



## 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:** JR046

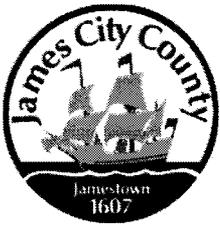
**DATE VERIFIED:** June 20, 2012

**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:** Jo Anna Ripley, Stormwater  
**PO:** 270712  
**RE:** Files Approved for Scanning

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**General File ID or BMP ID:** JR046

**PIN:** 5140200001A

**Subdivision, Tract, Business or Owner**

**Name (if known):**

Kingsmill

**Property Description:**

Common Area Sandys Fort

**Site Address:**

*(For internal use only)*

**Box** 12

**Drawer:** 7

**Agreements:** (in file as of scan date)

N

**Book or Doc#:**

**Page:**

Comments

JR-046

**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

(NORTH OF  
115 Andrew  
LINDSEY)

GPIN  
5140200001A

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

County Plan No.: S-85-97  
Project Name: BUSCH-KINGSMILL EAST SANDY'S FORT  
Stormwater Management Facility: WET POND #2

Phase:  I  II  III  
Date: 3/23/01 AES  
 Information Received. Date: 3/23/01 AES  
 Administrative Check. Date: PSI MAR 15 2001 AES 3/23/01  
 Record Drawing. Date: PSI INC MAR 15 2001  
 Construction Certification. Date: PSI INC MAR 15 2001  
 RD/CC Standard Forms. (Required after Feb 1<sup>st</sup> 2001 Only) OK.  
 Insp/Maint Agreement \*. Info: None in File; None in Log; JOANS LOG - YES.  
 Other: \_\_\_\_\_

Standard E&SC Note on Approved Plan Requiring RD/CC or County comment in plan review file.  
 Yes  No Note/Sheet: Note #18 on Sheet 18.  
 Assign County BMP ID Code Code: JR046  
 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, copies of hydraulics, etc.)  
 Inspector Check of RD/CC. MIKE

Pre-Inspection Drawing Review (Quick look prior to field inspection).  
 Final Inspection (FI) Date: 11/02/01. SJT/MON  
 Record Drawing (RD) Review Date: 11/06/01. SJT  
 Construction Certification (CC) Review Date: 11/06/01.

Actions:  
 No comments.  
 Comments. Letter Forwarded. Date: 11/06/01.  
 Record Drawing (RD)  
 Construction Certification (CC)  
 Construction-Related (CR)  
 Site Issues (SI)  
 Other: \_\_\_\_\_

Second Submission: Field-related items addressed. RD ok.  
 Third Submission: \_\_\_\_\_  
 Acceptable for stormwater management facility purposes (RD/CC/CR/Other). Proceed with bond release.  
 Notify Darryl & Joan of acceptability using email (preferred) or verbal. Form 3/30/04  
 Clean active file of all stormwater management related material and finish/establish "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.  
 Digital Photographs obtained.  
 Add to JCC Hydrology & Hydraulic database (optional).

BMP Certification Information Acceptable

Plan Reviewer: [Signature] Date: 3/30/04

\* ED comment #4 dated OCT 17 1997 required i/m Agreement.  
AES response dated Dec 2 1997 stated an i/m agreement shall be executed with the County.

JR 046  
S-85-97

March 5, 2001

Mr. Tom Dunn  
Busch Properties  
300 McLaws Circle  
Suite 106  
Williamsburg, VA 23187

Re: Earthwork Certification (County Plan S-85-97)  
Sandy's Fort - Wet Pond #2 and Wet Pond #5  
Williamsburg, VA  
PSI Project Number: 239-80041

Dear Mr. Dunn:

We have received a request from AES Consulting Engineers for a report certifying the referenced storm water management ponds were constructed in accordance with James City County standards. We are familiar with the County document for these types of structures; however, the preparation of this document was not required at the time of the permitting and construction of the dams.

We have been in contact with Scott Thomas of the Environmental Division of James City County (the Division which is requesting this documentation). We suggested that a letter be prepared to complete a portion of the document, since the entire document could not be prepared (since PSI had no knowledge of these requirements prior to or during construction). Mr. Thomas indicated that this letter was sufficient for the County's needs. Therefore, PSI offers the following geotechnical statements regarding wet ponds #2 and #5.

- 1) The earth embankments were constructed in accordance with the plan requirements with regard to soil density and soil type. PSI provided full-time inspection of these earthwork activities.
- 2) No discrepancies regarding soil compaction remain at this time (for those soil layers tested by PSI).

*Earthwork Certification (County Plan S-85-97)*

*Sandy's Fort - Wet Ponds #2 and #5*

*Williamsburg, VA*

*PSI Project Number: 239-80041*

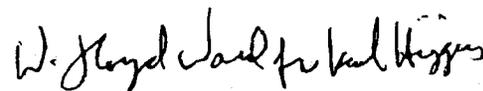
Page 2 of 2

Should you have any additional questions, please do not hesitate to call our office at (757) 249-3811.

Respectfully submitted,  
**PROFESSIONAL SERVICE INDUSTRIES, INC.**

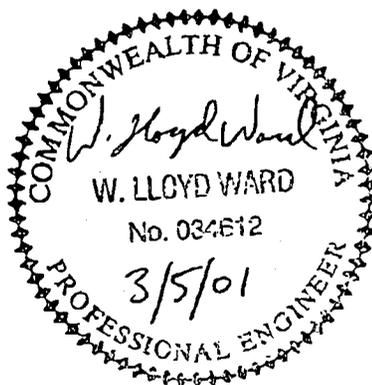


W. Lloyd Ward P.E.  
Project Engineer



Karl Higgins III P.E.  
Branch Manager

Cc: Mark Richardson (AES Consulting Engineers) fx 220-8994  
Scott Thomas, P.E. (JCC Environmental Division) fx 259-4032  
Ray Nice, (George Nice and Sons) fx 565-1526





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: KINGSMILL EAST SANDY'S FORT  
Structure/BMP Name: WET POND #2  
Project Location: SANDY'S FORT SECTION  
BMP Location: 200' EAST OF INT. OF WAREHAM'S POND ROAD & EDWARD GRINDON  
County Plan No.: S - 85 - 97

Project Type:  Residential  Business  Commercial  Office  Institutional  Industrial  Public  Roadway  Other \_\_\_\_\_  
Tax Map/Parcel No.: PART OF (51-4)(1-8)  
BMP ID Code (if known): JR 046  
Zoning District: R-4  
Land Use: \_\_\_\_\_  
Site Area (sf or acres): 61.375 AC.

Brief Description of Stormwater Management/BMP Facility: PHASE II WET POND

Nearest Visible Landmark to SWM/BMP Facility: EDWARD GRINDON

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

**Section 2 - Stormwater Management / BMP Facility Construction Information:**

PreConstruction Meeting Held for Construction of SWM/BMP Facility:  Yes  No  Unknown  
Approx. Construction Start Date for SWM/BMP Facility: UNKNOWN 6/1/98  
Facility Monitored by County Representative during Construction:  Yes  No  Unknown  
Name of Site Work Contractor Who Constructed Facility: GEORGE NICE & SONS  
Name of Professional Firm Who Routinely Monitored Construction: PSI  
Date of Completion for SWM/BMP Facility: \_\_\_\_\_  
Date of Record Drawing/Construction Certification Submittal: \_\_\_\_\_

*( 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: BOUCH PROPERTIES  
Mailing Address: 300 MELAWES CIRCLE, SUITE 106  
WILLIAMSBURG, VA  
Business Phone: 253-3917 Fax: 253-3929  
Contact Person: TRM DUNN Title: \_\_\_\_\_

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

Firm Name: AES CONSULTING ENGINEERS  
Mailing Address: 5248 OLDE TOWNE ROAD, SUITE 1  
WILLIAMSBURG, VA 23188  
Business Phone: 253-0040  
Fax: 220-8994  
Responsible Plan Preparer: MARY RICHARDSON  
Title: PROJECT MANAGER  
Plan Name: KINGSMILL EAST SANDY'S FORT  
Firm's Project No. 7753-6  
Plan Date: \_\_\_\_\_  
Sheet No.'s Applicable to SWM/BMP Facility: 1 1 2 1 3 1 4 1

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

Name: GEORGE NICE & SONS  
Mailing Address: 143 SKIMMID ROAD  
WILLIAMSBURG, VA 23188  
Business Phone: 565-2885  
Fax: 565-1526  
Contact Person: RAY NICE  
Site Foreman/Supervisor: JERRY NICE  
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: 5248 OLDE TOWNE ROAD  
SUITE 1 WILLIAMSBURG, VA 23188  
Business Phone: 253-0040  
Fax: 220-8994

Name: G. ARNER MARSTON III P.E.  
Title: \_\_\_\_\_

Signature: [Handwritten Signature]  
Date: 3/23/01

I hereby certify to the best of my judgement, 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.

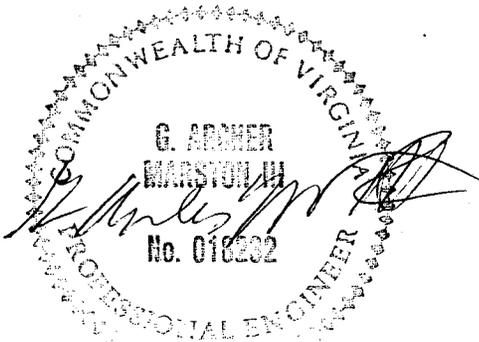
**Construction Certification**

Firm Name: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
Business Phone: \_\_\_\_\_  
Fax: \_\_\_\_\_

Name: \_\_\_\_\_  
Title: \_\_\_\_\_

Signature: \_\_\_\_\_  
Date: \_\_\_\_\_

I hereby certify to the best of my judgement, 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

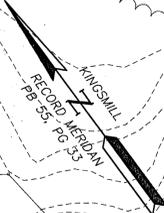
\_\_\_\_\_  
( Seal )  
Virginia Registered  
Professional Engineer

NOTE: LIMITS OF CUT AND/FILL SLOPES COINCIDE W/LIMITS OF CLEARING UNLESS OTHERWISE NOTED

LIMITS OF CLEARING (TYP.)

20' ACCESS/MAINTENANCE EASEMENT

20' ACCESS/MAINTENANCE EASEMENT



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



CONSULTING ENGINEERS

DRAINAGE, EROSION AND SEDIMENTATION CONTROL PLAN  
SANDY'S FORT  
OWNER/DEVELOPER: BUSCH PROPERTIES, INC.  
JAMES CITY COUNTY, VIRGINIA

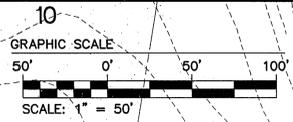
Designed CAH	Drawn GG
Scale 1"=50'	Date 9/19/97
Project No. 7753-6	
Drawing No. 1 OF 4	

I HEREBY CERTIFY TO THE BEST OF MY JUDGMENT, KNOWLEDGE, AND BELIEF THAT THIS RECORD DRAWING REPRESENTS THE ACTUAL CONDITIONS OF THE STORMWATER MANAGEMENT/BMP FACILITY ON THE DATE IT WAS SURVEYED. THE FACILITY APPEARS TO CONFORM WITH THE PROVISIONS OF THE APPROVED DESIGN PLAN, SPECIFICATIONS AND STORMWATER MANAGEMENT PLAN, EXCEPT AS SPECIFICALLY NOTED.  
*[Signature]*  
VIRGINIA REGISTERED PROFESSIONAL ENGINEER  
DATE: 3/23/01

- NOTE:
- ROAD "A" SHALL BE CONSTRUCTED TO PAVEMENT FILLET POINT FOR PHASE I.
  - ALL FEATURES ASSOCIATED WITH WET POND #2 SHALL BE CONSTRUCTED IN PHASE II.

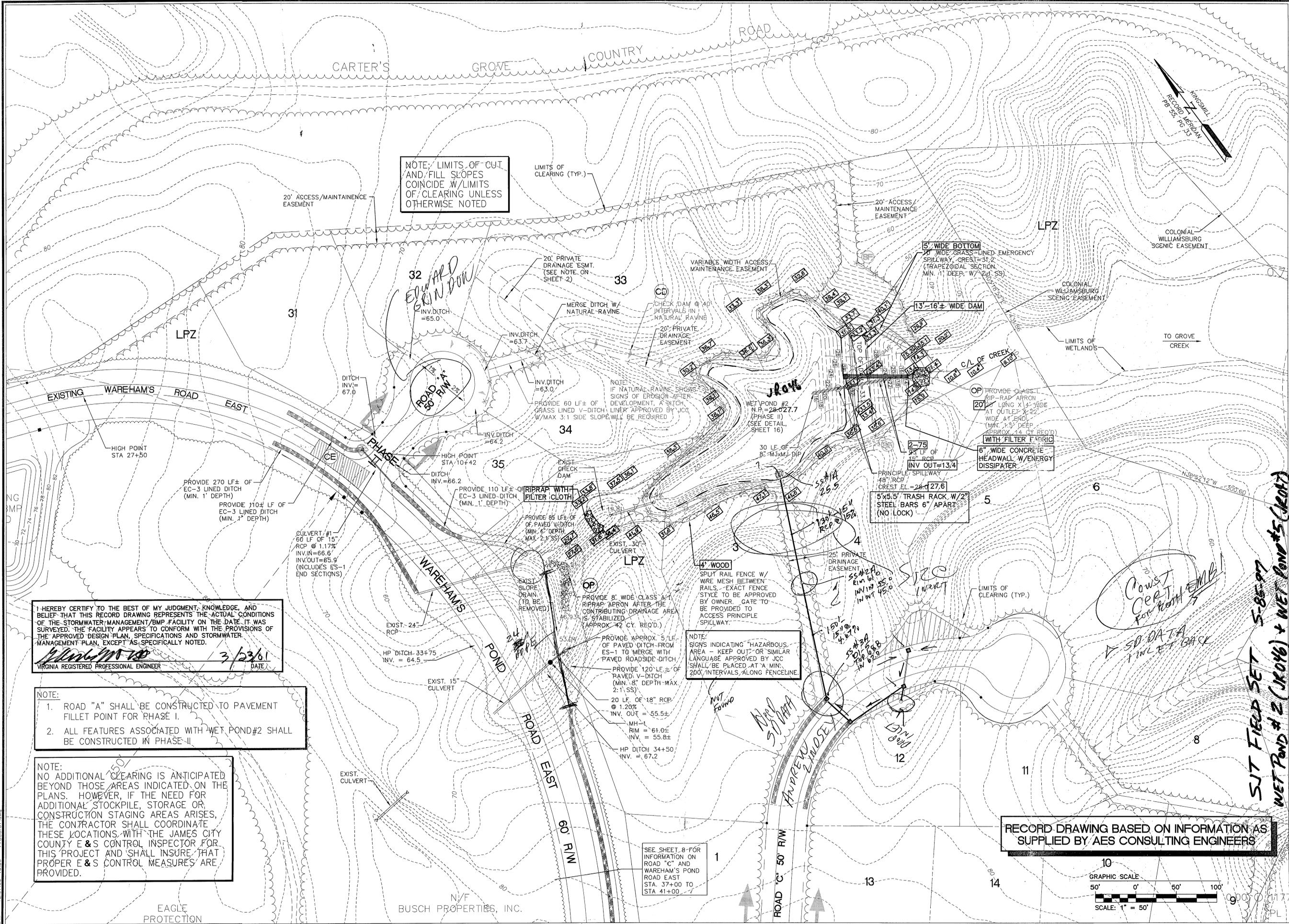
NOTE:  
NO ADDITIONAL CLEARING IS ANTICIPATED BEYOND THOSE AREAS INDICATED ON THE PLANS. HOWEVER, IF THE NEED FOR ADDITIONAL STOCKPILE, STORAGE OR CONSTRUCTION STAGING AREAS ARISES, THE CONTRACTOR SHALL COORDINATE THESE LOCATIONS WITH THE JAMES CITY COUNTY E & S CONTROL INSPECTOR FOR THIS PROJECT AND SHALL INSURE THAT PROPER E & S CONTROL MEASURES ARE PROVIDED.

RECORD DRAWING BASED ON INFORMATION AS SUPPLIED BY AES CONSULTING ENGINEERS



SUT FIELD SET 5-85-97  
WET Pond # 2 (JK046) + WET Ponds (JE047)

*CONST CERT FOR BOTH EMB*  
*SD DATA INLET BACK*



EAW 12.07.00-13.39 77535607.dwg

NOTE: LIMITS OF CUT AND/FILL SLOPES COINCIDE W/LIMITS OF CLEARING UNLESS OTHERWISE NOTED

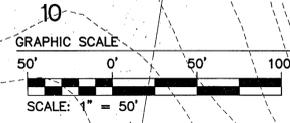
I HEREBY CERTIFY TO THE BEST OF MY JUDGMENT, KNOWLEDGE, AND BELIEF THAT THIS RECORD DRAWING REPRESENTS THE ACTUAL CONDITIONS OF THE STORMWATER MANAGEMENT BMP FACILITY ON THE DATE IT WAS SURVEYED. THE FACILITY APPEARS TO CONFORM WITH THE PROVISIONS OF THE APPROVED DESIGN PLAN, SPECIFICATIONS AND STORMWATER MANAGEMENT PLAN, EXCEPT AS SPECIFICALLY NOTED.

*[Signature]*  
 VIRGINIA REGISTERED PROFESSIONAL ENGINEER  
 DATE: 3/22/01

NOTE:  
 1. ROAD "A" SHALL BE CONSTRUCTED TO PAVEMENT FILLET POINT FOR PHASE I.  
 2. ALL FEATURES ASSOCIATED WITH WET POND #2 SHALL BE CONSTRUCTED IN PHASE II.

NOTE:  
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No.	DATE	REVISION / COMMENT / NOTE	BY

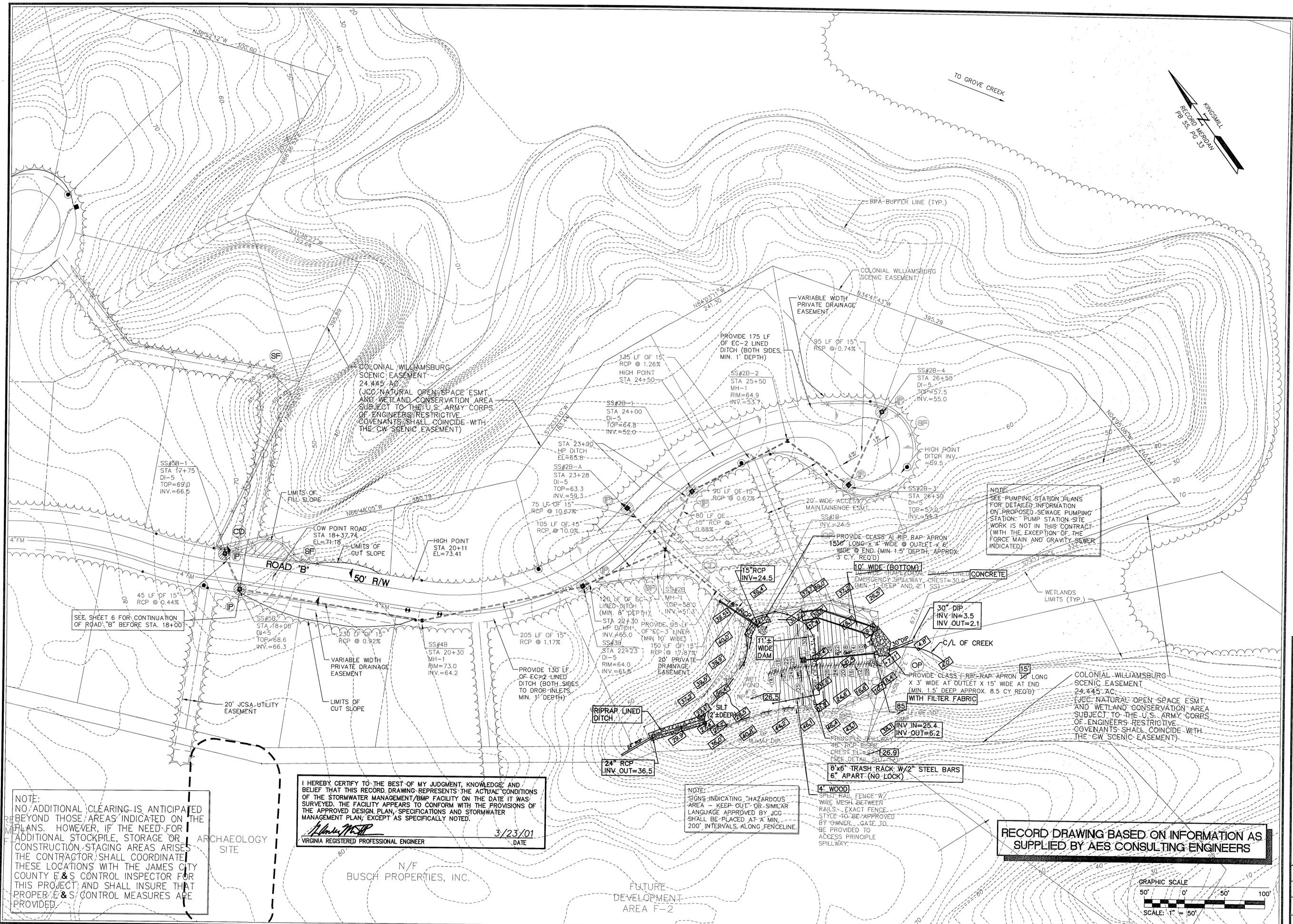


5248 Old Towne Road, Suite 1  
 Williamsburg, Virginia 23188  
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 Fax (757) 220-8994



CONSULTING ENGINEERS  
 DRAINAGE, EROSION AND SEDIMENTATION CONTROL PLAN  
 SANDY'S FORT  
 OWNER/DEVELOPER: BUSCH PROPERTIES, INC.  
 JAMES CITY COUNTY, VIRGINIA

Designed CAH	Drawn GG
Scale 1"=50'	Date 9/19/97
Project No. 7753-6	
Drawing No. 1 OF 4	



SEE SHEET 6 FOR CONTINUATION OF ROAD 'B' BEFORE STA. 18+00

NOTE:  
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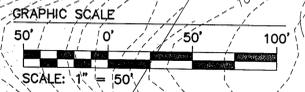
*Virginia Registered Professional Engineer*  
3/23/01  
DATE

NOTE:  
SIGNS INDICATING "HAZARDOUS AREA - KEEP OUT" OR SIMILAR LANGUAGE APPROVED BY JCC SHALL BE PLACED AT A MIN. 200' INTERVALS ALONG FENCELINE.

4" WOOD SPIKE RAIL FENCE W/ WIRE MESH BETWEEN RAILS - EXACT FENCE STYLE TO BE APPROVED BY OWNER - GATE TO BE PROVIDED TO ACCESS PRINCIPLE SPILLWAY

NOTE:  
SEE PUMPING STATION PLANS FOR DETAILED INFORMATION ON PROPOSED SEWAGE PUMPING STATION. PUMP STATION SITE WORK IS NOT IN THIS CONTRACT (WITH THE EXCEPTION OF THE FORCE MAIN AND GRAVITY SEWER INDICATED)

RECORD DRAWING BASED ON INFORMATION AS SUPPLIED BY AES CONSULTING ENGINEERS



NO.	DATE	REVISION / COMMENT / NOTE	BY

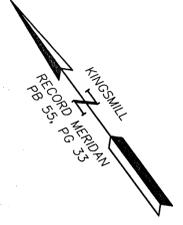
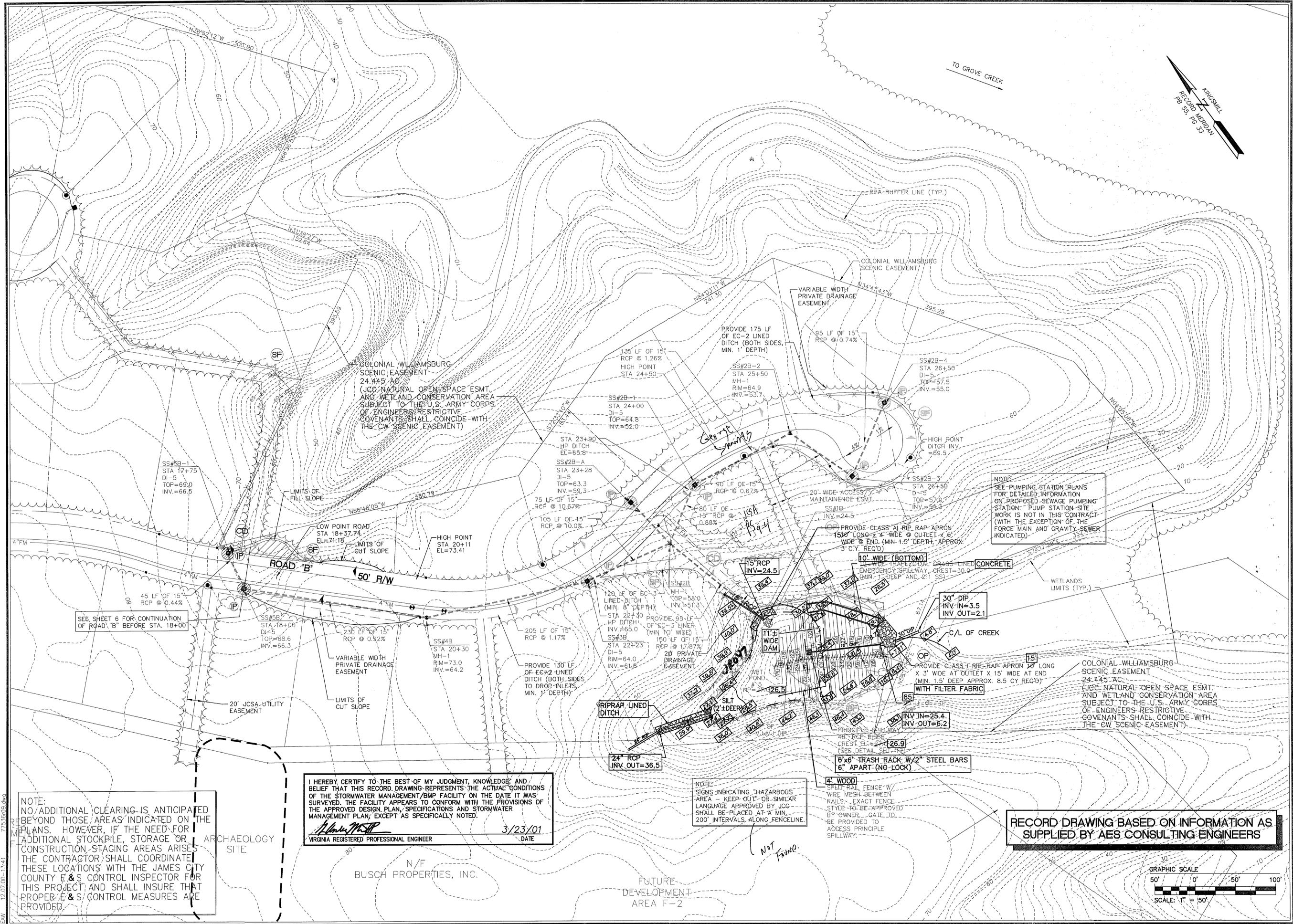


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**SANDY'S FORT**  
OWNER/DEVELOPER: BUSCH PROPERTIES, INC.  
JAMES CITY COUNTY VIRGINIA

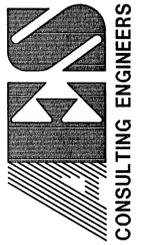
Designed CAH	Drawn GG
Scale 1"=50'	Date 9/19/97
Project No. 7753-6	Drawing No. 2 OF 4



NO.	DATE	REVISION / COMMENT / NOTE	BY



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



**DRAINAGE, EROSION AND SEDIMENTATION CONTROL PLAN**  
**SANDYS FORT**  
 OWNER/DEVELOPER: BUSCH PROPERTIES, INC.  
 JAMES CITY COUNTY, VIRGINIA

Designed	CAH	Drawn	GG
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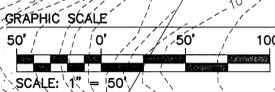
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*Alvin M. Smith*  
 VIRGINIA REGISTERED PROFESSIONAL ENGINEER  
 3/23/01  
 DATE

NOTE:  
 SIGNS INDICATING "HAZARDOUS" AREA - KEEP OUT" OR SIMILAR LANGUAGE APPROVED BY JCC SHALL BE PLACED AT A MIN. 200' INTERVALS ALONG FENCELINE.

**RECORD DRAWING BASED ON INFORMATION AS SUPPLIED BY AES CONSULTING ENGINEERS**

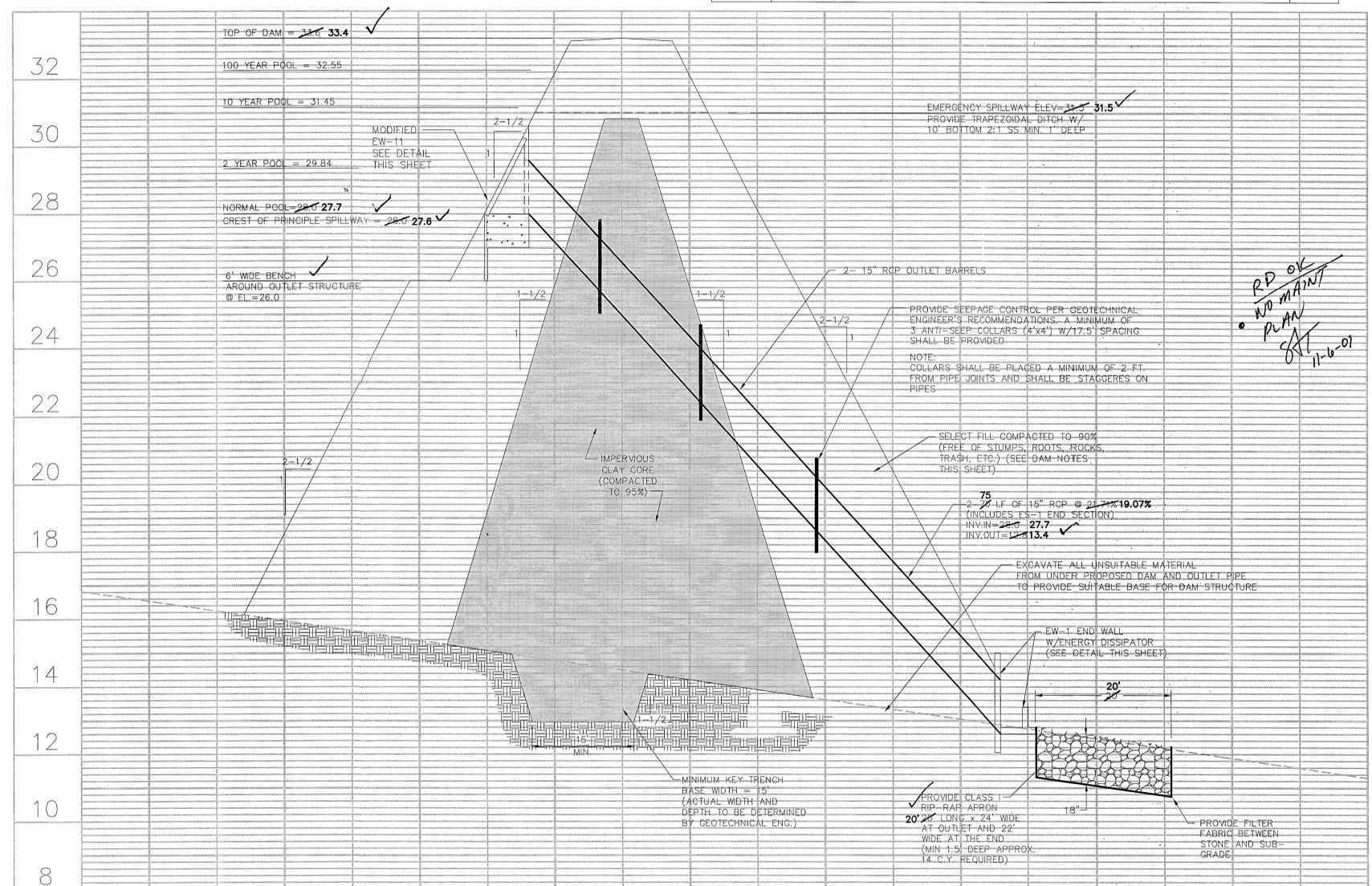
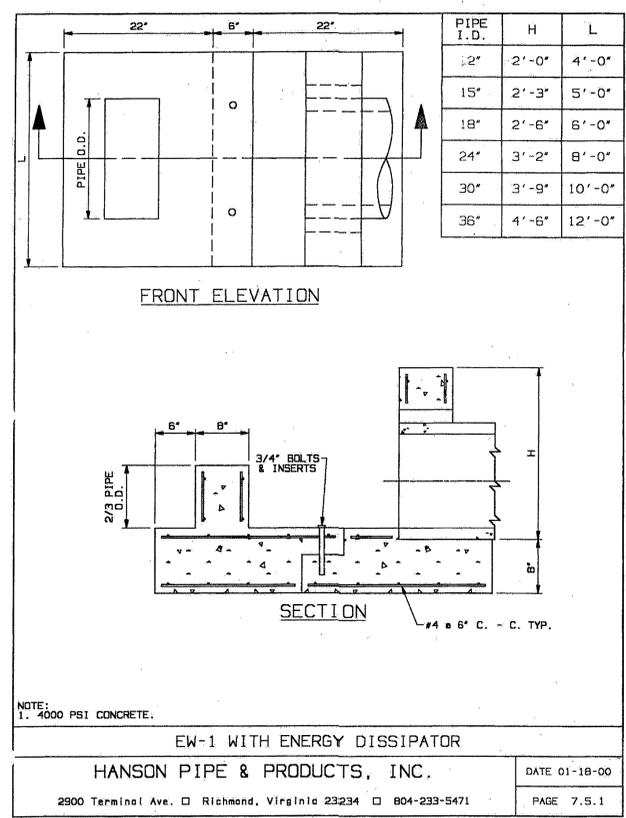
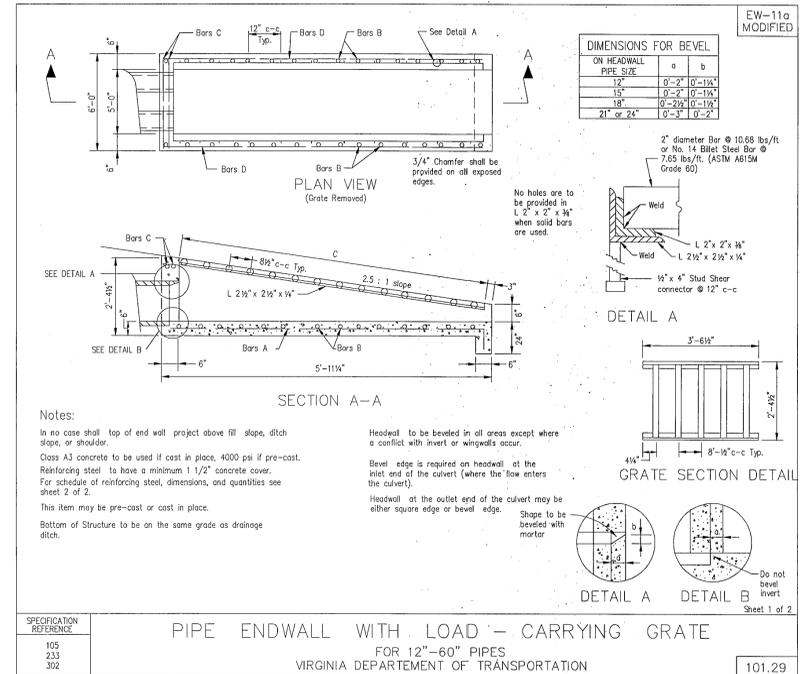


DAM CONSTRUCTION NOTES

- A GEOTECHNICAL SUBSURFACE EXPLORATION AT THE PROPOSED DAM SITE SHALL BE PERFORMED AT THE CONTRACTOR'S EXPENSE. THE GEOTECHNICAL INVESTIGATION WILL DETERMINE KEY TRENCH DEPTH AND WIDTH ACCORDINGLY. THE GEOTECHNICAL ENGINEER SHALL SUBMIT TO THE OWNER/CONTRACTOR AND JAMES CITY COUNTY CODE COMPLIANCE, HIS/HER RECOMMENDATIONS FOR DAM DESIGN, TRENCH WIDTH, DEPTH, SEEPAGE CONTROL, ETC. THESE RECOMMENDATIONS ARE HEREBY MADE A PART OF THE DAM'S CONSTRUCTION SPECIFICATIONS. ADDITIONALLY, THE GEOTECHNICAL ENGINEER WILL ENSURE PROPER MATERIALS AND DAM CONSTRUCTION METHODS ARE USED DURING CONSTRUCTION. AFTER CONSTRUCTION, A PROFESSIONAL GEOTECHNICAL ENGINEER SHALL ALSO SUBMIT A LETTER TO JAMES CITY COUNTY CERTIFYING THAT THE DAM WAS BUILT IN ACCORDANCE WITH APPROVED PLANS, SPECIFICATIONS, AND GEOTECHNICAL REPORT.
- SITE PREPARATION: THE CONTRACTOR SHALL STRIP ALL AREAS OF THE PERMANENT CONSTRUCTION TO REMOVE ALL UNSUITABLE MATERIALS. THE UNSUITABLE MATERIALS TO BE REMOVED BY STRIPPING SHALL INCLUDE ALL TOPSOIL, DEBRIS AND VEGETABLE MATTER, INCLUDING STUMPS AND ROOTS, AND ALL OTHER MATERIALS WHICH MAY BE UNSUITABLE FOR USE IN THE PERMANENT CONSTRUCTION.
- EMBANKMENT: THE EXPOSED SUB GRADE SOILS SHALL BE CAREFULLY INSPECTED BY THE GEOTECHNICAL ENGINEER. ANY UNSUITABLE MATERIALS THIS EXPOSED SHALL BE REMOVED AND REPLACED WITH A WELL COMPACTED, SUITABLE MATERIAL. DENSITY TESTING, AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER, SHALL BE PERFORMED AT THIS TIME. THE EMBANKMENT SHALL BE KEVED INTO THE UNDISTURBED (EXISTING) SOIL STRATUM. EMBANKMENT SHOULD BE KEVED AS SPECIFIED BY THE GEOTECHNICAL ENGINEER (WIDTH = 6 FT. MINIMUM). THE EMBANKMENT FOUNDATION AND ABUTMENTS SHALL BEAR ON FIRM AND STABLE EXISTING SUB GRADE WHICH HAS BEEN PREPARED SO AS TO REMOVE ALL ORGANIC, LOOSE, AND GENERALLY UNSUITABLE MATERIAL. ALL MATERIALS TO BE USED FOR BACK FILL OR COMPACTED FILL SHALL BE INSPECTED AND, IF NECESSARY, TESTED BY THE GEOTECHNICAL ENGINEER IN ACCORDANCE WITH ASTM D2487 PRIOR TO PLACEMENT TO DETERMINE IF THEY ARE SUITABLE FOR THE INTENDED USE. THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED BORROW AREAS. IT SHALL BE CLEAN MINERAL SOIL, FREE OF ROOTS, WOOD VEGETATION, OVERSIZED STONES, ROCKS, OR OTHER OBJECTIONABLE MATERIAL. SOILS WHICH ARE APPROVED FOR THE CONSTRUCTION OF THE IMPERVIOUS CLAY CORE, AS DEFINED BY THE UNIFIED SOIL CLASSIFICATION SYSTEM, ARE OH, INORGANIC CLAYS OF HIGH PLASTICITY; CL, INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY; GRAYLY CLAYS, SANDY CLAYS, SILTY CLAYS, SC, (WITH GEOTECHNICAL ENGINEERS APPROVAL CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES. MATERIALS TO BE USED FOR THE CONSTRUCTION OF THE SHELL SHALL BE SELECT BACK FILL FREE OF STUMPS, ROOTS, ROCKS, TRASH, ETC. AND SHALL BE MORE PERVIOUS THAN THE IMPERVIOUS CLAY CORE. AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED A MINIMUM DEPTH OF 4 INCHES PRIOR TO PLACEMENT OF FILL. THE FILL MATERIAL'S MOISTURE CONTENT SHALL BE +3 TO -2 PERCENTAGE POINTS OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D2216 (I.E. IN GENERAL THE FILL MATERIAL SHOULD CONTAIN SUFFICIENT MOISTURE SO THAT IT CAN BE FORMED INTO A BALL WITHOUT CRUMBLING. IF WATER CAN BE SQUEEZED OUT OF THE BALL, IT IS TOO WET FOR PROPER COMPACTION). FILL MATERIAL WILL BE PLACED IN 6 TO 8-INCH CONTINUOUS LAYERS OVER THE ENTIRE LENGTH OF THE FILL. FIRST LIFT ON SUB GRADE MAY BE PLACED AT A DEPTH UP TO 36 INCHES TO BRIDGE SUB GRADE WITH GREATER THAN OPTIMUM MOISTURE CONTENT. COMPACTION, AS NOTED ON PLAN, SHALL BE OBTAINED GENERALLY BY USING A SHEEPSFOOT COMPACTOR. FINISHED GRADES SHALL BE MERGED INTO THE EXISTING GRADES.
- CUTOFF TRENCH/KEY TRENCH: THE TRENCH SHALL BE EXCAVATED ALONG THE CENTERLINE OF THE DAM. THE WIDTH AND DEPTH SHALL BE AS DETERMINED BY THE GEOTECHNICAL ENGINEER. THE MIN. BOTTOM WIDTH SHALL BE WIDE ENOUGH TO PERMIT OPERATION OF COMPACTION EQUIPMENT. THE SIDE SLOPES SHALL BE NO STEEPER THAN 1:1. COMPACTION REQUIREMENTS SHALL BE THE SAME AS THOSE FOR THE EMBANKMENT. THE TRENCH SHALL BE KEPT DRAINED DURING THE BACKFILLING-COMPACTION OPERATIONS.
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- PRINCIPAL SPILLWAY: THE BOTTOM OF THE SPILLWAY RISER FOUNDATION BASE EXCAVATION SHALL BE OBSERVED BY THE GEOTECHNICAL ENGINEER TO ENSURE THAT ALL UNSUITABLE AND LOOSE MATERIALS ARE REMOVED AND THAT ACCEPTABLE BEARING CONDITIONS EXIST IN THE FOUNDATION'S BASE. ALL JOINTS IN THE PRINCIPAL SPILLWAY STRUCTURE SHALL BE OF WATERTIGHT CONSTRUCTION. PERVIOUS MATERIALS SUCH AS SAND, GRAVEL OR CRUSHED STONE SHALL NOT BE USED AS BACK FILL AROUND THE BARREL. FILL MATERIAL SHALL BE PLACED AROUND THE PIPE IN 4-INCH LAYERS AND COMPACTED BY HAND TO THE SAME DENSITY AS THE EMBANKMENT. A MINIMUM OF TWO FEET OF FILL SHALL BE HAND-COMPACTED OVER THE BARREL BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT.
- VEGETATIVE STABILIZATION: FINAL VEGETATIVE COVER (STABILIZATION) SHALL CONSIST OF TOP SOILING, LIMING, FERTILIZING, SEEDING, AND MULCHING TO ASSURE A FIRM STAND OF GRASS AS SOON AS PRACTICAL. SEDIMENT BASINS AND OTHER TEMPORARY EROSION CONTROL MEASURES ARE TO BE REMOVED ONLY WHEN STABILIZATION IS COMPLETE. FINAL VEGETAL COVER SHALL BE PROVIDED IN ACCORDANCE WITH THE FOLLOWING:  
 TOPSOIL: AT LEAST 2" THICKNESS OBTAINED FROM STOCKPILES ON SITE, FREE OF LARGE DEBRIS.  
 LIME: 4,000#/ACRE (90#/1,000 S.F.)  
 SEED: KENTUCKY 31 TALL FESCUE 250#/ACRE (6#/1,000 S.F.)  
 FERTILIZER: 10/20/10 MIX, 1,000#/ACRE (25#/1,000 S.F.)  
 MULCH: STRAW OR HAY (LOCALLY OBTAINED) 4,000#/ACRE (90#/1,000 S.F.)

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

*James M. Sandys* 3/23/01  
 VIRGINIA REGISTERED PROFESSIONAL ENGINEER DATE



DAM CROSS SECTION  
 WET POND #2  
 SCALE: HORIZ. 1"=10'  
 VERT. 1"=2'

RECORD DRAWING BASED ON INFORMATION AS SUPPLIED BY AES CONSULTING ENGINEERS

NO.	DATE	REVISION / COMMENT / NOTE	BY



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



NOTES AND DETAILS - WET POND #2  
**SANDY'S FORT**  
 OWNER/DEVELOPER: BUSCH PROPERTIES, INC.  
 JAMES CITY COUNTY VIRGINIA

Designed CAH/GAM	Drawn GG
Scale NOTED	Date 9/19/97
Project No. 7753-6	
Drawing No. 3 OF 4	



DAM CONSTRUCTION NOTES

1. A GEOTECHNICAL SUBSURFACE EXPLORATION AT THE PROPOSED DAM SITE SHALL BE PERFORMED AT THE CONTRACTOR'S EXPENSE. THE GEOTECHNICAL INVESTIGATION WILL DETERMINE KEY TRENCH DEPTH AND WIDTH ACCORDINGLY. THE GEOTECHNICAL ENGINEER SHALL SUBMIT TO THE OWNER/CONTRACTOR AND JAMES CITY COUNTY CODE COMPLIANCE, HIS/HER RECOMMENDATIONS FOR DAM DESIGN, TRENCH WIDTH, DEPTH, SEEPAGE CONTROL, ETC. THESE RECOMMENDATIONS ARE HEREBY MADE A PART OF THE DAM'S CONSTRUCTION SPECIFICATIONS. ADDITIONALLY, THE GEOTECHNICAL ENGINEER WILL ENSURE PROPER MATERIALS AND DAM CONSTRUCTION METHODS ARE USED DURING CONSTRUCTION. AFTER CONSTRUCTION, A PROFESSIONAL GEOTECHNICAL ENGINEER SHALL ALSO SUBMIT A LETTER TO JAMES CITY COUNTY CERTIFYING THAT THE DAM WAS BUILT IN ACCORDANCE WITH APPROVED PLANS, SPECIFICATIONS, AND GEOTECHNICAL REPORT.

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

3. EMBANKMENT: THE EXPOSED SUBGRADE SOILS SHALL BE CAREFULLY INSPECTED BY THE GEOTECHNICAL ENGINEER. ANY UNSUITABLE MATERIALS THIS EXPOSED SHALL BE REMOVED AND REPLACED WITH A WELL COMPACTED, SUITABLE MATERIAL DENSITY TESTING, AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER, SHALL BE PERFORMED AT THIS TIME.

THE EMBANKMENT SHALL BE KEPT INTO THE UNDISTURBED (EXISTING) SOIL STRATUM. EMBANKMENT SHOULD BE KEPT AS SPECIFIED BY THE GEOTECHNICAL ENGINEER (WIDTH = 6 FT. MINIMUM). THE EMBANKMENT FOUNDATION AND ABUTMENTS SHALL BEAR ON FIRM AND STABLE EXISTING SUBGRADE WHICH HAS BEEN PREPARED SO AS TO REMOVE ALL ORGANIC, LOOSE, AND GENERALLY UNSUITABLE MATERIAL.

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MAY BE PLACED AT A DEPTH UP TO 36 INCHES TO BRIDGE SUBGRADE WITH GREATER THAN OPTIMUM MOISTURE CONTENT. COMPACTION, AS NOTED ON PLAN, SHALL BE OBTAINED GENERALLY BY USING A SHEEPSFOOT COMPACTOR. FINISHED GRADES SHALL BE MERGED INTO THE EXISTING GRADES.

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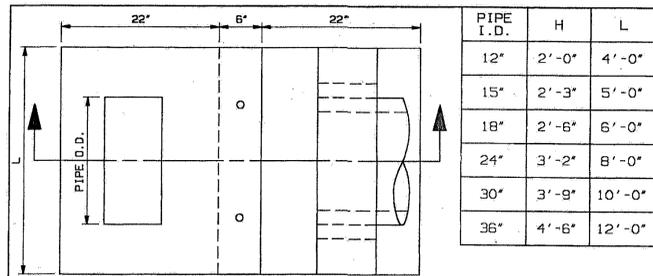
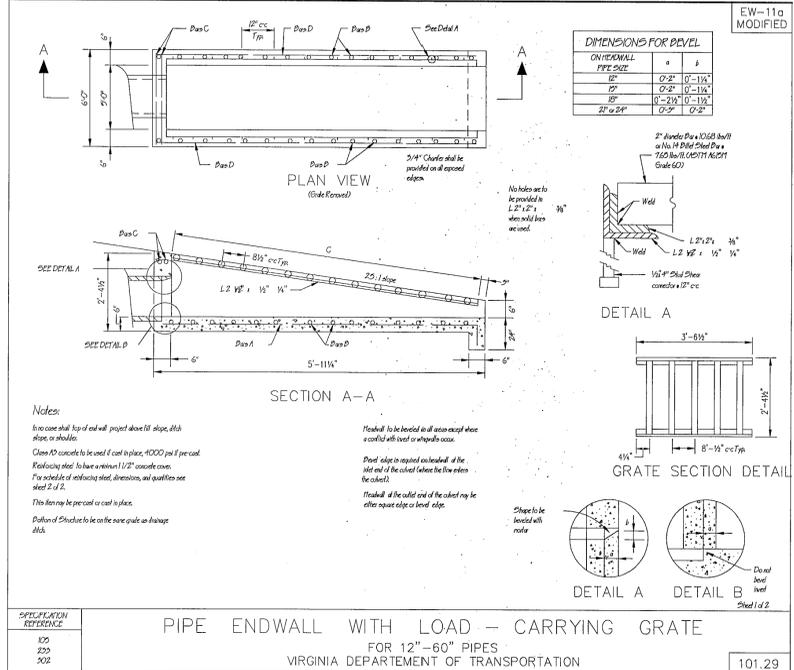
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*Virginia M. Hill*  
 VIRGINIA REGISTERED PROFESSIONAL ENGINEER  
 3/23/01  
 DATE



PIPE I.D.	H	L
12"	2'-0"	4'-0"
15"	2'-3"	5'-0"
18"	2'-6"	6'-0"
24"	3'-2"	8'-0"
30"	3'-9"	10'-0"
36"	4'-6"	12'-0"

FRONT ELEVATION

SECTION

NOTES:  
 1. 4000 PSI CONCRETE.

EW-1 WITH ENERGY DISSIPATOR

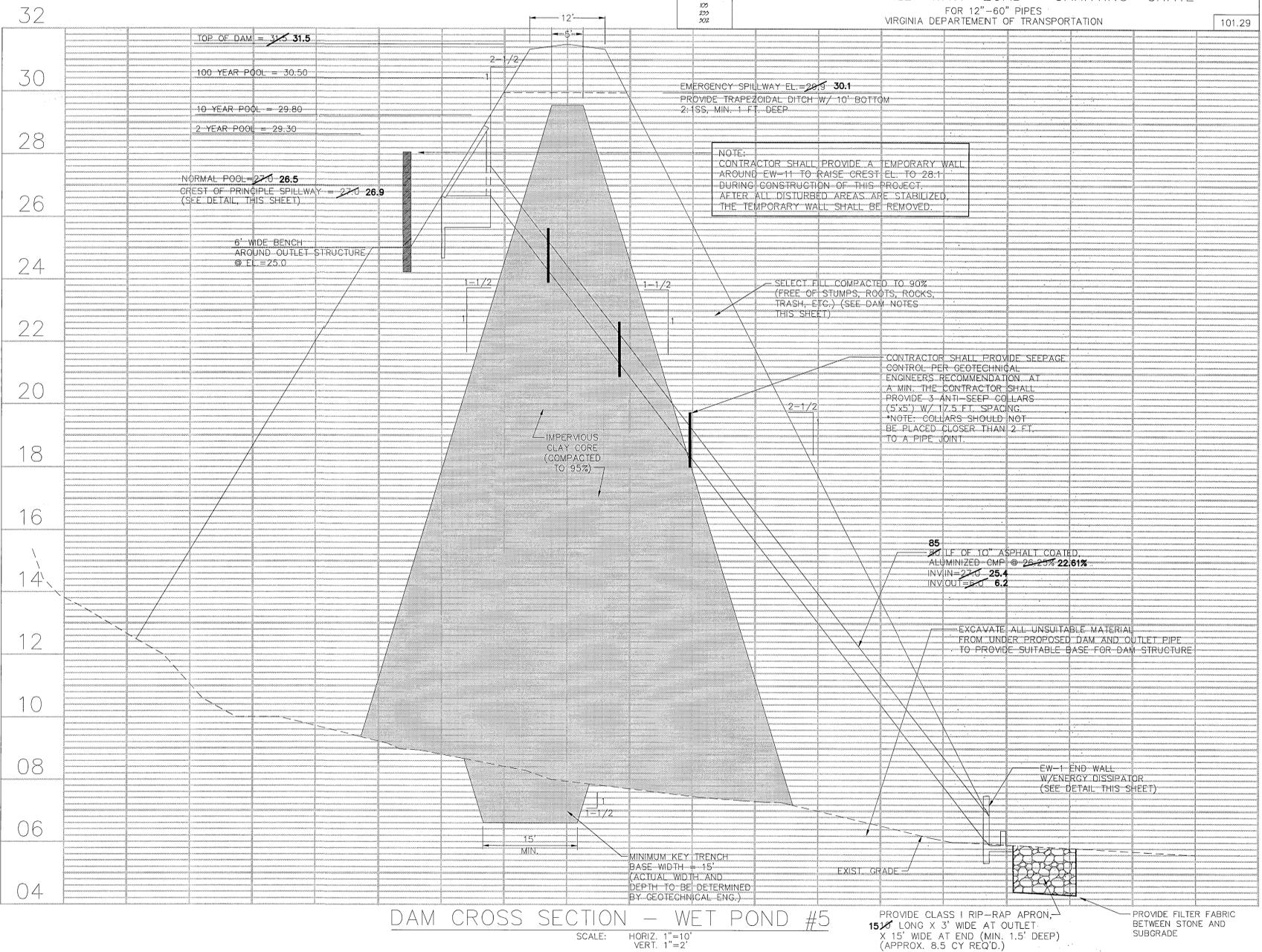
HANSON PIPE & PRODUCTS, INC.

DATE 01-19-00

2900 Terminal Ave. □ Richmond, Virginia 23234 □ 804-233-5471

PAGE 7.5.1

RECORD DRAWING BASED ON INFORMATION AS SUPPLIED BY AES CONSULTING ENGINEERS



DAM CROSS SECTION - WET POND #5

SCALE: HORIZ. 1"=10'  
 VERT. 1"=2'

PROVIDE CLASS I RIP-RAP APRON, 15' LONG X 3' WIDE AT OUTLET X 15' WIDE AT END (MIN. 1.5' DEEP) (APPROX. 8.5 CY REQ'D.)

PROVIDE FILTER FABRIC BETWEEN STONE AND SUBGRADE



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



NOTES AND DETAILS - WET POND #5  
**SANDY'S FORT**  
 OWNER/DEVELOPER: BUSCH PROPERTIES, INC.  
 JAMES CITY COUNTY, VIRGINIA

Designed CAH/GAM	Drawn GG
Scale NOTED	Date 9/19/97
Project No. 7753-6	
Drawing No. 4 OF 4	

DAM CONSTRUCTION NOTES

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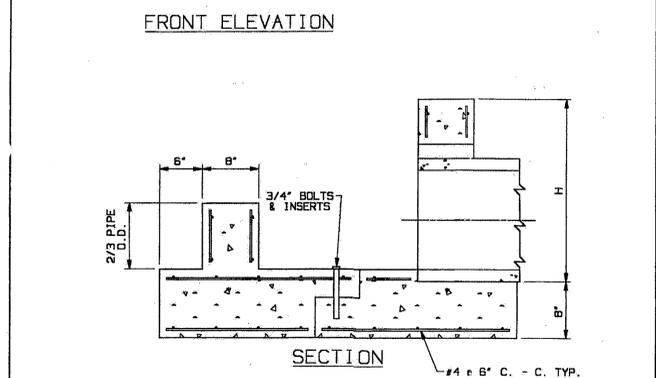
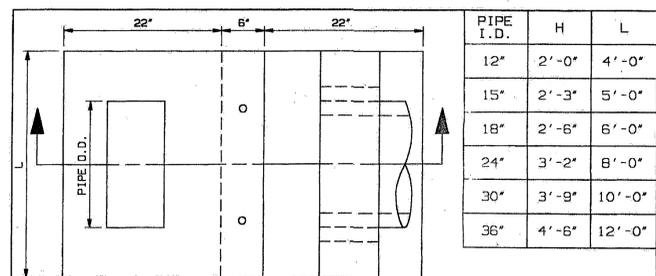
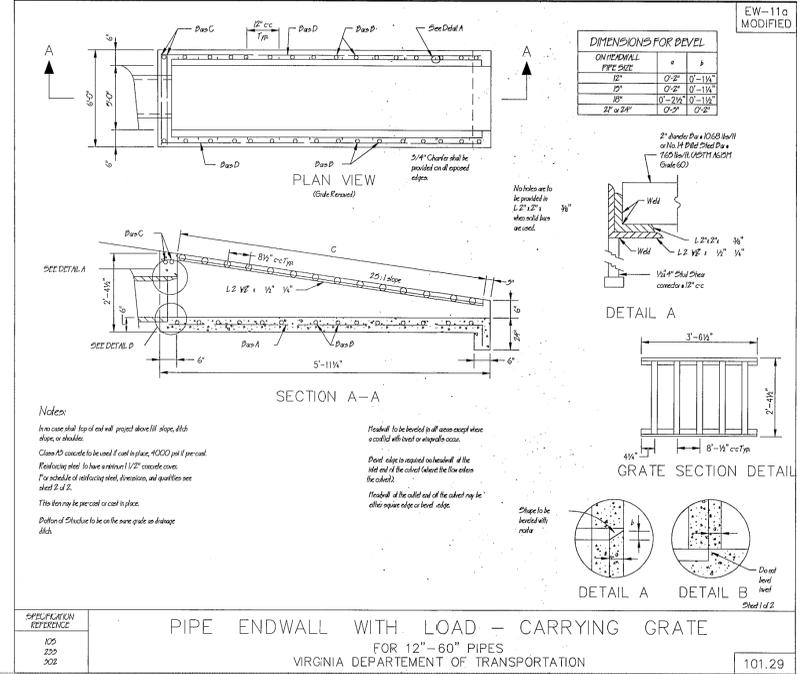
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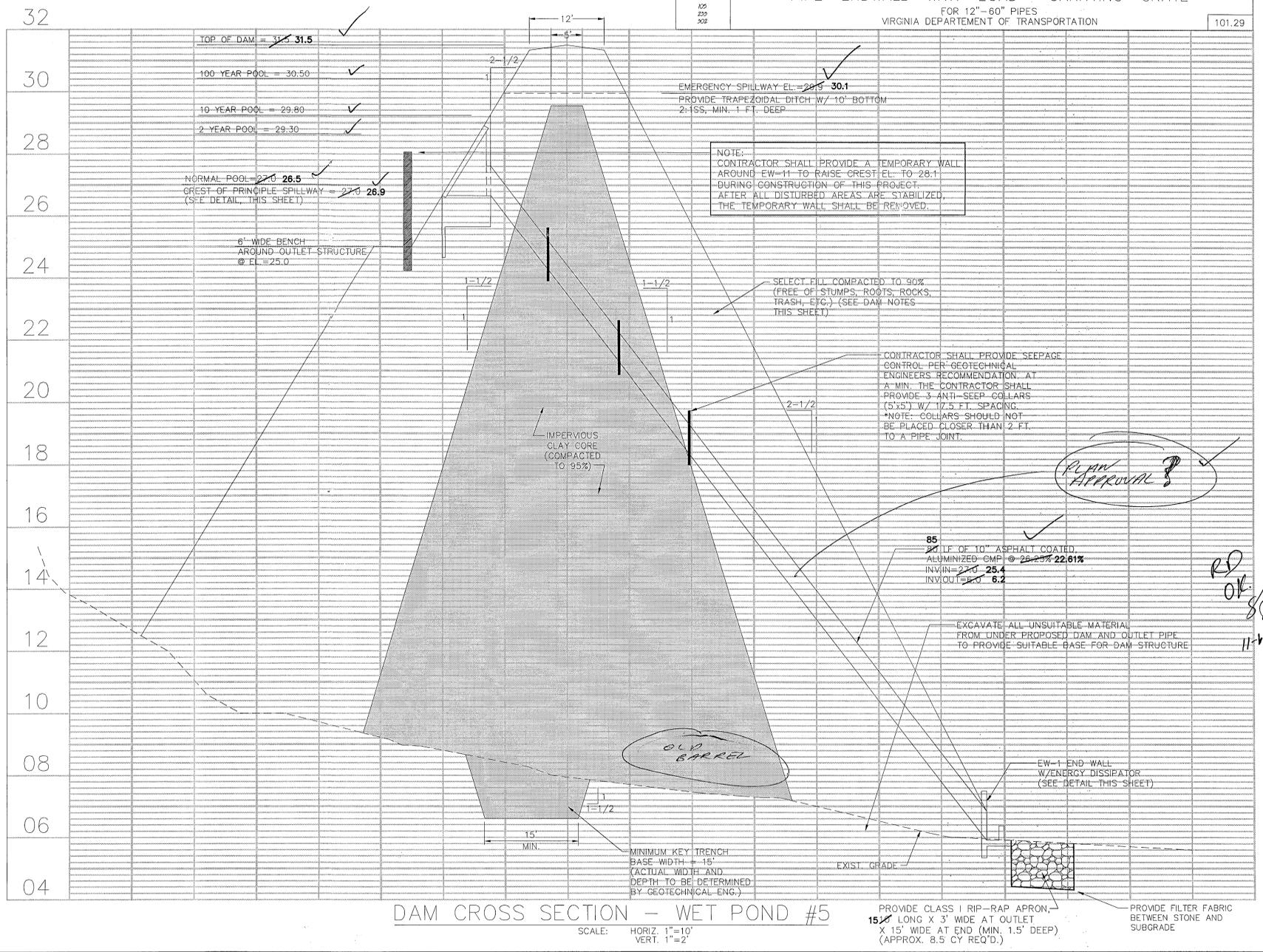
*Andrew M. Smith*  
VIRGINIA REGISTERED PROFESSIONAL ENGINEER  
3/23/01  
DATE



NOTE:  
1. 4000 PSI CONCRETE.

EW-1 WITH ENERGY DISSIPATOR  
HANSON PIPE & PRODUCTS, INC.  
2900 Terminal Ave. □ Richmond, Virginia 23234 □ 804-233-5471

DATE 01-18-00  
PAGE 7.5.1



RECORD DRAWING BASED ON INFORMATION AS SUPPLIED BY AES CONSULTING ENGINEERS

NO.	DATE	REVISION / COMMENT / NOTE	BY



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



NOTES AND DETAILS - WET POND #5  
SANDY'S FORT  
OWNER/DEVELOPER: BUSCH PROPERTIES, INC.  
JAMES CITY COUNTY, VIRGINIA

Designed CAH/GAM	Dwg GG
Scale NOTED	Date 9/19/97
Project No. 7753-6	
Drawing No. 4 OF 4	

**LETTER OF TRANSMITTAL**

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

*Deliver*

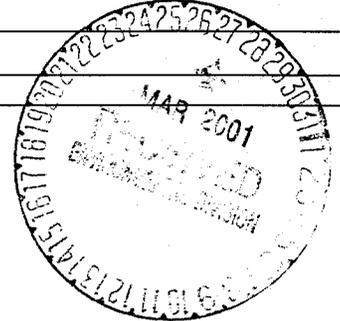
TO JCC Environmental Division

DATE <i>3/23/01</i>	JOB NO. <i>7753-6</i>
ATTENTION	
RE: <i>Sandy's Fort BMP #2 &amp; #5 JR046 JR047 Record Drawings S-85-97</i>	

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
<i>1</i>		<i>1</i>	<i>Wet Pond Certifications</i>
<i>4</i>		<i>2</i>	<i>Record Drawings</i>



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

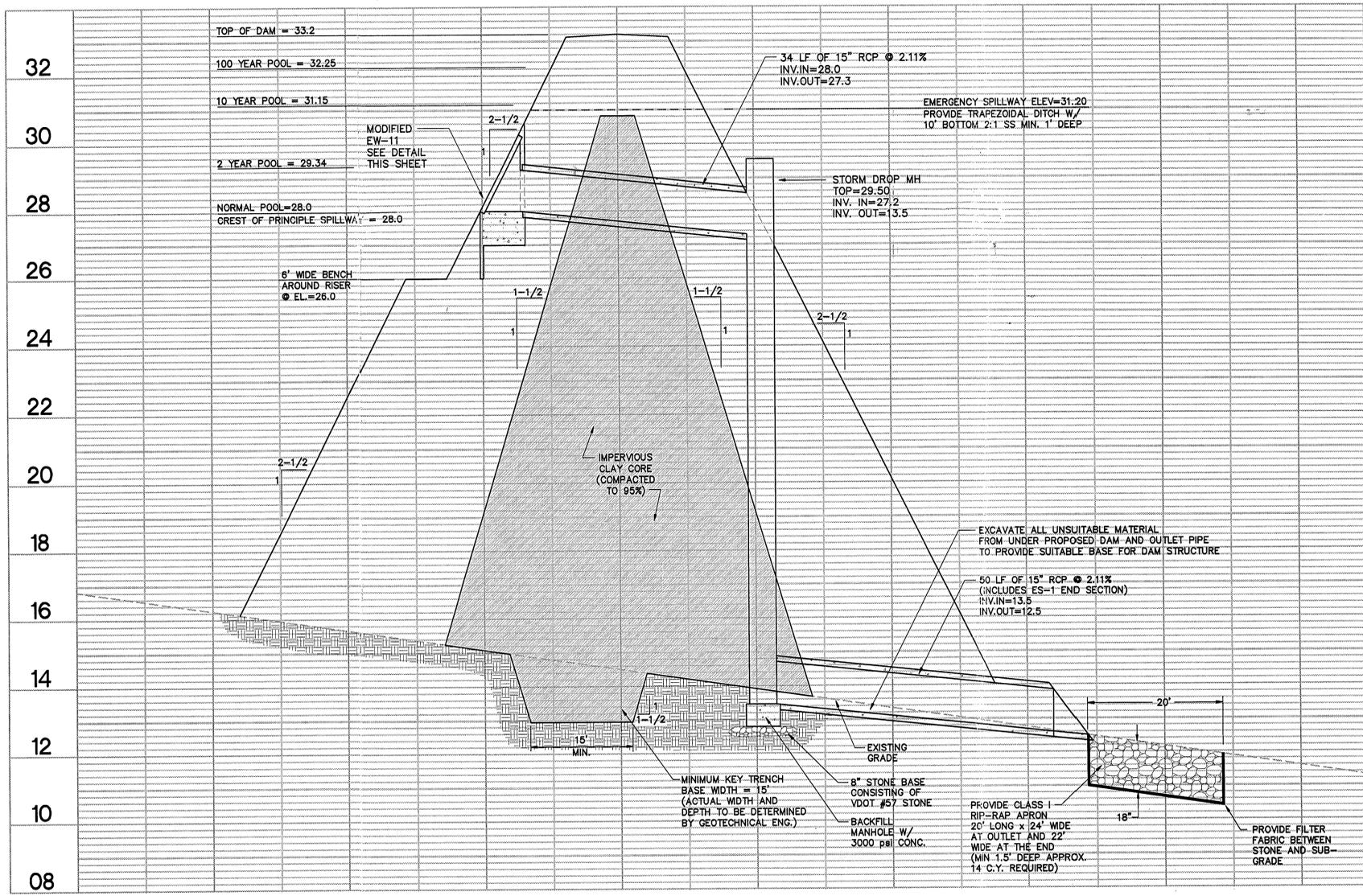
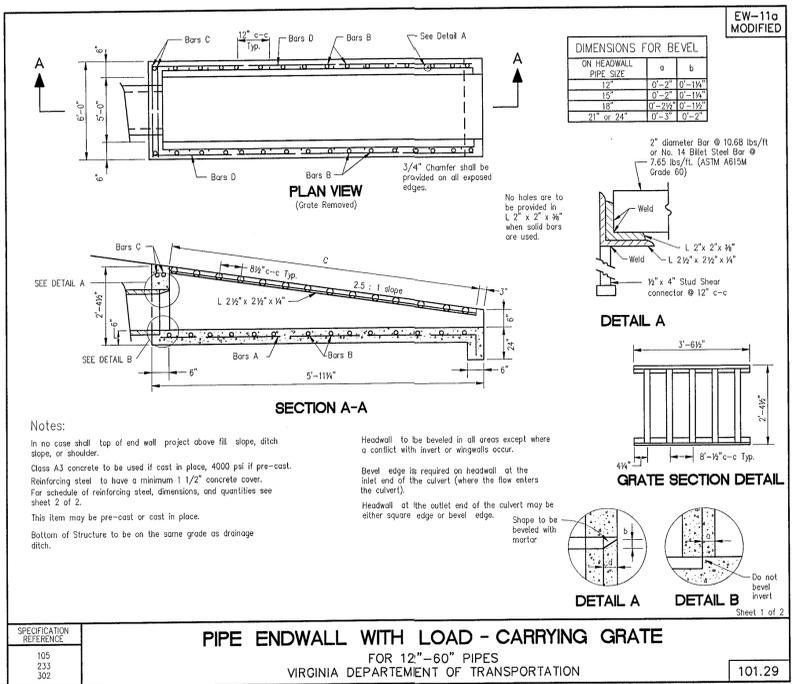
COPY TO \_\_\_\_\_ SIGNED: *Mark Richardson*



DAM CONSTRUCTION NOTES

- A GEOTECHNICAL SUBSURFACE EXPLORATION AT THE PROPOSED DAM SITE SHALL BE PERFORMED AT THE CONTRACTOR'S EXPENSE.** THE GEOTECHNICAL INVESTIGATION WILL DETERMINE KEY TRENCH DEPTH AND WIDTH ACCORDING TO THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS. THE CONTRACTOR SHALL SUBMIT TO THE OWNER/CONTRACTOR AND JAMES CITY COUNTY CODE COMPLIANCE HIS/HER RECOMMENDATIONS FOR DAM DESIGN, TRENCH WIDTH, DEPTH, SEEPAGE CONTROL, ETC. THESE RECOMMENDATIONS ARE HEREBY MADE A PART OF THE DAM'S CONSTRUCTION SPECIFICATIONS. ADDITIONALLY, THE GEOTECHNICAL ENGINEER WILL ENSURE PROPER MATERIALS AND DAM CONSTRUCTION METHODS ARE USED DURING CONSTRUCTION AFTER CONSTRUCTION A PROFESSIONAL GEOTECHNICAL ENGINEER SHALL ALSO SUBMIT A LETTER TO JAMES CITY COUNTY CERTIFYING THAT THE DAM WAS BUILT IN ACCORDANCE WITH APPROVED PLANS, SPECIFICATIONS, AND GEOTECHNICAL REPORT.
- SITE PREPARATION:** THE CONTRACTOR SHALL STRIP ALL AREAS OF THE PERMANENT CONSTRUCTION TO REMOVE ALL UNSUITABLE MATERIALS. THE UNSUITABLE MATERIALS TO BE REMOVED BY STRIPPING SHALL INCLUDE ALL TOPSOIL, DEBRIS AND VEGETABLE MATTER, INCLUDING STUMPS AND ROOTS, AND ALL OTHER MATERIALS WHICH MAY BE UNSUITABLE FOR USE IN THE PERMANENT CONSTRUCTION.
- EMBANKMENT:** THE EXPOSED SUB GRADE SOILS SHALL BE CAREFULLY INSPECTED BY THE GEOTECHNICAL ENGINEER. ANY UNSUITABLE MATERIALS THUS EXPOSED SHALL BE REMOVED AND REPLACED WITH A WELL COMPACTED, SUITABLE MATERIAL. DENSITY TESTING, AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER, SHALL BE PERFORMED AT THIS TIME.  
  
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ALL MATERIALS TO BE USED FOR BACK FILL OR COMPACTED FILL SHALL BE INSPECTED AND, IF NECESSARY, TESTED BY THE GEOTECHNICAL ENGINEER IN ACCORDANCE WITH ASTM D2487 PRIOR TO PLACEMENT TO DETERMINE IF THEY ARE SUITABLE FOR THE INTENDED USE.  
  
THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED BORROW AREAS. IT SHALL BE CLEAN MINERAL SOIL, FREE OF ROOTS, WOOD VEGETATION, OVERSIZED STONES, ROCKS, OR OTHER OBJECTIONABLE MATERIAL. SOILS WHICH ARE APPROVAL FOR THE CONSTRUCTION OF THE IMPERVIOUS CLAY CORE, AS DEFINED BY THE UNIFIED SOIL CLASSIFICATION SYSTEM, ARE OH, INORGANIC CLAYS OF HIGH PLASTICITY; CL, INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY; GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS; SC, (WITH GEOTECHNICAL ENGINEERS APPROVAL CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES. MATERIALS TO BE USED FOR THE CONSTRUCTION OF THE SHELL SHALL BE SELECT BACK FILL FREE OF STUMPS, ROOTS, ROCKS, TRASH, ETC. AND SHALL BE MORE PERVIOUS THAN THE IMPERVIOUS CLAY CORE. AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED A MINIMUM DEPTH OF 4 INCHES PRIOR TO PLACEMENT OF FILL. THE FILL MATERIAL'S MOISTURE CONTENT SHALL BE +3 TO -2 PERCENTAGE POINTS OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D2216 (I.E. IN GENERAL THE FILL MATERIAL SHOULD CONTAIN SUFFICIENT MOISTURE SO THAT IT CAN BE FORMED INTO A BALL WITHOUT CRUMBLING. IF WATER CAN BE SQUEEZED OUT OF THE BALL, IT IS TOO WET FOR PROPER COMPACTION). FILL MATERIAL WILL BE PLACED IN 6 TO 8-INCH CONTINUOUS LAYERS OVER THE ENTIRE LENGTH OF THE FILL. FIRST LIFT ON SUB GRADE

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TOPSOIL: AT LEAST 2" THICKNESS OBTAINED FROM STOCKPILES ON SITE, FREE OF LARGE DEBRIS.  
LIME: 4,000#/ACRE (90#/1,000 S.F.)  
SEED: KENTUCKY 31 TALL FESCUE 250#/ACRE (6#/1,000 S.F.)  
FERTILIZER: 10/20/10 MIX, 1,000#/ACRE (25#/1,000 S.F.)  
MULCH: STRAW OR HAY (LOCALLY OBTAINED) 4,000#/ACRE (90#/1,000 S.F.)



**DAM CROSS SECTION WET POND #2**  
SCALE: HORIZ. 1"=10'  
VERT. 1"=2'

REVISED OUTLET STRUCTURE TYPE	CAH	BY
REVISED METES AND BOUNDS FOR CONSV. AREA	CAH	
REVISED PER U.S. ARMY CORPS	CAH	
REVISED PER U.S. ARMY CORPS	CAH	
REVISED PER COMMENTS	CAH	
REVISED PER ACC COMMENTS	CAH	
REVISED PER ACC COMMENTS	CAH	
REVISION / COMMENT / NOTE	CAH	
No.	DATE	



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



**NOTES AND DETAILS - WET POND #2**  
**SANDY'S FORT**  
OWNER/DEVELOPER: BUSCH PROPERTIES, INC.  
JAMES CITY COUNTY, VIRGINIA

Designed CAH/GAM	Drawn GG
Scale NOTED	Date 9/19/97
Project No. 7753-6	
Drawing No. 16	

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MAY BE PLACED AT A DEPTH UP TO 36 INCHES TO BRIDGE SUB GRADE WITH GREATER THAN OPTIMUM MOISTURE CONTENT. COMPACTION, AS NOTED ON PLAN, SHALL BE OBTAINED GENERALLY BY USING A SHEEPSFOOT COMPACTOR. FINISHED GRADES SHALL BE MERGED INTO THE EXISTING GRADES.

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- MULCH: STRAW OR HAY (LOCALLY OBTAINED) 4,000#/ACRE (90#/1,000 S.F.)

32	TOP OF DAM = 33.2
	100 YEAR POOL = 32.17
	10 YEAR POOL = 31.05
30	

S. 85.97

KINGSMILL

in the James

ROAD EAST

ADJACENT TO FORT

LAND PROPERTIES, INC.

APR 19 1997



COUNTY OF JAMES CITY  
FINAL SITE PLAN

Received 5/7/98

APPROVALS DATE

File Dist. JCD 10/9/97

Health Dept. KED 9/24/97

Highway Dept. —

Plan. Dept. —

ENV. Dept. DEC 4/28/98

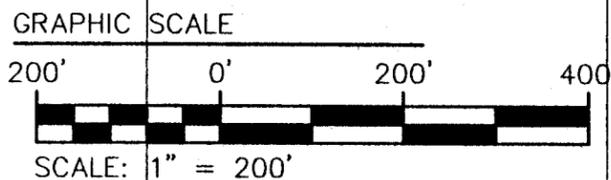
Water Dept. JCD 5/7/98

Fire Dept. WNB 4/10/98

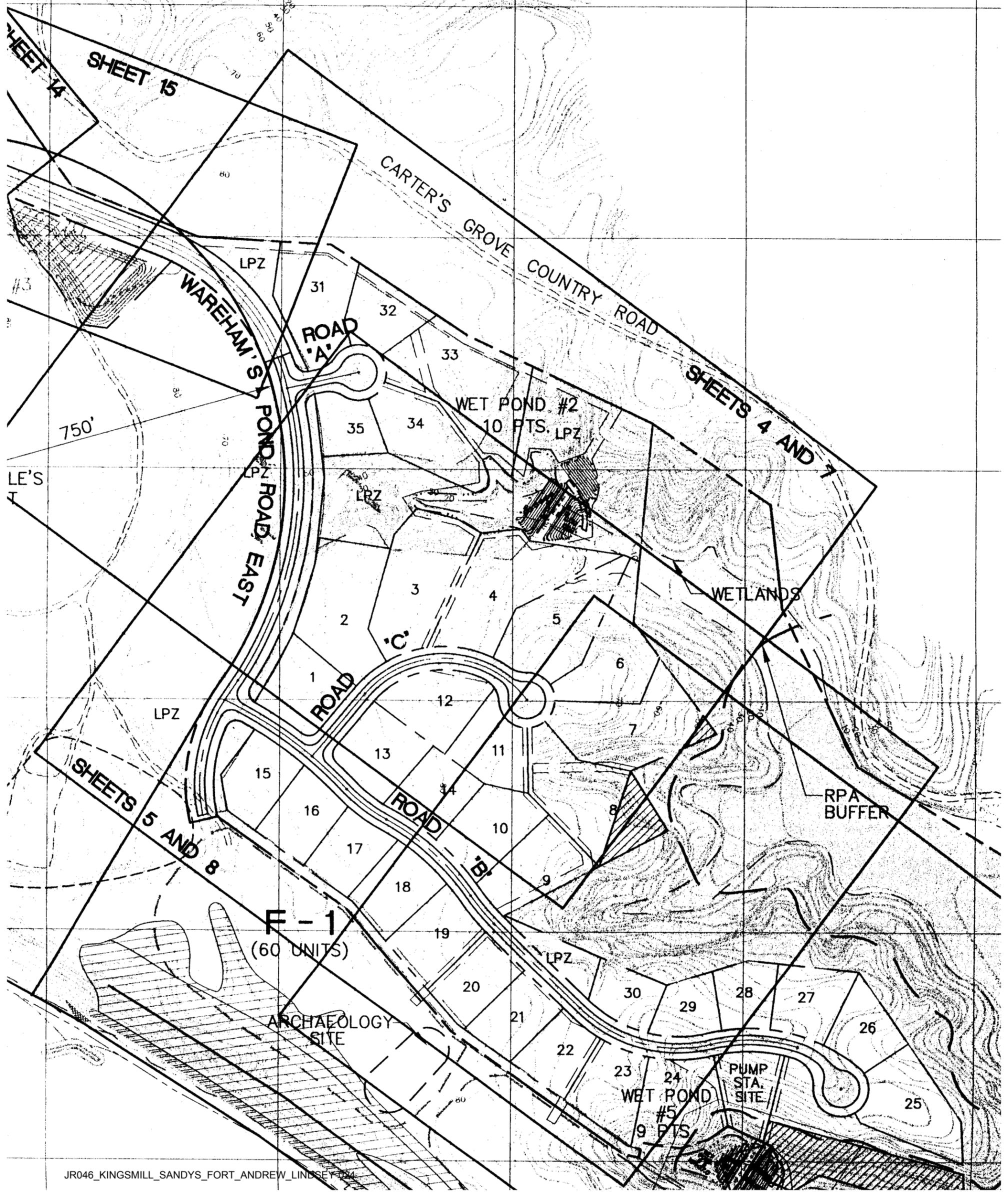
Per. Ce. 9/25/97

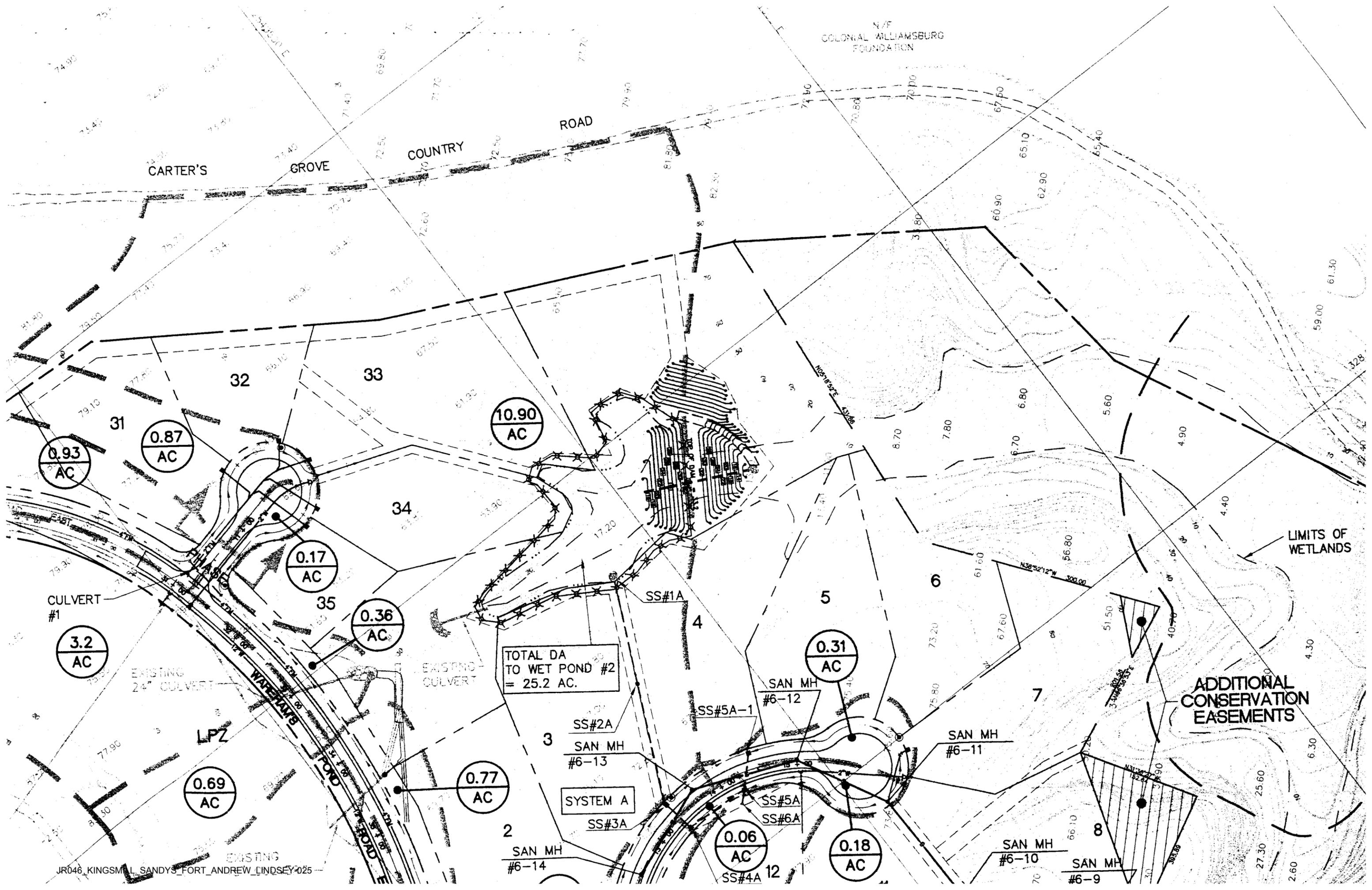
LEGEND





N/F  
COLONIAL  
WILLIAMSBURG  
FOUNDATION





N/F  
COLONIAL WILLIAMSBURG  
FOUNDATION

CARTER'S GROVE

COUNTRY ROAD

32

33

31

0.93  
AC

0.87  
AC

10.90  
AC

34

0.17  
AC

0.36  
AC

35

3.2  
AC

CULVERT #1

EXISTING 24\"

0.69  
AC

LPZ

0.77  
AC

2

SAN MH #6-14

3

SS#2A  
SAN MH #6-13

SYSTEM A  
SS#3A

SS#1A

4

0.06  
AC

SS#4A 12

0.31  
AC

SAN MH #6-12

SS#5A-1

5

SAN MH #6-11

6

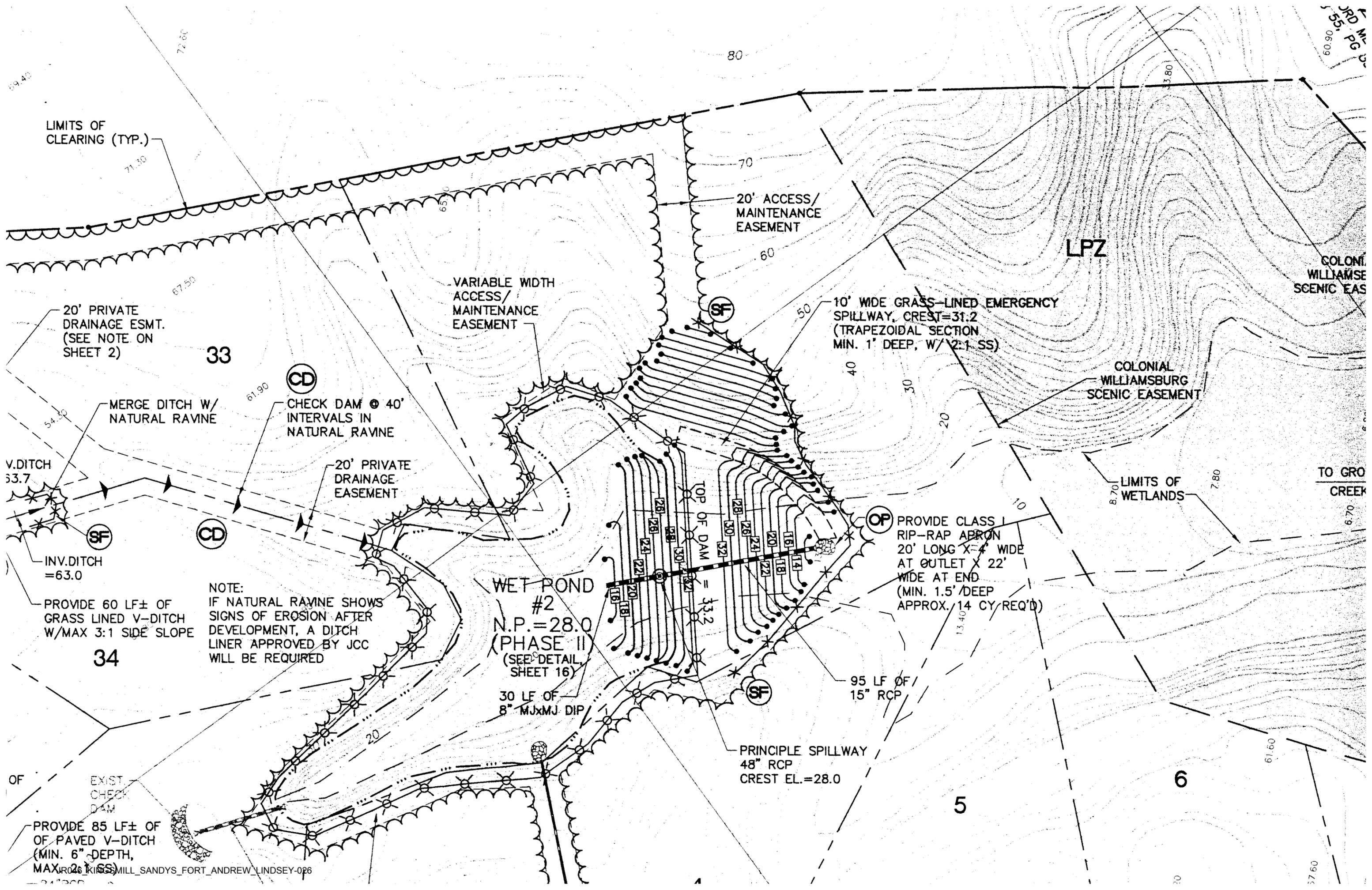
SAN MH #6-10

8

SAN MH #6-9

ADDITIONAL  
CONSERVATION  
EASEMENTS

LIMITS OF  
WETLANDS



LIMITS OF CLEARING (TYP.)

20' PRIVATE DRAINAGE ESMT. (SEE NOTE ON SHEET 2)

MERGE DITCH W/ NATURAL RAVINE

CHECK DAM @ 40' INTERVALS IN NATURAL RAVINE

20' PRIVATE DRAINAGE EASEMENT

VARIABLE WIDTH ACCESS/ MAINTENANCE EASEMENT

20' ACCESS/ MAINTENANCE EASEMENT

10' WIDE GRASS-LINED EMERGENCY SPILLWAY, CREST=31.2 (TRAPEZOIDAL SECTION MIN. 1' DEEP, W/2:1 SS)

COLONIAL WILLIAMSBURG SCENIC EASEMENT

LIMITS OF WETLANDS

TO GRO CREEK

NOTE: IF NATURAL RAVINE SHOWS SIGNS OF EROSION AFTER DEVELOPMENT, A DITCH LINER APPROVED BY JCC WILL BE REQUIRED

WET POND #2  
N.P.=28.0  
(PHASE II)  
(SEE DETAIL, SHEET 16)

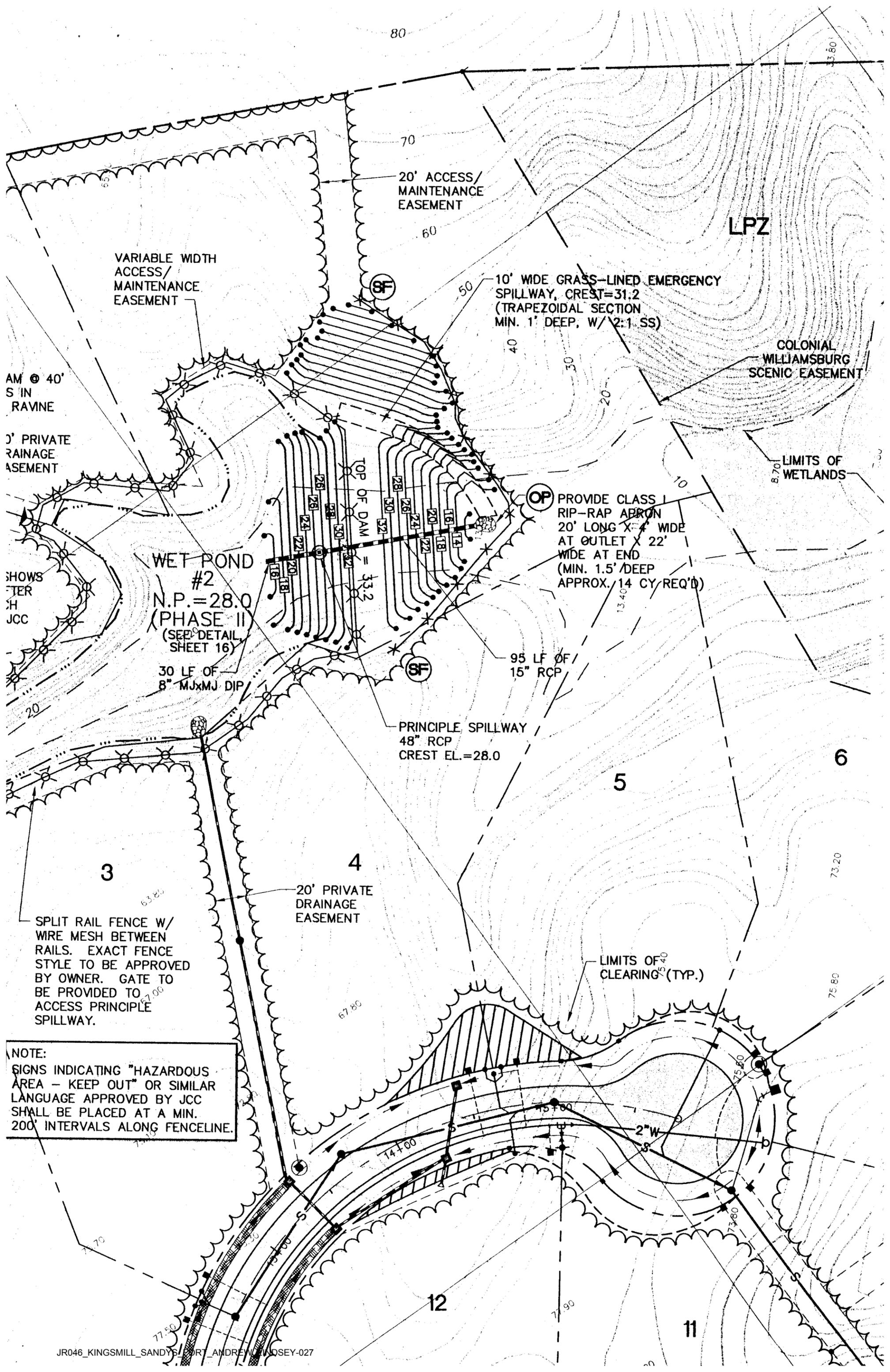
30 LF OF 8" MJxMJ DIP

PROVIDE CLASS I RIP-RAP APRON 20' LONG X 4' WIDE AT OUTLET X 22' WIDE AT END (MIN. 1.5' DEEP APPROX. 14 CY REQ'D)

95 LF OF 15" RCP

PRINCIPLE SPILLWAY 48" RCP CREST EL.=28.0

PROVIDE 85 LF± OF PAVED V-DITCH (MIN. 6" DEPTH, MAX 2:1 SS)



VARIABLE WIDTH  
ACCESS/  
MAINTENANCE  
EASEMENT

20' ACCESS/  
MAINTENANCE  
EASEMENT

10' WIDE GRASS-LINED EMERGENCY  
SPILLWAY, CREST=31.2  
(TRAPEZOIDAL SECTION  
MIN. 1' DEEP, W/ 2:1 SS)

LPZ

COLONIAL  
WILLIAMSBURG  
SCENIC EASEMENT

LIMITS OF  
WETLANDS

AM @ 40'  
S IN  
RAVINE

3' PRIVATE  
DRAINAGE  
EASEMENT

SHOWS  
CENTER  
LINE  
JCC

WET POND  
#2  
N.P.=28.0  
(PHASE II)  
(SEE DETAIL  
SHEET 16)

30 LF OF  
8" MJxMJ DIP

TOP OF DAM =  
33.2

OP PROVIDE CLASS I  
RIP-RAP APRON  
20' LONG X 4' WIDE  
AT OUTLET X 22'  
WIDE AT END  
(MIN. 1.5' DEEP  
APPROX. 14 CY REQ'D)

95 LF OF  
15" RCP

PRINCIPLE SPILLWAY  
48" RCP  
CREST EL.=28.0

3

4

5

6

SPLIT RAIL FENCE W/  
WIRE MESH BETWEEN  
RAILS. EXACT FENCE  
STYLE TO BE APPROVED  
BY OWNER. GATE TO  
BE PROVIDED TO  
ACCESS PRINCIPLE  
SPILLWAY.

20' PRIVATE  
DRAINAGE  
EASEMENT

LIMITS OF  
CLEARING (TYP.)

NOTE:  
SIGNS INDICATING "HAZARDOUS  
AREA - KEEP OUT" OR SIMILAR  
LANGUAGE APPROVED BY JCC  
SHALL BE PLACED AT A MIN.  
200' INTERVALS ALONG FENCELINE.

12

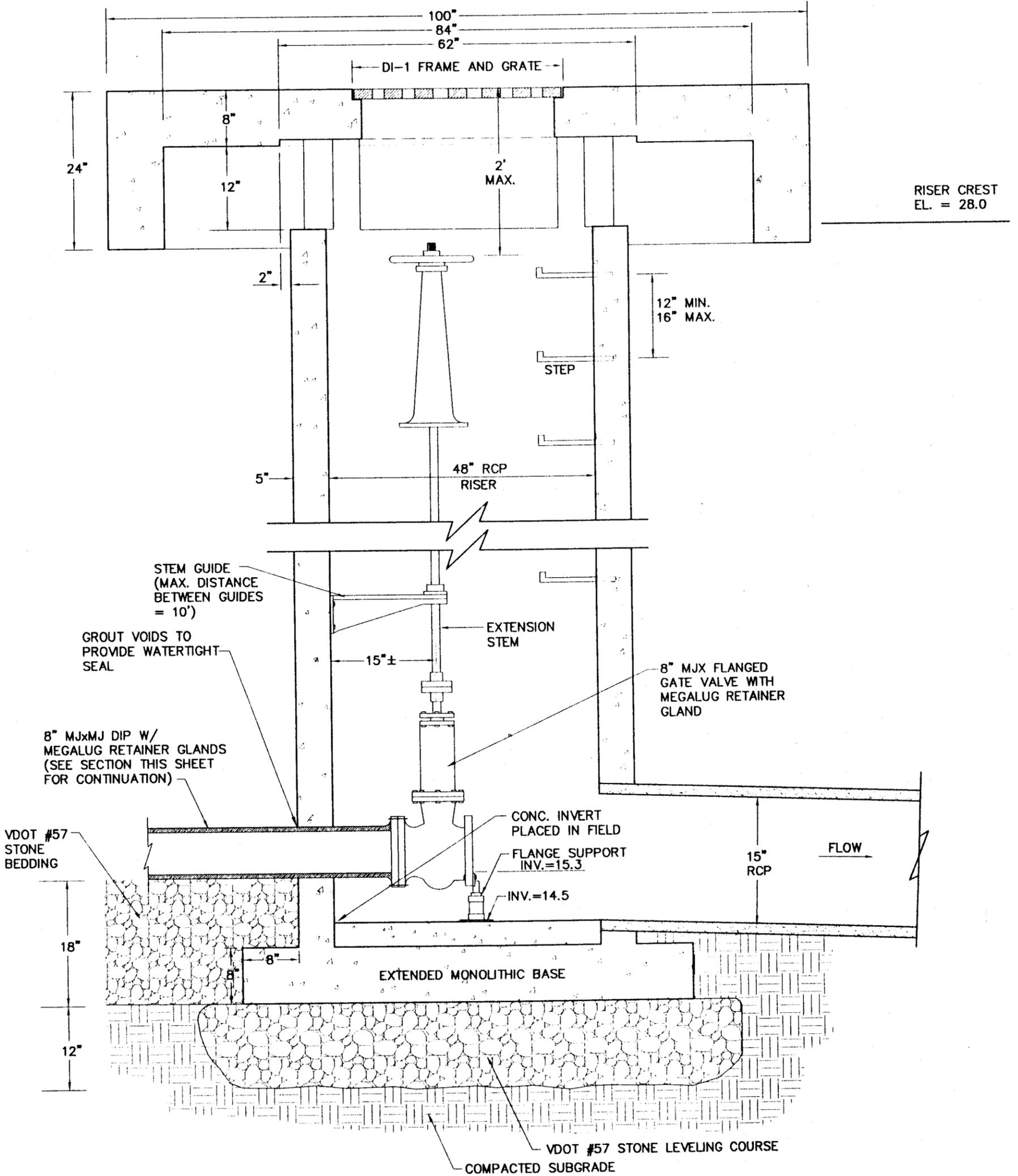
11

SHALL BE INSPECTED AND, IF NECESSARY, TESTED BY THE GEOTECHNICAL ENGINEER IN ACCORDANCE WITH ASTM D2487 PRIOR TO PLACEMENT TO DETERMINE IF THEY ARE SUITABLE FOR THE INTENDED USE.

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BE PROVIDED IN ACCORDANCE WITH THE FOLLOWING:

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- FERTILIZER: 10/20/10 MIX, 1,000#/ACRE (25#/1,000 S.F.)
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**CROSS SECTION  
PROP. 48" RISER STRUCTURE  
WITH ANTI-VORTEXING TOP**

NOT TO SCALE

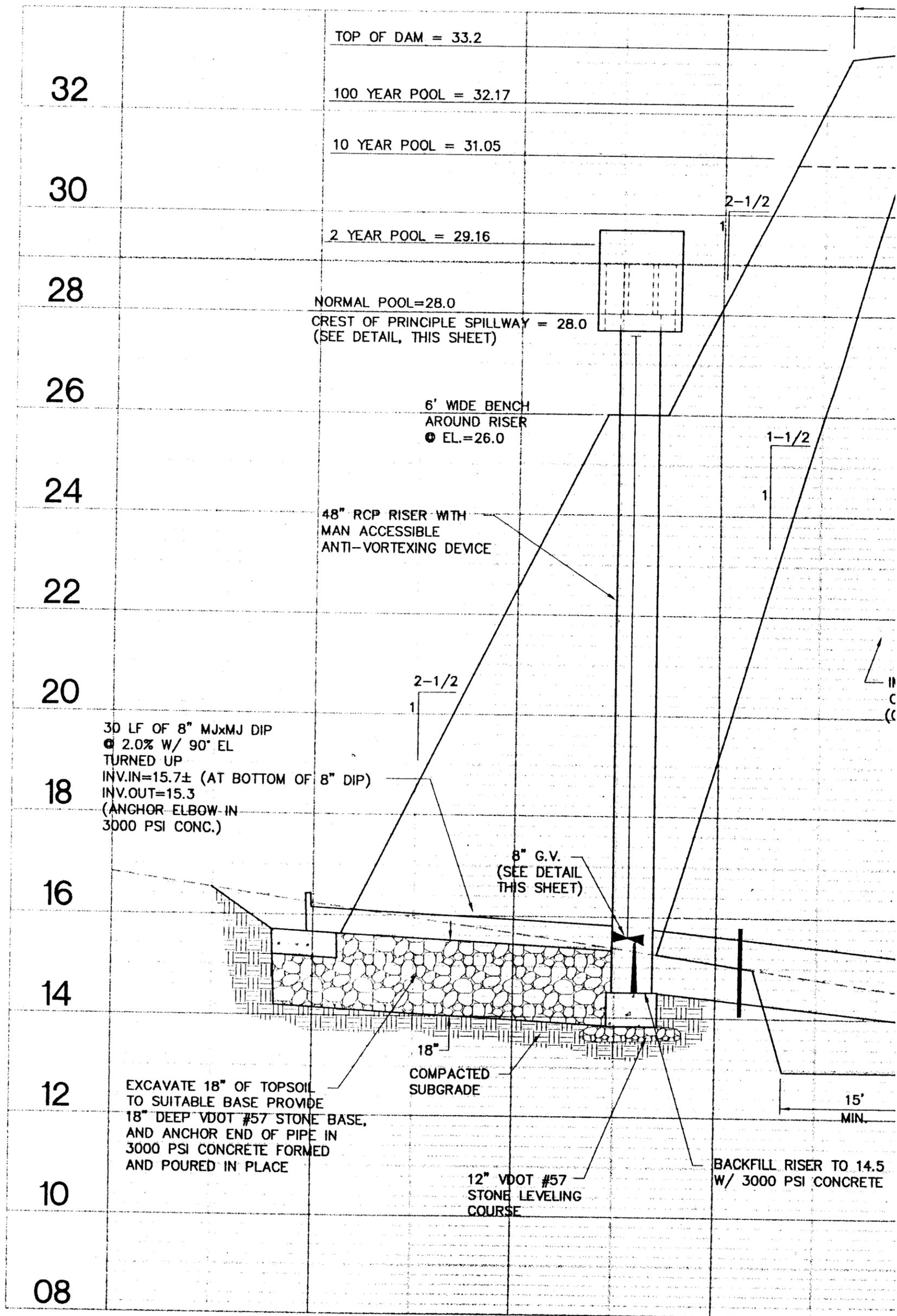
03.24.03-15.3

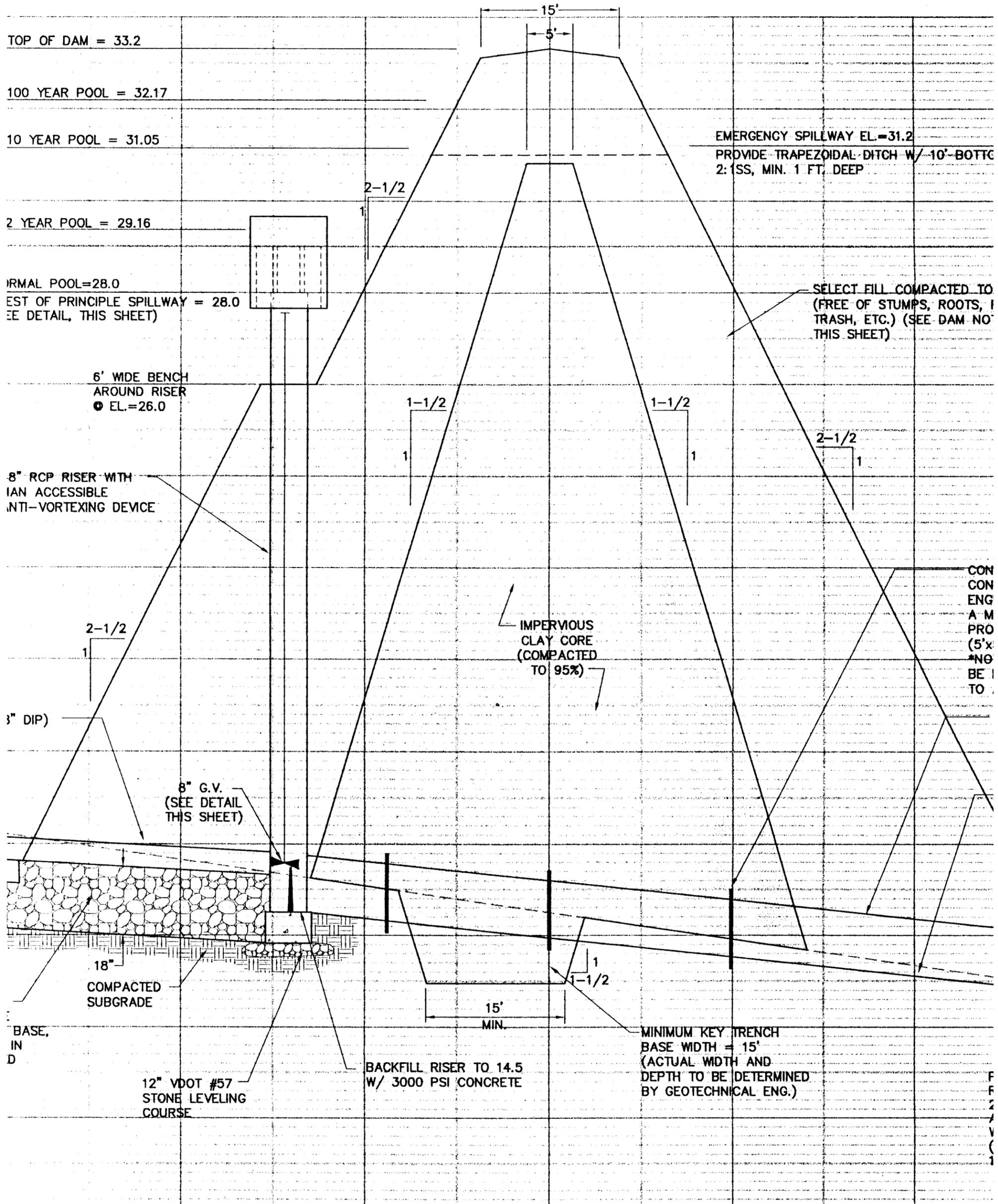
COVER  
 G, LIMING,  
 RE A FIRM STAND OF  
 SINS AND OTHER  
 TO BE REMOVED ONLY  
 TAL COVER SHALL  
 WING:

FROM STOCKPILES ON

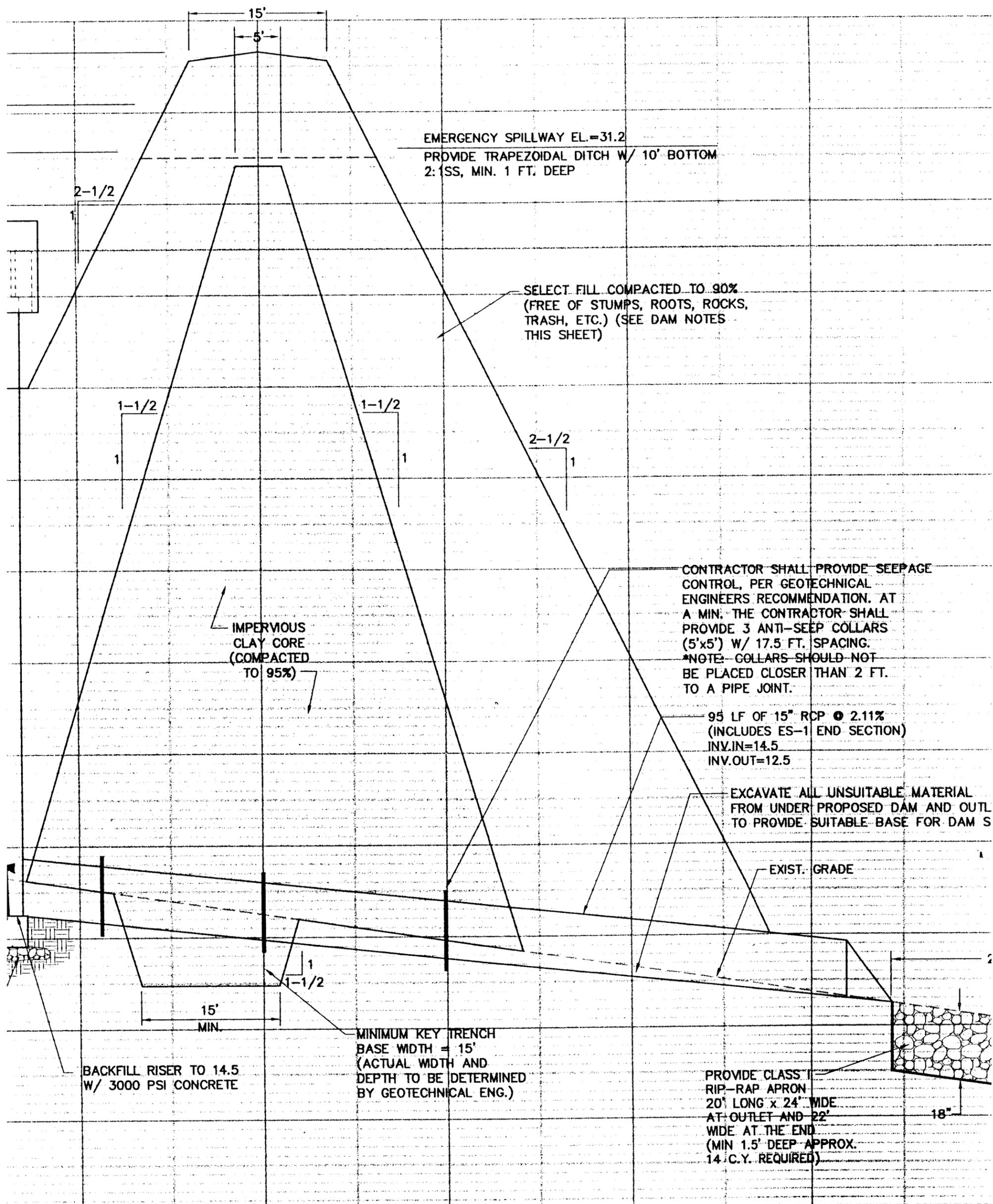
CRE (6#/1,000 S.F.)  
 00 S.F.)  
 ) 4,000#/ACRE

SPER CREST  
 = 28.0





# DAM CROSS SECTION



EMERGENCY SPILLWAY EL.=31.2  
 PROVIDE TRAPEZOIDAL DITCH W/ 10' BOTTOM  
 2:1SS, MIN. 1 FT. DEEP

SELECT FILL COMPACTED TO 90%  
 (FREE OF STUMPS, ROOTS, ROCKS,  
 TRASH, ETC.) (SEE DAM NOTES  
 THIS SHEET)

IMPERVIOUS  
 CLAY CORE  
 (COMPACTED  
 TO 95%)

CONTRACTOR SHALL PROVIDE SEEPAGE  
 CONTROL, PER GEOTECHNICAL  
 ENGINEERS RECOMMENDATION. AT  
 A MIN. THE CONTRACTOR SHALL  
 PROVIDE 3 ANTI-SEEP COLLARS  
 (5'x5') W/ 17.5 FT. SPACING.  
 \*NOTE: COLLARS SHOULD NOT  
 BE PLACED CLOSER THAN 2 FT.  
 TO A PIPE JOINT.

95 LF OF 15" RCP @ 2.11%  
 (INCLUDES ES-1 END SECTION)  
 INV.IN=14.5  
 INV.OUT=12.5

EXCAVATE ALL UNSUITABLE MATERIAL  
 FROM UNDER PROPOSED DAM AND OUTL  
 TO PROVIDE SUITABLE BASE FOR DAM S

EXIST. GRADE

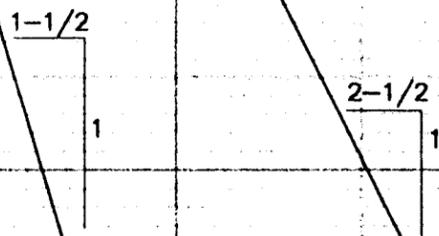
PROVIDE CLASS II  
 RIP-RAP APRON  
 20' LONG x 24' WIDE  
 AT OUTLET AND 22'  
 WIDE AT THE END  
 (MIN 1.5' DEEP APPROX.  
 14 C.Y. REQUIRED)

MINIMUM KEY TRENCH  
 BASE WIDTH = 15'  
 (ACTUAL WIDTH AND  
 DEPTH TO BE DETERMINED  
 BY GEOTECHNICAL ENG.)

BACKFILL RISER TO 14.5  
 W/ 3000 PSI CONCRETE

EMERGENCY SPILLWAY EL.=31.2  
PROVIDE TRAPEZOIDAL DITCH W/ 10' BOTTOM  
2:1SS, MIN. 1 FT. DEEP

SELECT FILL COMPACTED TO 90%  
(FREE OF STUMPS, ROOTS, ROCKS,  
TRASH, ETC.) (SEE DAM NOTES  
THIS SHEET)



CONTRACTOR SHALL PROVIDE SEEPAGE  
CONTROL, PER GEOTECHNICAL  
ENGINEERS RECOMMENDATION. AT  
A MIN. THE CONTRACTOR SHALL  
PROVIDE 3 ANTI-SEEP COLLARS  
(5'x5') W/ 17.5 FT. SPACING.  
\*NOTE: COLLARS SHOULD NOT  
BE PLACED CLOSER THAN 2 FT.  
TO A PIPE JOINT.

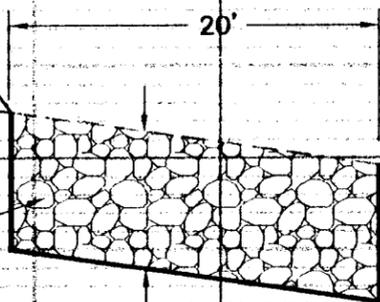
95 LF OF 15" RCP @ 2.11%  
(INCLUDES ES-1 END SECTION)  
INV.IN=14.5  
INV.OUT=12.5

EXCAVATE ALL UNSUITABLE MATERIAL  
FROM UNDER PROPOSED DAM AND OUTLET PIPE  
TO PROVIDE SUITABLE BASE FOR DAM STRUCTURE

EXIST. GRADE

MINIMUM KEY TRENCH  
BASE WIDTH = 15'  
(ACTUAL WIDTH AND  
DEPTH TO BE DETERMINED  
BY GEOTECHNICAL ENG.)

PROVIDE CLASS I  
RIP-RAP APRON  
20' LONG x 24" WIDE  
AT OUTLET AND 22'  
WIDE AT THE END  
(MIN 1.5' DEEP APPROX.  
14 C.Y. REQUIRED)



PROVIDE FILTER  
FABRIC BETWEEN  
STONE AND SUB-  
GRADE

**HYDROLOGIC REPORT FOR**

**KINGSMILL EAST**

**WAREHAM'S POND ROAD**

**EXTENSION**

**WET POND #2**

**AES CONSULTING ENGINEERS**

**5248 OLDE TOWNE ROAD**

**WILLIAMSBURG, VA. 23188**

**AES JOB NO. 7753-4**

**REVISED 6/16/98**

*JR046*

1. RESERVOIR No = 2. 2. RESERVOIR NAME = WET POND #2.

3.  $S = K_s * Z^b$

$K_s = 0$ .....  $b = 0$ .....

START ELEV = 0..... INCREMENT = 0...

STAGE	ELEVATION	CO AREA	INC STORAGE	TOT STORAGE	
ft	ft	sq ft	cu ft	cu ft	
4	0.00	14.50	.0000001	0	0
5	13.49	27.99	.0000001	0	0
6	13.50	28.00	27592...	137	137
7	15.50	30.00	.31733...	59325	59462
8	25.50	40.00	.73317...	525250	584712
9	0.00	0.00	0.....	0	0
10	0.00	0.00	0.....	0	0
11	0.00	0.00	0.....	0	0
12	0.00	0.00	0.....	0	0
13	0.00	0.00	0.....	0	0
14	0.00	0.00	0.....	0	0

CULVERT STRUC A.  $Q = CoA[2gh/k]^{.5}$  CULVERT STRUC B.  $Q = CoA[2gh/k]^{.5}$

1. WIDTH (in) = 15.                      9. WIDTH (in) = 0..  
2. HEIGHT (in) = 15.                     10. HEIGHT (in) = 0..  
3. No. BARRELS = 1..                    11. No. BARRELS = 0..  
4. INVERT ELEV. = 14.5.....          12. INVERT ELEV. = 0.....  
5.  $Co = 0.60$                               13.  $Co = 0.60$   
6. CULVERT LENGTH (ft) = 84..        14. CULVERT LENGTH (ft) = 0...  
7. CULVERT SLOPE (%) = 2.11        15. CULVERT SLOPE (%) = 0...  
8. MANNING'S N-VALUE = .013        16. MANNING'S N-VALUE = .013  
17. MULTI-STAGE OPTION ? (Y/N) N

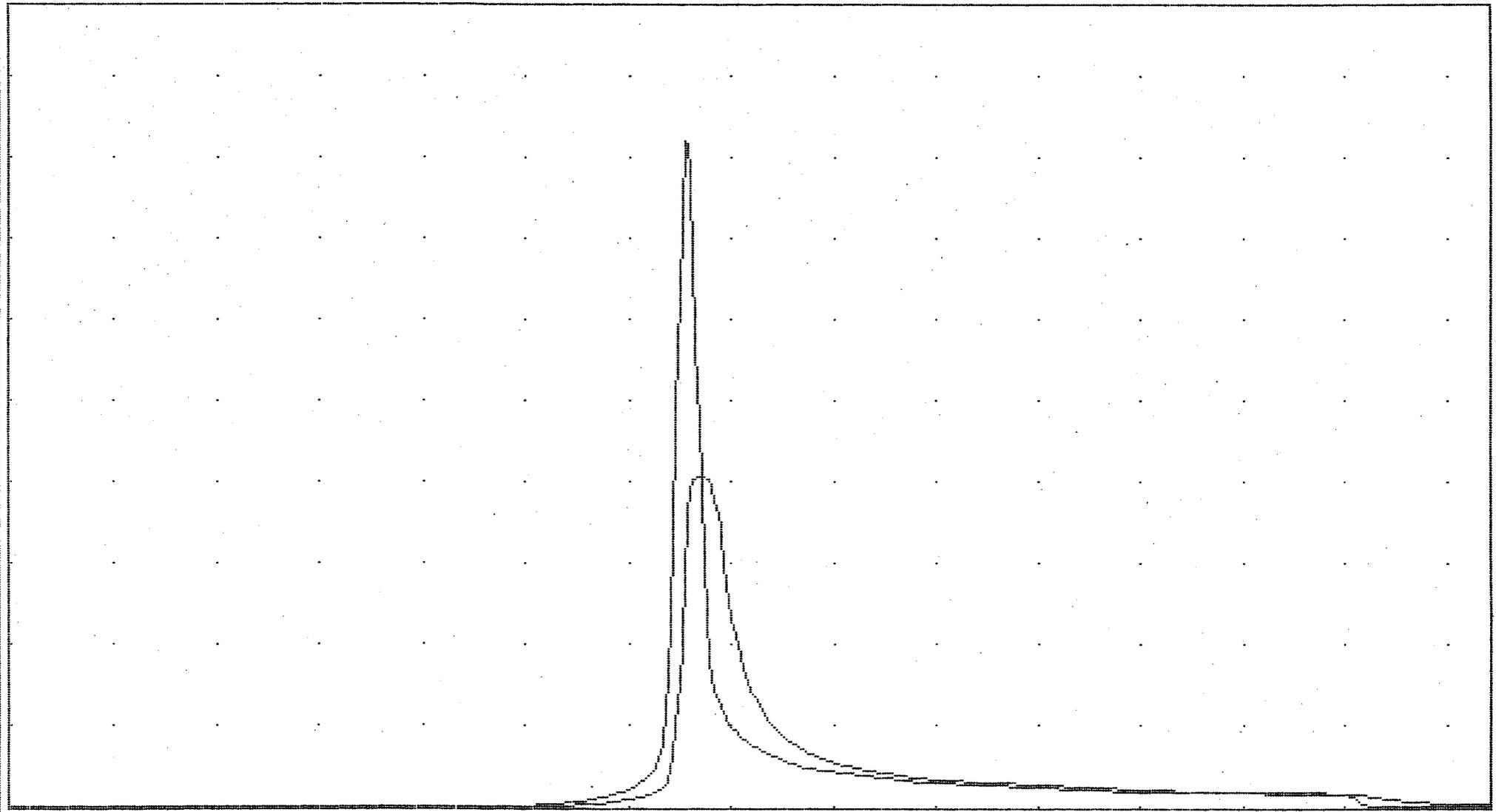
WEIR STRUCTURE A.  $Q = C_w L H^{EXP}$  WEIR STRUCTURE B.  $Q = C_w L H^{EXP}$

18. CREST LENGTH (ft) = 6.....      23. CREST LENGTH (ft) = 10.....  
19. CREST ELEVATION = 28.....      24. CREST ELEVATION = 31.2...  
20.  $C_w = 3.00$                               25.  $C_w = 3.00$   
21.  $EXP = 1.50$                               26.  $EXP = 1.50$   
22. MULTI-STAGE OPTION ? (Y/N) Y    27. MULTI-STAGE OPTION ? (Y/N) N

Qp = 20.3

RESERVOIR ROUTE

2' Yr



HGU = 111 min

9

UGU = 5.0 cfs

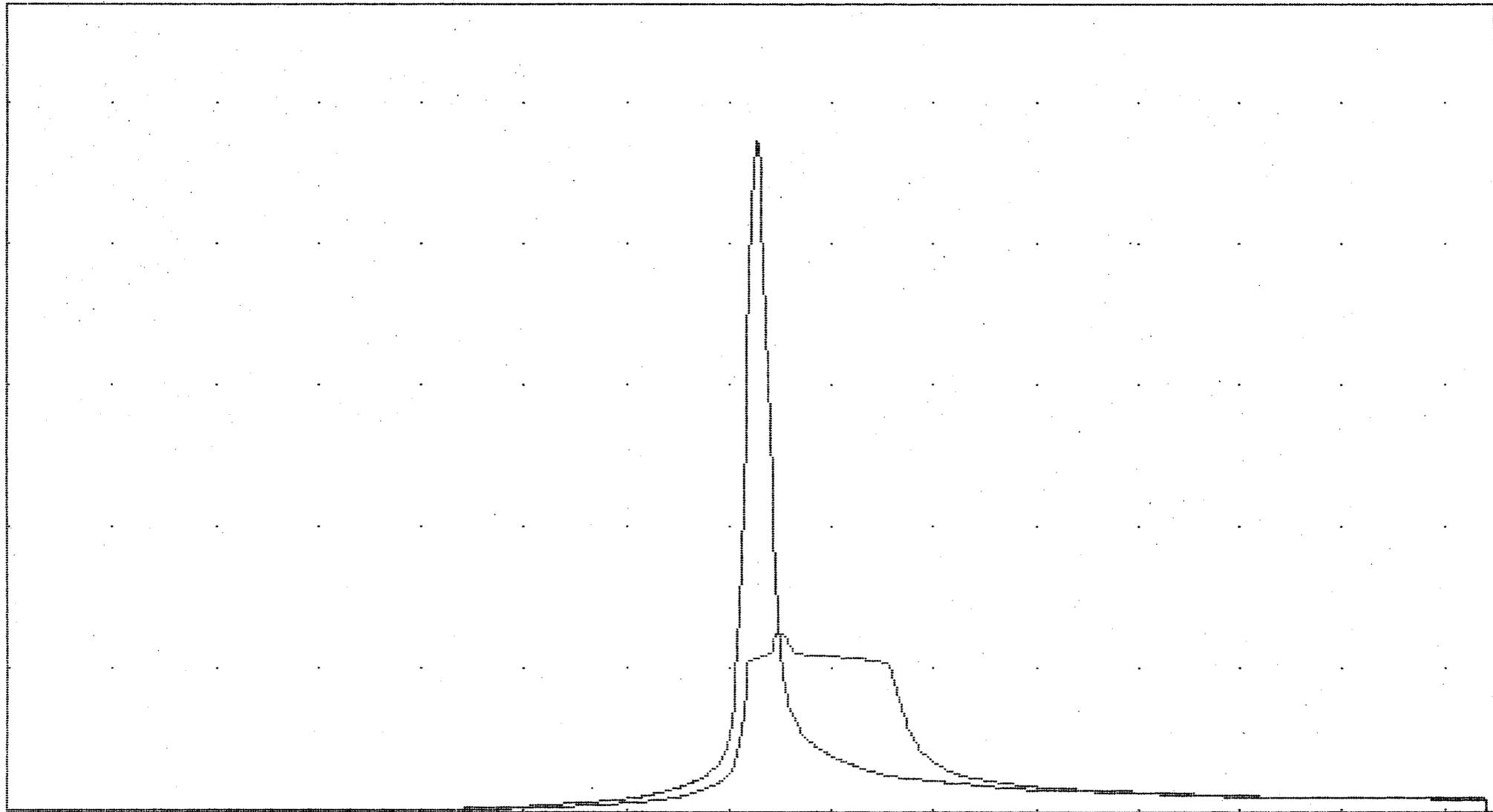
MAX STORAGE = 39998

MAX ELEVATION = 29.34

Qp = 24.9

RESERVOIR ROUTE

10 Yr



HGU = 100 min

10

UGU = 20.0 cfs

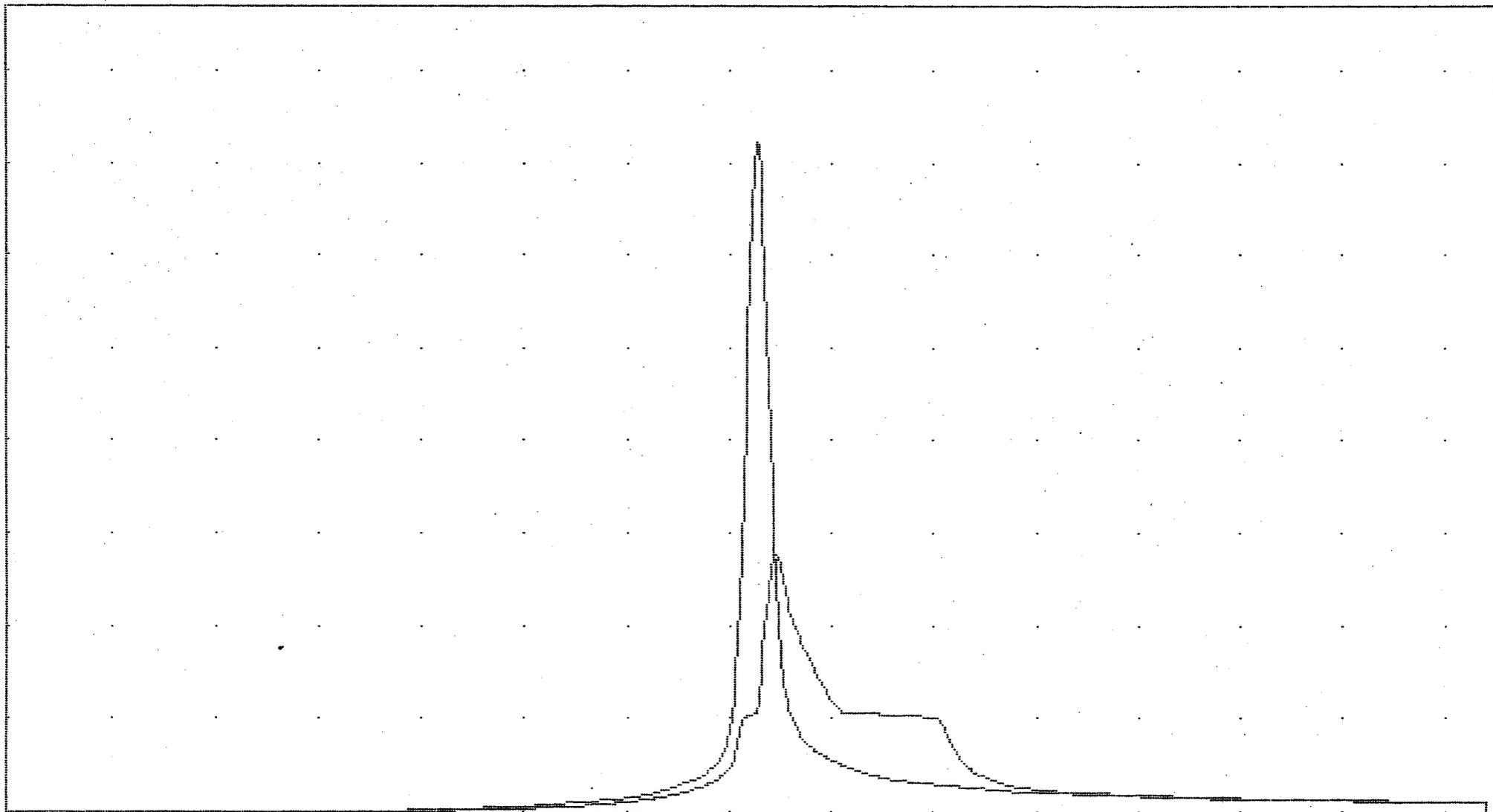
MAX STORAGE = 119045

MAX ELEVATION = 31.13

Qp = 56.0

RESERVOIR ROUTE

100 Yr



HGU = 100 min

12

UGU = 20.0 cfs

MAX STORAGE = 177395

MAX ELEVATION = 32.25

HYDROLOGIC REPORT FOR

OK

*incl revised  
cales -  
2-barely -  
no river*

KINGSMILL EAST

SANDYS FORT

WET POND #2

AES JOB NUMBER 7753-6

AES CONSULTING ENGINEERS

5248 OLDE TOWNE ROAD  
WILLIAMSBURG, VA. 23188

JUNE 6, 1997

REVISED NOVEMBER 14, 1997

# WET POND # 2 OPTION B

6/6/97

PRE-DEV. DA = 21.9

CN = ~~73~~  
70 ✓ (WOODED)

POST DEV. DA = 25.7 AC

14 AC± = SINGLE FAMILY LOTS → CN = 76

2.5 AC± = TRIGHT OF WAY → CN = 90

6 AC± = MULTI-FAMILY → CN = ~~90~~

3.2 AC± = OPEN SPACE → CN = ~~70~~  
(UNDEVELOPED)

$$\frac{14(76) + 2.5(\frac{90}{\cancel{90}}) + 6(\frac{90}{\cancel{90}}) + 3.2(\frac{70}{\cancel{70}})}{25.7} = \frac{78}{25.7} = \underline{\underline{80}} \checkmark$$

## BNP DESIGN

\* TRY WET POND TYPE 7A - 10PTS

IMPERVIOUS AREA = LOTS = 0.3 (14)

R/W = 0.6 (2.5)

OPEN = 0.16 (3.2)

MULTI-FAMILY = 0.6 (6)

$$P_v = 0.05 + (0.009)(0.38) = 0.39$$

$$\text{VOL. REQD} = 10 V_R = 10 \left(\frac{1}{2}\right) \left(\frac{1}{2}\right) (25.7) (43560) (0.39) =$$

33% IMP ✓

$$\underline{\underline{\text{VOL} = 181,918 \text{ CF}}} \leftarrow$$

$$\frac{9.8}{25.7} = 0.38$$

\* VOL ACHIEVED @ ELEV = 27.4 (MIN NP)

\* USE NP = 28 > 27.4 ✓

# WET POND #2

11/14/97

## TIME OF CONCENTRATION

(OVERLAND → SEELYE CHART  
CHANNEL → KIRPICH CHART)

PRE-DEV. DA = 21.9 AC

L = 1000 ft

OVERLAND FLOW → 300 ft S = 5% →  $T_c = 16$  min

CHANNEL FLOW → 700 ft  $\Delta z = 54$  ft  $T_c = 3$  min

$T_c = 19$  min ←

POST DEV. DA = 25.2 AC

L = 1200 ft

OVERLAND FLOW → 300 ft S = 2% →  $T_c = 17$  min

CHANNEL FLOW → 900 ft  $\Delta z = 60$  ft →  $T_c = 4$  min

$T_c = 21$  min ←

# WET POND #2

11/17/97

## ANTI-SEEP COLLAR DESIGN

$$L_s = Y(z+4) \left(1 + \frac{S}{0.25-S}\right)$$

$$L_s = 12(2.5+4) \left(1 + \frac{0.0211}{0.25-0.0211}\right)$$

$$L_s = 85 \text{ ft} \rightarrow \text{Enter Plate 3.14-12}$$

\* Use 2-5.5' x 5.5' COLLARS

\* Use 14 x 2 = 28' SPACING

# HYDROLOGIC REPORT

2YEAR PRE-DEVELOPMENT.

Hyd. No. 1

Hydrograph type = S.C.S. RUNOFF	Peak discharge = 24.03 cfs
Storm frequency = 2 yr	Time interval = 3 min
Basin area = 21.9 ac	Basin curve No. = 70
Ave basin slope = 6.9 %	Hydraulic len = 1000 ft
Basin lag = 11.4 min	Time of concen = 19.00 min
Total precip. = 3.50 in	Distribution = S.C.S. II

## HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs      cfs)	TIME--OUTFLOW (hrs      cfs)	TIME--OUTFLOW (hrs      cfs)	TIME--OUTFLOW (hrs      cfs)
11.65    0.72	11.70    1.25	11.75    2.12	11.80    3.56
11.85    5.96	11.90    9.83	11.95    14.97	12.00    19.92
12.05    23.30	12.10    24.03	12.15    22.09	12.20    19.08
12.25    15.98	12.30    12.88	12.35    9.96	12.40    7.50
12.45    5.91	12.50    5.20	12.55    4.82	12.60    4.45
12.65    4.12	12.70    3.83	12.75    3.59	12.80    3.40
12.85    3.24	12.90    3.11	12.95    3.01	13.00    2.91
13.05    2.82	13.10    2.73	13.15    2.64	13.20    2.57
13.25    2.49	13.30    2.43	13.35    2.37	13.40    2.31
13.45    2.26	13.50    2.21	13.55    2.16	13.60    2.10
13.65    2.06	13.70    2.01	13.75    1.96	13.80    1.92
13.85    1.88	13.90    1.84	13.95    1.80	14.00    1.76
14.05    1.72	14.10    1.69	14.15    1.65	14.20    1.62
14.25    1.60	14.30    1.58	14.35    1.56	14.40    1.54
14.45    1.53	14.50    1.52	14.55    1.50	14.60    1.49
14.65    1.48	14.70    1.46	14.75    1.45	14.80    1.44
14.85    1.42	14.90    1.41	14.95    1.40	15.00    1.38
15.05    1.37	15.10    1.36	15.15    1.34	15.20    1.33
15.25    1.32	15.30    1.30	15.35    1.29	15.40    1.28
15.45    1.26	15.50    1.25	15.55    1.23	15.60    1.22
15.65    1.21	15.70    1.19	15.75    1.18	15.80    1.16
15.85    1.15	15.90    1.13	15.95    1.12	16.00    1.10
16.05    1.09	16.10    1.08	16.15    1.06	16.20    1.05
16.25    1.04	16.30    1.04	16.35    1.03	16.40    1.02
16.45    1.02	16.50    1.01	16.55    1.01	16.60    1.00

# HYDROLOGIC REPORT

## 2 YEAR POSTDEVELOPMENT

.....  
 .....

Hyd. No. 2

Hydrograph type = S.C.S. RUNOFF	Peak discharge = 41.09 cfs
Storm frequency = 2 yr	Time interval = 3 min
Basin area = 25.2 ac	Basin curve No. = 80
Ave basin slope = 5.5 %	Hydraulic len = 1200 ft
Basin lag = 12.6 min	Time of concen = 21.00 min
Total precip. = 3.50 in	Distribution = S.C.S. II

### HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs      cfs)	TIME--OUTFLOW (hrs      cfs)	TIME--OUTFLOW (hrs      cfs)	TIME--OUTFLOW (hrs      cfs)
11.05    1.01	11.10    1.07	11.15    1.14	11.20    1.21
11.25    1.30	11.30    1.42	11.35    1.56	11.40    1.70
11.45    1.86	11.50    2.03	11.55    2.28	11.60    2.69
11.65    3.39	11.70    4.52	11.75    6.28	11.80    8.89
11.85    12.79	11.90    18.46	11.95    25.51	12.00    32.40
12.05    37.92	12.10    41.09	12.15    40.79	12.20    37.27
12.25    32.55	12.30    27.75	12.35    22.99	12.40    18.41
12.45    14.23	12.50    10.82	12.55    8.64	12.60    7.63
12.65    7.05	12.70    6.52	12.75    6.06	12.80    5.67
12.85    5.35	12.90    5.07	12.95    4.85	13.00    4.65
13.05    4.48	13.10    4.33	13.15    4.19	13.20    4.06
13.25    3.93	13.30    3.82	13.35    3.71	13.40    3.61
13.45    3.52	13.50    3.43	13.55    3.34	13.60    3.26
13.65    3.18	13.70    3.11	13.75    3.03	13.80    2.96
13.85    2.89	13.90    2.83	13.95    2.76	14.00    2.70
14.05    2.64	14.10    2.58	14.15    2.52	14.20    2.47
14.25    2.43	14.30    2.39	14.35    2.35	14.40    2.32
14.45    2.30	14.50    2.27	14.55    2.25	14.60    2.23
14.65    2.21	14.70    2.19	14.75    2.17	14.80    2.15
14.85    2.13	14.90    2.11	14.95    2.09	15.00    2.06
15.05    2.04	15.10    2.02	15.15    2.00	15.20    1.98
15.25    1.96	15.30    1.94	15.35    1.92	15.40    1.89
15.45    1.87	15.50    1.85	15.55    1.83	15.60    1.81
15.65    1.79	15.70    1.76	15.75    1.74	15.80    1.72
15.85    1.70	15.90    1.68	15.95    1.65	16.00    1.63
16.05    1.61	16.10    1.59	16.15    1.57	16.20    1.55
16.25    1.53	16.30    1.52	16.35    1.51	16.40    1.50
16.45    1.49	16.50    1.48	16.55    1.47	16.60    1.46
16.65    1.46	16.70    1.45	16.75    1.44	16.80    1.43

HYDROGRAPH DISCHARGE TABLE Cont'd

TIME--OUTFLOW		TIME--OUTFLOW		TIME--OUTFLOW		TIME--OUTFLOW	
(hrs	cfs)	(hrs	cfs)	(hrs	cfs)	(hrs	cfs)
16.35	1.42	16.90	1.42	16.95	1.41	17.00	1.40
17.05	1.39	17.10	1.39	17.15	1.38	17.20	1.37
17.25	1.36	17.30	1.36	17.35	1.35	17.40	1.34
17.45	1.33	17.50	1.32	17.55	1.32	17.60	1.31
17.65	1.30	17.70	1.29	17.75	1.29	17.80	1.28
17.85	1.27	17.90	1.26	17.95	1.25	18.00	1.25
18.05	1.24	18.10	1.23	18.15	1.22	18.20	1.22
18.25	1.21	18.30	1.20	18.35	1.19	18.40	1.18
18.45	1.18	18.50	1.17	18.55	1.16	18.60	1.15
18.65	1.14	18.70	1.14	18.75	1.13	18.80	1.12
18.85	1.11	18.90	1.10	18.95	1.10	19.00	1.09
19.05	1.08	19.10	1.07	19.15	1.06	19.20	1.06
19.25	1.05	19.30	1.04	19.35	1.03	19.40	1.02
19.45	1.01	19.50	1.01	19.55	1.00	19.60	0.99

**HYDROLOGIC REPORT FOR**

**KINGSMILL EAST**

**WAREHAM'S POND ROAD**

**EXTENSION**

**WET POND #2**

**AES CONSULTING ENGINEERS**

**5248 OLDE TOWNE ROAD**

**WILLIAMSBURG, VA. 23188**

**AES JOB NO. 7753-4**

**REVISED 7/14/98**

1. RESERVOIR No = 2. 2. RESERVOIR NAME = WET POND #2.  
 3.  $S = K_s * Z^b$   
 $K_s = 0.....$   $b = 0.....$   
 START ELEV = 0..... INCREMENT = 0...

STAGE	ELEVATION	CO	AREA	INC STORAGE	TOT STORAGE
ft	ft	sq ft	cu ft	cu ft	
4	0.00	28.00.	27592...	0	0
5	2.00	30.00.	31733...	59325	59325
6	12.00	40.00.	73317...	525250	584575
7	0.00	0.00.	0.....	0	0
8	0.00	0.00.	0.....	0	0
9	0.00	0.00.	0.....	0	0
10	0.00	0.00.	0.....	0	0
11	0.00	0.00.	0.....	0	0
12	0.00	0.00.	0.....	0	0
13	0.00	0.00.	0.....	0	0
14	0.00	0.00.	0.....	0	0

CULVERT STRUC A.  $Q = CoA[2gh/k]^{.5}$  CULVERT STRUC B.  $Q = CoA[2gh/k]^{.5}$

1. WIDTH (in) = 15. 9. WIDTH (in) = 0..  
 2. HEIGHT (in) = 15. 10. HEIGHT (in) = 0..  
 3. No. BARRELS = 2.. 11. No. BARRELS = 0..  
 4. INVERT ELEV. = 28..... 12. INVERT ELEV. = 0.....  
 5.  $Co = 0.60$  13.  $Co = 0.60$   
 6. CULVERT LENGTH (ft) = 70.. 14. CULVERT LENGTH (ft) = 0...  
 7. CULVERT SLOPE (%) = 21.7 15. CULVERT SLOPE (%) = 0...  
 8. MANNING'S N-VALUE = .013 16. MANNING'S N-VALUE = .013  
 17. MULTI-STAGE OPTION ? (Y/N) N

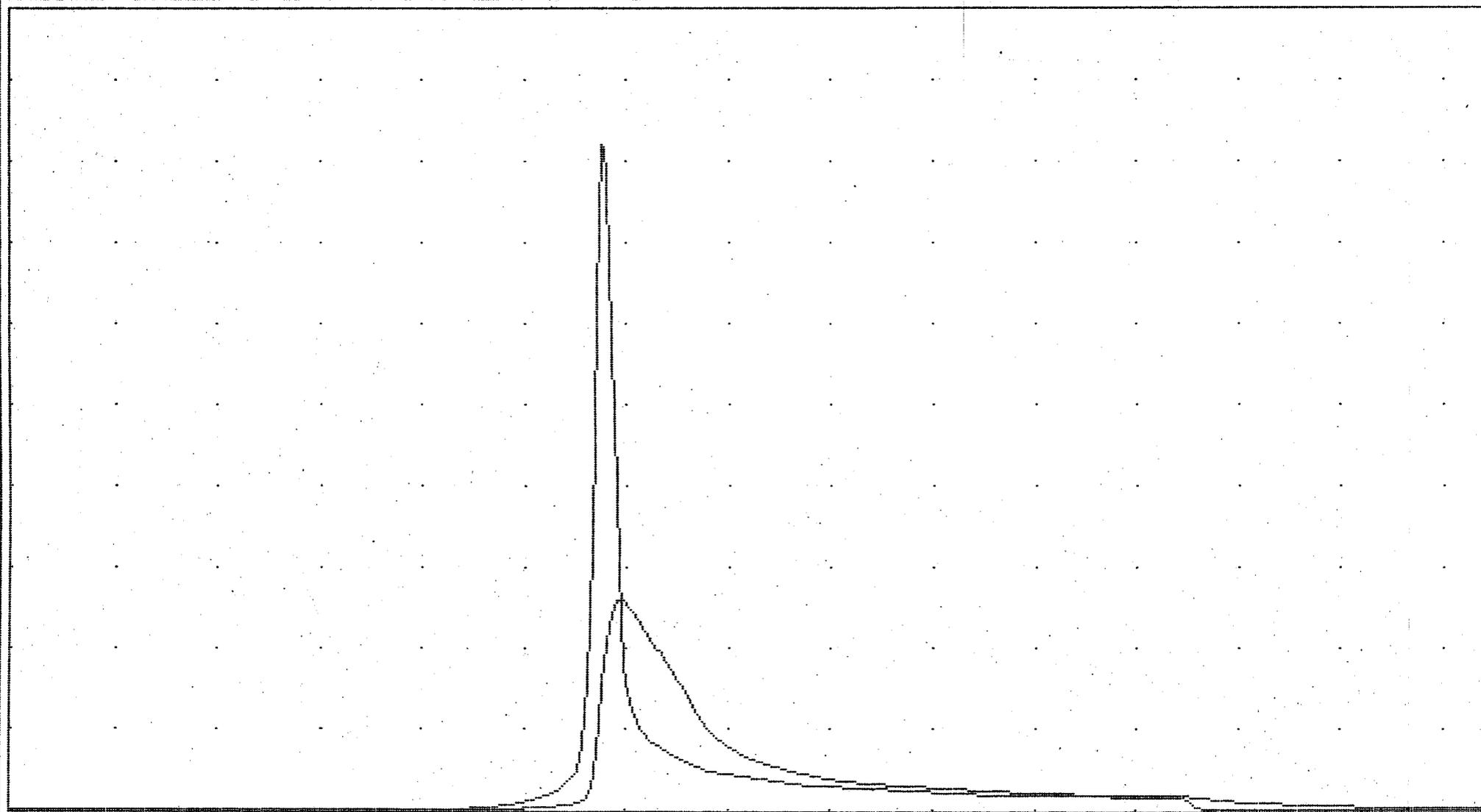
WEIR STRUCTURE A.  $Q = CwLH^{EXP}$  WEIR STRUCTURE B.  $Q = CwLH^{EXP}$

18. CREST LENGTH (ft) = 6..... 23. CREST LENGTH (ft) = 10.....  
 19. CREST ELEVATION = 28..... 24. CREST ELEVATION = 31.5...  
 20.  $Cw = 3.00$  25.  $Cw = 3.00$   
 21.  $EXP = 1.50$  26.  $EXP = 1.50$   
 22. MULTI-STAGE OPTION ? (Y/N) Y 27. MULTI-STAGE OPTION ? (Y/N) N

Qp = 13.0

RESERVOIR ROUTE

2 Yr



HGU = 126 min

9

UGU = 5.0 cfs

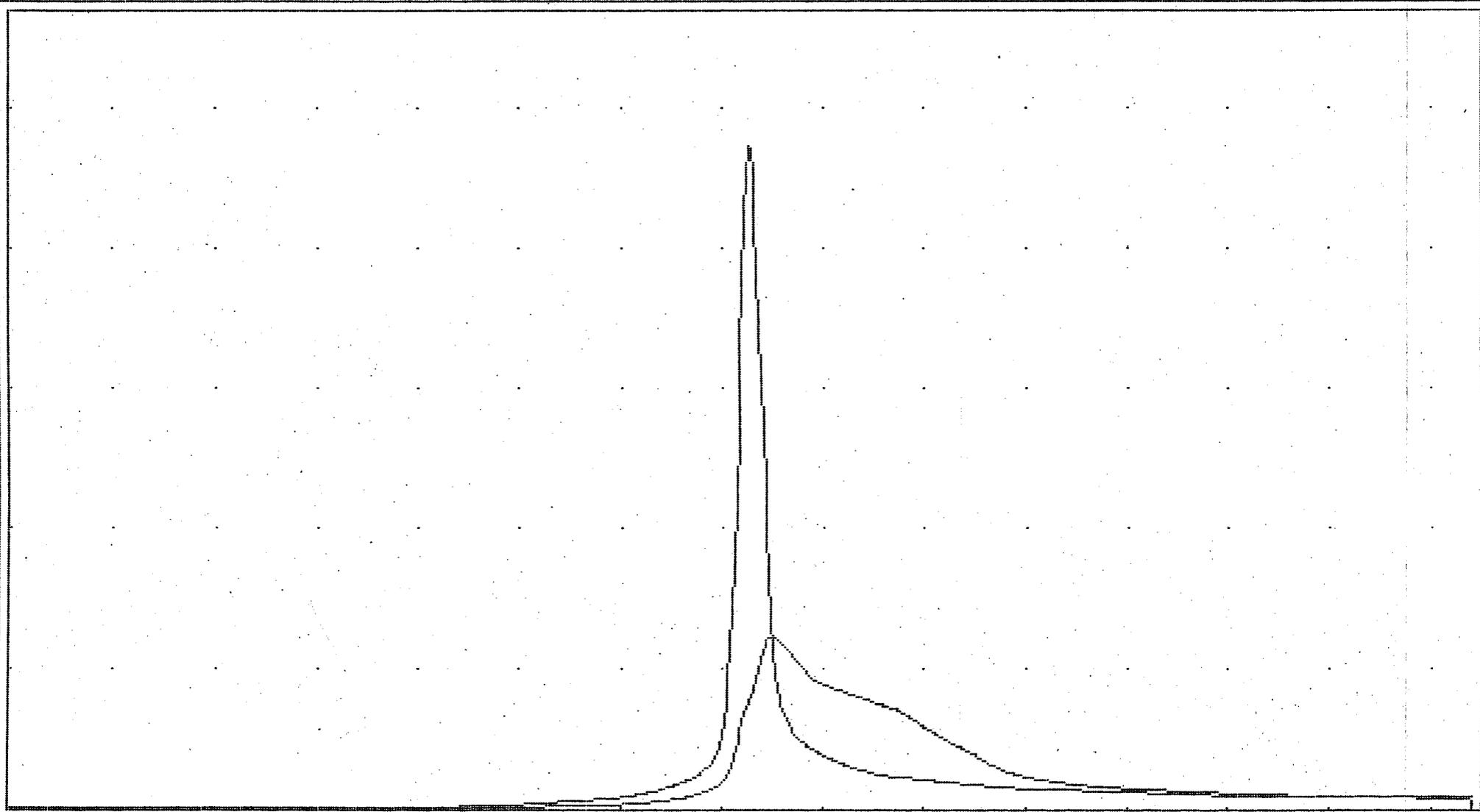
MAX STORAGE = 54488

MAX ELEVATION = 29.84

Qp = 24.5

RESERVOIR ROUTE

10 Yr



HGU = 100 min

10

UGU = 20.0 cfs

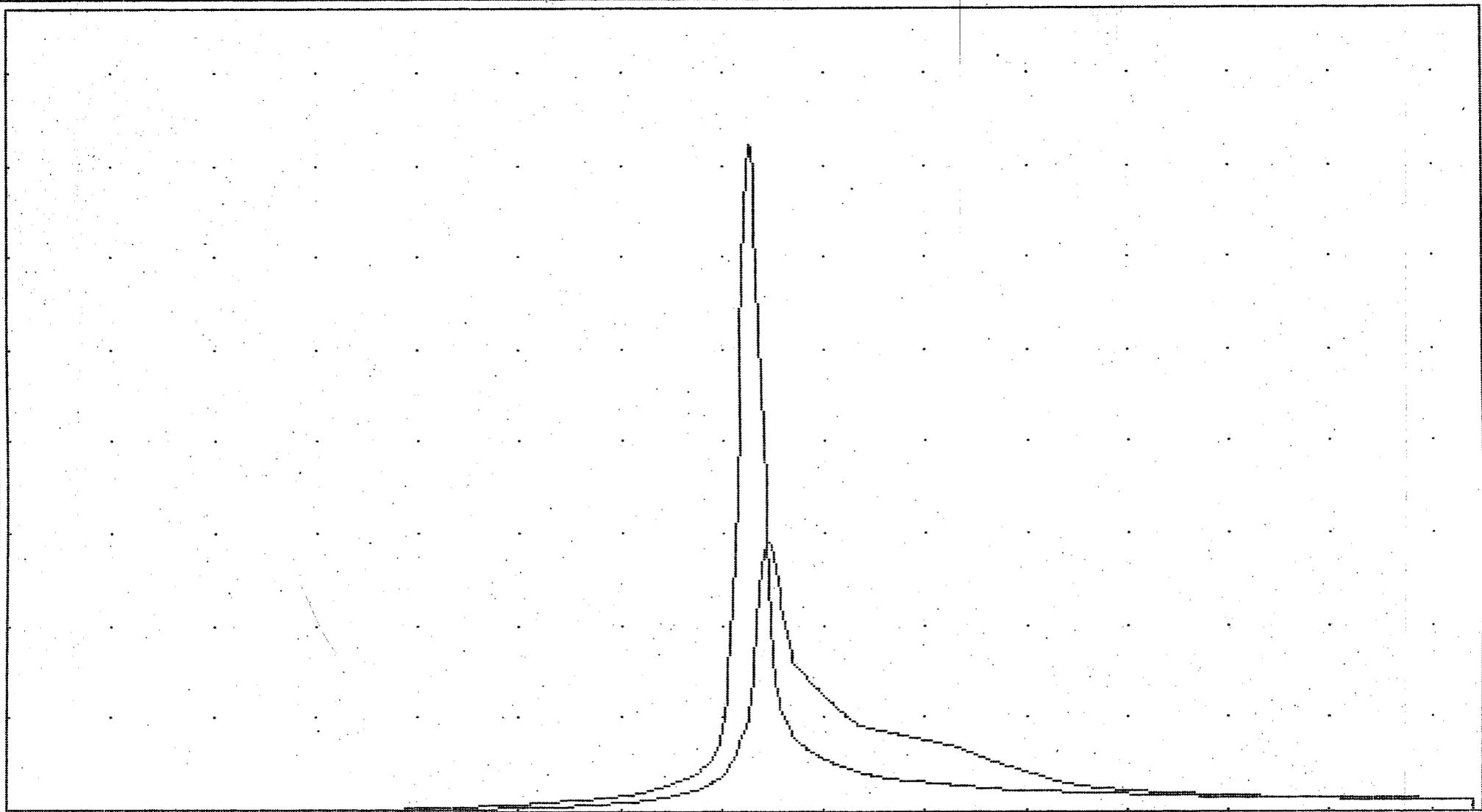
MAX STORAGE = 135392

MAX ELEVATION = 31.45

Qp = 58.5

RESERVOIR ROUTE

100 Yr



HGU = 100 min

12

UGU = 20.0 cfs

MAX STORAGE = 193274

MAX ELEVATION = 32.55

**HYDROLOGIC REPORT FOR**

**KINGSMILL EAST**

**WAREHAM'S POND ROAD**

**EXTENSION**

**WET POND #2**

**AES CONSULTING ENGINEERS**

**5248 OLDE TOWNE ROAD**

**WILLIAMSBURG, VA. 23188**

**AES JOB NO. 7753-4**

**REVISED 6/16/98**

1. RESERVOIR No = 2. 2. RESERVOIR NAME = WET POND #2.

3.  $S = K_s * Z^b$

$K_s = 0$ .....  $b = 0$ .....

START ELEV = 0..... INCREMENT = 0...

STAGE	ELEVATION	CO AREA	INC STORAGE	TOT STORAGE
ft	ft	sq ft	cu ft	cu ft
4	0.00	14.50.	.0000001	0
5	13.49	27.99.	.0000001	0
6	13.50	28.00.	27592...	137
7	15.50	30.00.	31733...	59325
8	25.50	40.00.	73317...	525250
9	0.00	0.00.	0.....	0
10	0.00	0.00.	0.....	0
11	0.00	0.00.	0.....	0
12	0.00	0.00.	0.....	0
13	0.00	0.00.	0.....	0
14	0.00	0.00.	0.....	0

CULVERT STRUC A.  $Q = CoA[2gh/k]^{.5}$  CULVERT STRUC B.  $Q = CoA[2gh/k]^{.5}$

- |                                  |                                |
|----------------------------------|--------------------------------|
| 1. WIDTH (in) = 15.              | 9. WIDTH (in) = 0..            |
| 2. HEIGHT (in) = 15.             | 10. HEIGHT (in) = 0..          |
| 3. No. BARRELS = 1..             | 11. No. BARRELS = 0..          |
| 4. INVERT ELEV. = 14.5.....      | 12. INVERT ELEV. = 0.....      |
| 5. Co = 0.60                     | 13. Co = 0.60                  |
| 6. CULVERT LENGTH (ft) = 84..    | 14. CULVERT LENGTH (ft) = 0... |
| 7. CULVERT SLOPE (%) = 2.11      | 15. CULVERT SLOPE (%) = 0...   |
| 8. MANNING'S N-VALUE = .013      | 16. MANNING'S N-VALUE = .013   |
| 17. MULTI-STAGE OPTION ? (Y/N) N |                                |

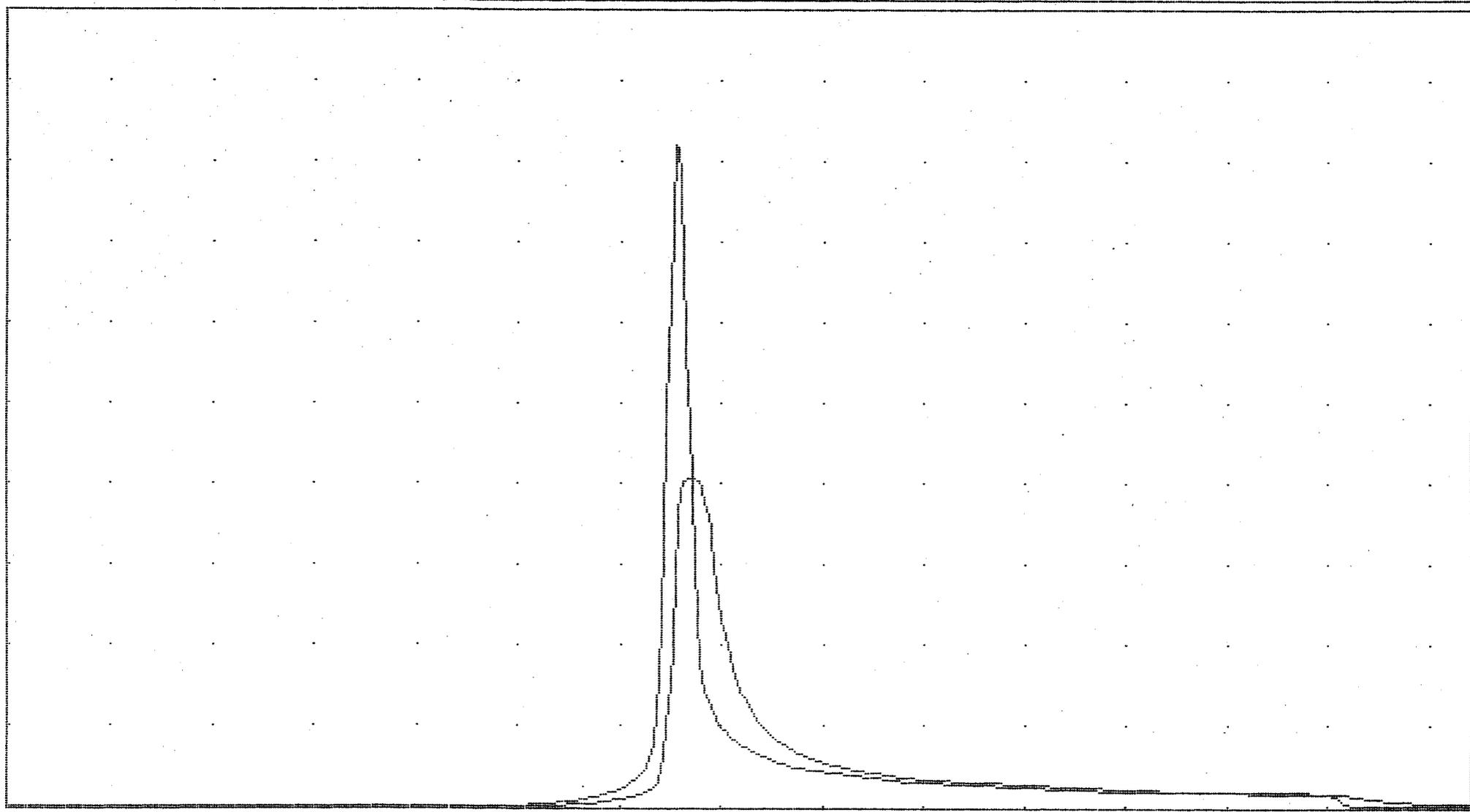
WEIR STRUCTURE A.  $Q = CwLH^{EXP}$  WEIR STRUCTURE B.  $Q = CwLH^{EXP}$

- |                                  |                                  |
|----------------------------------|----------------------------------|
| 18. CREST LENGTH (ft) = 6.....   | 23. CREST LENGTH (ft) = 10.....  |
| 19. CREST ELEVATION = 28.....    | 24. CREST ELEVATION = 31.2...    |
| 20. Cw = 3.00                    | 25. Cw = 3.00                    |
| 21. EXP = 1.50                   | 26. EXP = 1.50                   |
| 22. MULTI-STAGE OPTION ? (Y/N) Y | 27. MULTI-STAGE OPTION ? (Y/N) N |

Qp = 20.3

RESERVOIR ROUTE

2 Yr



HGU = 111 min

9

UGU = 5.0 cfs

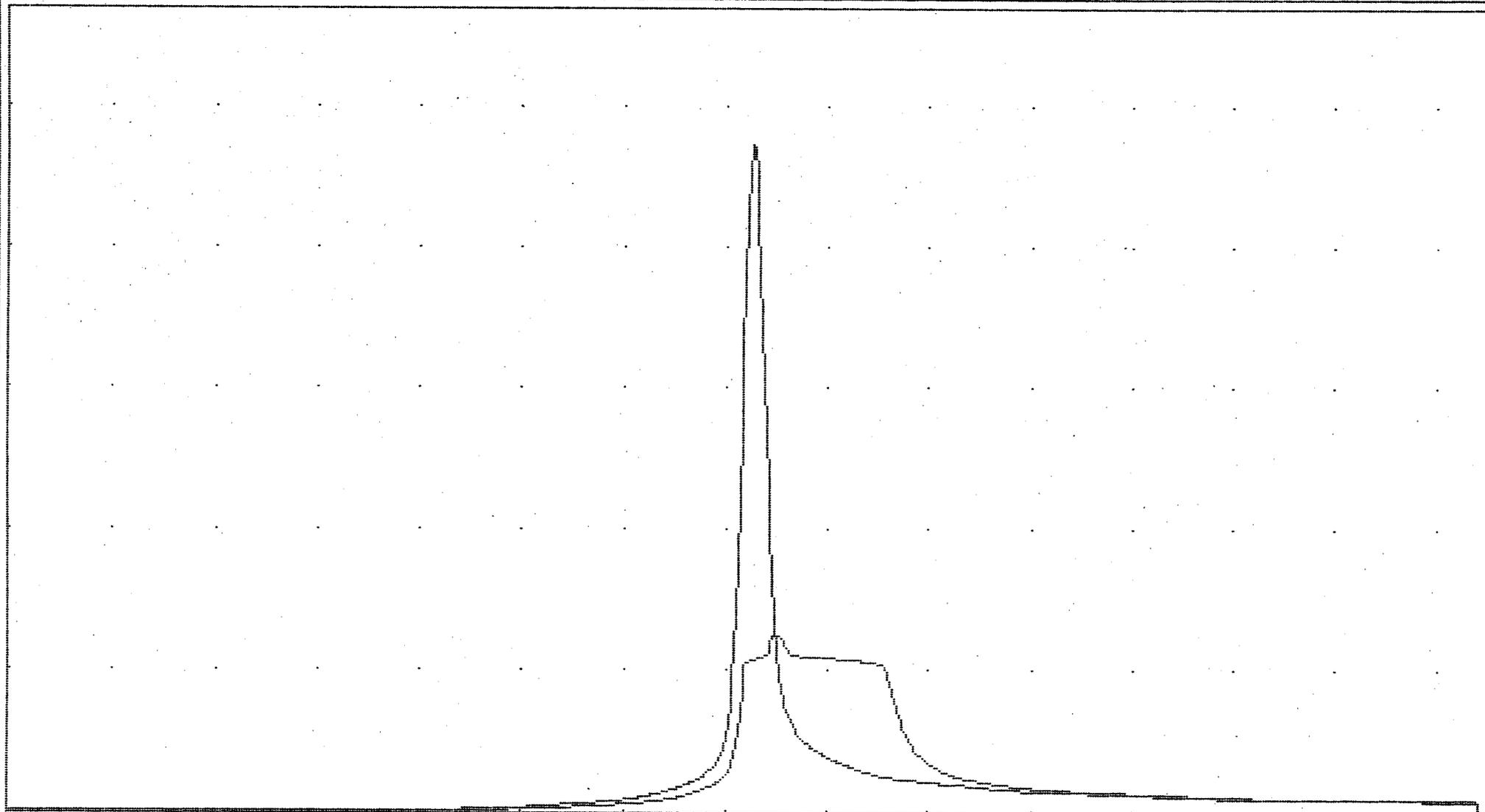
MAX STORAGE = 39998

MAX ELEVATION = 29.34

Qp = 24.9

RESERVOIR ROUTE

10 Yr



HGU = 100 min

10

UGU = 20.0 cfs

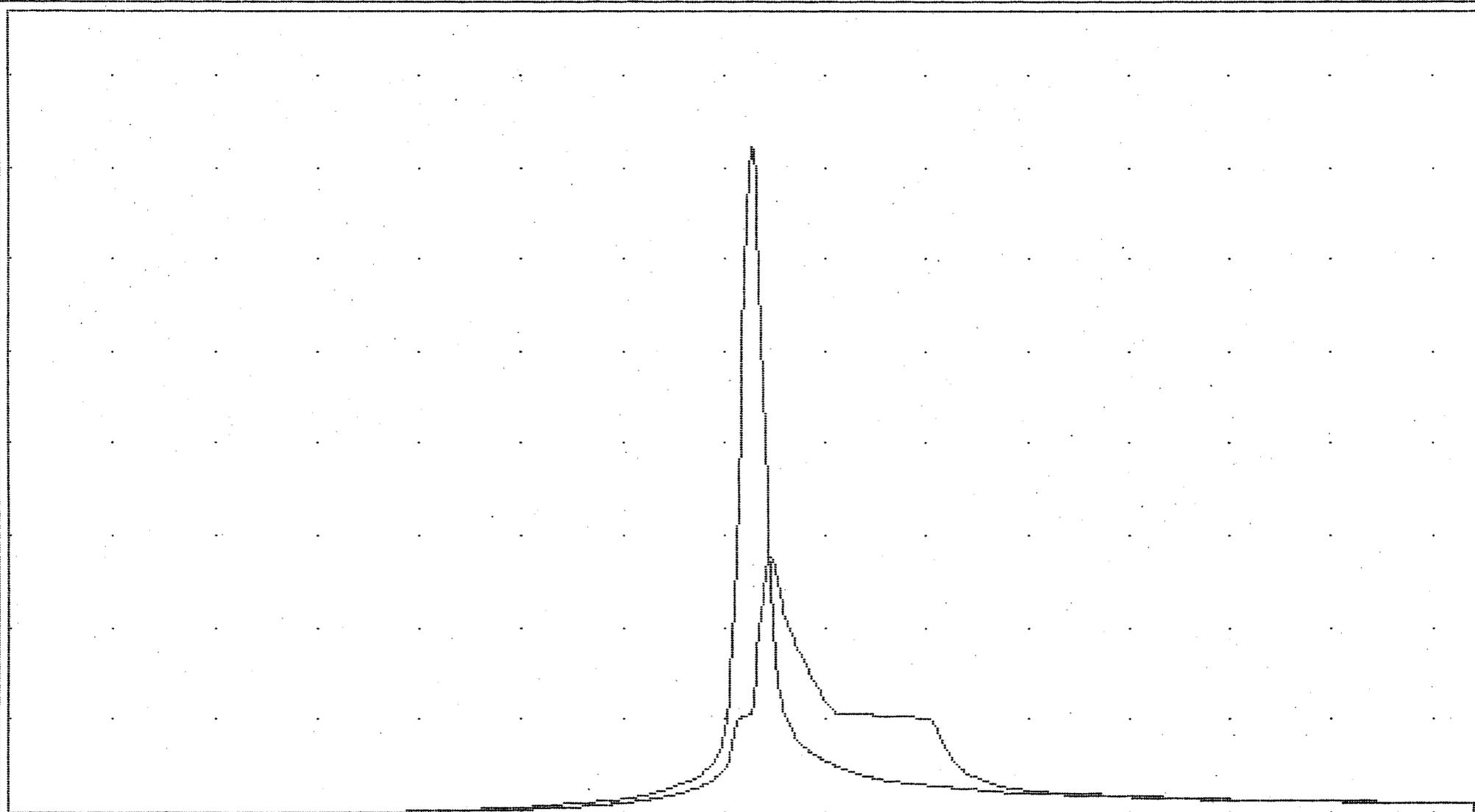
MAX STORAGE = 119045

MAX ELEVATION = 31.13

Qp = 56.0

RESERVOIR ROUTE

100 Yr



HGU = 100 min

12

UGU = 20.0 cfs

MAX STORAGE = 177395

MAX ELEVATION = 32.25

**AES CONSULTING ENGINEERS**

Engineering, Surveying and Planning

5248 Olde Towne Road, Suite 1

WILLIAMSBURG, VIRGINIA 23188

**LETTER OF TRANSMITTAL**

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

TO KC ENVIRONMENTAL DIV.

DATE	<u>6/17/98</u>	JOB NO.	<u>7753-6</u>
ATTENTION	<u>DARRYL COOK</u>		
RE:	<u>SANDYS FORT WET POND #Z</u>		

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

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

COPIES	DATE	NO.	DESCRIPTION
<u>2</u>			<u>REVISED DETAIL</u>
<u>2</u>			<u>REVISED CALCS</u>

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 \_\_\_\_\_ 19 \_\_\_\_  PRINTS RETURNED AFTER LOAN TO US

REMARKS

DARRYL,  
PLEASE ADVISE IF THIS IS ACCEPTABLE,  
AT YOUR EARLIEST CONVENIENCE.

HANKS  
ANDY

Andrew Hess

COPY TO \_\_\_\_\_ SIGNED: \_\_\_\_\_

**GEOTECHNICAL  
ENGINEERING SERVICES  
REPORT**

For the

**KINGSMILL EAST – SANDY'S  
FORT DEVELOPMENT  
JAMES CITY COUNTY, VIRGINIA**

Prepared For

**George Nice & Sons, Inc.  
143 Skimino Road  
Williamsburg, Virginia 23185**

Prepared by

**Professional Service Industries, Inc.  
11835 Canon Boulevard  
Suite C-108  
Newport News, Virginia 23606  
Telephone (757) 873-4611  
Fax (757) 873-4612**

**PSI Project No. 239-85083-1  
November 3, 1998**



A handwritten signature in cursive script that reads "Camille A. Kattan".

**Camille A. Kattan, P.E.  
District Manager  
VA Reg. No. 18045**



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### APPENDIX

- I. Figure 1: Site Location Plan
- Figure 2: Boring Location Plan – Pond #5
- Figure 3: Boring Location Plan – Pond #2
- II. Logs of Borings
- III. Soil Boring Profile
- IV. Figure 4-8: Laboratory Test Data

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*George Nice & Sons, Inc.  
Re: The Kingsmill East – Sandy's Fort Development  
PSI Project No. 239-85083-1*



## 1.0 PROJECT INFORMATION

### 1.1 PROJECT AUTHORIZATION

Authorization to proceed with this project was issued by George Nice & Sons, Inc. through acceptance of PSI Proposal (239-8p134) dated July 1, 1998.

### 1.2 PROJECT DESCRIPTION

The Kingsmill East – Sandy's Fort Development is planned to be an extension of the existing Kingsmill residential development. The proposed roadways within the extension consist of Wareham's Pond Road East and three culverts presently identified as "Roads A, B, and C" totaling approximately 3,200 linear feet of paved roadway. A total of 35 residential lots are planned to be located along the roadways.

Topographic maps indicate that the site is generally hilly throughout. A relatively steep slope appears to be formed where a ridgeline along the eastern portion of the site intersects a lower lying area identified as wetlands. Stormwater generated throughout the proposed development appears to be routed to two locations of the ridge/wetland intersection. The stormwater runoff will be detained in two proposed wet ponds identified as Wet Pond #2 and Wet Pond #5. The locations of these ponds are shown in the appended Site Plan (Figure 1).

The proposed design of the wet ponds consists of the construction of embankment dams across valleys of the "U" shaped ridgelines. The length of the dams from ridge to ridge is approximately 140 feet at the normal pool elevation. The existing side slopes of the ridges are approximately 1 vertical to 1 horizontal (1V:1H) and in some locations steeper. Cross-section diagrams indicate that the proposed dams are approximately 140 feet in width at the base and 12 feet in width at the crest. The existing valley elevations within the damn area of Wet Pond #2 range from +13 to +17 feet. The proposed normal pool elevation for this damn is +28 feet and the 100-year pool elevation is estimated to be +31.4 feet. The proposed crest elevation of the damn is +33.2 feet, giving a maximum height of the damn of approximately 20 feet. For Wet Pond #5, the existing valley elevation within the damn area ranges from +6 to +12 feet. The proposed normal

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pool elevation for this damn is +27 feet and the 100-year pool elevation is estimated to be +30.4 feet. The proposed crest elevation of the damn is +31.5 feet, giving a maximum height of the damn of approximately 24 feet.

The damns are designed with overflow structures at the normal pool elevations. These structures route excess water through the bases of the damns to outlet structures at the dry side of the damns. Emergency spillways are proposed at elevations just below the 100-year pool elevations. The emergency spillways route water through a trapezoidal ditch over the crest of the damn.

### 1.3 PURPOSE

The purpose of this study was explore the subsurface conditions within the proposed damn areas of Wet Pond #2 and Wet Pond #5, and to evaluate the results of exploration with respect to the following: 1) slope stability of the damn; 2) seepage patterns of the damn; 3) potential settlement of the damn; and 4) recommendations for damn design and construction.

### 1.4 SCOPE OF WORK PERFORMED

To explore the subsurface conditions, Professional Service Industries, Inc. (PSI) performed a total of 2 Standard Penetration Test borings to total depths of 50 feet and a total of 4 hand auger borings to approximate depths of 15 feet below the existing ground surface. In the SPT borings, split spoon soil sampling was performed virtually continuously to a depth of 1.0 feet and at intervals of 5 feet thereafter. In the hand auger borings soil samples were collected from each soil stratum encountered. Representative soil samples were placed in sealed containers and returned to our Newport News laboratory for evaluation and testing. Groundwater levels were recorded in the borings at the time of drilling.

The collected soil samples were visually classified in the laboratory by a Geotechnical Engineer. An opinion was formed of the site soil stratigraphy, and laboratory testing was subsequently performed to estimate the engineering properties of the soil strata. Laboratory testing of the subsurface soil samples primarily included Minus #200 sieve analysis to determine the percent clay and silt of the soil strata.

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In addition, laboratory testing was performed on representative soil samples of possible fill material to be used for construction of the dams. Testing of the fill materials included Minus #200 sieve analysis, Atterberg Limits testing, and moisture-density relationship testing.

The results of subsurface exploration and testing were used to perform a three-dimensional seepage analysis of the dam under varying conditions. The test results were also used to evaluate side slopes of the dam and to calculate estimated settlement of the dam due to compression of the underlying soils. The results of our exploration and analysis along with our recommendations for design and construction of the dam are presented in this report.

The scope of services did not include an environmental assessment for determining the presence or absence of wetlands or hazardous or toxic materials in the soil, bedrock, surface water, groundwater or air, on or below or around this site. Any statements contained in this report or on the boring profiles regarding odors, colors, unusual or suspicious items or conditions are strictly for the information of the client.

## 2.0 SUBSURFACE CONDITIONS

The locations of the soil borings are identified in the appended Boring Location Plans (Figures 2 and 3) as B-1 through B-6. The results of exploration and testing performed in the valleys indicated the presence of recent alluvium deposits to a depth of approximately 8 feet, underlain by older marine deposits extending to the boring termination depths of 50 feet. The alluvium deposits primarily consisted of very loose silty sands often containing organic silts. The Standard Penetration Test results, N-values, ranged from 1 to 5 blows per foot (bpf) within these deposits (0 to 8 feet below ground surface).

The marine deposits consisted of a yellowish brown sand layer with shell fragments from 8 to 12 feet. At the location of soil boring B-2, a greenish-gray silty sand with shell fragments was encountered beneath the yellowish-brown sand layer at the approximate depth interval of 12 to 17 feet. Underlying the greenish-gray silty sand at boring location B-2 and underlying the yellowish-brown sand at boring location B-1, a greenish-gray silty clay was encountered. The silty clay layer extended to depths ranging from 22 to 27 feet, with an average thickness of approximately 10 feet. At boring location B-2, a greenish-gray silty sand with shell fragments was encountered below the silty clay layer and extended to the boring termination depth of 50 feet. At boring location B-1, inter-bedded layers of

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greenish-gray silty sand and silty clay were encountered to the boring termination depth of 50 feet, with silty-sands predominating at depths below 32 feet. The N-values recorded within the marine deposits ranged from 8 to 15 indicating loose to medium dense granular soils, and medium stiff clay soils. Groundwater levels were encountered at approximate depths of 2 feet at both pond base locations.

The results obtained from hand auger soil borings performed in the existing valley side slopes varied from location to location. Along the sides of the valley at Wet Pond #2, sandy clays and clayey sands were encountered to a depth of 3 feet, and were underlain by a silty sand with varying degrees of shell fragments to the boring termination depths of 15 feet. Along the sides of the valley at Wet Pond #5, sandy silts and clays containing significant shell fragments were encountered from land surface to depths ranging from 8 to 10 feet. Underlying this layer, a clayey sand was encountered to the boring termination depths of 15 feet. Groundwater was not encountered at these boring locations. The hand auger boring termination elevations were approximately equivalent to the bottom elevation of the valleys.

Laboratory testing consisted of Minus #200 sieve analysis to determine the percent clay and silt present in the soil samples. The results of sieve analysis are summarized below in Table 1.

**Table 1: Summary of Laboratory Test Data – Subsurface Soils**

Boring Location	Depth (feet)	Soil Description	USCS <sup>(1)</sup>	Passing No. 200 Sieve (%)
B-1	2 – 4	Dark Brown Silty Sand	SM	26.4
B-1	4 – 6	Dark Brown Silty Sand	SM	45.4
B-1	8 – 10	Yellowish-Brown Slightly Silty Sand	SP-SM	11.0
B-1	18 – 20	Greenish-Gray Silty Clay	CL	74.1
B-2	0 - 2	Gray Silty Sand	SM	33.6
B-2	2 – 4	Gray Silty Sand	SM	14.4
B-2	4 – 6	Dark Brown Silty Sand	SM	37.0
B-2	6 – 8	Gray Silty Sand	SM	35.4
B-2	8 – 10	Yellowish-Brown Slightly Silty Sand	SP-SM	11.4

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Boring Location	Depth (feet)	Soil Description	USCS <sup>(1)</sup>	Passing No. 200 Sieve (%)
B-2	18 - 20	Greenish-Gray Silty Clay	CL	56.7
B-2	43 - 45	Greenish-Gray Silty Sand	SM	13.3
B-3	1 - 10	Mixture Sandy Silt with Marine Shell Fragments	ML	31.4
B-4	1 - 8	Orangish-Brown Sandy Clay	CL	60.5
B-4	8 - 15	Orangish-Brown Clayey Sand	SC	37.0
B-5	3 - 15	Tan Silty Sand with Marine Shell Fragments	SM	47.0

(1)USCS = Unified Soil Classification System

Boring logs are provided in the Appendix of this report. The above subsurface description is of a generalized nature to highlight the major subsurface stratification features and material characteristics. The boring logs provide a more specific description of the subsurface conditions encountered and should be reviewed. The stratifications shown on the boring logs represent the condition only at the actual boring location. Variations may occur and should be expected between boring locations. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual.

Fill materials desired for use in the project consist of on-site borrow soils. The borrow soils were observed in the field to range from clayey sands to sandy clays. Stockpiled soils appeared to contain a mixture of these two soils. A representative soil sample of each borrow material was obtained and returned to PSI's laboratory for subsequent laboratory testing including moisture content determination, Minus #200 sieve analysis, Atterberg limits testing and moisture-density relationship testing. The results of testing are summarized below in Table 2.

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**Table 2: Summary of Laboratory Test Data – Borrow Soils**

Sample No.	Sample Description	Natural Moisture Content (%)	Passing #200 Sieve (%)	Liquid Limit (%)	Plasticity Index (%)	Optimum Moisture (%)	Maximum Dry Density
1	Light Reddish Brown and Gray Sandy Clay (CL)	18.9	66.7	41	23	14.5	113.0
2	Reddish Brown and Gray Clayey Sand (SC)	17.3	37.7	28	12	12.5	118.0

### 3.0 EVALUATION AND RECOMMENDATIONS

#### 3.1 SEEPAGE

PSI performed a three-dimensional seepage analysis to evaluate seepage forces and rates for the proposed clay core damn design. The analysis was performed utilizing a computer model implementing a finite element analysis and traditional flow net theory. The results of preliminary analysis indicated that the seepage rates occurring through the bases and sides of the dams are unacceptable due to the porous granular soils and shell fragments encountered in the upper portion of the soil profile and the relatively large difference in head occurring from the wet pond side of the damn to the dry side of the damn.

To prevent excessive seepage in these areas, the cut-off trench for this damn would be required to extend to minimum depths ranging from approximately 14 to 19 feet into the existing ground surface, and would be required to extend along the full length of the damn into the existing valley walls.

PSI recommends the installation of steel sheet piles as opposed to the use of a cut-off trench. The pilings should be continuously driven the full length of the dams and should extend horizontally a minimum distance of 20 feet into the existing valley walls from the intersection of the crest of the damn and the existing valley walls. The piling tip elevations should be a minimum of 20 feet below the existing ground surface elevations at all piling locations.

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The piling butts should extend a minimum of 3 feet above the existing ground surface at all piling locations to key into the damn fill materials. A representative of PSI should be present during piling installation to verify pile location and depth.

PSI further recommends use of anti-seep collars along the overflow pipe running through the base of the damn. The anti-seep collars should be a minimum of 5 feet by 5 feet in size. The collars should be spaced a minimum of 18 feet apart, and should not be spaced closer than 2 feet to a pipe joint.

### 3.2 FILL MATERIALS AND PLACEMENT

PSI recommends utilizing the on-site clayey sands and sandy clays for the entirety of the damn cross section. A representative of PSI should be present at all times to observe the fill type to ensure that the borrow materials are consistent with those evaluated for this project. Sampling of the borrow materials should be performed frequently. The samples should be analyzed to determine the percent fines and the Standard Proctor Maximum Dry Density (ASTM D698). All fill materials should contain a minimum of 35 percent by weight of fines and should be classified as clayey sand (SC) or sandy clay (CL). When questionable fill materials are encountered, all use of these materials should be discontinued until laboratory testing results are obtained by PSI.

Fill materials should be placed in maximum 10-inch lifts and compacted to 98 percent of the Standard Proctor Maximum Dry Density for the fill material. Based on the natural moisture contents of the fill materials recorded at the time of this evaluation and the optimum moisture contents recorded during Proctor analysis, some drying out of the fill materials may be required to obtain the required percent compaction of these materials.

The fill materials should be placed in accordance with the above criteria to an elevation slightly above the design piling butt elevations, prior to installation of the pilings. This will provide a better seal between the fill soils and the sheet piling and will reduce excessive seepage along the piling/fill interface.

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The surface of the damn slopes should be constructed approximately 12 inches above grade. Subsequent to compaction of the slopes, the excess fill should be cut to the design grade to achieve proper slopes. This method will ensure that proper compaction is obtained along the damn side slopes, and will prevent deterioration of the side slopes due to equipment operation.

### 3.3 SLOPE STABILITY

Evaluation of slope stability was performed by utilizing a computer model based on the UTexas 3 Method. To maintain a minimum factor of safety of 1.5 against failure, our analysis indicated that slopes no steeper than 2½ horizontal to 1 vertical (2½H:1V) will be required on the pond side of the damns and slopes no steeper than 3.0 horizontal to 1 vertical (3H:1V) will be required on the discharge or dry side of the damn.

PSI also recommends installation of a relatively shallow drainage ditch at the toe of the dry side of the damn. The drainage ditch should be designed to adequately route stormwater runoff away from the base of the damn.

### 3.4 SETTLEMENT

Settlement of the soils underlying the center of the damn is estimated to range from approximately 8 to 10 inches. Approximately six inches of the estimated settlements are attributed to the granular compression of the upper very loose sands. This type of settlement will occur almost immediately as the fill loads are applied. The remaining estimated settlements are attributed to consolidation settlement of the deeper clay layers and the degradation of organics in the upper silty sands. These types of settlement are gradual and can take years to complete; however, 90 percent of the settlement would likely occur within the first three to six months after fill placement.

PSI recommends placing the stormwater drainage pipe that extends through the base of the damn approximately 6 inches above the desired elevation. During construction of the discharge pipe to the overflow riser, possible total settlements of this magnitude should be expected, and differential settlements on the order of approximately 2 to 4 inches should be expected for the entire pipe length.

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#### 4.0 REPORT LIMITATIONS

The recommendations submitted are based on the available soil information obtained by PSI for the proposed project. If there are any revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes in our recommendations are required. If PSI is not retained to perform these functions, PSI can not be responsible for the impact of those conditions on the performance of the project.

The Geotechnical Engineer warrants that the findings, recommendations, specifications or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

After the plans and specifications are more complete the Geotechnical Engineer should be provided the opportunity to review the final design plans and specifications to check that our engineering recommendations have been properly incorporated into the design documents. At that time, it may be necessary to submit supplementary recommendations. This report has been prepared for the exclusive use of George Nice & Sons, Inc. and their consultants for the specific application to the proposed The Kingsmill East – Sandy's Fort Development.

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Re: The Kingsmill East – Sandy's Fort Development  
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## APPENDIX

- I. Figure 1: Site Location Plan  
Figure 2: Boring Location Plan – Pond #5  
Figure 3: Boring Location Plan – Pond #2
- II. Logs of Borings
- III. Soil Boring Profile
- IV. Figures 4-8: Laboratory Test Data



# **APPENDIX I**

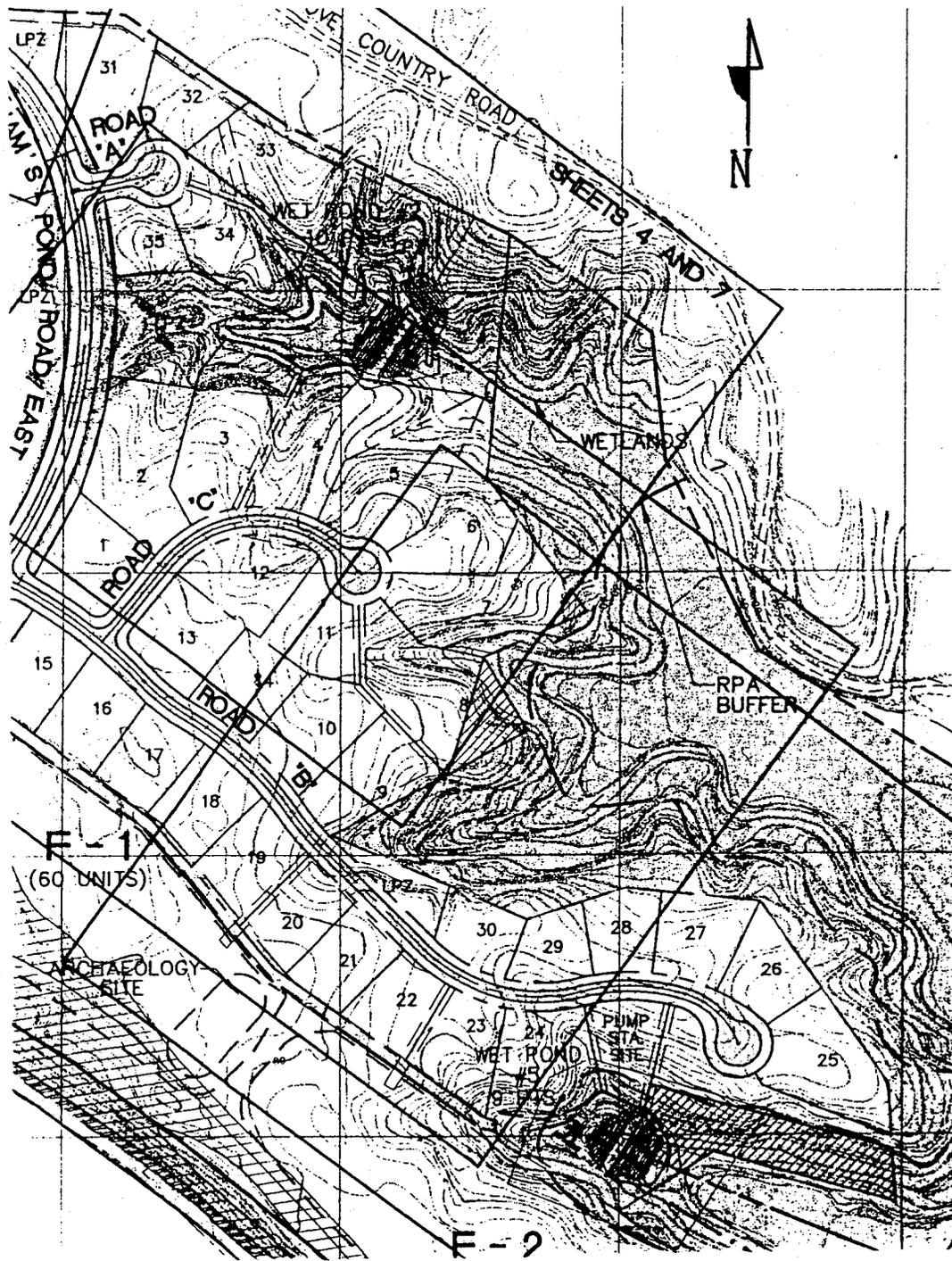
**Figure 1: Site Location Plan**

**Figure 2: Boring Location Plan – Pond #5**

**Figure 3: Boring Location Plan – Pond #2**



FIGURE 1



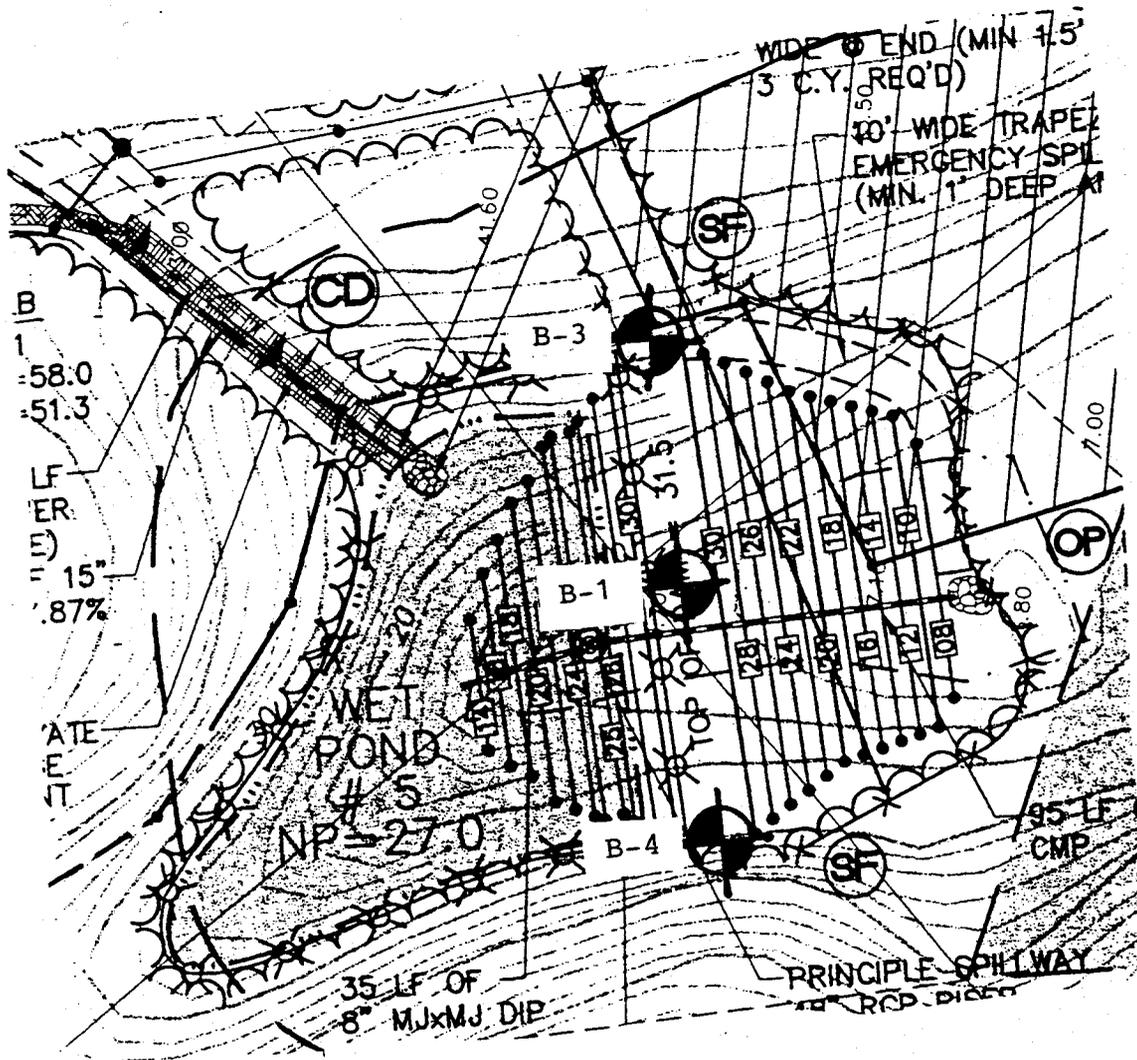
Adapted from AES Consulting Engineers Civil Drawing - #1, dated 9/19/97

**SITE LOCATION PLAN**

**PROJECT NAME:** The Kingsmill East – Sandy’s Fort Development  
**LOCATION:** James City County, Virginia  
**PSI PROJECT NUMBER:** 239-85083-1  
**CLIENT:** George Nice & Sons, Inc.

**SCALE:** 1" = 400'  
**DATE:** 07/27/98

*Professional Service Industries, Inc.*



LEGEND

 B-1: Indicates Approximate Boring Location

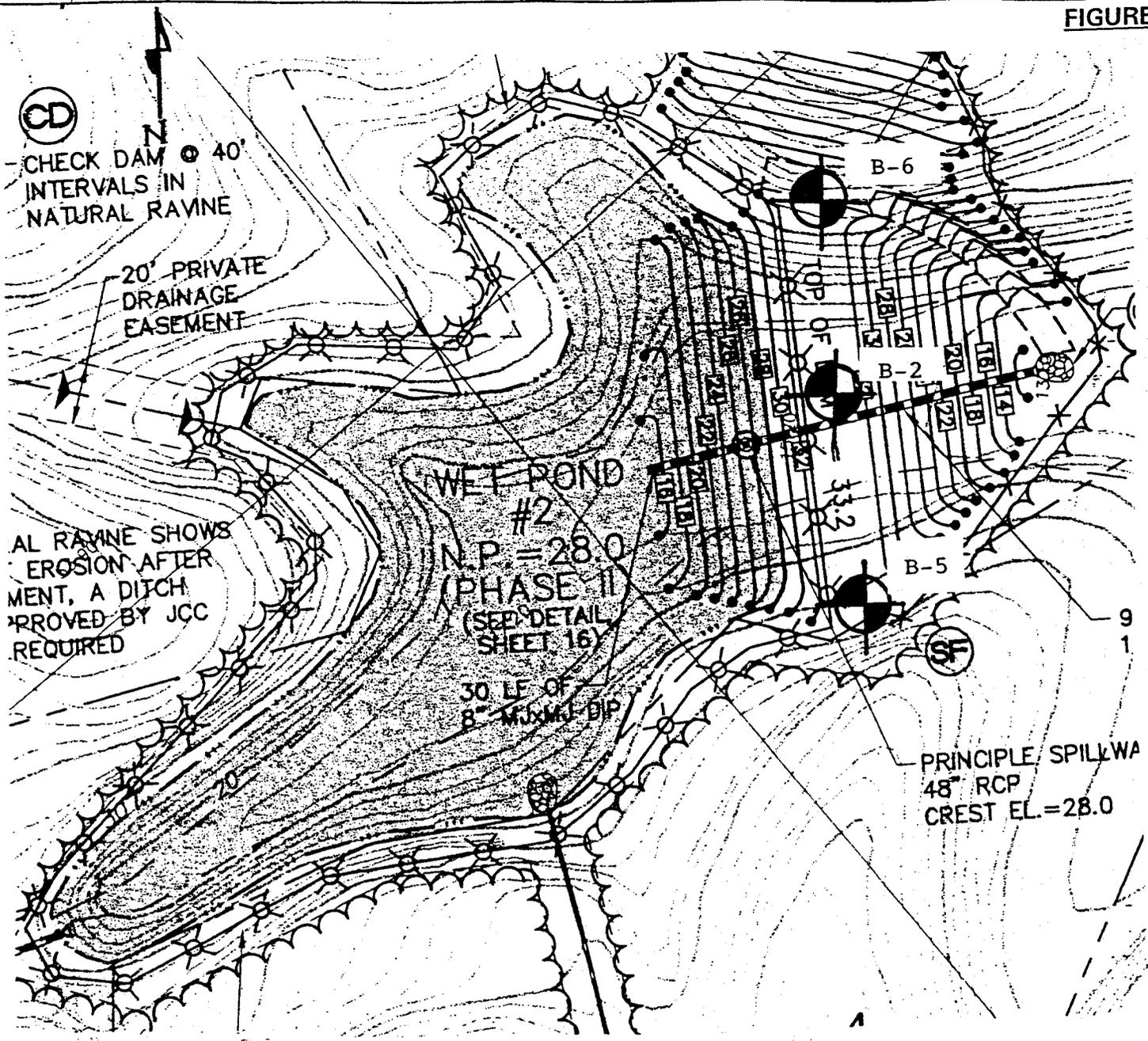
Adapted from AES Consulting Engineers Civil Drawing - #9, dated 9/19/97

**BORING LOCATION PLAN - WET POND #5**

PROJECT NAME: The Kingsmill East - Sandy's Fort Development  
 LOCATION: James City County, Virginia  
 PSI PROJECT NUMBER: 239-85083-1  
 CLIENT: George Nice & Sons, Inc.

SCALE: 1" = 50'  
 DATE: 07/27/99

**Professional Service Industries, Inc.**



Legend



B-6: Indicates Approximate Boring Location

Adapted from AES Consulting Engineers Civil Drawing - #7, dated 9/19/97

**BORING LOCATION PLAN - WET POND #2**

**PROJECT NAME:** The Kingsmill East - Sandy's Fort Development

**LOCATION:** James City County, Virginia

**SCALE:** 1" = 50'

**PSI PROJECT NUMBER:** 239-85083-1

**DATE:** 07/27/98

**CLIENT:** George Nice & Sons, Inc.

*Professional Service Industries, Inc.*

# **APPENDIX II**

## **Logs of Borings**



PROFESSIONAL SERVICE INDUSTRIES, INC.		PROJECT NO. 239-85083-1	SHEET 1 OF 2
Project Name THE KINGSMILL EAST - SANDY'S FORT DEVELOPMENT		Date 6/22/98	
Client GEORGE NICE & SONS, INC.		Boring Location SEE BORING LOCATION PLAN	
Project Location JAMES CITY COUNTY, VIRGINIA		Drill Method MUD DRILLING	Station Depth of Hole:(Ft) 50
Name of Foreman T. JONES		Water Level Observations: (all levels noted in feet)	Noted on Rods:(Ft) 2.0
Name of Inspector S WALL, EIT/C KATTAN, PE		After Hours Feet	At Completion:(Ft) Cave in at:(Ft)

Signature of Inspector

DEPTH	LEGEND	CLASSIFICATION OF MATERIAL (Description)	SAMPLE NO.	BLOWS/6" N-VALUES	RECOVERY (INCHES)	REMARKS
0		DARK BROWN TO GRAY SILTY SAND (SM), VERY LOOSE NOTE: ORGANIC SILT SATURATED SOILS ENCOUNTERED BELOW 2.0 FEET		1	1 1	6" TOPSOIL           WOH=WEIGHT-OF-HAMMER
				2	1 0	
				2	1 1	
				WOH/12"		
5				3	1 2	
				4	2 1	
				4	2 2	
10				5	2 3	
				5	3 7	
		YELLOWISH-BROWN SLIGHTLY SILTY SAND (SP) WITH SHELL FRAGMENTS, LOOSE				
15			6	3		
			6	4 6		
20			7	3		
			7	3 5		
		GREENISH-GRAY SILTY CLAY (CL), MEDIUM STIFF				
25			8	3		
			8	4 4		
30			9	5		
			9	6 6		
		GREENISH-GRAY SILTY SAND (SM) WITH SHELL FRAGMENTS, LOOSE TO MEDIUM DENSE				
35			10	5		
			10	6 5		

Project	THE KINGSMILL EAST - SANDY'S FORT DEVELOPMENT	HOLE NO.	B-1
---------	-----------------------------------------------	----------	-----

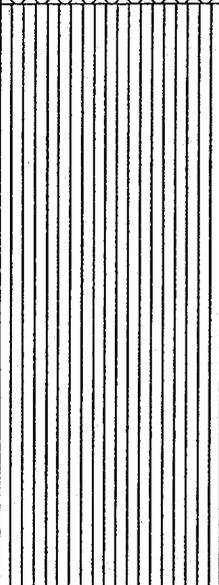
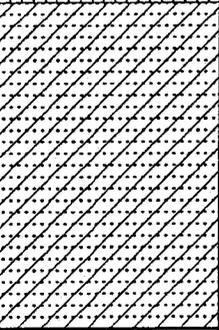


PROFESSIONAL SERVICE INDUSTRIES, INC.		PROJECT NO.	239-85083-1	SHEET 1 OF 2
Project Name			THE KINGSMILL EAST - SANDY'S FORT DEVELOPMENT	
Client			GEORGE NICE & SONS, INC.	
Project Location			JAMES CITY COUNTY, VIRGINIA	
Name of Foreman			T. JONES	
Name of Inspector			S WALL, EIT/C KATTAN, PE	
Boring Location			SEE BORING LOCATION PLAN	
Drill Method			MUD DRILLING	
Station				
Water Level Observations: (all levels noted in feet)			Noted on Rods:(Ft) 1.5	
After			Hours	
			Feet	
Signature of Inspector				
Depth of Hole:(Ft)			50	
At Completion:(Ft)				
Cave in at:(Ft)				

DEPTH	LEGEND	CLASSIFICATION OF MATERIAL (Description)	SAMPLE NO.	BLOWS/6" N-VALUES	RECOVERY (INCHES)	REMARKS
0		GRAY TO DARK BROWN SILTY SAND (SM), VERY LOOSE TO LOOSE	1	1 1		6" TOPSOIL
		SATURATED SOILS ENCOUNTERED BELOW 1.5 FEET		0 1		
		TRACE OF SHELL FRAGMENTS ENCOUNTERED AT 3.0 FEET	2	3 3		
				2 1		
5		TRACE OF GRAVEL ENCOUNTERED AT 6.0 FEET	3	1 1		
				1 1		
			4	WOH/12"		WOH=WEIGHT-OF-HAMMER
				1 2		
10		YELLOWISH-BROWN SLIGHTLY SILTY SAND (SP-SM) WITH SHELL FRAGMENTS, LOOSE	5	2 3		
				3 4		
				5		
15		GREENISH-GRAY SILTY SAND (SM) WITH SHELL FRAGMENTS, LOOSE	6	4 5		
				5		
20		GREENISH-GRAY SILTY CLAY (CL), MEDIUM STIFF	7	3 5		
				3		
25			8	4 5		
				7		
30		GREENISH-GRAY SILTY SAND (SM) WITH SHELL FRAGMENTS, LOOSE TO MEDIUM DENSE	9	8 7		
				7		
35			10	7 7		
				7		
				7 7		
Project						HOLE NO. B-2
THE KINGSMILL EAST - SANDY'S FORT DEVELOPMENT						



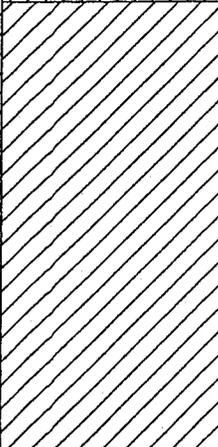
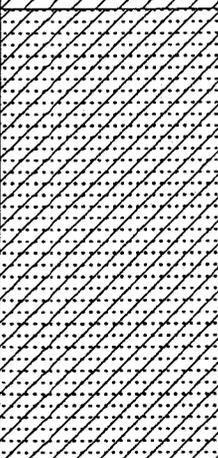
PROFESSIONAL SERVICE INDUSTRIES, INC.		PROJECT NO.	239-85083-1	SHEET 1 OF 1	
Project Name		THE KINGSMILL EAST - SANDY'S FORT DEVELOPMENT		Date	06/30/98
Client		GEORGE NICE & SONS, INC.		Boring Location	WET POND #5
Project Location		JAMES CITY COUNTY, VIRGINIA		Hole No.	B-3
Name of Foreman		SCOTT WALL, E.I.T.		Drill Method	HAND AUGER
Name of Inspector		CAMILLE A. KATTAN, P.E.		Station	
Signature of Inspector				Depth of Hole:(Ft)	15
		Water Level Observations: (all levels noted in feet)		Noted on Rods:(Ft)	At Completion:(Ft)
		After		Hours	Feet
					Cave In at:(Ft)

DEPTH	LEGEND	CLASSIFICATION OF MATERIAL (Description)	REMARKS
0		TOPSOIL AND ROOTS ("FILL")	
1.5		TAN SANDY SILT (ML) WITH SIGNIFICANT SHELL FRAGMENTS	
3			
4.5			
6			
7.5			
9			
10.5		ORGANISH-BROWN CLAYEY SAND (SC)	
12			
13.5			
15		BORING TERMINATION AT 15 FT.	

Project	THE KINGSMILL EAST - SANDY'S FORT DEVELOPMENT	HOLE NO.	B-3
---------	-----------------------------------------------	----------	-----

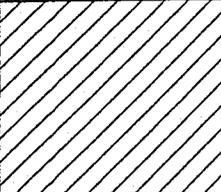
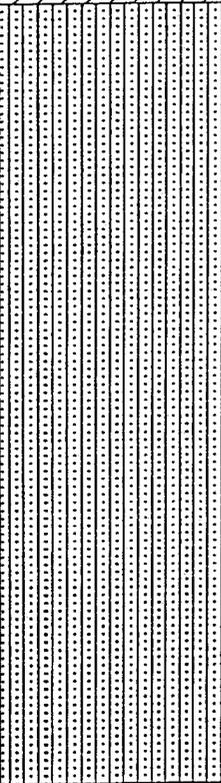
PROFESSIONAL SERVICE INDUSTRIES, INC.		PROJECT NO. 239-85083-1	SHEET 1 OF 1
Project Name THE KINGSMILL EAST - SANDY'S FORT DEVELOPMENT		Date 06/30/98	
Client GEORGE NICE & SONS, INC.		Boring Location WET POND #5	Hole No. B-4
Project Location JAMES CITY COUNTY, VIRGINIA		Drill Method HAND AUGER	Station Depth of Hole:(Ft) 15
Name of Foreman SCOTT WALL, E.I.T.		Water Level Observations: (all levels noted in feet)	Noted on Rods:(Ft) At Completion:(Ft)
Name of Inspector CAMILLE A. KATTAN, P.E.		After Hours Feet	Cave in at:(Ft)

Signature of Inspector

DEPTH	LEGEND	CLASSIFICATION OF MATERIAL (Description)	REMARKS
0		1' OF NATIVE TOPSOIL	
1.5		ORANGISH BROWN SANDY CLAY (CL) WITH SIGNIFICANT SHELL FRAGMENTS	
3			
4.5			
6			
7.5			
9		ORANGISH BROWN CLAYEY SAND (SC)	
10.5			
12			
13.5			
15		BORING TERMINATION AT 15 FT.	

Project	THE KINGSMILL EAST - SANDY'S FORT DEVELOPMENT	HOLE NO.	B-4
---------	-----------------------------------------------	----------	-----

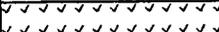
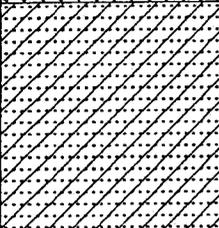
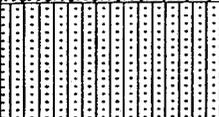
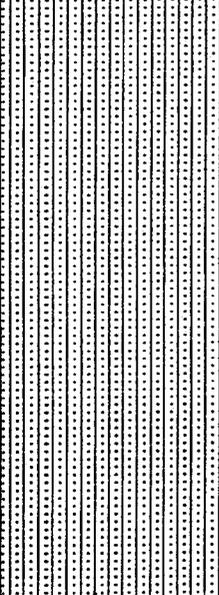
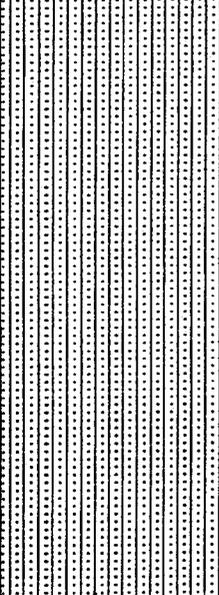
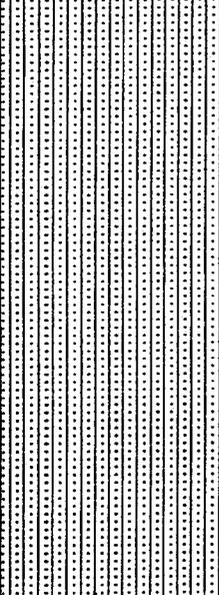
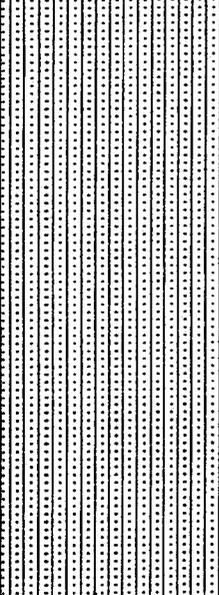
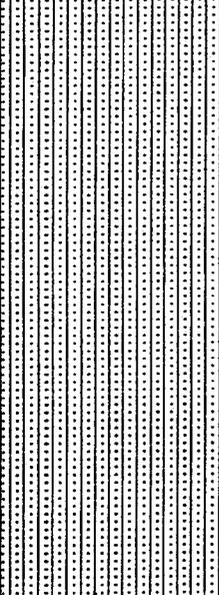
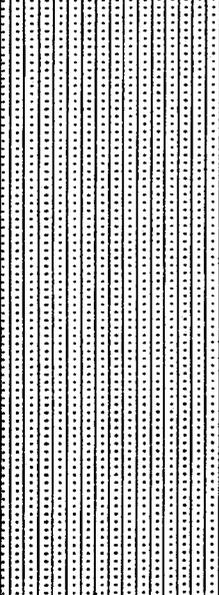
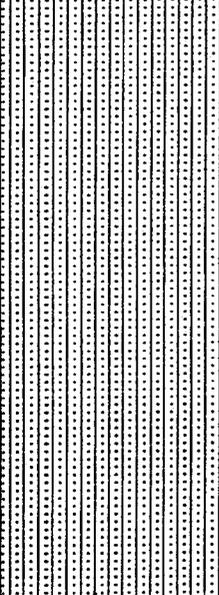
PROFESSIONAL SERVICE INDUSTRIES, INC.	PROJECT NO. 239-85083-1	SHEET 1 OF 1
Project Name THE KINGSMILL EAST - SANDY'S FORT DEVELOPMENT		Date 06/30/98
Client GEORGE NICE & SONS, INC.	Boring Location WET POND #5	Hole No. B-5
Project Location JAMES CITY COUNTY, VIRGINIA	Drill Method HAND AUGER	Station
Name of Foreman SCOTT WALL, E.I.T.	Water Level Observations: (all levels noted in feet)	Noted on Rods:(Ft)
Name of Inspector CAMILLE A. KATTAN, P.E.	After Hours Feet	At Completion:(Ft)
Signature of Inspector		

DEPTH	LEGEND	CLASSIFICATION OF MATERIAL (Description)	REMARKS	
0		ORANGE SANDY CLAY (CL)		
1.5				
3		TAN SILTY SAND (SM) WITH NO SHELL TO SIGNIFICANT SHELL FRAGMENTS		
4.5				
6				
7.5				
9				
10.5				
12				
13.5				
15				
		BORING TERMINATION AT 15 FT.		

Project THE KINGSMILL EAST - SANDY'S FORT DEVELOPMENT	HOLE NO. B-5
-------------------------------------------------------	--------------

PROFESSIONAL SERVICE INDUSTRIES, INC.	PROJECT NO. 239-85083-1	SHEET 1 OF 1
Project Name THE KINGSMILL EAST - SANDY'S FORT DEVELOPMENT	Date 06/30/98	
Client GEORGE NICE & SONS, INC.	Boring Location WET POND #5	Hole No. B-6
Project Location JAMES CITY COUNTY, VIRGINIA	Drill Method HAND AUGER	Station Depth of Hole:(Ft) 15
Name of Foreman SCOTT WALL, E.I.T.	Water Level Observations: (all levels noted in feet)	Noted on Rods:(Ft) At Completion:(Ft)
Name of Inspector CAMILLE A. KATTAN, P.E.	After Hours Feet	Cave in at:(Ft)

Signature of Inspector

DEPTH	LEGEND	CLASSIFICATION OF MATERIAL (Description)	REMARKS
0		6" TOPSOIL	
1.5		ORGANISH BROWN CLAYEY SAND (SC)	
3			
4.5		TAN SILTY SAND (SM)	
6			
7.5			
9			
10.5			
12			
13.5			
15		BORING TERMINATION AT 15 FT.	

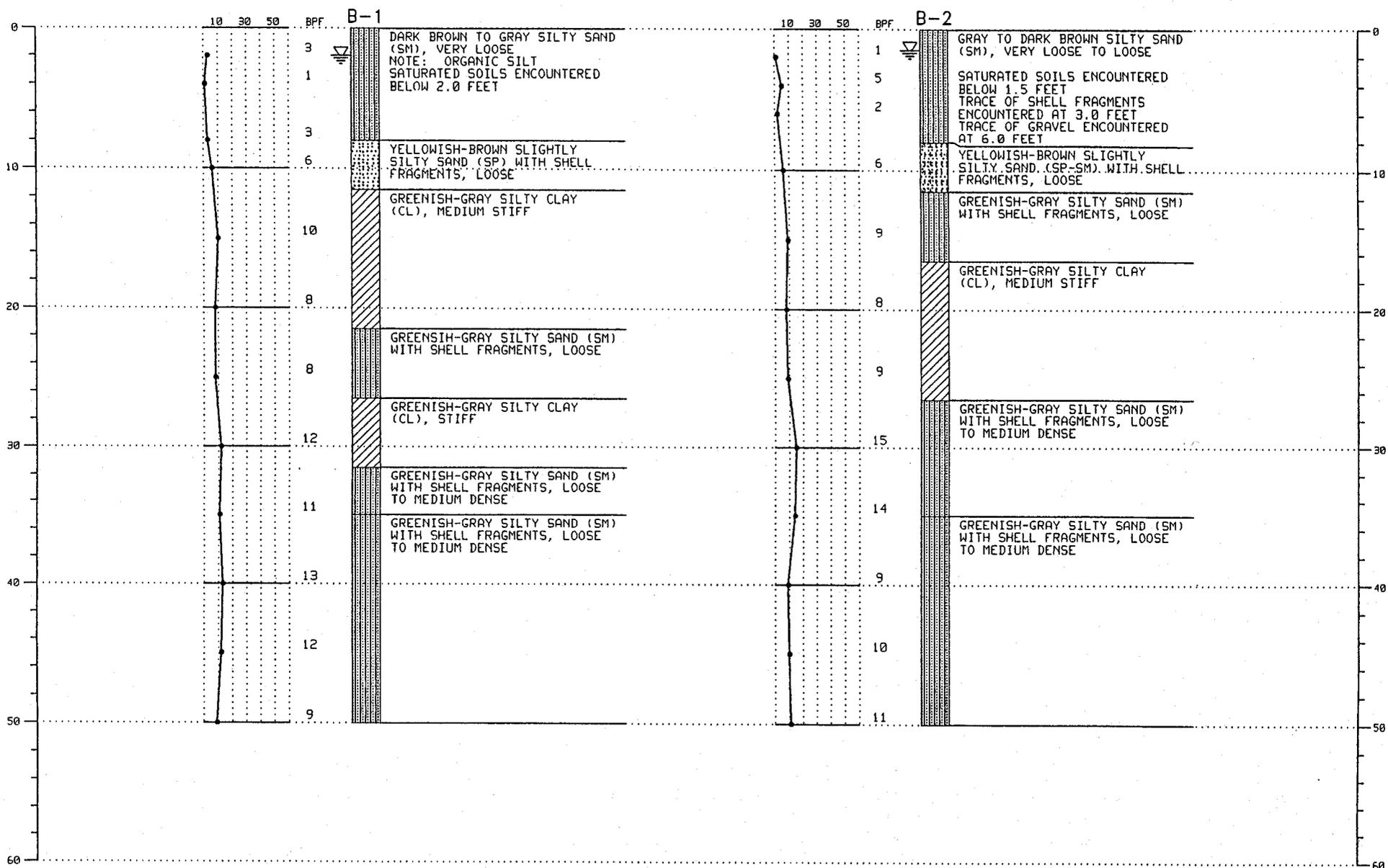
Project	THE KINGSMILL EAST - SANDY'S FORT DEVELOPMENT	HOLE NO. B-6
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# **APPENDIX III**

## **Soil Boring Profile**



# BORING PROFILE THE KINGSMILL EAST - SANDY'S FORT DEVELOPMENT

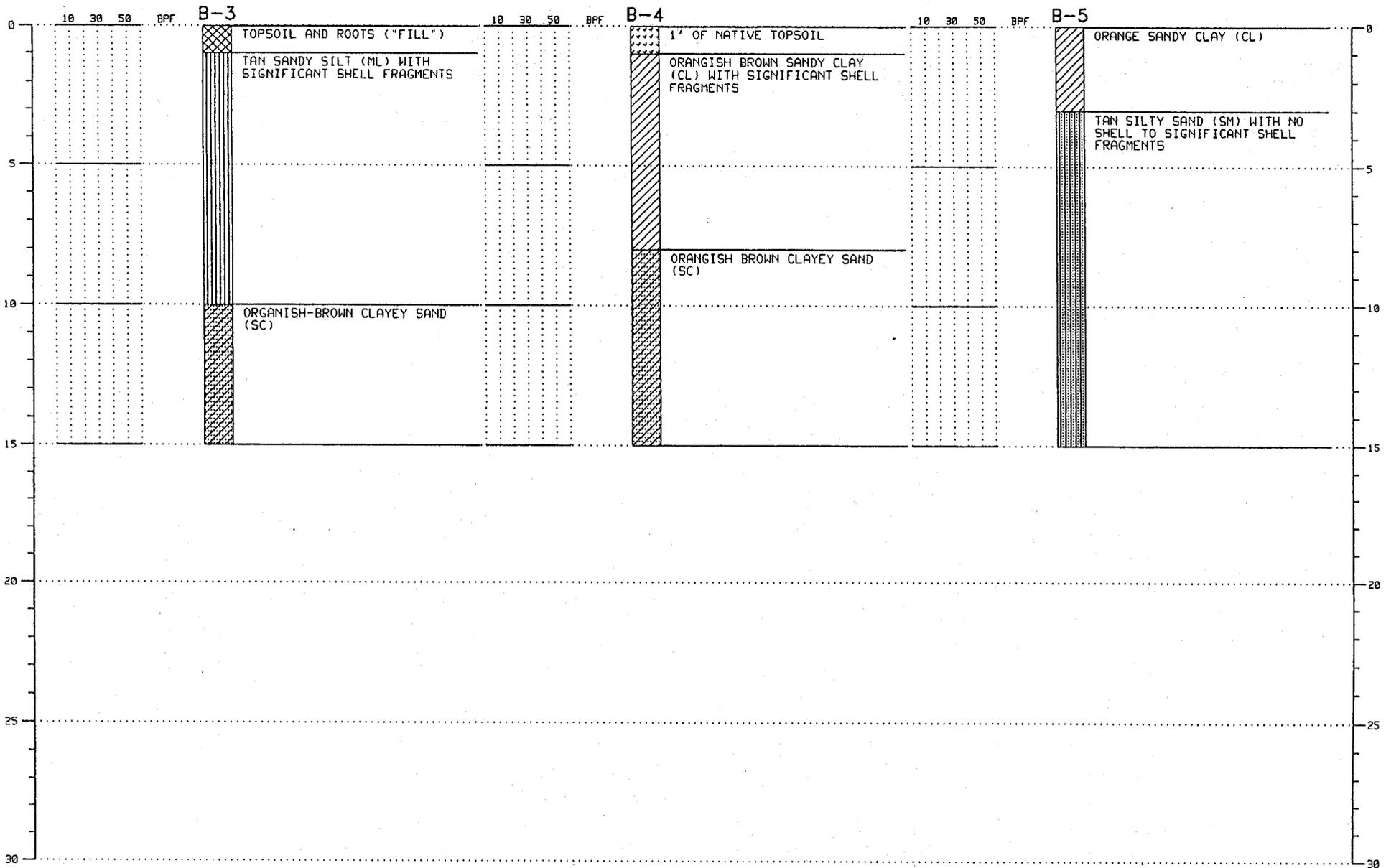


**Strata symbols**

- Silty sand
- Poorly graded sand
- Low plasticity clay
- Poorly graded sand with silt

PROFESSIONAL SERVICE INDUSTRIES

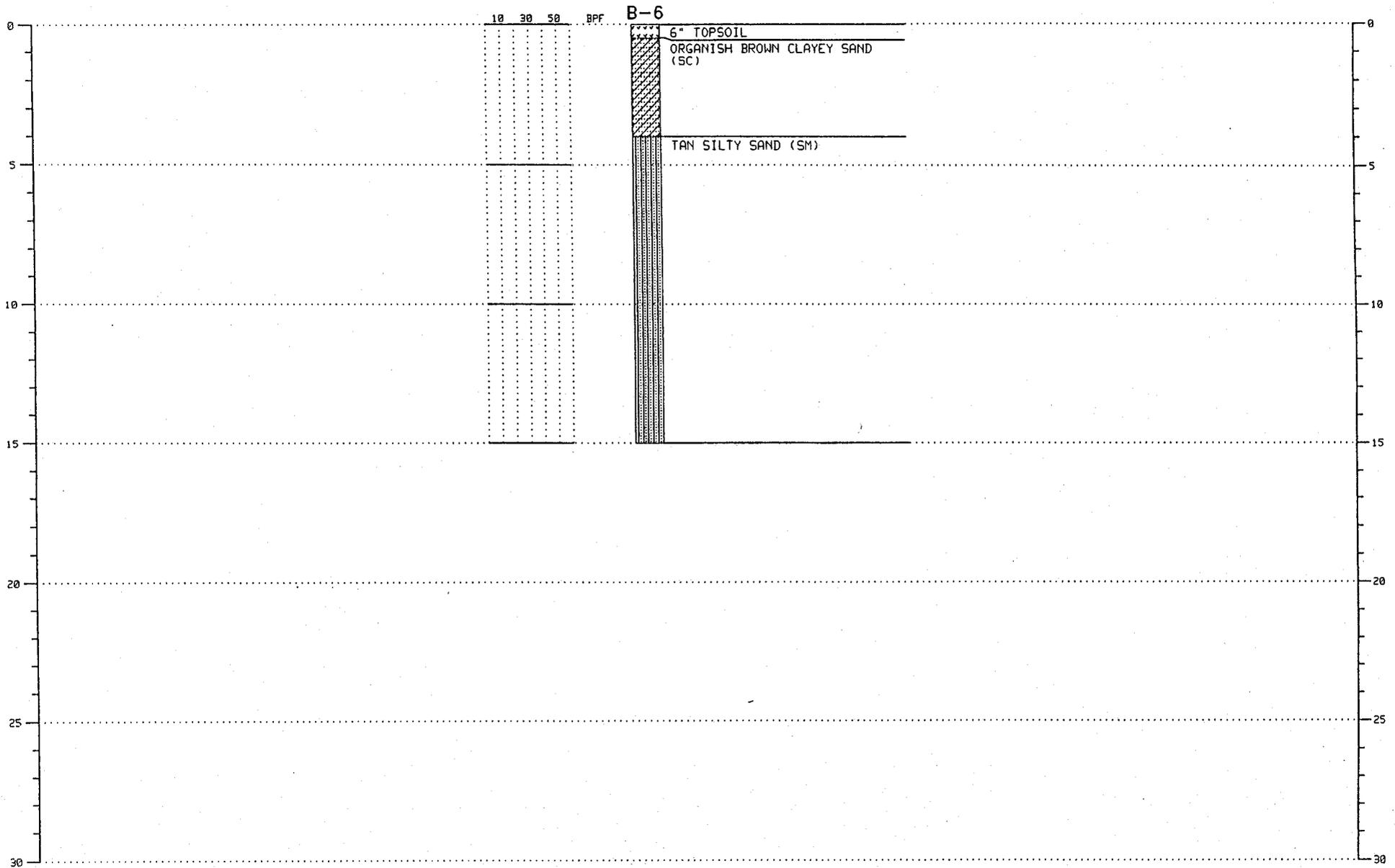
# BORING PROFILE THE KINGSMILL EAST - SANDY'S FORT DEVELOPMENT



PROFESSIONAL SERVICE INDUSTRIES

# BORING PROFILE

## THE KINGSMILL EAST - SANDY'S FORT DEVELOPMENT



**Strata symbols**

-  Fill
-  Silt
-  Topsoil
-  Silty sand
-  Clayey sand
-  Low plasticity clay

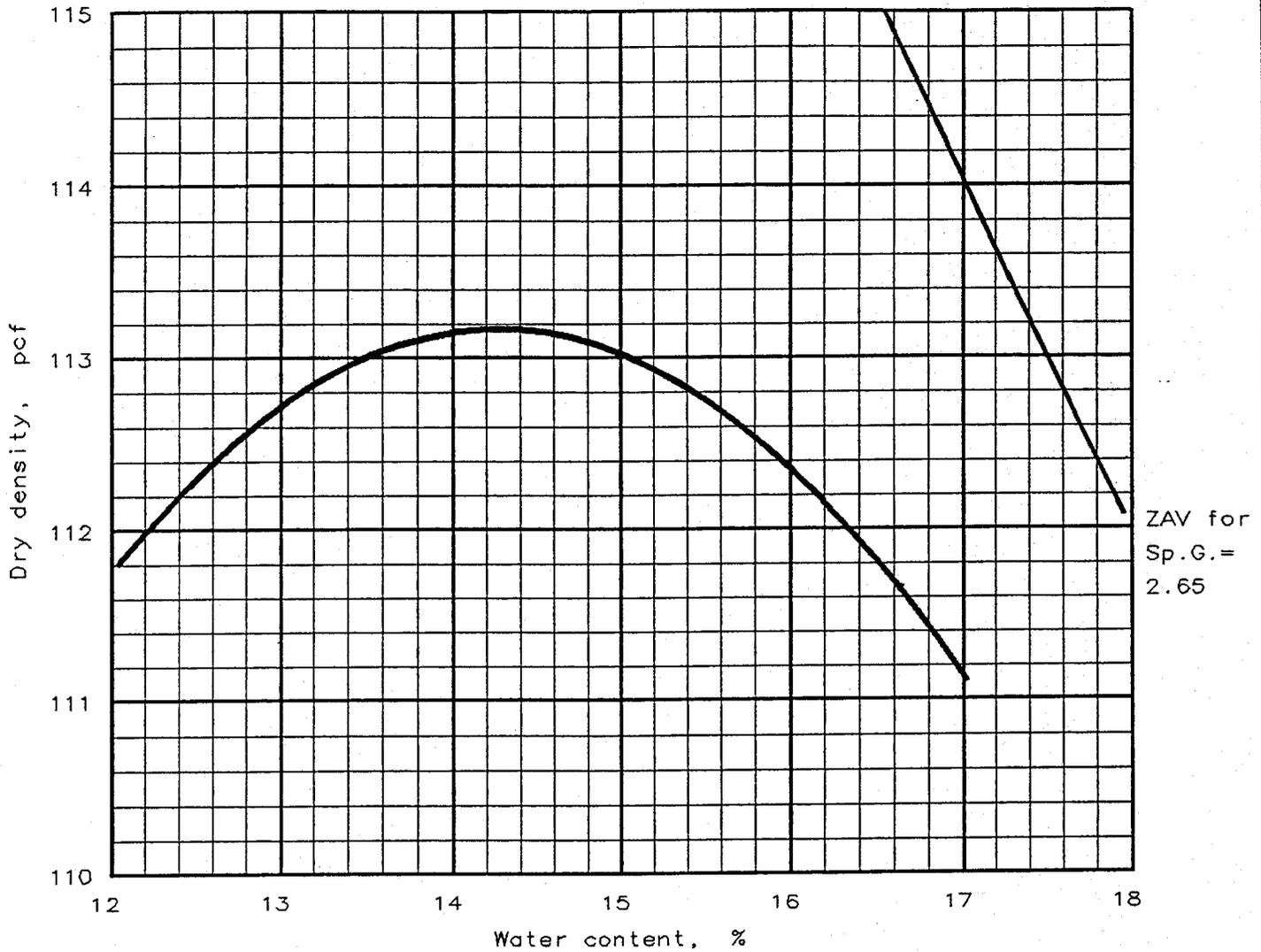
PROFESSIONAL SERVICE INDUSTRIES

# APPENDIX IV

## Figures 4-8: Laboratory Test Data



# MOISTURE-DENSITY RELATIONSHIP TEST

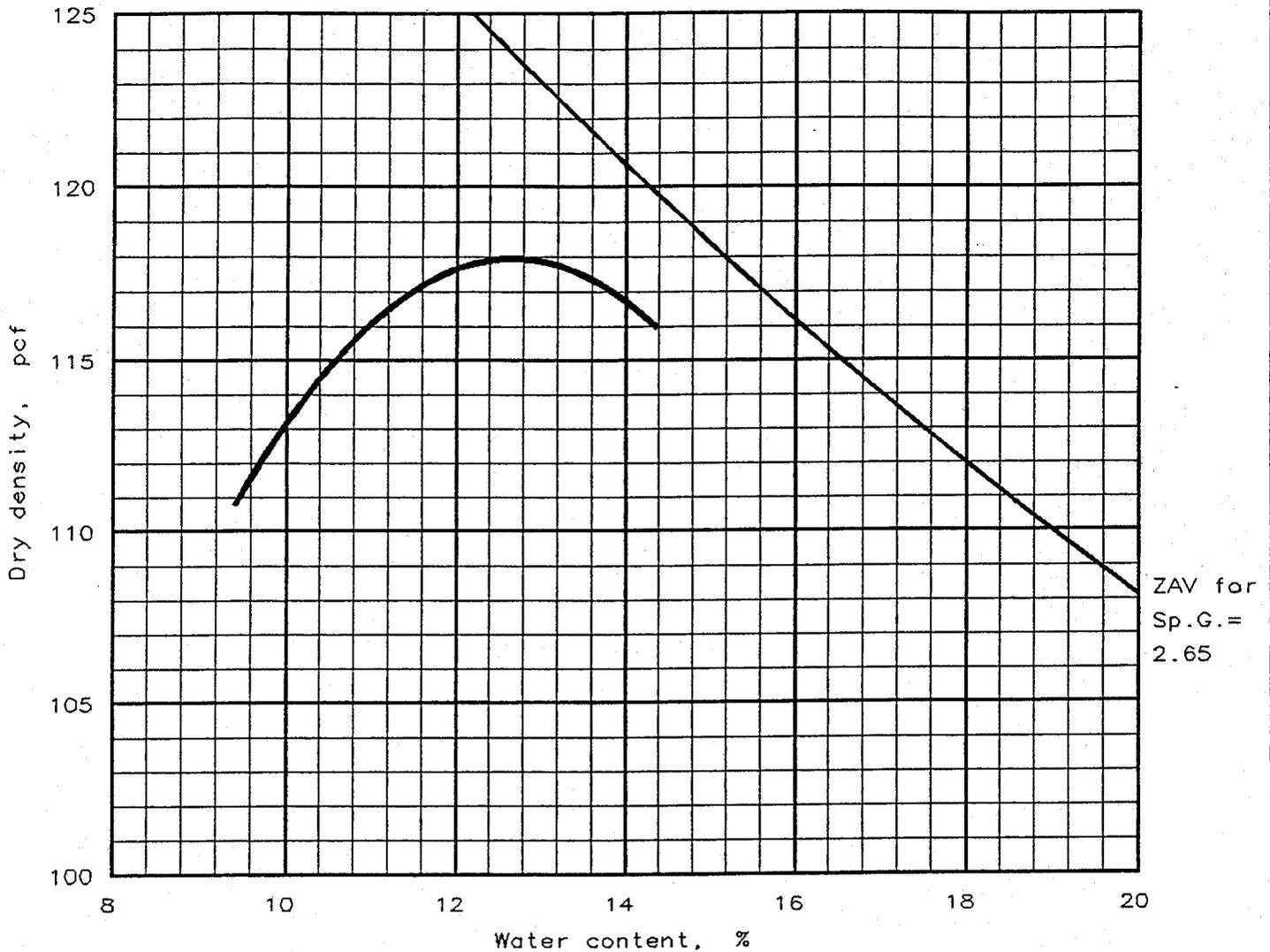


Test specification: ASTM D 698-91 Procedure A, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No. 4	% < No. 200
	USCS	AASHTO						
	CL		18.9 %	2.65	41	23	- %	66.7 %

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 113.0 pcf Optimum moisture = 14.5 %	LT REDDISH BROWN W/GREY SANDY CLAY
Project No.: 85083-239 * Project: SANDY'S FORT Location: WILLIAMSBURG, VA ON SITE MAT. -STOCKPILE FOR DAM Date: 07-10-98	Remarks: SAMPLED 07-08-98 TESTED BY DR PROCTOR #1
MOISTURE-DENSITY RELATIONSHIP TEST PROFESSIONAL SERVICE INDUSTRIES, INC.	Fig. No. 4

# MOISTURE-DENSITY RELATIONSHIP TEST

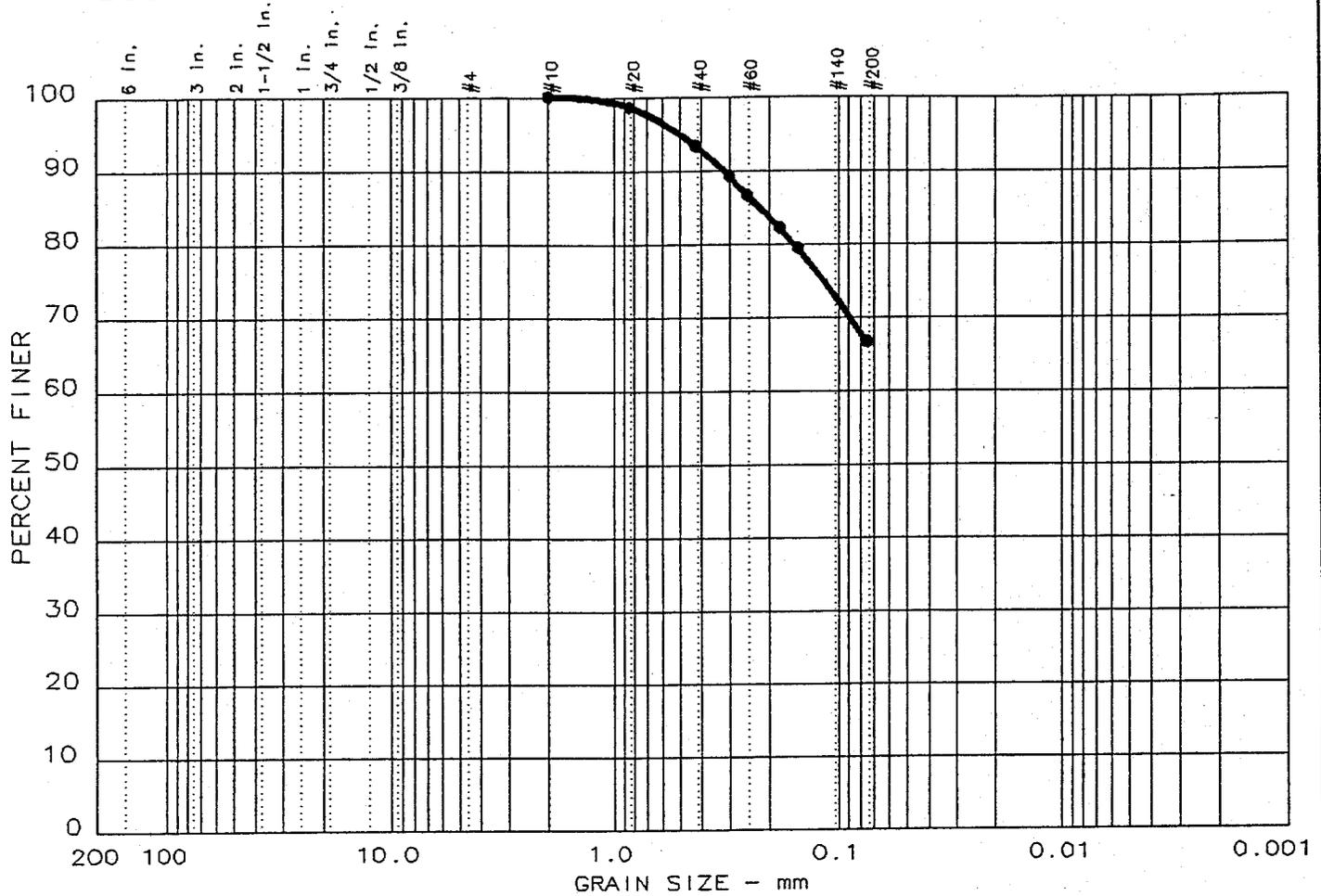


Test specification: ASTM D 698-91 Procedure A, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No. 4	% < No. 200
	USCS	AASHTO						
	SC		17.3 %	2.65	28	12	- %	37.7 %

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 118.0 pcf Optimum moisture = 12.5 %	REDDISH BROWN W/GREY CLAYEY SAND
Project No.: 85083-239 * Project: SANDY'S FORT Location: WILLIAMSBURG, VA ON SITE MAT. -STOCKPILE FOR DAM Date: 07-10-98	Remarks: SAMPLED 07-08-98 TESTED BY DR PROCTOR #2
MOISTURE-DENSITY RELATIONSHIP TEST PROFESSIONAL SERVICE INDUSTRIES, INC.	Fig. No. 5

# GRAIN SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
● 1	0.0	0.0	33.3	66.7	

LL	PI	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
● 41	23	0.219							

MATERIAL DESCRIPTION	USCS	AASHTO
● LT REDDISH BROWN W/GREY	CL	A-7-6(13.3)

Project No.: 85083-239  
 Project: SANDY'S FORT  
 ● Location: WILLIAMSBURG, VA

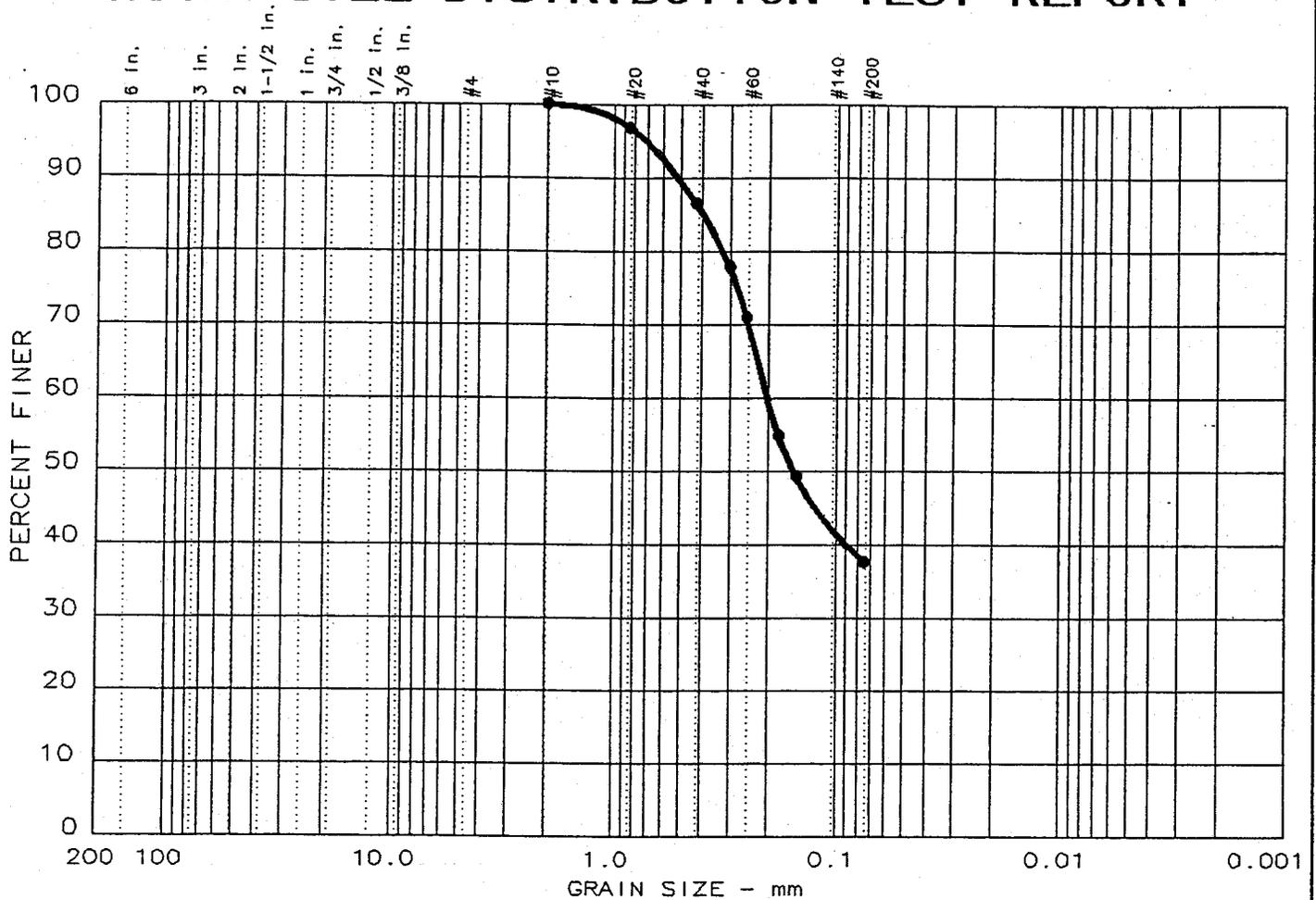
Date: 07-13-98

GRAIN SIZE DISTRIBUTION TEST REPORT  
 PROFESSIONAL SERVICE INDUSTRIES, INC.

Remarks:  
 SAMPLE #1

Fig. No.: 6

# GRAIN SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
● 2	0.0	0.0	62.3	37.7	

LL	PI	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
● 28	12	0.394	0.201	0.154					

MATERIAL DESCRIPTION	USCS	AASHTO
● REDDISH BROWN W/GREY	SC	A-6(0.9)

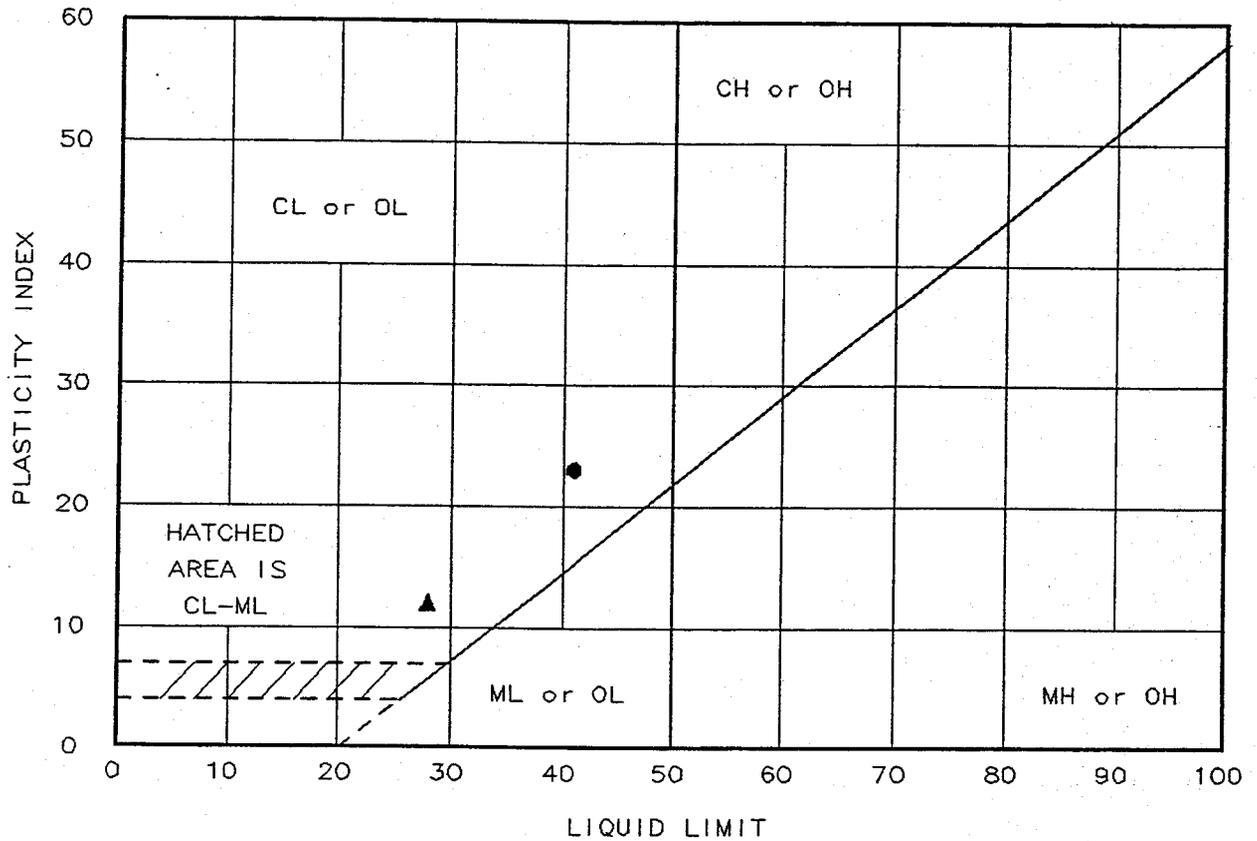
Project No.: 85083-239  
 Project: SANDY'S FORT  
 ● Location: WILLIAMSBURG, VA  
 Date: 07-13-98

Remarks:  
 SAMPLE #2

GRAIN SIZE DISTRIBUTION TEST REPORT  
 PROFESSIONAL SERVICE INDUSTRIES, INC.

Fig. No.: 7

# LIQUID AND PLASTIC LIMITS TEST REPORT



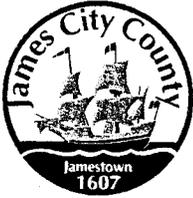
Location + Description	LL	PL	PI	-200	ASTM D 2487-90
● SAMPLE #1 DEPTH= STOCKPILE NAT. MOISTURE=18.9%	41	18	23	66.7	CL, Sandy lean clay
▲ SAMPLE #2 DEPTH= STOCKPILE NAT. MOISTURE=17.3%	28	16	12	37.7	SC, Clayey sand

Project No.: 85083-239  
 Project: SANDY'S FORT  
  
 Client: RAY NICE  
 Location: WILLIAMSBURG, VA  
  
 Date: 07-13-98

Remarks:

LIQUID AND PLASTIC LIMITS TEST REPORT  
**GEODESIGN CONSULTANTS, INC.**

Fig. No. 8



# 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

CODE COMPLIANCE  
(757) 253-6626  
codecomp@james-city.va.us

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) 259-4116

November 6, 2001

Busch Properties Inc.  
100 Kingsmill Road  
Williamsburg, Va. 23185  
Attn: Mr. Thomas E. Dunn,  
Director, Construction

Re: Kingsmill East - Sandy's Fort  
County Plan S-85-97  
Stormwater Management Facilities - Wet Pond # 2 & # 5  
County BMP ID Code: JR 046 & JR 047

Dear Mr. Dunn:

The Environmental Division has reviewed record drawing and construction certification information as forwarded to our office for the above referenced project. The record drawings provide as-built information for two wet pond facilities located near to Andrew Lindsey and George Sandys (roads).

Based on our review of information as submitted and a concurrent field observation as performed on November 2<sup>nd</sup> 2001, the following items must be addressed prior to release of the developer's surety instrument associated with stormwater management/BMP facilities **JR 046** (Wet Pond # 2 at Andrew Lindsey) and **JR 047** (Wet Pond # 5 at George Sandys).

**Inspection/Maintenance Agreement:**

- 1. Based on a review of our active file/records for the project, Environmental Division comments under S-85-97 dated October 17, 1997 required a Declaration of Covenants, Inspection/Maintenance agreement to be executed with the County for the BMP facility for this project. None was found. Please forward the executed inspection/maintenance agreement to our office. *(Note: Also, correspondence from the engineer dated December 2<sup>nd</sup> 1997 responding to our November 1997 comment's indicated that an inspection/maintenance agreement shall be executed with the County.)*

*Resolved  
Blanket  
11/13/01  
Kingsmill.*

**Construction Certification:**

- 2. The construction certification dated March 5<sup>th</sup> 2001, as forwarded to our office for both facilities, is satisfactory.

*✓  
OK*

**Record Drawings:**

- 3. Wet Pond # 2. Show the following additional information on record drawing Sheet 1 of 4: Construction information for the storm drain pipe system which traverses between Lots 3 and 4 and enters the pond on the south side. Include pipe size, inverts and structure types to at least one structure back from the outfall at the pond. (Note: This system corresponds to storm drainage structures SS # 3a to SS # 1a on the approved plan). Also, if possible, label Road C as Andrew Lindsey and Road A as Edward Grindon.

*✓  
OK*

4. If possible add the following identifiers to the bottom right hand corners of the record drawing set: JR 046 to Sheet 1 and 3; JR 047 to Sheet 2 and 4; and S-85-97 to all sheets.

Construction-Related:

- ??
- ✓ OK
11. Wet Pond # 5. Remove leaves, debris, a fallen tree and live tree saplings from within the rock outfall protection pad at the end of the emergency spillway.
5. Provisions of the approved plan required safety signs to be placed around the perimeter of both wet pond facilities. Based on our field observations, the signs were not present.
  6. Wet Pond # 2. Remove logs and wood debris piled up on the interior basin slope just above the principal flow control structure near the fence. The control structure is the 5' x 5' concrete box with grate on the upstream side of the dual pipes through the dam embankment.
  7. Wet Pond # 2. Clean vegetation 5 to 10 feet from the principal flow control structure. Live vegetation is starting to work it's way across the bar grate and into the riser.
  8. Wet Pond # 2. Clear and remove the 18-inch tree which has fallen across the rock outlet protection pad at the outfall end of the dual barrels through the dam.
  9. Wet Pond # 5. Remove small size trees (6-8 total) on the downstream embankment; along the south edge of the concrete emergency spillway and at the area where flow enters the emergency spillway on the upstream embankment. Trees should not obstruct flow into the emergency spillway.
  10. Wet Pond # 5. Remove trash, leaves and debris from within the principal flow structure at the upstream end of the 10-inch barrel through the dam and from within the headwall structure located at the downstream (outfall) end of the barrel.

Once this work is satisfactorily completed, contact our office appropriately. We can then proceed with final release of the surety on the project. 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, Mike Woolson, at 757-253-6823 if you have any further comments or questions.

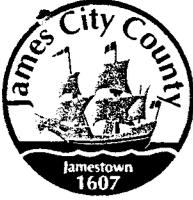
Sincerely,



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

cc: Mark Richardson, AES (fax)

G:\SWMProg\AsBuilts\S8597.jr046



# 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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COUNTY ENGINEER  
(757) 253-6678  
INTEGRATED PEST MANAGEMENT  
(757) 259-4116

November 6, 2001

Busch Properties Inc.  
100 Kingsmill Road  
Williamsburg, Va. 23185  
Attn: Mr. Thomas E. Dunn,  
Director, Construction

Re: Kingsmill East - Sandy's Fort  
County Plan S-85-97  
Stormwater Management Facilities - Wet Pond # 2 & # 5  
County BMP ID Code: JR 046 & JR 047

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### Construction Certification:

2. The construction certification dated March 5<sup>th</sup> 2001, as forwarded to our office for both facilities, is satisfactory.

### Record Drawings:

3. Wet Pond # 2. Show the following additional information on record drawing Sheet 1 of 4: Construction information for the storm drain pipe system which traverses between Lots 3 and 4 and enters the pond on the south side. Include pipe size, inverts and structure types to at least one structure back from the outfall at the pond. (Note: This system corresponds to storm drainage structures SS # 3a to SS # 1a on the approved plan). Also, if possible, label Road C as Andrew Lindsey and Road A as Edward Grindon.

4. If possible add the following identifiers to the bottom right hand corners of the record drawing set: JR 046 to Sheet 1 and 3; JR 047 to Sheet 2 and 4; and S-85-97 to all sheets.

**Construction-Related:**

5. Provisions of the approved plan required safety signs to be placed around the perimeter of both wet pond facilities. Based on our field observations, the signs were not present.
6. Wet Pond # 2. Remove logs and wood debris piled up on the interior basin slope just above the principal flow control structure near the fence. The control structure is the 5' x 5' concrete box with grate on the upstream side of the dual pipes through the dam embankment.
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Sincerely,



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

cc: Mark Richardson, AES (fax)

G:\SWMPProg\AsBuilts\S8597\_jr046



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

SP 5-85-99  
GPIN

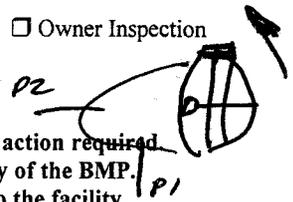
County BMP ID Code (if known): JR046  
 Name of Facility: Kingsmill-Sandys Fort Wet Pond #2 BMP No.: 2 of 2 Date: 11/02/07  
 Location: Andrew Lindsey (Behind 115 Andrew Lindsey)  
 Name of Owner: Busch - Kingsmill  
 Name of Inspector: St Thomas, MD Watson  
 Type of Facility: Wet Pond  
 Weather Conditions: Sunny, Mild 70's Type:  Final Inspection  County BMP Inspection Program  Owner Inspection

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

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

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

Facility Item	O.K.	Routine	Urgent	Comments
<b>Embankments and Side Slopes:</b> <u>2.5H:1V DS EARTH SLOPE; U/S 3H:1V TO POOL</u>				
Grass Height	<input checked="" type="checkbox"/>			<u>4" HIGH, GREEN</u>
Vegetation Condition	<input checked="" type="checkbox"/>			<u>GOOD VEG STATE</u>
Tree Growth	<input checked="" type="checkbox"/>			<u>NONE. SMALL SAPLINGS STARTING</u>
Erosion	<input checked="" type="checkbox"/>			<u>NONE. EMERG SWILLOW AREA. NORTH EMB.</u>
Trash & Debris	<input checked="" type="checkbox"/>			<u>NONE.</u>
Seepage	<input checked="" type="checkbox"/>			<u>NONE OBSERVED.</u>
Fencing or Benches	<input checked="" type="checkbox"/>			
<b>Interior Landscaping/Planted Areas:</b> <input type="checkbox"/> None <input type="checkbox"/> Constructed Wetland/Shallow Marsh <input checked="" type="checkbox"/> Naturally Established Vegetation				
Vegetated Conditions	<input checked="" type="checkbox"/>			<u>Pockets of shoreline Cattails, willows</u>
Trash & Debris	<input checked="" type="checkbox"/>			<u>Meadow Grass, upland woody</u>
Floating Material	<input checked="" type="checkbox"/>			<u>butter. Good butter although</u>
Erosion	<input checked="" type="checkbox"/>			<u>steep sloped.</u>
Sediment	<input checked="" type="checkbox"/>			
Dead Plant	<input checked="" type="checkbox"/>			
Aesthetics	<input checked="" type="checkbox"/>			
Other	<input checked="" type="checkbox"/>			
<u>Serves SF Lots, Roads &amp; wooded area</u>				

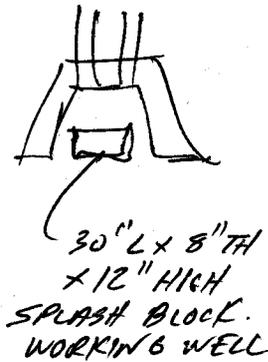


Facility Item	O.K.	Routine	Urgent	Comments
<b>Water Pools:</b> <input checked="" type="checkbox"/> Permanent Pool (Retention Basin) <input type="checkbox"/> Shallow Marsh (Detention Basin) <input type="checkbox"/> None, Dry (Detention Basin)				
Shoreline Erosion	X			Mild erosion @ fluctuating Pool
Algae	X			Pool 3-4' deep at deepest.
Trash & Debris	X			Some floating leaves
Sediment	X			6" deep @ riser.
Aesthetics				10' bench up toe of dam.
Other		X		Remove logs piled just above riser.
<b>Inflows (Describe Types/Locations):</b> 15" RCP <sup>pipe 1</sup> ALONG LOT 3/4 (SOUTH SIDE); Forebay-30" <sup>pipe 2</sup> @ BACK WEST				
Condition of Structure	X			PIPE 1 RCP w/END SECT. PIPE 2 30" CPP
Erosion	X			w/COMP END SECT TO FOREBAY
Trash and Debris	X			
Sediment	X			PIPE 1 OK. PIPE 2 OK. Forebay OK.
Aesthetics	X			Remote setting, steep slope.
Other				Forebay 20' w x 100' Long.
<b>Principal Flow Control Structure - Riser, Intake, etc. (Describe Location):</b> 5x5 endwall; 2" bar & 8" oc; sloped.				
Condition of Structure	X			Inclinerack dual barrels
Corrosion	X			
Trash and Debris		X		clean veg 5' from riser.
Sediment	X			None. Minor.
Aesthetics	X			
Other				
<b>Principal Outlet Structure - Barrel, Conduit, etc. :</b> DUAL 15" RCP; 4x6 END WALL (25' depth); 30"x8"x1 Deep <sup>SPASH BLOCK</sup>				
Condition of Structure	X			
Settlement	X			
Trash & Debris	X	X		None. Clear fallen tree in OP.
Erosion/Sediment	X			
Outlet Protection	X			END SECT WALL w/ SPASH BLOCK
Other				No flow-barrel. OP 20'L x 30' WIDE <sup>CLASS I ROCK.</sup>
<b>Emergency Spillway (Overflow):</b> Grassed, trapez. shaped, 10' BW				
Vegetation	X			Stable
Lining	X			
Erosion	X			None.
Trash & Debris	X			Minor leaves.
Other	X			
Forebay - Twigs, Leaves SEDIMENT. CHECK DAM 3' High				
CLASS I & II riprap				

Facility Item	O.K.	Routine	Urgent	Comments
<b>Nuisance Type Conditions:</b>				
Mosquito Breeding	X			Somewhat pesty.
Animal Burrows	X			
Graffiti	X			
Other				Minnows in pool; water clear.
<b>Surrounding Perimeter Conditions:</b> <sup>4' HIGH</sup> Wooden Fence w/ screen encircles entire pond perimeter.				
Land Uses	X			steep slopes
Vegetation	X			Good NAT Buffer to Pond
Trash & Debris	X			
Aesthetics	X			
Access /Maintenance Roads or Paths	X			Access steep. From future Sed/OP via 20' WIDE EASEMENT (NORTH SIDE)
Other				Fence HAS GATE AT RISER. NO LOCK.

**Remarks:**

- A Clear & remove 18" DIA FALLEN TREE ACROSS 30' x 220' outlet protection rock area. Could cause erosion of embankment top.
- D Remove pile of dead wood logs on v/s Emb just above river structure.
- D Clear & remove veg 5' from principal flow control structure. Veg encircles & starting to grow over grate.
- D Erosion from SF Lot along south slope is contributing sediment to BMP. Stabilize bare slope or add erosion protection [LOT 4-115 Andrew Lindsey]
- D Note: Lot 35 HAS 4 CPP DRAINS TO FOREBAY, L=200' EACH.
- D Easement Access is long. steep slopes adjacent to pond rough walking



Overall Environmental Division Internal Rating: 3 (Trash, Veg)

Signature: [Signature] P.E.  
 Title: Civil Engineer ENV DIV.

Date: 10/02/01 12:00

SANDYS  
 FORT  
 BMP  
 RD

Date Record Created:

WS\_BMPNO:

JR046

Print Record

Created By:

**PRINTED ON  
Thursday, March 11, 2010  
12:38:36 PM**

**WATERSHED** JR  
**BMP ID NO** 046  
**PLAN NO** S-85-97  
**TAX PARCEL** (51-4)(2-1A)  
**PIN NO** 5140200001A  
**CONSTRUCTION DATE** 6/1/1998  
**PROJECT NAME** Kingsmill East-Sandys Fort  
**FACILITY LOCATION** Wet Pond # 2 North of 115 Andrew Lindsey  
**CITY-STATE** Williamsburg, Va. 23185  
**CURRENT OWNER** Busch Properties Inc.  
**OWNER ADDRESS** One Busch Place  
**OWNER ADDRESS 2**  
**CITY-STATE-ZIP CODE** St. Louis, MO 63118  
**OWNER PHONE**  
**MAINT AGREEMENT** No  
**EMERG ACTION PLAN** No

Get Last BMP No

Return to Menu

**MAINTENANCE PLAN**

**SITE AREA acre**

No

61.375

**LAND USE**

Resid Planned Co

**old BMP TYP**

Wet Pond

**JCC BMP CODE**

A2 Wet Pond

**POINT VALUE**

10

**SVC DRAIN AREA acres**

25.7

**SERVICE AREA DESCR**

SF Lots, Roadways, Woods

**IMPERV AREA acres**

9.80

**RECV STREAM**

UT of James River

**EXT DET-WQ-CTRL**

Yes

**WTR QUAL VOL acre-ft**

4.17

**CHAN PROT CTRL**

No

**CHAN PROT VOL acre-ft**

0

**SW/FLOOD CONTROL**

Yes

**GEOTECH REPORT**

Yes

**CTRL STRUC DESC**

Conc Box

**CTRL STRUC SIZE inches**

60 x 60

**OTLT BARRL DESC**

Dual RCP

**OTLT BARRL SIZE inch**

15

**EMERG SPILLWAY**

Yes

**DESIGN HW ELEV**

32.55

**PERM POOL ELEV**

27.7

**2-YR OUTFLOW cfs**

5.00

**10-YR OUTFLOW cfs**

20.00

**REC DRAWING**

Yes

**CONSTR CERTIF**

Yes

**LAST INSP DATE** 11/2/2001

**Inspected by:**

**INTERNAL RATING**

3

**MISC/COMMENTS**

Wet Pond 2. See JR 047. Principal flow cont struct change from orig design.

Additional Comments:

