



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: PC343, PC355

DATE VERIFIED: December 16, 2021

QUALITY ASSURANCE TECHNICIAN: Charles E. Lovett II

Charles E. Lovett II

LOCATION: WILLIAMSBURG, VIRGINIA

NOTES: CERTIFY & UPLOAD

1. Maintenance Agreement



COUNTY OF JAMES CITY, VIRGINIA

Sanitary and Resource
Protection Division
101-E Mounts Bay Road
Williamsburg, VA 23185
757-253-6670
jamescitycountyva.gov

**EASEMENT & DECLARATION OF COVENANTS
INSPECTION/MAINTENANCE OF DRAINAGE SYSTEM**

THIS EASEMENT AND DECLARATION OF COVENANTS, made this 24th day of October,
2019, between Ironbound, L.L.C.

and all successors in interest, (the "OWNER"), owner(s) of the following property:

Tax Map Parcel Identification Number(s): 3842300001

Property Address: 4091 Ironbound Rd

Subdivision Name (or project name if not a subdivision): Ironbound Road Self Storage Facility

Subdivision Lot Number (if known): _____

and the County of James City, Virginia, a political subdivision of the Commonwealth of Virginia (the
"COUNTY").

WITNESSETH:

The OWNER, with full authority to execute deeds, mortgages, other covenants, and all rights, titles and
interests in the property described above, does grant the COUNTY the following rights and hereby covenants
with the COUNTY as follows:

1. The OWNER 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 right-of-
ways.

2. If necessary, the OWNER 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 OWNER, at its sole expense, shall cause the SYSTEM to be inspected by a professional
engineer licensed as such by the Commonwealth of Virginia, at such regular intervals as deemed necessary by
the COUNTY. Such inspections shall either determine that the SYSTEM continues to meet the design
specifications as shown on applicable plans, or else indicate what corrective measures must be taken to return
the SYSTEM to the original design specifications. The OWNER shall provide a written copy of the inspection
certified by the professional engineer to the COUNTY. The COUNTY shall not be bound by the inspection or
recommendations of the professional engineer.

4. The OWNER shall provide and maintain perpetual access from public right-of-ways to the
SYSTEM for the COUNTY, its agents and its contractors.

Prepared by (Name, Address, and Phone):

Ashley Dickerson

2929 Sabre St Suite 500

Virginia Beach, VA 23452

757-486-1122

Return to:

JCC Attorney's Office

101-D Mounts Bay Road

Williamsburg, VA 23185

(757) 253-6612

5. The OWNER hereby grants the COUNTY, its agents and its contractors a right-of-entry to the SYSTEM for the purpose of inspecting, monitoring, operating, installing, constructing, reconstructing, maintaining or repairing the SYSTEM consistent with the rights granted by this Easement and Declaration of Covenants.

6. If, after reasonable notice by the COUNTY, the OWNER shall fail to maintain the SYSTEM in accordance with the approved design standards and with the law and applicable regulations, the COUNTY may perform all necessary repair or maintenance work and assess the OWNER and/or all property served by the SYSTEM for the cost of the work and any applicable penalties.

7. Any amounts incurred by the COUNTY in repairing or maintaining the SYSTEM under these covenants shall be an automatic lien on the above-described property.

8. The OWNER 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.

9. The OWNER shall promptly notify the COUNTY when the OWNER legally transfers any of the OWNER responsibilities for the SYSTEM. The OWNER shall supply the COUNTY with a copy of any document of transfer executed by both parties.

10. The rights and covenants contained herein shall run with the land and shall bind the OWNER and the OWNER's heirs, executors, administrators, successors and assignees, and shall bind all present and subsequent owners of property served by the SYSTEM.

11. This Easement and Declaration of Covenants shall be recorded in the County Land Records.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the OWNER executed this EASEMENT AND DECLARATION OF COVENANTS as of the date first above written.

OWNER

Michael D. Sifen Pres.
Signature

Michael D. Sifen President
Print Name and Title

ACKNOWLEDGMENT

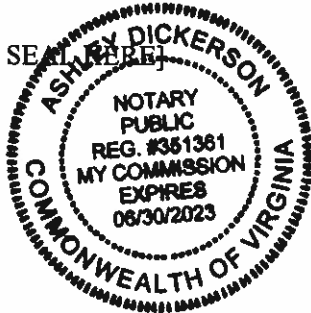
COMMONWEALTH OF VIRGINIA

CITY/COUNTY OF Virginia Beach, to wit:

I hereby certify that on this 24 day of October, 20 19, before the subscribed, a Notary Public for the Commonwealth of Virginia, personally appeared Michael D. Sifen and did acknowledge the foregoing instrument to be his/her Act.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal this 24 day of October, 20 19.

[PLACE NOTARY SEAL HERE]



Ashley Dickerson
Notary Public

Notary Registration Number: 351361

My Commission Expires: 6-30-23

Approved as to form:

M. H.
County Attorney

For Circuit Court Use Only

INSTRUMENT 190016099
RECORDED IN THE CLERK'S OFFICE OF
WMSBG/JAMES CITY CIRCUIT ON
NOVEMBER 1, 2019 AT 02:42 PM
MONA A. FOLEY, CLERK
RECORDED BY: JLZ

April 2019

2. Deeds/Easements/ Agreements/Property Records

3. Construction Certificate



Stormwater Conveyance and Stormwater Management / BMP Facilities Record Drawing and Construction Certification Forms

Standard Forms and Instructions

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Issue Date: February 1, 2001

Revised: April 2019



Stormwater Conveyance and Stormwater Management / BMP Facilities Record Drawing and Construction Certification Forms

Note: In accordance with the Subdivision and Zoning ordinances of the County Code, plans of development have requirements to ensure that at the completion of the project and prior to release of surety, certified record drawings (as-builts) and construction certifications by a registered Professional Engineer, must be provided for constructed stormwater conveyance/drainage system and stormwater management/Best Management Practice (BMP) facilities. In addition, Sections 8-25 and 8-26 of Article II of Chapter 8 of the County Code, require the submission of construction record drawings and construction certifications for permanent stormwater management/BMP facilities and permanent stormwater conveyance systems such as inlets, pipes and channels. In addition, for stormwater management/BMP facilities involving the construction of an impounding structure or dam embankment, certification is required by a professional engineer who performed inspections during construction of the facility.

Section 1 - Site Information:

Project Name: IRONBOUND SELF STORAGE

Structure/BMP Name: UNDERGROUND INFILTRATION SYSTEM AND STORM WATER PIPES

Project Location: 4091 IRONBOUND ROAD

BMP Location: ON SITE

County Plan No.: S-19-0016

VAHU6 HUC Code: 1L31HUC

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

Tax Map/Parcel No.: 3842300001 & 3842300002
County BMP ID Code (if known): _____
Zoning District: M-1 LIMITED BUSINESS/ INDUSTRIAL
Land Use: SELF STORAGE FACILITY
Site Area (sf or acres): 2.18 AC (49,950 SF)

Brief Description of Stormwater Conveyance and/or Stormwater Management/BMP Facility:

The Storm-water conveyance system consists of underground pipe ranging in size from 10 inches to 18 inches.

Connected to an on-site underground infiltration system and jelly fish structure; discharging to an existing 18 " concrete pipe which convey the storm water to an outfall which will eventually ends in the Powhatan Creek

Nearest Visible Landmark to SWM/BMP Facility: The BMP is located with in the drive lane in front of the loading door.

Nearest Vertical Ground Control (if known):

☐ JCC Geodetic Ground Control ☐ USGS ☐ Temporary ☐ Arbitrary ☐ Other

Station Number or Name: _____

Datum or Reference Elevation: _____

Control Description: _____

Control Location from Subject Facility: _____

**Stormwater Conveyance and Stormwater Management/BMP Facilities
Record Drawing and Construction Certification Forms**

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Section 2 - Construction Information

Section 2A - Stormwater Conveyance System Construction Information (Pipes, Channels, etc.):

Pre-Construction Meeting Held: ☒ Yes ☐ No ☐ Unknown

Approx. Construction Start Date for System: 2-24-2020

System Milestone Inspection(s) by County Representative during Construction: ☒ Yes ☐ No ☐ Unknown

Name of Site Work Contractor Who Constructed System: Toano Contractors

Name of Professional Firm Who Monitored Construction: McGillivray Testing

Date of Completion of System: 3-31-2020

Date of Record Drawing/Construction Certification Submittal: _____

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

Pre-Construction Meeting Held for Construction of SWM/BMP Facility: ☐ Yes ☐ No ☐ Unknown

Approx. Construction Start Date for SWM/BMP Facility: _____

Facility Monitored by County Representative during Construction: ☐ Yes ☐ No ☐ Unknown

Name of Site Work Contractor Who Constructed Facility: _____

Name of Professional Firm Who Monitored Construction: _____

Date of Completion for SWM/BMP Facility: _____

Date of Record Drawing/Construction Certification Submittal: _____

(Note: Record drawings and construction certifications are required within thirty (30) days of the completion of the stormwater conveyance system and/or stormwater management/ BMP facility construction. Record drawings and construction certifications must be reviewed and approved by the VESCP/VSMP authority prior to final inspection, acceptance, and surety release or reduction.)

Section 3 - Owner/Designer/Contractor Information:

Owner/Developer: *(Note: Site owner, operator, applicant or permittee responsible for development of the project.)*

Name: Michael D. Sifen, Inc

Mailing Address: 2700 International Pkwy, Suite 100

Virginia Beach, VA 23452

Business Phone: 757-486-1122

Fax: _____

Email: TonySifen@AOL.com

Contact Person: Tony Otash

Title: Project Manager

Design Professional: *(Note: Professional Engineer, Certified Land Surveyor or other qualified professional responsible for the design and preparation of plans and specifications for the stormwater conveyance system and/or stormwater management/BMP facility.)*

Firm Name: Site Improvement Associates, Inc

Mailing Address: 5267 Greenwich Rd, Suite 300, Virginia Beach, VA 23462

Business Phone/Fax: 757.871.9000

Email: jbaraki@siaa.us

Name of Responsible Plan Preparer: Jasam Baraki, PE

Title: Vice President

Plan Name: Iron Bound Self Storage

Firm's Project No. 16189

Plan/Revision Date: 7/26/19

Plan Sheet No.'s Applicable: _____ / _____ / _____ / _____ / _____ / _____ /

**Stormwater Conveyance and Stormwater Management / BMP Facilities
Record Drawing and Construction Certification Forms**

Page 3

Site/Utility Contractor: *(Note: Contractor directly responsible for construction of the stormwater conveyance system and/or stormwater management/BMP facility.)*

Firm Name: Toano Contractors Inc.

Mailing Address: 8589 Richmond Rd.
Toano, VA 23168

Business Phone/Fax: 757-566-0057

Email: info@toanocontractors.com

Contact Person: Chris Taylor

Site Foreman/Supervisor: Chris Taylor

Specialty Subcontractors and Purpose: _____

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 drawing, for the stormwater conveyance system for the project including any stormwater management/BMP facilities. A Registered Professional Engineer is responsible for the inspection, monitoring, and certification of stormwater conveyance systems and/or stormwater management / BMP facilities during its construction. See next page for the "simple" County provided certification form that can be used by qualified professionals to provide this information.)*

Stormwater Conveyance and Stormwater Management / BMP Facilities
Record Drawing and Construction Certification Forms

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STANDARD CERTIFICATION FORM

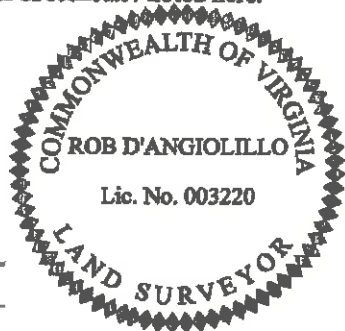
Record Drawing Certification

Firm Name: R. L. Galloway Surveying
Mailing Address: 4908 Fennell Lane Suffolk Va. 23435
Business Phone: 757-394-1995
Fax: N/A
Name: Rob D'Angiolillo
Title: Project Manager
Signature: [Signature]
Date: 9-Sept-2021

I hereby certify to the best of my knowledge and belief that this record drawing represents the actual condition of the,

- ☒ Stormwater conveyance system
☒ Stormwater management / BMP facility

and the facility appears to conform to the provisions of the approved design plan, specifications, and stormwater management plan, except as specifically noted here.



[Signature]

Virginia Registered Professional Engineer or Certified Land Surveyor

Construction Certification

Firm Name: Site Improvement Associates, Inc
Mailing Address: 5267 Greenwich Rd. Suite 300.
Virginia Beach, VA 23462
Business Phone: 757.671.9000
Fax: n/a
Name: Issam Baraki
Title: Vice President
Signature: [Signature]
Date: 09/09/2021

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

- ☒ Stormwater conveyance system
☒ Stormwater management / BMP facility

was monitored and constructed in accordance with the provisions of the approved plan, specifications, and stormwater management plan, except as specifically noted here.



[Signature]

(Seal)

Virginia Registered Professional Engineer

Section 5 - Record Drawing and Construction Certification Requirements and Instructions:

- ☐ Pre-Construction Meeting - Provides an opportunity to review SWM/BMP facility construction, maintenance and operation plans and addresses any questions regarding construction and/or monitoring of the structure. The design engineer, certifying professionals (if different), Owner/Applicant, Contractor and County representative(s) are encouraged to attend the preconstruction meeting. Advanced notice to the Engineering and Resource Protection Division is requested. Usually, this requirement can be met simultaneously with Erosion and Sediment Control preconstruction meetings held for the project.
- ☐ The Record Drawing shall be prepared by a Registered Professional Engineer or Certified Land Surveyor for the drainage system of the project including any Best Management Practices.
- ☐ **Construction Certification** - Construction of stormwater management / BMP facilities which contain impoundments, embankments and related engineered appurtenances including subgrade preparation, compacted soils, structural fills, liners, geotextiles, filters, seepage controls, cutoffs, toe drains, hydraulic flow control structures, etc. shall be visually observed and monitored by a Registered Professional Engineer or his/her authorized representative. The Engineer must certify that the structure, embankment and associated appurtenances were built in accordance with the approved design plan, specifications and stormwater management plan and standard accepted construction practice and shall submit a written certification and/or drawings to the VESCP/VSMP authority as required. Soil and compaction test reports, concrete test reports, inspection reports, logs and other required construction material or installation documentation may be required by the VESCP/VSMP authority to substantiate the certification, if specifically requested. The Engineer shall have the authority and responsibility to make minor changes to the approved plan, in coordination with the assigned County inspector, in order to compensate for unsafe or unusual conditions encountered during construction such as those related to bedrock, soils, groundwater, topography, etc. as long as changes do not adversely affect the integrity of the structure(s). Major changes to the approved design plan or structure must be reviewed and approved by the original design professional and the VESCP/VSMP authority.
- ☐ Record Drawing and Construction Certifications are required within thirty (30) days of the completion of Stormwater Management / BMP facility construction. Submittals must be reviewed and accepted by James City County Engineering and Resource Protection Division prior to final inspection, acceptance and bond/surety release.

Dual Purpose Facilities (Temporary Sediment Basin & BMP) - Completion of construction also includes an interim stage for stormwater management / BMP facilities which serve dual purpose as temporary sediment basins during construction and as permanent stormwater management / BMP facilities following construction, once development and stabilization are substantially complete. For these dual purpose facilities, construction certification is required once the temporary sediment basin phase of construction is complete. Final record drawing and construction certification of additional permanent components is required once permanent facility construction is complete.

Interim Construction Certification is required for those dual purpose embankment-type facilities that are generally ten (10) feet or greater in dam height (*) and may not be converted, modified or begin function as a permanent SWM / BMP structure for a period generally ranging from six (6) to eighteen (18) months or more from issuance of a Land Disturbance permit for construction.

Interim or final record drawing and construction certifications are not required for temporary sediment basins which are designed and constructed in accordance with current minimum standards and specifications for temporary sediment basins per the Virginia Erosion and Sediment Control Handbook (VESCH); have a temporary service life of less than eighteen (18) months; and will be removed completely once associated disturbed areas are stabilized, unless a distinct hazard to the public's health, safety and welfare is determined by the Engineering and Resource Protection Division due to the size or presence of the structure or due to evidence of improper construction.

(*Note: Dam Height as referenced above is generally defined as the vertical distance from the natural bed of the stream or waterway at the downstream toe of the embankment to the top of the embankment structure in accordance with 4VAC50-20-30, Virginia Impoundment Structure Regulations and the Virginia Dam Safety Program.)

- ☐ In accordance with Sections 8-25 and 8-27 of the Chapter 8 of the County Code, an *internal closed-circuit television (CCTV)* post installation inspection, performed by the operator, is required as part of the as-built and construction certification process. CCTV inspections shall follow standards and specifications developed by the VSMP authority administrator.
- ☐ Record Drawings shall provide, at a minimum, all information as shown within these requirements, in accordance with standard industry practice, and in accordance with applicable **RECORD DRAWING CHECKLISTS** specific to the type of SWM/BMP facility being constructed. Other additional record data may be formally requested by the VESCP/VSMP authority. (*Note: Refer to the Virginia BMP Clearinghouse website and the current edition of the Virginia Stormwater Management Handbook for representative record drawing and construction certification checklists for the specific type of stormwater management/BMP facility being used. If none are available, the VSMP authority can provide this information if specifically requested.*)
- ☐ Record Drawings shall consist of blue/black line prints and a reproducible (mylar, sepia, diazo, etc.) set of the approved stormwater management plan including applicable plan views, profiles, sections, details, maintenance plans, etc. as related to the subject SWM / BMP facility. The set shall indicate "**RECORD DRAWING**" in large text in the lower right hand corner of each sheet with record elevations, dimensions and data drawn in a clearly annotated format and/or boxed beside design values. Approved design plan values, dimensions and data shall not be removed or erased. Drawing sheet revision blocks shall be modified as required to indicate record drawing status. Elevations to the nearest 0.1' are sufficiently accurate except where higher accuracy is needed to show positive drainage. Certification statements as shown in Section 4 of the Record Drawing and Construction Certification Form, or similar forms thereof, and professional signatures and seals, with dates matching that of the record drawing status in the revision or title block, are also required on all associated record drawing plans, prints or reproducible.

- Submission Requirements - Initial and subsequent submissions for review shall consist of a minimum of one (1) blue/black line set for record drawings and one copy of the construction certification documents with appropriate transmittal. Under certain circumstances, it is understood that the record drawing and construction certification submissions may be performed by different professional firms. Therefore, record drawing submission may be in advance of construction certification or vice versa. Upon approval and prior to release of bond/surety, final submission shall include one (1) reproducible set of the record drawings, one (1) blue/black line set of the record drawings and one (1) copy of the construction certification. Also for current and/or future incorporation into the County's BMP database and GIS system, it is requested that the record drawings also be submitted to the VESCP/VSMP authority on a CD-ROM in an acceptable electronic file format such as *.pdf, *.dxf, *.dwg, etc. or in a standard scanned and readable format. The electronic file requirement can be discussed and coordinated with Engineering and Resource Protection Division staff at the time of final submission.

4. Record Drawing (as-built plan)

SP-21-0072

SITE PLAN FOR IRONBOUND SELF-STORAGE

IRONBOUND RD
WILLIAMSBURG, VA

7.21.21
SP-21-0072
(AMENDMENT TO SP-19-0016)

*(SUBSTITUTION OF TREES IN PLANTING SCHEDULE)

PROPERTY OWNER / DEVELOPER:

DONALD R. SMITH
MICHAEL D. SIFEN, INC.
500 CENTRAL DRIVE
SUITE 106
VIRGINIA BEACH, VIRGINIA 23454
TELEPHONE: (757) 486-1122
FAX: (757) 486-0905

CIVIL ENGINEER:

CLAUDE F. LYM, PE
SITE IMPROVEMENT ASSOCIATES, INC.
800 JUNIPER CRESCENT
SUITE A
CHESAPEAKE, VIRGINIA 23320
TELEPHONE: (757) 671-9000

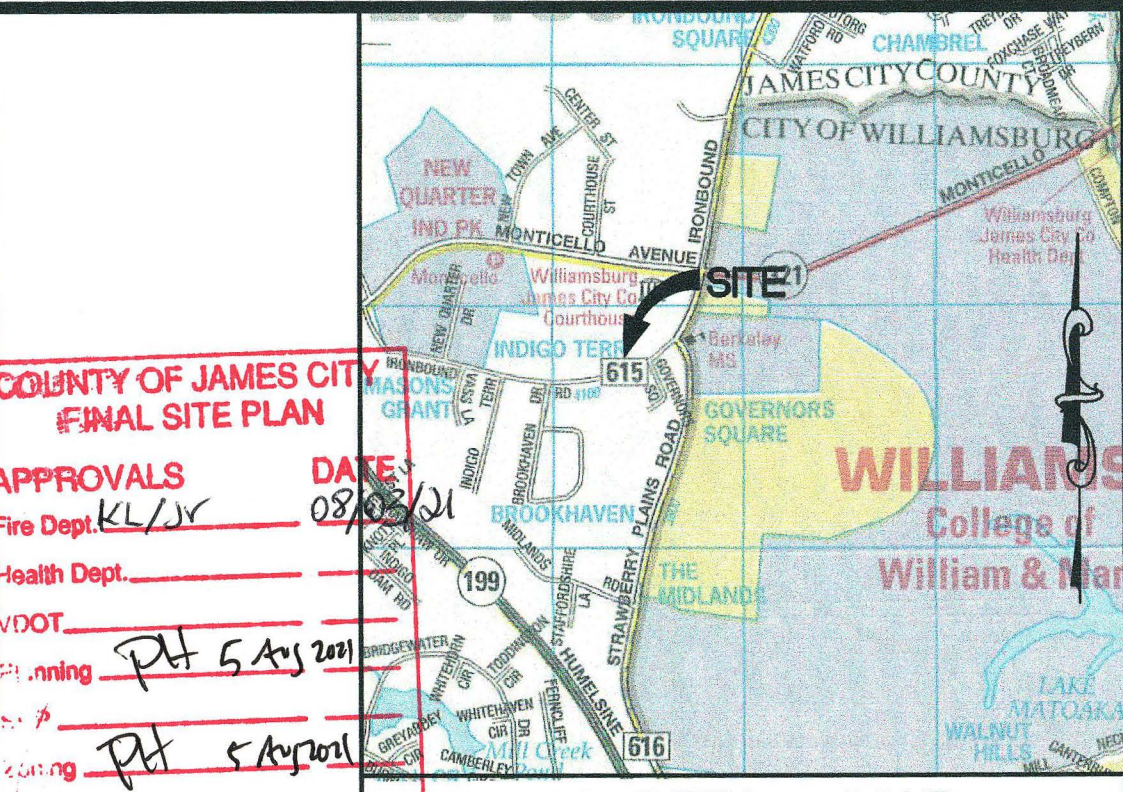
SITE DATA/GENERAL NOTES:

1. SITE ADDRESS(S): 4091 IRONBOUND ROAD, WILLIAMSBURG, VIRGINIA
2. LEGAL DESCRIPTION: PARCEL A, PLAT SHOWING BOUNDARY LINE ADJUSTMENT & PROPERTY LINE EXTINGUISHMENT BETWEEN PARCEL A, PARCEL B, PARCEL C & PARCEL D AND PRIVATE DRAINAGE EASEMENT FOR PARCEL A, PARCEL B, PARCEL C & PARCEL D
3. PIN: 3842300001
4. SITE AREA: 2.18 AC. (94,950 SF)
5. ZONING: M1 LIMITED BUSINESS/INDUSTRIAL
6. PROPERTY CLASS: 404 COMMERCIAL AND INDUSTRIAL
7. THIS PROPERTY DOES NOT FALL WITHIN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON THE FEMA FIRM COMMUNITY-PANEL NO. 51095-00138D EFFECTIVE DATE DECEMBER 16, 2015
8. SITE TO BE SERVED BY PUBLIC WATER & SEWER OWNED BY THE JAMES CITY COUNTY SERVICE AUTHORITY, J.C.S.A.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF THE CONSTRUCTION EFFORTS WITH VIRGINIA NATURAL GAS, VIRGINIA POWER, C&P TELEPHONE, APPROPRIATE CABLE COMPANY, JAMES CITY SERVICE AUTHORITY, VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT), AND OTHERS THAT MAY BE REQUIRED.
10. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS PRIOR TO COMMENCEMENT OF WORK TO INCLUDE, BUT NOT LIMITED TO: JAMES CITY COUNTY LAND DISTURBANCE, BUILDING, AND UTILITY (JCSA).
11. NO WETLANDS EXIST ON THE SITE.
12. NO SLOPES GREATER THAN 25% EXIST ON THE SITE.
13. THIS SITE DOES NOT LIE WITHIN ANY RESOURCE PROTECTION AREA. ENTIRE SITE LIES WITHIN THE RESOURCE MANAGEMENT AREAS.
14. NO SHOWN-SWELL, HYDRO, OR SIMILAR SOILS EXIST ON THE SITE.
15. IMPERVIOUS AREA: 1.31 AC. (60%)
 - 15.1. BUILDING FOOTPRINT: 37,795 SF (0.87 AC.)
 - 15.2. PARKING LOT ASPHALT: 15,775 SF (0.36 AC.)
 - 15.3. CONCRETE ENTRANCE: 1,165 SF (0.03 AC.)
 - 15.4. SIDEWALKS: 2,733 SF (0.06 AC.)
 - 15.5. TOTAL IMPERVIOUS: 57,466 SF (1.31 AC.)
16. OPEN SPACE AREA: 0.87 AC. (40%)
17. TOTAL DISTURBED AREA: 1.81 AC.
18. BUILDING HEIGHT: 37' (THREE FLOORS)
19. BUILDING TYPE: TYPE II, NON-COMBUSTIBLE
20. FLOOR AREA OF EACH STORY (1-3): 37,795 SF
21. TOTAL GROSS FLOOR AREA: 113,385 SF
22. FAR (TOTAL FLOOR AREA)/(LOT AREA) = (113,385 SF)/(94,950 SF) = 1.19
23. OFFICE SIZE: 1,260 SF
24. USE: SELF STORAGE, 833 UNITS
25. PARKING REQUIREMENT: 1:250 SF FOR OFFICE PLUS 1 PER 100 UNITS = 13 SPACES (INCLUDING 1 HANDICAP SPACE)
26. PARKING PROVIDED: 13 SPACES (INCLUDING 1 VAN ACCESSIBLE HANDICAP SPACE)
27. LOADING SPACES REQUIRED: 1 SPACE FOR EACH 30,000 SF = 1/30,000 SF X (113,385 SF)=4 SPACES
28. LOADING SPACES PROVIDED: 4 SPACES
29. ALL NEW UTILITIES SHALL BE PLACED UNDERGROUND
30. ALL NEW SIGNS SHALL BE IN ACCORDANCE WITH ARTICLE II, DIVISION 3 OF THE JAMES CITY COUNTY ZONING ORDINANCE
31. ALL ROADS SHALL BE PRIVATE RIGHT-OF-WAYS AND SHALL NOT BE MAINTAINED BY JAMES CITY COUNTY OR THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT)
32. NO DUMPSTER/DUMPSTER PAD PROPOSED OR APPROVED FOR THIS SITE
33. REDUCED SETBACKS AS SHOWN ON SHEET 4 GRANTED BY THE PLANNING DIRECTOR, REFERENCE CASE NO. C-18-0045

STORMWATER AND RESOURCE PROTECTION NOTES:

1. ALL OBJECTIONABLE AND DELETERIOUS MATERIAL IS TO BE REMOVED FROM THE SITE AND DISPOSED OF IN A STATE APPROVED FACILITY MEETING THE REQUIREMENTS OF ALL APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS.
2. THE STORMWATER MANAGEMENT/BMP FACILITY AND ASSOCIATED STORMWATER CONVEYANCE SYSTEMS AS PROPOSED FOR THIS PROJECT WILL REQUIRE SUBMISSION, REVIEW, AND APPROVAL OF A RECORD DRAWING (AS-BUILT) AND CONSTRUCTION CERTIFICATION PRIOR TO RELEASE OF THE POSTED BOND/SURETY.
3. CCTV, AN INTERNAL CLOSED CIRCUIT TELEVISION (CCTV) POST INSTALLATION INSPECTION PERFORMED BY THE OPERATOR, IS REQUIRED FOR ALL STORMWATER CONVEYANCE SYSTEM PIPES, ACCESS OR INLET STRUCTURES, AND CULVERTS OF 15-INCH NOMINAL DIAMETER SIZE OR GREATER AS PART OF THE CONSTRUCTION RECORD DRAWING (AS-BUILT) AND CONSTRUCTION CERTIFICATION PROCESS. CCTV INSPECTIONS SHALL BE SUBMITTED ON CD-ROM OR EQUIVALENT ELECTRONIC FILE FORMAT FOR STAFF REVIEW. REFER TO SECTIONS 8-25(F) AND 8-27(E) OF THE COUNTY'S CHAPTER 8 ORDINANCE.
4. THIS PROJECT IS LOCATED IN THE J31 HUC
5. THIS PROJECT IS LOCATED WITHIN THE POWHATAN CREEK WATERSHED

Sheet List Table	
Sheet Number	Sheet Title
1	COVER SHEET
2	BOUNDARY AND TOPOGRAPHIC SURVEY
3	DEMOLITION AND EROSION AND SEDIMENT CONTROL PLAN
4	SITE LAYOUT AND UTILITY PLAN
5	GRADING PLAN
6	LANDSCAPE PLAN
7	LIGHTING PLAN
8	EROSION AND SEDIMENT CONTROL DETAILS
9	EROSION AND SEDIMENT CONTROL NARRATIVE
10	GENERAL DETAILS
11	UTILITY DETAILS
12	UTILITY GENERAL NOTES
13	STORMWATER DETAILS



VICINITY MAP
SCALE: 1" = 2000'

PLANNING DIVISION

JUL 22 2021

RECEIVED

STANDARD COUNTY STORMWATER POLLUTION PREVENTION PLAN NOTES (REVISED: JULY 1, 2014)

- THE FOLLOWING STANDARD COUNTY NOTES SHALL BECOME PART OF ANY APPROVED STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR PLAN OF DEVELOPMENT PROJECTS IN JAMES CITY COUNTY, VIRGINIA. COMPONENTS OF A SWPPP MAY INCLUDE AS APPLICABLE, A SITE EROSION AND SEDIMENT CONTROL (E&S) PLAN, A SITE STORMWATER MANAGEMENT (SWM) PLAN, AND A SITE POLLUTION PREVENTION PLAN (PPP). THE COUNTY'S DIVISION OF ENGINEERING AND RESOURCE PROTECTION IS DESIGNATED BY CHAPTER 8 OF THE COUNTY CODE AS THE LOCAL VIRGINIA EROSION AND SEDIMENT CONTROL PROGRAM (VESP) AUTHORITY AND VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSPM) AUTHORITY.
1. ALL THE PROVISIONS OF VIRGINIA EROSION AND SEDIMENT CONTROL (E&S) LAW AND REGULATIONS, THE VIRGINIA STORMWATER MANAGEMENT ACT AND REGULATIONS (VSM), THE VIRGINIA BMP CLEARINGHOUSE WEBSITE, STATE EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT HANDBOOKS, AND ANY ASSOCIATED TECHNICAL BULLETINS AND GUIDANCE DOCUMENTS AS PUBLISHED BY THE STATE WATER CONTROL BOARD, THE VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ), AND THE LOCAL VESP AND VSPM AUTHORITY SHALL APPLY TO THE PROJECT.
 2. MINIMUM STANDARDS NO. 1 THROUGH NO. 19 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS VAC25-840 ET SEQ. SHALL APPLY TO THE PROJECT.
 3. THE OWNER, APPLICANT, OPERATOR, OR PERMITTEE SHALL BE RESPONSIBLE TO REGISTER FOR CONSTRUCTION GENERAL PERMIT (CGP) COVERAGE, AS APPLICABLE, IN ACCORDANCE WITH THE GENERAL VPDES PERMIT FOR DISCHARGE OF STORMWATER FROM CONSTRUCTION ACTIVITIES (VAR10) CHAPTER 880; THE VIRGINIA STORMWATER MANAGEMENT PROGRAM REGULATIONS CHAPTER 870; AND IN ACCORDANCE WITH CURRENT REQUIREMENTS OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSPM), THE STATE WATER CONTROL BOARD, THE VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY, CHAPTER 8 OF THE COUNTY CODE AND THE LOCAL VESP/VSPM AUTHORITY.
 4. THE OWNER, APPLICANT, OPERATOR OR PERMITTEE SHALL PROVIDE THE NAME OF AN INDIVIDUAL HOLDING A VALID RESPONSIBLE LAND DISTURBER (RLD) CERTIFICATE OF COMPETENCE WHO WILL BE RESPONSIBLE FOR THE LAND DISTURBING ACTIVITY PRIOR TO ENGAGING IN THE LAND DISTURBING ACTIVITY. THIS WILL BE NECESSARY PRIOR TO ISSUANCE OF A LOCAL LAND DISTURBING AND/OR STORMWATER CONSTRUCTION PERMIT FOR THE PROJECT. THE RLD IS REQUIRED TO ATTEND THE PRECONSTRUCTION CONFERENCE FOR THE PROJECT.
 5. THE CONTRACTOR IS RESPONSIBLE TO CONTACT MISS UTILITY (DIAL 811 IN VA OR 1-800-552-7001) PRIOR TO ANY UTILITY OR SITE WORK EXCAVATIONS.
 6. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PLANNED, DESIGNED, IMPLEMENTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH). THE CONTRACTOR SHALL MAINTAIN, INSPECT, AND REPAIR ALL EROSION AND SEDIMENT CONTROL MEASURES AS NEEDED THROUGHOUT THE LIFE OF THE PROJECT TO ENSURE CONTINUED ACCEPTABLE PERFORMANCE.
 7. A PRECONSTRUCTION CONFERENCE (MEETING) SHALL BE HELD ON SITE AND INCLUDE REPRESENTATIVES FROM THE LOCAL VESP/VSPM AUTHORITY, THE OWNER/APPLICANT/OPERATOR/PERMITTEE, THE RESPONSIBLE LAND DISTURBER (RLD), AND THE CONTRACTOR, ENGINEER, AND OTHER RESPONSIBLE AGENCIES, AS APPLICABLE, PRIOR TO AUTHORIZATION AND ISSUANCE OF A LOCAL LAND DISTURBING OR STORMWATER CONSTRUCTION PERMIT. THE OWNER, APPLICANT, OPERATOR OR PERMITTEE IS REQUIRED TO COORDINATE SCHEDULING OF THE PRECONSTRUCTION CONFERENCE BETWEEN ALL APPLICABLE PARTIES. THE CONTRACTOR SHALL SUBMIT A SEQUENCE OF CONSTRUCTION AND A REVISED POLLUTION PREVENTION PLAN (P2 PLAN OR PPP), IF APPLICABLE, TO THE LOCAL VESP/VSPM AUTHORITY FOR REVIEW AND APPROVAL PRIOR TO THE PRECONSTRUCTION MEETING.
 8. A POLLUTION PREVENTION PLAN (P2 PLAN OR PPP), IF REQUIRED, SHALL BE DEVELOPED, IMPLEMENTED AND UPDATED AS NECESSARY AND MUST DETAIL THE DESIGN, INSTALLATION, IMPLEMENTATION, AND MAINTENANCE OF EFFECTIVE POLLUTION PREVENTION MEASURES TO: MINIMIZE THE DISCHARGE OF POLLUTANTS FROM EQUIPMENT AND VEHICLE WASHING, WHEEL WASH WATER AND OTHER WASH WATERS; MINIMIZE THE EXPOSURE OF ALL MATERIALS ON THE SITE (SUCH AS BUILDING MATERIALS AND PRODUCTS, CONSTRUCTION WASTE, TRASH, LANDSCAPE MATERIALS, FERTILIZERS, PESTICIDES, HERBICIDES, DETERGENTS, SANITARY WASTE, ETC.) TO PRECIPITATION AND STORMWATER; MINIMIZE THE DISCHARGE OF POLLUTANTS FROM SPILLS AND LEAKS; IMPLEMENT CHEMICAL SPILL AND LEAK PREVENTION AND RESPONSE PROCEDURES; AND INCLUDE EFFECTIVE BEST MANAGEMENT PRACTICES TO PROHIBIT THE DISCHARGE OF WASTEWATER FROM: CONCRETE WASHOUT AREAS, DISCHARGE OF WASTEWATER FROM WASHOUT AND CLEANOUT OF STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS AND OTHER CONSTRUCTION MATERIALS; DISCHARGE OF FUELS, OILS, OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE ACTIVITIES; AND THE DISCHARGE OF SOAPS AND SOLVENTS USED FOR VEHICLE AND EQUIPMENT WASHING. THIS PLAN SHALL BE AVAILABLE ONSITE FOR REVIEW AT REASONABLE TIMES BY THE LOCAL VESP/VSPM AUTHORITY WHEN REQUESTED.
 9. THE OWNER, APPLICANT, OPERATOR, OR PERMITTEE IS RESPONSIBLE FOR ALL OPERATOR SELF-INSPECTIONS AS REQUIRED IN THE POLLUTION PREVENTION PLAN (P2 PLAN OR PPP) OR AS REQUIRED AS PART OF A DEVELOPED STORMWATER POLLUTION PREVENTION PLAN (SWPPP). THESE INSPECTIONS SHALL BE MADE AVAILABLE, UPON REQUEST, BY THE LOCAL VESP/VSPM AUTHORITY.
 10. ALL PERIMETER EROSION AND SEDIMENT CONTROL (E&S) MEASURES SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LANDDISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPLOPE LAND DISTURBANCE AND BEFORE ANY OTHER CONSTRUCTION ACTIVITIES TAKE PLACE.
 11. ADDITIONAL SAFETY FENCE OR DUST CONTROL MEASURES, IN ACCORDANCE WITH THE PROVISIONS OF MINIMUM STANDARDS & SPECS. 3.01 AND 3.39 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH), MAY BE REQUIRED TO BE IMPLEMENTED ON THE SITE IN ADDITION TO THAT SHOWN ON THE APPROVED PLAN AND SPECIFICATIONS IN ORDER TO ENSURE ADEQUATE PROTECTION OF THE HEALTH, SAFETY AND WELFARE OF THE PUBLIC OR IF SITE CONDITIONS CHANGE, BECOME APPARENT OR ALTER SIGNIFICANTLY FOLLOWING THE DATE OF PLAN APPROVAL.
 12. EROSION AND SEDIMENT CONTROL MEASURES MAY REQUIRE MINOR FIELD ADJUSTMENTS AT OR FOLLOWING THE TIME OF CONSTRUCTION TO ENSURE THEIR INTENDED PURPOSE IS ACCOMPLISHED, TO ENSURE ADEQUATE PROTECTION OF THE HEALTH, SAFETY, AND WELFARE OF THE PUBLIC, OR IF SITE CONDITIONS CHANGE, BECOME APPARENT OR ALTER SIGNIFICANTLY FOLLOWING THE DATE OF PLAN APPROVAL. LOCAL VESP/VSPM AUTHORITY APPROVAL SHALL BE REQUIRED FOR ANY DEVIATION OF EROSION AND SEDIMENT CONTROL MEASURES FROM THE APPROVED PLAN.
 13. OFF-SITE WASTE OR BORROW AREAS SHALL BE APPROVED BY THE LOCAL VESP/VSPM AUTHORITY PRIOR TO THE IMPORT OF ANY BORROW OR EXPORT OF ANY WASTE TO OR FROM THE PROJECT SITE.
 14. TEMPORARY SOIL STOCKPILES SHALL COMPLY WITH THE PROVISIONS OF SECTION 24-46 OF THE COUNTY CODE.
 15. CULVERT AND STORM DRAIN INLET PROTECTIONS, IN ACCORDANCE WITH THE PROVISIONS OF MINIMUM STANDARDS & SPECS. 3.07 AND 3.08 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH), MAY BE REMOVED AT THE DISCRETION OF THE ASSIGNED LOCAL VESP/VSPM AUTHORITY COMPLIANCE INSPECTOR, SHOULD PLACEMENT OF THE MEASURE RESULT IN EXCESSIVE ROAD FLOODING, TRAFFIC OR SAFETY HAZARD, OR RESULT IN THE REDIRECTION OF DRAINAGE ONTO OR TOWARD EXISTING LOTS, HOMES, DRIVEWAYS, GARAGES OR OTHER STRUCTURES. DECISIONS SHALL BE MADE BY THE VESP/VSPM AUTHORITY ON A CASE-BY-CASE BASIS BASED ON FIELD SITUATIONS ENCOUNTERED.
 16. DRAINAGE FACILITIES SHALL BE INSTALLED AND FUNCTIONAL WITHIN 30 DAYS FOLLOWING COMPLETION OF ROUGH GRADING AT ANY POINT WITHIN THE PROJECT.
 17. NO MORE THAN 300 FEET OF TRENCH MAY BE OPEN AT ONE TIME FOR UNDERGROUND UTILITY LINES, INCLUDING STORM WATER CONVEYANCES. ALL OTHER PROVISIONS OF MINIMUM STANDARD NO. 16 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS APPLY.
 18. PERMANENT OR TEMPORARY STABILIZATION OF DISTURBED SOIL AREAS SHALL COMPLY WITH MINIMUM STANDARD # 1 AND # 3 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS.
 19. THE TERM SEEDING, FINAL VEGETATIVE COVER OR STABILIZATION ON THE APPROVED PLAN SHALL MEAN THE SUCCESSFUL GERMINATION AND ESTABLISHMENT OF A STABLE GRASS COVER FROM A PROPERLY PREPARED SEEDBED, IN ACCORDANCE WITH MINIMUM STANDARD #1 AND # 3 FROM THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS AND MINIMUM STANDARDS & SPECS. 3.22 THROUGH 3.37 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH), AND ANY TECHNICAL BULLETINS ISSUED BY THE STATE WATER CONTROL BOARD OR VIRGINIA DEQ, AS APPLICABLE. IRRIGATION, IF NECESSARY, SHALL COMPLY WITH ALL APPLICABLE SEASONAL OUTDOOR WATER USE RESTRICTIONS OF THE JAMES CITY SERVICE AUTHORITY.
 20. IF DISTURBED AREA STABILIZATION IS TO BE ACCOMPLISHED DURING THE MONTHS OF DECEMBER, JANUARY OR FEBRUARY, STABILIZATION SHALL CONSIST OF MULCHING IN ACCORDANCE WITH MINIMUM STANDARD SPEC. 3.35 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH). SEEDING WILL THEN TAKE PLACE AS SOON AS THE SEASON PERMITS.
 21. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL NOT BE REMOVED UNTIL ALL DISTURBED AREAS ARE STABILIZED. REMOVAL SHALL NOT OCCUR WITHOUT AUTHORIZATION BY THE LOCAL VESP/VSPM AUTHORITY. DISTURBANCES ASSOCIATED WITH THE REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROPERLY STABILIZED.
 22. NO SEDIMENT TRAP OR SEDIMENT BASIN SHALL BE REMOVED UNTIL A) AT LEAST 75 PERCENT OF THE SINGLE-FAMILY LOTS WITHIN THE DRAINAGE AREA TO THE TRAP OR BASIN HAVE BEEN SOLD TO A THIRD PARTY FOR THE CONSTRUCTION OF HOMES (UNRELATED TO THE DEVELOPER); AND/OR, B) 60 PERCENT OF THE SINGLE-FAMILY LOTS WITHIN THE DRAINAGE AREA TO THE TRAP OR BASIN ARE COMPLETED AND STABILIZED. A BULK SALE OF THE LOTS TO ANOTHER BUILDER DOES NOT SATISFY THIS PROVISION. SEDIMENT TRAPS AND SEDIMENT BASINS SHALL NOT BE REMOVED WITHOUT AUTHORIZATION OF THE LOCAL VESP/VSPM AUTHORITY.
 23. DESIGN AND CONSTRUCTION OF PRIVATE-TYPE STORM DRAINAGE SYSTEMS, OUTSIDE VDOT RIGHT-OF-WAY, SHALL BE PERFORMED IN ACCORDANCE WITH THE CURRENT VERSION OF THE JAMES CITY COUNTY, ENGINEERING AND RESOURCE PROTECTION DIVISION, STORMWATER DRAINAGE CONVEYANCE SYSTEMS (NON-BMP RELATED), GENERAL DESIGN AND CONSTRUCTION GUIDELINES (IE. COUNTY DRAINAGE STANDARDS).
 24. RECORD DRAWINGS (AS-BUILTS) AND CONSTRUCTION CERTIFICATIONS ARE REQUIRED FOR ALL STORMWATER FACILITIES INCLUDING STORMWATER MANAGEMENT/BMP FACILITIES AND STORM DRAINAGE CONVEYANCE SYSTEMS. THE CERTIFICATION PROCESS SHALL INCLUDE AN INTERNAL CLOSED-CIRCUIT TELEVISION CAMERA (CCTV) POST INSTALLATION INSPECTION PERFORMED BY THE OWNER IN ACCORDANCE WITH STANDARDS AND SPECIFICATIONS DEVELOPED BY THE VSPM AUTHORITY. RECORD DRAWINGS AND CONSTRUCTION CERTIFICATIONS MUST MEET ESTABLISHED PROGRAM REQUIREMENTS OF THE COUNTY'S CHAPTER 8 EROSION AND SEDIMENT CONTROL AND VSPM ORDINANCE AND THE LOCAL VESP/VSPM AUTHORITY.
 25. ALL STORMWATER FACILITIES INCLUDING BMPs, STORM DRAINAGE PIPES, STORMWATER CONVEYANCES, INLETS, MANHOLES, OUTFALLS AND ROADSIDE AND OTHER OPEN CHANNELS SHALL BE INSPECTED BY THE LOCAL VESP/VSPM AUTHORITY, THE OWNER, AND THE APPLICANT/OPERATOR/PERMITTEE DESIGNATED GEOTECHNICAL ENGINEER FOR THE PROJECT IN ACCORDANCE WITH ESTABLISHED COUNTY STORMWATER FACILITY INSPECTION PROGRAM REQUIREMENTS.

LEGEND

EXISTING

PROPOSED

ASPHALT

BUILDINGS

CONCRETE

PAVEMENT PATCH

CATCH BASINS, CURB INLETS

CL DITCH/SWALE

COMMUNICATION BOX

CONSTRUCTION ENTRANCE

CONTOURS

CURB

CURB AND GUTTER

DEMOLITION NOTE REFERENCE

DROP INLETS

FENCE

FIRE HYDRANT

FLARED END SECTION W/RIP-RAP

FLOW LINE

GAS LINE

GAS VALVE

GRAVEL

INLET PROTECTION

LAYOUT NOTE REFERENCE

MG = MATCH GRADE

MONUMENT FOUND

MONUMENT SET

OVERHEAD LINE

P = PAVEMENT GRADE

PIN FOUND

PIN SET

POWER POLE

REMOVE AND DISPOSE

RL = RIDGELINE

SANITARY REFERENCE

SANITARY SEWER (SEE SCHEDULE FOR LENGTH, SIZE, AND SLOPE)

SANITARY SEWER CLEANOUT

SANITARY SEWER MANHOLE (SEE SCHEDULE)

SIGN

SILT FENCE

SPOT ELEVATIONS

STORM SEWER REFERENCE

STORM SEWER (SEE SCHEDULE FOR LENGTH, SIZE, AND SLOPE)

STORM SEWER MANHOLE (SEE SCHEDULE)

POWER POLE WITH LIGHT

TELEPHONE PEDESTAL

TOE OF SLOPE

TOP OF BANK

TOP OF CURB GRADE

TOP OF WALK GRADE

TOP OF WALL GRADE

TREE

TREE PROTECTION

UTILITY NOTE REFERENCE

WATER LINE (SEE PLANS FOR SIZE)

WATER METER

WATER VALVE

ABBREVIATIONS:
EX. = EXISTING
PROP. = PROPOSED
SAN = SANITARY
MH = MANHOLE
SCO = SANITARY CLEANOUT
TYP = TYPICAL
INV = INVERT
STD. = STANDARD
CDI = CURB DROP INLET
BSL = BUILDING SETBACK LINE

NOTE:
THIS PLAN DOES NOT GUARANTEE THE LOCATION OF EXISTING UNDERGROUND UTILITIES. CONTRACTOR TO DETERMINE ACTUAL LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO MOBILIZATION. IF CONFLICTS EXIST, NOTIFY ENGINEER.
BEFORE DIGGING CONTACT "MISS UTILITY ONE CALL CENTER" AT 811.

COVER SHEET
FOR
IRONBOUND SELF-STORAGE

IRONBOUND RD
WILLIAMSBURG, VA

JOB# 16189
DWG: 16189_Details for SP.dwg
DATE: 7.17.19
SCALE: -
SHEET NUMBER 1 OF 13

Site Improvement Associates, Inc.
Civil Engineers, Surveyors, & Site Contractors
Where Engineering and Construction Come Together
800 Juniper Crescent, Suite A
Chesapeake, VA 23320
Office: 757-671-9000
Fax: 757-671-9288

CLAUDE F. LYM
Lic. No. 19310
7.21.21
PROFESSIONAL ENGINEER

PLANTING REQUIREMENTS:

PARKING LOT LANDSCAPE

- 14 AUTOMOBILE PARKING SPACES
(3) TREES REQUIRED (1 TREE PER 5 SPACES)
(6) SHRUBS REQUIRED (2 SHRUBS PER TREE)
- (3) TREES PROVIDED
(6) SHRUBS PROVIDED

ADJACENT TO BUILDING 9,700 SF

- 1 TREE OR 5 SHRUB IS REQUIRED FOR EVERY 200 SF
49 TREES
OR
243 SHRUBS (OR COMBINATION THEREOF)
- PROVIDE 243 SHRUBS

35' TRANSITIONAL BUFFER ALONG IRONBOUND INFILL - 15,400 SF

- 440' OF FRONTAGE
1 TREE AND 3 SHRUBS IS REQUIRED FOR EVERY 400 SQUARE FEET
39 TREES
AND
116 SHRUBS REQUIRED
- PROVIDE 39 TREES AND 116 SHRUBS

VARIABLE 15' NORTHERN EASEMENT - 6,150 SF

- 410' OF FRONTAGE
1 TREE AND 3 SHRUBS IS REQUIRED FOR EVERY 400 SQUARE FEET
16 TREES REQUIRED
AND
47 SHRUBS REQUIRED
- PROVIDE 16 TREES AND 47 SHRUBS

ADJACENT TO ENTRANCE R/W 30' EASEMENT 3,300 SF

- 110' OF FRONTAGE
1 TREE AND 3 SHRUBS IS REQUIRED FOR EVERY 400 SQUARE FEET
9 TREES REQUIRED
AND
23 SHRUBS REQUIRED
- PROVIDE 23 SHRUBS

PLANTING SCHEDULE:

PARKING LOT LANDSCAPE

- TOTAL TREES: 3
(CM) COLUMNAR MAPLE "ACER PLATANOIDES"
(LL) LOBLOLLY PINE "PINUS TAEDA"
- SIZE: 2.5"
SIZE: 1.25"
- SPACING: AS SHOWN
SPACING: 15' OC
- QUANTITY: 2
QUANTITY: 1

ADJACENT TO BUILDING 9,700 SF

- TOTAL TREES: 17
(GM) LITTLE GEM MAGNOLIA "MAGNOLIA GRANDIFLORA (LITTLE GEM)"
(CL) CURLY LEAF LIGUSTRUM "LIGUSTRUM JAPONICUM CORIACEUM"
- SIZE: 1.25"
SIZE: 18"
- SPACING: 20' OC
SPACING: AS SHOWN
- QUANTITY: 17
QUANTITY: 6

35' TRANSITIONAL BUFFER ALONG IRONBOUND INFILL - 15,400 SF

- TOTAL TREES: 158
(CL) CURLY LEAF LIGUSTRUM "LIGUSTRUM JAPONICUM CORIACEUM"
(H) INDIAN HAWTHORNE "RAPHIOLEPIS INDICA (UMBELLATA)"
(BB) BLUE HAVEN FLUTTERBY PETITE BUTTERFLY BUSH "BUDDLERIA PODERAS #8 (PP22069)"
- SIZE: 18"
SIZE: 22"
SIZE: 18"
- SPACING: 3' OC
SPACING: 3' OC
SPACING: 3' OC
- QUANTITY: 8
QUANTITY: 100
QUANTITY: 50

VARIABLE 15' NORTHERN EASEMENT - 6,150 SF

- TOTAL TREES: 32
(AE) ALEE ELM "ULMUS PARVIFOLIA 'EMER II'"
(CR) CRAPE MYRTLE "LAGERSTROEMIA"
(LL) LOBLOLLY PINE "PINUS TAEDA"
- SIZE: 2.5"
SIZE: 1.25"
SIZE: 1.25"
- SPACING: 10' OC
SPACING: 10' OC
SPACING: 15' OC
- QUANTITY: 19
QUANTITY: 6
QUANTITY: 14

ADJACENT TO ENTRANCE R/W 30' EASEMENT 3,300 SF

- TOTAL TREES: 16
(PE) PRINCETON ELM "ULMUS AMERICANA 'PRINCETON'"
(FT) WHITE FRINGE TREE "CHIONANTHUS VIRGINICUS"
(LL) LOBLOLLY PINE "PINUS TAEDA"
- SIZE: 2.5"
SIZE: 1.25"
SIZE: 1.25"
- SPACING: 10' OC
SPACING: 10' OC
SPACING: 15' OC
- QUANTITY: 6
QUANTITY: 3
QUANTITY: 7

ADJACENT TO ENTRANCE R/W 30' EASEMENT 3,300 SF

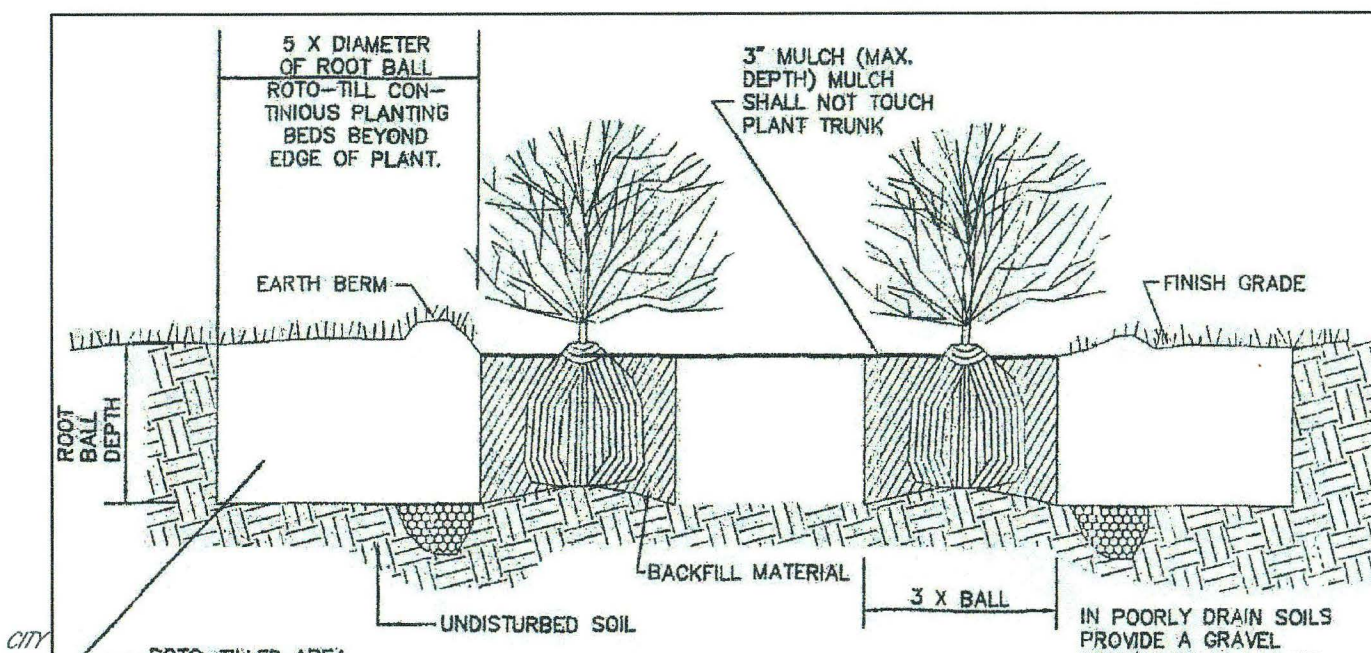
- TOTAL TREES: 9
(PE) PRINCETON ELM "ULMUS AMERICANA 'PRINCETON'"
(FT) WHITE FRINGE TREE "CHIONANTHUS VIRGINICUS"
(LL) LOBLOLLY PINE "PINUS TAEDA"
- SIZE: 2.5"
SIZE: 1.25"
SIZE: 1.25"
- SPACING: 10' OC
SPACING: 10' OC
SPACING: 15' OC
- QUANTITY: 4
QUANTITY: 2
QUANTITY: 3

TOTAL SHRUBS: 25

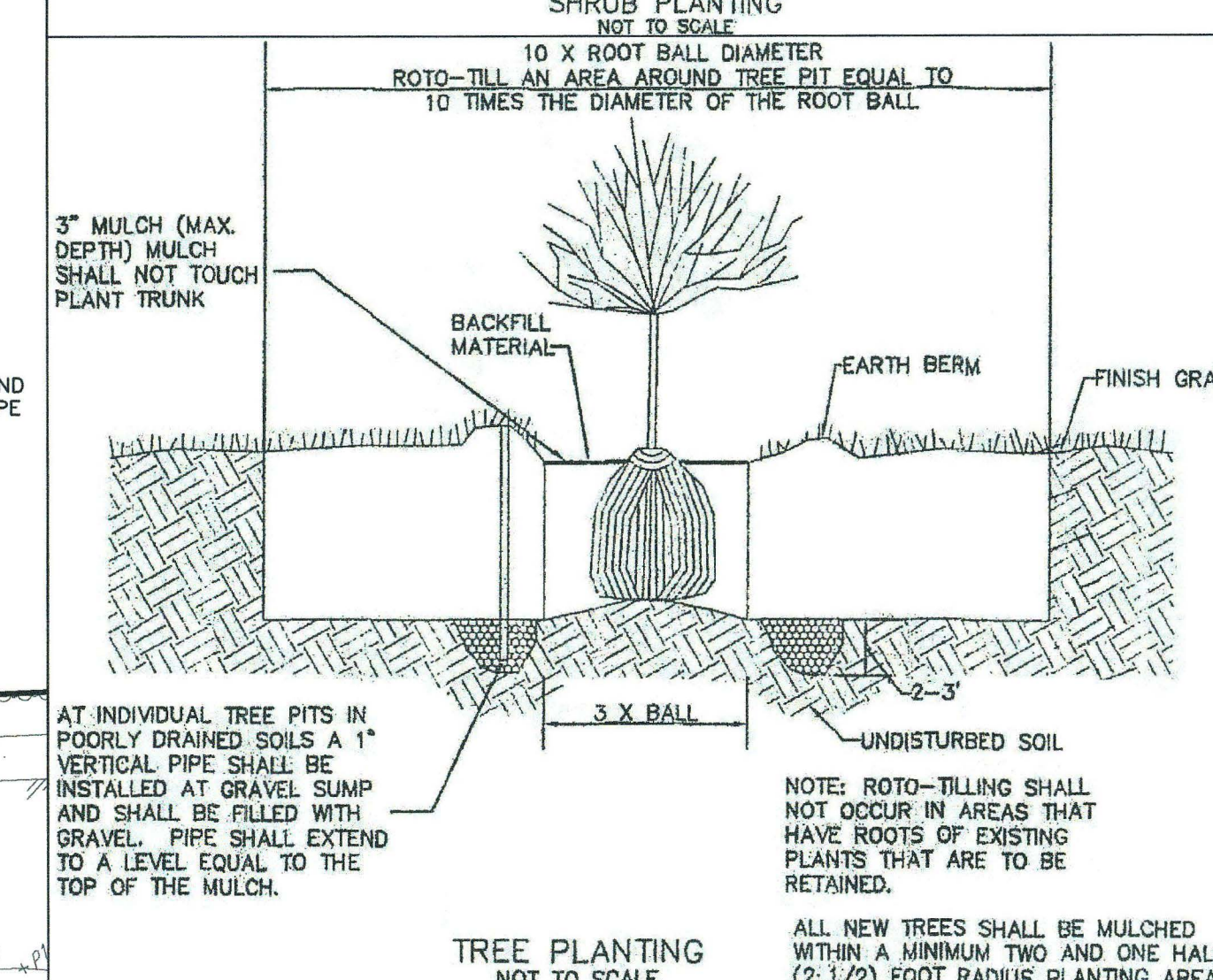
- (BB) BLUE HAVEN FLUTTERBY PETITE BUTTERFLY BUSH "BUDDLERIA PODERAS #8 (PP22069)"
(VC) SPRING BOUQUET VIBURNUM "VIBURNUM COMPACTUM"
- SIZE: 18"
SIZE: 24"
- SPACING: 3' OC
SPACING: 3' OC
- QUANTITY: 16
QUANTITY: 9

LANDSCAPE INSTALLATION NOTES:

- THE CONTRACTOR IS REQUIRED TO CONTACT "MISS UTILITIES" (1-800-552-7001) 48 HOURS PRIOR TO THE COMMENCEMENT OF WORK ON THE SITE. NO WORK IS TO BEGIN UNTIL ALL UTILITIES ARE MARKED. IF UTILITY LINE/TREE CONFLICTS ARE EVIDENT, PLEASE CONTACT LANDSCAPE DESIGNER.
- VERIFICATION OF THE ACCURACY OF THE TOTAL QUANTITIES SHOWN IN THE LANDSCAPE SCHEDULE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. IN THE EVENT OF A DISCREPANCY, THE PLANTING PLAN SHALL GOVERN.
- ALL PLANTS SHALL BE NURSERY GROWN, WELL BRANCHED, TRUE TO TYPE SPECIMEN MATERIAL, FREE OF INSECT INFESTATION, INJURY, DISEASE, OR OTHER DEFECTS. PLANTS ARE TO CONFORM STANDARDS SET IN AMERICAN STANDARD FOR NURSERY STOCK AND SHALL MEET OR EXCEED MEASUREMENTS SPECIFIED IN THE PLANT KEY.
- THE CONTRACTOR SHALL WARRANT ALL NEW PLANTINGS FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE. ALL REPLACEMENT PLANTS SHALL CONFORM TO ORIGINAL SPECIFICATIONS. WHEN PLANTING OPERATIONS MUST BE PERFORMED OUTSIDE NORMAL PLANTING SEASON FOR THE LOCALITY, THIS WARRANTY MAY BE RE-NEGOTIATED WITH THE OWNER PRIOR TO PLANTING.
- PLANTING AND BED PREPARATION ARE TO BE CONDUCTED UNDER FAVORABLE WEATHER CONDITIONS. UNDER NO CIRCUMSTANCES SHALL SOIL BE WORKED, DRIVEN OVER, OR WALKED UPON IN A WET CONDITION.
- THE CONTRACTOR IS RESPONSIBLE FOR REPORTING TO THE OWNER ANY CONDITIONS DETERIOR TO PLANT GROWTH ENCOUNTERED ON SITE DURING INSTALLATION AND WARRANTY PERIODS.
- ALL PLANT VARIETIES AND LAYOUTS ARE TO CONFORM ACCURATELY TO THE LANDSCAPE PLAN, SUBJECT TO INSPECTION. GROUND COVERS AND PERENNIALS ARE TO BE PLANTED IN A STAGGERED ARRANGEMENT AND NOT IN ROWS.
- PRUNE ONLY BROKEN OR CROSSING BRANCHES. DO NOT THIN TREE CANOPIES.
- ALL PLANTINGS ARE TO BE PROVIDED WITH A 3" DEPTH OF SHREDDED HARDWOOD BARK MULCH (2" DEPTH IN GROUND COVER AREAS). MULCH TO BED LINES WHERE SHOWN. HEDGES ARE TO BE MULCHED AS CONTINUOUS BEDS OF THE WIDTH SHOWN ON PLAN (PLANTS ARE NOT TO BE MULCHED INDIVIDUALLY). TREES SHALL BE MULCHED WITHIN A MINIMUM TWO AND ONE HALF (2 1/2) FOOT RADIUS OF EACH TRUNK.
- REMOVE THE BURLAP, TWINE, AND WIRE BASKETS FROM THE TOP 1/3 OF ALL B&B ROOT BALLS. NO PLASTIC TWINE OR BURLAP SHALL BE PERMITTED ON B&B PLANTS. PLANTING PITS SHALL BE THE SAME DEPTH AS ROOT BALLS. STAKE TREES AS FOLLOWS:
 - ALL TREES 2" CALIPER AND GREATER AND
 - ALL EVERGREENS BRANCHED TO GROUND (I.E. LEYLAND CYPRESS, ETC.).
 - CONTRACTOR IS REQUIRED TO UNSTAKE TREES IN A TIMELY MANNER WITHIN THE YEAR FOLLOWING FINAL ACCEPTANCE TO ENSURE TREES ARE NOT DAMAGED BY STAKING WIRE. CONTRACTOR WILL BE RESPONSIBLE FOR REPLACEMENT OF TREES DAMAGED BY WIRES IF NOT REMOVED IN A TIMELY FASHION.
- DO NOT WRAP TREE TRUNKS. DO NOT USE TREE WOUND PAINT.
- ALL GREEN AREAS NOT DESIGNATED OTHERWISE ARE TO BE SEEDED WITH TURFGRASS.
- CONTRACTOR IS RESPONSIBLE FOR WATERING AND INSECT CONTROL UNTIL THE DATE OF FINAL INSPECTION. REPLANTING, WHEN RESULTING FROM SITE DISTURBANCE BY OTHERS, SHALL BE AT ADDITIONAL CHARGE.
- THE WORK AREA IS TO BE KEPT REASONABLY NEAT AND CLEAN AND ALL DEBRIS HAULED AWAY AND DISPOSED OF LEGALLY, OFF SITE, IN A TIMELY MANNER.
- IF ANY CONFLICT SHOULD ARISE BETWEEN THESE SPECIFICATIONS AND THOSE OF BOOK SPECIFICATIONS FOR THIS PROJECT, THE BOOK SPECIFICATIONS SHALL GOVERN.
- ANY PLANT SUBSTITUTIONS PROPOSED REQUIRE THE APPROVAL OF THE LANDSCAPE DESIGNER AND THE CITY OF CHESAPEAKE.



NOTE: ROTO-TILLING SHALL NOT OCCUR IN AREAS THAT HAVE ROOTS OF EXISTING PLANTS THAT ARE TO BE RETAINED.



NOTE: ROTO-TILLING SHALL NOT OCCUR IN AREAS THAT HAVE ROOTS OF EXISTING PLANTS THAT ARE TO BE RETAINED.

SYMBOL KEY:

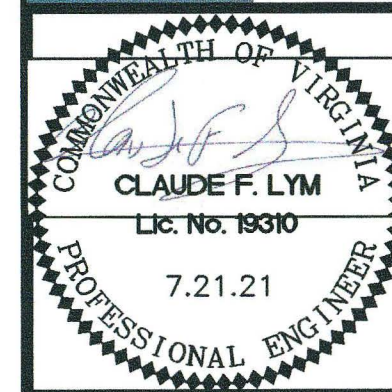
- (GH) COLUMNAR-HORNBEAM
(CM) COLUMNAR MAPLE
(CL) CURLY LEAF LIGUSTRUM
(IH) INDIAN HAWTHORNE
(BB) BLUE HAVEN FLUTTERBY PETITE BUTTERFLY BUSH
(AE) ALEE ELM
(WM) WAX MYRTLE
(VC) SPRING BOUQUET VIBURNUM
(LL) LOBLOLLY PINE
(GM) LITTLE GEM MAGNOLIA
(FT) WHITE FRINGE TREE
(CR) CRAPE MYRTLE
(KR) KNOCK OUT ROSE

LANDSCAPING CONSULTANT

KEVIN SULLIVAN
3840 DAWLHEY ROAD
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(757) 426-3081
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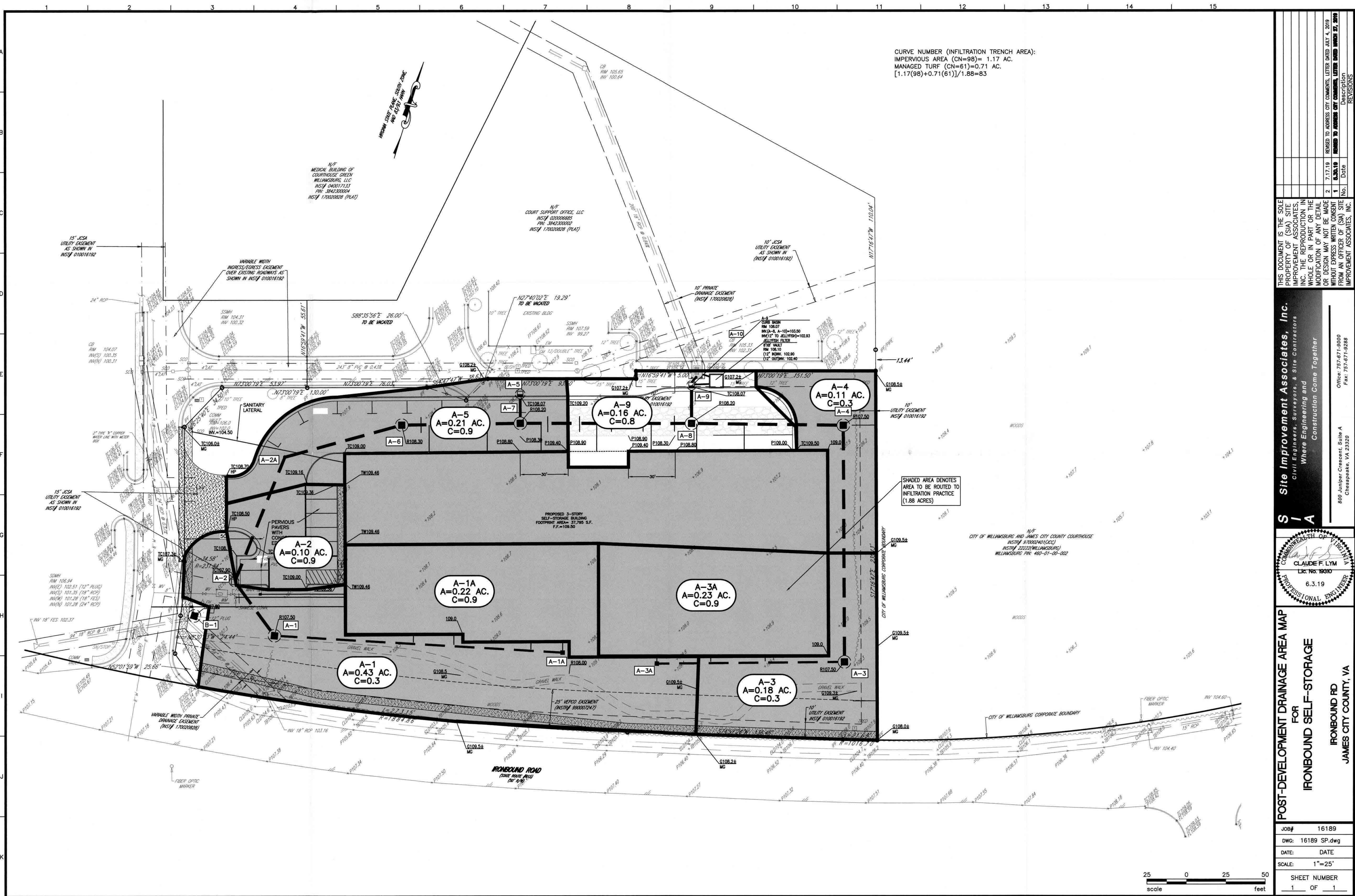
DATE 07-21-2021
VIRGINIA CERTIFIED NURSERYMAN #145 (03-19-80)
EXPIRES 12-31-21
(INSTALLATION PRICING AVAILABLE UPON REQUEST)

Site Improvement Associates, Inc.
Civil Engineers, Surveyors, & Site Contractors
Where Engineering and Construction Come Together



LANDSCAPE PLAN
FOR
IRONBOUND SELF-STORAGE

JOB# 16189
DWG: 16189 SP.dwg
DATE: 7.17.19
SCALE: 1"=25'
SHEET NUMBER 6 OF 13



CURVE NUMBER (INFILTRATION TRENCH AREA):
IMPERVIOUS AREA (CN=98)= 1.17 AC.
MANAGED TURF (CN=61)=0.71 AC.
[1.17(98)+0.71(61)]/1.88=83

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2 7/17/19 1 8/30/19

REVISIONS

NO. DATE DESCRIPTION

Site Improvement Associates, Inc.
Civil Engineers, Surveyors, & Site Contractors
Where Engineering and Construction Come Together

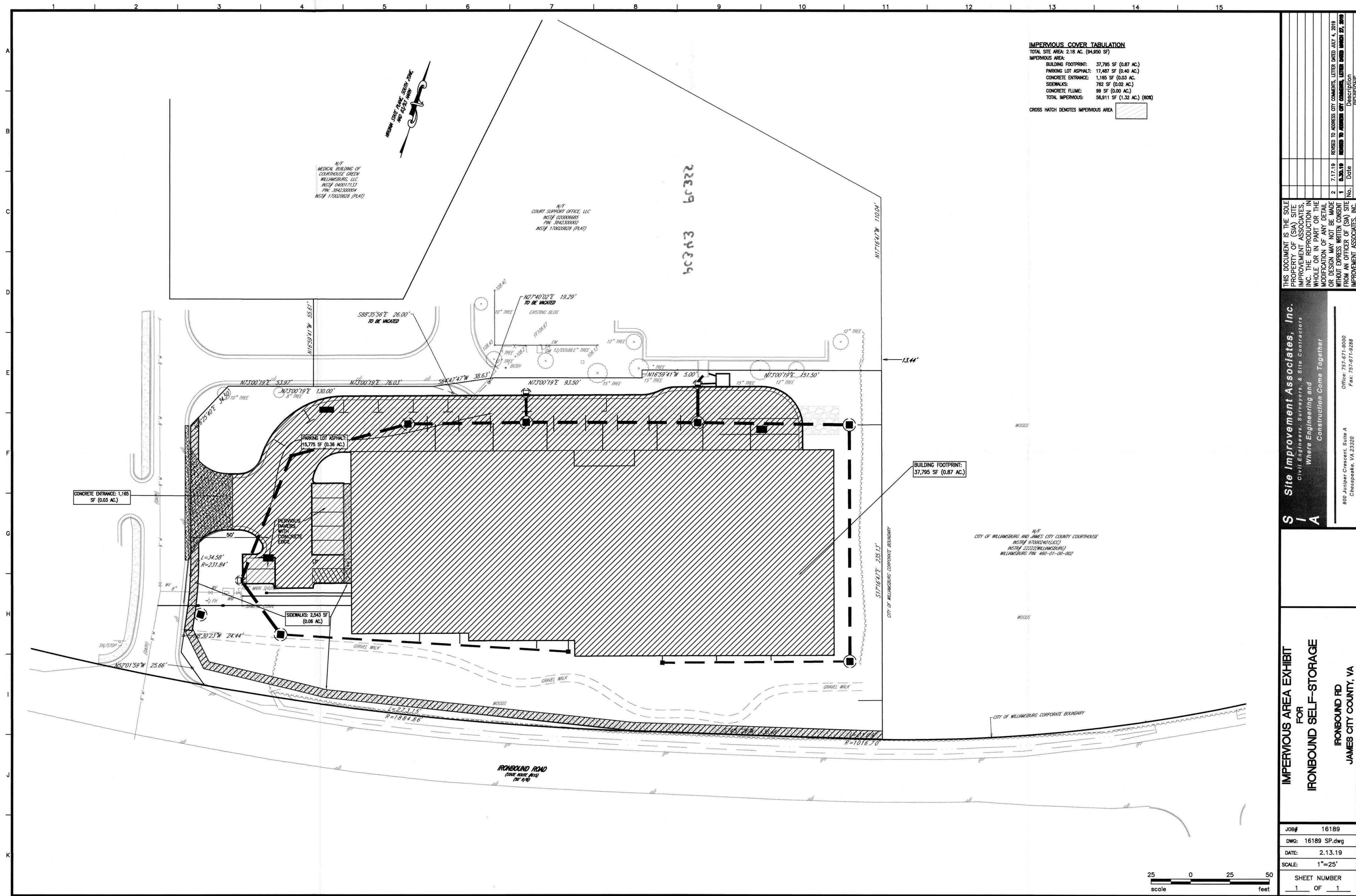
Office: 757-671-9000
800 Juniper Crescent, Suite A
Chesapeake, VA 23320
Fax: 757-671-9288

COMMONWEALTH OF VIRGINIA
CLAUDE F. LYM
Lic. No. 19310
6.3.19
PROFESSIONAL ENGINEER

POST-DEVELOPMENT DRAINAGE AREA MAP FOR IRONBOUND SELF-STORAGE

JOB# 16189
DWG: 16189 SP.dwg
DATE: DATE
SCALE: 1"=25'
SHEET NUMBER 1 OF 1

IRONBOUND RD
JAMES CITY COUNTY, VA



IMPERVIOUS COVER TABULATION

TOTAL SITE AREA: 2.18 AC. (94,950 SF)

IMPERVIOUS AREA:

BUILDING FOOTPRINT:	37,795 SF (0.87 AC.)
PARKING LOT ASPHALT:	17,487 SF (0.40 AC.)
CONCRETE ENTRANCE:	1,165 SF (0.03 AC.)
SIDEWALKS:	782 SF (0.02 AC.)
CONCRETE FLUME:	99 SF (0.00 AC.)
TOTAL IMPERVIOUS:	56,911 SF (1.32 AC.) (60%)

CROSS HATCH DENOTES IMPERVIOUS AREA

IMPERVIOUS AREA EXHIBIT
FOR
IRONBOUND SELF-STORAGE

IRONBOUND RD.
JAMES CITY COUNTY, VA

S I A
Site Improvement Associates, Inc.
Civil Engineers, Surveyors, & Site Contractors
Where Engineering and Construction Come Together

800 Juniper Crescent, Suite A
Chesapeake, VA 23320
Office: 757-671-9000
Fax: 757-671-9288

NO.	DATE	DESCRIPTION
1	7/17/19	REVISION TO ADDRESS CITY COMMENTS, LETTER DATED JULY 4, 2019
2	8/30/19	REVISION TO ADDRESS CITY COMMENTS, LETTER DATED MARCH 27, 2019

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JOB#	16189
DWG:	16189 SP.dwg
DATE:	2.13.19
SCALE:	1"=25'
SHEET NUMBER	1 OF 1

TRANSMITTAL

DATE: 10/14/19
TO: Records
FROM: Tori Haynes, Planning
SUBJECT: SP-19-0016, 4091 Ironbound Road Self-Storage Facility
TAX ID: 3842300001
ITEM(S): Stamped approved plans
ACTION: Please scan and upload to Energov.

SP-19-0016

SITE PLAN FOR IRONBOUND SELF-STORAGE

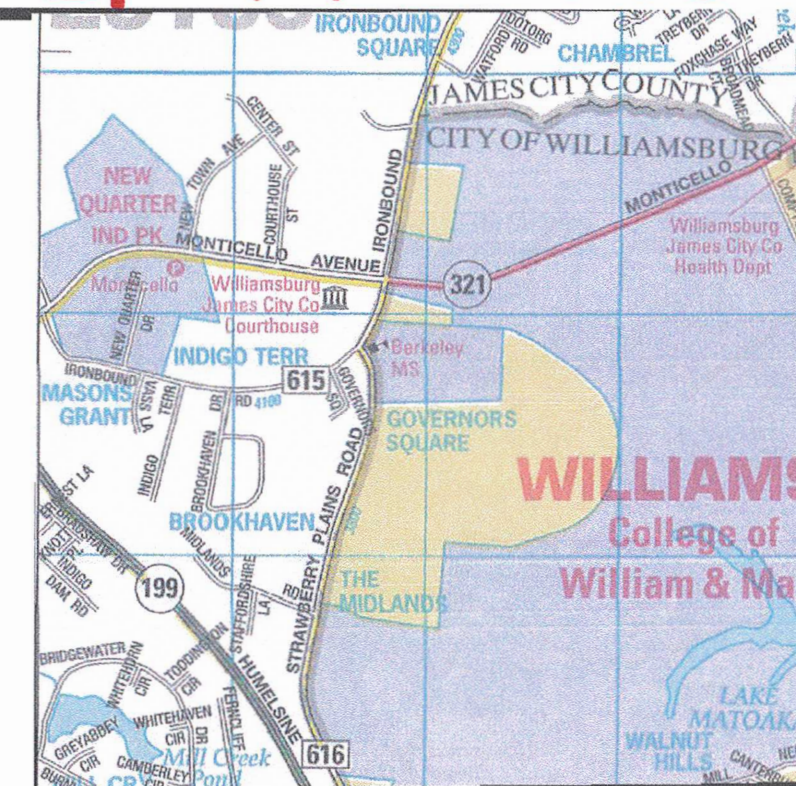
IRONBOUND RD
WILLIAMSBURG, VA
8.2.19
SP-19-0016

PLANNING DIVISION

AUG 07 2019

RECEIVED

Sheet List Table	
Sheet Number	Sheet Title
1	COVER SHEET
2	BOUNDARY AND TOPOGRAPHIC SURVEY
3	DEMOLITION AND EROSION AND SEDIMENT AND CONTROL PLAN
4	SITE LAYOUT AND UTILITY PLAN
5	GRADING PLAN
6	LANDSCAPE PLAN
7	LIGHTING PLAN
8	EROSION AND SEDIMENT CONTROL DETAILS
9	EROSION AND SEDIMENT CONTROL NARRATIVE
10	GENERAL DETAILS
11	UTILITY DETAILS
12	UTILITY GENERAL NOTES
13	STORMWATER DETAILS



VICINITY MAP
SCALE: 1" = 2000'

COUNTY OF JAMES CITY FINAL SITE PLAN	
APPROVALS	DATE
Fire Dept.	
Health Dept.	
VDOT	
Planning	
SRP	
Zoning	
JCSA	
BSP	
REA	
Landscape	
Other	

STANDARD COUNTY STORMWATER POLLUTION PREVENTION PLAN NOTES (REVISED: JULY 1, 2014)

- THE FOLLOWING STANDARD COUNTY NOTES SHALL BECOME PART OF ANY APPROVED STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR PLAN OF DEVELOPMENT PROJECTS IN JAMES CITY COUNTY, VIRGINIA. COMPONENTS OF A SWPPP MAY INCLUDE AS APPLICABLE: A SITE EROSION AND SEDIMENT CONTROL (E&S) PLAN, A SITE STORMWATER MANAGEMENT (SWM) PLAN, AND A SITE POLLUTION PREVENTION PLAN (PPP). THE COUNTY'S DIVISION OF ENGINEERING AND RESOURCE PROTECTION IS DESIGNATED BY CHAPTER 8 OF THE COUNTY CODE AS THE LOCAL VIRGINIA EROSION AND SEDIMENT CONTROL PROGRAM (VESCP) AUTHORITY AND VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) AUTHORITY.
- ALL THE PROVISIONS OF VIRGINIA EROSION AND SEDIMENT CONTROL (E&S) LAW AND REGULATIONS, THE VIRGINIA STORMWATER MANAGEMENT ACT AND REGULATIONS (VSMP), THE VIRGINIA BMP CLEARINGHOUSE WEBSITE, STATE EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT HANDBOOKS, AND ANY ASSOCIATED TECHNICAL BULLETINS AND GUIDANCE DOCUMENTS AS PUBLISHED BY THE STATE WATER CONTROL BOARD, THE VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ), AND THE LOCAL VESCP AND VSMP AUTHORITY SHALL APPLY TO THE PROJECT.
 - MINIMUM STANDARDS NO. 1 THROUGH NO. 19 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS 9VAC25-840 ET SEQ. SHALL APPLY TO THE PROJECT.
 - THE OWNER, APPLICANT, OPERATOR, OR PERMITTEE SHALL BE RESPONSIBLE TO REGISTER FOR CONSTRUCTION GENERAL PERMIT (CGP) COVERAGE, AS APPLICABLE, IN ACCORDANCE WITH THE GENERAL VPDES PERMIT FOR DISCHARGE OF STORMWATER FROM CONSTRUCTION ACTIVITIES (VAR10) CHAPTER 880; THE VIRGINIA STORMWATER MANAGEMENT PROGRAM REGULATIONS CHAPTER 870; AND IN ACCORDANCE WITH CURRENT REQUIREMENTS OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP), THE STATE WATER CONTROL BOARD, THE VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY, CHAPTER 8 OF THE COUNTY CODE AND THE LOCAL VESCP/VSMPT AUTHORITY.
 - THE OWNER, APPLICANT, OPERATOR OR PERMITTEE SHALL PROVIDE THE NAME OF AN INDIVIDUAL HOLDING A VALID RESPONSIBLE LAND DISTURBER (RLD) CERTIFICATE OF COMPETENCY WHO WILL BE RESPONSIBLE FOR THE LAND DISTURBING ACTIVITY PRIOR TO ENGAGING IN THE LAND DISTURBING ACTIVITY. THIS WILL BE NECESSARY PRIOR TO ISSUANCE OF A LOCAL LAND DISTURBING AND/OR STORMWATER CONSTRUCTION PERMIT FOR THE PROJECT. THE RLD IS REQUIRED TO ATTEND THE PRECONSTRUCTION CONFERENCE FOR THE PROJECT.
 - THE CONTRACTOR IS RESPONSIBLE TO CONTACT MISS UTILITY (DIAL 811 IN VA OR 1-800-552-7001) PRIOR TO ANY UTILITY OR SITE WORK EXCAVATIONS.
 - ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PLANNED, DESIGNED, IMPLEMENTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH). THE CONTRACTOR SHALL MAINTAIN, INSPECT, AND REPAIR ALL EROSION AND SEDIMENT CONTROL MEASURES AS NEEDED THROUGHOUT THE LIFE OF THE PROJECT TO ENSURE CONTINUED ACCEPTABLE PERFORMANCE.
 - A PRECONSTRUCTION CONFERENCE (MEETING) SHALL BE HELD ON SITE AND INCLUDE REPRESENTATIVES FROM THE LOCAL VESCP/VSMPT AUTHORITY, THE OWNER/APPLICANT/PERMITTEE, THE RESPONSIBLE LAND-DISTURBER (RLD), AND THE CONTRACTOR, ENGINEER, AND OTHER RESPONSIBLE AGENCIES, AS APPLICABLE. PRIOR TO AUTHORIZATION AND ISSUANCE OF A LOCAL LAND DISTURBING OR STORMWATER CONSTRUCTION PERMIT, THE OWNER, APPLICANT, OPERATOR OR PERMITTEE IS REQUIRED TO COORDINATE SCHEDULING OF THE PRECONSTRUCTION CONFERENCE BETWEEN ALL APPLICABLE PARTIES. THE CONTRACTOR SHALL SUBMIT A SEQUENCE OF CONSTRUCTION AND A REVISED POLLUTION PREVENTION PLAN (P2 PLAN OR PPP), IF APPLICABLE, TO THE LOCAL VESCP/VSMPT AUTHORITY FOR REVIEW AND APPROVAL PRIOR TO THE PRECONSTRUCTION MEETING.
 - A POLLUTION PREVENTION PLAN (P2 PLAN OR PPP), IF REQUIRED, SHALL BE DEVELOPED, IMPLEMENTED AND UPDATED AS NECESSARY AND MUST DETAIL THE DESIGN, INSTALLATION, IMPLEMENTATION, AND MAINTENANCE OF EFFECTIVE POLLUTION PREVENTION MEASURES TO: MINIMIZE THE DISCHARGE OF POLLUTANTS FROM EQUIPMENT AND VEHICLE WASHING, WHEEL WASH WATER AND OTHER WASH WATERS; MINIMIZE THE EXPOSURE OF ALL MATERIALS ON THE SITE (SUCH AS BUILDING MATERIALS AND PRODUCTS, CONSTRUCTION WASTE, TRASH, LANDSCAPE MATERIALS, FERTILIZERS, PESTICIDES, HERBICIDES, DETERGENTS, SANITARY WASTE, ETC.) TO PRECIPITATION AND STORMWATER; MINIMIZE THE DISCHARGE OF POLLUTANTS FROM SPILLS AND LEAKS; IMPLEMENT CHEMICAL SPILL AND LEAK PREVENTION AND RESPONSE PROCEDURES; AND INCLUDE EFFECTIVE BEST MANAGEMENT PRACTICES TO PROHIBIT THE DISCHARGE OF WASTEWATER FROM: CONCRETE WASHOUT AREAS, DISCHARGE OF WASTEWATER FROM WASHOUT AND CLEANOUT OF STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS AND OTHER CONSTRUCTION MATERIALS; DISCHARGE OF FUELS, OILS, OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE ACTIVITIES; AND THE DISCHARGE OF SOAPS AND SOLVENTS USED FOR VEHICLE AND EQUIPMENT WASHING. THIS PLAN SHALL BE AVAILABLE ON-SITE FOR REVIEW AT REASONABLE TIMES BY THE LOCAL VESCP/VSMPT AUTHORITY WHEN REQUESTED.
 - THE OWNER, APPLICANT, OPERATOR, OR PERMITTEE IS RESPONSIBLE FOR ALL OPERATOR SELF-INSPECTIONS AS REQUIRED IN THE POLLUTION PREVENTION PLAN (P2 PLAN OR PPP) OR AS REQUIRED AS PART OF A DEVELOPED STORMWATER POLLUTION PREVENTION PLAN (SWPPP). THESE INSPECTIONS SHALL BE MADE AVAILABLE, UPON REQUEST, BY THE LOCAL VESCP/VSMPT AUTHORITY.
 - ALL PERMITTEE EROSION AND SEDIMENT CONTROL (E&S) MEASURES SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LANDDISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE ACTIVITY TAKES PLACE.
 - ADDITIONAL SAFETY FENCE OR DUST CONTROL MEASURES, IN ACCORDANCE WITH THE PROVISIONS OF MINIMUM STANDARDS & SPECS. 3.01 AND 3.39 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH), MAY BE REQUIRED TO BE IMPLEMENTED ON THE SITE IN ADDITION TO THAT SHOWN ON THE APPROVED PLAN AND SPECIFICATIONS IN ORDER TO ENSURE ADEQUATE PROTECTION OF THE HEALTH, SAFETY AND WELFARE OF THE PUBLIC OR IF SITE CONDITIONS CHANGE, BECOME APPARENT OR ALTER SIGNIFICANTLY FOLLOWING THE DATE OF PLAN APPROVAL. LOCAL VESCP/VSMPT AUTHORITY COMPLIANCE INSPECTOR, SHOULD PLACEMENT OF THE MEASURE RESULT IN EXCESSIVE ROAD FLOODING, TRAFFIC OR SAFETY HAZARD, OR RESULT IN THE REDIRECTION OF DRAINAGE ONTO OR TOWARD EXISTING LOTS, HOMES, DRIVEWAYS, GARAGES OR OTHER STRUCTURES. DECISIONS SHALL BE MADE BY THE VESCP/VSMPT AUTHORITY ON A CASE-BY-CASE BASIS BASED ON FIELD SITUATIONS ENCOUNTERED.
 - TEMPORARY SOIL STOCKPILES SHALL COMPLY WITH THE PROVISIONS OF SECTION 24-46 OF THE COUNTY CODE.
 - CULVERT AND STORM DRAIN INLET PROTECTIONS, IN ACCORDANCE WITH THE PROVISIONS OF MINIMUM STANDARDS & SPECS. 3.07 AND 3.08 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH), MAY BE REMOVED AT THE DISCRETION OF THE ASSIGNED LOCAL VESCP/VSMPT AUTHORITY COMPLIANCE INSPECTOR, SHOULD PLACEMENT OF THE MEASURE RESULT IN EXCESSIVE ROAD FLOODING, TRAFFIC OR SAFETY HAZARD, OR RESULT IN THE REDIRECTION OF DRAINAGE ONTO OR TOWARD EXISTING LOTS, HOMES, DRIVEWAYS, GARAGES OR OTHER STRUCTURES. DECISIONS SHALL BE MADE BY THE VESCP/VSMPT AUTHORITY ON A CASE-BY-CASE BASIS BASED ON FIELD SITUATIONS ENCOUNTERED.
 - DRAINAGE FACILITIES SHALL BE INSTALLED AND FUNCTIONAL WITHIN 30 DAYS FOLLOWING COMPLETION OF ROUGH GRADING AT ANY POINT WITHIN THE PROJECT.
 - NO MORE THAN 300 FEET OF TRENCH MAY BE OPEN AT ONE TIME FOR UNDERGROUND UTILITY LINES, INCLUDING STORM WATER CONVEYANCES. ALL OTHER PROVISIONS OF MINIMUM STANDARD NO. 16 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS APPLY.
 - PERMANENT OR TEMPORARY STABILIZATION OF DISTURBED SOIL AREAS SHALL COMPLY WITH MINIMUM STANDARD # 1 AND # 3 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS.
 - THE TERM SEEDING, FINAL VEGETATIVE COVER OR STABILIZATION ON THE APPROVED PLAN SHALL MEAN THE SUCCESSFUL GERMINATION AND ESTABLISHMENT OF A STABLE GRASS COVER FROM A PROPERLY PREPARED SEEDBED, IN ACCORDANCE WITH MINIMUM STANDARD # 1 AND # 3 FROM THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS, MINIMUM STANDARDS & SPECS. 3.29 THROUGH 3.37 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH), AND ANY TECHNICAL BULLETINS ISSUED BY THE STATE WATER CONTROL BOARD OR VIRGINIA DEQ, AS APPLICABLE. IRRIGATION, IF NECESSARY, SHALL COMPLY WITH ALL APPLICABLE SEASONAL OUTDOOR WATER USE RESTRICTIONS OF THE JAMES CITY SERVICE AUTHORITY.
 - IF DISTURBED AREA STABILIZATION IS TO BE ACCOMPLISHED DURING THE MONTHS OF DECEMBER, JANUARY OR FEBRUARY, STABILIZATION SHALL CONSIST OF MULCHING IN ACCORDANCE WITH MINIMUM STANDARD & SPEC. 3.35 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH). SEEDING WILL THEN TAKE PLACE AS SOON AS THE SEASON PERMITS.
 - TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL NOT BE REMOVED UNTIL ALL DISTURBED AREAS ARE STABILIZED. REMOVAL SHALL NOT OCCUR WITHOUT AUTHORIZATION BY THE LOCAL VESCP/VSMPT AUTHORITY. DISTURBANCES ASSOCIATED WITH THE REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROPERLY STABILIZED.
 - NO SEDIMENT TRAP OR SEDIMENT BASIN SHALL BE REMOVED UNTIL A) AT LEAST 75 PERCENT OF THE SINGLE-FAMILY LOTS WITHIN THE DRAINAGE AREA TO THE TRAP OR BASIN HAVE BEEN SOLD TO A THIRD PARTY FOR THE CONSTRUCTION OF HOMES (UNRELATED TO THE DEVELOPER); AND/OR, B) 60 PERCENT OF THE SINGLE-FAMILY LOTS WITHIN THE DRAINAGE AREA TO THE TRAP OR BASIN ARE COMPLETED AND STABILIZED. A BULK SALE OF THE LOTS TO ANOTHER BUILDER DOES NOT SATISFY THIS PROVISION. SEDIMENT TRAPS AND SEDIMENT BASINS SHALL NOT BE REMOVED WITHOUT AUTHORIZATION OF THE LOCAL VESCP/VSMPT AUTHORITY.
 - DESIGN AND CONSTRUCTION OF PRIVATE-TYPE STORM DRAINAGE SYSTEMS, OUTSIDE VDOT RIGHT-OF-WAY, SHALL BE PERFORMED IN ACCORDANCE WITH THE CURRENT VERSION OF THE JAMES CITY COUNTY, ENGINEERING AND RESOURCE PROTECTION DIVISION, STORMWATER DRAINAGE CONVEYANCE SYSTEMS (NON-BMP RELATED), GENERAL DESIGN AND CONSTRUCTION GUIDELINES (IE. COUNTY DRAINAGE STANDARDS).
 - RECORD DRAWINGS (CONSULTS) AND CONSTRUCTION CERTIFICATIONS ARE REQUIRED FOR ALL STORMWATER FACILITIES INCLUDING STORMWATER MANAGEMENT/BMP FACILITIES AND STORM DRAINAGE CONVEYANCE SYSTEMS. THE CERTIFICATION PROCESS SHALL INCLUDE AN INTERNAL CLOSED-CIRCUIT TELEVISION CAMERA (CCTV) POST INSTALLATION INSPECTION PERFORMED BY THE OWNER IN ACCORDANCE WITH STANDARDS AND SPECIFICATIONS DEVELOPED BY THE VSMP AUTHORITY. RECORD DRAWINGS AND CONSTRUCTION CERTIFICATIONS MUST MEET ESTABLISHED PROGRAM REQUIREMENTS OF THE COUNTY'S CHAPTER 8 EROSION AND SEDIMENT CONTROL AND VSMP ORDINANCE AND THE LOCAL VESCP/VSMPT AUTHORITY.
 - ALL STORMWATER FACILITIES INCLUDING BMPs, STORM DRAINAGE PIPES, STORMWATER CONVEYANCES, INLETS, MANHOLES, OUTFALLS AND ROADSIDE AND OTHER OPEN CHANNELS SHALL BE INSPECTED BY THE LOCAL VESCP/VSMPT AUTHORITY. THE OWNER, AND THE APPLICANT/OPERATOR/PERMITTEE DESIGNATED GEOTECHNICAL ENGINEER FOR THE PROJECT IN ACCORDANCE WITH ESTABLISHED COUNTY STORMWATER FACILITY INSPECTION PROGRAM REQUIREMENTS.

LEGEND	
EXISTING	PROPOSED

ABBREVIATIONS:

EX. = EXISTING
PROP. = PROPOSED
SAN = SANITARY
MH = MANHOLE
SCU = SANITARY CLEANOUT

TYP = TYPICAL
INV = INVERT
STD. = STANDARD
CUI = CURB DROP INLET
BSL = BUILDING SETBACK LINE

NOTE:

THIS PLAN DOES NOT GUARANTEE THE LOCATION OF EXISTING UNDERGROUND UTILITIES. CONTRACTOR TO DETERMINE ACTUAL LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO MOBILIZATION. IF CONFLICTS EXIST, NOTIFY ENGINEER. BEFORE DIGGING CONTACT "MISS UTILITY ONE CALL CENTER" AT 811.

PROPERTY OWNER / DEVELOPER:

DONALD R. SMITH
MICHAEL D. SIFEN, INC.
500 CENTRAL DRIVE
SUITE 106
VIRGINIA BEACH, VIRGINIA 23454
TELEPHONE: (757) 486-1122
FAX: (757) 486-0905

CIVIL ENGINEER:

CLAUDE F. LYM, PE
SITE IMPROVEMENT ASSOCIATES, INC.
800 JUNIPER CRESCENT
SUITE A
CHESAPEAKE, VIRGINIA 23320
TELEPHONE: (757) 671-9000

SITE DATA/GENERAL NOTES:

- SITE ADDRESS(S): 4091 IRONBOUND ROAD, WILLIAMSBURG, VIRGINIA
- LEGAL DESCRIPTION: PARCEL A, PLAT SHOWING BOUNDARY LINE ADJUSTMENT & PROPERTY LINE EXTINGUISHMENT BETWEEN PARCEL A, PARCEL B, PARCEL C & PARCEL D AND PRIVATE DRAINAGE EASEMENT FOR PARCEL A, PARCEL B, PARCEL C & PARCEL D
- PK: 3842300001
- SITE AREA: 2.18 AC. (94,950 SF)
- ZONING: M1 LIMITED BUSINESS/INDUSTRIAL
- PROPERTY CLASS: 404 COMMERCIAL AND INDUSTRIAL
- THIS PROPERTY DOES NOT FALL WITHIN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON THE FEMA FIRM COMMUNITY-PANEL NO. 51095-01380 EFFECTIVE DATE DECEMBER 16, 2015
- SITE TO BE SERVED BY PUBLIC WATER & SEWER OWNED BY THE JAMES CITY COUNTY SERVICE AUTHORITY, J.C.S.A.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF THE CONSTRUCTION EFFORTS WITH VIRGINIA NATURAL GAS, VIRGINIA POWER, C&P TELEPHONE, APPROPRIATE CABLE COMPANY, JAMES CITY SERVICE AUTHORITY, VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT), AND OTHERS THAT MAY BE REQUIRED.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS PRIOR TO COMMENCEMENT OF WORK TO INCLUDE, BUT NOT LIMITED TO JAMES CITY COUNTY LAND DISTURBANCE, BUILDING, AND UTILITY (JCSA).
- NO LIMITED JAMES CITY COUNTY LAND DISTURBANCE, BUILDING, AND UTILITY (JCSA).
- NO SLOPES GREATER THAN 25% EXIST ON THE SITE.
- THIS SITE DOES NOT LIE WITHIN ANY RESOURCE PROTECTION AREA. ENTIRE SITE LIES WITHIN THE RESOURCE MANAGEMENT AREAS.
- NO SHROU-SWELL, HYDRO, OR SIMILAR SOILS EXIST ON THE SITE.
- IMPERVIOUS AREA: 1.31 AC. (60%)
 - BUILDING FOOTPRINT: 37,795 SF (0.87 AC.)
 - PARKING LOT ASPHALT: 15,775 SF (0.36 AC.)
 - CONCRETE ENTRANCE: 1,165 SF (0.03 AC.)
 - SIDEWALKS: 2,543 SF (0.06 AC.)
 - TOTAL IMPERVIOUS: 57,278 SF (1.31 AC.)
- OPEN SPACE AREA: 0.87 AC. (40%)
- TOTAL DISTURBED AREA: 1.81 AC.
- BUILDING HEIGHT: 37' (THREE FLOORS)
- BUILDING TYPE: TYPE II, NON-COMBUSTIBLE
- FLOOR AREA OF EACH STORY (1-3): 37,795 SF
- TOTAL GROSS FLOOR AREA: 113,385 SF
- FAR: (TOTAL FLOOR AREA)/(LOT AREA) = (113,385 SF)/(94,950 SF) = 1.19
- OFFICE SIZE: 1,280 SF
- USE: SELF STORAGE, 833 UNITS
- PARKING REQUIREMENT: 1,280 SF FOR OFFICE PLUS 1 PER 100 UNITS = 13 SPACES (INCLUDING 1 HANDICAP SPACE)
- PARKING PROVIDED: 13 SPACES (INCLUDING 1 VAN ACCESSIBLE HANDICAP SPACE)
- LOADING SPACES REQUIRED: 1 SPACE FOR EACH 30,000 SF = 1/30,000 SF X (113,385 SF)=4 SPACES
- LOADING SPACES PROPOSED: 4 SPACES
- ALL NEW UTILITIES SHALL BE PLACED UNDERGROUND
- ALL NEW SONS SHALL BE IN ACCORDANCE WITH ARTICLE II, DIVISION 3 OF THE JAMES CITY COUNTY ZONING ORDINANCE
- ALL ROWS SHALL BE PRIVATE RIGHT-OF-WAYS AND SHALL NOT BE MAINTAINED BY JAMES CITY COUNTY OR THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT)
- NO DUMPSTER/DUMPSTER PAD PROPOSED OR APPROVED FOR THIS SITE
- REDUCED SETBACKS AS SHOWN ON SHEET 4 GRANTED BY THE PLANNING DIRECTOR, REFERENCE CASE NO. C-19-0045

STORMWATER AND RESOURCE PROTECTION NOTES:

- ALL OBJECTIONABLE AND DELETERIOUS MATERIAL IS TO BE REMOVED FROM THE SITE AND DISPOSED OF IN A STATE APPROVED FACILITY MEETING THE REQUIREMENTS OF ALL APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS.
- THE STORMWATER MANAGEMENT/BMP FACILITY AND ASSOCIATED STORMWATER CONVEYANCE SYSTEMS AS PROPOSED FOR THIS PROJECT WILL REQUIRE SUBMISSION, REVIEW, AND APPROVAL OF A RECORD DRAWING (AS-BUILT) AND CONSTRUCTION CERTIFICATION PRIOR TO RELEASE OF THE POSTED BOND/SURETY.
- CCTV AN INTERNAL CLOSED CIRCUIT TELEVISION (CCTV) POST INSTALLATION INSPECTION PERFORMED BY THE OPERATOR, IS REQUIRED FOR ALL STORMWATER CONVEYANCE SYSTEM PIPES, ACCESS OR INLET STRUCTURES, AND CULVERTS OF 15-INCH NOMINAL DIAMETER SIZE OR GREATER AS PART OF THE CONSTRUCTION RECORD DRAWING (ASBUILT) AND CONSTRUCTION CERTIFICATION PROCESS. CCTV INSPECTIONS SHALL BE SUBMITTED ON CD-ROM OR EQUIVALENT ELECTRONIC FILE FORMAT FOR STAFF REVIEW. REFER TO SECTIONS 8-25(F) AND 8-27(E) OF THE COUNTY'S CHAPTER 8 ORDINANCE.
- THIS PROJECT IS LOCATED IN THE AL31 HUC
- THIS PROJECT IS LOCATED WITHIN THE POWHATAN CREEK WATERSHED

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Site Improvement Associates, Inc.

Civil Engineers, Surveyors, & Site Contractors

Where Engineering and Construction Come Together

800 Juniper Crescent, Suite A

Chesapeake, VA 23320

Office: 757-671-9000

Fax: 757-671-9288

COVER SHEET

FOR

IRONBOUND SELF-STORAGE

IRONBOUND RD

WILLIAMSBURG, VA

JOB#

16189

DWG:

16189_Details for SP.dwg

DATE:

7.17.19

SCALE:

-

SHEET NUMBER

1 OF 13

EROSION AND SEDIMENT CONTROL LEGEND

- CE CONSTRUCTION ENTRANCE
 SF SEDIMENT FENCE—SEE SPECIFICATIONS ON DETAIL SHEET
 IP INLET PROTECTION
 TP TREE PROTECTION

DEMOLITION NOTES:

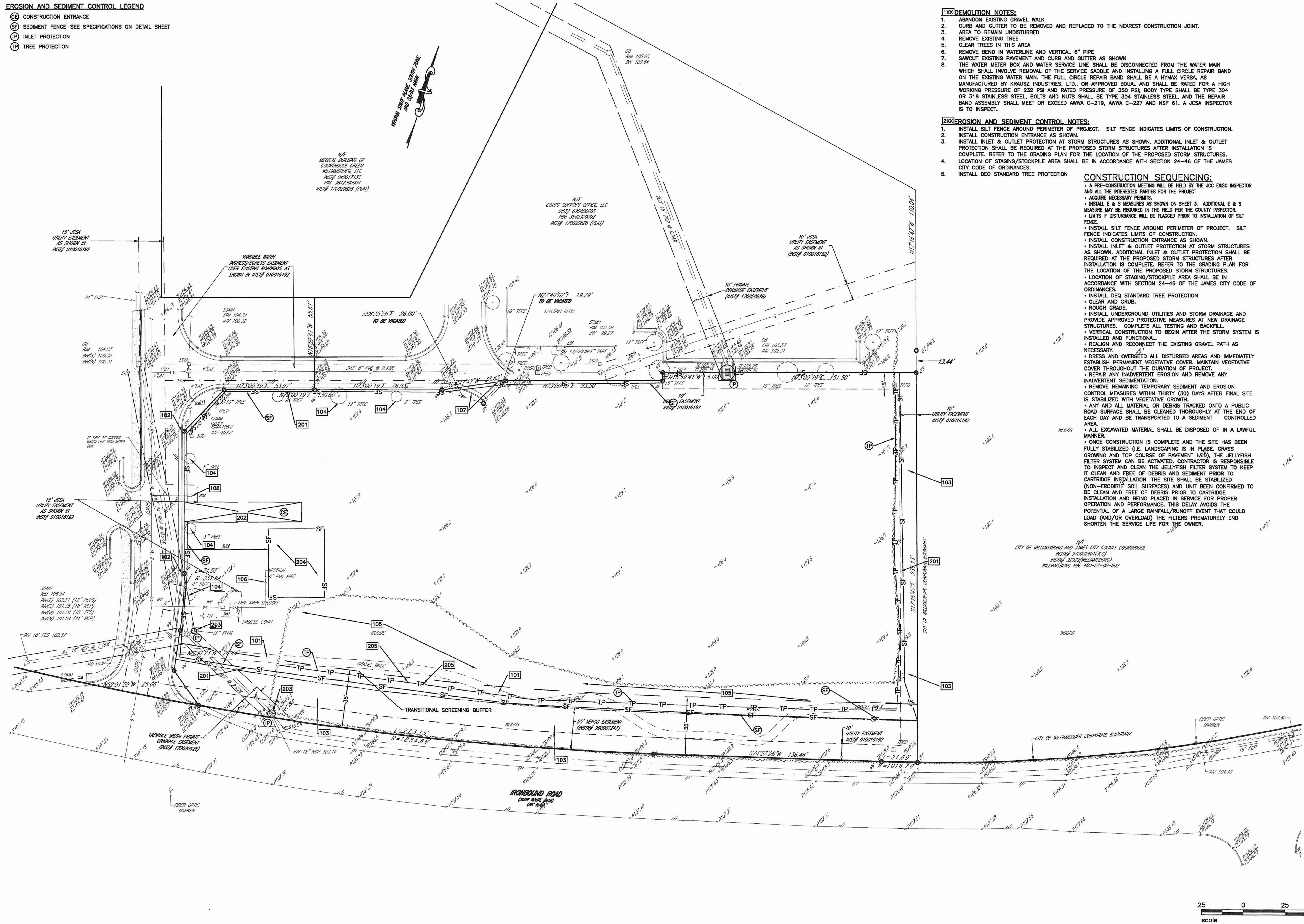
1. ABANDON EXISTING GRAVEL WALK
2. CURB AND GUTTER TO BE REMOVED AND REPLACED TO THE NEAREST CONSTRUCTION JOINT.
3. AREA TO REMAIN UNDISTURBED
4. REMOVE EXISTING TREE
5. CLEAR TREES IN THIS AREA
6. REMOVE BEND IN WATERLINE AND VERTICAL 6" PIPE
7. SAWCUT EXISTING PAVEMENT AND CURB AND GUTTER AS SHOWN
8. THE WATER METER BOX AND WATER SERVICE LINE SHALL BE DISCONNECTED FROM THE WATER MAIN WHICH SHALL INVOLVE REMOVAL OF THE SERVICE SADDLE AND INSTALLING A FULL CIRCLE REPAIR BAND ON THE EXISTING WATER MAIN. THE FULL CIRCLE REPAIR BAND SHALL BE A HYMAX VERSA, AS MANUFACTURED BY KRAUSZ INDUSTRIES, LTD., OR APPROVED EQUAL AND SHALL BE RATED FOR A HIGH WORKING PRESSURE OF 232 PSI AND RATED PRESSURE OF 350 PSI; BODY TYPE SHALL BE TYPE 304 OR 316 STAINLESS STEEL. BOLTS AND NUTS SHALL BE TYPE 304 STAINLESS STEEL, AND THE REPAIR BAND ASSEMBLY SHALL MEET OR EXCEED ANMA C-219, ANMA C-227 AND NSF 61. A JCSA INSPECTOR IS TO INSPECT.

EROSION AND SEDIMENT CONTROL NOTES:

1. INSTALL SILT FENCE AROUND PERIMETER OF PROJECT. SILT FENCE INDICATES LIMITS OF CONSTRUCTION.
2. INSTALL CONSTRUCTION ENTRANCE AS SHOWN.
3. INSTALL INLET & OUTLET PROTECTION AT STORM STRUCTURES AS SHOWN. ADDITIONAL INLET & OUTLET PROTECTION SHALL BE REQUIRED AT THE PROPOSED STORM STRUCTURES AFTER INSTALLATION IS COMPLETE. REFER TO THE GRADING PLAN FOR THE LOCATION OF THE PROPOSED STORM STRUCTURES.
4. LOCATION OF STAGING/STOCKPILE AREA SHALL BE IN ACCORDANCE WITH SECTION 24-46 OF THE JAMES CITY CODE OF ORDINANCES.
5. INSTALL DEQ STANDARD TREE PROTECTION

CONSTRUCTION SEQUENCING:

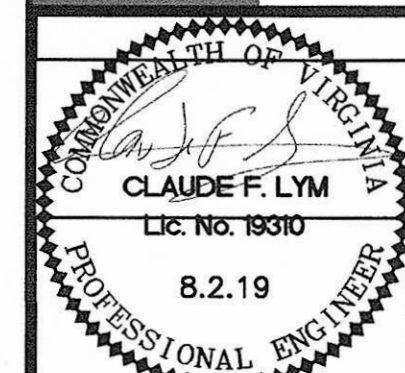
- A PRE-CONSTRUCTION MEETING WILL BE HELD BY THE JCC E&S INSPECTOR AND ALL THE INTERESTED PARTIES FOR THE PROJECT
- ACQUIRE NECESSARY PERMITS
- INSTALL E & S MEASURES AS SHOWN ON SHEET 3. ADDITIONAL E & S MEASURE MAY BE REQUIRED IN THE FIELD PER THE COUNTY INSPECTOR.
- LIMITS IF DISTURBANCE WILL BE FLAGGED PRIOR TO INSTALLATION OF SILT FENCE
- INSTALL SILT FENCE AROUND PERIMETER OF PROJECT. SILT FENCE INDICATES LIMITS OF CONSTRUCTION.
- INSTALL CONSTRUCTION ENTRANCE AS SHOWN.
- INSTALL INLET & OUTLET PROTECTION AT STORM STRUCTURES AS SHOWN. ADDITIONAL INLET & OUTLET PROTECTION SHALL BE REQUIRED AT THE PROPOSED STORM STRUCTURES AFTER INSTALLATION IS COMPLETE. REFER TO THE GRADING PLAN FOR THE LOCATION OF THE PROPOSED STORM STRUCTURES.
- LOCATION OF STAGING/STOCKPILE AREA SHALL BE IN ACCORDANCE WITH SECTION 24-46 OF THE JAMES CITY CODE OF ORDINANCES.
- INSTALL DEQ STANDARD TREE PROTECTION
- CLEAR AND GRUB.
- ROUGH GRADE.
- INSTALL UNDERGROUND UTILITIES AND STORM DRAINAGE AND PROVIDE APPROVED PROTECTIVE MEASURES AT NEW DRAINAGE STRUCTURES. COMPLETE ALL TESTING AND BACKFILL.
- VERTICAL CONSTRUCTION TO BEGIN AFTER THE STORM SYSTEM IS INSTALLED AND FUNCTIONAL.
- REALIGN AND RECONNECT THE EXISTING GRAVEL PATH AS NECESSARY.
- DRESS AND OVERSEED ALL DISTURBED AREAS AND IMMEDIATELY ESTABLISH PERMANENT VEGETATIVE COVER. MAINTAIN VEGETATIVE COVER THROUGHOUT THE DURATION OF PROJECT.
- REPAIR ANY INADVERTENT EROSION AND REMOVE ANY INADVERTENT SEDIMENTATION.
- REMOVE REMAINING TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES WITHIN THIRTY (30) DAYS AFTER FINAL SITE IS STABILIZED WITH VEGETATIVE GROWTH.
- ANY AND ALL MATERIAL OR DEBRIS TRACKED ONTO A PUBLIC ROAD SURFACE SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY AND BE TRANSPORTED TO A SEDIMENT CONTROLLED AREA.
- ALL EXCAVATED MATERIAL SHALL BE DISPOSED OF IN A LAWFUL MANNER.
- ONCE CONSTRUCTION IS COMPLETE AND THE SITE HAS BEEN FULLY STABILIZED (I.E. LANDSCAPING IS IN PLACE, GRASS GROWING AND TOP COURSE OF PAVEMENT LAID), THE JELLYFISH FILTER SYSTEM CAN BE ACTIVATED. CONTRACTOR IS RESPONSIBLE TO INSPECT AND CLEAN THE JELLYFISH FILTER SYSTEM TO KEEP IT CLEAN AND FREE OF DEBRIS AND SEDIMENT PRIOR TO CARTRIDGE INSTALLATION. THE SITE SHALL BE STABILIZED (NON-ERODIBLE SOIL SURFACES) AND UNIT BEEN CONFIRMED TO BE CLEAN AND FREE OF DEBRIS PRIOR TO CARTRIDGE INSTALLATION AND BEING PLACED IN SERVICE FOR PROPER OPERATION AND PERFORMANCE. THIS DELAY AVOIDS THE POTENTIAL OF A LARGE RAINFALL/RUNOFF EVENT THAT COULD LOAD (AND/OR OVERLOAD) THE FILTERS PREMATURELY END SHORTEN THE SERVICE LIFE FOR THE OWNER.



NO.	DATE	DESCRIPTION	REVISIONS
1	7.28.19	REVISED TO ADDRESS CITY COMMENTS, LETTER DATED JULY 11, 2019	
2	7.17.19	REVISED TO ADDRESS CITY COMMENTS, LETTER DATED JULY 4, 2019	
3	5.30.19	REVISED TO ADDRESS CITY COMMENTS, LETTER DATED MARCH 27, 2019	

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S I A
 Site Improvement Associates, Inc.
 Civil Engineers, Surveyors, & Site Contractors
 Where Engineering and Construction Come Together
 800 Juniper Crescent, Suite A
 Chesapeake, VA 23320
 Office: 757-671-9000
 Fax: 757-671-9288



DEMOLITION AND EROSION AND SEDIMENT CONTROL PLAN
 FOR
IRONBOUND SELF-STORAGE
 IRONBOUND RD
 WILLIAMSBURG, VA

JOB#	16189
DWG:	16189 SP.dwg
DATE:	7.17.19
SCALE:	1"=25'
SHEET NUMBER	3 OF 13

UTILITY ADVISORY NOTES:

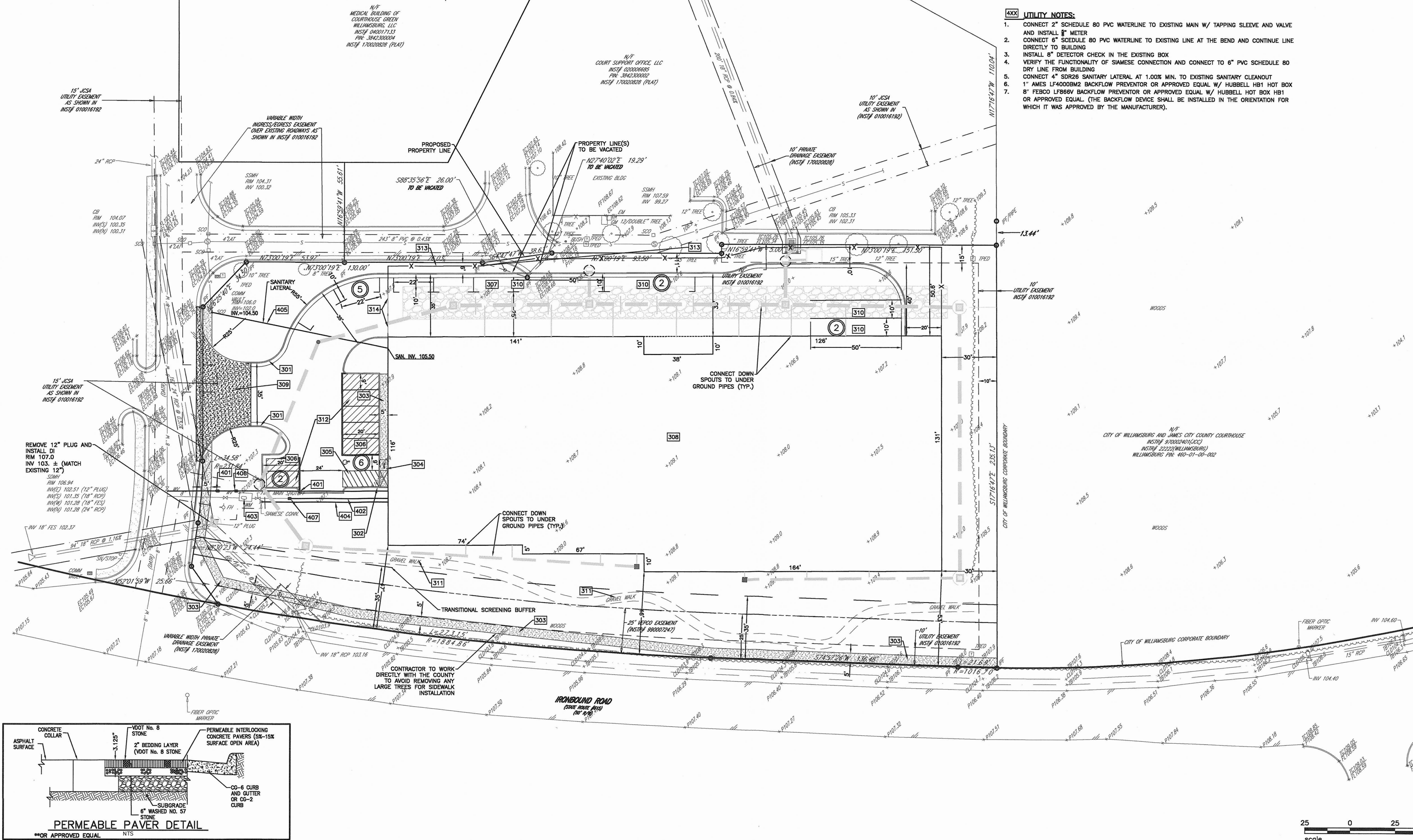
- APPROVED BACKFLOW PREVENTION ASSEMBLIES (BPAS) ARE THOSE WHICH MEET AWWA STANDARDS, AND ARE APPROVED BY ASSE AND THE USC-FCC&HR (UNIVERSITY OF SOUTHERN CALIFORNIA FOUNDATION FOR CROSS CONNECTION CONTROL AND HYDRAULIC RESEARCH). THE BPAS SHALL BE INSTALLED IN THE ORIENTATION IT WAS APPROVED FOR BY USC-FCC&HR. BACKFLOWS MUST NOT BE INSTALLED IN LOCATIONS SUBJECT TO FLOODING SUCH AS UNDERGROUND VAULTS. OUTDOOR ENCLOSURES FOR BACKFLOW PREVENTERS SHALL COMPLY WITH ASSE 1060. SEE SECTION 2.4 OF THE JCSA BACKFLOW PREVENTION AND CROSS CONNECTION CONTROL PROGRAM. ANY QUESTION OR INQUIRIES SHOULD BE DIRECTED TO THE JCSA CROSS CONNECTION CONTROL COORDINATOR, AT (757) 259-4138.
- JCSA WILL NOT OWN NOR MAINTAIN THE PROPOSED BACKFLOW PREVENTION ASSEMBLY, HOWEVER THE OWNER SHALL COORDINATE AN INSPECTION OF THE BACKFLOW PREVENTION DEVICE WITH THE JCSA FOG CROSS CONNECTION CONTROL SUPERVISOR, AT (757) 259-4138. ADDITIONALLY, THE ASSEMBLY SHALL BE TESTED, MAINTAINED AND OPERATED IN ACCORDANCE WITH THE JCSA UTILITY REGULATIONS AND THE JCSA BACKFLOW PREVENTION AND CROSS CONNECTION CONTROL PROGRAM.

LAYOUT NOTES:

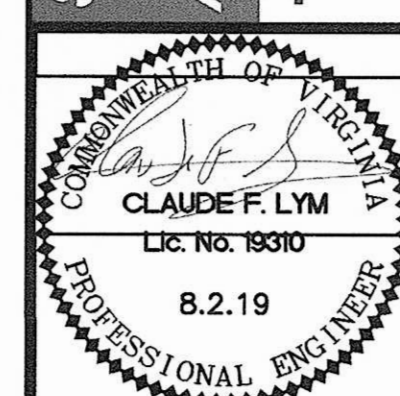
- VDOT CG-6
- VDOT CG-2
- 5' SIDEWALK (VDOT STANDARD)
- HC RAMP
- HC PARKING WITH LOADING AREA AND SIGN
- 9'X20' PARKING SPACE (8 PROVIDED)
- 10'X22' PARALLEL PARKING SPACE (5 PROVIDED)
- SEE ARCHITECTURE PLANS FOR EXACT BUILDING DIMENSIONS
- VDOT CG-11 STANDARD ENTRANCE
- 10'X50' LOADING SPACE (4 PROVIDED)
- GRAVEL PATH IS TO BE ABANDONED IN PLACE.
- PERVIOUS PAVERS WITH CONCRETE EDGE.
- FENCE
- GATE

UTILITY NOTES:

- CONNECT 2" SCHEDULE 80 PVC WATERLINE TO EXISTING MAIN W/ TAPPING SLEEVE AND VALVE AND INSTALL 8" METER
- CONNECT 6" SCHEDULE 80 PVC WATERLINE TO EXISTING LINE AT THE BEND AND CONTINUE LINE DIRECTLY TO BUILDING
- INSTALL 8" DETECTOR CHECK IN THE EXISTING BOX
- VERIFY THE FUNCTIONALITY OF SIAMESE CONNECTION AND CONNECT TO 6" PVC SCHEDULE 80 DRY LINE FROM BUILDING
- CONNECT 4" SDR26 SANITARY LATERAL AT 1.00% MIN. TO EXISTING SANITARY CLEANOUT
- 1" AMES LF4000B2 BACKFLOW PREVENTOR OR APPROVED EQUAL W/ HUBBELL HB1 HOT BOX
- 8" FESCO LF860V BACKFLOW PREVENTOR OR APPROVED EQUAL W/ HUBBELL HOT BOX HB1 OR APPROVED EQUAL. (THE BACKFLOW DEVICE SHALL BE INSTALLED IN THE ORIENTATION FOR WHICH IT WAS APPROVED BY THE MANUFACTURER).

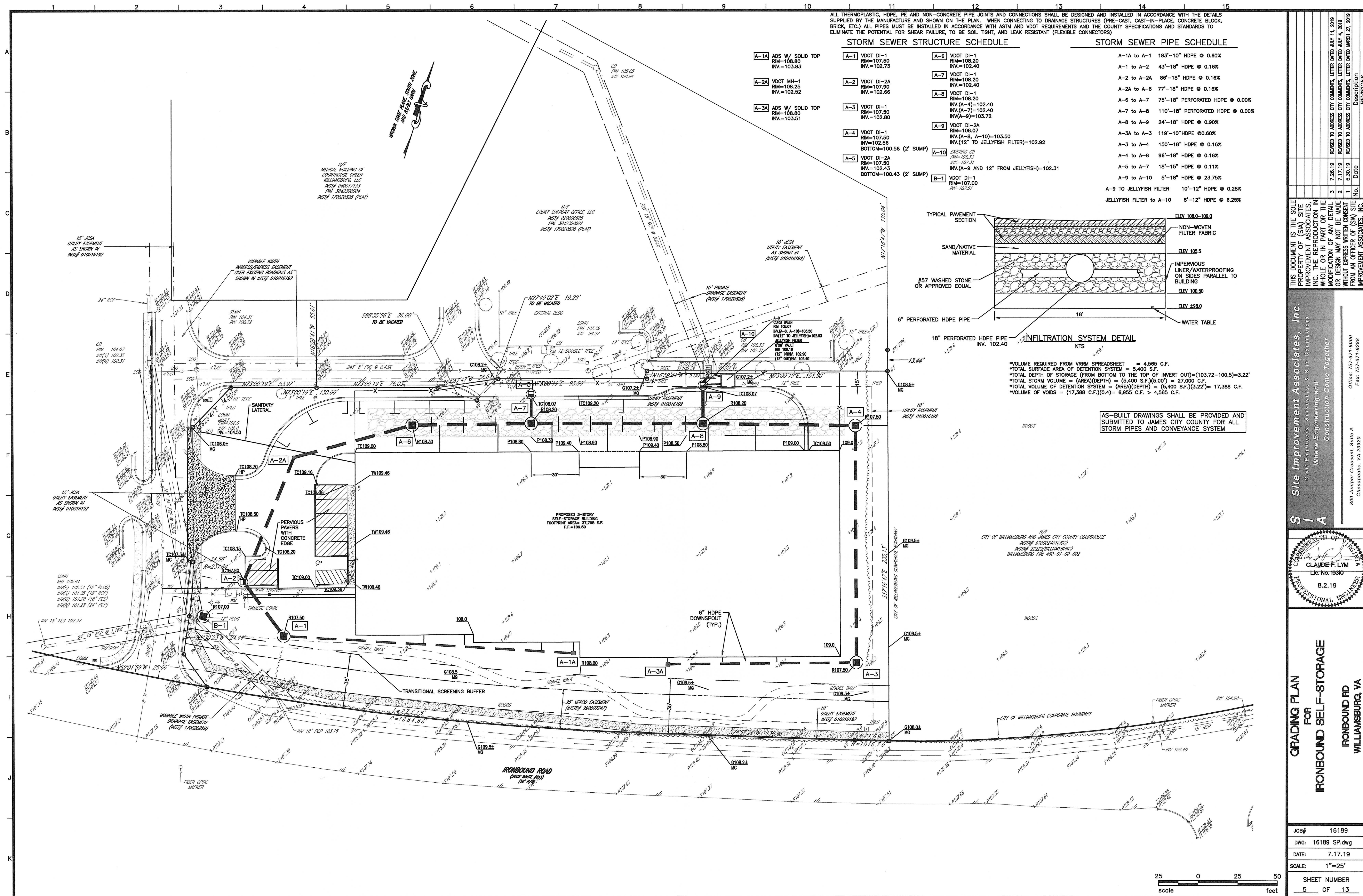


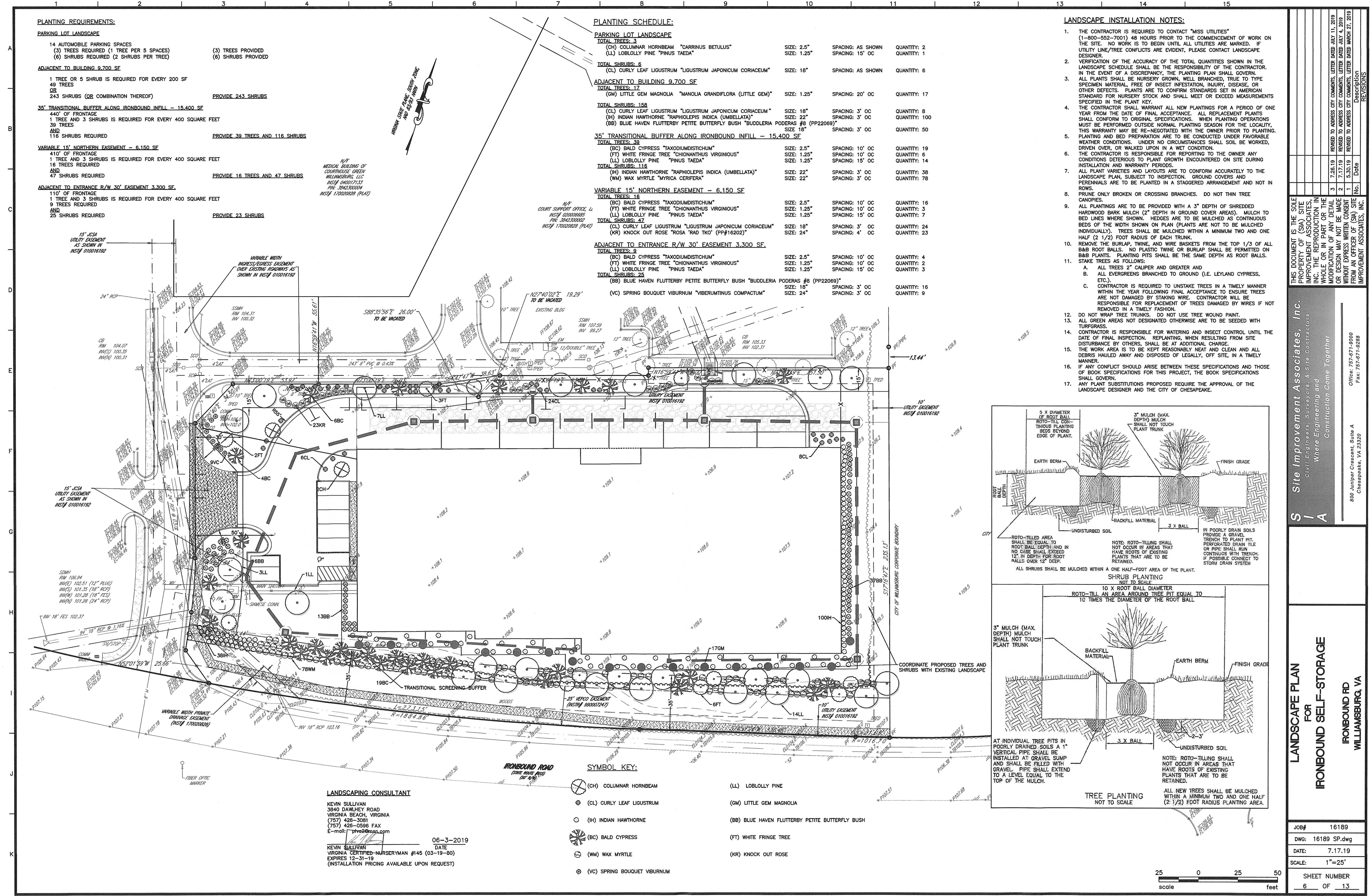
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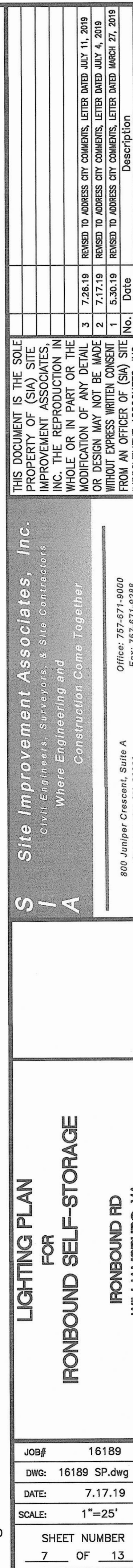


SITE LAYOUT AND UTILITY PLAN FOR IRONBOUND SELF-STORAGE

JOB# 16189
DWG: 16189 SP.dwg
DATE: 7.17.19
SCALE: 1"=25'
SHEET NUMBER 4 OF 13







A vertical scale from 0 to 100. Major tick marks are labeled 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100. Minor tick marks are present every 2 units. The scale is labeled with letters A through K at the top and bottom.

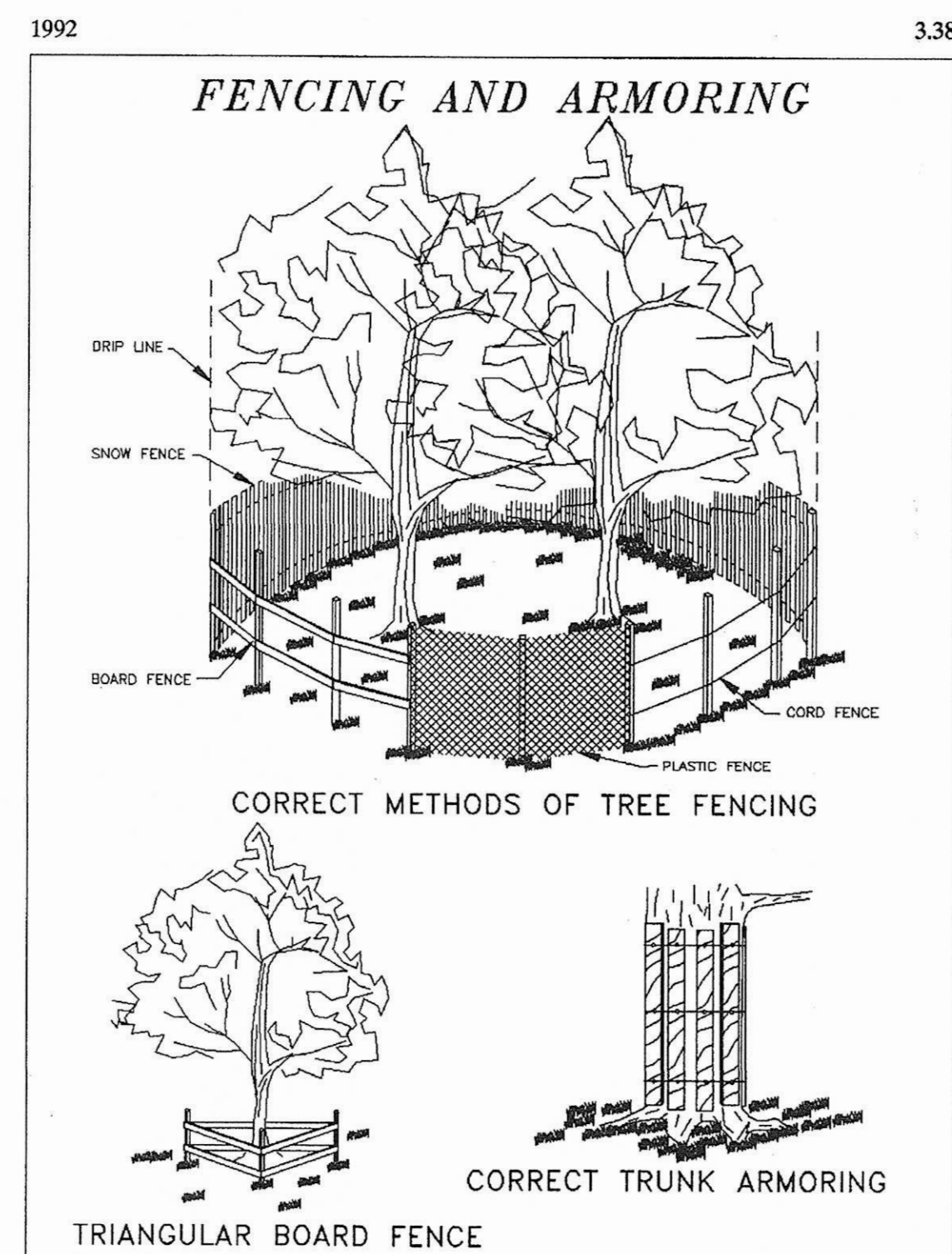
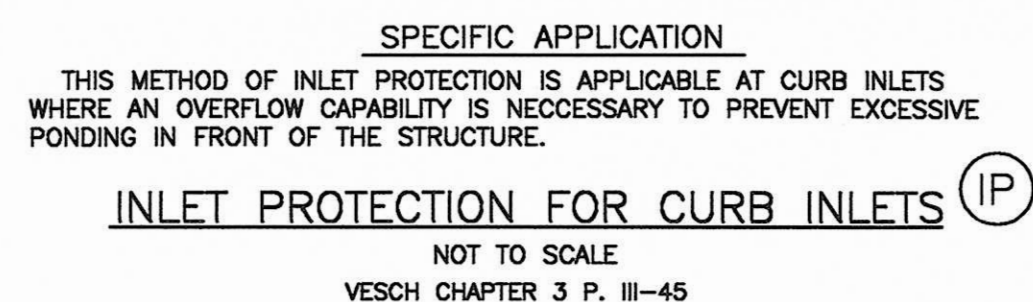


Plate 3.38-2

TREE PROTECTION BARRIERS (TP)

VESCH CHAPTER 3 P. III-401



INLET PROTECTION FOR CURB INLETS (IP)

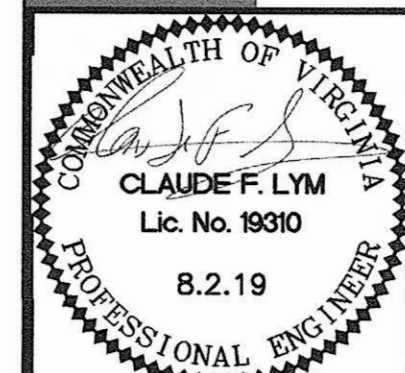
NOT TO SCALE
VESCH CHAPTER 3 P. III-36

NOT TO SCALE
VESCH CHAPTER 3 P. III-45

S I / A **Site Improvement Associates, Inc.**
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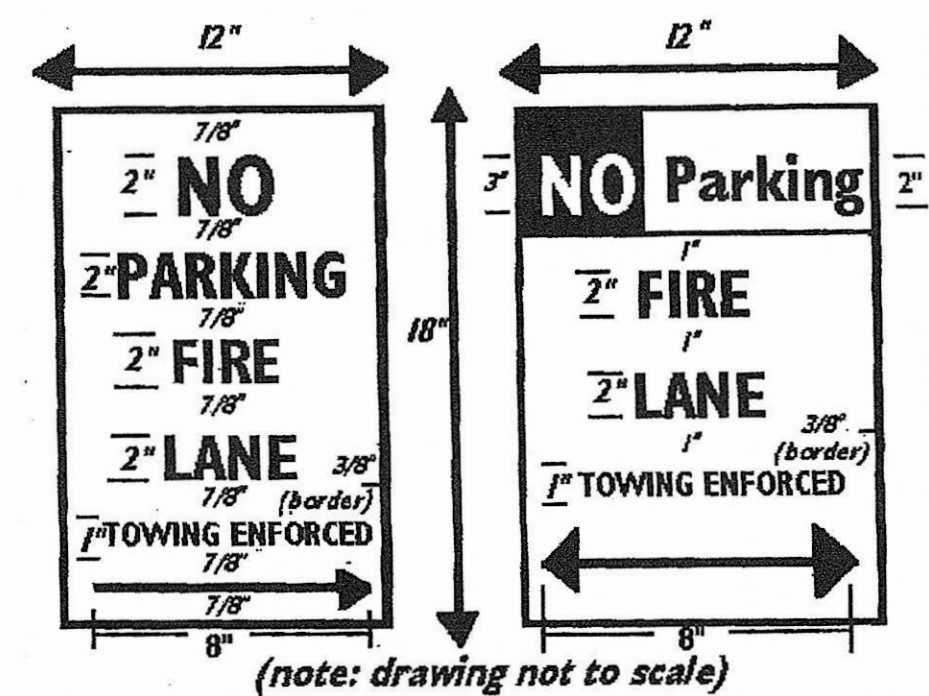
Office: 757-671-9000
Fax: 757-671-9288



EROSION AND SEDIMENT CONTROL DETAILS
FOR
IRONBOUND SELF-STORAGE
IRONBOUND RD
WILLIAMSBURG, VA

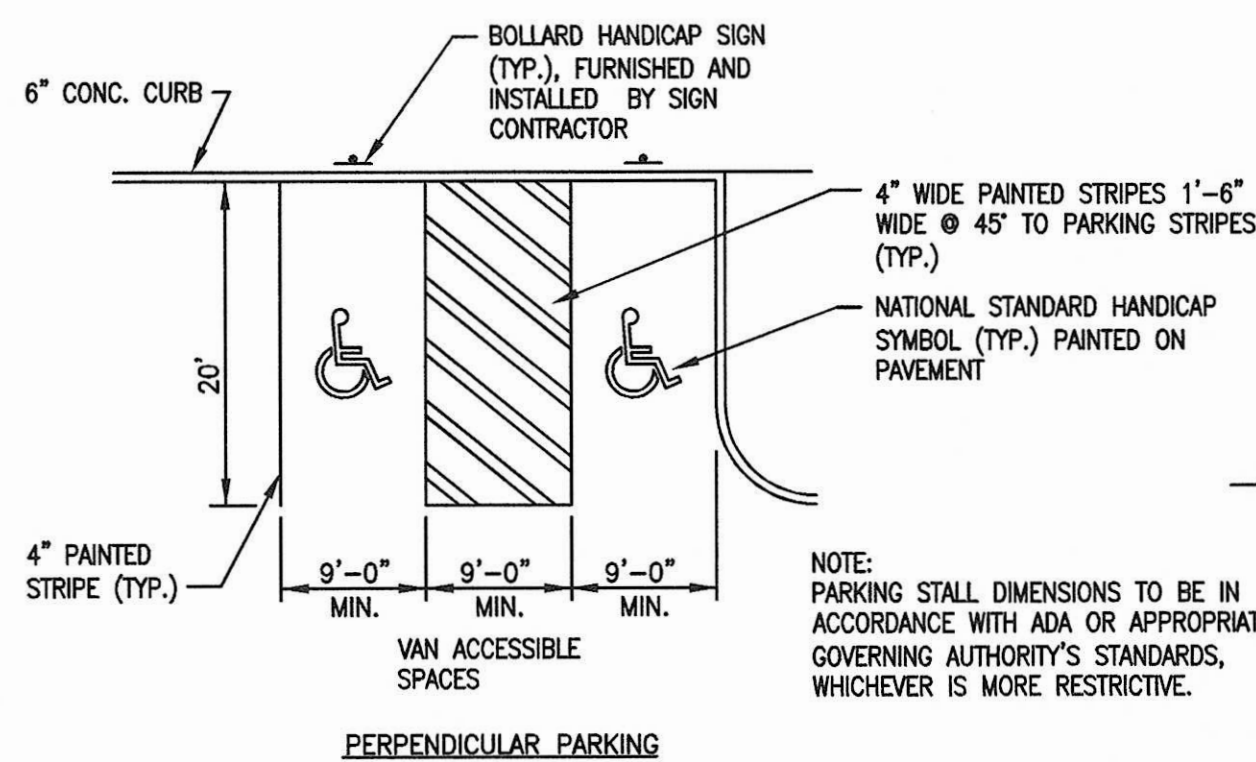
JOB#	16189
DWG:	16189_Details for SP.dwg
DATE:	7.17.19
SCALE:	NONE
SHEET NUMBER	
8	OF 13

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15										
EROSION CONTROL NARRATIVE																									
Project Description: This project consists of the construction of a self-storage facility and associated parking lot and utilities. The storage facility consists of one building that is 37,795 square feet. The disturbed area is ±2.2 acres.																									
Existing Site Conditions: The existing site is an undeveloped but mostly cleared parcel on the North side of Ironbound Road. The total site area is approximately 2.16 acres. The existing site drains into the existing storm pipe system and ultimately to a wet pond designed for Courthouse Greens development.																									
Adjacent Areas: The site is located within the Courthouse Greens development along Ironbound Road.																									
Off-Site Areas: Any off-site borrow operations will be required to be in conformance with state and local regulations. The contractor may dispose of the spoil material off-site. Off-site disposal shall be in conformance with state and local regulations, i.e. disposed in an approved landfill or borrow site.																									
Critical Areas: There are no steep slopes, CBPA buffers, or wetland areas within or adjacent to the project limits.																									
Soils: (From NRCS WSS) Soils are mostly silty sand, Type B.																									
Erosion and Sediment Control Measures: Unless otherwise indicated, all vegetative and structural erosion and sediment control practices shall be constructed and maintained according to minimum standards and specifications of the Virginia Erosion & Sediment Control Handbook (VESCR). The minimum standards of the VESCR shall be adhered to unless otherwise waived or approved.																									
Maintenance: Maintenance of the erosion and sediment control measures is specified under the listing for each structural practice (i.e. temporary silt fence, temporary construction entrance).																									
Structural Practices																									
Temporary Construction Entrance – 3.02 ☑ A temporary stone construction entrance will be installed at the east and northwestern portion of the property (proposed entrances). Wash racks are to be provided where water is available. The entrance shall be maintained in a condition which will prevent tracking or flow of mud into public rights-of-way. This may require periodic top dressing with conditioned stone or the sealing and reworking of existing stone as conditions demand and repair and/or cleanup of any structures used to trap sediment. All materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains must be removed immediately. The use of water trucks to remove materials dropped, washed, or tracked onto roadways will not be permitted under any circumstances.																									
Temporary Silt Fence – 3.05 ☑ Temporary silt fence will be installed around the project site in order to prevent offsite transport of sediment. Maintenance of silt fence shall be bi-weekly and after any significant storm event. Silt fences shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective prior to the end of the expected usable life and the barrier still be necessary, the fabric shall be replaced promptly. Sediment deposits should be removed after each storm event. They must be removed when deposits reach approximately one-half the height of the barrier. Any sediment deposits remaining in place after the silt fence is no longer required shall be dressed to conform to the existing grade, prepared, and seeded.																									
Storm Drain Inlet Protection – 3.07 ☑ Inlet protection will be installed at existing storm structures adjacent to the site, and at proposed storm structures on-site. Inlet protection shall consist of, but not limited to, silt fence drop inlet protection, gravel and wire mesh drop inlet sediment filters, gravel curb inlet sediment filters, and/or gutter budoys for use on the existing catch basins. The structures shall be inspected after each rain and repairs made as needed. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design depth of the trap. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode. Structures shall be removed and the area stabilized when the remaining drainage area has been properly stabilized.																									
Topsoiling (stockpiles) – 3.30 ☑ Topsoil will be stripped from areas to be graded and stockpiled for later use. The stockpile shall be placed at a location designated by the City Inspector and will be stabilized with temporary vegetation prior to land-disturbing activities. Topsoil shall be stockpiled in such a manner that natural drainage is not obstructed and no off-site sediment discharge shall result. Stabilize or protect stockpiles in accordance with MS#2. Side-slopes of the stockpile shall not exceed 2:1. Perimeter controls must be placed around the stockpile immediately: seeding of stockpiles shall be completed within 7 days of the formation of the stockpile. In accordance with Std. & Spec. 3.31, TEMPORARY SEEDING if it is to remain dormant for longer than 30 days (refer to MS #1 and MS #2).																									
Temporary Seeding – 3.31 ☑ All denuded areas, which will be left dormant for more than 30 days shall be seeded within 7 days with fast germinating temporary vegetation immediately following grading. Selection of the seed mixture will depend on the time of year it is applied. Areas which fail to establish vegetative cover adequate to prevent full erosion will be resseeded as soon as such areas are identified.																									
Permanent Seeding/Stabilization – 3.32 ☑ Once the clearing and grading operations are completed, permanent stabilization will be applied to the entire site in accordance with the VESCR section 3.32 for the Coastal Plain (South) area. The quantities for Permanent Seeding are as follows: Seeding Mixture per Acre Red Top Grass 2 lbs Seasonal Nurel Crop 20 lbs February, March, and April – Annual Ryegrass May 1st through August – Fescue Millet September, October, through November 15th – Annual Ryegrass November 16th through January – Winter Ryegrass Lime 4000 lbs per Acre Fertilizer 1000 lbs per Acre of 10-20-10 Mulch 2000 lbs per Acre																									
Mulch – 3.35 ☑ Mulch (straw or fiber) will be used on relatively flat areas and will be applied as a second step in the seeding operation. All mulches and soil coverings should be inspected periodically (particularly after rainstorms) to check for erosion. Where erosion is observed in mulched areas, additional mulch should be applied. Inspections should take place up until grasses are firmly established. Where mulch is used in conjunction with ornamental plantings, inspect periodically throughout the year to determine if mulch is maintaining coverage of the soil surface; report as needed.																									
Tree Preservation and Protection – 3.38 ☑ At a minimum, the limits of clearing/work shall be located outside the drip line of any tree to be retained, and in no case, closer than 5 feet to the trunk of any tree. Plastic Fencing – 40 inch high "intermediate orange" plastic (polyethylene) line fencing secured to conventional metal "T" or "U" posts driven to a minimum depth of 18 inches on 6-foot minimum centers shall be installed at the limits of clearing. Fencing shall be in place before any excavation or grading is begun, shall be kept in good repair for the duration of construction activities, and shall be the last items removed during the final cleanup after the completion of the project.																									
Stormwater Runoff Considerations: The stormwater runoff is being managed through a wet pond designed and installed with the Courthouse Greens master plan. The pond provides both quantity and quality control. The runoff is collected through a series of underground pipe conveyance systems. The stormwater will be treated by manufactured device (Jellyfish Filter) to meet water quality criteria.																									
Calculations: The proposed development is held to the proposed impervious area for the wet pond design (60% impervious). However, this site is served by an existing wet pond for water quantity and quality. A manufactured device will be installed on-site to meet the water quality requirements.																									
CONSTRUCTION SEQUENCING: • A PRE-CONSTRUCTION MEETING WILL BE HELD BY THE JCC E&S INSPECTOR AND ALL THE INTERESTED PARTIES FOR THE PROJECT • ACQUIRE NECESSARY PERMITS. • INSTALL E & S MEASURES AS SHOWN ON SHEET 3. ADDITIONAL E & S MEASURE MAY BE REQUIRED IN THE FIELD PER THE COUNTY INSPECTOR. • LIMITS OF DISTURBANCE WILL BE FLAGGED PRIOR TO INSTALLATION OF SILT FENCE. • INSTALL SILT FENCE AROUND PERIMETER OF PROJECT. SILT FENCE INDICATES LIMITS OF CONSTRUCTION. • INSTALL CONSTRUCTION ENTRANCE AS SHOWN. • INSTALL INLET & OUTLET PROTECTION AT STORM STRUCTURES AS SHOWN. ADDITIONAL INLET & OUTLET PROTECTION SHALL BE REQUIRED AT THE PROPOSED STORM STRUCTURES AFTER INSTALLATION IS COMPLETE. REFER TO THE GRADING PLAN FOR THE LOCATION OF THE PROPOSED STORM STRUCTURES. • LOCATION OF STAGING/STOCKPILE AREA SHALL BE IN ACCORDANCE WITH SECTION 24-46 OF THE JAMES CITY CODE OF ORDINANCES. • INSTALL DEQ STANDARD TREE PROTECTION • CLEAR AND GRUB. • ROUGH GRADE. • INSTALL UNDERGROUND UTILITIES AND STORM DRAINAGE AND PROVIDE APPROVED PROTECTIVE MEASURES AT NEW DRAINAGE STRUCTURES. COMPLETE ALL TESTING AND BACKFILL. • VERTICAL CONSTRUCTION TO BEGIN AFTER THE STORM SYSTEM IS INSTALLED AND FUNCTIONAL. • REALIGN AND RECONNECT THE EXISTING GRAVEL PATH AS NECESSARY. • DRESS AND OVERSEED ALL DISTURBED AREAS AND IMMEDIATELY ESTABLISH PERMANENT VEGETATIVE COVER. MAINTAIN VEGETATIVE COVER THROUGHOUT THE DURATION OF PROJECT. • REPAIR ANY INADVERTENT EROSION AND REMOVE ANY INADVERTENT SEDIMENTATION. • REMOVE REMAINING TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES WITHIN THIRTY (30) DAYS AFTER FINAL SITE IS STABILIZED WITH VEGETATIVE GROWTH. • ANY AND ALL MATERIAL OR DEBRIS TRACKED ONTO A PUBLIC ROAD SURFACE SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY AND BE TRANSPORTED TO A SEDIMENT CONTROLLED AREA. • ALL EXCAVATED MATERIAL SHALL BE DISPOSED OF IN A LAWFUL MANNER. • ONCE CONSTRUCTION IS COMPLETE AND THE SITE HAS BEEN FULLY STABILIZED (I.E. LANDSCAPING IS IN PLACE, GRASS GROWING AND TOP COURSE OF PAVEMENT LAID), THE JELLYFISH FILTER SYSTEM CAN BE ACTIVATED. CONTRACTOR IS RESPONSIBLE TO INSPECT AND CLEAN THE JELLYFISH FILTER SYSTEM TO KEEP IT CLEAN AND FREE OF DEBRIS AND SEDIMENT PRIOR TO CARTRIDGE INSTALLATION. THE SITE SHALL BE STABILIZED (NON-ERODIBLE SOIL SURFACES) AND UNIT BEEN CONFIRMED TO BE CLEAN AND FREE OF DEBRIS PRIOR TO CARTRIDGE INSTALLATION AND BEING PLACED IN SERVICE FOR PROPER OPERATION AND PERFORMANCE. THIS DELAY AVOIDS THE POTENTIAL OF A LARGE RAINFALL/RUNOFF EVENT THAT COULD LOAD (AND/OR OVERLOAD) THE FILTERS PREMATURELY END SHORTEN THE SERVICE LIFE FOR THE OWNER.																									
EROSION AND SEDIMENT CONTROL NOTES: MANAGEMENT STRATEGIES AND SEQUENCES OF EROSION CONTROL MEASURES UNLESS OTHERWISE INDICATED, ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE LATEST EDITION OF THE VESCR AND VEASO HANDBOOK. THE FOLLOWING SEQUENCE OF EVENTS AND EROSION CONTROL MEASURES SHALL BE INCORPORATED INTO THE CONSTRUCTION SCHEDULE FOR THIS PROJECT AND SHALL APPLY TO ALL CONSTRUCTION ACTIVITIES WITHIN PROJECT LIMITS: 1. A) TEMPORARY CONSTRUCTION ENTRANCE(S) SHALL BE PROVIDED AT THE LOCATION(S) WHERE CONSTRUCTION ACTIVITIES WILL BE CONDUCTED. THE ENTRANCE(S) SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (STD. & SPEC. 3.02). WASH RACKS ARE TO BE PROVIDED WHERE WATER IS AVAILABLE. B) WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED PUBLIC ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT ONTO THE PAVED SURFACE. WHERE SEDIMENT IS TRANSPORTED ONTO A PUBLIC ROAD SURFACE, THE ROAD SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROAD BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY IF SEDIMENT IS REMOVED IN THIS MANNER. THIS PROVISION SHALL APPLY TO INDIVIDUAL SUBDIVISION LOTS AS WELL AS LARGER LAND-DISTURBING ACTIVITIES. C) CONSTRUCTION TRAFFIC SHALL BE LIMITED TO ACCESS ROADS. ALL TRAFFIC IS PROHIBITED FROM CROSSING DRAINAGE SWALES AND STREAMS EXCEPT WHERE ABSOLUTELY NECESSARY (STD. & SPEC. 3.24 VEASO HANDBOOK). 2. TEMPORARY SEDIMENT TRAPS, SEDIMENT BARRIERS, CONSTRUCTION ENTRANCE, AND EROSION CONTROL STONE ARE TO BE PLACED PRIOR TO CLEARING AND GRUBBING PRIOR TO THE FIRST PHASE OF CONSTRUCTION. 3. ALL PERMANENT STORM WATER MANAGEMENT FACILITIES INCLUDING EROSION CONTROL ARE TO BE INSTALLED AND MADE OPERATIONAL AT THE START OF CLEARING OPERATIONS, INCLUDING APPROVED SEDIMENT BASINS. 4. THE CONTRACTOR SHALL COMPLETE DRAINAGE FACILITIES WITHIN THIRTY (30) DAYS FOLLOWING COMPLETION OF ROUGH GRADING AT ANY POINT WITHIN THE PROJECT. 5. CONSTRUCTION WILL BE SEQUENCED SO THAT GRADING OPERATIONS CAN BEGIN AND END AS QUICKLY AS POSSIBLE. 6. AREAS WHICH ARE NOT TO BE DISTURBED WILL BE CLEARLY MARKED BY FENCING, FLAGS, SIGNS, ETC. A) PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDATED AREAS WITHIN SEVEN (7) DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN (7) DAYS TO DENUDATED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN THIRTY(30) DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE (1) YEAR. B) DURING CONSTRUCTION OF PROJECT, SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE APPLICANT IS RESPONSIBLE FOR THE TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES OR SITE AS WELL AS SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE. C) A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENUDATED AREAS NOT OTHERWISE PERMANENTLY STABILIZED. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL A GROUND COVER IS ACHIEVED THAT, IN THE OPINION OF THE LOCAL PROGRAM ADMINISTRATOR OR HIS DESIGNATED AGENT, IS UNIFORM, MATURE ENOUGH TO SURVIVE AND WILL INHIBIT EROSION. VEGETAL COVER SHALL BE ESTABLISHED AS FOLLOWS: <table><tr><td>SEED</td><td>PER VOLUME III OF THE PFM</td></tr><tr><td>TOPSOIL</td><td>4"THICK, PER VDOT SPEC. 602(CLASS B)</td></tr><tr><td>LIME</td><td>4000#/AC.</td></tr><tr><td>FERTILIZER</td><td>1000#/AC. OF 10-10-10</td></tr><tr><td>MULCH</td><td>2000#/AC.</td></tr></table> (HYDROSEEDING MAY BE USED IN PLACE OF MULCHING ON AREA OTHER THAN DITCH BANKS). STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIVERSIONS, AND DITCH OR WATERCOURSE BEDS AND BANKS IMMEDIATELY AFTER INSTALLATION (STD. & SPEC. 3.36 VEASO HANDBOOK). 8. A) ALL STORM SAN INLETS THAT ARE MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT-LADEN WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT. B) BEFORE NEWLY CONSTRUCTED CONVEYANCE CHANNELS ARE MADE OPERATIONAL, ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNEL LINING SHALL BE INSTALLED IN BOTH THE CONVEYANCE CHANNEL AND RECEIVING CHANNEL. C) CUT AND FILL SLOPES SHALL BE DESIGNED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. SLOPES THAT ARE FOUND TO BE ERODING EXCESSIVELY WITHIN ONE (1) YEAR OF PERMANENT STABILIZATION SHALL BE PROVIDED WITH ADDITIONAL SLOPE STABILIZING MEASURES UNTIL THE PROBLEM IS CORRECTED. 9. A) CUT AND FILL SLOPES SHALL BE DESIGNED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. SLOPES THAT ARE FOUND TO BE ERODING EXCESSIVELY WITHIN ONE (1) YEAR OF PERMANENT STABILIZATION SHALL BE PROVIDED WITH ADDITIONAL SLOPE STABILIZING MEASURES UNTIL THE PROBLEM IS CORRECTED. B) CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME, OR SLOPE DRAIN STRUCTURE. 10. PERIODIC INSPECTIONS AND REQUIRED MAINTENANCE MUST BE PROVIDED, ESPECIALLY AFTER EACH SIGNIFICANT STORM. THE PROJECT SUPERINTENDENT SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL PRACTICES. 11. THE PLAN APPROVING AUTHORITY MUST BE NOTIFIED ONE (1) WEEK PRIOR TO THE PRECONSTRUCTION CONFERENCE, ONE (1) WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE (1) WEEK PRIOR TO THE FINAL INSPECTION. 12. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN THIRTY(30) DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE LOCAL PROGRAM ADMINISTRATOR. THE EROSION AND SEDIMENT CONTROL SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION. MAINTENANCE: IN GENERAL, ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED AFTER EACH RAINFALL OR WEEKLY, WHICHEVER IS MOST FREQUENT, AND SHOULD BE CLEANED AND REPAIRED ACCORDING TO THE FOLLOWING SCHEDULE: 1. THE SEDIMENT TRAPS WILL BE CHECKED REGULARLY FOR SEDIMENT CLEANOUT. 2. THE SEDIMENT BASIN WILL BE CLEANED OUT WHEN THE LEVEL OF SEDIMENT BUILDUP REACHES THE CLEANOUT POINT INDICATED ON THE RISER PIPE. 3. EROSION AND SEDIMENT CONTROL WILL BE CHECKED REGULARLY FOR UNDERMINING OR DETERIORATION AND BUILDUP OR CLOGGING WITH SEDIMENT. CORRECTIVE ACTION WILL BE TAKEN IMMEDIATELY. 4. ALL SEEDED AREAS WILL BE CHECKED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED AND RESEED AS NEEDED. 5. ALL TEMPORARY EROSION AND SEDIMENT MEASURES SHALL BE DISPOSED OF WITHIN THIRTY (30) DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED AND VEGETATION IS ESTABLISHED.																SEED	PER VOLUME III OF THE PFM	TOPSOIL	4"THICK, PER VDOT SPEC. 602(CLASS B)	LIME	4000#/AC.	FERTILIZER	1000#/AC. OF 10-10-10	MULCH	2000#/AC.
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STANDARD COUNTY STORMWATER POLLUTION PREVENTION PLAN NOTES (REVISED: JULY 1, 2014) THE FOLLOWING STANDARD COUNTY NOTES SHALL BECOME PART OF ANY APPROVED STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR PLAN OF DEVELOPMENT PROJECTS IN JAMES CITY COUNTY, VIRGINIA. COMPONENTS OF A SWPPP MAY INCLUDE AS APPLICABLE, A SITE EROSION AND SEDIMENT CONTROL (E&S) PLAN, A SITE STORMWATER MANAGEMENT (SWM) PLAN, AND A SITE POLLUTION PREVENTION PLAN (PPP). THE COUNTY'S DIVISION OF ENGINEERING AND RESOURCE PROTECTION IS DESIGNATED BY CHAPTER 8 OF THE COUNTY CODE AS THE LOCAL VIRGINIA EROSION AND SEDIMENT CONTROL PROGRAM (VESCP) AUTHORITY AND VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMPP) AUTHORITY. 1. ALL THE PROVISIONS OF VIRGINIA EROSION AND SEDIMENT CONTROL (E&S) LAW AND REGULATIONS, THE VIRGINIA STORMWATER MANAGEMENT ACT AND REGULATIONS (VSMPP), THE VIRGINIA BMP CLEARINGHOUSE WEBSITE, STATE EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT HANDBOOKS, AND ANY ASSOCIATED TECHNICAL BULLETINS AND GUIDANCE DOCUMENTS AS PUBLISHED BY THE STATE WATER CONTROL BOARD, THE VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ), AND THE LOCAL VESCP AND VSMPP AUTHORITY SHALL APPLY TO THE PROJECT. 2. MINIMUM STANDARDS NO. 1 THROUGH NO. 19 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS 9VAC25-840 ET SEQ. SHALL APPLY TO THE PROJECT. 3. THE OWNER, APPLICANT, OPERATOR, OR PERMITTEE SHALL BE RESPONSIBLE TO REGISTER FOR CONSTRUCTION GENERAL PERMIT (COP) COVERAGE, AS APPLICABLE, IN ACCORDANCE WITH THE GENERAL VPOES PERMIT FOR DISCHARGE OF STORMWATER FROM CONSTRUCTION ACTIVITIES (VAR10) CHAPTER 8B0; THE VIRGINIA STORMWATER MANAGEMENT PROGRAM REGULATIONS CHAPTER 870; AND IN ACCORDANCE WITH CURRENT REQUIREMENTS OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMPP), THE STATE WATER CONTROL BOARD, THE VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY, CHAPTER 8 OF THE COUNTY CODE AND THE LOCAL VESCP/VSMPP AUTHORITY. 4. THE OWNER, APPLICANT, OPERATOR OR PERMITTEE SHALL PROVIDE THE NAME OF AN INDIVIDUAL HOLDING A VALID RESPONSIBLE LAND DISTURBER (RLD) CERTIFICATE OF COMPETENCE WHO WILL BE RESPONSIBLE FOR THE LAND DISTURBING ACTIVITY PRIOR TO ENGAGING IN THE LAND DISTURBING ACTIVITY. THIS INDIVIDUAL SHALL BE NECESSARY PRIOR TO ISSUANCE OF A LOCAL LAND DISTURBING AND/OR STORMWATER CONSTRUCTION PERMIT FOR THE PROJECT. THE RLD IS REQUIRED TO ATTEND THE PRECONSTRUCTION CONFERENCE FOR THE PROJECT. 5. THE CONTRACTOR IS RESPONSIBLE TO CONTACT MISS UTILITY (DIAL 811 IN VA OR 1-800-552-7001) PRIOR TO ANY UTILITY OR SITE WORK EXCAVATIONS. 6. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PLANNED, DESIGNED, IMPLEMENTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH). THE CONTRACTOR SHALL MAINTAIN, INSPECT, AND REPAIR ALL EROSION AND SEDIMENT CONTROL MEASURES AS NEEDED THROUGHOUT THE LIFE OF THE PROJECT TO ENSURE CONTINUED ACCEPTABLE PERFORMANCE. 7. A PRECONSTRUCTION CONFERENCE (MEETING) SHALL BE HELD ON SITE AND INCLUDE REPRESENTATIVES FROM THE LOCAL VESCP/VSMPP AUTHORITY, THE OWNER/APPLICANT/OPERATOR/PERMITTEE, THE RESPONSIBLE LAND-DISTURBER (RLD), AND THE CONTRACTOR, ENGINEER, AND OTHER RESPONSIBLE AGENCIES, AS APPLICABLE, PRIOR TO AUTHORIZATION AND ISSUANCE OF A LOCAL LAND DISTURBING OR STORMWATER CONSTRUCTION PERMIT. THE OWNER, APPLICANT, OPERATOR OR PERMITTEE IS REQUIRED TO COORDINATE SCHEDULING OF THE PRECONSTRUCTION CONFERENCE BETWEEN ALL APPLICABLE PARTIES. THE CONTRACTOR SHALL SUBMIT A SEQUENCE OF CONSTRUCTION AND A REVISED POLLUTION PREVENTION PLAN (P2 PLAN OR PPP), IF APPLICABLE, TO THE LOCAL VESCP/VSMPP AUTHORITY FOR REVIEW AND APPROVAL PRIOR TO THE PRECONSTRUCTION MEETING. 8. A POLLUTION PREVENTION PLAN (P2 PLAN OR PPP), IF REQUIRED, SHALL BE DEVELOPED, IMPLEMENTED AND UPDATED AS NECESSARY AND MUST DETAIL THE DESIGN, INSTALLATION, IMPLEMENTATION, AND MAINTENANCE OF EFFECTIVE POLLUTION PREVENTION MEASURES TO: MINIMIZE THE DISCHARGE OF POLLUTANTS FROM EQUIPMENT AND VEHICLE WASHING, WHEEL WASH WATER, OTHER WASTES, MINIMIZE THE EXPOSURE OF ALL MATERIALS ON THE SITE (SUCH AS BUILDING MATERIALS AND PRODUCTS, CONSTRUCTION WASTE, TRASH, LANDSCAPE MATERIALS, FERTILIZERS, PESTICIDES, HERBICIDES, DETERGENTS, SANITARY WASTE, ETC.) TO PRECIPITATION AND STORMWATER; MINIMIZE THE DISCHARGE OF POLLUTANTS FROM SPILLS AND LEAKS; IMPLEMENT CHEMICAL SPILL AND LEAK PREVENTION AND RESPONSE PROCEDURES; AND INCLUDE EFFECTIVE BEST MANAGEMENT PRACTICES TO PROHIBIT THE DISCHARGE OF WASTEWATER FROM: CONCRETE WASHOUT AREAS, DISCHARGE OF WASTEWATER FROM WASHOUT AND CLEANOUT OF STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS AND OTHER CONSTRUCTION MATERIALS; DISCHARGE OF FUELS, OILS, OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE ACTIVITIES; AND THE DISCHARGE OF SOAPS AND SOLVENTS USED FOR VEHICLE AND EQUIPMENT WASHING. THIS PLAN SHALL BE AVAILABLE ONSITE FOR REVIEW AT REASONABLE TIMES BY THE LOCAL VESCP/VSMPP AUTHORITY WHEN REQUESTED. 9. THE OWNER, APPLICANT, OPERATOR, OR PERMITTEE IS RESPONSIBLE FOR ALL OPERATOR SELF-INSPECTIONS AS REQUIRED IN THE POLLUTION PREVENTION PLAN (P2 PLAN OR PPP) OR AS REQUIRED AS PART OF A DEVELOPED STORMWATER POLLUTION PREVENTION PLAN (SWPPP). THESE INSPECTIONS SHALL BE MADE AVAILABLE, UPON REQUEST, BY THE LOCAL VESCP/VSMPP AUTHORITY. 10. ALL PERMITTEE EROSION AND SEDIMENT CONTROL (E&S) MEASURES SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LANDDISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE ACTIVITY TAKES PLACE. 11. ADDITIONAL SAFETY FENCE OR DUST CONTROL MEASURES, IN ACCORDANCE WITH THE PROVISIONS OF MINIMUM STANDARDS & SPECS. 3.01 AND 3.39 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH), MAY BE REQUIRED TO BE IMPLEMENTED ON THE SITE IN ADDITION TO THAT SHOWN ON THE APPROVED PLAN AND SPECIFICATIONS IN ORDER TO ENSURE ADEQUATE PROTECTION OF THE HEALTH, SAFETY AND WELFARE OF THE PUBLIC OR IF SITE CONDITIONS CHANGE, BECOME APPARENT OR ALTER SIGNIFICANTLY FOLLOWING THE DATE OF PLAN APPROVAL. 12. EROSION AND SEDIMENT CONTROL MEASURES MAY REQUIRE MINOR FIELD ADJUSTMENTS AT OR FOLLOWING TIME OF CONSTRUCTION TO ENSURE THEIR INTENDED PURPOSE IS ACCOMPLISHED, TO ENSURE ADEQUATE PROTECTION OF THE HEALTH, SAFETY, AND WELFARE OF THE PUBLIC, OR IF SITE CONDITIONS CHANGE, BECOME APPARENT OR ALTER SIGNIFICANTLY FOLLOWING THE DATE OF PLAN APPROVAL. LOCAL VESCP/VSMPP AUTHORITY APPROVAL SHALL BE REQUIRED FOR ANY SUCH CHANGES. 13. OFF-SITE WASTE OR BORROW AREAS SHALL BE APPROVED BY THE LOCAL VESCP/VSMPP AUTHORITY PRIOR TO THE IMPORT OF ANY BORROW OR EXPORT OF ANY WASTE TO OR FROM THE PROJECT SITE. 14. TEMPORARY SOIL STOCKPILES SHALL COMPLY WITH THE PROVISIONS OF SECTION 24-46 OF THE COUNTY CODE. 15. CULVERT AND STORM DRAIN INLET PROTECTIONS, IN ACCORDANCE WITH THE PROVISIONS OF MINIMUM STANDARDS & SPECS. 3.07 AND 3.08 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH), MAY BE REMOVED AT THE DISCRETION OF THE ASSIGNED LOCAL VESCP/VSMPP AUTHORITY COMPLIANCE INSPECTOR, SHOULD PLACEMENT OF THE MEASURE RESULT IN EXCESSIVE ROAD FLOODING, TRAFFIC OR SAFETY HAZARD, OR RESULT IN THE REDIRECTION OF DRAINAGE ONTO OR TOWARD EXISTING LOTS, HOMES, DRIVEWAYS, GARAGES OR OTHER STRUCTURES. DECISIONS SHALL BE MADE BY THE VESCP/VSMPP AUTHORITY ON A CASE-BY-CASE BASIS BASED ON FIELD SITUATIONS ENCOUNTERED. 16. DRAINAGE FACILITIES SHALL BE INSTALLED AND FUNCTIONAL WITHIN 30 DAYS FOLLOWING COMPLETION OF ROUGH GRADING AT ANY POINT WITHIN THE PROJECT. 17. NO MORE THAN 300 FEET OF TRENCH MAY BE OPEN AT ONE TIME FOR UNDERGROUND UTILITY LINES, INCLUDING STORM WATER CONVEYANCES. ALL OTHER PROVISIONS OF MINIMUM STANDARD NO. 16 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS APPLY. 18. PERMANENT OR TEMPORARY STABILIZATION OF DISTURBED SOIL AREAS SHALL COMPLY WITH MINIMUM STANDARD # 1 AND # 3 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS. 19. THE TERM SEEDING, FINAL VEGETATIVE COVER OR STABILIZATION ON THE APPROVED PLAN SHALL MEAN THE SUCCESSFUL GERMINATION AND ESTABLISHMENT OF A STABLE GRASS COVER FROM A PROPERLY PREPARED SEEDBED, IN ACCORDANCE WITH MINIMUM STANDARD # 1 AND # 3 FROM THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS, MINIMUM STANDARDS & SPECS. 3.29 THROUGH 3.37 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH), AND ANY TECHNICAL BULLETINS ISSUED BY THE STATE WATER CONTROL BOARD OR VIRGINIA DEQ, AS APPLICABLE. IRRIGATION, IF NECESSARY, SHALL COMPLY WITH ALL APPLICABLE SEASONAL OUTDOOR WATER USE RESTRICTIONS OF THE JAMES CITY SERVICE AUTHORITY. 20. IF DISTURBED AREA STABILIZATION IS TO BE ACCOMPLISHED DURING THE MONTHS OF DECEMBER, JANUARY OR FEBRUARY, STABILIZATION SHALL CONSIST OF MULCHING IN ACCORDANCE WITH MINIMUM STANDARD & SPEC. 3.35 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH). SEEDING WILL THEN TAKE PLACE AS SOON AS THE SEASON PERMITS. 21. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL NOT BE REMOVED UNTIL ALL DISTURBED AREAS ARE STABILIZED. REMOVAL SHALL NOT OCCUR WITHOUT AUTHORIZATION BY THE LOCAL VESCP/VSMPP AUTHORITY. DISTURBANCES ASSOCIATED WITH THE REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROPERLY STABILIZED. 22. NO SEDIMENT TRAP OR SEDIMENT BASIN SHALL BE REMOVED UNTIL A) AT LEAST 75 PERCENT OF THE SINGLE-FAMILY LOTS WITHIN THE DRAINAGE AREA TO THE TRAP OR BASIN HAVE BEEN SOLD TO A THIRD PARTY FOR THE CONSTRUCTION OF HOMES (UNRELATED TO THE DEVELOPER); AND/OR, B) 60 PERCENT OF THE SINGLE-FAMILY LOTS WITHIN THE DRAINAGE AREA TO THE TRAP OR BASIN ARE COMPLETED AND STABILIZED. A BULK SALE OF THE LOTS TO ANOTHER BUILDER DOES NOT SATISFY THIS PROVISION. SEDIMENT TRAPS AND SEDIMENT BASINS SHALL NOT BE REMOVED WITHOUT AUTHORIZATION OF THE LOCAL VESCP/VSMPP AUTHORITY. 23. DESIGN AND CONSTRUCTION OF PRIVATE-TYPE STORM DRAINAGE SYSTEMS, OUTSIDE VDOT RIGHT-OF-WAY, SHALL BE PERFORMED IN ACCORDANCE WITH THE CURRENT VERSION OF THE JAMES CITY COUNTY, ENGINEERING AND RESOURCE PROTECTION DIVISION, STORMWATER DRAINAGE CONVEYANCE SYSTEMS (NON-BMP RELATED), GENERAL DESIGN AND CONSTRUCTION GUIDELINES (I.E. COUNTY DRAINAGE STANDARDS). 24. RECORD DRAWINGS (ASBUILTS) AND CONSTRUCTION CERTIFICATIONS ARE REQUIRED FOR ALL STORMWATER FACILITIES INCLUDING STORMWATER MANAGEMENT/BMP FACILITIES AND STORM DRAINAGE CONVEYANCE SYSTEMS. THE CERTIFICATION PROCESS SHALL INCLUDE AN INTERNAL CLOSED-CIRCUIT TELEVISION CAMERA (CCTV) POST INSTALLATION INSPECTION PERFORMED BY THE OWNER IN ACCORDANCE WITH STANDARDS AND SPECIFICATIONS DEVELOPED BY THE VSMPP AUTHORITY. RECORD DRAWINGS AND CONSTRUCTION CERTIFICATIONS MUST MEET ESTABLISHED PROGRAM REQUIREMENTS OF THE COUNTY'S CHAPTER 8 EROSION AND SEDIMENT CONTROL AND VSMPP ORDINANCE AND THE LOCAL VESCP/VSMPP AUTHORITY. 25. ALL STORMWATER FACILITIES INCLUDING BMPs, STORM DRAINAGE PIPES, STORMWATER CONVEYANCES, INLETS, MANHOLES, OUTFALLS AND ROADSIDE AND OTHER OPEN CHANNELS SHALL BE INSPECTED BY THE LOCAL VESCP/VSMPP AUTHORITY, THE OWNER, AND THE APPLICANT/OPERATOR/PERMITTEE DESIGNATED GEOTECHNICAL ENGINEER FOR THE PROJECT IN ACCORDANCE WITH ESTABLISHED COUNTY STORMWATER FACILITY INSPECTION PROGRAM REQUIREMENTS.																									
COMPLIANCE FOR MINIMUM STANDARDS (1-19) SECTION 9VAC25-840-40 1. Soil stabilization is noted in the E and S narrative. Seeding schedules (temporary and permanent) are included with this plan. 2. Stockpile areas (with silt fence perimeters) are shown on the plan. 3. Permanent stabilization is noted in the E and S narrative. A permanent seeding schedule is included with this plan. 4. Based on the employment of other E and S measures (silt fence), a sediment basin/trap is not required for this project. 5. No earthen structures (swales, berms) are proposed for this project. 6. Based on the employment of other E and S measures (silt fence), a sediment basin/trap is not required for this project. 7. No cut or fill slopes are proposed. 8. No cut or fill slopes are proposed. Concentrated Runoff Down Slopes – No cut or fill slopes are proposed. 9. No slope faces (existing or proposed) are shown on the plan. 10. Inlet protection is shown for the existing storm structures. 11. Stormwater Conveyance Protection – The outfall connection(a) proposed with this project is the existing municipal storm sewer system in the right of way. 12. No live watercourses within the limits of construction are associated with this project. 13. No live watercourses within the limits of construction are associated with this project. 14. No live watercourses within the limits of construction are associated with this project. 15. No live watercourses within the limits of construction are associated with this project. 16. No more than 500 LF of trenching shall be open at any time. Excavated material shall be placed on the uphill side of the trench. Once utility work has been completed the trenches shall be backfilled and compacted in a manner in which to minimize erosion and promote stabilization. 17. A construction entrance is shown on the plan. A construction entrance detail is also shown on the plan. 18. The removal of temporary measures are noted in the sequence of construction. 19. The submitted drainage calculations are included. The site was master-planned in the Courthouse Greens Development and a Jellyfish Filter was added for additional water treatment needed on-site.																									
Virginia Erosion and Sediment Control Plan Minimum Standards (MS) Checklist August 30, 2013																									
Yes	N/A	9VAC25-840-40 Minimum Standards										Describe how MS is addressed on plan													
X		MS1: Permanent or temporary soil stabilization shall be applied to denuded areas within seven days after final grade is reached on any portion of the site. Temporary soil stabilization shall be applied within seven days to denuded areas that may not be at final grade but will remain dormant for longer than 14 days. Permanent stabilization shall be applied to areas that are to be left dormant for more than one year.	See compliance response, this sheet.																						
X		MS2: During construction of the project, soil stock piles and borrow areas shall be stabilized or protected with sediment trapping measures. The applicant is responsible for the temporary protection and permanent stabilization of all soil stockpiles on site as well as borrow areas and soil intentionally transported from the project site.	See compliance response, this sheet.																						
X		MS3: A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved that is uniform, mature enough to survive and will inhibit erosion.	See compliance response, this sheet.																						
X		MS4: Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment shall be constructed as a first step in any land-disturbing activity and shall be made functional before upslope land disturbance takes place.	See compliance response, this sheet.																						
X		MS5: Stabilization measures shall be applied to earthen structures such as dams, dikes and diversions immediately after installation.	See compliance response, this sheet.																						
X		MS6: Sediment traps and sediment basins shall be designed and constructed based upon the total drainage area to be served by the trap or basin. a. The minimum storage capacity of a sediment trap shall be 134 cubic yards per acre of drainage area and the trap shall only control drainage areas less than three acres. b. Surface runoff from disturbed areas that is comprised of flow from drainage areas greater than or equal to three acres shall be controlled by a sediment basin. The minimum storage capacity of a sediment basin shall be 134 cubic yards per acre of drainage area. The outfall system shall, at a minimum, maintain the structural integrity of the basin during a 25-year storm of 24-hour duration. Runoff coefficients used in runoff calculations shall correspond to a bare earth condition or those conditions expected to exist while the sediment basin is utilized.	See compliance response, this sheet.																						
X		MS7: Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion. Slopes that are found to be eroding excessively within one year of permanent stabilization shall be provided with additional slope stabilizing measures until the problem																							



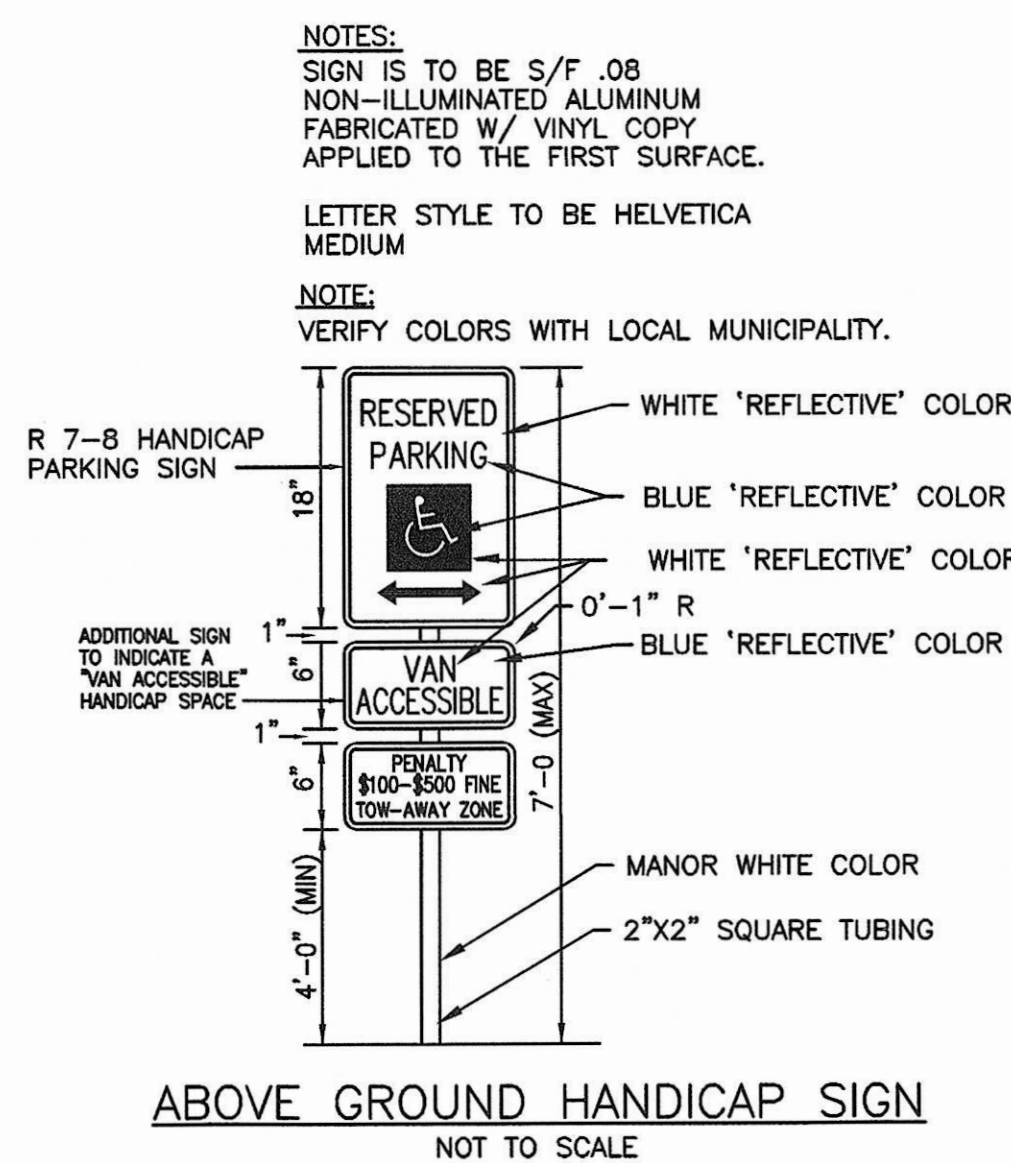
FIRE LANE SIGN

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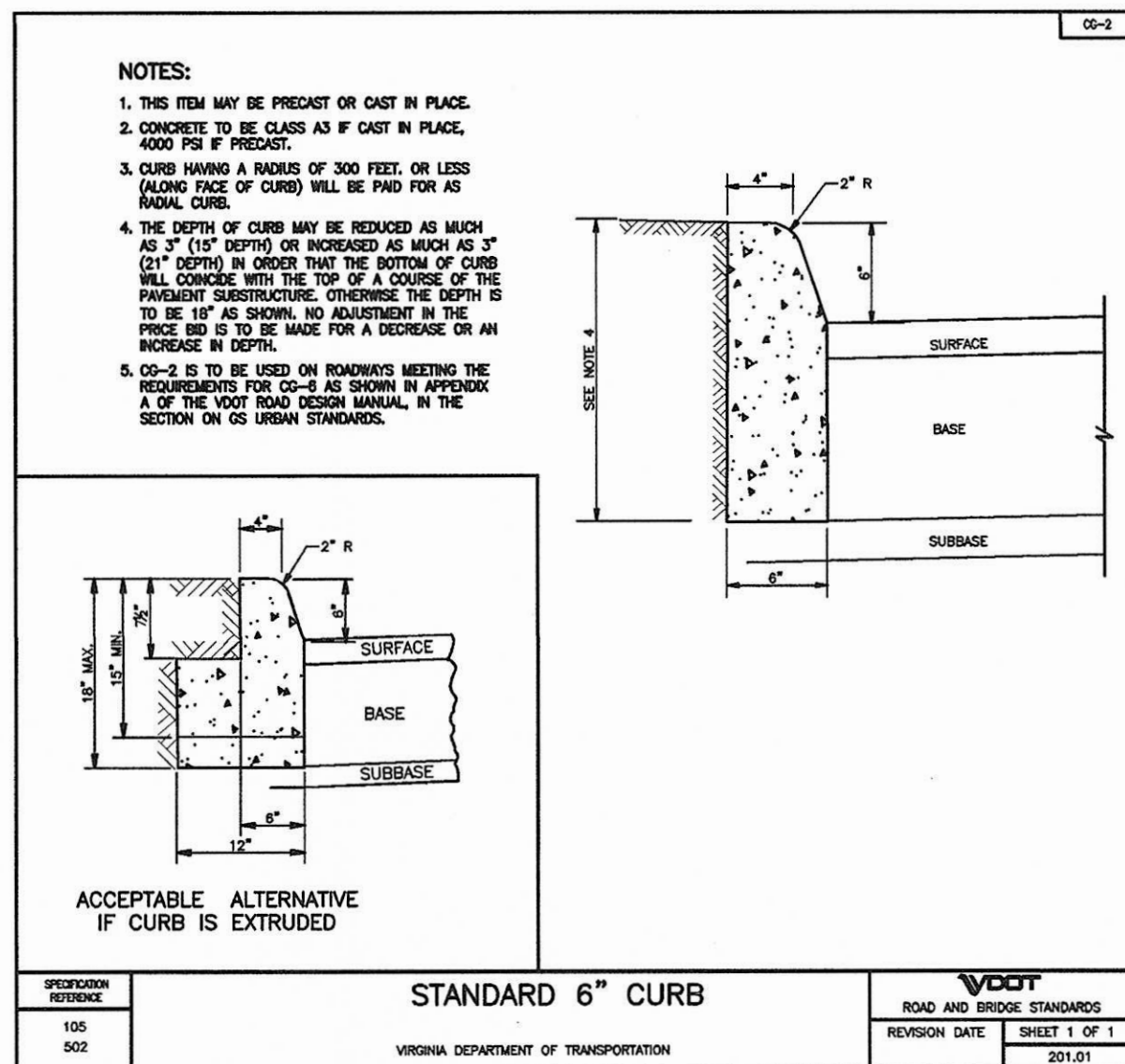


ACCESSIBLE PARKING STALL DETAIL

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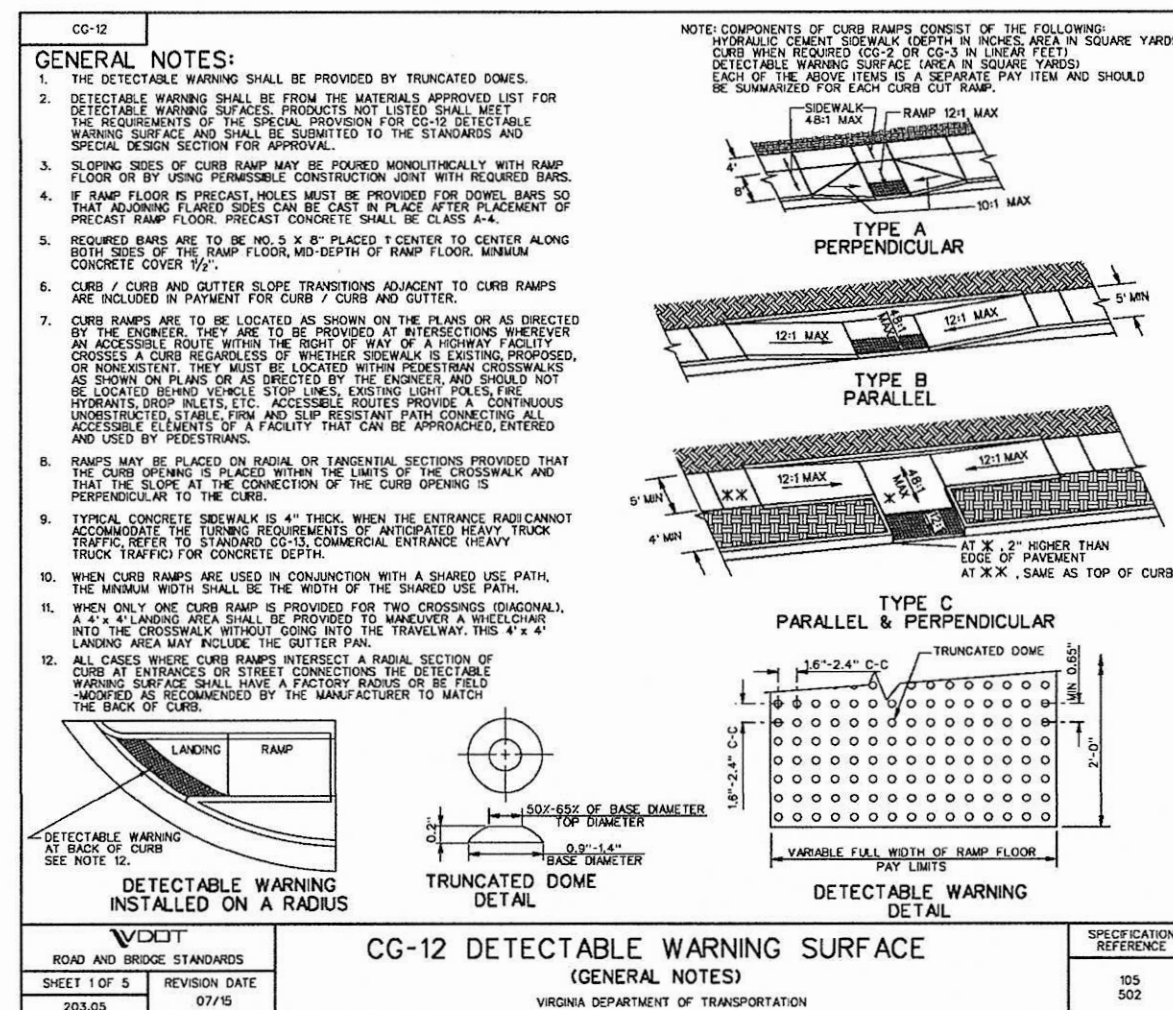
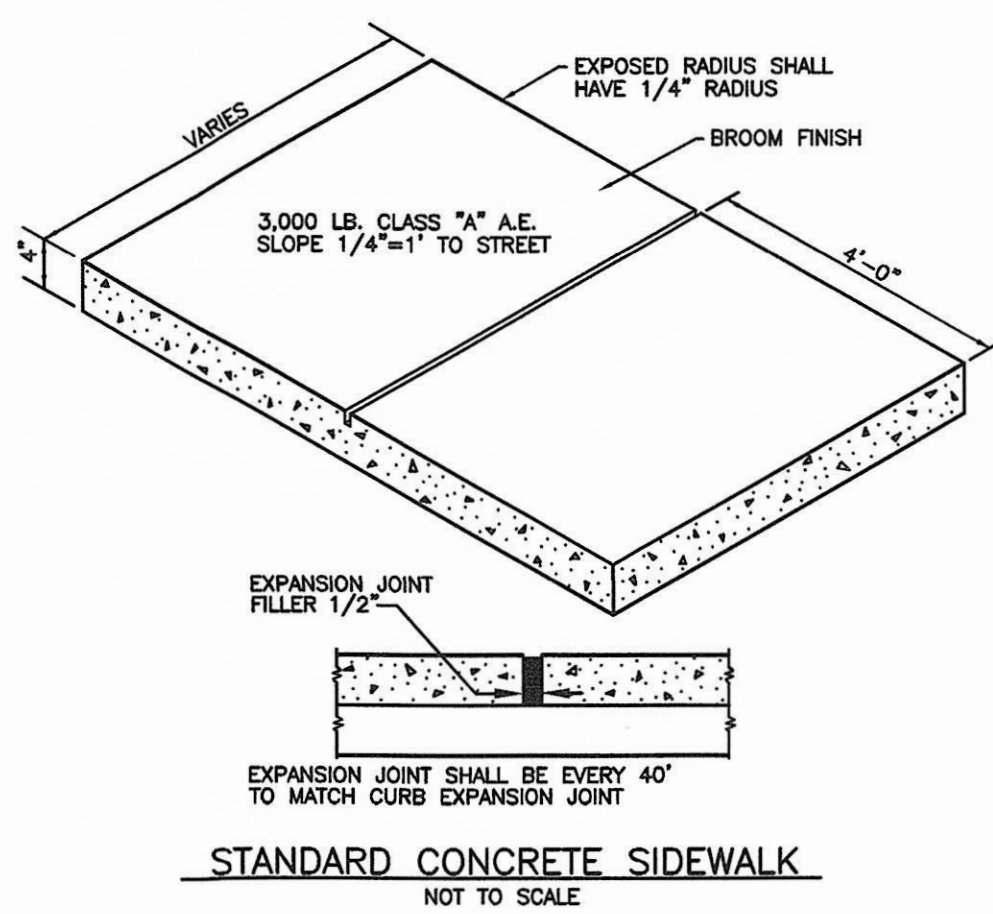


ABOVE GROUND HANDICAP SIGN



GUTTER MODIFICATION DETAIL

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2016 ROAD & BRIDGE STANDARDS

VIRGINIA DEPARTMENT OF TRANSPORTATION

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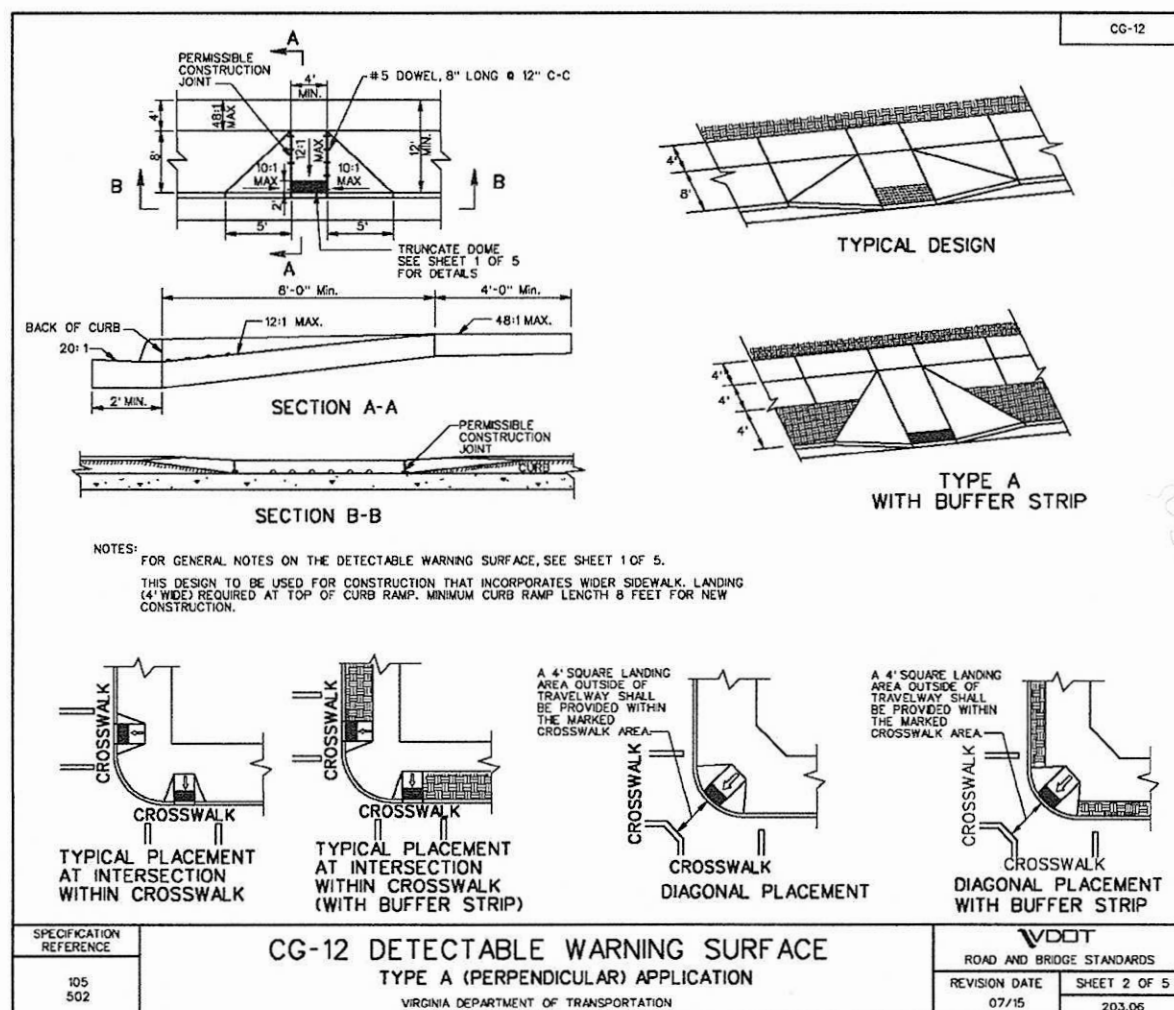
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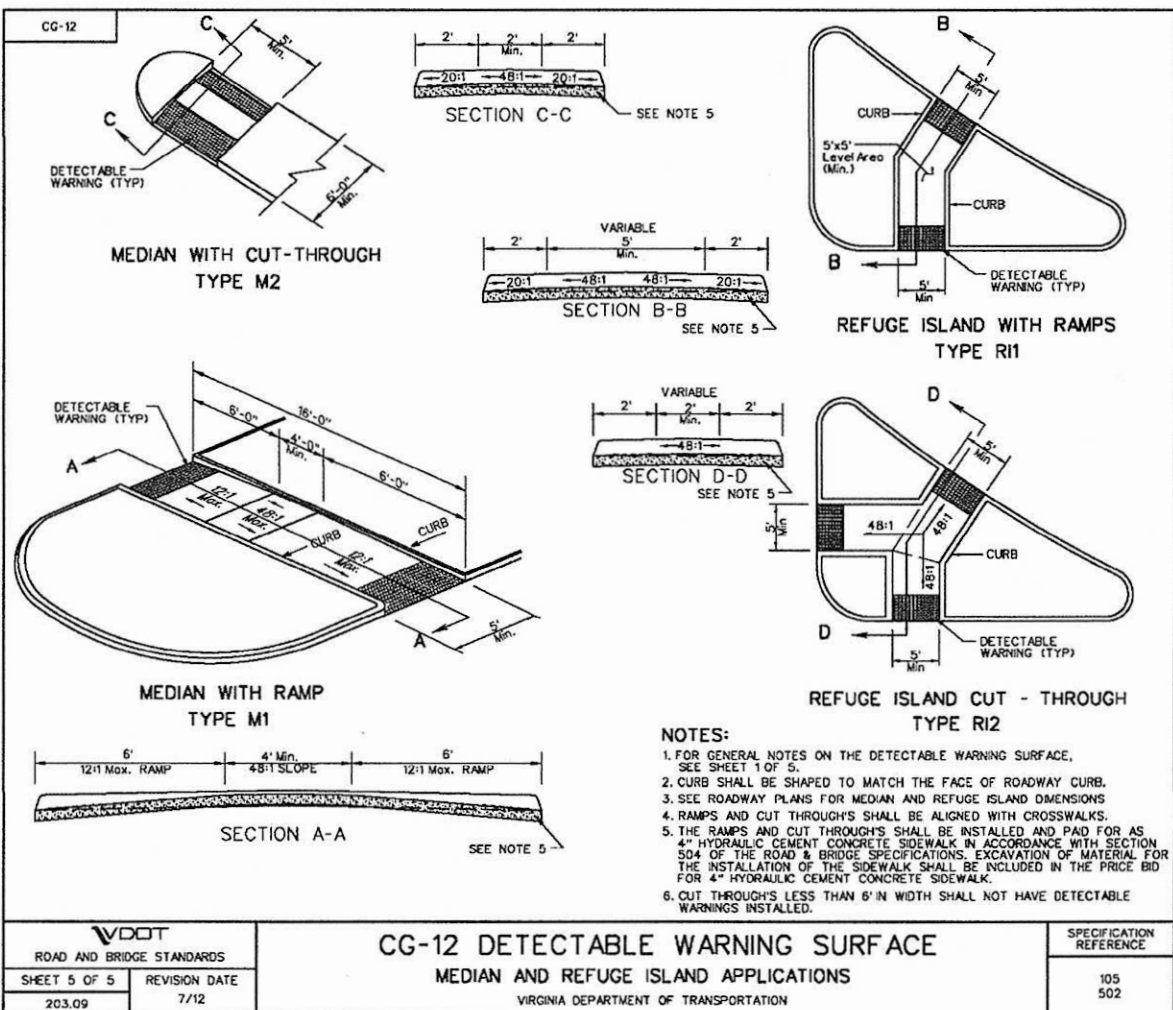
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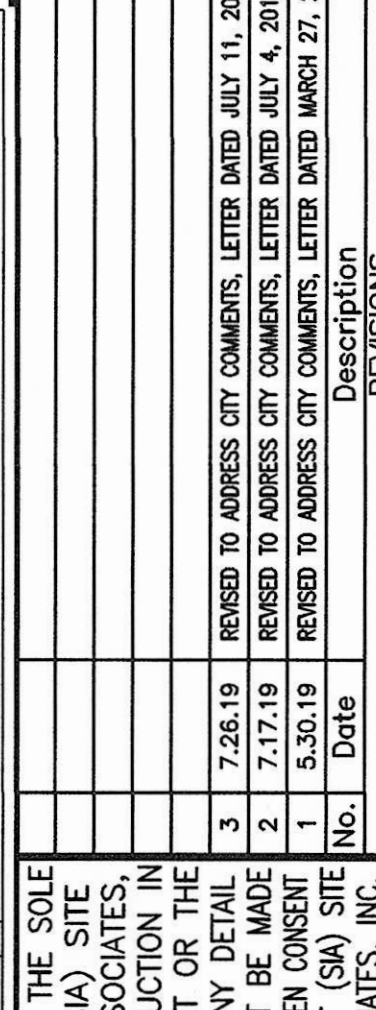
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2016 ROAD & BRIDGE STANDARDS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SHEET 1 OF 1

REVISION DATE

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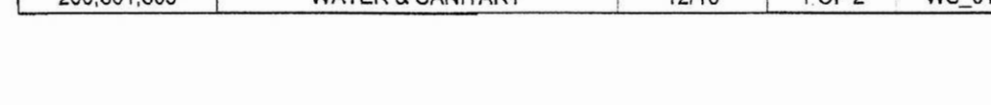
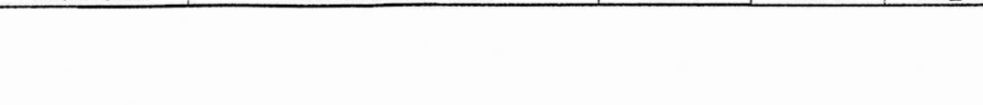
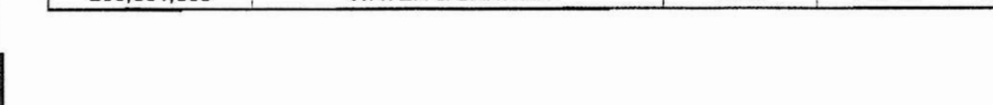
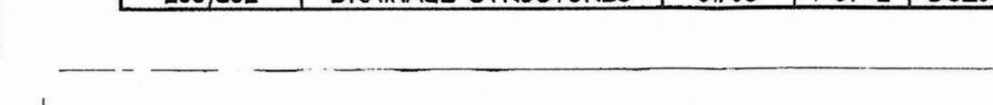
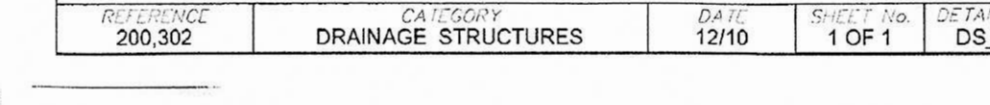
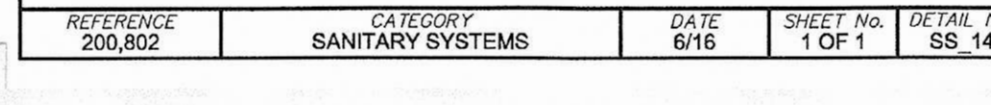
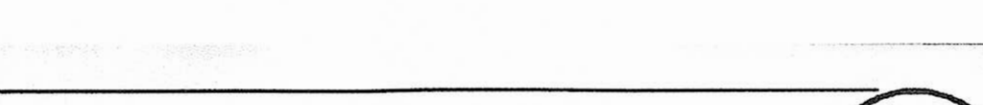
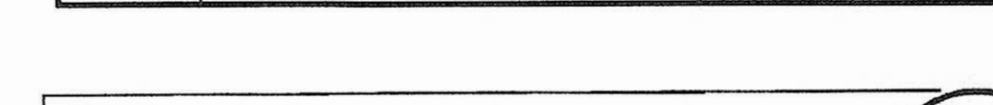
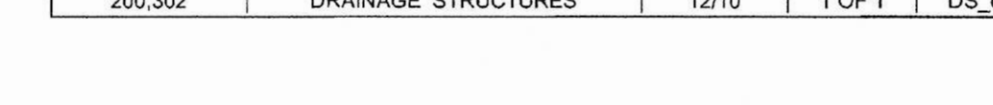
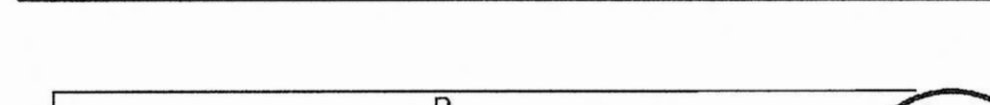
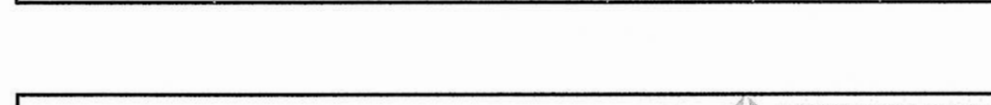
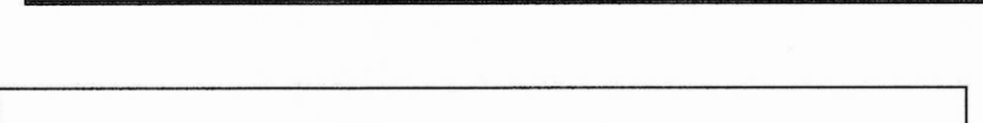
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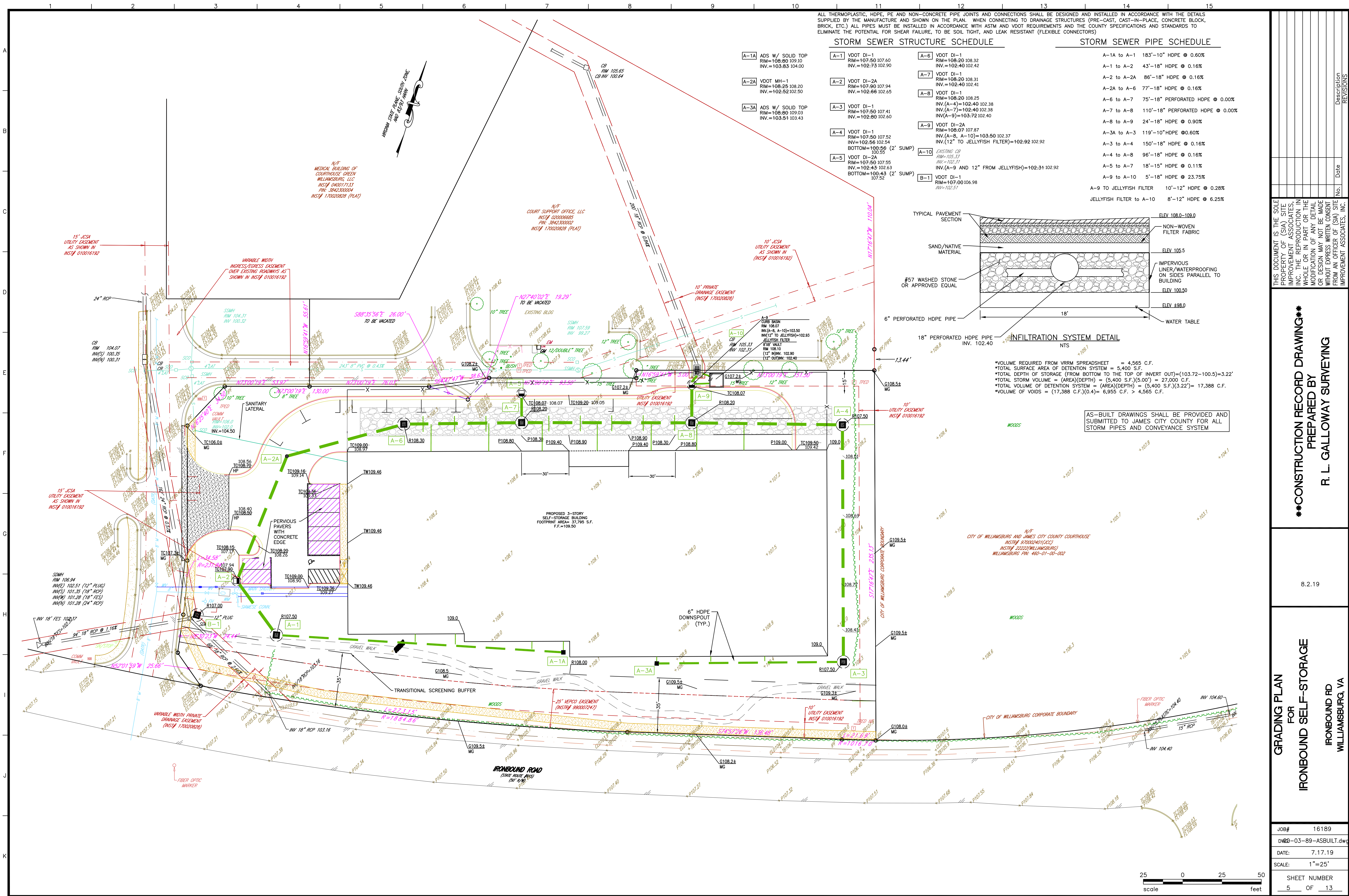
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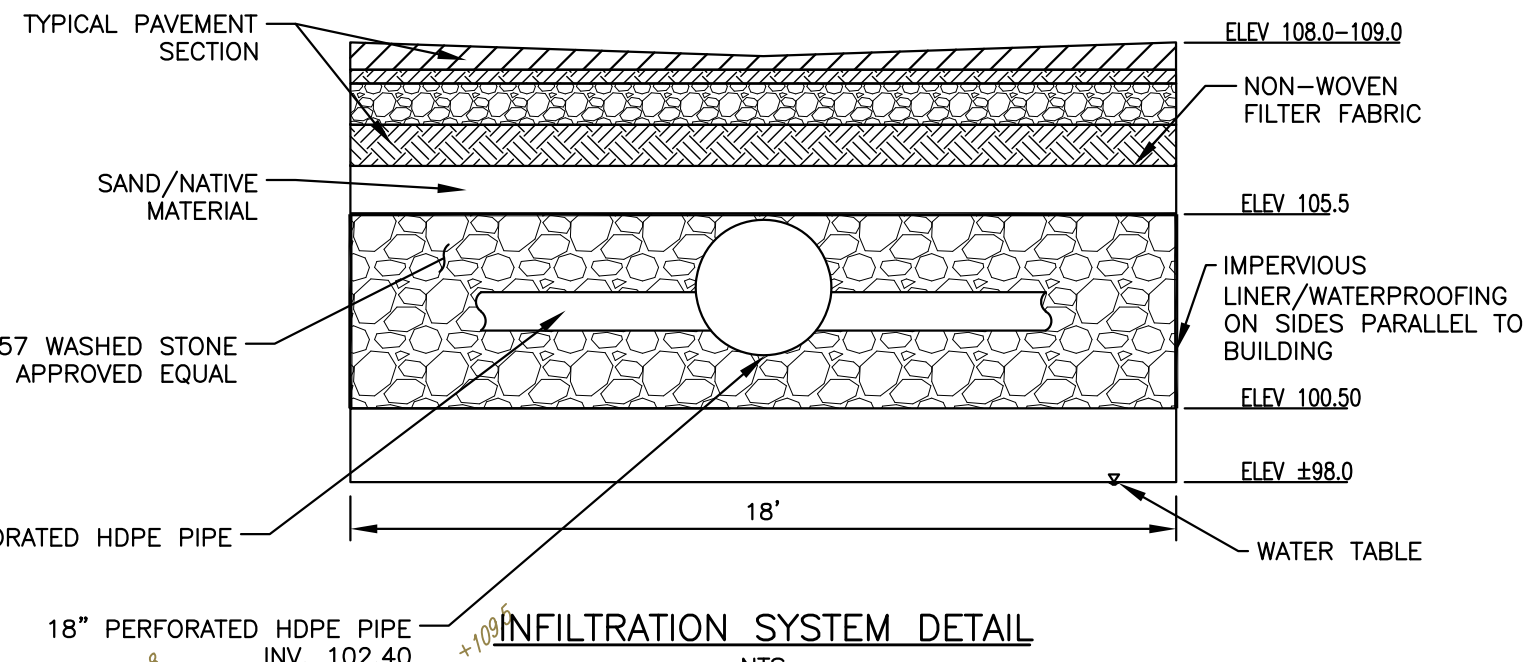
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STORM SEWER STRUCTURE SCHEDULE		STORM SEWER PIPE SCHEDULE	
A-1A	ADS W/ SOLID TOP RIM=108.80 109.10 INV.=103.83 104.00	A-1	VDOT DI-1 RIM=107.50 107.60 INV.=102.73 102.90
A-2A	VDOT MH-1 RIM=108.25 108.20 INV.=102.52 102.50	A-2	VDOT DI-2A RIM=107.90 107.94 INV.=102.66 102.65
A-3A	ADS W/ SOLID TOP RIM=108.80 109.03 INV.=103.51 103.43	A-3	VDOT DI-1 RIM=107.50 107.41 INV.=102.60 102.60
		A-4	VDOT DI-1 RIM=107.50 107.52 INV.=102.56 102.54 BOTTOM=100.50 (2' SUMP)
		A-5	VDOT DI-2A RIM=107.50 107.55 INV.=102.43 102.63 BOTTOM=100.43 (2' SUMP)
		A-6	VDOT DI-1 RIM=108.20 108.32 INV.=102.40 102.42
		A-7	VDOT DI-1 RIM=108.20 108.31 INV.=102.40 102.41
		A-8	VDOT DI-1 RIM=108.20 108.25 INV.(A-4)=102.49 102.38 INV.(A-7)=102.40 102.38 INV.(A-9)=103.72 102.40
		A-9	VDOT DI-2A RIM=108.07 107.87 INV.(A-8, A-10)=103.50 102.37 INV.(12" TO JELLYFISH FILTER)=102.92 102.92
		A-10	EXISTING CB RIM=103.31 INV.=102.37 INV.(A-9 AND 12" FROM JELLYFISH)=102.31 102.92
		B-1	VDOT DI-1 RIM=107.00 106.98 INV.=102.51
		A-1A to A-1 183'-10" HDPE @ 0.60%	
		A-1 to A-2 43'-18" HDPE @ 0.16%	
		A-2 to A-2A 86'-18" HDPE @ 0.16%	
		A-2A to A-6 77'-18" HDPE @ 0.16%	
		A-6 to A-7 75'-18" PERFORATED HDPE @ 0.00%	
		A-7 to A-8 110'-18" PERFORATED HDPE @ 0.00%	
		A-8 to A-9 24'-18" HDPE @ 0.90%	
		A-3A to A-3 119'-10" HDPE @ 0.60%	
		A-3 to A-4 150'-18" HDPE @ 0.16%	
		A-4 to A-8 96'-18" HDPE @ 0.16%	
		A-5 to A-7 18'-15" HDPE @ 0.11%	
		A-9 to A-10 5'-18" HDPE @ 23.75%	
		A-9 TO JELLYFISH FILTER 10'-12" HDPE @ 0.28%	
		JELLYFISH FILTER TO A-10 8'-12" HDPE @ 6.25%	



*VOLUME REQUIRED FROM VRRM SPREADSHEET = 4,565 C.F.
*TOTAL SURFACE AREA OF DETENTION SYSTEM = 5,400 S.F.
*TOTAL DEPTH OF STORAGE (FROM BOTTOM TO THE TOP OF INVERT OUT)=(103.72-100.5)=3.22'
*TOTAL STORM VOLUME = (AREA)(DEPTH) = (5,400 S.F.)(3.22') = 17,388 C.F.
*TOTAL VOLUME OF DETENTION SYSTEM = (AREA)(DEPTH) = (5,400 S.F.)(3.22') = 17,388 C.F.
*VOLUME OF VOIDS = (17,388 C.F.)(0.4) = 6,955 C.F. > 4,565 C.F.

AS-BUILT DRAWINGS SHALL BE PROVIDED AND SUBMITTED TO JAMES CITY COUNTY FOR ALL STORM PIPES AND CONVEYANCE SYSTEM

CONSTRUCTION RECORD DRAWING
PREPARED BY
R. L. GALLOWAY SURVEYING

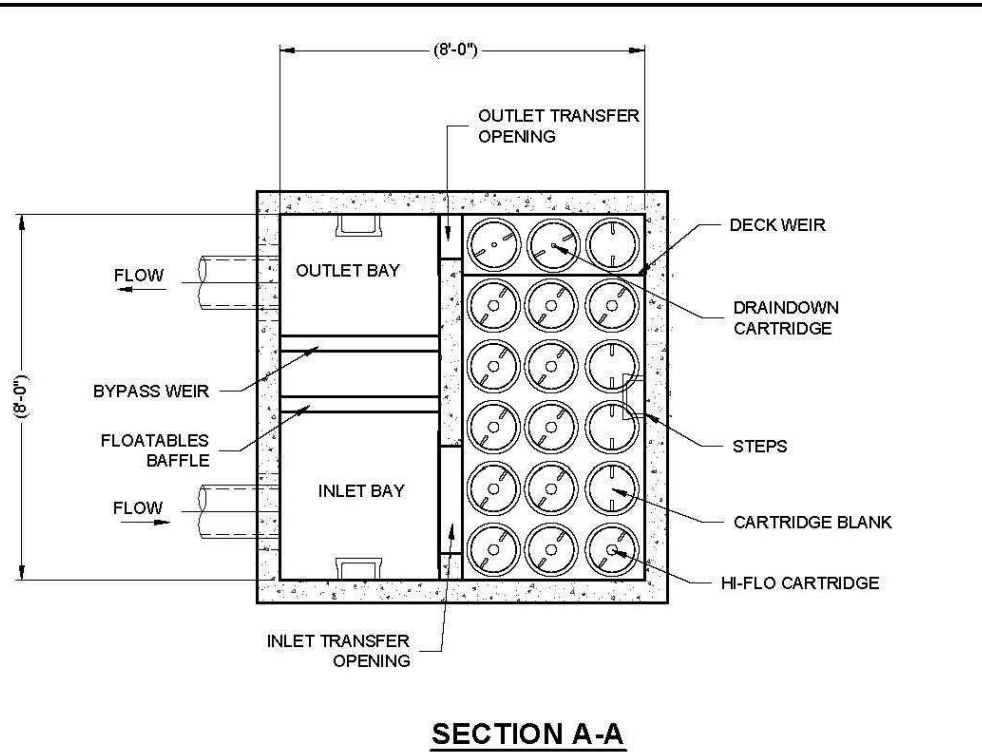
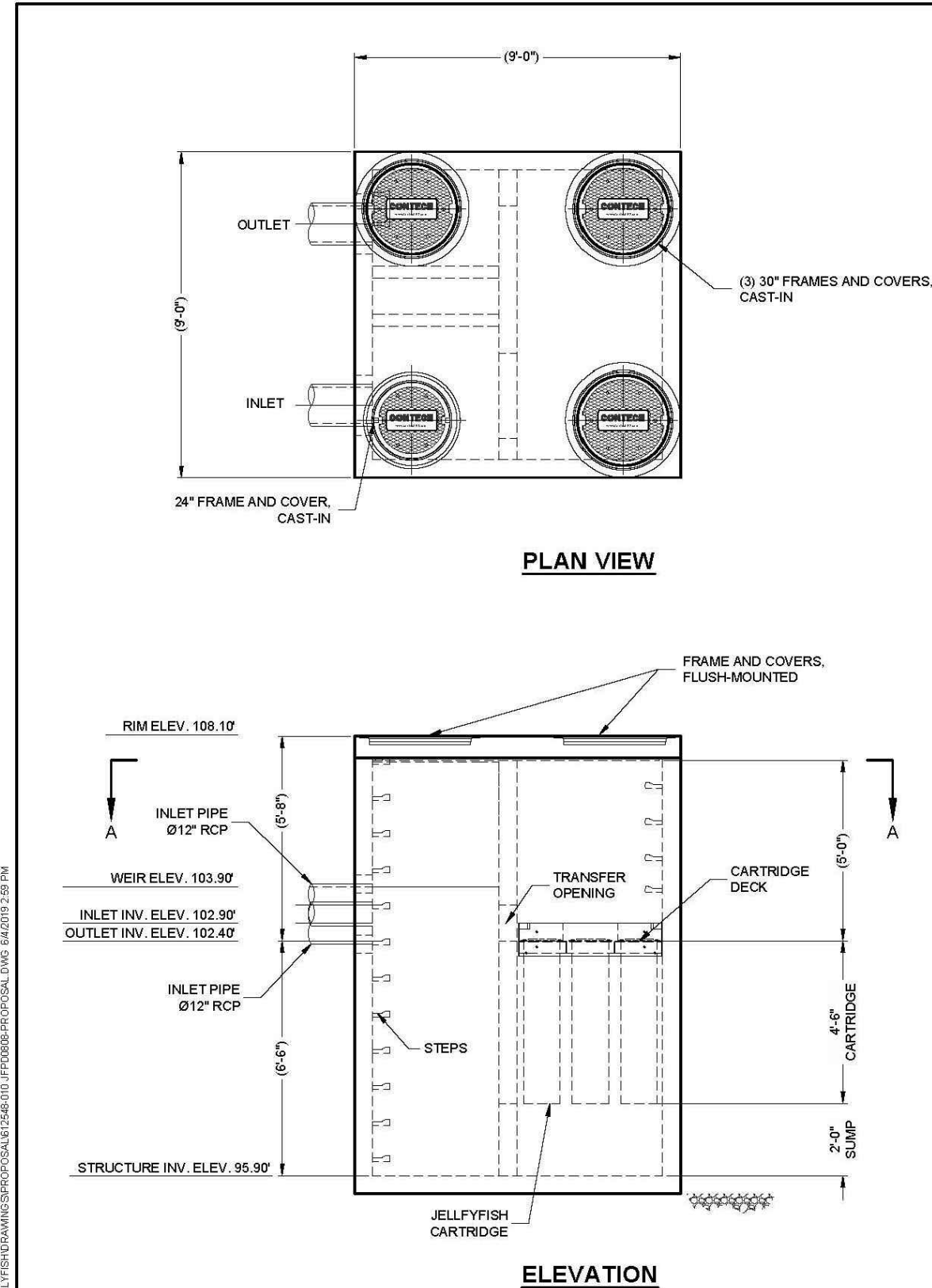
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GRADING PLAN
FOR
IRONBOUND SELF-STORAGE
IRONBOUND RD
WILLIAMSBURG, VA

JOB#	16189
DWG#	03-89-ASBUILT.dwg
DATE:	7.17.19
SCALE:	1"=25'
SHEET NUMBER	5 OF 13

5. Construction Drawings

A
B
C
D
E
F
G
H
I
J
K



MATERIAL LIST - PROVIDED BY CONTECH		
COUNT	DESCRIPTION	INSTALLED BY
12	54" HI-FLO CARTRIDGE (70mm ORIFICE)	CONTECH
2	54" DRAINDOWN CARTRIDGE (35mm ORIFICE)	CONTECH
4	CARTRIDGE BLANK (NO ORIFICE)	CONTECH
1	VAULT JELLYFISH DECK	CONTECH
2	TRANSFER HOLE COVERS	CONTECH
1	JOINT SEALANT	CONTRACTOR
1	Ø24" x 4" EIMV #41600306, OR EQUIVALENT FRAME AND COVER	CONTRACTOR
3	Ø30" x 4" EIMV #41600484, OR EQUIVALENT FRAME AND COVER	CONTRACTOR
16	PLCS STEPS, P10CTS LANE LADDER, OR EQUIVALENT	CONTECH

- GENERAL NOTES:
- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
 - FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. www.conteches.com
 - JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
 - STRUCTURE SHALL MEET AASHTO H-20, ASSUMING EARTH COVER OF 0' AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
 - STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

- INSTALLATION NOTES
- ANY SUB-BASE BACKFILL DEPTH AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
 - CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED).
 - CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT).
 - CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
 - CARTRIDGE INSTALLATION, BY CONTECH, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION AT (866) 740-3318.
 - CONTRACTOR TO REMOVE THE TRANSFER HOLE COVERS WHEN THE SYSTEM IS BROUGHT ONLINE.

STRUCTURE WEIGHT
APPROXIMATE HEAVIEST PICK = T.B.D. LBS.



GILL

1.0 Inspection and Maintenance Overview

The primary purpose of the Jellyfish® Filter is to capture and remove pollutants from stormwater runoff. As with any filtration system, these pollutants must be removed to maintain the filter's maximum treatment performance. Regular inspection and maintenance are required to insure proper functioning of the system.

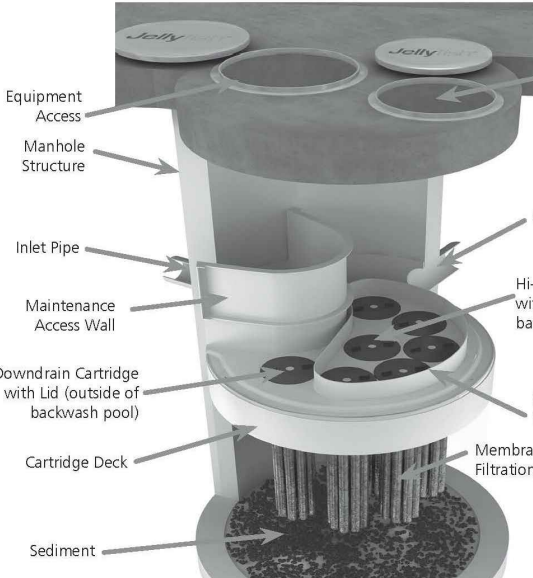
Maintenance frequencies and requirements are site specific and vary depending on pollutant loading. Additional maintenance activities may be required in the event of non-storm event runoff, such as base-flow or seasonal flow, an upstream chemical spill or due to excessive sediment loading from site erosion or extreme runoff events. It is a good practice to inspect the system after major storm events.

Inspection activities are typically conducted from surface observations and include:

- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW)

Maintenance activities typically include:

- Removal of oil, floatable trash and debris
- Removal of collected sediments
- Rinsing and re-installing the filter cartridges
- Replace filter cartridge tentacles, as needed



Note: Separator Skirt not shown

2.0 Inspection Timing

Inspection of the Jellyfish Filter is key in determining the maintenance requirements for, and to develop a history of the site's pollutant loading characteristics. In general, inspections should be performed at the times indicated below, or per the approved project stormwater quality documents (if applicable), whichever is more frequent.

- Post-construction inspection is required prior to putting the Jellyfish Filter into service. All construction debris or construction-related sediment within the device must be removed, and any damage to system components repaired, before installing the filter cartridge.
- A minimum of two inspections during the first year of operation to assess the sediment and floatable pollutant accumulation, and to ensure proper functioning of the system.
- Inspection frequency in subsequent years is based on the inspection and maintenance plan developed in the first year of operation. Minimum frequency should be once per year.
- Inspection is recommended after each major storm event.
- Inspection is required immediately after an upstream oil, fuel or other chemical spill.

3.0 Inspection Procedure

The following procedure is recommended when performing inspections:

- Provide traffic control measures as necessary.
- Inspect the MAW for floatable pollutants such as trash, debris, and oil sheen.
- Measure oil and sediment depth in several locations, by lowering a sediment probe through the MAW opening until contact is made with the floor of the structure. Record sediment depth, and presences of any oil layers.
- Inspect cartridge lids. Missing or damaged cartridge lids to be replaced.
- Inspect the MAW, cartridge deck, and backwash pool weir, for cracks or broken components. If damaged, repair is required.

3.1 Dry weather inspections

- Inspect the cartridge deck for standing water, and/or sediment on the deck.
- No standing water under normal operating conditions.
- Standing water inside the backwash pool, but not outside the backwash pool indicates that the filter cartridges need to be rinsed.



Inspection Utilizing Sediment Probe

- Standing water outside the backwash pool may indicate a backwash condition caused by high water elevation in the receiving water body, or possibly a blockage in downstream infrastructure.
- Any appreciable sediment (≥ 1/16") accumulated on the deck surface should be removed.

3.2 Wet weather inspections

- Observe the rate and movement of water in the unit. Note the depth of water above deck elevation within the MAW.
- Less than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges (i.e. cartridges located outside the backwash pool).
- Greater than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges and each of the hi-flo cartridges (i.e. cartridges located inside the backwash pool), and water should be overflowing the backwash pool weir.
- 18 inches or greater and relatively little flow is exiting the cartridge lids and outlet pipe, this condition indicates that the filter cartridges are occluded with sediment and need to be rinsed

4.0 Maintenance Requirements

Required maintenance for the Jellyfish Filter is based upon results of the most recent inspection, historical maintenance records, or the site specific water quality management plan; whichever is more frequent. In general, maintenance requires some combination of the following:

- Sediment removal for depths reaching 12 inches or greater, or within 3 years of the most recent sediment cleaning, whichever occurs sooner.
- Floatable trash, debris, and oil removal.
- Deck cleaned and free from sediment.
- Filter cartridges rinsed and re-installed as required by the most recent inspection results, or within 12 months of the most recent filter rinsing, whichever occurs sooner.
- Replace tentacles if rinsing does not restore adequate hydraulic capacity, remove accumulated sediment, or if damaged or missing. It is recommended that tentacles should remain in service no longer than 5 years before replacement.
- Damaged or missing cartridge deck components must be repaired or replaced as indicated by results of the most recent inspection.
- The unit must be cleaned out and filter cartridges inspected immediately after an upstream oil, fuel, or chemical spill. Filter cartridge tentacles should be replaced if damaged or compromised by the spill.

5.0 Maintenance Procedure

The following procedures are recommended when maintaining the Jellyfish Filter:

- Provide traffic control measures as necessary.
- Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures.
- Caution: Dropping objects onto the cartridge deck may cause damage.

- Perform inspection procedure prior to maintenance activity.
- To access the cartridge deck for filter cartridge service, descend the ladder and step directly onto the deck. Caution: Do not step onto the maintenance access wall (MAW) or backwash pool weir, as damage may result. Note that the cartridge deck may be slippery.
- Maximum weight of maintenance crew and equipment on the cartridge deck not to exceed 450 lbs.

5.1 Filter Cartridge Removal

- Remove a cartridge lid.
- Remove cartridges from the deck using the lifting loops in the cartridge head plate. Rope or a lifting device (available from Contech) should be used. Caution: Should a snag occur, do not force the cartridge upward as damage to the tentacles may result. Wet cartridges typically weigh between 100 and 125 lbs.
- Replace and secure the cartridge lid on the exposed empty receptacle as a safety precaution. Contech does not recommend exposing more than one empty cartridge receptacle at a time.

5.2 Filter Cartridge Rinsing

- Remove all 11 tentacles from the cartridge head plate. Take care not to damage or break the plastic threaded nut or connector.
- Position tentacles in a container (or over the MAW), with the



Cartridge Removal & Rinsing Device

- threaded connector (open end) facing down, so rinse water is flushed through the membrane and captured in the container.
- Using the Jellyfish rinse tool (available from Contech) or a low-pressure garden hose sprayer, direct water spray onto the tentacle membrane, sweeping from top to bottom along the length of the tentacle. Rinse until all sediment is removed from the membrane. Caution: Do not use a high pressure sprayer or focused stream of water on the membrane. Excessive water pressure may damage the membrane.

- Collected rinse water is typically removed by vacuum hose.
- Reattach tentacles to cartridge head plate. Reuse O-rings and nuts, ensuring proper placement on each tentacle.

5.3 Cleaning Procedure

- Perform vacuum cleaning of the Jellyfish Filter only after filter cartridges have been removed from the system. Access the lower chamber for vacuum cleaning only through the maintenance access wall (MAW) opening, being careful not to damage the flexible plastic separator skirt that is attached to the underside of the deck. The separator skirt surrounds the filter cartridge zone, and could be torn if contacted by the wand. Do not lower the vacuum wand through a cartridge receptacle, as damage to the receptacle will result.
- Vacuum floatable trash, debris, and oil, from the MAW opening. Alternatively, floatable solids may be removed by a net or skimmer.



Tentacle Rinse Using Jellyfish Rinse Tool

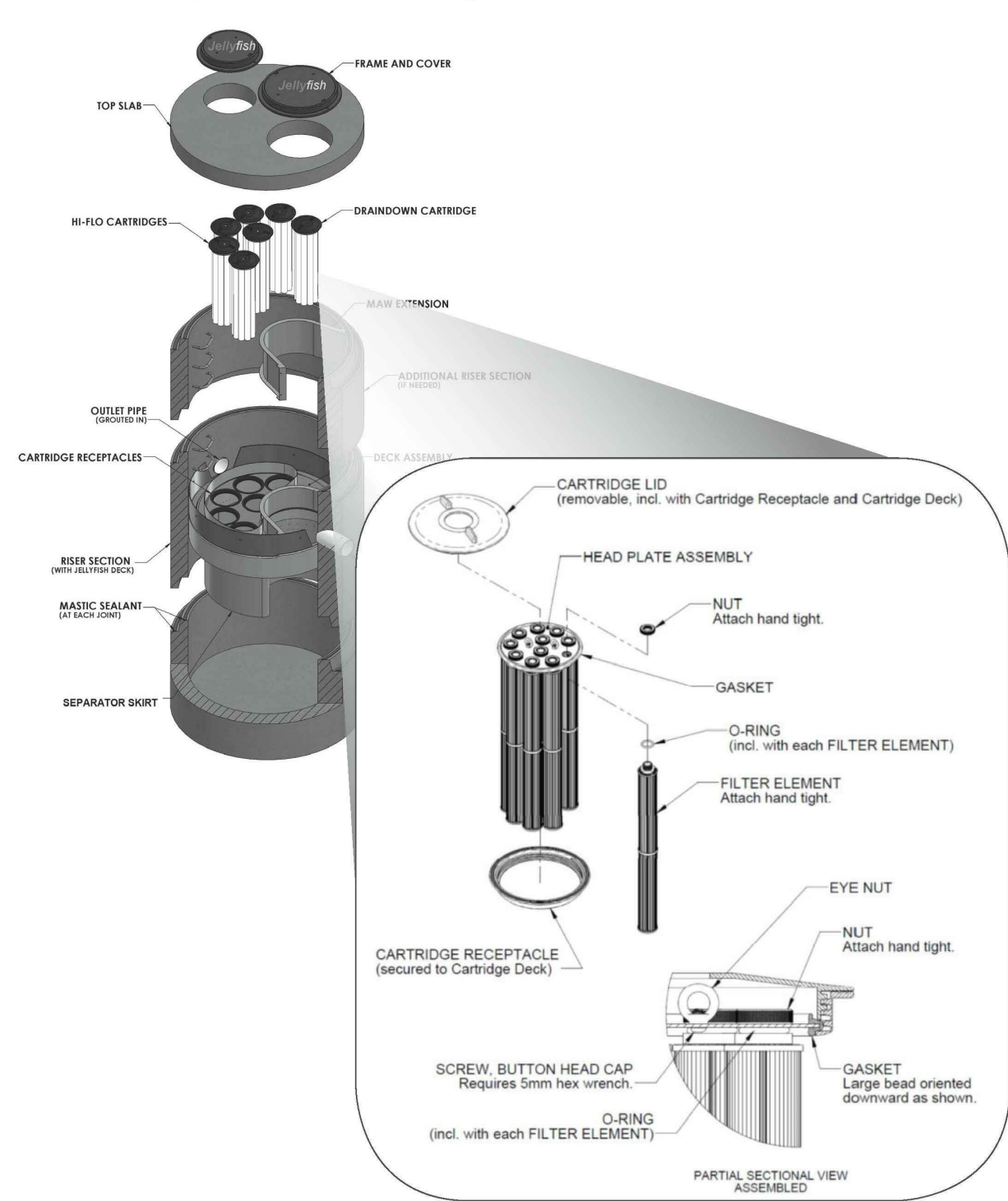
- Pressure wash cartridge deck and receptacles to remove all sediment and debris. Sediment should be rinsed into the sump area. Take care not to flush rinse water into the outlet pipe.
- Remove water from the sump area. Vacuum or pump equipment should only be introduced through the MAW.
- Remove the sediment from the bottom of the unit through the MAW opening.



Vacuuming Sump Through MAW

- For larger diameter Jellyfish Filter manholes (>8-ft) and vaults without an MAW opening, complete sediment removal may be facilitated by removing a cartridge lid from an empty receptacle and inserting a jetting wand (not a vacuum wand) through the receptacle. Use the sprayer to loose loosened sediment toward the vacuum hose in the MAW opening, being careful not to damage the receptacle.

Jellyfish Filter Components & Filter Cartridge



Caution: If a chemical spill has been captured, do not attempt maintenance. Immediately contact the local hazard response agency and contact Contech.

6.0 Related Maintenance Activities

Jellyfish units are often just one of many structures in a more comprehensive stormwater drainage and treatment system. In order for maintenance of the Jellyfish filter to be successful, it is imperative that all other components be properly maintained. The maintenance and repair of upstream facilities should be carried out prior to Jellyfish maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.

7.0 Material Disposal

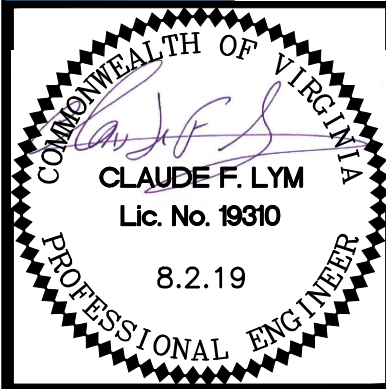
The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads. Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.

Site Improvement Associates, Inc.

Civil Engineers, Surveyors, & Site Contractors
Where Engineering and Construction Come Together

Office: 757-671-9000
Fax: 757-671-9226

800 Juniper Crescent, Suite A
Chesapeake, VA 23320



STORMWATER DETAILS
FOR
IRONBOUND SELF-STORAGE

IRONBOUND RD
WILLIAMSBURG, VA

JOB# 16189

DWG: 16189_Details for SP.dwg

DATE: 7.17.19

SCALE: NONE

SHEET NUMBER
13 OF 13

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No.	Date	Description
3	7.26.19	REVISED TO ADDRESS CITY COMMENTS, LETTER DATED JULY 11, 2019
2	7.17.19	REVISED TO ADDRESS CITY COMMENTS, LETTER DATED JULY 4, 2019
1	5.30.19	REVISED TO ADDRESS CITY COMMENTS, LETTER DATED MARCH 27, 2019

6. Design Calculations



Site Improvement Associates, Inc.

Civil Engineers, Surveyors, & Site Contractors

*Where Engineering and
Construction Come Together*

SP-19-0016



PLANNING DIVISION

AUG 07 2019

RECEIVED

**Ironbound Self-Storage
DRAINAGE CALCULATIONS
SIA # 16189**

August 2, 2019

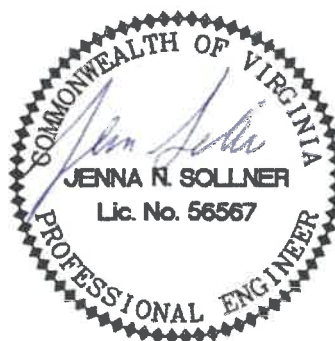


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- 1.STORMWATER NARRATIVE**
- 2.HYDROGRAPHS**
- 3.VRRM SPREADSHEET**
- 4.PIPE CALCULATIONS**
- 5.SOIL REPORT**
- 6.JELLYFISH FILTER DETAILS**
- 7.DRAINAGE AREA MAPS**
- 8.BMP AS-BUILTS (RECENT AND POST-
CONSTRUCTION)**
- 9.IMPERVIOUS AREA EXHIBIT**
- 10. PREVIOUSLY APPROVED DRAINAGE
PLAN**

1. STORMWATER NARRATIVE



Site Improvement Associates, Inc.

Civil Engineers, Surveyors, & Site Contractors

Where Engineering and
Construction Come Together

Stormwater Narrative For Ironbound Rd. Self-Storage SIA # 16189

The property Pin Number is 3842300001. The site address is 4091 Ironbound Rd. and zoned M1 Limited Business. The total area of the site is 2.18 acres with 1.32 acres of impervious area (60% impervious cover).

The building and parking areas drain to a proposed piped system which connects to the 18" existing pipe provided for this parcel that leads to a dry pond.

This drainage design is in accordance with the master plans for Courthouse Green.

Previously Approved Design (Courthouse Green)

The approved design for the site as shown on the Courthouse Green Site Plan includes a drainage area of 1.53 acres with 1.30 acres of impervious area. This equates to a Curve Number of 92. The outfall pipe for the drainage area is a 200'-18" pipe at 0.84% slope. The capacity in the pipe was calculated to be 11.35 cfs. The calculated runoff for the previously approved conditions are shown in the hydrograph reports, see Hydrograph 1. Runoff for various rainfall events were calculated as shown in chart:

Storm Frequency (24 Hour)	Runoff (cfs)
1-year	4.54
2-year	5.77
10-year	9.50
100-year	16.56

The PC144 is the extended detention dry pond BMP for Courthouse Green. A post-construction as-built drawing was compared to a recent as-built drawing and the current elevations are in conformance with the post-construction as-built. It is recommended to re-establish the rip-rap aprons at the outfall pipes, but the facility is in good working order and performing at the design level of service.

Proposed Conditions

The proposed site includes a drainage area of 2.07 acres and 1.32 acres of impervious area. The total impervious area proposed is equal to the previously approved plans. An infiltration trench is proposed under the drive isle for additional water quality and quantity. Most of the site is directed to the infiltration trench, except the area draining to A-9, but all 2.07 acres is treated by the Jellyfish filter before going to the 18" pipe and ultimately to the dry pond designed with Courthouse Greens. Hydrograph 3 represents

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Chesapeake, VA 23320

Office: 757-671-9000
Fax: 757-671-9288

the area that is directed to the infiltration trench. Hydrograph 4 is the routing Hydrograph that routes Hydrograph 3 through the infiltration trench. Hydrograph 5 represents the area to structure A-9 that bypasses the infiltration trench. Hydrograph 6 represents the total runoff from the site to the 18" pipe (Hydrograph 4 plus Hydrograph 5). The infiltration rate used for the calculations was assumed to be 0.2 in/hr, a conservative assumption for sandy clay. The 100-year storm was run separately because in the 100-year event, the infiltration fills up and the system will function as if the trench is not there. The proposed flows are as follows:

Storm Frequency (24 Hour)	Runoff (cfs)
1-year	0.63
2-year	2.70
10-year	8.72
100-year	20.26

The proposed flows are in accordance with the flows for the approved site plans. There is adequate storage in the downstream system for the proposed plans according to the previously approved plans for Courthouse Greens. Pipe design calculations are included.

Volume calculations are as follows:

VOLUME REQUIRED FROM VRRM SPREADSHEET = 4,565 CF

TOTAL SURFACE AREA OF DETENTION SYSTEM = 5,400 S.F.

TOTAL DEPTH OF STORAGE (FROM BOTTOM TO THE TOP OF INVERT OUT)=(103.72-100.5)=3.22'

TOTAL VOLUME OF DETENTION SYSTEM = (AREA)(DEPTH) = (5,400 S.F.)(3.22')= 17,388 C.F.

VOLUME OF VOIDS = (17,388 C.F.)(0.4)= 6,955 C.F.

The drawdown time for this area, using the 0.2 inches per hour is:

TOTAL SURFACE AREA OF DETENTION SYSTEM = 5,400 S.F.

TOTAL INFILTRATION OUTFLOW= (0.2 IN/HR.)(5,400 S.F.)= 0.025 CFS

DRAWDOWN TIME= 6,955CF/(0.025 CFS)= 3.2 DAYS

Water Quality

To meet water quality standards, in addition to the infiltration trench, a Jellyfish Filter will be utilized on site to meet phosphorus removal requirements. VRRM Spreadsheet is included.

2. HYDROGRAPHS

SP-19-0016

Ironbound Mini Storage

HGL calcs to show added system
of site will not pond due to dnstrm pond

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)

Element Count

Number of rain gages 1
Number of subcatchments ... 2
Number of nodes 4
Number of links 3
Number of pollutants 0
Number of land uses 0

Raingage Summary

Name	Data Source	Data Type	Recording Interval
10YR	10YR	INTENSITY	6 min.

Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
S2	0.53	115.43	60.00	1.0000	10YR	SS#2A
S3	0.45	98.01	60.00	1.0000	10YR	SS#3A

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
SS#2A	JUNCTION	100.50	4.50	0.0	
SS#3A	JUNCTION	100.88	5.12	0.0	
SS#4A	JUNCTION	102.70	2.82	0.0	
SS#1A	OUTFALL	99.50	2.00	0.0	

Name	From Node	To Node	Type	Length	%Slope	Roughness
2A:1A	SS#2A	SS#1A	CONDUIT	217.0	0.4608	0.0130
3A:2A	SS#3A	SS#2A	CONDUIT	74.0	0.5135	0.0130
4A:3A	SS#4A	SS#3A	CONDUIT	206.0	0.8835	0.0130

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
2A:1A	CIRCULAR	2.00	3.14	0.50	2.00	1	15.36
3A:2A	CIRCULAR	1.50	1.77	0.38	1.50	1	7.53
4A:3A	CIRCULAR	1.50	1.77	0.38	1.50	1	9.87

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Flow Units CFS
Process Models:

```

Process Models:
Rainfall/Runoff ..... YES
RDII ..... NO
Snowmelt ..... NO
Groundwater ..... NO
Flow Routing ..... YES
Ponding Allowed ..... NO
Water Quality ..... NO

```

```

Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date ..... 08/29/2019 00:00:00
Ending Date ..... 08/30/2019 00:00:00
Antecedent Dry Days ..... 0.0

```

Report Time Step 00:01:00
 Wet Time Step 00:05:00
 Dry Time Step 00:05:00
 Routing Time Step 5.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 1
 Head Tolerance 0.005000 ft

	Volume acre-feet	Depth inches
Runoff Quantity Continuity		
Total Precipitation	0.450	5.510
Evaporation Loss	0.000	0.000
Infiltration Loss	0.049	0.597
Surface Runoff	0.390	4.782
Final Storage	0.012	0.145
Continuity Error (%)	-0.244	

	Volume acre-feet	Volume 10^6 gal
Flow Routing Continuity		
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.390	0.127
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.001	0.000
External Outflow	0.391	0.127
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	-0.010	

 Time-Step Critical Elements

 None

 Highest Flow Instability Indexes

All links are stable.

Routing Time Step Summary

Minimum Time Step : 4.50 sec
Average Time Step : 5.00 sec
Maximum Time Step : 5.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 2.00
Percent Not Converging : 0.00

Subcatchment Runoff Summary

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Imperv Runoff in	Perv Runoff in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coe
S2	5.51	0.00	0.00	0.60	3.26	1.85	4.78	0.07	3.15	0.86
S3	5.51	0.00	0.00	0.60	3.26	1.85	4.78	0.06	2.67	0.86

Node Depth Summary

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
SS#2A	JUNCTION	1.38	3.64	104.14	0 11:54	3.64
SS#3A	JUNCTION	1.10	3.33	104.21	0 11:54	3.33
SS#4A	JUNCTION	0.19	1.51	104.21	0 11:53	1.51
SS#1A	OUTFALL	2.25	4.50	104.00	0 12:00	4.50

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
SS#2A	JUNCTION	3.15	5.81	0 11:54	0.0688	0.128	0.063
SS#3A	JUNCTION	2.67	2.67	0 11:54	0.0584	0.0599	0.044
SS#4A	JUNCTION	0.00	0.12	0 11:49	0	0.00142	0.054
SS#1A	OUTFALL	0.00	5.82	0 11:54	0	0.128	0.000

Node Surge Summary

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
SS#2A	JUNCTION	8.00	1.645	0.855
SS#3A	JUNCTION	8.64	1.835	1.785
SS#4A	JUNCTION	0.03	0.012	1.308

Node Flooding Summary

No nodes were flooded.

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
SS#1A	98.67	0.20	5.82	0.128

System 98.67 0.20 5.82 0.128

Link Flow Summary

Link	Type	Maximum Flow CFS	Time of Max Occurrence days hr:min	Maximum Veloc ft/sec	Max/ Full Flow	Max/ Full Depth
2A:1A	CONDUIT	5.82	0 11:54	1.85	0.38	1.00
3A:2A	CONDUIT	2.67	0 11:54	1.51	0.36	1.00
4A:3A	CONDUIT	0.12	0 11:49	0.07	0.01	1.00

Flow Classification Summary

Conduit	Adjusted /Actual Length	Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
2A:1A	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.23	0.00
3A:2A	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.32	0.00
4A:3A	1.00	0.00	0.62	0.00	0.38	0.00	0.00	0.36	0.00

Conduit Surcharge Summary

Conduit	Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
2A:1A	8.00	8.00	13.32	0.01	0.01
3A:2A	8.64	8.64	10.66	0.01	0.01
4A:3A	0.03	0.03	7.78	0.01	0.01

Analysis begun on: Thu Aug 29 15:56:09 2019

Analysis ended on: Thu Aug 29 15:56:09 2019
Total elapsed time: < 1 sec

Hydraflow Table of Contents

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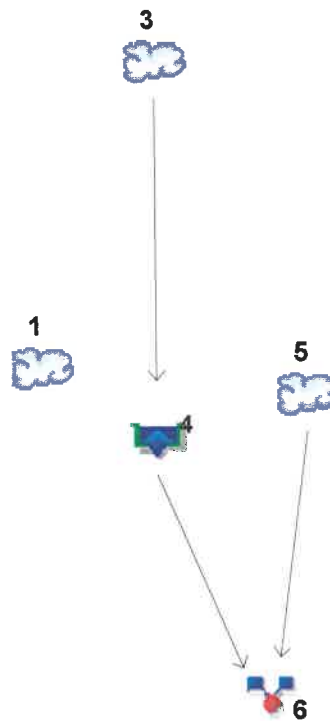
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020



Legend

Hyd.	Origin	Description
1	SCS Runoff	Previously Approved Flows
3	SCS Runoff	Proposed Routed Area
4	Reservoir	Routed
5	SCS Runoff	A-9
6	Combine	Proposed Runoff

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	4.543	2	720	12,053	-----	-----	-----	Previously Approved Flows
3	SCS Runoff	3.786	2	720	9,842	-----	-----	-----	Proposed Routed Area
4	Reservoir	0.082	2	958	1,690	3	103.83	7,199	Routed
5	SCS Runoff	0.634	2	716	1,475	-----	-----	-----	A-9
6	Combine	0.634	2	716	5,876	4, 5	-----	-----	Proposed Runoff
2019, 5-10, Hydrographs.gpw					Return Period: 1 Year			Wednesday, 07 / 31 / 2019	

Hydrograph Report

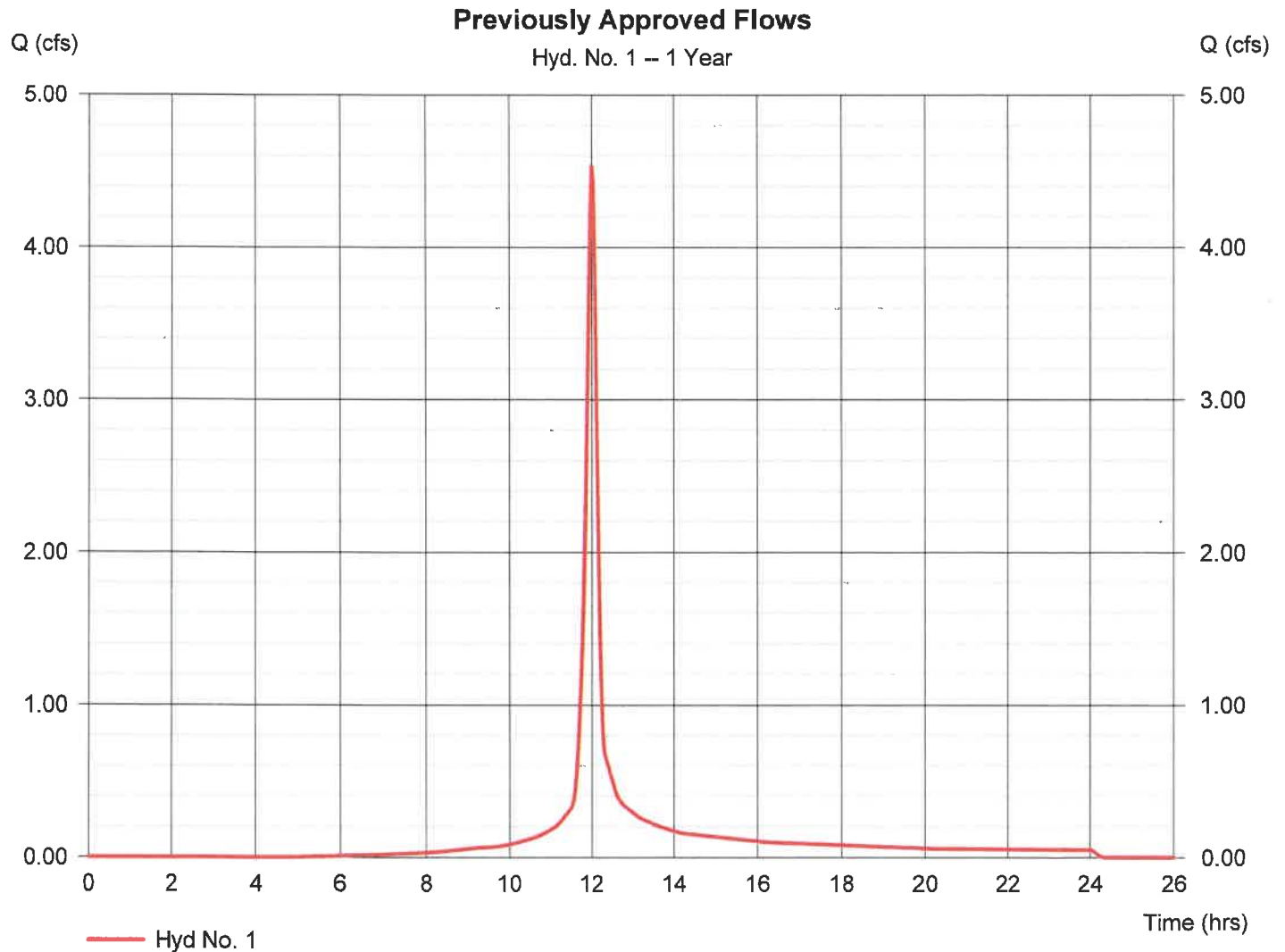
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Wednesday, 07 / 31 / 2019

Hyd. No. 1

Previously Approved Flows

Hydrograph type	= SCS Runoff	Peak discharge	= 4.543 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 12,053 cuft
Drainage area	= 1.530 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 2.94 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

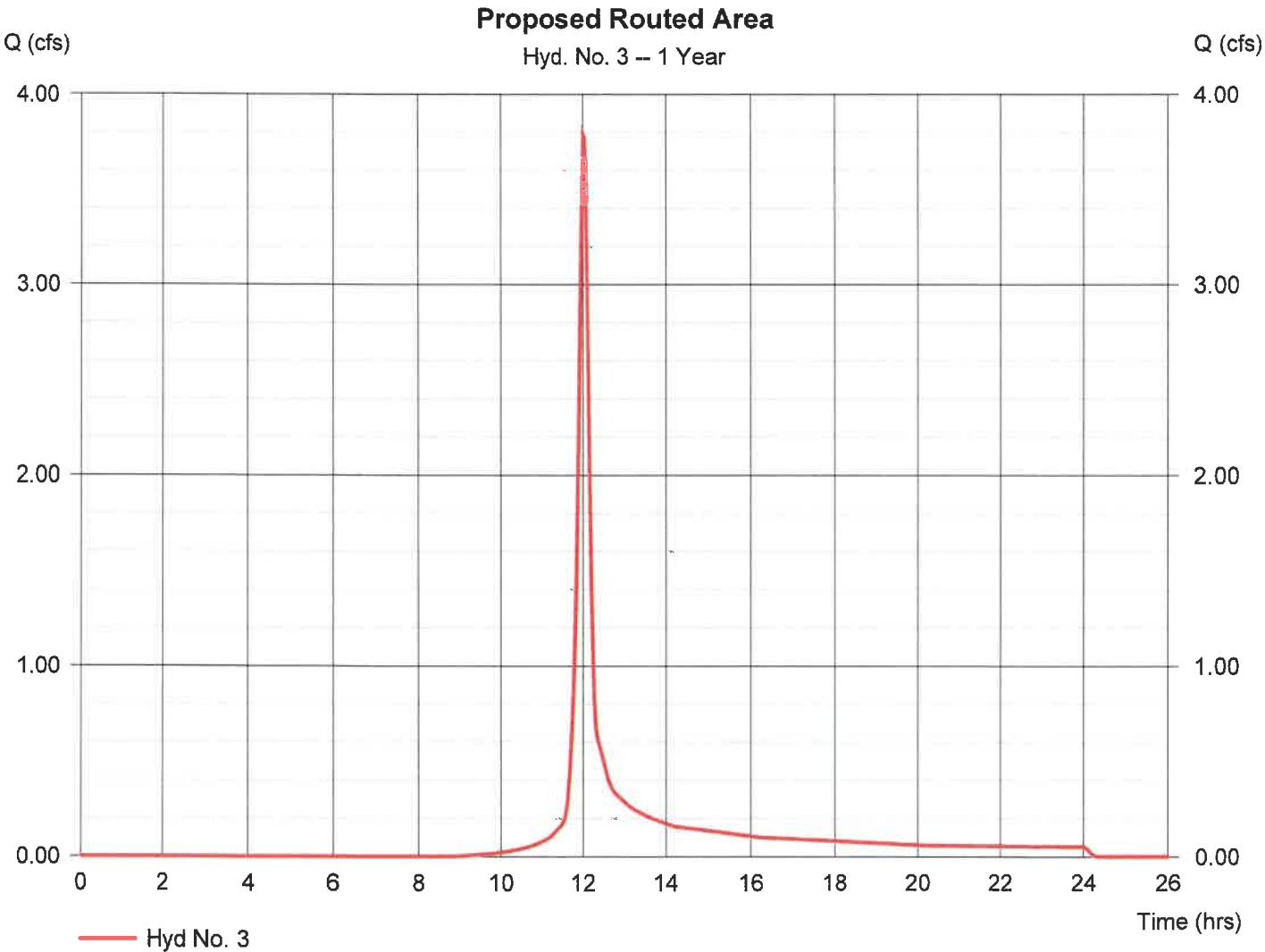
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Wednesday, 07 / 31 / 2019

Hyd. No. 3

Proposed Routed Area

Hydrograph type	= SCS Runoff	Peak discharge	= 3.786 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 9,842 cuft
Drainage area	= 1.880 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 2.94 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

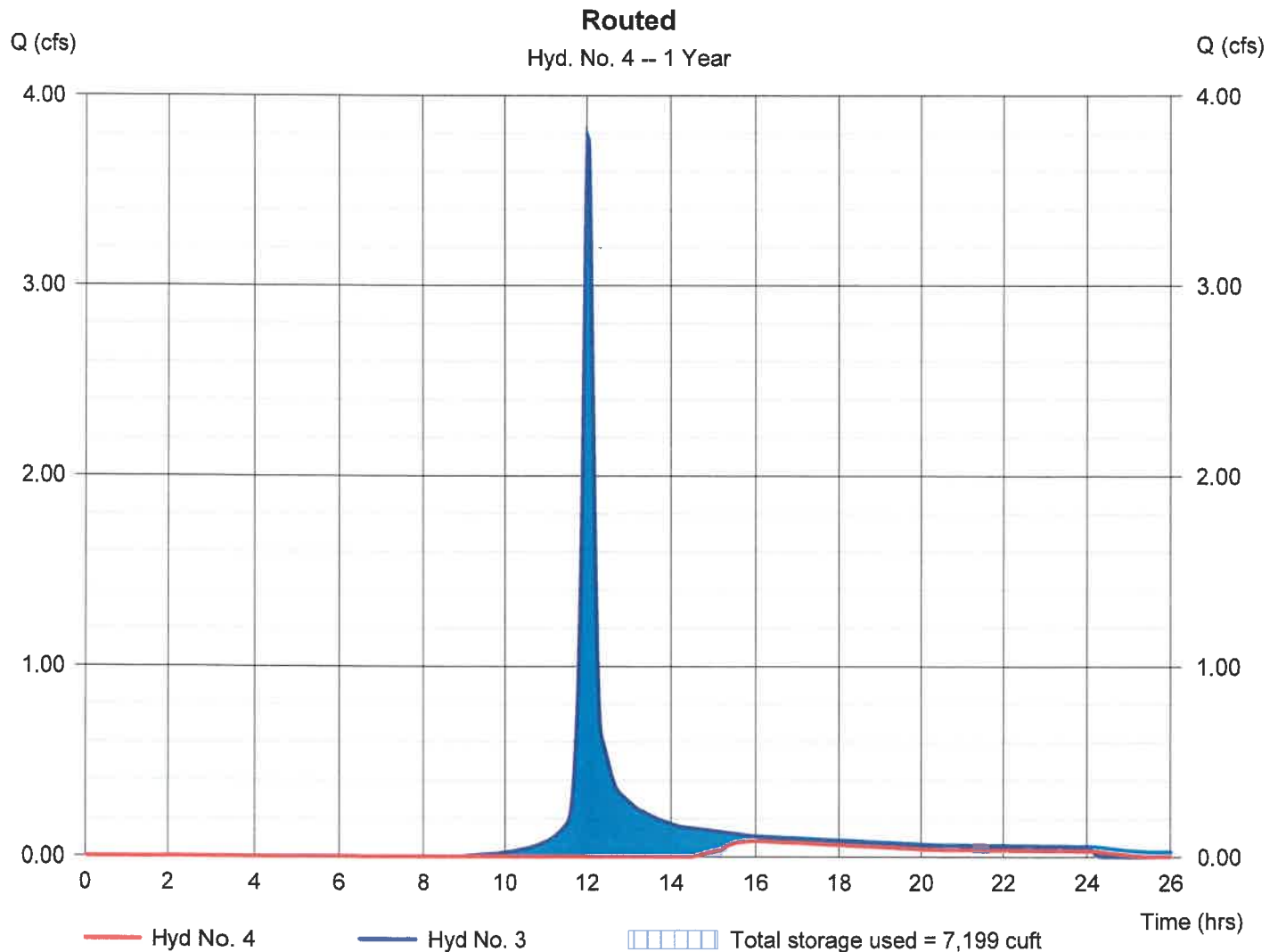
Wednesday, 07 / 31 / 2019

Hyd. No. 4

Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.082 cfs
Storm frequency	= 1 yrs	Time to peak	= 15.97 hrs
Time interval	= 2 min	Hyd. volume	= 1,690 cuft
Inflow hyd. No.	= 3 - Proposed Routed Area	Max. Elevation	= 103.83 ft
Reservoir name	= Infiltration Trench	Max. Storage	= 7,199 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

7

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Wednesday, 07 / 31 / 2019

Pond No. 1 - Infiltration Trench

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 100.50 ft. Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.50	5,400	0	0
1.00	101.50	5,400	2,160	2,160
2.00	102.50	5,400	2,160	4,320
3.00	103.50	5,400	2,160	6,479
4.00	104.50	5,400	2,160	8,639
5.00	105.50	5,400	2,160	10,799

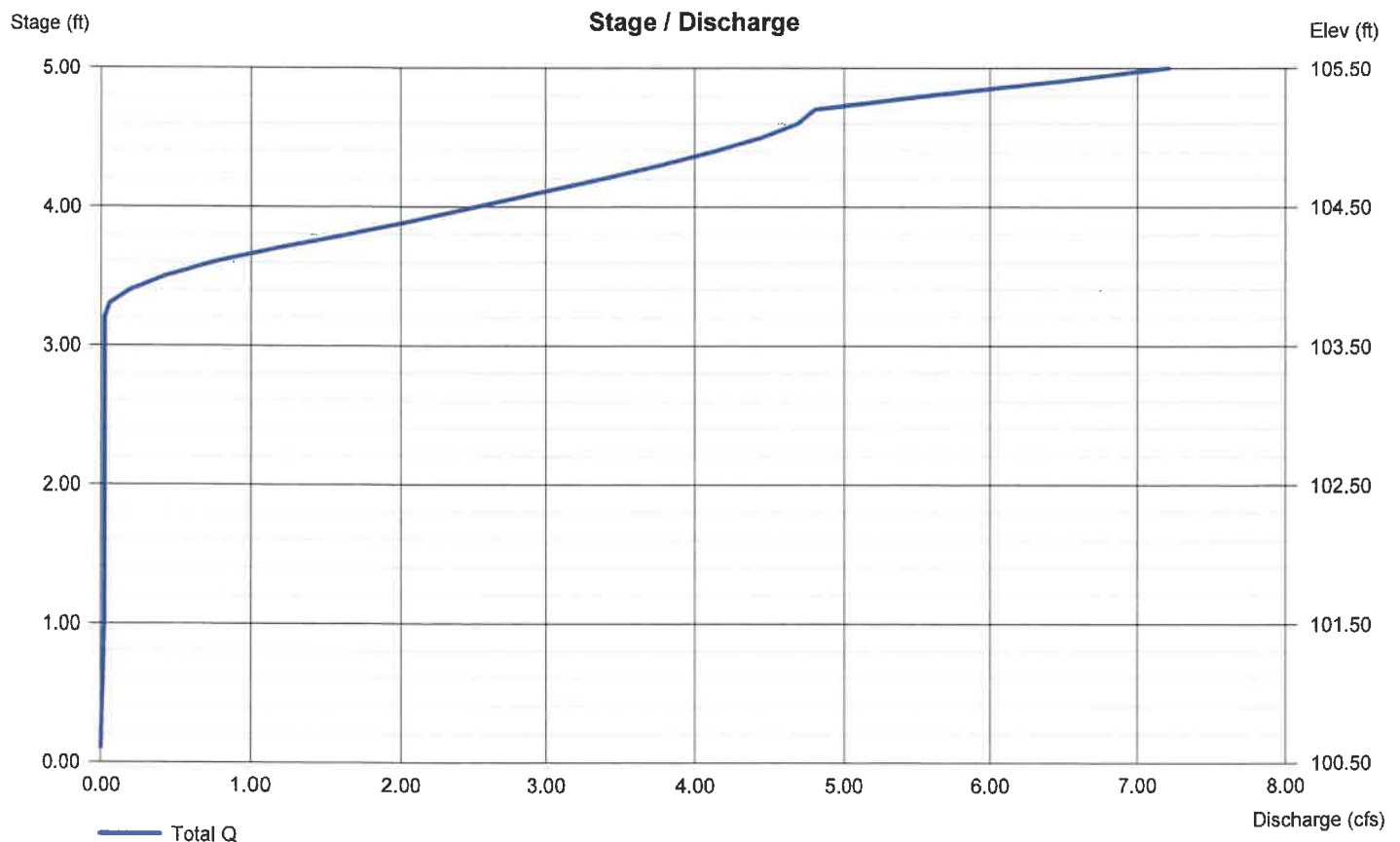
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	0.00	0.00	0.00
Span (in)	= 18.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 103.72	0.00	0.00	0.00
Length (ft)	= 24.00	0.00	0.00	0.00
Slope (%)	= 0.90	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.200 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Hydrograph Report

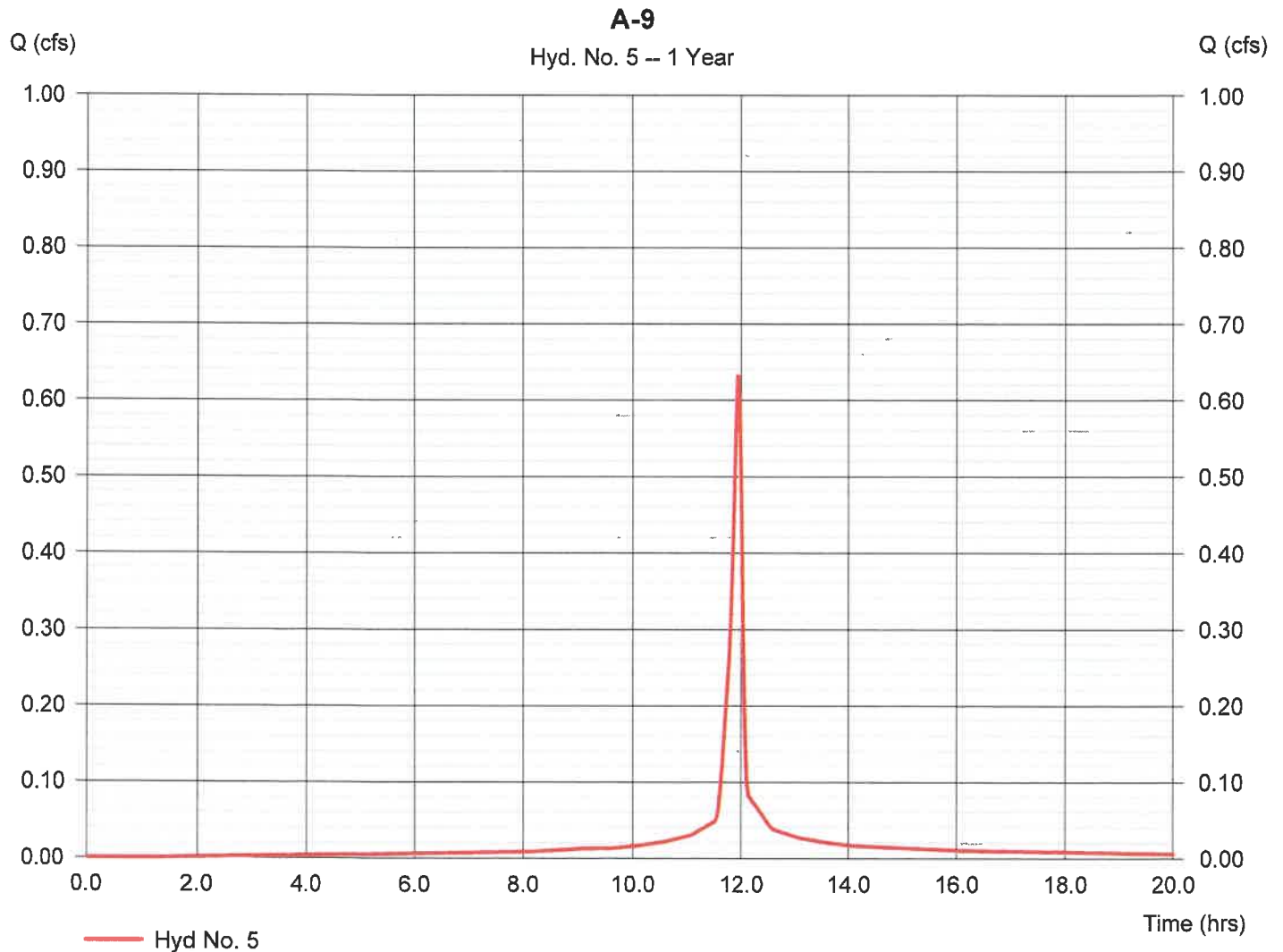
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Wednesday, 07 / 31 / 2019

Hyd. No. 5

A-9

Hydrograph type	= SCS Runoff	Peak discharge	= 0.634 cfs
Storm frequency	= 1 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 1,475 cuft
Drainage area	= 0.160 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.94 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

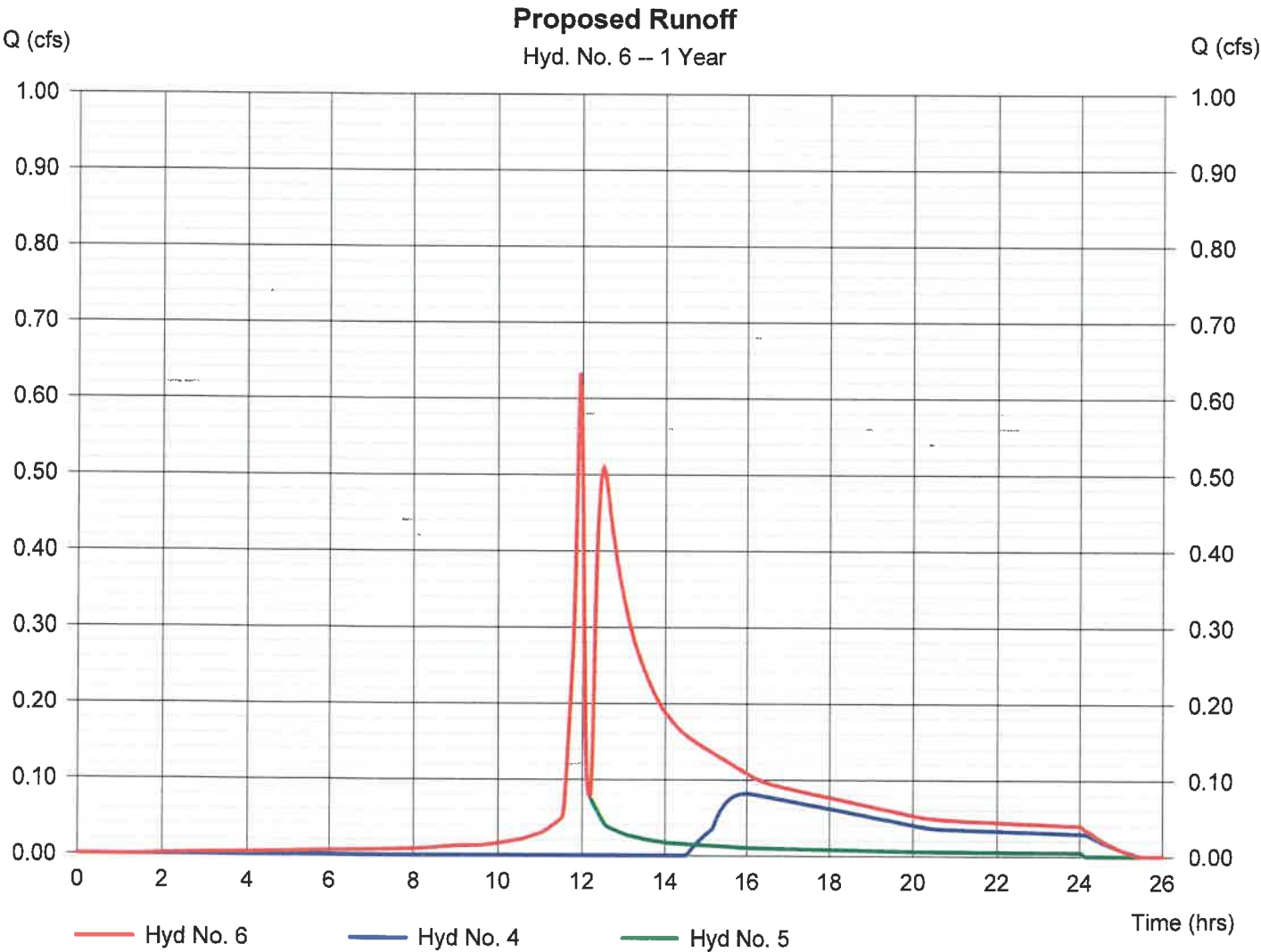
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Wednesday, 07 / 31 / 2019

Hyd. No. 6

Proposed Runoff

Hydrograph type	= Combine	Peak discharge	= 0.634 cfs
Storm frequency	= 1 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 5,876 cuft
Inflow hyds.	= 4, 5	Contrib. drain. area	= 0.160 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	5.766	2	720	15,486	-----	-----	-----	Previously Approved Flows
3	SCS Runoff	5.206	2	720	13,495	-----	-----	-----	Proposed Routed Area
4	Reservoir	0.452	2	760	5,297	3	104.01	7,586	Routed
5	SCS Runoff	0.773	2	716	1,817	-----	-----	-----	A-9
6	Combine	2.696	2	730	9,843	4, 5	-----	-----	Proposed Runoff
2019, 5-10, Hydrographs.gpw					Return Period: 2 Year			Wednesday, 07 / 31 / 2019	

Hydrograph Report

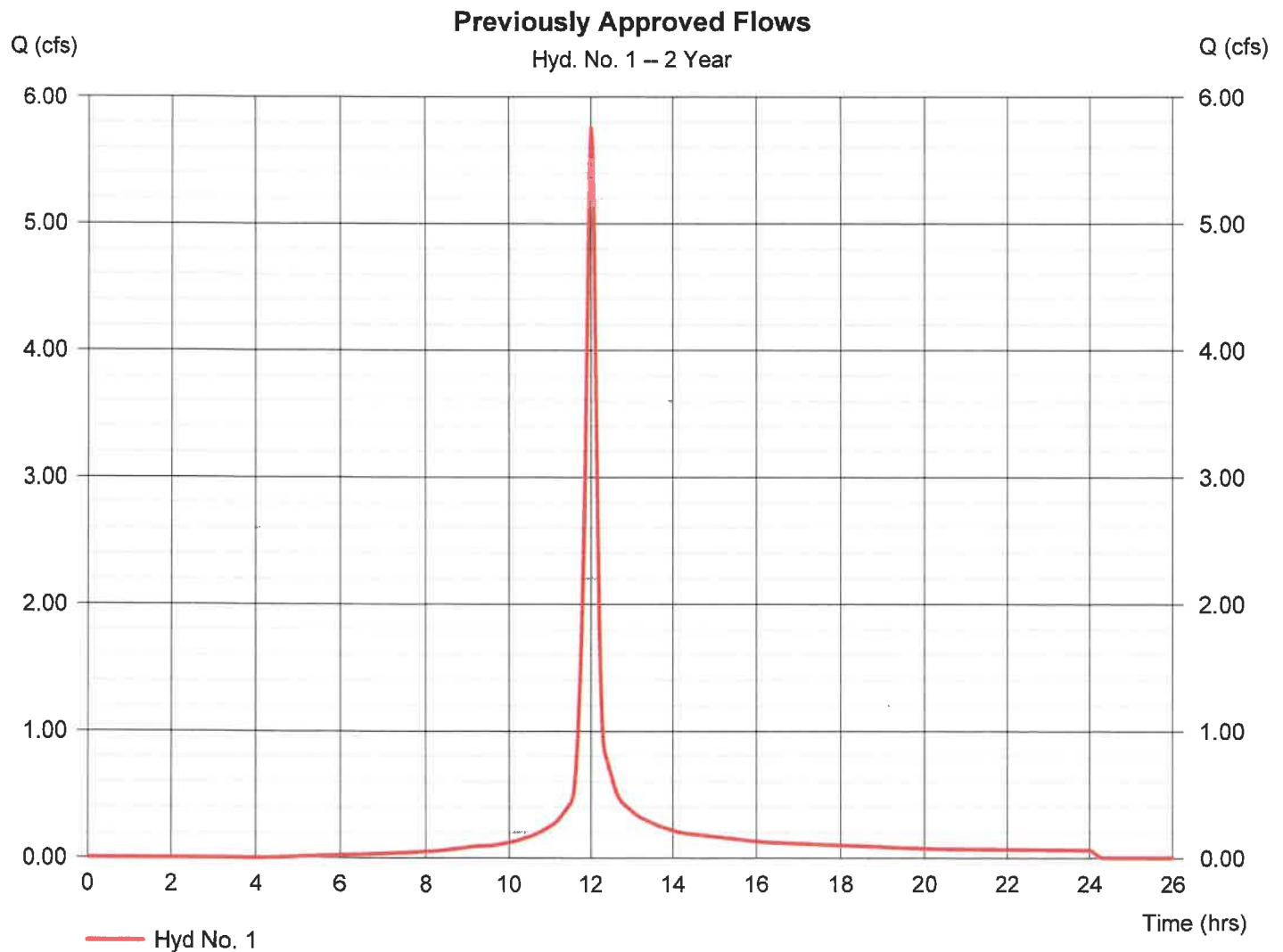
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Wednesday, 07 / 31 / 2019

Hyd. No. 1

Previously Approved Flows

Hydrograph type	= SCS Runoff	Peak discharge	= 5.766 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 15,486 cuft
Drainage area	= 1.530 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.57 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

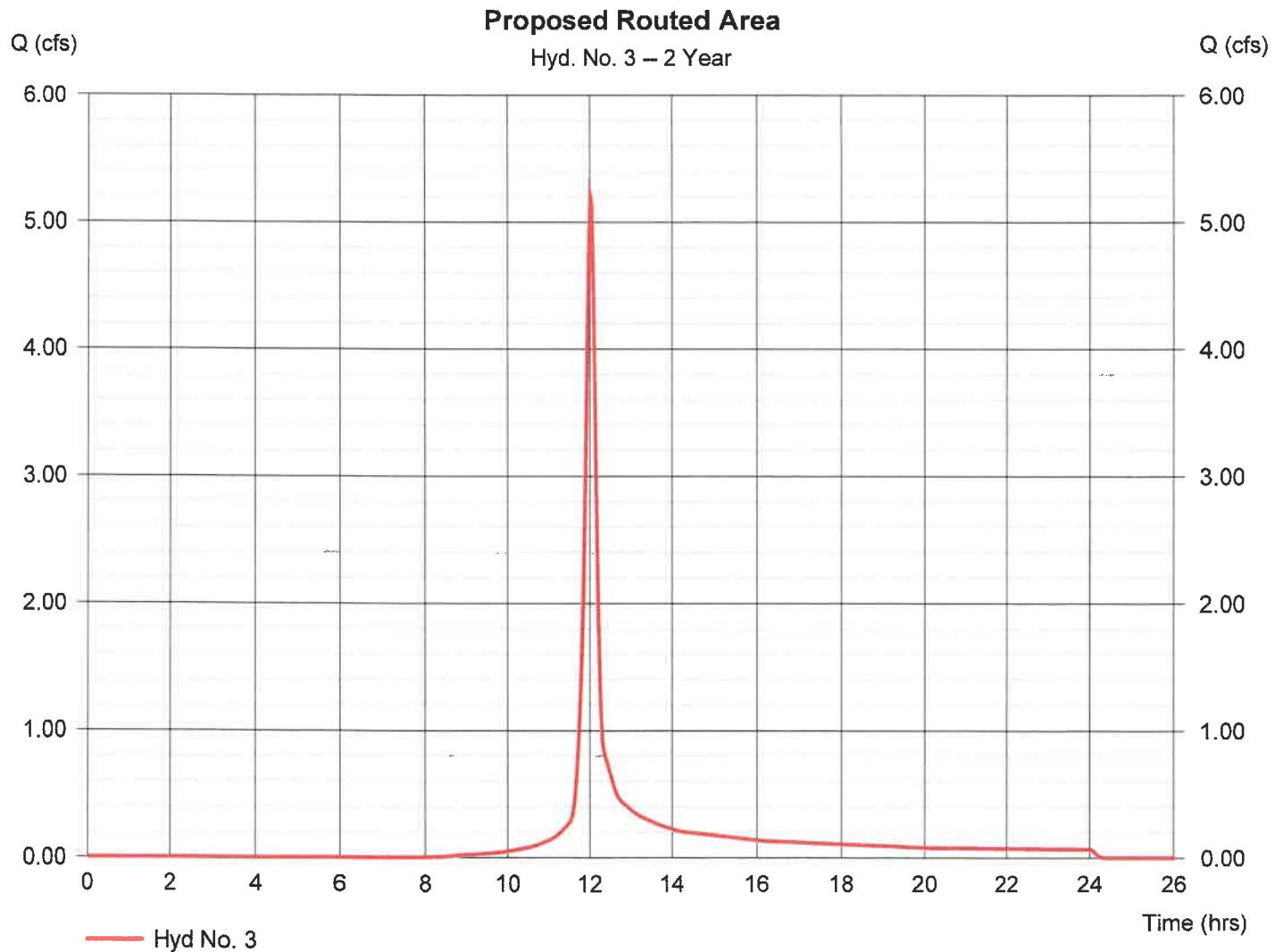
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Wednesday, 07 / 31 / 2019

Hyd. No. 3

Proposed Routed Area

Hydrograph type	= SCS Runoff	Peak discharge	= 5.206 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 13,495 cuft
Drainage area	= 1.880 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.57 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

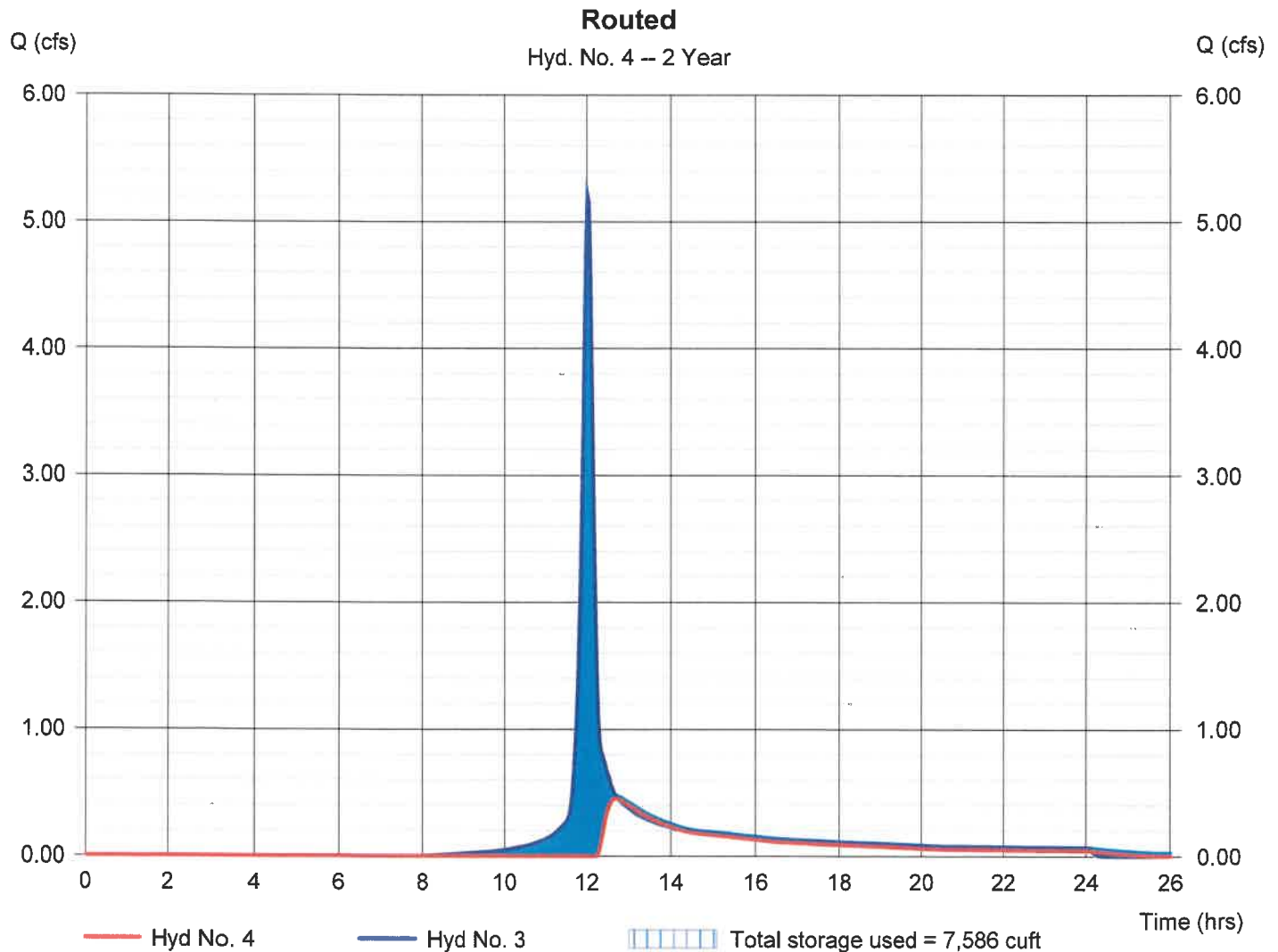
Wednesday, 07 / 31 / 2019

Hyd. No. 4

Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.452 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.67 hrs
Time interval	= 2 min	Hyd. volume	= 5,297 cuft
Inflow hyd. No.	= 3 - Proposed Routed Area	Max. Elevation	= 104.01 ft
Reservoir name	= Infiltration Trench	Max. Storage	= 7,586 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

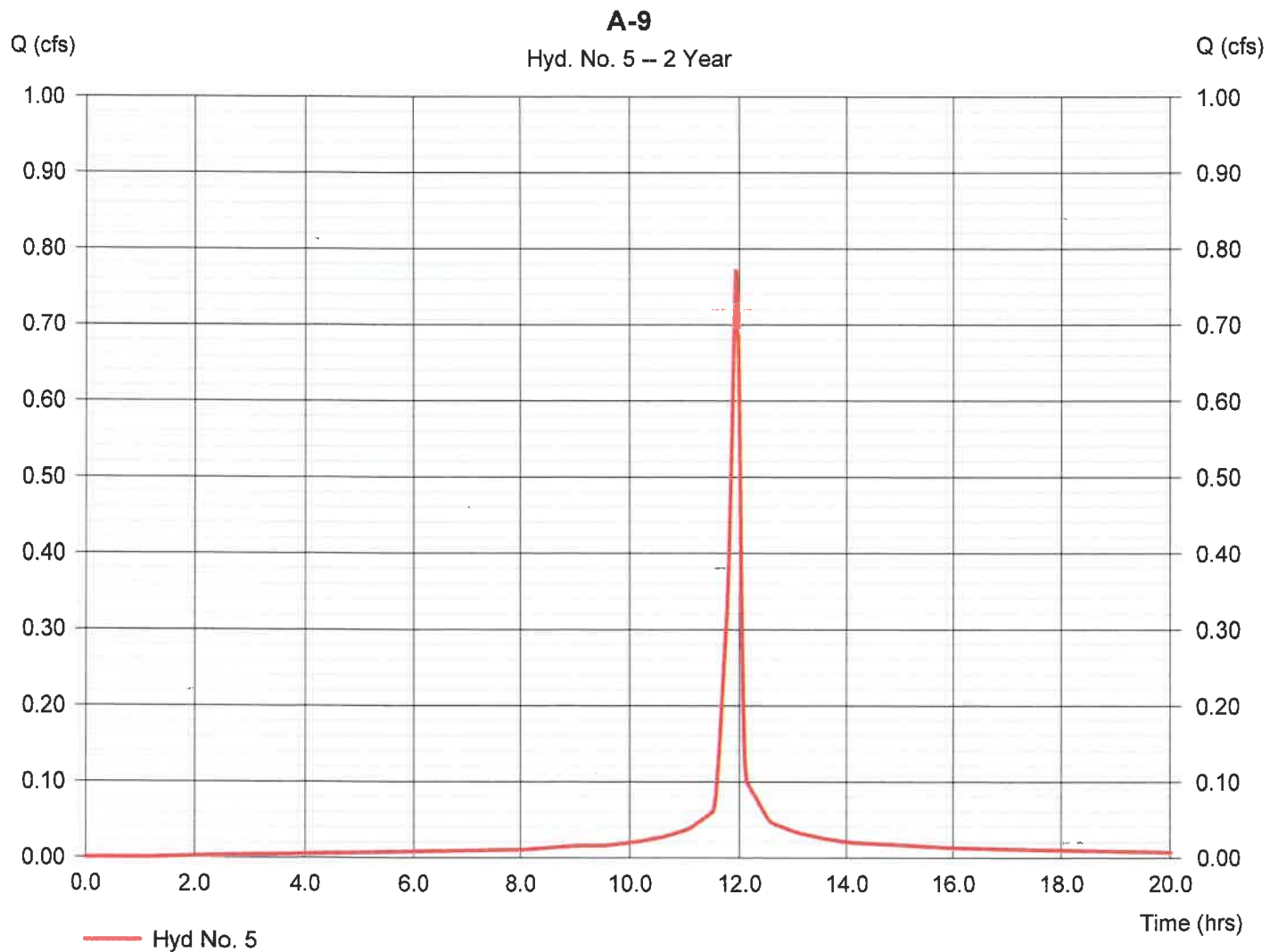
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Wednesday, 07 / 31 / 2019

Hyd. No. 5

A-9

Hydrograph type	= SCS Runoff	Peak discharge	= 0.773 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 1,817 cuft
Drainage area	= 0.160 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.57 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

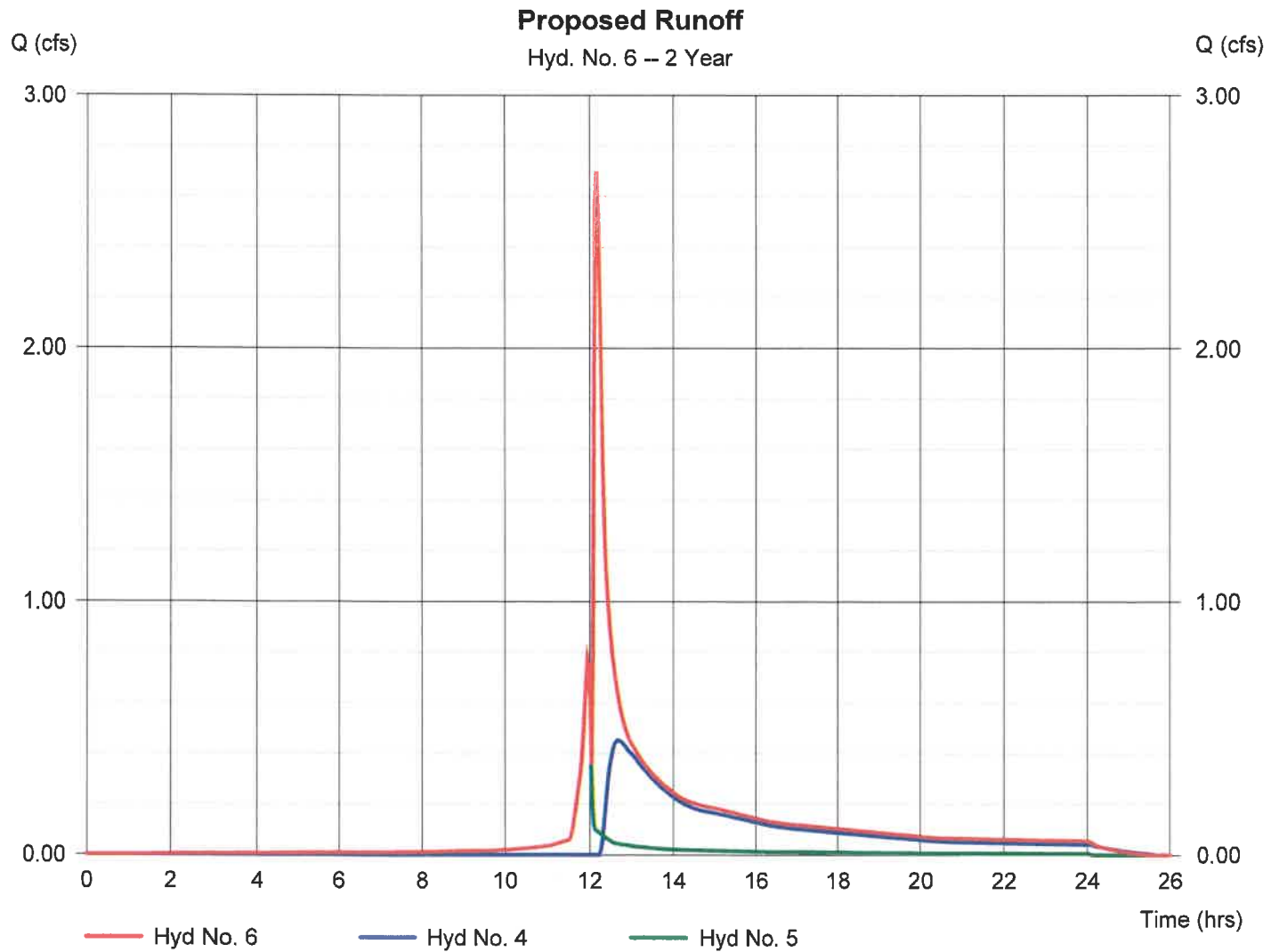
Wednesday, 07 / 31 / 2019

Hyd. No. 6

Proposed Runoff

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 4, 5

Peak discharge = 2.696 cfs
Time to peak = 12.17 hrs
Hyd. volume = 9,843 cuft
Contrib. drain. area = 0.160 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	9.501	2	720	26,280	-----	-----	-----	Previously Approved Flows
3	SCS Runoff	9.768	2	720	25,610	-----	-----	-----	Proposed Routed Area
4	Reservoir	5.749	2	728	17,275	3	105.32	10,417	Routed
5	SCS Runoff	1.199	2	716	2,871	-----	-----	-----	A-9
6	Combine	8.716	2	724	22,908	4, 5	-----	-----	Proposed Runoff
2019, 5-10, Hydrographs.gpw					Return Period: 10 Year			Wednesday, 07 / 31 / 2019	

Hydrograph Report

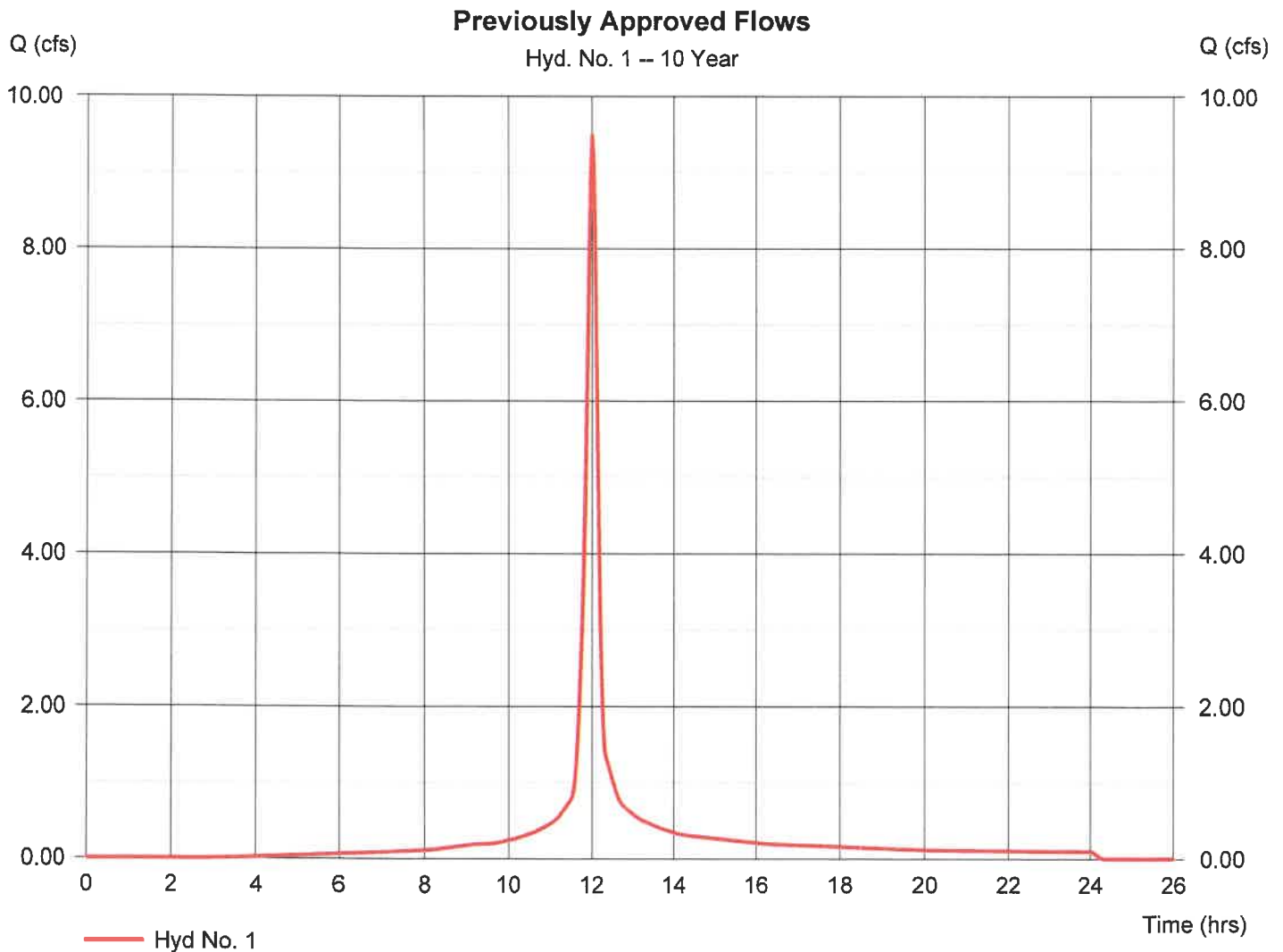
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Wednesday, 07 / 31 / 2019

Hyd. No. 1

Previously Approved Flows

Hydrograph type	= SCS Runoff	Peak discharge	= 9.501 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 26,280 cuft
Drainage area	= 1.530 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.51 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

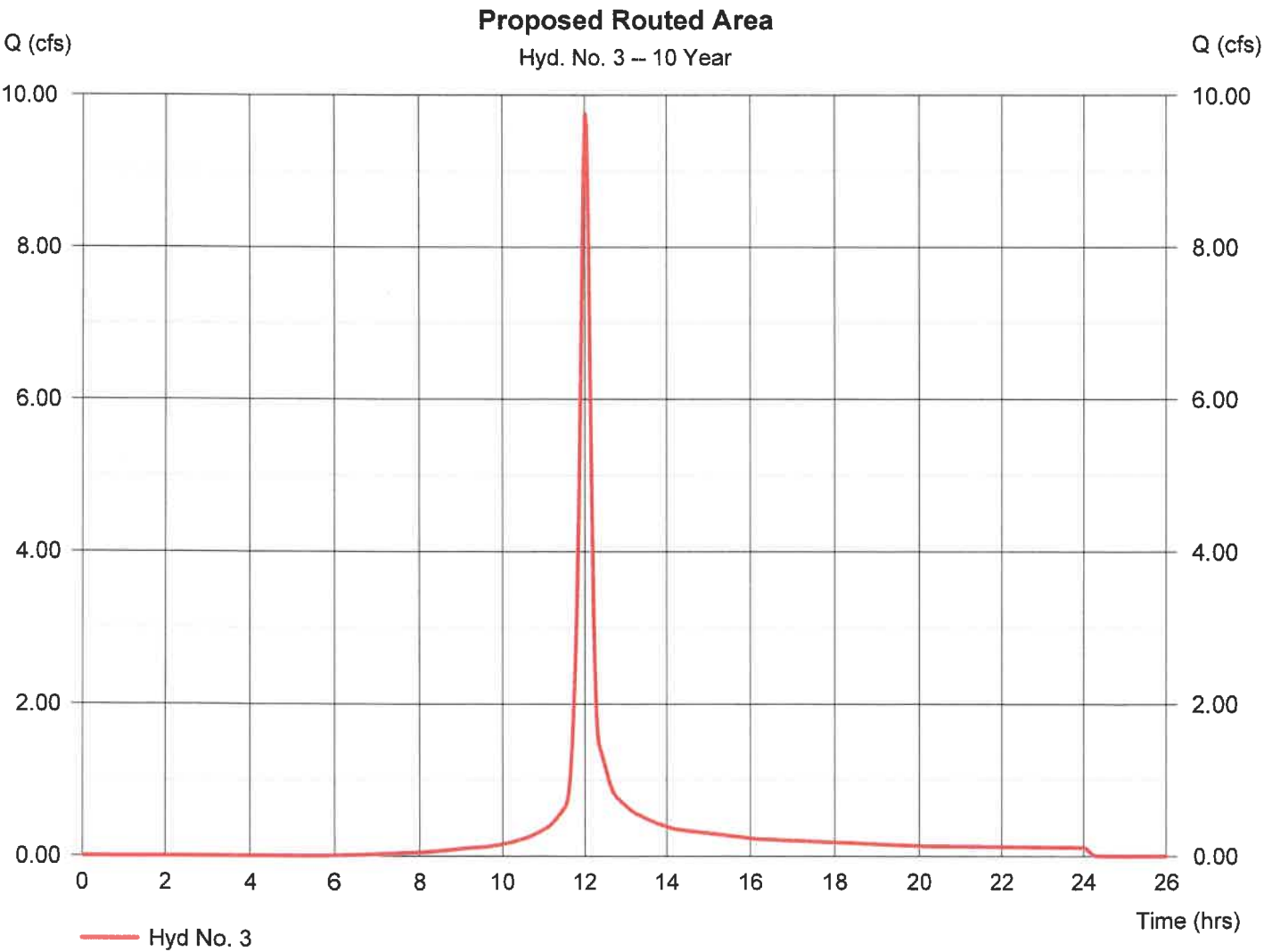
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Wednesday, 07 / 31 / 2019

Hyd. No. 3

Proposed Routed Area

Hydrograph type	= SCS Runoff	Peak discharge	= 9.768 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 25,610 cuft
Drainage area	= 1.880 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.51 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

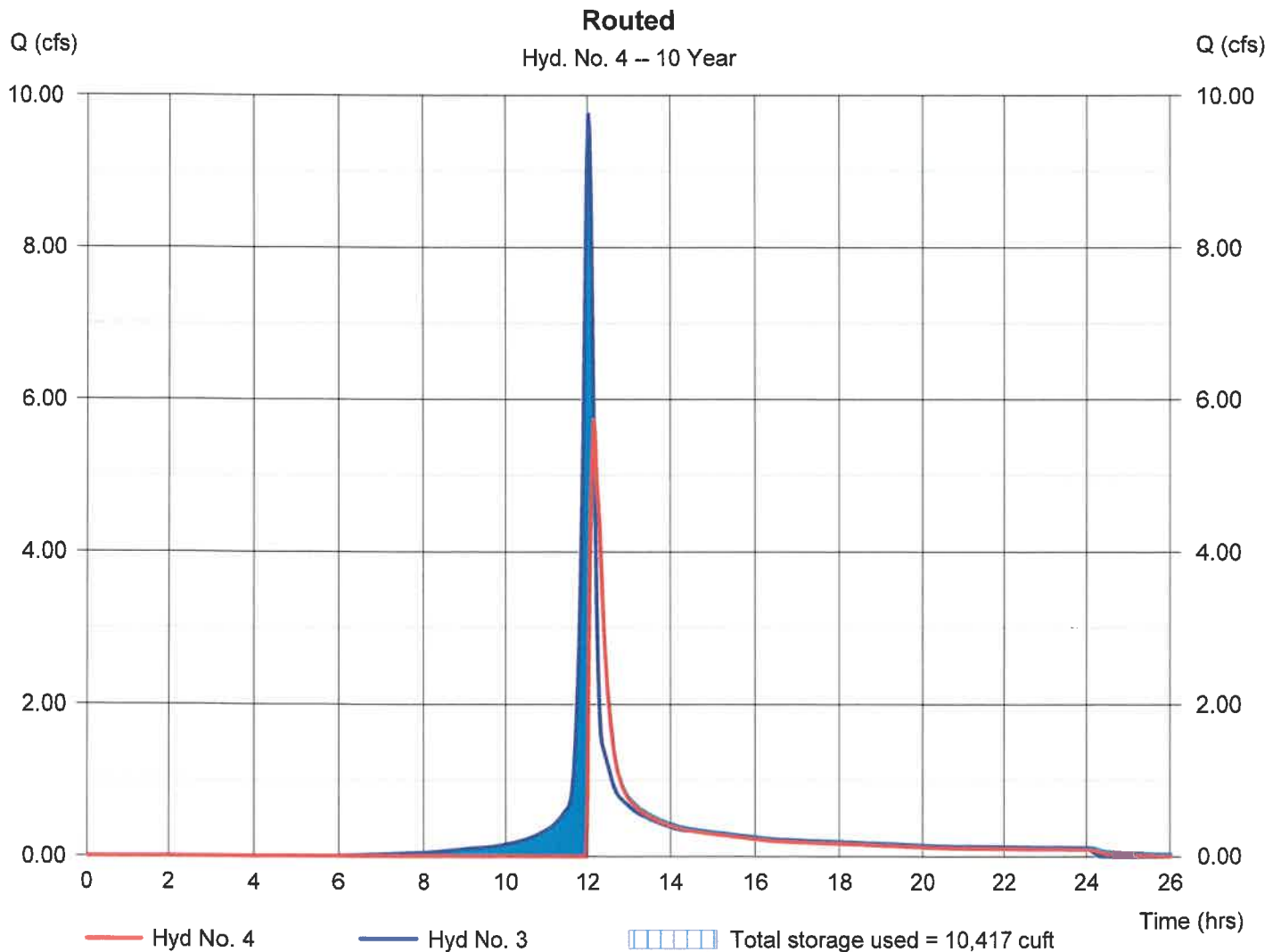
Wednesday, 07 / 31 / 2019

Hyd. No. 4

Routed

Hydrograph type	= Reservoir	Peak discharge	= 5.749 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 17,275 cuft
Inflow hyd. No.	= 3 - Proposed Routed Area	Max. Elevation	= 105.32 ft
Reservoir name	= Infiltration Trench	Max. Storage	= 10,417 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

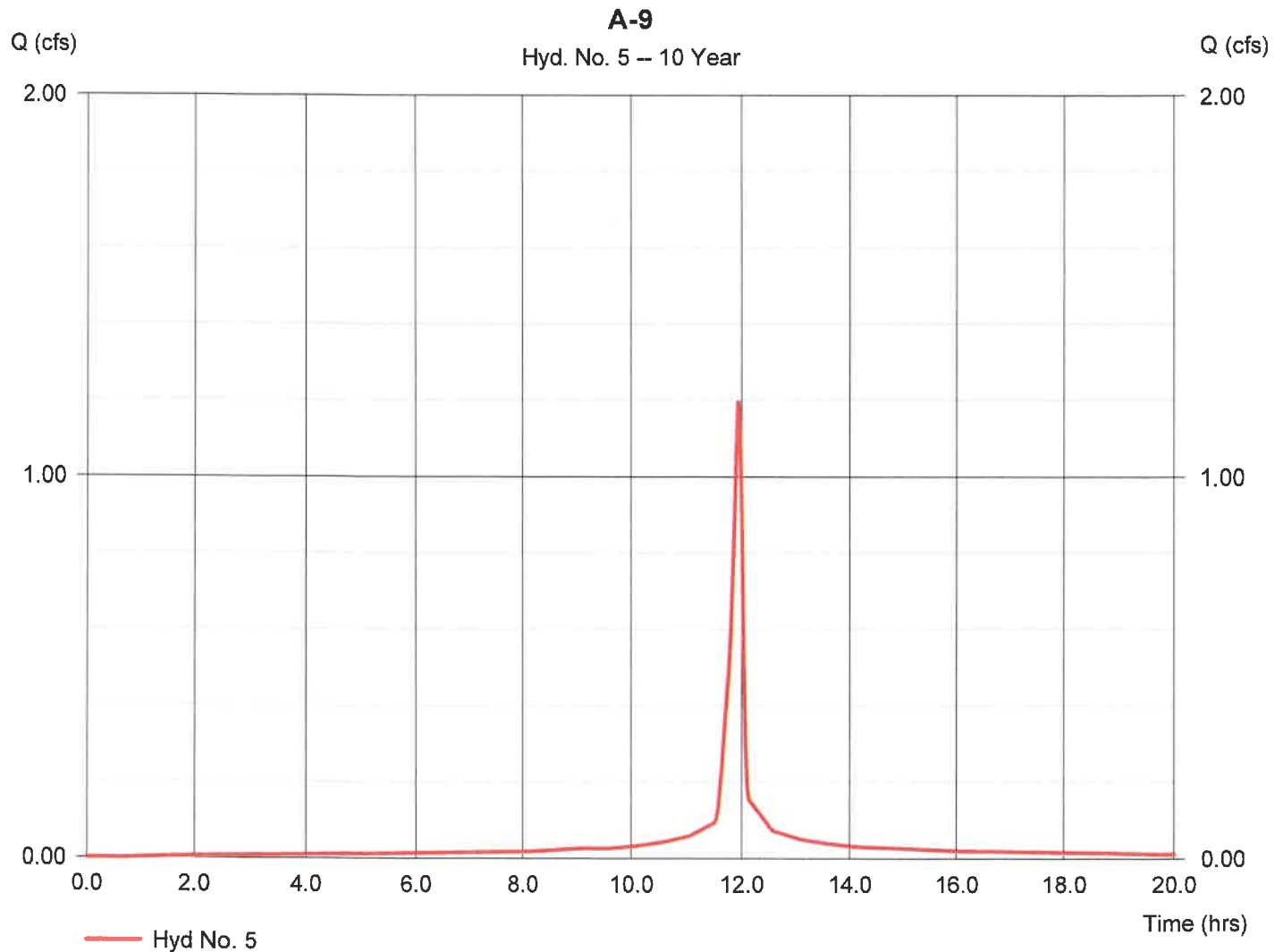
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Wednesday, 07 / 31 / 2019

Hyd. No. 5

A-9

Hydrograph type	= SCS Runoff	Peak discharge	= 1.199 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 2,871 cuft
Drainage area	= 0.160 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.51 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

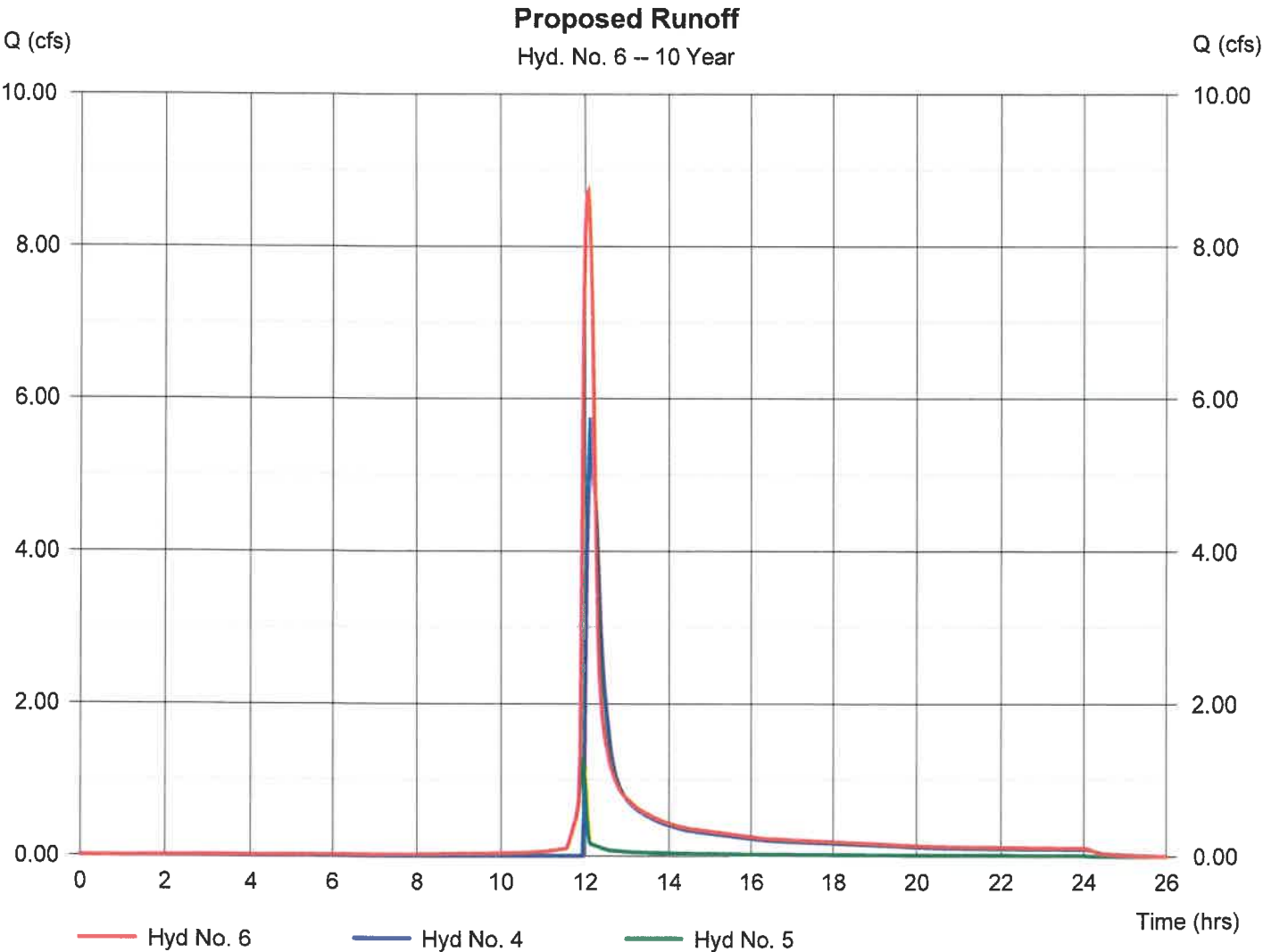
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Wednesday, 07 / 31 / 2019

Hyd. No. 6

Proposed Runoff

Hydrograph type	= Combine	Peak discharge	= 8.716 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 22,908 cuft
Inflow hyds.	= 4, 5	Contrib. drain. area	= 0.160 ac



Hydraflow Table of Contents

2019, 5-10, Hydrographs(100Year).gpw

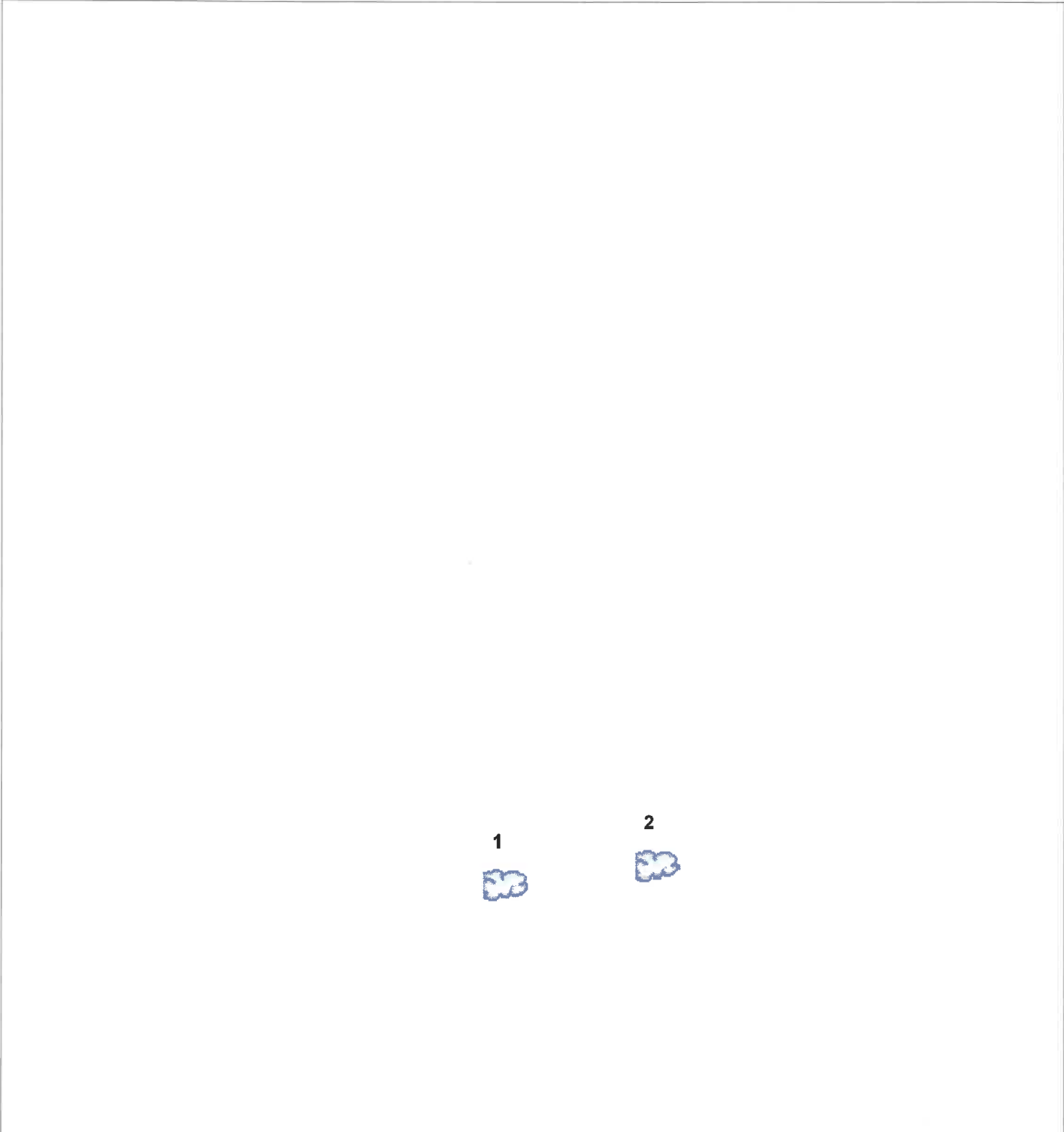
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 05 / 10 / 2019

- Watershed Model Schematic..... 1**
- Hydrograph Return Period Recap..... 2**
- 100 - Year**
 - Summary Report..... 3**
 - Hydrograph Reports..... 4**
 - Hydrograph No. 1, SCS Runoff, Previously Approved Flows..... 4
 - Hydrograph No. 2, SCS Runoff, Proposed Flows..... 5
- IDF Report..... 6**

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020



Legend

<u>Hyd.</u>	<u>Origin</u>	<u>Description</u>
1	SCS Runoff	Previously Approved Flows
2	SCS Runoff	Proposed Flows

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	16.56	2	720	47,381	-----	-----	-----	Previously Approved Flows
2	SCS Runoff	20.26	2	720	54,738	-----	-----	-----	Proposed Flows
2019, 5-10, Hydrographs(100Year).gpw					Return Period: 100 Year			Friday, 05 / 10 / 2019	

Hydrograph Report

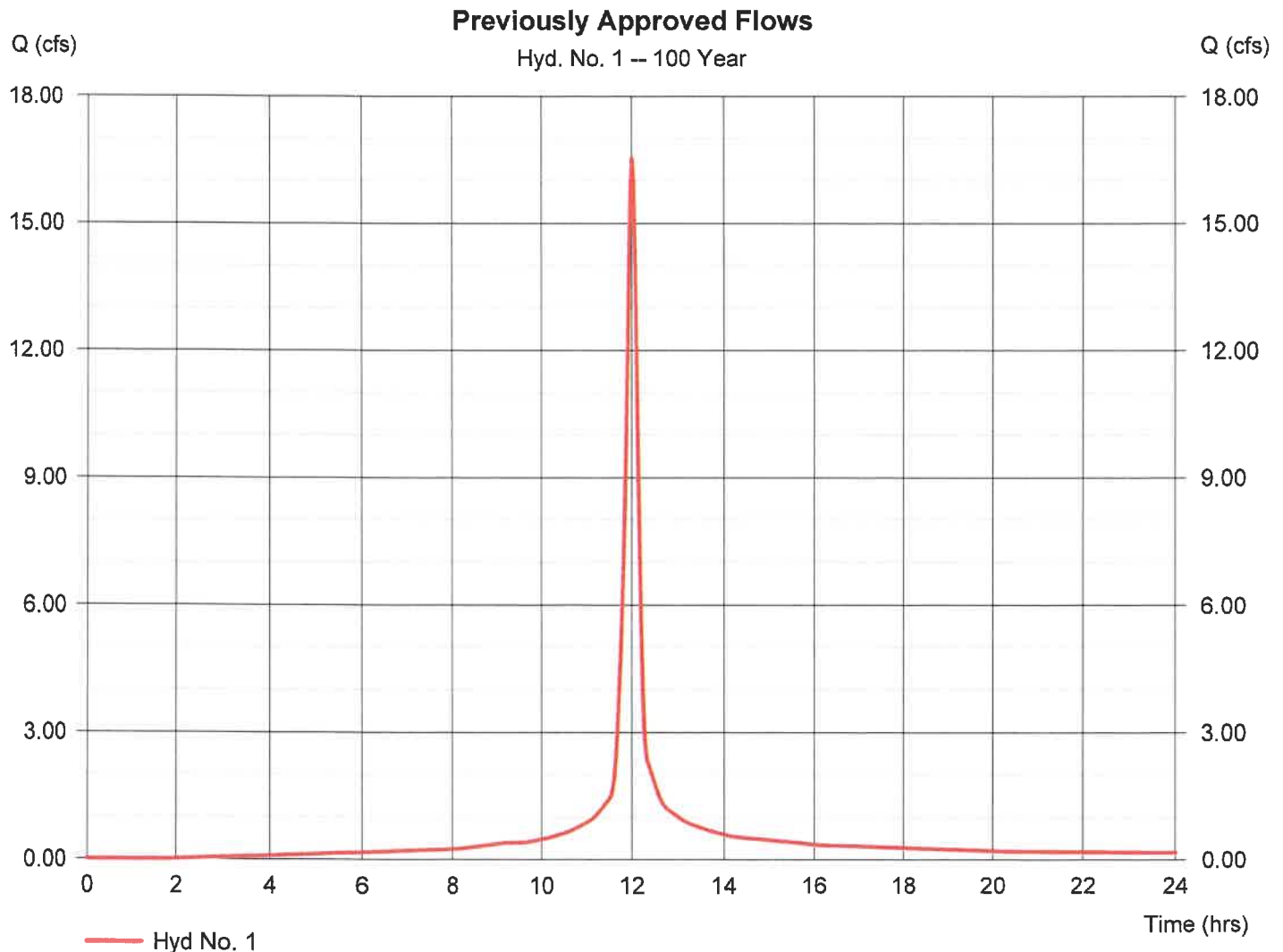
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 05 / 10 / 2019

Hyd. No. 1

Previously Approved Flows

Hydrograph type	= SCS Runoff	Peak discharge	= 16.56 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 47,381 cuft
Drainage area	= 1.530 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 9.24 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

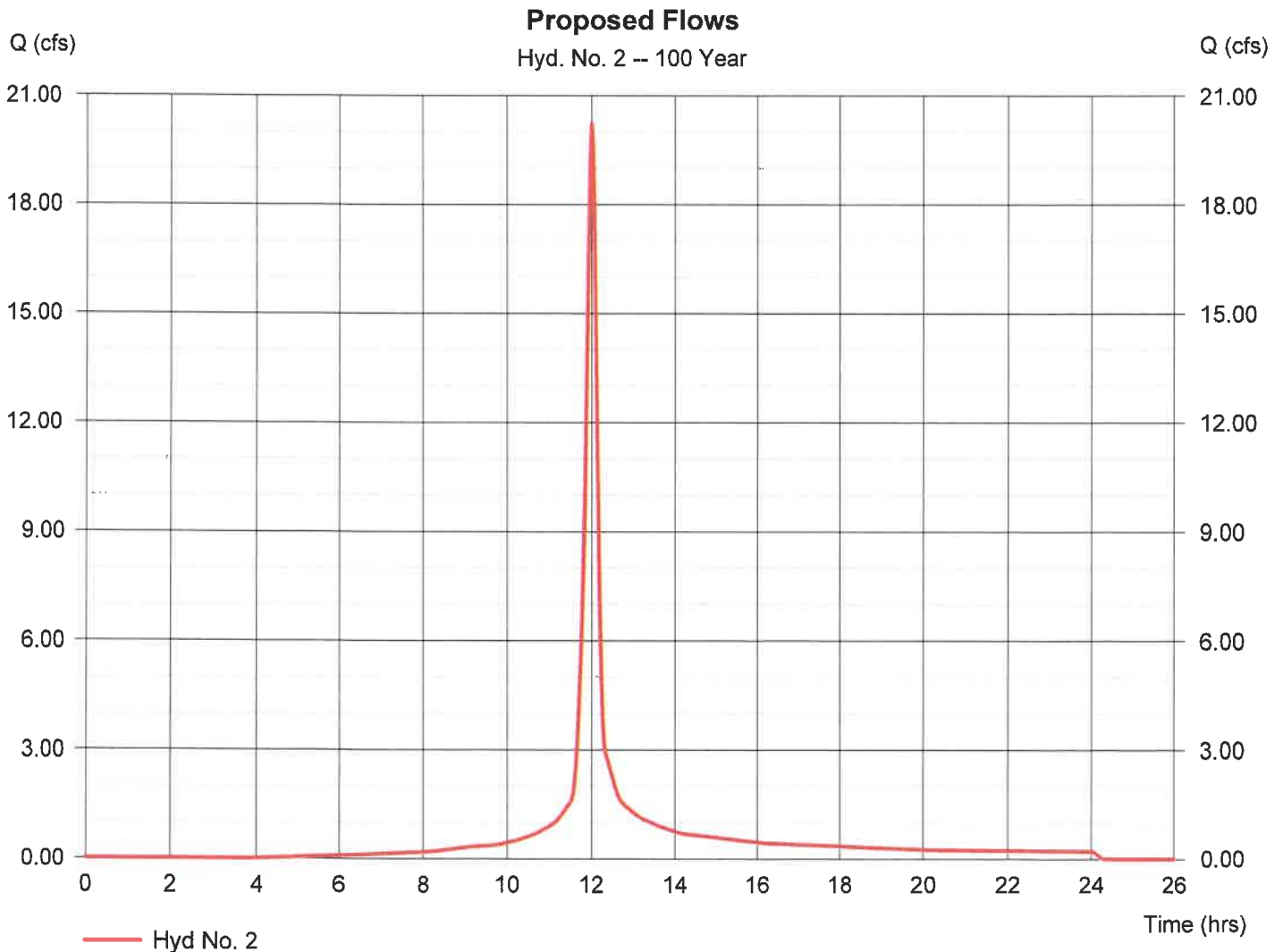
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 05 / 10 / 2019

Hyd. No. 2

Proposed Flows

Hydrograph type	= SCS Runoff	Peak discharge	= 20.26 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 54,738 cuft
Drainage area	= 2.040 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 9.24 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



3. VRRM SPREADSHEET

2011 BMP Standards and Specifications

2013 Draft BMP Standards and Specifications

Project Name: Ironbound Self-Storage

Date: 5/13/2019

BMP Design Specifications List: 2011 Stds & Specs

CLEAR ALL

(Ctrl+Shift+R)

data input cells

constant values

calculation cells

final results

Site Information

Post-Development Project (Treatment Volume and Loads)

Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) – undisturbed, protected forest/open space or reforested land					0.00
Managed Turf (acres) – disturbed, graded for yards or other turf to be mowed/managed		0.86			0.86
Impervious Cover (acres)		1.32			1.32
					2.18

Constants

Annual Rainfall (inches)	43
Target Rainfall Event (inches)	1.00
Total Phosphorus (TP) EMC (mg/L)	0.26
Total Nitrogen (TN) EMC (mg/L)	1.86
Target TP Load (lb/acre/yr)	0.41
Pj (unitless correction factor)	0.90

Runoff Coefficients (Rv)

	A Soils	B Soils	C Soils	D Soils
Forest/Open Space	0.02	0.03	0.04	0.05
Managed Turf	0.15	0.20	0.22	0.25
Impervious Cover	0.95	0.95	0.95	0.95

Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)

2.36

LAND COVER SUMMARY – POST DEVELOPMENT

Land Cover Summary		Treatment Volume and Nutrient Loads	
Forest/Open Space Cover (acres)	0.00	Treatment Volume (acre-ft)	0.1188
Weighted Rv (forest)	0.00	Treatment Volume (cubic feet)	5.176
% Forest	0%	TP Load (lb/yr)	3.25
Managed Turf Cover (acres)	0.86	TN Load (lb/yr)	23.27
Weighted Rv (turf)	0.20	(Informational Purposes Only)	
% Managed Turf	39%		
Impervious Cover (acres)	1.32		
Rv (impervious)	0.95		
% Impervious	61%		
Site Area (acres)	2.18		
Site Rv	0.65		

Drainage Area A

Drainage Area A Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)					0.00	0.00
Managed Turf (acres)		0.86			0.86	0.20
Impervious Cover (acres)		1.32			1.32	0.95
Total					2.18	

CLEAR BMP AREAS

Total Phosphorus Available for Removal in D.A. A (lb/yr)	3.25
Post Development Treatment Volume in D.A. A (ft ³)	5,176

Stormwater Best Management Practices (RR = Runoff Reduction)

--Select from dropdown lists--

Practice	Runoff Reduction Credit (%)	Managed Turf Credit Area (acres)	Impervious Cover Credit Area (acres)	Volume from Upstream Practice (ft ³)	Runoff Reduction (ft ³)	Remaining Runoff Volume (ft ³)	Total BMP Treatment Volume (ft ³)	Phosphorus Removal Efficiency (%)	Phosphorus Load from Upstream Practices (lb)	Untreated Phosphorus Load to Practice (lb)	Phosphorus Removed By Practice (lb)	Remaining Phosphorus Load (lb)	Downstream Practice to be Employed
1. Vegetated Roof (RR)													
1.a. Vegetated Roof #1 (Spec #5)	45			0	0	0	0	0	0.00	0.00	0.00	0.00	
1.b. Vegetated Roof #2 (Spec #5)	60			0	0	0	0	0	0.00	0.00	0.00	0.00	
2. Rooftop Disconnection (RR)													
2.a. Simple Disconnection to A/B Soils (Spec #1)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.b. Simple Disconnection to C/D Soils (Spec #1)	25			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.c. To Soil Amended Filter Path as per specifications (existing C/D soils) (Spec #4)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.d. To Dry Well or French Drain #1, Micro-Infiltration #1 (Spec #8)	50			0	0	0	0	25	0.00	0.00	0.00	0.00	
2.e. To Dry Well or French Drain #2, Micro-Infiltration #2 (Spec #8)	90			0	0	0	0	25	0.00	0.00	0.00	0.00	
2.f. To Rain Garden #1, Micro-Bioretenention #1 (Spec #9)	40			0	0	0	0	25	0.00	0.00	0.00	0.00	
2.g. To Rain Garden #2, Micro-Bioretenention #2 (Spec #9)	80			0	0	0	0	50	0.00	0.00	0.00	0.00	
2.h. To Rainwater Harvesting (Spec #6)	0			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.i. To Stormwater Planter, Urban Bioretention (Spec #9, Appendix A)	40			0	0	0	0	25	0.00	0.00	0.00	0.00	
3. Permeable Pavement (RR)													
3.a. Permeable Pavement #1 (Spec #7)	45			0	0	0	0	25	0.00	0.00	0.00	0.00	
3.b. Permeable Pavement #2 (Spec #7)	75			0	0	0	0	25	0.00	0.00	0.00	0.00	
4. Grass Channel (RR)													
4.a. Grass Channel A/B Soils (Spec #3)	20			0	0	0	0	15	0.00	0.00	0.00	0.00	
4.b. Grass Channel C/D Soils (Spec #3)	10			0	0	0	0	15	0.00	0.00	0.00	0.00	
4.c. Grass Channel with Compost Amended Soils as per specs (see Spec #4)	30			0	0	0	0	15	0.00	0.00	0.00	0.00	
5. Dry Swale (RR)													
5.a. Dry Swale #1 (Spec #10)	40			0	0	0	0	20	0.00	0.00	0.00	0.00	
5.b. Dry Swale #2 (Spec #10)	60			0	0	0	0	40	0.00	0.00	0.00	0.00	

Nitrogen Removal Efficiency (%)	Nitrogen Load from Upstream Practices (lbs)	Untreated Nitrogen Load to Practice (lbs)	Nitrogen Removed By Practice (lbs)	Remaining Nitrogen Load (lbs)
1. Vegetated Roof (RR)				
0		0.00	0.00	0.00
0		0.00	0.00	0.00
2. Rooftop Disconnection (RR)				
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00
60	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00
3. Permeable Pavement (RR)				
25	0.00	0.00	0.00	0.00
25		0.00	0.00	0.00
4. Grass Channel (RR)				
20	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00
5. Dry Swale (RR)				
25	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.00

6. Bioretention (RR)													
6.a. Bioretention #1 or Micro-Bioretention #1 or Urban Bioretention (Spec #9)	40			0	0	0	0	25	0.00	0.00	0.00	0.00	
6.b. Bioretention #2 or Micro-Bioretention #2 (Spec #9)	80			0	0	0	0	50	0.00	0.00	0.00	0.00	
7. Infiltration (RR)													
7.a. Infiltration #1 (Spec #8)	50	0.73	1.17	0	2,282	2,282	4,565	25	0.00	2.86	1.79	1.07	14.b. MTD - Filtering
7.b. Infiltration #2 (Spec #8)	90			0	0	0	0	25	0.00	0.00	0.00	0.00	
8. Extended Detention Pond (RR)													
8.a. ED #1 (Spec #15)	0			0	0	0	0	15	0.00	0.00	0.00	0.00	
8.b. ED #2 (Spec #15)	15			0	0	0	0	15	0.00	0.00	0.00	0.00	
9. Sheetflow to Filter/Open Space (RR)													
9.a. Sheetflow to Conservation Area, A/B Soils (Spec #2)	75			0	0	0	0	0	0.00	0.00	0.00	0.00	
9.b. Sheetflow to Conservation Area, C/D Soils (Spec #2)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	
9.c. Sheetflow to Vegetated Filter Strip, A Soils or Compost Amended B/C/D Soils (Spec #2 & #4)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	

TOTAL IMPERVIOUS COVER TREATED (ac)	1.17	AREA CHECK: OK.
TOTAL MANAGED TURF AREA TREATED (ac)	0.73	AREA CHECK: OK.
TOTAL RUNOFF REDUCTION IN D.A. A (ft ³)	2,282	
TOTAL PHOSPHORUS AVAILABLE FOR REMOVAL IN D.A. A (lb/yr)	3.25	
TOTAL PHOSPHORUS REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	1.79	
TOTAL PHOSPHORUS REMAINING AFTER APPLYING RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	1.46	
SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS		

6. Bioretention (RR)				
40	0.00	0.00	0.00	0.00
60	0.00	0.00	0.00	0.00
7. Infiltration (RR)				
15	0.00	20.49	11.78	8.71
15	0.00	0.00	0.00	0.00
8. Extended Detention Pond (RR)				
10	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00
9. Sheetflow to Filter/Open Space (RR)				
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00

TOTAL RUNOFF REDUCTION IN D.A. A (ft ³)	2,282
NITROGEN REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	11.78
SEE WATER QUALITY COMPLIANCE TAB FOR SITE CALCULATIONS (Information Only)	

10. Wet Swale (no RR)													
10.a. Wet Swale #1 (Spec #11)	0			0	0	0	0	20	0.00	0.00	0.00	0.00	
10.b. Wet Swale #2 (Spec #11)	0			0	0	0	0	40	0.00	0.00	0.00	0.00	
11. Filtering Practices (no RR)													
11.a. Filtering Practice #1 (Spec #12)	0			0	0	0	0	60	0.00	0.00	0.00	0.00	
11.b. Filtering Practice #2 (Spec #12)	0			0	0	0	0	65	0.00	0.00	0.00	0.00	
12. Constructed Wetland (no RR)													
12.a. Constructed Wetland #1 (Spec #13)	0			0	0	0	0	50	0.00	0.00	0.00	0.00	
12.b. Constructed Wetland #2 (Spec #13)	0			0	0	0	0	75	0.00	0.00	0.00	0.00	
13. Wet Ponds (no RR)													
13.a. Wet Pond #1 (Spec #14)	0			0	0	0	0	50	0.00	0.00	0.00	0.00	
13.b. Wet Pond #1 (Coastal Plain) (Spec #14)	0			0	0	0	0	45	0.00	0.00	0.00	0.00	
13.c. Wet Pond #2 (Spec #14)	0			0	0	0	0	75	0.00	0.00	0.00	0.00	
13.d. Wet Pond #2 (Coastal Plain) (Spec #14)	0			0	0	0	0	65	0.00	0.00	0.00	0.00	
14. Manufactured Treatment Devices (no RR)													
14.a. Manufactured Treatment Device-Hydrodynamic	0			0	0	0	0	20	0.00	0.00	0.00	0.00	
14.b. Manufactured Treatment Device-Filtering	0	0.05	0.12	2,282	0	2,732	2,732	50	1.07	0.28	0.68	0.68	

10. Wet Swale (Coastal Plain) (no RR)				
25	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.00
11. Filtering Practices (no RR)				
30	0.00	0.00	0.00	0.00
45	0.00	0.00	0.00	0.00
12. Constructed Wetland (no RR)				
25	0.00	0.00	0.00	0.00
55	0.00	0.00	0.00	0.00
13. Wet Ponds (no RR)				
30	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00
14. Manufactured BMP (no RR)				
0	0.00	0.00	0.00	0.00
0	8.71	2.02	0.00	10.73

14.c. Manufactured Treatment Device-Generic	0			0	0	0	0	20	0.00	0.00	0.00	0.00	
---	---	--	--	---	---	---	---	----	------	------	------	------	--

0	0.00	0.00	0.00	0.00
---	------	------	------	------

TOTAL IMPERVIOUS COVER TREATED (ac)

1.29

AREA CHECK: OK.

TOTAL MANAGED TURF AREA TREATED (ac)

0.78

AREA CHECK: OK.

TOTAL PHOSPHORUS REMOVAL REQUIRED ON SITE (lb/yr)

2.36

TOTAL PHOSPHORUS AVAILABLE FOR REMOVAL IN D.A. A (lb/yr)

3.25

TOTAL PHOSPHORUS REMOVED WITHOUT RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)

0.68

TOTAL PHOSPHORUS REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)

1.79

TOTAL PHOSPHORUS LOAD REDUCTION ACHIEVED IN D.A. A (lb/yr)

2.47

TOTAL PHOSPHORUS REMAINING AFTER APPLYING BMP LOAD REDUCTIONS IN D.A. A (lb/yr)

0.78

SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS

NITROGEN REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)

11.78

NITROGEN REMOVED WITHOUT RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)

0.00

TOTAL NITROGEN REMOVED IN D.A. A (lb/yr)

11.78

Site Results (Water Quality Compliance)

Area Checks	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	Area Check
FOREST/OPEN SPACE (in)	0.00	0.00	0.00	0.00	0.00	OK
IMPERVIOUS COVER (in)	1.32	0.00	0.00	0.00	0.00	OK
IMPERVIOUS COVER TREATED (in)	1.29	0.00	0.00	0.00	0.00	OK
MANAGED TURF AREA (in)	0.85	0.00	0.00	0.00	0.00	OK
MANAGED TURF AREA TREATED (in)	0.78	0.00	0.00	0.00	0.00	OK
AREA CHECK	OK	OK	OK	OK	OK	

Site Treatment Volume (ft³)

0

Runoff Reduction Volume and TP By Drainage Area

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	TOTAL
RUNOFF REDUCTION VOLUME ACHIEVED (in)	2,282	0	0	0	0	2,282
TP LOAD AVAILABLE FOR REMOVAL (lb/yr)	3.25	0.00	0.00	0.00	0.00	3.25
TP LOAD REDUCTION ACHIEVED (lb/yr)	2.47	0.00	0.00	0.00	0.00	2.47
TP LOAD REMAINING (lb/yr)	0.78	0.00	0.00	0.00	0.00	0.78
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	11.78	0.00	0.00	0.00	0.00	11.78

Total Phosphorus

FINAL POST-DEVELOPMENT TP LOAD (lb/yr)	3.25
TP LOAD REDUCTION REQUIRED (lb/yr)	2.47
TP LOAD REDUCTION ACHIEVED (lb/yr)	2.47
TP LOAD REMAINING (lb/yr)	0.78
REMAINING TP LOAD REDUCTION REQUIRED (lb/yr)	0.00

** TARGET TP REDUCTION EXCEEDED BY 0.11 LB/YEAR **

Total Nitrogen (For Information Purposes)

POST-DEVELOPMENT LOAD (lb/yr)	23.27
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	11.78
REMAINING POST-DEVELOPMENT NITROGEN LOAD (lb/yr)	11.49

Runoff Volume and Curve Number Calculations

Enter design storm rainfall depths (in):

1-year storm	2-year storm	10-year storm
2.94	3.37	4.31

Use NOAA Atlas 14 (<http://hdsc.nws.noaa.gov/hdsc/atlas14/>)

Notes (see below):

- The curve numbers and runoff volumes computed in this spreadsheet for each drainage area are limited in their applicability for determining and demonstrating compliance with water quantity requirements. See VROM User's Guide and Documentation for additional information.
- Runoff Volume (RV) for pre- and post-development drainage areas must be in volumetric units (e.g., acre-feet or cubic feet) when using the Energy Balance Equation. Runoff measured in watershed-inches and shown in this spreadsheet as RV_{watershed-inch} can only be used in the Energy Balance Equation when the pre- and post-development drainage areas are equal. Otherwise RV_{watershed-inch} must be multiplied by the drainage area.
- Adjusted CNs are based on runoff reduction volumes as calculated in D.A. tabs. An alternative CN adjustment calculation for Vegetated Roofs is included in BMP specification No. 5.

Drainage Area Curve Numbers and Runoff Depths *

Curve numbers (CN, C_{adj}) and runoff depths (RV_{depths}) are computed with and without reduction practices.

Drainage Area A		A Soils	B Soils	C Soils	D Soils	Total Area (acres): 2.18
Forest/Open Space - undisturbed, protected	Area (acres):	0.00	0.00	0.00	0.00	Runoff Reduction Volume (ft ³): 2,282
Turf/Open Space or reforested land	CN	30	55	73	77	
Managed Turf - disturbed, graded for yards or other turf to be mowed/managed	Area (acres):	0.00	0.00	0.00	0.00	
	CN	39	61	74	80	
Impervious Cover	Area (acres):	0.00	1.92	0.00	0.00	
	CN	98	98	98	98	
		CN _{adj} (D.A.)				
		83				
		1-year storm	2-year storm	10-year storm		
RV _{Developed} (watershed-inch) with no Runoff Reduction ¹		1.40	1.92	3.64		
RV _{Developed} (watershed-inch) with Runoff Reduction ²		1.11	1.63	3.35		
Adjusted CN ³		78	79	80		

*See Notes above

Drainage Area B		A Soils	B Soils	C Soils	D Soils	Total Area (acres):	0.00
Forest/Open Space - undisturbed, protected forest/open space or reforested land	Area (acres):	0.00	0.00	0.00	0.00	Runoff Reduction Volume (ft ³):	0
	CN	30	55	70	77		
Managed Turf - disturbed, graded for yards or other turf to be mowed/managed	Area (acres):	0.00	0.00	0.00	0.00		
	CN	39	61	74	80		
Impervious Cover	Area (acres):	0.00	0.00	0.00	0.00		
	CN	98	98	98	98		
		CN (D.A. B)					
		0					
		1-year storm	2-year storm	10-year storm			
RV _{Developed} (watershed-inch) with no Runoff Reduction ¹		0.00	0.00	0.00			
RV _{Developed} (watershed-inch) with Runoff Reduction ²		0.00	0.00	0.00			
Adjusted CN ³		0	0	0			

*See Notes above

Drainage Area C		A Soils	B Soils	C Soils	D Soils	Total Area (acres):	0.00
Forest/Open Space - undisturbed, protected forest/open space or reforested land	Area (acres)	0.00	0.00	0.00	0.00	Runoff Reduction Volume (ft ³):	0
	CN	30	55	73	77		
Managed Turf - disturbed, graded for yards or other turf to be mowed/managed	Area (acres)	0.00	0.00	0.00	0.00		
	CN	39	61	74	80		
Impervious Cover	Area (acres)	0.00	0.00	0.00	0.00		
	CN	98	98	98	98		
		CN _{adj} (C)					
		0					
		1-year storm	2-year storm	10-year storm			
RV _{Developed} (watershed-inch) with no Runoff Reduction ¹		0.00	0.00	0.00			
RV _{Developed} (watershed-inch) with Runoff Reduction ²		0.00	0.00	0.00			
Adjusted CN ³		0	0	0			

*See Notes above

Drainage Area D		A Soils	B Soils	C Soils	D Soils	Total Area (acres):	0.00
Forest/Open Space – undisturbed, protected forest/open space or reforested land	Area (acres):	0.00	0.00	0.00	0.00	Runoff Reduction Volume (ft ³):	0
	CN	30	55	73	77		
Managed Turf – disturbed, graded for yards or other turf to be mowed/maintained	Area (acres):	0.00	0.00	0.00	0.00		
	CN	39	61	74	80		
Impervious Cover	Area (acres):	0.00	0.00	0.00	0.00		
	CN	98	98	98	98		
		CN _{adj} (D)					
		0					
		1-year storm	2-year storm	10-year storm			
RV _{Developed} (watershed-inch) with no Runoff Reduction ¹		0.00	0.00	0.00			
RV _{Developed} (watershed-inch) with Runoff Reduction ²		0.00	0.00	0.00			
Adjusted CN ³		0	0	0			
*See Notes above							

*See Notes above

Forest/Open Space – undisturbed, protected forest/open space or reforested land		Area (acres)	A Soils	B Soils	C Soils	D Soils	Total Area (acres):	Runoff Reduction Volume (ft ³):
		CN	30	55	73	77		0
Managed Turf – disturbed, graded for yards or other turf to be mowed/managed		Area (acres)	0.00	0.00	0.00	0.00		
		CN	39	61	74	80		
Impervious Cover:		Area (acres)	0.00	0.00	0.00	0.00		
		CN	98	98	98	98		
							CN _{adj} (E)	
							0	
			1-year storm	2-year storm	10-year storm			
RV _{Developed} (watershed-inch) with no Runoff Reduction ¹			0.00	0.00	0.00			
RV _{Developed} (watershed-inch) with Runoff Reduction ²			0.00	0.00	0.00			
Adjusted CN ³			0	0	0			

¹See Notes below

*See Notes above

DEQ Virginia Runoff Reduction Method New Development Compliance Spreadsheet - Version 3.0

BMP Design Specifications List: 2011 Stds & Specs

Site Summary

Total Rainfall = 43 inches

Site Land Cover Summary

	A soils	B Soils	C Soils	D Soils	Totals	% of Total
Forest/Open (acres)	0.00	0.00	0.00	0.00	0.00	0
Managed Turf (acres)	0.00	0.86	0.00	0.00	0.86	39
Impervious Cover (acres)	0.00	1.32	0.00	0.00	1.32	61
					2.18	100

Site Tv and Land Cover Nutrient Loads

Site Rv	0.65
Treatment Volume (ft ³)	5,176
TP Load (lb/yr)	3.25
TN Load (lb/yr)	23.27

Total TP Load Reduction Required (lb/yr)	2.36
--	------

Site Compliance Summary

Total Runoff Volume Reduction (ft ³)	2,282
Total TP Load Reduction Achieved (lb/yr)	2.47
Total TN Load Reduction Achieved (lb/yr)	11.78
Remaining Post Development TP Load (lb/yr)	0.78
Remaining TP Load Reduction (lb/yr) Required	0.00

** TARGET TP REDUCTION EXCEEDED BY 0.11 LB/YEAR **

Drainage Area Summary

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	Total
Forest/Open (acres)	0.00	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres)	0.86	0.00	0.00	0.00	0.00	0.86
Impervious Cover (acres)	1.32	0.00	0.00	0.00	0.00	1.32
Total Area (acres)	2.18	0.00	0.00	0.00	0.00	2.18

Drainage Area Compliance Summary

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	Total
TP Load Reduced (lb/yr)	2.47	0.00	0.00	0.00	0.00	2.47
TN Load Reduced (lb/yr)	11.78	0.00	0.00	0.00	0.00	11.78

Drainage Area A Summary

Land Cover Summary

	A Soils	B Soils	C Soils	D Soils	Total	% of Total
Forest/Open (acres)	0.00	0.00	0.00	0.00	0.00	0
Managed Turf (acres)	0.00	0.86	0.00	0.00	0.86	39
Impervious Cover (acres)	0.00	1.32	0.00	0.00	1.32	61
					2.18	

BMP Selections

Practice	Managed Turf Credit Area (acres)	Impervious Cover Credit Area (acres)	BMP Treatment Volume (ft ³)	TP Load from Upstream Practices (lbs)	Untreated TP Load to Practice (lbs)	TP Removed (lb/yr)	TP Remaining (lb/yr)	Downstream Treatment to be Employed
7.a. Infiltration #1 (Spec #8)	0.73	1.17	4,564.73	0.00	2.86	1.79	1.07	14.b. MTD - Filtering
14.b. Manufactured Treatment Device- Filtering	0.05	0.12	2,732.48	1.07	0.28	0.68	0.68	

Total Impervious Cover Treated (acres)	1.29
Total Turf Area Treated (acres)	0.78
Total TP Load Reduction Achieved in D.A. (lb/yr)	2.47
Total TN Load Reduction Achieved in D.A. (lb/yr)	11.78

Runoff Volume and CN Calculations

	1-year storm	2-year storm	10-year storm
Target Rainfall Event (in)	2.94	3.57	5.51

Drainage Areas	RV & CN	Drainage Area A	Drainage Area B	Drainage Area C	Drainage Area D	Drainage Area E
CN		83	0	0	0	0
RR (ft ³)		2,282	0	0	0	0
1-year return period	RV wo RR (ws-in)	1.40	0.00	0.00	0.00	0.00
	RV w RR (ws-in)	1.11	0.00	0.00	0.00	0.00
	CN adjusted	78	0	0	0	0
2-year return period	RV wo RR (ws-in)	1.92	0.00	0.00	0.00	0.00
	RV w RR (ws-in)	1.63	0.00	0.00	0.00	0.00
	CN adjusted	79	0	0	0	0
10-year return period	RV wo RR (ws-in)	3.64	0.00	0.00	0.00	0.00
	RV w RR (ws-in)	3.35	0.00	0.00	0.00	0.00
	CN adjusted	80	0	0	0	0

4. PIPE CALCULATIONS

Site Improvement Associates, Inc.
800 Juniper Crescent, Suite A
Chesapeake, VA 23320
(757)671-9000

Drainage Calculations
for
IRONBOUND SELF-STORAGE

Rainfall Intensity B D E
I=B/(Tc+D)^E 55.61 10.00 0.74

Yr. Storm: 10
Des. By: JNS
Chkd. By:

n(rcp)= **0.013** n(pvc)= **0.011**

SIA PROJECT NO. **16189**

FROM	TO	AREA	RUN-	C*A	ACCU.	INLET TIME		RAIN-	SY.	RUNOFF		PIPE	PIPE	PIPE	PIPE	PIPE	FLOW	ELEV.	INVERT	
		ACRES	OFF			INCR.	MINUTES	FALL		'Q' C.F.S.	ACCU.	CAPA-	DIA.	SLOPE	LGH.	VEL.	TIME	DIFF.	ELEV	UPR.
			COEF			INCR.	SYS.	IN.		INCR.		CITY	IN.	(%)	FT.	F.P.S.	MIN.	FT.		
A-1A	A-1	0.22	0.90	0.20	0.20	5.0	5.0	7.50	7.50	1.48	1.48	2.00	10	0.60	183	3.67	0.8	1.09	103.83	102.73
A-1	A-2	0.43	0.30	0.13	0.33	5.0	5.8	7.50	7.20	0.97	2.36	5.00	18	0.16	43	2.83	0.3	0.07	102.73	102.66
A-2	A-2A	0.10	0.90	0.09	0.42	5.0	6.1	7.50	7.12	0.67	2.97	5.00	18	0.16	86	2.83	0.5	0.14	102.66	102.52
A-2A	A-6	0.00	0.30	0.00	0.42	5.0	6.6	7.50	6.96	0.00	2.90	5.00	18	0.16	77	2.83	0.5	0.12	102.52	102.40
A-5	A-7	0.21	0.90	0.19	0.19	5.0	5.0	7.50	7.50	1.42	1.42	3.00	15	0.15	18	2.44	0.1	0.03	102.43	102.40
A-3A	A-3	0.23	0.90	0.21	0.21	5.0	5.1	7.50	7.45	1.55	1.54	2.00	10	0.60	119	3.67	0.5	0.71	103.51	102.80
A-3	A-4	0.18	0.30	0.05	0.26	5.0	5.7	7.50	7.26	0.40	1.89	5.00	18	0.16	150	2.83	0.9	0.24	102.80	102.56
A-4	A-8	0.11	0.30	0.03	0.29	5.0	6.5	7.50	6.97	0.25	2.05	5.00	18	0.16	96	2.83	0.6	0.16	102.56	102.40
A-8	A-9	0.00	0.30	0.00	0.29	5.0	7.1	7.50	6.80	0.00	2.00	11.75	18	0.90	24	6.65	0.1	0.22	103.72	103.50
A-9	A-10	0.16	0.80	0.13	0.13	5.0	7.2	7.50	6.78	0.96	2.87	60.50	18	23.75	5	34.24	0.0	1.19	103.50	102.31
EXISTING PIPE																				
A-10	E-1										2.87	11.35	18	0.84	200	6.42	0.5	1.67	102.31	100.64

5. SOIL REPORT



Geotechnical Engineering Services Report

Prepared for:



2929 Sabre Street, Suite 500
Virginia Beach, Virginia 23452

By:

Engineering & Testing Services, Inc.
5226 Indian River Road, Suite 103
Virginia Beach, Virginia, 23464
Telephone: 757-306-1040
Fax: 757-306-1042
www.etsva.com

January 29, 2019



ENGINEERING & TESTING SERVICES, INC.

January 29, 2019

To: Sifen, Inc.
2929 Sabre Street, Suite 500
Virginia Beach, Virginia 23452

Attn: Ms. Ashley Dickerson

Re: **Geotechnical Engineering Services Report**
Proposed Self Storage Facility
4091 Ironbound Road
James City County, Virginia
ETS Report No.: ETS-19E100-1

Dear Ms. Dickerson:

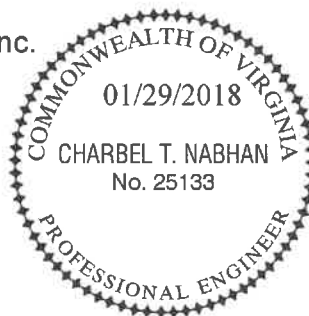
Transmitted herewith is our Geotechnical Engineering Services report for the above referenced project site. This study was authorized by Ms. Ashley Dickerson on January 2, 2019 and prepared in general accordance with ETS Proposal No.: ETS-18P312R dated January 2, 2019.

This report contains the results of our field exploration program and laboratory testing procedures along with an engineering interpretation of these data with respect to the available project characteristics, and our recommendations to aid in the design and construction of foundations and other earth related components of the project. We will store the soil samples for 30 days after which time they will be discarded, unless you request otherwise.

We appreciate the opportunity to be of service to you on this project. If we can be of further assistance, such as providing our inspection services during construction, or if you have any questions regarding this report, please contact our office at 757-306-1040.

Respectfully Submitted,
Engineering & Testing Services, Inc.

Charlie T. Nabhan, PE
Principal Geotechnical Engineer
VA License No.: 25133



Raju Acharya, PhD, PE
Geotechnical Engineer

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1.0 Purpose and Scope of Study

The purpose of this study was to determine the general subsurface conditions by drilling soil test borings and to evaluate the soil conditions with respect to the design and construction of foundations and other earth supported components of the proposed self-storage facility located at 4091 Ironbound Road in James City County, Virginia.

Also included is an evaluation of the site with respect to potential construction problems and recommendations dealing with the earthwork and quality control during construction. The recommended construction procedures are considered necessary to verify the subsurface conditions and to aid in ascertaining that the soils connected phases are properly performed.

2.0 Site and Project Characteristics

The project site is located at 4091 Ironbound Road in James City County, Virginia. At the time of our field visit, the site was clear and grass covered. Wooded areas were observed at the southern property lines along Ironbound Road. It is our understanding that the proposed development at this site will consist of building a 3-story self-storage facility and its associated pavement areas. The structure will consist of light gage system with composite deck slabs. The building relies on vertical and horizontal diaphragms for stability and over tuning moment. Based on the information available to ETS the 1st floor slab on grade will be subjected to 125 psf live loads with linear loading by a bearing wall system that is spaced at 8 to 10 feet on center. Typical interior stud reactions are 8.7 kips which are spaced at 30 inches on center. Concentrated column loads that will be carried by isolated footings are 44 kips. Based on the topographic plans developed by SIA and provided to ETS, the existing site elevations within the building area range from Elev.+107.4 to Elev.+109.1 above Mean Sea Level (MSL). At the time of this reporting, the finish floor elevations of the proposed building were not established. In this regard, for engineering analysis purposes, 18 to 24 inches of fill to be placed within the building area to establish first floor elevations was used to estimate postconstruction total and differential settlements.

If any of the proposed design information noted above is incorrect or has changed, please inform ETS so that we may amend the recommendations presented in this report, if appropriate.

3.0 Field Exploration Program

In order to explore the general subsurface soil types and to aid in geotechnical study of foundations and other earth supported components, six 20-foot deep Standard Penetration Test (SPT) Borings, designated as B-1 through B-6, two 15-foot deep SPT borings, designated as BMP-1 and BMP-2, and three 10-foot deep SPT borings, designated as P-1 through P-3, were drilled within this project site. SPT borings B-1 through B-6 were drilled within the footprints of the proposed self-storage building. SPT

borings P-1 through P-3 were drilled with the proposed pavement areas. Also, SPT borings BMP-1 and BMP-2 were drilled within the proposed BMP areas. The SPT borings were performed with the use of a power drill rig using mud-drilling procedures. The soil samples were obtained with a Split-Spoon Sampler in general accordance with the Standard Penetration Test (SPT) procedure (ASTM D1586). These samples were collected continuously from the ground surface to a 10-foot depth and at 5-foot intervals thereafter. The soil samples were obtained with a standard 2-inch outside diameter and 30-inch long split spoon sampler with each SPT. The split spoon sampler was driven into the soils 24 inches by a 140-pound hammer falling approximately 30 inches. The number of blows required to drive the sampler each 6-inch increment of penetration was recorded and is noted on the boring logs. The recorded SPT N value (blows per foot) noted in this report is the sum of the second and third penetration increments. The SPT borings were located and staked in the field by ETS personnel.

In addition to the SPT borings, two bulk soil samples, designated as P-1 and P-3, were collected from the locations of SPT borings P-1 and P-3, respectively. The CBR bulk soil samples were collected from a depth of about 12 to 24 inches below grades. The bulk soil samples were collected and returned to our AASHTO Accredited Laboratory for performing California Bearing Ratio (CBR) testing in accordance with ASTM Standards. The approximate boring locations are shown on the attached plan included in Appendix I. The boring logs and profiles are included in Appendix II and III of this report, respectively.

At the time of this reporting, the grading plan was not completed. Once the grading plan is complete, the infiltration tests will be conducted at depths selected by the Civil Engineer. The results of the infiltration tests will be submitted under a separate cover letter prepared by a professional engineer from ETS.

4.0 Laboratory Testing Procedures

Representative portions of all soil samples collected during field exploration study were sealed, labeled and transferred to our AASHTO Accredited Laboratory for classification and analysis. Following the sampling procedures, the soil specimens were examined by our geotechnical staff engineer and visually classified in accordance with the Unified Soil Classification System (USCS) under the direction of a Professional Geotechnical Engineer, and in accordance with ASTM D2487 and ASTM D2488 test methods.

Four test specimens retrieved from the SPT borings were selected and subjected to natural moisture content (ASTM D2216), and Sieve Analysis testing (ASTM D1140). The purpose of these tests was to substantiate the visual soil classifications and to estimate in-situ soil design parameters. The summary of laboratory test results is presented in Table 1 on the next page.

Table 1. Summary of laboratory test results

Boring Number	Depth (ft)	Natural Moisture (%)	- #200 Sieve (%)	USCS
B-2	2 - 4	21.1	42.2	SC-SM
B-3	6 - 8	18.6	40.2	SM
P-2	4 - 6	21.7	44.8	SC
BMP-1	6 - 8	14.4	39.4	SM

The CBR bulk soil samples were subjected to Natural Moisture Content (ASTM D2216), Atterberg Limits (ASTM D4318), No. 200 Sieve Analysis (ASTM D1140), Moisture-Density Relationship testing (ASTM D698) and California Bearing Ratio (CBR) testing (ASTM D1883). The summary of CBR test data is Included in Appendix IV of this report. The moisture-density relationship curves and CBR graphs are included in Appendix V and VI of this report, respectively.

5.0 Subsurface Soil Conditions

The results of our field exploration program indicated about 1 to 3 inches of topsoil materials at the SPT boring locations. Topsoil Materials were not encountered at SPT boring location P-2. However, topsoil materials thickness may vary between the boring locations. Based on the results of the field exploration program, the subsurface soils extending to the boring termination depths 10, 15 and 20 feet consisted of sandy materials (SC-SM, SP-SM, SC and SM) with varying amounts of silt and/or clay. The Standard Penetration Test results, N-values, recorded within this sand layer encountered at the test borings ranged from 2 to 48 blows per foot, indicating very loose to dense relative density.

A thin layer of sandy lean clay (CL) was also encountered at an approximate depth of 2 to 4 feet below existing grades at boring location of BMP-1 and P-3. The SPT result, N-value, recorded within this clay layer ranged from 4 to 5 blows per foot, indicating a soft consistency. The SPT blow counts profiles at the boring locations are presented in Figure 1.

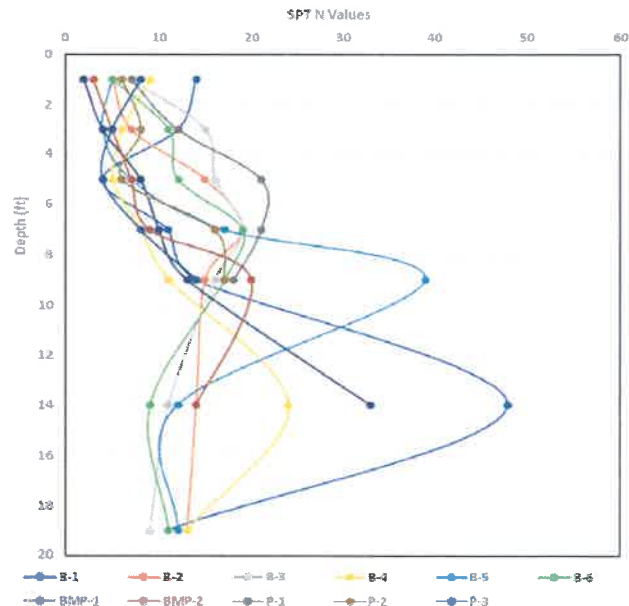


Figure 1: SPT N-values with depths

6.0 Groundwater Observations

6.1 Groundwater Level

The groundwater level was measured at boring locations B-1, B-2, B-3, B-5 and B-6 immediately following completion of drilling operations. The ground water table at these boring locations was found at about 11 to 13 feet below grades. The water table was measured at boring locations B-4, BMP-1 and BMP-2 24-hours after drilling. The 24-hour water table at boring B-4 and BMP-2 were 17.25 and 13 feet respectively. No water was found at the location of BMP-1 after 24 hours. It should be noted that the ground water levels tend to fluctuate during periods of prolonged drought and extended rainfall. In general, high groundwater levels are normally recorded in late winter and early spring.

6.2 Groundwater Concerns

It is expected that dewatering will be required for excavations which extend below the water levels. Dewatering at depths below the groundwater table from existing grades may require well pointing. It is recommended that the contractor determine the actual groundwater levels at the time of construction to determine groundwater impact during construction at this project.

7.0 Construction Recommendations

7.1 Clearing and Subgrade Preparation

Prior to construction, the location of any existing underground utility lines within the construction area should be established, and these utilities relocated to an area that will not be affected or interfere with construction. If underground pipes are not properly integrated, removed or plugged, they may serve as conduits for subsurface erosion, which subsequently may result in excessive settlement of foundations.

The proposed structural (pavement and building) areas should be cleared by means of removing the topsoil materials, and all vegetations or unsuitable materials. Based on the thickness of the topsoil materials encountered at the boring locations and our experience with similar projects, it is estimated that a cut ranging in depth from about 3 to 6 inches in depth will be required to remove the topsoil materials from within the proposed building and roadway areas. The actual thickness of the topsoil materials may be greater than those encountered at the boring locations. For bidding purposes, it is recommended that the bidders excavate test holes throughout the site and measure topsoil thicknesses at the test holes locations. The cuts will extend deeper, approximately 2 feet, in isolated areas to remove organic matter and unsuitable materials in wooded areas, which become evident during the clearing operations. It is

recommended that the clearing operations extend laterally at least 5 feet beyond the perimeter of the proposed building and pavement roadway areas.

7.2 Structural Fill and Placement Requirements

In general, soils classified as Clay (CL, CH and OH), Silt (MH and OH) and Peat (PT), typically possess a CBR value of less than 5 are considered unsuitable for use as structural fill materials. In addition, any soil material that has an excessive moisture content that prohibits proper compaction and contains deleterious debris such as organics, plastic, etc., possess poor bearing capacity or soils with a Liquid Limit (LL) greater than 40% and a Plasticity Index (PI) greater than 12% is considered unsuitable for use as structural fill materials.

All structural fill should be compacted to a dry density of at least 95 percent of the Standard Proctor maximum dry density (ASTM D698). Any material to be used for backfill or compacted fill should be tested by the Geotechnical Engineer prior to placement to determine if they are suitable for the intended use. Imported structural fill materials should consist of sand or gravel with less than 20% passing the No. 200 Sieve (0.074 mm) and classified as SP, SM, SW, GP, and GW.

All structural fill materials should be placed in 10-inch loose lifts and be compacted to a dry density of at least 95% of the Standard Proctor maximum dry density (ASTM D698). A soils technician working under the direction of a licensed professional Geotechnical Engineer should perform field density tests on each lift as necessary to determine that adequate compaction is achieved.

Backfill material in utility trenches to be located within the structural areas should consist of structural fill (as described above) and should be compacted to at least 95 percent of ASTM D698. This fill should be placed in 4 to 6-inch loose lifts when hand compaction equipment is used.

7.3 Bedding Materials Requirements

Trench excavation bottoms should be graded to provide a positive contact with the contour of proposed utility pipes to ensure uniform bearing for the full length of installed pipes. If required for stabilization purposes or to meet VDOT requirements, bedding materials for pipes may consist of 4 to 6 inches of clean gravel (No.: 57 stone). The thickness of bedding materials should meet all applicable construction requirements. Proposed trench bottoms should be inspected by ETS personnel for compliance with the construction drawings prior to placement of bedding materials and utility construction operations. Utility trench excavations should be performed as per the project requirements and in accordance with applicable OSHA standards. The thickness of bedding materials will depend on the soil conditions at the time of inspection and could increase if the soil conditions are saturated.

7.4 Excavation Stability

Based on the soil's conditions encountered at the boring locations, the shallow subsurface soils consist of sands (SC-SM, SP-SM, SC and SM) with varying amounts of silts and/or clay. The contractor should anticipate that the granular soils will have relatively no to little cohesion and tend to have high potential for "cave in". In addition, potential water conditions due to possible water seepage, should be expected within the side walls of the open cut areas increase the potential for "cave in". In this regard, it is the contractor responsibility to follow all Occupational Safety and Health Administration (OSHA) safety and requirements during construction.

8.0 Engineering Evaluation & Foundation Discussion

8.1 Foundation Discussion

Provided that the earthwork phase operations and other construction recommendations are performed properly and to the satisfaction of the Geotechnical Engineer, the results of our field exploration program and subgrade analysis indicate that the proposed self-storage facility may be supported by shallow continuous strip or spread footings bearing on the native subgrade soils or properly placed structural fill materials.

All footing foundations for the proposed building may be designed using a net allowable soil pressure of up to 2,000 pounds per square foot (PSF). In using net pressures, the weight of the footing and backfill over the footing need not be considered. Hence, only loads applied at or above the finished ground floor need to be used for dimensioning the footings.

The base of all wall footings should be a minimum of 18 inches in width. Furthermore, the base of all interior and exterior footings should be located at a minimum depth of 18 inches below final grades. These minimum width and depth requirements are considered necessary to attain the desired bearing capacity and to minimize the potential for deterioration of the bearing soils due to frost penetration and soil heave (swell).

8.2 Ground Supported Slabs

Provided the previously recommended earthwork activities are performed properly and under the supervision of the Geotechnical Engineer, ground slabs may be constructed as slab-on-grade members using a Modulus of Subgrade Reaction equal to 150 pounds per cubic inch for ground slab design. It is recommended that all ground floor slabs be "floating". That is generally ground supported and not rigidly connected to walls or foundations. This is to minimize the possibility of cracking and displacement of the floor slabs because of differential movements between the slab and the foundation.

It is recommended that all ground floor slabs be directly supported by at least a 4-inch layer of clean, compacted, poorly graded sand (SP) or gravel (GP) with less than 5% passing the No. 200 Sieve (0.074 mm). The purpose of the 4-inch layer is to act as a capillary barrier and equalize moisture conditions beneath the slab. It is also recommended that the floor slab bearing soils be covered by a vapor barrier or vapor retarder in order to minimize the potential for floor dampness, which can affect the performance of glued tile and carpet. Generally, use of a vapor retarder is recommended for minimal vapor resistance protection below the slab-on-grade. When floor finishes, site conditions or other considerations require greater vapor resistance protection; consideration should be given to using a vapor barrier. The Architect, based on project requirements, should make selection of a vapor retarder or vapor barrier.

8.3 Settlement

It is estimated that the maximum resulting foundation settlements should be on the order of approximately 1-inch or less. The maximum differential settlement is expected to be less than ½ -inch at the project site. Post-construction settlement was estimated on the basis of the results of the field penetration tests, laboratory tests, the structural load estimates and the proposed construction. Careful field control will contribute substantially towards minimizing the settlements at this site.

The loads specified in section 2.0 are used during our subsurface evaluation in order to estimate the potential for post-construction settlements and to estimate the soil-structure interaction at footings and ground slabs. If the structural load estimates are incorrect or have changed, please inform ETS so that we may amend the recommendations presented in this report, if appropriate.

8.4 Foundation Excavations

Footing excavations should extend into firm natural soil or compacted structural fill. The footing bearing soils should be observed by the Geotechnical Engineer prior to steel reinforcement and footing concrete placement. At the time of the observations, the Geotechnical Engineer may find it necessary to perform hand auger borings or use a hand penetration device in the bases of the foundation excavations. All unsuitable materials encountered in the bottom of foundation excavations should be undercut as recommended by the Geotechnical Engineer. The proposed footing elevations should be re-established by backfilling with lean concrete, sand or gravel. Sand backfill at footings should be compacted to a dry density of at least 100 percent of the Standard Proctor maximum dry density (ASTM D698). It is recommended that the approved footing bearing soils be compacted prior to reinforcing steel placement. All footings approved by the Geotechnical Engineer should be protected from physical disturbance, rain or frost. It is recommended that all footing concrete be placed the same day the excavations are performed.

8.5 Seismic Design Considerations

Per Chapter 20 of ASCE 7-05, the site soil shall be classified in accordance with table 20.3-1 and section 20.3 based on the upper 100 feet of the site profile. There are three methods to classify sites, shear wave velocity (V_s) method; the unconfined compressive strength (S_u) method, and the Standard Penetration Test (SPT) N-value method. To classify this site, the SPT N-value method was used based on the borings drilled to a depth of about 25 feet below grades. Based on the 2018 IBC, section 1613.3.2, and Chapter 20 of ASCE 7 table 20.3-1, this project is defined as "Site Class E" for seismic design considerations. If the site classification is critical to the structural design of this project, it is recommended to conduct a shear wave velocity test consisting of a 100-foot deep CPT sounding to better substantiate this site classification.

9.0 Pavement

Two bulk soil samples were collected from the proposed pavement areas from a depth of about 12 to 24 inches below existing grades. The bulk soil samples consisted mainly of sandy materials with varying amounts of silt and/or clay. The CBR tests conducted on the bulk soil samples indicated soaked CBR values ranging from 5.3 to 6.2 at 0.1-inch penetration. Pavement bearing soils encountered during site grading operations will depend on final grading requirements. The average CBR value was calculated to be about 5.7. Also, the average soaked CBR value was multiplied by a factor of two-thirds to determine a pavement design CBR value. The two-thirds factor provides the necessary safety margins to compensate for any non-uniformity of the soils. Therefore, a design CBR value of 3.8 should be used for pavement design purposes. Based on the soils conditions encountered at the boring locations and review of the Pavement Design Guide for Subdivision and Secondary Roads in Virginia published by the Virginia Department of Transportation (VDOT), the subgrade soils at the anticipated design elevations are expected to have good support characteristics and average Soil Resiliency Factor of 2.5.

It should be noted that the CBR tests were performed under optimum conditions on compacted samples. Therefore, it is suggested that the CBR values be applied conservatively. It is recommended that considerations particular to these subgrade soils be made beyond those based solely on CBR values. The following suggestions are therefore made regarding pavements construction.

- Following pavement rough grading operations, the exposed subgrade soils should be proofrolled under the observation of the Geotechnical Engineer. This proofrolling should be accomplished with a fully loaded dump truck or 7 to 10-ton drum roller to check for pockets of soft material hidden beneath a thin crust of better soil. Any unsuitable materials thus exposed should be removed and replaced with a well-compacted structural fill material. The inspection of these phases should be performed by the Geotechnical Engineer.

- If excessively unstable subgrade soils are observed during proofrolling and/or fill placement, it is expected that these weak areas can be stabilized by means of thickening the base course layer and/or the use of a Geotextile fabric (such as Mirafi 500x or equivalent). These alternatives are to be addressed by the Geotechnical Engineer during construction, if necessary, who will recommend the most economical approach at the time.

The Geotechnical Engineer should be called on to provide a final inspection of the stone surfaces prior to paving. The best indication of what problems could arise during the service life of the pavements is the performance of the stone base after exposure to construction traffic and the elements. It is therefore recommended that this inspection be performed so that observed drainage problems or base or subgrade deterioration problems can be addressed

10.0 Warranty and Limitations of Study

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted Geotechnical engineering principles and practices. This warranty is in lieu of all warranties, either express or implied. ETS, Inc. is not responsible for the independent conclusions; opinions or recommendations made by others based on the field exploration program and laboratory test data presented in this report.

The recommendations were developed from the information obtained from the test borings, which only depict subsurface conditions at the specific locations, times and depth shown on the logs. Soils conditions at other locations may differ from those encountered in the test borings, and the passage of time may cause the soil conditions to change from those described in this report.

The nature and extent of variation and change in the subsurface conditions at the site may not become evident until the course of construction. Construction monitoring by the Geotechnical Engineer or by his representative is therefore considered necessary to verify the subsurface conditions and to check that the soils construction phases are properly executed. If significant variations or changes are in evidence, it may be necessary to re-evaluate the recommendations of this report. Furthermore, if the project characteristics are altered from those discussed in this report, if the project information contained in this report is incorrect, or if additional information becomes available, a review should be made by this office to determine if any modifications in the recommendations will be required.

The scope of our services does not include any environmental assessment or investigations for the possible presence of hazardous or toxic materials in the soil, groundwater or surface water within or in the general vicinity of the site studied. Any statements made in this report or shown on the test boring logs regarding unusual subsurface conditions, and/or composition, odor, staining, origin or other characteristics

of the surface and/or subsurface materials are strictly for the information of our client and may or may not be indicative of an environmental problem. Unless complete environmental information regarding the site is already available, an environmental assessment is recommended prior to the development of this site.

APPENDICES

APPENDIX I – SOIL BORING PLAN

APPENDIX II - SOIL BORING LOGS

APPENDIX III - SOIL BORING PROFILE

APPENDIX IV – SUMMARY OF CBR TEST RESULTS

APPENDIX V – MOISTURE-DENSITY RELATIONSHIP CURVES

APPENDIX VI – CALIFORNIA BEARING RATIO GRAPHS

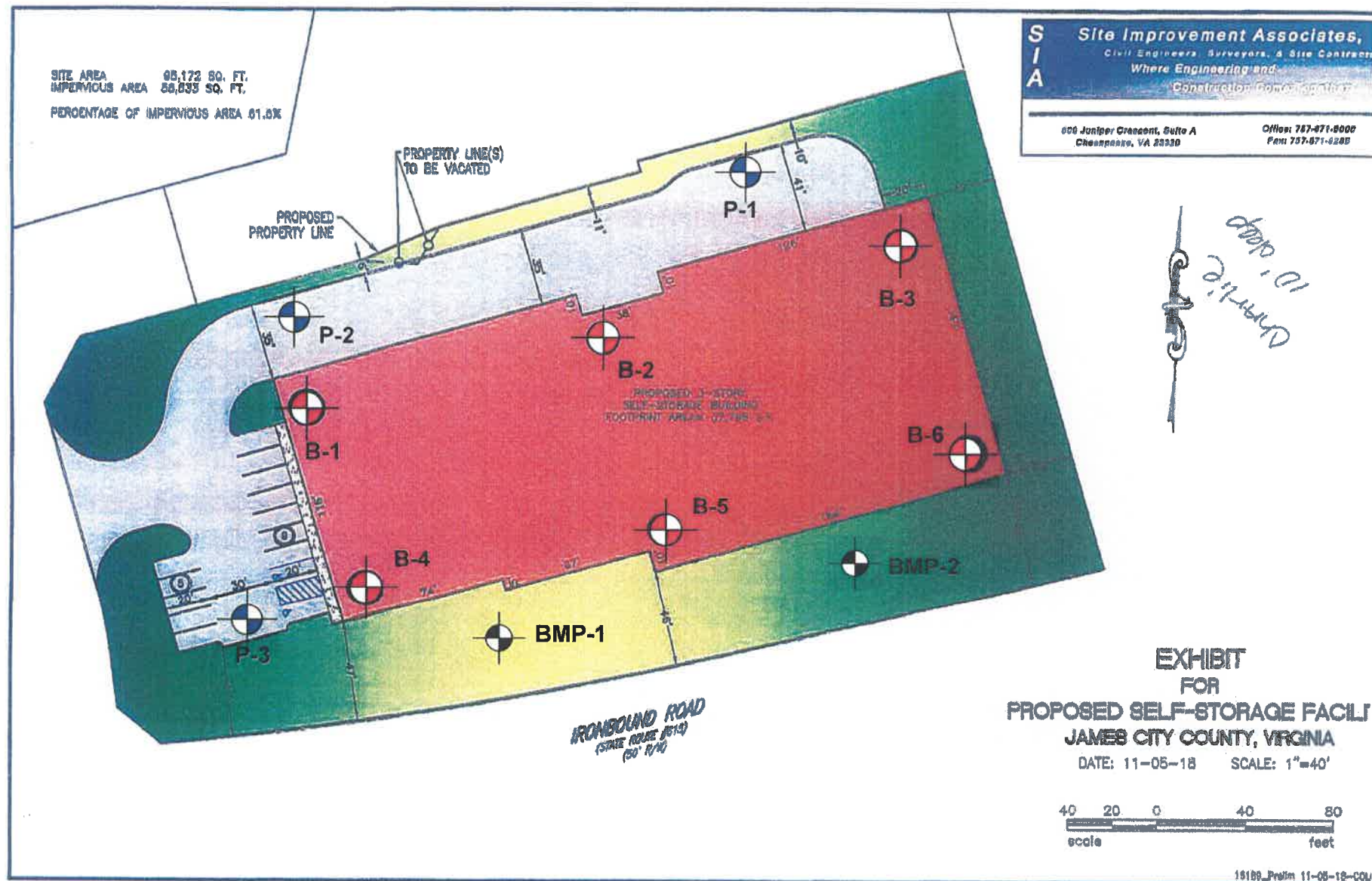
APPENDIX I – SOIL BORING PLAN

SITE AREA 95,172 SQ. FT.
 IMPERVIOUS AREA 58,839 SQ. FT.
 PERCENTAGE OF IMPERVIOUS AREA 61.8%

SIA Site Improvement Associates,
 Civil Engineers, Surveyors, & Site Contractors
 Where Engineering and Construction Come Together

600 Juniper Crescent, Suite A
 Chesapeake, VA 23320

Office: 757-671-8000
 Fax: 757-671-8285



APPENDIX II – SOIL BORING LOGS



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BORING NUMBER B-1

PAGE 1 OF 1

CLIENT Sifen, Inc

PROJECT NAME Proposed Self Storage Facility - 4091 Ironbound Road

PROJECT NUMBER ETS-19E100

PROJECT LOCATION James City County, Virginia

DATE STARTED 1/17/19

COMPLETED 1/17/19

GROUND ELEVATION HOLE SIZE 3 inches

DRILLING CONTRACTOR FDI

GROUND WATER LEVELS:

DRILLING METHOD MUD

▽ AT TIME OF DRILLING 11.00 ft

LOGGED BY A. Konwea, PhD, PE CHECKED BY C. Nabhan, PE

AT END OF DRILLING —

NOTES

AFTER DRILLING —

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 1/29/19 09:12 - N:\ETS-19E100-19E100 4091 IRON BOUND ROBING AND DRILLERS LOGS\BORING LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
0		3" TOPSOIL						PL	MC	LL	
		(SC-SM) TAN, MOIST, SILTY CLAYEY SAND, VERY LOOSE TO MEDIUM DENSE	SPT 1	83	4-6-8-4 (14)			20	40	60	80
			SPT 2	75	4-6-6-5 (12)						
5			SPT 3	75	2-2-2-3 (4)						
		(SM) TAN TO ORANGE, MOIST TO SATURATED, SILTY SAND, MEDIUM DENSE	SPT 4	75	2-4-7-5 (11)						
			SPT 5	75	4-6-8-20 (14)						
10											
		(SP-SM) LIGHT GRAY TO BROWN, SATURATED, POORLY GRADED SAND WITH SILT	SPT 6	75	20-28-20-18 (48)						
15											
			SPT 7	75	4-7-4-7 (11)						
20											

Bottom of borehole at 20.0 feet.



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BORING NUMBER B-2

PAGE 1 OF 1

CLIENT Sifen, Inc

PROJECT NAME Proposed Self Storage Facility - 4091 Ironbound Road

PROJECT NUMBER ETS-19E100

PROJECT LOCATION James City County, Virginia

DATE STARTED 1/17/19 COMPLETED 1/17/19

GROUND ELEVATION _____ HOLE SIZE 3 inches

DRILLING CONTRACTOR FDI

GROUND WATER LEVELS:

DRILLING METHOD MUD

▽ AT TIME OF DRILLING 13.00 ft

LOGGED BY A. Konwea, PhD, PE CHECKED BY C. Nabhan, PE

AT END OF DRILLING —

NOTES _____

AFTER DRILLING —

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
								20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
0		2" TOPSOIL									
		(SM) TAN, MOIST, SILTY SAND, VERY LOOSE	SPT 1	83	2-2-3-3 (5)						
		(SC-SM) TAN, MOIST, SILTY CLAYEY SAND, LOOSE	SPT 2	83	2-3-4-5 (7)						
		(SM) TAN, MOIST, SILTY SAND, MEDIUM DENSE	SPT 3	92	6-7-8-8 (15)						
		(SP-SM) TAN, MOIST, POORLY GRADED SAND WITH SILT, MEDIUM DENSE	SPT 4	83	7-8-11-11 (19)						
		(SM) LIGHT GRAY, MOIST, SILTY SAND, MEDIUM DENSE	SPT 5	75	4-7-8-10 (15)						
10											
		(SC-SM) LIGHT TAN, SATURATED, SILTY CLAYEY SAND, MEDIUM DENSE	SPT 6	75	4-7-7-7 (14)						
15											
			SPT 7	75	4-6-7-7 (13)						
20											

Bottom of borehole at 20.0 feet.

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 1/29/19 09:12 - N:\ETS-19E100-4091 IRON BOUND RDBORING AND DRILLERS LOGS\BORING LOGS.GPJ

CLIENT Sifen, Inc

PROJECT NUMBER ETS-19E100

DATE STARTED 1/17/19 **COMPLETED** 1/17/19

DRILLING CONTRACTOR FDI

DRILLING METHOD MUD

LOGGED BY A. Konwea, PhD, PE CHECKED BY C. Nabhan, PE

NOTES

PROJECT NAME Proposed Self Storage Facility - 4091 Ironbound Road

PROJECT LOCATION James City County, Virginia

GROUND ELEVATION _____ HOLE SIZE 3 inches

GROUND WATER LEVELS:

 AT TIME OF DRILLING 12.00 ft

AT END OF DRILLING —

AFTER DRILLING —

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲					
								PL MC LL					
								20	40	60	80		
0								☐ FINES CONTENT (%) ☐					
								20	40	60	80		
0		2" TOPSOIL	SPT 1	75	3-3-4-5 (7)								
		(SC-SM) TAN, MOIST, SILTY CLAYEY SAND, LOOSE TO MEDIUM DENSE	SPT 2	83	6-7-8-8 (15)								
5		(SM) TAN, MOIST TO SATURATED, SILTY SAND, MEDIUM DENSE	SPT 3	100	6-7-9-10 (16)								
			SPT 4	83	7-11-8-8 (19)								
			SPT 5	83	6-8-8-9 (16)								
10													
			SPT 6	83	4-5-6-5 (11)								
15		(SC-SM) LIGHT TAN TO ORANGE, SATURATED, SILTY CLAYEY SAND, MEDIUM DENSE											
			SPT 7	75	4-5-4-5 (9)								
20		(SC) LIGHT TAN TO ORANGE, SATURATED, CLAYEY SAND, LOOSE											

Bottom of borehole at 20.0 feet.



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BORING NUMBER B-4

PAGE 1 OF 1

CLIENT Sifen, Inc

PROJECT NAME Proposed Self Storage Facility - 4091 Ironbound Road

PROJECT NUMBER ETS-19E100

PROJECT LOCATION James City County, Virginia

DATE STARTED 1/17/19 COMPLETED 1/17/19

GROUND ELEVATION _____ HOLE SIZE 3 inches

DRILLING CONTRACTOR FDI

GROUND WATER LEVELS:

DRILLING METHOD MUD

AT TIME OF DRILLING —

LOGGED BY A. Konwea, PhD, PE CHECKED BY C. Nabhan, PE

AT END OF DRILLING —

NOTES _____

24hrs AFTER DRILLING 17.25 ft

GEOTECH BH PLOTS - GINT STD US LAB GDT - 1/29/19 09:12 - N:\ETS-19E100-4091 IRON BOUND RD BORING AND DRILLERS LOGS\BORING LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
								20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
0		2" TOPSOIL									
		(SM) LIGHT BROWN TO TAN, MOIST, SILTY SAND, VERY LOOSE TO MEDIUM DENSE	SPT 1	75	2-5-4-3 (9)						
			SPT 2	83	3-3-3-2 (6)						
5			SPT 3	83	1-3-2-2 (5)						
			SPT 4	83	1-3-5-5 (8)						
			SPT 5	100	5-5-6-5 (11)						
10											
		(SP-SM) LIGHT GRAY TO LIGHT TAN TO ORANGE, MOIST TO SATURATED, POORLY GRADED SAND WITH SILT, MEDIUM DENSE	SPT 6	75	10-11-13-14 (24)						
15											
			SPT 7	75	8-6-7-6 (13)						
20											

Bottom of borehole at 20.0 feet.



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BORING NUMBER B-5

PAGE 1 OF 1

CLIENT Sifen, Inc

PROJECT NAME Proposed Self Storage Facility - 4091 Ironbound Road

PROJECT NUMBER ETS-19E100

PROJECT LOCATION James City County, Virginia

DATE STARTED 1/17/19 COMPLETED 1/17/19

GROUND ELEVATION _____ HOLE SIZE 3 inches

DRILLING CONTRACTOR FDI

GROUND WATER LEVELS:

DRILLING METHOD MUD

▽ AT TIME OF DRILLING 13.00 ft

LOGGED BY A. Konwea, PhD, PE CHECKED BY C. Nabhan, PE

AT END OF DRILLING —

NOTES _____

AFTER DRILLING —

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
0		3" TOPSOIL (SM) TAN TO BROWN TO ORANGE, MOIST, SILTY SAND, VERY LOOSE TO MEDIUM DENSE	SPT 1	75	2-3-2-2 (5)						
			SPT 2	83	2-2-2-2 (4)						
5			SPT 3	75	2-3-4-5 (7)						
			SPT 4	83	4-7-10-10 (17)						
10		(SP-SM) TAN, MOIST TO SATURATED, POORLY GRADED SAND WITH SILT, MEDIUM DENSE TO DENSE	SPT 5	75	9-18-21-23 (39)						
			SPT 6	75	9-6-6-7 (12)						
15											
20		(SC) TAN TO ORANGE, SATURATED, CLAYEY SAND, MEDIUM DENSE	SPT 7	83	5-6-6-9 (12)						

Bottom of borehole at 20.0 feet.



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BORING NUMBER B-6

PAGE 1 OF 1

CLIENT Sifen, Inc

PROJECT NAME Proposed Self Storage Facility - 4091 Ironbound Road

PROJECT NUMBER ETS-19E100

PROJECT LOCATION James City County, Virginia

DATE STARTED 1/17/19 COMPLETED 1/17/19

GROUND ELEVATION _____ HOLE SIZE 3 inches

DRILLING CONTRACTOR FDI

GROUND WATER LEVELS:

DRILLING METHOD MUD

▽ AT TIME OF DRILLING 13.00 ft

LOGGED BY A. Konwea, PhD, PE CHECKED BY C. Nabhan, PE

AT END OF DRILLING —

NOTES _____

AFTER DRILLING —

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
0								20	40	60	80
								☐ FINES CONTENT (%) ☐			
								20	40	60	80
0		4" TOPSOIL (SM) LIGHT BROWN TO TAN TO ORANGE, MOIST TO SATURATED, SILTY SAND, VERY LOOSE TO MEDIUM DENSE	SPT 1	75	1-2-3-3 (5)						
			SPT 2	83	4-6-5-4 (11)						
5			SPT 3	83	4-6-6-5 (12)						
			SPT 4	100	6-9-10-9 (19)						
			SPT 5	83	5-8-9-10 (17)						
10											
			SPT 6	75	3-4-5-6 (9)						
15											
			SPT 7	75	4-6-5-5 (11)						
20											

Bottom of borehole at 20.0 feet.



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BORING NUMBER BMP-1

PAGE 1 OF 1

CLIENT Sifen, Inc

PROJECT NAME Proposed Self Storage Facility - 4091 Ironbound Road

PROJECT NUMBER ETS-19E100

PROJECT LOCATION James City County, Virginia

DATE STARTED 1/16/19 COMPLETED 1/16/19

GROUND ELEVATION HOLE SIZE 3 inches

DRILLING CONTRACTOR FDI

GROUND WATER LEVELS:

DRILLING METHOD MUD

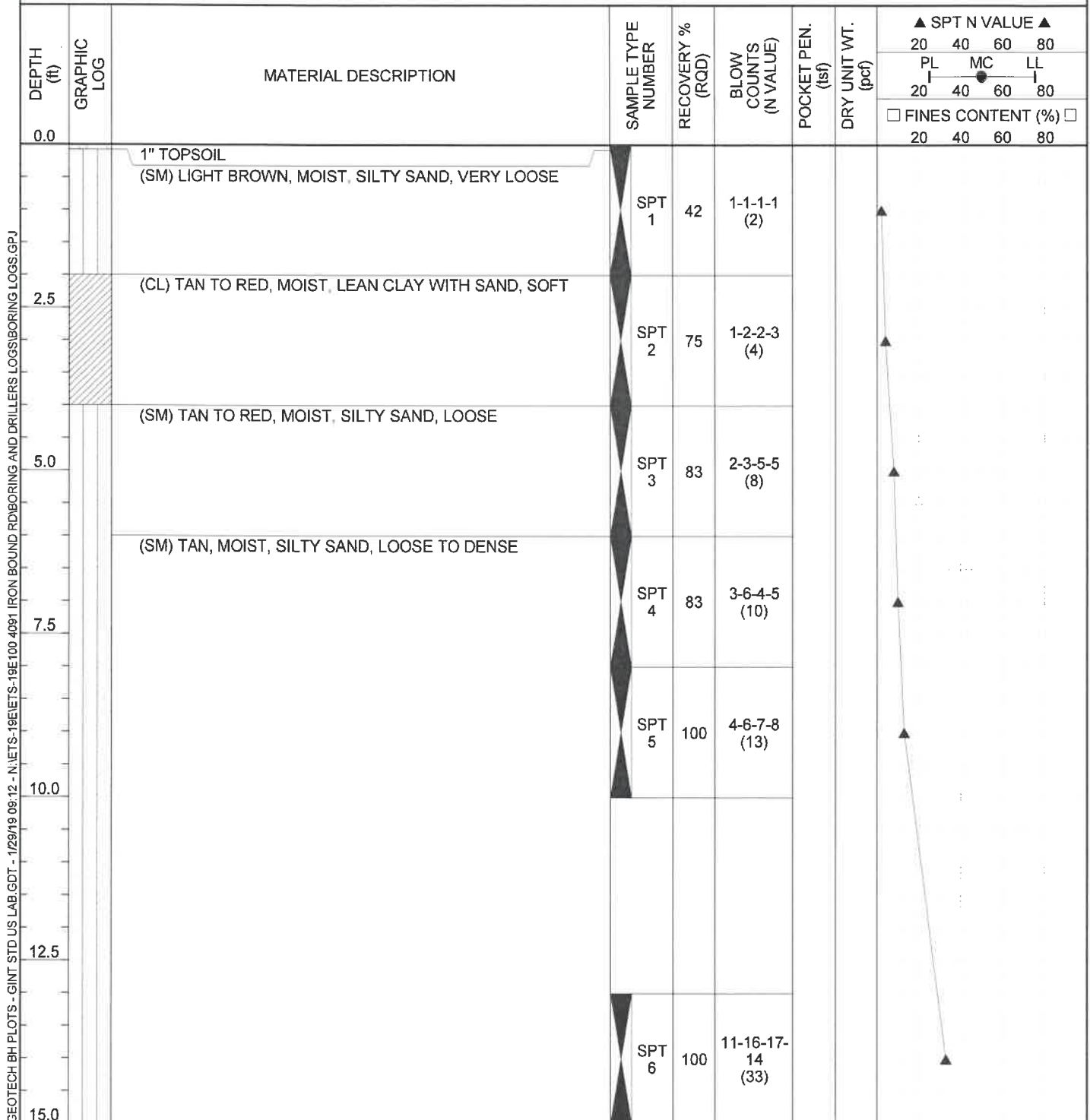
AT TIME OF DRILLING —

LOGGED BY A. Konwea, PhD, PE CHECKED BY C. Nabhan, PE

AT END OF DRILLING —

NOTES Water table not encountered

AFTER DRILLING —





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Virginia Beach, Virginia 23464
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BORING NUMBER BMP-2

PAGE 1 OF 1

CLIENT Sifen, Inc

PROJECT NAME Proposed Self Storage Facility - 4091 Ironbound Road

PROJECT NUMBER ETS-19E100

PROJECT LOCATION James City County, Virginia

DATE STARTED 1/16/19 COMPLETED 1/16/19

GROUND ELEVATION HOLE SIZE 3 inches

DRILLING CONTRACTOR FDI

GROUND WATER LEVELS:

DRILLING METHOD MUD

AT TIME OF DRILLING —

LOGGED BY A. Konwea, PhD, PE CHECKED BY C. Nabhan, PE

AT END OF DRILLING —

NOTES Water table not encountered during drilling

24hrs AFTER DRILLING 13.00 ft

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
0.0		3" TOPSOIL						20	40	60	80
		(SM) TAN, MOIST, SILTY SAND, VERY LOOSE TO MEDIUM DENSE WITH ORGANICS FROM 0.25 FEET TO 2 FEET	SPT 1	75	1-2-1-1 (3)						
2.5			SPT 2	75	2-2-3-3 (5)						
5.0			SPT 3	75	3-4-3-3 (7)						
7.5			SPT 4	83	2-4-5-5 (9)						
10.0			SPT 5	75	7-10-10-11 (20)						
12.5											
15.0		(SC) LIGHT TAN, SATURATED, CLAYEY SAND, MEDIUM DENSE	SPT 6	75	4-5-9-9 (14)						

Bottom of borehole at 15.0 feet.



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BORING NUMBER P-1

PAGE 1 OF 1

CLIENT Sifen, Inc

PROJECT NAME Proposed Self Storage Facility - 4091 Ironbound Road

PROJECT NUMBER ETS-19E100

PROJECT LOCATION James City County, Virginia

DATE STARTED 1/17/19

COMPLETED 1/17/19

GROUND ELEVATION _____

HOLE SIZE 3 inches

DRILLING CONTRACTOR FDI

GROUND WATER LEVELS:

DRILLING METHOD MUD

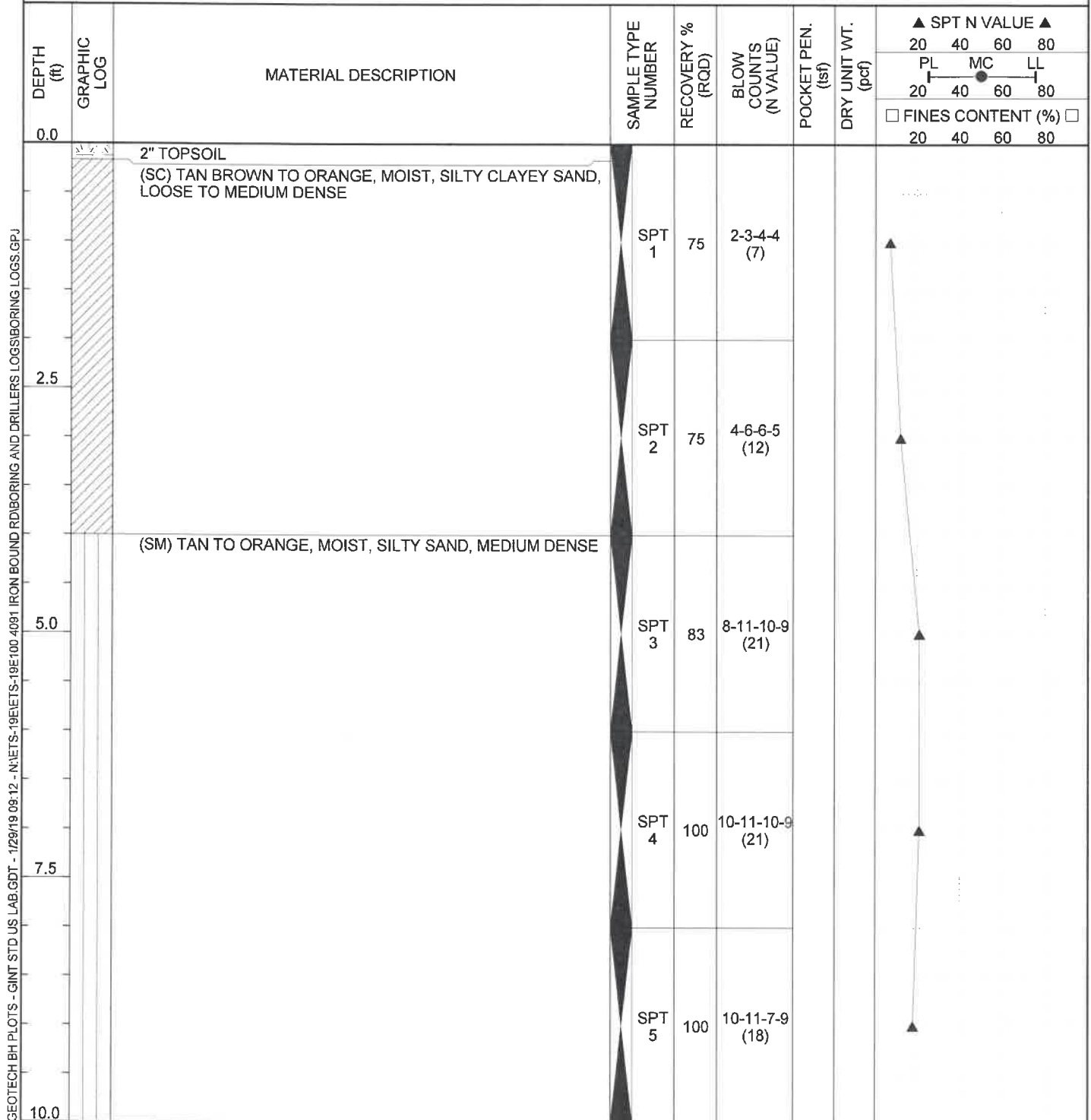
AT TIME OF DRILLING —

LOGGED BY A. Konwea, PhD, PE CHECKED BY C. Nabhan, PE

AT END OF DRILLING —

NOTES Water table not encountered

AFTER DRILLING —



GEOTECH BH PLOTS - CINT STD US LAB.GDT - 1/29/19 09:12 - N:\ETS-19E100-4091 IRON BOUND RD BORING AND DRILLERS LOGS\BORING LOGS.GPJ



Engineering & Testing Services, Inc.
5226 Indian River Road
Virginia Beach, Virginia 23464
Telephone: 757-306-1040
Fax: 757-306-1042

BORING NUMBER P-2

PAGE 1 OF 1

CLIENT Sifen, Inc

PROJECT NUMBER ETS-19E100

DATE STARTED 1/17/19 COMPLETED 1/17/19

DRILLING CONTRACTOR FDI

DRILLING METHOD MUD

LOGGED BY A. Konwea, PhD, PE CHECKED BY C. Nabhan, PE

NOTES Water table not encountered

PROJECT NAME Proposed Self Storage Facility - 4091 Ironbound Road

PROJECT LOCATION James City County, Virginia

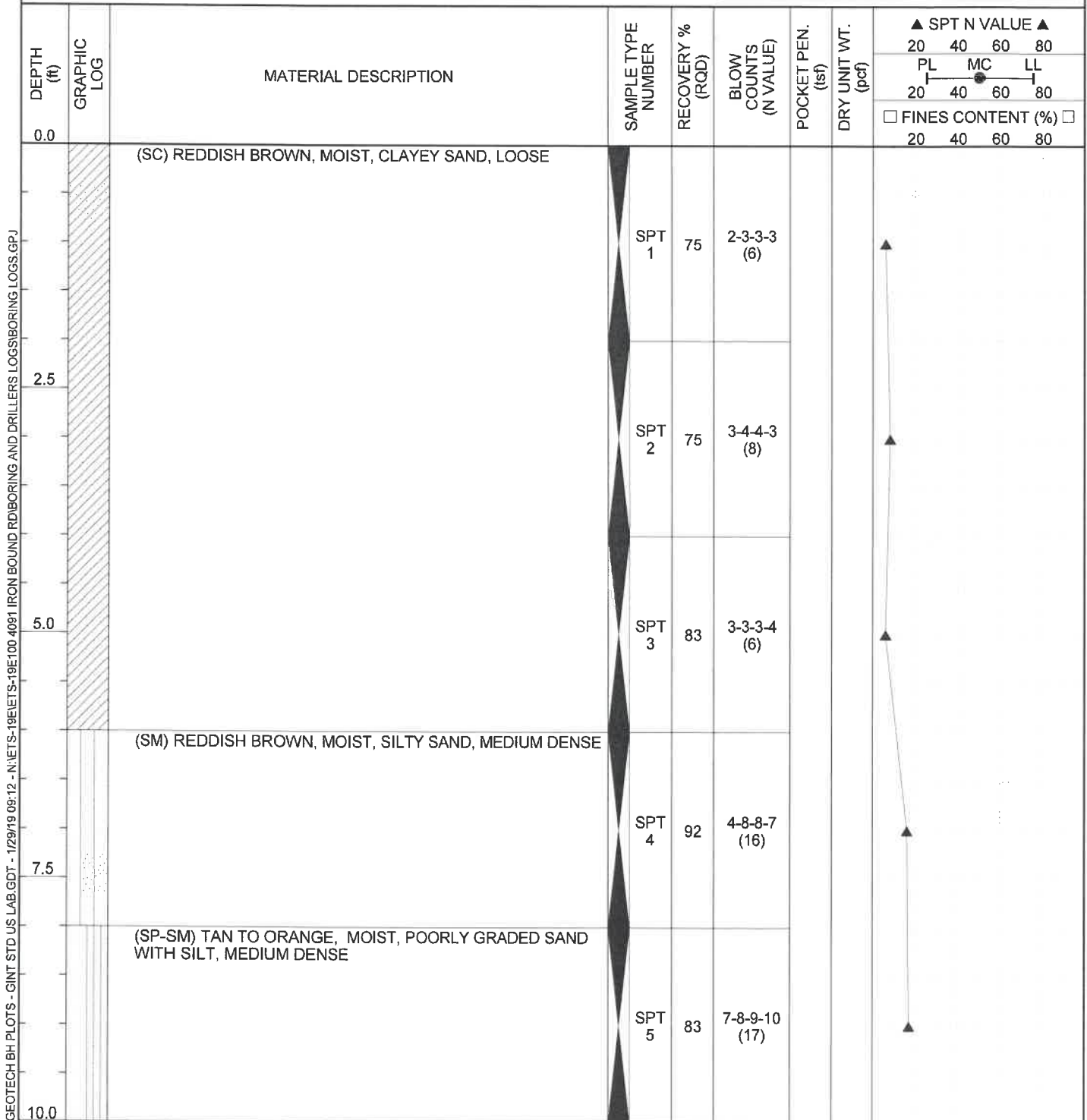
GROUND ELEVATION _____ HOLE SIZE 3 inches

GROUND WATER LEVELS:

AT TIME OF DRILLING —

AT END OF DRILLING —

AFTER DRILLING —



GEOTECH BH PLOTS - GINT STD US LAB.GDT - 1/29/19 09:12 - N:\ETS-19E100-4091 IRON BOUND RD BORING AND DRILLERS LOGS\BORING LOGS.GPJ



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Virginia Beach, Virginia 23464
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Fax: 757-306-1042

BORING NUMBER P-3

PAGE 1 OF 1

CLIENT Sifen, Inc

PROJECT NAME Proposed Self Storage Facility - 4091 Ironbound Road

PROJECT NUMBER ETS-19E100

PROJECT LOCATION James City County, Virginia

DATE STARTED 1/17/19 COMPLETED 1/17/19

GROUND ELEVATION HOLE SIZE 3 inches

DRILLING CONTRACTOR FDI

GROUND WATER LEVELS:

DRILLING METHOD MUD

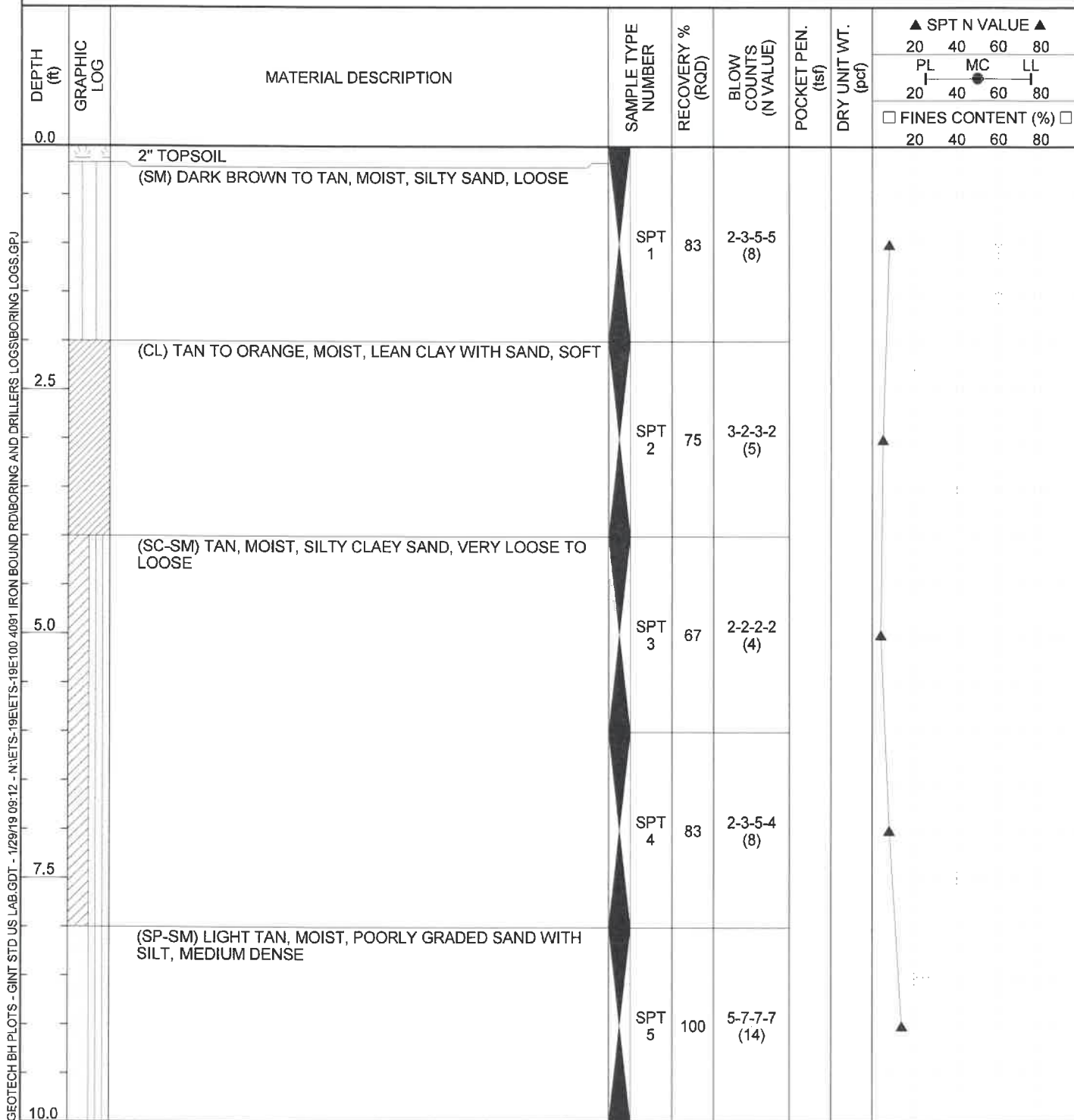
AT TIME OF DRILLING —

LOGGED BY A. Konwea, PhD, PE CHECKED BY C. Nabhan, PE

AT END OF DRILLING —

NOTES Water table not encountered

AFTER DRILLING —



APPENDIX III – SOIL BORING PROFILE



Engineering & Testing Services, Inc.
5226 Indian River Road
Virginia Beach, Virginia 23464
Telephone: 757-306-1040
Fax: 757-306-1042



Topsoil



USCS Clayey Sand



USCS Silty Sand



USCS Poorly-graded Sand with Silt



USCS Clayey Sand

SUBSURFACE DIAGRAM

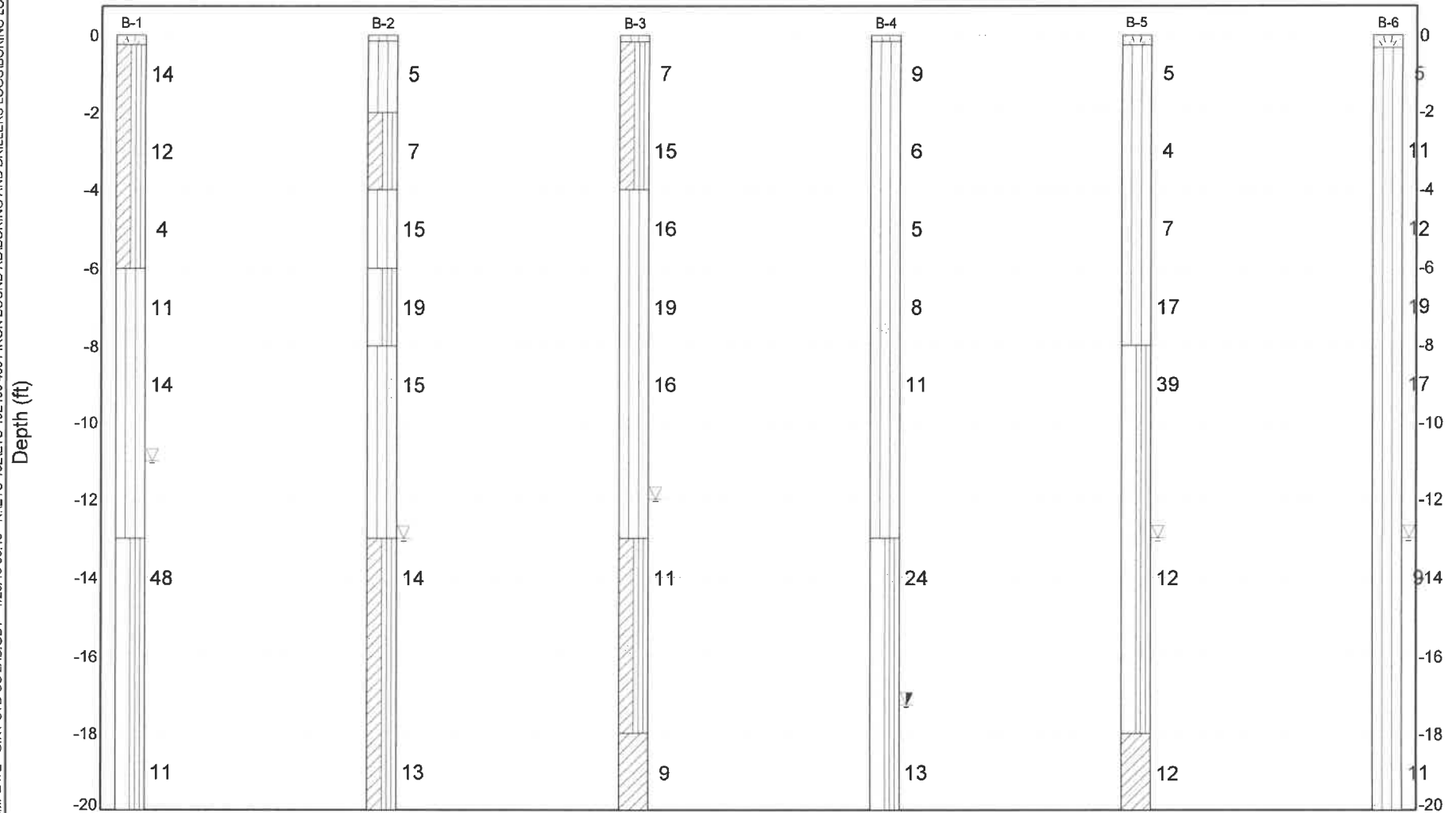
CLIENT Sifen, Inc

PROJECT NAME Proposed Self Storage Facility - 4091 Ironbound Road

PROJECT NUMBER ETS-19E100

PROJECT LOCATION James City County, Virginia

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Engineering & Testing Services, Inc.
5226 Indian River Road
Virginia Beach, Virginia 23464
Telephone: 757-306-1040
Fax: 757-306-1042



Topsoil



USCS Silty Sand



USCS Low Plasticity Clay



USCS Clayey Sand



USCS Poorly-graded Sand with Silt



USCS Clayey Sand

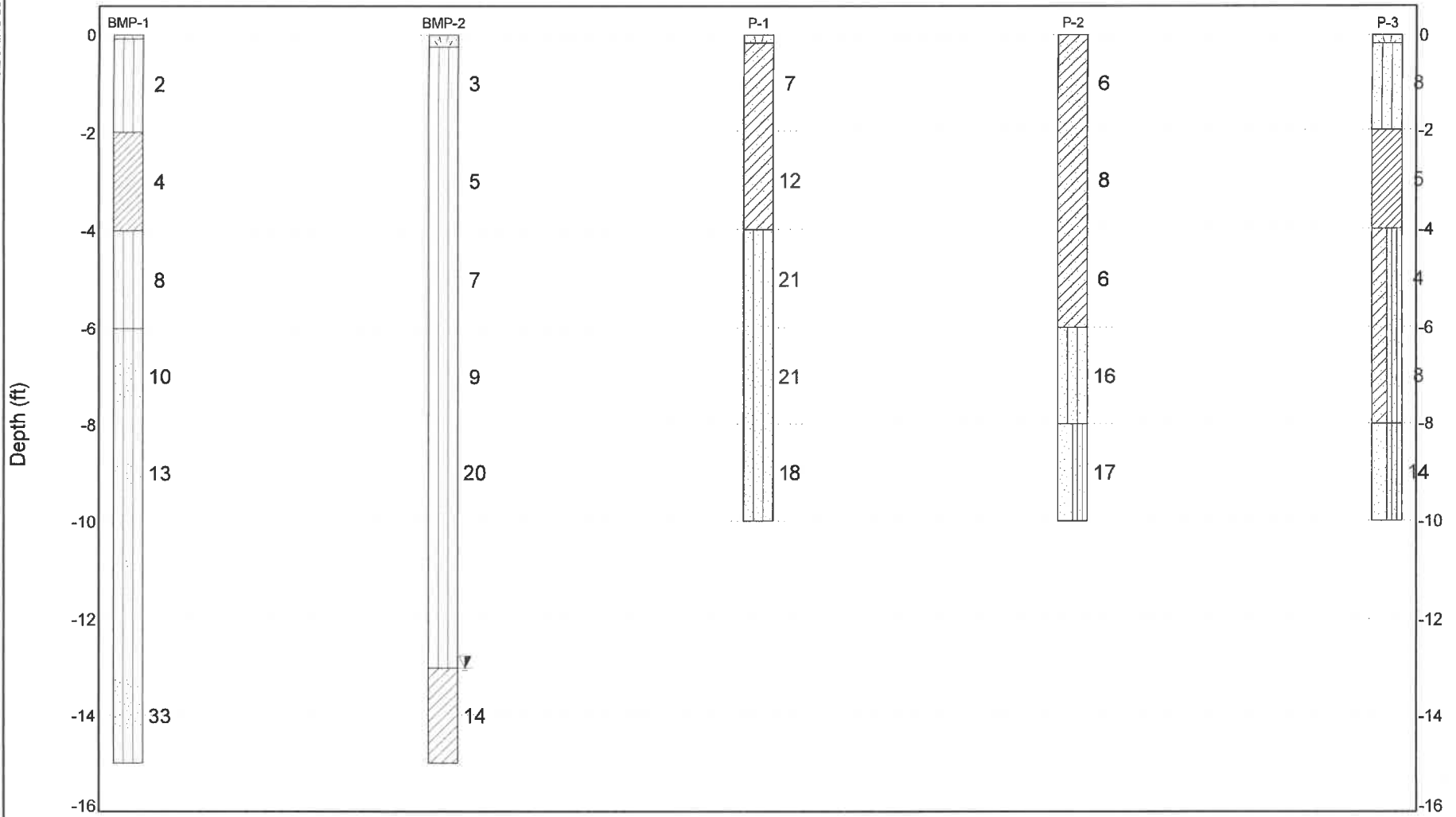
SUBSURFACE DIAGRAM

CLIENT Sifen, Inc

PROJECT NUMBER ETS-19E100

PROJECT NAME Proposed Self Storage Facility - 4091 Ironbound Road

PROJECT LOCATION James City County, Virginia



APPENDIX IV – SUMMARY OF CBR TEST RESULTS



Summary of CBR Test Data

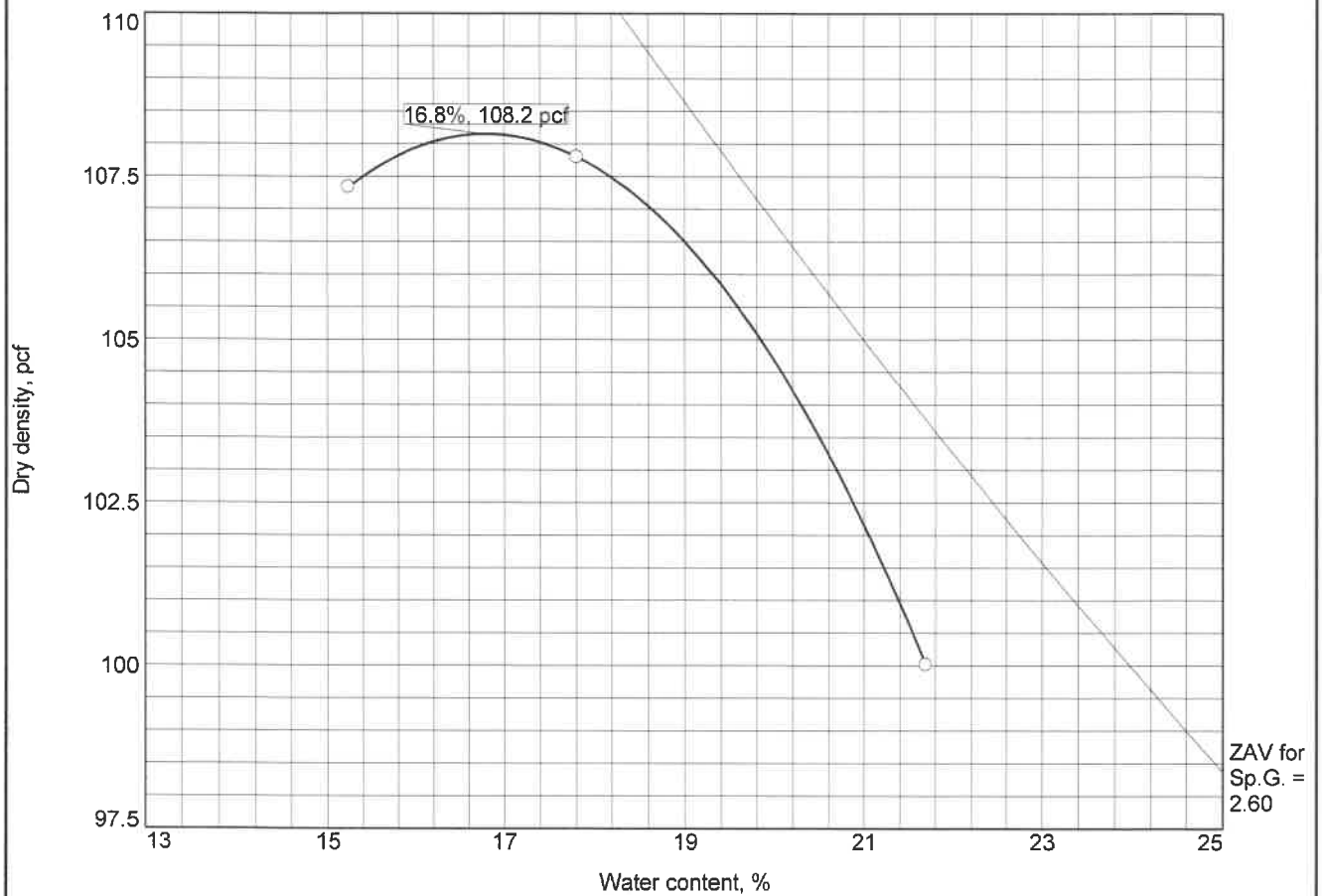
Project Name: Proposed Self Storage
Facility – 4091 Ironbound Road
Project Number: ETS-19E100
Client: Sifen, Inc.



CBR Sample Number	Sample Depth (ft/in)	USCS	AASHTO	Natural Moisture (%)	LL	PI	Fines (%)	Maximum Dry Density (PCF)	Optimum Moisture (%)	Soaked CBR Value @ 0.1"	Resiliency Factor
CBR-1	12"-24"	SC	A-6(3)	16.5	32	11	49.9	108.2	16.8	6.2	2.5
CBR-2	12"-24"	SM	A-4(0)	16.5	20	3	44.2	115.2	12.9	5.3	2.5

APPENDIX V – MOISTURE-DENSITY RELATIONSHIP CURVES

MOISTURE DENSITY RELATIONSHIP CURVE



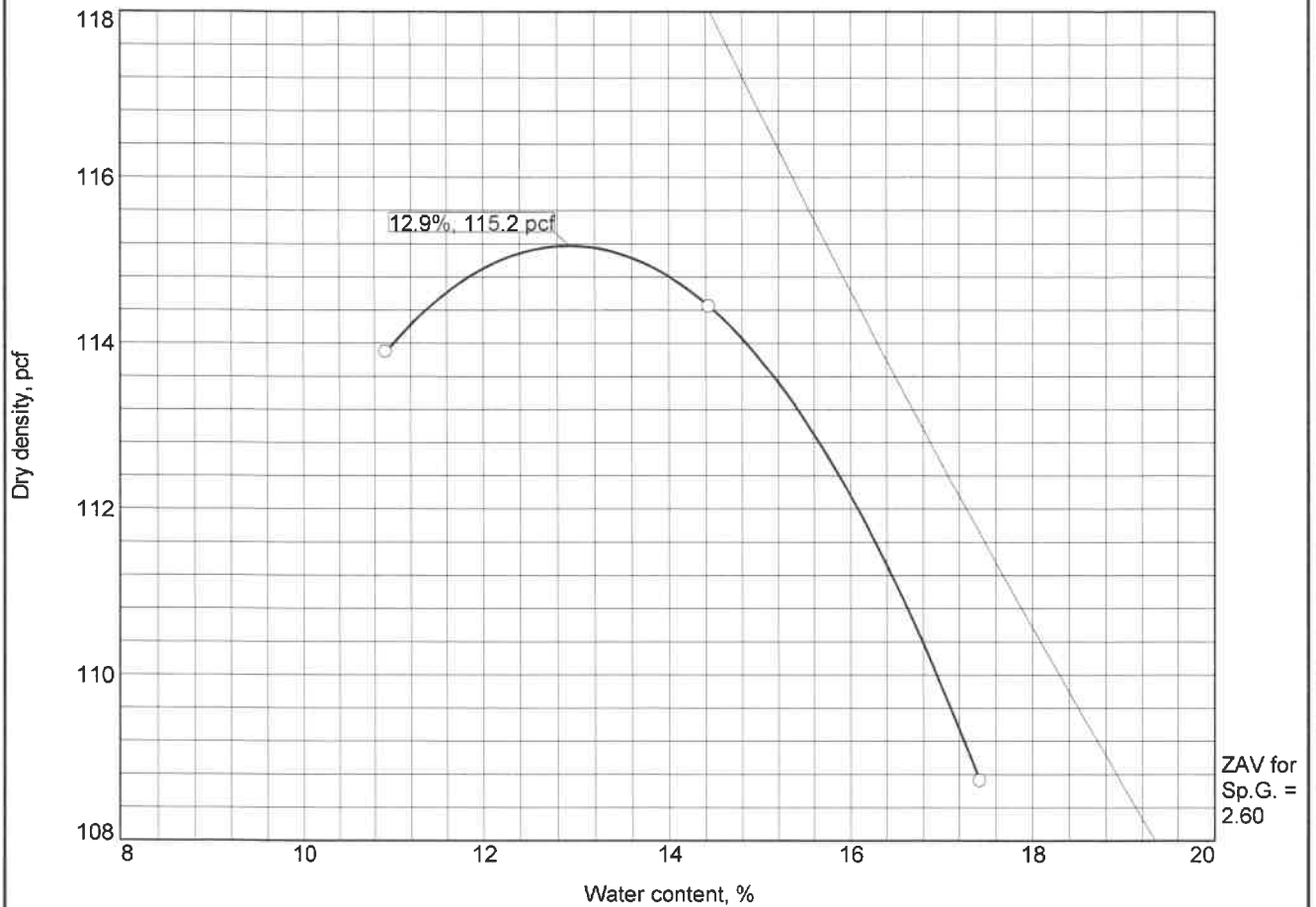
Test specification: ASTM D 698-12 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
1-2	SC	A-6(3)	16.5	2.6	32	11	0.0	49.9

TEST RESULTS		MATERIAL DESCRIPTION
Maximum dry density = 108.2 pcf		TAN BROWN, MOIST, CLAYEY SAND (SC)
Optimum moisture = 16.8 %		
Project No. ETS-19E100 Client: MICHAEL D. SIFEN, INC.		Remarks: SAMPLE WAS COLLECTED ON 1/7/2019
Project: 4091 IRON BOUND RD.		
Date: 1/9/2019		
Sample Number: P-1		
ENGINEERING AND TESTING SERVICES, INC.		Figure P-1
Virginia Beach, VA		

Tested By: MM Checked By: C. NABHAN, PE

MOISTURE DENSITY RELATIONSHIP CURVE



Test specification: ASTM D 698-12 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
1-2	SM	A-4(0)	16.5	2.6	20	3	1.1	44.2

TEST RESULTS		MATERIAL DESCRIPTION
Maximum dry density = 115.2 pcf		TAN BROWN, MOIST, SILTY SAND (SM), TRACE CLAY
Optimum moisture = 12.9 %		
Project No. ETS-19E100 Client: MICHAEL D. SIFEN, INC. Project: 4091 IRON BOUND RD. Date: 1/9/2019 Sample Number: P-3		Remarks: SAMPLE WAS COLLECTED ON 1/7/2019
ENGINEERING AND TESTING SERVICES, INC.		
Virginia Beach, VA		

Figure P-3

Figure P-3

Tested By: MM _____ Checked By: C. NABHAN, PE _____

APPENDIX VI – CALIFORNIA BEARING RATIO GRAPHS

ENGINEERING & TESTING SERVICES, INC.

California Bearing Ratio Test Report

1/14/2019

Checked By: C. NABHAN, PE

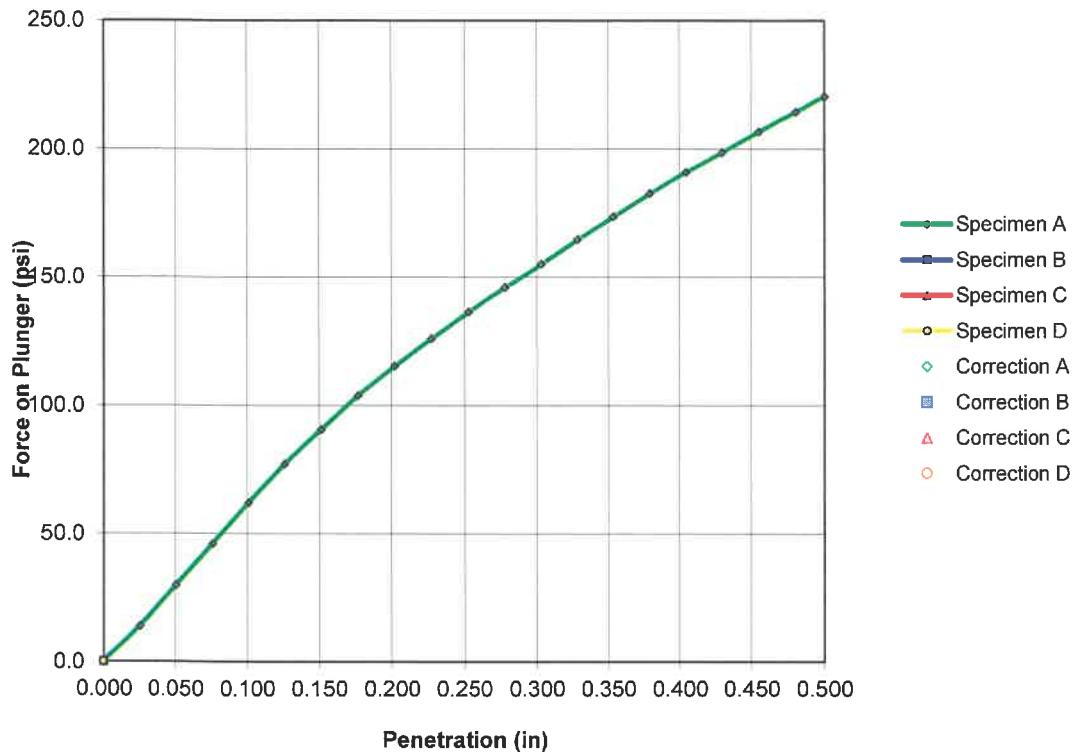
1/14/2019

Computed By: M. Maranton

ETS Soils Lab 1/10/2019

Tested By:

Load Penetration Curve



Project Information

Project Number	ETS-19E100
Project Name	4091 IRON BOUND RD.
Project Location	JAMES CITY COUNTY, VA
Test Date	1/14/2019
Client	SIFEN, INC.

Test Results

Measurements	CBR Results	Density Data
0.1 in Pen.	6.2	Compaction Type
0.2 in Pen.	7.7	Test Standard
Moisture (%)	16.1	Max Dry Density (PCF)
Dry Dens (pcf)	110.5	Optimum Moisture (%)

Project Data

Test Variables

Sample Number	P-1	LL/PI	32 / 11
		% FINES	48.4

Remarks: **TAN BROWN, MOIST, CLAYEY SAND (SC)**
Other laboratory tests conducted in accordance with ASTM D422, D698, D1883, D2216, D2487 and D2488.

ENGINEERING & TESTING SERVICES, INC.

California Bearing Ratio Test Report

1/14/2019

Checked By: C. NABHAN, PE

1/14/2019

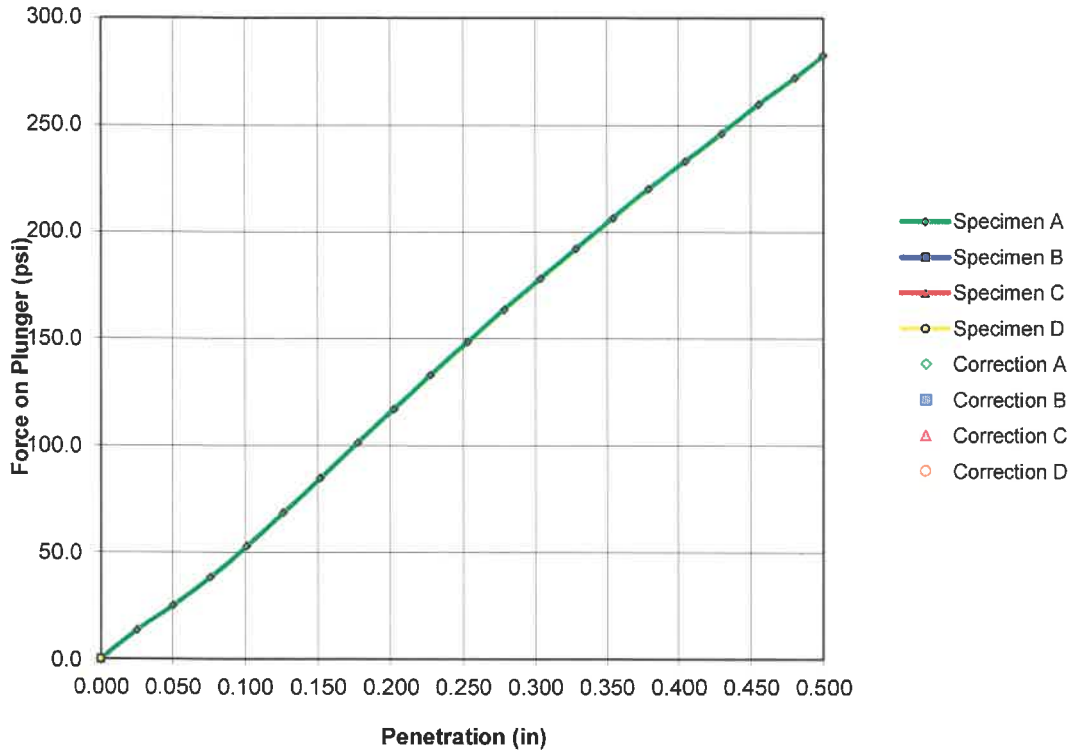
Computed By: M. Maranton

1/10/2019

ETS Soils Lab

Tested By:

Load Penetration Curve



Project Information

Project Number	ETS-19E100
Project Name	4091 IRON BOUND RD.
Project Location	JAMES CITY COUNTY, VA
Test Date	1/14/2019
Client	SIFEN, INC.

Test Results

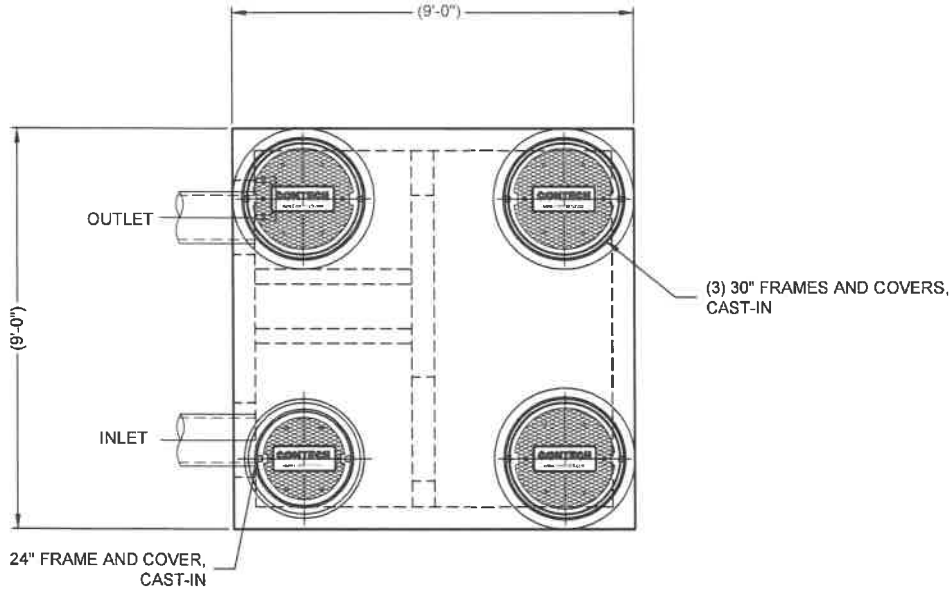
Measurements	CBR Results	Density Data
0.1 in Pen.	5.3	Compaction Type
0.2 in Pen.	7.8	Test Standard
Moisture (%)	11.9	Max Dry Density (PCF)
Dry Dens (pcf)	117.0	Optimum Moisture (%)

Project Data	Test Variables
Sample Number	LL/PI
	% FINES

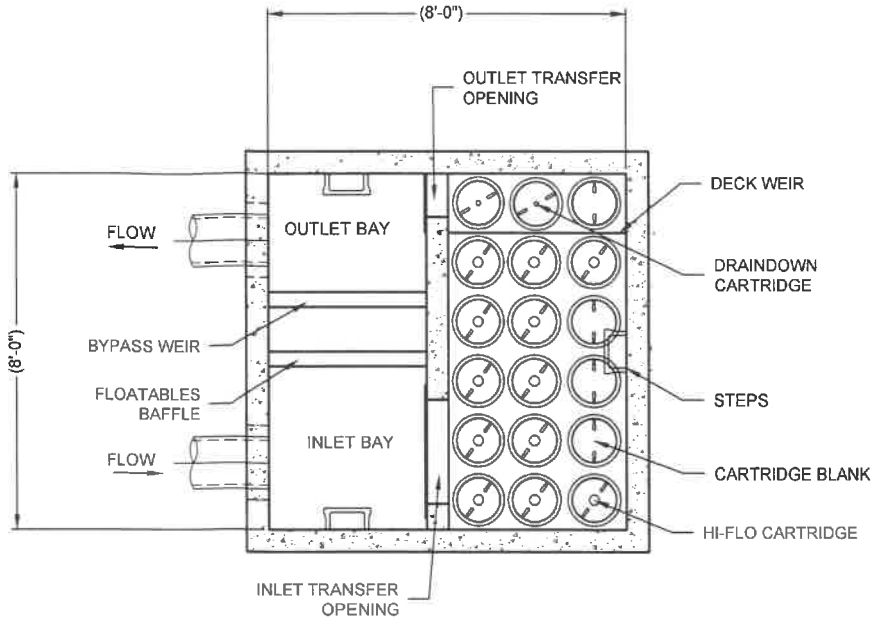
Remarks	TAN BROWN, MOIST, SILTY SAND (SM), TRACE CLAY
	Other laboratory tests conducted in accordance with ASTM D422, D698, D1883, D2216, D2487 and D2488.

6. JELLYFISH FILTER DETAILS

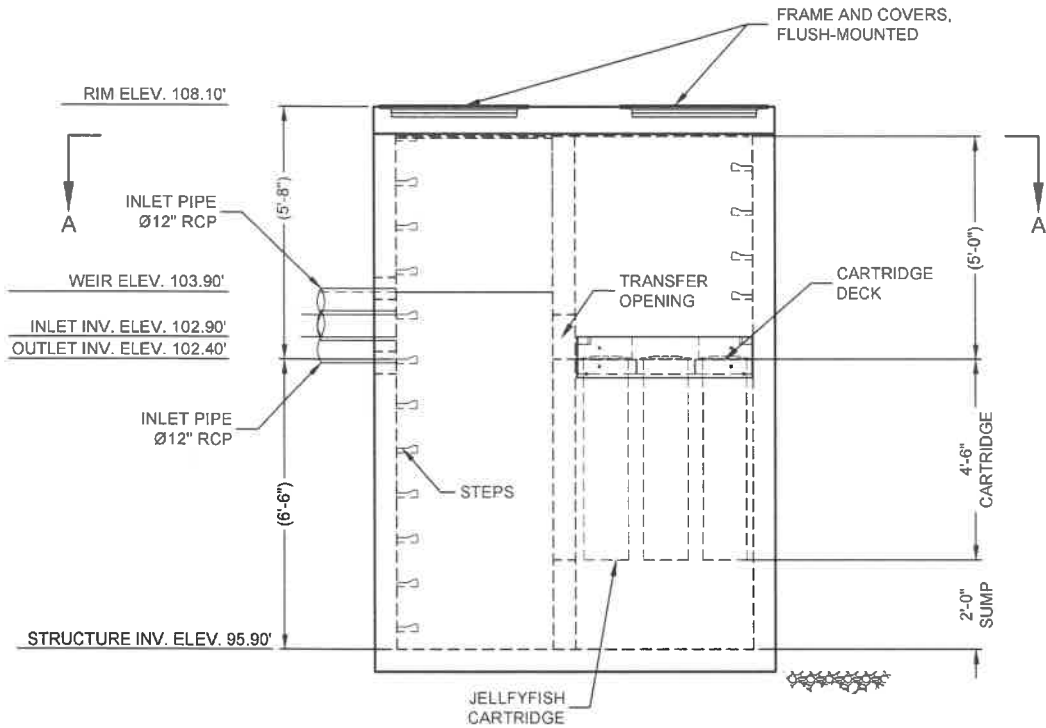
I:\MERLIN\PROJECTS\ACTIVE\150006\12548-10-JELLYFISH\DRAWINGS\PROPOSAL\12548-10_JFPD0808-PROPOSAL.DWG 6/4/2019 2:59 PM



PLAN VIEW



SECTION A-A



ELEVATION

MATERIAL LIST - PROVIDED BY CONTECH

COUNT	DESCRIPTION	INSTALLED BY
12	54" HI-FLO CARTRIDGE (70mm ORIFICE)	CONTECH
2	54" DRAINDOWN CARTRIDGE (35mm ORIFICE)	CONTECH
4	CARTRIDGE BLANK (NO ORIFICE)	CONTECH
1	VAULT JELLYFISH DECK	CONTECH
2	TRANSFER HOLE COVERS	CONTECH
1	JOINT SEALANT	CONTRACTOR
1	Ø24" x 4" EJIW #41600306, OR EQUIVALENT FRAME AND COVER	CONTRACTOR
3	Ø30" x 4" EJIW #41600484, OR EQUIVALENT FRAME AND COVER	CONTRACTOR
16 PLCS	STEPS, P10CTS LANE LADDER, OR EQUIVALENT	CONTECH

SITE DESIGN DATA

WATER QUALITY	2.26 CFS
FLOW RATE	
PEAK FLOW	TBD
RATE	
RETURN PERIOD	10 YRS
OF PEAK FLOW	

GENERAL NOTES:

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. WWW.ContechES.COM
- JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
- STRUCTURE SHALL MEET AASHTO HS-20, ASSUMING EARTH COVER OF 0', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
- STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES

- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SEPCIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
- CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
- CARTRIDGE INSTALLATION, BY CONTECH, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION AT (866) 740-3318.
- CONTRACTOR TO REMOVE THE TRANSFER HOLE COVERS WHEN THE SYSTEM IS BROUGHT ONLINE.

STRUCTURE WEIGHT

APPROXIMATE HEAVIEST PICK = T.B.D. LBS.

CONTECH
PROPOSAL
DRAWING

PEAK DIVERSION JELLYFISH FILTER

JFPD0808 - 612548-10

IRONBOUND SELF-STORAGE

JAMES CITY COUNTY, VA

for SYSTEM: JELLYFISH

CONTECH
ENGINEERED SOLUTIONS LLC

www.conteches.com

11835 NE Glenn Wildlife Drive, Portland, OR 97220

800-548-4667 503-240-3393 800-561-1271 FAX

Jellyfish® Filter

THE PRODUCT IS A REGISTERED TRADEMARK OF THE FOLLOWING INTERNATIONAL PATENT OFFICES

DATE:

06/04/19

DESIGNED:

YI

CHECKED:

YI

APPROVED:

PROJECT NUMBER:

612548

SHEET:

SHEET_NO. 1

GILL

The design and information shown on this drawing is provided as a service to the project owner, engineer or contractor by Contech Engineered Solutions LLC (Contech). Contech is not responsible for the use or misuse of this information in any manner, without the prior written consent of Contech. Failure to obtain the prior written consent of Contech may result in Contech being held liable for damages, including but not limited to, Contech's reasonable attorneys' fees and costs. Contech expressly disclaims any liability or responsibility for such use.

If discrepancies between the supplied information upon which the drawing is based and actual field conditions are encountered as site work progresses, the contractor shall be responsible to Contech for the necessary modifications to the drawing. Contech accepts no liability for designs based on misleading, incomplete or inaccurate information supplied by others.

CONTECH[®]

ENGINEERED SOLUTIONS

Project Name: Ironbound Self-Storage

Site Designation: Jellyfish

Date: 5/30/19

County or Independent City: James City

Design Engineer: YI

State: VA

Flow Based Data:

Peak Design Flow (cfs)

TBD

Water Quality Flow (cfs)

2.26

Annual Rainfall (inches)

43

Total Drainage Area, A (ac)

2.18

Post Development Impervious Area, A_i (ac)

1.29

Pervious Area, A_p (ac)

0.89

Impervious Runoff Coefficient, R_v

0.95

Pervious Runoff Coefficient, R_v

0.25

% Impervious

59%

Runoff Coefficient, R_c

0.66

Flow Based Filter Sizing:

Filter Type

Jellyfish

Structure Type

Peak Diversion

Cartridge Length

54"

Hi-Flo Cartridges Required

12

Draindown Cartridges Required

2

Recommended Model

8'x8' Peak Diversion

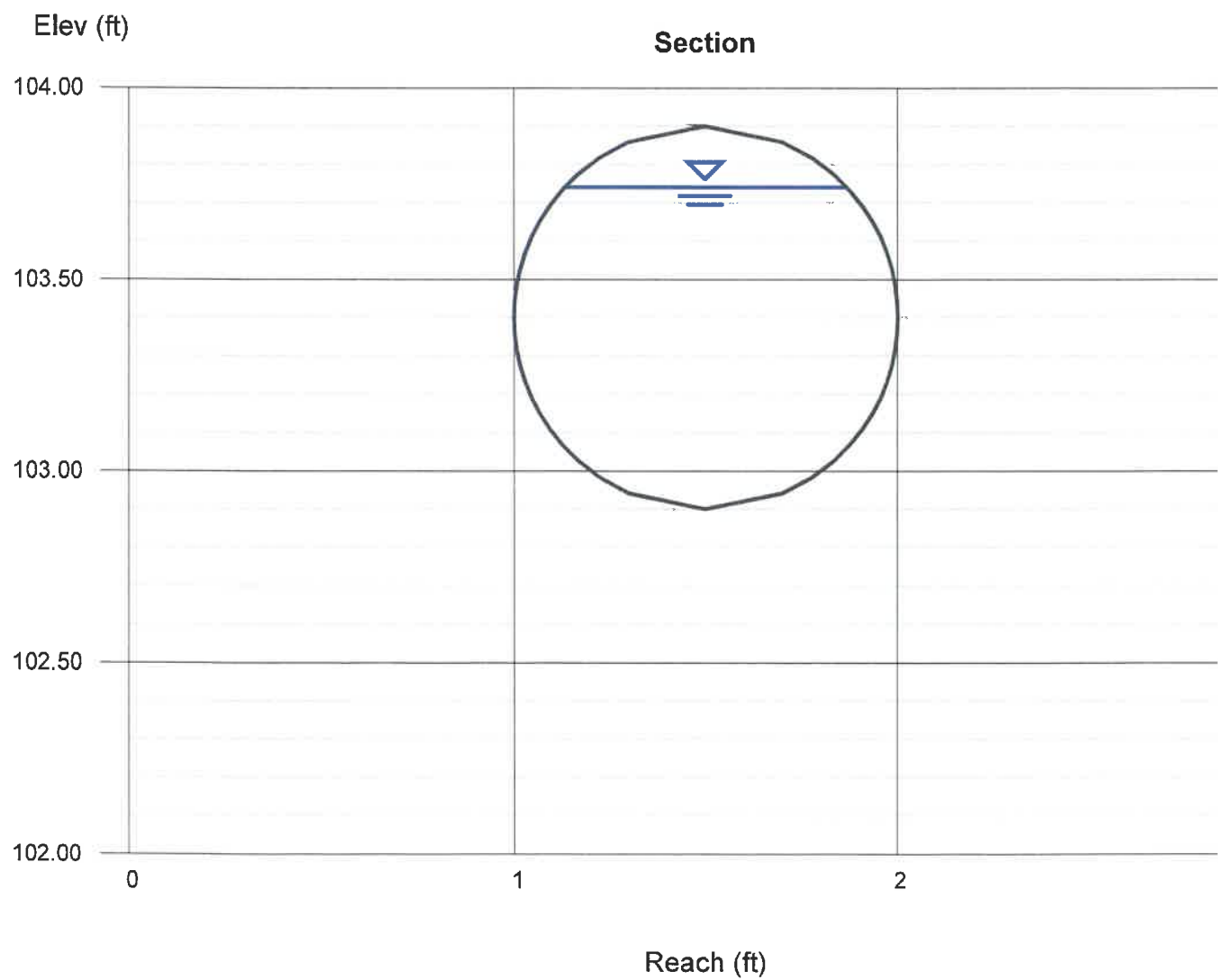
Maximum Water Quality Flow

2.32 cfs

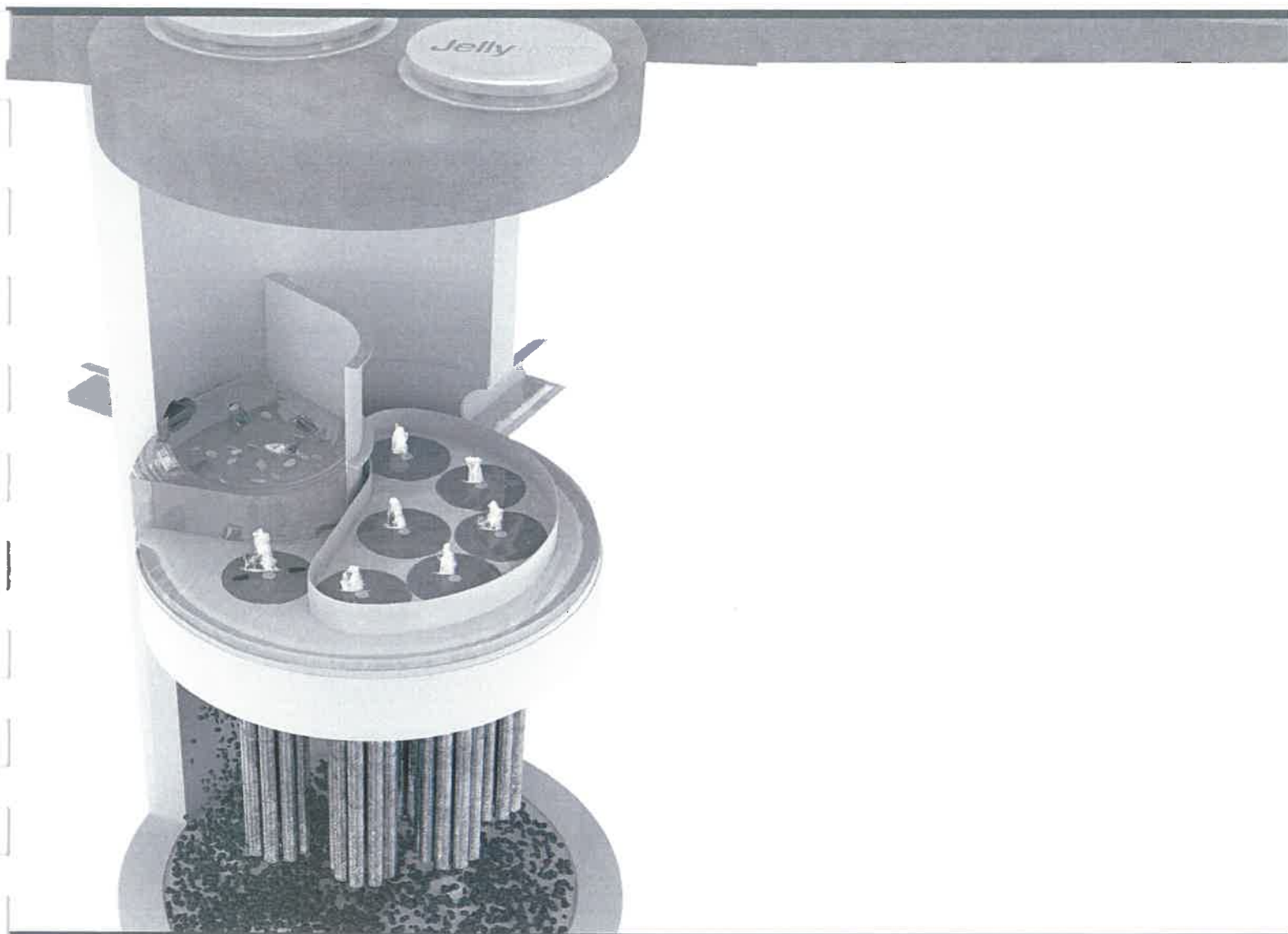
Channel Report

12in. HDPE to JELLYFISH FILTER

Circular		Highlighted	
Diameter (ft)	= 1.00	Depth (ft)	= 0.84
		Q (cfs)	= 2.260
		Area (sqft)	= 0.70
Invert Elev (ft)	= 102.90	Velocity (ft/s)	= 3.21
Slope (%)	= 0.28	Wetted Perim (ft)	= 2.32
N-Value	= 0.011	Crit Depth, Yc (ft)	= 0.65
		Top Width (ft)	= 0.73
		EGL (ft)	= 1.00
Calculations			
Compute by:	Known Q		
Known Q (cfs)	= 2.26		



JellyFish® Filter Maintenance Guide



Jellyfish®



JELLYFISH® FILTER MANHOLE CONFIGURATIONS INSPECTION & MAINTENANCE GUIDE

TABLE OF CONTENTS

Inspection and Maintenance Overview	3
Inspection Procedure.....	4
Maintenance Procedure.....	4
Cartridge Assembly & Cleaning.....	5
Jellyfish Filter & Components.....	6
Inspection Process	7

1.0 Inspection and Maintenance Overview

The primary purpose of the Jellyfish® Filter is to capture and remove pollutants from stormwater runoff. As with any filtration system, these pollutants must be removed to maintain the filter's maximum treatment performance. Regular inspection and maintenance are required to insure proper functioning of the system.

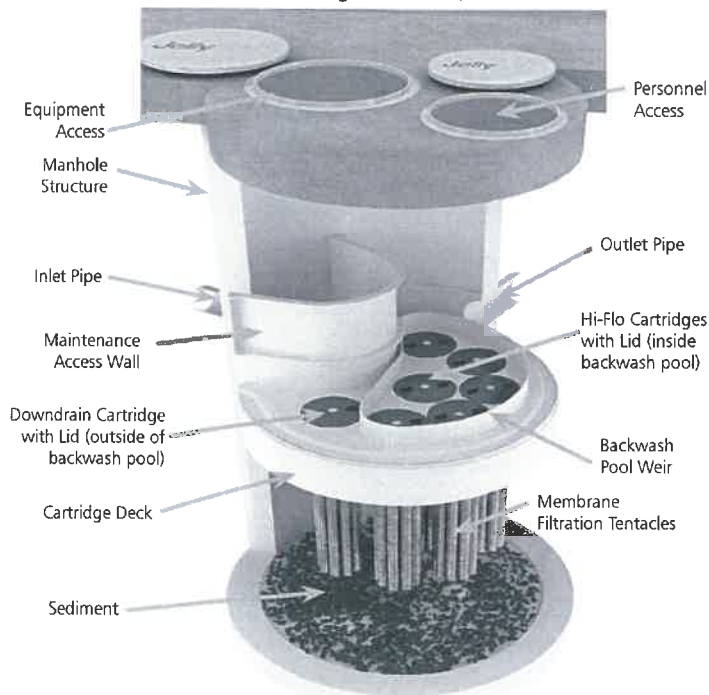
Maintenance frequencies and requirements are site specific and vary depending on pollutant loading. Additional maintenance activities may be required in the event of non-storm event runoff, such as base-flow or seasonal flow, an upstream chemical spill or due to excessive sediment loading from site erosion or extreme runoff events. It is a good practice to inspect the system after major storm events.

Inspection activities are typically conducted from surface observations and include:

- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW)

Maintenance activities typically include:

- Removal of oil, floatable trash and debris
- Removal of collected sediments
- Rinsing and re-installing the filter cartridges
- Replace filter cartridge tentacles, as needed



2.0 Inspection Timing

Inspection of the Jellyfish Filter is key in determining the maintenance requirements for, and to develop a history of the site's pollutant loading characteristics. In general, inspections should be performed at the times indicated below; or *per the approved project stormwater quality documents (if applicable), whichever is more frequent.*

1. Post-construction inspection is required prior to putting the Jellyfish Filter into service. All construction debris or construction-related sediment within the device must be removed, and any damage to system components repaired, before installing the filter cartridges.
2. A minimum of two inspections during the first year of operation to assess the sediment and floatable pollutant accumulation, and to ensure proper functioning of the system.
3. Inspection frequency in subsequent years is based on the inspection and maintenance plan developed in the first year of operation. Minimum frequency should be once per year.
4. Inspection is recommended after each major storm event.
5. Inspection is required immediately after an upstream oil, fuel or other chemical spill.

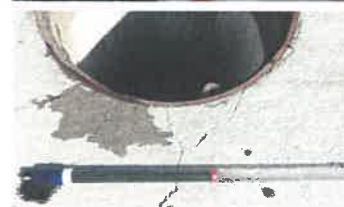
3.0 Inspection Procedure

The following procedure is recommended when performing inspections:

1. Provide traffic control measures as necessary.
2. Inspect the MAW for floatable pollutants such as trash, debris, and oil sheen.
3. Measure oil and sediment depth in several locations, by lowering a sediment probe through the MAW opening until contact is made with the floor of the structure. Record sediment depth, and presences of any oil layers.
4. Inspect cartridge lids. Missing or damaged cartridge lids to be replaced.
5. Inspect the MAW, cartridge deck, and backwash pool weir, for cracks or broken components. If damaged, repair is required.

3.1 Dry weather inspections

- Inspect the cartridge deck for standing water, and/or sediment on the deck.
- No standing water under normal operating conditions.
- Standing water inside the backwash pool, but not outside the backwash pool indicates that the filter cartridges need to be rinsed.



Inspection Utilizing Sediment Probe

- Standing water outside the backwash pool may indicate a backwater condition caused by high water elevation in the receiving water body, or possibly a blockage in downstream infrastructure.
- Any appreciable sediment ($\geq 1/16"$) accumulated on the deck surface should be removed.

3.2 Wet weather inspections

- Observe the rate and movement of water in the unit. Note the depth of water above deck elevation within the MAW.
- Less than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges (i.e. cartridges located outside the backwash pool).
- Greater than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges and each of the hi-flo cartridges (i.e. cartridges located inside the backwash pool), and water should be overflowing the backwash pool weir.
- 18 inches or greater and relatively little flow is exiting the cartridge lids and outlet pipe, this condition indicates that the filter cartridges are occluded with sediment and need to be rinsed

4.0 Maintenance Requirements

Required maintenance for the Jellyfish Filter is based upon results of the most recent inspection, historical maintenance records, or the site specific water quality management plan; whichever is more frequent. In general, maintenance requires some combination of the following:

1. Sediment removal for depths reaching 12 inches or greater, or within 3 years of the most recent sediment cleaning, whichever occurs sooner.
2. Floatable trash, debris, and oil removal.
3. Deck cleaned and free from sediment.
4. Filter cartridges rinsed and re-installed as required by the most recent inspection results, or within 12 months of the most recent filter rinsing, whichever occurs sooner.
5. Replace tentacles if rinsing does not restore adequate hydraulic capacity, remove accumulated sediment, or if damaged or missing. It is recommended that tentacles should remain in service no longer than 5 years before replacement.
6. Damaged or missing cartridge deck components must be repaired or replaced as indicated by results of the most recent inspection.
7. The unit must be cleaned out and filter cartridges inspected immediately after an upstream oil, fuel, or chemical spill. Filter cartridge tentacles should be replaced if damaged or compromised by the spill.

5.0 Maintenance Procedure

The following procedures are recommended when maintaining the Jellyfish Filter:

1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures.
3. Caution: Dropping objects onto the cartridge deck may cause damage.

4. Perform Inspection Procedure prior to maintenance activity.
5. To access the cartridge deck for filter cartridge service, descend the ladder and step directly onto the deck. Caution: Do not step onto the maintenance access wall (MAW) or backwash pool weir, as damage may result. Note that the cartridge deck may be slippery.
6. Maximum weight of maintenance crew and equipment on the cartridge deck not to exceed 450 lbs.

5.1 Filter Cartridge Removal

1. Remove a cartridge lid.
2. Remove cartridges from the deck using the lifting loops in the cartridge head plate. Rope or a lifting device (available from Contech) should be used. Caution: Should a snag occur, do not force the cartridge upward as damage to the tentacles may result. Wet cartridges typically weigh between 100 and 125 lbs.
3. Replace and secure the cartridge lid on the exposed empty receptacle as a safety precaution. Contech does not recommend exposing more than one empty cartridge receptacle at a time.

5.2 Filter Cartridge Rinsing

1. Remove all 11 tentacles from the cartridge head plate. Take care not to damage or break the plastic threaded nut or connector.
2. Position tentacles in a container (or over the MAW), with the



Cartridge Removal & Lifting Device



threaded connector (open end) facing down, so rinse water is flushed through the membrane and captured in the container.

3. Using the Jellyfish rinse tool (available from Contech) or a low-pressure garden hose sprayer, direct water spray onto the tentacle membrane, sweeping from top to bottom along the length of the tentacle. Rinse until all sediment is removed from the membrane. Caution: Do not use a high pressure sprayer or focused stream of water on the membrane. Excessive water pressure may damage the membrane.

4. Collected rinse water is typically removed by vacuum hose.
5. Reattach tentacles to cartridge head plate. Reuse O-rings and nuts, ensuring proper placement on each tentacle.

5.3 Cleaning Procedure

1. Perform vacuum cleaning of the Jellyfish Filter only after filter cartridges have been removed from the system. Access the lower chamber for vacuum cleaning only through the maintenance access wall (MAW) opening, being careful not to damage the flexible plastic separator skirt that is attached to the underside of the deck. The separator skirt surrounds the filter cartridge zone, and could be torn if contacted by the wand. Do not lower the vacuum wand through a cartridge receptacle, as damage to the receptacle will result.
2. Vacuum floatable trash, debris, and oil, from the MAW opening. Alternatively, floatable solids may be removed by a net or skimmer.



Tentacle Rinse Using Jellyfish Rinse Tool

3. Pressure wash cartridge deck and receptacles to remove all sediment and debris. Sediment should be rinsed into the sump area. Take care not to flush rinse water into the outlet pipe.
4. Remove water from the sump area. Vacuum or pump equipment should only be introduced through the MAW.
5. Remove the sediment from the bottom of the unit through the MAW opening.



Vacuuming Sump Through MAW

6. For larger diameter Jellyfish Filter manholes (≥ 8 -ft) and vaults without an MAW opening, complete sediment removal may be facilitated by removing a cartridge lid from an empty receptacle and inserting a jetting wand (not a vacuum wand) through the receptacle. Use the sprayer to rinse loosened sediment toward the vacuum hose in the MAW opening, being careful not to damage the receptacle.

7. After the unit is clean, re-fill the lower chamber with water if required by the local jurisdiction, and re-install filter cartridges.
8. Dispose of sediment, floatable trash and debris, oil, spent tentacles, and water according to local regulatory requirements.

5.4 Filter Cartridge Replacement

1. Cartridges should be installed after the deck has been cleaned. It is important that the receptacle surfaces be free from grit and debris.
2. If rinsing is ineffective in removing sediment from the tentacles, or if tentacles are damaged, provisions must be made to replace the spent or damaged tentacles with new tentacles. Contact Contech to order replacement tentacles.
3. Lower filter cartridge to the cartridge deck. Remove cartridge lid from deck and carefully lower the filter cartridge into the receptacle until head plate gasket is seated squarely in receptacle. Caution: Should a snag occur when lowering the cartridge into the receptacle, do not force the cartridge downward; damage may occur.
4. Replace the cartridge lid and check fit before completing rotation to a firm hand-tight attachment.

5.5 Chemical Spills

Caution: If a chemical spill has been captured, do not attempt maintenance. Immediately contact the local hazard response agency and contact Contech.

6.0 Related Maintenance Activities

Jellyfish units are often just one of many structures in a more comprehensive stormwater drainage and treatment system.

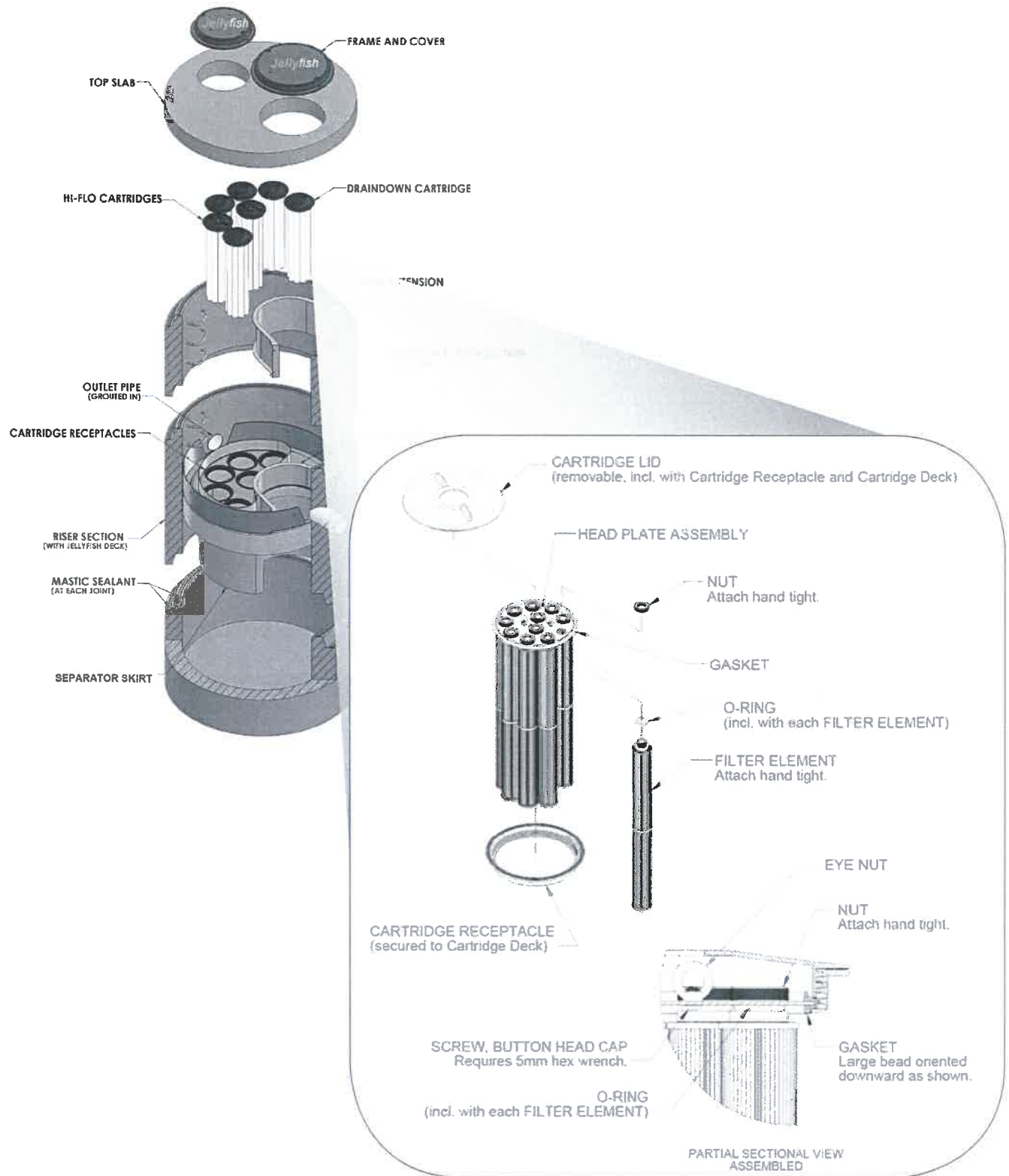
In order for maintenance of the Jellyfish filter to be successful, it is imperative that all other components be properly maintained. The maintenance and repair of upstream facilities should be carried out prior to Jellyfish maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.

7.0 Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads. Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.

Jellyfish Filter Components & Filter Cartridge



Jellyfish Filter Inspection and Maintenance Log

Owner:				Jellyfish Model No:		
Location:				GPS Coordinates:		
Land Use:	Commercial:		Industrial:		Service Station:	
	Roadway/Highway:		Airport:		Residential:	

Date/Time:						
Inspector:						
Maintenance Contractor:						
Visible Oil Present: (Y/N)						
Oil Quantity Removed:						
Floatable Debris Present: (Y/N)						
Floatable Debris Removed: (Y/N)						
Water Depth in Backwash Pool						
Draindown Cartridges externally rinsed and recommissioned: (Y/N)						
New tentacles put on Cartridges: (Y/N)						
Hi-Flo Cartridges externally rinsed and recommissioned: (Y/N)						
New tentacles put on Hi-Flo Cartridges: (Y/N)						
Sediment Depth Measured: (Y/N)						
Sediment Depth (inches or mm):						
Sediment Removed: (Y/N)						
Cartridge Lids intact: (Y/N)						
Observed Damage:						
Comments:						



Jellyfish®

CONTECH
ENGINEERED SOLUTIONS

Support

- Drawings and specifications are available at ContechES.com/jellyfish.
- Site-specific design support is available from Contech Engineered Solutions.

800.338.1122
www.ContechES.com

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Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater, wastewater treatment and earth stabilization products. For information on other Contech segment offerings, visit ContechES.com or call 800.338.1122

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Jellyfish Maintenance DRAFT 2/17

7. DRAINAGE AREA MAPS

7. Reports

8. Correspondence

**Community Development**

101-A Mounts Bay Road

P.O. Box 8784

Williamsburg, VA 23187-8784

P: 757-253-6671

F: 757-253-6822

community.development@jamescitycountyva.gov

jamescitycountyva.gov**Building Safety & Permits**

757-253-6620

Neighborhood Development

757-253-6640

Planning

757-253-6685

Zoning

757-253-6671

August 5, 2021

Ms. Ashley Smith
Site Improvement Associates, Inc.
800 Juniper Crescent, Unit A
Chesapeake, VA 23320

Re: SP-21-0072, 4091 Ironbound Road Self-Storage Facility Landscape Amendment

Ms. Smith,

I am pleased to inform you that your site plan received final approval on **August 5, 2021**. Enclosed are two copies of the stamped final approval drawing for your files. It is the applicant's responsibility to provide a signed copy of the approved site plan to the Building Safety and Permits Division when the application for a building permit is submitted.

Final approval of the site plan shall expire five years after the date of approval. During that period all permits shall be obtained or the development shall be put into use. When the permits have been issued, the site plan approval shall run concurrently with the permits' term of validity for only those uses and improvements covered by the permits. All work shall be completed in the manner and location indicated upon the approved plan. Modifications shall be approved in advance by the Zoning Administrator.

Sincerely,

Paul D. Holt, III, AICP, CNU-A, CFM

Director of Community Development and Planning

Contech Activation Letter - Jellyfish

Core & Main LP#558
Attn: Dave Huber
224 Industrial Blvd
Toano, VA 23168

September 1, 2021

Project Name: Ironbound Self Storage
Project Jurisdiction: Williamsburg City, VA

Huber,

This 2 page letter should be used as official notification to your local jurisdiction with regard to the activation of your Jellyfish Systems.

Please be advised that after installation (not by Contech), the Jellyfish stormwater treatment units were activated on 08/31/2021. Activation refers to bringing the unit into operation by installing the filter cartridges.

The second page of this letter contains a list of each Jellyfish unit that is covered by this activation letter.

Please feel free to contact me if any additional information is needed.

Sincerely,



Tony Williams
Activation and Maintenance Coordinator
Contech Engineered Solutions, LLC

Contech Activation Letter - Jellyfish

Contech hereby confirms that the following units were supplied to the subject project as per the approved plans:

Unit # JF JFPD 8x8-12-2



General Services
107 Tewning Road
Williamsburg, VA 23188
P: 757-259-4080
General.Services@jamescitycountyva.gov
jamescitycountyva.gov

Capital Projects 107 Tewning Road Williamsburg, VA 23188 757-259-4080	Fleet 103 Tewning Road Williamsburg, VA 23188 757-259-4122	Stormwater and Resource Protection 101-E Mounts Bay Road Williamsburg, VA 23185 757-253-6670	Facilities & Grounds 113 Tewning Road Williamsburg, VA 23188 757-259-4080	Solid Waste 1204 Jolly Pond Road Williamsburg, VA 23188 757-565-0971
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December 1, 2021

Sifen Inc.
Ashley Dickerson
2700 International Parkway, Suite 100
Virginia Beach, VA 23452

Sifen Inc.
Tony O'Toole
2929 Sabre St. Suite 500
Virginia Beach, VA 23452

RE: 4091 Ironbound Rd. Mini Storage
SP-19-0016 Final Asbuilt Package
Approval for FASB-21-0014

The Final Stormwater As-built case is approved by the Stormwater and Resource Protection Division (VESCH/VSMP Authority). Conditions of the approval are listed below.

- This approval acknowledges that the site stormwater was installed in reasonable conformance with the approved plan and that areas requiring repair or final stabilization are acceptable.
- Items approved as part of the FASB review include:
 - Storm system and stormwater facility record drawing dated 09/20/2021 by R.L. Galloway Surveying.
 - Construction certification form signed and dated 09/09/2021 by Site Improvement Associates, Inc.
 - Proof of activation letter for Jellyfish System signed and dated 09/01/2021 by Contech Engineered Solutions.
 - Punch list items noted for field correction inspected and approved 11/30/2021 by JCC staff.
- This approval does not indicate final release of sureties associated with the project as full surety review involves various agencies who may have outstanding issues with the project.

Please contact our offices with any questions or concerns regarding the conditions noted. Bonding, surety, and permitting process questions are most appropriately directed to Cheryl Waldren or Joseph Buchite. Staff contact information is listed below for your convenience.

Sincerely,



Deirdre P. Wells, P.E., CFM
Chief Civil Engineer
Deirdre.Wells@jamescitycountyva.gov
(757) 253-6702

CC: Joseph Buchite
Permitting Specialist
Joseph.Buchite@jamescitycountyva.gov
(757) 253-6643

Cheryl Waldren
Lead Stormwater Assistant
Cheryl.Waldren@jamescitycountyva.gov
(757)253-6866

9. Inspection Records

10. Miscellaneous

(ex. photos)



County Record Checklist

*Directions: Please check the type of file for scanning and check the documents enclosed in the file. Remove any budget documents, contractor financial statements or any documents with account numbers.

☐ Stormwater Projects, General Site/Subdivision (from ERP) and Stream Restoration Files

Order of Contents:

File Name:

	a.	Certification of Authenticity (placed in the file at the time of certification)
	b.	Memorandum of files approved for scanning
	c.	This checklist
<input type="checkbox"/>	1.	Maintenance Agreement
<input type="checkbox"/>	2.	Deeds/Easements/Agreements/Property Records
<input type="checkbox"/>	3.	Construction Certificate
<input type="checkbox"/>	4.	Record Drawings (As Builts)
<input type="checkbox"/>	5.	Construction Drawings
<input type="checkbox"/>	6.	Design Calculations
<input type="checkbox"/>	7.	Reports
<input type="checkbox"/>	8.	Correspondence
<input type="checkbox"/>	9.	Inspections
<input type="checkbox"/>	10.	Permitting
<input type="checkbox"/>	11.	Misc. (ex. photos)
<input type="checkbox"/>	12.	Project Development Documents

☐ Stormwater Stormwater Mangement Facilities (BMP) Files

Order of Contents:

File Name:

PC 343 PC 355

	a.	Certification of Authenticity (placed in the file at the time of certification)
	b.	Memorandum of files approved for scanning
	c.	This checklist
<input type="checkbox"/>	1.	Maintenance Agreement
<input type="checkbox"/>	2.	Deeds/Easements/Agreements/Property Records
<input type="checkbox"/>	3.	Construction Certificate
<input type="checkbox"/>	4.	Record Drawing (as-built plan)
<input type="checkbox"/>	5.	Construction Drawings
<input checked="" type="checkbox"/>	6.	Design Calculations
<input type="checkbox"/>	7.	Reports
<input type="checkbox"/>	8.	Correspondence
<input type="checkbox"/>	9.	Inspection Records
<input checked="" type="checkbox"/>	10.	Misc. (ex. photos)



General Services
107 Tewning Road
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P: 757-259-4080
General.Services@jamescitycountyva.gov
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Capital Projects
107 Tewning Road
Williamsburg, VA 23188
757-259-4080

Fleet
103 Tewning Road
Williamsburg, VA 23188
757-259-4122

**Stormwater and
Resource Protection**
101-E Mounts Bay Road
Williamsburg, VA 23185
757-253-6670

Facilities & Grounds
113 Tewning Road
Williamsburg, VA 23188
757-259-4080

Solid Waste
1204 Jolly Pond Road
Williamsburg, VA 23188
757-565-0971

As-Built Project Close Out Transmittal

The attached as-built file(s) are closed out and ready for scanning.

BMP (Stormwater Docs site)

Private Streets

Storm Systems (Records Management)

Project Information:

Project Name- 4091 Ironbound Road Mini Storage

Case Number- SP-19-0016

Pin Number-

BMP Type- PC343 Infiltration Trench; PC 355 Jelly Fish Filter MTD

BMP ID- PC343 and PC355

Property Use: Subdivision **Commercial** Other ___INDUSTRIAL___

Items Included in this Submittal: Record DWGs/ Calcs/ Certifications/ DOC-IM/
Geotech/ Approved Plans& Amends/ Other ___Pictures___

Digital Files are Located at the following path:

Files are labeled for Final Asbuilt in the FASB-21-0014 case.