



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: CC-002

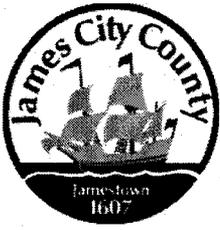
DATE VERIFIED: March 15, 2012

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: CC002

PIN: 5020100090

Subdivision, Tract, Business or Owner

Name (if known):

Property Description:

Site Address:

Williamsburg Corporate Center Association T/A

Busch Corporate Center Association

Basin B Stormwater Basin Busch Corporate Center

416 McLaws Circle

(For internal use only)

Box 11

Drawer: 6

Agreements: (in file as of scan date)

N

Book or Doc#:

Page:

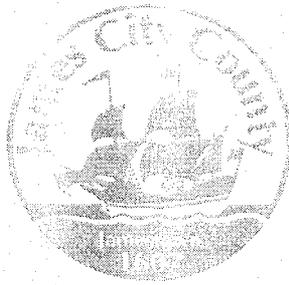
Comments

CC002

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

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: Melaws Centre
Structure/BMP Name: Sediment Forebay for Existing Pond
Project Location: 416 Melaws Circle
BMP Location: SW Corner of Existing BMP
County Plan No.: SP - 119 - 01

Project Type: Residential Business Commercial Office Institutional Industrial Public Roadway Other
Tax Map/Parcel No.: 5020100090
BMP ID Code (if known): CC 002
Zoning District: M-1
Land Use:
Site Area (sf or acres): 2.78 ac.

Brief Description of Stormwater Management/BMP Facility: Construct sediment forebay in existing BMP. Forebay to serve Melaws Centre and Melaws Park developments

Nearest Visible Landmark to SWM/BMP Facility: BMP located NW of Melaws Centre

Nearest Vertical Ground Control (if known):
 JCC Geodetic Ground Control USGS Temporary Arbitrary Other
Station Number or Name: 329
Datum or Reference Elevation: 81.75
Control Description: 3/4" disk
Control Location from Subject Facility: Approx. 1000' north at intersection of Rt. 60 & Rt. 199

Section 2 - Stormwater Management / BMP Facility Construction Information:

PreConstruction Meeting Held for Construction of SWM/BMP Facility: Yes No Unknown
Approx. Construction Start Date for SWM/BMP Facility: 5/02
Facility Monitored by County Representative during Construction: Yes No Unknown
Name of Site Work Contractor Who Constructed Facility: Toano Contractors, Inc.
Name of Professional Firm Who Routinely Monitored Construction: Unknown
Date of Completion for SWM/BMP Facility: 6/02
Date of Record Drawing/Construction Certification Submittal: 9/9/03

(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: CO4A, Inc.
Mailing Address: 368 McLaw's Circle
Williamsburg, Va. 23185
Business Phone: (757) 565-0003 Fax: (757) 565-0416
Contact Person: Andy Piplco Title: President

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: Richmond Engineering, Inc.
Mailing Address: 1643 Merrimac Trail
Williamsburg, Va. 23185
Business Phone: (757) 229-1776
Fax: (757) 229-4683
Responsible Plan Preparer: Kenneth Jenkins
Title: P.E.
Plan Name: Busch Corporate Center McLaw's Centre
Firm's Project No. 01183
Plan Date: 10/25/01
Sheet No.'s Applicable to SWM/BMP Facility: C3 / C4 / / / /

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

Name: Toano Contractors, Inc
Mailing Address: 8589 Richmond Road
Toano, Va. 23168
Business Phone: 566-0097
Fax: 566-8874
Contact Person: Randy Taylor
Site Foreman/Supervisor: Chris Taylor
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: LandTech Resources, Inc.
Mailing Address: 5810-F Moorctown Rd.
Williamsburg, Va. 23188
Business Phone: (757) 565-1677
Fax: (757) 565-0782

Name: Kenneth M. Jenkins
Title: Senior Engineer

Signature: Kenneth M. Jenkins
Date: 9/9/03

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.

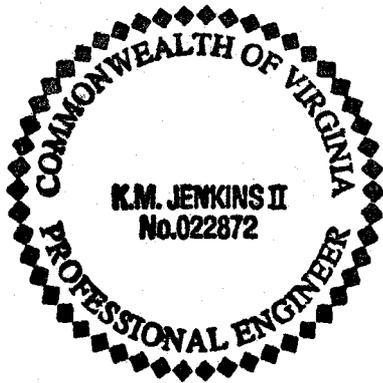
Construction Certification

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.



(Seal)
Virginia Registered Professional Engineer
or Certified Land Surveyor

(Seal)
Virginia Registered
Professional Engineer

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

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

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

- XX 1. All constructed facilities meet approved design plans, unless otherwise shown. Record information or deviations from approved design plan shown in clearly annotated format and/or boxed beside design values.
- XX 2. Elevations to the nearest 0.1' unless higher accuracy is needed to show positive drainage.
- XX 3. All plan sheets labeled with "RECORD DRAWING" in large text in lower right hand corner (Approved County Plan Number and BMP ID Code can be included if known).
- NA 4. All plan sheet revision blocks modified to indicate date and record drawing status.
- XX 5. All plan sheets have certification statements and certifying professional's signature and seal.

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

- XX 1. All requirements of Section I (Methods and Presentation) apply to this section.
- XX 2. Plan Views: Show general location, arrangement and dimensions. Location and alignment shall generally match approved design plans.
- NA 3. Profile or elevations along top or berm of the facility. At a minimum, elevations are required at each end, at intervals not to exceed 50 feet and where low spots may be present. Top of embankment or berm elevations must be no less than design elevation plus any settlement allowances.
- XX 4. Top widths, berm widths and embankment side slopes.
- XX 5. Show length, width and depth of facility or grading, contours or spot elevations as required to verify permanent pool and design storage volumes were met or were reasonably close to the approved design. Evaluation of as-built grading, contours, spot elevations, or cross-sections, may be necessary by the professional to ensure approved design configurations, depths and volumes were closely maintained. If grading or elevations are significantly different from the approved plan, the Environmental Division shall be contacted immediately to determine whether the variation is acceptable or whether further evidence will be required. Facilities which do not closely resemble approved plan grades, elevations or configurations may require regrading by the Contractor; check volumetric computations; and/or a check hydraulic routing to ensure approved design water surface elevations, discharges or freeboard were closely maintained.
- NA 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.
- NA 7. Profile or elevations along the entire centerline of the emergency spillway. Emergency spillway may be steeper, but no flatter or narrower than design.
- NA 8. Elevation of the principal spillway crest or outlet crest of the structure.

- NA 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.
- NA 10. Dimensions, locations and elevations of outlet orifices, weirs, slots and drains.
- INC. 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. **Concrete Anti-Vortex Top not installed as called for on approved plans**
- NA 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.**
- NA 13. Top of impervious core embankment, core trench limits and elevation of cut-off trench bottom. **May need to obtain this information during construction.**
- NA 14. Elevation of the principal spillway barrel (outlet pipe) inlet and outlet invert.
- NA 15. Outlet barrel diameter, length, slope, type and thickness class of material and type of flared end sections, headwall or endwall.
- XX 16. Outfall protection dimension, type and depth of rock and if underlain filter fabric is present.
- NA 17. BMP interior and periphery landscaping zones conform with arrangements and requirements of the approved design plan.
- NA 18. Maintenance plan taken from approved design plan transposed onto record drawing set.
- NA 19. Fencing location and type, if applicable to facility.
- INC. 20. BMP vicinity properly cleaned of stockpiles and construction debris. **Sediment Buildup in Forebay**
- NA 21. No visual signs of erosion or channel degradation immediately downstream of facility.
- NA 22. Any other information formally requested by the Environmental Division specific to the constructed SWM/BMP facility.

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

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

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

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

**James City County, Virginia
Environmental Division**

**Stormwater Management/BMP
Record Drawing and Construction Certification Review
Tracking Form**

County Plan No.: SP-119-01
 Project Name: McCLANS Center
 Stormwater Management Facility: New Forebay at EXIST Dry Pond (CC002)

Phase: I II III
 Date/By: Sept 16 '03 LANDTECH Resource 03-504

- Information Received. Date/By: _____
- Administrative Check. Date/By: _____
- Record Drawing. Date/By: LANDTECH 9/4/03
- Construction Certification. Date/By: _____
- RD/CC Standard Forms. (Required for all BMPs after Feb 1st 2001 Only)
- Insp/Maint Agreement. #/Date: Previous Busch Corp Center
- 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: Note 20 Sheet C8

- Assign County BMP ID Code: Code: CC002 EXIST BMP
- Preliminary Input into Division's "As-Built Tracking Log"
- Add Location to GIS Database Map. Obtain site information (GPIN, Owner, Site Area, Address, etc.) CC002
- Preliminary Log into Access BMP Database (BMP ID #, Plan No., GPIN, Project Name, etc.) CC002
- Active Project File Review (correspondence, H&H, etc.).
- Initial As-Built File setup (Label, copy hydraulics, BMP plan and detail information, etc.).
- Inspector Check of RD/CC (forward to inspector using transmittal for cursory review).
- Pre-Inspection Drawing Review - Approved Plan (Quick look prior to Field Inspection).

Final Inspection (FI) Performed Date: 11/20/03
 Record Drawing (RD) Review (***) Date: 9/24/03
 Construction Certification (CC) Review Date: NA SIMPLE DEVICE, NOTHING TO CERT. TO.

- Actions:
- No comments. 11/20/03
 - Comments. Letter Forwarded. Date: _____
 - Record Drawing (RD)
 - Construction Certification (CC)
 - Construction-Related (CR)
 - Site Issues (SI)
 - Other: _____

CALL TO KEN JENKINS
SEND REPRODUCIBLE.

- Second Submission: _____
- Reinspection (if necessary): _____
- Acceptable for stormwater management facility purposes (RD/CC/CR/Other). Proceed with bond release.
- Notify Inspector and Inspector Supervisor using "Surety Request Form". 11/20/03
- 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). NO, CC002
- Copy Final Inspection Report into County BMP Inspection Program file. NO
- Obtain Digital Photographs of BMP and log into computer.
- Complete "As-built Tracking Log"
- Last check of BMP Access Database. Add to PRIDE database. NO
- NO Add to JCC Hydrology & Hydraulic database (optional).
- NO Add to PRIDE BMP ratings database.

Plan Reviewer: [Signature] Date: 11/20/03

*** See separate checklist.

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: 5/02
Facility Monitored by County Representative during Construction: Yes No Unknown
Name of Site Work Contractor Who Constructed Facility: Toano Contractors, Inc.
Name of Professional Firm Who Routinely Monitored Construction: Unknown
Date of Completion for SWM/BMP Facility: 6/02
Date of Record Drawing/Construction Certification Submittal: 9/9/03

(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: COYA, Inc.
Mailing Address: 368 McLaws Circle
Williamsburg, Va. 23185
Business Phone: (757) 565-0003 Fax: (757) 565-0416
Contact Person: Andy Piplco Title: President

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: Richmond Engineering, Inc.
Mailing Address: 1643 Merrimac Trail
Williamsburg, Va. 23185
Business Phone: (757) 229-1776
Fax: (757) 229-4683
Responsible Plan Preparer: Kenneth Jenkins
Title: P.E.
Plan Name: Busch Corporate Center McLaws Centre
Firm's Project No. 01183
Plan Date: 10/25/01
Sheet No.'s Applicable to SWM/BMP Facility: C3 / C4 / / / /

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

Name: Toano Contractors, Inc
Mailing Address: 8589 Richmond Road
Toano, Va. 23168
Business Phone: 566-0097
Fax: 566-8874
Contact Person: Randy Taylor
Site Foreman/Supervisor: Chris Taylor
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: LandTech Resources, Inc.
Mailing Address: 5810-F Moorctown Rd.
Williamsburg, Va. 23188
Business Phone: (757) 565-1677
Fax: (757) 565-0782

Name: Kenneth H. Jenkins
Title: Senior Engineer

Signature: Kenneth H. Jenkins
Date: 9/9/03

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.

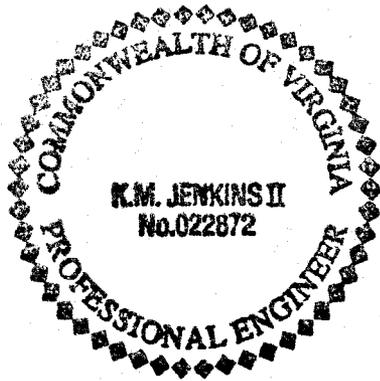
Construction Certification

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.



_____ (Seal)

Virginia Registered Professional Engineer
or Certified Land Surveyor

_____ (Seal)

Virginia Registered
Professional Engineer

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

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

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

- XX 1. All constructed facilities meet approved design plans, unless otherwise shown. Record information or deviations from approved design plan shown in clearly annotated format and/or boxed beside design values.
- XX 2. Elevations to the nearest 0.1' unless higher accuracy is needed to show positive drainage.
- XX 3. All plan sheets labeled with "RECORD DRAWING" in large text in lower right hand corner (Approved County Plan Number and BMP ID Code can be included if known).
- NA 4. All plan sheet revision blocks modified to indicate date and record drawing status.
- XX 5. All plan sheets have certification statements and certifying professional's signature and seal.

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

- XX 1. All requirements of Section I (Methods and Presentation) apply to this section.
- XX 2. Plan Views: Show general location, arrangement and dimensions. Location and alignment shall generally match approved design plans.
- NA 3. Profile or elevations along top or berm of the facility. At a minimum, elevations are required at each end, at intervals not to exceed 50 feet and where low spots may be present. Top of embankment or berm elevations must be no less than design elevation plus any settlement allowances.
- XX 4. Top widths, berm widths and embankment side slopes.
- XX 5. Show length, width and depth of facility or grading, contours or spot elevations as required to verify permanent pool and design storage volumes were met or were reasonably close to the approved design. Evaluation of as-built grading, contours, spot elevations, or cross-sections, may be necessary by the professional to ensure approved design configurations, depths and volumes were closely maintained. If grading or elevations are significantly different from the approved plan, the Environmental Division shall be contacted immediately to determine whether the variation is acceptable or whether further evidence will be required. Facilities which do not closely resemble approved plan grades, elevations or configurations may require regrading by the Contractor; check volumetric computations; and/or a check hydraulic routing to ensure approved design water surface elevations, discharges or freeboard were closely maintained.
- NA 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.
- NA 7. Profile or elevations along the entire centerline of the emergency spillway. Emergency spillway may be steeper, but no flatter or narrower than design.
- NA 8. Elevation of the principal spillway crest or outlet crest of the structure.

- NA 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.
- NA 10. Dimensions, locations and elevations of outlet orifices, weirs, slots and drains.
- INC. 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. **Concrete Anti-Vortex Top not installed as called for on approved plans**
- NA 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.**
- NA 13. Top of impervious core embankment, core trench limits and elevation of cut-off trench bottom. **May need to obtain this information during construction.**
- NA 14. Elevation of the principal spillway barrel (outlet pipe) inlet and outlet invert.
- NA 15. Outlet barrel diameter, length, slope, type and thickness class of material and type of flared end sections, headwall or endwall.
- XX 16. Outfall protection dimension, type and depth of rock and if underlain filter fabric is present.
- NA 17. BMP interior and periphery landscaping zones conform with arrangements and requirements of the approved design plan.
- NA 18. Maintenance plan taken from approved design plan transposed onto record drawing set.
- NA 19. Fencing location and type, if applicable to facility.
- INC. 20. BMP vicinity properly cleaned of stockpiles and construction debris. **Sediment Buildup in Forebay**
- NA 21. No visual signs of erosion or channel degradation immediately downstream of facility.
- NA 22. Any other information formally requested by the Environmental Division specific to the constructed SWM/BMP facility.

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

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

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

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

James City County, Virginia
Environmental Division
Stormwater Management Program

1:00 - 1:30

Record Drawing / Construction Certification Submittal for a BMP

Date: 9/24/03

Inspector: Pat Menichino
 Joe Buchite
 Beth Davis
 Gerry Lewis
 Jim Rudnicky
 Other: _____

Project: McCLANS Center
BMP Facility: New Forebay on Existing Det Basin
Plan No.: SP-119-01
Assigned County BMP ID Code: CC002

I have received a transmittal for a Record Drawing and Construction Certification for the above referenced facility on Sept 16. Prior to performing a field inspection of the BMP and performing a full review of these certification items, I am first forwarding the items to you to cursory review in case any major field changes were performed that I should be aware of and/or to ensure the record drawing accurately portrays what you saw observed in the field. Please review the drawing and return to me promptly so I can proceed with the review of certification material.

During my review, I will look at issues related to the BMP and its primary inflow and outflow conveyance systems, and may make comment on the following areas: Inspection/Maintenance agreement, Record Drawings (RD), Construction Certification (CC) and Construction-Related (CR) field items as it pertains to the BMP. If you have any other related non-BMP site issues such as site erosion, stabilization, removal of erosion & sediment controls, etc. that are not related to the BMP, you must proceed with closing out these items on your own accord; or alternatively, if needed, I can easily add these items to any comment letter that I may generate to the owner.

Let me know if I need to add any site-related items to my punch list.

Scott

AsBuilts\Admin\z-inspector

*Forebay + New Riser
CAP ONLY.*

NO comments -

Soils Information:
Soil Survey Sheet

Site: 19B Kempsville-Emp FSL Hydric: Yes No
 DA: 19B HSG: B/C
 BMP: _____ Hydric: Yes No
 Description of Soils at BMP: OFFSITE, EXIST BMP.

BMP Control: None Onsite Offsite Previously Approved Manufactured BMP SP-62-91
 BMP Types: 1- Name: Dry Pond (JCC BMP Type _____ - _____), Points CC 002
 2- Name: _____ (JCC BMP Type _____ - _____), Points _____
 3- Name: _____ (JCC BMP Type _____ - _____), Points _____

Onsite Drainage: Reinforced Concrete Pipe Corrugated Metal Pipe Aluminum Type Pipe
 Corrugated Polyethylene Pipe PVC Type Pipe Open Channel Type
 Storm Drain Culverts Type: _____
 Inlets Other (Specify): _____

1. VDOT Standards & Specifications Referenced for work **within** R/W: Yes No
 2. VDOT Standards & Specifications Referenced for work **outside** R/W: Yes No

Site Limitations: RPA RMA Steep Slopes Delineated Wetlands
 Hydric Soils Critical Soils Vegetated Buffers: _____
 Defined Natural Drainage Features onsite Downstream Storm/Culv.
 Downstream Channel Erosion Floodplain Problem Drainage Area
 Stormwater Hotspot Other, _____
 Site Activities may warrant a General VPDES Permit for Discharge of Stormwater Associated with Industrial Activities (ie. process water, batch plants, etc.).

? NO ENV INVENTORY!

Site Stormwater Management / BMP Control (Add sheets if necessary for Multiple Onsite Facilities):

<input type="checkbox"/> Yes <input type="checkbox"/> No	# <u>offsite Dry Pond</u>
Predev (Present)	DA = _____ ac. C/CN = _____ Tc = _____ min / hrs.
2-year	cfs
10-year	cfs
100-year	cfs
PostDev w/o Detention (Inflow)	DA = <u>73.3</u> ac. C/CN = _____ Tc = _____ min / hrs.
1-year	
2-year	<u>159.12</u> cfs
10-year	<u>208.08</u> cfs
100-year	<u>297.84</u> cfs
PostDev with Detention (Routed)	DA = _____ ac. C/CN = _____ Tc = _____ min / hrs.
2-year	<u>39.65</u> cfs at El. <u>68.18</u>
10-year	<u>45.42</u> cfs at El. <u>70.15</u>
100-year (DHW)	<u>74.12</u> cfs at El. <u>72.39</u>

Downstream Tailwater Assumption for Pond Routing: ?
 Routed Peak Discharges (Outflows) from BMP meet Predevelopment Allowables: Yes No
 Appears to Meet VESCH / E&SC Ordinance / CBP Ordinance Requirements: Yes No



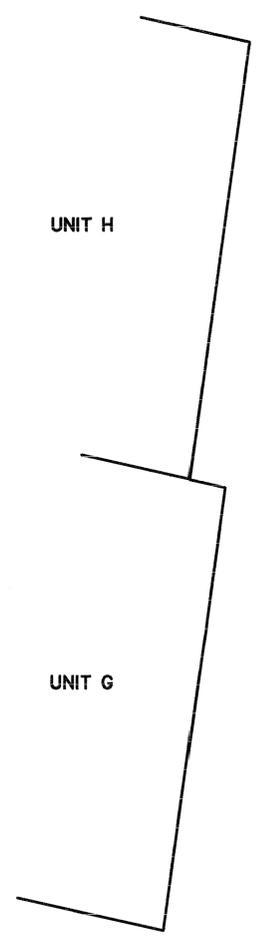
RECORD DRAWING CERTIFICATION

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.



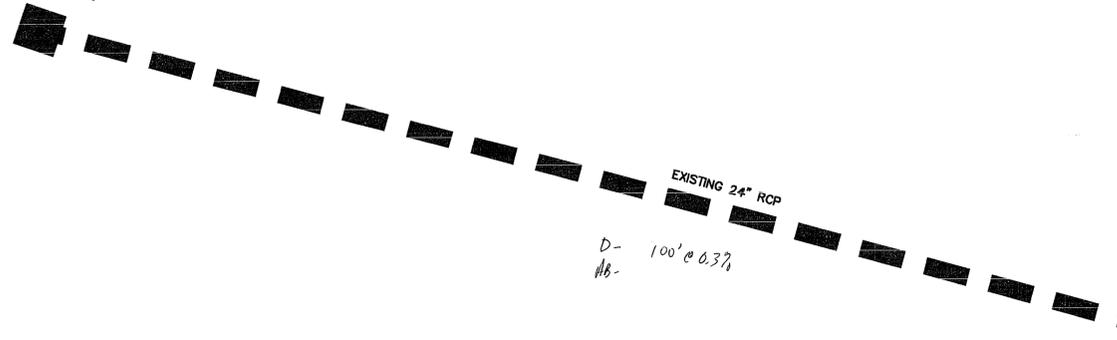
Need SIGNATURE!

*NEED CC? (No)
ASBUT (GERT)*



DI-7
INV 81.50
INV 71.70

D-77.26



EXISTING 24" RCP

D- 100' @ 0.37%

ES-1
INV 70.22

LIMITS OF RIP RAP
SEDIMENT FOREBAY

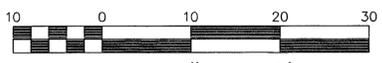
WSE=65±
BTM=62±

EXISTING 48" CMP RISER

Show CRIPST ELEV 71.91? Label CAP (As this was part of plan.)

LIMITS OF ROCK CHECK
DAM BAFFLE WALL

LEAN 520' RCP



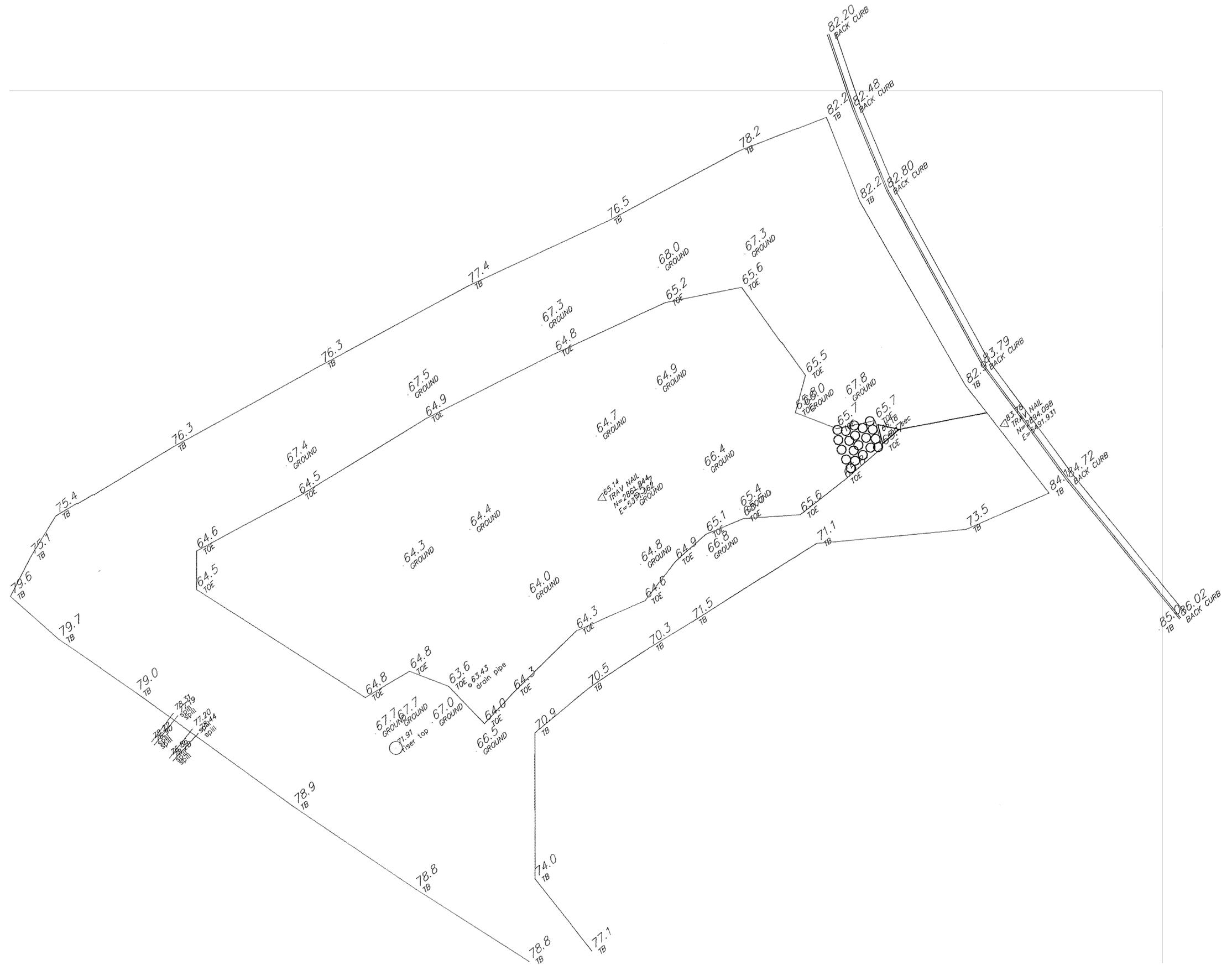
Scale 1" = 10'

NO.	DATE	REVISION / COMMENT / NOTE

LandTech Resources, Inc.
 Surveying • Engineering • GPS
 5810-F Mooretown Road, Williamsburg, VA 23188
 Phone: (757) 565-1677 Fax: (757) 565-0782
 web: landtechresources.com

SCALE: 1" = 10'
 DATE: 9/9/03
 JOB: 03-504
 DRAWN BY: KMJ
 SHEET: 1 OF 1

**McLaws Centre
 BMP RECORD DRAWING PLAN
 SEDIMENT FOREBAY**
 County Plan Number SP-119-01 - BMP ID Code: CC 002
 James City County Virginia



BUSCH CORPORATE CENTER
 STORMWATER BASIN B AS-BUILT
 1/14/02
 SCALE: 1"=20'

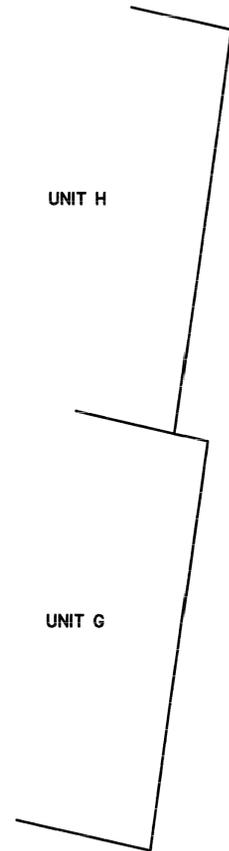
RECORD DRAWING CERTIFICATION

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.

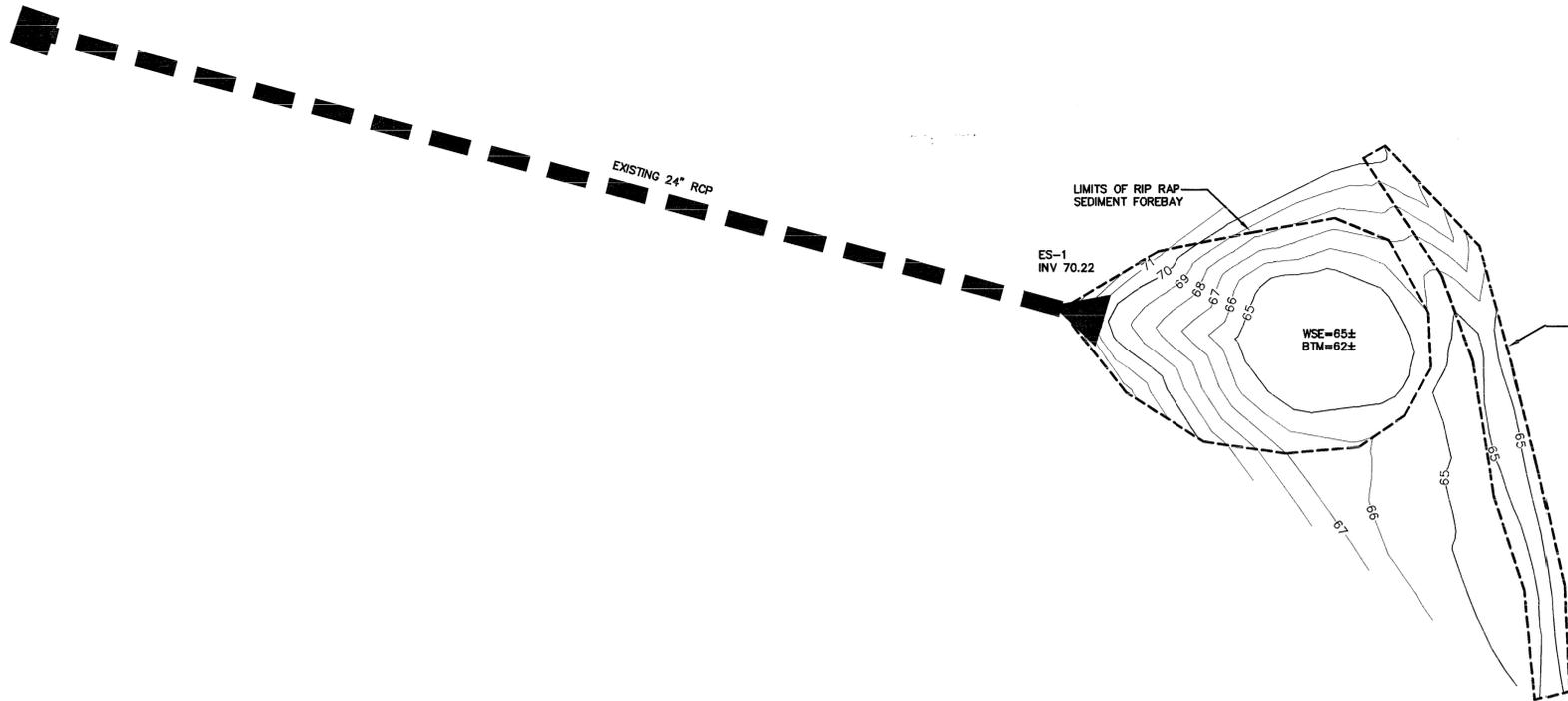


**McLAWS CENTRE
BMP RECORD DRAWING PLAN**

SEDIMENT FOREBAY
County Plan Number SP-119-01 - BMP ID Code: CC 002
James City County Virginia



DI-7
INV 81.50
INV 71.70



EXISTING 24" RCP

LIMITS OF RIP RAP
SEDIMENT FOREBAY

ES-1
INV 70.22

WSE=65±
BTM=62±

EXISTING 48"
CMP RISER

LIMITS OF ROCK CHECK
DAM BAFFLE WALL

CC002; SP-119-01

APPROVED
James City County
Environmental Division
By: *[Signature]*
Date: 11-20-03



Scale 1" = 10'

NO.	DATE	REVISION / COMMENT / NOTE

LandTech Resources, Inc.
Surveying • Engineering • GPS
5810-F Moorestown Road, Williamsburg, VA 23188
Phone: (757) 565-1677 Fax: (757) 565-0762
web: landtechresources.com

SCALE: 1" = 10'
DATE: 9/9/03
JOB: 03-504
DRAWN BY: KMJ
SHEET: 1 OF 1

BUSCH CORPORATE CENTER · WILLIAMSBURG

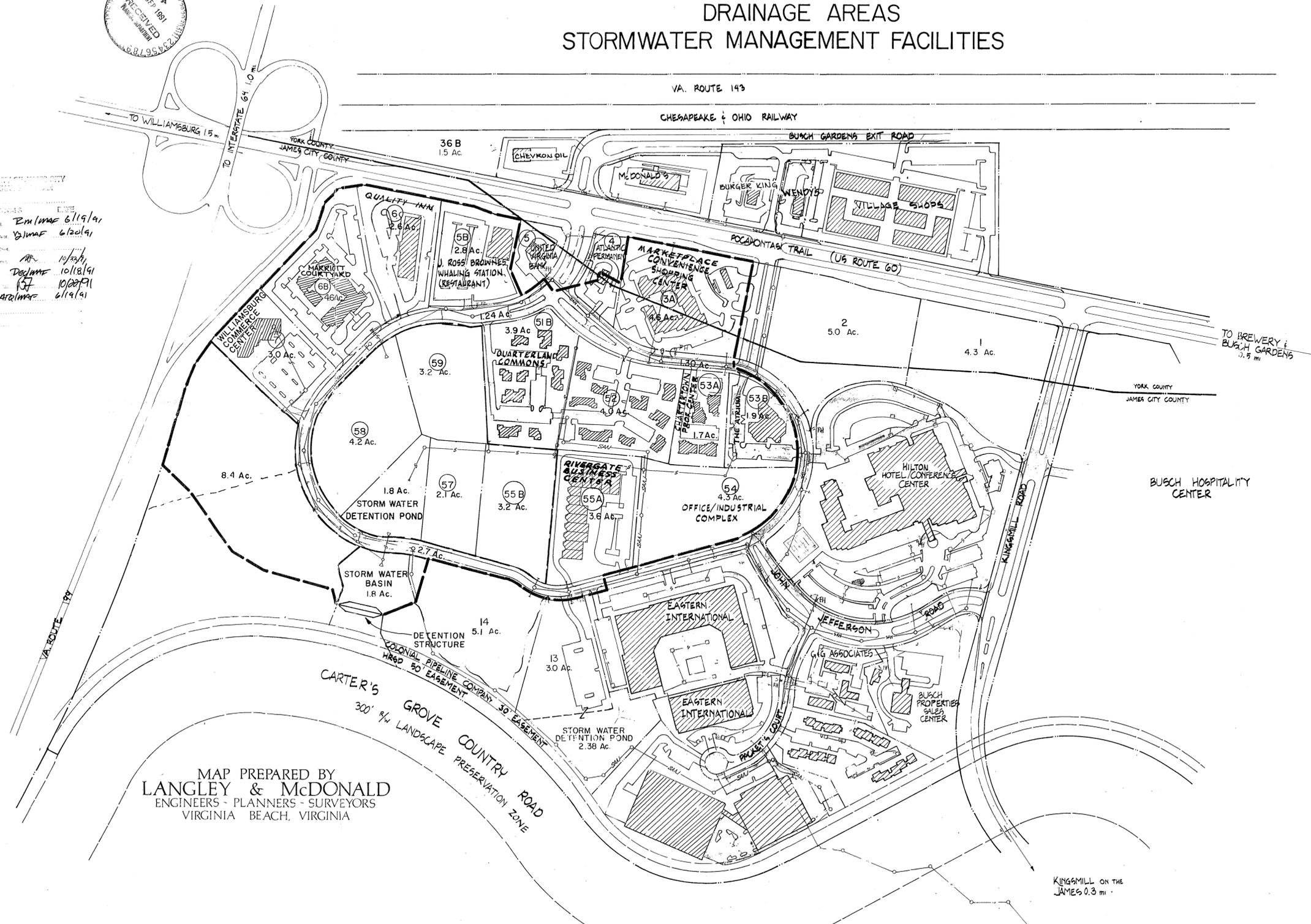
JAMES CITY COUNTY · YORK COUNTY · VIRGINIA

DRAINAGE AREAS

STORMWATER MANAGEMENT FACILITIES



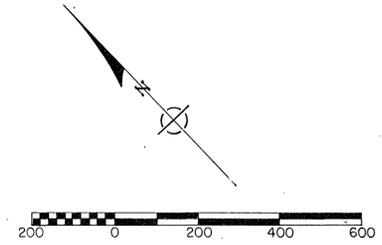
COUNTY OF WILLIAMSBURG
 PREPARED BY
 Method: **EM/MAF 6/19/91**
 Date: **6/20/91**
 High: **12/31/91**
 Plan: **10/18/91**
 Zoning: **10/20/91**
 J. **ARR/MAF 6/19/91**



LOCATION MAP

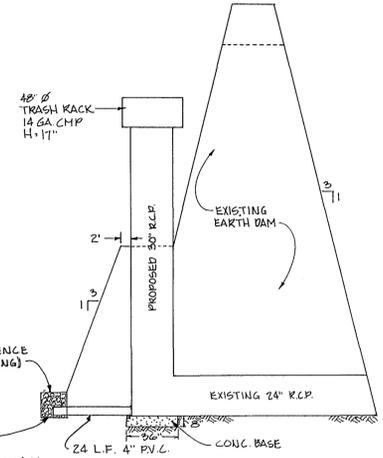
- LEGEND**
- PAVEMENT STRUCTURES
 - PROPERTY LINES
 - COUNTY LINES
 - STORM SEWER
 - SANITARY SEWER
 - WATER LINE
 - HYDRANT
 - EASEMENT
 - MANHOLE
 - DRAIN INLET
- ALL ACREAGES APPROXIMATE

MAP PREPARED BY
LANGLEY & McDONALD
 ENGINEERS - PLANNERS - SURVEYORS
 VIRGINIA BEACH, VIRGINIA

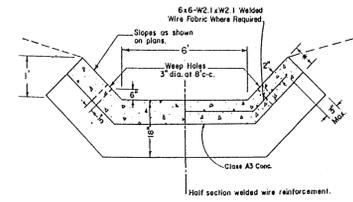


DHW
72-39

TOP OF DAM ELEV. = 74.00
 100 YR. STORM PEAK ELEV. = 72.20
 EMERGENCY SPILLWAY ELEV. = 71.50
 10 YR. STORM PEAK ELEV. = 70.00
 2 YR. STORM PEAK ELEV. = 68.47
 CREST OF STAND PIPE = 66.00
 INVERT OF 3" DIA. ORIFICES = 64.00
 (3 SPACED @ 120" TYP.)
 INVERT OF 3" DIA. ORIFICES = 63.00
 INVERT OF 3" DIA. ORIFICES = 62.25
 ELEV. = 62.00



DAM DETAIL
N.T.S.

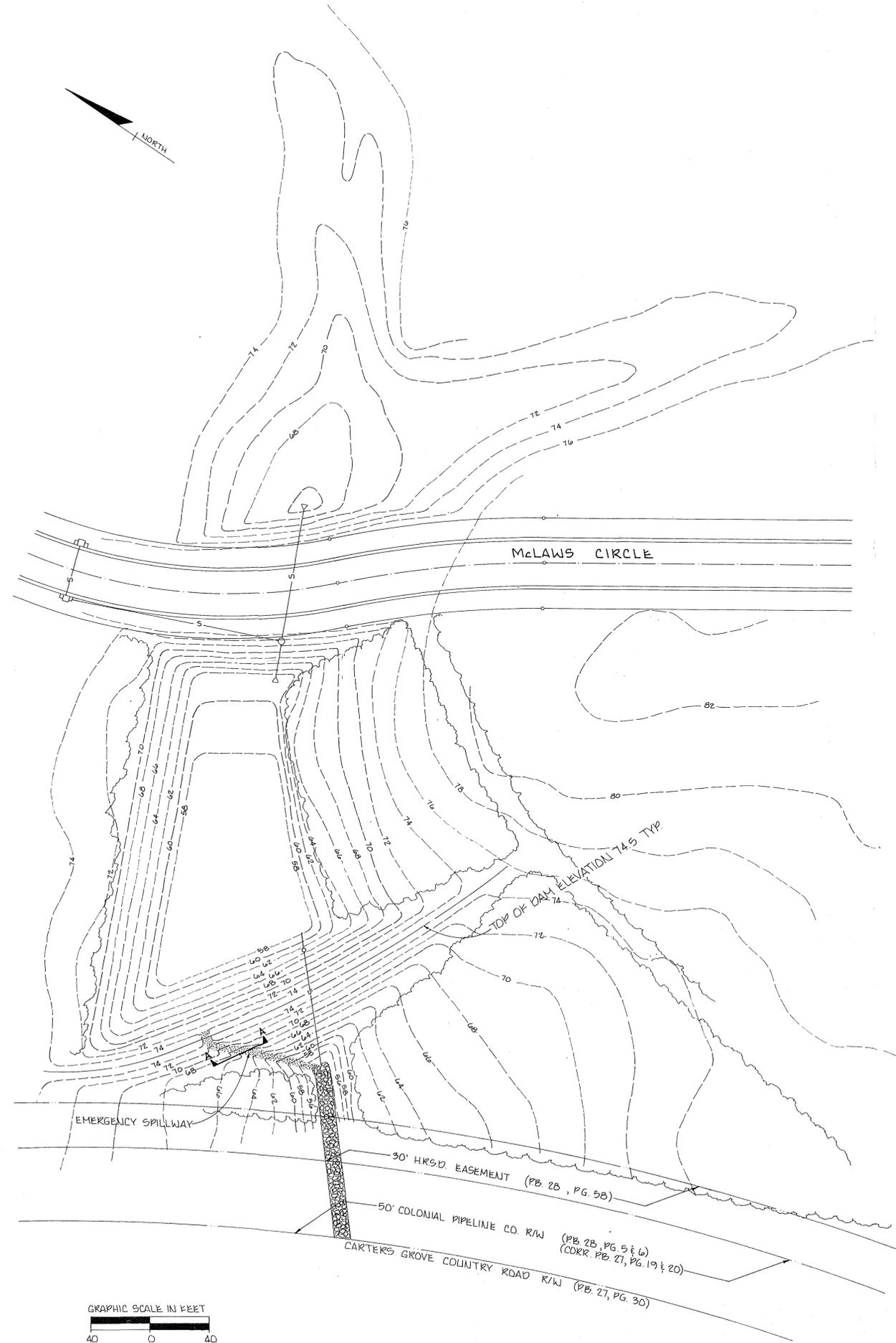
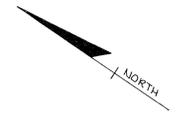


SECTION A-A
N.T.S.

GENERAL NOTES

1. ALL WORK TO BE IN ACCORDANCE WITH THE VIRGINIA DEPARTMENT OF TRANSPORTATION, "ROAD AND BRIDGE SPECIFICATIONS, DATED 1987, AND THE VIRGINIA DEPARTMENT OF HIGHWAYS AND TRANSPORTATION, "ROAD DESIGN AND BRIDGE STANDARDS," 1986 UNLESS OTHERWISE NOTED.
 2. VERTICAL CONTROL IS 0.00 NATIONAL OCEAN SURVEY M.S.L.
 3. HORIZONTAL CONTROL BASED UPON VIRGINIA PLANE COORDINATE GRID SYSTEM SOUTH ZONE.
 4. PRIOR TO COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR IS DIRECTED TO NOTIFY ALL APPLICABLE OWNERS OF UTILITIES OF THE LIMITS OF IMPENDING CONSTRUCTION IN ORDER THAT THE UTILITY COMPANIES MAY SAFEGUARD THEIR FACILITIES.
- ALL VIRGINIA POWER AND C&P FACILITIES REQUIRING RELOCATION ARE TO BE DONE SO BY AFOREMENTIONED UTILITIES AT CONTRACTOR'S EXPENSE.
5. ALL STORM SEWER PIPES AND DROP INLETS TO BE CLEANED OF DEBRIS AND ERODED MATERIAL AT LAST STAGES OF CONSTRUCTION.
 6. ALL DRAINAGE STRUCTURES TO CONFORM TO VIRGINIA DEPARTMENT OF TRANSPORTATION, "ROAD DESIGNS AND STANDARDS," 1986 UNLESS OTHERWISE INDICATED.
 7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING WITH MATCHING MATERIALS ANY PAVEMENT, DRIVEWAYS, WALKS, CURBS, ETC. THAT MUST BE CUT OR THAT ARE DAMAGED DURING CONSTRUCTION.
 8. ALL CONCRETE TO BE CLASS "A-3" AIR ENTRAINED (3,000 PSI).
 9. CONTRACTOR SHALL NOT COMMENCE WORK SHOULD RAIN BE FORECAST WITHIN 72 HOURS.

NOTE: VDOT IS NOT RESPONSIBLE FOR THE DETENTION POND OR ANY OF ITS APPURTENANCES.



Langley and McDonald
 A PROFESSIONAL CORPORATION
ENGINEERS • PLANNERS • SURVEYORS
 VIRGINIA BEACH - WILLIAMSBURG, VIRGINIA

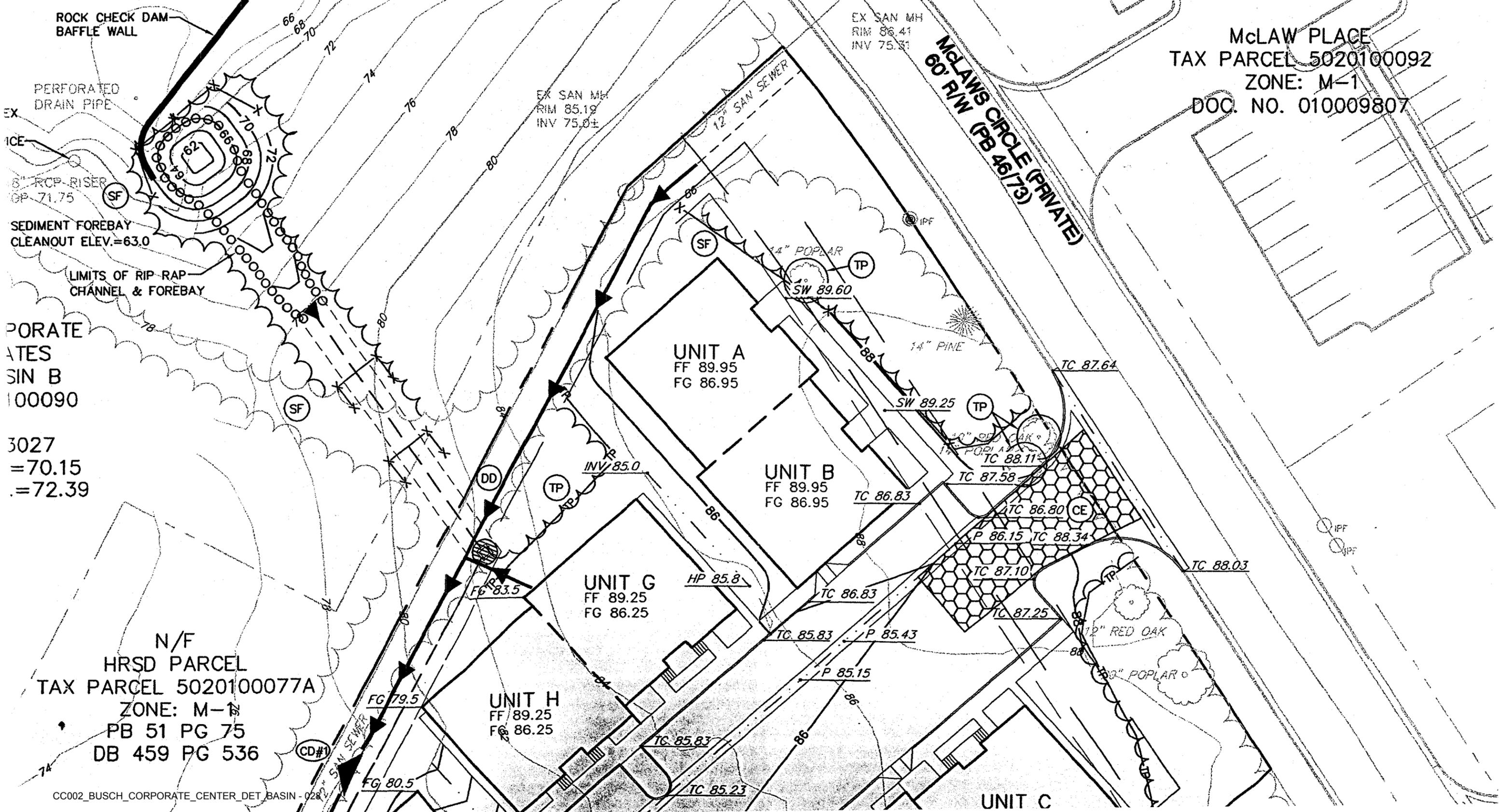


DES.	SAK
DWN.	CLJ
CHK.	NHJ
DATE	5-25-91

BUSCH CORPORATE CENTER - WILLIAMSBURG
 McLAWS CIRCLE DETENTION BASIN
 WATER QUALITY IMPROVEMENT MODIFICATIONS
 CONVERT 24" KCP CULVERT TO 30" KCP STAND PIPE
 PLAN AMENDING SP 93-87

PROJ. NO.	14067893
SCALE:	1" = 40'
SHEET	OF 1
DWG.	3923W

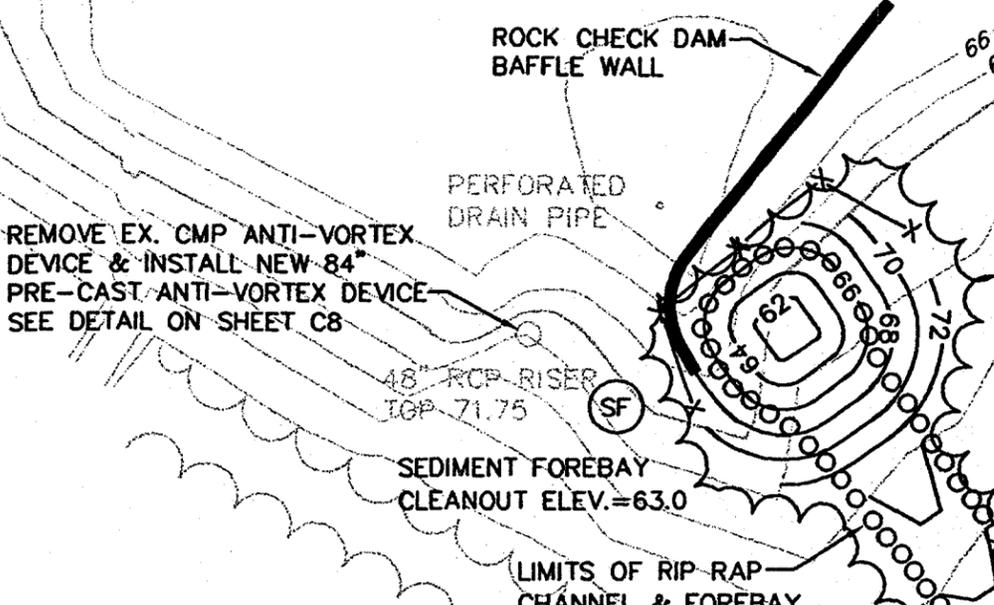
McLAW PLACE
 TAX PARCEL 5020100092
 ZONE: M-1
 DOC. NO. 010009807



CORPORATE
 CENTER
 TAX PARCEL
 5020100090
 ZONE: M-1
 PB 51 PG 75
 DB 459 PG 536

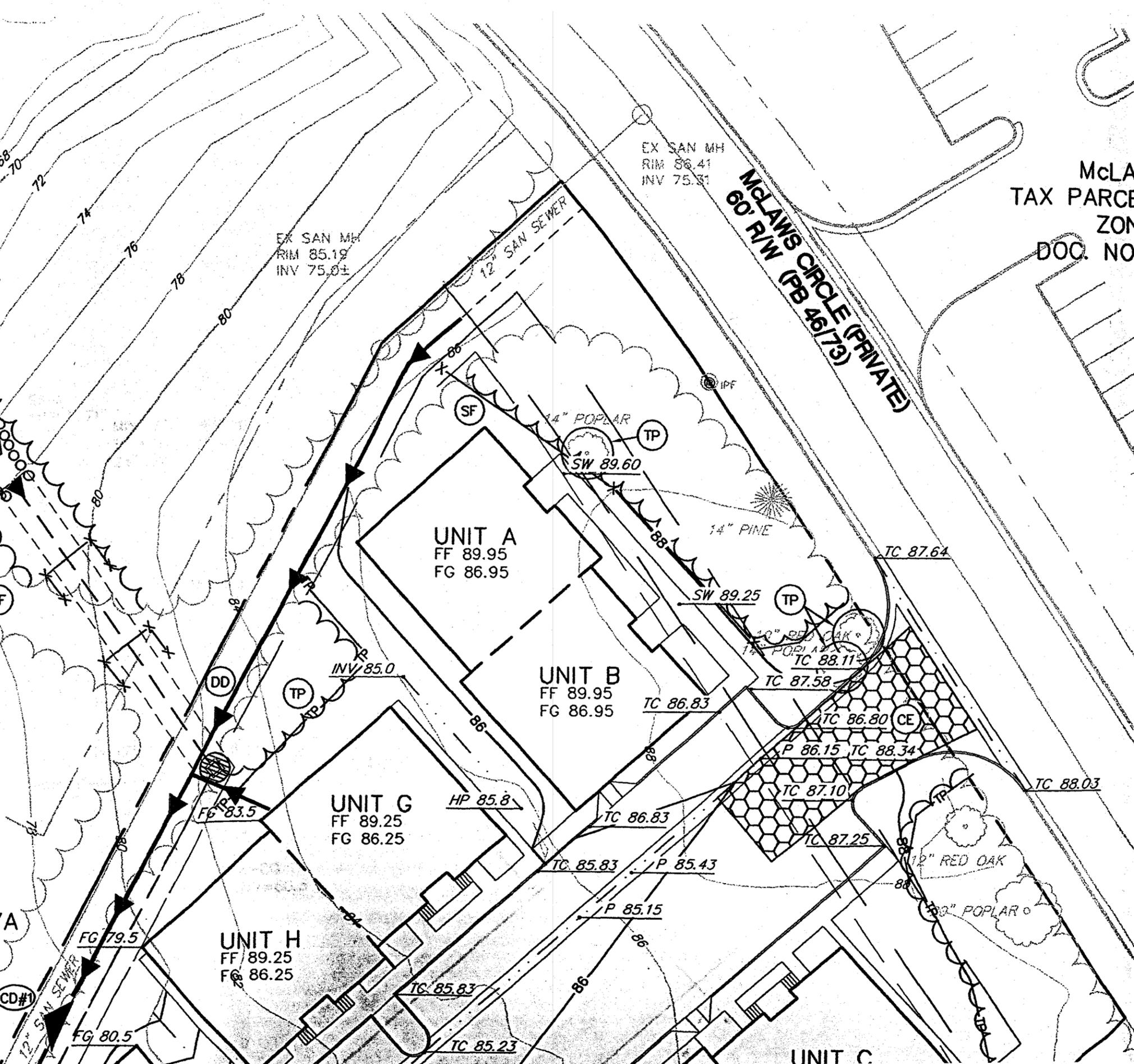
N/F
 HRSD PARCEL
 TAX PARCEL 5020100077A
 ZONE: M-1
 PB 51 PG 75
 DB 459 PG 536

McLAW
TAX PARCEL
ZONE:
DOC. NO.



N/F
WILLIAMSBURG CORPORATE
CENTER ASSOCIATES
STORMWATER BASIN B
TAX PARCEL 5020100090
ZONE: M-1
DOC. NO. 000013027
10 YR. PEAK ELEV.=70.15
00 YR. PEAK ELEV.=72.39

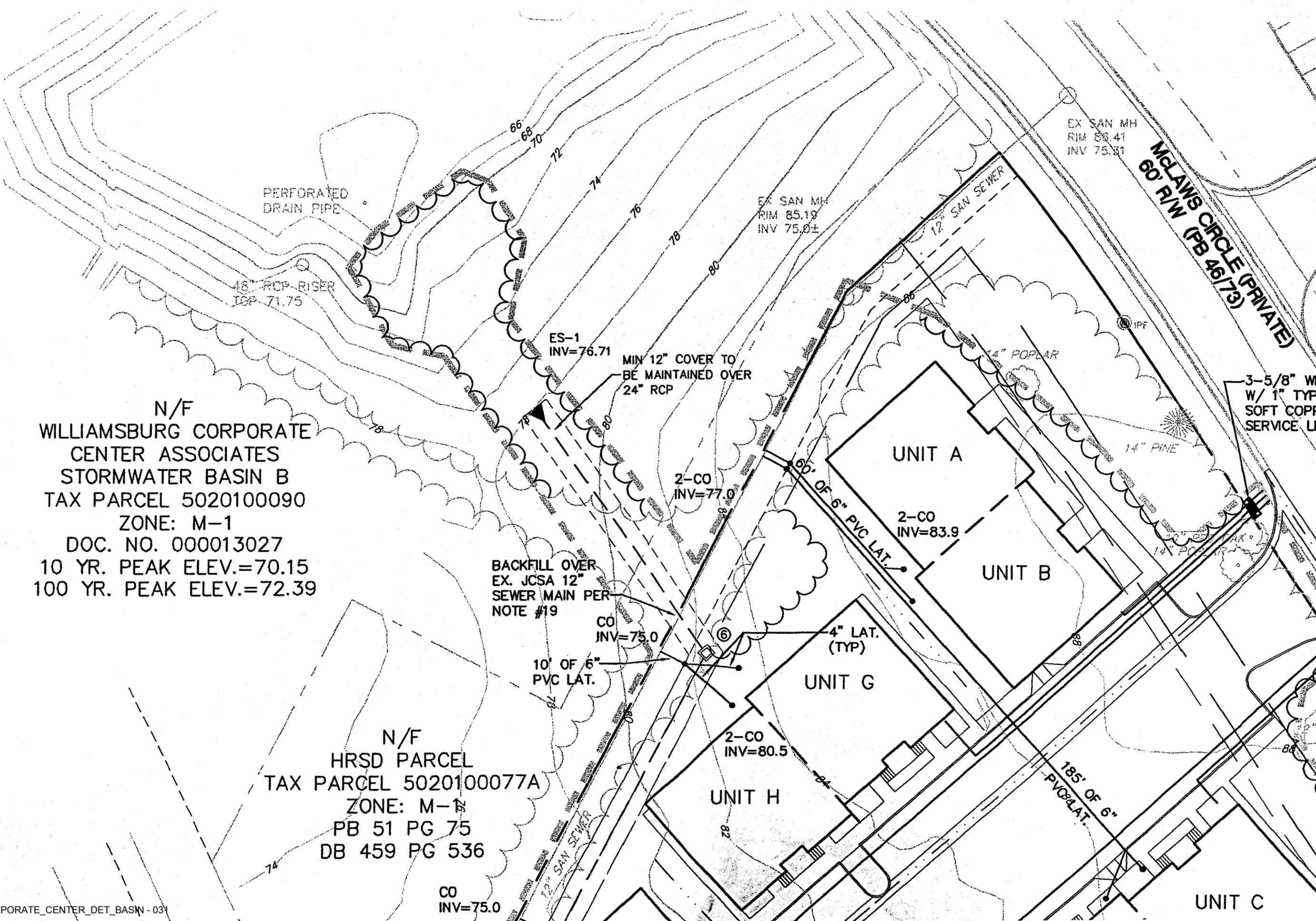
N/F
HRSD PARCEL
TAX PARCEL 5020100077A
ZONE: M-1
PB 51 PG 75
DB 459 PG 536



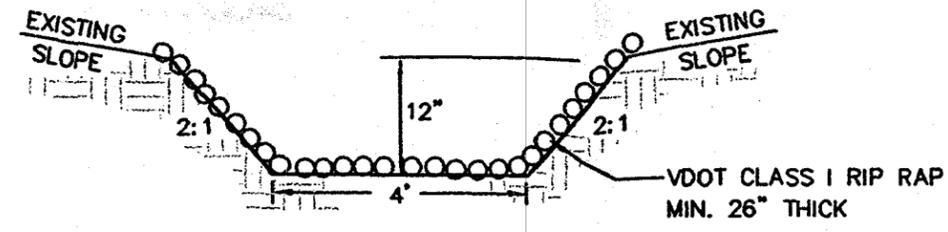
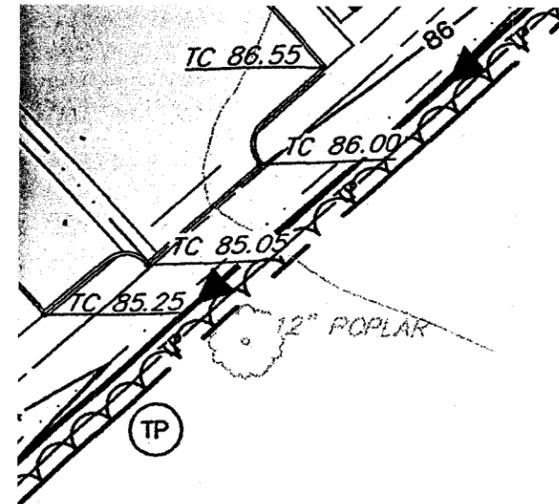
N/F
 WILLIAMSBURG CORPORATE
 CENTER ASSOCIATES
 STORMWATER BASIN B
 TAX PARCEL 5020100090
 ZONE: M-1
 DOC. NO. 000013027
 10 YR. PEAK ELEV.=70.15
 100 YR. PEAK ELEV.=72.39

N/F
 HRSD PARCEL
 TAX PARCEL 5020100077A
 ZONE: M-1
 PB 51 PG 75
 DB 459 PG 536

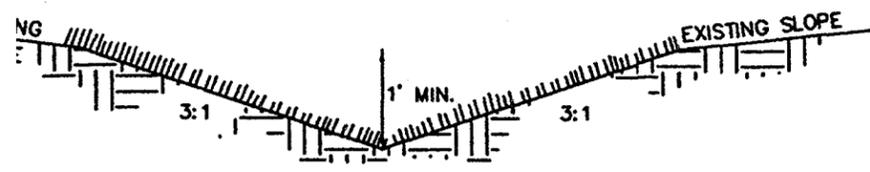
CO
 INV=75.0



BUSCH PROPERTIES, INC.
 TAX PARCEL 5020100094
 ZONE: M-1



RIP RAP CHANNEL



GRASS SWALE DETAIL

**ROCK CHECK DAM
 BAFFLE WALL**

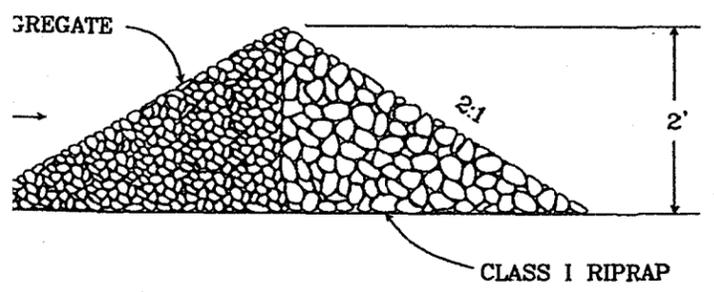


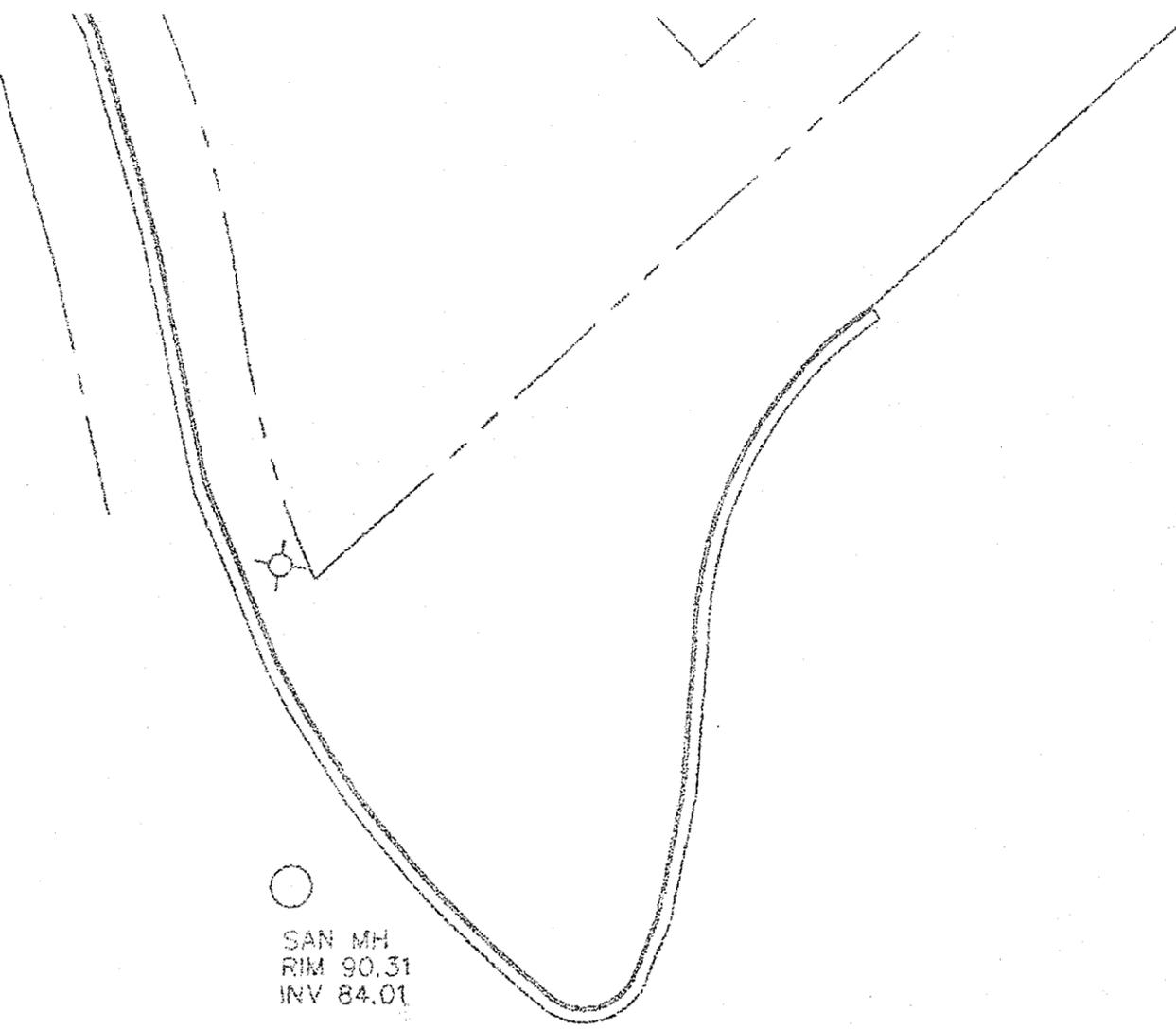
PLATE. 3.20-1

PERMANENT STABILIZATION
 ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY FOLLOWING FINISH GRADING. SEEDING SHALL BE DONE WITH KENTUCKY 31 TALL FESCUE ACCORDING TO STD. & SPEC. 3.32, "PERMANENT SEEDING", OF THE HANDBOOK. EROSION BLANKETS WILL BE INSTALLED OVER FILL SLOPES WHICH HAVE BEEN BROUGHT TO FINAL GRADE AND HAVE BEEN SEEDED TO PROTECT THE SLOPES FROM RILL AND GULLY EROSION TO ALLOW THE SEED TO GERMINATE PROPERLY. MULCH (STRAW OR FIBER) WILL BE USED ON RELATIVELY FLAT AREAS. IN ALL SEEDING OPERATIONS, SEED, FERTILIZER AND LIME WILL BE APPLIED PRIOR TO MULCHING.

LEGEND

- SILT FENCE
- INLET PROTECTION
- LIMITS OF CLEARING/
LIMITS OF WORK
- SWALE/DITCH
- CONSTRUCTION ENTRANCE
- FINISHED FLOOR ELEVATION FF
- FINISHED GRADE ELEVATION
AT BUILDING CORNER FG
- SIDEWALK ELEVATION SW
- PAVEMENT ELEVATION P
- TREE PROTECTION
- CHECK DAM
- DIVERSION DIKE

TREE PROTECTION FENCE TO BE ORANGE MESH OR SNOW FENCING.



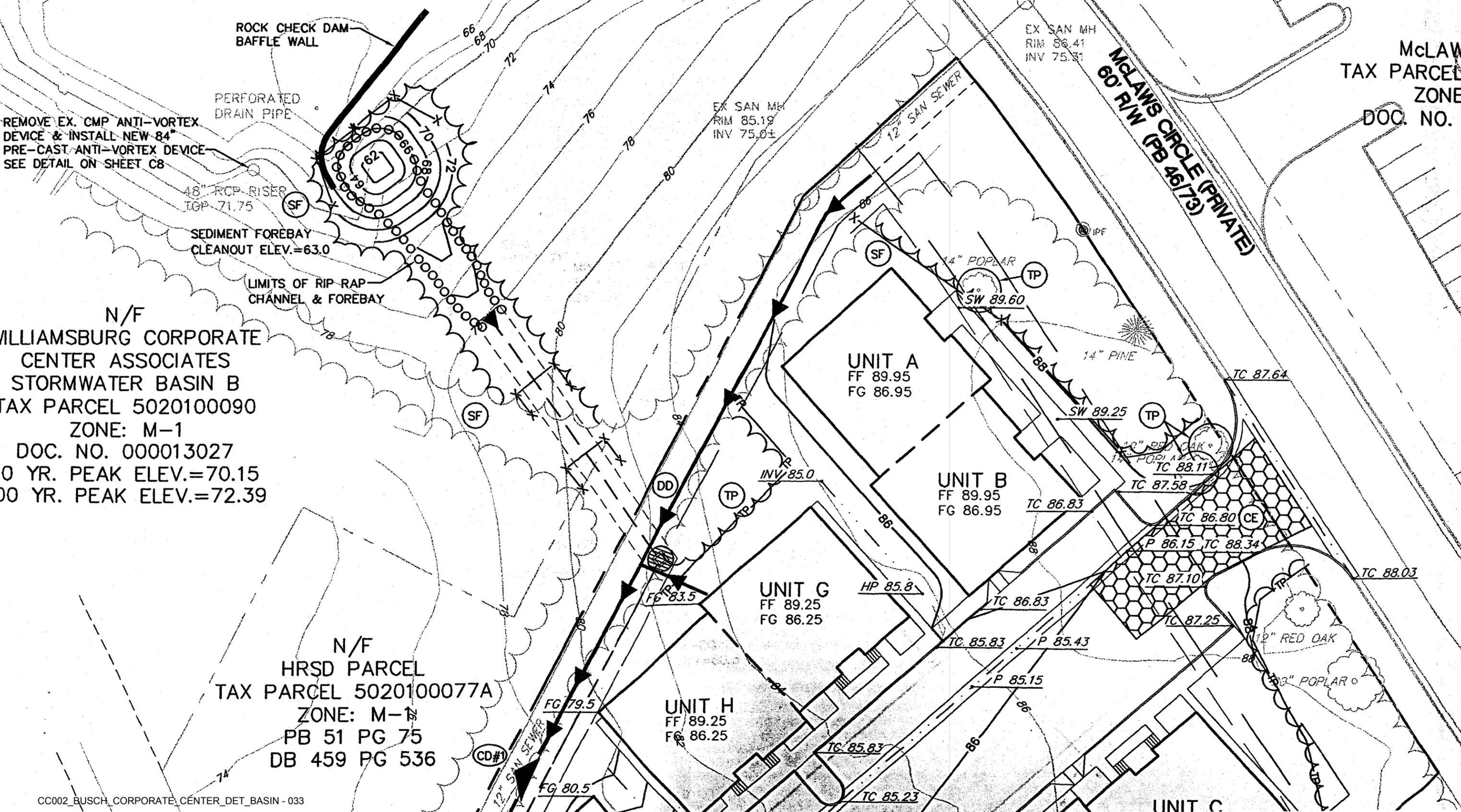
OFF-SITE BMP PROTECTION
 THE EXISTING OFF-SITE BMP LOCATED TO THE NORTHWEST OF THE SITE IS NOT DESIGNED FOR SEDIMENT CONTROL. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT SEDIMENT DOES NOT MIGRATE FROM THE SITE TO THE EXISTING BMP. IF SEDIMENT DOES MIGRATE TO THE EXISTING BMP IT WILL BE THE CONTRACTORS RESPONSIBILITY TO PROTECT THE BMP FROM FURTHER DEGRADATION BY INSTALLING ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES, REMOVING THE ACCUMULATED SEDIMENT AND RESTORING THE BMP TO ORIGINAL CONDITION. THESE RESTORATION REQUIREMENTS WILL NEED TO BE COORDINATED WITH THE OWNER, ENGINEER, AND THE COUNTY.

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

1. THE CHECK DAMS WILL BE CHECKED REGULARLY FOR SEDIMENT CLEANOUT.
2. THE GRAVEL OUTLETS WILL BE CHECKED REGULARLY FOR A SEDIMENT BUILDUP WHICH WILL PREVENT DRAINAGE. IF THE GRAVEL IS CLOGGED BY SEDIMENT, IT SHALL BE REMOVED AND CLEANED OR REPLACED.
3. THE SEEDED AREAS WILL BE CHECKED REGULARLY TO ENSURE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED AND RESEDED AS NEEDED.

P
 1.
 2.
 3.
 4.
 5.
 6.
 7.
 8.
 9.
 10.
 11.
 12.
 13.
 14.

McLAW
TAX PARCEL
ZONE:
DOC. NO.



REMOVE EX. CMP ANTI-VORTEX
DEVICE & INSTALL NEW 84"
PRE-CAST ANTI-VORTEX DEVICE
SEE DETAIL ON SHEET C8

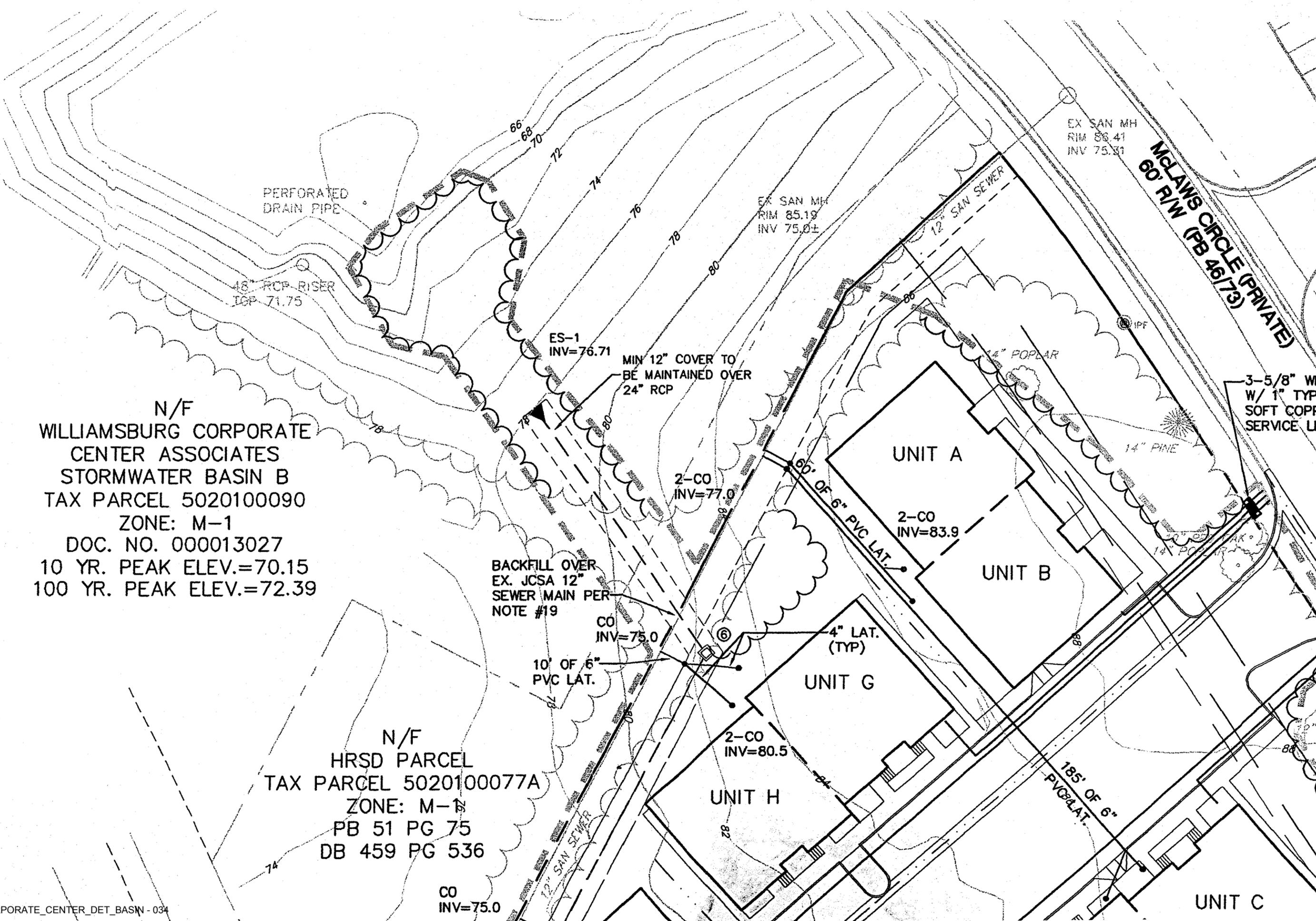
N/F
WILLIAMSBURG CORPORATE
CENTER ASSOCIATES
STORMWATER BASIN B
TAX PARCEL 5020100090
ZONE: M-1
DOC. NO. 000013027
10 YR. PEAK ELEV.=70.15
00 YR. PEAK ELEV.=72.39

N/F
HRSD PARCEL
TAX PARCEL 5020100077A
ZONE: M-1
PB 51 PG 75
DB 459 PG 536

N/F
 WILLIAMSBURG CORPORATE
 CENTER ASSOCIATES
 STORMWATER BASIN B
 TAX PARCEL 5020100090
 ZONE: M-1
 DOC. NO. 000013027
 10 YR. PEAK ELEV.=70.15
 100 YR. PEAK ELEV.=72.39

N/F
 HRSD PARCEL
 TAX PARCEL 5020100077A
 ZONE: M-1
 PB 51 PG 75
 DB 459 PG 536

CO
 INV=75.0



A PORTION OF PARCEL C
 BUSCH PROPERTIES, INC.
 TAX PARCEL 5020100094
 ZONE: M-1

APPROXIMATE LIMITS OF
 WORK, CLEARING AND GRADING

12" POPLAR

DRAINAGE STRUCTURE TABLE

STRUCTURE NO.	STRUCTURE TYPE	RIM	INV. IN	INV. OUT
1	DI-5 (TYPE III GRATE)	81.90		78.40
2	DI-1	83.95		81.00
3	DI-1	82.32	78.04	77.94
4	DI-1	84.43	78.75	78.65
5	MH-1	83.00	77.85	77.75
6	DI-7	81.50	77.16	77.06

PROPOSED 15' PRIVATE
 DRAINAGE EASEMENT

STORM SEWER TABLE

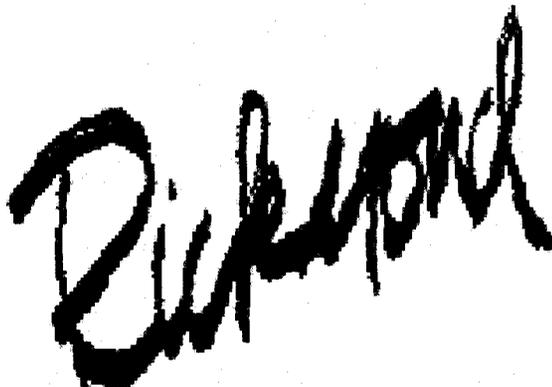
STRUCTURE FROM	STRUCTURE TO	PIPE
1	3	120' OF 21" RCP @ 0.3%
3	5	30' OF 24" RCP @ 0.3%
2	4	55' OF 15" RCP @ 4.09%
4	3	135' OF 15" RCP @ 0.45%
5	6	200' OF 24" RCP @ 0.3%
6	ES-1	100' OF 24" RCP @ 0.3%

SAN MH
 RIM 90.31
 INV 84.01

- NOTES:
- 1) SANITARY SEWER SYSTEM TO BE INSTALLED IN ACCORDANCE WITH JCSA SANITARY SEWER SYSTEM STANDARDS.
 - 2) WATER SYSTEM MATERIALS TO BE INSTALLED IN ACCORDANCE WITH WATER SYSTEMS STANDARDS.
 - 3) SIDEWALKS TO BE TROWEL FINISHED AND ALL EXPOSED AGGREGATE TO BE PROTECTED WITH A FILTER FABRIC TO LINE A MINIMUM OF 18" BELOW THE FINISH GRADE.
 - 4) PARKING LOT AREAS SHALL BE CONCRETE AND SHALL REQUIRE A SAND "CUSHION" FROM THE FACILITIES TO JCSA.
 - 5) IN AREAS WHERE WATER MAINS ARE LOCATED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
 - 6) ALL COMPONENTS OF THE SANITARY SEWER SYSTEM SHALL BE AND CONVEYED TO THE CONTRACTOR IN ACCORDANCE WITH THE LATEST EDITION OF THE JCSA SANITARY SEWER SYSTEM STANDARDS.
 - 7) THE RECEIVING OFF-SITE SANITARY SEWER SHALL BE WITH AN APPROVAL DATE OF 12/31/2010.
 - 8) ALL RCP STORM SEWER PIPE SHALL BE 15' DIA. UNLESS OTHERWISE NOTED ON PLANS.
 - 9) SANITARY SEWER LATERALS SHALL BE 12" DIA. UNLESS OTHERWISE NOTED ON PLANS.
 - 10) WATER SERVICE LINES SHALL BE 1/2" DIA. UNLESS OTHERWISE NOTED ON PLANS.
 - 11) CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL MAINS WITHIN THE PROJECT AREA AND SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EASEMENTS. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EASEMENTS.
 - 12) ALL STORM DRAIN ACCESSORIES SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE JCSA SANITARY SEWER SYSTEM STANDARDS.
 - 13) THE ONLY OFFSITE LAND USE SHALL BE IN ACCORDANCE WITH THE STORMWATER EASEMENT.
 - 14) THE ON-SITE SOILS CONSULTING REPORT IS THE SURVEY OF JAMES CITY COUNTY, FLORIDA, DATED APRIL 1985.
 - 15) ALL STORM DRAIN ACCESSORIES SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE JCSA SANITARY SEWER SYSTEM STANDARDS.
 - 16) A SAND "CUSHION" FROM THE FACILITIES TO JCSA SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE JCSA SANITARY SEWER SYSTEM STANDARDS.

**MCLAWS CENTRE
BUSCH CORPORATE CENTER
DRAINAGE CALCULATIONS**

**November 5, 2001
(Revised January 14, 2002)
(Revised January 30, 2002)**



ENGINEERING, INC.

Project No. 01183

SP-119-01

**1643 Merrimac Trail
Williamsburg, VA 23185
Phone: 757-229-1776
Fax: 757-229-4683**

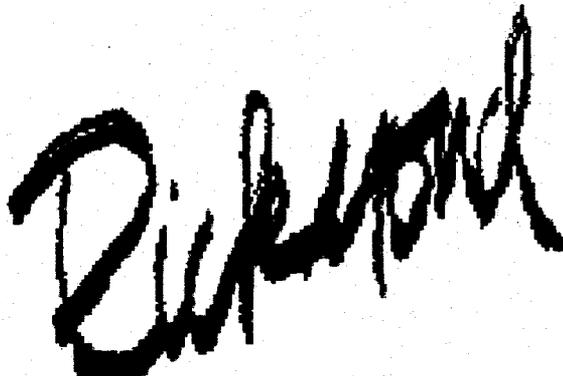
**Vint Hill • P.O.Box 861647
Warrenton, VA 20187
Phone: 540-349-7730
Fax: 540-349-7731**

www.rickmond.com

**MCLAWS CENTRE
BUSCH CORPORATE CENTER**

DRAINAGE CALCULATIONS

**November 5, 2001
(Revised January 14, 2002)
(Revised January 30, 2002)**


ENGINEERING, INC.

Project No. 01183



**1643 Merrimac Trail
Williamsburg, VA 23185
Phone: 757-229-1776
Fax: 757-229-4683**

**Vint Hill • P.O.Box 861647
Warrenton, VA 20187
Phone: 540-349-7730
Fax: 540-349-7731**

www.rickmond.com

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE NO.</u>
PROJECT DESCRIPTION	1
EXISTING SITE CONDITIONS	
ADJACENT AREAS	
OFF-SITE AREAS	
SOILS	
CRITICAL EROSION AREAS	2
Erosion and Sediment Control Measures	
PERMANENT STABILIZATION	3
STORMWATER MANAGEMENT	
MAINTENANCE	4

PROJECT DESCRIPTION

This project consists of a 2.78-acre parcel of land located on McLaws Circle in the Busch Corporate Center. The site will contain nine office buildings totaling 21,200 sq. ft. with 86 parking spaces, sidewalks, and landscaping. The site is served by public water and sewer.

EXISTING CONDITIONS

Currently, the entire site is wooded and slopes from McLaws Circle and the rear to the middle.

ADJACENT AREAS

The site is bounded on the north by McLaws Circle (private road). Directly across McLaws Circle from the site, two parcels containing office buildings are currently under construction. The site is bounded on the west and east by undeveloped land in the corporate park and on the south by Carters Grove Country Road.

OFF-SITE AREAS

The only off-site area to be disturbed is the 20' wide path to install storm sewer pipe from the site to the existing Stormwater Basin B.

SOILS

The on-site soils consist of Kempsville-Emporia fine sandy loams (19B).

Kempsville-Emporia fine sandy loams are deep, gently sloping, and well-drained soils.

Typically, the surface layer of this Kempsville soil is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is light yellowish brown fine sandy loam 10 inches thick.

The subsoil extends to a depth of 55 inches. It is yellowish brown and strong brown fine sandy loam and sandy clay loam to a depth of 32 inches. Below this, the subsoil is mottled fine sandy loam that is somewhat firm and compact over yellowish brown fine sandy loam. The substratum is yellowish brown fine sandy loam to a depth of at least 68 inches.

Typically, the surface layer of this Emporia soils is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is pale brown loam 9 inches thick. The subsoil extends to a depth of 58 inches. It is yellowish brown loam with mostly strong brown mottles in the upper part, yellowish brown firm sandy clay loam with strong brown and gray mottles in the middle part, and mottled gray and brown firm sandy clay loam in the lower part. The substratum is variegated gray, brown, and red firm sandy clay loam to a depth of at least 75 inches.

The permeability of the Kempsville soil is moderate. In the Emporia soil, permeability is moderate in the upper part of the subsoil and moderately slow to slow in the lower part. The erosion hazard for each soil is moderate.

CRITICAL EROSION AREAS

The critical erosion area of this site is the downstream rip rap channel and detention pond. To prevent sediment from entering these areas it is imperative that the contractor install all erosion and sediment control measures shown on these plans before any land disturbing activities commence. Regular inspection and maintenance is also required for all erosion and sediment control measure to keep them functioning as designed.

Erosion and Sediment Control Measures

The following erosion and sediment (E&S) control measures are used on-site:

- A construction entrance is installed at the entrance to reduce the amount of mud transported onto paved public roads by motor vehicles and runoff.

- Inlet protection is installed at all drainage inlets to prevent sediment from entering the storm drainage systems prior to permanent stabilization for the disturbed area.
- Sediment trap is installed to detain sediment laden runoff from upstream disturbed areas long enough to allow the majority of the sediment to settle out.
- Soil stabilization matting will be used on all slopes steeper than 3:1 to aid in controlling erosion by providing a microclimate which protects young vegetation and promotes its establishment.
- Diversion dike is used to divert sediment-laden runoff from a disturbed area to a sediment trap.
- Tree protection will be used to protect desirable trees during land disturbing activities.

PERMANENT STABILIZATION

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

STORMWATER MANAGEMENT

The site drains to a previously approved detention pond, which meets the requirements of James City County for water quality and quantity. The detention pond is shown on JCC Plan SP-62-91 and was approved on 10/22/91.

MAINTENANCE

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

- The sediment trap will be checked regularly for sediment cleanout.
- The gravel outlets will be checked regularly for a sediment buildup which will prevent drainage. If the gravel is clogged by sediment, it shall be removed and cleaned or replaced.
- The seeded areas will be checked regularly to ensure that a good stand is maintained. Areas should be fertilized and reseeded as needed.
- The diversion dikes shall be inspected after every storm and repairs made to the dike, flow channel, outlet or sediment trapping facility, as necessary. Once every two weeks, whether a storm event has occurred or not, the measure shall be inspected and repairs made if needed. Damages caused by construction traffic or other activity must be repaired before the end of each working day.

DA- 1 For Storm Sewer Design Calculations

c = 0.62
 A = 2.50 Ac.

OVERLAND FLOW

	<u>c</u>	<u>A</u>	<u>CA</u>
Roof/Road	.90	1.50	1.35
Grass	.20	1.00	.20
		2.50	1.55

L = — ft.
 S = — %
 Tc = 45 min.

2.50 ac offsite will drain through DI #1 when adjacent site is developed.

CHANNEL FLOW

H = — ft.
 L = — ft.
 Tc = 45 min.
 Tc = 5 min.

i₁₀ = 7.2 in/hr

$Q = CAi = (.60)(2.50 \text{ Ac.})(7.2 \text{ in/hr})(C_f 1.0)$

C_f for storms 25 yr+
 (VDOT Manual Pg. 1-11)

Q = 10.80 cfs

DA- 1

For Ditch and DI # 1 Design at Buildout

$c = .39$
 $A = .44$ Ac:

	<u>C</u>	<u>A</u>	<u>CA</u>
Roof	.90	.11	.10
Gross	.20	.33	.07
		.44	.17

OVERLAND FLOW

$L = 20$ ft.

$S = 5$ %

$T_c = 15$ min.

CHANNEL FLOW

$H = 4.6$ ft.

$L = 300$ ft.

$T_c = 15$ min.

$T_c = 5$ min.

$i_{10} = 7.2$ in/hr $i_2 = 5.7$ in/hr

$Q = CAi = (.39)(.44 \text{ Ac.})(7.2 \text{ in/hr})(C_f 1.0)$

C_f for storms 25 yr+
 (VDOT Manual Pg. 1-11)

$Q = 1.24$ cfs

$Q_2 = CAI = (.39)(.44)(5.7) = 0.98$ cfs

DA- 2

c = .83
 A = .18 Ac:

Roof/Road
 Grass

	<u>C</u>	<u>A</u>	<u>CA</u>
Roof/Road	.90	.17	.15
Grass	.20	.01	.00
		<u>.18</u>	<u>.15</u>

OVERLAND FLOW

L = 42 ft.
 S = 1.0 %
 Tc = 15 min.

CHANNEL FLOW

H = .55 ft.
 L = 55 ft.
 Tc = 15 min.
 Tc = 5 min.

$i_{10} = \underline{7.2}$ in/hr

$Q = CAi = (.83)(.18 \text{ Ac.})(7.2 \text{ in/hr})(C_f 1.0)$

C_f for storms 25 yr+
 (VDOT Manual Pg. 1-11)

$Q = \underline{1.08}$ cfs

$Q_{0.1} = CA(4.0) = (.83)(.18)(4.0) = \underline{0.60}$ cfs

DA- 3

c = .82
 A = .56 Ac.

OVERLAND FLOW

	<u>C</u>	<u>A</u>	<u>CA</u>
Roof/Road	.90	.50	.45
Grass	.20	.06	.01
		<u>.56</u>	<u>.46</u>

L = 42 ft.

S = 1.0 %

Tc = 15 min.

CHANNEL FLOW

H = 0.7 ft.

L = 140 ft.

Tc = 15 min.

Tc = 5 min.

$i_{10} = \underline{7.2}$ in/hr

$Q = CAi = (.82)(.56 \text{ Ac.})(7.2 \text{ in/hr})(C_f 1.0)$

C_f for storms 25 yr+
 (VDOT Manual Pg. 1-11)

Q = 3.31 cfs

$Q_{0.1} = CA(4.0) = (.82)(.56)(4.0) = 1.84 \text{ cfs}$

DA- 4

c = .74
 A = .53 Ac.

OVERLAND FLOW

L = 120 ft.
 S = 2.5 %
 Tc = 6 min.

CHANNEL FLOW

H = 1.3 ft.
 L = 130 ft.
 Tc = — min.
 Tc = 6 min.

$i_{10} = \underline{7.0}$ in/hr

$Q = CAi = (.74)(.53 \text{ Ac.})(7.0 \text{ in/hr})(C_f 1.0)$

C_f for storms 25 yr+
 (VDOT Manual Pg. 1-11)

$Q = \underline{2.75}$ cfs

$Q_{DI} = CA(4.0) = (.74)(.53)(4.0) = 1.57 \text{ cfs}$

	<u>C</u>	<u>A</u>	<u>CA</u>
Roof / Road	.90	.41	.37
Grass	.20	.12	.02
		<u>.53</u>	<u>.39</u>

V-DITCH DESIGN

DA-1

"Worst Case"

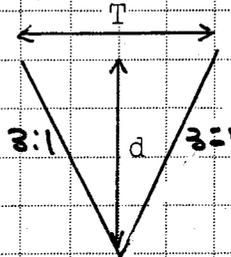
Q = _____ cfs

S = 1.53%

L = _____ ft.

T = 6 ft.

d = 1.0 ft.



$$R = \frac{zd}{2(z^2+1)^{3/2}} = \frac{(3)(1 \text{ ft.})}{2(10)^{3/2}} = 0.47 \text{ ft.}$$

n = 0.030

$$A = zd^2 = (3)(1 \text{ ft.})^2 = 3 \text{ ft.}^2$$

Check Capacity:

$Q_0 = 1.24 \text{ cfs}$

$d = 0.44'$

Since $d = 0.44' < 1.0'$
 Capacity is adequate

Check Velocity:

$Q_2 = 0.98 \text{ cfs}$

$d = 0.40' \quad V = 2.03 \text{ fps}$

Since $V = 2.03 \text{ fps} < 5.0 \text{ fps}$
 Velocity is adequate



RICKMOND ENGINEERING, INC.
1643 Merrimac Trail
Williamsburg, VA 23185-5624
Phone: 757-229-1776
Fax: 757-229-4683
e-mail rei@rickmond.com

PROJECT NO. 01183
PROJECT NAME _____
SHEET NO. _____ OF _____
CALCULATED BY KHJ DATE 10/31/01
CHECKED BY _____ DATE _____
SCALE _____

DESIGN DI #1

$$Q = 2.00 \text{ cfs}$$
$$S_x = 0.333 \text{ ft/ft}$$
$$DI-5$$
$$L = 3.33'$$
$$W = 3.00'$$

$$P = 2(W+L) = 12.66'$$

From Chart 14: $d = 0.15'$

$$T = \frac{Q}{S_x} = \frac{0.15'}{0.333} = 0.45' \quad \underline{\underline{OK}}$$

USE VDOT DI-5

Rickmond

RICKMOND ENGINEERING, INC.

1643 Merrimac Trail
Williamsburg, VA 23185-5624
Phone: 757-229-1776
Fax: 757-229-4683
e-mail rei@rickmond.com

PROJECT NO. 01183
PROJECT NAME _____
SHEET NO. _____ OF _____
CALCULATED BY KMJ DATE 10/31/01
CHECKED BY _____ DATE _____
SCALE _____

DESIGN DI #2

$Q = 0.60$ cfs
 $S_x = .01$ ft/ft
DI-1
 $L = 2.5'$
 $W = 2.5'$

$$P = 2W + L = 2(2.5) + 2.5 = 7.5'$$

From Chart 14: $d = .14'$

$$T = \frac{d}{S_x} = \frac{.14}{.01} = 14' \quad \underline{\underline{OK}}$$

USE VDOT DI-1

Rickmond

RICKMOND ENGINEERING, INC.
1643 Merrimac Trail
Williamsburg, VA 23185-5624
Phone: 757-229-1776
Fax: 757-229-4683
e-mail rei@rickmond.com

PROJECT NO. 01183
PROJECT NAME _____
SHEET NO. _____ OF _____
CALCULATED BY KMS DATE 10/31/01
CHECKED BY _____ DATE _____
SCALE _____

DESIGN DI#3

$$Q = 1.84 \text{ cfs}$$
$$S_x = .01 \text{ ft/ft}$$
$$D_H = 1$$
$$L = 2.5'$$
$$E = 2.5'$$

$$P = 2W + L = 2(2.5) + 2.5 = 7.5'$$

From Chart 14: $d = .20$

$$T = \frac{d}{S_x} = \frac{.20}{.01} = .20' \quad \underline{\underline{OK}}$$

USE VDOT DI-1



RICKMOND ENGINEERING, INC.
1643 Merrimac Trail
Williamsburg, VA 23185-5624
Phone: 757-229-1776
Fax: 757-229-4683
e-mail rei@rickmond.com

PROJECT NO. 01183
PROJECT NAME _____
SHEET NO. _____ OF _____
CALCULATED BY RMJ DATE 10/3/01
CHECKED BY _____ DATE _____
SCALE _____

DESIGN DI #4

$$Q = 1.57 \text{ cfs}$$
$$S_x = .01 \text{ ft/ft}$$
$$DI = -1$$
$$L = 2.5'$$
$$W = 2.5'$$

$$P = 2W + L = 2(2.5) + 2.5 = 7.5'$$

From Chart 148 $d = .17'$

$$T = \frac{d}{S_x} = \frac{.17'}{.01} = 17' \text{ OK}$$

USE VDOT DI-1

Project Manager: Kenny Jenkins

Project Engineer: Kenny Jenkins

For Tc Accumulation, Use VELOCITY (1) from Pipe Slope or (2) V=Q/A : 1

Project Number: 00183

Project: McLAWS CENTRE

Year Storm: 10

Structure		Rational Formula: $Q = CiA$									Pipe Data					Mannings Formula				
From	To	Area "A" (ac)	Coefficient "C"	CA		Inlet Time		Rain (in/hr)	Runoff, Q		Inverts		Length (ft)	Slope (%)	Diameter (in)	Velocity		Capacity (cfs)	Flow Time (min)	N
				Incremental	Cumulative	Incremental	Cumulative		Incremental	Cumulative	UPstream	DOWN-stream				Based on Q/A	Based on pipe slope			
From	To	Area	C	CAInc	CACum	TimeInc	TimeCum	Rain	Qinc	Qcum	InvertUp	InvertDown	Length	Slope	Diameter	VelocityQA	VelocityS	Capacity	FlowTime	ManningsN
1	3	2.50	0.6	1.55	1.55	5	5.00	6.96	10.78	10.78	78.40	78.04	120	0.30%	21	4.48	3.61	8.68	0.55	0.013
2	4	0.18	0.8	0.15	0.15	5	5.00	6.96	1.04	1.04	81.00	78.75	55	4.09%	15	0.85	10.65	13.07	0.09	0.013
4	3	0.53	0.7	0.39	0.54	6	6.00	6.72	2.64	3.64	78.65	78.04	135	0.45%	15	2.97	3.54	4.34	0.64	0.013
3	5	0.56	0.8	0.46	2.55	5	6.64	6.58	3.02	16.79	77.94	77.85	30	0.30%	24	5.34	3.94	12.39	0.13	0.013
5	6	0.00	0.0	0.00	2.55	0	6.76	6.56	0.00	16.72	77.75	77.16	200	0.30%	24	5.32	3.91	12.29	0.85	0.013
6	ES	0.11	0.6	0.06	2.61	5	7.61	6.38	0.39	16.65	77.06	76.76	100	0.30%	24	5.30	3.94	12.39	0.42	0.013
ES																				

Project Number: 00183
 Project: McLAWS CENTRE
 Date: 1.15.02

From Structure						HGL		STRUCTURE LOSSES		Performance Checks & Intermediate Computations												
1	2	3	4	5	6	HGL Slope	HGL Fall	Velocity Head	Invert Shaped?	Surface Flow?	Angle (deg)	Bend Losses	ENTRANCE	EXIT	TOTAL	HGL @ FROM	Rim/Flowline (Max. Allow. Elevation)	Freeboard (ft)	Elev., top of pipe @ From	Structure #'s: FROM-TO	TC plus Pipe Flow Time	Elevation at 80% Full Flow
0.463%	0.026%	0.318%	0.551%	0.547%	0.543%	0.463%	0.556	0.31	Y	Y	0	0.000	0.078	0.109	0.071	81.70	81.90	0.20	80.38	1-3	5.55	79.80
Y	Y	Y	Y	Y	Y	Y	0.000	0.000	Y	Y	0	0.000	0.000	0.004	0.003	82.00	83.95	1.95	82.44	2-4	5.09	82.00
0.000	0.000	0.098	0.319	0.229	0.227	0.000	0.000	0.000	Y	Y	90	0.098	0.034	0.048	0.033	81.54	84.43	2.89	80.09	4-3	6.64	79.65
0.000	0.000	0.098	0.319	0.229	0.227	0.000	0.000	0.000	Y	Y	90	0.098	0.034	0.048	0.033	81.54	84.43	2.89	80.09	4-3	6.64	79.65
0.078	0.003	0.111	0.111	0.110	0.109	0.078	0.110	0.110	Y	Y	90	0.110	0.111	0.154	0.216	81.08	82.32	1.24	80.19	3-5	6.76	79.54
0.000	0.000	0.078	0.078	0.111	0.110	0.078	0.111	0.111	Y	Y	90	0.111	0.111	0.154	0.216	81.08	82.32	1.24	80.19	3-5	6.76	79.54
0.109	0.004	0.155	0.155	0.154	0.153	0.109	0.154	0.154	Y	Y	90	0.154	0.154	0.154	0.216	81.08	82.32	1.24	80.19	3-5	6.76	79.54
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380	80.70	83.00	2.30	80.00	5-6	7.61	79.35
0.071	0.003	0.033	0.216	0.380	0.319	0.071	0.380	0.380	Y	Y	90	0.380	0.380	0.380	0.380							

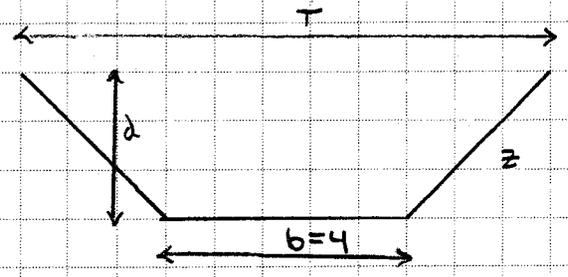
RICKMOND ENGINEERING, INC.

1643 C Merrimac Trail
 WILLIAMSBURG, VIRGINIA 23185
 (804) 229-1776
 (804) 875-1785

JOB 01183
 SHEET NO. _____ OF _____
 CALCULATED BY KWJ DATE 1/16/02
 CHECKED BY _____ DATE _____
 SCALE _____

TRAPEZOIDAL-DITCH DESIGN
 RIP RAP CHANNEL

Q = 16.27 cfs
 S = 21.5 %
 L = 50 ft.
 T = 8 ft.
 d = 1 ft.



$$R = \frac{bd + zd^2}{b + 2d(z + 1)} = \frac{(4 \text{ ft})(1 \text{ ft}) + (2)(1 \text{ ft})^2}{(4 \text{ ft}) + 2(1 \text{ ft})(5)} = \underline{0.71} \text{ ft}$$

n = .033

$$A = bd + zd^2 = (4 \text{ ft})(1 \text{ ft}) + (2)(1 \text{ ft})^2 = \underline{6} \text{ ft}^2$$

d = 0.36 ft V = 9.47 fps

RIP RAP LINED CHANNEL OK

Rickmond

RICKMOND ENGINEERING, INC.

1643 Merrimac Trail
Williamsburg, VA 23185-5624
Phone: 757-229-1776
Fax: 757-229-4683
e-mail: rei@rickmond.com

PROJECT NO. 01183

PROJECT NAME

SHEET NO.

CALCULATED BY

CHECKED BY

OF

DATE

DATE

KMJ

11/5/01

SCALE

DESIGN FOREBAY

$$\begin{aligned} \text{Impervious Area} &= 1.16 \text{ acre} + (2.5 \text{ acre offer}) (0.60) \\ &= 1.16 \text{ acre} + 1.50 \text{ acre} \\ &= 2.66 \text{ acre} \end{aligned}$$

$$\begin{aligned} \text{Forebay Volume} &= 2.66 \text{ acre} \times 0.12 \text{ inch} \times 43,560 \text{ sq ft/acre} \times 1 \text{ ft} \\ &= 966 \text{ cf} \end{aligned}$$

$$\text{Forebay depth} = 4'$$

$$\text{Forebay area} = \frac{966 \text{ cf}}{4 \text{ ft}} = 242 \text{ sq ft} = 16' \times 16'$$

RICKMOND ENGINEERING, INC.

**1643 Merrimac Trail
Williamsburg, VA 23185
Phone: 757-229-1776
Fax: 757-229-4683**

**Vint Hill • P.O.Box 861647
Warrenton, VA 20187
Phone: 540-349-7730
Fax: 540-349-7731**

www.rickmond.com



HRSD

P. O. BOX 5911, VIRGINIA BEACH, VIRGINIA 23471-0911 • (757) 460-2261 FAX (757) 460-2372

4 February, 2002

Commissioners

- Linda D. Cranahan
Chair
- Edward R. Goldsicker, CPA
Vice-Chair
- J. Brewer Moore, AICP
- Jack O. Summs
- James H. Shoemaker, Jr.
- Joseph R. Ambrose, Jr.
- Ethel M. Hoory
- William H. Pierce

Mr. Kenneth M. Jenkins, P.E.
Richmond Engineering
1643 Merrimac Trail
Williamsburg, VA 23185

Re: Busch Corporate Center, - McJaws Centre

Dear Mr. Jenkins:

Thank you for the complete set of the proposed plans for the subject project, submitted to this office for review on 12/07/01. This plan set consists of 9 sheets, C1 to C9 and contains thereon your original PE stamp and signature. In response to the review of these plans, Mr. Steve Richendollar, our Real Estate Manager is in the process of preparing a 20' easement to be granted to the developer for the proposed storm drainage discussed in my previous letter. This easement will be executed at our earliest opportunity upon receipt of the necessary plat, as discussed directly with the developer. Please be advised that Political Jurisdiction, easements must be presented to our commission for final approval and cannot be done so until the plat is received.

There seems to be some concern at the County regarding the proposed temporary erosion and sediment control shown on sheet C3 and the final grade plan on sheet C4. There appears to be no detrimental impact on the existing HRSD easement, or the future use of the adjacent HRSD pump station site. The same applies to the vegetation and landscaping plan as shown on sheet C5. Please be advised that HRSD does routinely access all of our easements for maintenance and inspection of our lines, we will make every effort not to damage the landscaping and in the event of an emergency repair, will make every reasonable effort to return the site to it's original condition. Therefore, as regards HRSD, I recommend plans approval by the County.

Please feel free to provide a copy of this letter to the appropriate County office where your plans are under review. If I can be of further assistance, please contact me.

Respectfully,

William A. Harrison
Interceptor Engineer

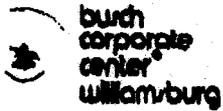
cc: Steve Richendollar, HRSD Real Estate
Jon Liebler, VP, CD&A
JCSA - Dev. Management

- D. R. Wheeler
General Manager
- Edward D. Brown, P.E.
Director of Engineering
- John A. Maniacello, CPA
Director of Finance & Administration
- Kath W. Emson, P.E.
Director of Interceptor Systems
- G. David Weltrip, P.E.
Director of Treatment
- Clay M. Aydin
Director of Water Quality

- Serving the Cities of
- Chesapeake
- Hampton
- Newport News
- Norfolk
- Poquoson
- Portsmouth
- Suffolk
- Virginia Beach
- Williamsburg
- Serving the Counties of
- Gloucester
- Isle of Wight
- James City
- King William
- Mathews
- Middlesex
- York

PROVIDING WASTEWATER SERVICES TO PROTECT AND ENHANCE OUR ENVIRONMENT

Att: King



January 11, 2002

Mr. Andy Piplico
Piplico and Associates
4780 Longhill Road
Williamsburg, Virginia 23185

Re: Offsite Drainage, Lot 14, Busch Corporate Center

Dear Mr. Piplico:

The storm water drainage infrastructure and retention ponds now owned by the Williamsburg Center Association DBA Busch Corporate Center-Williamsburg were designed to accommodate the offsite drainage needs of the adjacent lots in the business park.

Accordingly, you have the Association's permission to utilize the retention pond to the north of your lot for retention purposes in accordance with the approved development plans for your lot.

Let me know if you need anything else.

Sincerely,

William B. Voliva, Jr.
President
Williamsburg Center Association
DBA Busch Corporate Center-Williamsburg

WBV/me

cc: William I. Pennock

*SP119-01
McLANS Centre*

*ALLOWS FOR USE OF
BMP.
WHAT ABOUT
24" RCP STORM
DRAIN OUTFALL. DRAINAGE
EASEMENT NECESSARY.*

Date Record Created:

WS_BMPNO:

Print Record

Created By:

CC002

PRINTED ON
Thursday, March 11, 2010
11:24:09 AM

WATERSHED CC
 BMP ID NO 002
 PLAN NO SP-62-91
 TAX PARCEL (50-2)(1-77)
 PIN NO 50201000077
 CONSTRUCTION DATE 10/22/1991
 PROJECT NAME Busch Corporate Center (Pond A)
 FACILITY LOCATION McLaws Circle - Southwest Corner
 CITY-STATE Williamsburg, Va. 23185
 CURRENT OWNER Williamsburg Center Assoc DBA Busch Corp Center
 OWNER ADDRESS 100 Kingsmill Road
 OWNER ADDRESS 2
 CITY-STATE-ZIP CODE Williamsburg, Va. 23188
 OWNER PHONE 253-3938
 MAINT AGREEMENT Yes
 EMERG ACTION PLAN No

MAINTENANCE PLAN

SITE AREA acre
 LAND USE
 old BMP TYP
 JCC BMP CODE
 POINT VALUE

No

68

Lim Bus/Indust

Dry Pond

F2 Dry ED with forebay

9

SVC DRAIN AREA acres

73.3

SERVICE AREA DESCR

Office, Light Indust & Paved Roadway

IMPERV AREA acres

14.00

RECV STREAM

UT of Halfway Creek

EXT DET-WQ-CTRL

Yes

WTR QUAL VOL acre-ft

0.634

CHAN PROT CTRL

No

CHAN PROT VOL acre-ft

0

SW/FLOOD CONTROL

Yes

GEOTECH REPORT

No

CTRL STRUC DESC

RCP Riser

CTRL STRUC SIZE inches

30

OTLT BARRL DESC

RCP

OTLT BARRL SIZE inch

24

EMERG SPILLWAY

Yes

DESIGN HW ELEV

72.39

PERM POOL ELEV

None

2-YR OUTFLOW cfs

40.00

10-YR OUTFLOW cfs

45.00

REC DRAWING

No

CONSTR CERTIF

No

LAST INSP DATE 1/10/2002

Inspected by:

INTERNAL RATING

3

MISC/COMMENTS

Orig Design Modified 3/22/91. Forebay
McLaws Center SP11901. Upgrade SP-100-07.

Get Last BMP No

Return to Menu

Additional Comments:

