Return to:
Adam R. Kinsman
Deputy County Attorney
101-C Mounts Bay Road
Williamsburg, VA 23185
(757) 253-6612

COPY

COUNTY OF JAMES CITY, VIRGINIA

DECLARATION OF COVENANTS
INSPECTION/MAINTENANCE OF DRAINAGE SYSTEM

THIS DECLARATION, made this 15th day of JANUARY, 20 08, between NEW TOWN ASSOCIATES, LLC, and all successors in interest, ("COVENANTOR(S)"), owner(s) of the following property:

Parcel Identification Number: 3840100056
Legal Description: Remaining Area New Town Associates
Project or Subdivision Name: New Town Section 7+8 Roadway Infrastructure Plans Phase VII
Document No. 080027269
OR Deed Book _____, Page No. _____,
and the County of James City, Virginia ("COUNTY.")

WITNESSETH:

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

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

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

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

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

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

Instrument # 080003539
Recorded on Jan. 31, 2008

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

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

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

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

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

COVENANTOR(S)
NEWTOWN ASSOCIATES, LLC

Print Name JOHN P. McCANN

EXECUTIVE DIRECTOR
Title

ACKNOWLEDGMENT

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

I hereby certify that on this 15th day of JANUARY, 20 08, before the subscribed, a Notary Public for the Commonwealth of Virginia, personally appeared JOHN P. McCANN and did acknowledge the foregoing instrument to be his/her Act.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal this 15th day of JANUARY, 20 08.

[SEAL]

Yolanda P. Williams
Notary Public

Notary Registration Number: 7037688

My Commission expires: My Commission Expires November 30, 2010

YOLANDA P. WILLIAMS
COMMONWEALTH OF VIRGINIA
NOTARY PUBLIC

COVENANTOR(S)

_____
Print Name

_____
Title

ACKNOWLEDGMENT

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

I hereby certify that on this _____ day of _____, 20____, before the subscribed, a Notary Public for the Commonwealth of Virginia, personally appeared _____ and did acknowledge the foregoing instrument to be his/her Act.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal this _____ day of _____, 20____.

[SEAL]

_____
Notary Public

Notary Registration Number:_____

My Commission expires: _____

Approved as to form:

_____
County Attorney

This Declaration of Covenants prepared by:

Name: ~~John P.~~

Print Name: JOHN P. McCANN

Title: EXECUTIVE DIRECTOR

Address: 4801 COURTHOUSE ST.
SUITE 203, WILLIAMSBURG, VA 23188

Phone Number: 757-565-6200

(drainage1.pre)

James City County, Virginia
Environmental Division

Stormwater Management / BMP Facilities
Record Drawing and Construction Certification

Standard Forms & Instructions

Contents | Page

Record Drawing and Construction Certification Forms

	Section 1 – Site Information		1
	Section 2 – Construction Information		2
	Section 3 – Owner / Designer / Contractor Information		2
	Section 4 – Professional Certifications		3
	Section 5 – Certification Requirements and Instructions		4

Record Drawing Checklist

I.	Methods and Presentation	(Required for All Facilities)	6
II.	Minimum Standards	(Required for All Facilities)	6
III.	Group A – Wet Ponds		8
IV.	Group B – Wetlands		9
V.	Group C – Infiltration Practices		10
VI.	Group D – Filtering Systems		11
VII.	Group E – Open Channel Systems		12
VIII.	Group F – Extended Dry Detention		13
IX.	Group G – Open Spaces		14
X.	Storm Drainage Systems	(Associated with BMP's Only)	15
XII.	Other Systems		15
XIII.	References		16

Issue Date
February 1, 2001

James City County, Virginia
Environmental Division

Stormwater Management / BMP Facilities
Record Drawing and Construction Certification Forms

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

Section 1 – Site Information:

Project Name: New Town Section 7 & 8 Phase VII
Structure/BMP Name: BMP B02
Project Location: Newtown - Rollison Drive
BMP Location: Adjacent Rollison Drive
County Plan No.: SP - 0068 - 2007

Project Type:
- ☐ Residential
- ☐ Commercial
- ☐ Institutional
- ☐ Public
- ☒ Other Mixed Use
- ☐ Business
- ☐ Office
- ☐ Industrial
- ☐ Roadway

Tax Map/Parcel No.: 384010056
BMP ID Code (if known):
Zoning District: MU
Land Use: Mixed Use
Site Area (sf or acres): Undeternined

Brief Description of Stormwater Management/BMP Facility: Wet Extended Detention Facility (A-3)

Nearest Visible Landmark to SWM/BMP Facility: Intersecting Casey Blvd and Rollison Drive

Nearest Vertical Ground Control (if known):
☒ JCC Geodetic Ground Control ☐ USGS ☐ Temporary ☐ Arbitrary ☐ Other
Station Number or Name: 325
Datum or Reference Elevation: NGVD29 Elevation 110.67
Control Description: Benchmark Station #325
Control Location from Subject Facility: _____

Section 2 – Stormwater Management / BMP Facility Construction Information:

PreConstruction Meeting Held for Construction of SWM/BMP Facility: ☒ Yes ☐ No ☐ Unknown
Approx. Construction Start Date for SWM/BMP Facility: February 2007
Facility Monitored by County Representative during Construction: ☒ Yes ☐ No ☐ Unknown
Name of Site Work Contractor Who Constructed Facility: Jack L. Massie
Name of Professional Firm Who Routinely Monitored Construction: AES Consulting Engineers and ECS, LLC
Date of Completion for SWM/BMP Facility: May 2009
Date of Record Drawing/Construction Certification Submittal: November 2009

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

Section 3 – Owner / Designer / Contractor Information:

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

Name: New Town Associates
Mailing Address: 4801 Courthouse Street Suite 203
Williamsburg, Virginia 23188
Business Phone: 757-565-6200 Fax: 757-565-6291
Contact Person: Larry Salzman Title:

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

Firm Name: AES Consulting Engineers
Mailing Address: 5248 Olde Towne Road Suite 1
Williamsburg, Virginia 23188
Business Phone: 757-253-0040
Fax: 757-220-8994
Responsible Plan Preparer: Robert E. Cosby, III, P.E.
Title: Project Manager
Plan Name: New Town Section 7 & 8 Roadway Infrastructure Plans Phase VII
Firm's Project No. 6632-7-01
Plan Date: April 17, 2008
Sheet No.'s Applicable to SWM/BMP Facility: 05 / 06 / 08 / 12 /

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

Name: Jack L. Massie
Mailing Address: 3900 Cokes Lane
Williamsburg, Virginia 23188
Business Phone: 757-566-8643
Fax: 757-566-8566
Contact Person: Scott Kozenski
Site Foreman/Supervisor: Scott Kozenski
Specialty Subcontractors & Purpose (for BMP Construction Only):

Section 4 – Professional Certifications:

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

Record Drawing and Construction Certifications for Stormwater Management / BMP Facilities

Record Drawing Certification

Firm Name: AES Consulting Engineers
Mailing Address: 5248 Olde Towne Road Suite 1
Williamsburg, Virginia 23188
Business Phone: 757-253-0040
Fax: 757-220-8994

Name: Tom Sublet, L.S.
Title: Senior Land Surveyor/Project Manager

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

_____ (Seal)

Virginia Registered Professional Engineer
Or Certified Land Surveyor

Construction Certification

Firm Name: AES Consulting Engineers
Mailing Address: 5248 Olde Towne Road, Suite 1
Williamsburg, VA 23188
Business Phone: 757-253-0040
Fax: 757-220-8994

Name: Robert E. Cosby III, P.E.
Title: Project Manager

Signature: _____
Date: _____

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

_____ (Seal)

Virginia Registered
Professional Engineer

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

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

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

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

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

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

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

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

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

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

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

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

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

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

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

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

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

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

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

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

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

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

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

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

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

XX 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.

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

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

XX	9.	Primary control structure (riser) diameter or dimensions, height, type of material and base size. Indicate provisions for access that are present such as steps, ladders, etc.
XX	10.	Dimensions, locations and elevations of outlet orifices, weirs, slots and drains.
XX	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.
Inc	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.**
Inc	13.	Top of impervious core embankment, core trench limits and elevation of cut-off trench bottom. **May need to obtain this information during construction.**
XX	14.	Elevation of the principal spillway barrel (outlet pipe) inlet and outlet invert.
XX	15.	Outlet barrel diameter, length, slope, type and thickness class of material and type of flared end sections, headwall or endwall.
XX	16.	Outfall protection dimension, type and depth of rock and if underlain filter fabric is present.
Inc	17.	BMP interior and periphery landscaping zones conform with arrangements and requirements of the approved design plan.
Inc	18.	Maintenance plan taken from approved design plan transposed onto record drawing set.
Inc	19.	Fencing location and type, if applicable to facility.
Inc	20.	BMP vicinity properly cleaned of stockpiles and construction debris.
XX	21.	No visual signs of erosion or channel degradation immediately downstream of facility.
XX	22.	Any other information formally requested by the Environmental Division specific to the constructed SWM/BMP facility.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

XX	A1.	All requirements of Section II, Minimum Standards, apply to Group A facilities.
XX	A2.	Principal spillway consists of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.
XX	A3.	Sediment forebays or pretreatment devices provided at inlets to pond. Generally 4 to 6 ft. deep.
N/A	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.
N/A	A5.	Adequate fixed vertical sediment depth markers installed in the forebay(s) for future sediment monitoring purposes.
N/A	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.
XX	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).
N/A	A8.	No trees are present within a zone 15 feet around the embankment toe and 25 feet from the principal spillway structure.
XX	A9.	Wet permanent pool, typically 3 to 6 feet deep, is provided and maintains level within facility.
XX	A10.	Low flow orifice has a non-clogging mechanism.
N/A	A11.	A pond drain pipe with valve was provided.
XX	A12.	Pond side slopes are not steeper than 3H:1V, unless approved plan allowed for steeper slope.
N/A	A13.	End walls above barrels (outlet pipe) greater than 48 inch in diameter are fenced to prevent a fall hazard.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

IV. **<u>Group B – Wetlands:</u>** *(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 (½) 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 MANAGEMENT / BMP FACILITIES
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 MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

_____ 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 MANAGEMENT / BMP FACILITIES
RECORD DRAWING 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 diaphrahm provided in areas where lateral sheet flow from impervious surgaces 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 MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

VIII. <u>Group F – Extended Dry Detention</u> *(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 MANAGEMENT / BMP FACILITIES
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 MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

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

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

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

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

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

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

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

_____ 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 Environmental Division specific to the proposed SWM/BMP facility.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

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

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

Project Name: Newtown Section 7&8 PH V/II
County Plan No.: SP-068-07
Stormwater Management Facility: Wet Pond
BMP Phase #: ☐ I ☐ II ☐ III
☑ Information Package Received. Date/By: 11/17/09
☑ Completeness Check:
- ☑ Record Drawing Date/By: 11/17/09
- ☑ Construction Certification Date/By: 11/17/09 AES
- ☑ RD/CC Standard Forms (Required for all BMPs after Feb 1st 2001Only)
- ☑ Insp/Maint Agreement # / Date: 1/15/08
- ☑ BMP Maintenance Plan Location: SP-068-07 - Sheet 12
- ☐ Other:

☑ Standard E&SC Note on Approved Plan Requiring RD/CC or County comment in plan review
- ☑ Yes ☐ No Location: Sheet 9

☑ Assign **County BMP ID Code #**: Code: PC249
☑ Preliminary Input/Log into Division's "As-Built Tracking Log"
☑ Add Location to GIS Map. Obtain basic site information (GPIN, Owner, Address, etc.)
☑ Preliminary Log into Access Database (BMP ID #, Plan No., GPIN, Project Name, etc.)
☑ Active Project File Review (correspondence, H&H, design computations, etc.).
☑ Initial As-Built File setup (File label, folder, copy plan/details/design information, etc.).
☑ Inspector Check of RD/CC (forward to Inspector using transmittal for cursory review).
☑ Pre-Inspection Drawing Review of Approved Plan (Quick look prior to Field Inspection).
☑ Final Inspection (FI) Performed Date: 11/17/09
☑ Record Drawing (RD) Review Date: 1/8/13
☑ Construction Certification (CC) Review Date: 1/8/13
☐ Actions:
- ☐ No comments.
- ☐ Comments. Letter Forwarded. Date:
- ☐ Record Drawing (RD)
- ☐ Construction Certification (CC)
- ☐ Construction-Related (CR)
- ☐ Site Issues (SI)
- ☐ Other :

☐ Second Submission:
☐ Reinspection (if necessary): 1/8/13 for stabilization
☑ Acceptable for SWM Purposes (RD/CC/CR/Other). Ok to proceed with bond release.
☑ Complete "Surety Request Form".
☑ Check/Clean active file of any remaining material and finish "As-Built" file.
☐ Add to County BMP Inventory/Inspection schedule (Phase I, II or III).
☑ Copy Final Inspection Report into County BMP Inspection Program file.
☑ Obtain Digital Photographs of BMP and save into County BMP Inventory.
☑ Request ~~mylar/reproducible from As-Built plan preparer.~~ CD Pdf
☑ Complete "As-built Tracking Log".
☑ Last check of BMP Access Database (County BMP Inventory).
☐ Add BMP to JCC Hydrology & Hydraulic database (optional).
☐ Add BMP to Municipal BMP list (if a County-owned facility)
☐ Add BMP to PRIDE BMP ratings database.

Final Sign-Off

Inspector: Amy Pah Date: 11/20/13
Chief Engineer: Date: 12/21/13

*** See separate checklist, if needed.

Environmental Division

NOV 17 2009

RECEIVED

James City County, Virginia
Environmental Division

Stormwater Management / BMP Facilities
Record Drawing and Construction Certification Forms

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

Section 1 – Site Information:

Project Name: New Town Section 7 & 8 Phase VII
Structure/BMP Name: BMP B02
Project Location: Newtown - Rollison Drive
BMP Location: Adjacent Rollison Drive
County Plan No.: SP - 0068 - 2007

Project Type:
- ☐ Residential
- ☐ Commercial
- ☐ Institutional
- ☐ Public
- ☒ Other Mixed Use
- ☐ Business
- ☐ Office
- ☐ Industrial
- ☐ Roadway

Tax Map/Parcel No.: 384010056
BMP ID Code (if known):
Zoning District: MU
Land Use: Mixed Use
Site Area (sf or acres): Undeternined

Brief Description of Stormwater Management/BMP Facility: Wet Extended Detention Facility (A-3)

Nearest Visible Landmark to SWM/BMP Facility: Intersecting Casey Blvd and Rollison Drive

Nearest Vertical Ground Control (if known):
☒ JCC Geodetic Ground Control ☐ USGS ☐ Temporary ☐ Arbitrary ☐ Other
Station Number or Name: 325
Datum or Reference Elevation: NGVD29 Elevation 110.67
Control Description: Benchmark Station #325
Control Location from Subject Facility: _____

Return to:
Adam R. Kinsman
Deputy County Attorney
101-C Mounts Bay Road
Williamsburg, VA 23185
(757) 253-6612

COPY

COUNTY OF JAMES CITY, VIRGINIA

DECLARATION OF COVENANTS
INSPECTION/MAINTENANCE OF DRAINAGE SYSTEM

THIS DECLARATION, made this 15th day of JANUARY, 20 08, between NEW TOWN ASSOCIATES, LLC, and all successors in interest, ("COVENANTOR(S)"), owner(s) of the following property:

Parcel Identification Number: 3840100056
Legal Description: Remaining Area New Town Associates
Project or Subdivision Name: New Town Section 7+8 Roadway Infrastructure Plans Phase VII
Document No. 080027269
OR Deed Book _____, Page No. _____,
and the County of James City, Virginia ("COUNTY.")

WITNESSETH:

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

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

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

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

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

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

Instrument # 080003539
Recorded on Jan. 31, 2008

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

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

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

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

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

COVENANTOR(S)
NEW TOWN ASSOCIATES, LLC

Print Name JOHN P. McCANN

EXECUTIVE DIRECTOR
Title

ACKNOWLEDGMENT

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

I hereby certify that on this 15th day of JANUARY, 20 08, before the subscribed, a Notary Public for the Commonwealth of Virginia, personally appeared JOHN P. McCANN and did acknowledge the foregoing instrument to be his/her Act.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal this 15th day of JANUARY, 20 08.

[SEAL]

Yolanda P. Williams
Notary Public

Notary Registration Number: 7037688

My Commission expires: My Commission Expires November 30, 2010

YOLANDA P. WILLIAMS
COMMONWEALTH OF VIRGINIA
NOTARY PUBLIC

COVENANTOR(S)

_____
Print Name

_____
Title

ACKNOWLEDGMENT

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

I hereby certify that on this _____ day of _____, 20____, before the subscribed, a Notary Public for the Commonwealth of Virginia, personally appeared _____ and did acknowledge the foregoing instrument to be his/her Act.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal this _____ day of _____, 20____.

[SEAL]

_____
Notary Public

Notary Registration Number:_____

My Commission expires: _____

Approved as to form:

_____
County Attorney

This Declaration of Covenants prepared by:

Name: ~~John P.~~

Print Name: JOHN P. McCANN

Title: EXECUTIVE DIRECTOR

Address: 4801 COURTHOUSE ST.
SUITE 203, WILLIAMSBURG, VA 23188

Phone Number: 757-565-6200

(drainage1.pre)

I HEREBY CERTIFY TO THE BEST OF MY JUDGEMENT, KNOWLEDGE, AND BELIEF THAT THE INFORMATION SHOWN HEREON IS ACCURATE AND CORRECT. THE INFORMATION SHOWN IS BASED ON AN ACTUAL FIELD SURVEY PERFORMED BY AES CONSULTING ENGINEERS ON MAY 19, 2008 AND UPDATED ON NOVEMBER 9, 2009.

COMMONWEALTH OF VIRGINIA
THOMAS C. SUBLETT
Lic. No. 1886
11/17/09
LAND SURVEYOR

THOMAS C. SUBLETT, L.S. #1886 — DATE 11/17/09

BMP/DAM MAINTENANCE AND INSPECTION REQUIREMENTS

THE EMBANKMENT AND MAINTENANCE RIGHT OF WAY SHOULD BE MOWED PERIODICALLY DURING THE GROWING SEASON, ENSURING THAT THE LAST CUTTING OCCURS AT THE END OF THE SEASON. THE GRASS SHOULD NOT BE CUT LESS THAN 6 TO 8 INCHES IN HEIGHT.

IF NECESSARY, THE EMBANKMENT SHOULD BE LIMED, FERTILIZED AND SEEDED IN THE FALL, AFTER THE GROWING SEASON. LIME AND FERTILIZER APPLICATION RATES SHOULD BE CONSISTENT WITH THAT ORIGINALLY SPECIFIED ON THE CONSTRUCTION PLANS.

ALL EROSION GULLIES NOTED DURING THE GROWING SEASON SHOULD BE BACKFILLED WITH TOPSOIL, RESEEDED AND PROTECTED (MULCHED) UNTIL VEGETATION IS ESTABLISHED.

ALL BARE AREAS AND PATHWAYS ON THE EMBANKMENT SHOULD BE PROPERLY SEEDED AND PROTECTED (MULCHED) OR OTHERWISE STABILIZED TO ELIMINATE THE POTENTIAL FOR EROSION.

ALL ANIMAL BURROWS SHOULD BE BACKFILLED AND COMPACTED.

ALL TREES, WOODY VEGETATION AND OTHER DEEP-ROOTED GROWTH, INCLUDING STUMPS AND ASSOCIATED ROOT SYSTEMS, SHOULD BE REMOVED FROM THE EMBANKMENT AND ADJACENT AREAS EXTENDING TO AT LEAST 25 FEET BEYOND THE EMBANKMENT TOE AND ABUTMENT CONTACTS. THE ROOT SYSTEMS SHOULD BE EXTRACTED AND THE EXCAVATED VOLUME REPLACED AN COMPACTED WITH MATERIAL SIMILAR TO THE SURROUNDING AREA. ALL SEEDLINGS SHOULD BE REMOVED AT THE FIRST OPPORTUNITY. SIMILARLY, ANY VINE COVER AND BRUSH SHOULD BE REMOVED FROM THE EMBANKMENT TO ALLOW FOR INSPECTIONS.

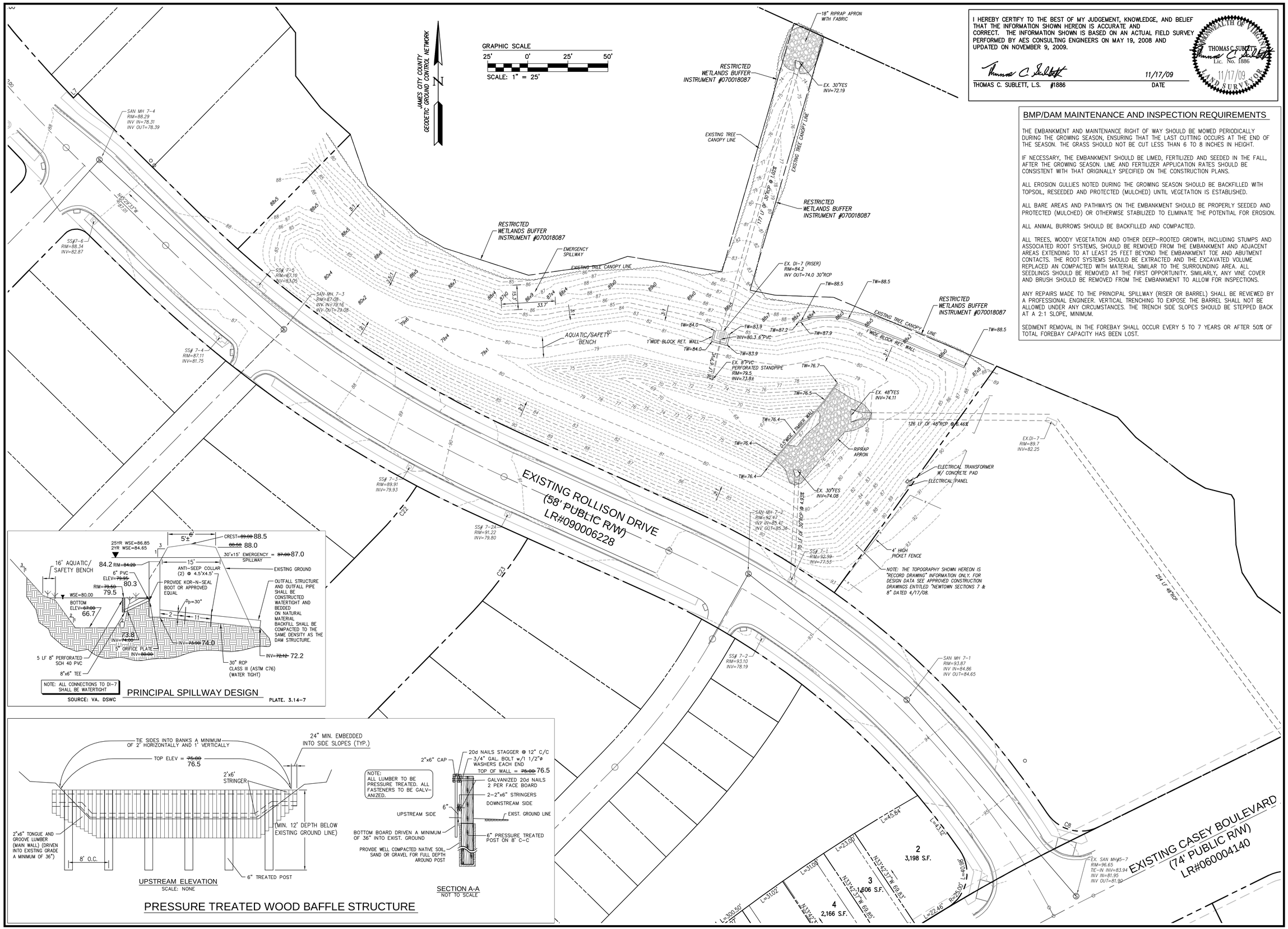
ANY REPAIRS MADE TO THE PRINCIPAL SPILLWAY (RISER OR BARREL) SHALL BE REVIEWED BY A PROFESSIONAL ENGINEER. VERTICAL TRENCHING TO EXPOSE THE BARREL SHALL NOT BE ALLOWED UNDER ANY CIRCUMSTANCES. THE TRENCH SIDE SLOPES SHOULD BE STEPPED BACK AT A 2:1 SLOPE, MINIMUM.

SEDIMENT REMOVAL IN THE FOREBAY SHALL OCCUR EVERY 5 TO 7 YEARS OR AFTER 50% OF TOTAL FOREBAY CAPACITY HAS BEEN LOST.

No.	DATE	REVISION / COMMENT / NOTE	REVISED BY	REVIEWED BY

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

JAMES CITY COUNTY GEODETIC GROUND CONTROL NETWORK



PRINCIPAL SPILLWAY DESIGN

SOURCE: VA. DSWC — PLATE. 3.14-7

PRESSURE TREATED WOOD BAFFLE STRUCTURE

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

AES CONSULTING ENGINEERS
WILLIAMSBURG • RICHMOND • GLOUCESTER • FREDERICKSBURG

BMP RECORD DRAWING / POND_BMP B02
NEW TOWN
SECTION 7 & 8
ROADWAY INFRASTRUCTURE PLANS
PHASE VII
JAMES CITY COUNTY — VIRGINIA
BERKELEY DISTRICT

Designed	Drawn
AES	CMA
Scale	Date
1"=25'	11/17/09

Project No. 6632-7-01S

Drawing No. 1 OF 1

I HEREBY CERTIFY TO THE BEST OF MY JUDGEMENT, KNOWLEDGE, AND BELIEF THAT THE INFORMATION SHOWN HEREON IS ACCURATE AND CORRECT. THE INFORMATION SHOWN IS BASED ON AN ACTUAL FIELD SURVEY PERFORMED BY AES CONSULTING ENGINEERS ON MAY 19, 2008 AND UPDATED ON NOVEMBER 9, 2009.

COMMONWEALTH OF VIRGINIA — THOMAS C. SUBLETT — Lic. No. 1886 — LAND SURVEYOR — 11/17/09

THOMAS C. SUBLETT, L.S. #1886 — 11/17/09 DATE

BMP/DAM MAINTENANCE AND INSPECTION REQUIREMENTS

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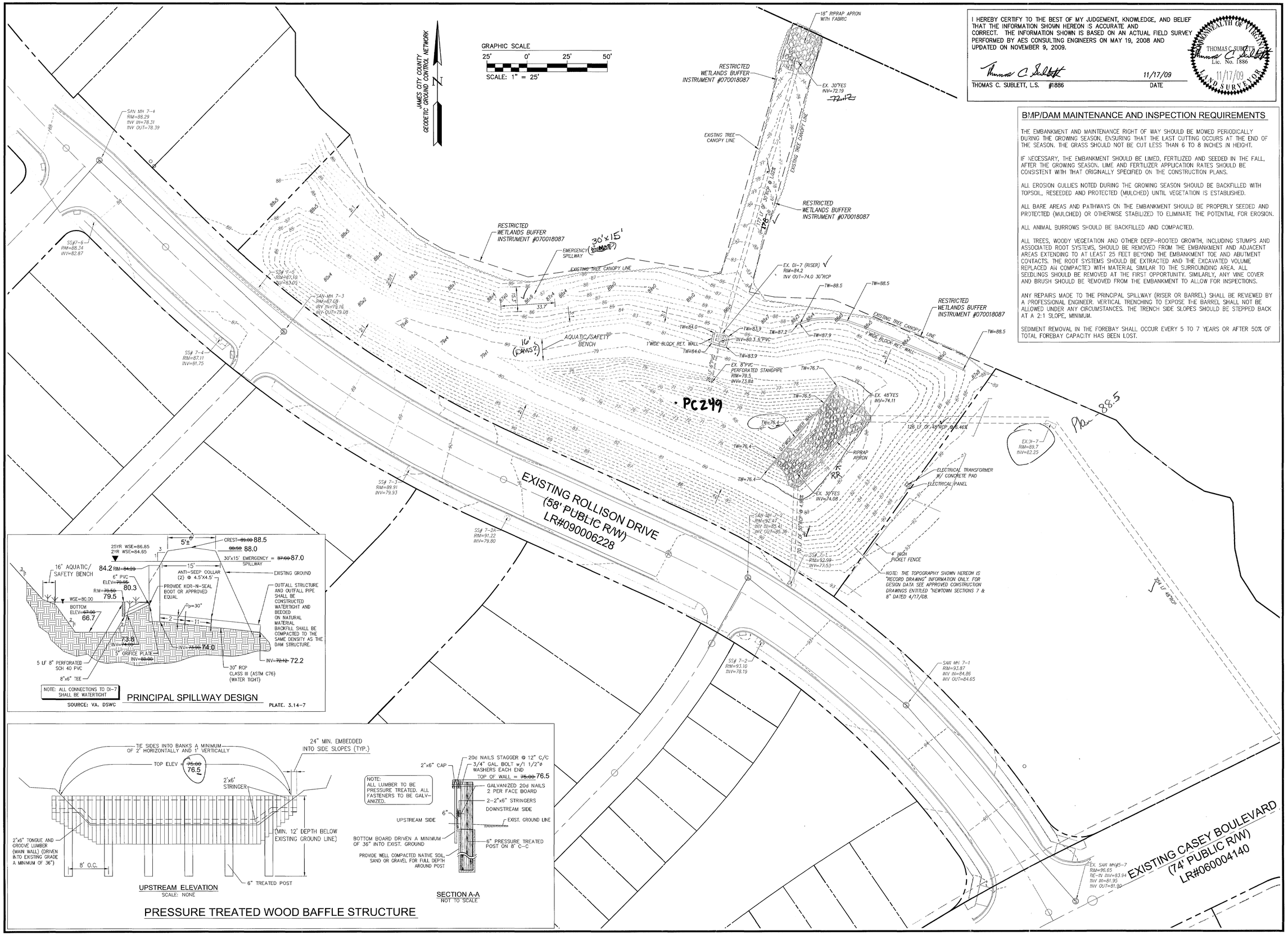

No.	DATE	REVISION / COMMENT / NOTE	REVISED BY	REVIEWED BY

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

CONSULTING ENGINEERS
WILLIAMSBURG • RICHMOND • GLOUCESTER • FREDERICKSBURG

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BMP RECORD DRAWING / POND_BMP_002

NEW TOWN
SECTION 7 & 8
ROADWAY INFRASTRUCTURE PLANS
PHASE VII
JAMES CITY COUNTY
BERKELEY DISTRICT

Designed	Drawn
AES	CMA
Scale	Date
1"=25'	11/17/09

Project No. 6632-7-01S

Drawing No. 1 OF 1

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SP-0068-2007

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APR 2008

NEW TOWN
SECTION 7 & 8
ROADWAY INFRASTRUCTURE PLANS
PHASE VII
BERKELEY DISTRICT
JAMES CITY COUNTY, VIRGINIA

OWNER/DEVELOPER INFORMATION:

NEW TOWN ASSOCIATES, L.L.C.
4801 COURTHOUSE STREET, SUITE 203
WILLIAMSBURG, VIRGINIA, 23188
TELEPHONE: 757-565-6200
CONTACT: MR. JOHN MCCANN
FAX: 757-565-6291

CERTIFIED RESPONSIBLE LAND DISTURBER:

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

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

COUNTY OF JAMES CITY FINAL SITE PLAN	
APPROVALS	DATE
Fire Dept. JB/EC	11/13/07
Health Dept.	
VDOT JB/EC	11/13/07
Planning	5/9/08
Environ. ST/EC	1/10/08
Zoning Adm. MOB	5/9/06
JCSA CP	4/29/08
County Eng. DC/EC	7/24/07
REA	
Other SW/EC	1/9/08

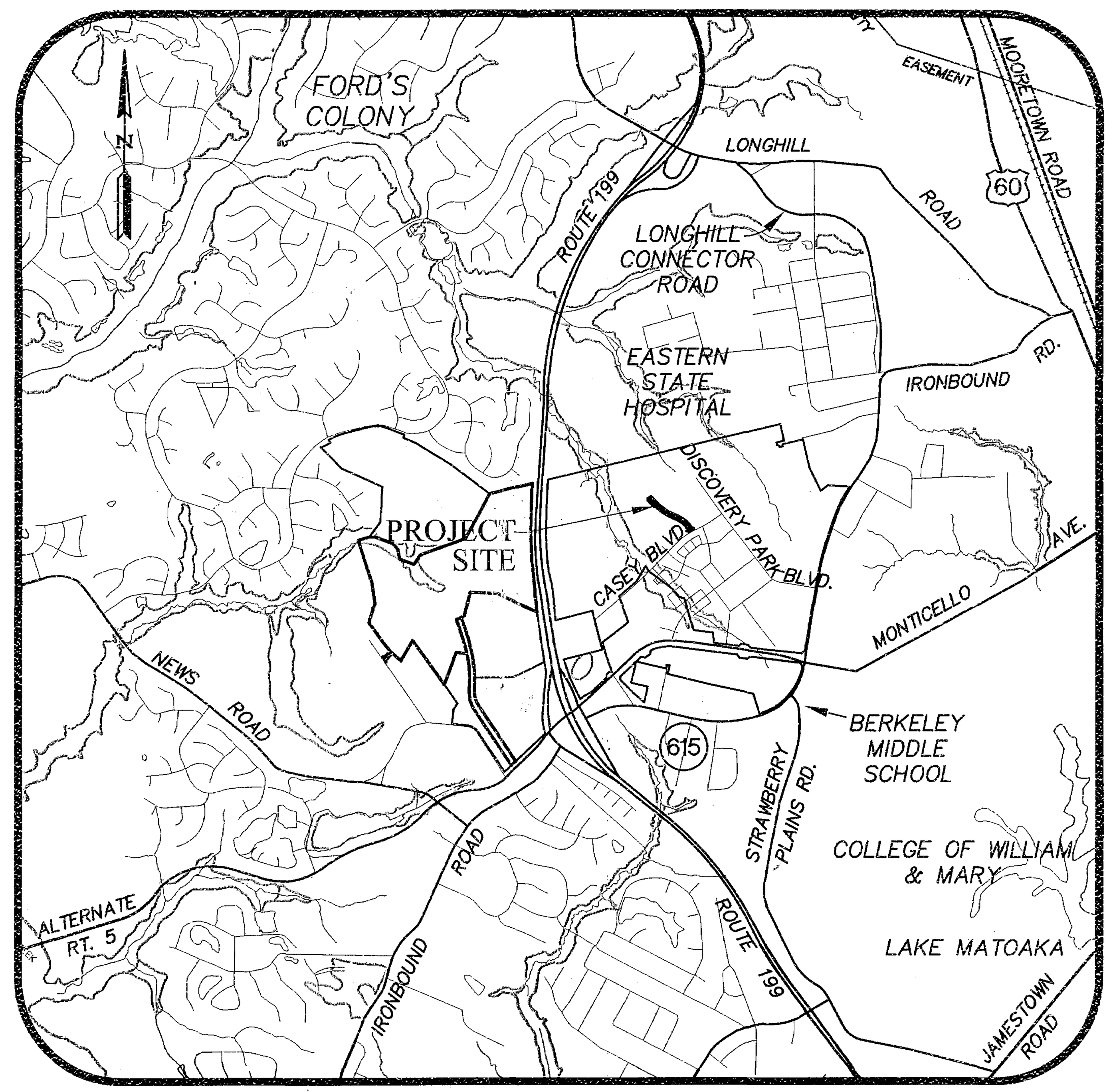
SITE DATA:

SITE ADDRESS:	5240 MONTICELLO AVENUE
TAX MAP PARCEL NO.:	(38-4)(01-0-0056) NEW TOWN
LEGAL DESCRIPTION:	REMAINING AREA NEW TOWN ASSOCIATES
PROPERTY REF.:	INSTR.# 030027269
ZONING:	R8 WITH PROFFERS
PROJECT LIMITS:	179763 S.F.±, 4.13 AC.±
RIGHT OF WAY AREA:	53,019 S.F.±, 1.22 AC.±
IMPERVIOUS COVER:	PUBLIC ROADWAY 30,576 S.F.±, 0.70 AC.± SIDEWALK 8,090 S.F.±, 0.19 AC.± TOTAL 38,666 S.F.±, 0.89 AC.±
TOTAL DISTURBED AREA:	191,350 S.F.±, 4.39 AC.±
FLOOD HAZARD MAP:	THIS PROPERTY LIES IN ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 500 YEAR FLOOD PLAIN) PER F.I.R.M. # 510201 0035 B DATED 2/6/91.

GENERAL NOTES

1. THE SITE IS CURRENTLY ZONED MIXED USE WITH PROFFERS REFERENCING Z-005-06 AND MP-007-06 APPROVED BY THE BOARD OF SUPERVISORS ON FEBRUARY 13, 2007.
2. ALL UTILITIES SHALL BE PLACED UNDERGROUND.
3. CONTACT MISS UTILITY (1-800-552-7001) AT LEAST 48 HOURS IN ADVANCE FOR MARKING OF EXISTING UTILITY LOCATIONS PRIOR TO ANY EXCAVATION OR DEMOLITION.
4. EXISTING UTILITY LOCATIONS INDICATED ARE APPROXIMATE. FIELD VERIFY PRIOR TO COMMENCING THE WORK.
5. A LAND DISTURBING PERMIT AND SILTATION AGREEMENT, WITH SURETY ARE REQUIRED FOR THIS PROJECT.
6. VERIFY ALL DIMENSIONS AND NOTIFY JAMES CITY SERVICE AUTHORITY PRIOR TO ANY EXCAVATION OR DEMOLITION WITHIN UTILITY CORRIDORS.
7. ANY EXISTING, UNUSED WELLS SHALL BE ABANDONED IN ACCORDANCE WITH STATE PRIVATE WELL REGULATIONS AND JAMES CITY COUNTY CODE.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF CONSTRUCTION EFFORTS WITH VIRGINIA NATURAL GAS, DOMINION VIRGINIA POWER, VERIZON TELEPHONE, APPROPRIATE TELEVISION CABLE COMPANY, AND OTHERS THAT MAY BE REQUIRED.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FOR THE WORK INDICATED.
10. ALL NEW SIGNS SHALL BE IN ACCORDANCE WITH ARTICLE II, DIVISION 3 OF THE JAMES CITY COUNTY ZONING ORDINANCE.
11. CONTOUR INTERVAL IS 1 FOOT.
12. ALL COMPONENTS OF THE WATER DISTRIBUTION AND SANITARY SEWER SYSTEM SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AUTHORITY STANDARDS AND SPECIFICATIONS FOR WATER DISTRIBUTION AND SANITARY SEWER SYSTEMS, THE HRPDC REGIONAL STANDARDS, AND THE COMMONWEALTH OF VIRGINIA WATERWORKS AND SEWERAGE REGULATIONS. 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. A COPY OF THE JCSA STANDARDS AND REGIONAL STANDARDS MUST BE KEPT ON-SITE BY THE CONTRACTOR DURING THE FULL TIME OF INSTALLING, TESTING, AND CONVEYING THE FACILITIES TO JCSA.
13. STORM STRUCTURES, SEWER AND BEDDING SHALL CONFORM TO THE VDOT ROAD AND BRIDGE STANDARDS AND VDOT SPECIFICATIONS. ALL PIPE BEDDING SHALL BE IN ACCORDANCE WITH PB-1 AND MANUFACTURER SPECS. AND GUIDELINES, AND MANHOLES DEEPER THAN 4 FEET SHALL HAVE STEPS (ST-1). ALL REINFORCED CONCRETE PIPE (RCP) SHALL BE CLASS III UNLESS OTHERWISE NOTED. STORM SEWER OUTSIDE OF VDOT R.O.W. CAN BE HIGH DENSITY POLYETHYLENE (HDPE).
14. THE PROFESSIONAL WHOSE SEAL IS AFFIXED HEREON SHALL ACT AS THE "RESPONSIBLE LAND DISTURBER" FOR PURPOSES OF PLAN APPROVAL ONLY. PRIOR TO ISSUANCE OF THE LAND DISTURBING PERMIT, THE 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.
15. THIS PROJECT IS LOCATED IN JAMES CITY COUNTY SUB WATERSHED 208 (LOWER CHISEL RUN) AND CATCHMENT 208-103-1 OF THE POWHATAN CREEK WATERSHED.
16. JCSA WILL NOT PERFORM ANY TESTING ON THE PROPOSED WATER OR SEWER MAINS UNTIL ALL UTILITIES HAVE BEEN INSTALLED.
17. PARKING SPACES SHALL BE DELINEATED BY PAVEMENT STRIPING. HANDICAP PARKING SPACES SHALL BE DESIGNATED BY ABOVE GROUND SIGNS PER USBC REQUIREMENTS.
18. EVERYTHING BEYOND THE RIGHT-OF-WAY LINE WILL BE CONSIDERED PRIVATE AND NOT MAINTAINED BY VDOT.
19. ALL WORK SHALL BE IN COMPLIANCE WITH NEW TOWN'S GENERAL VSMP PERMIT (PERMIT VAR 102294). THIS SHALL CONSIST OF, BUT NOT BE LIMITED TO, DAILY LOGS OF EARTHWORK, RECORDATION OF STORM EVENTS, AND LOGS OF MAINTENANCE OF EROSION AND SEDIMENT CONTROL MEASURES.
20. ALL ITEMS TO BE DEMOLISHED SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS.
21. ALL OBJECTIVE MATERIAL SHALL BE REMOVED FROM SITE AND PROPERLY DISPOSED IN A FACILITY MEETING LOCAL, STATE, AND FEDERAL REGULATIONS.
22. BENCHMARK: STATION NO. 325, EASTING(X) 11995286.983, NORTHING(Y) 3628200.301, ELEVATION=110.67
    HORIZONTAL DATUM: JAMES CITY COUNTY
    GEODETIC CONTROL NETWORK
    VA. STATE PLANE COORDINATE
    SYSTEM – SOUTH ZONE
    NAD 083 (1994 VA HARN)

    VERTICAL DATUM: JAMES CITY COUNTY
    GEODETIC CONTROL NETWORK
    NGVD 29



VICINITY MAP
(APPROX. SCALE 1"=2000')

JULY 3, 2007
JCC-SP-0068-2007
PROJECT NO.: 6632-7-01A
SHEET 1 OF 14

COMMONWEALTH OF VIRGINIA
ROBERT E. COSBY III
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4/17/08
PROFESSIONAL ENGINEER

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CHANGES DATED 04/17/08 TO SITE PLAN:

SHEET 4
1. REVISED 2" WATER SERVICE STA 29+55 TO 4" PVC WITH PLUG.

SHEET 5 & 12
1. ADJUSTED LOCATION AND TOP OF TIMBER WALL.

CHANGES DATED 03/03/08 TO SITE PLAN:

SHEET 3
1. SS#7-5 TO SS#7-4. PIPE RAISED 3'MIN DEPTH SS#7-5 AND SLOPE MODIFIED 0.5%.
2. REVISED WATER MAIN. ELIMINATE VERTICAL BENDS.
3. REVISED TC ELEVATIONS.

SHEET 4
1. REVISED TC ELEVATIONS.
2. REVISED LENGTH AND SLOPE OF OUTFALL PIPE TO BMP.

SHEET 5
1. REVISED OUTFALL INVERT ELEVATION INTO BMP.
2. ADJUSTED RIP RAP ELEVATION IN SEDIMENT FOREBAY.

SHEET 7
1. RELOCATE EXISTING LIGHT POLE AT ROLLISON DRIVE.

CHANGES DATED 01/07/08 TO SITE PLAN:

SHEET 3
1. REVISED WATER MAIN AND FITTINGS ALONG ROLLISON DRIVE FROM 8" TO 12".
2. REVISED LOCATION OF MANHOLE 7-4 TO STA 22+46, 9.0' LT. (ADDED 3 LF TO SAN B).
3. REVISED LOCATION OF MANHOLE 7-3 TO STA 24+02, 9.0' LT. (ADDED 1 LF TO SAN C).
4. STORM SS# 7-5 TO SS# 7-4 PIPE CHANGED FROM 18" TO 15". INVERT RAISED 3".

SHEET 4
1. REVISED WATER MAIN AND FITTINGS ALONG ROLLISON DRIVE FROM 8" TO 12".
2. STA 30+23 ADDED 12"x8" REDUCER.
3. 160 LF 8" PVC SANITARY REVISED TO DIP (SAN MH# 7-1 TO SAN MH# 5-7).

SHEET 6
1. ADDED ≈ 300 LF DIVERSON DIKE (21+80 TO 24+80).
2. ADDED 18" TEMPORARY SLOPE DRAIN.
3. REVISED EC MATTING FROM EC-2 TO EC-3.

SHEET 12
1. ADDED NOTES INDICATING INTERIM AND FINAL CERTIFICATION OF BMP/SEDIMENT BASIN.
2. SPILLWAY NOTED AS 30'x15'
3. 6" PVC CONNECTION TO DI-7 SHALL BE KOR-N-SEAL BOOT OR APPROVED EQUAL.
4. ADD 5" ORIFICE PLATE TO 6" PVC PIPE.

SHEET 14
1. REVISED WATER MAIN PROFILES FOR 12" WATER ON ROLLISON DRIVE.
2. REVISED SAN B PER NEW LOCATION.
3. REVISED SAN C PER NEW LOCATION.

NEW TOWN DRB REVIEWED AND APPROVED THE CONCEPTUAL SITE PLAN AT THE MEETING OF JULY 19, 2007.

VDOT DOES NOT ASSUME RESPONSIBILITY FOR MAINTENANCE OF THE DETENTION BMP OR IT'S STRUCTURE AND SHALL BE SAVED HARMLESS FROM ANY DAMAGES.

INDEX OF SHEETS	
SHEET NUMBER	DESCRIPTION
01	COVER SHEET
02	ENVIRONMENTAL INVENTORY SHEET
03	ROAD PLAN AND PROFILE
04	ROAD PLAN AND PROFILE
05	POND_BMP B02
06	CLEARING AND EROSION AND SEDIMENT CONTROL PLAN
07	LANDSCAPE AND LIGHTING PLAN
08	POND_BMP 02 PLANTING PLAN AND NOTES AND DETAILS
09	NOTES AND DETAILS
10	NOTES AND DETAILS
11	NOTES AND DETAILS
12	NOTES AND DETAILS
13	STRIPING PLAN
14	WATER AND SANITARY PROFILES

LEGEND

EXISTING		PROPOSED
W	WATER	
S	SANITARY SEWER	
	STORM SEWER	
EX. FM	FORCE MAIN	F.M.
	MANHOLE	
	CURB DROP INLET	
	YARD DROP INLET	
	FLARED END SECTION	
	VALVE	
	FIRE HYDRANT ASSEMBLY	
	BLOW-OFF VALVE	
	AIR RELEASE ASSEMBLY	
	CLEAN OUT	
	WATER METER	
	STREETLIGHT	
	CENTERLINE/BASELINE	
	RIGHT OF WAY	
	PROPERTY LINE	
	℄ DITCH/SWALE	
	CONCRETE LINED DITCH	
	EC-3 LINED DITCH	
	EXISTING TREELINE	
	LIMITS OF CLEARING	
	SILT FENCE	
	INLET PROTECTION	
	CHECK DAM	
	STRAW BALE BARRIER	
	RIP RAP	
	REVERSE ROLL TOP GUTTER	
25.1	GROUND ELEVATION	FG25.1
	PROPOSED TOP OF CURB ELEV.	TC25.1
	GRADING LINE TIE-IN	
80	EXISTING CONTOUR ELEV.	
	PROPOSED CONTOUR ELEV.	80
	PROPOSED CONTOURS (BY OTHERS)	80

APPROVAL DATE	No.	DATE	REVISION / COMMENT / NOTE	BY
	4	4/17/08	REVISED PER JCSA COMMENTS	REC
	3	3/03/08	REVISED PER COUNTY COMMENTS	REC
	2	1/07/08	REVISED PER COUNTY COMMENTS	REC
	1	11/02/07	REVISED PER COUNTY COMMENTS	REC

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SOIL No.	SOIL NAME	TYPICAL SLOPES	EROSION FACTOR (K)	EROSION FACTOR (T)
11C	CRAVEN YELLOW FINE SANDY LOAM	2–10%	0.32–0.37	3
15E	EMPORIA BROWN FINE SANDY LOAM	2–50%	0.20–0.28	4
19B	KEMPSVILLE–EMPORIA	2–6%	0.20–0.32	3–4
29B	SLAGLE	2–6%	0.24	3

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

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

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

DENOTES HIGHLY ERODIBLE SOILS / CRITICAL EROSION AREAS

DENOTES 25% OR GREATER SLOPES (NOTE ALL 25% SLOPES ARE TEMPORARY MANMADE SLOPES)

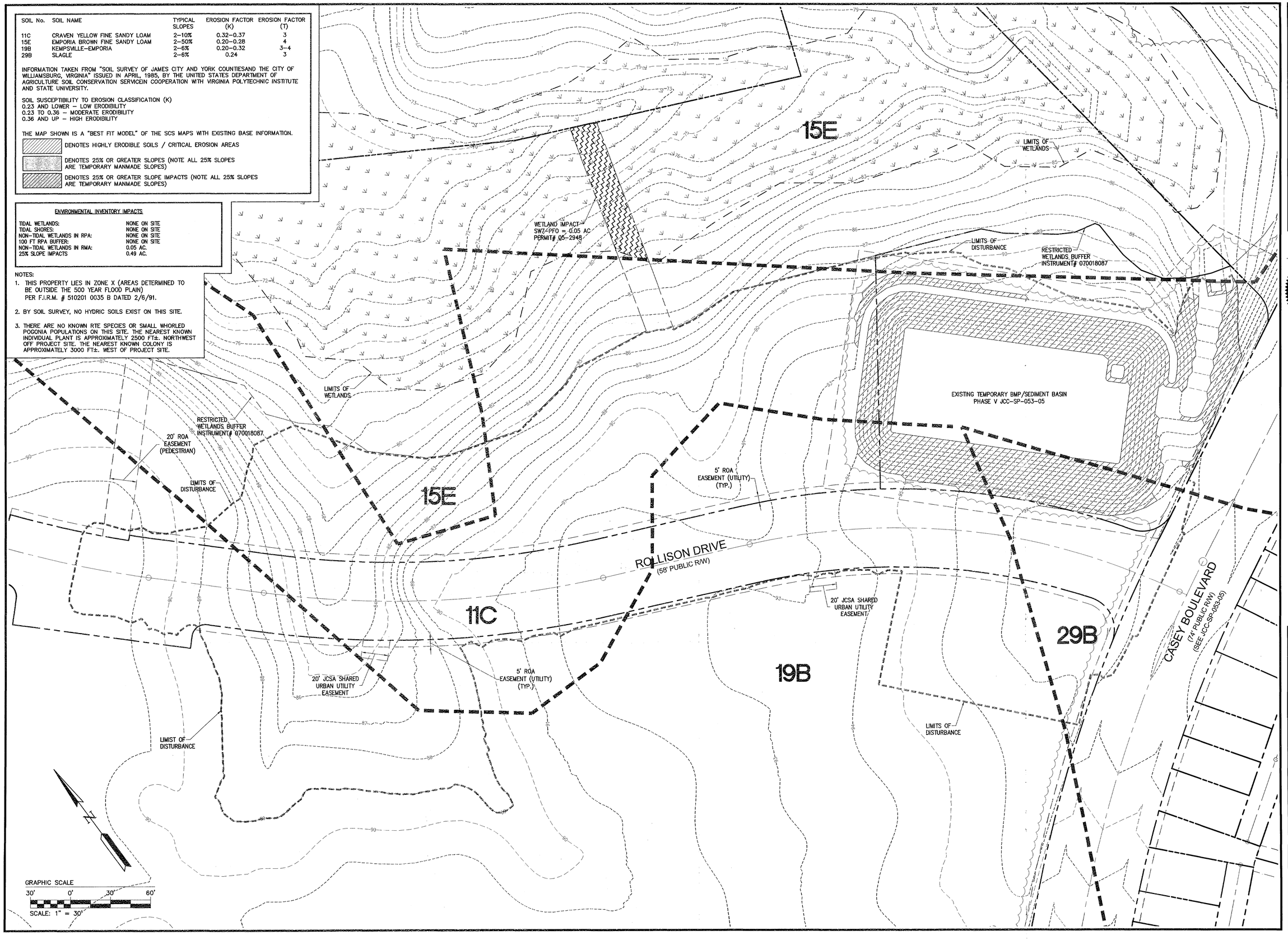
DENOTES 25% OR GREATER SLOPE IMPACTS (NOTE ALL 25% SLOPES ARE TEMPORARY MANMADE SLOPES)

ENVIRONMENTAL INVENTORY IMPACTS

TIDAL WETLANDS:	NONE ON SITE
TIDAL SHORES:	NONE ON SITE
NON–TIDAL WETLANDS IN RPA:	NONE ON SITE
100 FT RPA BUFFER:	NONE ON SITE
NON–TIDAL WETLANDS IN RMA:	0.05 AC.
25% SLOPE IMPACTS	0.49 AC.

NOTES:

1. THIS PROPERTY LIES IN ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 500 YEAR FLOOD PLAIN) PER F.I.R.M. # 510201 0035 B DATED 2/6/91.
2. BY SOIL SURVEY, NO HYDRIC SOILS EXIST ON THIS SITE.
3. THERE ARE NO KNOWN RTE SPECIES OR SMALL WHORLED POGONIA POPULATIONS ON THIS SITE. THE NEAREST KNOWN INDIVIDUAL PLANT IS APPROXIMATELY 2500 FT±. NORTHWEST OFF PROJECT SITE. THE NEAREST KNOWN COLONY IS APPROXIMATELY 3000 FT±. WEST OF PROJECT SITE.



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4	4/17/08	REVISED PER JCSA COMMENTS	REC	REC
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1	11/2/07	REVISED PER COUNTY COMMENTS	REC	REC

COMMONWEALTH OF VIRGINIA
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ENVIRONMENTAL INVENTORY SHEET
NEW TOWN
SECTION 7 & 8
ROADWAY INFRASTRUCTURE PLANS
PHASE VII
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
REC/VAB	SDC/BBS
Scale	Date
1"=30'	7/03/07

Project No. 6632S7–01A
Drawing No. 02

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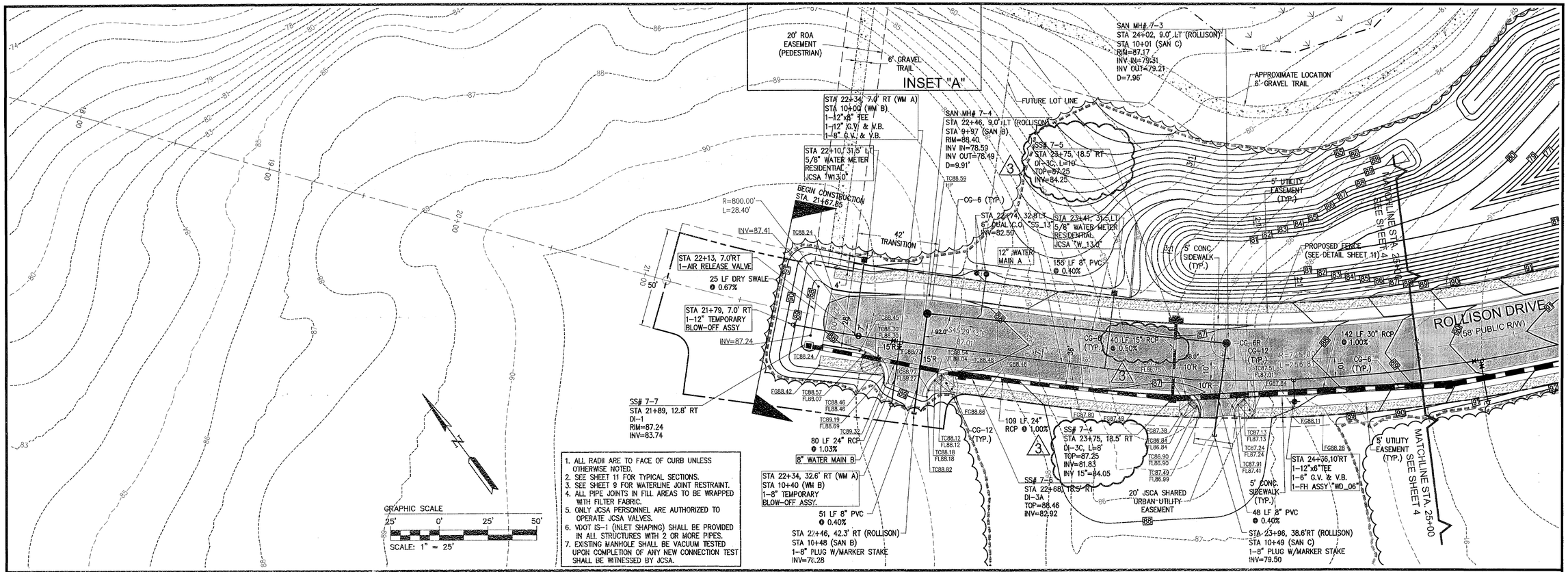
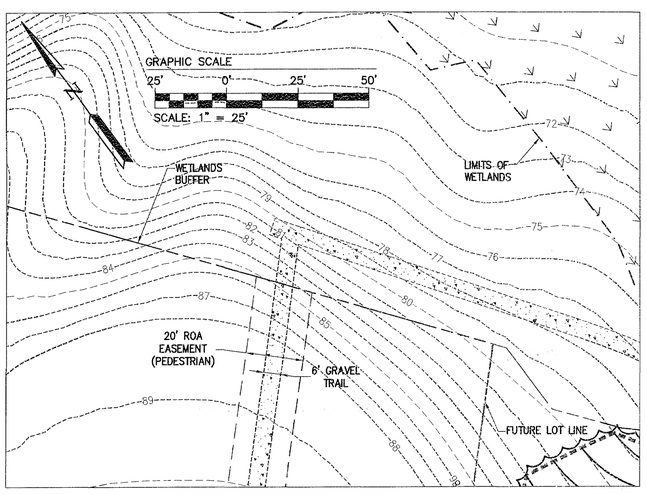
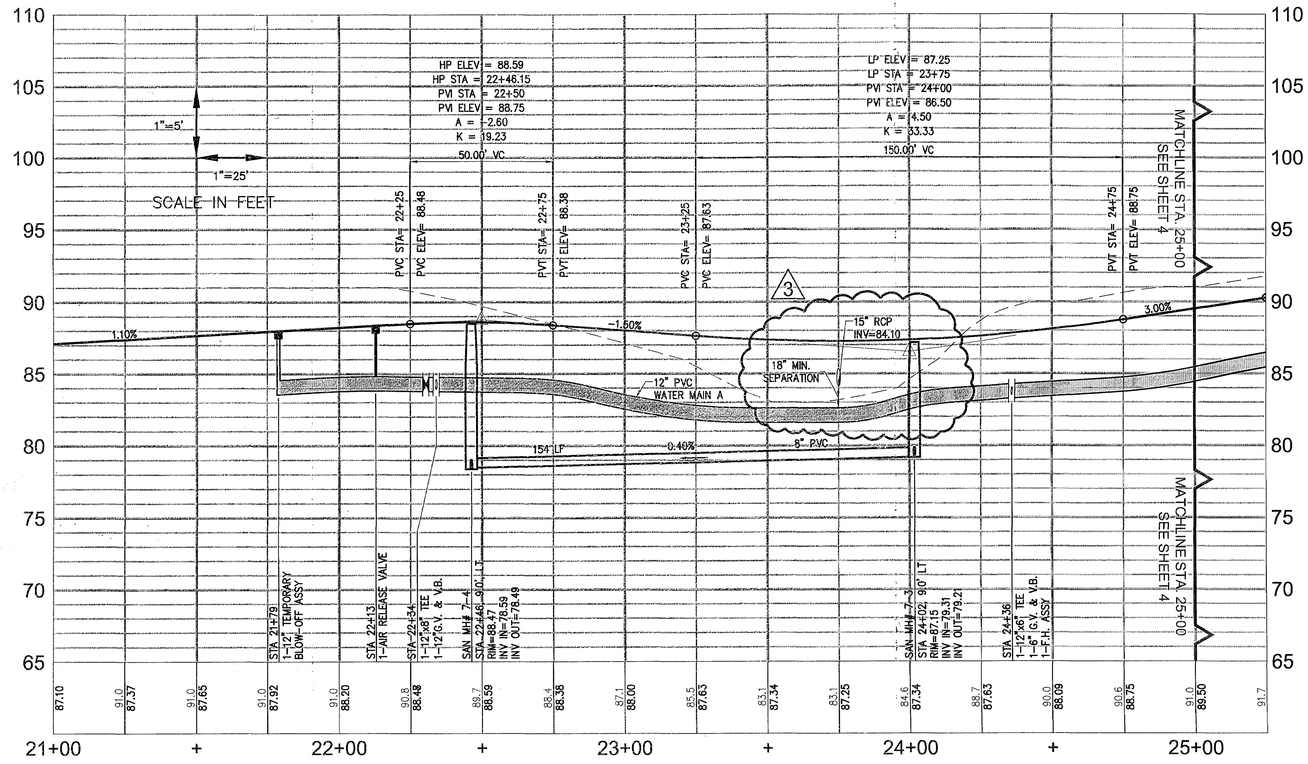


1. ALL RADII ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
2. SEE SHEET 11 FOR TYPICAL SECTIONS.
3. SEE SHEET 9 FOR WATERLINE JOINT RESTRAINT.
4. ALL PIPE JOINTS IN FILL AREAS TO BE WRAPPED WITH FILTER FABRIC.
5. ONLY JCSA PERSONNEL ARE AUTHORIZED TO OPERATE JCSA VALVES.
6. VDOT IS-1 (INLET SHAPING) SHALL BE PROVIDED IN ALL STRUCTURES WITH 2 OR MORE PIPES.
7. EXISTING MANHOLE SHALL BE VACUUM TESTED UPON COMPLETION OF ANY NEW CONNECTION TEST SHALL BE WITNESSED BY JCSA.



INSET "A"
SCALE: 1"=25'



ROLLISON DRIVE - STA 21+50 TO 25+00

No.	DATE	REVISION / COMMENT / NOTE	REVISED BY	REVIEWED BY
3	4/17/08	REVISED PER JCSA COMMENTS	REC	REC
2	3/03/08	REVISED PER COUNTY COMMENTS	REC	REC
2	1/07/08	REVISED PER COUNTY COMMENTS	REC	REC
1	11/2/07	REVISED PER COUNTY COMMENTS	REC	REC

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ROAD PLAN AND PROFILE
NEW TOWN
SECTION 7 & 8
ROADWAY INFRASTRUCTURE PLANS
PHASE VII
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
REC/VAB	SDC/BBS
Scale	Date
1"=25'	7/03/07
Project No.	
6632S7-01A	
Drawing No.	
03	

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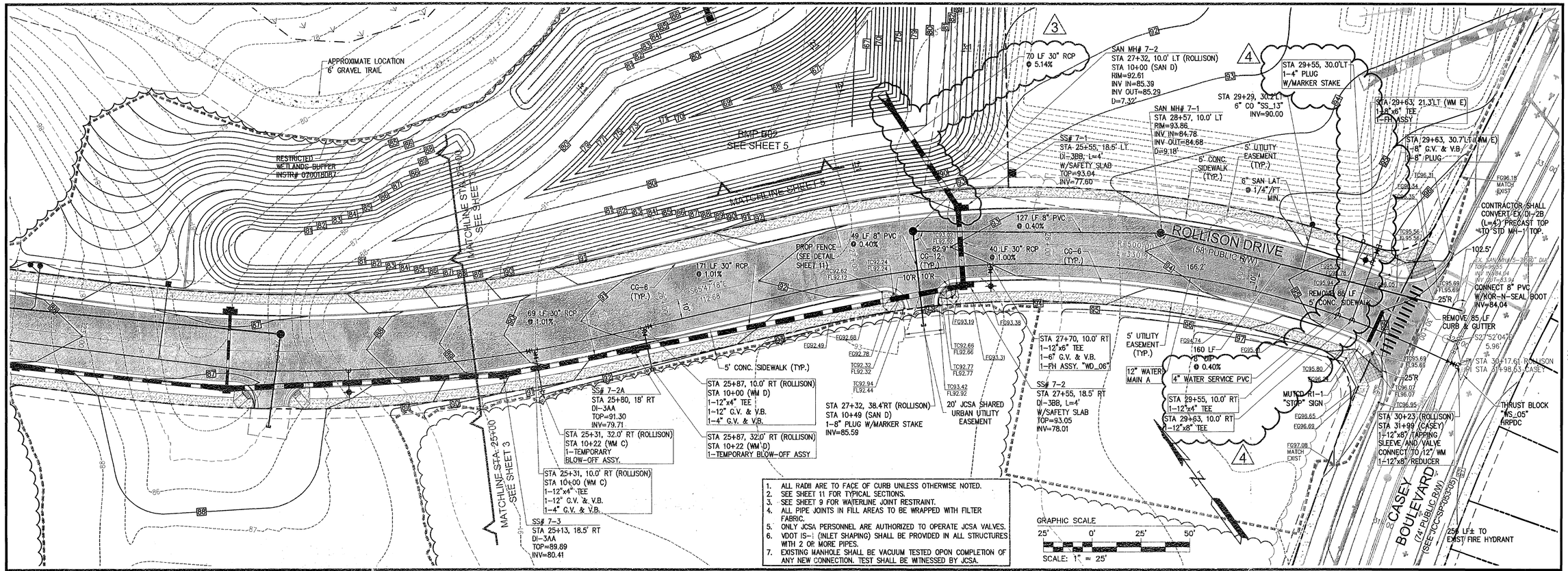
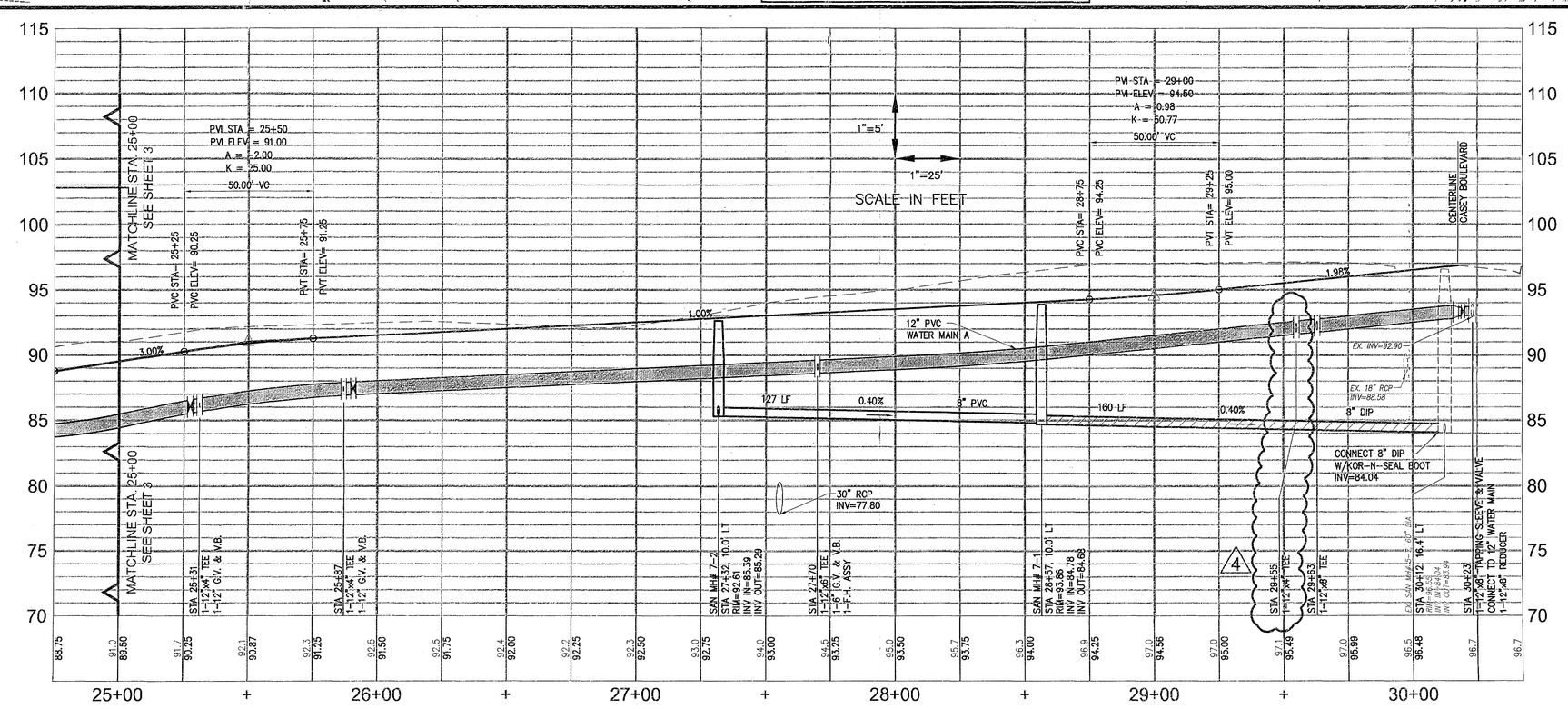


1. ALL RADII ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
2. SEE SHEET 11 FOR TYPICAL SECTIONS.
3. SEE SHEET 9 FOR WATERLINE JOINT RESTRAINT.
4. ALL PIPE JOINTS IN FILL AREAS TO BE WRAPPED WITH FILTER FABRIC.
5. ONLY JCSA PERSONNEL ARE AUTHORIZED TO OPERATE JCSA VALVES.
6. VDOT IS-1 (INLET SHAPING) SHALL BE PROVIDED IN ALL STRUCTURES WITH 2 OR MORE PIPES.
7. EXISTING MANHOLE SHALL BE VACUUM TESTED OPON COMPLETION OF ANY NEW CONNECTION. TEST SHALL BE WITNESSED BY JCSA.



ROLLISON DRIVE - STA 25+00 TO END

No.	DATE	REVISION / COMMENT / NOTE	REVISED BY	REVIEWED BY
4	4/17/08	REVISED PER JCSA COMMENTS	REC	REC
3	3/03/08	REVISED PER COUNTY COMMENTS	REC	REC
2	1/07/08	REVISED PER COUNTY COMMENTS	REC	REC
1	11/12/07	REVISED PER COUNTY COMMENTS	REC	REC

COMMONWEALTH OF VIRGINIA ROBERT E. COSBY III Lic. No. 35664 4/17/08 PROFESSIONAL ENGINEER

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ROAD PLAN AND PROFILE
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PHASE VII
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
REC/VAB	SDC/BBS
Scale	Date
1"=25'	7/03/07

Project No. 6632S7-01A
Drawing No. 04

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THE STORMWATER MANAGEMENT/BMP FACILITY AS PROPOSED FOR THIS PROJECT WILL REQUIRE SUBMISSION, REVIEW, AND APPROVAL OF A RECORD DRAWING (AS-BUILT) AND CONSTRUCTION CERTIFICATION PRIOR TO RELEASE OF THE POSTED BOND/SURETY.

OUTLET PROTECTION STILLING BASIN SEE DETAIL SHEET 12

INV=72.12

178 LF 30" RCP @ 1.00%

WETLAND IMPACT SW7-PFO 0.05 AC PERMIT# 05-2948

CENTER CREST OF DAM ELEV=89.00

48" FES INV=74.00

TOP WALL=89.00 BOTTOM=87.00

DI-7 TOP=84.20 6" INV IN=80.00 INV OUT=73.90

APPROX. LOCATION 6' GRAVEL TRAIL

LIMITS OF WETLANDS

30'x15' LEVEL SPILLWAY WITH EC-3 MATTING

30' WIDE EMERGENCY SPILLWAY @ ELEVATION 87.00

RESTRICTED WETLANDS BUFFER INSTR# 070018087

EG89.1

CENTER CREST OF DAM ELEV=89.00

EG89.3

PROP. FENCE (SEE DETAIL SHEET 11)

ROLLISON DRIVE (58' PUBLIC R/W)

107 LF 2' HIGH RETAINING WALL DESIGN BY OTHERS

TOP WALL=89.00 BOTTOM=87.00

SS# 5-2A DI-7 TOP=88.50 INV=82.11

125 LF 48" RCP @ 6.49%

18" DEEP CLASS 1 RIP RAP TO ELEVATION 78.00

85 LF TIMBER WALL SEE DETAIL SHEET 12

SS# 7-0 30" FES INV=74.00

DEWATERING STRUCTURE DISCHARGE TO NEW SEDIMENT BASIN (SEE NOTE)

16' AQUATIC/SAFETY BENCH

LIMITS OF DISTURBANCE

TEMPORARY STOCK PILE FOR BMP FILL

APPROX. LOCATION 6' GRAVEL TRAIL

RESTRICTED WETLANDS BUFFER INSTR# 070018087

253 LF 48" RCP @ 1.00%

REMOVE STILLING BASIN

REMOVE DI-7 ,71 LF 36" RCP & FES AND (2) ANTI-SEEP COLLARS

REMOVE EXISTING BAFFLE WALL

REMOVE 114 LF 48" RCP & FES

EX. SS# 5-2 MH-1 WITH SL-1 TOP=95.08 INV=84.54

CASEY BOULEVARD (74' PUBLIC R/W) (SEE ACC-SP-053-05)

NOTE:
EXISTING BASIN TO BE DEWATERED AND SEDIMENT + TOPSOIL REMOVED FROM EXISTING BASIN PRIOR TO PLACING FILL. FILL MATERIAL SHALL BE PLACED IN 8" LOOSE LIFTS AND COMPACTED TO 95% MAX DRY DENSITY. CONTRACTOR SHALL COORDINATE WITH GEOTECHNICAL ENGINEER.

VDOT DOES NOT ASSUME RESPONSIBILITY FOR MAINTENANCE OF THE DETENTION BMP OR IT'S STRUCTURE AND SHALL BE SAVED HARMLESS FROM ANY DAMAGES.

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

No.	DATE	REVISION / COMMENT / NOTE	REVISED BY	REVIEWED BY
4	4/17/08	REVISED PER JCSA COMMENTS	REC	REC
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1	11/2/07	REVISED PER COUNTY COMMENTS	REC	REC

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POND_BMP B02
NEW TOWN
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PHASE VII
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
REC/VAB	SDC/BBS
Scale	Date
1"=25'	7/03/07

Project No. 6632S7-01A

Drawing No. 05

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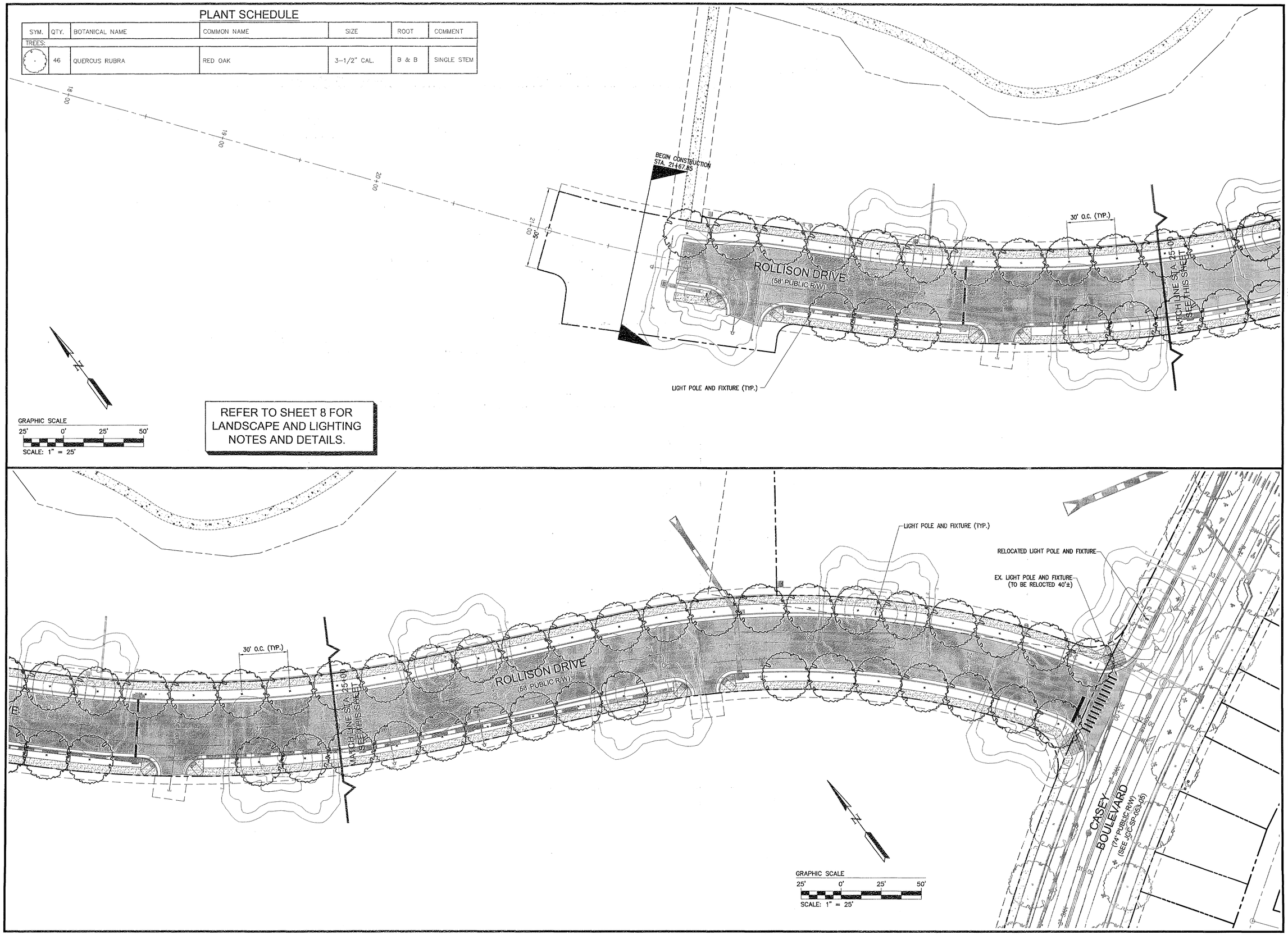
PLANT SCHEDULE

SYM.	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	COMMENT
TREES:						
	46	QUERCUS RUBRA	RED OAK	3-1/2" CAL.	B & B	SINGLE STEM



REFER TO SHEET 8 FOR LANDSCAPE AND LIGHTING NOTES AND DETAILS.

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4	4/17/08	REVISED PER JCSA COMMENTS	REC	REC
3	3/03/08	REVISED PER COUNTY COMMENTS	REC	REC
2	1/07/08	REVISED PER COUNTY COMMENTS	REC	REC
1	11/12/07	REVISED PER COUNTY COMMENTS	REC	REC

COMMONWEALTH OF VIRGINIA
James S. Rice
Cert. No. 393
4/17/08
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CONSULTING ENGINEERS
WILLIAMSBURG • RICHMOND • GLOUCESTER

LANDSCAPE AND LIGHTING PLAN
NEW TOWN
SECTION 7 & 8
ROADWAY INFRASTRUCTURE PLANS
PHASE VII
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
SCB	SCB
Scale	Date
1"=25'	7/03/07

Project No.
6632S7-01A

Drawing No.
07

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SEQUENCE OF CONSTRUCTION

1. CONTRACTOR SHALL FLAG LIMITS OF CLEARING.
2. CONTRACTOR SHALL SETUP AND ATTEND A PRECONSTRUCTION MEETING WITH JAMES CITY COUNTY ENVIRONMENTAL INSPECTOR.
3. THE CONTRACTOR SHALL INSTALL THE CONSTRUCTION ENTRANCE, TREE PROTECTION AND SILT FENCE.
4. CLEAR FOR ACCESS TO THE SEDIMENT BASIN, SEDIMENT BASIN AREA, AND TEMPORARY STOCKPILE AREA. ACCESS SHALL BE OBTAINED ALONG ROLLISON DRIVE.
5. CONSTRUCT THE SEDIMENT BASIN AND PROVIDE SILT FENCE AND TREE PROTECTION AS NECESSARY.
6. ONCE THE TEMPORARY SEDIMENT BASIN IS COMPLETE, FUNCTIONING, AND APPROVED BY COUNTY'S ENVIRONMENTAL INSPECTOR, CLEAR THE REMAINDER OF THE SITE AND REMOVE TOPSOIL AS NECESSARY, WITHIN THE LIMITS OF DISTURBANCE AS SHOWN ON PLANS.
7. AFTER APPROVAL OF THE ASSIGNED ENVIRONMENTAL INSPECTOR, INSTALL STORM STRUCTURE #5-2A AND 48" RCP FROM SEDIMENT BASIN TO SS#5-2A AND 180 LF. FROM SS#5-2A TOWARDS EXISTING STRUCTURE SS#5-2A SHOWN ON SHEET 6. PROVIDE INLET PROTECTION AT THE DI-7 TO MINIMIZE TRANSPORT OF SEDIMENT INTO 48" PIPE AND SEDIMENT BASIN.
8. DEWATER EXISTING SEDIMENT BASIN, REMOVE EXISTING OUTFALL STRUCTURE. REMOVE EXISTING 48" RCP & FES FROM STRUCTURE #5-2 TO EXISTING BASIN AS SHOWN ON SHEET 5. INSTALL REMAINING . 48"RCP TO STRUCTURE #5-2. THIS STEP SHALL BE COMPLETED AS QUICKLY AS POSSIBLE DURING A DRY PERIOD.
9. DEWATER EXISTING SEDIMENT BASIN, REMOVE SEDIMENT AND TOPSOIL, PLACE COMPACTED FILL TO PROPOSED GRADE, PLACE 4" TOPSOIL AND SEED/STABILIZE AREA WITHIN 30 DAYS.
10. BEGIN GRADING OPERATIONS FOR ROADWAYS.
11. INSTALL STORM DRAINAGE AND ASSOCIATED EROSION AND SEDIMENT CONTROL MEASURES INCLUDING INLET PROTECTION.
12. INSTALL AND TEST GRAVITY SEWER AND WATER MAINS.
13. INSTALL BASE STONE AND PAVEMENT FOR ROADWAYS.
14. ESTABLISH VEGETATIVE COVER IN DENUDED AREAS.
15. REMOVE SEDIMENT FROM BASIN IN ACCORDANCE WITH VESCH STANDARD AND SPECIFICATION 3.14, AS NECESSARY TO MAINTAIN ADEQUATE STORAGE, STOCKPILE MATERIAL ONSITE FOR DEWATERING AND SPREAD ON SITE.
16. THE TEMPORARY SEDIMENT BASIN SHOWN ON THIS SITE PLAN, SHALL BE CONVERTED TO THE "WET" BMP AS NOTED ON SHEET 5 AFTER DISTURBED AREAS ARE STABILIZED, AND CONSENT IS OBTAINED FROM JAMES CITY COUNTY ENVIRONMENTAL DIVISION.

GENERAL NOTES:

DUST CONTROL MEASURES IN ACCORDANCE WITH THE VESCH SHALL BE IMPLEMENTED AS NECESSARY.

THERE ARE NO OFF-SITE LAND DISTURBING AREAS PROPOSED WITH THIS PROJECT.

ALL EXCESS UNSUITABLE MATERIAL AND TOPSOIL SHALL BE REMOVED FROM PROJECT AREA AND DIPOSED OF OFF SITE.

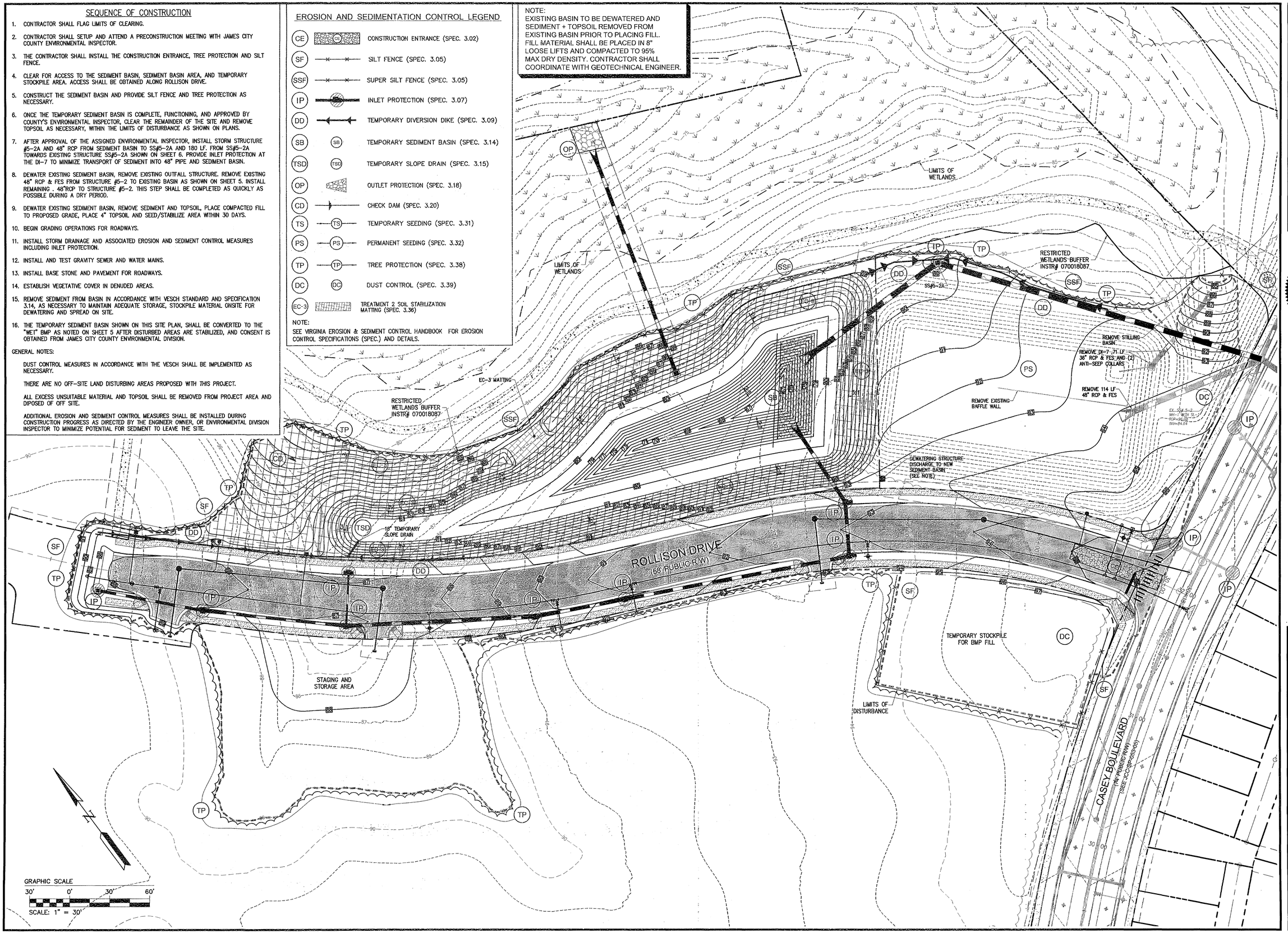
ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED DURING CONSTRUCTION PROGRESS AS DIRECTED BY THE ENGINEER OWNER, OR ENVIRONMENTAL DIVISION INSPECTOR TO MINIMIZE POTENTIAL FOR SEDIMENT TO LEAVE THE SITE.

EROSION AND SEDIMENTATION CONTROL LEGEND

CE	CONSTRUCTION ENTRANCE (SPEC. 3.02)
SF	SILT FENCE (SPEC. 3.05)
SSF	SUPER SILT FENCE (SPEC. 3.05)
IP	INLET PROTECTION (SPEC. 3.07)
DD	TEMPORARY DIVERSION DIKE (SPEC. 3.09)
SB	TEMPORARY SEDIMENT BASIN (SPEC. 3.14)
TSD	TEMPORARY SLOPE DRAIN (SPEC. 3.15)
OP	OUTLET PROTECTION (SPEC. 3.18)
CD	CHECK DAM (SPEC. 3.20)
TS	TEMPORARY SEEDING (SPEC. 3.31)
PS	PERMANENT SEEDING (SPEC. 3.32)
TP	TREE PROTECTION (SPEC. 3.38)
DC	DUST CONTROL (SPEC. 3.39)
EC-3	TREATMENT 2 SOIL STABILIZATION MATTING (SPEC. 3.36)

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

NOTE:
EXISTING BASIN TO BE DEWATERED AND SEDIMENT + TOPSOIL REMOVED FROM EXISTING BASIN PRIOR TO PLACING FILL. FILL MATERIAL SHALL BE PLACED IN 8" LOOSE LIFTS AND COMPACTED TO 95% MAX DRY DENSITY. CONTRACTOR SHALL COORDINATE WITH GEOTECHNICAL ENGINEER.



No.	DATE	REVISED BY	REVIEWED BY
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REVISION / COMMENT / NOTE
4 REVISED PER JCSA COMMENTS
3 REVISED PER COUNTY COMMENTS
2 REVISED PER COUNTY COMMENTS
1 REVISED PER COUNTY COMMENTS

COMMONWEALTH OF VIRGINIA
ROBERT E. COSBY III
Lic. No. 35664
4/17/08
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CLEARING AND EROSION AND SEDIMENT CONTROL PLAN
NEW TOWN
SECTION 7 & 8
ROADWAY INFRASTRUCTURE PLANS
PHASE VII
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
REC/VAB	SDC/BBS
Scale	Date
1"=30'	7/03/07

Project No.
6632S7-01A
Drawing No.
06

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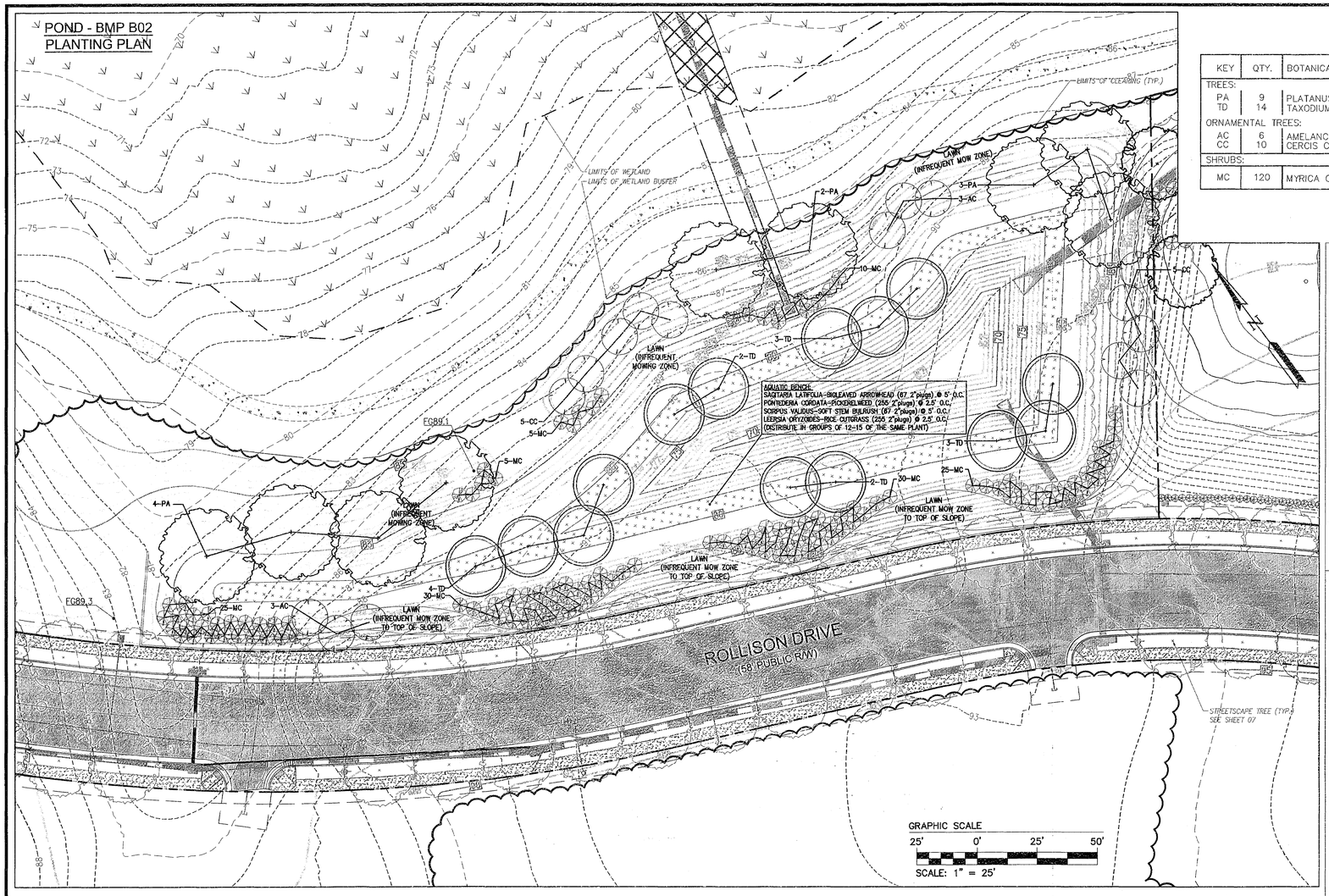
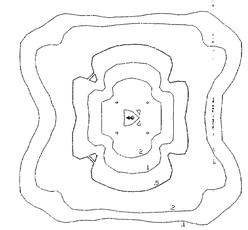
POND - BMP B02 PLANTING PLAN



PLANT SCHEDULE

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	COMMENT
TREES:						
PA	9	PLATANUS ACERIFOLIA	LONDON PLANE TREE	1.5–2" CAL.	B & B	SINGLE STEM
TD	14	TAXODIUM DISTICHUM	BALD CYPRESS	1.5–2" CAL.	B & B	SINGLE STEM
ORNAMENTAL TREES:						
AC	6	AMELANCHIER CANADENSIS	SERVICEBERRY	1.25" CAL.	B & B	MULTI–STEM
CC	10	CERCIS CANADENSIS	EASTERN REDBUD	1.25" CAL.	B & B	MULTI–STEM
SHRUBS:						
MC	120	MYRICA CERIFERA	SOUTHERN WAXMYRTLE	24–30" HT./ W	CONT.	DENSE, FULL



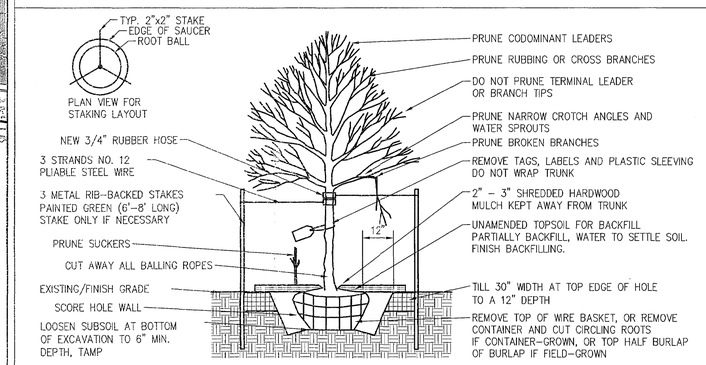
ISO–FOOTCANDLE DIAGRAM SHOWING TYPICAL ILLUMINATION PATTERN
N.T.S.

FIXTURE:
STERNBERG CARSON CITY 1843/100MH120/R05/CA/BK SOLID ROOF, 100 WATT METAL HALIDE LAMP, 120 VOLTS, HORIZONTALLY MOUNTED, RECESSED, TYPE V LAMP WITH A FROSTED CHIMNEY INSIDE A CLEAR ACRYLIC LENS. BLACK POWDER COAT FINISH. 1 FIXTURE PER POLE.

POLE:
STERNBERG 12' "NEW TOWN" 11 GA. STEEL SQUARE TAPERED POLE.
COLOR BLACK, MATTE FINISH.

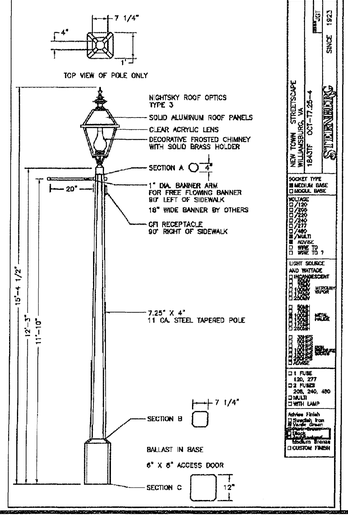
QUANTITY: 14

NOTE:
1.– STERNBERG LIGHT FIXTURES HAVE DRB APPROVAL. FIXTURES ILLUSTRATED MEET COUNTY REQUIREMENTS FOR LAMP MOUNTING AND REDUCTION OF LIGHT SOURCE VISIBILITY.
2.– DECORATIVE LIGHTING IS NOT REQUIRED TO MEET PARKING LOT LIGHTING REQUIREMENT.
3.–LUMINAIRES SHALL BE MOUNTED ON LIGHT POLES HORIZONTALLY AND SHALL BE RECESSED FIXTURES WITH NO BULB, LENS, OR GLOBE EXTENDING BELOW THE CASING.

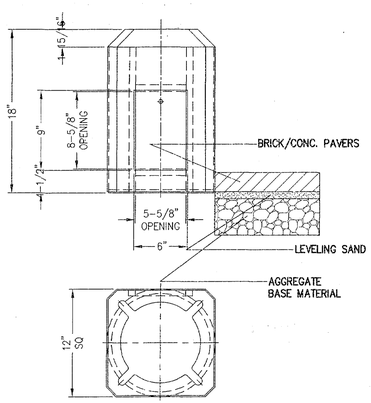


DECIDUOUS TREE PLANTING METHOD
N.T.S.

STERNBERG POLE DETAIL



STERNBERG CONCEPT 100B296



(4) 3/4 ANCHOR BOLTS ON 11" TO 12" BC

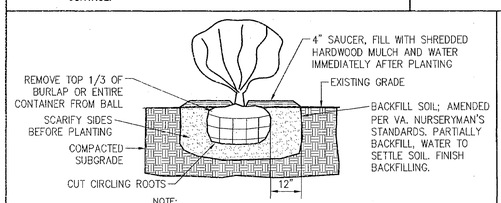
STERNBERG POLE BASE DETAIL

GENERAL NOTES:

1. ALL PLANT MATERIAL SHALL BE INSTALLED AS SPECIFIED IN THE VNLA STANDARDIZED LANDSCAPE SPECIFICATIONS, LATEST EDITION.
2. GROUPINGS OF PLANTS SHALL BE MULCHED IN CONTINUOUS BEDS.
3. AREAS NOT PLANTED, AREAS OUTSIDE EXISTING TREE LINES AND NOT COVERED IN SITE CONTRACT ARE TO BE SODDED OR SEEDED WITH AGRUM FESCUE OR APPROVED SUBSTITUTE.
4. SINGLE STEM DECIDUOUS SHADE TREES SHALL BE STAKED AS DETAILED IN TREE PLANTING METHOD.
5. PLANT SUBSTITUTIONS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
6. ALL INSTALLED PLANT MATERIAL SHALL BE SUBJECT TO REGULAR MAINTENANCE, INCLUDING FERTILIZATION, PRUNING, REPLACEMENT, INSECT AND DISEASE CONTROL, WATERING, MULCHING, AND WEED CONTROL.

GENERAL NOTES FOR WETLANDS & AQUATIC BENCH PLANTING:

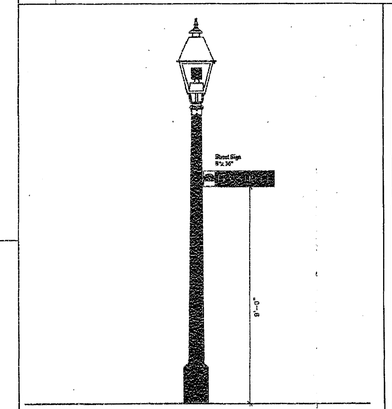
1. ALL WOODY PLANT MATERIAL SHALL BE INSTALLED A SPECIFIED IN THE VNLA STANDARDIZED LANDSCAPE SPECIFICATIONS, LATEST EDITION. ALL WETLAND & AQUATIC BENCH PLANTING SHALL BE INSTALLED AS SPECIFIED IN MINIMUM STANDARD 3.05 OF THE VIRGININA STORMWATER MANAGEMENT HANDBOOK.
2. ALL PLANT MATERIAL SHALL BE OBTAINED FROM LOCAL AQUATIC PLANT NURSERIES AND TRANSPLANTED/ INSTALLED BETWEEN APRIL & JUNE.
3. ONE PLANT SPECIES SHOULD BE PLANTED WITHIN A PLANTING ZONE, BASED ON THEIR APPROX. DEPTH REQUIREMENTS.
4. PLANT SUBSTITUTIONS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.



NOTE:
ALL SHRUBS ARE TO BE PLANTED SO TOP OF ROOT BALL IS 3" ABOVE FINISH GRADE.

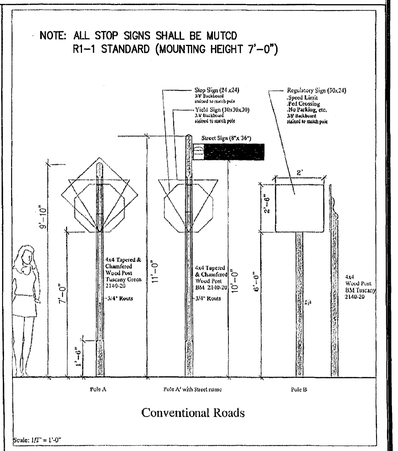
SHRUB PLANTING METHOD
N.T.S.

NOTES:
1.– ELECTRICAL CONDUITS SHALL MEET NEC REQUIREMENTS AND VDOT SPECIFICATIONS (SECTION 700 OF VDOT ROAD AND BRIDGE SPECIFICATIONS) AND SHALL BE A MINIMUM OF 18" BELOW GRADE. CONDUIT PULL BOXES SHALL BE CONFORMING TO VDOT ROAD AND BRIDGE STANDARD JB–3A AND SHALL BE INSTALLED IN ACCORDANCE TO VDOT SPECIFICATIONS.
2.– SIZING OF ELECTRICAL SERVICE WIRING SHALL BE THE CONTRACTORS RESPONSIBILITY AND SHALL MEET NEC REQUIREMENTS FOR APPLICATION.
3.– CONDUIT ELBOWS SHALL HAVE A 90° BEND. THE BEND RADIUS SHALL BE IN ACCORDANCE WITH THE NEC.



Regulatory Signage
New Town - Streetscape
James City County, VA
November 14, 2002

NOTE: ALL STOP SIGNS SHALL BE MUTCD R1–1 STANDARD (MOUNTING HEIGHT 7'–0")



Regulatory Signage - Traffic
New Town - Streetscape
James City County, VA
November 14, 2002

No.	DATE	REVISION / COMMENT / NOTE	REVISED BY	REVIEWED BY
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COMMONWEALTH OF VIRGINIA
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POND_BMP 02 PLANTING PLAN AND NOTES AND DETAILS
NEW TOWN
SECTION 7 & 8
ROADWAY INFRASTRUCTURE PLANS
PHASE VII
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
SCB	SCB
Scale	Date
AS NOTED	7/03/07

Project No.
6632S7–01A
Drawing No.
08

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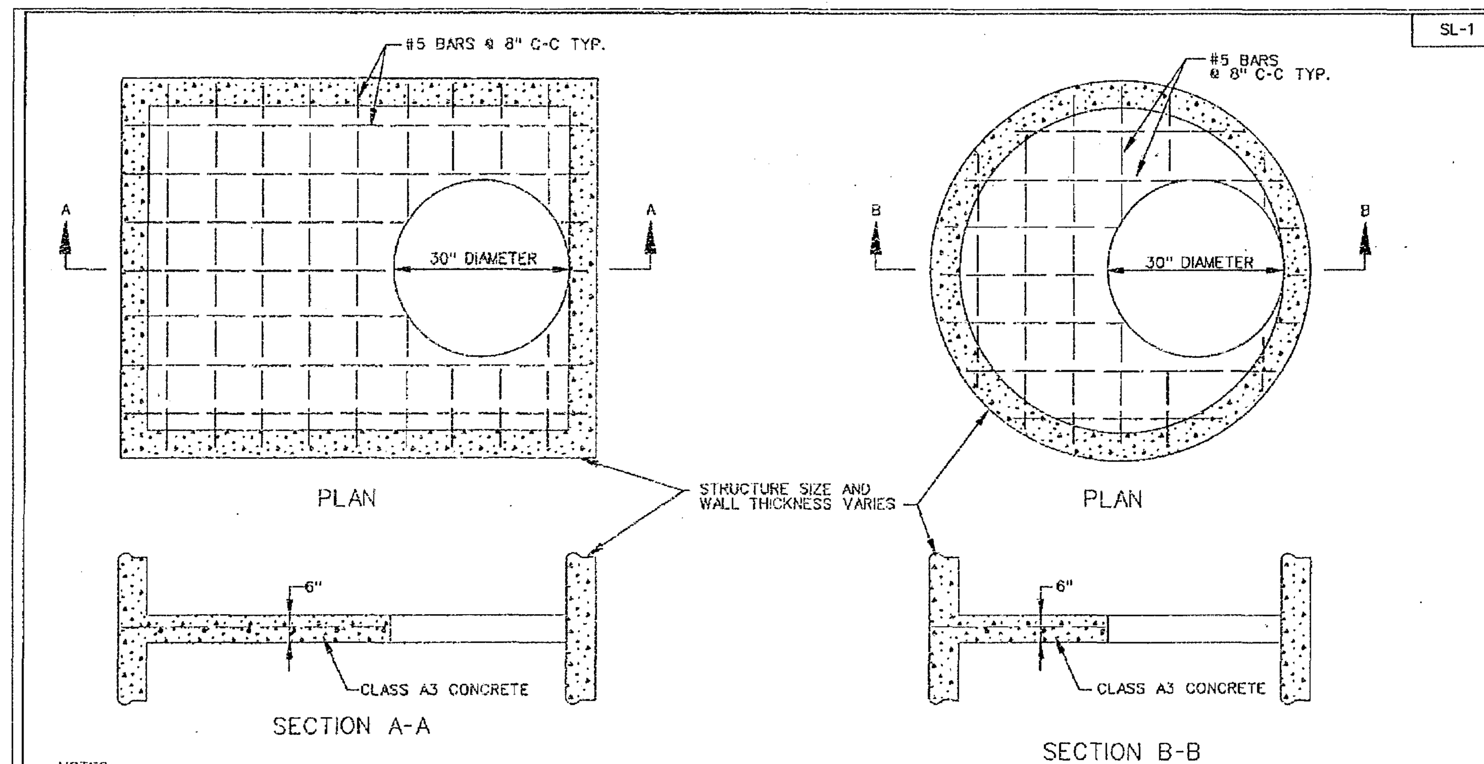
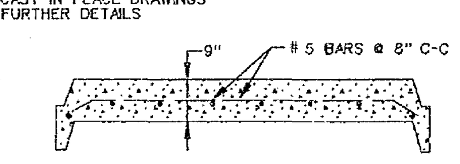
SL-1



NOTES:

1. STANDARD SL-1, MANHOLE SAFETY SLAB, IS REQUIRED AS PART OF THE DRAINAGE DESIGN FOR MANHOLES, JUNCTION BOXES AND DROP INLETS WITH HEIGHTS GREATER THAN 12 FEET. THE SPACING OF ADJACENT SAFETY SLABS SHALL BE 8' TO 12' WITH NO SAFETY SLAB LOCATED WITHIN 6 FEET OF THE TOP OR BOTTOM OF THE STRUCTURE. SAFETY SLABS SHALL NOT BE LOCATED BELOW ANY INLET PIPE OF 30" DIAMETER OR GREATER.
2. THE COST OF THE SL-1 IS INCLUDED IN THE COST OF THE STRUCTURE.
3. ACCESS OPENINGS ARE TO BE STAGGERED FROM ONE SIDE OF STRUCTURE TO THE OTHER WHERE APPLICABLE. STEPS ARE TO BE STAGGERED ACCORDINGLY.
4. SAFETY SLAB MAY BE CAST-IN-PLACE OR PRECAST. CAST-IN-PLACE CONCRETE TO BE CLASS A3 (3000 PSI). PRECAST CONCRETE IS TO BE A4 (4000 PSI). REINFORCING STEEL TO BE IN ACCORDANCE WITH AASHTO M31.
5. ACCESS OPENINGS MAY BE 30" DIAMETER OR 30" SQUARE. WHEN STRUCTURE WIDTH IS LESS THAN 30" THE ACCESS OPENING SHALL BE RECTANGULAR (STRUCTURE WIDTH BY 30" LONG).

SEE CAST IN PLACE DRAWINGS FOR FURTHER DETAILS



TYPICAL PRECAST UNIT

SPECIFICATION REFERENCE 302

TYPICAL CONCRETE SAFETY SLAB FOR DROP INLETS, MANHOLES AND JUNCTION BOXES

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 7/05 | 106.14

TABLE OF CONTENTS

TYPE	L	AREA OF SLOT	CONCRETE	REINFORCING STEEL														WEIGHT
				BARS A		BARS B		BARS C		BARS D		BARS E		BARS F		BARS G		
	FT.	SQ. FT.	CU. YDS.	NO.	LIN. FT. *	NO.	LIN. FT. *	NO.	LIN. FT. *	NO.	LIN. FT. *	NO.	LIN. FT. *	NO.	LIN. FT. *	NO.	LIN. FT. *	LBS.
DI-3A	2'-6"	1.15	2.26	–	–	–	–	1	5'-7"	3	3'-2"	–	–	–	–	6	1'-0"	22
DI-3B	4'	1.83	2.59	5	1'-6"	2	6'7"to6'10"	3	5'-7"	3	3'-2"	4	1'-6"	3	1'-6"	4	1'-0"	64
	6'	2.75	3.02	5	3'-6"	6	6'7"to6'10"	3	5'-7"	3	3'-2"	4	3'-6"	3	1'-6"	4	1'-0"	111
	8'	3.67	3.46	5	5'-6"	10	6'7"to6'10"	3	5'-7"	3	3'-2"	4	5'-6"	3	1'-6"	4	1'-0"	158
	10'	4.58	3.90	5	7'-6"	14	6'7"to6'10"	3	5'-7"	3	3'-2"	4	7'-6"	3	1'-6"	4	1'-0"	204
	12'	5.50	4.34	5	9'-6"	18	6'7"to6'10"	3	5'-7"	3	3'-2"	4	9'-6"	3	1'-6"	4	1'-0"	251
	14'	6.42	4.78	5	11'-6"	22	6'7"to6'10"	3	5'-7"	3	3'-2"	4	11'-6"	3	1'-6"	4	1'-0"	298
	16'	7.33	5.22	5	13'-6"	26	6'7"to6'10"	3	5'-7"	3	3'-2"	4	13'-6"	3	1'-6"	4	1'-0"	345
	18'	8.25	5.66	5	15'-6"	30	6'7"to6'10"	3	5'-7"	3	3'-2"	4	15'-6"	3	1'-6"	4	1'-0"	391
	20'	9.17	6.09	5	17'-6"	34	6'7"to6'10"	3	5'-7"	3	3'-2"	4	17'-6"	3	1'-6"	4	1'-0"	438
DI-3C	6'	2.75	3.01	10	1'-9"	4	6'7"to6'10"	5	5'-7"	3	3'-2"	8	1'-9"	6	1'-6"	2	1'-0"	111
	8'	3.67	3.45	10	2'-9"	8	6'7"to6'10"	5	5'-7"	3	3'-2"	8	2'-9"	6	1'-6"	2	1'-0"	158
	10'	4.58	3.89	10	3'-9"	12	6'7"to6'10"	5	5'-7"	3	3'-2"	8	3'-9"	6	1'-6"	2	1'-0"	205
	12'	5.50	4.33	10	4'-9"	16	6'7"to6'10"	5	5'-7"	3	3'-2"	8	4'-9"	6	1'-6"	2	1'-0"	252
	14'	6.42	4.77	10	5'-9"	20	6'7"to6'10"	5	5'-7"	3	3'-2"	8	5'-9"	6	1'-6"	2	1'-0"	298
	16'	7.33	5.21	10	6'-9"	24	6'7"to6'10"	5	5'-7"	3	3'-2"	8	6'-9"	6	1'-6"	2	1'-0"	345
	18'	8.25	5.65	10	7'-9"	28	6'7"to6'10"	5	5'-7"	3	3'-2"	8	7'-9"	6	1'-6"	2	1'-0"	392
	20'	9.17	6.09	10	8'-9"	32	6'7"to6'10"	5	5'-7"	3	3'-2"	8	8'-9"	6	1'-6"	2	1'-0"	439

* DENOTES LENGTH OF (1) BAR.

NOTES:

ALL REINFORCING BARS TO BE NO. 5 . ○

ALL CAST IN PLACE CONCRETE TO BE CLASS A3.
FOR ACCEPTABLE ALTERNATE SEE PRECAST STANDARD DESIGNS. CONCRETE QUANTITIES ARE SHOWN FOR DEPTH (H) OF 5'-2" WITHOUT PIPES.

THE AMOUNT DISPLACED BY PIPES MUST BE DEDUCTED TO OBTAIN TRUE QUANTITIES. FOR INLETS OF DIFFERENT DEPTHS ADD OR SUBTRACT 0.32 CU. YDS. OF CONCRETE FOR EACH FOOT OF DIFFERENCE OF DEPTH.

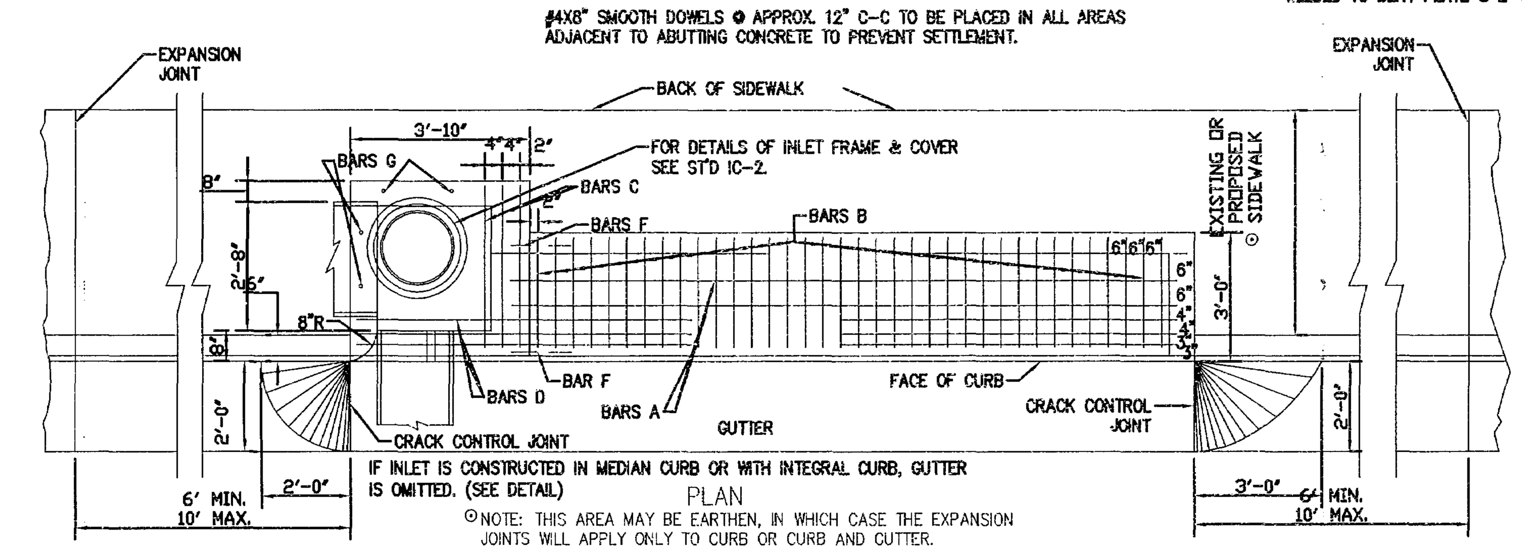
LENGTH OF ANGLE IRON AS SHOWN ON SHEET 1 IS TO BE L + 16" @ 4.10 LBS. PER FT.

STANDARD CURB DROP INLET

12"–30" PIPE MAXIMUM DEPTH (H)=8' VIRGINIA DEPARTMENT OF TRANSPORTATION

#4X8" SMOOTH DOWELS @ APPROX. 12" C–C TO BE PLACED IN ALL AREAS ADJACENT TO ABUTTING CONCRETE TO PREVENT SETTLEMENT.

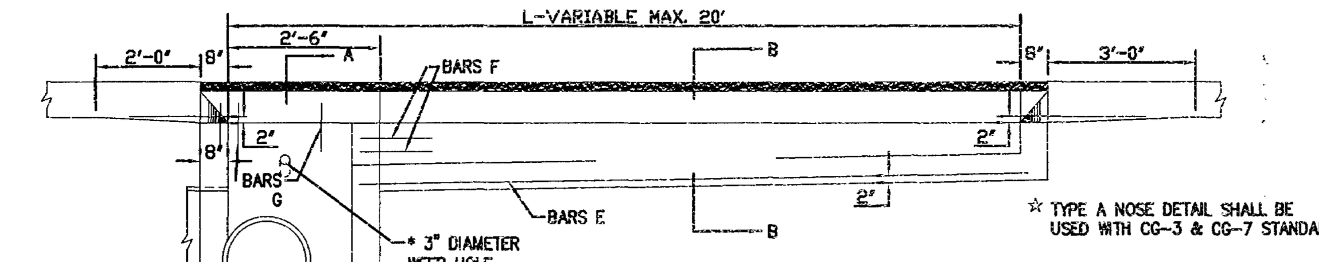
GALVANIZED BENT PLATE TO BE BENT ON AN ANGLE OF 68°30' AND IS TO BE ANCHORED WITH 1/2"X4" STUD SHEAR CONNECTORS WELDED TO BENT PLATE @ 2' C.–C.



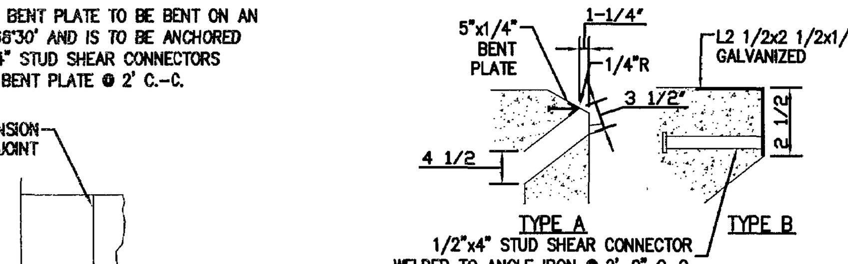
IF INLET IS CONSTRUCTED IN MEDIAN CURB OR WITH INTEGRAL CURB, GUTTER IS OMITTED. (SEE DETAIL)

PLAN

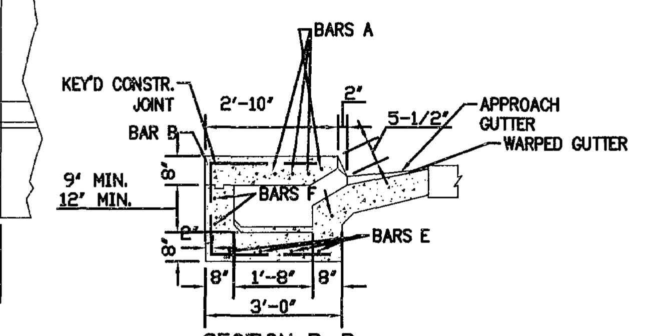
⊙NOTE: THIS AREA MAY BE EARTHEN, IN WHICH CASE THE EXPANSION JOINTS WILL APPLY ONLY TO CURB OR CURB AND GUTTER.



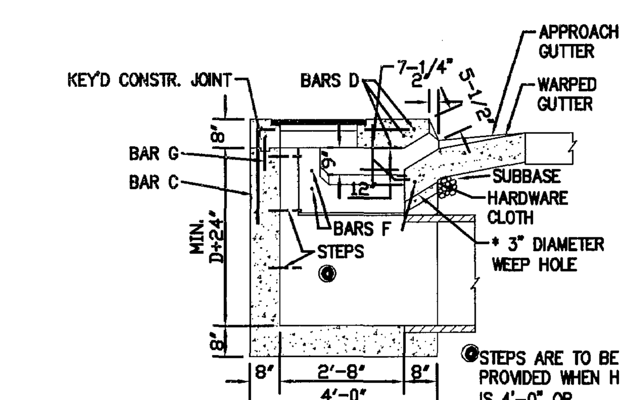
FRONT ELEVATION
(GUTTER REMOVED)



☆ NOSE DETAILS



SECTION B–B



SECTION A–A

◎STEPS ARE TO BE PROVIDED WHEN H IS 4'-0" OR GREATER.

☆ TYPE A NOSE DETAIL SHALL BE USED WITH CG–3 & CG–7 STANDARDS.

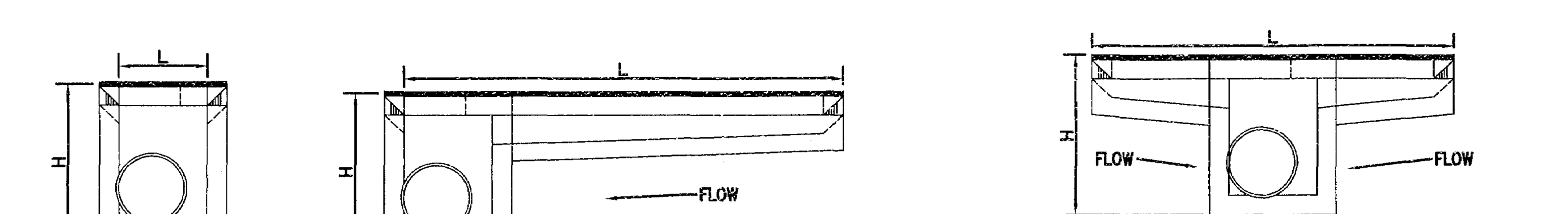
TYPE B NOSE DETAIL SHALL BE USED WITH CG–2 & CG–6 STANDARDS.

* 3" DIAMETER WEEP HOLE TO BE LOCATED TO DRAIN SUBBASE MATERIAL. WEEP HOLE WITH 12"X12" PLASTIC HARDWARE CLOTH 1/4" MESH OR GALVANIZED STEEL WIRE DIA. 0.03 INCH, NUMBER 4 MESH HARDWARE CLOTH ANCHORED FIRMLY TO OUTSIDE OF STRUCTURE.

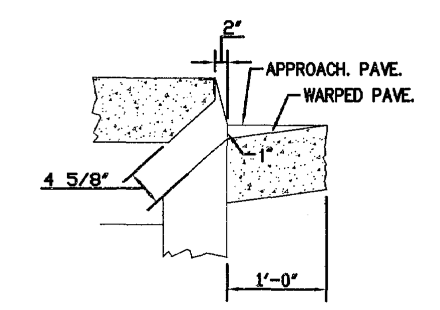
NOTES:
STANDARD INLETS MAY BE CONSTRUCTED WITH CONCRETE BLOCK IN ACCORDANCE WITH THE DETAILS SHOWN ON STANDARD DRAWING DI–MB.

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

FOR DIMENSIONS AND QUANTITIES NOT SHOWN, SEE SHEET 2 OF 2.



FOR USE ON GRADES



DETAIL WHEN USED ADJACENT TO CURB WITHOUT GUTTER

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

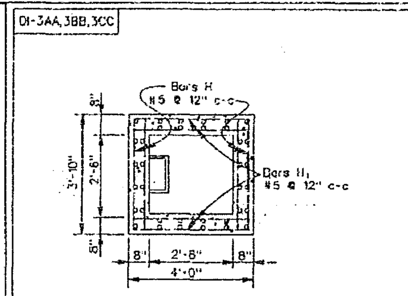
WHEN SPECIFIED ON THE PLANS THE INVERT IS TO BE SHAPED IN ACCORDANCE WITH STANDARD PLAN IS–1. THE COST OF FURNISHING AND PLACING ALL MATERIALS INCIDENTAL TO THE SHAPING IS TO BE INCLUDED IN THE PRICE BID FOR THE DROP INLET COMPLETE. LENGTH OF SLOT (L) WILL, IN EVERY CASE, BE SHOWN ON PLANS. WHEN INLET IS USED IN 4'–0" MEDIAN, BACK OF INLET IS TO BE SHAPED TO CONFORM WITH PROPOSED CURB.

THIS ITEM MAY BE PRECAST OR CAST IN PLACE.

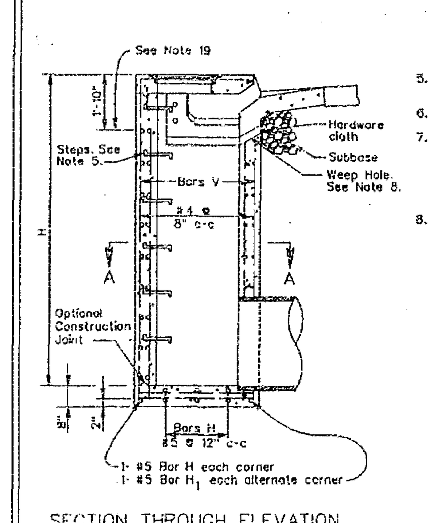
STANDARD CURB DROP INLET (DI-3A,B,C)

12"–30" PIPE MAXIMUM DEPTH (H)=8' VIRGINIA DEPARTMENT OF TRANSPORTATION

DI-3AA,3BB,3CC



SECTION A-A



SECTION THROUGH ELEVATION

NOTES

1. DEPTH OF INLET (H) TO BE SHOWN ON PLANS. MINIMUM DEPTH (H) TO BE 8'-0", MAXIMUM DEPTH TO BE 20'-0". FOR INLETS LESS THAN 8' USE STANDARD DI-3A, 3B, 3C.
2. THE "H" DIMENSION SHOWN ON THE STANDARDS AND SPECIFIED ON THE PLANS WILL BE MEASURED FROM THE INVERT OF THE OUTFALL PIPE TO THE TOP OF THE STRUCTURE. PLAN "H" DIMENSIONS ARE APPROXIMATE ONLY FOR ESTIMATING PURPOSES AND THE ACTUAL DIMENSIONS SHALL BE DETERMINED BY THE CONTRACTOR FROM FIELD CONDITIONS.
3. WHEN SPECIFIED ON THE PLANS THE INVERT IS TO BE SHAPED IN ACCORDANCE WITH STANDARD IS-1. THE COST OF FURNISHING AND PLACING ALL MATERIALS INCIDENTAL TO THE SHAPING IS TO BE INCLUDED IN THE BID PRICE FOR THE STRUCTURE.
4. IN THE EVENT THE INVERT OF THE OUTFALL PIPE IS HIGHER THAN THE BOTTOM OF THE STRUCTURE, THE INVERT OF THE STRUCTURE SHALL BE SHAPED WITH CEMENT MORTAR TO PREVENT STANDING OR PONDING OF WATER IN THE STRUCTURE. THE COST OF FURNISHING AND PLACING ALL MATERIALS INCIDENTAL TO THE SHAPING IS TO BE INCLUDED IN THE BID PRICE FOR THE STRUCTURE.
5. STEPS ARE REQUIRED. FOR DETAILS SEE STANDARD ST-1.
6. THIS ITEM MAY BE PRECAST OR CAST-IN-PLACE.
7. # 4 X 8" SMOOTH DOWELS AT APPROXIMATELY 12" C-C TO BE PLACED IN ALL AREAS ADJACENT TO ABUTTING CONCRETE TO PREVENT SETTLEMENT. IN LIEU OF DOWELS A 2" X 4" NOTCH MAY BE PROVIDED. SEE STANDARD T-DI-3, 4 FOR ALTERNATE DESIGN.
8. 3" DIAMETER WEEP HOLE TO BE LOCATED TO DRAIN SUBBASE MATERIAL. WEEP HOLE WITH 12"X12" PLASTIC HARDWARE CLOTH 1/4" MESH OR GALVANIZED STEEL WIRE, MINIMUM WIRE DIAMETER 0.03", NUMBER 4 MESH HARDWARE CLOTH ANCHORED FIRMLY TO THE OUTSIDE OF THE STRUCTURE.
9. ALL REINFORCING STEEL SHALL HAVE A MIN. COVER OF 2".
10. ALL REINFORCING STEEL TO BE CUT CLEAR OF ALL OPENINGS BY 2".
11. CAST-IN PLACE CONCRETE IS TO BE CLASS A3 (3000 PSI). PRECAST CONCRETE IS TO BE 4000 PSI.
12. LENGTH OF SLOT (L) WILL, IN EVERY CASE, BE SHOWN ON PLANS.
13. WHEN INLET IS USED IN 4' MEDIAN BACK OF INLET IS TO BE SHAPED TO CONFORM WITH PROPOSED CURB.
14. IF OPTIONAL CONSTRUCTION JOINT IS USED IT IS TO BE KEYED. ALL SPLICES IN BARS V TO BE A MINIMUM OF 40 DIAMETERS (20").
15. FOR PLAN VIEW OF INLET SEE STANDARD DI-3A, 3B, 3C.
16. QUANTITIES SHOWN ARE FOR MINIMUM INLETS OF EACH TYPE. FOR INLETS OF GREATER DEPTH (H) OR LONGER SLOT (L) INCREMENTS SHOWN PER FOOT MUST BE ADDED. THE AMOUNT OF CONCRETE AND STEEL DISPLACED BY PIPES MUST BE DEDUCTED TO OBTAIN TRUE QUANTITIES.
17. FOR NUMBER OF BARS A-G REQUIRED AND LENGTHS SEE SHEET 104.10.
18. FOR DESCRIPTION AND LOCATION OF DIMENSION I, SEE SHEET 104.09.
19. FOR ALL DETAILS, DIMENSIONS, AND REINFORCING STEEL ABOVE THIS LINE SEE STANDARD DI-3A, 3B, 3C.

SCHEDULE OF REINFORCING STEEL

BARS H		BARS H1		BARS V	
NO. REQ'D.	LENGTH	NO. REQ'D.	LENGTH	NO. REQ'D.	LENGTH
4x(H-1)	3'-6"	4x(H-1)	3'-8"	36	H-1'-4"

APPROXIMATE QUANTITIES FOR MINIMUM 8' DEPTH INLET

TYPE	DIMENSION L SEE NOTE 12	REINFORCING STEEL	CONCRETE
DI-	Lin. Ft.	Lbs.	Cu. Yds.
3AA	2'-6"	452	3.14
3BB	4'-0"	494	3.47
3CC	6'-0"	541	3.89

INCREMENTS TO BE ADDED FOR EACH ADDITIONAL FOOT OF DEPTH (H) AND/OR SLOT LENGTH (L)

H		L	
CONCRETE	STEEL	CONCRETE	STEEL
Cu. Yds.	Lbs.	Cu. Yds.	Lbs.
0.317	54	-	-
0.317	54	0.22	23.5
0.317	54	0.22	23.5

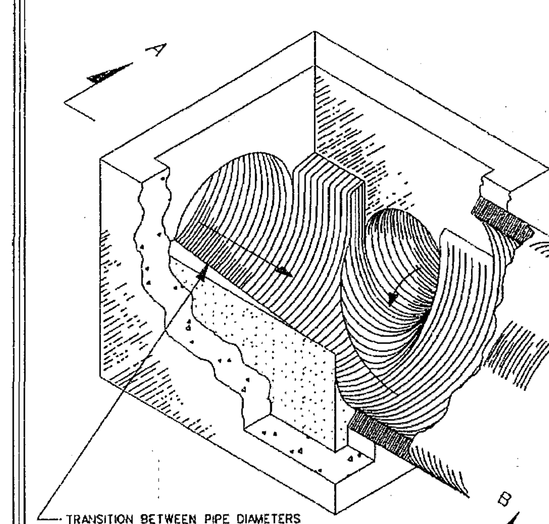
STANDARD CURB DROP INLET 12" - 30" PIPE: DEPTH (H) 8' TO 20'

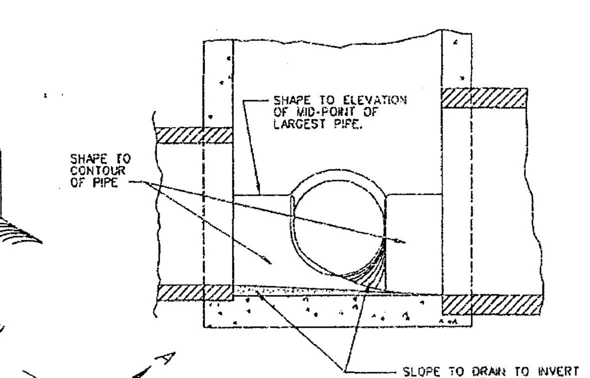
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE 233 302

104.11

IS-1





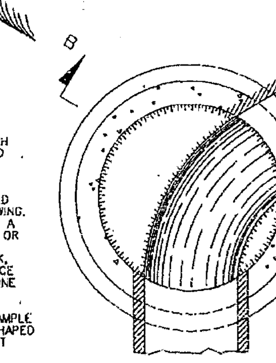
SECTION A-A

METHOD OF TREATMENT IN DROP INLETS

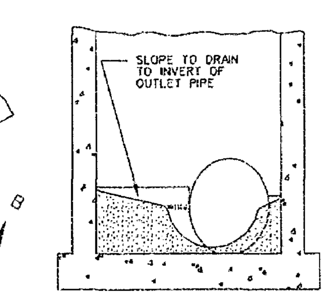
NOTES:
SHAPING OF MANHOLE AND INLET INVERTS IN ACCORDANCE WITH THIS DRAWING IS TO APPLY TO THOSE STRUCTURES SPECIFIED ON PLANS OR WHERE INVERT OF PIPE IS ABOVE INVERT OF STRUCTURE.

MANHOLE OR DROP INLET IS TO BE FORMED AND CONSTRUCTED IN ACCORDANCE WITH APPLICABLE STANDARD OR SPECIAL DRAWING. THE INVERT SHAPING AS DETAILED HEREON IS TO CONSIST OF A PORTLAND CEMENT CONCRETE MIX CONFORMING TO CLASS A3 OR CLASS C1, EXCEPT THAT 25% OF COARSE AGGREGATE MAY BE UP TO 4" IN DIAMETER AND CONSIST OF STONE, BROKEN BRICK, BROKEN CONCRETE OR BROKEN CONCRETE BLOCK. THE SURFACE SHALL BE LEFT SMOOTH BY MEANS OF HAND TROWELLING. NONE OF THE COARSE AGGREGATE SHALL REMAIN EXPOSED.

DETAILS OF INVERT SHAPING AS SHOWN HEREON ARE FOR EXAMPLE PURPOSES ONLY. EACH MANHOLE OR DROP INLET IS TO BE SHAPED INDIVIDUALLY TO BEST FIT THE PARTICULAR INLET AND OUTLET CONFIGURATION AND FLOW LINES.



PLAN



SECTION B-B

METHOD OF TREATMENT IN MANHOLES

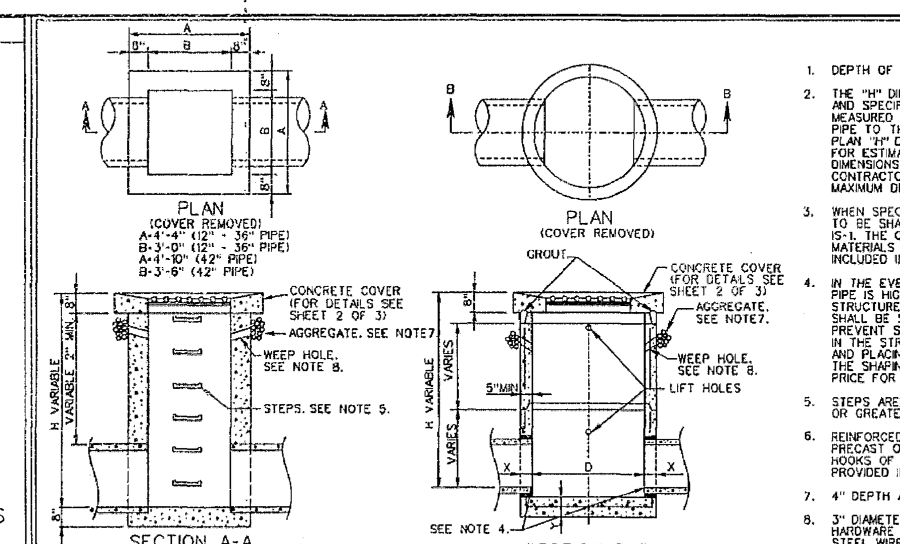
SPECIFICATION REFERENCE 302

STANDARD METHOD OF SHAPING MANHOLE & INLET INVERTS

VIRGINIA DEPARTMENT OF TRANSPORTATION

106.08

DI-7,7A,7B



SECTION A-A
CAST IN PLACE
FOR USE WITH 12" TO 42" PIPES

SECTION B-B
PRECAST

RECOMMENDED MINIMUM HEIGHT CHART

PIPE SIZE	H DIMENSION	
	CONC.	CORR. METAL
12"	2'-6"	2'-5"
15"	2'-9¼"	2'-8"
18"	3'-0½"	2'-11"
21"	3'-3¾"	3'-2"
24"	3'-7"	3'-5"
27"	3'-10¼"	3'-8"
30"	4'-1½"	3'-11"
33"	4'-4¾"	4'-2"
36"	4'-8"	4'-5"
42"	5'-2½"	4'-11"

NOTES (CONT.)

15. DI-7--------NO GUTTER
DI-7A-------SINGLE GUTTER WHEN DROP INLET IS ON A GRADE.
DI-7B------ DOUBLE GUTTER WHEN DROP INLET IS IN A SAG BETWEEN TWO GRADES.
16. FOR DETAILS OF PRECAST DI-7 NOT SHOWN HEREON SEE PRECAST UNIT ASSEMBLY DIAGRAM, PAGE 103.01, FOR PRECAST GENERAL NOTES, PAGE 103.02 AND FOR APPLICABLE PRECAST BASE, RISER AND TOP DETAILS, PAGES 103.07 THRU 103.12.
17. GRATE BARS TO BE PARALLEL TO DITCH FLOW.

PIPE SIZE	12"	15"	18"	24"	30"	36"	42"
MINIMUM DEPTH H	2'-0"	2'-3¼"	2'-6½"	3'-1"	3'-7½"	4'-2"	4'-8½"
CONCRETE CUBIC YARDS	.947	1.045	1.143	1.339	1.535	1.731	1.927

INCREMENT PER FOOT OF ADDITIONAL DEPTH (H) { = 0.362 CU. YDS. (12" - 36" PIPE) = 0.410 CU. YDS. (42" PIPE)

NOTES

1. DEPTH OF INLET (H) TO BE SHOWN ON PLANS.
2. THE "H" DIMENSION SHOWN ON THE STANDARDS AND SPECIFIED ON THE PLANS WILL BE MEASURED FROM THE INVERT OF THE OUTFALL PIPE TO THE TOP OF THE STRUCTURE. PLAN "H" DIMENSIONS ARE APPROXIMATE ONLY FOR ESTIMATING PURPOSES AND THE ACTUAL DIMENSIONS SHALL BE DETERMINED BY THE CONTRACTOR FROM FIELD CONDITIONS. MAXIMUM DEPTH (H) TO BE 12'-8.
3. WHEN SPECIFIED ON THE PLANS THE INVERT IS TO BE SHAPED IN ACCORDANCE WITH STANDARD IS-1. THE COST OF FURNISHING AND PLACING ALL MATERIALS INCIDENTAL TO THE SHAPING IS TO BE INCLUDED IN THE BID PRICEN FOR THE STRUCTURE.
4. IN THE EVENT THE INVERT OF THE OUTFALL PIPE IS HIGHER THAN THE BOTTOM OF THE STRUCTURE, THE INVERT OF THE STRUCTURE SHALL BE SHAPED WITH CEMENT MORTAR TO PREVENT STANDING OR PONDING OF WATER IN THE STRUCTURE. THE COST OF FURNISHING AND PLACING ALL MATERIALS INCIDENTAL TO THE SHAPING IS TO BE INCLUDED IN THE BID PRICE FOR THE STRUCTURE.
5. STEPS ARE TO BE PROVIDED WHEN H IS 4'-0" OR GREATER. FOR DETAILS SEE STANDARD ST-1.
6. REINFORCED CONCRETE FOOTING MAY BE PRECAST OR CAST-IN-PLACE. TWO LIFTING HOOKS OF FABRICATORS DESIGN TO BE PROVIDED IN PRECAST FOOTING
7. 4" DEPTH AGGREGATE #68, #78, OR #8 X 6" WIDTH.
8. 3" DIAMETER WEEP HOLE WITH 12"X12" PLASTIC HARDWARE CLOTH ¼" MESH OR GALVANIZED STEEL WIRE, MINIMUM WIRE DIAMETER 0.03", NUMBER 4 MESH HARDWARE CLOTH ANCHORED FIRMLY TO THE OUTSIDE OF THE STRUCTURE.
9. THE TYPE OF INLET (PRECAST OR CAST IN PLACE), DETAILED HEREON, TO BE CONSTRUCTED, WILL BE AT THE OPTION OF THE CONTRACTOR.
10. FOR DETAILS OF CONCRETE COVER, COLLAR AND GRATE AND THE METHOD OF PLACING APPROACH GUTTER SEE SHEET 2 OF 3.
11. CAST-IN PLACE CONCRETE IS TO BE CLASS A3 (3000 PSI). PRECAST CONCRETE IS TO BE 4000 PSI.
12. CONCRETE QUANTITIES SHOWN ARE FOR INDICATED DEPTH (H) WITHOUT PIPES. THE AMOUNT DISPLACED BY PIPES MUST BE DEDUCTED TO OBTAIN TRUE QUANTITIES. FOR INLETS OF DIFFERENT DEPTHS ADD OR SUBTRACT THE APPROPRIATE CUBIC YARDS OF CONCRETE FOR EACH FOOT OF DEPTH.
13. PAVED DITCHES ARE TO BE TRANSITIONED TO MEET INLET GUTTER AS SHOWN IN STANDARD PG-2A.
14. PROVIDE SAFETY SLABS WHEN SPECIFIED ON THE PLANS.

SHEET 1 OF 3

SPECIFICATION REFERENCE 241 505

STANDARD MEDIAN DROP INLET

12" TO 42" PIPE

VIRGINIA DEPARTMENT OF TRANSPORTATION

104.22

No.	DATE	REVISION / COMMENT / NOTE	REVISED BY	REVIEWED BY
1	11/2/07	REVISED PER COUNTY COMMENTS	REC	REC
2	1/07/08	REVISED PER COUNTY COMMENTS	REC	REC
3	3/03/08	REVISED PER COUNTY COMMENTS	REC	REC
4	4/17/08	REVISED PER JCSA COMMENTS	REC	REC

COMMONWEALTH OF VIRGINIA
ROBERT E. COSBY III
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WILLIAMSBURG • RICHMOND • GLOUCESTER

NOTES AND DETAILS
NEW TOWN
SECTION 7 & 8
ROADWAY INFRASTRUCTURE PLANS
PHASE VII

BERKELEY DISTRICT   JAMES CITY COUNTY   VIRGINIA

Designed	Drawn
REC/VAB	SDC/BBS
Scale	Date
AS NOTED	7/03/07

Project No. 6632S7-01A

Drawing No. 10

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EROSION AND SEDIMENT CONTROL NARRATIVE

PROJECT DESCRIPTION

THIS PLAN CONTAINS INFRASTRUCTURE IMPROVEMENTS FOR A MULTI PHASE PROJECT. THIS PROJECT IS BEING DEVELOPED TO ALLOW NEW TOWN SECTION 7 ACCESS TO CASEY BOULEVARD IN ADDITION TO THE ROADWAY IMPROVEMENTS, A SEDIMENT BASIN THAT IS TO BE CONVERTED TO A BEST MANAGEMENT PRACTICE (BMP) FACILITY IS INCLUDED IN THESE PLANS. THE TOTAL SITE IS COMPRISED OF APPROXIMATELY 300 ACRES OF WHICH 4.13 ACRES WILL BE DISTURBED DURING THIS PHASE OF THE PROJECT.

EXISTING SITE CONDITIONS

THIS SITE IS CURRENTLY WOODED AND FARMLAND. STORMWATER RUNOFF IS CURRENTLY CONVEYED OVERLAND TO EXISTING WETLANDS.

ADJACENT PROPERTY

THE PROPOSED SITE IS SURROUNDED BY THE NEW TOWN DEVELOPMENT.

OFFSITE AREAS

NO OFFSITE AREAS ARE PROPOSED. ALL TEMPORARY SOILS STOCKPILES WILL RESIDE WITHIN THE PROJECT LIMITS.

SOILS

THE SOIL CONSERVATION SERVICE HAS IDENTIFIED THE PRESENCE OF THE SOILS TYPES AS INDICATED ON MAP NUMBER 17 OF THE SOIL SURVEY OF JAMES CITY AND YORK COUNTIES AND THE CITY OF WILLIAMSBURG VIRGINIA. SEE THE ENVIRONMENTAL INVENTORY SHEET (SHEET 2) FOR SOIL TYPES AND LOCATIONS.

CRITICAL AREAS

SEE THE ENVIRONMENTAL INVENTORY (SHEET 2) FOR THE LOCATION OF WETLANDS AND 25% SLOPES.

EROSION AND SEDIMENT CONTROL MEASURES

UNLESS OTHERWISE INDICATED, ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH). THE MINIMUM STANDARDS OF THE VESCH SHALL BE ADHERED TO UNLESS OTHERWISE WAIVED AND APPROVED BY THE ON-SITE E&S CONTROL INSPECTOR. THESE MEASURES SHALL INCLUDE BUT NOT BE LIMITED TO: CONSTRUCTION ENTRANCE, SILT FENCE, SUPER SILT FENCE, INLET PROTECTION, DVERSION DIKE, SEDIMENT BASIN, DUST CONTROL, TEMPORARY SEEDING, AND PERMANENT SEEDING

MANAGEMENT STRATEGIES

1. CONSTRUCTION WILL BE SEQUENCED SO THAT GRADING OPERATIONS CAN BEGIN AND END AS QUICKLY AS POSSIBLE.
2. TEMPORARY SEEDING OR OTHER STABILIZATION WILL FOLLOW IMMEDIATELY AFTER GRADING.
3. AREAS, WHICH ARE NOT TO BE DISTURBED, WILL BE CLEARLY MARKED BY FLAGS, SIGNS, ETC.
4. THE CONTRACTOR SHALL HAVE A CERTIFIED RESPONSIBLE LAND DISTURBER AND SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL PRACTICES.
5. AFTER ACHIEVING ADEQUATE STABILIZATION, THE TEMPORARY E&S CONTROLS WILL BE CLEARED UP AND REMOVED.

PERMANENT STABILIZATION

ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE STABILIZED WITH PERMANENT OR TEMPORARY SEEDING IMMEDIATELY FOLLOWING FINISH GRADING.

MAINTENANCE

IN GENERAL, ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED DAILY AND AFTER EACH SIGNIFICANT RAINFALL. THE FOLLOWING ITEMS WILL BE CHECKED IN PARTICULAR:

1. THE INLET PROTECTION WILL BE CHECKED REGULARLY FOR SEDIMENT BUILDUP, WHICH COULD PREVENT POSITIVE DRAINAGE. IF THE INLET PROTECTION IS CLOGGED BY SEDIMENT, IT SHALL BE REMOVED AND CLEANED OR REPLACED.
2. THE SILT FENCE BARRIER WILL BE CHECKED REGULARLY FOR UNDERMINING OR DETERIORATION OF THE FABRIC. SEDIMENT SHALL BE REMOVED WHEN THE LEVEL OF SEDIMENT DEPOSITION REACHES HALF WAY TO THE TOP OF THE BARRIER.
3. THE SEEDED AREAS WILL BE CHECKED REGULARLY TO ENSURE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED AND RE-SEEDED AS NEEDED.

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

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

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

PS
VA DSWC
PG. III - 304

SITE SPECIFIC SEEDING MIXTURES FOR COASTAL PLAIN AREA

JCSA GENERAL NOTES FOR WATER DISTRIBUTION AND SANITARY SEWER SYSTEM

(Revised August 2005)

A. ALL COMPONENTS OF THE WATER DISTRIBUTION AND SANITARY SEWER SYSTEM SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH THE LATEST EDITION OF THE JCSA DESIGN AND ACCEPTANCE CRITERIA FOR WATER DISTRIBUTION AND SANITARY SEWER SYSTEMS, THE HRPDC REGIONAL CONSTRUCTION STANDARDS (THIRD EDITION WITH AMENDMENTS DATED JANUARY 2003), AND THE COMMONWEALTH OF VIRGINIA DEPARTMENT OF HEALTH WATERWORKS AND SANITARY SEWERAGE REGULATIONS. 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. A COPY OF THE JCSA DESIGN AND ACCEPTANCE CRITERIA AND HRPDC REGIONAL CONSTRUCTION STANDARDS MUST BE KEPT ON-SITE BY THE CONTRACTOR DURING TIME OF INSTALLING, TESTING, AND CONVEYING FACILITIES TO JCSA.

B. THE CONTRACTOR/DEVELOPER SHALL ACQUIRE A CERTIFICATE TO CONSTRUCT WATER AND SEWER FACILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION OF ANY WATER OR SANITARY SEWER FACILITIES.

C. THE DEVELOPER'S REPRESENTATIVE SHALL SUBMIT SHOP DRAWINGS FOR ALL MATERIALS FOR APPROVAL TO JCSA PRIOR TO COMMENCEMENT OF CONSTRUCTION. ALL MATERIALS ORDERED AND INSTALLED PRIOR TO JCSA'S REVIEW AND ACCEPTANCE WILL BE AT THE CONTRACTOR'S/DEVELOPER'S RISK.

D. PIPE LINES AND SERVICES SHALL BE INSTALLED AFTER GRADING TO WITHIN 6-INCHES OF FINAL GRADE AND PRIOR TO PLACEMENT OF BASE MATERIAL.

E. ALL WATER MAINS SHALL BE FULLY FLUSHED, PRESSURE TESTED, AND DISINFECTED AND SATISFACTORY BACTERIOLOGICAL SAMPLES OBTAINED, IN ACCORDANCE WITH JCSA DESIGN AND ACCEPTANCE CRITERIA.

F. ROUTINE PERIODIC INSPECTIONS DURING CONSTRUCTION WILL BE PROVIDED BY JCSA. THESE INSPECTIONS DO NOT RELIEVE THE DEVELOPER/CONTRACTOR/OWNER FROM HIS OBLIGATION AND RESPONSIBILITY FOR CONSTRUCTING A WATER DISTRIBUTION AND SANITARY SEWER SYSTEM IN STRICT ACCORDANCE WITH THE JCSA DESIGN AND ACCEPTANCE CRITERIA.

G. ANY FIELD MODIFICATIONS OR CHANGES TO THE APPROVED PLANS SHALL BE VERIFIED AND CHECKED BY THE ENGINEER OF RECORD AND ACCEPTED BY JCSA PRIOR TO ANY FIELD MODIFICATIONS OR CHANGES. ALL APPROVED CHANGE AND FIELD MODIFICATIONS SHALL BE ACCURATELY INDICATED ON THE RECORD DRAWINGS.

H. ALL LOTS SHALL BE PROVIDED WITH WATER SERVICE AND SANITARY SEWER CONNECTIONS. THE CONNECTIONS SHALL BE EXTENDED FROM THE MAIN TO THE PROPERTY LINE OR EASEMENT LINE, AND SHALL TERMINATE WITH A YOKE IN A METER BOX, OR AT THE CLEAN OUT, SET AT FINAL FINISHED GRADE. METERS FOR ALL LOTS (UNITS) SHALL BE PAID FOR BY THE DEVELOPER OR BUILDER AND INSTALLED BY JCSA.

I. ANY REQUIRED EASEMENTS, PERMITS AND APPROVALS SHALL BE ACQUIRED BY THE DEVELOPER PRIOR TO COMMENCEMENT OF WATER MAIN AND/OR SANITARY SEWER CONSTRUCTION.

J. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS AND ORDERS OF ANY PUBLIC BODY 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. THE CONTRACTOR SHALL ALSO NOTIFY "MISS UTILITY" PRIOR TO PERFORMING ANY UNDERGROUND EXCAVATION.

K. WATER METER BOX INSTALLATION SHALL MAINTAIN A MINIMUM 18-INCH HORIZONTAL EDGE-TO-EDGE CLEARANCE FROM DRIVEWAYS AND/OR DRIVE PATHS, SIDEWALKS OR BIKE PATHS.

L. ONLY JCSA PERSONNEL ARE AUTHORIZED TO OPERATE VALVES ON EXISTING JCSA WATER MAINS AND SANITARY FORCE MAINS.

M. ANY EXISTING UNUSED WELL(S) SHALL BE ABANDONED IN ACCORDANCE WITH STATE PRIVATE WELL REGULATIONS AND JAMES CITY COUNTY CODE.

N. BEDDING OF JCSA UTILITIES SHALL BE IN ACCORDANCE WITH HRPDC DETAIL EW_01.

O. NO TREES, SHRUBS, FENCES OR OBSTACLES SHALL BE PLACED WITHIN A JCSA EASEMENT WHICH WOULD RENDER THE EASEMENT INACCESSIBLE BY EQUIPMENT. SHRUBS SHALL BE A MINIMUM OF 5-FEET, AND TREES A MINIMUM OF 10-FEET, FROM THE CENTER OF WATER AND SANITARY SEWER PIPELINES.

P. JOINT RESTRAINT SHALL BE PROVIDED IN ACCORDANCE WITH MINIMUM REQUIREMENTS OF JCSA DETAIL JR.1, UNLESS SHOWN OTHERWISE ON THE PLANS. ALL PRESSURE PIPELINES SHALL HAVE JOINT RESTRAINT.

Q. PROPOSED WATER AND SANITARY SEWER SYSTEMS SHALL MAINTAIN A MINIMUM HORIZONTAL SEPARATION OF 5-FEET FROM OTHER UTILITIES AND STRUCTURES, INCLUDING BUT NOT LIMITED TO STORM SEWERS, STREET LIGHTS, ETC. WATER AND SANITARY SEWER FACILITIES SHALL HAVE A MINIMUM 10-FOOT HORIZONTAL EDGE-TO-EDGE SEPARATION.

R. ANY PROPOSED BACKFLOW PREVENTION DEVICE AND/OR GREASE TRAP MUST BE INSPECTED BY THE JCSA UTILITY SPECIAL PROJECTS COORDINATOR AT (757) 259-4138.

S. PLUMBING INSIDE OF PROPOSED BUILDINGS MUST BE INSPECTED BY JCSA'S UTILITY SPECIAL PROJECTS COORDINATOR AT (757) 259-4138, FOR POTENTIAL CROSS CONNECTIONS. ANY CROSS CONNECTIONS MUST BE PROTECTED BY THE APPROPRIATE BACKFLOW PREVENTION DEVICE(S)".

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

U. JCSA SHALL NOT BE HELD RESPONSIBLE FOR ANY PAVEMENT SETTLEMENT DUE TO PIPE BEDDING, BACKFILLING, BACKFILL MATERIALS OR COMPACTION FOR WATER OR SANITARY SEWER FACILITIES FOR THIS PROJECT.

V. FIRE HYDRANTS TO BE INSTALLED WITHIN EXISTING OR PROPOSED VDOT RIGHT-OF--WAYS SHALL BE LOCATED IN ACCORDANCE WITH VDOT REQUIREMENTS.

HRPDC DETAIL REFERENCES

ITEM	DETAIL NO.	ITEM	DETAIL NO.
BLOW-OFF ASSEMBLY	WD-05 *	SANITARY SEWER MANHOLE COVER (24")	SS_10
FIRE HYDRANT SETTING (TYPE I)	WD_06 *	STANDARD VALVE BOX AND COVER	WS_01
TEMPORARY MANIFOLD FOR TEST AND CHLORINATION	WD_09 *	VALVE SETTING DETAIL	WS_02
STANDARD PRECAST MANHOLE W/ EXTENDED MONOLITHIC BASE	SS_01 *	MANUAL AIR VENT ASSEMBLY	WS_03
SANITARY SEWER MANHOLE INVERT SHAPING	SS_07	THRUST BLOCK	WS_05
SANITARY SEWER MANHOLE CASTING (24")	SS_09	TYPICAL WATER METER INSTALLATION	W_13.0 *
DUAL SANITARY SEWER SERVICE CONNECTIONS	SS_15	PIPE BEDDING DETAIL	EW_01 *
		JOINT RESTRAINT TABLE	JR-1 *

* SEE JCSA SPECIAL PROVISIONS TO REGIONAL STANDARDS (3rd EDITION, JANUARY 2003) (APPENDIX A TO JCSA STANDARDS AND SPECIFICATIONS)

JAMES CITY COUNTY ENVIRONMENTAL DIVISION EROSION AND SEDIMENT CONTROL NOTES

REVISED 7/6/01

THE PURPOSE OF THE EROSION CONTROL MEASURES SHOWN ON THESE PLANS SHALL BE TO PRECLUDE THE TRANSPORT OF ALL WATERBORNE SEDIMENTS RESULTING FROM CONSTRUCTION ACTIVITIES FROM ENTERING ONTO ADJACENT PROPERTIES OR STATE WATERS. IF FIELD INSPECTION REVEALS THE INADEQUACY OF THE PLAN TO CONFINE SEDIMENT TO THE PROJECT SITE, ALL APPROPRIATE MODIFICATIONS WILL BE MADE TO CORRECT ANY PLAN DEFICIENCIES. IN ADDITION TO THESE NOTES, ALL PROVISIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS SHALL APPLY TO THIS PROJECT.

1. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, 3RD EDITION, 1992. THE CONTRACTOR SHALL BE THOROUGHLY FAMILIAR WITH ALL APPLICABLE MEASURES CONTAINED THEREIN THAT MAY BE PERTINENT TO THIS PROJECT, INCLUDING MINIMUM STANDARDS 1 THROUGH 19. IF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN IS FOUND TO BE INADEQUATE IN THE FIELD, THE MINIMUM STANDARDS WILL APPLY IN ADDITION TO THE PROVISIONS OF THE APPROVED PLAN.

2. AS A PREREQUISITE TO APPROVAL OF AN EROSION AND SEDIMENT CONTROL PLAN FOR LAND-DISTURBING ACTIVITIES, THE NAME OF A RESPONSIBLE LAND-DISTURBER SHALL BE PROVIDED. THE RESPONSIBLE LAND-DISTURBER SHALL BE AN INDIVIDUAL WHO HOLDS A VALID CERTIFICATE OF COMPETENCE ISSUED BY THE VIRGINIA DEPARTMENT OF CONSERVATION AND IS DEFINED AS THE PERSON IN CHARGE OF AND RESPONSIBLE FOR CARRYING OUT THE LAND-DISTURBING ACTIVITY. PERMITS OR PLANS WITHOUT THIS INFORMATION ARE DEEMED INCOMPLETE AND WILL NOT BE APPROVED UNTIL PROPER NOTIFICATION IS RECEIVED. ALSO, IF THE PERSON DESIGNATED AS RESPONSIBLE LAND-DISTURBER CHANGES BETWEEN THE TIME OF PLAN APPROVAL AND THE SCHEDULED PRECONSTRUCTION MEETING, THE ENVIROMENTAL DIVISION SHALL BE INFORMED OF THE CHANGE IN WRITING, 24-HOURS IN ADVANCE OF THE PRECONSTRUCTION MEETING.

3. A PRECONSTRUCTION MEETING SHALL BE HELD ON SITE BETWEEN THE COUNTY, THE DEVELOPER, THE PROJECT ENGINEER, THE RESPONSIBLE LAND-DISTURBER AND THE CONTRACTOR PRIOR TO ISSUANCE OF THE LAND DISTURBING PERMIT. THE CONTRACTOR SHALL SUBMIT A SEQUENCE OF CONSTRUCTION TO THE COUNTY FOR APPROVAL PRIOR TO THE PRECONSTRUCTION MEETING. THE DESIGNATED RESPONSIBLE LAND-DISTURBER IS REQUIRED TO ATTEND THE PRECONSTRUCTION MEETING FOR THE PROJECT.

4. ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS SHALL BE PROTECTED BY A TEMPORARY CONSTRUCTION ENTRANCE TO PREVENT TRACKING OF MUD ONTO PUBLIC RIGHT-OF-WAYS. AN ENTRANCE PERMIT FROM VDOT IS REQUIRED PRIOR TO ANY CONSTRUCTION ACTIVITIES WITHIN STATE RIGHT-OF-WAYS. WHERE SEDIMENT IS TRANSPORTED ONTO A PUBLIC ROAD SURFACE, THE ROAD SHALL BE THOROUGHLY CLEANED AT THE END OF EACH DAY (STD & SPEC 3.02).

5. SEDIMENT BASINS AND TRAPS (STD & SPEC 3.13 AND 3.14), PERIMETER DIKES (STD & SPEC 3.09 AND 3.12), SEDIMENT FILTER BARRIERS (STD. & AND SPEC 3.05) AND OTHER MEASURES INTENDED TO TRAP SEDIMENT ON-SITE MUST BE CONSTRUCTED AS A FIRST STEP IN GRADING AND MUST BE MADE FUNCTIONAL PRIOR TO ANY UPSLOPE LAND DISTURBANCE TAKING PLACE. EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS MUST BE SEEDED AND MULCHED IMMEDIATELY AFTER INSTALLATION.
PERIODIC INSPECTIONS OF THE EROSION CONTROL MEASURES BY THE OWNER OR OWNER'S REPRESENTATIVE SHALL BE MADE TO ASSESS THEIR CONDITION. ANY NECESSARY MAINTENANCE OF THE MEASURES SHALL BE ACCOMPLISHED IMMEDIATELY AND SHALL INCLUDE THE REPAIR OF MEASURES DAMAGED BY ANY SUBCONTRACTOR INCLUDING THOSE OF THE PUBLIC UTILITY COMPANIES.

6. SURFACE FLOWS OVER CUT AND FILL SLOPES SHALL BE CONTROLLED BY EITHER REDIRECTING FLOWS FROM TRANSVERSING THE SLOPES OR BY INSTALLING MECHANICAL DEVICES TO SAFELY LOWER WATER DOWNSLOPE WITHOUT CAUSING EROSION. A TEMPORARY FILL DIVERSION (STD. & SPEC. 3.10) AND SLOPE
DRAIN (STD. & SPEC. 3.15) SHALL BE INSTALLED PRIOR TO THE END OF EACH WORKING DAY.

7. SEDIMENT CONTROL MEASURES MAY REQUIRE MINOR FIELD ADJUSTMENTS AT TIME OF CONSTRUCTION TO INSURE THEIR INTENDED PURPOSE IS ACCOMPLISHED. ENVIRONMENTAL DIVISION APPROVAL WILL BE REQUIRED FOR OTHER DEVIATIONS FROM THE APPROVED PLAN.

8. THE CONTRACTOR SHALL PLACE SOIL STOCKPILES AT THE LOCATIONS SHOWN ON THE PLAN. SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. OFF-SITE WASTE OR BORROW AREAS SHALL BE APPROVED BY THE ENVIROMENTAL DIVISION PRIOR TO THE IMPORT OF ANY BORROW OR EXPORT OF ANY WASTE TO OR FROM THE PROJECT SITE.

9. THE CONTRACTOR SHALL COMPLETE DRAINAGE FACILITIES WITHIN 30 DAYS FOLLOWING COMPLETION OF ROUGH GRADING AT ANY POINT WITHIN THE PROJECT. THE INSTALLATION OF DRAINAGE FACILITIES SHALL TAKE PRECEDENCE OVER ALL UNDERGROUND UTILITIES. OUTFALL DITCHES FROM DRAINAGE STRUCTURES SHALL BE STABILIZED IMMEDIATELY AFTER CONSTRUCTION OF THE SAME (STD & SPEC 3.18). THIS INCLUDES INSTALLATION OF EROSION CONTROL STONE OR PAVED DITCHES WHERE REQUIRED. ANY DRAINAGE OUTFALLS REQUIRED FOR A STREET MUST BE COMPLETED BEFORE STREET GRADING OR UTILITY INSTALLATION BEGINS.

10. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAT 30 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.

11. NO MORE THAN 300 FEET OF SANITARY SEWER, STORM DRAIN, WATER OR UNDERGROUND UTILITY LINES ARE TO BE OPEN AT ONE TIME. FOLLOWING INSTALLATION OF ANY PORTION OF THESE ITEMS, ALL DISTURBED AREAS ARE TO BE IMMEDIATELY STABILIZED (I.E., THE SAME DAY).

12. IF DISTURBED AREA STABILIZATION IS TO BE ACCOMPLISHED DURING THE MONTHS OF DECEMBER, JANUARY OR FEBRUARY, STABILIZATION SHALL CONSIST OF MULCHING (STD & SPEC 3.35). SEEDING WILL THEN TAKE PLACE AS SOON AS THE SEASON PERMITS.

13. THE TERM SEEDING, FINAL VEGETATIVE COVER OR STABILIZATION ON THIS PLAN SHALL MEAN THE SUCCESSFUL GERMINATION AND ESTABLISHMENT OF A STABLE GRASS COVER FROM A PROPERLY PREPARED SEEDBED CONTAINING THE SPECIFIED AMOUNTS OF SEED, LIME AND FERTILIZER (STD & SPEC 3.32). IRRIGATION SHALL BE REQUIRED AS NECESSARY TO ENSURE ESTABLISHMENT OF GRASS COVER.

14. ALL SLOPES STEEPER THAN 3H:1V SHALL REQUIRE THE USE OF EROSION CONTROL BLANKETS AND MATTINGS TO AID IN THE ESTABLISHMENT OF A VEGETATIVE COVER. INSTALLATION SHALL BE IN ACCORDANCE WITH STD. & SPEC. 3.36, MULCHING, STD. & SPEC. 3.36, SOIL STABILIZATION BLANKETS AND MATTING AND MANUFACTURER=S INSTRUCTIONS. NO SLOPES SHALL BE CREATED STEEPER THAN 2H:1V.

15. INLET PROTECTION (STD & SPEC 3.07 AND 3.08) SHALL BE PROVIDED FOR ALL STORM DRAIN AND CULVERT INLETS FOLLOWING CONSTRUCTION OF THE SAME.

16. TEMPORARY LINERS, SUCH AS POLYETHYLENE SHEETS, SHALL BE PROVIDED FOR ALL PAVED DITCHES UNTIL THE PERMANENT CONCRETE LINER IS INSTALLED.

17. PAVED DITCHES SHALL BE REQUIRED WHEREVER ACCELERATED EROSION IS EVIDENT. PARTICULAR ATTENTION SHALL BE PAID TO THOSE AREAS WHERE GRADES EXCEED 3 PERCENT.

18. TEMPORARY EROSION CONTROL MEASURES SUCH AS SILT FENCE ARE NOT TO BE REMOVED UNTIL ALL DISTURBED AREAS ARE STABILIZED. TRAPPED SEDIMENT SHALL BE SPREAD, SEEDED AND MULCHED. AFTER THE PROJECT AND STABILIZATION IS COMPLETE, ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS.

19. NO SEDIMENT TRAP OR SEDIMENT BASIN SHALL BE REMOVED UNTIL A) AT LEAST 75 PERCENT OF THE LOTS WITHIN THE DRAINAGE AREA TO THE TRAP OR BASIN HAVE BEEN SOLD TO A THIRD PARTY (UNRELATED TO THE DEVELOPER) FOR THE CONSTRUCTION OF HOMES AND/OR B) 60 PERCENT OF THE SINGLE FAMILY LOTS WITHIN THE DRAINAGE AREA TO THE TRAP OR BASIN HAVE BEEN COMPLETED AND THE SOIL 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 THE EXPRESS AUTHORIZATION OF THE JAMES CITY COUNTY ENVIRONMENTAL DIVISION.

20. RECORD DRAWINGS (AS-BUILTS) AND CONSTRUCTION CERTIFICATIONS ARE BOTH REQUIRED FOR NEWLY CONSTRUCTED OR MODIFIED STORMWATER MANAGEMENT/BMP FACILITIES. CERTIFICATION ACTIVITIES SHALL BE ADEQUATELY COORDINATED AND PERFORMED BEFORE, DURING AND FOLLOWING CONSTRUCTION IN ACCORDANCE WITH THE CURRENT VERSION OF THE JAMES CITY COUNTY ENVIRONMENTAL DIVISION, STORMWATER MANAGEMENT/BMP FACILITIES, RECORD DRAWING AND CONSTRUCTION CERTIFICATION, STANDARD FORMS & INSTRUCTIONS.

21. DESIGN AND CONSTRUCTION OF PRIVATE-TYPE SITE DRAINAGE SYSTEMS OUTSIDE VDOT RIGHTS-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.

No.	DATE	REVISION / COMMENT / NOTE	REVISED BY	REVIEWED BY
1	11/2/07	REVISED PER COUNTY COMMENTS	REC	REC
2	1/07/08	REVISED PER COUNTY COMMENTS	REC	REC
3	3/03/08	REVISED PER COUNTY COMMENTS	REC	REC
4	4/17/08	REVISED PER JCSA COMMENTS	REC	REC

COMMONWEALTH OF VIRGINIA
ROBERT E. COSBY III
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4/17/08
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CONSULTING ENGINEERS
WILLIAMSBURG • RICHMOND • GLOUCESTER

NOTES AND DETAILS
NEW TOWN
SECTION 7 & 8
ROADWAY INFRASTRUCTURE PLANS
PHASE VII

BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
REC/VAB	SDC/BBS
Scale	Date
AS NOTED	7/03/07

Project No. 6632S7-01A

Drawing No. 09

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VDOT GENERAL NOTES
REVISED 08/04

1. A Land Use Permit must be obtained from VDOT before any construction is started within the existing state right of way. Contact the VDOT Residency for the permit fee and bond amount. All Land Use Permit applications must have two (2) sets of approved plans, a check for the processing fee made payable to VDOT, and surety in the required amount.

2. The developer is responsible for the relocation of any utilities or pavement markings within the existing right of way or proposed right of way required by the development of the site/subdivision.

3. The developer is responsible for the cost of a traffic signal or any modifications to an existing traffic signal that are determined to be necessary. These costs will be charged under an Operational Project (Accounts Receivable) Number. Contact the VDOT Residency for the proper procedure.

4. Prior to any construction, the contractor shall consult with the developer's engineer to verify the final approval of the plans, or any revised plans, by the various agencies (County, VDOT, etc.).

5. VDOT approval of these plans will expire in five (5) years from the date of approval.

6. VDOT is to receive written notification 48 hours prior to the start of any work. A pre-construction meeting will be required prior to any land disturbance of the site. The developer, his engineer, geotechnical (soils) engineer, and contractor shall attend the pre-construction meeting. The developer's contractor shall have a proposed progress schedule of work.

7. Any errors, conflicts, or discrepancies found on the approved plans shall be reported to the developer's engineer and VDOT for resolution before proceeding further with the work.

8. The developer's engineer and contractor (sub-contractor) shall verify in the field the elevations of all points of connection of proposed work to existing curbs, sanitary sewer, storm sewer, drainage structures, waterlines, etc., prior to the construction in the field.

9. An Operational Project (accounts receivable) Number may be assigned to the site/subdivision. The developer will be responsible for this by providing the necessary information requested by VDOT.

10. All materials and construction within the proposed public right of way, to include private entrances, shall be in accordance with the current VDOT specifications and standards.

11. Any request for a change of specified materials or design from the approved plans will need to be submitted to VDOT. A letter must accompany the proposed changes and revised plan sheets and/or drainage calculations for review and approval by the VDOT Resident Engineer.

12. The developer will be responsible for providing the Geotechnical (soils) Engineer. A professional engineer or professional geologist will submit a complete report with boring data and recommendations to VDOT for approval of his proposed method of construction. This report shall include shrink swell values of the soils, moisture sensitive soils, sieve analyses, dry and wet CBR values, standard proctor and Atterberg Limits. The report will show the bore locations, types of soils encountered, and stabilization recommendations for soils with poor support values, high moisture, mica, and silt content. The report shall include a pavement structural design recommendation based on laboratory tests of the actual soils and approved traffic volume for the site/subdivision in accordance with the latest VDOT *Pavement Design Guide for Subdivision and Secondary Roads in Virginia.*

13. When soils occur that are unsuitable for foundations, embankment fill, pipe backfill, subgrade, or other roadway purposes, the developer's contractor shall excavate said material under the direction of the developer's soils engineer, by undercutting such material below the proposed grades shown on the plans. The contractor shall notify the developer's engineer and VDOT upon the discovery of the unsuitable material. Concurrence of the engineer shall be obtained before additional work is undertaken.

14. All erosion and sediment control measures shall be the responsibility of the contractor. All erosion control measures will be in place and reviewed by the contractor daily and after all inclement weather to insure compliance for the control of any erosion and siltation. Any corrections or repairs will be made immediately. In accordance with Road and Bridge Specifications, VDOT requires an individual certified by the Virginia Department of Conservation and Recreation, holding a Responsible Land Disturber Certification, to be in charge of the land disturbing activity and on the work site at all times.

15. The contractor and subcontractor(s) shall have a copy of the current VDOT *Road and Bridge Specifications* and the VDOT *Road and Bridge Standards*. The contractor shall have at least one (1) set of approved plans with all approved revisions. The Land Use Permit will be at the site at all times.

16. The contractor shall be responsible for locating and protecting all underground and overhead utilities, whether or not they are shown on the plans. The contractor will be responsible for repairs at his own expense of any utilities damaged by his construction methods. MISS UTILITY must be contacted at 1-800-552-7001 at least 72 hours prior to the commencement of construction.

17. The contractor will be responsible for replacing, with matching materials, any pavement, curb and gutter, driveway, pipe, sidewalk, etc. that are damaged during the construction of the site/subdivision.

18. Certification and source of materials are to be submitted to VDOT. All materials must meet VDOT specifications and standards.

19. The developer's Geotechnical Engineer and/or his certified materials technicians will perform compaction (density) tests for review by VDOT. All tests will be performed in accordance with the current VDOT specifications and standards. Backfill material for pipe, structures, and utilities located within the proposed right of way will be compacted and tested as the fill material is placed in uniform lifts. A minimum of 95% density with the soils standard proctor will be obtained with the proper moisture content on embankment and fills material. For the final 6" of the finished subgrade, 100% density will be obtained. The test results will be submitted to VDOT for review and compliance of the materials, prior to the developer's contractor requesting an inspection for a proof roll on the subgrade, aggregate stone, base mix (asphalt) or the placement of the surface mix.

20. All drainage easements shall be labeled as either "Drainage Easements" or "County Drainage Easements" and shall not be dedicated to VDOT or become the responsibility of VDOT. VDOT does not accept responsibility for the maintenance of the detention/retention pond or its structure, and shall be saved harmless from any damages.

21. Temporary drainage measures will be maintained by the contractor during construction to relieve areas that may cause damage to the right of way, roadway, or adjacent properties.

22. Dry gutter (rip rap) is not allowed in the ditches on VDOT right of way.

23. All storm sewer pipes shall be reinforced concrete pipe (tongue and groove) in accordance with ASTM-C-76 or an alternative that has been approved on the plans.

24. Installation of pipe culverts, storm sewers, and drainage structures shall have bedding material placed under the pipes and structures in accordance with VDOT specifications (a minimum of 4" under pipes and a minimum of 6" under drainage structures). The backfill material shall be suitable material free of debris, silt, tree roots (organic material), and excess moisture. The fill material will be compacted in uniform lifts and tested for density.

25. All vegetation (organic material, roots, stumps) and overburden are to be removed from the shoulders prior to the construction of the road's subgrade.

26. All concrete shall be Class A3-AE (3000PSI with air entrained additive) and tested by the developer's Geotechnical Engineer for conformance to VDOT specifications and standards.

27. There shall be a minimum of 6" of compacted 21-B aggregate material or stone depth shall match the existing pavement typical under the curb and gutter; this material shall extend 1' beyond the back of the curb and gutter. Density tests shall be taken prior to a proof roll of the material and placement of the curb/curb and gutter. Underdrains will be installed on raised curb medians in accordance with current VDOT specifications and standards.

28. All streets with curb and gutter shall have a standard CG entrance installed in accordance with the current *VDOT Road and Bridge Specifications and Standards*. The curb and gutter pan shall be removed prior to the installation of the entrance unless a wipe-down of the curb was made during the installation of the curb and gutter. The saw cutting and removal of only the curb portion is not allowed. It is the developer's responsibility to insure that the builders have installed all concrete entrances in accordance with VDOT specifications and standards.

29. All underground utilities are to be in place prior to the placement of the base material and shall have a minimum covering of 36". On curb and gutter streets, the area directly behind the curb to the right of way line shall be relatively flat at the private entrance location. The developer's contractor should cut embankments to the right of way line prior to the installation of all underground utilities to insure a minimum 36" of cover.

30. The sub-base and/or base material shall have a roller pattern and a control strip with densities performed on the material and the test results submitted to VDOT prior to the proof roll of the material and the placement of the asphalt (Hot Mix) course. The material shall be at finished grade, have the template as shown on the pavement typical, and have a stone depth and proof roll performed by VDOT and the developer's soils engineer. Density (compaction) tests will be performed using a roller pattern and a control strip in accordance with current VDOT specifications and standards to acquire the theoretical density of the material. Optimum moisture shall come from the supplier of the material. Any yield material must be corrected prior to the placement of the Hot Mix (asphalt). The Hot Mix shall be placed within 72 hours after the proof roll has been completed satisfactorily. Any significant rainfall prior to the placement of the prime coat and/or Hot Mix will require another proof roll to insure the material is stabilized and non-yielding.

31. In accordance with Section 311 of the *VDOT Road and Bridge Specifications*, a prime coat of .30 gal. /sq. yd. will be required for any pavement typical with less than 4" of Hot Mix prior to the placement of the surface course.

32. All Hot Mix (asphalt) courses shall be placed in accordance with Section 315 of the current *VDOT Road and Bridge Specifications*. The weather limitations of a 40° F surface temperature or 50° F and rising air temperature shall be followed. The developer's Geotechnical Engineer shall test the material to insure compliance with current VDOT specifications and the supplier's job mix design. The developer's Geotechnical Engineer shall also perform a roller pattern and a control strip for the theoretical density (compaction) of the material in conformance with the current VDOT specifications.

33. All utility cabinets, pedestals, and streetlights shall be located in accordance with clear zone requirements, as noted in the Road Design Manual. There shall not be any cabinets, pedestals, or fire hydrants located on the shoulder.

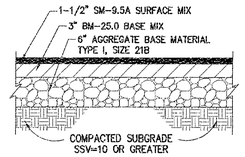
34. All storm pipe, drop inlet structures, ditches, and curb and gutter shall be cleaned of debris and silt during the last stages of construction.

35. Flowers, shrubs, and trees shall not be placed within the proposed right of way by the developer or homeowner without an approved set of plans and an approved planting agreement. No irrigation (sprinkler) systems shall be located within the proposed right of way. Any irrigation system found within the right of way will be removed prior to the acceptance of the streets and all costs will be borne by the owner. No brick columns, endwalls, and/or brick mailboxes will be constructed or installed in the proposed right of way. Any of the above items found in the proposed right of way will be removed, and all costs of the removal will be borne by the owner and/or developer. The developer is responsible for installing mailbox posts.

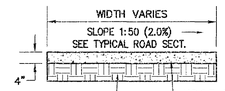
36. No easements shall encroach upon the proposed right of way; any easements located within the proposed right of way must be removed from the plat prior to the recordation of the plat. A Deed of Quit Claim will be required on any easements located within the proposed right of way prior to the acceptance of the streets into the State Secondary Road system.

37. Contact Mr. Sal Sibilia 72 hours in advance of all pavement markings/sign installations at (757) 925-1679. Failure to do so may result in additional cost to the developer.

38. Contact Traffic Engineering at (757) 925-2693 a minimum of 48 hours in advance whenever an open cut or boring of a utility line across a road is within 400 feet of a traffic signal, so the lines can be marked. Failure to do so could be a costly repair for the developer.



PAVEMENT SECTION
N.T.S.



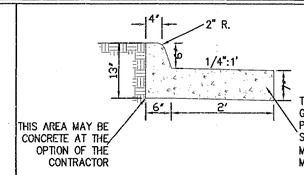
NOTE:
THE SIDEWALK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECT. 504 OF THE VDOT ROAD AND BRIDGE SPEC.

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

SIDEWALK DETAIL
N.T.S.

D-CONCSW

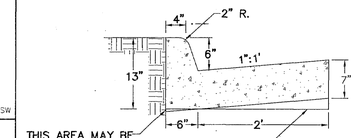
CG-6R



NOTE: COMBINATION CURB AND GUTTER HAVING A RADIUS OF 300' OR LESS (ALONG FACE OF CURB) SHALL BE PAID FOR AS A RADIAL COMBINATION CURB AND GUTTER. THIS ITEM MAY BE PRECAST OR CAST IN PLACE. CONCRETE TO BE CLASS A3 IF CAST IN PLACE, 4000 PSI IF PRECAST.

REVERSE COMBINATION CURB & GUTTER
N.T.S.

CG-6



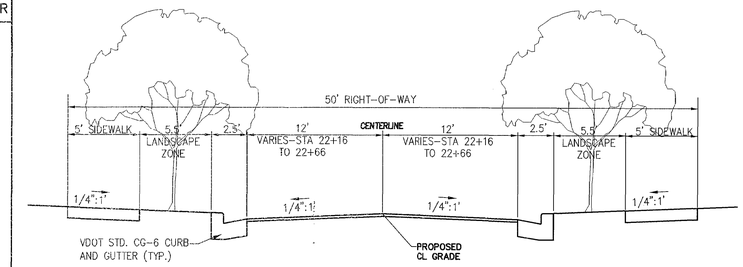
NOTE: COMBINATION CURB AND GUTTER HAVING A RADIUS OF 300' OR LESS (ALONG FACE OF CURB) SHALL BE PAID FOR AS A RADIAL COMBINATION CURB AND GUTTER.

THIS ITEM MAY BE PRECAST OR CAST IN PLACE.

CONCRETE TO BE CLASS A3 IF CAST IN PLACE, 4000 PSI IF PRECAST.

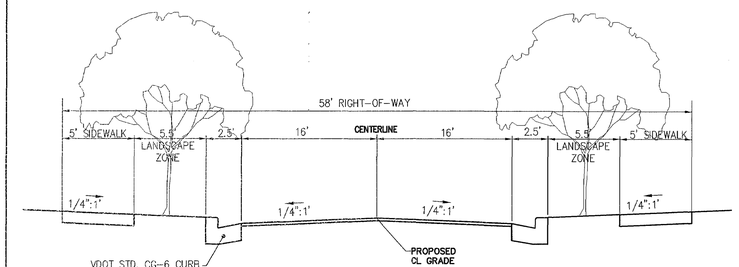
COMBINATION CURB AND GUTTER
N.T.S.

D-CG6



1. PROVIDE 24' ASPHALT DRIVE, SLOPE 1/4" PER FT.
2. PROVIDE 5.5' LANDSCAPE ZONE, SLOPE= 1/4" PER FT.
3. PROVIDE 5' SIDEWALK, SLOPE= 1/4" PER FT.
4. PROVIDE SSV = 10 OR GREATER

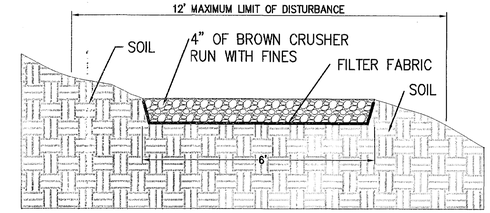
TYPICAL ROADWAY SECTION STA 21+96 TO 22+66
N.T.S.



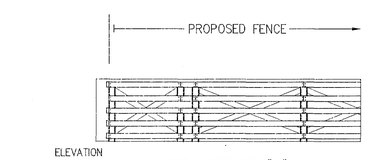
1. PROVIDE 32' ASPHALT DRIVE, SLOPE 1/4" PER FT.
2. PROVIDE 5.5' LANDSCAPE ZONE, SLOPE= 1/4" PER FT.
3. PROVIDE 5' SIDEWALK, SLOPE= 1/4" PER FT.
4. PROVIDE SSV = 10 OR GREATER

TYPICAL ROADWAY SECTION STA 22+66 TO CASEY BOULEVARD
N.T.S.

NOTE:
FINAL LOCATION OF TRAIL TO BE FLAGGED BY OWNER OR OWNER'S REPRESENATIVE PRIOR TO CONSTRUCTION. LOCATION SHALL INSURE MAXIMUM TREE PROTECTION AND SHALL BE FIELD REVIEWED BY JCC STAFF PRIOR TO CONSTRUCTION. NO SPECIMEN TREES PER JCC ORDINANCE DEFINITION SHALL BE REMOVED DURING CONSTRUCTION.



6' GRAVEL WALKWAY
N.T.S.



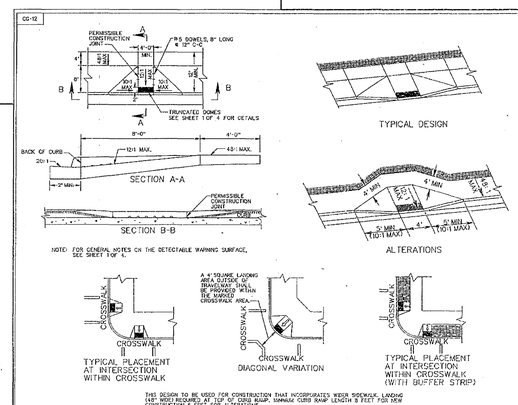
ELEVATION

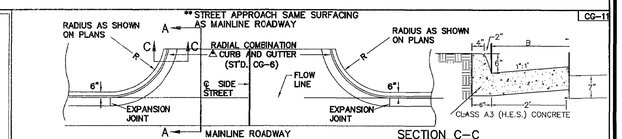
NOTE: POSTS ARE 6"x6". ALL HORIZONTAL MEMBERS TO BE 1"x6".

FENCE TO MATCH EXISTING FENCE ON NEW TOWN AVENUE ADJACENT TO TOWNE BANK

NOTE:
ALL WOOD IS PRESSURE TREATED AND STAINED WHITE.

ELEVATION OF FENCE
SCALE: 1'= 1/4"



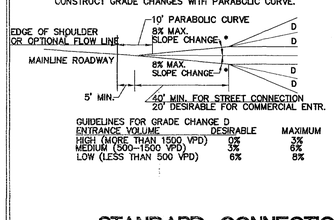


NOTE:
WIDTH "B" 2'-0" OR AS SHOWN ON TYPICAL SECTION.

SECTION C-C

PLAN VIEW

CONSTRUCT GRADE CHANGES WITH PARABOLIC CURVE.



GUIDELINES FOR GRADE CHANGE D

ENTRANCE VOLUME	DESIRABLE	MAXIMUM
HIGH (MORE THAN 1500 VPD)	0%	3%
MEDIUM (500-1500 VPD)	3%	6%
LOW (LESS THAN 500 VPD)	6%	8%

WHEN STD. CG-11 IS USED FOR ENTRANCES BUILT IN CONJUNCTION WITH VDOT PROJECTS, PLEASE NOTE THE FOLLOWING:
MAINLINE PAVEMENT SHALL BE CONSTRUCTED TO THE R/W LINE (EXCEPT ANY SUBGRADE STABILIZATION REQUIRED FOR MAINLINE PAVEMENT WHICH CAN BE OMITTED IN THE ENTRANCE.)
△ RADIAL CURB COMBINATION CURB AND GUTTER SHALL NOT BE CONSTRUCTED BEYOND THE R/W LINE EXCEPT FOR REPLACEMENT PURPOSES.
WHEN USED IN CONJUNCTION WITH STANDARD CG-3 OR CG-7, THE CURB FACE ON THIS STANDARD IS TO BE ADJUSTED TO MATCH THE MOUNTABLE CURB CONFIGURATION.
SEE STANDARD CG-12 FOR CURB RAMP DESIGN TO BE USED WITH THIS STANDARD.
WHEN ENTRANCE RADII CANNOT ACCOMMODATE THE TURNING REQUIREMENTS OF ANTICIPATED HEAVY TRUCK TRAFFIC CONSIDERATION SHOULD BE GIVEN TO INCREASING THE DEPTH OF ADJACENT PROPOSED SIDEWALK TO 7 INCHES.
OPTIONAL FLOWLINE MAY BE USED FOR ENTRANCES IN CUT SECTIONS.
OPTIONAL FLOWLINE MAY REQUIRE WARPING OF A PORTION OF GUTTER TO PRECLUDE PONDING OF WATER.

STANDARD CONNECTION FOR STREET INTERSECTIONS AND COMMERCIAL ENTRANCES
N.T.S.

d-cg11.dwg

No.	DATE	REVISION / COMMENT / NOTE	REVISED BY	REVIEWED BY
3	4/17/08	REVISED PER JCSA COMMENTS	REC	REC
2	3/03/08	REVISED PER COUNTY COMMENTS	REC	REC
1	1/07/08	REVISED PER COUNTY COMMENTS	REC	REC
	11/12/07	REVISED PER COUNTY COMMENTS	REC	REC

COMMONWEALTH OF VIRGINIA
ROBERT E. COSBY III
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NOTES AND DETAILS
NEW TOWN
SECTION 7 & 8
ROADWAY INFRASTRUCTURE PLANS
PHASE VII
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
REC/VAB	SDC/BBS
Scale	Date
AS NOTED	7/03/07

Project No.
6632S7-01A
Drawing No.
11

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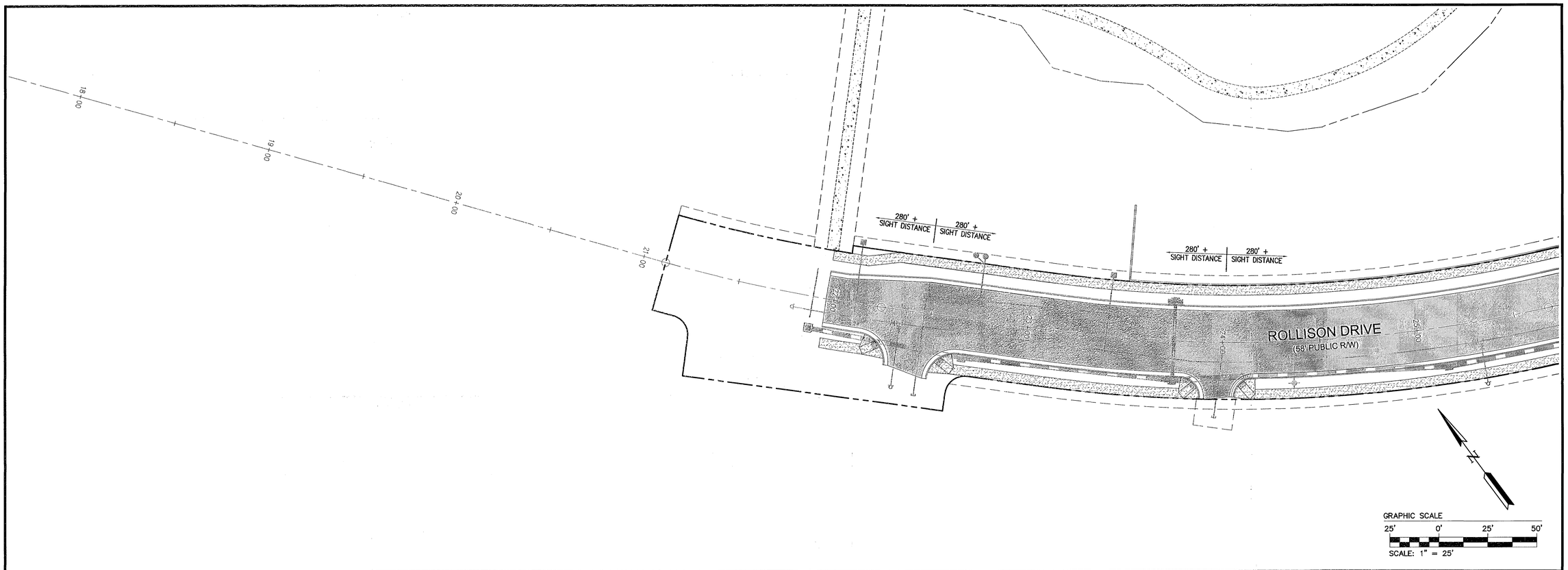

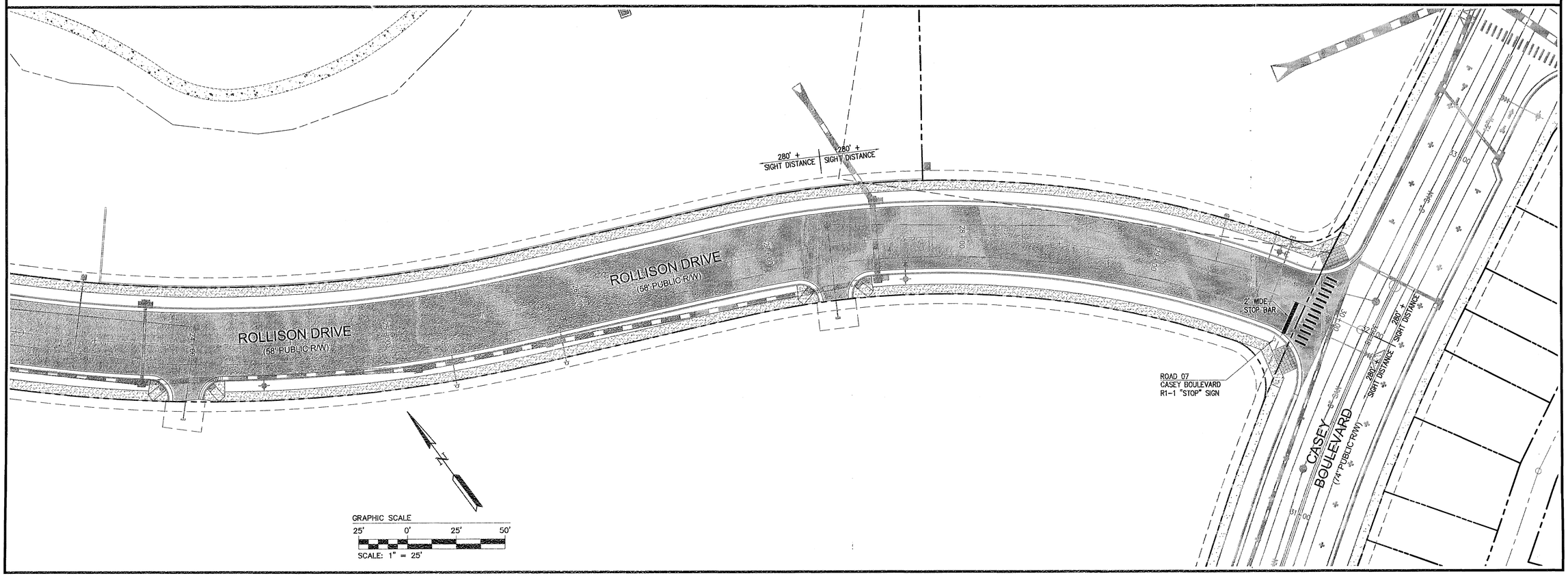

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STRIPING PLAN
NEW TOWN
SECTION 7 & 8
ROADWAY INFRASTRUCTURE PLANS
PHASE VII

BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
REC/VAB	SDC/BBS
Scale	Date
1"=25'	7/03/07
Project No.	
6632S7-01A	
Drawing No.	
13	

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THE STORMWATER MANAGEMENT/BMP FACILITY AS PROPOSED FOR THIS PROJECT WILL REQUIRE SUBMISSION, REVIEW, AND APPROVAL OF A RECORD DRAWING (AS-BUILT) AND CONSTRUCTION CERTIFICATION PRIOR TO RELEASE OF THE POSTED BOND/SURETY.

VDOT DOES NOT ASSUME RESPONSIBILITY FOR MAINTENANCE OF THE DETENTION/RETENTION POND OR IT'S STRUCTURE AND SHALL BE SAVED HARMLESS FROM ANY DAMAGES.

DAM CONSTRUCTION NOTES

1. GEOTECHNICAL ENGINEER:
A GEOTECHNICAL ENGINEER SHALL BE ON SITE DURING CONSTRUCTION OF THE DAM TO ENSURE PROPER MATERIALS AND DAM CONSTRUCTION METHODS ARE UTILIZED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE DAM CONSTRUCTION SCHEDULE WITH THE GEOTECHNICAL CONSULTANT IN ORDER TO ENSURE ON-SITE MONITORING.

2. SITE PREPARATION:
THE CONTRACTOR SHALL STRIP ALL AREAS OF THE PERMANENT COVER IN CONSTRUCTION AREA TO REMOVE ALL UNSUITABLE MATERIALS. THE UNSUITABLE MATERIALS TO BE REMOVED BY STRIPPING SHALL INCLUDE ALL TOPSOIL, DEBRIS AND VEGETABLE MATTER, INCLUDING STUMPS AND ROOTS, AND ALL OTHER MATERIALS WHICH MAY BE UNSUITABLE FOR USE IN THE PERMANENT CONSTRUCTION.

3. EMBANKMENT:
THE EXPOSED SUB GRADE SOILS SHALL BE CAREFULLY INSPECTED BY THE GEOTECHNICAL ENGINEER ANY UNSUITABLE MATERIALS THUS EXPOSED SHALL BE REMOVED AND REPLACED WITH A WELL COMPACTED, SUITABLE MATERIAL. DENSITY TESTING, AT THE DISCRETION OF THE OWNER/GEOTECHNICAL ENGINEER, SHALL BE PERFORMED AT THIS TIME. THE EMBANKMENT SHALL BE KEYED INTO THE UNDISTURBED (EXISTING) SOIL STRATUM. EMBANKMENT SHOULD BE KEYED AT LEAST 1 FOOT INTO THE STRATUM OR AS SPECIFIED BY THE GEOTECHNICAL ENGINEER (WIDTH=4 FT. MIN.) THE EMBANKMENT FOUNDATION SHALL BEAR ON FIRM AND STABLE EXISTING SUB-GRADE WHICH HAS BEEN PREPARED SO AS TO REMOVE ALL ORGANIC, LOOSE, AND GENERALLY UNSUITABLE MATERIAL. ALL MATERIALS TO BE USED FOR BACKFILL OR COMPACTED FILL SHALL BE INSPECTED AND, IF NECESSARY, TESTED BY THE GEOTECHNICAL ENGINEER IN ACCORDANCE WITH ASTM D2487 PRIOR TO PLACEMENT, TO DETERMINE IF THEY ARE SUITABLE FOR THE INTENDED USE. THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED BORROW AREAS. IT SHALL BE CLEAN MINERAL SOIL, FREE OF ROOTS, WOOD VEGETATION, OVERSIZED STONES, ROCKS, OR OTHER OBJECTIONABLE MATERIALS. AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED A MINIMUM OF 4 INCHES PRIOR TO PLACEMENT OF FILL. THE FILL MATERIAL'S MOISTURE CONTENT SHALL BE (+3 TO -2) PERCENTAGE POINTS OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D2216 (I.E. IN GENERAL THE FILL MATERIAL SHOULD CONTAIN SUFFICIENT MOISTURE SO THAT IT CAN BE FORMED INTO A BALL WITHOUT CRUMBLING. IF WATER CAN BE SQUEEZED OUT OF THE BALL, IT IS TOO WET FOR PROPER COMPACTION). FILL MATERIAL WILL BE PLACED IN 6 TO 8 INCH CONTINUOUS LAYERS OVER THE ENTIRE LENGTH OF THE FILL. FINISHED GRADES SHALL BE MERGED NATURALLY INTO THE EXISTING GRADES.

4. CUTOFF TRENCH/KEY TRENCH:
THE TRENCH SHALL BE EXCAVATED ALONG THE CENTERLINE OF THE DAM. THE MINIMUM DEPTH SHALL BE AS SHOWN ON THE PLANS. THE BOTTOM WIDTH SHALL BE THE GREATER OF 4 FEET WIDE OR WIDE ENOUGH TO PERMIT OPERATION OF COMPACTING EQUIPMENT. THE SIDE SLOPES SHALL BE NO STEEPER THAN 1:1.

5. PRINCIPAL SPILLWAY:
THE BOTTOM OF THE SPILLWAY RISER FOUNDATION BASE EXCAVATION SHALL BE OBSERVED BY THE GEOTECHNICAL ENGINEER TO ENSURE THAT ALL UNSUITABLE AND LOOSE MATERIALS ARE REMOVED AND THAT ACCEPTABLE BEARING CONDITIONS EXIST IN THE FOUNDATION'S BASE. ALL JOINTS IN THE PRINCIPAL SPILLWAY STRUCTURE SHALL BE WATERTIGHT CONSTRUCTION. PERMIOUS MATERIALS SUCH AS SAND, GRAVEL OR CRUSHED STONE SHALL NOT BE USED AS BACKFILL AROUND THE BARREL OR ANTI-SEEP COLLAR. FILL MATERIAL SHALL BE PLACED AROUND THE PIPE IN 4 INCH LAYERS AND COMPACTED BY HAND TO THE SAME DENSITY AS THE EMBANKMENT. A MINIMUM OF TWO FEET OF FILL SHALL BE HAND-COMPACTED OVER THE BARREL BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT.

CONVERSION OF SEDIMENT BASIN TO PERMANENT BMP.

1. DRAIN SEDIMENT BASIN.

2. REMOVE ACCUMULATED SEDIMENT AND DISPOSE OF ON SITE. STABILIZE MATERIAL.

3. GRADE BMP BOTTOM TO ELEVATION 68.00.

4. INSTALL TIMBER WALL AND RIP RAP IN FOREBAY TO ELEVATION 73.0

BMP/DAM MAINTENANCE AND INSPECTION REQUIREMENTS

THE EMBANKMENT AND MAINTENANCE RIGHT OF WAY SHOULD BE MOWED PERIODICALLY DURING THE GROWING SEASON, ENSURING THAT THE LAST CUTTING OCCURS AT THE END OF THE SEASON. THE GRASS SHOULD NOT BE CUT LESS THAN 6 TO 8 INCHES IN HEIGHT.

IF NECESSARY, THE EMBANKMENT SHOULD BE LIMED, FERTILIZED AND SEEDED IN THE FALL, AFTER THE GROWING SEASON. LIME AND FERTILIZER APPLICATION RATES SHOULD BE CONSISTENT WITH THAT ORIGINALLY SPECIFIED ON THE CONSTRUCTION PLANS.

ALL EROSION GULLIES NOTED DURING THE GROWING SEASON SHOULD BE BACKFILLED WITH TOPSOIL, RESEEDED AND PROTECTED (MULCHED) UNTIL VEGETATION IS ESTABLISHED.

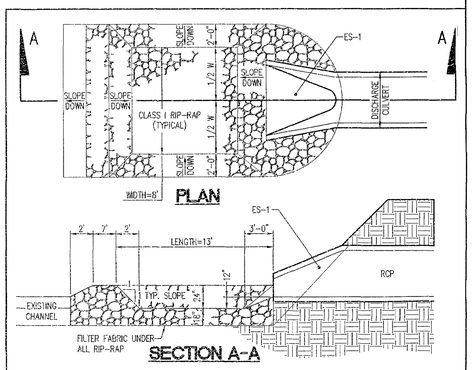
ALL BARE AREAS AND PATHWAYS ON THE EMBANKMENT SHOULD BE PROPERLY SEEDED AND PROTECTED (MULCHED) OR OTHERWISE STABILIZED TO ELIMINATE THE POTENTIAL FOR EROSION.

ALL ANIMAL BURROWS SHOULD BE BACKFILLED AND COMPACTED.

ALL TREES, WOODY VEGETATION AND OTHER DEEP-ROOTED GROWTH, INCLUDING STUMPS AND ASSOCIATED ROOT SYSTEMS, SHOULD BE REMOVED FROM THE EMBANKMENT AND ADJACENT AREAS EXTENDING TO AT LEAST 25 FEET BEYOND THE EMBANKMENT TOE AND ABUTMENT CONTACTS. THE ROOT SYSTEMS SHOULD BE EXTRACTED AND THE EXCAVATED VOLUME REPLACED AN COMPACTED WITH MATERIAL SIMILAR TO THE SURROUNDING AREA. ALL SEEDLINGS SHOULD BE REMOVED AT THE FIRST OPPORTUNITY. SIMILARLY, ANY VINE COVER AND BRUSH SHOULD BE REMOVED FROM THE EMBANKMENT TO ALLOW FOR INSPECTIONS.

ANY REPAIRS MADE TO THE PRINCIPAL SPILLWAY (RISER OR BARREL) SHALL BE REVIEWED BY A PROFESSIONAL ENGINEER. VERTICAL TRENCHING TO EXPOSE THE BARREL SHALL NOT BE ALLOWED UNDER ANY CIRCUMSTANCES. THE TRENCH SIDE SLOPES SHOULD BE STEPPED BACK AT A 2:1 SLOPE, MINIMUM.

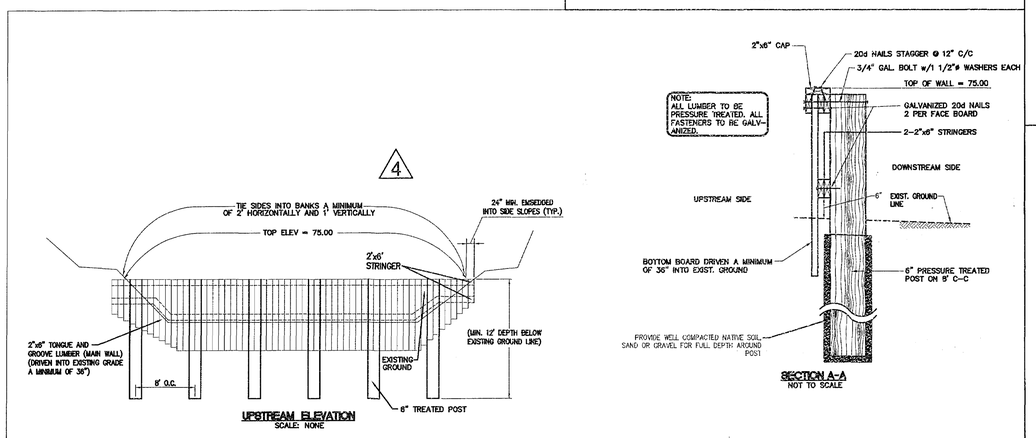
SEDIMENT REMOVAL IN THE FOREBAY SHALL OCCUR EVERY 5 TO 7 YEARS OR AFTER 50% OF TOTAL FOREBAY CAPACITY HAS BEEN LOST.



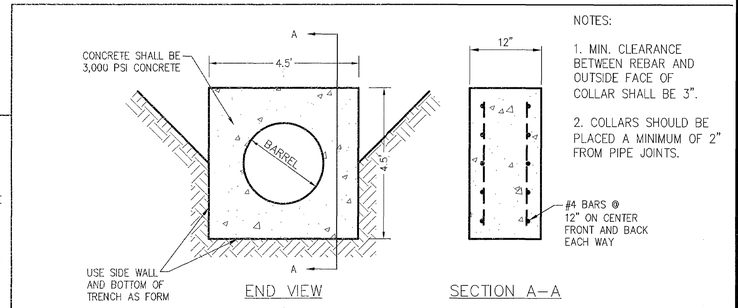
* TO BE INSTALLED AT LEVEL GRADE

STILLING BASIN (OP)

N.T.S



PRESSURE TREATED WOOD BAFFLE STRUCTURE



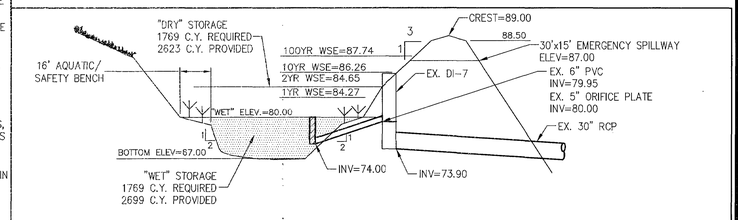
NOTES:

1. MIN. CLEARANCE BETWEEN REBAR AND OUTSIDE FACE OF COLLAR SHALL BE 3".

2. COLLARS SHOULD BE PLACED A MINIMUM OF 2" FROM PIPE JOINTS.

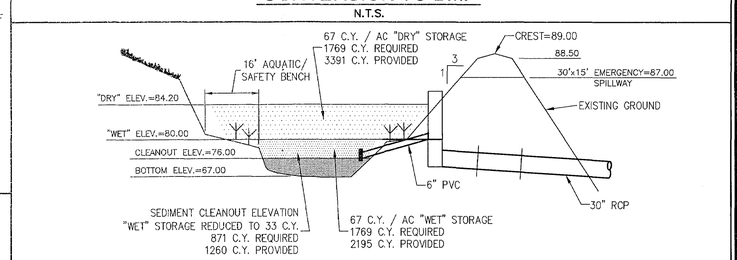
CONCRETE ANTI-SEEP COLLAR

N.T.S.



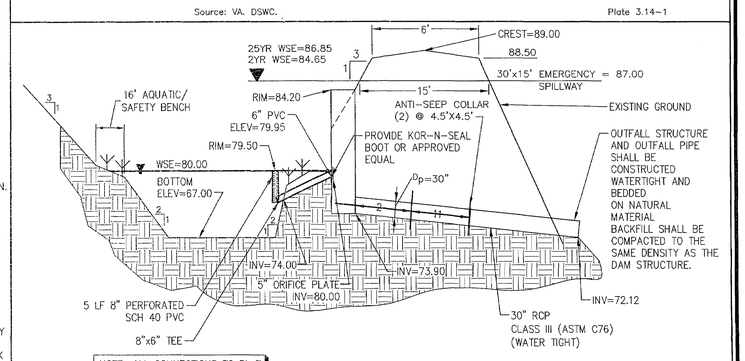
CONVERSION TO BMP

N.T.S.



MINIMUM STORAGE VOLUME AND SEDIMENT STORAGE

Source: VA. DSWC. Plate 3.14-1



NOTE: ALL CONNECTIONS TO DI-7 SHALL BE WATERTIGHT

PRINCIPAL SPILLWAY DESIGN

SOURCE: VA. DSWC PLATE. 3.14-7

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4	4/17/08	REVISED PER JCSA COMMENTS	REC
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AS NOTED	7/03/07
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6632S7-01A	
Drawing No.	
12	

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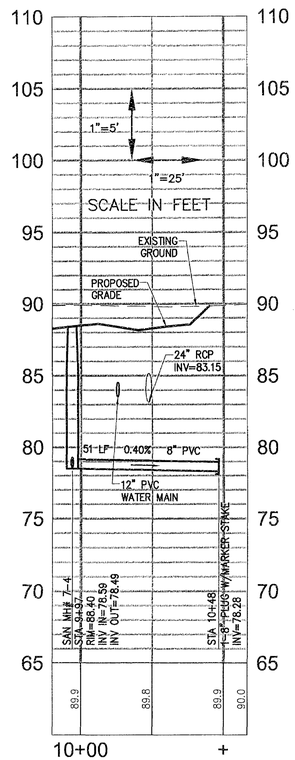
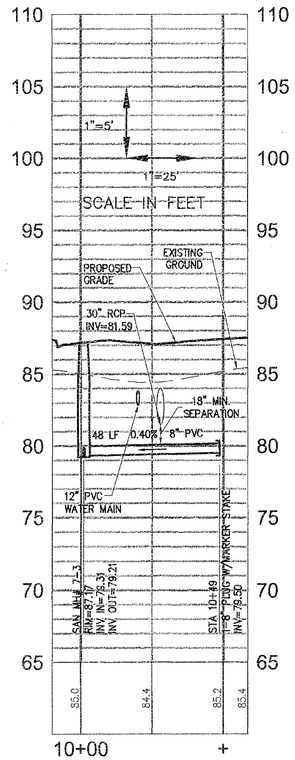
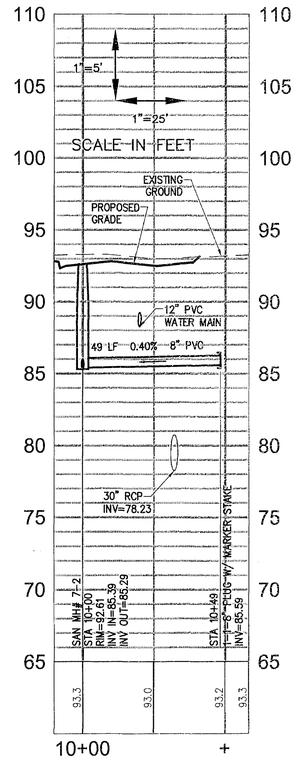


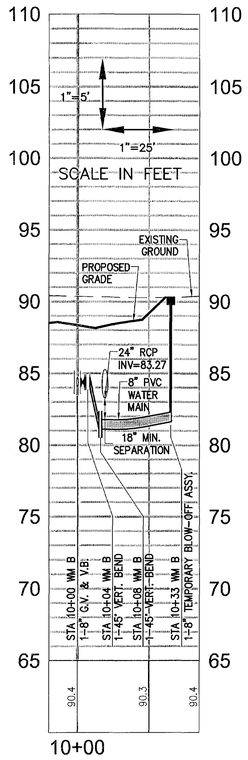
SANITARY B



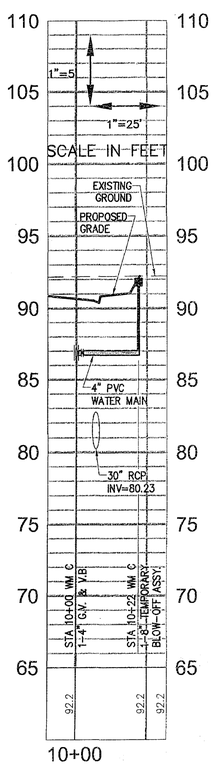
SANITARY C



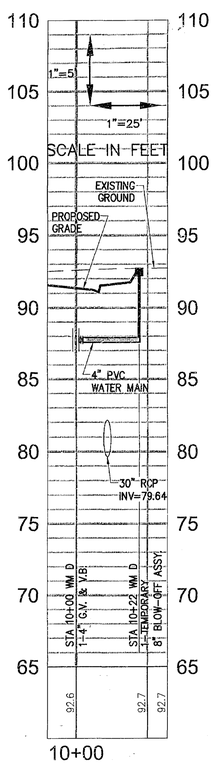
SANITARY D



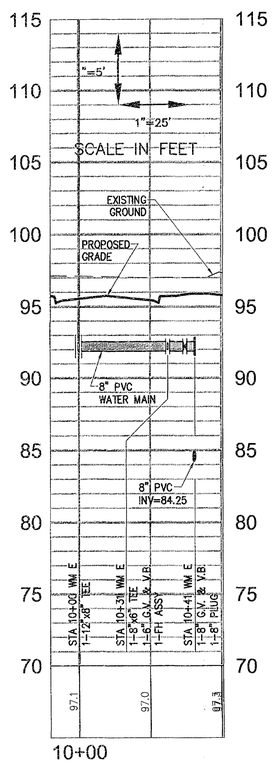
WATER MAIN B



WATER MAIN C



WATER MAIN D



WATER MAIN E

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CONSULTING ENGINEERS
WILLIAMSBURG • RICHMOND • GLOUCESTER

WATER AND SANITARY PROFILES

NEW TOWN

SECTION 7 & 8
ROADWAY INFRASTRUCTURE PLANS
PHASE VII

BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
REC/VAB	SDC/BBS
Scale 1"=25'	Date 7/03/07

Project No. 6632S7-01A

Drawing No. 14

S:\Jobs\6632S7\01-Phase7\dwg\Eng\Plans\6632S701c14-profiles.dwg, 4/17/2008 1:48:58 PM, bobby.sanders

AES
CONSULTING ENGINEERS

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

Environmental Division
JAN 10 2013
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Letter of Transmittal

ATTN: **Amy Parker**

CO.: James City County

Address: Engineering & Res. Protection
Building E

cc:

DATE	JOB NO.
1/10/13	6632-7-05

FROM: Bob Cosby

RE
New Town, Section 7, Phase VII
BMP As-Builts

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

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

☐ Copy of letter(s) ☐ Other:

COPIES	DATE	No. of Pages	DESCRIPTION
1	1/10/13	1	CD with PDF of As-builts and Certification

THESE ARE TRANSMITTED as checked below:

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

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

☐ Other:

REMARKS:

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

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

File name: S:\Jobs\6632\S7\01-Phase7\Admin\Correspondence\Transmittals\6632-7-1-T08.doc
Form Rev. 7/02

JUL 2007
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James City County, Virginia
Environmental Division

Erosion and Sediment Control and Stormwater Management Design Plan Checklists

Table of Contents

Contents		Page
Erosion and Sediment Control Plan		
I.	General	1
II.	Site Plan	1
III.	Narrative	3
IV.	Calculations	4
Stormwater Management Design Plan		
I.	General	5
II.	Stormwater Conveyance Systems	7
III.	Stormwater Management / BMP Facilities	8
IV.	Outlet Protections	14
V.	Additional Comments and Information	14

GENERAL INFORMATION

Project Name: New Town - Section 7, Phase VII
Owner / Applicant: New Town Associates, L.L.C./AES Consulting Engineers
Plan Preparer: AES Consulting Engineers/ Robert Cosby Email: rcosby@aesva.com
Project Location: New town Section 7, Phase VII
Tax Map / Parcel: (38-4) (24-0-0010)
County Plan No. (if known): _____
County BMP Type: _____ (-)
Other information submitted in addition to this checklist (Check all that apply):

- ☒ Design or Construction Drawings (Plans, Profiles, Details, etc.).
- ☒ Erosion & Sediment Control Plan (Plan, Details, etc.).
- ☐ Erosion & Sediment Control Plan Design Report.
- ☒ Stormwater Management Design Plan (Plans, Profiles, Details, etc.).
- ☒ Stormwater Management Design Report.
- ☐ Other, List: _____

Issue Date
March 1, 2001

JAMES CITY COUNTY, VIRGINIA
ENVIRONMENTAL DIVISION

EROSION AND SEDIMENT CONTROL PLAN CHECKLIST

I. *GENERAL*:

Yes	No	N/A	
☒	☐	☐	*FAMILIARITY* with current versions of Chapter 8, Erosion and Sedimentation Control and Chapter 23, Chesapeake Bay Preservation ordinances of the Code of James City County, Virginia and the Virginia Erosion and Sediment Control Handbook (VESCH).
☒	☐	☐	*LAND DISTURBING PERMIT AND SILTATION AGREEMENT* with surety are required for the project.
☐	☒	☐	*VARIANCE* if necessary, requested in writing, for the plan approving authority to waive or modify any of the minimum standards and specifications of the VESCH deemed inappropriate based on site conditions specific to this review case only. Variances which are approved shall be properly documented in the plan and become part of the approved erosion and sediment control plan for the site.

II. *SITE PLAN*:

Yes	No	N/A	
☒	☐	☐	*VICINITY MAP* locating the site in relation to the surrounding area. Include any major landmarks which might assist in physically locating the site.
☒	☐	☐	*INDICATE NORTH* direction in relation to the site.
☒	☐	☐	*LIMITS OF CLEARING AND GRADING* for the site including that required for implementation of erosion and sediment controls, stockpile areas and utilities.
☒	☐	☐	*DISTURBED AREA ESTIMATES* in acres or square feet for the project.
☒	☐	☐	*EXISTING TOPOGRAPHY* or contours for the site at no more than 5 foot contour interval.
☒	☐	☐	*FINAL TOPOGRAPHY,* contours or proposed site grading in accordance with the design plan which indicates changes to existing topography and drainage patterns at no more than 2 foot contour interval (or 1 foot contours where required).
☒	☐	☐	*EXISTING AND PROPOSED SPOT ELEVATIONS* to supplement existing and proposed contours, topography or site grading information. Spot elevations may replace final contours in some instances, especially if terrain is in a low lying area or relatively flat.
☒	☐	☐	*EXISTING VEGETATION* including existing tree lines, grassed or unique vegetation areas.

Yes	No	N/A	
☒	☐	☐	*EXISTING SITE FEATURES* including roads, buildings, homes, utilities, streams, fences, structures and other important surface features of the site.
☒	☐	☐	*SOILS MAP* with soil symbols, boundaries and legend in accordance with the current Soil Survey of James City and York Counties and the City of Williamsburg, Virginia.
☒	☐	☐	*ENVIRONMENTAL INVENTORY* in accordance with Section 23-10(2) of the Chesapeake Bay Preservation Ordinance of James City County. Inventory generally includes: tidal shores and wetlands, non-tidal wetlands, resource protection area, hydric soils and slopes steeper than 25 percent. For wetlands, provide a copy of issued permits or satisfactory evidence that appropriate permits are being pursued for the entire project.
☒	☐	☐	*100-YEAR FLOODPLAIN LIMITS* or any special flood hazard areas or flood zones based on appropriate Federal Management Agency Flood Insurance Rate Maps (FIRMs) or Flood Hazard Boundary Maps (FHBMs) of James City County, Virginia.
☒	☐	☐	*DRAINAGE AREAS* for offsite and onsite areas, existing or proposed as applicable. Include drainage divides and directional labels for all subareas at points of interest and size (in acres), weighted runoff coefficient or curve number and times of concentration for each subarea.
☒	☐	☐	*CRITICAL EROSION AREAS* which require special consideration or unique erosion and sediment control measures. Refer to the VESCH, Chapter 6 for criteria.
☒	☐	☐	*DEVELOPMENT PLAN* for the site showing all improvements such as buildings, structures, parking areas, access roadways, above and below ground utilities, stormwater management and drainage facilities, trails or sidewalks, proposed vegetation and landscaping, amenities, etc.
☒	☐	☐	*LOCATION OF PRACTICES* proposed for erosion and sediment control, tree protection and temporary stormwater management due to land disturbance activities at the site. Use standard abbreviations, labels and symbols consistent for plan views based on minimum standards and specifications in Chapter 3 of the VESCH.
☒	☐	☐	*TEMPORARY STOCKPILE AREAS* or staging and equipment storage areas as required for onsite or offsite construction activities or indicate that none are anticipated for this project.
☐	☐	☒	*OFFSITE LAND DISTURBING AREAS* including borrow sites, waste areas, utility extensions, etc. and required erosion and sediment controls. If none are anticipated for the project, then indicate on the plans by general or erosion and sediment control notes.
☒	☐	☐	*DETAILS* or alternately, appropriate reference to current minimum standards and specifications of the VESCH for each measure proposed for the project. Non-modified, standard duplicated details (silt fence, diversion dikes, etc.) may be referenced to the current version of the VESCH. Specific dimensional or modified standards (basins, traps, outlet protections, check dams, etc.) require presentation on detail sheets. Schedules or tables may be used for multiple site measures such as sediment traps, basins, channels, slope drains, etc. Any modification to standard details should be clearly defined, explained and illustrated.

Yes	No	N/A	
☒	☐	☐	*MAINTENANCE PLAN* or alternately, appropriate reference to current minimum standards and specifications of the VESCH, outlining the inspection frequency and maintenance requirements for all erosion and sediment control measures proposed for the project.
☒	☐	☐	*TRENCH DEWATERING* methods and erosion and sediment controls, if anticipated for the project.
☒	☐	☐	*CONSTRUCTION SEQUENCE* outlining the anticipated sequence for installation of erosion and sediment controls and site, grading and utility work to be performed for the project by the site contractor.
☐	☐	☒	*PHASING PLAN* if required for larger project sites that are to be developed in stages or phases.
☒	☐	☐	*STANDARD COUNTY NOTES* are required to be placed on the erosion and sediment control plan. Refer to the standard James City County Erosion and Sediment Control Notes dated May 5, 1999.
☒	☐	☐	*PROFESSIONAL SEAL AND SIGNATURE* required on final and complete approved plans, drawings, technical reports and specifications.

III. ***NARRATIVE:***

Yes	No	N/A	
☒	☐	☐	*PROJECT DESCRIPTION* briefly describing the nature and purpose of the land disturbing activity and the acreage to be disturbed.
☒	☐	☐	*EXISTING SITE CONDITIONS* description of existing topography, land use, cover and drainage patterns at the site.
☒	☐	☐	*ADJACENT AREA* descriptions of neighboring onsite or offsite areas such as streams, lakes, property, roads, etc. and potential impacts due to concentrated flow or runoff from the land disturbing activity.
☐	☐	☒	*OFFSITE DISTURBED AREA* descriptions of proposed borrow sites, water or surplus areas, utility extensions and erosion and sediment controls to be implemented.
☒	☐	☐	*SOILS DESCRIPTION* briefly summarizing site, disturbed area and drainage basin soils including name, unit, hydrologic soil group (HSG) classification, surface runoff potential, erodibility, permeability, depth, texture, structure, erosion hazards, shrink-swell potential, limitations for use and anticipated depths to bedrock and the seasonal water table, as applicable.
☒	☐	☐	*CRITICAL AREAS* on the site which may have potentially serious erosion and sediment control problems and special considerations required (i.e. steep slopes, hydric soils, channels, springs, sinkholes, water supply reservoirs, groundwater recharge areas, etc.)

Yes	No	N/A	
☒	☐	☐	*PROPOSED EROSION & SEDIMENT CONTROL MEASURES* inclusive to the specific erosion and sediment control plan as proposed for the land disturbing activity. Measures should be consistent with those proposed on the site drawings. Address general use, installation, limitations, sequencing and maintenance requirements for each control measure.
☒	☐	☐	*STABILIZATION MEASURES* required for the site, either temporary or permanent, and during and following construction including temporary and permanent seeding and mulching, paving, stone, soil stabilization blankets and matting, sodding, landscaping or special stabilization techniques to be utilized at the site.
☒	☐	☐	*STORMWATER MANAGEMENT CONSIDERATIONS* for the site, either of temporary or permanent nature, and strategies, sequences and measures required for control. May reference the stormwater management plan for the site, if prepared, for permanent stormwater management facilities and control of drainage once the site is stabilized.

IV. ***CALCULATIONS:***

Yes	No	N/A	
☒	☐	☐	*CALCULATIONS AND COMPUTATIONS* associated with hydrology, hydraulics and design of proposed temporary and permanent erosion and sediment control measures including: sediment traps and basins, diversions, stormwater conveyance channels, culverts, slope drains, outlet protections, etc. Computations are not required on the construction plan and may be attached in a supplemental erosion and sediment control plan design report, if presented in a clear and organized format.
☒	☐	☐	*TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET* submitted for each basin along with schematic or sketch cross-section showing applicable design and construction data, storage volumes (wet-dry), dimensions and elevations. Peak design runoff to be based on the 2- or 25-year design storm event based on maximum disturbed site conditions (existing, interim or proposed conditions) in accordance with Minimum Standard 3.14 of the VESCH.

JAMES CITY COUNTY, VIRGINIA
ENVIRONMENTAL DIVISION

STORMWATER MANAGEMENT DESIGN PLAN CHECKLIST

I. *GENERAL*:

Yes	No	N/A	
☒	☐	☐	*FAMILIARITY* with current versions of the James City County Guidelines for Design and Construction of Stormwater Management BMPs manual; Chapter 8, Erosion and Sediment Control and Chapter 23, Chesapeake Bay Preservation ordinances of the Code of James City County, Virginia; the Virginia Erosion and Sediment Control Handbook (VESCH); and the Virginia Stormwater Management Handbook (VSMH).
☐	☐	☒	*WAIVER OR EXCEPTION* if necessary, requested in writing, for the plan approving authority to waive or except the requirements of Chapter 23, Chesapeake Bay Preservation ordinance in accordance with procedure established in Sections 23-14 through 23-17 of the ordinance. Applies to the review case only.
☐	☐	☒	*VARIANCE REQUEST* if necessary, requested in writing for the plan approving authority to waive or modify any of the minimum standards and specifications of the VESCH deemed inappropriate based on site conditions specific to this review case only. Variances which are approved shall be properly documented in the plan and become part of the approved erosion and sediment control plan for the site.
☒	☐	☐	*PROFESSIONAL SEAL AND SIGNATURE* required on final and complete approved stormwater management plans, drawings, technical reports and specifications.
☐	☒	☐	*WORKSHEET FOR BMP POINT SYSTEM* to ensure the stormwater management plan for the project attains at least 10 BMP points (New Development) or traditional pollutant load reduction computations per the Chesapeake Bay Local Assistance Manual (Redevelopment Only)
☐	☐	☒	*PROPOSED CONSERVATION EASEMENT AREAS* for any natural open space points claimed in the BMP worksheet.
☐	☒	☐	*INSPECTION/MAINTENANCE AGREEMENT* is required to be prepared and executed with the County for the project.
☒	☐	☐	*FEMA FIRM PANEL* reference with designated special flood hazard areas or zone designations associated with the site, as applicable.
☒	☐	☐	*DRAINAGE AREA MAP* at a maximum scale of 1"=200' scale showing drainage area boundaries for pre- and postdevelopment conditions and associated time of concentration flow paths. Labels to include drainage area size, runoff coefficient or curve number and time of concentration for each subarea shown on the map.

Yes	No	N/A	
☒	☐	☐	*SOILS MAP* with soil symbols, boundaries and legend in accordance with the current Soil Survey of James City and York Counties and the City of Williamsburg, Virginia with approximate locations of the project site, BMPs and applicable drainage basins.
☒	☐	☐	*STORMWATER MANAGEMENT NARRATIVE* in a brief and simple format which describes the project; location; site and drainage basin soil characteristics; receiving water or drainage facility; existing site and drainage basin conditions (topography, land use, cover, slopes, etc.); proposed site development; proposed stormwater management and drainage plan including County BMP type selected; summary of hydrology and hydraulics; maintenance program; and any special assumptions utilized for development of the stormwater management and drainage design plan or computations.
☒	☐	☐	*TEMPORARY STORMWATER MANAGEMENT* (if applicable) for control of stormwater runoff encountered during construction activities in addition to measures provided in the erosion and sediment control plan or stormwater management/drainage plan for the site. Adequate protection measures or sequencing provided.
☒	☐	☐	*MODIFICATION PLAN* clearly defined for temporary sediment control structures which will be converted to permanent SWM/BMP structures. Includes appropriate hydrologic and hydraulic computations, conversions, sequencing and cleanout information or details. Normally related to primary control structures associated with dry detention or wet retention ponds. Normally not permitted for Group C or D categories such as bioretention, infiltration and filtering system facilities.
☒	☐	☐	*STORMWATER MANAGEMENT and DRAINAGE DESIGN REPORT* in a bound 8-1/2 x 11 inch size format. Report shall generally include a title sheet, date, project identification, owner and preparer information, table of contents, narrative, summaries and computations as required. Computations may include: backwater, closed conduit, headwater, hydraulic, hydraulic grade line, hydrology, inlet, open channel, storm sewer, water quality, extended detention or stream channel protection and multi-stage storm routing calculations, as applicable, for the project. Computation data may include hand or computer generated computations, maps or schematics. All information should be presented in a clear, easy to follow format and should closely match construction plan information.
☒	☐	☐	*PLAN VIEW* at 1 inch = 50 ft. scale or less (1" = 40', 1" = 30', etc.)
☒	☐	☐	North arrow and plan legend.
☒	☐	☐	Property lines.
☒	☐	☐	Adjacent property information.
☒	☐	☐	Existing site features and existing impervious cover areas.
☒	☐	☐	Impervious cover tabulations.
☒	☐	☐	Existing drainage facilities (natural or manmade)
☒	☐	☐	Existing environmentally sensitive areas (RPA, wetlands, floodplain, steep slopes, critical soils, buffers, etc.)
☒	☐	☐	Existing and proposed contours (1' or 2' contour interval) and spot elevations as necessary to define high and low topography.
☒	☐	☐	Existing and proposed easement locations.

Yes	No	N/A	
☒	☐	☐	Proposed site improvements and proposed impervious cover areas.
☒	☐	☐	Proposed stormwater conveyance, drainage and management facilities with appropriate labeled construction data and information.
☒	☐	☐	Proposed landscaping and seeding plans (disturbed areas, pond interior, etc.)
☒	☐	☐	Proposed slope stabilization areas (riprap, blankets, mattings, walls, etc.)
☒	☐	☐	Delineation of permanent pools and the 1-, 2-, 10- and 100-year Design Water Surface Elevations.
☐	☐	☒	Delineation of ponding, headwater, surcharge or backwater areas which may affect adjacent existing or proposed buildings, structures or upstream adjacent properties.
☐	☐	☒	Test boring locations with reference surface elevations (if known).
☒	☐	☐	Risers, barrels, underdrains, overflows and outlet protections.
☒	☐	☐	Emergency spillway level section and outlet channel.
☒	☐	☐	Existing and proposed site utilities and protection measures.
☒	☐	☐	Erosion and sediment control measures (for site or BMP).
☒	☐	☐	Maintenance or access corridors to permanent stormwater management, BMP or drainage facilities.

II. ***STORMWATER CONVEYANCE SYSTEMS***:

Yes	No	N/A	
☒	☐	☐	*PLAN VIEWS*
			☒ ☐ ☐ Storm drain lengths, sizes, types, classes and slopes for all segments. Label directly on plan or use structure/pipe schedule.
			☒ ☐ ☐ Access structure (inlets, manholes, junctions, etc.) rim elevations, inverts, type and required grate or top unit and lengths labeled.
			☒ ☐ ☐ All structure numbers labeled.
			☒ ☐ ☐ Adequate horizontal clearance from other site utilities or structures.
☐	☒	☐	*PROFILES* generally are not required but are encouraged to expedite review. If not provided, ensure all pipe segments have adequate minimum cover, do not exceed maximum depths of cover for the type/class of pipe specified and do not conflict with other site utilities or excavation areas.
☒	☐	☐	*DETAILS*
			☒ ☐ ☐ Typical storm drain bedding details or reference note.
			☒ ☐ ☐ Standard details or reference note for all proposed access structure types (inlets, manholes, junctions, etc.).
			☒ ☐ ☐ Inlet shaping detail or applicable reference note.
			☒ ☐ ☐ Step detail or applicable reference note (if depth 4 ft. or more).
			☐ ☐ ☒ Typical open channel details with designation, location, shape, type, bottom width, top width, lining, slope, length, side slope, and installation depth required for construction. Channel design data as necessary may also be included.
			☒ ☐ ☐ Outlet protections at all pipe outfalls.

Yes	No	N/A	
☒	☐	☐	*STORMWATER CONVEYANCE SYSTEM COMPUTATIONS*
☒	☐	☐	Storm Sewer Design computations based on 10-year design event.
☒	☐	☐	Hydraulic Grade Line computations based on 10-year design event.
☒	☐	☐	Inlet computations based on current VDOT procedure for spread, ponding depth and grate size required.
☐	☐	☒	Culvert Headwater computations. Design based on 10-year design storm event and check only for 100-year storm event.
☐	☐	☒	Open Channel computations based on 2-year design event for velocity and 10-year design event for capacity.
☒	☐	☐	Standard outlet protection or special energy dissipators.
☐	☐	☒	Pipe thickness design computations, as required, for selected pipe type (live load, minimum cover, maximum height of cover, etc.).
☐	☐	☒	Adequate channel computations for receiving channels (based on field measured channel section data).

III. ***STORMWATER MANAGEMENT/BMP FACILITIES***:

Yes	No	N/A	
☒	☐	☐	*HYDROLOGY* – An SCS based methodology is required for the design of stormwater management/BMP facilities with watersheds exceeding 20 acres. Under 20 acres, other generally accepted methodologies such as the modified rational, critical storm are allowable. Refer to Chapter 5 of the VESCH or Chapter 5 of the VSMH.
☒	☐	☐	Runoff Curve Number or Coefficient determinations: predeveloped and ultimate development land use scenarios.
☒	☐	☐	Time of concentration: predeveloped and ultimate development indicating overland, shallow concentrated, and channel flow components (200 ft. maximum length for overland flow).
☒	☐	☐	Hydrograph generation (tabular or graphical): pre- and postdevelopment conditions for the 1-, 2-, 10- and 100-year design storm events.
☒	☐	☐	*FACILITY CONFIGURATION and MINIMUM SEPARATIONS*
☒	☐	☐	Screening and layout consistent with Section 24-98(d) of the Chapter 24 Zoning ordinance (landscaping, screening, visibility, etc.).
☒	☐	☐	Basic considerations for safety and unauthorized entry.
☒	☐	☐	Proper length to width ratio (Typically 2H:1V).
☒	☐	☐	Facilities with deep pools (4 feet or more in depth) provided with two benches. Fifteen (15) ft. safety bench outward from normal pool at maximum 6 percent slope and aquatic bench inward from normal shoreline below normal pool. Narrower widths may be considered on a case-by-case basis.
☒	☐	☐	Pond buffer minimum 25 feet outward from maximum design WSEL. Additional setbacks may be required to permanent structures.
☒	☐	☐	No trees, shrubs or woody plants within 15 feet of embankment toe or 25 feet from principal spillway structure.
☐	☐	☒	Infiltration and filtering system facilities generally located at least 100 feet horizontally from any water supply well; 100 feet from any downslope building; and 25 feet from any upslope buildings, unless site specific investigation allows for reduced separation.

Yes	No	N/A	
☒	☐	☐	*HYDRAULIC COMPUTATIONS*
☒	☐	☐	Elevation- or Stage-Storage curve and/or tabular data.
☒	☐	☐	Weir / Orifice Control – Extended Detention.
☒	☐	☐	Weir / Orifice Control – riser 1-year control for channel protection.
☒	☐	☐	Weir / Orifice Control – riser 2-year control for quantity (if required).
☒	☐	☐	Weir / Orifice Control – riser 10-year control for quantity (if required).
☒	☐	☐	Inlet / Outlet (barrel) control – (All Storms).
☒	☐	☐	Check for barrel control prior to riser orifice flow to prevent slug flow-water hammer conditions.
☒	☐	☐	Emergency spillway capacity and depth of flow.
☒	☐	☐	Elevation – Discharge (Outlet Rating) curve and/or table. Provide all supporting calculations and/or design assumptions.
☐	☐	☒	Adequate channel computations for receiving channel. May be waived if facility is designed based on current Stream Channel Protection criteria.
☒	☐	☐	*POND or RESERVOIR ROUTING*
☒	☐	☐	Storage-Indication Routing of postdeveloped inflow hydrographs for the 1-, 2-, 10-, and 100-year design storms. Preference is for structure to discharge up to the 10-year storm through the principal spillway and pass the 100-year storm with a minimum 1 foot of freeboard through a combination principal and emergency spillways. If no emergency spillway is provided, riser must be large enough to pass the design high water flow and trash without overtopping the facility, have 3 square feet or more of cross-sectional area, contain a hood type inlet and have a minimum freeboard of 2 feet. Token spillways with minimum 8 ft. width are also recommended at or above the design 100-year storm elevation.
☒	☐	☐	Downstream hydrographs at established study points, if conditions warrant (i.e. facility discharge combined with uncontrolled bypass).
☒	☐	☐	*MISCELLANEOUS COMPUTATIONS*
☒	☐	☐	Water quality volume for permanent pool based on selected BMP treatment volume (WQv).
☒	☐	☐	Water quality volume for extended detention base on selected BMP treatment volume (WQv) with drawdown computations.
☒	☐	☐	Drawdown computations for the 1-year, 24 hour detention for stream channel protection criteria.
☒	☐	☐	Pond drain computations (within 24 hours).
☒	☐	☐	Anti-seep collar design (concrete preferred) or match material type.
☒	☐	☐	Filter diaphragm design (or alternative method of controlling seepage).
☒	☐	☐	Riser / base structure flotation analyses. FS = 1.25 minimum.
☐	☐	☒	Downstream danger reach study and/or emergency action plan (if conditions warrant).
☐	☐	☒	Upstream backwater analyses onto offsite adjacent property (if conditions warrant).
☐	☐	☒	100 year floodplain impacts (if conditions warrant).

Yes	No	N/A	
☐	☒	☐	*GEOTECHNICAL REQUIREMENTS*
☐	☒	☐	Geotechnical Report with recommendations specific to BMP facility type selected. Report prepared by a registered professional engineer. Requires submission, review and approval prior to issuance of Land Disturbance Permit.
☐	☒	☐	Initial Feasibility Testing requirements satisfied as per Appendix E of the James City County Guidelines fro Design and Construction of Stormwater Management BMPs manual. (Infiltration, Bioretention and Filtering System BMP types only).
☐	☒	☐	Concept Design Testing requirements satisfied as per Appendix E of the James City County Guidelines for Design and Construction of Stormwater Management BMPs manual. . (Infiltration, Bioretention and Filtering System BMP types only).
☐	☒	☐	Minimum Boring locations: borrow area, pool area, principal control structure, top of facility near one abutment and emergency spillway if provided.
☐	☒	☐	Boring logs with Unified Soil Classification (ASTM D2487), soils descriptions and depths to bedrock and the seasonal water table indicated.
☒	☐	☐	Standard County Record Drawing/Construction Certification note provided on plan. *Note: It is understood that preparation of record drawings and construction certifications as required for project facilities may not necessarily be performed by the plan preparer. These components may be performed by others.*
☒	☐	☐	*PRINCIPAL SPILLWAY PROFILE AND ASSOCIATED DETAILS*
☒	☐	☐	*EXISTING GROUND AND PROPOSED GRADE*
☒	☐	☐	Embankment or excavation side slopes labeled (3H:1V maximum).
☒	☐	☐	Minimum top width labeled (per VESCH or VSMH requirements).
☒	☐	☐	Removal of unsuitable material under proposed facility (per Geotechnical Report requirements).

Yes	No	N/A	
☒	☐	☐	*CORE TRENCH*
☒	☐	☐	Material (per plan or Geotechnical Report).
☒	☐	☐	Bottom width (4' minimum or greater as dictated by Geotechnial Report recommendations).
☒	☐	☐	Side slopes (1:1 maximum steepness)
☒	☐	☐	Depth (4' minimum or greater as dictated by Geotechnical Report).
☒	☐	☐	*PRINCIPAL CONTROL STRUCTURE. RISER OR SIMILAR STRUCTURE (DETAILS REQUIRED FOR ALL ITEMS)*
☒	☐	☐	Durable, watertight, resistant material (concrete preferred).
☒	☐	☐	Riser diameter is at least 1.25 times larger than barrel diameter.
☒	☐	☐	All pertinent dimensions and elevations shown.
☒	☐	☐	Control orifice or weir dimensions and elevations shown.
☒	☐	☐	Trash rack – removable – for each release.
☐	☒	☐	Anti-vortex device, baffle or plate.
☒	☐	☐	Riser base structure with dimensions and embedment specifications (concrete preferred).
☒	☐	☐	Interior access (steps, ladders, etc.) for maintenance for structures over 4 feet in height. Excessively high risers may need some form of exterior access on top portion.
☒	☐	☐	Low flow orifice with trash rack device.
☒	☐	☐	*PRINCIPAL CONTROL STRUCTURE OUTLET BARREL*
☒	☐	☐	Material (ASTM C-361 reinforced concrete pipe) with watertight joints. Prior approval required for all other pipe material (other RCP types, CMP, CPP, PVC, etc.).
☒	☐	☐	Support and bedding requirements for barrel – concrete cradles, etc. or as recommended by the Geotechnical Report.
☒	☐	☐	Pipe inverts, length, size, class and slope shown.
☒	☐	☐	Flared end section or endwall provided on barrel outlet.
☒	☐	☐	*SEEPAGE CONTROL*
☐	☐	☒	Phreatic line shown (4:1 slope measured from the intersection of the embankment and the principal spillway design high water).
☒	☐	☐	*ANTI-SEEP COLLARS*
☒	☐	☐	Anti-seep collar, concrete preferred.
☒	☐	☐	Size – 15 percent increase in length of saturation using outside pipe diameter.
☒	☐	☐	Spacing and location on barrel (located at least 2 feet from a pipe joint).
☐	☐	☒	*FILTER DIAPHRAGMS*
☐	☐	☒	Design based on latest NRCS design methods and certified by a professional engineer.

Yes	No	N/A	
☒	☐	☐	*ELEVATION AND DIMENSIONAL DESIGN DATA*
☒	☐	☐	Top of facility – construction height and settled height (10 percent settlement).
☒	☐	☐	Crest of principal control structure spillway at least one (1) foot below crest of emergency spillway, if provided.
☒	☐	☐	Minimum freeboard of one (1) foot above the 100-year design high water elevation for facilities <u>with</u> an emergency spillway.
☒	☐	☐	Minimum freeboard of two (2) feet above the 100-year design high water elevation for facilities <u>without</u> an emergency spillway or in accordance with the SCS National Engineering Handbook (prior approval required).
☒	☐	☐	Basin Sediment Clean-Out elevation (permanent mode). Typically 10 to 25 percent of water quality volume.
☒	☐	☐	*CROSS SECTION THROUGH FACILITY*
☒	☐	☐	Existing Ground.
☒	☐	☐	Proposed grade.
☒	☐	☐	Top of facility – constructed and settled.
☒	☐	☐	Location of emergency spillway with side slopes labeled (emergency spillway in cut).
☒	☐	☐	Bottom of core trench (4' minimum).
☐	☒	☐	Location of each soil boring.
☒	☐	☐	Barrel location.
☒	☐	☐	Existing and proposed utility location/protection.
☒	☐	☐	*EMERGENCY SPILLWAY PROFILE*
☒	☐	☐	Existing ground.
☒	☐	☐	Inlet, level (control) and outlet sections per SCS.
☒	☐	☐	Spillway and crest elevations.
☒	☐	☐	*PRETREATMENT DEVICES* of adequate depth and properly designed using required pretreatment volumes for the selected County BMP facility type. Including, but not limited to: sediment forebays, sediment basins, sumps, grass channels, gravel diaphragms, plunge pools, chamber separators, manufactured systems or other acceptable methods.

Yes	No	N/A	
☒	☐	☐	*CONSTRUCTION SPECIFICATIONS and NOTES*
☒	☐	☐	Anticipated sequence of construction for BMP (consistent with erosion and sediment control plan).
☒	☐	☐	Provisions to control base stream or storm flow conditions encountered during construction.
☒	☐	☐	Site and subgrade preparation requirements.
☒	☐	☐	Embankment, fill and backfill material soil and placement (lift) thickness requirements.
☒	☐	☐	Compaction and soil moisture content requirements.
☐	☐	☒	Geosynthetics for drainage, filtration, moisture barrier, separation, and reinforcement purposes.
☐	☐	☒	Clay or synthetic (PVC or HDPE) pond liners.
☒	☐	☐	Storm drain, underdrain and pipe conduit requirements.
☒	☐	☐	Minimum depth of pipe cover for temporary (construction) and final cover conditions.
☐	☐	☒	Permanent shutoff valve and pond drain.
☒	☐	☐	Concrete requirements for structural components.
☒	☐	☐	Riprap and slope protection.
☒	☐	☐	Access or maintenance road surface, base, subbase.
☒	☐	☐	Temporary and permanent stabilization measures.
☐	☐	☒	Temporary or permanent safety fencing.
☒	☐	☐	BMP Landscaping (deep, shallow, fringe, perimeter, etc.)
☒	☐	☐	Dust and traffic control (if warranted).
☒	☐	☐	Construction monitoring and certification by professional.
☐	☐	☒	Other: _____
☐	☐	☒	Other: _____
☒	☐	☐	*MAINTENANCE PROVISIONS*
☒	☐	☐	Entity responsible for maintenance identified.
☒	☐	☐	Maintenance Plan which outlines the long-term schedule for inspection/maintenance of the facility and forebays.
☒	☐	☐	Maintenance access from public right-of-way or publicly traveled road.
☒	☐	☐	Maintenance easement provided encompassing high water pool and buffer, principal and emergency spillways, outlet structures, forebays, embankment area and possible sediment-removal stockpile areas.
☒	☐	☐	Minimum 6 foot wide public safety shelf (landing) or alternative fencing.

IV. *OUTLET PROTECTIONS*:

Yes	No	N/A	
☒	☐	☐	Sized for maximum design release (generally 10-year storm).
☒	☐	☐	Flared end section or endwall.
☒	☐	☐	Dimensions.
☒	☐	☐	Rock or riprap size, quantity and placement thickness.
☒	☐	☐	Slope at 0 percent (Level Grade).
☒	☐	☐	Geotextiles (nonwoven).
☒	☐	☐	Special energy dissipators are required for design discharge velocities that exceed eighteen (18) feet per second; or if use of standard outlet protection would result in velocities exceeding permissible channel velocities; or if space restricts or limits their use.

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

Plan Preparer: RGC
Date: 7/5/07

Copy of JCC: SWMProg/BMP/Checklist/ChkList

DRAINAGE CALCULATIONS

FOR

NEW TOWN
SECTION 7 & 8
PHASE VII ROADWAY PLANS

SITE:

James City County

SUBMITTED TO:

Environmental Division
James City County

COMMONWEALTH OF VIRGINIA
ROBERT E. COSBY, III
Lic. No. 035664
1/7/08
PROFESSIONAL ENGINEER

Prepared By:

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

July 3, 2007
Revised: November 2, 2007
Revised: January 7, 2008

AES Project No. 6632-S-7-1

6632S7-1.drncalcs.doc

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CONSULTING ENGINEERS

TABLE OF CONTENTS

I INTRODUCTION

II EXISTING SITE CONDITIONS

III PROPOSED STORMDRAIN SYSTEM

IV PROPOSED BEST MANAGEMENT FACILITY / SEDIMENT BASIN

APPENDICES

APPENDIX A DRAINAGE AREA MAPS

APPENDIX B STORM SEWER SYSTEM

APPENDIX C TEMPORARY SEDIMENT BASIN

APPENDIX D BEST MANAGEMENT PRACTICE (BMP) FACILITY

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I INTRODUCTION

This project, known as Section 7&8 Phase VII Roadways is the first project located in Section 7 which will provide roadway access into the site, construction of BMP B02, and elimination of the existing temporary sediment basin/bmp installed as part of Phase V Roadway. The drainage associated with the roadway will be collected into a storm drainage system draining to a best management practice (BMP) facility. During construction, diversion dikes and diversions will be utilized to collect runoff from the disturbed area into the sediment basin. In addition Silt Fence and Tree Protection shall be utilized to limit potential of sediment leaving the project area and minimize potential for damage to existing woodlands which are to remain.

II EXISTING SITE CONDITIONS

The majority of this site is a wooded area with an existing temporary sediment basin which was previously constructed as part of New Town Phase V Roadway. Stormwater is currently conveyed via sheet flow to natural channels downstream.

III PROPOSED STORMDRAIN SYSTEM

This project will be collected by a single storm drainage system which is designed to collect the runoff from the roadway and lots upon the completion of all construction. The drainage system is draining to a best management practice (BMP) facility. This facility is designed as a temporary sediment basin, which will be converted to a best management practice (BMP) facility with this project. The sediment basin is designed for the ultimate drainage areas for sizing the basins which includes the current construction proposed with this project as well as ongoing construction upstream and future construction within Section 7. No Low Impact Design (LID) features are planned as part of this scope of work. The master plan for Section 7 & 8 has several planned locations for LID; however, none are located within the limits of this project.

The existing Storm Drainage System from Phase 5 is extended along the existing sediment basin to the new facility by a 48" drainage pipe and inlet. Revised drainage calculations are provided in Appendix B noting this additional pipe and that no flooding occurs upstream in this system. The analysis assumes the maximum 10 year water surface elevation from BMP B02.

The proposed roadway and associated future lots will be collected in a new storm drainage system installed as part of this project. This consists of several pipes and inlets within the roadway section. Appendix B has inlet spread computations for each of the proposed inlets and a capacity and hydraulic gradeline (HGL) analysis. The starting tailwater for this system is 6 inches above the rim of the outlet structure within the downstream BMP. It is noted that while the BMP is designed utilizing the SCS 24

hour methodology to generate a large volume storm event to maximize potential storage volumes in the BMP. The storm drainage system is analyzed using Rational Method with a minimal time of concentration and therefore maximum intensity. The maximum intensity storm utilized within the storm drainage system will not provide an adequate volume of runoff to fill the proposed BMP. Therefore a less conservative analysis is utilized for the starting tailwater condition for this drainage system. All pipes are significantly oversized to minimize losses within the system and maintain the lowest possible HGL based on the computations. It should be further noted that the Hydroflow Software utilized for the design does not account for inlet shaping within the inlets which reduces the junction losses at each inlet and therefore lowers the actual HGL within the system when compared to design. Therefore while the software is overly conservative related to HGL computations a less conservative approach to the starting tailwater is utilized for this system to confirm if flooding occurs within the proposed system during the 10 year event.

IV PROPOSED BEST MANAGEMENT FACILITY / SEDIMENT BASIN

As noted above this project area is supported by a temporary sediment basin for construction which upon completion of construction shall be converted to a permanent BMP facility. In accordance with the Master Plan a "wet" pond, County Type A-3, or 10 point pond is planned for this development. The drainage area for this BMP is altered from the Master Plan based on final grading and location of the BMP. Drainage area which is removed from this structure shown previously on the master plan will be collected by other 10 point facilities within the Section 7 portion of the development. Therefore no changes to the stormwater master plan are anticipated as part of this project other than adjusting drainage areas of various BMP facilities which does not affect the overall BMP Point Calculation.

The proposed BMP B02 consists of a Wet Pond that serves 26.40 acres of drainage area within Section 2&4 and 7&8. The impervious cover for this drainage area is 16.30 acres. See Appendix A for graphic denoting impervious cover for Buildings, Roads/Parking Lots/Sidewalks, and Future Impervious Cover. 1" per impervious acre is provided within the permanent pool of the BMP as noted in calculations. In addition 1" per impervious acre is provided in the extended detention portion of the facility as required by James City County BMP Manual. The 1 year 24 hour storm for channel protection volume requirements is provided by the Kerplunk Method as shown in Appendix D. The 1 year storm is contained within the BMP facility and released over the 24 hour time period through a proposed 5" orifice. The Kerplunk method indicates that the storage for the 1 year channel protection volume is 84.25. The 1 year storm when routed through the BMP provides a maximum elevation of 84.27 for the 1 year storm event. Therefore the riser is set at 84.20 for detention of the 1 year storm. The 2 and 10 year storm events are contained within the BMP facility and released at or below pre development runoff rates at the outflow of the BMP in accordance with MS-19 criteria. An Emergency Spillway is provided above the 10 year storm event to allow the 100 year storm to pass through the BMP without overtopping the dam. This BMP is almost fully excavated with a top of dam elevation of 88.50. The top of dam is then crested to the center point an additional 6 inches to elevation 89.0. As the BMP is excavated into existing material no clay core is required within the dam structure which is well above

the normal pool elevation of the BMP. In addition adjacent to the wetlands restricted buffer a 2' segmental block retaining wall from elevation 87 to 89 to eliminate grading within the wetland buffer and provide adequate volume within the BMP. A 16' aquatic bench/safety bench is provided at the normal water surface elevation. 8' of this bench is located under the water surface, and the remaining 8' is above the water surface. A sediment forebay is provided by use of a timber wall which is 1' under the water surface. This forebay provide 0.1" per impervious acre of volume in accordance with standard practices. The outfall from the BMP consists of a 30" water tight Class III RCP. The outfall is located at the existing center of wetlands with outlet protection as requested by James City County. The wetland impacts in this area have not been altered from the joint permit as a result of the final design of this BMP facility.

The BMP will operate during construction as a temporary sediment basin. The sediment basin utilizes the same configuration of the outfall structure. The 2 and 25 year storm event have been routed through the BMP and outlet structure without utilizing the emergency spillway. As required in the Virginia Erosion and Sediment Control Handbook a volume of 67 cubic yards per acre is provide in the permanent pool. In addition the same volume is provided within the extended detention portion of the facility and released over a time period greater than 6 hours in accordance with the requirements in the handbook. This sediment basin will be utilized for the completion of ongoing construction upstream, as well as the construction of this project and future projects planned within the drainage area which are constructed prior to conversion to the permanent facility.

APPENDIX A

DRAINAGE AREA MAPS

PREDEVELOPED DRAINAGE AREA
SEDIMENT BASIN/BMP DRAINAGE AREA
STORM DRAINAGE AREA MAP

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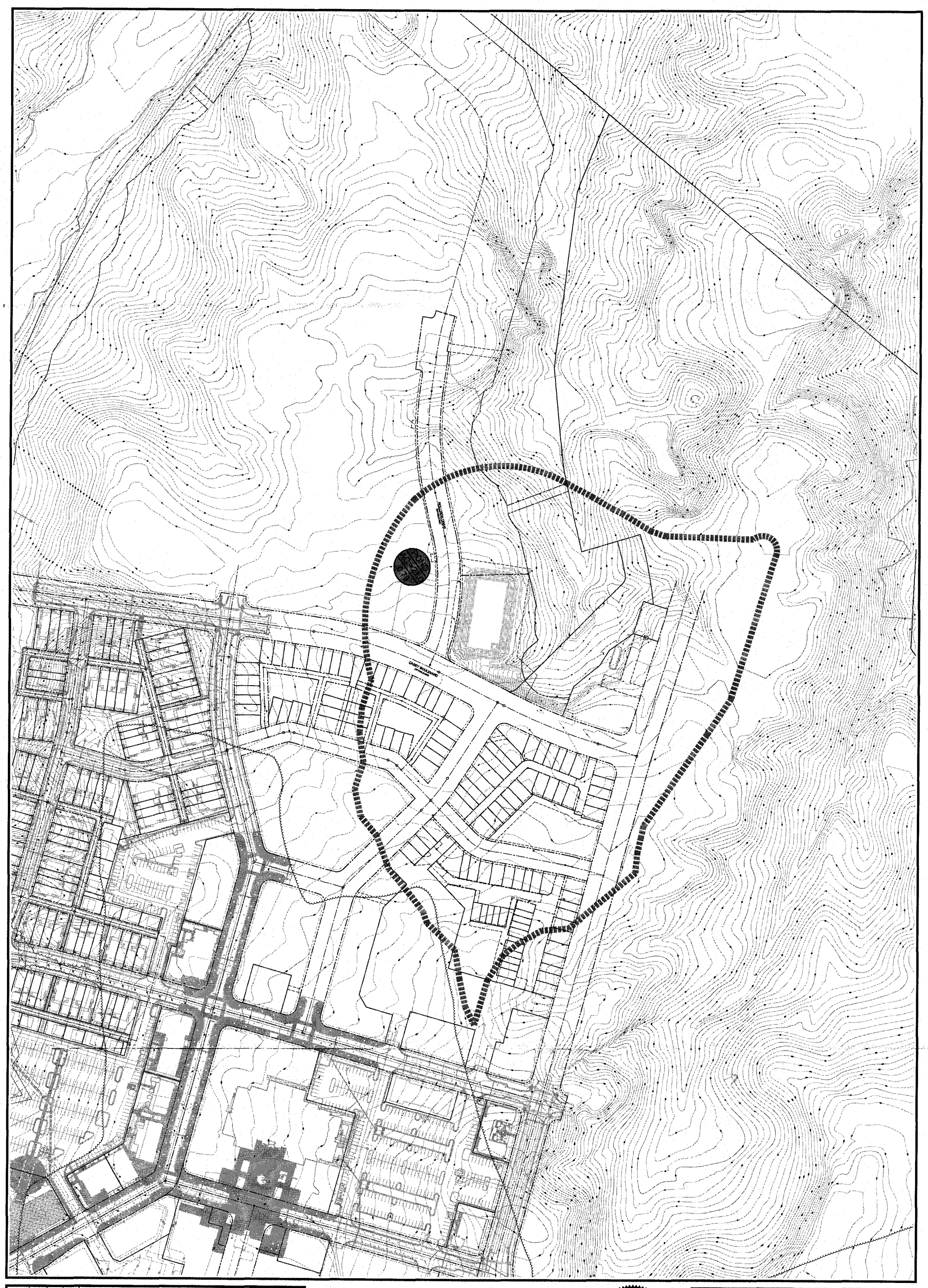

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Drawn	SDC/BBS
Scale	1"=100'
Date	7/03/07
Project No.	6632S7-01A
Drawing No.	1

PRE-DEVELOPMENT DRAINAGE AREA MAP

NEW TOWN

SECTION 7 & 8

ROADWAY INFRASTRUCTURE PLANS

PHASE VII

BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

AES CONSULTING ENGINEERS
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COMMONWEALTH OF VIRGINIA
ROBERT E. COSBY III
Lic. No. 35664
1/07/08
PROFESSIONAL ENGINEER

No.	DATE	REVISION / COMMENT / NOTE	REVISED BY	REVIEWED BY
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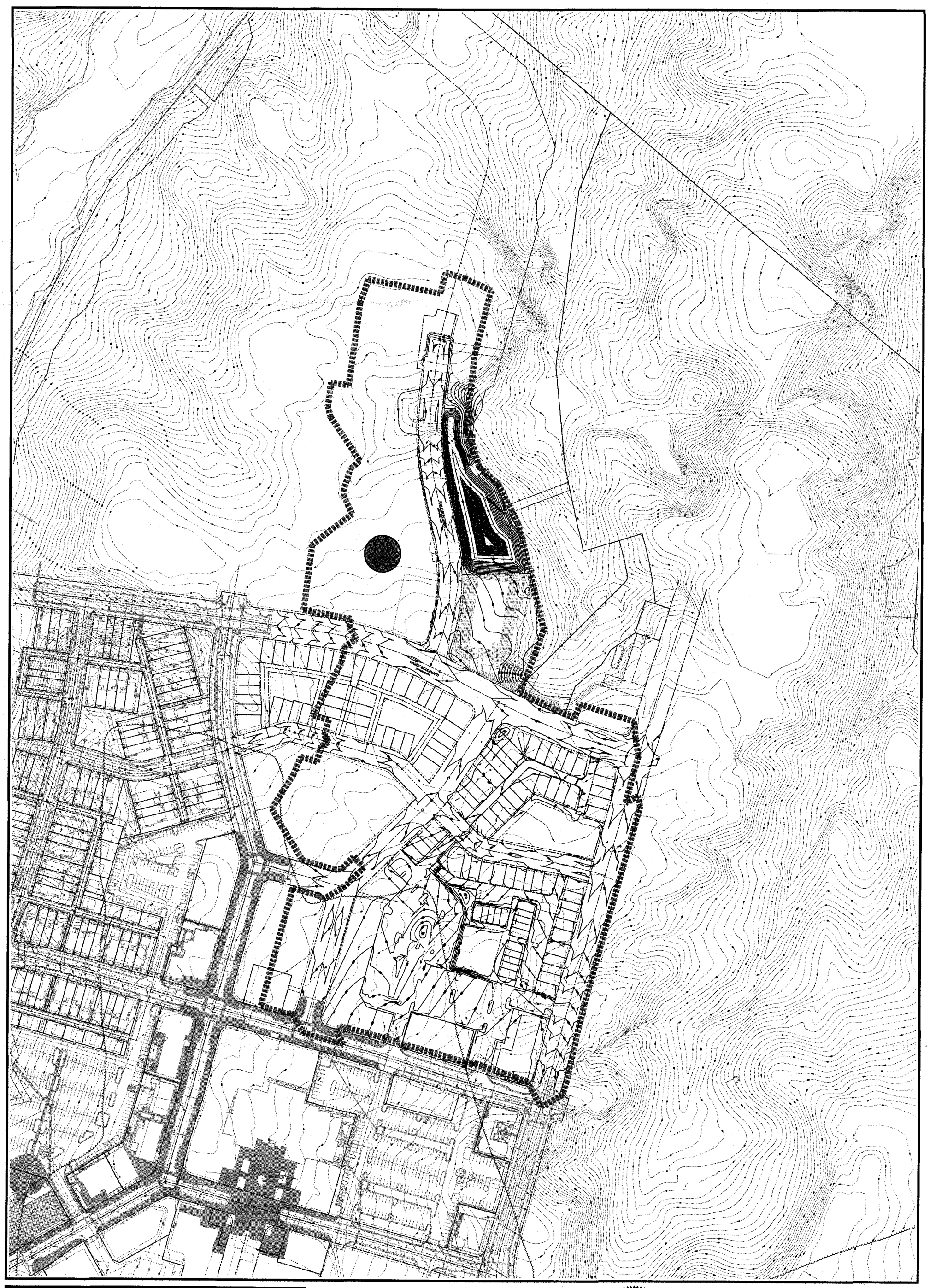
1	11/2/07	REVISED PER COUNTY COMMENTS	REC	REC



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Scale	1"=100'
Date	7/03/07
Project No.	6632S7-01A
Drawing No.	1

POST-DEVELOPMENT DRAINAGE AREA MAP

NEW TOWN

SECTION 7 & 8

ROADWAY INFRASTRUCTURE PLANS

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IMPERVIOUS AREA

BUILDINGS =	2.9 AC.
PARKING/ROADS/SIDEWALK =	8.8 AC.
FUTURE =	4.6 AC.
TOTAL =	16.3 AC.

Designed	REC/VAB
Drawn	SDC/BBS
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POST-DEVELOPMENT DRAINAGE AREA MAP

NEW TOWN

SECTION 7 & 8

ROADWAY INFRASTRUCTURE PLANS

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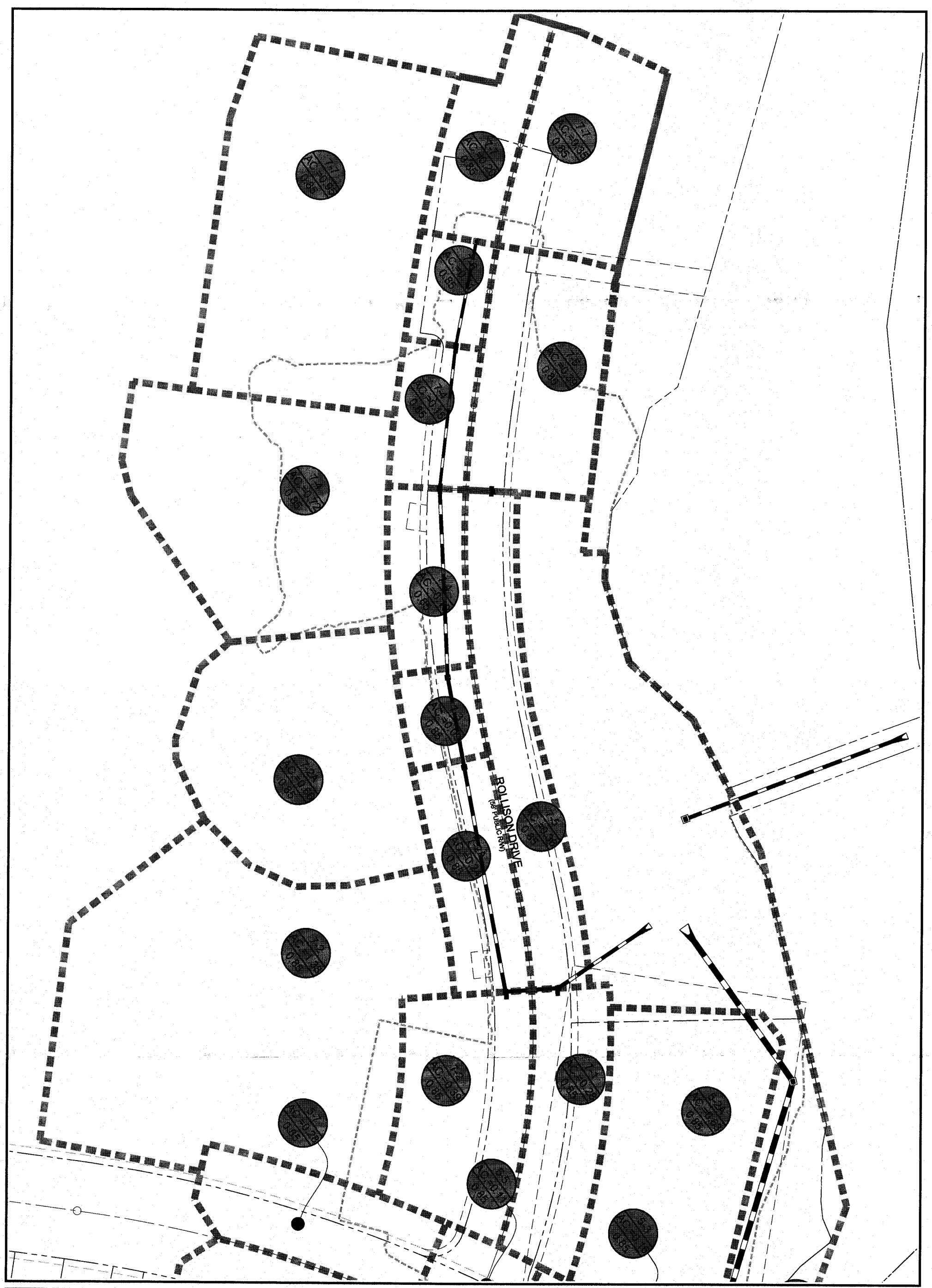

STORM SYSTEM DRAINAGE AREA MAP

NEW TOWN

SECTION 7 & 8

ROADWAY INFRASTRUCTURE PLANS

PHASE VII

BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	REC/VAB
Drawn	SDC/BBS
Scale	1"=30'
Date	7/03/07
Project No.	6632S7-01A
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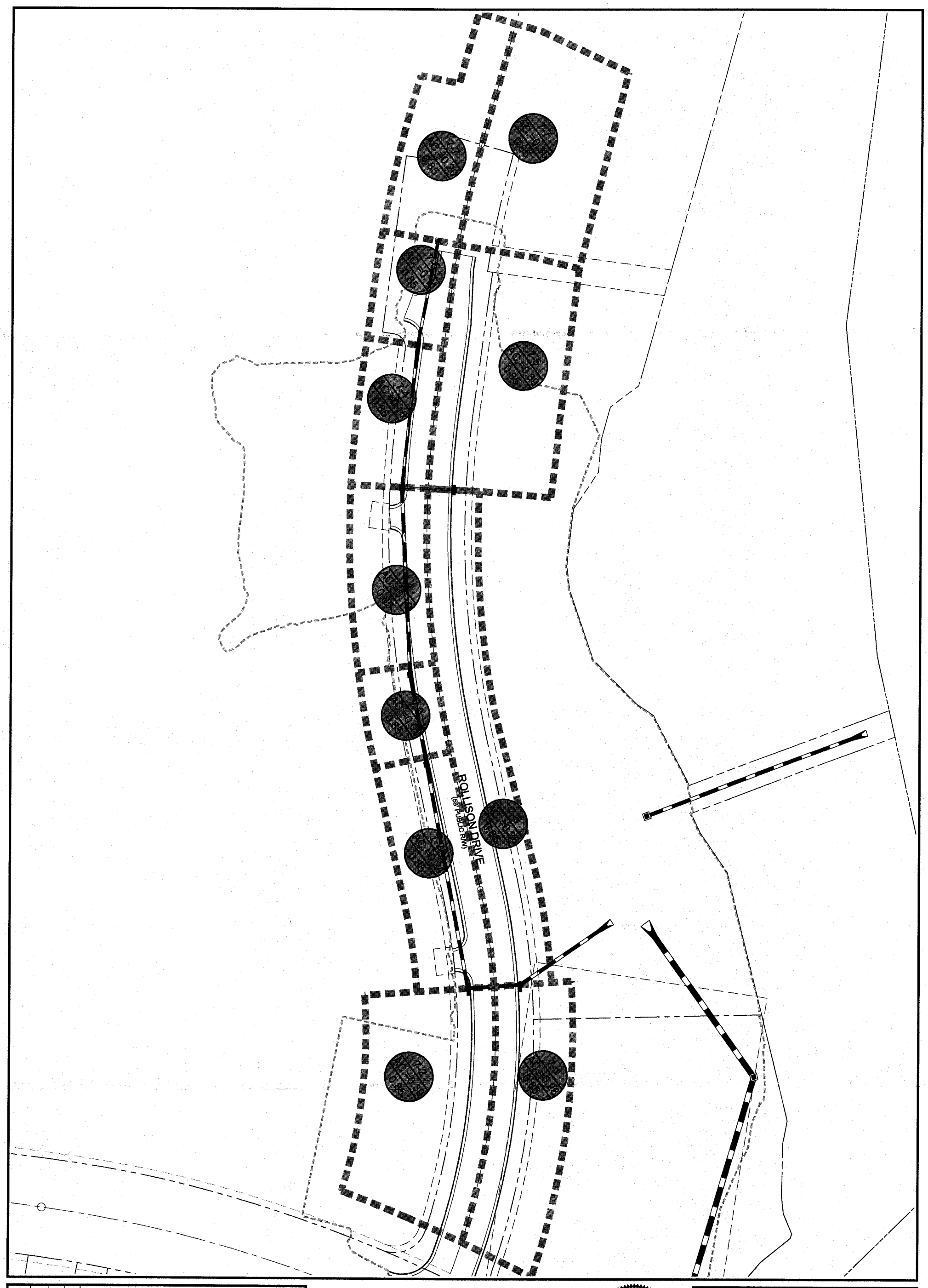

Designed	REC/VAB
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Scale	1"=30'
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Project No.	6632S7-01A
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STORM SYSTEM SPREAD DRAINAGE AREA MAP

NEW TOWN

SECTION 7 & 8

ROADWAY INFRASTRUCTURE PLANS

PHASE VII

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1	11/2/07	REVISED PER COUNTY COMMENTS	REC	REC

APPENDIX B

STORM SEWER SYSTEM

INLET SPREAD COMPUTATIONS (WITH SUMMARY)

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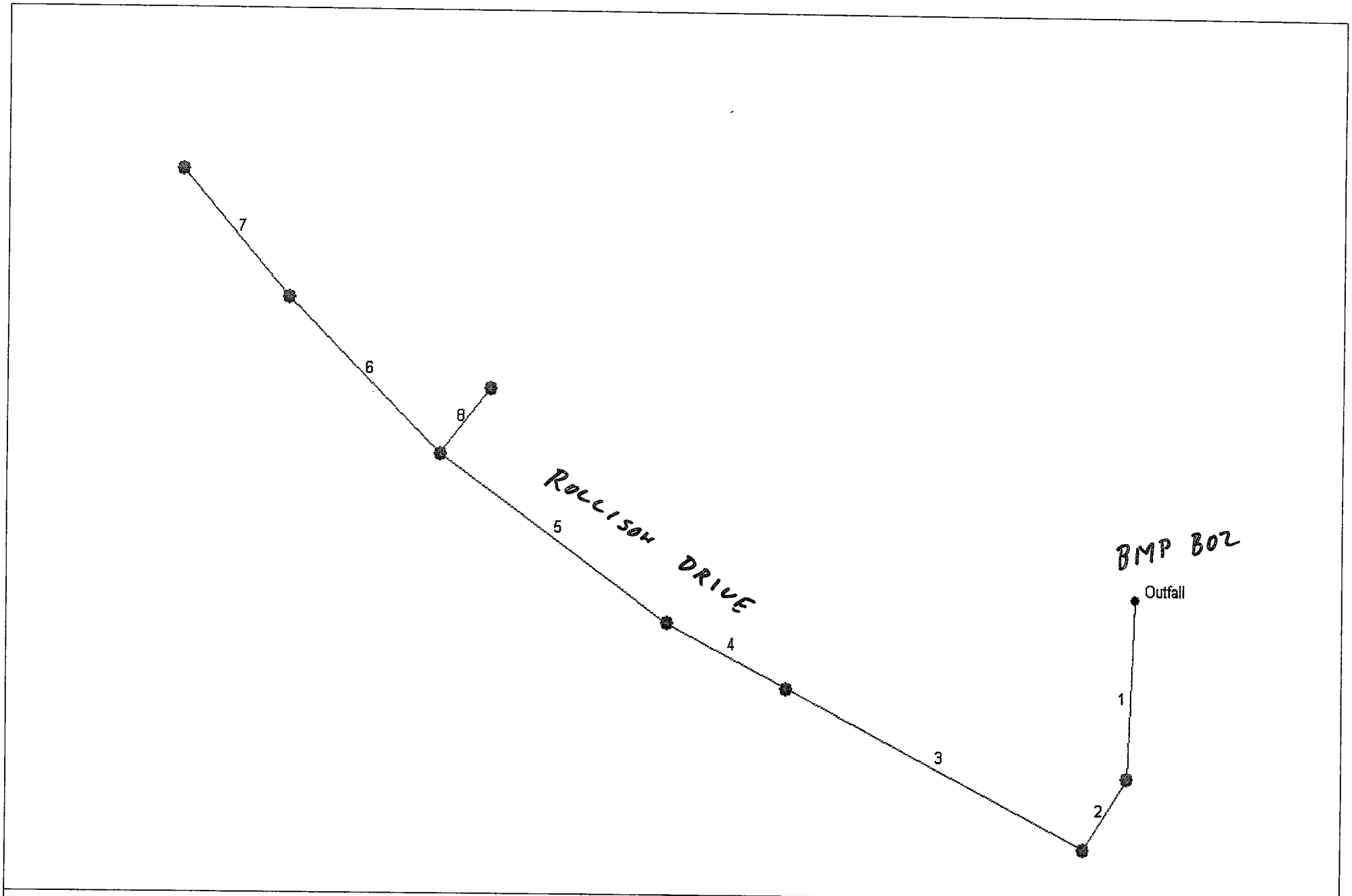
Hydraflow Plan View



Project File: 6632-7-01APhaseVII.stm	No. Lines: 8	01-07-2008

Hydraflow Storm Sewers 2005

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	84.0	92.9	MH	0.00	0.28	0.85	5.0	67.00	12.62	77.60	30	Cir	0.013	0.15	93.00	#7-1 to Outfall
2	1	40.0	29.8	MH	0.00	1.77	0.85	15.0	77.60	1.03	78.01	30	Cir	0.013	0.50	93.01	#7-2 to #7-1
3	2	171.0	83.2	MH	0.00	0.90	0.85	9.0	78.01	0.99	79.71	30	Cir	0.013	0.15	91.01	#7-3 to #7-2
4	3	69.0	0.0	MH	0.00	0.09	0.85	10.0	79.71	1.01	80.41	30	Cir	0.013	0.50	89.74	#7-4 to #7-3
5	4	142.0	8.0	MH	0.00	1.06	0.85	10.0	80.41	1.00	81.83	30	Cir	0.013	0.50	87.21	#7-5 to #7-4
6	5	107.0	9.0	MH	0.00	0.11	0.85	5.0	81.83	1.02	82.92	24	Cir	0.013	0.15	88.42	#7-7 to #7-5
7	6	81.0	4.8	MH	0.00	1.50	0.85	10.0	82.92	1.01	83.74	24	Cir	0.013	0.50	87.24	#7-8 to #7-7
8	5	40.0	96.0	MH	0.00	0.75	0.85	7.0	82.86	1.00	83.26	15	Cir	0.013	0.50	87.21	#7-6 to #7-5

Project File: 6632-7-01APhaseVII.stm | Number of lines: 8 | Date: 01-07-2008

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	84.0	0.28	6.46	0.85	0.24	5.49	5.0	15.1	5.0	27.46	145.7	5.60	30	12.62	77.60	67.00	84.58	84.20	93.00	70.00	#7-1 to Outfall
2	1	40.0	1.77	6.18	0.85	1.50	5.25	15.0	15.0	5.0	26.36	41.52	5.37	30	1.03	78.01	77.60	84.85	84.69	93.01	93.00	#7-2 to #7-1
3	2	171.0	0.90	4.41	0.85	0.77	3.75	9.0	12.3	5.4	20.30	40.89	4.14	30	0.99	79.71	78.01	85.68	85.26	91.01	93.01	#7-3 to #7-2
4	3	69.0	0.09	3.51	0.85	0.08	2.98	10.0	12.0	5.5	16.33	41.31	3.33	30	1.01	80.41	79.71	85.92	85.81	89.74	91.01	#7-4 to #7-3
5	4	142.0	1.06	3.42	0.85	0.90	2.91	10.0	11.3	5.6	16.26	41.01	3.31	30	1.00	81.83	80.41	86.23	86.01	87.21	89.74	#7-5 to #7-4
6	5	107.0	0.11	1.61	0.85	0.09	1.37	5.0	10.6	5.7	7.83	22.83	2.49	24	1.02	82.92	81.83	86.52	86.39	88.42	87.21	#7-7 to #7-5
7	6	81.0	1.50	1.50	0.85	1.28	1.28	10.0	10.0	5.8	7.43	22.76	2.37	24	1.01	83.74	82.92	86.63	86.54	87.24	88.42	#7-8 to #7-7
8	5	40.0	0.75	0.75	0.85	0.64	0.64	7.0	7.0	6.5	4.13	6.46	3.36	15	1.00	83.26	82.86	86.48	86.32	87.21	87.21	#7-6 to #7-5

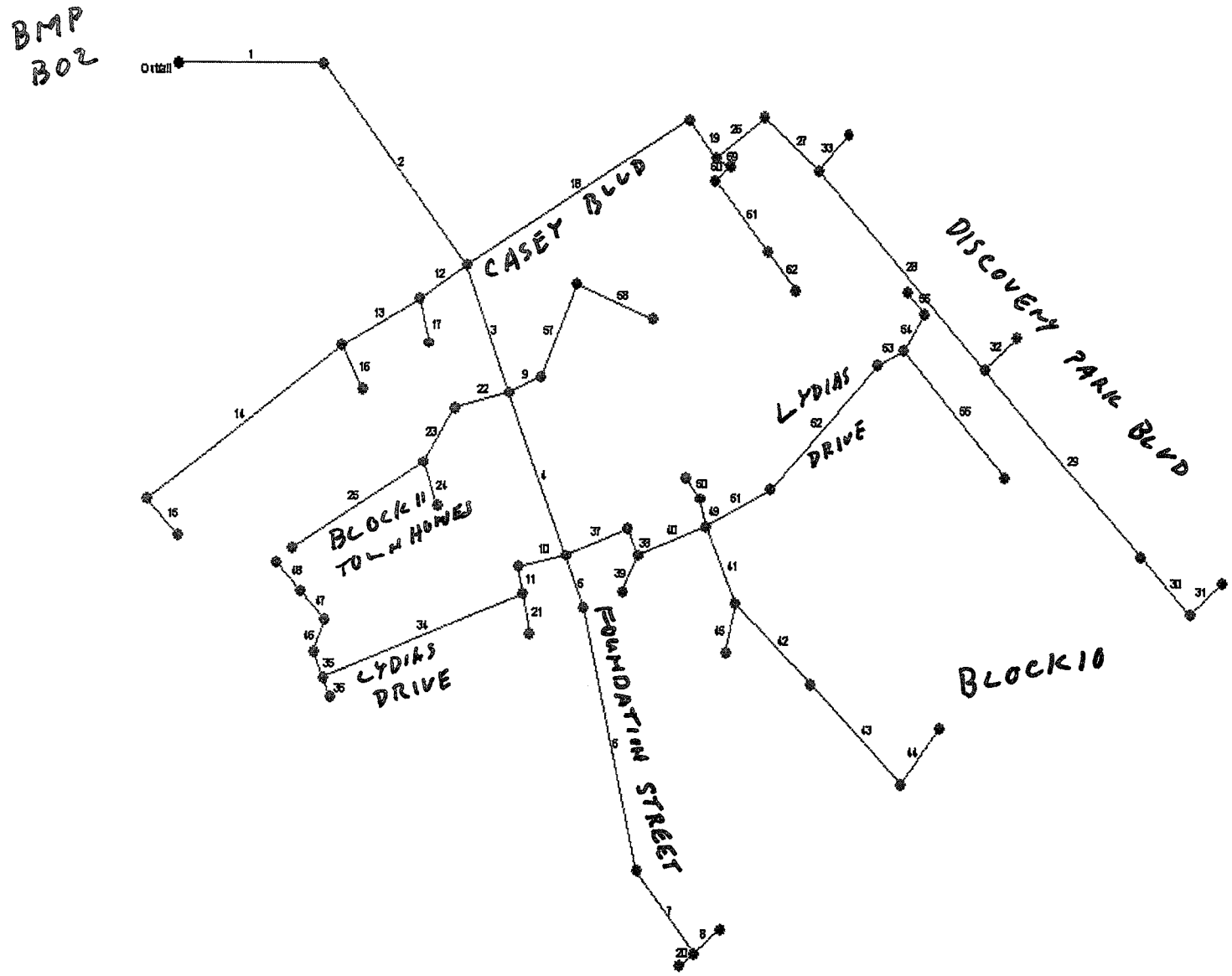
Project File: 6632-7-01APhaseVII.stm

Number of lines: 8

Run Date: 01-07-2008

NOTES: Intensity = 80.56 / (Inlet time + 14.90) ^ 0.82; Return period = 10 Yrs.

Hydraflow Plan View



Project File: 6632-E-23-StormSys-REV-Phase7.stm	No. Lines: 62	01-08-2008

Hydraflow Storm Sewers 2005

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	157.0	0.0	MH	0.00	0.63	0.85	5.0	68.00	8.99	82.11	48	Cir	0.013	0.82	88.50	SS #1 TO OUTFALL
2	1	253.0	52.2	MH	0.00	0.00	0.00	0.0	82.11	1.00	84.64	48	Cir	0.013	1.00	96.08	SS#2 TO SS#1
3	2	134.0	17.6	MH	0.00	0.34	0.85	5.0	84.64	0.50	85.31	42	Cir	0.013	1.00	94.49	SS#9 TO SS#2
4	3	173.0	-0.8	MH	0.00	0.00	0.00	0.0	85.31	2.14	89.02	36	Cir	0.013	1.00	95.75	SS#11 TO SS#9
5	4	56.3	1.5	MH	0.00	0.28	0.85	5.0	89.02	2.01	90.15	18	Cir	0.013	0.15	96.61	SS#21 TO SS#11
6	5	266.0	7.2	MH	0.00	0.00	0.00	0.0	90.15	0.60	91.75	18	Cir	0.013	0.48	97.65	SS#22 TO SS#21
7	6	104.1	-24.8	MH	0.00	0.23	0.90	5.0	91.75	0.81	92.59	18	Cir	0.013	1.00	97.06	SS#23 TO SS#22
8	7	38.0	-94.5	MH	0.00	0.92	0.90	5.0	92.59	1.24	93.06	15	Cir	0.013	1.00	97.06	SS#24 TO SS#23
9	3	38.0	-93.5	MH	0.00	0.65	0.85	5.0	86.31	4.00	87.83	18	Cir	0.013	0.73	94.49	SS#10 TO SS#9
10	4	54.0	99.0	MH	0.00	0.26	0.85	5.0	89.02	1.00	89.56	24	Cir	0.013	1.00	95.66	SS#15 TO SS#11
11	10	28.0	-88.9	MH	0.00	0.26	0.85	5.0	89.56	1.00	89.84	24	Cir	0.013	0.99	95.66	SS#16 TO SS#15
12	2	61.0	95.0	MH	0.00	0.42	0.85	5.0	84.64	4.08	87.13	24	Cir	0.013	0.95	95.65	SS#3 TO SS#2
13	12	97.0	4.1	MH	0.00	0.11	0.85	5.0	87.13	1.66	88.74	24	Cir	0.013	1.00	96.40	SS#5 TO SS#3
14	13	259.3	-7.0	MH	0.00	0.28	0.85	5.0	88.74	0.50	90.04	18	Cir	0.013	1.00	94.03	SS#7 TO SS#5
15	14	48.0	-97.3	MH	0.00	0.29	0.85	5.0	90.04	0.50	90.28	18	Cir	0.013	1.00	94.03	SS#8 TO SS#7
16	13	48.0	-89.6	MH	0.00	0.11	0.85	5.0	88.74	2.00	89.70	12	Cir	0.013	1.00	96.40	SS#6 TO SS#5
17	12	45.0	-70.0	MH	0.00	0.23	0.85	5.0	87.13	2.00	88.03	12	Cir	0.013	1.00	95.65	SS#4 TO SS#3
18	2	283.0	-83.0	MH	0.00	0.38	0.85	5.0	84.64	0.88	87.12	30	Cir	0.013	1.00	95.17	SS#25 TO SS#2
19	18	48.0	83.8	MH	0.00	0.00	0.00	0.0	87.12	1.42	87.80	24	Cir	0.013	1.00	95.17	SS#26 TO SS#25
20	7	20.0	90.0	MH	0.00	0.60	0.25	10.0	92.59	1.00	92.79	18	Cir	0.013	1.00	97.50	FUTURE
21	11	40.0	0.0	MH	0.00	0.90	0.85	5.0	89.84	1.00	90.24	15	Cir	0.013	1.00	97.50	FUTURE

Project File: 6632-E-23-StormSys-REV-Phase7.stm | Number of lines: 62 | Date: 01-08-2008

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
22	3	61.0	96.0	MH	0.00	0.00	0.00	0.0	86.31	4.20	88.87	15	Cir	0.013	0.72	96.00	SS#9A TO SS#9
23	22	63.0	-42.7	MH	0.00	0.28	0.85	5.0	88.87	1.90	90.07	15	Cir	0.013	0.82	95.63	SS#9B TO SS#9A
24	23	47.0	-51.6	MH	0.00	0.24	0.85	5.0	90.07	1.00	90.54	12	Cir	0.013	1.00	95.00	SS#9C TO SS#9B
25	23	167.0	25.7	MH	0.00	0.21	0.85	5.0	90.07	1.00	91.74	12	Cir	0.013	1.00	96.30	SS#9D TO SS#9B
26	19	68.0	-90.0	MH	0.00	0.00	0.00	0.0	87.80	1.16	88.59	24	Cir	0.013	0.99	95.86	SS#27 TO SS#26
27	26	78.7	79.6	MH	0.00	0.26	0.85	5.0	88.59	1.00	89.38	24	Cir	0.013	1.00	97.49	SS#28 TO SS#27
28	27	269.1	4.9	MH	0.00	0.39	0.85	5.0	89.38	1.00	92.07	18	Cir	0.013	1.00	100.29	SS#30 TO SS#28
29	28	251.0	0.0	MH	0.00	0.28	0.85	5.0	92.07	0.59	93.55	15	Cir	0.013	0.15	104.40	SS#32 TO SS#30
30	29	79.0	0.0	MH	0.00	0.20	0.85	5.0	93.55	0.51	93.95	15	Cir	0.013	1.00	106.21	SS#33 TO SS#32
31	30	48.0	-90.0	MH	0.00	0.38	0.85	5.0	93.95	0.50	94.19	12	Cir	0.013	1.00	106.21	SS#34 TO SS#33
32	28	48.0	-90.0	MH	0.00	0.40	0.85	5.0	92.07	1.00	92.55	12	Cir	0.013	1.00	100.29	SS#31 TO SS#30
33	27	48.0	-90.0	MH	0.00	0.41	0.85	5.0	89.38	1.00	89.86	12	Cir	0.013	1.00	97.49	SS#29 TO SS#28
34	11	233.0	80.0	MH	0.00	0.12	0.85	5.0	89.84	0.50	91.00	18	Cir	0.013	1.00	95.03	SS#17 TO SS#16
35	34	28.0	90.0	MH	0.00	0.09	0.85	5.0	91.00	1.00	91.28	18	Cir	0.013	0.72	95.03	SS#18 TO SS#17
36	34	20.0	-90.0	MH	0.00	0.33	0.85	5.0	91.00	1.00	91.20	18	Cir	0.013	1.00	95.00	FUTURE
37	4	73.0	-90.0	MH	0.00	0.06	0.85	5.0	89.02	1.00	89.75	30	Cir	0.013	1.00	96.78	SS#12 TO SS#11
38	37	28.0	90.0	MH	0.00	0.13	0.85	5.0	89.75	1.00	90.03	30	Cir	0.013	1.00	97.48	SS#13 TO SS#12
39	38	40.0	45.0	MH	0.00	0.24	0.85	5.0	91.95	2.00	92.75	12	Cir	0.013	1.00	96.61	SS#14 TO SS#13
40	38	80.0	-90.0	MH	0.00	0.12	0.85	5.0	90.03	1.99	91.62	30	Cir	0.013	1.00	97.40	SS#10-5 TO SS#5-13
41	40	84.0	89.0	MH	0.00	0.73	0.85	5.0	91.62	1.00	92.46	24	Cir	0.013	0.62	98.05	SS#10-4 TO SS#10-5
42	41	115.0	-24.0	MH	0.00	0.86	0.85	5.0	92.46	1.00	93.61	24	Cir	0.013	0.15	98.00	SS#10-3 TO SS#10-4

Project File: 6632-E-23-StormSys-REV-Phase7.stm | Number of lines: 62 | Date: 01-08-2008

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
43	42	138.0	1.0	MH	0.00	0.99	0.85	10.0	93.61	1.01	95.00	24	Cir	0.013	1.00	99.00	SS#10-2 TO SS#10-3
44	43	68.0	-97.0	MH	0.00	1.09	0.85	5.0	95.00	4.41	98.00	15	Cir	0.013	1.00	102.00	SS#10-1 TO SS#10-2
45	41	50.0	34.3	MH	0.00	0.37	0.85	5.0	92.46	2.70	93.81	15	Cir	0.013	1.00	98.10	SS#10-6 TO SS#10-4
46	35	33.0	42.0	MH	0.00	0.00	0.00	0.0	91.28	2.12	91.98	8	Cir	0.013	0.91	96.42	SS#5-18ATOSS#5-18
47	46	39.0	-62.9	MH	0.00	0.07	0.85	5.0	91.98	2.00	92.76	8	Cir	0.013	0.15	95.70	SS#5-18BTOSS#5-18A
48	47	39.0	0.0	MH	0.00	0.10	0.85	5.0	92.76	2.00	93.54	8	Cir	0.013	1.00	95.70	SS#5-18CTOSS#5-5-1
49	40	28.0	-81.0	MH	0.00	0.14	0.85	5.0	91.62	2.00	92.18	12	Cir	0.013	0.48	98.38	SS#10-5ATOSS#10-5
50	49	27.0	-24.9	MH	0.00	0.10	0.85	5.0	92.18	2.00	92.72	12	Cir	0.013	1.00	97.95	SS#10-5BTOSS#10-5A
51	40	80.0	-6.2	MH	0.00	0.08	0.85	5.0	91.62	0.50	92.02	24	Cir	0.013	0.39	100.01	SS#10-7TOSS#10-5
52	51	168.0	-19.5	MH	0.00	0.14	0.85	5.0	92.02	0.40	92.69	24	Cir	0.013	0.40	100.01	SS#10-8TOSS#10-7
53	52	33.0	20.3	MH	0.00	0.46	0.85	5.0	92.69	0.39	92.82	24	Cir	0.013	0.97	99.97	SS#10-9TOSS#10-8
54	53	43.0	-31.6	MH	0.00	0.13	0.85	5.0	92.82	0.40	92.99	15	Cir	0.013	0.97	99.27	SS#10-10TOSS#10-9
55	54	28.0	-73.7	MH	0.00	0.13	0.85	5.0	92.99	0.39	93.10	12	Cir	0.013	1.00	99.27	SS#10-11TOSS#10-10
56	53	167.0	74.7	MH	0.00	0.44	0.85	5.0	92.82	2.65	97.25	15	Cir	0.013	1.00	103.25	SS#10-9ATOSS#10-9
57	9	100.0	-43.2	MH	0.00	0.05	0.85	5.0	87.83	2.89	90.72	15	Cir	0.013	1.00	96.20	SS#5-10ATOSS#5-10
58	57	90.0	89.8	MH	0.00	0.42	0.85	5.0	90.72	2.89	93.32	12	Cir	0.013	1.00	97.32	SS#5-10BTOSS#5-10A
59	19	18.0	-24.7	MH	0.00	0.21	0.85	5.0	88.80	4.00	89.52	18	Cir	0.013	1.00	95.15	SS#5-26ATOSS#5-26
60	59	22.0	113.1	MH	0.00	0.33	0.85	5.0	89.52	4.00	90.40	18	Cir	0.013	1.00	95.00	SS#5-26BTOSS#5-26A
61	60	91.0	-90.3	MH	0.00	0.18	0.85	5.0	90.40	2.03	92.25	15	Cir	0.013	0.15	96.25	SS#5-26CTOSS#5-26B
62	61	50.0	0.3	MH	0.00	0.74	0.85	10.0	92.25	6.50	95.50	12	Cir	0.013	1.00	97.50	SS#5-26DTOSS#5-26C

Project File: 6632-E-23-StormSys-REV-Phase7.stm | Number of lines: 62 | Date: 01-08-2008

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	157.0	0.63	18.79	0.85	0.54	15.67	5.0	13.9	5.3	83.09	430.6	6.61	48	8.99	82.11	68.00	86.79	86.26	88.50	0.00	SS #1 TO OUTF
2	1	253.0	0.00	18.16	0.00	0.00	15.13	0.0	13.3	5.4	82.01	143.6	6.89	48	1.00	84.64	82.11	87.64	87.36	96.08	88.50	SS#2 TO SS#1
3	2	134.0	0.34	12.56	0.85	0.29	10.37	5.0	12.9	5.5	56.94	71.14	5.92	42	0.50	85.31	84.64	88.88	88.45	94.49	96.08	SS#9 TO SS#2
4	3	173.0	0.00	10.37	0.00	0.00	8.51	0.0	12.4	5.6	47.41	97.67	7.63	36	2.14	89.02	85.31	91.21	89.43	95.75	94.49	SS#11 TO SS#9
5	4	56.3	0.28	2.03	0.85	0.24	1.42	5.0	12.2	5.6	7.98	14.88	4.52	18	2.01	90.15	89.02	92.36	92.04	96.61	95.75	SS#21 TO SS#11
6	5	266.0	0.00	1.75	0.00	0.00	1.19	0.0	11.1	5.8	6.91	8.14	3.91	18	0.60	91.75	90.15	93.64	92.49	97.65	96.61	SS#22 TO SS#21
7	6	104.1	0.23	1.75	0.90	0.21	1.19	5.0	10.6	5.9	7.01	9.43	3.97	18	0.81	92.59	91.75	94.22	93.75	97.06	97.65	SS#23 TO SS#22
8	7	38.0	0.92	0.92	0.90	0.83	0.83	5.0	5.0	7.5	6.21	7.18	5.06	15	1.24	93.06	92.59	94.81	94.46	97.06	97.06	SS#24 TO SS#23
9	3	38.0	0.65	1.12	0.85	0.55	0.95	5.0	6.1	7.1	6.76	21.00	3.83	18	4.00	87.83	86.31	89.90	89.75	94.49	94.49	SS#10 TO SS#9
10	4	54.0	0.26	2.13	0.85	0.22	1.81	5.0	8.0	6.6	11.86	22.62	3.78	24	1.00	89.56	89.02	92.28	92.13	95.66	95.75	SS#15 TO SS#11
11	10	28.0	0.26	1.87	0.85	0.22	1.59	5.0	7.9	6.6	10.48	22.62	3.33	24	1.00	89.84	89.56	92.61	92.55	95.66	95.66	SS#16 TO SS#15
12	2	61.0	0.42	1.44	0.85	0.36	1.22	5.0	9.0	6.3	7.70	45.70	2.97	24	4.08	87.13	84.64	88.45	88.45	95.65	96.08	SS#3 TO SS#2
13	12	97.0	0.11	0.79	0.85	0.09	0.67	5.0	7.9	6.6	4.42	29.15	2.86	24	1.66	88.74	87.13	89.48	88.79	96.40	95.65	SS#5 TO SS#3
14	13	259.3	0.28	0.57	0.85	0.24	0.48	5.0	5.8	7.2	3.50	7.44	3.59	18	0.50	90.04	88.74	90.75	89.69	94.03	96.40	SS#7 TO SS#5
15	14	48.0	0.29	0.29	0.85	0.25	0.25	5.0	5.0	7.5	1.85	7.43	2.11	18	0.50	90.28	90.04	90.93	90.92	94.03	94.03	SS#8 TO SS#7
16	13	48.0	0.11	0.11	0.85	0.09	0.09	5.0	5.0	7.5	0.70	5.04	1.85	12	2.00	89.70	88.74	90.06	89.74	96.40	96.40	SS#6 TO SS#5
17	12	45.0	0.23	0.23	0.85	0.20	0.20	5.0	5.0	7.5	1.47	5.04	2.03	12	2.00	88.03	87.13	88.83	88.77	95.65	95.65	SS#4 TO SS#3
18	2	283.0	0.38	4.16	0.85	0.32	3.54	5.0	10.9	5.9	20.75	38.39	4.61	30	0.88	87.12	84.64	88.73	88.45	95.17	96.08	SS#25 TO SS#2
19	18	48.0	0.00	3.78	0.00	0.00	3.21	0.0	10.7	5.9	18.95	26.92	6.66	24	1.42	87.80	87.12	89.34	89.11	95.17	95.17	SS#26 TO SS#25
20	7	20.0	0.60	0.60	0.25	0.15	0.15	10.0	10.0	6.1	0.91	10.50	0.51	18	1.00	92.79	92.59	94.70	94.70	97.50	97.06	FUTURE
21	11	40.0	0.90	0.90	0.85	0.77	0.77	5.0	5.0	7.5	5.73	6.46	4.67	15	1.00	90.24	89.84	93.10	92.78	97.50	95.66	FUTURE

Project File: 6632-E-23-StormSys-REV-Phase7.stm | Number of lines: 62 | Run Date: 01-08-2008

NOTES: Intensity = 55.61 / (Inlet time + 10.00) ^ 0.74; Return period = 10 Yrs.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
22	3	61.0	0.00	0.73	0.00	0.00	0.62	0.0	6.9	6.9	4.25	13.23	3.53	15	4.20	88.87	86.31	90.02	89.79	96.00	94.49	SS#9A TO SS#9
23	22	63.0	0.28	0.73	0.85	0.24	0.62	5.0	6.6	6.9	4.31	8.91	4.24	15	1.90	90.07	88.87	90.90	90.17	95.63	96.00	SS#9B TO SS#9
24	23	47.0	0.24	0.24	0.85	0.20	0.20	5.0	5.0	7.5	1.53	3.56	2.53	12	1.00	90.54	90.07	91.08	91.09	95.00	95.63	SS#9C TO SS#9
25	23	167.0	0.21	0.21	0.85	0.18	0.18	5.0	5.0	7.5	1.34	3.56	2.60	12	1.00	91.74	90.07	92.23	91.24	96.30	95.63	SS#9D TO SS#9
26	19	68.0	0.00	2.32	0.00	0.00	1.97	0.0	7.9	6.6	12.99	24.38	4.94	24	1.16	88.59	87.80	90.09	89.90	95.86	95.17	SS#27 TO SS#26
27	26	78.7	0.26	2.32	0.85	0.22	1.97	5.0	7.5	6.7	13.18	22.66	5.17	24	1.00	89.38	88.59	90.67	90.60	97.49	95.86	SS#28 TO SS#27
28	27	269.1	0.39	1.65	0.85	0.33	1.40	5.0	6.7	6.9	9.72	10.50	5.53	18	1.00	92.07	89.38	93.56	91.37	100.29	97.49	SS#30 TO SS#28
29	28	251.0	0.28	0.86	0.85	0.24	0.73	5.0	5.7	7.2	5.30	4.96	4.32	15	0.59	93.55	92.07	95.73	94.04	104.40	100.29	SS#32 TO SS#30
30	29	79.0	0.20	0.58	0.85	0.17	0.49	5.0	5.3	7.4	3.65	4.59	2.97	15	0.51	93.95	93.55	96.18	95.93	106.21	104.40	SS#33 TO SS#32
31	30	48.0	0.38	0.38	0.85	0.32	0.32	5.0	5.0	7.5	2.42	2.52	3.08	12	0.50	94.19	93.95	96.54	96.32	106.21	106.21	SS#34 TO SS#33
32	28	48.0	0.40	0.40	0.85	0.34	0.34	5.0	5.0	7.5	2.55	3.56	3.25	12	1.00	92.55	92.07	94.29	94.04	100.29	100.29	SS#31 TO SS#30
33	27	48.0	0.41	0.41	0.85	0.35	0.35	5.0	5.0	7.5	2.61	3.56	3.33	12	1.00	89.86	89.38	91.93	91.67	97.49	97.49	SS#29 TO SS#28
34	11	233.0	0.12	0.71	0.85	0.10	0.60	5.0	6.3	7.1	4.26	7.41	2.41	18	0.50	91.00	89.84	93.25	92.86	95.03	95.66	SS#17 TO SS#16
35	34	28.0	0.09	0.26	0.85	0.08	0.22	5.0	5.7	7.2	1.60	10.50	0.90	18	1.00	91.28	91.00	93.42	93.42	95.03	95.03	SS#18 TO SS#17
36	34	20.0	0.33	0.33	0.85	0.28	0.28	5.0	5.0	7.5	2.10	10.50	1.19	18	1.00	91.20	91.00	93.41	93.41	95.00	95.03	FUTURE
37	4	73.0	0.06	6.21	0.85	0.05	5.28	5.0	11.6	5.7	30.18	41.01	6.22	30	1.00	89.75	89.02	91.91	91.76	96.78	95.75	SS#12 TO SS#11
38	37	28.0	0.13	6.15	0.85	0.11	5.23	5.0	11.5	5.7	29.97	41.01	6.11	30	1.00	90.03	89.75	92.21	92.53	97.48	96.78	SS#13 TO SS#12
39	38	40.0	0.24	0.24	0.85	0.20	0.20	5.0	5.0	7.5	1.53	5.04	2.92	12	2.00	92.75	91.95	93.27	92.79	96.61	97.48	SS#14 TO SS#13
40	38	80.0	0.12	5.78	0.85	0.10	4.91	5.0	11.3	5.8	28.40	57.82	6.69	30	1.99	91.62	90.03	93.40	92.79	97.40	97.48	SS#10-5 TO SS#
41	40	84.0	0.73	4.04	0.85	0.62	3.43	5.0	11.1	5.8	20.01	22.62	6.68	24	1.00	92.46	91.62	94.53	93.67	98.05	97.40	SS#10-4 TO SS#
42	41	115.0	0.86	2.94	0.85	0.73	2.50	5.0	10.7	5.9	14.77	22.62	4.70	24	1.00	93.61	92.46	95.78	95.29	98.00	98.05	SS#10-3 TO SS#

Project File: 6632-E-23-StormSys-REV-Phase7.stm | Number of lines: 62 | Run Date: 01-08-2008

NOTES: Intensity = 55.61 / (Inlet time + 10.00) ^ 0.74; Return period = 10 Yrs.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
43	42	138.0	0.99	2.08	0.85	0.84	1.77	10.0	10.0	6.1	10.71	22.70	4.39	24	1.01	95.00	93.61	96.33	96.00	99.00	98.00	SS#10-2 TO SS#
44	43	68.0	1.09	1.09	0.85	0.93	0.93	5.0	5.0	7.5	6.95	13.56	5.97	15	4.41	98.00	95.00	99.05	96.77	102.00	99.00	SS#10-1 TO SS#
45	41	50.0	0.37	0.37	0.85	0.31	0.31	5.0	5.0	7.5	2.36	10.61	1.92	15	2.70	93.81	92.46	95.36	95.29	98.10	98.05	SS#10-6 TO SS#
46	35	33.0	0.00	0.17	0.00	0.00	0.14	0.0	5.6	7.3	1.05	1.76	3.02	8	2.12	91.98	91.28	93.68	93.43	96.42	95.03	SS#5-18ATOSS#
47	46	39.0	0.07	0.17	0.85	0.06	0.14	5.0	5.4	7.4	1.06	1.71	3.05	8	2.00	92.76	91.98	94.11	93.81	95.70	96.42	SS#5-18BTOSS#
48	47	39.0	0.10	0.10	0.85	0.09	0.09	5.0	5.0	7.5	0.64	1.71	1.83	8	2.00	93.54	92.76	94.34	94.23	95.70	95.70	SS#5-18CTOSS#
49	40	28.0	0.14	0.24	0.85	0.12	0.20	5.0	5.6	7.3	1.49	5.04	1.90	12	2.00	92.18	91.62	94.29	94.24	98.38	97.40	SS#10-5ATOSS#
50	49	27.0	0.10	0.10	0.85	0.09	0.09	5.0	5.0	7.5	0.64	5.04	0.81	12	2.00	92.72	92.18	94.37	94.36	97.95	98.38	SS#10-5BTOSS#
51	40	80.0	0.08	1.38	0.85	0.07	1.17	5.0	7.6	6.7	7.81	15.99	2.49	24	0.50	92.02	91.62	94.30	94.20	100.01	97.40	SS#10-7TOSS#1
52	51	168.0	0.14	1.30	0.85	0.12	1.11	5.0	6.5	7.0	7.73	14.28	2.52	24	0.40	92.69	92.02	94.51	94.34	100.01	100.01	SS#10-8TOSS#1
53	52	33.0	0.46	1.16	0.85	0.39	0.99	5.0	6.2	7.1	6.98	14.20	2.33	24	0.39	92.82	92.69	94.58	94.56	99.97	100.01	SS#10-9TOSS#1
54	53	43.0	0.13	0.26	0.85	0.11	0.22	5.0	5.4	7.3	1.62	4.06	1.32	15	0.40	92.99	92.82	94.75	94.73	99.27	99.97	SS#10-10TOSS#
55	54	28.0	0.13	0.13	0.85	0.11	0.11	5.0	5.0	7.5	0.83	2.23	1.05	12	0.39	93.10	92.99	94.80	94.79	99.27	99.27	SS#10-11TOSS#
56	53	167.0	0.44	0.44	0.85	0.37	0.37	5.0	5.0	7.5	2.80	10.52	3.23	15	2.65	97.25	92.82	97.92	94.67	103.25	99.97	SS#10-9ATOSS#
57	9	100.0	0.05	0.47	0.85	0.04	0.40	5.0	5.4	7.3	2.93	10.98	3.32	15	2.89	90.72	87.83	91.41	90.21	96.20	94.49	SS#5-10ATOSS#
58	57	90.0	0.42	0.42	0.85	0.36	0.36	5.0	5.0	7.5	2.68	6.05	4.32	12	2.89	93.32	90.72	94.01	91.51	97.32	96.20	SS#5-10BTOSS#
59	19	18.0	0.21	1.46	0.85	0.18	1.24	5.0	10.7	5.9	7.34	21.00	5.47	18	4.00	89.52	88.80	90.55	89.90	95.15	95.17	SS#5-26ATOSS#
60	59	22.0	0.33	1.25	0.85	0.28	1.06	5.0	10.6	5.9	6.31	21.00	4.55	18	4.00	90.40	89.52	91.36	90.85	95.00	95.15	SS#5-26BTOSS#
61	60	91.0	0.18	0.92	0.85	0.15	0.78	5.0	10.2	6.0	4.71	9.21	4.56	15	2.03	92.25	90.40	93.12	91.56	96.25	95.00	SS#5-26CTOSS#
62	61	50.0	0.74	0.74	0.85	0.63	0.63	10.0	10.0	6.1	3.81	9.08	5.26	12	6.50	95.50	92.25	96.33	93.17	97.50	96.25	SS#5-26DTOSS#

Project File: 6632-E-23-StormSys-REV-Phase7.stm | Number of lines: 62 | Run Date: 01-08-2008

NOTES: Intensity = 55.61 / (Inlet time + 10.00) ^ 0.74; Return period = 10 Yrs.

Inlet Spread Computation Summary

NEW TOWN - SECTION 7 PHASE VII

AES Project Number: 6632-7-1

Date: 11/02/07

Inlet Number	Area (Acres)	"C"	I (in/hr)	Q (cfs)	Q Tot (cfs)	Bypass (cfs)	Total Q Intercepted	Bypass To Inlet #	Spread (feet)	Depth (feet)	Sag / On Grade	Throat Length	Notes
7-1	0.28	0.85	4.0	0.95	0.95	0.31	0.64	7-5	4.96	0.23	OG	4	
	0.36	0.85	4.0	1.22	1.53								Gutter Flow From Upstation
7-5	0.75	0.85	4.0	2.55	2.86	0.00	2.86	N/A	9.75	0.33	S	10	
	0.39	0.85	4.0	1.33	1.33								Gutter Flow From Downstation
7-2	0.39	0.85	4.0	1.33	1.33	0.55	0.78	7-2A	6.12	0.25	OG	4	
7-2A	0.24	0.85	4.0	0.82	1.37	0.84	0.53	7-3	6.22	0.25	OG	2.5	
7-3	0.09	0.85	4.0	0.31	1.15	0.66	0.49	7-4	5.61	0.24	OG	2.5	
	0.19	0.85	4.0	0.65	1.31								Gutter Flow From Upstation
7-4	0.34	0.85	4.0	1.16	1.94	0.00	1.94	N/A	8.37	0.30	S	8	
	0.15	0.85	4.0	0.51	0.63								Gutter Flow From Downstation
7-6	0.11	0.85	4.0	0.37	0.37	0.12	0.25	7-4	1.99	0.17	OG	2.5	

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 06/29/2007

Project No. : 6632-7-01A
Project Name.: NEW TOWN SECTION 7, PHASE VII

Computed by : VAB
inlet no. : ss#7-1

Inlets on Grade: Curb Opening Inlet

Roadway and Discharge Data

	Cross Slope		Composite
S	Longitudinal Slope	(ft/ft)	0.0100
Sx	Pavement Cross Slope	(ft/ft)	0.0208
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.015
W	Gutter Width (ft)		2.00
a	Gutter Depression (inch)		0.00
Q	Discharge (cfs)		0.950
T	Width of Spread (ft)		4.96

Gutter Flow

Eo	Gutter Flow Ratio	0.889
d	Depth of Flow (ft)	0.23
V	Average Velocity (ft/sec)	2.50

Inlet Interception

	Inlet Type		Curb-Opening
LT	Length for 100% Inteception	(ft)	8.58
L	Curb-Opening Length (ft)		4.00
e	Inlet Efficiency		0.677
Qi	Intercepted Flow (cfs)		0.643
Qb	By-pass Flow (cfs)		0.307

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 06/29/2007

Project No. : 6632-7-01A
Project Name.: NEW TOWN SECTION 7, PHASE VII

Computed by : VAB
INLET NO. : SS#7-2

Inlets on Grade: Curb Opening Inlet

Roadway and Discharge Data

	Cross Slope		Composite
S	Longitudinal Slope	(ft/ft)	0.0100
Sx	Pavement Cross Slope	(ft/ft)	0.0208
Sw	Gutter Cross Slope	(ft/ft)	0.0833
n	Manning's Coefficient		0.015
W	Gutter Width (ft)		2.00
a	Gutter Depression (inch)		0.00
Q	Discharge (cfs)		1.330
T	Width of Spread (ft)		6.12

Gutter Flow

Eo	Gutter Flow Ratio	0.808
d	Depth of Flow (ft)	0.25
V	Average Velocity (ft/sec)	2.59

Inlet Interception

	Inlet Type	Curb-Opening
LT	Length for 100% Inteception (ft)	10.30
L	Curb-Opening Length (ft)	4.00
e	Inlet Efficiency	0.587
Qi	Intercepted Flow (cfs)	0.781
Qb	By-pass Flow (cfs)	0.549

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 11/02/2007

Project No. : 6632-7-01A
Project Name.: NEW TOWN SECTION 7, PHASE VII

Computed by : VAB
INLET NO. : SS#7-2A

Inlets on Grade: Curb Opening Inlet

Roadway and Discharge Data

	Cross Slope	Composite
S	Longitudinal Slope (ft/ft)	0.0100
Sx	Pavement Cross Slope (ft/ft)	0.0208
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.015
W	Gutter Width (ft)	2.00
a	Gutter Depression (inch)	0.00
Q	Discharge (cfs)	1.370
T	Width of Spread (ft)	6.22

Gutter Flow

Eo	Gutter Flow Ratio	0.800
d	Depth of Flow (ft)	0.25
V	Average Velocity (ft/sec)	2.60

Inlet Interception

	Inlet Type	Curb-Opening
LT	Length for 100% Inteception (ft)	10.47
L	Curb-Opening Length (ft)	2.50
e	Inlet Efficiency	0.388
Qi	Intercepted Flow (cfs)	0.532
Qb	By-pass Flow (cfs)	0.838

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 11/02/2007

Project No. : 6632-7-01A
Project Name.: NEW TOWN SECTION 7, PHASE VII

Computed by : VAB
INLET NO. : SS#7-3

Inlets on Grade: Curb Opening Inlet

Roadway and Discharge Data

	Cross Slope	Composite
S	Longitudinal Slope (ft/ft)	0.0100
Sx	Pavement Cross Slope (ft/ft)	0.0208
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.015
W	Gutter Width (ft)	2.00
a	Gutter Depression (inch)	0.00
Q	Discharge (cfs)	1.150
T	Width of Spread (ft)	5.61

Gutter Flow

Eo	Gutter Flow Ratio	0.844
d	Depth of Flow (ft)	0.24
V	Average Velocity (ft/sec)	2.54

Inlet Interception

	Inlet Type	Curb-Opening
LT	Length for 100% Inteception (ft)	9.51
L	Curb-Opening Length (ft)	2.50
e	Inlet Efficiency	0.423
Qi	Intercepted Flow (cfs)	0.486
Qb	By-pass Flow (cfs)	0.664

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Sag
Date: 11/02/2007

Project No. : 6632-7-01A
Project Name.: NEW TOWN SECTION 7, PHASE VII

Computed by : VAB
INLET NO. : SS#7-4

Inlets on Sag: Curb-Opening Inlet

Roadway and Discharge Data

	Cross Slope	Composite
Sx	Pavement Cross Slope (ft/ft)	0.0208
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.015
W	Gutter Width (ft)	2.00
a	Gutter Depression (inch)	0.00

Inlet Interception

	Inlet Type *Sag*	Curb-Opening
T	Width of Spread (ft)	8.37
L	Curb-Opening Length (ft)	8.00
H	Curb-Opening Height (in)	6.00
d_curb	Depth at Curb (ft)	0.299
Qi	Intercepted Flow (cfs)	1.940

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Sag
Date: 06/29/2007

Project No. : 6632-7-01A
Project Name.: NEW TOWN SECTION 7, PHASE VII

Computed by : VAB
INLET NO. : SS#7-5

Inlets on Sag: Curb-Opening Inlet

Roadway and Discharge Data

	Cross Slope	Composite
Sx	Pavement Cross Slope (ft/ft)	0.0208
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	2.00
a	Gutter Depression (inch)	0.00

Inlet Interception

	Inlet Type *Sag*	Curb-Opening
T	Width of Spread (ft)	9.75
L	Curb-Opening Length (ft)	10.00
H	Curb-Opening Height (in)	6.00
d_curb	Depth at Curb (ft)	0.328
Qi	Intercepted Flow (cfs)	2.860

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 11/02/2007

Project No. : 6632-7-01A
Project Name.: NEW TOWN SECTION 7, PHASE VII

Computed by : VAB
INLET NO. : SS#7-6

Inlets on Grade: Curb Opening Inlet

Roadway and Discharge Data

	Cross Slope	Composite
S	Longitudinal Slope (ft/ft)	0.0100
Sx	Pavement Cross Slope (ft/ft)	0.0208
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.015
W	Gutter Width (ft)	2.00
a	Gutter Depression (inch)	0.00
Q	Discharge (cfs)	0.370
T	Width of Spread (ft)	1.99

Gutter Flow

Eo	Gutter Flow Ratio	1.000
d	Depth of Flow (ft)	0.17
V	Average Velocity (ft/sec)	2.22

Inlet Interception

	Inlet Type	Curb-Opening
LT	Length for 100% Inteception (ft)	5.48
L	Curb-Opening Length (ft)	2.50
e	Inlet Efficiency	0.666
Qi	Intercepted Flow (cfs)	0.246
Qb	By-pass Flow (cfs)	0.124

APPENDIX C

TEMPORARY SEDIMENT BASIN

E&S MANUAL WORKSHEETS
STORAGE ELEVATIONS CURVE "WET" & "DRY" STORAGE
STORMWATER ROUTING 2 & 25 YEAR STORM

Storm Event	Incoming Flow (cfs)	Outgoing Flow (cfs)	Water Surface Elevation
2 yr	77.5	15.6	84.65
25 yr	162.5	77.4	86.85

CONSULTING ENGINEERS

TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET

(with or without an emergency spillway)

Project New Town Phase VII Roadways

Basin # B02 Location Adjeacent to Proposed Roadway in Section 7

Total area draining to basin: 26.4 acres.

Basin Volume Design

Wet Storage:

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

   67 cu. yds. x 26.4 acres = 1768.8 cu. yds.

2. Available basin volume = 2172 cu. yds. at elevation 80. (From storage - elevation curve)

3. Excavate 2172 cu. yds. to obtain required volume*.

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

4. Available volume before cleanout required.

   33 cu. yds. x 26.4 acres = 871.2 cu. yds.

5. Elevation corresponding to cleanout level = 76.

   (Form Storage - Elevation Curve)

6. Distance from invert of the dewatering orifice to cleanout level = 4 ft. (Min. = 1.0 ft.)

Dry Storage:

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

   67 cu. yds. x 26.4 acres = 1768.8 cu. yds.

8. Total available basin volume at crest of riser* = 4795 cu. yds. at elevation 84 . (From Storage - Elevation Curve)

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

9. Diameter of dewatering orifice = 5 in.

10. Diameter of flexible tubing = 8 in. (diameter of dewatering orifice plus 2 inches).

Preliminary Design Elevations

11. Crest of Riser = 84.2

Top of Dam = 88.5

Design High Water = 86.85

Upstream Toe of Dam = 67

Basin Shape

12. $\frac{\text{Length of Flow}}{\text{Effective Width}}$ $\frac{L}{We}$ = _____

If > 2, baffles are not required _____

If < 2, baffles are required ✓

Runoff

13. Q_2 = 15.6 cfs (From Chapter 5)

14. Q_{25} = 77.4 cfs (From Chapter 5)

Principal Spillway Design

15. With emergency spillway, required spillway capacity $Q_p = Q_2$ = 15.6 cfs. (riser and barrel)

Without emergency spillway, required spillway capacity $Q_p = Q_{25}$ = 77.4 cfs. (riser and barrel)

16. With emergency spillway:

Assumed available head (h) = 2.8 ft. (Using Q_2)

h = Crest of Emergency Spillway Elevation - Crest of Riser Elevation

Without emergency spillway:

Assumed available head (h) = n/a ft. (Using Q_{25})

h = Design High Water Elevation - Crest of Riser Elevation

17. Riser diameter (D_r) = 3.0'x3.0' in. Actual head (h) = 2.2 ft.

(From Plate 3.14-8.)

Note: Avoid orifice flow conditions.

18. Barrel length (l) = 178 ft.

Head (H) on barrel through embankment = 12.9 ft.

(From Plate 3.14-7).

19. Barrel diameter = 30 in.

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

20. Trash rack and anti-vortex device

Diameter = n/a inches.

Height = n/a inches.

(From Table 3.14-D).

Emergency Spillway Design

21. Required spillway capacity $Q_e = Q_{25} - Q_p$ = 0 cfs.

22. Bottom width (b) = 30 ft.; the slope of the exit channel (s) = n/a ft./foot; and the minimum length of the exit channel (x) = n/a ft.
(From Table 3.14-C)

Anti-Seep Collar Design

23. Depth of water at principal spillway crest (Y) = 16.2 ft.

Slope of upstream face of embankment (Z) = 3 :1.

Slope of principal spillway barrel (S_b) = 1 %

Length of barrel in saturated zone (L_s) = 30 ft.

24. Number of collars required = 2 dimensions = 4.5'x4.5'

(from Plate 3.14-12).

Final Design Elevations

25. Top of Dam = 88.5

Design High Water = 86.85

Emergency Spillway Crest = 87

Principal Spillway Crest = 84.2

Dewatering Orifice Invert = 80

Cleanout Elevation = 76

Elevation of Upstream Toe of Dam
or Excavated Bottom of "Wet Storage
Area" (if excavation was performed) = 67

Temporary Sediment Basin Volumes **"Wet" and "Dry" Volume**

Elev.	Countour Area (in s.f.)	Storage (Between contours)	Cumulative Storage Volume
88	Area = 37901 s.f.		Cumulative Storage = 10469.2 c.y.
		Storage = 36634 c.f.= 1356.8 c.y.	
87	Area = 35367 s.f.		Cumulative Storage = 9112.4 c.y.
		Storage = 34160 c.f.= 1265.2 c.y.	
86	Area = 32953 s.f.		Cumulative Storage = 7847.2 c.y.
		Storage = 31735 c.f.= 1175.4 c.y.	
85	Area = 30517 s.f.		Cumulative Storage = 6671.8 c.y.
		Storage = 29317 c.f.= 1085.8 c.y.	
84	Area = 28116 s.f.		Cumulative Storage = 5586.0 c.y.
		Storage = 26947 c.f.= 998.0 c.y.	
83	Area = 25777 s.f.		Cumulative Storage = 4588.0 c.y.
		Storage = 24636 c.f.= 912.4 c.y.	
82	Area = 23495 s.f.		Cumulative Storage = 3675.6 c.y.
		Storage = 22389 c.f.= 829.2 c.y.	
81	Area = 21283 s.f.		Cumulative Storage = 2846.3 c.y.
		Storage = 17601 c.f.= 651.9 c.y.	
80	Area = 13919 s.f.		Cumulative Storage = 2194.5 c.y.
		Storage = 11454 c.f.= 424.2 c.y.	
79	Area = 8989 s.f.		Cumulative Storage = 1770.2 c.y.
		Storage = 8479 c.f.= 314.1 c.y.	
78	Area = 7970 s.f.		Cumulative Storage = 1456.2 c.y.
		Storage = 7490 c.f.= 277.4 c.y.	
77	Area = 7010 s.f.		Cumulative Storage = 1178.8 c.y.
		Storage = 6556 c.f.= 242.8 c.y.	
76	Area = 6103 s.f.		Cumulative Storage = 935.9 c.y.
		Storage = 5675 c.f.= 210.2 c.y.	
75	Area = 5247 s.f.		Cumulative Storage = 725.8 c.y.
		Storage = 4842 c.f.= 179.3 c.y.	
74	Area = 4438 s.f.		Cumulative Storage = 546.4 c.y.
		Storage = 4056 c.f.= 150.2 c.y.	
73	Area = 3675 s.f.		Cumulative Storage = 396.2 c.y.
		Storage = 3316 c.f.= 122.8 c.y.	
72	Area = 2957 s.f.		Cumulative Storage = 273.4 c.y.
		Storage = 2621 c.f.= 97.1 c.y.	
71	Area = 2284 s.f.		Cumulative Storage = 176.3 c.y.
		Storage = 1970 c.f.= 73.0 c.y.	
70	Area = 1656 s.f.		Cumulative Storage = 103.4 c.y.
		Storage = 1378 c.f.= 51.0 c.y.	
69	Area = 1099 s.f.		Cumulative Storage = 52.3 c.y.
		Storage = 886 c.f.= 32.8 c.y.	
68	Area = 673 s.f.		Cumulative Storage = 19.5 c.y.
		Storage = 527 c.f.= 19.5 c.y.	
67	Area = 380 s.f.		Cumulative Storage = 0.0 c.y.
		Storage = 0 c.f.= 0.0 c.y.	

Volume Required
67 CY per acre "Wet"
67 CY per acre "Dry"
33 CY per acre "Cleanout"

Total Drainage Area =	26.4 acre	
Volume Required =	1768.8 c.y.	
Volume Required =	47757.6 c.f.	
"Wet" Volume Provided =	2194.5 c.y.	At Elevation 80.0
"Wet" Volume Provided =	59250 c.f.	

Adequate "Wet" Volume is provided in Sediment Basin

"Dry" Volume Provided =	3391.6 c.y.	At Elevation 84.0
"Dry" Volume Provided =	91572 c.f.	

Adequate "Dry" Volume is provided in Sediment Basin

Clenaout Volume Required =	871.2 c.y.
Clenaout Volume Required =	23522.4 c.f.

"Cleanout" Volume Provided =	1258.5 c.y.	At Elevation 76.0
"Cleanout" Volume Provided =	33980 c.f.	

Adequate "Cleanout" Volume is provided in Sediment Basin

Pond Report

Hydraflow Hydrographs by Intelisolve — Tuesday, Jan 8 2008, 9:50 AM

Pond No. 1 - Phase 7 Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	80.00	13,919	0	0
1.00	81.00	21,283	17,601	17,601
2.00	82.00	23,495	22,389	39,990
3.00	83.00	25,777	24,636	64,626
4.00	84.00	28,116	26,947	91,573
5.00	85.00	30,517	29,317	120,889
6.00	86.00	32,953	31,735	152,624
7.00	87.00	35,367	34,160	186,784
8.00	88.00	37,901	36,634	223,418
9.00	89.00	41,003	39,452	262,870

Culvert / Orifice Structures

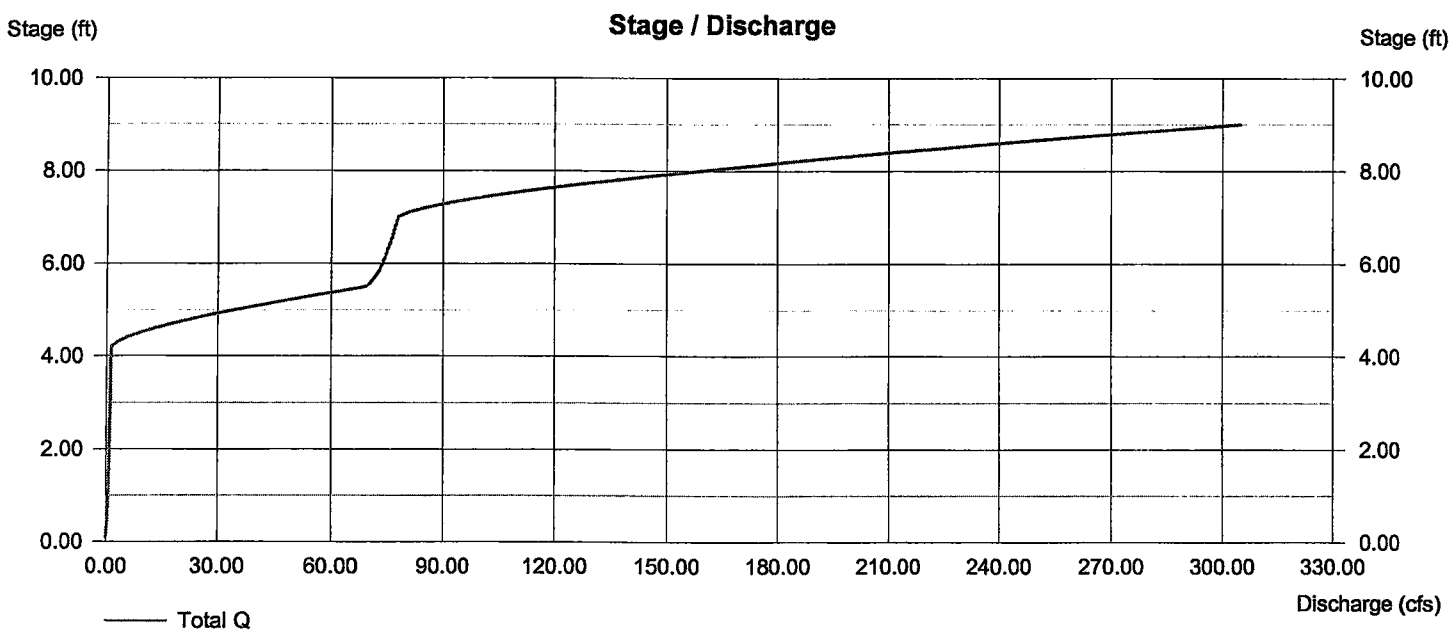
	[A]	[B]	[C]	[D]
Rise (in)	= 30.00	5.00	0.00	0.00
Span (in)	= 30.00	5.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 73.90	80.00	0.00	0.00
Length (ft)	= 178.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	0.00
N-Value	= .013	.013	.000	.000
Orif. Coeff.	= 0.60	0.60	0.00	0.00
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 14.00	30.00	0.00	0.00
Crest El. (ft)	= 84.20	87.00	0.00	0.00
Weir Coeff.	= 3.33	2.60	0.00	0.00
Weir Type	= Rect	Broad	---	---
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	33.25	5	725	119,375	---	-----	-----	Phase 7 Pre
3	SCS Runoff	77.51	5	720	211,773	---	-----	-----	Phase 7 Post
5	Reservoir	15.63	5	740	211,710	3	84.65	110,694	Routing Phase 7 Post

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

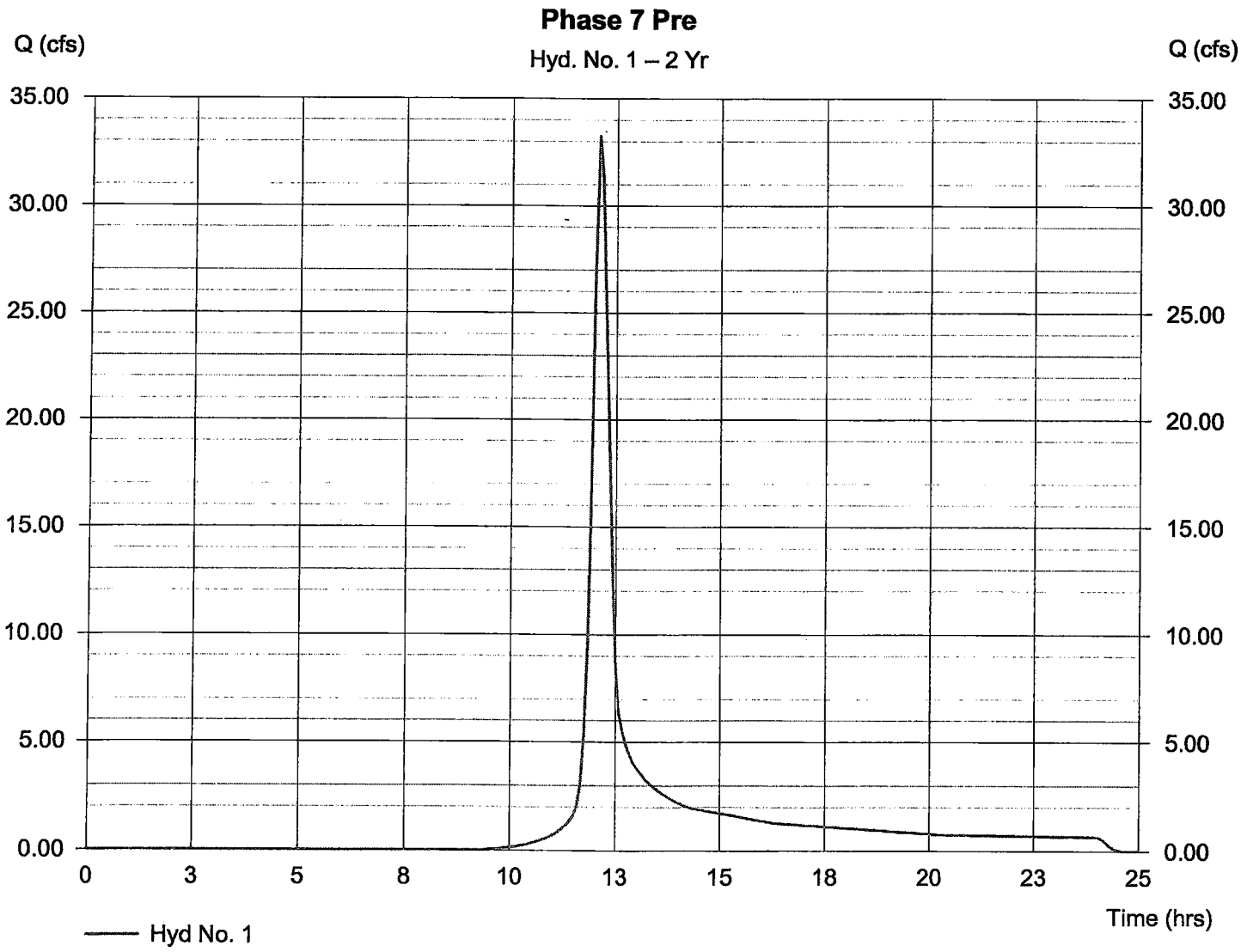
Tuesday, Jan 8 2008, 9:50 AM

Hyd. No. 1

Phase 7 Pre

Hydrograph type	= SCS Runoff	Peak discharge	= 33.25 cfs
Storm frequency	= 2 yrs	Time interval	= 5 min
Drainage area	= 21.00 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 3.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 119,375 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

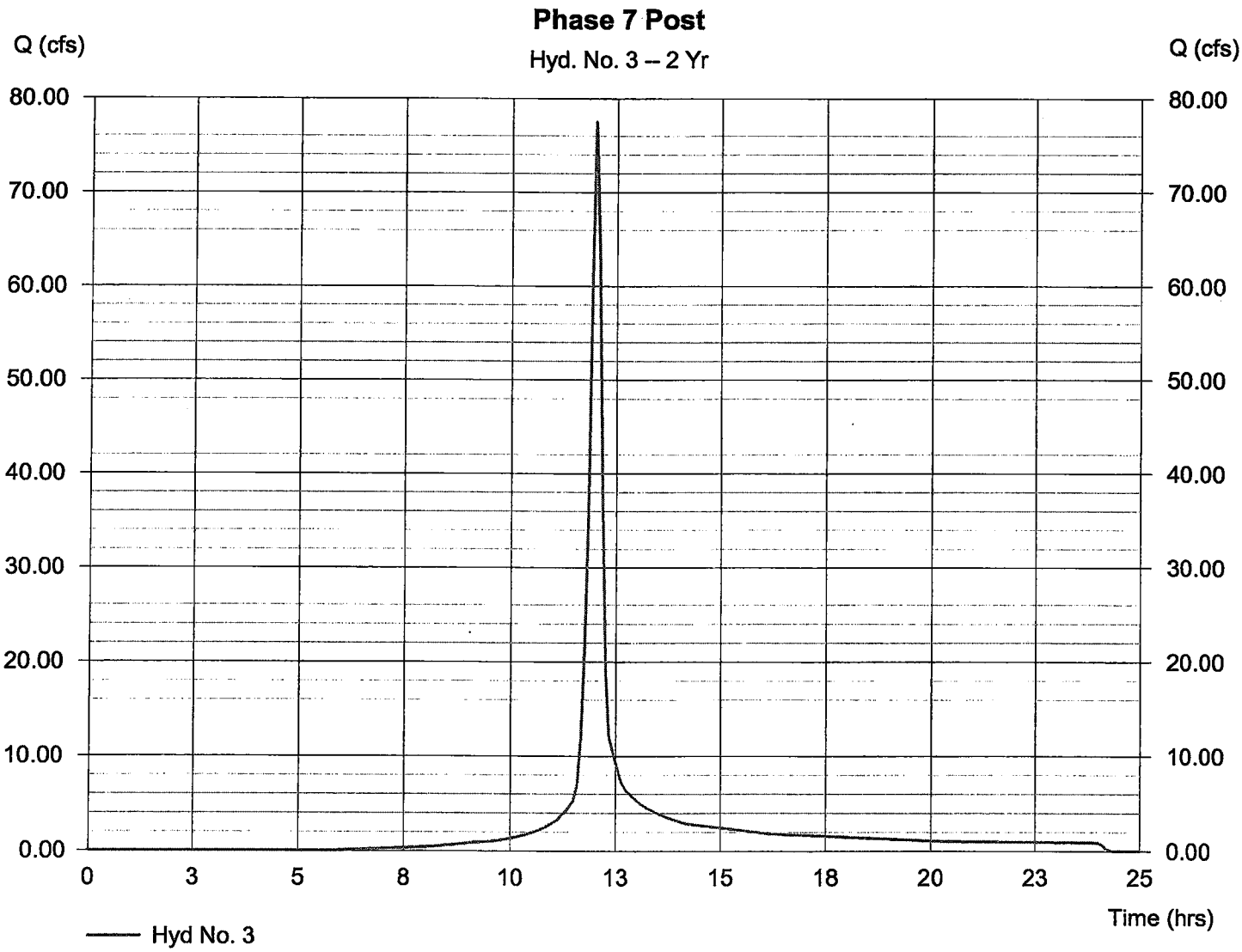
Tuesday, Jan 8 2008, 9:50 AM

Hyd. No. 3

Phase 7 Post

Hydrograph type	= SCS Runoff	Peak discharge	= 77.51 cfs
Storm frequency	= 2 yrs	Time interval	= 5 min
Drainage area	= 26.40 ac	Curve number	= 89
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15 min
Total precip.	= 3.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 211,773 cuft



Hydrograph Plot

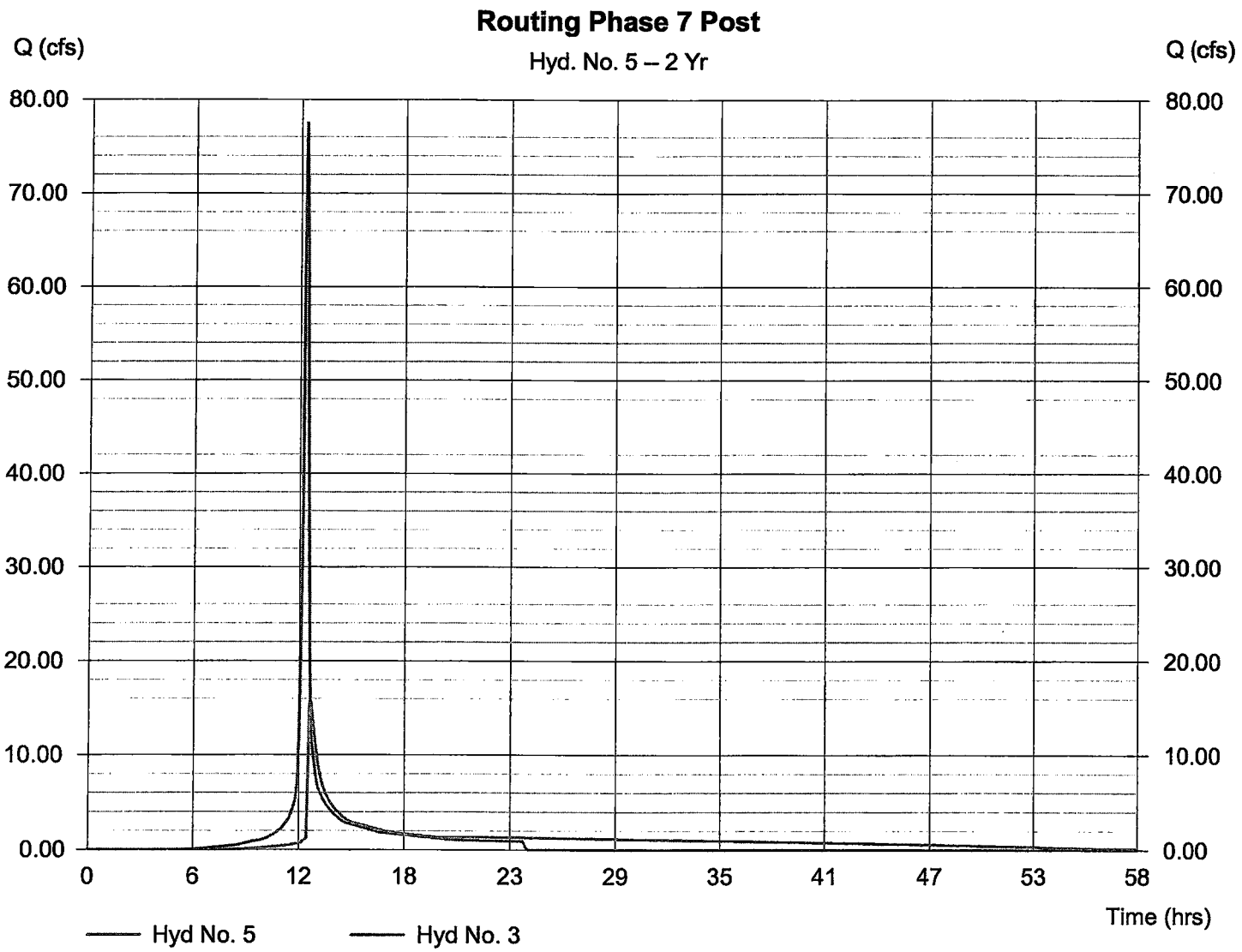
Hydraflow Hydrographs by Intelisolve | Tuesday, Jan 8 2008, 9:50 AM

Hyd. No. 5

Routing Phase 7 Post

Hydrograph type	= Reservoir	Peak discharge	= 15.63 cfs
Storm frequency	= 2 yrs	Time interval	= 5 min
Inflow hyd. No.	= 3	Max. Elevation	= 84.65 ft
Reservoir name	= Phase 7 Pond	Max. Storage	= 110,694 cuft

Storage Indication method used. | Hydrograph Volume = 211,710 cuft



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	87.16	5	725	307,882	---	-----	-----	Phase 7 Pre
3	SCS Runoff	162.54	5	720	460,317	---	-----	-----	Phase 7 Post
5	Reservoir	77.39	5	730	460,254	3	86.85	181,830	Routing Phase 7 Post

Hydrograph Plot

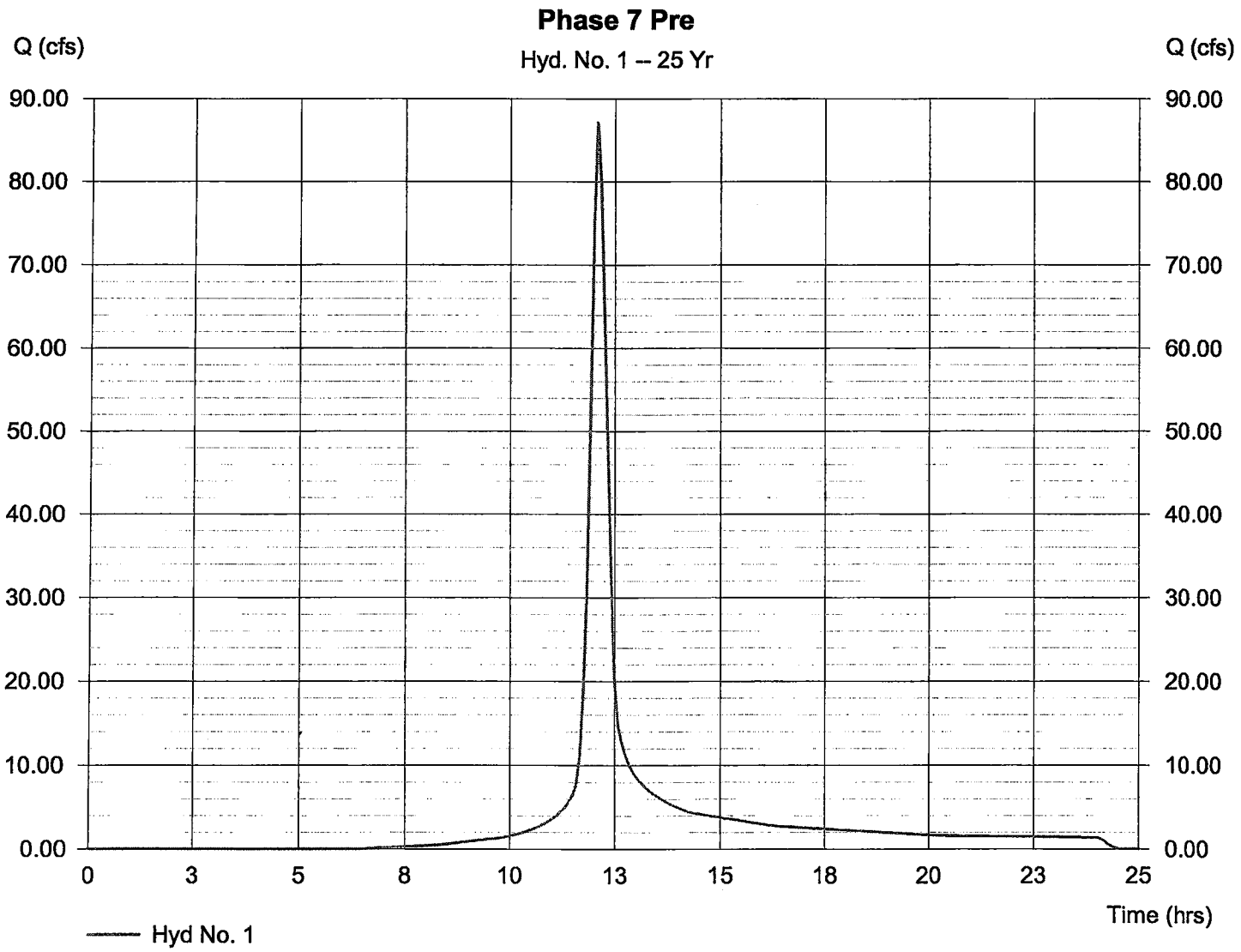
Hydraflow Hydrographs by Intellisolve | Tuesday, Jan 8 2008, 9:51 AM

Hyd. No. 1

Phase 7 Pre

Hydrograph type	= SCS Runoff	Peak discharge	= 87.16 cfs
Storm frequency	= 25 yrs	Time interval	= 5 min
Drainage area	= 21.00 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 6.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 307,882 cuft



Hydrograph Plot

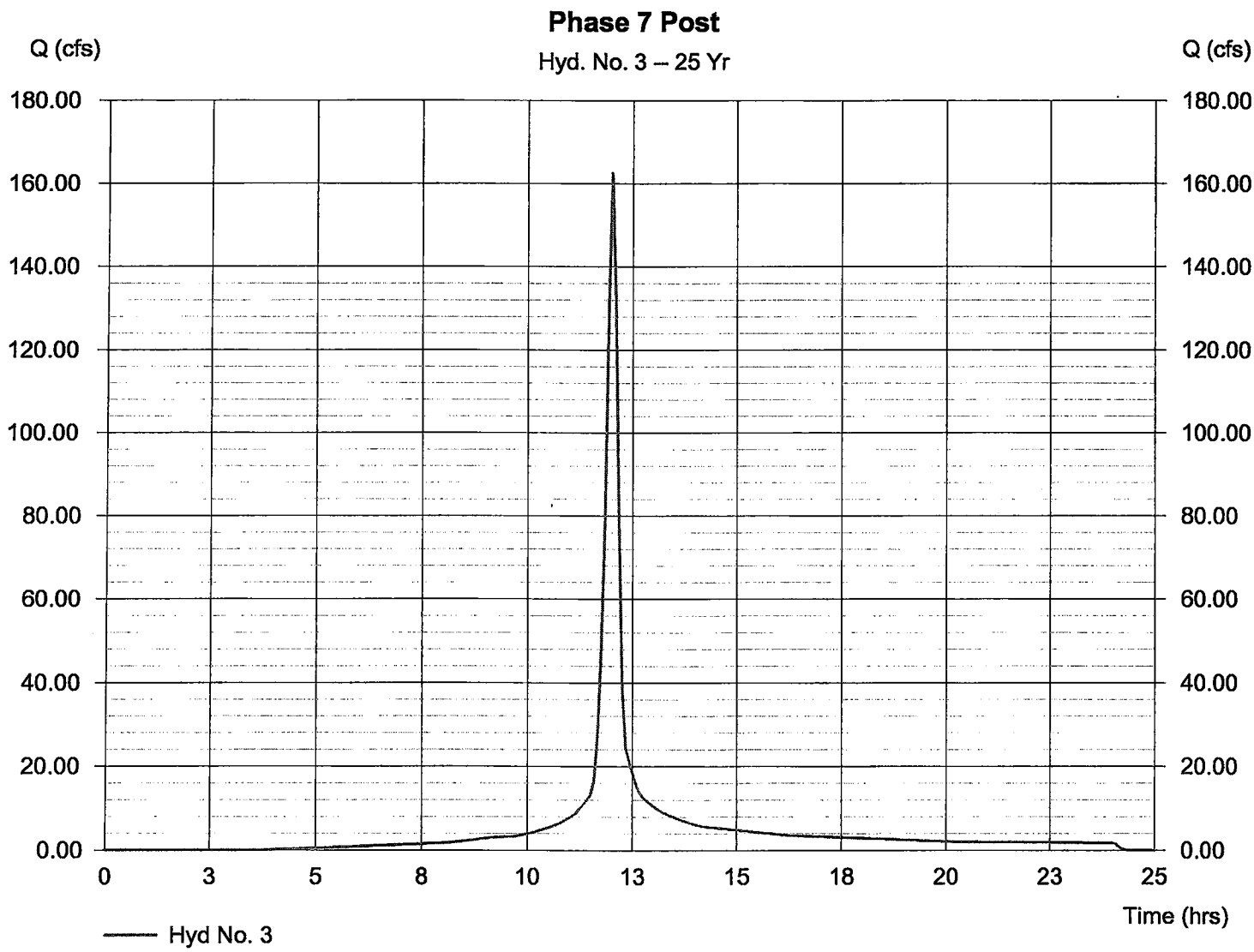
Hydraflow Hydrographs by Intelisolve | Tuesday, Jan 8 2008, 9:51 AM

Hyd. No. 3

Phase 7 Post

Hydrograph type	= SCS Runoff	Peak discharge	= 162.54 cfs
Storm frequency	= 25 yrs	Time interval	= 5 min
Drainage area	= 26.40 ac	Curve number	= 89
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15 min
Total precip.	= 6.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 460,317 cuft



Hydrograph Plot

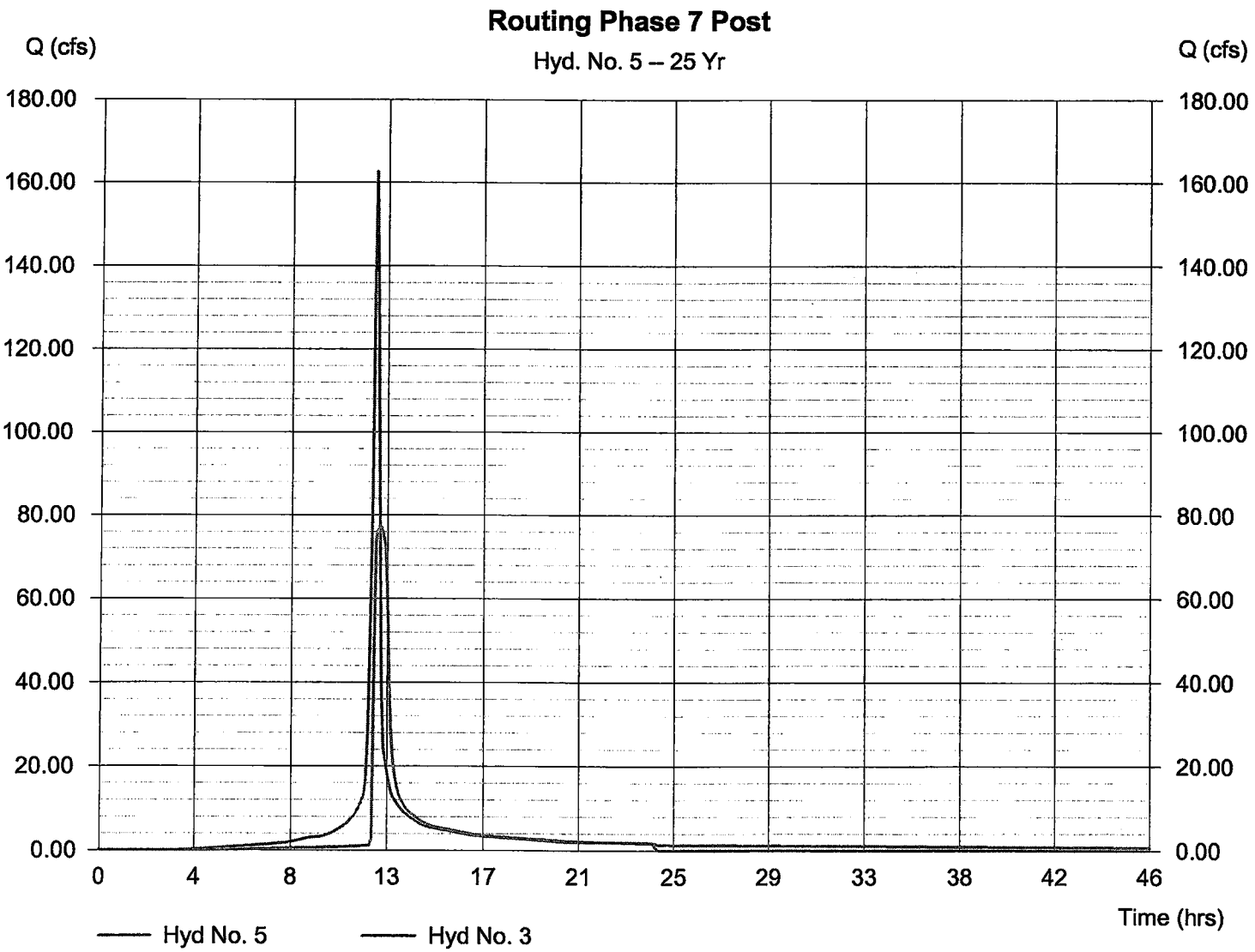
Hydraflow Hydrographs by Intelisolve | Tuesday, Jan 8 2008, 9:51 AM

Hyd. No. 5

Routing Phase 7 Post

Hydrograph type	= Reservoir	Peak discharge	= 77.39 cfs
Storm frequency	= 25 yrs	Time interval	= 5 min
Inflow hyd. No.	= 3	Max. Elevation	= 86.85 ft
Reservoir name	= Phase 7 Pond	Max. Storage	= 181,830 cuft

Storage Indication method used. | Hydrograph Volume = 460,254 cuft



APPENDIX D

TEMPORARY BEST MANAGEMENT PRACTICE (BMP) FACILITY

CHANNEL PROTECTION VOLUME
WATER QUALITY VOLUME
SEDIMENT FOREBAY
WEIGHTED CURVE NUMBER
DI-7 BOUYANCY CALCULATION
OUTLET PROTECTION
STORMWATER ROUTING 1, 2, 10 & 100 YEAR STORM

Storm Event	Incoming Flow (cfs)	Outgoing Flow (cfs)	Water Surface Elevation	PRE-DEVELOPMENT (cfs)
1	57.0	2.4	84.27	21.6
2	77.5	15.6	84.65	33.3
10	145.0	75.0	86.26	75.6
100	209.0	129.8	87.74	118.2

CONSULTING ENGINEERS

AES CONSULTING ENGINEERS
Williamsburg (757) 253-0040
Gloucester (804) 693-4450
Richmond (804) 330-8040

Project	New Town BMP B02
Project No.	6632-7-1
Subject	Pond # 1
Sheet No.	1 of 1
Calculated By	VAB Date 1/7/08

Channel Protection Volume:

Drainage Area = 26.4 Acres
Runoff Curve No. = 89
1-Yr, 24-Hr Storm Volume = 2.8 inches

Direct Runoff (From TR55 Equations 2-3 & 2-4)
Q = 1.72 inches

Channel Protection Volume = DA * Q * 60% (Virginia Stormwater Managment Handbook section 5-6.2 - Method 2)

Vcp = 45.41 Ac-in = **98,901** cubic feet

Determine Volume of Pond by Contour (starting at normal pool):

Elevation	Incremental Depth	Area (sq. ft.)	Volume (cu. ft.)	Volume (cu. yd.)	Sum Volume (cu. ft.)	Sum Volume (cu. yd.)	Incremental Avg Head[1] (feet)	Incremental Avg Flow[1] (feet)	Incremental Drawdown Time[1] (hrs)
80.0	0.0	13,919	-	-	-	-			
81.0	1.0	21,283	17,601	652	17,601	652	0.5	0.35	13.79
82.0	1.0	23,495	22,389	829	39,990	1,481	1.5	0.75	8.33
83.0	1.0	25,777	24,636	912	64,626	2,394	2.5	0.99	6.89
84.0	1.0	28,116	26,947	998	91,572	3,392	3.5	1.19	6.28
85.0	1.0	30,517	29,317	1,086	120,889	4,477	4.12	1.30	1.57
86.0	1.0	32,953	31,735	1,175	152,624	5,653	0.00	0.00	0.00
87.0	1.0	35,367	34,160	1,265	186,784	6,918	0.00	0.00	0.00
88.0	1.0	37,901	36,634	1,357	223,418	8,275	0.00	0.00	0.00
		Total	223,418	8,275					36.86

[1] Incremental values computed from Channel Protection Volume Elevation

Elevation of Normal Pool	=	80.00	feet
Elevation of 1-yr, 24-hr Storage Volume	=	84.25	feet
Size of Orifice	=	5.00	inches
Total Average Drawdown Time	=	**36.86**	**hrs**

>24 HRS, OK

BMP Water Quality Volumes

Elev.	Countour Area (in s.f.)	Storage (Between contours)	Cumulative Storage Volume
88	Area = 37901 s.f.		Cumulative Storage = 10469.2 c.y.
		Storage = 36634 c.f.= 1356.8 c.y.	
87	Area = 35367 s.f.		Cumulative Storage = 9112.4 c.y.
		Storage = 34160 c.f.= 1265.2 c.y.	
86	Area = 32953 s.f.		Cumulative Storage = 7847.2 c.y.
		Storage = 31735 c.f.= 1175.4 c.y.	
85	Area = 30517 s.f.		Cumulative Storage = 6671.8 c.y.
		Storage = 29317 c.f.= 1085.8 c.y.	
84	Area = 28116 s.f.		Cumulative Storage = 5586.0 c.y.
		Storage = 26947 c.f.= 998.0 c.y.	
83	Area = 25777 s.f.		Cumulative Storage = 4588.0 c.y.
		Storage = 24636 c.f.= 912.4 c.y.	
82	Area = 23495 s.f.		Cumulative Storage = 3675.6 c.y.
		Storage = 22389 c.f.= 829.2 c.y.	
81	Area = 21283 s.f.		Cumulative Storage = 2846.3 c.y.
		Storage = 17601 c.f.= 651.9 c.y.	
80	Area = 13919 s.f.		Cumulative Storage = 2194.5 c.y.
		Storage = 11454 c.f.= 424.2 c.y.	
79	Area = 8989 s.f.		Cumulative Storage = 1770.2 c.y.
		Storage = 8479 c.f.= 314.1 c.y.	
78	Area = 7970 s.f.		Cumulative Storage = 1456.2 c.y.
		Storage = 7490 c.f.= 277.4 c.y.	
77	Area = 7010 s.f.		Cumulative Storage = 1178.8 c.y.
		Storage = 6556 c.f.= 242.8 c.y.	
76	Area = 6103 s.f.		Cumulative Storage = 935.9 c.y.
		Storage = 5675 c.f.= 210.2 c.y.	
75	Area = 5247 s.f.		Cumulative Storage = 725.8 c.y.
		Storage = 4842 c.f.= 179.3 c.y.	
74	Area = 4438 s.f.		Cumulative Storage = 546.4 c.y.
		Storage = 4056 c.f.= 150.2 c.y.	
73	Area = 3675 s.f.		Cumulative Storage = 396.2 c.y.
		Storage = 3316 c.f.= 122.8 c.y.	
72	Area = 2957 s.f.		Cumulative Storage = 273.4 c.y.
		Storage = 2621 c.f.= 97.1 c.y.	
71	Area = 2284 s.f.		Cumulative Storage = 176.3 c.y.
		Storage = 1970 c.f.= 73.0 c.y.	
70	Area = 1656 s.f.		Cumulative Storage = 103.4 c.y.
		Storage = 1378 c.f.= 51.0 c.y.	
69	Area = 1099 s.f.		Cumulative Storage = 52.3 c.y.
		Storage = 886 c.f.= 32.8 c.y.	
68	Area = 673 s.f.		Cumulative Storage = 19.5 c.y.
		Storage = 527 c.f.= 19.5 c.y.	
67	Area = 380 s.f.		Cumulative Storage = 0.0 c.y.
		Storage = 0 c.f.= 0.0 c.y.	

AES Consulting Engineers
Project #6632-7-1

Section 7 - Roadway Phase VII
James City County

Volume Required
2 * WQV
WQV = 1/2" per impervious acre

Impervious Area =	16.3 acre	
Wet WQV =	29585 c.f.	
Wet Volume Required =	59170 c.f.	
Wet WQV Volume Provided =	2194.5 c.y.	At Elevation 80.00
Wet WQV Volume Provided =	59250 c.f.	

Adequate Water Quality Volume is provided in BMP

Dry WQV =	29585 c.f.	
Dry Volume Required =	59170 c.f.	
Dry WQV Volume Provided =	3391.6 c.y.	At Elevation 84.00
Dry WQV Volume Provided =	91572 c.f.	

Adequate Water Quality Volume is provided in BMP

BMP Sediment Forebay Volumes

Elev.	Countour Area (in s.f.)	Storage (Between contours)	Cumulative Storage Volume
79.5	Area = 2680 s.f.		Cumulative Storage = 440.6 c.y.
		Storage = 1197 c.f.= 44.3 c.y.	
79	Area = 2106 s.f.		Cumulative Storage = 396.3 c.y.
		Storage = 1975 c.f.= 73.2 c.y.	
78	Area = 1845 s.f.		Cumulative Storage = 323.1 c.y.
		Storage = 1722 c.f.= 63.8 c.y.	
77	Area = 1600 s.f.		Cumulative Storage = 259.3 c.y.
		Storage = 1486 c.f.= 55.0 c.y.	
76	Area = 1372 s.f.		Cumulative Storage = 204.3 c.y.
		Storage = 1267 c.f.= 46.9 c.y.	
75	Area = 1161 s.f.		Cumulative Storage = 157.3 c.y.
		Storage = 1064 c.f.= 39.4 c.y.	
74	Area = 967 s.f.		Cumulative Storage = 117.9 c.y.
		Storage = 879 c.f.= 32.6 c.y.	
73	Area = 790 s.f.		Cumulative Storage = 85.4 c.y.
		Storage = 710 c.f.= 26.3 c.y.	
72	Area = 630 s.f.		Cumulative Storage = 59.1 c.y.
		Storage = 559 c.f.= 20.7 c.y.	
71	Area = 487 s.f.		Cumulative Storage = 38.4 c.y.
		Storage = 423 c.f.= 15.7 c.y.	
70	Area = 360 s.f.		Cumulative Storage = 22.7 c.y.
		Storage = 304 c.f.= 11.2 c.y.	
69	Area = 247 s.f.		Cumulative Storage = 11.5 c.y.
		Storage = 199 c.f.= 7.4 c.y.	
68	Area = 150 s.f.		Cumulative Storage = 4.1 c.y.
		Storage = 111 c.f.= 4.1 c.y.	
67	Area = 71 s.f.		Cumulative Storage = 0.0 c.y.
		Storage = 0 c.f.= 0.0 c.y.	

Volume Required
10% of Water Quality Volume Required
WQV = 59170.0 CF

Volume Required = 5917 c.f.

WQV Volume Provided = 440.6 c.y. At Elevation 79.50
WQV Volume Provided = 11895 c.f.

Adequate Volume is provided in Forebay

CONSULTING ENGINEERS

Williamsburg (757) 253-0040
Gloucester (804) 693-4450
Richmond (804) 330-8040

Project:	New Town - Phase VII
Project No.:	7/1/6632
Subject:	Runoff Curve Number
Date:	January 8, 2008
Calculated By:	REC

Subject Area: Total BMP Drainage Area

Soil Name and Hydrologic Group	Cover Description	CN	Area	CN x Area
				0
C	Served by LID	72	2.6	187.2
C	Open Space/Lawn/Wooded	74	2.5	185
C	Single Family Lots	91	6.3	573.3
C	Commercial/Townhomes	94	15	1410
				0
				0
		Totals =	26.4	2355.5

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{2355.5}{26.4} = 89.2$$

Use CN = **89**

NEW TOWN PHASE VII ROADWAYS
BMP BUOYANCY CALCULATIONS
July 3, 2007

Note: THESE CALCULATION PROVIDED TO INSURE THE PRINCIPAL SPILLWAY / RISER DOES NOT HAS THE TENDENCY TO FLOAT.

ELEVATIOIN OF RISER CREST =	84.20	
ELEVATION OF INVERT OF RISER =	73.90	
WIDTH OF RISER =	3	feet
LENGTH OF RISER =	3	feet
THICKNESS OF STRUCTURE =	8	inches
BOTTOM THICKNESS OF STRUCTURE	8	inches

WEIGHT OF WATER DISPLACED BY STRUCTURE

Volume of Riser =	205.93	
Weight of water displaced by air		Weight of water per cu. Ft. * Volume of Riser
Weight of water displaced by air	12,850	lbs.

WEIGHT OF PRINCIPAL SPILLWAY / RISER

Volume of Concrete = (Volume of Riser - Inside Volume of Air)	113.23	
Weight of concrete of riser =		Weight of concrete per cu. Ft. * Volume of Concrete
Weight of Concrete Riser =	16,984	lbs.
Weight of Grate =	200	lbs.
Total Weight of Riser =	17,184	lbs.

Total Weight of Riser > Weight of Water Displaced, i.e. Will not float !
Safety Factor = 1.3

AES CONSULTING ENGINEERS

Williamsburg (757) 253-0040
Gloucester (804) 693-4450
Richmond (804) 330-8040

Project	New Town Phase 7
Project No.	6632-7-01
Subject	Riprap Basin For Circular Culvert
Date	November 2, 2007
Calculated By	REC

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

Outfall Description: **BMP B02**

Pipe Diameter (D) or (W_o) = **2.50** FT.

Flow (Q) = **74.00** CFS

Tailwater Depth (TW) = **1.00** FT.

Determine brink depth (y_o):

$$(K_u)\frac{Q}{D^{2.5}} = (1)\frac{74}{9.88} = 7.49$$

$$\frac{TW}{D} = \frac{1.00}{2.50} = 0.40$$

y_o / D = **1.00** From Figure 3.4

$$y_o = \underset{y_o/D}{1} \times \underset{D}{2.50} = 2.50 \text{ FT.}$$

Determine culvert outlet velocity (V_o):

$$\frac{TW}{y_o} = \frac{1.00}{2.50} = 0.400$$

A / D^2 = **0.7854** From Table B.2 where y_o / D = d / D

$$A = A/D^2 \times D^2 = 0.7854 \times 6.25 = 4.91 \text{ SF}$$
$$V_o = Q \div A = 74.0 \div 4.91 = 15.1 \text{ FT/S}$$

Determine Froude number (Fr):

$$y_e = (A/2)^{1/2} = 1.57 \text{ FT.}$$
$$Fr = V_o / [(32.2)(y_e)]^{1/2} = 2.12$$

Try d_{50} / y_e = **0.69** d_{50} = **0.69** x **1.57** = **1.08** FT. or **13.0** IN.

Tailwater Parameter, C_o	Equation 10.2		
TW / y_e = **1.00** ÷ **1.57** = **0.64**			
$TW / y_e < 0.75$	C_o	=	1.4
$0.75 < TW / y_e < 1.0$	C_o	=	$4.0 (TW/y_e) - 1.6$
		=	4.0 (**0.64**) - 1.6 = **0.95**
$1.0 < TW / y_e$	C_o	=	2.4

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

h_s / y_e = 0.86 (**0.69** $)^{-0.55}$ (**2.12**) - **1.40**

h_s / y_e = **0.8386**

h_s = **0.8386** x **1.57** = **1.31** FT.

Check

hs / d_{50} = **1.22** ≥ 2 OK

d_{50} / y_e = **0.69** ≥ 0.1 OK

Riprap Basin Size

Length of Dissipator Pool

L_s = 10 x h_s = **13.1** FT.

or L_s = 3 x W_o = **7.5** FT. Use Larger Value L_s = **13.0** FT.

Total Length

L_B = 15 x h_s = **19.7** FT.

or L_B = 4 x W_o = **10.0** FT. Use Larger Value L_B = **20.0** FT.

Width of Apron

W_B = W_o + 2 (L_B/3) = **15.8** FT.

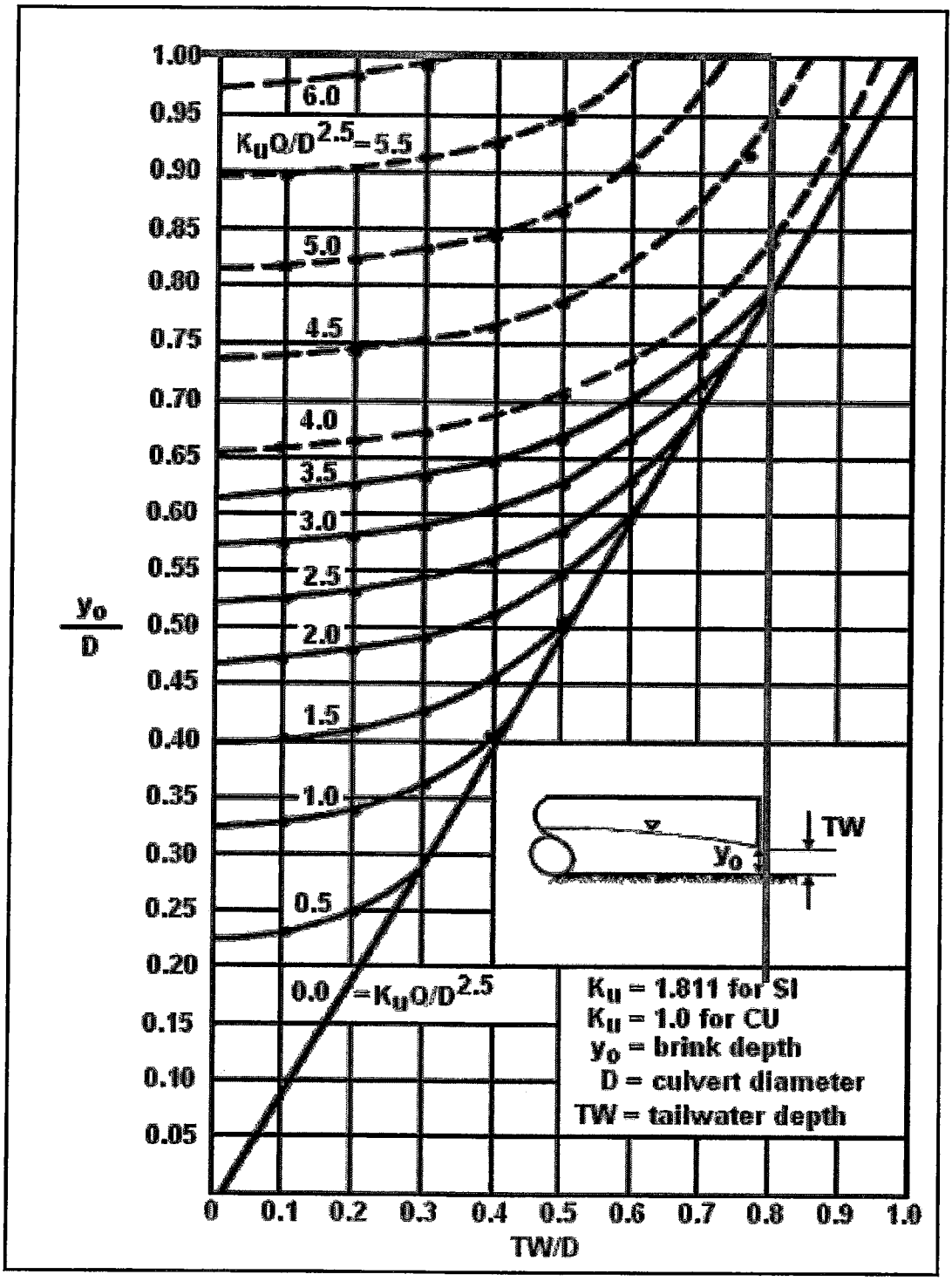


Figure 3.4. Dimensionless Rating Curves for the Outlets of Circular Culverts on Horizontal and Mild Slopes (Simons, 1970)

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

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

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

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

Pond Report

Hydraflow Hydrographs by Intelisolve — Tuesday, Jan 8 2008, 9:51 AM

Pond No. 1 - Phase 7 Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	80.00	13,919	0	0
1.00	81.00	21,283	17,601	17,601
2.00	82.00	23,495	22,389	39,990
3.00	83.00	25,777	24,636	64,626
4.00	84.00	28,116	26,947	91,573
5.00	85.00	30,517	29,317	120,889
6.00	86.00	32,953	31,735	152,624
7.00	87.00	35,367	34,160	186,784
8.00	88.00	37,901	36,634	223,418
9.00	89.00	41,003	39,452	262,870

Culvert / Orifice Structures

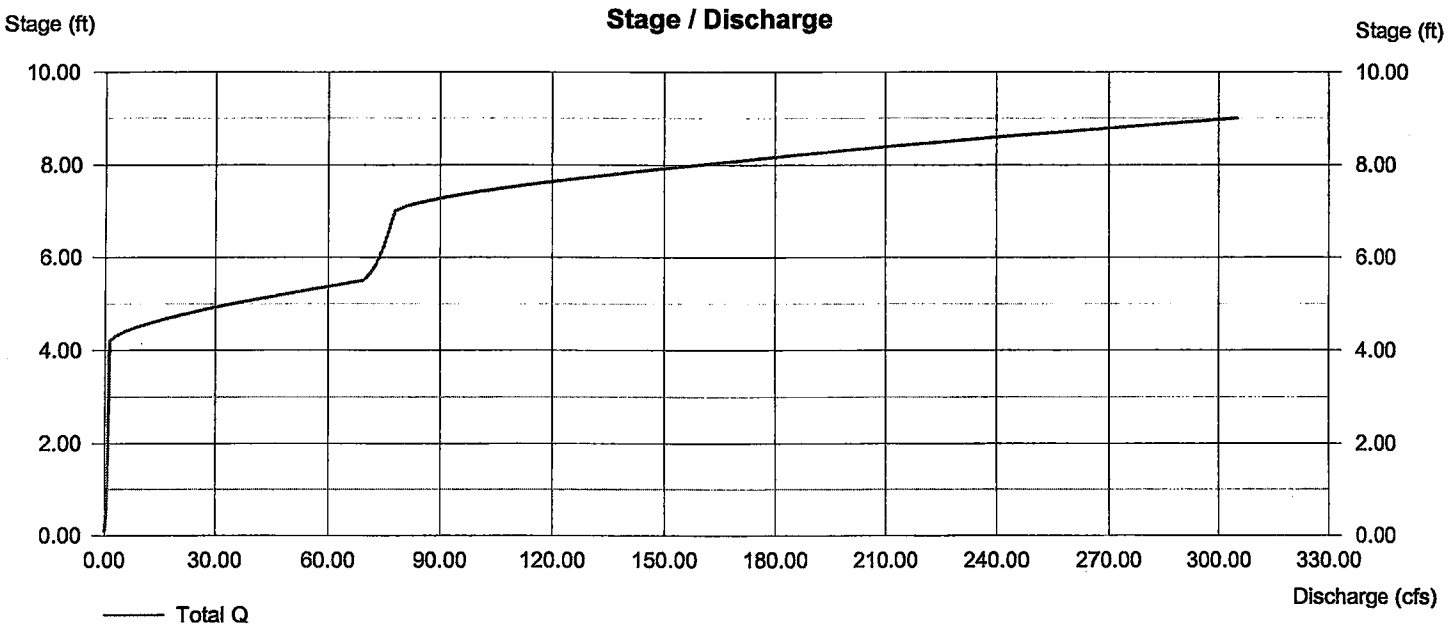
	[A]	[B]	[C]	[D]
Rise (in)	= 30.00	5.00	0.00	0.00
Span (in)	= 30.00	5.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 73.90	80.00	0.00	0.00
Length (ft)	= 178.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	0.00
N-Value	= .013	.013	.000	.000
Orif. Coeff.	= 0.60	0.60	0.00	0.00
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 14.00	30.00	0.00	0.00
Crest El. (ft)	= 84.20	87.00	0.00	0.00
Weir Coeff.	= 3.33	2.60	0.00	0.00
Weir Type	= Rect	Broad	---	---
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Return Period Recap

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	------	21.56	33.25	------	------	75.64	87.16	------	118.18	Phase 7 Pre
3	SCS Runoff	------	57.04	77.51	------	------	145.03	162.54	------	208.96	Phase 7 Post
5	Reservoir	3	2.41	15.63	------	------	75.00	77.39	------	129.85	Routing Phase 7 Post

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	21.56	5	725	79,616	---	-----	-----	Phase 7 Pre
3	SCS Runoff	57.04	5	720	154,533	---	-----	-----	Phase 7 Post
5	Reservoir	2.41	5	840	154,470	3	84.27	99,589	Routing Phase 7 Post

Hydrograph Plot

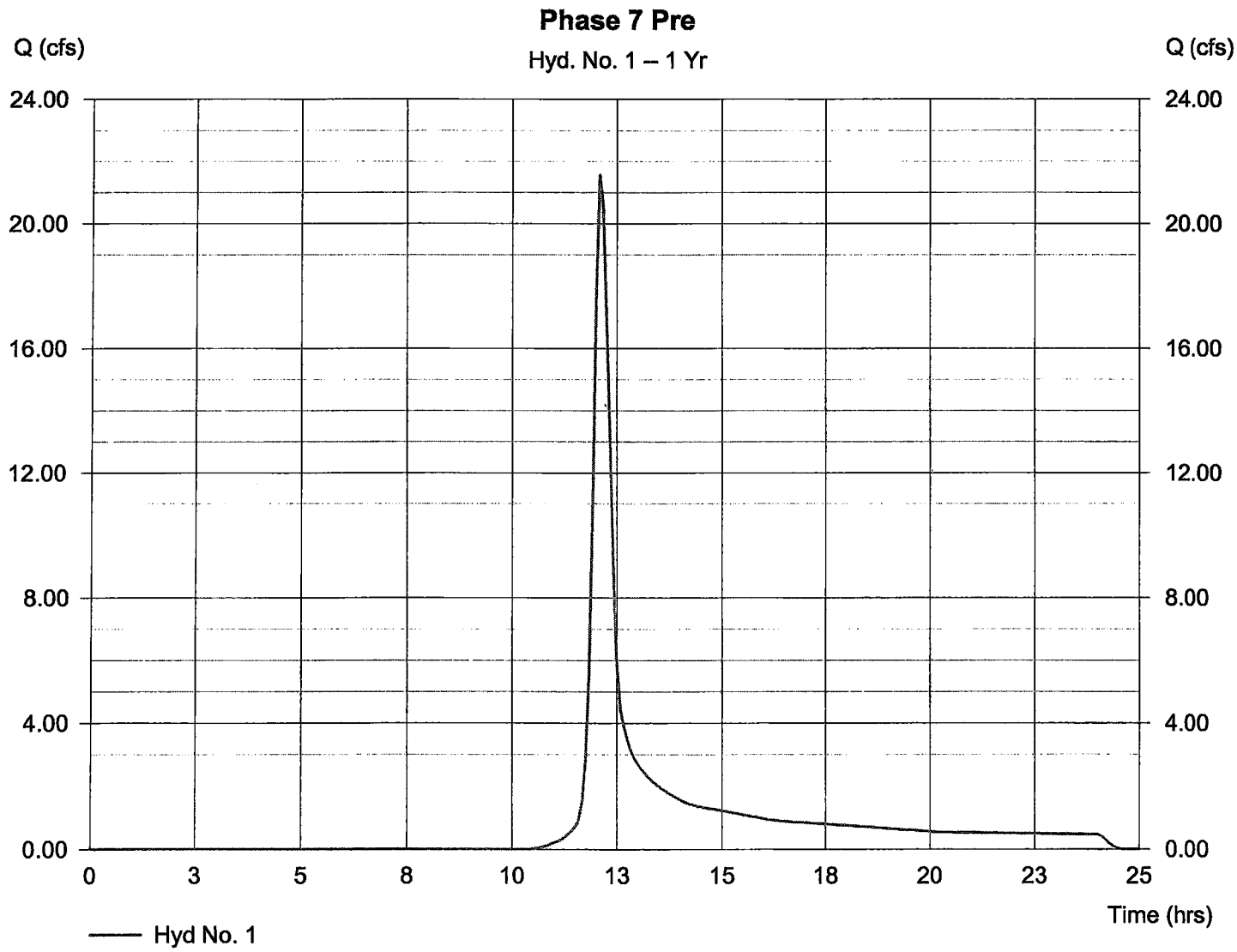
Hydraflow Hydrographs by Intelisolve | Tuesday, Jan 8 2008, 9:51 AM

Hyd. No. 1

Phase 7 Pre

Hydrograph type	= SCS Runoff	Peak discharge	= 21.56 cfs
Storm frequency	= 1 yrs	Time interval	= 5 min
Drainage area	= 21.00 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 2.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 79,616 cuft



Hydrograph Plot

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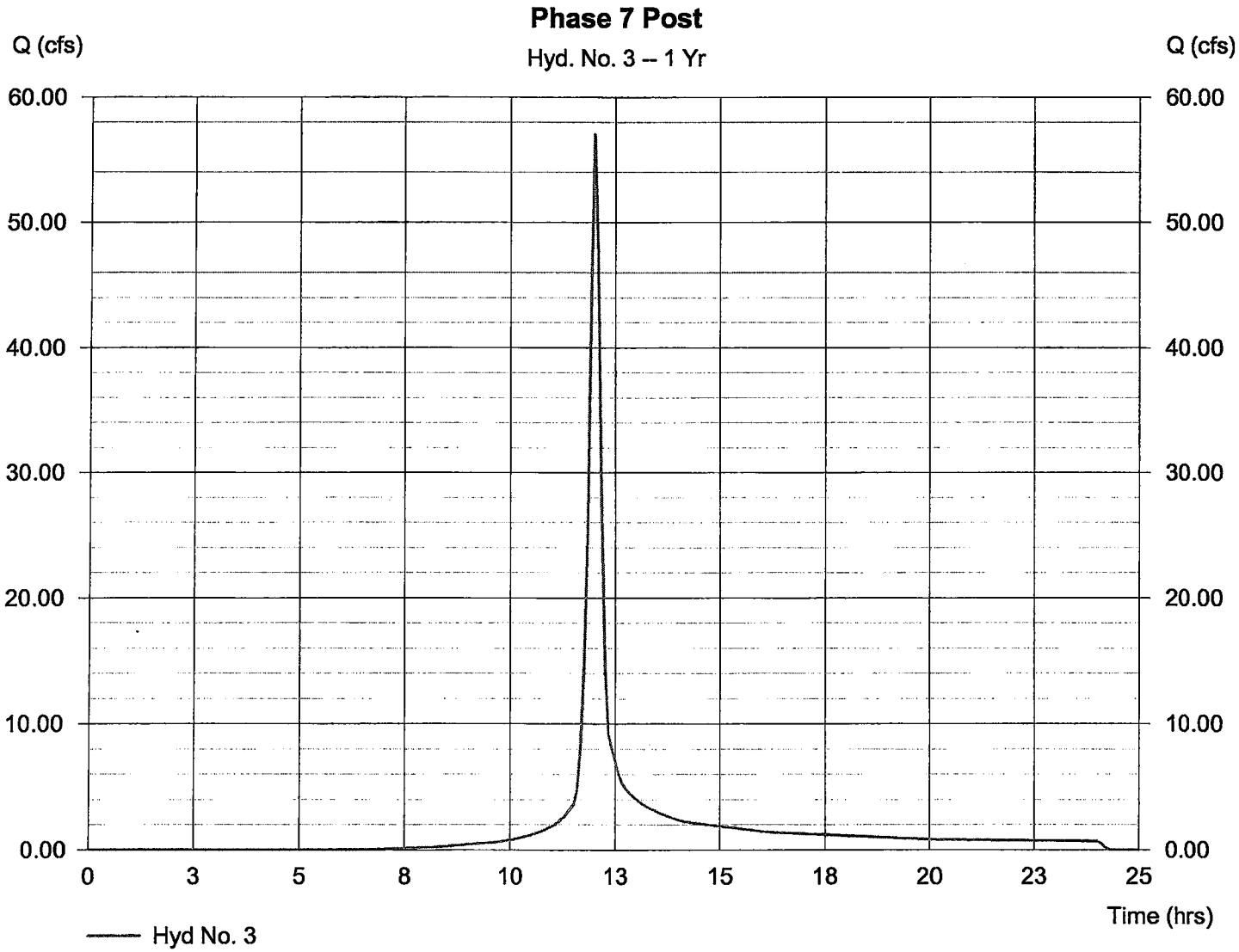
Hyd. No. 3

Phase 7 Post

Hydrograph type	= SCS Runoff	Peak discharge	= 57.04 cfs
Storm frequency	= 1 yrs	Time interval	= 5 min
Drainage area	= 26.40 ac	Curve number	= 89
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15 min
Total precip.	= 2.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 154,533 cuft



Hydrograph Plot

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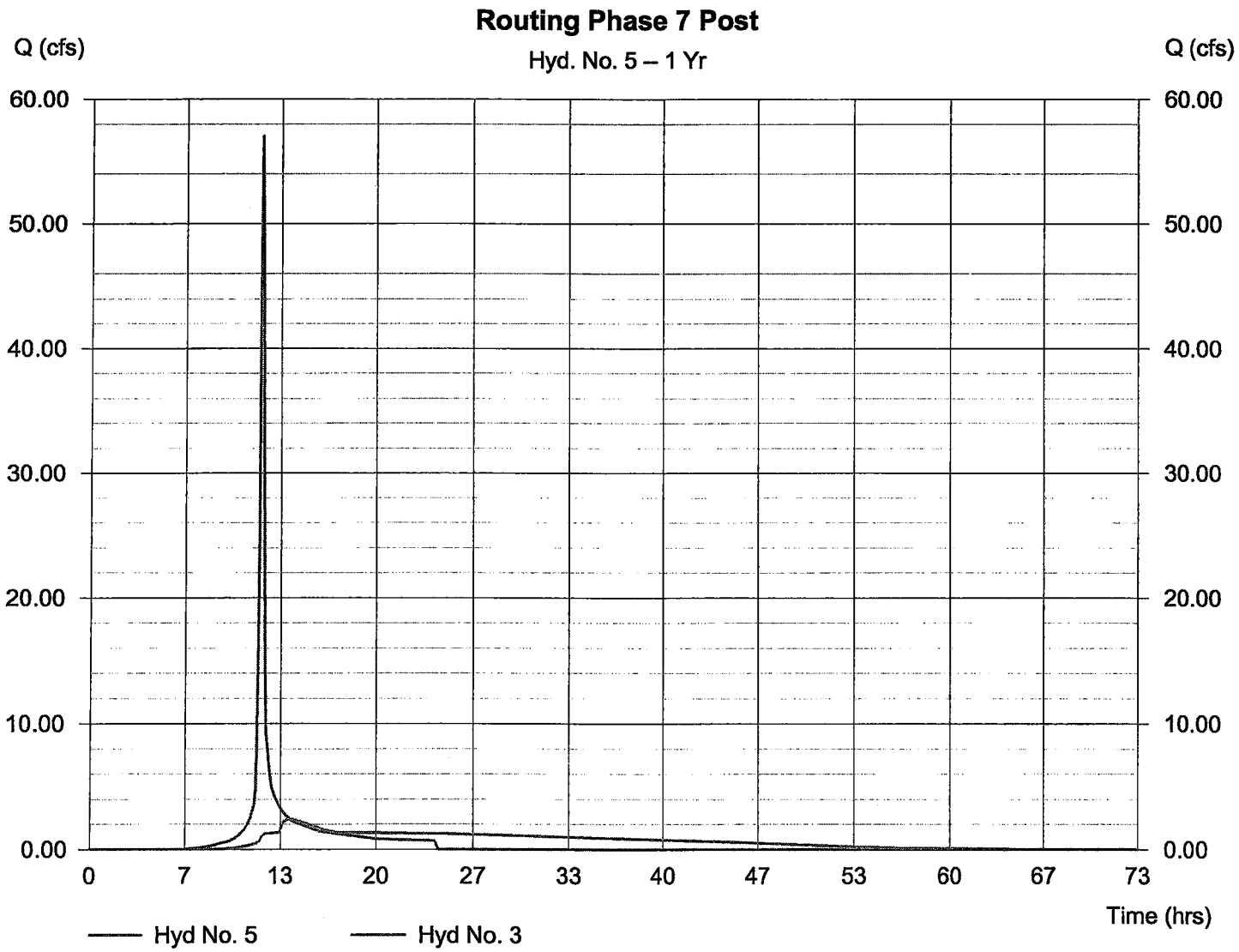
Hyd. No. 5

Routing Phase 7 Post

Hydrograph type	= Reservoir	Peak discharge	= 2.41 cfs
Storm frequency	= 1 yrs	Time interval	= 5 min
Inflow hyd. No.	= 3	Max. Elevation	= 84.27 ft
Reservoir name	= Phase 7 Pond	Max. Storage	= 99,589 cuft

Storage Indication method used. | Hydrograph Volume = 154,470 cuft



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	33.25	5	725	119,375	—	—	—	Phase 7 Pre
3	SCS Runoff	77.51	5	720	211,773	—	—	—	Phase 7 Post
5	Reservoir	15.63	5	740	211,710	3	84.65	110,694	Routing Phase 7 Post

Hydrograph Plot

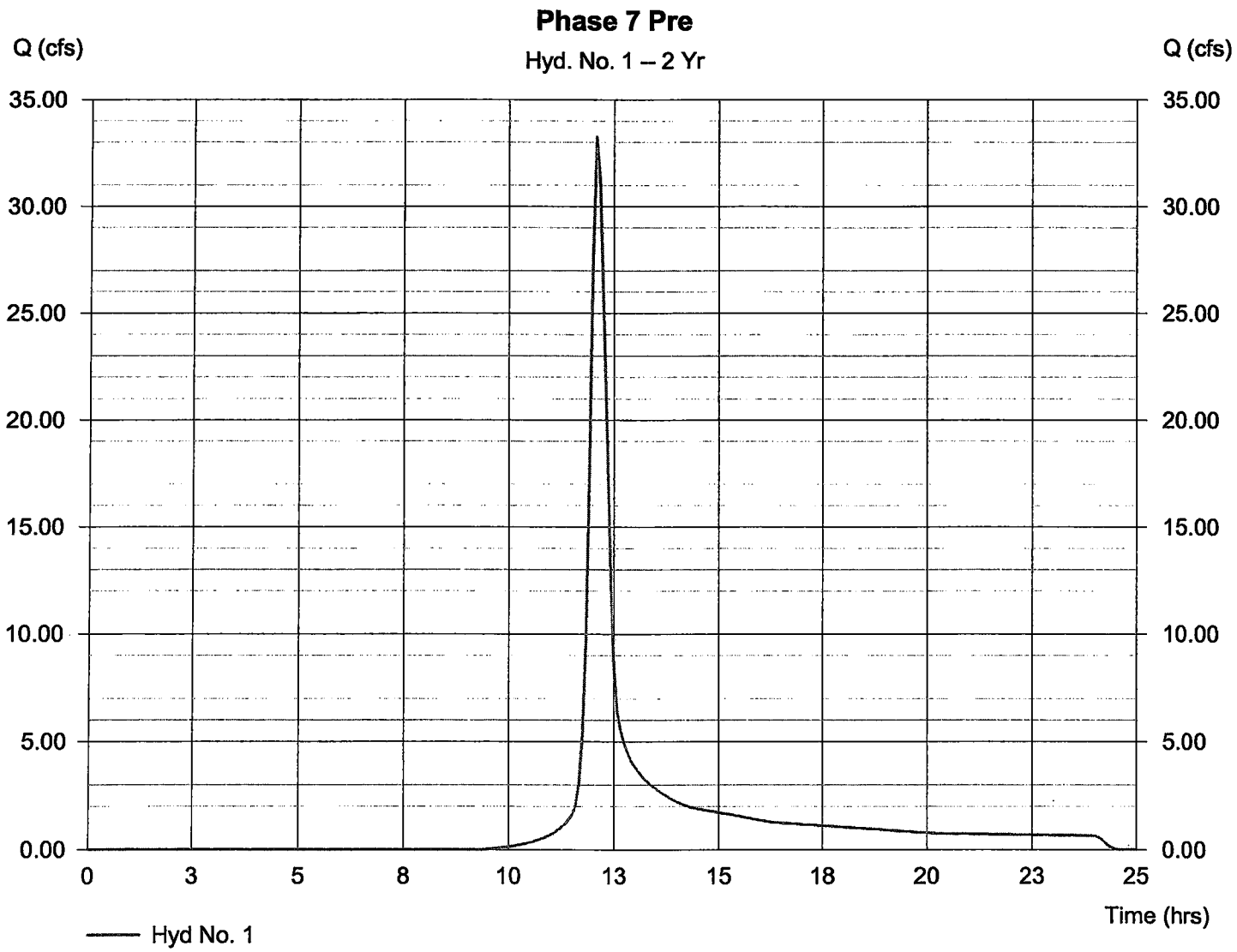
Hydraflow Hydrographs by Intelisolve | Tuesday, Jan 8 2008, 9:51 AM

Hyd. No. 1

Phase 7 Pre

Hydrograph type	= SCS Runoff	Peak discharge	= 33.25 cfs
Storm frequency	= 2 yrs	Time interval	= 5 min
Drainage area	= 21.00 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 3.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 119,375 cuft



Hydrograph Plot

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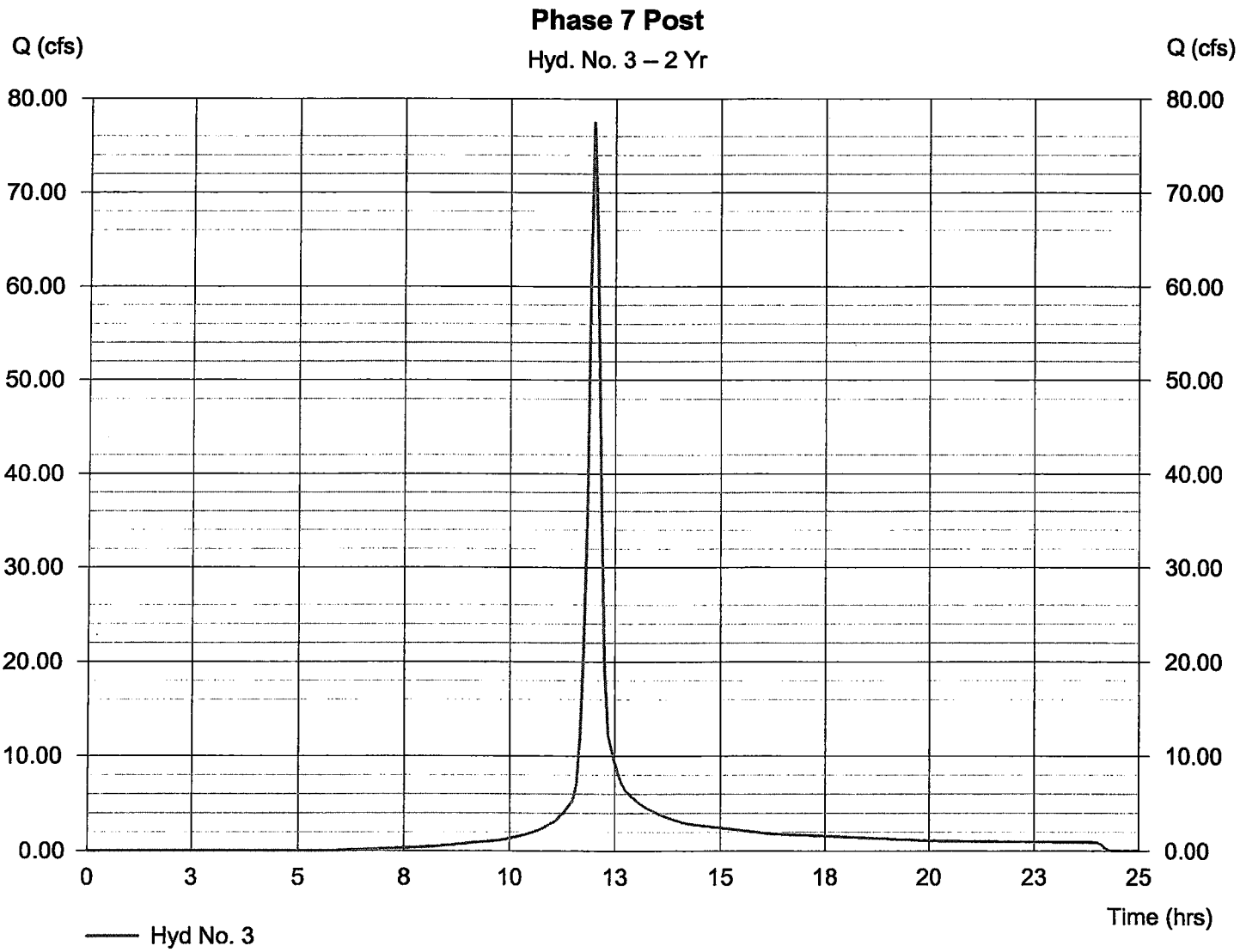
Hyd. No. 3

Phase 7 Post

Hydrograph type	= SCS Runoff	Peak discharge	= 77.51 cfs
Storm frequency	= 2 yrs	Time interval	= 5 min
Drainage area	= 26.40 ac	Curve number	= 89
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15 min
Total precip.	= 3.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 211,773 cuft



Hydrograph Plot

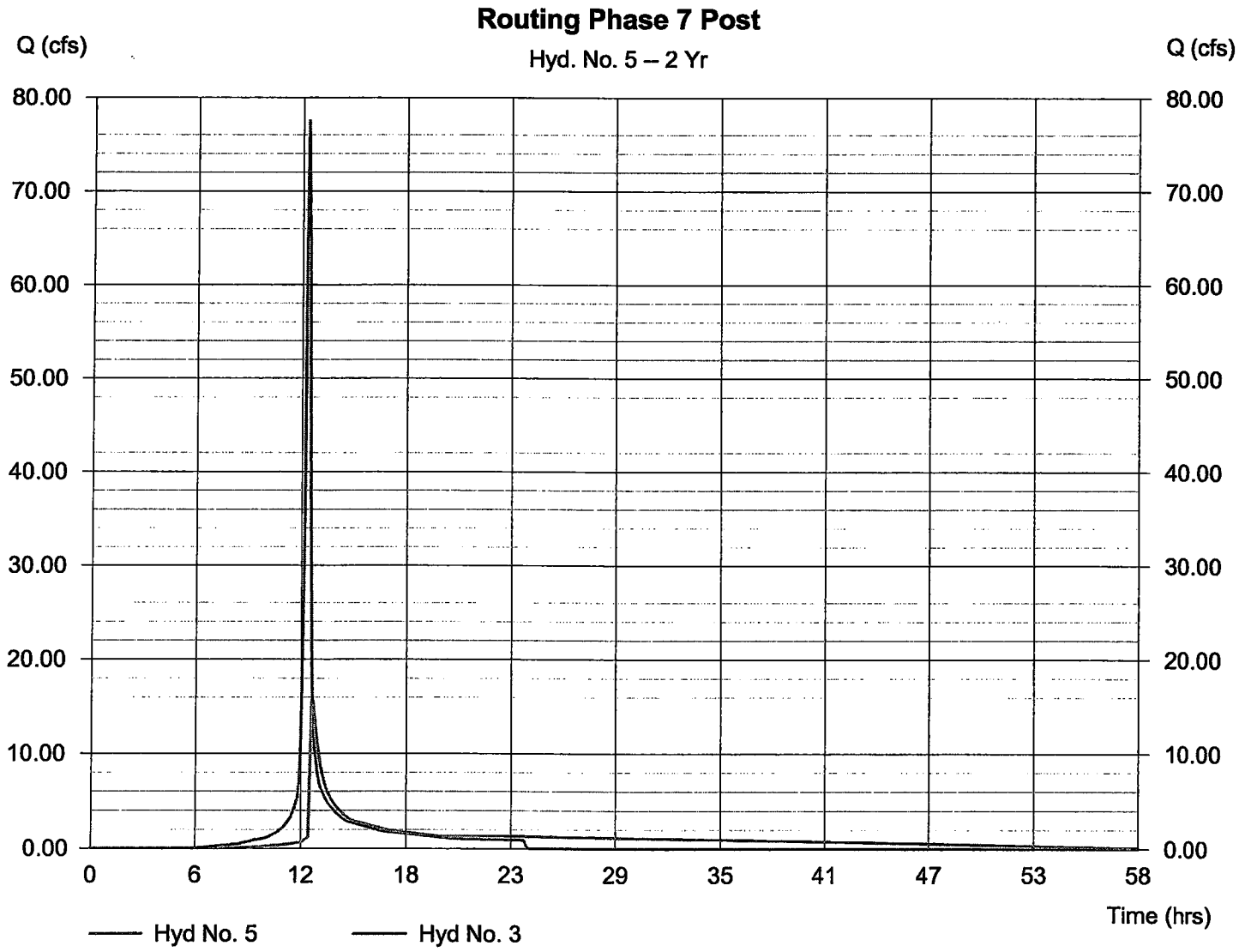
Hydraflow Hydrographs by Intelisolve | Tuesday, Jan 8 2008, 9:51 AM

Hyd. No. 5

Routing Phase 7 Post

Hydrograph type	= Reservoir	Peak discharge	= 15.63 cfs
Storm frequency	= 2 yrs	Time interval	= 5 min
Inflow hyd. No.	= 3	Max. Elevation	= 84.65 ft
Reservoir name	= Phase 7 Pond	Max. Storage	= 110,694 cuft

Storage Indication method used. | Hydrograph Volume = 211,710 cuft



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	75.64	5	725	266,925	—	—	—	Phase 7 Pre
3	SCS Runoff	145.03	5	720	408,053	—	—	—	Phase 7 Post
5	Reservoir	75.00	5	730	407,990	3	86.26	161,566	Routing Phase 7 Post

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

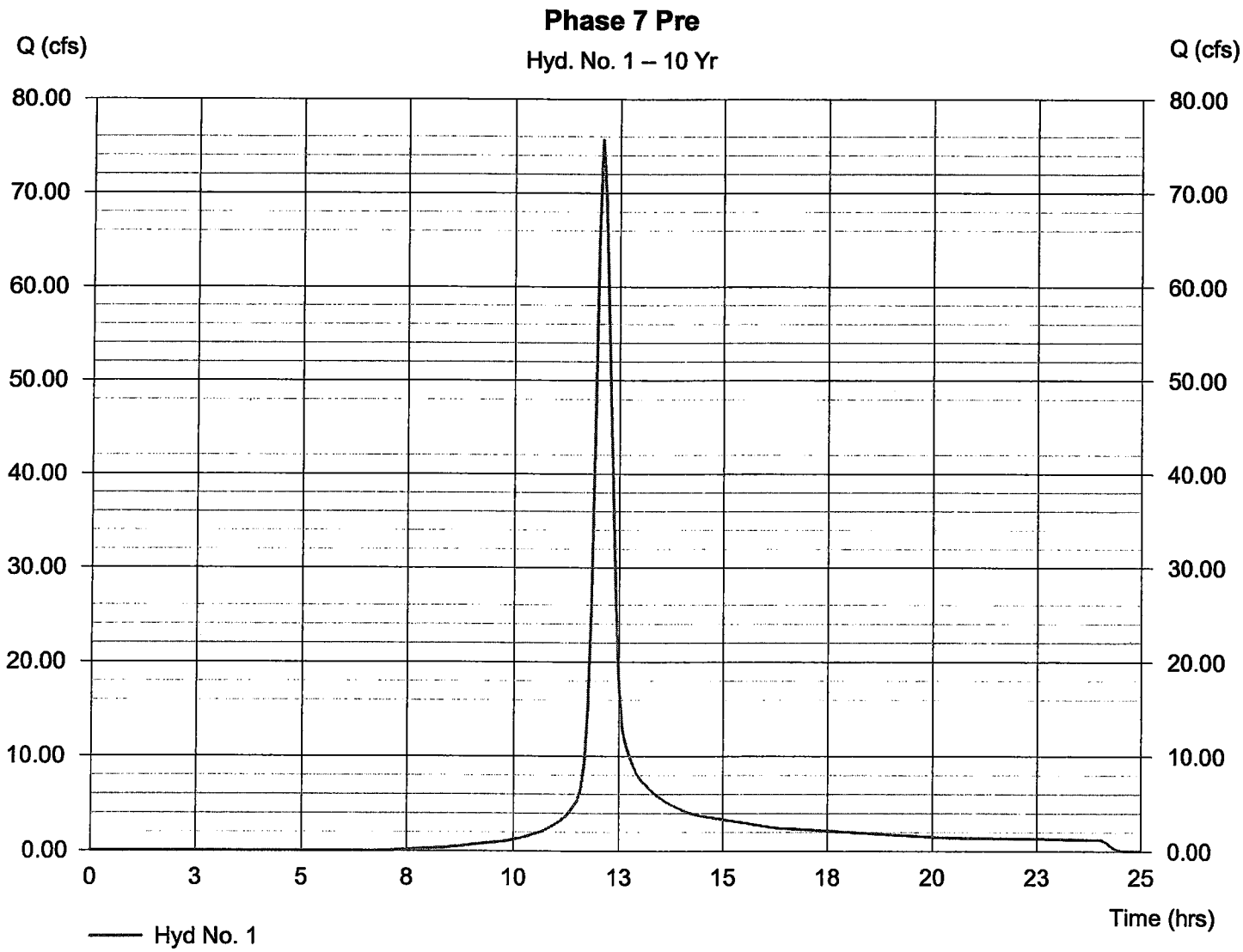
Tuesday, Jan 8 2008, 9:51 AM

Hyd. No. 1

Phase 7 Pre

Hydrograph type	= SCS Runoff	Peak discharge	= 75.64 cfs
Storm frequency	= 10 yrs	Time interval	= 5 min
Drainage area	= 21.00 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 5.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 266,925 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

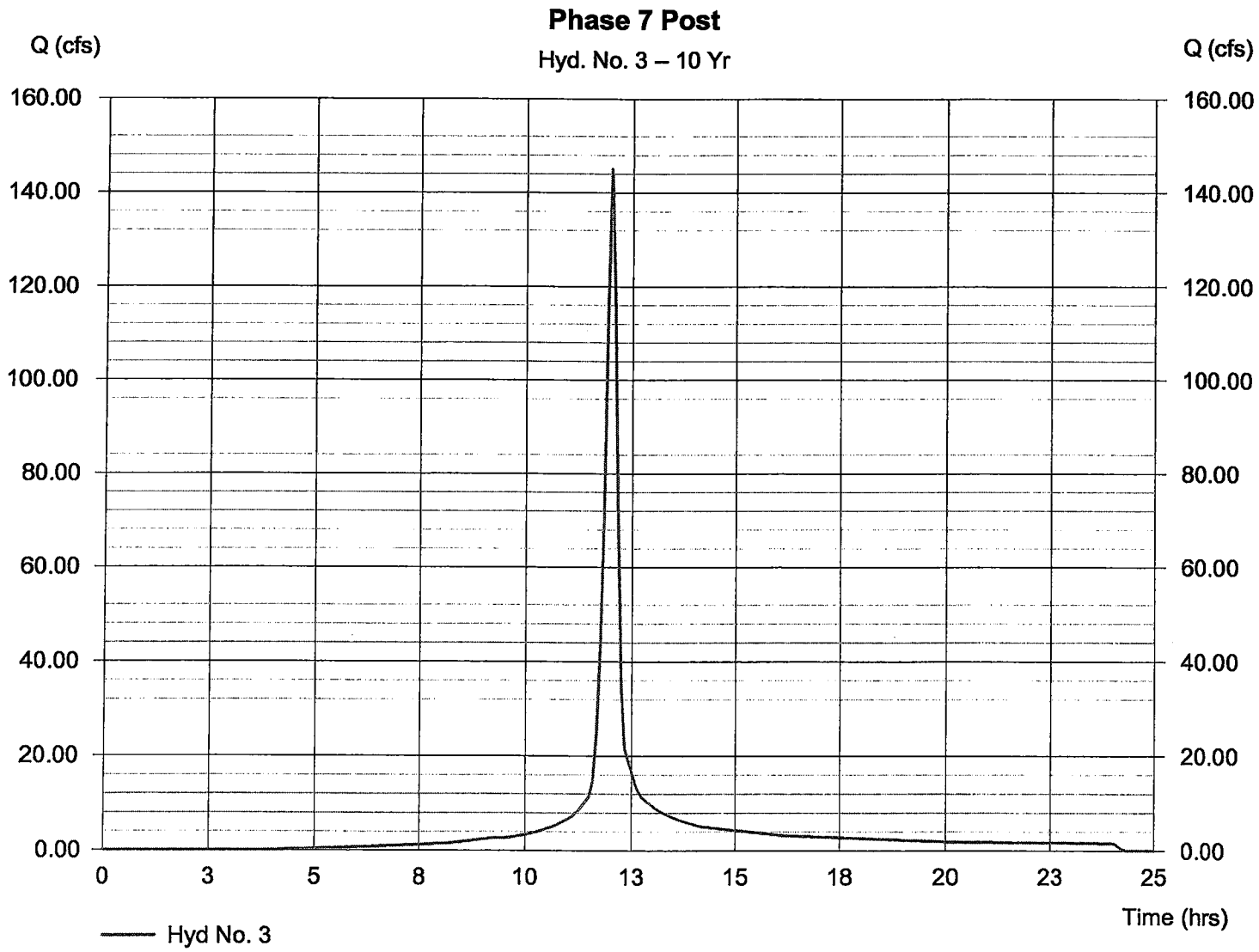
Tuesday, Jan 8 2008, 9:51 AM

Hyd. No. 3

Phase 7 Post

Hydrograph type	= SCS Runoff	Peak discharge	= 145.03 cfs
Storm frequency	= 10 yrs	Time interval	= 5 min
Drainage area	= 26.40 ac	Curve number	= 89
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15 min
Total precip.	= 5.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 408,053 cuft



Hydrograph Plot

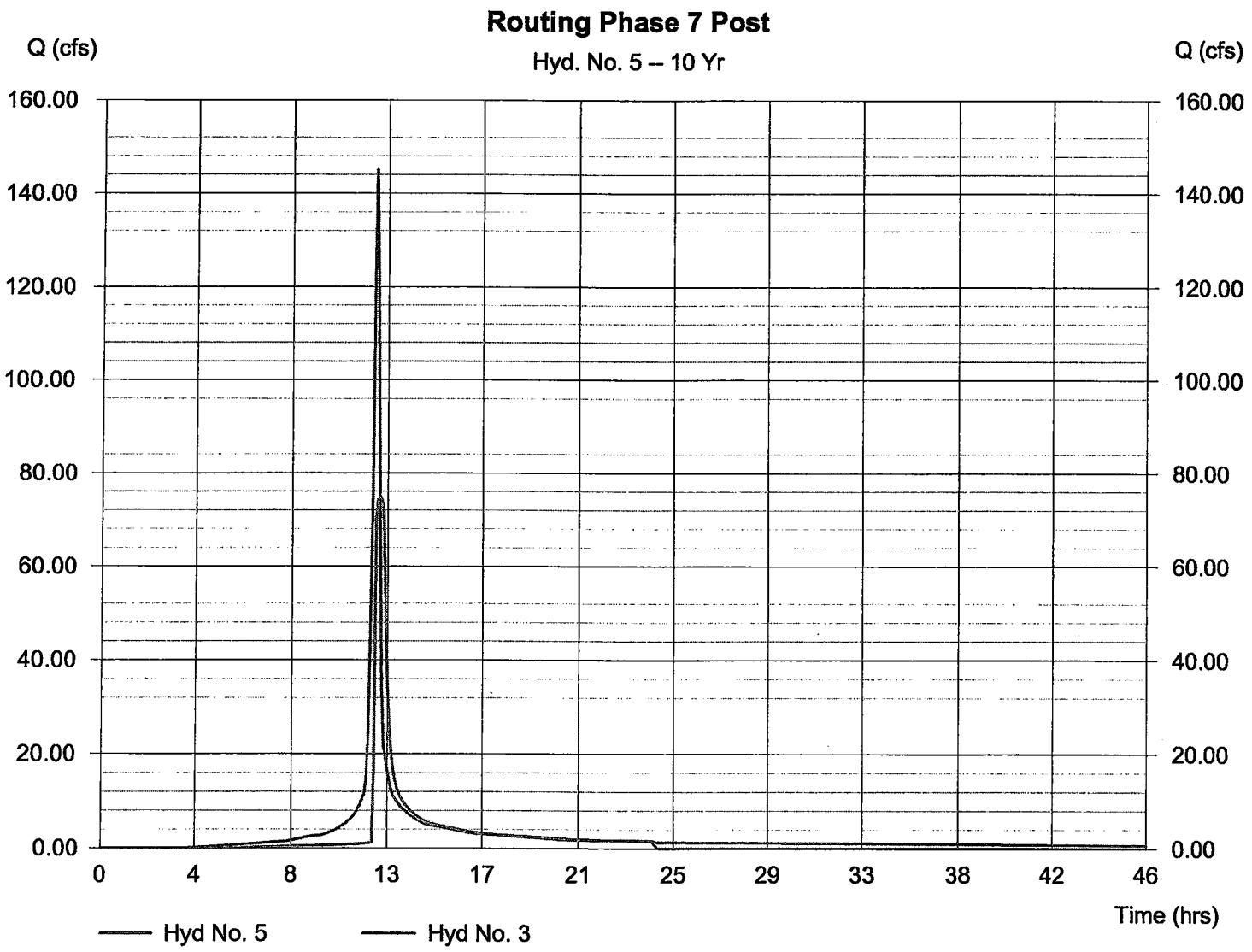
Hydraflow Hydrographs by Intelisolve | Tuesday, Jan 8 2008, 9:51 AM

Hyd. No. 5

Routing Phase 7 Post

Hydrograph type	= Reservoir	Peak discharge	= 75.00 cfs
Storm frequency	= 10 yrs	Time interval	= 5 min
Inflow hyd. No.	= 3	Max. Elevation	= 86.26 ft
Reservoir name	= Phase 7 Pond	Max. Storage	= 161,566 cuft

Storage Indication method used. | Hydrograph Volume = 407,990 cuft



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	118.18	5	725	419,867	---	-----	-----	Phase 7 Pre
3	SCS Runoff	208.96	5	720	600,758	---	-----	-----	Phase 7 Post
5	Reservoir	129.85	5	730	600,695	3	87.74	213,795	Routing Phase 7 Post

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

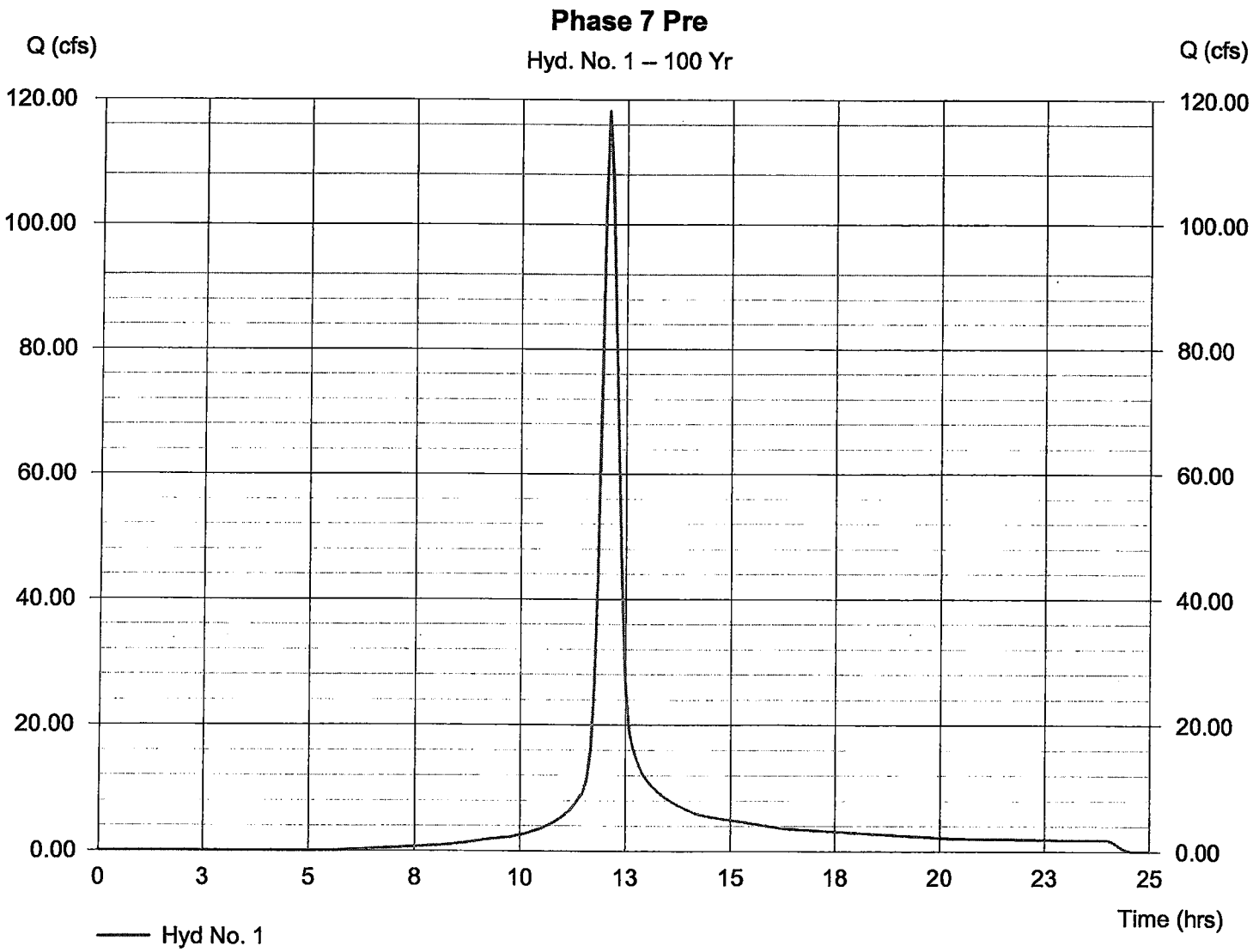
Tuesday, Jan 8 2008, 9:51 AM

Hyd. No. 1

Phase 7 Pre

Hydrograph type	= SCS Runoff	Peak discharge	= 118.18 cfs
Storm frequency	= 100 yrs	Time interval	= 5 min
Drainage area	= 21.00 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 8.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 419,867 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

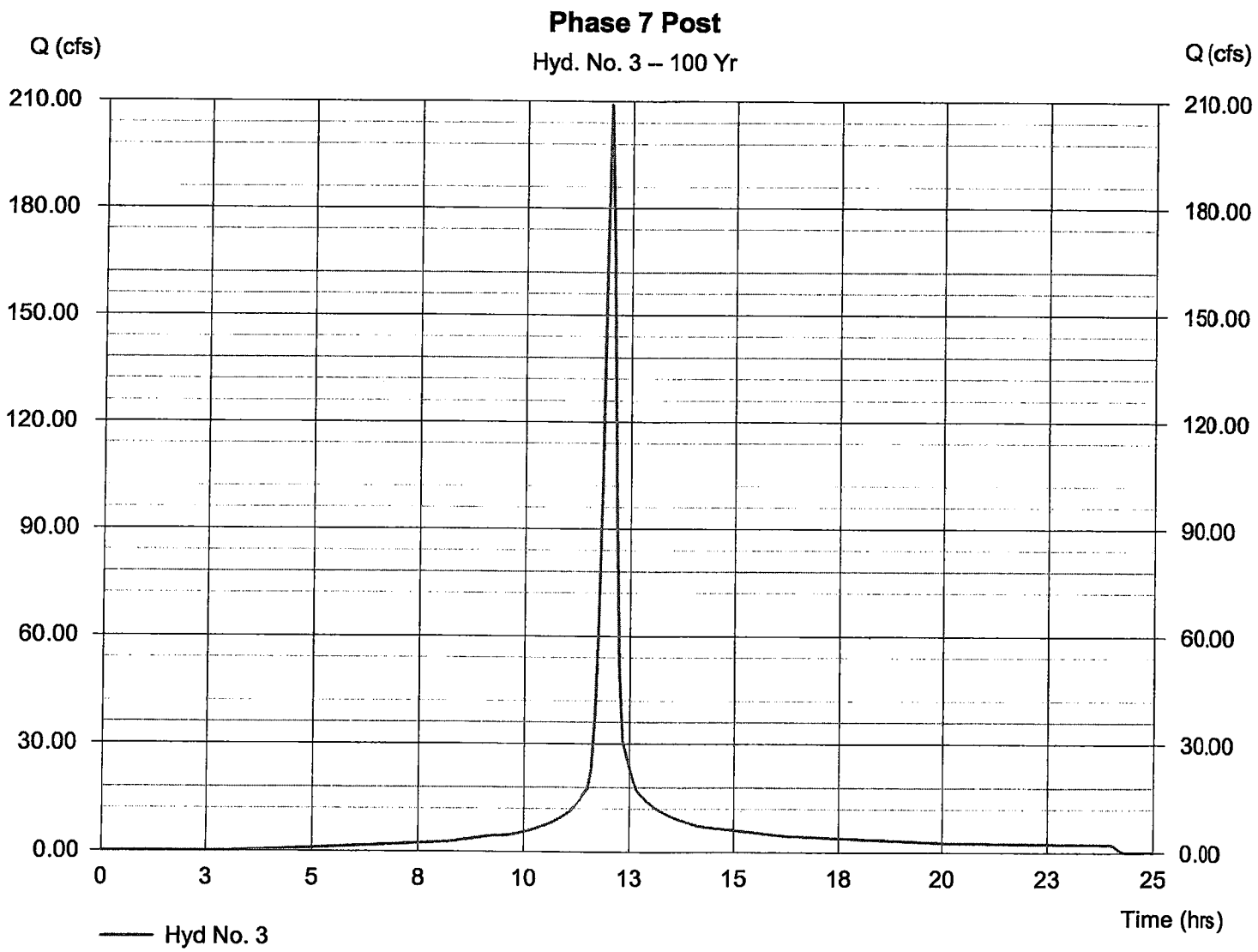
Tuesday, Jan 8 2008, 9:51 AM

Hyd. No. 3

Phase 7 Post

Hydrograph type	= SCS Runoff	Peak discharge	= 208.96 cfs
Storm frequency	= 100 yrs	Time interval	= 5 min
Drainage area	= 26.40 ac	Curve number	= 89
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15 min
Total precip.	= 8.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 600,758 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Tuesday, Jan 8 2008, 9:51 AM

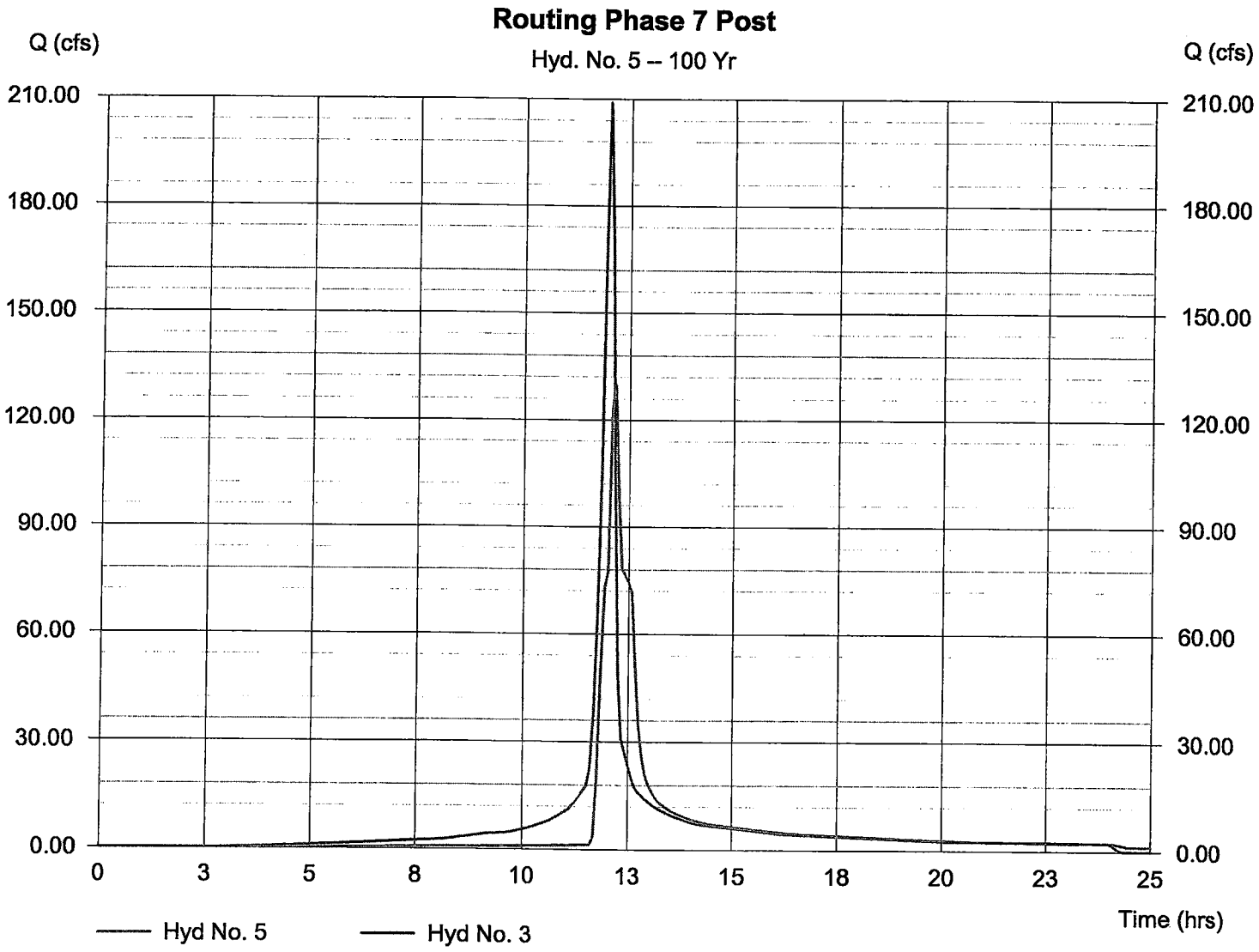
Hyd. No. 5

Routing Phase 7 Post

Hydrograph type	= Reservoir	Peak discharge	= 129.85 cfs
Storm frequency	= 100 yrs	Time interval	= 5 min
Inflow hyd. No.	= 3	Max. Elevation	= 87.74 ft
Reservoir name	= Phase 7 Pond	Max. Storage	= 213,795 cuft

Storage Indication method used.

Hydrograph Volume = 600,695 cuft



James City County Environmental Division
Stormwater Management / BMP Inspection Report
Detention and Retention Pond Facilities

County BMP ID Code (if known): PC 249 SP-068-07

Name of Facility: Newtown Sec 7+8 Ph. VII BMP No.: ____ of ____ Date: 4/5/11

Location: Rollison Dr. (Behind Goddard School)

Name of Owner: ____

Name of Inspector: Amy Parker

Type of Facility: Retention Pond

Weather Conditions: Cloudy Type: ☐ Final Inspection ☐ County BMP Inspection Program ☐ Owner Inspection Interim

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

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

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

Facility Item	O.K.	Routine	Urgent	Comments
Embankments and Side Slopes:				
Grass Height	✓			
Vegetation Condition				*Not stabilized over EC-3
Tree Growth	✓			
Erosion	✓			
Trash & Debris	✓			
Seepage	✓			
Fencing or Benches	✓			
Interior Landscaping/Planted Areas: ☐ None ☐ Constructed Wetland/Shallow Marsh ☐ Naturally Established Vegetation				
Vegetated Conditions	✓			
Trash & Debris	✓			
Floating Material	✓			
Erosion	✓			
Sediment	✓			
Dead Plant	✓			
Aesthetics	✓			
Other				
Notes:				

Facility Item	O.K.	Routine	Urgent	Comments
Water Pools: ☒ Permanent Pool (Retention Basin) ☐ Shallow Marsh (Detention Basin) ☐ None, Dry (Detention Basin)				
Shoreline Erosion	✓			
Algae		✓		
Trash & Debris	✓			
Sediment	✓			
Aesthetics	✓			
Other				
Inflows (Describe Types/Locations):				
Condition of Structure				
Erosion				
Trash and Debris				
Sediment				
Outlet Protection				
Other				
Principal Flow Control Structure - Riser, Intake, etc. (Describe Type):				
Condition of Structure	✓			
Corrosion	✓			
Trash and Debris	✓			
Sediment	✓			
Vegetation	✓			
Other				
Principal Outlet Structure - Barrel, Conduit, etc. :				
Condition of Structure	✓			
Settlement	✓			
Trash & Debris	✓			
Erosion/Sediment	✓			
Outlet Protection	✓			
Other				
Emergency Spillway (Overflow):				
Vegetation				
Lining				
Erosion				
Trash & Debris				
Other				
Notes:				

Facility Item	O.K.	Routine	Urgent	Comments
Nuisance Type Conditions:				
Mosquito Breeding	✓			
Animal Burrows	✓			
Graffiti	✓			
Other	✓			
Surrounding Perimeter Conditions:				
Land Uses	✓			
Vegetation	✓			
Trash & Debris	✓			
Aesthetics	✓			
Access /Maintenance Roads or Paths	✓			
Other				

Remarks:

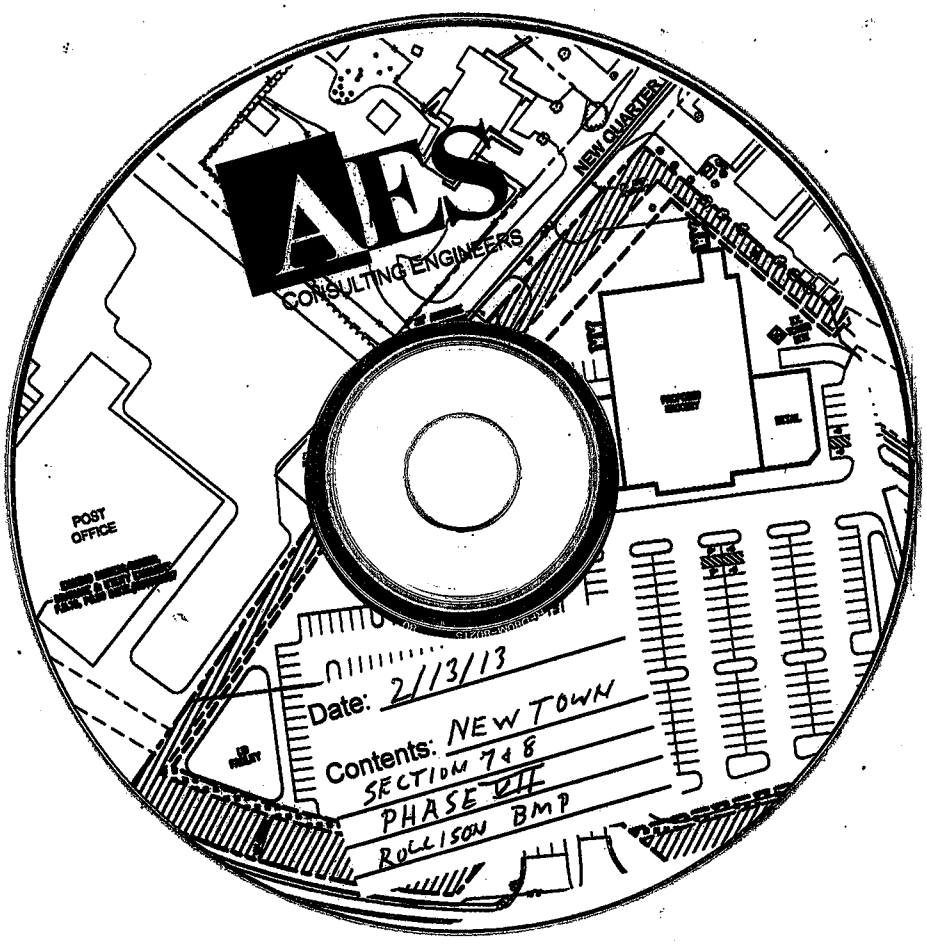
Overall Environmental Division Internal Rating: _____

Signature: Amy Park **Date:** 4/5/11

Title: Inspector

SWMProg\BMP\CoInspProg\InspForms\DetRet.wpd

Re-inspect 1/8/13
ok to close out


AES
CONSULTING ENGINEERS
NEW QUARTERS
POST OFFICE
Date: 2/13/13
Contents: NEW TOWN
SECTION 7 & 8
PHASE VII
ROLLISON BMP