



## **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.**

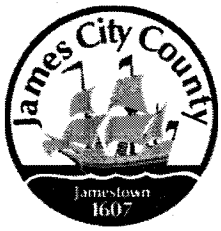
**BMP NUMBER: CC023**

**DATE VERIFIED: May 17, 2012**

**QUALITY ASSURANCE TECHNICIAN: Leah Hardenbergh**

*Leah Hardenbergh*

**LOCATION: WILLIAMSBURG, VIRGINIA**



## Stormwater Division

### MEMORANDUM

**DATE:** March 10, 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:** CC023

**PIN:** 4820100005A

**Subdivision, Tract, Business or Owner**

**Name (if known):**

Williamsburg Jamestown Airport

**Property Description:**

Airport

**Site Address:**

100 Marclay Road

**(For internal use only)**

**Box** 10

**Drawer:** 6

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

**Y**

**Book or Doc#:**

070002412

**Page:**

165

262

640

457-458

Comments

CC-023

## **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

COUNTY OF JAMES CITY, VIRGINIA

**COPY**

DECLARATION OF COVENANTS

INSPECTION/MAINTENANCE OF DRAINAGE SYSTEM

THIS DECLARATION, made this 12 day of JANUARY, 2007,  
between LARRY & JEAN WALTRIP, and  
all successors in interest, ("COVENANTOR(S),") owner(s) of the following property:

Parcel Identification Number: 4820100005A  
Legal Description: Pt Shortneck (100 Marclay Road)  
Project or Subdivision Name: WILLIAMSBURG-JAMESTOWN AIRPORT-T HANGAR & PARKING LOT  
Document No. EXPANSION  
OR Deed Book 165, Page No. 262,  
and the County of James City, Virginia ("COUNTY.")

WITNESSETH:

We, the COVENANTOR(S), with full authority to execute deeds, mortgages, other covenants, and all rights, titles and interests in the property described above, do hereby covenant with the COUNTY as follows:

1. The COVENANTOR(S) shall provide maintenance for the drainage system including any runoff control facilities, conveyance systems and associated easements, hereinafter referred to as the "SYSTEM," located on and serving the above-described property to ensure that the SYSTEM is and remains in proper working condition in accordance with approved design standards, and with the law and applicable executive regulations. The SYSTEM shall not include any elements located within any Virginia Department of Transportation rights-of-way.

2. If necessary, the COVENANTOR(S) shall levy regular or special assessments against all present or subsequent owners of property served by the SYSTEM to ensure that the SYSTEM is properly maintained.

3. The COVENANTOR(S) shall provide and maintain perpetual access from public right-of-ways to the SYSTEM for the COUNTY, its agent and its contractor.

4. The COVENANTOR(S) shall grant the COUNTY, its agent and its contractor a right of entry to the SYSTEM for the purpose of inspecting, monitoring, operating, installing, constructing, reconstructing, maintaining or repairing the SYSTEM.

5. If, after reasonable notice by the COUNTY, the COVENANTOR(S) shall fail to maintain the SYSTEM in accordance with the approved design standards and with the law and applicable executive regulations, the COUNTY may perform all necessary repair or maintenance

*Instrument # 070002412*

*Recorded on Jan. 25, 2007* Page 1

Revised 05/06

work, and the COUNTY may assess the COVENANTOR(S) and/or all property served by the SYSTEM for the cost of the work and any applicable penalties.

6. The COVENANTOR(S) shall indemnify and save the COUNTY harmless from any and all claims for damages to persons or property arising from the installation, construction, maintenance, repair, operation or use of the SYSTEM.

7. The COVENANTOR(s) shall promptly notify the COUNTY when the COVENANTOR(S) legally transfers any of the COVENANTOR(S)' responsibilities for the SYSTEM. The COVENANTOR(S)' shall supply the COUNTY with a copy of any document of transfer, executed by both parties.

8. The covenants contained herein shall run with the land and shall bind the COVENANTOR(S) and the COVENANTOR(S)' heirs, executors, administrators, successors and assignees, and shall bind all present and subsequent owners of property served by the SYSTEM.

9. This COVENANT shall be recorded in the County Land Records.

IN WITNESS WHEREOF, the COVENANTOR(S) have executed this DECLARATION OF COVENANTS as of the date first above written.

COVENANTOR(S)

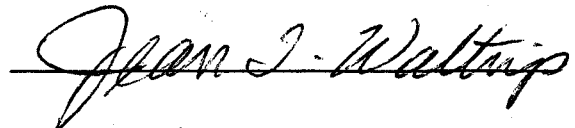


Print Name/Title President

ATTEST:

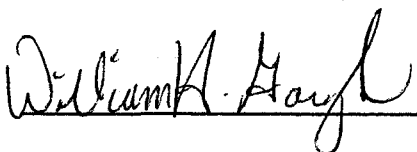
\_\_\_\_\_

COVENANTOR(S)



Print Name/Title Secretary

ATTEST:



COMMONWEALTH OF VIRGINIA

CITY/COUNTY OR James City County

I hereby certify that on this 12<sup>th</sup> day of January, 2007, before the subscribed, a Notary Public for the Commonwealth of Virginia, personally appeared Larry T. Wathrip and Jean T. Wathrip and did acknowledge the foregoing instrument to be their Act.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal this 12<sup>th</sup> day of January, 2007.

Beverly De Leo  
Notary Public

My Commission expires: 10/31/08

Approved as to form:

Joseph C. Kuyt  
AST. County Attorney

SP-050-03

This Declaration of Covenants prepared by:

LARRY T. WATHRIP  
(Print Name)

President  
(Title)

100 Mardray Rd.  
(Address)

Williamsburg VA - 23185  
(City) (State) (Zip)

257-229-0434  
(Phone Number)

drainage1.pre

## DECLARATION OF COVENANTS

## INSPECTION/MAINTENANCE OF RUNOFF CONTROL FACILITY

THIS DECLARATION, made this 29th day of JULY, 1993, between Larry T. Waltrip and Jean \*, and all successors in interest, hereinafter referred to as the "COVENANTOR(S)," owner(s) of the following property: 19.015 acres ±, as shown on a plat dated February 16, 1988 entitled "PLAT OF BOUNDARY ADJUSTMENT BETWEEN THE PROPERTIES OF: LINWOOD WALTRIP, ET ALS: AND WILLIAMSBURG-JAMESTOWN\*\* and James City County, Virginia, hereinafter referred to as the "COUNTY."

\*T. Waltrip, husband and wife  
 \*\*AIRPORT, INC., JAMES CITY COUNTY, VIRGINIA" and recorded in Plat Book 49, Page 24.

WITNESSETH:

We, the COVENANTOR(S), with full authority to execute deeds, mortgages, other covenants, and all rights, titles and interests in the property described above, do hereby covenant with the COUNTY as follows:

1. The COVENANTOR(S) shall provide maintenance for the runoff control facility, hereinafter referred to as the "FACILITY," located on and serving the above-described property to ensure that the FACILITY is and remains in proper working condition in accordance with approved design standards, and with the law and applicable executive regulations.
2. If necessary, the COVENANTOR(S) shall levy regular or special assessments against all present or subsequent owners of property served by the FACILITY to ensure that the FACILITY is properly maintained.
3. The COVENANTOR(S) shall provide and maintain perpetual access from public right-of-ways to the FACILITY for the COUNTY, its agent and its contractor.
4. The COVENANTOR(S) shall grant the COUNTY, its agent and its contractor a right of entry to the FACILITY for the purpose of inspecting, operating, installing, constructing, reconstructing, maintaining or repairing the FACILITY.
5. If, after reasonable notice by the COUNTY, the COVENANTOR(S) shall fail to maintain the FACILITY in accordance with the approved design standards and with the law and applicable executive regulations, the COUNTY may perform all necessary repair or maintenance work, and the COUNTY may assess the COVENANTOR(S) and/or all property served by the FACILITY for the cost of the work and any applicable penalties.
6. The COVENANTOR(S) shall indemnify and save the COUNTY harmless from any and all claims for damages to persons or property arising from the installation, construction, maintenance, repair, operation or use of the FACILITY.
7. The COVENANTOR(s) shall promptly notify the COUNTY when the COVENANTOR(S) legally transfers any of the COVENANTOR(S)' responsibilities for the FACILITY. The COVENANTOR(S)' shall supply the COUNTY with a copy of any document of transfer, executed by both parties.
8. The covenants contained herein shall run with the land and shall bind the COVENANTOR(S) and the COVENANTOR(S)' heirs, executors, administrators, successors and assignees, and shall bind all present and subsequent owners of property served by the FACILITY.
9. This DECLARATION shall be recorded in the County Land Records.

IN WITNESS WHEREOF, the COVENANTOR(S) have executed this DECLARATION OF COVENANTS as of this 29th day of July, 1993.

COVENANTOR(S)

Larry T. Waltrip  
Larry T. Waltrip

ATTEST:

Jean T. Waltrip  
Jean T. Waltrip

COVENANTOR(S)

\_\_\_\_\_

ATTEST:

\_\_\_\_\_

COMMONWEALTH OF VIRGINIA  
CITY/COUNTY OF James City

I, the undersigned Notary Public, in and for the jurisdiction aforesaid, do certify that Larry T. Waltrip, ~~husband~~ \* whose name is signed as such to the foregoing writing bearing date 29th day of July, 1993, this day sworn the same before me in my jurisdiction aforesaid.  
\* and Jean T. Waltrip, husband - wife  
GIVEN under my hand this 29th day of July, of 1993.

Melissa L. Williams  
Notary Public

My Commission expires: My Commission Expires March 31, 1997

Approved as to form:

Lee P. Rogers

0261U.Wpf  
Revised 9/92

VIRGINIA: City of Williamsburg and County of James City, to Wit:  
In the Clerk's Office of the Circuit Court of the City of Williamsburg, County of James City the 14th day of August, 1993 This Declaration was presented with certificate annexed and admitted to record at 3:52 o'clock  
Teste: Helena Ward, Clerk  
by Debra S. Ward  
Deputy Clerk





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: T-HANGAR SITE PREPARATION & PARKING LOT EXPANSION  
Structure/BMP Name: SAND FILTER  
Project Location: WILLIAMSBURG-JAMESTOWN AIRPORT  
BMP Location: 37° 14' 30.35" N 76° 43' 15.77" W  
County Plan No.: SP - 050 - 03

Project Type: ☐ Residential ☐ Business ☐ Commercial ☐ Office ☐ Institutional ☐ Industrial ☐ Public ☐ Roadway ☒ Other AIRPORT TAXILANE  
Tax Map/Parcel No.: 48-4-01-5A  
BMP ID Code (if known): CC 023  
Zoning District: R-8  
Land Use: AIRPORT  
Site Area (sf or acres): 130.60 AC

Brief Description of Stormwater Management/BMP Facility: SAND FILTER TIED-IN TO DRAINAGE STRUCTURE A. SAND FILTER TIED-IN TO DRAINAGE STRUCTURE B.

Nearest Visible Landmark to SWM/BMP Facility: END OF RUNWAY 13

Nearest Vertical Ground Control (if known): ☒ JCC Geodetic Ground Control ☐ USGS ☐ Temporary ☐ Arbitrary ☐ Other  
Station Number or Name: 332  
Datum or Reference Elevation: 71.71  
Control Description: 3 1/4" DISK IN CONCRETE  
Control Location from Subject Facility: 820' NORTH OF DRAINAGE STRUCTURE

**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: 10-9-06  
Facility Monitored by County Representative during Construction: ☐ Yes ☐ No ☒ Unknown  
Name of Site Work Contractor Who Constructed Facility: BASIC CONSTRUCTION CO.  
Name of Professional Firm Who Routinely Monitored Construction: TALBERT & BRIGHT, INC.  
Date of Completion for SWM/BMP Facility: 4-25-08 (PUNCHLIST)  
Date of Record Drawing/Construction Certification Submittal: 5-7-08

*( 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: WILLIAMSBURG-JAMESTOWN AIRPORT, INC.  
Mailing Address: 11 MARCLAY ROAD  
WILLIAMSBURG, VA 23185  
Business Phone: 757-229-0434 Fax: 757-258-9086  
Contact Person: LARRY WALTRIP Title: PRESIDENT

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

Firm Name: TALBERT & BRIGHT, INC.  
Mailing Address: 10105 KRAUSE ROAD, SUITE 100  
CHESTERFIELD, VA 23832  
Business Phone: 804-768-6878  
Fax: 804-768-6871  
Responsible Plan Preparer: JOHN ROBINSON  
Title: PROJECT ENGINEER  
Plan Name: T-HANGER SITE PREPARATION & PARKING LOT EXPANSION  
Firm's Project No. 4205-0101  
Plan Date: JANUARY 2003  
Sheet No.'s Applicable to SWM/BMP Facility:        /        /        /        /       

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

Name: BASIC CONSTRUCTION CO.  
Mailing Address: 538 OYSTER POINT ROAD  
NEWPORT NEWS, VA 23602  
Business Phone: 757-249-3789  
Fax: 757-249-2229  
Contact Person: C. DEREK PATTERSON, PRESIDENT  
Site Foreman/Supervisor: JOE LINK  
Specialty Subcontractors & Purpose (for BMP Construction Only):       

N/A

#### Section 4 - Professional Certifications:

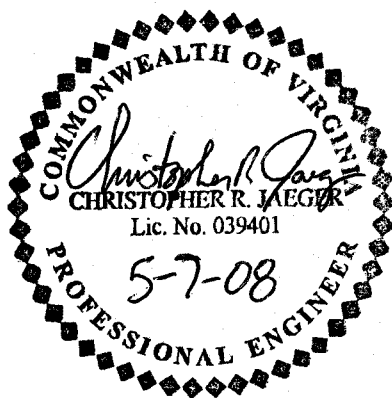
Certifying Professionals: (Note: A Registered Professional Engineer or Certified Land Surveyor is responsible for preparation of a Record Drawing, sometimes referred to as an As-Built plan, for the drainage system for the project including any Stormwater Management/BMP Facilities. A Registered Professional 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: TALBERT & BRIGHT, INC.  
Mailing Address: 10105 KRAUSE ROAD, SUITE 100  
CHESTERFIELD, VA 23832  
Business Phone: 804-768-6878  
Fax: 804-768-6871  
Name: CHRIS JAEGER  
Title: PROJECT ENGINEER  
Signature: Chris Jaeger  
Date: 5-7-08

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



\_\_\_\_\_  
( Seal )  
Virginia Registered Professional Engineer  
or Certified Land Surveyor

##### Construction Certification

Firm Name: TALBERT & BRIGHT, INC.  
Mailing Address: 10105 KRAUSE ROAD, SUITE 100  
CHESTERFIELD, VA 23832  
Business Phone: 804-768-6878  
Fax: 804-768-6871  
Name: CHRIS JAEGER  
Title: PROJECT ENGINEER  
Signature: Chris Jaeger  
Date: 5-7-08

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



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

# T-HANGAR SITE PREPARATION (PHASE I) & PARKING LOT EXPANSION

## WILLIAMSBURG-JAMESTOWN AIRPORT

DOAV PROJECT NO. CS9010-21

TBI PROJECT NO. 4205-0101

JCC CASE NO. SP-050-03

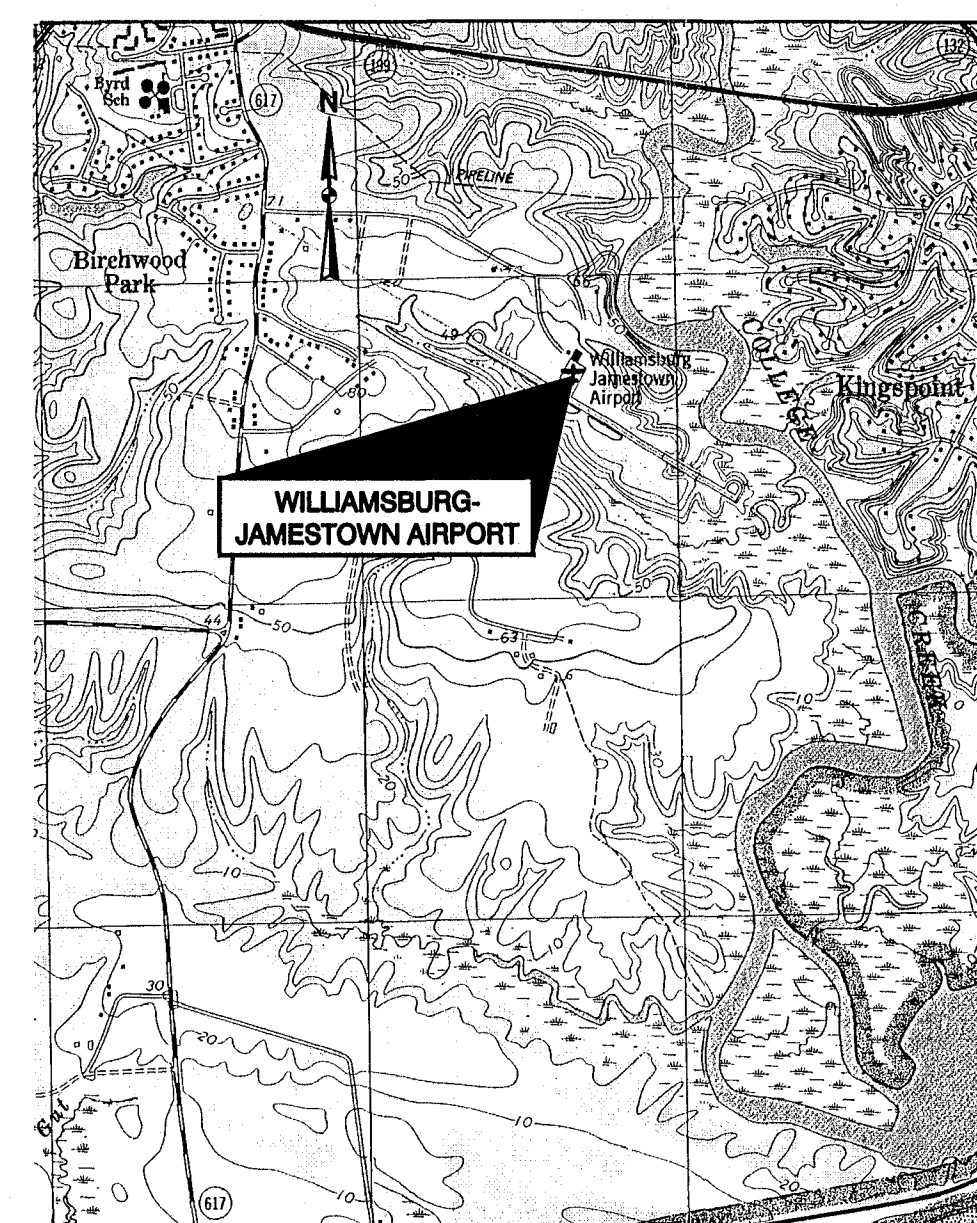
prepared for

WILLIAMSBURG-JAMESTOWN AIRPORT, INC.  
WILLIAMSBURG, VIRGINIA

### QUANTITY SCHEDULE

NO.	SPEC. NO.	DESCRIPTION	UNIT	AS - BID	AS - BUILT
1	P-152	UNCLASSIFIED EXCAVATION	CY	10,000	10,000
2	P-152	UNCLASSIFIED EXCAVATION	EA	1,000	1,000
3	P-156	CONSTRUCTION ENTRANCE	EA	3	3
4	P-156	SILT FENCE	LF	1,055	1,055
5	P-156	CULVERT INLET PROTECTION	EA	3	3
6	P-156	INLET PROTECTION	EA	4	4
7	P-156	ROCK CHECK DAM	EA	7	7
8	P-156	TEMPORARY SEDIMENT TRAP	CY	855	0
9	P-156	TEMPORARY DIVERSION DIKE	LF	1,100	0
10	T-901	SEEDING	AC	6	5.45
11	T-905	TOPSOILING (OBTAINED ON SITE OR REMOVED FROM STOCKPILE)	CY	1,800	1,844
12	T-908	MULCHING	AC	6	5
13	L-108	CABLE TRENCHING	LF	195	0
14	L-110	4" PVC SCHEDULE 40 CONDUIT	LF	610	620
15	VA-309	AGGREGATE BASE MATERIAL TYPE 21A	TN	5,500	4,311
16	VA-315	ASPHALT CONCRETE TYPE SM-12.5A	TN	1,700	1,396.61
17	VA-414	EROSION CONTROL RIP RAP, CLASS A1	TN	115	23.86
18	VA-501	SAND FILTER	LF	250	250
19	VA-502	CURB, VDOT STD. CG-2	LF	190	180
20	VA-502	BUMPER BLOCK	EA	30	37
21	VA-513	MOBILIZATION	LS	1	1
22	VA-520	SANITARY SEWER LINE 6"	LF	20	20
23	VA-520	SANITARY SEWER LINE 8"	EA	2	2
24	VA-520	SANITARY SEWER CLEAN OUT	LF	30	30
25	VA-520	WATER SERVICE LINE 2" PVC	EA	245	245
26	VA-520	WATER SERVICE LINE 6" PVC	LF	1	1
27	VA-520	WATERTIGHT MANHOLE FRAME AND COVER	EA	1	1
28	VA-520	PLUG OR CAP, 2"	EA	1	1
29	VA-520	PLUG OR CAP, 6"	EA	3	3
30	VA-520	PLUG OR CAP, 8"	EA	1	1
31	VA-704	PAVEMENT LINE MARKING, TYPE A	SF	2,540	2,540
32	M-104	TRAFFIC DRUMS	EA	22	0
33	M-107	LOW PROFILE AVIATION BARRICADES	LF	96	96
34	D-701	15" RCP, CLASS III	LF	130	130
35	D-701	24" RCP, CLASS III	LF	205	205
36	D-701	30" RCP, CLASS III	LF	280	280
37	D-751	15" FLARED END SECTION	EA	2	2
38	D-751	30" FLARED END SECTION	EA	1	1
39	D-751	DI-1 DROP INLET	EA	1	1
40	D-751	MH-1 MANHOLE	EA	3	3
41	PSP-9	EXCELSIOR BLANKET	SY	6,750	6,800
42	PSP-10	CONSTRUCTION FENCING	LF	760	760
43	CO-1	6" CRUSHED CONCRETE	TN	5,500	4,311
44	CO-1	FINE GRADE & PREPARE CRUSHED CONCRETE	SY	16,867	11,960
45	CO-2	ADDITIONAL UNCLASSIFIED EXCAVATION	CY	16,130	16,130
46	CO-3	EXPOSED AGGREGATE CONCRETE CURB	LF	160	160

JANUARY 2003



VICINITY MAP

SCALE: 1"= 200'



THE PROPOSED SITE IMPROVEMENTS ARE IN ACCORDANCE WITH THE CONDITIONS OF THE SPECIAL USE PERMIT (SUP-16-04) ADOPTED BY THE JAMES CITY COUNTY BOARD OF SUPERVISORS ON JUNE 8, 2004.

RECORD DRAWINGS  
MAY 7, 2008

These record drawings have been prepared, in part, on the basis of information compiled and furnished by others. The Engineer will not be responsible for any errors or omissions which may have been incorporated into this document as a result. All items listed as "to be", "install", "remove", "provide", etc. under this project were accomplished unless noted otherwise.

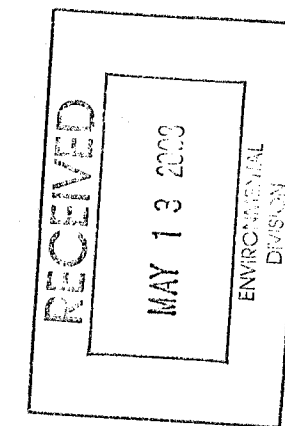
TALBERT & BRIGHT, INC.

### SHEET INDEX

NO.	TITLE
1	COVER SHEET
2	GENERAL LAYOUT AND PHASING
3	T-HANGAR SITE PLAN AND MARKING
4	PARKING LOT SITE PLAN AND MARKING
5	GRADING AND DRAINAGE
6	GRADING AND DRAINAGE
7	GRADING AND DRAINAGE
8	EROSION AND SEDIMENT CONTROL DETAILS
9	EROSION AND SEDIMENT CONTROL NOTES
10	PAVEMENT DETAILS AND TYPICAL SECTIONS
11	DRAINAGE DETAILS
12	DRAINAGE DETAILS
13	MARKING DETAILS
14	MISCELLANEOUS DETAILS
15	STORM SEWER PROFILE
16	CROSS SECTIONS
17	CROSS SECTIONS
	LANDSCAPE PLAN - PHASE I - T-HANGAR
	LANDSCAPE PLAN - PHASE I - PARKING EXPANSION

SET NO. \_\_\_\_\_

DATE \_\_\_\_\_



TALBERT & BRIGHT

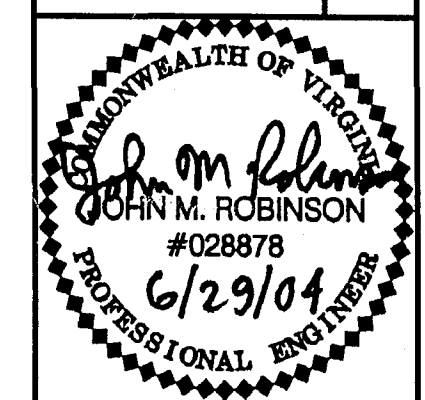
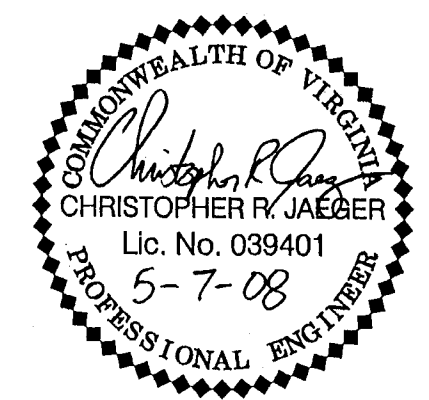
ENGINEERING & PLANNING CONSULTANTS  
10103 KRAUSE ROAD, SUITE 100  
CHESTERFIELD, VIRGINIA 23832  
PHONE: 804-768-6878 FAX: 804-768-6871

REV. NO.	DATE	DESCRIPTION
1	6/19/03	JAMES CITY COUNTY/ DOAV COMMENTS
2	8/6/03	JAMES CITY COUNTY COMMENTS
3	2/19/04	ADD LANDSCAPE PLAN
4	6/29/04	REVISED PROPERTY LINE
5	6/22/05	APPENDIX NO. ONE (1)
6	5/07/08	RECORD DRAWINGS

COVER SHEET

T-Hangar Site Preparation (Phase I) & Parking Lot Expansion

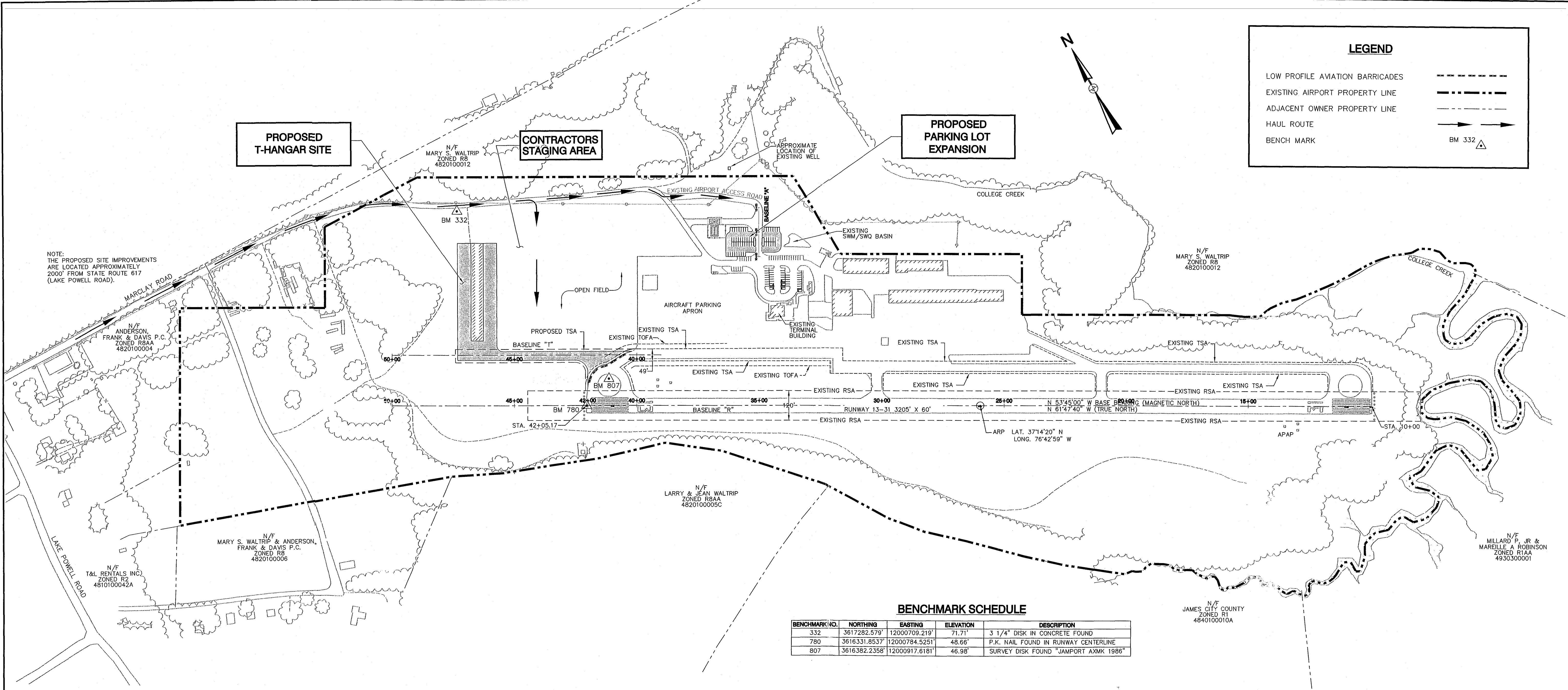
Williamsburg-Jamestown Airport - Williamsburg, Virginia



Date	JANUARY 2003
Scale	NONE
Drawn	MSP
Checked	STP
Project No.	4205-0101
Sheet No.	1
Of	17

SP-50-03 CC023/CC024





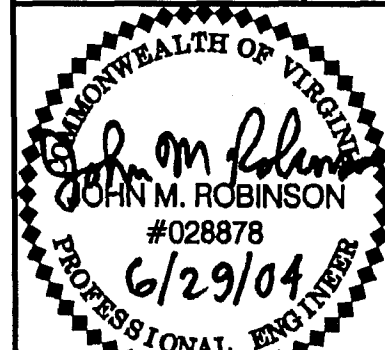
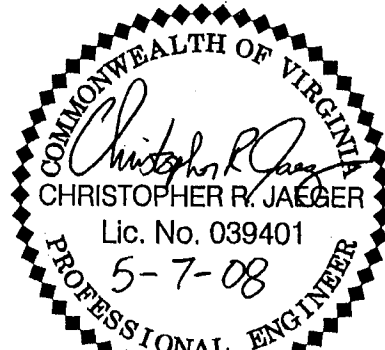
TALBERT & BRIGHT

ENGINEERING & PLANNING CONSULTANTS  
10105 KRAUSE ROAD, SUITE 100  
CHESFIELD, VIRGINIA 2302  
PHONE: 804-768-6878 FAX: 804-768-6871

REV. NO.	DESCRIPTION	REVISIONS	DATE
1	JAMES CITY COUNTY DAY COMMENTS		5/19/03
2	REVISED PROPERTY LINE		6/29/04
3	RECORD DRAWINGS		5/07/08

GENERAL LAYOUT AND PHASING  
T-Hangar Site Preparation (Phase I) & Parking Lot Expansion

Williamsburg-Jamestown Airport - Williamsburg, Virginia

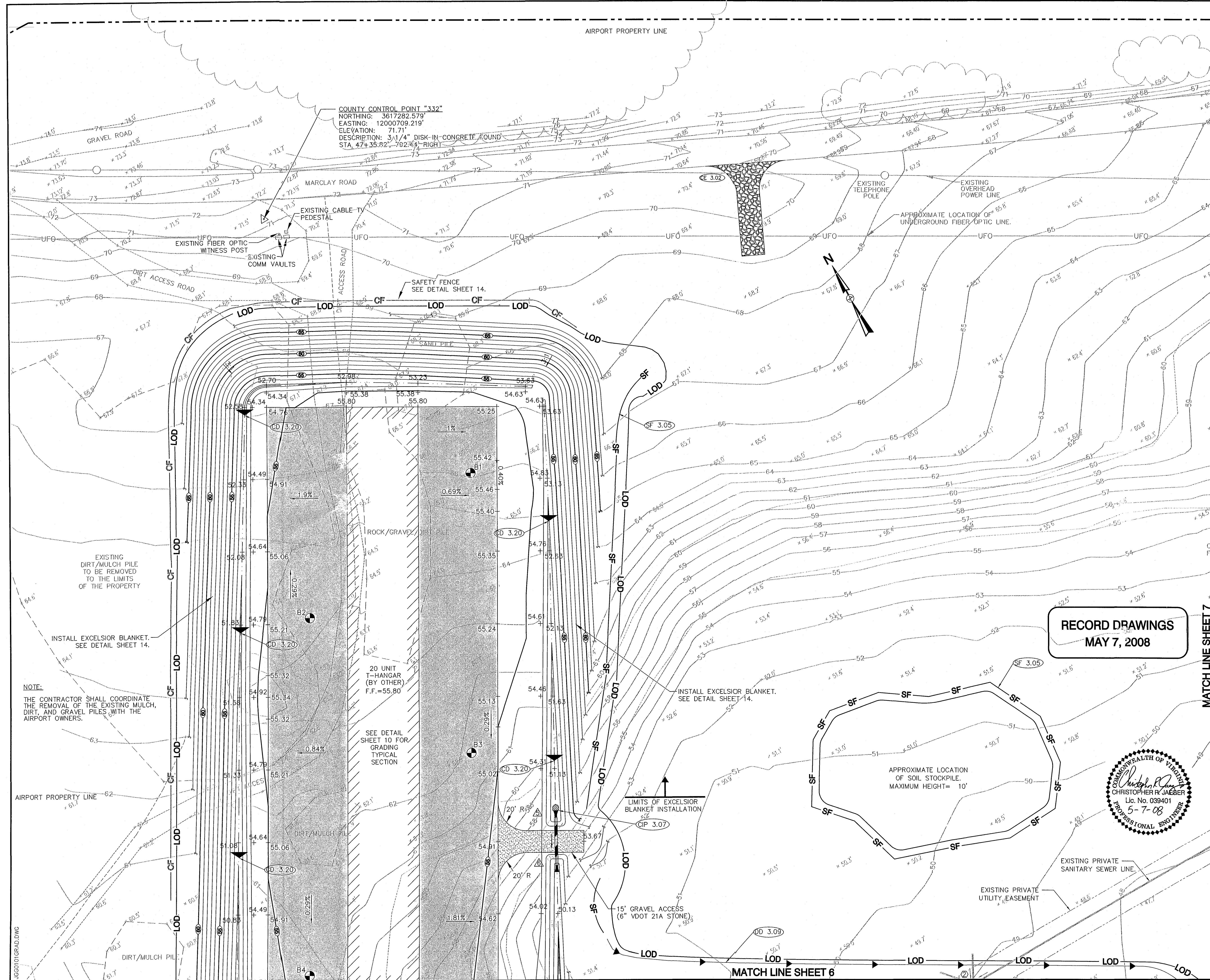


Date	JANUARY 2003
Scale	1"=200'
Drawn	MSP
Checked	STP
Project No.	4205-0101
Sheet No.	2
Of	17





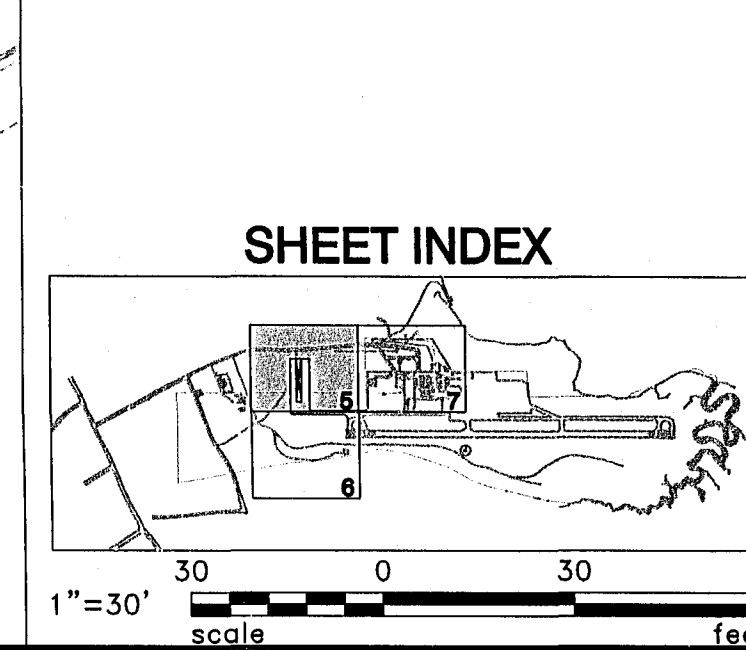




LEGEND	
EXISTING	PROPOSED
SPOT ELEVATION	44.35
PROPERTY LINE	
1' CONTOURS	38
5' CONTOURS	40
TREES	
UTILITY POLE	
BORINGS	B1
DIRT ROAD	
TAXIWAY SAFETY AREA	TSA
RUNWAY SAFETY AREA	RSA
TAXIWAY OBJECT FREE AREA	TOFA
SANITARY MANHOLE	
GAS VALVE	
WATER VALVE	
LIGHT POLE	
SIGN	
HELIPAD LIGHT	
RUNWAY LIGHT	
UNDERGROUND PHONE BOX	
FENCE	
STORM SEWER (RCP) SIZE & CLASS	
FLARED END SECTION	
ROCK CHECK DAM (CD 3.20)	
DIVERSION DIKE	
UNDERGROUND FIBER OPTIC LINE	UFO
LIMITS OF DISTURBANCE	L.O.D.
SILT FENCE (SF 3.05)	SF
ORANGE CONSTRUCTION FENCING	CF
CULVERT INLET PROTECTION (CIP 3.08)	
INLET PROTECTION (IP 3.07)	
OUTLET PROTECTION (OP 3.16)	
SAND FILTER	
ASPHALT PAVEMENT	
TEMPORARY CONSTRUCTION ENTRANCE (CE 3.02)	

EXISTING STORM SEWER SCHEDULE	
YARD INLET (NO TOP OR GRATE)	
TOP SLAB=43.54'	
INV IN 15" RCP= 40.57'	
INV OUT 15" RCP= 40.55'	
YARD INLET	
TOP GRATE= 45.94'	
INVERT OUT 15" RCP= 43.57'	
PROPOSED STORM SEWER SCHEDULE	
VDOT STD. 15" ES-1 END SECTION	
INV= 50.79	
VDOT STD. 15" ES-1 END SECTION	
INV= 50.46	
33 LF OF 15" CLASS III RCP	
SLOPE = 1.0%	
INV IN = 50.79	
INV OUT = 50.46	
SANITARY SEWER SCHEDULE	
SANITARY SEWER MANHOLE	
RIM = 49.48	
INV IN 8" PVC(E) = 30.15'	
INV IN 8" PVC(N) = 30.15'	
INV IN 8" PVC(W) = 20.07'	
INV OUT 8" PVC(S) = 30.08'	
SANITARY SEWER MANHOLE	
RIM = 48.06'	
INV IN 8" PVC(N) = 31.60'	
INV IN 8" PVC(N) = 31.67'	
INV OUT 8" PVC(SW) = 31.51'	
SANITARY SEWER MANHOLE	
RIM = 47.40'	
INV IN 8" PVC(N) = 28.66'	
INV OUT 8" PVC(SW) = 28.57'	

**NOTE:**  
1. ANY EXISTING UNUSED WELLS SHALL BE ABANDONED IN ACCORDANCE WITH THE STATE HEALTH DEPARTMENT REGULATIONS AND JAMES CITY COUNTY CODE.  
2. SEE GENERAL LAYOUT FOR LOCATION OF EXISTING WELL.



TALBERT & BRIGHT

ENGINEERING & PLANNING CONSULTANTS

1005 KRAUSE ROAD, SUITE 100

CHESTERFIELD, VIRGINIA 23832

PHONE: 804-768-6878 FAX: 804-768-6871

5/19/03	JAMES CITY COUNTY / DOAV COMMENTS	DATE
6/29/04	REVISED PROPERTY LINE	
5/07/08	RECORD DRAWINGS	
1		
2		
3		
REV. NO.	DESCRIPTION	REVISIONS

GRADING AND DRAINAGE

T-Hanger Site Preparation (Phase I) & Parking Lot Expansion

Williamsburg-Jamestown Airport - Williamsburg, Virginia

COMMONWEALTH OF VIRGINIA

Christopher R. Jaeger

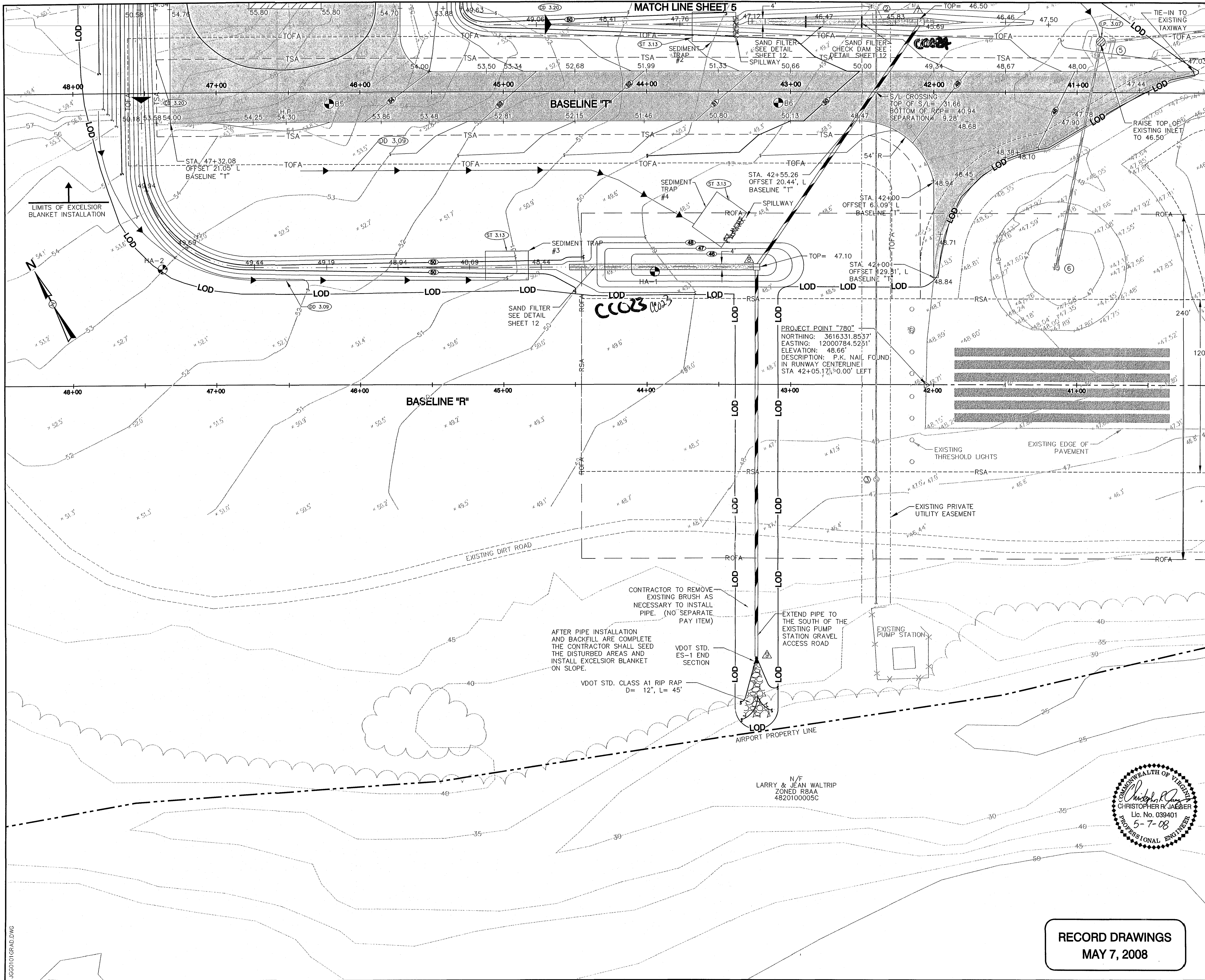
Lic. No. 039401

5-7-08

PROFESSIONAL ENGINEER

Date	JANUARY 2003
Scale	1"=30'
Drawn	MSP
Checked	STP
Project No.	4205-0101
Sheet No.	5
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LEGEND		
EXISTING		PROPOSED
SPOT ELEVATION		44.35
PROPERTY LINE		
1' CONTOURS		38
5' CONTOURS		40
TREES		
UTILITY POLE		
BORINGS		B1
DIRT ROAD		
TAXIWAY SAFETY AREA		TSA
RUNWAY SAFETY AREA		RSA
TAXIWAY OBJECT FREE AREA		TOFA
SANITARY MANHOLE		
GAS VALVE		
WATER VALVE		
LIGHT POLE		
SIGN		
HELIPAD LIGHT		
RUNWAY LIGHT		
UNDERGROUND PHONE BOX		
FENCE		
STORM SEWER (RCP) SIZE & CLASS		
FLARED END SECTION		
ROCK CHECK DAM (CD 3.20)		
DIVERSION DIKE		
UNDERGROUND FIBER OPTIC LINE		UFO
LIMITS OF DISTURBANCE		LOD
SILT FENCE (SF 3.05)		SF
ORANGE CONSTRUCTION FENCING		CF
CULVERT INLET PROTECTION (CP 3.08)		
INLET PROTECTION (IP 3.07)		
OUTLET PROTECTION (OP 3.18)		
SAND FILTER		
ASPHALT PAVEMENT		
TEMPORARY CONSTRUCTION ENTRANCE (CE 3.02)		

EXISTING STORM SEWER SCHEDULE	
5	YARD INLET (NO TOP OR GRATE) TOP SLAB=43.54' INV IN 15" RCP= 40.57' INV OUT 15" RCP= 40.55'
6	YARD INLET TOP GRATE= 45.94' INVERT OUT 15" RCP= 43.57'

PROPOSED STORM SEWER SCHEDULE	
1	VDOT STD. MH-1 MANHOLE W/STEPS TOP= 45.60 H= 4.51
2	VDOT STD. MH-1 MANHOLE W/STEPS TOP= 47.10 H= 8.49
3	VDOT STD. 30" ES-1 END SECTION INV= 35.91
4	205 LF OF 24" CLASS III RCP SLOPE = 1.6% INV IN = 41.99 INV OUT = 38.71
5	275 LF OF 30" CLASS III RCP SLOPE = 1.0% INV IN = 38.61 INV OUT = 35.9+ 81

SANITARY SEWER SCHEDULE	
1	SANITARY SEWER MANHOLE RIM= 49.48' INV IN 8" PVC(E)= 30.15' INV IN 8" PVC(N)= 30.15' INV IN 8" PVC(W)= 20.07' INV OUT 8" PVC(S)= 30.08'
2	SANITARY SEWER MANHOLE RIM= 48.06' INV IN 8" PVC(N)= 31.60' INV IN 8" PVC(W)= 31.67' INV OUT 8" PVC(SW)= 31.51'
3	SANITARY SEWER MANHOLE RIM= 47.40' INV IN 8" PVC(N)= 28.66' INV OUT 8" PVC(SW)= 28.57'

**NOTE:**  
1. ANY EXISTING UNUSED WELLS SHALL BE ABANDONED IN ACCORDANCE WITH THE STATE HEALTH DEPARTMENT REGULATIONS AND JAMES CITY COUNTY CODE.  
2. SEE GENERAL LAYOUT FOR LOCATION OF EXISTING WELL.

**SHEET INDEX**

**RECORD DRAWINGS**  
MAY 7, 2008

**TALBERT & BRIGHT**  
ENGINEERING & PLANNING CONSULTANTS  
10105 KRAUSE ROAD, SUITE 100  
CHESTERFIELD, VIRGINIA 23832  
PHONE 804-768-4878 FAX 804-768-4871

**GRADING AND DRAINAGE**  
T-Hanger Site Preparation (Phase I) & Parking Lot Expansion  
Williamsburg-Jamestown Airport - Williamsburg, Virginia

**PROFESSIONAL ENGINEER**  
JOHN M. ROBINSON  
#028878  
6/29/04

**DATE**  
JANUARY 2003

**SCALE**  
1"=30'

**DRAWN**  
MSP

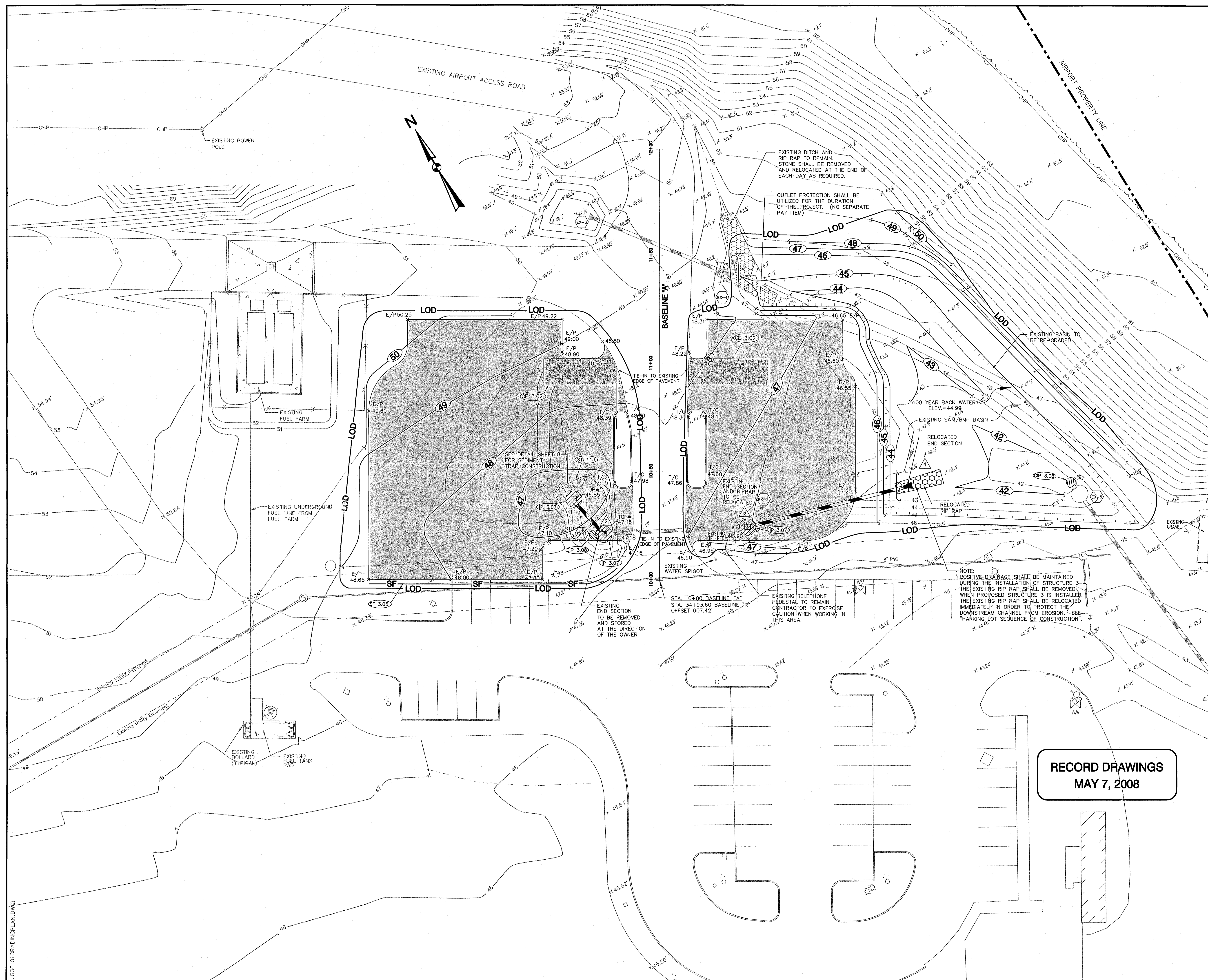
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STP

**PROJECT NO.**  
4205-0101

**SHEET NO.**  
6

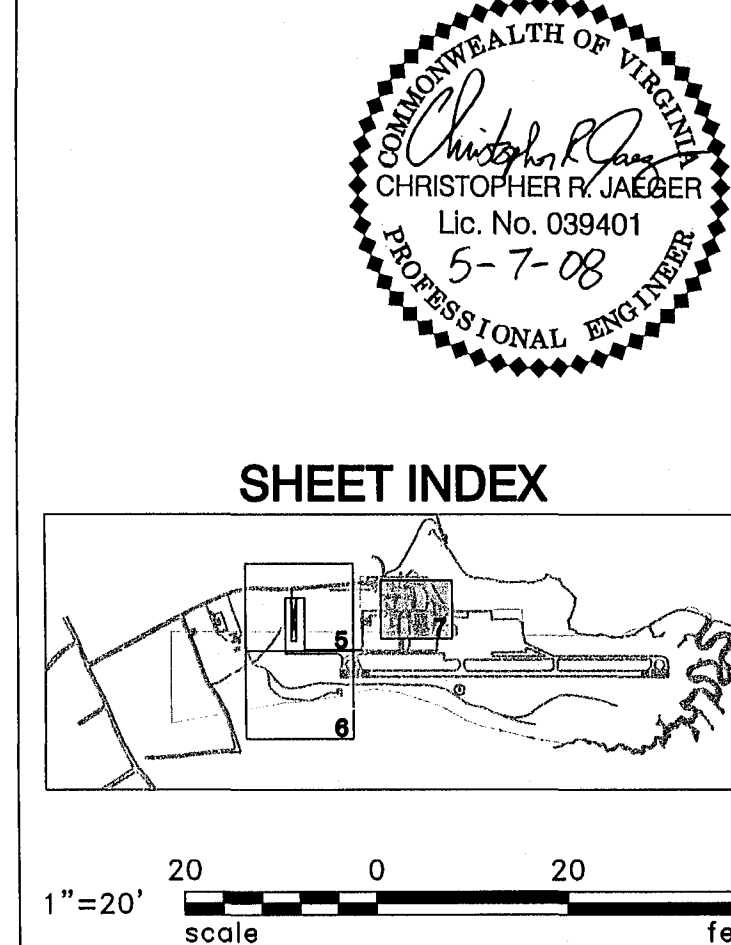
**OF**  
17






LEGEND		
	EXISTING	PROPOSED
SPOT ELEVATION		
PROPERTY LINE		
1' CONTOURS		
5' CONTOURS		
TREES		
UTILITY POLE		
BORINGS		
DIRT ROAD		
TAXIWAY SAFETY AREA		
RUNWAY SAFETY AREA		
TAXIWAY OBJECT FREE AREA		
SANITARY MANHOLE		
GAS VALVE		
WATER VALVE		
LIGHT POLE		
SIGN		
HELIPAD LIGHT		
RUNWAY LIGHT		
UNDERGROUND PHONE BOX		
FENCE		
STORM SEWER (PCP) SIZE & CLASS AS		
FLARED END SECTION		
LIMITS OF DISTURBANCE		
SILT FENCE (SF 3.05)		
CULVERT INLET PROTECTION (CP 3.08)		
INLET PROTECTION (P 3.07)		
OUTLET PROTECTION (OP 3.18)		
ASPHALT PAVEMENT		
TEMPORARY CONSTRUCTION ENTRANCE (CE 3.02)		

STORM SEWER SCHEDULE	
EX-1	FLARED END SECTION INVERT 15" RCP=44.21'
EX-2	FLARED END SECTION INVERT 15" RCP=43.87'
EX-3	FLARED END SECTION INVERT 15" RCP=46.33'
EX-4	FLARED END SECTION INVERT 15" RCP=44.31'
STORM RISER	
EX-5	TOP OF RISER=44.53' INVERT IN 15" RCP=44.10" (FROM POND) INVERT OUT=UNATTAINABLE
①	D1-1 DROP INLET, TOP=46.85 H=2.17", IS-1 INLET SHAPING
②	VDOT STD. MH-1 MANHOLE W/IS-1 INLET SHAPING TOP = 47.15 INV IN= 44.21 INV OUT= 43.87
③	D1-1 DROP INLET, TOP=46.80 H=3.03", IS-1 INLET SHAPING
④	RELOCATED 15" ES-1 END SECTION
①-②	22 LF OF 15" CLASS III RCP @ 0.56% INV. IN= 44.43 INV. OUT=44.31
③-④	75 LF OF 15" CLASS III RCP @ 1.16% INV. IN= 43.77 INV. OUT=42.90
SWM / SWQ BASIN	
10 YEAR BACKWATER ELEV.=44.56	
100 YEAR BACKWATER ELEV.=44.89	

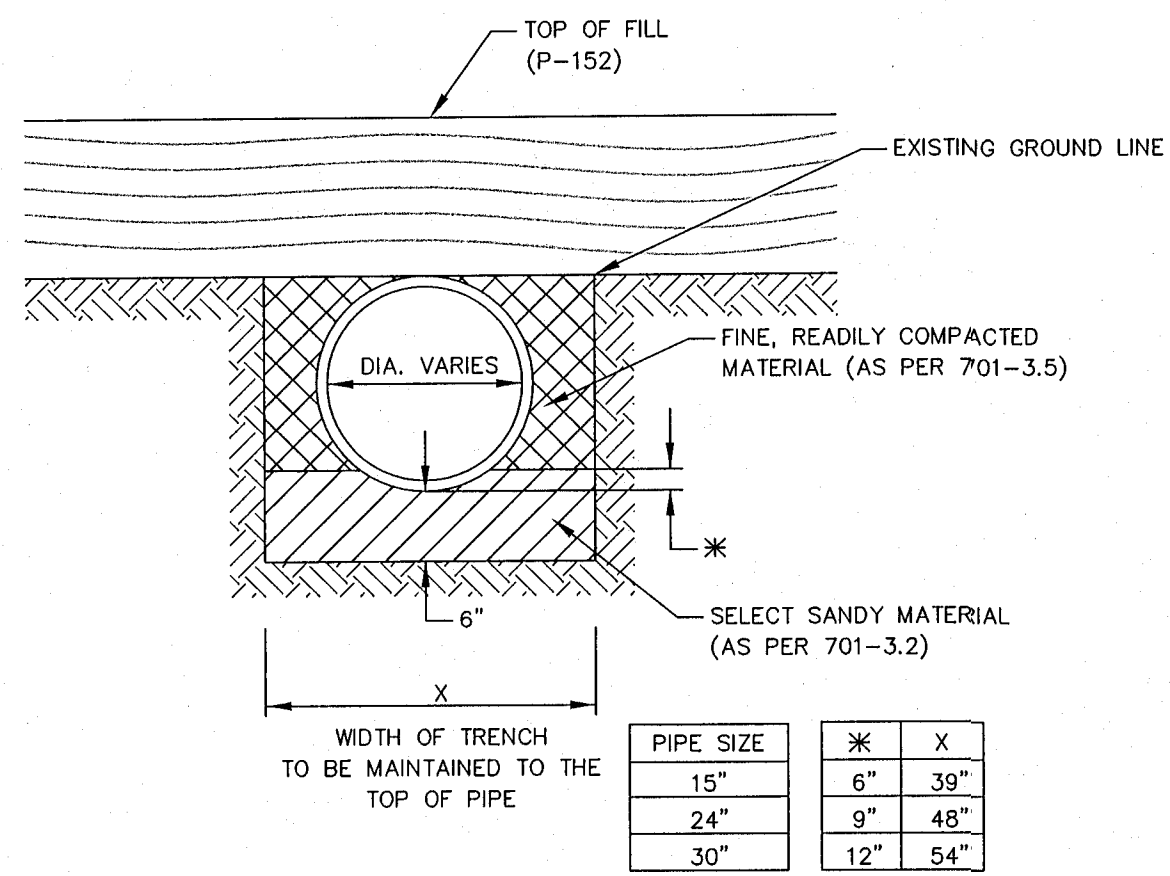


		<p align="center"><b>GRADING AND DRAINAGE</b></p> <p align="center"><b>T-Hangar Site Preparation (Phase I) &amp; Parking Lot Expansion</b></p> <p align="center"><b>Williamsburg-Jamestown Airport - Williamsburg, Virginia</b></p>		<p align="center"><b>TALBERT &amp; BRIGHT</b></p> <p align="center">ENGINEERING &amp; PLANNING CONSULTANTS 1105 KINGSLEY ROAD CHESTERFIELD, VIRGINIA 23832 PHONE: 804-768-6678 FAX: 804-768-6671</p>	
Date	JANUARY 2003	1	JAMES CITY COUNTY/ DOAC COMMENTS	6/19/03	
Scale	1"=20'	2	RECORD DRAWINGS	5/07/08	
Drawn	MSP				
Checked	STP				
Project No.	4205-0101				
Sheet No.	<b>7</b>	REV. NO.	DESCRIPTION	DATE	
	17		REVISIONS		

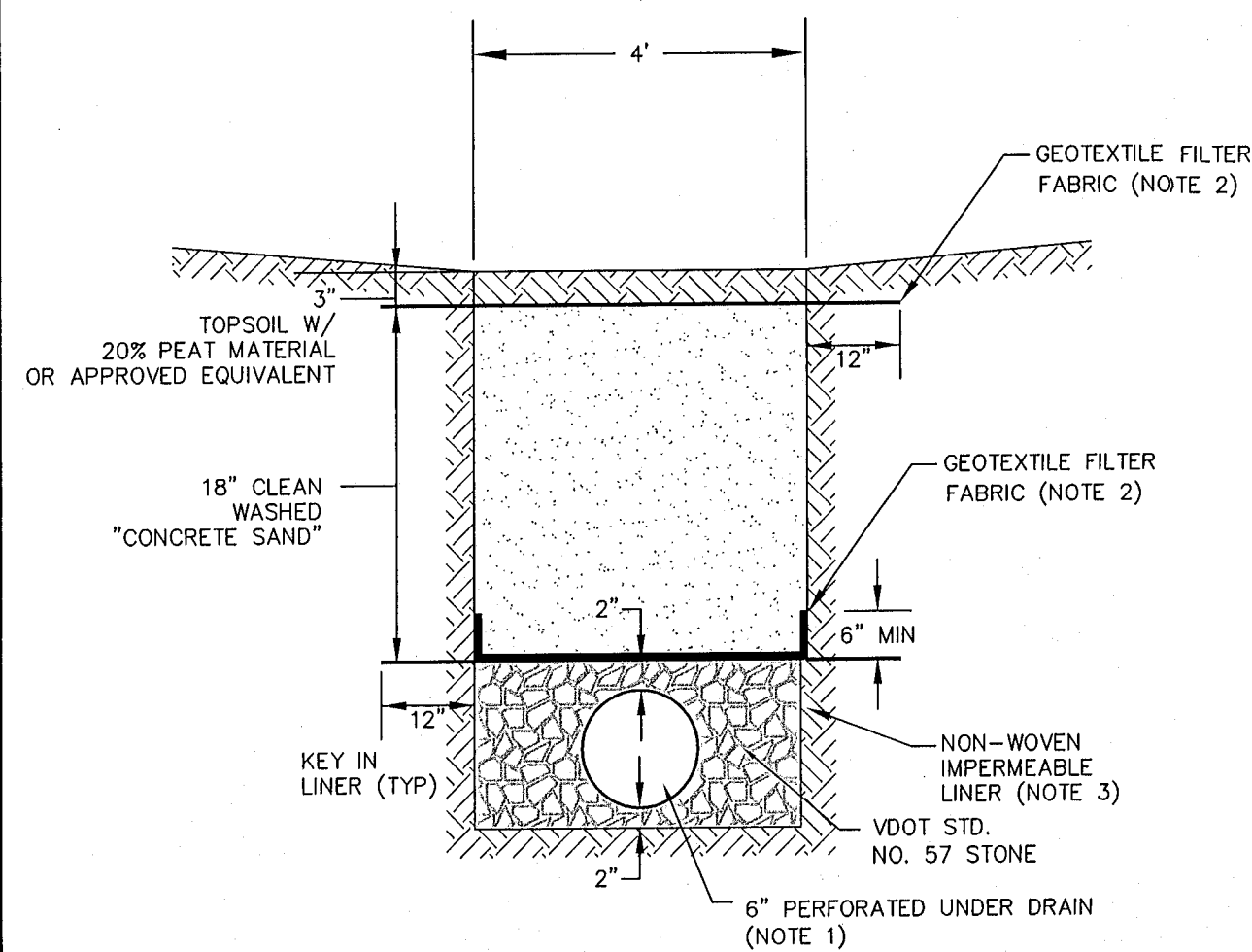






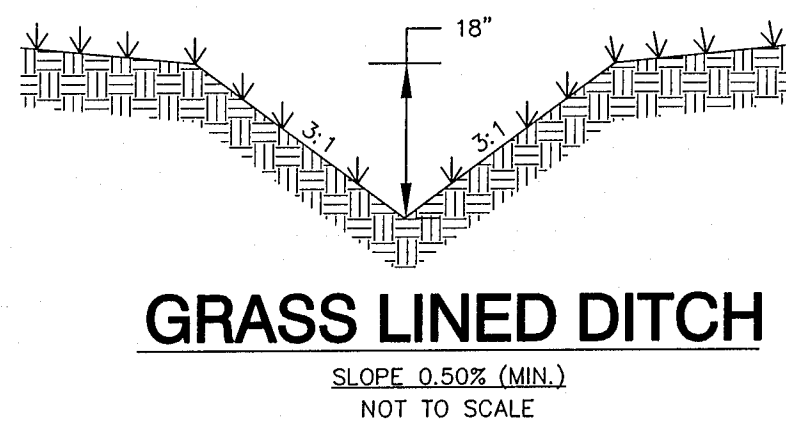


PIPE BEDDING DETAIL  
NOT TO SCALE

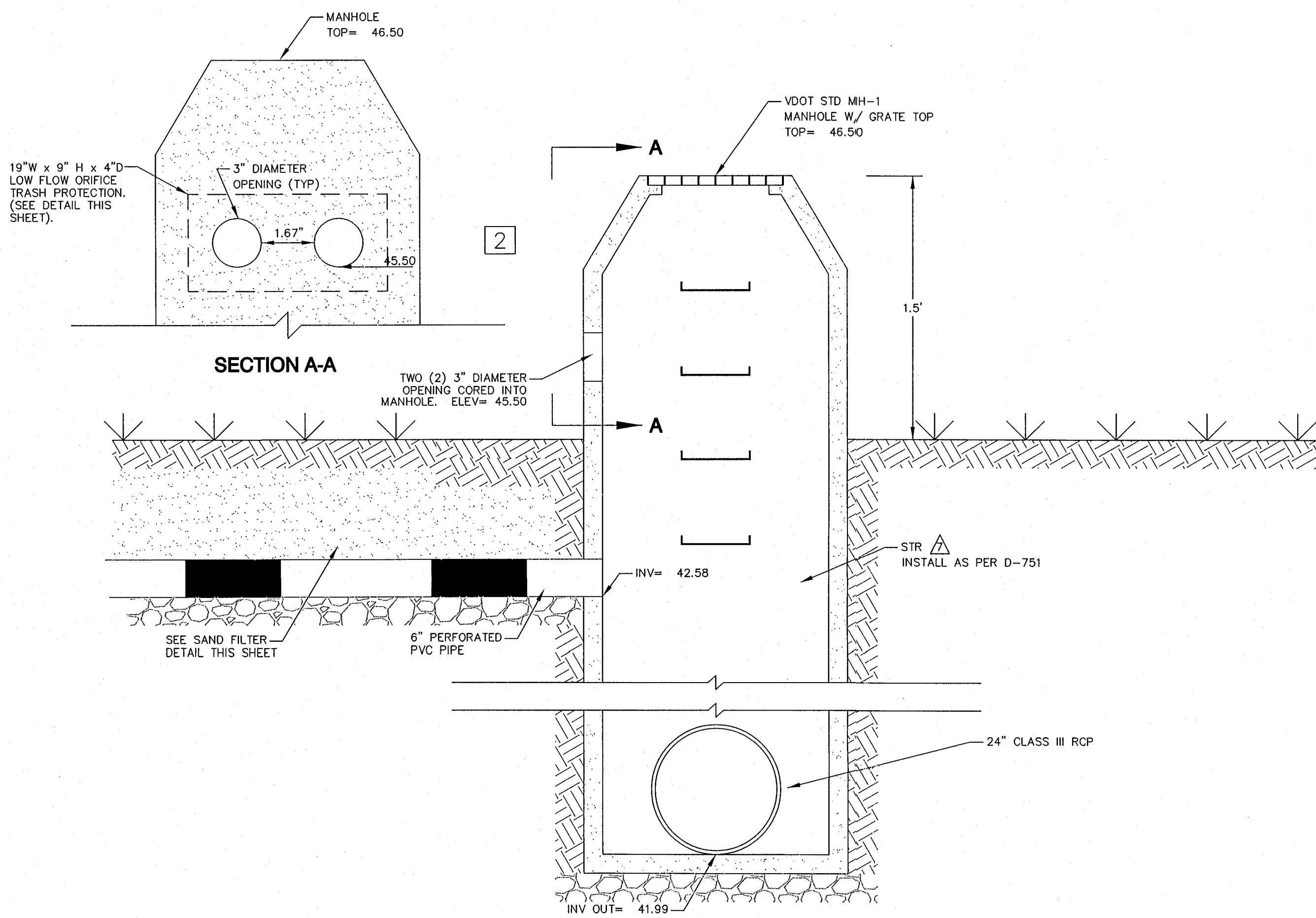


SAND FILTER DETAIL  
NOT TO SCALE

- NOTE: 1. 6" PERFORATED UNDERDRAIN SHALL BE ADS N-12 PIPE, OR APPROVED EQUIVALENT.
2. GEOTEXTILE FILTER FABRIC SHALL BE SYNTHETIC INDUSTRIES TYPE 200ST WOVEN POLYPROPYLENE OR APPROVED EQUIVALENT.
3. IMPERMEABLE LINER SHALL HAVE THE FOLLOWING CHARACTERISTICS:  
GRAB TENSILE STRENGTH - 300 LB'S (MIN)  
ELONGATION - 50% (MIN)  
PUNCTURE STRENGTH - 175 LB'S (MIN)

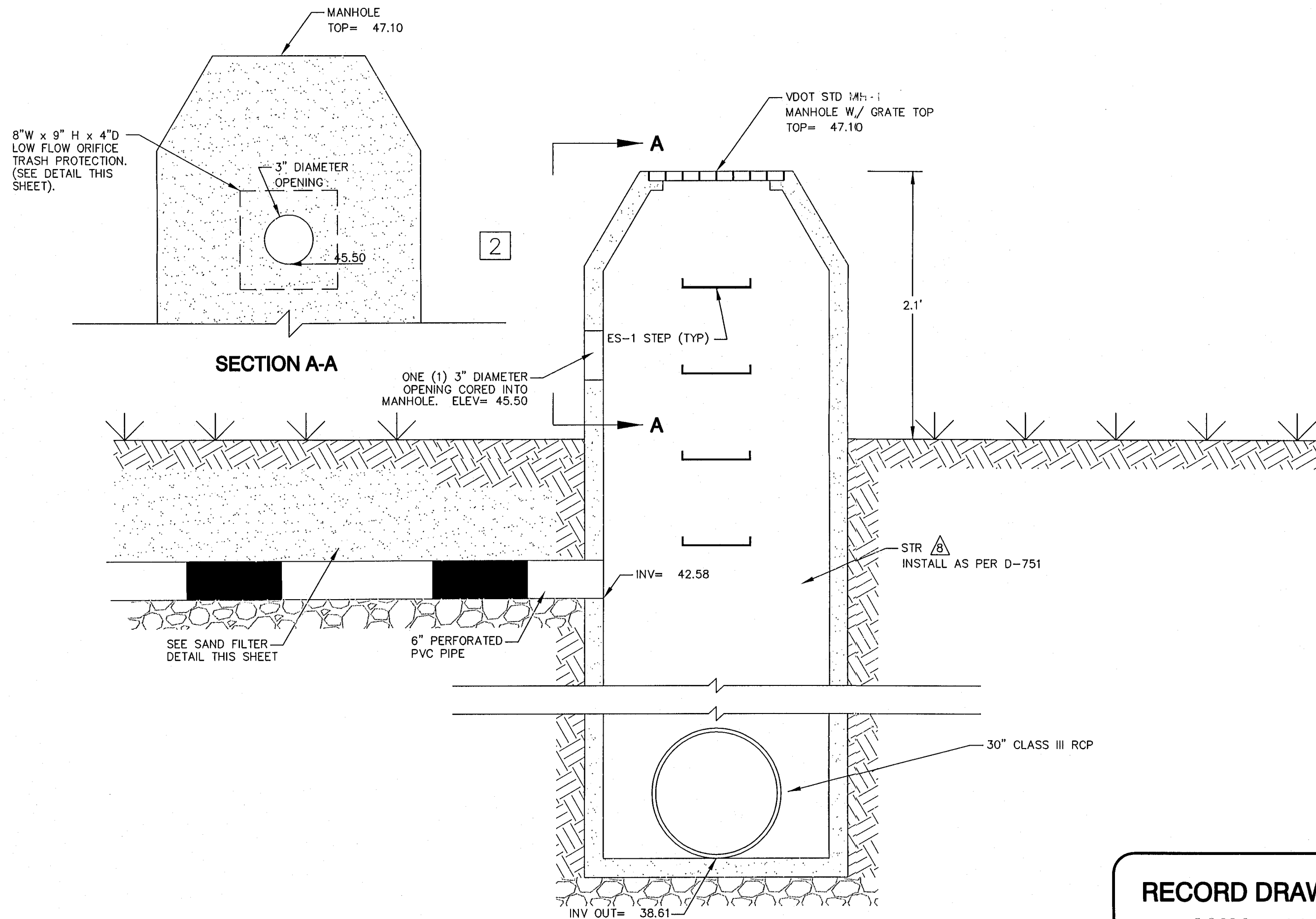


GRASS LINED DITCH  
SLOPE 0.50% (MIN.)  
NOT TO SCALE



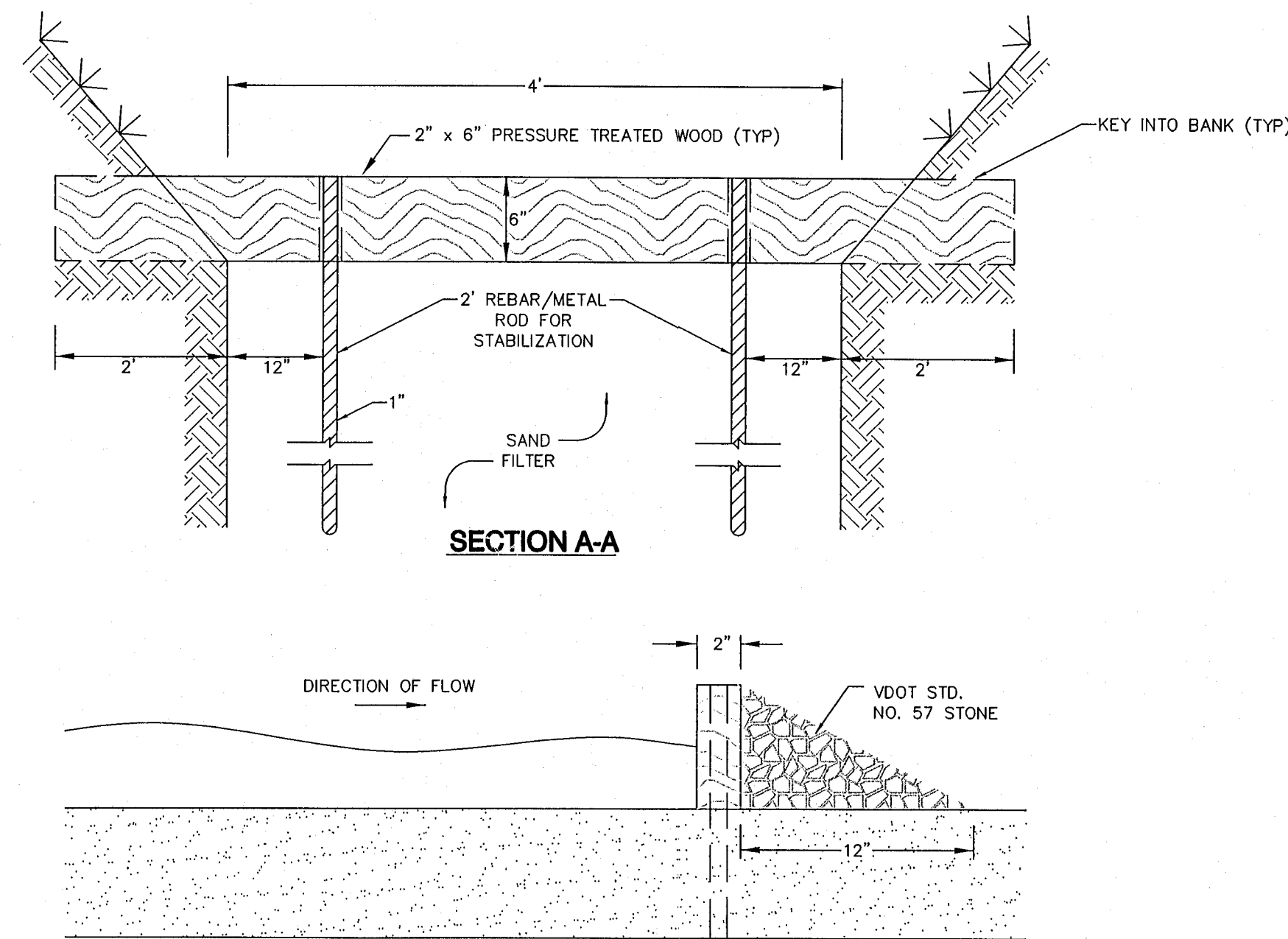
MANHOLE DETAIL - STR. 7  
NOT TO SCALE

- NOTE: 1. PRICE OF 15" CLASS III RCP SHALL BE INCLUDED IN MANHOLE PAY ITEM.

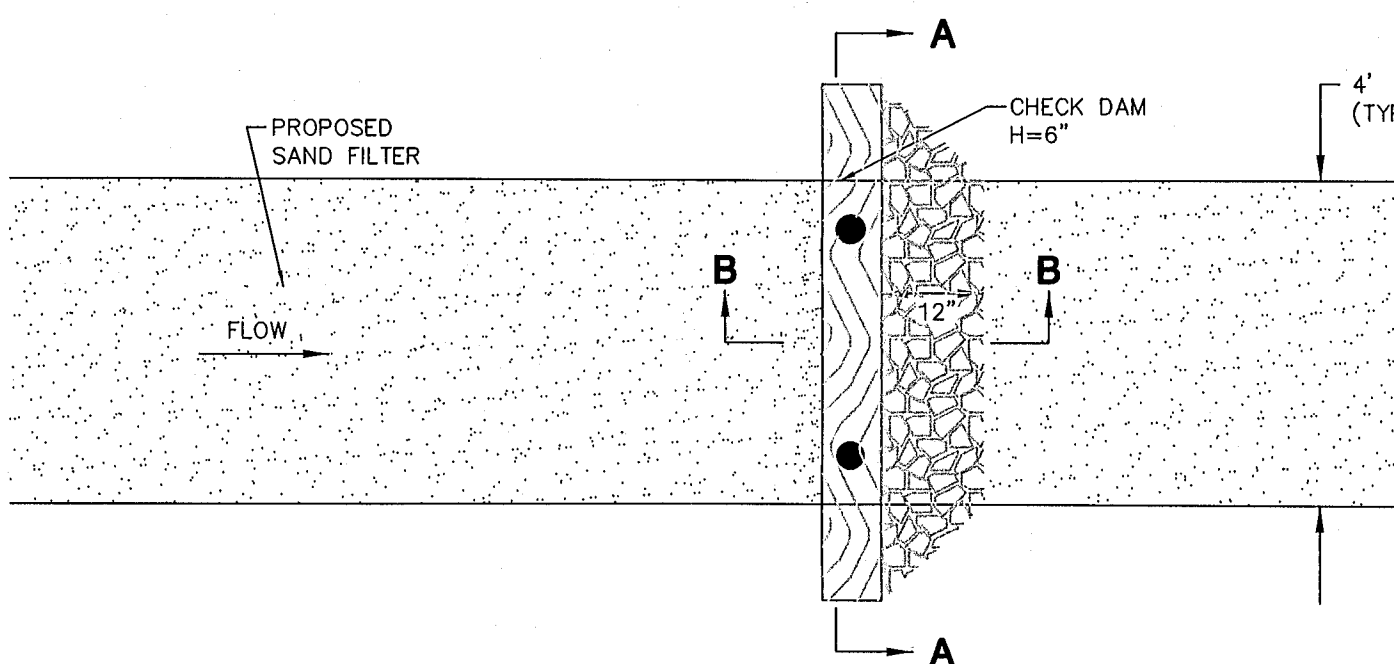


MANHOLE DETAIL - STR. 8  
NOT TO SCALE

- NOTE: 1. PRICE OF 15" CLASS III RCP SHALL BE INCLUDED IN MANHOLE PAY ITEM.

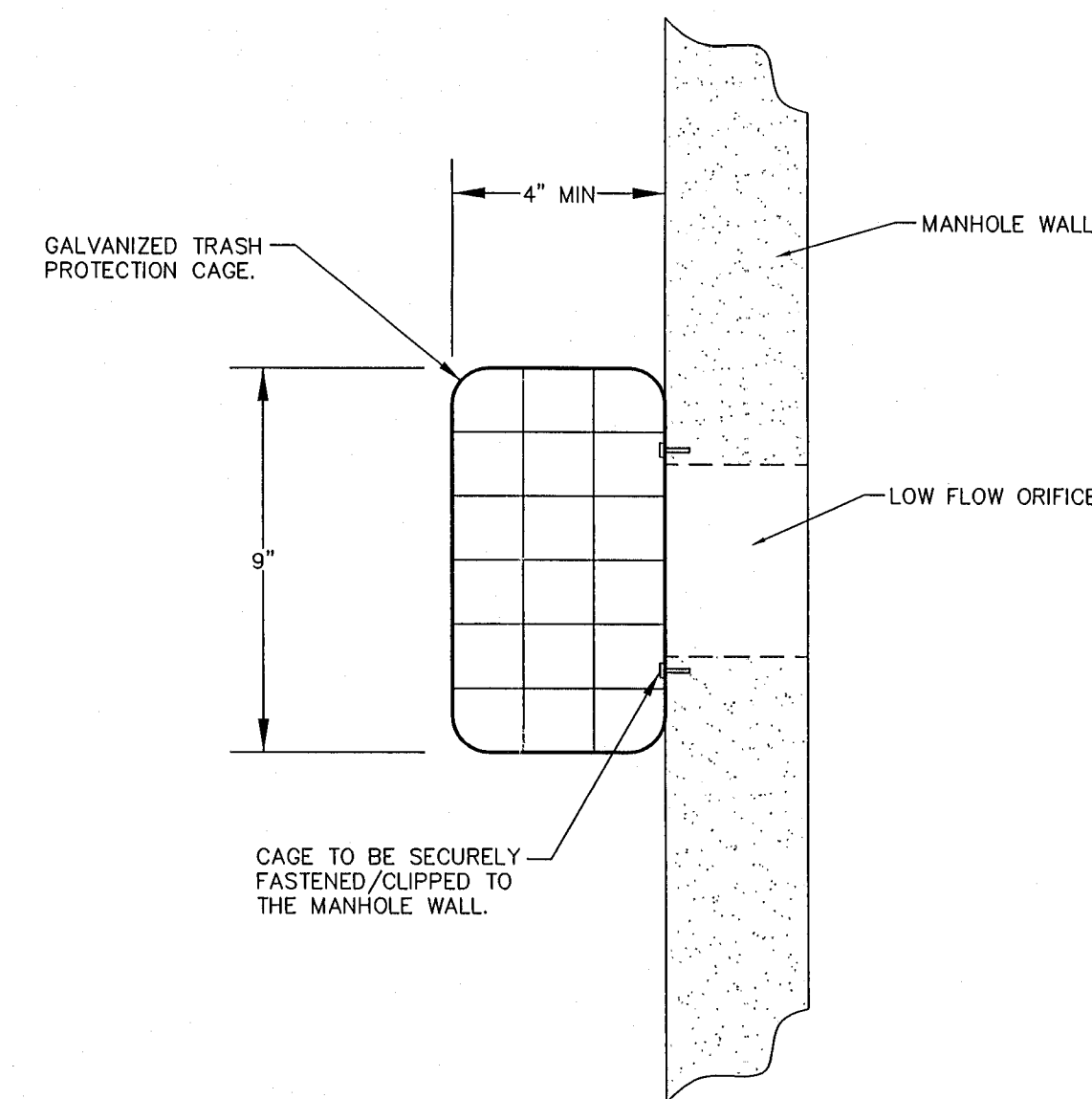


SECTION B-B



PLAN VIEW

SAND FILTER CHECK DAM  
NOT TO SCALE



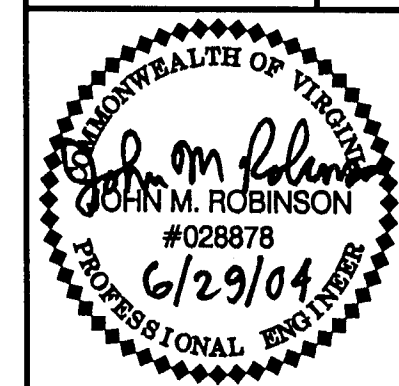
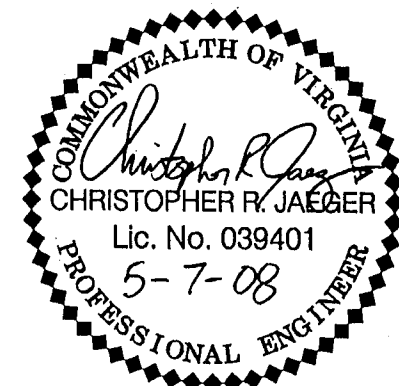
- NOTE: TRASH PROTECTION CAGE SHALL BE INSPECTED AND APPROVED BY THE ENGINEER.

LOW FLOW ORIFICE TRASH PROTECTION  
NOT TO SCALE

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ENGINEERING & PLANNING CONSULTANTS  
10105 KRAUSE ROAD, SUITE 100  
CHESTERFIELD, VIRGINIA 23832  
PHONE 804-768-6878 FAX 804-768-6871

REV.	NO.	DESCRIPTION	REVISIONS
1	1	JAMES CITY COUNTY / DAY COMMENTS	DATE
2	2	JAMES CITY COUNTY COMMENTS - ORIFICE DIAMETER	DATE
3	3	CHANGED TO THREE INCHES	DATE
4	4	RECORD DRAWINGS	DATE

DRAINAGE DETAILS  
T-Hanger Site Preparation (Phase D) & Parking Lot Expansion  
Williamsburg-Jamestown Airport - Williamsburg, Virginia

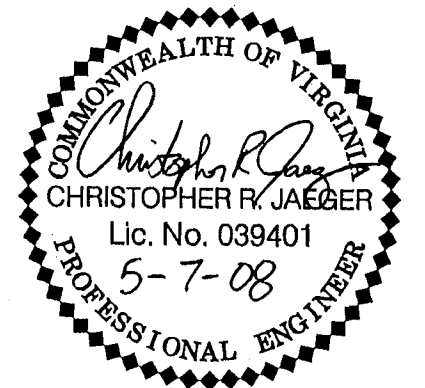
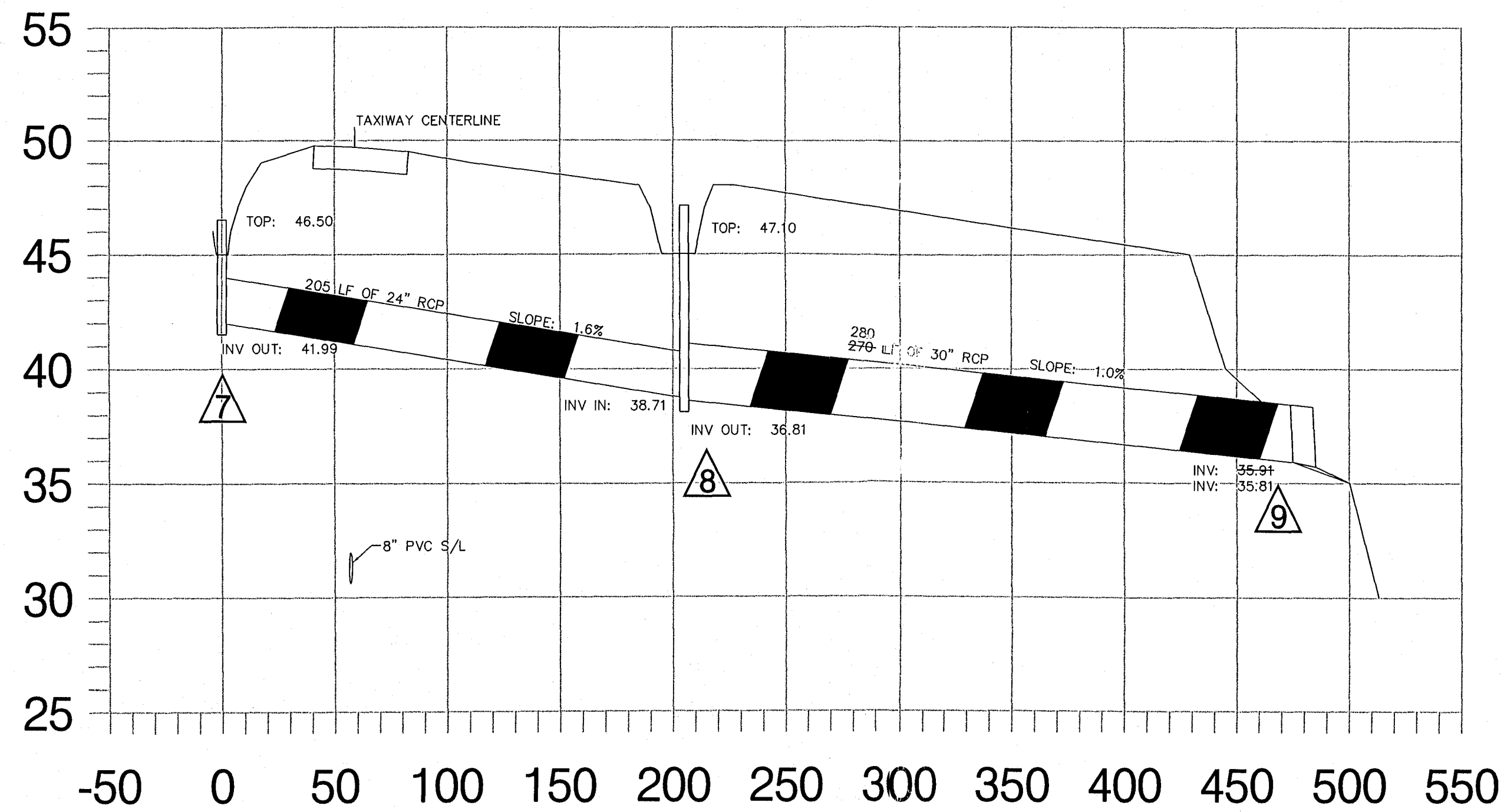


Date	JANUARY 2003
Scale	NONE
Drawn	MSP
Checked	STP
Project No.	4205-0101
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RECORD DRAWINGS  
MAY 7, 2008

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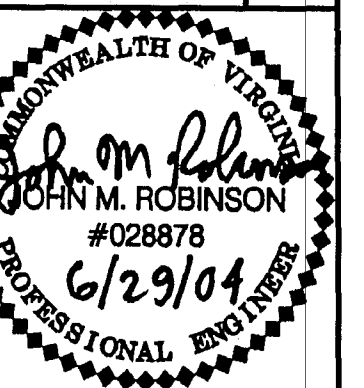


RECORD DRAWINGS  
MAY 7, 2008

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10105 KRAUSE ROAD, SUITE 100  
CHESTERFIELD, VIRGINIA 23822  
PHONE 804-768-6878 FAX 804-768-6871

RECORD DRAWINGS		5/07/08
REV. NO.	DESCRIPTION	DATE
1		

**STORM SEWER PROFILE**  
T-Hanger Site Preparation (Phase I) & Parking Lot Expansion  
Williamsburg-Jamestown Airport - Williamsburg, Virginia



Date	JANUARY 2003
Scale	HORZ. 1"=50' VERT. 1"=5'
Drawn	MSP
Checked	STP
Project No.	4205-0101
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Of 17

## Worksheet 2: Runoff curve number and runoff

Project \_\_\_\_\_ By \_\_\_\_\_ Date \_\_\_\_\_

Location \_\_\_\_\_ Checked \_\_\_\_\_ Date \_\_\_\_\_

Circle one: Present Developed

### 1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN <sup>1/</sup>			Area <input checked="" type="checkbox"/> acres <input type="checkbox"/> mi <sup>2</sup> <input type="checkbox"/> %	Product of CN x area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	OPEN SPACE	99			49.7	3926.3
C	ASPHALT (R/W, T/W, APRON)	98			5.6	548.8
Totals =					55.3	4475.1

<sup>1/</sup> Use only one CN source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{4475.1}{55.3} = 80.9$$
 Use CN = 81

### 2. Runoff

Frequency ..... yr  
 Rainfall, P (24-hour) ..... in  
 Runoff, Q ..... in  
 (Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)

Storm #1	Storm #2	Storm #3
1	10	100
2.8	5.8	8.0
1.10	3.6	5.8

Same

Location \_\_\_\_\_ Checked \_\_\_\_\_ Date \_\_\_\_\_

Circle one:  $T_c$   $T_r$  through subarea

Include a map, schematic, or description of flow segments.

Segment ID

- [illegible]

Segment ID

- [illegible]

Segment ID

- |  |   |  |   |     |
|--|---|--|---|-----|
|  |   |  |   |     |
|  |   |  |   |     |
|  |   |  |   |     |
|  |   |  |   |     |
|  |   |  |   |     |
|  |   |  |   |     |
|  |   |  |   |     |
|  |   |  |   |     |
|  |   |  |   |     |
|  |   |  |   |     |
|  | + |  | = |     |
|  |   |  |   | .89 |

# Worksheet 4: Graphical Peak Discharge method

Project T-HANGAR SITE PREP By SNP Date 12-27-02

Location WILLIAMSBURG - JAMESTOWN AIRPORT Checked \_\_\_\_\_ Date \_\_\_\_\_

Circle one: Present Developed \_\_\_\_\_

## 1. Data:

Drainage area .....  $A_m = .10$   $mi^2$  (acres/640)  
 Runoff curve number .... CN = 81 (From worksheet 2)  
 Time of concentration ..  $T_c = .89$  hr (From worksheet 3)  
 Rainfall distribution type = II (I, IA, II, III)  
 Pond and swamp areas spread throughout watershed ..... = 1.0 percent of  $A_m$  (— acres or  $mi^2$  covered)

		Storm #1	Storm #2	Storm #3
2. Frequency .....	yr	1	10	100
3. Rainfall, P (24-hour) .....	in	2.8	5.8	8.0
4. Initial abstraction, $I_a$ .....	in	.469	.469	.469
(Use CN with table 4-1.)				
5. Compute $I_a/P$ .....		.168	.081	.059
6. Unit peak discharge, $q_u$ .....	csn/in	375	425	475
(Use $T_c$ and $I_a/P$ with exhibit 4-11)				
7. Runoff, Q .....	in	1.10	3.6	5.8
(From worksheet 2).				
8. Pond and swamp adjustment factor, $F_p$ ....		1.0	1.0	1.0
(Use percent pond and swamp area with table 4-2. Factor is 1.0 for zero percent pond and swamp area.)				
9. Peak discharge, $q_p$ .....	cfs	41.3	153.0	275.5
(Where $q_p = q_u A_m Q F_p$ )				

# Worksheet 2: Runoff curve number and runoff

27.9

Project \_\_\_\_\_ By \_\_\_\_\_ Date \_\_\_\_\_

Location \_\_\_\_\_ Checked \_\_\_\_\_ Date \_\_\_\_\_

Circle one: Present Developed \_\_\_\_\_

## 1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN <sup>1/</sup>			Area <input checked="" type="checkbox"/> acres <input type="checkbox"/> mi <sup>2</sup> <input type="checkbox"/> %	Product of CN x area
		Table 2-2	Fig. 2-3	Fig. 2-4		
C	GRAVEL PARKING, ROOFS	98			2.8	274.4
C	OPEN SPACE	79			33.4	2638.6
C	Pavement (T/w, R/w)	98			3.0	294
C	OPEN SPACE	79			24.9	1967.1
Totals =					64.1	5174.1

<sup>1/</sup> Use only one CN source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{5174.1}{64.1} = 80.7$$

Use CN =

81

## 2. Runoff

Frequency ..... yr  
 Rainfall, P (24-hour) ..... in  
 Runoff, Q ..... in  
 (Use P and CN with table 2-1, fig. 2-1,  
 or eqs. 2-3 and 2-4.)

Storm #1	Storm #2	Storm #3
1	10	100
2.8	5.8	8.0
1.10	3.6	5.8



### Worksheet 3: Time of concentration ( $T_c$ ) or travel time ( $T_t$ )

Project \_\_\_\_\_ By \_\_\_\_\_ Date \_\_\_\_\_

Location \_\_\_\_\_ Checked \_\_\_\_\_ Date \_\_\_\_\_

Circle one: Present Developed \_\_\_\_\_

Circle one:  $T_c$   $T_t$  through subarea \_\_\_\_\_

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

#### Sheet flow (Applicable to $T_c$ only)

- Segment ID
1. Surface description (table 3-1) .....
  2. Manning's roughness coeff.,  $n$  (table 3-1) ..
  3. Flow length,  $L$  (total  $L \leq 300$  ft) ..... ft
  4. Two-yr 24-hr rainfall,  $P_2$  ..... in
  5. Land slope,  $s$  ..... ft/ft
  6.  $T_t = \frac{0.007 (nL)^{0.8}}{P_2^{0.5} s^{0.4}}$  Compute  $T_t$  ..... hr

1	
WOODS	
.80	
300	
3.5	
.10	
.75	+ — = .75

#### Shallow concentrated flow

- Segment ID
7. Surface description (paved or unpaved) .....
  8. Flow length,  $L$  ..... ft
  9. Watercourse slope,  $s$  ..... ft/ft
  10. Average velocity,  $V$  (figure 3-1) ..... ft/s
  11.  $T_t = \frac{L}{3600 V}$  Compute  $T_t$  ..... hr

2	
UNPAVED	
350	
.125	
6.5	
.015	+ — = .02

#### Channel flow

- Segment ID
12. Cross sectional flow area,  $a$  ..... ft<sup>2</sup>
  13. Wetted perimeter,  $p_w$  ..... ft
  14. Hydraulic radius,  $r = \frac{a}{p_w}$  Compute  $r$  ..... ft
  15. Channel slope,  $s$  ..... ft/ft
  16. Manning's roughness coeff.,  $n$  .....
  17.  $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$  Compute  $V$  ..... ft/s
  18. Flow length,  $L$  ..... ft
  19.  $T_t = \frac{L}{3600 V}$  Compute  $T_t$  ..... hr
  20. Watershed or subarea  $T_c$  or  $T_t$  (add  $T_t$  in steps 6, 11, and 19) ..... hr

3	
1187.5	
4750	
.25	
.03	
.06	
1.7	
750	
.12	+ — = .12
.89	

# Worksheet 4: Graphical Peak Discharge method

Project T-HANGER SIDE PREP By STP Date 12-27-02

Location WILLIAMSBURG - JAMESTOWN AIRPORT Checked \_\_\_\_\_ Date \_\_\_\_\_

Circle one: Present Developed

## 1. Data:

Drainage area .....  $A_m = .086$   $mi^2$  (acres/640)  
 Runoff curve number .... CN = 81 (From worksheet 2)  
 Time of concentration ..  $T_c = .89$  hr (From worksheet 3)  
 Rainfall distribution type = II (I, IA, II, III)  
 Pond and swamp areas spread throughout watershed ..... = 1.0 percent of  $A_m$  (\_\_\_\_ acres or  $mi^2$  covered)

2. Frequency ..... yr

3. Rainfall, P (24-hour) ..... in

4. Initial abstraction,  $I_a$  ..... in  
 (Use CN with table 4-1.)

5. Compute  $I_a/P$  .....

6. Unit peak discharge,  $q_u$  ..... csm/in  
 (Use  $T_c$  and  $I_a/P$  with exhibit 4-\_\_\_\_)

7. Runoff, Q ..... in  
 (From worksheet 2).

8. Pond and swamp adjustment factor,  $F_p$  ....  
 (Use percent pond and swamp area with table 4-2. Factor is 1.0 for zero percent pond and swamp area.)

9. Peak discharge,  $q_p$  ..... cfs  
 (Where  $q_p = q_u A_m OF_p$ )

Storm #1	Storm #2	Storm #3
1	10	100
2.8	5.8	8.0

.469	.469	.469
------	------	------

.168	.081	.059
------	------	------

375	425	475
-----	-----	-----

1.0	3.6	5.8
-----	-----	-----

1.0	1.0	1.0
-----	-----	-----

35.48	131.58	236.9
-------	--------	-------

## Worksheet for BMP Point System

## A. STRUCTURAL BMP POINT ALLOCATION

<u>BMP</u>	<u>BMP Points</u>		<u>Fraction of Site Served by BMP</u>	<u>Weighted BMP Points</u>
<u>SAND FILTER</u>	<u>8</u>	x	<u>100%</u>	<u>8</u>
<u>EXCESS POINTS FROM APRON PROJECT</u>		x	<u>SP-63-01 (SEE ATTACHED)</u>	<u>2</u>
		x		
		x		

TOTAL WEIGHTED STRUCTURAL BMP POINTS: 10

B. NATURAL OPEN SPACE CREDIT

<u>Fraction of Site</u>		<u>Natural Open Space Credit</u>		<u>Points for Natural Open Space</u>
_____	X	_____	=	_____
		(0.1 per 1%)		
_____	X	_____	=	_____
		(0.15 per 1%)		

TOTAL NATURAL OPEN SPACE CREDIT: \_\_\_\_\_

C. TOTAL WEIGHTED POINTS

+      =
<u>Structural BMP Points</u> + <u>Natural Open Space Points</u> = <u>Total</u>

Table 2

## Worksheet for BMP Point System

## A. STRUCTURAL BMP POINT ALLOCATION

<u>BMP</u>	<u>BMP Points</u>		<u>Fraction of Site Served by BMP</u>		<u>Weighted BMP Points</u>
<u>SAND FILTER</u>	<u>8</u>	x	<u>100%</u>	=	<u>8</u>
<u>SAND FILTER</u>	<u>8</u>	x	<u>50% ex. imp. cover</u>	=	<u>4</u>
<u>                    </u>	<u>                    </u>	x	<u>                    </u>	=	<u>                    </u>
<u>                    </u>	<u>                    </u>	x	<u>                    </u>	=	<u>                    </u>

TOTAL WEIGHTED STRUCTURAL BMP POINTS: 12

## B. NATURAL OPEN SPACE CREDIT

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

TOTAL NATURAL OPEN SPACE CREDIT:                     

## C. TOTAL WEIGHTED POINTS

<u>12</u>	+	<u>0</u>	=	<u>12</u>
Structural BMP Points		Natural Open Space Points		Total

# Williamsburg-Jamestown Airport - Existing Channel

## Worksheet for Irregular Channel

Project Description	
Worksheet	Existing Channel
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data	
Slope	0.030000 ft/ft
Water Surface Elevation	12.00 ft

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results	
Mannings Coefficient	0.060
Elevation Range	11.50 to 60.00
Discharge	2,021.46 cfs
Flow Area	1,187.5 ft²
Wetted Perimeter	4,750.00 ft
Top Width	4,750.00 ft
Actual Depth	0.50 ft
Critical Elevation	11.91 ft
Critical Slope	0.089138 ft/ft
Velocity	1.70 ft/s
Velocity Head	0.05 ft
Specific Energy	12.05 ft
Froude Number	0.60
Flow Type	Subcritical

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00	680+00	0.060

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00	43.50
100+00	40.00
140+00	32.50
152+00	30.00
175+00	12.50
210+00	11.50
270+00	12.50
290+00	22.50
400+00	30.00
445+00	32.50
475+00	32.50
510+00	31.00
580+00	42.50
680+00	60.00

Project Engineer: Marty Wynn  
FlowMaster v6.0 [614e]  
Page 1 of 1

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Talbert and Bright, Inc.

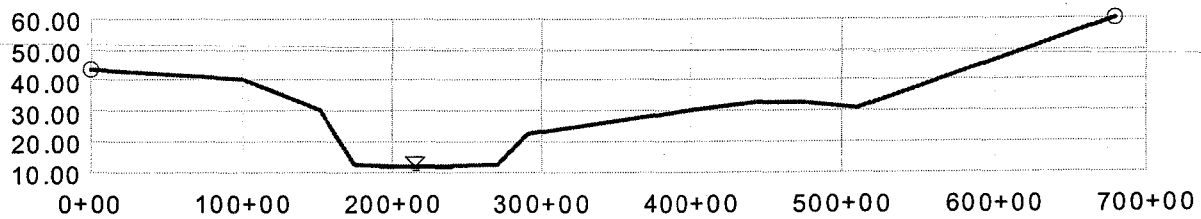
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© Haestad Methods, Inc. 37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

# Cross Section Cross Section for Irregular Channel

Project Description	
Worksheet	Existing Channel
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.060
Slope	0.030000 ft/ft
Water Surface Elevation	12.00 ft
Elevation Range	11.50 to 60.00
Discharge	2,021.46 cfs



V:200.0  
H:1  
NTS

## STORM SEWER DESIGN COMPUTATIONS

PROJECT Williamsburg-Jamestown Airport - T-Hangar Site Preparation

[illegible]

## HYDRAULIC GRADE LINE

PROJECT Williamsburg-Jamestown Airport T-Hangar Site Prep.

[illegible]

$$H_i = 0.35 \frac{V_i^2}{2g}$$

$$H_0 = 0.25 \frac{V_0^2}{2g}$$

$$H_{\Delta} = K \frac{V_i^2}{2g}$$

$$\begin{aligned}\text{FINAL } H &= H_f + H_t \\ H_t &= H_0 + H_i + H_{\Delta} \\ g &= 32.2\end{aligned}$$

$$90^\circ \text{ K} = 0.70$$

$$80^{\text{u}} \text{ K} = 0.66$$

$$70^{\circ}\text{K} = 0.61$$

$$60^\circ \text{ K} = 0.55$$

$$50^{\circ} \text{ K} = 0.47$$

$$40^{\text{u}} \text{ K} = 0.38$$

$$30^{\circ} \text{ K} = 0.28$$

$$25^{\circ} \text{ K} = 0.22$$

$$20^{\circ} \text{ K} = 0.16$$

$$15^\circ \text{ K} = 0.10$$



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

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

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

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

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

- XX 1. All requirements of Section I (Methods and Presentation) apply to this section.
- XX 2. Plan Views: Show general location, arrangement and dimensions. Location and alignment shall generally match approved design plans.
- N/A 3. Profile or elevations along top or berm of the facility. At a minimum, elevations are required at each end, at intervals not to exceed 50 feet and where low spots may be present. Top of embankment or berm elevations must be no less than design elevation plus any settlement allowances.
- N/A 4. Top widths, berm widths and embankment side slopes.
- N/A 5. Show length, width and depth of facility or grading, contours or spot elevations as required to verify permanent pool and design storage volumes were met or were reasonably close to the approved design. Evaluation of as-built grading, contours, spot elevations, or cross-sections, may be necessary by the professional to ensure approved design configurations, depths and volumes were closely maintained. If grading or elevations are significantly different from the approved plan, the Environmental Division shall be contacted immediately to determine whether the variation is acceptable or whether further evidence will be required. Facilities which do not closely resemble approved plan grades, elevations or configurations may require regrading by the Contractor; check volumetric computations; and/or a check hydraulic routing to ensure approved design water surface elevations, discharges or freeboard were closely maintained.
- N/A 6. Cross-section of the embankment through the principal spillway or outlet barrel. Must extend at least 100 ft. downstream of the pipe outlet or to recorded site property line, whichever is closer. Proper correlation is required between principal spillway (control structure) crest, emergency spillway crest, orifice and weirs and the top of the dam or facility. All elevations and dimensions must reasonably match the design plan or be sequentially relative to each other and the facility must reflect the required design storage volume(s) and/or design depth.
- N/A 7. Profile or elevations along the entire centerline of the emergency spillway. Emergency spillway may be steeper, but no flatter or narrower than design.
- N/A 8. Elevation of the principal spillway crest or outlet crest of the structure.

- N/A 9. Primary control structure (riser) diameter or dimensions, height, type of material and base size. Indicate provisions for access that are present such as steps, ladders, etc.
- XX 10. Dimensions, locations and elevations of outlet orifices, weirs, slots and drains.
- N/A 11. Type and size of anti-vortex and trash rack device. Height, diameter, dimensions, bar spacings (if applicable) and elevations relative to the principal spillway crest. Indicate if lockable hatch is present or not.
- N/A 12. Type, location, size and number of anti-seep collars or documentation of other methods utilized for seepage control. **May need to obtain this information during construction.**
- N/A 13. Top of impervious core embankment, core trench limits and elevation of cut-off trench bottom. **May need to obtain this information during construction.**
- N/A 14. Elevation of the principal spillway barrel (outlet pipe) inlet and outlet invert.
- N/A 15. Outlet barrel diameter, length, slope, type and thickness class of material and type of flared end sections, headwall or endwall.
- N/A 16. Outfall protection dimension, type and depth of rock and if underlain filter fabric is present.
- N/A 17. BMP interior and periphery landscaping zones conform with arrangements and requirements of the approved design plan.
- XX 18. Maintenance plan taken from approved design plan transposed onto record drawing set.
- N/A 19. Fencing location and type, if applicable to facility.
- XX 20. BMP vicinity properly cleaned of stockpiles and construction debris.
- XX 21. No visual signs of erosion or channel degradation immediately downstream of facility.
- XX 22. Any other information formally requested by the Environmental Division specific to the constructed SWM/BMP facility.

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

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

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

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

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

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

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

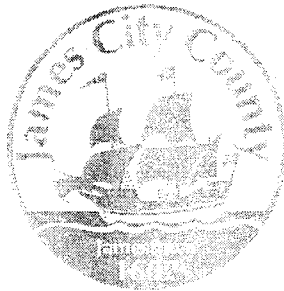
*( Includes all incidental stormwater drainage conveyance systems associated with SWM/BMP facilities such as onsite or offsite storm drains, open channels, inlets, manholes, junctions, outlet protections, deflectors, etc. These facilities are external to the treatment function of, but are directly associated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

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

**XII.    Other Systems**

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

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



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AUG 30 2002

BY:.....

James City County, Virginia  
Environmental Division

**Erosion and Sediment Control and  
Stormwater Management Design Plan Checklists**

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GENERAL INFORMATION

Project Name: T-HANGAR SITE PREPARATION (PHASE I) & PARKING LOT EXPANSION  
Owner / Applicant: WILLIAMSBURG - JAMESTOWN AIRPORT, INC.  
Plan Preparer: STEVEN T. PETERSON - TALBERT & BROWN Email: speterson@tbiric.com  
Project Location: WILLIAMSBURG - JAMESTOWN AIRPORT  
Tax Map / Parcel: 48-4-01-5A  
County Plan No. (if known): SP-63-01  
County BMP Type: \_\_\_\_\_ ( - )

Other information submitted in addition to this checklist (Check all that apply):

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

**Issue Date**  
**March 1, 2001**

**JAMES CITY COUNTY, VIRGINIA  
ENVIRONMENTAL DIVISION**

***EROSION AND SEDIMENT CONTROL PLAN CHECKLIST***

**I. GENERAL:**

Yes No N/A

- ☒ ☐ ☐ *FAMILIARITY* with current versions of Chapter 8, Erosion and Sedimentation Control and Chapter 23, Chesapeake Bay Preservation ordinances of the Code of James City County, Virginia and the Virginia Erosion and Sediment Control Handbook (VESCH).
- ☒ ☐ ☐ *LAND DISTURBING PERMIT AND SILTATION AGREEMENT* with surety are required for the project.
- ☐ ☐ ☒ *VARIANCE* if necessary, requested in writing, for the plan approving authority to waive or modify any of the minimum standards and specifications of the VESCH deemed inappropriate based on site conditions specific to this review case only. Variances which are approved shall be properly documented in the plan and become part of the approved erosion and sediment control plan for the site.

**II. SITE PLAN:**

Yes No N/A

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

Yes No N/A

☒ ☐ ☐

*EXISTING SITE FEATURES* including roads, buildings, homes, utilities, streams, fences, structures and other important surface features of the site.

☐ ☐ ☐

*SOILS MAP* with soil symbols, boundaries and legend in accordance with the current Soil Survey of James City and York Counties and the City of Williamsburg, Virginia.

☐ ☐ ☒

*ENVIRONMENTAL INVENTORY* in accordance with Section 23-10(2) of the Chesapeake Bay Preservation Ordinance of James City County. Inventory generally includes: tidal shores and wetlands, non-tidal wetlands, resource protection area, hydric soils and slopes steeper than 25 percent. For wetlands, provide a copy of issued permits or satisfactory evidence that appropriate permits are being pursued for the entire project.

☐ ☐ ☒

*100-YEAR FLOODPLAIN LIMITS* or any special flood hazard areas or flood zones based on appropriate Federal Management Agency Flood Insurance Rate Maps (FIRMs) or Flood Hazard Boundary Maps (FHBMs) of James City County, Virginia.

☒ ☐ ☐

*DRAINAGE AREAS* for offsite and onsite areas, existing or proposed as applicable. Include drainage divides and directional labels for all subareas at points of interest and size (in acres), weighted runoff coefficient or curve number and times of concentration for each subarea.

☐ ☐ ☒

*CRITICAL EROSION AREAS* which require special consideration or unique erosion and sediment control measures. Refer to the VESCH, Chapter 6 for criteria.

☒ ☐ ☐

*DEVELOPMENT PLAN* for the site showing all improvements such as buildings, structures, parking areas, access roadways, above and below ground utilities, stormwater management and drainage facilities, trails or sidewalks, proposed vegetation and landscaping, amenities, etc.

☒ ☐ ☐

*LOCATION OF PRACTICES* proposed for erosion and sediment control, tree protection and temporary stormwater management due to land disturbance activities at the site. Use standard abbreviations, labels and symbols consistent for plan views based on minimum standards and specifications in Chapter 3 of the VESCH.

☒ ☐ ☐

*TEMPORARY STOCKPILE AREAS* or staging and equipment storage areas as required for onsite or offsite construction activities or indicate that none are anticipated for this project.

☐ ☒ ☐

*OFFSITE LAND DISTURBING AREAS* including borrow sites, waste areas, utility extensions, etc. and required erosion and sediment controls. If none are anticipated for the project, then indicate on the plans by general or erosion and sediment control notes.

☒ ☐ ☐

*DETAILS* or alternately, appropriate reference to current minimum standards and specifications of the VESCH for each measure proposed for the project. Non-modified, standard duplicated details (silt fence, diversion dikes, etc.) may be referenced to the current version of the VESCH. Specific dimensional or modified standards (basins, traps, outlet protections, check dams, etc.) require presentation on detail sheets. Schedules or tables may be used for multiple site measures such as sediment traps, basins, channels, slope drains, etc. Any modification to standard details should be clearly defined, explained and illustrated.

Yes No N/A

☒ ☐ ☐

*MAINTENANCE PLAN* or alternately, appropriate reference to current minimum standards and specifications of the VESCH, outlining the inspection frequency and maintenance requirements for all erosion and sediment control measures proposed for the project.

☐ ☐ ☒

*TRENCH DEWATERING* methods and erosion and sediment controls, if anticipated for the project.

☒ ☐ ☐

*CONSTRUCTION SEQUENCE* outlining the anticipated sequence for installation of erosion and sediment controls and site, grading and utility work to be performed for the project by the site contractor.

☒ ☐ ☐

*PHASING PLAN* if required for larger project sites that are to be developed in stages or phases.

☒ ☐ ☐

*STANDARD COUNTY NOTES* are required to be placed on the erosion and sediment control plan. Refer to the standard James City County Erosion and Sediment Control Notes, latest version.

☒ ☐ ☐

*PROFESSIONAL SEAL AND SIGNATURE* required on final and complete approved plans, drawings, technical reports and specifications.

### III. NARRATIVE:

Yes No N/A

☒ ☐ ☐

*PROJECT DESCRIPTION* briefly describing the nature and purpose of the land disturbing activity and the acreage to be disturbed.

☒ ☐ ☐

*EXISTING SITE CONDITIONS* description of existing topography, land use, cover and drainage patterns at the site.

☒ ☐ ☐

*ADJACENT AREA* descriptions of neighboring onsite or offsite areas such as streams, lakes, property, roads, etc. and potential impacts due to concentrated flow or runoff from the land disturbing activity.

☐ ☒ ☐

*OFFSITE DISTURBED AREA* descriptions of proposed borrow sites, waste or surplus areas, utility extensions and erosion and sediment controls to be implemented.

☒ ☐ ☐

*SOILS DESCRIPTION* briefly summarizing site, disturbed area and drainage basin soils including name, unit, hydrologic soil group (HSG) classification, surface runoff potential, erodibility, permeability, depth, texture, structure, erosion hazards, shrink-swell potential, limitations for use and anticipated depths to bedrock and the seasonal water table, as applicable.

☐ ☒ ☐

*CRITICAL AREAS* on the site which many have potentially serious erosion and sediment control problems and special considerations required (ie. steep slopes, hydric soils, channels, springs, sinkholes, water supply reservoirs, groundwater recharge areas, etc.)

Yes No N/A



Yes No N/A

☒ ☐ ☐

*PROPOSED EROSION & SEDIMENT CONTROL MEASURES* inclusive to the specific erosion and sediment control plan as proposed for the land disturbing activity. Measures should be consistent with those proposed on the site drawings. Address general use, installation, limitations, sequencing and maintenance requirements for each control measure.

☒ ☐ ☐

*STABILIZATION MEASURES* required for the site, either temporary or permanent, and during and following construction including temporary and permanent seeding and mulching, paving, stone, soil stabilization blankets and matting, sodding, landscaping or special stabilization techniques to be utilized at the site.

☒ ☐ ☐

*STORMWATER MANAGEMENT CONSIDERATIONS* for the site, either of temporary or permanent nature, and strategies, sequences and measures required for control. May reference the stormwater management plan for the site, if prepared, for permanent stormwater management facilities and control of drainage once the site is stabilized.

#### IV. CALCULATIONS:

Yes No N/A

☒ ☐ ☐

*CALCULATIONS AND COMPUTATIONS* associated with hydrology, hydraulics and design of proposed temporary and permanent erosion and sediment control measures including: sediment traps and basins, diversions, stormwater conveyance channels, culverts, slope drains, outlet protections, etc. Computations are not required on the construction plan and may be attached in a supplemental erosion and sediment control plan design report, if presented in a clear and organized format.

☐ ☐ ☒

*TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET* submitted for each basin along with schematic or sketch cross-section showing applicable design and construction data, storage volumes (wet-dry), dimensions and elevations. Peak design runoff to be based on the 2- or 25-year design storm event based on maximum disturbed site conditions (existing, interim or proposed conditions) in accordance with Minimum Standard 3.14 of the VESCH.

**JAMES CITY COUNTY, VIRGINIA  
ENVIRONMENTAL DIVISION**

***STORMWATER MANAGEMENT DESIGN PLAN CHECKLIST***

**I. GENERAL:**

Yes No N/A

☒ ☐ ☐

*FAMILIARITY* with current versions of the James City County Guidelines for Design and Construction of Stormwater Management BMPs manual; Chapter 8, Erosion and Sediment Control and Chapter 23, Chesapeake Bay Preservation ordinances of the Code of James City County, Virginia; the Virginia Erosion and Sediment Control Handbook (VESCH); and the Virginia Stormwater Management Handbook (VSMH).

☐ ☐ ☒

*WAIVER OR EXCEPTION* if necessary, requested in writing, for the plan approving authority to waive or except the requirements of Chapter 23, Chesapeake Bay Preservation ordinance in accordance with procedure established in Sections 23-14 through 23-17 of the ordinance. Applies to this review case only.

☐ ☐ ☒

*VARIANCE REQUEST* if necessary, requested in writing for the plan approving authority to waive or modify any of the minimum standards and specifications of the VESCH deemed inappropriate based on site conditions specific to this review case only. Variances which are approved shall be properly documented in the plan and become part of the approved erosion and sediment control plan for the site.

☒ ☐ ☐

*PROFESSIONAL SEAL AND SIGNATURE* required on final and complete approved stormwater management plans, drawings, technical reports and specifications.

☒ ☐ ☐

*WORKSHEET FOR BMP POINT SYSTEM* to ensure the stormwater management plan for the project attains at least 10 BMP points (New Development) or traditional pollutant load reduction computations per the Chesapeake Bay Local Assistance Manual (Redevelopment Only).

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*PROPOSED CONSERVATION EASEMENT AREAS* for any natural open space points claimed in the BMP worksheet.

☐ ☐ ☐

*INSPECTION/MAINTENANCE AGREEMENT* is required to be prepared and executed with the County for the project.

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*FEMA FIRM PANEL* reference with designated special flood hazard areas or zone designations associated with the site, as applicable.

☒ ☐ ☐

*DRAINAGE AREA MAP* at a maximum scale of 1"=200' scale showing drainage area boundaries for pre- and postdevelopment conditions and associated time of concentration flow paths. Labels to include drainage area size, runoff coefficient or curve number and time of concentration for each subarea shown on the map.

Yes No N/A

☒ ☐ ☐

*SOILS MAP* with soil symbols, boundaries and legend in accordance with the current Soil Survey of James City and York Counties and the City of Williamsburg, Virginia with approximate locations of the project site, BMPs and applicable drainage basins.

☒ ☐ ☐

*STORMWATER MANAGEMENT NARRATIVE* in a brief and simple format which describes the project; location; site and drainage basin soil characteristics; receiving water or drainage facility; existing site and drainage basin conditions (topography, land use, cover, slopes, etc.); proposed site development; proposed stormwater management and drainage plan including County BMP type selected; summary of hydrology and hydraulics; maintenance program; and any special assumptions utilized for development of the stormwater management and drainage design plan or computations.

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*TEMPORARY STORMWATER MANAGEMENT* (if applicable) for control of stormwater runoff encountered during construction activities in addition to measures provided in the erosion and sediment control plan or stormwater management/drainage plan for the site. Adequate protection measures or sequencing provided.

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*MODIFICATION PLAN* clearly defined for temporary sediment control structures which will be converted to permanent SWM/BMP structures. Includes appropriate hydrologic and hydraulic computations, conversions, sequencing and cleanout information or details. Normally related to primary control structures associated with dry detention or wet retention ponds. Normally not permitted for Group C or D categories such as bioretention, infiltration and filtering system facilities.

☐ ☐ ☒

*STORMWATER MANAGEMENT and DRAINAGE DESIGN REPORT* in a bound 8-1/2 x 11 inch size format. Report shall generally include a title sheet, date, project identification, owner and preparer information, table of contents, narrative, summaries and computations as required. Computations may include: backwater, closed conduit, headwater, hydraulic, hydraulic grade line, hydrology, inlet, open channel, storm sewer, water quality, extended detention or stream channel protection and multi-stage storm routing calculations, as applicable, for the project. Computation data may include hand or computer generated computations, maps or schematics. All information should be presented in a clear, easy to follow format and should closely match construction plan information.

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*PLAN VIEW* at 1 inch = 50 ft. scale or less (1" = 40', 1" = 30', etc.)

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North arrow and plan legend.

☒ ☐ ☐

Property lines.

☒ ☐ ☐

Adjacent property information.

☒ ☐ ☐

Existing site features and existing impervious cover areas.

☒ ☐ ☐

Impervious cover tabulations.

☒ ☐ ☐

Existing drainage facilities (natural or manmade).

☐ ☐ ☒

Existing environmentally sensitive areas (RPA, wetlands, floodplain, steep slopes, critical soils, buffers, etc.).

☒ ☐ ☐

Existing and proposed contours (1' or 2' contour interval) and spot elevations as necessary to define high and low topography.

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Existing and proposed easement locations.

Yes No N/A

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Proposed site improvements and proposed impervious cover areas.  
Proposed stormwater conveyance, drainage and management facilities with appropriate labeled construction data and information.  
Proposed landscaping and seeding plans (disturbed areas, pond interior, etc.).  
Proposed slope stabilization areas (riprap, blankets, matings, walls, etc.).  
Delineation of permanent pools and the 1-, 2-, 10- and 100-year Design Water Surface Elevations.  
Delineation of ponding, headwater, surcharge or backwater areas which may affect adjacent existing or proposed buildings, structures or upstream adjacent properties.  
Test boring locations with reference surface elevations (if known).  
Risers, barrels, underdrains, overflows and outlet protections.  
Emergency spillway level section and outlet channel.  
Existing and proposed site utilities and protection measures.  
Erosion and sediment control measures (for site or BMP).  
Maintenance or access corridors to permanent stormwater management, BMP or drainage facilities.

## II. STORMWATER CONVEYANCE SYSTEMS:

Yes No N/A

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### PLAN VIEWS

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Storm drain lengths, sizes, types, classes and slopes for all segments. Label directly on plan or use structure/pipe schedule.  
Access structure (inlets, manholes, junctions, etc.) rim elevations, inverts, type and required grate or top unit and lengths labeled.  
All structure numbers labeled.  
Adequate horizontal clearance from other site utilities or structures.

☐ ☐ ☒

**PROFILES** generally are not required but are encouraged to expedite review. If not provided, ensure all pipe segments have adequate minimum cover, do not exceed maximum depths of cover for the type/class of pipe specified and do not conflict with other site utilities or excavation areas.

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### DETAILS

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Typical storm drain bedding details or reference note.  
Standard details or reference note for all proposed access structure types (inlets, manholes, junctions, etc.).  
Inlet shaping detail or applicable reference note.  
Step detail or applicable reference note (if depth 4 ft. or more).  
Typical open channel details with designation, location, shape, type, bottom width, top width, lining, slope, length, side slope, and installation depth required for construction. Channel design data as necessary may also be included.  
Outlet protections at all pipe outfalls.

Yes No N/A

☐ ☐ ☐

***STORMWATER CONVEYANCE SYSTEM COMPUTATIONS***

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

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

Yes No N/A

☒ ☐ ☐

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

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

☐ ☐ ☐

***FACILITY CONFIGURATION and MINIMUM SEPARATIONS***

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

Yes No N/A

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

Yes No N/A

☐ ☐ ☒

#### *HYDRAULIC COMPUTATIONS*

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

☐ ☐ ☒

#### *POND or RESERVOIR ROUTING*

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

☐ ☐ ☐

#### *MISCELLANEOUS COMPUTATIONS*

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

Yes No N/A

- ☐ ☐ ☒ Riser / base structure flotation analyses. FS = 1.25 minimum.
- ☐ ☐ ☒ Downstream danger reach study and/or emergency action plan (if conditions warrant).
- ☐ ☐ ☒ Upstream backwater analyses onto offsite adjacent property (if conditions warrant).
- ☐ ☐ ☒ 100 year floodplain impacts (if conditions warrant).

Yes No N/A

☐ ☐ ☐

**GEOTECHNICAL REQUIREMENTS**

- ☒ ☐ ☐ Geotechnical Report with recommendations specific to BMP facility type selected. Report prepared by a registered professional engineer. Requires submission, review and approval prior to issuance of Land Disturbance Permit.
- ☒ ☐ ☐ Initial Feasibility Testing requirements satisfied as per Appendix E of the James City County Guidelines for Design and Construction of Stormwater Management BMPs manual. (Infiltration, Bioretention and Filtering System BMP types only).
- ☐ ☐ ☒ Concept Design Testing requirements satisfied as per Appendix E of the James City County Guidelines for Design and Construction of Stormwater Management BMPs manual. (Infiltration, Bioretention and Filtering System BMP types only).
- ☒ ☐ ☐ Minimum Boring locations: borrow area, pool area, principal control structure, top of facility near one abutment and emergency spillway if provided.
- ☒ ☐ ☐ Boring logs with Unified Soil Classification (ASTM D2487), soils descriptions and depths to bedrock and the seasonal water table indicated.
- ☒ ☐ ☐ Standard County Record Drawing/Construction Certification note provided on plan. *Note: It is understood that preparation of record drawings and construction certifications as required for project facilities may not necessarily be performed by the plan preparer. These components may be performed by others.*

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**PRINCIPAL SPILLWAY PROFILE AND ASSOCIATED DETAILS**

☐ ☐ ☒

**EXISTING GROUND AND PROPOSED GRADE**

- ☐ ☐ ☐ Embankment or excavation side slopes labeled (3H:1V maximum).
- ☐ ☐ ☐ Minimum top width labeled (per VESCH or VSMH requirements).
- ☐ ☐ ☐ Removal of unsuitable material under proposed facility (per Geotechnical Report requirements).

Yes No N/A

☒ ☐ ☐

**CORE TRENCH**

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

☐ ☐ ☒

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

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

☐ ☐ ☒

**PRINCIPAL CONTROL STRUCTURE OUTLET BARREL**

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

☐ ☐ ☒

**SEEPAGE CONTROL**

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

☐ ☐ ☒

**ANTI-SEEP COLLARS**

- ☐ ☐ ☐ Anti-seep collar, concrete preferred.
- ☐ ☐ ☐ Size - 15 percent increase in length of saturation using outside pipe diameter.
- ☐ ☐ ☐ Spacing and location on barrel (located at least 2 feet from a pipe joint).



☐ ☐ ☒ *FILTER DIAPHRAGMS*

- ☐ ☐ ☐ Design based on latest NRCS design methods and certified by a professional engineer.

Yes No N/A

☐ ☐ ☒ *ELEVATION AND DIMENSIONAL DESIGN DATA*

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

☐ ☐ ☒ *CROSS SECTION THROUGH FACILITY*

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

☐ ☐ ☒ *EMERGENCY SPILLWAY PROFILE*

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

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

Yes No N/A

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**CONSTRUCTION SPECIFICATIONS and NOTES**

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

☐ ☐ ☐

**MAINTENANCE PROVISIONS**

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

#### IV. OUTLET PROTECTIONS:

~~Yes~~ No N/A

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Sized for maximum design release (generally 10-year storm).

Flared end section or endwall.

### Dimensions.

Rock or riprap size, quantity and placement thickness.

Slope at 0 percent (Level Grade).

Geotextiles (nonwoven).

Special energy dissipators are required for design discharge velocities that exceed eighteen (18) feet per second; or if use of standard outlet protection would result in velocities exceeding permissible channel velocities; or if space restricts or limits their use.

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

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no text or other markings on the paper.

Plan Preparer:

Date:

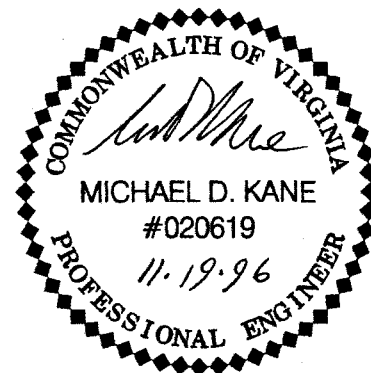
# ***DESIGN ENGINEER'S REPORT***

## ***HANGAR SITE PREPARATION AND APRON***

***WILLIAMSBURG-JAMESTOWN AIRPORT  
Williamsburg, Virginia***

***NOVEMBER 1996***

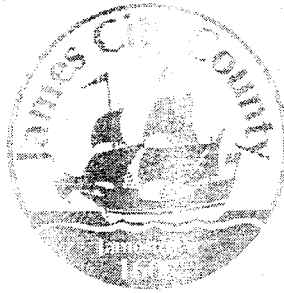
Prepared by:  
Talbert & Bright, Inc.  
13509 East Boundary Rd.  
Suite E  
Midlothian, Virginia 23112  
TBI Project No. 4205-9601



Label	Length	Size	Discharge	Hydraulic Grade	
				Upstream	Downstream
P-1	56.00	18 inch	4.43	39.01	37.92
P-2	123.00	24 inch	5.67	37.92	37.91
P-3	12.00	24 inch	5.51	37.91	37.90
P-5	44.00	36.25 x 22	8.16	38.42	38.19
P-6	227.00	36.25 x 22	8.97	38.19	37.90
P-7	20.00	15 inch	1.50	37.99	37.92
P-9	196.00	24 inch	17.99	37.90	36.66
P-11	9.00	15 inch	4.51	36.70	36.66
P-12	164.00	24 inch	21.98	35.09	33.54
P-13	172.00	24 inch	23.87	33.54	31.60
P-14	11.00	24 inch	30.92	31.60	30.77
P-15	177.00	24 inch	21.28	36.66	35.09
P-17	10.00	15 inch	3.69	37.78	35.37

Label	Discharge	Elevations		
		Ground	Upstream HGL	Downstream HGL
I-1	4.43	39.70	39.01	39.01
J-1	5.67	41.00	37.92	37.92
J-2	5.51	40.00	37.91	37.91
I-2	17.99	39.87	37.90	37.90
I-3	21.98	39.62	35.09	35.09
I-4	8.16	40.50	38.42	38.42
I-5	8.97	39.63	38.19	38.19
I-6	1.50	39.00	37.99	37.99
I-8	4.51	39.74	36.70	36.70
J-3	21.28	39.75	36.66	36.66
I-9	23.87	39.40	33.54	33.54
I-10	30.92	37.69	31.60	31.60
Outlet	30.90	31.23	30.40	30.40
I-12	3.69	38.25	37.78	37.78

Elapsed: 0 minute(s) 8 second(s)



James City County, Virginia  
Environmental Division



## Erosion and Sediment Control and Stormwater Management Design Plan Checklists

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#### GENERAL INFORMATION

Project Name: APRON EXPANSION - PHASE I  
Owner / Applicant: WILLIAMSBURG - JAMESTOWN AIRPORT, INC  
Plan Preparer: STEVEN T. PETERSON - TALBERT & BLUNT Email: speterson@t&binc.com  
Project Location: WILLIAMSBURG - JAMESTOWN AIRPORT  
Tax Map / Parcel: 48-4-01-SA  
County Plan No. (if known): SP-63-01  
County BMP Type: \_\_\_\_\_ ( - )

Other information submitted in addition to this checklist (Check all that apply):

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

Issue Date  
March 1, 2001

**JAMES CITY COUNTY, VIRGINIA  
ENVIRONMENTAL DIVISION**

***EROSION AND SEDIMENT CONTROL PLAN CHECKLIST***

**I. GENERAL:**

Yes No N/A

- ☒ ☐ ☐ *FAMILIARITY* with current versions of Chapter 8, Erosion and Sedimentation Control and Chapter 23, Chesapeake Bay Preservation ordinances of the Code of James City County, Virginia and the Virginia Erosion and Sediment Control Handbook (VESCH).
- ☒ ☐ ☐ *LAND DISTURBING PERMIT AND SILTATION AGREEMENT* with surety are required for the project.
- ☐ ☐ ☒ *VARIANCE* if necessary, requested in writing, for the plan approving authority to waive or modify any of the minimum standards and specifications of the VESCH deemed inappropriate based on site conditions specific to this review case only. Variances which are approved shall be properly documented in the plan and become part of the approved erosion and sediment control plan for the site.

**II. SITE PLAN:**

Yes No N/A

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

Yes No N/A

☒ ☐ ☐

*EXISTING SITE FEATURES* including roads, buildings, homes, utilities, streams, fences, structures and other important surface features of the site.

☒ ☐ ☐

*SOILS MAP* with soil symbols, boundaries and legend in accordance with the current Soil Survey of James City and York Counties and the City of Williamsburg, Virginia.

☐ ☐ ☒

*ENVIRONMENTAL INVENTORY* in accordance with Section 23-10(2) of the Chesapeake Bay Preservation Ordinance of James City County. Inventory generally includes: tidal shores and wetlands, non-tidal wetlands, resource protection area, hydric soils and slopes steeper than 25 percent. For wetlands, provide a copy of issued permits or satisfactory evidence that appropriate permits are being pursued for the entire project.

☐ ☐ ☒

*100-YEAR FLOODPLAIN LIMITS* or any special flood hazard areas or flood zones based on appropriate Federal Management Agency Flood Insurance Rate Maps (FIRMs) or Flood Hazard Boundary Maps (FHBMs) of James City County, Virginia.

☒ ☐ ☐

*DRAINAGE AREAS* for offsite and onsite areas, existing or proposed as applicable. Include drainage divides and directional labels for all subareas at points of interest and size (in acres), weighted runoff coefficient or curve number and times of concentration for each subarea.

☒ ☐ ☐

*CRITICAL EROSION AREAS* which require special consideration or unique erosion and sediment control measures. Refer to the VESCH, Chapter 6 for criteria.

☒ ☐ ☐

*DEVELOPMENT PLAN* for the site showing all improvements such as buildings, structures, parking areas, access roadways, above and below ground utilities, stormwater management and drainage facilities, trails or sidewalks, proposed vegetation and landscaping, amenities, etc.

☒ ☐ ☐

*LOCATION OF PRACTICES* proposed for erosion and sediment control, tree protection and temporary stormwater management due to land disturbance activities at the site. Use standard abbreviations, labels and symbols consistent for plan views based on minimum standards and specifications in Chapter 3 of the VESCH.

☒ ☐ ☐

*TEMPORARY STOCKPILE AREAS* or staging and equipment storage areas as required for onsite or offsite construction activities or indicate that none are anticipated for this project.

☐ ☐ ☒

*OFFSITE LAND DISTURBING AREAS* including borrow sites, waste areas, utility extensions, etc. and required erosion and sediment controls. If none are anticipated for the project, then indicate on the plans by general or erosion and sediment control notes.

☒ ☐ ☐

*DETAILS* or alternately, appropriate reference to current minimum standards and specifications of the VESCH for each measure proposed for the project. Non-modified, standard duplicated details (silt fence, diversion dikes, etc.) may be referenced to the current version of the VESCH. Specific dimensional or modified standards (basins, traps, outlet protections, check dams, etc.) require presentation on detail sheets. Schedules or tables may be used for multiple site measures such as sediment traps, basins, channels, slope drains, etc. Any modification to standard details should be clearly defined, explained and illustrated.



Yes No N/A

☒ ☐ ☐

*MAINTENANCE PLAN* or alternately, appropriate reference to current minimum standards and specifications of the VESCH, outlining the inspection frequency and maintenance requirements for all erosion and sediment control measures proposed for the project.

☐ ☐ ☒

*TRENCH DEWATERING* methods and erosion and sediment controls, if anticipated for the project.

☒ ☐ ☐

*CONSTRUCTION SEQUENCE* outlining the anticipated sequence for installation of erosion and sediment controls and site, grading and utility work to be performed for the project by the site contractor.

☒ ☐ ☐

*PHASING PLAN* if required for larger project sites that are to be developed in stages or phases.

☒ ☐ ☐

*STANDARD COUNTY NOTES* are required to be placed on the erosion and sediment control plan. Refer to the standard James City County Erosion and Sediment Control Notes dated May 5, 1999.

☒ ☐ ☐

*PROFESSIONAL SEAL AND SIGNATURE* required on final and complete approved plans, drawings, technical reports and specifications.

### III. NARRATIVE:

Yes No N/A

☒ ☐ ☐

*PROJECT DESCRIPTION* briefly describing the nature and purpose of the land disturbing activity and the acreage to be disturbed.

☒ ☐ ☐

*EXISTING SITE CONDITIONS* description of existing topography, land use, cover and drainage patterns at the site.

☒ ☐ ☐

*ADJACENT AREA* descriptions of neighboring onsite or offsite areas such as streams, lakes, property, roads, etc. and potential impacts due to concentrated flow or runoff from the land disturbing activity.

☒ ☐ ☐

*OFFSITE DISTURBED AREA* descriptions of proposed borrow sites, waste or surplus areas, utility extensions and erosion and sediment controls to be implemented.

☒ ☐ ☐

*SOILS DESCRIPTION* briefly summarizing site, disturbed area and drainage basin soils including name, unit, hydrologic soil group (HSG) classification, surface runoff potential, erodibility, permeability, depth, texture, structure, erosion hazards, shrink-swell potential, limitations for use and anticipated depths to bedrock and the seasonal water table, as applicable.

☒ ☐ ☐

*CRITICAL AREAS* on the site which may have potentially serious erosion and sediment control problems and special considerations required (ie. steep slopes, hydric soils, channels, springs, sinkholes, water supply reservoirs, groundwater recharge areas, etc.)

Yes No N/A

☒ ☐ ☐

*PROPOSED EROSION & SEDIMENT CONTROL MEASURES* inclusive to the specific erosion and sediment control plan as proposed for the land disturbing activity. Measures should be consistent with those proposed on the site drawings. Address general use, installation, limitations, sequencing and maintenance requirements for each control measure.

☒ ☐ ☐

*STABILIZATION MEASURES* required for the site, either temporary or permanent, and during and following construction including temporary and permanent seeding and mulching, paving, stone, soil stabilization blankets and matting, sodding, landscaping or special stabilization techniques to be utilized at the site.

☒ ☐ ☐

*STORMWATER MANAGEMENT CONSIDERATIONS* for the site, either of temporary or permanent nature, and strategies, sequences and measures required for control. May reference the stormwater management plan for the site, if prepared, for permanent stormwater management facilities and control of drainage once the site is stabilized.

#### IV. CALCULATIONS:

Yes No N/A

☒ ☐ ☐

*CALCULATIONS AND COMPUTATIONS* associated with hydrology, hydraulics and design of proposed temporary and permanent erosion and sediment control measures including: sediment traps and basins, diversions, stormwater conveyance channels, culverts, slope drains, outlet protections, etc. Computations are not required on the construction plan and may be attached in a supplemental erosion and sediment control plan design report, if presented in a clear and organized format.

☐ ☐ ☒

*TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET* submitted for each basin along with schematic or sketch cross-section showing applicable design and construction data, storage volumes (wet-dry), dimensions and elevations. Peak design runoff to be based on the 2- or 25-year design storm event based on maximum disturbed site conditions (existing, interim or proposed conditions) in accordance with Minimum Standard 3.14 of the VESCH.

**JAMES CITY COUNTY, VIRGINIA  
ENVIRONMENTAL DIVISION**

**STORMWATER MANAGEMENT DESIGN PLAN CHECKLIST**

**I. GENERAL:**

Yes No N/A

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <i>FAMILIARITY</i> with current versions of the James City County Guidelines for Design and Construction of Stormwater Management BMPs manual; Chapter 8, Erosion and Sediment Control and Chapter 23, Chesapeake Bay Preservation ordinances of the Code of James City County, Virginia; the Virginia Erosion and Sediment Control Handbook (VESCH); and the Virginia Stormwater Management Handbook (VSMH).      |
| <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> | <i>WAIVER OR EXCEPTION</i> if necessary, requested in writing, for the plan approving authority to waive or except the requirements of Chapter 23, Chesapeake Bay Preservation ordinance in accordance with procedure established in Sections 23-14 through 23-17 of the ordinance. Applies to this review case only.  |
| <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> | <i>VARIANCE REQUEST</i> if necessary, requested in writing for the plan approving authority to waive or modify any of the minimum standards and specifications of the VESCH deemed inappropriate based on site conditions specific to this review case only. Variances which are approved shall be properly documented in the plan and become part of the approved erosion and sediment control plan for the site. |
| <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <i>PROFESSIONAL SEAL AND SIGNATURE</i> required on final and complete approved stormwater management plans, drawings, technical reports and specifications.  |
| <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <i>WORKSHEET FOR BMP POINT SYSTEM</i> to ensure the stormwater management plan for the project attains at least 10 BMP points (New Development) or traditional pollutant load reduction computations per the Chesapeake Bay Local Assistance Manual (Redevelopment Only).  |
| <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> | <i>PROPOSED CONSERVATION EASEMENT AREAS</i> for any natural open space points claimed in the BMP worksheet.  |
| <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <i>INSPECTION/MAINTENANCE AGREEMENT</i> is required to be prepared and executed with the County for the project.   |
| <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <i>FEMA FIRM PANEL</i> reference with designated special flood hazard areas or zone designations associated with the site, as applicable.  |
| <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <i>DRAINAGE AREA MAP</i> at a maximum scale of 1"=200' scale showing drainage area boundaries for pre- and postdevelopment conditions and associated time of concentration flow paths. Labels to include drainage area size, runoff coefficient or curve number and time of concentration for each subarea shown on the map.   |

Yes No N/A

☒ ☐ ☐

*SOILS MAP* with soil symbols, boundaries and legend in accordance with the current Soil Survey of James City and York Counties and the City of Williamsburg, Virginia with approximate locations of the project site, BMPs and applicable drainage basins.

☒ ☐ ☐

*STORMWATER MANAGEMENT NARRATIVE* in a brief and simple format which describes the project; location; site and drainage basin soil characteristics; receiving water or drainage facility; existing site and drainage basin conditions (topography, land use, cover, slopes, etc.); proposed site development; proposed stormwater management and drainage plan including County BMP type selected; summary of hydrology and hydraulics; maintenance program; and any special assumptions utilized for development of the stormwater management and drainage design plan or computations.

☒ ☐ ☐

*TEMPORARY STORMWATER MANAGEMENT* (if applicable) for control of stormwater runoff encountered during construction activities in addition to measures provided in the erosion and sediment control plan or stormwater management/drainage plan for the site. Adequate protection measures or sequencing provided.

☐ ☐ ☒

*MODIFICATION PLAN* clearly defined for temporary sediment control structures which will be converted to permanent SWM/BMP structures. Includes appropriate hydrologic and hydraulic computations, conversions, sequencing and cleanout information or details. Normally related to primary control structures associated with dry detention or wet retention ponds. Normally not permitted for Group C or D categories such as bioretention, infiltration and filtering system facilities.

☐ ☐ ☒

*STORMWATER MANAGEMENT and DRAINAGE DESIGN REPORT* in a bound 8-1/2 x 11 inch size format. Report shall generally include a title sheet, date, project identification, owner and preparer information, table of contents, narrative, summaries and computations as required. Computations may include: backwater, closed conduit, headwater, hydraulic, hydraulic grade line, hydrology, inlet, open channel, storm sewer, water quality, extended detention or stream channel protection and multi-stage storm routing calculations, as applicable, for the project. Computation data may include hand or computer generated computations, maps or schematics. All information should be presented in a clear, easy to follow format and should closely match construction plan information.

☒ ☐ ☐

*PLAN VIEW* at 1 inch = 50 ft. scale or less (1" = 40', 1" = 30', etc.)

☒ ☐ ☐

North arrow and plan legend.

☒ ☐ ☐

Property lines.

☒ ☐ ☐

Adjacent property information.

☒ ☐ ☐

Existing site features and existing impervious cover areas.

☒ ☐ ☐

Impervious cover tabulations.

☒ ☐ ☐

Existing drainage facilities (natural or manmade).

☐ ☐ ☒

Existing environmentally sensitive areas (RPA, wetlands, floodplain, steep slopes, critical soils, buffers, etc.).

☒ ☐ ☐

Existing and proposed contours (1' or 2' contour interval) and spot elevations as necessary to define high and low topography.

☒ ☐ ☐

Existing and proposed easement locations.

Yes No N/A

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- Proposed site improvements and proposed impervious cover areas.
- Proposed stormwater conveyance, drainage and management facilities with appropriate labeled construction data and information.
- Proposed landscaping and seeding plans (disturbed areas, pond interior, etc.).
- Proposed slope stabilization areas (riprap, blankets, mattings, walls, etc.).
- Delineation of permanent pools and the 1-, 2-, 10- and 100-year Design Water Surface Elevations.
- Delineation of ponding, headwater, surcharge or backwater areas which may affect adjacent existing or proposed buildings, structures or upstream adjacent properties.
- Test boring locations with reference surface elevations (if known).
- Risers, barrels, underdrains, overflows and outlet protections.
- Emergency spillway level section and outlet channel.
- Existing and proposed site utilities and protection measures.
- Erosion and sediment control measures (for site or BMP).
- Maintenance or access corridors to permanent stormwater management, BMP or drainage facilities.

## II. STORMWATER CONVEYANCE SYSTEMS:

Yes No N/A

☐ ☐ ☐

### PLAN VIEWS

☒ ☐ ☐

Storm drain lengths, sizes, types, classes and slopes for all segments.

Label directly on plan or use structure/pipe schedule.

☒ ☐ ☐

Access structure (inlets, manholes, junctions, etc.) rim elevations, inverts, type and required grate or top unit and lengths labeled.

☒ ☐ ☐

All structure numbers labeled.

☒ ☐ ☐

Adequate horizontal clearance from other site utilities or structures.

☐ ☐ ☒

*PROFILES* generally are not required but are encouraged to expedite review. If not provided, ensure all pipe segments have adequate minimum cover, do not exceed maximum depths of cover for the type/class of pipe specified and do not conflict with other site utilities or excavation areas.

☐ ☐ ☐

### DETAILS

☒ ☐ ☐

Typical storm drain bedding details or reference note.

☒ ☐ ☐

Standard details or reference note for all proposed access structure types (inlets, manholes, junctions, etc.).

☐ ☐ ☒

Inlet shaping detail or applicable reference note.

☐ ☐ ☒

Step detail or applicable reference note (if depth 4 ft. or more).

☒ ☐ ☐

Typical open channel details with designation, location, shape, type, bottom width, top width, lining, slope, length, side slope, and installation depth required for construction. Channel design data as necessary may also be included.

☒ ☐ ☐

Outlet protections at all pipe outfalls.

Yes No N/A

☐ ☐ ☐

***STORMWATER CONVEYANCE SYSTEM COMPUTATIONS***

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

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

Yes No N/A

☒ ☐ ☐

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

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

☐ ☐ ☒

***FACILITY CONFIGURATION and MINIMUM SEPARATIONS***

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

Yes No N/A

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

Yes No N/A

☐ ☐ ☐

*HYDRAULIC COMPUTATIONS*

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

☐ ☐ ☐

*POND or RESERVOIR ROUTING*

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

☐ ☐ ☐

*MISCELLANEOUS COMPUTATIONS*

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

Yes No N/A

- ☐ ☐ ☒ Riser / base structure flotation analyses. FS = 1.25 minimum.
- ☐ ☐ ☒ Downstream danger reach study and/or emergency action plan (if conditions warrant).
- ☐ ☐ ☒ Upstream backwater analyses onto offsite adjacent property (if conditions warrant).
- ☐ ☐ ☒ 100 year floodplain impacts (if conditions warrant).

Yes No N/A

☐ ☐ ☐ **GEOTECHNICAL REQUIREMENTS**

- ☒ ☐ ☐ Geotechnical Report with recommendations specific to BMP facility type selected. Report prepared by a registered professional engineer. Requires submission, review and approval prior to issuance of Land Disturbance Permit.
- ☒ ☐ ☐ Initial Feasibility Testing requirements satisfied as per Appendix E of the James City County Guidelines for Design and Construction of Stormwater Management BMPs manual. (Infiltration, Bioretention and Filtering System BMP types only).
- ☐ ☐ ☒ Concept Design Testing requirements satisfied as per Appendix E of the James City County Guidelines for Design and Construction of Stormwater Management BMPs manual. (Infiltration, Bioretention and Filtering System BMP types only).
- ☒ ☐ ☐ Minimum Boring locations: borrow area, pool area, principal control structure, top of facility near one abutment and emergency spillway if provided.
- ☒ ☐ ☐ Boring logs with Unified Soil Classification (ASTM D2487), soils descriptions and depths to bedrock and the seasonal water table indicated.
- ☒ ☐ ☐ Standard County Record Drawing/Construction Certification note provided on plan. *Note: It is understood that preparation of record drawings and construction certifications as required for project facilities may not necessarily be performed by the plan preparer. These components may be performed by others.*

☐ ☐ ☐ **PRINCIPAL SPILLWAY PROFILE AND ASSOCIATED DETAILS**

- ☐ ☐ ☒ **EXISTING GROUND AND PROPOSED GRADE**
  - ☐ ☐ ☒ Embankment or excavation side slopes labeled (3H:1V maximum).
  - ☐ ☐ ☒ Minimum top width labeled (per VESCH or VSMH requirements).
  - ☐ ☐ ☒ Removal of unsuitable material under proposed facility (per Geotechnical Report requirements).



Yes No N/A

☒ ☐ ☐

**CORE TRENCH**

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

☐ ☐ ☒

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

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

☐ ☐ ☒

**PRINCIPAL CONTROL STRUCTURE OUTLET BARREL**

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

☐ ☐ ☒

**SEEPAGE CONTROL**

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

☐ ☐ ☒

**ANTI-SEEP COLLARS**

- ☐ ☐ ☒ Anti-seep collar, concrete preferred.
- ☐ ☐ ☒ Size - 15 percent increase in length of saturation using outside pipe diameter.
- ☐ ☐ ☒ Spacing and location on barrel (located at least 2 feet from a pipe joint).

☐ ☐ ☒

**FILTER DIAPHRAGMS**

☐ ☐ ☒

Design based on latest NRCS design methods and certified by a professional engineer.

Yes No N/A

☐ ☐ ☒

**ELEVATION AND DIMENSIONAL DESIGN DATA**

☐ ☐ ☒

Top of facility - construction height and settled height (10 percent settlement).

☐ ☐ ☒

Crest of principal control structure spillway at least one (1) foot below crest of emergency spillway, if provided.

☐ ☐ ☒

Minimum freeboard of one (1) foot above the 100-year design high water elevation for facilities with an emergency spillway.

☐ ☐ ☒

Minimum freeboard of two (2) feet above the 100-year design high water elevation for facilities without an emergency spillway or in accordance with the SCS National Engineering Handbook (prior approval required).

☐ ☐ ☒

Basin Sediment Clean-Out elevation (permanent mode). Typically 10 to 25 percent of water quality volume.

☐ ☐ ☒

**CROSS SECTION THROUGH FACILITY**

☐ ☐ ☒

Existing Ground.

☐ ☐ ☒

Proposed grade.

☐ ☐ ☒

Top of facility - constructed and settled.

☐ ☐ ☒

Location of emergency spillway with side slopes labeled (emergency spillway in cut).

☐ ☐ ☒

Bottom of core trench (4' minimum).

☐ ☐ ☒

Location of each soil boring.

☐ ☐ ☒

Barrel location.

☐ ☐ ☒

Existing and proposed utility location/protection.

☐ ☐ ☒

**EMERGENCY SPILLWAY PROFILE**

☐ ☐ ☒

Existing ground.

☐ ☐ ☒

Inlet, level (control) and outlet sections per SCS.

☐ ☐ ☒

Spillway and crest elevations.

☒ ☐ ☐

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

Yes No N/A

☐ ☐ ☐

**CONSTRUCTION SPECIFICATIONS and NOTES**

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

☐ ☐ ☐

**MAINTENANCE PROVISIONS**

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

#### IV. OUTLET PROTECTIONS:

**Yes No N/A**

☐ ☐ ☒☐ ☐ ☒☐ ☐ ☒☐ ☐ ☒☐ ☐ ☒☐ ☐ ☒☐ ☐ ☒

Sized for maximum design release (generally 10-year storm).

Flared end section or endwall.

### Dimensions.

Rock or riprap size, quantity and placement thickness.


Slope at 0 percent (Level Grade).

Geotextiles (nonwoven).

Special energy dissipators are required for design discharge velocities that exceed eighteen (18) feet per second; or if use of standard outlet protection would result in velocities exceeding permissible channel velocities; or if space restricts or limits their use.

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

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

Plan Preparer: 

Date: 2-7-02

# Williamsburg-Jamestown Airport - Infield Ditch

## Worksheet for Trapezoidal Channel

Project Description	
Worksheet	Proposed Infield Ditch
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Mannings Coefficient	0.030
Slope	0.005000 ft/ft
Left Side Slope	5.00 H : V
Right Side Slope	5.00 H : V
Bottom Width	3.00 ft
Discharge	38.58 cfs

Results	
Depth	1.34 ft
Flow Area	13.0 ft <sup>2</sup>
Wetted Perimeter	16.67 ft
Top Width	16.40 ft
Critical Depth	1.04 ft
Critical Slope	0.015561 ft/ft
Velocity	2.97 ft/s
Velocity Head	0.14 ft
Specific Energy	1.48 ft
Froude Number	0.59
Flow Type	Subcritical



**Williamsburg - Jamestown Airport - Infield Ditch**  
**Cross Section for Trapezoidal Channel**

---

**Project Description**

---

Worksheet	Proposed Infield Ditch
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

---

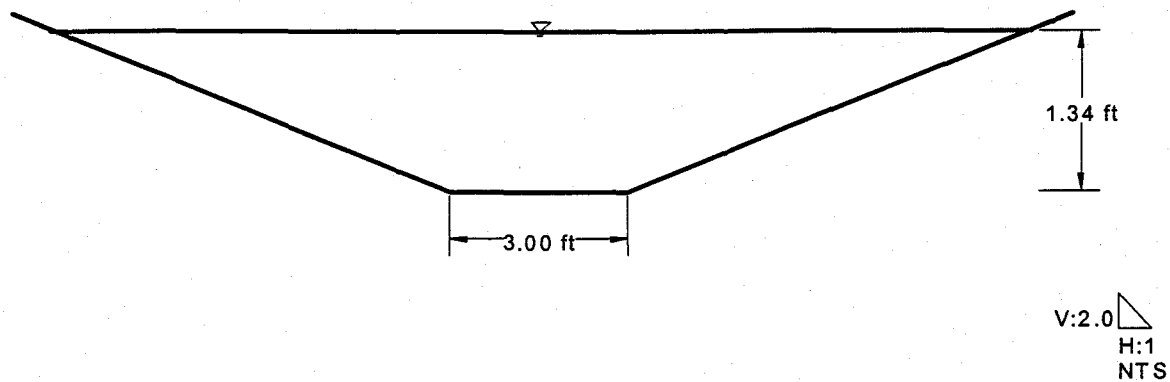
---

**Section Data**

---

Mannings Coefficient	0.030
Slope	0.005000 ft/ft
Depth	1.34 ft
Left Side Slope	5.00 H : V
Right Side Slope	5.00 H : V
Bottom Width	3.00 ft
Discharge	38.58 cfs

---



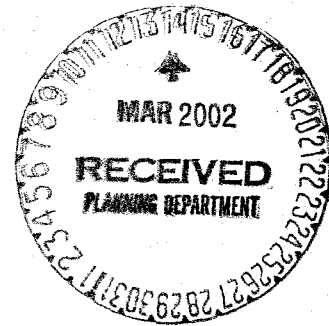
# Existing Outfall Ditch @ STR 6

## Worksheet for Triangular Channel

Project Description	
Worksheet	Outfall Ditch at STR 5-6
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data	
Mannings Coefficient	0.040
Slope	0.055000 ft/ft
Depth	1.50 ft
Left Side Slope	3.00 H : V
Right Side Slope	3.00 H : V

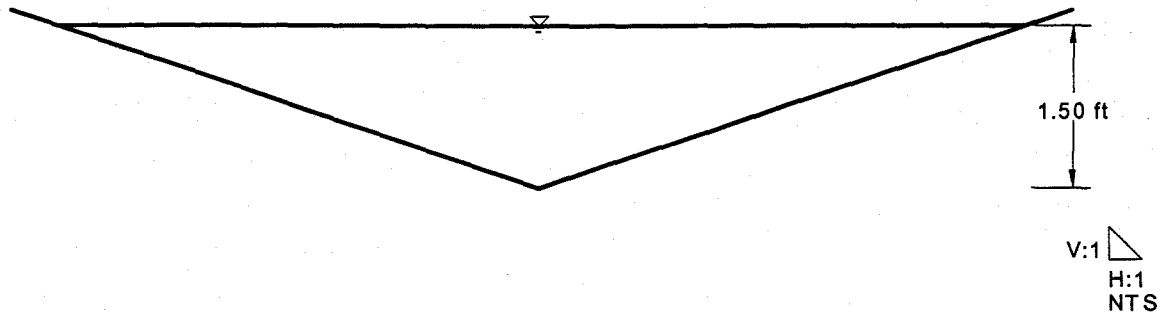
Results	
Discharge	46.87 cfs
Flow Area	6.8 ft <sup>2</sup>
Wetted Perimeter	9.49 ft
Top Width	9.00 ft
Critical Depth	1.72 ft
Critical Slope	0.026287 ft/ft
Velocity	6.94 ft/s
Velocity Head	0.75 ft
Specific Energy	2.25 ft
Froude Number	1.41
Flow Type	Supercritical



**Outfall Ditch @ STR 6**  
**Cross Section for Triangular Channel**

Project Description	
Worksheet	Outfall Ditch at STR 5-6
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.040
Slope	0.055000 ft/ft
Depth	1.50 ft
Left Side Slope	3.00 H : V
Right Side Slope	3.00 H : V
Discharge	46.87 cfs





# Williamsburg-Jamestown Airport - Proposed Ditch @ Apron

## Worksheet for Triangular Channel

Project Description	
Worksheet	Proposed Ditch
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

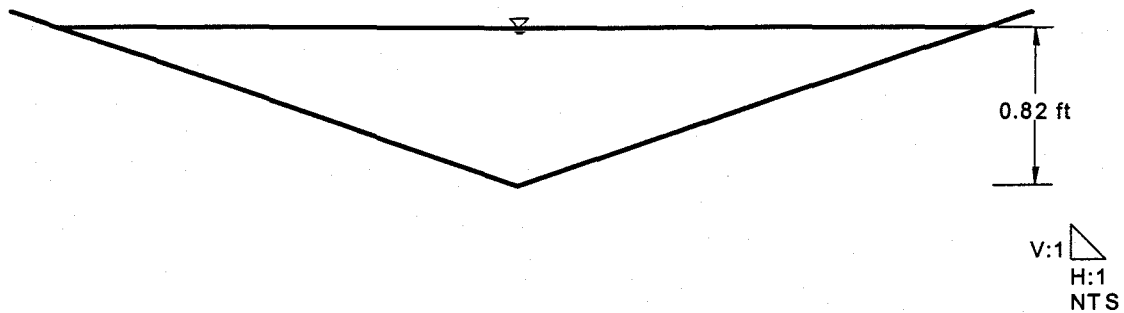
Input Data	
Mannings Coefficient	0.030
Slope	0.005200 ft/ft
Left Side Slope	3.00 H : V
Right Side Slope	3.00 H : V
Discharge	3.89 cfs

Results	
Depth	0.82 ft
Flow Area	2.0 ft <sup>2</sup>
Wetted Perimeter	5.21 ft
Top Width	4.94 ft
Critical Depth	0.64 ft
Critical Slope	0.020606 ft/ft
Velocity	1.91 ft/s
Velocity Head	0.06 ft
Specific Energy	0.88 ft
Froude Number	0.52
Flow Type	Subcritical

**Williamsburg-Jamestown Airport - Proposed Ditch @ Apron**  
**Cross Section for Triangular Channel**

Project Description	
Worksheet	Proposed Ditch
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.030
Slope	0.005200 ft/ft
Depth	0.82 ft
Left Side Slope	3.00 H : V
Right Side Slope	3.00 H : V
Discharge	3.89 cfs



CC023 WMBG JAMESTOWN AIRPORT T HANGER - 075

# JGG DRAINAGE

2/14/02  
CRS

$$Q = C i A \quad C_f = 1.0 \text{ (10-year storm)} \\ A = 3.5 \text{ ACRE}$$

$C = ?$

$$C_1 = .40 \text{ lawn}$$

$$C_2 = .50 \text{ ditch}$$

$$A_1 = (3.5 \text{ ACRE} - \frac{10' \times 550'}{43560}) = 3.37 \text{ AC}$$

$$A_2 = (10' \times 550') / 43560 = .13 \text{ AC}$$

$$C = \frac{3.37(.40) + .13(.50)}{3.37 + .13} = \underline{\underline{.404}}$$

Rainfall intensity

Overland Flow Chart

$$200' \text{ sheet flow - grass slope} = 3.3\%$$

$$230' \text{ channelized flow - grass slope} = 5\%$$

$$20' \text{ channelized flow - grass before ditch slope} = 25\%$$

$$210' \text{ channelized flow - ditch slope} = .80\%$$

$$T_L = 15.5 \text{ min}$$

$$T_L = 14.7 \text{ min}$$

$$T_L = 3.0 \text{ min}$$

$$T_L = 20.7 \text{ min}$$

$$53.9 \text{ min}$$

$$\text{NORFOLK, VA} \rightarrow i = 2.75 \text{ in/hr (10-year storm)}$$

$$Q = (.404)(2.75)(3.5) = 3.89 \text{ cfs}$$

$$Q = 3.89 \text{ cfs}$$

Table 2

## Worksheet for BMP Point System



## A. STRUCTURAL BMP POINT ALLOCATION

<u>BMP</u>	<u>BMP Points</u>		<u>Fraction of Site Served by BMP</u>		<u>Weighted BMP Points</u>
<u>SAND FILTER</u>	<u>8</u>	x	<u>100%</u>	=	<u>8</u>
<u>SAND FILTER</u>	<u>8</u>	x	<u>50% EX. IMP. COVER</u>	=	<u>4</u>
<u>                    </u>	<u>                    </u>	x	<u>                    </u>	=	<u>                    </u>
<u>                    </u>	<u>                    </u>	x	<u>                    </u>	=	<u>                    </u>

TOTAL WEIGHTED STRUCTURAL BMP POINTS: 12

## B. NATURAL OPEN SPACE CREDIT

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

TOTAL NATURAL OPEN SPACE CREDIT:                     

## C. TOTAL WEIGHTED POINTS

<u>12</u>	+	<u>0</u>	=	<u>12</u>
<u>Structural BMP Points</u>		<u>Natural Open Space Points</u>		<u>Total</u>

Williamsburg - Jamestown 4205-0101  
 SAND FILTER VOLUME COMPS - AIRRAIL PT ①

REF: VIRGINIA STORM WATER MANAGEMENT HANDBOOK  
 CHAPTER 3, SUBSECTION 3.12c  
 AUSTIN SURFACE SAND FILTER SYSTEM

IMPERVIOUS AREA ( $I_a$ )

PROPOSED DEVELOPMENT = 0.95AC (T-HANGER & APRON)

MINIMUM AREA OF SAND FILTER ( $A_{fm}$ )

SAND DEPTH = 1.5'

AVG DEPTH OF WATER ABOVE SURFACE ( $h$ ) = 6"

$$A_{fm} = \frac{545 (I_a) (df)}{(h + df)} = \frac{545 (0.95AC) (1.5')}{(0.5' + 1.5')} = 367.9 SF$$

$$FILTER LENGTH = 368 SF / 5' = 77.7' \quad \text{USE } 80'$$

WILLIAMSBURG - JAMESTOWN 4205-0101  
SAND FILTER VOLUME COMPS - PROP PT (2)

REF: VIRGINIA STORM WATER MANAGEMENT HANDBOOK  
CHAPTER 3, SUBSECTION 3.12 C  
AUSTIN SURFACE SAND FILTER SYSTEM

IMPERVIOUS AREA ( $I_a$ )

$$I_a = 1.23 A_c \quad (T_{\text{HANGAR}} + T_{\text{AIRLINE}} / T_{\text{AIRWAY}})$$

MINIMUM AREA OF SAND FILTER ( $A_{FM}$ )

SAND DEPTH ( $d_f$ ) = 1.5'

Avg DEPTH OF WATER ABOVE SURFACE ( $h$ ) = 6"

$$A_{FM} = \frac{545 (I_a) (d_f)}{(h + d_f)} = \frac{545 (1.23) (1.5')}{(0.5' + 1.5')} = 503 \text{ SF}$$

$$\text{FILTER LENGTH} = 503' / 4' = 126' \quad \text{USE } \underline{\underline{130'}}$$

Date Record Created:

Created By:

WS BMPNO:

CC023

Print Record

PRINTED ON

Wednesday, March 10, 201

2:27:43 PM

WATERSHED

CC

BMP ID NO

023

PLAN NO

SP-50-03

TAX PARCEL

(48-2)(1-5A)

PIN NO

4820100005A

CONSTRUCTION DATE

PROJECT NAME

Wmbg-Jamestown Airport T-Hangers

FACILITY LOCATION

100 Marclay Road

CITY-STATE

Williamsburg, VA 23185

CURRENT OWNER

Williamsburg-Jamestown Airport Inc.

OWNER ADDRESS

100 Marclay Road

OWNER ADDRESS 2

CITY-STATE-ZIP CODE

Williamsburg, VA 23185

OWNER PHONE

MAINT AGREEMENT

No

EMERG ACTION PLAN

No

MAINTENANCE PLAN

No

SITE AREA acre

119

LAND USE

Private Airport

old BMP TYP

Dry Swale

JCC BMP CODE

E2 Dry Swale

POINT VALUE

SVC DRAIN AREA acres

55.3

SERVICE AREA DESCRI

IMPERV AREA acres

5.70

RECV STREAM

EXT DET-WQ-CTRL

No

WTR QUAL VOL acre-ft

CHAN PROT CTRL

No

CHAN PROT VOL acre-ft

SW/FLOOD CONTROL

No

GEOTECH REPORT

No

CTRL STRUC DESC

CTRL STRUC SIZE Inches

OTLT BARRL DESC

OTLT BARRL SIZE inch

EMERG SPILLWAY

No

DESIGN HW ELEV

PERM POOL ELEV

2-YR OUTFLOW cfs

0.00

10-YR OUTFLOW cfs

0.00

REC DRAWING

No

CONSTR CERTIF

Yes

LAST INSP DATE

Inspected by:

INTERNAL RATING

MISC/COMMENTS

T-hanger & parking lot exp. Plans for both CC023 & CC024 are in CC024

Get Last BMP No

Return to Menu

Additional Comments:

Called Sand Filter on plan. Also provides for future impervious area of 0.7 acres.

CC023\_WMBG\_JAMESTOWN\_AIRPORT\_T\_HANGER - 080