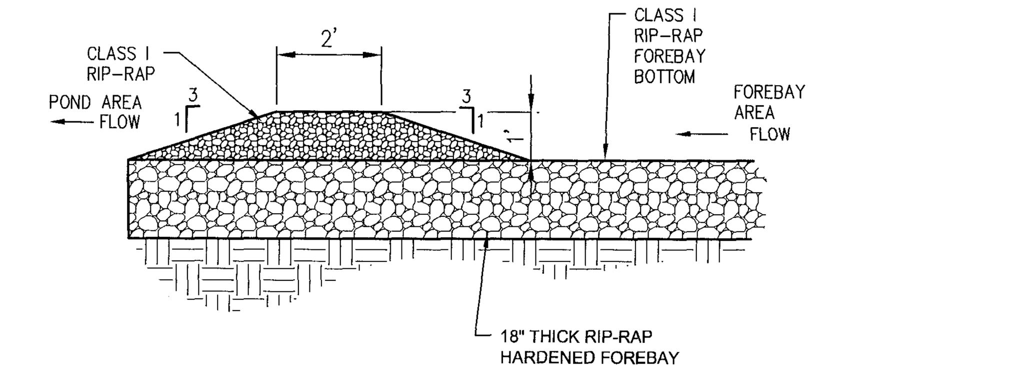
ULTIMATE TENSILE YIELD: AVERAGE 2,900 LBS. PER 4' WIDTH (ASTM D638)

ELONGATION AT BREAK (%): GREATER THAN 1000% (ASTM D638)

CHEMICAL RESISTANCE: INERT TO MOST CHEMICALS AND ACIDS

PLACE FENCE 5' OUTSIDE DRIPLINE

(TP) TREE PROTECTION
N.T.S.

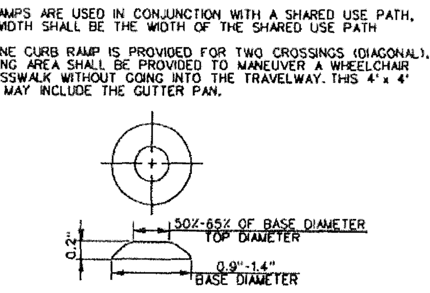


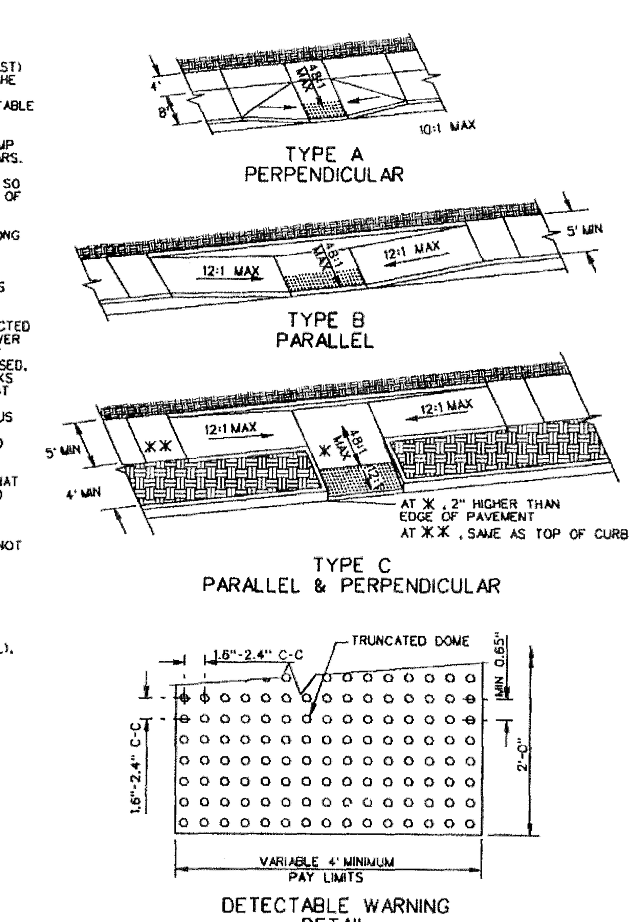
SEDIMENT FOREBAY SECTION

CG-12

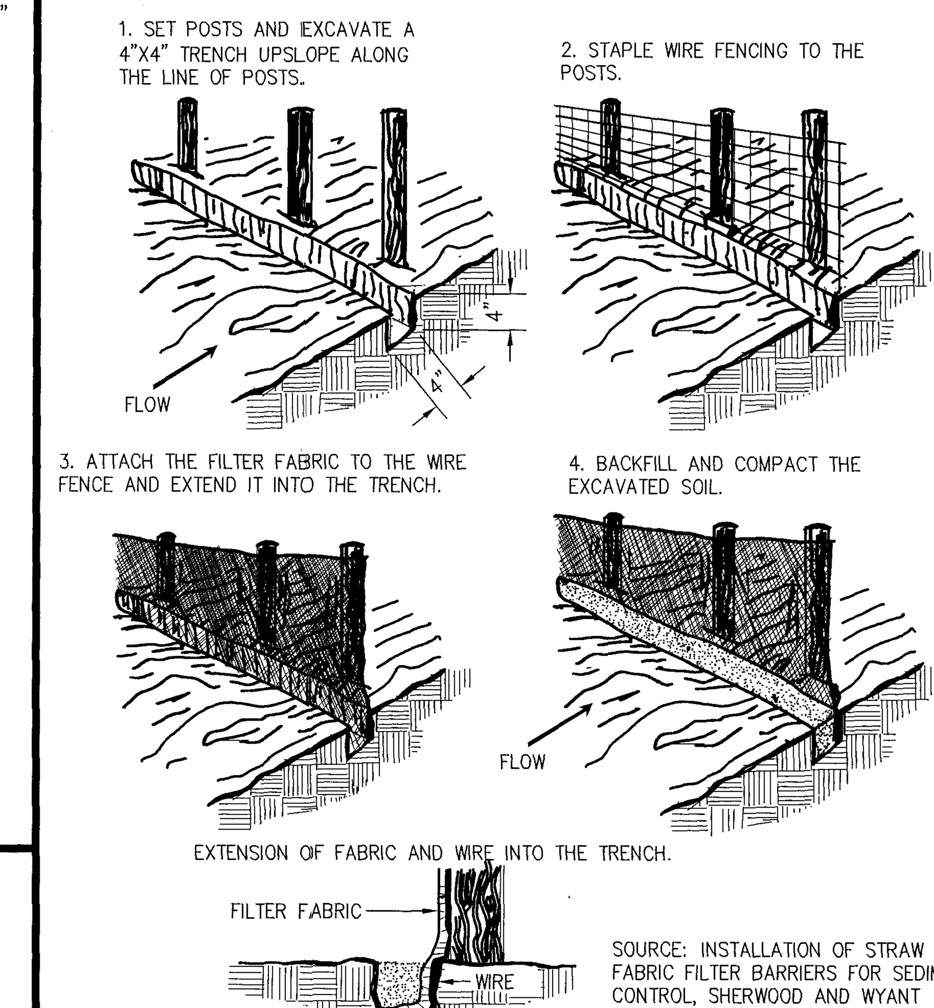
GENERAL NOTES:

1. THE DETECTABLE WARNING SHALL BE PROVIDED BY TRUNCATED DOMES.
2. DETECTABLE WARNING TO BE CLASS A-3 CONCRETE (CLASS A-4 IF PRECAST) WITH SLIP RESISTANT INTEGRAL SURFACE COVERING THE FULL WIDTH OF THE RAMP FLOOR BY 2 FOOT IN LENGTH IN THE DIRECTION OF PEDESTRIAN TRAVEL. OTHER TYPES OF MATERIAL WITH THE TRUNCATED DOMES DETECTABLE WARNING MAY BE USED WITH THE APPROVAL OF THE ENGINEER.
3. SLOPING SIDES OF CURB RAMP MAY BE POURED MONOLITHICALLY WITH RAMP FLOOR OR BY USING PERMISSIBLE CONSTRUCTION JOINT WITH REQUIRED BARS.
4. IF RAMP FLOOR IS PRECAST, HOLES MUST BE PROVIDED FOR DOWEL BARS SO THAT ADJOINING FLARED SIDES CAN BE CAST IN PLACE AFTER PLACEMENT OF PRECAST RAMP FLOOR. PRECAST CONCRETE SHALL BE CLASS A-4.
5. REQUIRED BARS ARE TO BE NO. 5 X 8" PLACED 1' CENTER TO CENTER ALONG BOTH SIDES OF THE RAMP FLOOR, MID-DEPTH OF RAMP FLOOR. MINIMUM CONCRETE COVER 1½".
6. CURB / CURB AND GUTTER SLOPE TRANSITIONS ADJACENT TO CURB RAMPS ARE INCLUDED IN PAYMENT FOR CURB / CURB AND GUTTER.
7. CURB RAMPS ARE TO BE LOCATED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THEY ARE TO BE PROVIDED AT INTERSECTIONS WHEREVER AN ACCESSIBLE ROUTE WITHIN THE RIGHT OF WAY OF A HIGHWAY FACILITY CROSSES A CURB REGARDLESS OF WHETHER SIDEWALK IS EXISTING, PROPOSED, OR NONEXISTENT. THEY MUST BE LOCATED WITHIN PEDESTRIAN CROSSWALKS AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER, AND SHOULD NOT BE LOCATED BEHIND VEHICLE STOP LINES, EXISTING LIGHT POLES, FIRE HYDRANTS, DROP INLETS, ETC. ACCESSIBLE ROUTES PROVIDE A CONTINUOUS UNOBSTRUCTED, STABLE, FIRM AND SLIP RESISTANT PATH CONNECTING ALL ACCESSIBLE ELEMENTS OF A FACILITY THAT CAN BE APPROACHED, ENTERED AND USED BY PEDESTRIANS.
8. RAMPS MAY BE PLACED ON RADIAL OR TANGENTIAL SECTIONS PROVIDED THAT THE CURB OPENING IS PLACED WITHIN THE LIMITS OF THE CROSSWALK AND THAT THE SLOPE AT THE CONNECTION OF THE CURB OPENING IS PERPENDICULAR TO THE CURB.
9. TYPICAL CONCRETE SIDEWALK IS 4" THICK. WHEN THE ENTRANCE RADII CANNOT ACCOMMODATE THE TURNING REQUIREMENTS OF ANTICIPATED HEAVY TRUCK TRAFFIC, REFER TO STANDARD CG-13, COMMERCIAL ENTRANCE (HEAVY TRUCK TRAFFIC) FOR CONCRETE DEPTH.
10. WHEN CURB RAMPS ARE USED IN CONJUNCTION WITH A SHARED USE PATH, THE MINIMUM WIDTH SHALL BE THE WIDTH OF THE SHARED USE PATH.
11. WHEN ONLY ONE CURB RAMP IS PROVIDED FOR TWO CROSSINGS (DIAGONAL), A 4' x 4' LANDING AREA SHALL BE PROVIDED TO MANEUVER A WHEELCHAIR INTO THE CROSSWALK WITHOUT GOING INTO THE TRAVELWAY. THIS 4' x 4' LANDING AREA MAY INCLUDE THE GUTTER PAN.



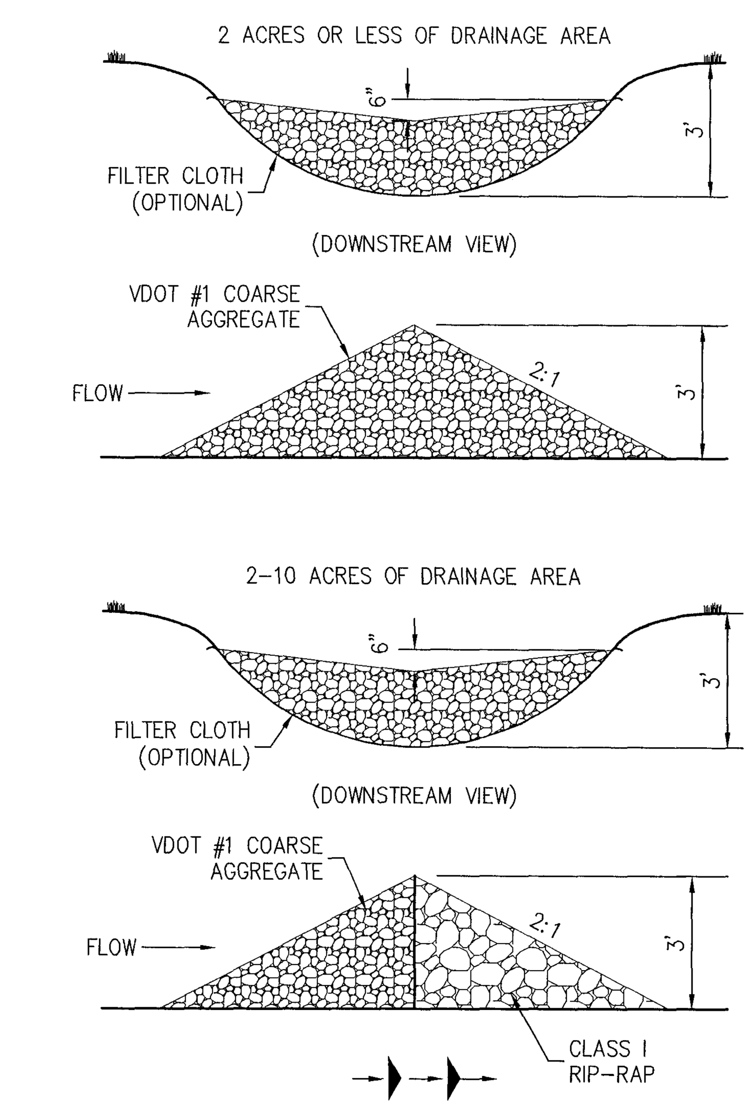


VDOT ROAD AND BRIDGE STANDARDS	CG-12 DETECTABLE WARNING SURFACE (GENERAL NOTES) VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 5 / REVISION DATE 10/09 / 203.05		105 502

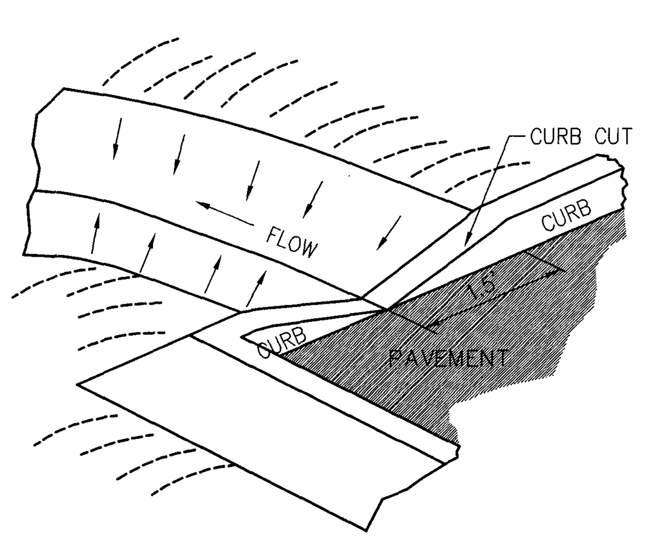


SOURCE: INSTALLATION OF STRAW AND FABRIC FILTER BARRIERS FOR SEDIMENT CONTROL, SHERWOOD AND WYANT PLATE. 3.05–1

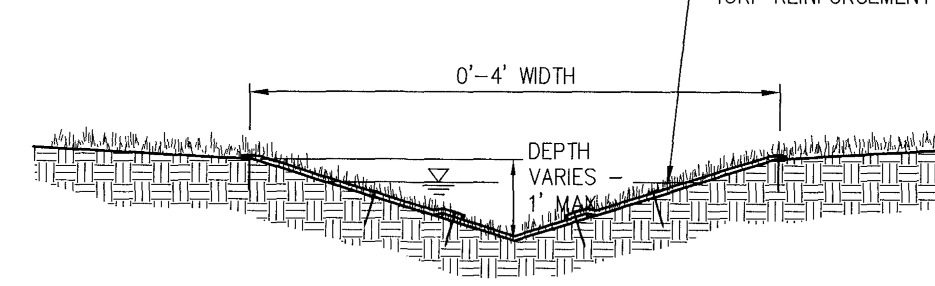
CONSTRUCTION OF A SILT FENCE (SSF) (WITH WIRE SUPPORT)
N.T.S.



(CD) ROCK CHECK DAM
SOURCE: VA. DSWC PLATE. 3.20–1
N.T.S.

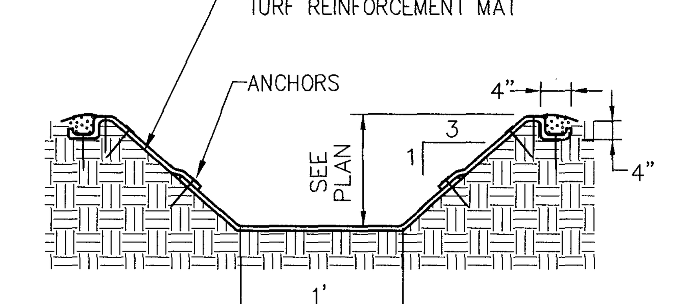


CURB CUT TO PAVED DITCH
N.T.S.



NOTES:
1. THE SWALE BANKS SHALL BE STABILIZED WITH EC–3 (HP–TRM) MATTING AND GRASS.
2. MINIMUM LONGITUDINAL SWALE SLOPE NOTED ON PLAN
3. SWALE SIDE SLOPES TO BE 2:1 MAX.

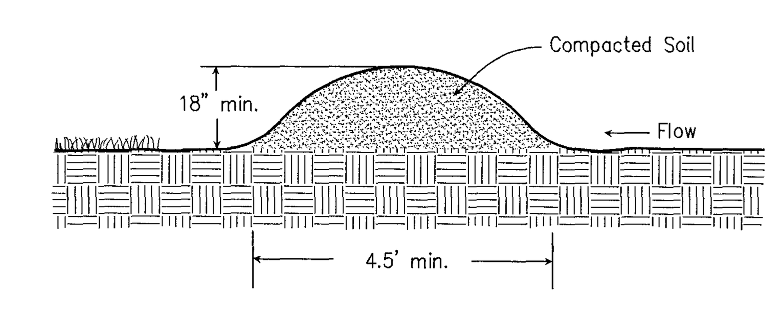
E-E SHT.5 V- DITCH AND HIGH PERFORMANCE TURF REINFORCEMENT MATTING (HP-TRM) DETAIL (SSCP #28)
N.T.S.



NOTE:
1. HIGH PERFORMANCE TURF REINFORCEMENT MAT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.

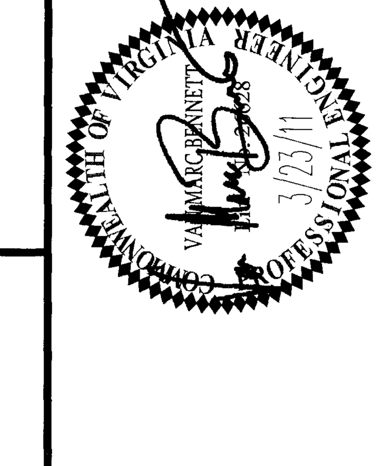
D-D SHT.4 TRAPEZOIDAL DITCH AND HIGH PERFORMANCE TURF REINFORCEMENT MATTING (HP-TRM) DETAIL (SSCP #28)
N.T.S.

TEMPORARY DIVERSION DIKE



(DD)
Plate 3.09-1

Rev.	Date	Description	Revised By
1	3/23/11	REVISION PER JCC COMMENTS	LBA



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SITE PLAN AMENDMENT
TO
D. J. MONTAGUE ELEMENTARY SCHOOL
ADDITIONAL PARKING
AND
PLAYGROUND DRAINAGE IMPROVEMENTS
W/JCC PUBLIC SCHOOLS
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Project Contacts:	LBA
Project Number:	10162-00
Scale: AS NOTED	Date: 2/2/11
Sheet Title:	NOTES & DETAILS
Sheet Number	C09

GENERAL NOTES

1. ALL PLANT STOCK SHALL MEET THE MINIMUM STANDARDS & SPECIFICATIONS DESCRIBED IN THE "AMERICAN STANDARD FOR NURSERY STOCK," LATEST EDITION, PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
2. ALL PLANT MATERIAL SHALL BE INSTALLED AS SPECIFIED IN THE VNLA STANDARDIZED LANDSCAPE SPECIFICATIONS, LATEST EDITION.
3. THE CONTRACTOR SHALL SUPPLY ALL NEW PLANT MATERIAL IN QUANTITIES SUFFICIENT TO COMPLETE ALL PLANTING SHOWN ON THE DRAWINGS. WHERE DISCREPANCIES EXIST BETWEEN THE PLANS & THE PLANT LIST, THE PLANS SHALL TAKE PRECEDENCE.
3. GROUPINGS OF PLANTS SHALL BE MULCHED IN CONTINUOUS PLANT BEDS.
4. AREAS DISTURBED BY CONSTRUCTION, NOT OTHERWISE WITHIN PLANT BEDS OR COVERED IN SITE CONTRACT, ARE TO BE SODDED OR SEEDED WITH A STATE CERTIFIED TURF-TYPE TALL FESCUE VARIETY SELECTED FROM THE FOLLOWING LIST:

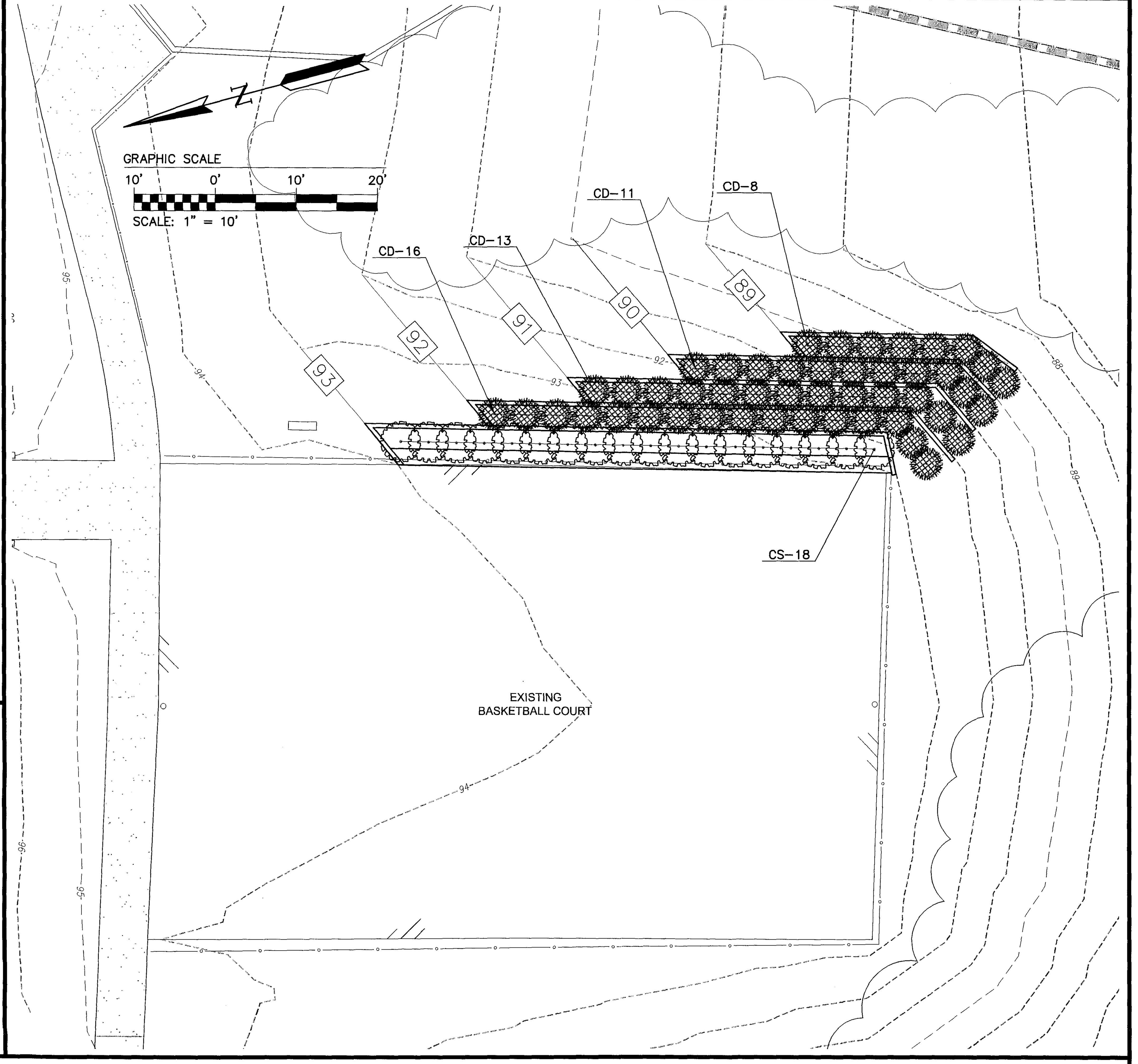
   Biltmore, Bingo, Cochise III, Constitution, Coyote II, Crossfire II, Endeavor, Fidelity, Good-en, Grande, Greenkeeper WAF, Inferno, Kalahari, Magellan, Masterpiece, Onyx, Padre, Picasso, Penn 1901, Quest, Raptor, Rebel Exeda, Rembrandt, Rendition, SR 8250, SR 8300, Tarheel, Titanium, Watchdog, Wolfpack, WPEZE.
5. TREES SUPPORT STAKING IS OPTIONAL FOR TREES THAT ARE 1" CAL. OR 6' HT. OR LESS. ALL TREE STAKING SHALL BE REMOVED AFTER 1-2 GROWING SEASONS.
9. ALL TREES ARE TO BE PLANTED SO TOP OF ROOT BALL IS 3" ABOVE FINISH GRADE.
10. TREE SHALL BE INSTALLED PLUMB & STRAIGHT.
11. PRUNE ALL SUCKERS, RUBBING OR CROSSED BRANCHES, CODOMINANT LEADERS, NARROW CROTCH ANGLES, WATER SPROUTS, BROKEN BRANCHES.
12. DO NOT PRUNE CENTRAL LEADER OR BRANCH TIPS.
13. REMOVE TAGS, LABELS & PLASTIC SLEEVING.
14. DO NOT WRAP TRUNK.
15. IF PLANT MATERIAL IS CONTAINER-GROWN, REMOVE TOP OF WIRE BASKET, OR REMOVE CONTAINER & CUT CIRCLING ROOT; IF FIELD-GROWN, CUT ROPE SURROUNDING BOTTOM OF TREE TRUNK AFTER BACKFILLING BUT BEFORE MULCHING & REMOVE BURLAP FROM TOP 1/3 OF BALL ROOT.
16. REMOVE ALL STAKES, STRAPS, WIRES, RUBBER HOSES, ETC. AFTER 1-2 GROWING SEASONS.
17. PLANT SUBSTITUTIONS WILL NOT BE MADE WITHOUT THE WRITTEN CONSENT OF THE OWNER OR THE OWNER'S DESIGNATED REPRESENTATIVE PRIOR TO INSTALLATION.
18. ALL INSTALLED PLANT MATERIAL SHALL BE SUBJECT TO REGULAR MAINTENANCE, INCLUDING FERTILIZATION, PRUNING, REPLACEMENT, INSECT AND DISEASE CONTROL, WATERING, MULCHING, AND WEED CONTROL.
19. CONTRACTORS ARE RESPONSIBLE FOR LOCATING ALL UTILITIES PRIOR TO THE BEGINNING OF WORK AND AVOIDING THEM DURING LANDSCAPING OPERATIONS.

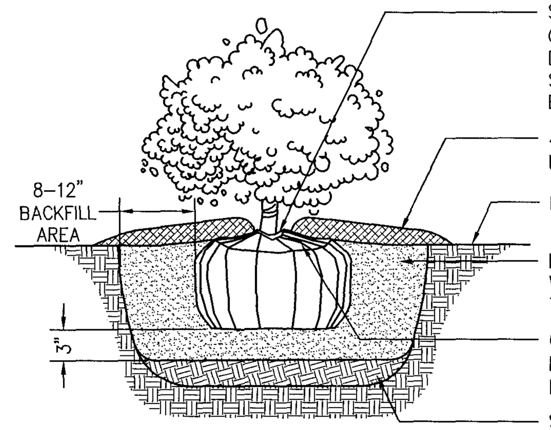
PLANT SCHEDULE

DECIDUOUS TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONT	REMARKS
AR	6	ACER RUBRUM 'RED SUNSET'	RED SUNSET MAPLE	2-1/2" CAL.	B & B	SINGLE STEM
BN	3	BETULA NIGRA 'DURAHEAT'	DURAHEAT RIVER BIRCH	10'-12' HT.	B & B	3-5 CANES
EVERGREEN TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONT	REMARKS
PT	10	PINUS TAEDA	LOBLOLLY PINE	10'-12' HT.	B & B	DENSE FULL
SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONT	REMARKS
AA	35	ARONIA ARBUTIFOLIA 'BRILLIANTISSIMA'	BRILLIANT RED CHOKEBERRY/RED CHOKEBERRY	22"-30" HT./W.	CONT.	DENSE, FULL
CS	18	CORNUS SANGUINEA	DOGWOOD	22"-30" HT./W.	CONT.	DENSE, FULL
CD	48	COTONEASTER DAMMERI	BEARBERRY COTONEASTER	22"-30" HT./W.	CONT.	DENSE, FULL
IV	17	ITEA VIRGINICA 'HENRY'S GARNET'	HENRY'S GARNET SWEETSPIRE	22"-30" HT./W.	CONT.	DENSE, FULL
JC	22	JUNIPERUS CHINENSIS 'PARSONII'	PARSONI JUNIPER	18"-24" HT./W.	CONT.	DENSE, FULL
MC	17	MYRICA CERIFERA	WAX MYRTLE	18"-24" HT./W.	CONT.	DENSE, FULL
OH	44	OSMANTHUS HETEROPHYLLUS 'GOSHIKI'	GOSHIKI HOLLY OLIVE	18"-24" HT./W.	CONT.	DENSE, FULL

JAMES CITY COUNTY LANDSCAPE REQUIREMENTS

AREAS		TREES AND SHRUBS		
LANDSCAPE YARD	COUNTY REQ.	PLANTING RATIO	PLANTS REQUIRED	NEW PLANTS PROVIDED
PARKING LOT	45 ADDITIONAL SPACES	1 TREE AND 2 SHRUBS: 5 PARKING SPACES	9 TREES 50% 5 LG DECIDUOUS 35% 4 EVERGREEN 18 SHRUBS 35% 7 EVERGREEN	11 TREES 6 LG DECIDUOUS 5 EVERGREEN 22 SHRUBS 22 EVERGREEN





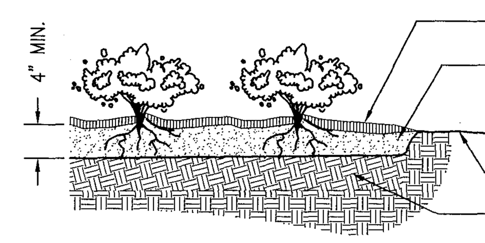
- SET TOP OF ROOTBALL 3" ABOVE FINISH GRADE; COVER EDGES OF ROOTBALL W/ SOIL, TAPERING DOWN TO SURROUNDING SOIL LINE; CUT ROPE SURROUNDING CROWN OF ROOTBALL AFTER BACKFILLING BUT BEFORE MULCHING.
- 4" HT. SAUCER, FILL WITH SHREDDED HARDWOOD MULCH
- EXISTING/FINISH GRADE
- BACKFILL W/ NATIVE TOP SOIL; PARTIALLY BACKFILL, WATER TO SETTLE SOIL; FINISH BACKFILLING; TAMP LIGHTLY
- CUT CIRCLING ROOTS; SCARIFY SIDES BEFORE PLANTING; REMOVE BURLAP FROM TOP 1/3 OF BALL ROOT.
- SCARIFY SUBSOIL TO 4" MIN. DEPTH

SECTION VIEW

NOTES:
1. SPACE AS SHOWN ON PLAN OR AS INDICATED ON PLANT CHART.
2. WATER IMMEDIATELY AFTER PLANTING.

SHRUB PLANTING

NOT TO SCALE



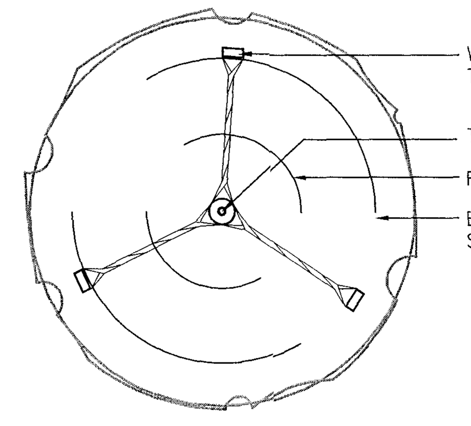
- 3" HT. SHREDDED HARDWOOD MULCH
- REMOVE TOP 4" OF SOIL FROM FINISH GRADE W/IN THE GROUND COVER PLANTING BED. BACKFILL W/ NATIVE TOP SOIL; PARTIALLY BACKFILL, WATER TO SETTLE SOIL. FINISH BACKFILLING; TAMP LIGHTLY
- EXISTING/FINISH GRADE
- SCARIFY SUBGRADE TO 4" MIN. DEPTH

SECTION VIEW

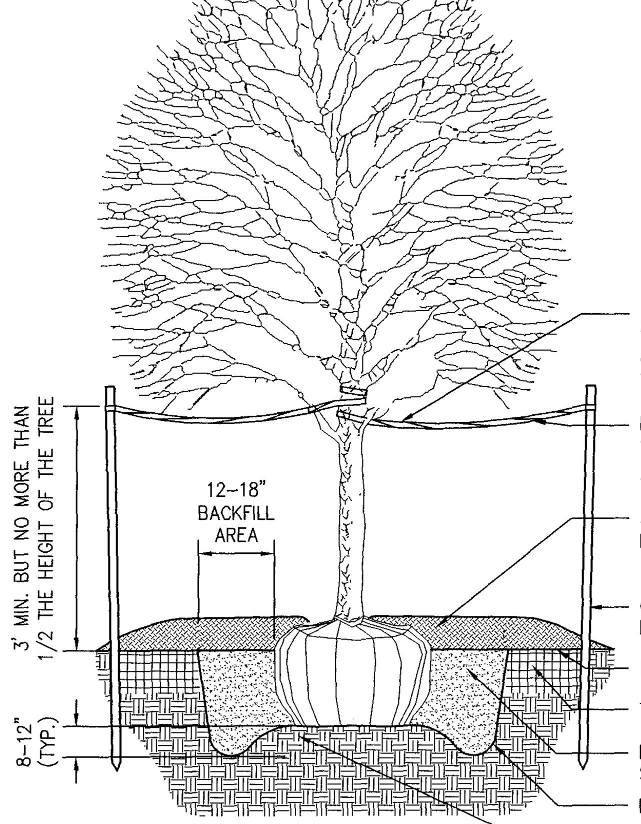
NOTES:
1. SPACE AS SHOWN ON PLAN OR AS INDICATED ON PLANT CHART.
2. WATER IMMEDIATELY AFTER PLANTING.

GROUND COVER PLANTING BED

NOT TO SCALE



PLAN VIEW FOR STAKING

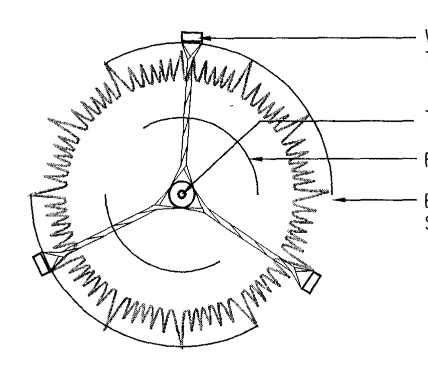


- 2-3" WIDE WEBBING OR POLYETHYLENE STRAPS TWISTED LOOSELY AT THEIR MIDPOINT AND WRAPPED ONCE AROUND THE TREE TRUNK FLAT. ATTACHED TO THE STAKE WITH STAPLES.
- LOOSELY TWIST EACH STRAP TO ALLOW FOR 4-6" OF TRUNK FLEXING (REMOVE ALL STRAPS AND STAKING AFTER 1-2 FULL GROWING SEASONS)
- 3" HT. SHREDDED HARDWOOD MULCH; KEPT AWAY FROM TRUNK. DO NOT COVER THE ROOT COLLAR WITH TOP SOIL OR MULCH.
- 6-8' WOOD STAKES, 3 PER TREE. STAKES TO BE SAME HEIGHT, DRIVEN IN ON A SLIGHT ANGLE.
- EXISTING/FINISH GRADE
- TILL 18" WIDTH AT TOP EDGE OF HOLE TO A 8-12" DEPTH
- BACKFILL W/ NATIVE TOP SOIL; PARTIALLY BACKFILL, WATER TO SETTLE SOIL; FINISH BACKFILLING; TAMP LIGHTLY
- ROUGHEN HOLE WALLS AND BOTTOM
- TRENCH AROUND PERIMETER OF MOUND TO DEPTH SHOWN.

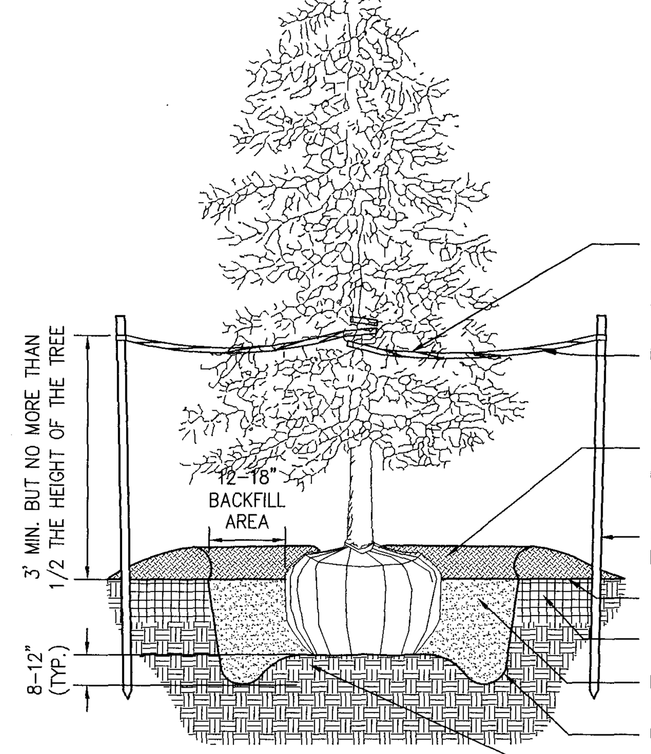
SECTION VIEW

DECIDUOUS TREE PLANTING

NOT TO SCALE



PLAN VIEW FOR STAKING



- 2-3" WIDE WEBBING OR POLYETHYLENE STRAPS TWISTED LOOSELY AT THEIR MIDPOINT AND WRAPPED ONCE AROUND THE TREE TRUNK FLAT. ATTACHED TO THE STAKE WITH STAPLES.
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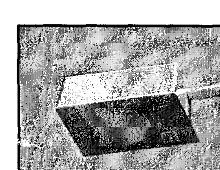
- EXISTING/FINISH GRADE
- TILL 18" WIDTH AT TOP EDGE OF HOLE TO A 8-12" DEPTH
- BACKFILL W/ NATIVE TOP SOIL; PARTIALLY BACKFILL, WATER TO SETTLE SOIL; FINISH BACKFILLING; TAMP LIGHTLY
- ROUGHEN HOLE WALLS AND BOTTOM
- TRENCH AROUND PERIMETER OF MOUND TO DEPTH SHOWN.

SECTION VIEW

EVERGREEN TREE PLANTING

NOT TO SCALE



Dominion

Ultra Flat Lens

The Ultra Flat Lens luminaire provides a full cut-off distribution for lighting parking areas and for roadway lighting.

- Aluminum housing with a grey paint finish.
- Flat glass lens with a Type III distribution directs all light down.
- High pressure sodium lamping in 70, 100, 150, 250, and 400 watts.

Luminaires:

Lamp Type	Nominal Lamp Watts	Nominal Mean Lamp Lumens	Finish Color	Initial Lamp Lumens	Input Wattage	Recommended Mounting Height	Percent Uplight	WMIS CU	Luminaire Stock #
HPS	70	5,000	Grey	6,500	82	25 ft.	0.0 %	LULT5FSV	66303100
HPS	100	8,000	Grey	9,500	120	25 ft.	0.0 %	LULT8FSV	66303300
HPS	150	14,000	Grey	16,000	202	30 ft.	0.0 %	LULT14FSV	66393800
HPS	250	23,000	Grey	27,000	315	30 ft.	0.0 %	LULT23FSV	66393700
HPS	400	42,000	Grey	50,000	460	40 ft.	0.0 %	LULT42FSV	66393900

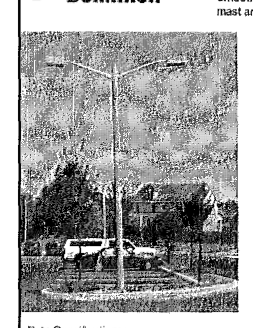
Poles Available:

Smooth Round Tapered Concrete	- Standard
Smooth Round Tapered Heavy Duty Concrete	- Standard
Smooth Round Tapered Grey Composite	- Standard
Smooth Round Tapered Aluminum	- Standard
Smooth Round Tapered Aluminum Bridge	- Premium
Standard Wood	- Standard

Dominion

Pole - Smooth Round Tapered Concrete

Smooth round tapered concrete poles with natural concrete mold finish for mast arm bracket mounted luminaires.



- Poles are directly embeded for use with underground supply conductors.
- Single mast arm or two mast arms at 180 degrees.
- Available for use with:
  - Directional Floodlight Luminaire
  - Enclosed Drop Lens Luminaire
  - Enclosed Flat Lens Luminaire
  - Expressway Luminaire
  - Open Vertical Luminaire
  - Ultra Flat Lens Luminaire
- Class 002T poles are restricted to underground supply conductors only.

Pole Specifications:

Total Length (Feet)	Butt Diameter (Inches)	Groundline Diameter (Inches)	Pole Top Diameter (Inches)	Embed Depth (Feet)	Mast Arm Mounting Height (Feet)	Pole Class	Finish Color	WMIS CU Assembly	Pole Only Stock #
30	9.6	8.6	4.75	6.0	23.0	002T	Natural Concrete	PC30002	50513100
30	10.5	9.5	5.6	6.0	23.0	003T	Natural Concrete	PC30003	50513000
35	10.5	9.5	4.75	6.0	28.0	002T	Natural Concrete	PC35002	50515500
35	11.25	10.3	5.6	6.0	28.0	004T	Natural Concrete	PC35004	50516000
40	12.0	11.0	5.6	6.0	33.0	004T	Natural Concrete	PC40004	50517500
45	12.75	11.7	5.6	6.5	37.5	045T	Natural Concrete	PC45045	50517600

Mast Arms - Brackets:

Arm Length (Feet)	Arm End O.D. (Inches)	Arm Rise (Inches)	Material	Finish Color	Description	WMIS CU Assembly	Arm Only Stock #
2.5 (30")	2.0	10.0	Aluminum	Aluminum	Single member elliptical upswept mast arm	BKTUS30INC	42021268
6.0	2.0	20.0	Aluminum	Aluminum	Single member elliptical upswept mast arm	BKTTTUS06FT	42021269
8.0	2.0	26.0	Aluminum	Aluminum	Single member elliptical upswept mast arm	BKTTTUS08FT	42021270
10.0	2.0	36.0	Aluminum	Aluminum	Single member elliptical upswept mast arm	BKTTTUS10FT	66089000
12.0	2.0	42.0	Aluminum	Aluminum	Single member elliptical upswept mast arm	BKTTTUS12FT	66089200
1.0	N.A.	N.A.	Aluminum	Aluminum	Directional floodlight bracket	BKTDF1	42021266
N.A.	N.A.	N.A.	Aluminum	Aluminum	Directional floodlight arm - use with directional floodlight bracket for mounting 2, 3, or 4 luminaires	BKTDF234	42021267
1.0	N.A.	N.A.	Aluminum	Aluminum	Expressway bracket for non-tenon poles	BKT12EPOH	66084000
N.A.	N.A.	N.A.	Aluminum	Aluminum	Expressway luminaire adapter - use with pole top tenon and expressway bracket for mounting luminaire	LEXADAPTOR	42059940

Many localities have restrictions on light distribution and placement of outdoor lighting equipment. Consult with your local government before selecting outdoor lighting equipment.

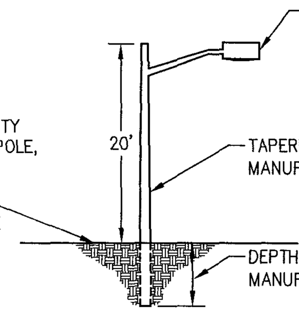
LIGHTING SCHEDULE

FIXTURE TYPE	MOUNTING HEIGHT	POLE TYPE/ MOUNTING INSTRUCTIONS	FIXTURES PER POLE	TOTAL FIXTURES
DOMINION VA POWER MODEL#: LULT14FSV ULTRA FLAT LENS, 150 WATT, HIGH PRESSURE SODIUM, TYPE III COLOR: (MATCH EXISTING)	20'	DOMINION VA POWER SMOOTH ROUND TAPERED CONCRETE POLE (DIRECT-BURY) WITH 6' MAST ARM BRACKET	1	4

LIGHTING NOTES

1. THE DOMINION VIRGINIA POWER SHALL BE RESPONSIBLE FOR: SOURCE OF ELECTRICAL POWER; CIRCUITRY; WIRE SIZE; CONDUIT LAYOUT; AND ANY OTHER ELECTRICAL REQUIREMENTS.
2. DOMINION VIRGINIA POWER SHALL ENSURE THE LIGHT FIXTURE, POLE, POLE BASE, AND CONCRETE BASE ARE COMPATIBLE.
3. INSTALLATION OF POLES AND LIGHTING FIXTURES SHALL BE IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.
4. THE DOMINION VIRGINIA POWER SHALL ENSURE THAT THE POLE DIAMETER, GAUGE, AND CONCRETE BASE MEET OR EXCEED THE MINIMUM LOAD REQUIREMENTS BASED ON FIXTURE COUNT, REGIONAL WIND LOAD STATISTICS, ADDITIONAL BANNERS / POLE ARMS, AND THE FIXTURE SPECIFICATIONS.
5. SITE CONTRACTOR TO COORDINATE WITH DOMINION VIRGINIA POWER IN THE CONSTRUCTION OF NEW POLES AND WIRING.

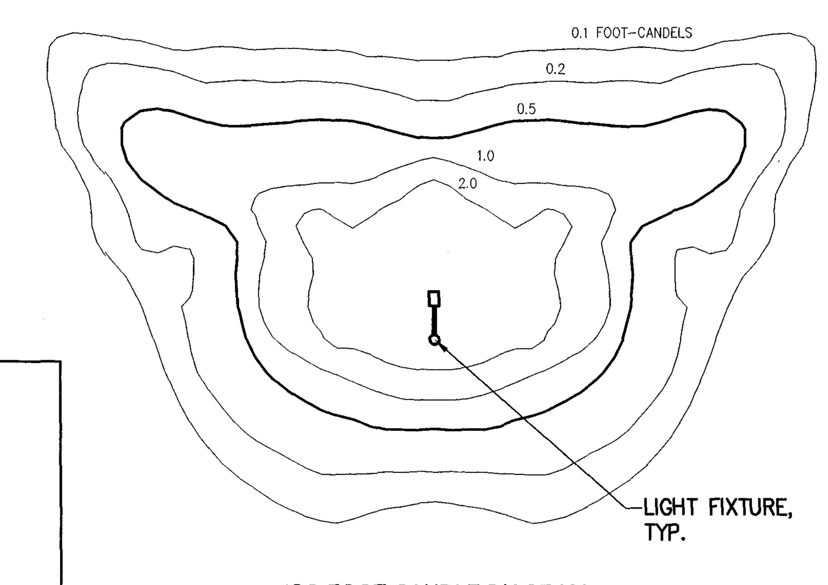
NOTE:
CONTRACTOR SHALL ENSURE COMPATIBILITY OF LIGHT FIXTURE, POLE, AND BASE.



- PROPOSED FINISHED GRADE
- LIGHT FIXTURE. LUMINARIES SHALL BE MOUNTED ON LIGHT POLES HORIZONTALLY AND SHALL BE RECESSED FIXTURES WITH NO BULB, LENS, OR GLOBE EXTENDING BELOW THE CASING.
- TAPERED CONC. POLE. INSTALL PER MANUFACTURER'S SPECIFICATIONS.
- DEPTH VARIES - INSTALL PER MANUFACTURER'S SPECIFICATIONS

TYPICAL DIRECT-BURY TAPERED POLE DETAIL

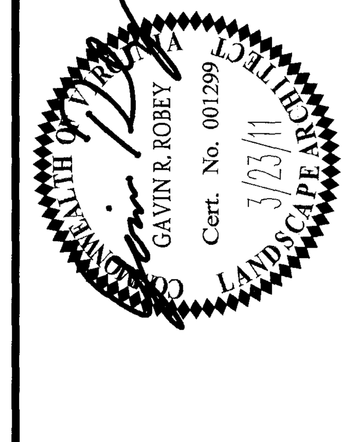
N.T.S.



ISO FOOT-CANDLE DIAGRAM

N.T.S.

Rev.	Date	Description	Revised By
1	3/23/11	REVISION PER JCC COMMENTS	LBA



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SITE PLAN AMENDMENT
TO
D. J. MONTAGUE ELEMENTARY SCHOOL
ADDITIONAL PARKING
AND
PLAYGROUND DRAINAGE IMPROVEMENTS
W/JCC PUBLIC SCHOOLS
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Project Contacts:	LBA
Project Number:	10162-00
Scale: 1"=10'	Date: 2/2/11

Sheet Title:
LANDSCAPE & LIGHTING PLAN / NOTES & DETAILS

Sheet Number
C11

NOTE: EXISTING LIGHT FIXTURE FOOT-CANDLE CONTOURS ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY. NO LIGHT LEVEL MEASUREMENTS WERE TAKEN IN THE FIELD. THE CONTOURS SHOWN ASSUME A SIMILAR FIXTURE WATTAGE AND HEIGHT, AND DOES NOT ACCOUNT FOR LIGHT LEVELS LOST DUE TO AGED BULBS OR FIXTURES.

EXISTING LIGHT FIXTURE, TYP.

PROPOSED LIGHT FIXTURE, TYP.

PROPOSED DUST TO DAWN LIGHT FIXTURE INSTALLED ON EXIST. POWER POLE BY DOMINION POWER

GRAPHIC SCALE 25' 0' 25' 50'
SCALE: 1" = 25'

CENTERVILLE RD. RT. 614

GRAPHIC SCALE 20' 0' 20' 40'
SCALE: 1" = 20'

20' JCSA UTILITY EASEMENT

MATCH LINE SEE THIS SHEET

Rev.	Date	Description	Revised By
1	3/23/11	REVISION PER JCC COMMENTS	LBA

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SITE PLAN AMENDMENT
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WJCC PUBLIC SCHOOLS
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Project Contacts:	LBA
Project Number:	10162-00
Scale: 1"=20'	Date: 2/2/11

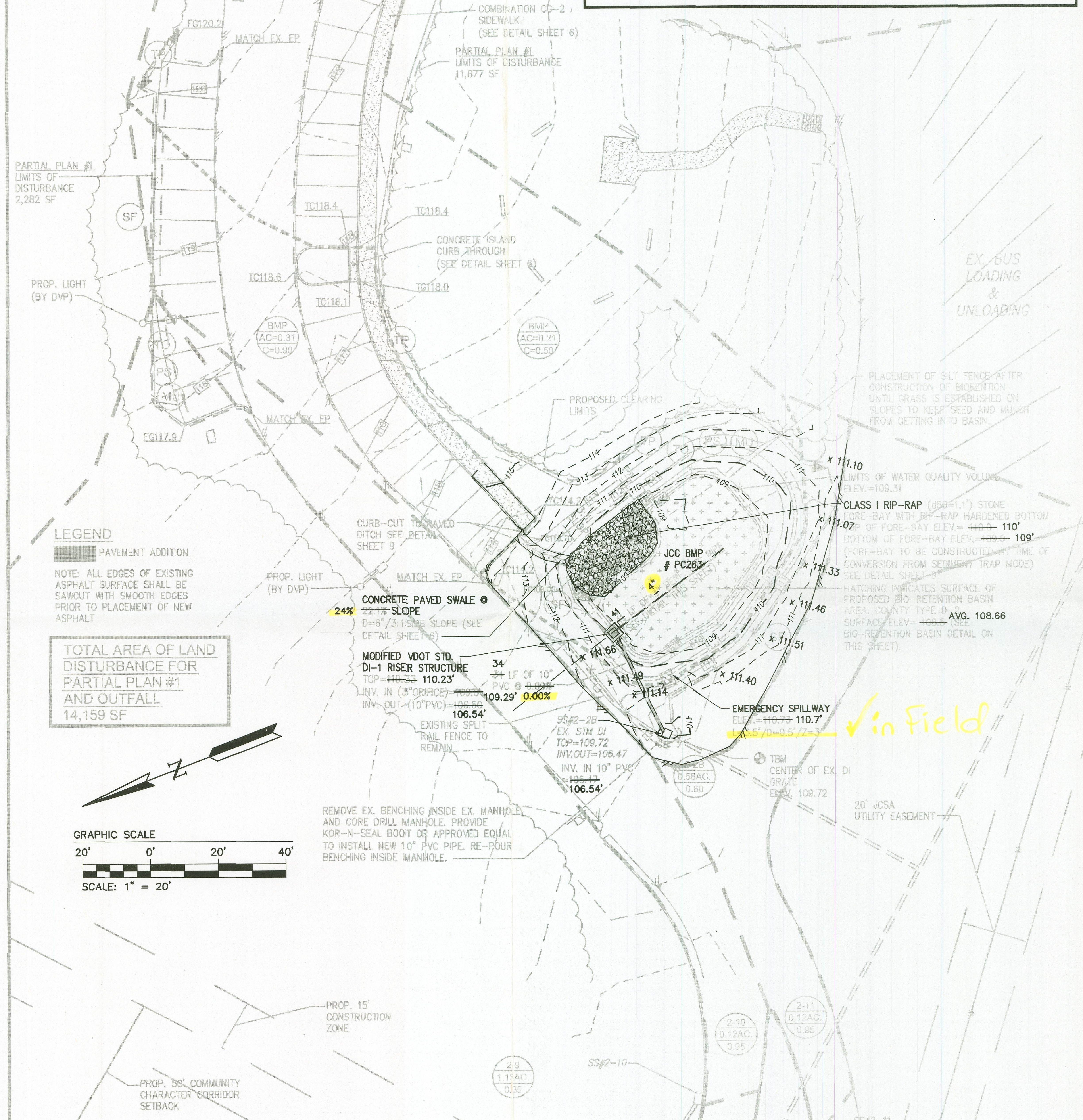
Sheet Title:
LANDSCAPE & LIGHTING PLAN

Sheet Number
C10

"THE STORM DRAINAGE AS-BUILT LOCATIONS AND GRADES SHOWN ON THESE DRAWINGS, ARE ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF AND I CERTIFY THAT I, OR MY AGENT, HAVE MADE SUFFICIENT INSPECTION TO ENSURE THE ACCURACY OF THIS STATEMENT."

Thomas C. Sublett 12/21/11
THOMAS C. SUBLETT DATE

COMMONWEALTH OF VIRGINIA
12/21/2011
THOMAS C. SUBLETT
No. 1886
LAND SURVEYOR



LEGEND

PAVEMENT ADDITION

NOTE: ALL EDGES OF EXISTING ASPHALT SURFACE SHALL BE SAWCUT WITH SMOOTH EDGES PRIOR TO PLACEMENT OF NEW ASPHALT

TOTAL AREA OF LAND DISTURBANCE FOR PARTIAL PLAN #1 AND OUTFALL
14,159 SF

PERMANENT STABILIZATION
PERMANENT SEEDING WILL BE USED TO STABILIZE THE SITE AFTER CONSTRUCTION IS COMPLETE. A SCHEDULE HAS BEEN PROVIDED.

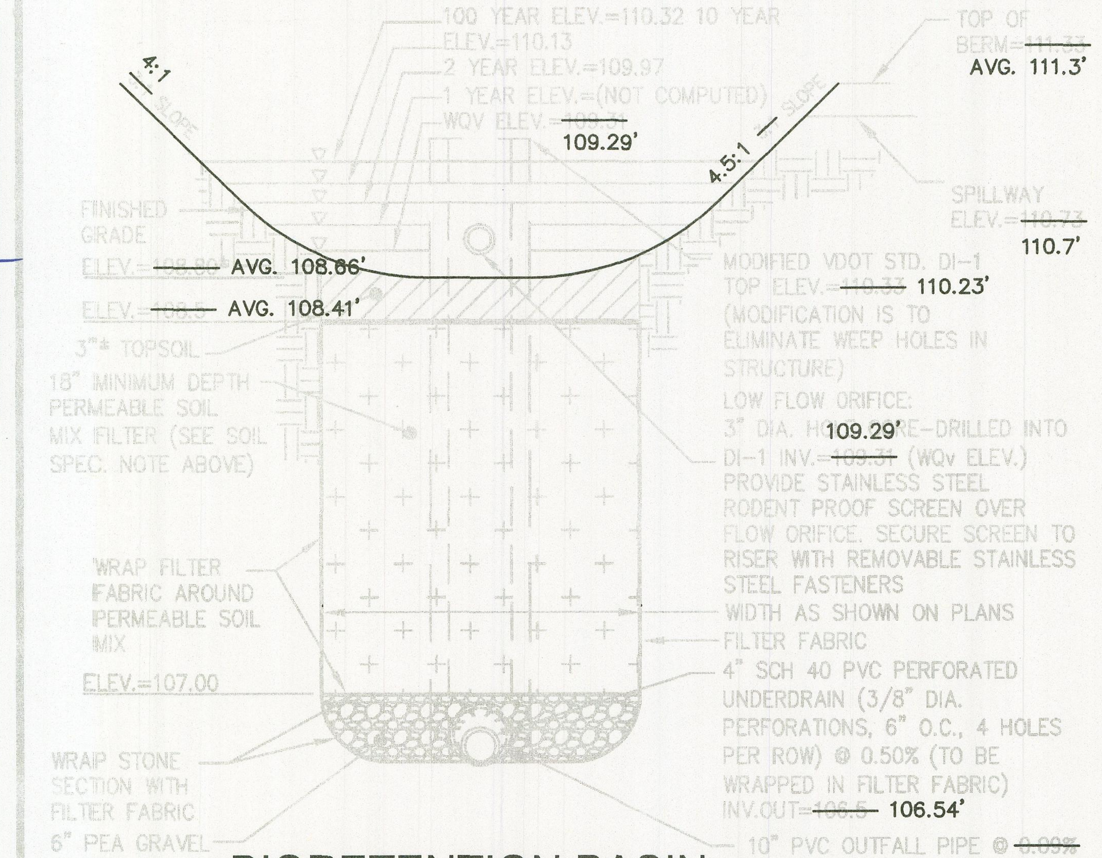
STORMWATER RUNOFF CONSIDERATIONS
STORMWATER GENERATED FROM THE PROJECT SITE WILL BE TREATED BY THE BIORETENTION FACILITY LOCATED AT THE SCHOOL ENTRANCE.

SPECIAL STORMWATER CRITERIA (SSC COMPLIANCE)
THE FOLLOWING IS A LIST OF JAMES CITY COUNTY APPROVED STORMWATER CONTROL MEASURES TO COMPLY WITH THE SPECIAL STORMWATER CONTROL MEASURES. SSC CRITERIA REQUIRES 2 MEASURES FOR DISTURBANCES LESS THAN 1 ACRE. THEY ARE AS FOLLOWS

- SSCP#12 – BIORETENTION BASIN SERVING MAJOR AREA OF PARKING EXPANSION.
- SSCP#28 – ENHANCED CHANNEL STABILIZATION APPLIED TO PROPOSED CHANNELS. (1 UNIT).

MAINTENANCE
ALL TEMPORARY 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. THE BIO-RETENTION CELL SHALL BE MAINTAINED AS OUTLINED IN THE DETAIL LOCATED ON THIS SHEET.

PARTIAL PLAN 1



BIORETENTION BASIN
N.T.S.

MAINTENANCE PROGRAM & SCHEDULE

INSPECT AND REPAIR EROSION	MONTHLY
REMOVAL AND REPLACEMENT OF ALL DISEASED VEGETATION CONSIDERED BEYOND TREATMENT	WHENEVER NEEDED
CHECK FOR ACCUMULATED SEDIMENTS	MONTHLY
INSPECT AND REMOVE ANY DEBRIS THAT MAY COLLECT AT THE 6" OUTLET CULVERT	AFTER MAJOR STORM EVENTS/OR SEMI ANNUALLY
STABILIZATION & RESEEDING OF BARE SPOTS	AS NEEDED
CHECK FOR ACCUMULATED SEDIMENT	MONTHLY
INSPECT & REMOVE DEBRIS THAT MAY COLLECT IN DRY SWALE	AFTER MAJOR EVENT OR SEMI-ANNUALLY

PLANTING REQUIREMENTS

MIXTURE OF GROUND COVERS, SHRUBS, AND TREES SHALL BE PLANTED IN DRY SWALE AREAS.

PERMEABLE SOIL MIX SPECIFICATIONS

THE DRY SWALE AREAS SHALL CONTAIN A PLANTING SOIL MIXTURE OF 50% SAND, 30% LEAF COMPOST (FULLY COMPOSTED, NOT PARTIALLY DECOMPOSED 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 HINDRANCE TO PLANT GROWTH OR MAINTENANCE.

THE TOPSOIL SHALL BE FREE OF PLANTS OR PLANT PARTS OF BERMUDA 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.

NOTES

1. WATER PLANT MATERIAL EACH DAY FOR FOURTEEN CONSECUTIVE DAYS AFTER INSTALLATION.
2. 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.
3. VDOT SHALL BE SAVED HARMLESS FROM THE MAINTENANCE RESPONSIBILITY OR LIABILITY ASSOCIATED WITH ANY FAILURE OF THE STORM WATER MANAGEMENT FACILITY AND ITS STRUCTURES.
4. 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.
5. STANDING WATER SHOULD NOT BE PRESENT FOR MORE THAN A 48 HOUR PERIOD.
6. THE STORMWATER MANGEMENT/BMP FACILITY AS PROPOSED FOR THIS PROJECT WILL REQUIRE SUBMISSION, REVIEW AND APPROVAL OF A RECORD DRAWING (AS-BUILT) AND CONSTRUCTION CERTIFICATION PRIOR TO RELEASE OF THE POSTED BOND/SURETY.
7. THE SWM/BMP FACILITY AS-BUILT DRAWINGS AND CONSTRUCTION CERTIFICATION AND SUBMITTALS ARE TO BE COORDINATED AND PERFORMED BEFORE, DURING AND FOLLOWING CONSTRUCTION IN ACCORDANCE WITH CURRENT COUNTY GUIDELINES.THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE.

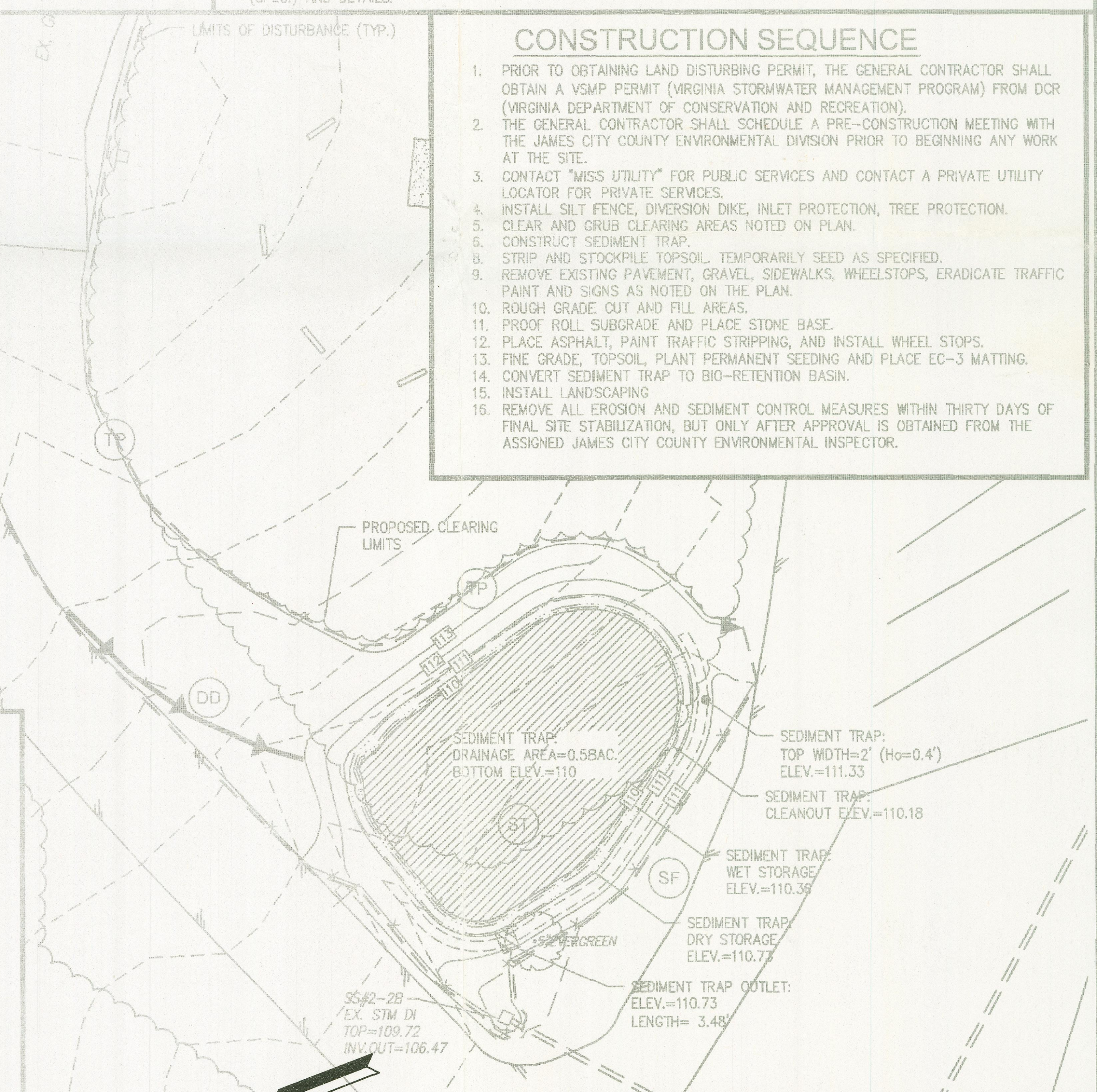
EROSION AND SEDIMENTATION CONTROL LEGEND

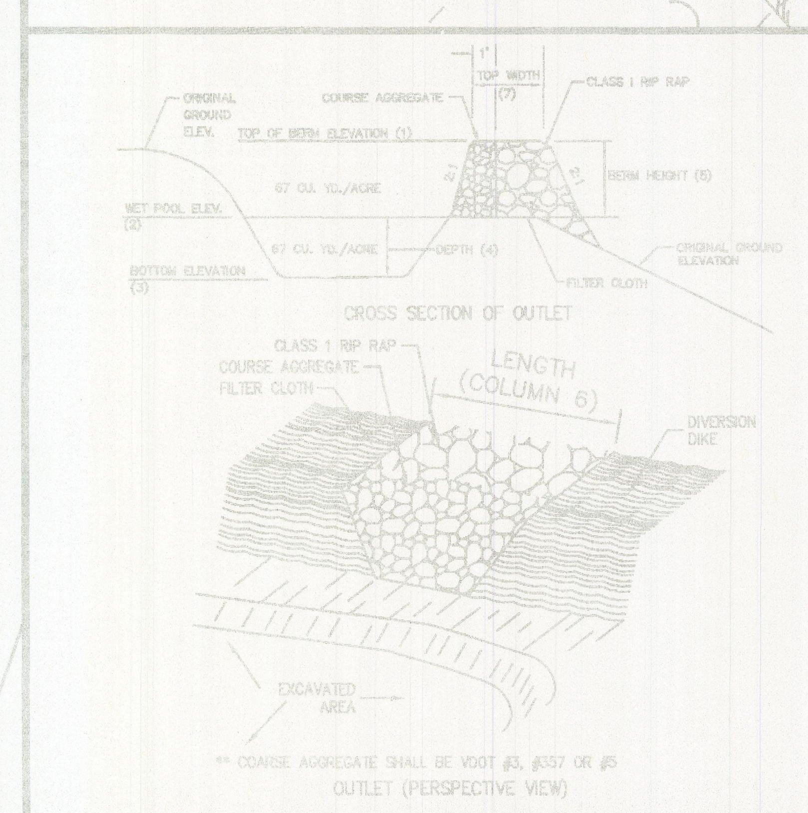
- SF — SILT FENCE (SPEC. 3.05)
- IP — STORM DRAIN INLET PROTECTION (SPEC. 3.07)
- DD — TEMPORARY DIVERSION DIKE (SPEC. 3.09)
- ST — TEMPORARY SEDIMENT TRAP (SPEC. 3.13)
- TO — TOP SOIL (SPEC. 3.30)
- PS — PERMANENT SEEDING (SPEC. 3.32)
- MU — MULCHING (SPEC. 3.35)
- TP — TREE PROTECTION (SPEC. 3.38)

NOTE: SEE VIRGINIA EROSION & SEDIMENT CONTROL HANDBOOK LATEST EDITION FOR EROSION CONTROL SPECIFICATIONS (SPEC.) AND DETAILS.

CONSTRUCTION SEQUENCE

1. PRIOR TO OBTAINING LAND DISTURBING PERMIT, THE GENERAL CONTRACTOR SHALL OBTAIN A VSMP PERMIT (VIRGINIA STORMWATER MANAGEMENT PROGRAM) FROM DCR (VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION).
2. THE GENERAL CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE JAMES CITY COUNTY ENVIRONMENTAL DIVISION PRIOR TO BEGINNING ANY WORK AT THE SITE.
3. CONTACT "MISS UTILITY" FOR PUBLIC SERVICES AND CONTACT A PRIVATE UTILITY LOCATOR FOR PRIVATE SERVICES.
4. INSTALL SILT FENCE, DIVERSION DIKE, INLET PROTECTION, TREE PROTECTION.
5. CLEAR AND GRUB CLEARING AREAS NOTED ON PLAN.
6. CONSTRUCT SEDIMENT TRAP.
8. STRIP AND STOCKPILE TOPSOIL. TEMPORARILY SEED AS SPECIFIED.
9. REMOVE EXISTING PAVEMENT, GRAVEL, SIDEWALKS, WHEELSTOPS, ERADICATE TRAFFIC PAINT AND SIGNS AS NOTED ON THE PLAN.
10. ROUGH GRADE CUT AND FILL AREAS.
11. PROOF ROLL SUBGRADE AND PLACE STONE BASE.
12. PLACE ASPHALT, PAINT TRAFFIC STRIPPING, AND INSTALL WHEEL STOPS.
13. FINE GRADE, TOPSOIL, PLANT PERMANENT SEEDING AND PLACE EC-3 MATTING.
14. CONVERT SEDIMENT TRAP TO BIO-RETENTION BASIN.
15. INSTALL LANDSCAPING
16. 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.





	TOP OF BERM	WET POOL ELEV.	BOTTOM ELEV.	DEPTH	BERM HEIGHT	LENGTH	TOP WIDTH	DRAIN AREA	WET VOLUME	TOTAL VOLUME
SEDIMENT TRAP #	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(ACRES)	(CU. FT.)	(CU. FT.)
1	111.33	110.36	110.0	0.36'	1.33'	3.48'	2.0'	0.58	1,049	1,049

SOURCE: VA. DSMC PLATE. 3.13-2

TEMPORARY SEDIMENT TRAP
N.T.S.

SEDIMENT TRAP CONSTRUCTION NOTES:

1. THE CONTRACTOR IS TO UTILIZE THE BASIN OF THE DRY SWALE AS THE BASIN FOR THE TEMPORARY SEDIMENT TRAP.
2. THE SEDIMENT TRAP SHALL NOT BE EXCAVATED BELOW ELEVATION 110 TO ENSURE UNDERLYING SOIL INTEGRITY OF THE PROPOSED BIORETENTION BASIN.
3. THE CONTRACTOR SHALL NOT CONVERT THE SEDIMENT TRAP TO THE FINAL BIORETENTION UNTIL THE JAMES CITY COUNTY ENVIRONMENTAL INSPECTOR HAS BEEN SATISFIED THAT THE CONTRIBUTING DRAINAGE AREA HAS BEEN ADEQUATELY STABILIZED.
4. UPON APPROVAL FROM THE INSPECTOR THE CONTRACTOR SHALL REMOVE ANY ACCUMULATED SEDIMENT FROM THE BASIN PRIOR TO EXCAVATING THE REMAINDER OF THE BASIN AND THE BIORETENTION BASIN FILTER VOLUME. INSTALLATION OF THE UNDERLYING TRENCH DRAINAGE PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAIL ON THIS SHEET.

PARTIAL PLAN 1 - E&S PLAN

Rev	Date	Description	Revised By
2	12/21/11	BIORETENTION BASIN AND STORM SWEWER ASBUILT	JFS
1	3/23/11	REVISION PER JCC COMMENTS	LBA

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RECORD DRAWING FOR STORM AS-BUILTS
D. J. MONTAGUE ELEMENTARY SCHOOL
ADDITIONAL PARKING AND PLAYGROUND DRAINAGE IMPROVEMENTS
W/JCC PUBLIC SCHOOLS
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Project Contacts:	LBA/TCS
Project Number:	9888-34 XREF- 10162-00
Scale: AS NOTED	Date: 9/28/11

Sheet Title: RECORD DRAWING FOR BIORETENTION BASIN

Sheet Number R03

RECORD DRAWING 12/21/11 (JCC PLAN SP-0008-2011)

NOTE:
UTILITY EASEMENTS DENOTED AS "JCSA UTILITY EASEMENTS" ARE FOR THE EXCLUSIVE USE OF THE JCSA AND THE PROPERTY OWNER. OTHER UTILITY SERVICE PROVIDERS DESIRING TO USE THESE EASEMENTS WITH THE EXCEPTION OF PERPENDICULAR UTILITY CROSSINGS MUST OBTAIN AUTHORIZATION FOR ACCESS AND USE FROM THE JCSA AND THE PROPERTY OWNER. ADDITIONALLY, JCSA SHALL NOT BE HELD RESPONSIBLE FOR ANY DAMAGE TO IMPROVEMENTS WITHIN THIS EASEMENT, FROM ANY CAUSE.

"THE STORM DRAINAGE AS-BUILT LOCATIONS AND GRADES SHOWN ON THESE DRAWINGS, ARE ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF AND I CERTIFY THAT I, OR MY AGENT, HAVE MADE SUFFICIENT INSPECTION TO ENSURE THE ACCURACY OF THIS STATEMENT."

THOMAS C. SUBLETT — DATE 12/21/11

COMMONWEALTH OF VIRGINIA
12/21/2011
THOMAS C. SUBLETT
No. 1886
LAND SURVEYOR

EROSION AND SEDIMENTATION CONTROL LEGEND

- SF — SILT FENCE (SPEC. 3.05)
- IP — STORM DRAIN INLET PROTECTION (SPEC. 3.07)
- CD — CHECK DAM (SPEC. 3.20)
- TO — TOP SOIL (SPEC. 3.30)
- PS — PERMANENT SEEDING (SPEC. 3.32)
- MU — MULCHING (SPEC. 3.35)
- EC-3 — TREATMENT 2 SOIL STABILIZATION MATTING (SPEC. 3.36)
- TP — TREE PROTECTION (SPEC. 3.38)

NOTE:
SEE VIRGINIA EROSION & SEDIMENT CONTROL HANDBOOK LATEST EDITION FOR EROSION CONTROL SPECIFICATIONS (SPEC.) AND DETAILS.

Rev.	Date	Description	Revised By
2	12/21/11	BIORETENTION BASIN AND STORM SWEWER AS-BUILT	JFS
1	3/23/11	REVISION PER JCC COMMENTS	LBA

EX. SCHOOL BUILDING

EX. BUS LOADING & UNLOADING

TOTAL AREA OF LAND DISTURBANCE FOR PARTIAL PLAN #2 9,153 SF

LEGEND
PAVEMENT ADDITION
NOTE: ALL EDGES OF EXISTING ASPHALT SURFACE SHALL BE SAWCUT WITH SMOOTH EDGES PRIOR TO PLACEMENT OF NEW ASPHALT

GRAPHIC SCALE 20' 0' 20' 40'
SCALE: 1" = 20'

PARTIAL PLAN 2

EXIST. 50' BUFFER

ST ANDREWS (80' PRIVATE RIGH

EXIST. 15' SETBACK LINE

VDOT STD. DI-7 (STRADDLE MANHOLE) WITH TYPE III GRATE TO BE CONSTRUCTED OVER EX. 12" RCP
TOP 95.02'
INV: 86.85'

TOTAL AREA OF LAND DISTURBANCE FOR PARTIAL PLAN #3 3,686 SF

GRAPHIC SCALE 20' 0' 20' 40'
SCALE: 1" = 20'

PARTIAL PLAN 3

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RECORD DRAWING
FOR STORM AS-BUILTS
D. J. MONTAGUE ELEMENTARY SCHOOL
ADDITIONAL PARKING
AND
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W/JCC PUBLIC SCHOOLS
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Project Contacts:	LBA/TCS
Project Number:	8888-34 XREF: 10182-00
Scale: AS NOTED	Date: 9/28/11
Sheet Title: RECORD DRAWING FOR STORM STRUCTURES	
Sheet Number: R04	

RECORD DRAWING 12/21/11 (JCC PLAN SP-0008-2011)

NOTE:
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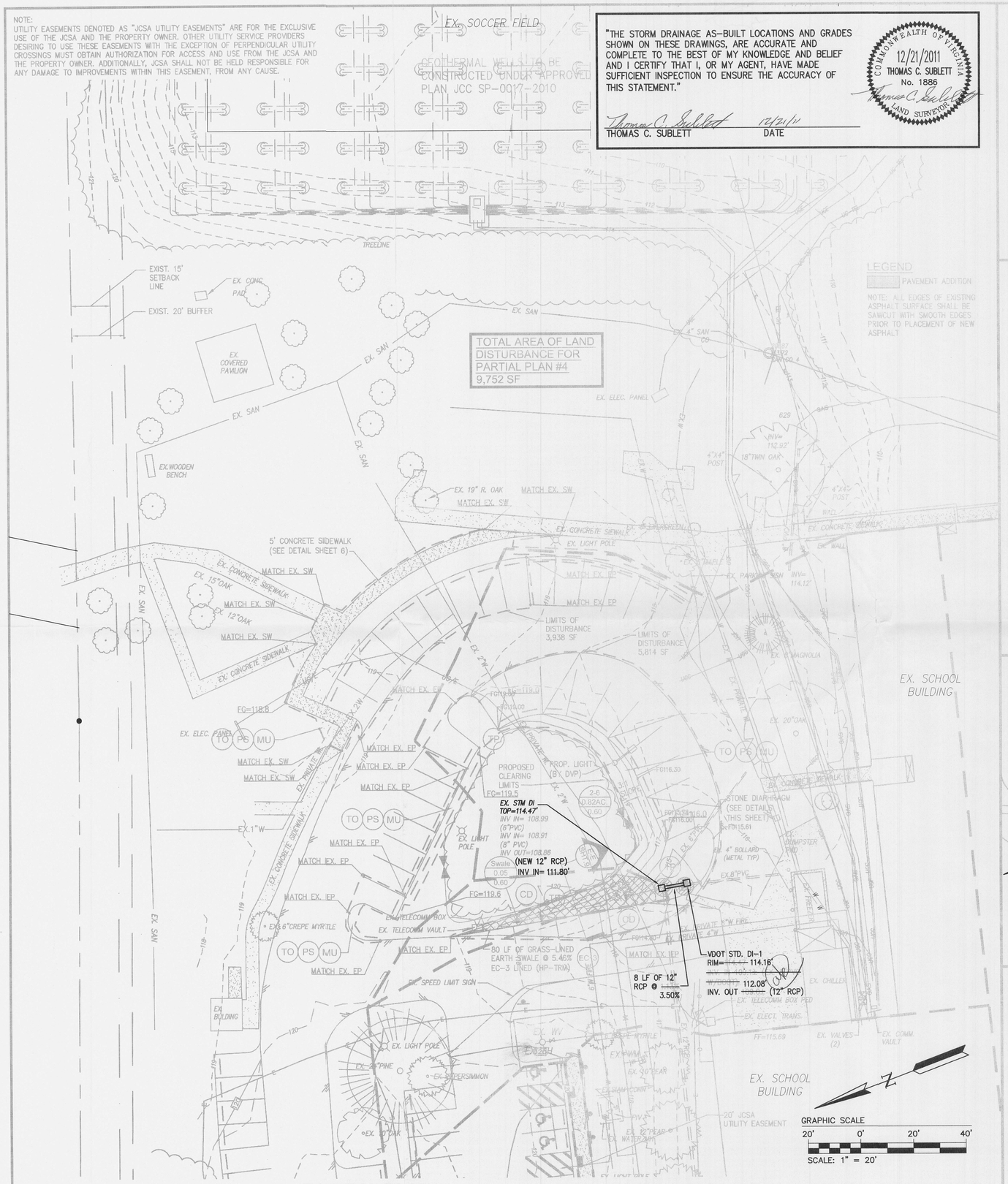
"THE STORM DRAINAGE AS-BUILT LOCATIONS AND GRADES SHOWN ON THESE DRAWINGS, ARE ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF AND I CERTIFY THAT I, OR MY AGENT, HAVE MADE SUFFICIENT INSPECTION TO ENSURE THE ACCURACY OF THIS STATEMENT."

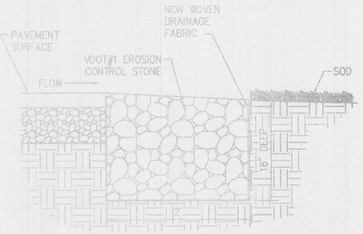
Thomas C. Sublett 12/21/11
THOMAS C. SUBLETT DATE

COMMONWEALTH OF VIRGINIA
12/21/2011
THOMAS C. SUBLETT
No. 1886
LAND SURVEYOR



PARTIAL PLAN 4

LEGEND
PAVEMENT ADDITION
NOTE: ALL EDGES OF EXISTING ASPHALT SURFACE SHALL BE SAWCUT WITH SMOOTH EDGES PRIOR TO PLACEMENT OF NEW ASPHALT



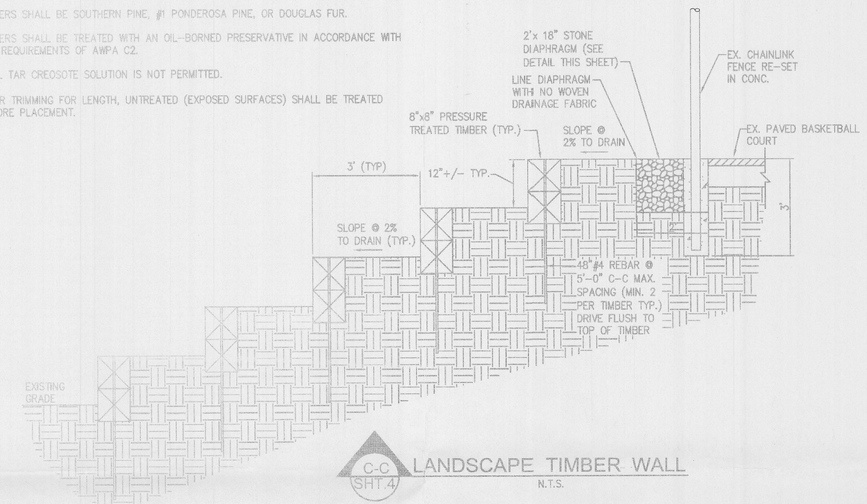
STONE DIAPHRAGM
N.T.S.

EROSION AND SEDIMENTATION CONTROL LEGEND

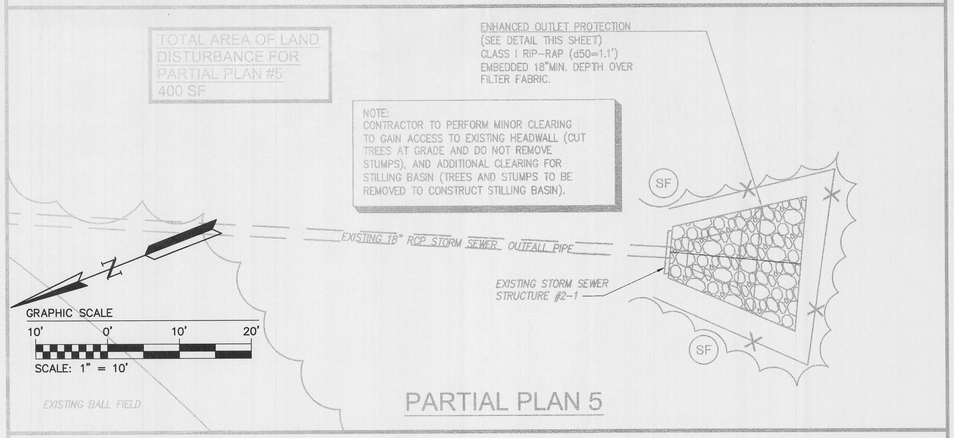
SF		SILT FENCE (SPEC. 3.05)
IP		STORM DRAIN INLET PROTECTION (SPEC. 3.07)
CD		CHECK DAM (SPEC. 3.20)
TO	TO	TOP SOIL (SPEC. 3.30)
PS	PS	PERMANENT SEEDING (SPEC. 3.32)
MU	MU	MULCHING (SPEC. 3.35)
EC-3		TREATMENT 2 SOIL STABILIZATION MATTING (SPEC. 3.36)
TP	TP	TREE PROTECTION (SPEC. 3.38)

NOTE:
SEE VIRGINIA EROSION & SEDIMENT CONTROL HANDBOOK LATEST EDITION FOR EROSION CONTROL SPECIFICATIONS (SPEC.) AND DETAILS.

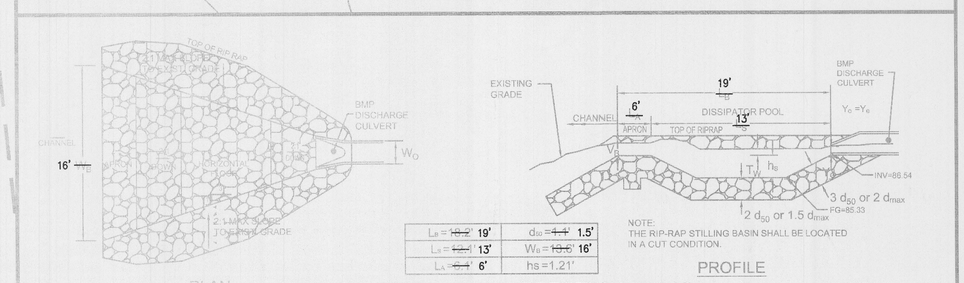
NOTE:
1. TIMBERS SHALL BE SOUTHERN PINE, #1 PONDEROSA PINE, OR DOUGLAS FUR.
2. TIMBERS SHALL BE TREATED WITH AN OIL-BORNED PRESERVATIVE IN ACCORDANCE WITH THE REQUIREMENTS OF AWPA C2.
3. COAL TAR CREOSOTE SOLUTION IS NOT PERMITTED.
4. AFTER TRIMMING FOR LENGTH, UNTREATED (EXPOSED SURFACES) SHALL BE TREATED BEFORE PLACEMENT.



LANDSCAPE TIMBER WALL
N.T.S.



PARTIAL PLAN 5



L_B = ~~10.2'~~	19'	d_{50} = ~~1.1'~~	1.5'
L_S = ~~12.1'~~	13'	W_B = ~~10.6'~~	16'
L_A = ~~6.1'~~	6'	hs = 1.21'	

NOTE:
THE RIP-RAP STILLING BASIN SHALL BE LOCATED IN A CUT CONDITION.

PLAN PROFILE

ENHANCED OUTLET PROTECTION DETAIL
(EXISTING STORM STRUCTURE. 2-1)
N.T.S

Rev.	Date	Description	Revised by
2	12/21/11	BIORETENTION BASIN AND STORM SWEWER ASBUILT	JFS
1	3/23/11	REVISION PER JCC COMMENTS	LBA

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POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

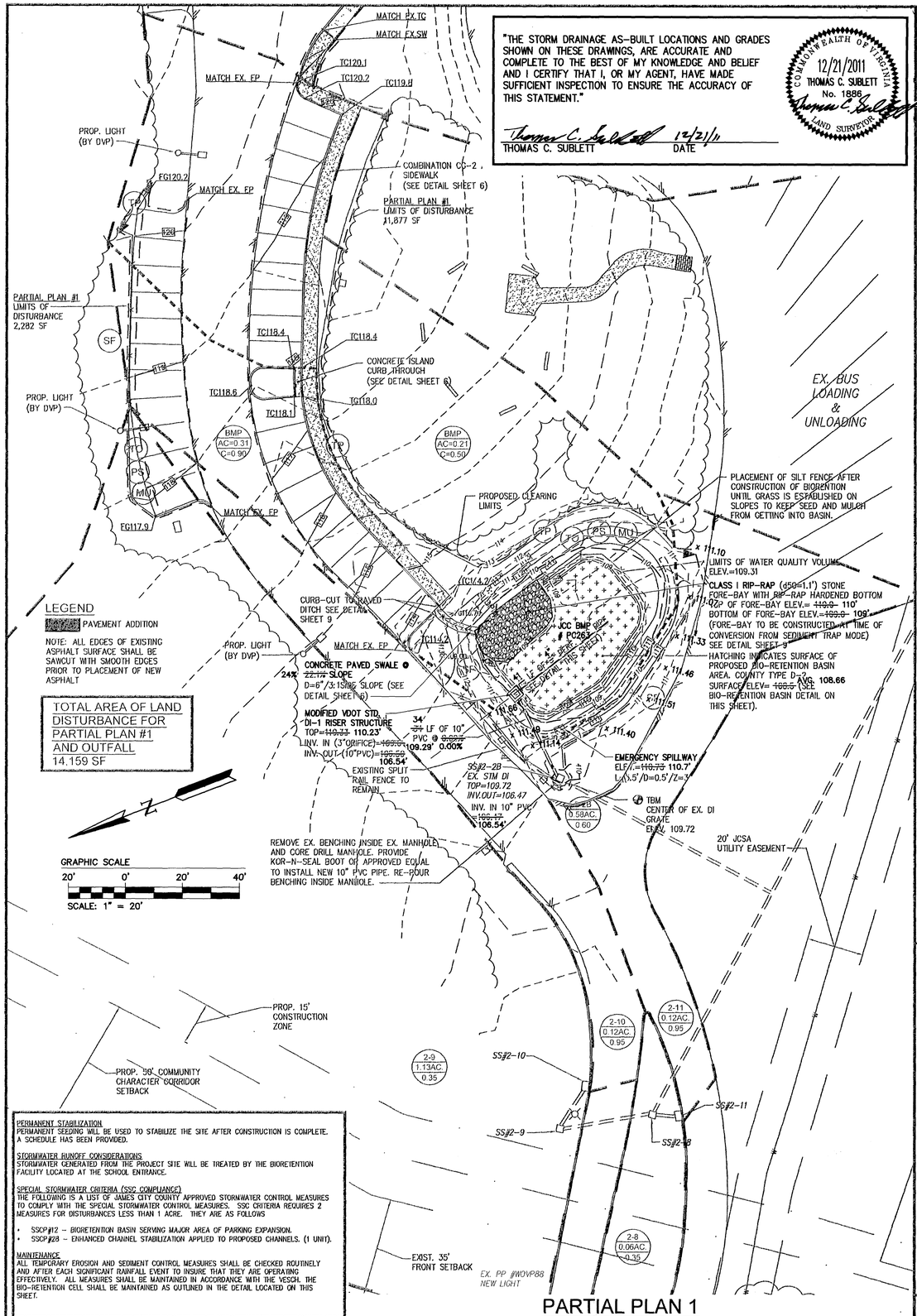
Project Contacts:	LBA/TCS
Project Number:	9888-34 XREF- 10182-00
Scale: AS NOTED	Date: 9/28/11
Sheet Title: RECORD DRAWING FOR STORM STRUCTURES	
Sheet Number: R05	

RECORD DRAWING 9/28/11 (JCC PLAN SP-0008-2011)

"THE STORM DRAINAGE AS-BUILT LOCATIONS AND GRADES SHOWN ON THESE DRAWINGS, ARE ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF AND I CERTIFY THAT I, OR MY AGENT, HAVE MADE SUFFICIENT INSPECTION TO ENSURE THE ACCURACY OF THIS STATEMENT."

COMMONWEALTH OF VIRGINIA 12/21/2011 THOMAS C. SUBLETT No. 1886 LAND SURVEYOR

THOMAS C. SUBLETT 12/21/11 DATE



LEGEND

PAVEMENT ADDITION

NOTE: ALL EDGES OF EXISTING ASPHALT SURFACE SHALL BE SAWCUT WITH SMOOTH EDGES PRIOR TO PLACEMENT OF NEW ASPHALT

TOTAL AREA OF LAND DISTURBANCE FOR PARTIAL PLAN #1 AND OUTFALL 14.159 SF

PERMANENT STABILIZATION
PERMANENT SEEDING WILL BE USED TO STABILIZE THE SITE AFTER CONSTRUCTION IS COMPLETE. A SCHEDULE HAS BEEN PROVIDED.

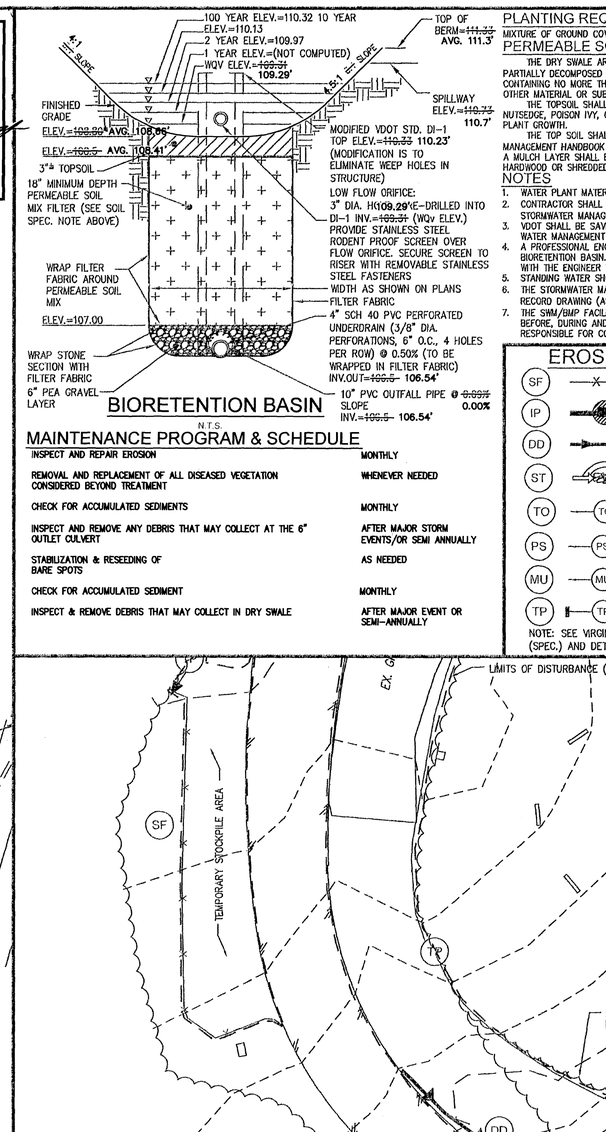
STORMWATER RUNOFF CONSIDERATIONS
STORMWATER GENERATED FROM THE PROJECT SITE WILL BE TREATED BY THE BIORETENTION FACILITY LOCATED AT THE SCHOOL ENTRANCE.

SPECIAL STORMWATER CRITERIA (SSC COMPLIANCE)
THE FOLLOWING IS A LIST OF JAMES CITY COUNTY APPROVED STORMWATER CONTROL MEASURES TO COMPLY WITH THE SPECIAL STORMWATER CONTROL MEASURES. SSC CRITERIA REQUIRES 2 MEASURES FOR DISTURBANCES LESS THAN 1 ACRE. THEY ARE AS FOLLOWS

- SSCP#12 – BIORETENTION BASIN SERVING MAJOR AREA OF PARKING EXPANSION.
- SSCP#28 – ENHANCED CHANNEL STABILIZATION APPLIED TO PROPOSED CHANNELS. (1 UNIT).

MAINTENANCE
ALL TEMPORARY 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. THE BIO-RETENTION CELL SHALL BE MAINTAINED AS OUTLINED IN THE DETAIL LOCATED ON THIS SHEET.

PARTIAL PLAN 1



BIORETENTION BASIN

N.T.S.

MAINTENANCE PROGRAM & SCHEDULE

INSPECT AND REPAIR EROSION	MONTHLY
REMOVAL AND REPLACEMENT OF ALL DISEASED VEGETATION CONSIDERED BEYOND TREATMENT	WHENEVER NEEDED
CHECK FOR ACCUMULATED SEDIMENTS	MONTHLY
INSPECT AND REMOVE ANY DEBRIS THAT MAY COLLECT AT THE 6" OUTLET CULVERT	AFTER MAJOR STORM EVENTS/OR SEMI ANNUALLY
STABILIZATION & RESEEDING OF BARE SPOTS	AS NEEDED
CHECK FOR ACCUMULATED SEDIMENT	MONTHLY
INSPECT & REMOVE DEBRIS THAT MAY COLLECT IN DRY SWALE	AFTER MAJOR EVENT OR SEMI-ANNUALLY

PLANTING REQUIREMENTS

MIXTURE OF GROUND COVERS, SHRUBS, AND TREES SHALL BE PLANTED IN DRY SWALE AREAS.

PERMEABLE SOIL MIX SPECIFICATIONS

THE DRY SWALE AREAS SHALL CONTAIN A PLANTING SOIL MIXTURE OF 50% SAND, 30% LEAF COMPOST (FULLY COMPOSTED, NOT PARTIALLY DECOMPOSED 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 HINDRANCE TO PLANT GROWTH OR MAINTENANCE.

THE TOPSOIL SHALL BE FREE OF PLANTS OR PLANT PARTS OF BERMUDA 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.

NOTES

1. WATER PLANT MATERIAL EACH DAY FOR FOURTEEN CONSECUTIVE DAYS AFTER INSTALLATION.
2. 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.
3. VDOT SHALL BE SAVED HARMLESS FROM THE MAINTENANCE RESPONSIBILITY OR LIABILITY ASSOCIATED WITH ANY FAILURE OF THE STORM WATER MANAGEMENT FACILITY AND ITS STRUCTURES.
4. 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.
5. STANDING WATER SHOULD NOT BE PRESENT FOR MORE THAN A 48 HOUR PERIOD.
6. THE STORMWATER MANGEMENT/BMP FACILITY AS PROPOSED FOR THIS PROJECT WILL REQUIRE SUBMISSION, REVIEW AND APPROVAL OF A RECORD DRAWING (AS-BUILT) AND CONSTRUCTION CERTIFICATION PRIOR TO RELEASE OF THE POSTED BOND/SURETY.
7. THE SWM/BMP FACILITY AS-BUILT DRAWINGS AND CONSTRUCTION CERTIFICATION AND SUBMITTALS ARE TO BE COORDINATED AND PERFORMED BEFORE, DURING AND FOLLOWING CONSTRUCTION IN ACCORDANCE WITH CURRENT COUNTY GUIDELINES.THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE.

EROSION AND SEDIMENTATION CONTROL LEGEND

SF	—X—	SILT FENCE (SPEC. 3.05)
IP		STORM DRAIN INLET PROTECTION (SPEC. 3.07)
DD		TEMPORARY DIVERSION DIKE (SPEC. 3.09)
ST		TEMPORARY SEDIMENT TRAP (SPEC. 3.13)
TO	—TO—	TOP SOIL (SPEC. 3.30)
PS	—PS—	PERMANENT SEEDING (SPEC. 3.32)
MU	—MU—	MULCHING (SPEC. 3.35)
TP	—TP—	TREE PROTECTION (SPEC. 3.38)

NOTE: SEE VIRGINIA EROSION & SEDIMENT CONTROL HANDBOOK LATEST EDITION FOR EROSION CONTROL SPECIFICATIONS (SPEC.) AND DETAILS.

CONSTRUCTION SEQUENCE

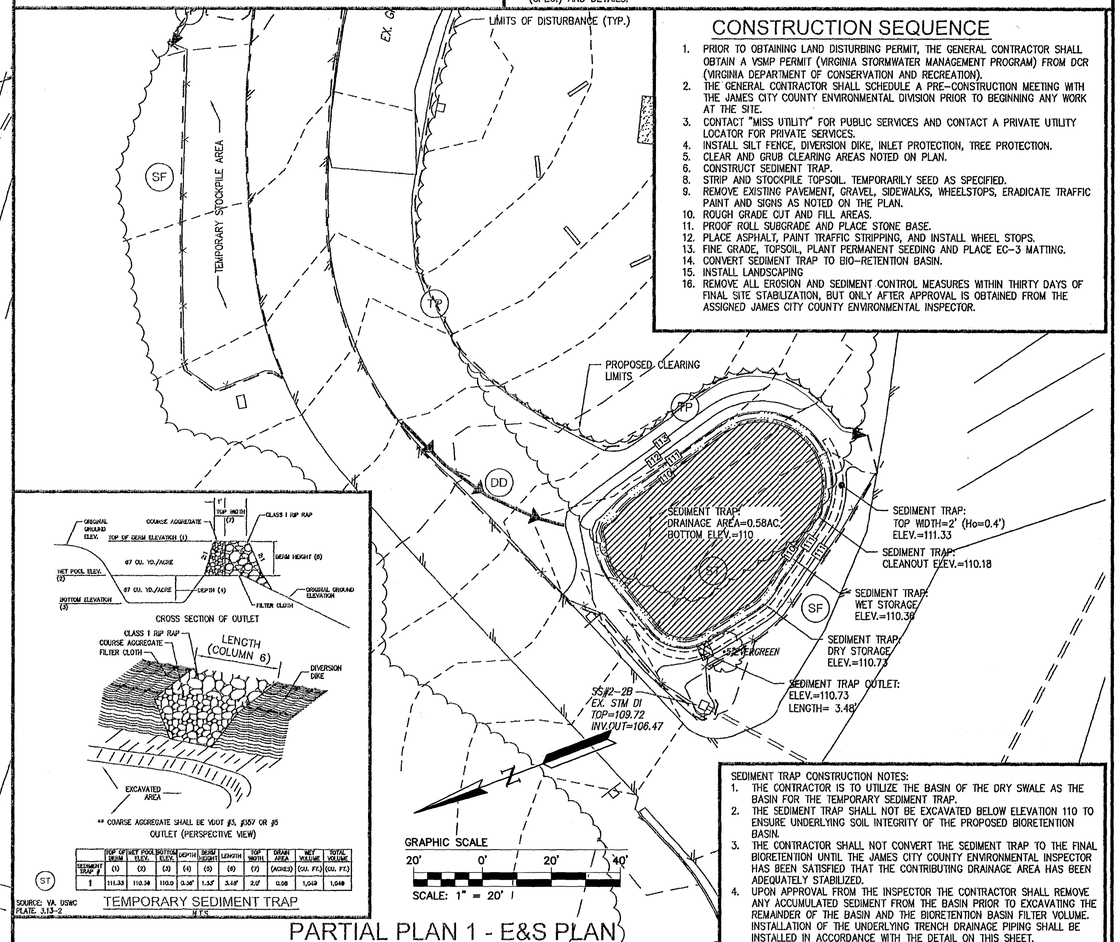
1. PRIOR TO OBTAINING LAND DISTURBING PERMIT, THE GENERAL CONTRACTOR SHALL OBTAIN A VSMP PERMIT (VIRGINIA STORMWATER MANAGEMENT PROGRAM) FROM DCR (VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION).
2. THE GENERAL CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE JAMES CITY COUNTY ENVIRONMENTAL DIVISION PRIOR TO BEGINNING ANY WORK AT THE SITE.
3. CONTACT "MISS UTILITY" FOR PUBLIC SERVICES AND CONTACT A PRIVATE UTILITY LOCATOR FOR PRIVATE SERVICES.
4. INSTALL SILT FENCE, DIVERSION DIKE, INLET PROTECTION, TREE PROTECTION.
5. CLEAR AND GRUB CLEARING AREAS NOTED ON PLAN.
6. CONSTRUCT SEDIMENT TRAP.
8. STRIP AND STOCKPILE TOPSOIL. TEMPORARILY SEED AS SPECIFIED.
9. REMOVE EXISTING PAVEMENT, GRAVEL, SIDEWALKS, WHEELSTOPS, ERADICATE TRAFFIC PAINT AND SIGNS AS NOTED ON THE PLAN.
10. ROUGH GRADE CUT AND FILL AREAS.
11. PROOF ROLL SUBGRADE AND PLACE STONE BASE.
12. PLACE ASPHALT, PAINT TRAFFIC STRIPPING, AND INSTALL WHEEL STOPS.
13. FINE GRADE, TOPSOIL, PLANT PERMANENT SEEDING AND PLACE EC-3 MATTING.
14. CONVERT SEDIMENT TRAP TO BIO-RETENTION BASIN.
15. INSTALL LANDSCAPING
16. 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.

SEDIMENT TRAP #	TOP OF BERM	WET POOL ELEV.	BOTTOM ELEV.	DEPTH	BERM HEIGHT	LENGTH	TOP WIDTH	DRAIN AREA	WET VOLUME	TOTAL VOLUME
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(ACRES)	(CU. FT.)	(CU. FT.)
1	111.33	110.38	110.0	0.38'	1.33'	3.66'	2.0'	0.58	1,019	1,049

SOURCE: VA. DSWC PLATE 3.13-2

ST TEMPORARY SEDIMENT TRAP

N.T.S.



SEDIMENT TRAP CONSTRUCTION NOTES:

1. THE CONTRACTOR IS TO UTILIZE THE BASIN OF THE DRY SWALE AS THE BASIN FOR THE TEMPORARY SEDIMENT TRAP.
2. THE SEDIMENT TRAP SHALL NOT BE EXCAVATED BELOW ELEVATION 110 TO ENSURE UNDERLYING SOIL INTEGRITY OF THE PROPOSED BIORETENTION BASIN.
3. THE CONTRACTOR SHALL NOT CONVERT THE SEDIMENT TRAP TO THE FINAL BIORETENTION UNTIL THE JAMES CITY COUNTY ENVIRONMENTAL INSPECTOR HAS BEEN SATISFIED THAT THE CONTRIBUTING DRAINAGE AREA HAS BEEN ADEQUATELY STABILIZED.
4. UPON APPROVAL FROM THE INSPECTOR THE CONTRACTOR SHALL REMOVE ANY ACCUMULATED SEDIMENT FROM THE BASIN PRIOR TO EXCAVATING THE REMAINDER OF THE BASIN AND THE BIORETENTION BASIN FILTER VOLUME. INSTALLATION OF THE UNDERLYING TRENCH DRAINAGE PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAIL ON THIS SHEET.

PARTIAL PLAN 1 - E&S PLAN

Rev.	Date	Revision / Description	Drawn	Reviewed
2	12/21/11	BIORETENTION BASIN AND STORM SEWER AS-BUILT	JFS	LBA
1	5/23/11	REVISION PER JCC COMMENTS	LBA	RJH

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Hampton Roads | Central Virginia | Middle Peninsula

RECORD DRAWING
FOR STORM AS-BUILTS
D. J. MONTAGUE ELEMENTARY SCHOOL
ADDITIONAL PARKING
AND
PLAYGROUND DRAINAGE IMPROVEMENTS
W/JCC PUBLIC SCHOOLS
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Project Contacts:	LBA/TCS
Project Number:	5566/34 XREF: 10162-00
Scale: AS NOTED	Date: 9/28/11

Sheet Title: RECORD DRAWING FOR BIORETENTION BASIN

Sheet Number R03

RECORD DRAWING 12/21/11 (JCC PLAN SP-0008-2011) JCC BMP # PC263

NOTE:
UTILITY EASEMENTS DENOTED AS "JCSA UTILITY EASEMENTS" ARE FOR THE EXCLUSIVE USE OF THE JCSA AND THE PROPERTY OWNER. OTHER UTILITY SERVICE PROVIDERS DESIRING TO USE THESE EASEMENTS WITH THE EXCEPTION OF PERPENDICULAR UTILITY CROSSINGS MUST OBTAIN AUTHORIZATION FOR ACCESS AND USE FROM THE JCSA AND THE PROPERTY OWNER. ADDITIONALLY, JCSA SHALL NOT BE HELD RESPONSIBLE FOR ANY DAMAGE TO IMPROVEMENTS WITHIN THIS EASEMENT, FROM ANY CAUSE.

"THE STORM DRAINAGE AS-BUILT LOCATIONS AND GRADES SHOWN ON THESE DRAWINGS, ARE ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF AND I CERTIFY THAT I, OR MY AGENT, HAVE MADE SUFFICIENT INSPECTION TO ENSURE THE ACCURACY OF THIS STATEMENT."

THOMAS C. SUBLETT 12/21/11
THOMAS C. SUBLETT DATE

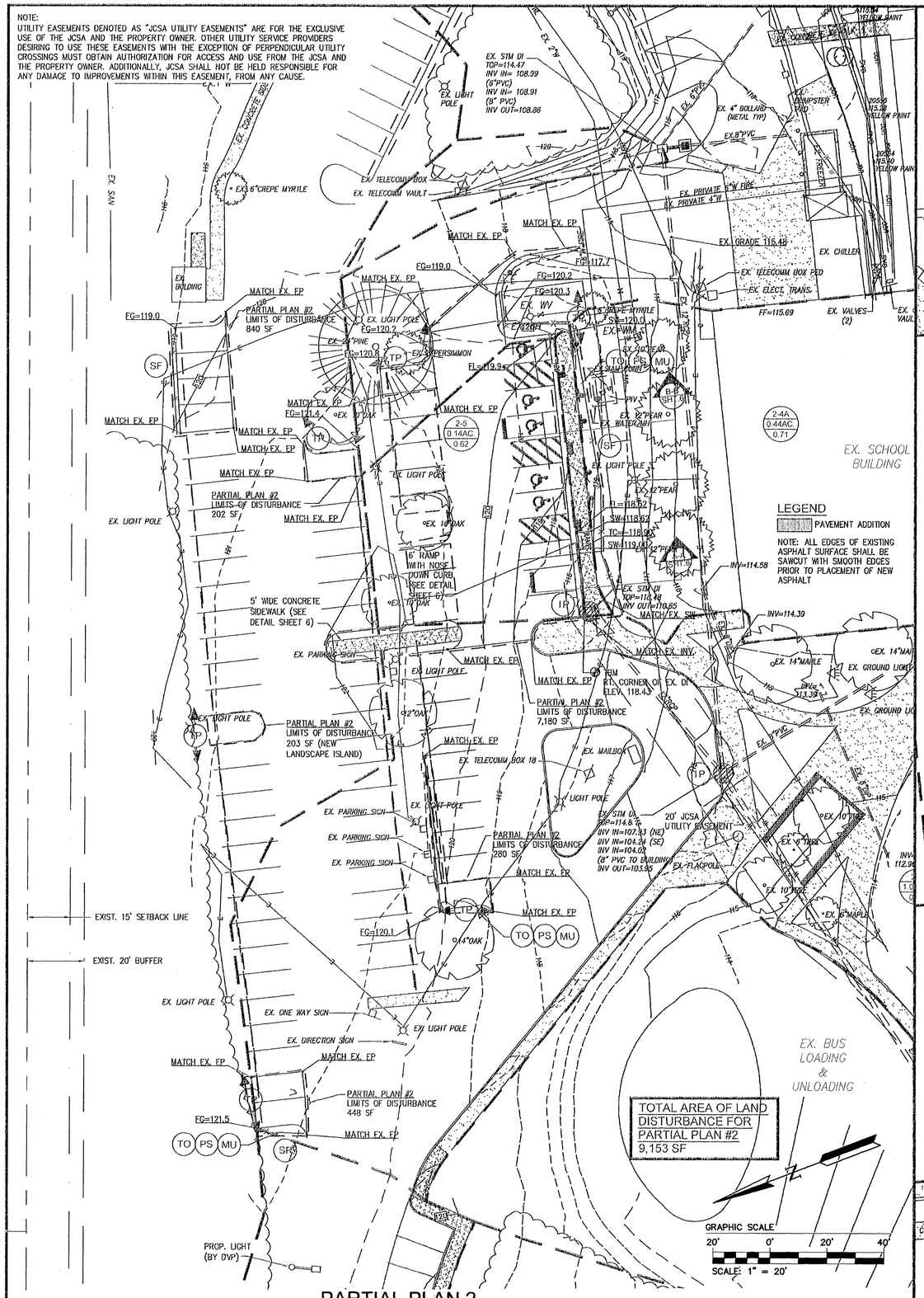
COMMONWEALTH OF VIRGINIA
12/21/2011
THOMAS C. SUBLETT
No. 1886
LAND SURVEYOR

EROSION AND SEDIMENTATION CONTROL LEGEND

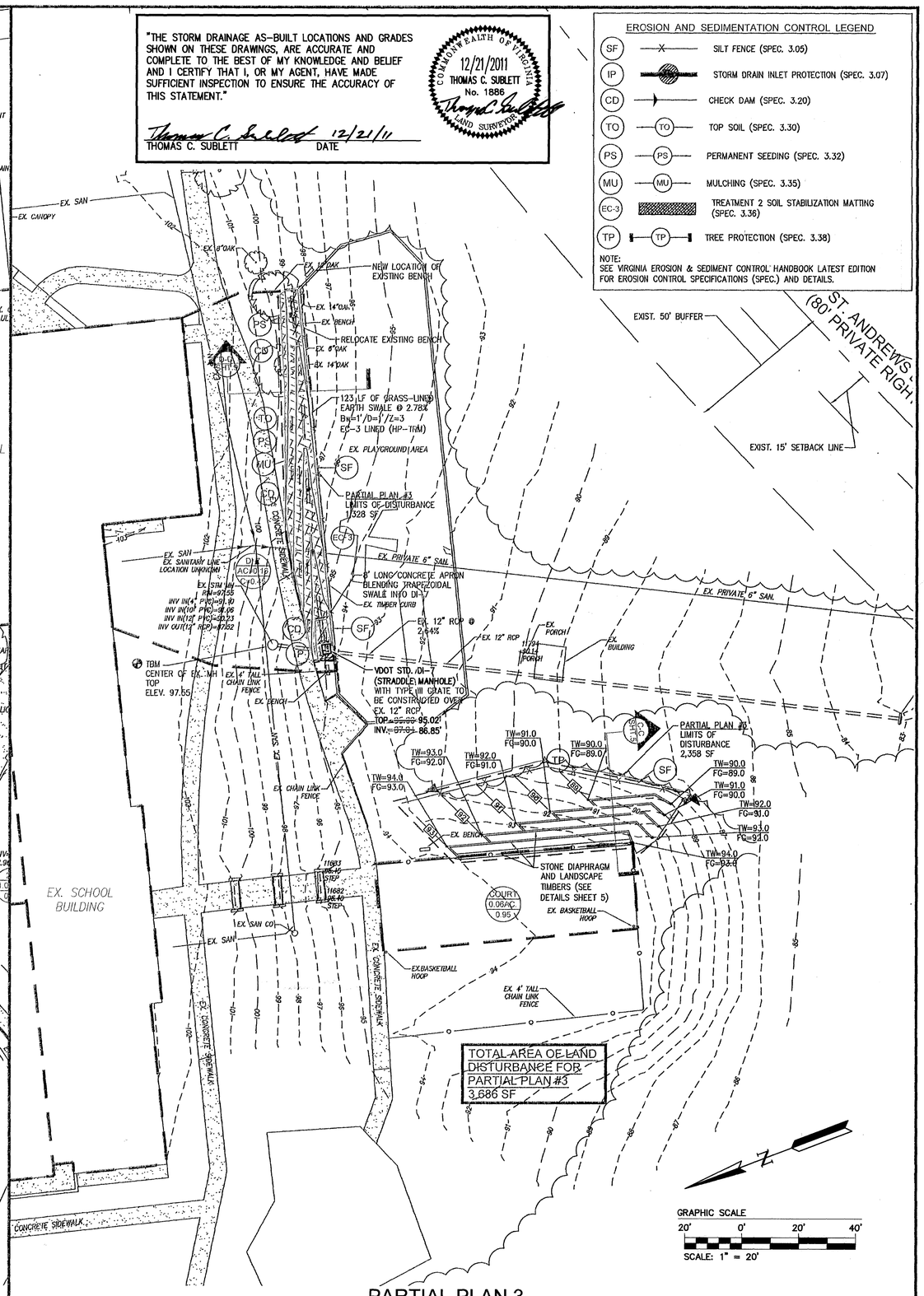
- SF — SILT FENCE (SPEC. 3.05)
- IP — STORM DRAIN INLET PROTECTION (SPEC. 3.07)
- CD — CHECK DAM (SPEC. 3.20)
- TO — TOP SOIL (SPEC. 3.30)
- PS — PERMANENT SEEDING (SPEC. 3.32)
- MU — MULCHING (SPEC. 3.35)
- EC-3 — TREATMENT 2 SOIL STABILIZATION MATTING (SPEC. 3.36)
- TP — TREE PROTECTION (SPEC. 3.38)

NOTE:
SEE VIRGINIA EROSION & SEDIMENT CONTROL HANDBOOK LATEST EDITION FOR EROSION CONTROL SPECIFICATIONS (SPEC.) AND DETAILS.

Rev.	Date	Description	Revised By
2	12/21/11	BIORETENTION BASIN AND STORM SEWER ASBUILT	JFS
1	3/23/11	REVISION PER JCC COMMENTS	LBA



PARTIAL PLAN 2



PARTIAL PLAN 3

RECORD DRAWING FOR STORM AS-BUILTS
D. J. MONTAGUE ELEMENTARY SCHOOL
ADDITIONAL PARKING
AND
PLAYGROUND DRAINAGE IMPROVEMENTS
W/JCC PUBLIC SCHOOLS
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Project Contacts:	LBA/TCS
Project Number:	5838-34 XREF: 10162-00
Scale: AS NOTED	Date: 9/28/11
Sheet Title: RECORD DRAWING FOR STORM STRUCTURES	
Sheet Number	R04

RECORD DRAWING 12/21/11 (JCC PLAN SP-0008-2011) JCC BMP # PC263

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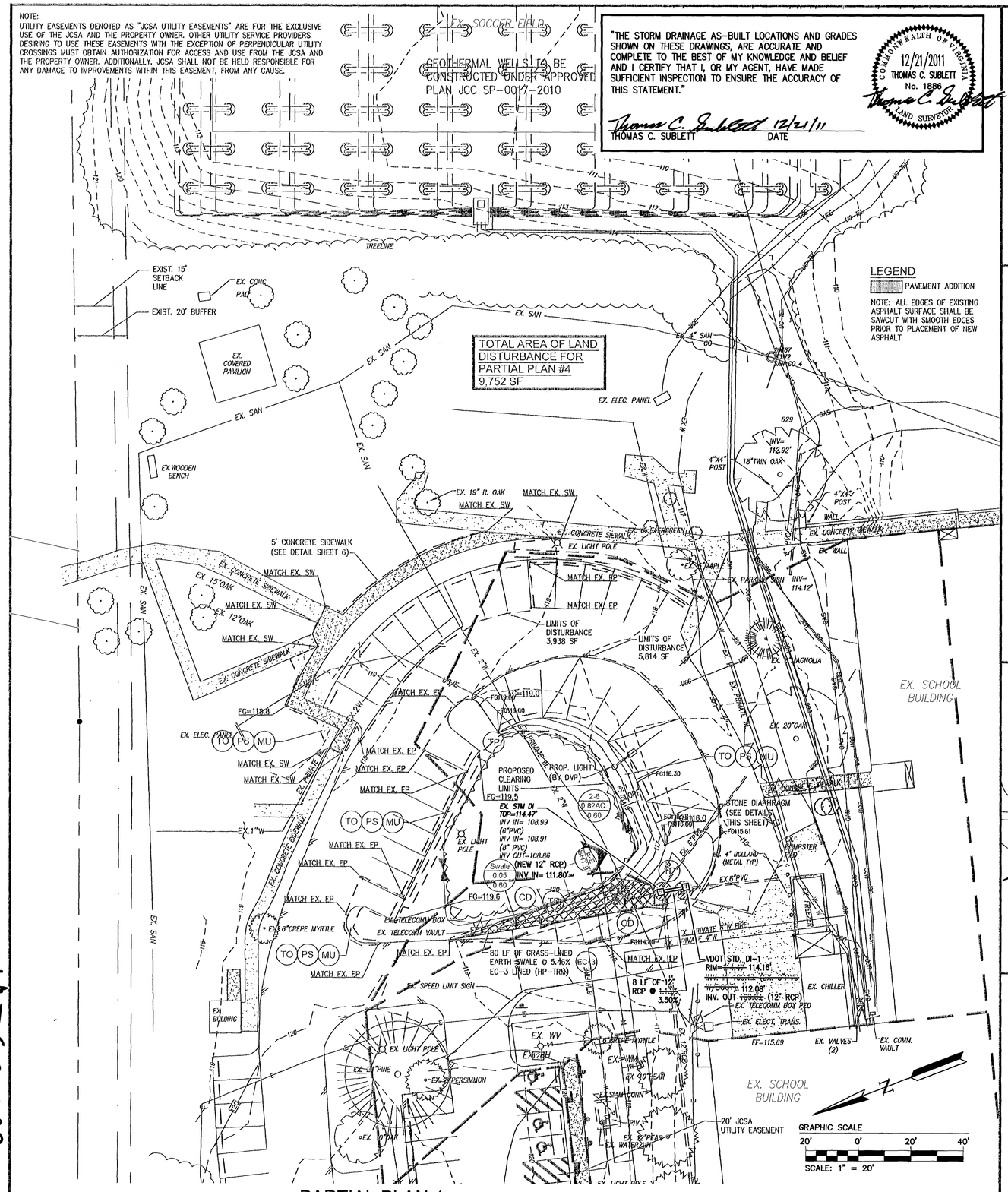
COMMONWEALTH OF VIRGINIA
12/21/2011
THOMAS C. SUBLETT
No. 1886
LAND SURVEYOR

THOMAS C. SUBLETT 12/21/11
THOMAS C. SUBLETT DATE

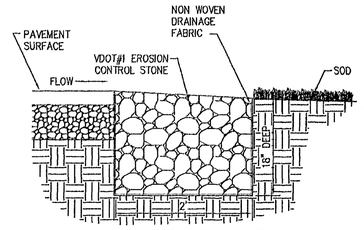


PARTIAL PLAN 4

LEGEND

PAVEMENT ADDITION

NOTE: ALL EDGES OF EXISTING ASPHALT SURFACE SHALL BE SAWCUT WITH SMOOTH EDGES PRIOR TO PLACEMENT OF NEW ASPHALT



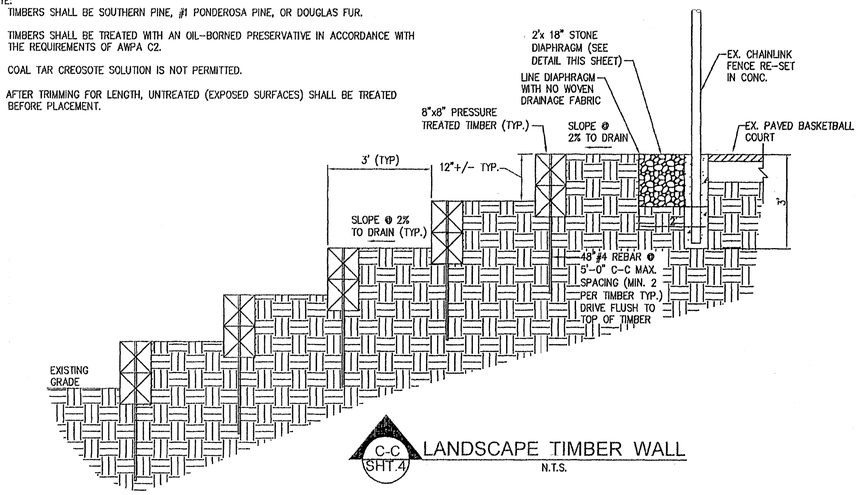
STONE DIAPHRAGM
N.T.S.

EROSION AND SEDIMENTATION CONTROL LEGEND

SF	SILT FENCE (SPEC. 3.05)
IP	STORM DRAIN INLET PROTECTION (SPEC. 3.07)
CD	CHECK DAM (SPEC. 3.20)
TO	TOP SOIL (SPEC. 3.30)
PS	PERMANENT SEEDING (SPEC. 3.32)
MU	MULCHING (SPEC. 3.35)
EC-3	TREATMENT 2 SOIL STABILIZATION MATTING (SPEC. 3.36)
TP	TREE PROTECTION (SPEC. 3.38)

NOTE:
SEE VIRGINIA EROSION & SEDIMENT CONTROL HANDBOOK LATEST EDITION FOR EROSION CONTROL SPECIFICATIONS (SPEC.) AND DETAILS.

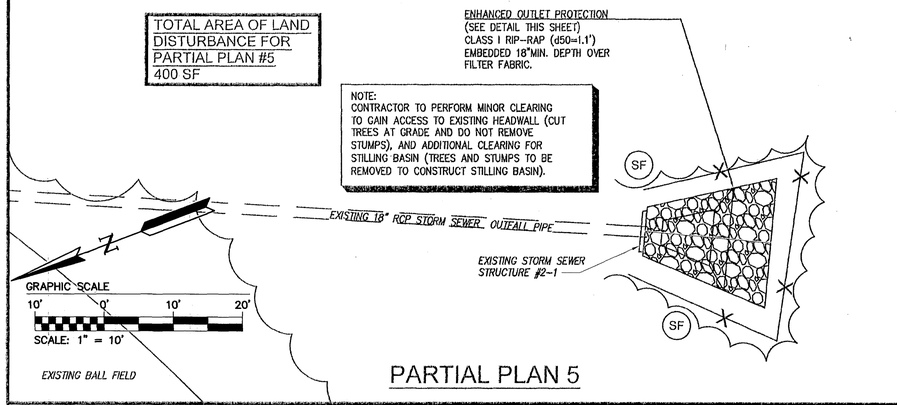
NOTE:
1. TIMBERS SHALL BE SOUTHERN PINE, #1 PONDEROSA PINE, OR DOUGLAS FUR.
2. TIMBERS SHALL BE TREATED WITH AN OIL-BORNED PRESERVATIVE IN ACCORDANCE WITH THE REQUIREMENTS OF AWPA C2.
3. COAL TAR CREOSOTE SOLUTION IS NOT PERMITTED.
4. AFTER TRIMMING FOR LENGTH, UNTREATED (EXPOSED SURFACES) SHALL BE TREATED BEFORE PLACEMENT.



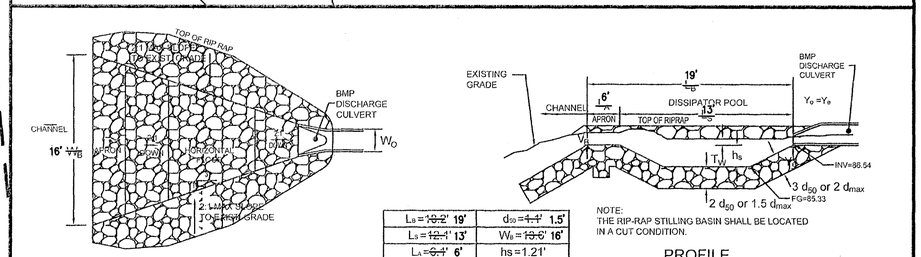
C-C SHT. 4 LANDSCAPE TIMBER WALL
N.T.S.

TOTAL AREA OF LAND DISTURBANCE FOR PARTIAL PLAN #5 400 SF

NOTE:
CONTRACTOR TO PERFORM MINOR CLEARING TO GAIN ACCESS TO EXISTING HEADWALL (CUT TREES AT GRADE AND DO NOT REMOVE STUMPS), AND ADDITIONAL CLEARING FOR STILLING BASIN (TREES AND STUMPS TO BE REMOVED TO CONSTRUCT STILLING BASIN).



PARTIAL PLAN 5



L_B = ~~10.2'~~ 19'	d_{50} = ~~1.1'~~ 1.5'
L_S = ~~12.1'~~ 13'	W_B = ~~13.6'~~ 16'
L_A = ~~0.7'~~ 6'	hs = 1.21'

PLAN

NOTE:
THE RIP-RAP STILLING BASIN SHALL BE LOCATED IN A CUT CONDITION.

PROFILE

ENHANCED OUTLET PROTECTION DETAIL
(EXISTING STORM STRUCTURE. 2-1)
N.T.S

RECORD DRAWING 12/21/11 (JCC PLAN SP-0008-2011) JCC BMP # PC263

Rev.	Date	Description	Revised By
2	12/21/11	BIORETENTION BASIN AND STORM SWEWER ASBUILT	JFS
1	3/23/11	REVISION PER JCC COMMENTS	LBA

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RECORD DRAWING
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POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

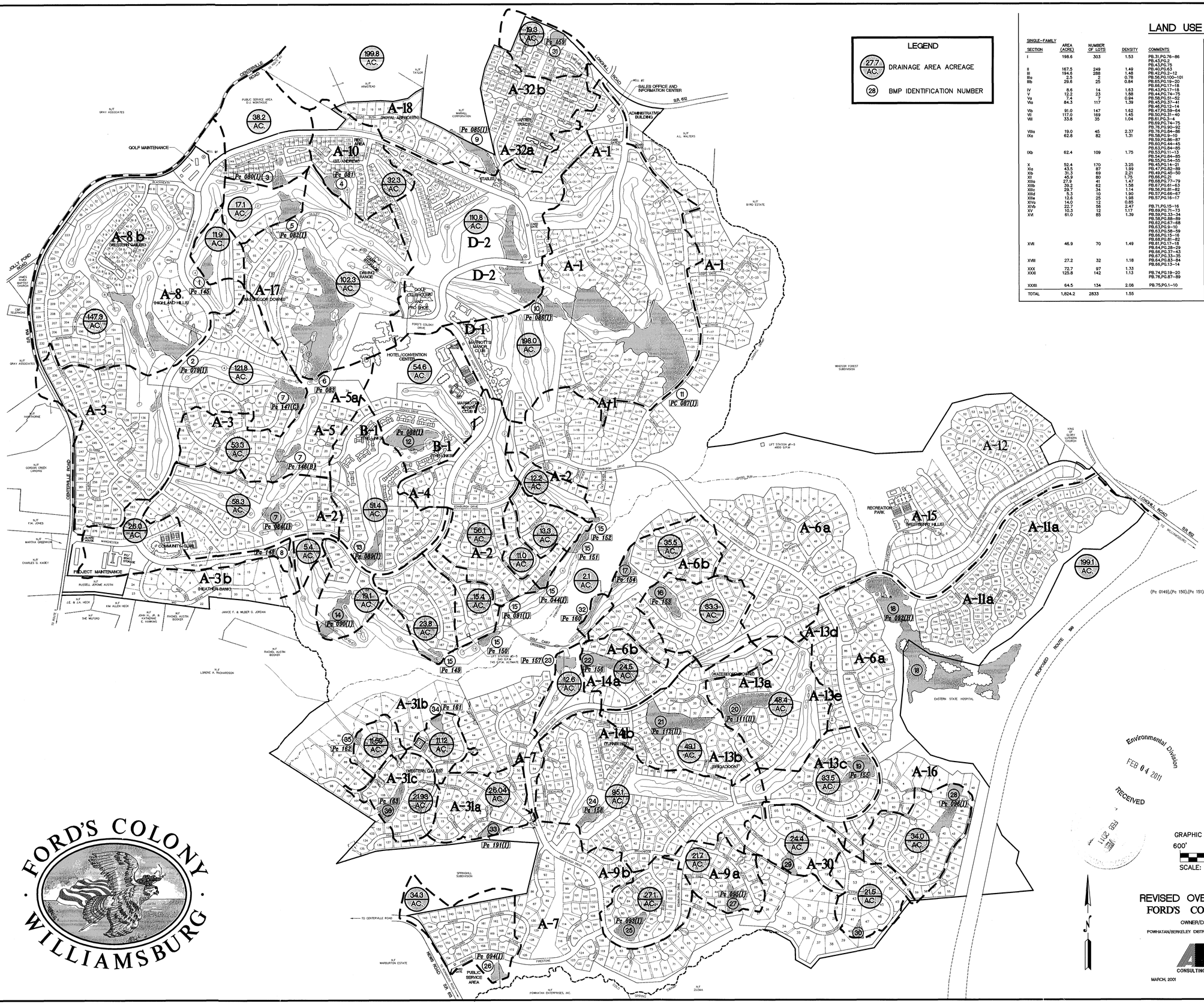
Project Contacts:	LBA/TCS
Project Number:	0888-56 XREF: 10162-00
Scale: AS NOTED	Date: 9/28/11

Sheet Title:
RECORD DRAWING FOR STORM STRUCTURES

Sheet Number
R05

Page 23 of 29

SP-00068-2011



LEGEND

27.7 AC. — DRAINAGE AREA ACREAGE

28 — BMP IDENTIFICATION NUMBER

LAND USE ANALYSIS

SINGLE-FAMILY SECTION	AREA (ACRE)	NUMBER OF LOTS	DENSITY	COMMENTS
I	198.6	303	1.53	PB.31,PG.76–86 PB.43,PG.5
II	167.5	249	1.49	PB.40,PG.7
III	194.6	288	1.48	PB.40,PG.63
IIIa	3.5	2	0.78	PB.42,PG.3–12
IIIb	29.6	25	0.84	PB.56,PG.100–101
IV	8.6	14	1.63	PB.66,PG.19–20 PB.66,PG.17–18
V	12.2	23	1.88	PB.43,PG.17–18
Va	7.4	7	0.94	PB.44,PG.74–75
Vla	84.3	117	1.39	PB.58,PG.31–52 PB.45,PG.37–41
Vb	91.0	147	1.62	PB.46,PG.12–14
VI	117.0	169	1.45	PB.47,PG.59–64
VIII	33.8	35	1.04	PB.50,PG.31–40 PB.61,PG.3–4
VIIa	19.0	45	2.37	PB.69,PG.74–75 PB.76,PG.90–92
IXa	62.6	82	1.31	PB.76,PG.84–86 PB.58,PG.9–10
IXb	62.4	109	1.75	PB.59,PG.85–87 PB.60,PG.44–45 PB.63,PG.84–85 PB.53,PG.11–13 PB.54,PG.84–85
X	52.4	170	3.25	PB.55,PG.54–55 PB.45,PG.14–21
Xla	43.5	87	1.99	PB.47,PG.82–89
Xlb	31.3	69	2.21	PB.48,PG.45–50
XII	45.9	80	1.75	PB.66,PG.21
XIIla	27.9	41	1.47	PB.68,PG.77–79
XIIlb	39.2	62	1.58	PB.67,PG.61–63
XIIlc	29.7	34	1.14	PB.56,PG.81–82
XIIId	5.3	10	1.90	PB.57,PG.66–67
XIIIe	12.6	25	1.98	PB.57,PG.16–17
XIVa	14.0	12	0.85	
XIVb	22.7	56	2.47	PB.71,PG.15–16
XV	10.3	12	1.17	PB.69,PG.71–73
XVI	61.0	85	1.39	PB.59,PG.33–34 PB.58,PG.88–89
XVII	46.9	70	1.49	PB.62,PG.67–68 PB.63,PG.9–10 PB.63,PG.58–59 PB.66,PG.15–16 PB.68,PG.81–82
XVIII	27.2	32	1.18	PB.81,PG.17–18 PB.64,PG.28–29 PB.66,PG.37–43
XXX	72.7	97	1.33	PB.67,PG.33–35
XXXI	125.8	142	1.13	PB.74,PG.19–20 PB.76,PG.87–89
XXXII	64.5	134	2.08	PB.75,PG.1–10
TOTAL	1,824.2	2833	1.55	

MULTI-FAMILY SECTION	AREA (ACRE)	NUMBER OF LOTS	DENSITY	COMMENTS
LINKS (B–1)	22.9	80	3.49	PB.43,PG.8–11 PB.43,PG.13–16 PB.49,PG.64–66 PB.45,PG.85–87 PB.49,PG.29–31
MARRIOTT'S MANOR CLUB (D–1)	21.9	201	9.19	PB.53,PG.27 PB.64,PG.35–43 PB.64,PG.52–61 PB.68,PG.10–19 PB.69,PG.16–24 PB.75,PG.67–76 PB.5,PG.42
CONDOMINIUMS (D–2)	10.6	80	7.53	
TOTAL	55.4 AC.	361.0 UNITS	6.52	

NON-RESIDENTIAL AMENITY AND SERVICE SITES	AREA (AC.)	COMMENTS
1. HOTEL	32.71	PB.54,PG.40 PB.65,PG.89
2. GOLF CLUBHOUSE AND PRO–SHOP	6.53	PB.44,PG.37
3. GOLF MAINTENANCE	3.90	PB.52,PG.77
4. DRIVING RANGE, CART STORAGE	11.76	PB.44,PG.37 PB.5,PG.77 PB.52,PG.76
5. SALES OFFICE	1.81	
6. ADMINISTRATION BUILDING (FUTURE)	3.5	
7. PUBLIC SERVICE AREA (O.J. MONTAGUE)	28.05	P.B.40,PG.85 P.B.45,PG.63
8. COMMUNITY CLUB (REC. CENTER #1)	7.72	
9. PROJECT MAINTENANCE	10.59	P.B.50,PG.98
10. ADDITIONAL PUBLIC SERVICE AREA (FIRE STA.)	6.76	
11. RECREATION AREA SEC. X	0.95	
12. RECREATION PARK (@ CHISEL RUN)	6.36	P.B.69,PG.71–73
TOTAL	120.6	ACRES
GOLF COURSES		
1. ORIGINAL 18 HOLE	177.78	PB.44,PG.38
2. ADDITIONAL 9 HOLE "LINKS" COURSE	77.67	PB.44,PG.36
3. CHAMPIONSHIP 18 HOLE COURSE	179.81	PB.52,PG.53–54
4. WILLIAMSBURG WEST 9 HOLE COURSE	61.26	
TOTAL	496.5	ACRES
LAKES, RESERVES AND MISC. OPEN SPACE TOTAL	269.9	ACRES
TOTAL PROJECT ACREAGE	2,766.6	ACRES

Ford's Colony Master Plan Study BMP Points

Given:	Ford's Colony Total Site Acreage	=	2,483.61 Acres
	Additional Land Acquisition (Sec. 3, Casey, Carter, Wilford–New)	=	286.13 Acres
	Less Grandfathered Areas:		
	Original 18 Hole Golf Course		(178.85)
	Additional 9 Hole "Links" Course		(77.68)
	Ford's Colony BMP Watershed	=	2,513.21 Acres
	Total Golf	=	497.21 Acres±

A. Structural BMP Point Allocation

BMP No.	BMP (Design Type)	BMP Points	Total % Of Site Served	Weighted BMP Points	
(Pc 145) 1.	Dam # 6 (6)	8	0.48%	0.04	
(Pc 079) 2.	Dam # 2 (5)	6	5.85%	0.35	
(Pc 080) 3.	7th Hole Pond (5)	6	1.52%	0.09	
(Pc 081) 4.	8th Hole Pond (5)	6	1.28%	0.08	
(Pc 082) 5.	Dam # 7 (5)	6	2.20%	0.13	0.18
	Dam # 7 (8)	8	0.68%	0.05	
(Pc 083) 6.	Dam # 1 (6)	8	3.49%	0.28	0.65
	Dam # 1 (7)	9	4.07%	0.37	
(Pc 084),(Pc 146),(Pc 147) 7.	Pond A, B, & C (5)	6	9.29%	0.56	
(Pc 148) 8.	Pond E (5)	6	1.04%	0.06	
(Pc 085) 9.	Sec. 18 Pond (5)	6	7.95%	0.48	
(Pc 086) 10.	Dam # 3 (5)	6	4.41%	0.26	
(Pc 087) 11.	Dam # 4 (6)	8	11.26%	0.90	1.64
	Dam # 4 (7)	9	8.17%	0.74	
(Pc 088) 12.	17th Hole Pond (6)	8	2.17%	0.17	
(Pc 089) 13.	16th Hole Pond (5)	6	2.04%	0.12	
(Pc 090) 14.	Pond D (5)	6	4.22%	0.25	0.31
	Pond D (6)	8	6.68%	0.06	
(Pc 0149),(Pc 150),(Pc 151),(Pc 152),(Pc 044),(Pc 091) 15.	6 Basins in Sec 2 (5)	6	5.25%	0.32	
(Pc 153) 16.	6th Hole Pond (7A)	10	1.33%	0.13	
(Pc 154) 17.	5th Hole Pond (7A)	10	1.41%	0.14	0.25
	5th Hole Pond (8)	8	1.33%	0.11	
(Pc 092) 18.	Chisel Run Lake (5)	6	7.92%	0.48	
(Pc 155) 19.	Sec 13–C Lake (6)	8	1.33%	0.11	
(Pc 111) 20.	Sec 13–A Lake (6)	8	1.93%	0.15	
(Pc 112) 21.	Sec 13–B Lake (7A)	10	1.87%	0.19	0.39
	Sec 13–B Lake (7A)	10	1.96%	0.20	
(Pc 156) 22.	Sec 14–A Lake (5)	6	3.83%	0.23	0.33
	Sec 14–A Lake (7A)	10	0.98%	0.10	
(Pc 157) 23.	13th Hole Pond (7A)	10	0.50%	0.05	
(Pc 158) 24.	Sec 7 Lake (5)	6	3.78%	0.23	
(Pc 093) 25.	Sec 9–B Lake (6)	8	1.08%	0.09	
(Pc 094) 26.	Sec 7 Pond (5)	6	1.37%	0.08	
(Pc 095) 27.	Sec 9–A Lake (6)	8	0.86%	0.07	
(Pc 096) 28.	Sec 16 Lake (6)	8	1.35%	0.11	
29.	Sec 30 Pond #1 (3)	6	0.97%	0.06	
30.	Sec 30 Pond #2 (3)	6	0.85%	0.05	
(Pc 159) 31.	Sec 32B Pond (5)	6	0.77%	0.05	
(Pc 160) 32.	Sec 6B Pond (7)	9	0.08%	0.01	
(Pc 191) 33.	Sec 31 Pond #1 (3)	6	1.04%	0.06	
(Pc 161) 34.	Sec 31 Pond #2 (7A)	10	0.44%	0.04	
(Pc 162) 35.	Sec 31 Pond #3 (3)	6	0.46%	0.03	
(Pc 163) 36.	Sec 31 Pond #4 (7A)	10	0.82%	0.08	
	Total Structural BMP Point Allocation:			8.16	

B. Natural Open Space — 10% Golf Course = 1.98%; Streams & Other = 16.93%; 18.91% x 0.1 = 1.89

C. Total Weighted Points — 8.16 + 1.89 = 10.05

Environmental Division
FEB 04 2011
RECEIVED

GRAPHIC SCALE
600' 0' 600' 1200'
SCALE: 1" = 600'

FORD'S COLONY · WILLIAMSBURG ·

REVISED OVERALL BMP MASTER PLAN
FORD'S COLONY @ WILLIAMSBURG

OWNER/DEVELOPER: REALTEC, INCORPORATED

POWHATAN/BERKELEY DISTRICT — JAMES CITY COUNTY — VIRGINIA

AES CONSULTING ENGINEERS
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(757) 253-0040
Fax (757) 220-8994

MARCH, 2001 — JOB NO. 5652-75 — SCALE: 1"=600'

GENERAL NOTES

1. SITE IS CURRENTLY ZONED PUBLIC LANDS, PL.
2. SITE ADDRESS: 5380 CENTERVILLE ROAD WILLIAMSBURG, VA 23188
3. TAX MAP PARCEL ID. 3130100049
4. APPLICANT: WILLIAMSBURG JAMES CITY COUNTY PUBLIC SCHOOLS
   597 JOLLY POND ROAD
   WILLIAMSBURG VA. 23188-7328
   CONTACT: ALAN ROBERTSON
   PHONE: (757) 259-7157
   FAX: (757) 565-1462
5. THIS SITE PLAN IS AN AMENDMENT TO SP-0017-2010 TO ADD ADDITIONAL PARKING SPACES AND PROVIDE DRAINAGE IMPROVEMENTS TO THE EXISTING PLAYGROUND AREA.
6. PROPERTY SHOWN HEREON LIES IN ZONE "X", (AREA DETERMINED TO BE OUTSIDE THE 500 YEAR FLOOD PLAIN) PER F.I.R.M. #51095C0120C, DATED 9/28/07.
7. PROJECT LIES WITHIN SUB WATERSHED 204-101-1 OF THE POWHATAN CREEK WATERSHED.
8. THIS PROPERTY IS LOCATED IN THE POWHATAN DISTRICT AND IS WITHIN A COMMUNITY CHARACTER CORRIDOR.
9. SITE IS SERVED BY PUBLIC SEWER AND WATER.
10. NO ADDITIONAL WATER OR SEWER CONNECTIONS ARE REQUIRED FOR THIS PROJECT.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING MISS UTILITY (1-800-552-7001) AND A PRIVATE LOCATOR FOR EXISTING UTILITY LOCATIONS PRIOR TO COMMENCING CONSTRUCTION.
12. EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.
13. ALL UTILITIES WILL BE PLACED UNDERGROUND.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FOR THIS PROJECT.
15. ALL EXISTING BUILDINGS WILL BE RETAINED IN CURRENT USE, UNLESS OTHERWISE NOTED.
16. ON-SITE EXTERIOR CONCRETE IS TO BE A MINIMUM OF 3500 PSI WITH 5% TO 7% AIR ENTRAINMENT.
17. PROPERTY OWNER IS RESPONSIBLE FOR MAINTENANCE OF ALL SITE IMPROVEMENTS, INCLUDING LANDSCAPING, AS SHOWN ON THE APPROVED PLAN.
18. ALL EXISTING PAVED SURFACES SHALL BE KEEP CLEAN DAILY, NO TRUCK SHALL ENTER CENTERVILLE ROAD WITH MUD ON THE TIRES.
19. HORIZONTAL DATUM – NAD83 (1986) VIRGINIA STATE PLANE COORDINATE SYSTEM SOUTH ZONE VERTICAL DATUM – NGVD29 VIRGINIA STATE PLANE COORDINATE SYSTEM SOUTH ZONE. JAMES CITY COUNTY MONUMENTS USED – 309.
20. ALL ERRORS OR DISCREPANCIES WITH THE PLANS OR EXISTING SITE CONDITIONS SHALL BE REPORTED TO THE ENGINEER OF RECORD BEFORE PROCEEDING WITH THE WORK.
21. CONTOUR INTERVAL IS 1 FOOT. TOPOGRAPHICAL INFORMATION BASED UPON A SURVEY PROVIDED BY AES.
22. ANY EXISTING, UNUSED WELLS SHALL BE ABANDONED IN ACCORDANCE WITH THE VIRGINIA PRIVATE WELL REGULATIONS AND JAMES CITY COUNTY CODE.
23. THE CONTRACTOR SHALL MAINTAIN A COMPLETE SET OF THE APPROVED PLANS AT THE PROJECT SITE AT ALL TIMES DURING CONSTRUCTION.
24. CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF CONSTRUCTION EFFORTS WITH THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT), LOCAL EMERGENCY SERVICES, AND ALL NECESSARY UTILITY COMPANIES INCLUDING, BUT NOT LIMITED TO, ELECTRICITY, NATURAL GAS, TELECOMMUNICATIONS, CABLE TELEVISION, WATER, SEWER, PRIVATE LIGHTING, AND OTHERS THAT MAY BE REQUIRED.
25. THE CONTRACTOR SHALL SATISFY HIMSELF AS TO ALL SITE CONDITIONS PRIOR TO CONSTRUCTION.
26. OUTDOOR SIGNS ON THE PROPERTY WITHIN THE DISTRICT SHALL COMPLY WITH REGULATIONS FOR EXTERIOR SIGNS IN ACCORDANCE WITH ARTICLE II, DIVISION 3 OF THE ZONING ORDINANCE.
27. ALL CONSTRUCTION METHODS AND MATERIALS SHALL CONFORM WITH THE CURRENT JAMES CITY COUNTY STANDARDS AND SPECIFICATIONS, VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE STANDARDS AND SPECIFICATIONS, HAMPTON ROADS PLANNING DISTRICT COMMISSION (HRPDC) SPECIFICATIONS AND SUPPLEMENT CONDITIONS FOUND IN BID DOCUMENTS, VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS, AND ANY OTHER APPLICABLE CITY OR STATE ORDINANCES, CODES, AND LAWS PRIOR TO ANY CONSTRUCTION ACTIVITY.
28. THIS TOPOGRAPHIC SURVEY WAS COMPLETED UNDER THE DIRECT AND RESPONSIBLE CHARGE OF THOMAS C. SUBLETT, L.S. FROM AN ACTUAL GROUND SURVEY MADE UNDER HIS SUPERVISION. THE ORIGINAL DATA WAS OBTAINED ON NOVEMBER 2, 2010. THIS TOPOGRAPHIC SURVEY MAP MEETS MINIMUM ACCURACY STANDARDS AND IS REFERENCED TO NATIONAL GEODETIC VERTICAL DATUM 1929 (JAMES CITY COUNTY GEODETIC CONTROL MAIN STATION 309 RESET 1990, NGVD 1929).
29. BOUNDARY INFORMATION SHOWN ON THESE DRAWING DOES NOT REPRESENT A CURRENT BOUNDARY SURVEY BY AES.
30. ALL TRAFFIC CONTROL SIGNS AND PAVEMENT MARKINGS SHALL CONFORM TO THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS.
31. BURNING OF DEBRIS ON SITE IS NOT PERMITTED.
32. THE JAMES CITY COUNTY BOARD OF SUPERVISORS APPROVED JCC-SUP-0032-2010 WITH CONDITIONS AT THE MARCH 8, 2011 BOARD MEETING.

LEGEND

EXISTING		PROPOSED
—W—	WATER	—W—
—S—	SANITARY SEWER	—S—
	STORM SEWER	
—FM—	FORCE MAIN	—FM—
—C—	COMMUNICATIONS	—C—
—UG-TEL—	UNDERGROUND PHONE LINE	—UG-TEL—
	OVERHEAD ELECTRIC LINE	
—GAS—	GAS LINE	—G—
—FO—	FIBER OPTIC	—FO—
—UG-CATV—	UNDERGROUND CABLE TV	—UG-CATV—
TELPED	TELEPHONE PEDESTAL	
	SANITARY MANHOLE	
	STORM MANHOLE	
	CURB DROP INLET	
	YARD DROP INLET	
	FLARED END SECTION	
	VALVE	
FH	FIRE HYDRANT ASSEMBLY	
	BLOW-OFF VALVE	
	REDUCER	
	AIR RELEASE ASSEMBLY	
CO	CLEAN OUT	
WM	WATER METER	
PP	POWER POLE	
	POWER POLE W/GUY WIRE	
LP	LIGHT POLE	
	STREETLIGHT	
	FENCE	
	℄ DITCH/SWALE/STREAM	
	CONCRETE LINED DITCH	
	EC-2/EC-3 LINED DITCH	
	BITUMINOUS CONCRETE	

EXISTING		PROPOSED
	CONCRETE	
	AGGREGATE/GRAVEL	
	TREELINE	
8"MAPLE	TREE	1-CM
	LIMITS OF CLEARING	
	RIP RAP	
	BENCH MARK	
	GROUND ELEVATION	
	TOP OF CURB ELEV.	TC= ELEV
	FINISH GRADE ELEV.	FG= ELEV
	TOP OF WALL ELEV.	TW= ELEV
	GRADING LINE TIE-IN	
—80—	CONTOUR ELEV.	80
	RESERVED HANDICAP PARKING	
	YARD HYDRANT	
	MAILBOX	
	SIGN	
	WETLANDS	
	RPA BUFFER	
	100 YR. FLOODPLAIN	
	HIGH POINT	HP
	CENTERLINE/BASELINE	
	RIGHT OF WAY	
	PROPERTY LINE	
	EASEMENT LINE	
	SETBACK LINE	

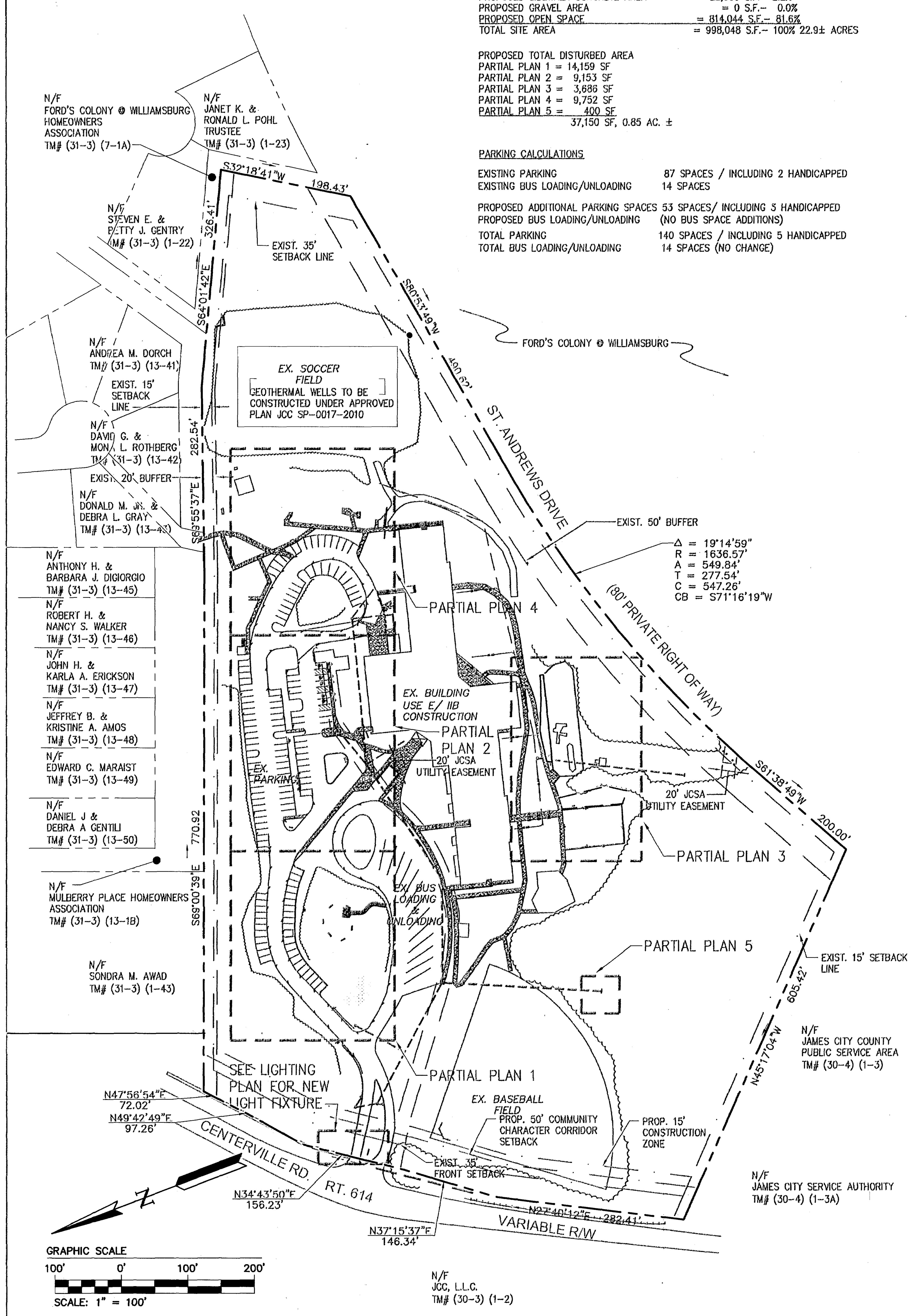
D. J. MONTAGUE ELEMENTARY SCHOOL

EXISTING BUILDING AREA	= 55,418 S.F.– 5.6%
EXISTING VEHICULAR PAVEMENT AREA	= 95,793 S.F.– 9.6%
EXISTING SIDEWALK CONCRETE AREA	= 21,711 S.F.– 2.2%
EXISTING GRAVEL AREA	= 2,052 S.F.– 0.2%
EXISTING OPEN SPACE	= 823,074 S.F.– 82.4%
TOTAL SITE AREA	= 998,048 S.F.– 100% 22.9± ACRES
PROPOSED BUILDING AREA	= 55,418 S.F.– 5.6%
PROPOSED VEHICULAR PAVEMENT AREA	= 106,251 S.F.– 10.6%
PROPOSED SIDEWALK CONCRETE AREA	= 22,335 S.F.– 2.2%
PROPOSED GRAVEL AREA	= 0 S.F.– 0.0%
PROPOSED OPEN SPACE	= 814,044 S.F.– 81.6%
TOTAL SITE AREA	= 998,048 S.F.– 100% 22.9± ACRES

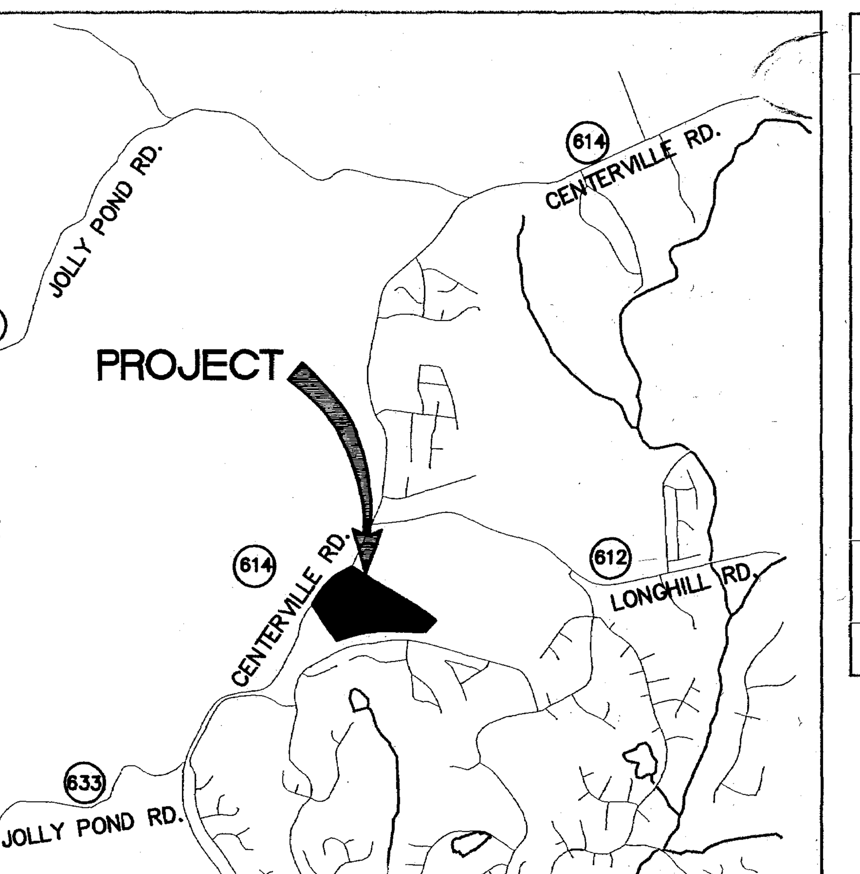
PROPOSED TOTAL DISTURBED AREA
PARTIAL PLAN 1 = 14,159 SF
PARTIAL PLAN 2 = 9,153 SF
PARTIAL PLAN 3 = 3,686 SF
PARTIAL PLAN 4 = 9,752 SF
PARTIAL PLAN 5 = 400 SF
37,150 SF, 0.85 AC. ±

PARKING CALCULATIONS

EXISTING PARKING	87 SPACES / INCLUDING 2 HANDICAPPED
EXISTING BUS LOADING/UNLOADING	14 SPACES
PROPOSED ADDITIONAL PARKING SPACES	53 SPACES/ INCLUDING 3 HANDICAPPED
PROPOSED BUS LOADING/UNLOADING	(NO BUS SPACE ADDITIONS)
TOTAL PARKING	140 SPACES / INCLUDING 5 HANDICAPPED
TOTAL BUS LOADING/UNLOADING	14 SPACES (NO CHANGE)



OVERALL SITE PLAN



VICINITY MAP
SCALE: 1"=2000'

JCC PLAN SP-0008-2011
INDEX OF SHEETS

C01 AMENDED SITE, COVER SHEET
C02 DEMOLITION & ENVIRONMENTAL INVENTORY PLAN
C03 DRAINAGE / GRADING / E&S / PARTIAL PLAN 1 & DETAILS
C04 DRAINAGE / GRADING / E&S / PARTIAL PLAN 2 & 3
C05 DRAINAGE / GRADING / E&S / PARTIAL PLANS 4 / 5 & DETAILS
C06 SITE LAYOUT PARTIAL PLAN 1 & DETAILS
C07 SITE LAYOUT PARTIAL PLAN 2 & 3
C08 SITE LAYOUT PARTIAL PLAN 4 & DETAILS
C09 NOTES & DETAILS
C10 LANDSCAPING & LIGHTING PLAN
C11 LIGHTING & LIGHTING PLAN / NOTES & DETAILS

"THE STORM DRAINAGE AS-BUILT LOCATIONS AND GRADES SHOWN ON THESE DRAWINGS, ARE ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF AND I CERTIFY THAT I, OR MY AGENT, HAVE MADE SUFFICIENT INSPECTION TO ENSURE THE ACCURACY OF THIS STATEMENT."

Thomas C. Sublett 12/21/2011
THOMAS C. SUBLETT DATE

COMMONWEALTH OF VIRGINIA
12/21/2011
THOMAS C. SUBLETT
No. 1886
LAND SURVEYOR

Rev.	Date	Description	Revised By
2	12/21/11	BIORETENTION BASIN AND STORM SWEWER ASBUILT	JFS
1	3/23/11	REVISION PER JCC COMMENTS	LBA

AES CONSULTING ENGINEERS
Hampton Roads | Central Virginia | Middle Peninsula
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
Phone: (757) 253-0040
Fax: (757) 220-8994
www.aesva.com

RECORD DRAWING
FOR STORM AS-BUILTS
D. J. MONTAGUE ELEMENTARY SCHOOL
ADDITIONAL PARKING
AND
PLAYGROUND DRAINAGE IMPROVEMENTS
W/JCC PUBLIC SCHOOLS
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Project Contacts:	LBA/TCS
Project Number:	9888-34 XREF- 10162-00
Scale: AS NOTED	Date: 9/28/11

Sheet Title:
RECORD DRAWING FOR STORM STRUCTURES

Sheet Number
R01

ECS Mid-Atlantic, LLC
108 Ingram Road
Suite 1
Williamsburg, VA 23188
(757) 229-6677

LETTER OF TRANSMITTAL

October 14, 2011	RE: **D.j. Montague Elementary School Parking Lot Cmt**
Williamsburg-JCC Public Schools 597 Jolly Pond Road Williamsburg, VA 23188	ECS Job # **07:11138**
	Permits:
ATTN: Mr. Alan Robertson	Location: **5380 Centerville Road** **Williamsburg, VA**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **AES Consulting Engineers, Inc. - Bruce Abbott**

ENCL:

Field Report # 3	10/12/2011	bio-retention

COMMONWEALTH OF VIRGINIA
B. SCOTT GRESHAM
Lic. No. 037[illegible]
PROFESSIONAL ENGINEER

OCT 13 2011

Scott Gresham, P.E.
Construction Services Manager

John M. Foster
Project Manager

ECS Mid-Atlantic, LLC
108 Ingram Road
Suite 1
Williamsburg, VA 23188
(757) 229-6677

FIELD REPORT

Project No.	07:11138
Report No.	3
Day & Date	Wednesday 10/12/2011
Weather	70°/ Rain
On-Site Time	1.00
Lab Time	0.25
Travel Time*	0.50
Total	1.75
Re Obs.Time	0.00

Project	D.J. Montague Elementary School Parking Lot Cmt
Location	Williamsburg, VA
Client	Williamsburg-JCC Public Schools - Alan Robertson

Remarks **bio-retention**

Trip Charges* Tolls/Parking* Mileage* 20

Chargeable Items

Time of Arrival 02:00P Departure 03:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on-site, as requested, to observe the bio-retention pond at the entrance of D.J. Montague Elementary School.

The undersigned observed the following after completion of the bio-retention pond:

Rip rap was observed to be one to three feet in depth built up at the culvert from the parking area into the pond, extending a minimum of six feet into the pond from the culvert opening. The soil was observed to have been placed and loose, appearing to be uncompacted fill with a minimum of three inches of mulch on the surface. Visible filter fabric was noted around the entire perimeter of the pond as well as around the rip rap at the culvert. The undersigned also noted that the silt fence in two areas had failed, allowing clay material from the outer edge of the pond to infiltrate. The clay was observed to be on the surface of the mulch, the contractor was notified and determined that the silt fence would be repaired and the clay material removed. At this time, the undersigned determined that the surrounding root material had not sufficiently established itself enough to retain the clay material around the pond without aid of the silt fence currently in place.

By **John M. Foster, — Project Manager** 1300

166580

PC263
PC080

RECEIVED
FEB 2011
Planning Department

D. J. MONTAGUE
ELEMENTARY SCHOOL

Environmental Division
FEB 04 2011
RECEIVED

ENVIRONMENTAL DIVISION
SUBMITTAL: FEBRUARY 2, 2011

SP-08-11

AES
CONSULTING ENGINEERS
Prepared by:
AES Consulting Engineers
5248 Olde Towne Road, Suite 1
Williamsburg, VA 23188
(757) 253-0040 Fax: (757) 220-8994
http://www.aesva.com

D. J. Montague Elementary School
Erosion & Sediment Control and Storm Water Control Narrative

AES Project No. W10162-00
Submittal: February 2, 2011

The following text will serve as a brief outline or narrative for the above referenced plan. This narrative will explain the erosion and sediment control plan, and sequence as well as the storm water control utilized on this site plan.

Erosion and Sediment Control

The erosion and sediment control for this site utilizes measures and practices found in the Virginia Erosion and Sediment Control (VESCH) Handbook Third Edition dated 1992.

Construction work will begin with the installation of the sediment trap and other perimeter controls located on the plan sheets. These controls are to be installed and functional before any demolition or land disturbance is to begin. It should be noted that the sediment trap is located at the proposed bio-retention site. This area will serve as a sediment trapping facility until the contributing drainage area to the final facility is stabilized.

Stormwater Control

With the installation of the erosion and sediment measures, the storm sewer modifications and the swales shown on the plan can now be installed. Stormwater from the existing storm sewers shown in this plan currently contribute to an existing BMP#3 (JCC#PC080i - located at Ford's Colony Golf Hole #7) within the existing Ford's Colony subdivision (as shown on the Ford's Colony Overall Land Plan submitted with this plan set). Computations have shown a moderate decrease in the rate of flow from the school site to the existing storm sewer (please refer to the attached Hydraflow hydrograph computations for this information).

Once the area is stabilized the bio-retention basin can then be excavated of any sediment accumulation from the sediment trap basin that occurred during the construction process. The contractor shall not construct or convert to the final bio-retention facility until the County Environmental Inspector has deemed the basin drainage area is stabilized and that any construction activity sediment transport has eliminated. The infiltration area of the facility can be excavated and backfilled with the infiltration media as shown in the plans at this time.

The 10-year event flow was applied to the existing storm sewer system #2. As noted above, the bio-retention facility resulted in a reduction of flow to the existing storm sewer system #2. Existing storm sewer system #2 has computations provided for both

existing and proposed conditions. The existing storm sewer #2 contributes, as stated above, to existing BMP#3 (JCC#PC080i).

The original design of BMP #33 (JCC#PC080i) has a published volume 400,000 cubic feet of storage. For the purpose of the narrative, it is assumed that the impervious area of Ford's Colony Section 10 is currently at 70 percent of the Section 10 drainage area to BMP3 (JCC#PC080i), this percentage results in 10.0 acres of impervious cover for Section 10. The impervious area of the D.J. Montague site is proposed to be 18% impervious area which results in 4.3 acres of impervious area to BMP3 (JCC#PC080i). The total impervious area for this site is expected to be at 14.3 acres total. Based upon the County criteria, for the currently approved 6-point facility, the Water Quality Volume (WQV) needs to treat 1.5" of storm-water over the impervious area. This Requirement results in a WQV of 77,864 cubic feet. This number is well below the published volume of 400,000 cubic feet currently provided in the existing BMP#33 (JCC#PC080i).

The conclusion is that this facility is already more than adequate to accept the increased drainage area of the proposed D. J. Montague site improvements.

Special Stormwater Criteria

Since this site is in the Powhatan Creek watershed the Special Stormwater Criteria (SSC) for this site has been addressed as well. Based upon the amount of disturbed area for this site an SSC requirement of 2 measures are to be provided for this site.

The first of these two measures is the application of a High Performance-Turf Reinforcement Matting within the swales to comply with SSCP#28. The swales requiring this application is a flat bottom trapezoidal swale adjacent to the playground area, and a V-ditch located at the delivery area. With these two applications this measure has complied with the site-wide requirement.

The bio-retention basin, SSCP#12, is the second measure used on this site. This facility will treat the largest increase of impervious area in this plan as well as the existing impervious area.

Environmental Impacts

There are no environmental impacts associated with this project.

D. J. MONTAGUE
ELEMENTARY SCHOOL

ENVIRONMENTAL DIVISION
SEDIMENT TRAP
SUBMITTAL: FEBRUARY 2, 2011

AES
CONSULTING ENGINEERS

Prepared by:
AES Consulting Engineers
5248 Olde Towne Road. Suite 1
Williamsburg, VA 23188
(757) 253-0040 Fax: (757) 220-8994
http://www.aesva.com

AES
CONSULTING ENGINEERS

Project:	D. J. Montague
Project No.:	W10162-00
Subject:	Sediment Trap Design
Date:	11/30/2010
Calculated By:	R. Smith

Drainage Area to Sediment Trap = 0.58 Acres

Required Wet Storage = 67 cy/acre * (Drainage Area) = 39 cubic yards, or 1,049 cubic feet

Required Dry Storage = 67 cy/acre * (Drainage Area) = 39 cubic yards, or 1,049 cubic feet

Determine Volume of Sediment Trap by Contour:

Elevation	Depth	Area (sq. ft.)	Volume (cu. ft.)	Volume (cu. yd.)	Sum Volume (cu. ft.)	Sum Volume (cu. yd.)
110	0	2514	0	0	0	0
111	1	3252	2883	107	2883	107
112	1	3771	3511.5	130	6395	237

Length of Aggregate Outlet Weir = 6 ft./acre & (Drainage Area) = 3.48 feet

Elevation of Wet Storage Volume = 110.36

Elevation of Dry Storage Volume = 110.73

Elevation of accumulated sediment when sediment removed is required (1/2 wet storage volume) = 110.18

Top Width of Embankment (H_O = 0.4 ft.) = 2 feet

D. J. MONTAGUE
ELEMENTARY SCHOOL

ENVIRONMENTAL DIVISION
STORMSEWER
SUBMITTAL: FEBRUARY 2, 2011

CONSULTING ENGINEERS
Prepared by:
AES Consulting Engineers
5248 Olde Towne Road. Suite 1
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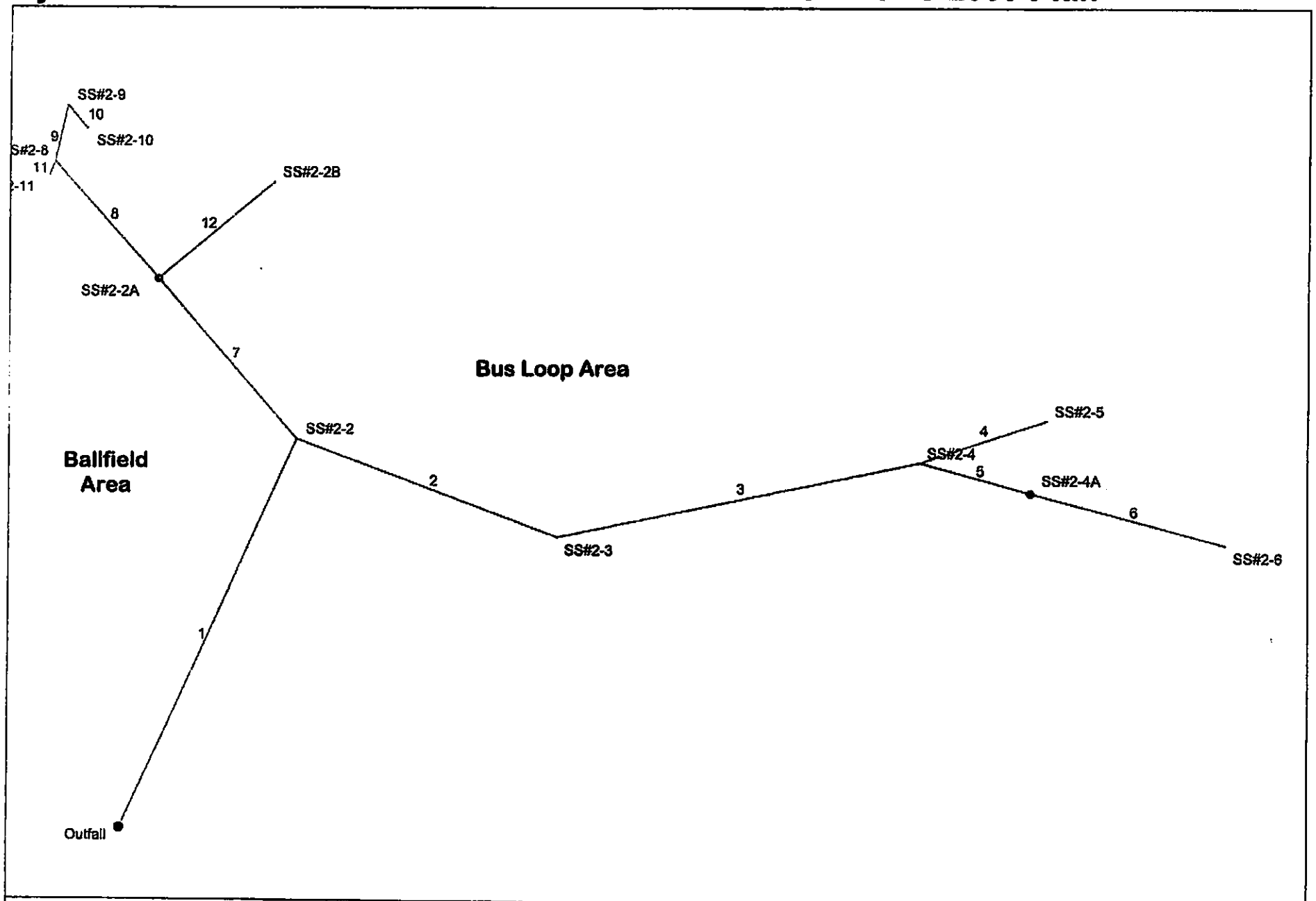
Hydraflow Storm Sewers Extension for AutoCAD® Civil 3D® 2009 Plan



Project File: Ex Storm Sys 2.stm	Number of lines: 12	Date: 01-11-2011

Hydraflow Storm Sewers Extension v6.066

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line shape	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	240.561	-66.007	DrGrt	0.00	0.49	0.87	5.0	86.54	3.92	95.96	18	Cir	0.013	2.07	107.58	SS#2-2>SS#2-1
2	1	154.326	86.672	Curb	0.00	0.62	0.70	5.0	96.03	2.94	100.56	18	Cir	0.013	0.90	112.36	SS#2-3>SS#2-2
3	2	205.397	-32.849	Curb	0.00	1.05	0.71	5.0	100.56	1.65	103.95	18	Cir	0.013	0.77	114.83	SS#2-4>SS#2-3
4	3	74.014	-6.951	Curb	0.00	0.14	0.62	5.0	107.93	3.40	110.45	12	Cir	0.013	1.00	118.48	SS#2-5>SS#2-4
5	3	64.000	27.218	DrGrt	0.00	0.44	0.35	5.0	104.02	2.22	105.44	12	Cir	0.013	0.50	114.58	SS#2-4A>SS#2-4
6	5	109.084	0.000	DrGrt	0.00	0.87	0.60	5.0	105.44	3.14	108.86	12	Cir	0.013	1.00	114.47	SS#2-6>SS#2-4A
7	1	118.421	-64.874	MH	0.00	0.00	0.00	0.0	96.05	3.01	99.61	12	Cir	0.013	1.00	110.00	SS#2-2A>SS#2-2
8	7	87.798	0.000	DrGrt	0.00	0.06	0.35	5.0	99.61	3.00	102.24	12	Cir	0.013	1.50	106.94	SS#2-8>SS#2-2A
9	8	32.642	52.928	DrGrt	0.00	1.13	0.35	15.0	102.44	0.83	102.71	12	Cir	0.013	1.50	107.11	SS#2-9>SS#2-8
10	9	17.136	129.018	Curb	0.00	0.12	0.95	5.0	103.22	5.72	104.20	12	Cir	0.013	1.00	107.79	SS#2-10>SS#2-9
11	8	8.790	-115.508	Curb	0.00	0.12	0.95	5.0	102.87	25.48	105.11	12	Cir	0.013	1.00	108.70	SS#2-11>SS#2-8
12	7	84.230	90.294	Curb	0.00	0.58	0.60	10.0	99.60	8.16	106.47	12	Cir	0.013	1.00	109.72	SS#2-2B>SS#2-2A

Project File: Ex Storm Sys 2.stm | Number of lines: 12 | Date: 01-11-2011

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VCE DOCUMENT CONVERSION

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	240.561	0.49	5.62	0.67	0.33	3.26	5.0	15.8	5.0	16.37	20.78	9.34	18	3.92	86.54	95.96	88.17	97.39	88.79	107.58	SS#2-2>SS#2-1
2	1	154.326	0.62	3.12	0.70	0.43	1.94	5.0	6.1	7.1	13.84	17.99	7.83	18	2.94	96.03	100.56	100.26	102.94	107.58	112.36	SS#2-3>SS#2-2
3	2	205.397	1.05	2.50	0.71	0.75	1.51	5.0	5.5	7.3	11.03	13.49	6.24	18	1.65	100.56	103.95	103.79	106.06	112.36	114.83	SS#2-4>SS#2-3
4	3	74.014	0.14	0.14	0.62	0.09	0.09	5.0	5.0	7.5	0.65	6.57	4.04	12	3.40	107.93	110.45	108.14	110.79	114.83	118.48	SS#2-5>SS#2-4
5	3	64.000	0.44	1.31	0.35	0.15	0.68	5.0	5.3	7.4	4.98	5.30	6.35	12	2.22	104.02	105.44	106.28	107.53	114.83	114.58	SS#2-4A>SS#2-4
6	5	109.084	0.87	0.87	0.60	0.52	0.52	5.0	5.0	7.5	3.91	6.31	5.27	12	3.14	105.44	108.86	107.57	109.70	114.58	114.47	SS#2-6>SS#2-4A
7	1	118.421	0.00	2.01	0.00	0.00	0.99	0.0	15.5	5.1	5.02	6.17	6.40	12	3.01	96.05	99.61	100.26	102.61	107.58	110.00	SS#2-2A>SS#2-2
8	7	87.798	0.06	1.43	0.35	0.02	0.64	5.0	15.2	5.1	3.29	6.16	4.20	12	3.00	99.61	102.24	103.25	104.00	110.00	106.94	SS#2-8>SS#2-2A
9	8	32.642	1.13	1.25	0.35	0.40	0.51	15.0	15.0	5.1	2.62	3.24	3.33	12	0.83	102.44	102.71	104.41	104.59	106.94	107.11	SS#2-9>SS#2-8
10	9	17.136	0.12	0.12	0.95	0.11	0.11	5.0	5.0	7.5	0.85	8.52	1.35	12	5.72	103.22	104.20	104.85	104.84	107.11	107.79	SS#2-10>SS#2-9
11	8	8.790	0.12	0.12	0.95	0.11	0.11	5.0	5.0	7.5	0.85	17.98	2.04	12	25.48	102.87	105.11	104.41	105.50	106.94	108.70	SS#2-11>SS#2-8
12	7	84.230	0.58	0.58	0.60	0.35	0.35	10.0	10.0	6.1	2.11	10.17	3.42	12	8.16	99.60	106.47	103.25	107.09	110.00	109.72	SS#2-2B>SS#2-2

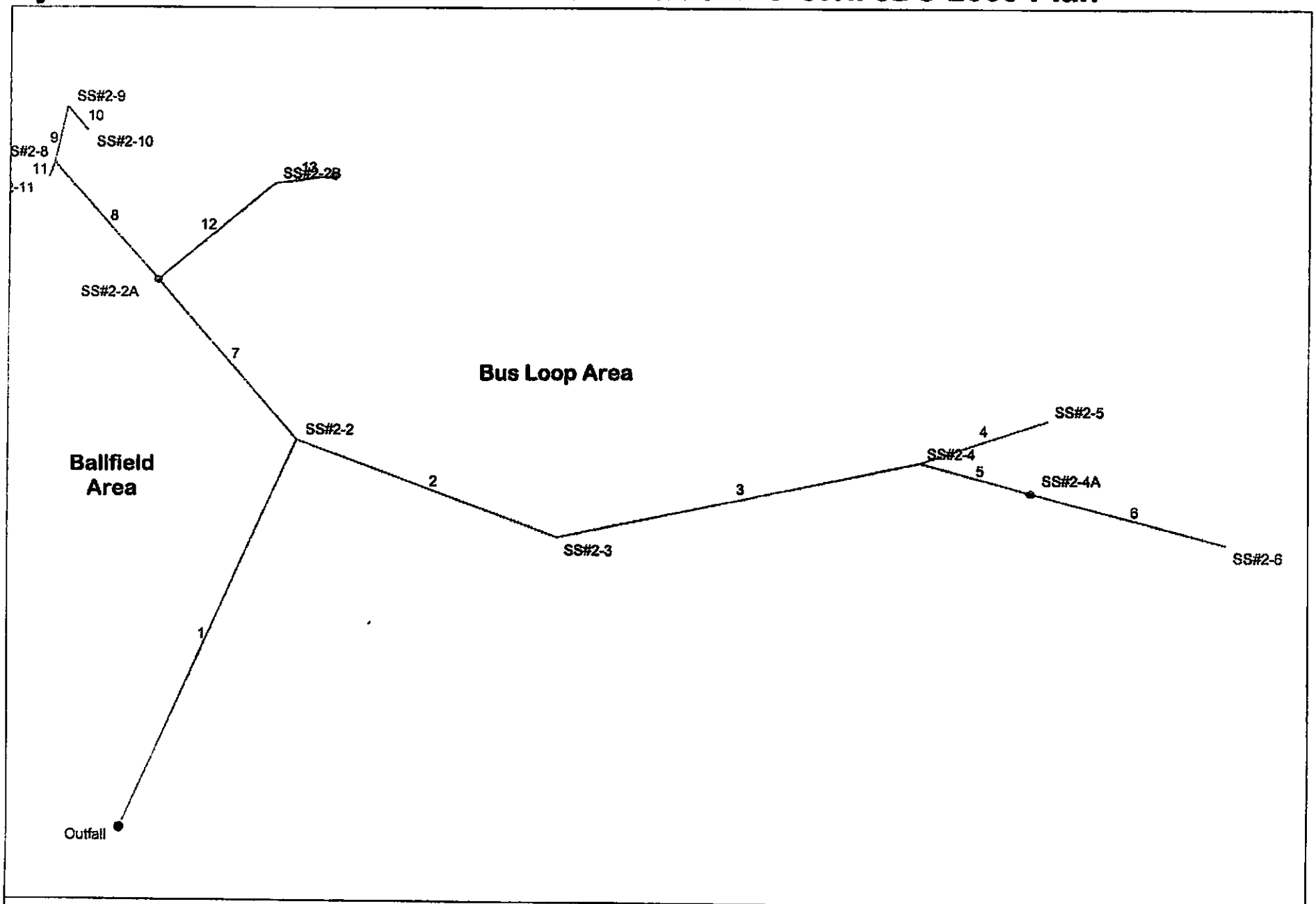
Project File: Ex Storm Sys 2.stm

Number of lines: 12

Run Date: 01-11-2011

NOTES: Intensity = 55.61 / (Inlet time + 10.00) ^ 0.74; Return period = 10 Yrs. ; c = cir e = ellip b = box

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



Project File: Proposed Storm Sys 2.stm	Number of lines: 13	Date: 01-11-2011

Hydraflow Storm Sewers Extension v6.066

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line shape	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	240.561	-66.007	DrGrt	0.00	0.49	0.67	5.0	86.54	3.92	95.96	18	Cir	0.013	2.07	107.58	SS#2-2>SS#2-1
2	1	154.326	86.672	Curb	0.00	0.62	0.70	5.0	96.03	2.94	100.56	18	Cir	0.013	0.90	112.36	SS#2-3>SS#2-2
3	2	205.397	-32.849	Curb	0.00	1.05	0.71	5.0	100.56	1.65	103.95	18	Cir	0.013	0.77	114.83	SS#2-4>SS#2-3
4	3	74.014	-6.951	Curb	0.00	0.14	0.62	5.0	107.93	3.40	110.45	12	Cir	0.013	1.00	118.48	SS#2-5>SS#2-4
5	3	64.000	27.218	DrGrt	0.00	0.44	0.35	5.0	104.02	2.22	105.44	12	Cir	0.013	0.50	114.58	SS#2-4A>SS#2-4
6	5	109.084	0.000	DrGrt	0.00	0.87	0.60	5.0	105.44	3.14	108.86	12	Cir	0.013	1.00	114.47	SS#2-6>SS#2-4A
7	1	118.421	-64.874	MH	0.00	0.00	0.00	0.0	96.05	3.01	99.61	12	Cir	0.013	1.00	110.00	SS#2-2A>SS#2-2
8	7	87.798	0.000	DrGrt	0.00	0.06	0.35	5.0	99.61	3.00	102.24	12	Cir	0.013	1.50	106.94	SS#2-8>SS#2-2A
9	8	32.642	52.928	DrGrt	0.00	1.13	0.35	15.0	102.44	0.83	102.71	12	Cir	0.013	1.50	107.11	SS#2-9>SS#2-8
10	9	17.136	129.018	Curb	0.00	0.12	0.95	5.0	103.22	5.72	104.20	12	Cir	0.013	1.00	107.79	SS#2-10>SS#2-9
11	8	8.790	-115.508	Curb	0.00	0.12	0.95	5.0	102.87	25.48	105.11	12	Cir	0.013	1.00	108.70	SS#2-11>SS#2-8
12	7	84.230	90.294	Curb	0.00	0.05	0.35	10.0	99.60	8.16	106.47	12	Cir	0.013	0.90	109.72	SS#2-2B>SS#2-2A
13	12	33.000	33.000	MH	0.19	0.00	0.00	5.0	106.47	0.09	106.50	12	Cir	0.013	1.00	111.42	Riser-->SS#2-2B

Project File: Proposed Storm Sys 2.stm | Number of lines: 13 | Date: 01-11-2011

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	240.561	0.49	5.09	0.67	0.33	2.93	5.0	15.9	5.0	14.86	20.78	8.53	18	3.92	86.54	95.96	88.17	97.36	88.79	107.58	SS#2-2>SS#2-1
2	1	154.326	0.62	3.12	0.70	0.43	1.94	5.0	6.1	7.1	13.84	17.99	7.83	18	2.94	96.03	100.56	99.68	102.36	107.58	112.36	SS#2-3>SS#2-2
3	2	205.397	1.05	2.50	0.71	0.75	1.51	5.0	5.5	7.3	11.03	13.49	6.24	18	1.65	100.56	103.95	103.79	106.06	112.36	114.83	SS#2-4>SS#2-3
4	3	74.014	0.14	0.14	0.62	0.09	0.09	5.0	5.0	7.5	0.85	6.57	4.04	12	3.40	107.93	110.45	108.14	110.79	114.83	118.48	SS#2-5>SS#2-4
5	3	64.000	0.44	1.31	0.35	0.15	0.68	5.0	5.3	7.4	4.98	5.30	6.35	12	2.22	104.02	105.44	106.28	107.53	114.83	114.58	SS#2-4A>SS#2-4
6	5	109.084	0.87	0.87	0.60	0.52	0.52	5.0	5.0	7.5	3.91	6.31	5.27	12	3.14	105.44	108.86	107.57	109.70	114.58	114.47	SS#2-6>SS#2-4A
7	1	118.421	0.00	1.48	0.00	0.00	0.66	0.0	15.5	5.1	3.54	6.17	4.51	12	3.01	96.05	99.61	99.68	100.85	107.58	110.00	SS#2-2A>SS#2-2
8	7	87.798	0.06	1.43	0.35	0.02	0.64	5.0	15.2	5.1	3.29	6.16	4.64	12	3.00	99.61	102.24	100.93	103.01	110.00	106.94	SS#2-8>SS#2-2A
9	8	32.642	1.13	1.25	0.35	0.40	0.51	15.0	15.0	5.1	2.62	3.24	3.33	12	0.83	102.44	102.71	103.67	103.84	106.94	107.11	SS#2-9>SS#2-8
10	9	17.136	0.12	0.12	0.95	0.11	0.11	5.0	5.0	7.5	0.85	8.52	2.08	12	5.72	103.22	104.20	104.10	104.59	107.11	107.79	SS#2-10>SS#2-9
11	8	8.790	0.12	0.12	0.95	0.11	0.11	5.0	5.0	7.5	0.85	17.98	2.13	12	25.48	102.87	105.11	103.67	105.50	106.94	108.70	SS#2-11>SS#2-8
12	7	84.230	0.05	0.05	0.35	0.02	0.02	10.0	10.0	6.1	0.30	10.17	1.27	12	8.16	99.60	106.47	100.93	106.70	110.00	109.72	SS#2-2B>SS#2-2
13	12	33.000	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	0.19	1.07	0.96	12	0.09	106.47	106.50	106.77	106.80	109.72	111.42	Riser-->SS#2-2B

Project File: Proposed Storm Sys 2.stm

Number of lines: 13

Run Date: 01-11-2011

NOTES: Intensity = 55.61 / (Inlet time + 10.00) ^ 0.74; Return period = 10 Yrs. ; c = cir e = ellip b = box

D. J. MONTAGUE
ELEMENTARY SCHOOL

ENVIRONMENTAL DIVISION
SWALE COMPUTATIONS
SUBMITTAL: FEBRUARY 2, 2011

CONSULTING ENGINEERS
Prepared by:
AES Consulting Engineers
5248 Olde Towne Road. Suite 1
Williamsburg, VA 23188
(757) 253-0040 Fax: (757) 220-8994
http://www.aesva.com

AES CONSULTING ENGINEERS

Project:	D. J. Montague Parking Expansion
Project No.:	W101062-00
Subject:	Channel Design at Bio-Retention Basin
Date:	12/21/2010
Calculated By:	R. Smith

Design Point:

2 Year Storm - Velocity Check

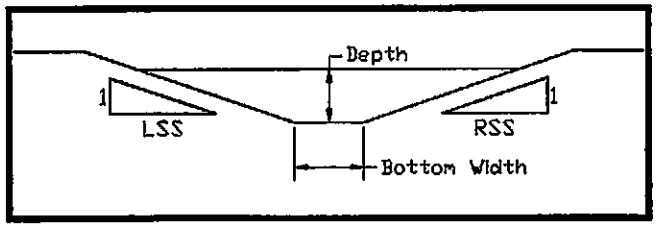
Drainage Area	=	0.31	Acres	(Area draining to Design Point)
C	=	0.90		(Runoff Coefficient)
I	=	5.50	in/hr	(Design Rainfall Intensity) **5 minutes**

Q = C I A (Peak Flow)

= 0.90 x 5.50 x 0.31

= 1.53 CFS

Channel Characteristics



Rt. Sideslope	=	3.00	:1
Lt. Sideslope	=	3.00	:1
Base Width	=	0.00	Ft.
Max. Depth	=	0.50	Ft.
Channel Slope	=	22.10	%
Mannings (n)	=	0.013	**Concrete Swale**

Depth of Flow	=	0.21	Ft.	
Area	=	0.13	SF	Wetted Perimeter = 1.33 Ft.
Hydraulic Radius	=	0.10	Ft.	
Velocity (V)	=	11.55	Ft./sec.	(From Manning's Equation)
Flow (Q)	=	1.53	CFS	(From Continuity Equation Q=AV)

10 Year Storm - Capacity Check

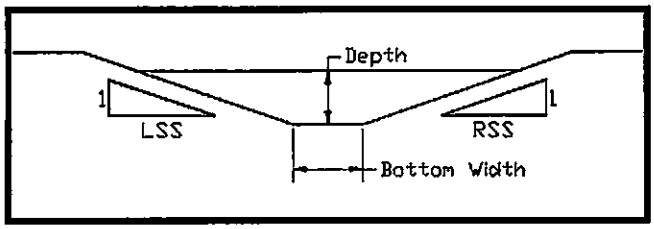
Drainage Area	=	0.31	Acres	(Area draining to Design Point)
C	=	0.90		(Runoff Coefficient)
I	=	6.40	in/hr	(Design Rainfall Intensity) **5 minutes**

Q = C I A (Peak Flow)

= 0.90 x 6.40 x 0.31

= 1.79 CFS

Channel Characteristics



Rt. Sideslope	=	3.00	:1
Lt. Sideslope	=	3.00	:1
Base Width	=	0.00	Ft.
Max. Depth	=	0.50	Ft.
Channel Slope	=	22.10	%
Mannings (n)	=	0.013	**Concrete Swale**

Depth of Flow	=	0.22	Ft.	
Area	=	0.15	SF	Wetted Perimeter = 1.41 Ft.
Hydraulic Radius	=	0.11	Ft.	
Velocity (V)	=	12.00	Ft./sec.	(From Manning's Equation)
Flow (Q)	=	1.78	CFS	(From Continuity Equation Q=AV)

$$Q = \frac{1}{n} R^{2/3} S^{1/2} A$$

$$V = \frac{Q}{A}$$

AES CONSULTING ENGINEERS

Project:	D. J. Montague Parking Expansion
Project No.:	W101062-00
Subject:	Channel Design at Playground
Date:	12/21/2010
Calculated By:	R. Smith

Design Point: **Proposed DI-7**

2 Year Storm - Velocity Check

Drainage Area	=	0.16	Acres	(Area draining to Design Point)
C	=	0.45		(Runoff Coefficient)
I	=	5.50	in/hr	(Design Rainfall Intensity) **5 Minutes**

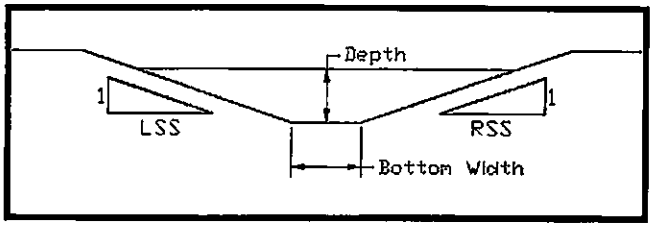
Q = C I A (Peak Flow)

= 0.45 x 5.50 x 0.16

= 0.40 CFS

where is length

Channel Characteristics



Rt. Sideslope	=	3.00	:1
Lt. Sideslope	=	3.00	:1
Base Width	=	1.00	Ft.
Max. Depth	=	1.00	Ft.
Channel Slope	=	2.04	%
Mannings (n)	=	0.035	**EC-3 HP-TRM Lining**

Depth of Flow	=	0.17	Ft.	
Area	=	0.26	SF	Wetted Perimeter = 2.09 Ft.
Hydraulic Radius	=	0.12	Ft.	
Velocity (V)	=	1.52	Ft./sec.	(From Manning's Equation)
Flow (Q)	=	0.40	CFS	(From Continuity Equation Q=AV)

10 Year Storm - Capacity Check

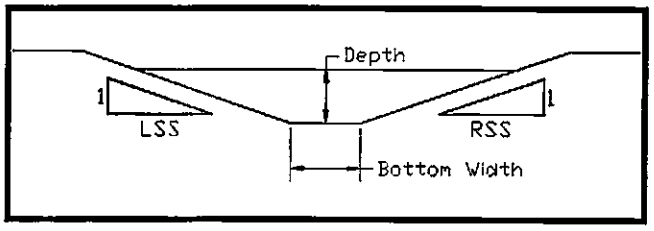
Drainage Area	=	0.16	Acres	(Area draining to Design Point)
C	=	0.45		(Runoff Coefficient)
I	=	6.40	in/hr	(Design Rainfall Intensity) **5 Minutes**

Q = C I A (Peak Flow)

= 0.45 x 6.40 x 0.16

= 0.46 CFS

Channel Characteristics



Rt. Sideslope	=	3.00	:1
Lt. Sideslope	=	3.00	:1
Base Width	=	1.00	Ft.
Max. Depth	=	1.00	Ft.
Channel Slope	=	2.04	%
Mannings (n)	=	0.035	**EC-3 HP-TRM Lining**

Depth of Flow	=	0.19	Ft.	
Area	=	0.29	SF	Wetted Perimeter = 2.18 Ft.
Hydraulic Radius	=	0.13	Ft.	
Velocity (V)	=	1.58	Ft./sec.	(From Manning's Equation)
Flow (Q)	=	0.46	CFS	(From Continuity Equation Q=AV)

D. J. MONTAGUE
ELEMENTARY SCHOOL

ENVIRONMENTAL DIVISION
BIO RETENTION CELL
SUBMITTAL: FEBRUARY 2, 2011

AES
CONSULTING ENGINEERS
Prepared by:
AES Consulting Engineers
5248 Olde Towne Road. Suite 1
Williamsburg, VA 23188
(757) 253-0040 Fax: (757) 220-8994
http://www.aesva.com

D J Montague Site Plan
Bio-retention Basin Design Calculation
AES Project No.:W10162-00
February 2, 2011

Site Hydrology
Design basis:
The Pre-Development drainage area to this site is 0.53 acres. Of this area 0.36 acres are in a non-impervious state at a C-value of 0.50 with the remaining area of 0.17 acres as impervious at a C-value of 0.90.
A Pre-Development weighted C-factor of 0.61 was calculated based upon this information

The Post-Development drainage area to this site is 0.53 acres. Of this area 0.21 acreas are in a non-impervious state at a C-value of 0.50 with the remaining area of 0.31 acres as impervious at a C-value of 0.90.
A Post-Development weighted C-factor of 0.69 was calculated based upon this information

Water Quality Volume Design

Bio-Retention Basin Volume

Design: Infiltrate 1" over the impervious area to comply with JCC 10-point requirement.

Storage Volume Required: 1125 Cubic feet

Known:
Total Drainage Area: 0.53 Acres

Total Impervious Area: 0.31 Acres

WQV (Water Quality Volume)

WQV= 1" / Impervious Acres= 1125 Cubic Feet

Elev.	Depth	Area (sq. ft.)	Incremental Volume (cu. ft.)	Sum Volume (cu. ft.)	Inc. Volume (cu. yd.)	Sum Volume (cu. yd.)
108.80		1373	0		0	
109.3	0.51	1945	1692	1692	63	63
Volume Provided =		**1,692**	**cu.ft.**	**(6" Depth)**		

Fore-bay Volume Design

Design: Store 1/10 of 1" of water over the impervious area.

Known:

Total Impervious Area: 0.31 Acres

Fore-bay Volume Required: 113 Cubic Feet

Elev.	Depth	Area (sq. ft.)	Incremental Volume (cu. ft.)	Sum Volume (cu. ft.)	Inc. Volume (cu. yd.)	Sum Volume (cu. yd.)
109.31		73.5	0		0	
110.0	0.69	241.5	217	217	8	8
Volume Provided =		**217**	**cu.ft.**			

Hydraflow Table of Contents

10162 Bio-retention.gpw

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

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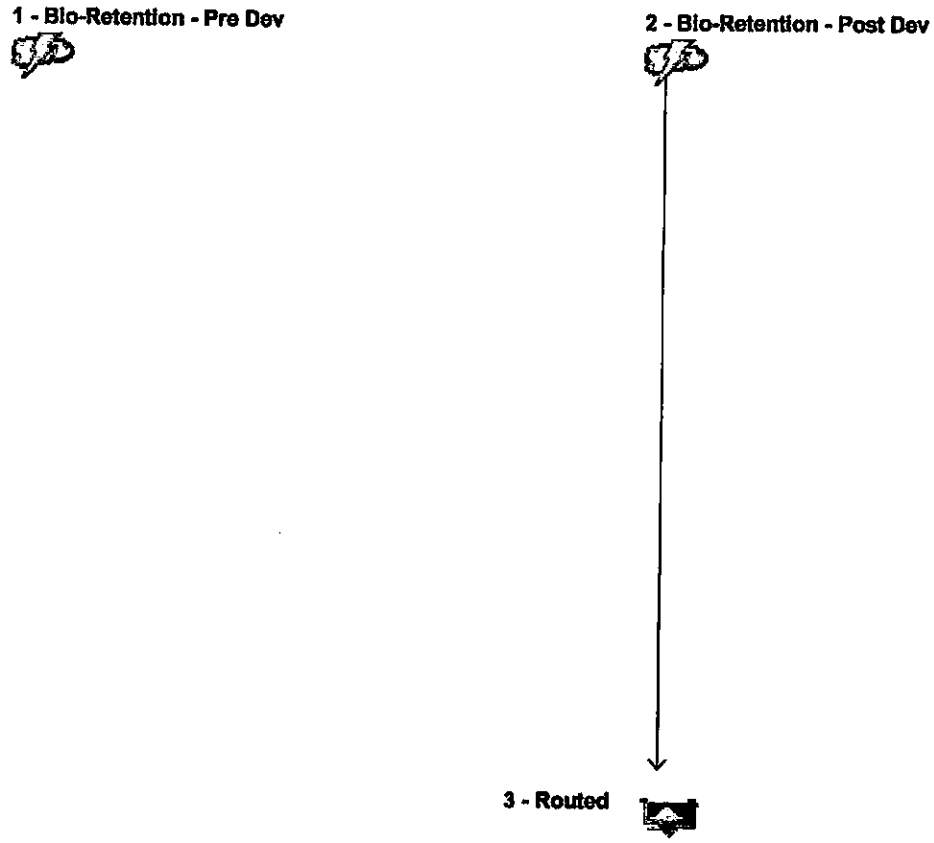
Watershed Model Schematic

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



Legend

Hyd.	Origin	Description
1	Rational	Bio-Retention - Pre Dev
2	Mod. Rational	Bio-Retention - Post Dev
3	Reservoir	Routed

Hydrograph Return Period Recap

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

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	Rational	------	1.257	1.482	------	------	1.927	------	------	2.543	Bio-Retention - Pre Dev
2	Mod. Rational	------	1.445	1.704	------	------	1.966	------	------	2.605	Bio-Retention - Post Dev
3	Reservoir	2	0.130	0.147	------	------	0.185	------	------	0.208	Routed

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	1.257	1	10	754	---	---	---	Bio-Retention - Pre Dev
2	Mod. Rational	1.445	1	5	867	---	---	---	Bio-Retention - Post Dev
3	Reservoir	0.130	1	15	856	2	109.74	1,561	Routed

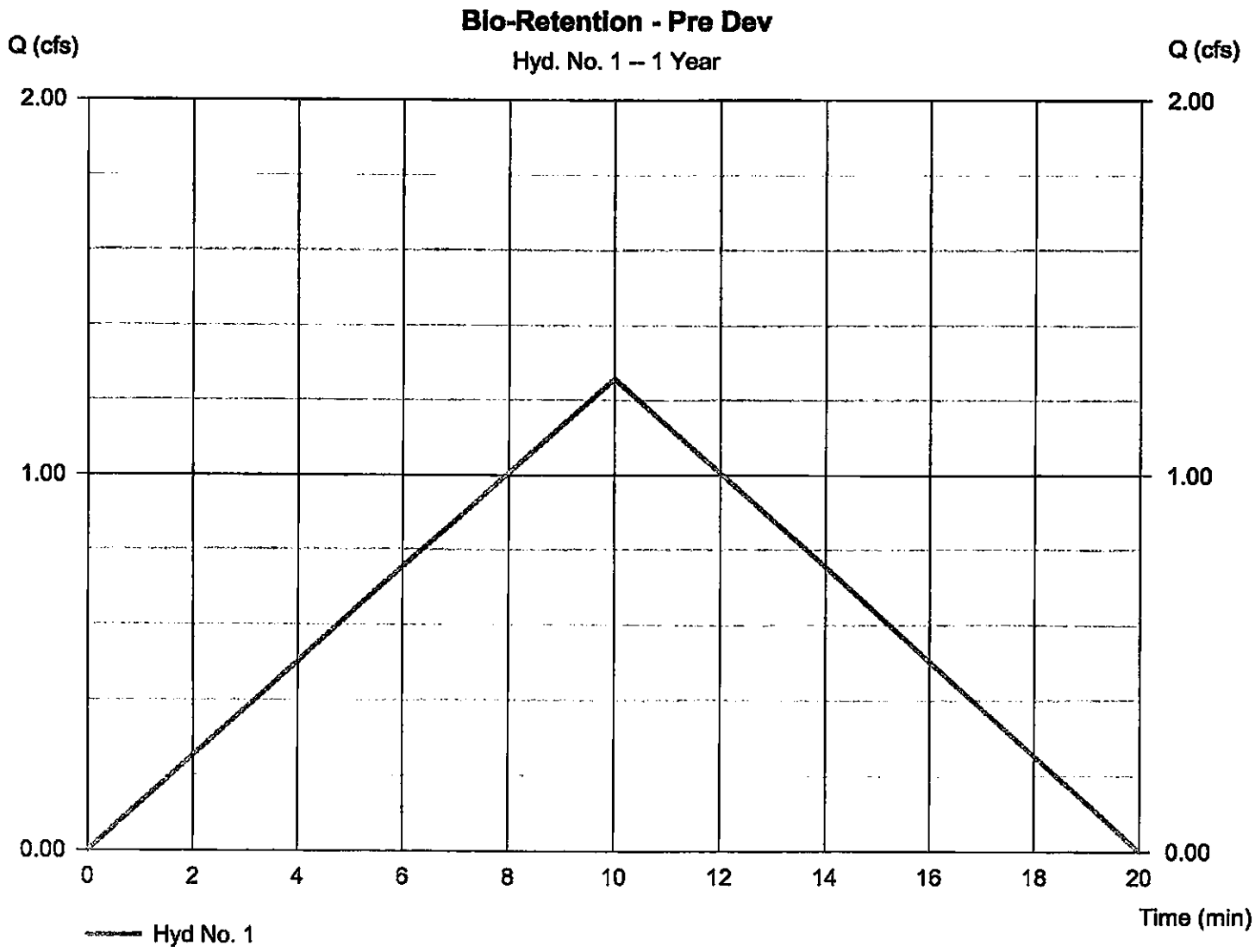
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Jan 27, 2011

Hyd. No. 1

Bio-Retention - Pre Dev

Hydrograph type	= Rational	Peak discharge	= 1.257 cfs
Storm frequency	= 1 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 754 cuft
Drainage area	= 0.530 ac	Runoff coeff.	= 0.6
Intensity	= 3.953 in/hr	Tc by User	= 10.00 min
IDF Curve	= JamesCity-NW-14.IDF	Asc/Rec limb fact	= 1/1



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Thursday, Jan 27, 2011

Hyd. No. 2

Bio-Retention - Post Dev

Hydrograph type	= Mod. Rational	Peak discharge	= 1.445 cfs
Storm frequency	= 1 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 867 cuft
Drainage area	= 0.530 ac	Runoff coeff.	= 0.69
Intensity	= 3.953 in/hr	Tc by User	= 5.00 min
IDF Curve	= JamesCity-NW-14.IDF	Storm duration	= 2.0 x Tc
Target Q	= 1.257 cfs	Est. Req'd Storage	= 279 cuft

NO CHANGE?

4.8

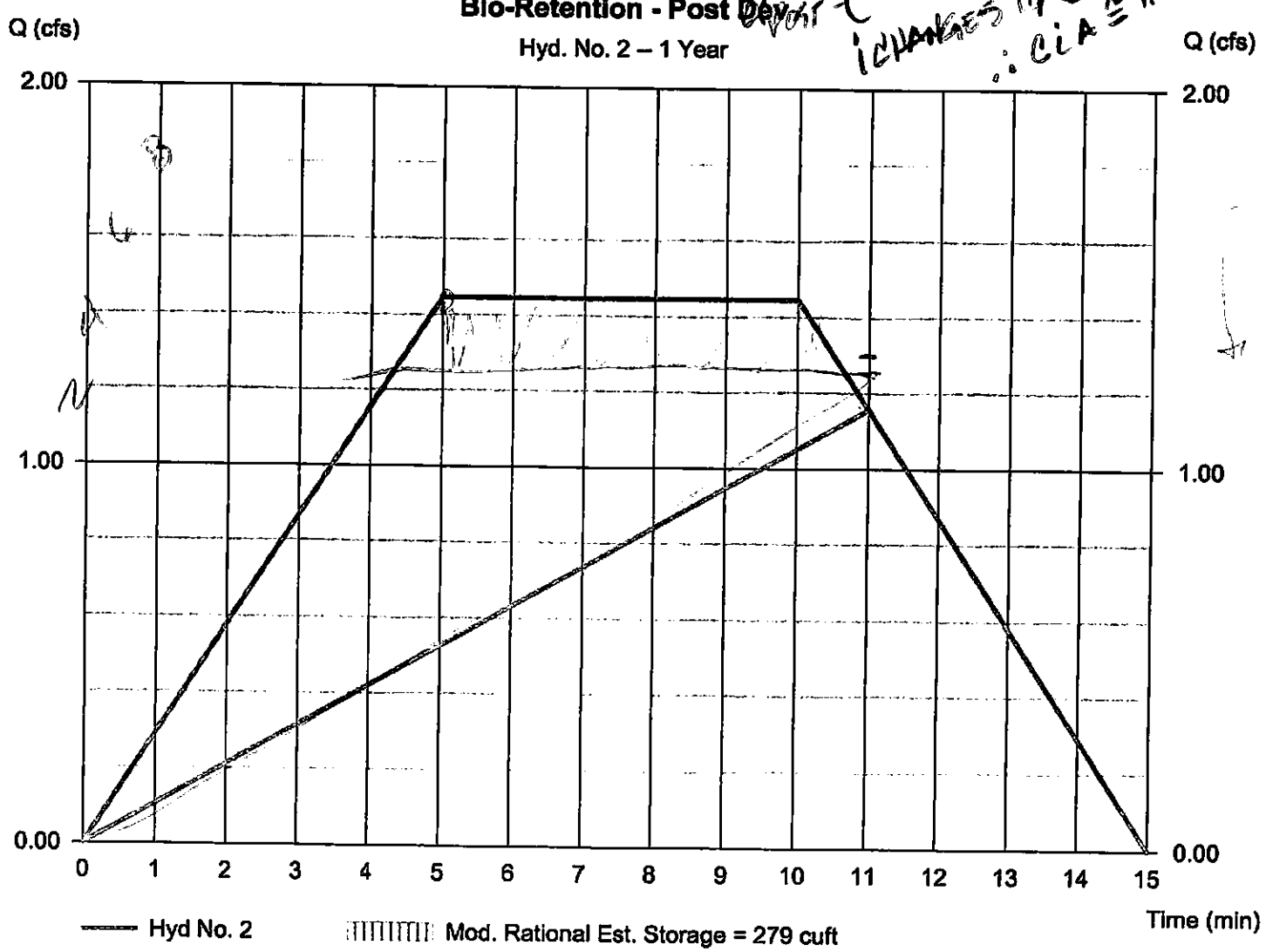
IF Q = CiA

$Q_{PRE} = (3.953)(0.16)(0.53) = 1.257$

$Q_{POST} = (4)(0.61)(0.53) = 1.445$

CHANGES w/ Tc

∴ CiA ≅ 1.76 ∴ ADDITIONAL VOL. REQ'D.



Hydrograph Report

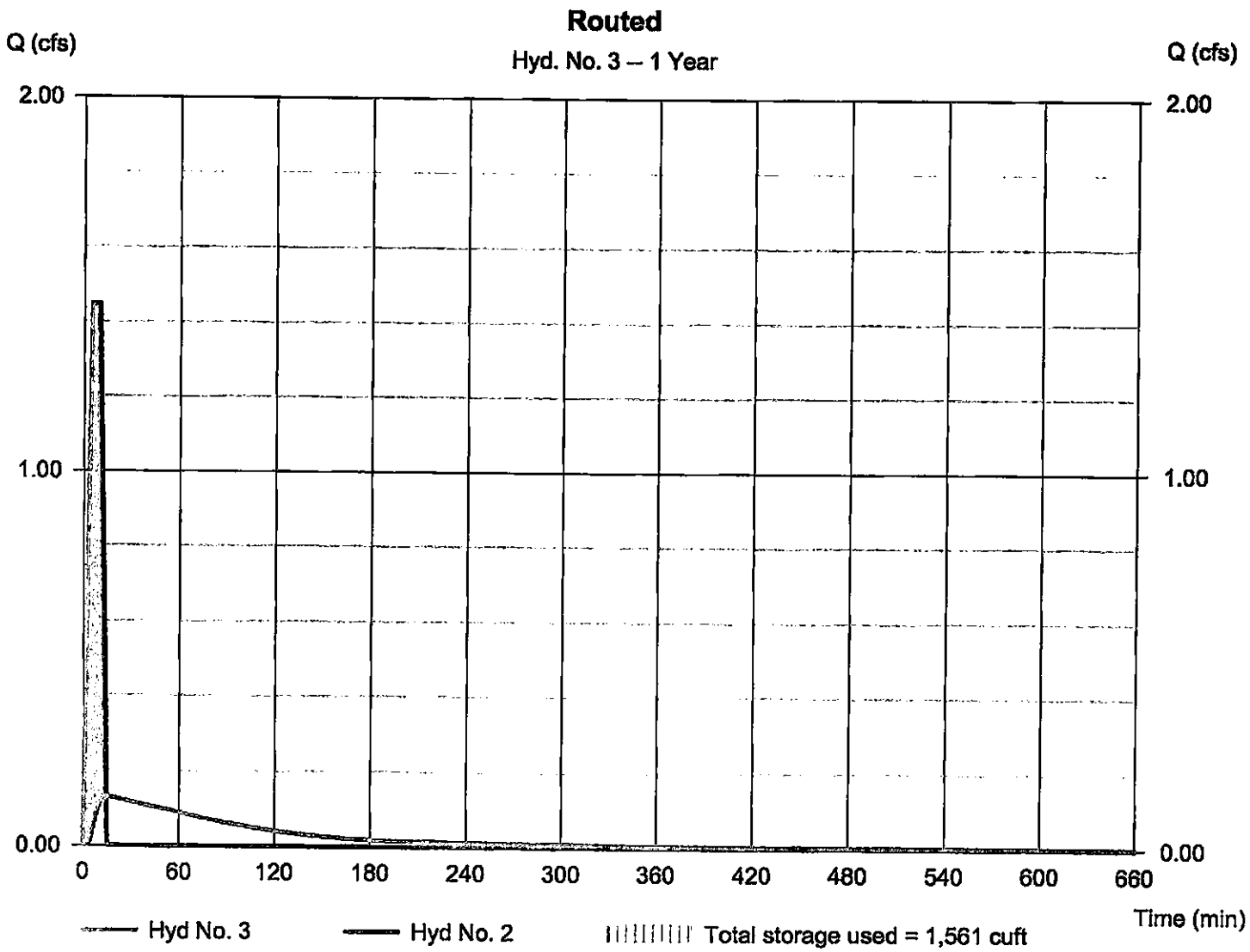
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Jan 27, 2011

Hyd. No. 3

Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.130 cfs
Storm frequency	= 1 yrs	Time to peak	= 15 min
Time interval	= 1 min	Hyd. volume	= 856 cuft
Inflow hyd. No.	= 2 - Bio-Retention - Post Dev	Max. Elevation	= 109.74 ft
Reservoir name	= Bio-Retention Filter	Max. Storage	= 1,561 cuft

Storage Indication method used. Wet pond routing start elevation = 109.30 ft.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Jan 27, 2011

Pond No. 1 - Bio-Retention Filter

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 108.80 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	108.80	827	0	0
0.20	109.00	1,227	204	204
1.20	110.00	2,514	1,832	2,036
2.20	111.00	3,252	2,875	4,911

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 10.00	3.00	0.00	0.00
Span (in)	= 10.00	3.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 106.50	109.31	0.00	0.00
Length (ft)	= 34.00	0.00	0.00	0.00
Slope (%)	= 0.09	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)	= 4.67	3.48	0.00	0.00
Crest El. (ft)	= 110.33	110.73	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Riser	Broad	---	---
Multi-Stage	= Yes	Yes	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).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	108.80	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.20	204	109.00	3.18 oc	0.00	---	---	0.00	0.00	---	---	---	---	0.000
1.20	2,036	110.00	3.18 oc	0.18 ic	---	---	0.00	0.00	---	---	---	---	0.178
2.20	4,911	111.00	4.95 oc	0.30 ic	---	---	4.09 s	0.85 s	---	---	---	---	5.239

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	1.482	1	10	889	---	---	---	Bio-Retention - Pre Dev
2	Mod. Rational	1.704	1	5	1,023	---	---	---	Bio-Retention - Post Dev
3	Reservoir	0.147	1	15	1,011	2	109.82	1,707	Routed

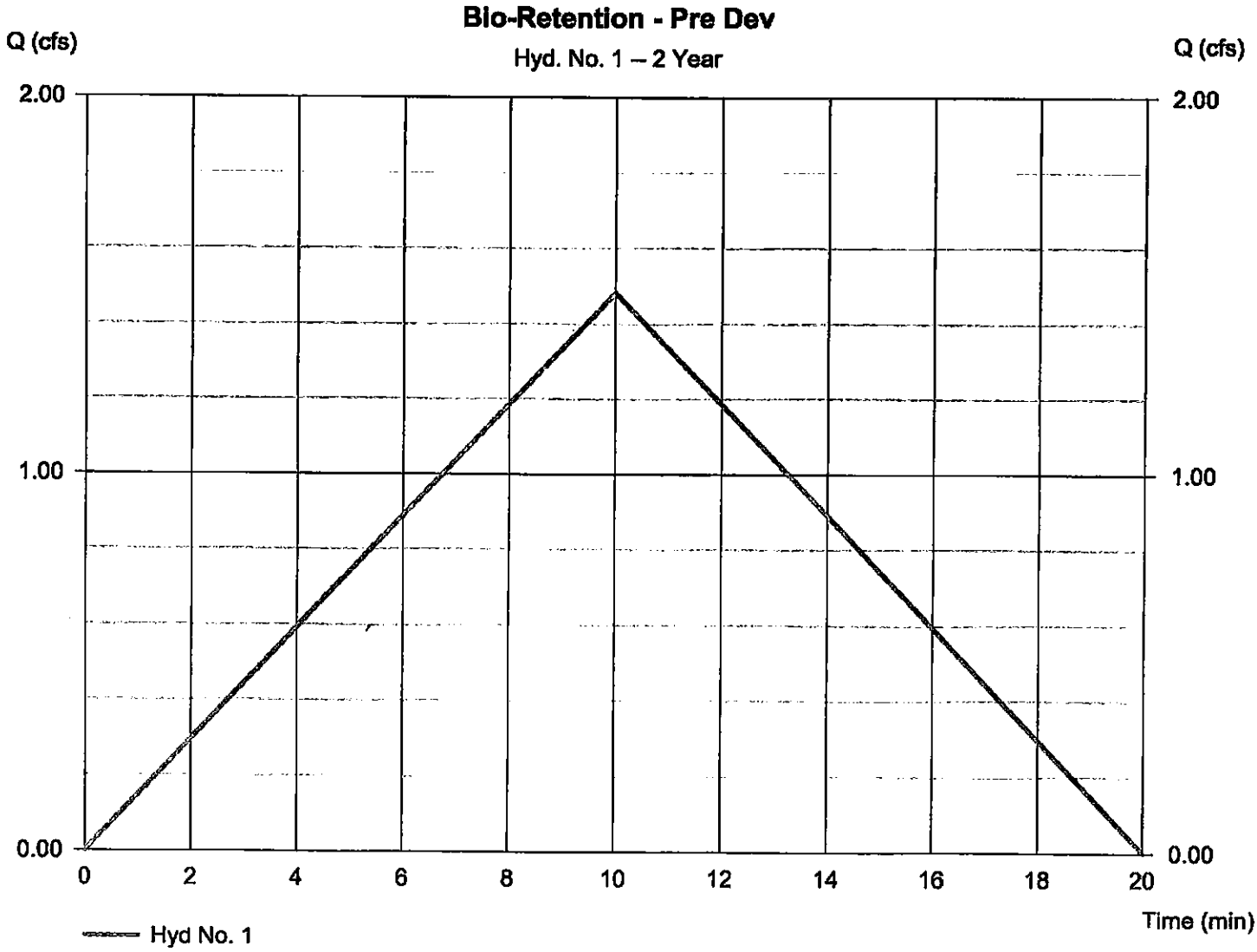
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Jan 27, 2011

Hyd. No. 1

Bio-Retention - Pre Dev

Hydrograph type	= Rational	Peak discharge	= 1.482 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 889 cuft
Drainage area	= 0.530 ac	Runoff coeff.	= 0.6
Intensity	= 4.660 in/hr	Tc by User	= 10.00 min
IDF Curve	= JamesCity-NW-14.IDF	Asc/Rec limb fact	= 1/1



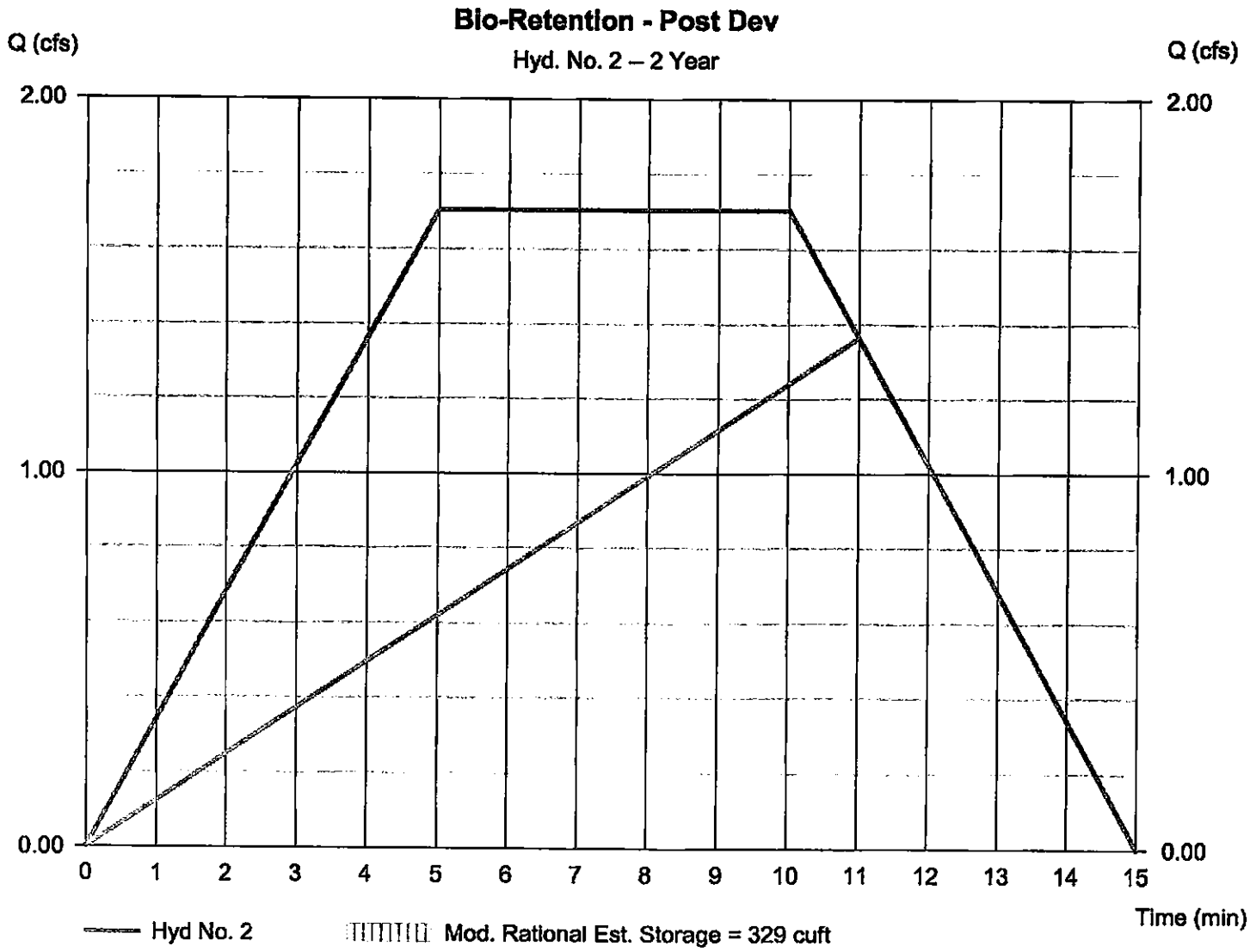
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Jan 27, 2011

Hyd. No. 2

Bio-Retention - Post Dev

Hydrograph type	= Mod. Rational	Peak discharge	= 1.704 cfs
Storm frequency	= 2 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 1,023 cuft
Drainage area	= 0.530 ac	Runoff coeff.	= 0.69
Intensity	= 4.660 in/hr	Tc by User	= 5.00 min
IDF Curve	= JamesCity-NW-14.IDF	Storm duration	= 2.0 x Tc
Target Q	= 1.482 cfs	Est. Req'd Storage	= 329 cuft



Hydrograph Report

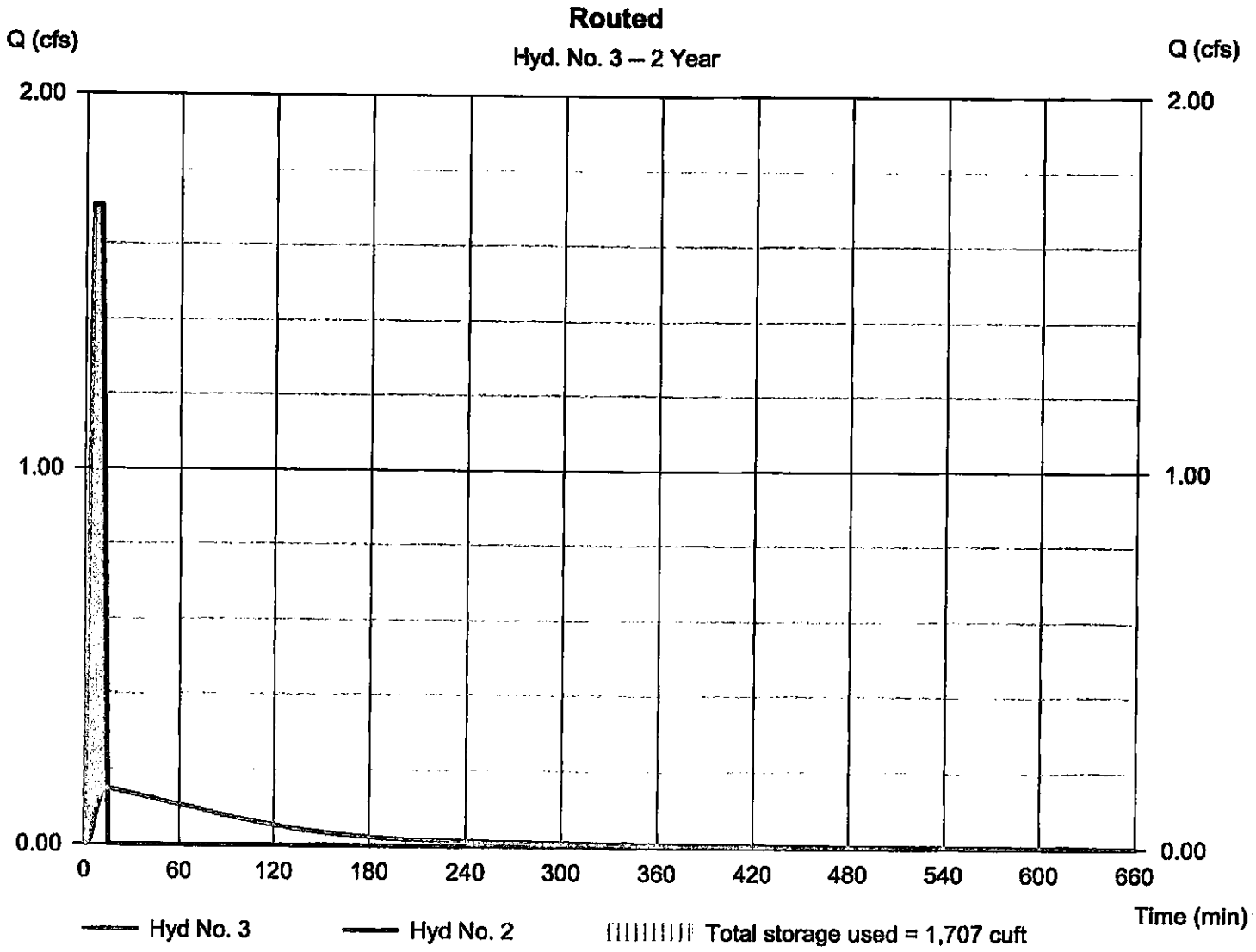
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Jan 27, 2011

Hyd. No. 3

Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.147 cfs
Storm frequency	= 2 yrs	Time to peak	= 15 min
Time interval	= 1 min	Hyd. volume	= 1,011 cuft
Inflow hyd. No.	= 2 - Bio-Retention - Post Dev	Max. Elevation	= 109.82 ft
Reservoir name	= Bio-Retention Filter	Max. Storage	= 1,707 cuft

Storage Indication method used. Wet pond routing start elevation = 109.30 ft.



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	1.927	1	10	1,156	----	----	----	Bio-Retention - Pre Dev
2	Mod. Rational	1.966	1	5	1,593	----	----	----	Bio-Retention - Post Dev
3	Reservoir	0.185	1	18	1,523	2	110.05	2,174	Routed

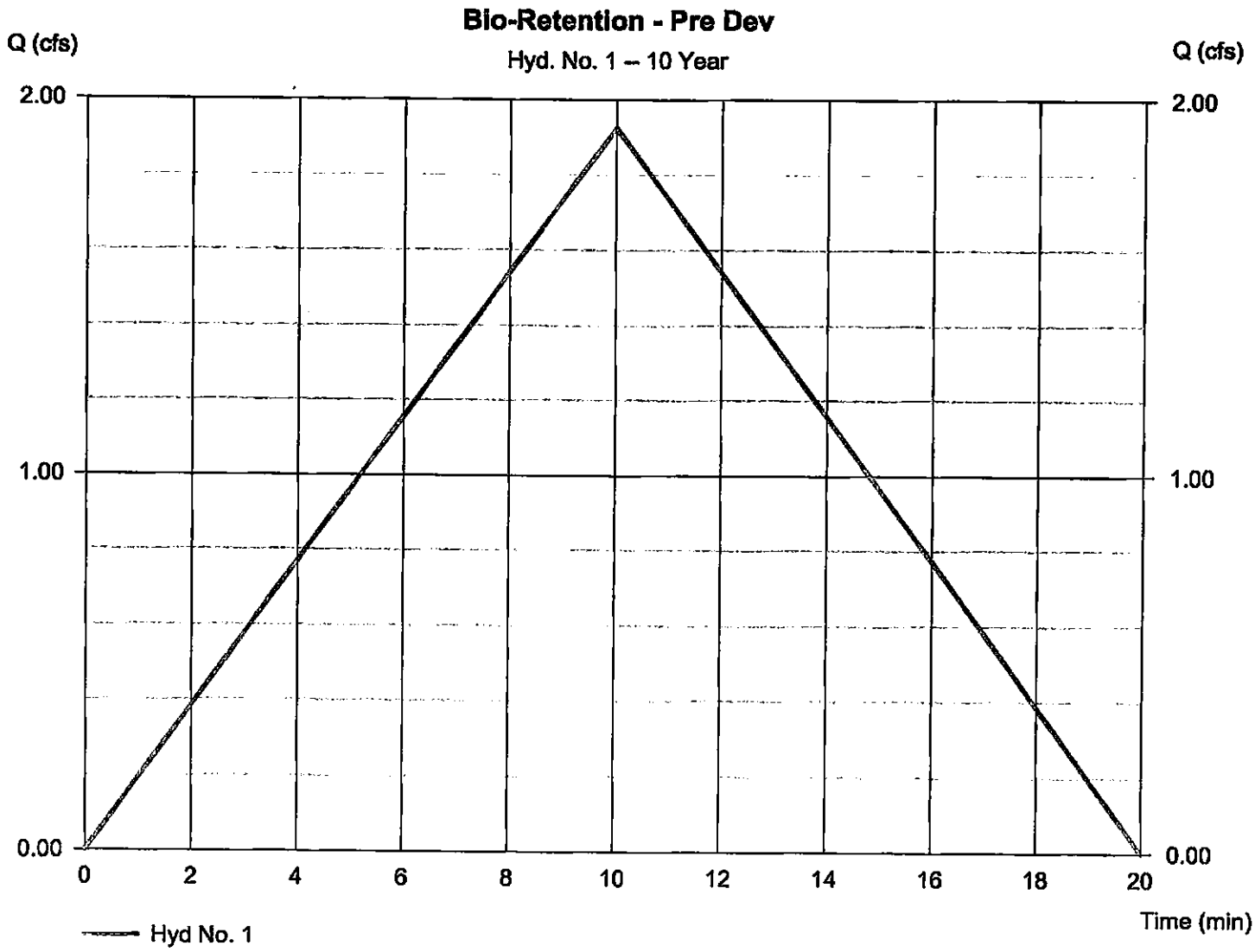
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.068 Thursday, Jan 27, 2011

Hyd. No. 1

Bio-Retention - Pre Dev

Hydrograph type	= Rational	Peak discharge	= 1.927 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 1,156 cuft
Drainage area	= 0.530 ac	Runoff coeff.	= 0.6
Intensity	= 6.059 in/hr	Tc by User	= 10.00 min
IDF Curve	= JamesCity-NW-14.IDF	Asc/Rec limb fact	= 1/1



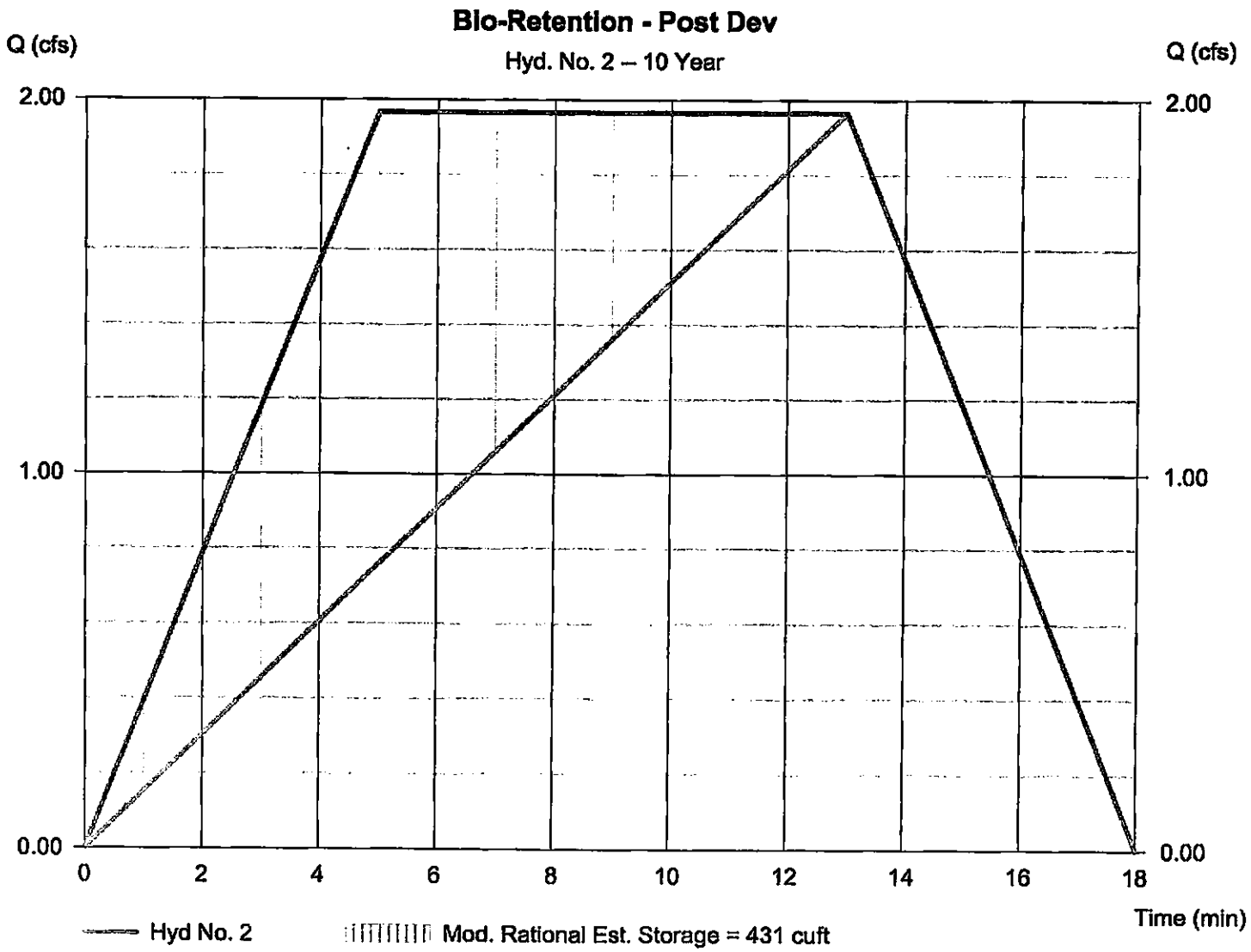
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Jan 27, 2011

Hyd. No. 2

Bio-Retention - Post Dev

Hydrograph type	= Mod. Rational	Peak discharge	= 1.966 cfs
Storm frequency	= 10 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 1,593 cuft
Drainage area	= 0.530 ac	Runoff coeff.	= 0.69
Intensity	= 5.377 in/hr	Tc by User	= 5.00 min
IDF Curve	= JamesCity-NW-14.IDF	Storm duration	= 2.7 x Tc
Target Q	= 1.927 cfs	Est. Req'd Storage	= 431 cuft



Hydrograph Report

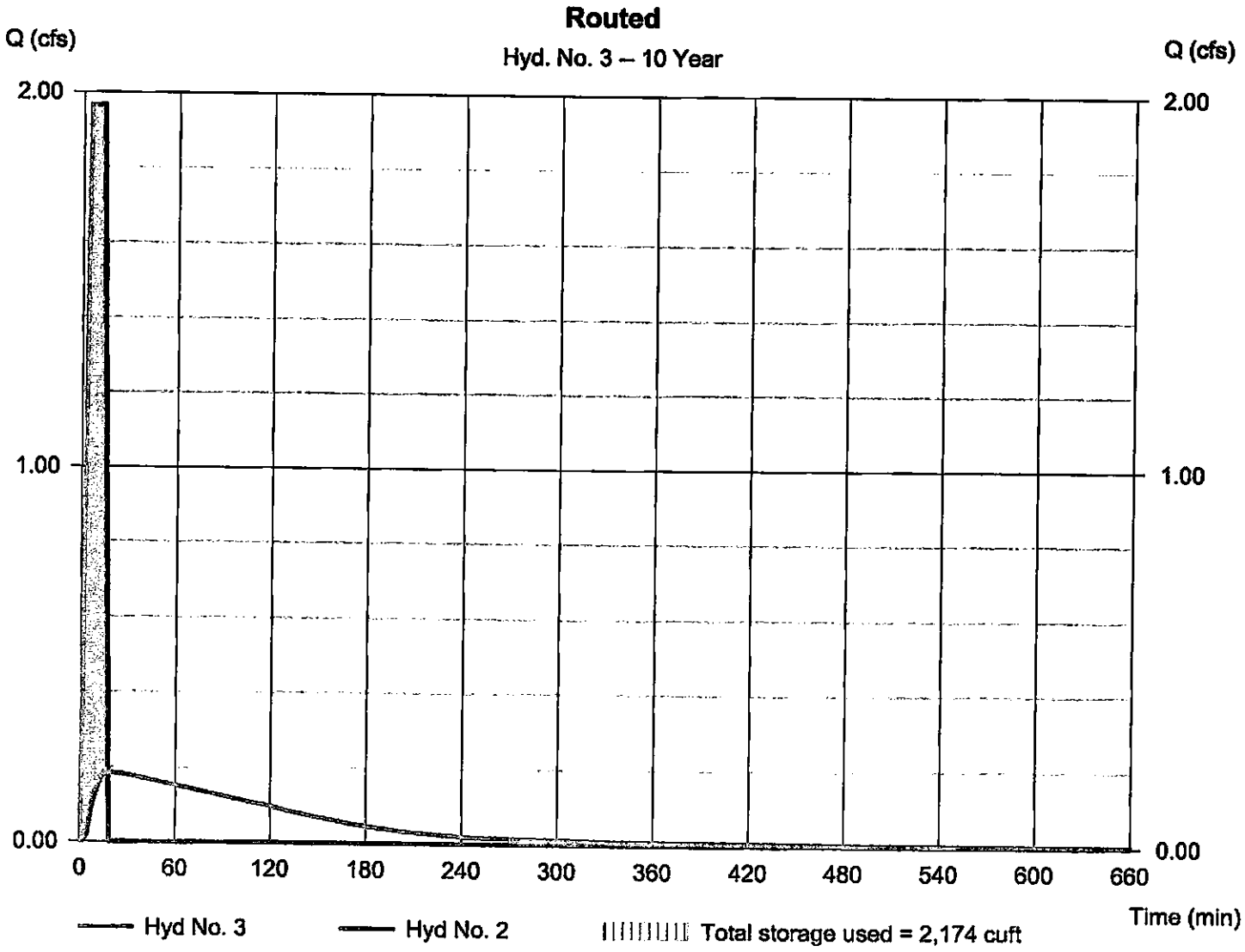
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Jan 27, 2011

Hyd. No. 3

Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.185 cfs
Storm frequency	= 10 yrs	Time to peak	= 18 min
Time interval	= 1 min	Hyd. volume	= 1,523 cuft
Inflow hyd. No.	= 2 - Bio-Retention - Post Dev	Max. Elevation	= 110.05 ft
Reservoir name	= Bio-Retention Filter	Max. Storage	= 2,174 cuft

Storage Indication method used. Wet pond routing start elevation = 109.30 ft.



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	2.543	1	10	1,526	-----	-----	-----	Bio-Retention - Pre Dev
2	Mod. Rational	2.605	1	5	2,110	-----	-----	-----	Bio-Retention - Post Dev
3	Reservoir	0.208	1	18	2,020	2	110.22	2,651	Routed

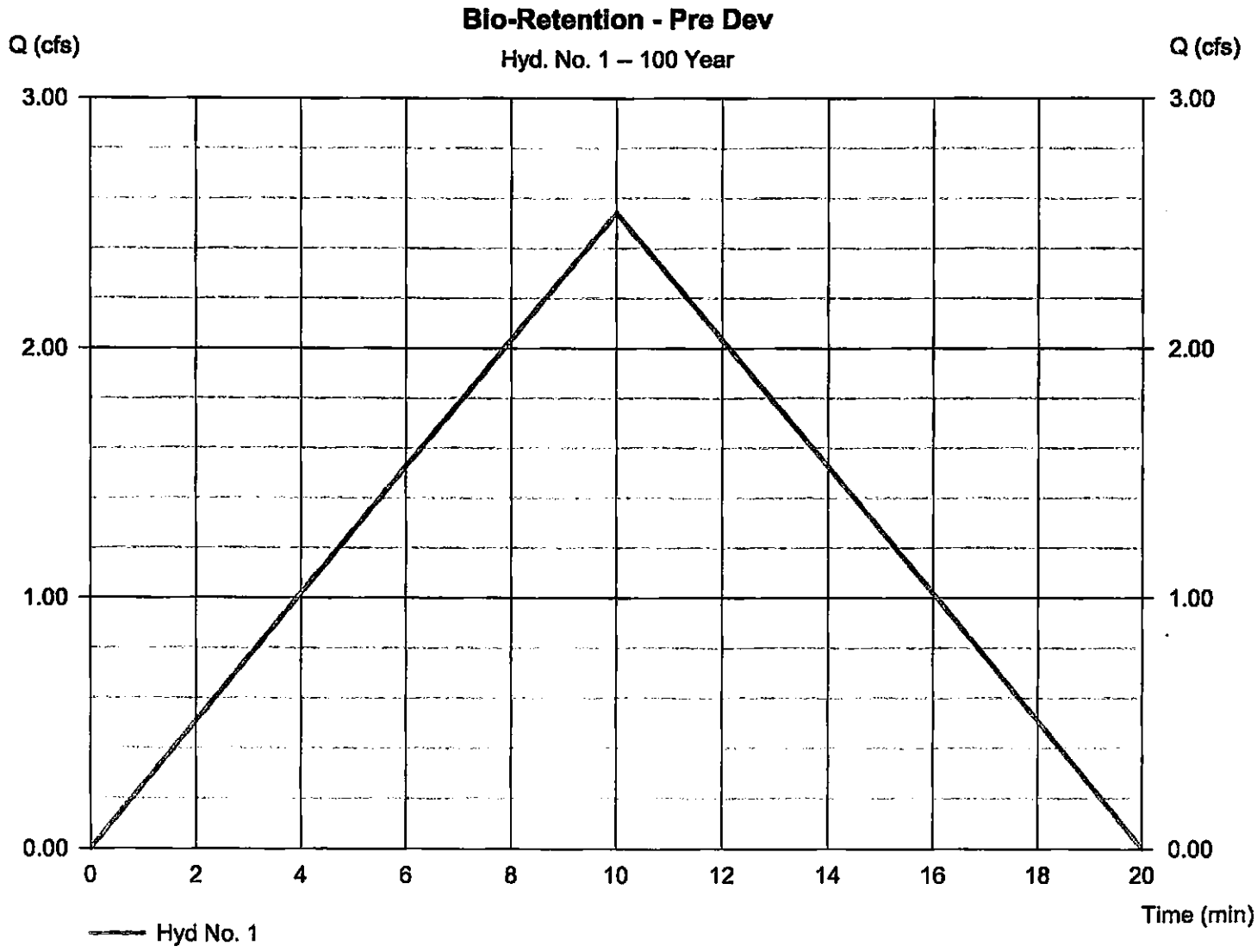
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Jan 27, 2011

Hyd. No. 1

Bio-Retention - Pre Dev

Hydrograph type	= Rational	Peak discharge	= 2.543 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 1,526 cuft
Drainage area	= 0.530 ac	Runoff coeff.	= 0.6
Intensity	= 7.996 in/hr	Tc by User	= 10.00 min
IDF Curve	= JamesCity-NW-14.IDF	Asc/Rec limb fact	= 1/1



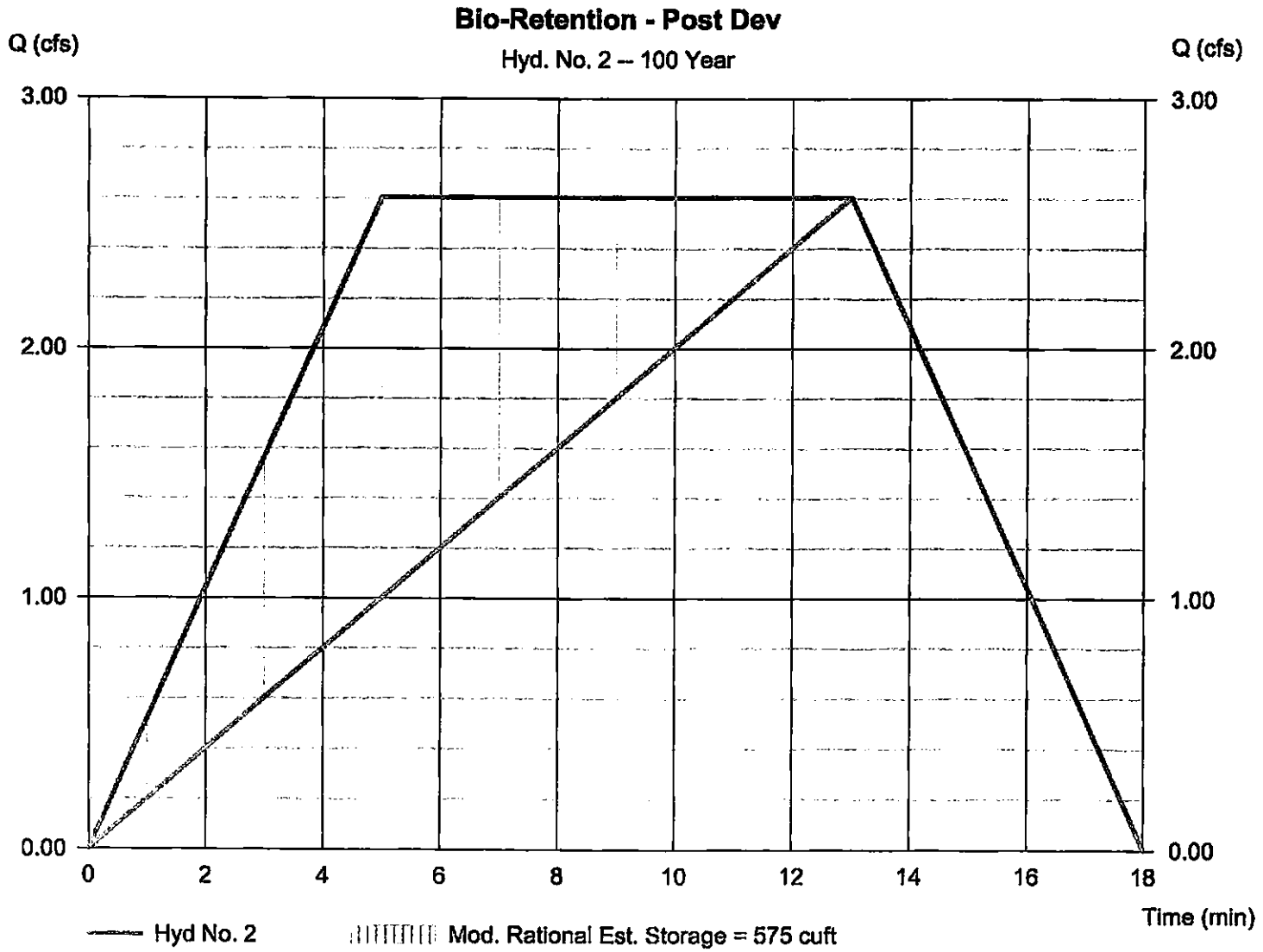
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Jan 27, 2011

Hyd. No. 2

Bio-Retention - Post Dev

Hydrograph type	= Mod. Rational	Peak discharge	= 2.605 cfs
Storm frequency	= 100 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 2,110 cuft
Drainage area	= 0.530 ac	Runoff coeff.	= 0.69
Intensity	= 7.122 in/hr	Tc by User	= 5.00 min
IDF Curve	= JamesCity-NW-14.IDF	Storm duration	= 2.7 x Tc
Target Q	= 2.543 cfs	Est. Req'd Storage	= 575 cuft



Hydrograph Report

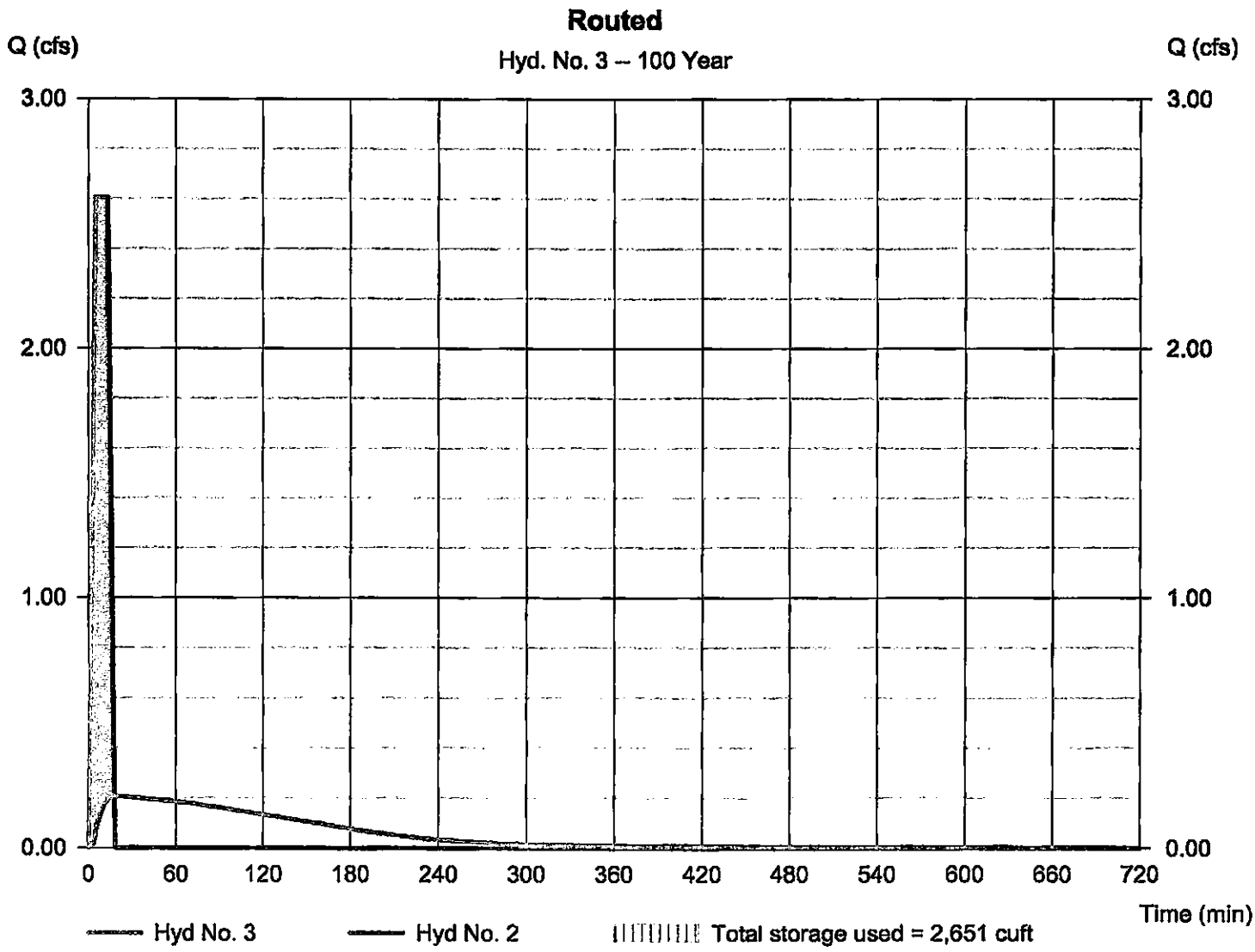
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Jan 27, 2011

Hyd. No. 3

Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.208 cfs
Storm frequency	= 100 yrs	Time to peak	= 18 min
Time interval	= 1 min	Hyd. volume	= 2,020 cuft
Inflow hyd. No.	= 2 - Bio-Retention - Post Dev	Max. Elevation	= 110.22 ft
Reservoir name	= Bio-Retention Filter	Max. Storage	= 2,651 cuft

Storage Indication method used. Wet pond routing start elevation = 109.30 ft.



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Jan 27, 2011

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	100.6580	15.8000	0.9960	------
2	70.6300	12.7500	0.8700	------
3	34.3730	3.7000	0.4880	------
5	57.8400	10.5000	0.7800	------
10	55.6100	10.0000	0.7400	------
25	48.5400	8.5000	0.6700	------
50	38.7800	6.0000	0.5900	------
100	36.7700	5.2500	0.5600	------

File name: JamesCity-NW-14.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	4.90	3.95	3.31	2.85	2.50	2.23	2.01	1.83	1.68	1.56	1.45	1.35
2	5.78	4.66	3.92	3.39	3.00	2.69	2.45	2.24	2.07	1.93	1.80	1.70
3	11.96	9.58	8.23	7.33	6.68	6.18	5.77	5.44	5.16	4.92	4.71	4.53
5	6.82	5.48	4.63	4.02	3.57	3.22	2.94	2.71	2.52	2.36	2.22	2.09
10	7.50	6.06	5.14	4.49	4.00	3.63	3.32	3.08	2.87	2.69	2.53	2.40
25	8.49	6.87	5.85	5.14	4.62	4.21	3.88	3.60	3.37	3.18	3.01	2.86
50	9.42	7.55	6.43	5.67	5.11	4.68	4.34	4.05	3.81	3.61	3.43	3.27
100	9.99	8.00	6.82	6.03	5.45	5.00	4.64	4.35	4.10	3.89	3.70	3.54

Tc = time in minutes. Values may exceed 60.

Precip. file name: James City.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.80	3.50	0.00	4.70	5.80	6.40	7.20	8.00
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10

D. J. MONTAGUE
ELEMENTARY SCHOOL

ENVIRONMENTAL DIVISION
RIP-RAP BASIN DESIGN AT SS #2-1
(HEC-14)

SUBMITTAL: FEBRUARY 2, 2011

AES
CONSULTING ENGINEERS

Prepared by:

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↑ where is that

AES
CONSULTING ENGINEERS

Project:	D. J. Montague
Project No.:	W10162-00
Subject:	Riprap Basin at Existing Storm Structure 2-1 For Circular Culvert
Date:	1/7/2011
Calculated By:	Richard Smith

Hydraulic Design of Energy Dissipators for Culverts and Channels
Hydraulic Engineering Circular No. 14, Third Edition
U.S. Department of Transportation Federal Highway Administration - July 2006

Outfall Description: **Existing Storm Structure 2-1**

Pipe Diameter (D) or (W_o) = **1.50** FT.

Flow (Q) = **14.86** CFS

Tailwater Depth (TW) = **0.50** FT.

Determine brink depth (y_o):

$$(K_u)\frac{Q}{D^{2.5}} = (1)\frac{14.86}{2.76} = 5.39$$

$$\frac{TW}{D} = \frac{0.50}{1.50} = 0.33$$

y_o / D = **0.90** From Figure 3.4

		y_o / D		D			
y_o	=	0.9	x	1.50	=	1.35	FT.

Determine culvert outlet velocity (V_o):

$$\frac{TW}{y_o} = \frac{0.50}{1.35} = 0.370$$

A / D^2 = **0.7445** From Table B.2 where y_o / D = d / D

A	=	A / D^2	x	D^2	=	0.7445	x	2.25	=	1.68	SF
V_o	=	Q	÷	A	=	14.9	÷	1.68	=	8.9	FT/S

Determine Froude number (Fr):

$y_e = (A / 2)^{1/2} = 0.92$ FT.

$Fr = V_o / [(32.2)(y_e)]^{1/2} = 1.63$

Try d_{50} / y_e = **0.30** d_{50} = **0.30** x **0.92** = **0.27** FT. or **3.3** IN.

Tailwater Parameter, C_o	Equation 10.2		
TW / y_e = **0.50** ÷ **0.92** = **0.55**			
$TW / y_e < 0.75$	C_o	=	1.4
$0.75 < TW / y_e < 1.0$	C_o	=	$4.0 (TW/y_e) - 1.6$
		=	4.0 (**0.55**) - 1.6 = **0.59**
$1.0 < TW / y_e$	C_o	=	2.4

h_s / y_e = 0.86 $(d_{50} / y_e)^{-0.55}$ (Fr) - C_o Equation 10.1

h_s / y_e = 0.86 (**0.30**)$^{-0.55}$ (**1.63**) - **1.40**

h_s / y_e = **1.325**

h_s = **1.325** x **0.92** = **1.21** FT.

Check

hs / d_{50} = **4.42** ≥ 2 OK

d_{50} / y_e = **0.30** ≥ 0.1 OK

Riprap Basin Size

Length of Dissipator Pool

L_s = 10 x h_s = **12.1** FT.

or L_s = 3 x W_o = **4.5** FT. Use Larger Value L_s = **12.1** FT.

Total Length

L_B = 15 x h_s = **18.2** FT.

or L_B = 4 x W_o = **6.0** FT. Use Larger Value L_B = **18.2** FT.

Width of Apron

W_B = W_o + 2 (L_B/3) = **13.6** FT.

Length of Apron

L_A = L_B - L_S

= **18.2** - **12.1** = **6.1** FT.

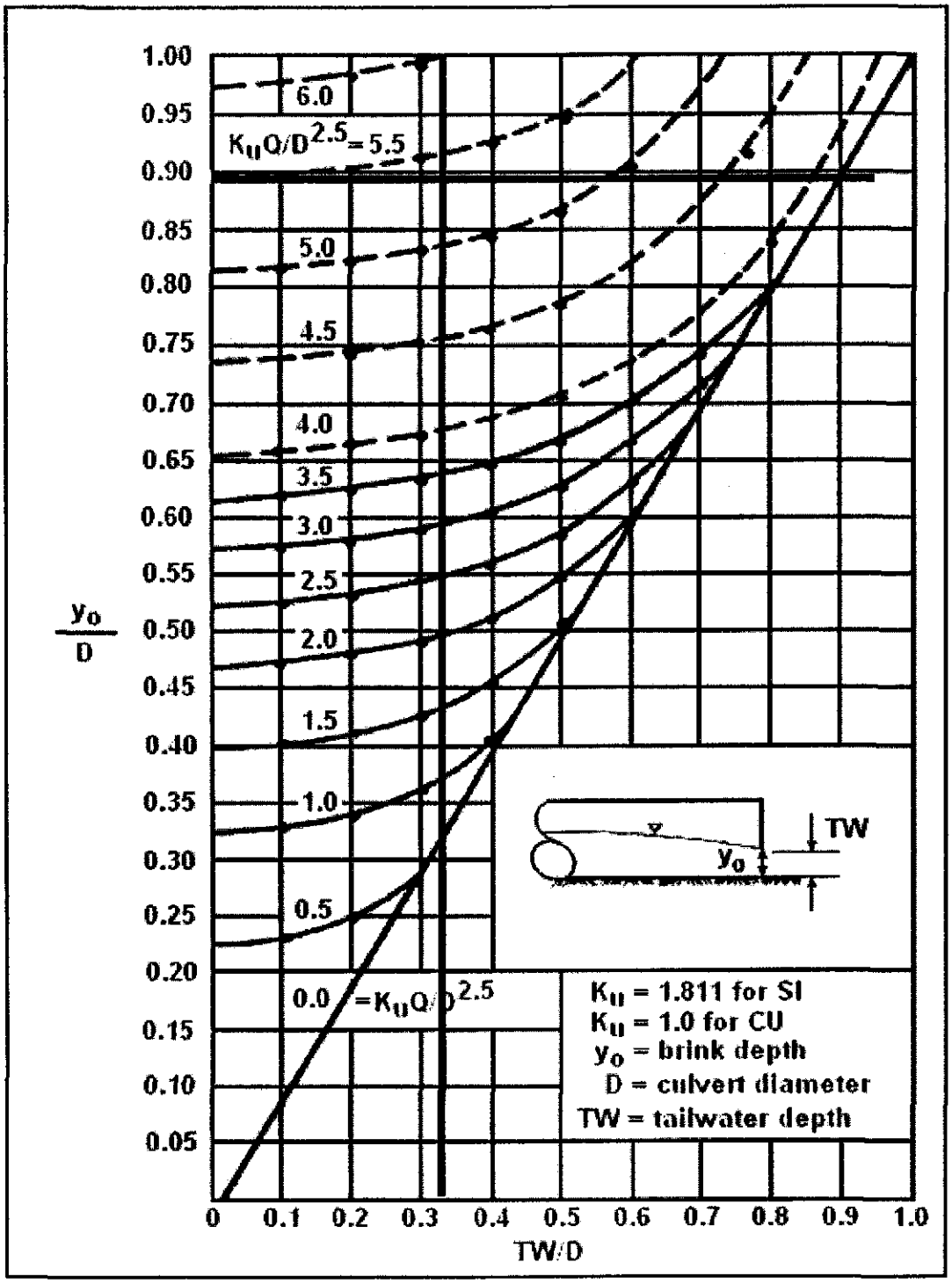


Figure 3.4. Dimensionless Rating Curves for the Outlets of Circular Culverts on Horizontal and Mild Slopes (Simons, 1970)

Table B.2. Uniform Flow in Circular Sections Flowing Partly Full

y/D	A/D^2	R/D	$\frac{(\alpha Qn)}{(D^{8/3} S^{1/2})}$	$\frac{(\alpha Qn)}{(y^{8/3} S^{1/2})}$	y/D	A/D^2	R/D	$\frac{(\alpha Qn)}{(D^{8/3} S^{1/2})}$	$\frac{(\alpha Qn)}{(y^{8/3} S^{1/2})}$
0.01	0.0013	0.0066	0.00007	15.04	0.51	0.4027	0.2531	0.239	1.442
0.02	0.0037	0.0132	0.00031	10.57	0.52	0.4127	0.2562	0.247	0.415
0.03	0.0069	0.0197	0.00074	8.56	0.53	0.4227	0.2592	0.255	1.388
0.04	0.0105	0.0262	0.00138	7.38	0.54	0.4327	0.2621	0.263	1.362
0.05	0.0147	0.0325	0.00222	6.55	0.55	0.4426	0.2649	0.271	1.336
0.06	0.0192	0.0389	0.00328	5.95	0.56	0.4526	0.2676	0.279	1.311
0.07	0.0294	0.0451	0.00455	5.47	0.57	0.1626	0.2703	0.287	1.286
0.08	0.0350	0.0513	0.00604	5.09	0.58	0.4724	0.2728	0.295	1.262
0.09	0.0378	0.0575	0.00775	4.76	0.59	0.4822	0.2753	0.303	1.238
0.10	0.0409	0.0635	0.0097	4.49	0.60	0.4920	0.2776	0.311	1.215
0.11	0.0470	0.0695	0.0118	4.25	0.61	0.5018	0.2799	0.319	1.192
0.12	0.0534	0.0755	0.0142	4.04	0.62	0.5115	0.2821	0.327	1.170
0.13	0.0600	0.0813	0.0167	3.86	0.63	0.5212	0.2842	0.335	1.148
0.14	0.0668	0.0871	0.0195	3.69	0.64	0.5308	0.2862	0.343	1.126
0.15	0.0739	0.0929	0.0225	3.54	0.65	0.5405	0.2988	0.350	1.105
0.16	0.0811	0.0985	0.0257	3.41	0.66	0.5499	0.2900	0.358	1.084
0.17	0.0885	0.1042	0.0291	3.28	0.67	0.5594	0.2917	0.366	1.064
0.18	0.0961	0.1097	0.0327	3.17	0.68	0.5687	0.2933	0.373	1.044
0.19	0.0139	0.1152	0.0365	3.06	0.69	0.5780	0.2948	0.380	1.024
0.20	0.1118	0.1206	0.0406	2.96	0.70	0.5872	0.2962	0.388	1.004
0.21	0.1199	0.1259	0.0448	2.87	0.71	0.5964	0.2975	0.395	0.985
0.22	0.1281	0.1312	0.0492	2.79	0.72	0.6054	0.2987	0.402	0.965
0.23	0.1365	0.1364	0.0537	2.71	0.73	0.6143	0.2998	0.409	0.947
0.24	0.1449	0.1416	0.0585	2.63	0.74	0.6231	0.3008	0.416	0.928
0.25	0.1535	0.1466	0.0634	2.56	0.75	0.6319	0.3042	0.422	0.910
0.26	0.1623	0.1516	0.0686	2.49	0.76	0.6405	0.3043	0.429	0.891
0.27	0.1711	0.1566	0.0739	2.42	0.77	0.6489	0.3043	0.435	0.873
0.28	0.1800	0.1614	0.0793	2.36	0.78	0.6573	0.3041	0.441	0.856
0.29	0.1890	0.1662	0.0849	2.30	0.79	0.6655	0.3039	0.447	0.838
0.30	0.1982	0.1709	0.0907	2.25	0.80	0.6736	0.3042	0.453	0.821
0.31	0.2074	0.1756	0.0966	2.20	0.81	0.6815	0.3043	0.458	0.804
0.32	0.2167	0.1802	0.1027	2.14	0.82	0.6893	0.3043	0.463	0.787
0.33	0.2260	0.1847	0.1089	2.09	0.83	0.6969	0.3041	0.468	0.770
0.34	0.2355	0.1891	0.1153	2.05	0.84	0.7043	0.3038	0.473	0.753
0.35	0.2450	0.1935	0.1218	2.00	0.85	0.7115	0.3033	0.453	0.736
0.36	0.2546	0.1978	0.1284	1.958	0.86	0.7186	0.3026	0.458	0.720
0.37	0.2642	0.2020	0.1351	1.915	0.87	0.7254	0.3018	0.485	0.703
0.38	0.2739	0.2062	0.1420	1.875	0.88	0.7320	0.3007	0.488	0.687
0.39	0.2836	0.2102	0.1490	1.835	0.89	0.7384	0.2995	0.491	0.670
0.40	0.2934	0.2142	0.1561	1.797	0.90	0.7445	0.2980	0.494	0.654
0.41	0.3032	0.2182	0.1633	1.760	0.91	0.7504	0.2963	0.496	0.637
0.42	0.3130	0.2220	0.1705	1.724	0.92	0.7560	0.2944	0.497	0.621
0.43	0.3229	0.2258	0.1779	1.689	0.93	0.7612	0.2921	0.498	0.604
0.44	0.3328	0.2295	0.1854	1.655	0.94	0.7662	0.2895	0.498	0.588
0.45	0.3428	0.2331	0.1929	1.622	0.95	0.7707	0.2865	0.498	0.571
0.46	0.3527	0.2366	0.201	1.590	0.96	0.7749	0.2829	0.496	0.553
0.47	0.3627	0.2401	0.208	1.559	0.97	0.7785	0.2787	0.494	0.535
0.48	0.3727	0.2435	0.216	1.530	0.98	0.7817	0.2735	0.489	0.517
0.49	0.3827	0.2468	0.224	1.500	0.99	0.7841	0.2666	0.483	0.496
0.50	0.3927	0.2500	0.232	1.471	1.00	0.7854	0.2500	0.463	0.463

y = depth of flow, m (ft)
D = diameter of pipe, m (ft)
A = area of flow, m^2 (ft^2)
R= hydraulic radius, m (ft)
Source: USBR (1974)

Q = discharge by Manning's Equation, m^3/s (ft^3/s)
n = Manning's coefficient
S = channel bottom and water surface slope
α = units conversion = 1.49 for SI, 1 for CU

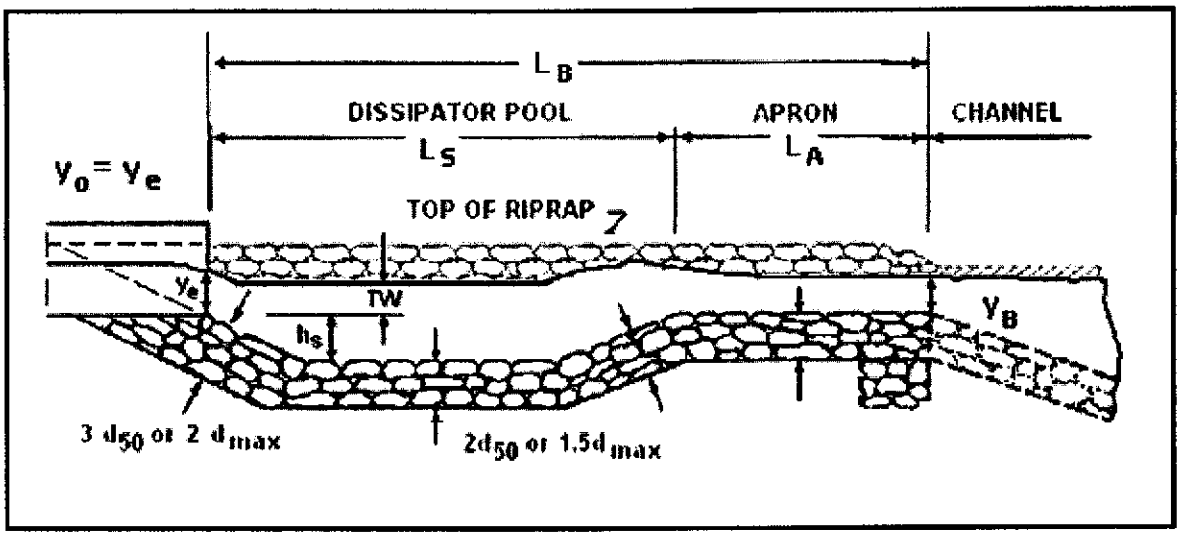


Figure 10.1. Profile of Riprap Basin

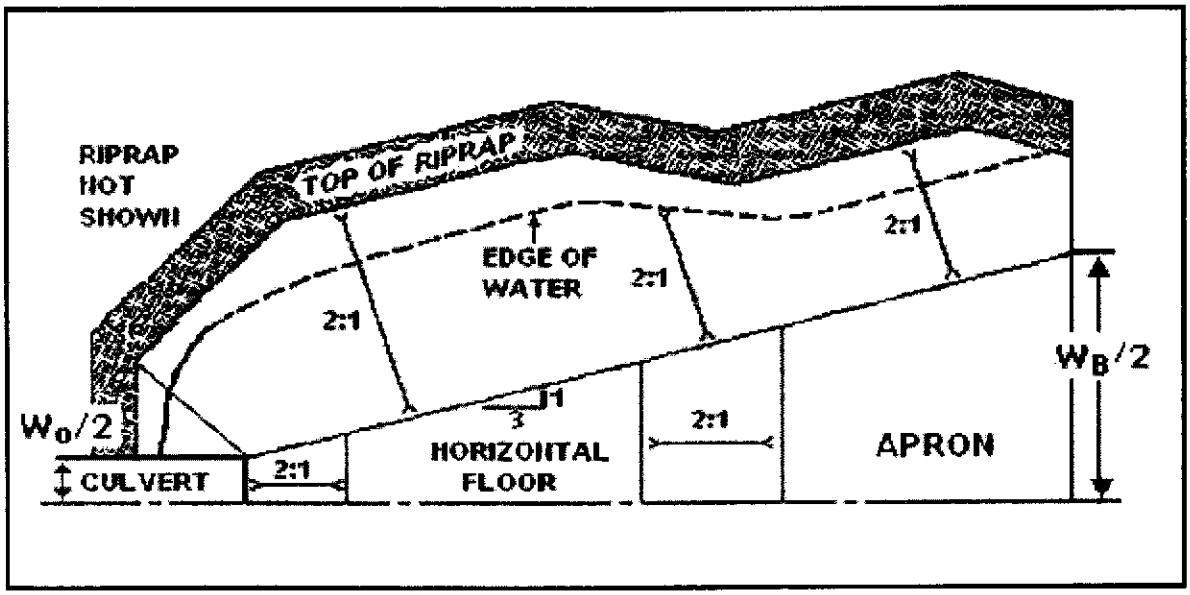
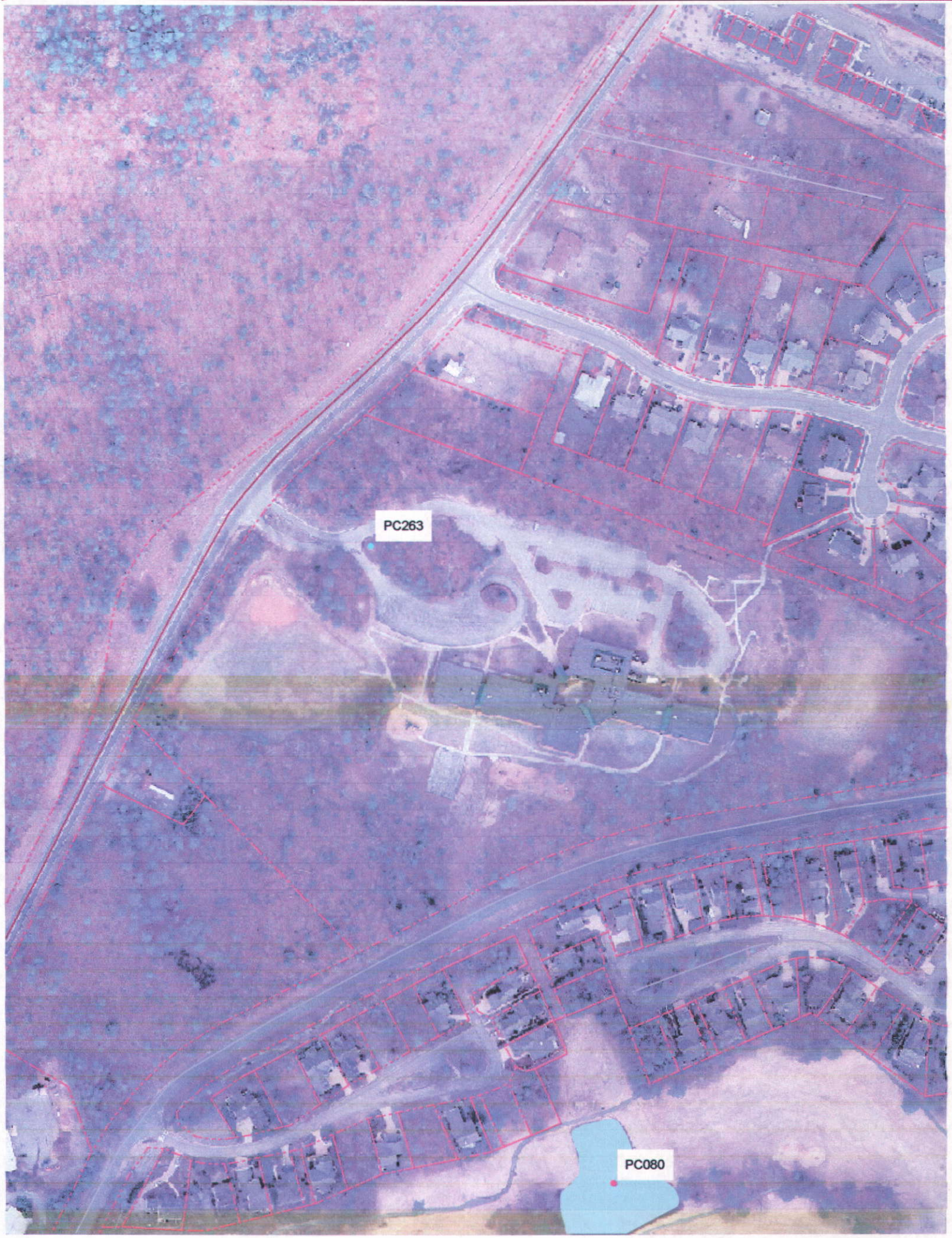


Figure 10.2. Half Plan of Riprap Basin


PC263
PC080

WATER CONSERVATION STANDARDS
FOR
D.J. Montage Elementary School
Williamsburg–James City County Schools
March 23, 2011

This document outlines the measures and standards to be implemented at the site of the D.J. Montague Elementary School, further identified as Tax Map Parcel #3130100049, in the effort to conserve water and reduce water use. By the countersigning by the authorized representative below, Williamsburg-James City County Public Schools agrees to honor the following water conserving guidelines, standards, and measures:

1. Williamsburg-James City County Public Schools agrees to endorse "Water Smart Landscaping", to include measures to minimize irrigated turf areas, to use drought tolerant plant material in landscaping enhancements and periodic replacements of plant materials, and to use landscaping materials requiring low water consumption for survival. Trees located in turf areas will be mulched. Warm season grasses such as Zoysia and Bermuda shall be used.

2. Williamsburg-James City County Public Schools agrees to not install irrigation systems to support any pre-existing vegetation located on the property. Wherever possible, existing trees and vegetation should be retained.

3. If the General Manager of the James City Service Authority approves use of the public water supply as a source for common area irrigation, it will be limited to the turf and landscaped areas with drip irrigation only for the common element of no more than 998,048 square feet. A rain sensor must be included at the time of installation of an irrigation system.

4. Williamsburg-James City County Public Schools shall incorporate the use of water-conserving fixtures to promote water conservation and minimize the use of public water resources. All replacement and new-installation installed fixture and appliances such as toilets, faucets, showers, and dishwashers shall be high-efficient models. Where appropriate, point of use and/or centrally located small-volume hot water heaters should be used.

5. Williamsburg-James City County Public Schools agrees to honor and support the efforts of the James City Service Authority and James City County during periods of water crisis, water restricted use periods, and drought.

6. Williamsburg-James City County Public Schools agrees to only withdraw water for irrigation from a shallow well (less than 100 feet) should ground water be needed for irrigation. Williamsburg-James City County Public Schools agrees not to install or construct a well on the property without the approval of James City Service Authority General Manager.

7. Williamsburg-James City County Public Schools agrees to provide this agreement to all future owners.

Being in support and agreement of these WATER CONSERVATION STANDARDS

For Williamsburg-James City County
Public Schools

By:_____(SEAL)
Printed Name: _____
Printed Tile: _____

Acknowledgement:
(Print Name & Title)
For the James City Service Authority

_____ (SEAL)
Larry M. Foster
General Manager
James City Service Authority

S:\Jobs\W10162\00-Dj Montague\Admin\Forms & Comments\JCC WaterConservationAgreement 2010.doc

SP-08-11 FINAL

AES CONSULTING ENGINEERS

Environmental Division
MAR 24 2011

Project:	D. J. Montague Parking Expansion
Project No.:	W101062-00
Subject:	Channel Design at Playground
Date:	12/21/2010 (Revised: 3/23/11)
Calculated By:	R. Smith

RECEIVED

Design Point: **Proposed DI-7**

2 Year Storm - Velocity Check

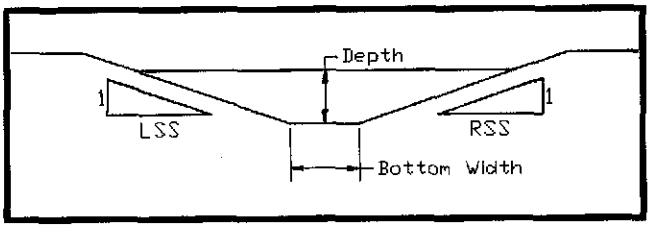
Drainage Area	=	0.16	Acres	(Area draining to Design Point)
C	=	0.45		(Runoff Coefficient)
I	=	5.50	in/hr	(Design Rainfall Intensity) **5 Minutes**

Q = C I A (Peak Flow)

= 0.45 x 5.50 x 0.16

= 0.40 CFS

Channel Characteristics



Rt. Sideslope	=	3.00	:1
Lt. Sideslope	=	3.00	:1
Base Width	=	1.00	Ft.
Max. Depth	=	1.00	Ft.
Channel Slope	=	2.78	%
Mannings (n)	=	0.035	**EC-3 HP-TRM Lining**

Depth of Flow	=	0.16	Ft.	
Area	=	0.23	SF	Wetted Perimeter = 2.00 Ft.
Hydraulic Radius	=	0.12	Ft.	
Velocity (V)	=	1.69	Ft./sec.	(From Manning's Equation)
Flow (Q)	=	0.39	CFS	(From Continuity Equation Q=AV)

10 Year Storm - Capacity Check

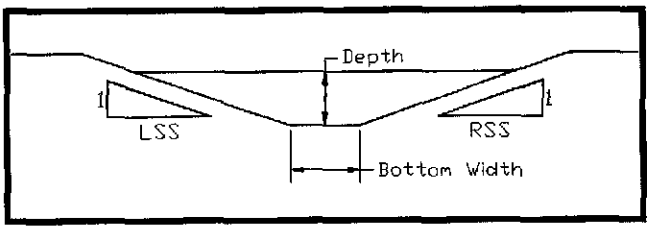
Drainage Area	=	0.16	Acres	(Area draining to Design Point)
C	=	0.45		(Runoff Coefficient)
I	=	6.40	in/hr	(Design Rainfall Intensity) **5 Minutes**

Q = C I A (Peak Flow)

= 0.45 x 6.40 x 0.16

= 0.46 CFS

Channel Characteristics



Rt. Sideslope	=	3.00	:1
Lt. Sideslope	=	3.00	:1
Base Width	=	1.00	Ft.
Max. Depth	=	1.00	Ft.
Channel Slope	=	2.78	%
Mannings (n)	=	0.035	**EC-3 HP-TRM Lining**

Depth of Flow	=	0.17	Ft.	
Area	=	0.26	SF	Wetted Perimeter = 2.08 Ft.
Hydraulic Radius	=	0.12	Ft.	
Velocity (V)	=	1.76	Ft./sec.	(From Manning's Equation)
Flow (Q)	=	0.46	CFS	(From Continuity Equation Q=AV)

Environmental Division
MAR 24 2011
RECEIVED

D. J. MONTAGUE
ELEMENTARY SCHOOL

ENVIRONMENTAL DIVISION
BIO RETENTION CELL

SUBMITTAL: FEBRUARY 2, 2011
REVISED: MARCH 21, 2011

SP-08-11
FINAL COMPS.

AES
CONSULTING ENGINEERS
Prepared by:
AES Consulting Engineers
5248 Olde Towne Road. Suite 1
Williamsburg, VA 23188
(757) 253-0040 Fax: (757) 220-8994
http://www.aesva.com

To the reviewer:

The following supporting documentation and calculations were performed through the following procedures:

Water Quality Volume Design is determined through simple, direct, mathematical calculations;

Modified Rational Storm Determination is generated using a graphical solution technique of the Modified Rational Method, Critical Storm - Direct Solution, as represented in Chapter 5 – Engineering Calculations of the Virginia Stormwater Management Handbook;

Hydrographs, pond volumes, water surface elevations, and pond release hydrographs were generated using Hydraflow Hydrographs 2007, Version 9.25. Please note that values of the input hydrograph to be routed were manual inputted from the values generate by the Modified Rational Storm Determination.

D J Montague Site Plan
Bio-retention Basin Design Calculation
AES Project No.:W10162-00
February 2, 2011

Site Hydrology
Design basis:
The Pre-Development drainage area to this site is 0.53 acres. Of this area 0.36 acres are in a non-impervious state ~~at a C-value of 0.50 with the remaining area of 0.17 acres as impervious at a C-value of 0.90.~~
A Pre-Development weighted C-factor of 0.61 was calculated based upon this information

The Post-Development drainage area to this site is 0.53 acres. Of this area 0.21 acreas are in a non-impervious state at a C-value of 0.50 with the remaining area of 0.31 acres as impervious at a C-value of 0.90.
A Post-Development weighted C-factor of 0.69 was calculated based upon this information

Water Quality Volume Design

Bio-Retention Basin Volume

Design: Infiltrate 1" over the impervious area to comply with JCC 10-point requirement.

Storage Volume Required: 1125 Cubic feet

Known:
Total Drainage Area: 0.53 Acres

Total Impervious Area: 0.31 Acres

WQV (Water Quality Volume)

WQV= 1" / Impervious Acres= 1125 Cubic Feet

Elev.	Depth	Area (sq. ft.)	Incremental Volume (cu. ft.)	Sum Volume (cu. ft.)	Inc. Volume (cu. yd.)	Sum Volume (cu. yd.)
108.80		1373	0		0	
109.3	0.51	1945	1692	1692	63	63

Volume Provided = 1,692 cu.ft. (6" Depth)

1692 > 1125

Fore-bay Volume Design

Design: Store 1/10 of 1" of water over the impervious area.

Known:

Total Impervious Area: 0.31 Acres

Fore-bay Volume Required: 113 Cubic Feet

Elev.	Depth	Area (sq. ft.)	Incremental Volume (cu. ft.)	Sum Volume (cu. ft.)	Inc. Volume (cu. yd.)	Sum Volume (cu. yd.)
109.31		73.5	0		0	
~~110.0~~	~~0.69~~	~~241.5~~	~~217~~	~~217~~	~~8~~	~~8~~

Volume Provided = 217 cu.ft.

217 > 113

Modified Rational Storm Determination - D. J. Montague Site Improvements

James City County

AES Job. No. W10162-00

March 21, 2011

Pre-Development

Area = 0.53 ac. T_c = 10.0 min.

Description	C factor	Area	CA	
Composite Area	0.6	0.53 ac.	0.32	
		0.00 ac.	0.00	
		0.00 ac.	0.00	
			0.32	= ∑ CA

Storm Event

2 yr.	I_2 =	4.59 in/hr	Q_2 = 1.46 cfs
10 yr.	I_{10} =	6.06 in/hr	Q_{10} = 1.93 cfs
25 yr.	I_{25} =	6.87 in/hr	Q_{25} = 2.19 cfs
100 yr.	I_{100} =	8.00 in/hr	Q_{100} = 2.54 cfs

Post Development

Area = 0.53 ac. T_c = 5.0 min.

Description	C factor	Area	CA	
Composite Area	0.69	0.53 ac.	0.37	
			0.00	
			0.00	
			0.37	= ∑ CA

Critical Storm Event

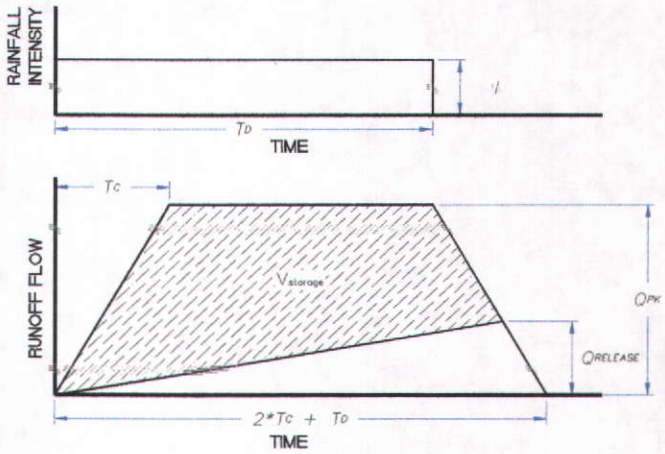
				Req'd Storage
2 yr.	I_2 =	4.05 in/hr	Q_2 = 1.48 cfs	391 CF
10 yr.	I_{10} =	5.29 in/hr	Q_{10} = 1.94 cfs	529 CF
25 yr.	I_{25} =	6.03 in/hr	Q_{25} = 2.20 cfs	607 CF
100 yr.	I_{100} =	7.02 in/hr	Q_{100} = 2.57 cfs	708 CF

Modified Rational Storm Determination - D. J. Montague Site Improvements
James City County
AES Job. No. W10162-00
Stormwater Management Facility Design (Modified Rational Method)

CONSULTING ENGINEERS

Post-Development Conditions:

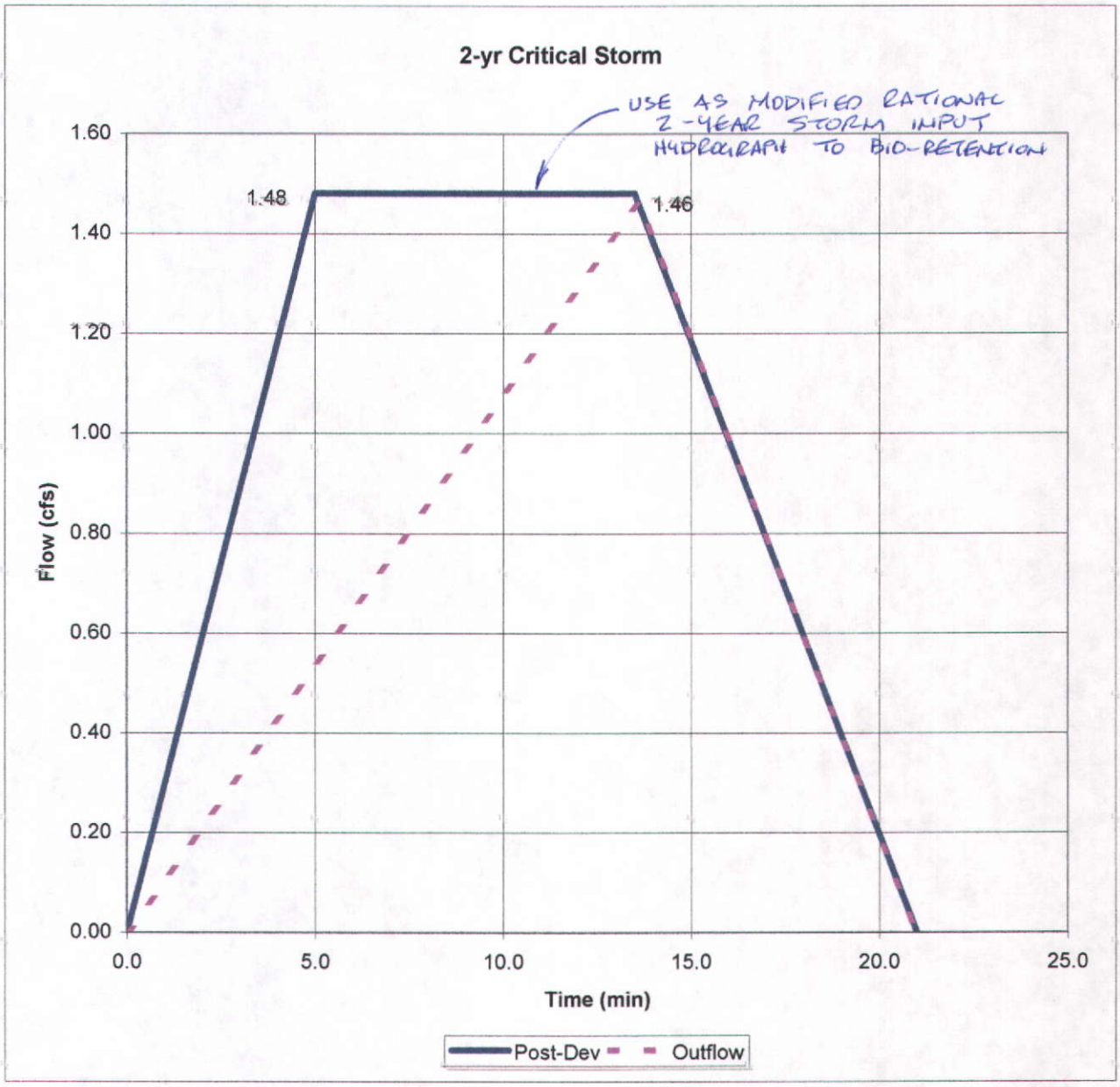
Drainage Area =	0.53 ac.
Rational "C" =	0.69
Time of Conc =	5.0 min.
Release Rate =	1.46 cfs
Rec. Limb Fac. =	1.5
Start Interval =	5 min.
Time Interval =	1 min.



Calculate 2-yr critical storm duration:

Storm Duration	Intensity	Qpk	Storm Runoff Volume (ft^3)	Release Flow Volume (ft^3)	Req'd Storage Volume (ft^3)	
5.0	5.70	2.08	782	547	235	
5.5	5.56	2.03	824	569	255	
6.0	5.43	1.99	864	591	274	
6.5	5.31	1.94	903	613	290	
7.0	5.19	1.90	940	635	305	
7.5	5.08	1.86	975	657	319	
8.0	4.97	1.82	1,009	678	331	
8.5	4.87	1.78	1,042	700	342	
9.0	4.77	1.75	1,073	722	351	
9.5	4.68	1.71	1,103	744	359	
10.0	4.59	1.68	1,133	766	367	
10.5	4.50	1.65	1,161	788	373	
11.0	4.42	1.62	1,188	810	378	
11.5	4.34	1.59	1,214	832	382	
12.0	4.26	1.56	1,239	854	386	
12.5	4.19	1.53	1,264	875	388	
13.0	4.12	1.51	1,287	897	390	
13.5	4.05	1.48	1,310	919	391	<== Critical
14.0	3.98	1.46	1,332	941	N/A	
14.5	3.92	1.43	1,354	963	N/A	
15.0	3.86	1.41	1,375	985	N/A	
15.5	3.80	1.39	1,395	1,007	N/A	
16.0	3.74	1.37	1,415	1,029	N/A	
16.5	3.68	1.35	1,434	1,050	N/A	
17.0	3.63	1.33	1,453	1,072	N/A	
17.5	3.58	1.31	1,471	1,094	N/A	
18.0	3.52	1.29	1,489	1,116	N/A	
18.5	3.48	1.27	1,506	1,138	N/A	
19.0	3.43	1.25	1,523	1,160	N/A	
19.5	3.38	1.24	1,539	1,182	N/A	
20.0	3.34	1.22	1,555	1,204	N/A	
20.5	3.29	1.20	1,571	1,226	N/A	
21.0	3.25	1.19	1,586	1,247	N/A	
21.5	3.21	1.17	1,601	1,269	N/A	

22.0	3.17	1.16	1,616	1,291	N/A
22.5	3.13	1.14	1,630	1,313	N/A



Hydrograph Data

2-yr Critical Storm

Post-Dev Inflow		Outflow	
Time	Flow	Time	Flow
0.0	0.00	0.0	0.00
5.0	1.48	13.6	1.46
13.5	1.48	21.0	0.00
21.0	0.00		

Modified Rational Storm Determination - D. J. Montague Site Improvements

James City County

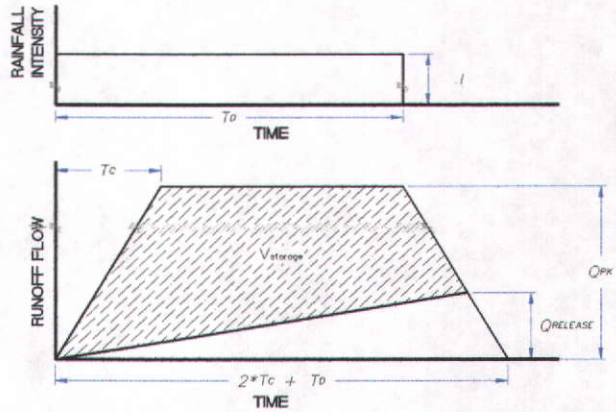
AES Job. No. W10162-00

Stormwater Management Facility Design (Modified Rational Method)

CONSULTING ENGINEERS

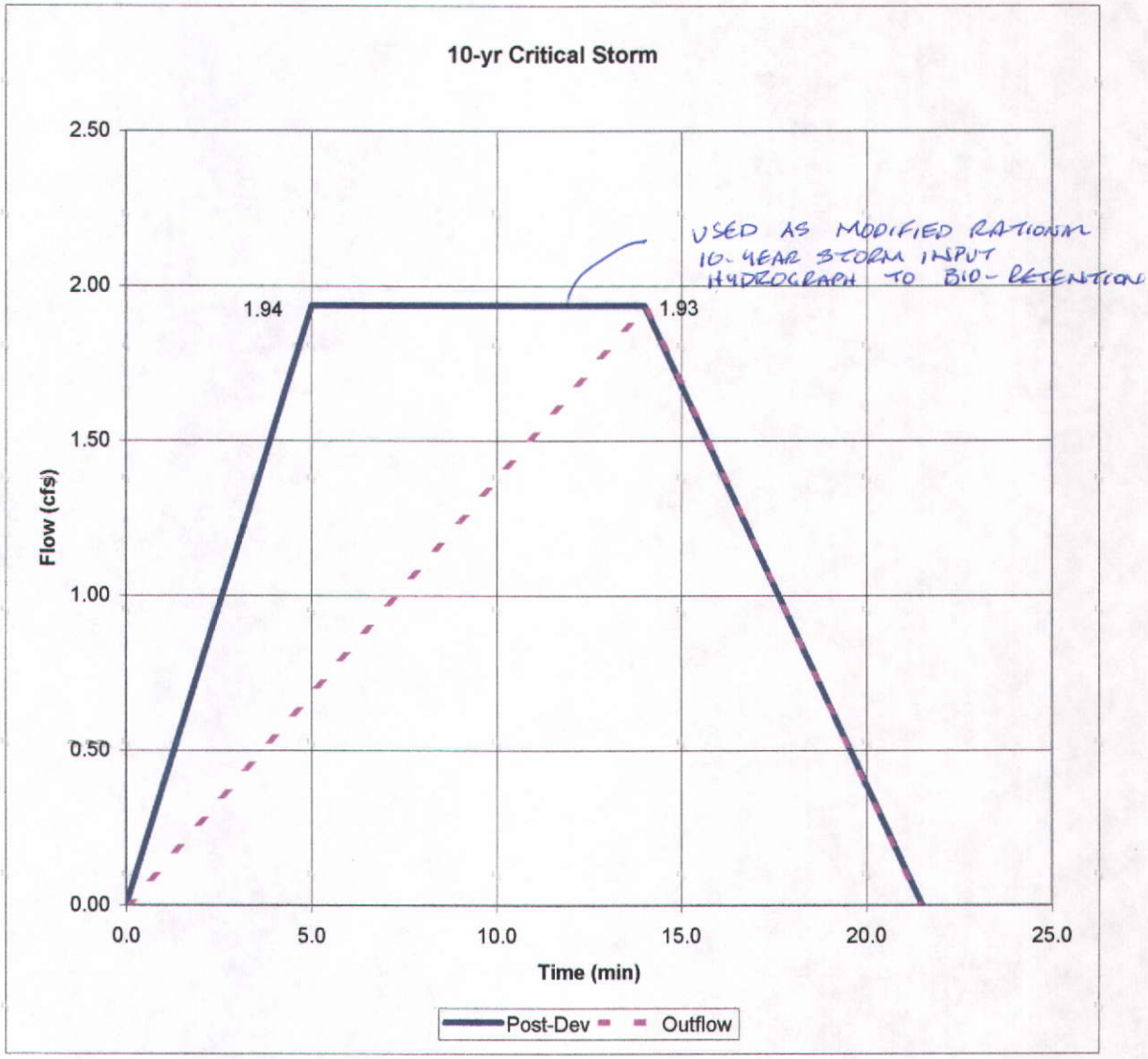
Post-Development Conditions:

Drainage Area =	0.53 ac.
Rational "C" =	0.69
Time of Conc =	5.0 min.
Release Rate =	1.93 cfs
Rec. Limb Fac. =	1.5
Start Interval =	5 min.
Time Interval =	1 min.



Calculate 10-yr critical storm duration:

Storm Duration	Intensity	Qpk	Storm Runoff Volume (ft^3)	Release Flow Volume (ft^3)	Req'd Storage Volume (ft^3)	
5.0	7.50	2.74	1,028	723	306	
6.0	7.15	2.61	1,137	780	357	
7.0	6.83	2.50	1,237	838	399	
8.0	6.55	2.40	1,329	896	434	
9.0	6.29	2.30	1,415	954	462	
10.0	6.06	2.22	1,496	1,012	484	
11.0	5.84	2.14	1,571	1,069	501	
12.0	5.65	2.06	1,642	1,127	514	
13.0	5.46	2.00	1,708	1,185	523	
14.0	5.29	1.94	1,772	1,243	529	<== Critical
15.0	5.14	1.88	1,831	1,301	N/A	
16.0	4.99	1.82	1,889	1,358	N/A	
17.0	4.85	1.77	1,943	1,416	N/A	
18.0	4.72	1.73	1,995	1,474	N/A	
19.0	4.60	1.68	2,045	1,532	N/A	
20.0	4.49	1.64	2,093	1,590	N/A	
21.0	4.38	1.60	2,139	1,647	N/A	
22.0	4.28	1.56	2,183	1,705	N/A	
23.0	4.18	1.53	2,226	1,763	N/A	
24.0	4.09	1.50	2,267	1,821	N/A	
25.0	4.00	1.46	2,306	1,879	N/A	
26.0	3.92	1.43	2,345	1,936	N/A	
27.0	3.84	1.41	2,382	1,994	N/A	
28.0	3.77	1.38	2,418	2,052	N/A	
29.0	3.70	1.35	2,453	2,110	N/A	
30.0	3.63	1.33	2,487	2,168	N/A	
31.0	3.56	1.30	2,521	2,225	N/A	
32.0	3.50	1.28	2,553	2,283	N/A	
33.0	3.44	1.26	2,584	2,341	N/A	
34.0	3.38	1.24	2,615	2,399	N/A	
35.0	3.32	1.22	2,645	2,457	N/A	
36.0	3.27	1.20	2,674	2,514	N/A	
37.0	3.22	1.18	2,702	2,572	N/A	
38.0	3.17	1.16	2,730	2,630	N/A	
39.0	3.12	1.14	2,757	2,688	N/A	
40.0	3.08	1.12	2,784	2,746	N/A	



Hydrograph Data

10-yr Critical Storm

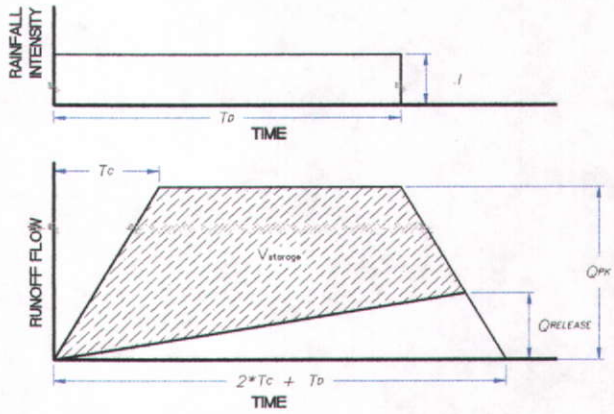
Post-Dev Inflow		Outflow	
Time	Flow	Time	Flow
0.0	0.00	0.0	0.00
5.0	1.94	14.0	1.93
14.0	1.94	21.5	0.00
21.5	0.00		

Modified Rational Storm Determination - D. J. Montague Site Improvements

James City County
AES Job. No. W10162-00
Stormwater Management Facility Design (Modified Rational Method)

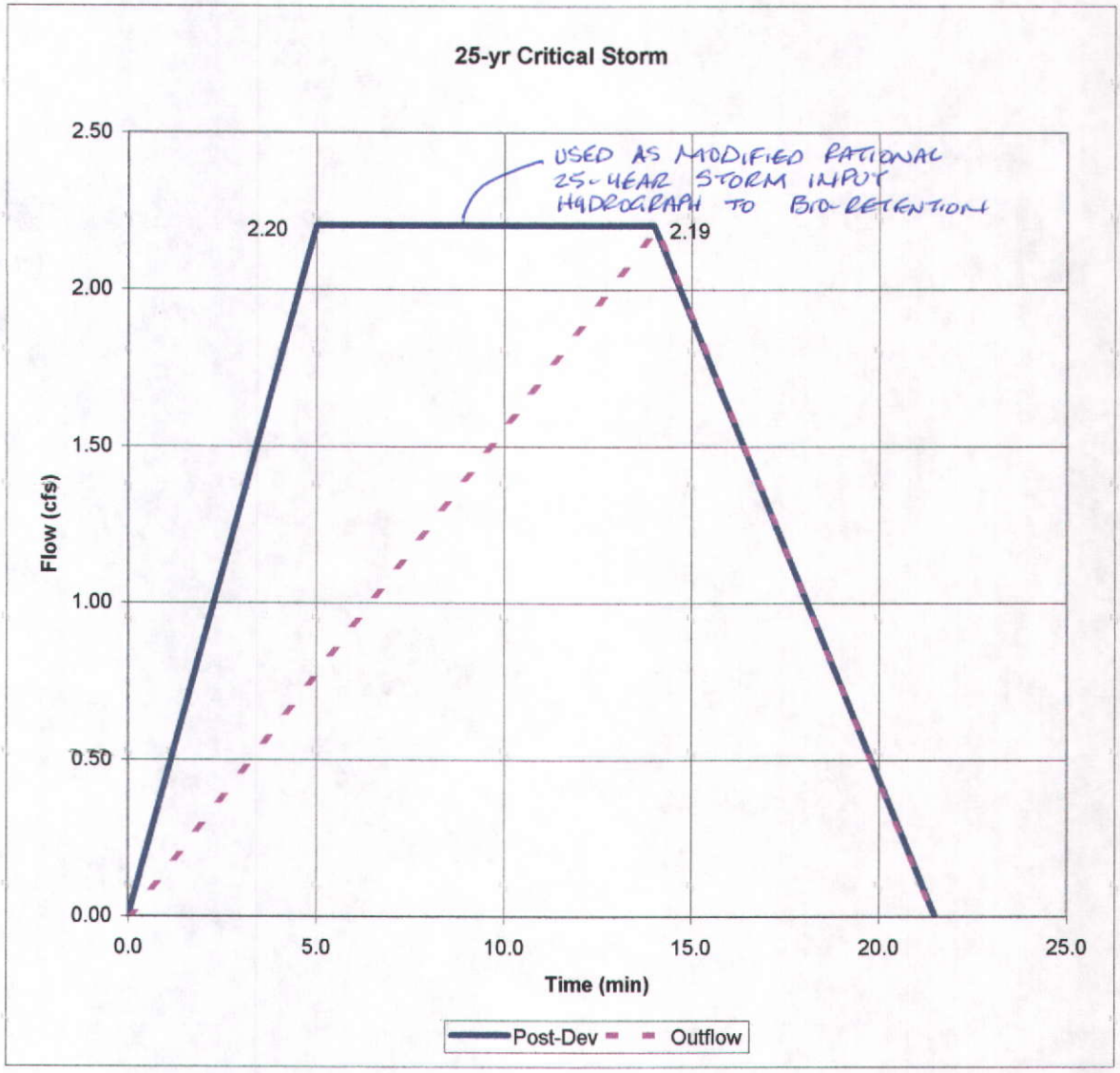
CONSULTING ENGINEERS

Post-Development Conditions:	
Drainage Area =	0.53 ac.
Rational "C" =	0.69
Time of Conc =	5.0 min.
Release Rate =	2.19 cfs
Rec. Limb Fac. =	1.5
Start Interval =	5 min.
Time Interval =	1 min.



Calculate 25-yr critical storm duration:

Storm Duration	Intensity	Qpk	Storm Runoff Volume (ft^3)	Release Flow Volume (ft^3)	Req'd Storage Volume (ft^3)	
5.0	8.49	3.10	1,164	820	344	
6.0	8.09	2.96	1,287	885	402	
7.0	7.74	2.83	1,401	951	450	
8.0	7.42	2.71	1,506	1,016	490	
9.0	7.13	2.61	1,604	1,082	522	
10.0	6.87	2.51	1,696	1,147	549	
11.0	6.63	2.43	1,783	1,213	570	
12.0	6.42	2.35	1,865	1,278	587	
13.0	6.21	2.27	1,943	1,344	599	
14.0	6.03	2.20	2,017	1,410	607	<== Critical
15.0	5.85	2.14	2,087	1,475	N/A	
16.0	5.69	2.08	2,155	1,541	N/A	
17.0	5.54	2.03	2,220	1,606	N/A	
18.0	5.40	1.98	2,282	1,672	N/A	
19.0	5.27	1.93	2,341	1,737	N/A	
20.0	5.14	1.88	2,399	1,803	N/A	
21.0	5.03	1.84	2,454	1,868	N/A	
22.0	4.92	1.80	2,508	1,934	N/A	
23.0	4.81	1.76	2,560	2,000	N/A	
24.0	4.71	1.72	2,610	2,065	N/A	
25.0	4.62	1.69	2,659	2,131	N/A	
26.0	4.53	1.66	2,706	2,196	N/A	
27.0	4.44	1.62	2,753	2,262	N/A	
28.0	4.36	1.59	2,797	2,327	N/A	
29.0	4.28	1.57	2,841	2,393	N/A	
30.0	4.21	1.54	2,884	2,459	N/A	
31.0	4.13	1.51	2,925	2,524	N/A	
32.0	4.07	1.49	2,966	2,590	N/A	
33.0	4.00	1.46	3,006	2,655	N/A	
34.0	3.94	1.44	3,044	2,721	N/A	
35.0	3.88	1.42	3,082	2,786	N/A	
36.0	3.82	1.40	3,120	2,852	N/A	
37.0	3.76	1.38	3,156	2,917	N/A	
38.0	3.71	1.36	3,192	2,983	N/A	
39.0	3.65	1.34	3,227	3,049	N/A	
40.0	3.60	1.32	3,261	3,114	N/A	



Hydrograph Data

25-yr Critical Storm

Post-Dev Inflow		Outflow	
Time	Flow	Time	Flow
0.0	0.00	0.0	0.00
5.0	2.20	14.1	2.19
14.0	2.20	21.5	0.00
21.5	0.00		

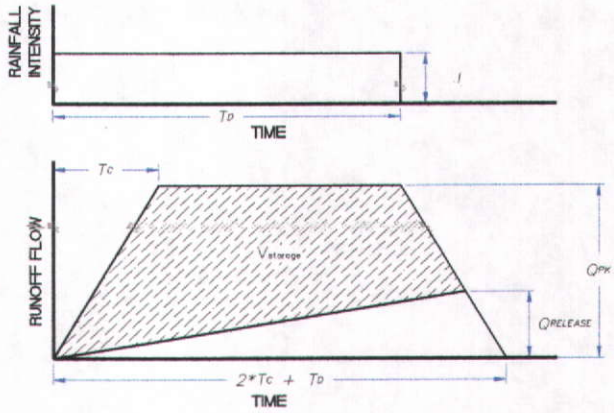
Modified Rational Storm Determination - D. J. Montague Site Improvements

James City County
AES Job. No. W10162-00
Stormwater Management Facility Design (Modified Rational Method)

CONSULTING ENGINEERS

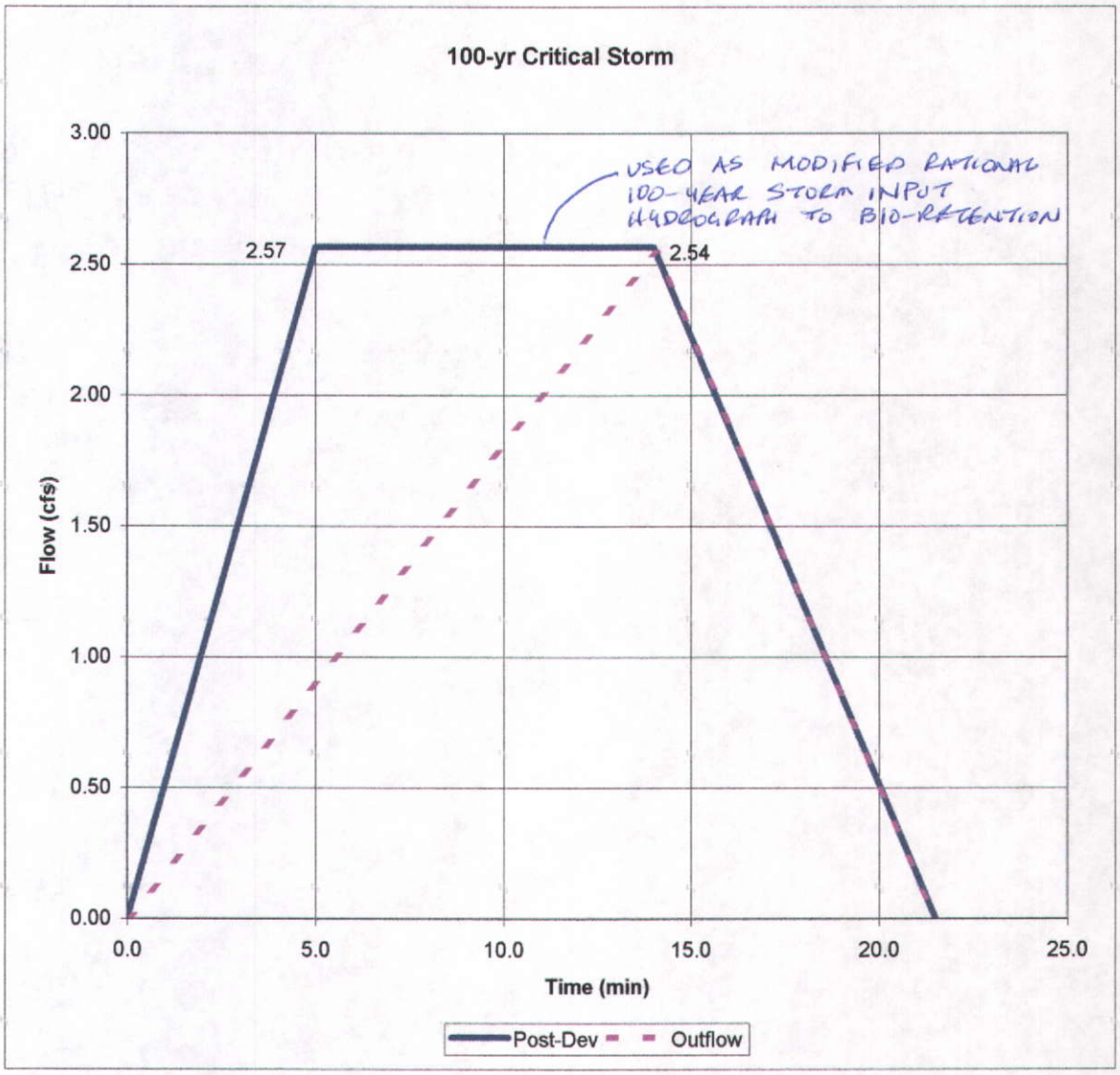
Post-Development Conditions:

Drainage Area =	0.53 ac.
Rational "C" =	0.69
Time of Conc =	5.0 min.
Release Rate =	2.54 cfs
Rec. Limb Fac. =	1.5
Start Interval =	5 min.
Time Interval =	1 min.



Calculate 100-yr critical storm duration:

Storm Duration	Intensity	Qpk	Storm Runoff Volume (ft^3)	Release Flow Volume (ft^3)	Req'd Storage Volume (ft^3)	
5.0	9.99	3.65	1,370	954	416	
6.0	9.48	3.47	1,508	1,030	478	
7.0	9.04	3.31	1,636	1,106	530	
8.0	8.65	3.16	1,756	1,182	573	
9.0	8.31	3.04	1,868	1,259	609	
10.0	8.00	2.92	1,974	1,335	639	
11.0	7.72	2.82	2,074	1,411	663	
12.0	7.46	2.73	2,170	1,487	682	
13.0	7.23	2.64	2,261	1,564	697	
14.0	7.02	2.57	2,348	1,640	708	<== Critical
15.0	6.82	2.49	2,432	1,716	N/A	
16.0	6.64	2.43	2,513	1,793	N/A	
17.0	6.47	2.37	2,591	1,869	N/A	
18.0	6.31	2.31	2,667	1,945	N/A	
19.0	6.17	2.26	2,740	2,021	N/A	
20.0	6.03	2.20	2,811	2,098	N/A	
21.0	5.90	2.16	2,880	2,174	N/A	
22.0	5.78	2.11	2,947	2,250	N/A	
23.0	5.66	2.07	3,012	2,327	N/A	
24.0	5.55	2.03	3,076	2,403	N/A	
25.0	5.45	1.99	3,138	2,479	N/A	
26.0	5.35	1.96	3,199	2,555	N/A	
27.0	5.26	1.92	3,258	2,632	N/A	
28.0	5.17	1.89	3,317	2,708	N/A	
29.0	5.08	1.86	3,374	2,784	N/A	
30.0	5.00	1.83	3,429	2,861	N/A	
31.0	4.92	1.80	3,484	2,937	N/A	
32.0	4.85	1.77	3,538	3,013	N/A	
33.0	4.78	1.75	3,591	3,089	N/A	
34.0	4.71	1.72	3,642	3,166	N/A	
35.0	4.64	1.70	3,693	3,242	N/A	
36.0	4.58	1.67	3,743	3,318	N/A	
37.0	4.52	1.65	3,793	3,394	N/A	
38.0	4.46	1.63	3,841	3,471	N/A	
39.0	4.40	1.61	3,889	3,547	N/A	
40.0	4.35	1.59	3,936	3,623	N/A	



Hydrograph Data

100-yr Critical Storm

Post-Dev Inflow		Outflow	
Time	Flow	Time	Flow
0.0	0.00	0.0	0.00
5.0	2.57	14.1	2.54
14.0	2.57	21.5	0.00
21.5	0.00		

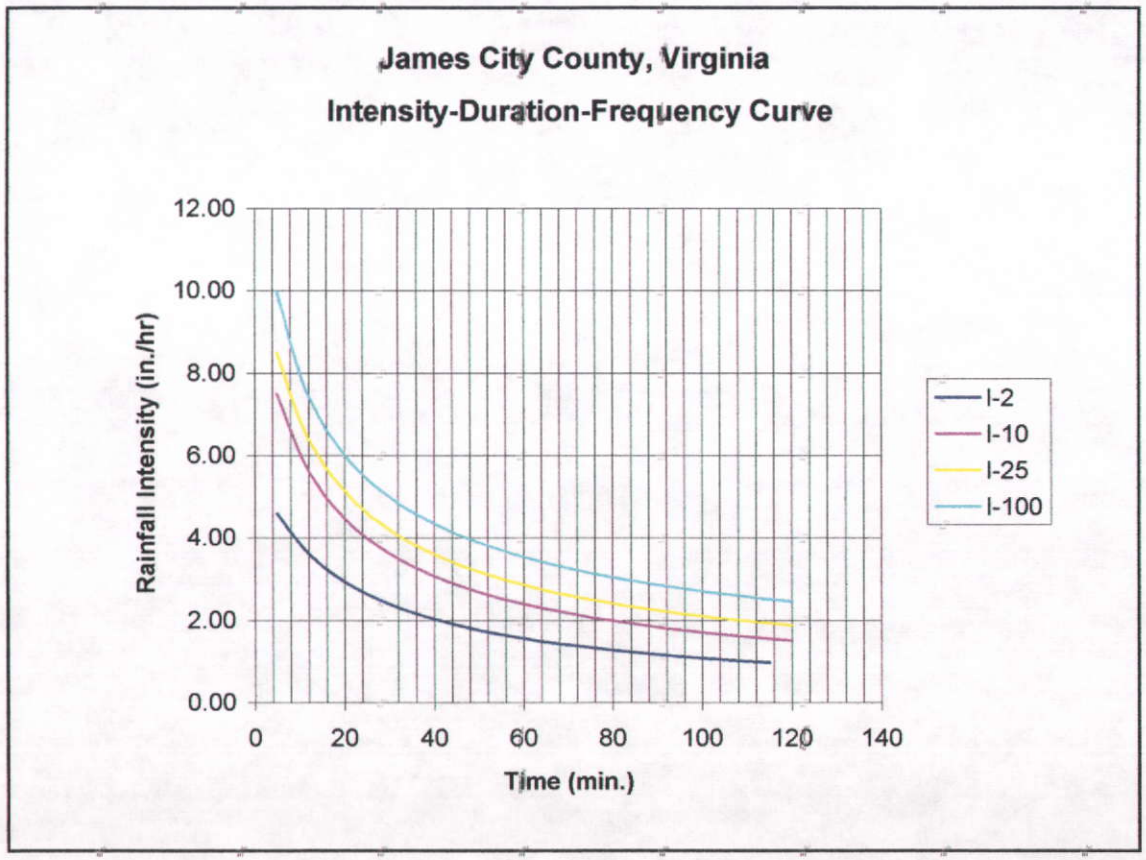
IDF Curve for
James City County, Virginia

Ix = B / (Tc + D)^E (in inches per hour)
(Tc in minutes)

X	B	D	E
2	70.63	12.75	0.875
10	55.61	10	0.74
25	48.54	8.5	0.67
100	36.77	5.25	0.56

Example:

Tc	I-2	I-10	I-25	I-100
5	5.70	7.50	8.49	9.99
10	4.59	6.06	6.87	8.00
15	3.86	5.14	5.85	6.82
20	3.34	4.49	5.14	6.03
25	2.95	4.00	4.62	5.45
30	2.64	3.63	4.21	5.00
35	2.40	3.32	3.88	4.64
40	2.20	3.08	3.60	4.35
45	2.03	2.87	3.37	4.10
50	1.89	2.69	3.18	3.89
55	1.77	2.53	3.01	3.70
60	1.66	2.40	2.86	3.54
65	1.57	2.28	2.73	3.40
70	1.48	2.17	2.61	3.27
75	1.41	2.08	2.50	3.16
80	1.34	1.99	2.41	3.05
85	1.28	1.91	2.32	2.95
90	1.23	1.84	2.24	2.87
95	1.18	1.78	2.17	2.79
100	1.13	1.72	2.10	2.71
105	1.09	1.66	2.04	2.64
110	1.05	1.61	1.98	2.58
115	1.01	1.56	1.93	2.52
120	0.98	1.52	1.88	2.46



AES Consulting Engineers
Williamsburg, Virginia
w10162-00 Modified Rational Critical Storm.xls
3/21/2011

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10162 Bio-retention 2011-03-21.gpw

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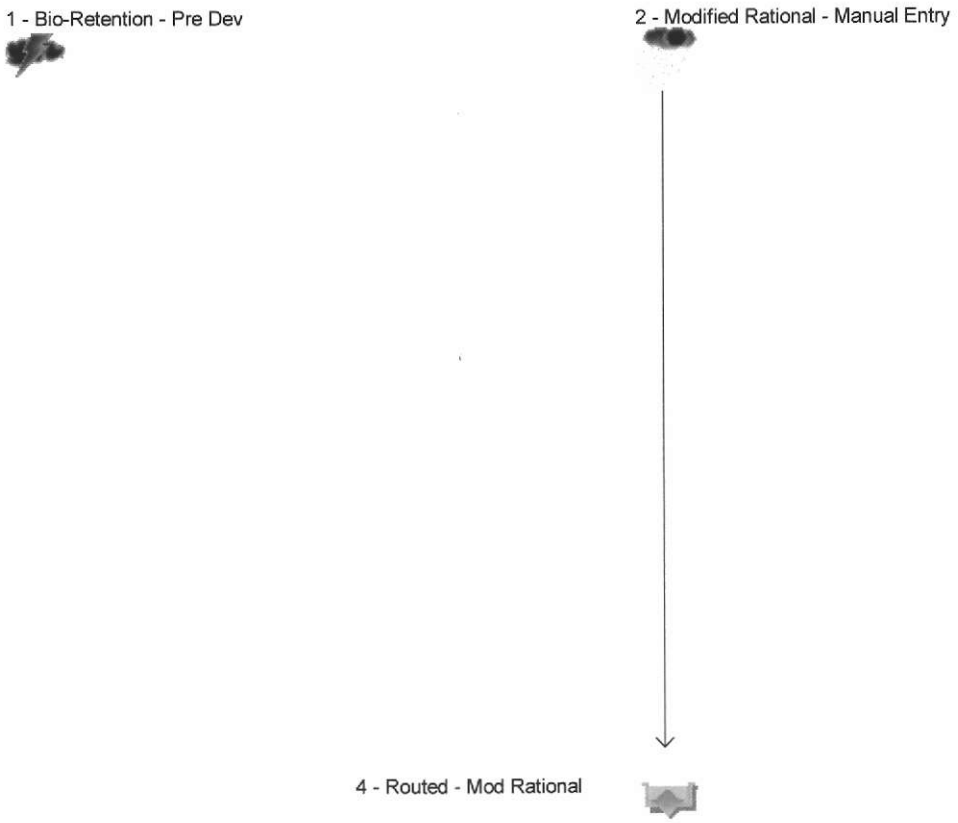
Watershed Model Schematic

Hydraflow Hydrographs by Intelisolve v9.25



Legend

Hyd.	Origin	Description
1	Rational	Bio-Retention - Pre Dev
2	Manual	Modified Rational - Manual Entry
4	Reservoir	Routed - Mod Rational

Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.25

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	Rational	------	1.257	1.482	------	------	1.927	2.185	------	2.543	Bio-Retention - Pre Dev
2	Manual	------	0.000	1.480	------	------	1.940	2.200	------	2.570	Modified Rational - Manual Entry FROM MODIFIED RATIONAL DETERMINATION
4	Reservoir	2	0.000	0.173	------	------	0.198	0.209	------	0.279	Routed - Mod Rational

$Q_{2\ OUT} = 0.173$ cfs

$Q_{10\ OUT} = 0.198$ cfs

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.25

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	1.482	1	10	1,111	------	------	------	Bio-Retention - Pre Dev
2	Manual	1.480	1	5	1,336	------	------	------	Modified Rational - Manual Entry FROM MODIFIED RATIONAL DETERMINATION (2-YEAR)
4	Reservoir	0.173	1	20	1,327	2	109.97	1,971	Routed - Mod Rational

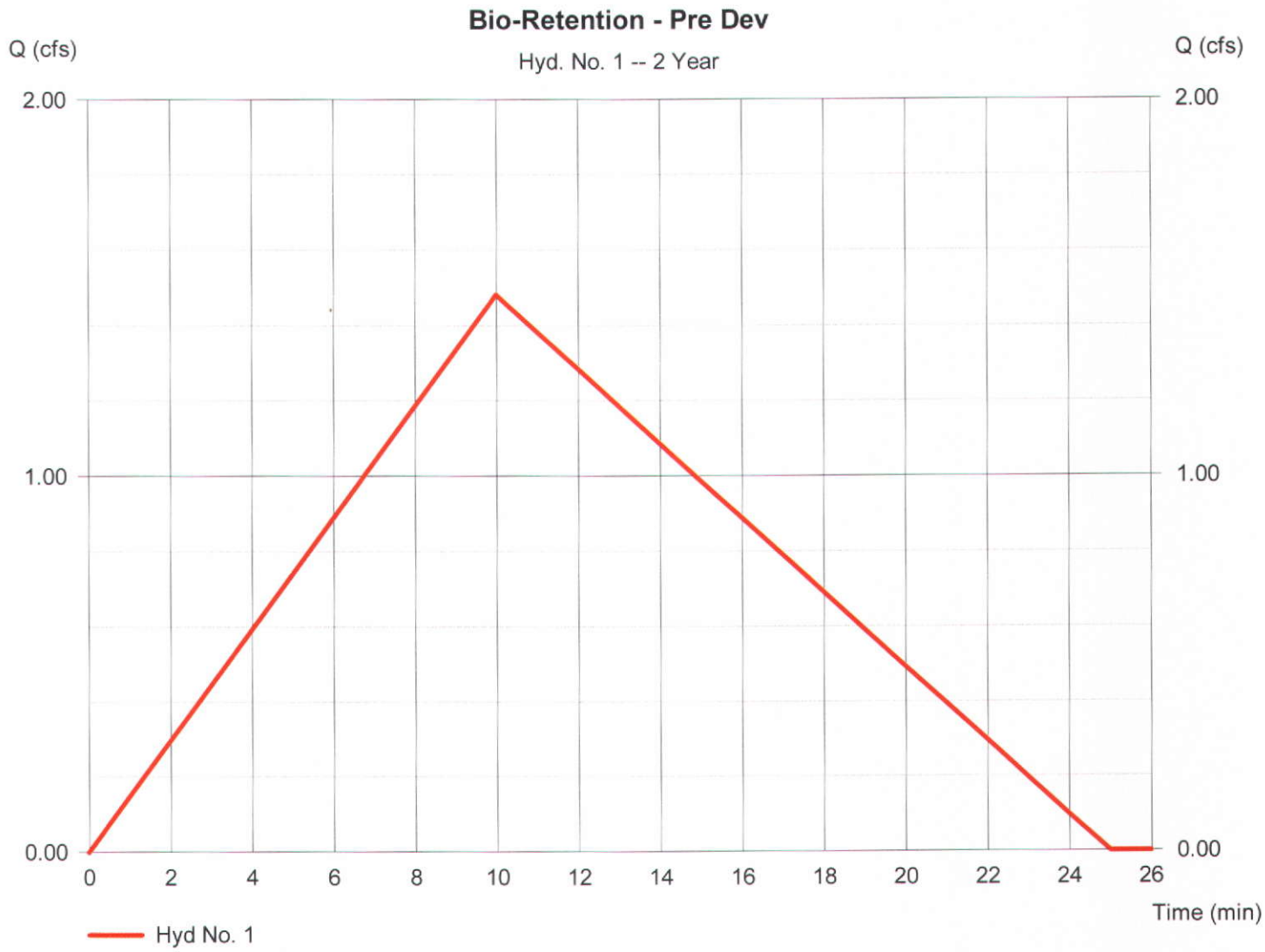
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.25 Monday, Mar 21, 2011

Hyd. No. 1

Bio-Retention - Pre Dev

Hydrograph type	= Rational	Peak discharge	= 1.482 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 1,111 cuft
Drainage area	= 0.530 ac	Runoff coeff.	= 0.6
Intensity	= 4.660 in/hr	Tc by User	= 10.00 min
IDF Curve	= JamesCity-NW-14.IDF	Asc/Rec limb fact	= 1/1.5



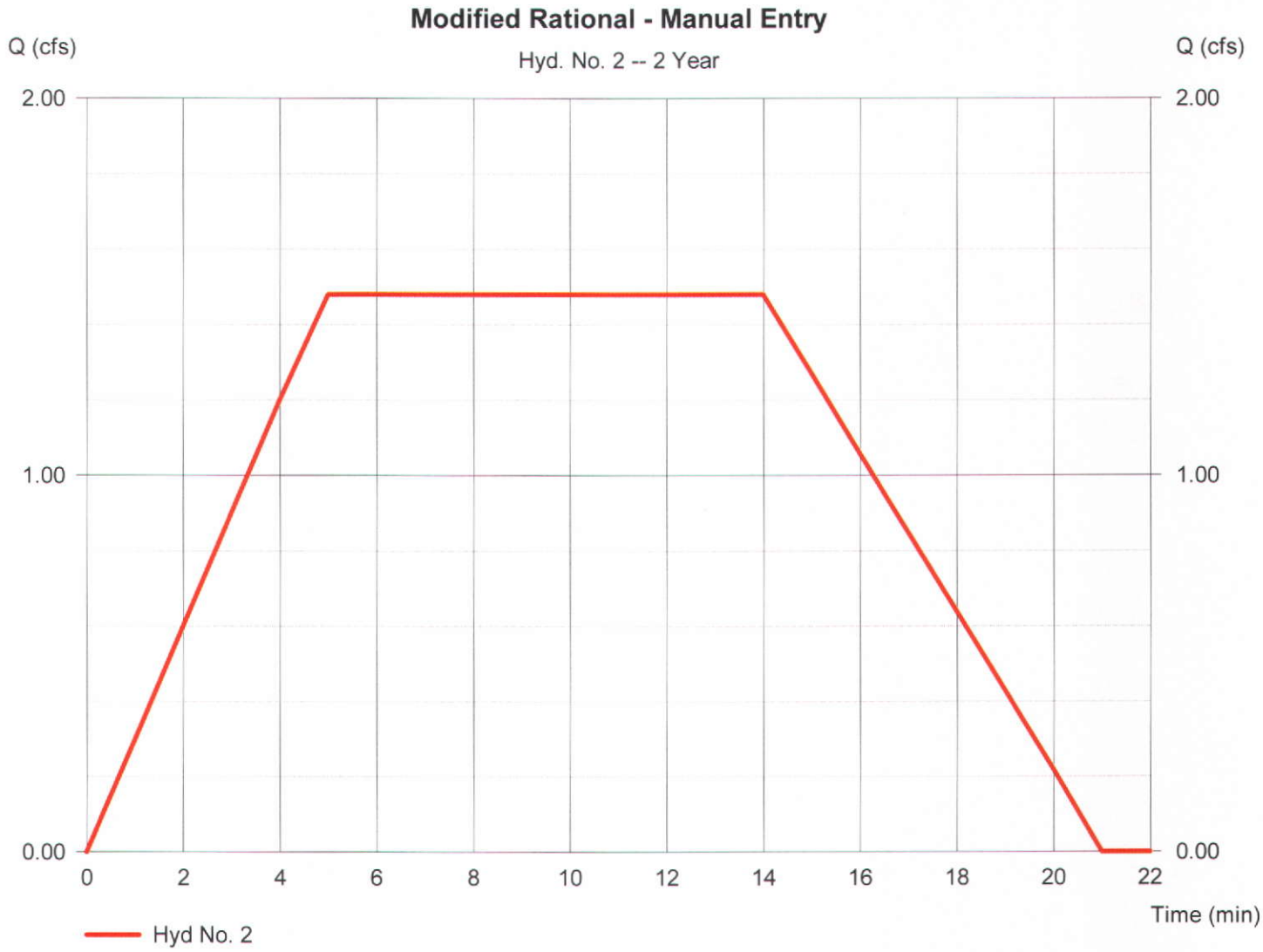
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.25 Monday, Mar 21, 2011

Hyd. No. 2

Modified Rational - Manual Entry

Hydrograph type	= Manual	Peak discharge	= 1.480 cfs
Storm frequency	= 2 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 1,336 cuft



Hydrograph Report

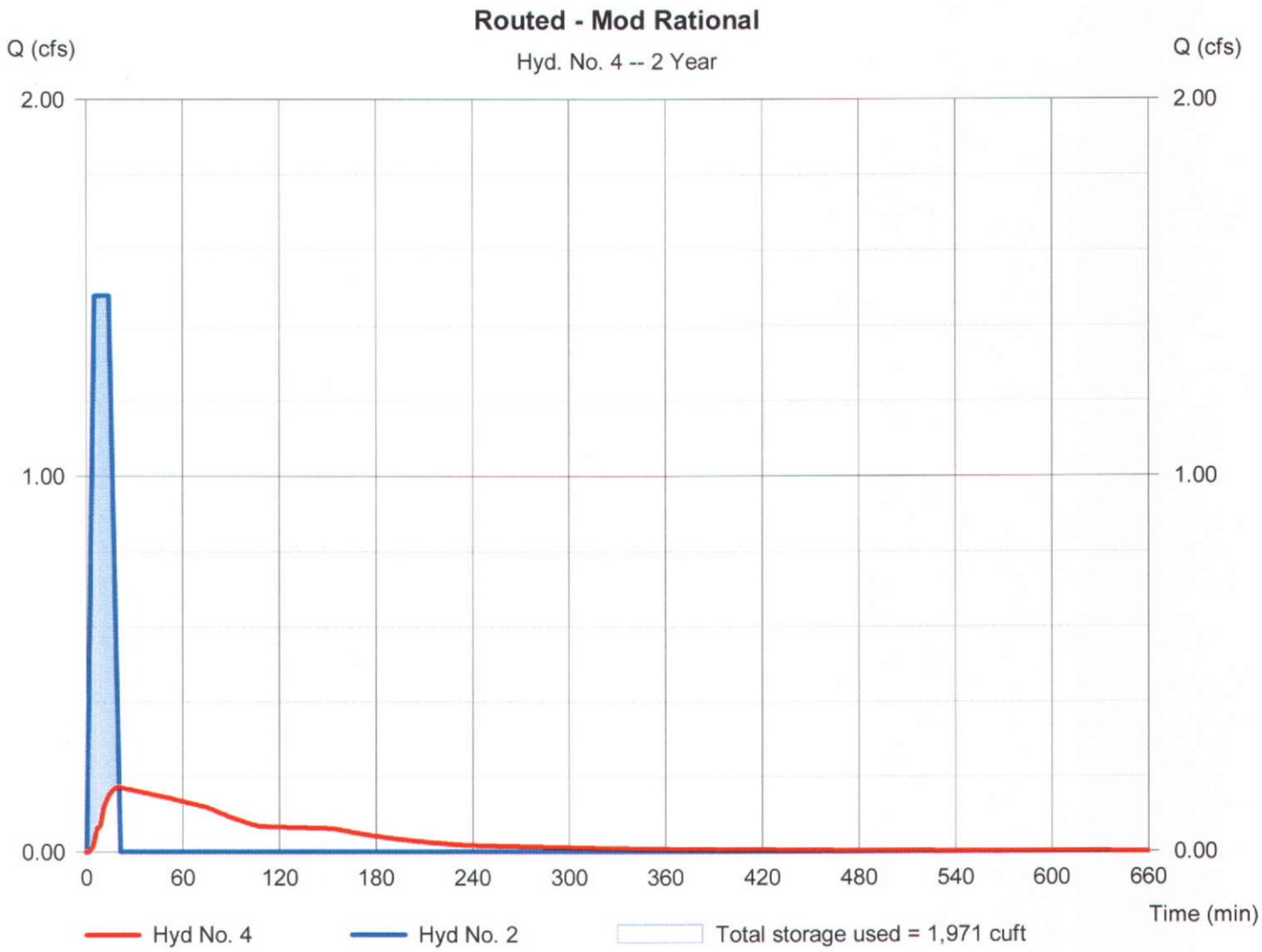
Hydraflow Hydrographs by Intelisolve v9.25 Monday, Mar 21, 2011

Hyd. No. 4

Routed - Mod Rational

Hydrograph type	= Reservoir	Peak discharge	= 0.173 cfs
Storm frequency	= 2 yrs	Time to peak	= 20 min
Time interval	= 1 min	Hyd. volume	= 1,327 cuft
Inflow hyd. No.	= 2 - Modified Rational - Manual Entry	Max. Elevation	= 109.97 ft
Reservoir name	= Bio-Retention Filter	Max. Storage	= 1,971 cuft

Storage Indication method used. Wet pond routing start elevation = 109.30 ft.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.25 — Monday, Mar 21, 2011

Pond No. 1 - Bio-Retention Filter

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 108.80 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	108.80	827	0	0
0.20	109.00	1,227	204	204
1.20	110.00	2,514	1,832	2,036
2.20	111.00	3,252	2,875	4,911

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 10.00	3.00	0.00	0.00
Span (in)	= 10.00	3.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 106.50	109.30	0.00	0.00
Length (ft)	= 34.00	0.50	0.00	0.00
Slope (%)	= 0.09	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

10"

Weir Structures

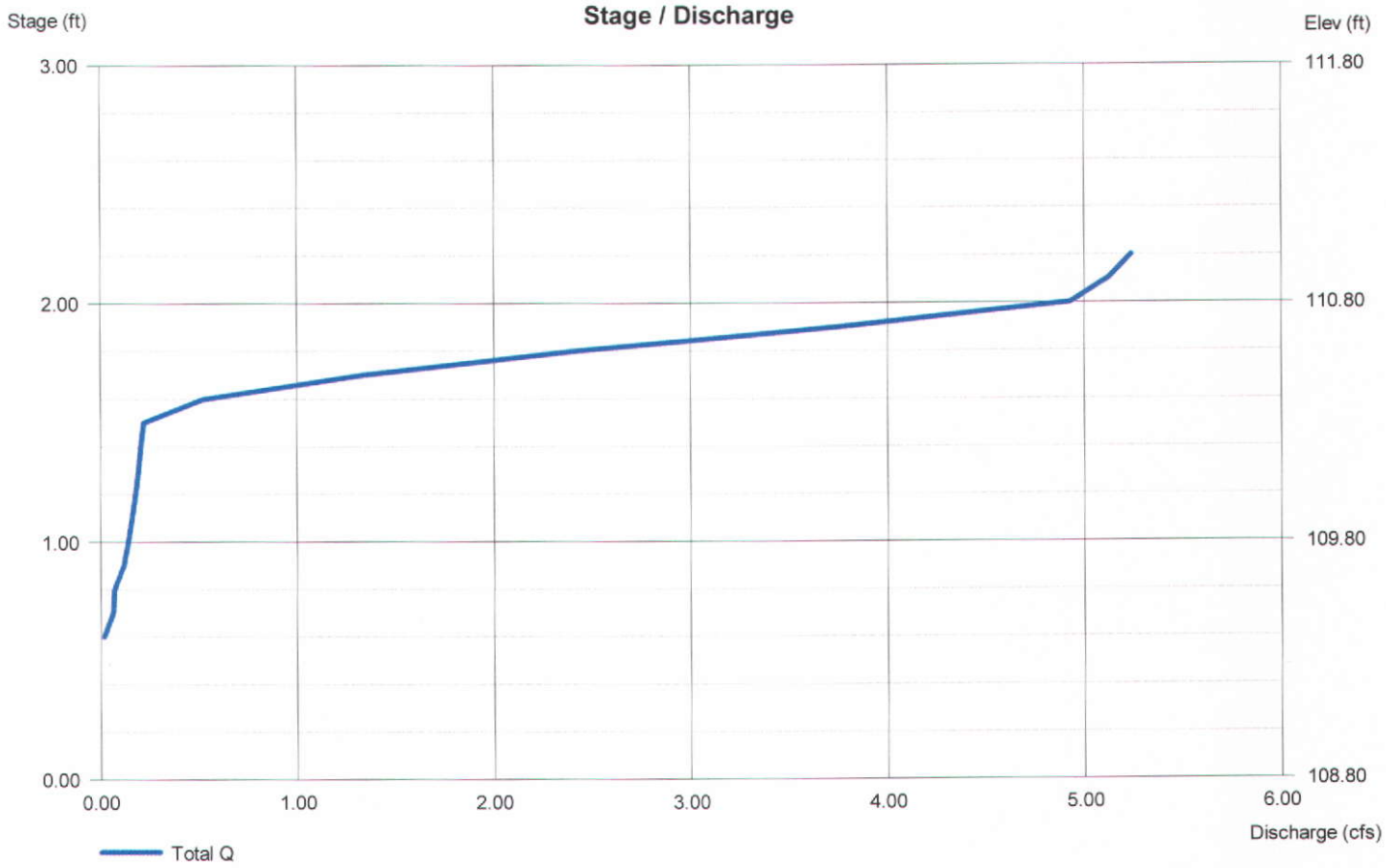
	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.67	3.48	0.00	0.00
Crest El. (ft)	= 110.33	110.73	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Riser	Broad	---	---
Multi-Stage	= Yes	Yes	No	No

CREST 110.33

Exfil.(in/hr)	= 0.000 (by Contour)
TW Elev. (ft)	= 0.00

3"

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



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.25

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	1.927	1	10	1,445	-----	-----	-----	Bio-Retention - Pre Dev
2	Manual	1.940	1	5	1,811	-----	-----	-----	Modified Rational - Manual Entry FROM MODIFIED RATIONAL DETERMINATION (10-YEAR)
4	Reservoir	0.198	1	21	1,802	2	110.13	2,409	Routed - Mod Rational

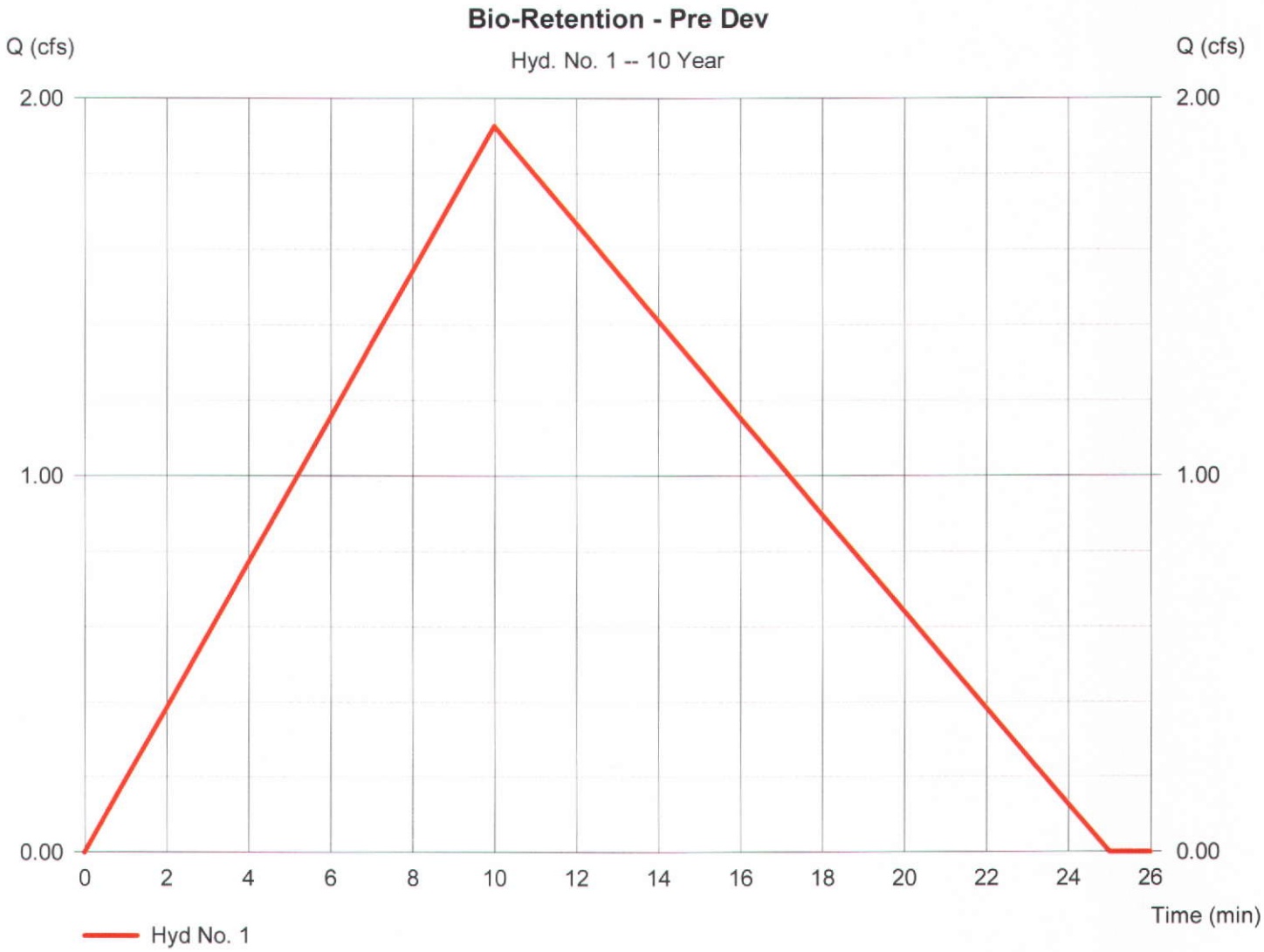
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.25 Monday, Mar 21, 2011

Hyd. No. 1

Bio-Retention - Pre Dev

Hydrograph type	= Rational	Peak discharge	= 1.927 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 1,445 cuft
Drainage area	= 0.530 ac	Runoff coeff.	= 0.6
Intensity	= 6.059 in/hr	Tc by User	= 10.00 min
IDF Curve	= JamesCity-NW-14.IDF	Asc/Rec limb fact	= 1/1.5



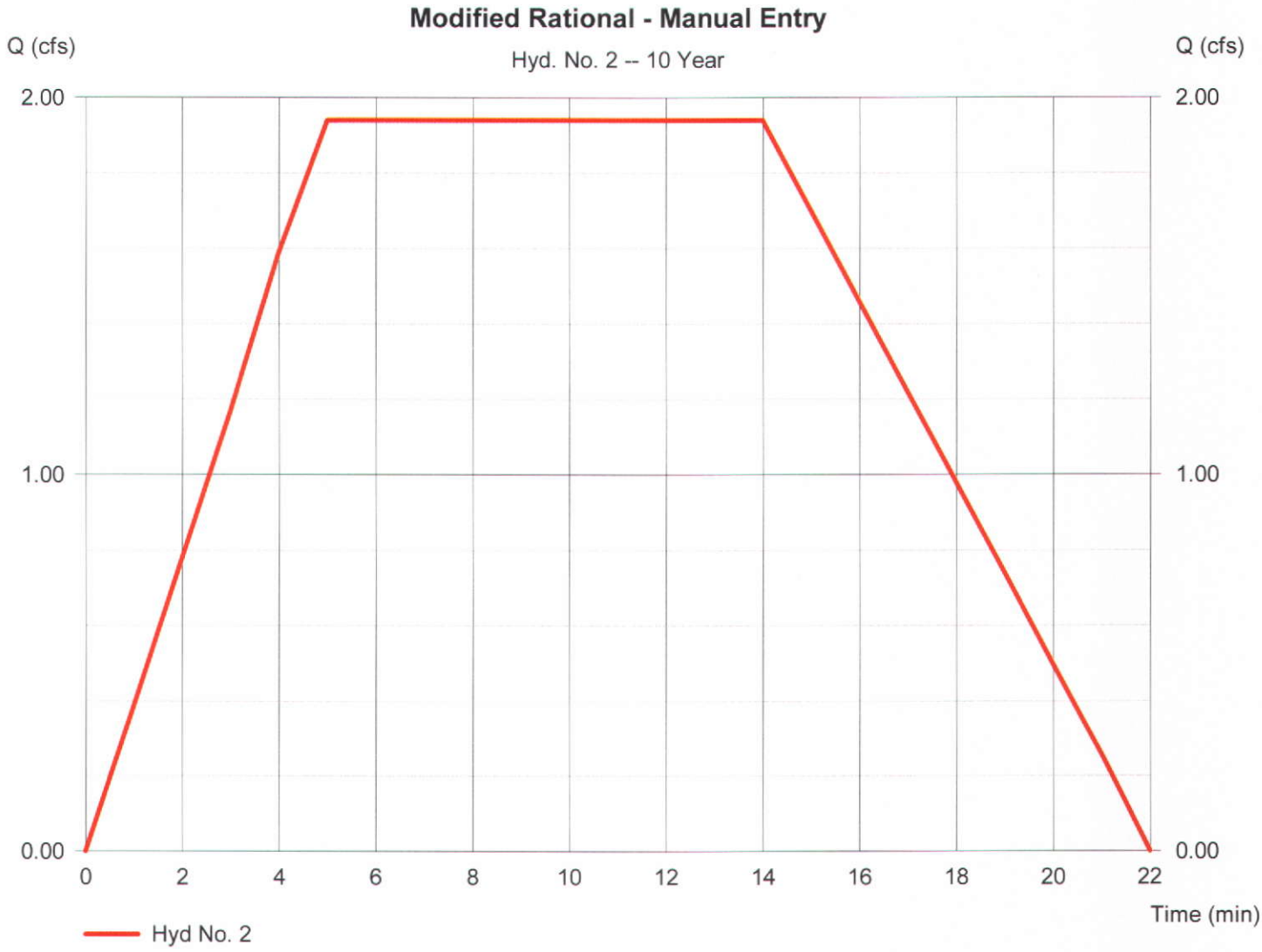
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.25 Monday, Mar 21, 2011

Hyd. No. 2

Modified Rational - Manual Entry

Hydrograph type	= Manual	Peak discharge	= 1.940 cfs
Storm frequency	= 10 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 1,811 cuft



Hydrograph Report

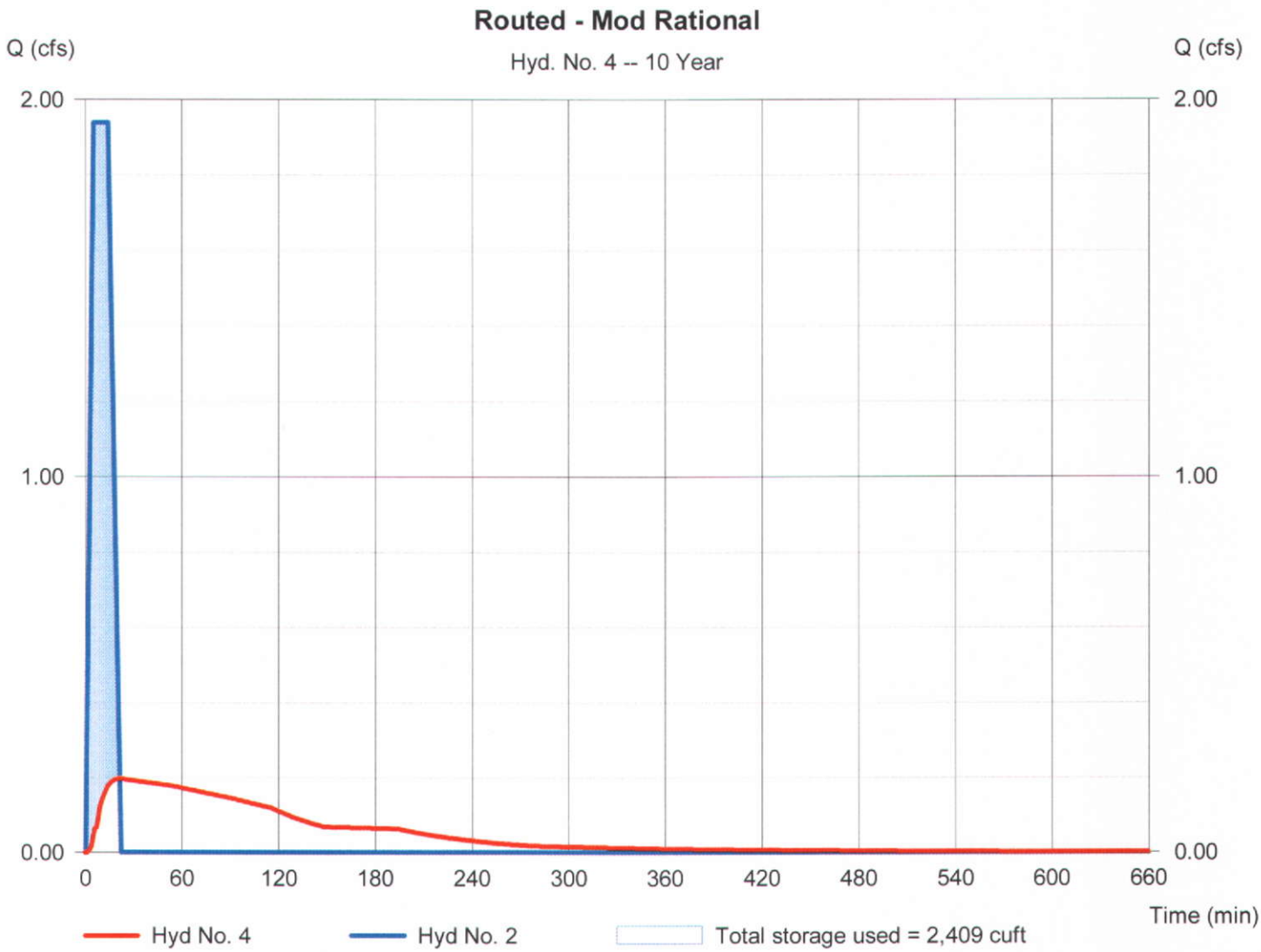
Hydraflow Hydrographs by Intelisolve v9.25 Monday, Mar 21, 2011

Hyd. No. 4

Routed - Mod Rational

Hydrograph type	= Reservoir	Peak discharge	= 0.198 cfs
Storm frequency	= 10 yrs	Time to peak	= 21 min
Time interval	= 1 min	Hyd. volume	= 1,802 cuft
Inflow hyd. No.	= 2 - Modified Rational - Manual Entry	Max. Elevation	= 110.13 ft
Reservoir name	= Bio-Retention Filter	Max. Storage	= 2,409 cuft

Storage Indication method used. Wet pond routing start elevation = 109.30 ft.



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.25

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	2.185	1	10	1,639	-----	------	-----	Bio-Retention - Pre Dev
2	Manual	2.200	1	5	2,057	-----	------	-----	Modified Rational - Manual Entry FROM MODIFIED RATIONAL DETERMINATION (25-YEAR)
4	Reservoir	0.209	1	21	2,048	2	110.21	2,639	Routed - Mod Rational

Hydrograph Report

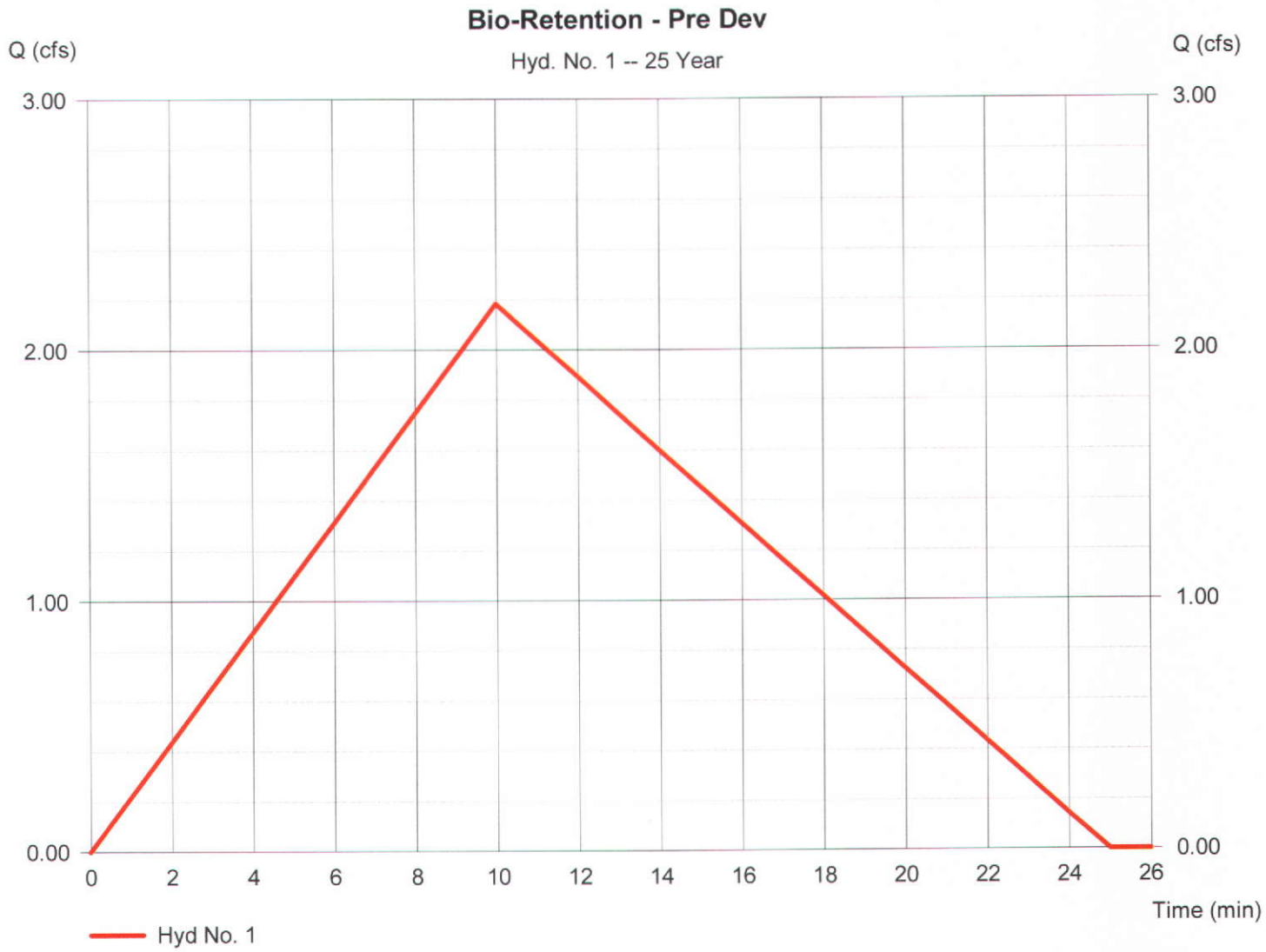
Hydraflow Hydrographs by Intelisolve v9.25

Monday, Mar 21, 2011

Hyd. No. 1

Bio-Retention - Pre Dev

Hydrograph type	= Rational	Peak discharge	= 2.185 cfs
Storm frequency	= 25 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 1,639 cuft
Drainage area	= 0.530 ac	Runoff coeff.	= 0.6
Intensity	= 6.872 in/hr	Tc by User	= 10.00 min
IDF Curve	= JamesCity-NW-14.IDF	Asc/Rec limb fact	= 1/1.5



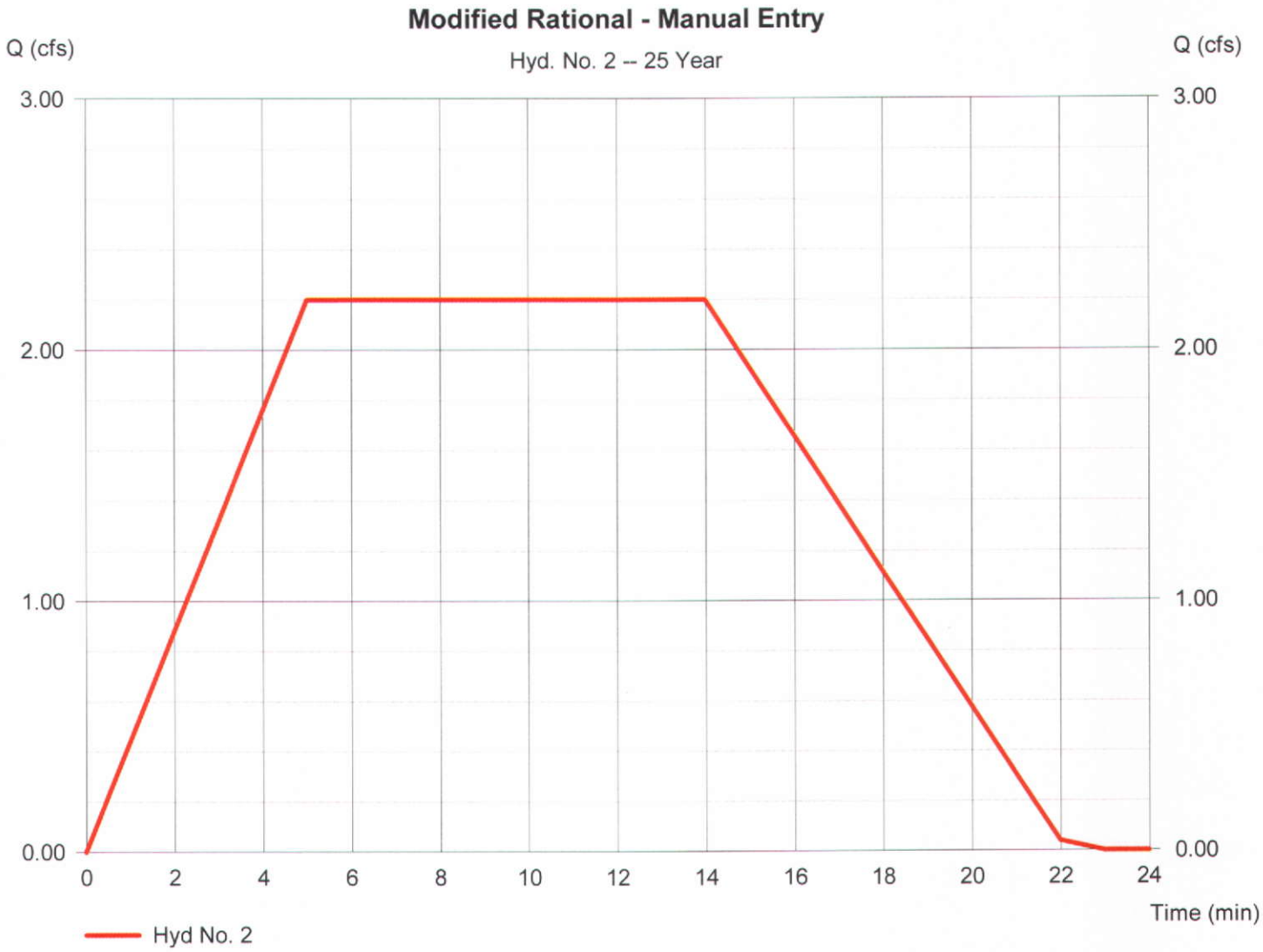
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.25 Monday, Mar 21, 2011

Hyd. No. 2

Modified Rational - Manual Entry

Hydrograph type	= Manual	Peak discharge	= 2.200 cfs
Storm frequency	= 25 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 2,057 cuft



Hydrograph Report

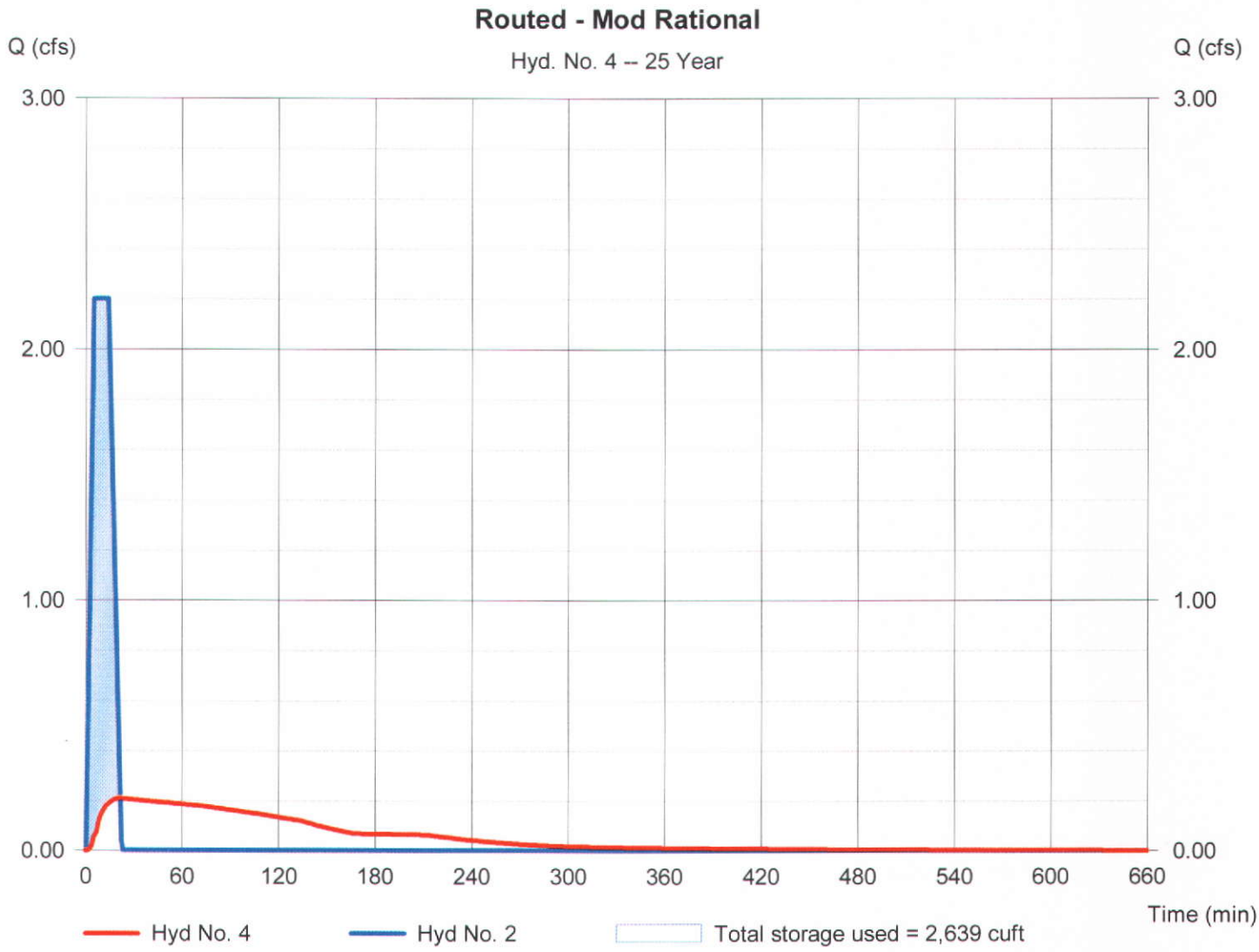
Hydraflow Hydrographs by Intelisolve v9.25 Monday, Mar 21, 2011

Hyd. No. 4

Routed - Mod Rational

Hydrograph type	= Reservoir	Peak discharge	= 0.209 cfs
Storm frequency	= 25 yrs	Time to peak	= 21 min
Time interval	= 1 min	Hyd. volume	= 2,048 cuft
Inflow hyd. No.	= 2 - Modified Rational - Manual Entry	Max. Elevation	= 110.21 ft
Reservoir name	= Bio-Retention Filter	Max. Storage	= 2,639 cuft

Storage Indication method used. Wet pond routing start elevation = 109.30 ft.



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.25

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	2.543	1	10	1,907	-----	-----	-----	Bio-Retention - Pre Dev
2	Manual	2.570	1	5	2,390	-----	-----	-----	Modified Rational - Manual Entry FROM MODIFIED RATIONAL DETERMINATION (100-YEAR)
4	Reservoir	0.279	1	21	2,381	2	110.32	2,955	Routed - Mod Rational

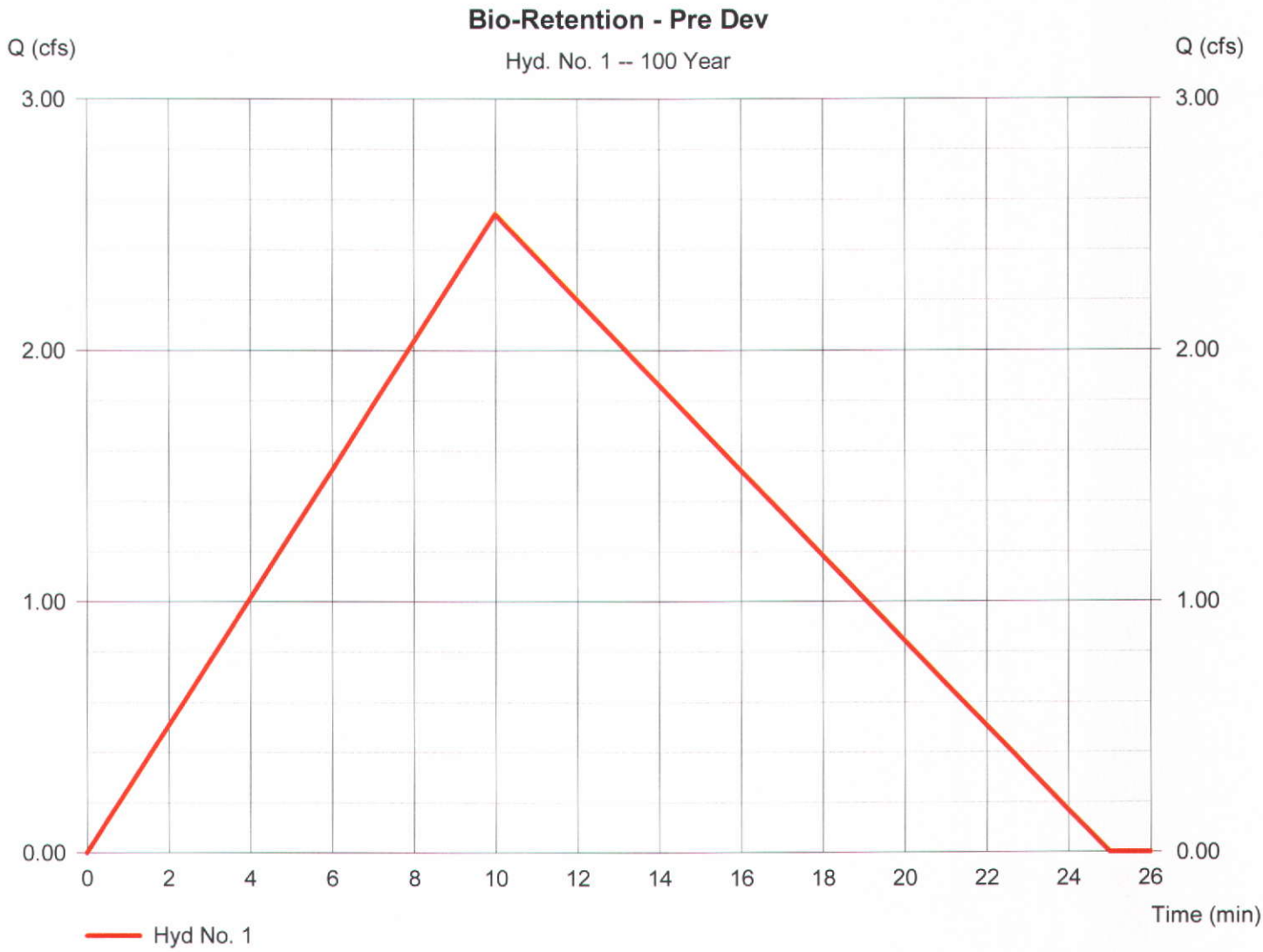
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.25 Monday, Mar 21, 2011

Hyd. No. 1

Bio-Retention - Pre Dev

Hydrograph type	= Rational	Peak discharge	= 2.543 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 1,907 cuft
Drainage area	= 0.530 ac	Runoff coeff.	= 0.6
Intensity	= 7.996 in/hr	Tc by User	= 10.00 min
IDF Curve	= JamesCity-NW-14.IDF	Asc/Rec limb fact	= 1/1.5



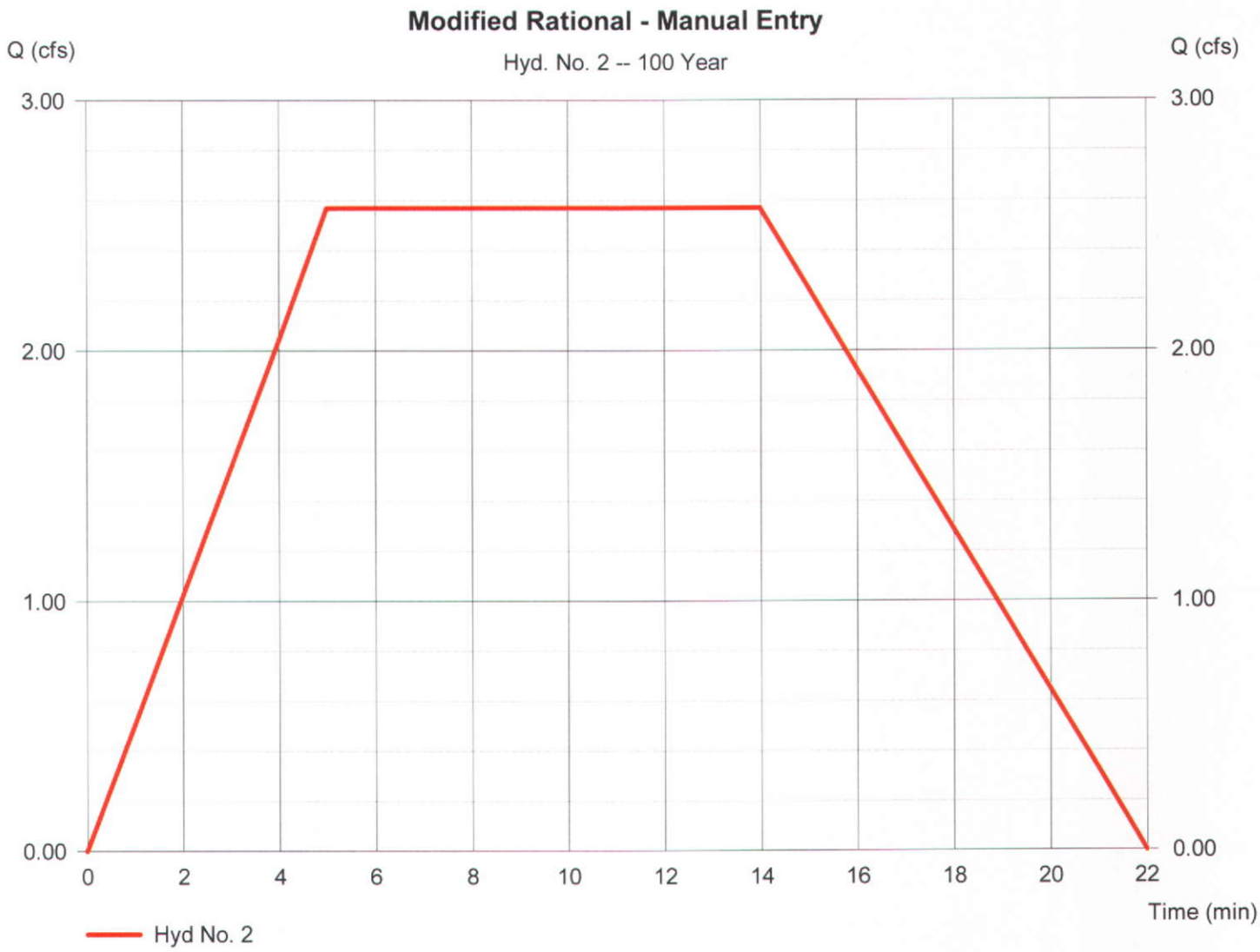
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.25 Monday, Mar 21, 2011

Hyd. No. 2

Modified Rational - Manual Entry

Hydrograph type	= Manual	Peak discharge	= 2.570 cfs
Storm frequency	= 100 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 2,390 cuft



Hydrograph Report

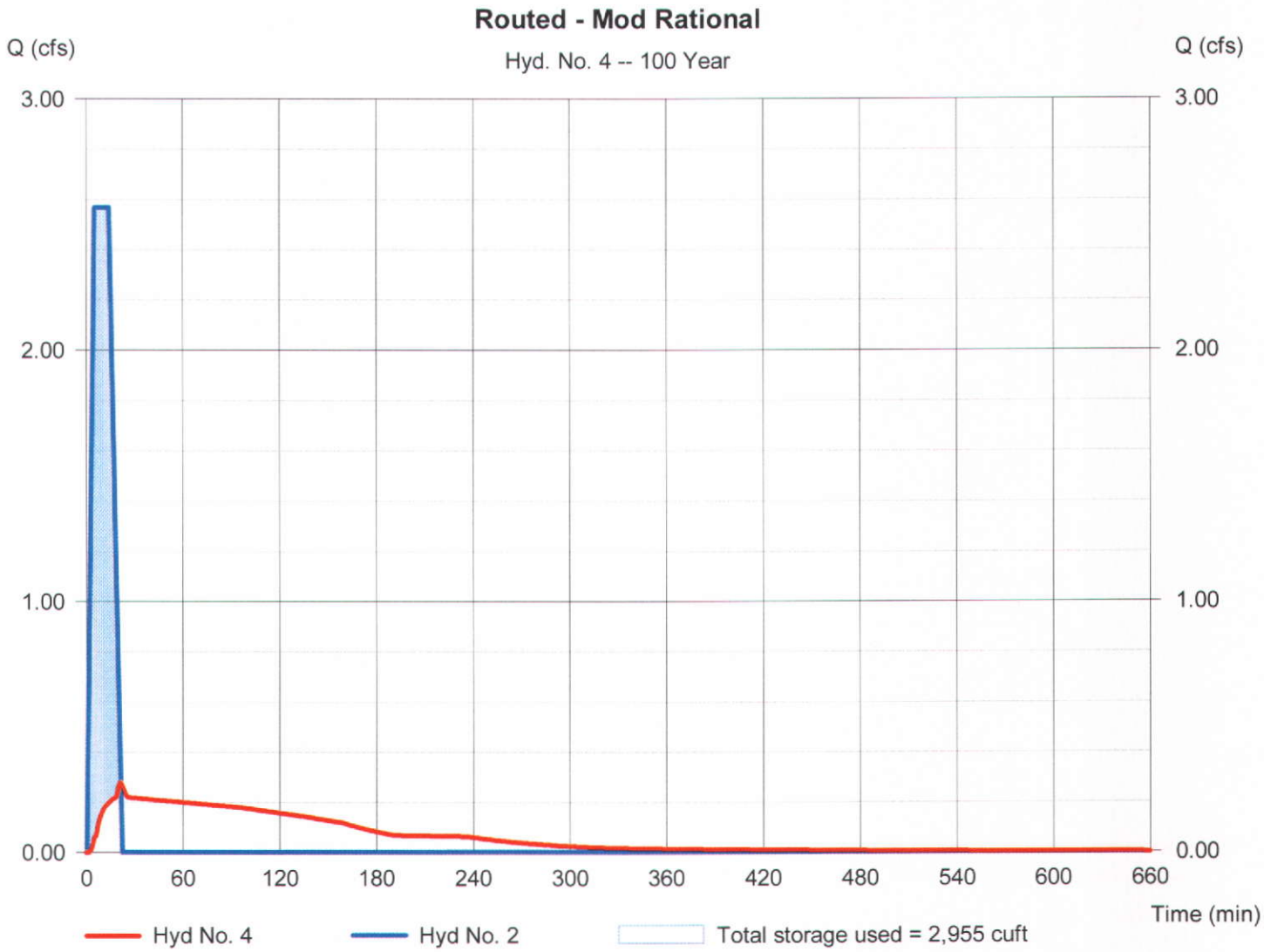
Hydraflow Hydrographs by Intelisolve v9.25 Monday, Mar 21, 2011

Hyd. No. 4

Routed - Mod Rational

Hydrograph type	= Reservoir	Peak discharge	= 0.279 cfs
Storm frequency	= 100 yrs	Time to peak	= 21 min
Time interval	= 1 min	Hyd. volume	= 2,381 cuft
Inflow hyd. No.	= 2 - Modified Rational - Manual Entry	Max. Elevation	= 110.32 ft
Reservoir name	= Bio-Retention Filter	Max. Storage	= 2,955 cuft

Storage Indication method used. Wet pond routing start elevation = 109.30 ft.



Hydraflow Rainfall Report

Hydraflow Hydrographs by Intelisolve v9.25 Monday, Mar 21, 2011

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	100.6580	15.8000	0.9960	-------
2	70.6300	12.7500	0.8700	-------
3	34.3730	3.7000	0.4880	-------
5	57.8400	10.5000	0.7800	-------
10	55.6100	10.0000	0.7400	-------
25	48.5400	8.5000	0.6700	-------
50	38.7800	6.0000	0.5900	-------
100	36.7700	5.2500	0.5600	-------

File name: JamesCity-NW-14.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	4.90	3.95	3.31	2.85	2.50	2.23	2.01	1.83	1.68	1.56	1.45	1.35
2	5.78	4.66	3.92	3.39	3.00	2.69	2.45	2.24	2.07	1.93	1.80	1.70
3	11.96	9.58	8.23	7.33	6.68	6.18	5.77	5.44	5.16	4.92	4.71	4.53
5	6.82	5.48	4.63	4.02	3.57	3.22	2.94	2.71	2.52	2.36	2.22	2.09
10	7.50	6.06	5.14	4.49	4.00	3.63	3.32	3.08	2.87	2.69	2.53	2.40
25	8.49	6.87	5.85	5.14	4.62	4.21	3.88	3.60	3.37	3.18	3.01	2.86
50	9.42	7.55	6.43	5.67	5.11	4.68	4.34	4.05	3.81	3.61	3.43	3.27
100	9.99	8.00	6.82	6.03	5.45	5.00	4.64	4.35	4.10	3.89	3.70	3.54

Tc = time in minutes. Values may exceed 60.

Precip. file name: James City.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.80	3.50	0.00	4.70	5.80	6.40	7.20	8.00
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10

RECEIVED
MAR 2011
Planning Department

ECS Mid-Atlantic, LLC
108 Ingram Road
Suite 1
Williamsburg, VA 23188
(757) 229-6677

LETTER OF TRANSMITTAL

August 9, 2011	RE: **D.j. Montague Elementary School Parking Lot Cmt**
AES Consulting Engineers, Inc. 5248 Olde Towne Road Suite # 1 Williamsburg, VA 23188	ECS Job # **07:11138** Permits: Location: **5380 Centerville Road** **Williamsburg, VA**
ATTN: Mr. Bruce Abbott	

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

ENCL:

Field Report # 1 08/04/2011 compaction

COMMONWEALTH OF VIRGINIA
B. SCOTT GRESHAM
No. 037726
PROFESSIONAL ENGINEER

AUG 8 2011

Scott Gresham, P.E.
Construction Services Manager

John M. Foster

John M. Foster
Project Manager

ECS Mid-Atlantic, LLC
108 Ingram Road
Suite 1
Williamsburg, VA 23188
(757) 229-6677

FIELD REPORT

Project No.	07:11138
Report No.	1
Day & Date	Thursday 08/04/2011
Weather	94°/ Cloudy
On-Site Time	1.50
Lab Time	0.50
Travel Time*	0.50
Total	2.50
Re Obs.Time	0.00

Project	D.j. Montague Elementary School Parking Lot Cmt
Location	Williamsburg, VA
Client	AES Consulting Engineers, Inc. - Bruce Abbott

Remarks **compaction**

Trip Charges* Tolls/Parking* Mileage* 20

Chargeable Items

Time of	Arrival	Departure
	01:00P	02:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on-site, as requested, to observe the placement and compaction of soils for the temporary sediment trap dam. Please see the attached sketch.

Utilizing the nuclear test method (ASTM D-2922) to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95-102% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method (ASTM D-698).

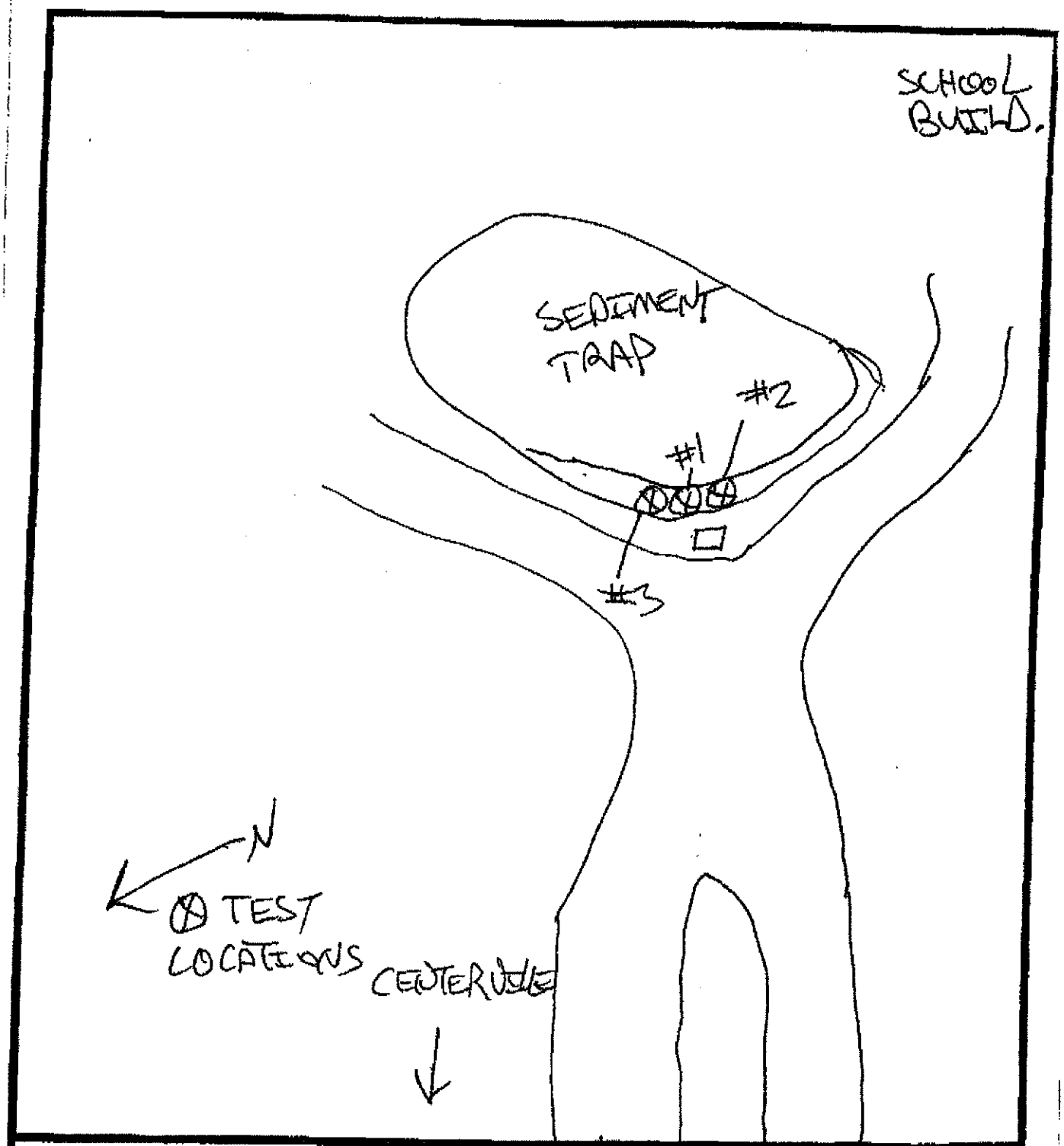
Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for structures located off of the observed engineered pad, misaligned utilities or stakeout errors causing uncontrolled fill to be placed in structural areas.

The soils observed on this date appeared to be placed in accordance with project drawings and specifications with regard to lift thickness and moisture content.

NOTE: A bulk soil sample was collected and returned to the ECS Laboratory for proctor analysis.

By **Clovis R. Sullivan, — Sr. Field Technician** 1700

163363



LOCATION: 5380 CENTERVILLE	ECS LLC MID-ATLANTIC	SITE DRAWING
TECHNICIAN: CRS		ECS PROJECT NAME: DJ MONTAGUE ELEMT
DATE: 8/4/11 THURSDAY		ECS PROJECT NO.: 11138
		WORK ORDER ID #: 58498

ECS MID-ATLANTIC, LLC

Field Compaction Summary, ASTM D6938

Project No: 11138 Project Name: D.j. Montague Elementary School Parking Lot Cmt Date: 08/04/11

Client: AES Consulting Engineers, Inc.

Contractor: None Listed

Technician: Clovis R. Sullivan

Test Method ASTM D6938			
Nuclear Gauge No.7081			
Make		Density Std	38069
Model		Moisture Std	9730
Ser. No.	MD30707081		

Sample: FP-1 Description: orangish-brown SANDY clay Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 117.00 Uncorrected Opt. MC: 11.00

Test No.	Test Mode	Probe Depth	Station / Location	Lift / Elev	% Oversize	Corrected Maximum Dry Density (pcf)	Corrected Optimum Moisture Content (%)	Test Data				P / F	Comments
								Wet Density (pcf)	Dry Density (pcf)	Moisture Content (%)	Percent Comp. (%)		
1	DT	8	the temporary sediment trap dam	subgrade	0.00	117.00	11.00	126.7	116.2	9.1	99.3	P	
2	DT	8	the temporary sediment trap dam	1ft below	0.00	117.00	11.00	123.5	111.7	10.7	95.5	P	
3	DT	8	the temporary sediment trap dam	2ft below	0.00	117.00	11.00	126.2	114.2	10.5	97.6	P	

Test Mode: DT = Direct Transmission BS = Back Scatter

ECS Mid-Atlantic, LLC
108 Ingram Road
Suite 1
Williamsburg, VA 23188
(757) 229-6677

LETTER OF TRANSMITTAL

August 26, 2011	RE: **D.j. Montague Elementary School Parking Lot Cmt**
AES Consulting Engineers, Inc. 5248 Olde Towne Road Suite # 1 Williamsburg, VA 23188	ECS Job # **07:11138** Permits: Location: **5380 Centerville Road** **Williamsburg, VA**
ATTN: Mr. Bruce Abbott	

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

ENCL:

Field Report # 2	08/24/2011	subgrade/bio-retent

COMMONWEALTH OF VIRGINIA
B. SCOTT GRESHAM
No. 037[illegible]
AUG 26 2011
PROFESSIONAL ENGINEER

Scott Gresham, P.E.
Construction Services Manager

John M. Foster

John M. Foster
Project Manager

ECS Mid-Atlantic, LLC
108 Ingram Road
Suite 1
Williamsburg, VA 23188
(757) 229-6677

FIELD REPORT

Project No.	07:11138
Report No.	2
Day & Date	Wednesday 08/24/2011
Weather	85°/ Sunny
On-Site Time	0.75
Lab Time	0.25
Travel Time*	0.50
Total	1.50
Re Obs.Time	0.00

Project	D.j. Montague Elementary School Parking Lot Cmt
Location	Williamsburg, VA
Client	AES Consulting Engineers, Inc. - Bruce Abbott

Remarks **subgrade/bio-retent**

Trip Charges* Tolls/Parking* Mileage* 20

Chargeable Items

Time of	Arrival	Departure
	10:15A	11:00A

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on-site, as requested, to observe the bio-retention pond at the entrance to the school. The undersigned observed the 10 inch pipework to be positioned in accordance with on site approved plans by AES dated 2/2/2011 on sheet CO3. The undersigned further observed the subgrade of the pipework using a 1.75-inch diameter geo-stick. Minimal to no penetrations were observed into the clayey material, indicating a firm and stable subgrade. The pea gravel was observed to be placed in accordance with the aforementioned plans as well as the 4 inch pipework wrapped in filter fabric. The undersigned noted filter fabric along the base of the pond over the pea gravel as well as up the sides of the walls of the pond. Nathan with David A. Nice was informed of the observations made on this day.

By **John M. Foster, — Project Manager** 1300

164436

TRANSMITTAL

Environmental Division

MAR 24 2011

RECEIVED

DATE: **March 24, 2011**

TO: ~~Environmental Division~~ (2)
JCSA (1)
Proffer Administrator(3)
Code Compliance(4)

FROM: Jose Ribeiro, Senior Planner

SUBJECT: SP-0008-2011, D.J. Montague Parking Expansion

ITEMS ATTACHED:
Site Plan
Bio Retention Cell (2)
Stormwater Calculations (2)
Channel Design (2)
Response Letter from Applicant (1,2,3 &4))
JCSA Easement Plat (1)
Water Conservation Standards (1)

Please review and return comments by April 1, 2011

NOTE: This site plan is associated with JCC SUP-0032-2010 (The SUP was approved by the BOS on March 08, 2011. Planning Commission recommended approval of the SUP application on February 02, 2011.) This is the second submittal for this site plan.

Thank you for your review,
José-Ricardo Linhares Ribeiro
JCC Planner

PLEASE UPLOAD YOUR COMMENTS ON CASE TRAK

Plan is approved by the Environmental Division. A Land-Disturbing Permit is required for this project. Siltation agreement, Declaration of Covenants, Inspection maintenance agreement, siltation surety and stormwater facility inspection fees are not required as this is a W-JCC public school project. Registration for a state VSMP general permit for construction activities is required through the Virginia DCR.

0.85Ac. Disturbed; PC Watershed; HUC CODE JL31

04-04-11

RECEIVED
FEB 2011

Environmental Division
FEB 04 2011
RECEIVED

ECS LLC
MID-ATLANTIC

Subsurface Exploration and Geotechnical Engineering Report

DJ Montague Elementary School
Parking Expansion and BMP Facility

ECS Project No. 07:10946

For
Mr. Bruce Abbott
AES Consulting Engineers, Inc.
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188

SP-08-11

December 3, 2010

ECS MID-ATLANTIC, LLC "Setting the Standard for Service"
Geotechnical • Construction Materials • Environmental • Facilities

December 3, 2010

Mr. Bruce Abbott
AES Consulting Engineers, Inc.
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188

ECS Project No. 07:10946

Reference: Subsurface Exploration and Geotechnical Engineering Report
DJ Montague Elementary School
Parking Expansion and BMP Facility
James City County, Virginia

Dear Mr. Abbott,

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 spaces and infiltration facilities. This report has been completed in general in accordance with our proposal No. 07:15398 dated October 13, 2010.

Introduction:

The project site is located along the existing access roads and parking areas north of the existing DJ Montague Elementary School which is located at 5380 Centerville Road, in James City County, Virginia. An untitled and dated site plan, prepared by AES Consulting Engineers, Inc (AES), was provided to ECS. Based on the available drawings, we understand the overall project will include the following aspects relative to our scope of services

- Permeable Pavers – Five (5) locations, totaling 38 parking stalls, to be possibly constructed using a permeable paver system. It is anticipated that the pavement subgrade elevations will be within about 2 feet of existing grades. It is understood that infiltration within the upper two feet of existing soils in these areas is desired for the permeable paver system.
- Infiltration/Bioretention – One bioretention basin with infiltration component and an infiltration trench in the area of the edge of the northern parking lot. It is understood that infiltration within the upper two feet of existing elevations in these areas is desired for the infiltration trench and below 4 feet within the proposed bioretention pond.

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 various infiltration facilities. Our proposed investigation included drilling of 11 handauger borings to explore the subsurface soil and groundwater conditions, perform a site

reconnaissance to observe general topography, and analyzing field data to develop appropriate geotechnical engineering recommendations regarding the planned construction.

Site Conditions

At the time of the field exploration the majority of the proposed permeable paver and infiltration trench areas were open and covered with either grass or crushed stone. The proposed bioretention pond was moderately wooded. The topography of the site generally slopes downward toward the north, south and east with a grade change across the project area of between approximately 1 to 6 feet. The topographic high, EL. 121 mean sea level (msl), is located in the central portion of the site and the topographic low, EL. 115 msl, is located in the southeastern portion of the site (B-10).

Field Exploration Procedures:

10 handauger borings were completed within the proposed permeable paver and infiltration trench areas to a depth of 6 feet below surface elevations. One (1) handauger boring was completed within the approximate center of the proposed bioretention pond. The soil test borings were performed by ECS personnel utilizing handauger equipment. 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. Please refer to the Boring Location Plan provided in Appendix I of this report for further detail regarding boring locations.

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 between approximately 1 to 4 inches of topsoil/mulch or 1 to 2 inches of crushed stone.

All of the soil borings, with the exception of borings B-1, B-7 and B-8, encountered FILL soils to depths of up to 2 feet below existing ground surface (bgs). The FILL soils consisted primarily of crushed stone. Boring locations B-5 and B-6 encountered the deepest FILL that consisted of organic mulch, GRAVEL (GP & GP-GM), Silty SAND (SM), Clayey SAND (SC), and Sandy Lean CLAY (CL).

The natural soils encountered below the topsoil or FILL, consisted of approximately 2 feet of Silty SAND (SM) overlying mainly low permeability, Clayey SAND (SC) and Sandy CLAY (CL & CH) deposits to boring termination depths of 6 or 10 feet bgs.

Perched groundwater was encountered at boring locations B-6 and B-7 at approximately 0 to 3 feet bgs. Please note that due to the near surface fine grained soils encountered at all of the boring locations, a perched water condition is possible and apparent at other areas of the site. 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 Recommendations:

In order to evaluate infiltration potential of the soils encountered, the 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 an 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

The table below summarizes the different Soil Types encountered in each of the soil borings and depth to groundwater, if encountered.

Estimated Infiltration Rates

Boring Location	Approximate Surface Elevation	Soil Type I depth (feet)	Soil Type II Depth (feet)	Soil Type III Depth (feet)	Water Table Depth (feet)
B-1	117.0	0 - 1.17	--	1.17 - 10.0	Below 10 feet
B-2	118.5	0 - 1.42	1.42 - 2.08	2.08 - 6.0	Below 6 feet
B-3	119.0	0 - 1.33	--	1.33 - 6.0	Below 6 feet
B-4	120.0	0 - 2.0	--	2.0 - 6.0	Below 6 feet
B-5	120.0	--	1.92 – 2.17	0 - 1.92 & 2.17 - 6.0	Below 6 feet
B-6	119.0	2.0 – 3.0	--	0 – 2.0 & 3.0 - 6.0	3 feet (Perched)
B-7	118.0	0.83 – 1.5	0 – 0.83	1.5 – 6.0	4 feet (Perched) Standing Water Observed
B-8	118.0	0 - 1.67	--	1.67 – 6.0	Below 6 feet
B-9	118.0	0 – 1.67	1.67 – 2.0	2.0 – 6.0	Below 6 feet
B-10	116.0	0 – 1.25	--	1.25 – 6.0	Below 6 feet
B-11	120.0	0 – 1.67	--	1.67 – 6.0	Below 6 feet

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 (A Group) were encountered to depths of only about 2 feet below the existing ground surfaces. These soils overly C and D Group soils and will likely experience seasonal perched water conditions within the upper 2 feet of the soil profiles observed. Therefore, all of the locations do not appear to be suitable for permeable paver, infiltration trench, and a bioretention pond with infiltration construction.

Subgrade Preparation and Earthwork Operations:

The data developed during this study indicate that the subsoil and groundwater conditions at the site are generally suitable for support of the proposed pavement 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 between 1 and 4 inches with crushed stone depths between 1 and 2 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, crushed stone and associated organic matter. 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.). FILL soils were encountered in soil borings B-5 and B-6 to a depth of approximately 2 feet. If the FILL is determined to be free or organics and deleterious material and is stable during a proofroll, it can remain in place under proposed pavement elements. 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 inspection.

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 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 soils classified as SAND (SM & SC) should be suitable for re-use as Engineered Fill. On-site CLAY should be evaluated by the Geotechnical Engineer through laboratory testing prior to its 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.

Aggregate Base Material: Aggregate Base Material, VDOT Type I, Size 21BA.

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.

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 10 vehicles per day. 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.

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.

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.

Construction Considerations:

Exposure to the environment may weaken the exposed subgrade soils and at the bearing level if the excavations remain open for too long a time. Therefore, the subgrade should be graded to promote drainage and the design stone depths be installed as soon as practical. 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 characteristics. Additional soil borings can be completed at different locations or to deeper depths upon request.

We have appreciated being of service to AES Consulting Engineers, Inc. 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.
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Principal Engineer

Appendix:
I. Boring Location Plan (1)
II. Hand Auger Logs (11)
III. Unified Soil Classification System/ Reference Notes for Boring Logs (2)

Copies: (1) Client via email [babbott@aesva.com]

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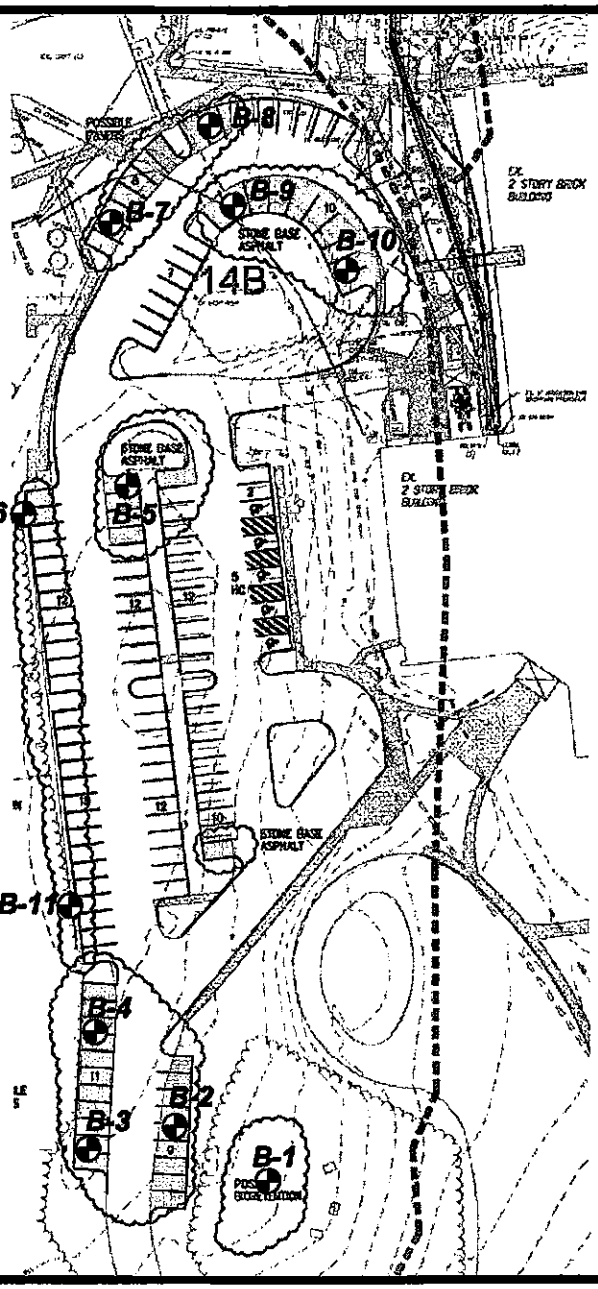
Appendix I

Boring Location Plan



LEGEND

- Approximate Boring Location

SCALE

NTS

SOURCE

AES Consulting Engineers, Inc.

DATED:

N/A

ECS LLC
MID-ATLANTIC

FIGURE 1

BORING LOCATION PLAN
DJ Montague Elementary School
Parking Expansion and BMP
James City County, Virginia

ECS PROJECT NO. 07:10946

Appendix II

Soil Boring Logs

HANDAUGER LOGS

DJ Montague Elementary School
Parking Expansion and BMP
James City County, Virginia
ECS Project No.: 07:10946

DEPTH (FEET)	B-1 DESCRIPTION OF MATERIALS
0 - 0.25	3" Topsoil
0.25 - 1.17	Silty SAND, Tan, Moist (SM)
1.17 – 6.00	Sandy Lean CLAY, Orangish Brown, Moist (CL)
6.00 – 10.00	Sandy Lean CLAY, Reddish Brown With Yellowish Brown Mottles, Moist (CL)
	GROUNDWATER NOT ENCOUNTERED
	END OF BORING AT 10.00 FEET

DEPTH (FEET)	B-2 DESCRIPTION OF MATERIALS
0 – 0.08	[FILL] 1" Crushed Stone
0.08 – 1.42	Silty SAND, Light Brown, Moist (SM)
1.42 – 2.08	Clayey SAND, Orangish Brown, Moist (SC)
2.08 – 4.83	Sandy Lean CLAY, Orangish Brown With Light Gray Mottles, Moist (CL)
4.83 – 6.00	Sandy Fat CLAY, Mottled Red, Light Gray and Orangish Brown, Moist (CH)
	GROUNDWATER NOT ENCOUNTERED
	END OF BORING AT 6.00 FEET

DEPTH (FEET)	B-3 DESCRIPTION OF MATERIALS
0 – 0.17	[FILL] 2" Crushed Stone
0.17 – 1.33	Silty SAND, Light Brown, Moist (SM)
1.33 – 5.17	Sandy Lean CLAY, Orangish Brown With Light Gray Mottles, Moist (CL)
5.17 – 6.00	Sandy Fat CLAY, Mottled Red, Light Gray and Orangish Brown, Moist (CH)
	GROUNDWATER NOT ENCOUNTERED
	END OF BORING AT 6.00 FEET

Note: Soils were classified in general accordance with ASTM D-2488 (Description and Identification of Soils - Visual/Manual Procedures)

HANDAUGER LOGS

DJ Montague Elementary School
Parking Expansion and BMP
James City County, Virginia
ECS Project No.: 07:10946

DEPTH (FEET)	B-4 DESCRIPTION OF MATERIALS
0 – 0.17	[FILL] 2" Crushed Stone
0.17 – 2.00	Silty SAND, Light Brown, Moist (SM)
2.00 – 4.83	Sandy Lean CLAY, Orangish Brown With Light Gray Mottles, Moist (CL)
4.83 – 6.00	Sandy Fat CLAY, Mottled Red, Light Gray and Orangish Brown, Moist (CH)
	GROUNDWATER NOT ENCOUNTERED
	END OF BORING AT 6.00 FEET

DEPTH (FEET)	B-5 DESCRIPTION OF MATERIALS
0 – 0.33	[FILL] 4" Wood Mulch
0.33 – 0.83	[FILL] Silty SAND With Crushed Stone, Light Brown, Moist (SM)
0.83 – 1.17	[FILL] Clayey SAND, Orangish Brown, Moist (SC)
1.17 – 1.83	[FILL]Sandy Lean CLAY, Orangish Brown, Moist (CL)
1.83 – 1.92	[FILL] GRAVEL (GP)
1.92 – 2.17	Clayey SAND, Reddish Brown, Moist (SC)
2.17 – 3.50	Sandy Fat CLAY, Orangish Brown to Yellowish Brown With Light Gray Mottles, Moist (CH)
3.50 – 6.00	Sandy Lean CLAY, Orangish Brown With Light Gray Mottles, Moist (CL)
	GROUNDWATER NOT ENCOUNTERED
	END OF BORING AT 6.00 FEET

DEPTH (FEET)	B-6 DESCRIPTION OF MATERIALS
0 – 1.33	[FILL] Poorly Graded GRAVEL With Silt and Sand, Gray, Moist (GP-GM)
1.33 – 2.00	[FILL] Sandy Lean CLAY, Orangish Brown, Moist (CL)
2.00 – 3.00	Silty SAND, Light Brown, Moist (SM)
3.00 – 6.00	Sandy Fat CLAY, Mottled Red, Light Gray and Orangish Brown, Wet (CH)
	MINOR PERCHED GROUNDWATER ENCOUNTERED AT 3 FEET
	END OF BORING AT 6.00 FEET

Note: Soils were classified in general accordance with ASTM D-2488 (Description and Identification of Soils - Visual/Manual Procedures)

HANDAUGER LOGS

DJ Montague Elementary School
Parking Expansion and BMP
James City County, Virginia
ECS Project No.: 07:10946

DEPTH (FEET)	B-7 DESCRIPTION OF MATERIALS
0 – 0.17	2" Topsoil
0.17 – 0.83	Clayey SAND, Grayish Brown, Saturated (SC)
0.83 – 1.5	Silty Clayey SAND, Light Brown, Saturated (SC-SM)
1.50 – 4.00	Sandy Lean CLAY, Orangish Brown, Wet (CL)
4.00 – 6.00	Sandy Fat CLAY, Mottled, Orangish Brown, Yellow and Red, Wet to Moist (CH)
	PERCHED GROUNDWATER ABOVE 4 FEET STANDING WATER OBSERVED ADJACENT TO BORING LOCATION
	END OF BORING AT 6.00 FEET

DEPTH (FEET)	B-8 DESCRIPTION OF MATERIALS
0 – 0.25	Topsoil
0.25 – 1.67	Silty SAND, Light Brown, Moist (SM)
1.67 – 4.50	Sandy Lean CLAY, Orangish Brown With Light Gray Mottles, Moist (CL)
4.50 – 6.00	Sandy Fat CLAY, Mottled Red, Light Gray and Orangish Brown, Moist (CH)
	GROUNDWATER NOT ENCOUNTERED
	END OF BORING AT 6.00 FEET

DEPTH (FEET)	B-9 DESCRIPTION OF MATERIALS
0 – 0.17	[FILL] 2" Crushed Stone
0.17 – 1.67	Silty SAND, Light Brown, Moist (SM)
1.67 – 2.00	Clayey SAND, Orangish Brown, Moist (SC)
2.00 – 4.17	Sandy Lean CLAY, Orangish Brown With Yellow Mottles, Moist (CL)
4.17 – 6.00	Sandy Fat CLAY, Contains Iron Concretions between 5 and 6 feet, Orangish Brown With Yellow Mottles, Moist (CH)
	GROUNDWATER NOT ENCOUNTERED
	END OF BORING AT 6.00 FEET

Note: Soils were classified in general accordance with ASTM D-2488 (Description and Identification of Soils - Visual/Manual Procedures

HANDAUGER LOGS

DJ Montague Elementary School
Parking Expansion and BMP
James City County, Virginia
ECS Project No.: 07:10946

DEPTH (FEET)	B-10 DESCRIPTION OF MATERIALS
0 – 0.17	[FILL] 2"Crushed Stone
0.17 – 1.25	Silty SAND, Light Brown, Moist (SM)
1.25 – 4.25	Sandy Lean CLAY, Orangish Brown With Light Gray Mottles, Moist (CL)
4.25 – 6.00	Sandy Fat CLAY, Mottled Red, Light Gray and Orangish Brown, Moist (CH)
	GROUNDWATER NOT ENCOUNTERED
	END OF BORING AT 6.00 FEET

DEPTH (FEET)	B-11 DESCRIPTION OF MATERIALS
0 – 0.17	[FILL] 2" Crushed Stone
0.17 – 1.67	Silty SAND, Light Brown, Moist (SM)
1.67 – 4.42	Sandy Lean CLAY, Orangish Brown With Light Gray Mottles, Moist (CL)
4.42 – 6.00	Sandy Fat CLAY, Mottled Red, Light Gray and Orangish Brown, Moist (CH)
	GROUNDWATER NOT ENCOUNTERED
	END OF BORING AT 6.00 FEET

Note: Soils were classified in general accordance with ASTM D-2488 (Description and Identification of Soils - Visual/Manual Procedures

Appendix III

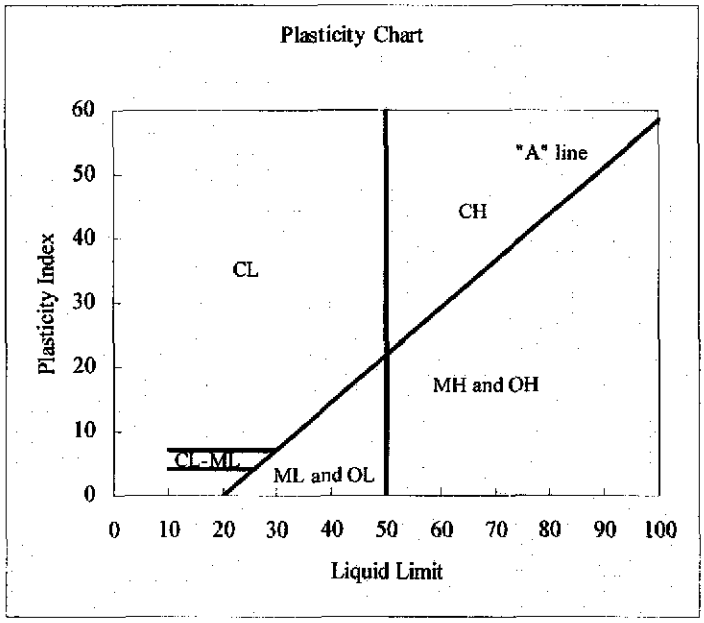
Unified Soil Classification System and Reference Notes for Boring Logs

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)	Clean gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_u = D_{60}/D_{10}$ greater than 4 $C_c = (D_{30})^2/(D_{10} x D_{60})$ between 1 and 3	
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW	
		Gravels with fines (Appreciable amount of fines)	GM[a] d / u	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
			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 $C_c = (D_{30})^2/(D_{10} x D_{60})$ between 1 and 3	
			SP	Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW	
		Sands with fines (Appreciable amount of fines)	SM[a] d / u	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
			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		
			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		

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 12 percent	GM, GC, SM, SC
5 to 12 percent	Borderline cases requiring dual symbols[b]



[a] 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.

[b] 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)

Density		*Relative Properties*	
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		

Particle Size Identification		
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)

Blows/ft	*Consistency*	*Unconfined Comp. Strength Q_p (tsf)*	*Degree of Plasticity*	*Plasticity Index*
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.

TRANSMITTAL

Environmental Division

MAR 24 2011

RECEIVED

DATE: **March 24, 2011**

TO: Environmental Division (2)
JCSA (1)
Proffer Administrator(3)
Code Compliance(4)

FROM: Jose Ribeiro, Senior Planner

SUBJECT: SP-0008-2011, D.J. Montague Parking Expansion

ITEMS ATTACHED:
Site Plan
Bio Retention Cell (2)
Stormwater Calculations (2)
Channel Design (2)
Response Letter from Applicant (1,2,3 &4))
JCSA Easement Plat (1)
Water Conservation Standards (1)

Please review and return comments by April 1, 2011

NOTE: This site plan is associated with JCC SUP-0032-2010 (The SUP was approved by the BOS on March 08, 2011. Planning Commission recommended approval of the SUP application on February 02, 2011.) This is the second submittal for this site plan.

Thank you for your review,
José-Ricardo Linhares Ribeiro
JCC Planner

PLEASE UPLOAD YOUR COMMENTS ON CASE TRAK

Plan is approved by the Environmental Division. A Land-Disturbing Permit is required for this project. Siltation agreement, Declaration of Covenants, Inspection maintenance agreement, siltation surety and stormwater facility inspection fees are not required as this is a W-JCC public school project. Registration for a state VSMP general permit for construction activities is required through the Virginia DCR.

Scott J. Thomas 04-04-11

0.85Ac. disturbed; PC watershed; HUC CODE JL31

Bill ✓ 03/30/204

All comment
has been ~~updated~~.
address.
Thanks Zu

SCOTT, ✓ 4/1/11

APPROVE! LDP RQD.

NO E.I. ITEMS TO DEAL WITH.

BM

AES
CONSULTING ENGINEERS

5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
Phone (757) 253-0040
Fax (757) 220-8994
aesva.com

March 23, 2011

Environmental Division
MAR 24 2011
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MAR 2011
Planning Department

Ms. Terry Costello
Development Management Assistant
Development Management
101-A Mounts Bay Road
P.O. Box 8784
Williamsburg, Virginia 23187-8784

RE: Williamsburg/James City County Schools D.J. Montague E.S Parking Expansion
James City County Number: SP-0008-2011
AES Project No. W10162-00

Dear Ms. Costello:

The following is our responses to your comments, dated with various dates in reference to the above referenced project.

Planning Department Review Comments:
March 2, 2011

1. This Site Plan Amendment has been assigned case number SP-0008-2011. Please include the new Site Plan number on all future submissions and related correspondence.
   Response: The case number has been added to the cover sheet of the drawings and all future correspondence will refer to this assigned number.

2. Please be aware that SUP-0032-2010 that is associated with this case has not yet been approved by the Board of Supervisors.
   Response: Acknowledged. The Board of Supervisors approved the SUP at the March 8, 2011 meeting. A note has been added to the cover sheet in reference to approval.

3. Under parking regulations, the proposed parking number should be the amount that is actually being added. Please add another section stating the total, including the total handicapped and the total bus parking spaces.
   Response: An additional line has been added to the cover sheet indicating the fifty-three (53) additional spaces with three (3) of them being handicapped spaces.

4. On Sheet #5, there was a note stating that there was an existing parking sign at the end of the six spaces that are already existing. Can you explain what this sign is and will it be removed?
   Response: The existing sign has been added to the demolition plan and will be removed during the construction.

5. Please be aware of Condition #3 of the Special Use Permit Conditions for Case No. SUP-0032-2010. It states that "Additional lighting shall be installed in the entrance from the property onto Centerville Road. The specific location and design of the entrance lighting shall be shown on a site plan and approved by the Planning Director. However, if upon presenting an Iso-footcandle diagram of the school's entrance lighting, or other evidence, additional lighting may not be required if it is demonstrated to the satisfaction of the Planning Director that the existing lighting at the school's entrance is adequate."
Response: A field visit has been scheduled to take light level/intensity readings. Our findings will be forth coming in response to the entrance lighting.

6. Please add a note stating that this case is associated with the Board of Supervisors approved case SUP-0032-2010.
Response: Acknowledged. Approval from the March 8, 2011 board meeting has been added as note #32 to the cover sheet.

James City County Fire Department Review Comments:
February 9, 2011

1. Approved as Site Plan only.
Response: No response required.

James City County Engineer Review Comments:
January 7, 2011

1. Approved as Site Plan only.
Response: No response required.

James City County Code Compliance Department Review Comments:
February 9, 2011

1. Code Compliance notes that the designated handicapped parking spaces are not located on the shortest accessible route to the accessible building entrance. The surface slope of the designated HC parking spaces appears to exceed 2%.
Response: After discussion with the Code Compliance office, it was noted that several drainage features prohibited a handicapped space from being placed any closer than designed to meet requirements. This is an existing condition and therefore making any other arrangements is technically not feasible. The design on the submitted plans meets the required 2% or less slopes in both directions.

James City County Environmental Division Review Comments:
February 21, 2011

General:

1. A Land-Disturbing Permit and Siltation Agreement, with surety, are required for this project.
Response: Acknowledged. At the time of the selection of a Contractor a Land Disturbing Permit Application and Siltation Agreement will be prepared and supplied to the Environmental Department.

2. It appears that this project includes stormwater conveyance and/or stormwater management facilities. Completion of a Stormwater Facilities Data Sheet and payment of Stormwater Facilities Inspection Fees, may be applicable prior to issuance of a land-disturbing permit.

Contact the James City County Stormwater Division at (757) 259-1460 or visit the Stormwater Division website at www.jccegov.com for additional information.
Response: Please find attached the Stormwater Facilities Data Sheet.

3. Record Drawing and Construction Certification. The stormwater management/BMP facility and associated stormwater conveyance systems as proposed for this project will require submission, review, and approval of a record drawing (as-built) and construction certification prior to release of the posted bond/surety. Provide notes on the plan accordingly to ensure this activity is adequately coordinated and performed before, during and following construction in accordance with current County guidelines.
Response: AES will be providing record drawings and ECS will be preparing the construction certification.

4. VSMP. It appears disturbed area for the site exceeds 2,500 square feet. Therefore, it is the owner's responsibility to register for coverage under the General Permit for Discharge of Stormwater from Construction Activities, in accordance with current requirements of the Virginia Department of Conservation and Recreation and the Virginia Stormwater Management Program. Visit http://www.dcr.virginia.gov/sw/vsmp.htm or contact the DCR Central Office at 804-371-7330 for additional information. (Note: Evidence of VSMP registration will be required by the County prior to or concurrently with a preconstruction meeting and must be provided prior to issuance of a local land-disturbing permit and start of land-disturbing activities.)
Response: A VSMP permit has already been applied for by the School system.

5. Plan Number. Please reference the assigned County plan number SP-0008-11 on all subsequent submissions.
Response: The case number has been added to the cover sheet of the drawings and all future correspondence will refer to this assigned number.

<u>As a final notation for the Environmental Division:</u>
It was suggested that our design team evaluated the bio-retention pond performance using Modified Rational input hydrographs consistent with the methods identified in the Virginia Stormwater Management Handbook (Chapter 5 – Engineering Calculations).

These re-evaluations were performed with satisfactory results. Documentation of the re-evaluation is provided with this correspondence.

<u>Erosion and Sediment Control:</u>

6. Silt Fence. Notes contained at the bottom of plan sheet 3 indicate that seeding is to be used for permanent stabilization for disturbed areas associated with the installation of the bioretention areas. This being the case, silt fence should be installed around the perimeter of the bio-retention areas to prevent the seed and mulch from entering the basin and germinating as this will create maintenance issues. It may be appropriate to minimize the disturbed area and propose the placement of sod as a suggestion.
Response: Additional silt fence and a note has been added to Partial Plan 1 on sheet 3 to place silt fence around the bio-retention area until the grass has been established.

7. Silt Fence. On plan sheet 3, provide silt fence downstream of the southern parking area, upland of the bio-retention area.
Response: By adding the additional silt fence on note #6, we believe that this will suffice the request.

8. Temporary Sediment Trap. Provide elevations for the trap outlet as shown on plan sheet 3.
Response: The trap outlet elevation is 110.73' and a detail has been added to the plan view.

9. Inlet Protection. Remove the inlet protection shown below the proposed Temporary Sediment Trap presented on plan sheet 3. Drainage to this inlet will be treated by traps and silt fence, and providing inlet protection in this location may prevent treated water from entering this inlet.
Response: Inlet protection has been removed from the plan as requested.

Stormwater Management / Drainage:

10. Dry Swale. For the proposed swale immediately upland of the existing playground, the slope should be revised to be uniform. This would assist with construction and maintenance of the measure and would increase the performance of the measure.
Response: Swale has been revised as requested and a concrete apron has been added to the new DI. Revised calculations are attached.

11. Swale. Provide a safe mode of bypass for the swale located in the front of the existing chiller unit. Site contour information generates concern regarding the potential for unintentionally directing stormwater runoff into the building should increases in runoff overwhelm this structure or should leaf litter partially clog the inlet. Please provide information with the next submittal to indicate how this scenario will be avoided.
Response: The drainage area to the inlet in question is 0.87 acres with a C-value of 0.60 and a time of concentration of 5 minutes when calculating these values into the Hydraflow results of a 100-year storm volume of 1,564 cubic feet. Based on the existing ground and proposed grading for the area surrounding the inlet, it can be shown that if the inlet is completely clogged then the water surface will reach an elevation of 115.70. The building finished floor elevation is 115.69 which would mean that the building could flood by 0.01' in this scenario. An additional drop inlet has been added to plan adjacent to the existing drop inlet to increase the intake capacity in this location.

James City Service Authority Review Comments:
February 22, 2011

General:

1. The Applicant shall provide a recorded easement plat of the proposed JCSA Utility Easements. JCSA is to receive a copy of the recorded plat before approval of the construction plans is given.
Response: The easement plat has been sent to the school system's Attorney for recording. Upon recording a copy of recording receipt will be forwarded to your office and after the Court House has recorded the plat, a copy of the plat will be forwarded also.

Sheets 4 & 5:

1. Show the edge of the JCSA easement at the back edge of the water meter (see JCSA detail W-13.0 for location). Only show the easement "bump out" to be 10 feet on each side of the water service line from the water main to the water meter. The PIV, which is privately owned, should not be in the JCSA easement. An added result of shortening this portion of the easement is the trees will be out of the JCSA easement.
Response: The easement has been revised as requested.

2. Add the following note: "Easements denoted as "JCSA Utility Easements" are for the exclusive use of the James City Service Authority and the property owner. Other utility service providers desiring to use these easements with the exception of perpendicular utility crossings must obtain authorization for access and use from JCSA and the property owner. Additionally, JCSA shall not be held responsible for any damage to improvements within this easement, from any cause."
Response: A note has been added to each sheet as requested.

Plat:

1. Adjust easement per Sheet 4 comment note #1.
Response: The easement has been revised as requested.

2. Add the following notes to each sheet of the plats:
   a. "Easements denoted as "JCSA Utility Easements" are for the exclusive use of the James City Service Authority and the property owner. Other utility service providers desiring to use these easements with the exception of perpendicular utility crossings must obtain authorization for access and use from JCSA and the property owner. Additionally, JCSA shall not be held responsible for any damage to improvements within this easement, from any cause."
   Response: A note has been added to plat as requested.

   b. "Any existing unused wells shall be abandoned in accordance with State Private Well Regulations and James City County Code."
   Response: A note has been added to plat as requested.

Water Conservation Agreement:

1. Revise item 3 to account for the square footage for the school site. The 500 SF listed the amount for another project and may not apply at the school. James City Service Authority (JCSA) shall approve the WCA prior to final Site Plan approval.
Response: The Water Conservation Agreement has been revised to include the entire site.

James City County Landscape Planner Review Comments:
February 4, 2011

1. I have reviewed the landscape plan for SP-0008-2011, DJ Montague parking expansion and have found that the plan complies with all James City County landscape ordinance requirements and is approved as submitted.
Response: No comment required.

James City County Proffer Department Review Comments:
February 7, 2011

1. Please refer to SUP-0032-2010 D.J. Montague E.S. parking lot expansion (under consideration at this time) for conditions associated with this case.
Response: The SUP was approved on March 8, 2011 by The Board of Supervisors and has been noted on the cover sheet under General Notes.

2. The project must comply with all SUP conditions (once approved). Please take note of the following time sensitive condition:

Commencement of Construction: If construction has not commenced on this project within thirty-six (36) months from the issuance of a special use permit, the special use permit shall become void.
Response: We acknowledge this condition.

3. Once the SUP is approved, please reference the case on the cover sheet.
Response: A note has been placed on the cover sheet to reflect the approval of the SUP.

Virginia Department of Transportation Review Comments:
March 1, 2011

1. The District has completed its review of the subject site plan and there appear to be no impacts to the VDOT right of way.
Response: No comment required.

I appreciate the time spent by the various review agencies in the review and guidance for this project. If anyone has any questions in reference to this project please do not hesitate to call me at my office at 757-253-0040.

Sincerely,

AES Consulting Engineers

L. Bruce Abbott
Project Manager
bruce.abbott@aesva.com

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