CERTIFICATE OF AUTHENTICITY

THIS IS TO CERTIFY THAT THE FOLLOWING ELECTRONIC RECORDS ARE TRUE AND ACCURATE REPRODUCTIONS OF THE ORIGINAL RECORDS OF JAMES CITY COUNTY GENERAL SERVICES DEPARTMENT- STORMWATER DIVISION; WERE SCANNED IN THE REGULAR COURSE OF BUSINESS PURSUANT TO GUIDELINES ESTABLISHED BY THE LIBRARY OF VIRGINIA AND ARCHIVES; AND HAVE BEEN VERIFIED IN THE CUSTODY OF THE INDIVIDUAL LISTED BELOW.

BMP NUMBER: **PC205**

DATE VERIFIED: **July 5, 2012**

QUALITY ASSURANCE TECHNICIAN: **Leah Hardenbergh**

Leah Hardenbergh

LOCATION: WILLIAMSBURG, VIRGINIA

Stormwater Division

MEMORANDUM

DATE: March 13, 2010

TO: Michael J. Gillis, Virginia Correctional Enterprises Document Management Services

FROM: Jo Anna Ripley, Stormwater

PO: 270712

RE: Files Approved for Scanning

General File ID or BMP ID: PC205

PIN: 3210100012

Subdivision, Tract, Business or Owner Name (if known): James City Service Authority

Property Description: Warhill Tract Parcel 1

Site Address: 5700 Warhill Trail and 4615 Opportunity Way

(For internal use only) **Box** 2 **Drawer:** 2

Agreements: (in file as of scan date) **N** **Book or Doc#:** **Page:**

Comments
Warhill elevated water tank

Forebay Only – Needed for SSC Purposes
Asbuilts for Storm System + Forebay
Const Cert not needed
Drains to Warhill East Pond PC106

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

Project Name: JCSA Warhill Elevated Water Tank + Waterline Exp.
County Plan No.: SP-79-05
Stormwater Management Facility: Pretreatment Sediment Forebay
BMP Phase #: ☐ I ☐ II ☒ III
☒ Information Package Received. Date/By: 4/16/07 Gannett Fleming
☐ Completeness Check:
- ☒ Record Drawing Date/By: 4/16/07 Gannett Fleming
- ☒ Construction Certification Date/By: Got, not needed
- ☒ RD/CC Standard Forms (Required for all BMPs after Feb 1st 2001Only)
- ☐ Insp/Maint Agreement # / Date: not needed, County project
- ☒ BMP Maintenance Plan Location: Sheet 10
- ☐ Other:

☒ Standard E&SC Note on Approved Plan Requiring RD/CC or County comment in plan review
☐ Yes ☐ No Location: Sheet 2 of plan requires AB/CC
☒ Assign **County BMP ID Code #**: Code: PC205
☒ 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: 4/23/07
☒ Record Drawing (RD) Review Date: 4/23/07
☒ Construction Certification (CC) Review Date: N/A but OK
☒ Actions:
- ☒ No comments.
- ☐ Comments. Letter Forwarded. Date:
- ☐ Record Drawing (RD)
- ☐ Construction Certification (CC)
- ☐ Construction-Related (CR)
- ☐ Site Issues (SI)
- ☐ Other :

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

Final Sign-Off

Plan Reviewer: Jason Bak Date: 5/14/07

*** 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: Warhill Sports Complex
Structure/BMP Name: Sediment Forebay
Project Location: Warhill Site adjacent District Park E Pond
BMP Location: East Side Pond
County Plan No.: n/a - _____ - _____ SP-79-05 SP-80-05

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

Tax Map/Parcel No.: TM 3210 P 100012
BMP ID Code (if known): PC 106 DRAINS TO
Zoning District:: Warhill
Land Use: R-8
Site Area (sf or acres): 23,774

Brief Description of Stormwater Management/BMP Facility: Riprap sediment forebay installed at end storm drain to filter sediment before entering BMP.

Nearest Visible Landmark to SWM/BMP Facility: Warhill Site Water Tank

Nearest Vertical Ground Control (if known):
☐ JCC Geodetic Ground Control ☐ USGS ☐ Temporary ☐ Arbitrary ☒ Other
Station Number or Name: _____
Datum or Reference Elevation: _____
Control Description: SD Headwall at tank site in roadway
Control Location from Subject Facility: 100' north of tank

Section 2 - Stormwater Management / BMP Facility Construction Information:

PreConstruction Meeting Held for Construction of SWM/BMP Facility: ☒ Yes ☐ No ☐ Unknown
Approx. Construction Start Date for SWM/BMP Facility: _____
Facility Monitored by County Representative during Construction: ☐ Yes ☐ No ☐ Unknown
Name of Site Work Contractor Who Constructed Facility: Wellvilla Construction Company
Name of Professional Firm Who Routinely Monitored Construction: Gannett Fleming
Date of Completion for SWM/BMP Facility: March 2007
Date of Record Drawing/Construction Certification Submittal: April 2007

(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: James City Service Authority
Mailing Address: 101-E Mounts Bay Road
Williamsburg, VA 23187
Business Phone: 757-253-6080 Fax: 757-253-6856
Contact Person: Mike Vergakis Title: Chief Engineer-Water

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: Gannett Fleming
Mailing Address: 11838 Rock Landing Drive, Ste 200
Newport News, VA 23606
Business Phone: 757-873-0768
Fax: 757-873-6868
Responsible Plan Preparer: Mike Luning
Title: Senior Project Manager
Plan Name: Warhill Sports Complex Water Main & Tank Site Plan
Firm's Project No. 44656
Plan Date: August 2005
Sheet No.'s Applicable to SWM/BMP Facility: 10 / 12 / ____ / ____ / ____

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

Name: Wellvilla Construction Company
Mailing Address: 601 Dinwiddie Avenue
Blackstone, VA 23824
Business Phone: 434-292-1999
Fax: 434-292-1994
Contact Person: Nancy D. Wilson
Site Foreman/Supervisor: _____
Specialty Subcontractors & Purpose (for BMP Construction Only): _____

Section 4 - Professional Certifications:

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

Record Drawing and Construction Certifications for Stormwater Management / BMP Facilities

Record Drawing Certification

Firm Name: Garnett Fleming
Mailing Address: 11838 Rock Landing Dr.
Newport News, VA 23606
Business Phone: 757-873-0768
Fax: 757-873-6868

Name: Mike Luning
Title: Senior Project Manager
Signature:
Date: 4-16-07

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

Construction Certification

Firm Name: Wellville Construction Company
Mailing Address: 601 Dinwiddie Avenue
Blackstone, VA 23824
Business Phone: 434-292-1993
Fax: 434-292-1994

Name: Nancy D. Wilson
Title: Project Manager
Signature:
Date: 4-16-07

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 P. LUNING
NO. 15764
PROFESSIONAL ENGINEER

(Seal)

Virginia Registered Professional Engineer or Certified Land Surveyor

(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.

N/A ☐ 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.)*

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

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

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

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

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

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

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

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

_____ 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.

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

_____ 5. Show length, width and depth of facility or grading, contours or spot elevations as required to verify permanent pool and design storage volumes were met or were reasonably close to the approved design. Evaluation of as-built grading, contours, spot elevations, or cross-sections, may be necessary by the professional to ensure approved design configurations, depths and volumes were closely maintained. If grading or elevations are significantly different from the approved plan, the 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.

_____ 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.

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

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

_____ 9. Primary control structure (riser) diameter or dimensions, height, type of material and base size. Indicate provisions for access that are present such as steps, ladders, etc.

_____ 10. Dimensions, locations and elevations of outlet orifices, weirs, slots and drains.

_____ 11. Type and size of anti-vortex and trash rack device. Height, diameter, dimensions, bar spacings (if applicable) and elevations relative to the principal spillway crest. Indicate if lockable hatch is present or not.

_____ 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.**

_____ 13. Top of impervious core embankment, core trench limits and elevation of cut-off trench bottom. **May need to obtain this information during construction.**

_____ 14. Elevation of the principal spillway barrel (outlet pipe) inlet and outlet invert.

_____ 15. Outlet barrel diameter, length, slope, type and thickness class of material and type of flared end sections, headwall or endwall.

_____ 16. Outfall protection dimension, type and depth of rock and if underlain filter fabric is present.

_____ 17. BMP interior and periphery landscaping zones conform with arrangements and requirements of the approved design plan.

_____ 18. Maintenance plan taken from approved design plan transposed onto record drawing set.

_____ 19. Fencing location and type, if applicable to facility.

_____ 20. BMP vicinity properly cleaned of stockpiles and construction debris.

_____ 21. No visual signs of erosion or channel degradation immediately downstream of facility.

_____ 22. Any other information formally requested by the 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.)*

_____ A1. All requirements of Section II, Minimum Standards, apply to Group A facilities.

_____ A2. Principal spillway consists of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.

_____ A3. Sediment forebays or pretreatment devices provided at inlets to pond. Generally 4 to 6 ft. deep.

_____ A4. Access for maintenance and equipment is provided to the forebay(s). Access corridors are at least 12 ft. wide, have a maximum slope of 15 percent and are adequately stabilized to withstand heavy equipment or vehicle use.

_____ A5. Adequate fixed vertical sediment depth markers installed in the forebay(s) for future sediment monitoring purposes.

_____ A6. Pond liner (if required) provided. Either clay liners, polyliners, bentonite liners or use of chemical soil additives based on requirements of the approved plan.

_____ A7. Minimum 6 percent slope safety bench extending a minimum of 15 feet outward from normal pool edge and/or an aquatic bench extending a minimum of 10 feet inward from the normal shoreline with a maximum depth of 12 inches below the normal pool elevation, if applicable, per the approved design plans. (Note: Safety benches may be waived if pond side slopes are no steeper than 4H:1V).

_____ A8. No trees are present within a zone 15 feet around the embankment toe and 25 feet from the principal spillway structure.

_____ A9. Wet permanent pool, typically 3 to 6 feet deep, is provided and maintains level within facility.

_____ A10. Low flow orifice has a non-clogging mechanism.

_____ A11. A pond drain pipe with valve was provided.

_____ A12. Pond side slopes are not steeper than 3H:1V, unless approved plan allowed for steeper slope.

_____ A13. End walls above barrels (outlet pipe) greater than 48 inch in diameter are fenced to prevent a fall hazard.

STORMWATER 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)*

_____ B1. Same requirements as Group A Wet Ponds.

_____ B2. Minimum 2:1 length to width flow path provided across the facility.

_____ B3. Micropool provided at or around outlet from BMP (generally 3 to 6 ft. deep).

_____ B4. Wetland type landscaping provided in accordance with approved plan. Includes correct pondscaping zones, plant species, planting arrangements, wetland beds, etc. Wetland plants include 5 to 7 emergent wetland species. Individual plants at 18 inches on center in clumps.

_____ B5. Adequate wetland buffer provided (Typically 25 ft. outward from maximum design water surface elevation and 15 ft. setback to structures).

_____ B6. No more than one-half (½) of the wetland surface area is planted.

_____ B7. Topsoil or wetland mulch provided to support vigorous growth of wetland plants.

_____ B8. Planting zones staked or flagged in field and locations subsequently established by appropriate field surveying methods for record drawing presentation.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

_____ C1. All requirements of Section II, Minimum Standards, apply to Group C facilities as applicable.

_____ C2. Facility is not located on fill slopes or on natural ground in excess of six (6) percent.

_____ C3. Pretreatment devices provided prior to entry into the infiltration facility. Acceptable pretreatment devices include sediment forebays, sediment basins, sediment traps, sump pits or inlets, grass channels, plunge pools or other acceptable measures.

_____ C4. Three (3) or more of the following pretreatment devices provided to protect long term integrity of structure: grass channel; grass filter strip; bottom sand layer; upper filter fabric layer; use of washed bank run gravel aggregate.

_____ C5. Sides of infiltration practice lined with filter fabric.

_____ C6. Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.

_____ C7. Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility.

_____ C8. Minimum one hundred (100) foot separation horizontally from any known water supply well and minimum one hundred (100) foot separation upslope from any building.

_____ C9. Minimum twenty-five (25) foot separation down gradient from any structure.

_____ C10. Stormwater outfalls provided for overflow associated with larger design storms.

_____ C11. No visual signs of erosion or channel degradation immediately downstream of facility.

_____ C12. Facility does not currently cause any apparent surface or subsurface water problems to downgrade properties.

_____ C13. Observation well provided.

_____ C14. Adequate, direct access provided to the facility for future maintenance, operation and inspection.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

_____ F1. All requirements of Section II, Minimum Standards, apply to Group F facilities.

_____ F2. Basin bottom has positive slope and drainage from all basin inflow points to the riser (or outflow) location.

_____ F3. Timber wall BMP used in intermittent stream only. (ie. Prohibited in perennial streams.)

_____ F4. Forebay provided approximately 20 ft. upstream of the facility. Forebays generally 4 to 6 feet in depth.

_____ F5. A reverse slope pipe, vertical stand pipe or mini-barrel and riser was provided to prevent clogging.

_____ F6. Principal spillway and outlet barrel provided consisting of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.

_____ F7. Mini-barrel and riser, if used, contains a removable trash rack to reduce clogging.

_____ F8. Low flow orifice, if used, has a minimum diameter of three (3) inches or two (2) inches if internal orifice control was utilized and a small, cage type external trash rack.

_____ F9. Timbers properly reinforced or concrete footing provided if soil conditions were prohibitive.

_____ F10. Timber wall cross members extended to a minimum depth of two (2) feet below ground elevation.

_____ F11. Protection against erosion and scour from the low flow orifice and weir-flow trajectory provided.

_____ F12. Stilling basin or standard outlet protection provided at principal spillway outlet.

_____ F13. Adequate, direct access provided to the facility. Access corridor to facility is at least ten (10) feet wide, slope is less than twenty (20) percent and appropriate stabilization provided for equipment and vehicle use. Access extends to forebay, standpipe and timber wall, as applicable.

_____ F14. No visual signs of undercutting of timber walls or clogging of the low orifice were present.

_____ F15. No visual signs of erosion or channel degradation immediately downstream of facility.

_____ F16. No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed and no adverse affects to the function of the facility are anticipated.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

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

_____ G2. Constructed impervious areas appear to conform with locations indicated on the approved plan and appear less than sixty (60) percent impervious in accordance with the requirements of the James City County Chesapeake Bay Preservation Ordinance.

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

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

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

_____ G6. Dedicated open space areas were not disturbed during construction (ie. cleared, grubbed or graded).

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

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

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

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

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

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

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

XII. Other Systems

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

_____ O1. All requirements of Section II, Minimum Standards, apply to this section.

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

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

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

James City County, Virginia
Environmental Division

Stormwater Management / BMP Facilities Record Drawing and Construction Certification

Standard Forms & Instructions

Contents

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Record Drawing and Construction Certification Forms			
	Section 1 - Site Information		1
	Section 2 - Construction Information		2
	Section 3 - Owner / Designer / Contractor Information		2
	Section 4 - Professional Certifications		3
	Section 5 - Certification Requirements and Instructions		4
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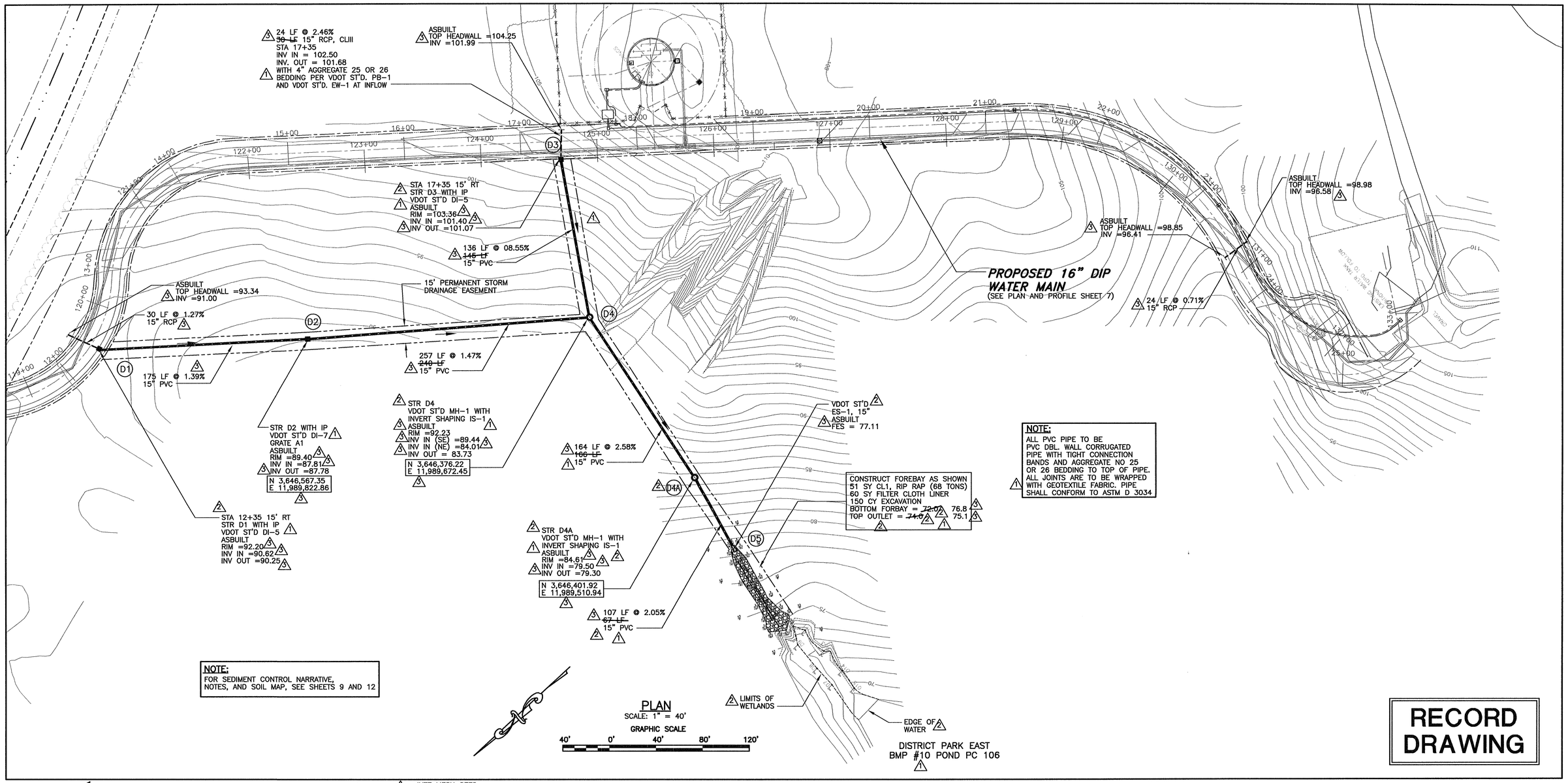
FOREBAY
SP-79-05
PC 205

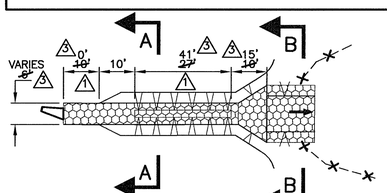
Issue Date
February 1, 2001



NOTE:
ALL PVC PIPE TO BE PVC DBL. WALL CORRUGATED PIPE WITH TIGHT CONNECTION BANDS AND AGGREGATE NO 25 OR 26 BEDDING TO TOP OF PIPE. ALL JOINTS ARE TO BE WRAPPED WITH GEOTEXTILE FABRIC. PIPE SHALL CONFORM TO ASTM D 3034

NOTE:
FOR SEDIMENT CONTROL NARRATIVE, NOTES, AND SOIL MAP, SEE SHEETS 9 AND 12

RECORD DRAWING



FOREBAY PLAN
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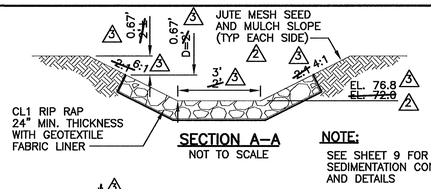
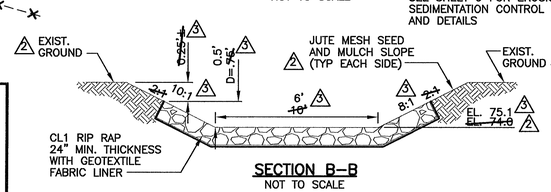


SECTION A–A
NOT TO SCALE

NOTE:
SEE SHEET 9 FOR EROSION AND SEDIMENTATION CONTROL SYMBOLS AND DETAILS



SECTION B–B
NOT TO SCALE

FOREBAY MAINTENANCE PLAN

RESPONSIBILITY:
THE BELOW MAINTENANCE PLAN SHALL BE CARRIED OUT BY THE JAMES CITY SERVICE AUTHORITY.

MOWING:
SINCE THE SIDE–SLOPES, EMBANKMENT AND EMERGENCY SPILLWAY OF THE WET POND ARE COVERED WITH TREES AND THICK UNDERBRUSH THAT CREATE A LANDSCAPE BUFFER AROUND THE POND, MOWING OF THESE AREAS WILL NOT BE REQUIRED.

INSPECTIONS:
THE FOREBAY SHALL BE INSPECTED ON AN ANNUAL BASIS TO ENSURE THAT THE STRUCTURE OPERATES IN THE MANNER ORIGINALLY INTENDED. THE INSPECTION SHALL BE CONDUCTED DURING WET WEATHER TO DETERMINE IF THE FOREBAY IS FUNCTIONING PROPERLY. INSPECTION PRIORITIES SHALL INCLUDE CHECKING THE EMBANKMENT FOR SUBSIDENCE, EROSION, CRACKING AND TREE GROWTH; THE CONDITION OF THE SPILLWAY, THE ACCUMULATION OF SEDIMENT, CLOGGING OF THE OUTLET STRUCTURE AND THE STABILITY OF THE FOREBAY SIDE–SLOPES. INSPECTIONS SHALL BE CARRIED OUT WITH THE "AS–BUILT" FOREBAY PLANS IN HAND.

DEBRIS & LITTER REMOVAL:
AS PART OF THE PERIODIC MOWING OPERATIONS, DEBRIS AND LITTER SHALL BE REMOVED FORM THE SURFACE OF THE FOREBAY. PARTICULAR ATTENTION SHALL BE PAID TO FLOATABLE DEBRIS AROUND THE RIP RAP AND THE OUTLET SHALL BE CHECKED FOR POSSIBLE CLOGGING.

EROSION CONTROL:
THE FOREBAY SIDE–SLOPES, EMERGENCY SPILLWAY AND EMBANKMENT ALL MAY SUFFER FROM EROSION. CORRECTIVE MEASURES SUCH AS REGRADING AND REVEGETATION MAY BE NECESSARY. SIMILARLY, THE RAP RIP PROTECTING THE CHANNEL NEAR THE OUTLET MAY NEED TO BE REPAIRED OR REPLACED.

SEDIMENT REMOVAL:
SEDIMENT WILL EVENTUALLY ACCUMULATE IN THE FOREBAYS TO SIGNIFICANTLY REDUCE THE STORAGE CAPACITY OF THE FOREBAYS. A SEDIMENT CLEAN–OUT CYCLE OF TEN TO TWENTY YEARS IS RECOMMENDED TO RESTORE THE FOREBAY TO THE ORIGINAL DESIGN VOLUME. THE SEDIMENT REMOVED FROM THE FOREBAY SHALL BE EVENLY SPREAD AROUND THE ADJACENT POND AREA AND IMMEDIATELY STABILIZED. THE SEDIMENT CLEANOUT ELEVATION FOR THE FOREBAY IS ELEVATION 69.25 (HALF DEPTH).

ANY REUSE ON PROJECT EXTENSIONS, ANY OTHER PROJECT OR ALTERATIONS OR ADDITIONS TO THIS PROJECT SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO GANNETT FLEMING, INC.

No.	DESCRIPTION	DATE	BY
3	RECORD INFO. ADDED	4/10/07	J.G.H.
2	ADDENDUM NO. 2	10/31/05	J.G.H.
1	ADDENDUM NO. 1	8/25/05	J.G.H.

REVISIONS

DESIGNED	TRACED	SCALE
J.G.H. / A.F.W.		GRAPHIC
DRAWN	CHECKED	APPROVED
J.R.G.	A.F.W..	M.P.L.

Gannett Fleming

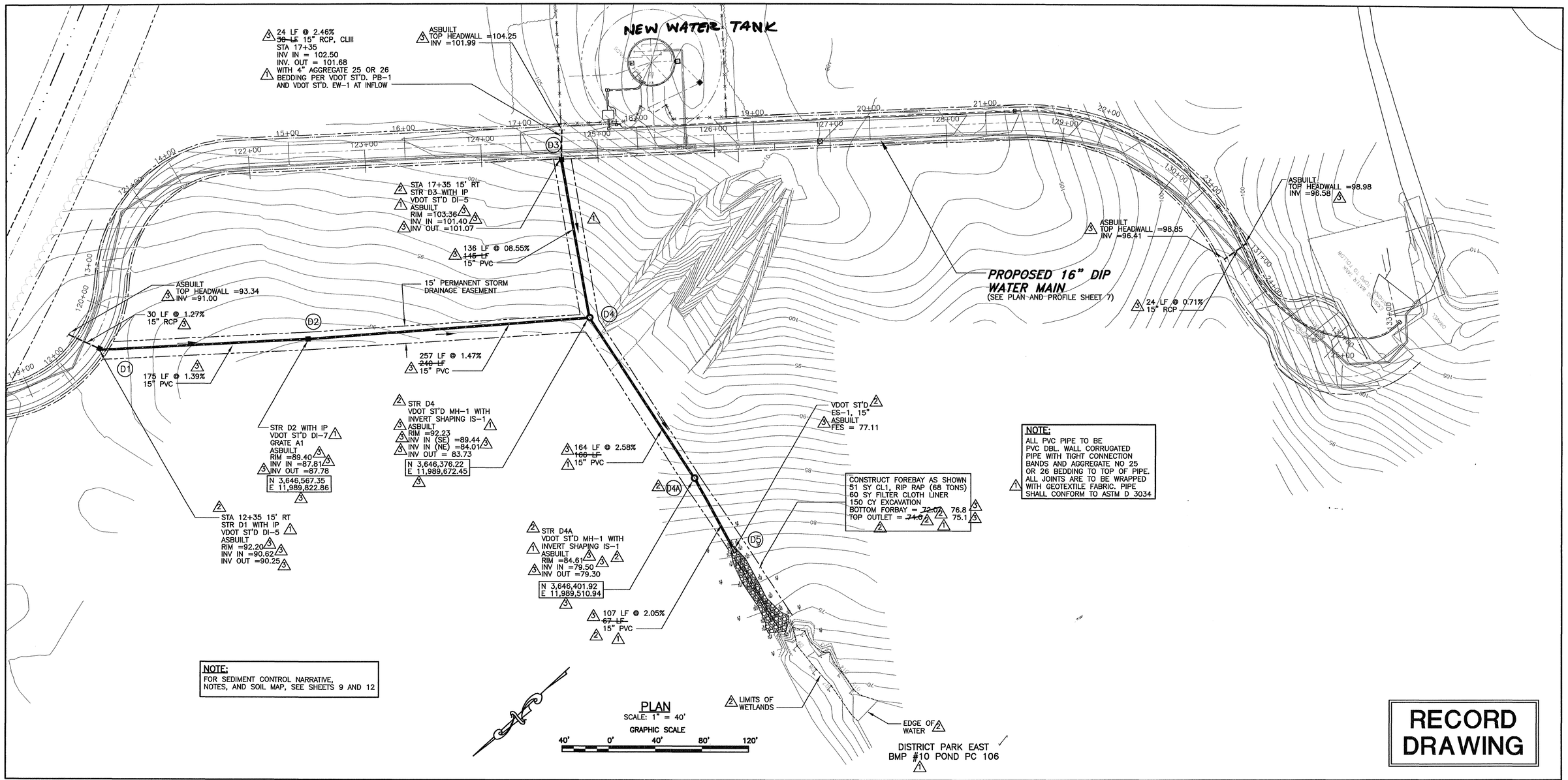
JAMES CITY SERVICE AUTHORITY

16 – INCH WATER MAINS

WARHILL SPORTS COMPLEX
DRAINAGE PLAN

JOB No.	FIGURE NO.
44656	
DATE	DRAWING NO.
AUGUST 2005	10

FILE: JCSA_WM–STRM10.DWG



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NOTE:
FOR SEDIMENT CONTROL NARRATIVE, NOTES, AND SOIL MAP, SEE SHEETS 9 AND 12

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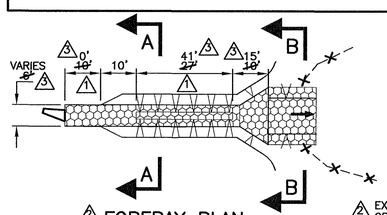

FOREBAY PLAN
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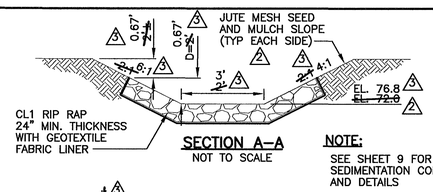

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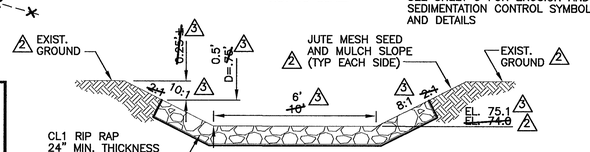

SECTION B–B
NOT TO SCALE

FOREBAY MAINTENANCE PLAN

SP-79-05/ ~~SP-2006-05~~

RESPONSIBILITY:
THE BELOW MAINTENANCE PLAN SHALL BE CARRIED OUT BY THE JAMES CITY SERVICE AUTHORITY.

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RECEIVED
APR 18 2007
ENVIRONMENTAL SERVICE

SJT REVIEW SET FOREBAY PC

ANY REUSE ON PROJECT EXTENSIONS, ANY OTHER PROJECT OR ALTERATIONS OR ADDITIONS TO THIS PROJECT SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO GANNETT FLEMING, INC.

FILE: JCSA_WM-STRM10.DWG

No.	DESCRIPTION	DATE	BY
3	RECORD INFO. ADDED	4/10/07	J.G.H.
2	ADDENDUM NO. 2	10/31/06	J.G.H.
1	ADDENDUM NO. 1	8/25/06	J.G.H.

REVISIONS

DESIGNED	TRACED	SCALE
J.G.H. A.F.W.		GRAPHIC
DRAWN	CHECKED	APPROVED
J.R.G.	A.F.W..	M.P.L.

Gannett Fleming

JAMES CITY SERVICE AUTHORITY

16 – INCH WATER MAINS

WARHILL SPORTS COMPLEX
DRAINAGE PLAN

JOB No.	FIGURE NO.
44656	
DATE	DRAWING NO.
AUGUST 2005	10

GANNETT FLEMING, INC.
Suite 200
11838 Rock Landing Drive
Newport News, VA 23606

Office: (757) 873-0768
Fax: (757) 873-6868
www.gannettfleming.com

Gannett Fleming

SP-79-05
FOREBAY PC205

TRANSMITTAL FORM

To: **Scott Thomas**
James City County

Environmental Division
101-E Mounts Bay Road
Williamsburg, Va 23187

Date: **4/16/2007**

GF Job No.: **44656** Sub:

Client Job No.:

Re: **JCSA ~~Stonehouse~~**
WARHILL

No onsite BMP. DRAINS TO WARHILL EAST POND DAM, PC106. FOREBAY & STORM SYSTEM PART OF THIS PROJECT.

- [ ] Letter/memo/minutes
- [ ] E-mail
- [ ] Prints
- [ ] Specifications
- [ ] Computer Files
- [ ] Plans
- [ ] Shop Drawing
- [ ] Other

Copies	Dated	Description
2		**Storm Drainage Record Drawing and Checklist**

- [x] For Approval
- [ ] As Requested
- [ ] Conforms As Submitted
- [ ] Returned For Correction
- [ ] For Your Use
- [x] For Review & Comment
- [ ] Conforms With Notations
- [ ] For Bids Due

Remarks

RECEIVED
APR 19 2007
ENVIRONMENTAL DIVISION

Copy To: **m. luning, m. vergakis**

2165

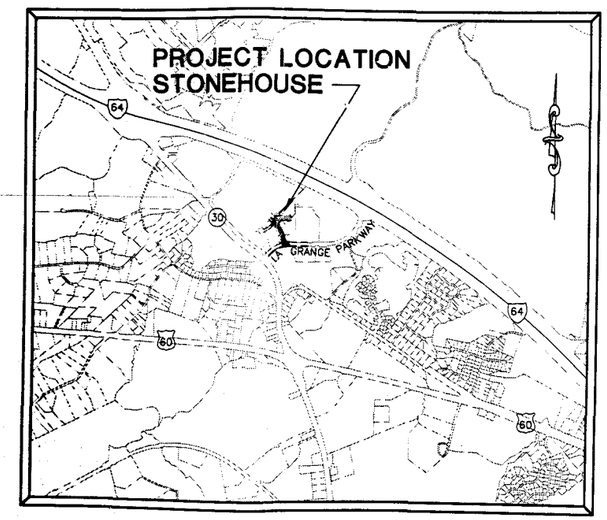
Signed: **John Harman, P.E.**

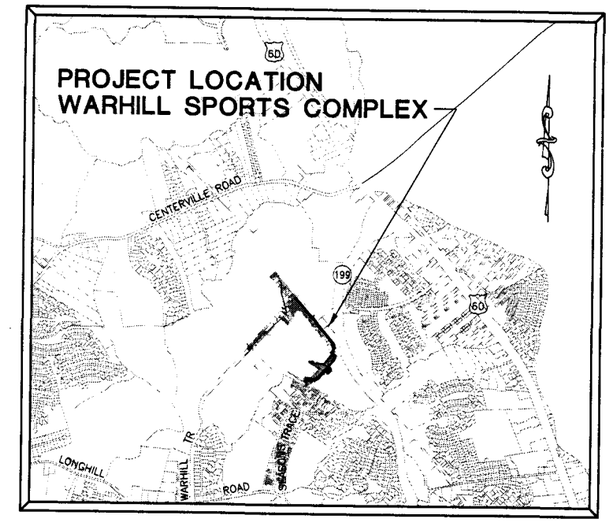
JAMES CITY SERVICE AUTHORITY

WARHILL SPORTS COMPLEX AND STONEHOUSE WATER MAIN AND TANK SITE PLANS

JAMES CITY COUNTY
INVITATION FOR BID
06-0001

JCSA
JAMES CITY SERVICE AUTHORITY





VICINITY MAP

SCALE: 1" = 2,000'

TABULATIONS:

1. ZONING: PUD-C
2. AREA: 23,773.97 SF
3. ADDRESS: 9188 MT. ZION ROAD
4. PARKING: 1 EMPLOYEE VISITOR
5. NUMBER OF FLOORS: 0
6. HEIGHT OF PROPOSED TANK: 135 FT
7. AREA OF TEMPORARY CONSTRUCTION EASEMENT: 6120.2 SF
8. DEED BOOK 2003, PAGE 024
9. TAX MAP 06401, PARCEL 9

VICINITY MAP

SCALE: 1" = 2,000'

TABULATIONS:

1. ZONING: R-8
2. AREA: 23,773.97 SF
3. ADDRESS: 5700 WARHILL TRAIL
4. PARKING: 1 EMPLOYEE VISITOR
5. NUMBER OF FLOORS: 0
6. HEIGHT OF PROPOSED TANK: 150 FT
7. AREA OF TEMPORARY CONSTRUCTION EASEMENT: 3339.0 SF
8. TAX MAP 3210, PARCEL 100012

DRAWING INDEX

	SHEET NUMBER	SHEET TITLE
(WATER MAIN)	1	COVER SHEET
	2	GENERAL NOTES, DETAIL REFERENCE AND LEGEND
	3	SITE PLAN – SHEET INDEX MAP
	4	STONEHOUSE WATER MAIN PLAN AND PROFILE – STA 10+24 TO STA 19+00±
	5	WARHILL SPORTS COMPLEX WATER MAIN – PLAN AND PROFILE – STA 99+82 TO STA 111+00
	5B	WARHILL SPORTS COMPLEX SERVICE ROAD – PLAN AND PROFILE – STA (–)1+73 TO STA 3+50
	6	WARHILL SPORTS COMPLEX WATER MAIN – PLAN AND PROFILE – STA 111+00 TO STA 122+00
	6B	WARHILL SPORTS COMPLEX SERVICE ROAD – PLAN AND PROFILE – STA 3+50 TO STA 15+00
	7	WARHILL SPORTS COMPLEX WATER MAIN – PLAN AND PROFILE – STA 122+00 TO STA 133+11±
	7B	WARHILL SPORTS COMPLEX SERVICE ROAD – PLAN AND PROFILE – STA 15+00 TO STA 25+62
	8	TRENCH AND PAVING DETAILS
	9	EROSION AND SEDIMENT CONTROL NOTES AND DETAILS
	10	WARHILL SPORTS COMPLEX – DRAINAGE PLAN
	11	DRAINAGE AREA MAP – STONEHOUSE
	12	DRAINAGE AREA MAP – WARHILL SPORTS COMPLEX
	13	TRAFFIC CONTROL
(TANKS)	14	SITE PLAN – STONEHOUSE – GRADING AND EROSION CONTROL PLAN
	15	SITE PLAN – WARHILL SPORTS COMPLEX – GRADING AND EROSION CONTROL PLAN
	16	SITE PLANS – LANDSCAPING DETAIL

PLAN
SP-79-05

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF WATER SYSTEM IMPROVEMENTS TO THE JAMES CITY SERVICE AUTHORITY WATER DISTRIBUTION SYSTEM AT THE WARHILL SPORTS COMPLEX AND ALONG WESTMONT DRIVE IN JAMES CITY COUNTY, VIRGINIA.

THE WORK UNDER THIS CONTRACT CONSIST OF THE INSTALLATION OF APPROXIMATELY 3,300 LINEAR FEET OF 16-INCH DIAMETER WATER MAIN, ACCESS ROAD AND APPURTENANCES AT THE WARHILL SPORTS COMPLEX AND APPROXIMATELY 925 LINEAR FEET OF 16-INCH DIAMETER WATER MAIN AND APPURTENANCES ALONG WESTMONT DRIVE, INCLUDING BUT NOT LIMITED INSTALLATION OF VALVES, FIRE HYDRANTS, AIR RELEASE VALVES AND OTHER WATER MAIN APPURTENANCES.

SERVICES PROVIDED BY THE CONTRACTOR SHALL INCLUDE, BUT NOT BE LIMITED TO THE FURNISH OF ALL MATERIALS, EQUIPMENT, LABOR, SUPERVISION, TOOLS, EXCAVATION, SHORING, GRADING, RESTORATION, EROSION AND SEDIMENT CONTROL, CLEARING AND GRUBBING, ROADWAY PAVEMENT, ACCESS ROAD, TRAFFIC CONTROL, DISINFECTION, TESTING, AND OTHER MISCELLANEOUS APPURTENANCES AND WORK NECESSARY TO COMPLETE THE WATER SYSTEM IMPROVEMENTS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

SPECIAL USE PERMIT

1. A SPECIAL USE PERMIT (CASE NO. SUP-03-05 AND HW-02-05) WAS ISSUED FOR THIS PROJECT BY THE BOARD OF SUPERVISORS ON MARCH 22, 2005.

AUGUST 2005

PROJECT NO. 44656

Gannett Fleming

SUITE 200
ROCK LANDING II
11838 ROCK LANDING DRIVE
NEWPORT NEWS, VIRGINIA 23606

NOTE: CONTRACTOR TO CONTACT MISS UTILITY (1-800-552-7001) AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION ON THE SITE.

ALWAYS CARE BEFORE YOU DIG
CALL MISS UTILITY
KEEP VIRGINIA SAFE

RESPONSIBLE LAND DISTURBER (RLD)

MR. MICHAEL D. VERGAKIS, P.E.
P.E. NO. 18315
P.O. BOX 8784
WILLIAMSBURG, VA. 23187
TELEPHONE: (757) 253-6677
FAX: (757) 253-6850

AT THE TIME OF THE PRE-CONSTRUCTION MEETING, THE CONTRACTOR SHALL PROVIDE A RLD TO TAKE RESPONSIBILITY FOR JCSA AND THE CONTRACTOR DURING ALL PHASES OF CONSTRUCTION.

APPROVED
James City County
Environmental Division
By: [signature]
Date: 11-04-05
APPROVED FOR LAND-DISTURBING PERMIT PURPOSES

SPECIAL NOTE:
THE TABLE BELOW IS FOR REFERENCE ONLY. THE DETAIL NUMBERS REFER TO HRPDC STANDARD DETAILS. NOT ALL OF THE DETAILS LISTED MAY BE REQUIRED FOR THIS PROJECT. THE COMMENTS PROVIDE ADDITIONAL INFORMATION SPECIFIC TO THIS PROJECT. IN SOME CASES, JCSA DETAILS SUPERSEDE HRPDC DETAILS. ANY DISCREPANCIES SHALL BE REFERRED TO THE JCSA FOR INTERPRETATION.

REFERENCED HRPDC DETAIL

DETAIL	NO. DESCRIPTION	COMMENTS
RC_01	PAVEMENT PATCHING DETAIL FOR FLEXIBLE PAVEMENT	
DS_05	YARD DRAIN	
EW_01	PIPE BEDDING DETAIL	TYPE II & TYPE III BEDDING
EW_02	PAVEMENT LIMITS TRENCH EXCAVATION AND BACKFILL	
EW_03	TRENCH WIDTH DETAIL FOR PAYMENT OF CONTINGENT ITEMS	
CI_01	24" CURB & GUTTER	
CI_05	STANDARD COMMERCIAL ENTRANCE	
WD_01	SINGLE AND DUAL SERVICE CONNECTIONS	
WD_02	WATER SERVICE INSTALLATION DETAIL	JCSA – W 13.0
WD_03	WATER METER BOX (TYPE I)	USE JCSA – W 14.0
WD_04	WATER METER BOX (TYPE II)	NOT USED
WD_05	BLOW-OFF ASSEMBLY	
WD_06	FIRE HYDRANT SETTING (TYPE II)	
WD_07	FIRE HYDRANT SETTING (TYPE I)	CONFORM TO EXISTING CONDITION & MAINTAIN SWALE
WD_09	TEMPORARY MANIFOLD FOR TEST AND CHLORINATION	
WS_01	STANDARD VALVE BOX FRAME AND COVER	
WS_02	VALVE SETTING DETAIL	
WS_03	MANUAL AIR VENT ASSEMBLY	
WS_04	STEEL CASING DETAIL	NOTE: THICKNESS NOTED ON SPECIFICATIONS
WS_05	STANDARD THRUST BLOCKS	
WS_06	OBSTRUCTION BY-PASS UNIFORM OFFSET	JOINT RESTRAINT ONLY – NO CONCRETE THRUST BLOCKS
WS_07	RESTRAINING ROD DETAIL	
JCSA PP.1	BITUMINOUS PAVEMENT PATCHING FOR UTILITY INSTALLATION	
W1	TYPICAL TEE CONNECTION DETAIL	
W2	POINT REPAIR DETAIL / PIPE REPLACEMENT DETAIL	
W4	TYPICAL PAVEMENT SECTION FOR OVERLAY	
W5	FORCE MAIN CONNECTION DETAIL	
W6	ABANDONED PIPE PLUG DETAIL	
W8	MANHOLE REHABILITATION DETAIL	

SEQUENCE OF CONSTRUCTION

A. ALL WORK SHALL BE SHOWN ON THE CONTRACT DRAWINGS. COORDINATION SHALL BE THROUGH THE JCSA'S REPRESENTATIVE. WHERE SHUT-OFF OF WATER LINES INTERRUPTS SERVICE, THE CONTRACTOR SHALL ARRANGE HIS OPERATIONS AND HAVE SUFFICIENT MATERIAL AND PERSONNEL AVAILABLE TO COMPLETE THE WORK WITHOUT DELAY IN THE EVENT OF AN EMERGENCY. ONCE A SHUT DOWN IS STARTED, THE CONNECTION WORK SHALL BE CONTINUOUS UNTIL COMPLETED.

B. SHUTDOWNS OF ANY JCSA FACILITIES SHALL BE LIMITED TO 6 HOURS MINIMUM BETWEEN THE HOURS OF 11:00 P.M. TO 5:00 A.M. ON TUESDAY OR WEDNESDAY NIGHTS. THE CONTRACTOR SHALL PROVIDE TWO (2) NOTIFICATIONS TO THE JCSA'S REPRESENTATIVE, ONE 7 DAYS AND THE SECOND 48 HOURS PRIOR TO PROCEEDING WITH ANY PORTION OF THE PIPELINE WORK.

C. FOR EACH SHUT DOWN, THE CONTRACTOR SHALL SUBMIT A PROJECT PLAN CONSISTING OF A CONSTRUCTION SEQUENCE, TIME SCHEDULE, AND DETAILS OF LABOR, EQUIPMENT AND MATERIAL AVAILABLE AND ONSITE TO THE JCSA'S REPRESENTATIVE FOR APPROVAL. PROJECT PLAN MUST BE GIVEN TO JCSA AT THE FIRST NOTIFICATION.

D. THE CONTRACTOR SHALL BE AWARE THAT HE MAY BE FORCED TO ABANDON HIS ATTEMPT AND TO RESCHEDULE THE WORK, SHOULD HIS TIME LIMITATIONS BE EXCEEDED FOR ANY PHASE OF THE WORK. IN NO CASE SHALL THE OWNER BE REQUIRED TO MAKE ADDITIONAL PAYMENTS FOR OVERTIME WORK OR REDOING THE WORK DUE TO THE CONTRACTOR'S FAILURE TO COMPLETE THE WORK IN THE ALLOTTED TIME.

E. THE CONTRACTOR SHALL SHORE, BRACE, SECURE AND PROTECT AS MAY BE NECESSARY, ANY PIPING, EXISTING STRUCTURE, OR PARTS OF STRUCTURES ADJACENT TO, ADJOINING, AND IN THE VICINITY OF THE WORK THAT MAY BE AFFECTED IN ANY WAY BY THE CONTRACT WORK.

GENERAL NOTES

1. ALL MATERIALS AND CONSTRUCTION OF THE WATER DISTRIBUTION SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, THE LATEST EDITION OF JAMES CITY SERVICE AUTHORITY (JCSA) STANDARDS AND SPECIFICATIONS FOR WATER DISTRIBUTION SYSTEMS, THE HAMPTON ROADS PLANNING DISTRICT COMMISSION REGIONAL STANDARDS (AS MODIFIED BY THE CONTRACT DOCUMENTS), AND THE VIRGINIA DEPARTMENT OF HEALTH WATERWORKS REGULATIONS.

   PRESSURE TESTING SHALL BE AT 150 PSI.

2. THE CONTRACTOR SHALL SUBMIT AFFIDAVITS FOR MATERIALS TO BE USED ON THE PROJECT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AS PART OF THE PRODUCT SUBMITTAL AND RECEIVE APPROVALS FROM JCSA FOR THOSE SUBMITTALS PRIOR TO ORDERING MATERIALS.

3. ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE IN ACCORDANCE WITH THE NOTES AND DETAILS SHOWN ON DRAWING 9. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE JAMES CITY COUNTY LAND DISTURBING PERMIT ISSUED FOR THIS PROJECT. CONTRACTOR TO PROVIDE A RESPONSIBLE LAND DISTURBER FOR THE EROSION AND SEDIMENT CONTROL PERMIT.

4. ALL WATER SYSTEM IMPROVEMENTS SHALL BE DISINFECTED AND PRESSURE TESTED, AND SATISFACTORY BACTERIOLOGICAL SAMPLES OBTAINED, IN ACCORDANCE WITH JCSA STANDARDS AND THE CONTRACT DOCUMENTS.

5. AFTER TESTING IS COMPLETE AND ALL COMPONENTS OF THE WATER MAIN SYSTEM ARE ACCEPTABLE TO JCSA, RECORD DRAWINGS SHALL BE SUBMITTED TO JCSA BY THE CONTRACTOR. ANY DISCREPANCIES NOTED DURING THE RECORD DRAWING INSPECTION SHALL BE CORRECTED BY THE CONTRACTOR WITHIN 30 DAYS.

6. ROUTINE PERIODIC INSPECTIONS DURING CONSTRUCTION WILL BE PROVIDED BY JCSA. THESE INSPECTIONS DO NOT RELIEVE THE CONTRACTOR FROM HIS OBLIGATION AND RESPONSIBILITY FOR CONSTRUCTING THE WATER MAIN AND RELATED FACILITIES IN STRICT ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF JCSA AND THE CONTRACT DOCUMENTS.

7. ANY CHANGES TO THE FINAL PLANS SHALL BE APPROVED IN WRITING BY JCSA AND SHALL BE ACCURATELY INDICATED ON THE RECORD DRAWINGS.

8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS AND ORDERS OF ANY BODY HAVING JURISDICTION. HE SHALL ERECT AND MAINTAIN, AS REQUIRED BY THE CONDITIONS AND PROGRESS OF THE WORK, ALL NECESSARY SAFEGUARDS FOR SAFETY AND PROTECTION.

9. THE CONTRACTOR SHALL REPAIR ALL DISTURBED AREAS TO A CONDITION EQUAL TO OR BETTER THAN THOSE EXISTING PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. JCSA RESERVES THE RIGHT TO STOP WORK IF AND WHEN, IN THE SOLE OPINION OF JCSA, CLEANUP, EROSION AND SEDIMENT CONTROLS, RESTORATION OR PUBLIC SAFETY ARE NOT BEING PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

10. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SHALL NOTIFY "MISS UTILITY" (1-800-552-7001) PRIOR TO ANY EXCAVATION. THE CONTRACTOR SHALL PROVIDE NOTIFICATION TO THE NEWPORT NEWS WATER REPRESENTATIVE DAN KUHNS, (757) 234-4849 SEVEN (7) DAYS PRIOR TO PROCEEDING WITH ANY PORTION OF THE WORK.

11. HORIZONTAL AND VERTICAL ORIENTATION OF EXISTING UNDERGROUND UTILITIES ARE NOT GUARANTEED. THE CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING UTILITIES PRIOR TO ORDERING OF MATERIALS. IN GENERAL, HOUSE SERVICES, BURIED ELECTRIC, GAS, CATV, TELEPHONE, WATER AND SEWER SERVICES TO HOUSES ARE NOT SHOWN. THE CONTRACTOR SHALL ASSUME THAT SUCH SERVICES SHALL EXIST AND SHALL BE RESPONSIBLE FOR PROTECTING, MAINTAINING AND RELOCATING SUCH SERVICES OR HAVING THEM REPLACED WHEN DAMAGED BY HIS OPERATIONS.

12. PIPE SHALL BE LAID TO A TRUE, UNIFORM LINE AND GRADE. HIGH POINTS, OTHER THAN THOSE INDICATED ON THE DRAWINGS WHERE AN AIR RELEASE VALVE IS PLACED, SHALL BE AVOIDED.

13. THE CONTRACTOR SHALL AVOID REMOVING TREES, BUSHES AND SHRUBS ALONG THE WATER MAIN CORRIDOR, UNLESS DESIGNATED ON THE DRAWINGS AS TO BE REMOVED. NO TREES GREATER THAN 4-INCHES IN DIAMETER SHALL BE REMOVED WITHOUT JCSA APPROVAL.

14. ALL DISTURBED AREAS, INCLUDING BUT NOT LIMITED TO PAVEMENT, SHOULDERS, DITCHES, HEAD WALLS, END WALLS, CULVERT PIPES, CURB-AND-GUTTER, UTILITIES, DRIVEWAY, SIGNS, MAILBOXES, ETC., SHALL BE REPAIRED TO A CONDITION EQUAL TO OR BETTER THAN THOSE EXISTING PRIOR TO CONSTRUCTION, OR AS SHOWN ON THE DRAWINGS. SIGNS, MAILBOXES, AND GUARDRAIL THAT ARE DISTURBED SHALL BE PUT BACK IN THEIR ORIGINAL LOCATIONS DAILY, AND MAINTAINED THROUGHOUT THE PROJECT.

15. THERE ARE EXISTING FIBER OPTIC CABLES LOCATED ALONG WESTMONT DRIVE AND LA GRANGE PARKWAY. IN ADDITION TO CONTACTING "MISS UTILITY", THE CONTRACTOR SHALL CONTACT THE OWNERS OF THE FIBER OPTIC CABLES PRIOR TO EXCAVATING IN THE VICINITY OF THE CABLES. THE CONTRACTOR SHALL BE COMPLETELY RESPONSIBLE FOR ANY DAMAGE TO THE FIBER OPTIC CABLES AND ALL ASSOCIATED REPAIR OR REPLACEMENT COSTS.

16. THE CONTRACTOR SHALL COORDINATE ALL WORK ASSOCIATED WITH EXISTING UTILITY RELOCATION, INCLUDING TEMPORARY POLE BRACING AND GUY WIRE RELOCATION, AND COSTS INVOICED BY THE UTILITY COMPANY FOR WORK PERFORMED BY THEM SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.

17. ALL STAGING AND MATERIAL STORAGE SHALL BE WITHIN THE TEMPORARY AND PERMANENT EASEMENTS. THE CONTRACTOR SHALL COORDINATE WITH THE JAMES CITY COUNTY ENVIRONMENTAL DIVISION IF ADDITIONAL STAGING AND STORAGE AREAS ARE REQUIRED. ADEQUATE EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROVIDED FOR ANY AREAS IDENTIFIED.

18. THE CONTRACTOR SHALL COORDINATE WITH THE JAMES CITY COUNTY ENVIRONMENTAL DIVISION REGARDING ANY OFF-SITE LAND DISTURBANCE. PROPER EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROVIDED FOR ANY OFF SITE DISTURBANCE. IF DEWATERING IS REQUIRED DUE TO SEDIMENT LADEN RUNOFF, THE CONTRACTOR SHALL PROVIDE NECESSARY EROSION AND SEDIMENT CONTROL MEASURES AS REQUIRED BY THE JAMES CITY COUNTY ENVIRONMENTAL DIVISION.

19. FOR ANY WORK WITHIN THE VDOT RIGHT-OF-WAY, APPROPRIATE TRAFFIC CONTROL DEVICES SHALL BE PROVIDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITION OF THE U.S. DEPARTMENT OF TRANSPORTATION, MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), THE VIRGINIA DEPARTMENT OF TRANSPORTATION, VIRGINIA SUPPLEMENT TO THE MUTCD, AND THE VIRGINIA DEPARTMENT OF TRANSPORTATION WORK AREA PROTECTION MANUAL. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE VDOT CE-7 PERMIT ISSUED FOR THIS PROJECT.

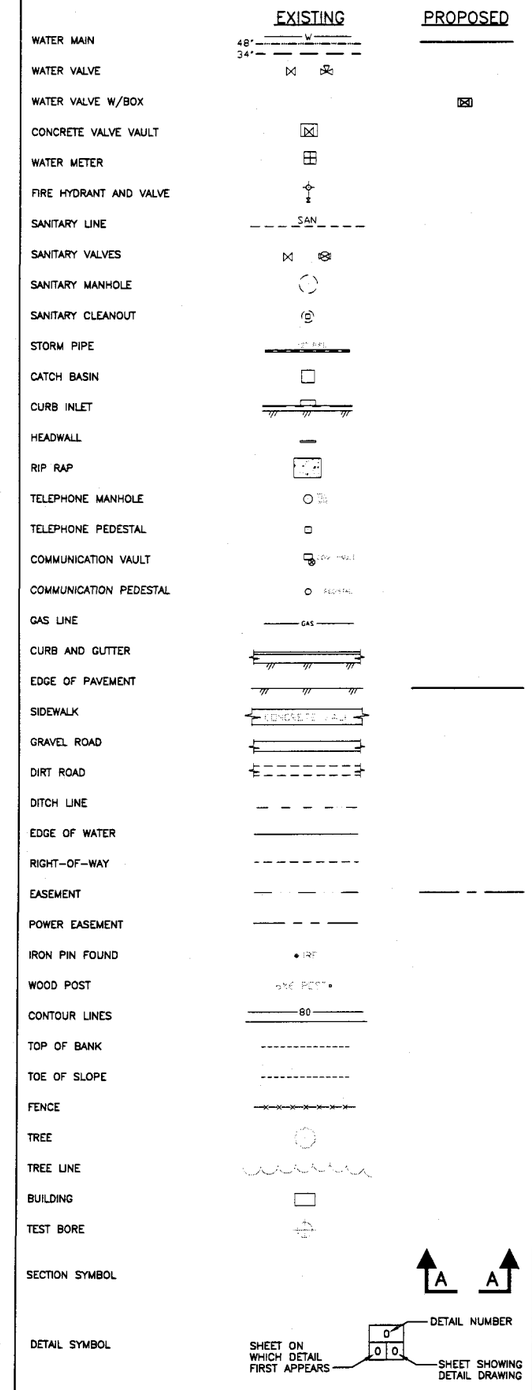
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING, PROTECTING, AND RESOLVING ANY CONFLICTS WITH EXISTING UTILITIES AS SHALL REPAIR, AT HIS OWN EXPENSE, ALL UTILITIES DAMAGED BY CONSTRUCTION. THE CONTRACTOR SHALL COORDINATE ALL WORK ASSOCIATED WITH THE APPROPRIATE UTILITY COMPANY.

21. PRIOR TO CONSTRUCTION, A PRECONSTRUCTION MEETING WITH VDOT AND THE COUNTY ENVIRONMENTAL DIVISION IS REQUIRED. THE CONTRACTOR'S SITE FOREMAN AND SUPERINTENDENT SHALL BE PRESENT AT THE MEETING. THE CONTRACTOR SHALL GENERATE A PRECONSTRUCTION VIDEO OF THE SITE TO DOCUMENT CONDITIONS OF EXISTING FEATURES INCLUDING BUT NOT LIMITED TO PAVEMENT, SHOULDERS, DITCHES, DRIVEWAY, ETC.

22. PRIOR TO FINAL PAYMENT FOR WATER MAIN INSTALLATION, THE CONTRACTOR SHALL PROVIDE RECORD DRAWINGS VERIFYING THAT THE PROPOSED WATER MAIN HAS BEEN INSTALLED IN ACCORDANCE WITH THE CONTRACT DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH RELOCATING TO THE PROPER LOCATION ANY WATER MAIN NOT INSTALLED IN ACCORDANCE WITH THE CONTRACT DRAWINGS. ALL SUCH WORK SHALL BE AT NO ADDITIONAL COST TO JCSA.

23. HORIZONTAL AND VERTICAL CONTROL IS NAVD 29. ENGINEER TO PROVIDE CONTROL POINTS TO CONTRACTOR.

LEGEND



ANY REUSE ON PROJECT EXTENSIONS, ANY OTHER PROJECT OR ALTERATIONS OR ADDITIONS TO THIS PROJECT SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO GANNETT FLEMING, INC.

No.	DESCRIPTION	DATE	BY
1	ADDENDUM NO. 1	8/22/05	J.G.H.

REVISIONS

DESIGNED	TRACED	SCALE
A.F.W.		GRAPHIC
DRAWN	CHECKED	APPROVED
J.R.G.	A.F.W	M.P.L.

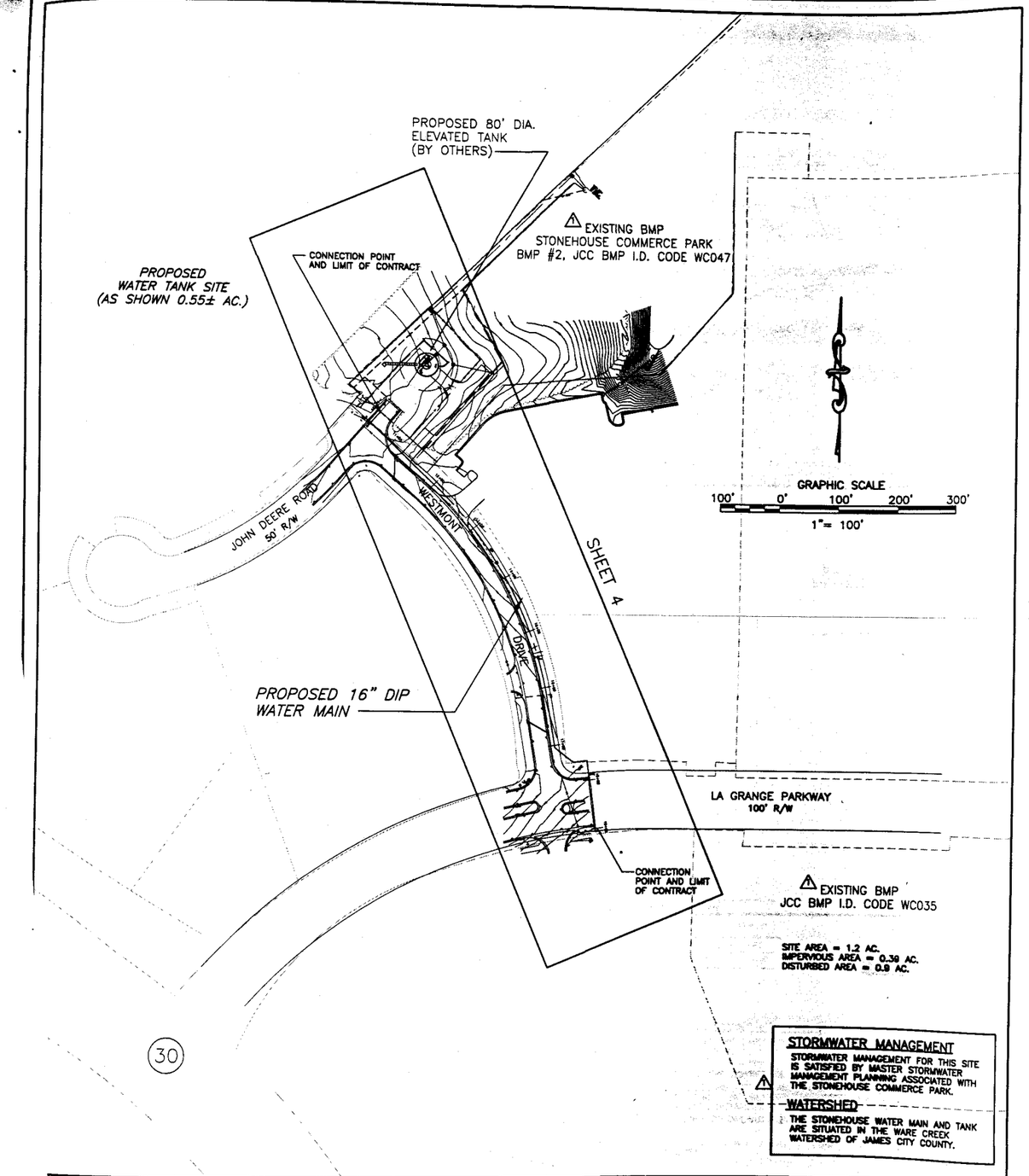
Gannett Fleming

JAMES CITY SERVICE AUTHORITY

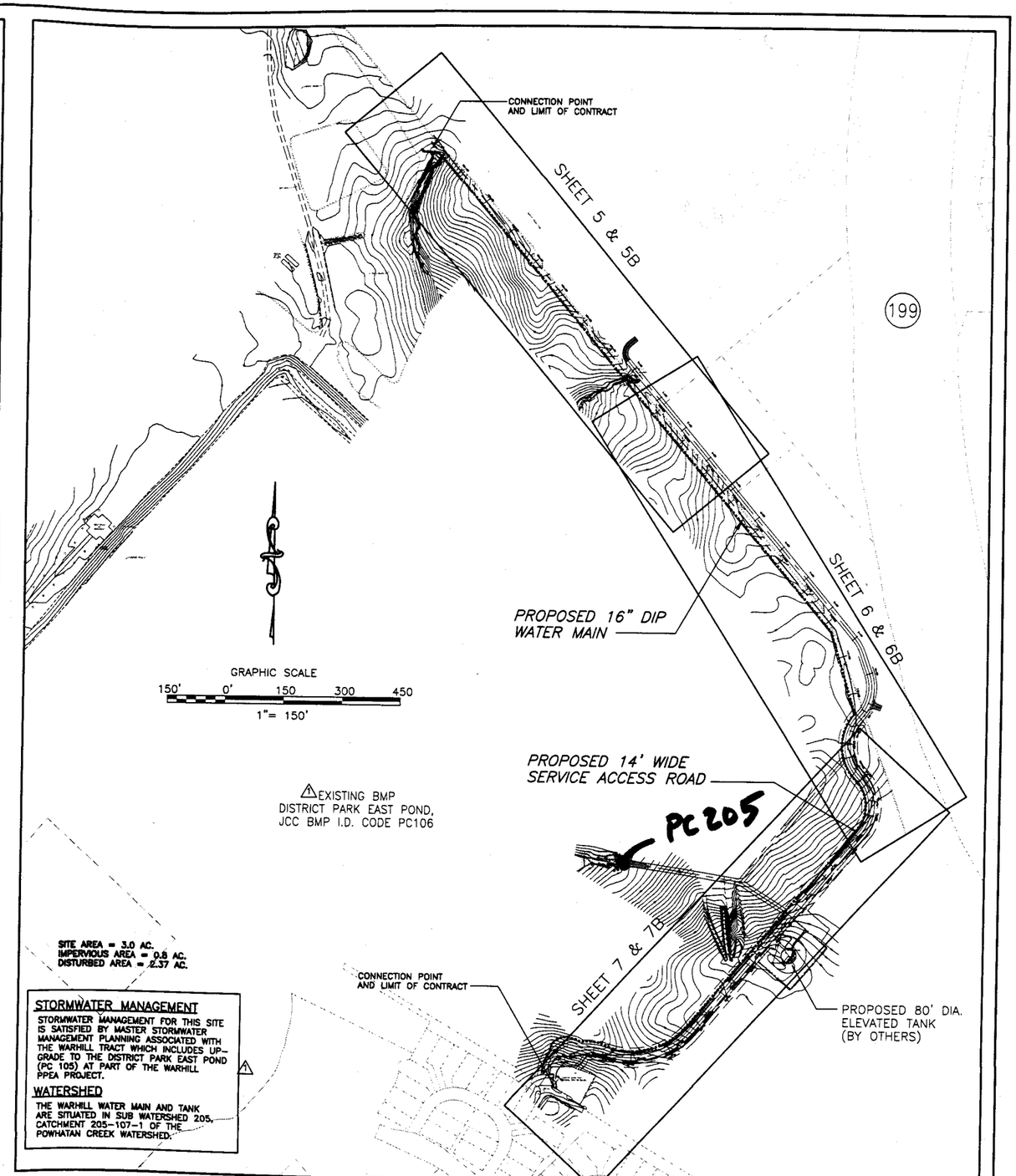
16 – INCH WATER MAINS

GENERAL NOTES, DETAIL REFERENCE AND LEGEND

JOB No.	FIGURE NO.
44656	
DATE	DRAWING NO.
AUGUST 2005	2



SITE PLAN – STONEHOUSE
SCALE: 1" = 100'



SITE PLAN – WARHILL SPORTS COMPLEX
SCALE: 1" = 150'

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No.	DESCRIPTION	DATE	BY
1	ADDENDUM NO. 1	8/25/05	J.G.H.

REVISIONS

DESIGNED	TRACED	SCALE
A.F.W.		GRAPHIC
DRAWN	CHECKED	APPROVED
J.R.G.	A.F.W..	M.P.L.

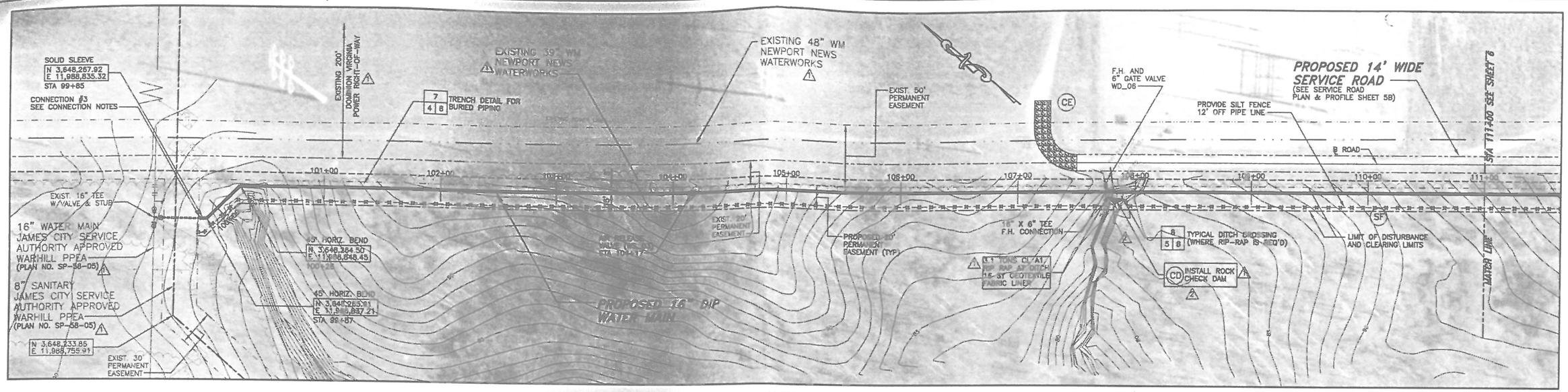
Gannett Fleming

JAMES CITY SERVICE AUTHORITY

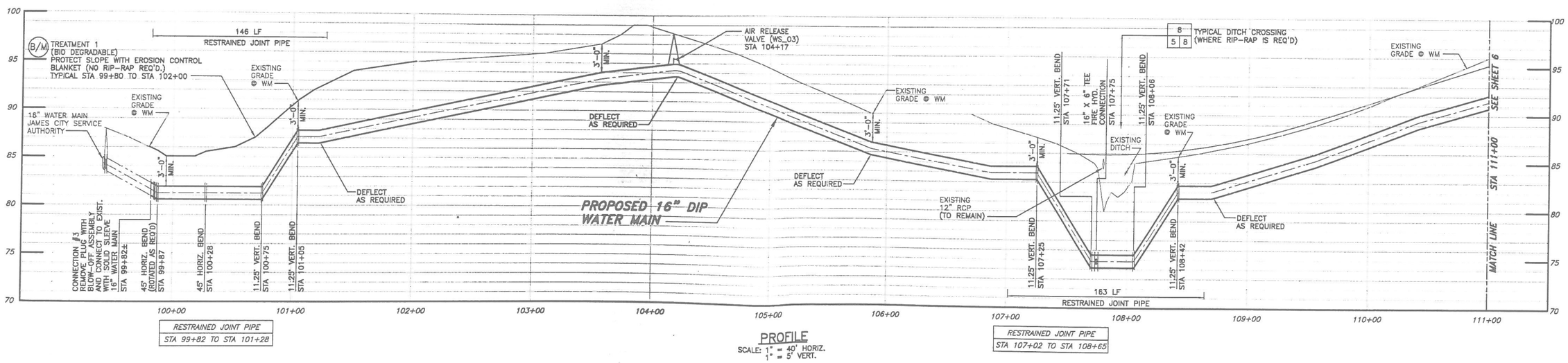
16 – INCH WATER MAINS

SITE PLAN
SHEET INDEX MAP

JOB No.	FIGURE NO.
44656	
DATE	DRAWING NO.
AUGUST 2005	3



PLAN
SCALE: 1" = 40'



PROFILE
SCALE: 1" = 40' HORIZ.
1" = 5' VERT.

NOTES:

WATER MAIN CONNECTIONS NO. 3 & 4

1. WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, REMOVING THE EXISTING CAP OR PLUG AND FURNISHING AND INSTALLING FITTINGS AND APPURTENANCES NECESSARY TO CONNECT TO THE EXISTING 16" WATER MAIN.
2. ALL JOINTS ASSOCIATED WITH THE CONNECTION SHALL BE RESTRAINED.
3. ALL PIPING, VALVES, SLEEVES AND FITTINGS ASSOCIATED WITH THE PROPOSED CONNECTION SHALL BE CLEANED AND SWABBED/DISINFECTED WITH A 1% CHLORINE SOLUTION PRIOR TO INSTALLATION.
4. EXISTING VALVES SHALL ONLY BE OPERATED BY THE JCSA.
5. THE CONTRACTOR SHALL VERIFY PIPE MATERIALS, SIZES, ALIGNMENT AND LOCATION OF THE EXISTING WATER PRIOR TO ORDERING MATERIALS FOR THE PROPOSED CONNECTION.

ANY REUSE ON PROJECT EXTENSIONS, ANY OTHER PROJECT OR ALTERATIONS OR ADDITIONS TO THIS PROJECT SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO GANNETT FLEMING, INC.

1"= 40' HORIZONTAL: 40' 0' 40' 80' 120'
1"= 5' VERTICAL: 5' 0' 5' 10' 15'

No.	DESCRIPTION	DATE	BY
2	ADDENDUM NO. 2	10/31/05	J.G.H.
1	ADDENDUM NO. 1	8/25/05	J.G.H.

REVISIONS

DESIGNED	TRACED	SCALE
A.F.W.		GRAPHIC
DRAWN	CHECKED	APPROVED
J.R.G.	A.F.W..	M.P.L.

Gannett Fleming

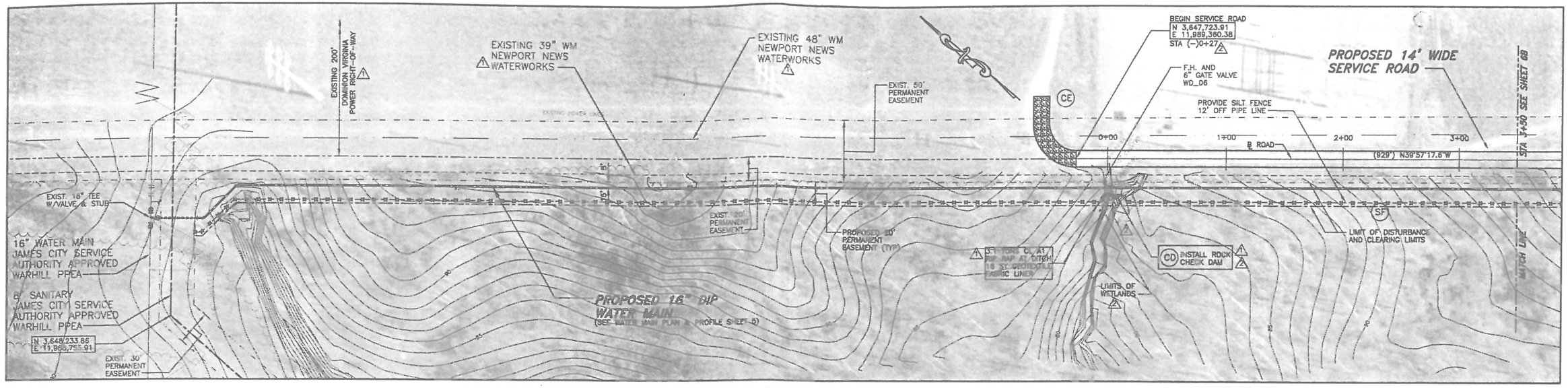
JAMES CITY SERVICE AUTHORITY

16 – INCH WATER MAINS

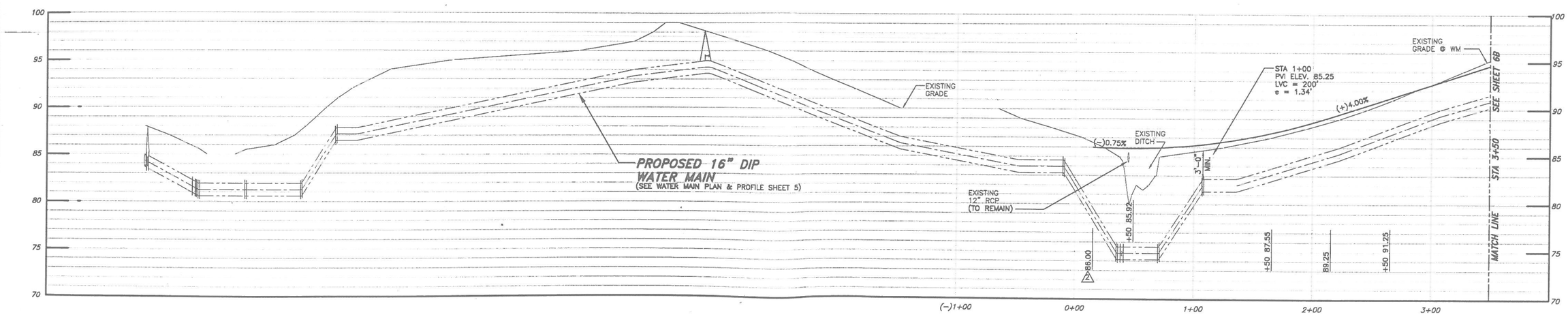
WARHILL SPORTS COMPLEX WATER MAIN
PLAN AND PROFILE
STA 99+82 TO STA 111+00

JOB No.	FIGURE NO.
44656	
DATE	DRAWING NO.
AUGUST 2005	5

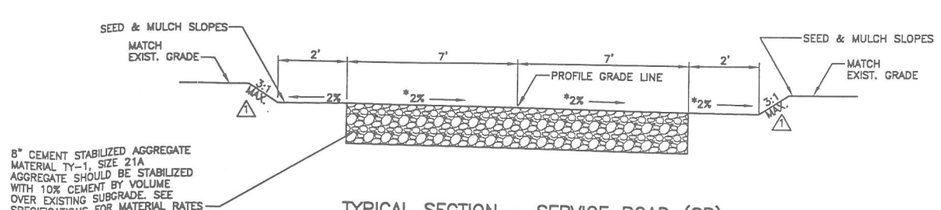
PC205_JCSA_WARHILL_ELEV_WATER_TANK - 025



PLAN
SCALE: 1" = 40'



PROFILE
SCALE: 1" = 40' HORIZ.
1" = 5' VERT.



TYPICAL SECTION – SERVICE ROAD (SR)
STA (–)1+73 TO STA 8+80
NOT TO SCALE

ANY REUSE ON PROJECT EXTENSIONS, ANY OTHER PROJECT OR ALTERATIONS OR ADDITIONS TO THIS PROJECT SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO GANNETT FLEMING, INC.

1"= 40' HORIZONTAL: 40' 0' 40' 80' 120'
1"= 5' VERTICAL: 5' 0' 5' 10' 15'

No.	DESCRIPTION	DATE	BY
2	ADDENDUM NO. 2	10/31/05	J.G.H.
1	ADDENDUM NO. 1	8/25/05	J.G.H.

REVISIONS

DESIGNED	TRACED	SCALE
A.F.W.		GRAPHIC
DRAWN	CHECKED	APPROVED
J.R.G.	A.F.W..	M.P.L.

Gannett Fleming

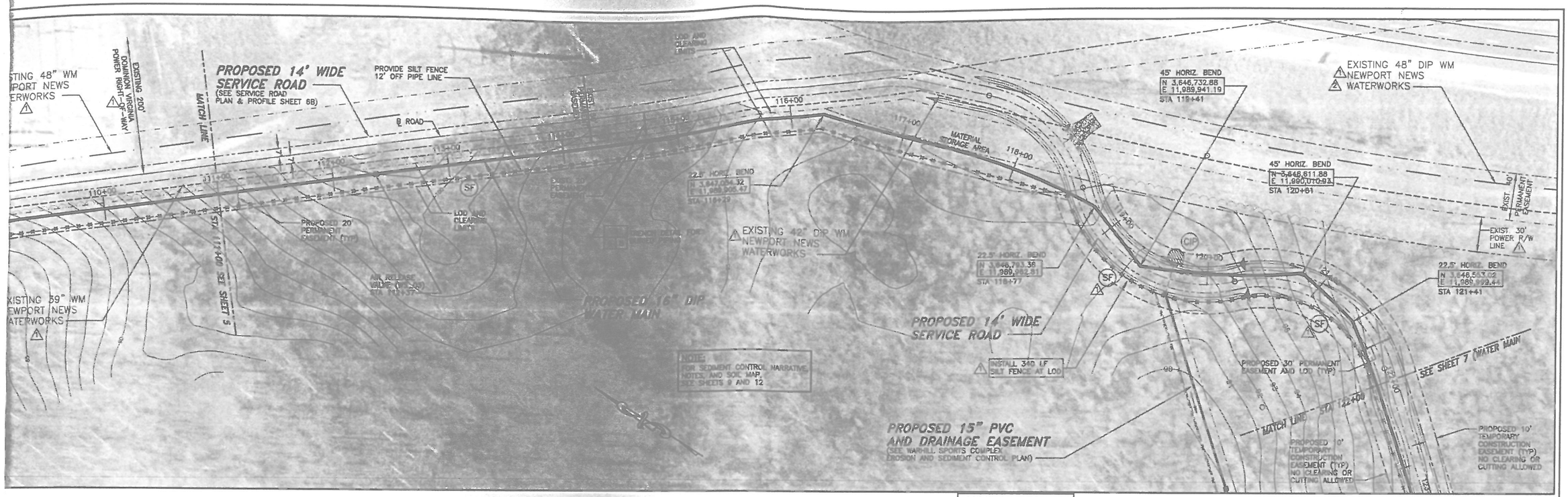
JAMES CITY SERVICE AUTHORITY

16 – INCH WATER MAINS

WARHILL SPORTS COMPLEX SERVICE ROAD
PLAN AND PROFILE
STA (–)1+73 TO STA 3+50

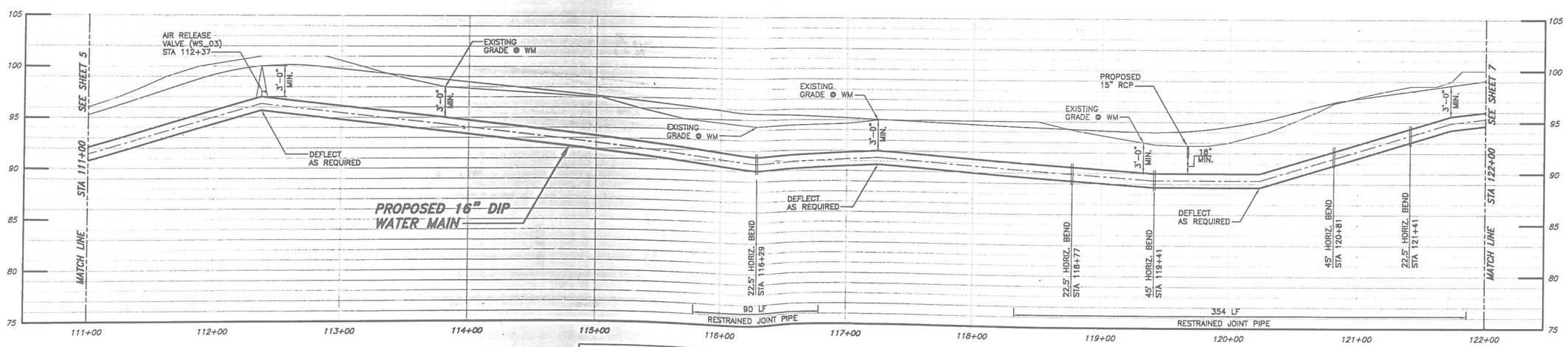
JOB No.	FIGURE NO.
44656	
DATE	DRAWING NO.
AUGUST 2005	5B

FILE: JCSA_RD-PPSB-7B.DWG



PLAN
SCALE: 1" = 40'

ABBREVIATION:
LOD – LIMIT OF DISTURBANCE



RESTRAINED JOINT PIPE
STA 115+84 TO STA 116+74

PROFILE
SCALE: 1" = 40' HORIZ.
1" = 5' VERT.

RESTRAINED JOINT PIPE
STA 118+32 TO STA 121+86

"REUSE ON PROJECT EXTENSIONS, ANY OTHER PROJECT OR ALTERATIONS OR ADDITIONS TO THIS SHEET SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO GANNETT FLEMING, INC.

1"= 40' HORIZONTAL: 40' 0' 40' 80' 120'
1"= 5' VERTICAL: 5' 0' 5' 10' 15'

REVISIONS			
2	ADDENDUM NO. 2	10/31/05	J.G.H.
1	ADDENDUM NO. 1	8/25/05	J.G.H.
	DESCRIPTION	DATE	BY

DESIGNED	TRACED	SCALE
J.G.H. / A.F.W.		GRAPHIC
DRAWN	CHECKED	APPROVED
J.R.G.	A.F.W.	M.P.L.

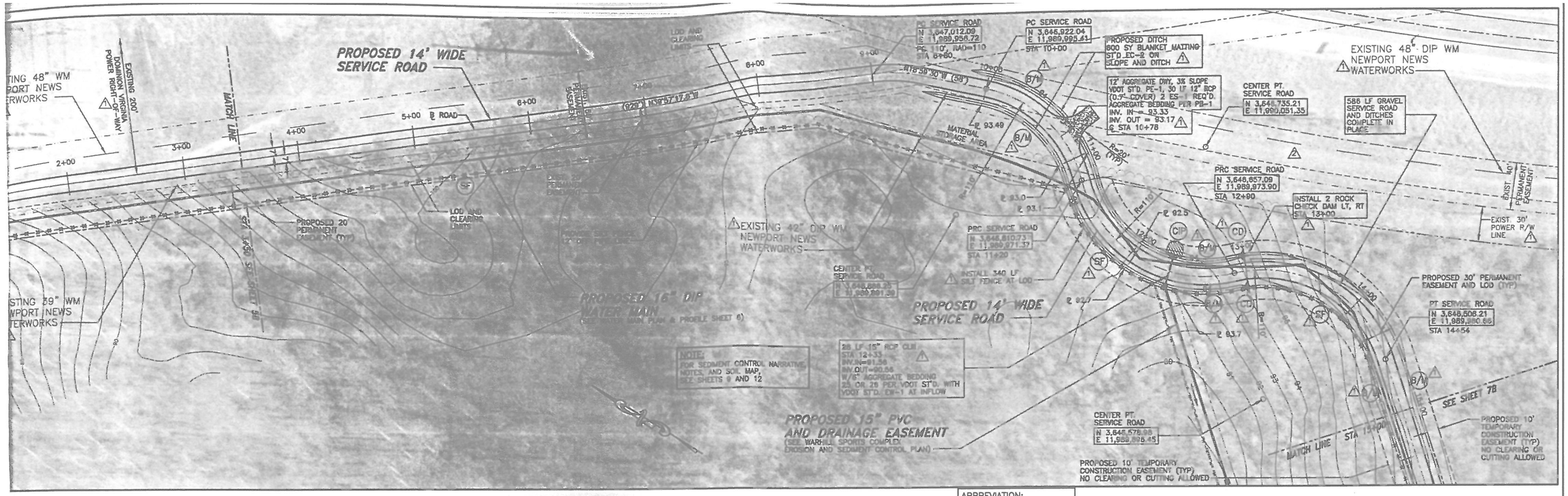
Gannett Fleming

JAMES CITY SERVICE AUTHORITY

16 – INCH WATER MAINS

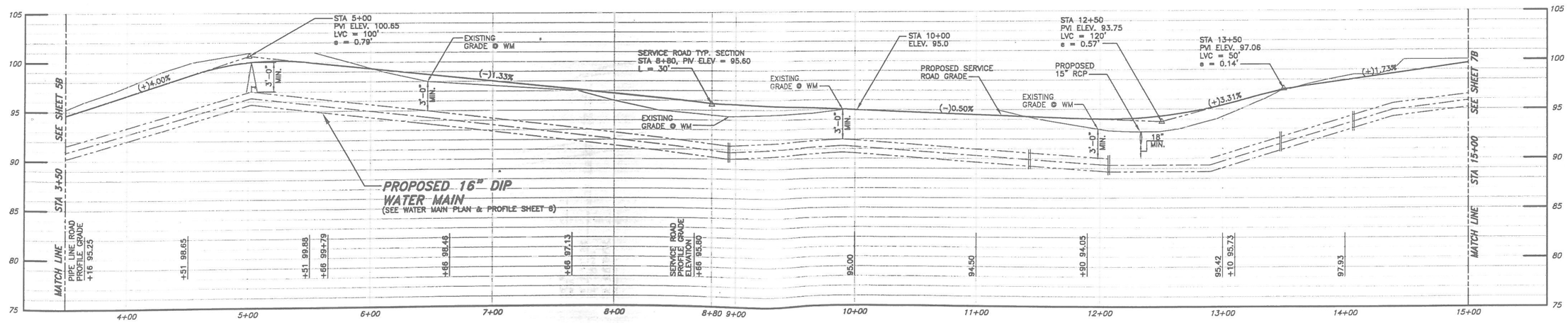
WARHILL SPORTS COMPLEX WATER MAIN
PLAN AND PROFILE
STA 111+00 TO STA 122+00

JOB No.	FIGURE NO.
44656	
DATE	DRAWING NO.
AUGUST 2005	6

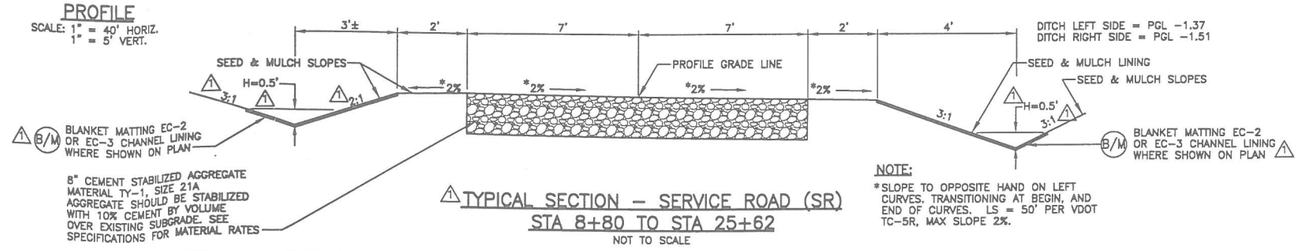


PLAN
SCALE: 1" = 40'

ABBREVIATION:
LOD – LIMIT OF DISTURBANCE



PROFILE
SCALE: 1" = 40' HORIZ.
1" = 5' VERT.



TYPICAL SECTION – SERVICE ROAD (SR)
STA 8+80 TO STA 25+62
NOT TO SCALE

NOTE:
*SLOPE TO OPPOSITE HAND ON LEFT CURVES. TRANSITIONING AT BEGIN, AND END OF CURVES. LS = 50' PER VDOT TC-5R, MAX SLOPE 2%.

1" = 40' HORIZONTAL: 40' 0' 40' 80' 120'
1" = 5' VERTICAL: 5' 0' 5' 10' 15'

No.	DESCRIPTION	DATE	BY
2	ADDENDUM NO.2	10/31/05	J.G.H.
1	ADDENDUM NO. 1	8/25/05	J.G.H.

REVISIONS

DESIGNED J.G.H. A.F.W. | TRACED | SCALE GRAPHIC
DRAWN J.R.G. | CHECKED A.F.W.. | APPROVED M.P.L.

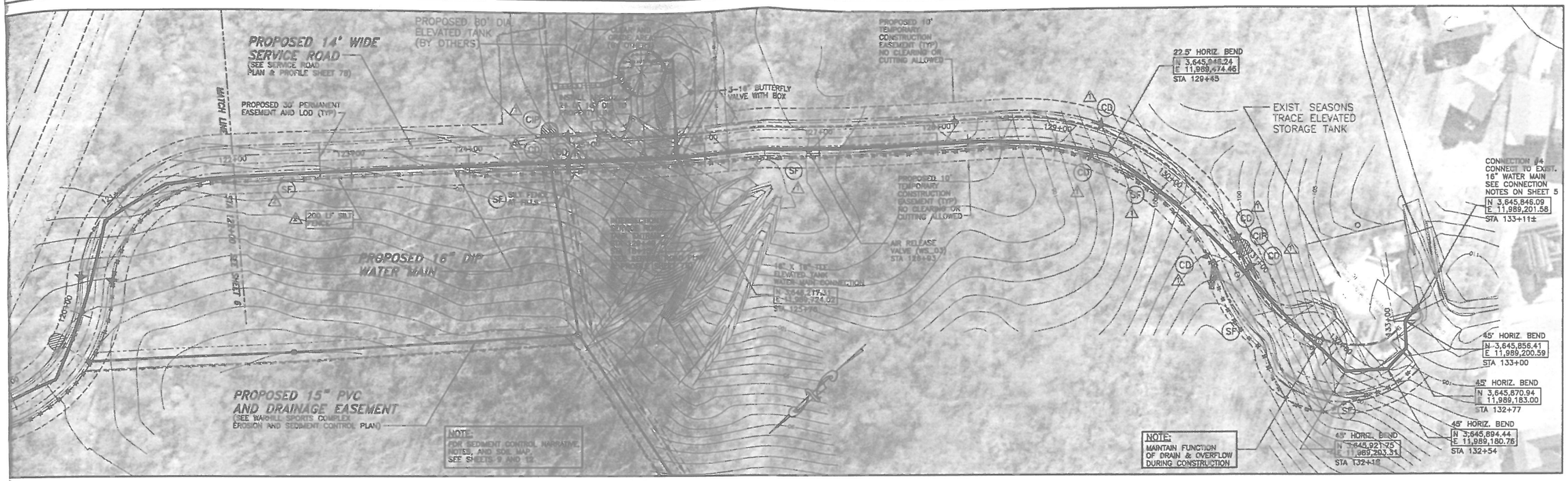
Gannett Fleming

JAMES CITY SERVICE AUTHORITY
16 – INCH WATER MAINS

WARHILL SPORTS COMPLEX SERVICE ROAD
PLAN AND PROFILE
STA 3+50 TO STA 15+00

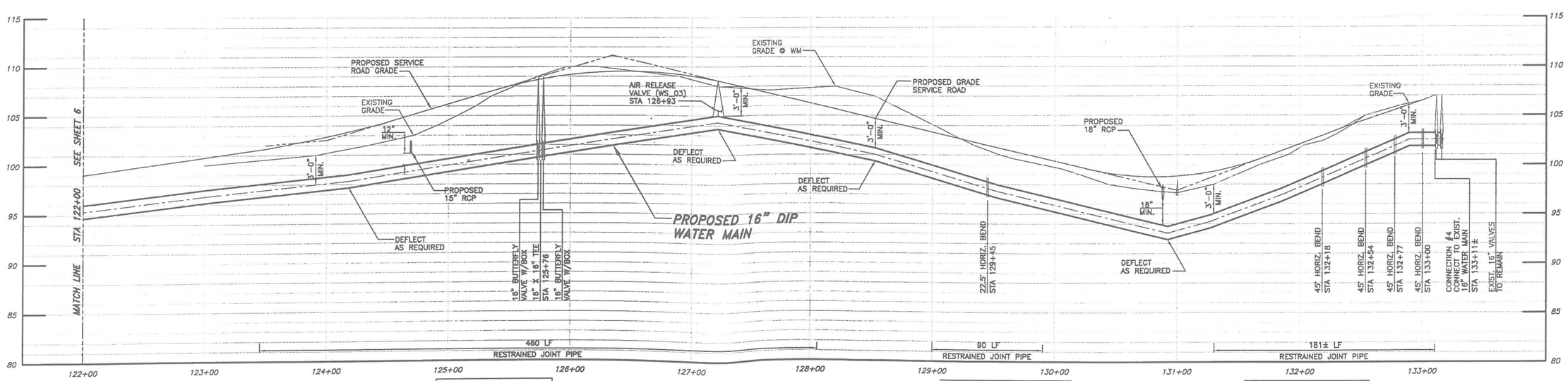
JOB No. 44656 | FIGURE NO.
DATE AUGUST 2005 | DRAWING NO. 6B

PC205_JCSA_WARHILL_ELEV_WATER_TANK - 028



7 / 4 8 TRENCH DETAIL FOR BURIED PIPING

PLAN
SCALE: 1" = 40'



PROFILE
SCALE: 1" = 40' HORIZ.
1" = 5' VERT.

1"= 40' HORIZONTAL 40' 0' 40' 80' 120'
1"= 5' VERTICAL 5' 0' 5' 10' 15'

E ON PROJECT EXTENSIONS, ANY OTHER PROJECT OR ALTERATIONS OR ADDITIONS TO THIS SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO GANNETT FLEMING, INC.

No.	DESCRIPTION	DATE	BY
2	ADDENDUM NO. 2	10/31/05	J.G.H.
1	ADDENDUM NO. 1	8/25/05	J.G.H.

REVISIONS

DESIGNED	TRACED	SCALE
J.G.H. / A.F.W.		GRAPHIC
DRAWN	CHECKED	APPROVED
J.R.G.	A.F.W..	M.P.L.

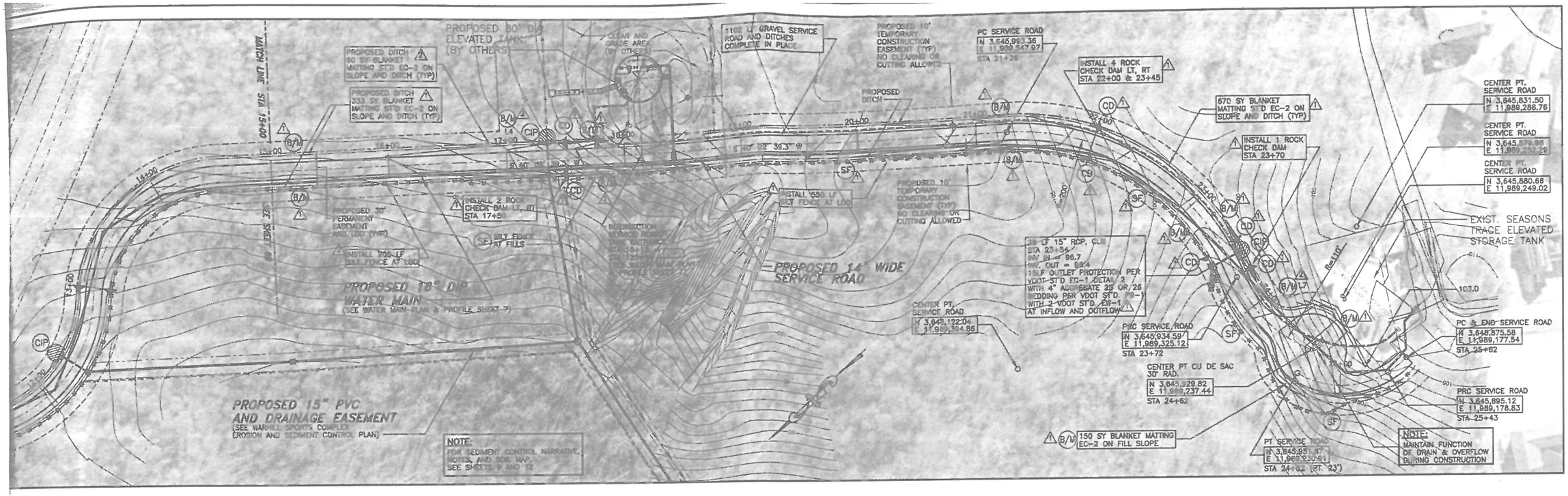
Gannett Fleming

JAMES CITY SERVICE AUTHORITY

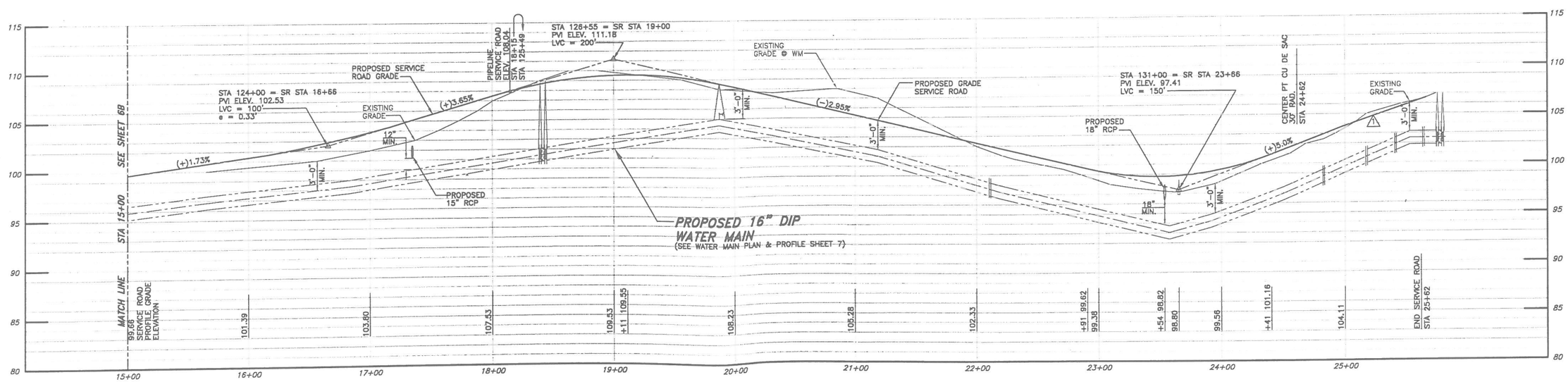
16 – INCH WATER MAINS

WARHILL SPORTS COMPLEX WATER MAIN
PLAN AND PROFILE
STA 122+00 TO STA 133+11±

JOB No.	FIGURE NO.
44656	
DATE	DRAWING NO.
AUGUST 2005	7



PLAN
SCALE: 1" = 40'



PROFILE
SCALE: 1" = 40' HORIZ.
1" = 5' VERT.

USE ON PROJECT EXTENSIONS, ANY OTHER PROJECT OR ALTERATIONS OR ADDITIONS TO THIS SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO GANNETT FLEMING, INC.

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2	ADDENDUM NO. 2	10/31/05	J.G.H.
1	ADDENDUM NO. 1	8/25/05	J.G.H.

REVISIONS

DESIGNED	TRACED	SCALE
J.G.H. / A.F.W.		GRAPHIC
DRAWN	CHECKED	APPROVED
J.R.G.	A.F.W..	M.P.L.

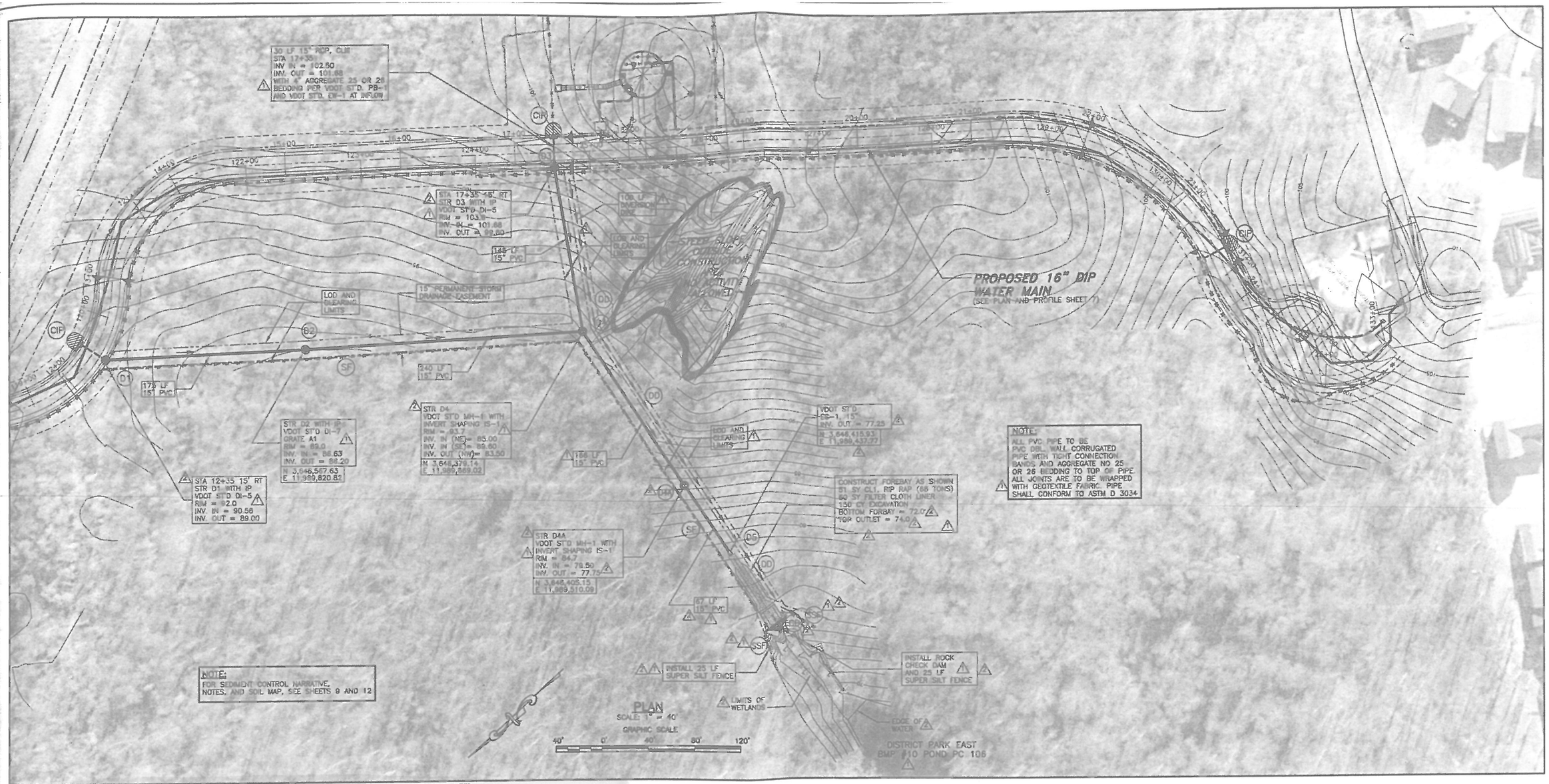
Gannett Fleming

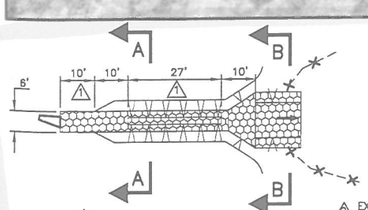
JAMES CITY SERVICE AUTHORITY

16 – INCH WATER MAINS

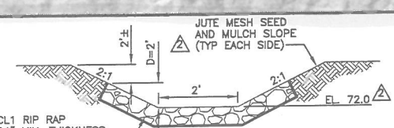
WARHILL SPORTS COMPLEX SERVICE ROAD
PLAN AND PROFILE
STA 15+00 TO STA 25+62

JOB No.	FIGURE NO.
44656	
DATE	DRAWING NO.
AUGUST 2005	7B



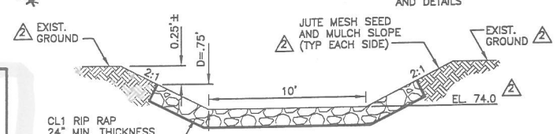


FOREBAY PLAN
NOT TO SCALE



SECTION A–A
NOT TO SCALE

NOTE:
SEE SHEET 9 FOR EROSION AND SEDIMENTATION CONTROL SYMBOLS AND DETAILS



SECTION B–B
NOT TO SCALE

FOREBAY MAINTENANCE PLAN

RESPONSIBILITY:
THE BELOW MAINTENANCE PLAN SHALL BE CARRIED OUT BY THE JAMES CITY SERVICE AUTHORITY.

MOWING:
SINCE THE SIDE-SLOPES, EMBANKMENT AND EMERGENCY SPILLWAY OF THE WET POND ARE COVERED WITH TREES AND THICK UNDERBRUSH THAT CREATE A LANDSCAPE BUFFER AROUND THE POND, MOWING OF THESE AREAS WILL NOT BE REQUIRED.

INSPECTIONS:
THE FOREBAY SHALL BE INSPECTED ON AN ANNUAL BASIS TO ENSURE THAT THE STRUCTURE OPERATES IN THE MANNER ORIGINALLY INTENDED. THE INSPECTION SHALL BE CONDUCTED DURING WET WEATHER TO DETERMINE IF THE FOREBAY IS FUNCTIONING PROPERLY. INSPECTION PRIORITIES SHALL INCLUDE CHECKING THE EMBANKMENT FOR SUBSIDENCE, EROSION, CRACKING AND TREE GROWTH; THE CONDITION OF THE SPILLWAY, THE ACCUMULATION OF SEDIMENT, CLOGGING OF THE OUTLET STRUCTURE AND THE STABILITY OF THE FOREBAY SIDE-SLOPES. INSPECTIONS SHALL BE CARRIED OUT WITH THE "AS-BUILT" FOREBAY PLANS IN HAND.

DEBRIS & LITTER REMOVAL:
AS PART OF THE PERIODIC MOWING OPERATIONS, DEBRIS AND LITTER SHALL BE REMOVED FORM THE SURFACE OF THE FOREBAY. PARTICULAR ATTENTION SHALL BE PAID TO FLOATABLE DEBRIS AROUND THE RIP RAP AND THE OUTLET SHALL BE CHECKED FOR POSSIBLE CLOGGING.

EROSION CONTROL:
THE FOREBAY SIDE-SLOPES, EMERGENCY SPILLWAY AND EMBANKMENT ALL MAY SUFFER FROM EROSION. CORRECTIVE MEASURES SUCH AS REGRADING AND REVEGETATION MAY BE NECESSARY. SIMILARLY, THE RAP RIP PROTECTING THE CHANNEL NEAR THE OUTLET MAY NEED TO BE REPAIRED OR REPLACED.

SEDIMENT REMOVAL:
SEDIMENT WILL EVENTUALLY ACCUMULATE IN THE FOREBAYS TO SIGNIFICANTLY REDUCE THE STORAGE CAPACITY OF THE FOREBAYS. A SEDIMENT CLEAN-OUT CYCLE OF TEN TO TWENTY YEARS IS RECOMMENDED TO RESTORE THE FOREBAY TO THE ORIGINAL DESIGN VOLUME. THE SEDIMENT REMOVED FROM THE FOREBAY SHALL BE EVENLY SPREAD AROUND THE ADJACENT POND AREA AND IMMEDIATELY STABILIZED. THE SEDIMENT CLEANOUT ELEVATION FOR THE FOREBAY IS ELEVATION 69.25 (HALF DEPTH).

ANY REUSE ON PROJECT EXTENSIONS, ANY OTHER PROJECT OR ALTERATIONS OR ADDITIONS TO THIS PROJECT SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO GANNETT FLEMING, INC.

No.	DESCRIPTION	DATE	BY
2	ADDENDUM NO. 2	10/31/05	J.G.H.
1	ADDENDUM NO. 1	8/25/05	J.G.H.

REVISIONS

DESIGNED	TRACED	SCALE
J.G.H. / A.F.W.		GRAPHIC
DRAWN	CHECKED	APPROVED
J.R.G.	A.F.W..	M.P.L.

Gannett Fleming

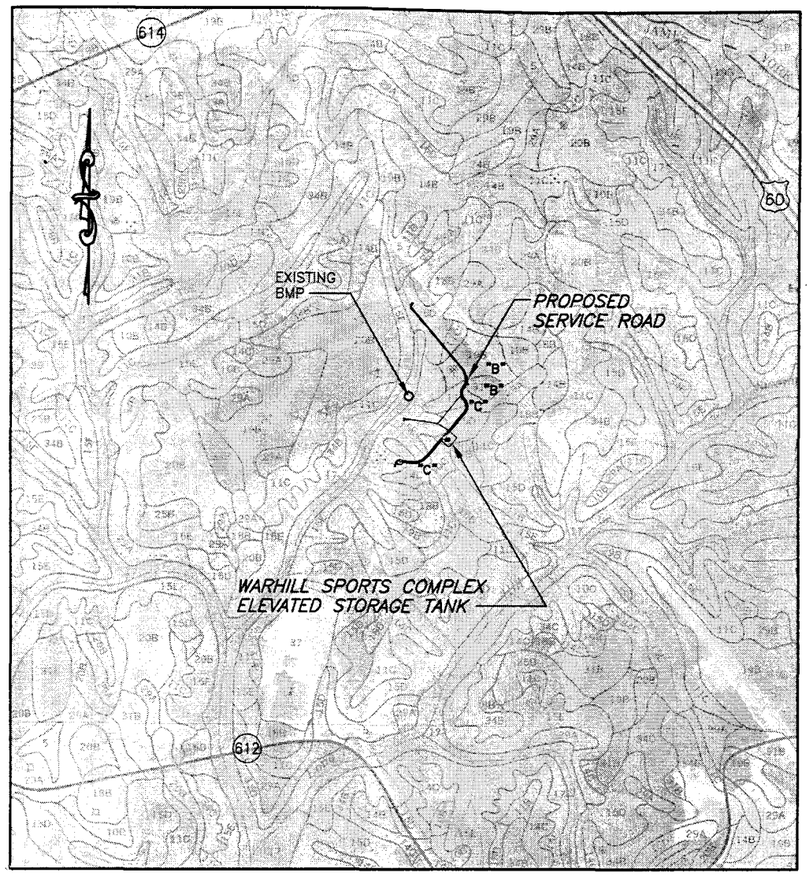
JAMES CITY SERVICE AUTHORITY

16 – INCH WATER MAINS

WARHILL SPORTS COMPLEX
DRAINAGE PLAN

JOB No.	FIGURE NO.
44656	
DATE	DRAWING NO.
AUGUST 2005	10

FILE: JCSA_WM-STRM10.DWG



GRAPHIC SCALE

800' 0' 800' 1600' 2400'

1" = 800'

SHEET 3 – JAMES CITY AND YORK COUNTY SOIL ATLAS

SOILS MAP

SCALE: 1" = 800'

⚠ SPECIAL STORMWATER CRITERIA PRACTICES PROVIDED

SSCP #1 SOIL TYPE A & B SAVED 50%
TOTAL = .038 AC. = 1.0 UNIT
2 2.37 AC – 0.81 AC – 0.86 AC = 0.70 AC NET "B" SOILS
DISTURBED "C" SOILS "B" SOILS PIPELINE
ROAD NON–PAVED SHOULDERS AND DITCHES = 0.38 AC 54% NET

SSCP #20 ENHANCED OUTLET PROTECTION
MEASURES AT SEDIMENT FOREBAY
1.5 X REQ'D. STORAGE = 1.0 UNIT

SSCP #39 PROVIDE AS–BUILT DRAWINGS FOR ENTIRE STORM
DRAINAGE SYSTEM = 1.0 UNITS
TOTAL SSCP POINTS = 3.0 UNITS

⚠ SOIL STABILIZATION BLANKETS AND MATTING 3.36

THE INSTALLATION OF A PROTECTIVE MAT ON A PREPARED PLANTING AREA OF A STEEP SLOPE CHANNEL OR SHORELINE. TO PREVENT EROSION AND SCOUR VESCH TREATMENT 1 IS EQUIVALENT TO VDOT EC–1. VESCH TREATMENT 2 IS EQUIVALENT TO VDOT EC–3.
SUPER SILT FENCE FOR LARGER DRAINAGE AREAS SHALL BE PLACED AROUND THE LIMITS OF CLEARING TO INTERCEPT AND DETAIN SMALL AMOUNT OF SEDIMENT FROM DISTURBED AREAS DURING CONSTRUCTION OPERATION.

⚠ (SCC) STORM WATER CONVEYANCE CHANNEL ST'D. & SPEC. 3.17

DEFINITION
A PERMANENT, DESIGNED WATERWAY, SHAPED, SIZED AND LINED WITH APPROPRIATE VEGETATION OR STRUCTURAL MATERIAL USED TO SAFELY CONVEY STROMWATER RUNOFF WITHIN OR AWAY FROM A DEVELOPING AREA.

PURPOSE
TO PROVIDE FOR THE CONVEYANCE OF CONCENTRATED SURFACE RUNOFF WATER TO A RECEIVING CHANNEL OR SYSTEM WITHOUT DAMAGE FROM EROSION.

ANY REUSE ON PROJECT EXTENSIONS, ANY OTHER PROJECT OR ALTERATIONS OR ADDITIONS TO THIS PROJECT SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO GANNETT FLEMING, INC.

EROSION AND SEDIMENT CONTROL NARRATIVE

PROJECT DESCRIPTION

THE PROJECT PLANS PROVIDE FOR CLEARING A WOODED LOT FOR CONSTRUCTION OF A WATER PIPELINE AND SERVICE ROAD. THE EROSION AND SEDIMENT CONTROL MEASURES ARE SHOWN ON THE PROJECT PLAN SHEETS AND PROVIDE A COMBINATION OF SILT FENCE, INLET PROTECTION AND CULVERT INLET PROTECTION. WORK ACTIVITIES ARE CONFINED TO THE PUBLIC EASEMENTS OR RIGHTS OF WAY. SEE PLAN SHEETS FOR EROSION AND SEDIMENT CONTROL NOTES AND EROSION AND SEDIMENT CONTROL DETAILS.
DETAILS NOT SHOWN CAN BE OBTAINED FROM THE VESC EROSION CONTROL HANDBOOK 1992.

EXISTING SITE CONDITIONS

THE EXISTING SITE TOPOGRAPHY CONTAINS SLOPES BETWEEN 2–6% IN A WOODED, RURAL VALLEY AREA ADJACENT A STORM WATER MANAGEMENT POND, LARGE RESIDENTIAL SUBDIVISION AND SCHOOL. THERE ARE NO EXISTING STORM DRAIN SYSTEMS IN THIS RURAL AREA. MOST DRAINAGE IN THE WATERSHED RUNS TO A STORM WATER MANAGEMENT POND CONSTRUCTED BY THE SUBDIVISION DEVELOPER.

ADJACENT AREAS

ON THE SOUTH SIDE OF THE PROJECT IS A LARGE RESIDENTIAL SUBDIVISION OF SEASONS TRACE WITH SOME UNDEVELOPED LOTS, WHICH HAS BEEN DEVELOPED WITHIN THE LAST TEN YEARS. ON THE EAST SIDE OF THE PROJECT IS UNDEVELOPED WOODLAND THAT DRAINS TOWARD THE SEASONS TRACE STORM WATER MANAGEMENT POND. ON THE WEST SIDE OF THE PROJECT IS LARGE UNDEVELOPED WOODLANDS AND THE WARHILL SPORTS COMPLEX WITHIN A PUBLIC PARK. ALL LOCAL DRAINAGE OUTFALLS INTO THE CENTRAL STORM WATER MANAGEMENT POND. THE POND OUTLETS INTO A TRIBUTARY OF LONG HILL SWAMP CREEK.

PROJECT SOIL TYPES

ACCORDING TO THE USDA SOILS ATLAS FOR THE JAMES CITY COUNTY AND THE CITY OF WILLIAMSBURG, THE SUBSOILS ARE AS FOLLOWING:
EMPORIA SANDY LOAM, SYMBOL 15E, FROM 10 TO 15 PERCENT SLOPES. THE EMPORIA LAYER GENERALLY RUNS ABOUT FOUR FEET DEEP AND HAS A LOW SHRINK SWELL POTENTIAL. IT IS CONSIDERED FAIR FOR ROAD FILL.
SUFFOLK FINE SANDY LOAM, SYMBOL 31B, FROM 2 TO 6% SLOPES. THE SUFFOLK LAYER RUNS DEEP AND IS WELL DRAINED. THE SUFFOLK SOILS ARE GOOD FOR ROADFILL.
CRAVEN–UCHEE FINE SANDY LOAM, SYMBOL 11C FROM 2 TO 6% SLOPES. THE CRAVEN–UCHEE LAYER IS DEEP AND FAIRLY WELL DRAINED. CRAVEN–UCHEE SOILS ARE RATED FAIR FOR ROAD FILLS.
SLAGLE FINE SANDY LOAM, SYMBOL 29A , FROM 0–2% SLOPES. SLAGE SOILS ARE DEEP AND MODERATELY WELL DRAINED. SLAGLE SOILS ARE RATED FAIR FOR ROAD FILL.
KEMPSVILLE–EMPORIA FINE SANDY LOAM, SYMBOL 19B, FROM 2–6% SLOPES. SOILS IN THIS LAYER ARE DEEP AND WELL DRAINED. THEY ARE BETTER DRAINED THAN SLAGLE SOILS AND HAVE A THICKER SUBSOIL THAN SUFFOLK SOILS.
CRAVEN FINE SANDY LOAM, SYMBOL 10B, FROM 2–6% SLOPES. CRAVEN SOILS ARE DEEP AND MODERATELY WELL DRAINED. CRAVEN SOILS ARE NOT AS WELL DRAINED AND DO NOT HAVE THE THICK SAND SURFACE LAYER COMMON TO UCHEE SOILS. CRAVEN SOILS HAVE A MODERATE SHRINK SWELL POTENTIAL.

EROSION CONTROL SEQUENCE OF CONSTRUCTION

PHASE 1

1. INSTALL PERIMETER CONTROLS FOR EROSION CONTROL CONSISTING OF SILT FENCE, AND THE STONE CONSTRUCTION ENTRANCE. CLEAR AND STRIP TOPSOIL FOR THE PIPELINE AND SERVICE ROAD CONSTRUCTION, AND THE MATERIAL STORAGE AREA.
2. STOCKPILE MATERIALS ADJACENT THE PIPELINE CONSTRUCTION AREA, INSIDE THE PERIMETER EROSION CONTROLS.
3. CLEAR AND GRUB FOR THE PIPELINE, SERVICE ROAD AND TANK AREA. CLEAR THE STORM DRAIN EASEMENTS FOR THE OUTFALLS, BUT DO NOT OTHERWISE DISTURB THE FOREST GROUND COVER.
4. HAUL IN MATERIALS AND EQUIPMENT FOR THE PIPELINE AND SERVICE ROAD CONSTRUCTION.
5. TEMPORARILY SEED AND MULCH THE DITCHES.

PHASE 2

6. MAINTAIN PERIMETER CONTROLS FOR EROSION CONTROL CONSISTING OF SILT FENCE, AND THE STONE CONSTRUCTION ENTRANCE AND OTHER REQUIRED MEASURES.
7. BEGIN PIPELINE CONSTRUCTION, NORTHWEST OF THE SERVICE ROAD.
8. STAKE THE SERVICE ROAD AND ROUGH GRADE TO SUB BASE AND DITCH GRADES.
9. BEGIN PIPELINE CONSTRUCTION FROM THE EXISTING SEASONS TRACE TANK NORTHEAST
10. INSTALL THE SERVICE ROAD CULVERTS AND CULVERT INLET PROTECTION AND OUTLET STABILIZATION. PROVIDE A MINIMUM OF 18" COVER OVER THE CULVERTS FOR CONSTRUCTION TRAFFIC.
11. PLACE SILT FENCE ,ROCK CHECK DAM AND DIVERSION DIKES ALONG THE STORM DRAIN OUTFALLS AND CONSTRUCT THE OUTFALLS AND A PORTION OF THE FOREBAY. AS THE STORM DRAIN TRENCH IS BACKFILLED, SEED AND MULCH THE AREA AND INSTALL INLET PROTECTION.
12. CONTINUE PIPELINE CONSTRUCTION AND BACKFILL TRENCHES WITH SELECT MATERIAL AFTER INSTALLATION. AS PORTIONS OF THE PIPELINE ARE COMPLETED, APPLY CEMENT STABILIZATION TO THE SERVICE ROAD BASE, ADD ROAD FILL AND INSTALL THE AGGREGATE BASE STONE. COMPLETE GRADING OF THE ACCESS ROAD DITCHES AND SEED AND MULCH SLOPES. DELAY PRIME AND DOUBLE SEAL COAT UNTIL THE PIPELINE IS COMPLETED.
13. COMPLETE PIPELINE CONSTRUCTION AND TEST THE SEGMENTS. AS PORTIONS OF THE PIPELINE ARE COMPLETED, APPLY CEMENT STABILIZATION TO THE SERVICE ROAD BASE, ADD ROAD FILL AND INSTALL THE AGGREGATE BASE STONE. COMPLETE GRADING OF THE ACCESS ROAD DITCHES AND SEED AND MULCH SLOPES. DELAY PRIME AND DOUBLE SEAL COAT UNTIL THE PIPELINE IS COMPLETED.
14. FINE GRADE DITCHES AND SLOPES. COMPLETED THE SEDIMENT FOREBAY AT THE STORM DRAIN OUTFALL. PERMANENTLY SEED AND MULCH THE SLOPES, STORM DRAIN OUTFALL AND DITCH AREAS.
15. REPAIR ANY DAMAGE TO THE ACCESS ROAD BASE PAVING AND SEED AND MULCH ANY DISTURBED AREAS. SEED AND MULCH THE PROPOSED TANK AREA.
16. REMOVE EROSION CONTROL MEASURES, WHEN THE JAMES CITY COUNTY PUBLIC WORKS INSPECTOR IS SATISFIED THAT THEY ARE NO LONGER NEEDED.

STORM WATER RUNOFF CONSIDERATIONS

THE SEASONS TRACE PIPELINE AND SERVICE ROAD CONSTRUCTION CAUSES A MINIMAL INCREASE IN PEAK RUNOFF RATES. THE TOTAL IMPERVIOUS AREA ADDED TO THE WATERSHED IS 0.8 ACRES. THE INCREASE IN RUNOFF WILL BE CONFINED TO THE ACCESS ROAD AND WILL NOT CAUSE FLOODING OR CHANNEL DEGRADATION DOWNSTREAM. IMPROVEMENTS TO THE DRAINAGE SYSTEM HAVE BEEN PROVIDED WITHIN THE PROJECT PLANS TO CONTROL THE STORM WATER RUNOFF.
VICINITY MAP IS INDICATED ON THE PROJECT PLAN SHEETS. CONSTRUCTION LIMITS ARE SHOWN ON THE PROJECT SITE PLAN.
EXISTING AND PROPOSED GRADES ARE INDICATED BY THE SPOT ELEVATION ON THE PROJECT SITE PLAN. EXISTING AND FINAL CONTOURS HAVE BEEN ADDED TO THE PLAN.
EXISTING VEGETATION AND LOCATIONS OF EROSION CONTROL PRACTICES ARE INDICATED ON THE SITE PLAN THE PROJECT DRAINAGE AREA MAP AND SOILS SHEET ARE INCLUDED WITH THE DRAINAGE CALCULATIONS.
MAINTENANCE OF EROSION AND SEDIMENT CONTROLS SHALL BE AS FOLLOWS:
PERIMETER CONTROLS OF SILT FENCE SHALL BE INSPECTED WEEKLY AND REPAIRED OR REPLACED AS NEEDED. INTERNAL CONTROLS SUCH AS CULVERT INLET PROTECTION AND DROP INLET SILT TRAPS SHALL BE INSPECTED WEEKLY AND REPAIRED AS NEEDED.

CRITCAL EROSION AREAS

THE CRITICAL EROSION AREA ASSOCIATED WITH THIS SITE IS THE ADJACENT SCHOOL SITE BEHIND THE SITE. TO PREVENT SEDIMENT FROM LEAVING THE SITE TO THIS AREA, IT IS IMPERATIVE THAT THE CONTRACTOR INSTALL ALL EROSION AND SEDIMENT CONTROL MEASURES SHOWN ON THESE PLANS BEFORE ANY LAND DISTURBING ACTIVITIES COMMENCE. REGULAR INSPECTION AND MAINTENANCE IS ALSO REQUIRED FOR ALL EROSION AND SEDIMENT CONTROL MEASURES TO KEEP THEM FUNCTIONING AS DESIGNED.

EROSION AND SEDIMENT CONTROL MEASURES

UNLESS OTHERWISE INDICATED, ALL STRUCTURAL AND VEGETATIVE EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE LATEST EDITION OF VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH). THE MINIMUM STANDARDS SHALL BE ADHERED TO UNLESS OTHERWISE WAIVED OR APPROVED BY VARIANCE.

STRUCTURAL PRACTICES

TEMPORARY STONE CONSTRUCTION ENTRANCE – 3.02

A CONSTRUCTION ENTRANCE SHALL BE PROVIDED AT ALL POINTS OF INGRESS AND EGRESS TO REDUCE THE AMOUNT OF MUD TRANSPORTED ONTO PAVED PUBLIC ROADS BY MOTOR VEHICLES AND RUNOFF.

⚠ SILT FENCE AND SUPER SILT FENCE – 3.05

SILT FENCE SHALL BE PLACED AROUND THE LIMITS OF CLEARING TO INTERCEPT AND DETAIN SMALL AMOUNTS OF SEDIMENT FROM DISTURBED AREAS DURING CONSTRUCTION OPERATIONS.

STORM DRAIN INLET PROTECTION – 3.07

STORM DRAIN PROTECTION IS INSTALLED AT ALL DRAINAGE INLETS TO PREVENT SEDIMENT FROM ENTERING THE STORM DRAINAGE SYSTEMS PRIOR TO PERMANENT STABILIZATION FOR THE DISTURBED AREAS.

CULVERT INLET PROTECTION – 3.08

CULVERT INLET PROTECTION SHALL BE INSTALLED AT THE INLET TO STORM SEWER CULVERTS AS DEPICTED ON THE PLANS.

TEMPORARY DIVERSION DIKE – 3.09

TEMPORARY DIVERSION DIKES ARE TO BE INSTALLED ALONG THE PERIMETER OF THE DISTURBED AREA TO DIVERT SEDIMENT–LADEN RUNOFF TO THE SEDIMENT TRAP.

OUTLET PROTECTION – 3.18

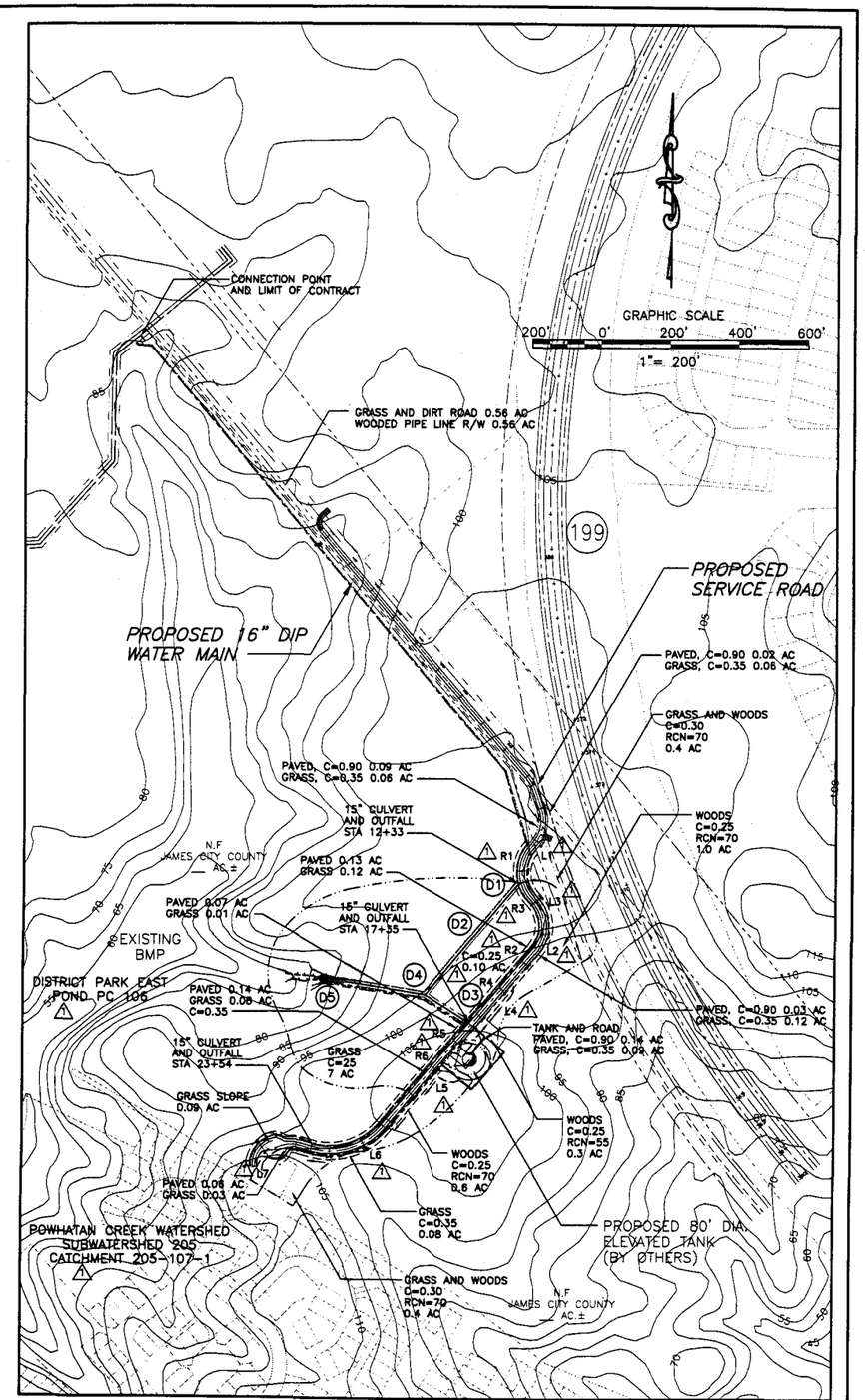
OUTLET PROTECTION SHALL BE PROVIDED TO PREVENT SCOUR AT THE CONCRETE SWALE OUTLET AND TO MINIMIZE THE POTENTIAL FOR DOWNSTREAM EROSION.

ROCK CHECK DAM – 3.20

A ROCK CHECK DAM SHALL BE PLACED AT THE OUTLET OF THE PARKING LOT CONCRETE SWALE TO TRAP SEDIMENT AND REDUCE THE VELOCITY OF THE CONCENTRATED STORMWATER FLOW, THEREBY REDUCING EROSION OF THE DOWNSTREAM SWALE.

TREE PRESERVATION AND PROTECTION – 3.38

TREE PRESERVATION AND PROTECTION SHALL BE PROVIDED TO PROTECT DESIRABLE TREES FROM MECHANICAL AND OTHER INJURY DURING LAND DISTURBING AND CONSTRUCTION ACTIVITY.



DRAINAGE AREA MAP – WARHILL SPORTS COMPLEX

SCALE: 1" = 200'

No.	DESCRIPTION	DATE	BY
2	ADDENDUM 2	10/31/05	J.G.H.
1	RE–ISSUED FOR APPROVAL	8/25/05	J.G.H.

REVISIONS

DESIGNED	TRACED	SCALE
J.G.H		GRAPHIC
DRAWN	CHECKED	APPROVED
J.R.G.	A.F.W..	M.P.L.

Gannett Fleming

JAMES CITY SERVICE AUTHORITY

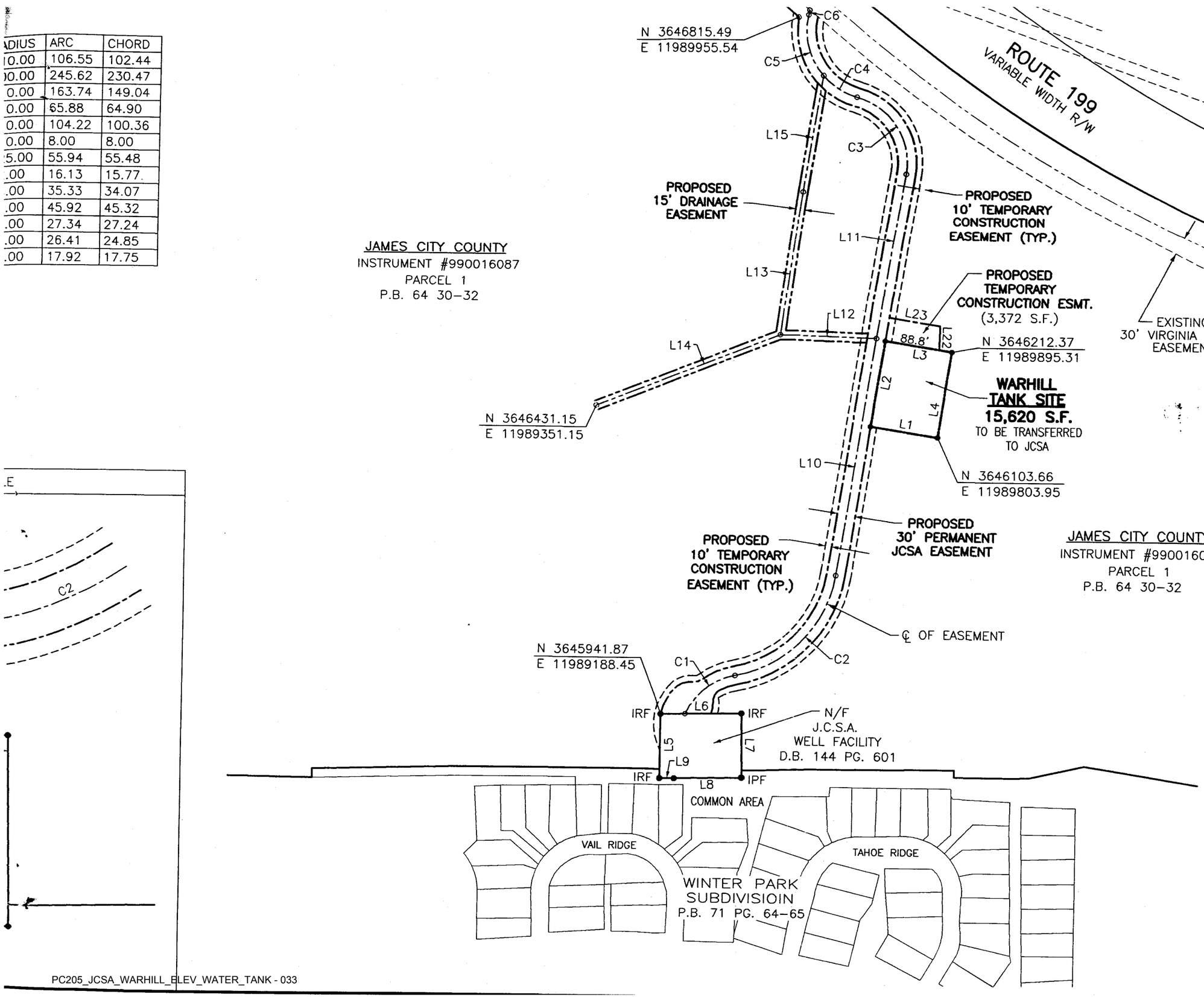
16 – INCH WATER MAINS

DRAINAGE AREA MAP
WARHILL SPORTS COMPLEX

JOB No.	FIGURE NO.
44656	
DATE	DRAWING NO.
AUGUST 2005	12

JCSA_WM–DRN–12.DWG PC205_JCSA_WARHILL_ELEV_WATER_TANK - 03

ADIUS	ARC	CHORD
10.00	106.55	102.44
00.00	245.62	230.47
0.00	163.74	149.04
0.00	65.88	64.90
0.00	104.22	100.36
0.00	8.00	8.00
5.00	55.94	55.48
.00	16.13	15.77
.00	35.33	34.07
.00	45.92	45.32
.00	27.34	27.24
.00	26.41	24.85
.00	17.92	17.75



PLAN & PLAT

PLAT 5-94-05

PLAN SP-79-05

PC205

COMMONWEALTH OF VIRGINIA
CHARLES A. CALHOUN
No. 002554
LAND SURVEYOR

SUBDIVISION AND EASEMENT
PARCEL 1 – WARHILL
(P.B. 64 PG. 30-32
OWNED BY JAMES CITY
DATE 9/14/05 SCALE 1" = 150

LandTe
Resources
Surveying • Mapping • Lar
5810-F Mooretown Road, William
Phone: (757) 565-1677 Fax:
web: landtechresource

James City County, Virginia
Environmental Division

Erosion and Sediment Control and Stormwater Management Design Plan Checklists

Table of Contents

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GENERAL INFORMATION

Project Name: 1.25 MG Elevated Storage Facilities Warrhill Sports Complex and Stonehouse 16-Inch Water Mains
Owner / Applicant: JAMES CITY SERVICE AUTHORITY
Plan Preparer: Gannett Fleming, Inc. Email: mluning@gfnet.com
Project Location: 5700 Warhill Trail and 9187 Six Mt. Zion Road
Tax Map / Parcel: 990016087/020030024
County Plan No. (if known): N/A
County BMP Type: Wet Ponds (-)
Other information submitted in addition to this checklist (Check all that apply):

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

Issue Date
March 1, 2001

ST

JAMES CITY COUNTY, VIRGINIA
ENVIRONMENTAL DIVISION

EROSION AND SEDIMENT CONTROL PLAN CHECKLIST

I. *GENERAL:*

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

II. *SITE PLAN:*

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

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

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

III. ***NARRATIVE:***

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

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

IV. *CALCULATIONS:*

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

Ditch Calcs Outstanding

ST.

JAMES CITY COUNTY, VIRGINIA
ENVIRONMENTAL DIVISION

STORMWATER MANAGEMENT DESIGN PLAN CHECKLIST

I. *GENERAL:*

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

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

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

II. *STORMWATER CONVEYANCE SYSTEMS:*

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

Yes No N/A

☑ ☐ ☐ *STORMWATER CONVEYANCE SYSTEM COMPUTATIONS*

- ☑ ☐ ☐ Storm Sewer Design computations based on 10-year design event.
- ☑ ☑ ☐ Hydraulic Grade Line computations based on 10-year design event.
- ☑ ☐ ☐ Inlet computations based on current VDOT procedure for spread, ponding depth and grate size required.
- ☑ ☐ ☐ Culvert Headwater computations. Design based on 10-year design storm event and check only for 100-year storm event.
- ☑ ☐ ☐ Open Channel computations based on 2-year design event for velocity and 10-year design event for capacity.
- ☐ ☐ ☑ Standard outlet protection or special energy dissipators.
- ☑ ☐ ☐ Pipe thickness design computations, as required, for selected pipe type (live load, minimum cover, maximum height of cover, etc.).
- ☑ ☐ ☐ Adequate channel computations for receiving channels (based on field measured channel section data).

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

Yes No N/A

☐ ☑ ☐ *HYDROLOGY* - An SCS based methodology is required for the design of stormwater management/BMP facilities with watersheds exceeding 20 acres. Under 20 acres, other generally accepted methodologies such as the modified rational, critical storm are allowable. Refer to Chapter 5 of the VESCH or Chapter 5 of the VSMH.

- ☐ ☐ ☐ Runoff Curve Number or Coefficient determinations: predeveloped and ultimate development land use scenarios.
- ☐ ☐ ☐ Time of concentration: predeveloped and ultimate development indicating overland, shallow concentrated, and channel flow components (200 ft. maximum length for overland flow).
- ☐ ☐ ☐ Hydrograph generation (tabular or graphical): pre- and postdevelopment conditions for the 1-, 2-, 10-, and 100-year design storm events.

☐ ☑ ☐ *FACILITY CONFIGURATION and MINIMUM SEPARATIONS*

- ☐ ☐ ☐ Screening and layout consistent with Section 24-98(d) of the Chapter 24 Zoning ordinance (landscaping, screening, visibility, etc.).
- ☐ ☐ ☐ Basic considerations for safety and unauthorized entry.
- ☐ ☐ ☐ Proper length to width ratio (Typically 2H:1V).
- ☐ ☐ ☐ Facilities with deep pools (4 feet or more in depth) provided with two benches. Fifteen (15) ft. safety bench outward from normal pool at maximum 6 percent slope and aquatic bench inward from normal shoreline below normal pool. Narrower widths may be considered on a case-by-case basis.
- ☐ ☐ ☐ Pond buffer minimum 25 feet outward from maximum design WSEL. Additional setbacks may be required to permanent structures.
- ☐ ☐ ☐ No trees, shrubs or woody plants within 15 feet of embankment toe or 25 feet from principal spillway structure.

Yes No N/A

☐ ☐ ☐ Infiltration and filtering system facilities generally located at least 100 feet horizontally from any water supply well; 100 feet from any downslope building; and 25 feet from any upslope buildings, unless site specific investigation allows for reduced separation.

Yes No N/A

☐ ☐ ☐ *HYDRAULIC COMPUTATIONS*

- ☐ ☐ ☐ Elevation- or Stage- Storage curve and/or tabular data.
- ☐ ☐ ☐ Weir / Orifice Control - Extended Detention.
- ☐ ☐ ☐ Weir / Orifice Control - riser 1-year control for channel protection.
- ☐ ☐ ☐ Weir / Orifice Control - riser 2-year control for quantity (if required).
- ☐ ☐ ☐ Weir / Orifice Control - riser 10-year control for quantity (if required).
- ☐ ☐ ☐ Inlet / Outlet (barrel) control - (All Storms).
- ☐ ☐ ☐ Check for barrel control prior to riser orifice flow to prevent slug flow-water hammer conditions.
- ☐ ☐ ☐ Emergency spillway capacity and depth of flow.
- ☐ ☐ ☐ Elevation - Discharge (Outlet Rating) curve and/or table. Provide all supporting calculations and/or design assumptions.
- ☐ ☐ ☐ Adequate channel computations for receiving channel. May be waived if facility is designed based on current Stream Channel Protection criteria.

☐ ☐ ☐ *POND or RESERVOIR ROUTING*

- ☐ ☐ ☐ Storage-Indication Routing of postdeveloped inflow hydrographs for the 1-, 2-, 10-, and 100-year design storms. Preference is for structure to discharge up to the 10-year storm through the principal spillway and pass the 100-year storm with a minimum 1 foot of freeboard through a combination principal and emergency spillways. If no emergency spillway is provided, riser must be large enough to pass the design high water flow and trash without overtopping the facility, have 3 square feet or more of cross-sectional area, contain a hood type inlet and have a minimum freeboard of 2 feet. Token spillways with minimum 8 ft. width are also recommended at or above the design 100-year storm elevation.
- ☐ ☐ ☐ Downstream hydrographs at established study points, if conditions warrant (ie. facility discharge combined with uncontrolled bypass).

☐ ☐ ☐ *MISCELLANEOUS COMPUTATIONS*

- ☐ ☐ ☐ Water quality volume for permanent pool based on selected BMP treatment volume (WQv).
- ☐ ☐ ☐ Water quality volume for extended detention based on selected BMP treatment volume (WQv) with drawdown computations.
- ☐ ☐ ☐ Drawdown computations for the 1-year, 24 hour detention for stream channel protection criteria.
- ☐ ☐ ☐ Pond drain computations (within 24 hours).
- ☐ ☐ ☐ Anti-seep collar design (concrete preferred) or match material type.
- ☐ ☐ ☐ Filter diaphragm design (or alternative method of controlling seepage).

Yes No N/A

☐ ☐ ☐ Riser / base structure flotation analyses. FS = 1.25 minimum.

☐ ☐ ☐ Downstream danger reach study and/or emergency action plan (if conditions warrant).

☐ ☐ ☐ Upstream backwater analyses onto offsite adjacent property (if conditions warrant).

☐ ☐ ☐ 100 year floodplain impacts (if conditions warrant).

Yes No N/A

☐ ☑ ☐ *GEOTECHNICAL REQUIREMENTS*

☐ ☐ ☐ Geotechnical Report with recommendations specific to BMP facility type selected. Report prepared by a registered professional engineer. Requires submission, review and approval prior to issuance of Land Disturbance Permit.

☐ ☐ ☐ Initial Feasibility Testing requirements satisfied as per Appendix E of the James City County Guidelines for Design and Construction of Stormwater Management BMPs manual. (Infiltration, Bioretention and Filtering System BMP types only).

☐ ☐ ☐ Concept Design Testing requirements satisfied as per Appendix E of the James City County Guidelines for Design and Construction of Stormwater Management BMPs manual. (Infiltration, Bioretention and Filtering System BMP types only).

☐ ☐ ☐ Minimum Boring locations: borrow area, pool area, principal control structure, top of facility near one abutment and emergency spillway if provided.

☐ ☐ ☐ Boring logs with Unified Soil Classification (ASTM D2487), soils descriptions and depths to bedrock and the seasonal water table indicated.

☐ ☐ ☐ Standard County Record Drawing/Construction Certification note provided on plan. *Note: It is understood that preparation of record drawings and construction certifications as required for project facilities may not necessarily be performed by the plan preparer. These components may be performed by others.*

☐ ☑ ☐ *PRINCIPAL SPILLWAY PROFILE AND ASSOCIATED DETAILS*

☐ ☐ ☐ *EXISTING GROUND AND PROPOSED GRADE*

☐ ☐ ☐ Embankment or excavation side slopes labeled (3H:1V maximum).

☐ ☐ ☐ Minimum top width labeled (per VESCH or VSMH requirements).

☐ ☐ ☐ Removal of unsuitable material under proposed facility (per Geotechnical Report requirements).

Yes No N/A

☐ ☐ ☐ *CORE TRENCH*

- ☐ ☐ ☐ Material (per plan or Geotechnical Report).
- ☐ ☐ ☐ Bottom width (4' minimum or greater as dictated by Geotechnical Report recommendations).
- ☐ ☐ ☐ Side slopes (1:1 maximum steepness)
- ☐ ☐ ☐ Depth (4' minimum or greater as dictated by Geotechnical Report).

☐ ☐ ☐ *PRINCIPAL CONTROL STRUCTURE. RISER OR SIMILAR STRUCTURE (DETAILS REQUIRED FOR ALL ITEMS)*

- ☐ ☐ ☐ Durable, watertight, resistant material (concrete preferred).
- ☐ ☐ ☐ Riser diameter is at least 1.25 times larger than barrel diameter.
- ☐ ☐ ☐ All pertinent dimensions and elevations shown.
- ☐ ☐ ☐ Control orifice or weir dimensions and elevations shown.
- ☐ ☐ ☐ Trash rack - removable - for each release.
- ☐ ☐ ☐ Anti-vortex device, baffle or plate.
- ☐ ☐ ☐ Riser base structure with dimensions and embedment specifications (concrete preferred).
- ☐ ☐ ☐ Interior access (steps, ladders, etc.) for maintenance for structures over 4 feet in height. Excessively high risers may need some form of exterior access on top portion.
- ☐ ☐ ☐ Low flow orifice with trash rack device.

☐ ☐ ☐ *PRINCIPAL CONTROL STRUCTURE OUTLET BARREL*

- ☐ ☐ ☐ Material (ASTM C-361 reinforced concrete pipe) with watertight joints. Prior approval required for all other pipe material (other RCP types, CMP, CPP, PVC, etc.).
- ☐ ☐ ☐ Support and bedding requirements for barrel - concrete cradles, etc. or as recommended by the Geotechnical Report.
- ☐ ☐ ☐ Pipe inverts, length, size, class and slope shown.
- ☐ ☐ ☐ Flared end section or endwall provided on barrel outlet.

☐ ☐ ☐ *SEEPAGE CONTROL*

- ☐ ☐ ☐ Phreatic line shown (4:1 slope measured from the intersection of the embankment and the principal spillway design high water).

- ☐ ☐ ☐ *ANTI-SEEP COLLARS*
  - ☐ ☐ ☐ Anti-seep collar, concrete preferred.
  - ☐ ☐ ☐ Size - 15 percent increase in length of saturation using outside pipe diameter.
  - ☐ ☐ ☐ Spacing and location on barrel (located at least 2 feet from a pipe joint).
  - ☐ ☐ ☐ *FILTER DIAPHRAGMS*
  - ☐ ☐ ☐ Design based on latest NRCS design methods and certified by a professional engineer.

Yes No N/A

☐ ☐ ☐ *ELEVATION AND DIMENSIONAL DESIGN DATA*

- ☐ ☐ ☐ Top of facility - construction height and settled height (10 percent settlement).
- ☐ ☐ ☐ Crest of principal control structure spillway at least one (1) foot below crest of emergency spillway, if provided.
- ☐ ☐ ☐ Minimum freeboard of one (1) foot above the 100-year design high water elevation for facilities <u>with</u> an emergency spillway.
- ☐ ☐ ☐ Minimum freeboard of two (2) feet above the 100-year design high water elevation for facilities <u>without</u> an emergency spillway or in accordance with the SCS National Engineering Handbook (prior approval required).
- ☐ ☐ ☐ Basin Sediment Clean-Out elevation (permanent mode). Typically 10 to 25 percent of water quality volume.

☐ ☐ ☐ *CROSS SECTION THROUGH FACILITY*

- ☐ ☐ ☐ Existing Ground.
- ☐ ☐ ☐ Proposed grade.
- ☐ ☐ ☐ Top of facility - constructed and settled.
- ☐ ☐ ☐ Location of emergency spillway with side slopes labeled (emergency spillway in cut).
- ☐ ☐ ☐ Bottom of core trench (4' minimum).
- ☐ ☐ ☐ Location of each soil boring.
- ☐ ☐ ☐ Barrel location.
- ☐ ☐ ☐ Existing and proposed utility location/protection.

☐ ☐ ☐ *EMERGENCY SPILLWAY PROFILE*

- ☐ ☐ ☐ Existing ground.
- ☐ ☐ ☐ Inlet, level (control) and outlet sections per SCS.
- ☐ ☐ ☐ Spillway and crest elevations.

☐ ☐ ☐ *PRETREATMENT DEVICES* of adequate depth and properly designed using required pretreatment volumes for the selected County BMP facility type. Including, but not limited to: sediment forebays, sediment basins, sumps, grass channels, gravel diaphragms, plunge pools, chamber separators, manufactured systems or other acceptable methods.

Yes No N/A

☐ ☑ ☐ *CONSTRUCTION SPECIFICATIONS and NOTES*

- ☐ ☐ ☐ Anticipated sequence of construction for BMP (consistent with erosion and sediment control plan).
- ☐ ☐ ☐ Provisions to control base stream or storm flow conditions encountered during construction.
- ☐ ☐ ☐ Site and subgrade preparation requirements.
- ☐ ☐ ☐ Embankment, fill and backfill material soil and placement (lift) thickness requirements.
- ☐ ☐ ☐ Compaction and soil moisture content requirements.
- ☐ ☐ ☐ Geosynthetics for drainage, filtration, moisture barrier, separation, and reinforcement purposes.
- ☐ ☐ ☐ Clay or synthetic (PVC or HDPE) pond liners.
- ☐ ☐ ☐ Storm drain, underdrain and pipe conduit requirements.
- ☐ ☐ ☐ Minimum depth of pipe cover for temporary (construction) and final cover conditions.
- ☐ ☐ ☐ Permanent shutoff valve and pond drain.
- ☐ ☐ ☐ Concrete requirements for structural components.
- ☐ ☐ ☐ Riprap and slope protection.
- ☐ ☐ ☐ Access or maintenance road surface, base, subbase.
- ☐ ☐ ☐ Temporary and permanent stabilization measures.
- ☐ ☐ ☐ Temporary or permanent safety fencing.
- ☐ ☐ ☐ BMP Landscaping (deep, shallow, fringe, perimeter,etc.)
- ☐ ☐ ☐ Dust and traffic control (if warranted).
- ☐ ☐ ☐ Construction monitoring and certification by professional.
- ☐ ☐ ☐ Other: _____
- ☐ ☐ ☐ Other: _____.

☑ ☐ ☐ *MAINTENANCE PROVISIONS*

- ☐ ☐ ☐ Entity responsible for maintenance identified..
- ☑ ☐ ☐ Maintenance Plan which outlines the long-term schedule for inspection/maintenance of the facility and forebays
- ☑ ☐ ☐ Maintenance access from public right-of-way or publicly traveled road.
- ☑ ☐ ☐ Maintenance easement provided encompassing high water pool and buffer, principal and emergency spillways, outlet structures, forebays, embankment area and possible sediment-removal stockpile areas.
- ☑ ☐ ☐ Minimum 6 foot wide public safety shelf (landing) or alternative fencing.

IV. *OUTLET PROTECTIONS:*

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

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

Plan Preparer: [illegible] Garrett Hea

Date: 6/23/05

SWMProg/BMP/Checklist/ChkList

JUN 2005
RECEIVED
PLANNING DEPARTMENT

Erosion and Sediment Control Narrative

for

Warhill Sports Complex Tank and Pipeline Site Plan
Road 5700 Warhill Trail

5-19-05

June 23, 2005

Project Number 44656

Gannett Fleming
Celebrating 90 years of Excellence

TABLE OF CONTENTS

SECTION

PROJECT DESCRIPTION

EXISTING CONDITIONS

ADJACENT AREAS

OFF-SITE AREA

SOILS

Slagle fine sandy loam (29A)
Kempsville-Emporia fine sandy loam (19B)
Emporia sandy loam (15E)
Craven- Uchee fine sandy loam (10B)
Suffolk fine sandy loam (31B)

CRITICAL EROSION AREAS

EROSION AND SEDIMENT CONTROL MEASURES

STRUCTURAL PRACTICES

Temporary Stone Construction Entrance – 3.02
Silt Fence – 3.05
Storm Drain Inlet Protection – 3.07
Culvert Inlet Protection – 3.08
Diversion Dike- 3.09
Soil Stabilization Matting-3.36
Dust Control – 3.39

VEGETATIVE PRACTICES

Permanent Seeding – 3.32

MANAGEMENT STRATEGIES

PERMANENT STABILIZATION

STORMWATER MANAGEMENT

MAINTENANCE

Temporary Stone Construction Entrance – 3.02
Silt Fence – 3.05
Storm Drain Inlet Protection – 3.07
Culvert Inlet Protection – 3.08
Diversion Dike- 3.09
Soil Stabilization Matting-3.36
Permanent Seeding – 3.32

APPENDICES

Storm Sewer System Design
and EXHIBIT 2 BMP Rating Form — APPENDIX A

Erosion and Sediment Control Narrative

Project Description

The project plans provide for clearing a wooded lot for construction of a water pipeline and Service Road. The Erosion and Sediment Control Measures are shown on the project plan sheets and provide a combination of silt fence, inlet protection and culvert inlet protection. Work activities are confined to the public easements or rights of way.. See Plan Sheets for Erosion and Sediment Control Notes and Erosion and Sediment Control Details.
Details not shown can be obtained from the VESC Erosion Control Handbook 1992.

Existing Site Conditions

The existing site topography contains slopes between 2-6% in a wooded, rural valley area adjacent a storm water management pond, large residential subdivision and school. There are no existing storm drain systems in this rural area. Most drainage in the watershed runs to a storm water management pond constructed by the subdivision developer.

Adjacent Areas

On the South side of the project is a large Residential subdivision of Seasons Trace with some undeveloped lots, which has been developed within the last ten years. On the East side of the project is undeveloped woodland that drains toward the Seasons Trace storm water management pond. On the West side of the project is large undeveloped woodlands and the Warhill Sports Complex within a public park. All local drainage outfalls into the central storm water management pond. The pond outlets into a tributary of Long Hill Swamp Creek.

Project Soil Types

According to the USDA Soils Atlas for the James City County and the City of Williamsburg, the subsoils are as following:

Emporia sandy loam, Symbol 15E, from 10 to 15 percent slopes. The Emporia layer generally runs about four feet deep and has a low shrink swell potential. It is considered fair for road fill.
Suffolk fine sandy loam, Symbol 31B, from 2 to 6% slopes. The Suffolk layer runs deep and is well drained. The Suffolk soils are good for roadfill.
Craven-Uchee fine sandy loam, Symbol 11C from 2 to 6% slopes. The Craven-Uchee layer is deep and fairly well drained. Craven-Uchee soils are rated fair for road fills.
Slagle fine sandy loam, Symbol 29A. , from 0-2% slopes. Slage soils are deep and moderately well drained. Slagle soils are rated fair for road fill.
Kempsville-Emporia fine sandy loam, Symbol 19B, from 2-6% slopes. Soils in this layer are deep and well drained. They are better drained than Slagle soils and have a thicker subsoil than Suffolk Soils.
Craven fine sandy loam, Symbol 10B, from 2-6% slopes. Craven soils are deep and moderately well drained. Craven soils are not as well drained and do not have the thick sand surface layer common to Uchee soils. Craven soils have a moderate shrink swell potential.

Erosion Control Sequence of Construction — PUT ON PLANS

PHASE 1

1. Install Perimeter Controls for Erosion Control consisting of Silt Fence, and the stone construction entrance. Clear and strip topsoil for the pipeline and service road construction, and the material storage area.

2. Stockpile materials adjacent the pipeline construction area, inside the perimeter erosion controls.
3. Clear and grub for the pipeline, service road and tank area. Clear the storm drain easements for the outfalls, but do not otherwise disturb the forest ground cover.
4. Haul in Materials and equipment for the pipeline and service road construction.
5. Temporarily seed and mulch the ditches.

PHASE 2

6. Maintain Perimeter Controls for Erosion Control consisting of Silt Fence, and the stone construction entrance and other required measures.
7. Begin pipeline construction, northwest of the Service Road.
8. Stake the Service Road and rough grade to sub base and ditch grades.
9. Begin pipeline construction from the existing Seasons Trace tank northeast
10. Install the service road culverts and culvert inlet protection and outlet stabilization. Provide a minimum of 18" cover over the culverts for construction traffic.
11. Place silt fence ,rock check dam and diversion dikes along the storm drain outfalls and construct the outfalls and a portion of the forebay. As the storm drain trench is backfilled, seed and mulch the area and install inlet protection.
12. Continue pipeline construction and backfill trenches with select material after installation. As portions of the pipeline are completed, apply cement stabilization to the service road base, add road fill and install the aggregate base stone. Complete grading of the access road ditches and seed and mulch slopes. Delay prime and double seal coat until the pipeline is completed.
13. Complete pipeline construction and test the segments. As portions of the pipeline are completed, apply cement stabilization to the service road base, add road fill and install the aggregate base stone. Complete grading of the access road ditches and seed and mulch slopes. Delay prime and double seal coat until the pipeline is completed.
14. Fine grade ditches and slopes. Completed the sediment forebay at the storm drain outfall. Permanently seed and mulch the slopes, storm drain outfall and ditch areas.
15. Repair any damage to the access road base paving and Seed and mulch any disturbed areas. Seed and mulch the proposed tank area.
16. Remove Erosion Control measures, when the James City County Public Works Inspector is satisfied that they are no longer needed.

Storm Water Runoff Considerations

The Seasons Trace pipeline and service road construction causes a minimal increase in peak runoff rates. The total impervious area added to the watershed is 0.8 Acres. The increase in runoff will be confined to the access road and will not cause flooding or channel degradation downstream. Improvements to the drainage system have been provided within the project plans to control the storm water runoff.

Vicinity Map is indicated on the project plan sheets. Construction limits are shown on the project site plan.

Existing and proposed grades are indicated by the spot elevation on the project site plan. Existing and final contours have been added to the plan.

Existing vegetation and locations of erosion control practices are indicated on the site plan The project drainage area map and soils sheet are included with the drainage calculations.

Maintenance of Erosion and Sediment Controls shall be as follows:
Perimeter Controls of Silt Fence shall be inspected weekly and repaired or replaced as needed.
Internal Controls such as culvert inlet protection and drop inlet silt traps shall be inspected weekly and repaired as needed.

CRITCAL EROSION AREAS

The critical erosion area associated with this site is the adjacent school site behind the site. To prevent sediment from leaving the site to this area, it is imperative that the contractor install all erosion and sediment control measures shown on these plans before any land disturbing activities commence. Regular inspection and maintenance is also required for all erosion and sediment control measures to keep them functioning as designed.

EROSION AND SEDIMENT CONTROL MEASURES

Unless otherwise indicated, all structural and vegetative erosion and sediment control practices shall be constructed and maintained according to minimum standards and specifications of the latest edition of Virginia Erosion and Sediment Control Handbook (VESCH). The minimum standards shall be adhered to unless otherwise waived or approved by variance.

STRUCTURAL PRACTICES

Temporary Stone Construction Entrance – 3.02

A construction entrance shall be provided at all points of ingress and egress to reduce the amount of mud transported onto paved public roads by motor vehicles and runoff.

Silt Fence – 3.05

Silt fence shall be placed around the limits of clearing to intercept and detain small amounts of sediment from disturbed areas during construction operations.

Storm Drain Inlet Protection – 3.07

Storm drain protection is installed at all drainage inlets to prevent sediment from entering the storm drainage systems prior to permanent stabilization for the disturbed areas.

Culvert Inlet Protection – 3.08

Culvert inlet protection shall be installed at the inlet to storm sewer culverts as depicted on the plans.

Temporary Diversion Dike – 3.09

Temporary diversion dikes are to be installed along the perimeter of the disturbed area to divert sediment-laden runoff to the sediment trap.

Outlet Protection – 3.18

Outlet protection shall be provided to prevent scour at the concrete swale outlet and to minimize the potential for downstream erosion.

Rock Check Dam – 3.20

A rock check dam shall be placed at the outlet of the parking lot concrete swale to trap sediment and reduce the velocity of the concentrated stormwater flow, thereby reducing erosion of the downstream swale.

Tree Preservation and Protection – 3.38

Tree preservation and protection shall be provided to protect desirable trees from mechanical and other injury during land disturbing and construction activity.

CRITCAL EROSION AREAS

The critical erosion area associated with this site is the adjacent woodland and stormwater management pond nearby the site. To prevent sediment from leaving the site to this area, it is imperative that the contractor install all erosion and sediment control measures shown on these plans before any land disturbing activities commence. Regular inspection and maintenance is also required for all erosion and sediment control measures to keep them functioning as designed.

EROSION AND SEDIMENT CONTROL MEASURES

Unless otherwise indicated, all structural and vegetative erosion and sediment control practices shall be constructed and maintained according to minimum standards and specifications of the latest edition of Virginia Erosion and Sediment Control Handbook (VESCH). The minimum standards shall be adhered to unless otherwise waived or approved by variance.

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Culvert Inlet Protection – 3.08

Culvert inlet protection shall be installed at the inlet to storm sewer culverts as depicted on the plans.

Temporary Diversion Dike – 3.09

The measure shall be inspected after every storm and repairs made to the dike, flow channel, outlet or sediment trapping facility, as necessary. Once every two weeks, whether a storm event has occurred or not, the measure shall be inspected and repairs made if needed. Damages caused by construction traffic or other activity must be repaired before the end of each working day.

Soil Stabilization Blankets and Matting – 3.36

All soil stabilization blankets and matting should be inspected periodically following installation, particularly after rainstorms to check for erosion and undermining. Any dislocation or failure should be repaired immediately. If washouts or breakage occurs, reinstall the material after repairing damage to the slope. Continue to monitor these areas until which time they become permanently stabilized; at that time an annual inspection should be adequate.

Dust Control – 3.39

Dust control will be applied as depicted on the plans to prevent surface and air movement of dust from exposed soil surfaces and reduce the presence of airborne substances which may present health hazards, traffic safety problems or harm animal or plant life.

Diversion Dike

VEGETATIVE PRACTICES

Permanent Seeding – 3.32

All denuded areas, which will be left dormant for extended periods of time, shall be seeded with permanent vegetation immediately following grading. Selection of the seed mixture will depend on the time of year it is applied.

MANAGEMENT STRATEGIES

- Sediment trapping measures will be installed as the first step in grading and will be seeded and mulched immediately following installation.
- Temporary seeding or other stabilization will follow immediate after grading.
- The contractor shall be responsible for the installation and maintenance of all erosion and sediment control practices depicted on the Plans.
- After achieving adequate stabilization, the temporary controls will be cleaned and removed. Any areas disturbed in the removal process shall be graded, top soiled, and seeded accordingly.

PERMANENT STABILIZATION

All areas disturbed by construction shall be stabilized with permanent seeding immediately following finish grading. Seeding shall be accomplished with Kentucky 31 Tall Fescue according to Standards and Specifications 3.32, Permanent Seeding of the VESCH. Soil stabilization blankets will be installed over slopes, which have been brought to final grade and have been seeded to protect the slopes from rill and gully erosion and to allow seed to germinate properly. Mulch (straw or fiber) will be used on relatively flat areas. In all seeding operations, seed, fertilizer and lime will be applied prior to mulching.

STORMWATER MANAGEMENT

This project is for the construction of an elevated water tank and service road. The current site is fully wooded and contains approximately 5 acres. After development, the site will contain approximately 0.80 impervious acres. To meet the storm water quality requirements of the James City County BMP Point System and the storm water quantity requirements of Minimum Standard 19 of the Virginia Storm water Management Handbook, the majority of the site drainage will be conveyed by piping to the inflow channel of the existing storm water pond, instead of discharging into open channels. To improve the runoff in that watershed, an open pit sediment forebay has been provided with the project plans. The forebay has been sized to provide 0.25" of storage for all of the impervious areas added, including the small amount that bypasses it. By treating the majority of the runoff into the stormwater management pond, the quality of the pond will not be degraded.

There is a single culvert at Station 23+54 that maintains flows in a natural swale under the access road. This drainage lies within the watershed of the storm water management pond and the natural swale safely conveys the flows to the pond. In order to limit clearing within the watershed, we did not pipe the outfall directly to the sediment forebay. However, we provided compensating storage within the sediment forebay for this outfall.

Table 2 Worksheet for BMP Rating is included within Appendix A

This project is for the construction of an elevated water tank and service road. The current site is fully wooded and contains approximately 5 acres. After development, the site will contain approximately 0.80 impervious acres. To meet the storm water quality requirements of the James City County BMP Point System and the storm water quantity requirements of Minimum Standard 19 of the Virginia Storm Water Management Handbook, the majority of the site drainage will be conveyed by piping to the inflow channel of the existing storm water pond, instead of discharging into open channels. To improve the runoff in that watershed, an open pit sediment forebay has been provided with the project plans. The forebay has been sized to provide 0.25" of storage for all of the impervious areas added, including the small amount that bypasses it. By treating the majority of the runoff into the stormwater management pond, the quality of the pond will not be degraded.

CALCULATIONS

Appendix A contains design calculations for the onsite storm drainage and Sediment Forebay.

MAINTENANCE

In general, all erosion and sediment control measures will be checked daily and after each significant rainfall. The following items will be checked in particular:

Temporary Stone Construction Entrance – 3.02

The entrance shall be maintained in a condition, which will prevent tracking or flow of mud onto public rights-of-way. This may require periodic dressing with additional stone or the washing and reworking of existing stone as conditions demand. All materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains must be removed immediately. The use of water trucks to remove materials dropped, washed, or tracked onto roadways will not be permitted under any circumstances.

Silt Fence – 3.05

Silt Fences shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately.

Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting.

Should the fabric on a silt fence decompose or become ineffective prior to the end of the expected usable life and the barrier still be necessary, the fabric shall be replaced promptly.

Sediment deposits should be removed after each storm event. They must be removed when deposits reach approximately one-half the height of the barrier.

Any sediment deposits remaining in place after the silt fence is not longer required shall be dressed to conform with the existing grade, prepared and seeded.

Storm Drain Inlet Protection – 3.07

The structure shall be inspected after each rain and repairs made as needed.

Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one-half the design depth of the trap. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.

Structures shall be removed and the area stabilized when the remaining drainage area has been properly stabilized.

Culvert Inlet Protection – 3.08

The structure shall be inspected after each rain and repairs made as needed.

Aggregate shall be replaced or cleaned when inspection reveals that clogged voids are causing ponding, which interfere with on-site construction.

Sediment shall be removed and the impoundment restored to its original dimensions when sediment has accumulated to one-half the design depth. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode and cause sedimentation problems.

Temporary structures shall be removed when they have served their useful purpose but not before the upslope area has been permanently stabilized.

Permanent Seeding – 3.32

The seeded/mulched areas should be checked regularly to ensure that a good stand is established and maintained. Areas should be fertilized, mulched and re-seeded as needed. When it is clear that plants have not germinated on an area or have died, these areas must be re-seeded immediately to prevent erosion damage. However, it is extremely important to determine for what reason germination did not take place and make any corrective action necessary prior to re-seeding the area.

- Fertilizer shall be applied using approved fertilization methods and equipment.

- Formulations and application rates shall conform to the guidelines given in VESCH.
- Maintain a ground cover or organic mulch around trees that is adequate to prevent erosion, protect roots, and hold water.

APPENDIX A

Drainage Area Worksheet												
Seasons Trace Access Road and Pipeline							JH	6/05				
Development Condition												
Acess RD		Total	Paved	Paved	Grass	Woods	C	C	C	Comp.	AC	**Total AC**
Station		Area, Ac.	Area, sf	Area, Ac.	Area,AC	Area, Ac	Paved	Grass	Woods	C	Product	
12+33	Culvert	0.40	0.00	0.00	0.20	0.20	0.90	0.35	0.25	0.30	0.12	
		1.00	0.00	0.00	0.00	1.00	0.90	0.35	0.25	0.25	0.250	
	Ditches	0.17		0.05	0.12	0.00	0.90	0.35	0.25	0.51	0.09	
15+64	Culvert	0.23		0.14	0.09	0.00	0.90	0.35	0.25	0.68	0.16	
Tank & Ditches		0.30		0.00	0.00	0.30	0.90	0.35	0.25	0.25	0.08	**0.23**
23+54	Culvert	1.00		0.00	0.20	0.80	0.90	0.35	0.25	0.27	0.27	
		0.17		0.06	0.11		0.90	0.35	0.25	0.54	0.09	**0.36**
Ditches RT Side												
8+80	12+33	0.15		0.09	0.06	0.00	0.90	0.35	0.25	0.68	0.10	**0.10**
12+33	19+26	0.19		0.08	0.11	0.00	0.90	0.35	0.25	0.58	0.11	**0.11**
19+26	23+54	0.22		0.14	0.08	0.00	0.90	0.35	0.25	0.70	0.15	**0.15**
Pipeline Extension		1.12			0.56	0.56						
Ditch LT Side												
23+54	25+25	0.09		0.06	0.03	0.00	0.90	0.35	0.25	0.72	0.06	**0.06**
		5.04		0.62	1.56	2.86						

TC Determination

DA No./	Overland	Overland	Slope	Overland	Shallow	Ditch	Storm	Shallow	Ditch	Storm	Time.	Time
Str. No.	Flow	Surface	ft/ft	Flow	Concet.	Flow	Drain	Concet.	Time	Drainage	Conc.	Conc.
	ft			Time	Flow	ft	Flow	Flow	Min.	Flow Time	Min.	Used
				min	ft		ft	Time		Min		Min.
Culvert	140	Poor Gr.	0.036	3.11	60	100	0	0.28	1.00	0	4.4	5.0
12+33			3.60%					5%	2.8%			
Culvert	40	Woods	0.04	1.33	20	265	0	0.09	2	0	3.4	5.0
15+64			4%		5%	3.65%		5%	3.65%			
Culvert	60	Woods	0.033	2.50	60	400	0	0.38	3.0	0	5.5	5.5
23+54			3.33%		2.50%	3.00%						
Ditches	RT	Side										5.0 Min
									Ref*			

Rainfall Intensities for James City County from VDOT Drainage Manual

*Ditch Flow Times from Kirpick Chart
VDOT Drainage Manual Appendix 6D-5

Shallow Concentrated Flow Velocities
VDOT Drainage Manual Appendix 6D-6
TR-55 Chart
Overland Flow Velocities

From Point	To Point	Area. (Ac.)	C	AC Increm.	Acc. AC	Flow Time min.	Int.	Runoff Q cfs.	Upper End Elev. Ft	Lower End Elev. Ft	Length (ft)	Slope (ft/ft)	Dia. in.	Capacity cfs.	Velocity fps	Mannings n	HG In (ft)	HGOut (ft)
'12+33	D1	1.78	0.27	0.48	0.48	5	7.17	3.5	91.50	90.50	26	0.0385	15 inch	12.67	8.82	0.013	92.25	90.98
D1	D2	0.4	0.65	0.26	0.75	5.05	7.16	5.37	90.00	87.00	175	0.0171	15 inch	10.99	8.91	0.01	90.94	87.62
D2	D4	0.1	0.25	0.03	0.77	5.38	7.07	5.49	86.50	85.00	240	0.0063	15 inch	6.64	6.04	0.01	87.45	85.87
'17+35	D3	0.23	0.68	0.16	0.16	5	7.17	1.14	102.50	101.68	30	0.0273	15 inch	10.68	5.67	0.013	102.92	101.96
D3	D4	0.08	0.83	0.07	0.22	5.09	7.15	1.61	101.18	89.60	145	0.0799	15 inch	23.73	11.04	0.01	101.68	89.82
D4	D5	0	0	0	0.99	6.04	6.89	6.91	84.50	71.00	320	0.0422	15 inch	17.25	13.28	0.01	85.55	71.55
'23+54		1.17	0.31	0.36	0.36	5.5	7.03	2.57	96.70	96.40	26	0.0115	15 inch	6.94	5.23	0.013	97.34	96.93

Calculations used VDOT Drainage Manual Methods and procedures and StormCAdd program by Haestad.

Intensity calculated using formula and factors for James City County.

LD-269

Project	Plan Sheet No. 4	Designer: jgh	Sheet
JCSA	Rev. Date	Date:06/05	Station 12+33

HYDROLOGICAL DATA

DA= 1.78 AC.

AC= 0.48 Ha.

Tc from Fig. 1.5.1.2

Tc= 5 min.

RISK ASSESSMENT

ADT= <5

Detours Available Yes

Length

Overtopping Stage n/a

DISCHARGES USED

Q2= CFS

Q10= 3.5 CFS

Q50= CFS

Q100= 4.7 CFS

AHW Controls

100 YR Floodplain Elev.

Design AHW depth, Elev.

Structures , Elev.

freq.= TW elev.

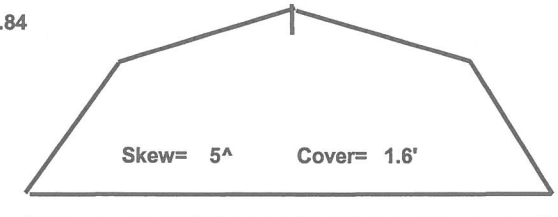
PRELIMINARY

12+33 Exist 93.5

C.L Elev. 94.13

12+00 94.02 Low Point

ES 93.84



10 yr TW=

50Yr TW=

Skew= 5^ Cover= 1.6'

Inv.Elev.= 91.50 So= 1.9% Inv.Elev.= 91.0

Orig. Gr. Elev= 93.90 L= 26 Orig. Gr. Elev.= 93.00

CULVERT TYPE & SIZE	Q	Q/B	HEADWATER COMPUTATIONS									CONT. HW ELEV.	AHW ELEV.	OUTLET Velocity	End. Treat.	COMMENTS
			INLET CONTROL		OUTLET CONTROL											
			HW/D	HW	Ke	H	dc	(dc+D)/2	ho/tw	Lso	HW					
15" RCP Projecting	3.5	n/a	0.83	1.04	0.5	0.5	0.8	1.03	1.03	0.5	1.03	1.04	92.5	6.74	EC-1	
	4.7	n/a	1.05	1.31	0.5	0.6	0.9	1.08	1.03	0.5	1.13	1.17	92.7	7.3		

Ref: USDOT, FHWA HDS No. 5, 1985 Design Charts

HWa= TW + Hloss

LD-269

Project	Plan Sheet No. 4	Designer: jgh	Sheet
JCSA	Rev. Date	Date:06/05	Station 17+35

HYDROLOGICAL DATA

DA= 0.53 AC.

AC= 0.23 Ha.

Tc from Fig. 1.5.1.2

Tc= 5 min.

RISK ASSESSMENT

ADT= <5

Detours Available Yes

Length

Overtopping Stage N/A

DISCHARGES USED

Q2= CFS

Q10= 1.1 CFS

Q50= CFS

Q100= 2.2 CFS

AHW Controls

100 YR Floodplain Elev.

Design AHW depth, Elev.

Structures , Elev.

freq.= TW elev.

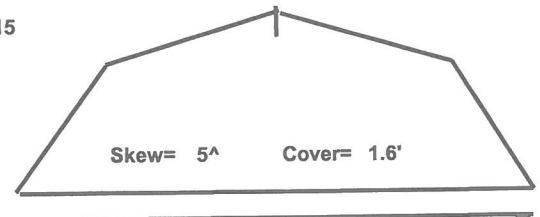
PRELIMINARY

17+35 Exist 102.5

C.L Elev 105.05

Low Point

ES 105.15



10 yr TW=

50Yr TW=

Skew= 5^ Cover= 1.6'

Inv.Elev.= 102.50 So= 0.67% Inv.Elev.= 101.68

Orig. Gr. Elev= 103.00 L= 30 Orig. Gr. Elev.= 102

CULVERT TYPE & SIZE	Q	Q/B	HEADWATER COMPUTATIONS									CONT. HW ELEV.	AHW ELEV.	OUTLET Velocity	End. Treat.	COMMENTS
			INLET CONTROL		OUTLET CONTROL											
			HW/D	HW	Ke	H	dc	(dc+D)/2	ho/tw	Lso	HW					
15" RCP Projecting	1.1	n/a	0.5	0.63	0.5	0.3	0.5	0.88	0.88	0.82	0.36	0.63	103.1	3.82	EC-1	
	2.2	n/a	0.65	0.81	0.5	0.4	0.6	0.93	0.93	0.82	0.51	0.81	103.3	4.14		

Ref: USDOT, FHWA HDS No. 5, 1985
Design Charts

HWa= TW + Hloss

LD-269

Project	Plan Sheet No. 4	Designer: jgh	Sheet
JCSA	Rev. Date	Date:06/05	Station 23+54

HYDROLOGICAL DATA

DA= 1.17 AC.

AC= 0.36 Ha.

Tc from Fig. 1.5.1.2

Tc= 5 min.

RISK ASSESSMENT

ADT= <5

Detours Available Yes

Length

Overtopping Stage 25Yr

DISCHARGES USED

Q2= CFS

Q10= 2.6 CFS

Q50= CFS

Q100= 3.5 CFS

AHW Controls

100 YR Floodplain Elev.

Design AHW depth, Elev.

Structures , Elev.

freq.= TW elev.

PRELIMINARY

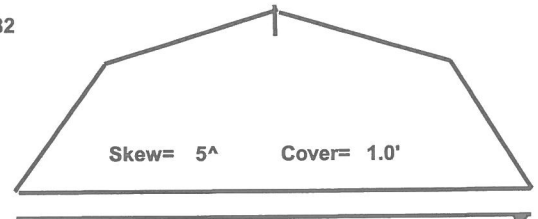
23+54 Exist 97.3

C.L Elev 101

Low Point

ES 100.82

97.7
1.17
97.87



Skew= 5^ Cover= 1.0'

10 yr TW=

50Yr TW=

Inv.Elev.= 96.70 So=0.78% Inv.Elev.= 96.4

Orig. Gr. Elev= 98.00 L= 26 Orig. Gr. Elev.= 97.00

CULVERT TYPE & SIZE	Q	Q/B	HEADWATER COMPUTATIONS									CONT. HW ELEV.	AHW ELEV.	OUTLET Velocity	End. Treat.	COMMENTS
			INLET CONTROL		OUTLET CONTROL											
			HW/D	HW	Ke	H	dc	(dc+D)/2	ho/tw	Lso	HW					
15" RCP Projecting	2.6	n/a	0.83	1.04	0.5	0.5	0.8	1.03	1.03	0.2	1.33	1.04	97.7	5.2	EC-1	
	3.5	n/a	0.93	1.17	0.5	0.6	0.9	1.08	1.08	0.2	1.48	1.17	97.9	5.7		

Ref: USDOT, FHWA HDS No. 5, 1985 Design Charts

HWa= TW + Hloss

JCSA Pipeline and Tanks

Preliminary Storm Water Calculations using TR-55
Seasons Trace Tank, pipeline and access road
Prepared by: J. Harman Gannett Fleming June 20, 2005

Predevelopment
RCN= 70
Wooded Area and limited dirt roads
Soil Type Slage, Kempsville, Craven-Uchee, Suffolk
Area 5.04 Acres
Tc= 0.24hr
1Yr Runoff = 3.0 cfs

Postdevelopment
RCN= 73
Gravel Access Roads and Grassy Pipeline Easements
Soil type Slagle, Kempsville, Craven –Uchee, Suffolk
Area- 5.04 Acres
Tc=0.10hr
1 Yr. Runoff = 5.6 cfs

Storm Water Storage, using chapter 7 TR-55
1 Yr = 0.23 Ac-ft, 10019 cf

Recommend Storm Water Storage be provided by existing Storm Water facilities downstream.

References

USDA TR-55 Urban Hydrology for Small Watersheds

USDA Soil Survey of James City and York Counties and the City of Williamsburg, Plate 13

Storm Water Management Handbook, DCR, Volume II

Gannett Fleming

SUBJECT JCSA
Seasons Trace / Warhill
BY JH DATE 6/08 CHKD. BY DATE

SHEET NO. 1 OF 2
JOB NO. 44656

Ref: James City Co BMP guidelines pg 37

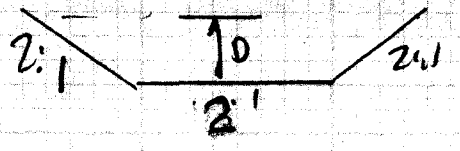
Determine Size Sediment Forebay

Provide WQV = 1/2" per Impervious Acre

Total Imp Area Added to Watershed = 0.76 Ac
Tank & Service Road

WQV = 1/4" (0.76)(1/12)(43,560 sf/Ac)
WQV = 1690 cf

Try 2' Width
2:1 Side Slopes



For D = 4', Area = 40 sf
Req'd Length = 690 cf / 40 sf = 17 LF OK

Determine Size Rip Rap Weir

Drainage Area thru SD = AC = 0.99 tc = 6 min
Strs D4 to D5
Woods between Road + Forebay AC = 1.75 tc = 10 min

Σ AC = 2.74 tc = 10 min

$Q_2 = CIA = (2.74)(4.58) = 12.5$ cfs

$Q_{10} = CIA = (2.74)(6.00) = 16.6$ cfs

Try a 10' Weir, $Q = CLH^{3/2}$ $H = \left(\frac{Q}{CL}\right)^{2/3}$ Broad Crested Weir Formula C = 3.1

$H_2 = \left(\frac{12.5}{3.1(10)}\right)^{2/3} = 0.55'$

$H_{10} = \left(\frac{16.6}{3.1(10)}\right)^{2/3} = 0.66'$ OK

Excavation = [20'(10sf) + 37'(84sf) + 10'(28sf)] 1/27 = 136 cy
200 3108 280 Say 150 cy

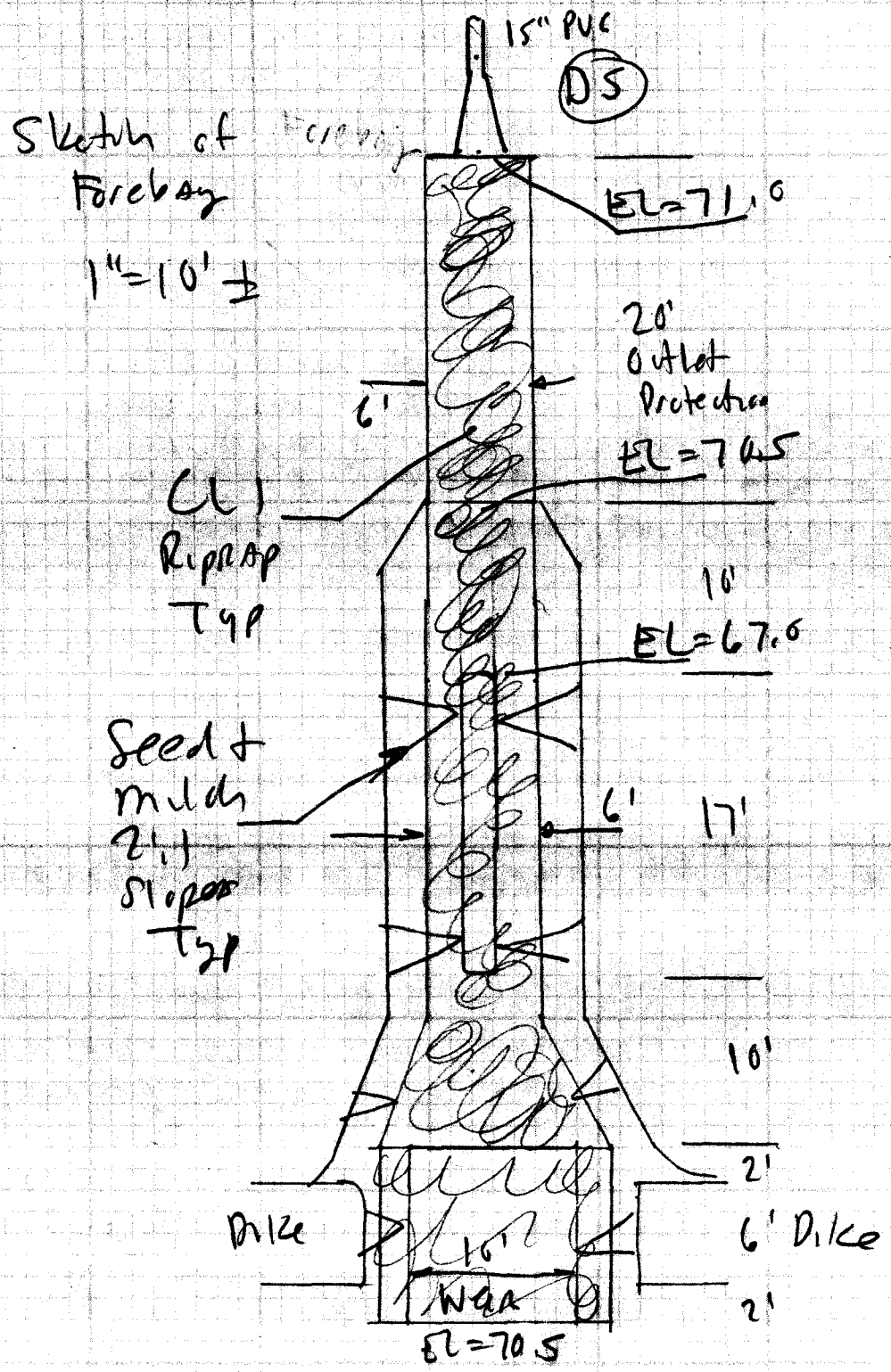
Gannett Fleming

SUBJECT JCSA

BY JH DATE 6/05 CHKD. BY DATE

SHEET NO. 2 OF 2

JOB NO. 44656



Warhill Tract Drainage Comps						10 Year Frequency Storm							8/05	JH			Hydraulic	Hydraulic
Struct.	Struct.	Area.(Ac.)	C	CA (ac.)	CA Acc.	Flow Time	Rainfall (in	Q (cfs)	Invert Elev	Invert Elev	Length (ft)	Slope (ft/ft)	Dia. in.	Cap.(cfs)	Vel.(ft/s)	Mann.n	Grade In (ft)	Grade Out (ft)
I-10	O-3	0.2	0.5	0.10	0.10	5.00	7.17	0.72	93.33	93.17	30	0.0053	12 inch	2.6 ✓	2.84	0.013	93.69	93.52
I-5	D1	1.78	0.27	0.48	0.48	5.00	7.17	3.5	91.56	90.56	26	0.0385	15 inch	12.67 ✓	8.82	0.013	92.31	91.04
D1	D2	0.4	0.65	0.26	0.75	5.05	7.16	5.37	89.00	86.63	175	0.0135	15 inch	9.77 ✓	8.15	0.010	89.94	87.29
D2	D4	0.1	0.25	0.03	0.77	5.41	7.06	5.48	86.20	85.00	240	0.0050	15 inch	5.94 ✓	5.49	0.010	87.15	85.95
I-3	D3	0.23	0.68	0.16	0.16	5.00	7.17	1.14	102.50	101.68	30	0.0273	15 inch	10.68 ✓	5.67	0.013	102.92	101.96
D3	D4	0.08	0.83	0.07	0.22	5.09	7.15	1.61	99.60	89.60	145	0.0690	15 inch	22.05 ✓	10.48	0.010	100.10	89.83
D4	D-4A	N/A	N/A	N/A	0.99	6.14	6.87	6.88	83.50	79.50	166	0.0241	15 inch	13.04 ✓	10.77	0.010	84.55	80.15
D-4A	D5	N/A	N/A	N/A	0.99	6.39	6.8	6.82	75.00	71.00	166	0.0241	15 inch	13.04 ✓	10.74	0.010	76.05	71.64
I-1	O-1	1.17	0.31	0.36	0.36	5.50	7.03	2.57	96.70	96.40	26	0.0115	15 inch	6.94 ✓	5.23	0.013	97.34	96.93

WHERE IS THIS?

Q < CAP
OK
not warned

$n_{PVC} = 0.010$

$n_{RCP} = 0.013$

Warhill Tract

Drainage Computations

FOREBAY
PC 205
SP-79-05

AB req'd to
compl'y w/ SSC
criteria

SP-79-05
2ND SUB

0.25" of
STORAGE

Drainage Area Worksheet										Page 2 of 2	
Seasons Trace Tank							JH	5/05			
PreDevelopment Condition											
DA No. /		Total	Paved	Paved	Grass	Grass	C	C	C	Comp.	AC
Str. No.		Area, Ac.	Area, sf	Area, Ac.	Area,sf.	Area, Ac	Paved	Grass &	Resid.	C	Product
								Woods			
		0.29	6634.00	0.15	5959.00	0.14	0.90	0.35	0.40	0.30	0.09
		0.04	1850.00	0.04	25.00	0.00	0.90	0.35	0.40	0.04	0.002
		0.22	6234.00	0.14	3345.00	0.08	0.90	0.35	0.40	0.25	0.06
		0.01	0.00	0.00	500.00	0.01	0.90	0.35	0.40	0.35	0.00
Ditch RT		0.23	7225.00	0.17	3000.00	0.07	0.90	0.35	0.40	0.25	0.06
Ditch End		0.10	0.00	0.00	3820.00	0.10	0.90	0.35	0.40	0.35	0.09
Offsite Areas											
1		0.20	900.00	0.02	7710.00	0.18	0.90	0.35	0.40	0.33	0.08
2		0.22	7975.00	0.18	1400.00	0.03	0.90	0.35	0.40	0.22	0.08
											0.15

Overland Flows for TC Determination

Overland Flow Nomograph from NN Design Criteria, Figure 1.5.1.1 VDOT Drainage Manual

DA No./	Overland	Overland	Slope	Travel	Storm	Paved	Ditch	Slope	Ditch	Storm	Time.	Time
Str. No.	Flow	Surface	ft/ft	Time	Drainage	Gutter	Flow	ft/ft	Time	Drainage	Conc.	Conc.
	ft			Min.	Flow	ft	ft		Min.	Flow Time	Min.	Used
					ft					Min		Min.
4	50	Poor Gr.	0.022	1.19			125	0.022	1.4		2.6	5
5	60	Paved	0.02	0.30			10	0.022	0		0.3	5.0
6	50	Poor Gr.	0.022	1.19			125	0.022	1.4		2.6	5
7	50	Poor Gr.	0.022	1.19			0		0.0		1.2	5
Offsite TC Determination												
1	65	Poor Gr.	0.022	1.19			50	0.022	0.7		1.9	5
2	20	Poor Gr.	0.022	0.48			50	0.01	1.4		1.9	5
									Ref*			

Rainfall Intensities for James City County from VDOT Drainage Manual

*Ditch Flow Times from Kirpick Chart
VDOT Drainage Manual Appendix 6D-5

Norfolk Va Chart in VDOT Drainage Manual

*Ditch Flow Times from Kirpick Chart
VDOT Drainage Manual Appendix 6D-5

LD-269

Project	Plan Sheet No. 4	Designer: jgh	Sheet
JCSA	Rev. Date	Date:06/05	Station 12+33

HYDROLOGICAL DATA

DA= 1.78 AC.
AC= 0.48 Ha.

Tc from Fig. 1.5.1.2
Tc= 5 min.

RISK ASSESSMENT

ADT= <5
Detours Available Yes
Length
Overtopping Stage n/a

DISCHARGES USED

Q2= CFS
Q10= 3.5 CFS
Q50= CFS
Q100= 4.7 CFS

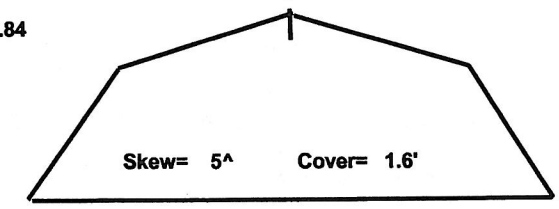
AHW Controls
100 YR Floodplain Elev.
Design AHW depth, Elev.
Structures , Elev.

freq.= TW elev.

PRELIMINARY

12+33 Exist 93.5
C.L Elev. 94.13
12+00 94.02 Low Point

ES 93.84



Skew= 5^ Cover= 1.6'

10 yr TW=
50Yr TW=

91.5
1.04
92.54 < 92.5

Inv.Elev.= 91.50 So= 1.9% Inv.Elev.= 91.0
Orig. Gr. Elev= 93.90 L= 26 Orig. Gr. Elev.= 93.00

CULVERT TYPE & SIZE	Q	Q/B	HEADWATER COMPUTATIONS									CONT. HW ELEV.	AHW ELEV.	OUTLET Velocity	End. Treat.	COMMENTS
			INLET CONTROL		OUTLET CONTROL											
			HW/D	HW	Ke	H	dc	(dc+D)/2	ho/tw	Lso	HW					
15" RCP Projecting	3.5	n/a	0.83	1.04	0.5	0.5	0.8	1.03	1.03	0.5	1.03	1.04	92.5	6.74	EC-1	
	4.7	n/a	1.05	1.31	0.5	0.6	0.9	1.08	1.03	0.5	1.13	1.17	92.7	7.3		

Ref: USDOT, FHWA HDS No. 5, 1985
Design Charts

HWa= TW + Hloss

LD-269

Project	Plan Sheet No. 4	Designer: jgh	Sheet
JCSA	Rev. Date	Date:06/05	Station 17+35

HYDROLOGICAL DATA

DA= 0.53 AC.

AC= 0.23 Ha.

Tc from Fig. 1.5.1.2

Tc= 5 min.

RISK ASSESSMENT

ADT= <5

Detours Available Yes

Length

Overtopping Stage N/A

DISCHARGES USED

Q2= CFS

Q10= 1.1 CFS

Q50= CFS

Q100= 2.2 CFS

AHW Controls

100 YR Floodplain Elev.

Design AHW depth, Elev.

Structures , Elev.

freq.= TW elev.

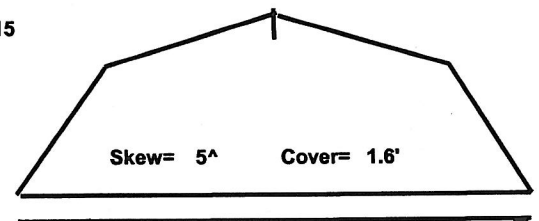
PRELIMINARY

17+35 Exist 102.5

C.L Elev 105.05

Low Point

ES 105.15



10 yr TW=

50Yr TW=

102.50

Skew= 5^ Cover= 1.6'

Inv.Elev.= 102.50 So= 0.67% Inv.Elev.= 101.68

Orig. Gr. Elev= 103.00 L= 30 Orig. Gr. Elev.= 102

CULVERT TYPE & SIZE	Q	Q/B	HEADWATER COMPUTATIONS									CONT. HW ELEV.	AHW ELEV.	OUTLET Velocity	End. Treat.	COMMENTS
			INLET CONTROL		OUTLET CONTROL											
			HW/D	HW	Ke	H	dc	(dc+D)/2	ho/tw	Lso	HW					
15" RCP Projecting	1.1	n/a	0.5	0.63	0.5	0.3	0.5	0.88	0.88	0.82	0.36	0.63	103.1	3.82	EC-1	
	2.2	n/a	0.65	0.81	0.5	0.4	0.6	0.93	0.93	0.82	0.51	0.81	103.3	4.14		
				1-1.5												

Ref: USDOT, FHWA HDS No. 5, 1985 Design Charts

HWa= TW + Hloss

LD-269

Project	Plan Sheet No. 4	Designer: jgh	Sheet
JCSA	Rev. Date	Date:06/05	Station 23+54

HYDROLOGICAL DATA

DA= 1.17 AC.

AC= 0.36 Ha.

Tc from Fig. 1.5.1.2

Tc= 5 min.

RISK ASSESSMENT

ADT= <5

Detours Available Yes

Length

Overtopping Stage 25Yr

DISCHARGES USED

Q2= CFS

Q10= 2.6 CFS

Q50= CFS

Q100= 3.5 CFS

AHW Controls

100 YR Floodplain Elev.

Design AHW depth, Elev.

Structures , Elev.

freq.= TW elev.

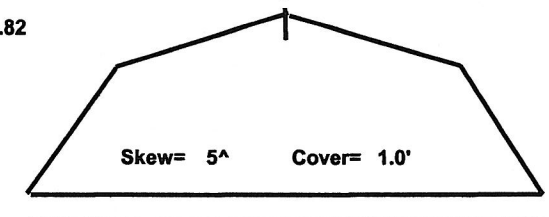
PRELIMINARY

23+54 Exist 97.3

C.L Elev 101

Low Point

ES 100.82



10 yr TW=

50Yr TW=

Skew= 5^ Cover= 1.0'

Inv.Elev.= 96.70 So=0.78% Inv.Elev.= 96.4

Orig. Gr. Elev= 98.00 L= 26 Orig. Gr. Elev.= 97.00

CULVERT TYPE & SIZE	Q	Q/B	HEADWATER COMPUTATIONS									CONT. HW ELEV.	AHW ELEV.	OUTLET Velocity	End. Treat.	COMMENTS
			INLET CONTROL		OUTLET CONTROL											
			HW/D	HW	Ke	H	dc	(dc+D)/2	ho/tw	Lso	HW					
15" RCP Projecting	2.6	n/a	0.83	1.04	0.5	0.5	0.8	1.03	1.03	0.2	1.33	1.04	97.7	5.2	EC-1	
	3.5	n/a	0.93	1.17	0.5	0.6	0.9	1.08	1.08	0.2	1.48	1.17	97.9	5.7		

Ref: USDOT, FHWA HDS No. 5, 1985 Design Charts

HWa= TW + Hloss

Worksheet for Triangular Channel - L3

Project Description		
Flow Element:	Triangular Channel	
Friction Method:	Manning Formula	
Solve For:	Normal Depth	

Input Data		
Roughness Coefficient:	0.035	
Channel Slope:	0.02000	ft/ft
Left Side Slope:	3.00	ft/ft (H:V)
Right Side Slope:	2.00	ft/ft (H:V)
Discharge:	1.43	ft^3/s

Results		
Normal Depth:	0.50	ft
Flow Area:	0.63	ft^2
Wetted Perimeter:	2.71	ft
Top Width:	2.51	ft
Critical Depth:	0.46	ft
Critical Slope:	0.03230	ft/ft
Velocity:	2.27	ft/s
Velocity Head:	0.08	ft
Specific Energy:	0.58	ft
Froude Number:	0.80	
Flow Type:	Subcritical	

GVF Input Data		
Downstream Depth:	0.00	ft
Length:	0.00	ft
Number Of Steps:	0	

GVF Output Data		
Upstream Depth:	0.00	ft
Profile Description:	N/A	
Profile Headloss:	0.00	ft
Downstream Velocity:	0.00	ft/s
Upstream Velocity:	0.00	ft/s
Normal Depth:	0.50	ft
Critical Depth:	0.46	ft
Channel Slope:	0.02000	ft/ft
Critical Slope:	0.03230	ft/ft

Worksheet for Triangular Channel - L2

Project Description		
Flow Element:	Triangular Channel	
Friction Method:	Manning Formula	
Solve For:	Normal Depth	

Input Data		
Roughness Coefficient:	0.035	
Channel Slope:	0.01700	ft/ft
Left Side Slope:	3.00	ft/ft (H:V)
Right Side Slope:	2.00	ft/ft (H:V)
Discharge:	1.18	ft^3/s

Results		
Normal Depth:	0.48	ft
Flow Area:	0.58	ft^2
Wetted Perimeter:	2.60	ft
Top Width:	2.41	ft
Critical Depth:	0.42	ft
Critical Slope:	0.03314	ft/ft
Velocity:	2.04	ft/s
Velocity Head:	0.06	ft
Specific Energy:	0.55	ft
Froude Number:	0.73	
Flow Type:	Subcritical	

GVF Input Data		
Downstream Depth:	0.00	ft
Length:	0.00	ft
Number Of Steps:	0	

GVF Output Data		
Upstream Depth:	0.00	ft
Profile Description:	N/A	
Profile Headloss:	0.00	ft
Downstream Velocity:	0.00	ft/s
Upstream Velocity:	0.00	ft/s
Normal Depth:	0.48	ft
Critical Depth:	0.42	ft
Channel Slope:	0.01700	ft/ft
Critical Slope:	0.03314	ft/ft

Worksheet for Triangular Channel - L1

Project Description		
Flow Element:	Triangular Channel	
Friction Method:	Manning Formula	
Solve For:	Normal Depth	

Input Data		
Roughness Coefficient:	0.035	
Channel Slope:	0.00500	ft/ft
Left Side Slope:	3.00	ft/ft (H:V)
Right Side Slope:	2.00	ft/ft (H:V)
Discharge:	0.72	ft^3/s

Results		
Normal Depth:	0.50	ft
Flow Area:	0.63	ft^2
Wetted Perimeter:	2.72	ft
Top Width:	2.52	ft
Critical Depth:	0.35	ft
Critical Slope:	0.03539	ft/ft
Velocity:	1.14	ft/s
Velocity Head:	0.02	ft
Specific Energy:	0.52	ft
Froude Number:	0.40	
Flow Type:	Subcritical	

GVF Input Data		
Downstream Depth:	0.00	ft
Length:	0.00	ft
Number Of Steps:	0	

GVF Output Data		
Upstream Depth:	0.00	ft
Profile Description:	N/A	
Profile Headloss:	0.00	ft
Downstream Velocity:	0.00	ft/s
Upstream Velocity:	0.00	ft/s
Normal Depth:	0.50	ft
Critical Depth:	0.35	ft
Channel Slope:	0.00500	ft/ft
Critical Slope:	0.03539	ft/ft

Worksheet for Triangular Channel - R2

Project Description		
Flow Element:	Triangular Channel	
Friction Method:	Manning Formula	
Solve For:	Normal Depth	

Input Data		
Roughness Coefficient:	0.035	
Channel Slope:	0.01700	ft/ft
Left Side Slope:	3.00	ft/ft (H:V)
Right Side Slope:	3.00	ft/ft (H:V)
Discharge:	0.79	ft^3/s

Results		
Normal Depth:	0.38	ft
Flow Area:	0.44	ft^2
Wetted Perimeter:	2.43	ft
Top Width:	2.31	ft
Critical Depth:	0.34	ft
Critical Slope:	0.03469	ft/ft
Velocity:	1.78	ft/s
Velocity Head:	0.05	ft
Specific Energy:	0.43	ft
Froude Number:	0.72	
Flow Type:	Subcritical	

GVF Input Data		
Downstream Depth:	0.00	ft
Length:	0.00	ft
Number Of Steps:	0	

GVF Output Data		
Upstream Depth:	0.00	ft
Profile Description:	N/A	
Profile Headloss:	0.00	ft
Downstream Velocity:	0.00	ft/s
Upstream Velocity:	0.00	ft/s
Normal Depth:	0.38	ft
Critical Depth:	0.34	ft
Channel Slope:	0.01700	ft/ft
Critical Slope:	0.03469	ft/ft

Worksheet for Triangular Channel - R3

Project Description		
Flow Element:	Triangular Channel	
Friction Method:	Manning Formula	
Solve For:	Normal Depth	

Input Data		
Roughness Coefficient:	0.035	
Channel Slope:	0.02000	ft/ft
Left Side Slope:	3.00	ft/ft (H:V)
Right Side Slope:	3.00	ft/ft (H:V)
Discharge:	1.36	ft^3/s

Results		
Normal Depth:	0.46	ft
Flow Area:	0.63	ft^2
Wetted Perimeter:	2.89	ft
Top Width:	2.74	ft
Critical Depth:	0.42	ft
Critical Slope:	0.03227	ft/ft
Velocity:	2.17	ft/s
Velocity Head:	0.07	ft
Specific Energy:	0.53	ft
Froude Number:	0.80	
Flow Type:	Subcritical	

GVF Input Data		
Downstream Depth:	0.00	ft
Length:	0.00	ft
Number Of Steps:	0	

GVF Output Data		
Upstream Depth:	0.00	ft
Profile Description:	N/A	
Profile Headloss:	0.00	ft
Downstream Velocity:	0.00	ft/s
Upstream Velocity:	0.00	ft/s
Normal Depth:	0.46	ft
Critical Depth:	0.42	ft
Channel Slope:	0.02000	ft/ft
Critical Slope:	0.03227	ft/ft

Worksheet for Triangular Channel - L4 where

Project Description		
Flow Element:	Triangular Channel	
Friction Method:	Manning Formula	
Solve For:	Normal Depth	

Input Data		
Roughness Coefficient:	0.035	
Channel Slope:	0.03650	ft/ft
Left Side Slope:	3.00	ft/ft (H:V)
Right Side Slope:	2.00	ft/ft (H:V)
Discharge:	1.65	ft^3/s

Results		
Normal Depth:	0.47	ft
Flow Area:	0.56	ft^2
Wetted Perimeter:	2.55	ft
Top Width:	2.37	ft
Critical Depth:	0.49	ft
Critical Slope:	0.03169	ft/ft
Velocity:	2.95 > 2.5	ft/s
Velocity Head:	0.14	ft
Specific Energy:	0.61	ft
Froude Number:	1.07	
Flow Type:	Supercritical	

GVF Input Data		
Downstream Depth:	0.00	ft
Length:	0.00	ft
Number Of Steps:	0	

GVF Output Data		
Upstream Depth:	0.00	ft
Profile Description:	N/A	
Profile Headloss:	0.00	ft
Downstream Velocity:	0.00	ft/s
Upstream Velocity:	0.00	ft/s
Normal Depth:	0.47	ft
Critical Depth:	0.49	ft
Channel Slope:	0.03650	ft/ft
Critical Slope:	0.03169	ft/ft

Worksheet for Triangular Channel - R4

Project Description		
Flow Element:	Triangular Channel	
Friction Method:	Manning Formula	
Solve For:	Normal Depth	

Input Data		
Roughness Coefficient:	0.035	
Channel Slope:	0.03650	ft/ft
Left Side Slope:	3.00	ft/ft (H:V)
Right Side Slope:	3.00	ft/ft (H:V)
Discharge:	0.48	ft^3/s

Results		
Normal Depth:	0.28	ft
Flow Area:	0.23	ft^2
Wetted Perimeter:	1.75	ft
Top Width:	1.66	ft
Critical Depth:	0.28	ft
Critical Slope:	0.03707	ft/ft
Velocity:	2.09	ft/s
Velocity Head:	0.07	ft
Specific Energy:	0.34	ft
Froude Number:	0.99	
Flow Type:	Subcritical	

GVF Input Data		
Downstream Depth:	0.00	ft
Length:	0.00	ft
Number Of Steps:	0	

GVF Output Data		
Upstream Depth:	0.00	ft
Profile Description:	N/A	
Profile Headloss:	0.00	ft
Downstream Velocity:	0.00	ft/s
Upstream Velocity:	0.00	ft/s
Normal Depth:	0.28	ft
Critical Depth:	0.28	ft
Channel Slope:	0.03650	ft/ft
Critical Slope:	0.03707	ft/ft

Worksheet for Triangular Channel - L5

Project Description		
Flow Element:	Triangular Channel	
Friction Method:	Manning Formula	
Solve For:	Normal Depth	

Input Data		
Roughness Coefficient:	0.035	
Channel Slope:	0.02140	ft/ft
Left Side Slope:	3.00	ft/ft (H:V)
Right Side Slope:	2.00	ft/ft (H:V)
Discharge:	0.45	ft^3/s

Results		
Normal Depth:	0.32	ft
Flow Area:	0.26	ft^2
Wetted Perimeter:	1.73	ft
Top Width:	1.61	ft
Critical Depth:	0.29	ft
Critical Slope:	0.03767	ft/ft
Velocity:	1.74	ft/s
Velocity Head:	0.05	ft
Specific Energy:	0.37	ft
Froude Number:	0.77	
Flow Type:	Subcritical	

GVF Input Data		
Downstream Depth:	0.00	ft
Length:	0.00	ft
Number Of Steps:	0	

GVF Output Data		
Upstream Depth:	0.00	ft
Profile Description:	N/A	
Profile Headloss:	0.00	ft
Downstream Velocity:	0.00	ft/s
Upstream Velocity:	0.00	ft/s
Normal Depth:	0.32	ft
Critical Depth:	0.29	ft
Channel Slope:	0.02140	ft/ft
Critical Slope:	0.03767	ft/ft

Worksheet for Triangular Channel - L6

Project Description		
Flow Element:	Triangular Channel	
Friction Method:	Manning Formula	
Solve For:	Normal Depth	

Input Data		
Roughness Coefficient:	0.035	
Channel Slope:	0.02950	ft/ft
Left Side Slope:	3.00	ft/ft (H:V)
Right Side Slope:	2.00	ft/ft (H:V)
Discharge:	1.10	ft^3/s

Results		
Normal Depth:	0.42	ft
Flow Area:	0.45	ft^2
Wetted Perimeter:	2.28	ft
Top Width:	2.11	ft
Critical Depth:	0.41	ft
Critical Slope:	0.03344	ft/ft
Velocity:	2.46	ft/s
Velocity Head:	0.09	ft
Specific Energy:	0.52	ft
Froude Number:	0.94	
Flow Type:	Subcritical	

GVF Input Data		
Downstream Depth:	0.00	ft
Length:	0.00	ft
Number Of Steps:	0	

GVF Output Data		
Upstream Depth:	0.00	ft
Profile Description:	N/A	
Profile Headloss:	0.00	ft
Downstream Velocity:	0.00	ft/s
Upstream Velocity:	0.00	ft/s
Normal Depth:	0.42	ft
Critical Depth:	0.41	ft
Channel Slope:	0.02950	ft/ft
Critical Slope:	0.03344	ft/ft

Worksheet for Triangular Channel - R5

Project Description		
Flow Element:	Triangular Channel	
Friction Method:	Manning Formula	
Solve For:	Normal Depth	

Input Data		
Roughness Coefficient:	0.035	
Channel Slope:	0.03650	ft/ft
Left Side Slope:	3.00	ft/ft (H:V)
Right Side Slope:	3.00	ft/ft (H:V)
Discharge:	0.48	ft^3/s

Results		
Normal Depth:	0.28	ft
Flow Area:	0.23	ft^2
Wetted Perimeter:	1.75	ft
Top Width:	1.66	ft
Critical Depth:	0.28	ft
Critical Slope:	0.03707	ft/ft
Velocity:	2.09	ft/s
Velocity Head:	0.07	ft
Specific Energy:	0.34	ft
Froude Number:	0.99	
Flow Type:	Subcritical	

GVF Input Data		
Downstream Depth:	0.00	ft
Length:	0.00	ft
Number Of Steps:	0	

GVF Output Data		
Upstream Depth:	0.00	ft
Profile Description:	N/A	
Profile Headloss:	0.00	ft
Downstream Velocity:	0.00	ft/s
Upstream Velocity:	0.00	ft/s
Normal Depth:	0.28	ft
Critical Depth:	0.28	ft
Channel Slope:	0.03650	ft/ft
Critical Slope:	0.03707	ft/ft

Worksheet for Triangular Channel - R6

Project Description		
Flow Element:	Triangular Channel	
Friction Method:	Manning Formula	
Solve For:	Normal Depth	

Input Data		
Roughness Coefficient:	0.035	
Channel Slope:	0.02140	ft/ft
Left Side Slope:	3.00	ft/ft (H:V)
Right Side Slope:	3.00	ft/ft (H:V)
Discharge:	0.55	ft^3/s

Results		
Normal Depth:	0.32	ft
Flow Area:	0.31	ft^2
Wetted Perimeter:	2.03	ft
Top Width:	1.93	ft
Critical Depth:	0.29	ft
Critical Slope:	0.03640	ft/ft
Velocity:	1.77	ft/s
Velocity Head:	0.05	ft
Specific Energy:	0.37	ft
Froude Number:	0.78	
Flow Type:	Subcritical	

GVF Input Data		
Downstream Depth:	0.00	ft
Length:	0.00	ft
Number Of Steps:	0	

GVF Output Data		
Upstream Depth:	0.00	ft
Profile Description:	N/A	
Profile Headloss:	0.00	ft
Downstream Velocity:	0.00	ft/s
Upstream Velocity:	0.00	ft/s
Normal Depth:	0.32	ft
Critical Depth:	0.29	ft
Channel Slope:	0.02140	ft/ft
Critical Slope:	0.03640	ft/ft

Worksheet for Triangular Channel - R7

Project Description		
Flow Element:	Triangular Channel	
Friction Method:	Manning Formula	
Solve For:	Normal Depth	

Input Data		
Roughness Coefficient:	0.035	
Channel Slope:	0.02950	ft/ft
Left Side Slope:	3.00	ft/ft (H:V)
Right Side Slope:	3.00	ft/ft (H:V)
Discharge:	1.10	ft^3/s

Results		
Normal Depth:	0.39	ft
Flow Area:	0.46	ft^2
Wetted Perimeter:	2.48	ft
Top Width:	2.36	ft
Critical Depth:	0.38	ft
Critical Slope:	0.03319	ft/ft
Velocity:	2.38	ft/s
Velocity Head:	0.09	ft
Specific Energy:	0.48	ft
Froude Number:	0.95	
Flow Type:	Subcritical	

GVF Input Data		
Downstream Depth:	0.00	ft
Length:	0.00	ft
Number Of Steps:	0	

GVF Output Data		
Upstream Depth:	0.00	ft
Profile Description:	N/A	
Profile Headloss:	0.00	ft
Downstream Velocity:	0.00	ft/s
Upstream Velocity:	0.00	ft/s
Normal Depth:	0.39	ft
Critical Depth:	0.38	ft
Channel Slope:	0.02950	ft/ft
Critical Slope:	0.03319	ft/ft

Worksheet for Triangular Channel - R1

Project Description		
Flow Element:	Triangular Channel	
Friction Method:	Manning Formula	
Solve For:	Normal Depth	

Input Data		
Roughness Coefficient:	0.035	
Channel Slope:	0.00500	ft/ft
Left Side Slope:	3.00	ft/ft (H:V)
Right Side Slope:	3.00	ft/ft (H:V)
Discharge:	0.72	ft^3/s

Results		
Normal Depth:	0.47	ft
Flow Area:	0.65	ft^2
Wetted Perimeter:	2.96	ft
Top Width:	2.80	ft
Critical Depth:	0.32	ft
Critical Slope:	0.03512	ft/ft
Velocity:	1.10	ft/s
Velocity Head:	0.02	ft
Specific Energy:	0.49	ft
Froude Number:	0.40	
Flow Type:	Subcritical	

GVF Input Data		
Downstream Depth:	0.00	ft
Length:	0.00	ft
Number Of Steps:	0	

GVF Output Data		
Upstream Depth:	0.00	ft
Profile Description:	N/A	
Profile Headloss:	0.00	ft
Downstream Velocity:	0.00	ft/s
Upstream Velocity:	0.00	ft/s
Normal Depth:	0.47	ft
Critical Depth:	0.32	ft
Channel Slope:	0.00500	ft/ft
Critical Slope:	0.03512	ft/ft

Worksheet for Triangular Channel - L7 where

Project Description		
Flow Element:	Triangular Channel	
Friction Method:	Manning Formula	
Solve For:	Normal Depth	

Input Data		
Roughness Coefficient:	0.035	
Channel Slope:	0.05000	ft/ft
Left Side Slope:	3.00	ft/ft (H:V)
Right Side Slope:	2.00	ft/ft (H:V)
Discharge:	1.29	ft^3/s

Results		
Normal Depth:	0.41	ft
Flow Area:	0.41	ft^2
Wetted Perimeter:	2.20	ft
Top Width:	2.03	ft
Critical Depth:	0.44	ft
Critical Slope:	0.03275	ft/ft
Velocity:	3.12	ft/s
Velocity Head:	0.15	ft
Specific Energy:	0.56	ft
Froude Number:	1.22	
Flow Type:	Supercritical	

GVF Input Data		
Downstream Depth:	0.00	ft
Length:	0.00	ft
Number Of Steps:	0	

GVF Output Data		
Upstream Depth:	0.00	ft
Profile Description:	N/A	
Profile Headloss:	0.00	ft
Downstream Velocity:	0.00	ft/s
Upstream Velocity:	0.00	ft/s
Normal Depth:	0.41	ft
Critical Depth:	0.44	ft
Channel Slope:	0.05000	ft/ft
Critical Slope:	0.03275	ft/ft

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

County BMP ID Code (if known): PC-205

Name of Facility: JCSA Warhill Elevated Water Tank BMP No.: 1 of 1 Date: 4/23/07

Location: Warhill

Name of Owner: JCSA

Name of Inspector: Jason Beck

Type of Facility: Forebay

Weather Conditions: sunny Type: ☒ Final Inspection ☐ County BMP Inspection Program ☐ Owner Inspection

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

O.K. - The item checked is in adequate condition and the maintenance program is currently satisfactory. No action required.
Routine - The item checked requires attention, but does not present an immediate threat to the function/integrity of the BMP.
Urgent - The item checked requires immediate attention to keep the BMP operational and 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: N/A				
Grass Height				
Vegetation Condition				
Tree Growth				
Erosion				
Trash & Debris				
Seepage				
Fencing or Benches				
Interior Landscaping/Planted Areas: ☒ None ☐ Constructed Wetland/Shallow Marsh ☐ Naturally Established Vegetation				
Vegetated Conditions				
Trash & Debris				
Floating Material				
Erosion				
Sediment				
Dead Plant				
Aesthetics				
Other	✓			Riprap
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	✓			15" HDPE - Flare Endsection
Erosion	✓			
Trash and Debris	✓			
Sediment	✓			
Outlet Protection	✓			
Other				
Principal Flow Control Structure - Riser, Intake, etc. (Describe Type): N/A				
Condition of Structure				
Corrosion				
Trash and Debris				
Sediment				
Vegetation				
Other				
Principal Outlet Structure - Barrel, Conduit, etc. : N/A				
Condition of Structure				
Settlement				
Trash & Debris				
Erosion/Sediment				
Outlet Protection				
Other				
Emergency Spillway (Overflow): N/A				
Vegetation				
Lining				
Erosion				
Trash & Debris				
Other				
Notes:				

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

Remarks:

Overall Environmental Division Internal Rating: 4

Signature: Jason Beck **Date:** 4/23/07

Title:

SWMProg\BMP\CoInspProg\InspForms\DetRet.wpd

WATERSHED	PC	MAINTENANCE PLAN	Yes	CTRL STRUC DESC	CL 1 Riprap
BMP ID NO	205	SITE AREA acre	3	CTRL STRUC SIZE inches	
PLAN NO	SP-79-05	LAND USE	Public Park	OTLT BARRL DESC	na
TAX PARCEL	(32-10)(1-12)	old BMP TYP	Pretreat Sed Foreb	OTLT BARRL SIZE inch	
PIN NO	3210100012	JCC BMP CODE			
CONSTRUCTION DATE	3/1/2007	POINT VALUE	0	EMERG SPILLWAY	Yes
PROJECT NAME	JCSA - Warhill Elevated Water Tank			DESIGN HW ELEV	74.0
FACILITY LOCATION	Warhill Tract - 5700 Warhill Trail			PERM POOL ELE	74.0
CITY-STATE	Williamsburg, VA 23188	SVC DRAIN AREA acres	5.04	2-YR OUTFLOW cfs	
CURRENT OWNER	James City Service Authority			10-YR OUTFLOW cfs	6.91
OWNER ADDRESS	P.O. Box 8784			REC DRAWING	Yes
OWNER ADDRESS 2		SERVICE AREA DESCRI	Access Road, tank & woods		
CITY-STATE-ZIP CODE	Williamsburg, VA 23187	IMPERV AREA acres	0.80	CONSTR CERTI	No
OWNER PHONE	253-6677	RECV STREAM	Dist Park East Pond PC106		
MAINT AGREEMENT	No	EXT DET-WQ-CTRL	Yes	LAST INSP DATE	
EMERG ACTION PLAN	No	WTR QUAL VOL acre-ft	0.038	INTERNAL RATING	
		CHAN PROT CTRL	No	MISC/COMMENTS	
		CHAN PROT VOL acre-ft	0	Storm drain system and pretreat sed forebay at East Pond PC 106. Seasons Trace.	
		SW/FLOOD CONTROL	No		
		GEOTECH REPORT	No		

Get Last BMP No

Return to Menu

RESOLUTION

CASE NO. SUP-03-05/HW-02-05. JAMES CITY SERVICE AUTHORITY

ELEVATED WATER STORAGE FACILITY, WARHILL SPORTS COMPLEX

WHEREAS, the Board of Supervisors of James City County has adopted by ordinance specific land uses that shall be subjected to a special use permit process and height limit restrictions; and

WHEREAS, Mr. Michael Vergakis of the James City Service Authority has applied for a special use permit and height limitation waiver to construct and operate a 165-foot public water storage tank and associated water transmission mains located at 5700 Warhill Trail; and

WHEREAS, the property is located on land zoned R-8, Rural Residential, and can be further identified as Parcel No. (32-1) on James City County Real Estate Tax Map No. (1-12); and

WHEREAS, the Planning Commission, following its Public Hearing on March 7, 2005, voted 7-0 to recommend approval of Case No. SUP-03-05; and

WHEREAS, a Public Hearing was advertised, adjoining property owners were notified, and a Board of Supervisors hearing was scheduled on Case No. HW-02-05; and

WHEREAS, the Board of Supervisors finds that the requirements of Section 24-354 of the James City County Zoning Ordinance have been satisfied in order to grant a height limitation waiver to allow the erection of a public water storage facility in excess of 60 feet.

NOW, THEREFORE, BE IT RESOLVED that the Board of Supervisors of James City County, Virginia, does hereby approve Case No. HW-02-05.

NOW, THEREFORE, BE IT FURTHER RESOLVED that the Board of Supervisors of James City County, Virginia, does hereby approve the issuance of Special Use Permit No. 03-05 as described herein with the following conditions:

1. The proposed water storage facility and associated water mains shall be constructed in general accordance to the location map attached to this staff report.

2. Prior to final site plan approval, the Planning Director shall review and approve the color and style of the water storage facility. The color shall be a neutral white or sky blue shade, with no signage permitted on the tank. The tank style shall be spherical or composite as illustrated in Attachment Nos. 2b and 3b of the corresponding staff report.

3. Any new exterior site lighting shall be limited to fixtures which are horizontally mounted on light poles not to exceed 15 feet in height and/or other structures and shall be recessed fixtures with no bulb, lens, or globe extending below the casing. The casing shall be opaque and shall completely surround the entire light fixture and light source in such a manner that all light will be directed downward and the light source is not visible from the side. No glare, defined as 0.1 footcandle or higher, shall extend

outside the property lines. Up-lighting of the water tank for aesthetic purposes only is prohibited. Any up-lighting of the water tank for security purposes only shall be approved by the Planning Director.

4. The owner shall be responsible for developing and enforcing water conservation standards to be submitted to and approved by the James City Service Authority prior to final site plan approval. The standards may include, but shall not be limited to, such water conservation measures as limitations on the installation and use of irrigation systems and irrigation wells, the use of approved landscaping materials including the use of drought-tolerant plants where appropriate, and the use of water-conserving fixtures and appliances to promote water conservation and minimize the use of public water resources.

5. If construction has not commenced on this project within 36 months from the issuance of a special use permit, the special use permit shall become void. Construction shall be defined as obtaining permits for building construction and footings and/or foundation has passed required inspections.

6. Hours of construction shall be Monday - Saturday from 7 a.m. to 7 p.m. for the new water storage facilities.

7. This special use permit is not severable. Invalidation of any word, phrase, clause, sentence, or paragraph shall invalidate the remainder.

Michael J. Brown
Chairman, Board of Supervisors

SUPERVISOR	VOTE
HARRISON	AYE
GOODSON	AYE
MCCLENNON	AYE
BRADSHAW	AYE
BROWN	AYE

ATTEST:

Sanford B. Wanner
Clerk to the Board

Adopted by the Board of Supervisors of James City County, Virginia, this 22nd day of March, 2005.

sup3-05hw02-05.res

ST

Table 2
Worksheet for BMP Point System

A. *STRUCTURAL BMP POINT ALLOCATION*

BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points
Wet Pond	10	x	100%	=	10
with EO		x		=	
		x		=	
		x		=	

TOTAL WEIGHTED STRUCTURAL BMP POINTS: _____

B. *NATURAL OPEN SPACE CREDIT*

Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
	x	(0.1 per 1%)	=	
	x	(0.15 per 1%)	=	

TOTAL NATURAL OPEN SPACE CREDIT: _____

C. *TOTAL WEIGHTED POINTS*

Structural BMP Points	+	Natural Open Space Points	=	Total

5700 WARHILL TRAIL

JAMES CITY COUNTY, VIRGINIA
ENVIRONMENTAL DIVISION

ENVIRONMENTAL INVENTORY CHECKLIST

GENERAL: The environmental inventory shall be drawn to scale clearly delineating the following components:

Yes	No	N/A	
☐	☑	☐	Tidal wetland.
☐	☑	☐	Tidal shores.
☐	☑	☐	Nontidal wetlands connected by surface flow and contiguous to tidal wetlands or water bodies with perennial flow (i.e. RPA wetlands).
☐	☑	☐	A 100-foot buffer area located adjacent to and landward of the components listed in items 1. through 3. above, and along both sides of any water body with perennial flow.
☐	☑	☐	Nontidal wetlands not included in item 3 (i.e. RMA wetlands).
☐	☑	☐	100-year floodplains as designated by chapter 24 of the County Code.
☐	☑	☐	Slopes 25 percent or greater

ENVIRONMENTAL DIVISION REVIEW COMMENTS
JCSA Elevated Water Tank behind Season's Trace
COUNTY PLAN NO. SUP-003-05
February 18, 2005

General Comments:

1. The Environmental Division offers no comments with respect to the SUP at this time.

Joanna Ripley

From: Theodore Williamson
Sent: Tuesday, July 05, 2016 10:37 AM
To: Joanna Ripley
Subject: 5700 warhill trail storm drain BMP clean up

Follow Up Flag: Follow up
Flag Status: Flagged

Good morning All work at the 5700 Warhill trl . BMP has been completed in conjunction with the inspection report given to us. If you have any concerns please feel free to call thanks for your help .

Ted Williamson
Underground Utility Foremen

James City Service Authority
119 Tewning Road
Williamsburg, VA 23188
P: 757-259-4097
F: 757-229-2463
jamescitycountyva.gov/jcsa