



Stormwater Division

MEMORANDUM

DATE: July 28, 2014
TO: Michael J. Gillis, Virginia Correctional Enterprises Document Management Services
FROM: Jacob Smith, Stormwater Intern
PO: 110426
RE: Files Approved for Scanning

NAME PDF/SCANNED FILE:		JCC FIRE ADMINISTRATION BUILDING	
BMP ID OR GEN		OWNER NAME:	
FILE NUMBER:	MC070		JCC
PIN:	4721500001	SITE ADDRESS:	N/A
		LEGAL DESCRIPTION:	N/A

MAINTENANCE AGREEMENT IN FILE:	N/A	BOOK/PAGE OR DOCUMENT NO.:	N/A	OTHER DESCRIPTION:	N/A
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BOX NO.:	2	COMMENTS:	TRANSMITTAL
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Environmental Division

SEP 19 2012

James City County, Virginia
Stormwater Division

RECEIVED

Stormwater Facilities - BMP and Conveyance Systems
Record Drawing and Construction Certification Forms

Note: In accordance with the requirements of the Chesapeake Bay Preservation Ordinance, Chapter 23, Section 23-10(4), BMPs shall be designed and constructed in accordance with the manual entitled James City County Guidelines for Design and Construction of Stormwater Management BMPs. The Subdivision Ordinance, Chapter 19-62, the Zoning Ordinance, Chapter 24-159, and approved construction 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, written construction certification is required by a Professional Engineer who inspected the structure during its construction. Currently there are over 20 water quality type BMPs accepted by the County.

Section 1 - Site Information:

Project Name: FIRE ADMINISTRATION Building

Structure/BMP Name: MC-070

Project Location: _____

BMP Location: _____

County Plan No.: SP - 068 - 2010

Project Type:	<input type="checkbox"/> Residential	<input type="checkbox"/> Business	Tax Map/Parcel No.: <u>4721500001</u>
	<input type="checkbox"/> Commercial	<input type="checkbox"/> Office	BMP ID Code (if known): <u>MC-070</u>
	<input type="checkbox"/> Institutional	<input type="checkbox"/> Industrial	Zoning District: <u>Berkeley</u>
	<input checked="" type="checkbox"/> Public	<input type="checkbox"/> Roadway	Land Use: <u>Public Land</u>
	<input type="checkbox"/> Other _____		Site Area (sf or acres): <u>4.023</u>

Brief Description of Stormwater Management/BMP Facility: _____

Nearest Visible Landmark to SWM/BMP Facility: _____

Nearest Vertical Ground Control (if known):

JCC Geodetic Ground Control USGS Temporary Arbitrary Other

Station Number or Name: 319

Datum or Reference Elevation: 101.31

Control Description: JCC CONTROL MONUMENT

Control Location from Subject Facility: 2000' ENE @ Rt 5 + Rt. 199

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: JAN 2012
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 CONSULTING ENGINEERS
Date of Completion for SWM/BMP Facility: 18 JULY 2012
Date of Record Drawing/Construction Certification Submittal: 18 SEPT 2012

(Note: Record Drawing and Construction Certifications are required within thirty (30) days of the completion of construction of a Stormwater Facility – BMP or Conveyance system. Record Drawings and Construction Certifications must be reviewed and approved by the James City County Stormwater Division prior to final inspection, acceptance and surety release.)

Section 3 - Owner / Designer / Contractor Information:

Owner/Developer: *(Note: Site Owner or Applicant responsible for development of the project.)*
Name: JAMES CITY COUNTY GENERAL SERVICES
Mailing Address: 101-F MOUNTS BAY, RA. WMBH, VA 23185
Business Phone: 757-259-4081 Fax: _____
Contact Person: SHAWN GORDON Title: CAPITAL PJT COORD.

Design Professional: *(Note: Professional Engineer or Certified Land Surveyor responsible for the design and preparation of plans and specifications for the Stormwater facilities.)*
Firm Name: AES CONSULTING ENGINEERS
Mailing Address: 5248 OLDE TOWN RD, SUITE 1 WILLIAMSBURG VA 23188
Business Phone: 757-253-0040 Fax: _____
Responsible Plan Preparer: VAN MARC BENNETT
Title: P.E.
Plan Name: JCC FIRE ADMIN BLDG.
Firm's Project No. 9801-E-31 Plan Date: 8/5/10
Sheet No. Applicable to SWM/BMP Facility: 41516171

Stormwater Facility Contractor: *(Note: Site Work Contractor directly responsible for construction of the Stormwater facilities.)*
Name: DAVID A. NICE BUILDERS, INC
Mailing Address: 4571 WARECKEEK RD WMBH, VA 23188
Business Phone: 757 566 3032 Fax: 757 566 4686
Contact Person: NATHAN SKALAK
Site Foreman/Supervisor: WILLIAM APPERSON
Specialty Subcontractors & Purpose (for BMP Construction Only): _____

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

Environmental Division

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Fax: _____
Contact Person: _____
Site Foreman/Supervisor: _____
Specialty Subcontractors and 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: _____
Mailing Address: _____

Business Phone: _____
Fax: _____
Name: _____
Title: _____
Signature: _____
Date: _____

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 to the provisions of the approved design plan, specifications design, and stormwater management plan, except as specifically noted.

(Seal)

Virginia Registered Professional Engineer or Certified Land Surveyor

Construction Certification

Firm Name: ECS Mid-Atlantic
Mailing Address: 108 Ingram Road Suite 1
Williamsburg Virginia 23188
Business Phone: 757-229-6677
Fax: 757-229-9978
Name: Scott Gresham, P.E.
Title: Construction Services Manager
Signature: [Signature]
Date: 11/15/13

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 plan, specifications, and stormwater management plan, except as specifically noted.



(Seal)

Virginia Registered Professional Engineer

Section 4 - Professional Certifications:

Certifying Professionals: *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 stormwater facilities for the project including all BMP and conveyance systems. A Registered Professional Engineer is responsible for the inspection, monitoring and certification of all stormwater facilities – BMP and conveyance systems during their construction.*

Record Drawing and Construction Certifications for Stormwater Facilities - BMP and Conveyance Systems

Record Drawing Certification

Firm Name: Sebert Surveying
Mailing Address: 173 Barlow Road
Williamsburg, VA 23188
Business Phone: 757-345-0931
Fax: 757-345-0931

Name: A. D. Sebert
Title: Owner
Signature: *A. D. Sebert*
Date: 9/17/2012

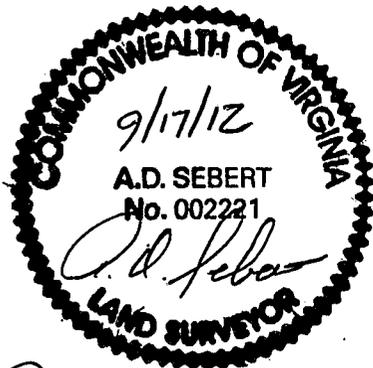
I hereby certify to the best of my knowledge and belief that this record drawing represents the actual condition of the Stormwater Facilities. The facilities appear to conform to the provisions of the approved construction plans and specifications except as specifically noted.

Construction Certification

Firm Name: _____
Mailing Address: _____
Business Phone: _____
Fax: _____

Name: _____
Title: _____
Signature: _____
Date: _____

I hereby certify to the best of my knowledge and belief that these Stormwater Facilities were monitored and constructed in accordance with the provisions of the approved construction plans and specifications except as specifically noted.



A. D. Sebert (Seal)
Virginia Registered Professional Engineer
or Certified Land Surveyor

Virginia Registered
Professional Engineer (Seal)

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

- Preconstruction Meeting - Provides an opportunity to review stormwater facilities construction, maintenance and operation plans, and address any questions regarding construction and/or monitoring of the structure. The certifying professionals, geotechnical engineer, Owner/Applicant, Contractor and County representative(s) are required to attend the preconstruction meeting. Advance notice to the Stormwater Division is required. Usually, this requirement can be met simultaneously with Erosion and Sediment Control preconstruction meeting held for the project.
- A fully completed *Stormwater Facilities – BMP and Conveyance Systems, 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 stormwater facilities including all BMPs and conveyance systems.
- Construction Certification. Construction of Stormwater 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 construction plans and specifications, and standard accepted construction practice and shall submit a written certification and/or drawings to the Stormwater Division as required. Soil and compaction test reports, concrete test reports, inspection reports, logs and other required construction material or installation documentation shall be required by the Stormwater Division to substantiate the certification. 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 with notification to the Stormwater Division.
- Record Drawing and Construction Certifications are required within **thirty (30) days** of the completion of any Stormwater Facility - BMP or conveyance system. Submittals must be reviewed and accepted by James City County Stormwater Division prior to final inspection, acceptance, surety release or issuance of a Certificate of Occupancy.

Dual Purpose Facilities - Completion of construction also includes any interim stage for Stormwater BMP facilities which serve a dual purpose as temporary sediment basins during construction and as permanent stormwater BMP facilities following completion of development and stabilization. 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 Stormwater 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 Stormwater 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 facilities construction plan including applicable plan views, profiles, sections, details, maintenance plans, etc. as related to the subject Stormwater 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 reproducible.
- 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 surety or a Certificate of Occupancy, 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 Stormwater 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 Stormwater Division staff at the time of final submission.

**STORMWATER FACILITY - BMP AND CONVEYANCE SYSTEM
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.)

- ✓ 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.
- ✓ 2. Elevations to the nearest 0.1' unless higher accuracy is needed to show positive drainage.
- ✓ 3. All plan sheets labeled with "RECORD DRAWING" in large text in lower right hand corner. Include approved County Plan Number and BMP ID Code if known.
- ✓ 4. All plan sheet revision blocks modified to indicate date and record drawing status.
- ✓ 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.)

- ✓ 1. All requirements of Section I (Methods and Presentation) apply to this section.
- ✓ 2. Plan Views: Show general location, arrangement and dimensions. Location and alignment shall generally match approved design plans.
- N/A 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.
- N/A 4. Top widths, berm widths and embankment side slopes.
- ✓ 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 Stormwater 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.
8. Elevation of the principal spillway crest or outlet crest of the structure.
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.
10. Dimensions, locations and elevations of outlet orifices, weirs, slots and drains.
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.**
14. Elevation of the principal spillway barrel (outlet pipe) inlet and outlet invert.
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.
- N/A 17. BMP interior and periphery landscaping zones conform with arrangements and requirements of the approved design plan.
18. Maintenance plan taken from approved design plan transposed onto record drawing set.
- N/A 19. Fencing location and type, if applicable to facility.
20. BMP vicinity properly cleaned of stockpiles and construction debris.
21. No visual signs of erosion or channel degradation immediately downstream of facility.
22. Any other information formally requested by the Stormwater Division specific to the constructed Stormwater BMP facility.

**STORMWATER FACILITY - BMP AND CONVEYANCE SYSTEM
RECORD DRAWING CHECKLIST**

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

III. Group A - Wet Ponds (Includes A-1 Small Wet Ponds; A-2 Wet Ponds; A-3 Wet Ext Det Ponds.)

- A1. All requirements of Section II, Minimum Standards, apply to Group A facilities.
- A2. Principal spillway consists of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.
- A3. Sediment forebays or pretreatment devices provided at inlets to pond. Generally 4 to 6 ft. deep.
- A4. Access for maintenance and equipment is provided to the forebay(s). Access corridors are at least 12 ft. wide, have a maximum slope of 15 percent and are adequately stabilized to withstand heavy equipment or vehicle use.
- A5. Adequate fixed vertical sediment depth markers installed in the forebay(s) for future sediment monitoring purposes.
- A6. Pond liner (if required) provided. Either clay liners, polyliners, bentonite liners or use of chemical soil additives based on requirements of the approved plan.
- A7. Minimum 6 percent slope safety bench extending a minimum of 15 feet outward from normal pool edge and/or an aquatic bench extending a minimum of 10 feet inward from the normal shoreline with a maximum depth of 12 inches below the normal pool elevation, if applicable, per the approved design plans. (Note: Safety benches may be waived if pond side slopes are no steeper than 4H:1V).
- A8. No trees are present within a zone 15 feet around the embankment toe and 25 feet from the principal spillway structure.
- A9. Wet permanent pool, typically 3 to 6 feet deep, is provided and maintains level within facility.
- A10. Low flow orifice has a non-clogging mechanism.
- A11. A pond drain pipe with valve was provided.
- A12. Pond side slopes are not steeper than 3H:1V, unless approved plan allowed for steeper slope.
- A13. End walls above barrels (outlet pipe) greater than 48 inch in diameter are fenced to prevent a fall hazard.

**STORMWATER FACILITY - BMP AND CONVEYANCE SYSTEM
RECORD DRAWING CHECKLIST**

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

IV. Group B – Wetlands (Includes B-1 Shallow Marsh; B-2 Ext Det Shallow Wetlands; B-3 Pond Wetland System and B-4 Pocket Wetland)

- B1. Same requirements as Group A Wet Ponds.
- B2. Minimum 2:1 length to width flow path provided across the facility.
- B3. Micropool provided at or around outlet from BMP (generally 3 to 6 ft. deep).
- B4. Wetland type landscaping provided in accordance with approved plan. Includes correct pondscaping zones, plant species, planting arrangements, wetland beds, etc. Wetland plants include 5 to 7 emergent wetland species. Individual plants at 18 inches on center in clumps.
- B5. Adequate wetland buffer provided (Typically 25 ft. outward from maximum design water surface elevation and 15 ft. setback to structures).
- B6. No more than one-half (1/2) of the wetland surface area is planted.
- B7. Topsoil or wetland mulch provided to support vigorous growth of wetland plants.
- B8. Planting zones staked or flagged in field and locations subsequently established by appropriate field surveying methods for record drawing presentation.

**STORMWATER FACILITY - BMP AND CONVEYANCE SYSTEM
RECORD DRAWING CHECKLIST**

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

V. Group C - Infiltration Practices *(Includes C-1 Infiltration Trench; C-2 Infiltration Trench;
C-3 Infiltration Basin; and C-4 Infiltration Basin)*

- C1. All requirements of Section II, Minimum Standards, apply to Group C facilities as applicable.
- C2. Facility is not located on fill slopes or on natural ground in excess of six (6) percent.
- C3. Pretreatment devices provided prior to entry into the infiltration facility. Acceptable pretreatment devices include sediment forebays, sediment basins, sediment traps, sump pits or inlets, grass channels, plunge pools or other acceptable measures.
- C4. Three (3) or more of the following pretreatment devices provided to protect long term integrity of structure: grass channel; grass filter strip; bottom sand layer; upper filter fabric layer; use of washed bank run gravel aggregate.
- C5. Sides of infiltration practice lined with filter fabric.
- C6. 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.
- C7. Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility.
- C8. Minimum one hundred (100) foot separation horizontally from any known water supply well and minimum one hundred (100) foot separation upslope from any building.
- C9. Minimum twenty-five (25) foot separation down gradient from any structure.
- C10. Stormwater outfalls provided for overflow associated with larger design storms.
- C11. No visual signs of erosion or channel degradation immediately downstream of facility.
- C12. Facility does not currently cause any apparent surface or subsurface water problems to downgrade properties.
- C13. Observation well provided.
- C14. Adequate, direct access provided to the facility for future maintenance, operation and inspection.

**STORMWATER FACILITY - BMP AND CONVEYANCE SYSTEM
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)

- D1. All requirements of Section II, Minimum Standards, apply to Group D facilities.
- D2. Sediment pretreatment devices provided.
- 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.
- 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.
- 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.
- D6. No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed .
- D7. Filtering system is off-line from storm drainage conveyance system.
- D8. Overflow outlet has adequate erosion protection.
- D9. Deflector, diversion, flow splitter or regulator structure provided to divert the water quality volume to the filtering structure.
- D10. Minimum four (4) inch perforated underdrain provided in a clean aggregate envelope layer beneath the facility.
- 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.
- D12. Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility.
- D13. No visual signs of erosion or channel degradation immediately downstream of facility.
- D14. Adequate, direct access provided to the pretreatment area and/or filter bed for future maintenance.

**STORMWATER FACILITY - BMP AND CONVEYANCE SYSTEM
AS-BUILT PLAN CHECKLIST**

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

VII. Group E - Open Channel Systems (Includes E-1 Wet Swales (Check Dams); E-2 Dry Swales; and E-3 Biofilters)

- E1. All requirements of Section II, Minimum Standards, apply to Group E facilities as applicable.
- E2. Open channel system has constructed longitudinal slope of less than four (4) percent.
- E3. No visual signs of erosion in the open channel system's soil and/or vegetative cover.
- E4. Open channel side slopes are no steeper than 2H:1V at any location. Preferred channel sideslope is 3H:1V or flatter.
- E5. No visual signs of ponding are present at any location in the open channel system, except at rock check dam locations for E-1 systems (Wet Swales).
- E6. For E-2 BMPs (Dry Swales), an underdrain system was provided.
- E7. Treated timber or rock check dams provided as pretreatment devices for the open channel system.
- E8. Gravel diaphragm provided in areas where lateral sheet flow from impervious surfaces are directly connected to the open channel system.
- E9. Grass cover/stabilization in the open channel system appears adaptable to the specific soils and hydric conditions for the site and along the channel system.
- E10. Open channel system areas with grass covers higher than four (4) to six (6) inches were properly mowed.
- E11. 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.
- E12. No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed and no adverse affects to the function of the facility are anticipated.
- E13. For E-3 BMPs (Biofilters), the bottom width is six (6) feet maximum at any location.
- E14. For E-3 BMPs (Biofilters), sideslopes are 3H:1V maximum at any location.
- E15. For E-3 BMPs (Biofilters), the constructed channel slope is less than or equal to three (3) percent at any location.
- E16. For E-3 BMPs (Biofilters), the constructed grass channel is approximately equivalent to the constructed roadway length.

**STORMWATER FACILITY - BMP AND CONVEYANCE SYSTEM
RECORD DRAWING CHECKLIST**

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

VIII. Group F - Extended Dry Detention (Includes F-1 Timber Walls; and F-2 Dry Extended Detention with Forebay)

- ___ F1. All requirements of Section II, Minimum Standards, apply to Group F facilities.
- ___ F2. Basin bottom has positive slope and drainage from all basin inflow points to the riser (or outflow) location.
- ___ F3. Timber wall BMP used in intermittent stream only. (ie. Prohibited in perennial streams.)
- ___ F4. Forebay provided approximately 20 ft. upstream of the facility. Forebays generally 4 to 6 feet in depth.
- ___ F5. A reverse slope pipe, vertical stand pipe or mini-barrel and riser was provided to prevent clogging.
- ___ F6. Principal spillway and outlet barrel provided consisting of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.
- ___ F7. Mini-barrel and riser, if used, contains a removable trash rack to reduce clogging.
- ___ F8. Low flow orifice, if used, has a minimum diameter of three (3) inches or two (2) inches if internal orifice control was utilized and a small, cage type external trash rack.
- ___ F9. Timbers properly reinforced or concrete footing provided if soil conditions were prohibitive.
- ___ F10. Timber wall cross members extended to a minimum depth of two (2) feet below ground elevation.
- ___ F11. Protection against erosion and scour from the low flow orifice and weir-flow trajectory provided.
- ___ F12. Stilling basin or standard outlet protection provided at principal spillway outlet.
- ___ F13. Adequate, direct access provided to the facility. Access corridor to facility is at least ten (10) feet wide, slope is less than twenty (20) percent and appropriate stabilization provided for equipment and vehicle use. Access extends to forebay, standpipe and timber wall, as applicable.
- ___ F14. No visual signs of undercutting of timber walls or clogging of the low orifice were present.
- ___ F15. No visual signs of erosion or channel degradation immediately downstream of facility.
- ___ F16. No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed and no adverse affects to the function of the facility are anticipated.

**STORMWATER FACILITY - BMP AND CONVEYANCE SYSTEM
RECORD DRAWING CHECKLIST**

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

IX. Group G - Open Spaces (Includes All Open Space Types G-1; G-2; and G-3)

- G1. All requirements of Section II, Minimum Standards, apply to Group G facilities as applicable.
- G2. Constructed impervious areas appear to conform with locations indicated on the approved plan and appear less than sixty (60) percent impervious in accordance with the requirements of the James City County Chesapeake Bay Preservation Ordinance.
- G3. Dedicated open space areas are in undisturbed common areas, conservation easements or are protected by other enforceable instruments that ensures perpetual protection.
- G4. Provisions included to clearly specify how the natural vegetated areas utilized as dedicated open space will be managed and field identified (marked).
- G5. Adequate protection measures were implemented during construction to protect the defined dedicated open space areas.
- G6. Dedicated open space areas were not disturbed during construction (ie. cleared, grubbed or graded).

**STORMWATER FACILITY - BMP AND CONVEYANCE SYSTEM
RECORD DRAWING CHECKLIST**

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

X. Storm Drainage Systems, closed and open

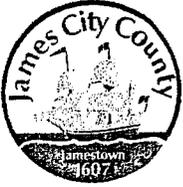
(Includes all stormwater drainage conveyance systems such as onsite or offsite storm drains, open channels, inlets, manholes, junctions, outlet protections, deflectors, etc. The intent of this portion of the certification is to ensure the drainage conveyance facilities are constructed in accordance with the construction plans and specifications so that they convey the design flow levels and do not require excessive maintenance.)

- ___ SD1. All requirements of Section II, Minimum Standards, apply to Storm Conveyance systems.
- ___ SD2. Horizontal location of all pipes, structures and channels relative to the approved plan.
- ___ SD3. Type, top elevation and invert elevation of all closed system access structures (inlets, manholes, etc.).
- ___ SD4. Material type, size or diameter, class, invert elevations, lengths and slopes for all closed pipe segments.
- ___ SD5. Channel cross-section and invert elevations at 100 foot intervals. Channel liners as specified on the construction plans.
- ___ SD6. 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.)

- ___ O1. All requirements of Section II, Minimum Standards, apply to this section.
- ___ O2. Certification criteria to be determined on a case-by-case basis by the Stormwater Division specific to the proposed SWM/BMP facility.



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

Project Name: FIRE ADMINISTRATION BUILDING
 County Plan No. (List any amendments): SP-068-210
 Stormwater Management Facility Type: LPO - BMP
 BMP Phase #: I II III

Information Package Submittal Date: 8/20/2012
 Completeness Check:
 Record Drawing Date/By: 8/29/2012 A.D. SEBERT
 Construction Certification Date/By: 11/15/12 Scott Gresham
 RD/CC Standard Forms (Ensure that all forms for the BMP type are included)
 Insp/Maint Agreement # / Date: NOT REQUIRED
 BMP Maintenance Plan Location: _____
 Special Considerations: _____

Standard E&SC Notes on Approved Plan Requiring RD/CC or County comment in plan review
 Location (sheet #): _____

County BMP ID Code #: MC-070

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: 9/7/2012
 Record Drawing (RD) Review Date: 9/7/2012
 Construction Certification (CC) Review Date: 9/7/2012

Actions:
 No comments.
 Comments. Letter Forwarded. Date: _____
 Record Drawing (RD)
 Construction Certification (CC)
 Construction-Related (CR)
 Site Issues (SI)
 Other : _____

Resubmittal (# and date): _____
 Re-inspection (if necessary): _____
 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: Scott Gresham Date: _____
 Chief Engineer: _____ Date: _____

*** See separate checklist, if needed.

check Mannings
(n)

DRAINAGE CALCULATIONS

FOR

**JAMES CITY COUNTY
FIRE ADMINISTRATION BUILDING**

Environmental Division

AUG 11 2010

RECEIVED

SITE:

James City County

SUBMITTED TO:

Environmental Division
James City County

Prepared By:

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

August 5, 2010

AES Project No. 9801-E-31

9801-E-31.drmcalcs.doc

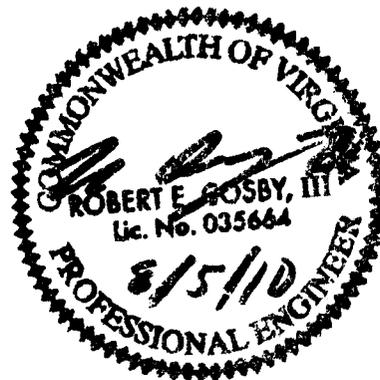


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- II EXISTING SITE CONDITIONS
- III EROSION AND SEDIMENT CONTROL
- IV PROPOSED STORMDRAIN SYSTEM AND BEST MANAGEMENT PRACTICE

APPENDICES

- APPENDIX A TEMPORARY SEDIMENT TRAP
- APPENDIX B ADEQUATE CAPACITY
- APPENDIX C BMP FEATURE
- APPENDIX D SOILS REPORT

I INTRODUCTION

This project, known as Fire Administration Building, will retrofit the existing Law Enforcement Center by providing 2 minor additions, and changes to the parking lot to accommodate 80 parking spaces on site.

II EXISTING SITE CONDITIONS

The majority of the disturbed area is the existing Law Enforcement Center and associated impervious cover. The front of the site along Jamestown Road consists of 70' of existing wooded buffer. Site currently drains overland into an existing 24" culvert under the exit from the adjacent Fire Station. The drainage then flows overland through a grassy swale area to a 24" RCP/18" HDPE culvert under the entrance of the Fire Station.

III EROSION AND SEDIMENT CONTROL

The majority of the clearing, grading, and improvements occur upstream of the planned Sediment Forebay. Therefore for during initial construction the Sediment Forebay will be overexcavated and utilized as a Sediment Trap serving the 2.6 acre drainage area. As this Trap has a 24" outfall control pipe the outfall structure for the Sediment Forebay will be constructed and modified to operate as a Trap during Construction. This modification includes a deeper and larger wet pool to elevation 72.0. The 6" orifice has a perforated section of pipe above the elevation of the "wet" storage. The 3' weir is blocked with a temporary timbers to hold the 67 CY per acre in a "dry" storage volume. Any additional runoff will overtop the facility and be directed into the downstream 24" pipe and existing overland flow system.

IV PROPOSED STORMDRAIN SYSTEM AND BEST MANAGEMENT PRACTICE

The redevelopment of this site will increase the impervious cover of the proposed site while providing additional parking for the Fire Administration Building. Stormwater from this site will be reduced and slowed through use of a Dry Swale with underdrain which collects the majority of the proposed pavement. In addition a Sediment Forebay is being added with a 6" slow release orifice on the Fire Administration portion of the site. The runoff is then directed into a planned Extended Detention Facility located in front of the existing fire house which is controlled with a Drop Inlet with a 3" orifice to reduce the peak flow. This system of infiltration through the Dry Swale and storage within the Extended Detention Facility reduce the peak flow rate, provide storage and infiltration of Volume, and clean the stormwater runoff in accordance with James City County, Virginia, and LEED requirements.

The Dry Swale is a 220 foot long swale at 1.0% slope with 2' bottom width and 3:1 side slopes. Based on the infiltration rates of the surrounding soil an engineered media with under drain is provided along this length to provide adequate infiltration and treatment of the runoff. This Dry Swale has 1' high

timber check dams every 80 feet to slow the runoff, allow ponding, and infiltration in the engineered soil media.

The outflow from the Dry Swale is a 12" pipe under a sidewalk and an overland channel to the Sediment Forebay. The underdrain flows to the Sediment Forebay.

The remainder of the site flows overland into an existing swale and eventually the Sediment Forebay. This is unchanged from the existing condition. The existing swale parallel to the fire station exit drive is upgraded and collects the flow from the upstream Dry Swale in addition to the current flow from the Fire Station and existing parking lot drive aisle. Computations are provided showing the adequacy of this manmade channel in the Appendix in accordance with MS-19.

The Sediment Forebay of the BMP has a capacity of 0.25" per acre of drainage area. This volume is slowly released through a 6" orifice at elevation 74.5. Larger Storm Events flow across a 3' Weir Wall into the existing 24" pipe. To reduce clogging potential of this low flow orifice an 18" wet micro pool is provided. The orifice pipe collects water from 6" below the water surface as well as through a vertical 24" long perforated pipe to minimize debris entering the orifice and downstream BMP.

Extended Detention Facility utilizes the existing drainage swale which has been enlarged to provide additional storage. A VDOT DI-7 is installed on the existing 24" pipe end with a 6" low flow pipe. This pipe is reduced to a 3" orifice internal to the structure to provide control of the runoff. The BMP is sized for 1" per impervious acre of upstream drainage area to be released through a minimum sized 3" orifice. This facility provides adequate storage to reduce the 2 and 10 year peak flow rates. Hydroflow 2007 is utilized for the design of the Sediment Forebay and Extended Detention Facility. As both facilities have a control structure they are modeled as a series of interconnected facilities. It is noted during design that the 24" pipe has been altered to an 18" HDPE pipe at the outfall. To account for this the outfall pipe is designed as the 18" pipe to confirm that the flow is reduced to below the outfall condition of the pipe.

APPENDIX A

TEMPORARY SEDIMENT TRAP

STORAGE ELEVATIONS CURVE "WET" & "DRY" STORAGE



Project: Fire Administration Building
 Project No.: 9801-E-31
 Subject: Sediment Trap Design
 Date: 8/5/2010
 Calculated By: REC

Drainage Area to Sediment Trap = 2.60 Acres

Required Wet Storage = 67 cy/acre * (Drainage Area) = 174 cubic yards, or
 4,703 cubic feet

Required Dry Storage = 67 cy/acre * (Drainage Area) = 174 cubic yards, or
 4,703 cubic feet

Determine Volume of Sediment Trap by Contour:

<u>Elevation</u>	<u>Depth</u>	<u>Area (sq. ft.)</u>	<u>Volume (cu. ft.)</u>	<u>Volume (cu. yd.)</u>	<u>Sum Volume (cu. ft.)</u>	<u>Sum Volume (cu. yd.)</u>
<u>72</u>	0	<u>448</u>	0	0	0	0
<u>73</u>	1	<u>692</u>	570	21	570	21
<u>74</u>	1	<u>974</u>	833	31	1403	52
<u>75</u>	1	<u>1488</u>	1231	46	2634	98
<u>76</u>	1	<u>2180</u>	1834	68	4468	165
<u>77</u>	1	<u>2965</u>	2572.5	95	7041	261
<u>78</u>	1	<u>5666</u>	4315.5	160	11356	421

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

Elevation of Wet Storage Volume = 76.09

Elevation of Dry Storage Volume = 77.55

Elevation of accumulated sediment when sediment removed is required (1/2 wet storage volume) = 74.77

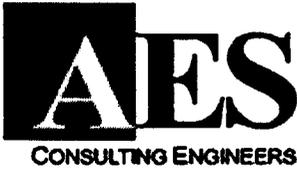
Top Width of Embankment (H_o = 1.5 ft.) = MODIFIED

Note: Existing access provides the embankment, existing 24" pipe provides outflow. Modified Structure is installed to provide "Wet" and "Dry" storage. Release of "Dry" storage is through a perforated pipe similar to a Sediment Basin.

APPENDIX B

ADEQUATE CAPACITY

VELOCITY AND DEPTH ANALYSIS FOR PROPOSED DITCHES



Project: Fire Administrtaion Building
 Project No.: 9801-E-31
 Subject: Channel Design
 Date: 5-Aug-10
 Calculated By: Bob Cosby

Design Point: End of Dry Swale - Area #1

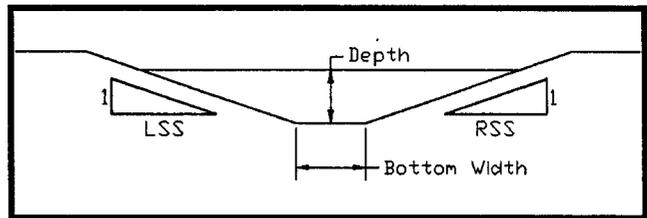
2 Year Storm - Velocity Check

Drainage Area = 0.84 Acres (Area draining to Design Point)
 C = 0.90 (Runoff Coefficient)
 I = 4.50 in/hr (Design Rainfall Intensity) 10 Minute Time of Conc.

$Q = C I A$ (Peak Flow)
 = 0.90 x 4.50 x 0.84
 = 3.40 CFS

Channel Characteristics

Rt. Sideslope = 3.00 :1
 Lt. Sideslope = 3.00 :1
 Base Width = 2.00 Ft.
 Max. Depth = 1.00 Ft.
 Channel Slope = 1.00 %
 Mannings (n) = 0.034



Grass lined Channel

Depth of Flow = 0.48 Ft.
 Area = 1.64 SF Wetted Perimeter = 5.02 Ft.
 Hydraulic Radius = 0.33 Ft.
 Velocity (V) = 2.07 Ft./sec. (From Manning's Equation)
 Flow (Q) = 3.39 CFS (From Continuity Equation Q=AV)

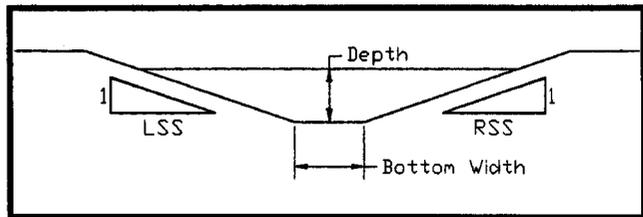
10 Year Storm - Capacity Check

Drainage Area = 0.84 Acres (Area draining to Design Point)
 C = 0.90 (Runoff Coefficient)
 I = 6.10 in/hr (Design Rainfall Intensity) 10 Minute Time of Conc.

$Q = C I A$ (Peak Flow)
 = 0.90 x 6.10 x 0.84
 = 4.61 CFS

Channel Characteristics

Rt. Sideslope = 3.00 :1
 Lt. Sideslope = 3.00 :1
 Base Width = 2.00 Ft.
 Max. Depth = 1.00 Ft.
 Channel Slope = 1.00 %
 Mannings (n) = 0.034



Grass lined Channel

Depth of Flow = 0.56 Ft.
 Area = 2.04 SF Wetted Perimeter = 5.52 Ft.
 Hydraulic Radius = 0.37 Ft.
 Velocity (V) = 2.25 Ft./sec. (From Manning's Equation)
 Flow (Q) = 4.61 CFS (From Continuity Equation Q=AV)



Project: Fire Administration Building
 Project No.: 9801-E-31
 Subject: Channel Design
 Date: 5-Aug-10
 Calculated By: Bob Cosby

Design Point: End of Ditch Section - Area 1 & 2

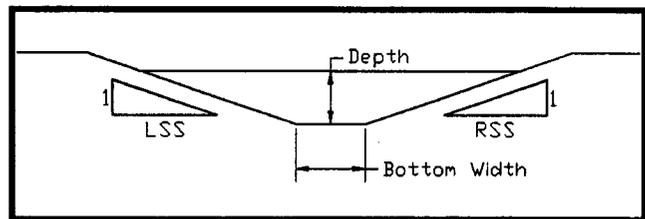
2 Year Storm - Velocity Check

Drainage Area = 1.46 Acres (Area draining to Design Point)
 C = 0.90 (Runoff Coefficient)
 I = 4.50 in/hr (Design Rainfall Intensity) 10 Minute Time of Conc.

$Q = C I A$ (Peak Flow)
 = 0.90 x 4.50 x 1.46
 = 5.91 CFS

Channel Characteristics

Rt. Sideslope = 2.00 :1
 Lt. Sideslope = 2.00 :1
 Base Width = 0.00 Ft.
 Max. Depth = 1.50 Ft.
 Channel Slope = 1.00 %
 Mannings (n) = 0.034



Grass lined Channel

Depth of Flow = 1.06 Ft.
 Area = 2.23 SF Wetted Perimeter = 4.72 Ft.
 Hydraulic Radius = 0.47 Ft.
 Velocity (V) = 2.65 Ft./sec. (From Manning's Equation)
 Flow (Q) = 5.91 CFS (From Continuity Equation Q=AV)

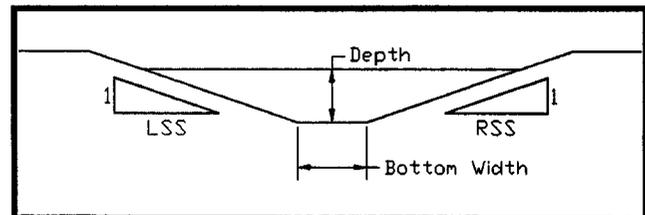
10 Year Storm - Capacity Check

Drainage Area = 1.46 Acres (Area draining to Design Point)
 C = 0.90 (Runoff Coefficient)
 I = 6.10 in/hr (Design Rainfall Intensity) 10 Minute Time of Conc.

$Q = C I A$ (Peak Flow)
 = 0.90 x 6.10 x 1.46
 = 8.02 CFS

Channel Characteristics

Rt. Sideslope = 2.00 :1
 Lt. Sideslope = 2.00 :1
 Base Width = 0.00 Ft.
 Max. Depth = 1.50 Ft.
 Channel Slope = 1.00 %
 Mannings (n) = 0.034



Grass lined Channel

Depth of Flow = 1.18 Ft.
 Area = 2.80 SF Wetted Perimeter = 5.29 Ft.
 Hydraulic Radius = 0.53 Ft.
 Velocity (V) = 2.86 Ft./sec. (From Manning's Equation)
 Flow (Q) = 8.01 CFS (From Continuity Equation Q=AV)

APPENDIX C

BMP FEATURE

**WEIGHTED CN
SEDIMENT FOREBAY VOLUME
BMP VOLUME
HYDROFLOW ROUTING**



Project: Fire Administration Building
 Project No.: 9801-E-31
 Subject: Runoff Curve Number
 Date: August 5, 2010
 Calculated By: Bob Cosby

Runoff Curve Numbers used in the following calculations were taken from Table 5-5 of the Virginia Erosion and Sediment Control Handbook

Subject Area: Total Site - Predevelopment

Soil Name and Hydrologic Group	Cover Description	CN	Area	CN x Area
"C" Soils	Urban Commercial	94 ✓	2.17	203.98
"C" Soils	Woods - Good Condition	70 ✓	0.97	67.9

Totals = 3.14 271.88

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{271.88}{3.14} = 86.6$$

Use CN = 87



Project: Fire Administration Building
 Project No.: 9801-E-31
 Subject: Runoff Curve Number
 Date: August 5, 2010
 Calculated By: Bob Cosby

Runoff Curve Numbers used in the following calculations were taken from Table 5-5 of the Virginia Erosion and Sediment Control Handbook

Subject Area: Fire Administration Building

Soil Name and Hydrologic Group	Cover Description	CN	Area	CN x Area
"C" Soils	Urban Commercial	94 ✓	2.03	190.82
"C" Soils	Woods - Good Condition	70 ✓	0.57	39.9

Totals = 2.60 230.72

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{230.72}{2.6} = 88.7$$

Use CN = 89



Project: Fire Administration Building
 Project No.: 9801-E-31
 Subject: Runoff Curve Number
 Date: August 5, 2010
 Calculated By: Bob Cosby

Runoff Curve Numbers used in the following calculations were taken from Table 5-5 of the Virginia Erosion and Sediment Control Handbook

Subject Area: Fire Station #3

Soil Name and Hydrologic Group	Cover Description	CN	Area	CN x Area
"C" Soils	Urban Commercial	94 ✓	0.37	34.78
"C" Soils	Woods - Good Condition	70 ✓	0.17	11.9

Totals = 0.54 46.68

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{46.68}{0.54} = 86.4$$

Use CN = 86



Project: Fire Administration Building
 Project No.: 9801-E-31
 Subject: Runoff Curve Number
 Date: August 5, 2010
 Calculated By: Bob Cosby

Runoff Curve Numbers used in the following calculations were taken from Table 5-5 of the Virginia Erosion and Sediment Control Handbook

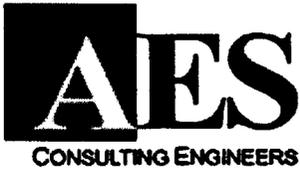
Subject Area: Total Site

Soil Name and Hydrologic Group	Cover Description	CN	Area	CN x Area
"C" Soils	Urban Commercial	94 ✓	2.40	225.6
"C" Soils	Woods - Good Condition	70 ✓	0.74	51.8

Totals = 3.14 277.4

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{277.4}{3.14} = 88.3$$

Use CN = 88



Project: Fire Administration Building
Project No.: 9801-E-31
Subject: Sediment Forebay Volume
Date: 8/5/2010
Calculated By: Bob Cosby

BMP Type = Sediment Forebay

$$\begin{aligned} \text{Water Quality Volume} &= 0.25 \text{ in.} \times \underline{2.6} \text{ acres of drainage area} \\ &= (0.25 / 12) \times (43,560 \times 2.6) \\ &= \boxed{2360 \text{ CF}} \end{aligned}$$

$$\begin{aligned} \text{Total Storage Volume Required} &= \underline{1} \times \text{Water Quality Volume} \\ &= 1 \times 2360 \\ &= 2359.5 \text{ CF} \end{aligned}$$

$$\begin{aligned} \text{Min. Dry Storage Volume Required} &= \underline{1} \times \text{Water Quality Volume} \\ &= 1 \times 2360 \\ &= 2360 \text{ CF} \end{aligned}$$

$$\text{Dry Storage Volume Provided} = \underline{2873} \text{ CF} \quad \text{Elevation} = \underline{76.50}$$



Project: Fire Administration Building
Project No.: 9801-E-31
Subject: Water Quality Volume
Date: 8/5/2010
Calculated By: Bob Cosby

BMP Type = Extended Detention Facility

$$\begin{aligned} \text{Water Quality Volume} &= 0.5 \text{ in.} \times \underline{1.67} \text{ acres of impervious area} \\ &= (0.5 / 12) \times (43,560 \times 1.67) \\ &= \boxed{3031 \text{ CF}} \end{aligned}$$

$$\begin{aligned} \text{Total Storage Volume Required} &= \underline{2} \times \text{Water Quality Volume} \\ &= 2 \times 3031 \\ &= 6062.1 \text{ CF} \end{aligned}$$

$$\begin{aligned} \text{Min. Dry Storage Volume Required} &= \underline{2} \times \text{Water Quality Volume} \\ &= 2 \times 3031 \\ &= 6062 \text{ CF} \end{aligned}$$

Sediment Forebay Provided =	<u>2873</u> CF	Elevation =	<u>76.50</u>
Dry Storage Volume Provided =	<u>3341</u> CF	Elevation =	<u>73.75</u>
Total Storage Provided =	<u>6214</u> CF		

Hydrograph Return Period Recap

Hydraflow Hydrographs by Intellisolve v9.02

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	SCS Runoff	---	7.872	9.837	-----	14.61	18.60	20.59	23.77	27.72	Predevelopment
3	SCS Runoff	---	7.082	8.728	-----	12.69	15.98	17.62	20.24	23.49	Fire Admin Bldg
4	SCS Runoff	---	1.296	1.631	-----	2.449	3.135	3.478	4.026	4.708	Fire Station
5	Reservoir(i)	3, 4	5.399	7.795	-----	12.55	14.80	15.49	16.21	17.15	Routing Forebay and Po
7	Reservoir	3	5.426	7.006	-----	11.02	14.24	15.82	18.46	22.91	Forebay Routed
8	Combine	4, 7	6.431	8.423	-----	13.17	16.98	18.92	22.02	27.48	Inflow to Main BMP
9	Reservoir	8	5.597	7.873	-----	12.73	14.87	15.56	16.26	17.21	BMP Routed
<p>#1 - PRE DEVELOPMENT ENTIRE SITE</p> <p>#3 - DRAINAGE AREA TO FOREBAY</p> <p>#4 - DRAINAGE AREA TO MAIN BMP</p> <p>#5 - INTER CONNECTED ROUTING FORE BAY AND BMP</p> <p>TESTING ONLY</p> <p>#7 - ROUTING OF FOREBAY NO TAIL WATER</p> <p>#8 - COMBINE Routed AND AREA TO BMP</p> <p>#9 - ROUTING MAIN BMP</p>											

Pond Report

Hydraflow Hydrographs by Intelisolve v9.02

Friday, Aug 6, 2010

Pond No. 1 - Forebay

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 74.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	74.50	300	0	0
0.50	75.00	1,233	357	357
1.50	76.00	1,820	1,517	1,874
2.50	77.00	2,526	2,163	4,037
3.50	78.00	5,142	3,757	7,794
4.00	78.50	7,159	3,061	10,855

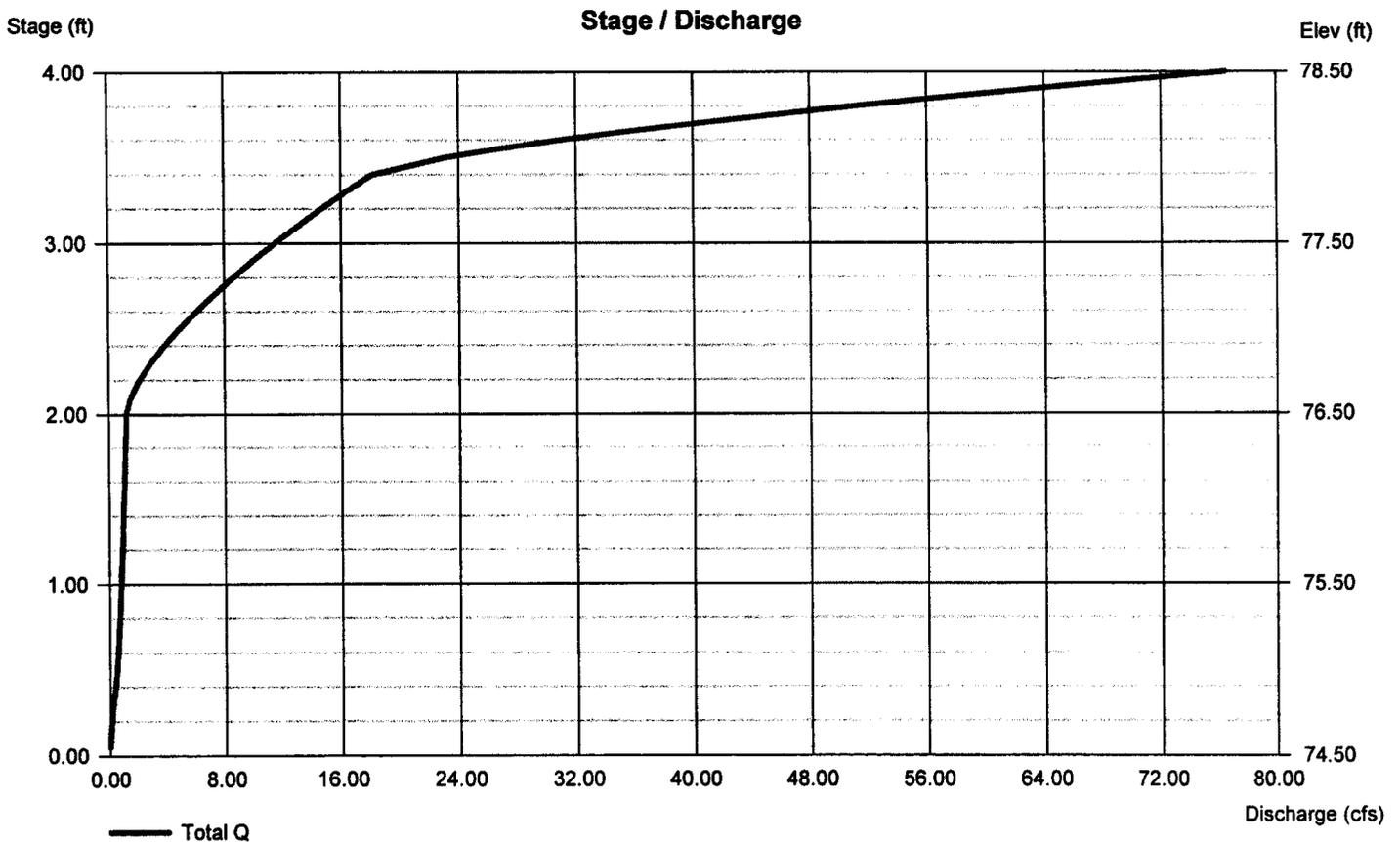
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	6.00	0.00	0.00
Span (in)	= 24.00	6.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 74.42	74.50	0.00	0.00
Length (ft)	= 49.00	1.00	0.00	0.00
Slope (%)	= 2.53	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 3.00	30.00	0.00	0.00
Crest El. (ft)	= 76.50	77.90	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Riser	Broad	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.02

Friday, Aug 6, 2010

Pond No. 2 - Main Pool

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 71.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	71.00	433	0	0
1.00	72.00	1,022	707	707
2.00	73.00	1,541	1,273	1,979
3.00	74.00	2,275	1,896	3,875
4.00	75.00	4,047	3,118	6,994
5.00	76.00	6,351	5,155	12,149
6.00	77.00	9,000	7,636	19,785

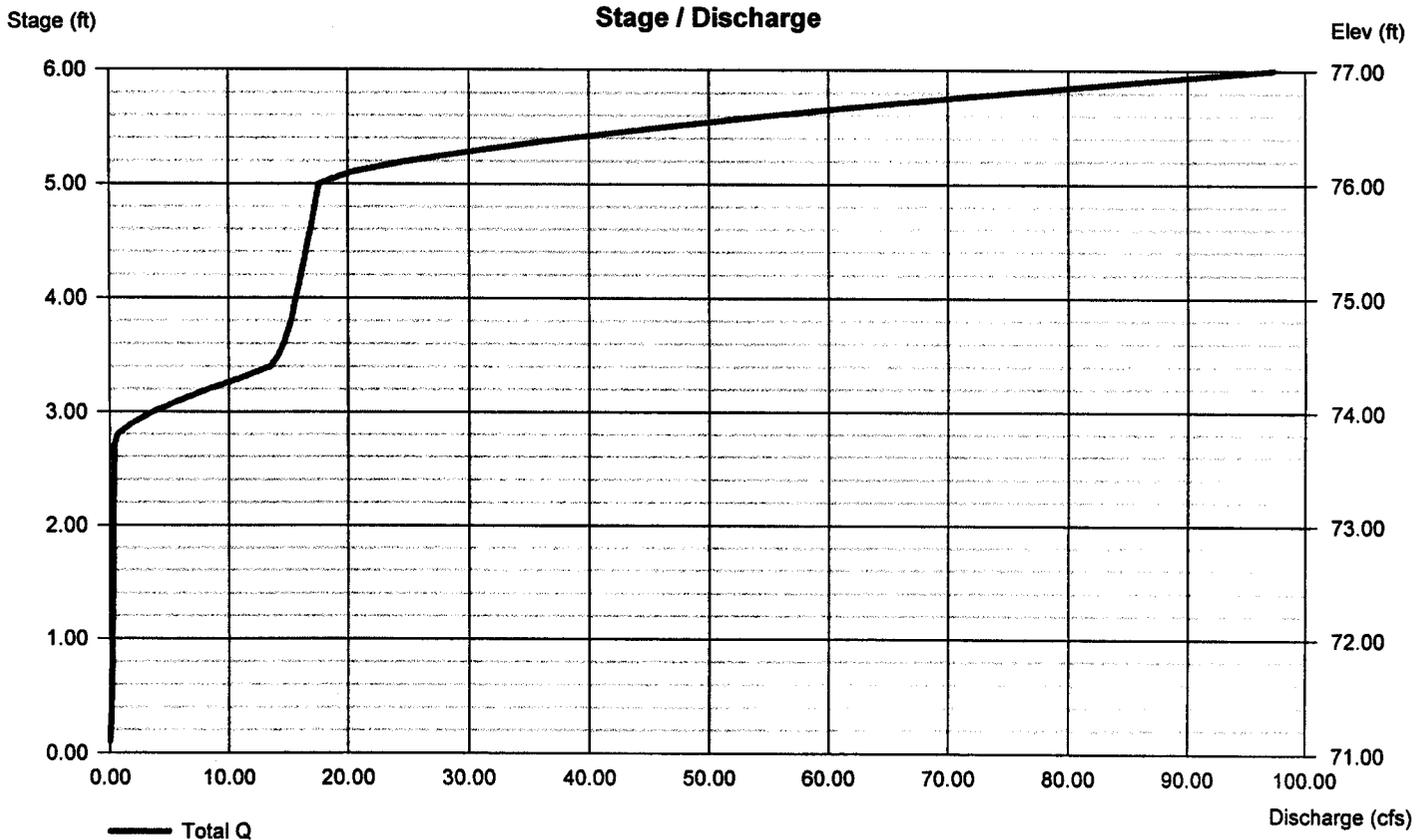
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (In)	= 18.00	3.00	0.00	0.00
Span (In)	= 18.00	3.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 70.41	71.00	0.00	0.00
Length (ft)	= 87.00	1.00	0.00	0.00
Slope (%)	= 0.94	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 8.00	30.00	0.00	0.00
Crest El. (ft)	= 73.75	76.00	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Riser	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(In/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

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	SCS Runoff	7.872	2	720	20,442	---	---	---	Predevelopment
3	SCS Runoff	7.082	2	720	18,491	---	---	---	Fire Admin Bldg
4	SCS Runoff	1.296	2	720	3,361	---	---	---	Fire Station
5	Reservoir(i)	5.399	2	728	21,867	3, 4	77.05	8,326	Routing Forebay and Po
7	Reservoir	5.426	2	726	18,486	3	77.05	4,209	Forebay Routed
8	Combine	6.431	2	724	21,847	4, 7	---	---	Inflow to Main BMP
9	Reservoir	5.597	2	730	21,843	8	74.09	4,145	BMP Routed
9801-E-31_Pond-REC.gpw					Return Period: 1 Year			Friday, Aug 6, 2010	

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Friday, Aug 6, 2010

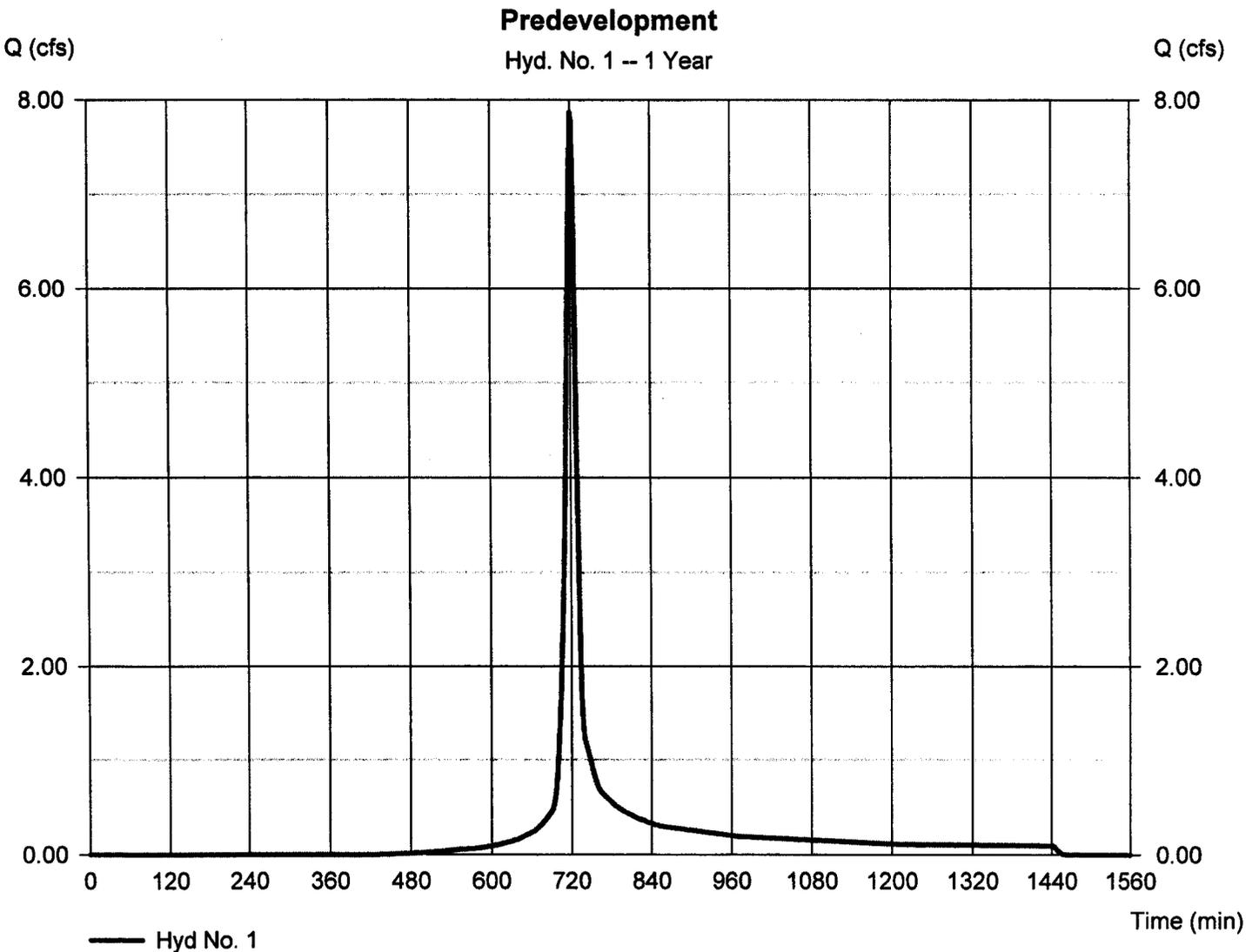
Hyd. No. 1

Predevelopment

Hydrograph type = SCS Runoff
Storm frequency = 1 yrs
Time interval = 2 min
Drainage area = 3.140 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 3.00 in
Storm duration = 24 hrs

Peak discharge = 7.872 cfs
Time to peak = 720 min
Hyd. volume = 20,442 cuft
Curve number = 87
Hydraulic length = 0 ft
Time of conc. (Tc) = 10.00 min
Distribution = Type II
Shape factor = 484

↑ entire site



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

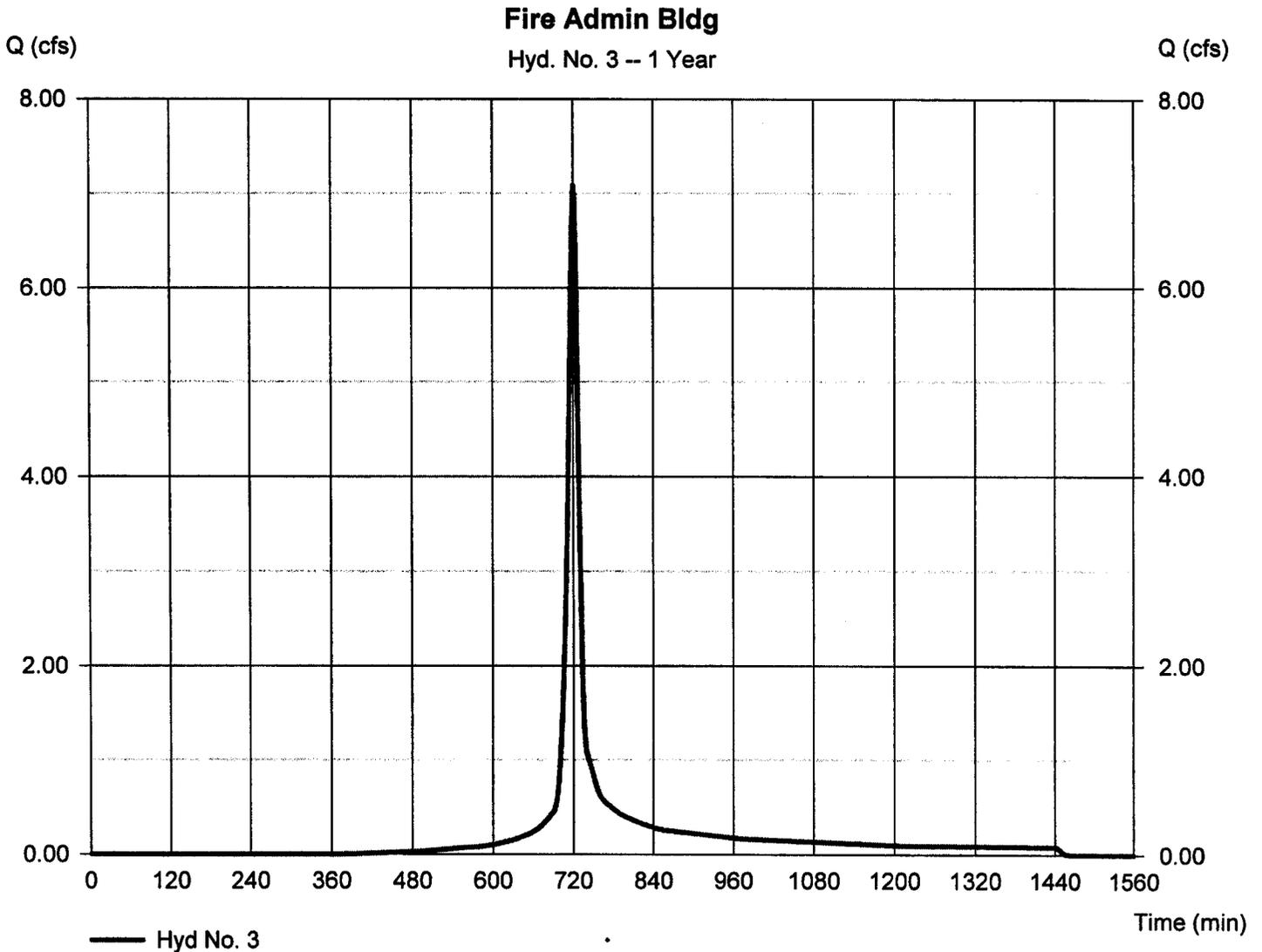
Friday, Aug 6, 2010

Hyd. No. 3

Fire Admin Bldg

Hydrograph type = SCS Runoff
Storm frequency = 1 yrs
Time interval = 2 min
Drainage area = 2.600 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 3.00 in
Storm duration = 24 hrs

Peak discharge = 7.082 cfs
Time to peak = 720 min
Hyd. volume = 18,491 cuft
Curve number = 89
Hydraulic length = 0 ft
Time of conc. (Tc) = 10.00 min
Distribution = Type II
Shape factor = 484



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

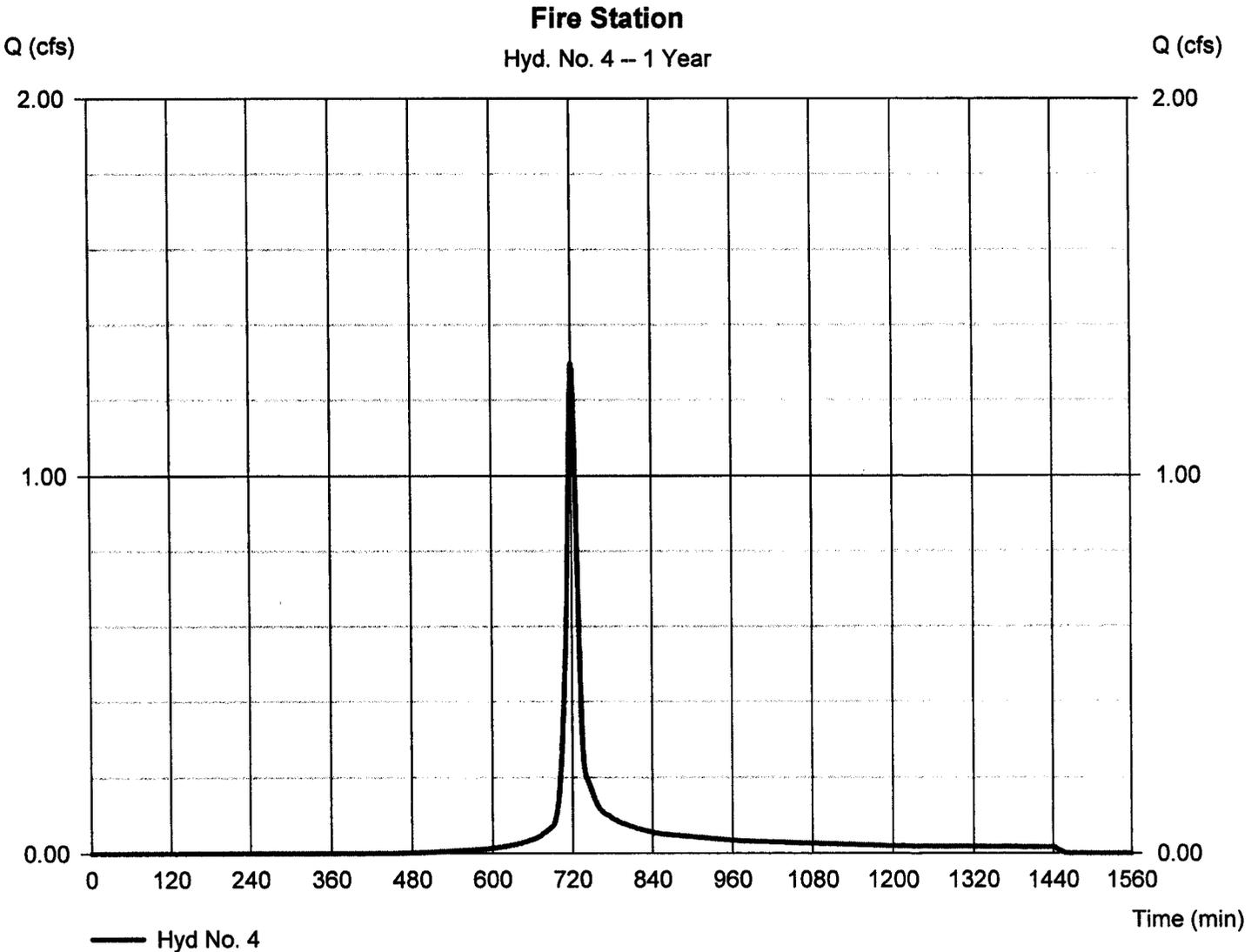
Friday, Aug 6, 2010

Hyd. No. 4

Fire Station

Hydrograph type = SCS Runoff
Storm frequency = 1 yrs
Time interval = 2 min
Drainage area = 0.540 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 3.00 in
Storm duration = 24 hrs

Peak discharge = 1.296 cfs
Time to peak = 720 min
Hyd. volume = 3,361 cuft
Curve number = 86
Hydraulic length = 0 ft
Time of conc. (Tc) = 10.00 min
Distribution = Type II
Shape factor = 484



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Friday, Aug 6, 2010

Hyd. No. 5

Routing Forebay and Po

Hydrograph type = Reservoir (Interconnected)
Storm frequency = 1 yrs
Time interval = 2 min

Upper Pond

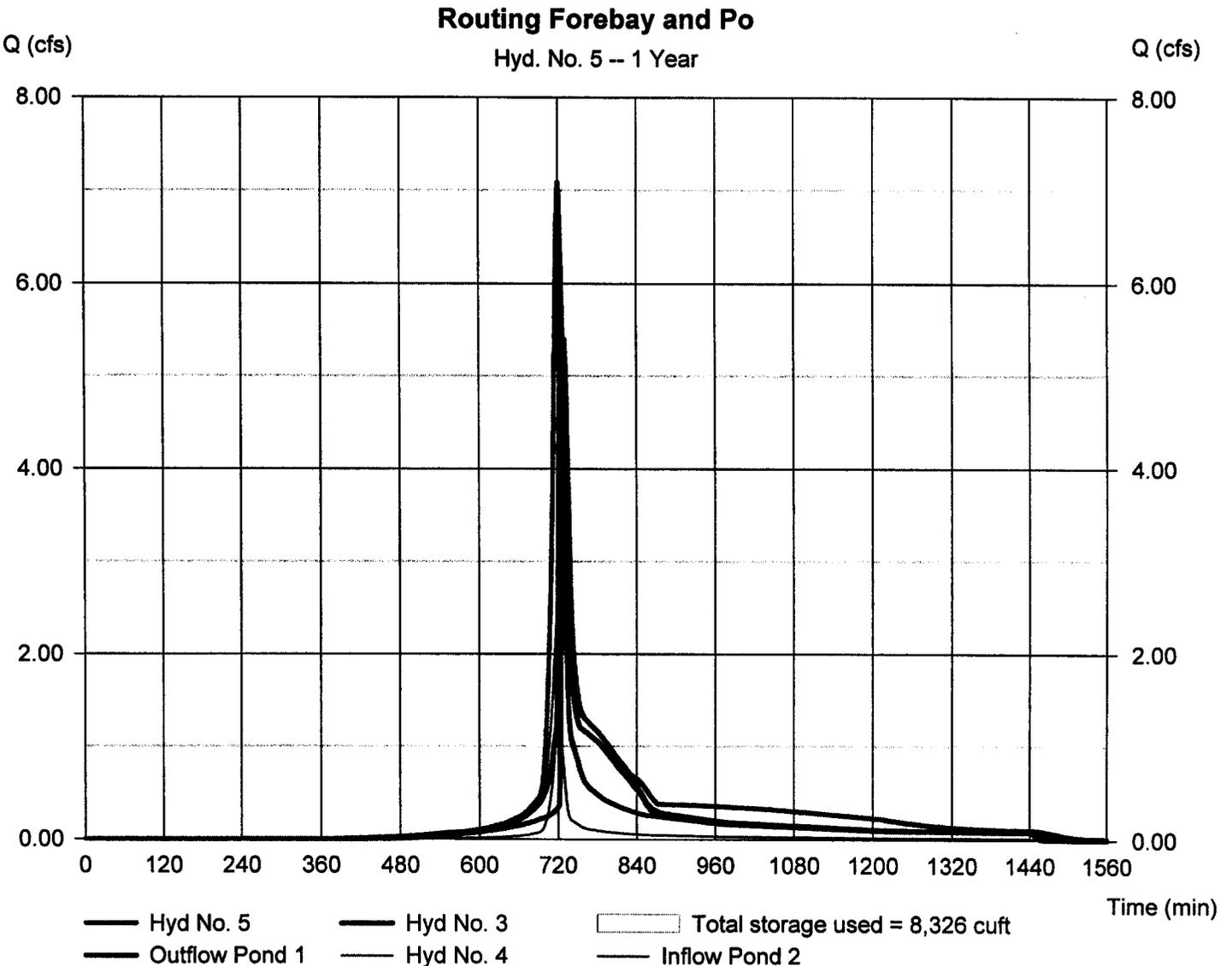
Pond name = Forebay
Inflow hyd. = 3 - Fire Admin Bldg
Max. Elevation = 77.05 ft
Max. Storage = 4,209 cuft

Peak discharge = 5.399 cfs
Time to peak = 728 min
Hyd. volume = 21,867 cuft

Lower Pond

Pond name = Main Pool
Other Inflow hyd. = 4 - Fire Station
Max. Elevation = 74.08 ft
Max. Storage = 4,117 cuft

Interconnected Pond Routing. Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Friday, Aug 6, 2010

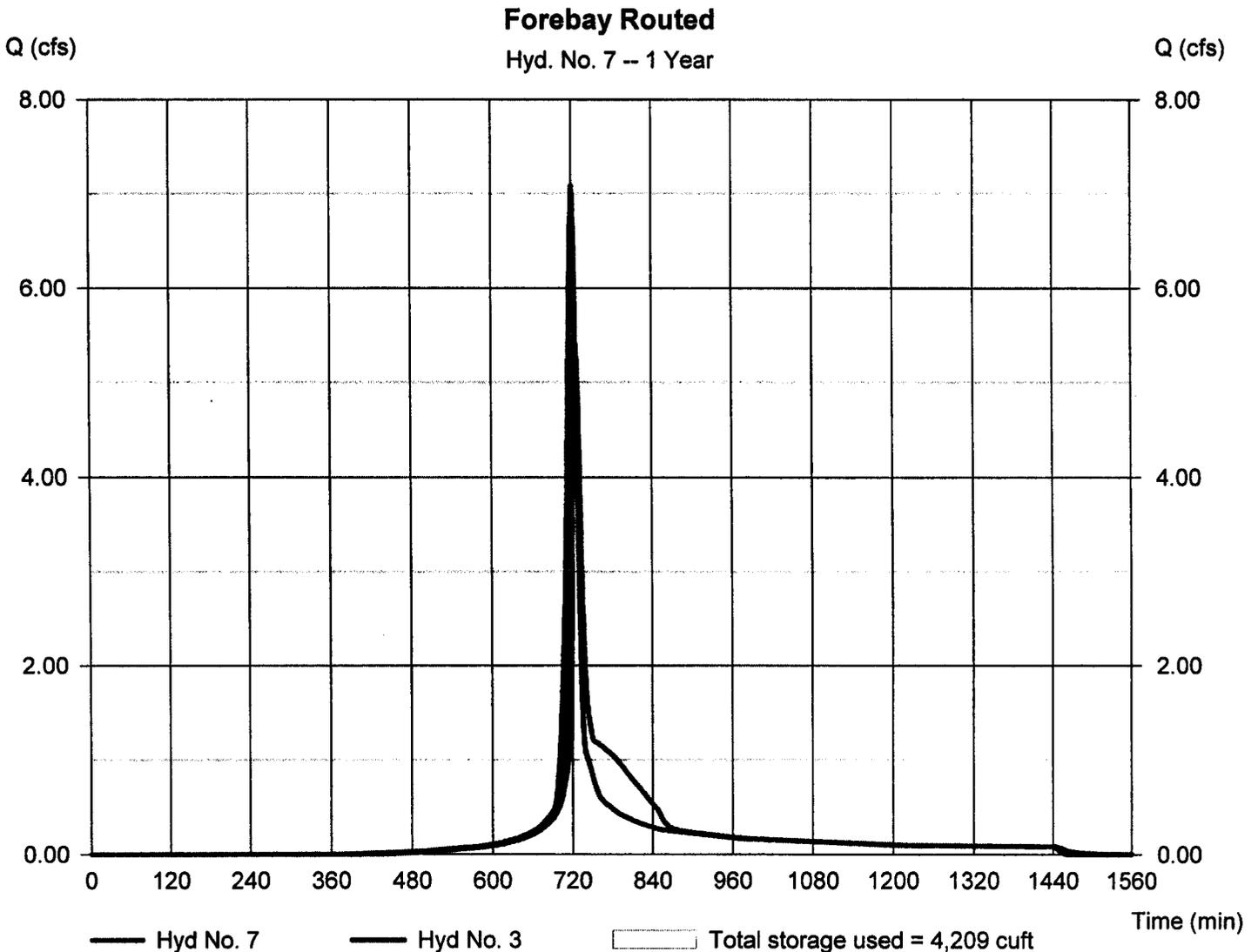
Hyd. No. 7

Forebay Routed

Hydrograph type = Reservoir
Storm frequency = 1 yrs
Time interval = 2 min
Inflow hyd. No. = 3 - Fire Admin Bldg
Reservoir name = Forebay

Peak discharge = 5.426 cfs
Time to peak = 726 min
Hyd. volume = 18,486 cuft
Max. Elevation = 77.05 ft
Max. Storage = 4,209 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

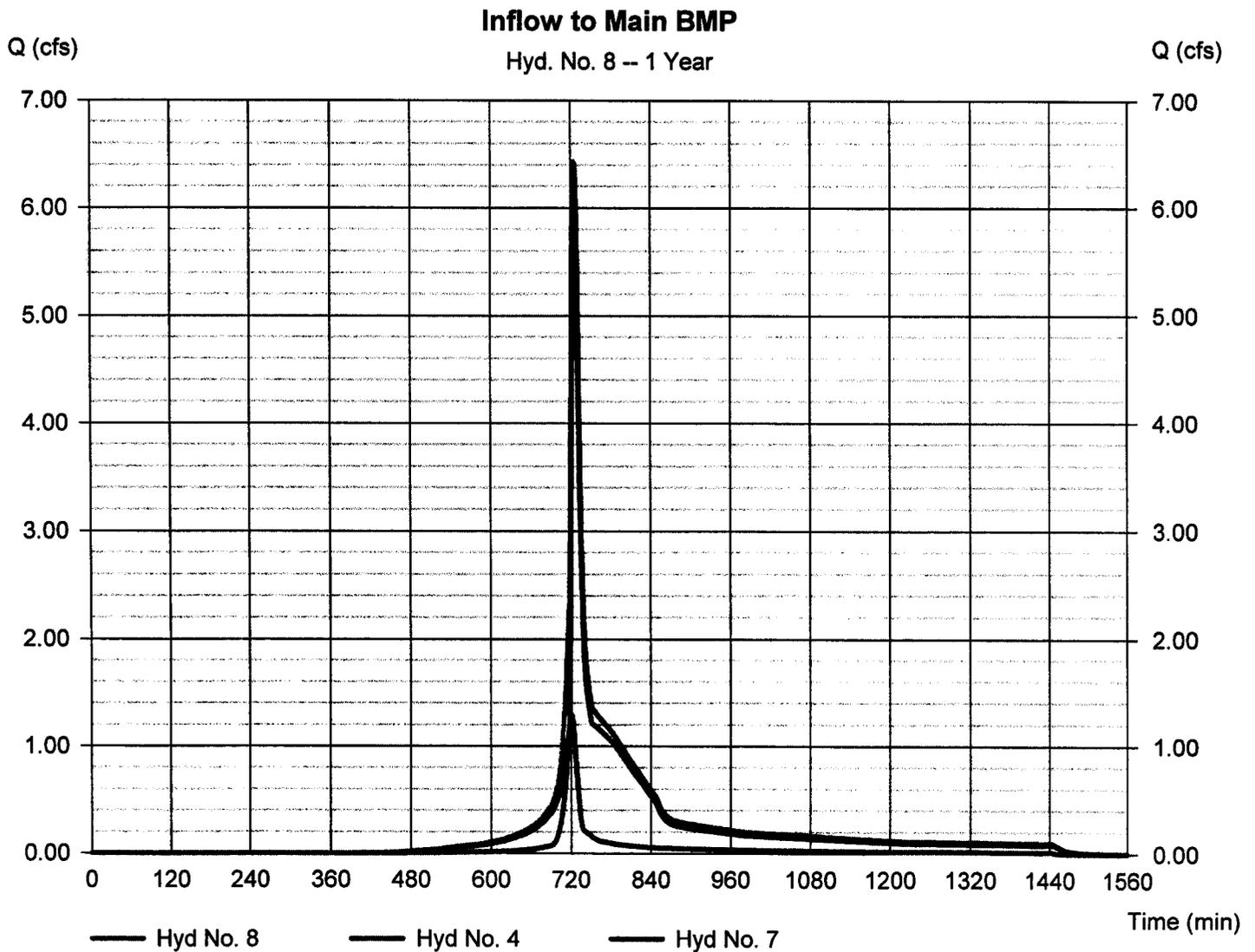
Friday, Aug 6, 2010

Hyd. No. 8

Inflow to Main BMP

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 2 min
Inflow hyds. = 4, 7

Peak discharge = 6.431 cfs
Time to peak = 724 min
Hyd. volume = 21,847 cuft
Contrib. drain. area = 0.540 ac



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Friday, Aug 6, 2010

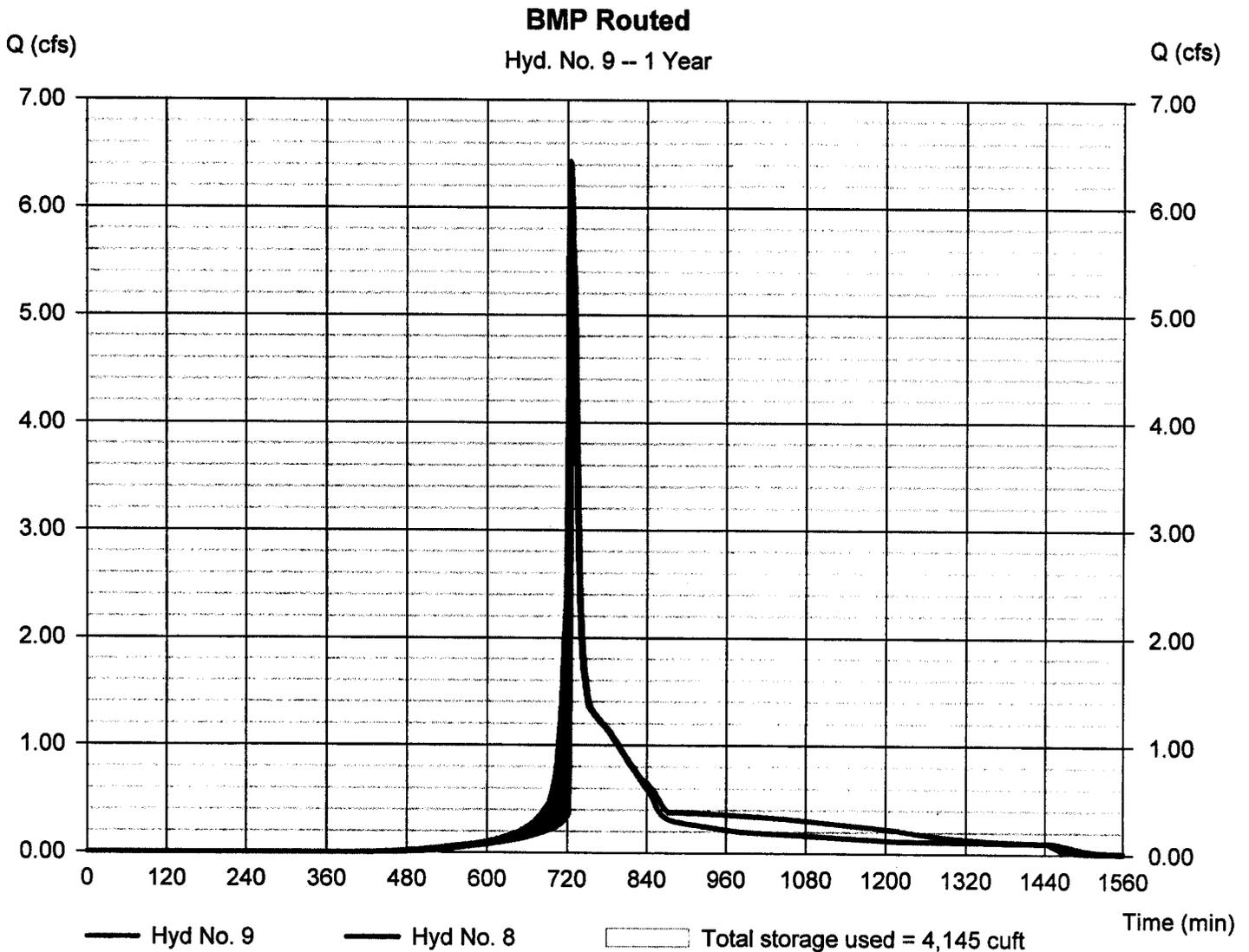
Hyd. No. 9

BMP Routed

Hydrograph type = Reservoir
Storm frequency = 1 yrs
Time interval = 2 min
Inflow hyd. No. = 8 - Inflow to Main BMP
Reservoir name = Main Pool

Peak discharge = 5.597 cfs
Time to peak = 730 min
Hyd. volume = 21,843 cuft
Max. Elevation = 74.09 ft
Max. Storage = 4,145 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

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	SCS Runoff	9.837	2	720	25,653	---	----	-----	Predevelopment	
3	SCS Runoff	8.728	2	720	22,942	---	----	-----	Fire Admin Bldg	
4	SCS Runoff	1.631	2	720	4,242	---	----	-----	Fire Station	
5	Reservoir(i)	7.795	2	726	27,219	3, 4	77.19	9,130	Routing Forebay and Po	
7	Reservoir	7.006	2	726	22,938	3	77.19	4,705	Forebay Routed	
8	Combine	8.423	2	724	27,179	4, 7	----	-----	Inflow to Main BMP	
9	Reservoir	7.873	2	728	27,176	8	74.18	4,435	BMP Routed	
9801-E-31_Pond-REC.gpw					Return Period: 2 Year			Friday, Aug 6, 2010		

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

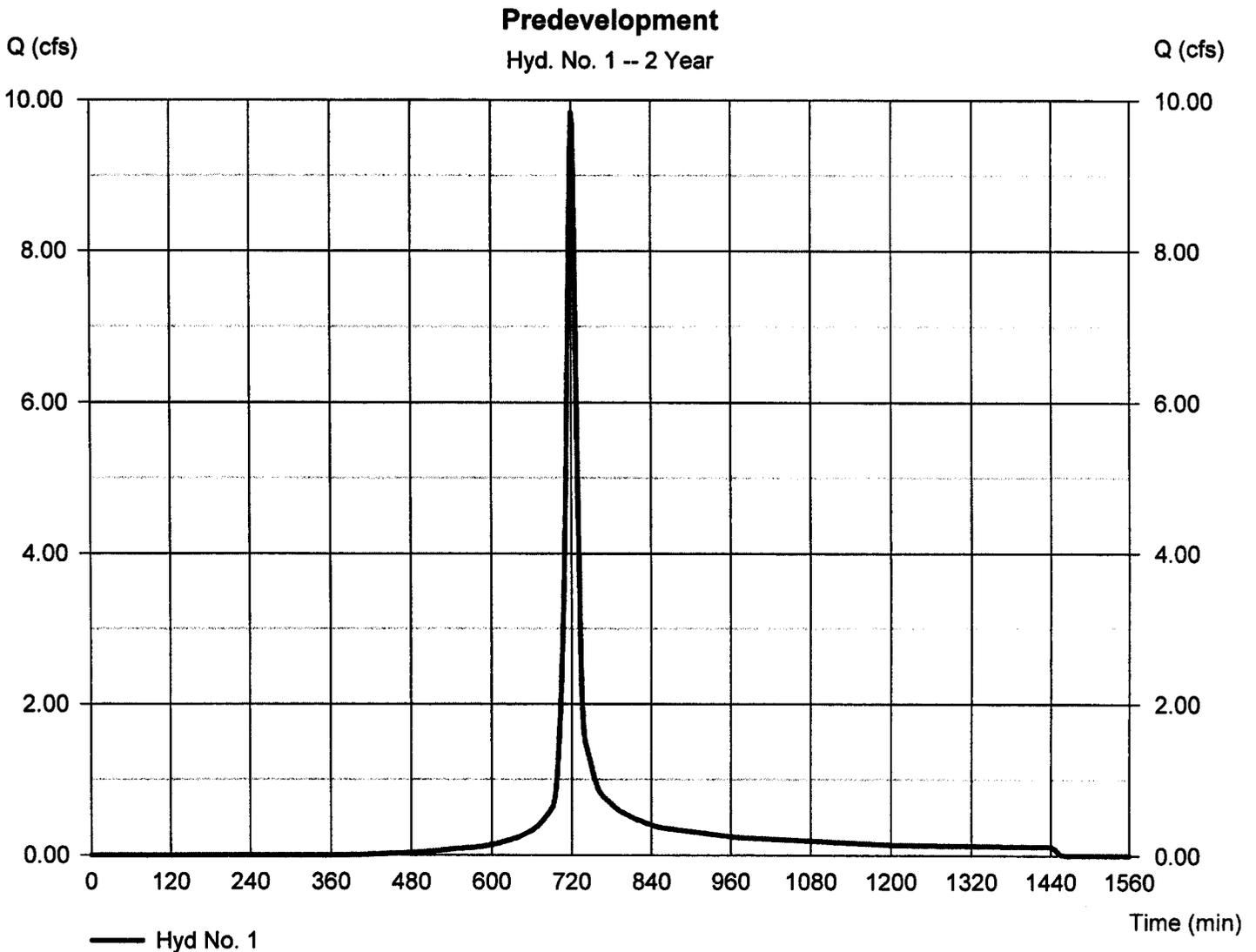
Friday, Aug 6, 2010

Hyd. No. 1

Predevelopment

Hydrograph type = SCS Runoff
Storm frequency = 2 yrs
Time interval = 2 min
Drainage area = 3.140 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 3.50 in
Storm duration = 24 hrs

Peak discharge = 9.837 cfs
Time to peak = 720 min
Hyd. volume = 25,653 cuft
Curve number = 87
Hydraulic length = 0 ft
Time of conc. (Tc) = 10.00 min
Distribution = Type II
Shape factor = 484



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

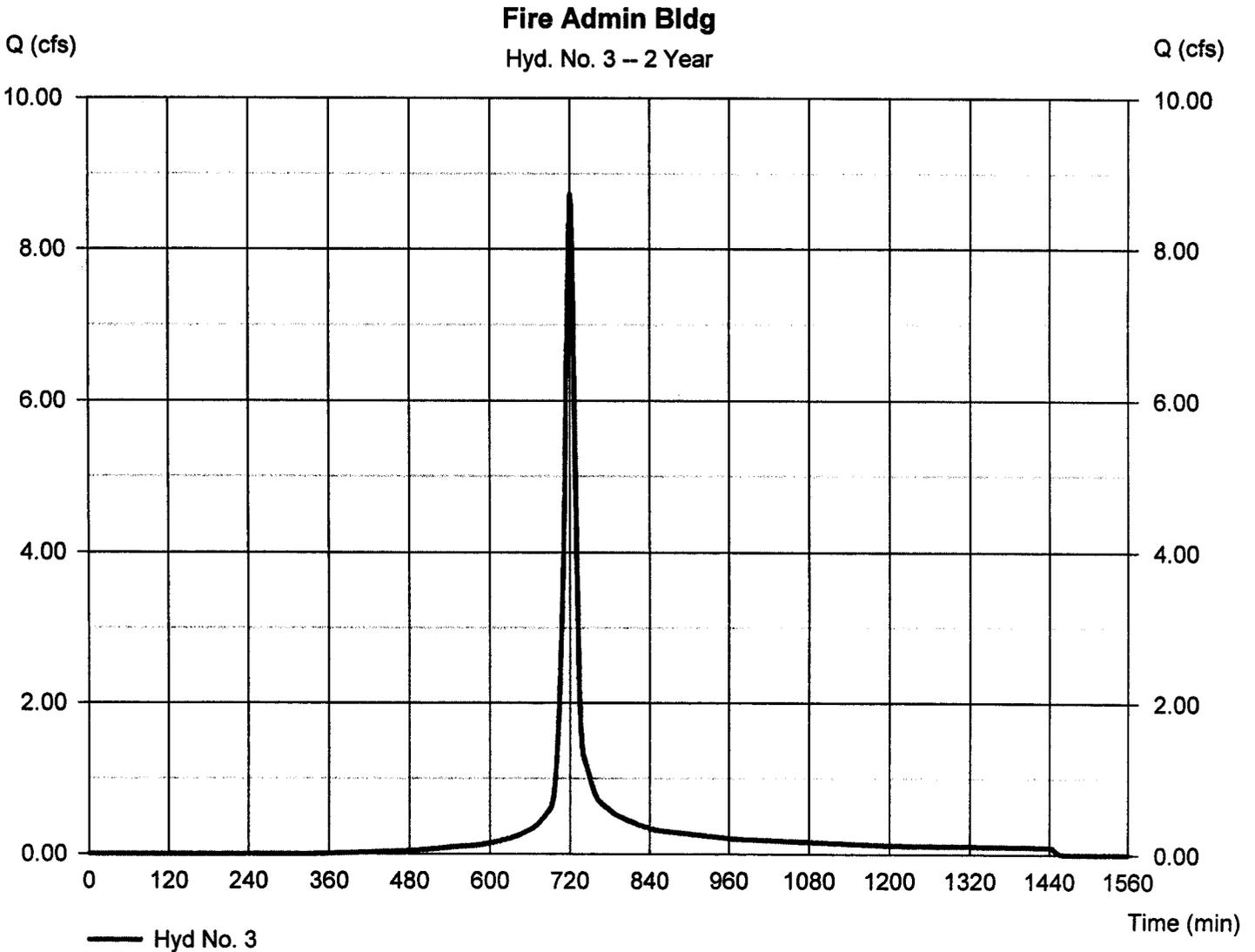
Friday, Aug 6, 2010

Hyd. No. 3

Fire Admin Bldg

Hydrograph type = SCS Runoff
Storm frequency = 2 yrs
Time interval = 2 min
Drainage area = 2.600 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 3.50 in
Storm duration = 24 hrs

Peak discharge = 8.728 cfs
Time to peak = 720 min
Hyd. volume = 22,942 cuft
Curve number = 89
Hydraulic length = 0 ft
Time of conc. (Tc) = 10.00 min
Distribution = Type II
Shape factor = 484



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

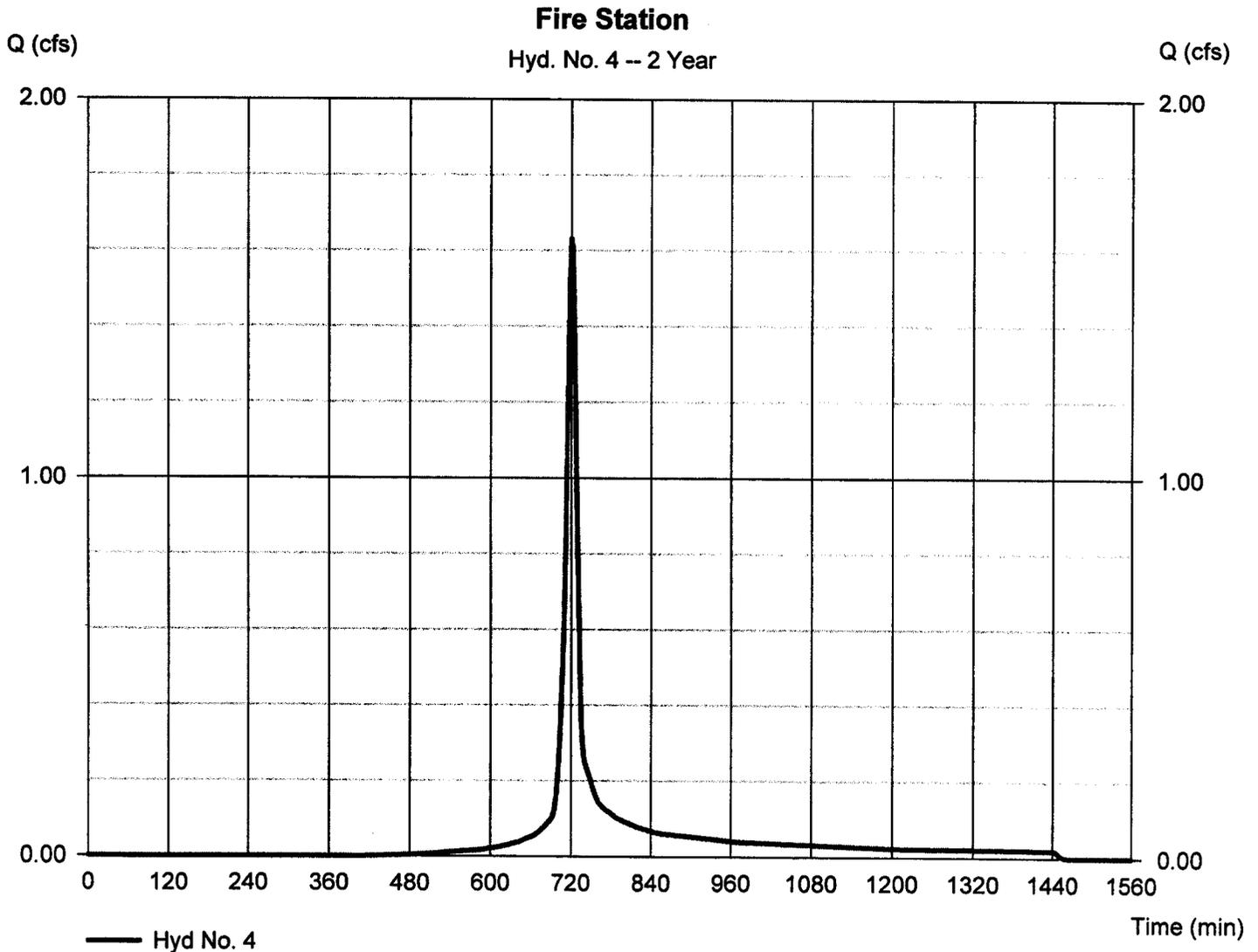
Friday, Aug 6, 2010

Hyd. No. 4

Fire Station

Hydrograph type = SCS Runoff
Storm frequency = 2 yrs
Time interval = 2 min
Drainage area = 0.540 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 3.50 in
Storm duration = 24 hrs

Peak discharge = 1.631 cfs
Time to peak = 720 min
Hyd. volume = 4,242 cuft
Curve number = 86
Hydraulic length = 0 ft
Time of conc. (Tc) = 10.00 min
Distribution = Type II
Shape factor = 484



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Friday, Aug 6, 2010

Hyd. No. 5

Routing Forebay and Po

Hydrograph type = Reservoir (Interconnected)
Storm frequency = 2 yrs
Time interval = 2 min

Upper Pond

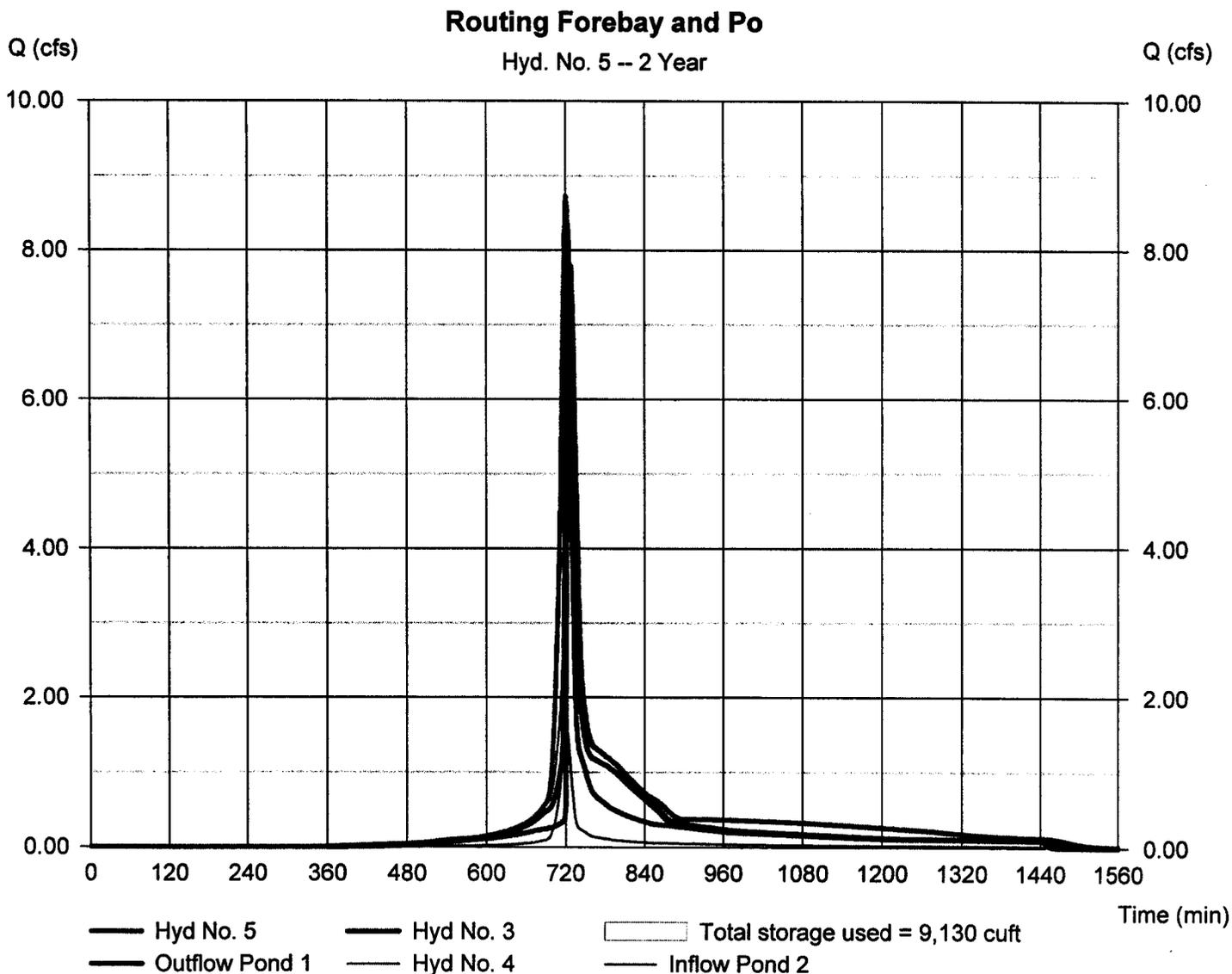
Pond name = Forebay
Inflow hyd. = 3 - Fire Admin Bldg
Max. Elevation = 77.19 ft
Max. Storage = 4,705 cuft

Peak discharge = 7.795 cfs
Time to peak = 726 min
Hyd. volume = 27,219 cuft

Lower Pond

Pond name = Main Pool
Other Inflow hyd. = 4 - Fire Statio
Max. Elevation = 74.18 ft
Max. Storage = 4,426 cuft

Interconnected Pond Routing. Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Friday, Aug 6, 2010

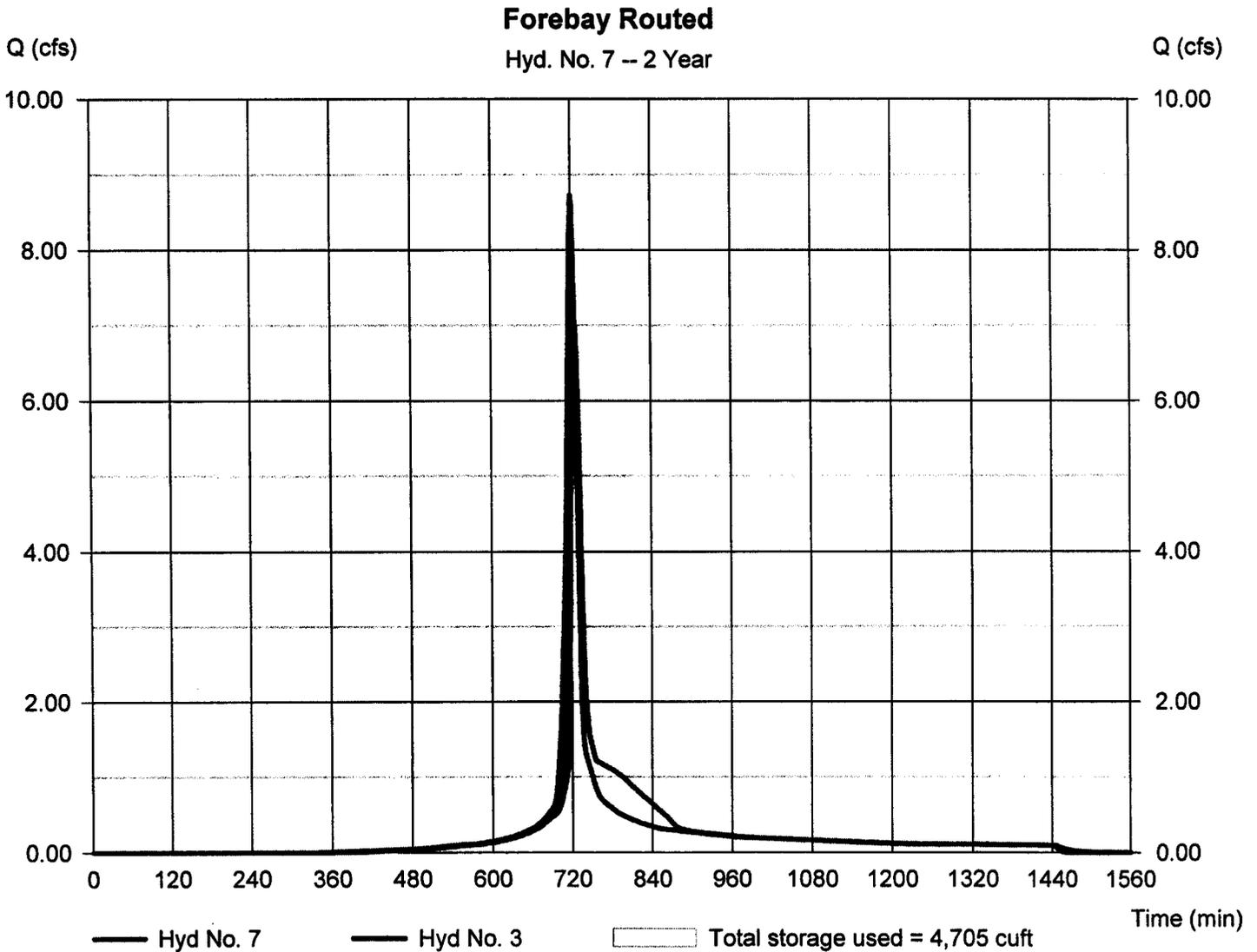
Hyd. No. 7

Forebay Routed

Hydrograph type = Reservoir
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyd. No. = 3 - Fire Admin Bldg
Reservoir name = Forebay

Peak discharge = 7.006 cfs
Time to peak = 726 min
Hyd. volume = 22,938 cuft
Max. Elevation = 77.19 ft
Max. Storage = 4,705 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

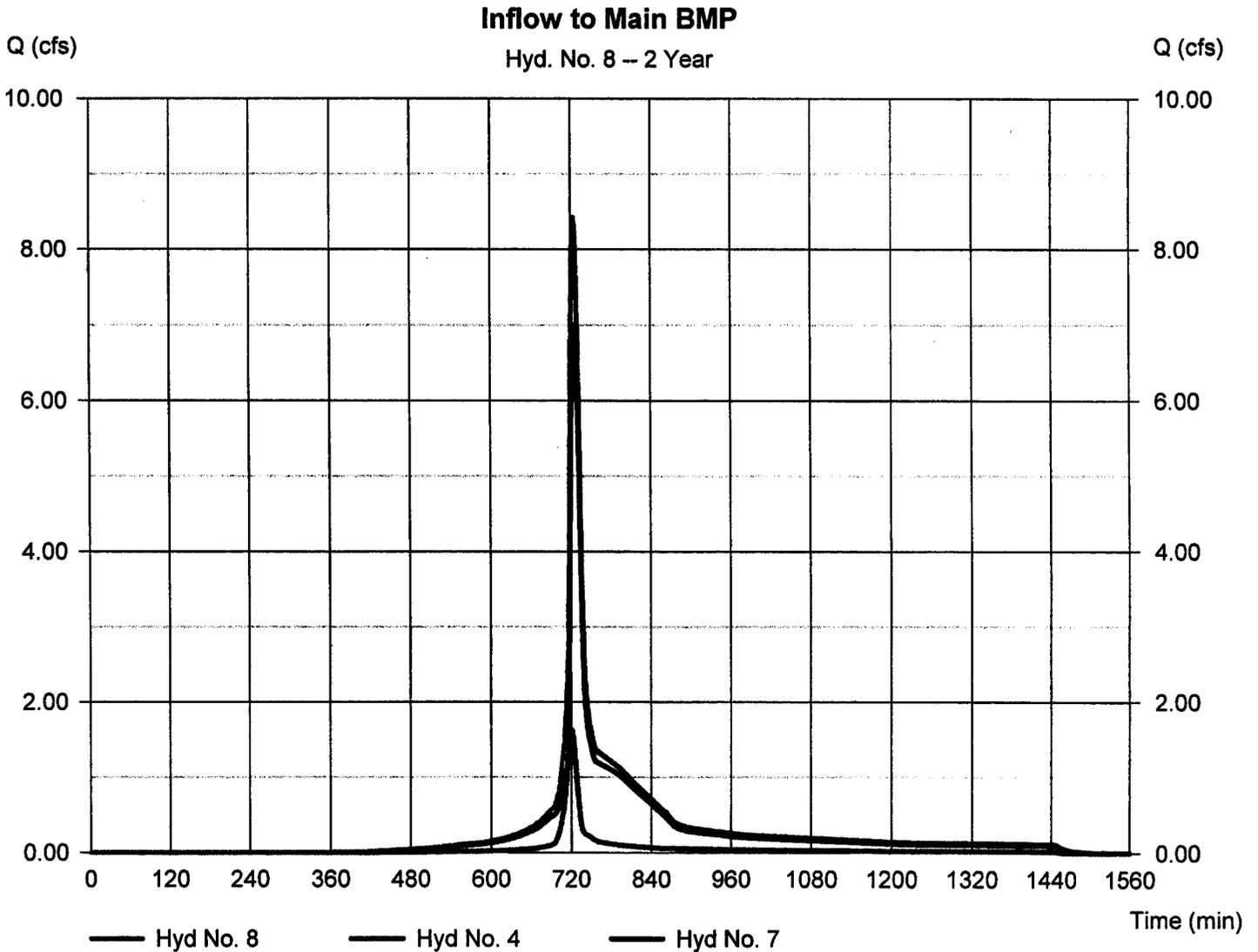
Friday, Aug 6, 2010

Hyd. No. 8

Inflow to Main BMP

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 4, 7

Peak discharge = 8.423 cfs
Time to peak = 724 min
Hyd. volume = 27,179 cuft
Contrib. drain. area = 0.540 ac



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Friday, Aug 6, 2010

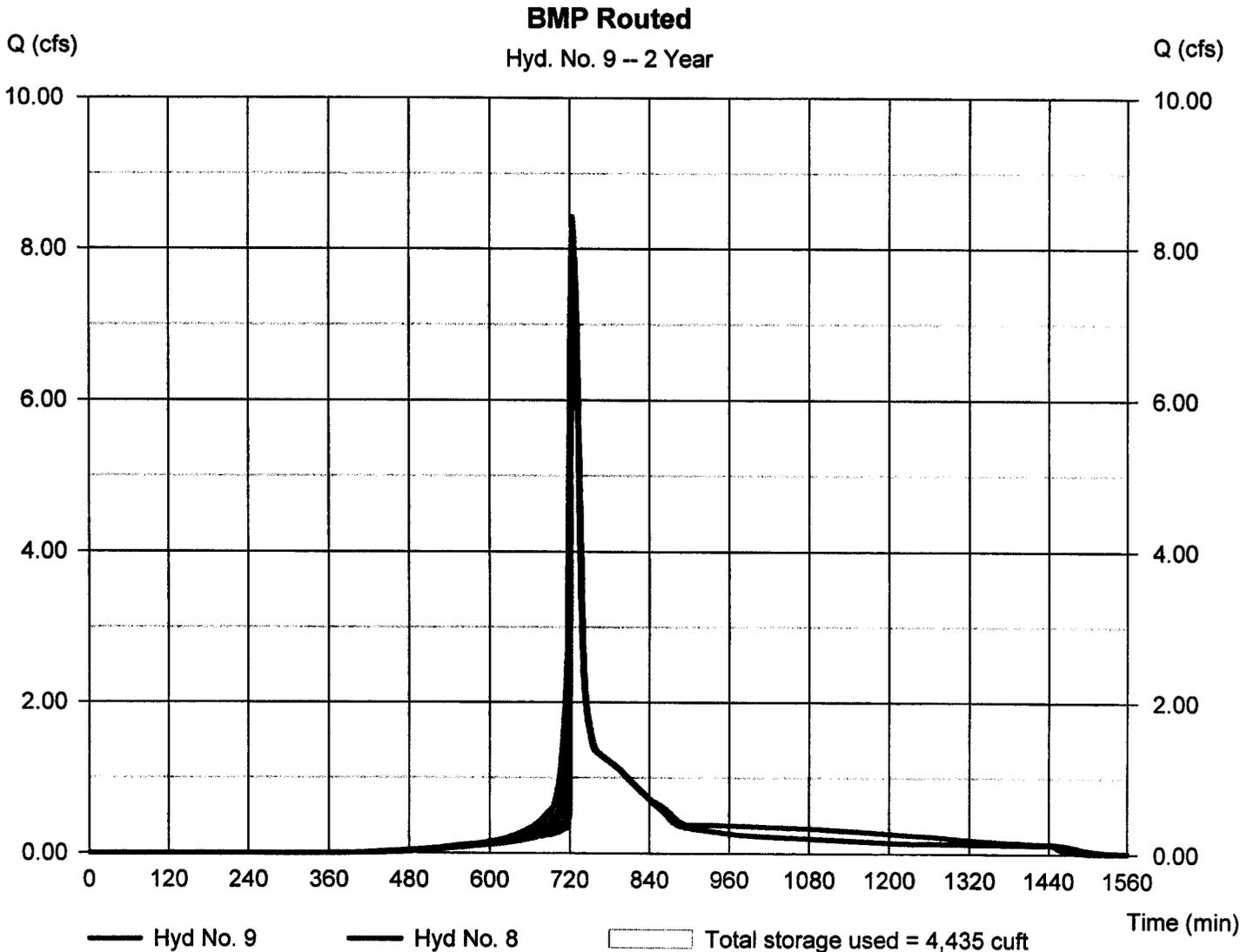
Hyd. No. 9

BMP Routed

Hydrograph type = Reservoir
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyd. No. = 8 - Inflow to Main BMP
Reservoir name = Main Pool

Peak discharge = 7.873 cfs
Time to peak = 728 min
Hyd. volume = 27,176 cuft
Max. Elevation = 74.18 ft
Max. Storage = 4,435 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

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	SCS Runoff	18.60	2	720	49,729	---	----	----	Predevelopment
3	SCS Runoff	15.98	2	720	43,265	---	----	----	Fire Admin Bldg
4	SCS Runoff	3.135	2	720	8,338	---	----	----	Fire Station
5	Reservoir(i)	14.80	2	726	51,662	3, 4	77.68	12,462	Routing Forebay and Po
7	Reservoir	14.24	2	724	43,261	3	77.68	6,560	Forebay Routed
8	Combine	16.98	2	724	51,599	4, 7	----	----	Inflow to Main BMP
9	Reservoir	14.87	2	728	51,596	8	74.68	5,964	BMP Routed
9801-E-31_Pond-REC.gpw					Return Period: 10 Year			Friday, Aug 6, 2010	

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

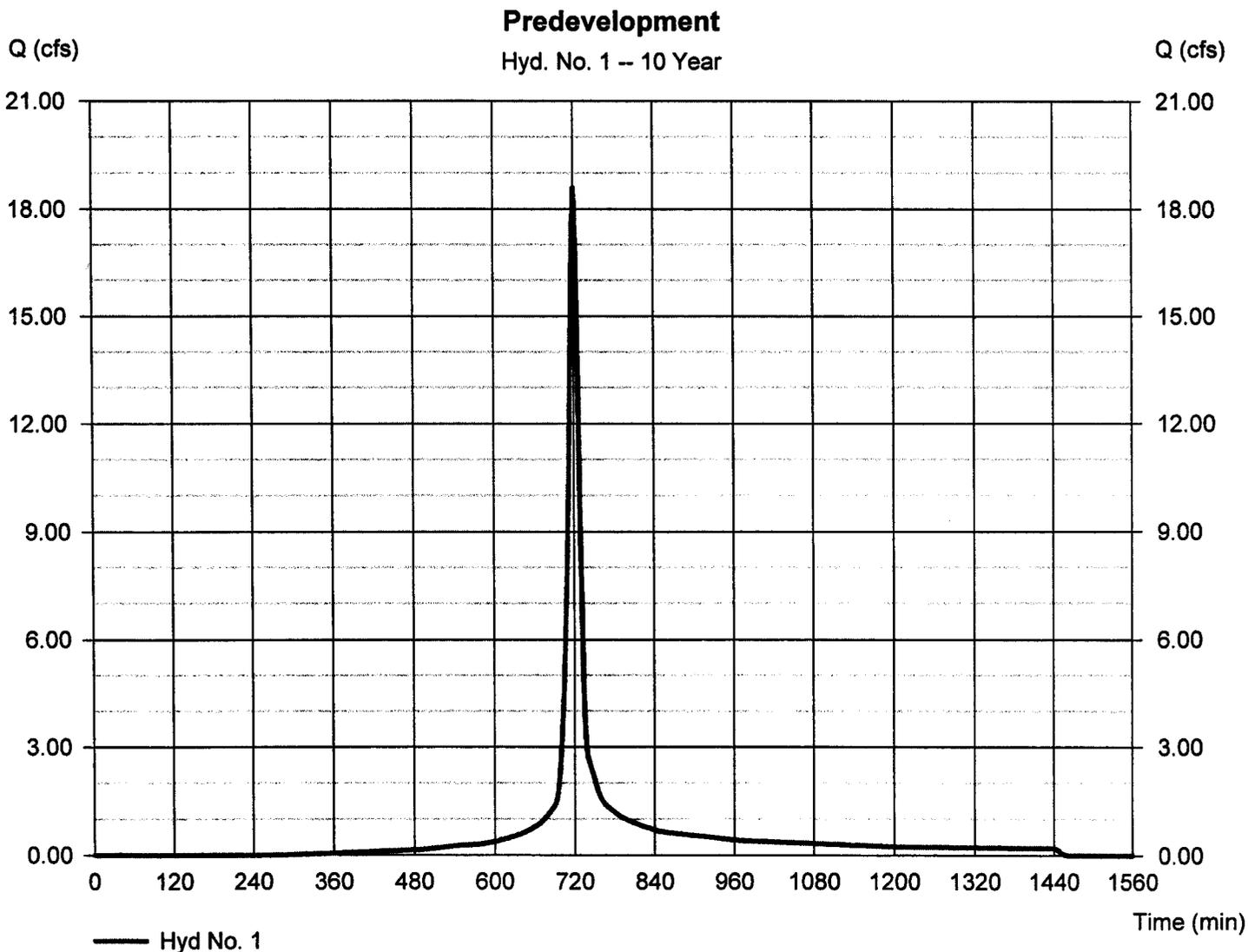
Friday, Aug 6, 2010

Hyd. No. 1

Predevelopment

Hydrograph type = SCS Runoff
Storm frequency = 10 yrs
Time interval = 2 min
Drainage area = 3.140 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 5.70 in
Storm duration = 24 hrs

Peak discharge = 18.60 cfs
Time to peak = 720 min
Hyd. volume = 49,729 cuft
Curve number = 87
Hydraulic length = 0 ft
Time of conc. (Tc) = 10.00 min
Distribution = Type II
Shape factor = 484



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

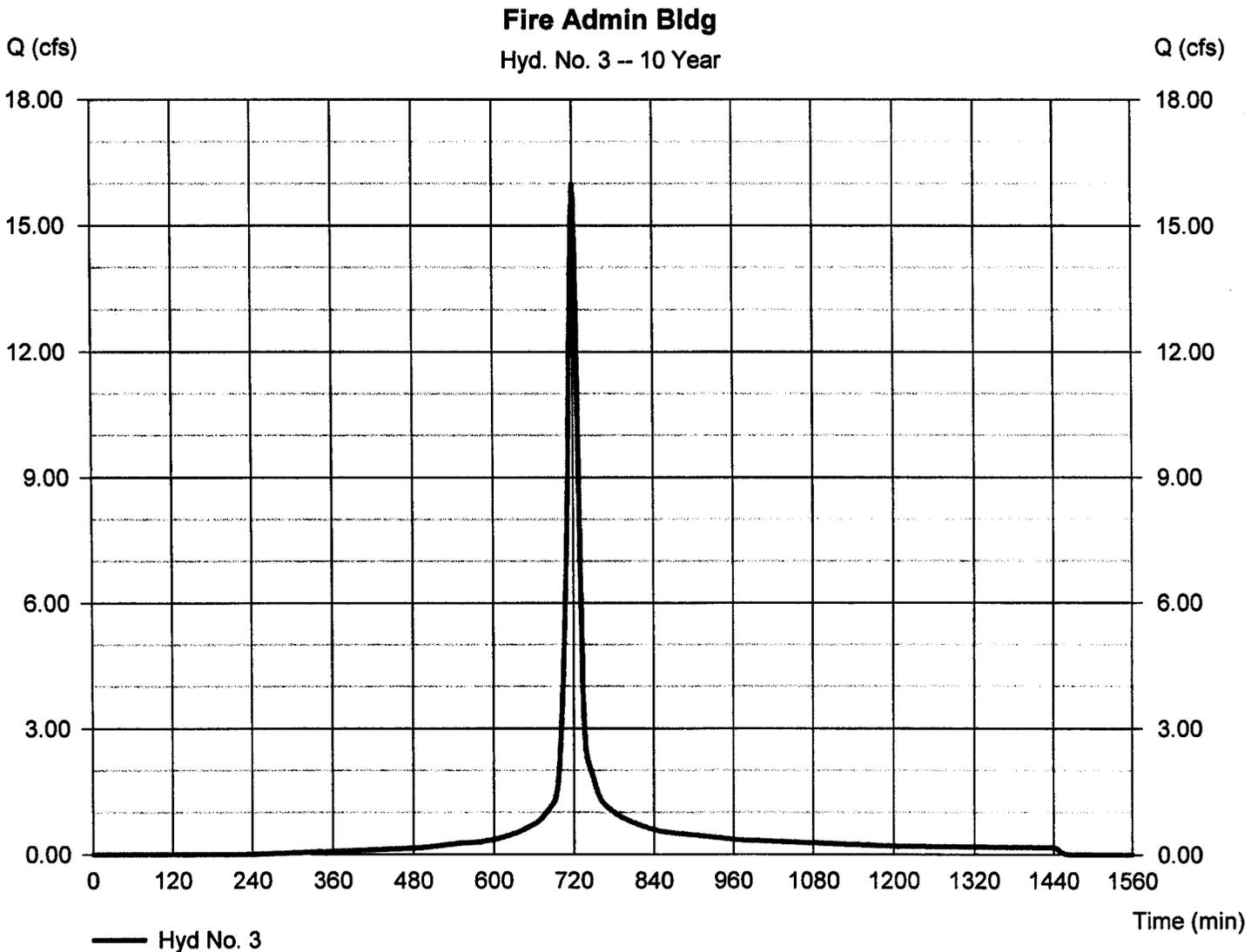
Friday, Aug 6, 2010

Hyd. No. 3

Fire Admin Bldg

Hydrograph type = SCS Runoff
Storm frequency = 10 yrs
Time interval = 2 min
Drainage area = 2.600 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 5.70 in
Storm duration = 24 hrs

Peak discharge = 15.98 cfs
Time to peak = 720 min
Hyd. volume = 43,265 cuft
Curve number = 89
Hydraulic length = 0 ft
Time of conc. (Tc) = 10.00 min
Distribution = Type II
Shape factor = 484



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

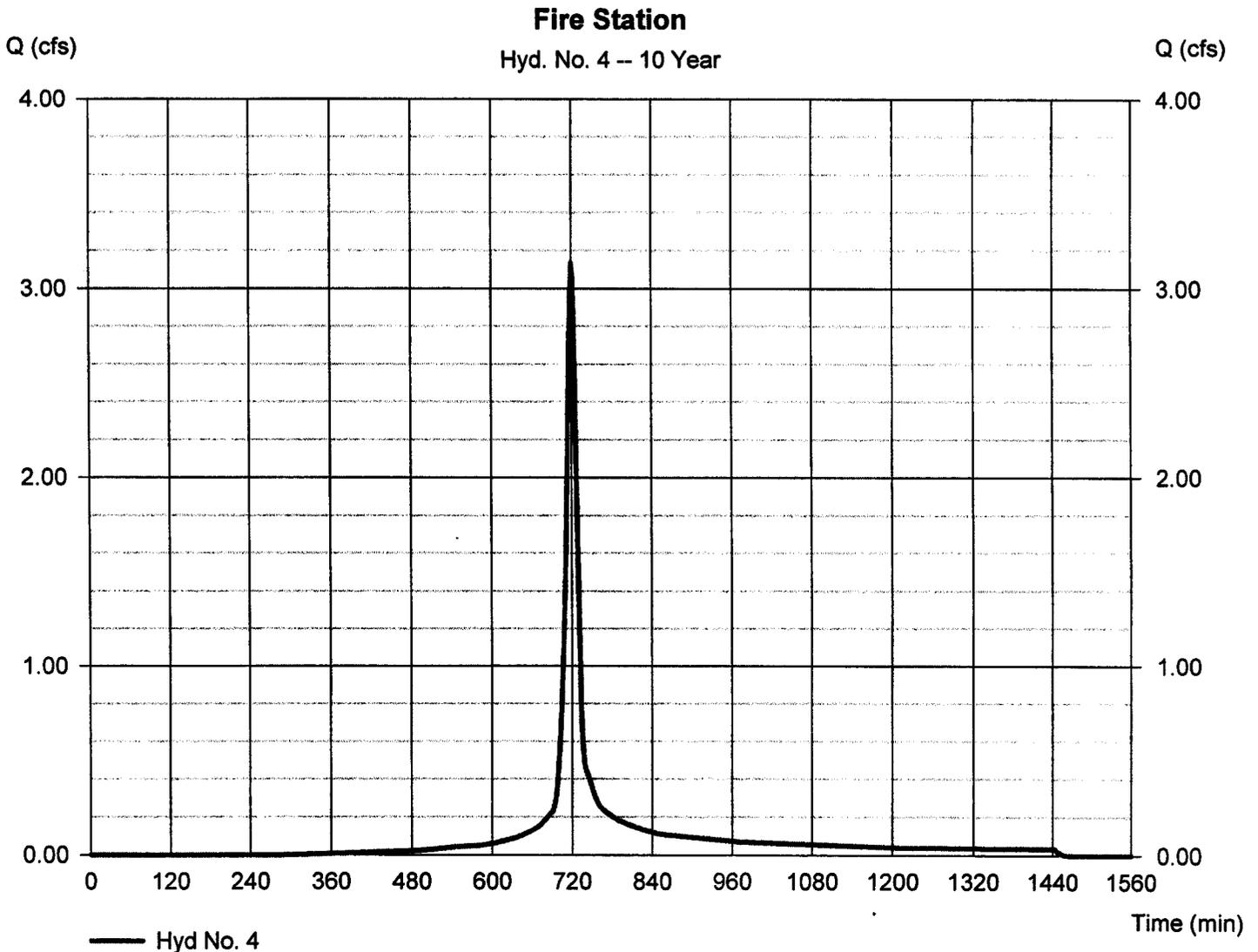
Friday, Aug 6, 2010

Hyd. No. 4

Fire Station

Hydrograph type = SCS Runoff
Storm frequency = 10 yrs
Time interval = 2 min
Drainage area = 0.540 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 5.70 in
Storm duration = 24 hrs

Peak discharge = 3.135 cfs
Time to peak = 720 min
Hyd. volume = 8,338 cuft
Curve number = 86
Hydraulic length = 0 ft
Time of conc. (Tc) = 10.00 min
Distribution = Type II
Shape factor = 484



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Friday, Aug 6, 2010

Hyd. No. 5

Routing Forebay and Po

Hydrograph type = Reservoir (Interconnected)
Storm frequency = 10 yrs
Time interval = 2 min

Upper Pond

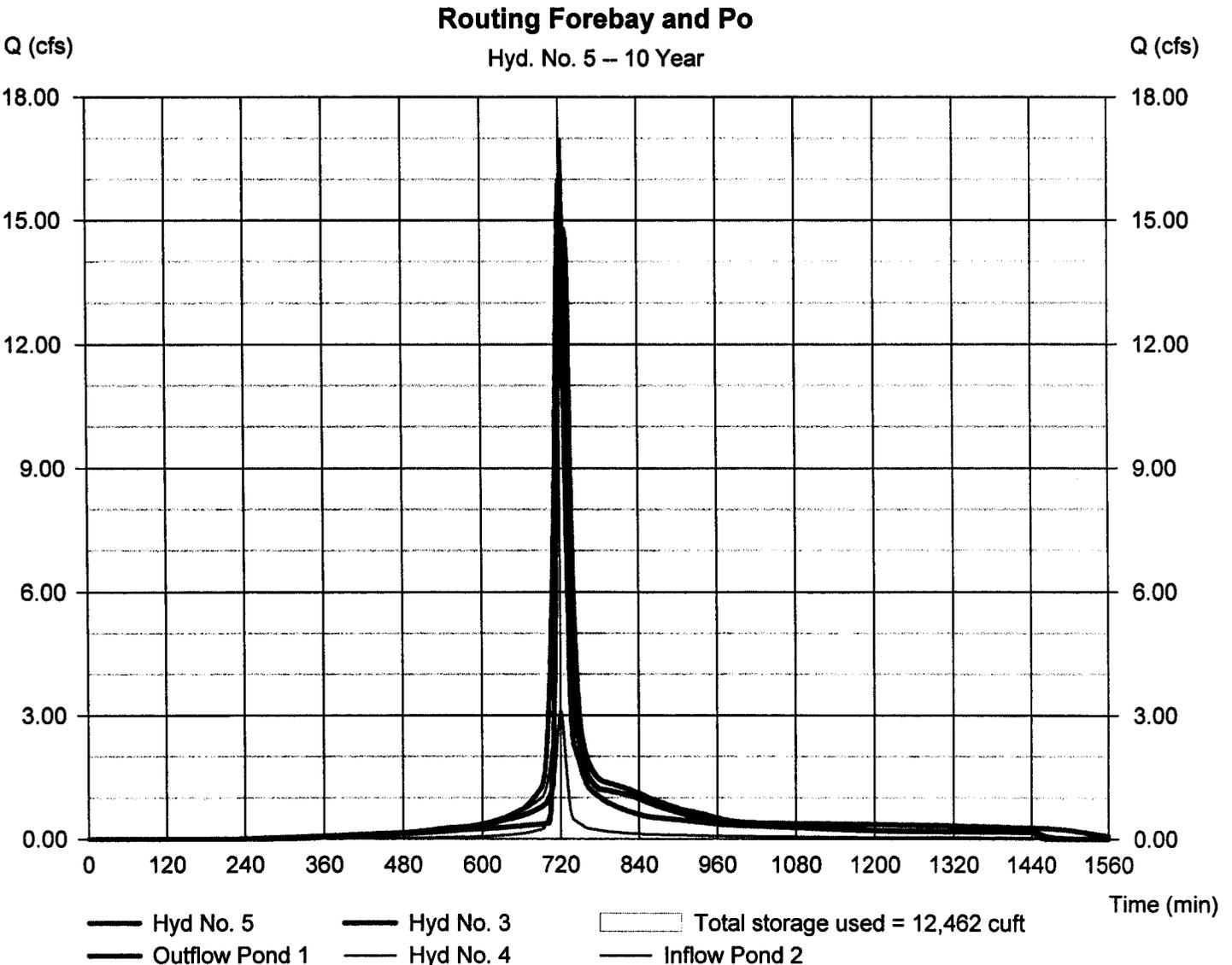
Pond name = Forebay
Inflow hyd. = 3 - Fire Admin Bldg
Max. Elevation = 77.68 ft
Max. Storage = 6,560 cuft

Peak discharge = 14.80 cfs
Time to peak = 726 min
Hyd. volume = 51,662 cuft

Lower Pond

Pond name = Main Pool
Other Inflow hyd. = 4 - Fire Statio
Max. Elevation = 74.66 ft
Max. Storage = 5,902 cuft

Interconnected Pond Routing. Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Friday, Aug 6, 2010

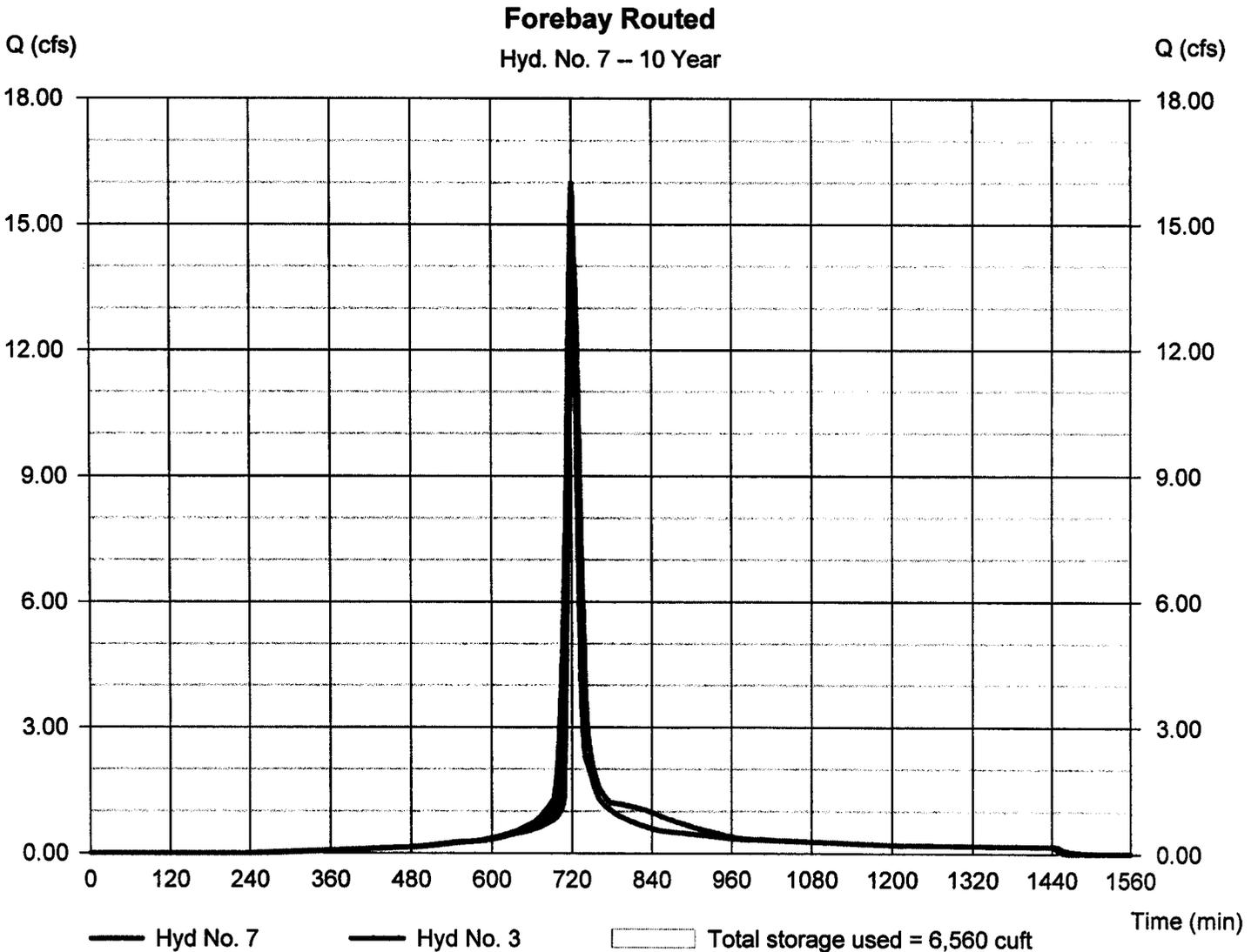
Hyd. No. 7

Forebay Routed

Hydrograph type = Reservoir
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyd. No. = 3 - Fire Admin Bldg
Reservoir name = Forebay

Peak discharge = 14.24 cfs
Time to peak = 724 min
Hyd. volume = 43,261 cuft
Max. Elevation = 77.68 ft
Max. Storage = 6,560 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

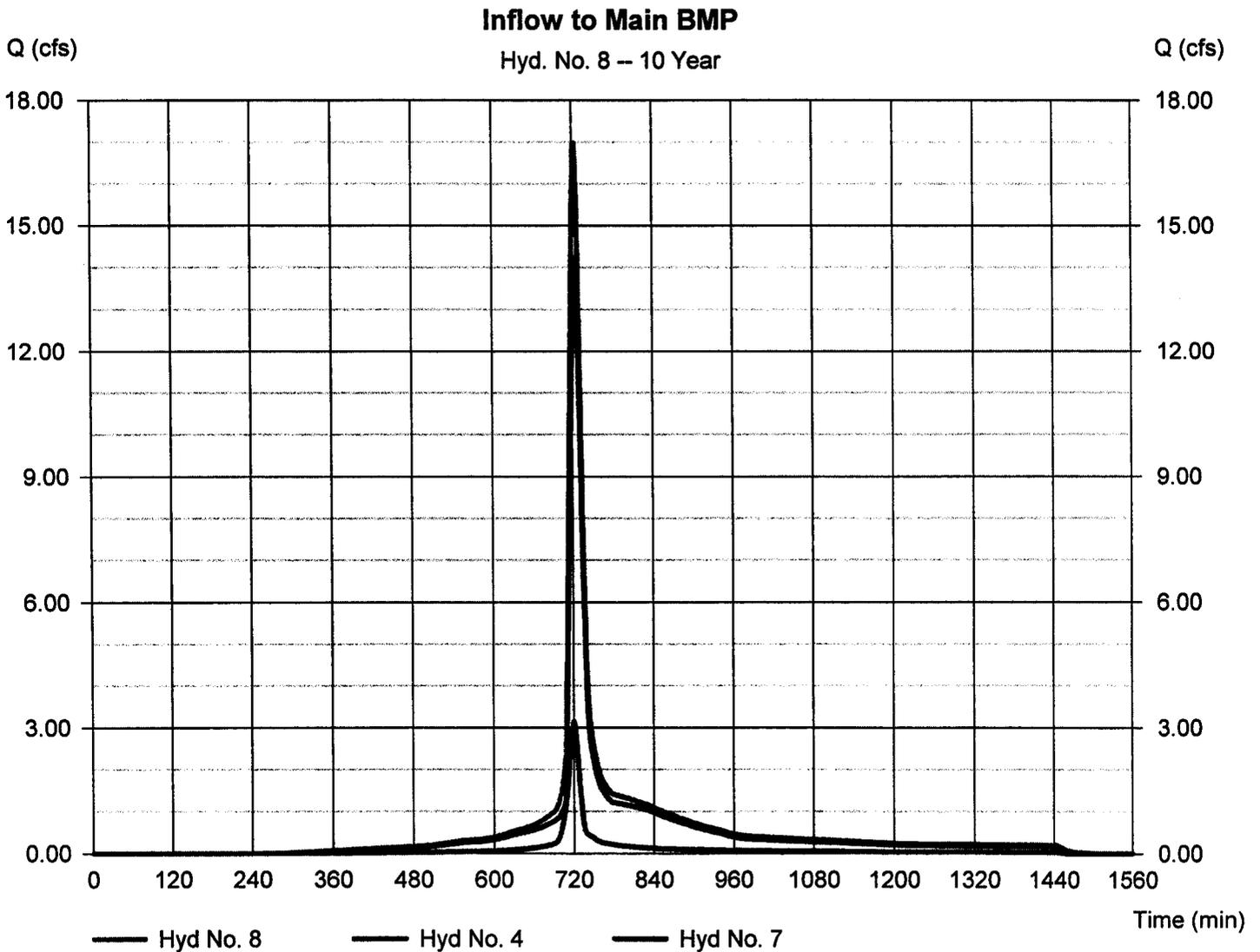
Friday, Aug 6, 2010

Hyd. No. 8

Inflow to Main BMP

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 4, 7

Peak discharge = 16.98 cfs
Time to peak = 724 min
Hyd. volume = 51,599 cuft
Contrib. drain. area = 0.540 ac



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Friday, Aug 6, 2010

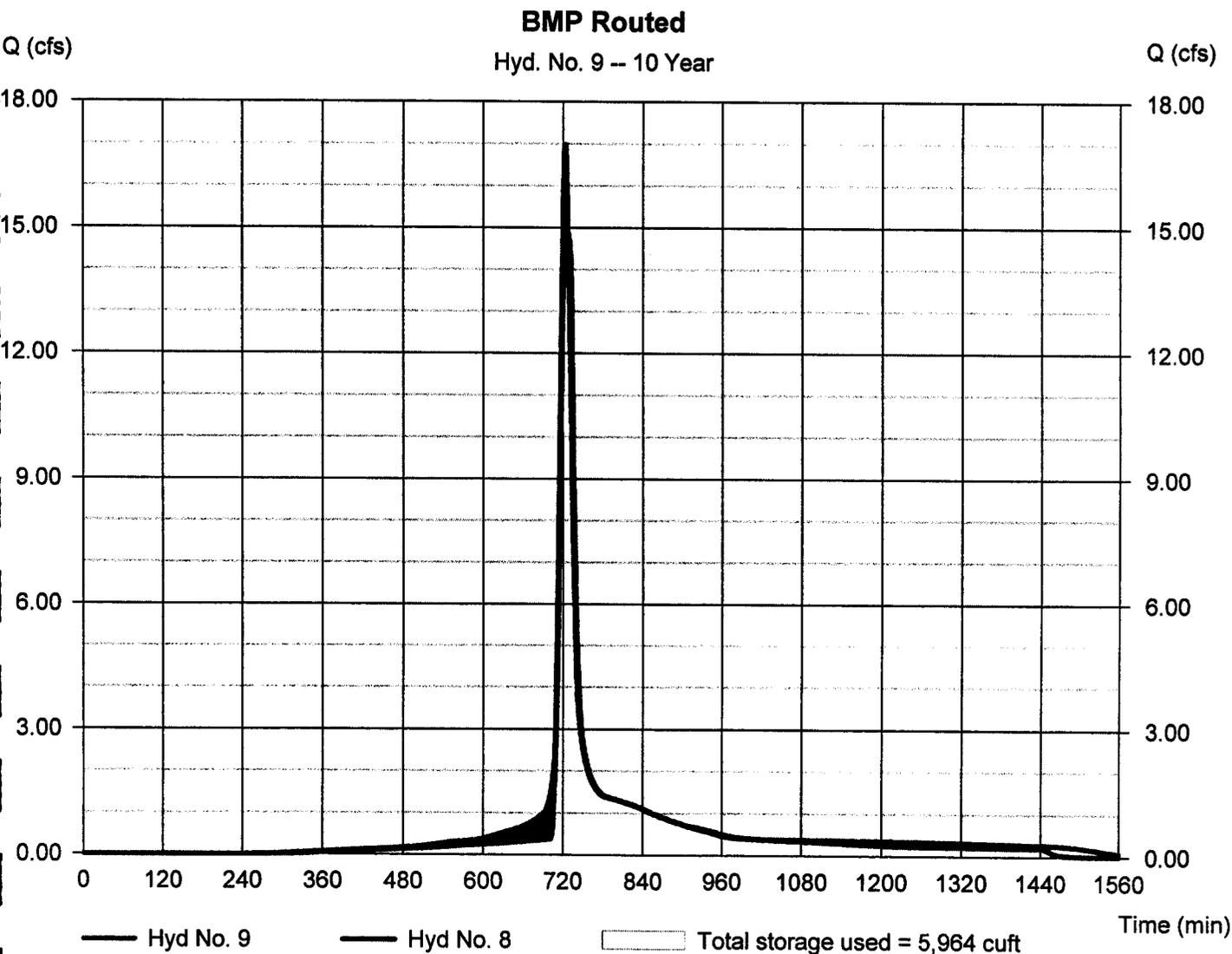
Hyd. No. 9

BMP Routed

Hydrograph type = Reservoir
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyd. No. = 8 - Inflow to Main BMP
Reservoir name = Main Pool

Peak discharge = 14.87 cfs
Time to peak = 728 min
Hyd. volume = 51,596 cuft
Max. Elevation = 74.68 ft
Max. Storage = 5,964 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

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	SCS Runoff	27.72	2	720	75,812	---	---	---	Predevelopment	
3	SCS Runoff	23.49	2	720	65,082	---	---	---	Fire Admin Bldg	
4	SCS Runoff	4.708	2	720	12,799	---	---	---	Fire Station	
5	Reservoir(i)	17.15	2	730	77,986	3, 4	78.00	18,632	Routing Forebay and Po	
7	Reservoir	22.91	2	722	65,078	3	78.00	7,774	Forebay Routed	
8	Combine	27.48	2	722	77,876	4, 7	---	---	Inflow to Main BMP	
9	Reservoir	17.21	2	730	77,873	8	75.78	11,021	BMP Routed	
9801-E-31_Pond-REC.gpw					Return Period: 100 Year		Friday, Aug 6, 2010			

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Friday, Aug 6, 2010

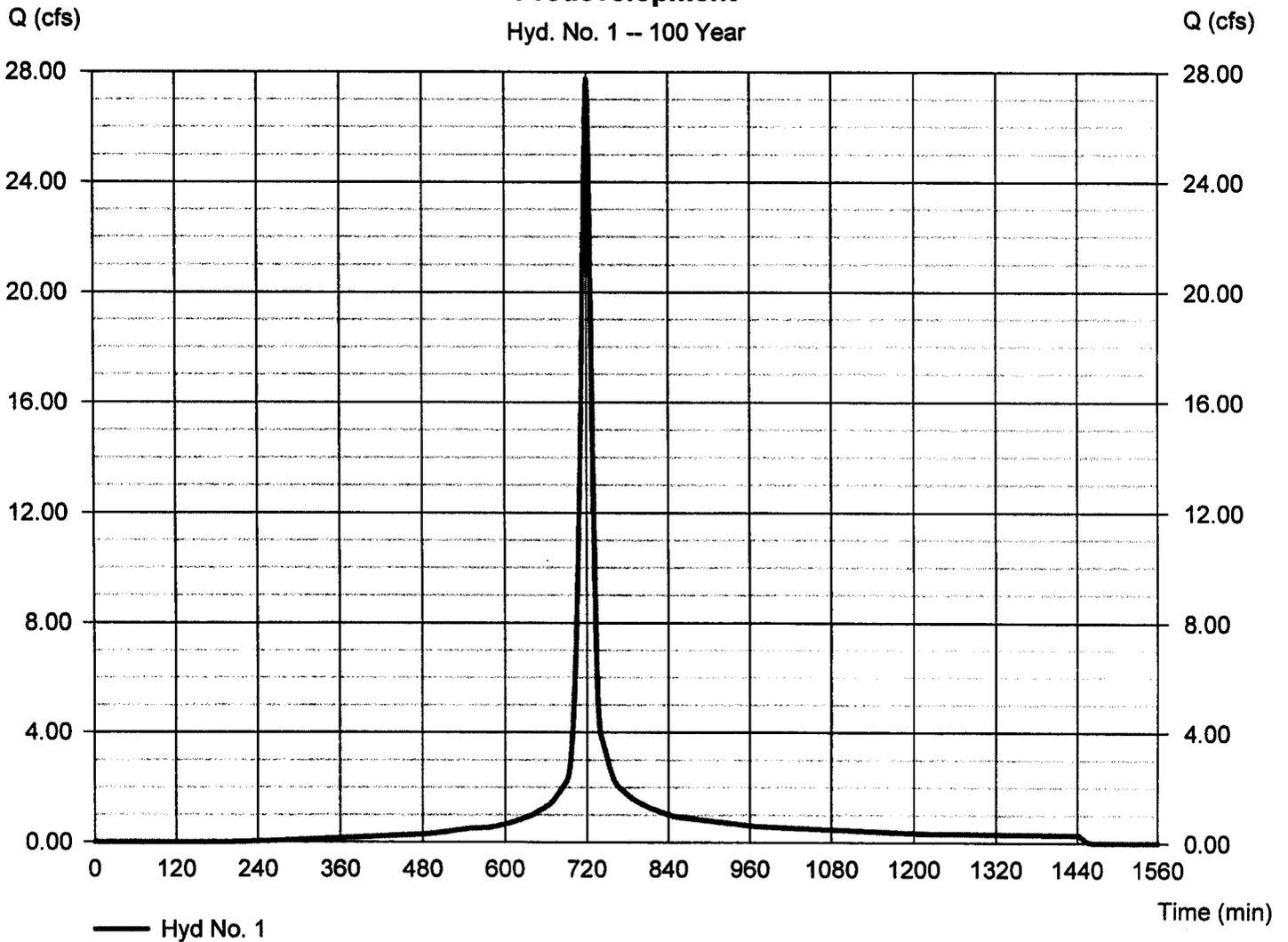
Hyd. No. 1

Predevelopment

Hydrograph type = SCS Runoff
Storm frequency = 100 yrs
Time interval = 2 min
Drainage area = 3.140 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 8.00 in
Storm duration = 24 hrs

Peak discharge = 27.72 cfs
Time to peak = 720 min
Hyd. volume = 75,812 cuft
Curve number = 87
Hydraulic length = 0 ft
Time of conc. (Tc) = 10.00 min
Distribution = Type II
Shape factor = 484

Predevelopment
Hyd. No. 1 -- 100 Year



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

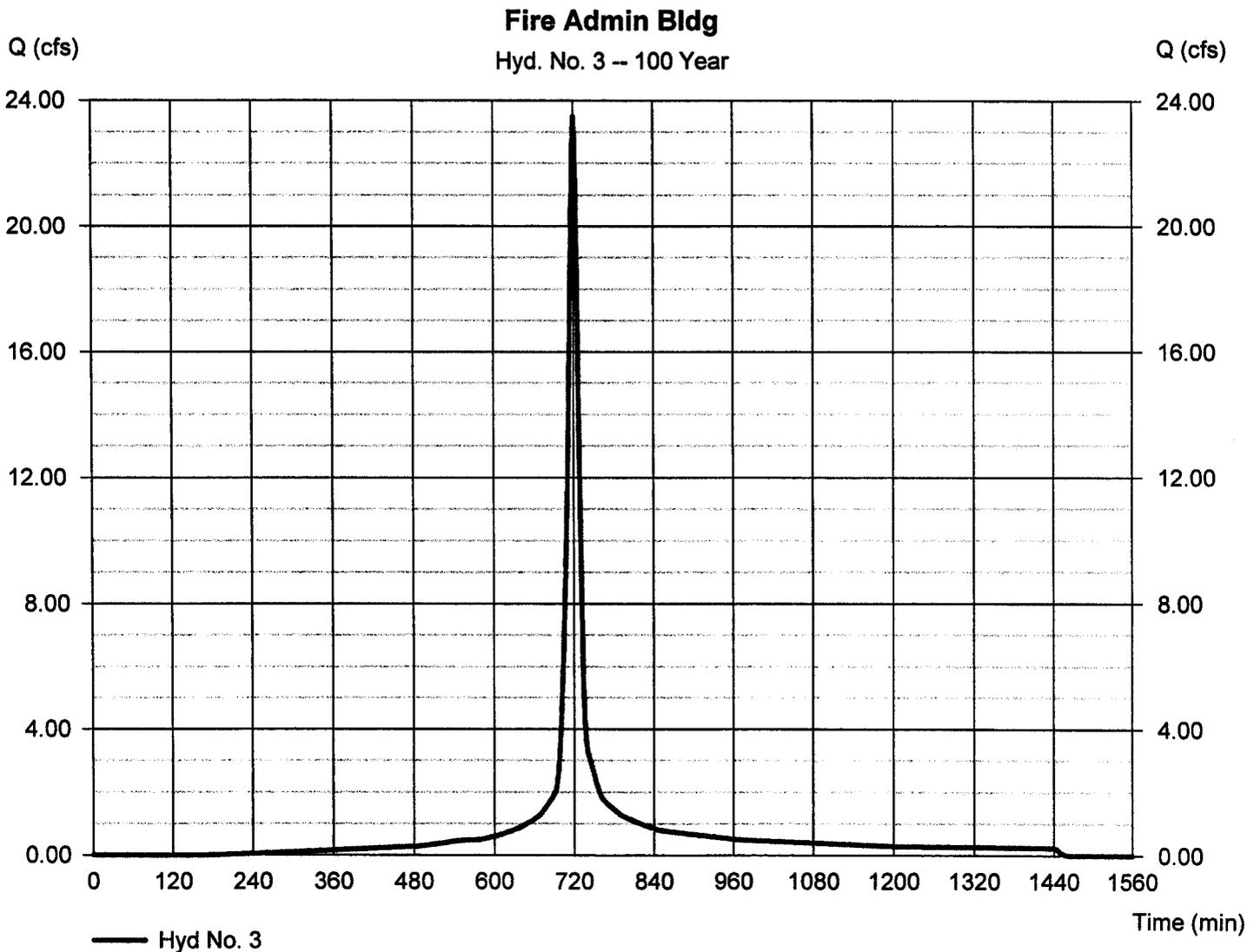
Friday, Aug 6, 2010

Hyd. No. 3

Fire Admin Bldg

Hydrograph type = SCS Runoff
Storm frequency = 100 yrs
Time interval = 2 min
Drainage area = 2.600 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 8.00 in
Storm duration = 24 hrs

Peak discharge = 23.49 cfs
Time to peak = 720 min
Hyd. volume = 65,082 cuft
Curve number = 89
Hydraulic length = 0 ft
Time of conc. (Tc) = 10.00 min
Distribution = Type II
Shape factor = 484



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

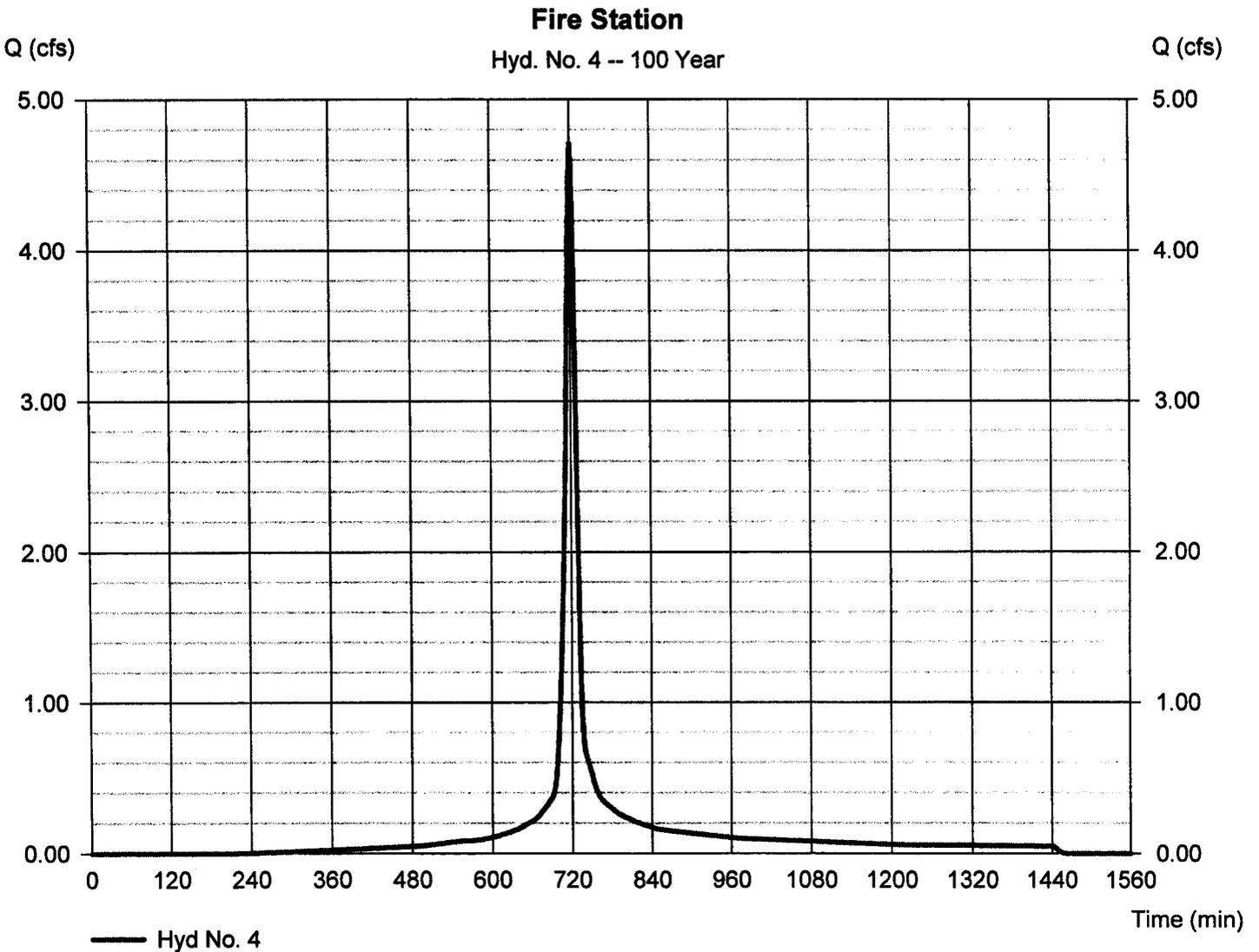
Friday, Aug 6, 2010

Hyd. No. 4

Fire Station

Hydrograph type = SCS Runoff
Storm frequency = 100 yrs
Time interval = 2 min
Drainage area = 0.540 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 8.00 in
Storm duration = 24 hrs

Peak discharge = 4.708 cfs
Time to peak = 720 min
Hyd. volume = 12,799 cuft
Curve number = 86
Hydraulic length = 0 ft
Time of conc. (Tc) = 10.00 min
Distribution = Type II
Shape factor = 484



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Friday, Aug 6, 2010

Hyd. No. 5

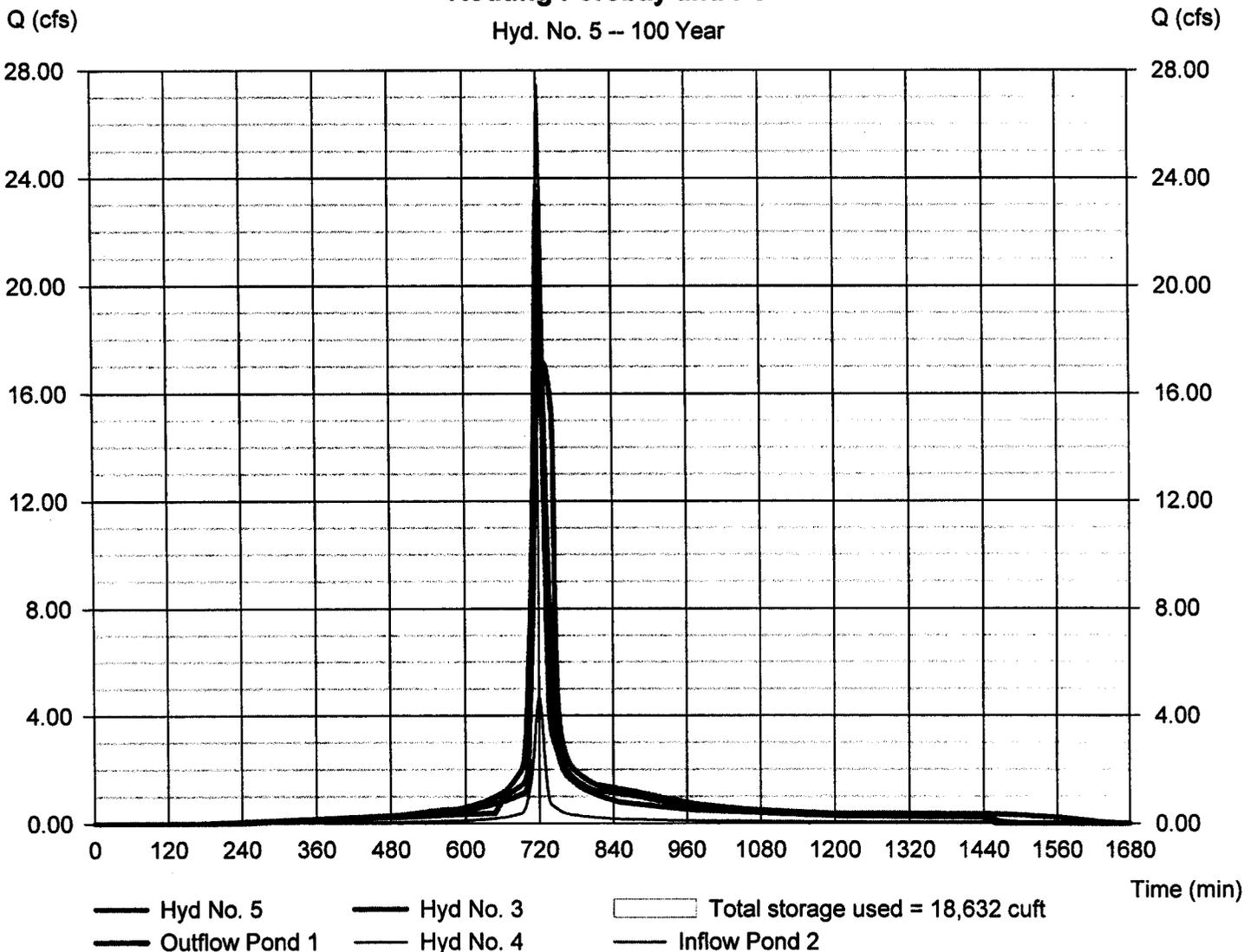
Routing Forebay and Po

Hydrograph type = Reservoir (Interconnected)
 Storm frequency = 100 yrs
 Time interval = 2 min
Upper Pond
 Pond name = Forebay
 Inflow hyd. = 3 - Fire Admin Bldg
 Max. Elevation = 78.00 ft
 Max. Storage = 7,776 cuft

Peak discharge = 17.15 cfs
 Time to peak = 730 min
 Hyd. volume = 77,986 cuft
Lower Pond
 Pond name = Main Pool
 Other Inflow hyd. = 4 - Fire Statio
 Max. Elevation = 75.75 ft
 Max. Storage = 10,856 cuft

Interconnected Pond Routing. Storage Indication method used.

Routing Forebay and Po
 Hyd. No. 5 -- 100 Year



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Friday, Aug 6, 2010

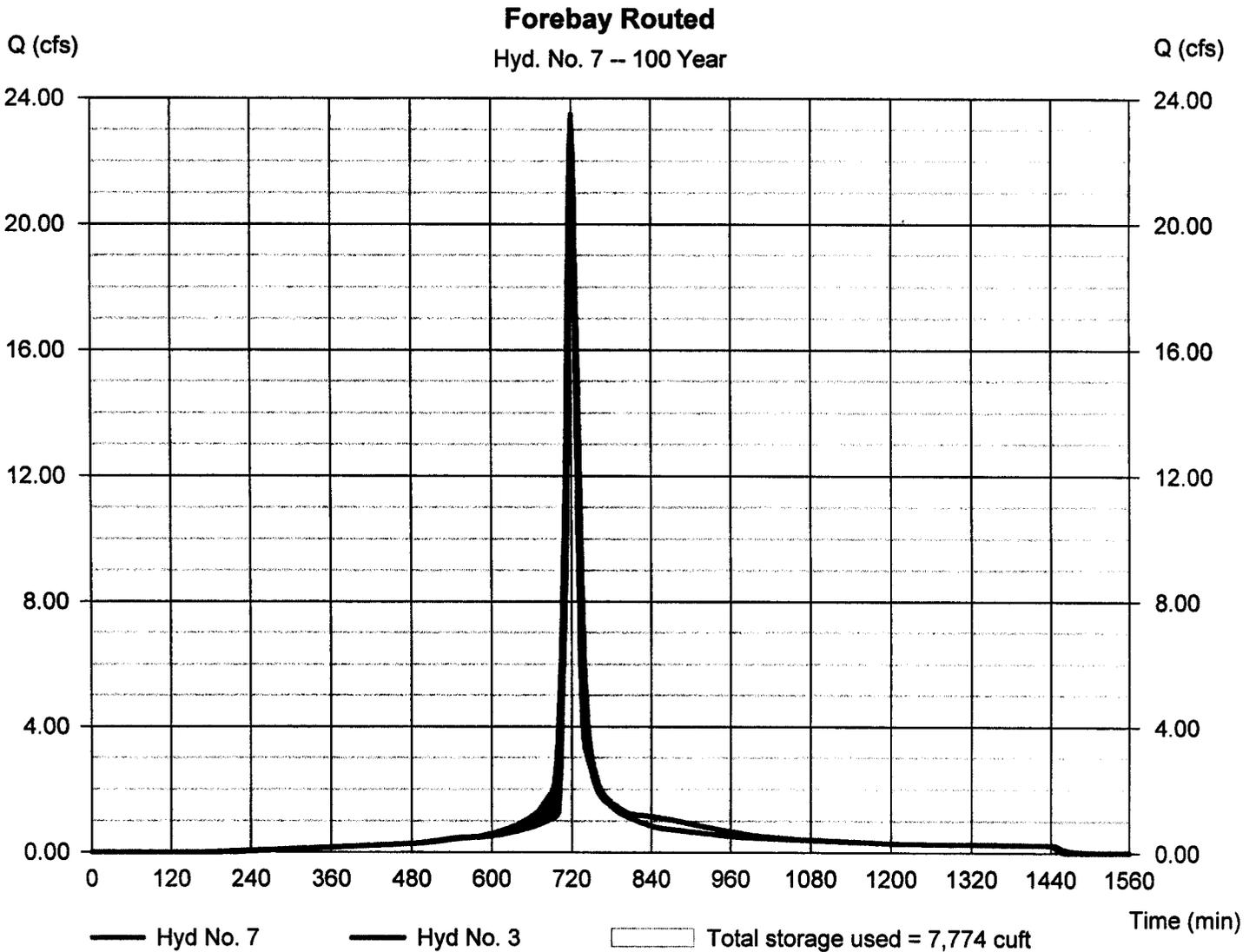
Hyd. No. 7

Forebay Routed

Hydrograph type = Reservoir
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyd. No. = 3 - Fire Admin Bldg
Reservoir name = Forebay

Peak discharge = 22.91 cfs
Time to peak = 722 min
Hyd. volume = 65,078 cuft
Max. Elevation = 78.00 ft
Max. Storage = 7,774 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

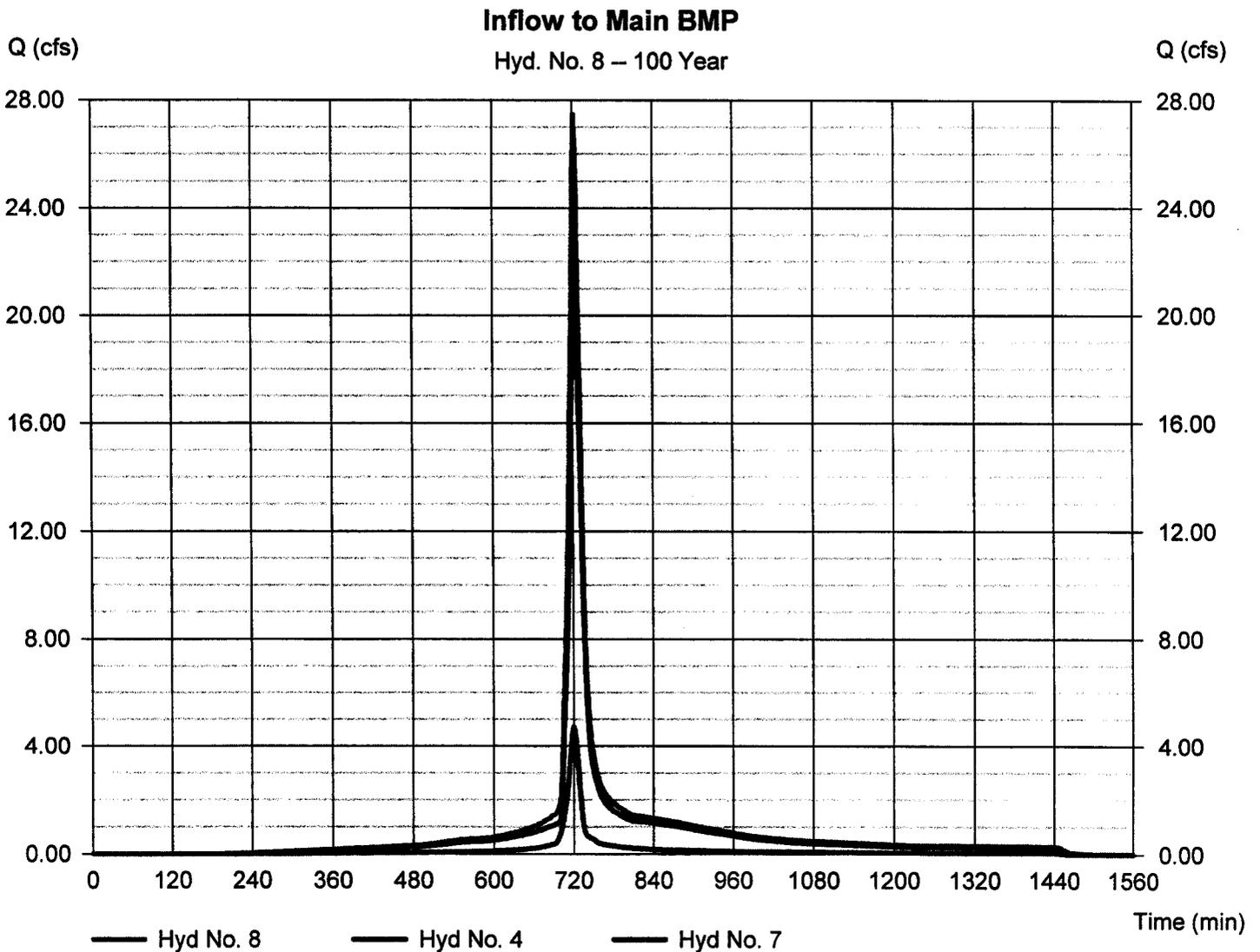
Friday, Aug 6, 2010

Hyd. No. 8

Inflow to Main BMP

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 4, 7

Peak discharge = 27.48 cfs
Time to peak = 722 min
Hyd. volume = 77,876 cuft
Contrib. drain. area = 0.540 ac



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Friday, Aug 6, 2010

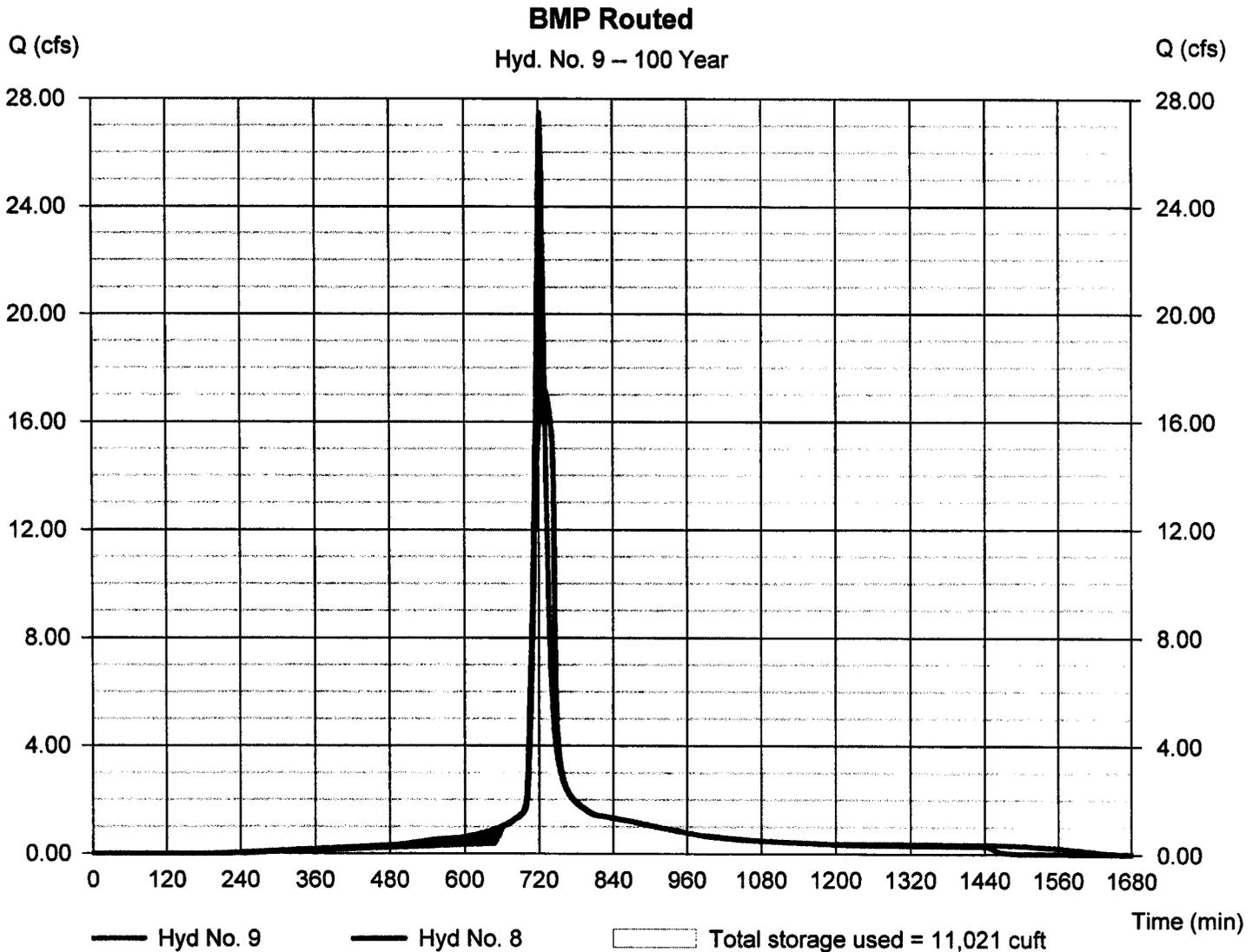
Hyd. No. 9

BMP Routed

Hydrograph type = Reservoir
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyd. No. = 8 - Inflow to Main BMP
Reservoir name = Main Pool

Peak discharge = 17.21 cfs
Time to peak = 730 min
Hyd. volume = 77,873 cuft
Max. Elevation = 75.78 ft
Max. Storage = 11,021 cuft

Storage Indication method used.



APPENDIX D

SOILS REPORT



**REPORT OF
SUBSURFACE EXPLORATION
AND GEOTECHNICAL ENGINEERING ANALYSIS**

**JAMES CITY COUNTY LAW ENFORCEMENT CENTER
IMPROVEMENTS
JAMES CITY COUNTY, VIRGINIA**

ECS PROJECT NO. 07:10723

For

**Mr. Shawn Gordon
James City County General Services
PO Box 8784
Williamsburg, Virginia 23187**

July 30, 2010



ECS MID-ATLANTIC, LLC

Geotechnical • Construction Materials • Environmental • Facilities

July 30, 2010

Mr. Shawn Gordon
James City County General Services
PO Box 8784
Williamsburg, Virginia 23187

ECS Job No. 07:10723

Reference: Report of Subsurface Exploration and Geotechnical Engineering Analysis
James City County Law Enforcement Center - Improvements
James City County, Virginia

Dear Mr. Gordon:

ECS Mid-Atlantic, LLC is pleased to provide you with this report of subsurface exploration and geotechnical engineering analysis for the proposed improvements to the existing facility as referenced above. Submitted herein are the results of our field and laboratory investigations and recommendations for geotechnical related design and construction aspects for the proposed project.

We appreciate the opportunity to provide consulting services to you during the design phase of this project. If you should have any questions regarding the information and recommendations contained in the accompanying report, or if we can be of further assistance, please do not hesitate to contact us.

Respectfully,

ECS MID-ATLANTIC, LLC

David J. Gordinier, P.E.
Geotechnical Engineer



Michael J. Galli, P. E.
Principal Engineer

Distribution: (1) Client via email
(1) AES Consulting Engineers (bob.cosby@aesva.com)

MJG:DJG

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1.0 PROJECT OVERVIEW

Our professional services for this project were performed in general accordance with your authorization of ECS Proposal No. 07:15135 dated May 4, 2010. The site information was obtained from an original undated site plan depicting the planned improvements and a later drawing dated June 17, 2010 prepared by AES Consulting Engineers.

1.1 Project Characteristics

The project will comprise the construction of two, one-story additions to the existing Law Enforcement Center building and parking lot expansions. The parking lot expansions will increase pavement areas for the Law Enforcement Center as well as the adjoining Fire Station facility. A new 2 ft tall segmental block retaining wall is proposed on the north side of the site between the Law Enforcement Center and Fire Station. Also proposed is a dry drainage swale that will be located on the southern portion of the site behind the new parking expansion proposed for the Law Enforcement Center.

The building additions are expected to be constructed of wood or light gauge steel framed construction with masonry bearing walls and a slab-on-grade floor. We have assumed structural loads will not exceed about 40 kips and 3 kips per linear foot for columns and walls, respectively. Finished floor elevations will be within about 2 feet of existing grades. Traffic on the site pavements will be limited to automobiles for the Law Enforcement Center but fire trucks for the Fire Station side of the property.

1.2 Scope of Work

The conclusions and recommendations contained in this report are based on seven (7) Standard Penetration Test (SPT) borings performed with an ATV-mounted drill rig and one (1) hand auger.

The borings were located in the field by ECS personnel based on the site plan provided to this office prepared by AES Consulting Engineers, using existing site features as a reference. The approximate boring and field sampling locations are shown on the Boring Location Plan provided in Appendix I.

Laboratory testing was performed on representative soil samples obtained during the field exploration to aid in the evaluation of the soils' engineering properties.

The recommendations contained herein were developed from our interpretation of the subsurface data obtained from the soil test borings and subsequent laboratory testing. The borings indicate subsurface conditions at specific locations at the time of the exploration. Conditions will vary between the borings. If, during the course of construction, significant variations appear evident, the Geotechnical Engineer should be informed so that the conditions can be addressed.

1.3 Purpose of Exploration

The purpose of this exploration was to explore the soil and groundwater conditions at the site in order to develop geotechnical engineering recommendations to aid in the design and construction of this project. This purpose was accomplished by:

- Advancing soil test borings to explore the subsurface soil and groundwater conditions.
- Performing laboratory tests on representative soil samples obtained from the borings to evaluate pertinent engineering properties.
- Analyzing the field and laboratory data to develop appropriate geotechnical engineering recommendations regarding development of earthwork specifications and the design of foundations, floor slabs, and pavements.

2.0 EXPLORATION PROCEDURES

This section describes the methods by which information was obtained during the subsurface exploration for the preparation of this report.

2.1 Subsurface Exploration Procedures

For this project, ECS performed seven (7) SPT borings (designated as B-1 through B-7) with an ATV-mounted drill rig at the approximate locations indicated on the Boring Location Plan. An

additional boring or hand auger boring was performed, B-8, in lieu of an SPT boring due to utility conflicts at the site.

Drilling services were provided by SDS, LLC of Toano, Virginia. Representative samples were obtained from the soil test boring by means of the split-barrel sampling procedure in accordance with ASTM Specification D 1586-99 (Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils). Samples were taken continuously to a depth of 10 feet, and at 5-foot intervals thereafter. In this procedure, a 2.25 inch O.D., split barrel sampler is driven into a soil a distance of 24 inches by a 140-pound hammer falling 30 inches. The first 6-inch increment is considered the seating interval. The number of blows required to drive the sampler through the next two 6-inch intervals is designated the Standard Penetration Test or the SPT "N" value and is indicated for each sample on the boring logs.

The hand auger boring utilizes a 3-inch diameter bucket auger. The auger is advanced into the ground generally in 6-inch intervals and the soil is extracted for visual inspection. This method can not determine the exact consistency or density of in place soils. Rather, it is used to determine the general soil types and can provide a general indication of the consistency or density of in-place soils by the ease of which the hand auger turns and advances

After recovery, representative portions of each sample were removed from the sampler, placed in sealed glass jars or plastic bags, and returned to the laboratory for laboratory testing and further visual examination in accordance with ASTM D 2487 (United Soil Classification System). An experienced geotechnical engineer classified each soil sample on the basis of texture and plasticity in accordance with the Unified Soil Classification System (USCS). The group symbol for each soil type is indicated in parentheses following the soil description 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. Individual soil test boring logs are included in Appendix II of this report. A description of the USCS and reference notes for the boring logs are included in Appendix III of this report.

The soil samples will be retained in our laboratory for a period of 60 days from the date of this report, after which they will be discarded unless written instructions are received as to their disposition.

A Boring Location Plan indicating soil test boring and hand auger boring locations is included in Appendix I.

2.2 Laboratory Testing Program

Representative soil samples from the borings were selected and tested in our laboratory to determine pertinent engineering properties. The laboratory testing program included visual classifications, moisture content, grain size analysis, and Atterberg Limits tests. Laboratory results are summarized in Appendix IV.

3.0 EXPLORATION RESULTS

3.1 Site Conditions

The overall site is currently developed with an existing Law Enforcement building and Fire Station, and associated parking areas. The area of the proposed additions to the Law Enforcement Building is open, level, and grass covered. The new parking areas, drainage swale, and retaining wall areas contained by both open and sparsely wooded areas and were generally level but with gently sloping terrain between the Law Enforcement and the Fire Station sites.

3.2 Subsurface Conditions

The site contained a 1 to 3 inch topsoil layer. Beneath the near surface topsoil, we encountered mixed deposits of Silty and Clayey SAND (SM and SC) and Sandy CLAY (CL). The coloring of these materials generally ranged from brown to orange-brown and gray. These soils extended to boring termination depths of 6 to 15 ft below existing site grades. Standard Penetration Test (SPT) N-Values in these natural materials generally ranged from 4 to 14 blows per foot (bpf). However, please note, we encountered refusal at depths of 6 to 15 ft at boring locations B-1, B-2, and B-6.

3.3 Groundwater Observations

We did not encounter the groundwater table at any of the boring locations. The location of the groundwater table can vary as a result of seasonal fluctuations in precipitation, evaporation, surface water runoff, local topography, and other factors not immediately apparent at the time of the exploration. Normally, the highest groundwater levels occur in the late winter and spring and lowest levels occur in the late summer and fall. Due to the near surface fine grained soils, perched water is possible within the top few feet.

We recommend that the contractor evaluate groundwater conditions prior to construction to determine their impact on the project.

4.0 ANALYSIS AND RECOMMENDATIONS

4.1 Subgrade Preparation and Earthwork Operations

Stripping: The subgrade preparation should consist of removing all topsoil and any other soft or unsuitable material from the expanded 5-foot building and 2-foot pavement limits. Topsoil was observed to be 1 to 3.0 inches in thickness. For planning purposes, a stripping depth of 4 to 6 inches could be assumed with the understanding that deeper stripping may be required in some areas to remove excessively soft and wet materials.

Subgrade Inspection and Verification:

After stripping of topsoil and other materials and cutting to the desired grade, and prior to footing construction or Structural Fill placement, the cut surface should be observed by an experienced Geotechnical Engineer or his authorized representative. Proofrolling using a 5-ton drum roller or a loaded tandem axle dump truck having an axle weight of at least 10 tons should be performed at this time to aid in identifying localized soft or unsuitable material. Any soft or unsuitable materials encountered during this proofrolling should be removed and replaced with an approved backfill (Structural Fill or Aggregate Base Material) compacted to the criteria outlined in the following paragraphs. Suitable materials which are excessively wet should be aerated, dried, and re-compacted to the specifications below. Existing subgrades should be moisture conditioned and compacted at this time. The contractor

should be prepared to moisture condition soils within the surface layer, particularly during typically wet seasonal conditions.

FILL could be present at the site. It is expected that the FILL is associated with the site grading operations during the original development. The stability of the FILL (if encountered) and subgrade surfaces in general should be verified by the Geotechnical Engineer at the time of proofrolling inspection.

Soils on this site within the top several feet consist of moisture-sensitive materials. Localized undercutting could be required to achieve a stable subgrade, depending on seasonal conditions at the time subgrades are exposed.

Subgrade and Structural Fill Compaction: Existing subgrades as well as subsequent layers of Structural Fill should be properly compacted as follows:

The existing subgrades within the expanded building and pavement limits to a depth of at least 8 inches should 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 D698). Field density testing of subgrades should be performed at a rate of no less than one test per 2,000 square feet in the building area and no less than one test per 5,000 square feet in pavement areas. Compaction of natural subgrade surfaces may be waived by the Geotechnical Engineer if they are observed to be stable during proofrolling inspection.

All Structural Fill within the building and pavement limits should 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 D698). Structural Fill lifts should be a maximum of 8 inches in loose thickness. Field density testing of each lift of fill should be performed at a rate of no less than one test per 2,000 square feet in the building area and no less than one test per 5,000 square feet in pavement areas, but not less than 2 tests per lift.

Structural Fill Materials: The following Structural Fill types are recommended for use on this project:

On-Site Borrow Structural Fill: Inorganic Soil Material classified as CL, SC, SM, SP, or better with a maximum 60% by weight Clay and Silt and a maximum Liquid Limit of 35 and maximum Plasticity Index of 15. Maximum aggregate size should be 4 inches. Most soils encountered by the borings (exclusive of topsoil) should be suitable for reuse as structural Fill. However, the upper soils were dry at the time of this exploration. On-site excavated materials may be difficult to work and compact and may require moisture conditioning. The use of granular, Imported Structural Fill below pavements and slabs will help protect the subgrades and aid in bridging unstable subgrade conditions.

Imported Structural Fill: Soil Material classified as SM, SP, or better containing a maximum 15% by weight Silt, and which is free of organics and debris. Maximum aggregate size should be 4 inches. Imported Structural Fill shall have a minimum CBR quality of 15.

Porous Fill: VDOT No. 57 Stone or clean SAND (SP) with a maximum of 5% fines employed in a minimum 4-inch layer or Aggregate Base Material, VDOT Type I, Size 21A employed in a minimum 6-inch layer.

Footing Excavation Backfill or backfill in areas which compaction equipment cannot access: VDOT Size No. 57 Stone or minimum 200 psi Flowable Fill placed at the direction of the Geotechnical Engineer.

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

It is recommended that all materials to be used for Structural Fill be analyzed and approved by the Geotechnical Engineer prior to their use on the site.

4.2 Foundation Design Recommendations

Bearing Pressure: Based on the results of our exploration, and considering the maximum anticipated foundation loads of 40 kips for columns and 4 kips/ft for walls, the proposed building additions can be supported by spread footings whose excavations have been prepared as discussed herein. Spread footings can be dimensioned for a net allowable soil bearing pressure of 3,000 psf. In order to develop this bearing capacity, all footings should have a minimum width of 24 inches. Footing excavations should penetrate any unsuitable materials or excessively loose soils.

Footing Embedment: The bottom of all footings should be located at a depth of at least 24 inches below finished exterior grades for bearing capacity and frost protection considerations. This embedment depth is considered appropriate for the Shrink-Swell capacity of the soils, which is estimated to be moderate to high.

Foundation Subgrade Preparation and Verification: The bearing capacity at the final footing elevation should be verified in the field by an experienced Geotechnical Engineer or his representative prior to concrete placement or backfilling with gravel or Flowable Fill to assure that the in-situ bearing capacity at the bottom of each footing excavation is adequate for the design loads. In areas where soft and/or unsuitable materials or excessively loose soils are undercut below the bottom of the footings, the footing undercut excavations should be backfilled to the original design subgrade elevation with Flowable Fill or an open-graded stone as recommended above.

Foundation Settlement: Provided the foundation design and construction recommendations discussed herein are employed, and considering the previously mentioned maximum foundation loading (40 kips for columns and 4 kif for walls), the total foundation settlement for the proposed building is estimated to be about 1 inch or less with differential settlements of approximately one-half this amount between columns and walls.

4.3 Seismic Site Classification

The Seismic Site Class, based on International Building Code guidelines (2006), was estimated for the site. The Seismic Site Class for the proposed building was determined from soil boring N-Value data and our experience with the soils in the project and surrounding areas. Based on Section 1615 of the International Building Code and our local experience, the project site is estimated to have a Seismic Site Class of D.

4.4 Floor Slab Design Recommendations

Slab Subgrade Preparation and Verification: For the design and construction of all slabs-on-grade for the proposed building additions, it is recommended that all soft, unstable, or unsuitable subgrade materials be removed from within the expanded 5-foot building limits. The Geotechnical Engineer should be called on to observe exposed subgrades and perform compaction testing of the subgrades to assure that adequate subgrade preparation has been achieved. A proofrolling using a drum roller or loaded dump truck should be performed in his presence at this time. Any excessively soft or unstable material should be removed from within the expanded 5-foot building limits. Once subgrades have been approved, new Structural Fill can be placed. Structural Fill required to establish the slab subgrade elevation should be placed and compacted to the criteria discussed in this report.

Porous Fill: For office and spaces with relatively light floor loads, the building floor slabs-on-grade should be directly supported by a minimum of 4 inches of Porous Fill. Porous Fill should consist of VDOT Size No. 57 Stone or clean SAND (SP) with a maximum of 5% fines. Alternatively, the Porous Fill in all slab areas can consist of a minimum 6 inches of Aggregate Base Material (VDOT Type I, Size 21A Stone). This densely graded aggregate (Size 21A) will help shed water and protect sensitive, underlying soils during wetter, winter weather. The Porous Fill layer will facilitate the fine grading of the subgrade, provide more uniform bearing conditions, and help minimize the rise of water to the bottom of the slab (capillary action). Porous Fill materials should be thoroughly compacted using a vibratory plate compactor prior to slab placement. A polyethylene vapor barrier should be employed above the Porous Fill in heated areas to provide additional moisture protection.

Subgrade Modulus: Provided the placement of Structural Fill and Porous Fill is per the recommendations discussed herein, the slabs may be designed assuming a Modulus of Subgrade Reaction, K_s , of 150 psi per inch.

4.5 Site Drainage and Dewatering

Drainage: Positive drainage away from the proposed building and pavement areas is an essential element in minimizing the adverse effects that water might have on the bearing soil's stability. Positive drainage should be provided around the perimeter of the building and pavement structures to minimize moisture infiltration into the foundation and/or subgrade soils. We recommend landscaped areas adjacent to the building be provided with a fall of least six inches for the first ten feet outward from the building perimeter. We recommend that gutters be employed on the building and that gutter effluent be discharged away from the building. Swales should be employed around the perimeter of all pavements to prevent migration of surface water into the base materials. Based on the anticipated finished grade elevations, underdrains for slabs (except depressed slabs) and foundation drains for footings (except retaining walls) are not considered necessary for this project. Foundation and wall drains are recommended for retaining walls, including elevator shaft walls. These drains should discharge to a suitable outlet.

Dewatering: Seepage from perched water may affect shallow excavations. This could be removed by pumping from sumps.

4.6 Pavement Design Recommendations

Subgrade Preparation: For the construction of new pavements, we recommend that any soft, unstable and/or unsuitable materials be removed from within the expanded 2 foot pavement limits and within 2 feet of the pavement subgrade surface. The exposed surface should be proofrolled and carefully observed at the time of construction in order to aid in identifying any localized soft or unsuitable materials. This material, where encountered, should be closely evaluated during construction and should be removed from below the pavement as required and/or considered necessary by the Geotechnical Engineer.

Design CBR: Based on the results of our soil test borings, it appears that the soils that will be exposed as pavement subgrades will consist mainly of Silty and Clayey SAND (SC) and Sandy CLAY (CL). We did not perform California Bearing Ratio testing. However, based on visual and minimal laboratory classification testing, we estimate a design CBR value of 6.

Minimum Pavement Sections JCC Law Enforcement Site: We have assumed an average daily traffic for the drive lane pavements of less than 500 VPD for the Law Enforcement Center. The pavement sections should consist of the minimum sections as provided below or match the existing pavement section for the various areas. Based on this, the following minimum pavement sections are suggested.

LIGHT DUTY PAVEMENT

(Parking Stalls)

- Asphalt Surface: - 2.0 inches Asphalt Surface Material Type SM-9.5A
- Aggregate Base: - 8.0 inches Aggregate Base Material 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.

HEAVY DUTY PAVEMENT

(Primary Drive Lanes and occasional truck access)

- Asphalt Surface: - 1.5 inches Asphalt Surface Material Type SM-9.5A
- Asphalt Base Course: - 3.0 inches Asphalt Base Material Type BM-25.0
- Aggregate Base: - 8.0 inches Aggregate Base Material 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.

The pavement sections provided above should be considered the minimum recommended section. Parking stalls not potentially subject to circulating traffic could employ a 6 inch Aggregate Base and 2 inch Asphalt Surface. However, the Civil Engineer should review actual traffic patterns to assure they are compatible with the minimum recommended sections.

We recommend that any dumpster pads (including the area the collection truck will be on while emptying the dumpster) be rigid (concrete) pavement sections. We recommend that concrete pavements be comprised of a minimum of 6 inches of Portland cement concrete having a minimum 28-day compression strength of 4,000 psi. The concrete should be air entrained and

should be reinforced with welded wire mesh-type reinforcement or Fibermesh concrete should be used. Construction joints or sawcut joints should be provided at a maximum spacing of 12 feet. Four inches of untreated aggregate base material, Type I - Size 21A/B, are recommended beneath exterior concrete pavements.

Minimum Pavement Section Fire Station Site:

The following pavement sections were preformed in accordance with AASHTO 1993 Design Methodology, our experience in the project area, and are recommended for this project. We understand that it is planned to use a heavy duty pavement cross section for structural reasons. The pavement will need to be designed to structurally accommodate the loads using an effective roadbed soil resistant modulus (M_R) of 9,000 psi/in. This value is found by 1500 multiplied by the CBR. The following sections are provided for rigid pavements based on wear from 18 kip Equivalent Single Axle Loads (ESALs) and a design life of 20 years:

Standard Duty Section

Concrete	- 6.0 inches Portland Concrete Cement, $f_c = 4,000$ psi
Aggregate Subbase	- 6.0 inches untreated Aggregate Base Material, 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 D-698)

Heavy Duty Section

Concrete	- 8 inches Portland Concrete Cement, $f_c = 4,000$.
Aggregate Subbase	- 12 inches untreated Aggregate Base Material, 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 D-698)

We recommend that the concrete be air entrained and should be reinforced with at least 7 gauge or greater galvanized welded wire mesh-type reinforcement (6 inch by 6 inch grid) or Fiber-mesh concrete should be used. However, due to the high wheel loads reinforcement may need to be increased for structural reasons. Construction joints or sawcut joints should be provided at a maximum spacing of 12 feet.

Pavement Drainage: An important consideration with regard to the design and construction of pavements is surface and subsurface drainage. Where standing water develops, either on the pavement surface or within the base course layer, softening of the subgrade and other problems related to the deterioration of the pavement can be expected. Furthermore, good drainage should minimize the possibility of the subgrade materials becoming saturated over a long period of time. Based upon the results of the soil test borings, the groundwater table should not affect the performance of pavements; however, surface runoff water that is trapped during construction on the exposed subgrade soils could create localized deterioration of the soil's bearing capacity. Standing water that may develop on the surface of the pavement may be controlled by adequate design (surface graded to control runoff to desired locations - catch basins, drain inlets, gutters, etc.), adequate compaction of each lift of pavement section component material (to reduce localized settlements that result in ponding) and accurate grading of each lift of pavement section component material (to achieve the desired design grades). Standing water that may develop within the base course layer may be removed by installing weep holes in drainage structures and backfilling around the structures with No. 57 Stone, construction of drainage swales and diversion ditches, and proper backfill and grading behind curbs to minimize water intrusion from behind the curbs.

Pavement subdrains or drainage ditches should be provided behind curbs in cut areas where the grades behind the curb slope toward the pavements. The invert elevation of swales should be at least 1 foot below the pavement subgrade level. Pavement subdrains should be extended to an appropriate discharge point.

4.7 Infiltration Design Recommendations

We understand a dry drainage swale is proposed on the southern portion of the site behind the parking expansion of the Law Enforcement building. Based on planned grades, the bottom of the basin will be about 2 ft below site grades at its lowest point. We performed three (3) borings, B-3, B-4, and B-5 in general alignment with the infiltration basin. We generally encountered mixed deposits of Silty and Clayey SAND and Sandy CLAY (CL) within the proposed drainage basin. Based on the USDA Textural Classification system, the soil types encountered range from Hydrologic Soil Grouping of B to D. Based on visual and laboratory classification, estimated infiltration rates are 0.52 inches to 0.02 inches per hour.

Typically, soils with the Hydrologic Soil Group designations of A and B are considered suitable for infiltration purposes. Some soils designated as C type soils are considered suitable for infiltration practices but these soils would need to be evaluated on a case specific basis. Soils with group designations of D are not considered suitable.

In summary, infiltration rates are estimated to be relatively slow. Even though granular in nature, the tested soils are not expected to infiltrate well due to their in place density, as indicated by the relatively high N-values shown on the logs.

4.8 Construction Considerations

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

In a dry and undisturbed state, the subgrade soils at the site will provide moderate subgrade support for Engineered Fill placement and construction operations. However, when wet, these soils will degrade quickly either with or without disturbance from contractor operations. Therefore, positive site drainage should be maintained during earthwork operations so as to help maintain the stability of the soil. We recommend that the design depths of stone be placed in the pavement areas early in the construction so as to help protect these subgrades. Any subgrades left exposed to precipitation will quickly degrade, regardless of the construction traffic exposure. Attempting site work during adverse seasonal conditions will have significant effect on the site work budget as substantially more undercutting may be required. Ideally, earthwork should be performed during the summer or early fall (typically drier and warmer months).

All Structural 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 on a full-time basis by the Geotechnical Engineer or their qualified representative to determine if minimum earthwork and compaction requirements are being met.

5.0 CLOSING

This report has been prepared for the exclusive use of the client for specific application to the project described herein. Our conclusions and recommendations have been rendered in a manner consistent with the level and skill ordinarily exercised by members of the geotechnical engineering profession in the Commonwealth of Virginia. No other warranty is expressed or implied.

Our conclusions and recommendations are based on design information furnished to us and our experience with similar projects. They do not necessarily reflect variations in the subsurface conditions, which can occur between borings or in unexplored areas of the site, due to geologic characteristics of the region or past land use. Should such variations become apparent during construction, it will be necessary to reevaluate our conclusions and recommendations based upon our site observations of the conditions.

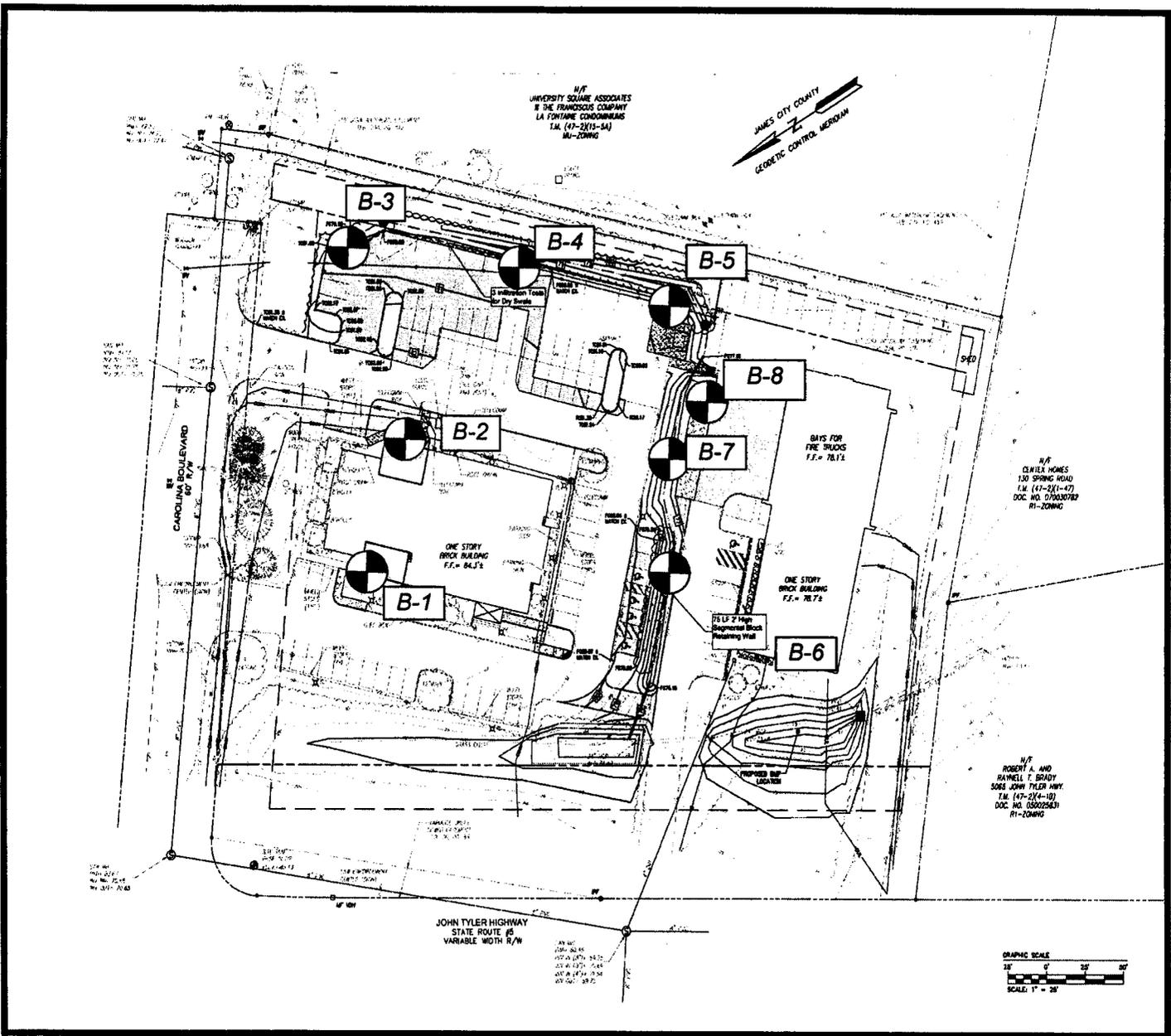
Field observations, monitoring, and quality assurance testing during earthwork and foundation installation are an extension of and integral to the geotechnical design recommendation. We recommend that the owner retain these services and we be allowed to continue our involvement throughout these phases of construction. ECS is not responsible for the conclusions, opinions or recommendations of others based on the data in this report.

APPENDICES

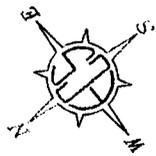
- APPENDIX I Boring Location Plan**
- APPENDIX II Soil Test Boring Logs**
- APPENDIX III Unified Soil Classification System and
Reference Notes for Boring Logs**
- APPENDIX IV Laboratory Test Summary**

APPENDIX I

Boring Location Plan



LEGEND



 - Approximate Boring Location

SCALE

GRAPHIC

SOURCE

AES Consulting Engineers

DATED:
05/17/10



FIGURE 1

BORING LOCATION PLAN
JCC Law Enforcement Center
James City County, VIRGINIA

ECS PROJECT NO. 07:10723

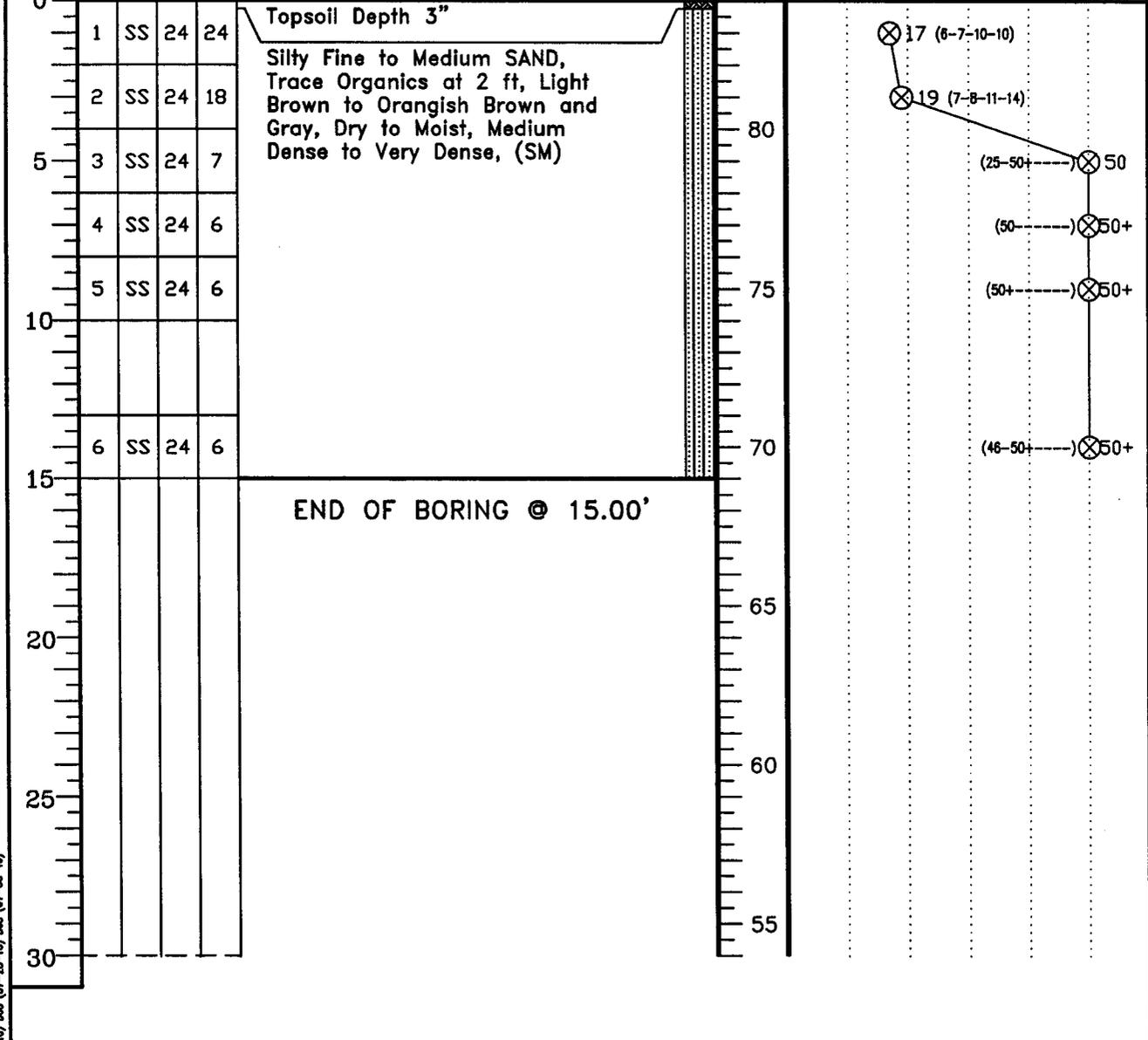
APPENDIX II

Soil Test Boring Logs

CLIENT James City County	JOB # 07:10723	BORING # B-1	SHEET 1 OF 1	ECS LLC MID-ATLANTIC
PROJECT NAME JCC Law Enforcement Center	ARCHITECT-ENGINEER AES Consulting Engineers			

SITE LOCATION
James City County, Virginia

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVELS ELEVATION (FT)
					BOTTOM OF CASING LOSS OF CIRCULATION 100%		
SURFACE ELEVATION					84.00		



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

∇ WL DRY	WS OR	BORING STARTED	6/4/10	
∇ WL(BCR)	∇ WL(ACR)	BORING COMPLETED	6/4/10	CAVE IN DEPTH ● 13 ft
∇ WL		RIG ATV	FOREMAN SDS	DRILLING METHOD SSA

D.E. (07-27-10) D.A.E. (07-28-10) D.A.E. (07-28-10) D.A.E. (07-30-10)

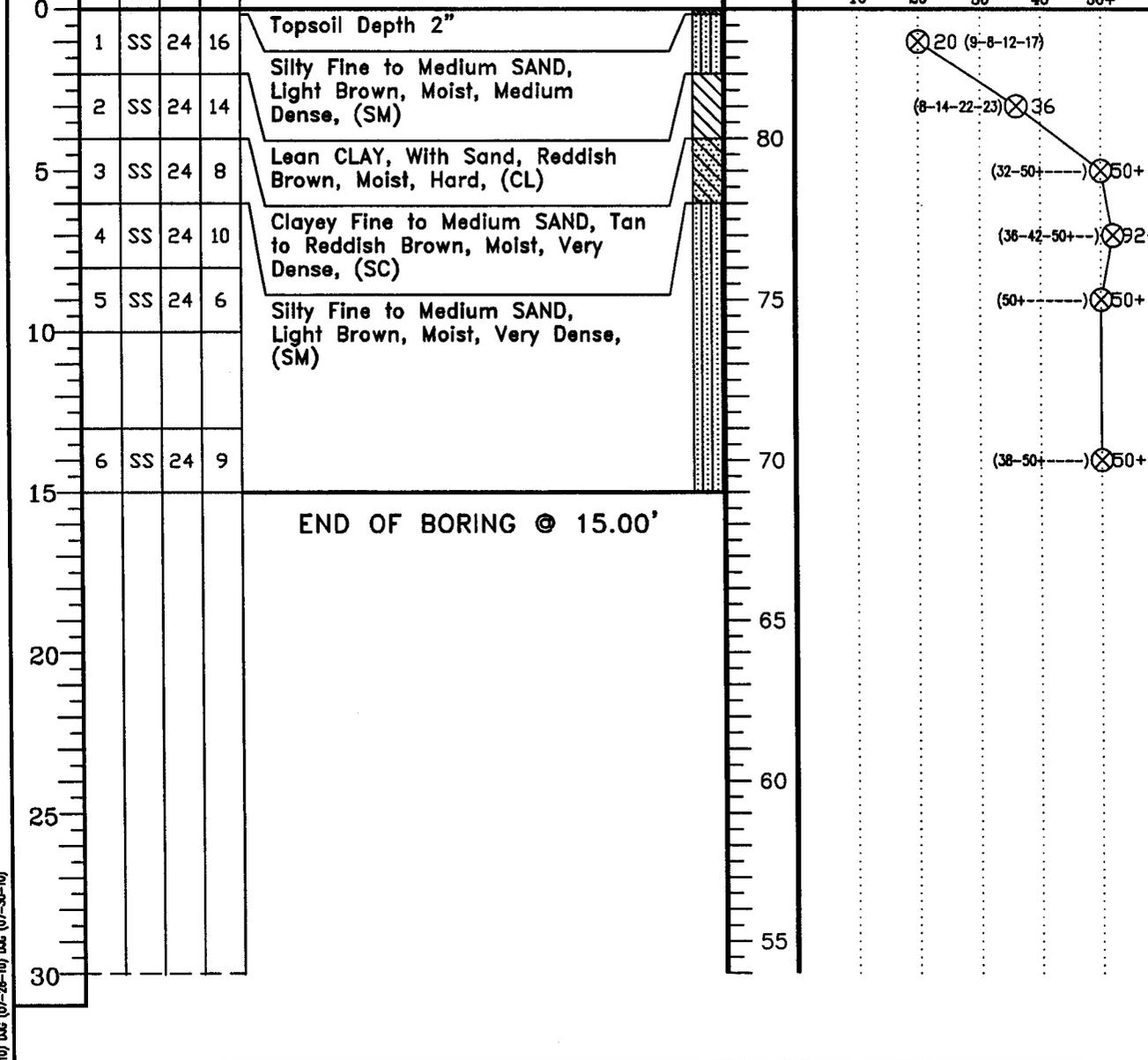
Dorland

CLIENT James City County	JOB # 07:10723	BORING # B-2	SHEET 1 OF 1	ECS LLC MID-ATLANTIC
PROJECT NAME JCC Law Enforcement Center	ARCHITECT-ENGINEER AES Consulting Engineers			

SITE LOCATION
James City County, Virginia

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVELS ELEVATION (FT)	
0					TOPSOIL Depth 2"			
1	1	SS	24	16	Silty Fine to Medium SAND, Light Brown, Moist, Medium Dense, (SM)	100%		
2	2	SS	24	14				
5	3	SS	24	8	Lean CLAY, With Sand, Reddish Brown, Moist, Hard, (CL)		80	
	4	SS	24	10	Clayey Fine to Medium SAND, Tan to Reddish Brown, Moist, Very Dense, (SC)			
	5	SS	24	6				
10					Silty Fine to Medium SAND, Light Brown, Moist, Very Dense, (SM)			
	6	SS	24	9				
15	END OF BORING @ 15.00'							

CALIBRATED PENETROMETER TONS/FT. ²				
1	2	3	4	5+
PLASTIC LIMIT %	WATER CONTENT %		LIQUID LIMIT %	
X	●		Δ	
ROCK QUALITY DESIGNATION & RECOVERY				
ROD% --- REC.%				
20% --- 40% --- 60% --- 80% --- 100%				
STANDARD PENETRATION BLOWS/FT.				
10	20	30	40	50+



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

∇WL DRY	WS OR (D)	BORING STARTED	6/4/10	
∇WL(BCR)	∇WL(ACR)	BORING COMPLETED	6/4/10	CAVE IN DEPTH ● 13 ft
∇WL		RIG ATV	FOREMAN SDS	DRILLING METHOD SSA

D&G (07-27-10) D&G (07-28-10) D&G (07-30-10)

D&G (07/30/2010 02:36:17 pm)

CLIENT James City County	JOB # 07:10723	BORING # B-3	SHEET 1 OF 1	ECS LLC MID-ATLANTIC
PROJECT NAME JCC Law Enforcement Center	ARCHITECT-ENGINEER AES Consulting Engineers			

SITE LOCATION
James City County, Virginia

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVELS ELEVATION (FT)
					BOTTOM OF CASING LOSS OF CIRCULATION 100%		
SURFACE ELEVATION					80.00		

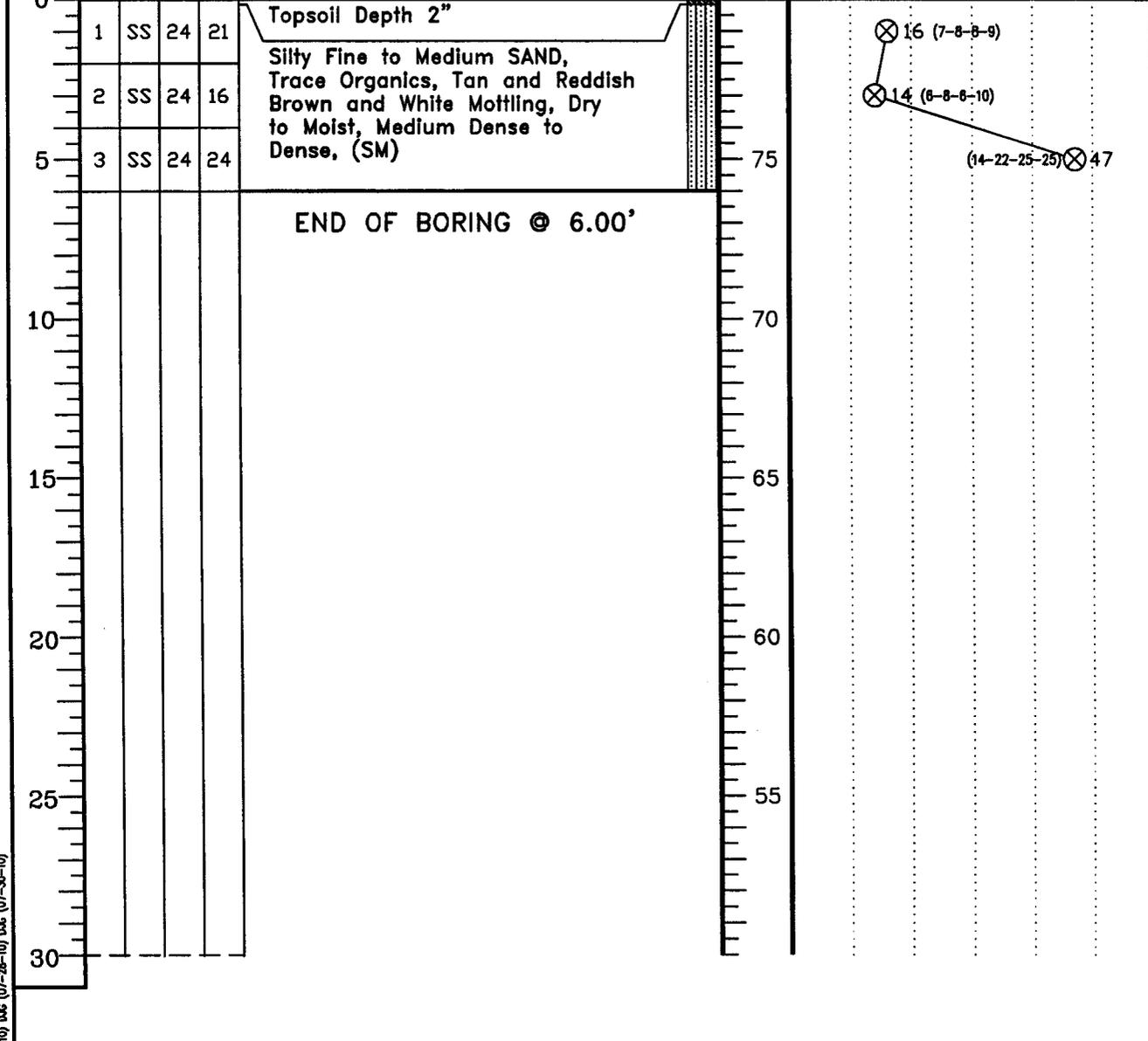
○ CALIBRATED PENETROMETER
TONS/FT. ²

1 2 3 4 5+

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

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

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



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

∇ WL DRY	WS OR	BORING STARTED	6/4/10	
∇ WL(BCR)	∇ WL(ACR)	BORING COMPLETED	6/4/10	CAVE IN DEPTH ● None
∇ WL		RIG ATV	FOREMAN SDS	DRILLING METHOD SSA

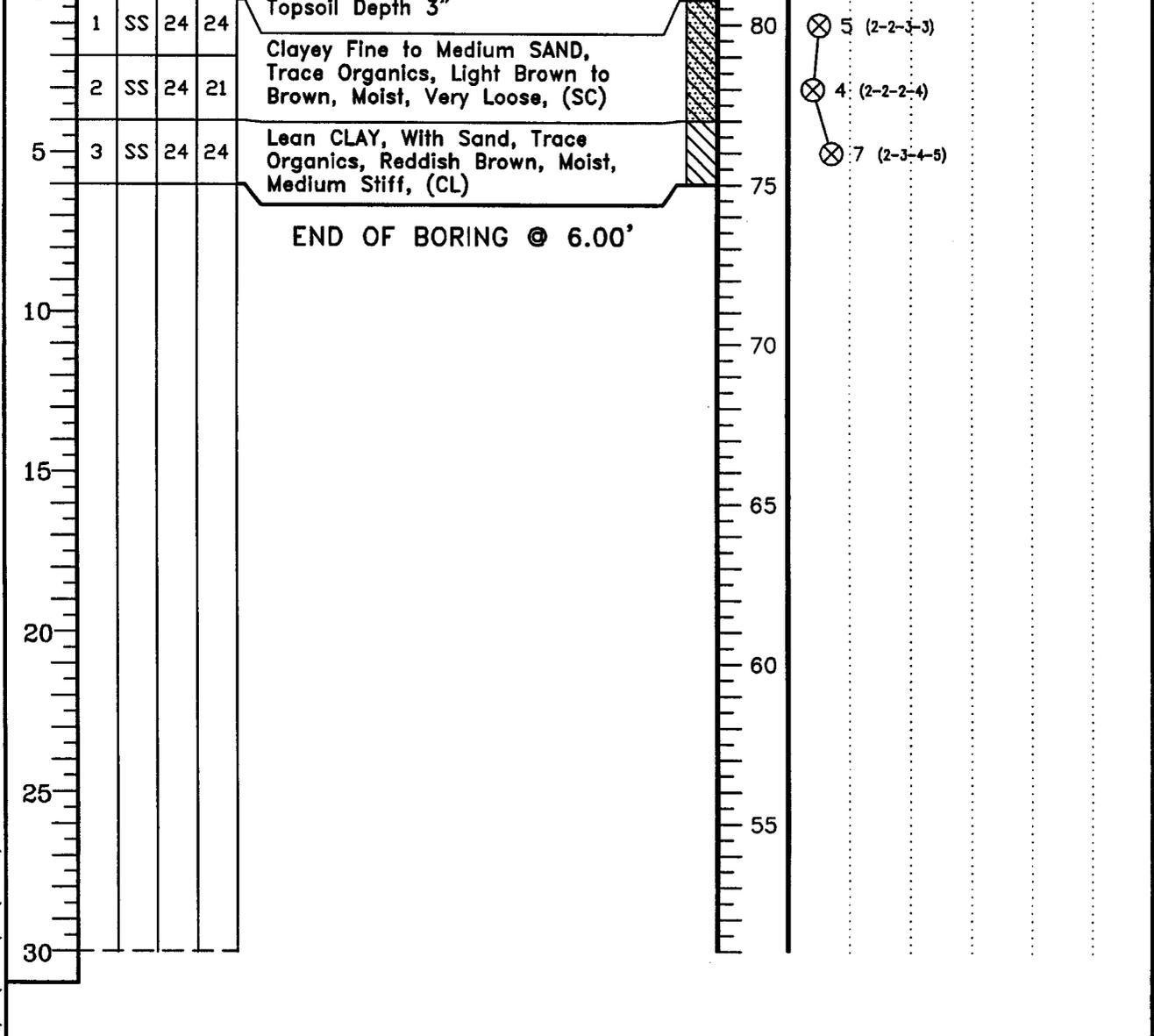
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CLIENT James City County	JOB # 07:10723	BORING # B-4	SHEET 1 OF 1	ECS LLC MID-ATLANTIC
PROJECT NAME JCC Law Enforcement Center	ARCHITECT-ENGINEER AES Consulting Engineers			

SITE LOCATION
James City County, Virginia

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVELS ELEVATION (FT)
					BOTTOM OF CASING LOSS OF CIRCULATION 100%		
SURFACE ELEVATION					81.00		



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

∇ WL DRY	WS OR	BORING STARTED	6/4/10	
∇ WL(BCR)	∇ WL(ACR)	BORING COMPLETED	6/4/10	CAVE IN DEPTH • None
∇ WL		RIG ATV	FOREMAN SDS	DRILLING METHOD SSA

DAS (07-27-10) DAS (07-28-10) DAS (07-28-10) DAS (07-30-10)

DAS (07-27-10) DAS (07-28-10) DAS (07-28-10) DAS (07-30-10)

CLIENT James City County	JOB # 07:10723	BORING # B-5	SHEET 1 OF 1	ECS LLC MID-ATLANTIC
PROJECT NAME JCC Law Enforcement Center	ARCHITECT-ENGINEER AES Consulting Engineers			

SITE LOCATION
James City County, Virginia

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVELS ELEVATION (FT)
					BOTTOM OF CASING LOSS OF CIRCULATION 100%		
SURFACE ELEVATION					80.00		

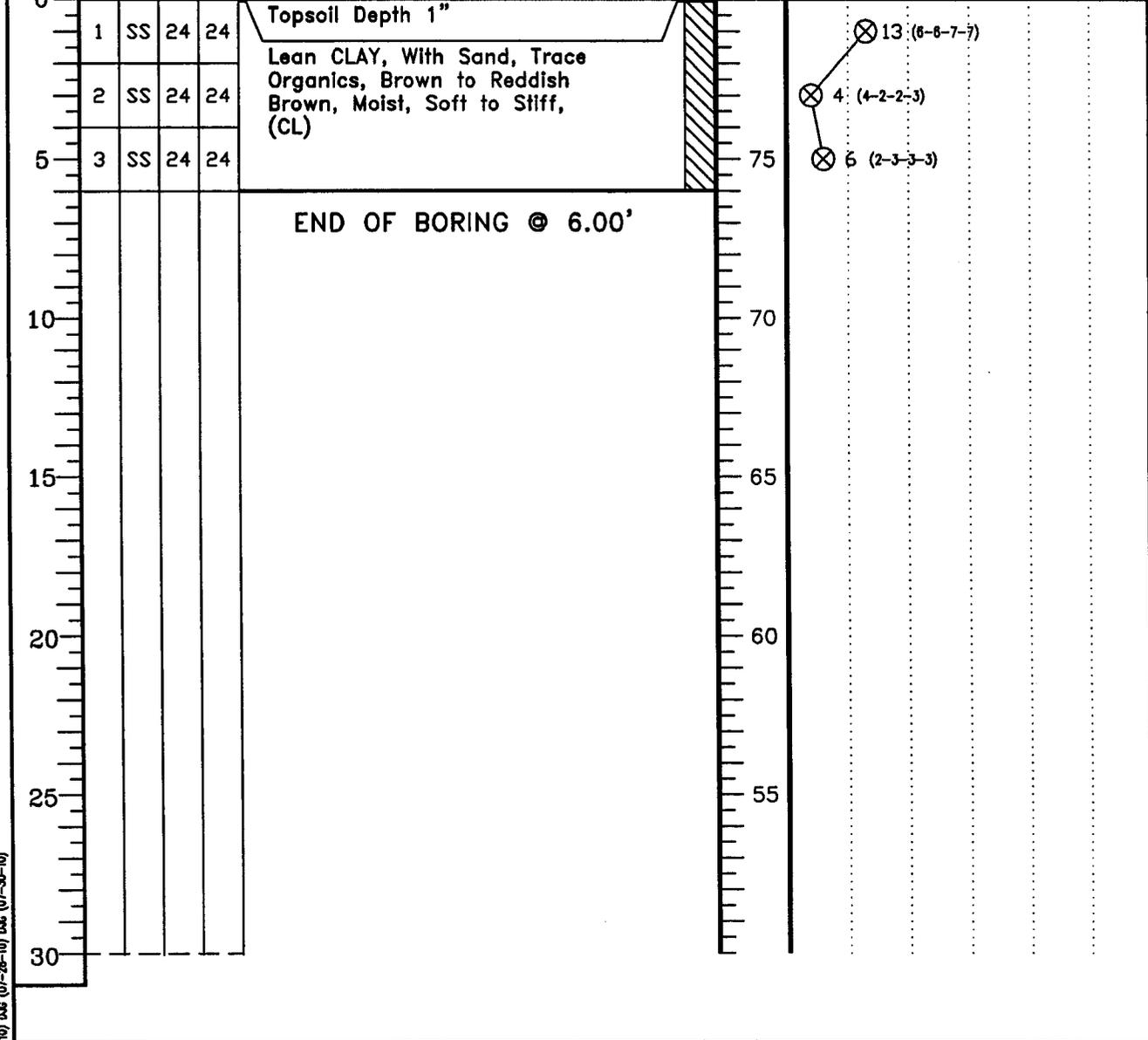
○ CALIBRATED PENETROMETER
TONS/FT.²

1 2 3 4 5+

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

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

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



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

∇ WL DRY	WS OR	BORING STARTED	6/4/10	
∇ WL(BCR)	∇ WL(ACR)	BORING COMPLETED	6/4/10	CAVE IN DEPTH ● None
∇ WL		RIG ATV	FOREMAN SDS	DRILLING METHOD SSA

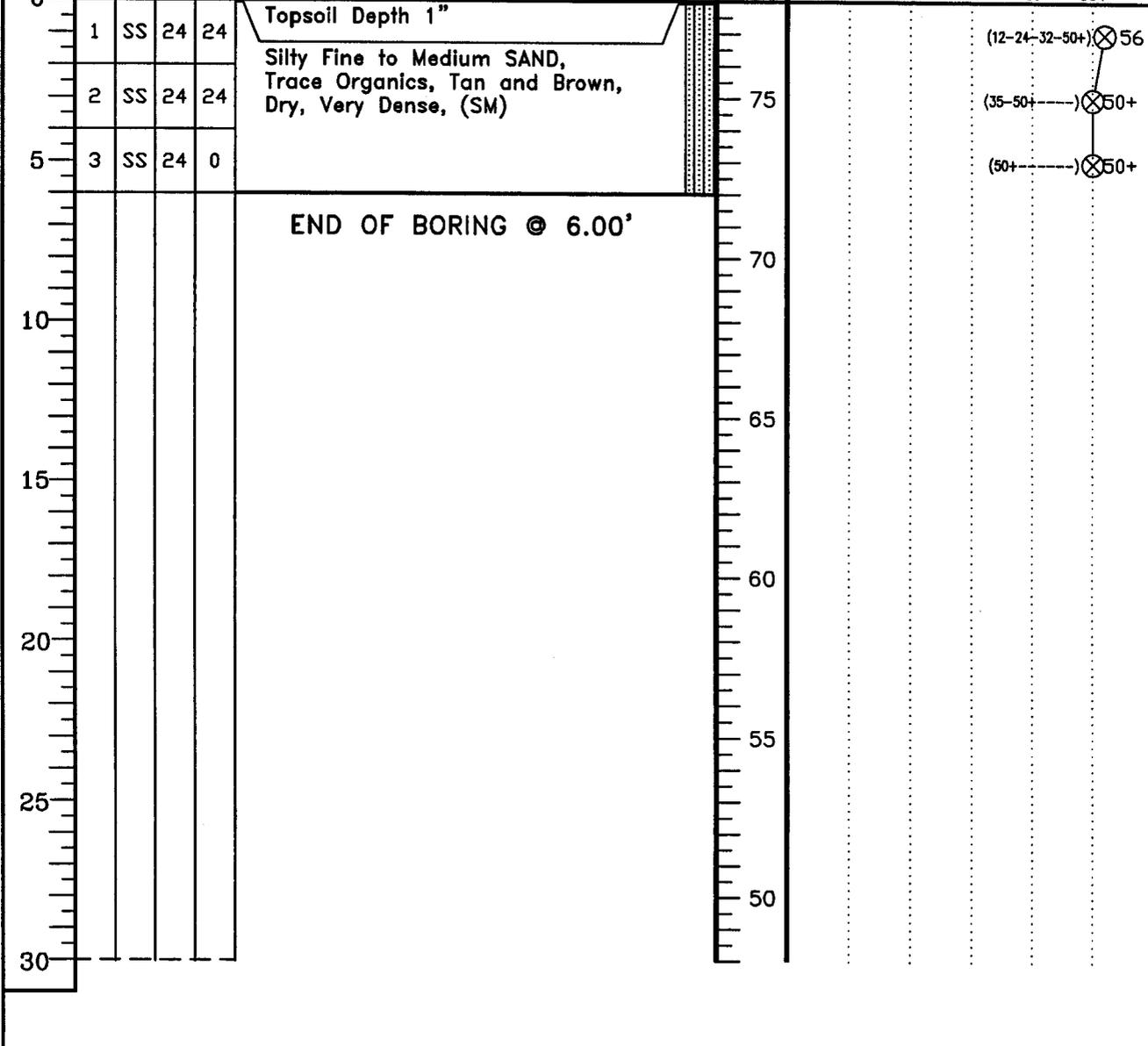
D&E (07-27-10) D&E (07-28-10) D&E (07-30-10)

D&E (07/30/2010 02:33:00 PM)

CLIENT James City County	JOB # 07:10723	BORING # B-6	SHEET 1 OF 1	ECS LLC MID-ATLANTIC
PROJECT NAME JCC Law Enforcement Center	ARCHITECT-ENGINEER AES Consulting Engineers			

SITE LOCATION
James City County, Virginia

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVELS	ELEVATION (FT)
					BOTTOM OF CASING	LOSS OF CIRCULATION 100%		
					SURFACE ELEVATION 78.00			



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

▽WL DRY	WS OR WD	BORING STARTED	6/4/10	
▽WL(BCR)	▽WL(ACR)	BORING COMPLETED	6/4/10	CAVE IN DEPTH • None
▽WL		RIG ATV	FOREMAN SDS	DRILLING METHOD SSA

DAS (07-27-10) DAS (07-28-10) DAS (07-29-10) DAS (07-30-10) DAS (07-30-10) DAS (07-30-10)

Dorehne(07/27/2010 11:48:09 am)

CLIENT James City County	JOB # 07:10723	BORING # B-7	SHEET 1 OF 1	ECS LLC MID-ATLANTIC
PROJECT NAME JCC Law Enforcement Center	ARCHITECT-ENGINEER AES Consulting Engineers			

SITE LOCATION
James City County, Virginia

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVELS ELEVATION (FT)
					BOTTOM OF CASING LOSS OF CIRCULATION 100%		
SURFACE ELEVATION					77.00		

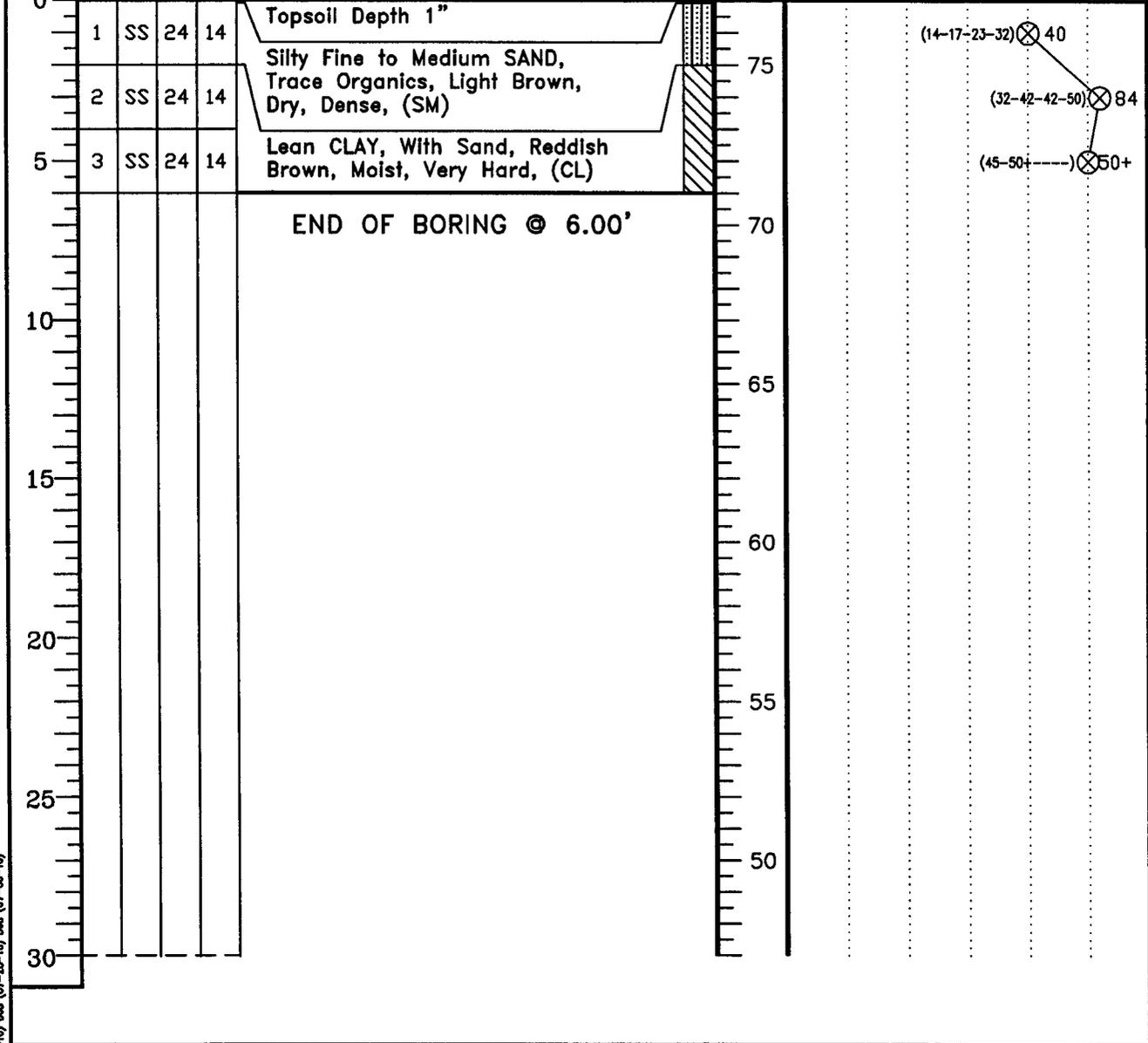
○ CALIBRATED PENETROMETER
TONS/FT. ²

1 2 3 4 5+

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

ROCK QUALITY DESIGNATION & RECOVERY
ROD% — — — REC.% — — —
20% — 40% — 60% — 80% — 100%

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



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

∇ WL DRY	WS OR	BORING STARTED	6/4/10
∇ WL(BCR)	∇ WL(ACR)	BORING COMPLETED	6/4/10
∇ WL		RIG ATV	FOREMAN SDS
		CAVE IN DEPTH ● None	
		DRILLING METHOD SSA	

D&E (07-27-10) D&E (07-28-10) D&E (07-28-10) D&E (07-30-10)

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APPENDIX III

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

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)

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

^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)

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

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

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

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

III. Water Level Measurement Symbols

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

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

APPENDIX IV

Laboratory Test Summary

**POOR
QUALITY**

ORIGINAL(S) FOLLOW

**THIS IS THE BEST COPY
AVAILABLE**

VCE DOCUMENT CONVERSION CENTER

REVISIONS
1 COUNTY COMMENTS 9/18/12

LEND:
N/F NOW OR FORMERLY
RF IRON ROD FOUND
CMF CONCRETE FOUNDMENT FOUND
N/S NAIL SET
R/W RIGHT-OF-WAY
B/L BUILDING SETBACK LINE
SM SANITARY MANHOLE
CO SANITARY CLEANOUT
WM WATER W/VE
WV WATER W/VE
X 98.2 EXISTING SPOT ELEVATION
* 98.2 PROPOSED SPOT ELEVATION

SEBERT & LAYOUT, LLC
SURVEYING
173 BARLOW ROAD
WILLIAMSBURG, VA
PHONE (757) 845-0931
CELL (757) 784-2418

JAMES CITY COUNTY
STORMWATER AS-BUILTS
FIRE ADMINISTRATION BUILDING
PREPARED FOR DAVID NICE BUILDERS, INC.

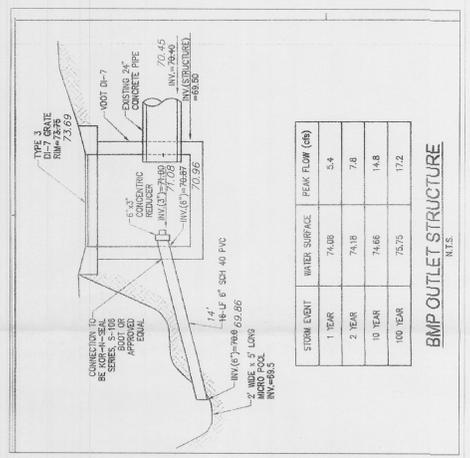
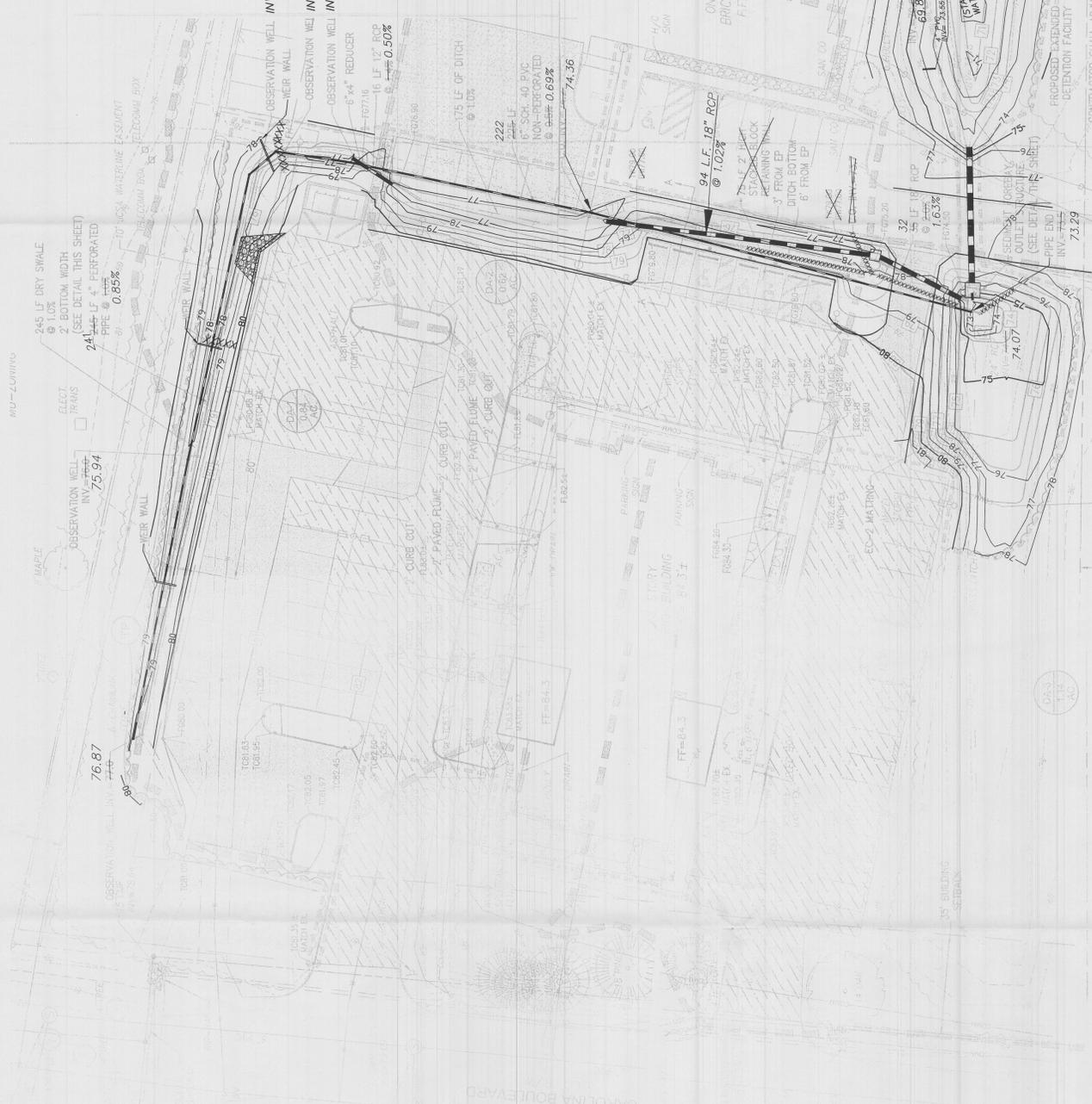
DATE: AUGUST 29, 2012
SCALE: 1" = 25'
PROJECT NO.: 4472-4
DRAWING NO.:
1 OF 1

SURVEYOR'S CERTIFICATION
I HEREBY CERTIFY THAT THE INFORMATION SHOWN HEREON REPRESENTS AN ACTUAL FIELD SURVEY, UNLESS NOTED OTHERWISE. THE HORIZONTAL AND VERTICAL LOCATION OF THE IMPROVEMENTS HAVE BEEN COMPLETED IN GENERAL CONFORMANCE WITH THE APPROVED SITE PLAN.
A.D. SEBERT, L.S.
DATE: 08/29/2012

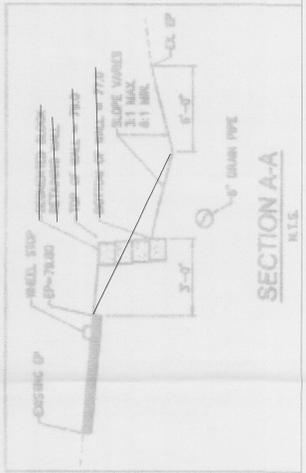


COUNTY PLAN NO. SP-068-10
BMP ID NO. MC-70

OBSERVATION WELL INV= 74.97
WEIR WALL
OBSERVATION WEI INV= 74.84
OBSERVATION WEL INV= 74.87
OBSERVATION WEL INV= 74.60
OBSERVATION WEL INV= 74.82



STORM EVENT	WATER SURFACE	PEAK FLOW (cfs)
1 YEAR	74.08	5.4
2 YEAR	74.18	7.0
10 YEAR	74.68	14.8
100 YEAR	75.75	17.2



STORM EVENT	WATER SURFACE
NORMAL	74.00
1 YEAR	74.00
2 YEAR	74.10
10 YEAR	74.60
100 YEAR	76.00



RECEIVED
SEP 19 2012
Environmental Division

RECEIVED
NOV 18 2013
Environmental Division

SURVEYOR'S CERTIFICATION

I HEREBY CERTIFY THAT THE INFORMATION SHOWN HEREON REPRESENTS AN ACTUAL FIELD SURVEY, UNLESS NOTED OTHERWISE. THE HORIZONTAL AND VERTICAL LOCATION OF THE IMPROVEMENTS HAVE BEEN COMPLETED IN GENERAL CONFORMANCE WITH THE APPROVED SITE PLAN.

A.D. Sebert
A.D. SEBERT, L.S.
DATE: 08/29/2012



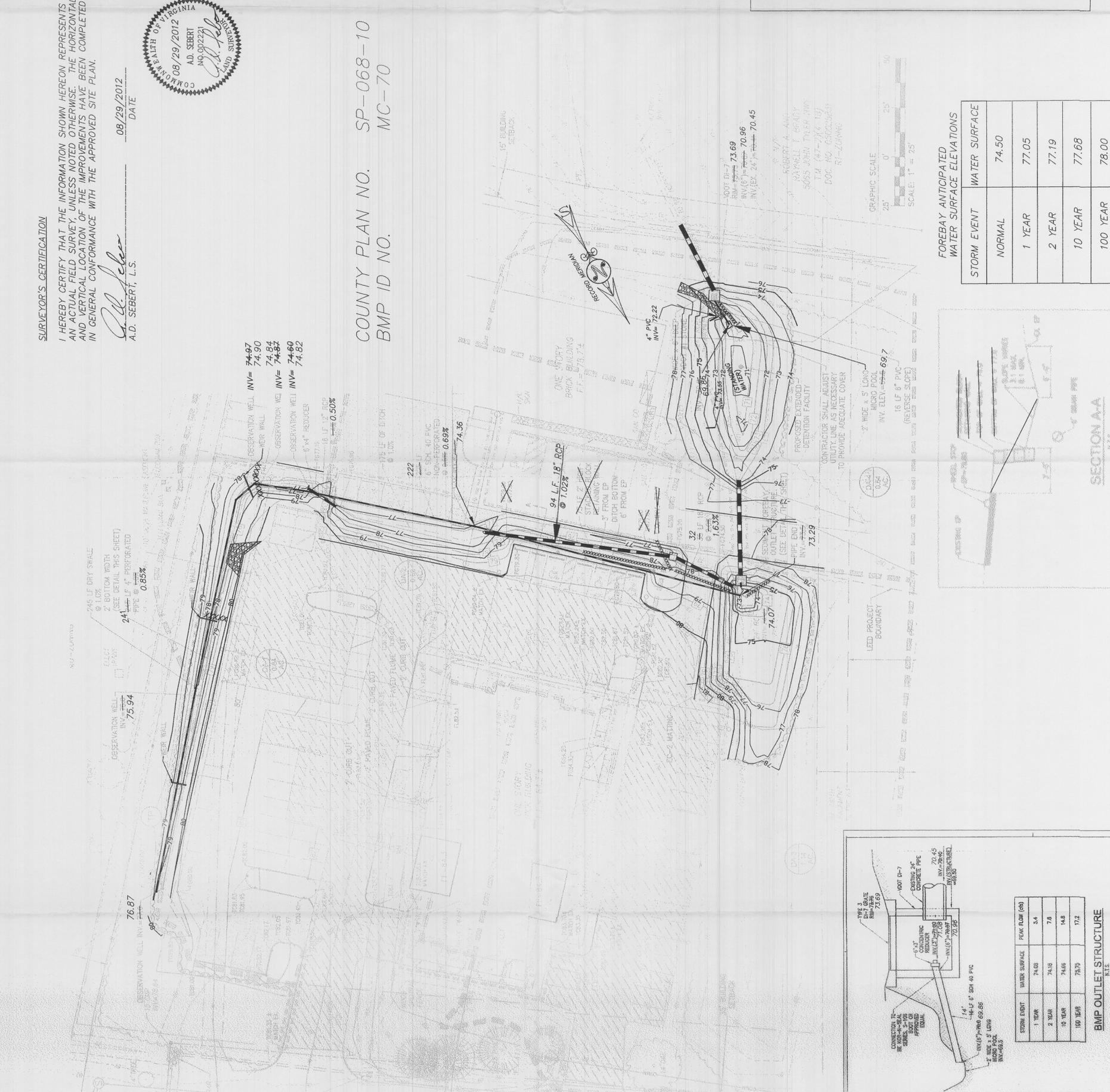
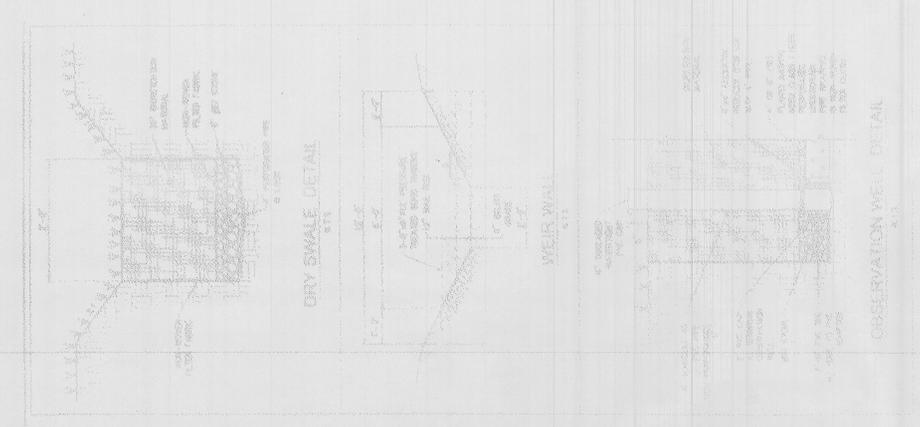
COUNTY PLAN NO. SP-068-10
BMP ID NO. MC-70

REVISIONS

1	COUNTY COMMENTS 9/18/12
---	-------------------------

LEGEND:

- N/F NOW OR FORMERLY
- RF FROM RFD FOUND
- IPF IRON PIPE FOUND
- CMF CONCRETE MONUMENT FOUND
- BSL BUILDING SETBACK LINE
- N/S MAIL SET
- R/W RIGHT-OF-WAY
- S/MH SANITARY MANHOLE
- CO SANITARY CLEANOUT
- WM WATER WALE
- X 98.2 EXISTING SPOT ELEVATION
- 98.2 PROPOSED SPOT ELEVATION



FOREBAY ANTICIPATED WATER SURFACE ELEVATIONS

STORM EVENT	WATER SURFACE
NORMAL	74.50
1 YEAR	77.05
2 YEAR	77.19
10 YEAR	77.68
100 YEAR	78.00



SEBERT & LAYOUT, LLC
173 BARLOW ROAD
WILLIAMSBURG, VA
PHONE (757) 345-0931
CELL (757) 784-2413

JAMES CITY COUNTY
STORMWATER AS-BUILTS
FIRE ADMINISTRATION BUILDING
PREPARED FOR DAVID NICE BUILDERS, INC.

DATE: AUGUST 29, 2012
SCALE: 1" = 25'
PROJECT NO. 1472-4
DRAWING NO. 1 OF 1

GREG, 9/6

SEE EMAIL.

EM

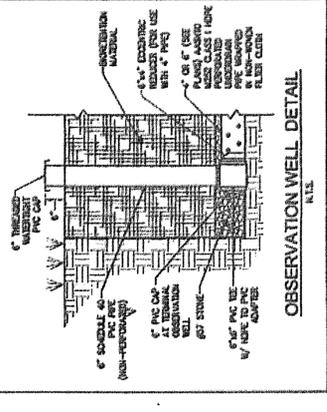
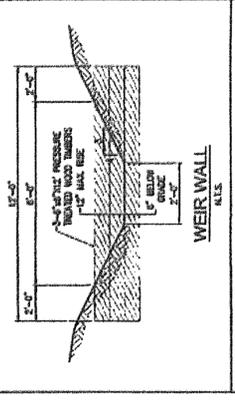
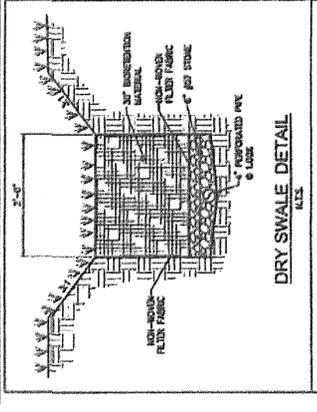
REVISIONS

LEGEND:
 N/ NOW OR FORMERLY
 IRF IRON ROD FOUND
 ICF IRON PIPE FOUND
 MLE M.L. SET
 N/S NORTH-SOUTH
 R/W RIGHT-OF-WAY
 BSL BUILDING SETBACK LINE
 S/ SANITARY CLEANOUT
 SHH SHOWER HEAD
 CO WATER VALVE
 X 98.2 PROPOSED SPOT ELEVATION
 X 98.2 EXISTING SPOT ELEVATION

RECEIVED
 AUG 30 2012
 Environmental Division

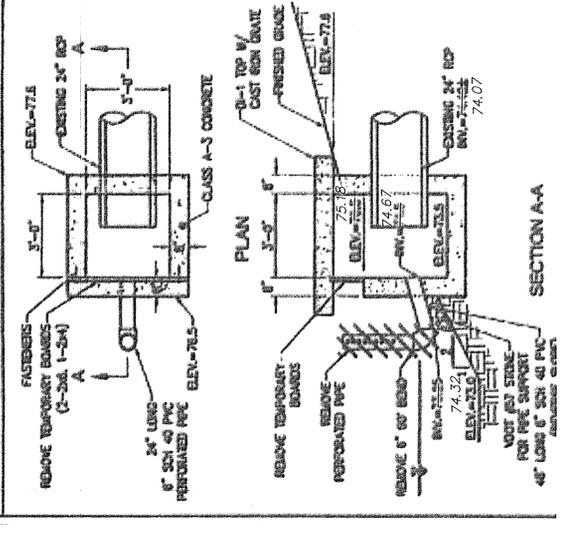
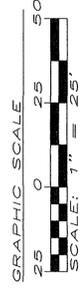
SEBERT & LAYOUT, LLC
 WILLIAMSBURG, VA
 PHONE (757) 345-0931
 CELL: (757) 784-2418

JAMES CITY COUNTY
 STORMWATER AS-BUILTS
 FIRE ADMINISTRATION BUILDING, INC.
 PREPARED FOR DAVID NICE BUILDERS, INC.
 VIRGINIA
 DATE AUGUST 29, 2012
 SCALE 1" = 25'
 PROJECT NO. J472-4
 DRAWING NO.
 1 OF 1

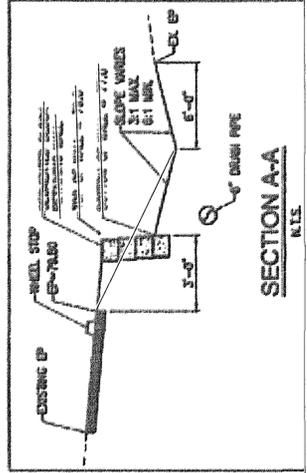


SURVEYOR'S CERTIFICATION
 I HEREBY CERTIFY THAT THE INFORMATION SHOWN HEREON REPRESENTS AN ACTUAL FIELD SURVEY, UNLESS NOTED OTHERWISE. THE HORIZONTAL AND VERTICAL LOCATION OF THE IMPROVEMENTS HAVE BEEN COMPLETED IN GENERAL CONFORMANCE WITH THE APPROVED SITE PLAN.

A.D. SEBERT, L.S.
 08/29/2012
 DATE



STORM EVENT	FUTURE ANTICIPATED WATER SURFACE ELEVATIONS	WATER SURFACE
NORMAL	74.50	74.50
1 YEAR	77.05	77.05
2 YEAR	77.15	77.15
10 YEAR	77.65	77.65
100 YEAR	78.00	78.00



**POOR
QUALITY**

ORIGINAL(S) FOLLOW

**THIS IS THE BEST COPY
AVAILABLE**

VCE DOCUMENT CONVERSION CENTER

Site Plan FOR

James City County Fire Administration Building

Jamestown District James City County Virginia

INDEX OF SHEETS:

SHEET NO.	SHEET DESCRIPTION
1	COVER SHEET
2	DEMOLITION PLAN & ENVIRONMENTAL INVENTORY
3	INITIAL EROSION AND SEDIMENT CONTROL PLAN
4	LAYOUT AND UTILITY PLAN
5	GRADING AND DRAINAGE PLAN
6	EROSION AND SEDIMENT CONTROL NOTES AND DETAILS
7	NOTES AND DETAILS
8	LANDSCAPE PLAN
9	LIGHTING PLAN

OWNER/DEVELOPER INFORMATION:

JAMES CITY COUNTY GENERAL SERVICES
 CONTACT: SHAWN GORDON
 901 F. MOUNTAIN ROAD, SUITE 300
 WILLIAMSBURG, VIRGINIA 23185
 PHONE NO.: (757) 253-6646
 FAX NO.: (757) 253-6753

CERTIFIED RESPONSIBLE LAND DISTURBER:

VAN MARC BENNETT, P.E.
 AES CONSULTING ENGINEERS
 5248 OLDE TOWNE ROAD, SUITE 1
 WILLIAMSBURG, VIRGINIA 23188
 TELEPHONE: 757-255-0040

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

SITE DATA:

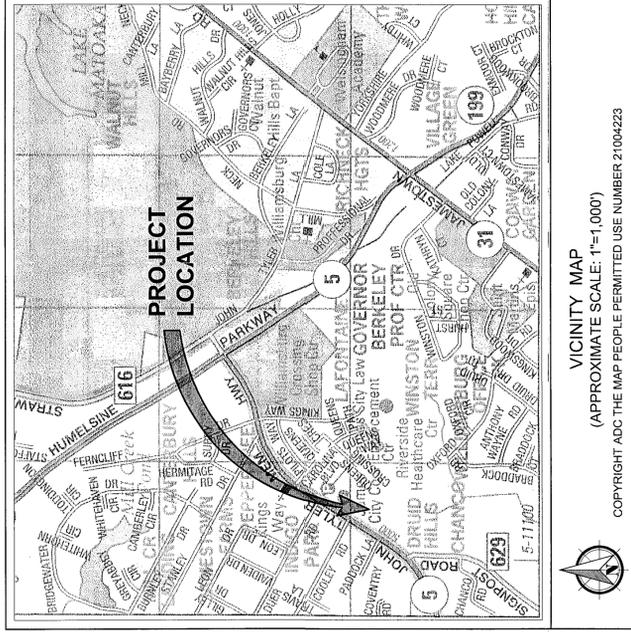
SITE ADDRESS: 5087 JOHN TYLER HIGHWAY
 WILLIAMSBURG, VIRGINIA 23185
 PARCEL TAX MAP NO.: 472150001
 ZONING: PL (PUBLIC LANDS)
 PROPERTY AREA: 175,239 S.F. ±, 4.02 AC ±
 LEED PROJECT AREA: 114,272 S.F. ±, 2.62 AC ±
 PROJECT LIMITS: 129,042 S.F. ±, 2.96 AC ±
 TOTAL EXISTING IMPERVIOUS AREA: 79,661 S.F. ±, 1.83 AC ±
 TOTAL PROPOSED IMPERVIOUS AREA: 86,623 S.F. ±, 1.99 AC ±
 TOTAL DISTURBED AREA: 64,041 S.F. ±, 1.47 AC ±
 FLOOD HAZARD MAP: THIS PROPERTY IS IN ZONE X AS SHOWN ON MAP NUMBER 51096C0140C, PANEL 0140C, FOR COMMUNITY NUMBER 510294, DATED 08/28/2007 OF THE FLOOD INSURANCE RATE MAPS FOR JAMES CITY COUNTY, VIRGINIA AND PROPOSED MAPS FOR FLOOD INSURANCE RATES ARE DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

PARKING PROVIDED:
 FIRE ADMINISTRATION BUILDING
 32 EXISTING PARKING SPACES TO REMAIN
 48 PROPOSED PARKING SPACES
 80 TOTAL SPACES PROVIDED

4 ADA COMPLIANT SPACES REQUIRED
 4 ADA COMPLIANT SPACES PROVIDED
 4 LEED FUEL EFFICIENT VEHICLE REQUIRED
 4 LEED FUEL EFFICIENT VEHICLE PROVIDED

EXISTING FIRE STATION
 24 EXISTING PARKING SPACES TO REMAIN
 NO CHANGES

BUILDING:
 1 ADA COMPLIANT SPACE REQUIRED
 1 EXISTING ADA COMPLIANT SPACE PROVIDED
 9,110 S.F. EXISTING
 1,093 S.F. PROPOSED ADDITIONS
 10,173 S.F. TOTAL



COUNTY PROJECT NO.: JCC-SP-0068-2010
 ORIGINAL SUBMITTAL DATE: AUGUST 5, 2010
 APPROVAL DATE:

GENERAL NOTES:

- ALL ERRORS OR DISCREPANCIES WITH THE PLANS OR EXISTING SITE CONDITIONS SHALL BE REPORTED TO THE ENGINEER OR SURVEYOR OF RECORD BEFORE PROCEEDING WITH THE WORK.
- CONTOUR INTERVAL IS 1 FOOT.
- ANY EXISTING, UNUSED WELLS SHALL BE ABANDONED IN ACCORDANCE WITH THE VIRGINIA PRIVATE WELL REGULATIONS AND JAMES CITY COUNTY CODE.
- SOLID WASTE DISPOSAL SHALL BE PROVIDED BY A PRIVATE HAULER.
- A VDOT CE7 PERMIT IS REQUIRED FOR ALL WORK WITHIN THE VDOT RIGHT-OF-WAY. THE CONTRACTOR SHALL NOTIFY VDOT IN WRITING 48 HOURS PRIOR TO COMMENCEMENT OF ANY WORK WITHIN THE VDOT RIGHT-OF-WAY.
- THE CONTRACTOR SHALL MAINTAIN A COMPLETE SET OF THE APPROVED PLANS AT THE PROJECT SITE AT ALL TIMES DURING CONSTRUCTION.
- CONSTRUCTION SHALL BE RESPONSIBLE FOR CONTACTING MISS UTILITY (4,800.662.7091) FOR EXISTING UTILITY LOCATIONS AT LEAST 3 WORKING DAYS PRIOR TO COMMENCING CONSTRUCTION, AND A PRIVATE UTILITY LOCATOR FOR THE LOCATING OF PRIVATE UTILITIES.
- THE ABSENCE OF THE DEVELOPER OR THE ENGINEER AT THE JOB SITE DOES NOT, IN ANY WAY, RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO PERFORM THE WORK IN ACCORDANCE WITH THE DRAWINGS, CONTRACT DOCUMENTS, ADDENDA, AND WRITTEN AUTHORIZED PLAN REVISIONS.
- THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS, AND ORDERS OF ANYBODY HAVING JURISDICTION. THE CONTRACTOR SHALL ERECT AND MAINTAIN, AS REQUIRED BY THE CONDITIONS AND PROGRESS OF THE WORK, ALL NECESSARY SAFEGUARDS FOR SAFETY AND PROTECTION.
- ALL CONSTRUCTION METHODS AND MATERIALS SHALL CONFORM WITH THE CURRENT JAMES CITY SERVICE AUTHORITY STANDARDS AND SPECIFICATIONS, VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE STANDARDS AND SPECIFICATIONS, VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS, AND ANY OTHER APPLICABLE CITY OR STATE ORDINANCES, CODES, AND LAWS.
- THE CONTRACTOR SHALL USE ONLY NEW MATERIALS, PARTS AND PRODUCTS ON ALL PROJECTS. ALL MATERIALS SHALL BE STORED SO AS TO ASSURE THE PRESERVATION OF THEIR QUALITY AND FITNESS FOR THE WORK.
- DESIGN MATERIAL EQUIPMENT AND PRODUCTS OTHER THAN THOSE INDICATED IN THE DRAWINGS SHALL NOT BE CONSIDERED UNLESS PRIOR APPROVAL IS OBTAINED FROM THE OWNER'S REPRESENTATIVE, DESIGN ENGINEER AND THE APPLICABLE LOCAL GOVERNING CODE AUTHORITY.
- CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FOR THE WORK INDICATED.
- 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, PETROLEUM TRANSMISSION, AND OTHERS THAT MAY BE REQUIRED.
- THE CONTRACTOR SHALL SATISFY HIMSELF AS TO ALL SITE CONDITIONS PRIOR TO CONSTRUCTION.
- THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF ALL SITE IMPROVEMENTS, INCLUDING INSTALLED LANDSCAPING, AS SHOWN ON THE APPROVED PLAN.
- THE CONTRACTOR SHALL REMOVE ALL EXCESS MATERIAL, INCLUDING SOIL AND DEBRIS, FROM THE SITE.
- THE CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS OF THE VIRGINIA UNDERGROUND UTILITY DAMAGE PREVENTION ACT (SECTION 66.206-14.1 ET. SEQ. CODE OF VIRGINIA, 1969 AS AMENDED) AND HEREBY AGREES TO HOLD THE DEVELOPER AND THE ENGINEER HARMLESS AGAINST ANY LOSS, DAMAGE, OR CLAIMS OF ANY NATURE WHATSOEVER ARISING OUT OF THE CONTRACTOR'S FAILURE TO COMPLY WITH THE REQUIREMENTS OF SAID ACT.
- THIS SITE LIES WITHIN THE MILL CREEK WATERSHED.
- A LAND DISTURBING PERMIT AND SILTATION AGREEMENT WITH SURETY ARE REQUIRED FOR THIS PROJECT.
- PROCS TO OBTAINING A LAND DISTURBING PERMIT. THE CONTRACTOR SHALL OBTAIN A VDOT PERMIT (VIRGINIA STORMWATER MANAGEMENT PROGRAM) FROM THE VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION FOR THE DISCHARGE OF STORMWATER FROM CONSTRUCTION ACTIVITIES. THIS PERMIT WILL REQUIRE DAILY LOSSES OF EARTHWORK, RECORDED FOR CONSTRUCTION, RECORDATION OF STORM EVENTS, LOSSES OF MAINTENANCE, AND OTHER ACTIONS DURING CONSTRUCTION.
- THE PROFESSIONAL ENGINEER SHALL BE A REGISTERED PROFESSIONAL ENGINEER AND SHALL NOT BE THE "RESPONSIBLE LAND DISTURBER" FOR PURPOSES OF PLAN APPROVAL ONLY. PRIOR TO ISSUANCE OF THE LAND DISTURBING PERMIT, THE OWNER OR DEVELOPER 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 OWNER OR DEVELOPER SHALL PROVIDE WRITTEN NOTIFICATION SHOULD THE "RESPONSIBLE LAND DISTURBER" CHANGE DURING CONSTRUCTION.
- NO OFFSITE LAND DISTURBANCE IS ANTICIPATED FOR THIS PROJECT.
- THE CONTRACTOR SHALL REFER TO REPORT OF SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING ANALYSIS JAMES CITY COUNTY LAW ENFORCEMENT CENTER IMPROVEMENTS, JAMES CITY COUNTY, VIRGINIA (PROJECT NO. 07-10722 BY EGS DATED JULY 30, 2010 FOR CONSTRUCTION SPECIFICATIONS).
- SITE BOUNDARY IS BASED ON RECORD INFORMATION AND DOES NOT REPRESENT A CURRENT BOUNDARY BY AES CONSULTING ENGINEERS.
- ALL DISTURBED AREAS, INCLUDING BUT NOT LIMITED TO PAVEMENT, SHOULDERS, DITCHES, ENDWALLS, CURBS AND GUTTERS, UTILITY POLES, CURBS AND GUTTERS, DRIVEWAYS, SIGNS, MAILBOXES, ETC., SHALL BE REPAIRED TO A CONDITION EQUAL TO OR BETTER THAN THOSE EXISTING PRIOR TO CONSTRUCTION, OR AS SHOWN ON THE DRAWINGS. SIGNS, MAILBOXES, AND GUARDRAIL THAT ARE DISTURBED SHALL BE RETURNED TO THEIR ORIGINAL LOCATIONS DAILY, AND MAINTAINED THROUGHOUT THE PROJECT.
- THE CONTRACTOR SHALL REESTABLISH ALL EXISTING PROPERTY LINES, MONUMENTS, WATER METERS, DRAINAGE CULVERTS, FENCES, UTILITY POLES, DRIVEWAYS, CURBS, GUTTERS, ETC. DISTURBED DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE DEVELOPER.
- 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.
- ALL PARKING SPACES ARE TO BE PROVIDED WITH 4-INCH WHITE PAINTED STRIPING AND HANDICAP ACCESS AGLES WITH 1 FT. WIDE BLUE PAINTED HATCHING. HANDICAP PARKING SPACES SHALL BE DESIGNATED BY ABOVE GROUND SIGNS PER UNIFORM STATEWIDE BUILDING CODE (USBC) REQUIREMENTS.
- ALL NEW SIGNS SHALL BE IN ACCORDANCE WITH ARTICLE II, DIVISION 3, OF THE JAMES CITY COUNTY ZONING ORDINANCE.
- ALL PROPOSED UTILITIES SHALL BE PLACED UNDERGROUND.
- SITE IS SERVED BY PUBLIC WATER AND SEWER.
- EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES. IF EXISTING UTILITIES ARE FOUND TO BE DIFFERENT FROM THOSE SHOWN ON THE PLANS, THE CONTRACTOR SHALL RELOCATE THE EXISTING UTILITIES AT THE OWNER'S/DEVELOPER'S EXPENSE. EITHER REDESIGN THE PROPOSED IMPROVEMENTS OR RELOCATE THE EXISTING UTILITIES AT THE OWNER'S/DEVELOPER'S EXPENSE.
- ALL UTILITIES AND/OR OBSTRUCTIONS (POWER POLES, TELEPHONE PEBSTALS, GUY WIRES, WATER METERS, ETC.) THAT ARE REQUIRED TO BE RELOCATED OR ADJUSTED DUE TO CONSTRUCTION SHALL BE DONE SO AT THE OWNER'S/DEVELOPER'S EXPENSE, INCLUDING THOSE WITHIN THE RIGHT-OF-WAY.
- WATER AND SEWER SYSTEMS SHALL MEET THE REQUIREMENTS OF THE LATEST EDITIONS OF THE JAMES CITY SERVICE AUTHORITY (JCSA) DESIGN AND ACCEPTANCE CRITERIA, THE HAMPTON ROADS PLANNING COMMISSION (HRPC) REGIONAL CONSTRUCTION STANDARDS AND THE COMMONWEALTH OF VIRGINIA WATERWORKS AND SEWERAGE REGULATIONS. CURRENT COPIES SHALL BE MAINTAINED AT THE PROJECT SITE AT ALL TIMES DURING CONSTRUCTION.
- PRIVATELY OWNED UTILITIES (I.E. WATER & SEWER LINES) SHOWN ON THE SITE PLAN ARE REGULATED BY THE VIRGINIA UNIFORM STATEWIDE BUILDING CODE AND ENFORCED BY THE CODE COMPLIANCE DIVISION. THESE PRIVATELY OWNED UTILITIES MUST COMPLY WITH THE INTERNATIONAL PLUMBING CODE, THE NATIONAL FIRE PREVENTION ASSOCIATION (NFPA) 969, AND ALL APPLICABLE REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND INSPECTIONS WITHOUT OBTAINING REQUIRED PERMITS AND INSPECTIONS.
- NOTIFY JAMES CITY SERVICE AUTHORITY PRIOR TO ANY EXCAVATION OR DEMOLITION WITHIN UTILITY CORRIDORS.
- THE CONTRACTOR IS REQUIRED TO SECURE ALL NECESSARY PERMITS FOR THE ABANDONMENT OR DEMOLITION OF ALL EXISTING WELLS, WATER LINES AND SEPTIC FIELDS IN ACCORDANCE WITH JAMES CITY COUNTY AND VIRGINIA DEPARTMENT OF HEALTH REGULATIONS. CONTACT VIRGINIA DEPARTMENT OF HEALTH AT 757-293-4813.
- ALL STORM SEWERS SHALL BE INSTALLED IN ACCORDANCE WITH THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) STANDARDS AND SPECIFICATIONS.
- CONSTRUCTION OF STORMWATER CONVEYANCE SYSTEMS OUTSIDE OF THE RIGHT-OF-WAY SHALL COMPLY WITH THE CURRENT JAMES CITY COUNTY ENVIRONMENTAL DIVISION STANDARDS AND SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND INSPECTIONS WITHOUT OBTAINING REQUIRED PERMITS AND INSPECTIONS. CHANNEL STABILIZATION BANKS AND EROSION CONTROL MATTINGS IF SITEWORK OR ASSOCIATED UTILITY OPERATIONS SUCH AS CABLE, ELECTRIC, GAS, PHONE, SEWER, WATER, ETC. DAMAGE THEIR FUNCTIONAL INTENT.
- THE STORMWATER MANAGEMENT FACILITY(S) SHOWN ON THESE PLANS REQUIRE THE SUBMISSION, REVIEW, AND APPROVAL OF RECORD DRAWINGS AND CONSTRUCTION CERTIFICATION PRIOR TO RELEASE OF THE POSTED BOND/SURETY. THE CONTRACTOR SHALL COORDINATE THE NECESSARY INSPECTIONS WITH THE PROFESSIONAL CERTIFYING THE CONSTRUCTION. THE GEOTECHNICAL ENGINEER IS TO ENSURE THAT HIS/HER INSPECTIONS ARE PERFORMED DURING AND FOLLOWING CONSTRUCTION OF THE SWMBMP IN ACCORDANCE WITH THE CURRENT JAMES CITY COUNTY ENVIRONMENTAL DIVISION REQUIREMENTS.

JAMES CITY COUNTY

BENCHMARK STATION NO. 319, EASTING (X) 11,985,919.117, NORTHING (Y) 3,622,621.654, ELEVATION = 101.31
 HORIZONTAL DATUM: JAMES CITY COUNTY GEODETIC CONTROL NETWORK
 VIRGINIA STATE PLANE COORDINATE SYSTEM - SOUTH ZONE
 NAD 83 (1984 VA HARN)
 JAMES CITY COUNTY GEODETIC CONTROL NETWORK
 VERTICAL DATUM:
 NGVD 29

Rev.	Date	Description
1	9/28/10	Revised Per County Comments
By		WAB

COUNTY OF JAMES CITY
 FINAL SITE PLAN

APPROVALS
 File Det. SJB DATE 8/14/10
 Health Dept. YF YF YF
 VDOT YF YF YF
 Planning SJJ YF YF
 Emission SJJ YF YF
 Zoning SJJ YF YF
 JCSA YF YF YF
 County Eng. YF YF YF
 REA YF YF YF
 Other



AES CONSULTING ENGINEERS
 5248 OLDE TOWNE ROAD, SUITE 1
 WILLIAMSBURG, VIRGINIA 23188
 PHONE: (757) 255-0040
 FAX: (757) 253-6646
 WWW.AESVIR.COM

JAMES CITY COUNTY
 PARKING ADDITIONS
 FIRE ADMINISTRATION BUILDING
 JAMESTOWN DISTRICT
 JAMES CITY COUNTY
 VIRGINIA

Project Contact: **VABREC**
 Project Number: **6801-E-01**
 Scale: **AS NOTED**
 AS NOTED: **28x10**
 Sheet Title: **COVER SHEET**
 Sheet Number: **1**

SP-0068-2010

Rev.	Date	Description	By
1	8/28/10	Revised Per County Comments	VAM



ARTS CONSULTING ENGINEERS
 5248 Oak Towne Road, Suite 1
 Williamsburg, Virginia 23185
 Phone: (757) 252-0040
 Fax: (757) 220-8994
 www.artseng.com

**JAMES CITY COUNTY
 FIRE ADMINISTRATION BUILDING
 PARKING ADDITIONS**

Project Name: VMBREC	Project Number: 0801E-51
Scale: 1"=25'	Date: 8/10
Sheet Title: DEMOLITION PLAN AND ENVIRONMENTAL INVENTORY	Sheet Number: 2

SOIL No.	SOIL NAME	HYDROLOGICAL GROUP	TYPICAL SLOPES	EROSION FACTOR (K)	EROSION FACTOR (I)
11C	GRAVEN-LOCHEE COMPLEX	C	6-10%	0.32-0.37	3
14B	EMPORA FINE SANDY LOAM	C	2-6%	0.20-0.28	4
15D	EMPORA COMPLEX	C	10-15%	0.20-0.28	4
19B	KEMPVILLE-EMPORA FINE SANDY LOAM	B	2-6%	0.24-0.32	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 TO 0.36 - LOW ERODIBILITY
 0.36 AND LOWER - MODERATE ERODIBILITY
 0.36 AND UP - HIGH ERODIBILITY

ENVIRONMENTAL INVENTORY IMPACTS
 NONE ON SITE
 25% SLOPES OR GREATER:
 3.25% S.F. 0.076 AC.

DEMOLITION LEGEND

- Areas to be demolished
- Items to be removed
- Items to be removed/relocated

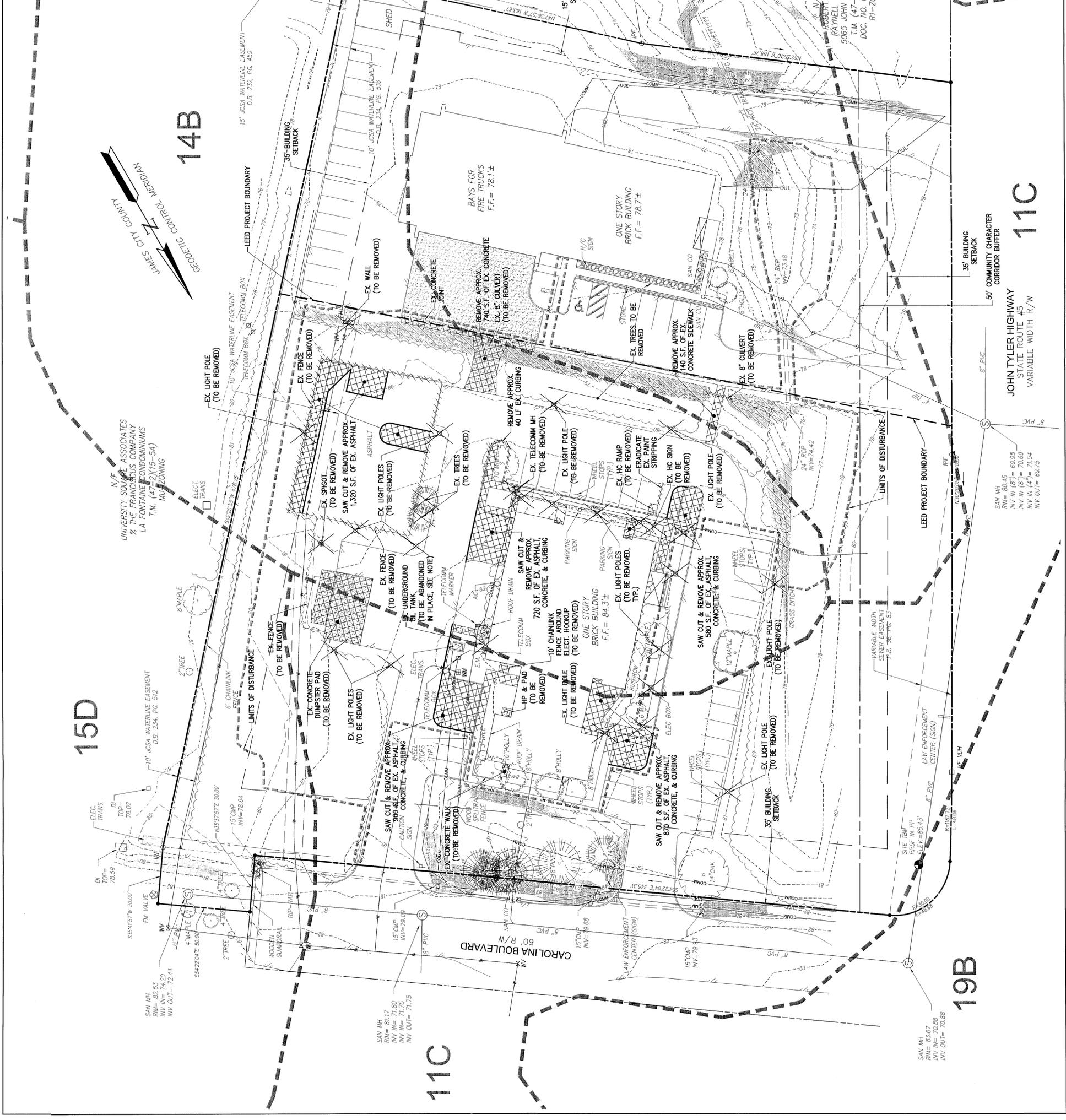
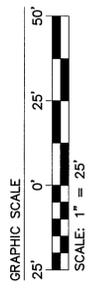
LEGEND

EXISTING

- Water
- Sanitary Sewer
- Storm Sewer
- Force Main
- Sanitary Manhole
- Storm Manhole
- Yard Drop Inlet
- Flared End Section
- Valve
- Fire Hydrant Assembly
- Blow-off Valve
- Air Release Assembly
- Clean Out
- Water Meter
- Streetlight
- Centerline/Base Line
- Right of Way
- Property Line
- Ditch/Swale
- Concrete Lined Ditch
- Existing Tree Line
- Limits of Clearing
- Rip Rap
- Curb
- Curb and Gutter
- Reverse Gutter Pan
- Edge of Pavement
- Existing Ground Elevation
- Proposed Spot Grade
- Contour

PROPOSED

- Water
- Sanitary Sewer
- Storm Sewer
- Force Main
- Sanitary Manhole
- Storm Manhole
- Yard Drop Inlet
- Flared End Section
- Valve
- Fire Hydrant Assembly
- Blow-off Valve
- Air Release Assembly
- Clean Out
- Water Meter
- Streetlight
- Centerline/Base Line
- Right of Way
- Property Line
- Ditch/Swale
- Concrete Lined Ditch
- Existing Tree Line
- Limits of Clearing
- Rip Rap
- Curb
- Curb and Gutter
- Reverse Gutter Pan
- Edge of Pavement
- Existing Ground Elevation
- Proposed Spot Grade
- Contour



DEMOLITION NOTES:

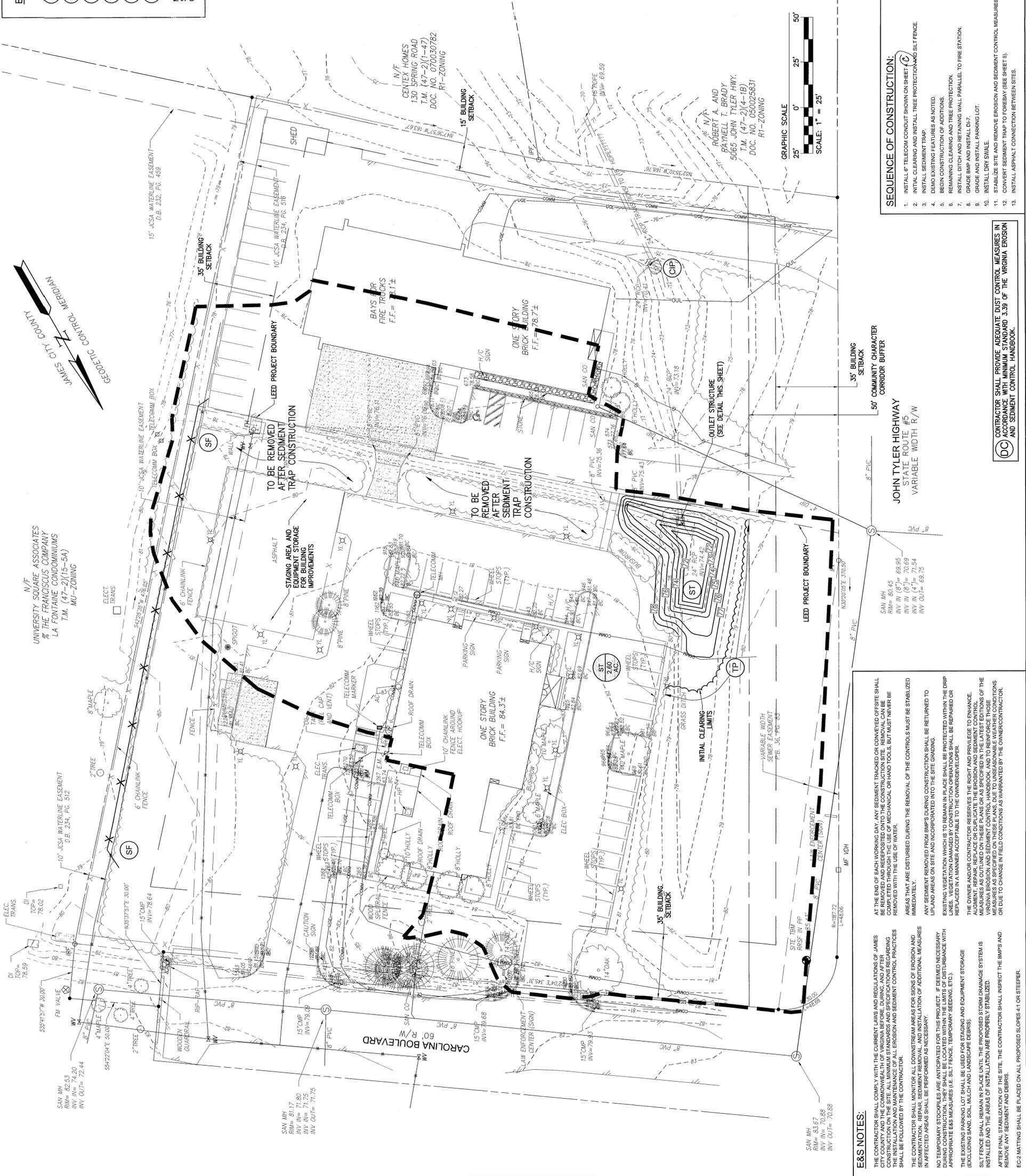
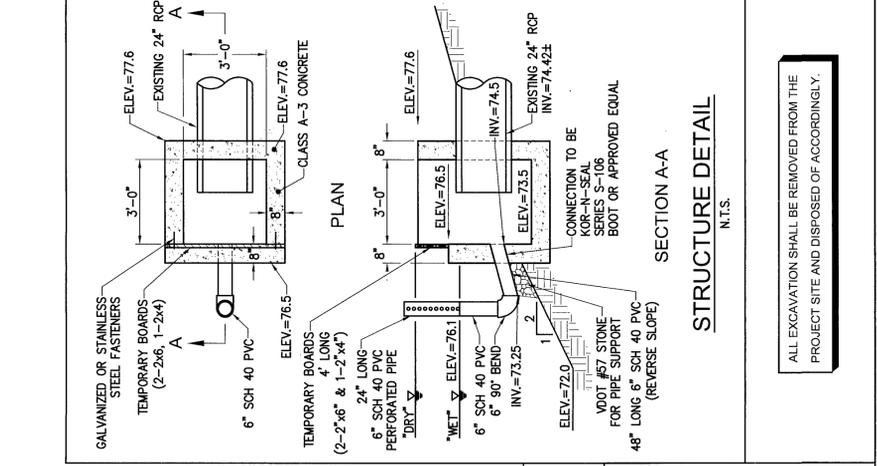
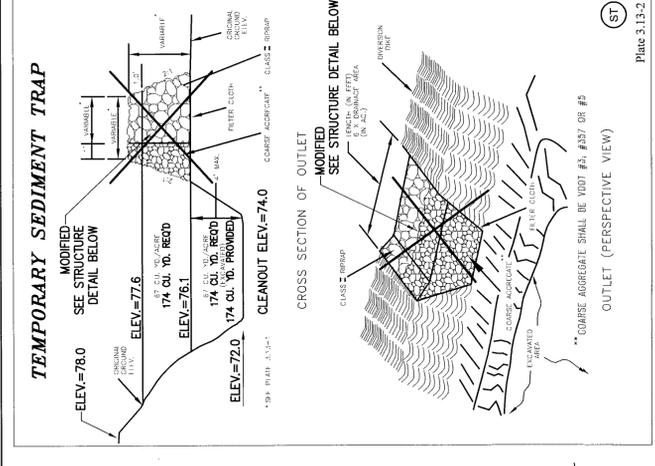
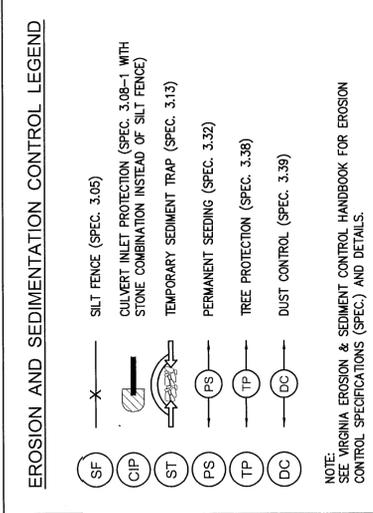
- SAWCUTTING SHALL BE PERFORMED ON EDGES OF PAVEMENT AND CONCRETE DEMOLITION.
- EXISTING PARKING LOT STRIPING TO BE ERADICATED AS NOTED.
- EXISTING UTILITY LINES NO LONGER NECESSARY (I.E. ELECTRIC, GAS, ETC.) SHALL BE REMOVED IN AREAS WHERE DISTURBANCE IS SHOWN.
- EXISTING UNDERGROUND OIL TANK SHALL BE EMPTIED OF ALL FLUID, CLEANED, AND FILLED WITH SAND.

Rev.	Date	Description
1	9/28/10	Revised Per County Comments
By		VAB



JAMES CITY COUNTY
FIRE ADMINISTRATION BUILDING
PARKING ADDITIONS
JAMESTOWN DISTRICT
JAMES CITY COUNTY
VIRGINIA

Project Name: FIRE ADMINISTRATION BUILDING
Project Number: 9801-E-31
Scale: 1"=25'
Sheet Title: INITIAL EROSION AND SEDIMENT CONTROL PLAN
Sheet Number: 3



E&S NOTES:

THE CONTRACTOR SHALL COMPLY WITH THE CURRENT LAWS AND REGULATIONS OF JAMES CITY COUNTY AND THE STATE OF VIRGINIA REGARDING EROSION AND SEDIMENT CONTROL MEASURES ON THE SITE. ALL MINIMUM STANDARDS AND SPECIFICATIONS REGARDING THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE FOLLOWED BY THE CONTRACTOR.

THE CONTRACTOR SHALL MONITOR ALL DOWNSTREAM AREAS FOR SIGNS OF EROSION AND SEDIMENTATION. REPAIR, SEDIMENT REMOVAL AND INSTALLATION OF ADDITIONAL MEASURES IN AFFECTED AREAS SHALL BE PERFORMED AS NECESSARY.

NO TEMPORARY STOCKPILES ARE ANTICIPATED FOR THIS PROJECT. IF DEEMED NECESSARY DURING CONSTRUCTION, THEY SHALL BE LOCATED WITHIN THE LIMITS OF DISTURBANCE WITH APPROPRIATE EAS MEASURES (E.G. SILT FENCE, TEMPORARY SEEDING, ETC.).

THE EXISTING PARKING LOT SHALL BE USED FOR STAGING AND EQUIPMENT STORAGE (EXCLUDING SAND, SOIL, MULCH AND LANDSCAPE DEBRIS).

SILT FENCE SHALL REMAIN IN PLACE UNTIL THE PROPOSED STORM DRAINAGE SYSTEM IS INSTALLED AND THE AREAS OF INSTALLATION ARE PROPERLY STABILIZED.

AFTER FINAL STABILIZATION OF THE SITE, THE CONTRACTOR SHALL INSPECT THE BMP'S AND REMOVE ANY SEDIMENT AND DEBRIS.

EGC MATTING SHALL BE PLACED ON ALL PROPOSED SLOPES 4:1 OR STEEPER.

AT THE END OF EACH WORKING DAY, ANY SEDIMENT TRACKED OR CONVERTED OFFSITE SHALL BE REMOVED FROM THE SITE. ALL MECHANICAL OR HAND TOOLS, BUT MUST NEVER BE COMPLETED THROUGH THE USE OF MECHANICAL OR HAND TOOLS, BUT MUST NEVER BE COMPLETED THROUGH THE USE OF WATER.

AREAS THAT ARE DISTURBED DURING THE REMOVAL OF THE CONTROLS MUST BE STABILIZED IMMEDIATELY.

ANY SEDIMENT REMOVED FROM BAYS DURING CONSTRUCTION SHALL BE RETURNED TO UPLAND AREAS ON SITE AND INCORPORATED INTO THE SITE GRADING.

EXISTING VEGETATION WHICH IS TO REMAIN IN PLACE SHALL BE PROTECTED WITHIN THE DRIP LINE. ANY SEDIMENT REMOVED FROM BAYS DURING CONSTRUCTION SHALL BE RETURNED TO UPLAND AREAS ON SITE AND INCORPORATED INTO THE SITE GRADING.

THE OWNER AND/OR CONTRACTOR RESERVES THE RIGHT AND SHALL BE RESPONSIBLE FOR OBTAINING NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AND STATE AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AND STATE AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AND STATE AUTHORITIES.

Rev.	Date	Description	By
1	9/28/10	Revised Per County Comments	VMS

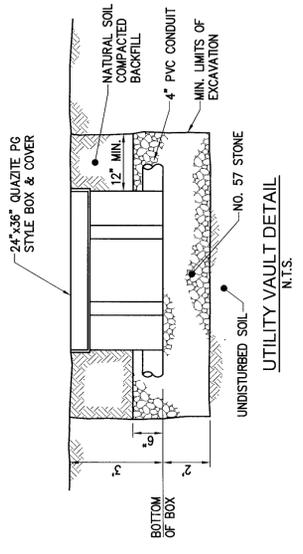


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 Fax: (757) 220-8994
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**JAMES CITY COUNTY
 FIRE ADMINISTRATION BUILDING
 PARKING ADDITIONS**

Project Contact: VMBREC
 Project Number: 9801E-51
 Scale: 1"=25'
 Sheet Title: LAYOUT AND UTILITY PLAN
 Sheet Number: 4

NOTE:
 CONTRACTOR TO PROVIDE SLURRY COAT OVER ENTIRE FIRE ADMINISTRATION BUILDING PARKING LOT.

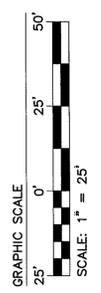
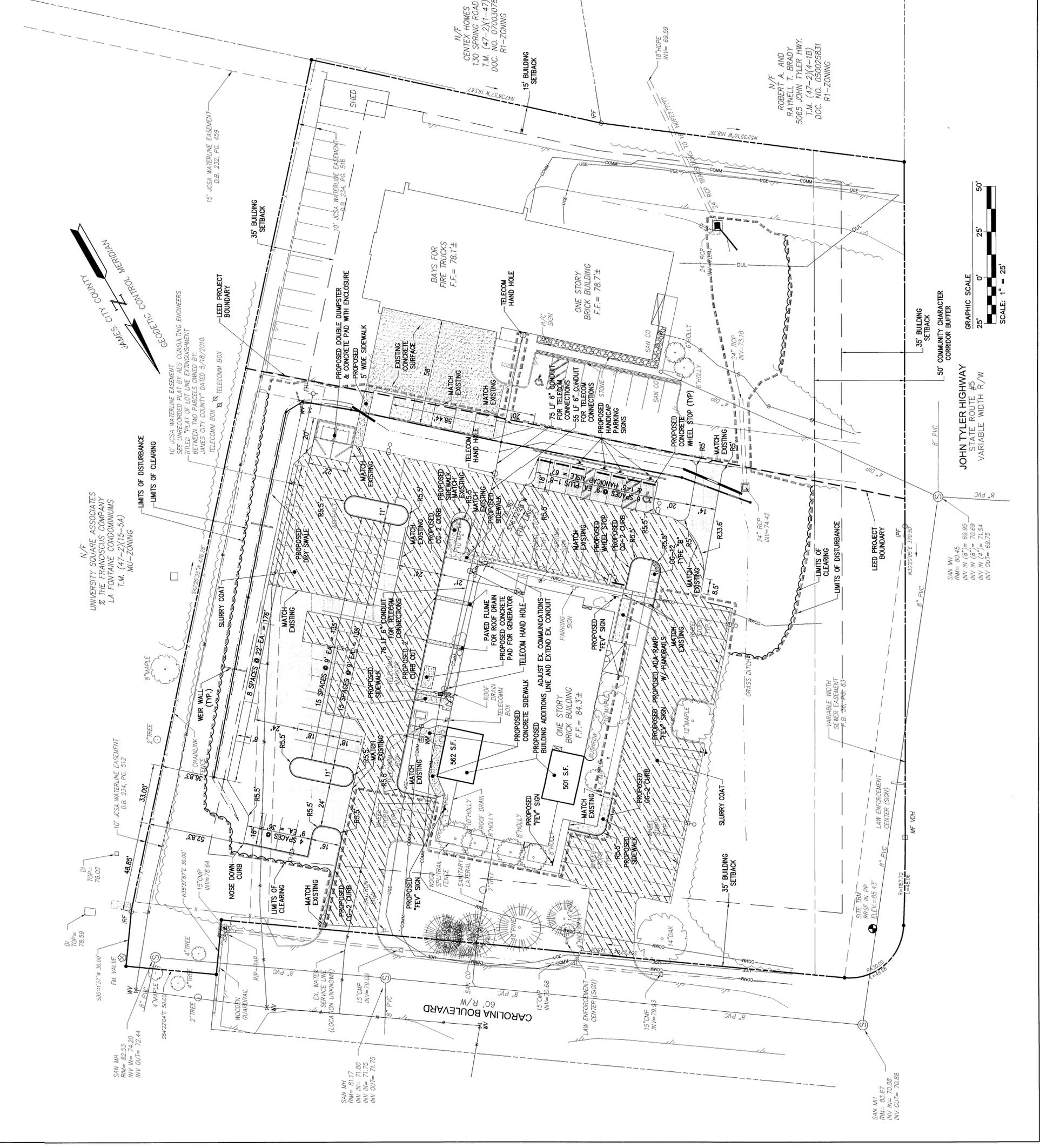


TELECOM CONDUIT & HAND HOLE NOTES

- PROVIDE FOUR (4) NEW UTILITY PULL (HAND HOLE) VAULTS AS SHOWN ON THE PLAN. VAULTS TO BE QUARTZITE 24"x36" OPEN BOTTOM, MODEL PG 2436 BB 36 AND COVER PG 2436 HH 00.
- LOGO DESIGNATED AREA OF THE QUARTZITE BOX COVER SHALL HAVE "J.C.C." PROVIDED.
- INSTALL NEW PVC 1/2" INCH NOMINAL CONDUIT WITH 4 INTEGRAL 1/2" INNERDUCTS AS SHOWN ON THE PLAN. MINIMUM DEPTH OF BURIAL SHALL BE 30 INCHES. CONTRACTOR TO COORDINATE ALIGNMENT AND DEPTH OF CONDUIT AND BOXES WITH JAMES CITY COUNTY. CONTACT TOM PENNINGTON, JAMES CITY COUNTY DIRECTOR OF INFORMATION RESOURCES MANAGEMENT AT (757) 253-6666.
- CONTRACTOR SHALL CONNECT TO EXISTING CONDUIT ADJACENT TO FIRE ADMINISTRATION BUILDING AND FIRE STATION #5.
- CONDUIT SHALL BE INSTALLED TRENCHLESS UNDER PAVEMENT AREAS.
- PROVIDE COPPER TRACER WIRE, 10 GAUGE SOLID WIRE WITH PLASTIC COATING, FOR THE ENTIRE LENGTH ATTACHED TO THE CONDUIT. TRACER WIRE TO BE ATTACHED EVERY 5 FEET TO THE CONDUIT WITH PLASTIC STRAPPING. THE WIRE SHALL TERMINATE ABOVE AT EVERY HAND HOLE BOX AND TERMINUS. THE WIRE SHALL BE OF SUFFICIENT LENGTH TO ALLOW THE WIRE TO BE UNCOILED AND INSTALLED IN THE CONDUIT. CONTRACTOR SHALL BE RESPONSIBLE FOR SERVICE WHEN THE OWNER CAN TRACE THE WIRE USING LOGGING EQUIPMENT. ANY BREAKS SHALL BE REPAIRED BY THE CONTRACTOR PRIOR TO PROJECT ACCEPTANCE.
- PROVIDE LONG SWEEP RADIUS PVC BENDS FOR ANY CHANGES IN THE CONDUIT DIRECTION.
- CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITTING TO COMPLETE THE WORK WITHIN THE PROJECTS LIMITS.

SITE & UTILITY NOTES:

- ALL CURBING, GUTTERS, AND SIDEWALKS SHALL BE VDOT CLASS A-3 CONCRETE.
- ALL WALKS AND SIMILAR PAVED SURFACES SHALL HAVE A MINIMUM 1.0% AND MAXIMUM 2.0% CROSS SLOPE AND SHALL MEET ALL LOCAL REQUIREMENTS.
- ALL PROPOSED PAVING SURFACES SHALL MEET ADJACENT PAVING SURFACES IN A SMOOTH CONTINUOUS MANNER, FLUSH ALONG ENTIRE COMMON EDGE.
- ALL RADI AND CURVES INDICATED SHALL HAVE CONTINUOUS / SMOOTH TRANSITIONS WITHOUT ABRUPT CHANGES, BENDS OR FACETED EDGE.
- ALL OBJECTIONABLE AND DELETERIOUS MATERIAL IS TO BE REMOVED FROM THE SITE AND DISPOSED OF IN A STATE APPROVED FACILITY MEETING THE REQUIREMENTS OF ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.
- DIMENSIONS AND RADI SHOWN ARE DIMENSIONED TO FACE OF CURB UNLESS OTHERWISE SPECIFIED.
- ALL SIGNAGE AND PAVEMENT MARKING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
- ALL HANDICAP PARKING, RAMPS, AND SIGNS SHALL MEET ANSI A117.1-1986.
- HANDICAP PARKING SPACES AND ACCESS AISLES SHALL COMPLY WITH SECTION 502.5 ANSI A117.1-2003 AND HAVE SURFACE SLOPES NOT STEEPER THAN 1:48. ACCESS AISLES SHALL BE AT THE SAME LEVEL AS THE PARKING SPACES THEY SERVE.
- EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES. IF EXISTING UTILITIES ARE FOUND TO BE IN CONFLICT WITH PROPOSED SITE IMPROVEMENTS, THE CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER, OWNER, AND THE UTILITY COMPANY TO EITHER REDESIGN THE PROPOSED IMPROVEMENTS OR RELOCATE THE EXISTING UTILITIES AT THE OWNER'S EXPENSE.
- ANY AND ALL UTILITIES AND/OR OBSTRUCTIONS (POWER POLES, TELEPHONE PEDESTALS, GLY WIPES, WATER METERS, ETC.) THAT ARE REQUIRED TO BE RELOCATED OR ADJUSTED DUE TO CONSTRUCTION SHALL BE DONE SO AT THE OWNER'S/DEVELOPER'S EXPENSE, INCLUDING THOSE WITHIN THE RIGHT-OF-WAY.
- ALL UTILITY AND SURVEY DATA SHOWN ON THE DRAWINGS HAVE BEEN PROVIDED BY ARES CONSULTING ENGINEERS. INFORMATION HAS BEEN OBTAINED FROM THE BEST AVAILABLE SOURCES AT THE TIME OF THE SURVEY BUT IS NOT REPRESENTED AS BEING GUARANTEED. CONTRACTOR SHALL VERIFY ALL UTILITIES AND STRUCTURES TO BE PROTECTED EXISTING UTILITIES AND UNDERGROUND STRUCTURES SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE DEVELOPER.
- THE CONTRACTOR SHALL PROVIDE SUFFICIENT COVER OVER ALL UTILITY LINES DURING CONSTRUCTION.



JOHN TYLER HIGHWAY
 STATE ROUTE #5
 VARIABLE WIDTH R/W

SAN MH
 RM= 80.45
 INV IN (0')= 69.85
 INV IN (1')= 71.64
 INV IN (2')= 73.54
 INV OUT= 69.75

SAN MH
 RM= 83.67
 INV IN= 70.86
 INV OUT= 70.88

SITE "B"
 R65F IN PP
 ELEV=85.43'

VARIABLE WIDTH
 SEWER EASEMENT
 F.B. 306-PC-63

LAW ENFORCEMENT
 CENTER (SIGN)

8" PVC

50' COMMUNITY CHARACTER
 CORRIDOR BUFFER

35' BUILDING
 SETBACK

18" HOPE
 INV= 69.59

N/F
 ROBERT A. AND
 RAYNELL T. BRADY
 5065 JOHN TYLER HWY.
 T.M. (47-2)(4-1B)
 DOC. NO. 050025631
 RT-ZONING

N/F
 CENTEX HOMES
 130 SPRING ROAD
 T.M. (47-2)(1-47)
 DOC. NO. 070030782
 RT-ZONING

UNIVERSITY SQUARE ASSOCIATES
 % THE FRANTOSCUS COMPANY
 LA FONTAINE CONDOMINIUMS
 T.M. (47-2)(15-5A)
 MU-ZONING

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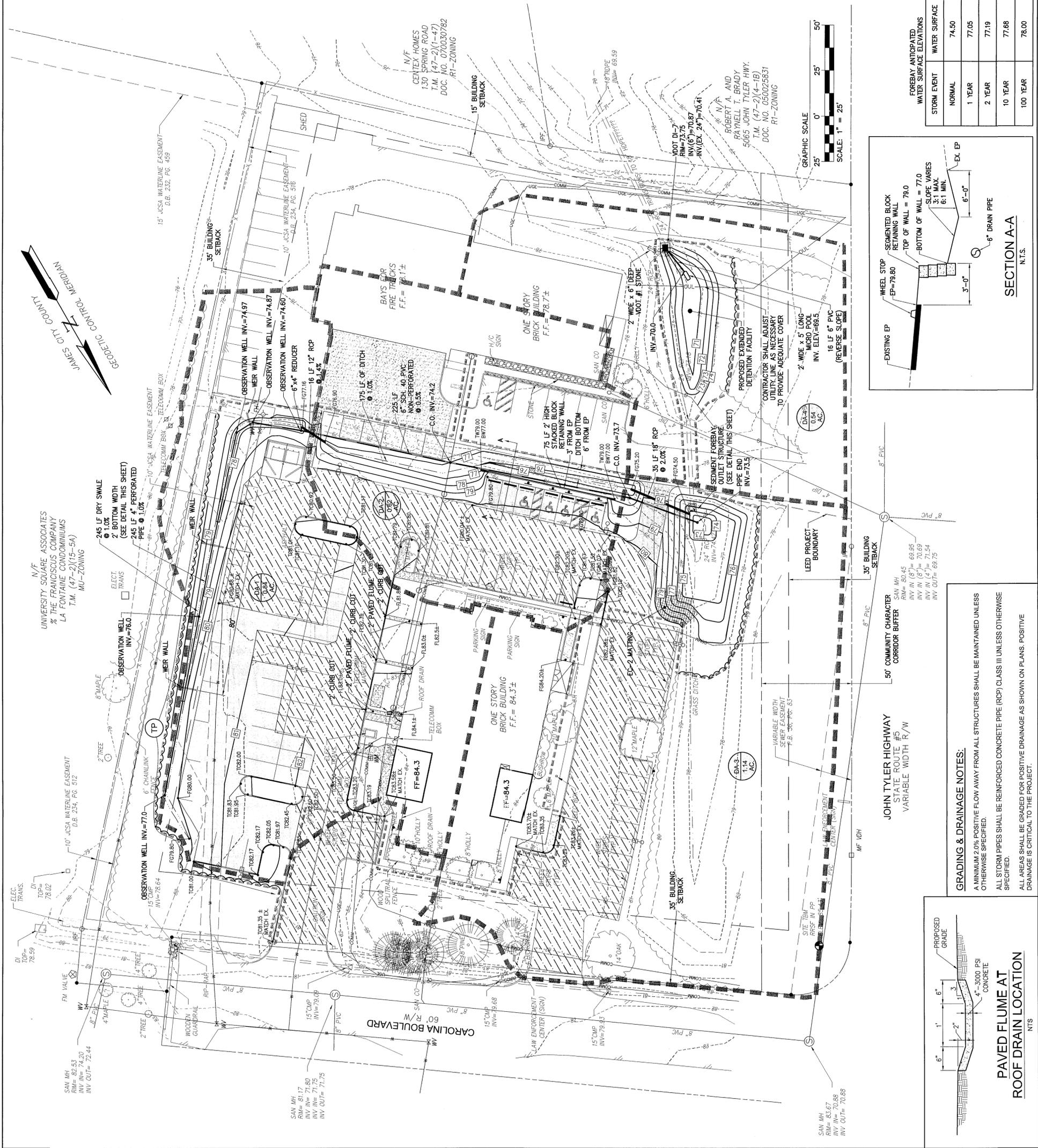
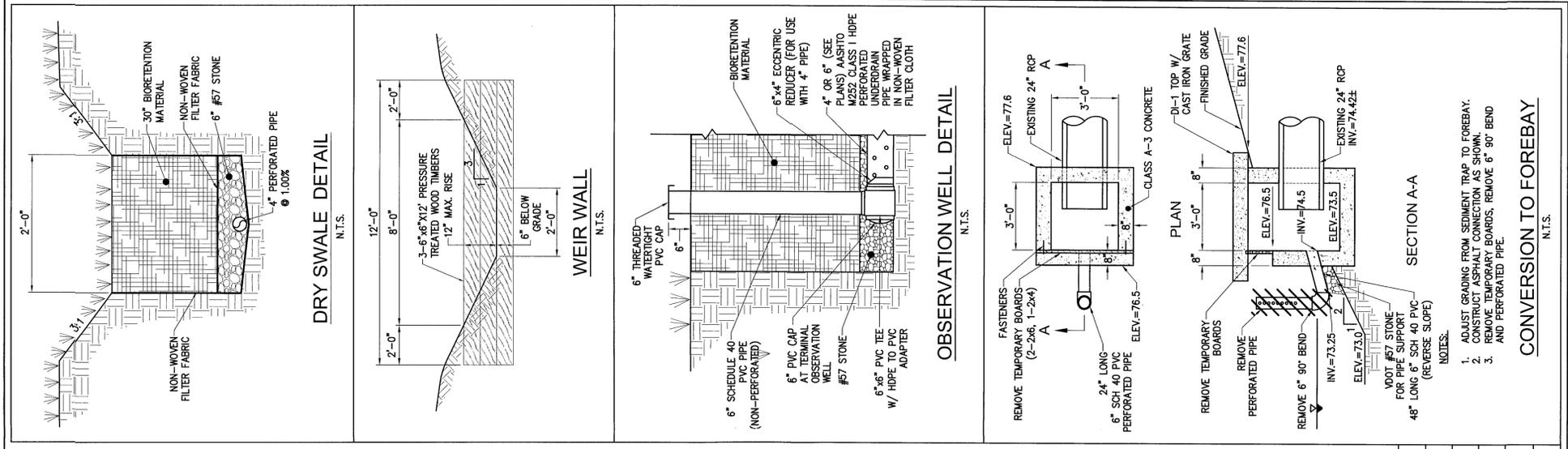
Rev.	Date	Description
1	9/28/10	Revised Per County Comments
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AES
 CONSULTING ENGINEERS
 5248 Old Town Road, Suite 101B
 Middle Peninsula, Virginia 23042
 Phone: (757) 220-8994
 Fax: (757) 220-8994
 www.aesva.com

JAMES CITY COUNTY
 FIRE ADMINISTRATION BUILDING
 PARKING ADDITIONS
 JAMESTOWN DISTRICT
 JAMES CITY COUNTY
 VIRGINIA

Project Contacts: VM/REC
 Project Number: 9801-E-51
 Scale: 1"=25'
 Date: 8/5/10
 Sheet Title: GRADING AND DRAINAGE PLAN
 Sheet Number: 5
 Sheet Number: 5



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.

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

CONSTRUCTION OF A SILT FENCE
(WITHOUT WIRE SUPPORT)

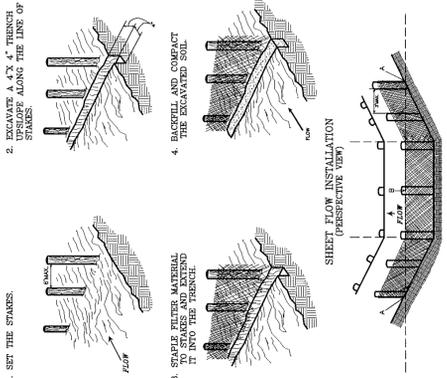


Plate 3.05-2

PIPE OUTLET CONDITIONS

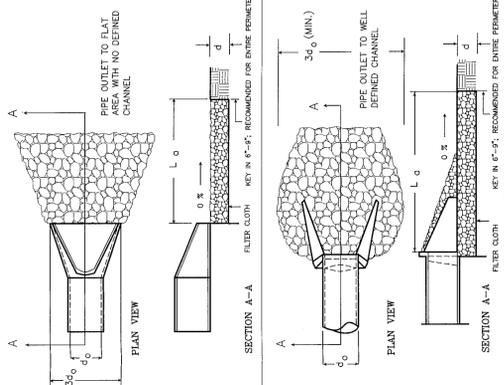


Plate 3.18-1

SITE SPECIFIC SEEDING MIXTURES
FOR COASTAL PLAIN AREA

MINIMUM CARE LAWN
COMMERCIAL OR RESIDENTIAL
-KENTUCKY 31 OR TURF-TYPE TALL FESCUE
-COMMON BERMUDA GRASS **
HIGH-MAINTENANCE LAWN
-KENTUCKY 31 OR TURF-TYPE TALL FESCUE
OR
-HYBRID BERMUDAGRASS (SEED) **
-HYBRID BERMUDAGRASS (BY OTHER VEGETATIVE
ESTABLISHMENT METHOD, SEE STD. & SPEC. 3.34)
GENERAL SLOPE (6:1 OR LESS)
-KENTUCKY 31 FESCUE
-RED TOP GRASS
-SEASONAL NURSE CRIP **
LOW MAINTENANCE SLOPE (STEEPER THAN 3:1)
-COMMON BERMUDAGRASS **
-RED TOP GRASS
-SEASONAL NURSE CRIP **
-SENECA LESPEDEZA **

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

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

Table 3.32-D

FENCING AND ARMORING

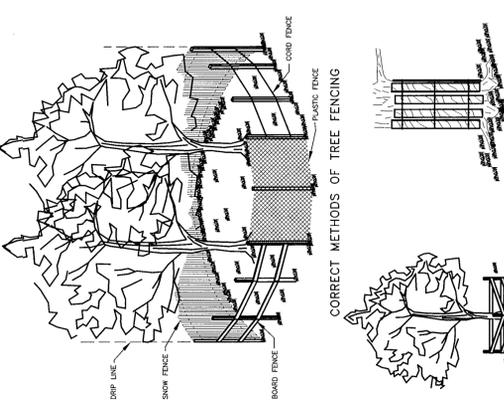
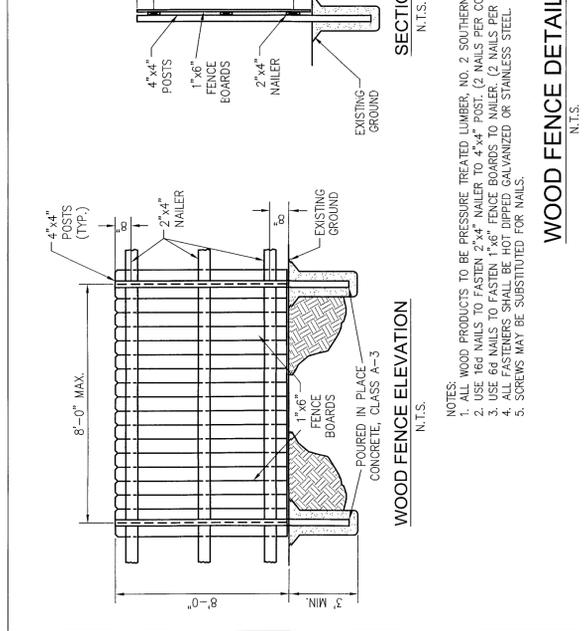


Plate 3.38-2



WOOD FENCE DETAIL

N.T.S.

SECTION

N.T.S.

FENCE BOARD TOP

N.T.S.

WOOD FENCE ELEVATION

N.T.S.

WOOD FENCE DETAIL

N.T.S.

WOOD FENCE DETAIL

N.T.S.

Rev.	Date	Description
1	9/28/10	Revised Per County Comments
2		
3		
4		
5		
6		
7		
8		
9		
10		



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1818 Old Town Road, Suite 1
Farmingdale, NY 11735
Phone: (757) 252-0040
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www.aeseng.com

JAMES CITY COUNTY
PARKING ADDITIONS
FIRE ADMINISTRATION BUILDING
JAMESTOWN DISTRICT
JAMES CITY COUNTY
VIRGINIA

Project Contact: VM/REC
Project Number: 9801E-31
Date: 9/28/10
Sheet Title: EROSION AND SEDIMENT CONTROL NOTES AND DETAILS
Sheet Number: 9

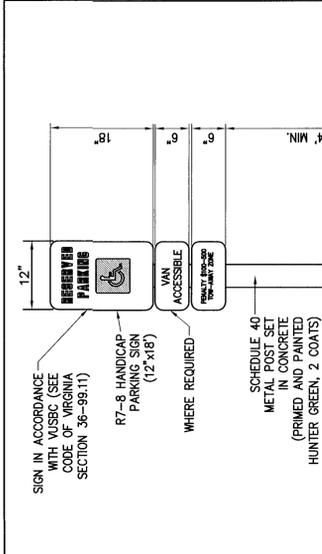
Rev	Date	Description
1	02/28/10	Revised Per County Comments
By		WMB
Checked		



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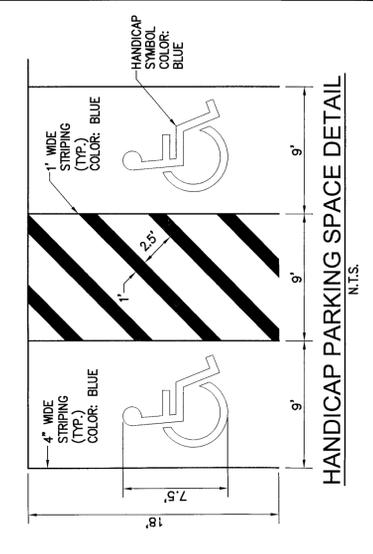
JAMES CITY COUNTY
FIRE ADMINISTRATION BUILDING
PARKING ADDITIONS
JAMESTOWN DISTRICT
JAMES CITY COUNTY
VIRGINIA

VMB/REC Project Number: 9801-E-31	Date:
Scale: AS SHOWN	8/10
Sheet Title: NOTES AND DETAILS	
Sheet Number: 7	



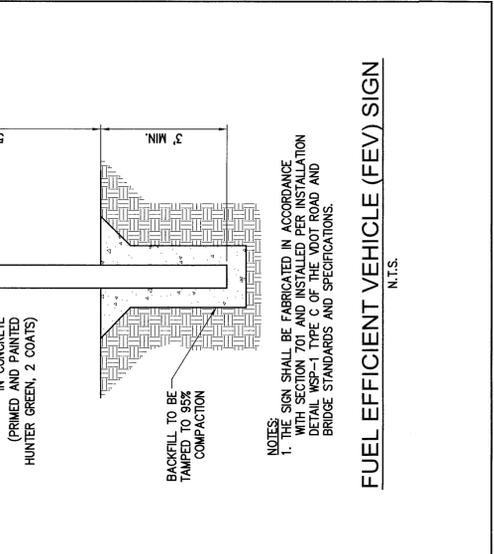
HANDICAP SIGN DETAIL
N.T.S.

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



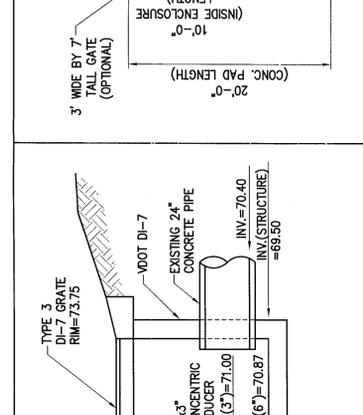
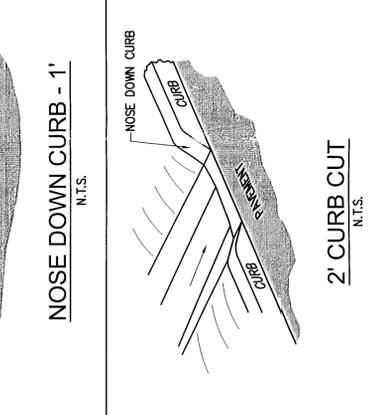
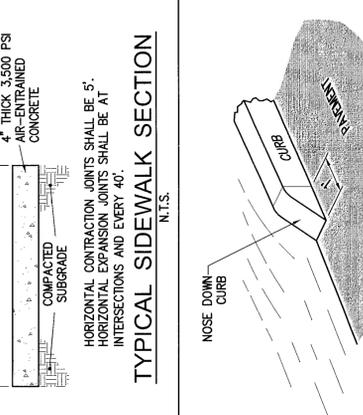
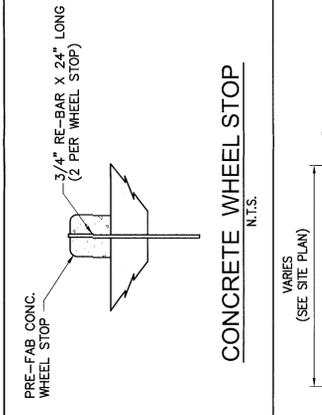
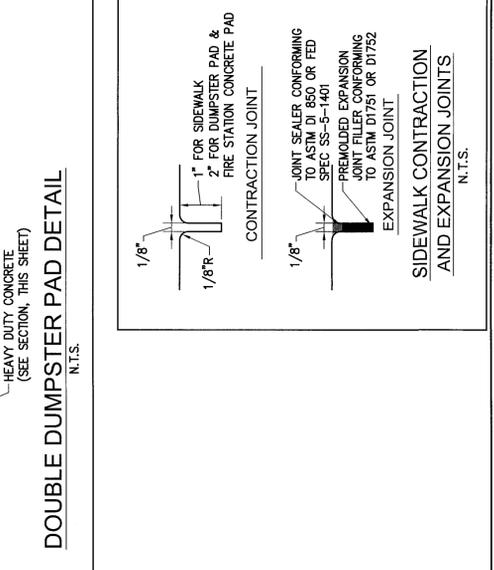
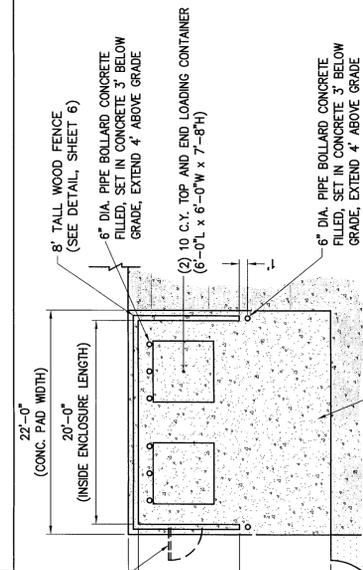
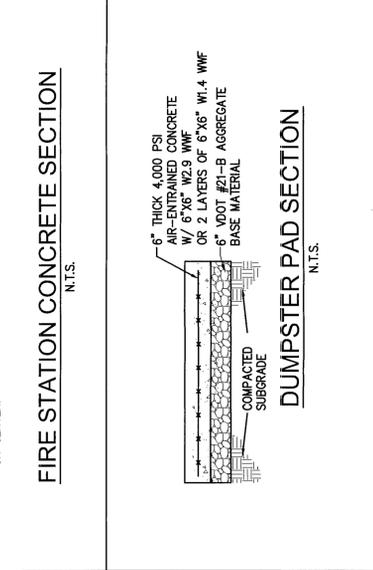
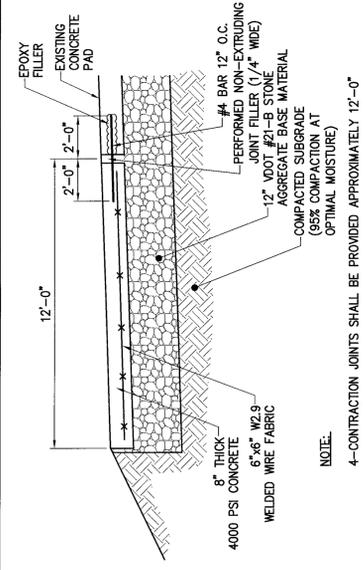
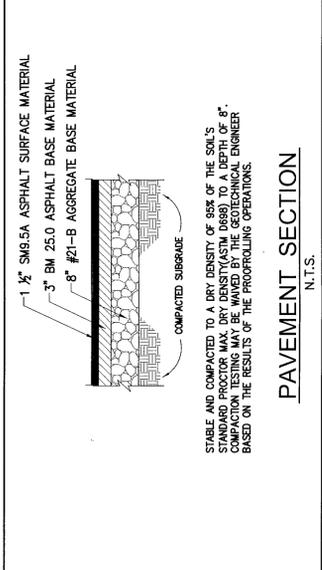
HANDICAP PARKING SPACE DETAIL
N.T.S.

NOTES:
1. THE SIGN SHALL BE FABRICATED IN ACCORDANCE WITH SECTION 701 AND INSTALLED PER INSTALLATION DETAIL WSP-1 TYPE C OF THE ROOT ROAD AND BRIDGE STANDARDS AND SPECIFICATIONS.



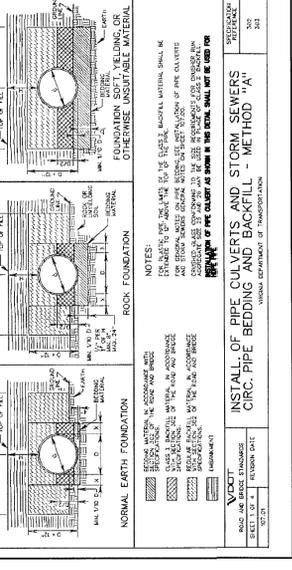
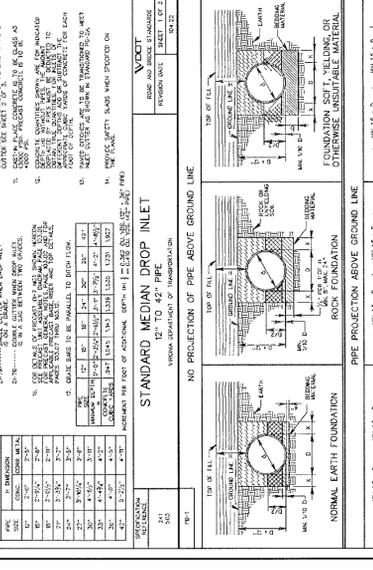
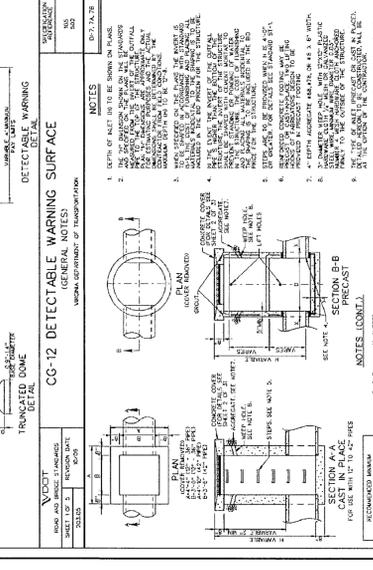
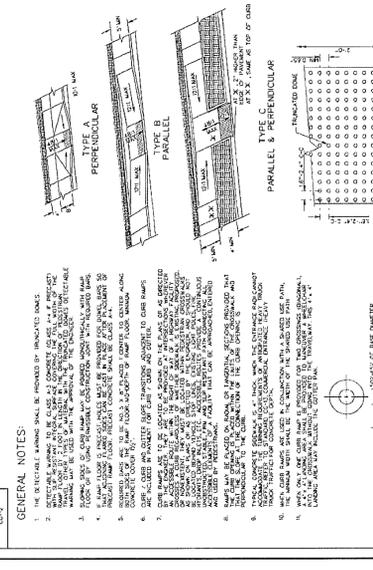
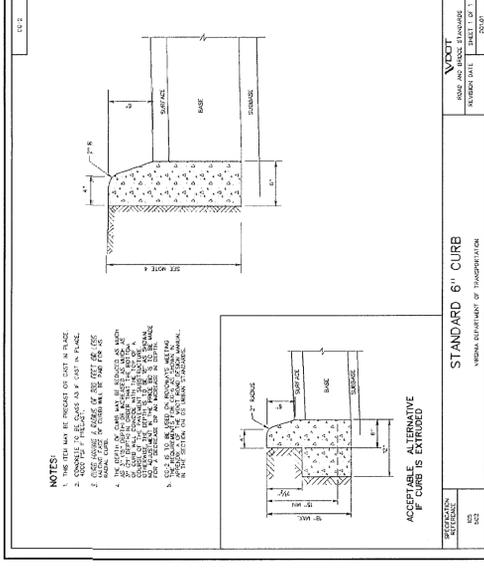
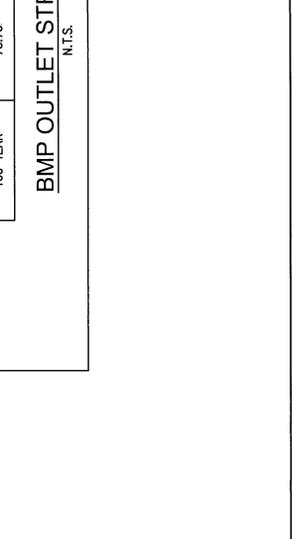
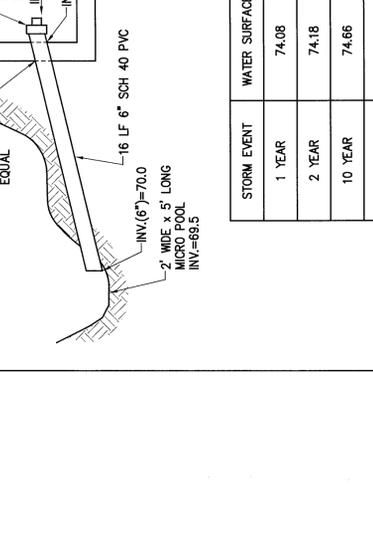
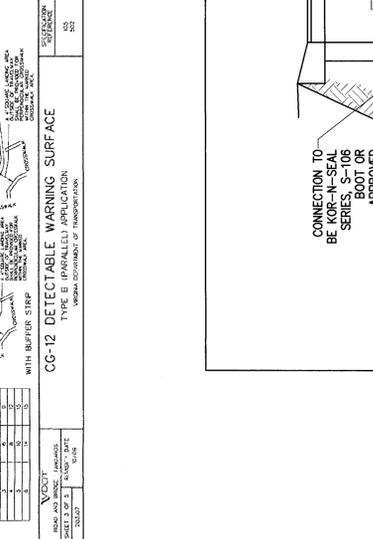
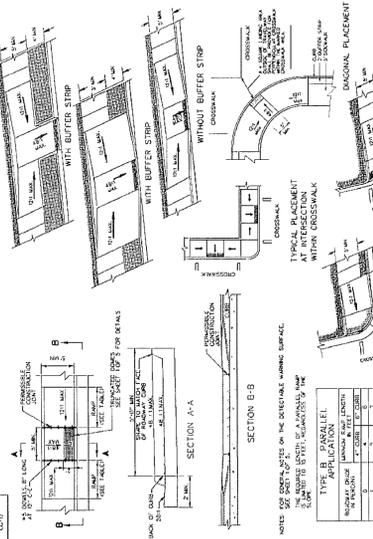
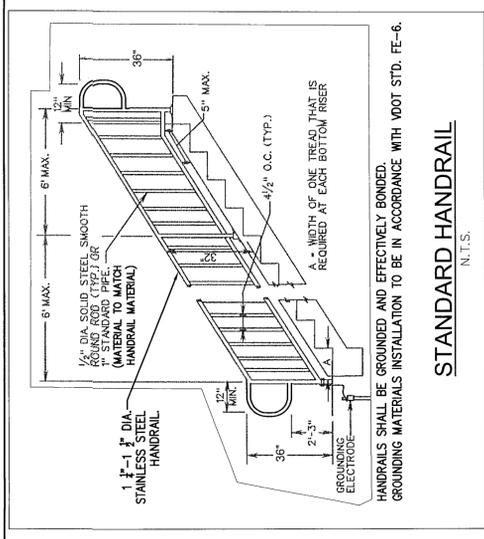
FUEL EFFICIENT VEHICLE (FEV) SIGN
N.T.S.

NOTES:
1. THE SIGN SHALL BE FABRICATED IN ACCORDANCE WITH SECTION 701 AND INSTALLED PER INSTALLATION DETAIL WSP-1 TYPE C OF THE ROOT ROAD AND BRIDGE STANDARDS AND SPECIFICATIONS.



BMP OUTLET STRUCTURE
N.T.S.

STORM EVENT	WATER SURFACE	PEAK FLOW (cfs)
1 YEAR	74.08	5.4
2 YEAR	74.18	7.8
10 YEAR	74.66	14.8
100 YEAR	75.75	17.2



Rev	Date	Description
1	9/28/10	Revised Per County Comments
By		
Reviewed		
WMB		



AES
CONSULTING ENGINEERS
5248 Old Town Road, Suite 1
Middle Peninsula
Central Virginia
Hampden Roads
JAMES CITY COUNTY
VIRGINIA

JAMES CITY COUNTY
PARKING ADDITIONS
FIRE ADMINISTRATION BUILDING
JAMESTOWN DISTRICT

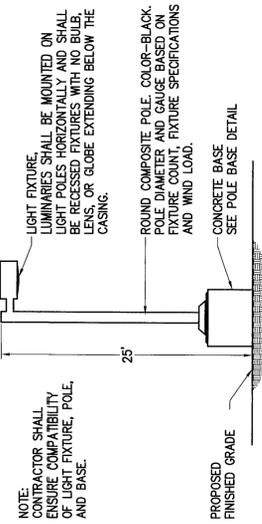
Project Controls: VM8REC
Project Number: 9801E-51
Date: 8/6/10
Scale: 1"=30'
Sheet Title: LIGHTING PLAN
Sheet Number: 9

LIGHTING SCHEDULE

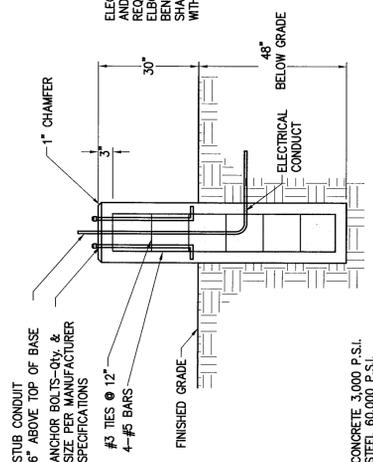
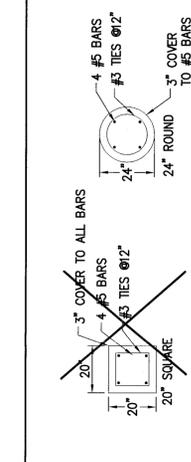
KEY	FIXTURE TYPE	MOUNTING HEIGHT	POLE TYPE / MOUNTING INSTRUCTIONS	FIXTURES PER POLE	TOTAL FIXTURES
A	DOMINION - ULTRA FLAT LENS (LUL123FSV) TYPE 3 HORIZONTAL LAMP, 250 WATT, HIGH PRESSURE SODIUM LIGHT FIXTURE COLOR: BLACK	25'	SMOOTH ROUND TAPERED COMPOSITE POLE	1	5
B	DOMINION - ULTRA FLAT LENS (LUL123FSV) TYPE 3 HORIZONTAL LAMP, 250 WATT, HIGH PRESSURE SODIUM LIGHT FIXTURE COLOR: BLACK	25'	SMOOTH ROUND TAPERED COMPOSITE POLE	2	2

LIGHTING NOTES

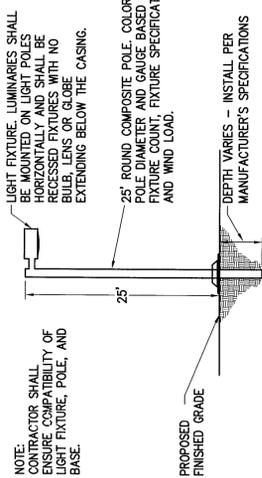
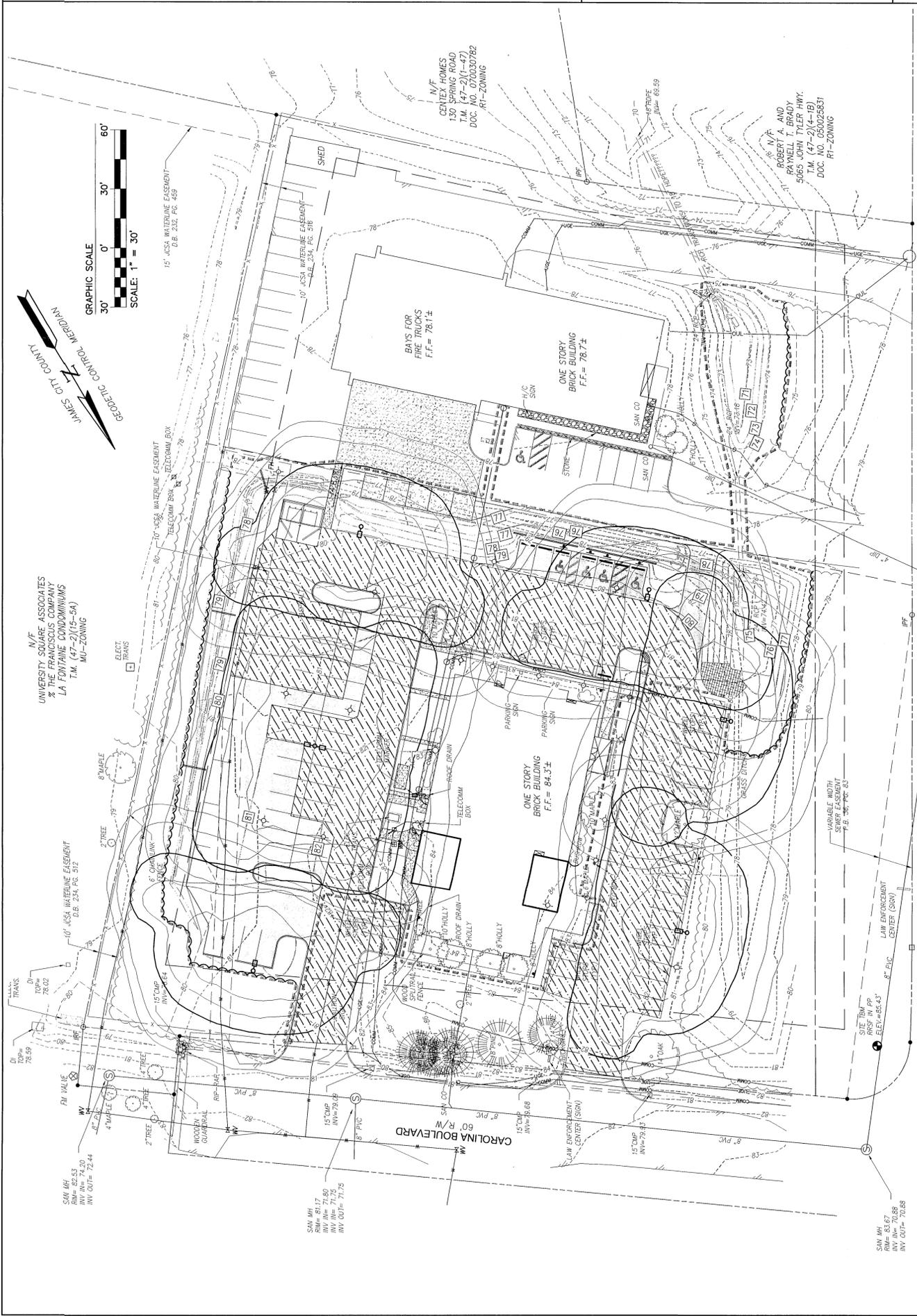
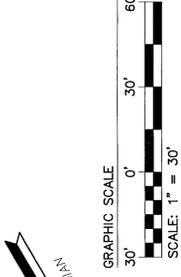
- THIS DRAWING IS INTENDED SOLELY FOR THE PURPOSE OF FIXTURE SELECTION & PLACEMENT AND DEPICTING ASSOCIATED ILLUMINANCE LEVELS.
- THE CONTRACTOR AND/OR ELECTRICAL ENGINEER SHALL BE RESPONSIBLE FOR: SOURCE OF ELECTRICAL POWER; CIRCUITRY; WIRE SIZE; CONDUIT LAYOUT; AND ANY OTHER ELECTRICAL REQUIREMENTS.
- CONTRACTOR SHALL ENSURE THE LIGHT FIXTURE, POLE, POLE BASE, AND CONCRETE BASE ARE COMPATIBLE.
- INSTALLATION OF POLES AND LIGHTING FIXTURES SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- THE CONTRACTOR SHALL ENSURE THAT THE POLE DIAMETER, GAUGE, AND FINISHING REQUIREMENTS EXCEED THE MINIMUM LOAD REQUIREMENTS BASED ON FIXTURE COUNT, REGION, WIND LOADS, LOCAL STATISTICS, ADDITIONAL BANNERS / POLE ARMS, AND THE FIXTURE SPECIFICATIONS.



TYPE 'B' POLE DETAIL
N.T.S.

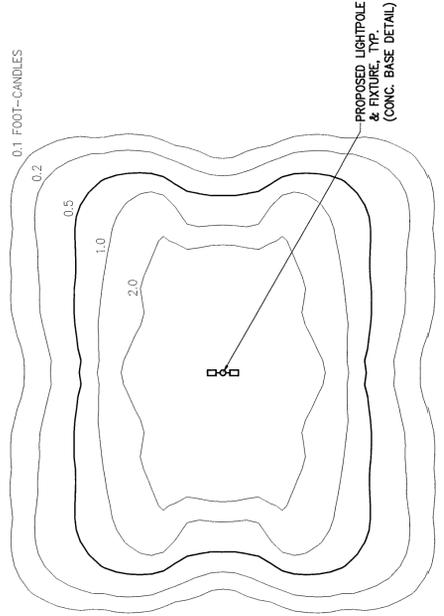


CONCRETE 3,000 P.S.I.
STEEL 60,000 P.S.I.
TYPE 'B' 16-25' POLE BASE DETAIL
N.T.S.

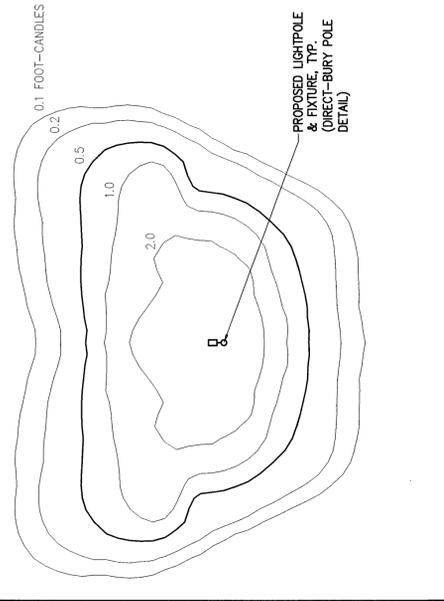


TYPE 'A' DIRECT-BURY POLE DETAIL
N.T.S.

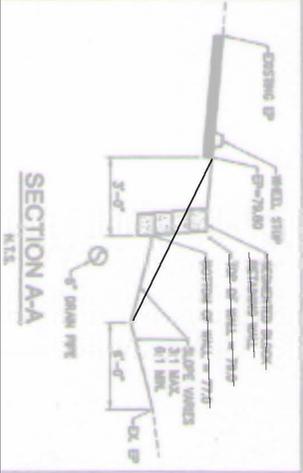
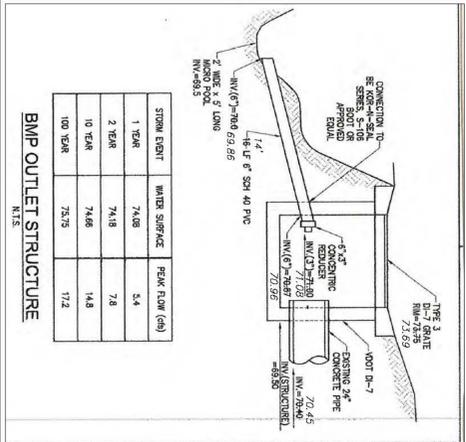
DEPTH VARIES - INSTALL PER MANUFACTURER'S SPECIFICATIONS
TYPE 'A' DIRECT-BURY POLE DETAIL
N.T.S.



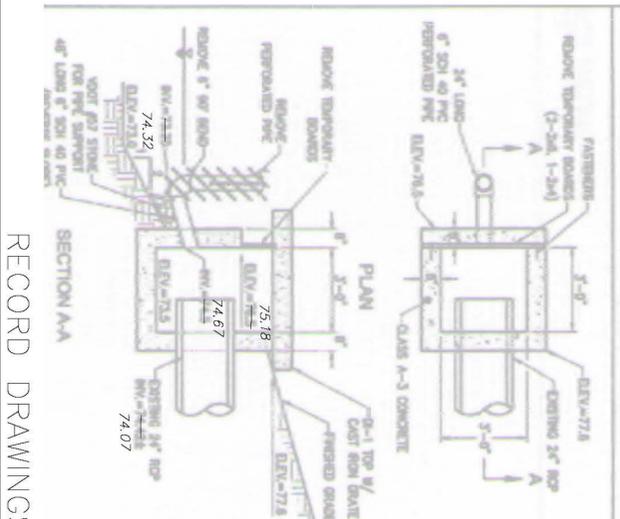
TYPE 'B' ISO-FOOTCANDLE DIAGRAM
N.T.S.



TYPE 'A' ISO-FOOTCANDLE DIAGRAM
N.T.S.



STORM EVENT	WATER SURFACE	WATER SURFACE
NORMAL	74.50	
1 YEAR	77.05	
2 YEAR	77.19	
10 YEAR	77.88	
100 YEAR	78.00	



STORMWATER AS-BUILTS
 JAMES CITY COUNTY
 FIRE ADMINISTRATION BUILDING
 PREPARED FOR DAVID NICE BUILDERS, INC.

JAMES CITY COUNTY VIRGINIA

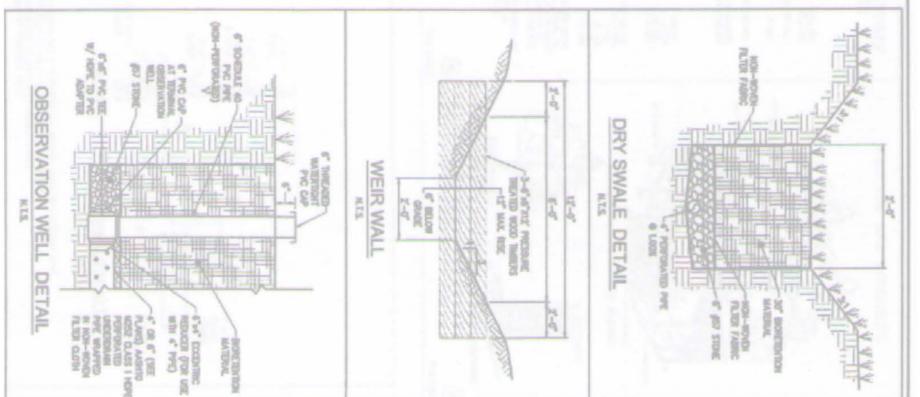
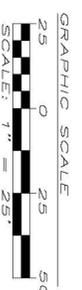
COUNTY PLAN NO. SP-068-10
 BMP ID NO. MC-70

08/29/2012
 DATE

A.D. SEBERT, L.S.



SURVEYOR'S CERTIFICATION
 I HEREBY CERTIFY THAT THE INFORMATION SHOWN HEREON REPRESENTS
 AN ACTUAL FIELD SURVEY, UNLESS NOTED OTHERWISE. THE HORIZONTAL
 AND VERTICAL LOCATION OF THE IMPROVEMENTS HAVE BEEN COMPLETED
 IN GENERAL CONFORMANCE WITH THE APPROVED SITE PLAN.



SEBERT
 SURVEYING
 & LAYOUT, LLC

173 BARLOW ROAD
 WILLIAMSBURG, VA
 PHONE (757) 345-0931
 CELL: (757) 784-2413

LEGEND:

N/F	NOW OR FORMERLY
IRF	IRON ROD FOUND
IFR	IRON PIPE FOUND
CMF	CONCRETE MONUMENT FOUND
NL/S	NAIL SET
BSL	BUILDING SETBACK LINE
R/W	RIGHT-OF-WAY
SMH	SANITARY MANHOLE
CO	SANITARY CLEANOUT
WM	WATER METER
WV	WATER VALVE
X 98.2	EXISTING SPOT ELEVATION
● 98.2	PROPOSED SPOT ELEVATION

REVISIONS	DATE	BY	DESCRIPTION
1	COUNTY COMMENTS 9/18/12		

PROJECT NO. J472-4
 DRAWING NO. 1 OF 1