
AES
CONSULTING ENGINEERS
NEW QUARTER
POST
OFFICE
Date: 7-10-2012
Contents: BMP AS-BUILTS
@ COL. HERITAGE
JCC # S-73-03
BMP # YC-033

TRANSMITTAL SHEET

ENGINEERING & RESOURCE PROTECTION → STORMWATER

Project: Colonial Heritage Phase 2 Section 2

County Plan No. S-073-03

Assigned BMP No.: YC-033

BMP Type: Dry Pond

Information Enclosed:

- ☑ Record Drawings (Asbuilts)
- ☑ Construction Certification
- ☑ Computations
- ☐ Other :

Name: Mike Maness

Date: 1/29/13

Signature: Mike P. M

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

Project Name: COLONIAL HERITAGE P2 S2
County Plan No.: S-073-03
Stormwater Management Facility: ✓
BMP Phase #: ☐ I ☐ II ☑ III
☑ Information Package Received. Date/By: 5/30/12 MPM
☑ Completeness Check:
- ☑ Record Drawing Date/By: 5/29/12 R. STEPENSON
- ☑ Construction Certification Date/By: 5/29/12 M. GALLI
- ☑ RD/CC Standard Forms (Required for all BMPs after Feb 1st 2001Only)
- ☑ Insp/Maint Agreement # / Date: OS0000154 / 12/20/04
- ☑ BMP Maintenance Plan Location: AS BUILT DRAWINGS
- ☑ Other: N/A

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

☑ Assign **County BMP ID Code #**: Code: YC-033
☑ 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: 5/12 MPM/LMC
☑ Record Drawing (RD) Review Date: 5/12 MPM/LMC
☑ Construction Certification (CC) Review Date: 5/12 MPM/LMC
☑ Actions:
- ☐ No comments.
- ☑ Comments. Letter Forwarded. Date: 5/12 LMC
- ☑ Record Drawing (RD) NONE
- ☑ Construction Certification (CC) NONE
- ☑ Construction-Related (CR)
- ☑ Site Issues (SI)
- ☐ Other :

☑ Second Submission: 5/12
☑ Reinspection (if necessary): 8/12 MPM/LMC
☑ 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. INCLUDED ON CD
☑ 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: M. P. M. Date: 1/28/13
Chief Engineer: [signature] Date: 1/29/13

*** See separate checklist, if needed.

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: Colonial Heritage Phase II - Section 2
Structure/BMP Name: JCC# YC-033 (WEG SWMP #4)
Project Location: Colonial Heritage
BMP Location: Phase II - Section 2 (behind lots 14-16 & 27-34)
County Plan No.: S-73-03 ____ - ____ - ____

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

Tax Map/Parcel No.: (24-3)(1-32)
BMP ID Code (if known): JCC# YC-033
Zoning District: Mixed Use (with proffers)
Land Use: Residential Community
Site Area (sf or acres): 19.03 Acres

Brief Description of Stormwater Management/BMP Facility: James City County Extended Dry Detention Type F-2

Nearest Visible Landmark to SWM/BMP Facility: Massie Farm Pond & Massie Circle (along Colonial Heritage Blvd.)

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

Section 2 – Stormwater Management / BMP Facility Construction Information:

PreConstruction Meeting Held for Construction of SWM/BMP Facility: ☒ Yes ☐ No ☐ Unknown
Approx. Construction Start Date for SWM/BMP Facility: 2006
Facility Monitored by County Representative during Construction: ☒ Yes ☐ No ☐ Unknown
Name of Site Work Contractor Who Constructed Facility: Jack L. Massie Contractors
Name of Professional Firm Who Routinely Monitored Construction: ECS Mid-Atlantic, LLC
Date of Completion for SWM/BMP Facility: May 2012
Date of Record Drawing/Construction Certification Submittal: May 2012

(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: Colonial Heritage, LLC
Mailing Address: 4443 Brookfield Corporate Drive
Chantilly, VA 20151
Business Phone: (703) 964-4202 Fax:(703) 961-0140
Contact Person: Gary Van Alstyne Title:VP of Land Development

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: 5284 Olde Towne Road, Suite 1
Williamsburg, VA 23188
Business Phone: (757) 253-0040
Fax: (757) 220-8994
Responsible Plan Preparer: Ryan Stephenson, P.E.
Title: Project Engineer
Plan Name: Colonial Heritage Phase II- Section 2
Firm's Project No. 8881-22
Plan Date: 8/27/03
Sheet No.'s Applicable to SWM/BMP Facility: 11 / 15 / ____ / ____ / ____

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

Name: Jack L. Massie Contractors
Mailing Address: 3900 Cokes Lane
Williamsburg, VA 23188-7010
Business Phone: (757) 566-8643
Fax: (757) 566-8566
Contact Person: Mr. Steve Massie
Site Foreman/Supervisor: Mr. Scott Massie
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, VA 23188
Business Phone: (757) 253-0040
Fax: (757) 220-8994

Name: Ryan Stephenson, P.E.
Title: Project Engineer
Signature:
Date: 5/29/12

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

COMMONWEALTH OF VIRGINIA
T. RYAN STEPHENSON
Lic. No. 044405
5/29/12
PROFESSIONAL ENGINEER

_____ (Seal)

Virginia Registered Professional Engineer
Or Certified Land Surveyor

Construction Certification

Firm Name: ECS Mid-Atlantic, LLC
Mailing Address: 108 Ingram Road, Suite 1
Williamsburg, VA 23188
Business Phone: (757) 229-6677
Fax: (757) 229-9978

Name: Michael J. Galli
Title: Principal Engineer
Signature:
Date: May 29, 2012

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

COMMONWEALTH OF VIRGINIA
MICHAEL J. GALLI
Lic. No. 030684
5/29/12
PROFESSIONAL ENGINEER

_____ (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.
XX	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.**
XX	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.
XX	17.	BMP interior and periphery landscaping zones conform with arrangements and requirements of the approved design plan.
XX	18.	Maintenance plan taken from approved design plan transposed onto record drawing set.
N/A	19.	Fencing location and type, if applicable to facility.
XX	20.	BMP vicinity properly cleaned of stockpiles and construction debris.
XX	21.	No visual signs of erosion or channel degradation immediately downstream of facility.
N/A	22.	Any other information formally requested by the Environmental Division specific to the constructed SWM/BMP facility.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

N/A	A1.	All requirements of Section II, Minimum Standards, apply to Group A facilities.
N/A	A2.	Principal spillway consists of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.
N/A	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.
N/A	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.
N/A	A9.	Wet permanent pool, typically 3 to 6 feet deep, is provided and maintains level within facility.
N/A	A10.	Low flow orifice has a non-clogging mechanism.
N/A	A11.	A pond drain pipe with valve was provided.
N/A	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: XX Acceptable N/A Not Applicable Inc Incomplete)

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

N/A	B1.	Same requirements as Group A Wet Ponds.
N/A	B2.	Minimum 2:1 length to width flow path provided across the facility.
N/A	B3.	Micropool provided at or around outlet from BMP (generally 3 to 6 ft. deep).
N/A	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.
N/A	B5.	Adequate wetland buffer provided (Typically 25 ft. outward from maximum design water surface elevation and 15 ft. setback to structures).
N/A	B6.	No more than one-half (½) of the wetland surface area is planted.
N/A	B7.	Topsoil or wetland mulch provided to support vigorous growth of wetland plants.
N/A	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)*

N/A	C1.	All requirements of Section II, Minimum Standards, apply to Group C facilities as applicable.
N/A	C2.	Facility is not located on fill slopes or on natural ground in excess of six (6) percent.
N/A	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.
N/A	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.
N/A	C5.	Sides of infiltration practice lined with filter fabric.
N/A	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.
N/A	C7.	Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility.
N/A	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.
N/A	C9.	Minimum twenty-five (25) foot separation down gradient from any structure.
N/A	C10.	Stormwater outfalls provided for overflow associated with larger design storms.
N/A	C11.	No visual signs of erosion or channel degradation immediately downstream of facility.
N/A	C12.	Facility does not currently cause any apparent surface or subsurface water problems to downgrade properties.
N/A	C13.	Observation well provided.
N/A	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)*

N/A	D1.	All requirements of Section II, Minimum Standards, apply to Group D facilities.
N/A	D2.	Sediment pretreatment devices provided.
N/A	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.
N/A	D4.	For D-1 BMPs (Bioretention Cells), plantings consist of native plant species; vegetation provided was based on zones of hydric tolerances; trees and understory of shrubs and herbaceous materials were provided; woody vegetation is absent from inflow locations; and trees are located around facility perimeter.
N/A	D5.	Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.
N/A	D6.	No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed.
N/A	D7.	Filtering system is off-line from storm drainage conveyance system.
N/A	D8.	Overflow outlet has adequate erosion protection.
N/A	D9.	Deflector, diversion, flow splitter or regulator structure provided to divert the water quality volume to the filtering structure.
N/A	D10.	Minimum four (4) inch perforated underdrain provided in a clean aggregate envelope layer beneath the facility.
N/A	D11.	Minimum fifty (50) foot separation from any slope fifteen (15) percent or greater. Minimum one hundred (100) foot separation horizontally from any known water supply well. Minimum one hundred (100) foot separation upslope and twenty-five (25) foot separation downslope from any building.
N/A	D12.	Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility.
N/A	D13.	No visual signs of erosion or channel degradation immediately downstream of facility.
N/A	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)*

N/A	E1.	All requirements of Section II, Minimum Standards, apply to Group E facilities as applicable.
N/A	E2.	Open channel system has constructed longitudinal slope of less than four (4) percent.
N/A	E3.	No visual signs of erosion in the open channel system's soil and/or vegetative cover.
N/A	E4.	Open channel side slopes are no steeper than 2H:1V at any location. Preferred channel sideslope is 3H:1V or flatter.
N/A	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).
N/A	E6.	For E-2 BMPs (Dry Swales), an underdrain system was provided.
N/A	E7.	Treated timber or rock check dams provided as pretreatment devices for the open channel system.
N/A	E8.	Gravel diaphrahm provided in areas where lateral sheet flow from impervious surgaces are directly connected to the open channel system.
N/A	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.
N/A	E10.	Open channel system areas with grass covers higher than four (4) to six (6) inches were properly mowed.
N/A	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.
N/A	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.
N/A	E13.	For E-3 BMPs (Biofilters), the bottom width is six (6) feet maximum at any location.
N/A	E14.	For E-3 BMPs (Biofilters), sideslopes are 3H:1V maximum at any location.
N/A	E15.	For E-3 BMPs (Biofilters), the constructed channel slope is less than or equal to three (3) percent at any location.
N/A	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: XX Acceptable N/A Not Applicable Inc Incomplete)

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

XX	F1.	All requirements of Section II, Minimum Standards, apply to Group F facilities.
XX	F2.	Basin bottom has positive slope and drainage from all basin inflow points to the riser (or outflow) location.
N/A	F3.	Timber wall BMP used in intermittent stream only. (ie. Prohibited in perennial streams.)
XX	F4.	Forebay provided approximately 20 ft. upstream of the facility. Forebays generally 4 to 6 feet in depth.
XX	F5.	A reverse slope pipe, vertical stand pipe or mini-barrel and riser was provided to prevent clogging
XX	F6.	Principal spillway and outlet barrel provided consisting of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.
N/A	F7.	Mini-barrel and riser, if used, contains a removable trash rack to reduce clogging.
XX	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.
N/A	F9.	Timbers properly reinforced or concrete footing provided if soil conditions were prohibitive.
N/A	F10.	Timber wall cross members extended to a minimum depth of two (2) feet below ground elevation.
XX	F11.	Protection against erosion and scour from the low flow orifice and weir-flow trajectory provided.
XX	F12.	Stilling basin or standard outlet protection provided at principal spillway outlet.
XX	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.
N/A	F14.	No visual signs of undercutting of timber walls or clogging of the low orifice were present.
XX	F15.	No visual signs of erosion or channel degradation immediately downstream of facility.
XX	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)*

N/A G1. All requirements of Section II, Minimum Standards, apply to Group G facilities as applicable.

N/A 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.

N/A G3. Dedicated open space areas are in undisturbed common areas, conservation easements or are protected by other enforceable instruments that ensures perpetual protection.

N/A G4. Provisions included to clearly specify how the natural vegetated areas utilized as dedicated open space will be managed and field identified (marked).

N/A G5. Adequate protection measures were implemented during construction to protect the defined dedicated open space areas.

N/A 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.)

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

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

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

Environmental Division

MAY 30 2012

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James City County, Virginia
Environmental Division

Stormwater Management / BMP Facilities
Record Drawing and Construction Certification Forms

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

Section 1 – Site Information:

Project Name: Colonial Heritage Phase II - Section 2
Structure/BMP Name: JCC# YC-033 (WEG SWMP #4)
Project Location: Colonial Heritage
BMP Location: Phase II - Section 2 (behind lots 14-16 & 27-34)
County Plan No.: S-73-03 - _____ - _____

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

Tax Map/Parcel No.: (24-3)(1-32)
BMP ID Code (if known): JCC# YC-033
Zoning District: Mixed Use (with proffers)
Land Use: Residential Community
Site Area (sf or acres): 19.03 Acres

Brief Description of Stormwater Management/BMP Facility: James City County Extended Dry Detention Type F-2

Nearest Visible Landmark to SWM/BMP Facility: Massie Farm Pond & Massie Circle (along Colonial Heritage Blvd.)

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

Section 2 – Stormwater Management / BMP Facility Construction Information:

PreConstruction Meeting Held for Construction of SWM/BMP Facility: ☒ Yes ☐ No ☐ Unknown
Approx. Construction Start Date for SWM/BMP Facility: 2006
Facility Monitored by County Representative during Construction: ☒ Yes ☐ No ☐ Unknown
Name of Site Work Contractor Who Constructed Facility: Jack L. Massie Contractors
Name of Professional Firm Who Routinely Monitored Construction: ECS Mid-Atlantic, LLC
Date of Completion for SWM/BMP Facility: May 2012
Date of Record Drawing/Construction Certification Submittal: May 2012

(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: Colonial Heritage, LLC
Mailing Address: 4443 Brookfield Corporate Drive
Chantilly, VA 20151
Business Phone: (703) 964-4202 Fax:(703) 961-0140
Contact Person: Gary Van Alstyne Title:VP of Land Development

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: 5284 Olde Towne Road, Suite 1
Williamsburg, VA 23188
Business Phone: (757) 253-0040
Fax: (757) 220-8994
Responsible Plan Preparer: Ryan Stephenson, P.E.
Title: Project Engineer
Plan Name: Colonial Heritage Phase II- Section 2
Firm's Project No. 8881-22
Plan Date: 8/27/03
Sheet No.'s Applicable to SWM/BMP Facility: 11 / 15 / _____ / _____ / _____

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

Name: Jack L. Massie Contractors
Mailing Address: 3900 Cokes Lane
Williamsburg, VA 23188-7010
Business Phone: (757) 566-8643
Fax: (757) 566-8566
Contact Person: Mr. Steve Massie
Site Foreman/Supervisor: Mr. Scott Massie
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, VA 23188
Business Phone: (757) 253-0040
Fax: (757) 220-8994

Name: Ryan Stephenson, P.E.
Title: Project Engineer
Signature:
Date: 5/29/12

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

COMMONWEALTH OF VIRGINIA
T. RYAN STEPHENSON
Lic. No. 044405
5/29/12
PROFESSIONAL ENGINEER

_____ (Seal)

Virginia Registered Professional Engineer
Or Certified Land Surveyor

Construction Certification

Firm Name: ECS Mid-Atlantic, LLC
Mailing Address: 108 Ingram Road, Suite 1
Williamsburg, VA 23188
Business Phone: (757) 229-6677
Fax: (757) 229-9978

Name: Michael J. Galli
Title: Principal Engineer
Signature:
Date: May 29, 2012

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

COMMONWEALTH OF VIRGINIA
MICHAEL J. GALLI
Lic. No. 030684
5/29/12
PROFESSIONAL ENGINEER

_____ (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.
XX	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.**
XX	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.
XX	17.	BMP interior and periphery landscaping zones conform with arrangements and requirements of the approved design plan.
XX	18.	Maintenance plan taken from approved design plan transposed onto record drawing set.
N/A	19.	Fencing location and type, if applicable to facility.
XX	20.	BMP vicinity properly cleaned of stockpiles and construction debris.
XX	21.	No visual signs of erosion or channel degradation immediately downstream of facility.
N/A	22.	Any other information formally requested by the Environmental Division specific to the constructed SWM/BMP facility.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

N/A	A1.	All requirements of Section II, Minimum Standards, apply to Group A facilities.
N/A	A2.	Principal spillway consists of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.
N/A	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.
N/A	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.
N/A	A9.	Wet permanent pool, typically 3 to 6 feet deep, is provided and maintains level within facility.
N/A	A10.	Low flow orifice has a non-clogging mechanism.
N/A	A11.	A pond drain pipe with valve was provided.
N/A	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: ***XX*** *Acceptable* ***N/A*** *Not Applicable* ***Inc*** *Incomplete)*

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

N/A	B1.	Same requirements as Group A Wet Ponds.
N/A	B2.	Minimum 2:1 length to width flow path provided across the facility.
N/A	B3.	Micropool provided at or around outlet from BMP (generally 3 to 6 ft. deep).
N/A	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.
N/A	B5.	Adequate wetland buffer provided (Typically 25 ft. outward from maximum design water surface elevation and 15 ft. setback to structures).
N/A	B6.	No more than one-half (½) of the wetland surface area is planted.
N/A	B7.	Topsoil or wetland mulch provided to support vigorous growth of wetland plants.
N/A	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)*

N/A	C1.	All requirements of Section II, Minimum Standards, apply to Group C facilities as applicable.
N/A	C2.	Facility is not located on fill slopes or on natural ground in excess of six (6) percent.
N/A	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.
N/A	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.
N/A	C5.	Sides of infiltration practice lined with filter fabric.
N/A	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.
N/A	C7.	Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility.
N/A	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.
N/A	C9.	Minimum twenty-five (25) foot separation down gradient from any structure.
N/A	C10.	Stormwater outfalls provided for overflow associated with larger design storms.
N/A	C11.	No visual signs of erosion or channel degradation immediately downstream of facility.
N/A	C12.	Facility does not currently cause any apparent surface or subsurface water problems to downgrade properties.
N/A	C13.	Observation well provided.
N/A	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)*

N/A	D1.	All requirements of Section II, Minimum Standards, apply to Group D facilities.
N/A	D2.	Sediment pretreatment devices provided.
N/A	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.
N/A	D4.	For D-1 BMPs (Bioretention Cells), plantings consist of native plant species; vegetation provided was based on zones of hydric tolerances; trees and understory of shrubs and herbaceous materials were provided; woody vegetation is absent from inflow locations; and trees are located around facility perimeter.
N/A	D5.	Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.
N/A	D6.	No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed.
N/A	D7.	Filtering system is off-line from storm drainage conveyance system.
N/A	D8.	Overflow outlet has adequate erosion protection.
N/A	D9.	Deflector, diversion, flow splitter or regulator structure provided to divert the water quality volume to the filtering structure.
N/A	D10.	Minimum four (4) inch perforated underdrain provided in a clean aggregate envelope layer beneath the facility.
N/A	D11.	Minimum fifty (50) foot separation from any slope fifteen (15) percent or greater. Minimum one hundred (100) foot separation horizontally from any known water supply well. Minimum one hundred (100) foot separation upslope and twenty-five (25) foot separation downslope from any building.
N/A	D12.	Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility.
N/A	D13.	No visual signs of erosion or channel degradation immediately downstream of facility.
N/A	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)*

N/A	E1.	All requirements of Section II, Minimum Standards, apply to Group E facilities as applicable.
N/A	E2.	Open channel system has constructed longitudinal slope of less than four (4) percent.
N/A	E3.	No visual signs of erosion in the open channel system's soil and/or vegetative cover.
N/A	E4.	Open channel side slopes are no steeper than 2H:1V at any location. Preferred channel sideslope is 3H:1V or flatter.
N/A	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).
N/A	E6.	For E-2 BMPs (Dry Swales), an underdrain system was provided.
N/A	E7.	Treated timber or rock check dams provided as pretreatment devices for the open channel system.
N/A	E8.	Gravel diaphrahm provided in areas where lateral sheet flow from impervious surgaces are directly connected to the open channel system.
N/A	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.
N/A	E10.	Open channel system areas with grass covers higher than four (4) to six (6) inches were properly mowed.
N/A	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.
N/A	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.
N/A	E13.	For E-3 BMPs (Biofilters), the bottom width is six (6) feet maximum at any location.
N/A	E14.	For E-3 BMPs (Biofilters), sideslopes are 3H:1V maximum at any location.
N/A	E15.	For E-3 BMPs (Biofilters), the constructed channel slope is less than or equal to three (3) percent at any location.
N/A	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: XX Acceptable N/A Not Applicable Inc Incomplete)

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

XX	F1.	All requirements of Section II, Minimum Standards, apply to Group F facilities.
XX	F2.	Basin bottom has positive slope and drainage from all basin inflow points to the riser (or outflow) location.
N/A	F3.	Timber wall BMP used in intermittent stream only. (ie. Prohibited in perennial streams.)
XX	F4.	Forebay provided approximately 20 ft. upstream of the facility. Forebays generally 4 to 6 feet in depth.
XX	F5.	A reverse slope pipe, vertical stand pipe or mini-barrel and riser was provided to prevent clogging
XX	F6.	Principal spillway and outlet barrel provided consisting of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.
N/A	F7.	Mini-barrel and riser, if used, contains a removable trash rack to reduce clogging.
XX	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.
N/A	F9.	Timbers properly reinforced or concrete footing provided if soil conditions were prohibitive.
N/A	F10.	Timber wall cross members extended to a minimum depth of two (2) feet below ground elevation.
XX	F11.	Protection against erosion and scour from the low flow orifice and weir-flow trajectory provided.
XX	F12.	Stilling basin or standard outlet protection provided at principal spillway outlet.
XX	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.
N/A	F14.	No visual signs of undercutting of timber walls or clogging of the low orifice were present.
XX	F15.	No visual signs of erosion or channel degradation immediately downstream of facility.
XX	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)*

N/A G1. All requirements of Section II, Minimum Standards, apply to Group G facilities as applicable.

N/A 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.

N/A G3. Dedicated open space areas are in undisturbed common areas, conservation easements or are protected by other enforceable instruments that ensures perpetual protection.

N/A G4. Provisions included to clearly specify how the natural vegetated areas utilized as dedicated open space will be managed and field identified (marked).

N/A G5. Adequate protection measures were implemented during construction to protect the defined dedicated open space areas.

N/A 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.)

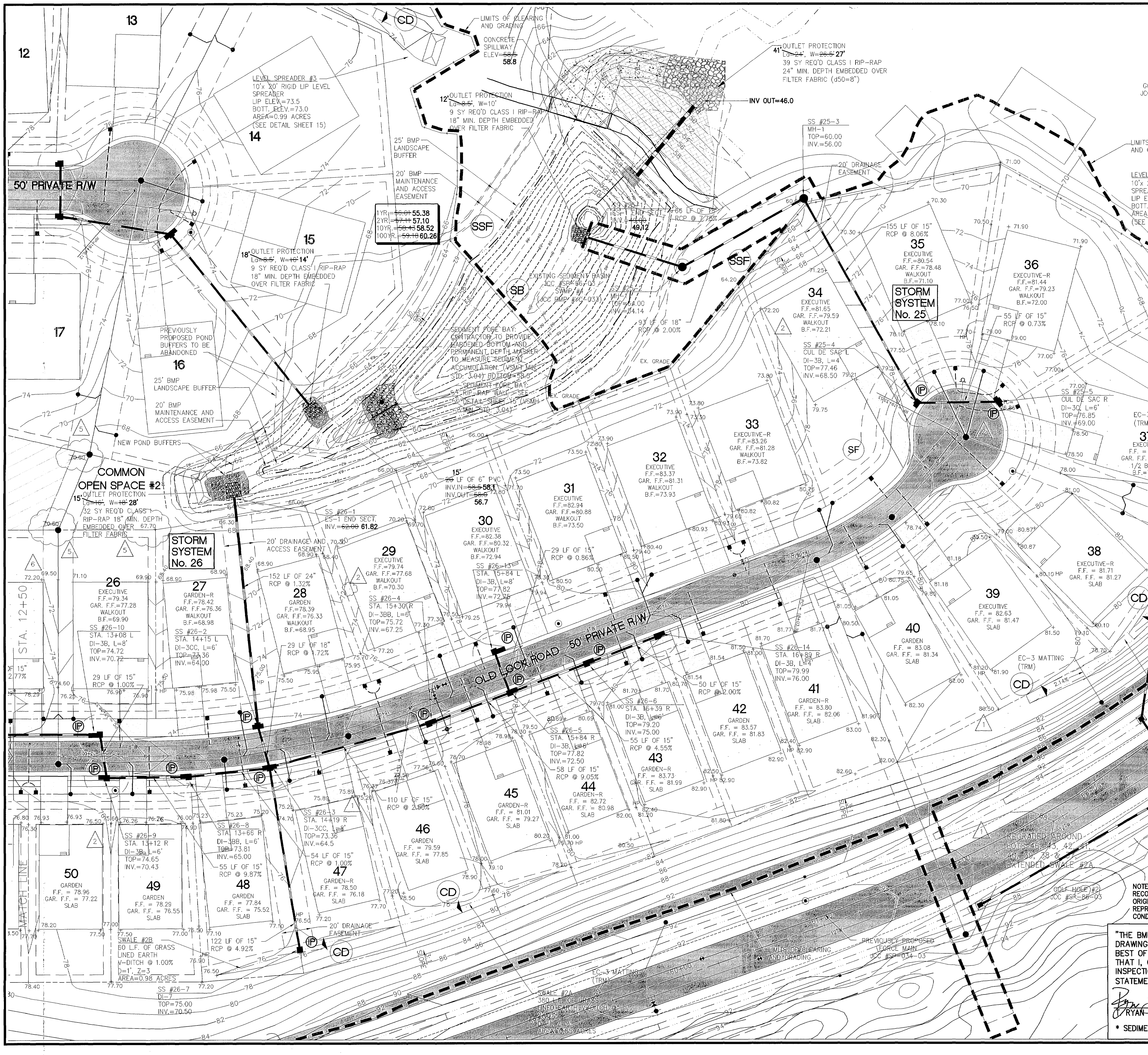
N/A O1. All requirements of Section II, Minimum Standards, apply to this section.

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

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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



No.	DATE	REVISION / COMMENT / NOTE	BY
3	5/24/12	RECORD DRAWING	TRS
9	8/10/05	ADJUSTED DIP 'WL' DUE TO MASS GRADING, SHTS. 12 & 13	HWP
8	8/9/05	ADDED SEWER CASING PER OWNER SHEET 14	HWP
7	7/21/05	REVISED SIDEWALKS	HWP
6	7/06/05	REVISED GRADING ON SHT 11 & MATCHLINE SHTS 10 & 11	HWP
5	5/11/05	REVISED MH2-24 & FG ELEVATIONS (SHEETS 6,10,11,& 12)	HWP
4	1/28/05	REVISED SANITARY MANHOLE#2-38 (SHEETS 7 & 13)	HWP

COMMONWEALTH OF VIRGINIA G. ARCHER MARSTON, III No. 018232 9/23/04 PROFESSIONAL ENGINEER

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CONSULTING ENGINEERS

GRADING, DRAINAGE AND EROSION AND SEDIMENT CONTROL PLAN
PHASE II, SECTION 2
COLONIAL HERITAGE

OWNER/DEVELOPER: COLONIAL HERITAGE L.L.C.

STONEHOUSE JAMES CITY COUNTY VIRGINIA

Designed	Drawn
CCM/HWP	AES
Scale 1"=30'	Date 8/27/03

Project No. 8881-22

Drawing No. 11

COUNTY PLAN NO. S-73-03; BMP #YC-033; RECORD DRAWING-05/24/12

STORM WATER MANAGEMENT/ BMP FACILITY MAINTENANCE PLAN

PROPER MAINTENANCE OF THIS FACILITY IS ENCOURAGED TO PREVENT THE INTRODUCTION OF DEBRIS AND SEDIMENT IN TO THE FACTILITY, SPILLWAY(S) AND DOWNSTREAM WATERWAYS. FOLLOWING INSTALLATION OF THE FACILITY AND ESTABLISHMENT OF VEGETATION IN DISTURBED AREAS, INSPECTIONS FOR SEDIMENT BUILDUPS WILL BE PERFORMED AT LEAST QUARTERLY. IT IS ANTICIPATED THAT UNDER NORMAL CONDITIONS, SEDIMENT REMOVAL FROM THE FACILITY WILL BE REQUIRED ONCE EVERY 10 YEARS. IF OTHER CONSTRUCTION OR RELATED ACTIVITIES ARE PERFORMED ON UPSLOPE PARCELS, ADEQUATE PROTECTION SHOULD BE PROVIDED AND INSPECTIONS PERFORMED AT LEAST ONCE WEEKLY OF THESE NEWLY DISTRIBUTED AREAS AS WELL AS INSPECTIONS FOR ACCUMULATED SEDIMENTS AT TWO BMP FACILITY.

A DESIGNATED REPRESENTATIVE OF THE OWNER WILL INSPECT THE BMP STRUCTURE AFTER EACH SIGNIFICANT RAINFALL EVENT OR THE FOLLOWING WORKING DAY IF A WEEKEND OR HOLIDAY OCCURS. A SIGNIFICANT RAINFALL FOR THIS STRUCTURE IS DEFINED AS ONE (1) INCH OR MORE OF GAUGED RAINFALL WITHIN A 24 HOUR PERIOD. ONCE PER YEAR, A REPRESENTATIVE OF THE COUNTY MAY JOINTLY INSPECT THE STRUCTURE. APPROPRIATE ACTION, PERFORMED AT THE COST OF THE OWNER, WILL BE TAKEN TO ENSURE APPROPRIATE MAINTENANCE. KEYS TO LOCKED ACCESS POINTS SHALL BE MADE AVAILABLE TO COUNTY INSPECTION PERSONNEL UPON REQUEST.

INSPECTION AND MAINTENANCE OF THE FACILITY WILL CONSIST OF THE FOLLOWING ADDITIONAL

1. THE INSPECTION FOR SEDIMENT BUILDUP WILL BE PERFORMED BY VISUAL INSPECTION AND A PHYSICAL DETERMINATION OF SEDIMENT DEPTH WITHIN THE STORAGE AREA. SEDIMENT REMOVAL IS REQUIRED USING A RUBBER-WHEELED BACKHOE. AT THE SAME TIME, OR AT LEAST ONCE PER YEAR, THE RISER BOTTOM AND OUTLET PIPE SHALL BE CLEANED OF ACCUMULATED SEDIMENTS. DISPOSE OF SEDIMENTS REMOVED FROM THE FACILITY AT AN ACCEPTABLE DISPOSAL AREA. SEDIMENT SHALL NOT BE ALLOWED TO ACCUMULATE IN DEPTHS GREATER THAN 1-FOOT. NO SEDIMENT SHALL BE ALLOWED TO ACCUMULATE TO PREVENT THE PROPER FUNCTION OF ANY PIPE

2. PERFORM MAINTENANCE MOWING OF GRASSED AREAS AT LEAST TWICE EACH YEAR. GRASSES SUCH AS TALL FESCUE SHOULD BE MOWED IN EARLY SUMMER AFTER EMERGENCE OF THE HEADS ON COOL SEASON GRASSES AND IN LATE FALL TO PREVENT SEEDS OF ANNUAL WEEDS FROM MATURING. MOWING OF LEGUMES CAN BE LESS FREQUENT TREES AND SHRUBS SHOULD NOT BE PERMITTED TO GROW ON ANY PART OF THE GRADED EMBANKMENT.

3. PERFORM SOIL SAMPLING ON STABILIZED BMP SOIL AREAS ONCE EVERY FOUR (4) YEARS. SOIL SAMPLING AND TESTING SHOULD BE PERFORMED BY A QUALIFIED INDEPENDENT TESTING LABORATORY. APPLY ADDITIONAL LIME AND FERTILIZER IN ACCORDANCE WITH TEST RECOMMENDATIONS.

4. IN STABILIZED BMP AREAS, IF VEGETATION COVERS LESS THAN 40% OF SOIL SURFACES, LIME, FERTILIZE AND SEED IN ACCORDANCE WITH RECOMMENDATIONS FOR NEW SEEDLINGS, AS LISTED IN DAM CONSTRUCTION NOTES. IF VEGETATION COVERS MORE THAN 40% BUT LESS THAN 70% OF SOIL SURFACES, LIME FERTILIZE AND OVERSEED IN ACCORDANCE WITH CURRENT SEEDLING RECOMMENDATIONS.

5. PERFORM QUARTERLY INSPECTIONS OF THE RELEASE STRUCTURES, RISER SECTION AND CREST OF SPILLWAY FOR THE OBSERVANCE OF COLLECTED DEBRIS. IMMEDIATELY REMOVE ANY DEBRIS TO MAINTAIN THE INTEGRITY OF THE STRUCTURE AND PROVIDE AN ATTRACTIVE APPEARANCE. DURING QUARTERLY INSPECTIONS, THE POND DRAIN VALVE, USUALLY LEFT IN THE VALVE "CLOSED" POSITION, SHALL BE INSPECTED AND OPERATED THROUGH TWO COMPLETE FULL-OPEN TO FULL-CLOSE TO FULL-OPEN CYCLES.

6. PERFORM YEARLY STRUCTURAL INSPECTIONS OF THE FACILITY FOR DAMAGE. STRUCTURAL INSPECTION SHALL BE PERFORMED ON THE CONCRETE RISER, ANTI-VORTEX DEVICE, TRASH RACK, ORIFICE/ WEIR(S), OUTLET BARREL AND POND EMBANKMENT. IF DAMAGE IS EVIDENT, FURTHER INVESTIGATION BY A PROFESSIONAL ENGINEER MAY BE REQUIRED TO ASSESS THE CONTINUED INTEGRITY OF THE STRUCTURE.

7. PERFORM QUARTERLY INSPECTIONS OF THE GRADED SIDE SLOPES OF THE FACILITY FOR SIGNS OF ANIMAL/ RODENT BORROWS OR SLOPE EROSION. IMMEDIATELY PERFORM NECESSARY REPAIRS, REFILLING OR RESEEDING AS APPROPRIATE.

8. RECORD KEEPING. THE LANDOWNER OR DESIGNATED REPRESENTATIVE SHALL KEEP REASONABLE, ACCURATE WRITTEN RECORDS OF INSPECTIONS PERFORMED ON THE STRUCTURE. RECORDS SHALL DOCUMENT ROUTINE MAINTENANCE AND/ OR REPAIRS PERFORMED. COPIES SHALL BE PROVIDED TO THE COUNTY UPON REQUEST.

9. THE FACILITY SHALL NOT BE MODIFIED IN ANY WAY WITHOUT PRIOR CONSENT/ APPROVAL OF

10. UPON CONVERSION TO A PERMANENT "DRY" POND SEDIMENT IS TO BE REMOVED TO EXISTING GRADE PREVIOUSLY DENUDED SIDE SLOPES (SEDIMENT BASIN CLEAN OUT ELEVATION) ARE TO BE SEEDED AND STABILIZED. IF THE COUNTY EROSION AND SEDIMENT CONTROL INSPECTOR IS NOT SATISFIED WITH THE PERFORMANCE OF THE SEEDED AREA HE CAN THEN REQUIRE RESEEDING AND EC-2 EROSION MATTING TO COMPLETE STABILIZATION THIS AREA IS TO BE LEFT TO REESTABLISH ITSELF IN A FORESTED MANNER.

GENERAL NOTES FOR CONSTRUCTION OF STORM WATER BASINS

1. THE CONTRACTOR SHALL PROVIDE ALL WORK AND MATERIALS NEEDED TO CONSTRUCT THE STORM WATER BASIN, STORM WATER MANAGEMENT PONDS, BEST MANAGEMENT PRACTICES, SEDIMENT BASINS AND SEDIMENT TRAPS. THE WORK SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT AND MATERIALS NEEDED FOR THE COMPLETION OF GRADING AND EARTHWORK ASSOCIATED WITH THE

2. THE CONTRACTOR SHALL CONSULT AND PROVIDE FOR THE SERVICES OF A GEOTECHNICAL ENGINEER. THE GEOTECHNICAL ENGINEER SHALL PROVIDE TEST RESULTS ON PLACED DAM MATERIALS, IDENTIFYING SOIL CLASSIFICATION, PERMEABILITY, PLASTICITY INDEX, AND COMPACTION. ALL TESTS SHALL BE IN CONFORMANCE WITH ASTM STANDARDS. THE COST OF THE SERVICES OF THE GEOTECHNICAL ENGINEER SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. SATISFACTORY GEOTECHNICAL RESULTS ARE NEEDED PRIOR TO FINAL APPROVAL.

3. ALL INSPECTIONS REQUIRED FOR THE WORK SHALL BE PERFORMED BY A GEOTECHNICAL ENGINEER AT THE EXPENSE OF THE GENERAL

4. ON-SITE EXCAVATED MATERIAL, IF DETERMINED SUITABLE FOR USE IN DAM CONSTRUCTION BY A GEOTECHNICAL ENGINEER, MAY BE USED FOR DAM CONSTRUCTION. SHOULD ADDITIONAL MATERIAL BE REQUIRED, THE CONTRACTOR SHALL IDENTIFY THE NEED FOR MATERIAL TO THE OWNER, AS ADDITIONAL BORROW MATERIAL MAY BE AVAILABLE ON THE PROPERTY. ALL EXCAVATED MATERIAL DETERMINED BY THE GEOTECHNICAL ENGINEER TO BE UNSUITABLE SHALL BE DISPOSED OF PROPERLY AT THE CONTRACTOR'S EXPENSE. ALL EXCAVATED MATERIAL NOT REQUIRED FOR BACK FILLING SHALL EITHER BE DEPOSITED ON SITE AND SPREAD BY THE CONTRACTOR, OR SHALL BE DEPOSITED IN AN AREA ON THE PROPERTY AS DIRECTED BY THE OWNER. THE CONTRACTOR SHALL PROVIDE PROPER STABILIZATION, AND EROSION AND SEDIMENT CONTROL MEASURES NEEDED TO CONTROL AS PER THE VESCH THIRD EDITION.

5. UNDERCUT FOR THE FOUNDATION OF THE DAM EMBANKMENT SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEER'S RECOMMENDATION. THE FOUNDATION SHALL BE BACK FILLED WITH SOILS CLASSIFIED AS SM, SC, OR CL UNDER THE UNIFIED SOIL CLASSIFICATION SYSTEM. SOILS SHALL HAVE A MINIMUM OF 15% BY WEIGHT FINES, HAVING A PLASTICITY INDEX OF 30% AND A PERMEABILITY OF 0.0004 IN./SEC. OR LESS. FILL SHALL BE COMPACTED IN 12-INCH LIFTS, OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER, TO A DRY DENSITY OF 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D-698). EXCAVATION FOR THE DAM KEY SHALL BE IN ACCORDANCE TO THE GEOTECHNICAL ENGINEER'S RECOMMENDATION. HEIGHT, DEPTH, AND WIDTH OF THE KEY SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS. THE KEY SHALL BE FORMED USING SOILS CLASSIFIED AS SC OR CL, WITH A PERMEABILITY OF 0.0004 IN./SEC. OR LESS.

6. THE DAM CORE SHALL BE AS CONSTRUCTED WITH NON-EXPANSIVE SC OR CL CLAYEY MATERIAL WITH PERMEABILITY OF 0.0004 IN./SEC. OR LESS. THE FILL OF THE CORE SHALL BE MADE IN 12-INCH LIFTS, OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER, TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D-698). SIZE, SHAPE, WIDTH, DEPTH, AND HEIGHT OF THE DAM CORE SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS. TO COVER THE DAM CORE, A SILTY FINE SAND OR CLAYEY SOIL (SM, SC, OR CL) SHALL BE PLACED. A VEGETATIVE COVER USING VDOT EC-2 EROSION CONTROL BLANKETS SHALL BE PLACED ON DAM SLOPES AND CREST TO PREVENT EROSION.

7. THE STORM WATER MANAGEMENT / BMP FACILITIES SHOWN ON THESE PLANS REQUIRE THE SUBMISSION, REVIEW AND APPROVAL OF RECORD DRAWING(S) AND CONSTRUCTION CERTIFICATION PRIOR TO RELEASE OF THE POSTED BOND / SURETY. THE GEOTECHNICAL ENGINEER IS TO ENSURE THAT HIS / HER INSPECTION OF THE SWM / BMP CONSTRUCTION ACTIVITY IS PERFORMED DURING AND FOLLOWING CONSTRUCTION OF THE SWM / BMP IN ACCORDANCE WITH THE JAMES CITY COUNTY ENVIRONMENTAL DIVISION STORM WATER MANAGEMENT / BMP FACILITIES DESIGN GUIDELINES HANDBOOK, DATED AUGUST 30, 2000.

8. THE CONTRACTOR SHALL PROVIDE INTERIM CERTIFICATION OF TEMPORARY SEDIMENT BASIN IN ACCORDANCE WITH SECTION 5 OF THE JAMES CITY COUNTY BMP, EROSION AND SEDIMENT CONTROL AND STORM WATER MANAGEMENT DESIGN GUIDES.

COLONIAL HERITAGE
"OUTLINE OF THE INSPECTION PROCEDURE FOR CONSTRUCTION OF PRIVATE STREETS"

1. THE ENGINEER WILL CONTACT A SOILS TESTING FIRM (GEOTECHNICAL ENGINEER) TO OBTAIN REPRESENTATIVE CBR SAMPLES. THE LOCATION AND NUMBER OF THE CBR (CALIFORNIA BEARING RATIO) SAMPLES IS TO BE DETERMINED BY THE SOILS ENGINEER. THE SOILS ENGINEER SHALL THEN PREPARE A REPORT WHICH SHALL INCLUDE AS A MINIMUM THE FOLLOWING:
   - A) NUMBER AND LOCATION (INCLUDING MAP) OF CBR SAMPLES AND TEST RESULTS OF THE SAMPLES.
   - B) SOILS ENGINEERING ANALYSIS.
   - C) RECOMMENDATIONS INCLUDING REQUIRED ALTERATIONS OF THE BASE MATERIAL APPLICATION RATE, MODIFICATIONS TO THE SUBBASE IF REQUIRED, ETC. FROM THOSE DESIGNS SHOWN ON THE APPROVED CONSTRUCTION DRAWINGS.
2. UPON COMPLETION OF ROAD GRADING TO SUBGRADE, THE GEOTECHNICAL ENGINEER SHALL BE PRESENT FOR A PROOFROLL TO DETERMINE ADEQUACY OF COMPACTION. ANY RECOMMENDATIONS FOR UNSUITABLE MATERIAL WILL BE GIVEN AT THIS TIME.
3. SUBBASE AND BASE MATERIAL WILL BE SUPPLIED AND CERTIFIED BY A VDOT CERTIFIED AND BONDED SOURCE. EVIDENCE OF THIS WILL BE PROVIDED VIA INVOICES FROM SUPPLIER.
4. A COPY OF THE GEOTECHNICAL ENGINEERING REPORT SHALL BE SUBMITTED TO THE COUNTY ENGINEER PRIOR TO THE PLACEMENT OF SUBBASE AND BASE MATERIAL. AFTER THE COUNTY ENGINEER HAS REVIEWED AND APPROVED THE GEOTECHNICAL ENGINEER'S REPORT, SUBBASE AND BASE MATERIAL WILL BE APPLIED AT THE DEPTHS NECESSARY TO PROVIDE REQUIRED DEPTH (EITHER BY PLAN OR BY GEOTECHNICAL ENGINEER'S RECOMMENDATION) AFTER COMPACTION. THE CONTRACTOR, IN THE PRESENCE OF THE ENGINEER, WILL TEST THE DEPTH OF THE SUBBASE AND BASE MATERIAL AT LEAST ONCE EVERY 250 LINEAR FEET AND REPORT THE RESULTS. INADEQUATE DEPTHS WILL REQUIRE ADDITIONAL MATERIAL AND SUBSEQUENT RETESTING. THE ENGINEER WILL PROVIDE THE TEST RESULTS TO THE COUNTY ENGINEER.
5. BITUMINOUS CONCRETE WILL BE SUPPLIED AND CERTIFIED BY A VDOT CERTIFICATE AND BONDED SOURCE. EVIDENCE OF THIS WILL BE PROVIDED VIA INVOICES FROM SUPPLIER.
6. DURING THE PLACEMENT OF THE BITUMINOUS CONCRETE AND PRIOR TO ITS COMPACTION, PRE-ROLLED DEPTH MEASUREMENTS OF THE ASPHALT SHALL BE INSPECTED BY THE ENGINEER, IN THE PRESENCE OF THE CONTRACTOR, AT A MINIMUM OF 500 FT. INTERVALS. FOR PURPOSES OF DETERMINING THE PRE-ROLLED DEPTH ADD AN ADDITIONAL 1/4 INCH OF PRE-ROLLED ASPHALT FOR EACH 1.5 INCHES OF ROLLED/COMPACTED DEPTH CALLED FOR ON THE PLANS. INADEQUATE DEPTHS WILL REQUIRE ADDITIONAL BITUMINOUS CONCRETE TO BE IMMEDIATELY INSTALLED BY THE CONTRACTOR AT THE APPROPRIATE LOCATIONS. THE ENGINEER WILL PRESENT THE TEST RESULTS TO THE COUNTY ENGINEER. THE INSTALLATION OF MULTIPLE COURSES WILL REQUIRE THE TESTING/INSPECTION OF EACH INDIVIDUAL COURSE.
7. REPORTING WILL BE PERFORMED BY A CONTRACTOR AND THE LICENSED ENGINEER AS OUTLINED ABOVE. THE NUMBER OF SAMPLES IN EACH CASE WILL BE, AS A MINIMUM, THE TOTAL LENGTH OF ROADS TESTED DIVIDED BY THE REQUIRED INTERVAL. IN ORDER TO PRESERVE THE INTEGRITY OF THE PROJECT'S CONSTRUCTION, A PLAN DEPICTING THE SAMPLING LOCATIONS WILL BE PROVIDED TO THE COUNTY PRIOR TO THE ACTUAL INSPECTIONS.
8. INTERIM STATEMENTS FROM THE ENGINEER, WITH ACCOMPANYING DOCUMENTATION, WILL BE SUBMITTED TO THE COUNTY ENGINEER PRIOR TO PARTIAL RELEASE OF SURETY.
9. APPLICATION FOR FINAL RELEASE OF SURETY WILL BE ACCOMPANIED BY

   THE CONTRACTOR'S STATEMENT AND CERTIFICATION THAT THE SPECIFICALLY NAMED PRIVATE STREETS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS AND APPLICABLE VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARDS. CONTRACTOR'S CERTIFICATION SHALL BE SUPPORTED BY THE INSPECTIONS PERFORMED BY THE ENGINEER (SEE ABOVE).

UTILITIES INSTALLATION NOTES

GENERAL NOTES FOR WATER DISTRIBUTION AND SANITARY SEWER SYSTEMS

THE FOLLOWING NOTES SHALL BE PROVIDED ON ALL DEVELOPER CONSTRUCTED WATER DISTRIBUTION AND SANITARY SEWER SYSTEM FACILITY CONSTRUCTION PLANS AND SPECIFICATIONS, AND COMPLIANCE IS REQUIRED BY THE CONTRACTOR/DEVELOPER.

A. 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 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 STANDARDS AND REGIONAL STANDARDS MUST BE KEPT ON-SITE BY THE CONTRACTOR DURING FULL TIME OF INSTALLING, TESTING, AND CONVEYING FACILITIES TO THE JCSA.

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

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

D. ALL APPROVED EROSION AND SEDIMENT CONTROL REQUIREMENTS SHALL BE ADHERED TO DURING CONSTRUCTION.

E. ALL WATER MAINS SHALL BE DISINFECTED AND PRESSURE TESTED, AND SATISFACTORY BACTERIOLOGICAL SAMPLES OBTAINED, IN ACCORDANCE WITH THE AUTHORITY STANDARDS.

F. AFTER TESTING IS COMPLETE AND ALL COMPONENTS OF THE WATER AND SANITARY SEWER SYSTEM ARE ACCEPTABLE, THEN THE RECORD DRAWINGS SHALL BE SUBMITTED TO THE AUTHORITY. NO WATER METERS WILL BE INSTALLED UNTIL COMPLIANCE WITH SECTION 3 HAS BEEN FOUND SATISFACTORY BY THE AUTHORITY. ANY DISCREPANCIES NOTED DURING THE FINAL INSPECTION SHALL BE CORRECTED BY THE DEVELOPER'S REPRESENTATIVE WITHIN 30 DAYS.

G. ROUTINE PERIODIC INSPECTIONS DURING CONSTRUCTION WILL BE PROVIDED BY THE AUTHORITY. THESE INSPECTIONS DO NOT RELIEVE THE DEVELOPER FROM HIS OBLIGATION AND RESPONSIBILITY FOR CONSTRUCTING A WATER DISTRIBUTION AND SANITARY SEWER SYSTEM IN STRICT ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE AUTHORITY.

H. ANY CHANGES TO THE FINAL PLANS SHALL BE APPROVED BY THE AUTHORITY AND SHALL BE ACCURATELY INDICATED ON THE RECORD DRAWINGS.

I. 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 THE AUTHORITY.

J. THE DEVELOPER IS REQUIRED TO SUBMIT WATER AND SANITARY SEWER DATA SHEETS.

K. THE CONTRACTOR/DEVELOPER SHALL ACQUIRE A CERTIFICATE TO CONSTRUCT WATER AND SEWER FACILITIES FROM THE JAMES CITY COUNTY ENVIRONMENTAL DIVISION OF THE OFFICE OF DEVELOPMENT MANAGEMENT, PRIOR TO COMMENCEMENT OF CONSTRUCTION.

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

M. 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.

"THE BMP/SWMP INFORMATION SHOWN ON THESE DRAWINGS, IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF AND CERTIFY THAT I, OR MY AGENT, HAVE MADE SUFFICIENT INSPECTION TO ENSURE THE ACCURACY OF THIS STATEMENT."

T. RYAN STEPHENSON — 05/24/12 (DATE)

COMMONWEALTH OF VIRGINIA — T. RYAN STEPHENSON — Lic. No. 044405 — 05/24/12 — PROFESSIONAL ENGINEER

* SEDIMENT CLEANED OUT OF POND BOTTOM IN MAY, 2012

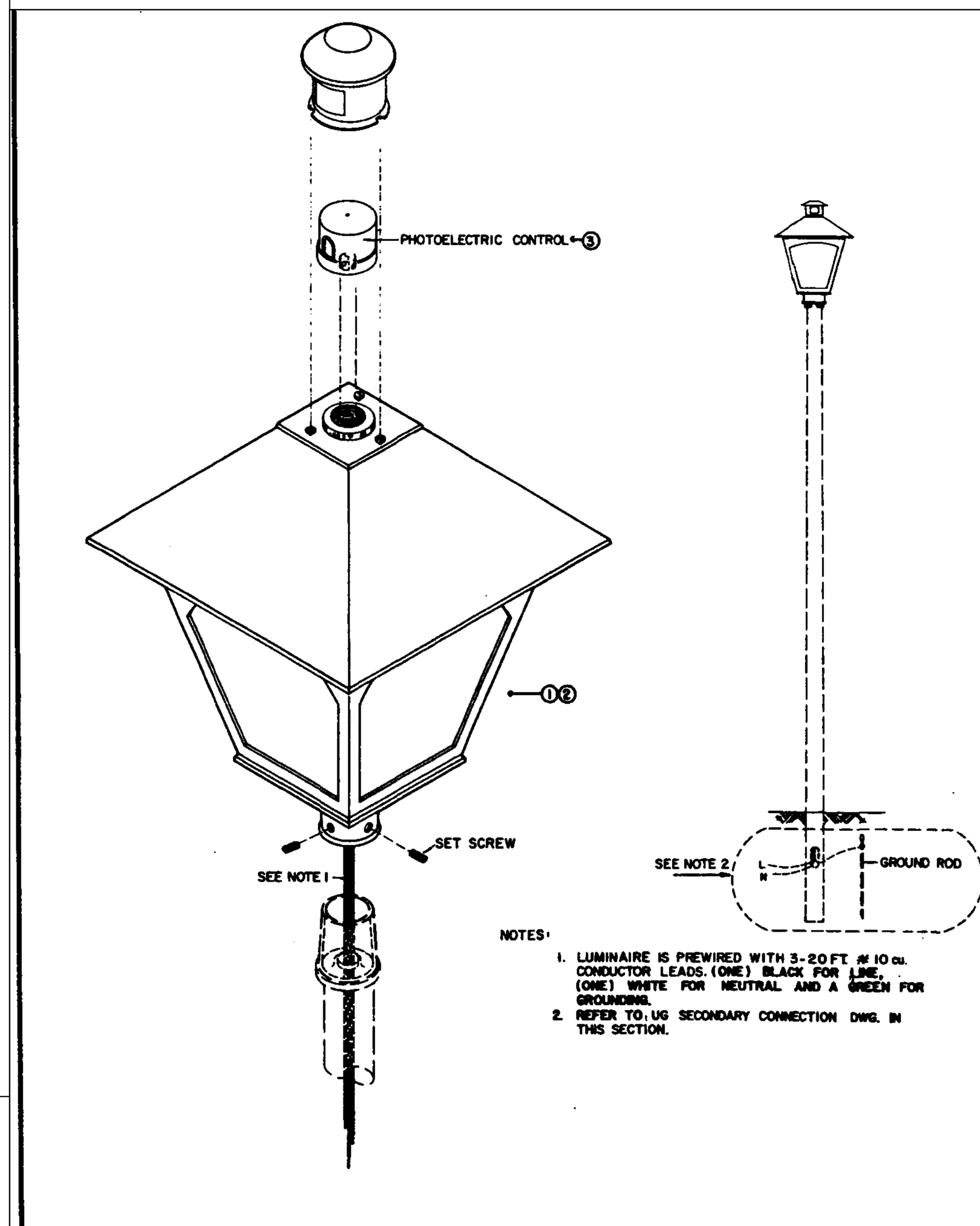
NOTE:
THE FOLLOWING DETAILS SHALL BE APPLIED TO THE UTILITIES SHOWN ON THESE PLANS:

HRPDC DETAILS

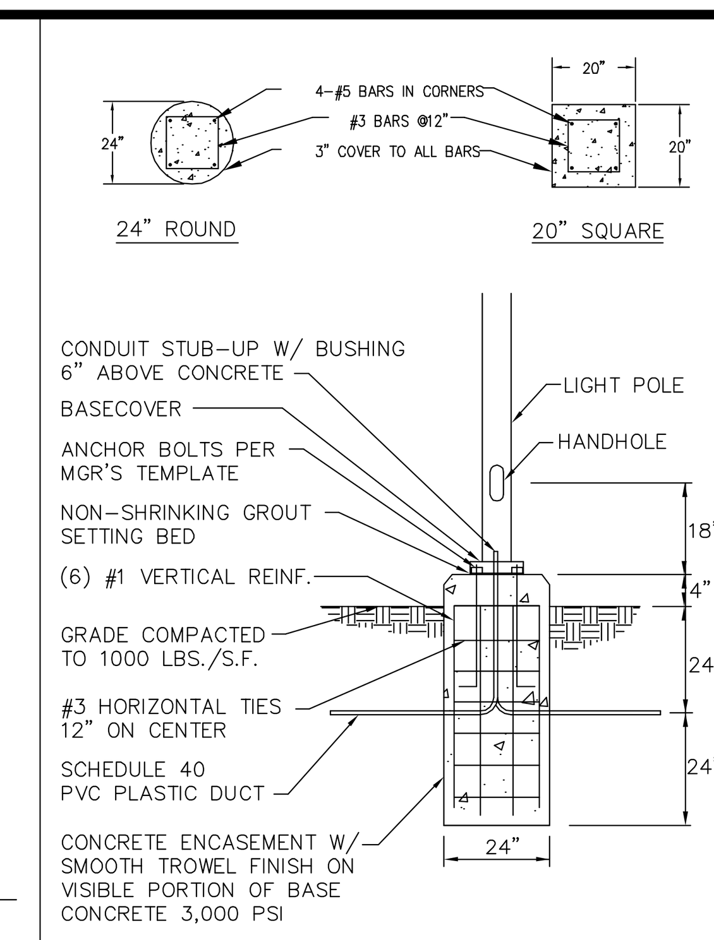
WD_01	SINGLE & DUAL CONNECTIONS
WD_05	BLOW-OFF ASSEMBLY
WD_06	FIRE HYDRANT SETTING
WD_09	TEMPORARY MANIFOLD FOR TEST & CHLORINATION
SS_01	STD. PRECAST CONCRETE MANHOLE w/EXTENDED MONO. BASE
SS_04	SANITARY SEWER INTERIOR DROP MANHOLE
SS_06	SANITARY SEWER MANHOLE ADJUSTMENT
SS_07	SANITARY SEWER MANHOLE INVERT SHAPING
SS_08	CONNECTION INTO EXISTING MANHOLES
SS_09	SANITARY SEWER MANHOLE CASTING
SS_10	SANITARY SEWER MANHOLE COVER
SS_11	SANITARY SERVICE LATERAL CLEAN OUT FRAME AND COVER
SS_12	SANITARY SERVICE LATERAL CLEAN OUT FRAME AND COVER FOR HEAVY LOADS
SS_14	SANITARY SEWER SERVICE CONNECTION
SS_15	DUAL SANITARY SEWER SERVICE CONNECTIONS
SS_16	DEEP SANITARY SEWER CONNECTION
WS_01	STD. VALVE BOX AND FRAME COVER
WS_02	VALVE SETTING DETAIL
WS_03	MANUAL AIR VENT ASSEMBLY
WS_04	STEEL CASING DETAIL
EW_01	PIPE BEDDING DETAIL

JCSA DETAILS

W 13.0	TYP. WATER METER INSTALLATION
W 14.0	RESIDENTIAL METER SETTING



	ORIGINAL	REVISION	REVISION	REVISION	REVISION	COLONIAL LUMINAIRE - POST TOP MERCURY VAPOR & HIGH PRESSURE SODIUM	L COL
BY	ALDEN	FH	FH				
CHECKED						VIRGINIA POWER / WEST VIRGINIA POWER / NORTH CAROLINA POWER — ENGINEERING AND CONSTRUCTION	NO. OLD030 2 OF 2
APPROVED							
DATE		9/3/79	4-30-80				



LIGHT POLE BASE DETAIL

N.T.S.

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.

CONDUIT ELBOWS SHALL HAVE A 90° BEND. THE BEND RADIUS SHALL BE IN ACCORDANCE WITH THE NEC.

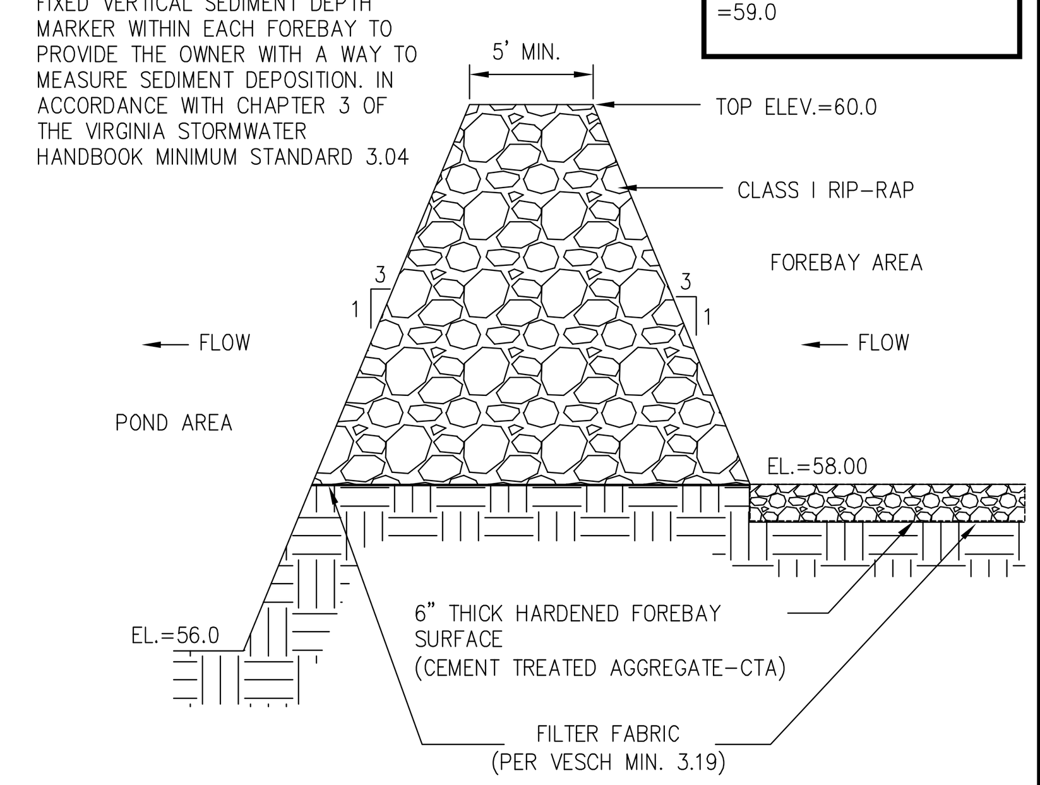
SIZING OF ELECTRICAL SERVICE WIRING SHALL BE THE CONTRACTORS RESPONSIBILITY AND SHALL MEET NEC REQUIREMENTS FOR APPLICATION.

CONTRACTOR SHALL ENSURE THE COMPATIBILITY OF LAMP, FIXTURE, POLE, AND POLE BASE.

POLE BASE SHALL BE LOCATED A MINIMUM OF 3' FROM BACK OF CURB.

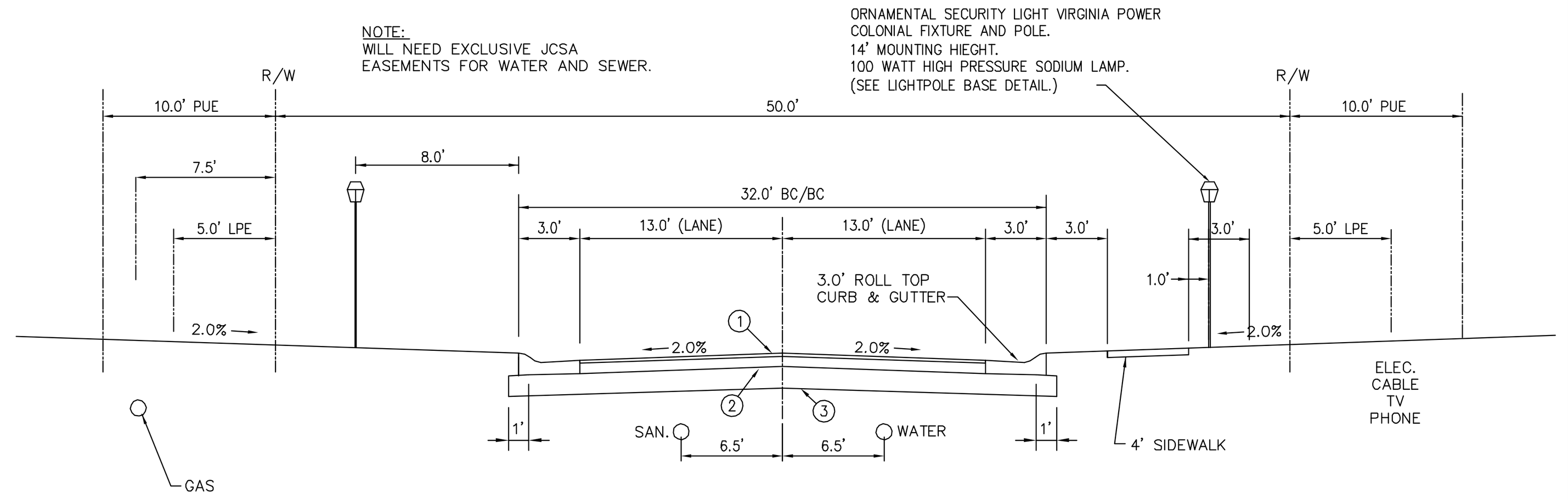
NOTE:
THE CONTRACTOR SHALL PROVIDE A FIXED VERTICAL SEDIMENT DEPTH MARKER WITHIN EACH FOREBAY TO PROVIDE THE OWNER WITH A WAY TO MEASURE SEDIMENT DEPOSITION. IN ACCORDANCE WITH CHAPTER 3 OF THE VIRGINIA STORMWATER HANDBOOK MINIMUM STANDARD 3.04

NOTE:
FOREBAY SEDIMENT CLEANOUT ELEVATION =59.0



SEDIMENT FOREBAY #1 SECTION A-A

N.T.S.

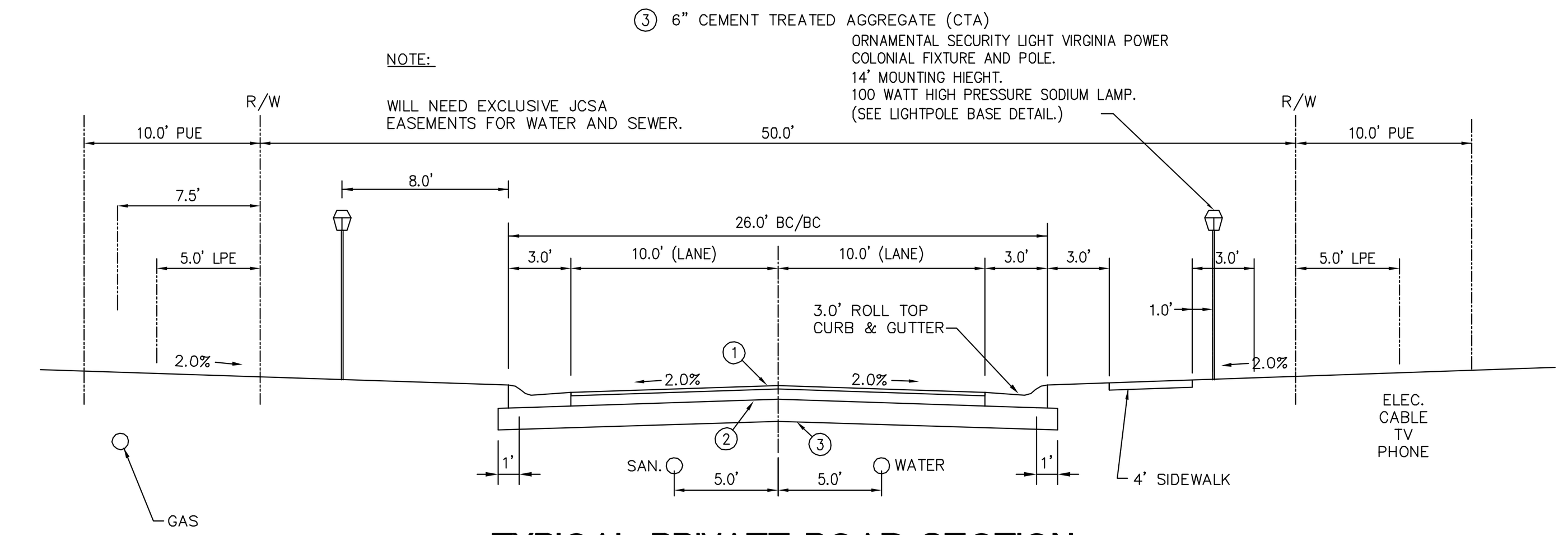


TYPICAL PRIVATE ROAD SECTION

CHAPEL CROSSING ROAD 10+00 TO 18+46.12(RP)

N.T.S.

1. 2.5" SM-9.5A BIT. CONCRETE
2. 3" BM-25.0 BASE
3. 6" CEMENT TREATED AGGREGATE (CTA)

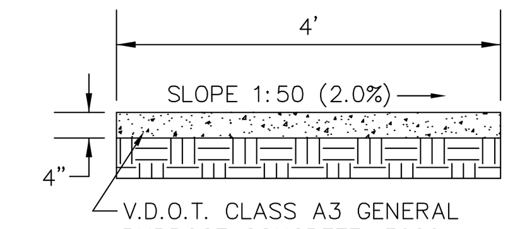


TYPICAL PRIVATE ROAD SECTION

OLD LOCK ROAD 10+00 TO 19+33.53

N.T.S.

1. 2.5" SM-9.5A BIT. CONCRETE
2. 3" BM-25.0 BASE
3. 6" CEMENT TREATED AGGREGATE (CTA)



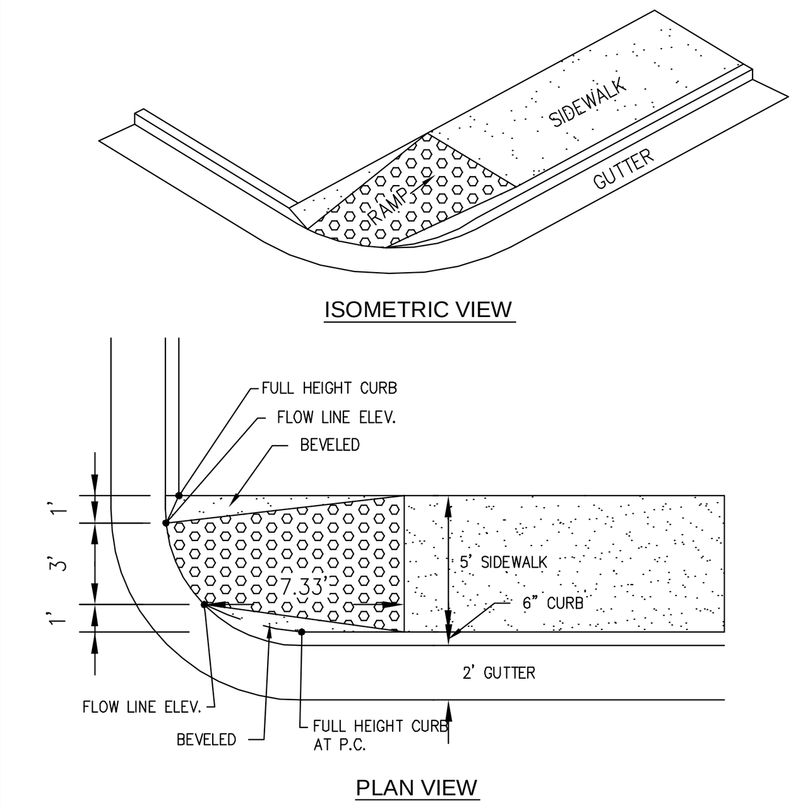
V.D.O.T. CLASS A3 GENERAL PURPOSE CONCRETE, 3000 PSI AT 28 DAY COMPRESSIVE STRENGTH

HORIZONTAL CRACK CONTROL JOINTS SHALL BE 5' C/C. COMPACTED SUBGRADE PER VDOT SPECIFICATIONS

SIDEWALK DETAIL

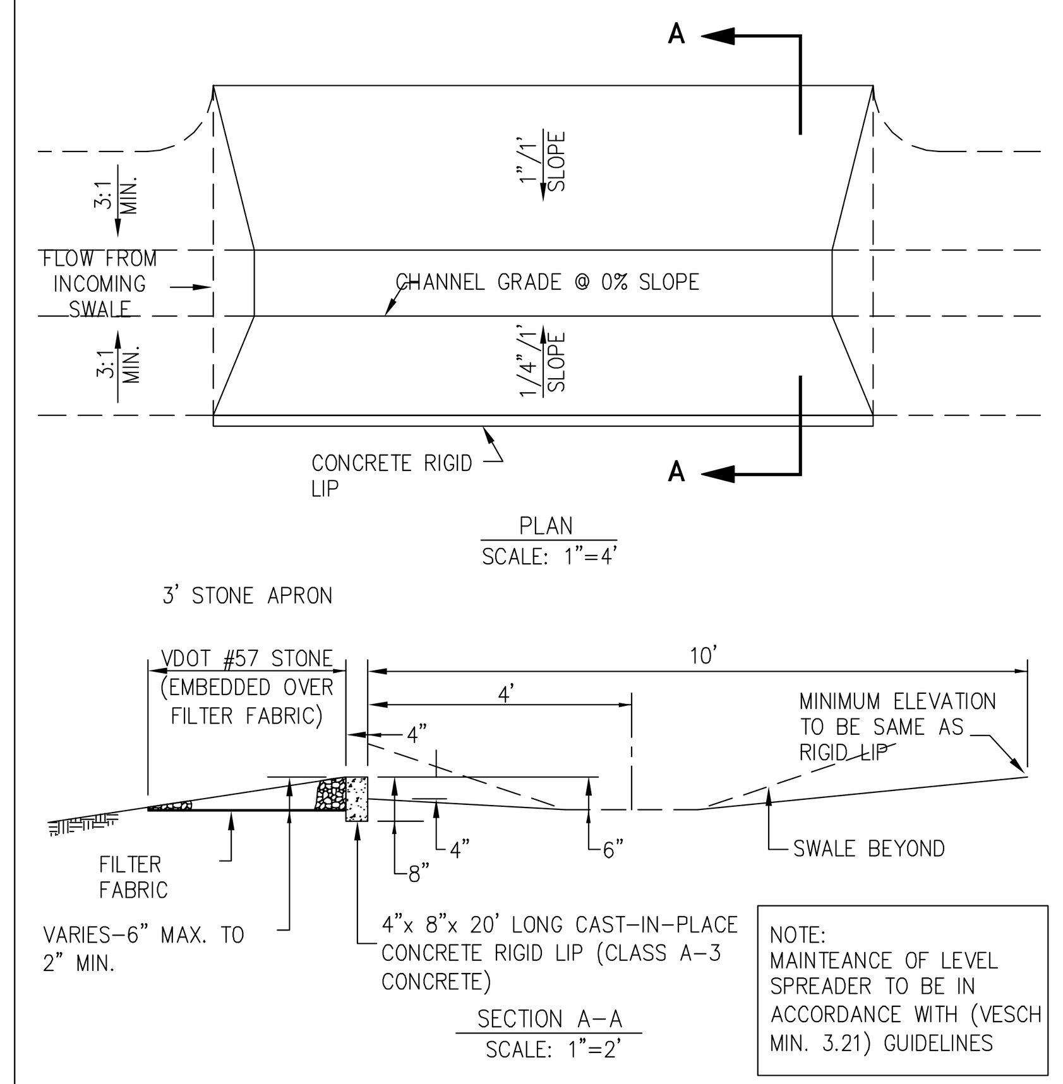
N.T.S.

D-CONCSW



MODIFIED CG-12

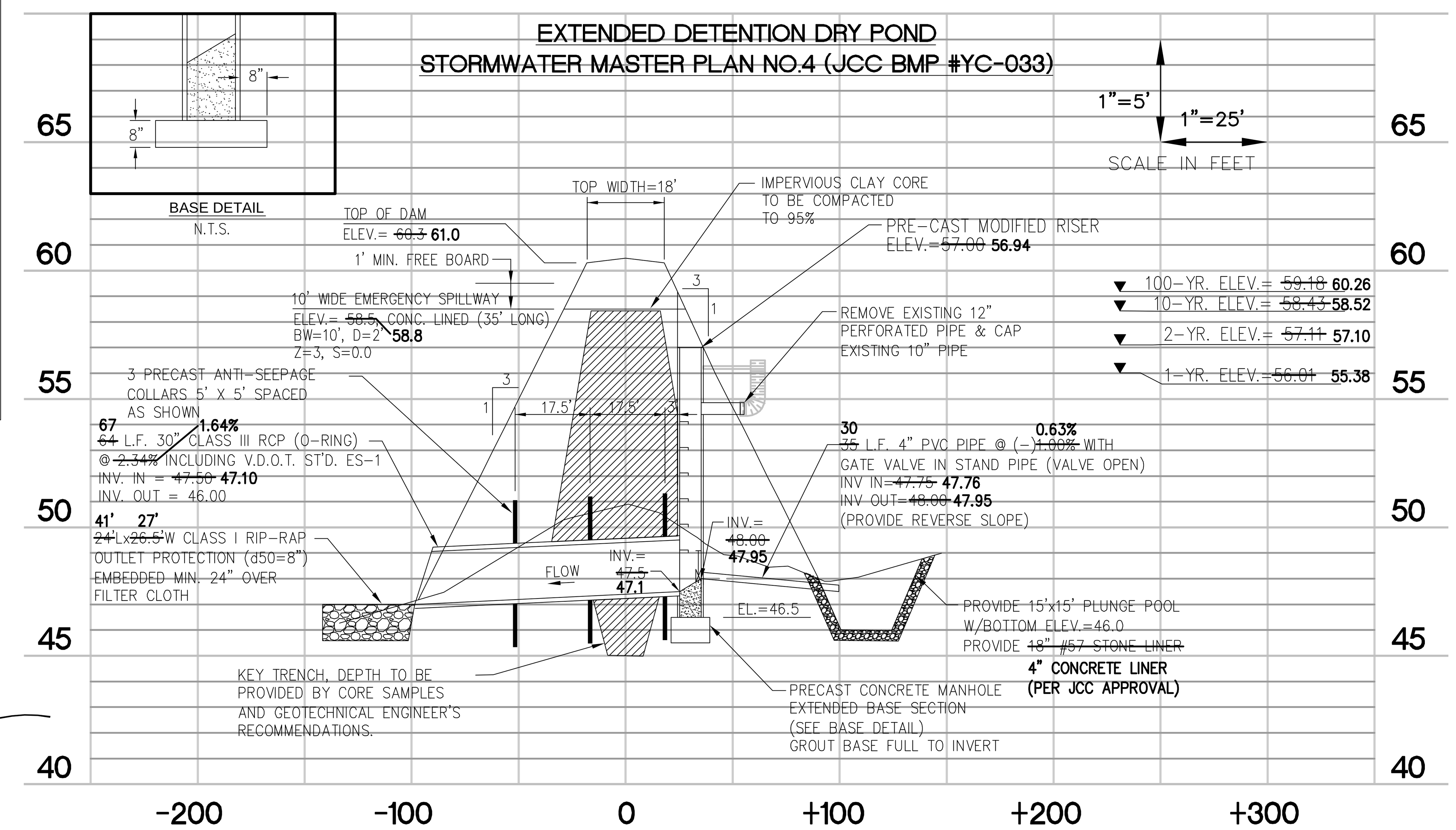
N.T.S.



NOTE:
MAINTEANCE OF LEVEL SPREADER TO BE IN ACCORDANCE WITH (VESCH MIN. 3.21) GUIDELINES

(LS) LOW IMPACT DESIGN LEVEL SPREADER

EXTENDED DETENTION DRY POND
STORMWATER MASTER PLAN NO.4 (JCC BMP #YC-033)



No.	DATE	REVISION / COMMENT / NOTE	BY
3	5/24/12	RECORD DRAWING	TRS
9	8/10/05	ADJUSTED DIP WL DUE TO MASS GRADING, SHTS. 12 & 13	HWP
8	8/9/05	ADDED SEWER CASING PER OWNER SHEET 14	HWP
7	7/21/05	REVISED SIDEWALKS	HWP
6	7/06/05	REVISED GRADING ON SHT 11 & MATCHLINE SHTS 10 & 11	HWP
5	5/11/05	REVISED MH2-24 & FG ELEVATIONS (SHEETS 6,10,11,& 12)	HWP
4	1/28/05	REVISED SANITARY MANHOLE#2-38 (SHEETS 7 & 13)	HWP

COMMONWEALTH OF VIRGINIA — G. ARCHER MARSTON, III — No. 018232 — 9/23/04 — PROFESSIONAL ENGINEER

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

CONSULTING ENGINEERS

NOTES AND DETAILS
PHASE II, SECTION 2 COLONIAL HERITAGE
OWNER/DEVELOPER: COLONIAL HERITAGE L.L.C.

STONEHOUSE — JAMES CITY COUNTY — VIRGINIA

Designed	Drawn
CCM/HWP	AES
Scale	Date
NOTED	8/27/03
Project No.	
8881-22	
Drawing No.	
15	

COUNTY PLAN NO. S-73-03; BMP #YC-033; RECORD DRAWING-05/24/12

NOTE:
CHECK DAMS SHOWN ARE FOR TEMPORARY USE AND ARE TO BE REMOVED UPON STABILIZATION OR UPON E & S INSPECTOR'S APPROVAL.

No.	DATE	REVISION / COMMENT / NOTE	BY
3	5/24/12	RECORD DRAWING	TRS
2	8/10/05	ADJUSTED DIP W. DUE TO MASS GRADING, SHTS. 12 & 13	HWP
1	8/9/05	ADDED SEWER CASING PER OWNER SHEET 14	HWP
1	7/21/05	REVISED SIDEWALKS	HWP
1	7/05/05	REVISED GRADING ON SHT 11 & MATCHLINE SHTS 10 & 11	HWP
1	5/31/05	REVISED MH2-24 & FG ELEVATIONS (SHEETS 6,10,11,& 12)	HWP
1	1/28/05	REVISED SANITARY MANHOLE #2-38 (SHEETS 7 & 13)	HWP

COMMONWEALTH OF VIRGINIA
C. ARCHER MARSTON, III
No. 018222
9/23/04
REGISTERED PROFESSIONAL ENGINEER

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

ES CONSULTING ENGINEERS

GRADING, DRAINAGE AND EROSION AND SEDIMENT CONTROL PLAN PHASE II, SECTION 2 COLONIAL HERITAGE

OWNER/DEVELOPER: COLONIAL HERITAGE L.L.C.

STONEHOUSE — JAMES CITY COUNTY — VIRGINIA

Designed	Drawn
CCM/HWP	AES
Scale	Date
1"=30'	8/27/03
Project No.	
8881-22	
Drawing No.	
11	

"THE BMP/SWMP INFORMATION SHOWN ON THESE DRAWINGS, IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF AND CERTIFY THAT I, OR MY AGENT, HAVE MADE SUFFICIENT INSPECTION TO ENSURE THE ACCURACY OF THIS STATEMENT."

T. RYAN STEPHENSON — 05/24/12 — DATE

COMMONWEALTH OF VIRGINIA
T. RYAN STEPHENSON
Lic. No. 044405
05/24/12
PROFESSIONAL ENGINEER

* SEDIMENT CLEANED OUT OF POND BOTTOM IN MAY, 2012

NOTE: THE DRIVEWAYS SHOWN ON THIS RECORD DRAWING REPRESENT THE ORIGINAL DESIGN AND ARE NOT REPRESENTATIVE OF AS-BUILT CONDITIONS.

GRAPHIC SCALE
30' 0' 30' 60'
SCALE: 1" = 30'

LEGEND FOR BMP HATCHING
- EC-3 MATTING
- POND NORMAL POOL ELEVATION
- HARDENED FOREBAY BOTTOM (CTA)

COUNTY PLAN NO. S-73-03; BMP #YC-033; RECORD DRAWING-05/24/12

Hydraflow Table of Contents

PH 2 SECT 2-6th HOLE BMP 2-4-04- As-built 2012-05-23.gpw

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9 — Thursday, 00 24, 2012

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9

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	-----	9.267	20.19	-----	-----	52.03	-----	-----	102.16	Pre-Dev
3	SCS Runoff	-----	24.16	39.54	-----	-----	78.11	-----	-----	133.34	Post-Dev
5	Reservoir	3	1.132	3.036	-----	-----	50.28	-----	-----	80.70	BMP As-built

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9

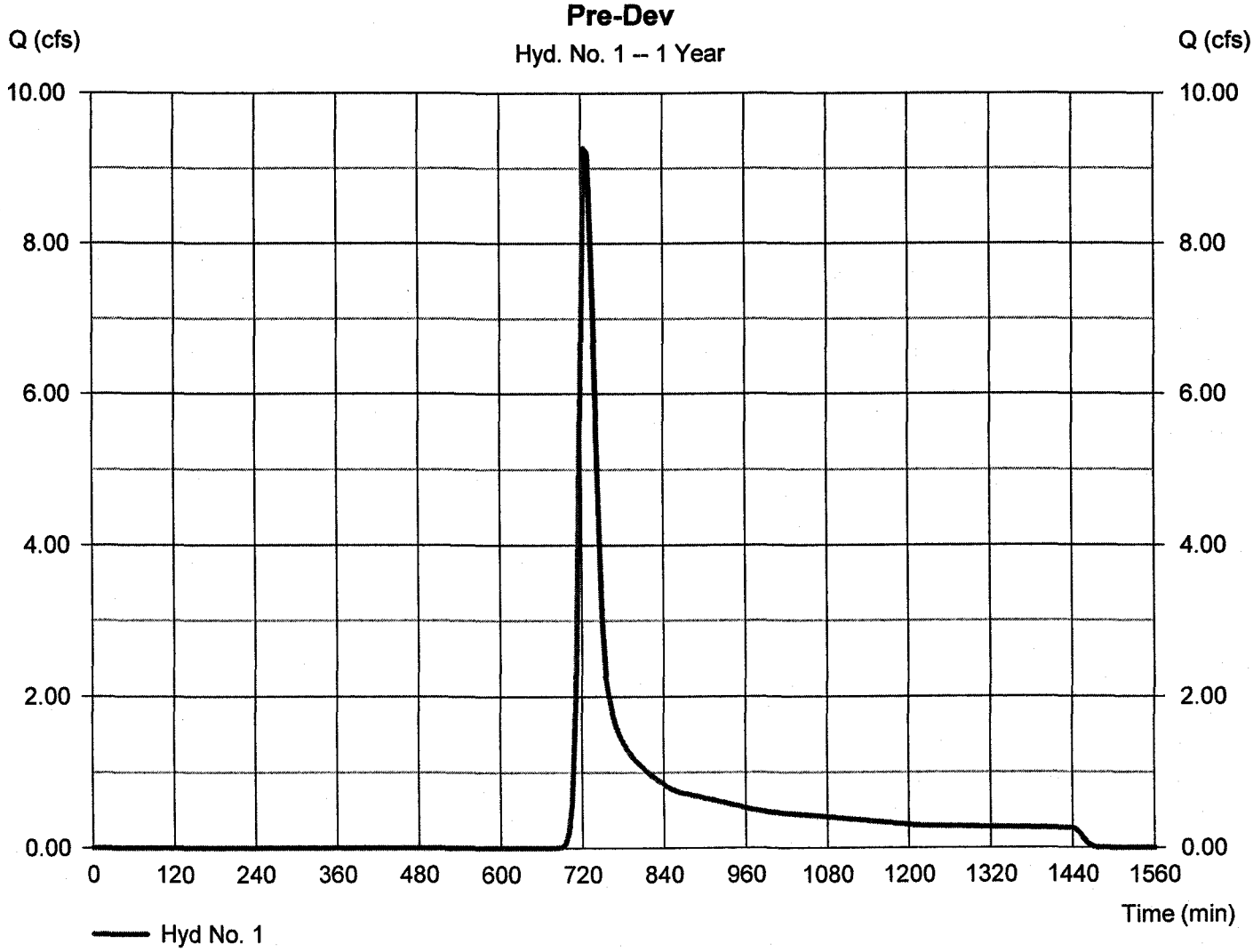
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	9.267	5	725	37,726	------	------	------	Pre-Dev
3	SCS Runoff	24.16	5	720	65,217	------	------	------	Post-Dev
5	Reservoir	1.132	5	835	65,216	3	55.38	34,701	BMP As-built

Hydrograph Report

Hyd. No. 1

Pre-Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 9.267 cfs
Storm frequency	= 1 yrs	Time to peak	= 725 min
Time interval	= 5 min	Hyd. volume	= 37,726 cuft
Drainage area	= 14.100 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.00 min
Total precip.	= 2.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

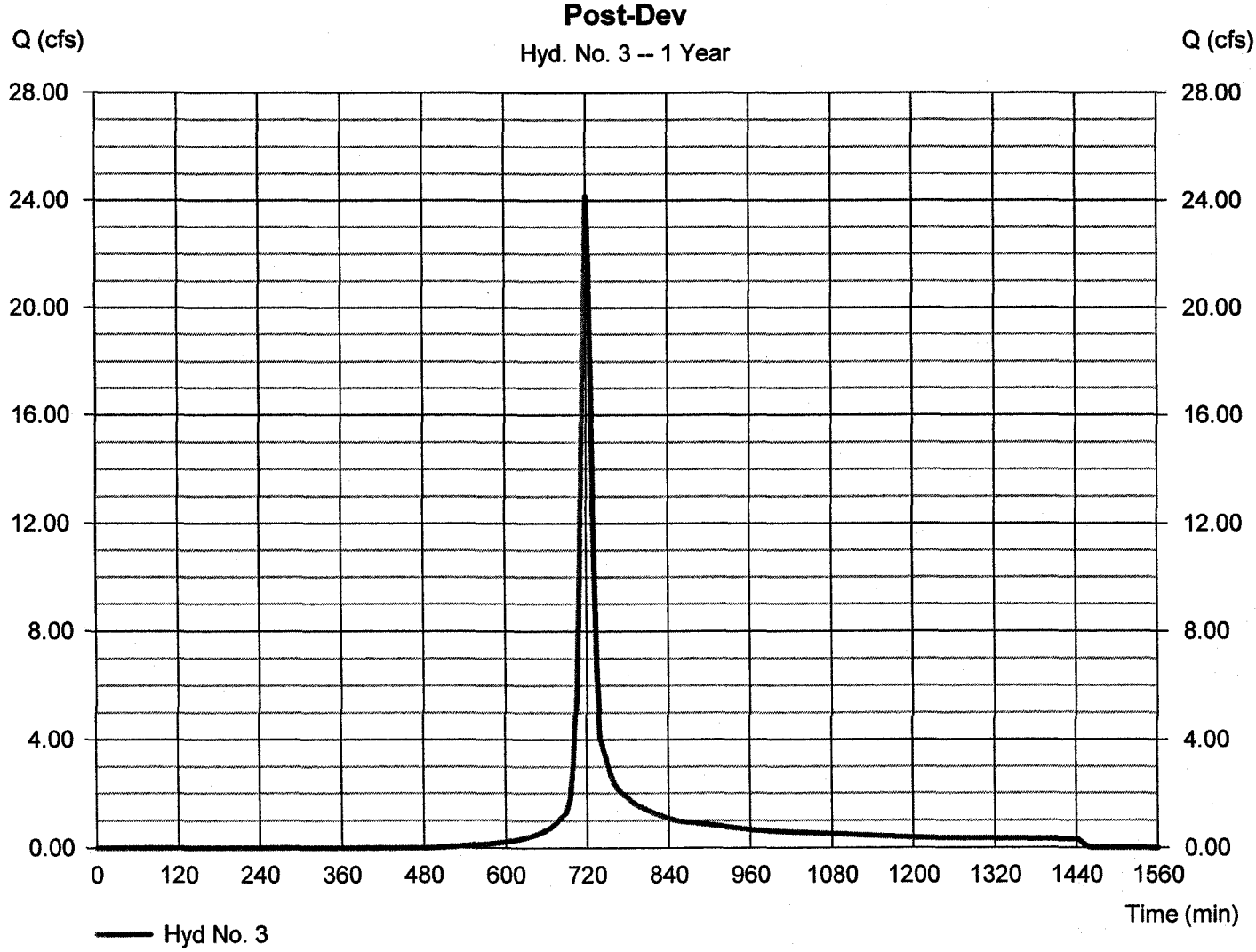


Hydrograph Report

Hyd. No. 3

Post-Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 24.16 cfs
Storm frequency	= 1 yrs	Time to peak	= 720 min
Time interval	= 5 min	Hyd. volume	= 65,217 cuft
Drainage area	= 12.840 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 2.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



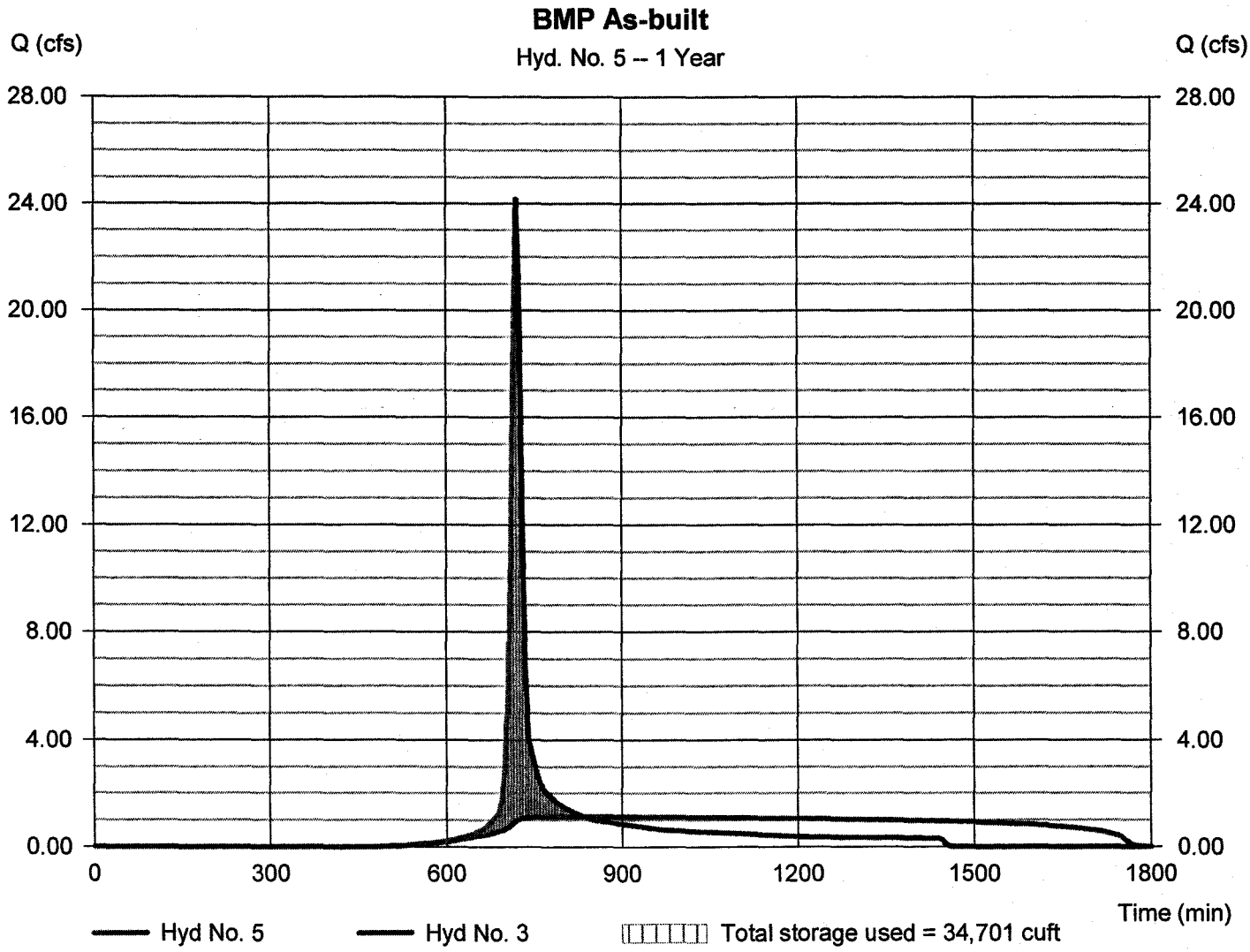
Hydrograph Report

Hyd. No. 5

BMP As-built

Hydrograph type	= Reservoir	Peak discharge	= 1.132 cfs
Storm frequency	= 1 yrs	Time to peak	= 835 min
Time interval	= 5 min	Hyd. volume	= 65,216 cuft
Inflow hyd. No.	= 3 - Post-Dev	Max. Elevation	= 55.38 ft
Reservoir name	= BMP As-built	Max. Storage	= 34,701 cuft

Storage Indication method used.



Pond Report

Pond No. 9 - BMP As-built

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 48.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	48.00	146	0	0
1.00	49.00	494	320	320
2.00	50.00	1,337	916	1,236
3.00	51.00	2,281	1,809	3,045
4.00	52.00	3,854	3,068	6,112
5.00	53.00	7,173	5,514	11,626
6.00	54.00	9,444	8,309	19,934
7.00	55.00	11,160	10,302	30,236
8.00	56.00	12,649	11,905	42,141
9.00	57.00	14,417	13,533	55,674
10.00	58.00	16,221	15,319	70,993
11.00	59.00	18,894	17,558	88,550
12.00	60.00	21,260	20,077	108,627
13.00	61.00	24,635	22,948	131,575

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 30.00	4.00	0.00	0.00
Span (in)	= 30.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 47.10	47.95	0.00	0.00
Length (ft)	= 67.00	30.00	0.00	0.00
Slope (%)	= 1.64	0.00	0.00	n/a
N-Value	= .013	.012	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

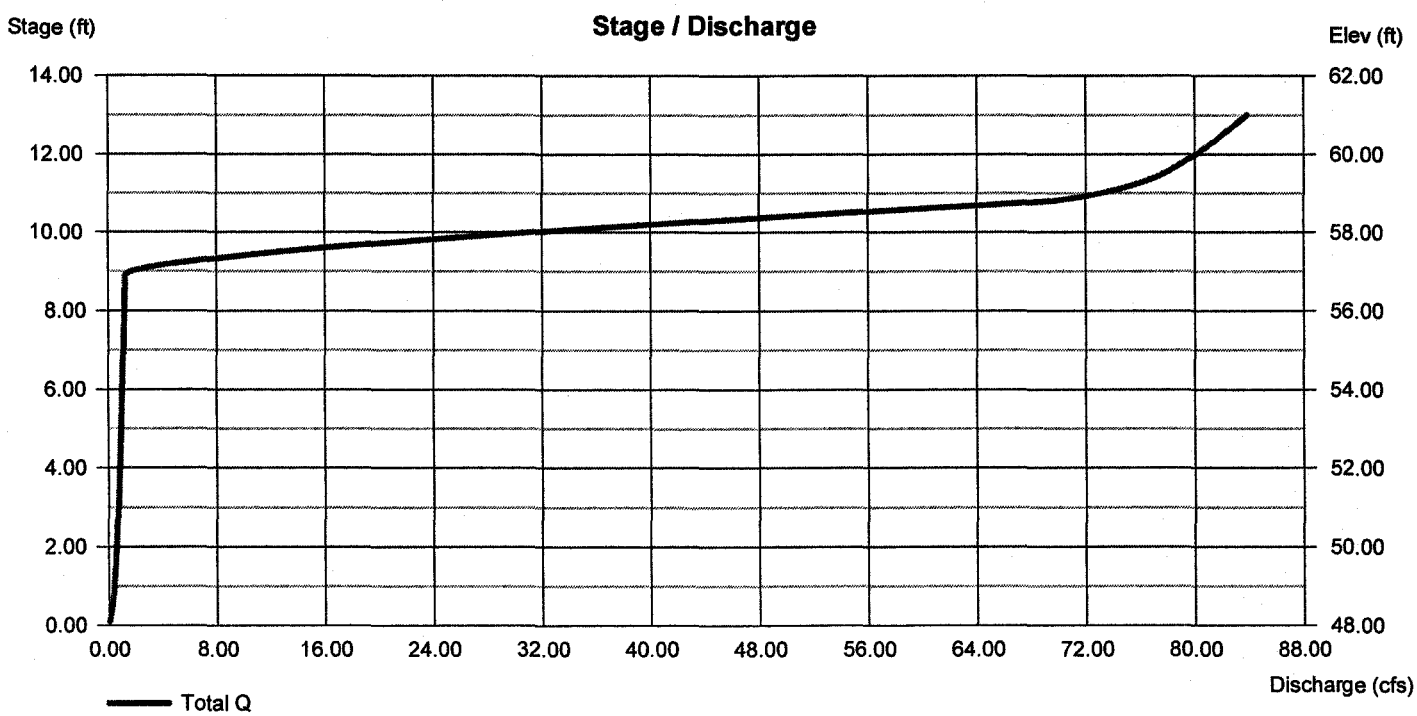
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 8.26	10.00	0.00	0.00
Crest El. (ft)	= 56.94	58.80	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	Ciplti	---	---
Multi-Stage	= Yes	Yes	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

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



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9

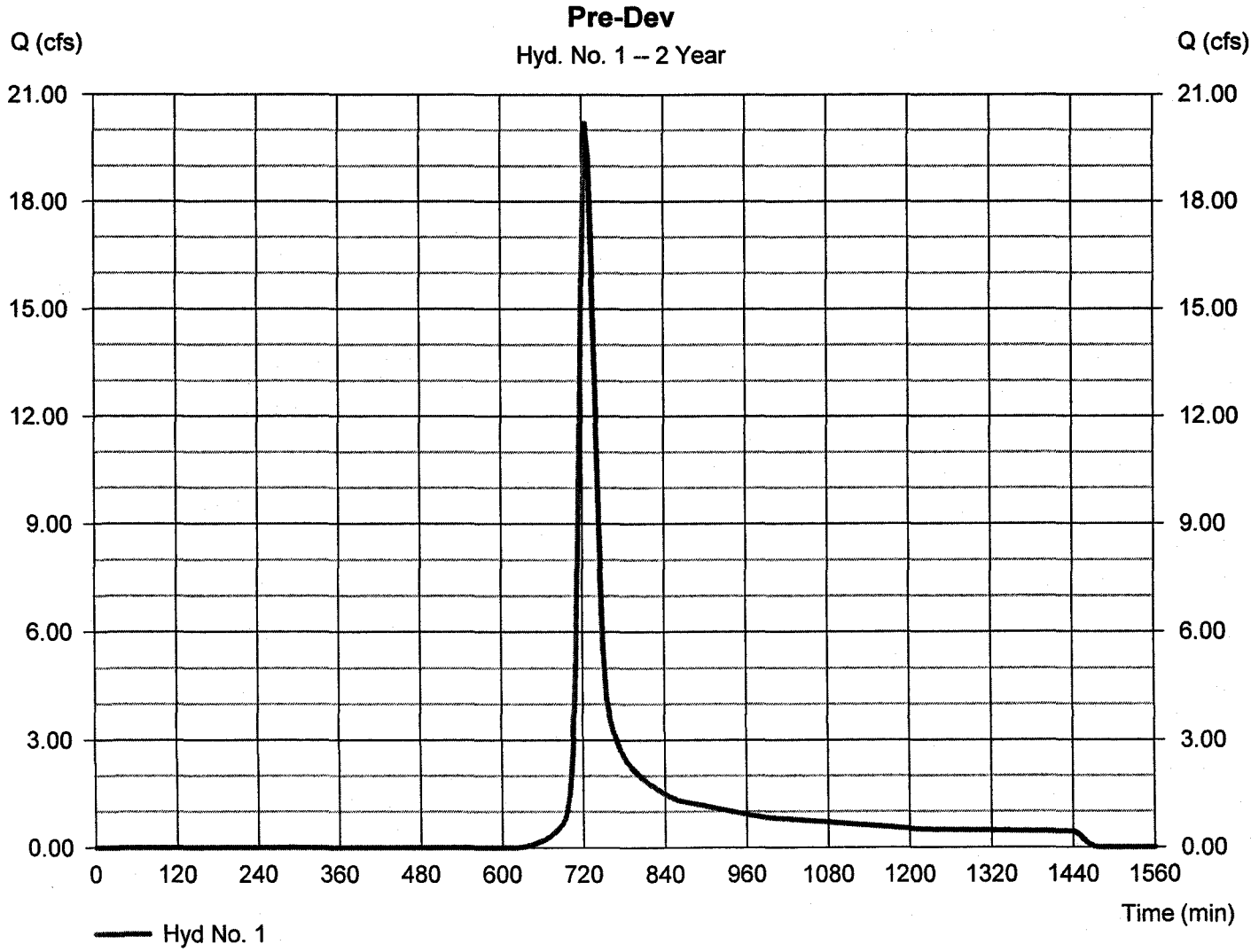
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	20.19	5	725	74,528	------	------	------	Pre-Dev
3	SCS Runoff	39.54	5	720	107,314	------	------	------	Post-Dev
5	Reservoir	3.036	5	775	107,313	3	57.10	57,219	BMP As-built

Hydrograph Report

Hyd. No. 1

Pre-Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 20.19 cfs
Storm frequency	= 2 yrs	Time to peak	= 725 min
Time interval	= 5 min	Hyd. volume	= 74,528 cuft
Drainage area	= 14.100 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.00 min
Total precip.	= 3.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

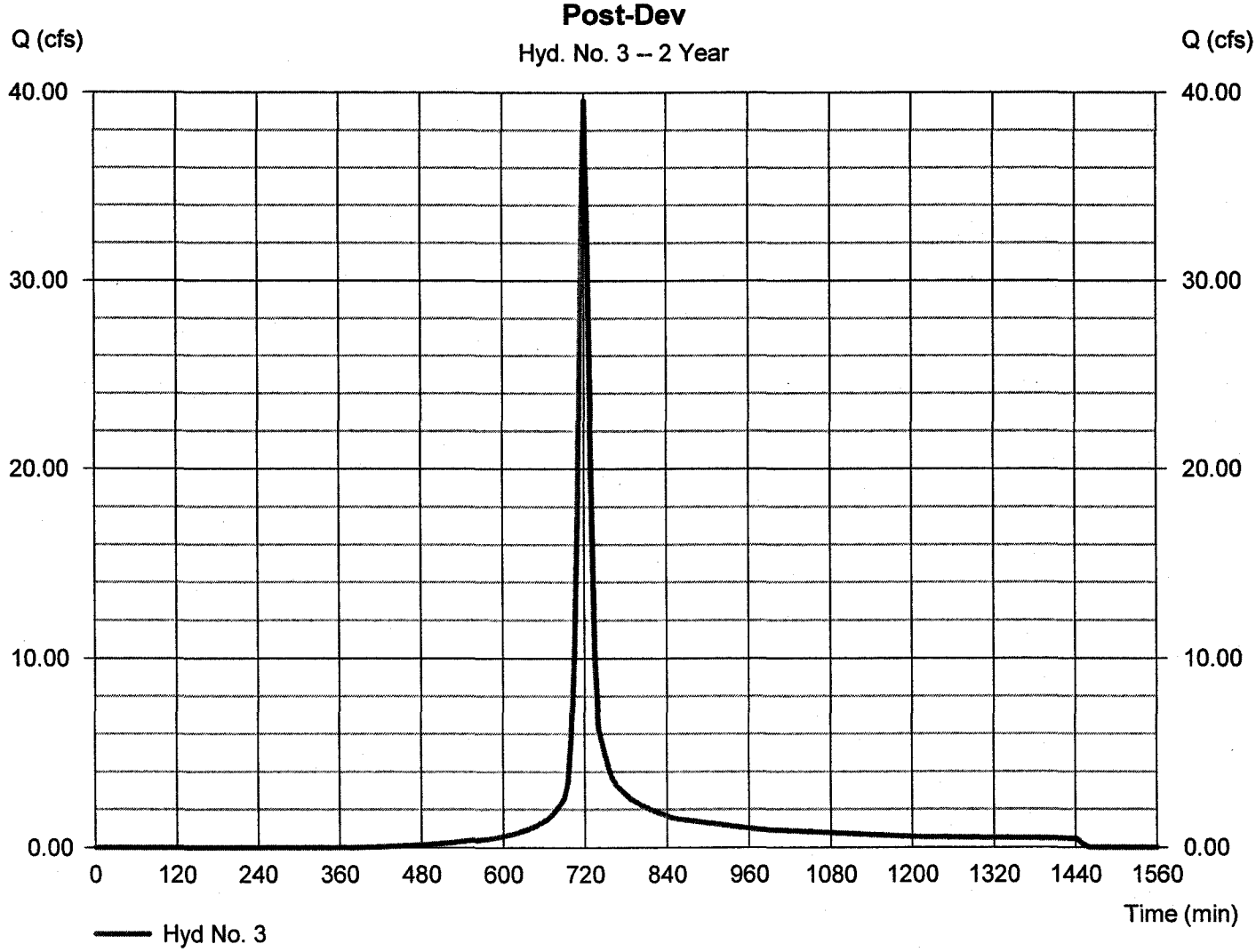


Hydrograph Report

Hyd. No. 3

Post-Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 39.54 cfs
Storm frequency	= 2 yrs	Time to peak	= 720 min
Time interval	= 5 min	Hyd. volume	= 107,314 cuft
Drainage area	= 12.840 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



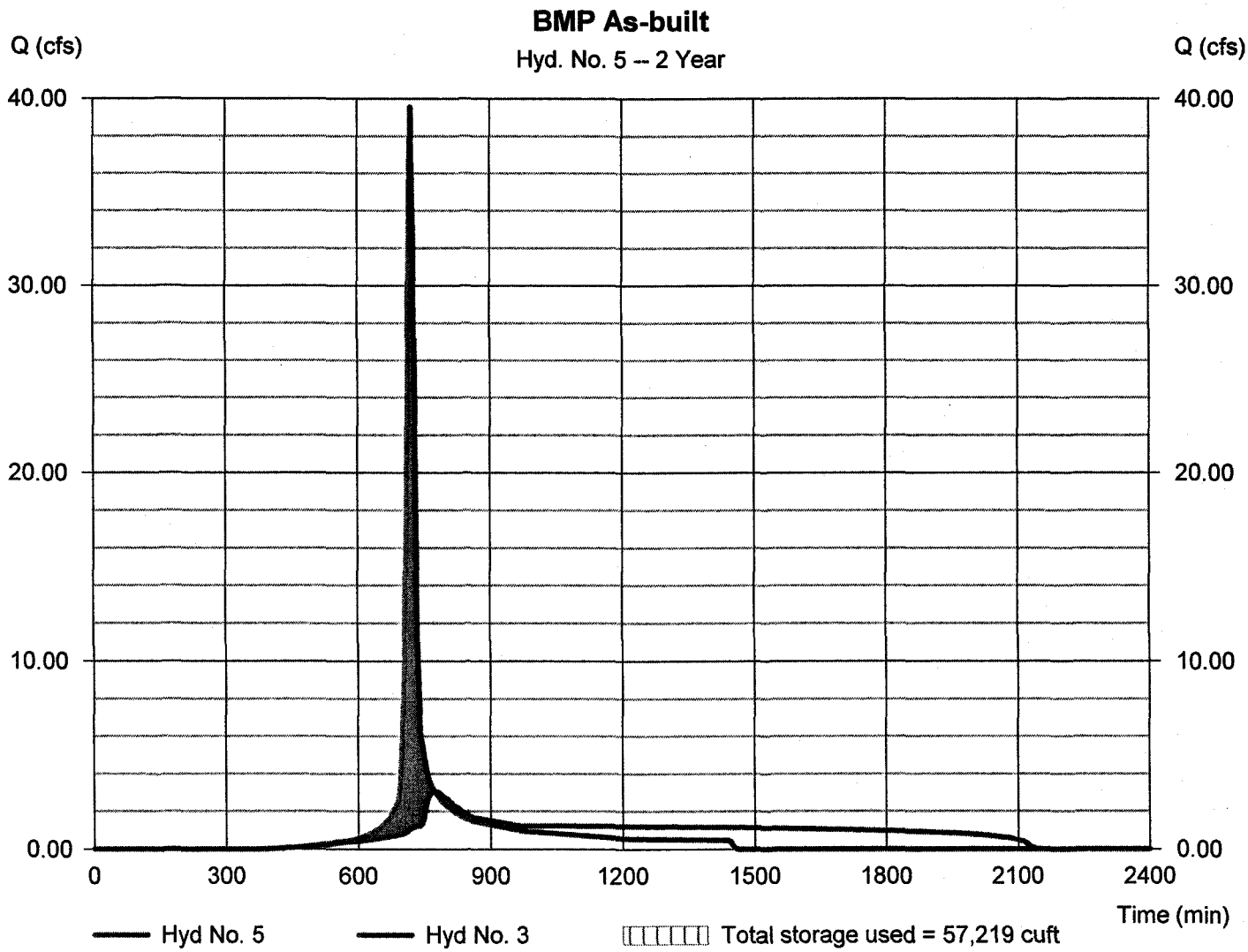
Hydrograph Report

Hyd. No. 5

BMP As-built

Hydrograph type	= Reservoir	Peak discharge	= 3.036 cfs
Storm frequency	= 2 yrs	Time to peak	= 775 min
Time interval	= 5 min	Hyd. volume	= 107,313 cuft
Inflow hyd. No.	= 3 - Post-Dev	Max. Elevation	= 57.10 ft
Reservoir name	= BMP As-built	Max. Storage	= 57,219 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9

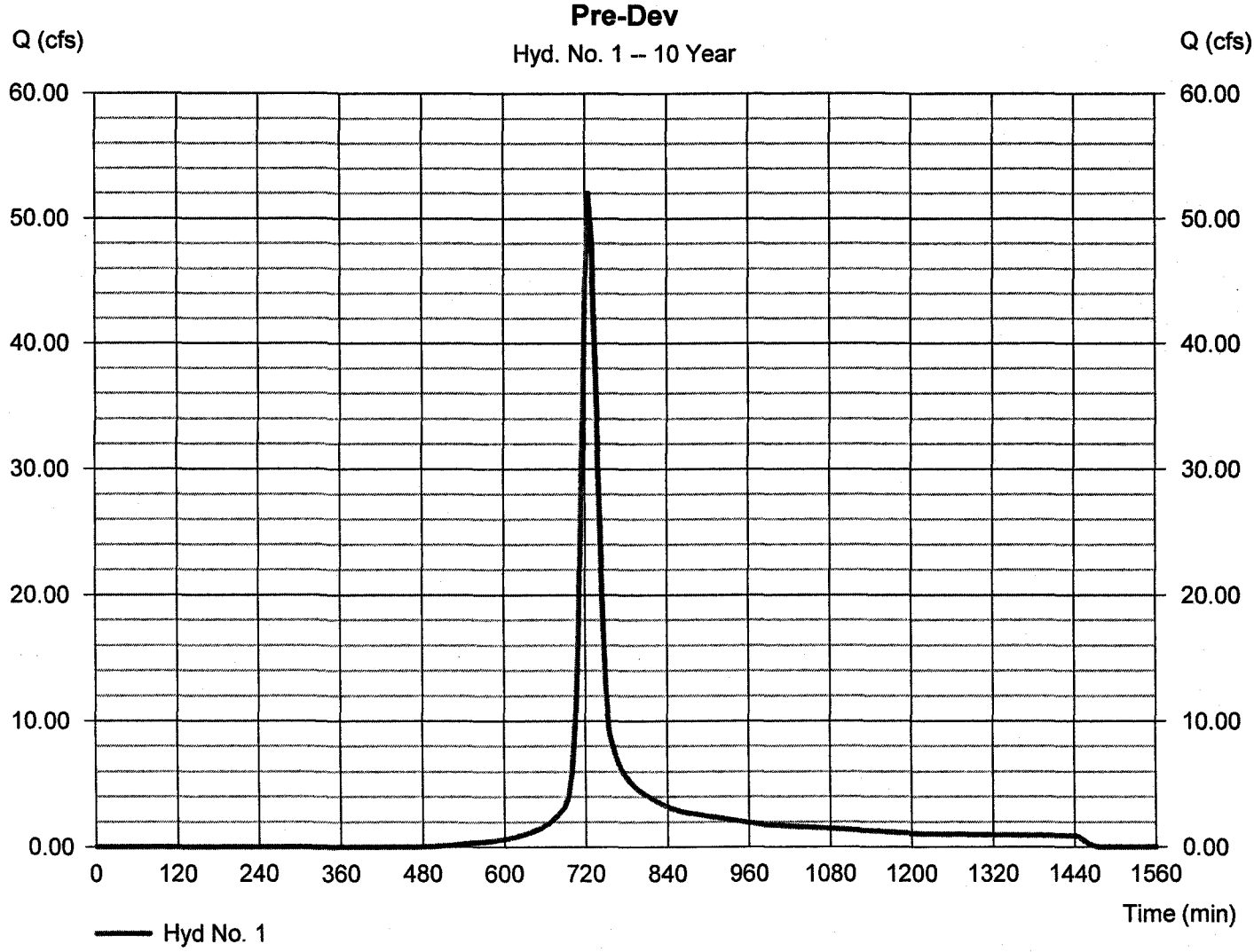
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	52.03	5	725	183,888	------	------	------	Pre-Dev
3	SCS Runoff	78.11	5	720	217,688	------	------	------	Post-Dev
5	Reservoir	50.28	5	730	217,688	3	58.52	78,282	BMP As-built

Hydrograph Report

Hyd. No. 1

Pre-Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 52.03 cfs
Storm frequency	= 10 yrs	Time to peak	= 725 min
Time interval	= 5 min	Hyd. volume	= 183,888 cuft
Drainage area	= 14.100 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.00 min
Total precip.	= 6.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

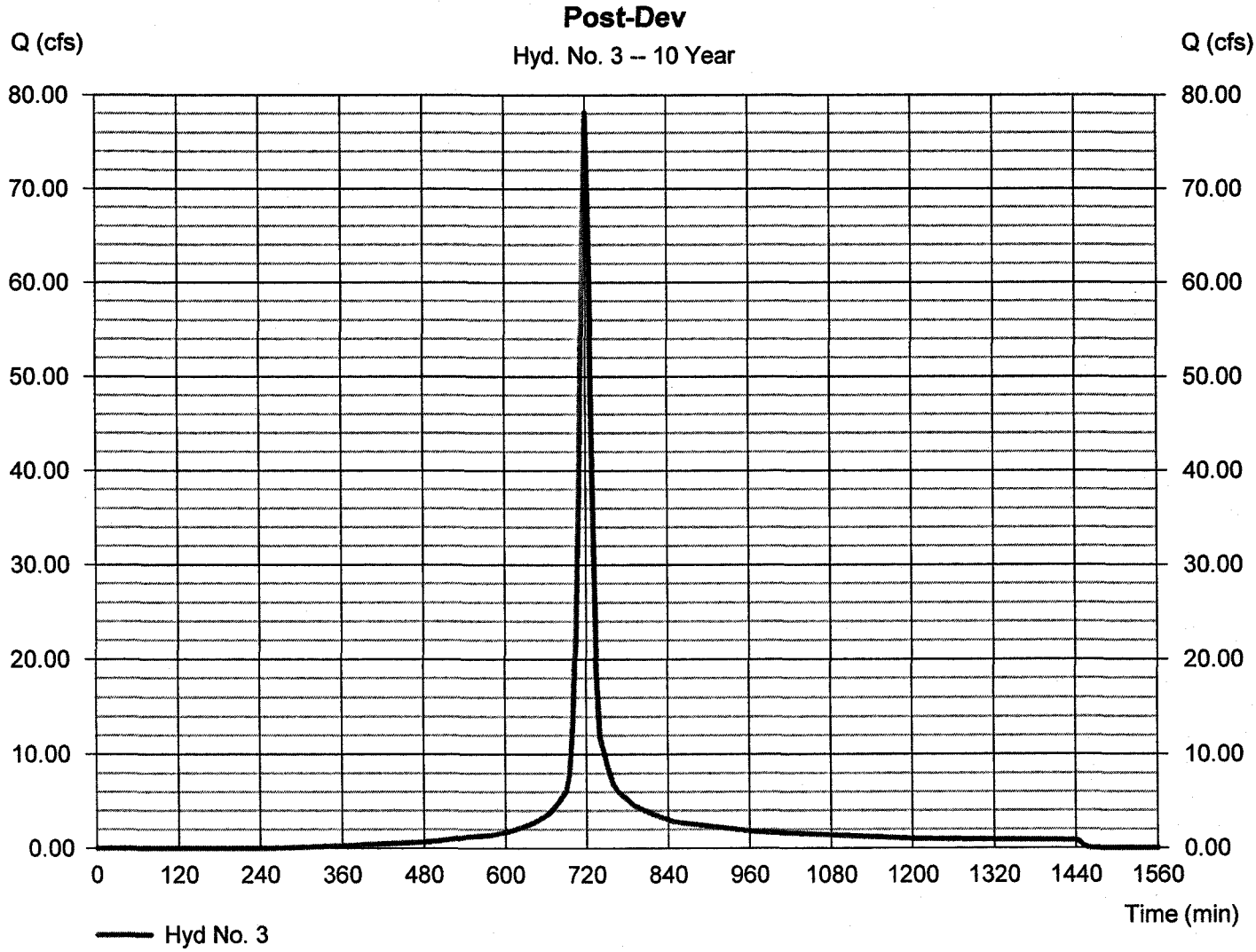


Hydrograph Report

Hyd. No. 3

Post-Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 78.11 cfs
Storm frequency	= 10 yrs	Time to peak	= 720 min
Time interval	= 5 min	Hyd. volume	= 217,688 cuft
Drainage area	= 12.840 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 6.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



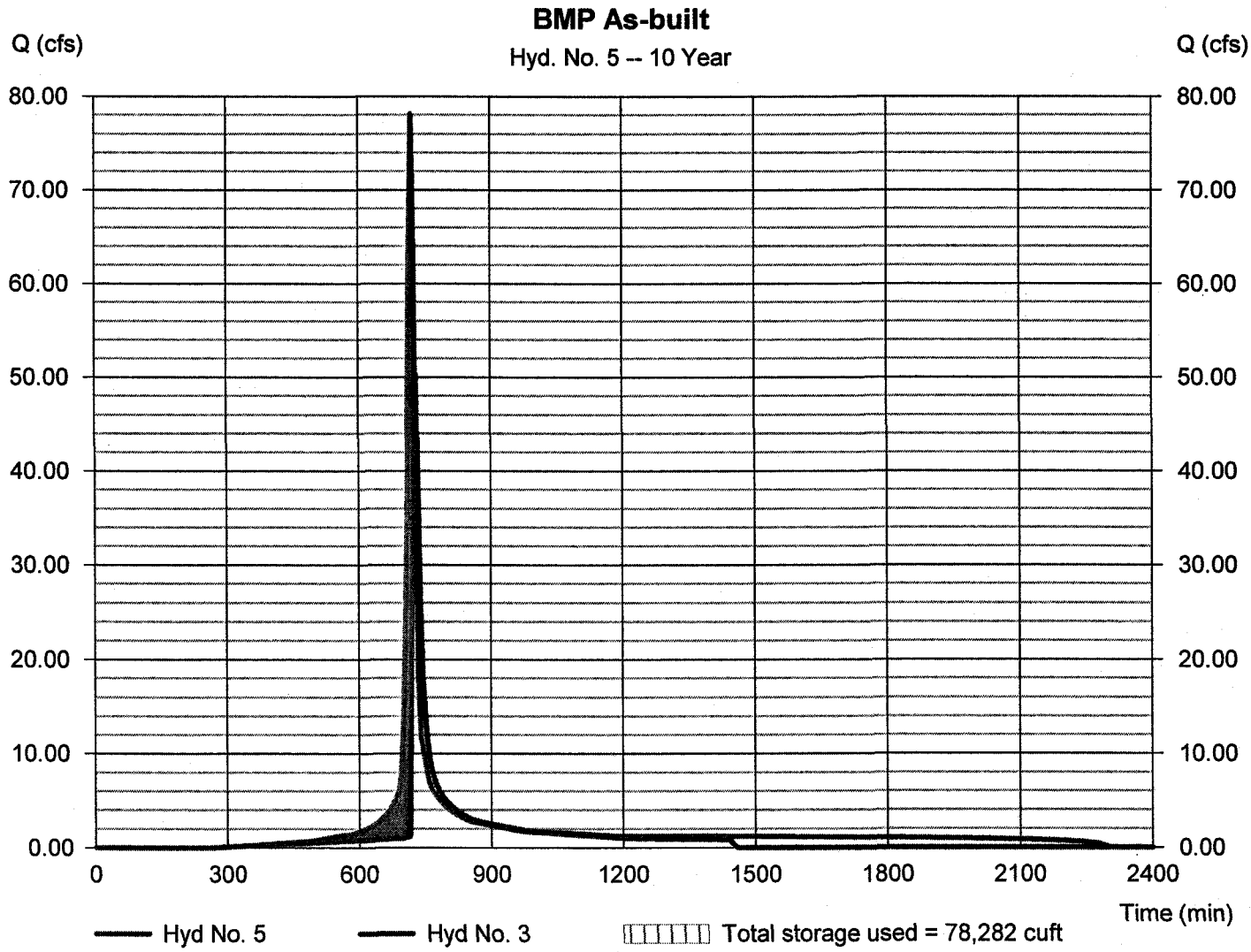
Hydrograph Report

Hyd. No. 5

BMP As-built

Hydrograph type	= Reservoir	Peak discharge	= 50.28 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 217,688 cuft
Inflow hyd. No.	= 3 - Post-Dev	Max. Elevation	= 58.52 ft
Reservoir name	= BMP As-built	Max. Storage	= 78,282 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9

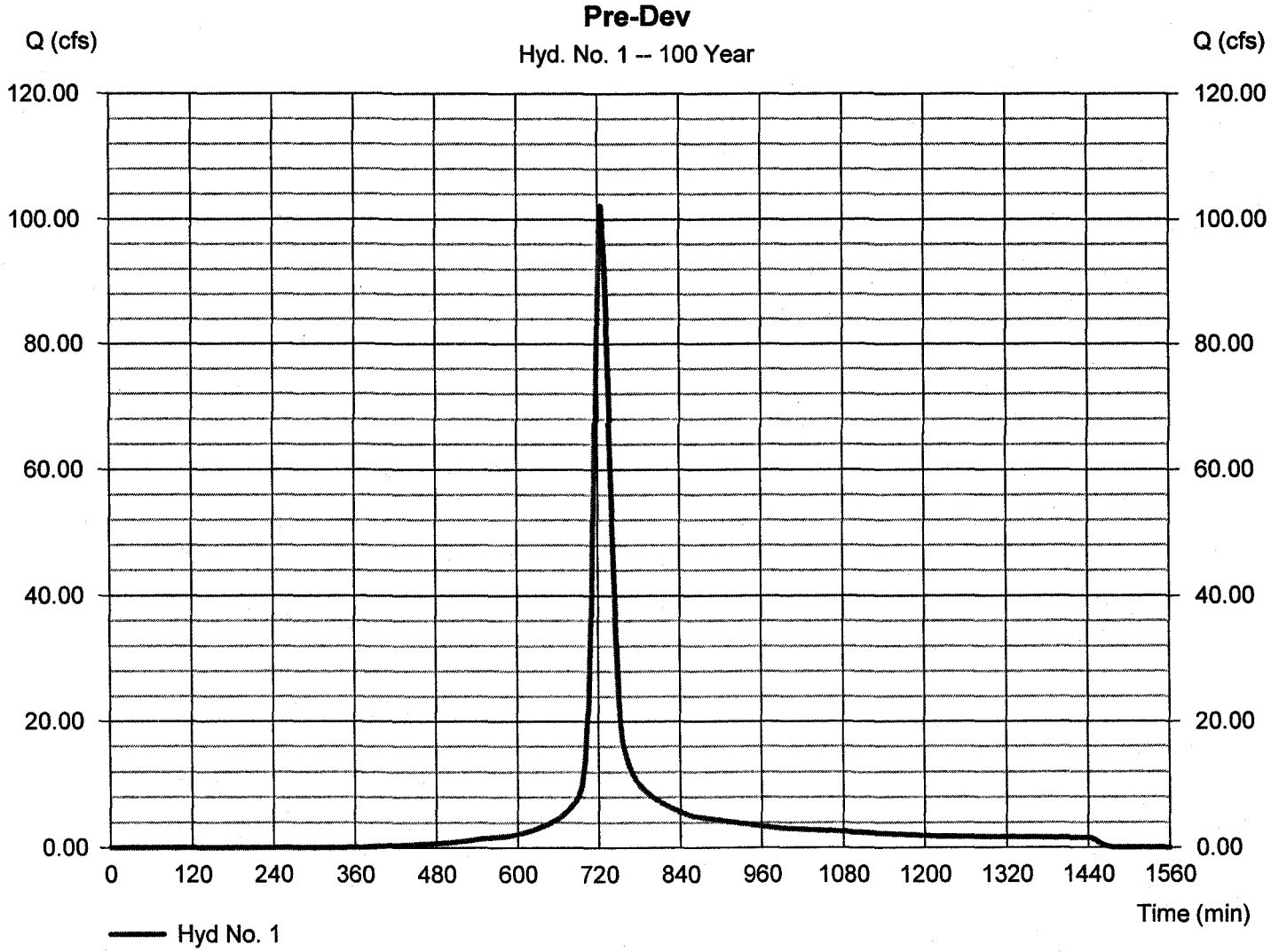
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	102.16	5	725	362,276	-----	-----	-----	Pre-Dev
3	SCS Runoff	133.34	5	720	383,261	-----	-----	-----	Post-Dev
5	Reservoir	80.70	5	730	383,261	3	60.26	112,164	BMP As-built

Hydrograph Report

Hyd. No. 1

Pre-Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 102.16 cfs
Storm frequency	= 100 yrs	Time to peak	= 725 min
Time interval	= 5 min	Hyd. volume	= 362,276 cuft
Drainage area	= 14.100 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.00 min
Total precip.	= 10.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

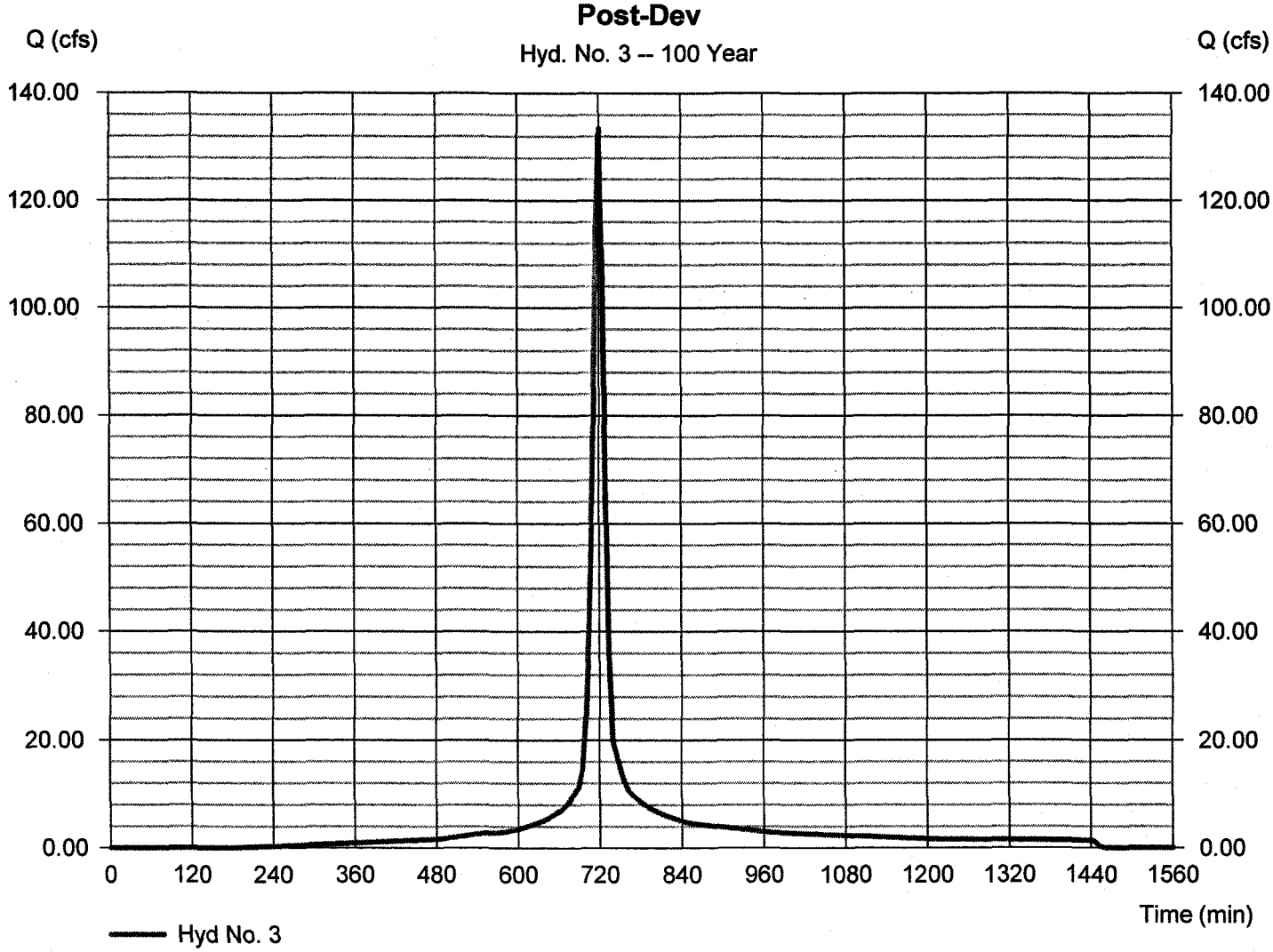


Hydrograph Report

Hyd. No. 3

Post-Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 133.34 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 5 min	Hyd. volume	= 383,261 cuft
Drainage area	= 12.840 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 10.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



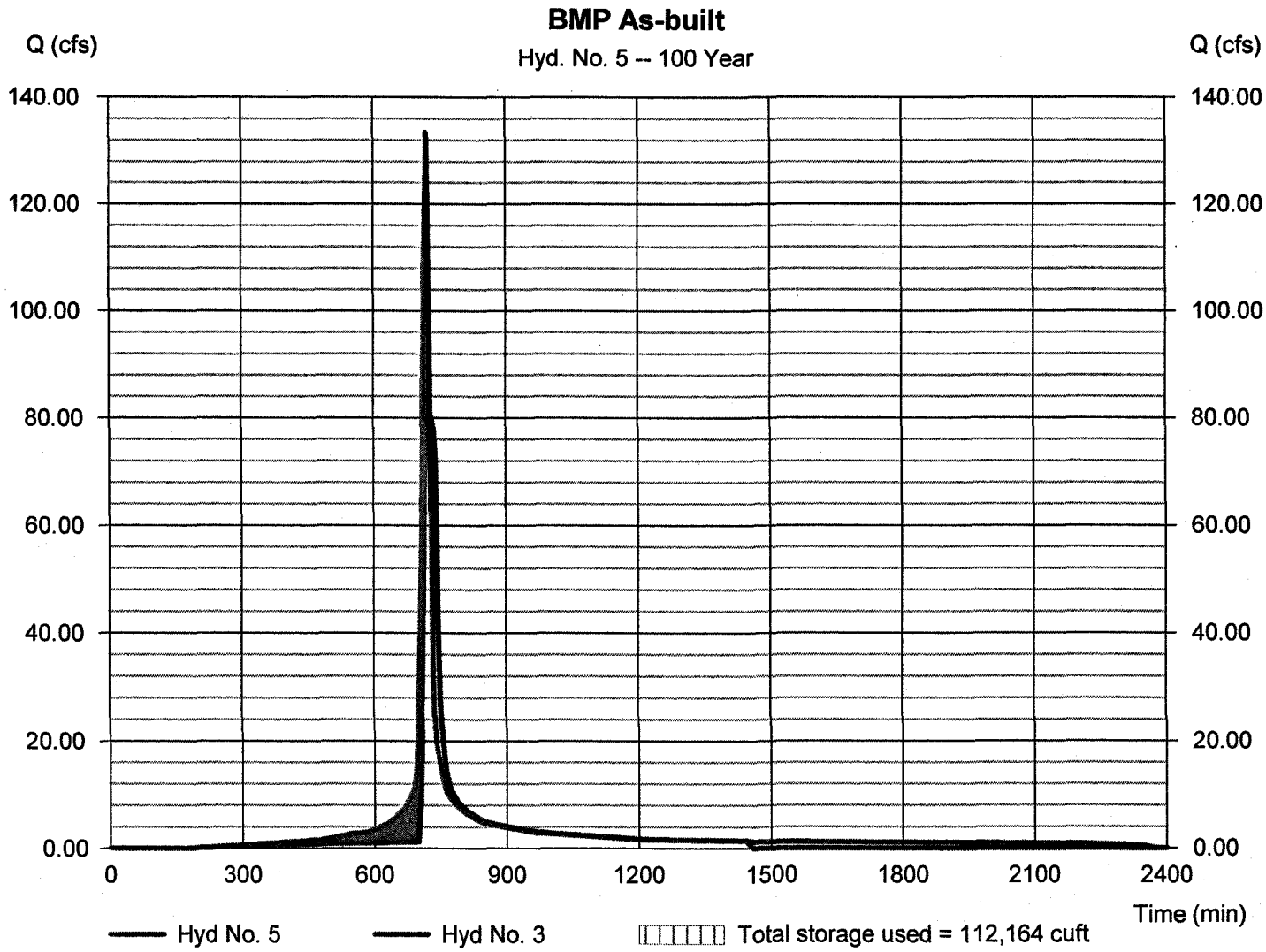
Hydrograph Report

Hyd. No. 5

BMP As-built

Hydrograph type	= Reservoir	Peak discharge	= 80.70 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 383,261 cuft
Inflow hyd. No.	= 3 - Post-Dev	Max. Elevation	= 60.26 ft
Reservoir name	= BMP As-built	Max. Storage	= 112,164 cuft

Storage Indication method used.



Hydraflow Table of Contents

PH 2 SECT 2-6th HOLE BMP 2-4-04- As-built 2012-05-23.gpw

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9 — Thursday, 00 24, 2012

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9

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	------	9.267	20.19	-------	-------	52.03	-------	-------	102.16	Pre-Dev
3	SCS Runoff	------	24.16	39.54	-------	-------	78.11	-------	-------	133.34	Post-Dev
5	Reservoir	3	1.132	3.036	-------	-------	50.28	-------	-------	80.70	BMP As-built

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9

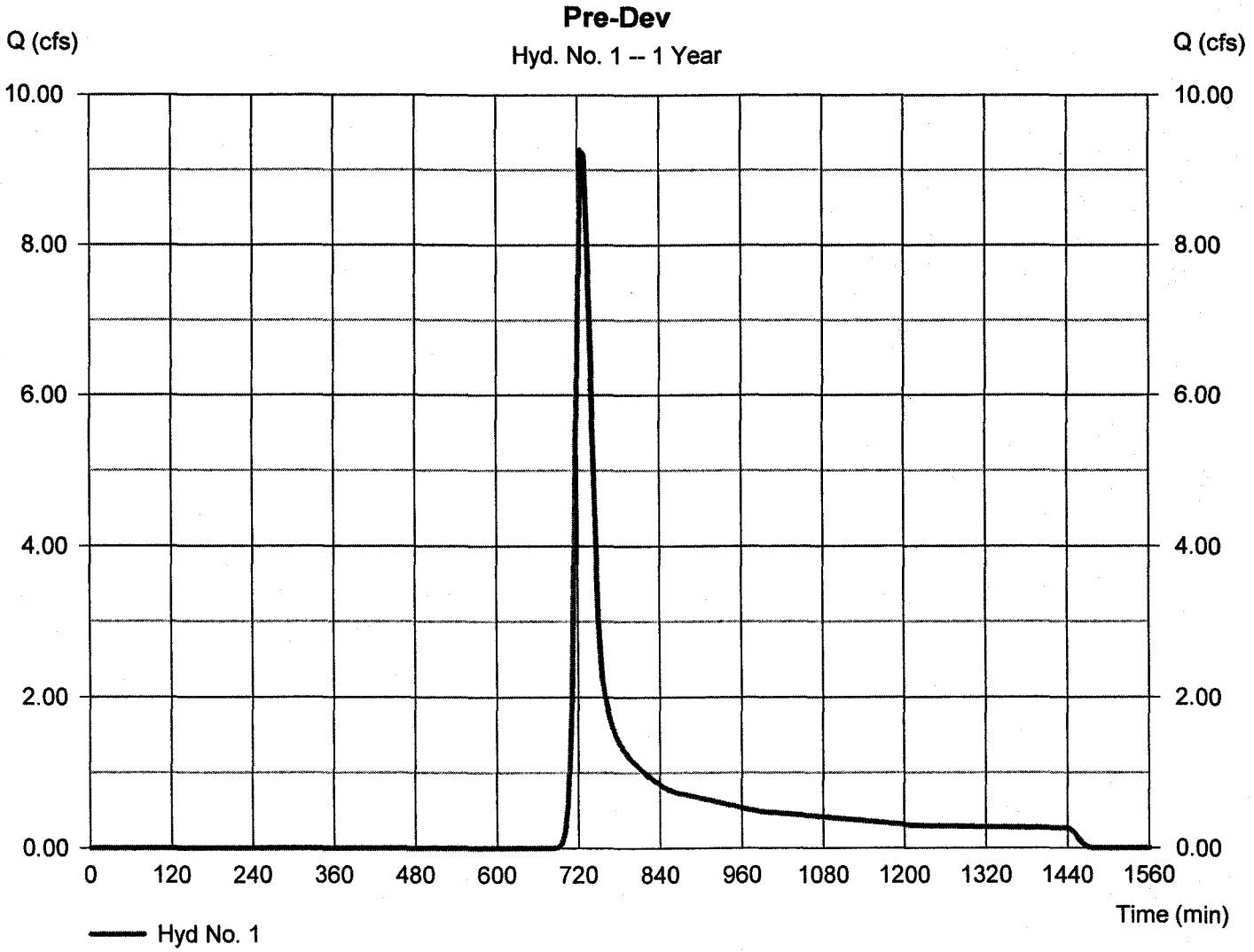
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	9.267	5	725	37,726	-----	-----	-----	Pre-Dev
3	SCS Runoff	24.16	5	720	65,217	-----	-----	-----	Post-Dev
5	Reservoir	1.132	5	835	65,216	3	55.38	34,701	BMP As-built

Hydrograph Report

Hyd. No. 1

Pre-Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 9.267 cfs
Storm frequency	= 1 yrs	Time to peak	= 725 min
Time interval	= 5 min	Hyd. volume	= 37,726 cuft
Drainage area	= 14.100 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.00 min
Total precip.	= 2.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

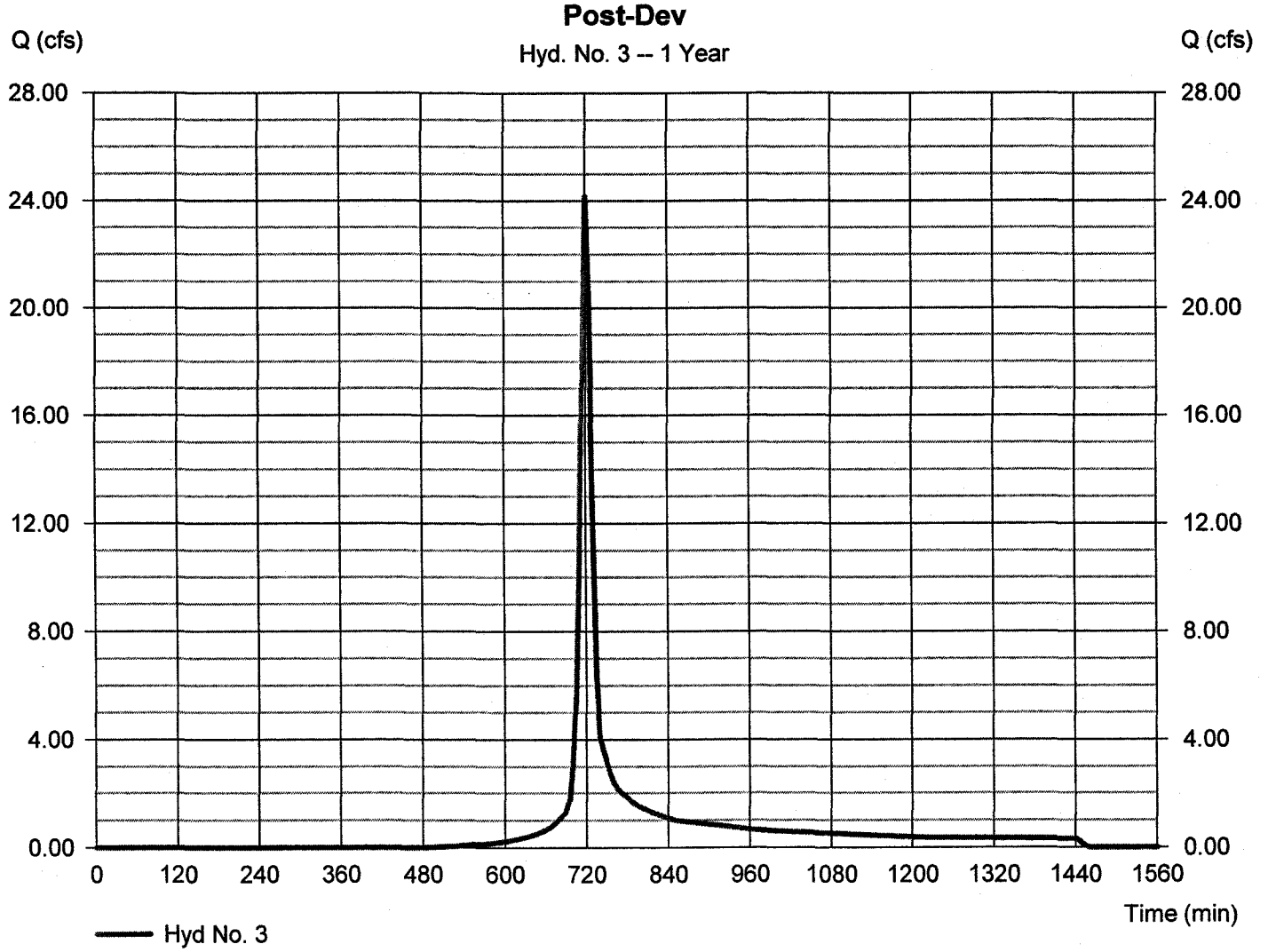


Hydrograph Report

Hyd. No. 3

Post-Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 24.16 cfs
Storm frequency	= 1 yrs	Time to peak	= 720 min
Time interval	= 5 min	Hyd. volume	= 65,217 cuft
Drainage area	= 12.840 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 2.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



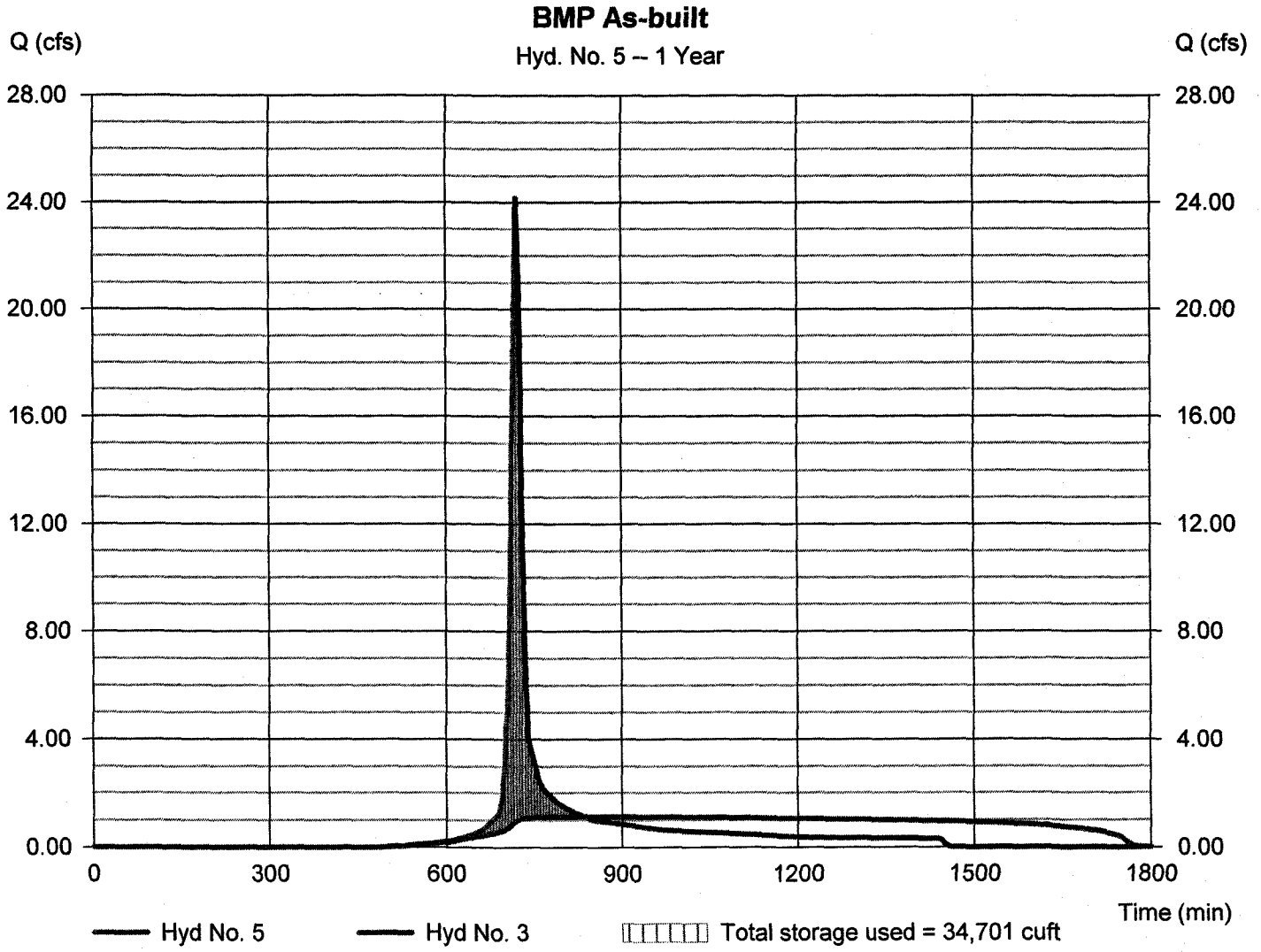
Hydrograph Report

Hyd. No. 5

BMP As-built

Hydrograph type	= Reservoir	Peak discharge	= 1.132 cfs
Storm frequency	= 1 yrs	Time to peak	= 835 min
Time interval	= 5 min	Hyd. volume	= 65,216 cuft
Inflow hyd. No.	= 3 - Post-Dev	Max. Elevation	= 55.38 ft
Reservoir name	= BMP As-built	Max. Storage	= 34,701 cuft

Storage Indication method used.



Pond Report

Pond No. 9 - BMP As-built

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 48.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	48.00	146	0	0
1.00	49.00	494	320	320
2.00	50.00	1,337	916	1,236
3.00	51.00	2,281	1,809	3,045
4.00	52.00	3,854	3,068	6,112
5.00	53.00	7,173	5,514	11,626
6.00	54.00	9,444	8,309	19,934
7.00	55.00	11,160	10,302	30,236
8.00	56.00	12,649	11,905	42,141
9.00	57.00	14,417	13,533	55,674
10.00	58.00	16,221	15,319	70,993
11.00	59.00	18,894	17,558	88,550
12.00	60.00	21,260	20,077	108,627
13.00	61.00	24,635	22,948	131,575

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 30.00	4.00	0.00	0.00
Span (in)	= 30.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 47.10	47.95	0.00	0.00
Length (ft)	= 67.00	30.00	0.00	0.00
Slope (%)	= 1.64	0.00	0.00	n/a
N-Value	= .013	.012	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

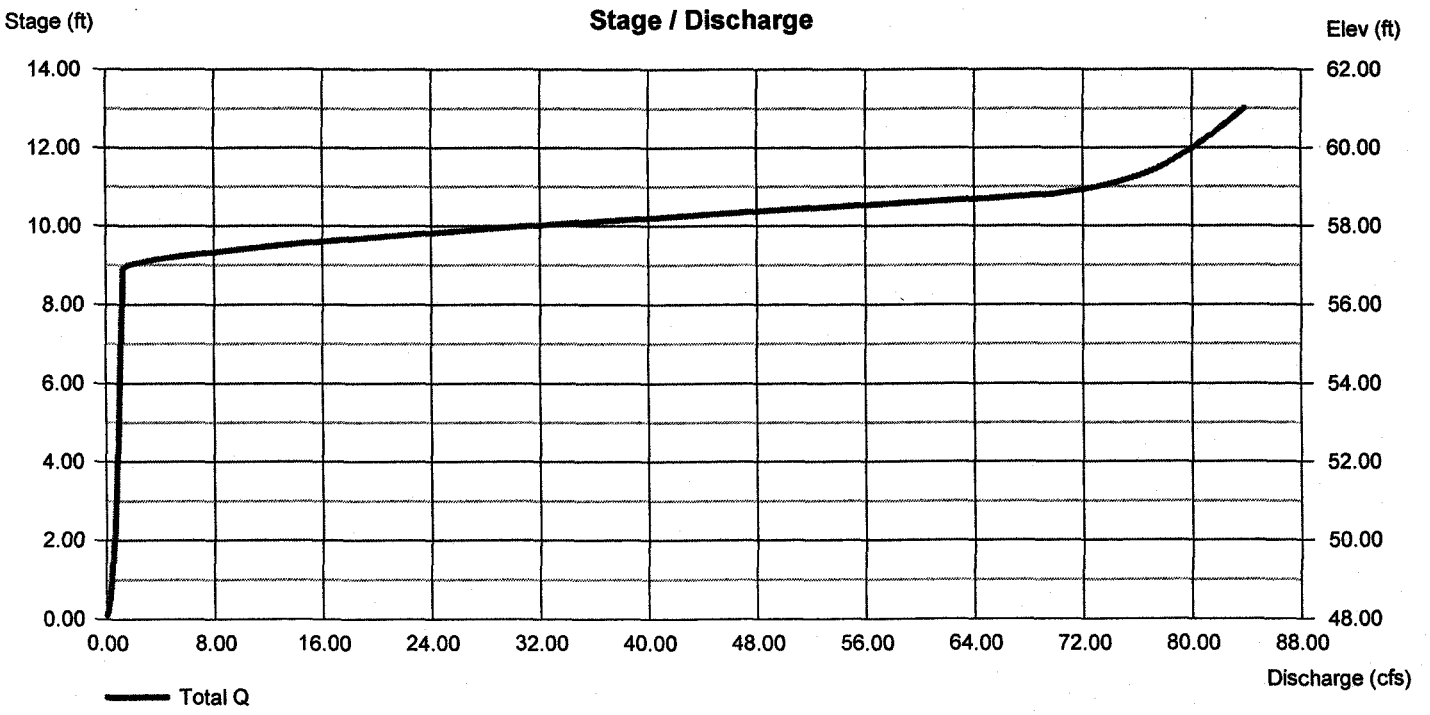
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 8.26	10.00	0.00	0.00
Crest El. (ft)	= 56.94	58.80	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	Cipiti	---	---
Multi-Stage	= Yes	Yes	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

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



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9

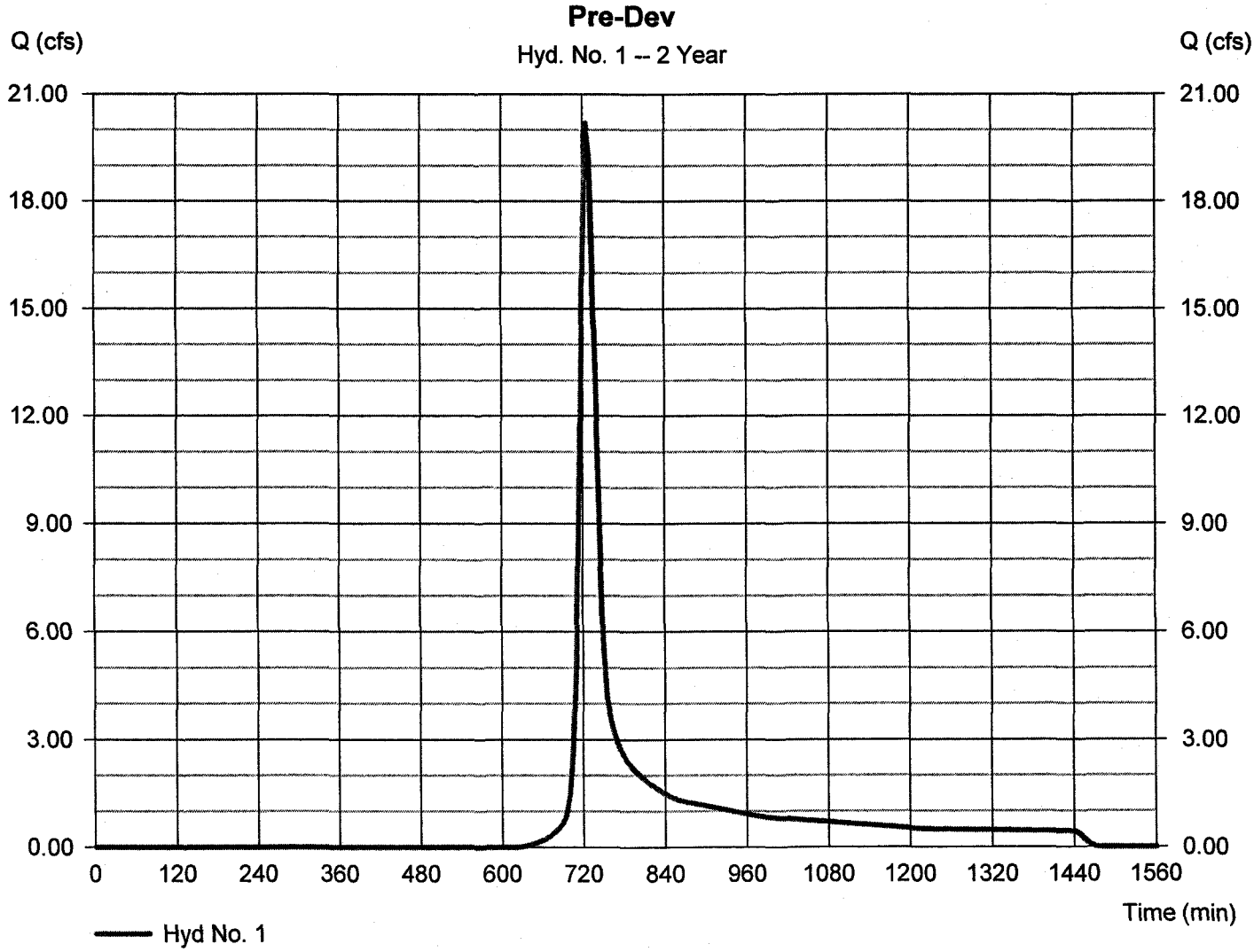
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	20.19	5	725	74,528	-----	-----	-----	Pre-Dev
3	SCS Runoff	39.54	5	720	107,314	-----	-----	-----	Post-Dev
5	Reservoir	3.036	5	775	107,313	3	57.10	57,219	BMP As-built

Hydrograph Report

Hyd. No. 1

Pre-Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 20.19 cfs
Storm frequency	= 2 yrs	Time to peak	= 725 min
Time interval	= 5 min	Hyd. volume	= 74,528 cuft
Drainage area	= 14.100 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.00 min
Total precip.	= 3.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

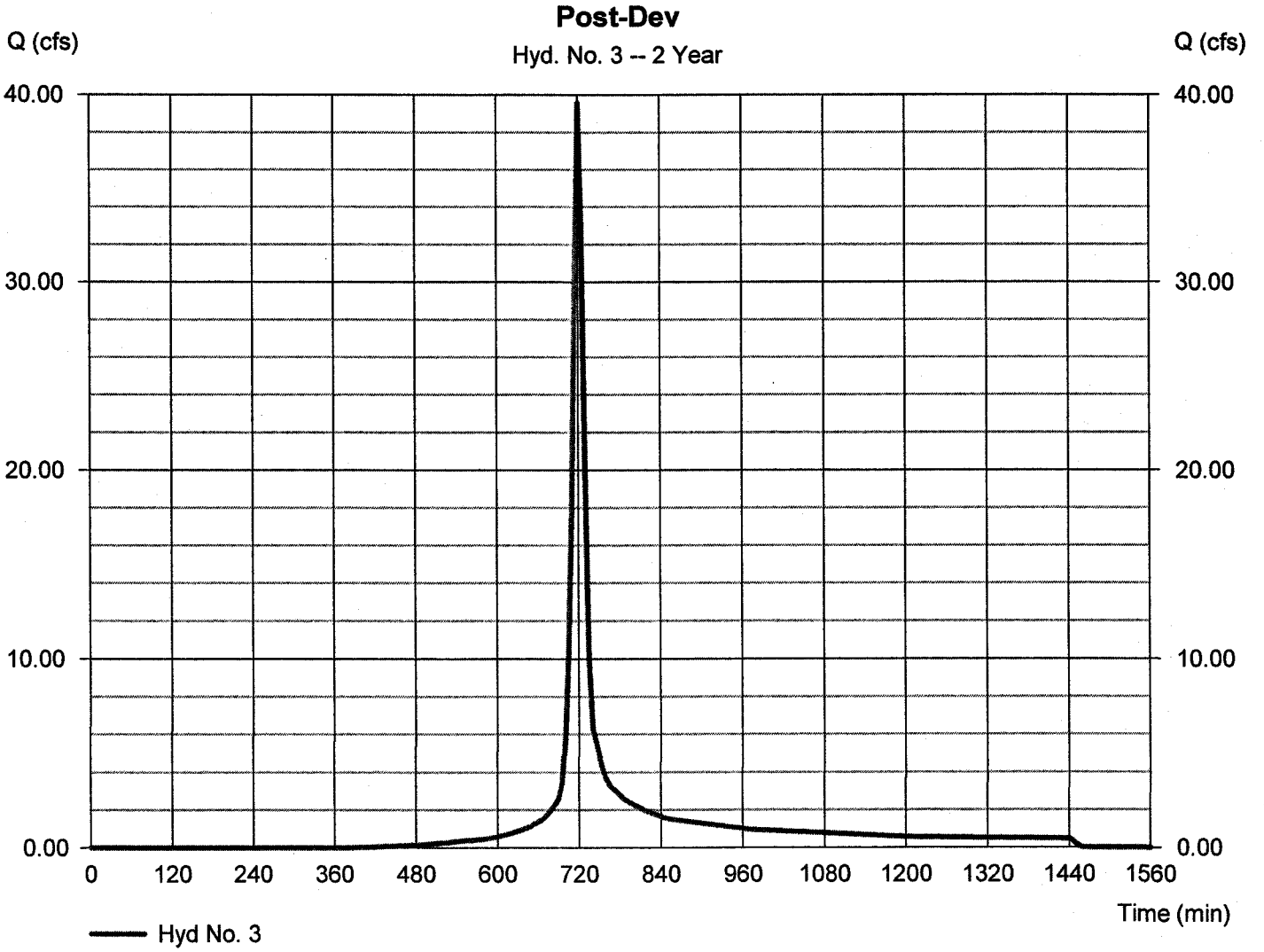


Hydrograph Report

Hyd. No. 3

Post-Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 39.54 cfs
Storm frequency	= 2 yrs	Time to peak	= 720 min
Time interval	= 5 min	Hyd. volume	= 107,314 cuft
Drainage area	= 12.840 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



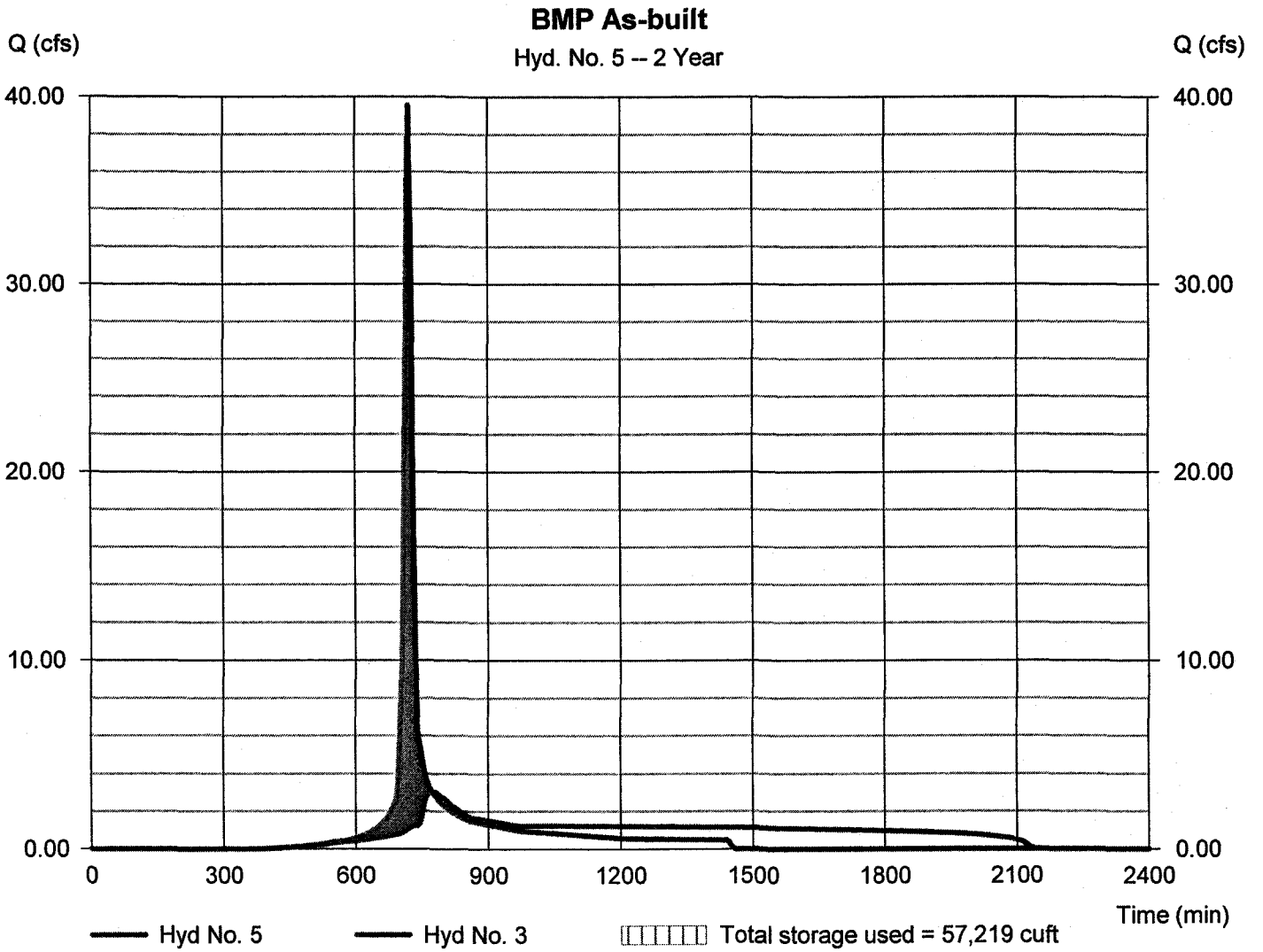
Hydrograph Report

Hyd. No. 5

BMP As-built

Hydrograph type	= Reservoir	Peak discharge	= 3.036 cfs
Storm frequency	= 2 yrs	Time to peak	= 775 min
Time interval	= 5 min	Hyd. volume	= 107,313 cuft
Inflow hyd. No.	= 3 - Post-Dev	Max. Elevation	= 57.10 ft
Reservoir name	= BMP As-built	Max. Storage	= 57,219 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	52.03	5	725	183,888	------	------	------	Pre-Dev
3	SCS Runoff	78.11	5	720	217,688	------	------	------	Post-Dev
5	Reservoir	50.28	5	730	217,688	3	58.52	78,282	BMP As-built

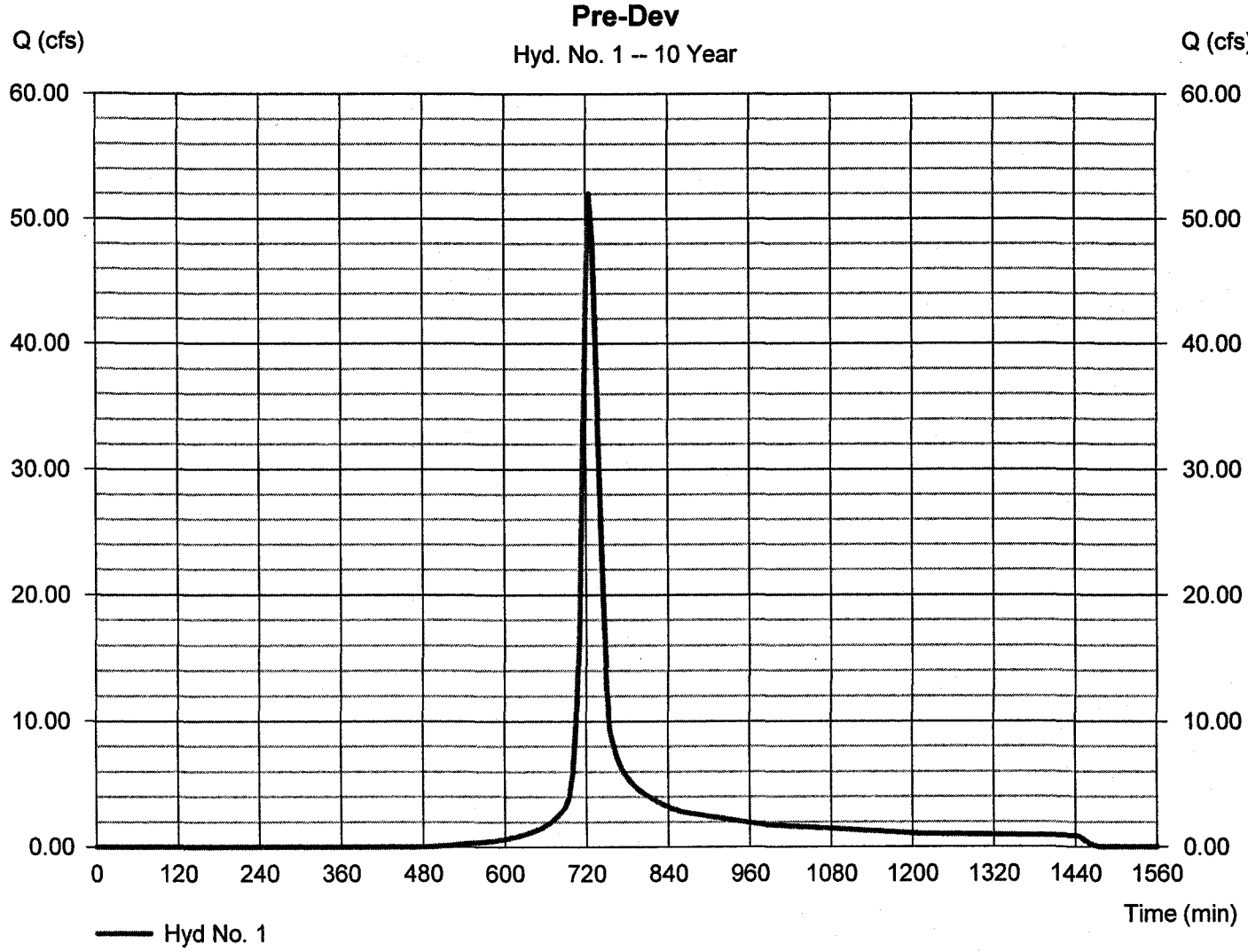
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9 Thursday, 00 24, 2012

Hyd. No. 1

Pre-Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 52.03 cfs
Storm frequency	= 10 yrs	Time to peak	= 725 min
Time interval	= 5 min	Hyd. volume	= 183,888 cuft
Drainage area	= 14.100 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.00 min
Total precip.	= 6.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

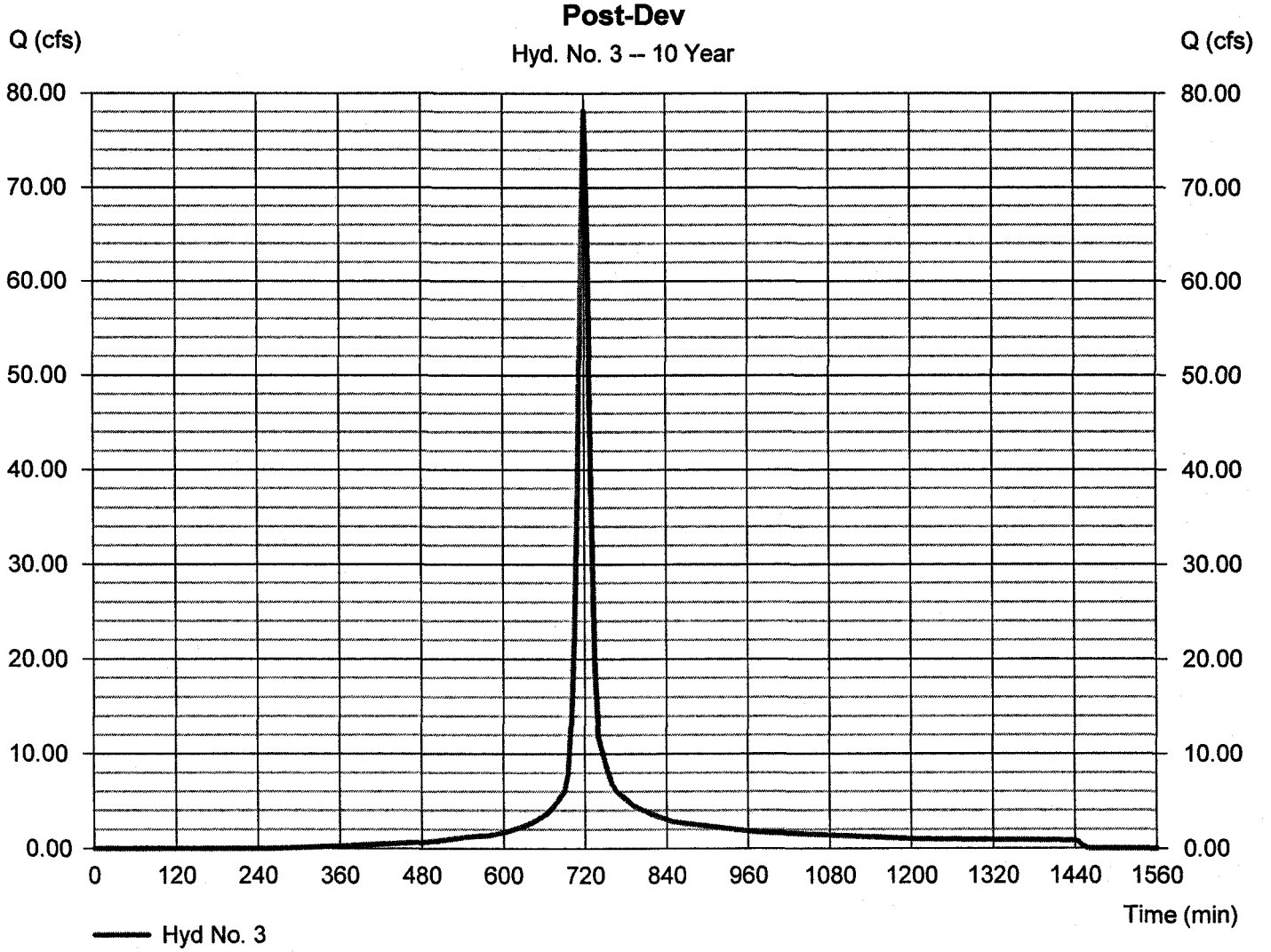


Hydrograph Report

Hyd. No. 3

Post-Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 78.11 cfs
Storm frequency	= 10 yrs	Time to peak	= 720 min
Time interval	= 5 min	Hyd. volume	= 217,688 cuft
Drainage area	= 12.840 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 6.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



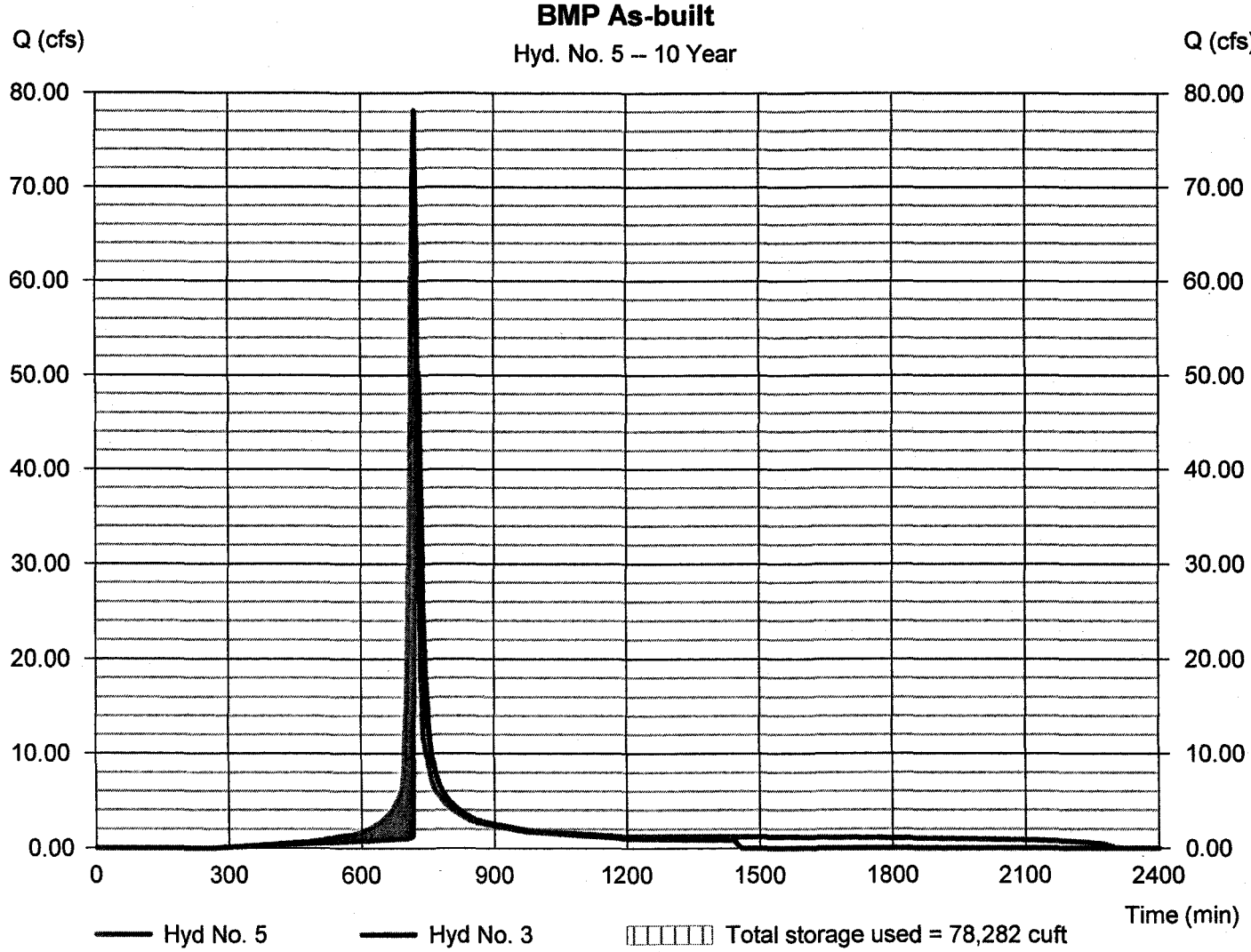
Hydrograph Report

Hyd. No. 5

BMP As-built

Hydrograph type	= Reservoir	Peak discharge	= 50.28 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 217,688 cuft
Inflow hyd. No.	= 3 - Post-Dev	Max. Elevation	= 58.52 ft
Reservoir name	= BMP As-built	Max. Storage	= 78,282 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9

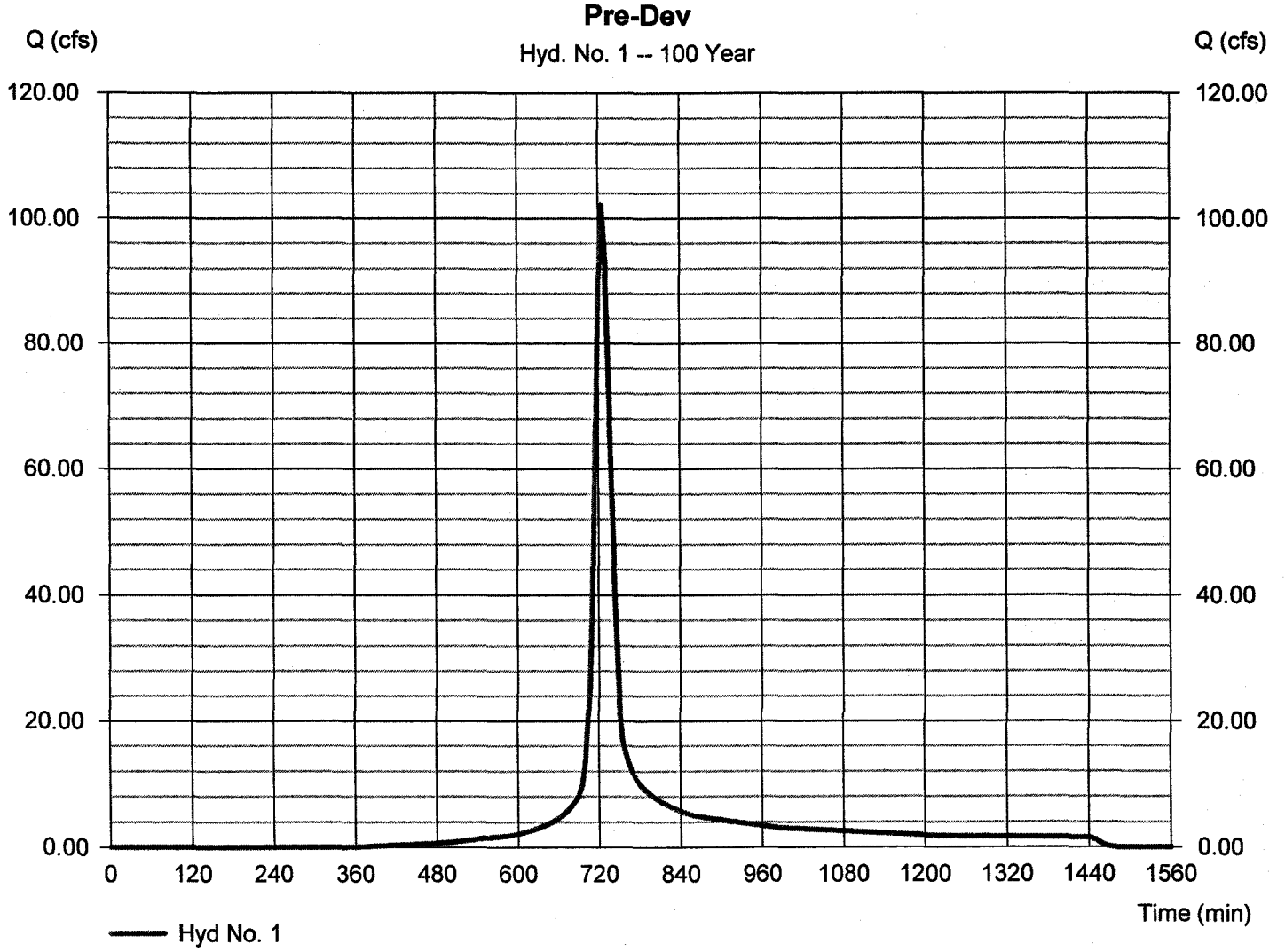
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	102.16	5	725	362,276	-----	-----	-----	Pre-Dev
3	SCS Runoff	133.34	5	720	383,261	-----	-----	-----	Post-Dev
5	Reservoir	80.70	5	730	383,261	3	60.26	112,164	BMP As-built

Hydrograph Report

Hyd. No. 1

Pre-Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 102.16 cfs
Storm frequency	= 100 yrs	Time to peak	= 725 min
Time interval	= 5 min	Hyd. volume	= 362,276 cuft
Drainage area	= 14.100 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.00 min
Total precip.	= 10.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

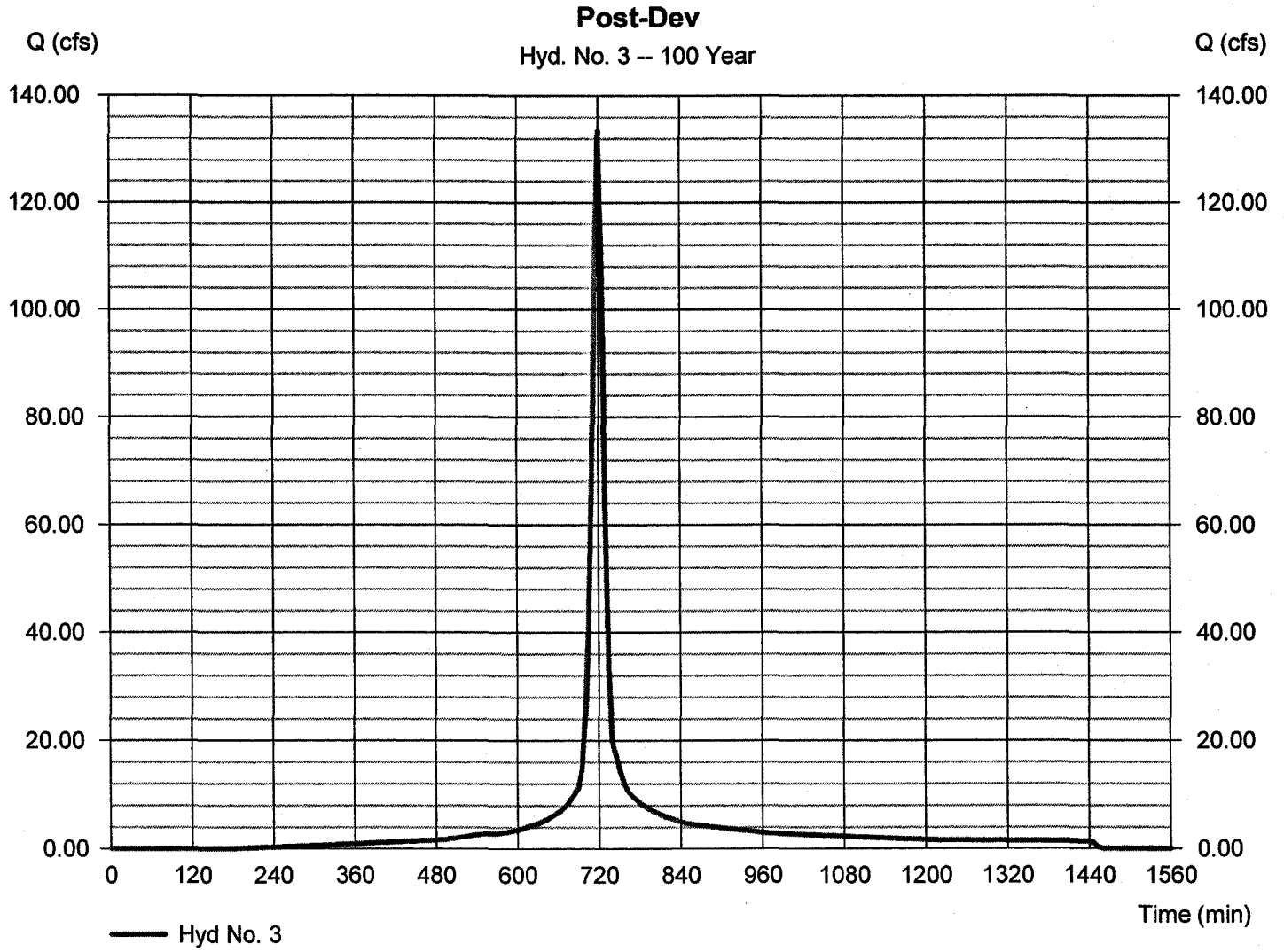


Hydrograph Report

Hyd. No. 3

Post-Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 133.34 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 5 min	Hyd. volume	= 383,261 cuft
Drainage area	= 12.840 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 10.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

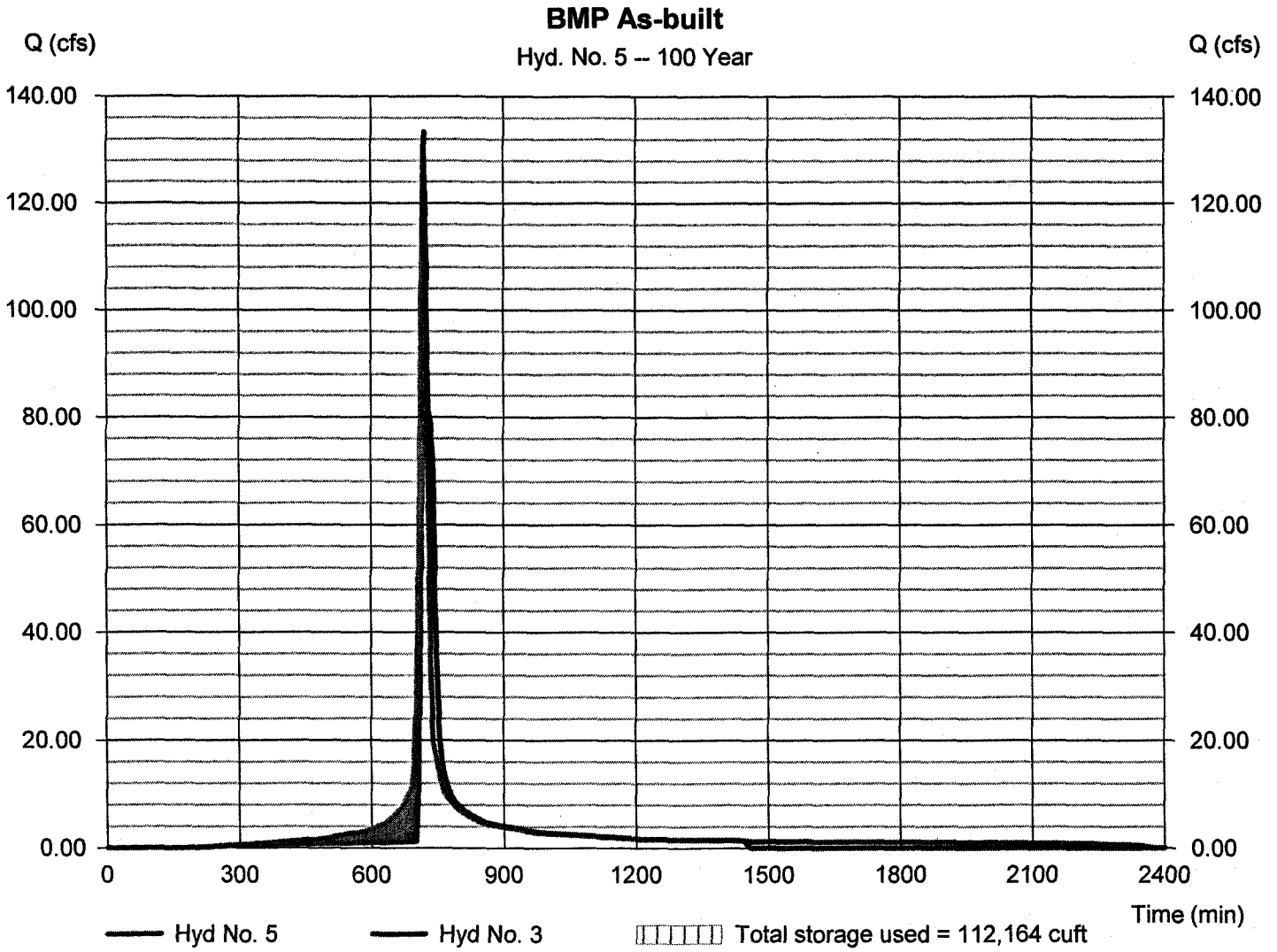
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9 Thursday, 00 24, 2012

Hyd. No. 5

BMP As-built

Hydrograph type	= Reservoir	Peak discharge	= 80.70 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 383,261 cuft
Inflow hyd. No.	= 3 - Post-Dev	Max. Elevation	= 60.26 ft
Reservoir name	= BMP As-built	Max. Storage	= 112,164 cuft

Storage Indication method used.



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

County BMP ID Code (if known): YC033

Name of Facility: Colonial Heritage P2 S2; Dry Pond BMP No.: 1 of 1 Date: 5/31/12

Location: Between Old Lock Rd and Chapel Crossing; Phase 2 Sec. 2 of Colonial Heritage

Name of Owner: Lennar VA Land Division

Name of Inspector: M. Majdeski

Type of Facility: Dry Detention Basin

Weather Conditions: Sunny 85° Type: ☑ Final Inspection ☐ County BMP Inspection Program ☐ Owner Inspection

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

O.K. - The item checked is in adequate condition and the maintenance program is currently satisfactory. No action required.
Routine - The item checked requires attention, but does not present an immediate threat to the function/integrity of the BMP.
Urgent - The item checked requires immediate attention to keep the BMP operational and 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	✓			
Tree Growth	✓			
Erosion	✓			
Trash & Debris	✓			
Seepage	✓			
Fencing or Benches	N/A			Dry Pond
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	✓			SMALL RILL IN UPPER CENTRAL CHANNEL
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	✓			CONCRETE ES
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:

- REPAIR RILL EROSION IN CENTER CHANNEL UNDER COCONUT MATTING.

Overall Environmental Division Internal Rating: 4/5

Signature: _____ **Date:** 5/31/12

Title: Sr. Resource Protection Inspector

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