



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.

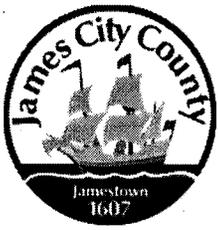
BMP NUMBER: JR033

DATE VERIFIED: June 19, 2012

QUALITY ASSURANCE TECHNICIAN: Leah Hardenbergh

Leah Hardenbergh

LOCATION: WILLIAMSBURG, VIRGINIA



Stormwater Division

MEMORANDUM

DATE: March 11, 2010
TO: Michael J. Gillis, Virginia Correctional Enterprises Document Management Services
FROM: Tina Cantwell, Stormwater
PO: 270712
RE: Files Approved for Scanning

General File ID or BMP ID: JR033

PIN: 4310100002 & 4320700001B

Subdivision, Tract, Business or Owner

Name (if known):

Governor's Land Foundation

Property Description:

Harbor Road

Site Address:

North to Intersection of Harbor Rd and Harbor Rd

(For internal use only)

Box 11

Drawer: 7

Agreements: (in file as of scan date)

N

Book or Doc#:

Page:

Comments

JR033

Contents for Stormwater Management Facilities As-built Files

Each file is to contain:

- ① As-built plan
2. Completed construction certification
3. Construction Plan
- ④ Design Calculations
5. Watershed Map
6. Maintenance Agreement
7. Correspondence with owners
8. Inspection Records
9. Enforcement Actions

James City County, Virginia
Environmental Division

Bond
was
Released.

Stormwater Management/BMP Facilities
Record Drawing/Construction Certification
Review Tracking Form

County Plan No.: S-127-93
Project Name: GOV LAND - Harbor Road BMP # 1 (AT ROAD INTERSECTION)
Stormwater Management Facility: WET MARSH

Phase: I II III

- Information Received. Date: 5/2/02 AES
- Administrative Check.
- Record Drawing. Date: 4/20/95; 6/7/99; NEW 3/30/02 AES
- Construction Certification. Date: _____
- RD/CC Standard Forms (Required after Feb 1st 2001 Only)
- Insp/Maint Agreement. Info: _____
- BMP Maintenance Plan. Location: _____
- Other: _____

Standard E&SC Note on Approved Plan Requiring RD/CC or County comment in plan review file.
 Yes No Location: _____

Assign County BMP ID Code Code: JR033

- Log into Division's "As-Built" Tracking Log
- Add Location to GIS Database Map. Obtain GIS site information (GPIN, Owner, Site Area, Address, etc.)
- Preliminary Log into BMP Database (BMP ID #, Site Plan #, GPIN, Project Name)
- Active Project File Review (correspondence, H&H, etc.)
- Initial As-Built File setup (label, copy hydraulics, BMP information, etc.)
- Inspector Check of RD/CC. NO

- Pre-Inspection Drawing Review - Approved Plan (Quick look prior to field inspection).
- Final Inspection (FI) Performed Date: 10/23/01 RH + Feb 2003
- Record Drawing (RD) Review Date: 2/28/03 SIT
- Construction Certification (CC) Review Date: na

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

} NO FORMAL REQUIREMENT
BOND HAS BEEN LET GO

Second Submission: 5/16/03 AES (RD)

Third Submission: _____

- Acceptable for stormwater management facility purposes (RD/CC/CR/Other). Proceed with bond release.
- Notify Darryl/Joan/Pat of acceptability using email (preferred), form or verbal.
- 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. used 10/23/01
- Digital Photographs obtained.
- No Add to JCC Hydrology & Hydraulic database (optional).

BMP Certification Information Acceptable

Plan Reviewer: [Signature] Date: 2/18/03



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: GOVERNOR'S LAND AT TWO RIVERS - THE HARBOR AT TWO RIVERS
Structure/BMP Name: ~~MARINA BMP~~ HARBOR ROAD BMP?
Project Location: SOUTH OF INTERSECTION OF HARBOR ROAD AND RIVER OAK ROAD
BMP Location: JUST NORTH OF INTERSECT OF HARBOR ROAD & HARBOR ROAD
County Plan No.: 3 - 127 - 93

Project Type: Residential Business Commercial Office Institutional Industrial Public Roadway Other
Tax Map/Parcel No.: (43-1)(1-1B) (44-2)(1-16)
BMP ID Code (if known): JR033
Zoning District: POWHEATAN DISTRICT
Land Use: RESIDENTIAL
Site Area (sf or acres): _____

Brief Description of Stormwater Management/BMP Facility: MARINA AUGMENTED DETENTION AREA

Nearest Visible Landmark to SWM/BMP Facility: GOVERNOR'S LAND HARBOR (DUE SOUTH)

Nearest Vertical Ground Control (if known):
 JCC Geodetic Ground Control USGS Temporary Arbitrary Other
Station Number or Name: 348
Datum or Reference Elevation: 12.74
Control Description: JCC MAN STATION
Control Location from Subject Facility: 7500 FEET DUE NORTH

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: 1994
Facility Monitored by County Representative during Construction: Yes No Unknown
Name of Site Work Contractor Who Constructed Facility: UNKNOWN
Name of Professional Firm Who Routinely Monitored Construction: _____
Date of Completion for SWM/BMP Facility: 1994
Date of Record Drawing/Construction Certification Submittal: MARCH 2002

(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: GOVERNOR'S LAND ASSOCIATES
Mailing Address: 9701 MILL POND RUN
TOANO, VIRGINIA
Business Phone: 757-234-5000 Fax: 757-234-5111
Contact Person: MR. JAMES H. BENNETT Title: VICE PRESIDENT - DEVELOPMENT

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

Firm Name: AES CONSULTING ENGINEERS / WILLIAMSBURG ENR. GROUP
Mailing Address: 5248 OLDE TOWNE ROAD, SUITE 1
WILLIAMSBURG, VIRGINIA 23188
Business Phone: 757-253-0040
Fax: 757-220-8994
Responsible Plan Preparer: V. MARC BENNETT / RON BOYD
Title: PROJECT ENGINEER
Plan Name: THE HARBOR AT TWO RIVERS
Firm's Project No. 7173-4-1
Plan Date: JANUARY 1994
Sheet No.'s Applicable to SWM/BMP Facility: 9A / 9 / 10 / 1

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

Name: _____
Mailing Address: _____
Business Phone: _____
Fax: _____
Contact Person: _____
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: AES CONSULTING ENGINEERS
Mailing Address: 5240 OLDE TOWNE RD, SUITE 1
WILLIAMSBURG, VIRGINIA 23108
Business Phone: 757-253-0040
Fax: 757-220-8994

Name: V. MARC BENNETT
Title: SENIOR PROJECT MANAGER

Signature: *V. Marc Bennett*
Date: 3/30/02

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

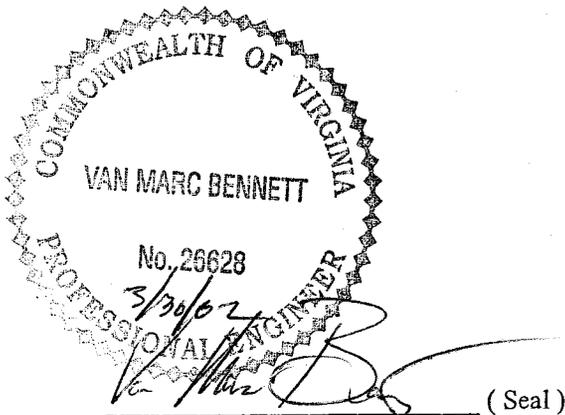
Construction Certification

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

Name: _____
Title: _____

Signature: _____
Date: _____

I hereby certify to the best of my knowledge and belief that 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.



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.
- 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.)

- XY 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.
- XY 2. Elevations to the nearest 0.1' unless higher accuracy is needed to show positive drainage.
- XY 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).
- XY 4. All plan sheet revision blocks modified to indicate date and record drawing status.
- XY 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.)

- XY 1. All requirements of Section I (Methods and Presentation) apply to this section.
- XY 2. Plan Views: Show general location, arrangement and dimensions. Location and alignment shall generally match approved design plans.
- XY 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.
- INC 4. Top widths, berm widths and embankment side slopes.
- XY 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.
- INC 6. Cross-section of the embankment through the principal spillway or outlet barrel. Must extend at least 100 ft. downstream of the pipe outlet or to recorded site property line, whichever is closer. Proper correlation is required between principal spillway (control structure) crest, emergency spillway crest, orifice and weirs and the top of the dam or facility. All elevations and dimensions must reasonably match the design plan or be sequentially relative to each other and the facility must reflect the required design storage volume(s) and/or design depth.
- N/A 7. Profile or elevations along the entire centerline of the emergency spillway. Emergency spillway may be steeper, but no flatter or narrower than design.
- N/A 8. Elevation of the principal spillway crest or outlet crest of the structure.

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

**STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST**

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

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

- | | | |
|------------|------|--|
| <u>N/A</u> | 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. |
| <u>N/A</u> | 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)

- XX B1. Same requirements as Group A Wet Ponds.
- XX B2. Minimum 2:1 length to width flow path provided across the facility.
- N/A B3. Micropool provided at or around outlet from BMP (generally 3 to 6 ft. deep).
- XX 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.
- INC B5. Adequate wetland buffer provided (Typically 25 ft. outward from maximum design water surface elevation and 15 ft. setback to structures).
- N/A B6. No more than one-half (1/2) of the wetland surface area is planted.
- N/A B7. Topsoil or wetland mulch provided to support vigorous growth of wetland plants.
- N/A B8. Planting zones staked or flagged in field and locations subsequently established by appropriate field surveying methods for record drawing presentation.

**STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST**

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

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

- N/A C1. All requirements of Section II, Minimum Standards, apply to Group C facilities as applicable.
- _____ 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.
- N/A C14. Adequate, direct access provided to the facility for future maintenance, operation and inspection.

**STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST**

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

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

- N/A D1. All requirements of Section II, Minimum Standards, apply to Group D facilities.
- D2. Sediment pretreatment devices provided.
- D3. For D-1 BMPs (Bioretention Cells), pretreatment consisting of a grass filter strip below level spreader (deflector); a gravel diaphragm; and mulch and planting soil layers were provided.
- D4. For D-1 BMPs (Bioretention Cells), plantings consist of native plant species; vegetation provided was based on zones of hydric tolerances; trees and understory of shrubs and herbaceous materials were provided; woody vegetation is absent from inflow locations; and trees are located around facility perimeter.
- D5. Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.
- D6. No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed .
- D7. Filtering system is off-line from storm drainage conveyance system.
- D8. Overflow outlet has adequate erosion protection.
- D9. Deflector, diversion, flow splitter or regulator structure provided to divert the water quality volume to the filtering structure.
- D10. Minimum four (4) inch perforated underdrain provided in a clean aggregate envelope layer beneath the facility.
- D11. Minimum fifty (50) foot separation from any slope fifteen (15) percent or greater. Minimum one hundred (100) foot separation horizontally from any known water supply well. Minimum one hundred (100) foot separation upslope and twenty-five (25) foot separation downslope from any building.
- D12. Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility.
- D13. No visual signs of erosion or channel degradation immediately downstream of facility.
- N/A D14. Adequate, direct access provided to the pretreatment area and/or filter bed for future maintenance.

**STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST**

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

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

- N/A D1. All requirements of Section II, Minimum Standards, apply to Group D facilities.
- _____ D2. Sediment pretreatment devices provided.
- _____ D3. For D-1 BMPs (Bioretention Cells), pretreatment consisting of a grass filter strip below level spreader (deflector); a gravel diaphragm; and mulch and planting soil layers were provided.
- _____ D4. For D-1 BMPs (Bioretention Cells), plantings consist of native plant species; vegetation provided was based on zones of hydric tolerances; trees and understory of shrubs and herbaceous materials were provided; woody vegetation is absent from inflow locations; and trees are located around facility perimeter.
- _____ D5. Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.
- _____ D6. No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed .
- _____ D7. Filtering system is off-line from storm drainage conveyance system.
- _____ D8. Overflow outlet has adequate erosion protection.
- _____ D9. Deflector, diversion, flow splitter or regulator structure provided to divert the water quality volume to the filtering structure.
- _____ D10. Minimum four (4) inch perforated underdrain provided in a clean aggregate envelope layer beneath the facility.
- _____ D11. Minimum fifty (50) foot separation from any slope fifteen (15) percent or greater. Minimum one hundred (100) foot separation horizontally from any known water supply well. Minimum one hundred (100) foot separation upslope and twenty-five (25) foot separation downslope from any building.
- _____ D12. Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility.
- _____ D13. No visual signs of erosion or channel degradation immediately downstream of facility.
- N/A D14. Adequate, direct access provided to the pretreatment area and/or filter bed for future maintenance.

**STORMWATER MANAGEMENT / BMP FACILITIES
AS-BUILT PLAN CHECKLIST**

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

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

- N/A E1. All requirements of Section II, Minimum Standards, apply to Group E facilities as applicable.
- E2. Open channel system has constructed longitudinal slope of less than four (4) percent.
- E3. No visual signs of erosion in the open channel system's soil and/or vegetative cover.
- E4. Open channel side slopes are no steeper than 2H:1V at any location. Preferred channel sideslope is 3H:1V or flatter.
- E5. No visual signs of ponding are present at any location in the open channel system, except at rock check dam locations for E-1 systems (Wet Swales).
- E6. For E-2 BMPs (Dry Swales), an underdrain system was provided.
- E7. Treated timber or rock check dams provided as pretreatment devices for the open channel system.
- E8. Gravel diaphragm provided in areas where lateral sheet flow from impervious surfaces are directly connected to the open channel system.
- E9. Grass cover/stabilization in the open channel system appears adaptable to the specific soils and hydric conditions for the site and along the channel system.
- E10. Open channel system areas with grass covers higher than four (4) to six (6) inches were properly mowed.
- E11. Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.
- E12. No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed and no adverse affects to the function of the facility are anticipated.
- E13. For E-3 BMPs (Biofilters), the bottom width is six (6) feet maximum at any location.
- E14. For E-3 BMPs (Biofilters), sideslopes are 3H:1V maximum at any location.
- E15. For E-3 BMPs (Biofilters), the constructed channel slope is less than or equal to three (3) percent at any location.
- N/A E16. For E-3 BMPs (Biofilters), the constructed grass channel is approximately equivalent to the constructed roadway length.

**STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST**

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

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

- N/A 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.
- N/A 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)

- | | | |
|------------|-----|---|
| <u>N/A</u> | 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. |
| <u>N/A</u> | 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.)

- N/A SD1. All requirements of Section II, Minimum Standards, apply to Storm Drainage Systems.
- N/A SD2. Horizontal location of all pipe and structures relative to the SWM/BMP facility.
- N/A SD3. Type, top elevation and invert elevation of all access type structures (inlets, manholes, etc.).
- N/A SD4. Material type, size or diameter, class, invert elevations, lengths and slopes for all pipe segments.
- N/A SD5. Class, length, width and depth of riprap and outlet protections or dimensions of special energy dissipation structures.

XII. Other Systems

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

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

**STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST**

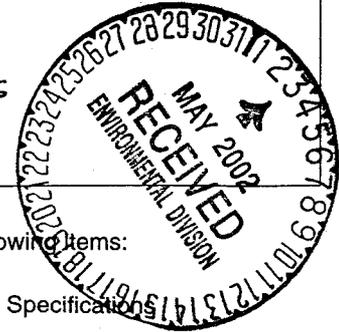
XIII. References *(The James City County Record Drawing and Construction Certification Forms and Checklists for Stormwater Management / BMP facilities were developed using the following sources and references.)*

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

File: Shared\SWMPProg\BMP\CertifRDCC.wpd

(757) 253-0040
 FAX (757) 220-8994

DATE 5/02/02	JOB NO. 7173-00
ATTENTION	
RE: GOVERNOR'S LAND BMP AS-BUILTS	



5-127-93
 JR033

TO JAMES CITY ENVIRONMENTAL DIVISION

WE ARE SENDING YOU Attached Under separate cover via _____ the following items:

- Shop drawings Prints Plans Samples Specifications
 Copy of letter Change order _____

COPIES	DATE	NO.	DESCRIPTION
1			EXCEPT FROM GEO-TECHNICAL REPORT FOR FOWLER'S LAKE
1			EXCEPT FROM GEO-TECHNICAL REPORT FOR WINGFIELD LAKE
2			RECORD DRAWINGS FOR TIMBER STRUCTURES #1, #2, #3, #4 IN PHASE 2
2			RECORD DRAWINGS FOR WINGFIELD LAKE
2			RECORD DRAWINGS FOR HORNES LAKE
2			RECORD DRAWINGS FOR MARINA BMP
2			RECORD DRAWINGS FOR THE HARBOR BMP MARINA VILLAGE BMP
2			RECORD DRAWINGS FOR WYCKE HAMLET BMP
2			RECORD DRAWINGS FOR NAUGHTON'S CORNER TIMBER STRUCTURE BMP

THESE ARE TRANSMITTED as checked below:

- For approval Approved as submitted Resubmit _____ copies for approval
 For your use Approved as noted Submit _____ copies for distribution
 As requested Returned for corrections Return _____ corrected prints
 For review and comment _____
 FOR BIDS DUE _____ PRINTS RETURNED AFTER LOAN TO US

REMARKS

~~THE~~ SHOULD BE THE FINISH OF THE BMP RECORD DRAWINGS IN GOVERNOR'S LAND

COPY TO _____

SIGNED: V. [Signature]

AES CONSULTING ENGINEERS

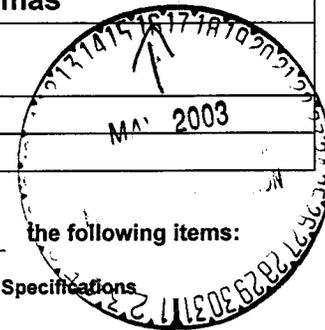
Engineering, Surveying and Planning
 5248 Olde Towne Road, Suite 1
 Williamsburg, Virginia 23188
 Phone: (757) 253-0040
 Fax: (757) 220-8994

LETTER OF TRANSMITTAL

DATE: 16-May-03	JOB NO. 7173-09
ATTENTION: Scott Thomas	
RE: Governor's Land	

TO : James City County
 Environmental Division

101 Mounts Bay Road
 Williamsburg, VA 23187



WE ARE SENDING YOU: Attached Under separate cover via _____ the following items:

Shop drawings Prints Plans Samples Specifications

Copy of letter Change order Other Construction Certification

COPIES	DATE	NO.	DESCRIPTION
1	5-15-03		As-Built drawing (Mylar) – Founder's Hill Timber Wall JR030
1	5-15-03		As-Built drawing (Black line) – Founder's Hill Timber Wall JR030
1	5-15-03		Memo responding to letter from County – Founder's Hill Timber Wall JR030
1	5-15-03		As-Built drawing (Mylar) – Fowler's Lake Block "B" Timber Wall JR054
1	5-15-03		As-Built drawing (Black line) – Fowler's Lake Block "B" Timber Wall JR054
1	5-15-03		Memo responding to letter from County – Fowler's Lake Block "B" Timber Wall JR054
1	5-15-03		As-Built drawing (Mylar) – The Harbor @ Two Rivers JR033
1	5-15-03		As-Built drawing (Black line) – The Harbor @ Two Rivers JR033
1	5-15-03		Memo responding to letter from County – The Harbor @ Two Rivers JR033
1	5-15-03		As-Built drawing (Mylar) – River Oaks North BMP JR034
1	5-15-03		As-Built drawing (Black line) – River Oaks North BMP JR034
1	5-15-03		Memo responding to letter from County – River Oaks North BMP JR034
1	5-16-03		As-Built drawing (Mylar) – Bennett's Pond JR021
1	5-16-03		As-Built drawing (Black line) – Bennett's Pond JR021
1	5-16-03		Memo responding to letter from County – Bennett's Pond JR021

THESE ARE TRANSMITTED as checked below:

- For Approval Approved as submitted Resubmit _____ copies for approval
- For your use Approved as noted Submit _____ copies for distribution
- As requested Returned for corrections Return _____ Corrected prints
- For review and comment For Signature _____
- FOR BIDS DUE _____ PRINTS RETURNED AFTER LOAN TO US

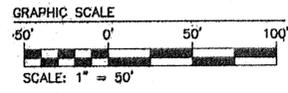
REMARKS:

If you have any questions please contact me. Thank you.

COPIES TO: file

SIGNED:

Victoria Bains
 Victoria Bains



NOTE:
REFER TO SHEET 8, PREPARED BY WILLIAMSBURG ENVIRONMENTAL GROUP, INC., FOR DESIGN INFORMATION OF BMP #1, #2, AND #3.

STREET NAME ASSIGNMENTS

ROAD A	RIVER OAKS ROAD
ROAD B	NO NAME ASSIGNED
ROAD C	NO NAME ASSIGNED
ROAD D	BARRET'S POINT ROAD
ROAD E	HARBOR ROAD
ROAD F	HARBOR ROAD

SELECT CLEARING

AREAS DENOTED FOR SELECT CLEARING ARE TO BE CLEARED FOR UNDERSTORY, MAINTENANCE, AND VISUAL PATH CLEARANCE. AREAS DENOTED FOR SELECT CLEARING WHICH ARE ALSO WETLANDS, RPA BUFFERS, OR RPA COMPONENTS SHALL OBTAIN APPROVAL FROM THE CODE COMPLIANCE OFFICE OF JAMES CITY COUNTY PRIOR TO ANY CLEARING ACTIVITIES.

TIE PERMANENT DIVERSION DIKE INTO EMBANKMENT OF BERM FOR BMP #1

GRASS SWALE W/ 3:1 SIDE SLOPES, 1.25' DEEP, AVR. SLOPE 0.50% (PROVIDE BACKSLOPE TO SWALE AS NECESSARY TO DIVERT FLOW TO BMP #1)

RIPRAP OUTLET PROTECTION - 4' WIDE x 6" LONG, USE $d_{50} = 12"$ STONE SIZE (APPROX. 1.5 CY) FILTER FABRIC TO BE PLACED UNDER RIPRAP

180 L.F. OF 15" RCP @ 0.41%

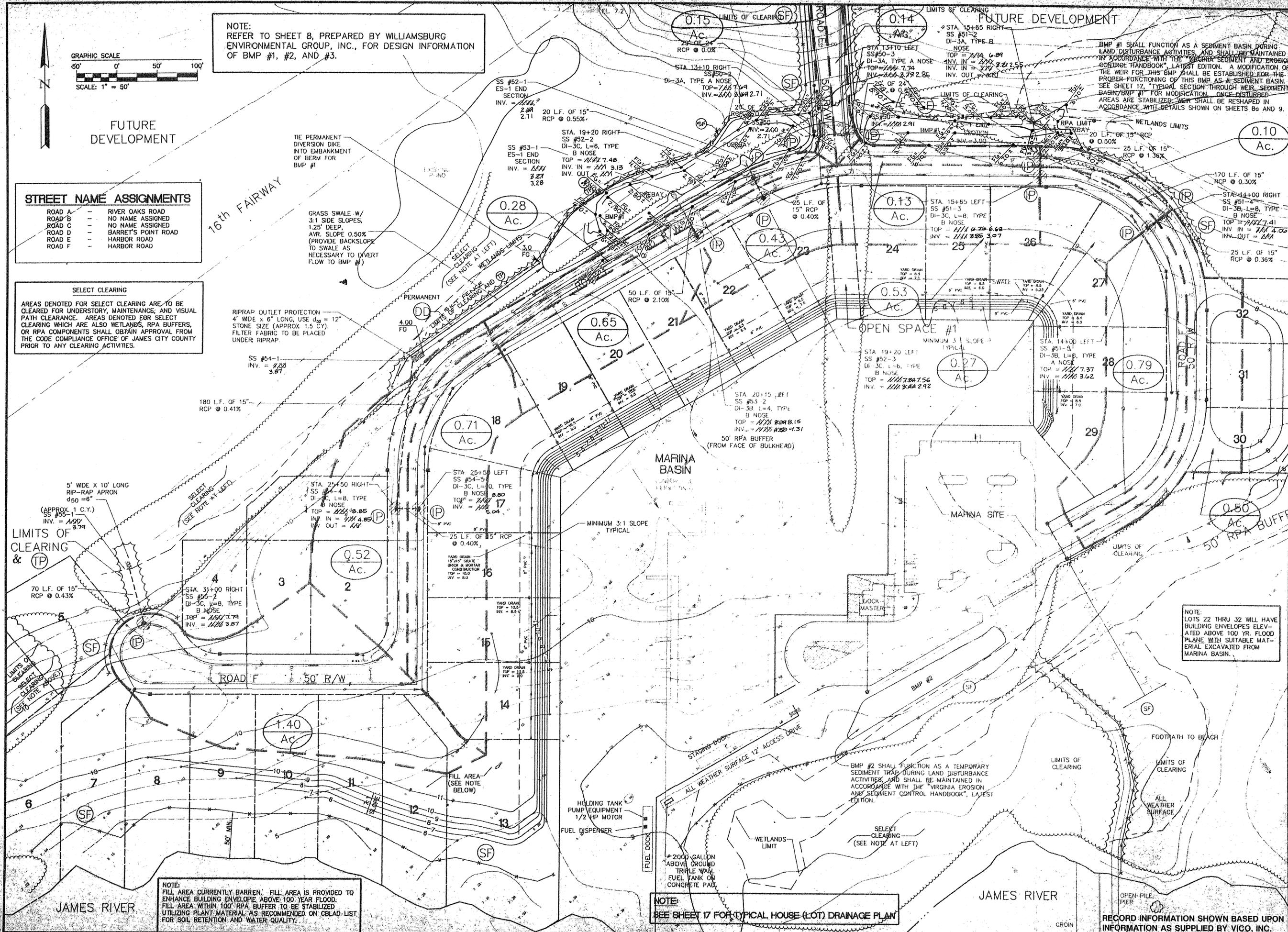
70 L.F. OF 15" RCP @ 0.43%

ROAD F 50' R/W

NOTE:
FILL AREA CURRENTLY BARRIEN. FILL AREA IS PROVIDED TO ENHANCE BUILDING ENVELOPE ABOVE 100 YEAR FLOOD. FILL AREA WITHIN 100' RPA BUFFER TO BE STABILIZED UTILIZING PLANT MATERIAL AS RECOMMENDED ON CBLAD LIST FOR SOIL RETENTION AND WATER QUALITY.

NOTE:
SEE SHEET 17 FOR TYPICAL HOUSE (LOT) DRAINAGE PLAN

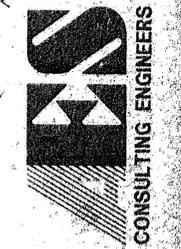
RECORD INFORMATION SHOWN BASED UPON INFORMATION AS SUPPLIED BY VICO, INC.



NO.	DATE	REVISION / COMMENT
1	1/94	REVISED PER COUNTY AND DEVELOPER COMMENTS
2	1/94	REVISED PER COUNTY AND DEVELOPER COMMENTS
3	4/20/95	REVISION DRAWING
4	6/7/99	BMP RECORD DRAWING



5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23186
(804) 253-0040
Fax (804) 220-8894



DRAINAGE AND EROSION CONTROL PLAN
THE HARBOR AT TWO RIVERS
GOVERNOR'S LAND AT TWO RIVERS

Designed	VMB	Drawn	B.A.J./SCL
Scale	1"=50'	Date	JAN. 1994
Project No.	7173	Drawing No.	7

GENERAL NOTES FOR GOVERNOR'S LAND - MARINA

- THE MARINA SITE IS LOCATED ON TAX PARCEL 1-16 AS SHOWN ON TAX MAP 44-2.
- THE SITE IS ZONED R-4, RESIDENTIAL PLANNED COMMUNITY.
- THE SITE IS LOCATED WITHIN THE ORIGINAL BOUNDARY OF THE GOVERNOR'S LAND TRACT AS SURVEYED AND PREPARED BY BENTSON, O'BELL, ELKIN & TITUS, LTD., AND DATED JULY 8, 1988.
- ALL UTILITIES ARE TO BE PLACED UNDERGROUND.
- A LAND DISTURBING PERMIT AND SILTATION AGREEMENT, WITH SURETY, ARE REQUIRED FOR THIS PROJECT.
- A PRECONSTRUCTION CONFERENCE SHALL BE HELD ON SITE AMONG THE COUNTY, THE DEVELOPER, THE PROJECT ENGINEER, AND THE CONTRACTOR PRIOR TO THE ISSUANCE OF A LAND DISTURBING PERMIT. THE CONTRACTOR SHALL SUBMIT A NARRATIVE PLAN TO THE COUNTY PRIOR TO THE PRE-CONSTRUCTION CONFERENCE DETAILING THE SEQUENCE OF CONSTRUCTION FOR THE PROJECT, INCLUDING INSTALLATION OF EROSION CONTROL MEASURES.
- GARBAGE REMOVAL WILL BE PROVIDED BY PRIVATE HAULER.
- BUILDING DATA

BUILDING HEIGHT	27'	10
NUMBER OF FLOORS	2	
USE TYPE	B	
CONSTRUCTION CLASSIFICATION	5B UNPROTECTED	
- BUILDING COVERAGE (INC. DOCKMASTER'S BLDG. & BOATHOUSE)

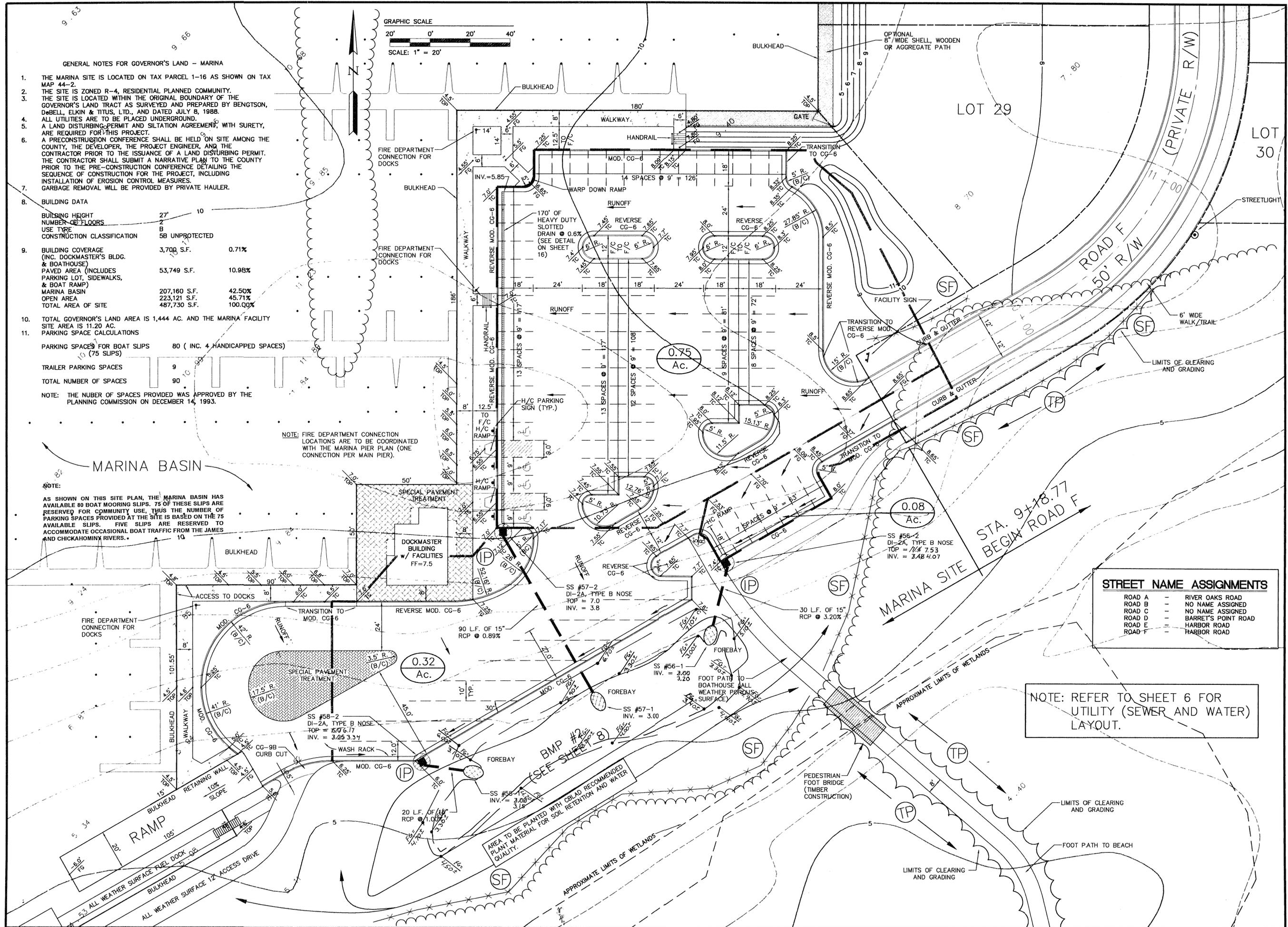
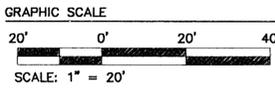
PAVED AREA (INCLUDES PARKING LOT, SIDEWALKS, & BOAT RAMP)	53,749 S.F.	10.98%
MARINA BASIN	207,160 S.F.	42.50%
OPEN AREA	223,121 S.F.	45.71%
TOTAL AREA OF SITE	487,730 S.F.	100.00%
- TOTAL GOVERNOR'S LAND AREA IS 1,444 AC. AND THE MARINA FACILITY SITE AREA IS 11.20 AC.

PARKING SPACES FOR BOAT SLIPS (75 SLIPS)	80 (INC. 4 HANDICAPPED SPACES)
TRAILER PARKING SPACES	9
TOTAL NUMBER OF SPACES	90

NOTE: THE NUMBER OF SPACES PROVIDED WAS APPROVED BY THE PLANNING COMMISSION ON DECEMBER 14, 1993.

NOTE: FIRE DEPARTMENT CONNECTION LOCATIONS ARE TO BE COORDINATED WITH THE MARINA PIER PLAN (ONE CONNECTION PER MAIN PIER).

NOTE: AS SHOWN ON THIS SITE PLAN, THE MARINA BASIN HAS AVAILABLE 80 BOAT MOORING SLIPS. 75 OF THESE SLIPS ARE RESERVED FOR COMMUNITY USE, THUS THE NUMBER OF PARKING SPACES PROVIDED AT THE SITE IS BASED ON THE 75 AVAILABLE SLIPS. FIVE SLIPS ARE RESERVED TO ACCOMMODATE OCCASIONAL BOAT TRAFFIC FROM THE JAMES AND CHICKAHOMINY RIVERS.



STREET NAME ASSIGNMENTS	
ROAD A	RIVER OAKS ROAD
ROAD B	NO NAME ASSIGNED
ROAD C	NO NAME ASSIGNED
ROAD D	BARRET'S POINT ROAD
ROAD E	HARBOR ROAD
ROAD F	HARBOR ROAD

NOTE: REFER TO SHEET 6 FOR UTILITY (SEWER AND WATER) LAYOUT.

NO.	DATE	REVISION / COMMENT / NOTE
1	3/94	REVISION PER COUNTY AND DEVELOPER COMMENTS
2	6/94	REVISION MARINA ROAD ALIGNMENT
3	6/99	BMP RECORD DRAWING



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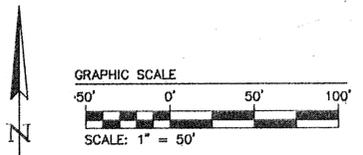


SITE PLAN - MARINA SITE
 THE HARBOR • TWO RIVERS
 GOVERNOR'S LAND
 AT
 TWO RIVERS

DESIGNED: VMB
 DRAWN: BJU
 SCALE: 1"=20'
 DATE: JAN. 1994
 PROJECT NO.: 7173
 DRAWING NO.: 10

POWhatan DISTRICT
 JAMES CITY COUNTY
 VIRGINIA

CONSULTING ENGINEERS



NOTE:
REFER TO SHEET 8, PREPARED BY WILLIAMSBURG ENVIRONMENTAL GROUP, INC., FOR DESIGN INFORMATION OF BMP #1, #2, AND #3.

STREET NAME ASSIGNMENTS

ROAD A	RIVER OAKS ROAD
ROAD B	NO NAME ASSIGNED
ROAD C	NO NAME ASSIGNED
ROAD D	BARRET'S POINT ROAD
ROAD E	HARBOR ROAD
ROAD F	HARBOR ROAD

SELECT CLEARING

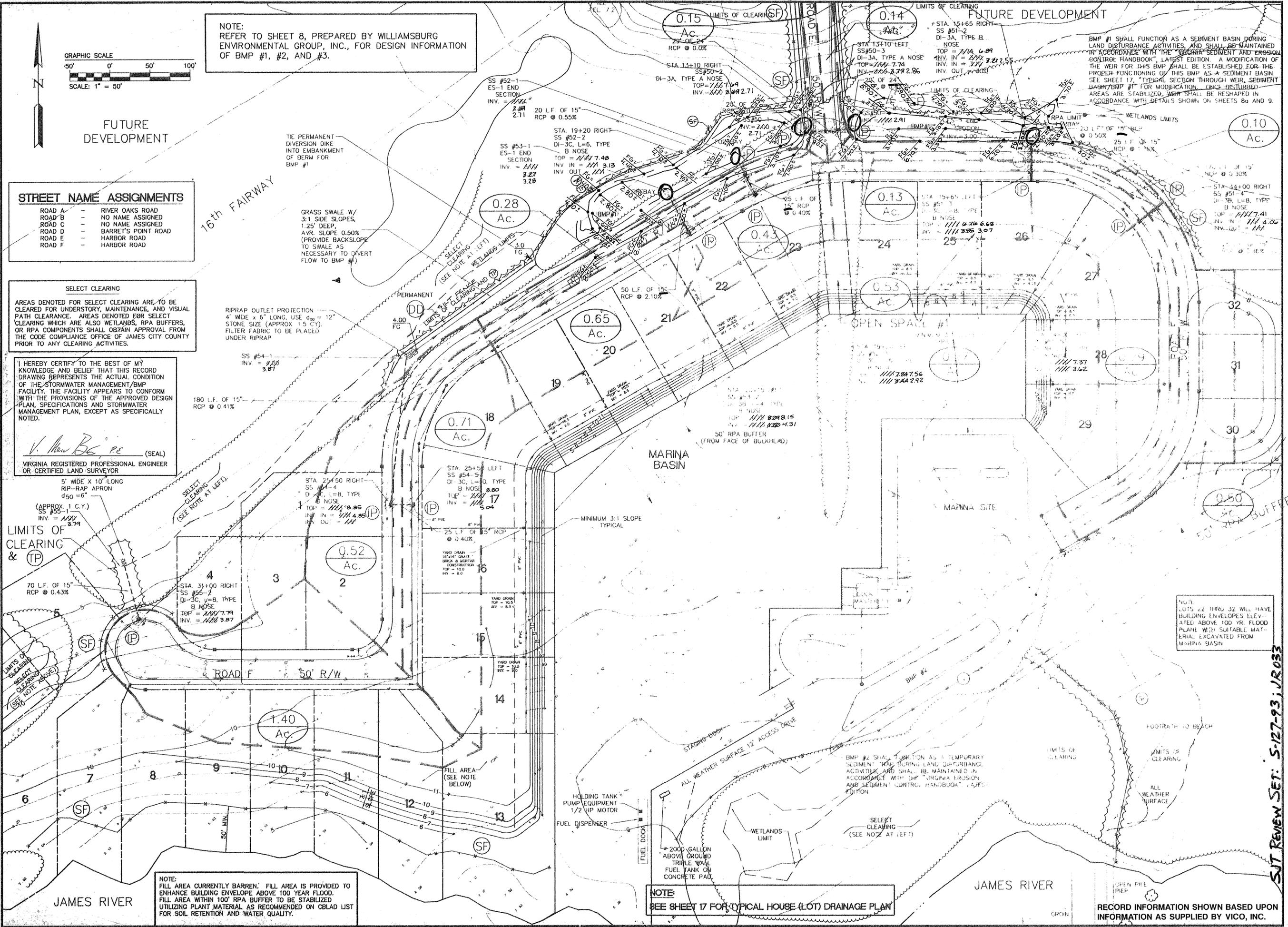
AREAS DENOTED FOR SELECT CLEARING ARE TO BE CLEARED FOR UNDERSTORY, MAINTENANCE, AND VISUAL PATH CLEARANCE. AREAS DENOTED FOR SELECT CLEARING WHICH ARE ALSO WETLANDS, RPA BUFFERS, OR RPA COMPONENTS SHALL OBTAIN APPROVAL FROM THE CODE COMPLIANCE OFFICE OF JAMES CITY COUNTY PRIOR TO ANY CLEARING ACTIVITIES.

I HEREBY CERTIFY TO THE BEST OF MY KNOWLEDGE AND BELIEF THAT THIS RECORD DRAWING REPRESENTS THE ACTUAL CONDITION OF THE STORMWATER MANAGEMENT/BMP FACILITY. THE FACILITY APPEARS TO CONFORM WITH THE PROVISIONS OF THE APPROVED DESIGN PLAN, SPECIFICATIONS AND STORMWATER MANAGEMENT PLAN, EXCEPT AS SPECIFICALLY NOTED.

V. Mue Beck, P.E. (SEAL)
VIRGINIA REGISTERED PROFESSIONAL ENGINEER OR CERTIFIED LAND SURVEYOR

5' WIDE X 10' LONG RIP-RAP APRON
d₅₀ = 6"
(APPROX. 1 C.Y.)
SS #55-1
INV. = 3.74

NOTE:
FILL AREA CURRENTLY BARREN. FILL AREA IS PROVIDED TO ENHANCE BUILDING ENVELOPE ABOVE 100 YEAR FLOOD. FILL AREA WITHIN 100' RPA BUFFER TO BE STABILIZED UTILIZING PLANT MATERIAL AS RECOMMENDED ON CBLAD LIST FOR SOIL RETENTION AND WATER QUALITY.



BMP #1 SHALL FUNCTION AS A SEDIMENT BASIN DURING LAND DISTURBANCE ACTIVITIES AND SHALL BE MAINTAINED ACCORDANCE WITH THE "CONCRETE SEDIMENT EROSION CONTROL HANDBOOK" LATEST EDITION. A MODIFICATION OF THE WEIR FOR THIS BMP SHALL BE ESTABLISHED FOR THE PROPER FUNCTIONING OF THIS BMP AS A SEDIMENT BASIN. SEE SHEET 17, "TYPICAL SECTION THROUGH WEIR, SEDIMENT BASIN/BMP #1" FOR MODIFICATION. ONCE DISTURBED AREAS ARE STABILIZED, WEIR SHALL BE RESHAPED IN ACCORDANCE WITH DETAILS SHOWN ON SHEETS 8a AND 9.

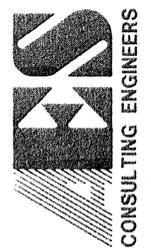
NOTE:
LOTS 22 THRU 32 WILL HAVE BUILDING ENVELOPES ELEVATED ABOVE 100 YR FLOOD PLANE WITH SUITABLE MATERIAL EXCAVATED FROM MARINA BASIN

NOTE:
SEE SHEET 17 FOR TYPICAL HOUSE (LOT) DRAINAGE PLAN

4	6/99	BMP RECORD DRAWING	VMB
3	4/20/99	RECORD DRAWING	VMB
2	6/94	REVISED MARINA ROAD ALIGNMENT	VMB
1	3/94	REVISED PER COUNTY AND DEVELOPER COMMENTS	VMB
		NO. DATE	BY



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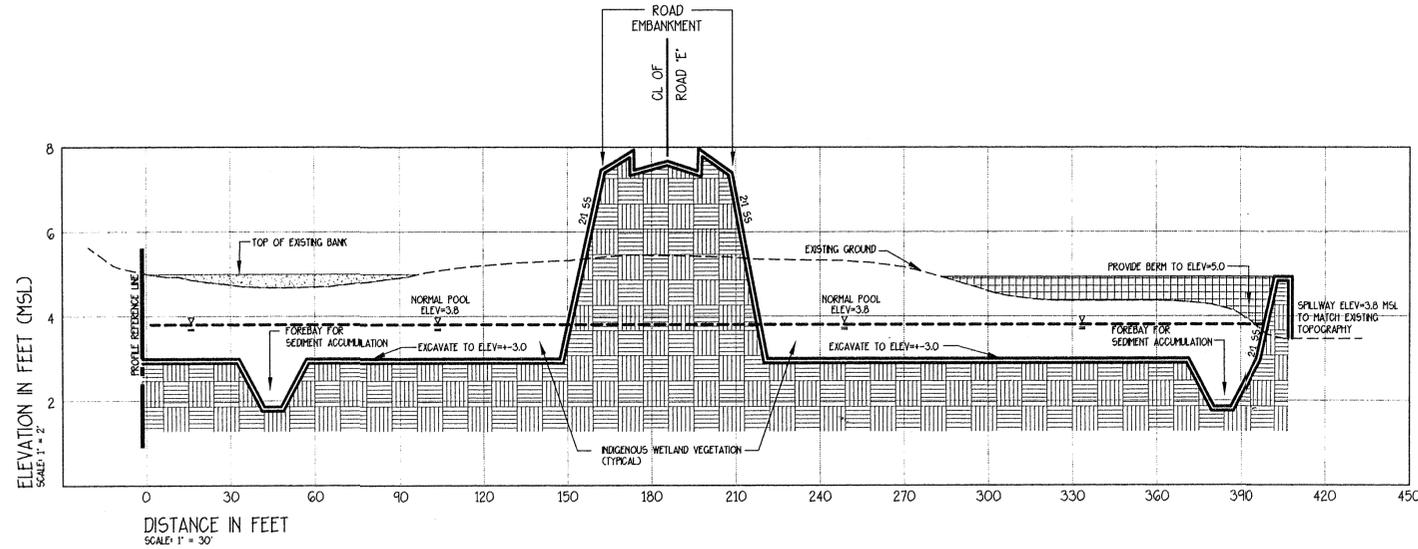


DRAINAGE AND EROSION CONTROL PLAN
THE HARBOR & TWO RIVERS
GOVERNOR'S LAND AT TWO RIVERS

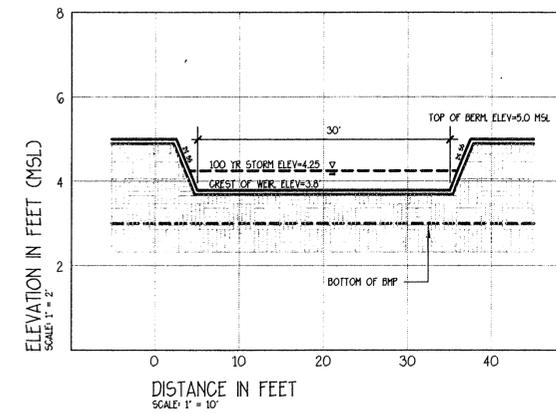
DESIGNED: VMB
DRAWN: BUJ/SCL
SCALE: 1" = 50'
DATE: JAN, 1994
PROJECT NO.: 7173
DRAWING NO.: 7

RECORD INFORMATION SHOWN BASED UPON INFORMATION AS SUPPLIED BY VICO, INC.

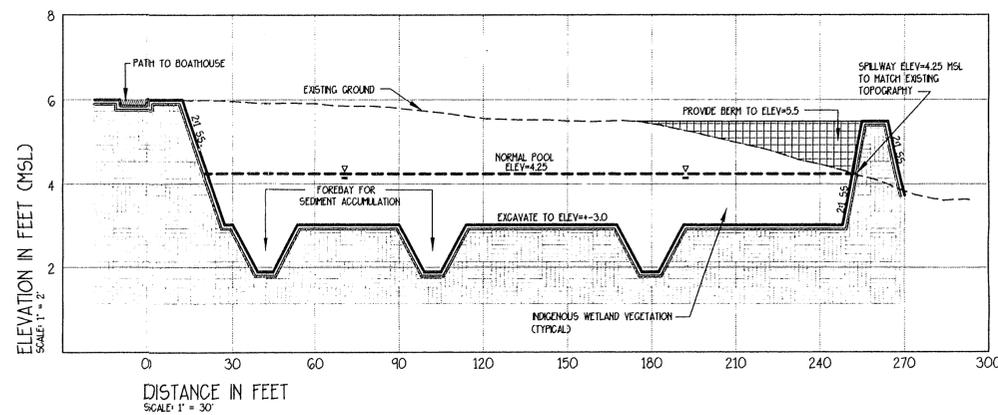
BMP #1: PROFILE



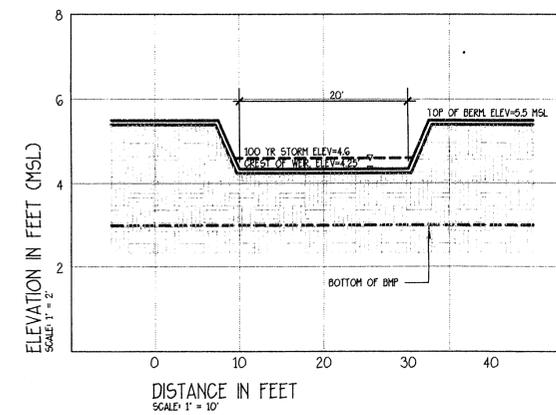
BMP #1: SPILLWAY SECTION



BMP #2: PROFILE

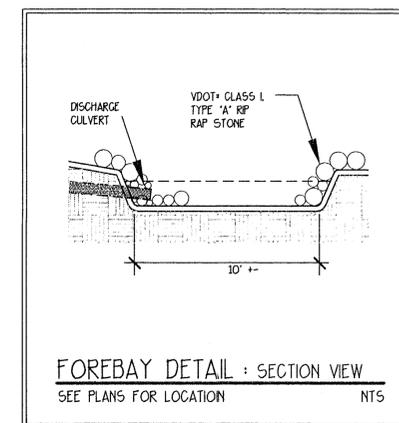
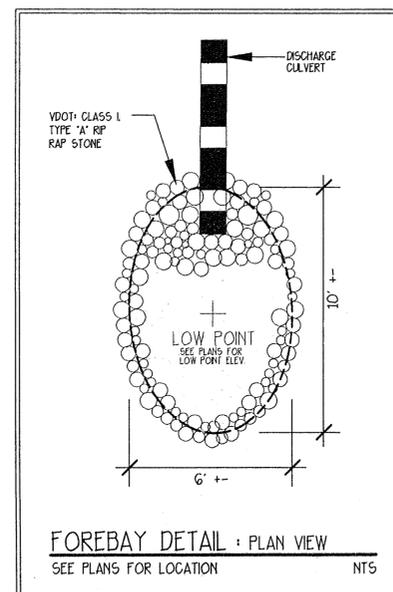


BMP #2: SPILLWAY SECTION



Governor's Land Marina BMP Hydrologic Characteristics

	Units	BMP #1	BMP #2
Drainage Characteristics			
Drainage Area	ac	6.5	1.2
Impervious Cover	%	36	95
Curve Number		75	98
Tc	hrs	0.4	0.1
BMP Physical Characteristics			
Embankment Elevation	ft (msl)	5.0	5.5
Weir Crest Elevation	ft (msl)	3.80	4.25
Weir Length	ft	30	20
Required Water Quality Storage	cult	8,620	3,910
Water Quality Storage Provided	cult	14,112	5,660
Normal Pool Elevation	ft(msl)	3.80	4.25
Stormwater Routings			
2-yr Inflow	cfs	8	6
10-yr Inflow	cfs	18	10
100-yr Inflow	cfs	31	15
2-yr Outflow	cfs	7	5
10-yr Outflow	cfs	18	8
100-yr Outflow	cfs	31	13
2-yr Elevation	ft (msl)	3.94	4.40
10-yr Elevation	ft (msl)	4.10	4.49
100-yr Elevation	ft (msl)	4.25	4.57
2-yr Velocity	fps	1.9	2.0
10-yr Velocity	fps	2.0	2.1
100-yr Velocity	fps	2.3	2.3



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BMP DETAILS
HARBOR AT TWO RIVERS
JAMES CITY COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
RONALD A. HOVD
NOV 02 2009
PROFESSIONAL ENGINEER

DRAWN BY: BLF/ACAD
CHECKED BY: RB
DATE: 06/15/94
SCALE:
SHEET: 9

JOB NUMBER:
06

Governor's Land
Marina

BMP Calculations

BMP #1, #2 + #3

prepared for:

Governor's Land Management Company
2700 Two Rivers Road
Williamsburg, Virginia 23185

prepared by:

Williamsburg Environmental Group, Inc.
516-B South Henry Street
Williamsburg, Virginia 23185

December , 1993

Governor's Land Marina

BMP Hydrologic Characteristics

	Units	BMP #1	BMP #2	BMP #3
Drainage Characteristics				
Drainage Area	ac	6.5	1.2	0.1
Impervious Cover	%	36	95	95
Curve Number		75	98	98
Tc	hrs	0.4	0.1	0.1
BMP Physical Characteristics				
Embankment Elevation	ft (msl)	5.0	5.5	5.0
Weir Crest Elevation	ft (msl)	3.80	4.25	4.00
Weir Length	ft	30	20	20
Required Water Quality Storage	cuft	8,620	3,910	240
Water Quality Storage Provided	cuft	10,900	5,660	350
Normal Pool Elevation	ft(msl)	3.80	4.25	4.00
Stormwater Routings				
2-yr Inflow	cfs	8	6	0
10-yr Inflow	cfs	18	10	1
100-yr Inflow	cfs	31	15	1
2-yr Outflow	cfs	7	5	0
10-yr Outflow	cfs	18	8	1
100-yr Outflow	cfs	31	13	1
2-yr Elevation	ft (msl)	3.94	4.40	4.00
10-yr Elevation	ft (msl)	4.10	4.49	4.03
100-yr Elevation	ft (msl)	4.25	4.57	4.03
2-yr Velocity	fps	1.9	2.0	0.0
10-yr Velocity	fps	2.0	2.1	1.7
100-yr Velocity	fps	2.3	2.3	1.7

BMP #1

Drainage Calculations

TR-55 TABULAR HYDROGRAPH METHOD
 Type II. Distribution
 (24 hr. Duration Storm)

Executed: 12-21-1993 16:49:24
 Watershed file: --> GLAND1 .MOP
 Hydrograph file: --> GLND12.HYD

Governor's Land
 BMP #1
 Post-development Flows

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
BMP #1	6.52	75.0	0.40	0.00	3.60	1.37	I.19 .19

* Travel time from subarea outfall to composite watershed outfall point.
 -- Subarea where user specified interpolation between Ia/p tables.

Total area = 6.52 acres or 0.01019 sq.mi
 Peak discharge = 8 cfs

>>>> Computer Modifications of Input Parameters <<<<

Subarea Description	Input Values		Rounded Values		Ia/p Interpolated	Ia/p Messages
	Tc (hr)	* Tt (hr)	Tc (hr)	* Tt (hr)	(Yes/No)	
BMP #1	0.40	0.00	**	**	Yes	--

* Travel time from subarea outfall to composite watershed outfall point.
 ** Tc & Tt are available in the hydrograph tables.

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-21-1993 16:49:24
Watershed file: --> GLAND1 .MOP
Hydrograph file: --> GLND12.HYD

Governor's Land
BMP #1
Post-development Flows

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
BMP #1	8	12.3
Composite Watershed	8	12.3

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-21-1993 16:49:24
Watershed file: --> GLAND1 .MOP
Hydrograph file: --> GLND12.HYD

Governor's Land
BMP #1
Post-development Flows

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
BMP #1	0	0	0	1	1	3	5	8	8
Total (cfs)	0	0	0	1	1	3	5	8	8

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
BMP #1	6	4	3	2	2	1	1	1	1
Total (cfs)	6	4	3	2	2	1	1	1	1

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
BMP #1	1	1	1	1	0	0	0	0	0
Total (cfs)	1	1	1	1	0	0	0	0	0

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
BMP #1	0	0	0	0	0
Total (cfs)	0	0	0	0	0

TR-55 TABULAR HYDROGRAPH METHOD
 Type II. Distribution
 (24 hr. Duration Storm)

Executed: 12-21-1993 16:49:24
 Watershed file: --> GLAND1 .MOP
 Hydrograph file: --> GLND110.HYD

Governor's Land
 BMP #1
 Post-development Flows

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
BMP #1	6.52	75.0	0.40	0.00	5.70	3.03	I.12 .12

* Travel time from subarea outfall to composite watershed outfall point.

I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 6.52 acres or 0.01019 sq.mi
 Peak discharge = 18 cfs

>>>> Computer Modifications of Input Parameters <<<<

Subarea Description	Input Values		Rounded Values		Ia/p Interpolated	Ia/p Messages
	Tc (hr)	* Tt (hr)	Tc (hr)	* Tt (hr)	(Yes/No)	
BMP #1	0.40	0.00	**	**	Yes	--

* Travel time from subarea outfall to composite watershed outfall point.

** Tc & Tt are available in the hydrograph tables.

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-21-1993 16:49:24
Watershed file: --> GLAND1 .MOP
Hydrograph file: --> GLND110.HYD

Governor's Land
BMP #1
Post-development Flows

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
BMP #1	18	12.3
Composite Watershed	18	12.3

TR-55 TABULAR HYDROGRAPH METHOD
 Type II. Distribution
 (24 hr. Duration Storm)

Executed: 12-21-1993 16:49:24
 Watershed file: --> GLAND1 .MOP
 Hydrograph file: --> GLND110.HYD

Governor's Land
 BMP #1
 Post-development Flows

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
MP #1	1	1	1	2	4	8	14	18	17
Total (cfs)	1	1	1	2	4	8	14	18	17

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
MP #1	13	9	7	5	3	2	2	2	2
Total (cfs)	13	9	7	5	3	2	2	2	2

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
MP #1	1	1	1	1	1	1	1	1	1
Total (cfs)	1	1	1	1	1	1	1	1	1

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
MP #1	1	1	0	0	0
Total (cfs)	1	1	0	0	0

TR-55 TABULAR HYDROGRAPH METHOD
 Type II. Distribution
 (24 hr. Duration Storm)

Executed: 12-21-1993 16:49:24
 Watershed file: --> GLAND1 .MOP
 Hydrograph file: --> GLND1100.HYD

Governor's Land
 BMP #1
 Post-development Flows

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
BMP #1	6.52	75.0	0.40	0.00	8.10	5.13	1.08 .10

* Travel time from subarea outfall to composite watershed outfall point.
 I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 6.52 acres or 0.01019 sq.mi
 Peak discharge = 31 cfs

>>>> Computer Modifications of Input Parameters <<<<

Subarea Description	Input Values		Rounded Values		Ia/p Interpolated	Ia/p Messages
	Tc (hr)	* Tt (hr)	Tc (hr)	* Tt (hr)	(Yes/No)	
BMP #1	0.40	0.00	**	**	No	Computed Ia/p < .1

* Travel time from subarea outfall to composite watershed outfall point.
 ** Tc & Tt are available in the hydrograph tables.

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-21-1993 16:49:24
Watershed file: --> GLAND1 .MOP
Hydrograph file: --> GLND1100.HYD

Governor's Land
BMP #1
Post-development Flows

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
BMP #1	31	12.3
Composite Watershed	31	12.3

TR-55 TABULAR HYDROGRAPH METHOD
 Type II. Distribution
 (24 hr. Duration Storm)

Executed: 12-21-1993 16:49:24
 Watershed file: --> GLAND1 .MOP
 Hydrograph file: --> GLND1100.HYD

Governor's Land
 BMP #1
 Post-development Flows

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
BMP #1	1	1	2	4	7	14	24	31	30
Total (cfs)	1	1	2	4	7	14	24	31	30

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
BMP #1	23	16	11	9	5	4	3	3	3
Total (cfs)	23	16	11	9	5	4	3	3	3

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
BMP #1	2	2	2	2	1	1	1	1	1
Total (cfs)	2	2	2	2	1	1	1	1	1

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
BMP #1	1	1	1	1	0
Total (cfs)	1	1	1	1	0

BMP #2

Drainage Calculations

TR-55 TABULAR HYDROGRAPH METHOD
 Type II. Distribution
 (24 hr. Duration Storm)

Executed: 12-21-1993 16:49:56
 Watershed file: --> GLAND2 .MOP
 Hydrograph file: --> GLND22.HYD

Governor's Land
 BMP #2
 Post-development Flows

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
BMP #2	1.17	98.0	0.10	0.00	3.60	3.37	I.01 .10

* Travel time from subarea outfall to composite watershed outfall point.
 -- Subarea where user specified interpolation between Ia/p tables.

Total area = 1.17 acres or 0.00183 sq.mi
 Peak discharge = 6 cfs

>>>> Computer Modifications of Input Parameters <<<<

Subarea Description	Input Values		Rounded Values		Ia/p Interpolated	Ia/p Messages
	Tc (hr)	* Tt (hr)	Tc (hr)	* Tt (hr)	(Yes/No)	
BMP #2	0.10	0.00	**	**	No	Computed Ia/p < .1

* Travel time from subarea outfall to composite watershed outfall point.
 ** Tc & Tt are available in the hydrograph tables.

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-21-1993 16:49:56
Watershed file: --> GLAND2 .MOP
Hydrograph file: --> GLND22.HYD

Governor's Land
BMP #2
Post-development Flows

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
BMP #2	6	12.1
Composite Watershed	6	12.1

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)Executed: 12-21-1993 16:49:56
Watershed file: --> GLAND2 .MOP
Hydrograph file: --> GLND22.HYDGovernor's Land
BMP #2
Post-development Flows

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
BMP #2	0	0	0	2	4	6	4	1	1
Total (cfs)	0	0	0	2	4	6	4	1	1

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
BMP #2	1	1	1	0	0	0	0	0	0
Total (cfs)	1	1	1	0	0	0	0	0	0

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
BMP #2	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
BMP #2	0	0	0	0	0
Total (cfs)	0	0	0	0	0

TR-55 TABULAR HYDROGRAPH METHOD
 Type II. Distribution
 (24 hr. Duration Storm)

Executed: 12-21-1993 16:49:56
 Watershed file: --> GLAND2 .MOP
 Hydrograph file: --> GLND210.HYD

Governor's Land
 BMP #2
 Post-development Flows

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
BMP #2	1.17	98.0	0.10	0.00	5.70	5.46	I.01 .10

* Travel time from subarea outfall to composite watershed outfall point.
 I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 1.17 acres or 0.00183 sq.mi
 Peak discharge = 10 cfs

>>>> Computer Modifications of Input Parameters <<<<

Subarea Description	Input Values		Rounded Values		Ia/p Interpolated	Ia/p Messages
	Tc (hr)	* Tt (hr)	Tc (hr)	* Tt (hr)	(Yes/No)	
BMP #2	0.10	0.00	**	**	No	Computed Ia/p < .1

* Travel time from subarea outfall to composite watershed outfall point.
 ** Tc & Tt are available in the hydrograph tables.

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-21-1993 16:49:56
Watershed file: --> GLAND2 .MOP
Hydrograph file: --> GLND210.HYD

Governor's Land
BMP #2
Post-development Flows

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
BMP #2	10	12.1
Composite Watershed	10	12.1

TR-55 TABULAR HYDROGRAPH METHOD
 Type II. Distribution
 (24 hr. Duration Storm)

Executed: 12-21-1993 16:49:56
 Watershed file: --> GLAND2 .MOP
 Hydrograph file: --> GLND210.HYD

Governor's Land
 BMP #2
 Post-development Flows

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
BMP #2	0	0	1	3	6	10	6	2	1
Total (cfs)	0	0	1	3	6	10	6	2	1

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
BMP #2	1	1	1	1	1	1	1	0	0
Total (cfs)	1	1	1	1	1	1	1	0	0

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
BMP #2	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
BMP #2	0	0	0	0	0
Total (cfs)	0	0	0	0	0

TR-55 TABULAR HYDROGRAPH METHOD
 Type II. Distribution
 (24 hr. Duration Storm)

Executed: 12-21-1993 16:49:56
 Watershed file: --> GLAND2 .MOP
 Hydrograph file: --> GLND2100.HYD

Governor's Land
 BMP #2
 Post-development Flows

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
BMP #2	1.17	98.0	0.10	0.00	8.10	7.86	I.01 .10

* Travel time from subarea outfall to composite watershed outfall point.
 I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 1.17 acres or 0.00183 sq.mi
 Peak discharge = 15 cfs

>>>> Computer Modifications of Input Parameters <<<<

Subarea Description	Input Values		Rounded Values		Ia/p Interpolated	Ia/p Messages
	Tc (hr)	* Tt (hr)	Tc (hr)	* Tt (hr)	(Yes/No)	
BMP #2	0.10	0.00	**	**	No	Computed Ia/p < .1

* Travel time from subarea outfall to composite watershed outfall point.
 ** Tc & Tt are available in the hydrograph tables.

TR-55 TABULAR HYDROGRAPH METHOD
 Type II. Distribution
 (24 hr. Duration Storm)

Executed: 12-21-1993 16:49:56
 Watershed file: --> GLAND2 .MOP
 Hydrograph file: --> GLND2100.HYD

Governor's Land
 BMP #2
 Post-development Flows

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
BMP #2	15	12.1
Composite Watershed	15	12.1

TR-55 TABULAR HYDROGRAPH METHOD
 Type II. Distribution
 (24 hr. Duration Storm)

Executed: 12-21-1993 16:49:56
 Watershed file: --> GLAND2 .MOP
 Hydrograph file: --> GLND2100.HYD

Governor's Land
 BMP #2
 Post-development Flows

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
BMP #2	0	0	1	5	9	15	9	3	2
Total (cfs)	0	0	1	5	9	15	9	3	2

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
BMP #2	2	1	1	1	1	1	1	1	1
Total (cfs)	2	1	1	1	1	1	1	1	1

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
BMP #2	1	0	0	0	0	0	0	0	0
Total (cfs)	1	0	0	0	0	0	0	0	0

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
BMP #2	0	0	0	0	0
Total (cfs)	0	0	0	0	0

BMP #3

Drainage Calculations

TR-55 TABULAR HYDROGRAPH METHOD
 Type II. Distribution
 (24 hr. Duration Storm)

Executed: 12-22-1993 10:18:49
 Watershed file: --> GLAND3 .MOP
 Hydrograph file: --> GLND32.HYD

Governor's Land
 BMP #3
 Post-development Flows

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
BMP #3	0.06	98.0	0.10	0.00	3.60	3.37	I.01 .10

* Travel time from subarea outfall to composite watershed outfall point.
 I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 0.06 acres or 0.00009 sq.mi
 Peak discharge = 0 cfs

>>>> Computer Modifications of Input Parameters <<<<

Subarea Description	Input Values		Rounded Values		Ia/p Interpolated (Yes/No)	Ia/p Messages
	Tc (hr)	* Tt (hr)	Tc (hr)	* Tt (hr)		
BMP #3	0.10	0.00	**	**	No	Computed Ia/p < .1

* Travel time from subarea outfall to composite watershed outfall point.
 * Tc & Tt are available in the hydrograph tables.

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-22-1993 10:18:49
Watershed file: --> GLAND3 .MOP
Hydrograph file: --> GLND32.HYD

Governor's Land
BMP #3
Post-development Flows

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
BMP #3	0	0.0
Composite Watershed	0	0.0

TR-55 TABULAR HYDROGRAPH METHOD
 Type II. Distribution
 (24 hr. Duration Storm)

Executed: 12-22-1993 10:18:49
 Watershed file: --> GLAND3 .MOP
 Hydrograph file: --> GLND32.HYD

Governor's Land
 BMP #3
 Post-development Flows

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
BMP #3	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
BMP #3	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
BMP #3	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
BMP #3	0	0	0	0	0
Total (cfs)	0	0	0	0	0

TR-55 TABULAR HYDROGRAPH METHOD
 Type II. Distribution
 (24 hr. Duration Storm)

Executed: 12-22-1993 10:18:49
 Watershed file: --> GLAND3 .MOP
 Hydrograph file: --> GLND310.HYD

Governor's Land
 BMP #3
 Post-development Flows

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
BMP #3	0.06	98.0	0.10	0.00	5.70	5.46	I.01 .10

* Travel time from subarea outfall to composite watershed outfall point.
 I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 0.06 acres or 0.00009 sq.mi
 Peak discharge = 1 cfs

>>>> Computer Modifications of Input Parameters <<<<

Subarea Description	Input Values		Rounded Values		Ia/p Interpolated	Ia/p Messages
	Tc (hr)	* Tt (hr)	Tc (hr)	* Tt (hr)	(Yes/No)	
BMP #3	0.10	0.00	**	**	No	Computed Ia/p < .1

* Travel time from subarea outfall to composite watershed outfall point.
 ** Tc & Tt are available in the hydrograph tables.

TR-55 TABULAR HYDROGRAPH METHOD
 Type II. Distribution
 (24 hr. Duration Storm)

Executed: 12-22-1993 10:18:49
 Watershed file: --> GLAND3 .MOP
 Hydrograph file: --> GLND310.HYD

Governor's Land
 BMP #3
 Post-development Flows

 Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
BMP #3	0	0	0	0	0	1	0	0	0
Total (cfs)	0	0	0	0	0	1	0	0	0

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
BMP #3	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
BMP #3	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
BMP #3	0	0	0	0	0
Total (cfs)	0	0	0	0	0

TR-55 TABULAR HYDROGRAPH METHOD
 Type II. Distribution
 (24 hr. Duration Storm)

Executed: 12-22-1993 10:18:49
 Watershed file: --> GLAND3 .MOP
 Hydrograph file: --> GLND3100.HYD

Governor's Land
 BMP #3
 Post-development Flows

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
BMP #3	0.06	98.0	0.10	0.00	8.10	7.86	I.01 .10

* Travel time from subarea outfall to composite watershed outfall point.
 I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 0.06 acres or 0.00009 sq.mi
 Peak discharge = 1 cfs

>>>> Computer Modifications of Input Parameters <<<<

Subarea Description	Input Values		Rounded Values		Ia/p Interpolated (Yes/No)	Ia/p Messages
	Tc (hr)	* Tt (hr)	Tc (hr)	* Tt (hr)		
BMP #3	0.10	0.00	**	**	No	Computed Ia/p < .1

* Travel time from subarea outfall to composite watershed outfall point.
 ** Tc & Tt are available in the hydrograph tables.

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-22-1993 10:18:49
Watershed file: --> GLAND3 .MOP
Hydrograph file: --> GLND3100.HYD

Governor's Land
BMP #3
Post-development Flows

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
BMP #3	1	12.1
Composite Watershed	1	12.1

TR-55 TABULAR HYDROGRAPH METHOD
 Type II. Distribution
 (24 hr. Duration Storm)

Executed: 12-22-1993 10:18:49
 Watershed file: --> GLAND3 .MOP
 Hydrograph file: --> GLND3100.HYD

Governor's Land
 BMP #3
 Post-development Flows

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
BMP #3	0	0	0	0	0	1	0	0	0
Total (cfs)	0	0	0	0	0	1	0	0	0

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
BMP #3	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
BMP #3	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
BMP #3	0	0	0	0	0
Total (cfs)	0	0	0	0	0

BMP #2

Outlet Structure

Outlet Structure File: GLAND2 .STR

POND-2 Version: 5.15

S/N: 1295100016

Date Executed:

Time Executed:

***** COMPOSITE OUTFLOW SUMMARY *****

<u>Elevation (ft)</u>	<u>Q (cfs)</u>	<u>Contributing Structures</u>
3.00	0.0	
3.25	0.0	
3.50	0.0	
3.75	0.0	
4.00	0.0	
4.25	0.0	1
4.50	8.3	1
4.75	23.4	1
5.00	42.9	1

Outlet Structure File: GLAND2 .STR

POND-2 Version: 5.15

S/N: 1295100016

Date Executed:

Time Executed:

Outlet Structure File: GLAND2 .STR
 Planimeter Input File: GLAND2 .VOL
 Rating Table Output File: GLAND2 .PND

Min. Elev.(ft) = 3 Max. Elev.(ft) = 5 Incr.(ft) = .25

Additional elevations (ft) to be included in table:

* * * * *

 SYSTEM CONNECTIVITY

Structure	No.	Q Table	Q Table
WEIR-VR	1	->	1

Outflow rating table summary was stored in file:
 GLAND2 .PND

Outlet Structure File: GLAND2 .STR

POND-2 Version: 5.15

S/N: 1295100016

Date Executed:

Time Executed:

>>>>> Structure No. 1 <<<<<<
(Input Data)

WEIR-VR

Weir - Vertical Rectangular

E1 elev.(ft)?	4.25
E2 elev.(ft)?	5.001
Weir coefficient?	3.33
Weir elev.(ft)?	4.25
Length (ft)?	20
Contracted/Suppressed (C/S)?	C

Outlet Structure File: GLAND2 .STR

POND-2 Version: 5.15

S/N: 1295100016

Date Executed:

Time Executed:

Outflow Rating Table for Structure #1
WEIR-VR Weir - Vertical Rectangular

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation	Messages
3.00	0.0	E < Inv.El.=	4.25
3.25	0.0	E < Inv.El.=	4.25
3.50	0.0	E < Inv.El.=	4.25
3.75	0.0	E < Inv.El.=	4.25
4.00	0.0	E < Inv.El.=	4.25
4.25	0.0	H =0.0	
4.50	8.3	H =.25	
4.75	23.4	H =.5	
5.00	42.9	H =.750	

C = 3.33 L (ft) = 20

H (ft) = Table elev. - Invert elev. (4.25 ft)

Q (cfs) = C * (L-.2H) * (H**1.5) -- Contracted Weir

BMP #3

Outlet Structure

Outlet Structure File: GLAND3 .STR

POND-2 Version: 5.15

S/N: 1295100016

Date Executed:

Time Executed:

***** COMPOSITE OUTFLOW SUMMARY *****

<u>Elevation (ft)</u>	<u>Q (cfs)</u>	<u>Contributing Structures</u>
3.00	0.0	
3.25	0.0	
3.50	0.0	
3.75	0.0	
4.00	0.0	1
4.25	8.3	1
4.50	23.4	1
4.75	42.9	1
5.00	65.9	1

Outlet Structure File: GLAND3 .STR

POND-2 Version: 5.15

S/N: 1295100016

Date Executed:

Time Executed:

Outlet Structure File: GLAND3 .STR
Planimeter Input File: GLAND3 .VOL
Rating Table Output File: GLAND3 .PND

Min. Elev.(ft) = 3 Max. Elev.(ft) = 5 Incr.(ft) = .25

Additional elevations (ft) to be included in table:

* * * * *

SYSTEM CONNECTIVITY

Structure	No.	Q Table	Q Table
-----	---	-----	-----
WEIR-VR	1		-> 1

Outflow rating table summary was stored in file:
GLAND3 .PND

Outlet Structure File: GLAND3 .STR

POND-2 Version: 5.15

S/N: 1295100016

Date Executed:

Time Executed:

>>>>> Structure No. 1 <<<<<<
(Input Data)

WEIR-VR

Weir - Vertical Rectangular

E1 elev.(ft)?	4
E2 elev.(ft)?	5.001
Weir coefficient?	3.33
Weir elev.(ft)?	4.0
Length (ft)?	20
Contracted/Suppressed (C/S)?	C

Outlet Structure File: GLAND3 .STR

POND-2 Version: 5.15

S/N: 1295100016

Date Executed:

Time Executed:

Outflow Rating Table for Structure #1
WEIR-VR Weir - Vertical Rectangular

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages
3.00	0.0	E < Inv.El.= 4
3.25	0.0	E < Inv.El.= 4
3.50	0.0	E < Inv.El.= 4
3.75	0.0	E < Inv.El.= 4
4.00	0.0	H =0.0
4.25	8.3	H =.25
4.50	23.4	H =.5
4.75	42.9	H =.750
5.00	65.9	H =1.0

C = 3.33 L (ft) = 20

H (ft) = Table elev. - Invert elev. (4 ft)

Q (cfs) = C * (L-.2H) * (H**1.5) -- Contracted Weir

BMP #1

Outlet Structure

Outlet Structure File: GLAND1 .STR

POND-2 Version: 5.15
Date Executed:

S/N: 1295100016
Time Executed:

***** COMPOSITE OUTFLOW SUMMARY *****

<u>Elevation (ft)</u>	<u>Q (cfs)</u>	<u>Contributing Structures</u>
3.00	0.0	
3.25	0.0	
3.50	0.0	
3.75	0.0	
4.00	8.9	1
4.25	30.1	1
4.50	58.2	1
4.75	91.9	1
5.00	130.3	1

Outlet Structure File: GLAND1 .STR

POND-2 Version: 5.15

S/N: 1295100016

Date Executed:

Time Executed:

Outlet Structure File: GLAND1 .STR

Planimeter Input File: GLAND1 .VOL

Rating Table Output File: GLAND1 .PND

Min. Elev.(ft) = 3 Max. Elev.(ft) = 5 Incr.(ft) = .25

Additional elevations (ft) to be included in table:

* * * * *

SYSTEM CONNECTIVITY

Structure	No.	Q Table	Q Table
-----	---	-----	-----
WEIR-VR	1	->	1

Outflow rating table summary was stored in file:

GLAND1 .PND

Outlet Structure File: GLAND1 .STR

POND-2 Version: 5.15

S/N: 1295100016

Date Executed:

Time Executed:

>>>>> Structure No. 1 <<<<<<
(Input Data)

WEIR-VR

Weir - Vertical Rectangular

E1 elev.(ft)?	3.8
E2 elev.(ft)?	5.001
Weir coefficient?	3.33
Weir elev.(ft)?	3.8
Length (ft)?	30
Contracted/Suppressed (C/S)?	C

BMP #1

Routing Calculations

Inflow Hydrograph: GLND32 .HYD
 Rating Table file: GLAND3 .PND

----INITIAL CONDITIONS----
 Elevation = 4.00 ft
 Outflow = 0.00 cfs
 Storage = 0.01 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
3.00	0.0	0.000
3.25	0.0	0.001
3.50	0.0	0.003
3.75	0.0	0.005
4.00	0.0	0.008
4.25	8.3	0.011
4.50	23.4	0.014
4.75	42.9	0.018
5.00	65.9	0.022

INTERMEDIATE ROUTING
 COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
0.0	0.0
0.3	0.3
0.7	0.7
1.2	1.2
1.9	1.9
2.6	10.9
3.4	26.8
4.3	47.2
5.3	71.2

Time increment (t) = 0.100 hrs.

Inflow Hydrograph: GLND12 .HYD
 Rating Table file: GLAND1 .PND

-----INITIAL CONDITIONS-----
 Elevation = 3.80 ft
 Outflow = 1.78 cfs
 Storage = 0.25 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
3.00	0.0	0.000
3.25	0.0	0.076
3.50	0.0	0.155
3.75	0.0	0.237
4.00	8.9	0.322
4.25	30.1	0.410
4.50	58.2	0.501
4.75	91.9	0.593
5.00	130.3	0.689

INTERMEDIATE ROUTING
 COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
0.0	0.0
18.3	18.3
37.5	37.5
57.4	57.4
78.0	86.9
99.3	129.4
121.1	179.3
143.6	235.5
166.6	296.9

Time increment (t) = 0.100 hrs.

***** SUMMARY OF ROUTING COMPUTATIONS *****

Pond File: GLAND1 .PND
Inflow Hydrograph: GLND12 .HYD
Outflow Hydrograph: GLND20 .HYD

Starting Pond W.S. Elevation = 3.80 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow = 8.00 cfs
Peak Outflow = 6.94 cfs
Peak Elevation = 3.94 ft

***** Summary of Approximate Peak Storage *****

Initial Storage = 0.25 ac-ft
Peak Storage From Storm = 0.05 ac-ft

Total Storage in Pond = 0.30 ac-ft

>>>> Warning, initial pond outflow > 1st inflow ordinate. <<<<<

Inflow Hydrograph: GLND110 .HYD
 Rating Table file: GLAND1 .PND

----INITIAL CONDITIONS----

Elevation = 3.80 ft
 Outflow = 1.78 cfs
 Storage = 0.25 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
3.00	0.0	0.000
3.25	0.0	0.076
3.50	0.0	0.155
3.75	0.0	0.237
4.00	8.9	0.322
4.25	30.1	0.410
4.50	58.2	0.501
4.75	91.9	0.593
5.00	130.3	0.689

INTERMEDIATE ROUTING
 COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
0.0	0.0
18.3	18.3
37.5	37.5
57.4	57.4
78.0	86.9
99.3	129.4
121.1	179.3
143.6	235.5
166.6	296.9

Time increment (t) = 0.100 hrs.

***** SUMMARY OF ROUTING COMPUTATIONS *****

Pond File: GLAND1 .PND
Inflow Hydrograph: GLND110 .HYD
Outflow Hydrograph: GLND100 .HYD

Starting Pond W.S. Elevation = 3.80 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow = 18.00 cfs
Peak Outflow = 17.50 cfs
Peak Elevation = 4.10 ft

***** Summary of Approximate Peak Storage *****

Initial Storage = 0.25 ac-ft
Peak Storage From Storm = 0.10 ac-ft

Total Storage in Pond = 0.36 ac-ft

Warning: Inflow hydrograph truncated on left side.

>>>>> Warning, initial pond outflow > 1st inflow ordinate. <<<<<

Inflow Hydrograph: GLND1100.HYD
 Rating Table file: GLAND1 .PND

-----INITIAL CONDITIONS-----
 Elevation = 3.80 ft
 Outflow = 1.78 cfs
 Storage = 0.25 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
3.00	0.0	0.000
3.25	0.0	0.076
3.50	0.0	0.155
3.75	0.0	0.237
4.00	8.9	0.322
4.25	30.1	0.410
4.50	58.2	0.501
4.75	91.9	0.593
5.00	130.3	0.689

INTERMEDIATE ROUTING
 COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
0.0	0.0
18.3	18.3
37.5	37.5
57.4	57.4
78.0	86.9
99.3	129.4
121.1	179.3
143.6	235.5
166.6	296.9

Time increment (t) = 0.100 hrs.

***** SUMMARY OF ROUTING COMPUTATIONS *****

Pond File: GLAND1 .PND
Inflow Hydrograph: GLND1100.HYD
Outflow Hydrograph: GLND1000.HYD

Starting Pond W.S. Elevation = 3.80 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow = 31.00 cfs
Peak Outflow = 30.55 cfs
Peak Elevation = 4.25 ft

***** Summary of Approximate Peak Storage *****

Initial Storage = 0.25 ac-ft
Peak Storage From Storm = 0.16 ac-ft

Total Storage in Pond = 0.41 ac-ft

Warning: Inflow hydrograph truncated on left side.

>>>>> Warning, initial pond outflow > 1st inflow ordinate. <<<<<

Memorandum

DATE: May 16, 2003
TO: Scott Thomas
FROM: Victoria Bains
SUBJECT: The Harbor at Two Rivers, County BMP ID Code: JR033

In response to your letter dated February 18, 2003 AES Consulting Engineers has taken several actions.

Construction Certification:

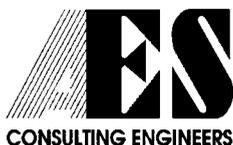
No further action required.

Record Drawings:

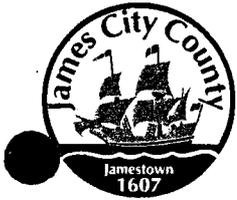
No further action required.

Construction – Related Items:

Accumulated vegetation, debris and sediment has been cleaned and removed within 10 ft. of the ends of all storm drain pipes that drain to and interconnect the basin.



5248 Olde Towne Road • Suite 1 • Williamsburg, Virginia 23188
(757) 253-0040 • Fax (757) 220-8994 • E-mail aes@aesva.com



DEVELOPMENT MANAGEMENT

101-E MOUNTS BAY ROAD, P.O. BOX 8784, WILLIAMSBURG, VIRGINIA 23187-8784
(757) 253-6671 Fax: (757) 253-6850 E-MAIL: devtman@james-city.va.us

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(757) 253-6626

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ENVIRONMENTAL DIVISION
(757) 253-6670

environ@james-city.va.us

PLANNING
(757) 253-6685

planning@james-city.va.us

COUNTY ENGINEER
(757) 253-6678

INTEGRATED PEST MANAGEMENT
(757) 253-2620

February 18, 2003

Mr. James H. Bennett
Governors Land Associates
9701 Mill Pond Run
Toano, Va. 23168

*Reinspect
6-2-03*

Re: Governor's Land - The Harbor at Two Rivers
County Plan No. S-127-93
County BMP ID Code: JR 033

Dear Mr. Bennett:

The Environmental Division has reviewed a record drawing as submitted to our office on May 3rd 2002 for the above project. The record drawing provides as-built information for dual interconnected forebay structures (BMP # 1) as situated at the tee-intersection of Harbor Road.

Although according to our records the surety being held for this project has been released, the following is recommended to be performed at this BMP:

Construction Certification:

- OK* 1. There is no construction certification requirement imposed for this facility.

Record Drawing:

- OK
6-2-03* 2. The record drawing with a Revision 4 date of June 1999 is **satisfactory**. The original date of the drawing is April 20th 1995. Please forward one reproducible and one blue/black line set of the record drawings to our office.

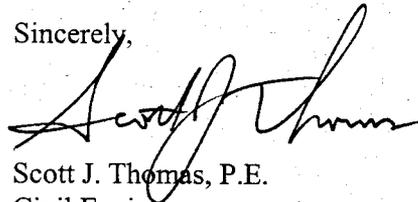
Construction - Related Items:

- OK
6-2-03* 3. Clean and remove accumulated vegetation, debris and sediment within 10 ft. of the ends of all storm drain pipes which drain to and interconnect the basin in order to establish positive drainage. This includes the outfall ends of the 15-inch pipes which convey flow into the BMP from Harbor Road and the 24-inch culvert pipe across Harbor Road which connects the two forebay cells. Vegetation, debris and sediment shall not obstruct flow into and through the basin.

Once this work is satisfactorily completed, contact our office appropriately for reinspection. One reproducible and one blue/black line set of the record drawings will be required once the above items are adequately addressed.

Please contact me at 757-253-6639 or the assigned Environmental Division inspector, Joe Buchite at 757-253-6643 if you have any further comments or questions.

Sincerely,



Scott J. Thomas, P.E.
Civil Engineer
Environmental Division

cc: Marc Bennett, AES - via fax
Joe Buchite, JCC Environmental Division Inspector

G:\AsBuilts\S12793.jr033

Date Record Created:

WS_BMPNO:

JR033

Print Record

Created By:

WATERSHED JR

BMP ID NO 033

PLAN NO S-127-93

TAX PARCEL (43-2)(7-24)

PIN NO 43207000024

CONSTRUCTION DATE 1/1/1995

PROJECT NAME Governor's Land - Harbor Road

FACILITY LOCATION 1600 Harbor Road

CITY-STATE Williamsburg, VA

CURRENT OWNER Governor's Land Management Corp.

OWNER ADDRESS 2700 Two Rivers Road

OWNER ADDRESS 2

CITY-STATE-ZIP CODE Williamsburg, VA 23185

OWNER PHONE

MAINT AGREEMENT Yes

EMERG ACTION PLAN No

PRINTED ON
Thursday, March 11, 2010
12:28:07 PM

MAINTENANCE PLAN No

SITE AREA acre 29

LAND USE SF Residential

old BMP TYP Dual Forebays

JCC BMP CODE F2 Dry ED with forebay

POINT VALUE 9

SVC DRAIN AREA acres 6.52

SERVICE AREA DESCRI Marina Villas & Roadways

IMPERV AREA acres 2.34

RECV STREAM UT of James River

EXT DET-WQ-CTRL No

WTR QUAL VOL acre-ft 0.32

CHAN PROT CTRL No

CHAN PROT VOL acre-ft 0

SW/FLOOD CONTROL No

GEOTECH REPORT No

CTRL STRUC DESC Weir

CTRL STRUC SIZE inches

OTLT BARRL DESC Weir

OTLT BARRL SIZE inch

EMERG SPILLWAY No

DESIGN HW ELEV 4.25

PERM POOL ELEV 3.80

2-YR OUTFLOW cfs 7.00

10-YR OUTFLOW cfs 18.00

REC DRAWING Yes

CONSTR CERTIF No

LAST INSP DATE 10/23/2001 Inspected by:

INTERNAL RATING 3

MISC/COMMENTS

BMP # 1. No formal outlet structure.

Get Last BMP No

Return to Menu

Additional Comments:

